Dual N-Channel MOSFET

30V, 20A, 20mΩ

FEATURES

- Fast switching
- 100% avalanche tested
- Pb-free plating
- Compliant to RoHS directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition

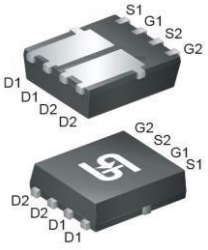
APPLICATIONS

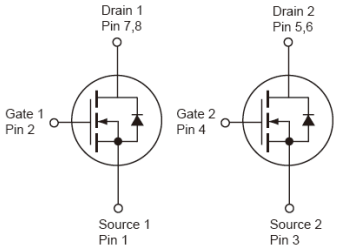
- Power Supply
- Motor Control

KEY PERFORMANCE PARAMETERS			
PARAMETER		**VALUE**	**UNIT**
V_{DS}		30	V
$R_{DS(on)}$ (max)	V_{GS} = 10V	20	mΩ
	V_{GS} = 4.5V	30	
Q_g		4.1	nC

Pb-Free RoHS COMPLIANT HALOGEN FREE

PDFN33 Dual





Dual N-Channel MOSFET

Note: MSL 1 (Moisture Sensitivity Level) per J-STD-020

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)				
PARAMETER		**SYMBOL**	**LIMIT**	**UNIT**
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current (Note 1)	T_C = 25°C	I_D	20	A
	T_C = 100°C		13	
Pulsed Drain Current (Note 2)		I_{DM}	80	A
Total Power Dissipation @ T_C = 25°C		P_{DTOT}	20	W
Single Pulsed Avalanche Energy (Note 3)		E_{AS}	14	mJ
Single Pulsed Avalanche Current (Note 3)		I_{AS}	17	A
Operating Junction and Storage Temperature Range		T_J,T_{STG}	- 55 to 150	°C

THERMAL PERFORMANCE			
PARAMETER	**SYMBOL**	**LIMIT**	**UNIT**
Junction to Case Thermal Resistance	$R_{\Theta JC}$	6.4	°C/W
Junction to Ambient Thermal Resistance	$R_{\Theta JA}$	62	°C/W

Notes: $R_{\Theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistances. The case thermal reference is defined at the solder mounting surface of the drain pins. $R_{\Theta JA}$ is guaranteed by design while $R_{\Theta CA}$ is determined by the user's board design. $R_{\Theta JA}$ shown below for single device operation on FR-4 PCB in still air

ELECTRICAL SPECIFICATIONS (T_A = 25°C unless otherwise noted)						
PARAMETER	**CONDITIONS**	**SYMBOL**	**MIN**	**TYP**	**MAX**	**UNIT**
Static (Note 4)						
Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	BV_{DSS}	30	--	--	V
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	$V_{GS(TH)}$	1.2	1.5	2.5	V
Gate Body Leakage	V_{GS} = ±20V, V_{DS} = 0V	I_{GSS}	--	--	±100	nA
Zero Gate Voltage Drain Current	V_{DS} = 30V, V_{GS} = 0V	I_{DSS}	--	--	1	μA
	V_{DS} = 24V, Tc = 125ºC		--	--	10	
Drain-Source On-State Resistance	V_{GS} = 10V, I_D = 10A	$R_{DS(on)}$	--	17	20	mΩ
	V_{GS} = 4.5V, I_D = 6A		--	23	30	
Forward Transconductance	V_{DS} = 5V, I_D = 6A	g_{fs}	--	13	--	S
Dynamic (Note 5)						
Total Gate Charge	V_{DS} = 15V, I_D = 8A, V_{GS} = 4.5V	Q_g	--	4.1	--	nC
Gate-Source Charge		Q_{gs}	--	1	--	
Gate-Drain Charge		Q_{gd}	--	2.1	--	
Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	C_{iss}	--	345	--	pF
Output Capacitance		C_{oss}	--	55	--	
Reverse Transfer Capacitance		C_{rss}	--	32	--	
Switching (Note 6)						
Turn-On Delay Time	V_{DD} = 15V, I_D = 1A, R_{GEN} =6Ω	$t_{d(on)}$	--	2.8	--	ns
Turn-On Rise Time		t_r	--	7.2	--	
Turn-Off Delay Time		$t_{d(off)}$	--	15.8	--	
Turn-Off Fall Time		t_f	--	4.6	--	
Source-Drain Diode (Note 4)						
Maximum Continuous Drain-Source Diode Forward Current	Integral reverse diode in the MOSFET	I_S	--	--	20	A
Maximum Pulse Drain-Source Diode Forward Current		I_{SM}	--	--	80	A
Diode-Source Forward Voltage	V_{GS} = 0V, I_S = 1A	V_{SD}	--	--	1	V

Notes:

1. Current limited by package
2. Pulse width limited by the maximum junction temperature
3. L = 0.1mH, I_{AS} = 17A, V_{DD} = 25V, R_G = 25Ω, Starting T_J = 25°C
4. Pulse test: PW ≤ 300μs, duty cycle ≤ 2%
5. For DESIGN AID ONLY, not subject to production testing.
6. Switching time is essentially independent of operating temperature.

ORDERING INFORMATION

PART NO.	PACKAGE	PACKING
TSM200N03DPQ33 RGG	PDFN33 Dual	5Kpcs / 13”Reel

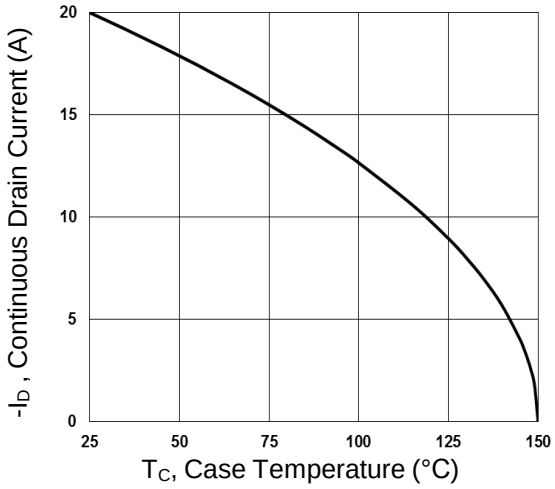
Note:

1. Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
2. Halogen-free according to IEC 61249-2-21 definition

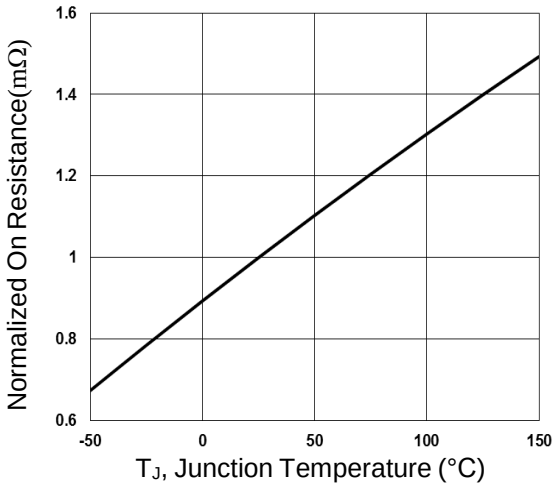
CHARACTERISTICS CURVES

(T_C = 25°C unless otherwise noted)

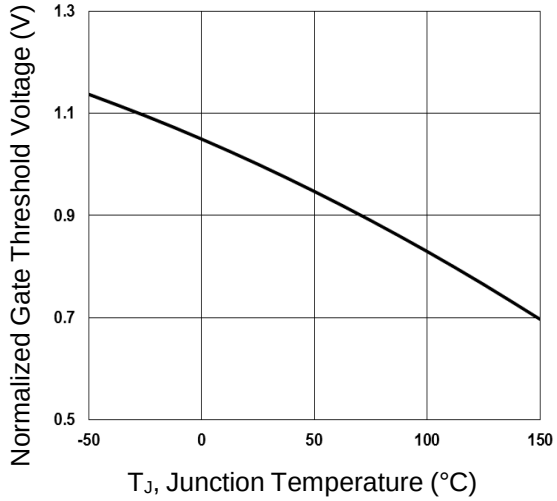
Continuous Drain Current vs. T_C



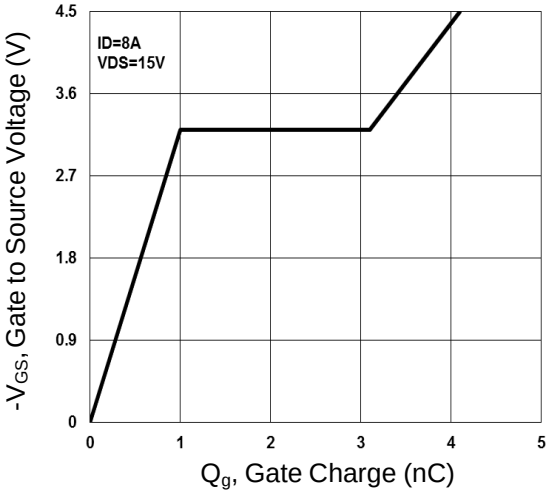
Normalized $R_{DS(ON)}$ vs. T_J



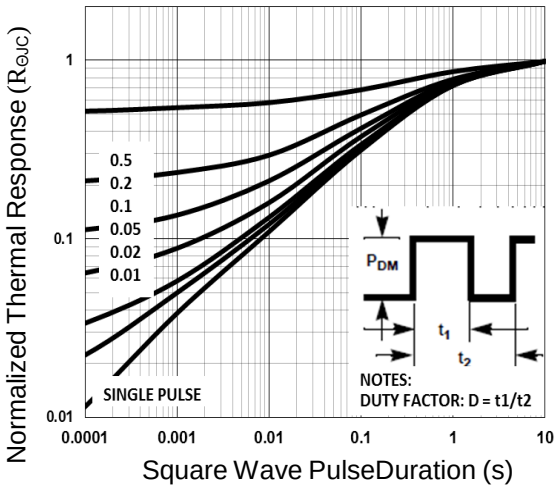
Normalized Vth vs. T_J



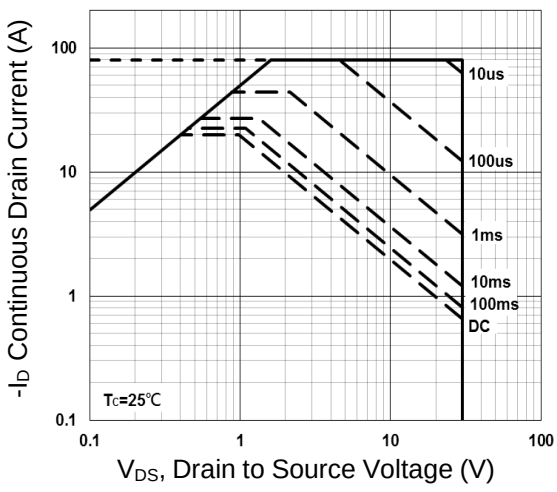
Gate Charge



Normalized Transient Impedance

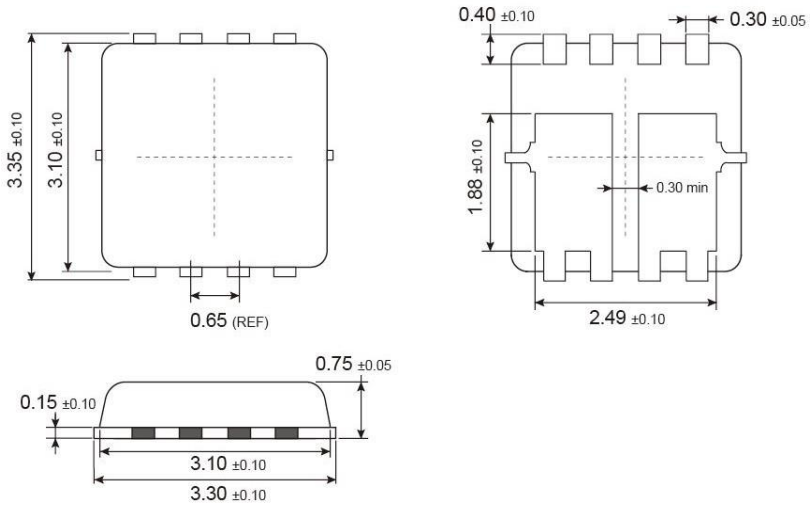


Maximum Safe Operation Area

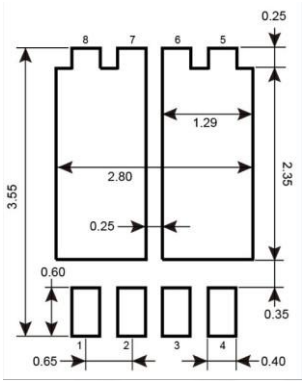


PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

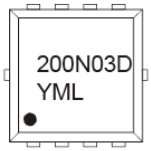
PDFN33 Dual



SUGGESTED PAD LAYOUT (Unit: Millimeters)



MARKING DIAGRAM



Y = Year Code

M = Month Code for Halogen Free Product

O =Jan **P** =Feb **Q** =Mar **R** =Apr
S =May **T** =Jun **U** =Jul **V** =Aug
W =Sep **X** =Oct **Y** =Nov **Z** =Dec

L = Lot Code (1~9, A~Z)

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