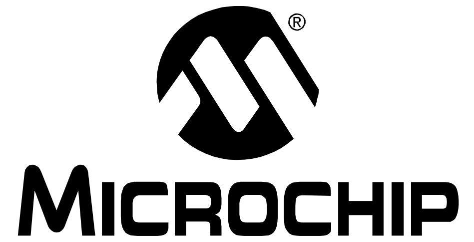

Packaging Specification

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MICROCHIP

Packaging Specification

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NOTES:

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Packaging Diagrams and Parameters

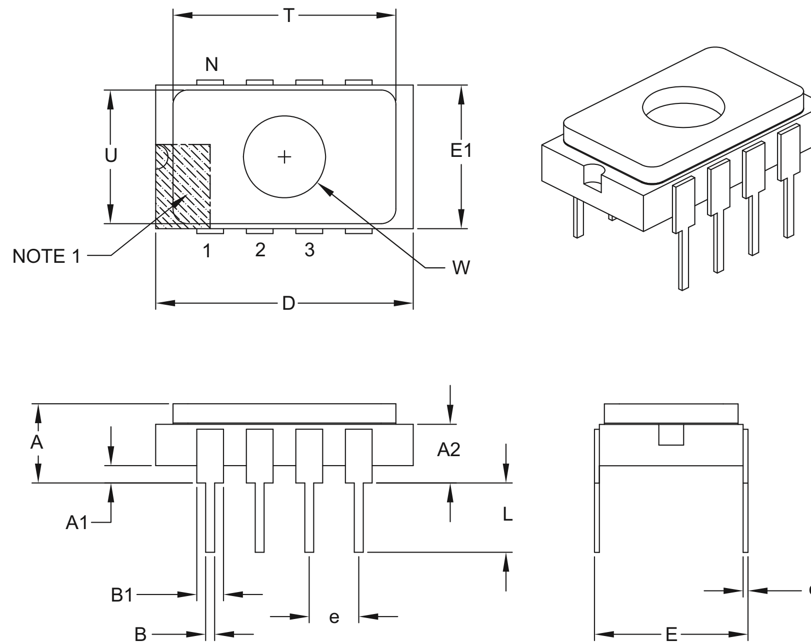
SIDEBRAZE Family

Ceramic Side Brazed Dual In-Line Packages

Packaging Diagrams and Parameters

8-Lead Ceramic Side Brazed Dual In-Line with Window (JW) – .300" Body

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	8		
Pitch	e	.100 BSC		
Top to Seating Plane	A	.085	–	.200
Top of Body to Seating Plane	A2	.103	–	.143
Standoff	A1	.025	–	.070
Package Width	E1	.280	–	.310
Overall Length	D	.500	–	.540
Tip to Seating Plane	L	.125	–	.200
Lead Thickness	c	.008	–	.015
Upper Lead Width	B1	.045	–	.065
Lower Lead Width	B	.015	–	.022
Overall Row Spacing §	E	.300	–	.325
Window Diameter	W	.161	–	.171
Lid Length	T	.440	–	.460
Lid Width	U	.260	–	.280

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include burrs and/or projections of package material. These particles shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-083B

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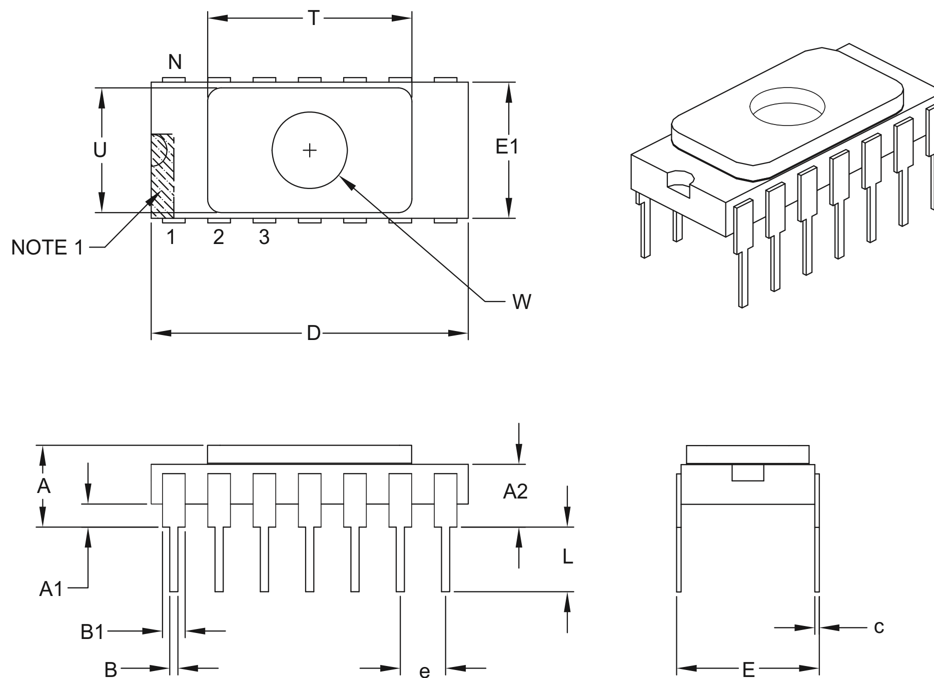
Packaging Diagrams and Parameters

14-Lead Ceramic Side Brazed Dual In-Line with Window (JW) – .300" Body

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	14		
Pitch	e	.100 BSC		
Top to Seating Plane	A	.085	–	.200
Top of Body to Seating Plane	A2	.100	–	.140
Standoff	A1	.025	–	.070
Package Width	E1	.280	–	.310
Overall Length	D	.693	–	.770
Tip to Seating Plane	L	.125	–	.200
Lead Thickness	c	.008	–	.015
Upper Lead Width	B1	.045	–	.065
Lower Lead Width	B	.015	–	.022
Overall Row Spacing §	E	.300	–	.325
Window Diameter	W	.161	–	.171
Lid Length	T	.440	–	.460
Lid Width	U	.260	–	.280

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include burrs and/or projections of package material. These particles shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

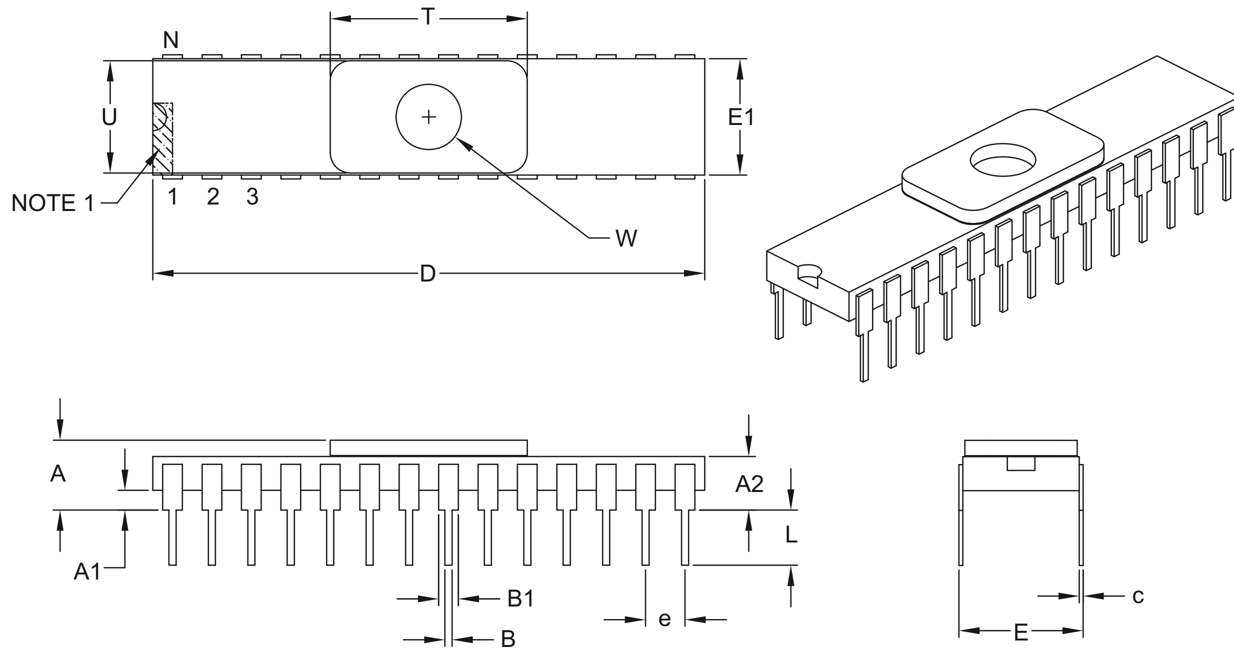
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-107B

Packaging Diagrams and Parameters

28-Lead Ceramic Side Brazed Dual In-Line with Window (JW) – .300" Body

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	28		
Pitch	e	.100 BSC		
Top to Seating Plane	A	.085	–	.200
Top of Body to Seating Plane	A2	.115	–	.155
Standoff	A1	.025	–	.070
Package Width	E1	.280	–	.310
Overall Length	D	1.380	–	1.420
Tip to Seating Plane	L	.125	–	.200
Lead Thickness	c	.008	–	.015
Upper Lead Width	B1	.045	–	.065
Lower Lead Width	B	.015	–	.022
Overall Row Spacing §	E	.300	–	.325
Window Diameter	W	.161	–	.171
Lid Length	T	.490	–	.510
Lid Width	U	.275	–	.295

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include burrs and/or projections of package material. These particles shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-084B

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Packaging Diagrams and Parameters

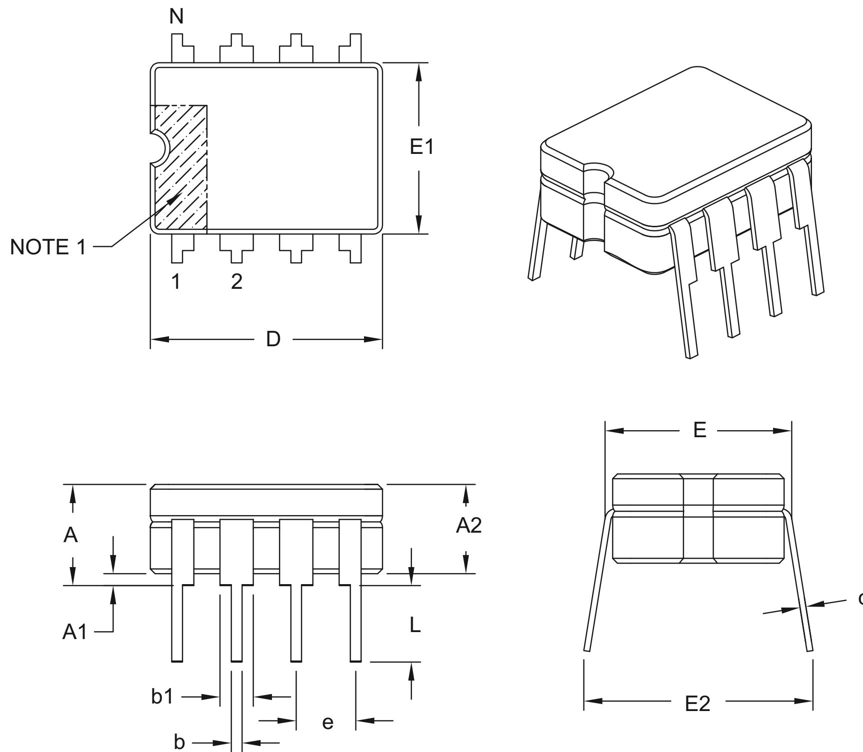
CERDIP Family

Ceramic Dual In-Line Packages

Packaging Diagrams and Parameters

8-Lead Ceramic Dual In-Line (JA) – .300" Body [CERDIP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		8	
Pitch	e		.100 BSC	
Top to Seating Plane	A	–	–	.200
Standoff §	A1	.015	–	–
Ceramic Package Height	A2	.140	–	.175
Shoulder to Shoulder Width	E	.290	–	.320
Ceramic Package Width	E1	.230	.248	.300
Overall Length	D	.370	.380	.400
Tip to Seating Plane	L	.125	–	.200
Lead Thickness	c	.008	–	.015
Upper Lead Width	b1	.045	–	.065
Lower Lead Width	b	.015	–	.023
Overall Row Spacing	E2	.314	–	.410

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-001B

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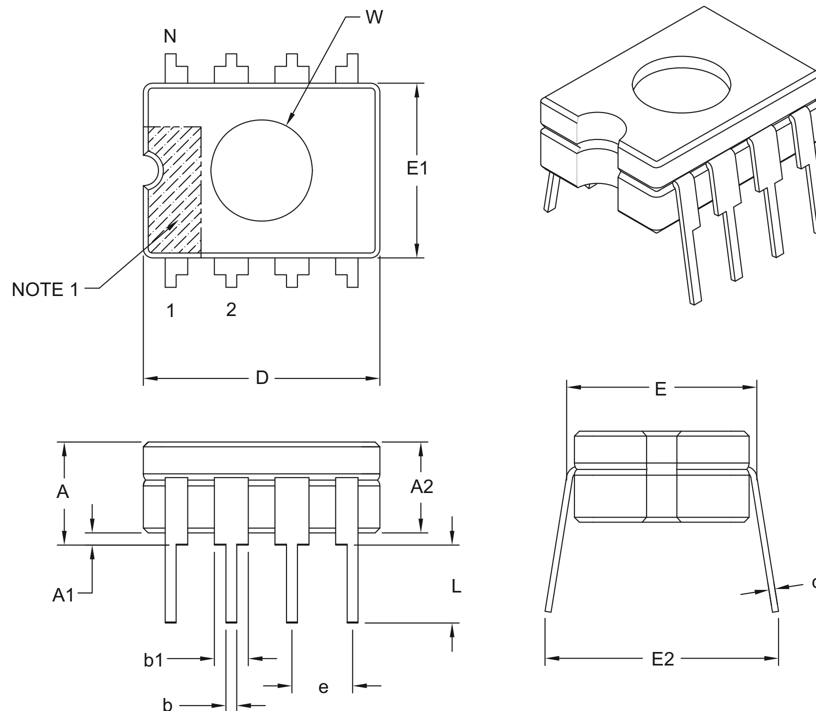
Packaging Diagrams and Parameters

8-Lead Ceramic Dual In-Line with Window (JW) – .300" Body [CERDIP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	8		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.200
Standoff §	A1	.015	–	–
Ceramic Package Height	A2	.140	–	.175
Shoulder to Shoulder Width	E	.290	–	.320
Ceramic Package Width	E1	.230	.248	.300
Overall Length	D	.370	.380	.400
Tip to Seating Plane	L	.125	–	.200
Lead Thickness	c	.008	–	.015
Upper Lead Width	b1	.045	–	.065
Lower Lead Width	b	.015	–	.023
Overall Row Spacing	E2	.314	–	.410
Window Diameter	W	.267	.270	.273

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.

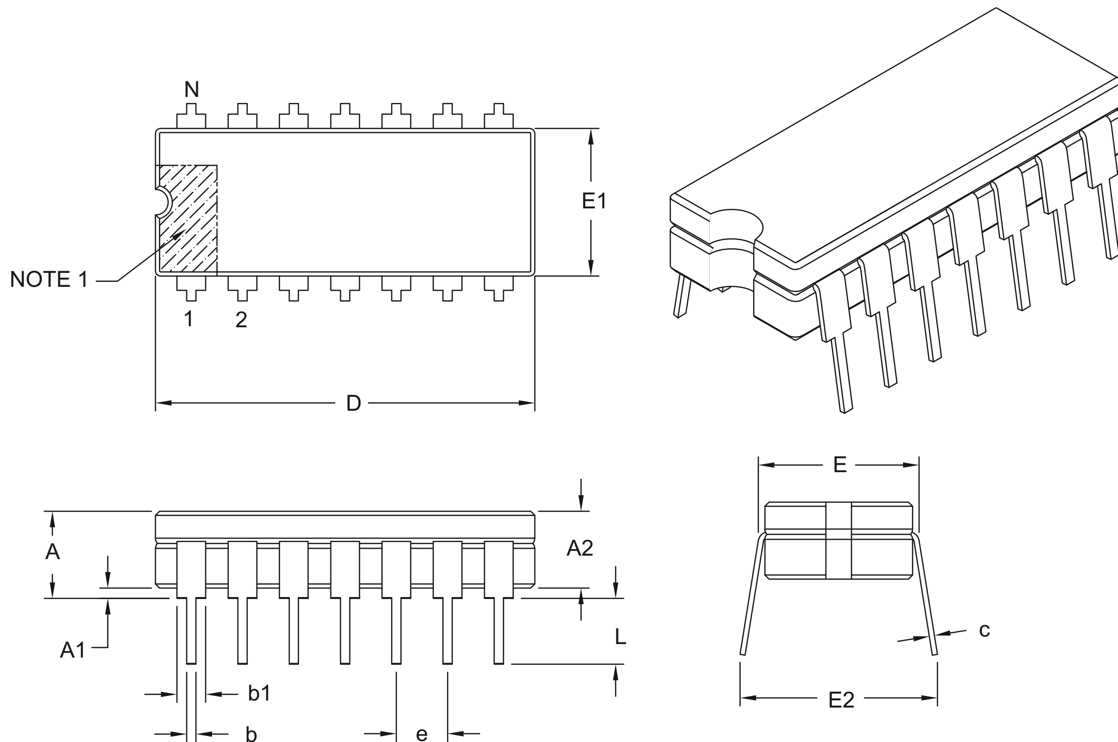
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-027B

Packaging Diagrams and Parameters

14-Lead Ceramic Dual In-Line (JD) – .300" Body [CERDIP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	14		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.200
Standoff §	A1	.015	–	–
Ceramic Package Height	A2	.140	–	.175
Shoulder to Shoulder Width	E	.290	–	.325
Ceramic Package Width	E1	.230	.288	.300
Overall Length	D	.740	.760	.780
Tip to Seating Plane	L	.125	–	.200
Lead Thickness	c	.008	–	.015
Upper Lead Width	b1	.045	–	.065
Lower Lead Width	b	.015	–	.023
Overall Row Spacing	E2	.320	–	.410

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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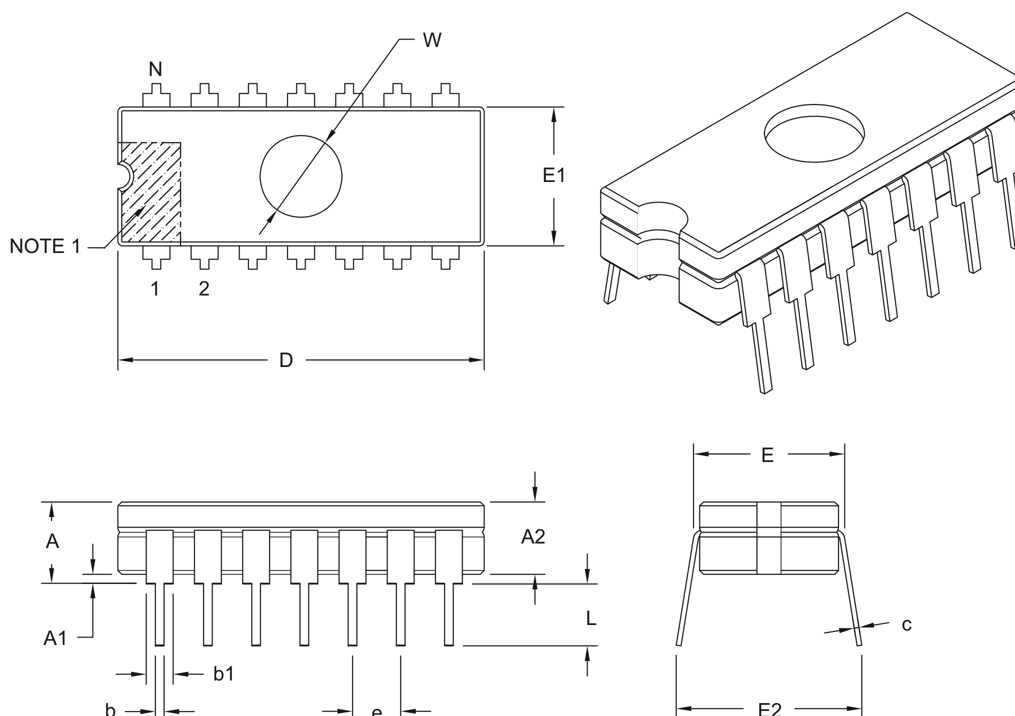
Packaging Diagrams and Parameters

14-Lead Ceramic Dual In-Line with Window (JW) – .300" Body [CERDIP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	14		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.200
Standoff §	A1	.015	–	–
Ceramic Package Height	A2	.140	–	.175
Shoulder to Shoulder Width	E	.290	–	.325
Ceramic Package Width	E1	.230	.288	.300
Overall Length	D	.740	.760	.780
Window Diameter	W	.125	.170	.210
Tip to Seating Plane	L	.125	–	.200
Lead Thickness	c	.008	–	.015
Upper Lead Width	b1	.045	–	.065
Lower Lead Width	b	.015	–	.023
Overall Row Spacing	E2	.320	–	.410

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.

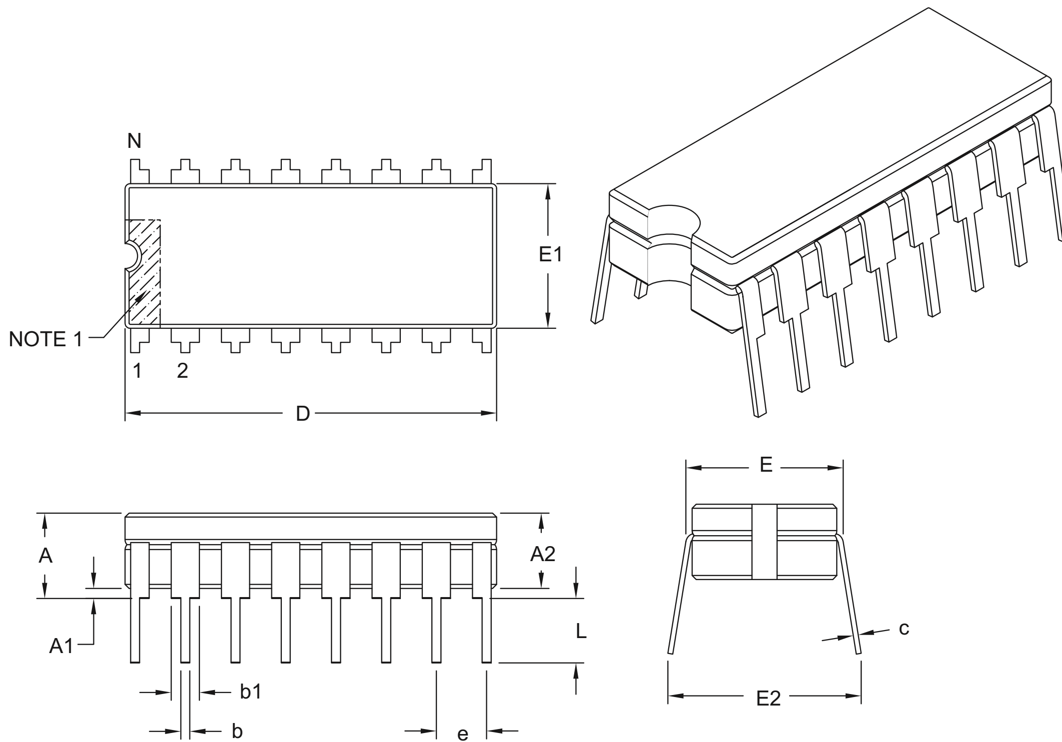
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-099B

Packaging Diagrams and Parameters

16-Lead Ceramic Dual In-Line (JE) – .300" Body [CERDIP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	16		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.200
Standoff §	A1	.015	–	–
Ceramic Package Height	A2	.140	–	.175
Shoulder to Shoulder Width	E	.290	–	.325
Ceramic Package Width	E1	.245	.288	.300
Overall Length	D	.740	.760	.780
Tip to Seating Plane	L	.125	–	.200
Lead Thickness	c	.008	–	.015
Upper Lead Width	b1	.045	–	.065
Lower Lead Width	b	.015	–	.023
Overall Row Spacing	E2	.320	–	.410

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-003B

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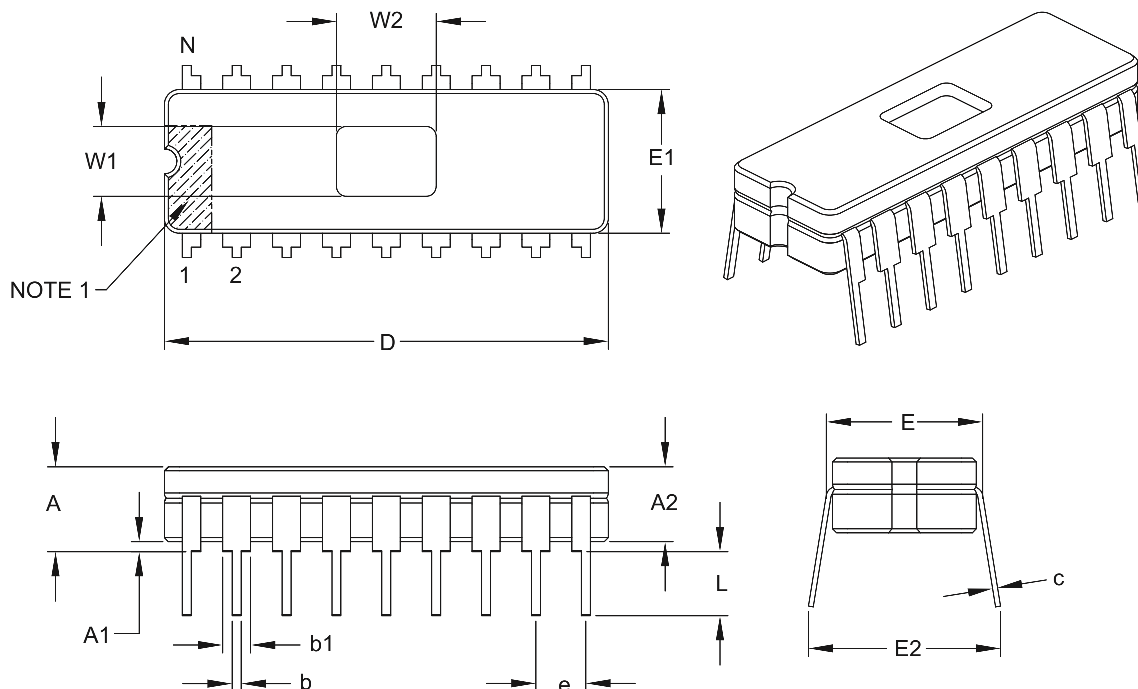
Packaging Diagrams and Parameters

18-Lead Ceramic Dual In-Line with Window (JW) – .300" Body [CERDIP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		18	
Pitch	e		.100 BSC	
Top to Seating Plane	A	–	–	.200
Ceramic Package Height	A2	.140	–	.175
Standoff §	A1	.015	–	–
Shoulder to Shoulder Width	E	.308	–	.325
Ceramic Package Width	E1	.280	.288	.296
Overall Length	D	.882	.890	.910
Tip to Seating Plane	L	.125	–	.200
Lead Thickness	c	.008	–	.014
Upper Lead Width	b1	.045	–	.065
Lower Lead Width	b	.015	–	.023
Overall Row Spacing	E2	.325	–	.410
Window Width	W1	.130	.140	.150
Window Length	W2	.190	.200	.210

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-010B

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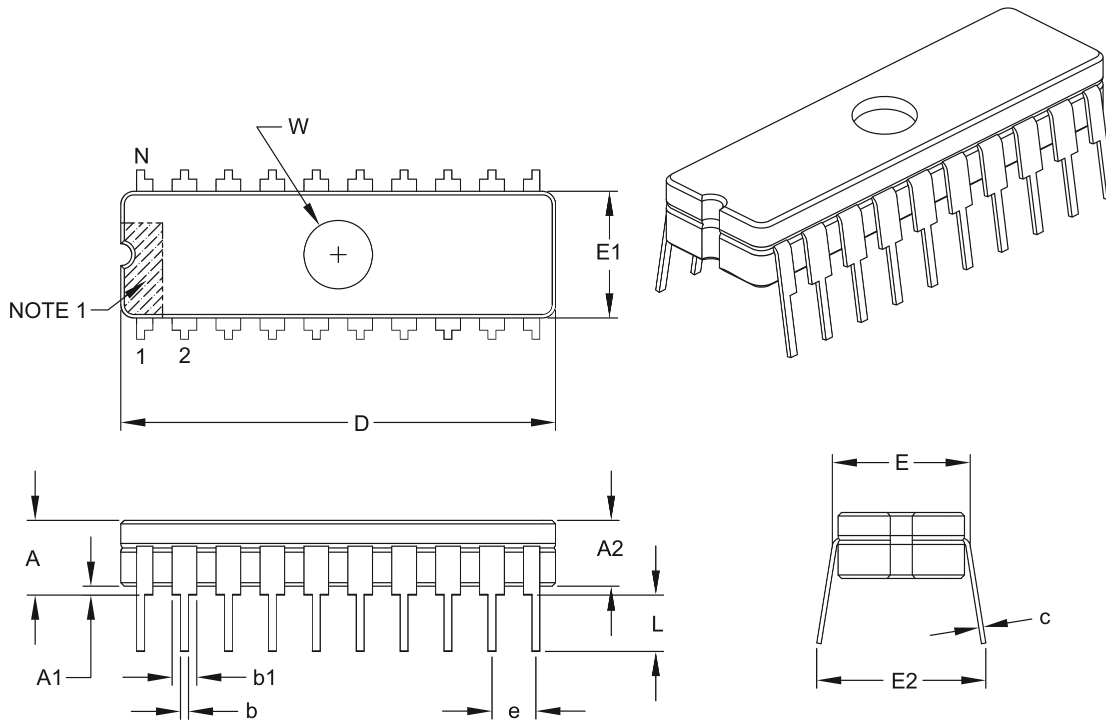
Packaging Diagrams and Parameters

20-Lead Ceramic Dual In-Line with Window (JW) – .300" Body [CERDIP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	20		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.200
Ceramic Package Height	A2	.140	–	.175
Standoff §	A1	.015	–	–
Shoulder to Shoulder Width	E	.308	–	.325
Ceramic Package Width	E1	.280	.288	.296
Overall Length	D	.942	.950	.970
Tip to Seating Plane	L	.125	–	.200
Lead Thickness	c	.008	–	.014
Upper Lead Width	b1	.045	–	.065
Lower Lead Width	b	.015	–	.023
Overall Row Spacing	E2	.325	–	.410
Window Diameter	W	.167	.170	.173

Notes:
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-115B

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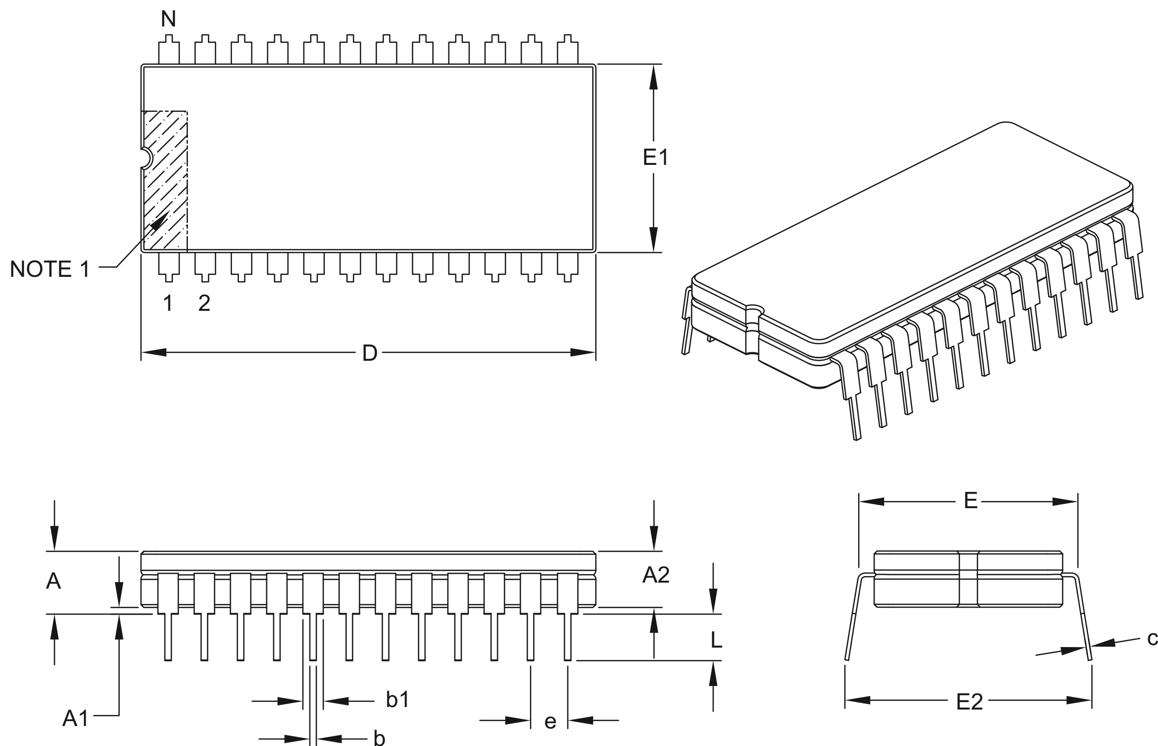
Packaging Diagrams and Parameters

24-Lead Ceramic Dual In-Line (JG) – .600" Body [CERDIP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	24		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.225
Ceramic Package Height	A2	.140	–	.175
Standoff §	A1	.015	–	–
Shoulder to Shoulder Width	E	.590	–	.625
Ceramic Package Width	E1	.510	.520	.540
Overall Length	D	1.240	1.250	1.270
Tip to Seating Plane	L	.125	–	.200
Lead Thickness	c	.008	–	.015
Upper Lead Width	b1	.045	–	.065
Lower Lead Width	b	.015	–	.023
Overall Row Spacing	E2	.620	–	.710

Notes:

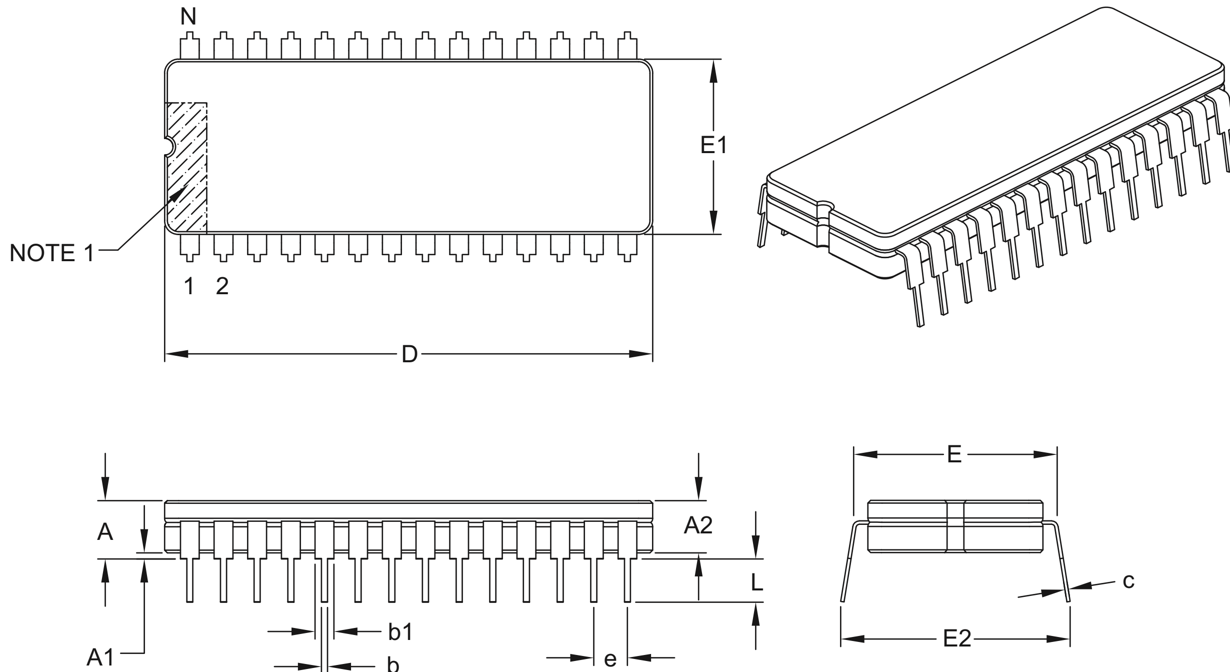
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-004B

Packaging Diagrams and Parameters

28-Lead Ceramic Dual In-Line (JN) – .600" Body [CERDIP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



		Units	INCHES	
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		28	
Pitch	e		.100 BSC	
Top to Seating Plane	A	–	–	.225
Ceramic Package Height	A2	.140	–	.175
Standoff §	A1	.015	–	–
Shoulder to Shoulder Width	E	.590	–	.625
Ceramic Package Width	E1	.510	.520	.540
Overall Length	D	1.440	1.450	1.470
Tip to Seating Plane	L	.125	–	.200
Lead Thickness	c	.008	–	.015
Upper Lead Width	b1	.045	–	.065
Lower Lead Width	b	.015	–	.023
Overall Row Spacing	E2	.620	–	.710

Notes:
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-006B

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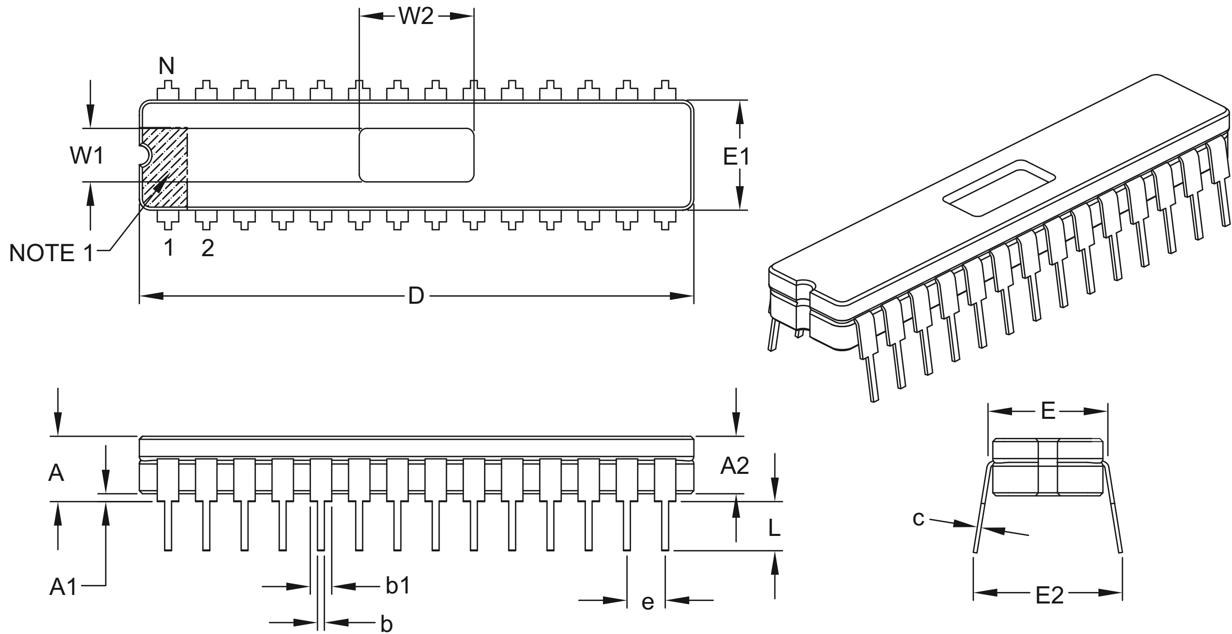
Packaging Diagrams and Parameters

28-Lead Ceramic Dual In-Line with Window (JW) – .300" Body [CERDIP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	28		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.200
Ceramic Package Height	A2	.140	–	.175
Standoff §	A1	.015	–	–
Shoulder to Shoulder Width	E	.308	–	.325
Ceramic Package Width	E1	.280	.288	.296
Overall Length	D	1.442	1.450	1.470
Tip to Seating Plane	L	.125	–	.200
Lead Thickness	c	.008	–	.014
Upper Lead Width	b1	.045	–	.065
Lower Lead Width	b	.015	–	.023
Overall Row Spacing	E2	.325	–	.410
Window Width	W1	.130	.140	.150
Window Length	W2	.290	.300	.310

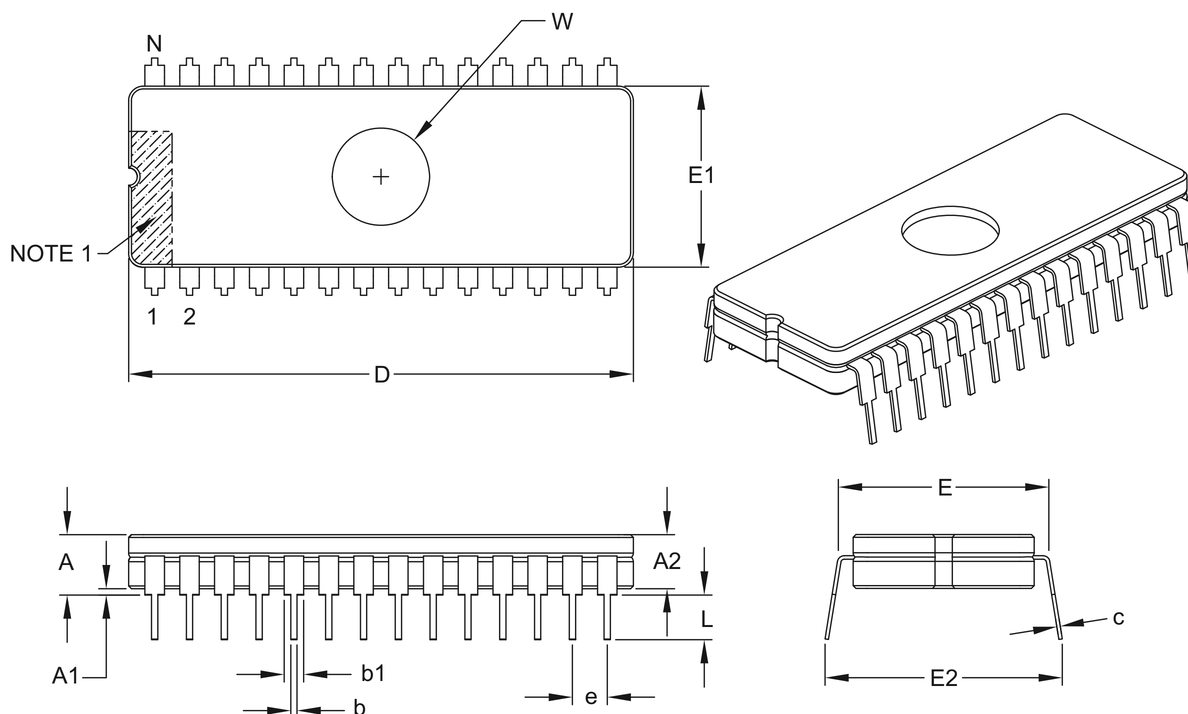
Notes:
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-080B

Packaging Diagrams and Parameters

28-Lead Ceramic Dual In-Line with Window (JW) – .600" Body [CERDIP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	28		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.225
Ceramic Package Height	A2	.140	–	.175
Standoff §	A1	.015	–	–
Shoulder to Shoulder Width	E	.590	–	.625
Ceramic Package Width	E1	.510	.520	.540
Overall Length	D	1.440	1.450	1.470
Tip to Seating Plane	L	.125	–	.200
Lead Thickness	c	.008	–	.015
Upper Lead Width	b1	.045	–	.065
Lower Lead Width	b	.015	–	.023
Overall Row Spacing	E2	.620	–	.710
Window Diameter	W	.270	.280	.290

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-013B

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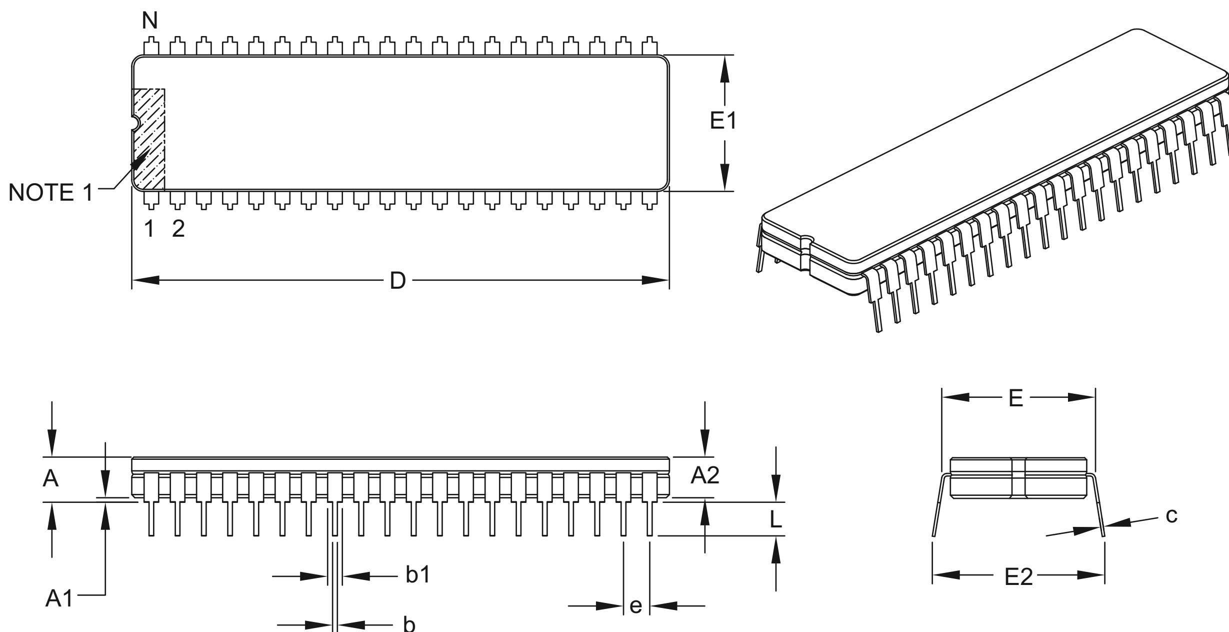
Packaging Diagrams and Parameters

40-Lead Ceramic Dual In-Line (JK) – .600" Body [CERDIP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		40	
Pitch	e		.100 BSC	
Top to Seating Plane	A	–	–	.225
Ceramic Package Height	A2	.140	–	.175
Standoff §	A1	.015	–	–
Shoulder to Shoulder Width	E	.590	–	.625
Ceramic Package Width	E1	.510	.520	.540
Overall Length	D	2.030	2.050	2.070
Tip to Seating Plane	L	.125	–	.200
Lead Thickness	c	.008	–	.015
Upper Lead Width	b1	.045	–	.065
Lower Lead Width	b	.015	–	.023
Overall Row Spacing	E2	.620	–	.710

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.

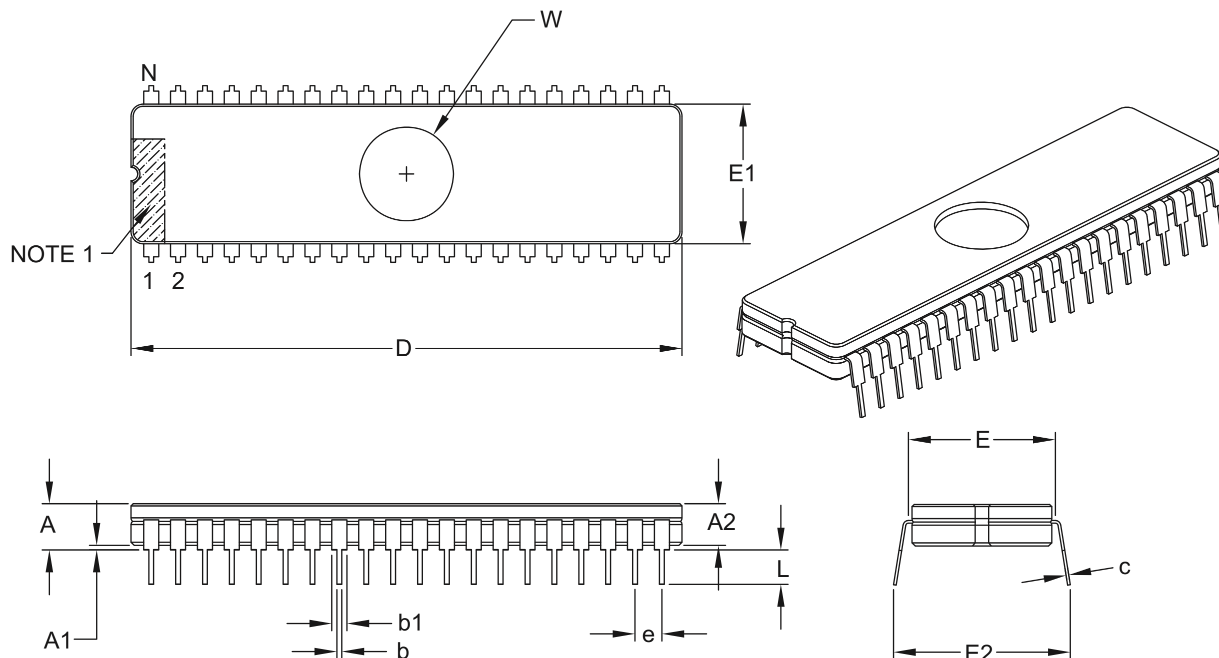
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-008B

Packaging Diagrams and Parameters

40-Lead Ceramic Dual In-Line with Window (JW) – .600" Body [CERDIP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		40	
Pitch	e		.100 BSC	
Top to Seating Plane	A	–	–	.225
Ceramic Package Height	A2	.140	–	.175
Standoff §	A1	.015	–	–
Shoulder to Shoulder Width	E	.590	–	.625
Ceramic Package Width	E1	.510	.520	.583
Overall Length	D	2.030	2.050	2.070
Tip to Seating Plane	L	.125	–	.200
Lead Thickness	c	.008	–	.015
Upper Lead Width	b1	.045	–	.065
Lower Lead Width	b	.015	–	.023
Overall Row Spacing	E2	.620	–	.710
Window Diameter	W	.340	.350	.360

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-014C

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Packaging Diagrams and Parameters

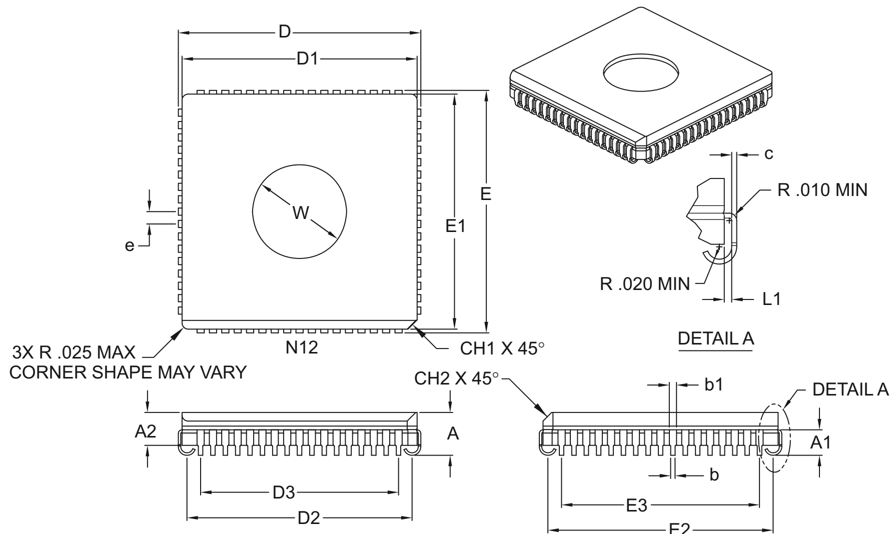
CERQUAD Family

Ceramic Leaded Chip Carrier Packages

Packaging Diagrams and Parameters

68-Lead Ceramic Leaded (CL) Chip Carrier with Window – Square [CERQUAD]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		68	
Pitch	e		.050 BSC	
Overall Height	A	.155	.172	.190
Package Thickness	A2		.132 REF	
Lead Height	A1	0.90	.100	.120
Side Chamfer	CH2		.035 REF	
Corner Chamfer	CH1		.040 REF	
Overall Package Width	E	.985	.990	.995
Overall Package Length	D	.985	.990	.995
Ceramic Package Width	E1	.930	.950	.965
Ceramic Package Length	D1	.930	.950	.965
Overall Lead Centers	E3		.800 REF	
Overall Lead Centers	D3		.800 REF	
Footprint Width	E2	.880	.910	.940
Footprint Length	D2	.880	.910	.940
Lead Length	L1	.006	–	–
Lead Thickness	c	.006	.007	.010
Upper Lead Width	b1	.026	.029	.032
Lower Lead Width	b	.017	.019	.021
Window Diameter	W	.370	.380	.390

Notes:

1. Dimensions D1 and E1 do not include glass protrusion. These protrusions shall not exceed .005" per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

BSC: Basic Dimension. Theoretically exact value shown without tolerances.
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-097B

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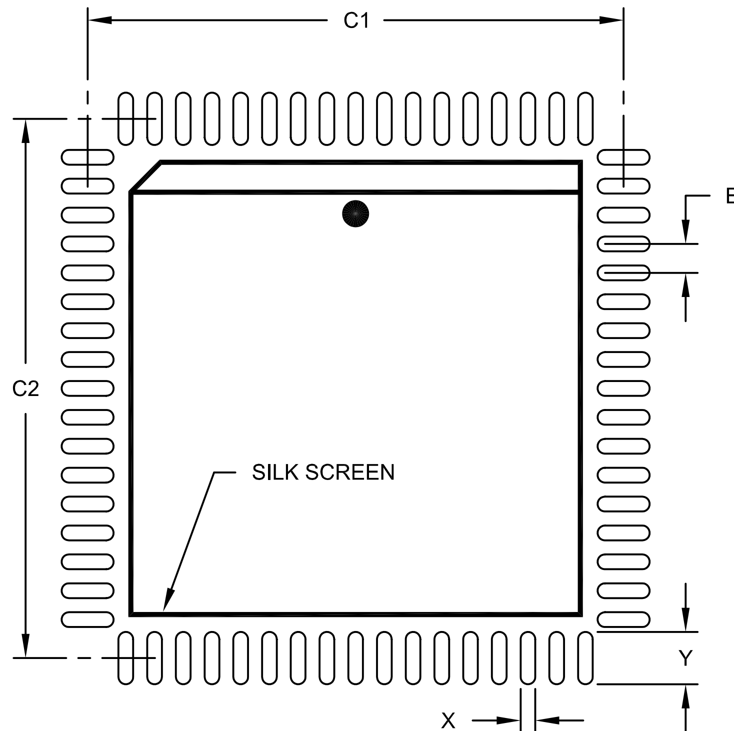
Land Pattern (Footprint)

68-Lead Ceramic Leaded (CL) Chip Carrier with Window - Square [CERQUAD]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	.050 BSC		
Contact Pad Spacing	C1		.933	
Contact Pad Spacing	C2		.933	
Contact Pad Width (X68)	X1			.026
Contact Pad Length (X68)	Y1			.091

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

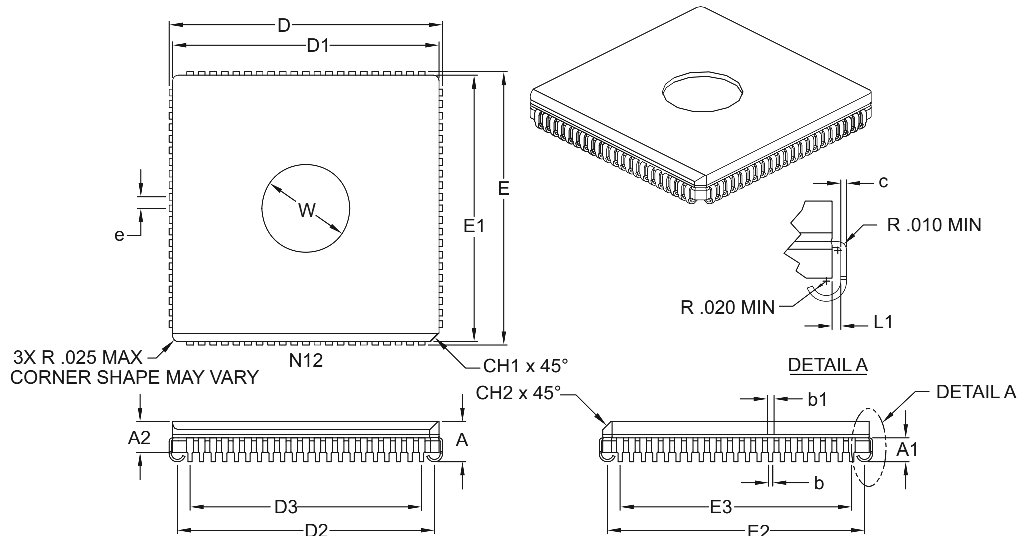
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2097A

Packaging Diagrams and Parameters

84-Lead Ceramic Leaded (CL) Chip Carrier with Window – Square [CERQUAD]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		84	
Pitch	e		.050 BSC	
Overall Height	A	.155	.172	.190
Package Thickness	A2		.132 REF	
Lead Height	A1	0.90	.100	.120
Side Chamfer	CH2		.035 REF	
Corner Chamfer	CH1		.040 REF	
Overall Package Width	E	1.185	1.190	1.195
Overall Package Length	D	1.185	1.190	1.195
Ceramic Package Width	E1	1.130	1.150	1.165
Ceramic Package Length	D1	1.130	1.150	1.165
Overall Lead Centers	E3		1.00 REF	
Overall Lead Centers	D3		1.00 REF	
Footprint Width	E2	1.080	1.110	1.140
Footprint Length	D2	1.080	1.110	1.140
Lead Length	L1	.006	–	–
Lead Thickness	c	.006	.007	.010
Lower Lead Width	b	.017	.019	.021
Upper Lead Width	b1	.026	.029	.032
Window Diameter	W	.395	.400	.405

Notes:

1. Dimensions D1 and E1 do not include glass protrusion. These protrusions shall not exceed .005" per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-112B

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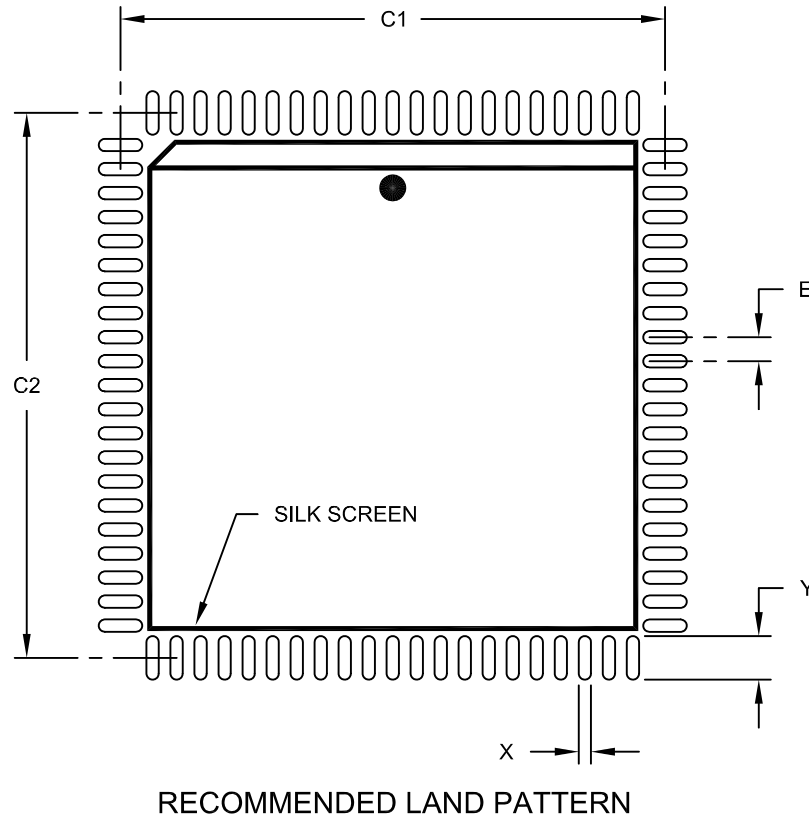
Land Pattern (Footprint)

84-Lead Ceramic Leaded (CL) Chip Carrier with Window - Square [CERQUAD]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E		.050	
Contact Pad Spacing	C1		1.134	
Contact Pad Spacing	C2		1.134	
Contact Pad Width (X84)	X			.026
Contact Pad Length (X84)	Y			.091

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2112A

NOTES:

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Packaging Diagrams and Parameters

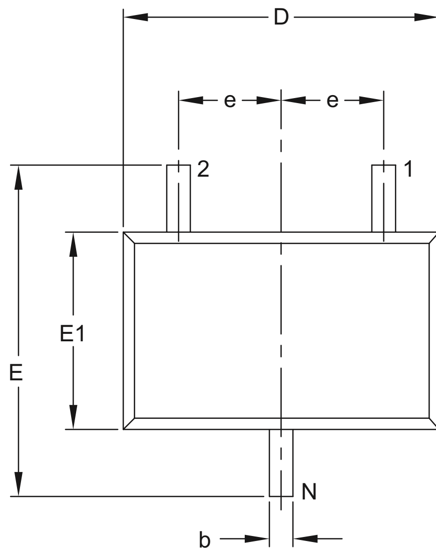
SOT Family

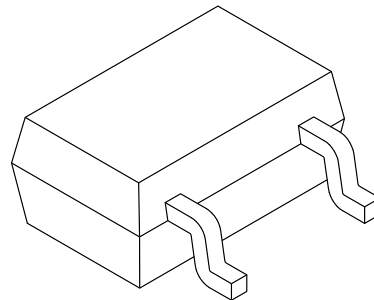
Small Outline Transister Packages

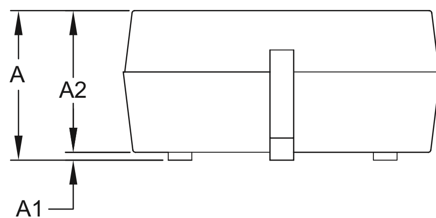
Packaging Diagrams and Parameters

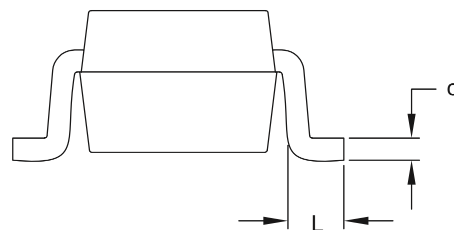
3-Lead Plastic Small Outline Transistor (LB) [SC70]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging









	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		3	
Pitch	e		0.65 BSC	
Overall Height	A	0.80	–	1.10
Molded Package Thickness	A2	0.80	–	1.00
Standoff	A1	0.00	–	0.10
Overall Width	E	1.80	2.10	2.40
Molded Package Width	E1	1.15	1.25	1.35
Overall Length	D	1.80	2.00	2.25
Foot Length	L	0.10	0.20	0.46
Lead Thickness	c	0.08	–	0.26
Lead Width	b	0.15	–	0.40

Notes:

1. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-060B

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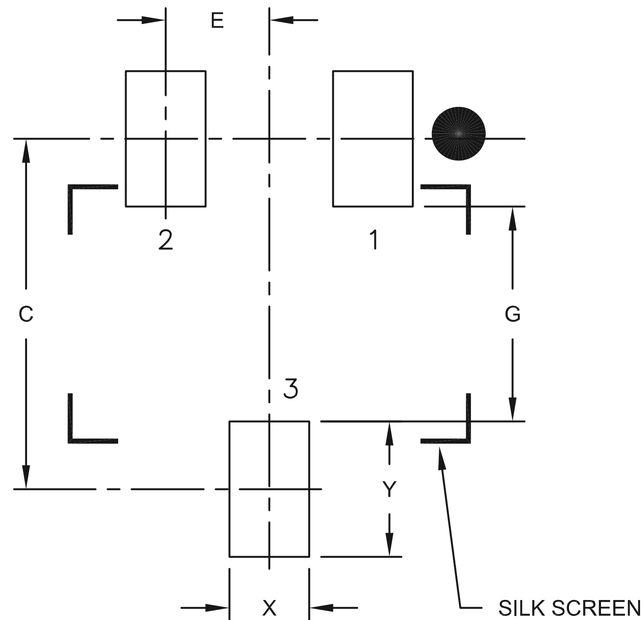
Land Pattern (Footprint)

3-Lead Plastic Small Outline Transistor (LB) [SC70]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E	0.65 BSC		
Contact Pad Spacing	C		2.20	
Contact Pad Width	X			0.50
Contact Pad Length	Y			0.95
Distance Between Pads	G	1.25		

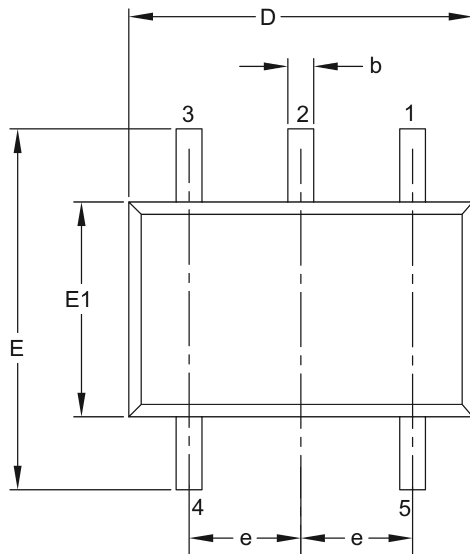
Notes:

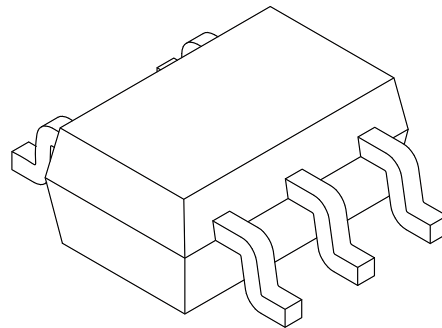
1. Dimensioning and tolerancing per ASME Y14.5M
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

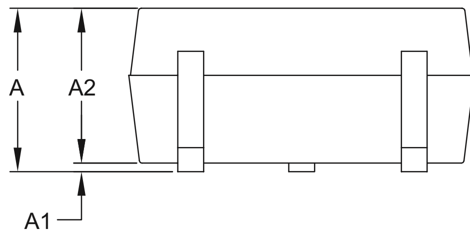
Microchip Technology Drawing No. C04-2060A

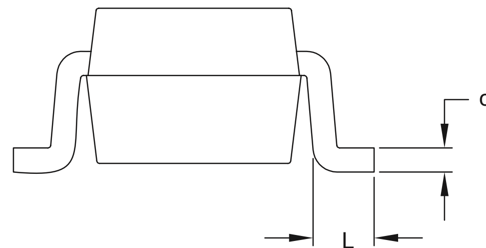
5-Lead Plastic Small Outline Transistor (LT) [SC70]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging









Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		5	
Pitch	e		0.65 BSC	
Overall Height	A	0.80	–	1.10
Molded Package Thickness	A2	0.80	–	1.00
Standoff	A1	0.00	–	0.10
Overall Width	E	1.80	2.10	2.40
Molded Package Width	E1	1.15	1.25	1.35
Overall Length	D	1.80	2.00	2.25
Foot Length	L	0.10	0.20	0.46
Lead Thickness	c	0.08	–	0.26
Lead Width	b	0.15	–	0.40

Notes:

1. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-061B

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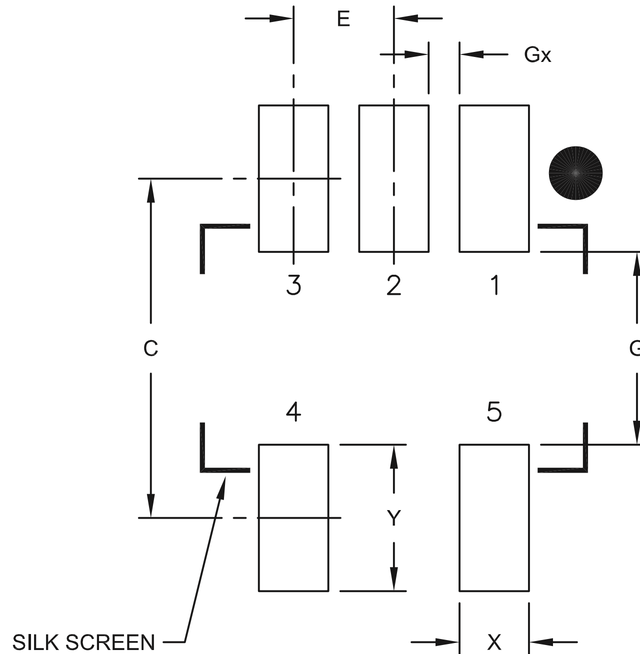
Land Pattern (Footprint)

5-Lead Plastic Small Outline Transistor (LT) [SC70]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.65 BSC		
Contact Pad Spacing	C		2.20	
Contact Pad Width	X			0.45
Contact Pad Length	Y			0.95
Distance Between Pads	G	1.25		
Distance Between Pads	Gx	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

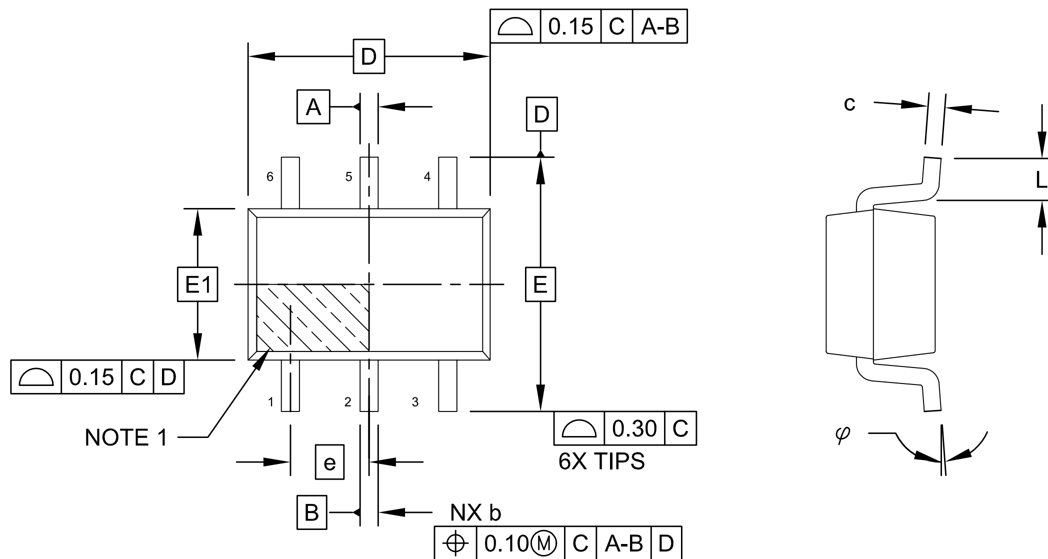
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

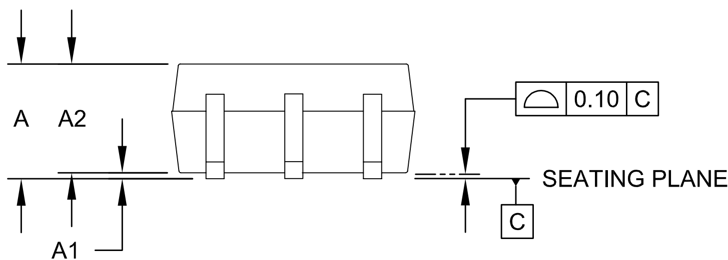
Microchip Technology Drawing No. C04-2061A

Packaging Diagrams and Parameters

6-Lead Plastic Small Outline Transistor (LT) [SC70]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging





Microchip Technology Drawing No. C04-151A Sheet 1 of 2

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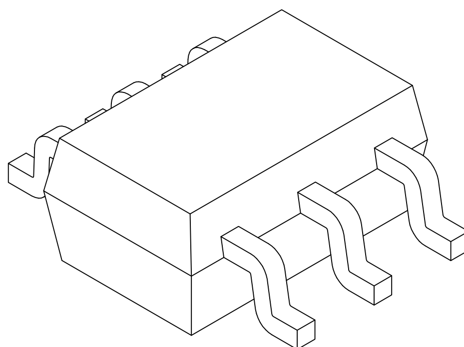
Packaging Diagrams and Parameters

6-Lead Plastic Small Outline Transistor (LT) [SC70]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		6	
Pitch	e		0.65 BSC	
Overall Height	A	0.80	-	1.10
Molded Package Thickness	A2	0.70	0.90	1.00
Standoff	A1	0.00	-	0.10
Overall Width	E		2.10 BSC	
Molded Package Width	E1		1.25 BSC	
Overall Length	D		2.00 BSC	
Foot Length	L	0.10	0.20	0.46
Lead Thickness	c	0.08	-	0.22
Lead Width	b	0.15	-	0.30

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-151A Sheet 2 of 2

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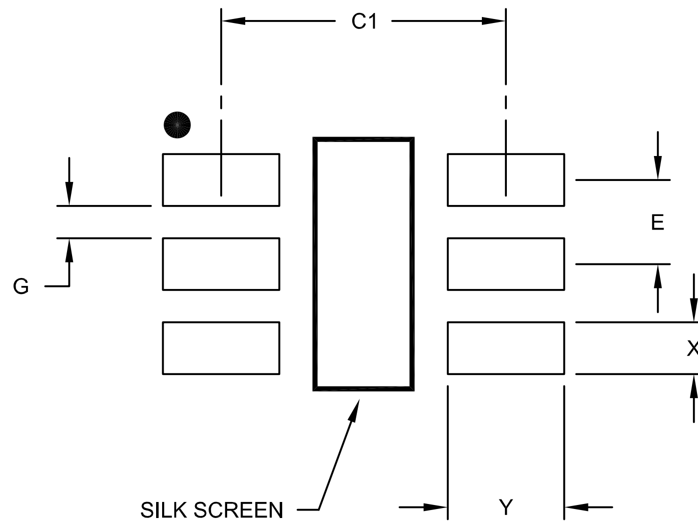
Land Pattern (Footprint)

6-Lead Plastic Small Outline Transistor (LT) [SC70]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.65 BSC		
Contact Pad Spacing	C		2.20	
Contact Pad Width (X6)	X			0.40
Contact Pad Length (X6)	Y			0.90
Distance Between Pads	G	0.25		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2151A

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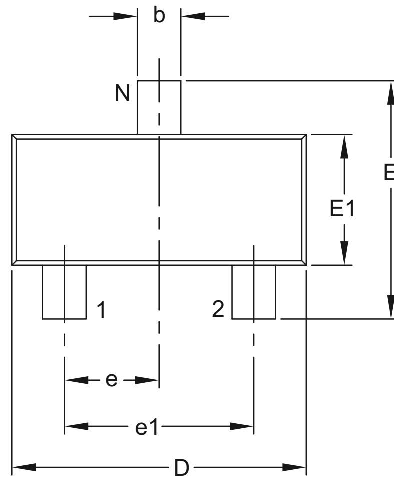
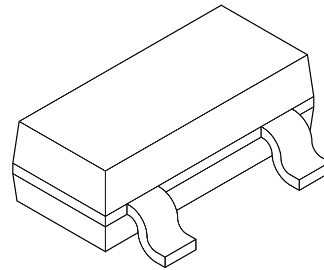
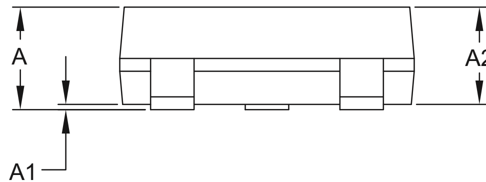
Packaging Diagrams and Parameters

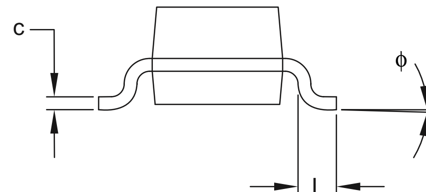
3-Lead Plastic Small Outline Transistor (NB) [SOT-23]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging









Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		3	
Lead Pitch	e		0.95 BSC	
Outside Lead Pitch	e1		1.90 BSC	
Overall Height	A	0.89	–	1.12
Molded Package Thickness	A2	0.79	0.95	1.02
Standoff	A1	0.01	–	0.10
Overall Width	E	2.10	–	2.64
Molded Package Width	E1	1.16	1.30	1.40
Overall Length	D	2.67	2.90	3.05
Foot Length	L	0.13	0.50	0.60
Foot Angle	φ	0°	–	10°
Lead Thickness	c	0.08	–	0.20
Lead Width	b	0.30	–	0.54

Notes:

1. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

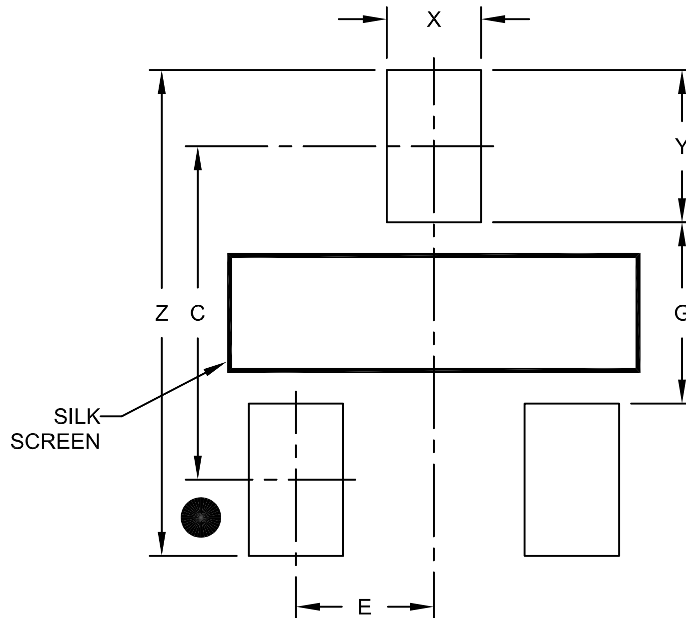
Microchip Technology Drawing C04-104B

MICROCHIP

Land Pattern (Footprint)

3-Lead Plastic Small Outline Transistor (NB) [SOT-23]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E	0.95 BSC		
Contact Pad Spacing	C		2.30	
Contact Pad Width (X3)	X			0.65
Contact Pad Length (X3)	Y			1.05
Distance Between Pads	G	1.25		
Overall Width	Z			3.35

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2104A

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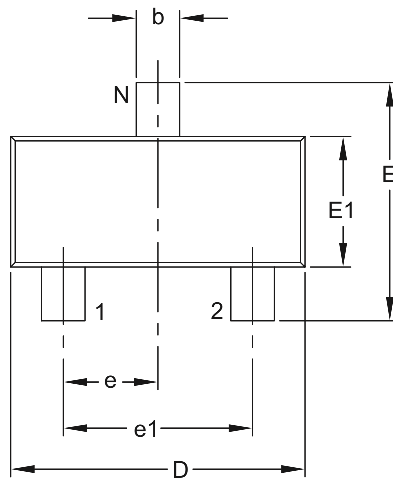
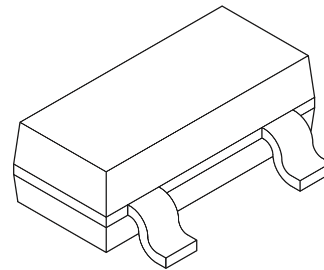
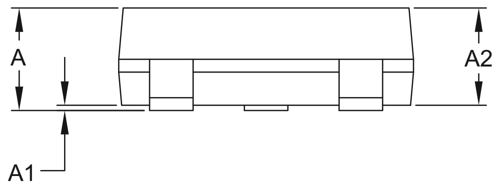
Packaging Diagrams and Parameters

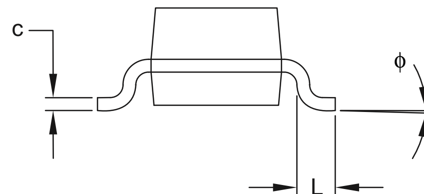
3-Lead Plastic Small Outline Transistor (TT) [SOT-23]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging









	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		3	
Lead Pitch	e		0.95 BSC	
Outside Lead Pitch	e1		1.90 BSC	
Overall Height	A	0.89	–	1.12
Molded Package Thickness	A2	0.79	0.95	1.02
Standoff	A1	0.01	–	0.10
Overall Width	E	2.10	–	2.64
Molded Package Width	E1	1.16	1.30	1.40
Overall Length	D	2.67	2.90	3.05
Foot Length	L	0.13	0.50	0.60
Foot Angle	φ	0°	–	10°
Lead Thickness	c	0.08	–	0.20
Lead Width	b	0.30	–	0.54

Notes:

1. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-104B

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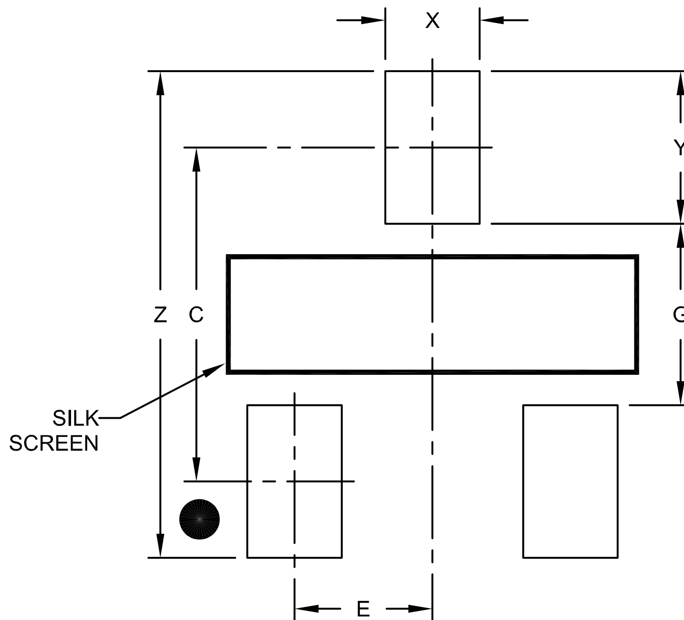
Land Pattern (Footprint)

3-Lead Plastic Small Outline Transistor (TT) [SOT-23]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.95 BSC		
Contact Pad Spacing	C		2.30	
Contact Pad Width (X3)	X			0.65
Contact Pad Length (X3)	Y			1.05
Distance Between Pads	G	1.25		
Overall Width	Z			3.35

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2104A

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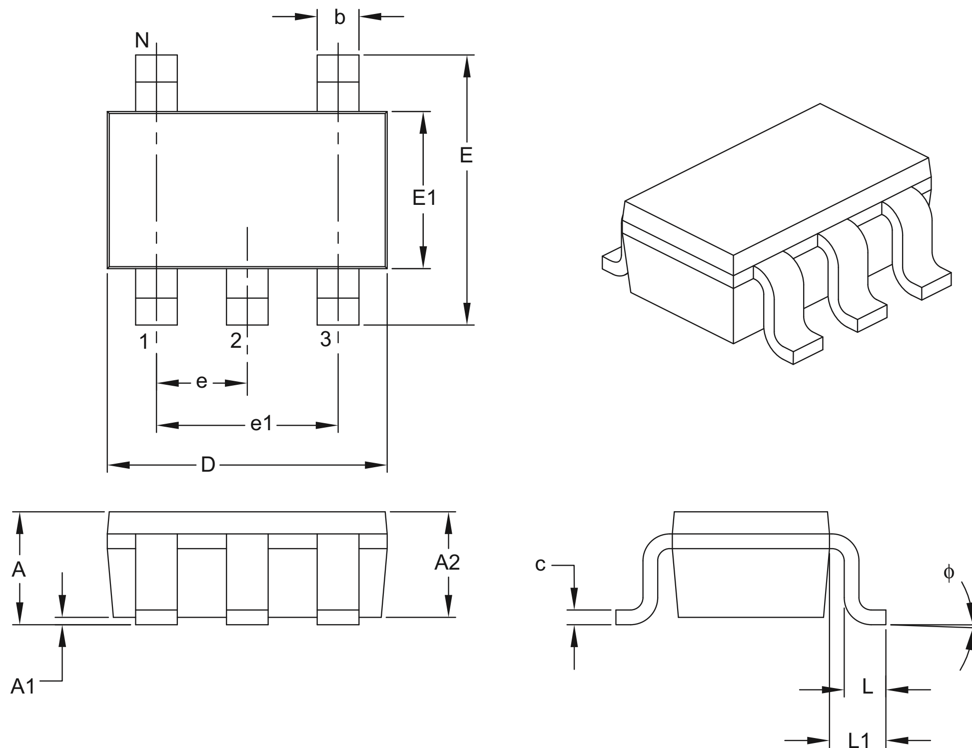
Packaging Diagrams and Parameters

5-Lead Plastic Small Outline Transistor (CT) [SOT-23]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	5		
Lead Pitch	e	0.95 BSC		
Outside Lead Pitch	e1	1.90 BSC		
Overall Height	A	0.90	–	1.45
Molded Package Thickness	A2	0.89	–	1.30
Standoff	A1	0.00	–	0.15
Overall Width	E	2.20	–	3.20
Molded Package Width	E1	1.30	–	1.80
Overall Length	D	2.70	–	3.10
Foot Length	L	0.10	–	0.60
Footprint	L1	0.35	–	0.80
Foot Angle	ϕ	0°	–	30°
Lead Thickness	c	0.08	–	0.26
Lead Width	b	0.20	–	0.51

Notes:

1. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

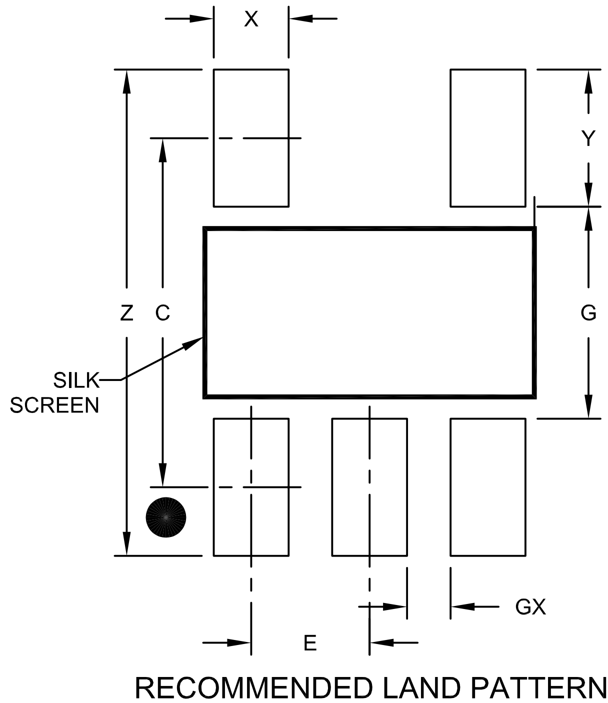
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-091B

Land Pattern (Footprint)

5-Lead Plastic Small Outline Transistor (CT) [SOT-23]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

		Units	MILLIMETERS		
		Dimension Limits	MIN	NOM	MAX
Contact Pitch	E		0.95 BSC		
Contact Pad Spacing	C			2.80	
Contact Pad Width (X5)	X				0.60
Contact Pad Length (X5)	Y				1.10
Distance Between Pads	G		1.70		
Distance Between Pads	GX		0.35		
Overall Width	Z				3.90

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2091A

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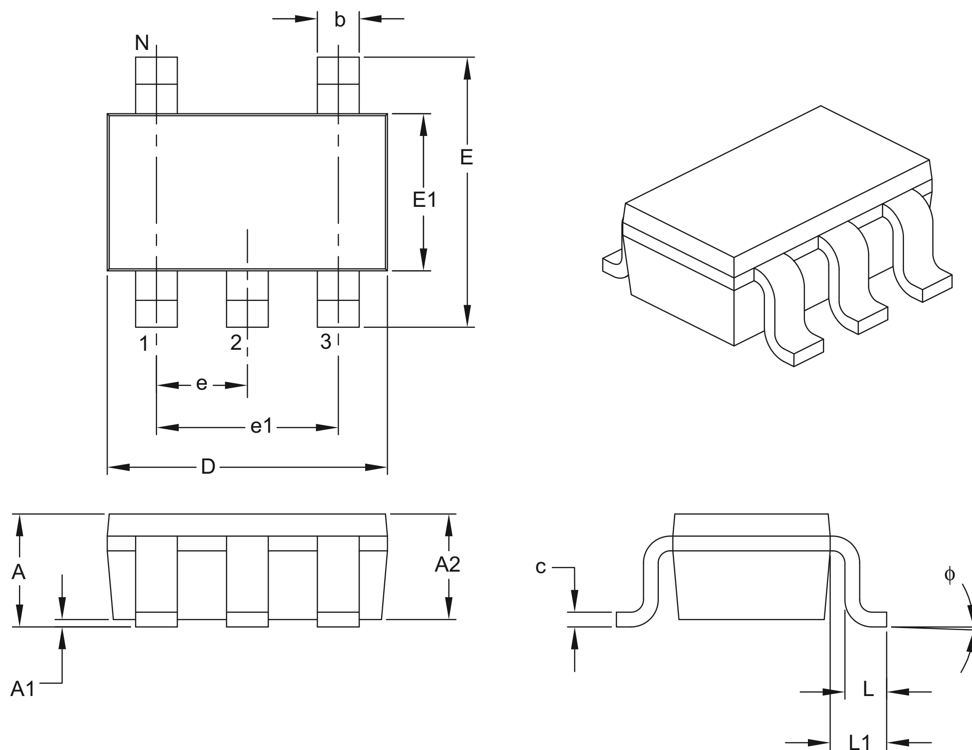
Packaging Diagrams and Parameters

5-Lead Plastic Small Outline Transistor (OT) [SOT-23]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	5		
Lead Pitch	e	0.95 BSC		
Outside Lead Pitch	e1	1.90 BSC		
Overall Height	A	0.90	–	1.45
Molded Package Thickness	A2	0.89	–	1.30
Standoff	A1	0.00	–	0.15
Overall Width	E	2.20	–	3.20
Molded Package Width	E1	1.30	–	1.80
Overall Length	D	2.70	–	3.10
Foot Length	L	0.10	–	0.60
Footprint	L1	0.35	–	0.80
Foot Angle	φ	0°	–	30°
Lead Thickness	c	0.08	–	0.26
Lead Width	b	0.20	–	0.51

Notes:

1. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

    BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-091B

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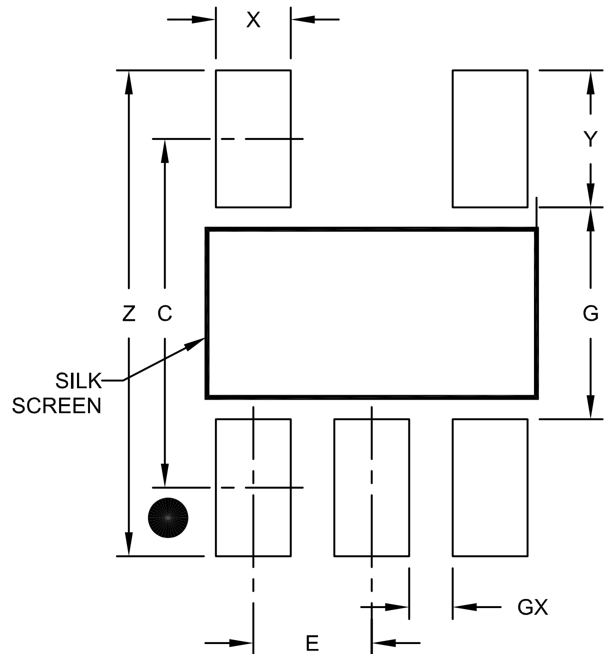
Land Pattern (Footprint)

5-Lead Plastic Small Outline Transistor (OT) [SOT-23]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E	0.95 BSC		
Contact Pad Spacing	C		2.80	
Contact Pad Width (X5)	X			0.60
Contact Pad Length (X5)	Y			1.10
Distance Between Pads	G	1.70		
Distance Between Pads	GX	0.35		
Overall Width	Z			3.90

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2091A

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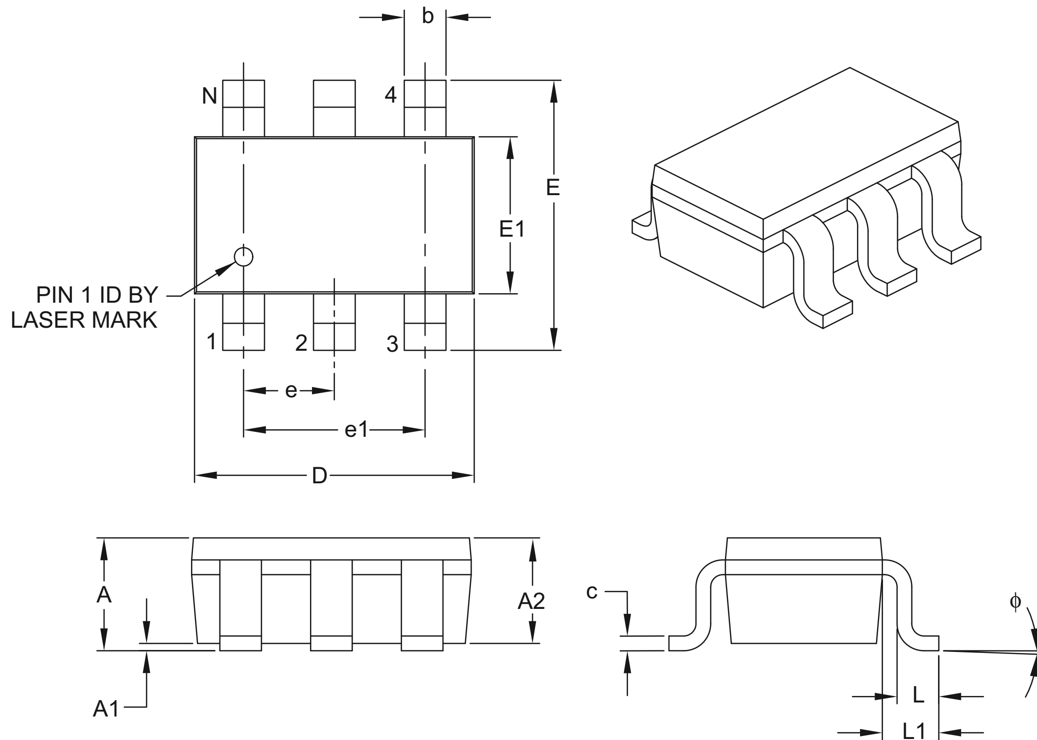
Packaging Diagrams and Parameters

6-Lead Plastic Small Outline Transistor (CH) [SOT-23]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		6	
Pitch	e		0.95 BSC	
Outside Lead Pitch	e1		1.90 BSC	
Overall Height	A	0.90	–	1.45
Molded Package Thickness	A2	0.89	–	1.30
Standoff	A1	0.00	–	0.15
Overall Width	E	2.20	–	3.20
Molded Package Width	E1	1.30	–	1.80
Overall Length	D	2.70	–	3.10
Foot Length	L	0.10	–	0.60
Footprint	L1	0.35	–	0.80
Foot Angle	ϕ	0°	–	30°
Lead Thickness	c	0.08	–	0.26
Lead Width	b	0.20	–	0.51

Notes:

1. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-028B

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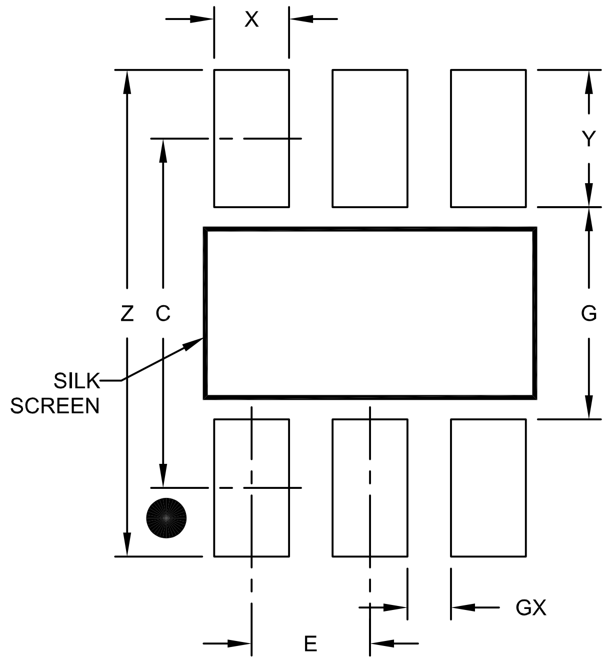
Land Pattern (Footprint)

6-Lead Plastic Small Outline Transistor (CH) [SOT-23]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E		0.95 BSC	
Contact Pad Spacing	C		2.80	
Contact Pad Width (X6)	X			0.60
Contact Pad Length (X6)	Y			1.10
Distance Between Pads	G	1.70		
Distance Between Pads	GX	0.35		
Overall Width	Z			3.90

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2028A

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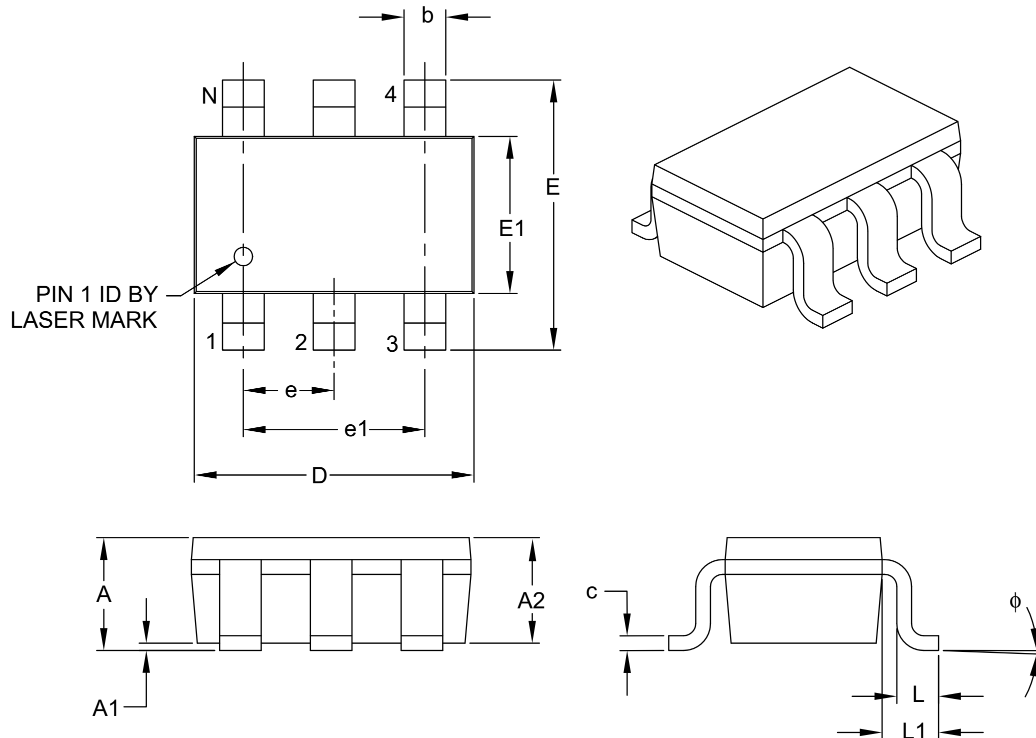
Packaging Diagrams and Parameters

6-Lead Plastic Small Outline Transistor (CHY) [SOT-23]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	6		
Pitch	e	0.95 BSC		
Outside Lead Pitch	e1	1.90 BSC		
Overall Height	A	0.90	–	1.45
Molded Package Thickness	A2	0.89	–	1.30
Standoff	A1	0.00	–	0.15
Overall Width	E	2.20	–	3.20
Molded Package Width	E1	1.30	–	1.80
Overall Length	D	2.70	–	3.10
Foot Length	L	0.10	–	0.60
Footprint	L1	0.35	–	0.80
Foot Angle	φ	0°	–	30°
Lead Thickness	c	0.08	–	0.26
Lead Width	b	0.20	–	0.51

Notes:

1. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

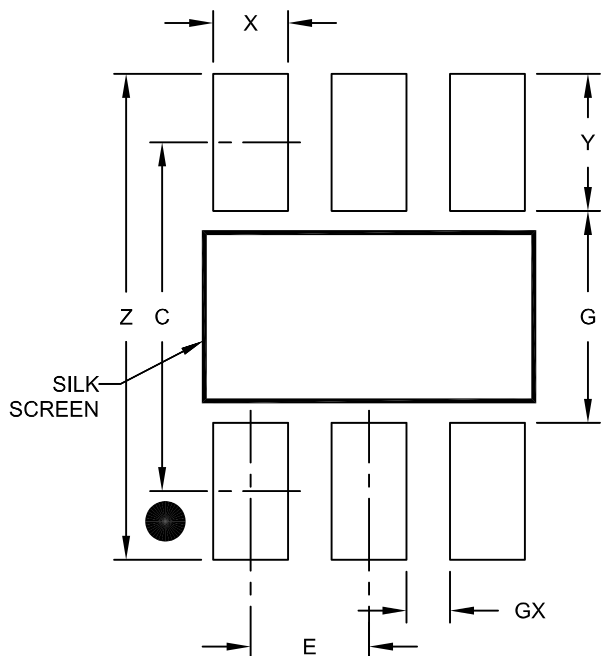
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-028B

Land Pattern (Footprint)

6-Lead Plastic Small Outline Transistor (CHY) [SOT-23]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.95 BSC		
Contact Pad Spacing	C		2.80	
Contact Pad Width (X6)	X			0.60
Contact Pad Length (X6)	Y			1.10
Distance Between Pads	G	1.70		
Distance Between Pads	GX	0.35		
Overall Width	Z			3.90

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2028A

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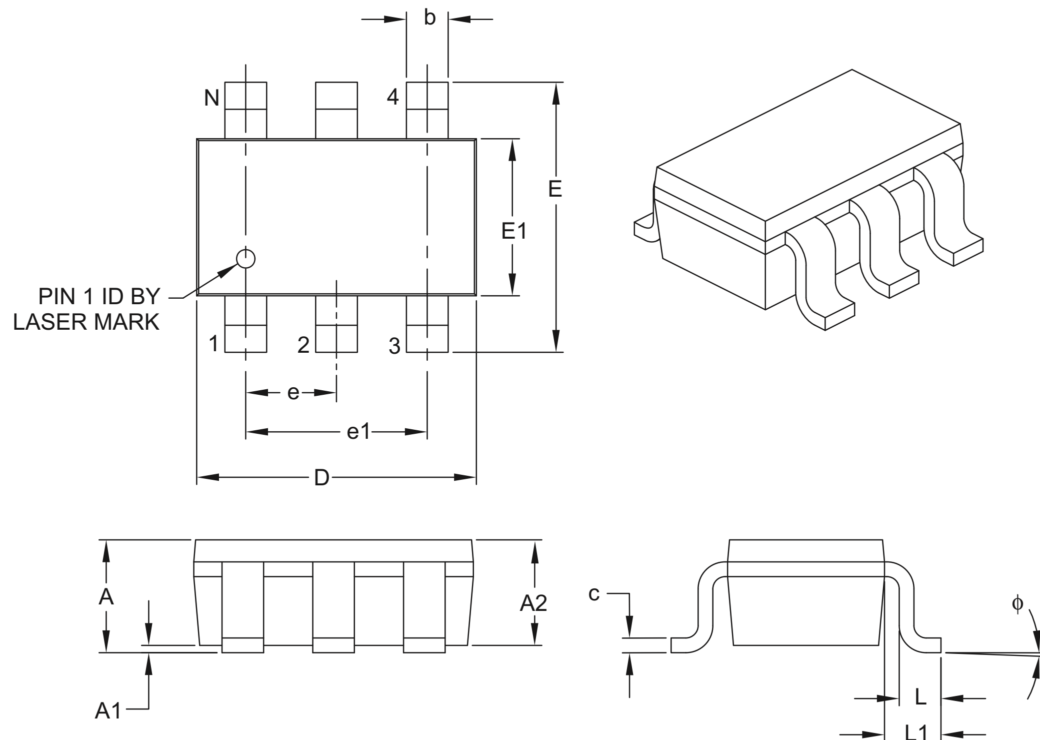
Packaging Diagrams and Parameters

6-Lead Plastic Small Outline Transistor (OT) [SOT-23]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		6	
Pitch	e		0.95 BSC	
Outside Lead Pitch	e1		1.90 BSC	
Overall Height	A	0.90	–	1.45
Molded Package Thickness	A2	0.89	–	1.30
Standoff	A1	0.00	–	0.15
Overall Width	E	2.20	–	3.20
Molded Package Width	E1	1.30	–	1.80
Overall Length	D	2.70	–	3.10
Foot Length	L	0.10	–	0.60
Footprint	L1	0.35	–	0.80
Foot Angle	ϕ	0°	–	30°
Lead Thickness	c	0.08	–	0.26
Lead Width	b	0.20	–	0.51

Notes:

1. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-028B

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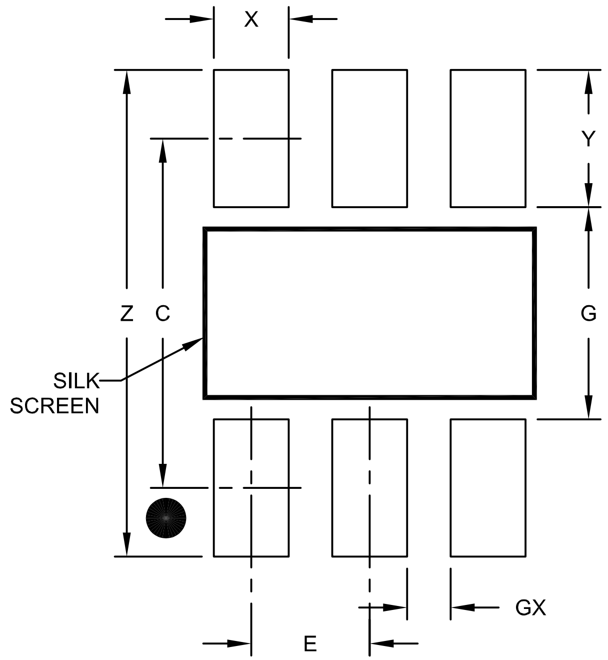
Land Pattern (Footprint)

6-Lead Plastic Small Outline Transistor (OT) [SOT-23]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.95 BSC		
Contact Pad Spacing	C		2.80	
Contact Pad Width (X6)	X			0.60
Contact Pad Length (X6)	Y			1.10
Distance Between Pads	G	1.70		
Distance Between Pads	GX	0.35		
Overall Width	Z			3.90

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2028A

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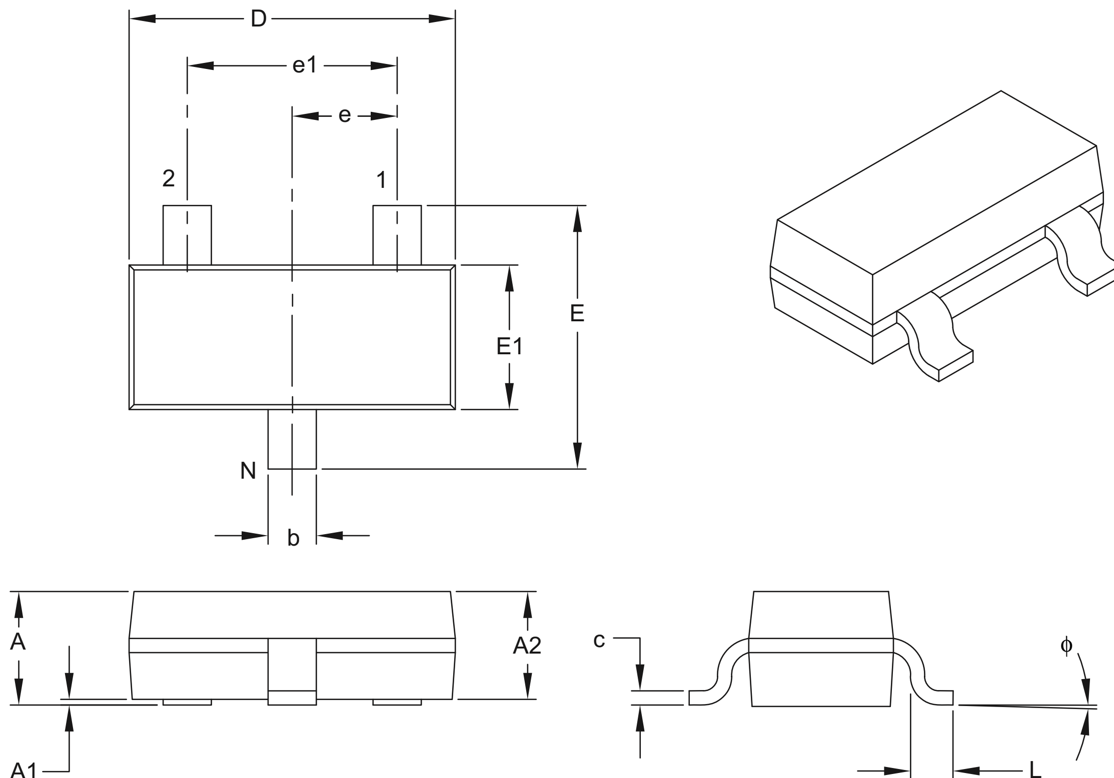
Packaging Diagrams and Parameters

3-Lead Plastic Small Outline Transistor (CB) [SOT-23A]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		3	
Lead Pitch	e		0.95 BSC	
Outside Lead Pitch	e1		1.90 BSC	
Overall Height	A	0.89	–	1.45
Molded Package Thickness	A2	0.90	–	1.30
Standoff	A1	0.00	–	0.15
Overall Width	E	2.10	–	3.00
Molded Package Width	E1	1.20	–	1.80
Overall Length	D	2.70	–	3.10
Foot Length	L	0.15	–	0.60
Foot Angle	ϕ	0°	–	30°
Lead Thickness	c	0.09	–	0.26
Lead Width	b	0.30	–	0.51

Notes:

1. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

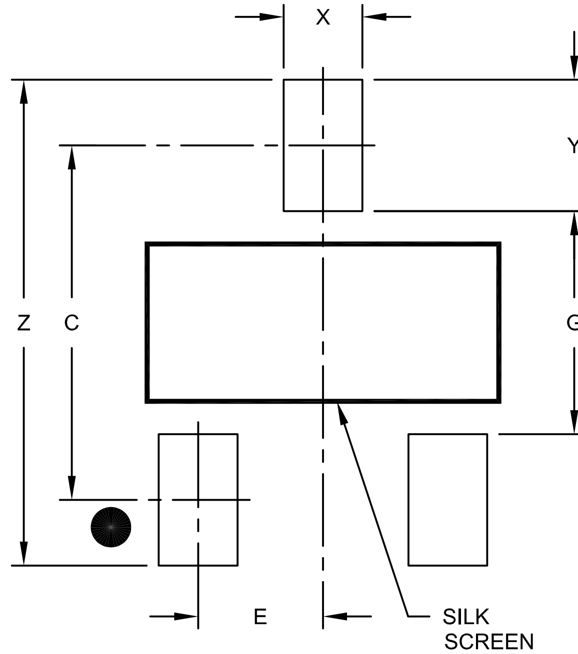
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-130B

Land Pattern (Footprint)

3-Lead Plastic Small Outline Transistor (CB) [SOT-23A]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E	0.95 BSC		
Contact Pad Spacing	C		2.70	
Contact Pad Width (X3)	X			0.60
Contact Pad Length (X3)	Y			1.00
Distance Between Pads	G	1.70		
Overall Width	Z			3.70

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2130A

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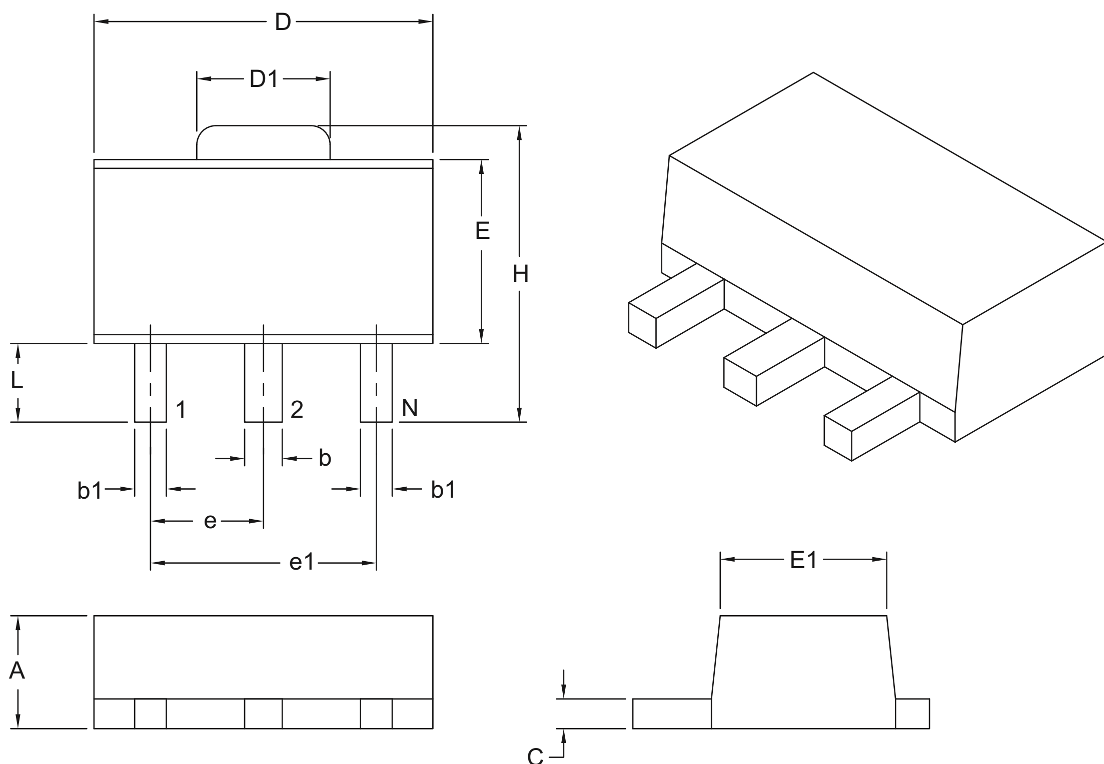
Packaging Diagrams and Parameters

3-Lead Plastic Small Outline Transistor Header (MB) [SOT-89]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS	
	Dimension Limits	MIN	MAX
Number of Leads	N	3	
Pitch	e	1.50 BSC	
Outside Lead Pitch	e1	3.00 BSC	
Overall Height	A	1.40	1.60
Overall Width	H	3.94	4.25
Molded Package Width at Base	E	2.29	2.60
Molded Package Width at Top	E1	2.13	2.29
Overall Length	D	4.39	4.60
Tab Length	D1	1.40	1.83
Foot Length	L	0.79	1.20
Lead Thickness	c	0.35	0.44
Lead 2 Width	b	0.41	0.56
Leads 1 & 3 Width	b1	0.36	0.48

Notes:

1. Dimensions D and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

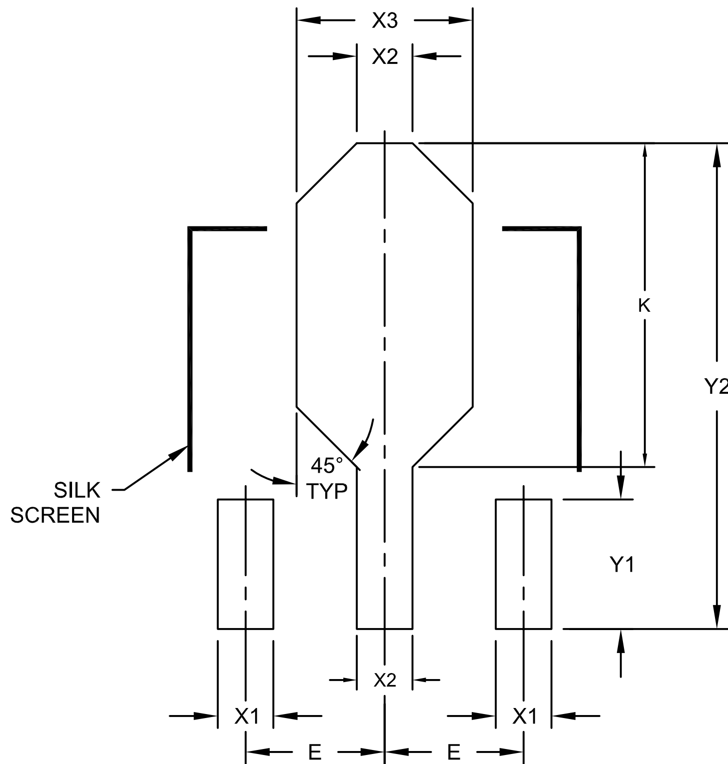
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-029B

Land Pattern (Footprint)

3-Lead Plastic Small Outline Transistor Header (MB) [SOT-89]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	1.50 BSC		
Contact Pads 1 & 3 Width	X1			0.48
Contact Pad 2 Width	X2			0.56
Heat Slug Pad Width	X3			1.20
Contact Pads 1 & 3 Length	Y1		1.40	
Contact 2 Pad Length	Y2			4.25
-	K	2.60		2.85

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2029A

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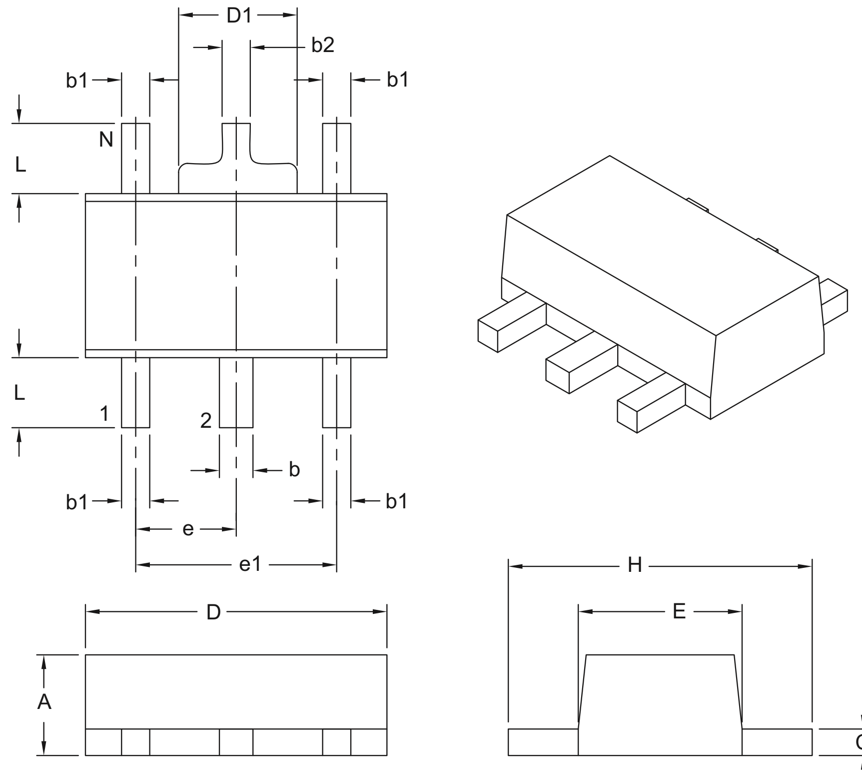
Packaging Diagrams and Parameters

5-Lead Plastic Small Outline Transistor Header (MT) [SOT-89]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS	
	Dimension Limits	MIN	MAX
Number of Leads	N	5	
Lead Pitch	e	1.50 BSC	
Outside Lead Pitch	e1	3.00 BSC	
Overall Height	A	1.40	1.60
Overall Width	H	3.94	4.50
Molded Package Width	E	2.29	2.60
Overall Length	D	4.40	4.60
Tab Width	D1	1.40	1.83
Foot Length	L	0.80	1.20
Lead Thickness	c	0.35	0.44
Lead 2 Width	b	0.41	0.56
Leads 1, 3, 4 & 5 Width	b1	0.36	0.48
Tab Lead Width	b2	0.32	0.48

Notes:

1. Dimensions D and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

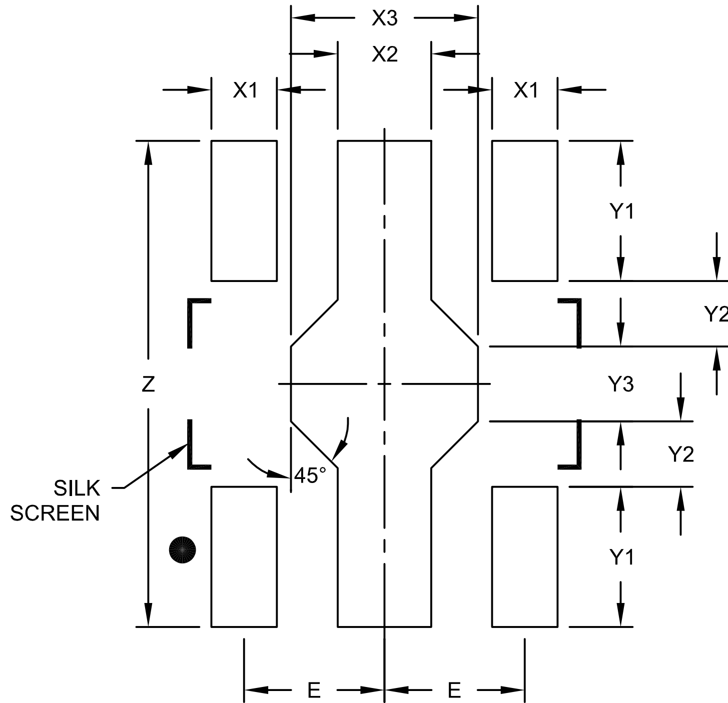
    BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-030B

Land Pattern (Footprint)

5-Lead Plastic Small Outline Transistor Header (MT) [SOT-89]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E	1.50 BSC		
Contact Pad Width (X4)	X1			0.70
Contact Pad Width	X2		1.00	
Contact Pad Width	X3		2.00	
Contact Pad Length (X4)	Y1		1.50	
Contact Pad Length (X2)	Y2		0.70	
Contact Pad Length	Y3		0.80	
Overall Length	Z		5.20	

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2030C

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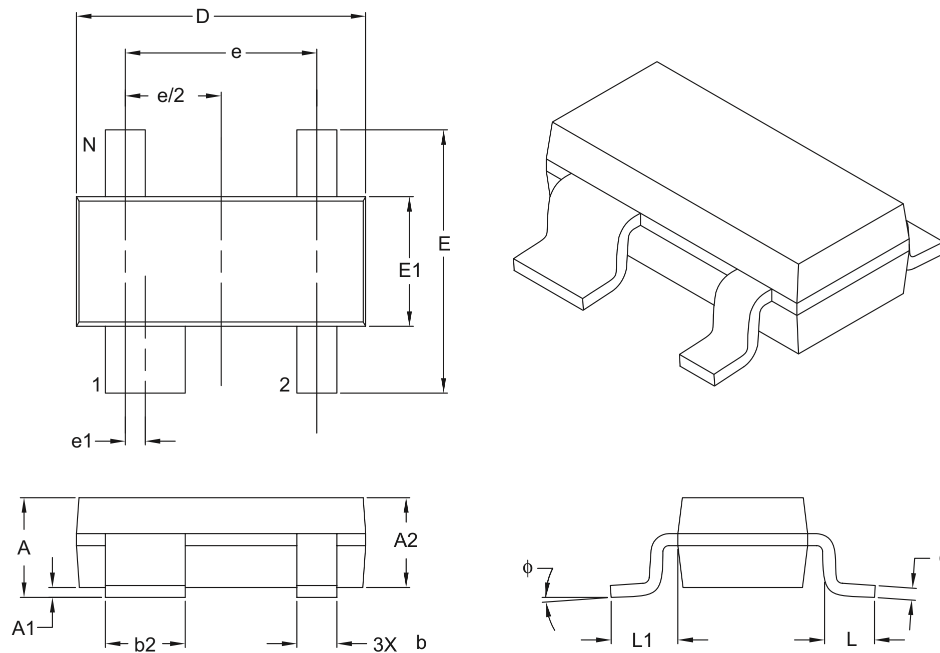
Packaging Diagrams and Parameters

4-Lead Plastic Small Outline Transistor (RC) [SOT-143]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	4		
Pitch	e	1.92 BSC		
Lead 1 Offset	e1	0.20 BSC		
Overall Height	A	0.80	–	1.22
Molded Package Thickness	A2	0.75	0.90	1.07
Standoff §	A1	0.01	–	0.15
Overall Width	E	2.10	–	2.64
Molded Package Width	E1	1.20	1.30	1.40
Overall Length	D	2.67	2.90	3.05
Foot Length	L	0.13	0.50	0.60
Footprint	L1	0.54 REF		
Foot Angle	ϕ	0°	–	8°
Lead Thickness	c	0.08	–	0.20
Lead 1 Width	b1	0.76	–	0.94
Leads 2, 3 & 4 Width	b	0.30	–	0.54

Notes:

1. § Significant Characteristic.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

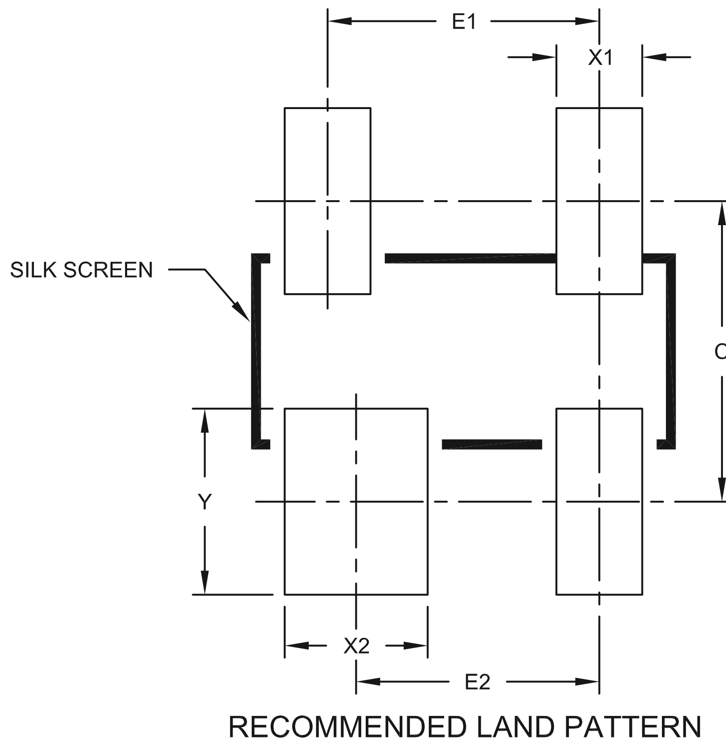
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-031B

Land Pattern (Footprint)

4-Lead Plastic Small Outline Transistor (RC) [SOT-143]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E1		1.90 BSC	
Contact Pitch	E2		1.60 BSC	
Contact Width	X1			0.60
Contact Width	X2			1.00
Contact Length	Y			1.30
Contact Pad Spacing	C		2.10	

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2031A

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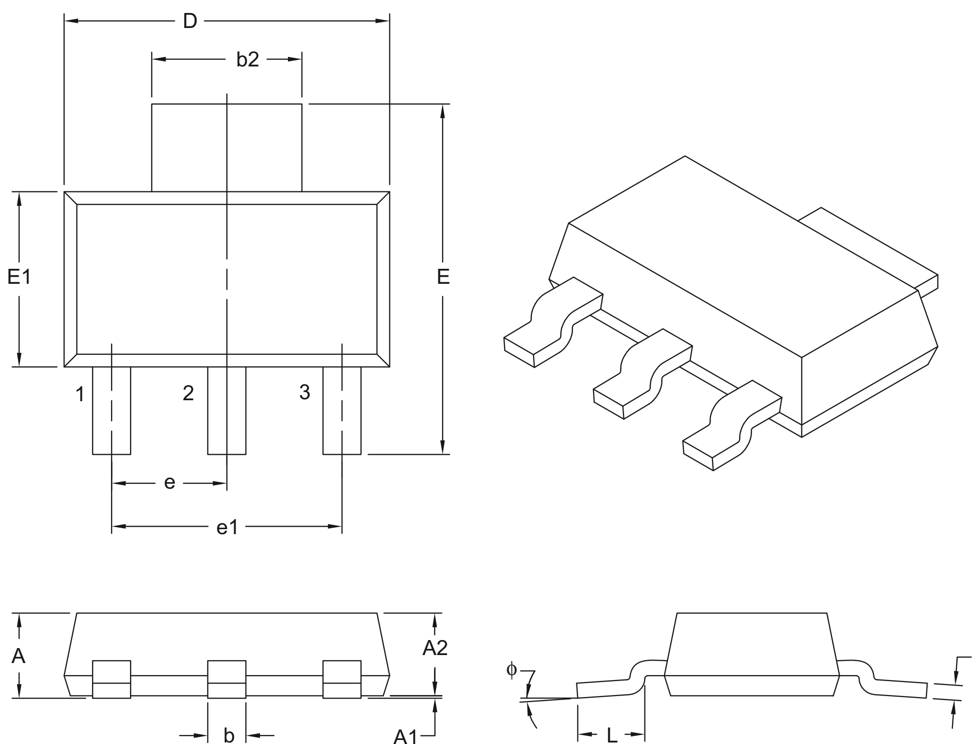
Packaging Diagrams and Parameters

3-Lead Plastic Small Outline Transistor (DB) [SOT-223]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Leads	N		3	
Lead Pitch	e		2.30 BSC	
Outside Lead Pitch	e1		4.60 BSC	
Overall Height	A	–	–	1.80
Standoff	A1	0.02	–	0.10
Molded Package Height	A2	1.50	1.60	1.70
Overall Width	E	6.70	7.00	7.30
Molded Package Width	E1	3.30	3.50	3.70
Overall Length	D	6.30	6.50	6.70
Lead Thickness	c	0.23	0.30	0.35
Lead Width	b	0.60	0.76	0.84
Tab Lead Width	b2	2.90	3.00	3.10
Foot Length	L	0.75	–	–
Lead Angle	ϕ	0°	–	10°

Notes:

1. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

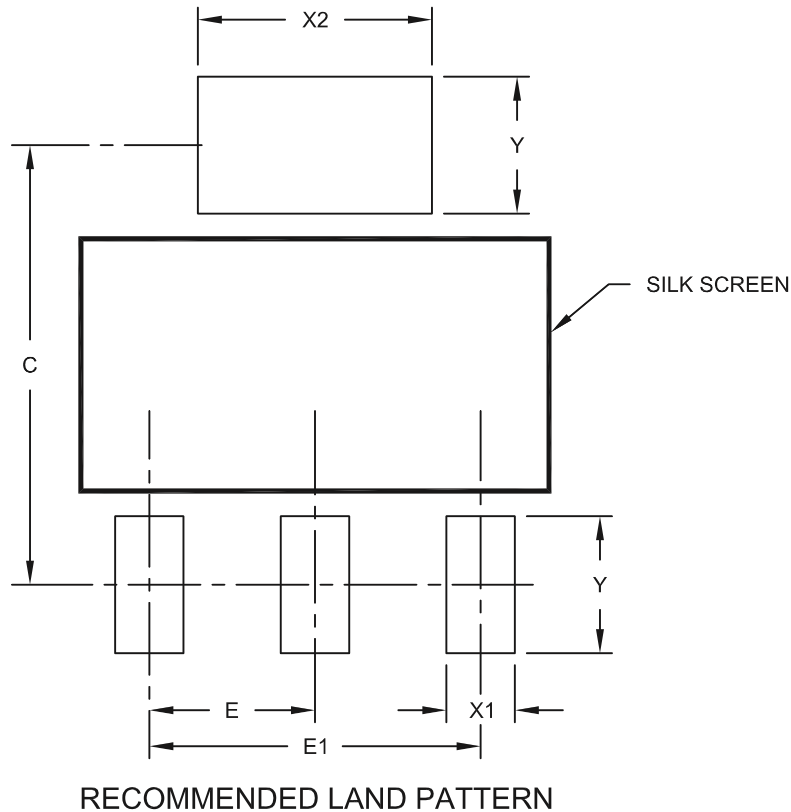
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-032B

Land Pattern (Footprint)

3-Lead Plastic Small Outline Transistor (DB) [SOT-223]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E		2.30 BSC	
Overall Pitch	E1		4.60 BSC	
Contact Pad Spacing	C		6.10	
Contact Pad Width	X1			0.95
Contact Pad Width	X2			3.25
Contact Pad Length	Y			1.90

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2032A

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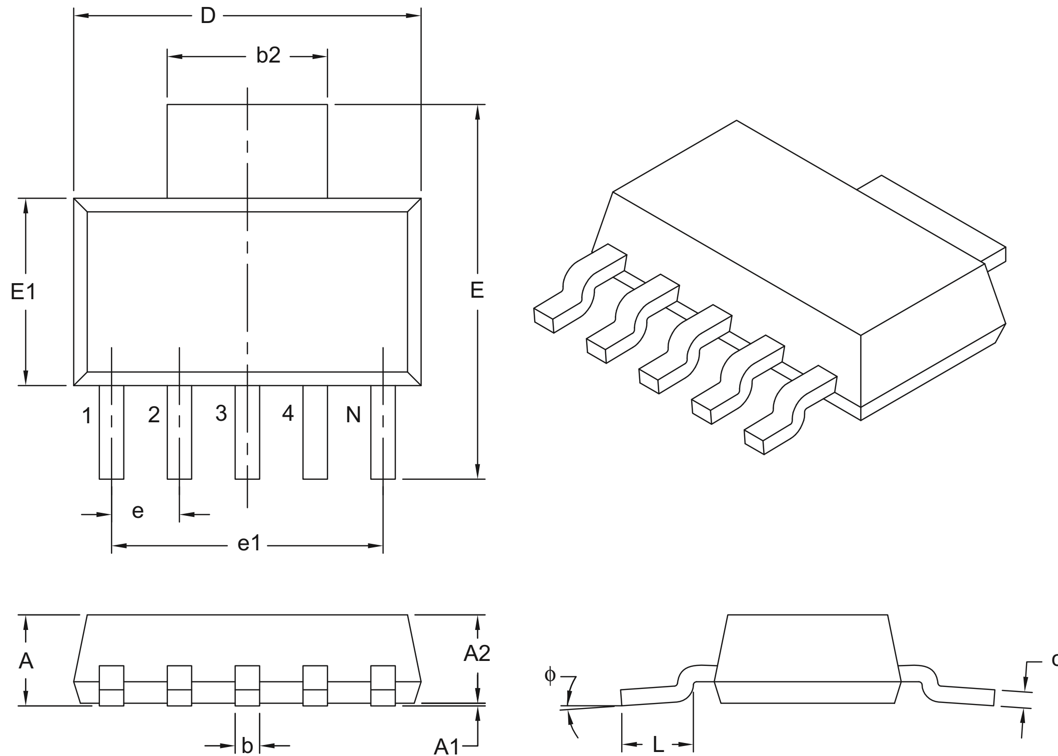
Packaging Diagrams and Parameters

5-Lead Plastic Small Outline Transistor (DC) [SOT-223]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



		Units	MILLIMETERS	
	Dimension Limits	MIN	NOM	MAX
Number of Leads	N		5	
Lead Pitch	e		1.27 BSC	
Outside Lead Pitch	e1		5.08 BSC	
Overall Height	A	–	–	1.80
Standoff	A1	0.02	0.06	0.10
Molded Package Height	A2	1.55	1.60	1.65
Overall Width	E	6.86	7.00	7.26
Molded Package Width	E1	3.45	3.50	3.55
Overall Length	D	6.45	6.50	6.55
Lead Thickness	c	0.24	0.28	0.32
Lead Width	b	0.41	0.457	0.51
Tab Lead Width	b2	2.95	3.00	3.05
Foot Length	L	0.91	–	1.14
Lead Angle	φ	0°	4°	8°

Notes:

1. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

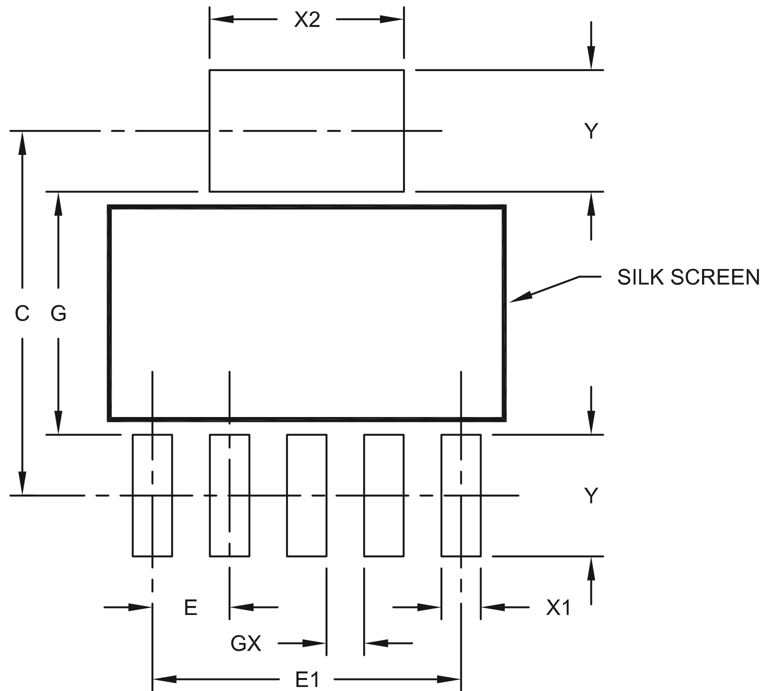
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-137B

Land Pattern (Footprint)

5-Lead Plastic Small Outline Transistor (DC) [SOT-223]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Pad Pitch	E		1.27 BSC	
Overall Pad Pitch	E1		5.08 BSC	
Pad Spacing	C		6.00	
Pad Width	X1			0.65
Pad Width	X2			3.20
Pad Length	Y			2.00
Distance Between Pads	G	4.00		
Distance Between Pads	GX	0.62		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2137A

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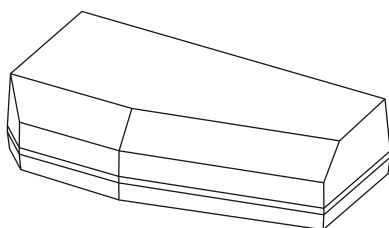
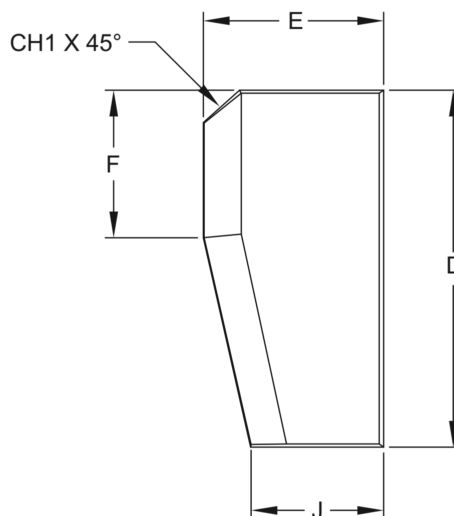
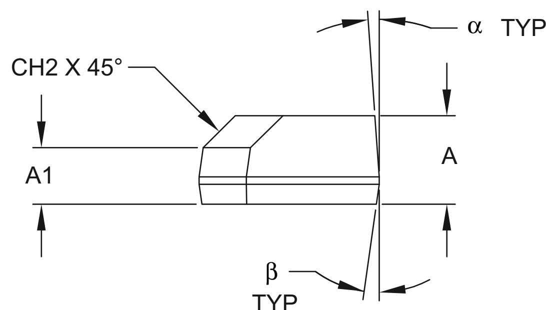
Packaging Diagrams and Parameters

Leadless Wedge Module Plastic Small Outline Transistor (WM) [SOT-385]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging







	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Overall Height	A	2.90	3.00	3.05
Bottom of Package to Chamfer	A1	1.90	2.00	2.10
Overall Width	E	6.00	6.10	6.20
Overall Length	D	12.00	12.10	12.20
Width at Tapered End	J	4.40	4.50	4.60
Length of Flat	F	4.90	5.00	5.10
Chamfer Distance, Horizontal	CH1	1.00	1.10	1.20
Chamfer Distance, Vertical	CH2	1.00	1.10	1.20
Mold Draft Angle Top	α	4°	6°	8°
Mold Draft Angle Bottom	β	4°	6°	8°

Note:

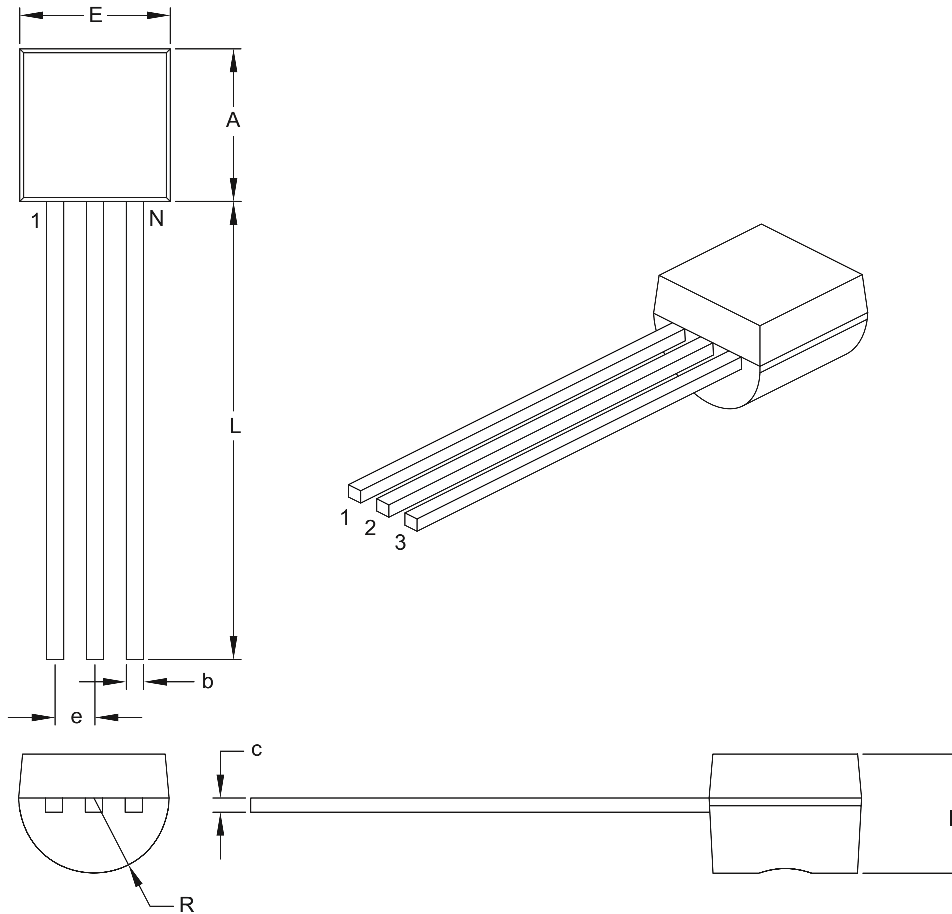
1. Dimensions D, E, F and J do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.

Microchip Technology Drawing C04-109B

Packaging Diagrams and Parameters

3-Lead Plastic Transistor Outline (TO) [TO-92]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES	
	Dimension Limits	MIN	MAX
Number of Pins	N	3	
Pitch	e	.050 BSC	
Bottom to Package Flat	D	.125	.165
Overall Width	E	.175	.205
Overall Length	A	.170	.210
Molded Package Radius	R	.080	.105
Tip to Seating Plane	L	.500	–
Lead Thickness	c	.014	.021
Lead Width	b	.014	.022

Notes:

1. Dimensions A and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .005" per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-101B

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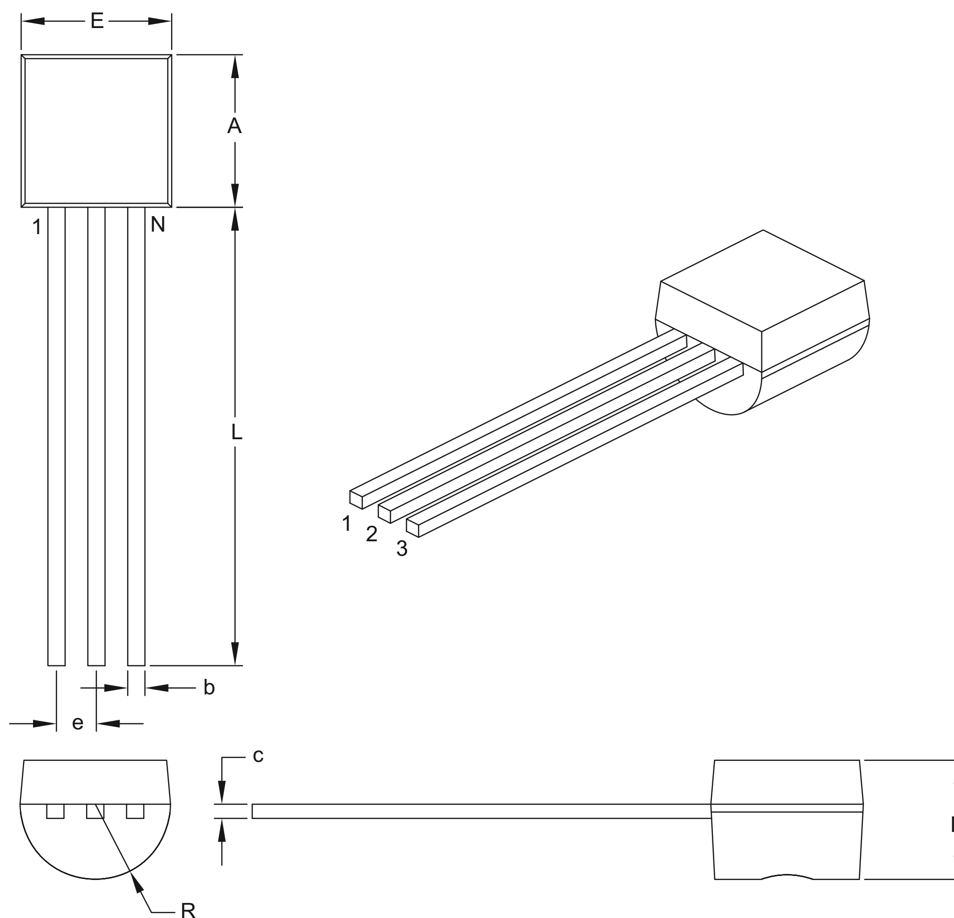
Packaging Diagrams and Parameters

3-Lead Plastic Transistor Outline (ZB) [TO-92]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES	
Dimension Limits		MIN	MAX
Number of Pins	N	3	
Pitch	e	.050 BSC	
Bottom to Package Flat	D	.125	.165
Overall Width	E	.175	.205
Overall Length	A	.170	.210
Molded Package Radius	R	.080	.105
Tip to Seating Plane	L	.500	–
Lead Thickness	c	.014	.021
Lead Width	b	.014	.022

Notes:

1. Dimensions A and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .005" per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

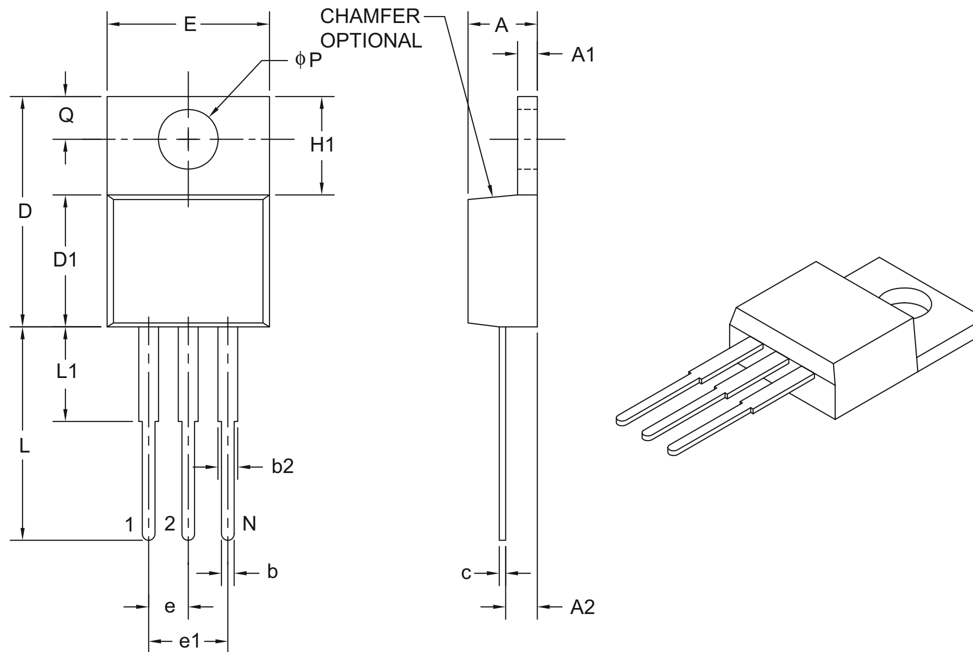
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-101B

Packaging Diagrams and Parameters

3-Lead Plastic Transistor Outline (AB) [TO-220]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	3		
Pitch	e	.100 BSC		
Overall Pin Pitch	e1	.200 BSC		
Overall Height	A	.140	–	.190
Tab Thickness	A1	.020	–	.055
Base to Lead	A2	.080	–	.115
Overall Width	E	.357	–	.420
Mounting Hole Center	Q	.100	–	.120
Overall Length	D	.560	–	.650
Molded Package Length	D1	.330	–	.355
Tab Length	H1	.230	–	.270
Mounting Hole Diameter	ϕP	.139	–	.156
Lead Length	L	.500	–	.580
Lead Shoulder	L1	–	–	.250
Lead Thickness	c	.012	–	.024
Lead Width	b	.015	.027	.040
Shoulder Width	b2	.045	.057	.070

Notes:

1. Dimensions D and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .005" per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-034B

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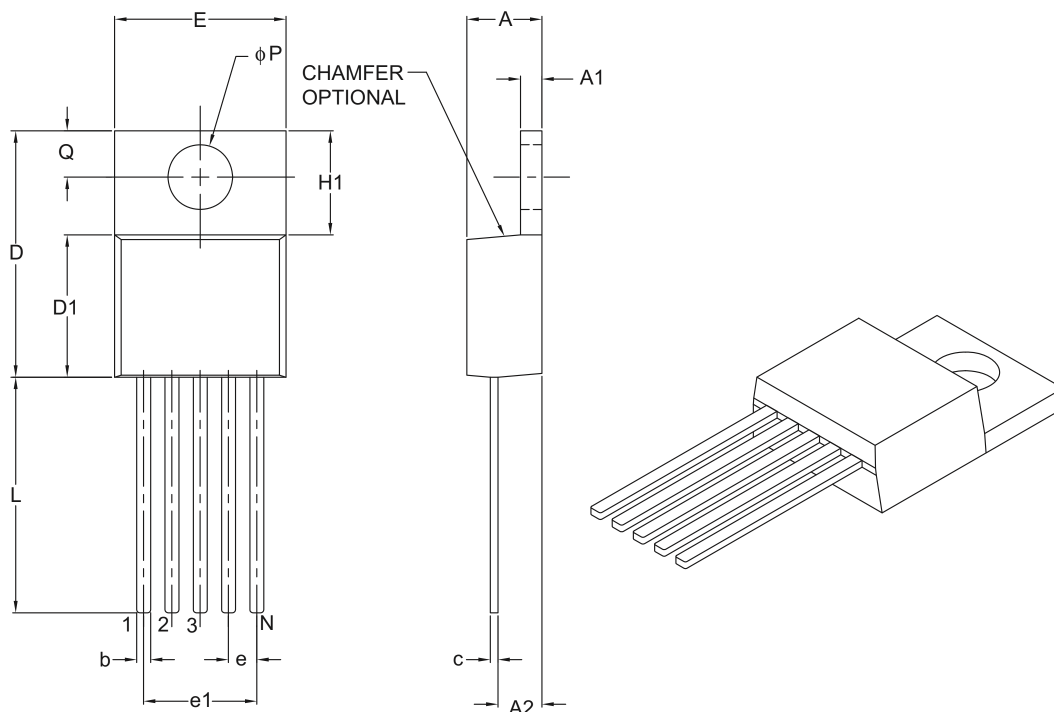
Packaging Diagrams and Parameters

5-Lead Plastic Transistor Outline (AT) [TO-220]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		5	
Pitch	e		.067 BSC	
Overall Pin Pitch	e1		.268 BSC	
Overall Height	A	.140	–	.190
Overall Width	E	.380	–	.420
Overall Length	D	.560	–	.650
Molded Package Length	D1	.330	–	.355
Tab Length	H1	.204	–	.293
Tab Thickness	A1	.020	–	.055
Mounting Hole Center	Q	.100	–	.120
Mounting Hole Diameter	φP	.139	–	.156
Lead Length	L	.482	–	.590
Base to Bottom of Lead	A2	.080	–	.115
Lead Thickness	c	.012	–	.025
Lead Width	b	.015	.027	.040

Notes:

1. Dimensions D and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .005" per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

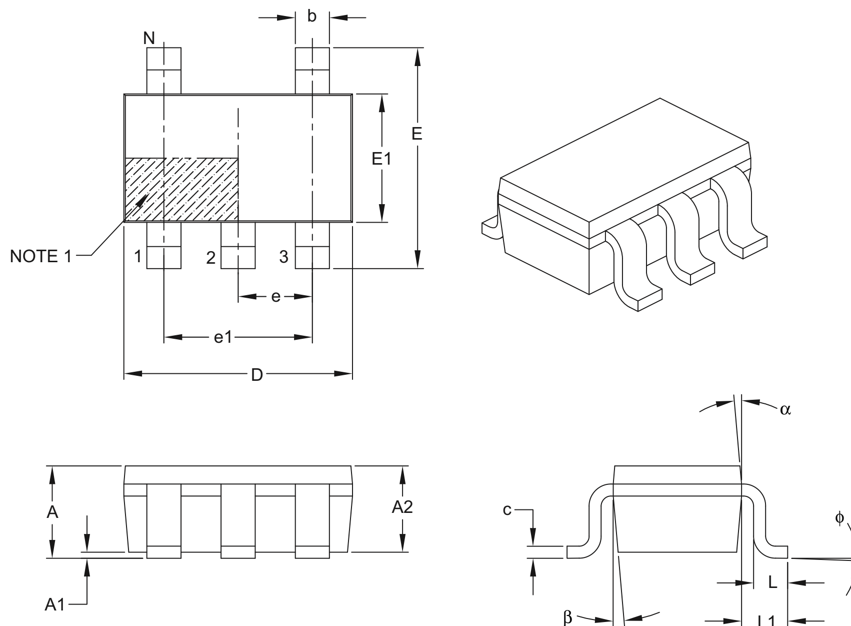
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-036B

Packaging Diagrams and Parameters

5-Lead Plastic Thin Small Outline Transistor (OS) [TSOT]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Leads	N	5		
Lead Pitch	e	0.95 BSC		
Outside Lead Pitch	e1	1.90 BSC		
Overall Height	A	–	–	1.10
Molded Package Thickness	A2	0.70	0.90	1.00
Standoff	A1	0.00	–	0.10
Overall Width	E	2.80 BSC		
Molded Package Width	E1	1.60 BSC		
Overall Length	D	2.90 BSC		
Foot Length	L	0.30	0.45	0.60
Footprint	L1	0.60 REF		
Foot Angle	φ	0°	4°	8°
Lead Thickness	c	0.08	–	0.20
Lead Width	b	0.30	–	0.50
Mold Draft Angle Top	α	4°	10°	12°
Mold Draft Angle Bottom	β	4°	10°	12°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-128B

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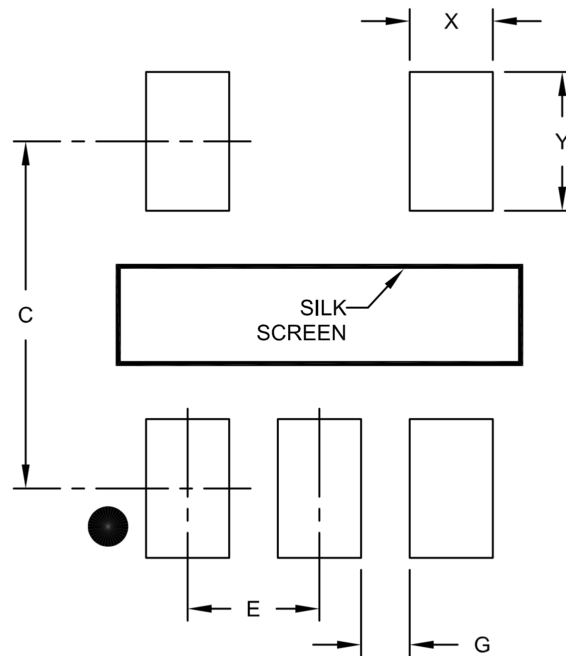
Land Pattern (Footprint)

5-Lead Plastic Thin Small Outline Transistor (OS) [TSOT]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.95 BSC		
Contact Pad Spacing	C		2.80	
Contact Pad Width (X5)	X			0.60
Contact Pad Length (X5)	Y			1.10
Distance Between Pads	G	0.35		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2128A

Packaging Diagrams and Parameters

NOTES:

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Packaging Diagrams and Parameters

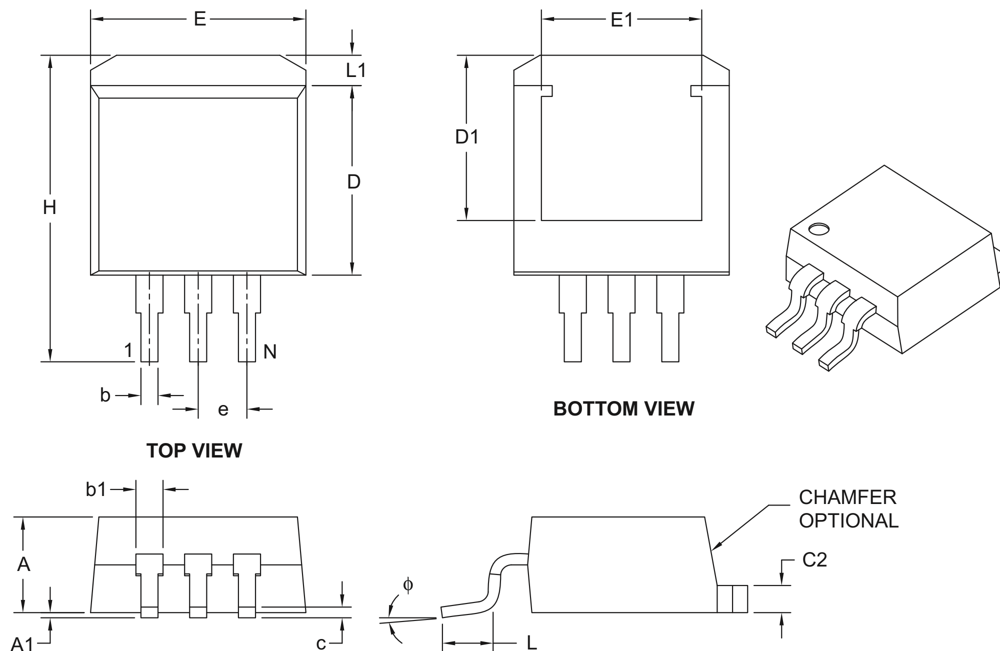
DDPAK Family

Double Deca-Watt Packages

Packaging Diagrams and Parameters

3-Lead Plastic (EB) [DDPAK]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	3		
Pitch	e	.100 BSC		
Overall Height	A	.160	–	.190
Standoff §	A1	.000	–	.010
Overall Width	E	.380	–	.420
Exposed Pad Width	E1	.245	–	–
Molded Package Length	D	.330	–	.380
Overall Length	H	.549	–	.625
Exposed Pad Length	D1	.270	–	–
Lead Thickness	c	.014	–	.029
Pad Thickness	C2	.045	–	.065
Lower Lead Width	b	.020	–	.039
Upper Lead Width	b1	.045	–	.070
Foot Length	L	.068	–	.110
Pad Length	L1	–	–	.067
Foot Angle	ϕ	0°	–	8°

Notes:

1. § Significant Characteristic.
2. Dimensions D and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .005" per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-011B

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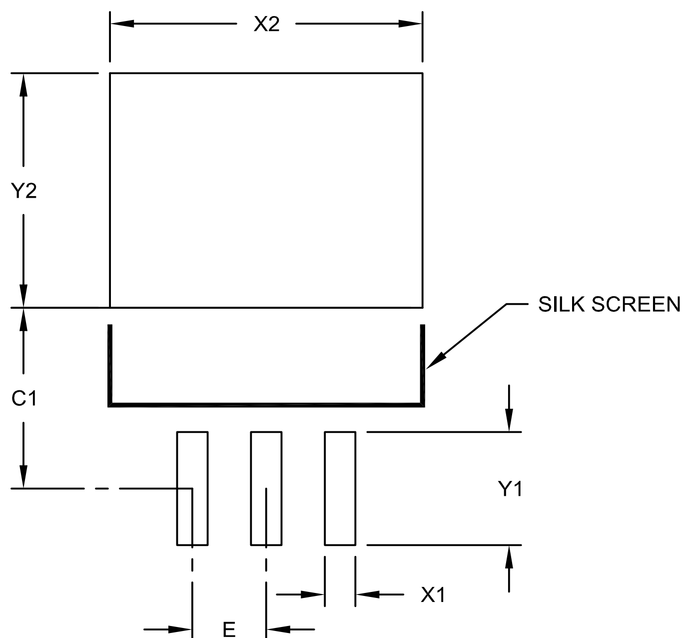
Land Pattern (Footprint)

3-Lead Plastic (EB) [DDPAK]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E	.100 BSC		
Pad Width	X2			.423
Pad Length	Y2			.327
Contact Pad Spacing	C1		.252	
Contact Pad Width (X3)	X1			.041
Contact Pad Length (X3)	Y1			.157

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2011A

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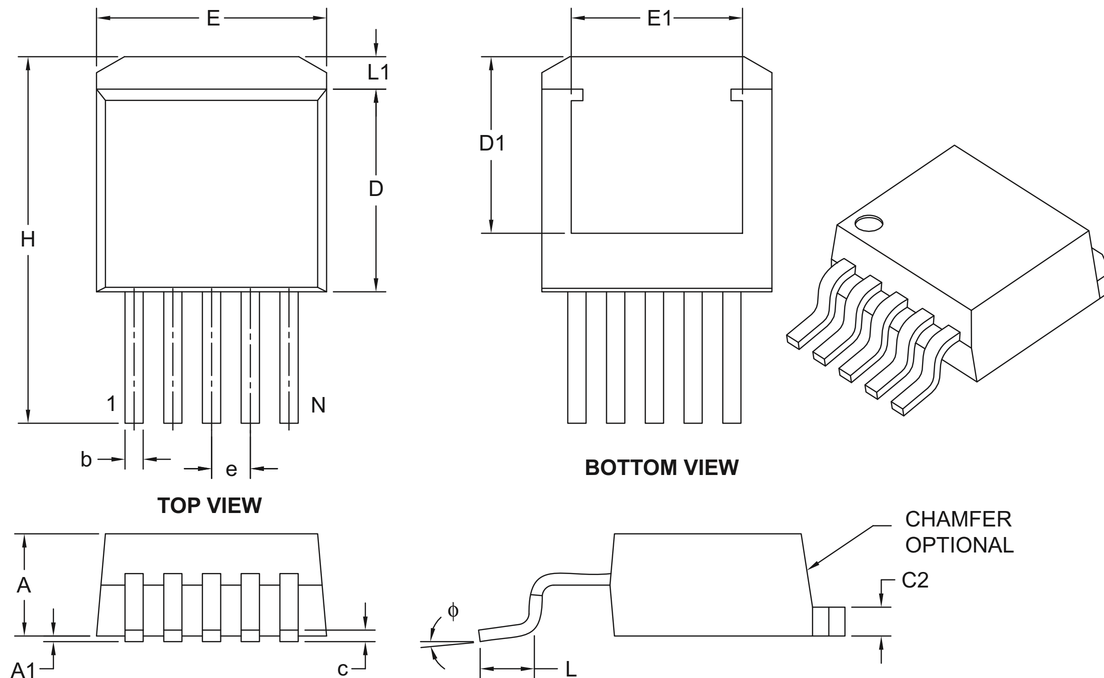
Packaging Diagrams and Parameters

5-Lead Plastic (ET) [DDPAK]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	5		
Pitch	e	.067 BSC		
Overall Height	A	.160	–	.190
Standoff §	A1	.000	–	.010
Overall Width	E	.380	–	.420
Exposed Pad Width	E1	.245	–	–
Molded Package Length	D	.330	–	.380
Overall Length	H	.549	–	.625
Exposed Pad Length	D1	.270	–	–
Lead Thickness	c	.014	–	.029
Pad Thickness	C2	.045	–	.065
Lead Width	b	.020	–	.039
Foot Length	L	.068	–	.110
Pad Length	L1	–	–	.067
Foot Angle	ϕ	0°	–	8°

Notes:

1. § Significant Characteristic.
2. Dimensions D and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .005" per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-012B

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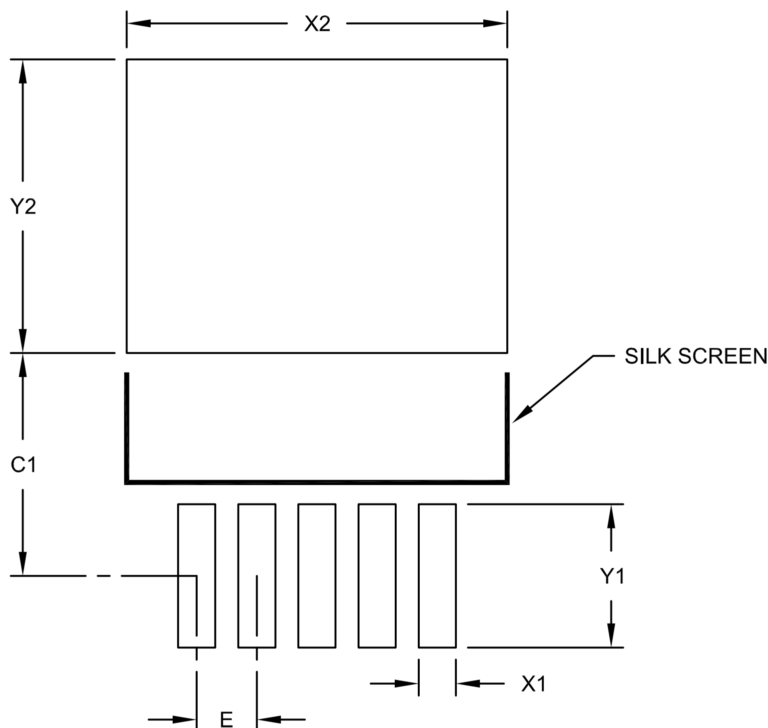
Land Pattern (Footprint)

5-Lead Plastic (ET) [DDPAK]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E		.067 BSC	
Optional Center Pad Width	X2			.423
Optional Center Pad Length	Y2			.327
Contact Pad Spacing	C1		.248	
Contact Pad Width (X5)	X1			.041
Contact Pad Length (X5)	Y1			.159

Notes:

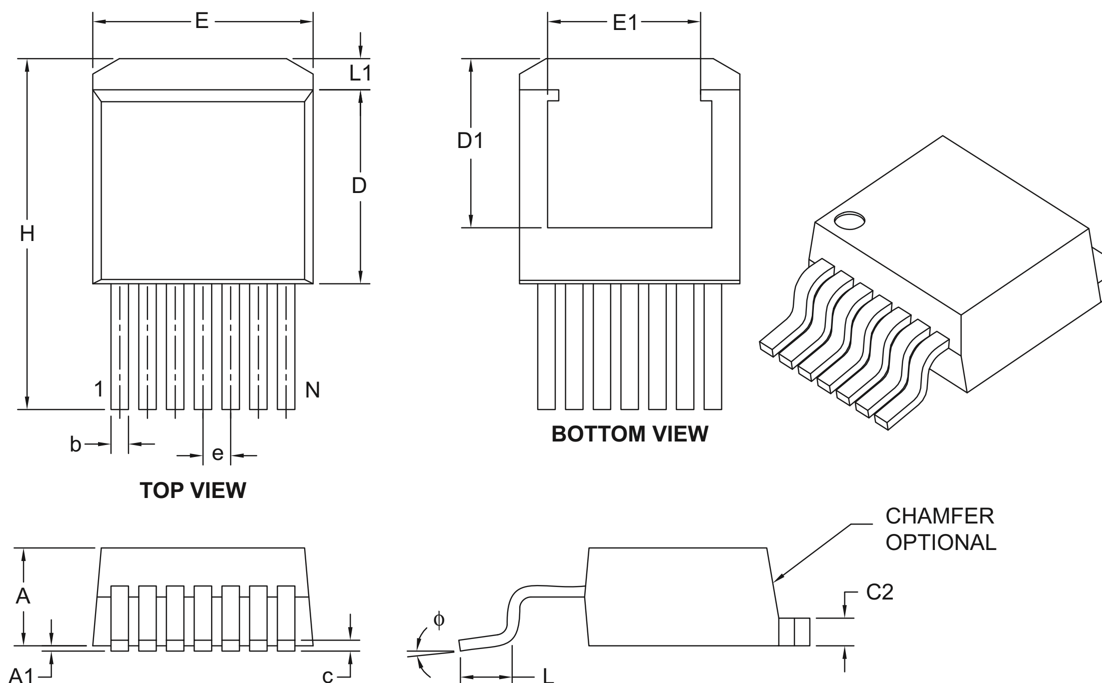
1. Dimensioning and tolerancing per ASME Y14.5M
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2012A

Packaging Diagrams and Parameters

7-Lead Plastic (EK) [DDPAK]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	7		
Pitch	e	.050 BSC		
Overall Height	A	.160	–	.190
Standoff §	A1	.000	–	.010
Overall Width	E	.380	–	.420
Exposed Pad Width	E1	.245	–	–
Molded Package Length	D	.330	–	.380
Overall Length	H	.549	–	.625
Exposed Pad Length	D1	.270	–	–
Lead Thickness	c	.014	–	.029
Pad Thickness	C2	.045	–	.065
Lead Width	b	.020	–	.037
Foot Length	L	.068	–	.110
Pad Length	L1	–	–	.067
Foot Angle	ϕ	0°	–	8°

Notes:

1. § Significant Characteristic.
2. Dimensions D and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .005" per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-015B

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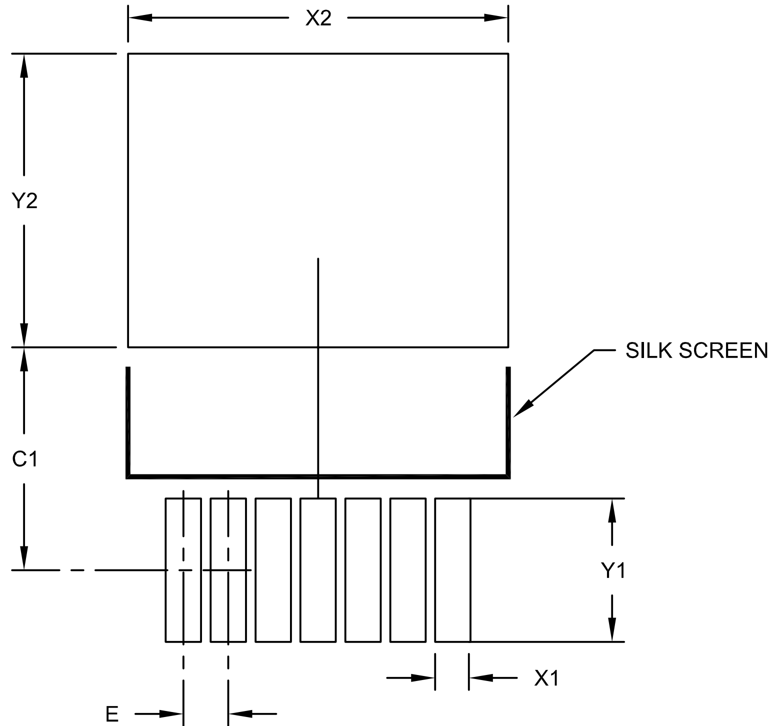
Land Pattern (Footprint)

7-Lead Plastic (EK) [DDPAK]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	.050 BSC		
Optional Center Pad Width	X2			.423
Optional Center Pad Length	Y2			.327
Contact Pad Spacing	C1		.248	
Contact Pad Width (X7)	X1			.039
Contact Pad Length (X7)	Y1			.159

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2015B

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Packaging Diagrams and Parameters

NOTES:

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Packaging Diagrams and Parameters

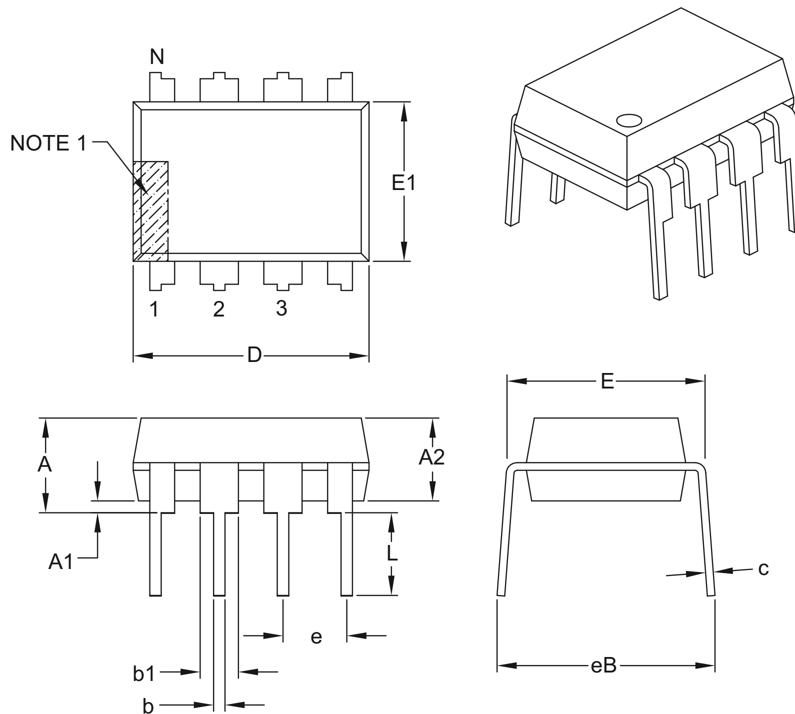
PDIP Family

Plastic Dual In-Line Packages

Packaging Diagrams and Parameters

8-Lead Plastic Dual In-Line (P) – 300 mil Body [PDIP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	8		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.210
Molded Package Thickness	A2	.115	.130	.195
Base to Seating Plane	A1	.015	–	–
Shoulder to Shoulder Width	E	.290	.310	.325
Molded Package Width	E1	.240	.250	.280
Overall Length	D	.348	.365	.400
Tip to Seating Plane	L	.115	.130	.150
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.040	.060	.070
Lower Lead Width	b	.014	.018	.022
Overall Row Spacing §	eB	–	–	.430

Notes:

1. Pin 1 visual index feature may vary, but must be located with the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-018B

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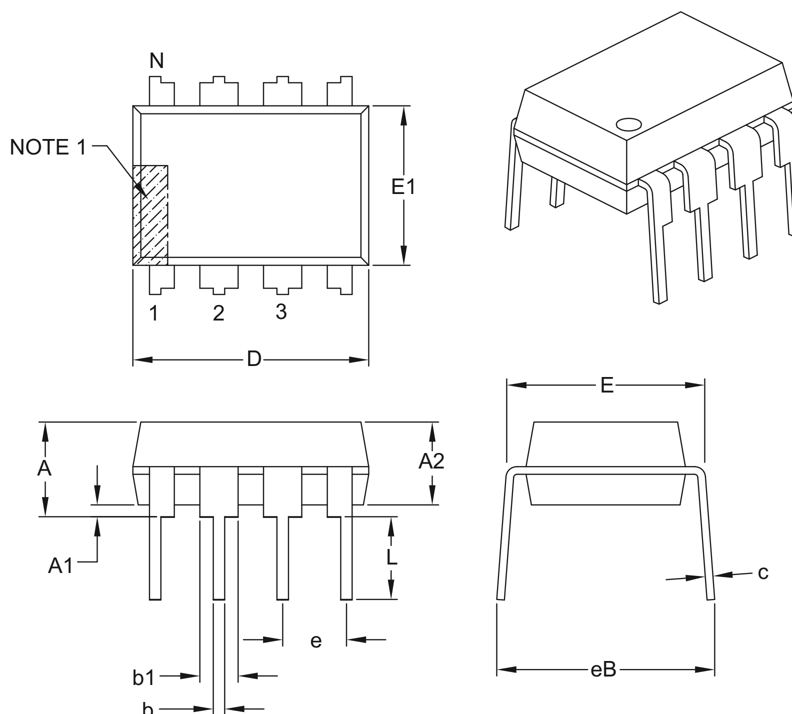
Packaging Diagrams and Parameters

8-Lead Plastic Dual In-Line (PA) – 300 mil Body [PDIP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	8		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.210
Molded Package Thickness	A2	.115	.130	.195
Base to Seating Plane	A1	.015	–	–
Shoulder to Shoulder Width	E	.290	.310	.325
Molded Package Width	E1	.240	.250	.280
Overall Length	D	.348	.365	.400
Tip to Seating Plane	L	.115	.130	.150
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.040	.060	.070
Lower Lead Width	b	.014	.018	.022
Overall Row Spacing §	eB	–	–	.430

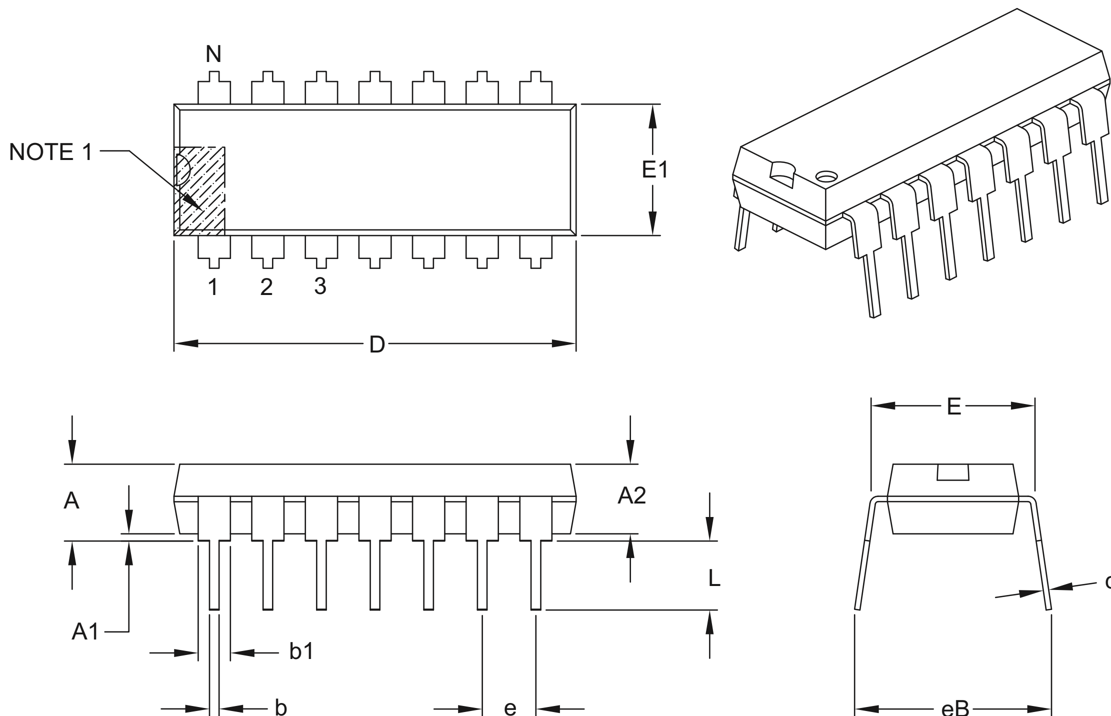
Notes:
1. Pin 1 visual index feature may vary, but must be located with the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-018B

Packaging Diagrams and Parameters

14-Lead Plastic Dual In-Line (P) – 300 mil Body [PDIP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		14	
Pitch	e		.100 BSC	
Top to Seating Plane	A	–	–	.210
Molded Package Thickness	A2	.115	.130	.195
Base to Seating Plane	A1	.015	–	–
Shoulder to Shoulder Width	E	.290	.310	.325
Molded Package Width	E1	.240	.250	.280
Overall Length	D	.735	.750	.775
Tip to Seating Plane	L	.115	.130	.150
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.045	.060	.070
Lower Lead Width	b	.014	.018	.022
Overall Row Spacing §	eB	–	–	.430

Notes:

1. Pin 1 visual index feature may vary, but must be located with the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-005B

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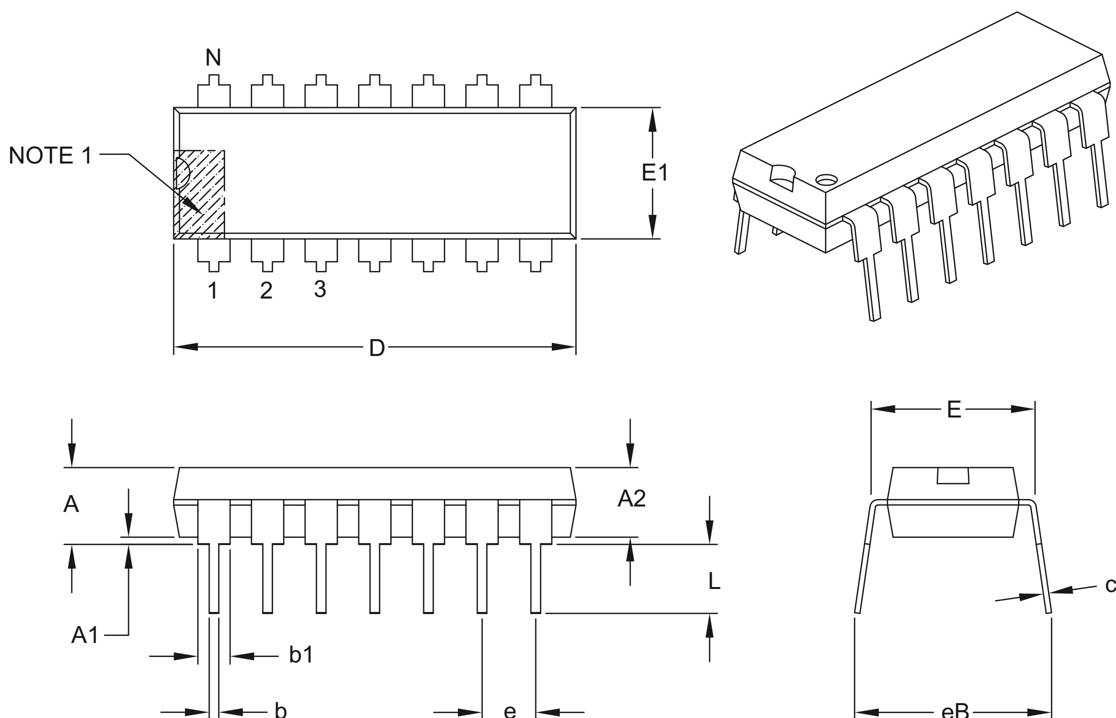
Packaging Diagrams and Parameters

14-Lead Plastic Dual In-Line (PD) – 300 mil Body [PDIP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	14		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.210
Molded Package Thickness	A2	.115	.130	.195
Base to Seating Plane	A1	.015	–	–
Shoulder to Shoulder Width	E	.290	.310	.325
Molded Package Width	E1	.240	.250	.280
Overall Length	D	.735	.750	.775
Tip to Seating Plane	L	.115	.130	.150
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.045	.060	.070
Lower Lead Width	b	.014	.018	.022
Overall Row Spacing §	eB	–	–	.430

Notes:

1. Pin 1 visual index feature may vary, but must be located with the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

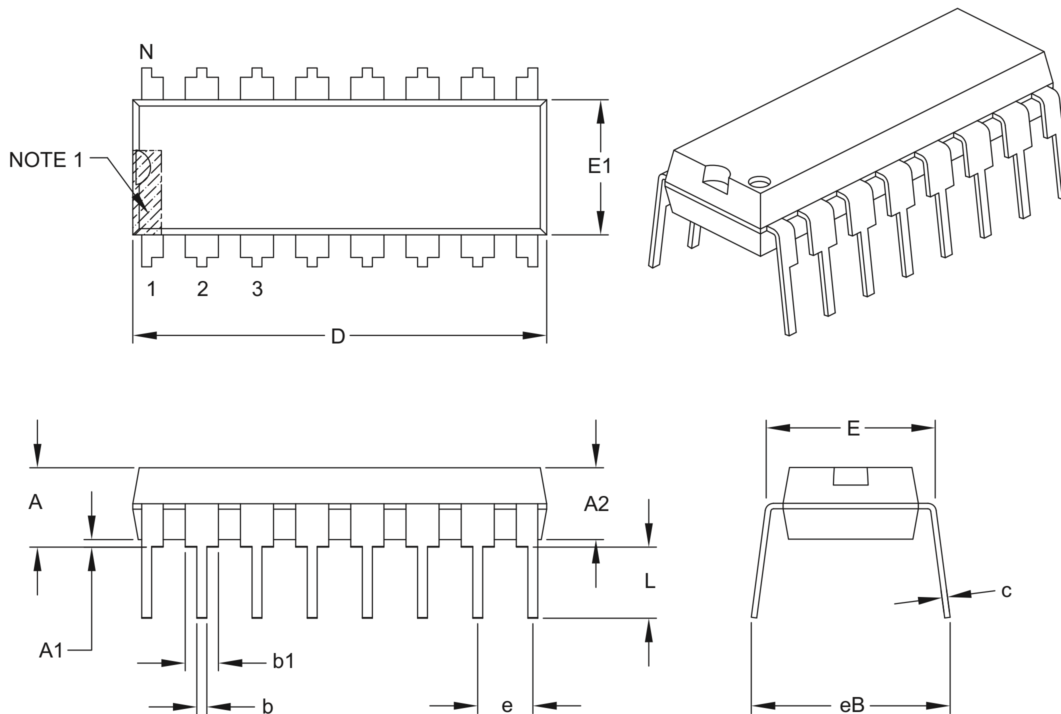
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-005B

Packaging Diagrams and Parameters

16-Lead Plastic Dual In-Line (P) – 300 mil Body [PDIP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	16		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.210
Molded Package Thickness	A2	.115	.130	.195
Base to Seating Plane	A1	.015	–	–
Shoulder to Shoulder Width	E	.290	.310	.325
Molded Package Width	E1	.240	.250	.280
Overall Length	D	.735	.755	.775
Tip to Seating Plane	L	.115	.130	.150
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.045	.060	.070
Lower Lead Width	b	.014	.018	.022
Overall Row Spacing §	eB	–	–	.430

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-017B

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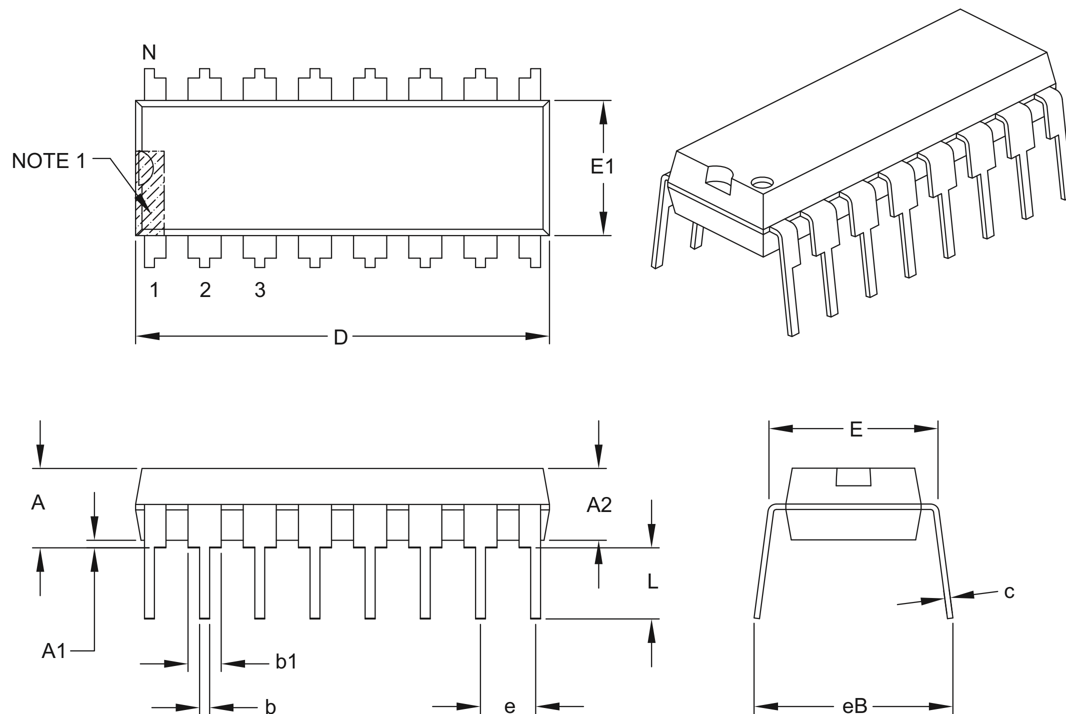
Packaging Diagrams and Parameters

16-Lead Plastic Dual In-Line (PE) – 300 mil Body [PDIP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	16		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.210
Molded Package Thickness	A2	.115	.130	.195
Base to Seating Plane	A1	.015	–	–
Shoulder to Shoulder Width	E	.290	.310	.325
Molded Package Width	E1	.240	.250	.280
Overall Length	D	.735	.755	.775
Tip to Seating Plane	L	.115	.130	.150
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.045	.060	.070
Lower Lead Width	b	.014	.018	.022
Overall Row Spacing §	eB	–	–	.430

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

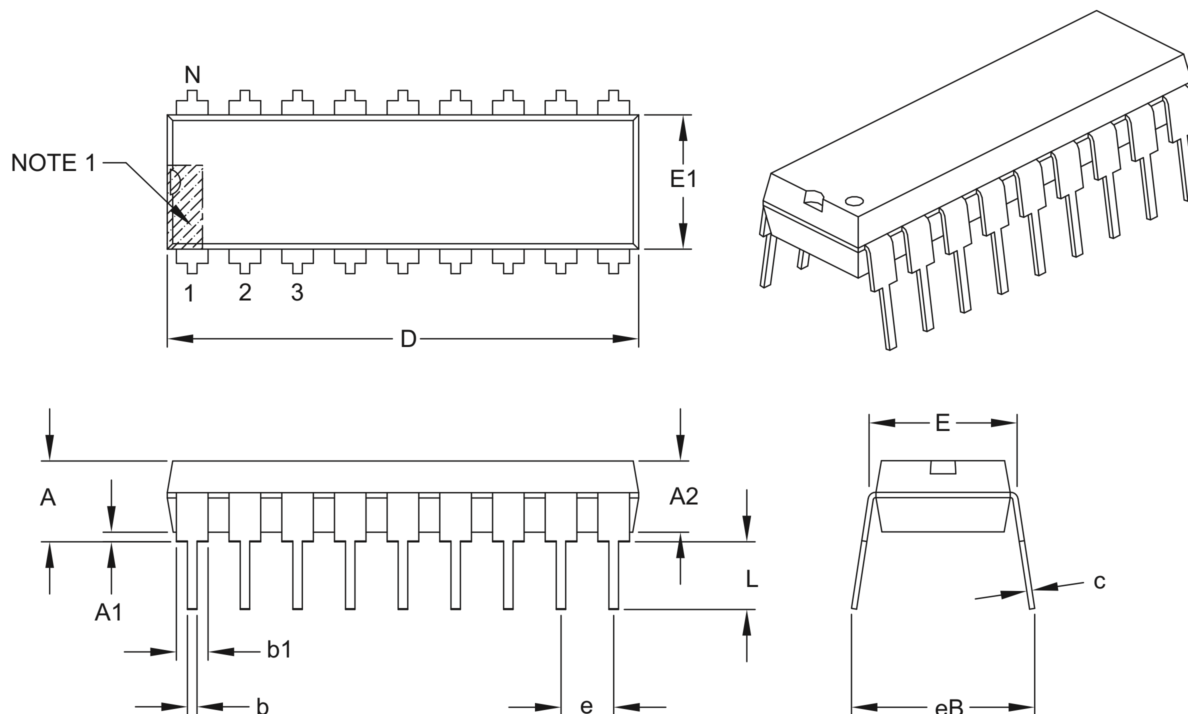
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-017B

Packaging Diagrams and Parameters

18-Lead Plastic Dual In-Line (P) – 300 mil Body [PDIP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		18	
Pitch	e		.100 BSC	
Top to Seating Plane	A	–	–	.210
Molded Package Thickness	A2	.115	.130	.195
Base to Seating Plane	A1	.015	–	–
Shoulder to Shoulder Width	E	.300	.310	.325
Molded Package Width	E1	.240	.250	.280
Overall Length	D	.880	.900	.920
Tip to Seating Plane	L	.115	.130	.150
Lead Thickness	c	.008	.010	.014
Upper Lead Width	b1	.045	.060	.070
Lower Lead Width	b	.014	.018	.022
Overall Row Spacing §	eB	–	–	.430

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-007B

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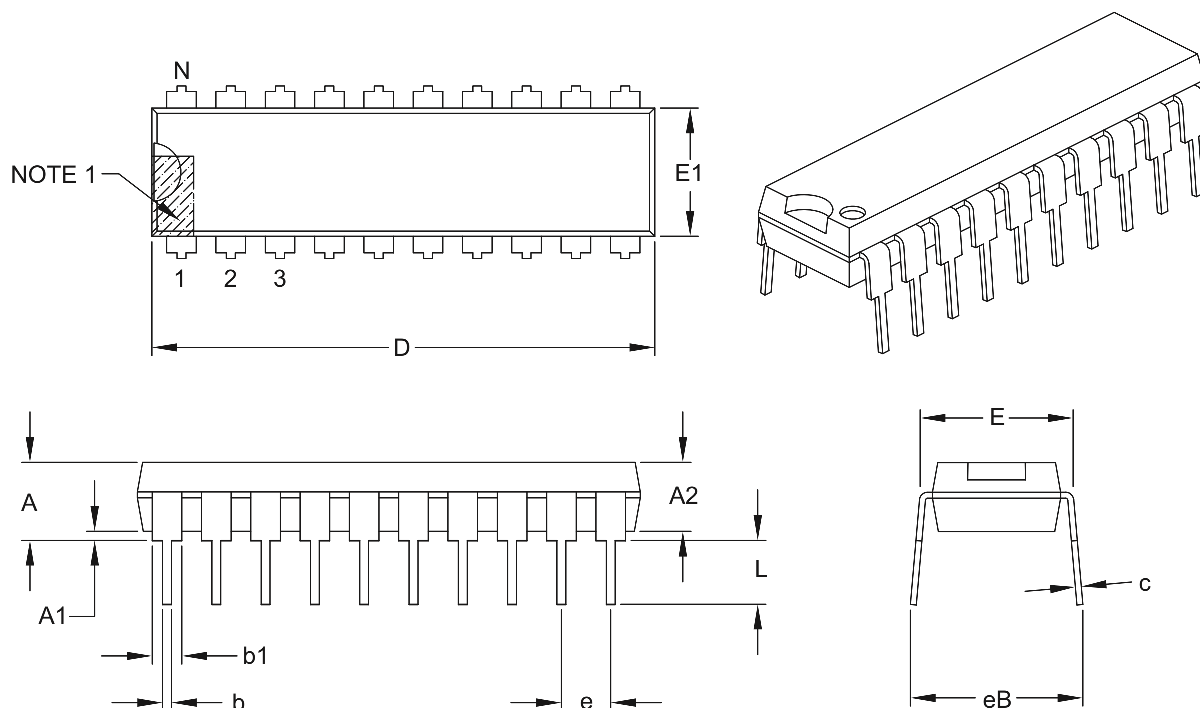
Packaging Diagrams and Parameters

20-Lead Plastic Dual In-Line (P) – 300 mil Body [PDIP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		20	
Pitch	e		.100 BSC	
Top to Seating Plane	A	–	–	.210
Molded Package Thickness	A2	.115	.130	.195
Base to Seating Plane	A1	.015	–	–
Shoulder to Shoulder Width	E	.300	.310	.325
Molded Package Width	E1	.240	.250	.280
Overall Length	D	.980	1.030	1.060
Tip to Seating Plane	L	.115	.130	.150
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.045	.060	.070
Lower Lead Width	b	.014	.018	.022
Overall Row Spacing §	eB	–	–	.430

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

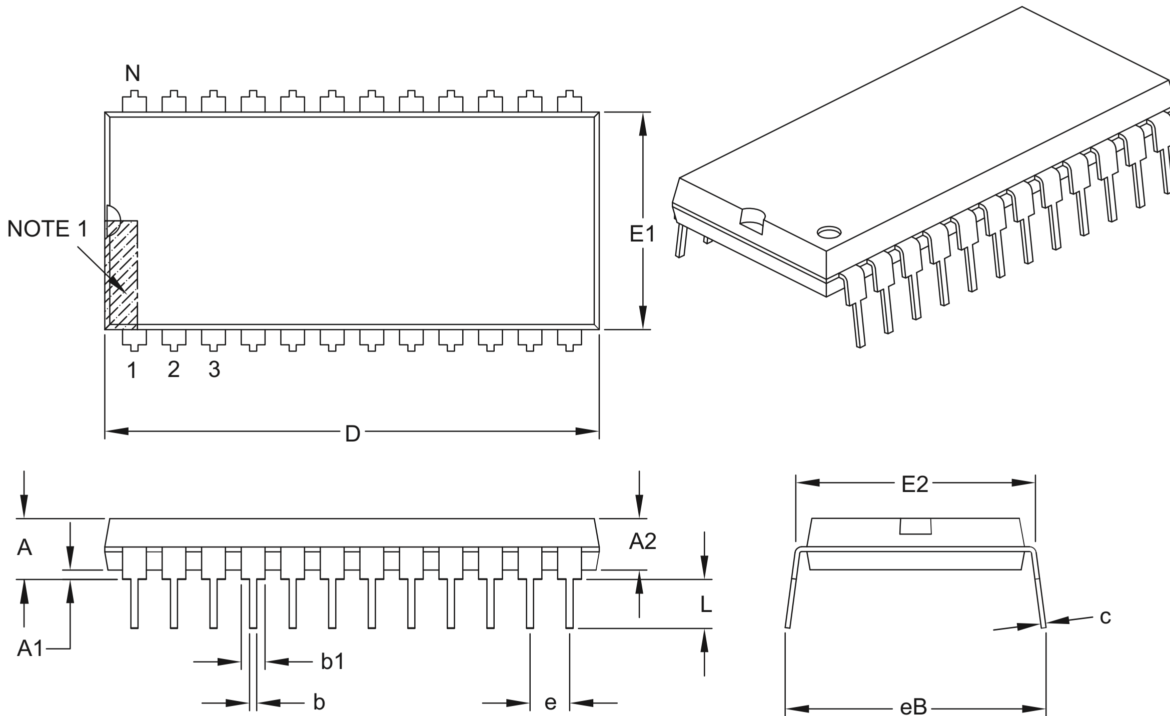
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-019B

Packaging Diagrams and Parameters

24-Lead Plastic Dual In-Line (P) – 600 mil Body [PDIP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	24		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.250
Molded Package Thickness	A2	.125	–	.195
Base to Seating Plane	A1	.015	–	–
Shoulder to Shoulder Width	E	.590	–	.625
Molded Package Width	E1	.485	–	.580
Overall Length	D	1.150	–	1.290
Tip to Seating Plane	L	.115	–	.200
Lead Thickness	c	.008	–	.015
Upper Lead Width	b1	.030	–	.070
Lower Lead Width	b	.014	–	.022
Overall Row Spacing §	eB	–	–	.700

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-081B

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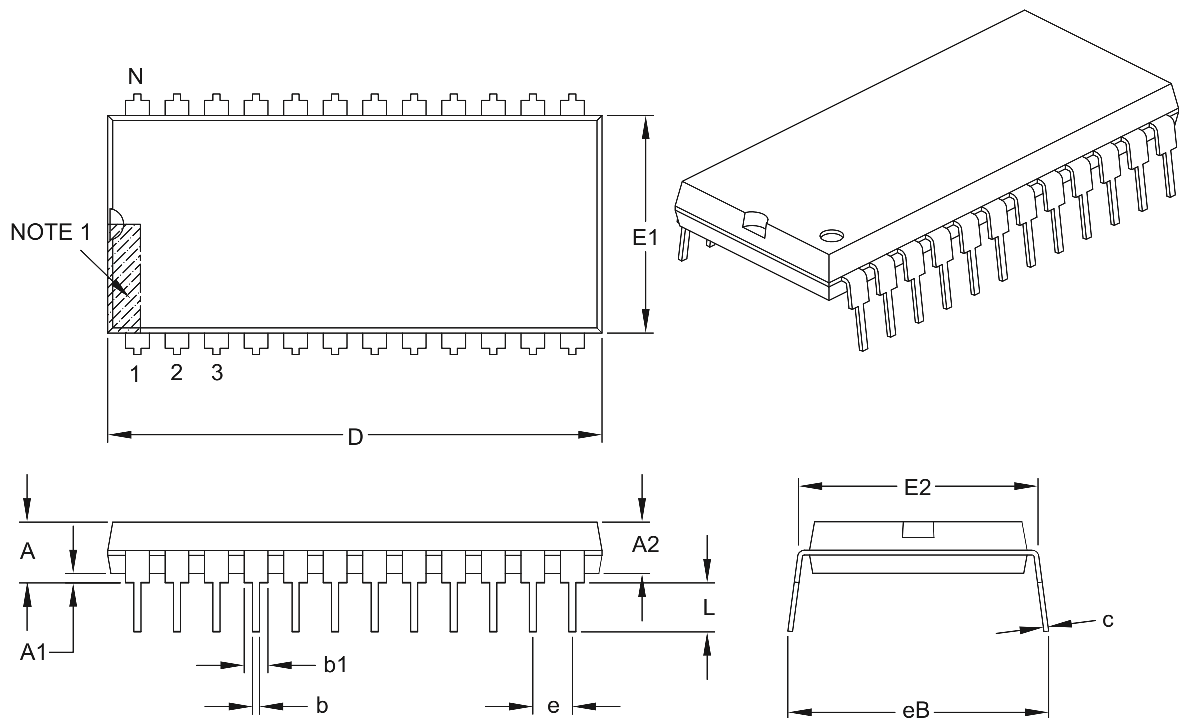
Packaging Diagrams and Parameters

24-Lead Plastic Dual In-Line (PG) – 600 mil Body [PDIP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	24		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.250
Molded Package Thickness	A2	.125	–	.195
Base to Seating Plane	A1	.015	–	–
Shoulder to Shoulder Width	E	.590	–	.625
Molded Package Width	E1	.485	–	.580
Overall Length	D	1.150	–	1.290
Tip to Seating Plane	L	.115	–	.200
Lead Thickness	c	.008	–	.015
Upper Lead Width	b1	.030	–	.070
Lower Lead Width	b	.014	–	.022
Overall Row Spacing §	eB	–	–	.700

Notes:
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

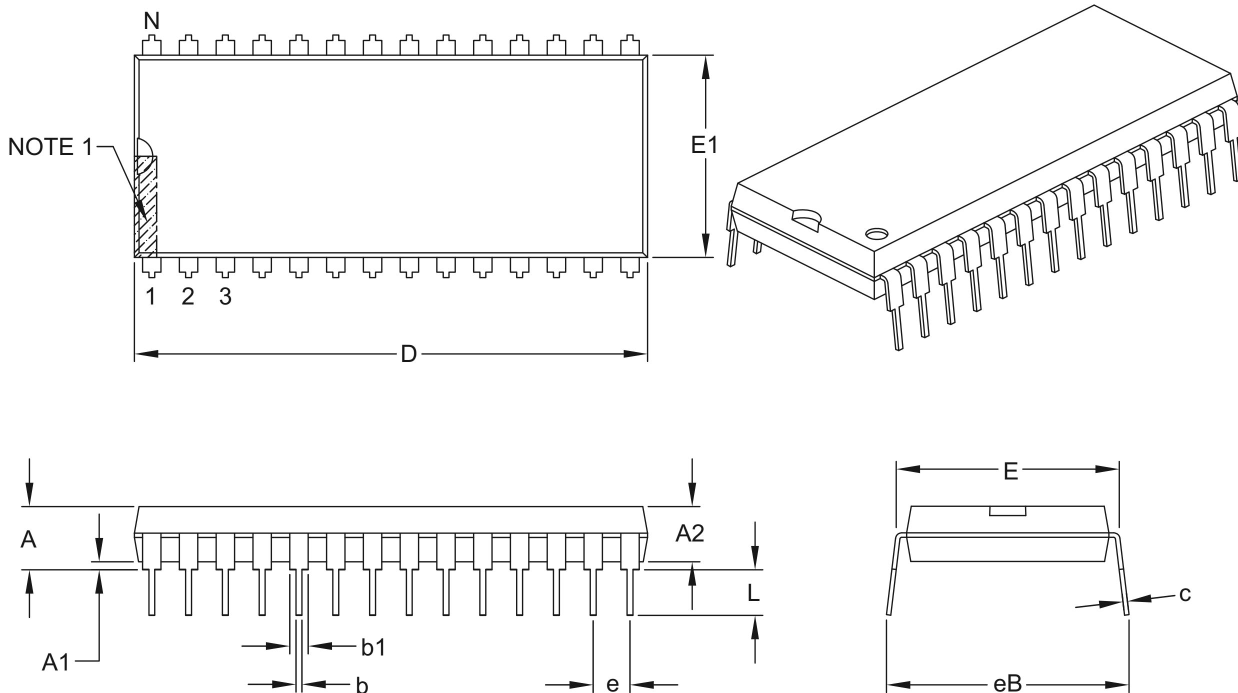
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-081B

Packaging Diagrams and Parameters

28-Lead Plastic Dual In-Line (P) – 600 mil Body [PDIP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	28		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.250
Molded Package Thickness	A2	.125	–	.195
Base to Seating Plane	A1	.015	–	–
Shoulder to Shoulder Width	E	.590	–	.625
Molded Package Width	E1	.485	–	.580
Overall Length	D	1.380	–	1.565
Tip to Seating Plane	L	.115	–	.200
Lead Thickness	c	.008	–	.015
Upper Lead Width	b1	.030	–	.070
Lower Lead Width	b	.014	–	.022
Overall Row Spacing §	eB	–	–	.700

Notes:
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-079B

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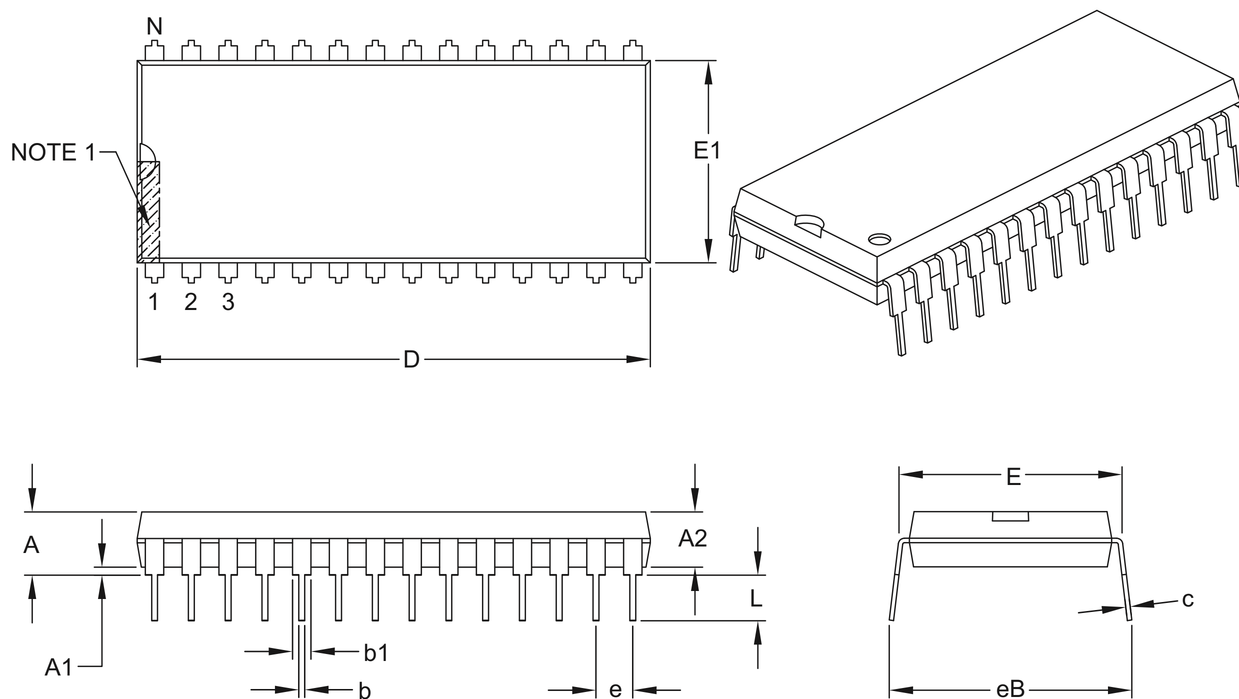
Packaging Diagrams and Parameters

28-Lead Plastic Dual In-Line (PI) – 600 mil Body [PDIP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



		Units	INCHES	
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		28	
Pitch	e		.100 BSC	
Top to Seating Plane	A	–	–	.250
Molded Package Thickness	A2	.125	–	.195
Base to Seating Plane	A1	.015	–	–
Shoulder to Shoulder Width	E	.590	–	.625
Molded Package Width	E1	.485	–	.580
Overall Length	D	1.380	–	1.565
Tip to Seating Plane	L	.115	–	.200
Lead Thickness	c	.008	–	.015
Upper Lead Width	b1	.030	–	.070
Lower Lead Width	b	.014	–	.022
Overall Row Spacing §	eB	–	–	.700

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

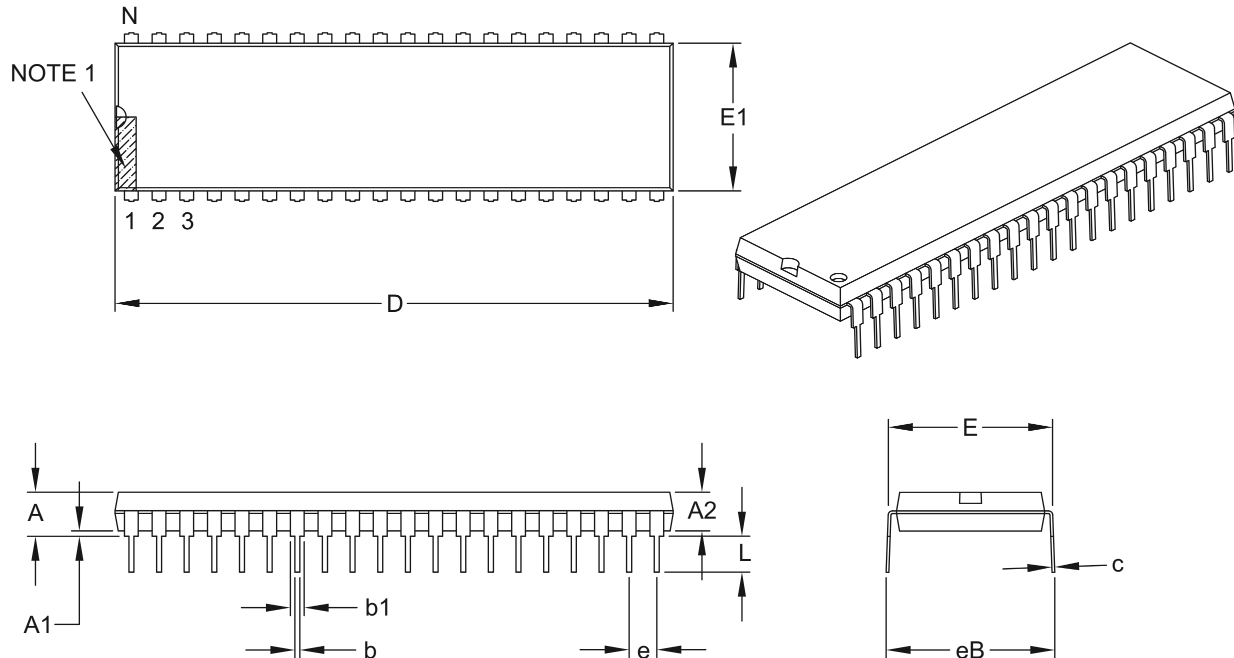
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-079B

Packaging Diagrams and Parameters

40-Lead Plastic Dual In-Line (P) – 600 mil Body [PDIP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	40		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.250
Molded Package Thickness	A2	.125	–	.195
Base to Seating Plane	A1	.015	–	–
Shoulder to Shoulder Width	E	.590	–	.625
Molded Package Width	E1	.485	–	.580
Overall Length	D	1.980	–	2.095
Tip to Seating Plane	L	.115	–	.200
Lead Thickness	c	.008	–	.015
Upper Lead Width	b1	.030	–	.070
Lower Lead Width	b	.014	–	.023
Overall Row Spacing §	eB	–	–	.700

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-016B

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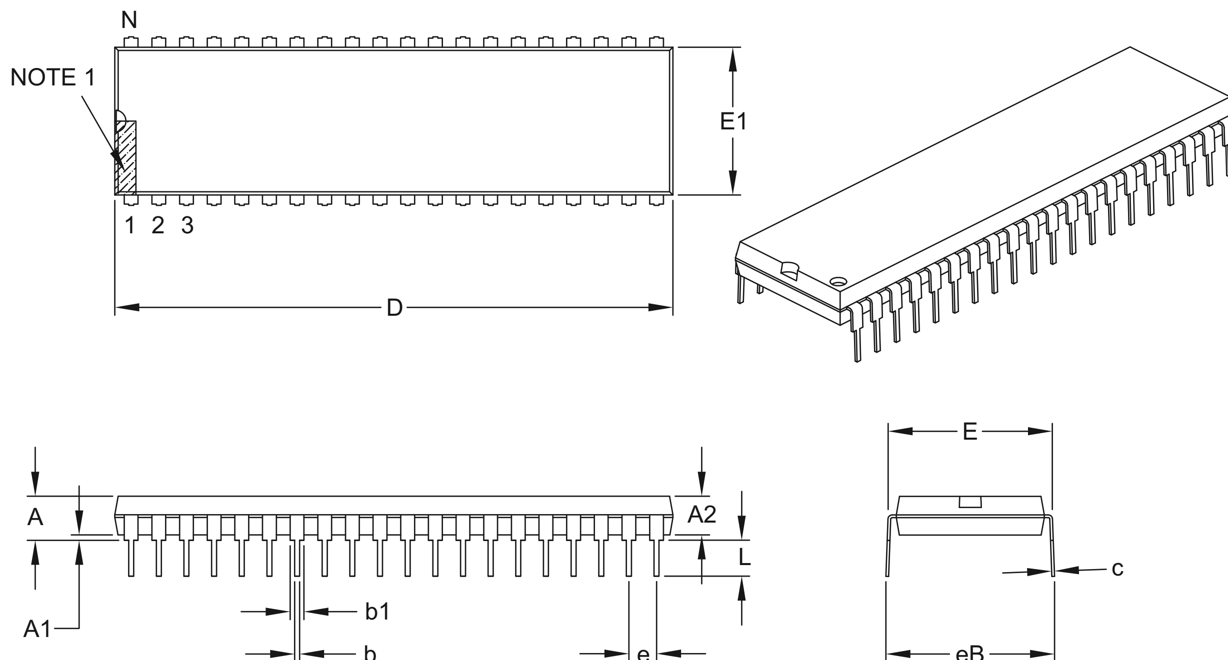
Packaging Diagrams and Parameters

40-Lead Plastic Dual In-Line (PL) – 600 mil Body [PDIP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



		Units	INCHES	
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		40	
Pitch	e		.100 BSC	
Top to Seating Plane	A	–	–	.250
Molded Package Thickness	A2	.125	–	.195
Base to Seating Plane	A1	.015	–	–
Shoulder to Shoulder Width	E	.590	–	.625
Molded Package Width	E1	.485	–	.580
Overall Length	D	1.980	–	2.095
Tip to Seating Plane	L	.115	–	.200
Lead Thickness	c	.008	–	.015
Upper Lead Width	b1	.030	–	.070
Lower Lead Width	b	.014	–	.023
Overall Row Spacing §	eB	–	–	.700

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

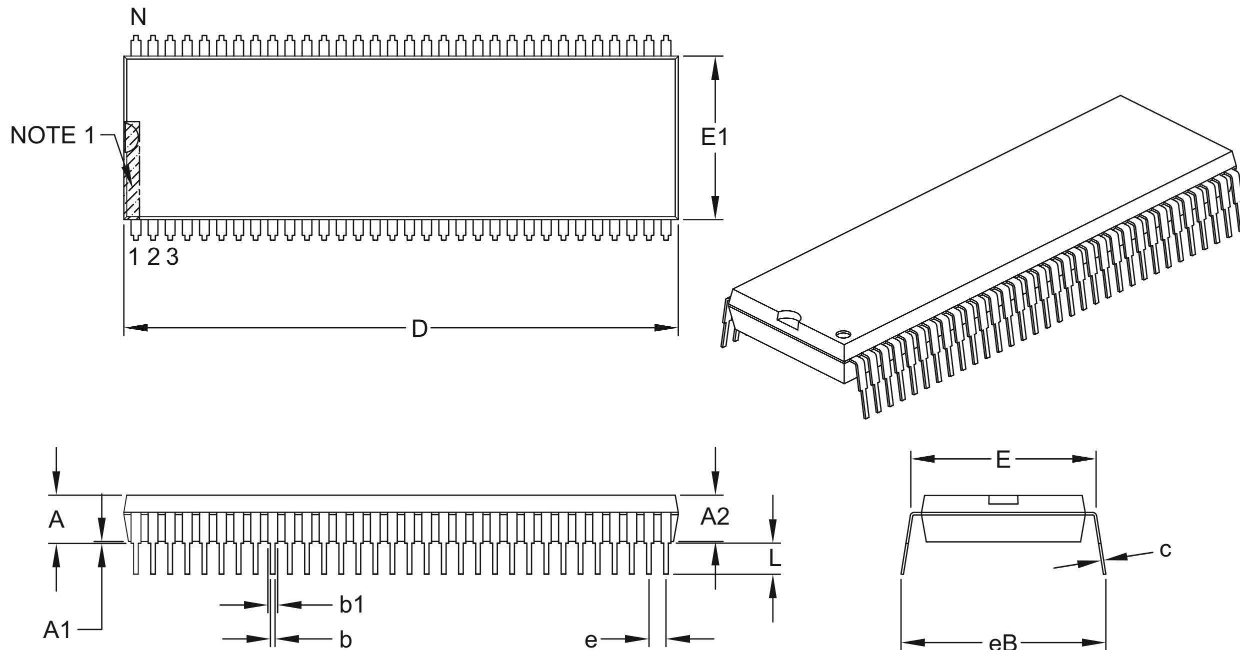
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-016B

Packaging Diagrams and Parameters

64-Lead Shrink Plastic Dual In-Line (SP) – 750 mil Body [PDIP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	64		
Pitch	e	.070 BSC		
Top to Seating Plane	A	–	–	.200
Molded Package Thickness	A2	.120	.150	.180
Base to Seating Plane	A1	.020	–	–
Shoulder to Shoulder Width	E	.750	–	.785
Molded Package Width	E1	.650	.670	.690
Overall Length	D	2.260	2.270	2.280
Tip to Seating Plane	L	.100	.130	.150
Lead Thickness	c	.009	.010	.015
Upper Lead Width	b1	.035	.040	.045
Lower Lead Width	b	.014	.018	.022
Overall Row Spacing §	eB	–	–	.880

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-090B

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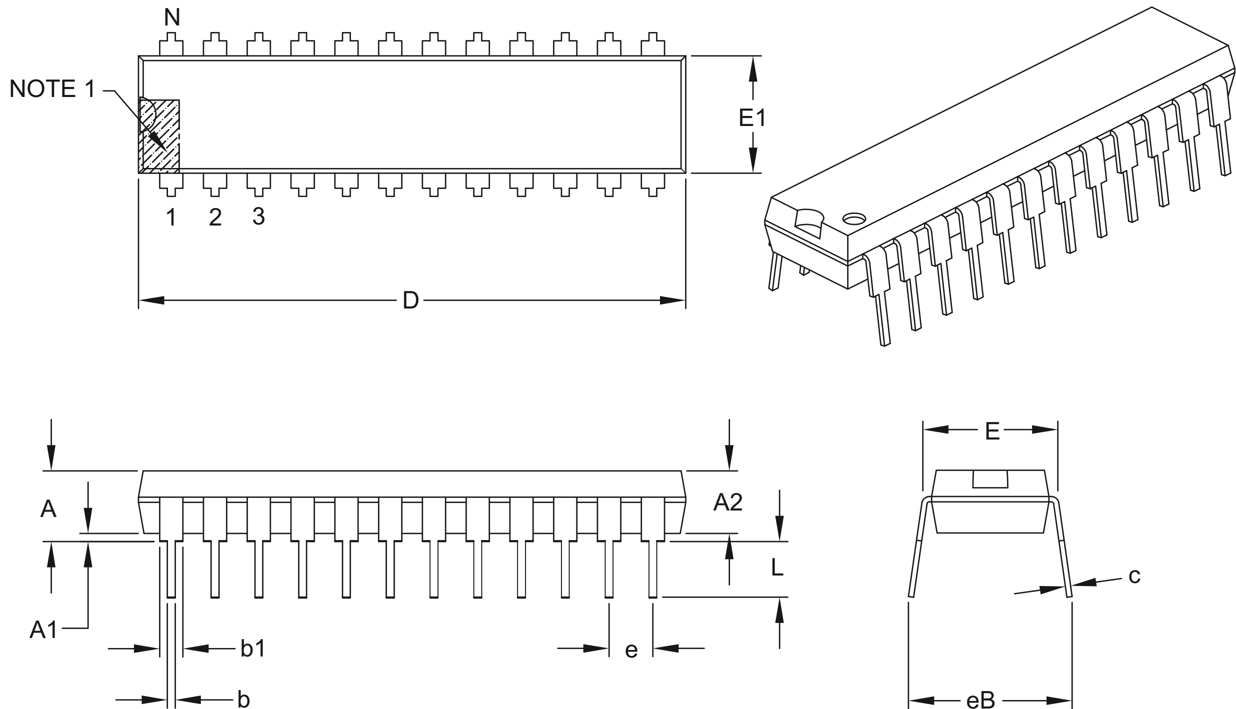
Packaging Diagrams and Parameters

24-Lead Skinny Plastic Dual In-Line (PF) – 300 mil Body [SPDIP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	24		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.210
Molded Package Thickness	A2	.115	.130	.195
Base to Seating Plane	A1	.015	–	–
Shoulder to Shoulder Width	E	.280	.310	.325
Molded Package Width	E1	.240	.250	.280
Overall Length	D	1.155	1.250	1.280
Tip to Seating Plane	L	.115	.130	.160
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.045	.060	.070
Lower Lead Width	b	.014	.018	.023
Overall Row Spacing §	eB	–	–	.430

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

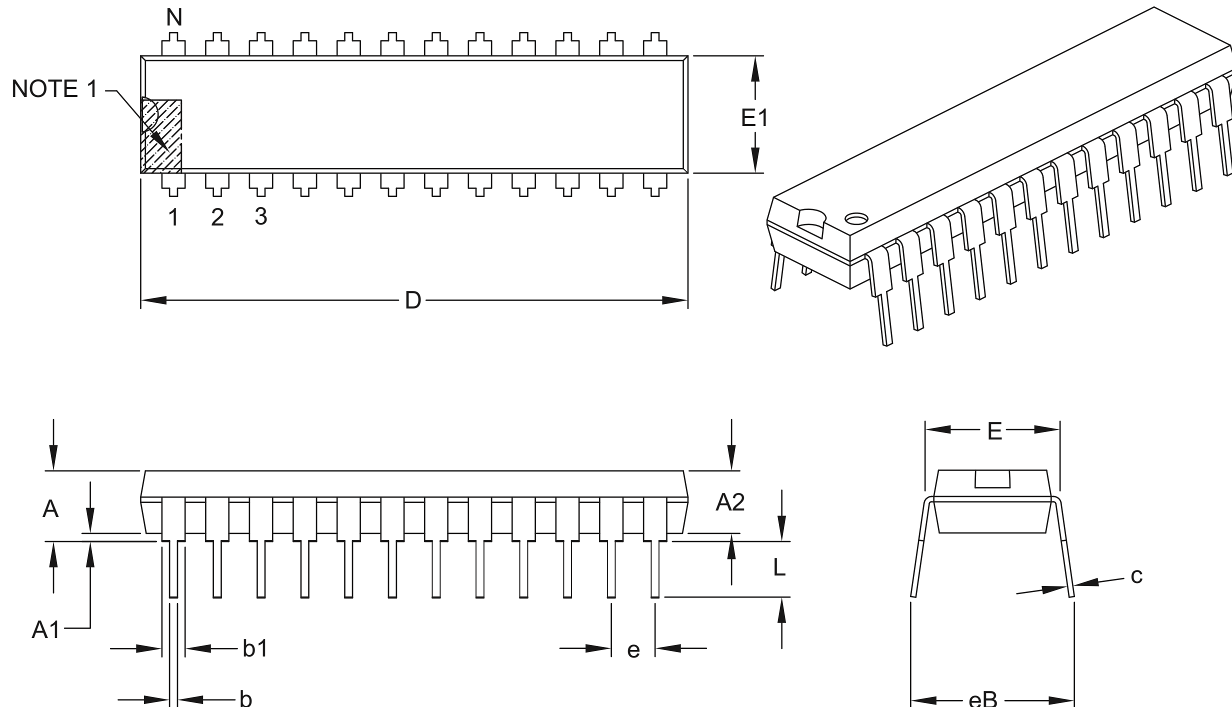
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-043B

Packaging Diagrams and Parameters

24-Lead Skinny Plastic Dual In-Line (SP) – 300 mil Body [SPDIP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	24		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.210
Molded Package Thickness	A2	.115	.130	.195
Base to Seating Plane	A1	.015	–	–
Shoulder to Shoulder Width	E	.280	.310	.325
Molded Package Width	E1	.240	.250	.280
Overall Length	D	1.155	1.250	1.280
Tip to Seating Plane	L	.115	.130	.160
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.045	.060	.070
Lower Lead Width	b	.014	.018	.023
Overall Row Spacing §	eB	–	–	.430

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-043B

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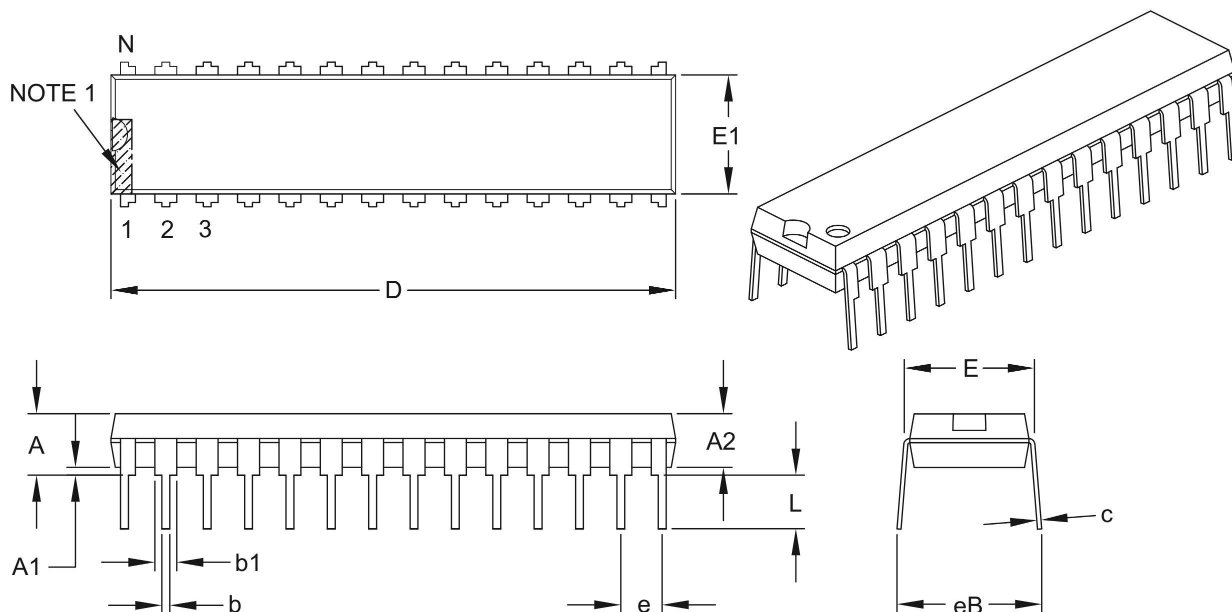
Packaging Diagrams and Parameters

28-Lead Skinny Plastic Dual In-Line (PJ) – 300 mil Body [SPDIP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	28		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.200
Molded Package Thickness	A2	.120	.135	.150
Base to Seating Plane	A1	.015	–	–
Shoulder to Shoulder Width	E	.290	.310	.335
Molded Package Width	E1	.240	.285	.295
Overall Length	D	1.345	1.365	1.400
Tip to Seating Plane	L	.110	.130	.150
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.040	.050	.070
Lower Lead Width	b	.014	.018	.022
Overall Row Spacing §	eB	–	–	.430

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

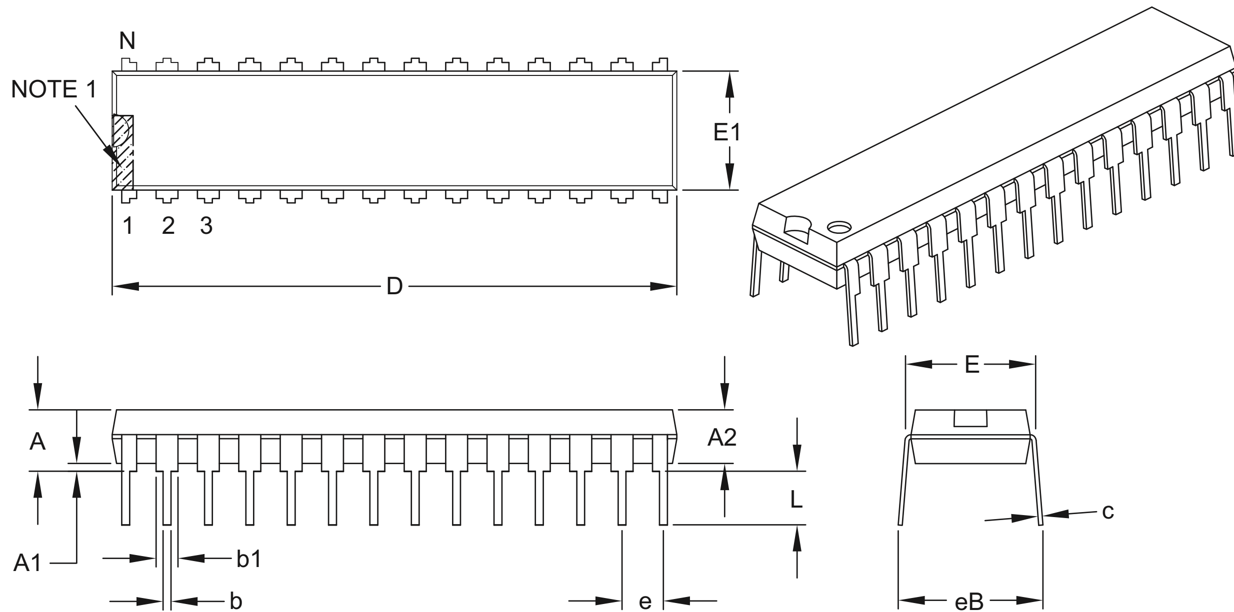
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-070B

Packaging Diagrams and Parameters

28-Lead Skinny Plastic Dual In-Line (SP) – 300 mil Body [SPDIP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		28	
Pitch	e		.100 BSC	
Top to Seating Plane	A	–	–	.200
Molded Package Thickness	A2	.120	.135	.150
Base to Seating Plane	A1	.015	–	–
Shoulder to Shoulder Width	E	.290	.310	.335
Molded Package Width	E1	.240	.285	.295
Overall Length	D	1.345	1.365	1.400
Tip to Seating Plane	L	.110	.130	.150
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.040	.050	.070
Lower Lead Width	b	.014	.018	.022
Overall Row Spacing §	eB	–	–	.430

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-070B

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MICROCHIP

Packaging Diagrams and Parameters

PLCC Family

Plastic Leaded Chip Carrier Packages

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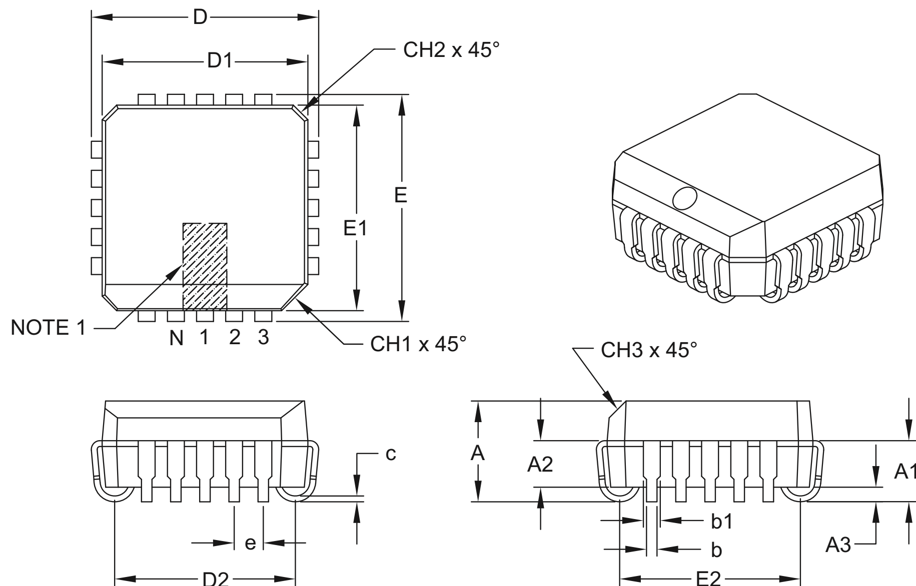
Packaging Diagrams and Parameters

20-Lead Plastic Leaded Chip Carrier (L) – Square [PLCC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	20		
Pitch	e	.050		
Overall Height	A	.165	.172	.180
Contact Height	A1	.090	.105	.120
Molded Package to Contact	A2	.062	–	.083
Standoff §	A3	.020	–	–
Corner Chamfer	CH1	.042	–	.048
Chamfers	CH2	–	–	.020
Side Chamfer	CH3	.042	–	.056
Overall Width	E	.385	.390	.395
Overall Length	D	.385	.390	.395
Molded Package Width	E1	.350	.353	.356
Molded Package Length	D1	.350	.353	.356
Footprint Width	E2	.282	.310	.338
Footprint Length	D2	.282	.310	.338
Lead Thickness	c	.0075	–	.0125
Upper Lead Width	b1	.026	–	.032
Lower Lead Width	b	.013	–	.021

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

Microchip Technology Drawing C04-064B

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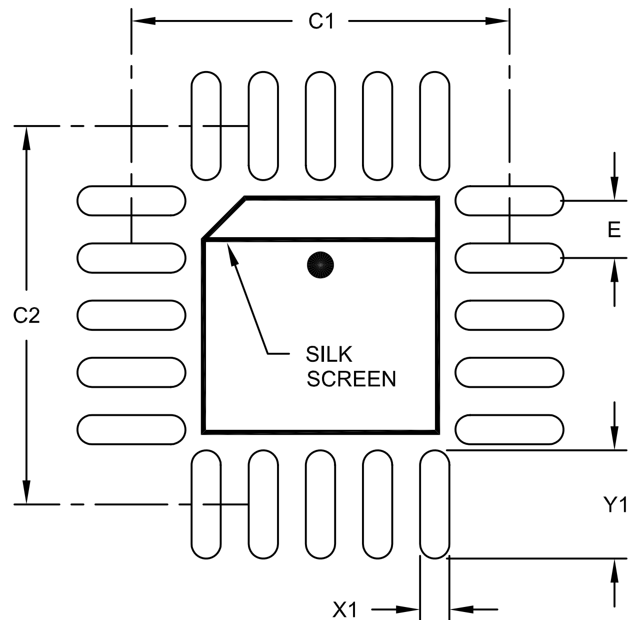
Land Pattern (Footprint)

20-Lead Plastic Leaded Chip Carrier (L) - Square [PLCC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E	.050 BSC		
Contact Pad Spacing	C1		.331	
Contact Pad Spacing	C2		.331	
Contact Pad Width (X20)	X1			.026
Contact Pad Length (X20)	Y1			.094

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

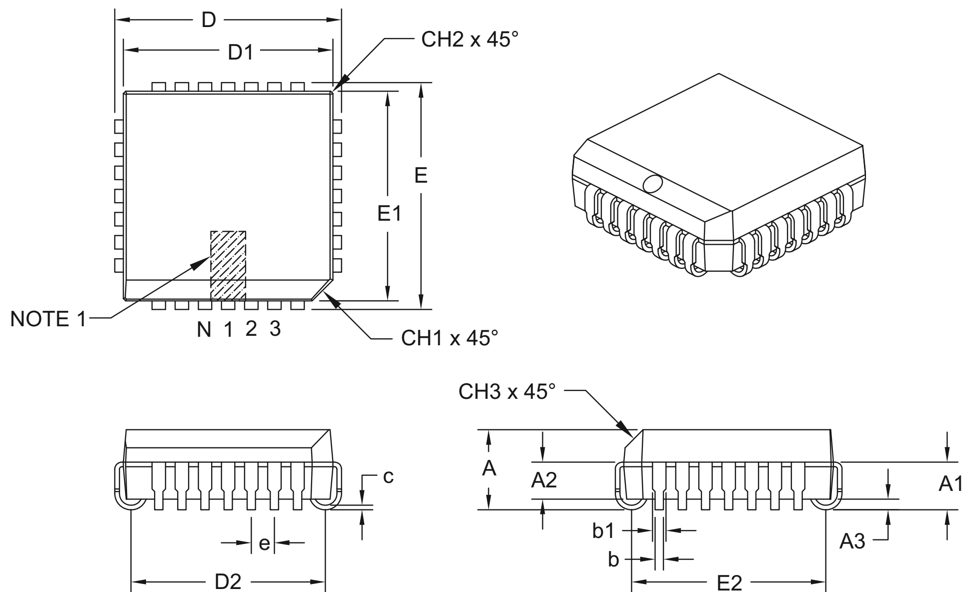
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2064A

Packaging Diagrams and Parameters

28-Lead Plastic Leaded Chip Carrier (L) – Square [PLCC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	28		
Pitch	e	.050		
Overall Height	A	.165	.172	.180
Contact Height	A1	.090	.105	.120
Molded Package to Contact	A2	.062	–	.083
Standoff §	A3	.020	–	–
Corner Chamfer	CH1	.042	–	.048
Chamfers	CH2	–	–	.020
Side Chamfer	CH3	.042	–	.056
Overall Width	E	.485	.490	.495
Overall Length	D	.485	.490	.495
Molded Package Width	E1	.450	.453	.456
Molded Package Length	D1	.450	.453	.456
Footprint Width	E2	.382	.410	.438
Footprint Length	D2	.382	.410	.438
Lead Thickness	c	.0075	–	.0125
Upper Lead Width	b1	.026	–	.032
Lower Lead Width	b	.013	–	.021

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

Microchip Technology Drawing C04-026B

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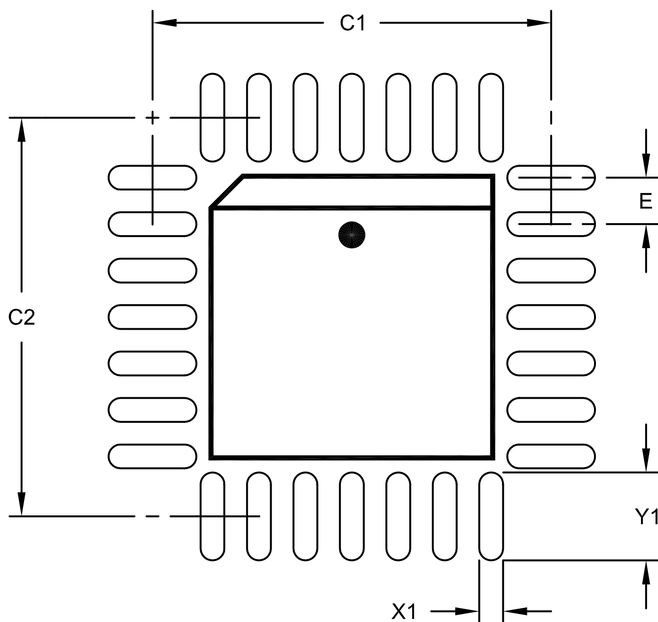
Land Pattern (Footprint)

28-Lead Plastic Leaded Chip Carrier (L) - Square [PLCC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	.050 BSC		
Contact Pad Spacing	C1		.429	
Contact Pad Spacing	C2		.429	
Contact Pad Width (X28)	X1			.026
Contact Pad Length (X28)	Y1			.094

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

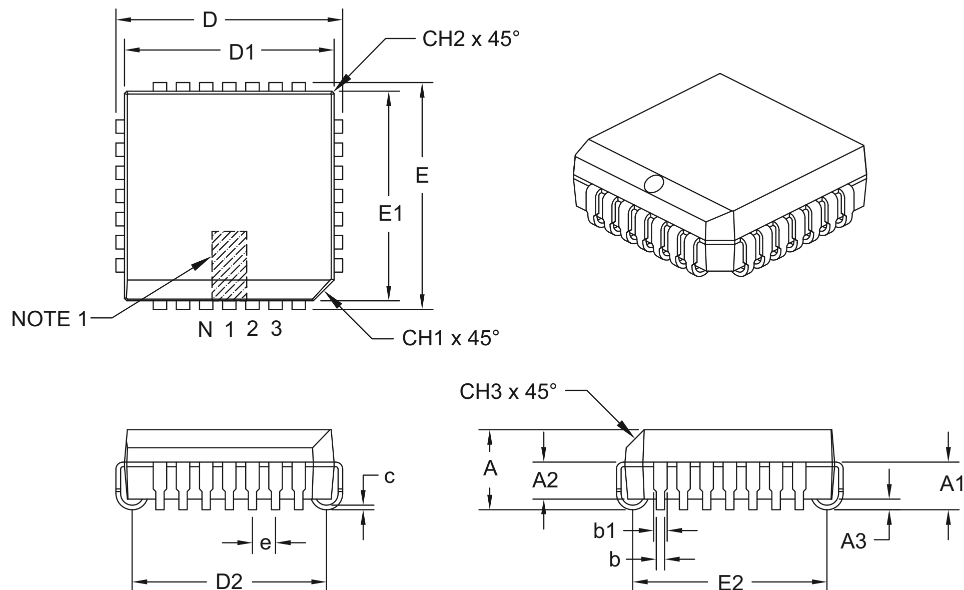
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2026A

Packaging Diagrams and Parameters

28-Lead Plastic Leaded Chip Carrier (LI) – Square [PLCC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		28	
Pitch	e		.050	
Overall Height	A	.165	.172	.180
Contact Height	A1	.090	.105	.120
Molded Package to Contact	A2	.062	–	.083
Standoff §	A3	.020	–	–
Corner Chamfer	CH1	.042	–	.048
Chamfers	CH2	–	–	.020
Side Chamfer	CH3	.042	–	.056
Overall Width	E	.485	.490	.495
Overall Length	D	.485	.490	.495
Molded Package Width	E1	.450	.453	.456
Molded Package Length	D1	.450	.453	.456
Footprint Width	E2	.382	.410	.438
Footprint Length	D2	.382	.410	.438
Lead Thickness	c	.0075	–	.0125
Upper Lead Width	b1	.026	–	.032
Lower Lead Width	b	.013	–	.021

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

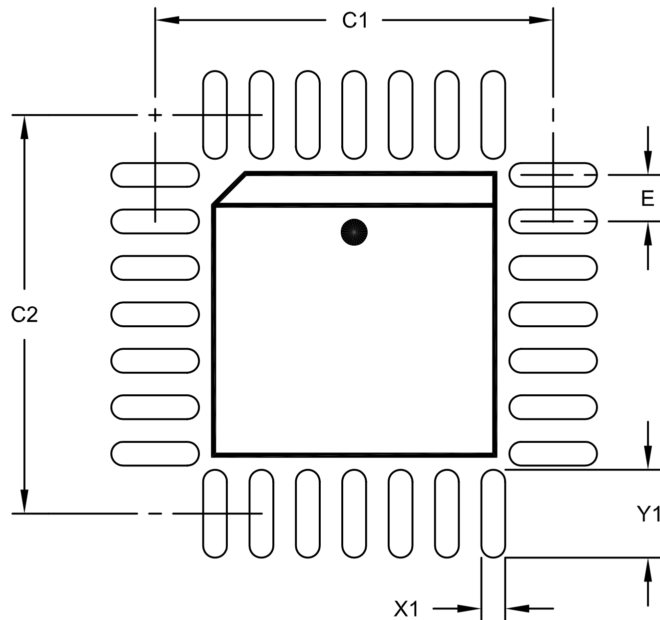
Microchip Technology Drawing C04-026B

© 2010 Microchip Technology Inc.

Land Pattern (Footprint)

28-Lead Plastic Leaded Chip Carrier (LI) - Square [PLCC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	.050 BSC		
Contact Pad Spacing	C1		.429	
Contact Pad Spacing	C2		.429	
Contact Pad Width (X28)	X1			.026
Contact Pad Length (X28)	Y1			.094

Notes:

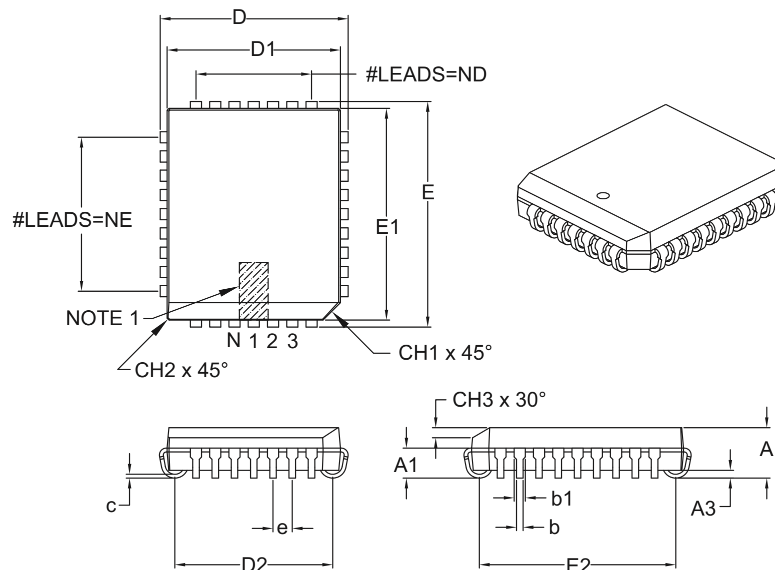
1. Dimensioning and tolerancing per ASME Y14.5M
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2026A

Packaging Diagrams and Parameters

32-Lead Plastic Leaded Chip Carrier (L) – Rectangle [PLCC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	32		
Pitch	e	.050		
Pins along Length	ND	7		
Pins along Width	NE	9		
Overall Height	A	.125	–	.140
Contact Height	A1	.060	–	.095
Standoff §	A3	.015	–	–
Corner Chamfer	CH1	.042	–	.048
Chamfers	CH2	–	–	.020
Side Chamfer Height	CH3	.023	–	.029
Overall Length	D	.485	–	.495
Overall Width	E	.585	–	.595
Molded Package Length	D1	.447	–	.453
Molded Package Width	E1	.547	–	.553
Footprint Length	D2	.376	–	.446
Footprint Width	E2	.476	–	.546
Lead Thickness	c	.008	–	.013
Upper Lead Width	b1	.026	–	.032
Lower Lead Width	b	.013	–	.021

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

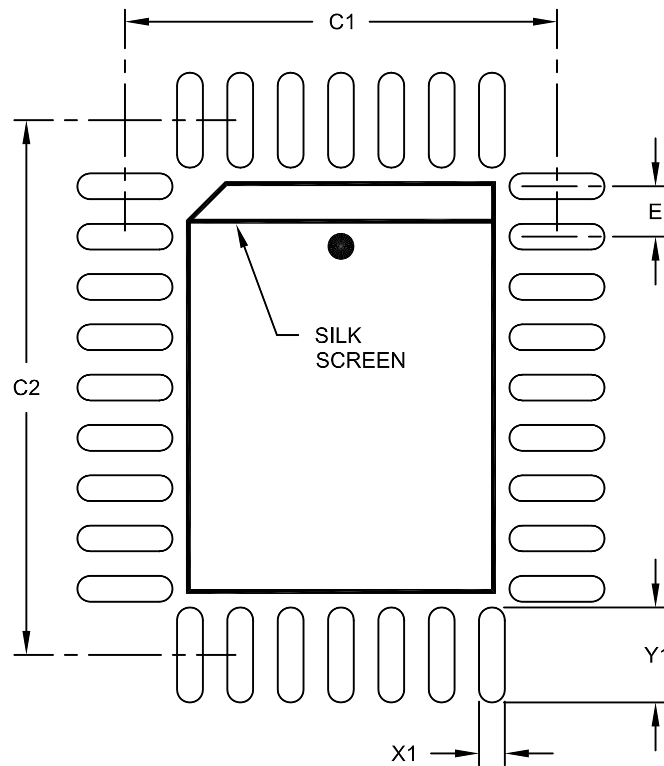
Microchip Technology Drawing C04-023B

© 2010 Microchip Technology Inc.

Land Pattern (Footprint)

32-Lead Plastic Leaded Chip Carrier (L) - Rectangle [PLCC]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	.050 BSC		
Contact Pad Spacing	C1		.429	
Contact Pad Spacing	C2		.531	
Contact Pad Width (X32)	X1			,026
Contact Pad Length (X32)	Y1			.094

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

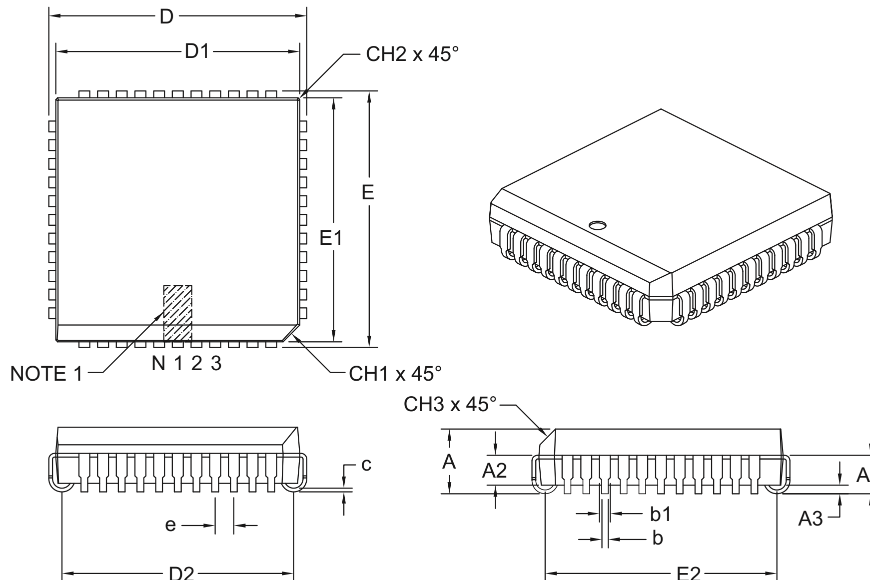
Microchip Technology Drawing No. C04-2023A

© 2010 Microchip Technology Inc.

Packaging Diagrams and Parameters

44-Lead Plastic Leaded Chip Carrier (L) – Square [PLCC]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		44	
Pitch	e		.050	
Overall Height	A	.165	.172	.180
Contact Height	A1	.090	.105	.120
Molded Package to Contact	A2	.062	–	.083
Standoff §	A3	.020	–	–
Corner Chamfer	CH1	.042	–	.048
Chamfers	CH2	–	–	.020
Side Chamfer	CH3	.042	–	.056
Overall Width	E	.685	.690	.695
Overall Length	D	.685	.690	.695
Molded Package Width	E1	.650	.653	.656
Molded Package Length	D1	.650	.653	.656
Footprint Width	E2	.582	.610	.638
Footprint Length	D2	.582	.610	.638
Lead Thickness	c	.0075	–	.0125
Upper Lead Width	b1	.026	–	.032
Lower Lead Width	b	.013	–	.021

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

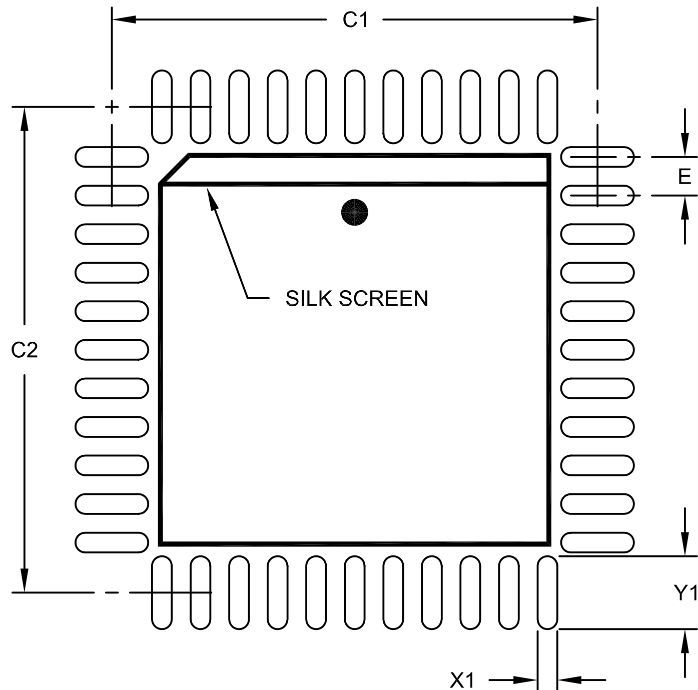
Microchip Technology Drawing C04-048B

© 2010 Microchip Technology Inc.

Land Pattern (Footprint)

44-Lead Plastic Leaded Chip Carrier (L) - Square [PLCC]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		INCHES		
Dimension	Limits	MIN	NOM	MAX
Contact Pitch	E		.050 BSC	
Contact Pad Spacing	C1		.630	
Contact Pad Spacing	C2		.630	
Contact Pad Width (X44)	X1			.026
Contact Pad Length (X44)	Y1			.094

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

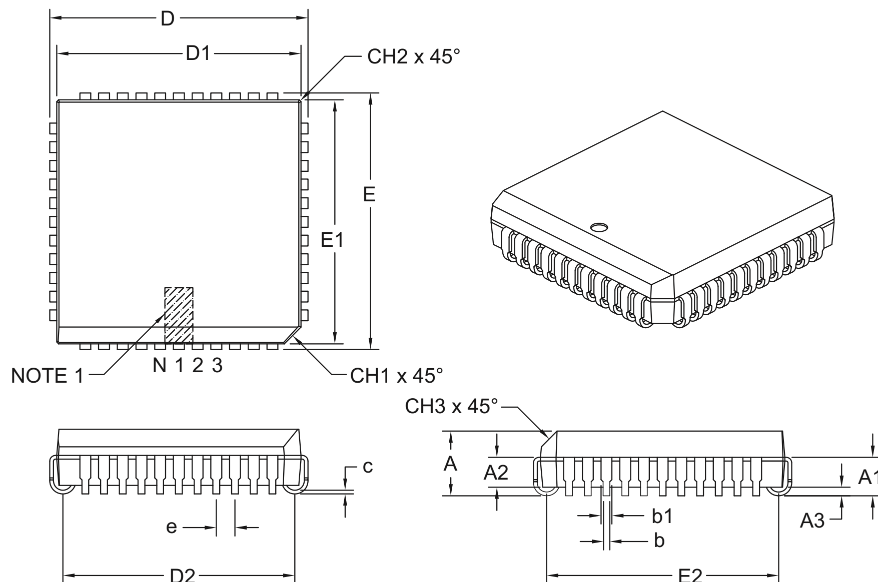
Microchip Technology Drawing No. C04-2048A

MICROCHIP

Packaging Diagrams and Parameters

44-Lead Plastic Leaded Chip Carrier (LW) – Square [PLCC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	44		
Pitch	e	.050		
Overall Height	A	.165	.172	.180
Contact Height	A1	.090	.105	.120
Molded Package to Contact	A2	.062	–	.083
Standoff §	A3	.020	–	–
Corner Chamfer	CH1	.042	–	.048
Chamfers	CH2	–	–	.020
Side Chamfer	CH3	.042	–	.056
Overall Width	E	.685	.690	.695
Overall Length	D	.685	.690	.695
Molded Package Width	E1	.650	.653	.656
Molded Package Length	D1	.650	.653	.656
Footprint Width	E2	.582	.610	.638
Footprint Length	D2	.582	.610	.638
Lead Thickness	c	.0075	–	.0125
Upper Lead Width	b1	.026	–	.032
Lower Lead Width	b	.013	–	.021

Notes:

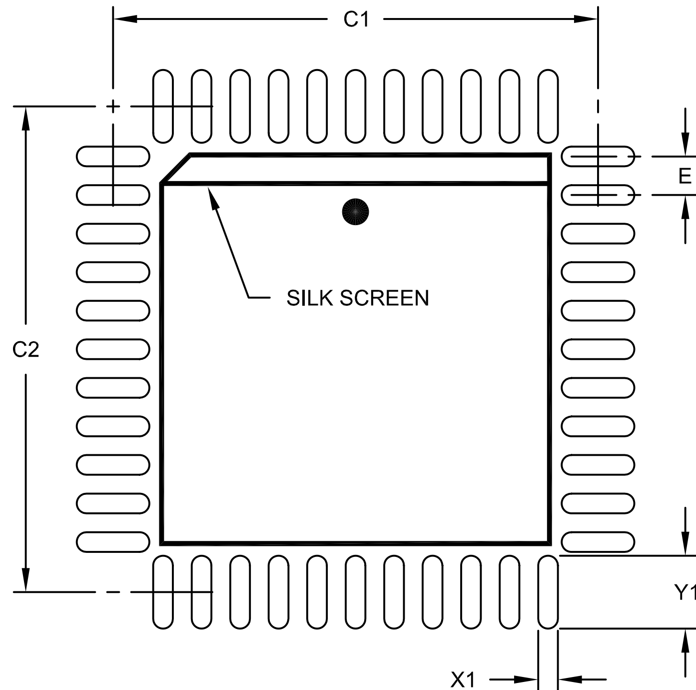
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

Microchip Technology Drawing C04-048B

© 2010 Microchip Technology Inc.

44-Lead Plastic Leaded Chip Carrier (LW) – Square [PLCC]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		INCHES		
Dimension	Limits	MIN	NOM	MAX
Contact Pitch	E		.050 BSC	
Contact Pad Spacing	C1		.630	
Contact Pad Spacing	C2		.630	
Contact Pad Width (X44)	X1			.026
Contact Pad Length (X44)	Y1			.094

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

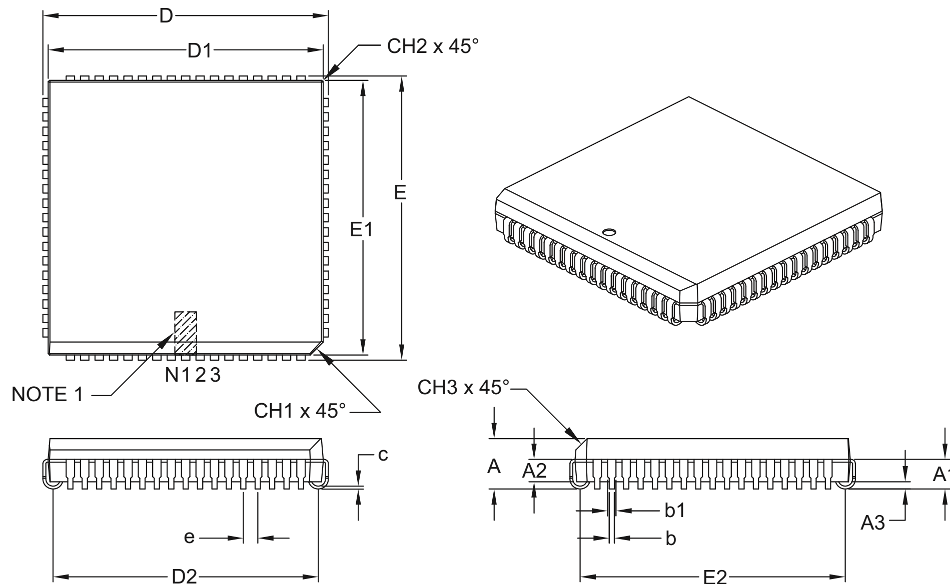
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2048A

Packaging Diagrams and Parameters

68-Lead Plastic Leaded Chip Carrier (L) – Square [PLCC]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	68		
Pitch	e	.050		
Overall Height	A	.165	.172	.180
Contact Height	A1	.090	.105	.120
Molded Package to Contact	A2	.062	–	.083
Standoff §	A3	.020	–	–
Corner Chamfer	CH1	.042	–	.048
Chamfers	CH2	–	–	.020
Side Chamfer	CH3	.042	–	.056
Overall Width	E	.985	.990	.995
Overall Length	D	.985	.990	.995
Molded Package Width	E1	.950	.954	.958
Molded Package Length	D1	.950	.954	.958
Footprint Width	E2	.882	.910	.938
Footprint Length	D2	.882	.910	.938
Lead Thickness	c	.0075	–	.0125
Upper Lead Width	b1	.026	–	.032
Lower Lead Width	b	.013	–	.021

Notes:
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

Microchip Technology Drawing C04-049B

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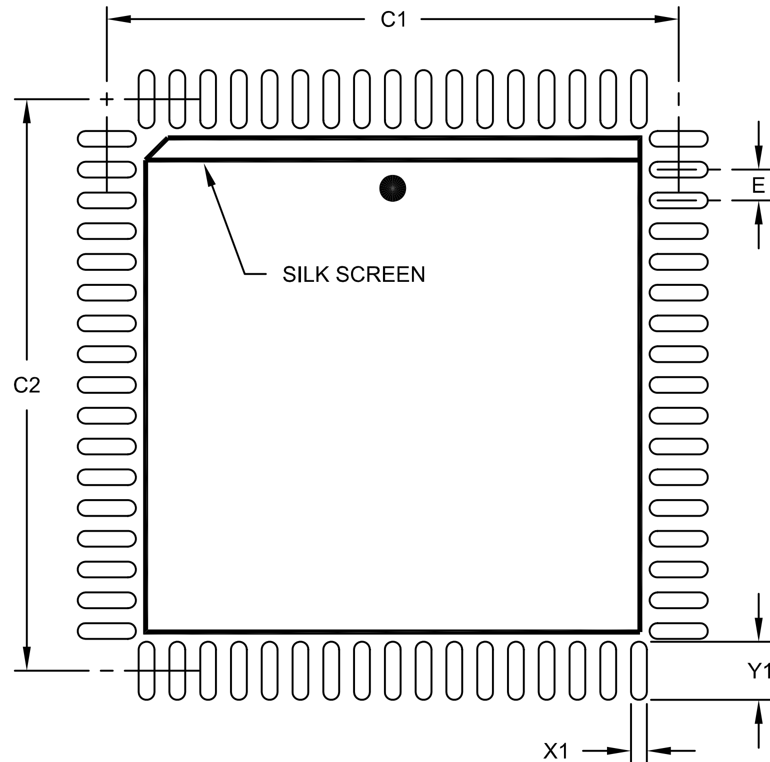
Land Pattern (Footprint)

68-Lead Plastic Leaded Chip Carrier (L) - Square [PLCC]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	.050 BSC		
Contact Pad Spacing	C1		.929	
Contact Pad Spacing	C2		.929	
Contact Pad Width (X68)	X1			.026
Contact Pad Length (X68)	Y1			.094

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

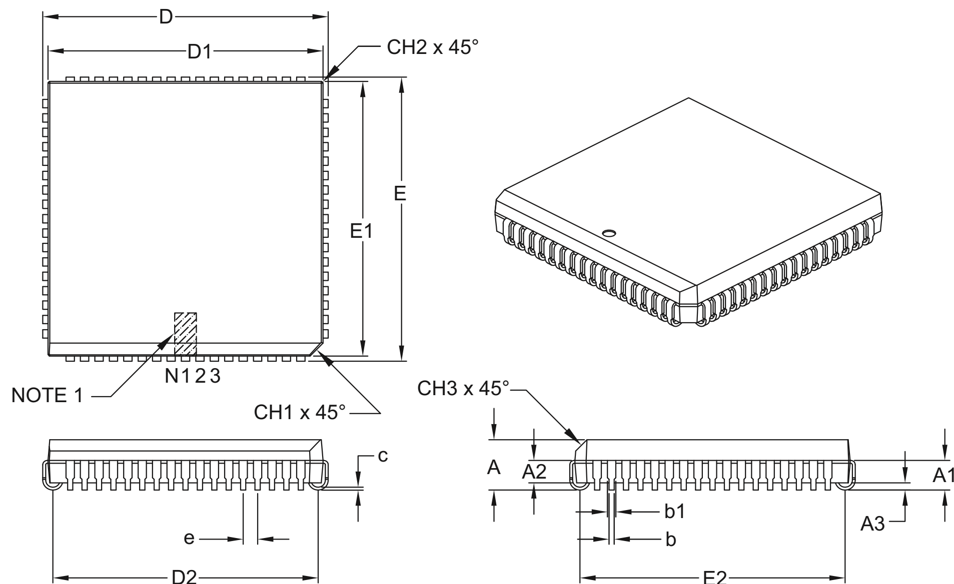
Microchip Technology Drawing No. C04-2049A

MICROCHIP

Packaging Diagrams and Parameters

68-Lead Plastic Leaded Chip Carrier (LS) – Square [PLCC]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	68		
Pitch	e	.050		
Overall Height	A	.165	.172	.180
Contact Height	A1	.090	.105	.120
Molded Package to Contact	A2	.062	–	.083
Standoff §	A3	.020	–	–
Corner Chamfer	CH1	.042	–	.048
Chamfers	CH2	–	–	.020
Side Chamfer	CH3	.042	–	.056
Overall Width	E	.985	.990	.995
Overall Length	D	.985	.990	.995
Molded Package Width	E1	.950	.954	.958
Molded Package Length	D1	.950	.954	.958
Footprint Width	E2	.882	.910	.938
Footprint Length	D2	.882	.910	.938
Lead Thickness	c	.0075	–	.0125
Upper Lead Width	b1	.026	–	.032
Lower Lead Width	b	.013	–	.021

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

Microchip Technology Drawing C04-049B

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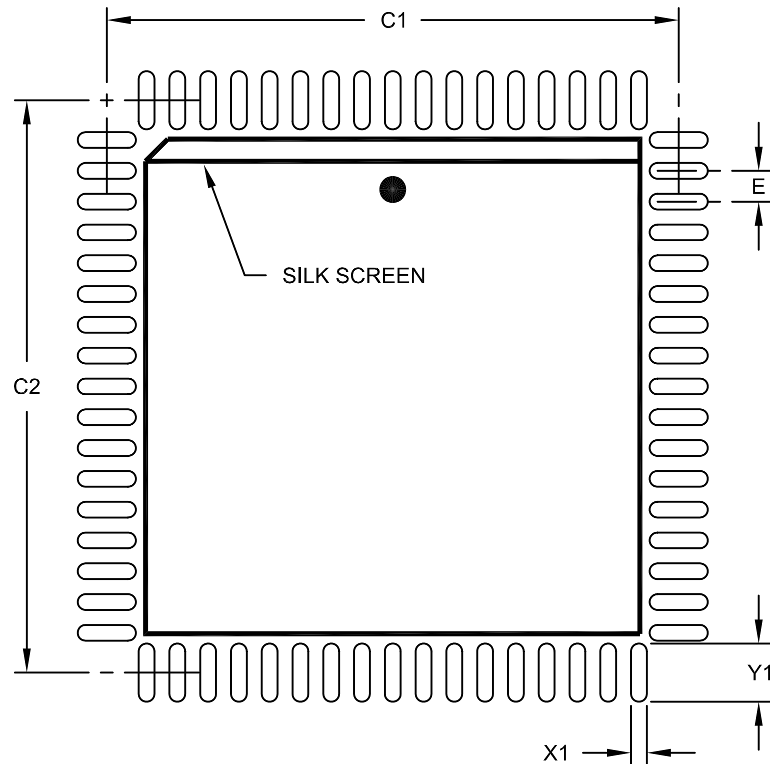
Land Pattern (Footprint)

68-Lead Plastic Leaded Chip Carrier (LS) - Square [PLCC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E	.050 BSC		
Contact Pad Spacing	C1		.929	
Contact Pad Spacing	C2		.929	
Contact Pad Width (X68)	X1			.026
Contact Pad Length (X68)	Y1			.094

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2049A

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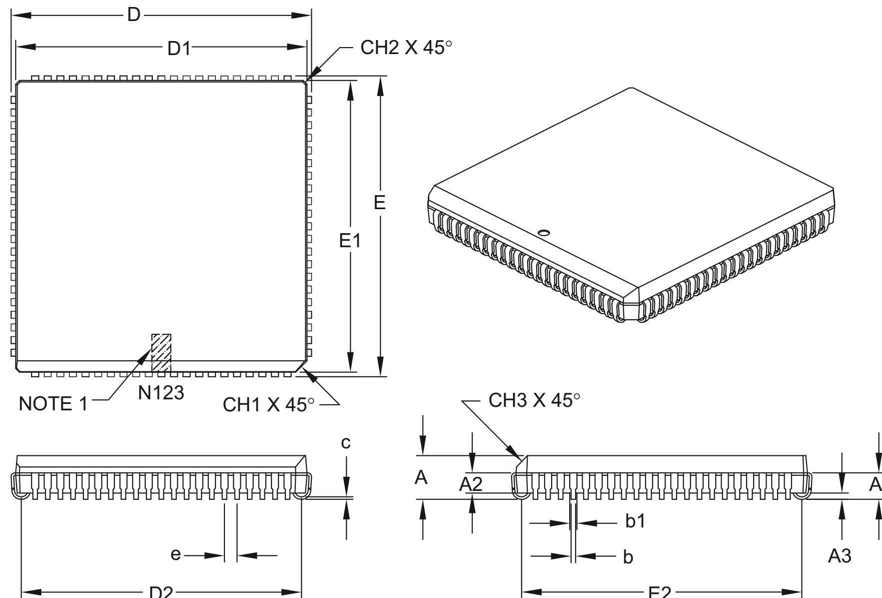
Packaging Diagrams and Parameters

84-Lead Plastic Leaded Chip Carrier (L) – Square [PLCC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		84	
Pitch	e		.050	
Overall Height	A	.165	.172	.200
Contact Height	A1	.090	.105	.130
Molded Package to Contact	A2	.059	–	.080
Standoff §	A3	.020	–	–
Corner Chamfer	CH1	.042	–	.048
Chamfers	CH2	–	–	.020
Side Chamfer	CH3	.042	–	.056
Overall Width	E	1.185	1.190	1.195
Overall Length	D	1.185	1.190	1.195
Molded Package Width	E1	1.150	1.154	1.158
Molded Package Length	D1	1.150	1.154	1.158
Footprint Width	E2	1.082	1.110	1.138
Footprint Length	D2	1.082	1.110	1.138
Lead Thickness	c	.0075	–	.0125
Upper Lead Width	b1	.026	–	.032
Lower Lead Width	b	.013	–	.021

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

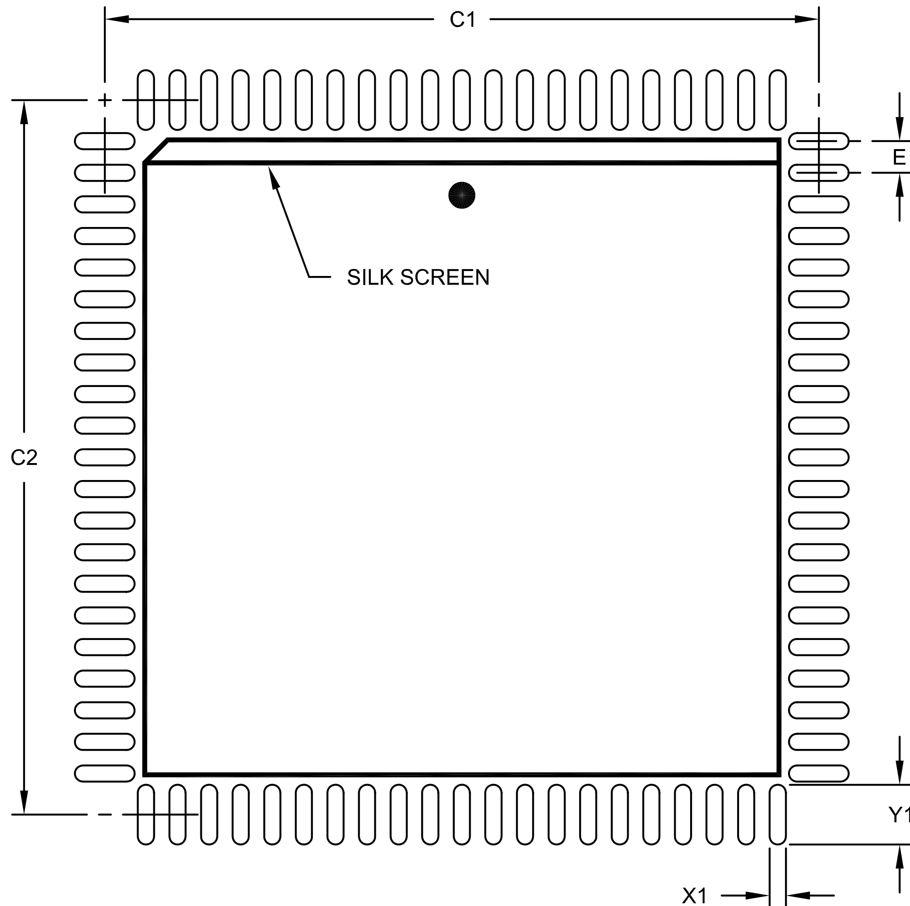
Microchip Technology Drawing C04-093B

© 2010 Microchip Technology Inc.

Land Pattern (Footprint)

84-Lead Plastic Leaded Chip Carrier (L) - Square [PLCC]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	INCHES		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	.050 BSC		
Contact Pad Spacing	C1		1.130	
Contact Pad Spacing	C2		1.130	
Contact Pad Width (X84)	X1			.026
Contact Pad Length (X84)	Y1			.094

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2093A

Packaging Diagrams and Parameters

NOTES:

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Packaging Diagrams and Parameters

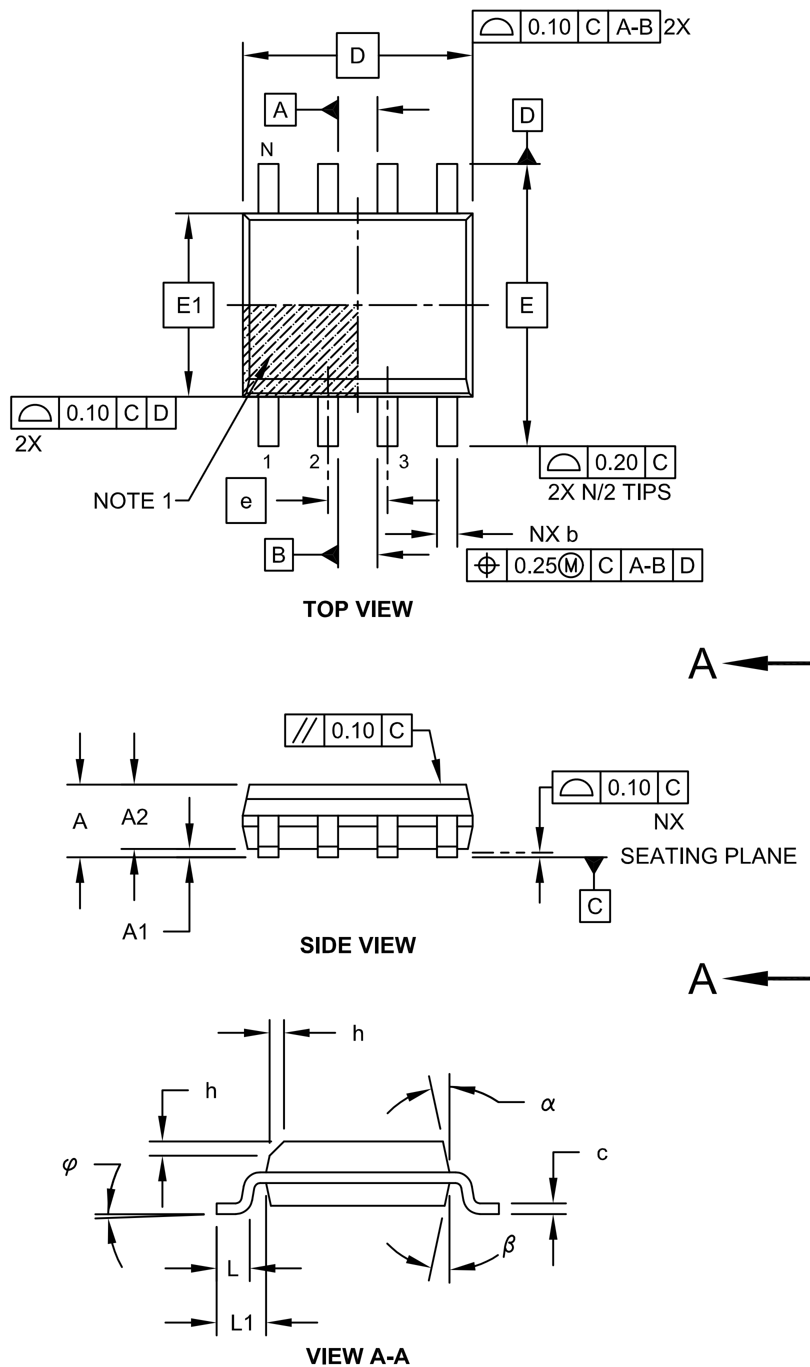
SOIC Family

Small Outline Plastic Packages

Packaging Diagrams and Parameters

8-Lead Plastic Small Outline (SN) - Narrow, 3.90 mm Body [SOIC]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing No. C04-057C Sheet 1 of 2

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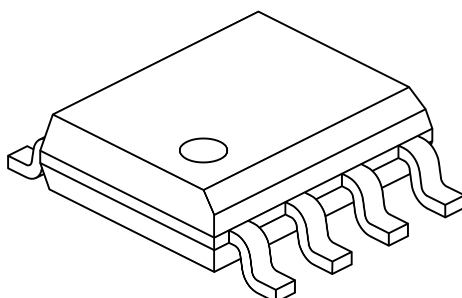
Land Pattern (Footprint)

8-Lead Plastic Small Outline (SN) - Narrow, 3.90 mm Body [SOIC]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		8	
Pitch	e		1.27 BSC	
Overall Height	A	-	-	1.75
Molded Package Thickness	A2	1.25	-	-
Standoff §	A1	0.10	-	0.25
Overall Width	E		6.00 BSC	
Molded Package Width	E1		3.90 BSC	
Overall Length	D		4.90 BSC	
Chamfer (Optional)	h	0.25	-	0.50
Foot Length	L	0.40	-	1.27
Footprint	L1		1.04 REF	
Foot Angle	φ	0°	-	8°
Lead Thickness	c	0.17	-	0.25
Lead Width	b	0.31	-	0.51
Mold Draft Angle Top	α	5°	-	15°
Mold Draft Angle Bottom	β	5°	-	15°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing No. C04-057C Sheet 2 of 2

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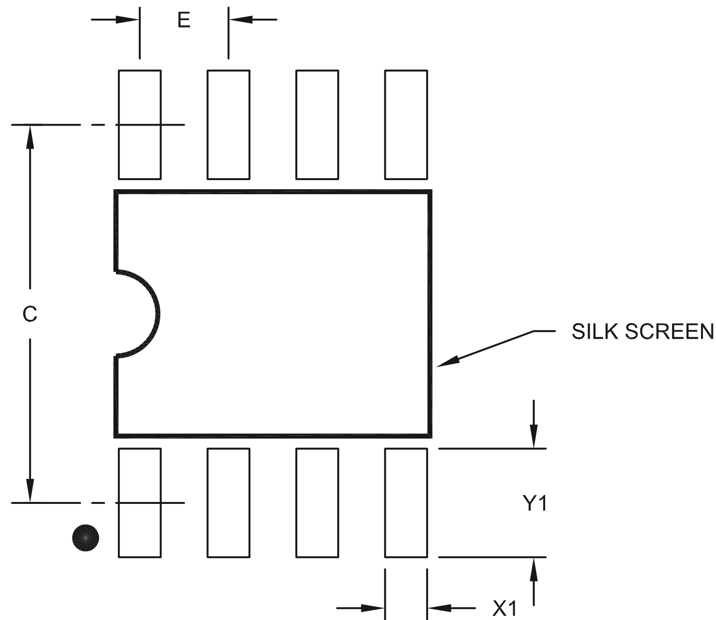
Land Pattern (Footprint)

8-Lead Plastic Small Outline (SN) – Narrow, 3.90 mm Body [SOIC]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	1.27 BSC		
Contact Pad Spacing	C		5.40	
Contact Pad Width (X8)	X1			0.60
Contact Pad Length (X8)	Y1			1.55

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2057A

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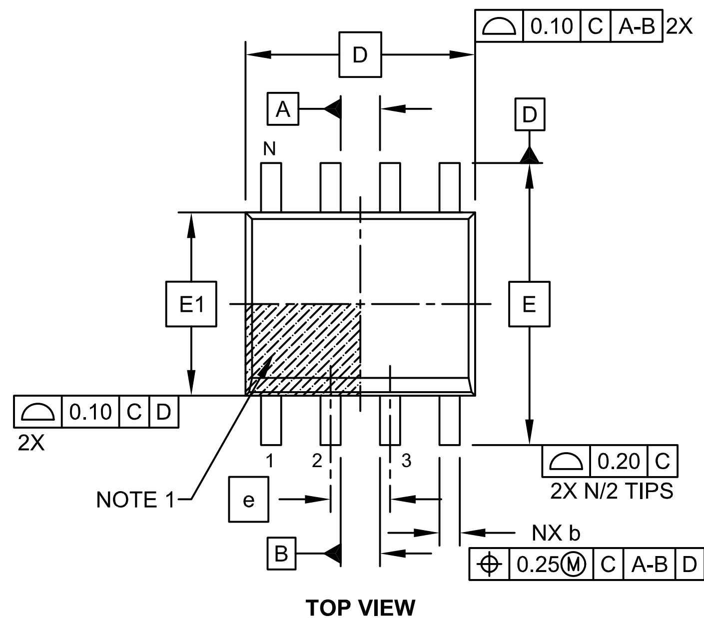
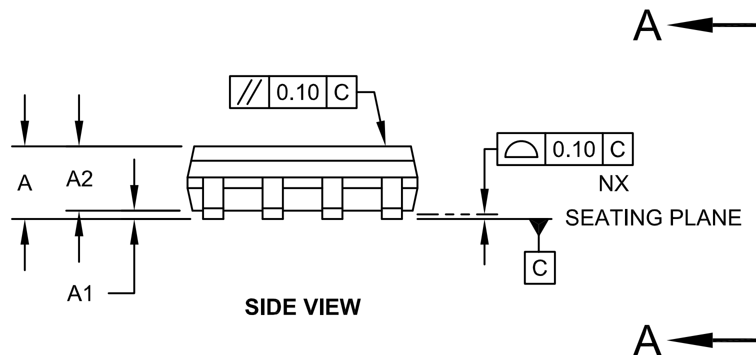
Packaging Diagrams and Parameters

8-Lead Plastic Small Outline (OA) - Narrow, 3.90 mm Body [SOIC]

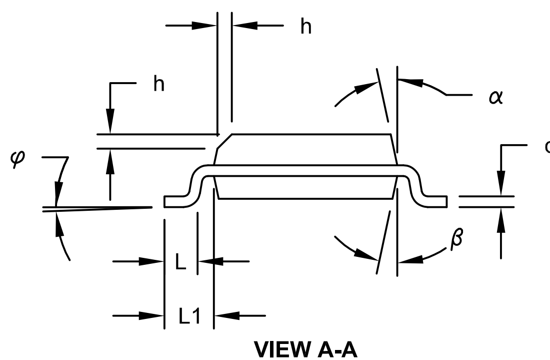
Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



TOP VIEW



SIDE VIEW

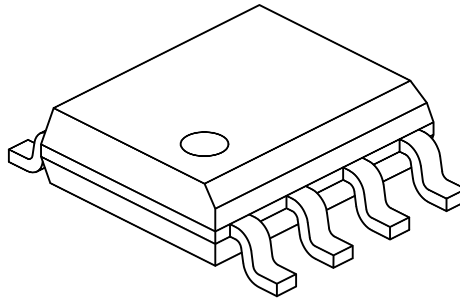


VIEW A-A

Microchip Technology Drawing No. C04-057C Sheet 1 of 2

8-Lead Plastic Small Outline (OA) - Narrow, 3.90 mm Body [SOIC]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	8		
Pitch	e	1.27 BSC		
Overall Height	A	-	-	1.75
Molded Package Thickness	A2	1.25	-	-
Standoff §	A1	0.10	-	0.25
Overall Width	E	6.00 BSC		
Molded Package Width	E1	3.90 BSC		
Overall Length	D	4.90 BSC		
Chamfer (Optional)	h	0.25	-	0.50
Foot Length	L	0.40	-	1.27
Footprint	L1	1.04 REF		
Foot Angle	φ	0°	-	8°
Lead Thickness	c	0.17	-	0.25
Lead Width	b	0.31	-	0.51
Mold Draft Angle Top	α	5°	-	15°
Mold Draft Angle Bottom	β	5°	-	15°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing No. C04-057C Sheet 2 of 2

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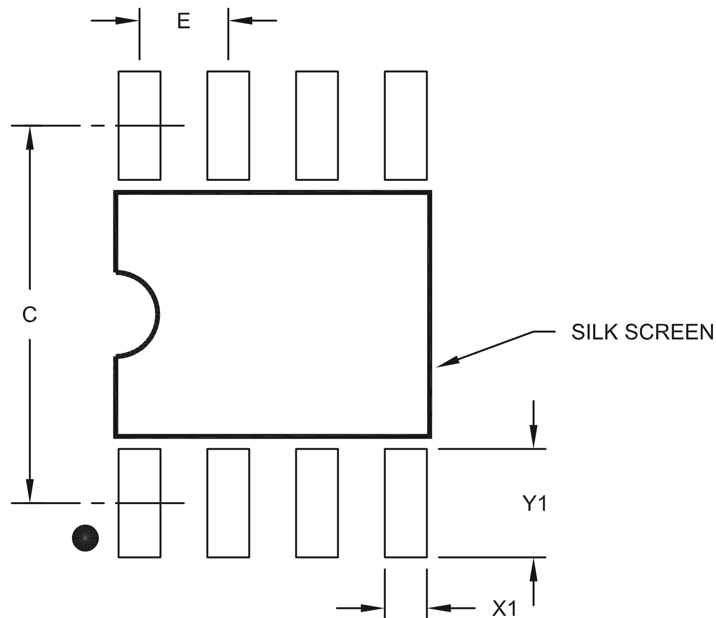
Land Pattern (Footprint)

8-Lead Plastic Small Outline (OA) – Narrow, 3.90 mm Body [SOIC]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E		1.27 BSC	
Contact Pad Spacing	C		5.40	
Contact Pad Width (X8)	X1			0.60
Contact Pad Length (X8)	Y1			1.55

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2057A

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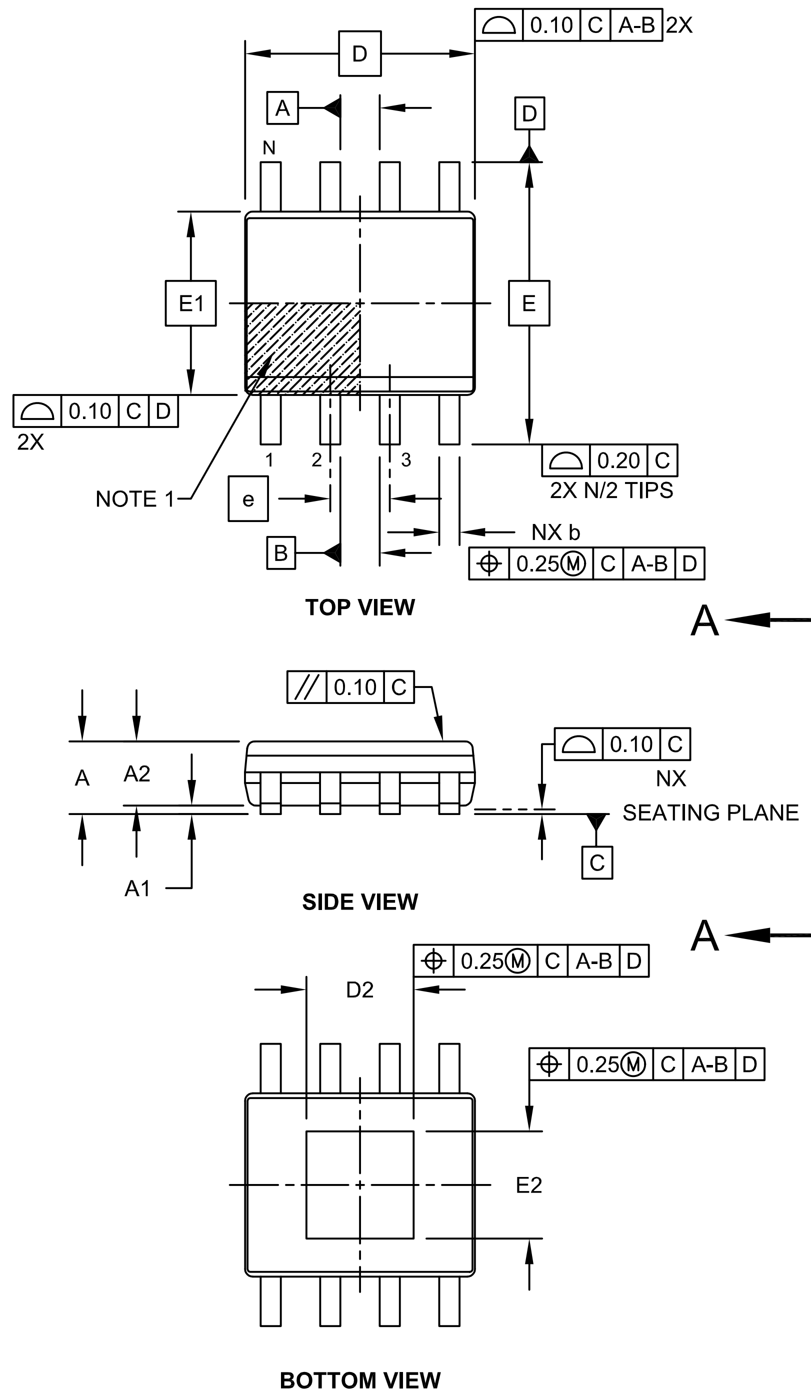
Packaging Diagrams and Parameters

8-Lead Thermally Enhanced Plastic Small Outline (SE) - Narrow, 3.90 mm Body [SOIC]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing No. C04-162A Sheet 1 of 2

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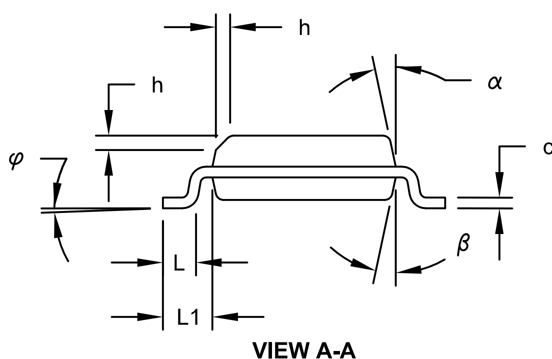
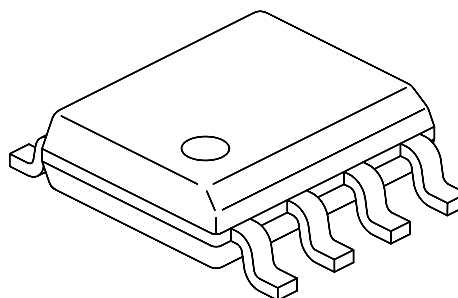
Packaging Diagrams and Parameters

8-Lead Plastic Small Outline (SE) - Narrow, 3.90 mm Body [SOIC] With Exposed Heat Slug

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging





Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	8		
Pitch	e	1.27 BSC		
Overall Height	A	-	-	1.75
Molded Package Thickness	A2	1.25	-	-
Standoff §	A1	0.10	-	0.25
Overall Width	E	6.00 BSC		
Molded Package Width	E1	3.90 BSC		
Overall Length	D	4.90 BSC		
Exposed Pad Width	E2	2.19	2.29	2.39
Exposed Pad Length	D2	2.19	2.29	2.39
Chamfer (Optional)	h	0.25	-	0.50
Foot Length	L	0.40	-	1.27
Footprint	L1	1.04 REF		
Foot Angle	φ	0°	-	8°
Lead Thickness	c	0.17	-	0.25
Lead Width	b	0.16	-	0.51
Mold Draft Angle Top	α	5°	-	15°
Mold Draft Angle Bottom	β	5°	-	15°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

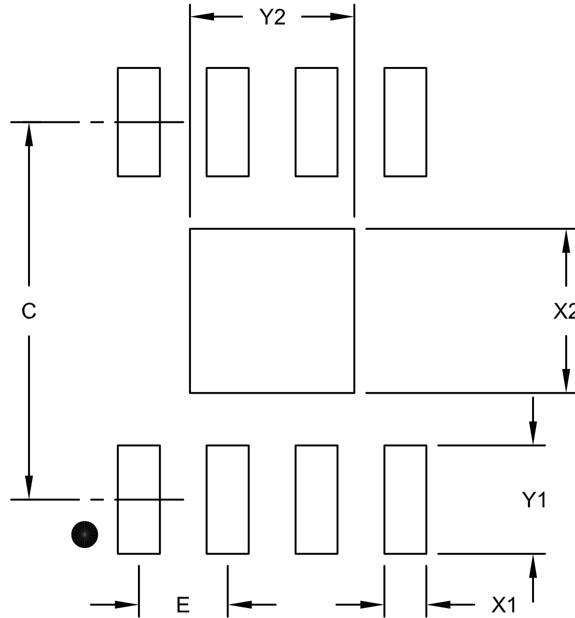
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing No. C04-162A Sheet 2 of 2

Land Pattern (Footprint)

8-Lead Thermally Enhanced Plastic Small Outline (SE) - Narrow, 3.90 mm Body [SOIC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E		1.27 BSC	
Contact Pad Spacing	C		5.40	
Contact Pad Width (X8)	X1			0.60
Contact Pad Length (X8)	Y1			1.55
Exposed Pad Width	X2			2.35
Exposed Pad Length	Y2			2.35

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2162A

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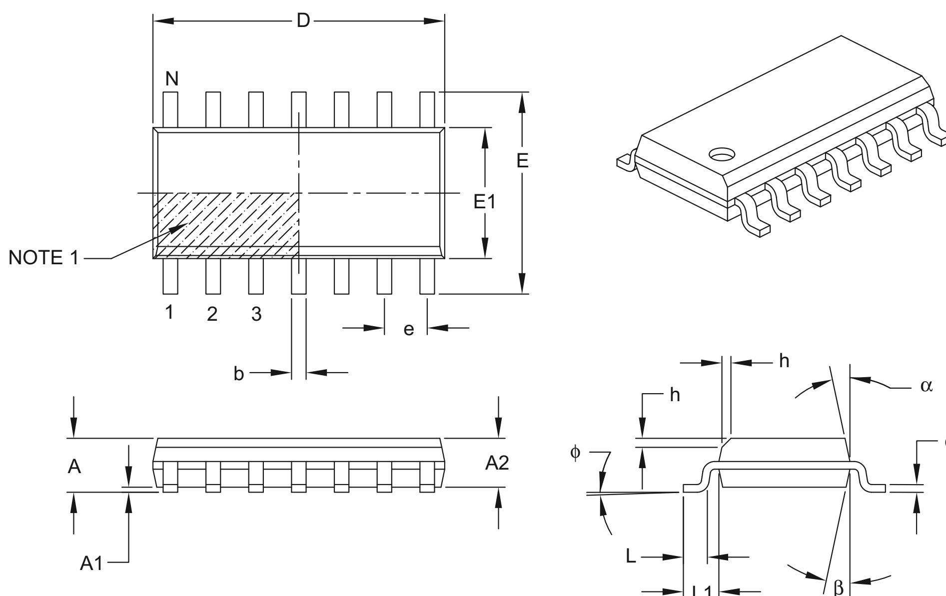
Packaging Diagrams and Parameters

14-Lead Plastic Small Outline (SL) – Narrow, 3.90 mm Body [SOIC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		14	
Pitch	e		1.27 BSC	
Overall Height	A	–	–	1.75
Molded Package Thickness	A2	1.25	–	–
Standoff §	A1	0.10	–	0.25
Overall Width	E		6.00 BSC	
Molded Package Width	E1		3.90 BSC	
Overall Length	D		8.65 BSC	
Chamfer (optional)	h	0.25	–	0.50
Foot Length	L	0.40	–	1.27
Footprint	L1		1.04 REF	
Foot Angle	ϕ	0°	–	8°
Lead Thickness	c	0.17	–	0.25
Lead Width	b	0.31	–	0.51
Mold Draft Angle Top	α	5°	–	15°
Mold Draft Angle Bottom	β	5°	–	15°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

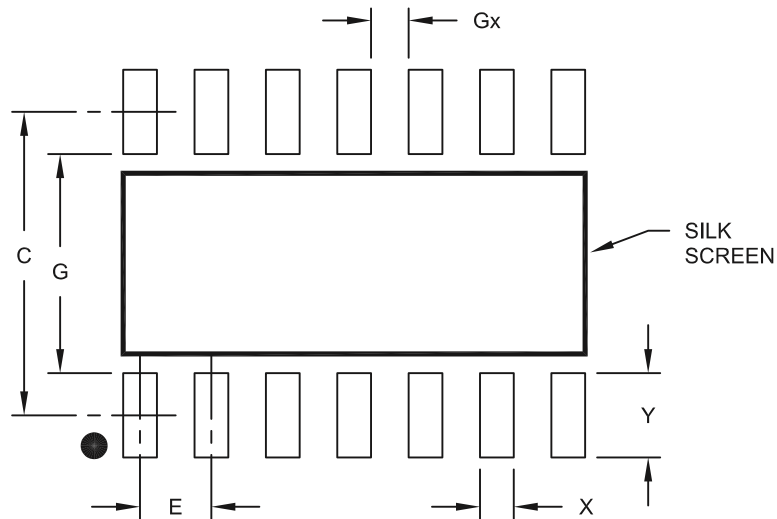
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-065B

Land Pattern (Footprint)

14-Lead Plastic Small Outline (SL) - Narrow, 3.90 mm Body [SOIC]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	1.27 BSC		
Contact Pad Spacing	C		5.40	
Contact Pad Width	X			0.60
Contact Pad Length	Y			1.50
Distance Between Pads	Gx	0.67		
Distance Between Pads	G	3.90		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2065A

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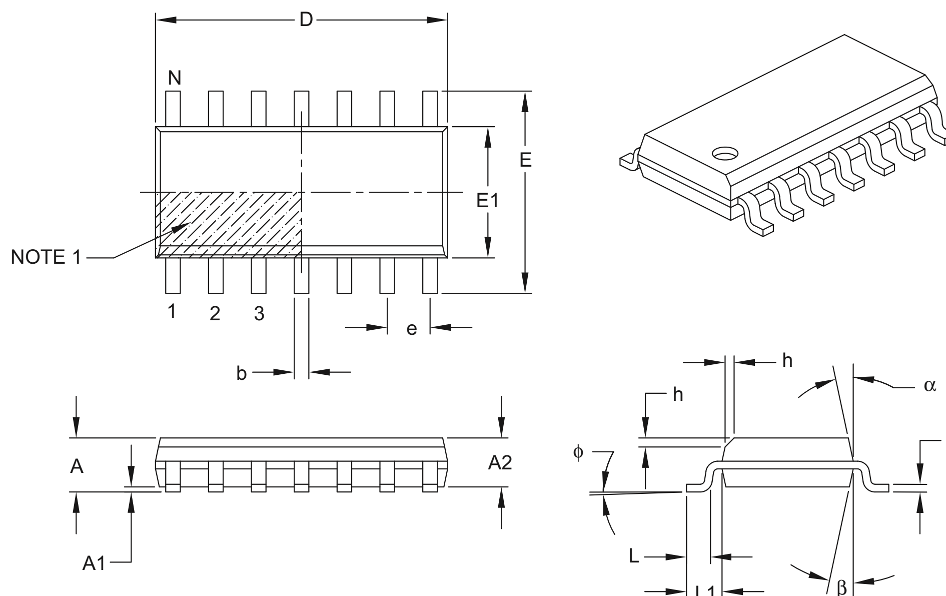
Packaging Diagrams and Parameters

14-Lead Plastic Small Outline (OD) – Narrow, 3.90 mm Body [SOIC]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	14		
Pitch	e	1.27 BSC		
Overall Height	A	–	–	1.75
Molded Package Thickness	A2	1.25	–	–
Standoff §	A1	0.10	–	0.25
Overall Width	E	6.00 BSC		
Molded Package Width	E1	3.90 BSC		
Overall Length	D	8.65 BSC		
Chamfer (optional)	h	0.25	–	0.50
Foot Length	L	0.40	–	1.27
Footprint	L1	1.04 REF		
Foot Angle	φ	0°	–	8°
Lead Thickness	c	0.17	–	0.25
Lead Width	b	0.31	–	0.51
Mold Draft Angle Top	α	5°	–	15°
Mold Draft Angle Bottom	β	5°	–	15°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

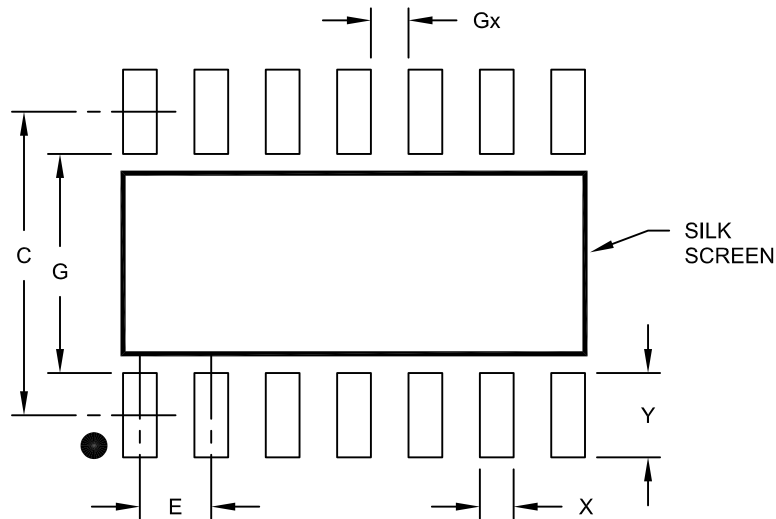
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-065B

Land Pattern (Footprint)

14-Lead Plastic Small Outline (OD) – Narrow, 3.90 mm Body [SOIC] Land Pattern

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E		1.27 BSC	
Contact Pad Spacing	C		5.40	
Contact Pad Width	X			0.60
Contact Pad Length	Y			1.50
Distance Between Pads	Gx	0.67		
Distance Between Pads	G	3.90		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2065A

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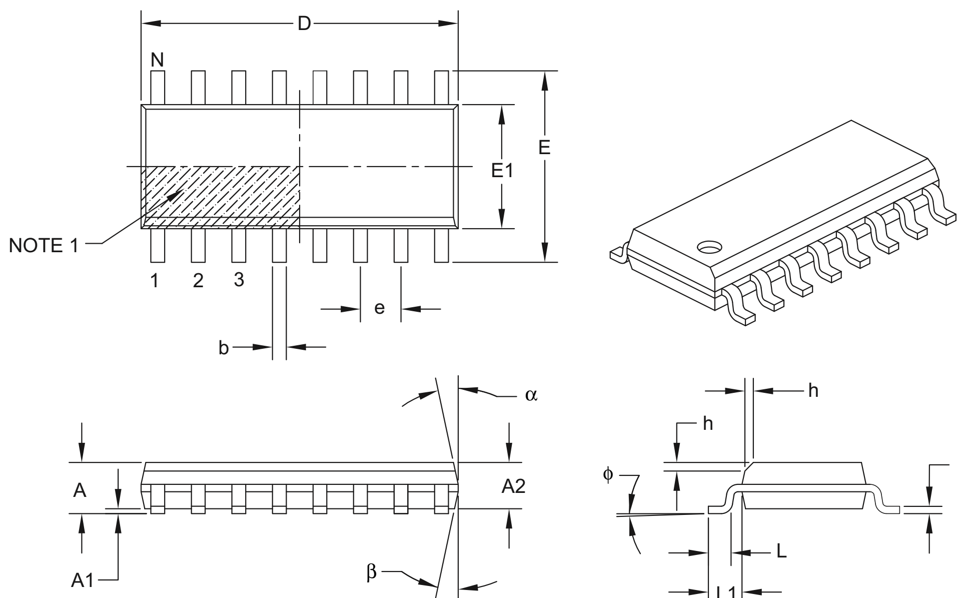
Packaging Diagrams and Parameters

16-Lead Plastic Small Outline (SL) – Narrow, 3.90 mm Body [SOIC]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	16		
Pitch	e	1.27 BSC		
Overall Height	A	–	–	1.75
Molded Package Thickness	A2	1.25	–	–
Standoff §	A1	0.10	–	0.25
Overall Width	E	6.00 BSC		
Molded Package Width	E1	3.90 BSC		
Overall Length	D	9.90 BSC		
Chamfer (optional)	h	0.25	–	0.50
Foot Length	L	0.40	–	1.27
Footprint	L1	1.04 REF		
Foot Angle	ϕ	0°	–	8°
Lead Thickness	c	0.17	–	0.25
Lead Width	b	0.31	–	0.51
Mold Draft Angle Top	α	5°	–	15°
Mold Draft Angle Bottom	β	5°	–	15°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

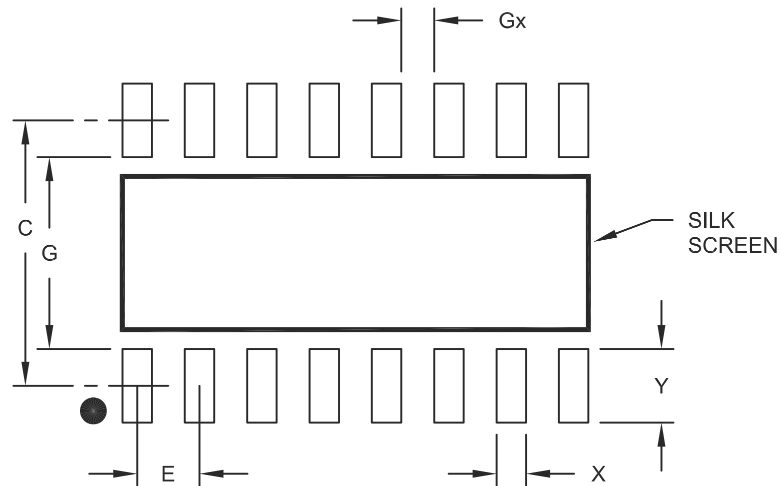
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-108B

Land Pattern (Footprint)

16-Lead Plastic Small Outline (SL) - Narrow, 3.90 mm Body [SOIC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	1.27 BSC		
Contact Pad Spacing	C		5.40	
Contact Pad Width	X			0.60
Contact Pad Length	Y			1.50
Distance Between Pads	Gx	0.67		
Distance Between Pads	G	3.90		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2108A

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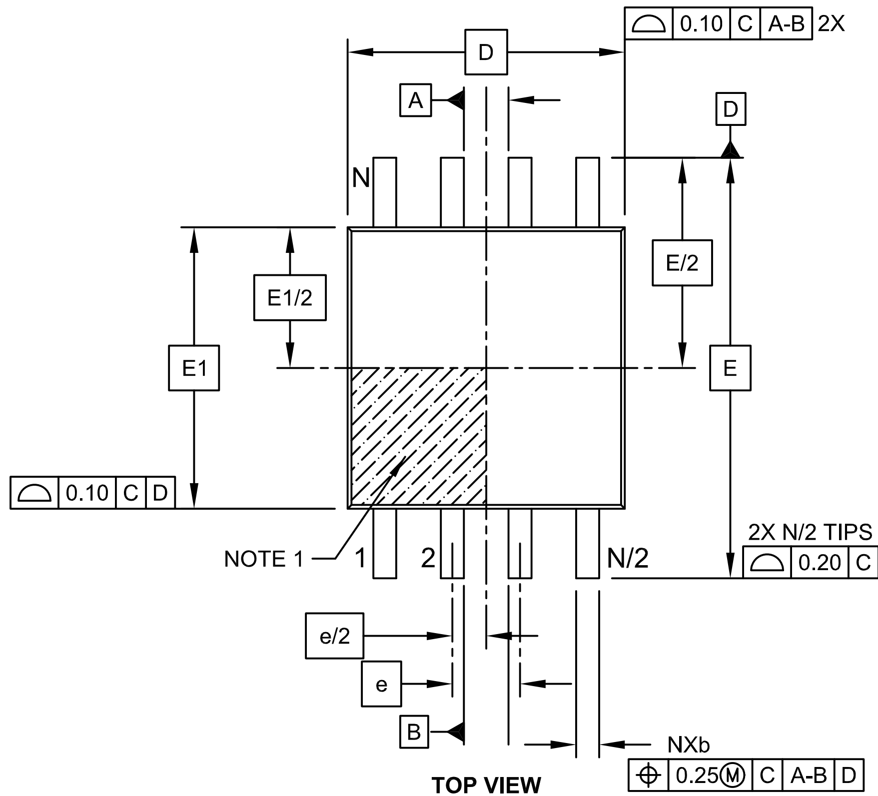
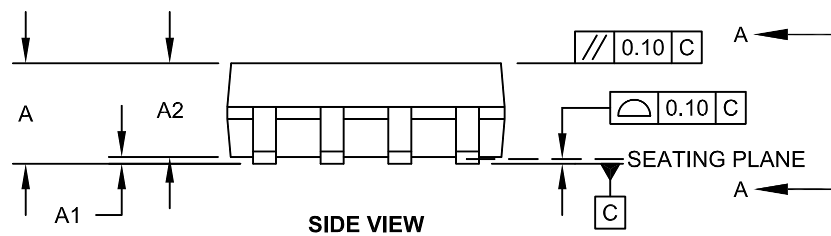
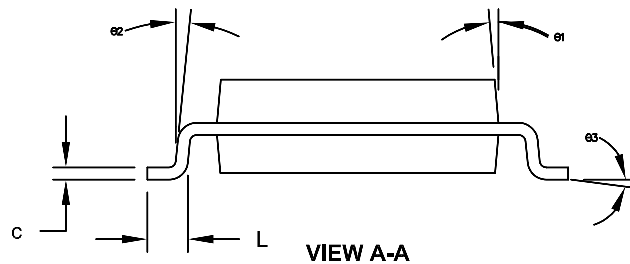
Packaging Diagrams and Parameters

8-Lead Plastic Small Outline (SM) - Medium, 5.28 mm Body [SOIJ]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



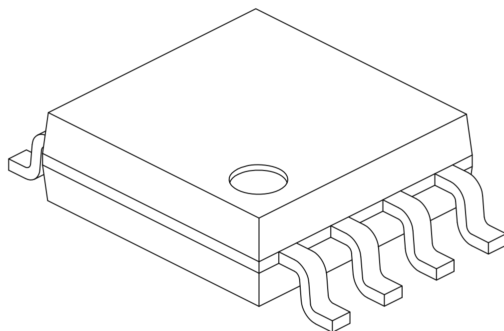




Microchip Technology Drawing C04-056C Sheet 1 of 2

8-Lead Plastic Small Outline (SM) - Medium, 5.28 mm Body [SOIJ]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	8		
Pitch	e	1.27 BSC		
Overall Height	A	1.77	-	2.03
Standoff §	A1	0.05		0.25
Molded Package Thickness	A2	1.75	-	1.98
Overall Width	E	7.94 BSC		
Molded Package Width	E1	5.25 BSC		
Overall Length	D	5.26 BSC		
Foot Length	L	0.51	-	0.76
Lead Thickness	c	0.15	-	0.25
Lead Width	b	0.36	-	0.51
Mold Draft Angle	Θ1	-	-	15°
Lead Angle	Θ2	0°	-	8°
Foot Angle	Θ3	0°	-	8°

Notes:

1. SOIJ, JEITA/EIAJ Standard, Formerly called SOIC
2. § Significant Characteristic
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25mm per side.

Microchip Technology Drawing No. C04-056C Sheet 2 of 2

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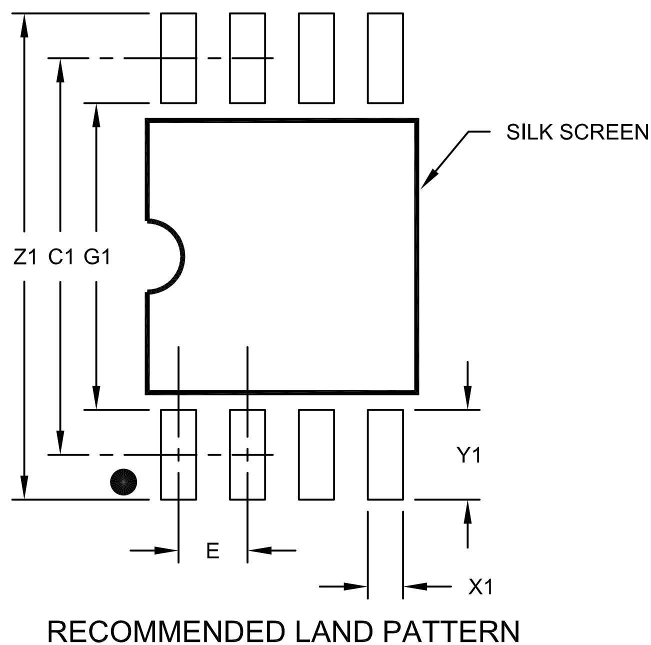
Land Pattern (Footprint)

8-Lead Plastic Small Outline (SM) - Medium, 5.28 mm Body [SOIJ]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	1.27 BSC		
Overall Width	Z1			9.00
Contact Pad Spacing	C1		7.30	
Contact Pad Width (X8)	X1			0.65
Contact Pad Length (X8)	Y1			1.70
Distance Between Pads	G1	5.60		
Distance Between Pads	G	0.62		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

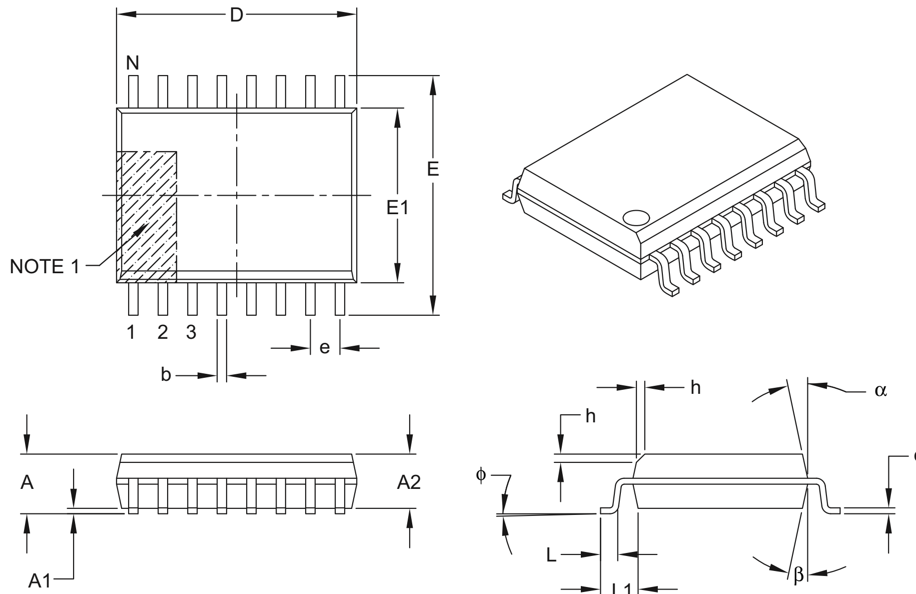
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2056C

Packaging Diagrams and Parameters

16-Lead Plastic Small Outline (SO) – Wide, 7.50 mm Body [SOIC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	16		
Pitch	e	1.27 BSC		
Overall Height	A	–	–	2.65
Molded Package Thickness	A2	2.05	–	–
Standoff §	A1	0.10	–	0.30
Overall Width	E	10.30 BSC		
Molded Package Width	E1	7.50 BSC		
Overall Length	D	10.30 BSC		
Chamfer (optional)	h	0.25	–	0.75
Foot Length	L	0.40	–	1.27
Footprint	L1	1.40 REF		
Foot Angle	ϕ	0°	–	8°
Lead Thickness	c	0.20	–	0.33
Lead Width	b	0.31	–	0.51
Mold Draft Angle Top	α	5°	–	15°
Mold Draft Angle Bottom	β	5°	–	15°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-102B

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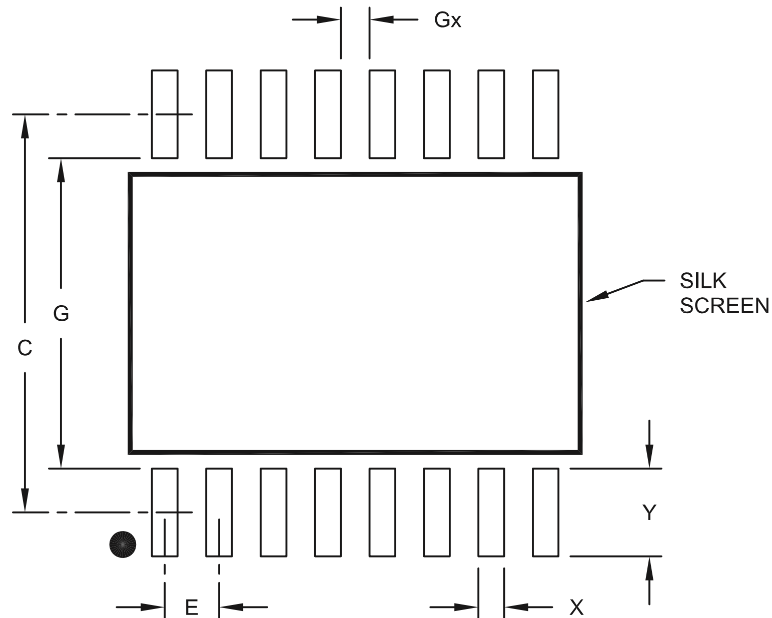
Land Pattern (Footprint)

16-Lead Plastic Small Outline (SO) – Wide, 7.50 mm Body [SOIC] Land Pattern

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	1.27 BSC		
Contact Pad Spacing	C		9.30	
Contact Pad Width	X			0.60
Contact Pad Length	Y			2.05
Distance Between Pads	Gx	0.67		
Distance Between Pads	G	7.25		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

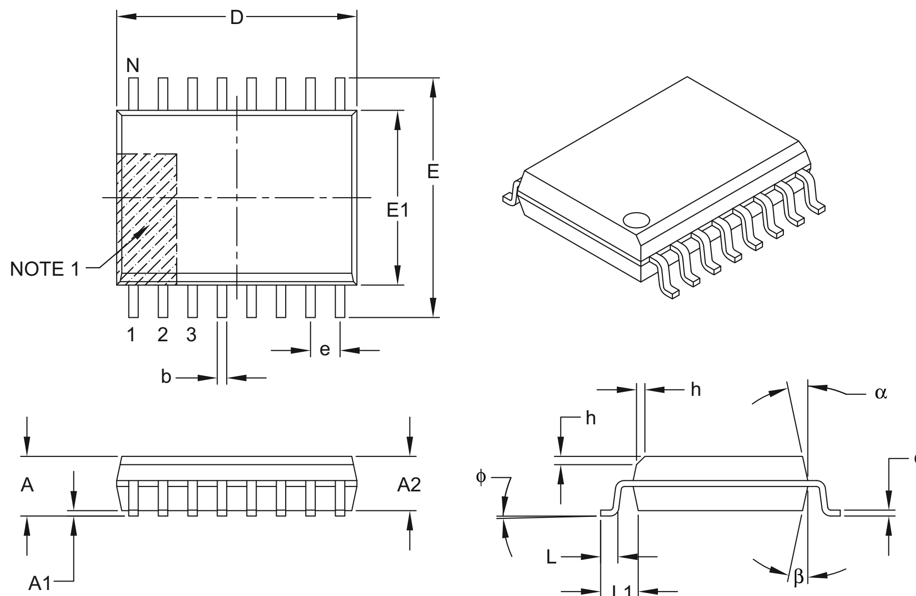
Microchip Technology Drawing No. C04-2102A

MICROCHIP

Packaging Diagrams and Parameters

16-Lead Plastic Small Outline (OE) – Wide, 7.50 mm Body [SOIC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	16		
Pitch	e	1.27 BSC		
Overall Height	A	–	–	2.65
Molded Package Thickness	A2	2.05	–	–
Standoff §	A1	0.10	–	0.30
Overall Width	E	10.30 BSC		
Molded Package Width	E1	7.50 BSC		
Overall Length	D	10.30 BSC		
Chamfer (optional)	h	0.25	–	0.75
Foot Length	L	0.40	–	1.27
Footprint	L1	1.40 REF		
Foot Angle	ϕ	0°	–	8°
Lead Thickness	c	0.20	–	0.33
Lead Width	b	0.31	–	0.51
Mold Draft Angle Top	α	5°	–	15°
Mold Draft Angle Bottom	β	5°	–	15°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-102B

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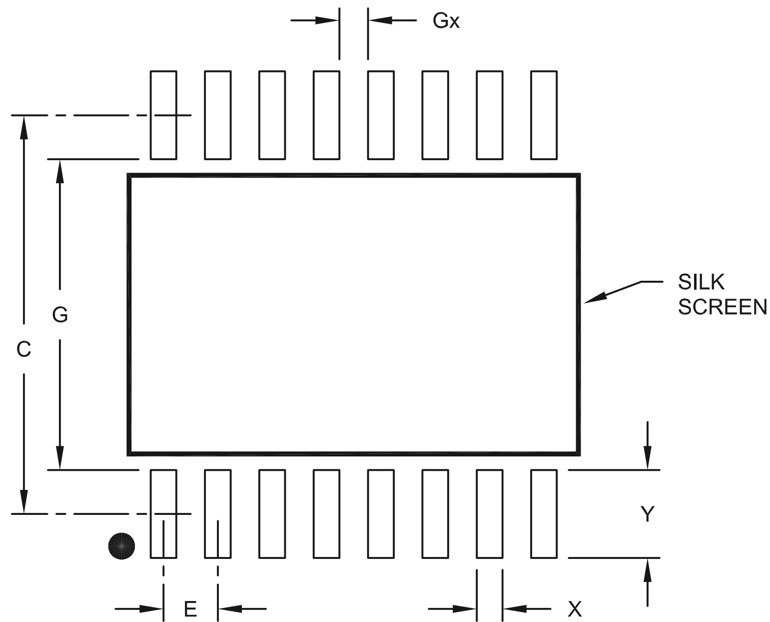
Land Pattern (Footprint)

16-Lead Plastic Small Outline (OE) – Wide, 7.50 mm Body [SOIC] Land Pattern

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	1.27 BSC		
Contact Pad Spacing	C		9.30	
Contact Pad Width	X			0.60
Contact Pad Length	Y			2.05
Distance Between Pads	Gx	0.67		
Distance Between Pads	G	7.25		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

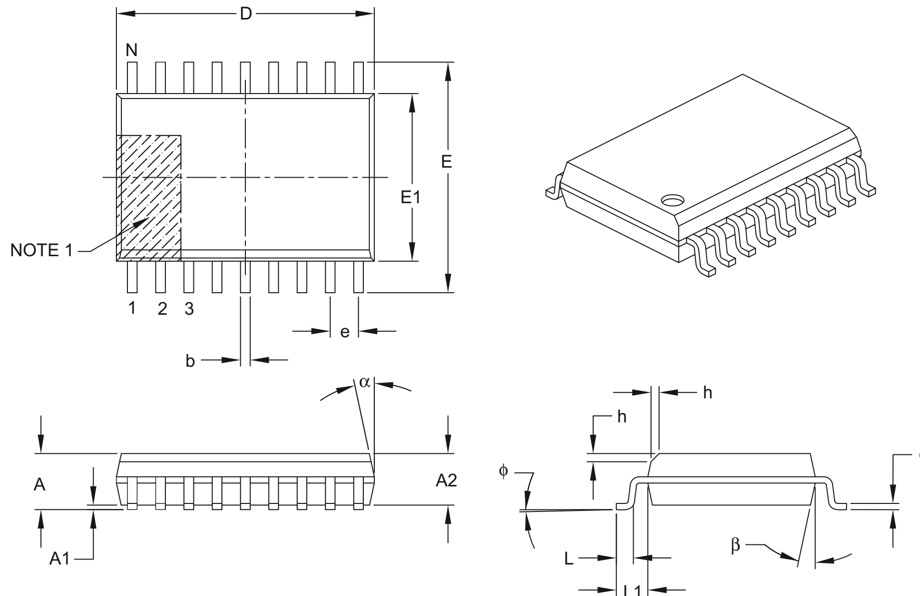
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2102A

Packaging Diagrams and Parameters

18-Lead Plastic Small Outline (SO) – Wide, 7.50 mm Body [SOIC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	18		
Pitch	e	1.27 BSC		
Overall Height	A	–	–	2.65
Molded Package Thickness	A2	2.05	–	–
Standoff §	A1	0.10	–	0.30
Overall Width	E	10.30 BSC		
Molded Package Width	E1	7.50 BSC		
Overall Length	D	11.55 BSC		
Chamfer (optional)	h	0.25	–	0.75
Foot Length	L	0.40	–	1.27
Footprint	L1	1.40 REF		
Foot Angle	φ	0°	–	8°
Lead Thickness	c	0.20	–	0.33
Lead Width	b	0.31	–	0.51
Mold Draft Angle Top	α	5°	–	15°
Mold Draft Angle Bottom	β	5°	–	15°

Notes:
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-051B

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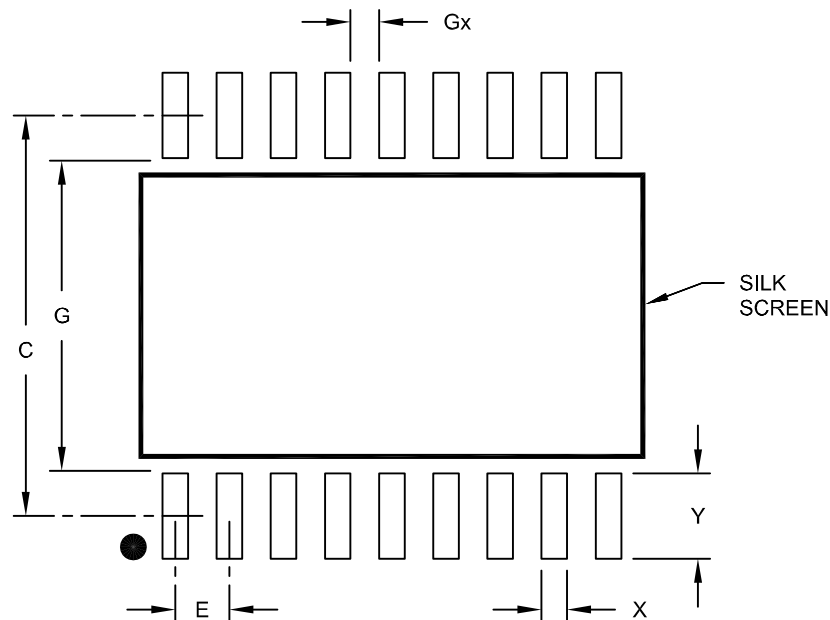
Land Pattern (Footprint)

18-Lead Plastic Small Outline (SO) - Wide, 7.50 mm Body [SOIC]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	1.27 BSC		
Contact Pad Spacing	C		9.40	
Contact Pad Width	X			0.60
Contact Pad Length	Y			2.00
Distance Between Pads	Gx	0.67		
Distance Between Pads	G	7.40		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2051A

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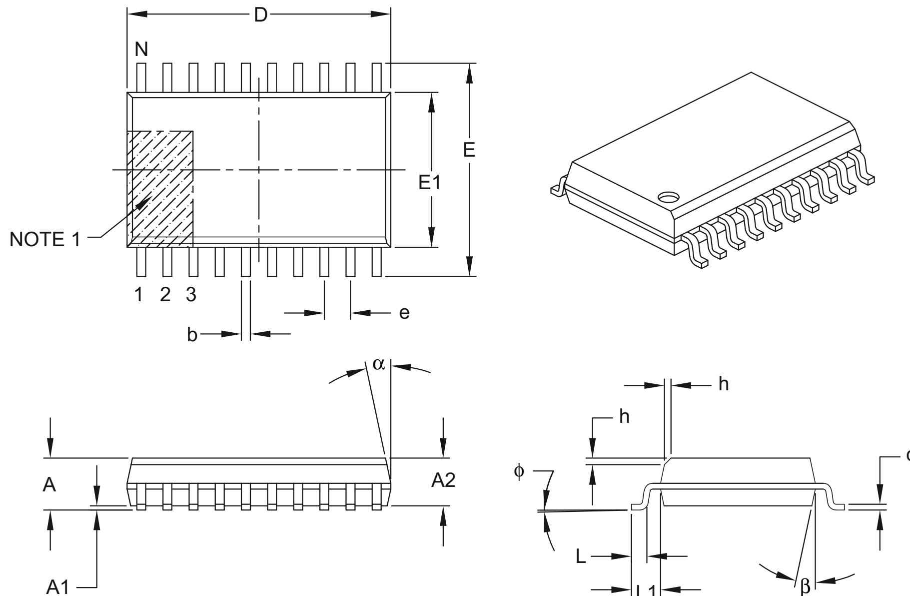
Packaging Diagrams and Parameters

Packaging Diagrams and Parameters

20-Lead Plastic Small Outline (SO) – Wide, 7.50 mm Body [SOIC]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	20		
Pitch	e	1.27 BSC		
Overall Height	A	–	–	2.65
Molded Package Thickness	A2	2.05	–	–
Standoff §	A1	0.10	–	0.30
Overall Width	E	10.30 BSC		
Molded Package Width	E1	7.50 BSC		
Overall Length	D	12.80 BSC		
Chamfer (optional)	h	0.25	–	0.75
Foot Length	L	0.40	–	1.27
Footprint	L1	1.40 REF		
Foot Angle	φ	0°	–	8°
Lead Thickness	c	0.20	–	0.33
Lead Width	b	0.31	–	0.51
Mold Draft Angle Top	α	5°	–	15°
Mold Draft Angle Bottom	β	5°	–	15°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-094B

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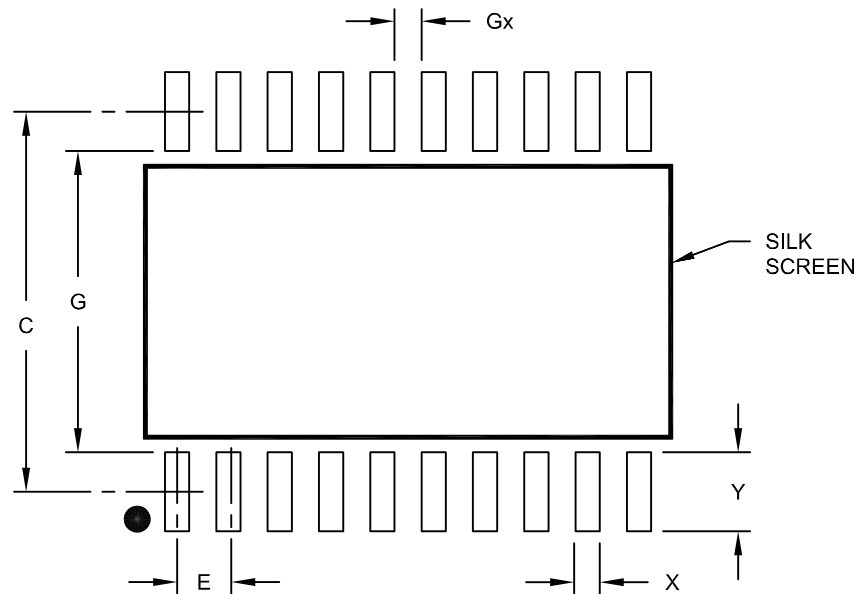
Land Pattern (Footprint)

20-Lead Plastic Small Outline (SO) - Wide, 7.50 mm Body [SOIC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E		1.27 BSC	
Contact Pad Spacing	C		9.40	
Contact Pad Width (X20)	X			0.60
Contact Pad Length (X20)	Y			1.95
Distance Between Pads	Gx	0.67		
Distance Between Pads	G	7.45		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

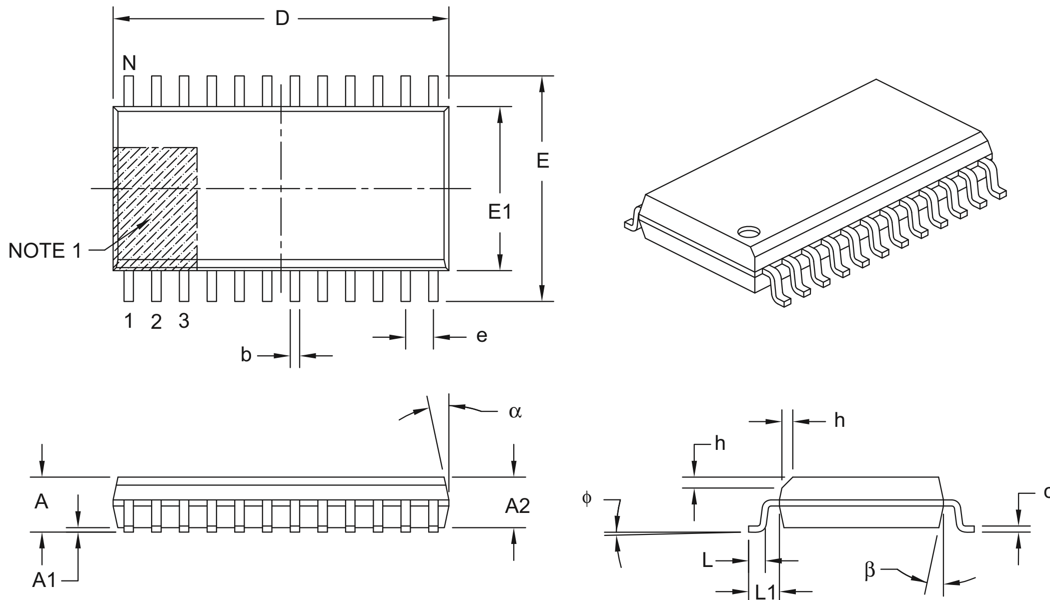
Microchip Technology Drawing No. C04-2094A

MICROCHIP

Packaging Diagrams and Parameters

24-Lead Plastic Small Outline (SO) – Wide, 7.50 mm Body [SOIC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	24		
Pitch	e	1.27 BSC		
Overall Height	A	–	–	2.65
Molded Package Thickness	A2	2.05	–	–
Standoff §	A1	0.10	–	0.30
Overall Width	E	10.30 BSC		
Molded Package Width	E1	7.50 BSC		
Overall Length	D	15.40 BSC		
Chamfer (optional)	h	0.25	–	0.75
Foot Length	L	0.40	–	1.27
Footprint	L1	1.40 REF		
Foot Angle	ϕ	0°	–	8°
Lead Thickness	c	0.20	–	0.33
Lead Width	b	0.31	–	0.51
Mold Draft Angle Top	α	5°	–	15°
Mold Draft Angle Bottom	β	5°	–	15°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-025B

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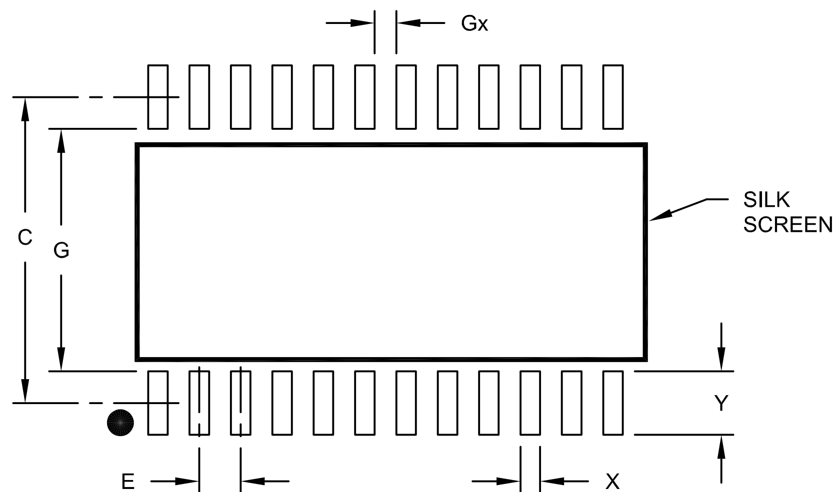
Land Pattern (Footprint)

24-Lead Plastic Small Outline (SO) – Wide, 7.50 mm Body [SOIC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	1.27 BSC		
Contact Pad Spacing	C		9.40	
Contact Pad Width (X24)	X			0.60
Contact Pad Length (X24)	Y			2.00
Distance Between Pads	Gx	0.67		
Distance Between Pads	G	7.40		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2025A

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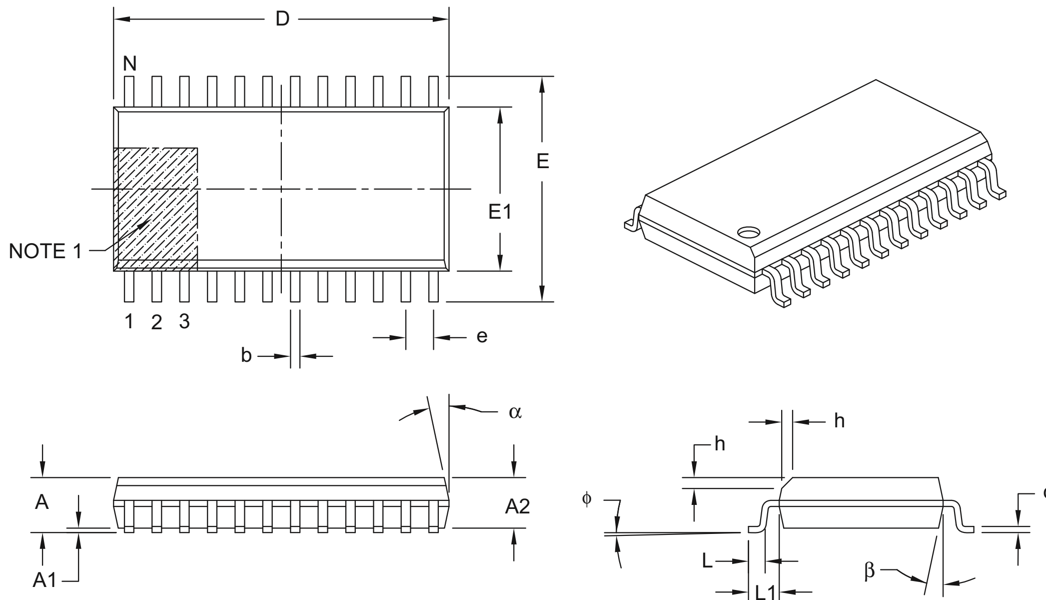
Packaging Diagrams and Parameters

24-Lead Plastic Small Outline (OG) – Wide, 7.50 mm Body [SOIC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	24		
Pitch	e	1.27 BSC		
Overall Height	A	–	–	2.65
Molded Package Thickness	A2	2.05	–	–
Standoff §	A1	0.10	–	0.30
Overall Width	E	10.30 BSC		
Molded Package Width	E1	7.50 BSC		
Overall Length	D	15.40 BSC		
Chamfer (optional)	h	0.25	–	0.75
Foot Length	L	0.40	–	1.27
Footprint	L1	1.40 REF		
Foot Angle	φ	0°	–	8°
Lead Thickness	c	0.20	–	0.33
Lead Width	b	0.31	–	0.51
Mold Draft Angle Top	α	5°	–	15°
Mold Draft Angle Bottom	β	5°	–	15°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-025B

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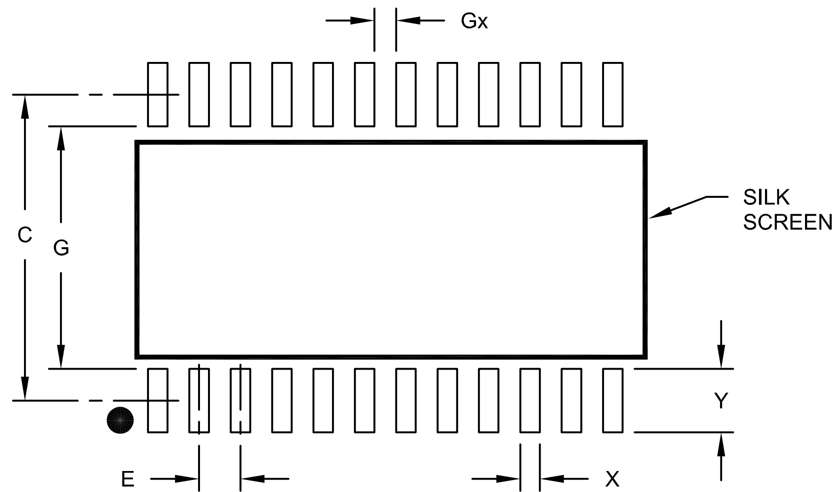
Land Pattern (Footprint)

24-Lead Plastic Small Outline (OG) – Wide, 7.50 mm Body [SOIC]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E	1.27 BSC		
Contact Pad Spacing	C		9.40	
Contact Pad Width (X24)	X			0.60
Contact Pad Length (X24)	Y			2.00
Distance Between Pads	Gx	0.67		
Distance Between Pads	G	7.40		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

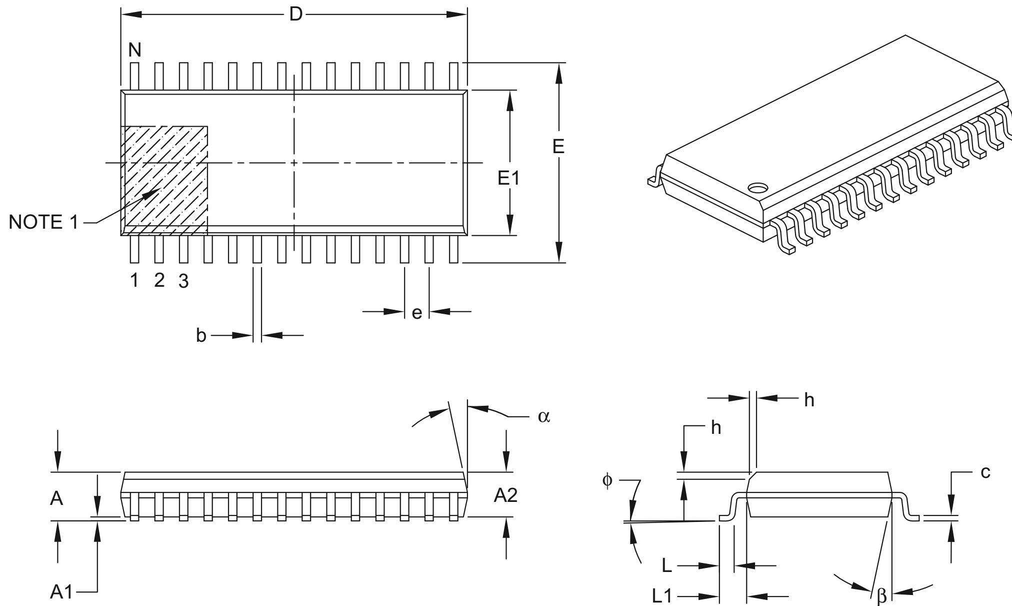
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2025A

Packaging Diagrams and Parameters

28-Lead Plastic Small Outline (SO) – Wide, 7.50 mm Body [SOIC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	28		
Pitch	e	1.27 BSC		
Overall Height	A	–	–	2.65
Molded Package Thickness	A2	2.05	–	–
Standoff §	A1	0.10	–	0.30
Overall Width	E	10.30 BSC		
Molded Package Width	E1	7.50 BSC		
Overall Length	D	17.90 BSC		
Chamfer (optional)	h	0.25	–	0.75
Foot Length	L	0.40	–	1.27
Footprint	L1	1.40 REF		
Foot Angle Top	φ	0°	–	8°
Lead Thickness	c	0.18	–	0.33
Lead Width	b	0.31	–	0.51
Mold Draft Angle Top	α	5°	–	15°
Mold Draft Angle Bottom	β	5°	–	15°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-052B

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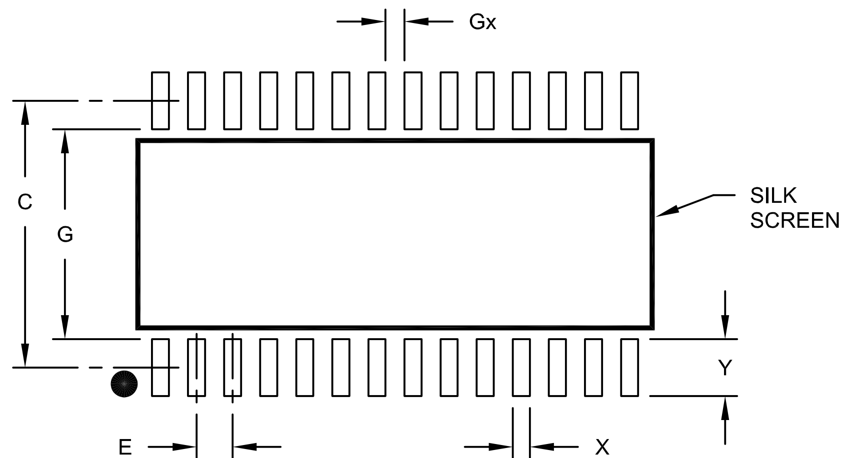
Land Pattern (Footprint)

28-Lead Plastic Small Outline (SO) - Wide, 7.50 mm Body [SOIC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	1.27 BSC		
Contact Pad Spacing	C		9.40	
Contact Pad Width (X28)	X			0.60
Contact Pad Length (X28)	Y			2.00
Distance Between Pads	Gx	0.67		
Distance Between Pads	G	7.40		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2052A

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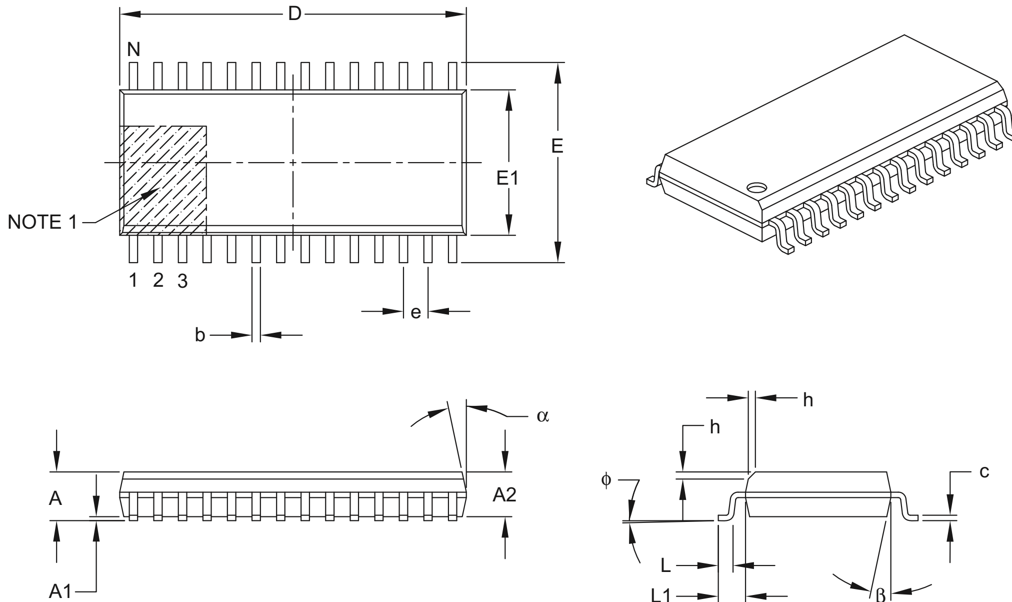
Packaging Diagrams and Parameters

28-Lead Plastic Small Outline (OI) – Wide, 7.50 mm Body [SOIC]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	28		
Pitch	e	1.27 BSC		
Overall Height	A	–	–	2.65
Molded Package Thickness	A2	2.05	–	–
Standoff §	A1	0.10	–	0.30
Overall Width	E	10.30 BSC		
Molded Package Width	E1	7.50 BSC		
Overall Length	D	17.90 BSC		
Chamfer (optional)	h	0.25	–	0.75
Foot Length	L	0.40	–	1.27
Footprint	L1	1.40 REF		
Foot Angle Top	φ	0°	–	8°
Lead Thickness	c	0.18	–	0.33
Lead Width	b	0.31	–	0.51
Mold Draft Angle Top	α	5°	–	15°
Mold Draft Angle Bottom	β	5°	–	15°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-052B

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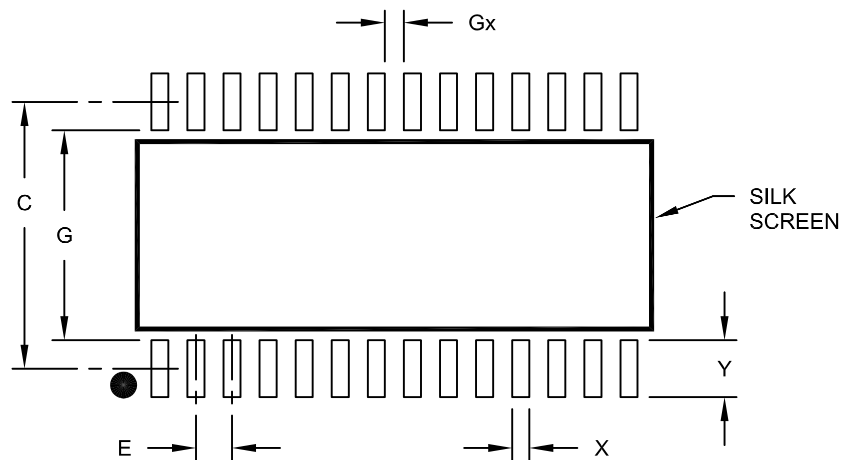
Land Pattern (Footprint)

28-Lead Plastic Small Outline (OI) - Wide, 7.50 mm Body [SOIC]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	1.27 BSC		
Contact Pad Spacing	C		9.40	
Contact Pad Width (X28)	X			0.60
Contact Pad Length (X28)	Y			2.00
Distance Between Pads	Gx	0.67		
Distance Between Pads	G	7.40		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2052A

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Packaging Diagrams and Parameters

NOTES:

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Packaging Diagrams and Parameters

DFN Family

Dual Flat, No Lead Packages

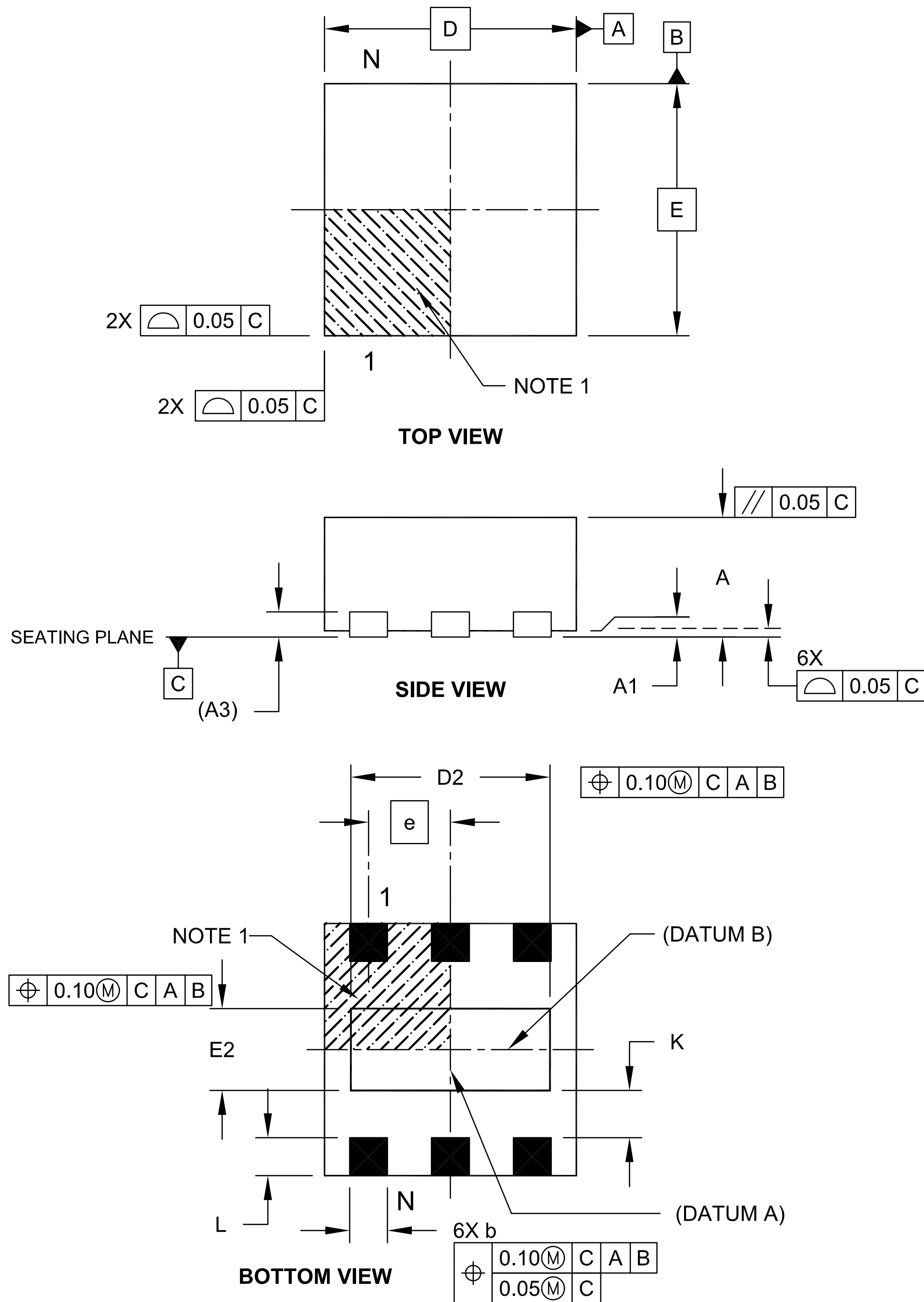
QFN Family

Quad Flat, No Lead Package

Packaging Diagrams and Parameters

6-Lead Plastic Dual Flat, No Lead Package (MA) - 2x2x0.9mm Body [DFN]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing C04-120B Sheet 1 of 2

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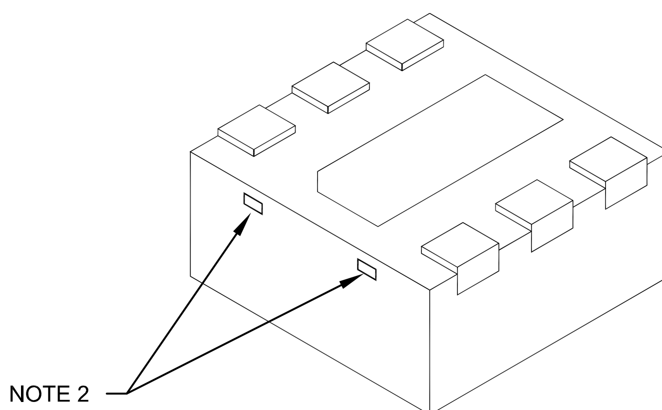
Packaging Diagrams and Parameters

6-Lead Plastic Dual Flat, No Lead Package (MA) - 2x2x0.9mm Body [DFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		6	
Pitch	e		0.65 BSC	
Overall Height	A	0.80	0.85	0.90
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Length	D		2.00 BSC	
Overall Width	E		2.00 BSC	
Exposed Pad Length	D2	1.50	1.60	1.70
Exposed Pad Width	E2	0.90	1.00	1.10
Contact Width	b	0.25	0.30	0.35
Contact Length	L	0.20	0.25	0.30
Contact-to-Exposed Pad	K	0.20	-	-

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package may have one or more exposed tie bars at ends.
3. Package is saw singulated.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-120B Sheet 2 of 2

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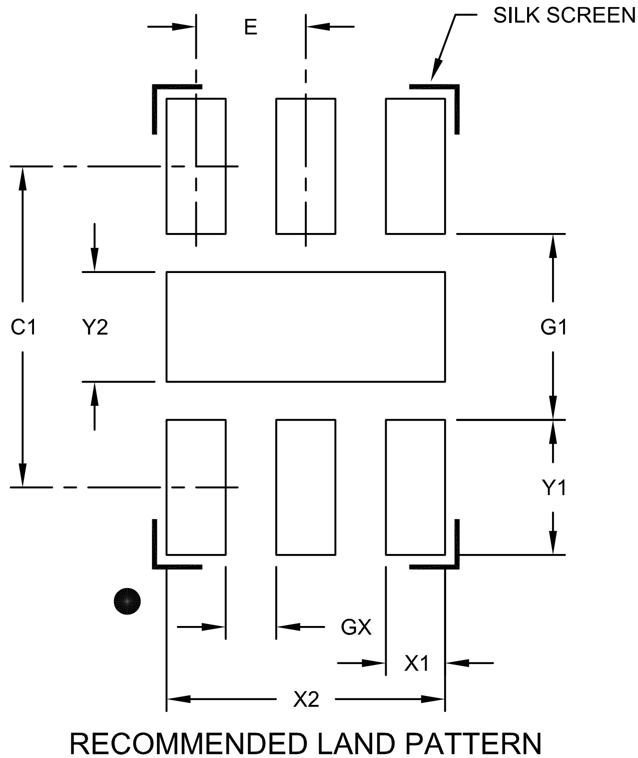
Land Pattern (Footprint)

6-Lead Plastic Dual Flat, No Lead Package (MA) - 2x2x0.9mm Body [DFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.65 BSC		
Optional Center Pad Width	Y2			1.00
Optional Center Pad Length	X2			1.70
Contact Pad Spacing	C1		2.10	
Contact Pad Width (X6)	X1			0.35
Contact Pad Length (X6)	Y1			0.65
Distance Between Pads	GX	0.20		
Distance Between Pads	G1	1.10		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2120A

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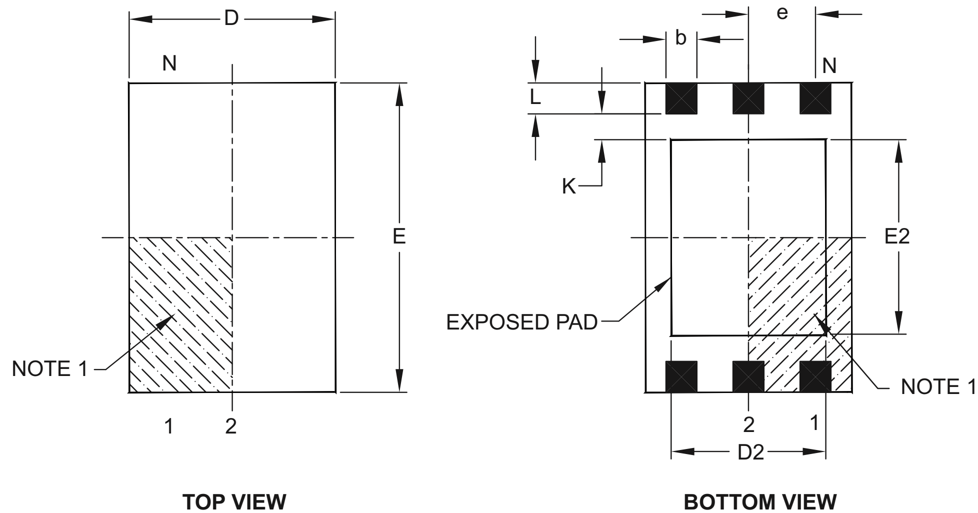
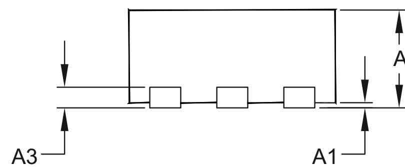
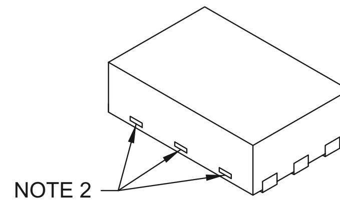
Packaging Diagrams and Parameters

6-Lead Plastic Dual Flat, No Lead Package (ME) – 2x3x0.9 mm Body [DFN]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging







	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		6	
Pitch	e		0.65 BSC	
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Length	D		2.00 BSC	
Overall Width	E		3.00 BSC	
Exposed Pad Length	D2	1.40	–	1.60
Exposed Pad Width	E2	1.80	–	2.00
Contact Width	b	0.25	0.30	0.35
Contact Length	L	0.20	0.30	0.40
Contact-to-Exposed Pad	K	0.20	–	–

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package may have one or more exposed tie bars at ends.
3. Package is saw singulated.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

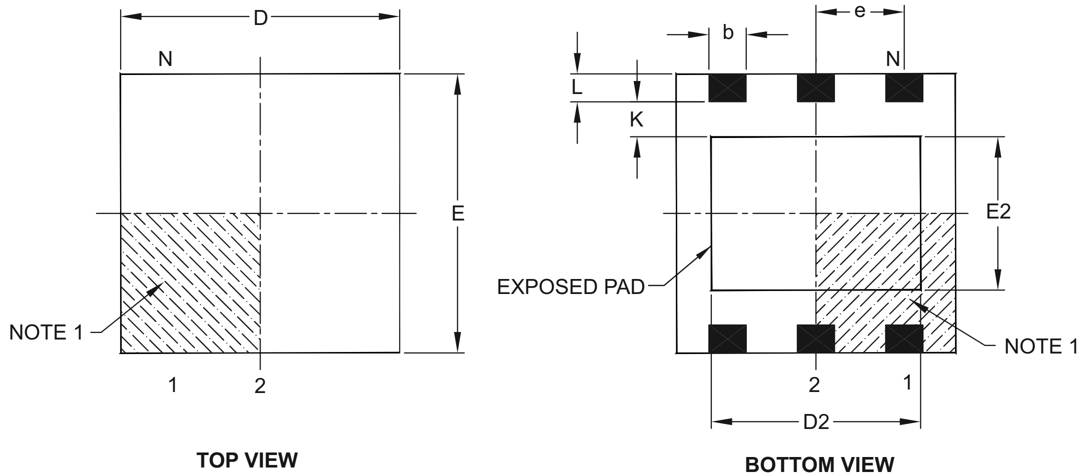
   REF: Reference Dimension, usually without tolerance, for information purposes only.

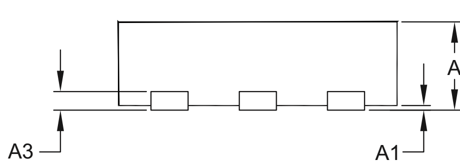
Microchip Technology Drawing C04-134A

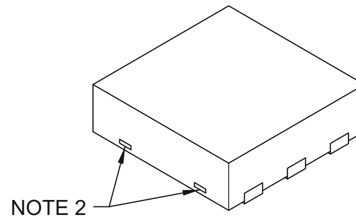
Packaging Diagrams and Parameters

6-Lead Plastic Dual Flat, No Lead Package (MH) – 3x3x0.9 mm Body [DFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging







	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		6	
Pitch	e		0.95 BSC	
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Length	D		3.00 BSC	
Overall Width	E		3.00 BSC	
Exposed Pad Length	D2	0.00	–	2.25
Exposed Pad Width	E2	0.00	–	1.65
Contact Width	b	0.30	0.40	0.45
Contact Length	L	0.20	0.30	0.45
Contact-to-Exposed Pad	K	0.20	–	–

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package may have one or more exposed tie bars at ends.
3. Package is saw singulated.
4. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-135A

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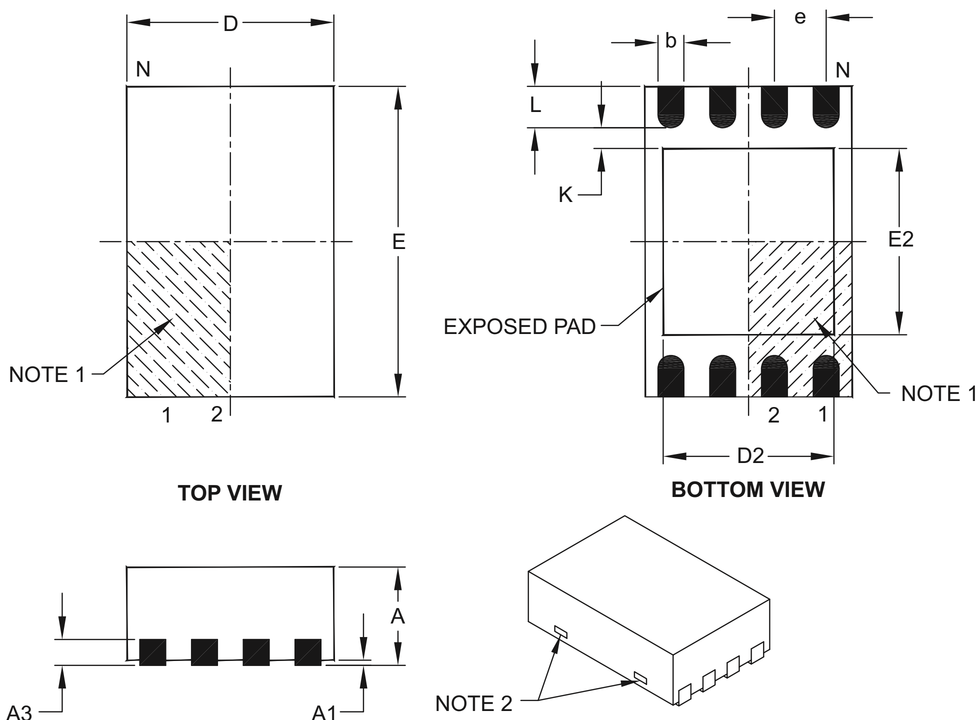
Packaging Diagrams and Parameters

8-Lead Plastic Dual Flat, No Lead Package (MC) – 2x3x0.9 mm Body [DFN]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		8	
Pitch	e		0.50 BSC	
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Length	D		2.00 BSC	
Overall Width	E		3.00 BSC	
Exposed Pad Length	D2	1.30	–	1.55
Exposed Pad Width	E2	1.50	–	1.75
Contact Width	b	0.20	0.25	0.30
Contact Length	L	0.30	0.40	0.50
Contact-to-Exposed Pad	K	0.20	–	–

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package may have one or more exposed tie bars at ends.
3. Package is saw singulated.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

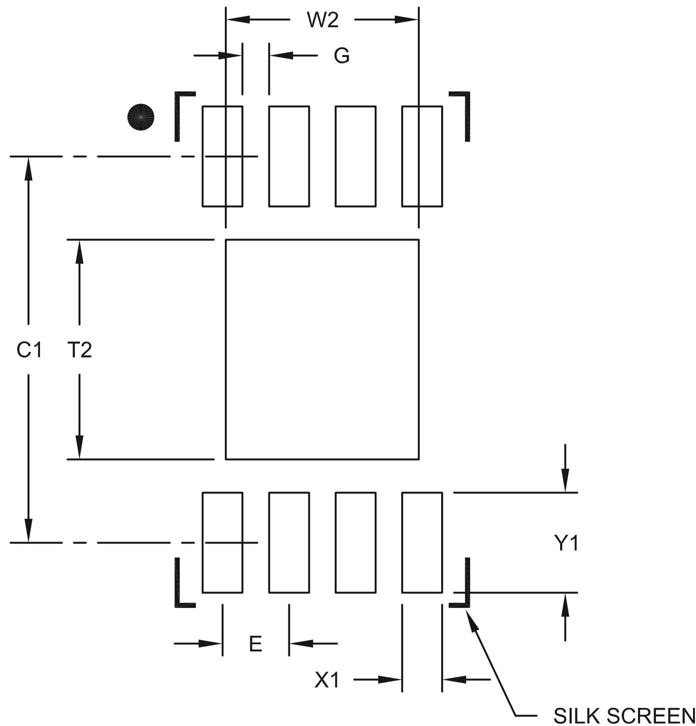
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-123C

Land Pattern (Footprint)

8-Lead Plastic Dual Flat, No Lead Package (MC) – 2x3x0.9 mm Body [DFN]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.50 BSC		
Optional Center Pad Width	W2			1.45
Optional Center Pad Length	T2			1.75
Contact Pad Spacing	C1		2.90	
Contact Pad Width (X8)	X1			0.30
Contact Pad Length (X8)	Y1			0.75
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2123A

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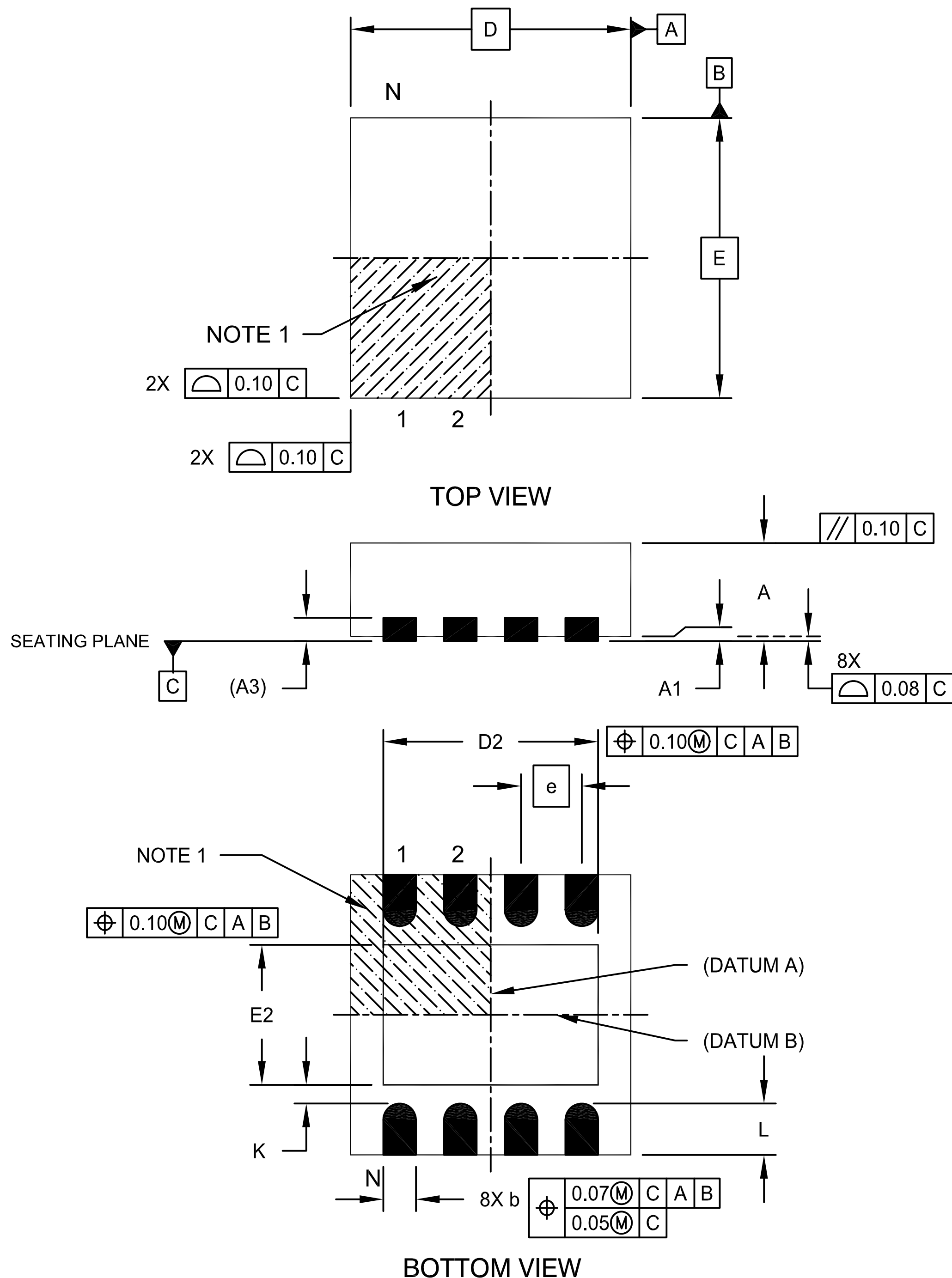
Packaging Diagrams and Parameters

8-Lead Plastic Dual Flat, No Lead Package (MF) - 3x3x0.9mm Body [DFN]

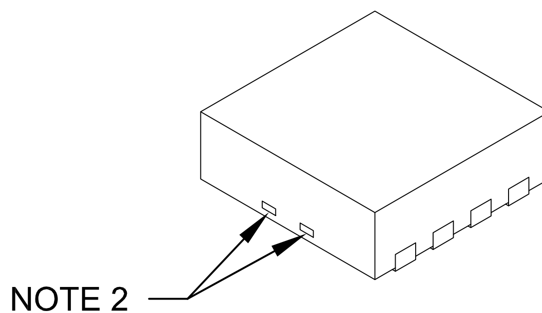
Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing No. C04-062C Sheet 1 of 2

8-Lead Plastic Dual Flat, No Lead Package (MF) - 3x3x0.9mm Body [DFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	8		
Pitch	e	0.65 BSC		
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3	0.20 REF		
Overall Length	D	3.00 BSC		
Exposed Pad Width	E2	1.34	-	1.60
Overall Width	E	3.00 BSC		
Exposed Pad Length	D2	1.60	-	2.40
Contact Width	b	0.25	0.30	0.35
Contact Length	L	0.20	0.30	0.55
Contact-to-Exposed Pad	K	0.20	-	-

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package may have one or more exposed tie bars at ends.
3. Package is saw singulated
4. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing No. C04-062C Sheet 2 of 2

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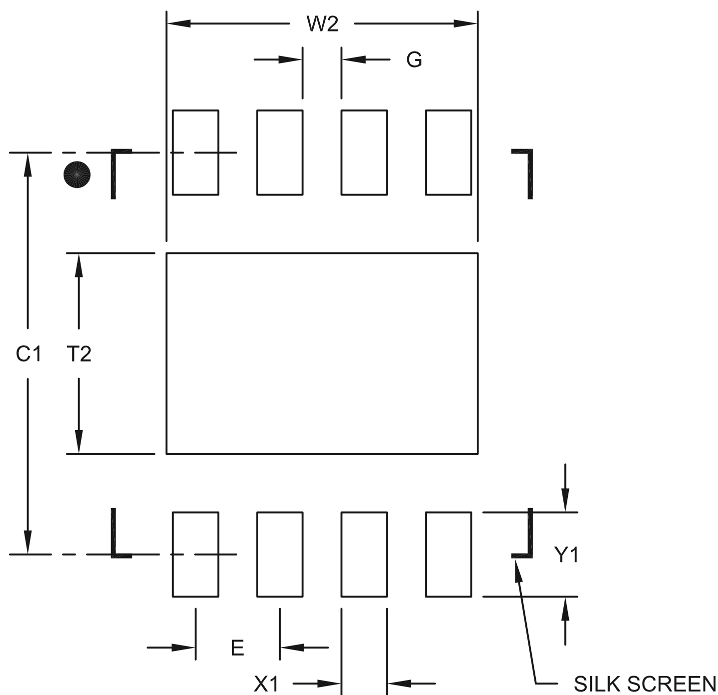
Land Pattern (Footprint)

8-Lead Plastic Dual Flat, No Lead Package (MF) – 3x3x0.9 mm Body [DFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.65 BSC		
Optional Center Pad Width	W2			2.40
Optional Center Pad Length	T2			1.55
Contact Pad Spacing	C1		3.10	
Contact Pad Width (X8)	X1			0.35
Contact Pad Length (X8)	Y1			0.65
Distance Between Pads	G	0.30		

Notes:

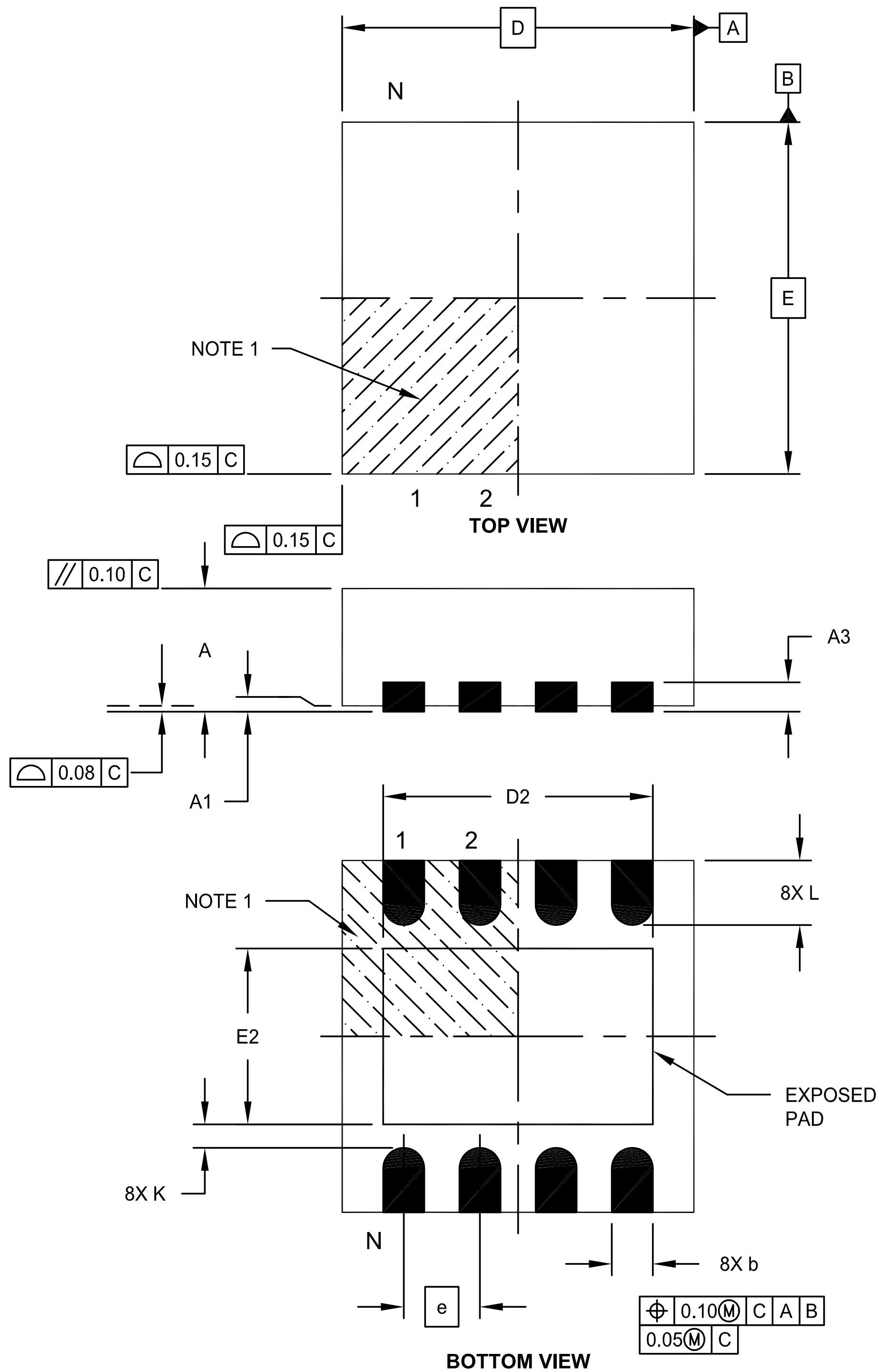
1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2062A

8-Lead Plastic Dual Flat, No Lead Package (MD) – 4x4x0.9 mm Body [DFN]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing C04-131E Sheet 1 of 2

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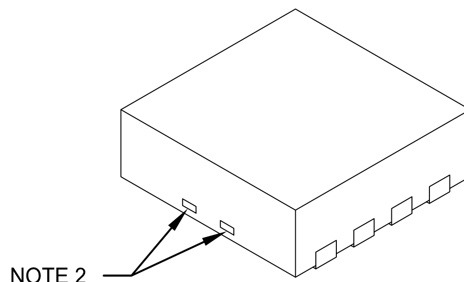
Packaging Diagrams and Parameters

8-Lead Plastic Dual Flat, No Lead Package (MD) – 4x4x0.9 mm Body [DFN]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		8	
Pitch	e		0.80 BSC	
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Length	D		4.00 BSC	
Exposed Pad Width	E2	2.60	2.70	2.80
Overall Width	E		4.00 BSC	
Exposed Pad Length	D2	3.40	3.50	3.60
Contact Width	b	0.25	0.30	0.35
Contact Length	L	0.30	0.40	0.50
Contact-to-Exposed Pad	K	0.20	-	-

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package may have one or more exposed tie bars at ends.
3. Package is saw singulated
4. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

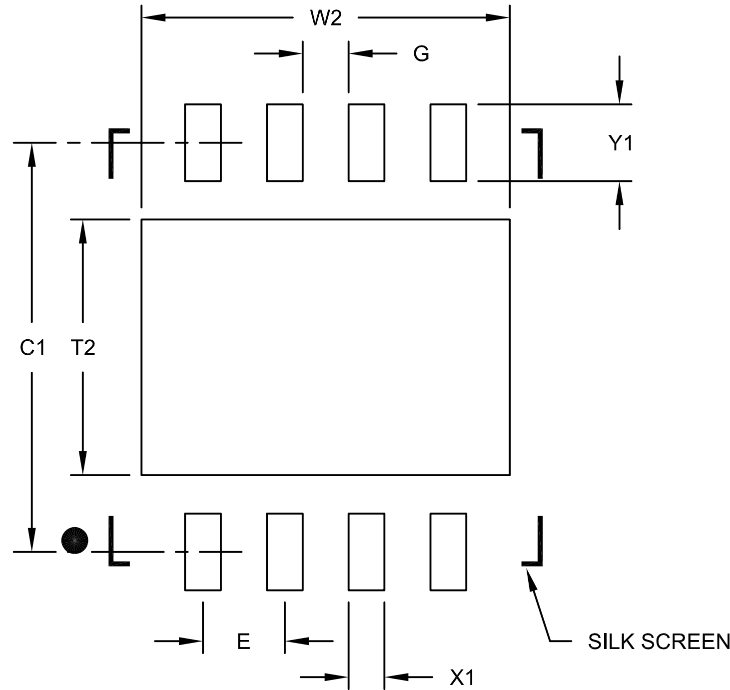
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-131E Sheet 2 of 2

Land Pattern (Footprint)

8-Lead Plastic Dual Flat, No Lead Package (MD) - 4x4x0.9 mm Body [DFN]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E	0.80 BSC		
Optional Center Pad Width	W2			3.60
Optional Center Pad Length	T2			2.50
Contact Pad Spacing	C1		4.00	
Contact Pad Width (X8)	X1			0.35
Contact Pad Length (X8)	Y1			0.75
Distance Between Pads	G	0.45		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2131C

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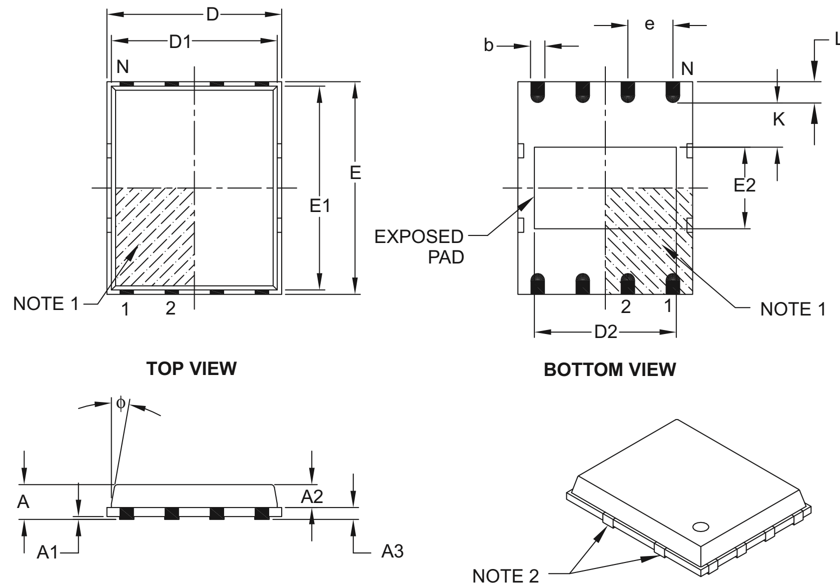
Packaging Diagrams and Parameters

8-Lead Plastic Dual Flat, No Lead Package (MF) – 6x5 mm Body [DFN-S] PUNCH SINGULATED

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		8	
Pitch	e		1.27 BSC	
Overall Height	A	–	0.85	1.00
Molded Package Thickness	A2	–	0.65	0.80
Standoff	A1	0.00	0.01	0.05
Base Thickness	A3		0.20 REF	
Overall Length	D		4.92 BSC	
Molded Package Length	D1		4.67 BSC	
Exposed Pad Length	D2	3.85	4.00	4.15
Overall Width	E		5.99 BSC	
Molded Package Width	E1		5.74 BSC	
Exposed Pad Width	E2	2.16	2.31	2.46
Contact Width	b	0.35	0.40	0.47
Contact Length	L	0.50	0.60	0.75
Contact-to-Exposed Pad	K	0.20	–	–
Model Draft Angle Top	φ	–	–	12°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package may have one or more exposed tie bars at ends.
3. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

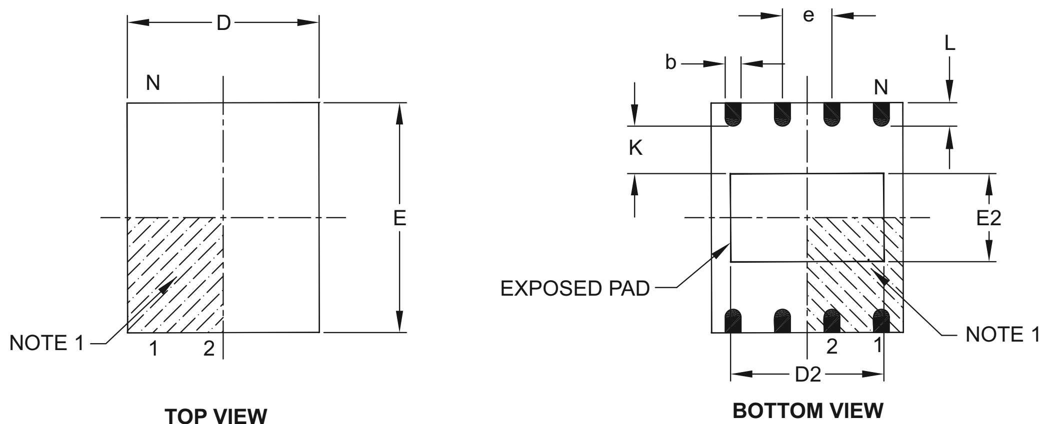
   REF: Reference Dimension, usually without tolerance, for information purposes only.

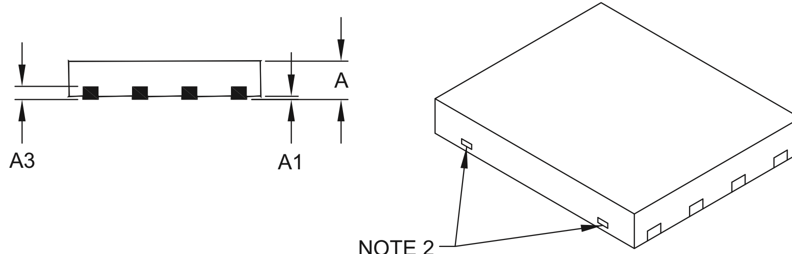
Microchip Technology Drawing C04-113B

Packaging Diagrams and Parameters

8-Lead Plastic Dual Flat, No Lead Package (MF) – 6x5 mm Body [DFN-S]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging





Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		8	
Pitch	e		1.27 BSC	
Overall Height	A	0.80	0.85	1.00
Standoff	A1	0.00	0.01	0.05
Contact Thickness	A3		0.20 REF	
Overall Length	D		5.00 BSC	
Overall Width	E		6.00 BSC	
Exposed Pad Length	D2	3.90	4.00	4.10
Exposed Pad Width	E2	2.20	2.30	2.40
Contact Width	b	0.35	0.40	0.48
Contact Length	L	0.50	0.60	0.75
Contact-to-Exposed Pad	K	0.20	–	–

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package may have one or more exposed tie bars at ends.
3. Package is saw singulated.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-122B

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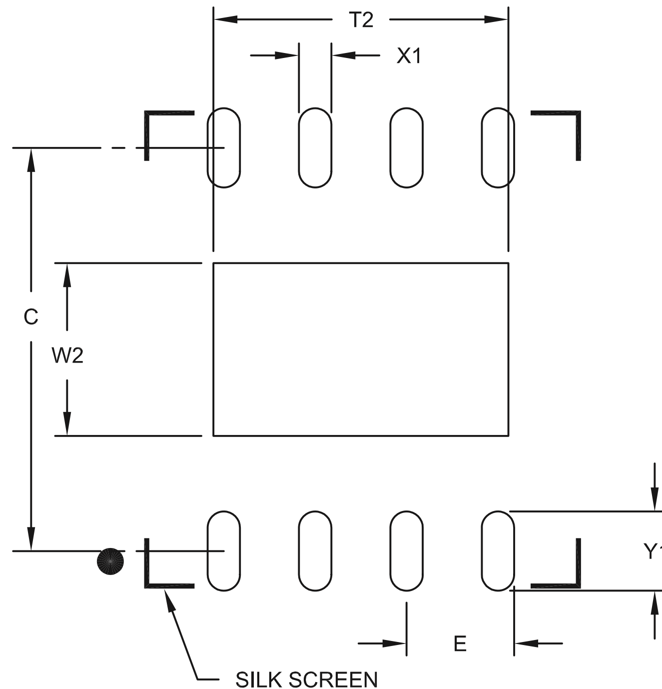
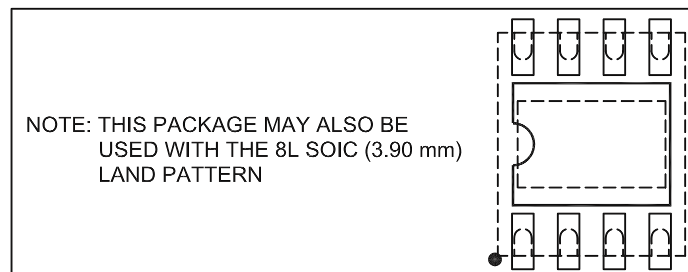
Land Pattern (Footprint)

8-Lead Plastic Dual Flat, No Lead Package (MF) - 6x5 mm Body [DFN-S]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN



	Units	MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E		1.27 BSC	
Optional Center Pad Width	W2			2.40
Optional Center Pad Length	T2			4.10
Contact Pad Spacing	C		5.60	
Contact Pad Width (X8)	X1			0.45
Contact Pad Length (X8)	Y1			1.10

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

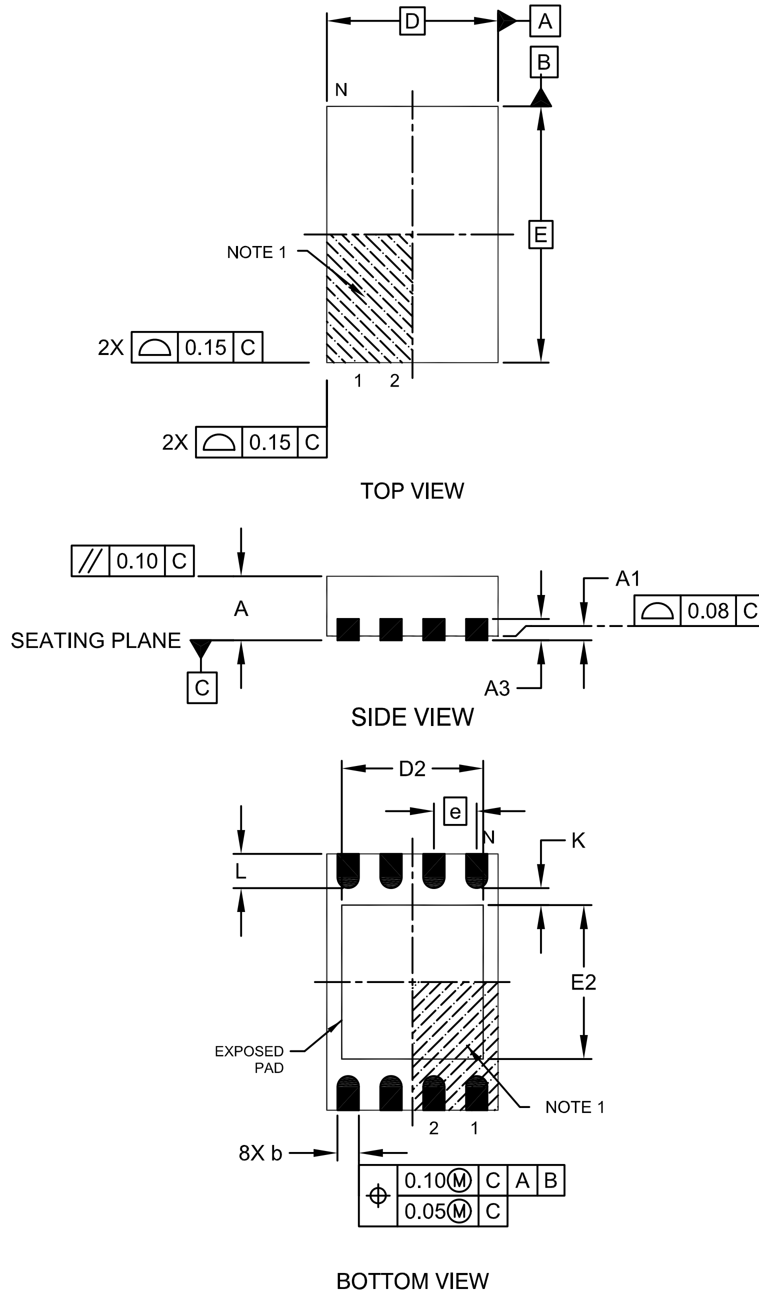
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2122A

Packaging Diagrams and Parameters

8-Lead Plastic Dual Flat, No Lead Package (MN) – 2x3x0.75mm Body [TDFN]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing No. C04-129C

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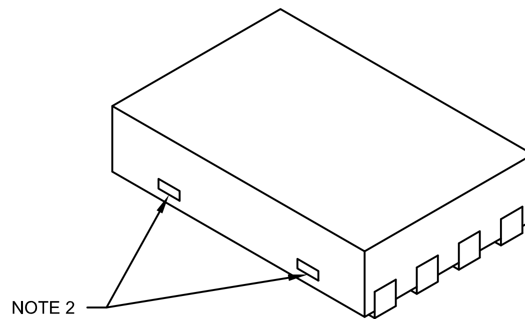
Packaging Diagrams and Parameters

8-Lead Plastic Dual Flat, No Lead Package (MN) – 2x3x0.75mm Body [TDFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		8	
Pitch	e		0.50 BSC	
Overall Height	A	0.70	0.75	0.80
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Length	D		2.00 BSC	
Overall Width	E		3.00 BSC	
Exposed Pad Length	D2	1.20	-	1.60
Exposed Pad Width	E2	1.20	-	1.60
Contact Width	b	0.20	0.25	0.30
Contact Length	L	0.25	0.30	0.45
Contact-to-Exposed Pad	K	0.20	-	-

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package may have one or more exposed tie bars at ends.
3. Package is saw singulated
4. Dimensioning and tolerancing per ASME Y14.5M

    BSC: Basic Dimension. Theoretically exact value shown without tolerances.

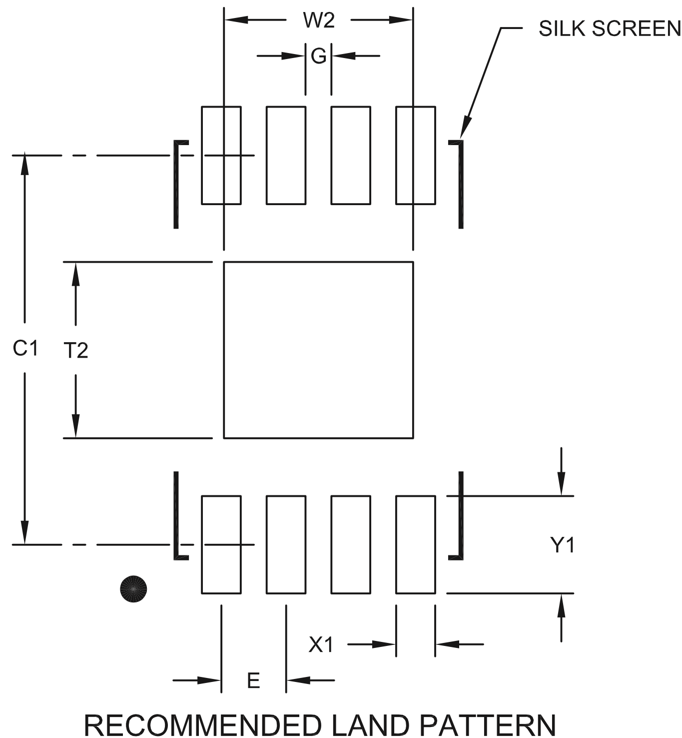
    REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing No. C04-129C Sheet 2 of 2

Land Pattern (Footprint)

8-Lead Plastic Dual Flat, No Lead Package (MN) – 2x3x0.75 mm Body [TDFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.50 BSC		
Optional Center Pad Width	W2			1.46
Optional Center Pad Length	T2			1.36
Contact Pad Spacing	C1		3.00	
Contact Pad Width (X8)	X1			0.30
Contact Pad Length (X8)	Y1			0.75
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2129A

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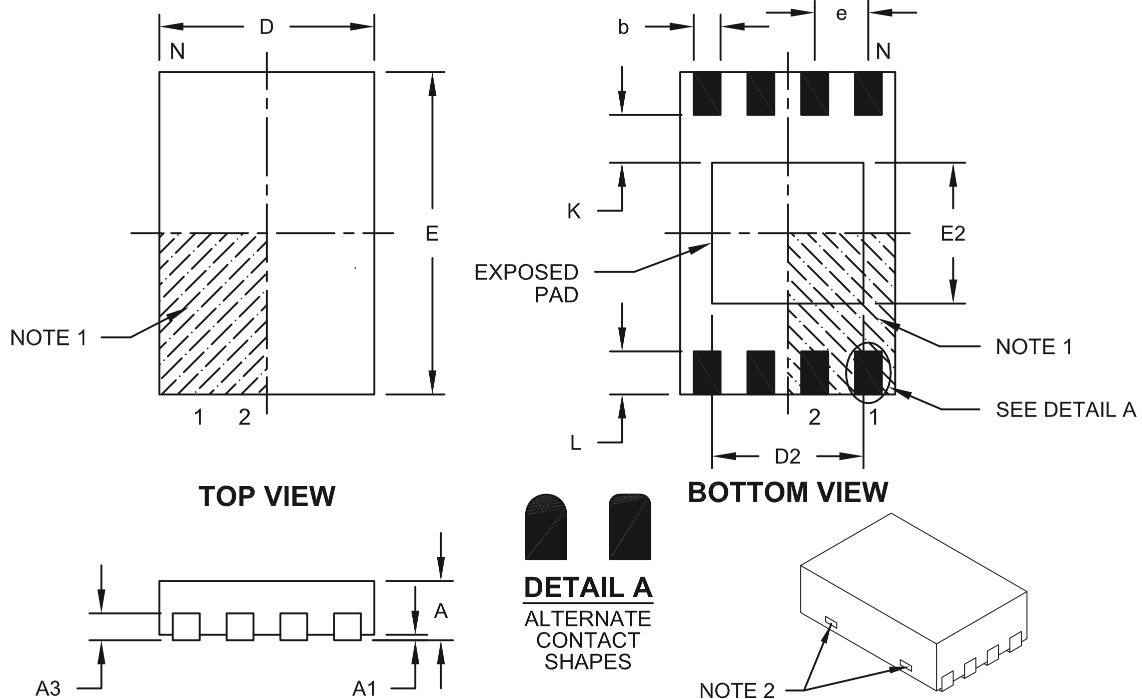
Packaging Diagrams and Parameters

8-Lead Plastic Dual Flat, No Lead Package (MU) – 2x3x0.5 mm Body [UDFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		8	
Pitch	e		0.50 BSC	
Overall Height	A	0.45	0.50	0.55
Standoff	A1			0.07
Contact Thickness	A3		0.127 REF	
Overall Length	D	1.95	2.00	2.05
Overall Width	E	2.95	3.00	3.05
Exposed Pad Length	D2	1.30	1.40	1.50
Exposed Pad Width	E2	1.20	1.30	1.40
Contact Width	b	0.20	0.25	0.30
Contact Length	L	0.25	0.30	0.35
Contact-to-Exposed Pad	K		0.55 REF	

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package may have one or more exposed tie bars at ends.
3. Package is saw singulated
4. Dimensioning and tolerancing per ASME Y14.5M

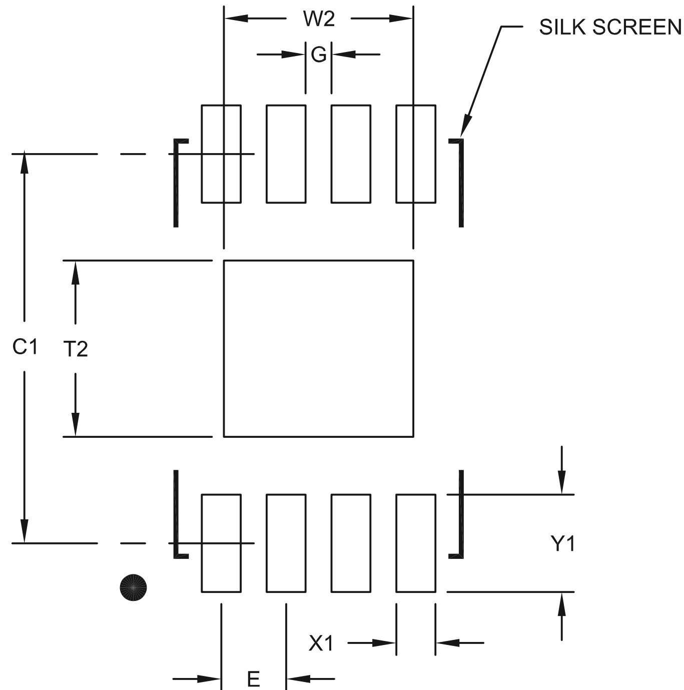
BSC: Basic Dimension. Theoretically exact value shown without tolerances.
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing No. C04-136B

Land Pattern (Footprint)

8-Lead Plastic Dual Flat, No Lead Package (MU) – 2x3x0.5 mm Body [UDFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E	0.50 BSC		
Optional Center Pad Width	W2			1.46
Optional Center Pad Length	T2			1.36
Contact Pad Spacing	C1		3.00	
Contact Pad Width (X8)	X1			0.30
Contact Pad Length (X8)	Y1			0.75
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2136A

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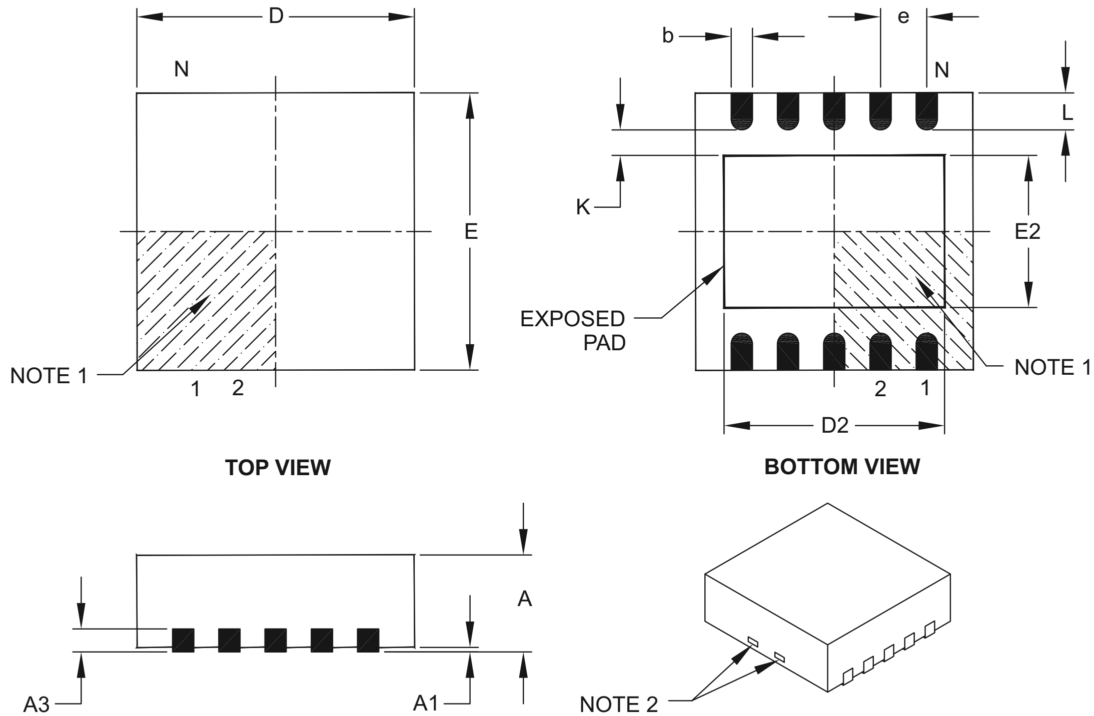
Packaging Diagrams and Parameters

10-Lead Plastic Dual Flat, No Lead Package (MF) – 3x3x0.9 mm Body [DFN]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		10	
Pitch	e		0.50 BSC	
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Length	D		3.00 BSC	
Exposed Pad Length	D2	2.20	2.35	2.48
Overall Width	E		3.00 BSC	
Exposed Pad Width	E2	1.40	1.58	1.75
Contact Width	b	0.18	0.25	0.30
Contact Length	L	0.30	0.40	0.50
Contact-to-Exposed Pad	K	0.20	–	–

Notes:

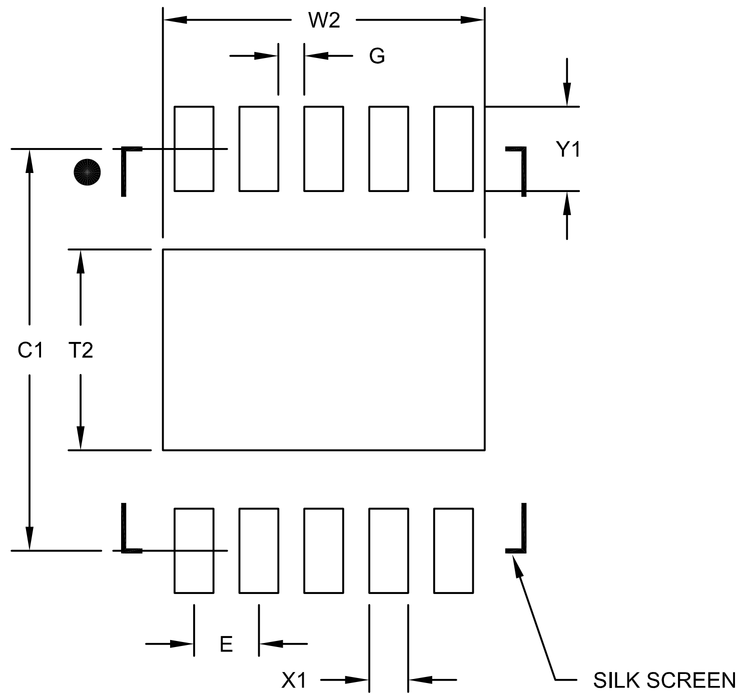
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package may have one or more exposed tie bars at ends.
3. Package is saw singulated.
4. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-063B

Land Pattern (Footprint)

10-Lead Plastic Dual Flat, No Lead Package (MF) - 3x3x0.9mm Body [DFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E		0.50 BSC	
Optional Center Pad Width	W2			2.48
Optional Center Pad Length	T2			1.55
Contact Pad Spacing	C1		3.10	
Contact Pad Width (X10)	X1			0.30
Contact Pad Length (X10)	Y1			0.65
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2063A

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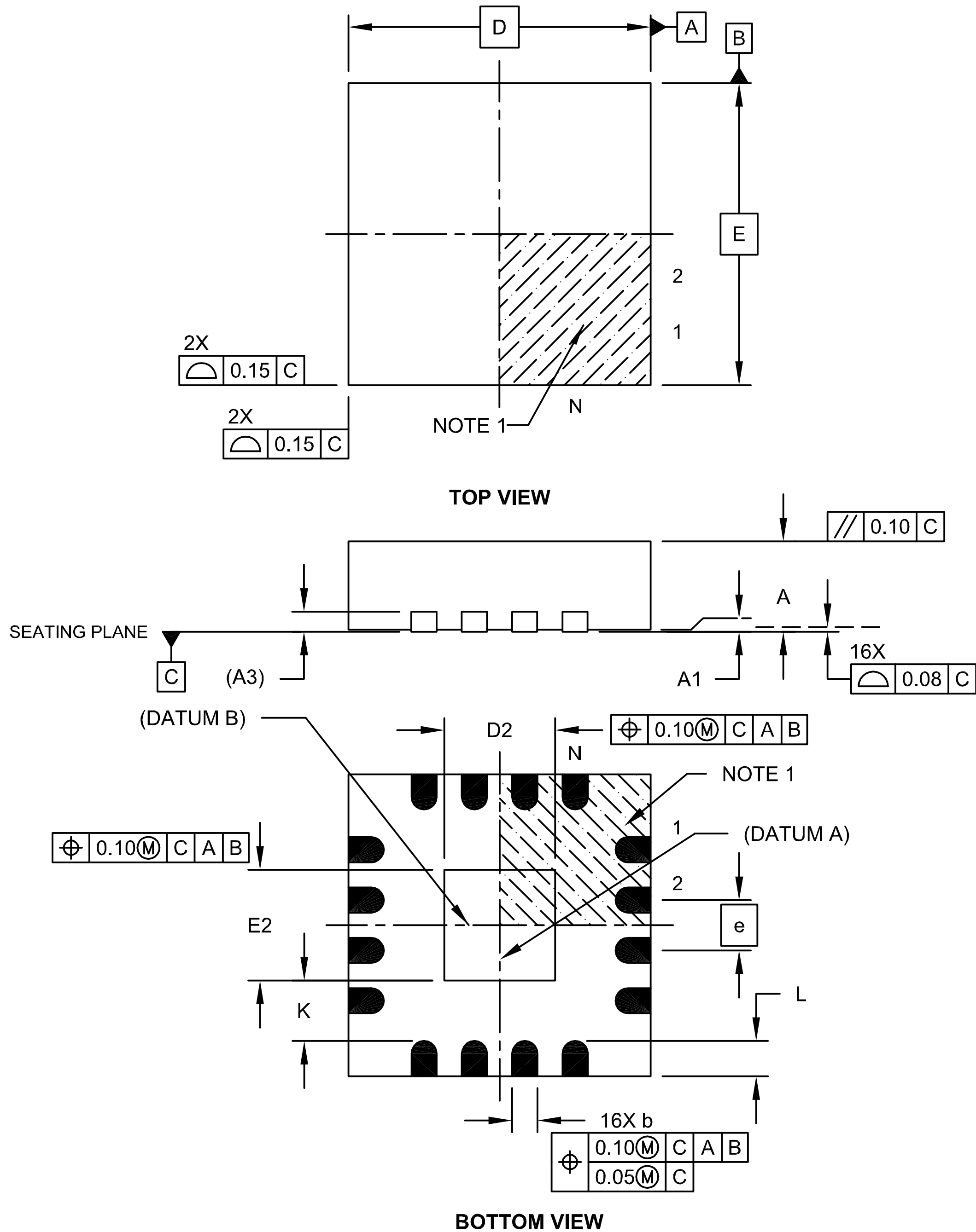
16-Lead Plastic Quad Flat, No Lead Package (MG) - 3x3x0.9 mm Body [QFN]

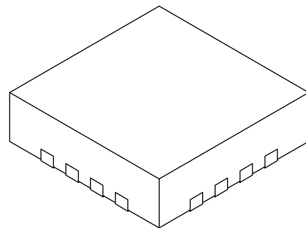
Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing C04-142A Sheet 1 of 2

16-Lead Plastic Quad Flat, No Lead Package (MG) - 3x3x0.9 mm Body [QFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		16	
Pitch	e		0.50 BSC	
Overall Height	A	0.80	0.85	0.90
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Width	E		3.00 BSC	
Exposed Pad Width	E2	1.00	1.10	1.50
Overall Length	D		3.00 BSC	
Exposed Pad Length	D2	1.00	1.10	1.50
Contact Width	b	0.18	0.25	0.30
Contact Length	L	0.25	0.35	0.45
Contact-to-Exposed Pad	K	0.20	-	-

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-142A Sheet 2 of 2

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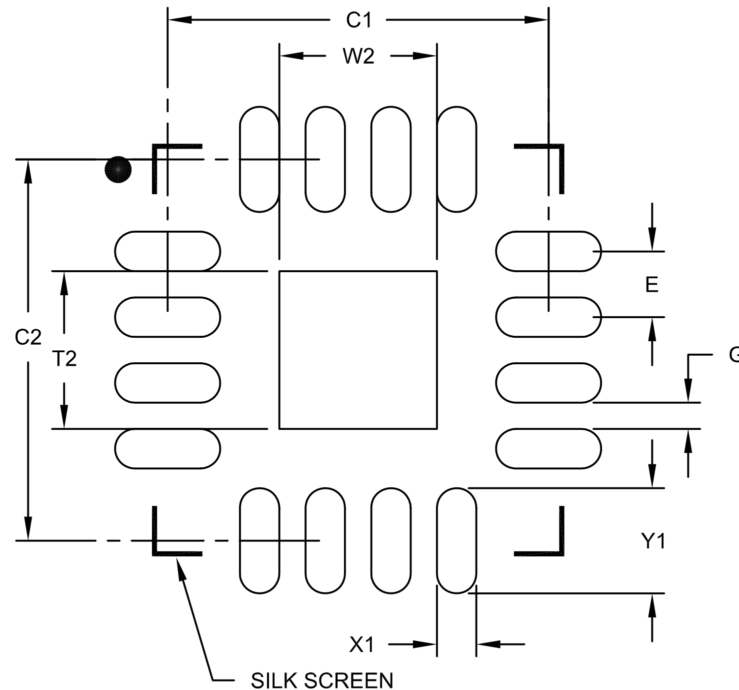
Land Pattern (Footprint)

16-Lead Plastic Quad Flat, No Lead Package (MG) – 3x3x0.9 mm Body [QFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.50 BSC		
Optional Center Pad Width	W2			1.20
Optional Center Pad Length	T2			1.20
Contact Pad Spacing	C1		2.90	
Contact Pad Spacing	C2		2.90	
Contact Pad Width (X16)	X1			0.30
Contact Pad Length (X16)	Y1			0.80
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2142A

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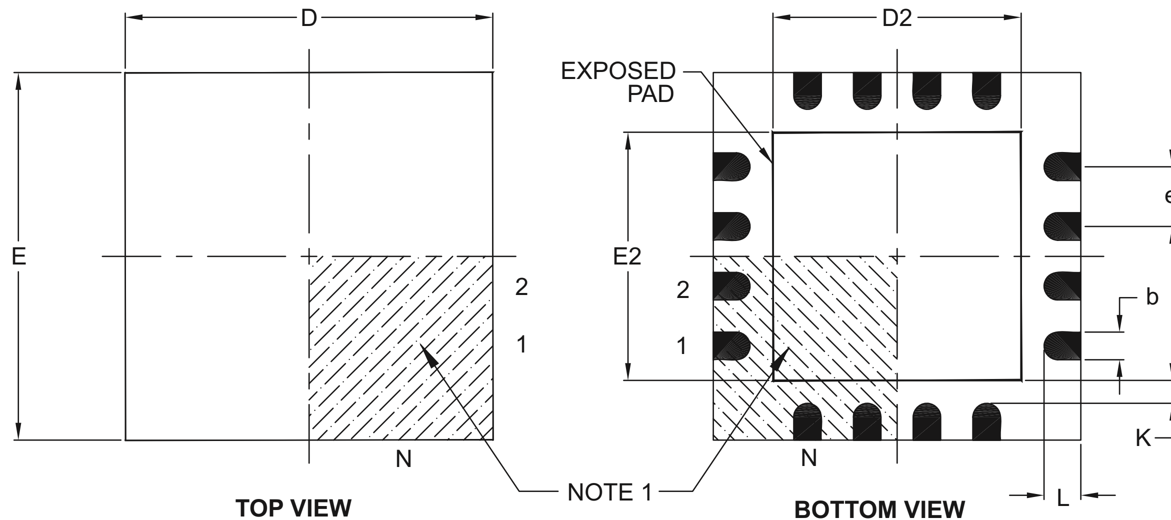
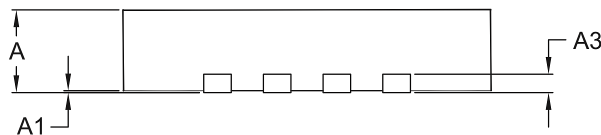
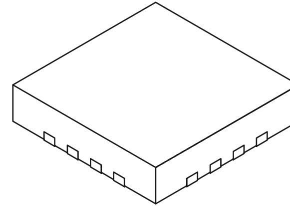
Packaging Diagrams and Parameters

16-Lead Plastic Quad Flat, No Lead Package (ML) – 4x4x0.9 mm Body [QFN]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging







	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	16		
Pitch	e	0.65 BSC		
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3	0.20 REF		
Overall Width	E	4.00 BSC		
Exposed Pad Width	E2	2.50	2.65	2.80
Overall Length	D	4.00 BSC		
Exposed Pad Length	D2	2.50	2.65	2.80
Contact Width	b	0.25	0.30	0.35
Contact Length	L	0.30	0.40	0.50
Contact-to-Exposed Pad	K	0.20	–	–

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-127B

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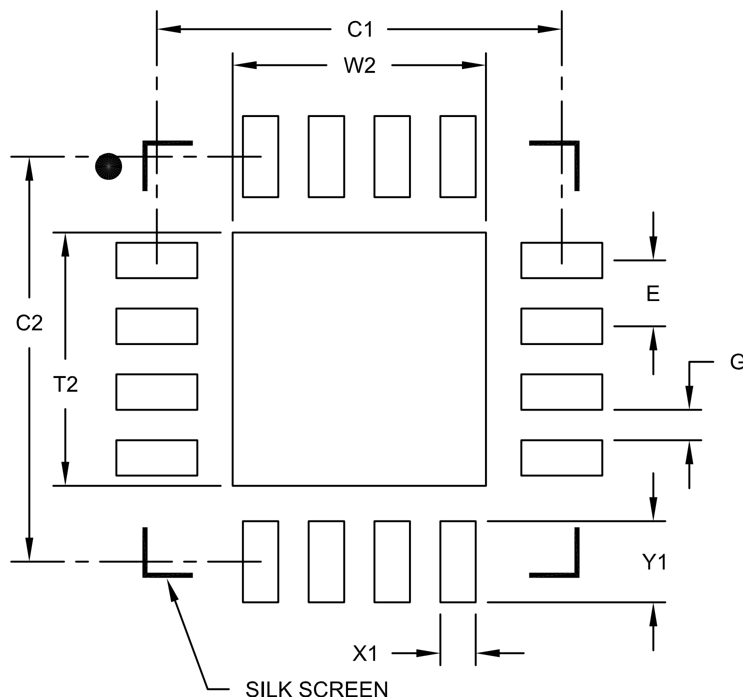
Land Pattern (Footprint)

16-Lead Plastic Quad Flat, No Lead Package (ML) - 4x4x0.9mm Body [QFN]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E		0.65 BSC	
Optional Center Pad Width	W2			2.50
Optional Center Pad Length	T2			2.50
Contact Pad Spacing	C1		4.00	
Contact Pad Spacing	C2		4.00	
Contact Pad Width (X16)	X1			0.35
Contact Pad Length (X16)	Y1			0.80
Distance Between Pads	G	0.30		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

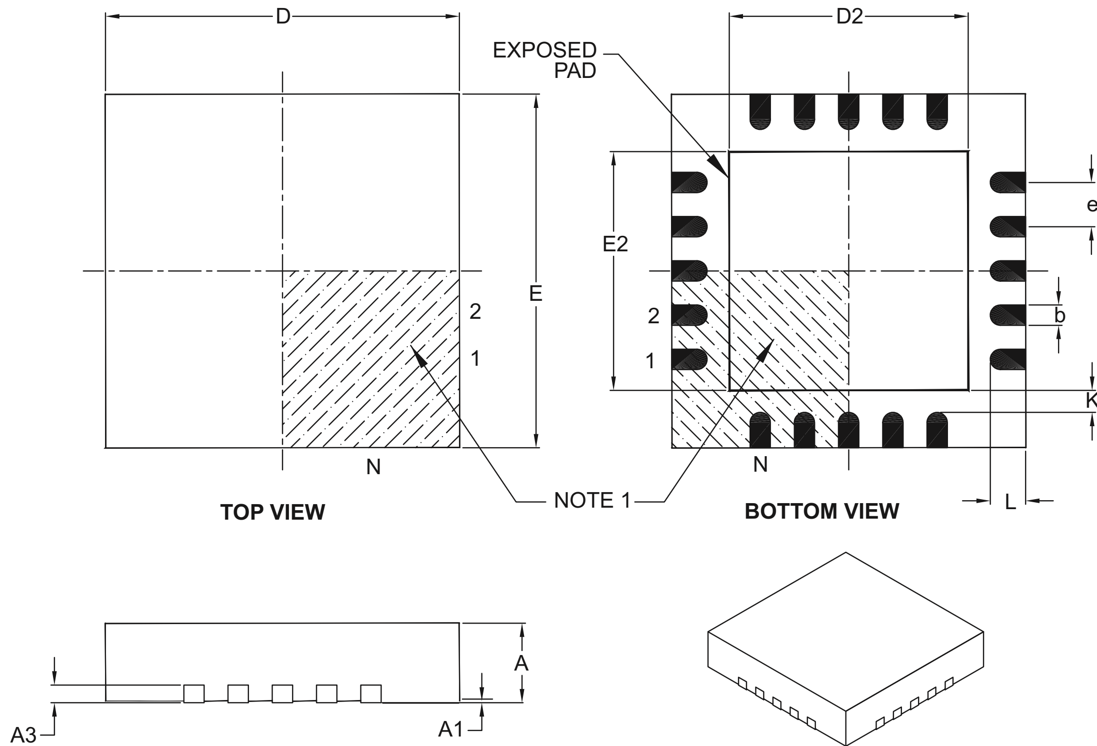
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2127A

Packaging Diagrams and Parameters

20-Lead Plastic Quad Flat, No Lead Package (ML) – 4x4x0.9 mm Body [QFN]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		20	
Pitch	e		0.50 BSC	
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Width	E		4.00 BSC	
Exposed Pad Width	E2	2.60	2.70	2.80
Overall Length	D		4.00 BSC	
Exposed Pad Length	D2	2.60	2.70	2.80
Contact Width	b	0.18	0.25	0.30
Contact Length	L	0.30	0.40	0.50
Contact-to-Exposed Pad	K	0.20	–	–

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-126B

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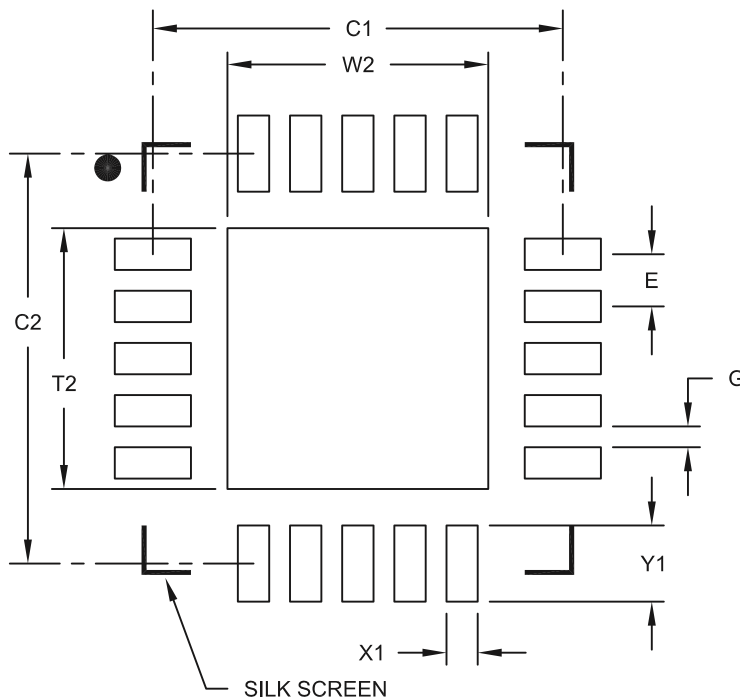
Land Pattern (Footprint)

20-Lead Plastic Quad Flat, No Lead Package (ML) - 4x4 mm Body [QFN]
With 0.40 mm Contact Length

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E		0.50 BSC	
Optional Center Pad Width	W2			2.50
Optional Center Pad Length	T2			2.50
Contact Pad Spacing	C1		3.93	
Contact Pad Spacing	C2		3.93	
Contact Pad Width	X1			0.30
Contact Pad Length	Y1			0.73
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2126A

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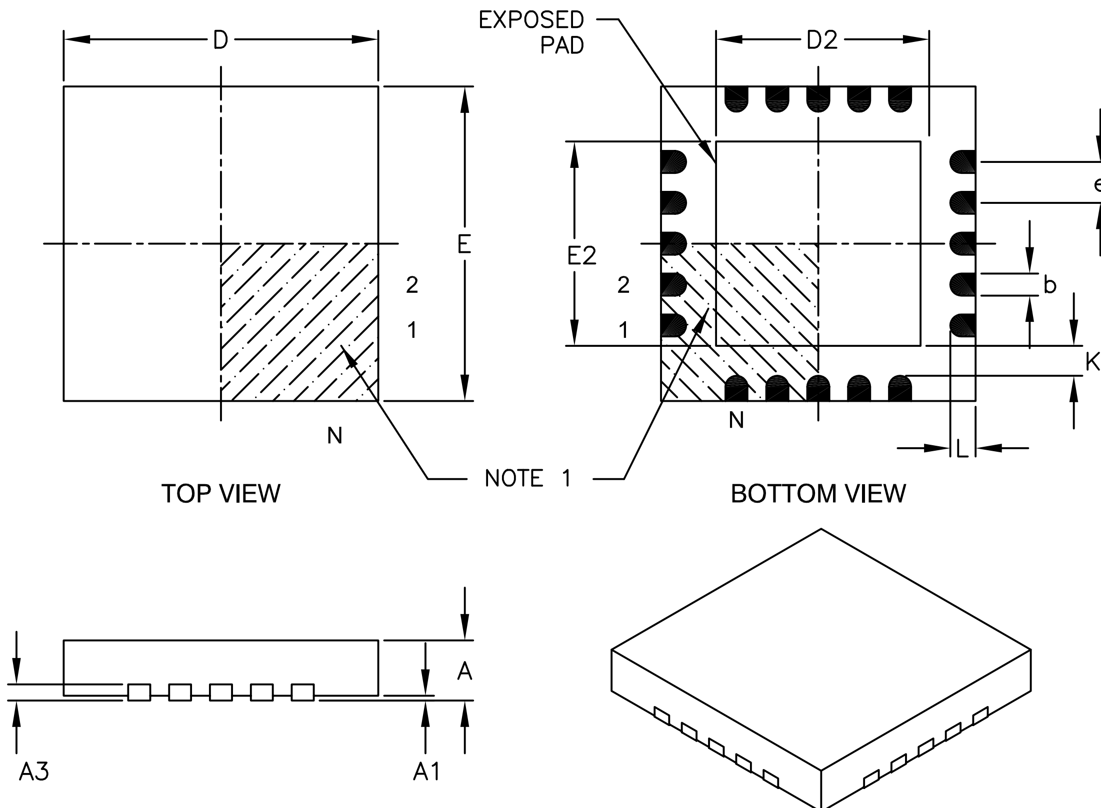
Packaging Diagrams and Parameters

20-Lead Plastic Quad Flat, No Lead Package (MQ) – 5x5x0.9 mm Body [QFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		20	
Pitch	e		0.65 BSC	
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Width	E		5.00 BSC	
Exposed Pad Width	E2	3.15	3.25	3.35
Overall Length	D		5.00 BSC	
Exposed Pad Length	D2	3.15	3.25	3.35
Contact Width	b	0.25	0.30	0.35
Contact Length	L	0.35	0.40	0.45
Contact-to-Exposed Pad	K	0.20	-	-

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-139B

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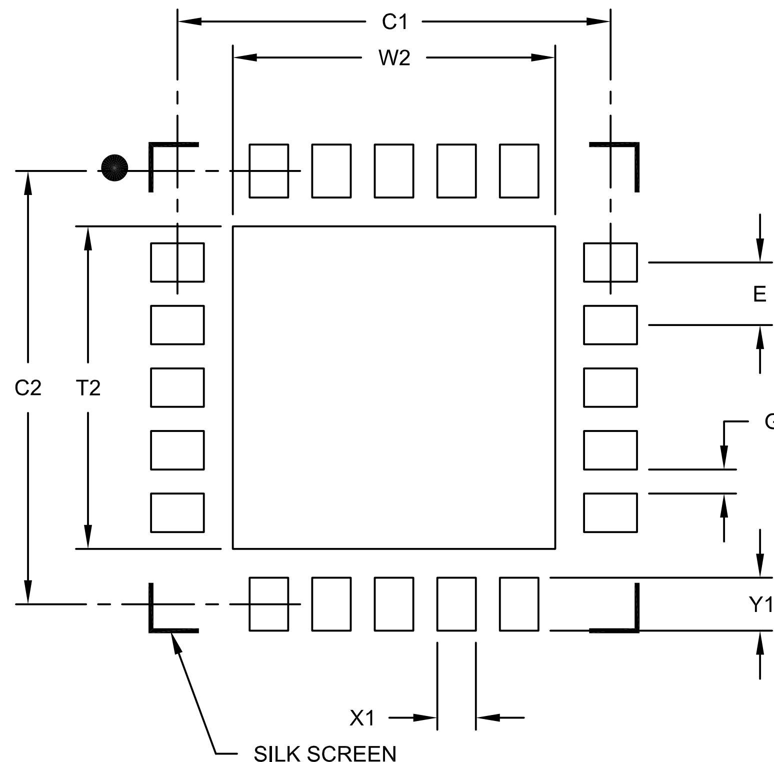
Land Pattern (Footprint)

20-Lead Plastic Quad Flat, No Lead Package (MQ) - 5x5 mm Body [QFN]
With 0.40mm Contact Length

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.65 BSC		
Optional Center Pad Width	W2			3.35
Optional Center Pad Length	T2			3.35
Contact Pad Spacing	C1		4.50	
Contact Pad Spacing	C2		4.50	
Contact Pad Width (X20)	X1			0.40
Contact Pad Length (X20)	Y1			0.55
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

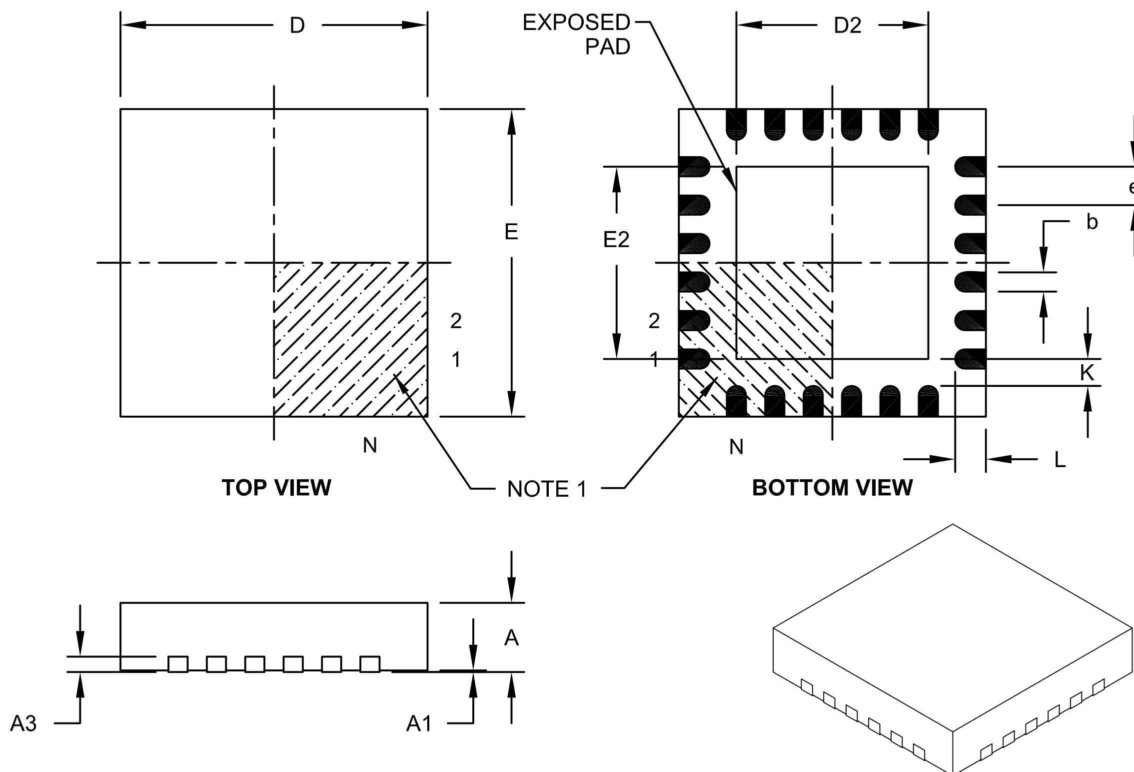
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2139A

Packaging Diagrams and Parameters

24-Lead Plastic Quad Flat, No Lead Package (MJ) – 4x4x0.9 mm Body [QFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		24	
Pitch	e		0.50 BSC	
Overall Height	A	0.80	0.85	0.90
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Width	E		4.00 BSC	
Exposed Pad Width	E2	2.40	2.50	2.60
Overall Length	D		4.00 BSC	
Exposed Pad Length	D2	2.40	2.50	2.60
Contact Width	b	0.20	0.25	0.30
Contact Length	L	0.30	0.40	0.50
Contact-to-Exposed Pad	K	0.20	-	-

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-143A

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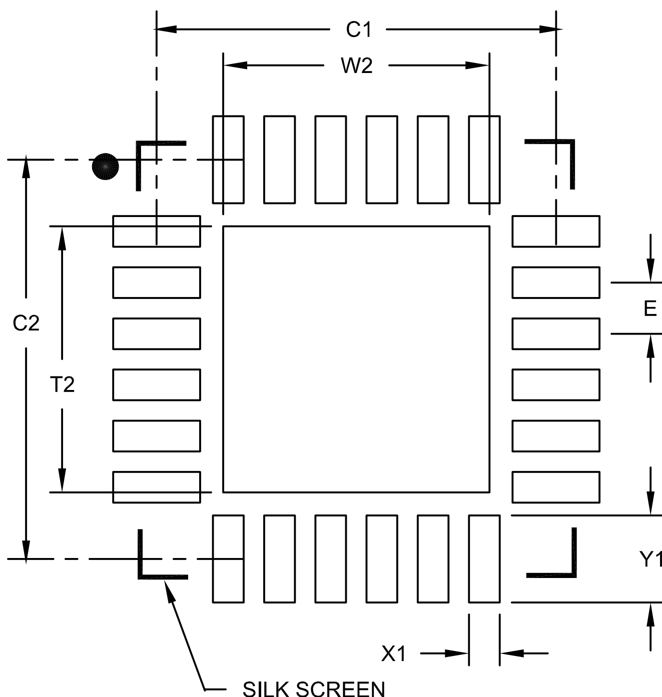
Land Pattern (Footprint)

24-Lead Plastic Quad Flat, No Lead Package (MJ) - 4x4 mm Body [QFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.50 BSC		
Optional Center Pad Width	W2			2.60
Optional Center Pad Length	T2			2.60
Contact Pad Spacing	C1		3.90	
Contact Pad Spacing	C2		3.90	
Contact Pad Width	X1			0.30
Contact Pad Length	Y1			0.85

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

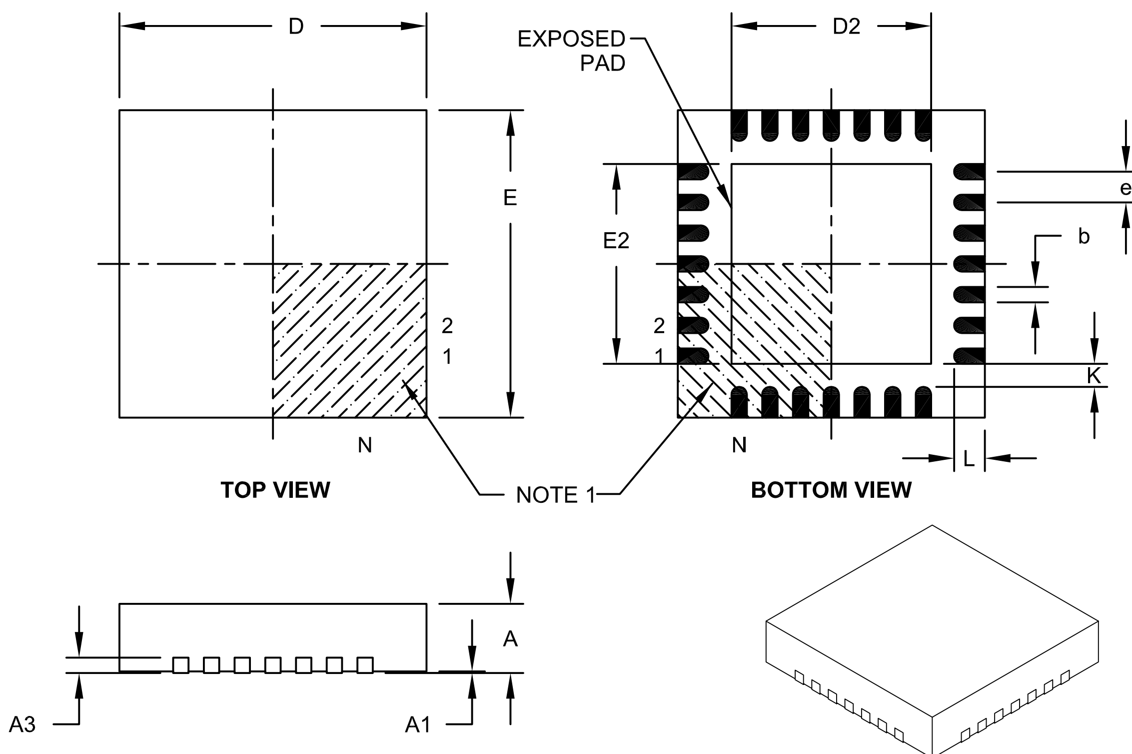
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2143B

Packaging Diagrams and Parameters

28-Lead Plastic Quad Flat, No Lead Package (MK) – 4x4x0.9 mm Body [QFN]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		28	
Pitch	e		0.40 BSC	
Overall Height	A	0.80	0.85	0.90
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Width	E		4.00 BSC	
Exposed Pad Width	E2	2.50	2.60	2.70
Overall Length	D		4.00 BSC	
Exposed Pad Length	D2	2.50	2.60	2.70
Contact Width	b	0.17	0.20	0.25
Contact Length	L	0.30	0.40	0.50
Contact-to-Exposed Pad	K	0.20	-	-

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-144A

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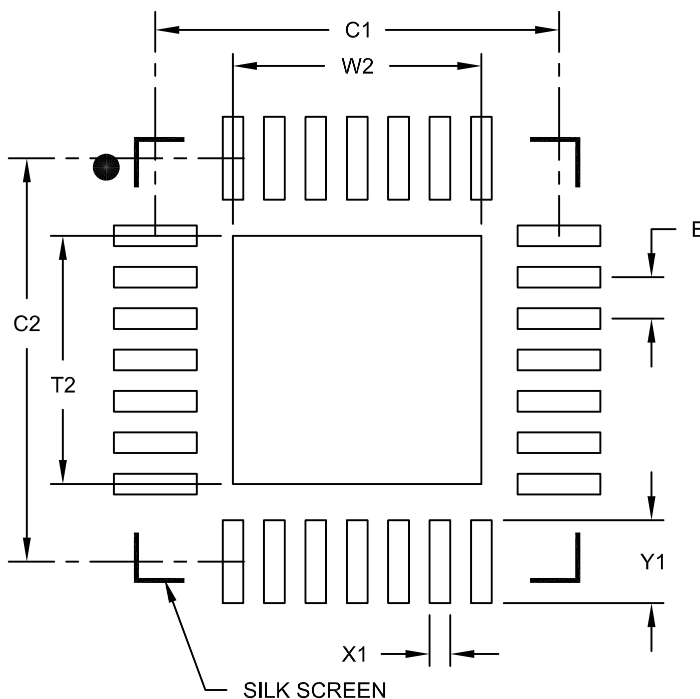
Land Pattern (Footprint)

28-Lead Plastic Quad Flat, No Lead Package (MK) – 4x4x0.9 mm Body [QFN] Land Pattern

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E		0.40 BSC	
Optional Center Pad Width	W2			2.40
Optional Center Pad Length	T2			2.40
Contact Pad Spacing	C1		3.90	
Contact Pad Spacing	C2		3.90	
Contact Pad Width	X1			0.20
Contact Pad Length	Y1			0.80

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

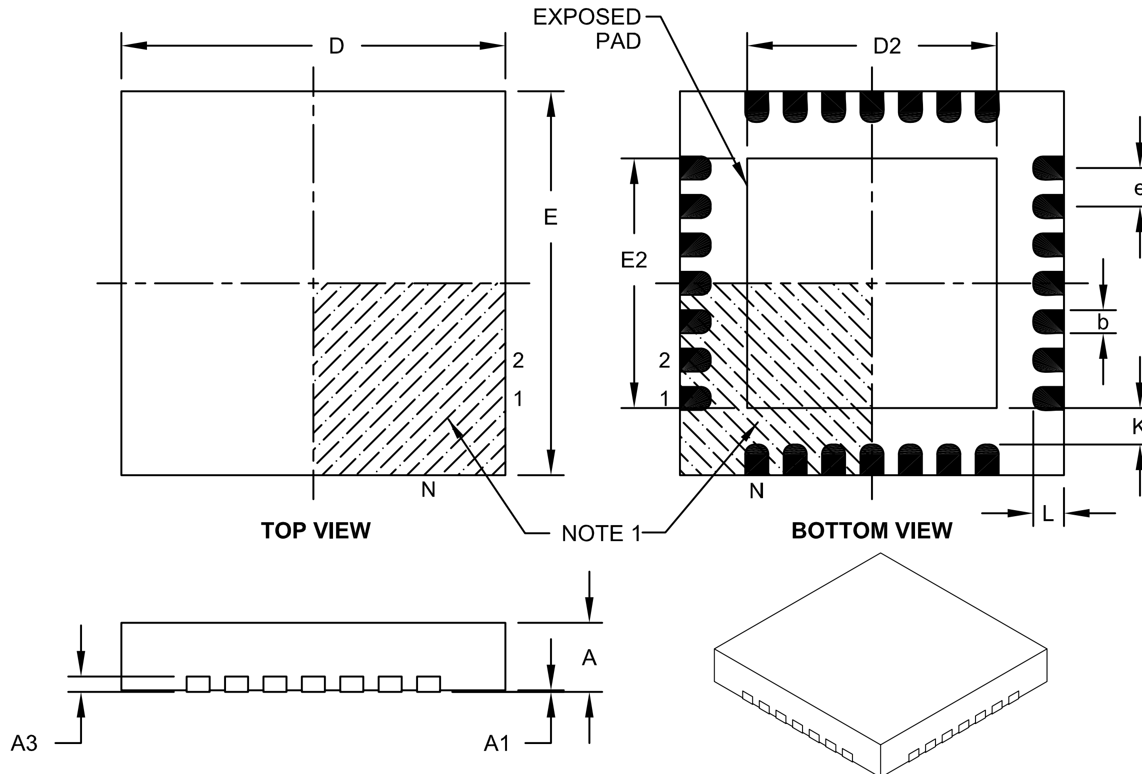
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2144A

Packaging Diagrams and Parameters

28-Lead Plastic Quad Flat, No Lead Package (MQ) – 5x5x0.9 mm Body [QFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		28	
Pitch	e		0.50 BSC	
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Width	E		5.00 BSC	
Exposed Pad Width	E2	3.15	3.25	3.35
Overall Length	D		5.00 BSC	
Exposed Pad Length	D2	3.15	3.25	3.35
Contact Width	b	0.18	0.25	0.30
Contact Length	L	0.35	0.40	0.45
Contact-to-Exposed Pad	K	0.20	-	-

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-140A

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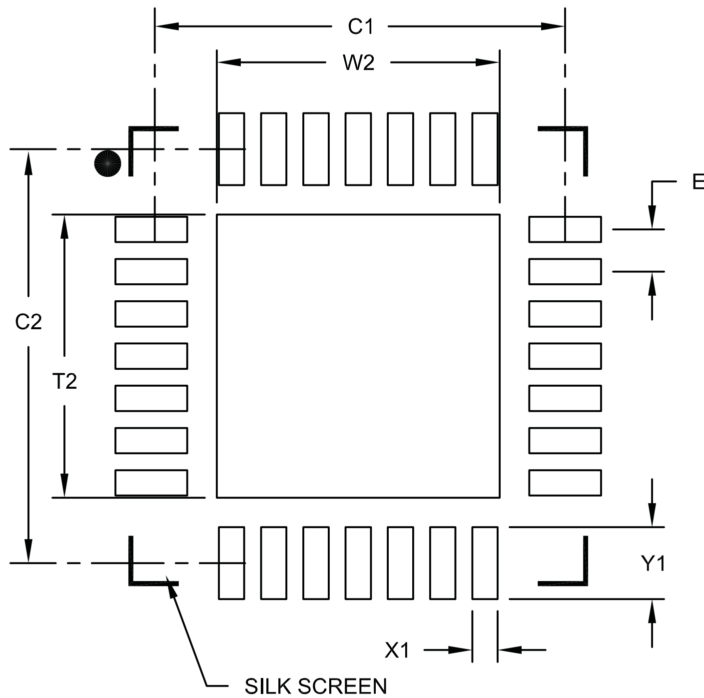
Land Pattern (Footprint)

28-Lead Plastic Quad Flat, No Lead Package (MQ) – 5x5 mm Body [QFN] Land Pattern With 0.55 mm Contact Length

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E	0.50 BSC		
Optional Center Pad Width	W2			3.35
Optional Center Pad Length	T2			3.35
Contact Pad Spacing	C1		4.90	
Contact Pad Spacing	C2		4.90	
Contact Pad Width (X28)	X1			0.30
Contact Pad Length (X28)	Y1			0.85

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

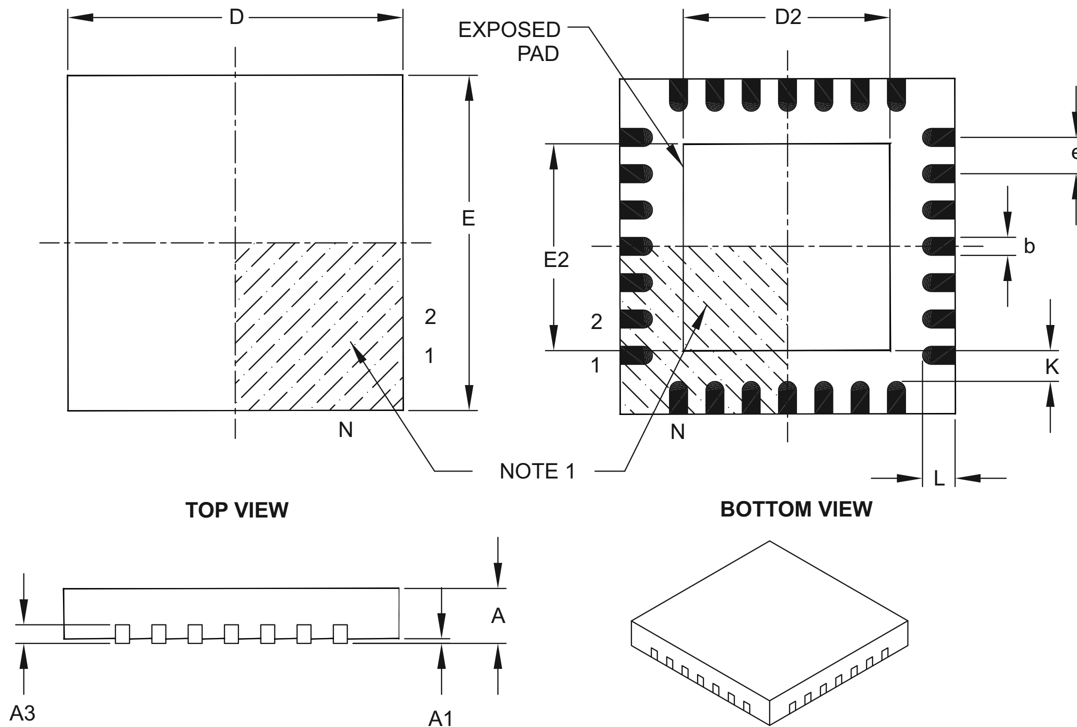
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-2140A

Packaging Diagrams and Parameters

28-Lead Plastic Quad Flat, No Lead Package (ML) – 6x6 mm Body [QFN] with 0.55 mm Contact Length

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		28	
Pitch	e		0.65 BSC	
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Width	E		6.00 BSC	
Exposed Pad Width	E2	3.65	3.70	4.20
Overall Length	D		6.00 BSC	
Exposed Pad Length	D2	3.65	3.70	4.20
Contact Width	b	0.23	0.30	0.35
Contact Length	L	0.50	0.55	0.70
Contact-to-Exposed Pad	K	0.20	–	–

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-105B

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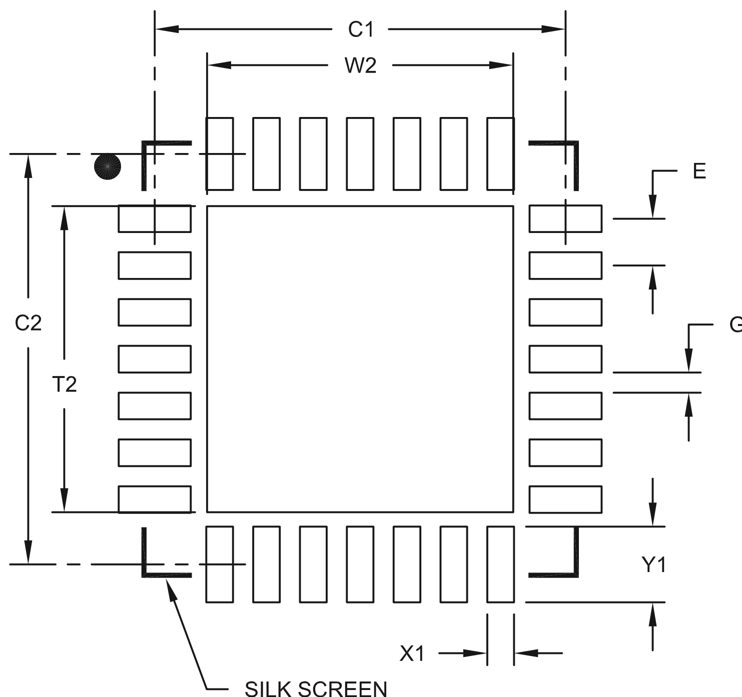
Land Pattern (Footprint)

28-Lead Plastic Quad Flat, No Lead Package (ML) – 6x6 mm Body [QFN] with 0.55 mm Contact Length

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E		0.65 BSC	
Optional Center Pad Width	W2			4.25
Optional Center Pad Length	T2			4.25
Contact Pad Spacing	C1		5.70	
Contact Pad Spacing	C2		5.70	
Contact Pad Width (X28)	X1			0.37
Contact Pad Length (X28)	Y1			1.00
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

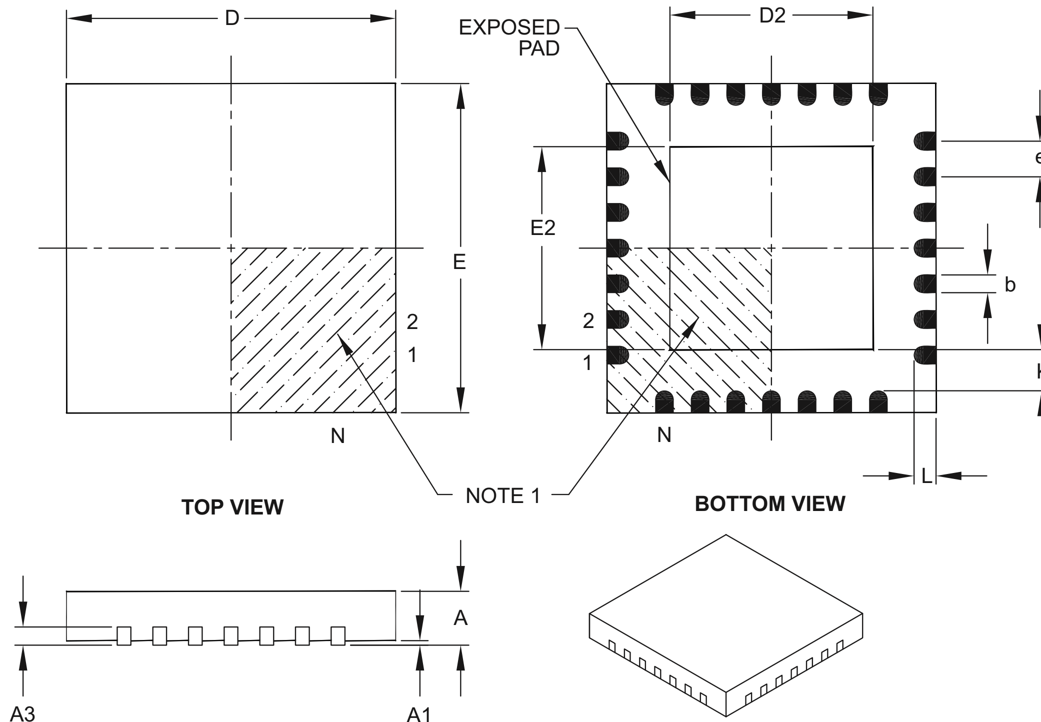
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2105A

Packaging Diagrams and Parameters

28-Lead Plastic Quad Flat, No Lead Package (MM) – 6x6x0.9 mm Body [QFN-S] with 0.40 mm Contact Length

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	28		
Pitch	e	0.65 BSC		
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3	0.20 REF		
Overall Width	E	6.00 BSC		
Exposed Pad Width	E2	3.65	3.70	4.70
Overall Length	D	6.00 BSC		
Exposed Pad Length	D2	3.65	3.70	4.70
Contact Width	b	0.23	0.38	0.43
Contact Length	L	0.30	0.40	0.50
Contact-to-Exposed Pad	K	0.20	–	–

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-124B

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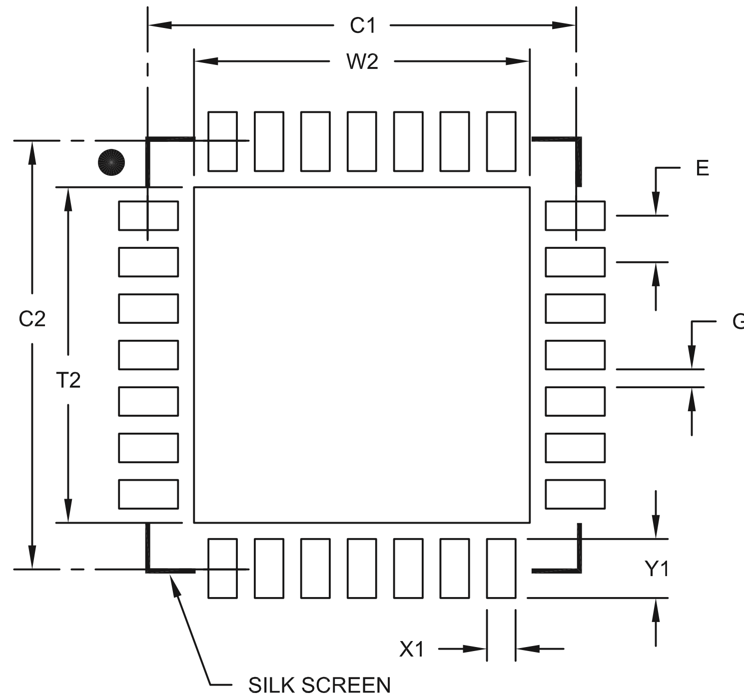
Land Pattern (Footprint)

28-Lead Plastic Quad Flat, No Lead Package (MM) – 6x6x0.9 mm Body [QFN-S] with 0.40 mm Contact Length

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E		0.65 BSC	
Optional Center Pad Width	W2			4.70
Optional Center Pad Length	T2			4.70
Contact Pad Spacing	C1		6.00	
Contact Pad Spacing	C2		6.00	
Contact Pad Width (X28)	X1			0.40
Contact Pad Length (X28)	Y1			0.85
Distance Between Pads	G	0.25		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

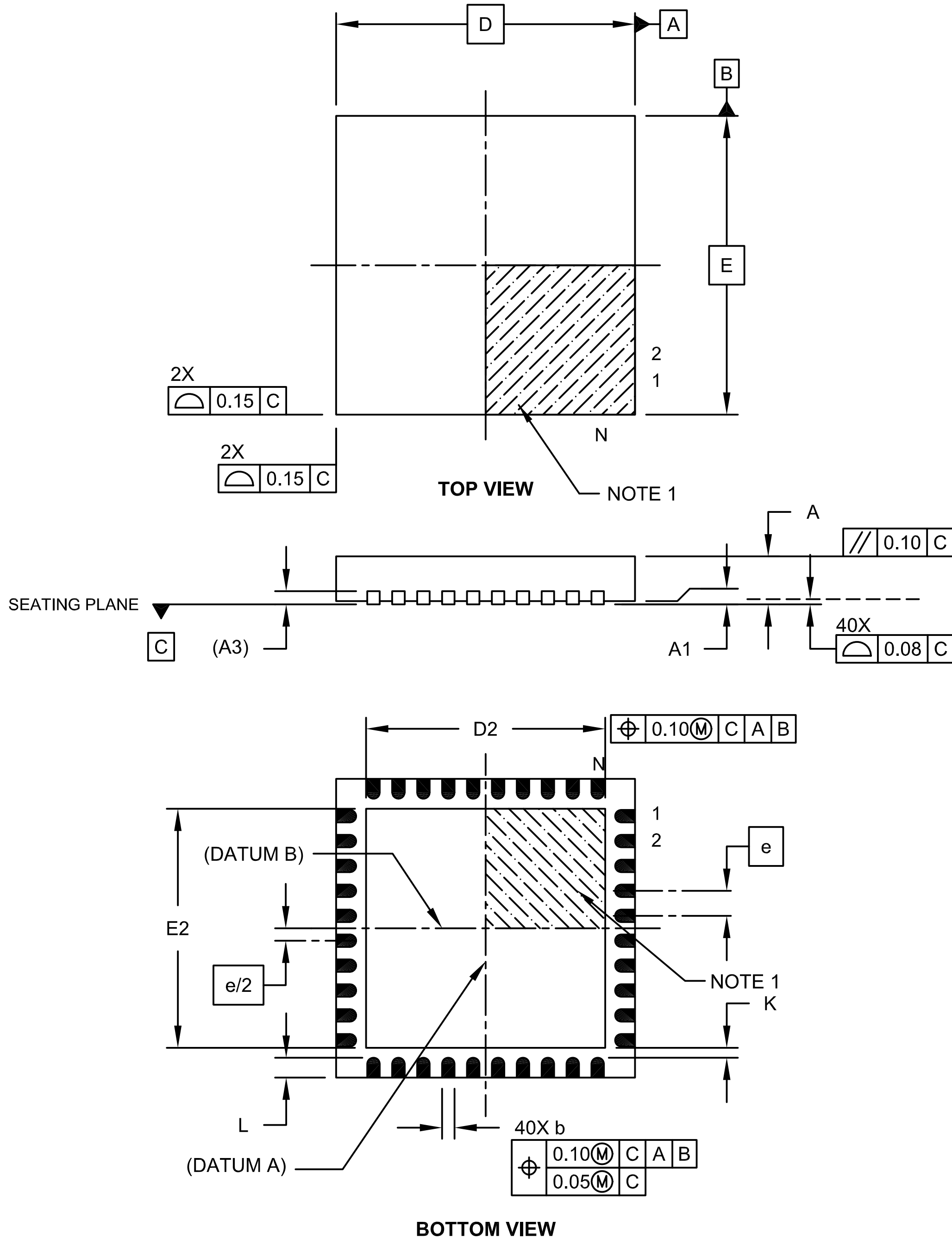
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2124A

Packaging Diagrams and Parameters

40-Lead Plastic Quad Flat, No Lead Package (ML) - 6x6x0.9mm Body [QFN] With 0.40mm Contact Length

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing C04-0118D Sheet 1 of 2

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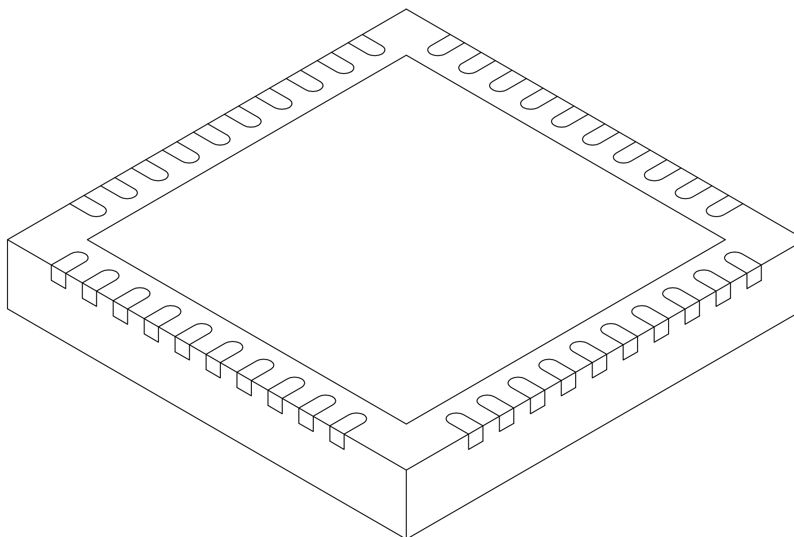
Packaging Diagrams and Parameters

40-Lead Plastic Quad Flat, No Lead Package (ML) - 6x6x0.9mm Body [QFN] With 0.40mm Contact Length

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		40	
Pitch	e		0.50 BSC	
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Width	E		6.00 BSC	
Exposed Pad Width	E2	4.50	4.65	4.80
Overall Length	D		6.00 BSC	
Exposed Pad Length	D2	4.50	4.65	4.80
Contact Width	b	0.18	0.25	0.30
Contact Length	L	0.30	0.40	0.50
Contact-to-Exposed Pad	K	0.20	-	-

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

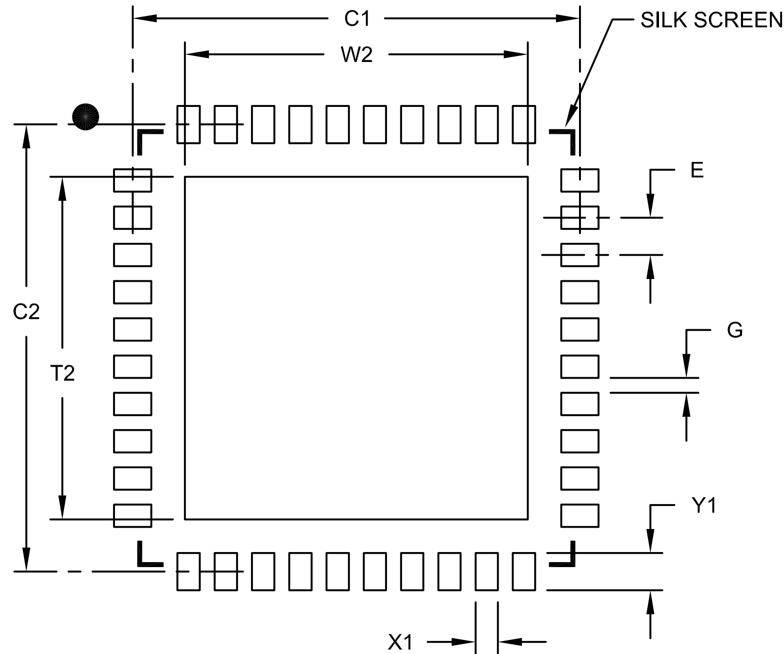
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-118D Sheet 2 of 2

Land Pattern (Footprint)

40-Lead Plastic Quad Flat, No Lead Package (ML) - 6x6x0.9mm Body [QFN]
With 0.40mm Contact Length

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.50 BSC		
Optional Center Pad Width	W2			4.60
Optional Center Pad Length	T2			4.60
Contact Pad Spacing	C1		6.00	
Contact Pad Spacing	C2		6.00	
Contact Pad Width (X40)	X1			0.30
Contact Pad Length (X40)	Y1			0.50
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2118A

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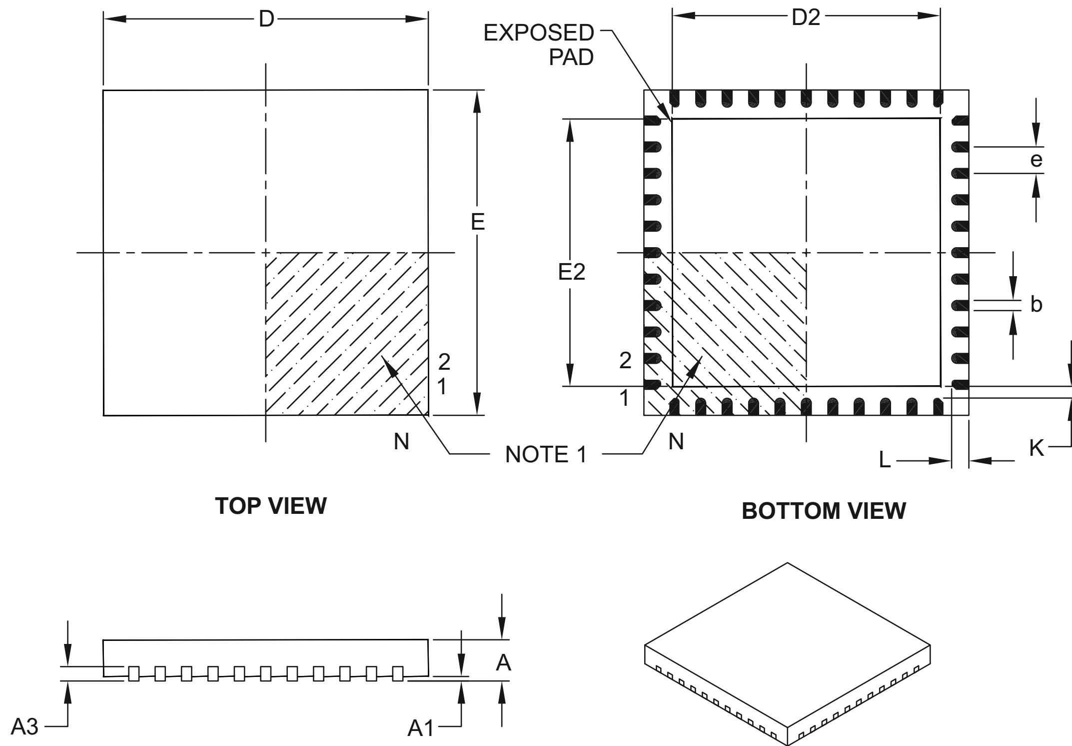
Packaging Diagrams and Parameters

44-Lead Plastic Quad Flat, No Lead Package (ML) – 8x8 mm Body [QFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		44	
Pitch	e		0.65 BSC	
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Width	E		8.00 BSC	
Exposed Pad Width	E2	6.30	6.45	6.80
Overall Length	D		8.00 BSC	
Exposed Pad Length	D2	6.30	6.45	6.80
Contact Width	b	0.25	0.30	0.38
Contact Length	L	0.30	0.40	0.50
Contact-to-Exposed Pad	K	0.20	–	–

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-103B

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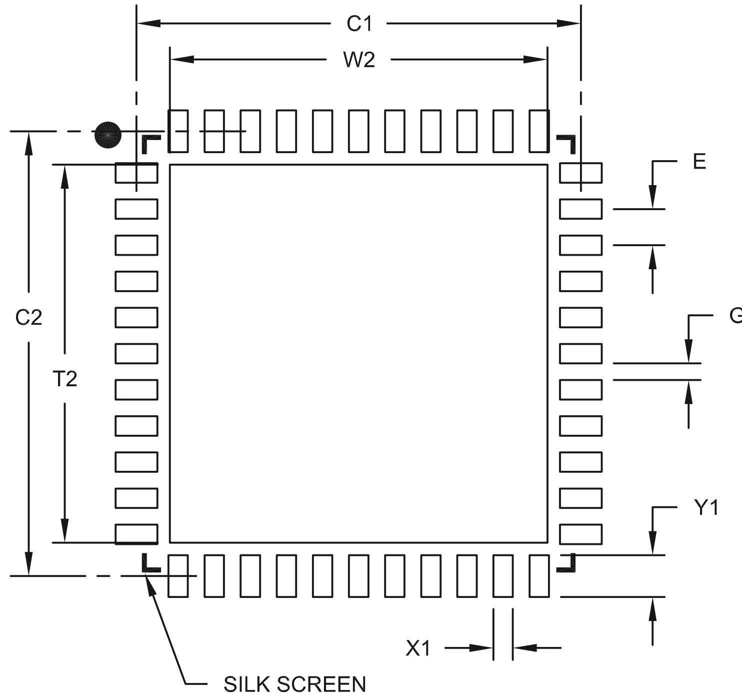
Land Pattern (Footprint)

44-Lead Plastic Quad Flat, No Lead Package (ML) – 8x8 mm Body [QFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E		0.65 BSC	
Optional Center Pad Width	W2			6.80
Optional Center Pad Length	T2			6.80
Contact Pad Spacing	C1		8.00	
Contact Pad Spacing	C2		8.00	
Contact Pad Width (X44)	X1			0.35
Contact Pad Length (X44)	Y1			0.80
Distance Between Pads	G	0.25		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2103A

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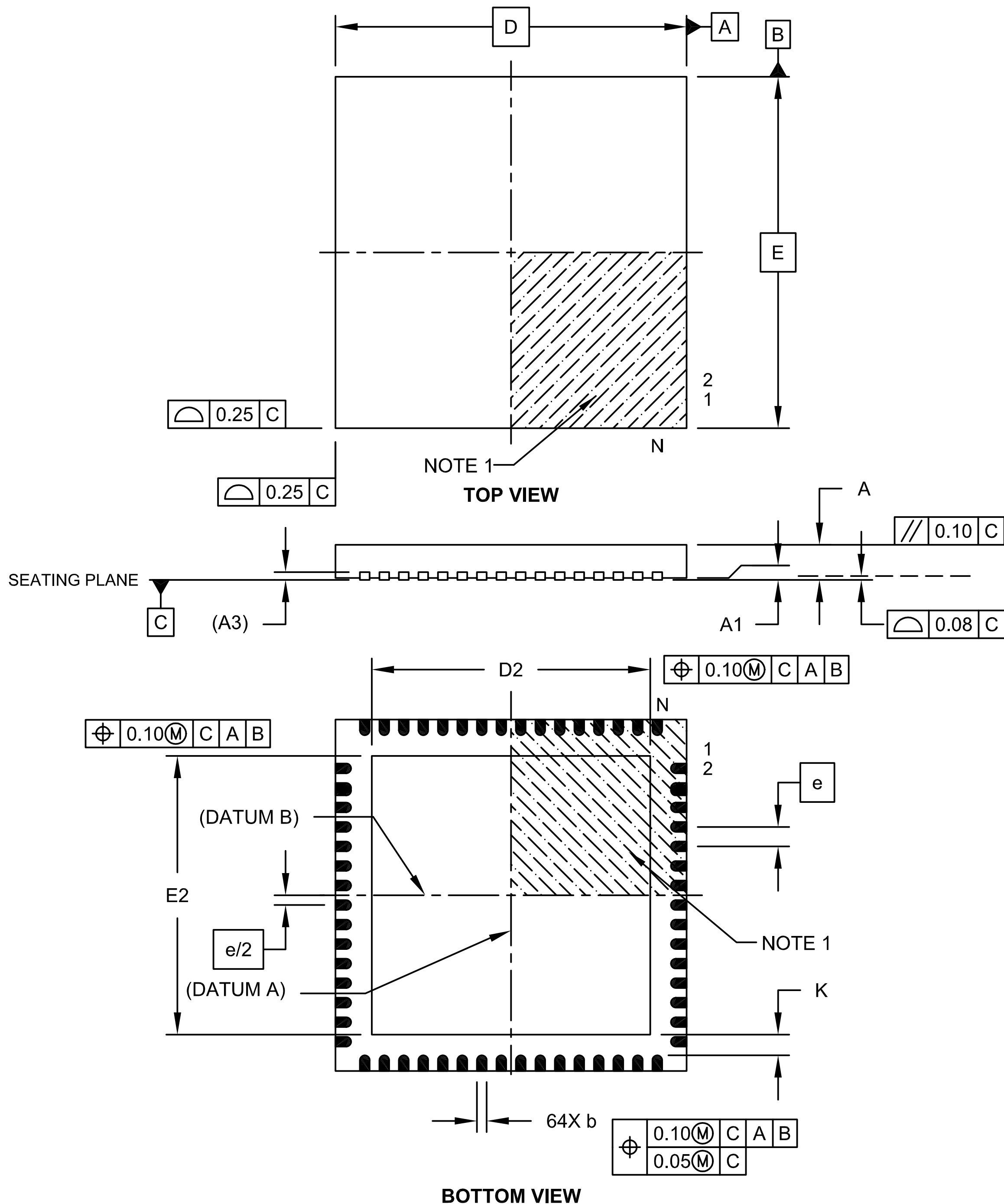
Packaging Diagrams and Parameters

64-Lead Plastic Quad Flat, No Lead Package (MR) – 9x9x0.9 mm Body [QFN]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing C04-149B Sheet 1 of 2

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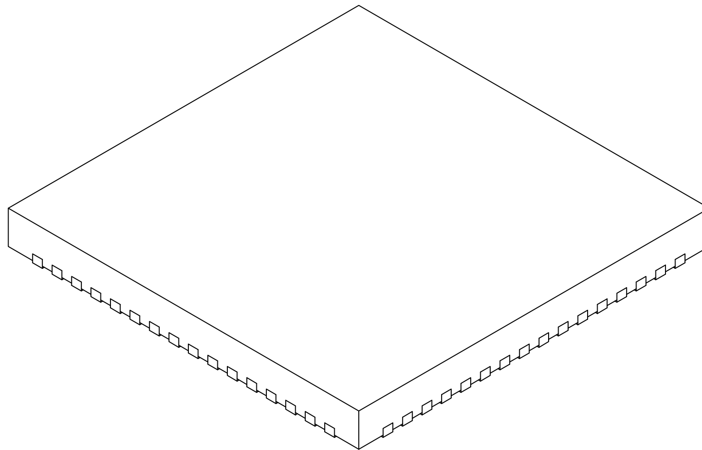
MICROCHIP

Packaging Diagrams and Parameters

64-Lead Plastic Quad Flat, No Lead Package (MR) – 9x9x0.9 mm Body [QFN]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		64	
Pitch	e		0.50 BSC	
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Width	E		9.00 BSC	
Exposed Pad Width	E2	7.05	7.15	7.50
Overall Length	D		9.00 BSC	
Exposed Pad Length	D2	7.05	7.15	7.50
Contact Width	b	0.18	0.25	0.30
Contact Length	L	0.30	0.40	0.50
Contact-to-Exposed Pad	K	0.20	-	-

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-149B Sheet 2 of 2

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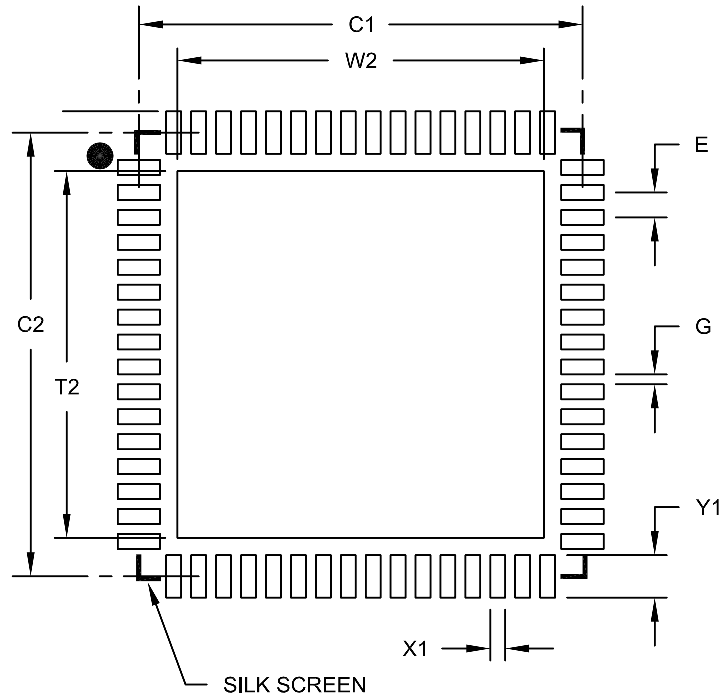
Land Pattern (Footprint)

64-Lead Plastic Quad Flat, No Lead Package (MR) – 9x9x0.9 mm Body [QFN]
With 0.40 mm Contact Length

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E		0.50 BSC	
Optional Center Pad Width	W2			7.35
Optional Center Pad Length	T2			7.35
Contact Pad Spacing	C1		8.90	
Contact Pad Spacing	C2		8.90	
Contact Pad Width (X64)	X1			0.30
Contact Pad Length (X64)	Y1			0.85
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

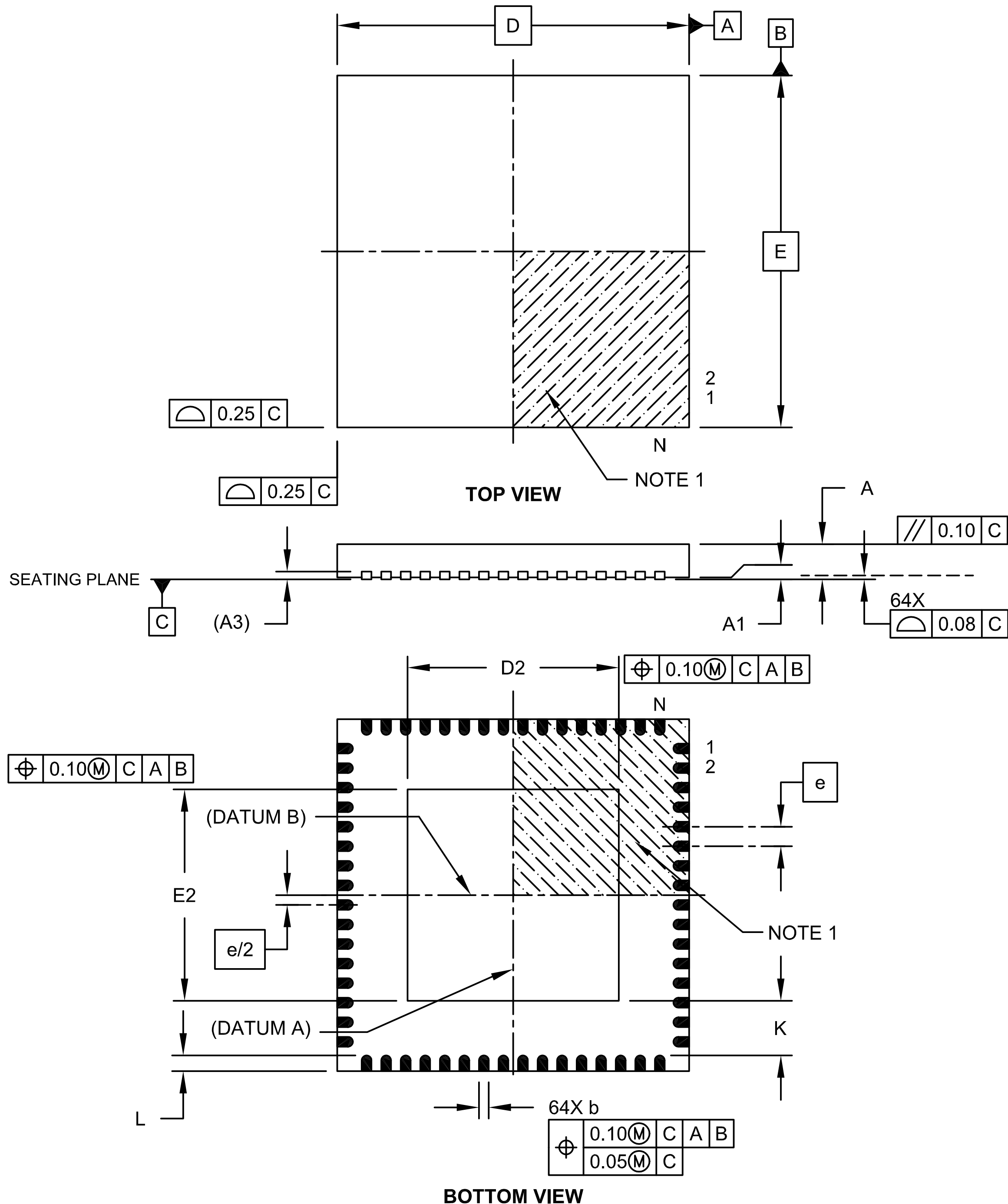
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2149A

Packaging Diagrams and Parameters

64-Lead Plastic Quad Flat, No Lead Package (MR) – 9x9x0.9 mm Body with 5.40 x 5.40 Exposed Pad [QFN]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing C04-154A Sheet 1 of 2

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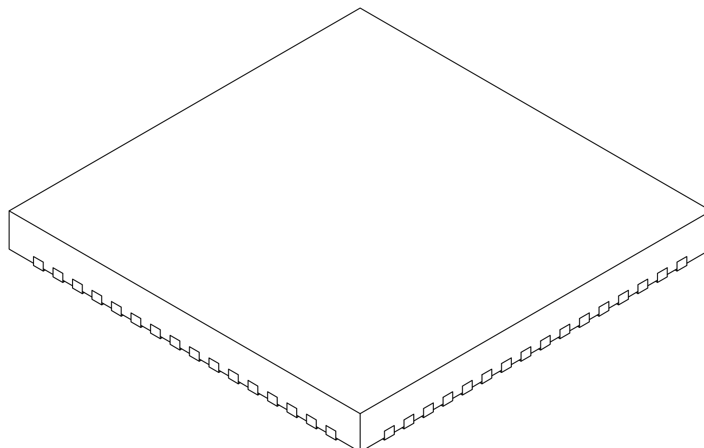
Packaging Diagrams and Parameters

64-Lead Plastic Quad Flat, No Lead Package (MR) – 9x9x0.9 mm Body with 5.40 x 5.40 Exposed Pad [QFN]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		64	
Pitch	e		0.50 BSC	
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Width	E		9.00 BSC	
Exposed Pad Width	E2	5.30	5.40	5.50
Overall Length	D		9.00 BSC	
Exposed Pad Length	D2	5.30	5.40	5.50
Contact Width	b	0.20	0.25	0.30
Contact Length	L	0.30	0.40	0.50
Contact-to-Exposed Pad	K	0.20	-	-

Notes:

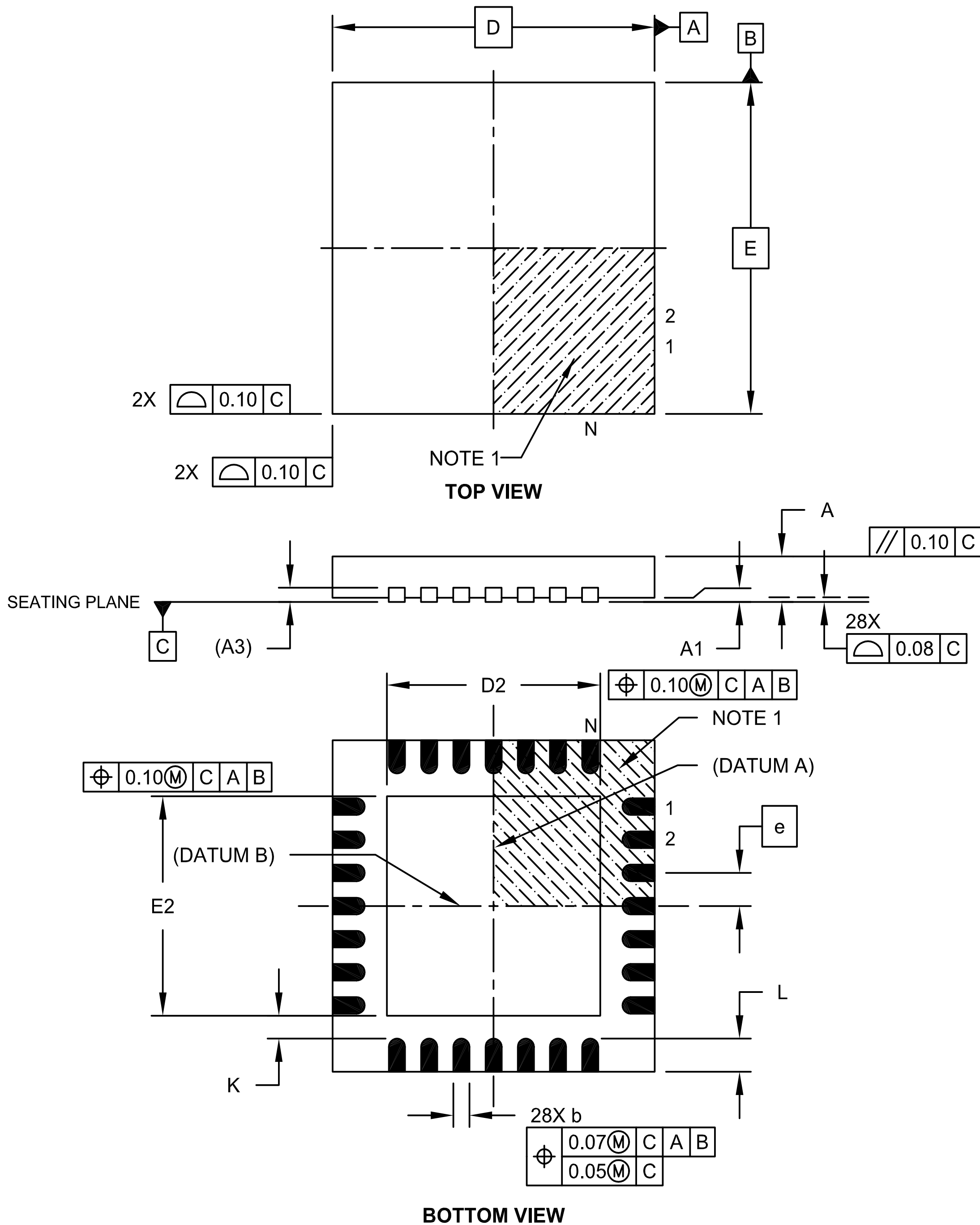
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-154A Sheet 2 of 2

Packaging Diagrams and Parameters

28-Lead Plastic Ultra Thin Quad Flat, No Lead Package (MV) – 4x4x0.5 mm Body [UQFN]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing C04-152A Sheet 1 of 2

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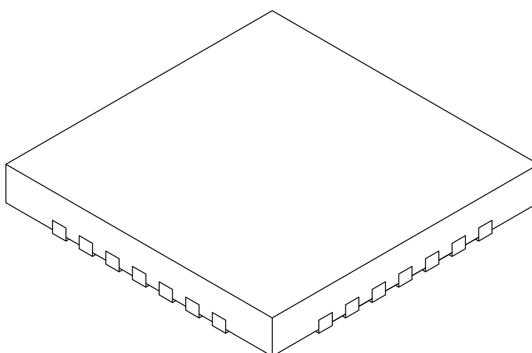
Packaging Diagrams and Parameters

28-Lead Plastic Ultra Thin Quad Flat, No Lead Package (MV) – 4x4x0.5 mm Body [UQFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		28	
Pitch	e		0.40 BSC	
Overall Height	A	0.45	0.50	0.55
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.127 REF	
Overall Width	E		4.00 BSC	
Exposed Pad Width	E2	2.55	2.65	2.75
Overall Length	D		4.00 BSC	
Exposed Pad Length	D2	2.55	2.65	2.75
Contact Width	b	0.15	0.20	0.25
Contact Length	L	0.30	0.40	0.50
Contact-to-Exposed Pad	K	0.20	-	-

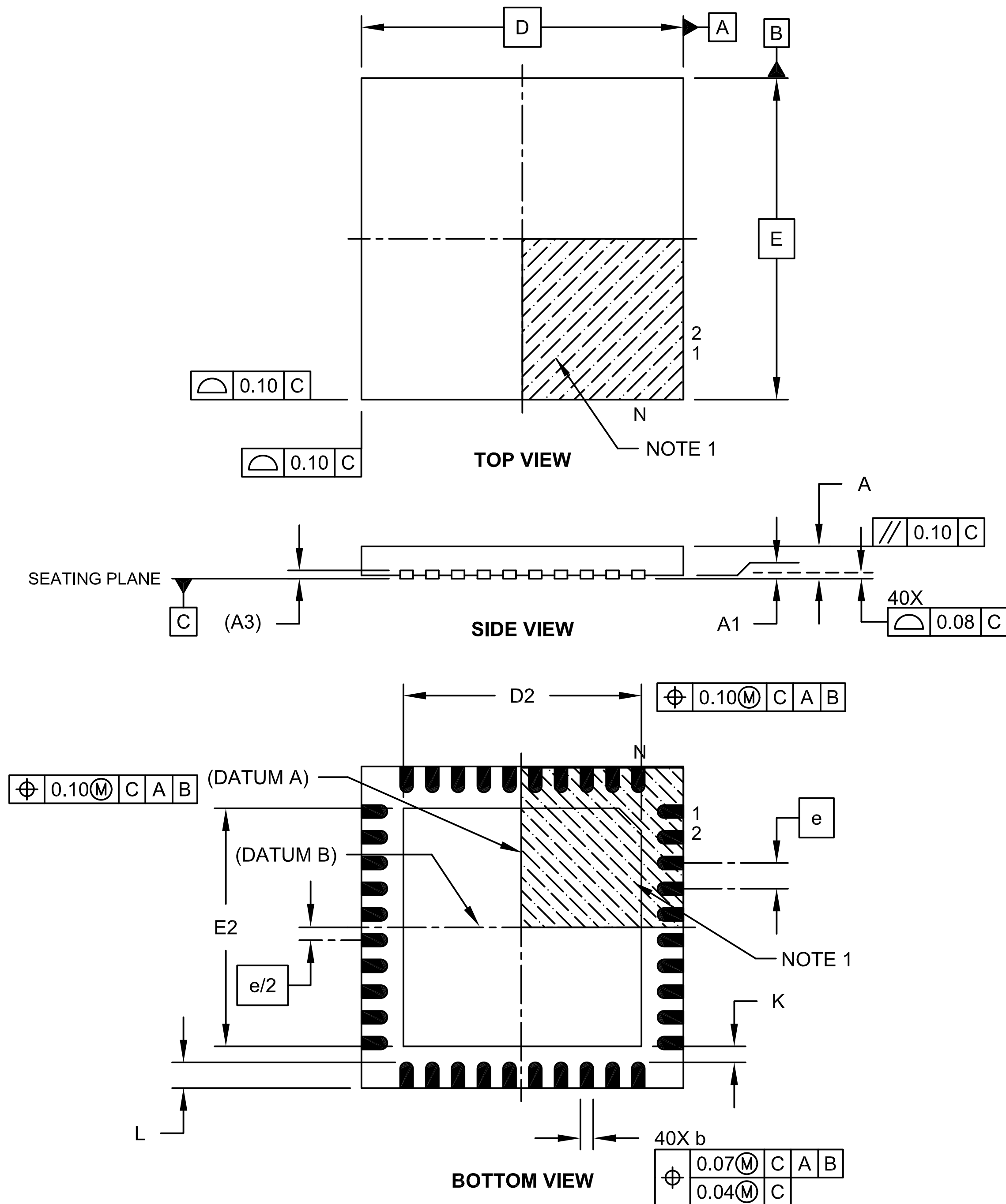
Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-152A Sheet 2 of 2

40-Lead Ultra Thin Plastic Quad Flat, No Lead Package (MV) – 5x5x0.5 mm Body [UQFN]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing C04-156A Sheet 1 of 2

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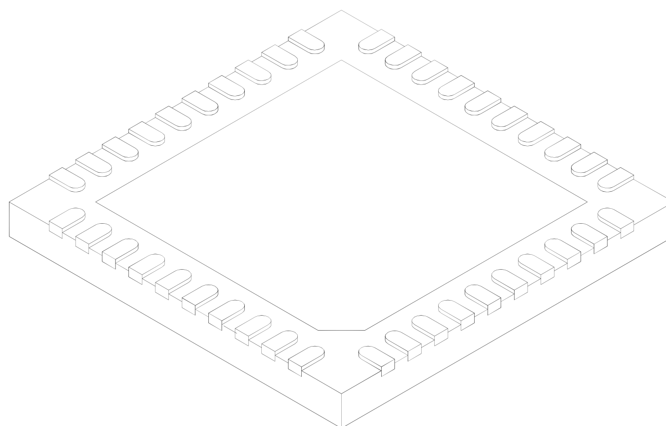
MICROCHIP

Packaging Diagrams and Parameters

40-Lead Ultra Thin Plastic Quad Flat, No Lead Package (MV) – 5x5x0.5 mm Body [UQFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		40	
Pitch	e		0.40 BSC	
Overall Height	A	0.45	0.50	0.55
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.127 REF	
Overall Width	E		5.00 BSC	
Exposed Pad Width	E2	3.60	3.70	3.80
Overall Length	D		5.00 BSC	
Exposed Pad Length	D2	3.60	3.70	3.80
Contact Width	b	0.15	0.20	0.25
Contact Length	L	0.30	0.40	0.50
Contact-to-Exposed Pad	K	0.20	-	-

Notes:

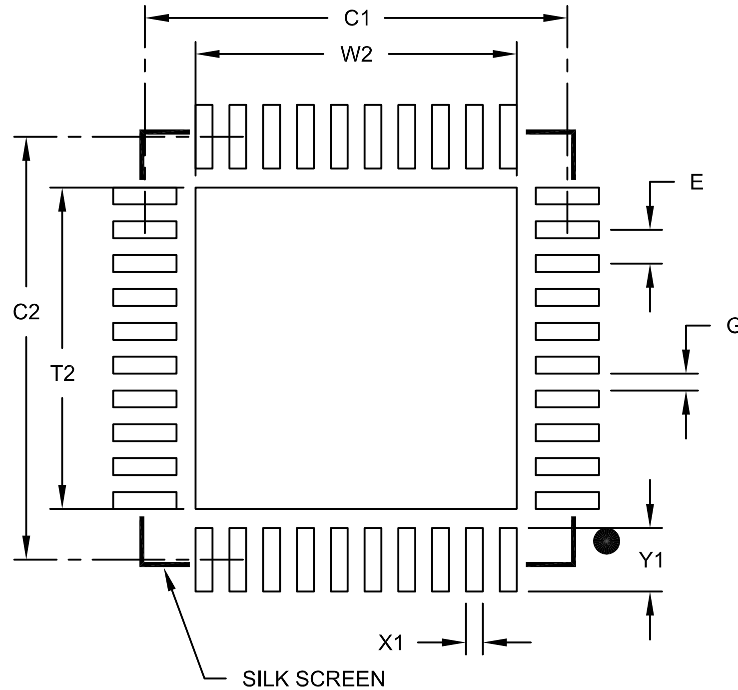
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-156A Sheet 2 of 2

Land Pattern (Footprint)

40-Lead Plastic Ultra Thin Quad Flat, No Lead Package (MV) - 5x5 mm Body [UQFN]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E		0.40 BSC	
Optional Center Pad Width	W2			3.80
Optional Center Pad Length	T2			3.80
Contact Pad Spacing	C1		5.00	
Contact Pad Spacing	C2		5.00	
Contact Pad Width (X40)	X1			0.20
Contact Pad Length (X40)	Y1			0.75
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2156A

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MICROCHIP

Packaging Diagrams and Parameters

MSOP Family

Micro Small Outline Packages

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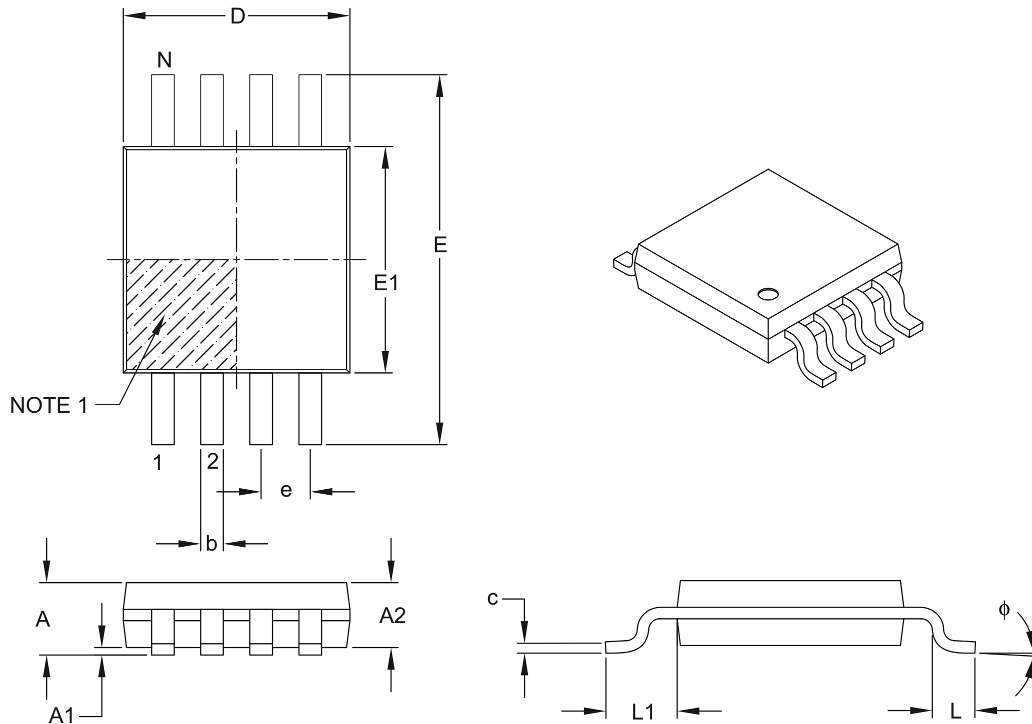
Packaging Diagrams and Parameters

8-Lead Plastic Micro Small Outline Package (MS) [MSOP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		8	
Pitch	e		0.65 BSC	
Overall Height	A	–	–	1.10
Molded Package Thickness	A2	0.75	0.85	0.95
Standoff	A1	0.00	–	0.15
Overall Width	E		4.90 BSC	
Molded Package Width	E1		3.00 BSC	
Overall Length	D		3.00 BSC	
Foot Length	L	0.40	0.60	0.80
Footprint	L1		0.95 REF	
Foot Angle	φ	0°	–	8°
Lead Thickness	c	0.08	–	0.23
Lead Width	b	0.22	–	0.40

Notes:
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-111B

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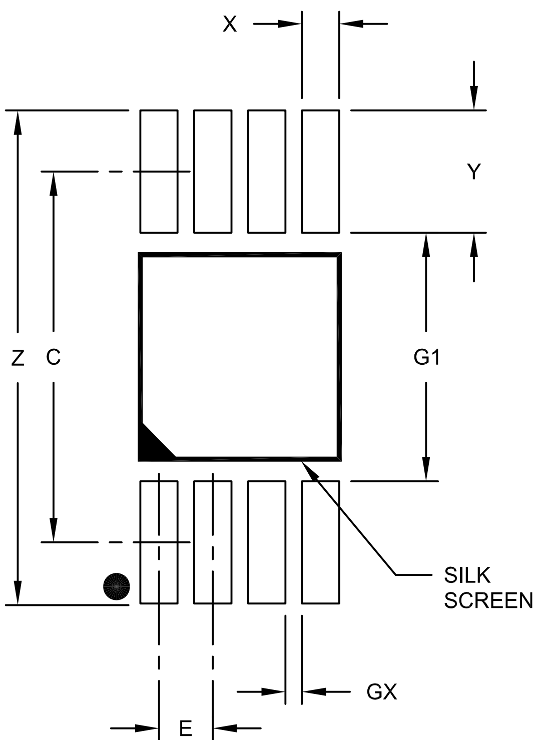
Land Pattern (Footprint)

8-Lead Plastic Micro Small Outline Package (MS) [MSOP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.65 BSC		
Contact Pad Spacing	C		4.40	
Overall Width	Z			5.85
Contact Pad Width (X8)	X1			0.45
Contact Pad Length (X8)	Y1			1.45
Distance Between Pads	G1	2.95		
Distance Between Pads	GX	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

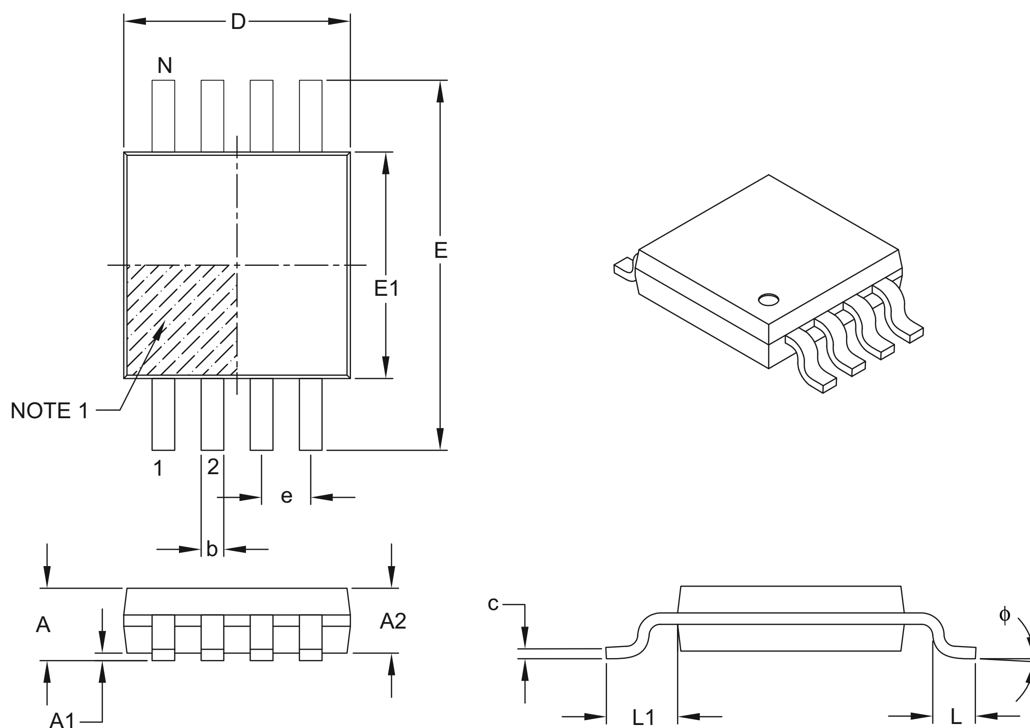
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2111A

Packaging Diagrams and Parameters

8-Lead Plastic Micro Small Outline Package (UA) [MSOP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		8	
Pitch	e		0.65 BSC	
Overall Height	A	–	–	1.10
Molded Package Thickness	A2	0.75	0.85	0.95
Standoff	A1	0.00	–	0.15
Overall Width	E		4.90 BSC	
Molded Package Width	E1		3.00 BSC	
Overall Length	D		3.00 BSC	
Foot Length	L	0.40	0.60	0.80
Footprint	L1		0.95 REF	
Foot Angle	φ	0°	–	8°
Lead Thickness	c	0.08	–	0.23
Lead Width	b	0.22	–	0.40

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-111B

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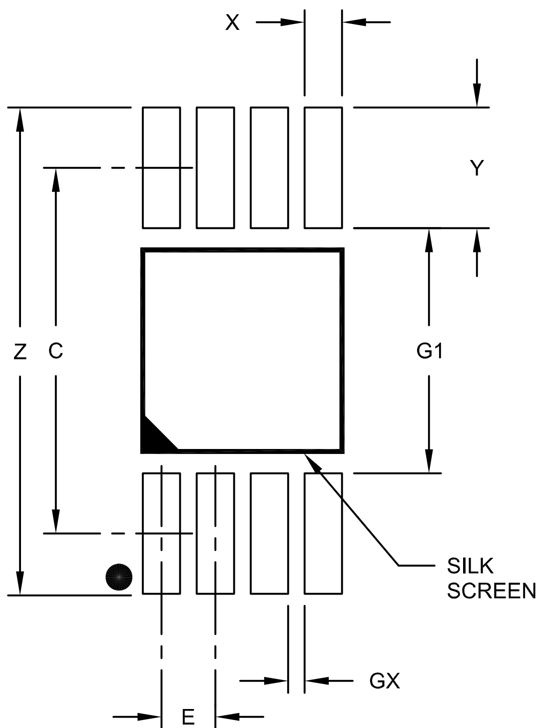
Land Pattern (Footprint)

8-Lead Plastic Micro Small Outline Package (UA) [MSOP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E	0.65 BSC		
Contact Pad Spacing	C		4.40	
Overall Width	Z			5.85
Contact Pad Width (X8)	X1			0.45
Contact Pad Length (X8)	Y1			1.45
Distance Between Pads	G1	2.95		
Distance Between Pads	GX	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

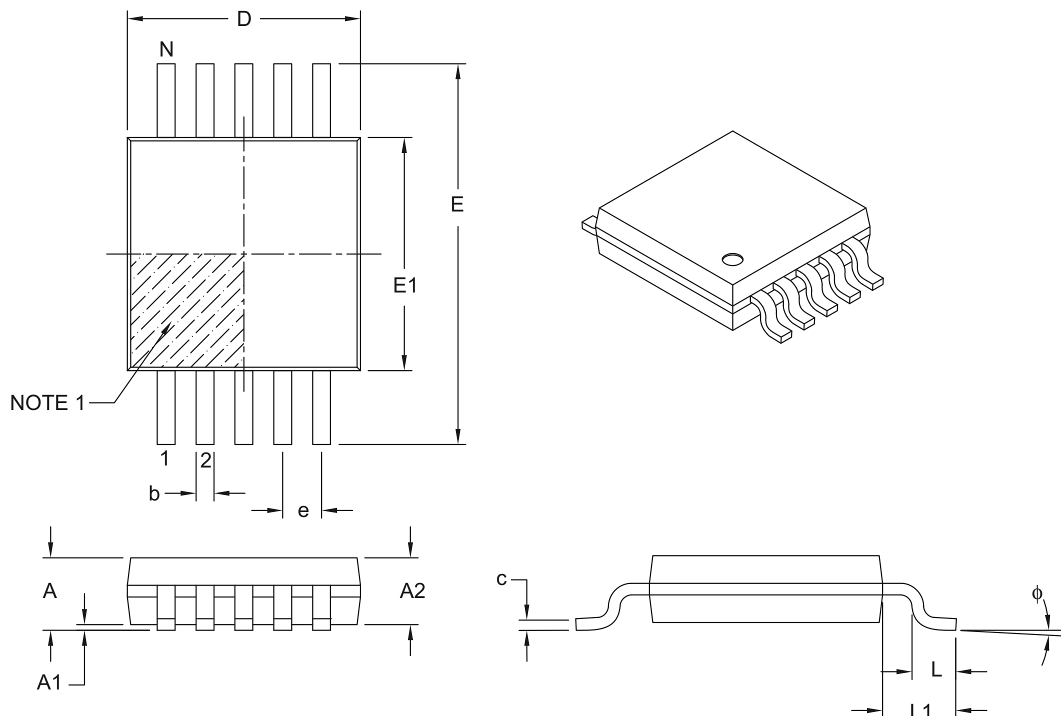
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2111A

Packaging Diagrams and Parameters

10-Lead Plastic Micro Small Outline Package (MS) [MSOP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		10	
Pitch	e		0.50 BSC	
Overall Height	A	–	–	1.10
Molded Package Thickness	A2	0.75	0.85	0.95
Standoff	A1	0.00	–	0.15
Overall Width	E		4.90 BSC	
Molded Package Width	E1		3.00 BSC	
Overall Length	D		3.00 BSC	
Foot Length	L	0.40	0.60	0.80
Footprint	L1		0.95 REF	
Foot Angle	φ	0°	–	8°
Lead Thickness	c	0.08	–	0.23
Lead Width	b	0.15	–	0.33

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-021B

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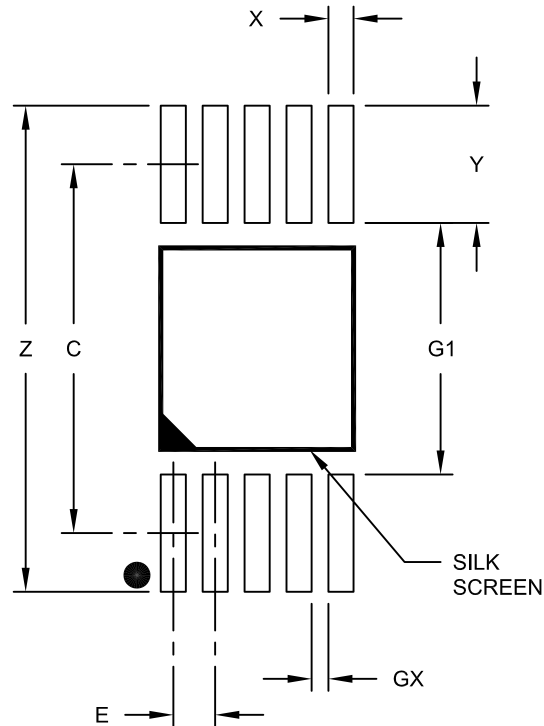
Land Pattern (Footprint)

10-Lead Plastic Micro Small Outline Package (MS) [MSOP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E		0.50 BSC	
Contact Pad Spacing	C		4.40	
Overall Width	Z			5.80
Contact Pad Width (X10)	X1			0.30
Contact Pad Length (X10)	Y1			1.40
Distance Between Pads	G1	3.00		
Distance Between Pads	GX	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

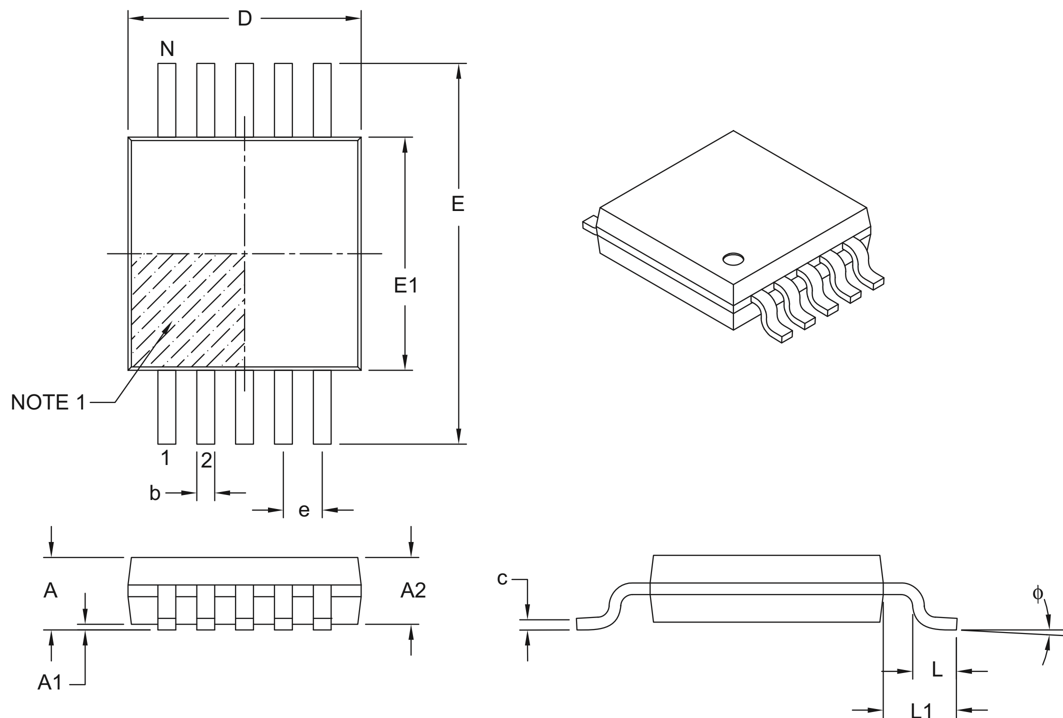
Microchip Technology Drawing No. C04-2021A

MICROCHIP

Packaging Diagrams and Parameters

10-Lead Plastic Micro Small Outline Package (UN) [MSOP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



		Units	MILLIMETERS	
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		10	
Pitch	e		0.50 BSC	
Overall Height	A	–	–	1.10
Molded Package Thickness	A2	0.75	0.85	0.95
Standoff	A1	0.00	–	0.15
Overall Width	E		4.90 BSC	
Molded Package Width	E1		3.00 BSC	
Overall Length	D		3.00 BSC	
Foot Length	L	0.40	0.60	0.80
Footprint	L1		0.95 REF	
Foot Angle	φ	0°	–	8°
Lead Thickness	c	0.08	–	0.23
Lead Width	b	0.15	–	0.33

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-021B

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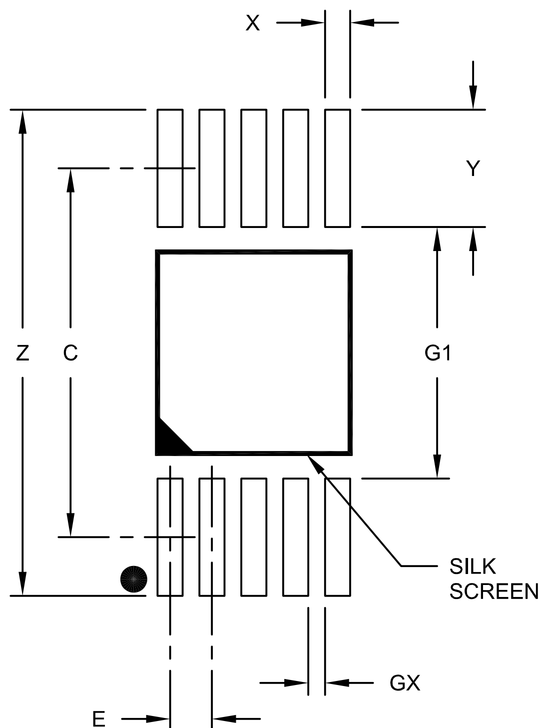
10-Lead Plastic Micro Small Outline Package (UN) [MSOP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E	0.50 BSC		
Contact Pad Spacing	C		4.40	
Overall Width	Z			5.80
Contact Pad Width (X10)	X1			0.30
Contact Pad Length (X10)	Y1			1.40
Distance Between Pads	G1	3.00		
Distance Between Pads	GX	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

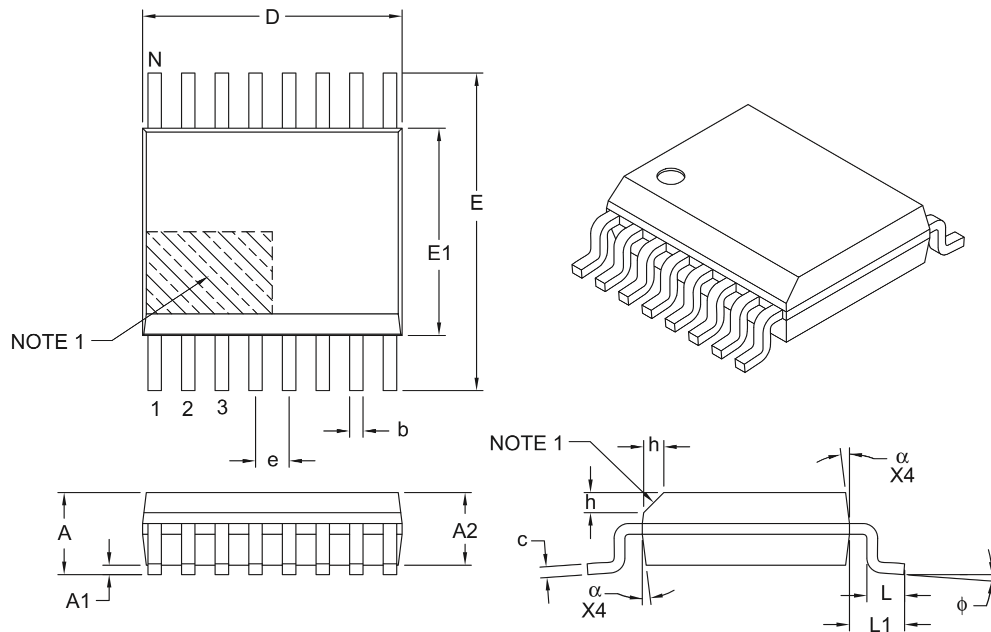
Microchip Technology Drawing No. C04-2021A

MICROCHIP

Packaging Diagrams and Parameters

16-Lead Plastic Shrink Small Outline Narrow Body (QR) – .150" Body [QSOP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	INCHES		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		16	
Pitch	e		.025 BSC	
Overall Height	A	–	–	.069
Standoff §	A1	.004	–	.010
Molded Package Height	A2	.049	–	–
Overall Width	E		.236 BSC	
Molded Package Width	E1		.154 BSC	
Overall Length	D		.193 BSC	
Chamfer Distance	h	.010	–	.020
Lead Thickness	c	.006	–	.010
Lead Width	b	.008	–	.012
Footprint	L1		.041 REF	
Foot Length	L	.016	–	.050
Foot Angle	φ	0°	–	8°
Molded Draft Angle	α	5°	–	15°

Notes:

1. Chamfer feature is optional. If it is not present, then a Pin 1 visual index feature must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .006" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-024C

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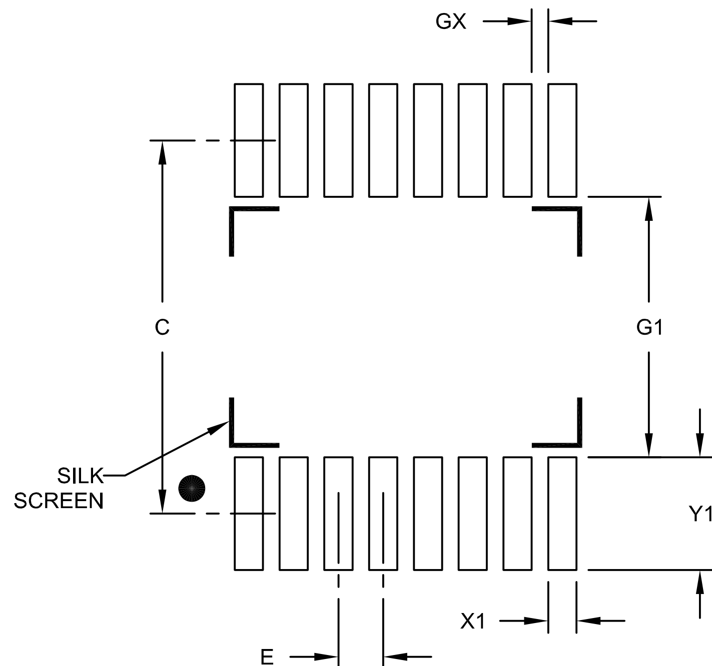
Land Pattern (Footprint)

16-Lead Plastic Shrink Small Outline Narrow Body (QR) - .150" Body [QSOP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	.025 BSC		
Contact Pad Spacing	C		.209	
Contact Pad Width (X16)	X1			.016
Contact Pad Length (X16)	Y1			.063
Distance Between Pads	GX	.009		
Distance Between Pads	G1	.146		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2024A

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NOTES:

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MICROCHIP

Packaging Diagrams and Parameters

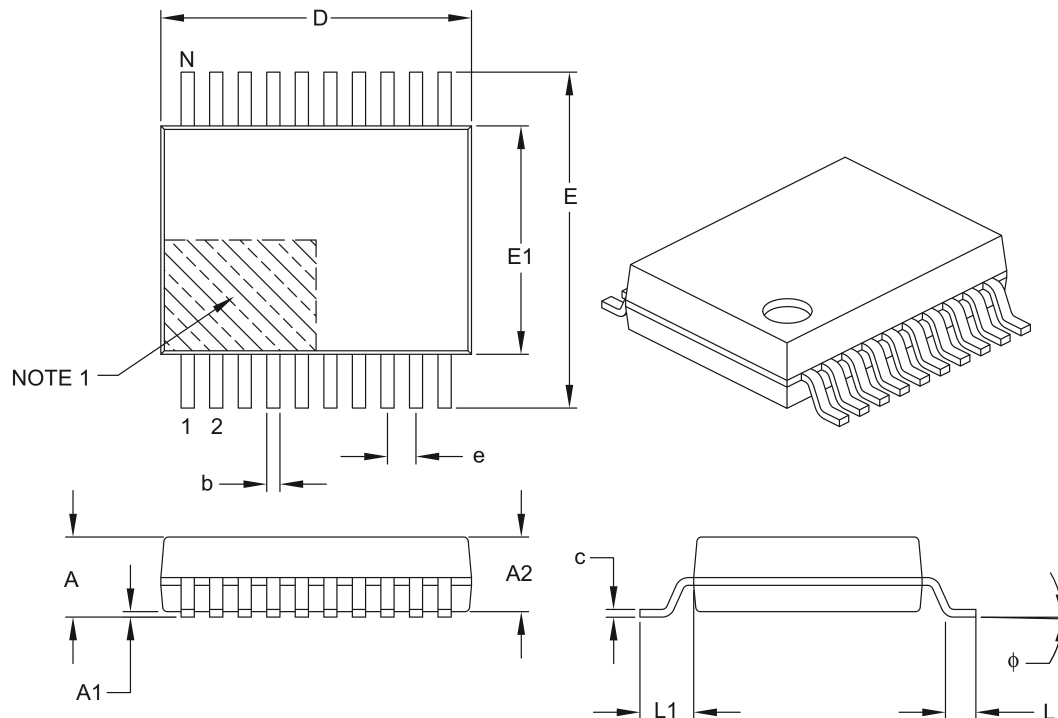
SSOP Family

Shrink Small Outline Packages

Packaging Diagrams and Parameters

20-Lead Plastic Shrink Small Outline (SS) – 5.30 mm Body [SSOP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	20		
Pitch	e	0.65 BSC		
Overall Height	A	–	–	2.00
Molded Package Thickness	A2	1.65	1.75	1.85
Standoff	A1	0.05	–	–
Overall Width	E	7.40	7.80	8.20
Molded Package Width	E1	5.00	5.30	5.60
Overall Length	D	6.90	7.20	7.50
Foot Length	L	0.55	0.75	0.95
Footprint	L1	1.25 REF		
Lead Thickness	c	0.09	–	0.25
Foot Angle	φ	0°	4°	8°
Lead Width	b	0.22	–	0.38

Notes:
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.20 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-072B

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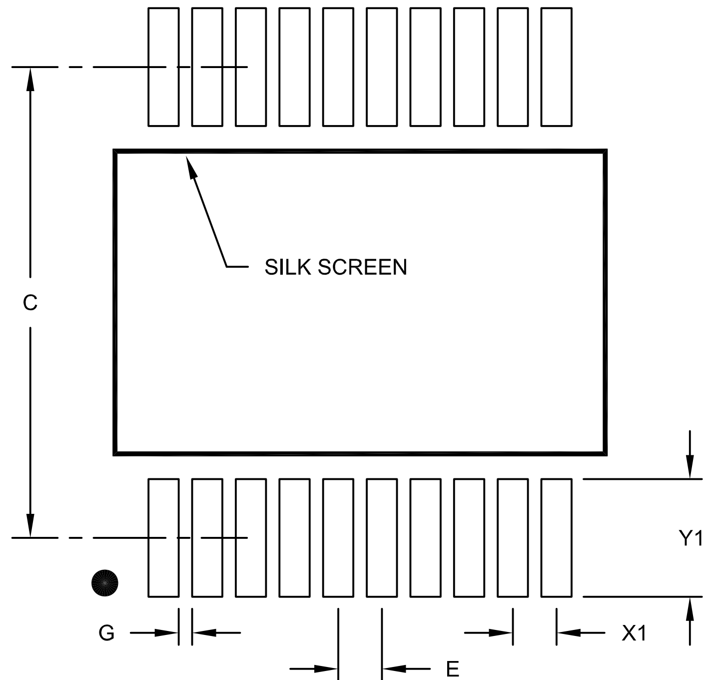
Land Pattern (Footprint)

20-Lead Plastic Shrink Small Outline (SS) - 5.30 mm Body [SSOP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.65 BSC		
Contact Pad Spacing	C		7.20	
Contact Pad Width (X20)	X1			0.45
Contact Pad Length (X20)	Y1			1.75
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

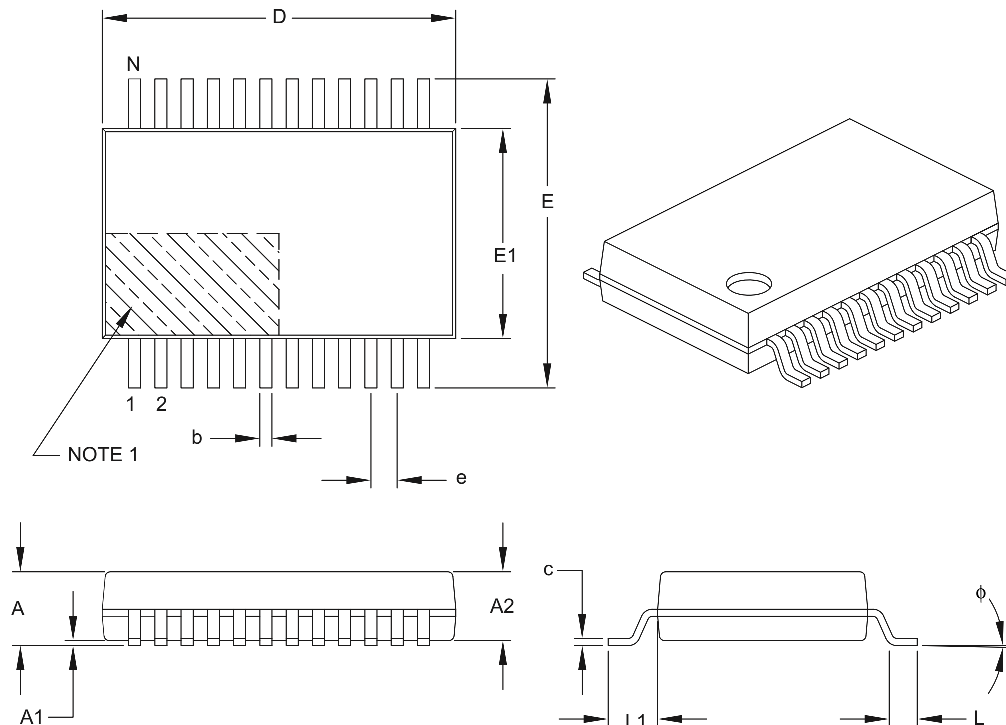
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2072A

Packaging Diagrams and Parameters

24-Lead Plastic Shrink Small Outline (SS) – 5.30 mm Body [SSOP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	24		
Pitch	e	0.65 BSC		
Overall Height	A	–	–	2.00
Molded Package Thickness	A2	1.65	1.75	1.85
Standoff	A1	0.05	–	–
Overall Width	E	7.40	7.80	8.20
Molded Package Width	E1	5.00	5.30	5.60
Overall Length	D	7.90	8.20	8.50
Foot Length	L	0.55	0.75	0.95
Footprint	L1	1.25 REF		
Lead Thickness	c	0.09	–	0.25
Foot Angle	ϕ	0°	4°	8°
Lead Width	b	0.22	–	0.38

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.20 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-132B

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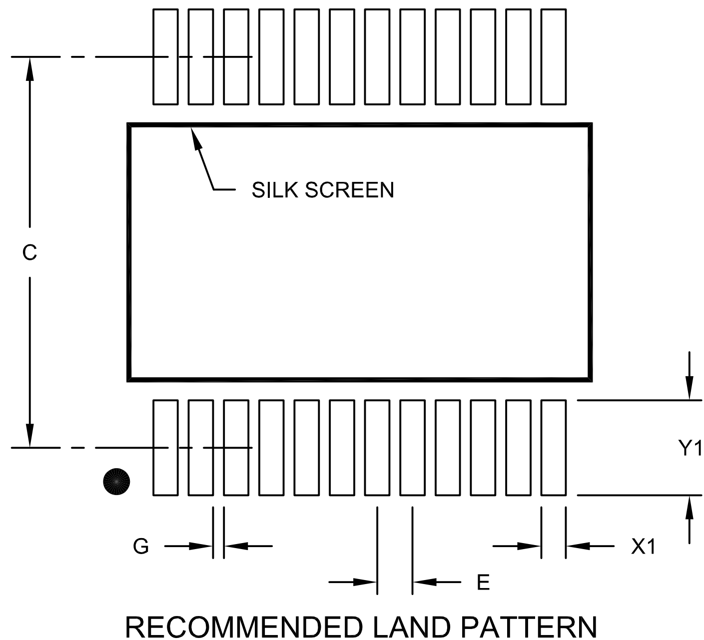
Land Pattern (Footprint)

24 Lead Plastic Shrink Small Outline (SS) - 5.30 mm Body [SSOP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

		Units	MILLIMETERS	
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.65 BSC		
Contact Pad Spacing	C		7.20	
Contact Pad Width (X24)	X1			0.45
Contact Pad Length (X24)	Y1			1.75
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2132A

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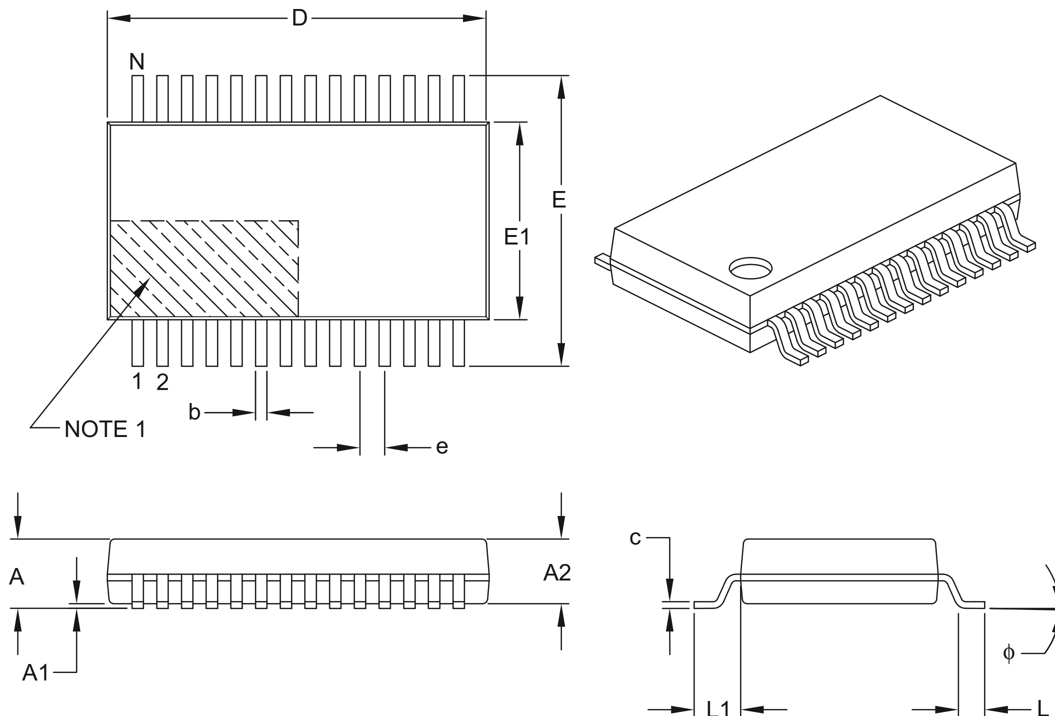
Packaging Diagrams and Parameters

28-Lead Plastic Shrink Small Outline (SS) – 5.30 mm Body [SSOP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	28		
Pitch	e	0.65 BSC		
Overall Height	A	–	–	2.00
Molded Package Thickness	A2	1.65	1.75	1.85
Standoff	A1	0.05	–	–
Overall Width	E	7.40	7.80	8.20
Molded Package Width	E1	5.00	5.30	5.60
Overall Length	D	9.90	10.20	10.50
Foot Length	L	0.55	0.75	0.95
Footprint	L1	1.25 REF		
Lead Thickness	c	0.09	–	0.25
Foot Angle	φ	0°	4°	8°
Lead Width	b	0.22	–	0.38

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.20 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-073B

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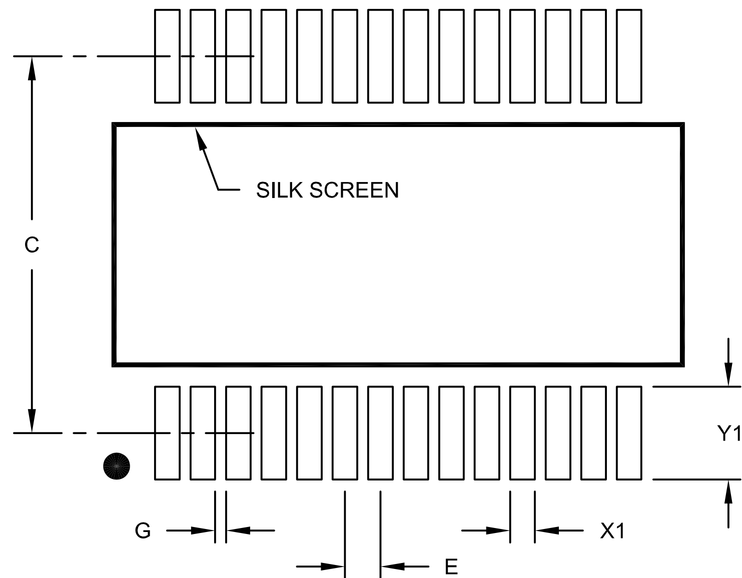
Land Pattern (Footprint)

28-Lead Plastic Shrink Small Outline (SS) - 5.30 mm Body [SSOP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.65 BSC		
Contact Pad Spacing	C		7.20	
Contact Pad Width (X28)	X1			0.45
Contact Pad Length (X28)	Y1			1.75
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2073A

Packaging Diagrams and Parameters

NOTES:

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MICROCHIP

Packaging Diagrams and Parameters

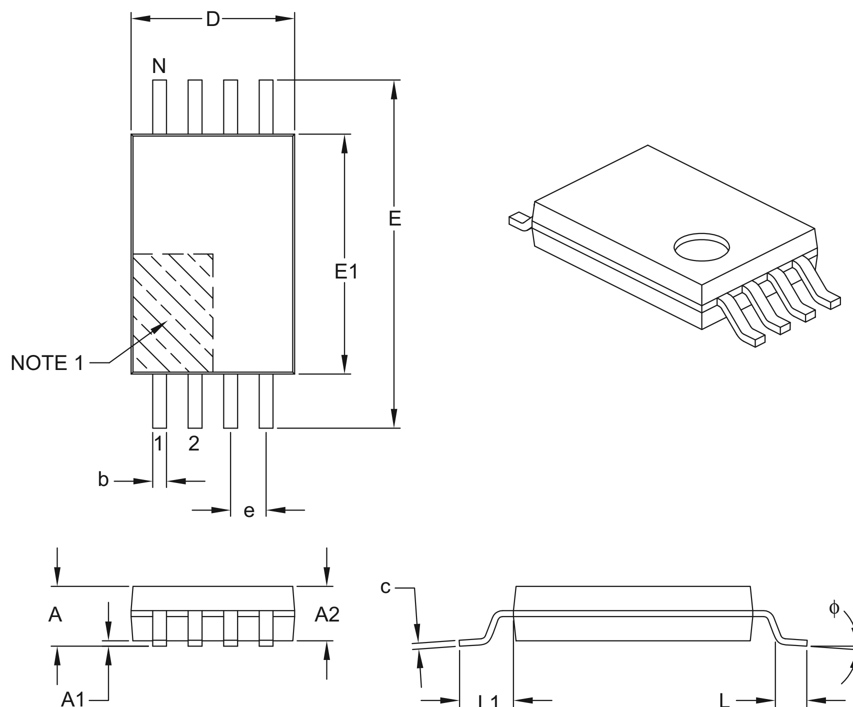
TSSOP Family

Thin Shrink Small Outline Packages

Packaging Diagrams and Parameters

8-Lead Plastic Thin Shrink Small Outline (ST) – 4.4 mm Body [TSSOP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		8	
Pitch	e		0.65 BSC	
Overall Height	A	–	–	1.20
Molded Package Thickness	A2	0.80	1.00	1.05
Standoff	A1	0.05	–	0.15
Overall Width	E		6.40 BSC	
Molded Package Width	E1	4.30	4.40	4.50
Molded Package Length	D	2.90	3.00	3.10
Foot Length	L	0.45	0.60	0.75
Footprint	L1		1.00 REF	
Foot Angle	φ	0°	–	8°
Lead Thickness	c	0.09	–	0.20
Lead Width	b	0.19	–	0.30

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-086B

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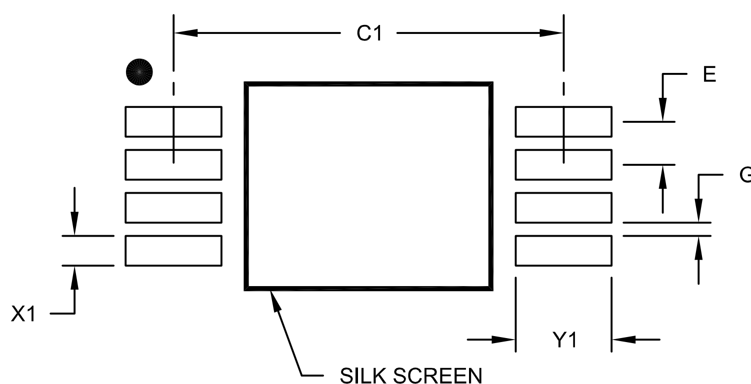
Land Pattern (Footprint)

8-Lead Plastic Thin Shrink Small Outline (ST) - 4.4 mm Body [TSSOP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.65 BSC		
Contact Pad Spacing	C1		5.90	
Contact Pad Width (X8)	X1			0.45
Contact Pad Length (X8)	Y1			1.45
Distance Between Pads	G	0.20		

Notes:

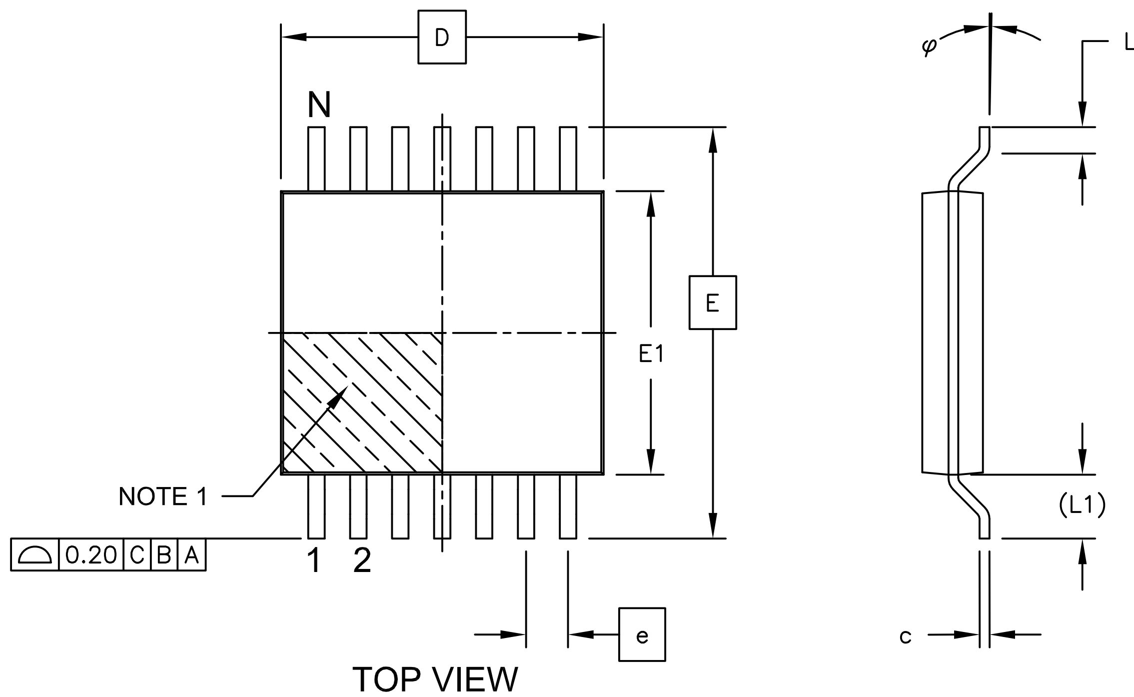
1. Dimensioning and tolerancing per ASME Y14.5M

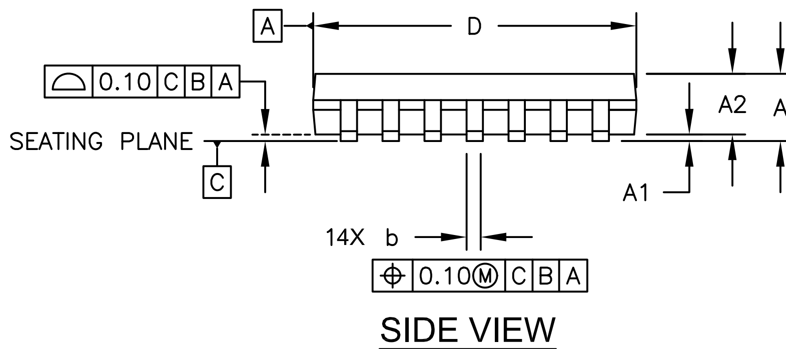
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2086A

14-Lead Plastic Thin Shrink Small Outline (ST) - 4.4 mm Body [TSSOP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging





Microchip Technology Drawing C04-087C Sheet 1 of 2

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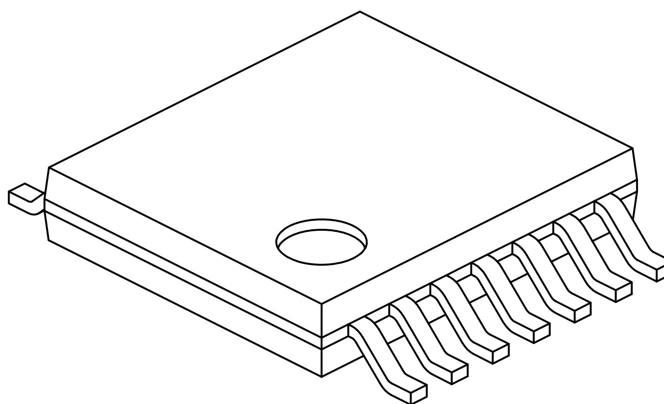
Packaging Diagrams and Parameters

14-Lead Plastic Thin Shrink Small Outline (ST) - 4.4 mm Body [TSSOP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	14		
Pitch	e	0.65 BSC		
Overall Height	A	-	-	1.20
Molded Package Thickness	A2	0.80	1.00	1.05
Standoff	A1	0.05	-	0.15
Overall Width	E	6.40 BSC		
Molded Package Width	E1	4.30	4.40	4.50
Molded Package Length	D	4.90	5.00	5.10
Foot Length	L	0.45	0.60	0.75
Footprint	(L1)	1.00 REF		
Foot Angle	φ	0°	-	8°
Lead Thickness	c	0.09	-	0.20
Lead Width	b	0.19	-	0.30

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

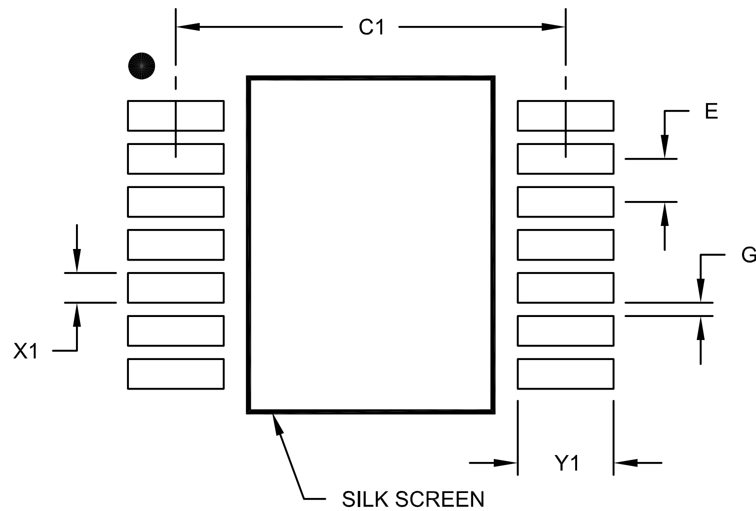
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing No. C04-087C Sheet 2 of 2

Land Pattern (Footprint)

14-Lead Plastic Thin Shrink Small Outline (ST) - 4.4 mm Body [TSSOP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E	0.65 BSC		
Contact Pad Spacing	C1		5.90	
Contact Pad Width (X14)	X1			0.45
Contact Pad Length (X14)	Y1			1.45
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2087A

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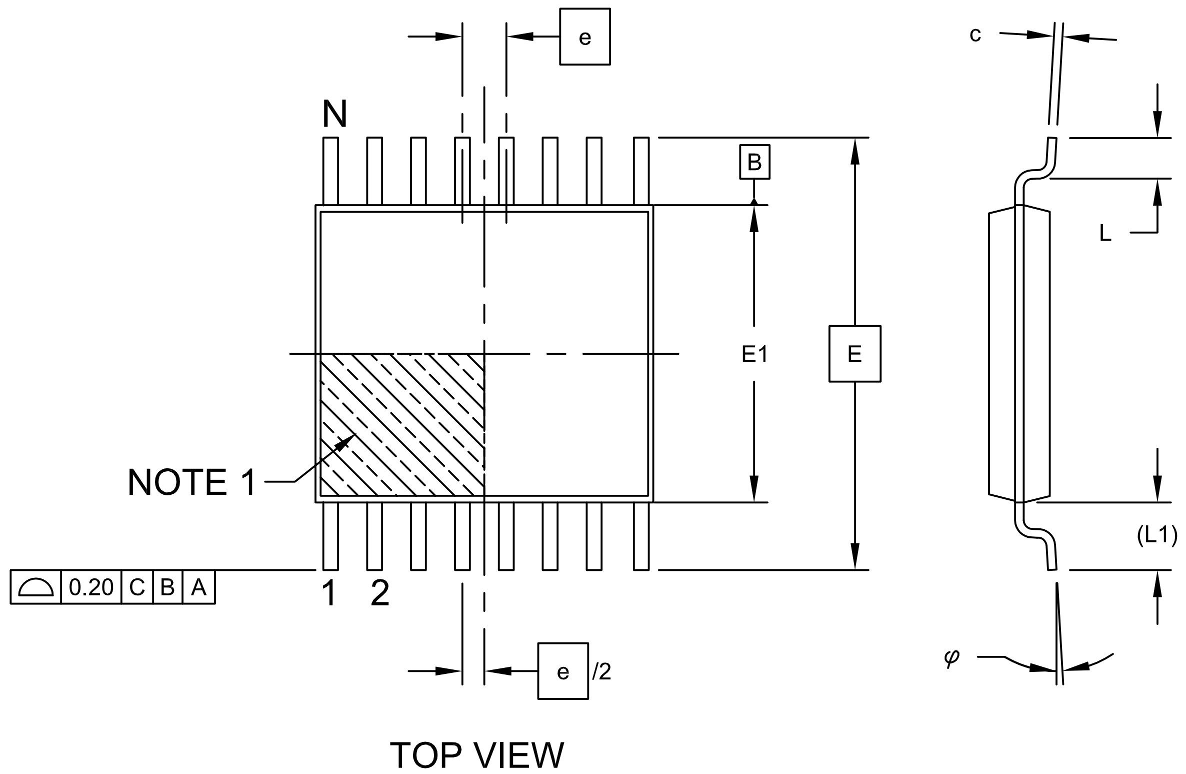
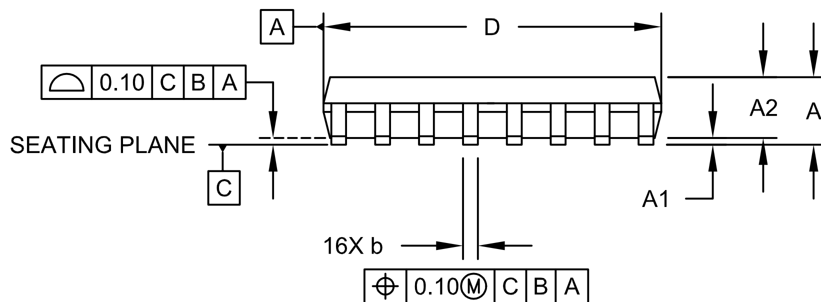
Packaging Diagrams and Parameters

16-Lead Plastic Thin Shrink Small Outline (ST) – 4.4 mm Body [TSSOP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging

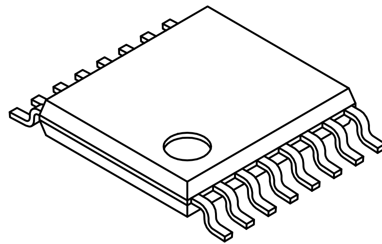




Microchip Technology Drawing C04-068A Sheet 1 of 2

16-Lead Plastic Thin Shrink Small Outline (ST) – 4.4 mm Body [TSSOP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	16		
Pitch	e	0.65 BSC		
Overall Height	A	-	-	1.20
Molded Package Thickness	A2	0.80	1.00	1.05
Standoff	A1	0.05	-	0.15
Overall Width	E	6.40 BSC		
Molded Package Width	E1	4.30	4.40	4.50
Molded Package Length	D	4.90	5.00	5.10
Foot Length	L	0.45	0.60	0.75
Footprint	(L1)	1.00 REF		
Foot Angle	φ	0°	-	8°
Lead Thickness	c	0.09	-	0.20
Lead Width	b	0.19	-	0.30

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-068A Sheet 2 of 2

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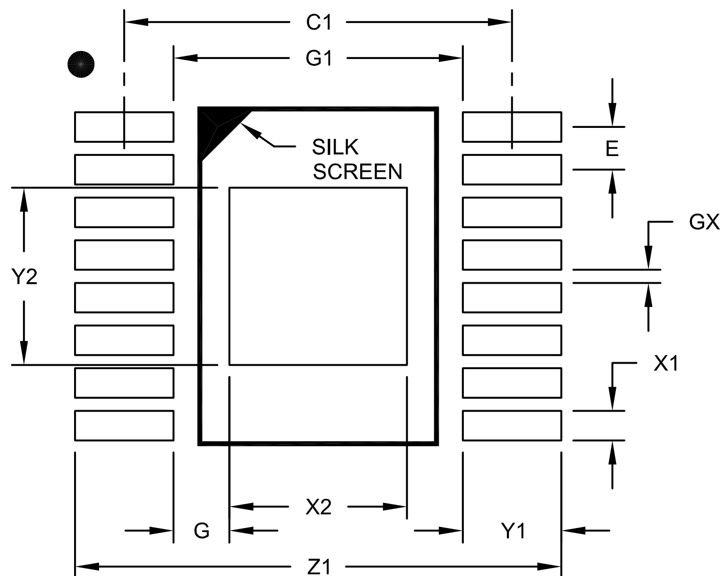
Land Pattern (Footprint)

16-Lead Plastic Thin Shrink Small Outline (ST) – 4.4 mm Body [TSSOP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.65 BSC		
Optional Center Pad Length	Y2			2.70
Optional Center Pad Width	X2			2.70
Clearance Between Contact Pads	G1	4.40		
Contact Pad To Center Pad	G	0.73		
Contact Pad Spacing	C1		5.90	
Contact Pad Width (X16)	X1			0.45
Contact Pad Length (X16)	Y1			1.50
Distance Between Pads	GX	0.20		
Overall Width	Z1			7.40

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2068A

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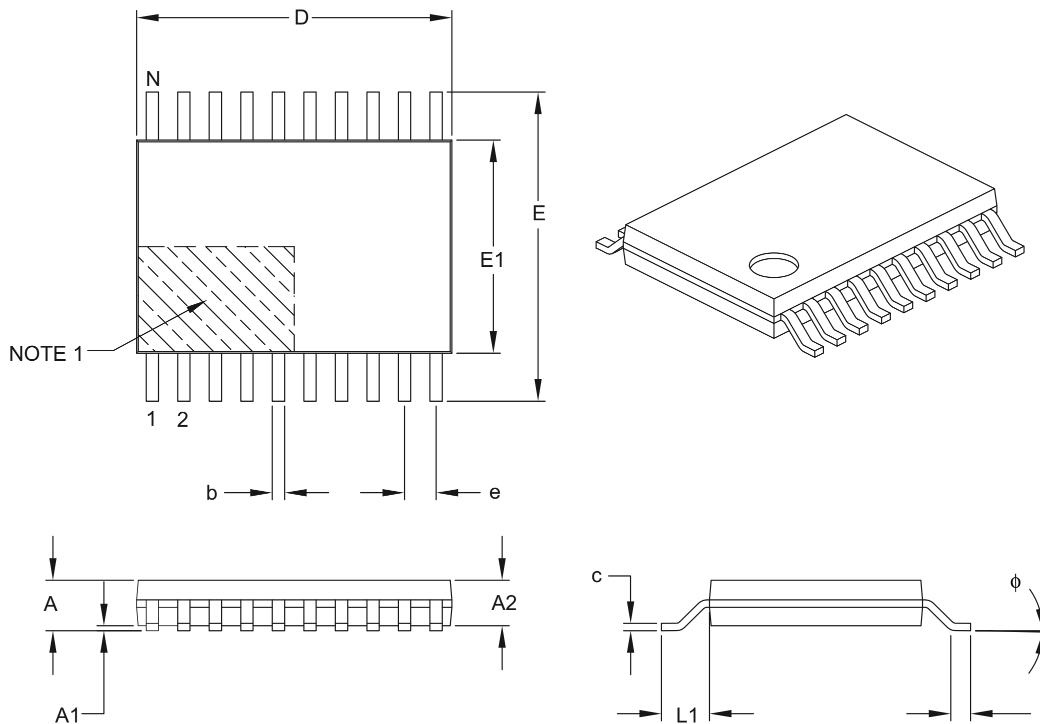
Packaging Diagrams and Parameters

20-Lead Plastic Thin Shrink Small Outline (ST) – 4.4 mm Body [TSSOP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N		20	
Pitch	e		0.65 BSC	
Overall Height	A	–	–	1.20
Molded Package Thickness	A2	0.80	1.00	1.05
Standoff	A1	0.05	–	0.15
Overall Width	E		6.40 BSC	
Molded Package Width	E1	4.30	4.40	4.50
Molded Package Length	D	6.40	6.50	6.60
Foot Length	L	0.45	0.60	0.75
Footprint	L1		1.00 REF	
Foot Angle	φ	0°	–	8°
Lead Thickness	c	0.09	–	0.20
Lead Width	b	0.19	–	0.30

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-088B

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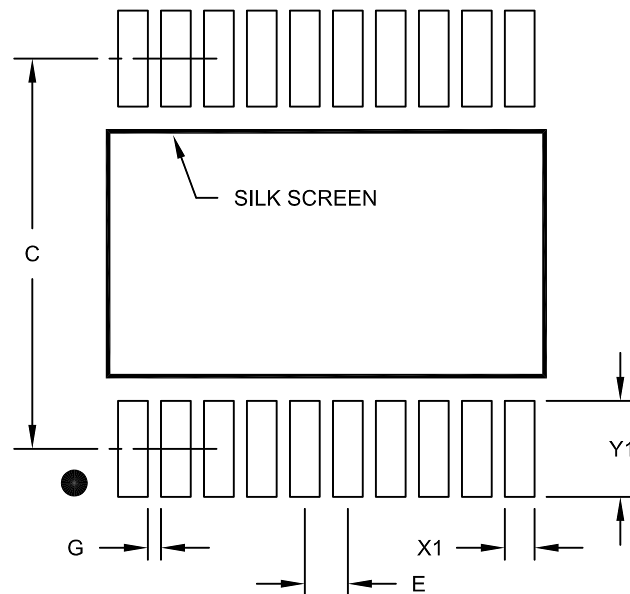
Land Pattern (Footprint)

20-Lead Plastic Thin Shrink Small Outline (ST) - 4.4 mm Body [TSSOP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.65 BSC		
Contact Pad Spacing	C		5.90	
Contact Pad Width (X20)	X1			0.45
Contact Pad Length (X20)	Y1			1.45
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2088A

NOTES:

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MICROCHIP

Packaging Diagrams and Parameters

TSOP Family

Thin Small Outline Package

VSOP Family

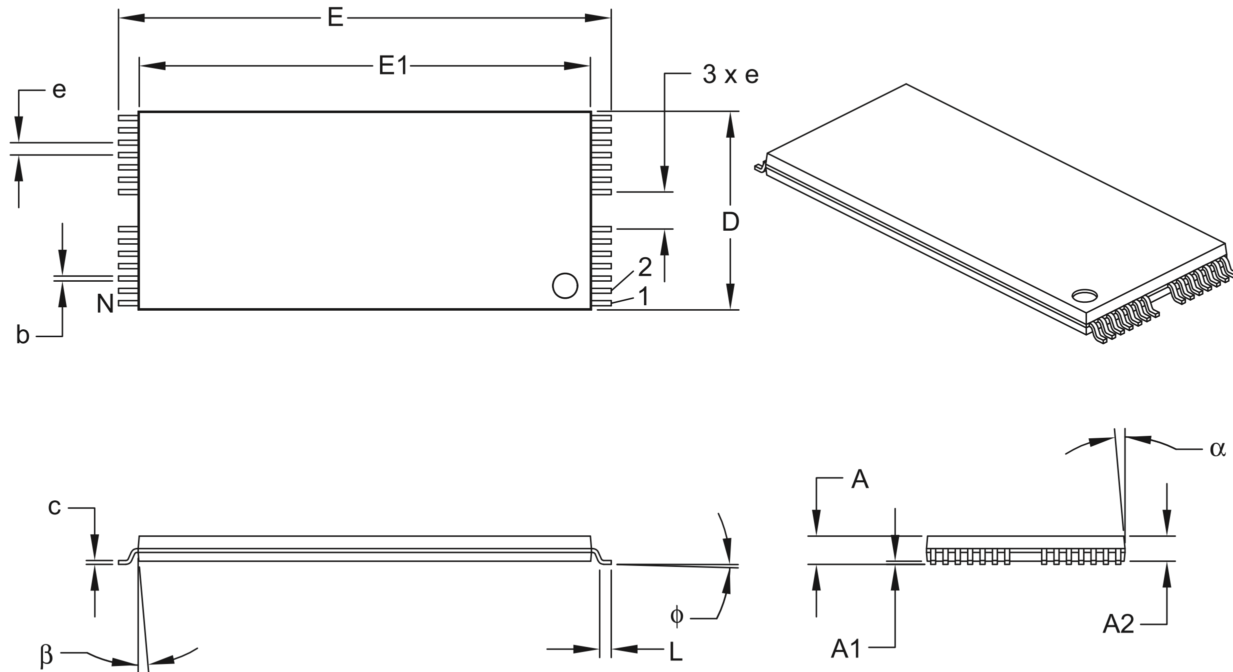
Very Small Outline Package

Microchip

Packaging Diagrams and Parameters

28-Lead Plastic Thin Small Outline (TS) – 8x20 mm [TSOP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		28	
Pitch	e		0.50	
Overall Height	A	0.99	1.14	1.30
Molded Package Thickness	A2	0.95	1.00	1.05
Standoff §	A1	0.05	0.15	0.25
Overall Width	E	19.80	20.00	20.20
Molded Package Width	E1	18.30	18.40	18.50
Molded Package Length	D	7.80	8.00	8.20
Foot Length	L	0.50	0.60	0.70
Foot Angle	φ	0°	4°	8°
Lead Thickness	c	0.10	0.15	0.20
Lead Width	b	0.15	0.20	0.25
Mold Draft Angle Top	α	0°	5°	10°
Mold Draft Angle Bottom	β	0°	5°	10°

Notes:

1. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
2. § Significant Characteristic.

Microchip Technology Drawing C04-067B

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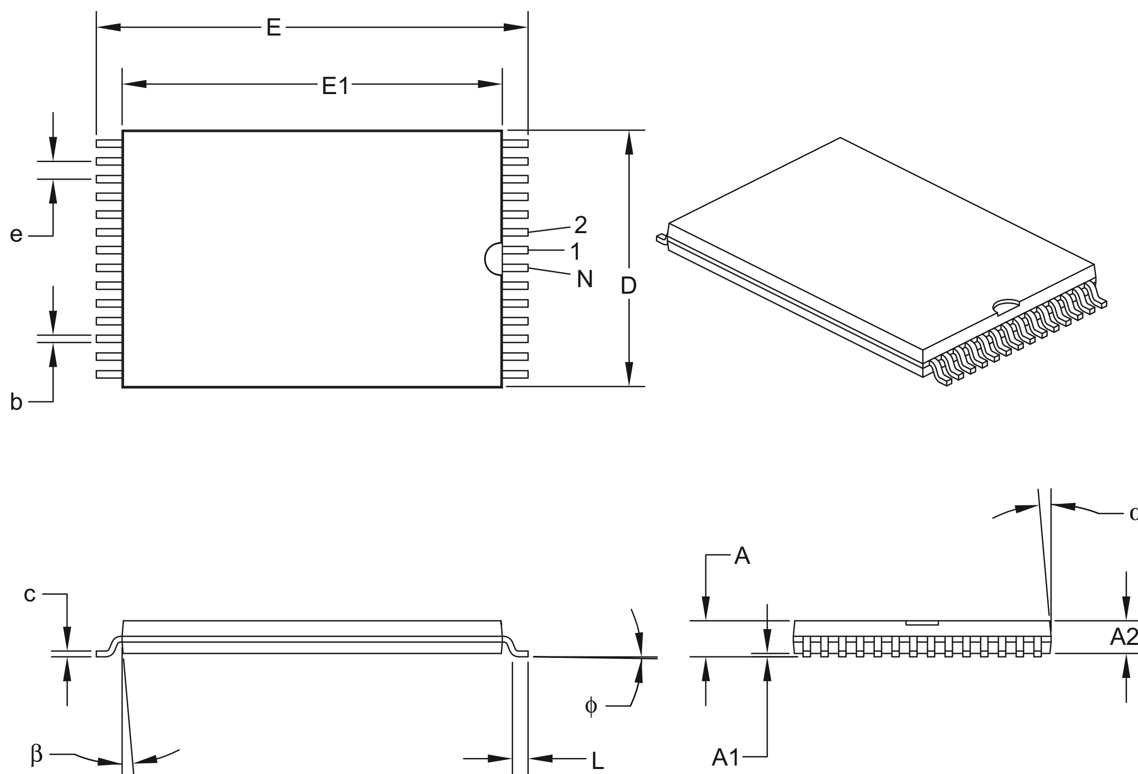
MICROCHIP

Packaging Diagrams and Parameters

28-Lead Plastic Very Small Outline (VS) – 8x13.4 mm Body [VSOP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Pins	N	28		
Pitch	e	0.55		
Overall Height	A	0.99	1.14	1.29
Molded Package Thickness	A2	0.95	1.00	1.05
Standoff §	A1	0.05	0.13	0.25
Overall Width	E	13.20	13.40	13.60
Molded Package Width	E1	11.70	11.80	11.90
Molded Package Length	D	7.90	8.00	8.10
Foot Length	L	0.30	0.50	0.70
Foot Angle	φ	0°	3°	5°
Lead Thickness	c	0.14	0.15	0.16
Lead Width	b	0.17	0.20	0.23
Mold Draft Angle Top	α	0°	5°	10°
Mold Draft Angle Bottom	β	0°	5°	10°

Notes:

1. § Significant Characteristic.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.

Microchip Technology Drawing C04-075B

Packaging Diagrams and Parameters

NOTES:

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Packaging Diagrams and Parameters

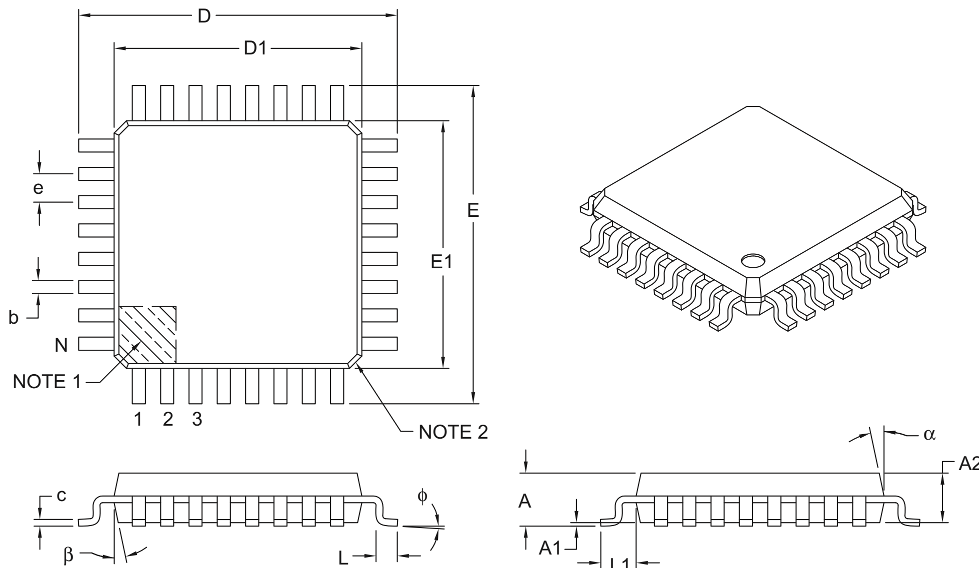
LQFP Family

Low Profile Quad Flat Packages

Packaging Diagrams and Parameters

32-Lead Plastic Low-Profile Quad Flatpack (PL) – 7x7x1.4 mm Body, 2.0 mm [LQFP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



		Units	MILLIMETERS	
	Dimension Limits	MIN	NOM	MAX
Number of Leads	N	32		
Lead Pitch	e	0.80 BSC		
Overall Height	A	–	–	1.60
Molded Package Thickness	A2	1.35	1.40	1.45
Standoff	A1	0.05	–	0.15
Foot Length	L	0.45	0.60	0.75
Footprint	L1	1.00 REF		
Foot Angle	φ	0°	3.5°	7°
Overall Width	E	9.00 BSC		
Overall Length	D	9.00 BSC		
Molded Package Width	E1	7.00 BSC		
Molded Package Length	D1	7.00 BSC		
Lead Thickness	c	0.09	–	0.20
Lead Width	b	0.30	0.37	0.45
Mold Draft Angle Top	α	11°	12°	13°
Mold Draft Angle Bottom	β	11°	12°	13°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-045B

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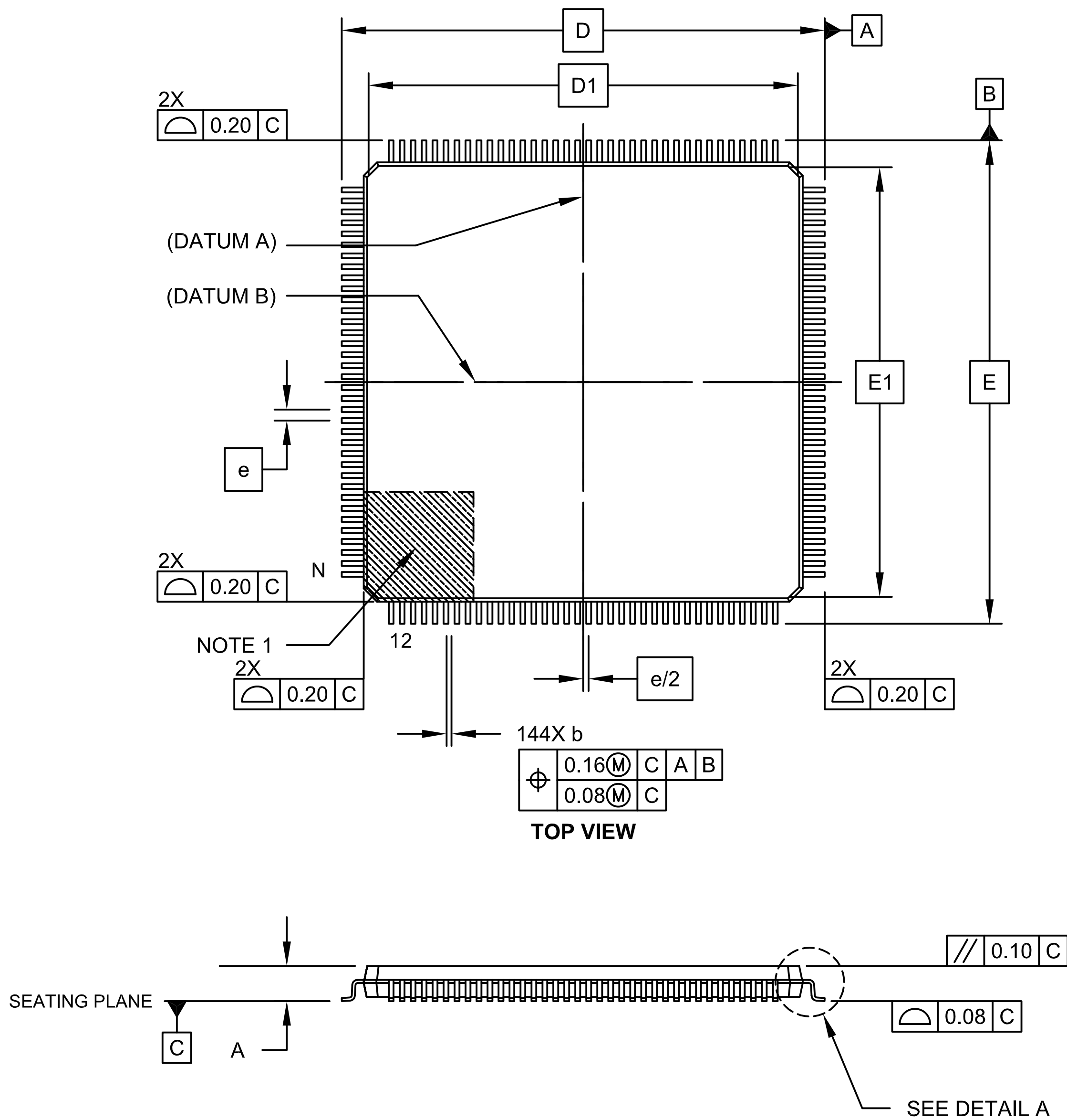
Packaging Diagrams and Parameters

144-Lead Plastic Low Profile Quad Flatpack (PL) – 20x20x1.40 mm Body, with 2.00 mm Footprint [LQFP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing C04-044B Sheet 1 of 2

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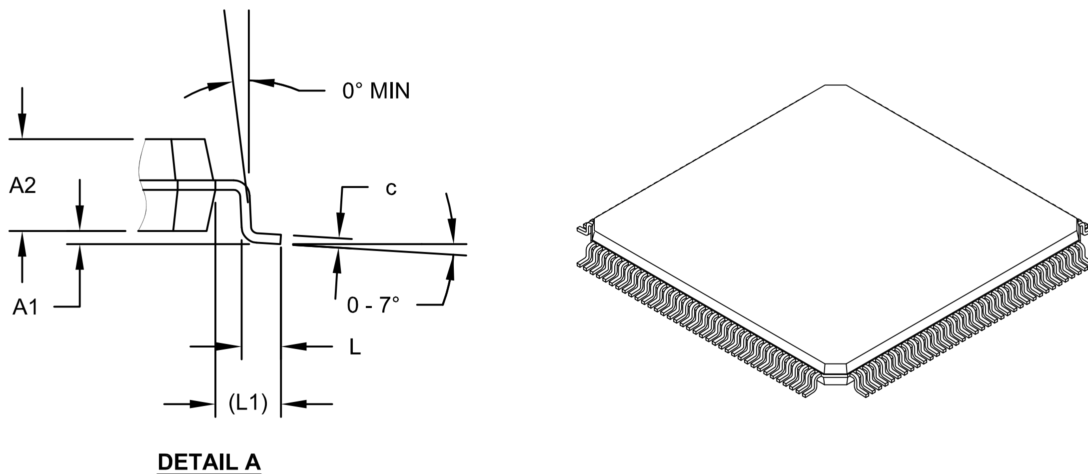
MICROCHIP

Packaging Diagrams and Parameters

144-Lead Plastic Low Profile Quad Flatpack (PL) – 20x20x1.40 mm Body, with 2.00 mm Footprint [LQFP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Leads	N		144	
Lead Pitch	e		0.50 BSC	
Overall Height	A	-	-	1.60
Molded Package Height	A2	1.35	1.40	1.45
Standoff	A1	0.05	-	0.15
Foot Length	L	0.45	0.60	0.75
Footprint	L1		1.00 (REF)	
Overall Width	E		22.00 BSC	
Overall Length	D		22.00 BSC	
Molded Body Width	E1		20.00 BSC	
Molded Body Length	D1		20.00 BSC	
Lead Thickness	c	0.09	-	0.20
Lead Width	b	0.17	0.22	0.27

Notes:
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-044B Sheet 2 of 2

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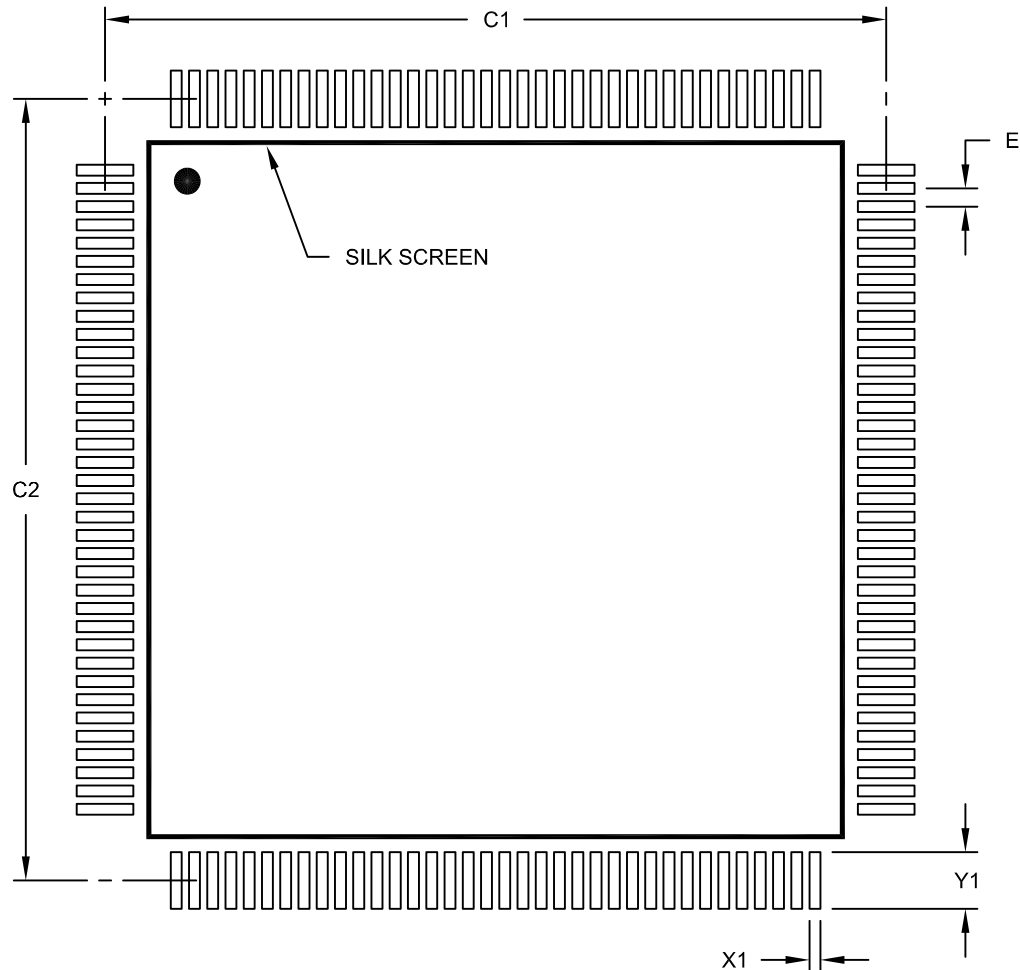
Land Pattern (Footprint)

144-Lead Plastic Low Profile Quad Flatpack (PL) – 20x20x1.40 mm Body, with 2.00 mm Footprint [LQFP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.50 BSC		
Contact Pad Spacing	C1		21.40	
Contact Pad Spacing	C2		21.40	
Contact Pad Width (X144)	X1			0.30
Contact Pad Length (X144)	Y1			1.55

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2044A

NOTES:

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Packaging Diagrams and Parameters

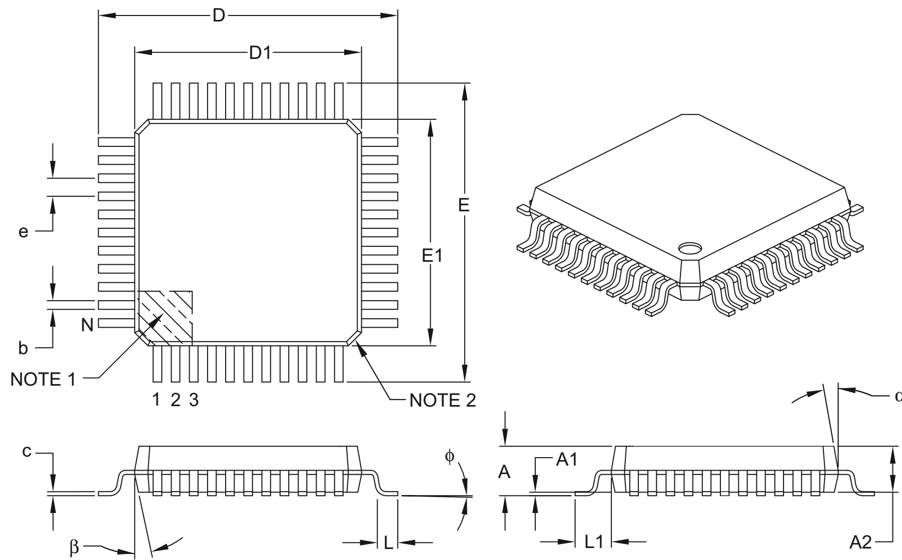
MQFP Family

Metric Quad Flat Packages

Packaging Diagrams and Parameters

44-Lead Plastic Metric Quad Flatpack (KW) – 10x10x2 mm Body, 3.20 mm [MQFP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Leads	N	44		
Lead Pitch	e	0.80 BSC		
Overall Height	A	–	–	2.45
Molded Package Thickness	A2	1.80	2.00	2.20
Standoff §	A1	0.00	–	0.25
Foot Length	L	0.73	0.88	1.03
Footprint	L1	1.60 REF		
Foot Angle	φ	0°	–	7°
Overall Width	E	13.20 BSC		
Overall Length	D	13.20 BSC		
Molded Package Width	E1	10.00 BSC		
Molded Package Length	D1	10.00 BSC		
Lead Thickness	c	0.11	–	0.23
Lead Width	b	0.29	–	0.45
Mold Draft Angle Top	α	5°	–	16°
Mold Draft Angle Bottom	β	5°	–	16°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.
5. § Significant Characteristic.

Microchip Technology Drawing C04-071B

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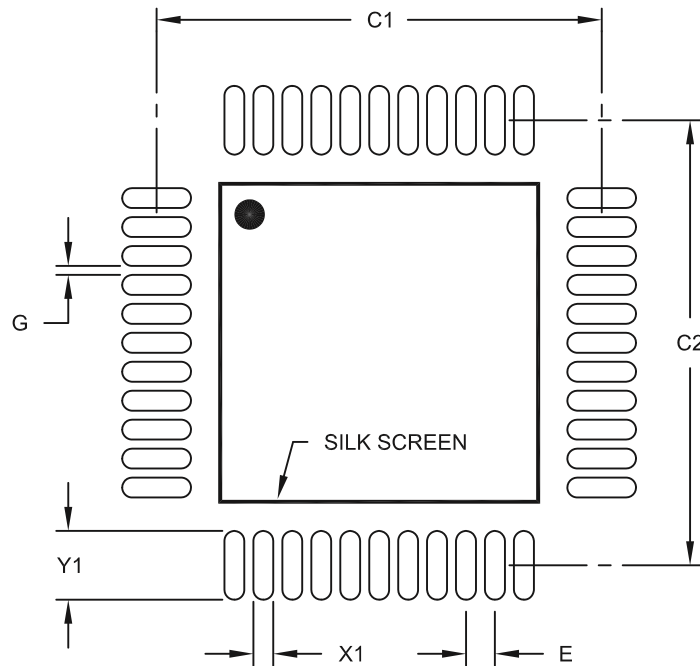
Land Pattern (Footprint)

44-Lead Plastic Metric Quad Flatpack (KW) – 10x10x2 mm Body, 3.20 mm [MQFP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.80 BSC		
Contact Pad Spacing	C1		12.30	
Contact Pad Spacing	C2		12.30	
Contact Pad Width (X44)	X1			0.55
Contact Pad Length (X44)	Y1			1.90
Distance Between Pads	G	0.25		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

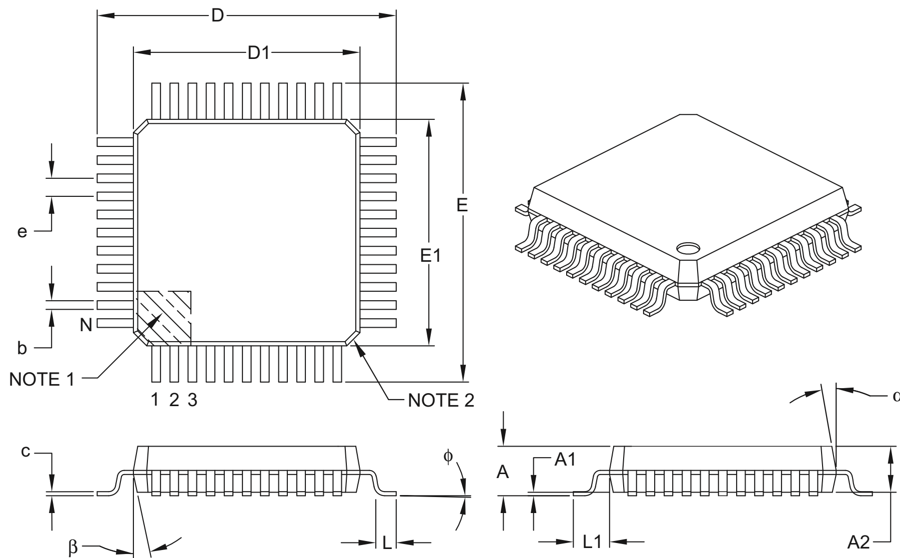
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2071A

Packaging Diagrams and Parameters

44-Lead Plastic Metric Quad Flatpack (PQ) – 10x10x2 mm Body, 3.20 mm [MQFP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Leads	N	44		
Lead Pitch	e	0.80 BSC		
Overall Height	A	–	–	2.45
Molded Package Thickness	A2	1.80	2.00	2.20
Standoff §	A1	0.00	–	0.25
Foot Length	L	0.73	0.88	1.03
Footprint	L1	1.60 REF		
Foot Angle	φ	0°	–	7°
Overall Width	E	13.20 BSC		
Overall Length	D	13.20 BSC		
Molded Package Width	E1	10.00 BSC		
Molded Package Length	D1	10.00 BSC		
Lead Thickness	c	0.11	–	0.23
Lead Width	b	0.29	–	0.45
Mold Draft Angle Top	α	5°	–	16°
Mold Draft Angle Bottom	β	5°	–	16°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.
5. § Significant Characteristic.

Microchip Technology Drawing C04-071B

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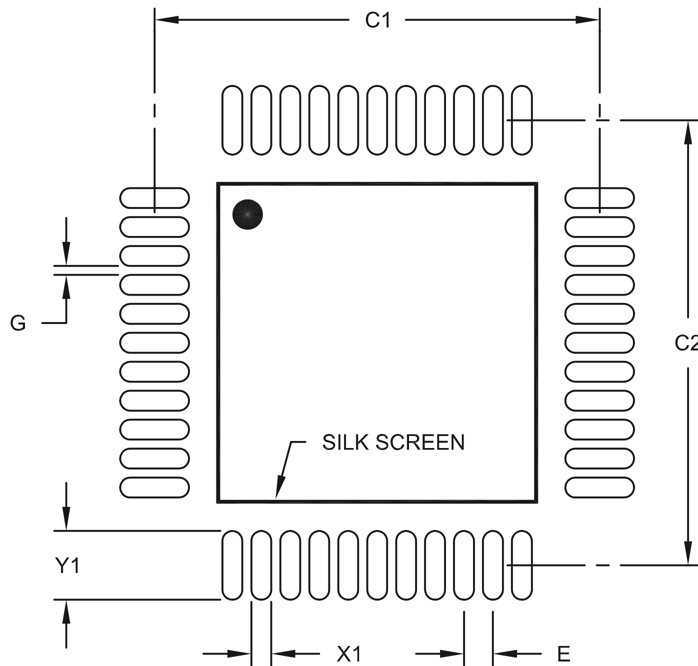
Land Pattern (Footprint)

44-Lead Plastic Metric Quad Flatpack (PQ) – 10x10x2 mm Body, 3.20 mm [MQFP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E	0.80 BSC		
Contact Pad Spacing	C1		12.30	
Contact Pad Spacing	C2		12.30	
Contact Pad Width (X44)	X1			0.55
Contact Pad Length (X44)	Y1			1.90
Distance Between Pads	G	0.25		

Notes:

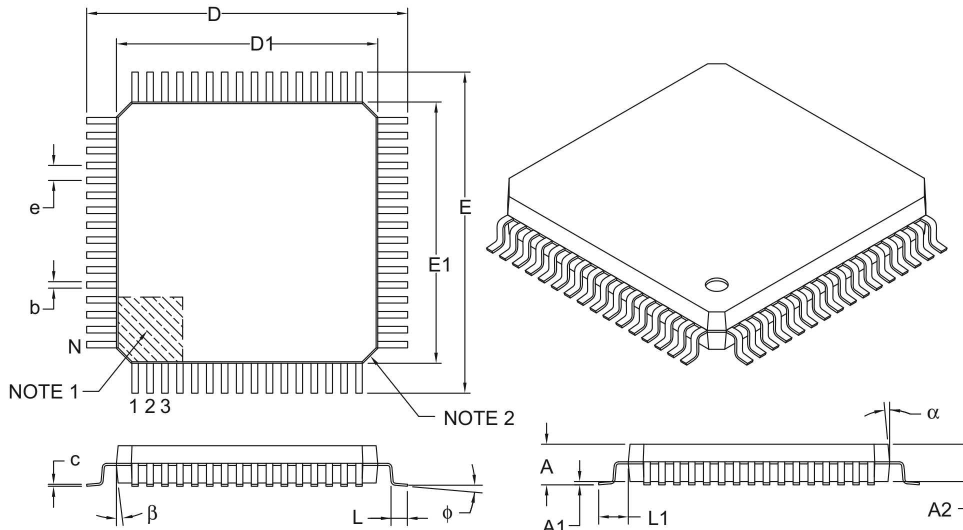
1. Dimensioning and tolerancing per ASME Y14.5M
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2071A

Packaging Diagrams and Parameters

64-Lead Plastic Metric Quad Flatpack (BU) – 14x14x2.7 mm Body, 3.20 mm [MQFP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Leads	N	64		
Lead Pitch	e	0.80 BSC		
Overall Height	A	–	–	3.15
Molded Package Thickness	A2	2.50	2.70	2.90
Standoff §	A1	0.00	–	0.25
Overall Width	E	17.20 BSC		
Molded Package Width	E1	14.00 BSC		
Overall Length	D	17.20 BSC		
Molded Package Length	D1	14.00 BSC		
Foot Length	L	0.73	0.88	1.03
Footprint	L1	1.60 REF		
Foot Angle	φ	0°	–	7°
Lead Thickness	c	0.11	–	0.23
Lead Width	b	0.29	–	0.45
Mold Draft Angle Top	α	5°	–	16°
Mold Draft Angle Bottom	β	5°	–	16°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.
5. § Significant Characteristic.
6. Formerly TelCom PQFP package.

Microchip Technology Drawing C04-022B

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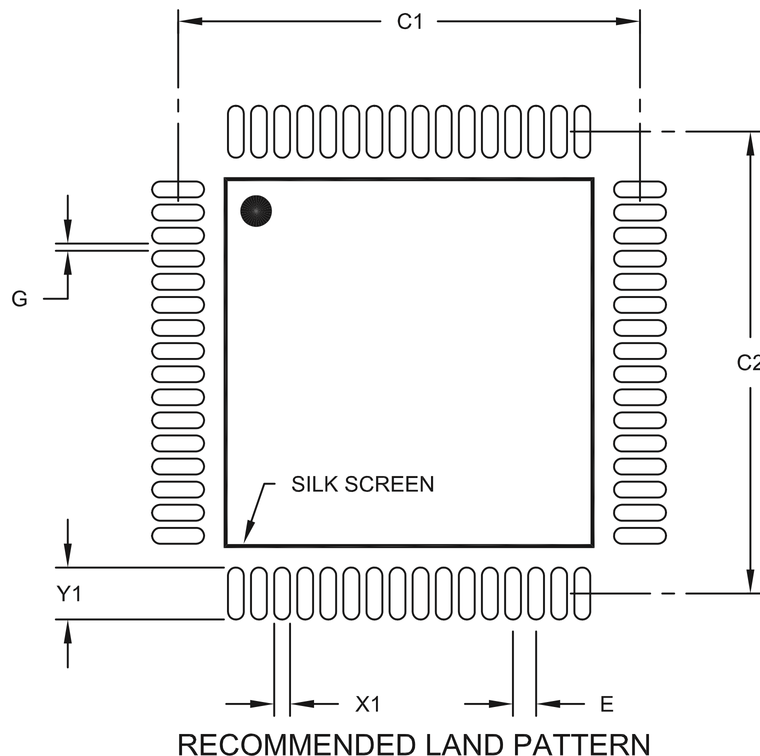
Land Pattern (Footprint)

64-Lead Plastic Metric Quad Flatpack (BU) – 14x14x2.7 mm Body, 3.20 mm [MQFP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.80 BSC		
Contact Pad Spacing	C1		16.10	
Contact Pad Spacing	C2		16.10	
Contact Pad Width (X64)	X1			0.55
Contact Pad Length (X64)	Y1			1.80
Distance Between Pads	G	0.25		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2022A

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NOTES:

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Packaging Diagrams and Parameters

TQFP Family

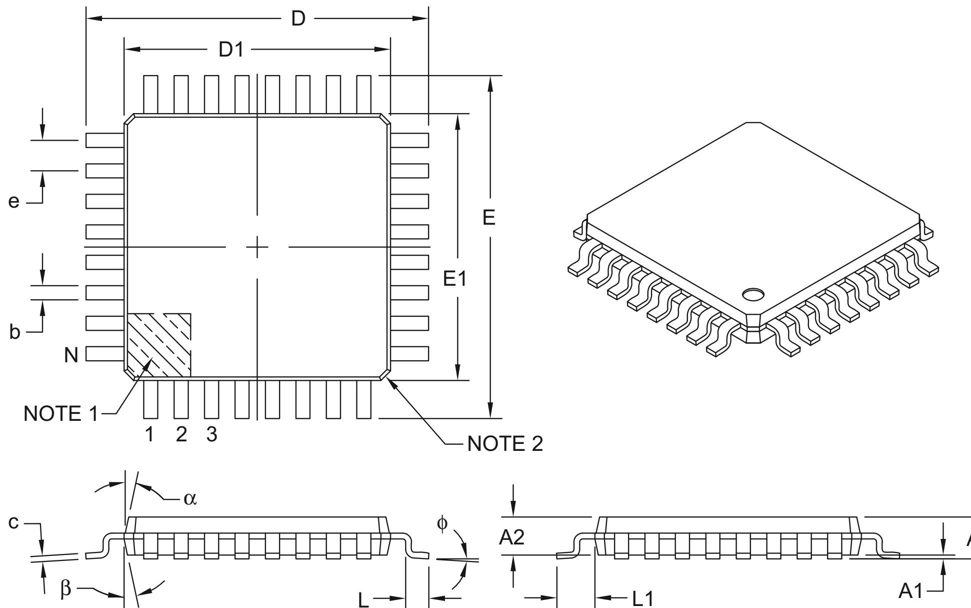
Thin Quad Flat Packages

MICROCHIP

Packaging Diagrams and Parameters

32-Lead Plastic Thin Quad Flatpack (PT) – 7x7x1.0 mm Body, 2.00 mm [TQFP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Leads	N	32		
Lead Pitch	e	0.80 BSC		
Overall Height	A	–	–	1.20
Standoff	A1	0.05	–	0.15
Molded Package Thickness	A2	0.95	1.00	1.05
Foot Length	L	0.45	0.60	0.75
Footprint	L1	1.00 REF		
Foot Angle	φ	0°	3.5°	7°
Overall Width	E	9.00 BSC		
Overall Length	D	9.00 BSC		
Molded Package Width	E1	7.00 BSC		
Molded Package Length	D1	7.00 BSC		
Lead Thickness	c	0.09	–	0.20
Lead Width	b	0.30	0.37	0.45
Mold Draft Angle Top	α	11°	12°	13°
Mold Draft Angle Bottom	β	11°	12°	13°

Notes:
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-074B

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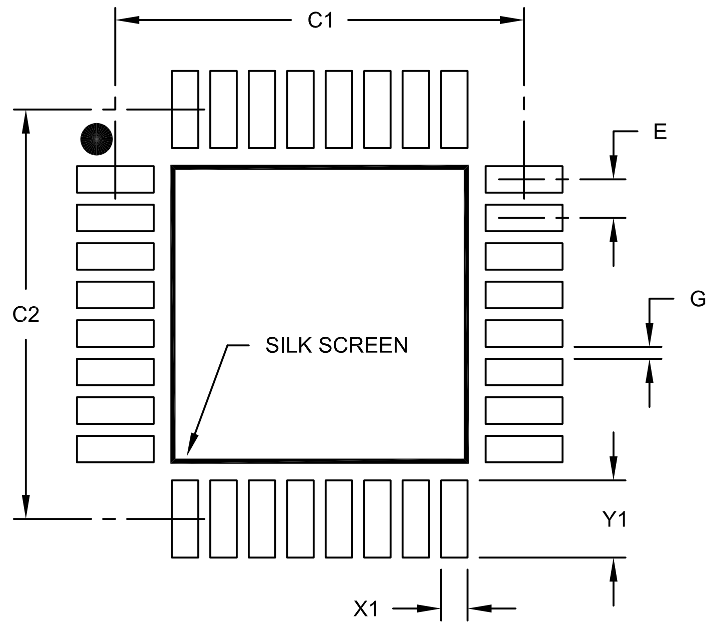
Land Pattern (Footprint)

32-Lead Plastic Thin Quad Flatpack (PT) - 7x7x1.0 mm Body, 2.00 mm Footprint [TQFP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.80 BSC		
Contact Pad Spacing	C1		8.50	
Contact Pad Spacing	C2		8.50	
Contact Pad Width (X32)	X1			0.55
Contact Pad Length (X32)	Y1			1.60
Distance Between Pads	G	0.25		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

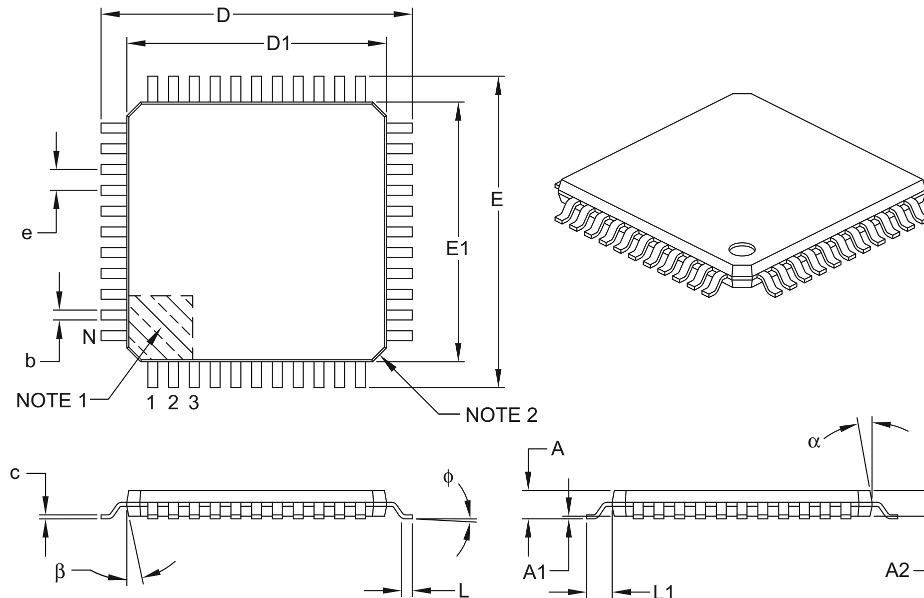
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2074A

Packaging Diagrams and Parameters

44-Lead Plastic Thin Quad Flatpack (PT) – 10x10x1 mm Body, 2.00 mm [TQFP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Leads	N	44		
Lead Pitch	e	0.80 BSC		
Overall Height	A	–	–	1.20
Molded Package Thickness	A2	0.95	1.00	1.05
Standoff	A1	0.05	–	0.15
Foot Length	L	0.45	0.60	0.75
Footprint	L1	1.00 REF		
Foot Angle	φ	0°	3.5°	7°
Overall Width	E	12.00 BSC		
Overall Length	D	12.00 BSC		
Molded Package Width	E1	10.00 BSC		
Molded Package Length	D1	10.00 BSC		
Lead Thickness	c	0.09	–	0.20
Lead Width	b	0.30	0.37	0.45
Mold Draft Angle Top	α	11°	12°	13°
Mold Draft Angle Bottom	β	11°	12°	13°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-076B

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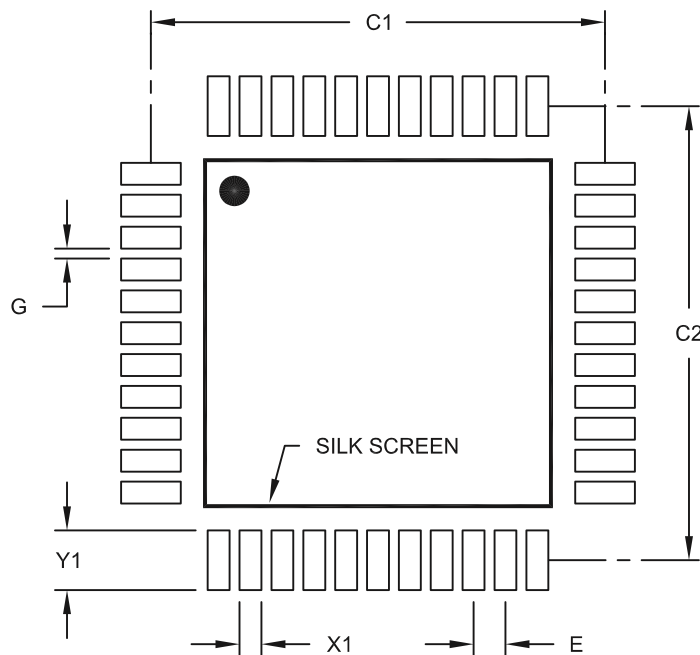
Land Pattern (Footprint)

44-Lead Plastic Thin Quad Flatpack (PT) – 10x10x1 mm Body, 2.00 mm [TQFP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.80 BSC		
Contact Pad Spacing	C1		11.40	
Contact Pad Spacing	C2		11.40	
Contact Pad Width (X44)	X1			0.55
Contact Pad Length (X44)	Y1			1.50
Distance Between Pads	G	0.25		

Notes:

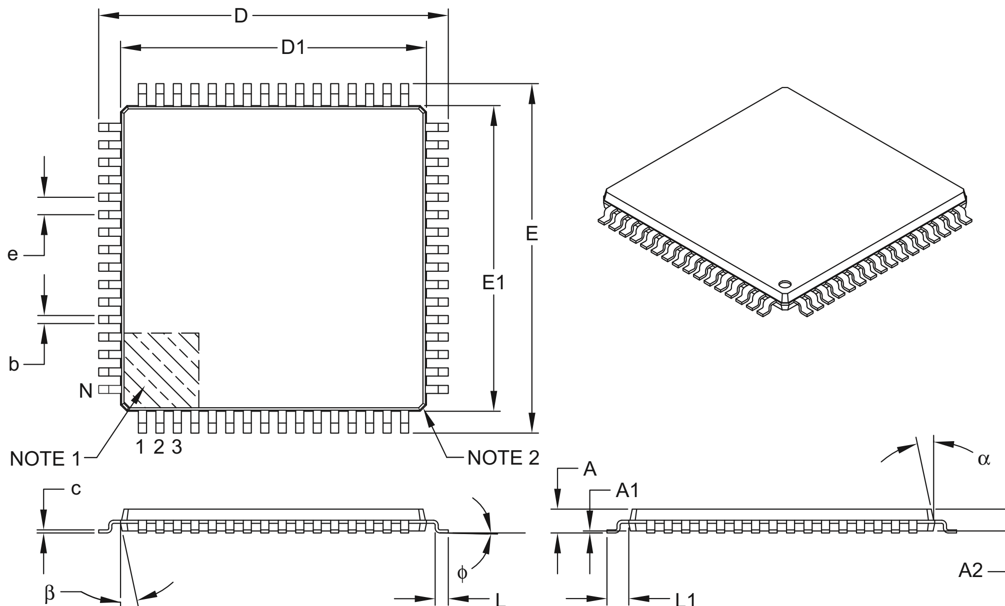
1. Dimensioning and tolerancing per ASME Y14.5M
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2076A

Packaging Diagrams and Parameters

64-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 2.00 mm [TQFP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Leads	N	64		
Lead Pitch	e	0.80 BSC		
Overall Height	A	–	–	1.20
Molded Package Thickness	A2	0.95	1.00	1.05
Standoff	A1	0.05	–	0.15
Foot Length	L	0.45	0.60	0.75
Footprint	L1	1.00 REF		
Foot Angle	φ	0°	3.5°	7°
Overall Width	E	16.00 BSC		
Overall Length	D	16.00 BSC		
Molded Package Width	E1	14.00 BSC		
Molded Package Length	D1	14.00 BSC		
Lead Thickness	c	0.09	–	0.20
Lead Width	b	0.30	0.37	0.45
Mold Draft Angle Top	α	11°	12°	13°
Mold Draft Angle Bottom	β	11°	12°	13°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-066B

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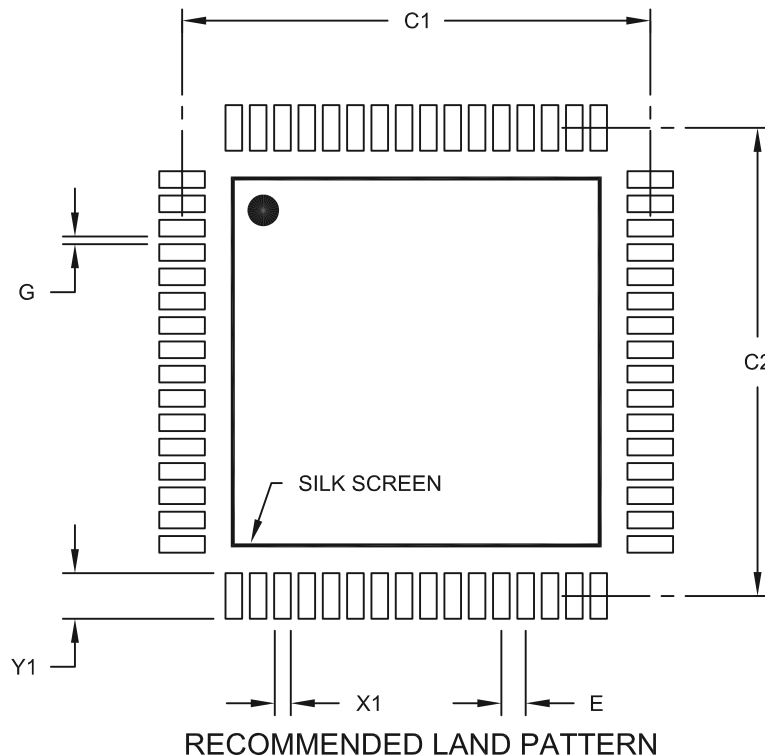
Land Pattern (Footprint)

64-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 2.00 mm [TQFP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.80 BSC		
Contact Pad Spacing	C1		15.40	
Contact Pad Spacing	C2		15.40	
Contact Pad Width (X64)	X1			0.55
Contact Pad Length (X64)	Y1			1.50
Distance Between Pads	G	0.25		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

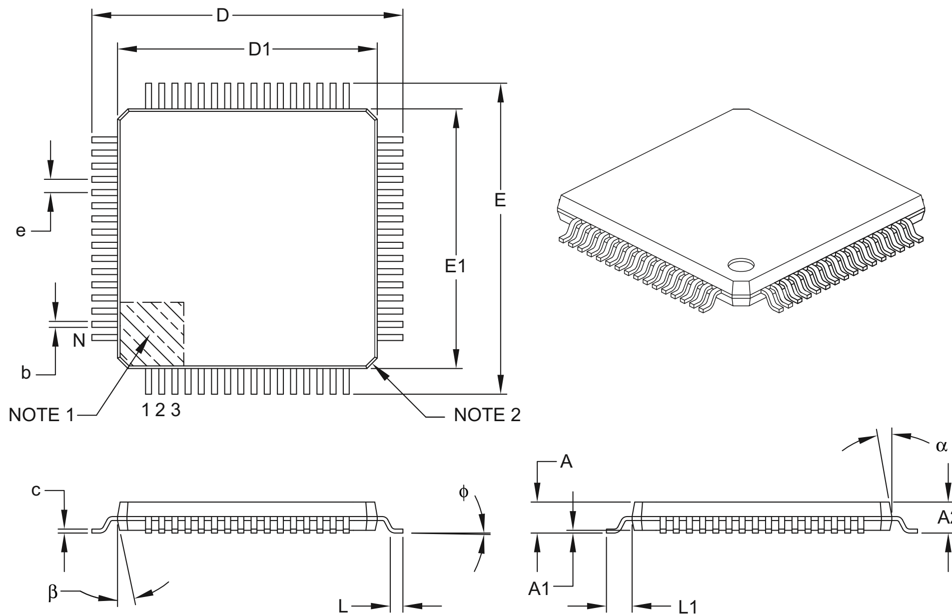
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2066A

Packaging Diagrams and Parameters

64-Lead Plastic Thin Quad Flatpack (PT) – 10x10x1 mm Body, 2.00 mm [TQFP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Leads	N	64		
Lead Pitch	e	0.50 BSC		
Overall Height	A	–	–	1.20
Molded Package Thickness	A2	0.95	1.00	1.05
Standoff	A1	0.05	–	0.15
Foot Length	L	0.45	0.60	0.75
Footprint	L1	1.00 REF		
Foot Angle	φ	0°	3.5°	7°
Overall Width	E	12.00 BSC		
Overall Length	D	12.00 BSC		
Molded Package Width	E1	10.00 BSC		
Molded Package Length	D1	10.00 BSC		
Lead Thickness	c	0.09	–	0.20
Lead Width	b	0.17	0.22	0.27
Mold Draft Angle Top	α	11°	12°	13°
Mold Draft Angle Bottom	β	11°	12°	13°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-085B

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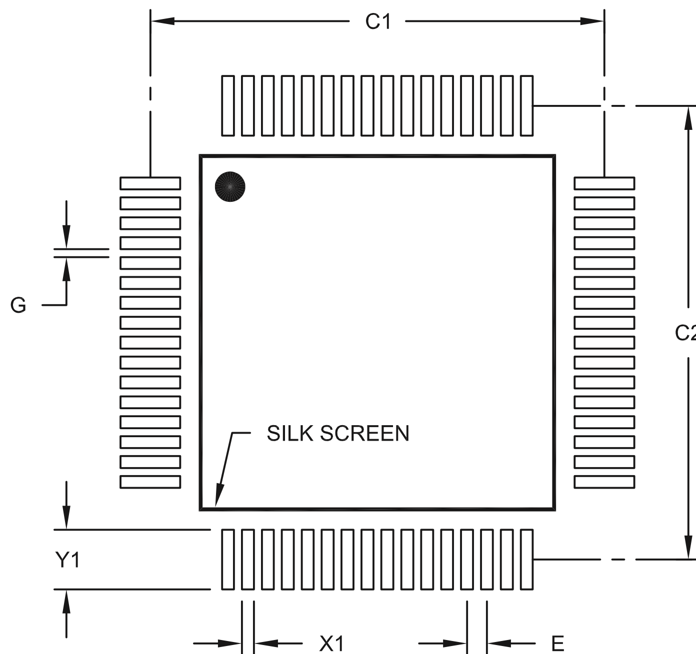
Land Pattern (Footprint)

64-Lead Plastic Thin Quad Flatpack (PT) – 10x10x1 mm Body, 2.00 mm [TQFP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.50 BSC		
Contact Pad Spacing	C1		11.40	
Contact Pad Spacing	C2		11.40	
Contact Pad Width (X64)	X1			0.30
Contact Pad Length (X64)	Y1			1.50
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2085A

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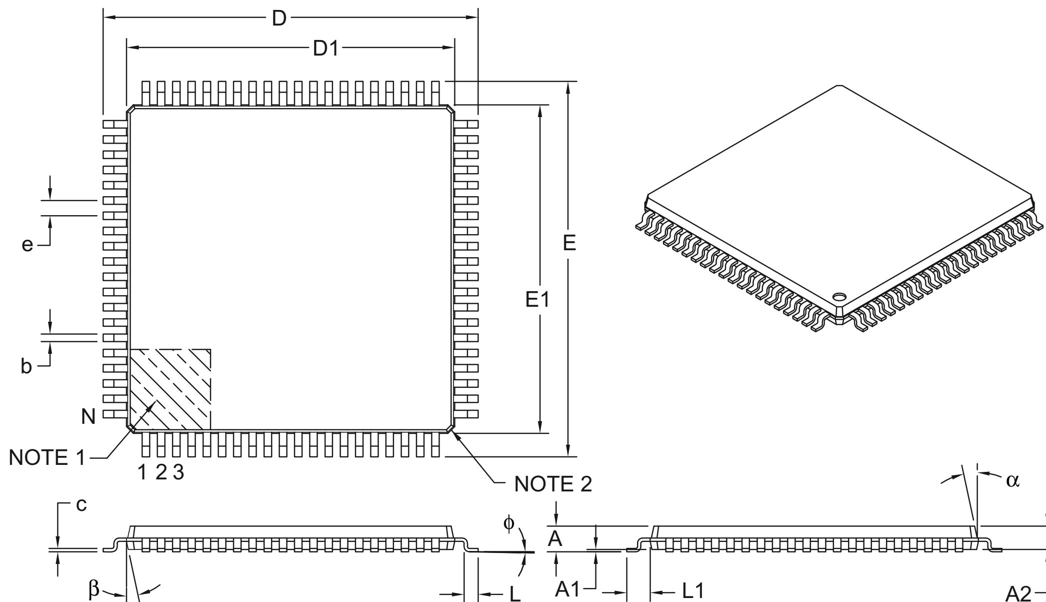
Packaging Diagrams and Parameters

80-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 2.00 mm [TQFP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Leads	N	80		
Lead Pitch	e	0.65 BSC		
Overall Height	A	–	–	1.20
Molded Package Thickness	A2	0.95	1.00	1.05
Standoff	A1	0.05	–	0.15
Foot Length	L	0.45	0.60	0.75
Footprint	L1	1.00 REF		
Foot Angle	φ	0°	3.5°	7°
Overall Width	E	16.00 BSC		
Overall Length	D	16.00 BSC		
Molded Package Width	E1	14.00 BSC		
Molded Package Length	D1	14.00 BSC		
Lead Thickness	c	0.09	–	0.20
Lead Width	b	0.22	0.32	0.38
Mold Draft Angle Top	α	11°	12°	13°
Mold Draft Angle Bottom	β	11°	12°	13°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-116B

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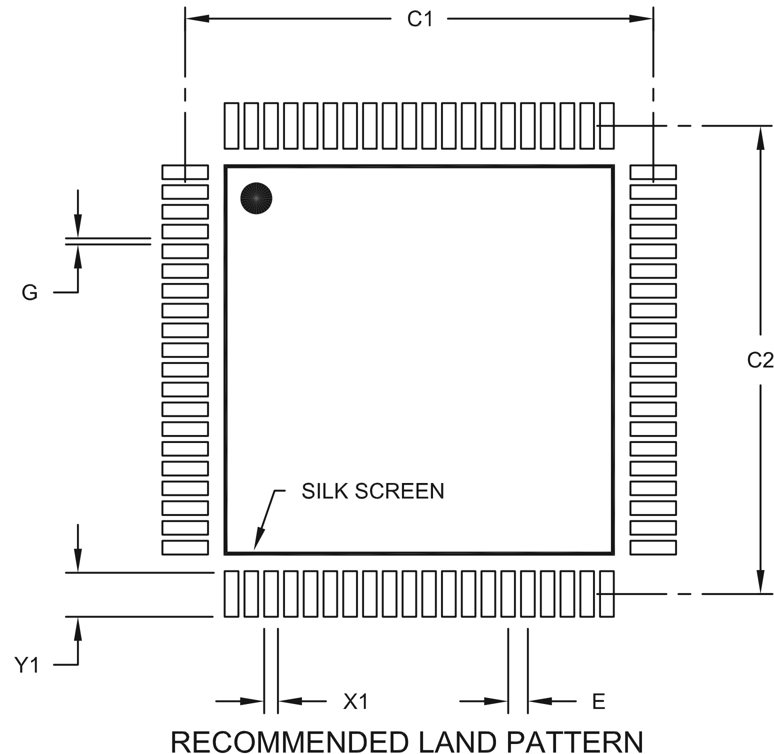
Land Pattern (Footprint)

80-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 2.00 mm Footprint [TQFP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E		0.65 BSC	
Contact Pad Spacing	C1		15.40	
Contact Pad Spacing	C2		15.40	
Contact Pad Width (X80)	X1			0.45
Contact Pad Length (X80)	Y1			1.50
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

    BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2116B

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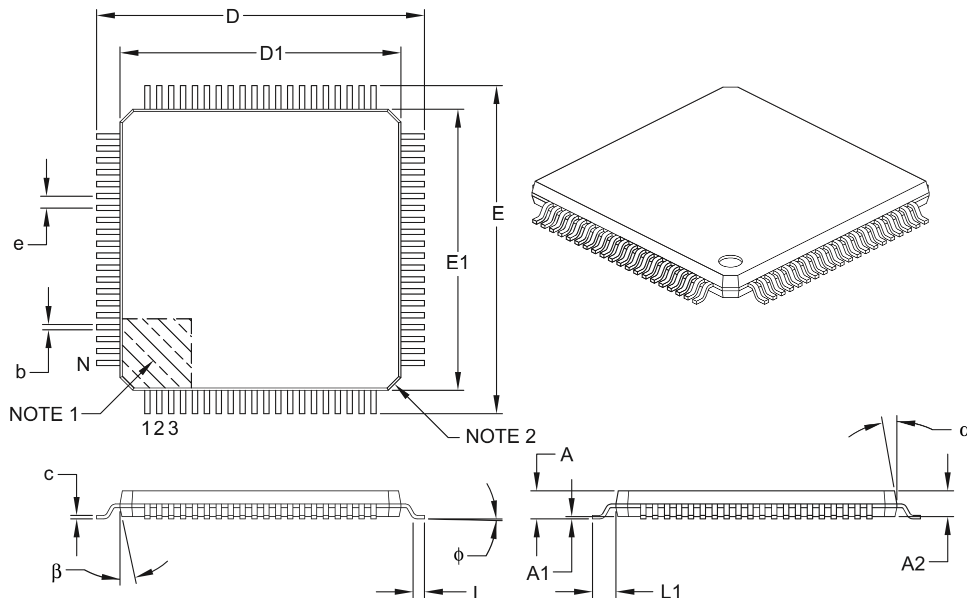
Packaging Diagrams and Parameters

80-Lead Plastic Thin Quad Flatpack (PT) – 12x12x1 mm Body, 2.00 mm [TQFP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Leads	N	80		
Lead Pitch	e	0.50 BSC		
Overall Height	A	–	–	1.20
Molded Package Thickness	A2	0.95	1.00	1.05
Standoff	A1	0.05	–	0.15
Foot Length	L	0.45	0.60	0.75
Footprint	L1	1.00 REF		
Foot Angle	φ	0°	3.5°	7°
Overall Width	E	14.00 BSC		
Overall Length	D	14.00 BSC		
Molded Package Width	E1	12.00 BSC		
Molded Package Length	D1	12.00 BSC		
Lead Thickness	c	0.09	–	0.20
Lead Width	b	0.17	0.22	0.27
Mold Draft Angle Top	α	11°	12°	13°
Mold Draft Angle Bottom	β	11°	12°	13°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-092B

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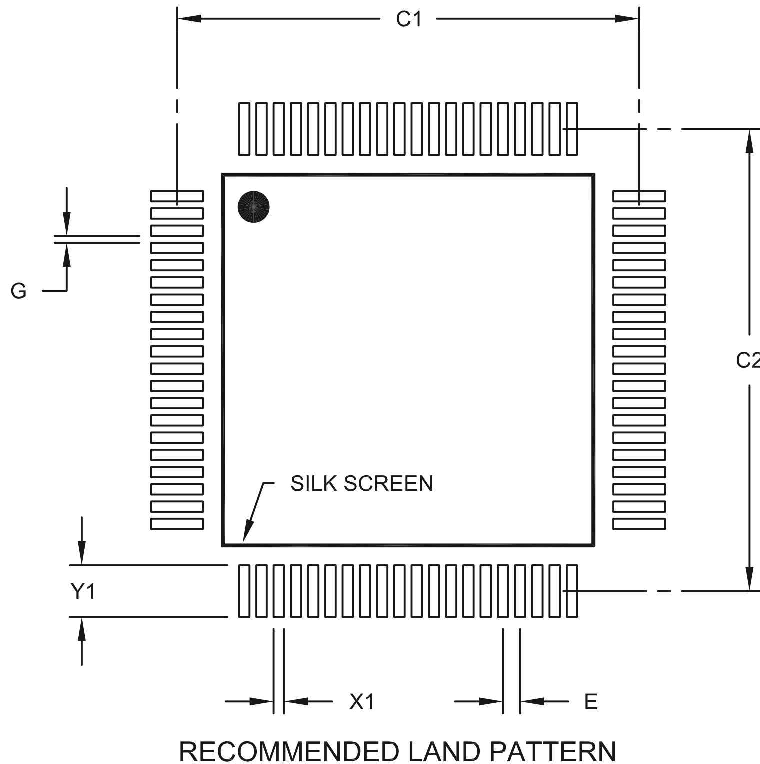
Land Pattern (Footprint)

80-Lead Plastic Thin Quad Flatpack (PT) – 12x12x1 mm Body, 2.00 mm [TQFP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.50 BSC		
Contact Pad Spacing	C1		13.40	
Contact Pad Spacing	C2		13.40	
Contact Pad Width (X80)	X1			0.30
Contact Pad Length (X80)	Y1			1.50
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

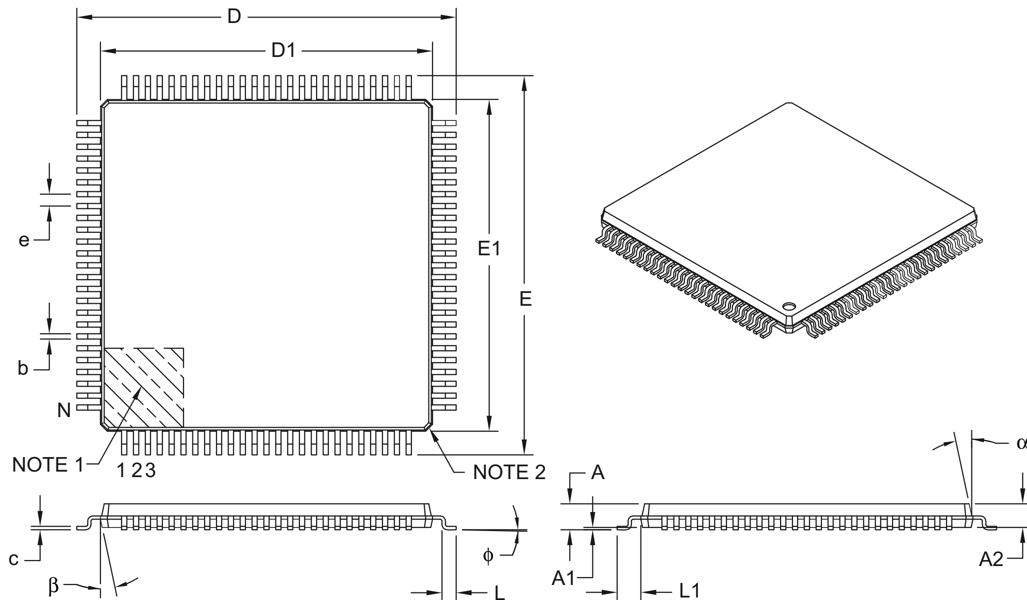
Microchip Technology Drawing No. C04-2092A

MICROCHIP

Packaging Diagrams and Parameters

100-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 2.00 mm [TQFP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Leads	N	100		
Lead Pitch	e	0.50 BSC		
Overall Height	A	–	–	1.20
Molded Package Thickness	A2	0.95	1.00	1.05
Standoff	A1	0.05	–	0.15
Foot Length	L	0.45	0.60	0.75
Footprint	L1	1.00 REF		
Foot Angle	φ	0°	3.5°	7°
Overall Width	E	16.00 BSC		
Overall Length	D	16.00 BSC		
Molded Package Width	E1	14.00 BSC		
Molded Package Length	D1	14.00 BSC		
Lead Thickness	c	0.09	–	0.20
Lead Width	b	0.17	0.22	0.27
Mold Draft Angle Top	α	11°	12°	13°
Mold Draft Angle Bottom	β	11°	12°	13°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-110B

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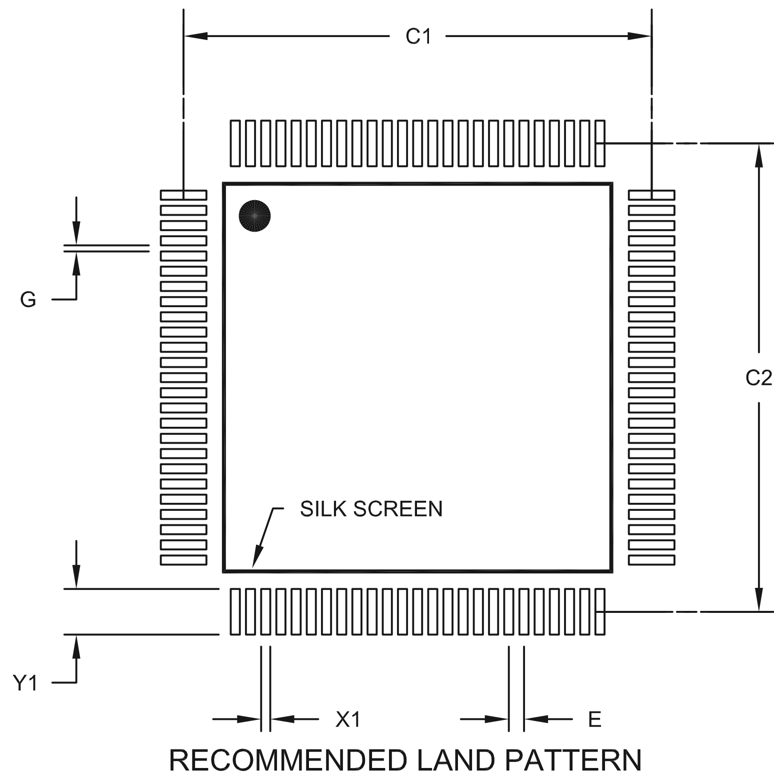
Land Pattern (Footprint)

100-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 2.00 mm [TQFP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E	0.50 BSC		
Contact Pad Spacing	C1		15.40	
Contact Pad Spacing	C2		15.40	
Contact Pad Width (X100)	X1			0.30
Contact Pad Length (X100)	Y1			1.50
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

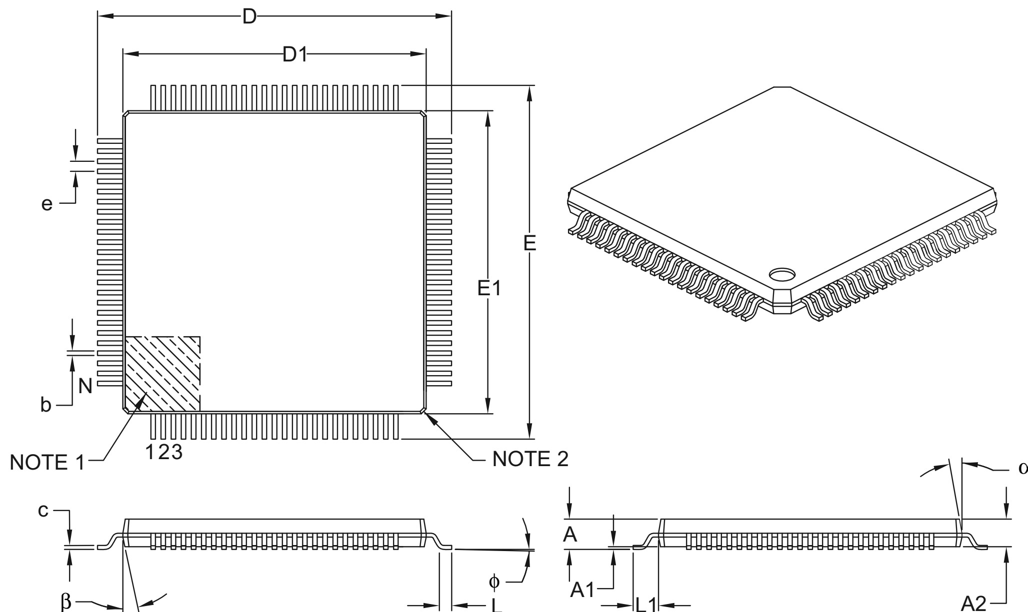
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2110A

Packaging Diagrams and Parameters

100-Lead Plastic Thin Quad Flatpack (PT) – 12x12x1 mm Body, 2.00 mm [TQFP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Leads	N	100		
Lead Pitch	e	0.40 BSC		
Overall Height	A	–	–	1.20
Molded Package Thickness	A2	0.95	1.00	1.05
Standoff	A1	0.05	–	0.15
Foot Length	L	0.45	0.60	0.75
Footprint	L1	1.00 REF		
Foot Angle	φ	0°	3.5°	7°
Overall Width	E	14.00 BSC		
Overall Length	D	14.00 BSC		
Molded Package Width	E1	12.00 BSC		
Molded Package Length	D1	12.00 BSC		
Lead Thickness	c	0.09	–	0.20
Lead Width	b	0.13	0.18	0.23
Mold Draft Angle Top	α	11°	12°	13°
Mold Draft Angle Bottom	β	11°	12°	13°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-100B

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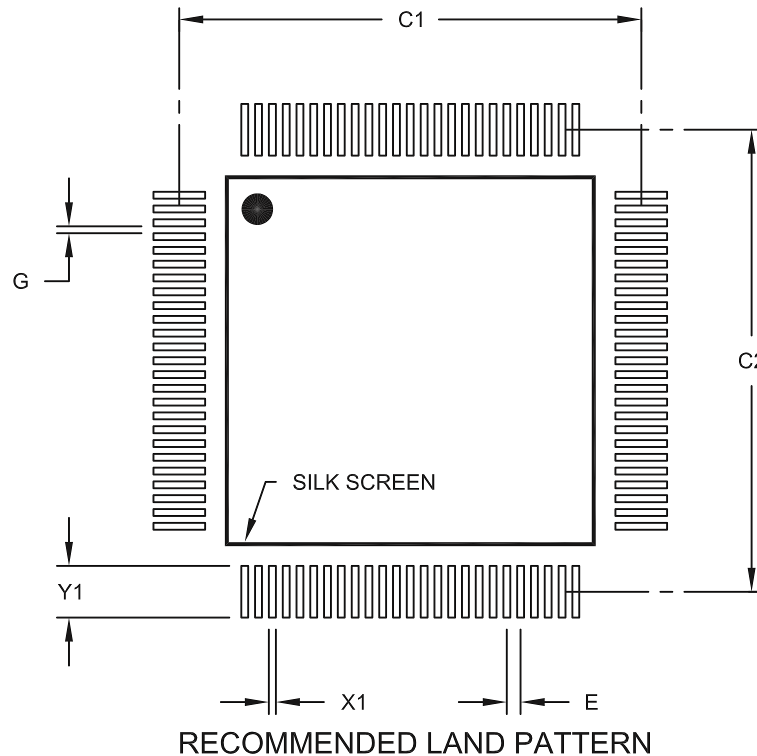
Land Pattern (Footprint)

100-Lead Plastic Thin Quad Flatpack (PT) – 12x12x1 mm Body, 2.00 mm [TQFP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E		0.40 BSC	
Contact Pad Spacing	C1		13.40	
Contact Pad Spacing	C2		13.40	
Contact Pad Width (X100)	X1			0.20
Contact Pad Length (X100)	Y1			1.50
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

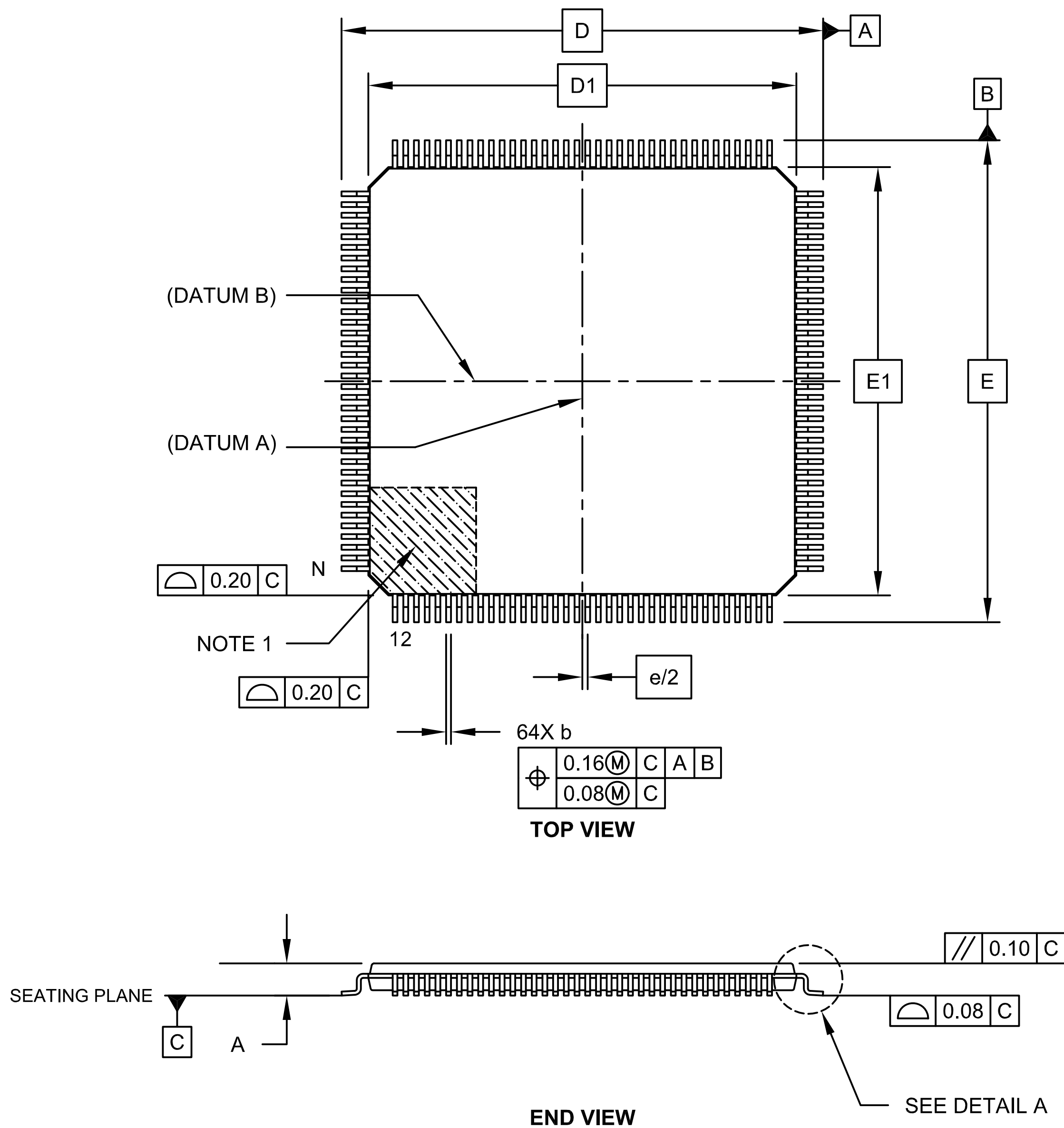
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2100A

Packaging Diagrams and Parameters

144-Lead Plastic Thin Quad Flatpack (PH)-16x16x1mm Body, 2.00 mm Footprint [TQFP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing C04-155A Sheet 1 of 2

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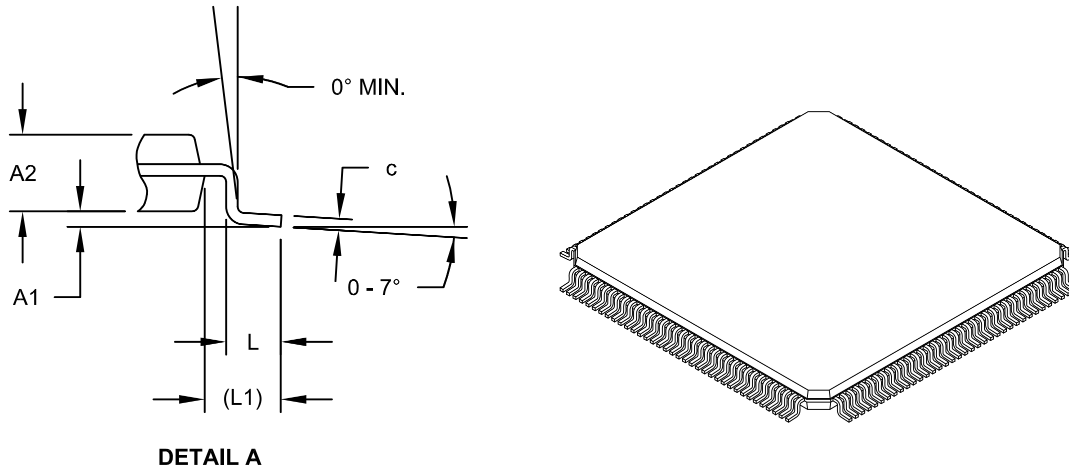
Packaging Diagrams and Parameters

144-Lead Plastic Thin Quad Flatpack (PH)-16x16x1mm Body, 2.00 mm Footprint [TQFP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	144		
Lead Pitch	e	0.40 BSC		
Overall Height	A	-	-	1.20
Molded PackageThickness	A2	0.95	1.00	1.05
Standoff	A1	0.05	-	0.15
Foot Length	L	0.45	0.60	0.75
Footprint	L1	1.00 REF		
Overall Width	D	18.00 BSC		
Overall Length	E	18.00 BSC		
Molded Body Width	D1	16.00 BSC		
Molded Body Length	E1	16.00 BSC		
Lead Thickness	c	0.09	-	0.20
Lead Width	b	0.13	-	0.23

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

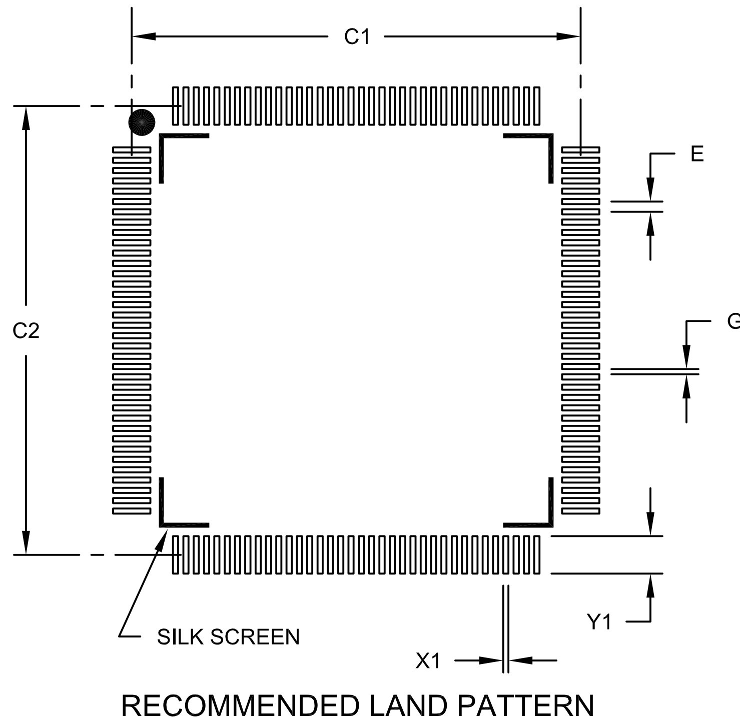
Microchip Technology Drawing C04-155A Sheet 2 of 2

MICROCHIP

Land Pattern (Footprint)

144-Lead Plastic Thin Quad Flat Pack (PH) - 16x16 mm Body, 2.00 mm Footprint [TQFP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E	0.40 BSC		
Contact Pad Spacing	C1		17.40	
Contact Pad Spacing	C2		17.40	
Contact Pad Width (X144)	X1			0.20
Contact Pad Length (X144)	Y1			1.45
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2155A

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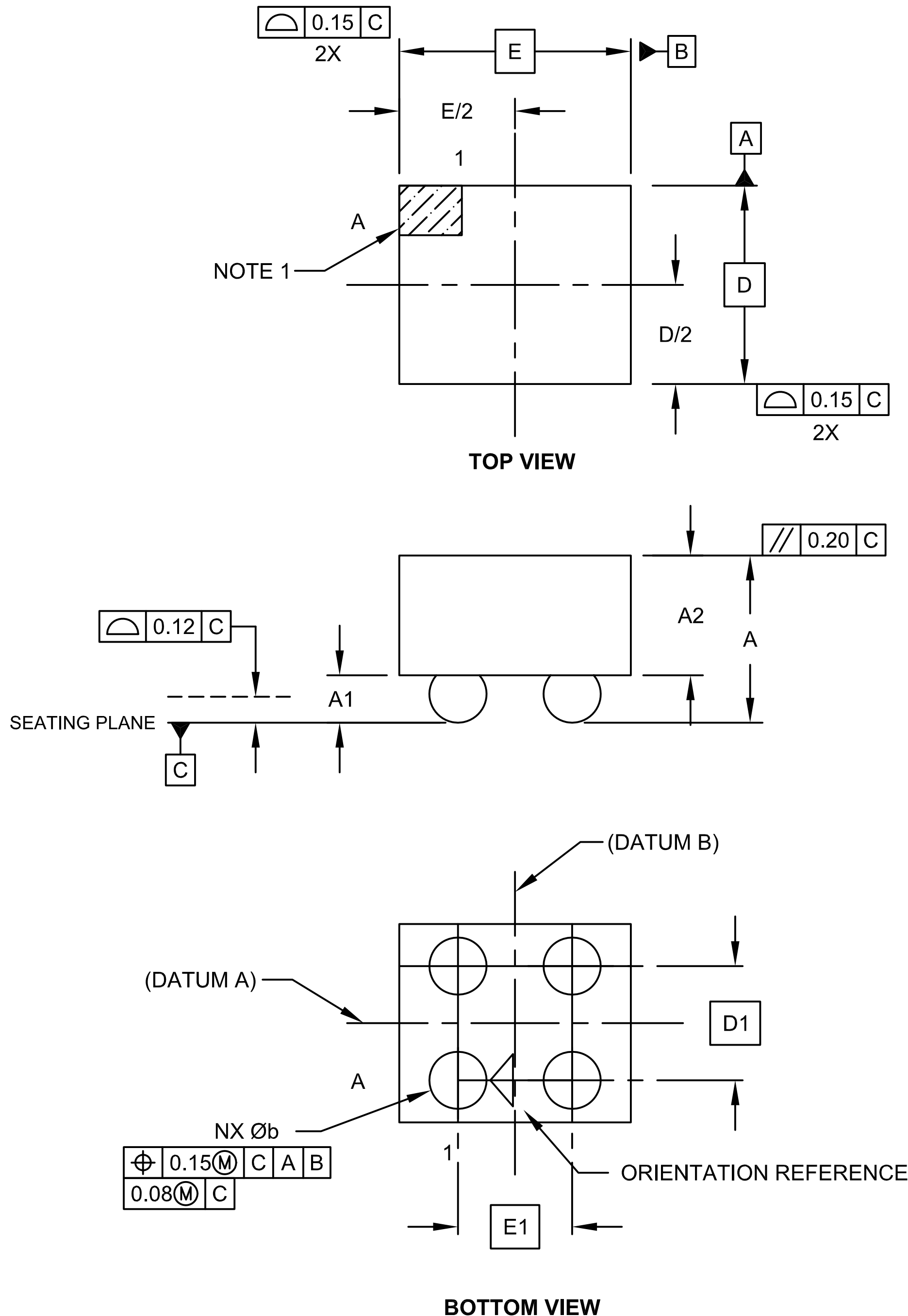
Packaging Diagrams and Parameters

CSP Family

Chip Scale Packages

4-Lead Chip Scale Package (CS) - [CSP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing C04-6005D Sheet 1 of 2

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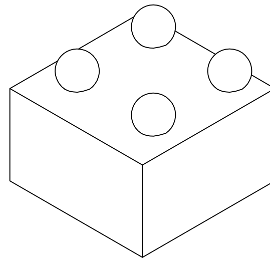
Packaging Diagrams and Parameters

4-Lead Chip Scale Package (CS) - [CSP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Contacts	N		4	
Adjacent Column X-Pitch	E1	0.400 BSC		
Adjacent Row Y-Pitch	D1	0.400 BSC		
Overall Height	A	0.47	0.51	0.55
Die Height	A2	0.33	0.35	0.37
Bump Height	A1	0.14	0.16	0.18
Overall Length	E	NOTE 4		
Overall Width	D	NOTE 4		
Ball Diameter	b	0.18	0.200	0.22

Notes:

1. Orientation reference feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.
4. Package size varies with specific devices. Please contact our local Microchip representative for specific details.

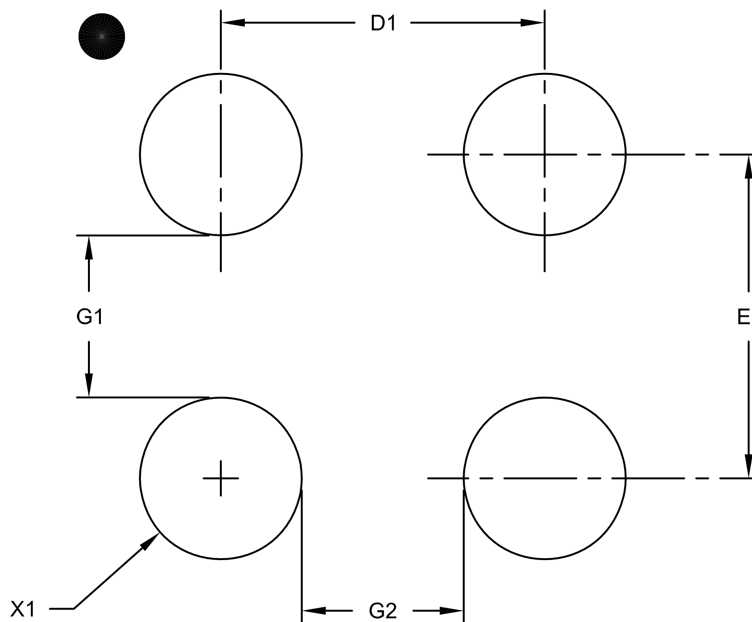
Microchip Technology Drawing C04-6005D Sheet 2 of 2

MICROCHIP

Land Pattern (Footprint)

4-Lead Chip Scale Package (CS) - [CSP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Contacts	N		4	
Contact Pad Spacing	E1		0.40	
Contact Pad Spacing	D1		0.40	
Contact Pad Diameter (X4)	X1			0.20
Distance Between Pads	G1	0.24		
Distance Between Pads	G2	0.24		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-8005A

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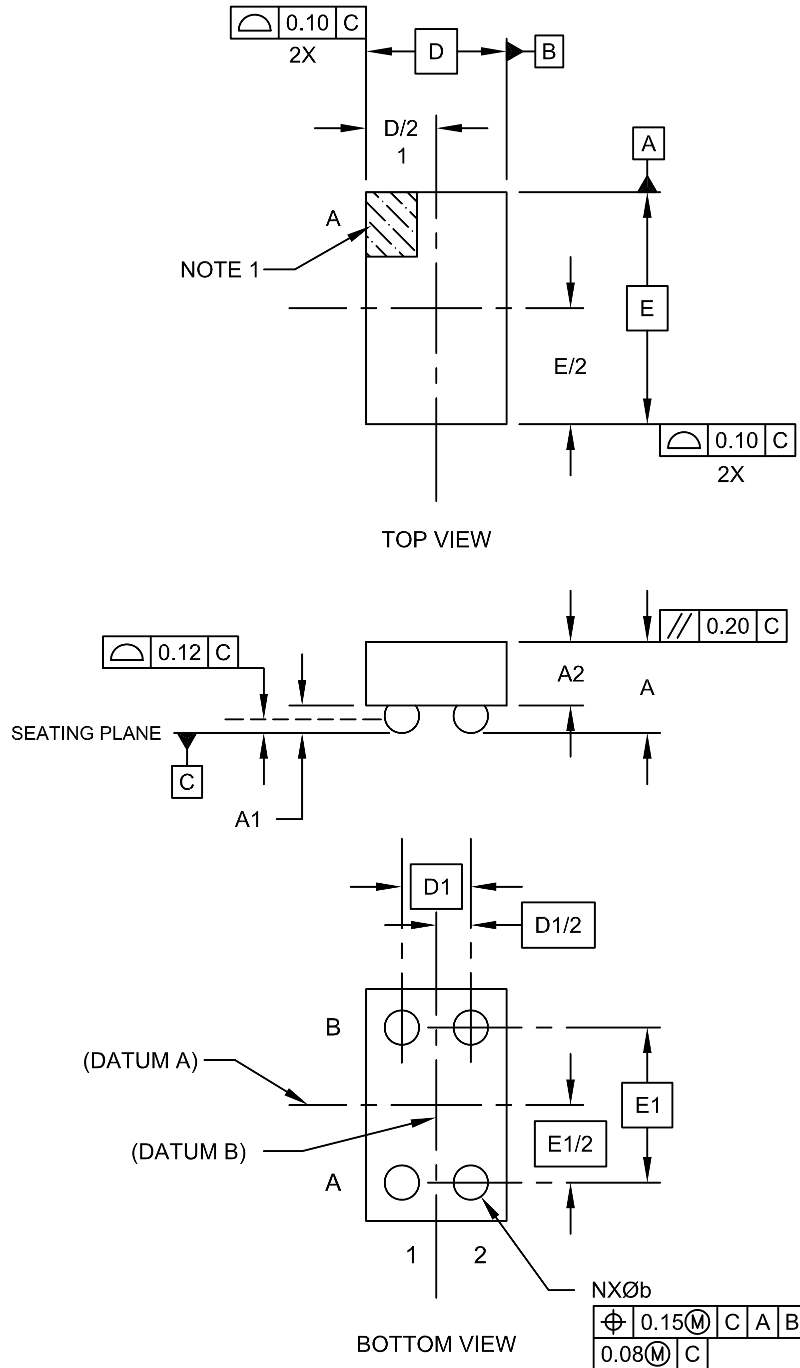
Packaging Diagrams and Parameters

4-Lead Chip Scale Package (CS) - [CSP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing C04-6008A Sheet 1 of 2

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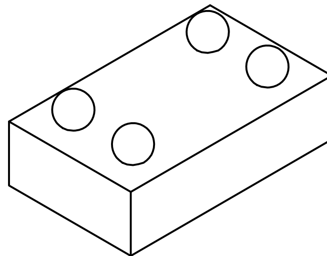
Packaging Diagrams and Parameters

4-Lead Chip Scale Package (CS) - [CSP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Contacts	N		4	
Adjacent Column X-Pitch	D1	0.400 BSC		
Adjacent Row Y-Pitch	E1	0.900 BSC		
Overall Height	A	0.47	0.51	0.55
Die Height	A2	0.33	0.35	0.37
Bump Height	A1	0.14	0.16	0.18
Overall Width	D	NOTE 4		
Overall Length	E	NOTE 4		
Ball Diameter	b	0.18	0.20	0.22

Notes:
1. Orientation reference feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.
4. Package size varies with specific devices. Please see the specific Product Data Sheet.

Microchip Technology Drawing C04-6008A Sheet 2 of 2

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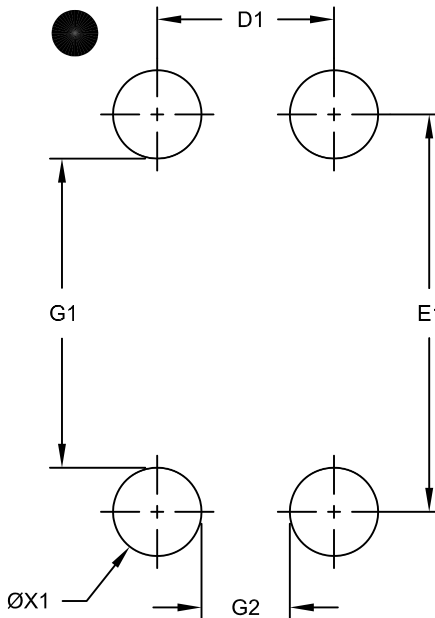
Land Pattern (Footprint)

4-Lead Chip Scale Package (CS) - [CSP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Contacts	N		4	
Contact Pad Spacing	D1		0.40	
Contact Pad Spacing	E1		0.90	
Contact Pad Diameter (X4)	ØX1		0.20	
Distance Between Pads	G1		0.70	
Distance Between Pads	G2		0.20	

Notes:

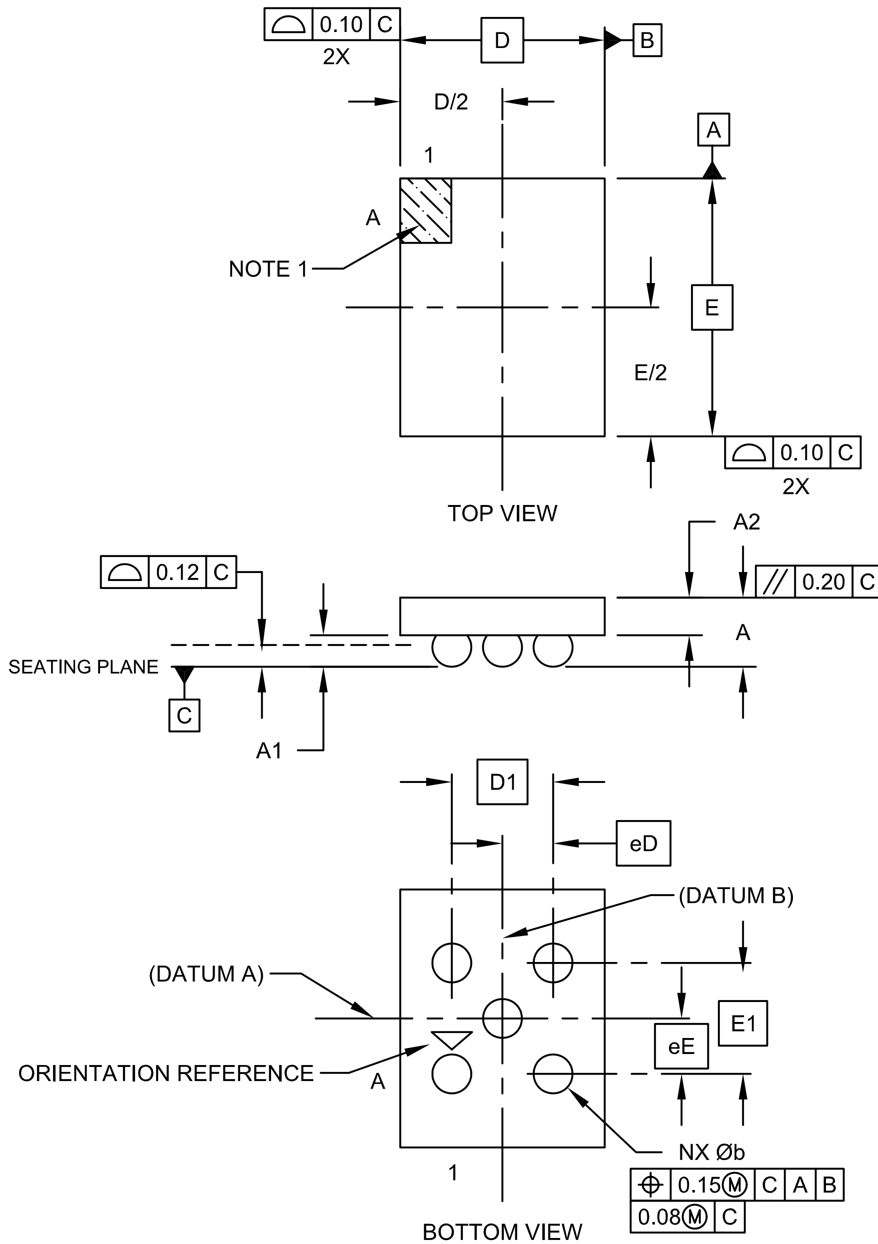
1. Dimensioning and tolerancing per ASME Y14.5M
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-8008A

Packaging Diagrams and Parameters

5-Lead Chip Scale Package (CS) - [CSP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing C04-6004D Sheet 1 of 2

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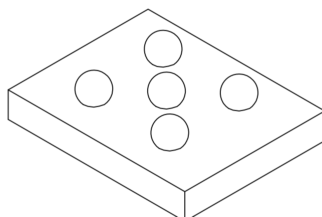
Packaging Diagrams and Parameters

5-Lead Chip Scale Package (CS) - [CSP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Number of Contacts	N		5	
Adjacent Column X-Pitch	E1		0.570 BSC	
Adjacent Row Y-Pitch	D1		0.520 BSC	
Adjacent Column X-Pitch	eE		0.285 BSC	
Adjacent Row Y-Pitch	eD		0.260 BSC	
Overall Height	A	0.47	0.51	0.55
Die Height	A2	0.33	0.35	0.37
Bump Height	A1	0.14	0.16	0.18
Overall Length	E		NOTE 4	
Overall Width	D		NOTE 4	
Ball Diameter	b	0.18	0.20	0.22

Notes:

1. Orientation reference feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.
4. Package size varies with specific devices. Please see the specific Product Data Sheet.

Microchip Technology Drawing C04-6004D Sheet 2 of 2

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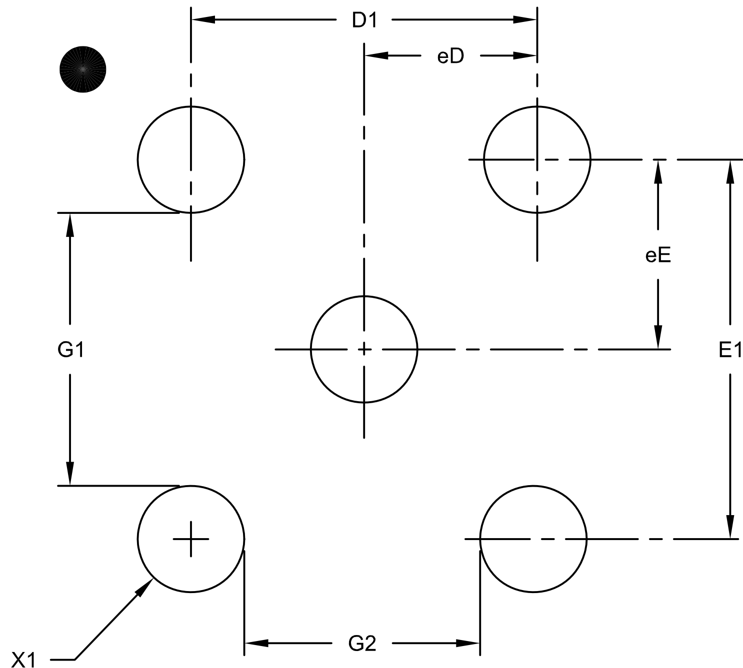
Land Pattern (Footprint)

5-Lead Chip Scale Package (CS) - [CSP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Contacts	N		5	
Contact Pitch Y	eE		0.285	
Contact Pitch X	eD		0.260	
Contact Pad Spacing	E1		0.570	
Contact Pad Spacing	D1		0.520	
Contact Pad Diameter (X5)	X1			0.20
Distance Between Pads	G1	0.41		
Distance Between Pads	G2	0.36		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

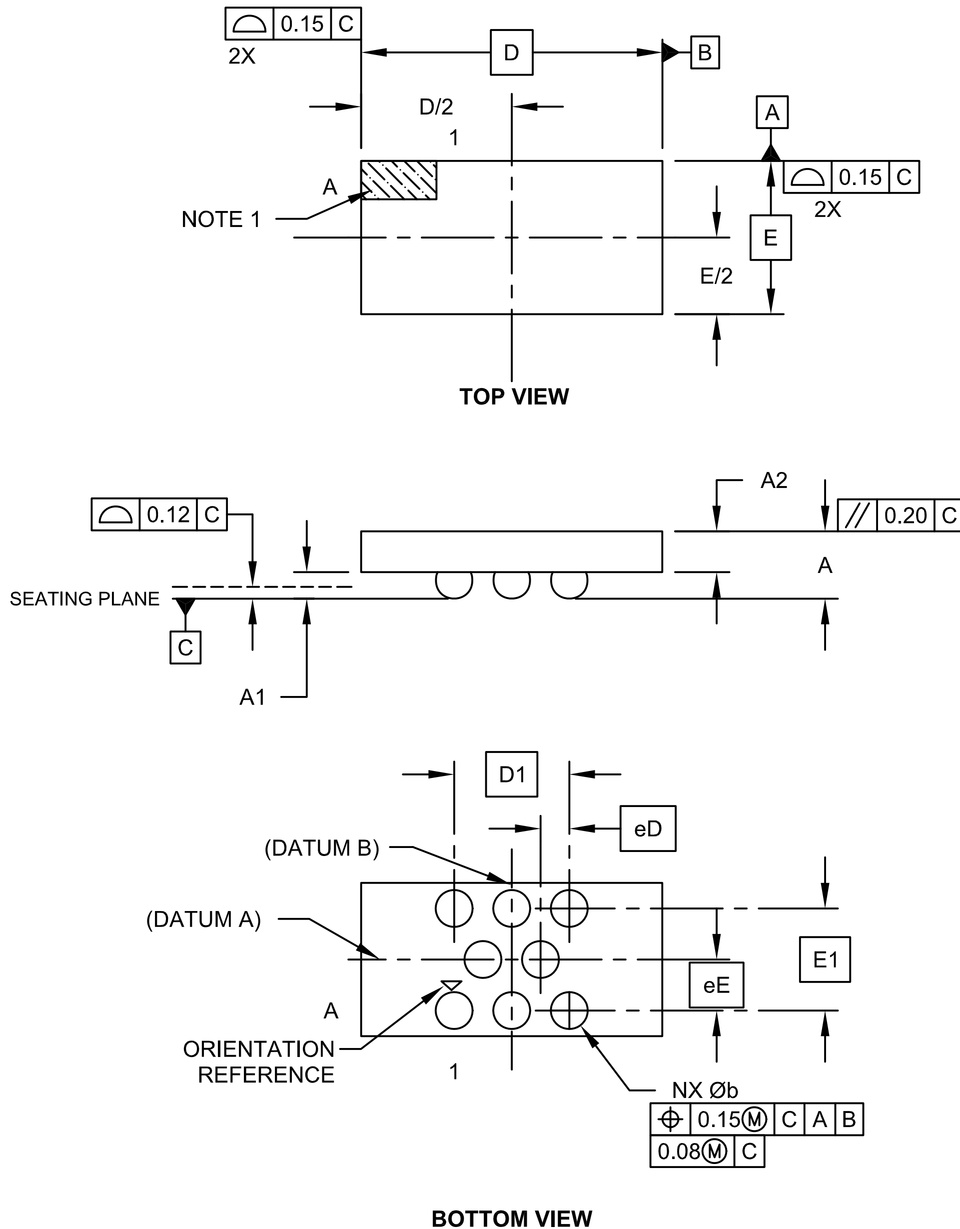
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-8004A

Packaging Diagrams and Parameters

8-Lead Chip Scale Package (CS) - [CSP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing C04-6001C Sheet 1 of 2

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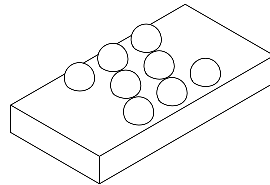
Packaging Diagrams and Parameters

8-Lead Chip Scale Package (CS) - [CSP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Contacts	N		8	
Overall Grid X-Pitch	E1	0.886 BSC		
Overall Grid Y-Pitch	D1	1.00 BSC		
Adjacent Column X-Pitch	eE	0.443 BSC		
Adjacent Row Y-Pitch	eD	0.25 BSC		
Overall Height	A	0.53	0.59	0.64
Die Height	A2	0.33	0.36	0.38
Bump Height	A1	0.20	0.23	0.26
Overall Width	E	NOTE 4		
Overall Length	D	NOTE 4		
Ball Diameter	b	0.30	0.32	0.34

Notes:

1. Orientation reference feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.
4. Package size varies with specific devices. Please contact your local Microchip representative for specific details

Microchip Technology Drawing C04-6001C Sheet 2 of 2

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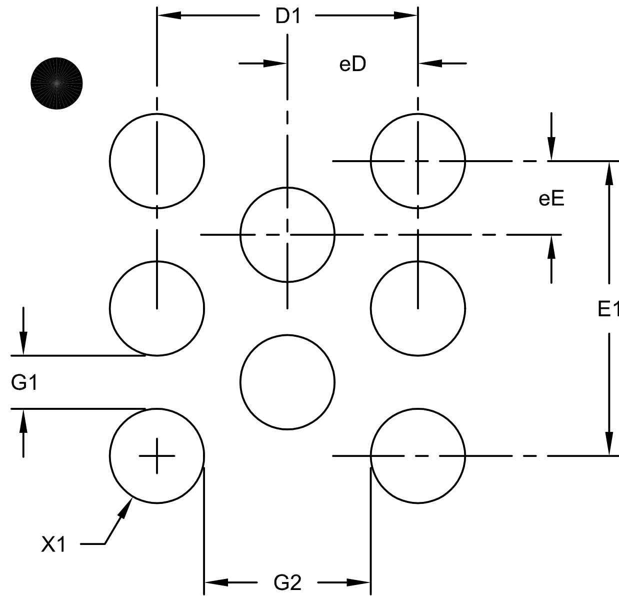
MICROCHIP

Land Pattern (Footprint)

8-Lead Chip Scale Package (CS) - [CSP]

Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Contacts	N		8	
Contact Pitch Y	eE		0.25	
Contact Pitch X	eD		0.443	
Contact Pad Spacing	E1		1.00	
Contact Pad Spacing	D1		0.886	
Contact Pad Diameter (X8)	X1			0.32
Distance Between Pads	G1	0.18		
Distance Between Pads	G2	0.56		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-8001A

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Packaging Diagrams and Parameters

NOTES:

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Packaging Diagrams and Parameters

XBGA Family

Plastic Thin Profile Ball Grid Array Package

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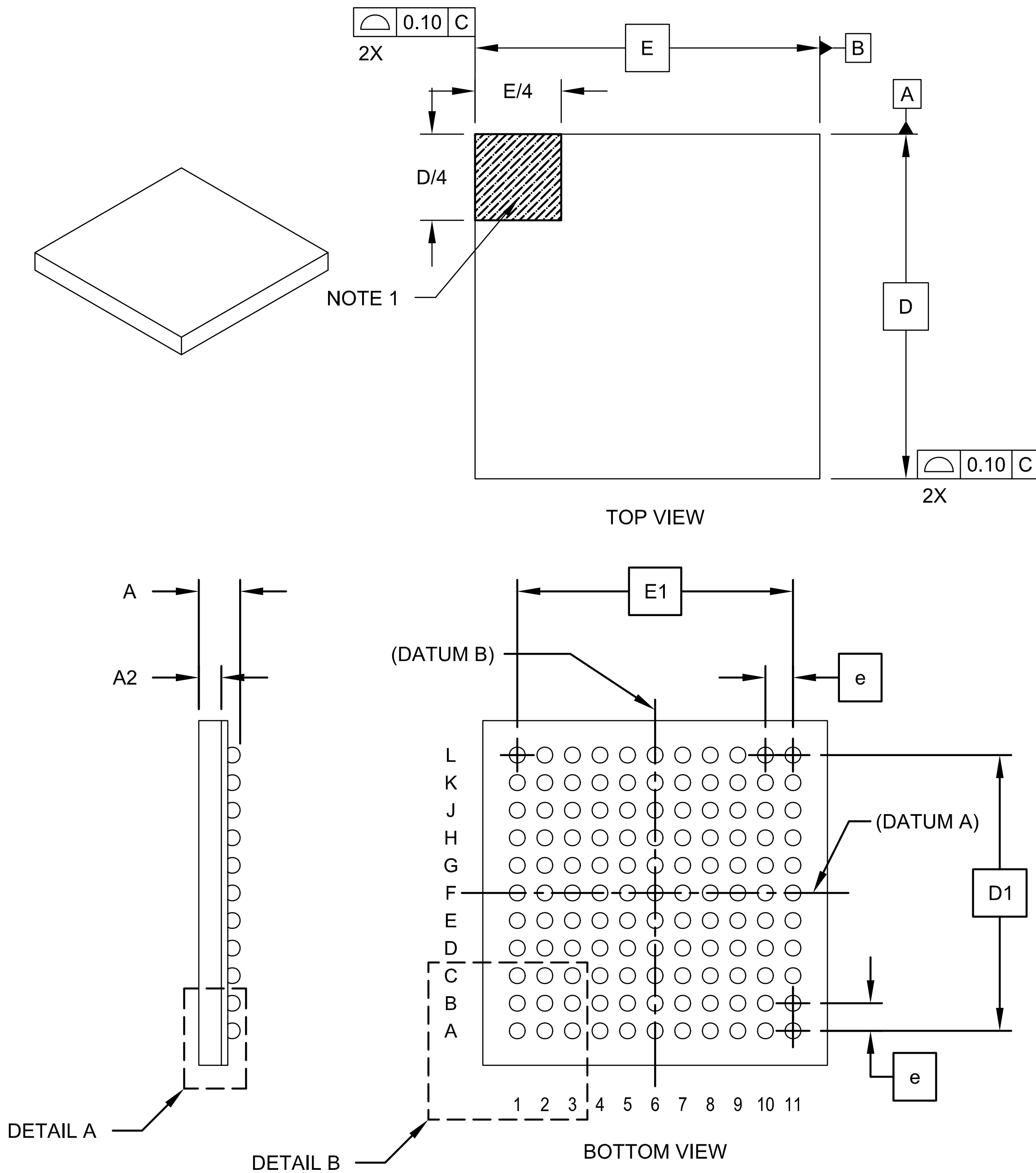
Packaging Diagrams and Parameters

121-Lead Plastic Thin Profile Ball Grid Array (BG) - 10x10x1.10 mm Body [XBGA]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing C04-148B Sheet 1 of 2

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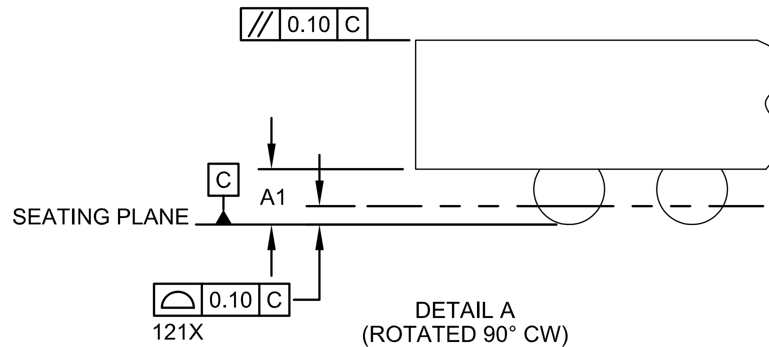
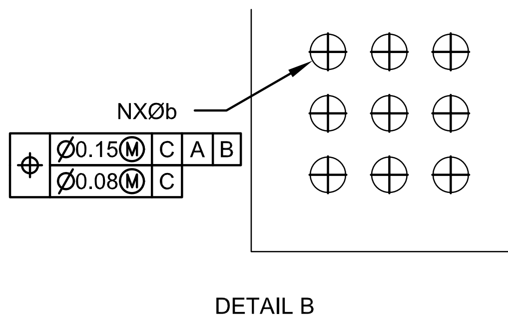
121-Lead Plastic Thin Profile Ball Grid Array (BG) - 10x10x1.10 mm Body [XBGA]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging





DETAIL B

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Contacts	N		121	
Contact Pitch	e		0.80 BSC	
Overall Height	A	1.00	1.10	1.20
Standoff	A1	0.25	0.30	0.35
Molded Package Thickness	A2	0.55	0.60	0.65
Overall Width	E		10.00 BSC	
Array Width	E1		8.00 BSC	
Overall Length	D		10.00 BSC	
Array Length	D1		8.00 BSC	
Contact Diameter	b		0.40 TYP	

Notes:
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensioning and tolerancing per ASME Y14.5M.
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.
3. The outer rows and colums of balls are located with respect to datums A and B.

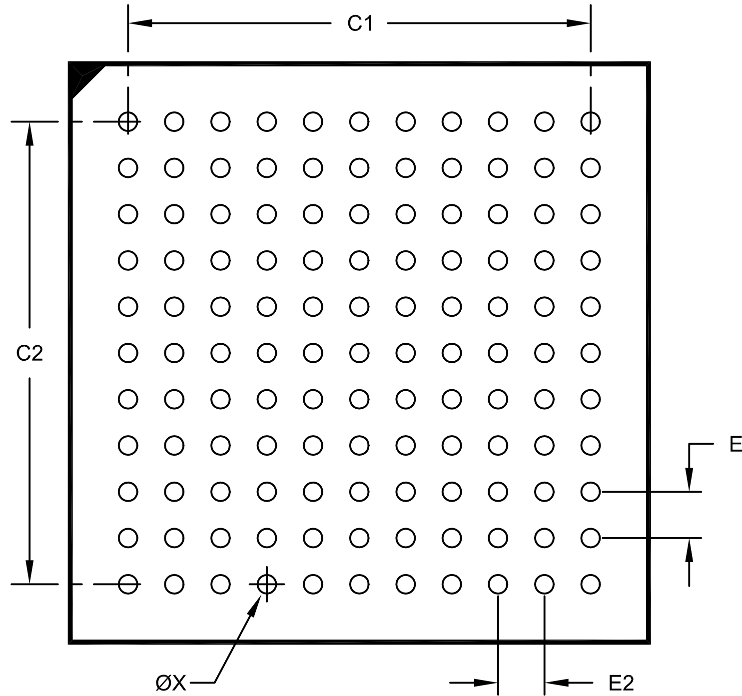
Microchip Technology Drawing C04-148 Rev B Sheet 2 of 2

MICROCHIP

Land Pattern (Footprint)

121-Lead Plastic Thin Profile Ball Grid Array (BG) - 10x10x1.10 mm Body [XBGA]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Contact Pitch	E1	0.80 BSC		
Contact Pitch	E2	0.80 BSC		
Contact Pad Spacing	C1		8.00	
Contact Pad Spacing	C2		8.00	
Contact Pad Diameter (X121)	X			0.32

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2148B

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APPENDIX A: REVISION HISTORY

Revision AE (September 2005)

The following is the list of modifications:

1. Added **Appendix A: Revision History**.
2. Revised dimensions D2 and E2 in the 8-Lead Plastic, No Lead (MC) 2x3x0.9 mm body (DFN) – Saw Singulated package diagram
3. Corrected graphic format in all packaging diagrams.
4. Added the following Packages:
   - 16-Lead Plastic Small Outline Narrow Body (QSOP)
   - 4-Lead Plastic Small Outline Transistor (SOT-143)
   - 3-Lead Plastic Small Outline Transistor (SOT-223)
   - 32-Lead Thin Quad Flatpack 7x7x1mm Body 1.0/0.10 Lead Form (TQFP)
   - 3-Lead SC-70 package diagram corrected.
5. The following package diagrams were replaced:
   - Drawing C04-142 replaced by C04-128 (5-Lead Small Outline Transistor) (TSOT)
   - Drawing C04-300 replaced by C04-132 (24-Lead Plastic Shrink Small Outline) (SSOP)
6. Added Part Number Designators DB, RC and QR to Part Number Suffix Designations table.

Revision AF (January 2006)

The following is the list of modifications:

1. Revised 28-Lead Plastic Shrink Small Outline (SS) – 209 mil body, 5.30 mm (SSOP)
2. Revised 28-Lead Plastic Quad Flat No Lead (MM) 6x6x0.9 mm body (QFN-S) with 0.40 mm Contact Length (Saw Singulated)

Revision AG (July 2006)

The following is the list of modifications:

1. Revised 8-Lead Plastic Thin Shrink Small Outline (ST) – 4.4 mm (TSSOP)
2. Added 40-Lead Plastic Quad Flat, No Lead (MM) 6x6x0.9 mm Body (QFN) with 0.40 mm Contact Length (Saw Singulated
3. Added 3-Lead Plastic Transistor Outline (AB) (TO-220)
4. Removed Drawing No. C04-300 as it does not exist.
5. Revised 28-Lead Plastic Shrink Small Outline (SS) – 209 mil Body, 5.30 mm (SSOP)
6. Revised 20-Lead Plastic Shrink Small Outline (SS) – 209 mil Body, 5.30 mm (SSOP)
7. Revised 14-Lead Plastic Small Outline (SL) – Narrow, 150 mil (SOIC)
8. Revised 64-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 1.0/0.10 mm Lead Form (TQFP)
9. Revised 80-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 1.0/0.10 mm Lead Form (TQFP)
10. Revised Part Number Suffix Designations

Revision AH (August 2006)

The following is the list of modifications:

1. Revised 28-Lead Plastic Quad Flat No Lead (ML) 6x6 mm Body (QFN) with 0.55 mm Contact Length (Saw Singulated)

Revision AJ (September 2006)

The following is the list of modifications:

1. Revised 8-Lead Plastic Dual Flat, No Lead Package (MC) - 2x3x0.9 mm Body [DFN]
2. Revised 8-Lead Plastic Dual Flat, No Lead Package (MF) - 6x5 mm Body (DFN-S) – Punch Singulated
3. Revised 8-Lead Plastic Dual Flat, No Lead Package (MF) - 3x3x0.9 mm Body [DFN]
4. Revised 8-Lead Plastic Dual Flat, No Lead Package (MD) - 4x4x0.9 mm Body [DFN]
5. Revised 8-Lead Plastic Dual Flat, No Lead Package (MF) - 6x5 mm Body [DFN-S]
6. Revised 10-Lead Plastic Dual Flat, No Lead Package (MF) - 3x3x0.9 mm Body [DFN]
7. Revised 16-Lead Plastic Quad Flat, No Lead Package (ML) - 4x4x0.9 mm Body [QFN]
8. Revised 20-Lead Plastic Quad Flat, No Lead Package (ML) - 4x4x0.9 mm Body [QFN]
9. Revised 28-Lead Plastic Quad Flat, No Lead Package (ML) - 6x6 mm Body [QFN] With 0.55 mm Contact Length
10. Revised 28-Lead Plastic Quad Flat, No Lead Package (MM) - 6x6x0.9 mm Body [QFN-S] With 0.40 mm Contact Length
11. Revised 40-Lead Plastic Quad Flat, No Lead Package (MM) 6x6x0.9 mm Body [QFN] With 0.40 mm Contact Length
12. Revised 44-Lead Plastic Quad Flat, No Lead Package (ML) - 8x8 mm Body [QFN]
13. Revised 8-Lead Plastic Micro Small Outline Package (MS) [MSOP]
14. Revised 10-Lead Plastic Micro Small Outline Package (MS) [MSOP]

Revision AK (January 2007)

The entire Packaging Specification has been updated.

Revision AL (February 2007)

Packages were revised. Telcom package designators were added where the designators vary from Microchip designators.

1. Revised 3-Lead Plastic Transistor Outline (TO or ZB) [TO-92]
2. Revised 3-Lead Plastic Small Outline Transistor (TT or NB) [SOT-23]
3. Revised 3-Lead Plastic Small Outline Transistor (CB or NB) [SOT-23A]
4. Revised 3-Lead Plastic Small Outline Transistor (DB) [SOT-223]
5. Revised 5-Lead Plastic Small Outline Transistor (DB) [SOT-223]
6. Revised 4-Lead Plastic Small Outline Transistor (RC) [SOT-143]
7. Revised 5-Lead Plastic Small Outline Transistor (OT or CT) [SOT-23]
8. Revised 6-Lead Plastic Small Outline Transistor (CH) [SOT-23]
9. Revised 8-Lead Plastic Dual In-Line (P or PA) 300 mil Body [PDIP]
10. Revised 14-Lead Plastic Dual In-Line (P or PD) 300 mil Body [PDIP]
11. Revised 16-Lead Plastic Dual In-Line (P or PE) 300 mil Body [PDIP]
12. Revised 24-Lead Plastic Dual In-Line (P or PG) 600 mil Body [PDIP]
13. Revised 24-Lead Skinny Plastic Dual In-Line (SP or PF) 300 mil Body [SPDIP]
14. Revised 28-Lead Skinny Plastic Dual In-Line (SP or PJ) 300 mil Body [SPDIP]
15. Revised 28-Lead Plastic Dual In-Line (P or PI) 600 mil Body [PDIP]
16. Revised 40-Lead Plastic Dual In-Line (P or PL) 600 mil Body [PDIP]
17. Revised 20-Lead Plastic Leaded Chip Carrier (L) Square [PLCC]
18. Revised 28-Lead Plastic Leaded Chip Carrier (L or LI) Square [PLCC]
19. Revised 32-Lead Plastic Leaded Chip Carrier (L) Rectangle [PLCC]
20. Revised 44-Lead Plastic Leaded Chip Carrier (L or LW) Square [PLCC]
21. Revised 68-Lead Plastic Leaded Chip Carrier (L or LS) Square [PLCC]
22. Revised 84-Lead Plastic Leaded Chip Carrier (L) Square [PLCC]
23. Revised 8-Lead Plastic Small Outline (SN or OA) Narrow, 3.90 mm Body [SOIC]
24. Revised 14-Lead Plastic Small Outline (SL or OD) Narrow, 3.90 mm Body [SOIC]
25. Revised 16-Lead Plastic Small Outline (SL) Narrow, 3.90 mm Body [SOIC]
26. Revised 8-Lead Plastic Small Outline (SM) Medium, 5.28 mm Body [SOIJ]
27. Revised 16-Lead Plastic Small Outline (SO or OE) Wide, 7.50 mm Body [SOIC]
28. Revised 18-Lead Plastic Small Outline (SO) Wide, 7.50 mm Body [SOIC]
29. Revised 20-Lead Plastic Small Outline (SO) Wide, 7.50 mm Body [SOIC]
30. Revised 24-Lead Plastic Small Outline (SO or PF) Wide, 7.50 mm Body [SOIC]
31. Revised 28-Lead Plastic Small Outline (SO or OI) Wide, 7.50 mm Body [SOIC]
32. Revised 8-Lead Plastic Micro Small Outline Package (MS or UA) [MSOP]
33. Revised 10-Lead Plastic Micro Small Outline Package (MS or UN) [MSOP]
34. Revised 16-Lead Plastic Shrink Small Outline Narrow Body (QR) .150" Body [QSOP]
35. Revised 64-Lead Plastic Metric Quad Flatpack (KU) 14x14x2.7 mm Body, 3.20 mm Footprint [MQFP]
36. Revised 44-Lead Plastic Metric Quad Flatpack (KW) 10x10x2.0 mm Body, 3.9 mm Footprint [PQFP]

Revision AM (March 2007)

Four Microchip and Telcom package designators were corrected and one package was removed.

1. Revised 6-Lead Plastic Small Outline Transistor (CH) [SOT-23] to (CH or OT)
2. Revised 3-Lead Plastic Small Outline Transistor (CB or NB) [SOT-23A] to (CB)
3. Revised 44-Lead Plastic Metric Quad Flatpack (PQ) [MQFP] to (PQ or KW)
4. Revised 64-Lead Plastic Metric Quad Flatpack (KU) [MQFP] to (BU)
5. Deleted 44-Lead Plastic Metric Quad Flatpack (KW) – 10x10x2.0 mm Body, 3.9 mm Footprint [PQFP]

Revision AN (March 2007)

16-Lead Plastic Shrink Small Outline Narrow Body (QR) .150” Body [QSOP]: the nominal pitch value for the package is corrected to “.025.” This correction revises MCHP Drawing C04-024B to C04-024C.

Packages with a Microchip and a Telcom designator are represented on separate pages, rather than having both designators on a single page.

Revision AP (April 2007)

Revised 40-Lead Ceramic Dual In-Line with Window (JW) .600” Body [CERDIP]. The E-1 MAX dimension has changed from “.540” to “.583”. This correction revises MCHP Drawing C04-014B to C04-014C.

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Revision AQ (July 2007)

Revised 5-Lead Plastic Small Outline Transistor [SOT-223] package designator from (DB) to (DC). This correction revises MCHP Drawing C04-137A to C04-137B.

Revision AR (September 2007)

Land patterns have been added for the following 13 packages:

8-Lead Plastic Small Outline (SN) – Narrow, 3.90 mm Body [SOIC]

28-Lead Plastic Quad Flat, No Lead Package (ML) – 6x6 mm Body [QFN]
with 0.55 mm Contact Length

28-Lead Plastic Quad Flat, No Lead Package (MM) – 6x6x0.9 mm Body [QFN-S]
with 0.40 mm Contact Length

44-Lead Plastic Quad Flat, No Lead Package (ML) – 8x8 mm Body [QFN]

44-Lead Plastic Metric Quad Flatpack (PQ) – 10x10x2 mm Body, 3.20 mm [MQFP]

64-Lead Plastic Metric Quad Flatpack (BU) – 14x14x2.7 mm Body, 3.20 mm [MQFP]

44-Lead Plastic Thin Quad Flatpack (PT) – 10x10x1 mm Body, 2.00 mm [TQFP]

64-Lead Plastic Thin Quad Flatpack (PT) – 10x10x1 mm Body, 2.00 mm [TQFP]

64-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 2.00 mm [TQFP]

80-Lead Plastic Thin Quad Flatpack (PT) – 12x12x1 mm Body, 2.00 mm [TQFP]

80-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 2.00 mm [TQFP]

100-Lead Plastic Thin Quad Flatpack (PT) – 12x12x1 mm Body, 2.00 mm [TQFP]

100-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 2.00 mm [TQFP]

Please refer to the Packaging Index for page numbers.

Notes: Packaging outline drawings and land pattern drawings appear on facing pages.

The last three digits of a package outline drawing number will always correspond to the last three digits of the land pattern drawing number.

The Microchip drawing number for any land pattern begins with the following characters: C04-2xxx.

Revision AS (January 2008)

The following packages are new:

- Drawing 0129B, 8-Lead Plastic Dual Flat, No Lead Package (MN) - 2x3x0.75 mm Body [TDFN] on page 156.
- Drawing 136B, 8-Lead Plastic Dual Flat, No Lead Package (MU) - 2x3x0.5 mm Body [UDFN] on page 158.

Land patterns have been added for the following packages:

- Drawing 2032A, 3-Lead Plastic Small Outline Transistor (DB) Footprint [SOT-223] on page 33.
- Drawing 2137A, 5-Lead Plastic Small Outline Transistor (DC) Footprint [SOT-223] on page 35.
- Drawing 2031A, 4-Lead Plastic Small Outline Transistor (RC) Footprint [SOT-143] on page 37.
- Drawing 2057A, 8-Lead Plastic Small Outline (SN) Narrow, 3.90 mm Body Footprint [SOIC] on page 79.
- Drawing 2057A, 8-Lead Plastic Small Outline (OA) Narrow, 3.90 mm Body Footprint [SOIC] on page 81.
- Drawing 2056A, 8-Lead Plastic Small Outline (SM) Medium, 5.28 mm Body Footprint [SOIJ] on page 86.
- Drawing 2123A, 8-Lead Plastic Dual Flat, No Lead Package (MC) 2x3x0.9 mm Body Footprint [DFN] on page 99.
- Drawing 2062A, 8-Lead Plastic Dual Flat, No Lead Package (MF) - 3x3x0.9 mm Body Footprint [DFN] on page 103.
- Drawing 2131A, 8-Lead Plastic Dual Flat, No Lead Package (MD) 4x4x0.9 mm Body Footprint [DFN] on page 105.
- Drawing 2063A, 10-Lead Plastic Dual Flat, No Lead Package (MF) 3x3x0.9 mm Body Footprint [DFN] on page 109.
- Drawing 2129A, 8-Lead Plastic Dual Flat, No Lead Package (MN) - 2x3x0.75 mm Body Footprint [TDFN] on page 157.
- Drawing 2136A, 8-Lead Plastic Dual Flat, No Lead Package (MU) - 2x3x0.5 mm Body Footprint [UDFN] on page 159.

Corrections have been made to the following packages:

- Drawing 123C, 8-Lead Plastic Dual Flat, No Lead Package (MC) 2x3x0.9 mm Body [DFN] on page 98.
- Drawing 131D, 8-Lead Plastic Dual Flat, No Lead Package (MD) 4x4x0.9 mm Body [DFN] on page 104.
- Drawing 2116A, 80-Lead Plastic Thin Quad Flat-pack (PF) 14x14x1 mm Body, 2.00 mm Footprint [TQFP] on page 151.

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Revision AT (June 2008)

Revised 24-Lead Plastic Small Outline [SOIC], Wide, 7.50 mm Body package designator from (PF) to (OG) on page 104.

The following packages are new:

- Drawing 0143A, 24-Lead Plastic Quad Flat, No Lead Package (MJ) 4x4 mm Body [QFN] on page 130.
- Drawing 0144A, 28-Lead Plastic Quad Flat, No Lead Package (MK) 4x4 mm Body [QFN] on page 132.
- Drawing 0140A, 28-Lead Plastic Quad Flat, No Lead Package (MQ) 5x5 mm Body [QFN] on page 134.
- Drawing 0145A, 8-Lead Chip Scale Package (CS) 3x2x3 Ball Pattern [CSP] on page 182.

Land patterns have been added for the following packages:

- Drawing 2060A, 3-Lead Plastic Small Outline Transistor (LB) Footprint [SC70] on page 43.
- Drawing 2061A, 5-Lead Plastic Small Outline Transistor (LT) Footprint [SC70] on page 45.
- Drawing 2015A, 7-Lead Plastic (EK) Footprint [DDPAK] on page 51.
- Drawing 2065A, 14-Lead Plastic Small Outline (SL) Narrow, 3.90 mm Body Footprint [SOIC] on page 89.
- Drawing 2065A, 14-Lead Plastic Small Outline (OD) Narrow, 3.90 mm Body Footprint [SOIC] on page 91.
- Drawing 2108A, 16-Lead Plastic Small Outline (SL) Narrow, 3.90 mm Body Footprint [SOIC] on page 93.
- Drawing 2102A, 16-Lead Plastic Small Outline (SO) Wide, 7.50 mm Body Footprint [SOIC] on page 97.
- Drawing 2102A, 16-Lead Plastic Small Outline (OE) Wide, 7.50 mm Body Footprint [SOIC] on page 99.
- Drawing 2051A, 18-Lead Plastic Small Outline (SO) Wide, 7.50 mm Body Footprint [SOIC] on page 101.
- Drawing 2122A, 8-Lead Plastic Dual Flat, No Lead Package (MF) 6x5 mm Body Footprint [DFN-S] on page 119.
- Drawing 2127A, 16-Lead Plastic Quad Flat, No Lead Package (ML) 4x4x0.9 mm Body Footprint [QFN] on page 127.
- Drawing 2126A, 20-Lead Plastic Quad Flat, No Lead Package (ML) 4x4x0.9 mm Body Footprint [QFN] on page 129.
- Drawing 2143A, 24-Lead Plastic Quad Flat, No Lead Package (MJ) 4x4 mm Body Footprint [QFN] on page 131.
- Drawing 2144A, 28-Lead Plastic Quad Flat, No Lead Package (MK) 4x4 mm Body Footprint [QFN] on page 133.
- Drawing 2140A, 28-Lead Plastic Quad Flat, No Lead Package (MQ) 5x5 mm Body Footprint [QFN] on page 135.

Revision AU (June 2008)

Updated 8-Lead Plastic Small Outline (SM) Medium 5.28 mm Body Footprint [SOIJ] on page 95.

Revision AV (September 2008)

Added Drawing 0139A, 20-Lead Plastic Quad Flat, No Lead Package (MQ) 5x5x0.9 mm Body [QFN] on page 124.

Revision AW (October 2008)

Revised 40-Lead Plastic Quad Flat, No Lead Package (MM) 6x6x0.9 mm Body [QFN] on page 136, correcting the package designator from (MM) to (ML).

Revision AX (January 2009)

Added Drawing 149A, 64-Lead Plastic Quad Flat, No Lead Package (ML) 6x6x0.9 mm Body [QFN] on page 140. This package is presented on 2 pages to facilitate a more explicit specification through the addition of geometric dimensioning and tolerancing (GD&T) information. GD&T symbols and rules are described and defined in the ASME Y14.5M-1994 standard (www.asme.org).

Revision AY (March 2009)

Revised Drawing 0131E, 8-Lead Plastic Dual Flat, No Lead Package (MD) 4x4x0.9 mm Body [DFN] to the new two-page format. It is shown on pages 115-116.

Also revised Drawing 149B, 64-Lead Plastic Quad Flat No Lead Package (MR) 9x9x0.9 mm Body [QFN] on pages 147-148. A corresponding land pattern (2149A), in the list below, was added.

The following packages are new:

- Drawing 151A, 6-Lead Plastic Small Outline Transistor (LT) [SC70] on pages 45-46.
- Drawing 2151A, 6-Lead Plastic Small Outline Transistor (LT) Footprint [SC70] on page 47.
- Drawing 2149A, 64-Lead Plastic Quad Flat, No Lead Package (MR) 9x9x0.9 mm Body Footprint [QFN] on page 149.
- Drawing 068A,16-Lead Plastic Thin Shrink Small Outline (ST) 4.4 mm Body [TSSOP] on page 161-162.
- Drawing 2068A, 16-Lead Plastic Thin Shrink Small Outline (ST) 4.4 mm Body Footprint [TSSOP] on page 163.

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- Drawing 6005A, 4-Lead Chip Scale Package (CS) 2x2 Ball Pattern [CSP] on pages 191-192.
- Drawing 8005A, 4-Lead Chip Scale Package (CS) 2x2 Ball Pattern Footprint [CSP] on page 193.
- Drawing 6004A, 5-Lead Chip Scale Package (CS) 2x1x2 Ball Pattern [CSP] on pages 195-196.
- Drawing 8004A, 5-Lead Chip Scale Package (CS) 2x1x2 Ball Pattern Footprint [CSP] on page 197.
- Drawing 6001A, 8-Lead Chip Scale Package (CS) 3x2x3 Ball Pattern [CSP] on pages 199-200. This package was designated Drawing 145A in the last version of the packaging specification (00049AX).
- Drawing 8001A, 8-Lead Chip Scale Package (CS) 3x2x3 Ball Pattern Footprint [CSP] on page 201.
- Drawing 6003A, 20-Lead Chip Scale Package (CS) 4x5 Special Array Pattern [CSP] on pages 203-204.
- Drawing 8003A, 20-Lead Chip Scale Package (CS) 4x5 Special Array Pattern Footprint [CSP] on page 205.
- Drawing 6002A, 28-Lead Chip Scale Package (CS) 7-6-7-6-7 [CSP] on pages 207-208.
- Drawing 8002A, 28-Lead Chip Scale Package (CS) 7-6-7-6-7 Footprint [CSP] on page 209.
- Appendix B: Control Dimensions (inspection information) on page 217.

Revision AZ (April 2009)

The following drawings were removed:

- Drawing 6003A, 20-Lead Chip Scale Package (CS) 4x5 Special Array Pattern [CSP] on pages 203-204.
- Drawing 8003A, 20-Lead Chip Scale Package (CS) 4x5 Special Array Pattern Footprint [CSP] on page 205.
- Drawing 6002A, 28-Lead Chip Scale Package (CS) 7-6-7-6-7 [CSP] on pages 207-208.
- Drawing 8002A, 28-Lead Chip Scale Package (CS) 7-6-7-6-7 Footprint [CSP] on page 209.

Appendix B: "Control Dimensions" was modified to include the item "Foot Angle" under **B.1 "On Surface Mount Devices (SMD)"** on page 315.

Revision BA (April 2009)

The following drawing is new:

- Drawing 142A, 16-Lead Plastic Quad Flat, No Lead Package (MG) 3x3x0.9 mm Body [QFN] on pages 126-127.

The following drawing was corrected:

- Drawing 2051A, 18-Lead Plastic Small Outline (SO) Wide, 7.50 mm Body Footprint [SOIC] on page 99. The second page of this drawing was incorrectly labeled as Drawing 2015A.

Note 4 on the following drawings has been modified to refer interested parties to a Microchip representative, instead of a data sheet, for details about the package:

- Drawing 6005A, 4-Lead Chip Scale Package (CS) 2x2 Ball Pattern [CSP] on page 194.
- Drawing 6004A, 5-Lead Chip Scale Package (CS) 2x1x2 Ball Pattern [CSP] on page 198.
- Drawing 6001A, 8-Lead Chip Scale Package (CS) 3x2x3 Ball Pattern [CSP] on page 202.

Revision BB (August 2009)

The following drawings are new:

- Drawing 0154A, 64-Lead Plastic Quad Flat, No Lead Package (MR) 9x9x0.9 mm Body with 5.40x5.40 Exposed Pad [QFN] on pages 152-153.
- Drawing 0152A, 28-Lead Plastic Ultra Thin Quad Flat, No Lead Package (MV) 4x4x0.5 mm Body [UQFN] on pages 154-155.
- Drawing 2111A, 8-Lead Plastic Micro Small Outline Package (MS) Footprint [MSOP] on page 157.
- Drawing 2021A, 10-Lead Plastic Micro Small Outline Package (MS) Footprint [MSOP] on page 161.
- Drawing 2086A, 8-Lead Plastic Thin Shrink Small Outline (ST) 4.4 mm Body Footprint [TSSOP] on page 169.
- Drawing 2087A, 14-Lead Plastic Thin Shrink Small Outline (ST) 4.4 mm Body Footprint [TSSOP] on page 171.
- Drawing 2088A, 20-Lead Plastic Thin Shrink Small Outline (ST) 4.4 mm Body Footprint [TSSOP] on page 177.
- Drawing 148A, 121-Lead Plastic Thin Profile Ball Grid Array (BG) 10x10x1.10 mm Body [XBGA] on pages 216-217.

Revision BC (January 2010)

The following drawings are new or corrected:

- Drawing 2097A, 68-Lead Ceramic Leaded (CL) Chip Carrier w/Window Square Footprint [CER-QUAD] on page 31.
- Drawing 2112A, 84-Lead Ceramic Leaded (CL) Chip Carrier w/Window Square Footprint [CER-QUAD] on page 33.
- Drawing 2104A, 3-Lead Plastic Small Outline Transistor (NB) Footprint [SOT-23] on page 44.
- Drawing 2104A, 3-Lead Plastic Small Outline Transistor (TT) Footprint [SOT-23] on page 46.
- Drawing 2091A, 5-Lead Plastic Small Outline Transistor (CT) Footprint [SOT-23] on page 48.
- Drawing 2091A, 5-Lead Plastic Small Outline Transistor (OT) Footprint [SOT-23] on page 50.
- Drawing 2028A, 6-Lead Plastic Small Outline Transistor (CH) Footprint [SOT-23] on page 52.

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- Drawing 2028A, 6-Lead Plastic Small Outline Transistor (OT) Footprint [SOT-23] on page 54.
- Drawing 2130A, 3-Lead Plastic Small Outline Transistor (CB) Footprint [SOT-23A] on page 56.
- Drawing 2029A, 3-Lead Plastic Small Outline Transistor Header (MB) Footprint [SOT-89] on page 58.
- Drawing 2030A, 5-Lead Plastic Small Outline Transistor Header (MT) Footprint [SOT-89] on page 60.
- Drawing 2128A, 5-Lead Plastic Thin Small Outline Transistor (OS) Footprint [TSOT] on page 73.
- Drawing 2011A, 3-Lead Plastic (EB) Footprint [DDPAK] on page 77.
- Drawing 2012A, 5-Lead Plastic (ET) Footprint [DDPAK] on page 79.
- Drawing 2064A, 20-Lead Plastic Leaded Chip Carrier (L) Square Footprint [PLCC] on page 105.
- Drawing 2026A, 28-Lead Plastic Leaded Chip Carrier (L) Square Footprint [PLCC] on page 107.
- Drawing 2026A, 28-Lead Plastic Leaded Chip Carrier (LI) Square Footprint [PLCC] on page 109.
- Drawing 2023A, 32-Lead Plastic Leaded Chip Carrier (L) Rectangle Footprint [PLCC] on page 111.
- Drawing 2048A, 44-Lead Plastic Leaded Chip Carrier (L) Square Footprint [PLCC] on page 113.
- Drawing 2048A, 44-Lead Plastic Leaded Chip Carrier (LW) Square Footprint [PLCC] on page 115.
- Drawing 2049A, 68-Lead Plastic Leaded Chip Carrier (L) Square Footprint [PLCC] on page 117.
- Drawing 2049A, 68-Lead Plastic Leaded Chip Carrier (LS) Square Footprint [PLCC] on page 119.
- Drawing 2093A, 84-Lead Plastic Leaded Chip Carrier (L) Square Footprint [PLCC] on page 121.
- Drawing 056C, 8-Lead Plastic Small Outline (SM) Medium, 5.28 mm Body [SOIJ] on pages 134-135.
- Drawing 2094A, 20-Lead Plastic Small Outline (SO) Wide, 7.50 mm Body Footprint [SOIC] on page 144.
- Drawing 2025A, 24-Lead Plastic Small Outline (OG) Wide, 7.50 mm Body Footprint [SOIC] on page 146.
- Drawing 2025A, 24-Lead Plastic Small Outline (SO) Wide, 7.50 mm Body Footprint [SOIC] on page 148.
- Drawing 2052A, 28-Lead Plastic Small Outline (OI) Wide, 7.50 mm Body Footprint [SOIC] on page 150.
- Drawing 2052A, 28-Lead Plastic Small Outline (SO) Wide, 7.50 mm Body Footprint [SOIC] on page 152.
- Drawing 062C, 8-Lead Plastic Dual Flat, No Lead Package (MF) 3x3x0.9 mm Body [DFN] on pages 159-160.
- Drawing 2131C, 8-Lead Plastic Dual Flat, No Lead Package (MD) 4x4x0.9 mm Body Footprint [DFN] on page 164.
- Drawing 0129C, 8-Lead Plastic Dual Flat, No Lead Package (MN) - 2x3x0.75 mm Body [TDFN] on pages 168-169.
- Drawing 2142A, 16-Lead Plastic Quad Flat, No Lead Package (MG) 3x3x0.9 mm Body Footprint [QFN] on page 177.
- Drawing 2139A, 20-Lead Plastic Quad Flat, No Lead Package (MQ) 5x5x0.9 mm Body Footprint [QFN] on page 183.
- Drawing 118D, 40-Lead Plastic Quad Flat, No Lead Package (ML) 6x6x0.9 mm Body [QFN] on pages 194-195.
- Drawing 2118A, 40-Lead Plastic Quad Flat, No Lead Package (ML) 6x6x0.9 mm Body Footprint [QFN] on page 196.
- Drawing 2111A, 8-Lead Plastic Micro Small Outline Package (UA) Footprint [MSOP] on page 211.
- Drawing 2021A, 10-Lead Plastic Micro Small Outline Package (UN) Footprint [MSOP] on page 215.
- Drawing 2024A, 16-Lead Plastic Shrink Small Outline Narrow Body (QR) .150" Body Footprint [QSOP] on page 217.
- Drawing 2072A, 20-Lead Plastic Shrink Small Outline (SS) 5.30 mm Body Footprint [SSOP] on page 221.
- Drawing 2132A, 24-Lead Plastic Shrink Small Outline (SS) 5.30 mm Body Footprint [SSOP] on page 223.
- Drawing 2073A, 28-Lead Plastic Shrink Small Outline (SS) 5.30 mm Body Footprint [SSOP] on page 225.
- Drawing 2086A, 8-Lead Plastic Thin Shrink Small Outline (ST) 4.4 mm Body Footprint [TSSOP] on page 229.
- Drawing 044A, 144-Lead Plastic Low Profile Quad Flatpack (PL) 20x20x1.40 mm Body, 2.0 mm [LQFP] on pages 243-244.
- Drawing 2044A, 144-Lead Plastic Low Profile Quad Flatpack (PL) 20x20x1.40 mm Body, 2.0 mm Footprint [LQFP] on page 245.
- Drawing 2071A, 44-Lead Plastic Metric Quad Flatpack (KW) 10x10x2 mm Body, 3.20 mm Footprint [MQFP] on page 249.
- Drawing 2074A, 32-Lead Plastic Thin Quad Flatpack (PT) 7x7x1.0 mm Body, 2.00 mm Footprint [TQFP] on page 257.
- Drawing 155A, 144-Lead Plastic Thin Quad Flatpack (PH) 16x16x1 mm Body, 2.00 mm [TQFP] on pages 272-273.

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- Drawing 2155A, 144-Lead Plastic Thin Quad Flat-pack (PH) 16x16x1 mm Body, 2.00 mm Footprint [TQFP] on page 274.
- Drawing 6005D, 4-Lead Chip Scale Package (CS) 2x2 Ball Pattern [CSP] on pages 276-277.
- Drawing 8005A, 4-Lead Chip Scale Package (CS) 2x2 Ball Pattern Footprint [CSP] on page 276.
- Drawing 6004D, 5-Lead Chip Scale Package (CS) 2x1x2 Ball Pattern [CSP] on pages 279-280.
- Drawing 6001C, 8-Lead Chip Scale Package (CS)3x2x3 Ball Pattern [CSP] on pages 282-283.
- Drawing 148A, 121-Lead Plastic Thin Profile Ball Grid Array (BG) 10x10x1.10 mm Body [XBGA] on pages 286-287.
- Drawing 2148A, 121-Lead Plastic Thin Profile Ball Grid Array (BG) 10x10x1.10 mm Body Footprint [XBGA] on page 288.

Revision BD (February 2010)

The following drawings are new:

Drawings 6008A (2) and 8008A, 4-Lead Chip Scale Package (CS) Package Code AL [CSP] on pages 279-282.

Revision BE (June 2010)

The following drawings are new:

- Drawing 162A, 8-Lead Thermally Enhanced Plastic Small Outline (SE) Narrow, 3.90 mm Body w/exposed heat slug [SOIC] on pages 130-131.
- Drawing 2162A, 8-Lead Thermally Enhanced Plastic Small Outline (SE) Narrow, 3.90 mm Body Footprint [SOIC] on page 132.
- Drawing 120B (Sheet 2) , 6-Lead Plastic Dual Flat, No Lead Package (MA) 2x2x0.9 mm Body [DFN] on page 161.
- Drawing 2120A, 6-Lead Plastic Dual Flat, No Lead Package (MA) 2x2x0.9 mm Body Footprint [DFN] on page 162.
- Drawing 2143B, 24-Lead Plastic Quad Flat, No Lead Package (MJ) 4x4 mm Body Footprint [QFN] on page 193.
- Drawing 156A, 40-Lead Plastic Ultra Thin Quad Flat No Lead Package (MV) 5x5 mm Body [UQFN] on pages 214-215.
- Drawing 2156A, 40-Lead Plastic Ultra Thin Quad Flat No Lead Package (MV) 5x5 mm Body Footprint [UQFN] on page 216.
- Drawing 087C (Sheet 2), 14-Lead Plastic Thin Shrink Small Outline (ST) 4.4 mm Body [TSSOP] on page 241.
- Drawing 2044A, 144-Lead Plastic Low Profile Quad Flatpack (PL) 20x20x1.40 mm Body, 2.0 mm Footprint [LQFP] on page 257.

The following drawings have been revised:

- Drawing Drawing 2030C 5-Lead Plastic Small Outline Transistor Header (MT) Footprint [SOT-89] on page 60.
- Drawing 057C 8-Lead Plastic Small Outline (SN) Narrow, 3.90 mm Body [SOIC] on pages 124-125.
- Drawing 057C 8-Lead Plastic Small Outline (OA) Narrow, 3.90 mm Body [SOIC] on pages 124-125.
- Drawing 120B 6-Lead Plastic Dual Flat, No Lead Package (MA) 2x2x0.9 mm Body [DFN] on page 160.
- Drawing 0129C 8-Lead Plastic Dual Flat, No Lead Package (MN) - 2x3x0.75 mm Body [TDFN] on page 176-177.
- Drawing 087C 14-Lead Plastic Thin Shrink Small Outline (ST) 4.4 mm Body [TSSOP] on page 240.
- Drawing 044B 144-Lead Plastic Low Profile Quad Flatpack (PL) 20x20x1.40 mm Body, 2.0 mm [LQFP] on page 255-256.
- Drawing 008A 4-Lead Chip Scale (CS) [CSP] on page 291.
- Drawing 6008A 4-Lead Chip Scale Package PkgCode_AL (continued) (CS) 2x2 Ball Pattern [CSP] on page 292.
- Drawing 148B 121-Lead Plastic Thin Profile Ball Grid Array (BG) 10x10x1.10 mm Body [XBGA] on pages 302-303.
- Drawing 2148B 121-Lead Plastic Thin Profile Ball Grid Array (BG) 10x10x1.10 mm Body Footprint [XBGA] on page 304.

Revision BF (July 2010)

Drawings C04-028A and C04-2028A with CHY package designators have been added for the 6-Lead Plastic Small Outline Transistor (CHY) [SOT-23] package and associated land pattern. The drawings appear on pages 53 and 54.

NOTES:

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APPENDIX B: CONTROL DIMENSIONS

Microchip inspects the first lot of every new package. Thereafter, one lot of each package, from each assembly site, shall be inspected yearly.

The following dimensions shall be inspected on all types of packages:

- Package Length
- Package Width
- Package Height
- Lead or Contact Width
- Lead or Contact Pitch

The following packages contain dimensions that shall be added to the inspection described above.

B.1 On Surface Mount Devices (SMD)

- § Lead Coplanarity[1]
- § Standoff*
- Molded Package Length (if different from overall package length)
- Side Flash
- Foot Angle

B.2 Through-Hole

- § Lead Span*

B.3 Surface Mount Devices And Through-Hole

- Molded Package Width
- Molded Package Thickness

B.4 DFN and QFN Only

- Contact Length
- Contact to Exposed Pad
- Exposed Pad Length
- Exposed Pad Width

[1] The § symbol denotes a significant characteristic specified in the control plan.

NOTES:

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Overview of Microchip Die/Wafer Support

INTRODUCTION

In addition to packaged devices, Microchip Technology Inc. devices are available in wafer and die form. All products sold in die or wafers have been characterized and qualified according to the requirements of Microchip Technology Inc. Specifications SPI-41014, “Characterization and Qualification of Integrated Circuits” and QCI-39000, “Worldwide Quality Conformance Requirements”.

PRODUCT INTEGRITY

Product supplied in die or wafer form is fully tested and characterized. Die and wafers are inspected to Microchip Technology Inc. Specification, QCI-30014.

CAUTION
Some EEPROM devices use EPROM cells for device configuration. Exposure to ultraviolet light must be avoided. Exposure to ultraviolet light may cause the device to operate improperly. Extreme care is urged in the handling and assembly of these products since they are susceptible to damage from electro-static discharge.

PACKAGING OPTIONS

Die/wafer products are available as individual Die in Waffle Pack, Whole Wafers or as Sawn Wafer on Frame. As a standard, all die on a wafer are tested and Ink Dots are used to indicate the bad die on a wafer. Inkless wafers with electronic wafer maps are also available upon request. To acquire individual electronic wafer maps, customers can request a password-protected account on a Microchip FTP site where their wafer maps are stored and easily downloaded.

Various wafer thicknesses are available, which include 8, 11, 15 and 29 mils for unground wafers. Standard wafer thickness varies from product to product, so contact your Microchip Sales Office for details.

ORDERING INFORMATION

Die sales must be initiated by contacting your Microchip Sales Office. To order or to obtain information (on pricing or delivery) for a specific device, use one of the following part numbers.

Standard Thickness Die/Wafer		**EEPROM Examples**
DEVICE_NUMBER/S	Die in Waffle Pack	24LC01B-I/S
DEVICE_NUMBER/W	Whole Wafers	24LC01B-I/W
DEVICE_NUMBER/WF	Sawn Wafer on Frame	24LC01B-I/WF
No Backgrind Wafers		
DEVICE_NUMBER/WNBG	Whole Wafers with Ink	24LC01B-I/WNBG
DEVICE_NUMBER/WNBI	Whole Wafers without Ink	24LC01B-I/WNBI
Standard Die/Wafers with Manufacturing Process Included in Part Number		
DEVICE_NUMBER/SXXX	Die in Waffle Pack	24LC01B-I/S15K
DEVICE_NUMBER/WXXX	Whole Wafers	24LC01B-I/W15K
DEVICE_NUMBER/WFXXX	Sawn Wafer on Frame	24LC01B-I/WF15K

DEVICE_NUMBER is the base part number of the device that you require, the S specifies Die in Waffle Pack, a W specifies a Whole Wafer and WF specifies Sawn Wafer on Frame. Whole wafers specified as NBG are shipped as inked wafers with no backgrind (29 mils) and those specified as NBI are shipped with no backgrind and without Ink.

As further clarification, the manufacturing process is sometimes indicated with a three digit suffix added at the end of the part number. For example, a wafer from the 160K process will use the suffix 16K, one from the 150K process will use 15K and one from the 121K process will use 12K.

Overview of Microchip Die/Wafer Support

ELECTRICAL SPECIFICATIONS

The functional and electrical specifications of Microchip devices in die form are identical to those of a packaged version. Please refer to individual data sheets for complete details.

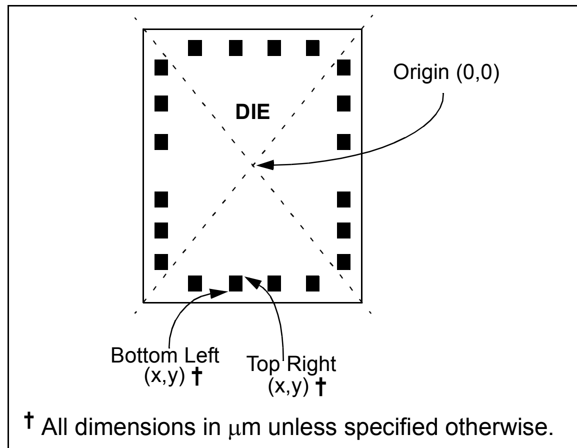
DIE MECHANICAL SPECIFICATIONS

Refer to the individual data sheet for these specifications.

BOND PAD COORDINATES

The die figures have associated bond pad coordinates. These coordinates assist in the attaching of the bond wire to the die. All the dimensions of these coordinates are in micrometers (μm) unless otherwise specified. The origin for the coordinates is the center of the die, as shown in Figure 1. Refer to the specific die data sheet for each device for openings and pitch.

FIGURE 1: DIE COORDINATE ORIGIN



† All dimensions in μm unless specified otherwise.

The die is capable of thermosonic gold or ultrasonic wire bonding. Die meet the minimum conditions of MIL-STD 883, Method 2011 on "Bond Strength (Destructive Bond Pull Test)". The Bond Pad metallization is silicon doped aluminum.

SUBSTRATE BONDING

Substrate bonding may be required on certain product families. For more information, refer to the specific die data sheet for that product.

SHIPPING OPTIONS

Die Form (/S)

Microchip product in die form can be shipped in waffle pack. The waffle pack has sufficient cavity area to restrain the die, while maintaining their orientation. Lint free paper inserts are placed over the waffle packs, and each pack is secured with a plastic locking clip. Groups of waffle packs are assembled into sets for shipment. A label with lot number, quantity and part number is attached.

These waffle packs are hermetically sealed in bags.

Wafer Form (/W)

Products may also be shipped in wafer form (see ordering information). Wafers are uncut and shipped in a wafer tub. The tub is padded with non-conductive foam. Lint free paper inserts are placed around each wafer. A label with lot number, quantity and part number is attached.

Sawn Wafer on Frames (/WF)

Products may also be shipped on wafer frames. Wafers are mounted on plastic frames and 100% sawn through. Sawn wafer on frames may be shipped in bulk (25 wafers per carrier) or as a single wafer in a carrier. A label with lot number, quantity and part number is attached with each shipment.

Storage Procedures

Temperature and humidity greatly affect the storage life of die. It is recommended that the die be used as soon as possible after receipt.

Upon receipt, the sealed bags should be stored in a cool and dry environment (25°C and 25% relative humidity). In these conditions, sealed bags have a shelf life of 12 months. Temperatures or humidities greater than these will reduce the storage life.

Once a bag containing waffle packs has been opened, the devices should be assembled and encapsulated within 48 hours (assuming 25°C and 25% humidity).

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NOTES:

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82-2-558-5934

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