

Dual N-Channel MOSFET

30V, 20A, 20mΩ

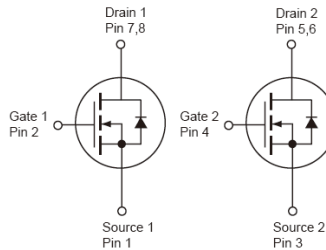
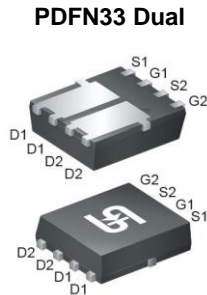
FEATURES

- Fast switching
- 100% avalanche tested
- Pb-free plating
- RoHS compliant
- Halogen-free package

APPLICATION

- Power Supply
- Motor Control

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



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Notes: Moisture sensitivity level: level 3. Per J-STD-020

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ 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)	I_D	$T_C = 25^\circ\text{C}$	20
		$T_C = 100^\circ\text{C}$	13
Pulsed Drain Current ^(Note 2)	I_{DM}	80	A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$	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	$^\circ\text{C}$

THERMAL PERFORMANCE			
PARAMETER	SYMBOL	LIMIT	UNIT
Junction to Case Thermal Resistance	$R_{\theta JC}$	6.4	$^\circ\text{C/W}$
Junction to Ambient Thermal Resistance	$R_{\theta JA}$	62	$^\circ\text{C/W}$

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 ($T_A = 25^\circ\text{C}$ unless otherwise noted)						
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static (Note 4)						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	BV_{DSS}	30	--	--	V
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(TH)}$	1.2	1.5	2.5	V
Gate Body Leakage	$V_{GS} = \pm 20V, V_{DS} = 0V$	I_{GSS}	--	--	± 100	nA
Zero Gate Voltage Drain Current	$V_{DS} = 30V, V_{GS} = 0V$	I_{DSS}	--	--	1	μA
	$V_{DS} = 24V, T_C = 125^\circ\text{C}$		--	--	10	
Drain-Source On-State Resistance	$V_{GS} = 10V, I_D = 10A$	$R_{DS(on)}$	--	17	20	m Ω
	$V_{GS} = 4.5V, I_D = 6A$		--	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	$V_{DS} = 25V, V_{GS} = 0V,$ $f = 1.0\text{MHz}$	C_{iss}	--	345	--	pF
Output Capacitance		C_{oss}	--	55	--	
Reverse Transfer Capacitance		C_{rss}	--	32	--	
Switching (Note 6)						
Turn-On Delay Time	$V_{DD} = 15V, I_D = 1A,$ $R_{GEN} = 6\Omega$	$t_{d(on)}$	--	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. $L = 0.1\text{mH}, I_{AS} = 17A, V_{DD} = 25V, R_G = 25\Omega,$ Starting $T_J = 25^\circ\text{C}$
4. Pulse test: $PW \leq 300\mu s,$ duty cycle $\leq 2\%$
5. For DESIGN AID ONLY, not subject to production testing.
6. Switching time is essentially independent of operating temperature.

ORDERING INFORMATION

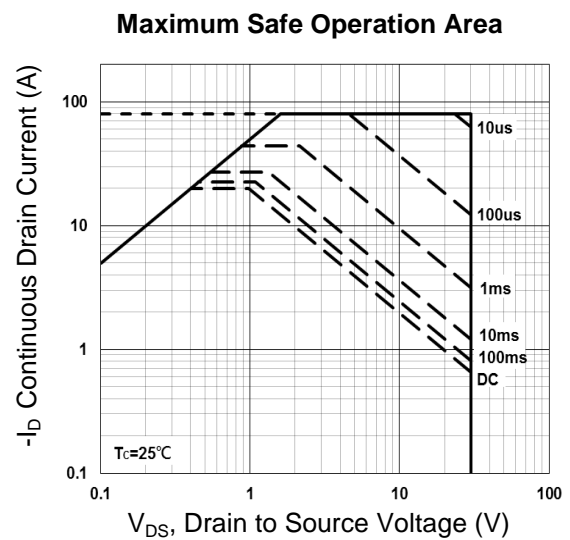
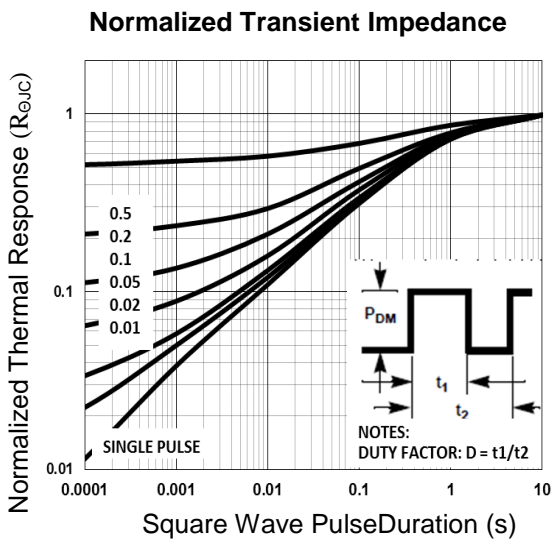
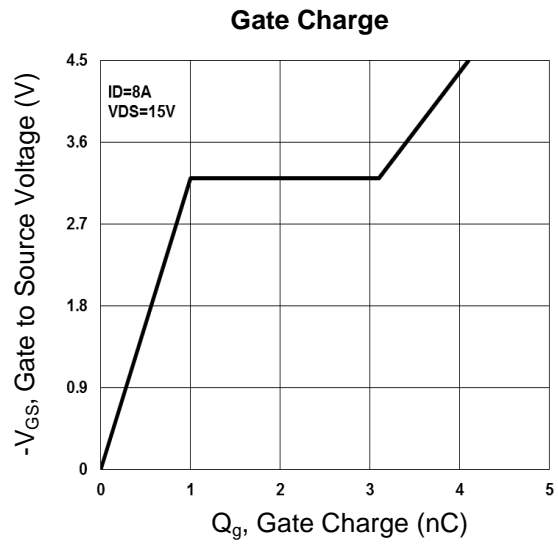
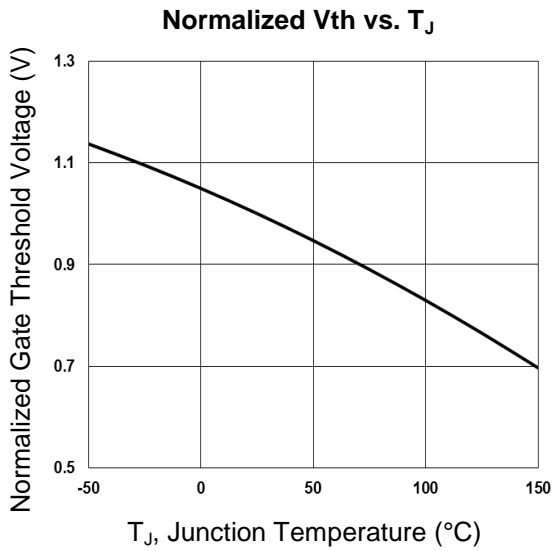
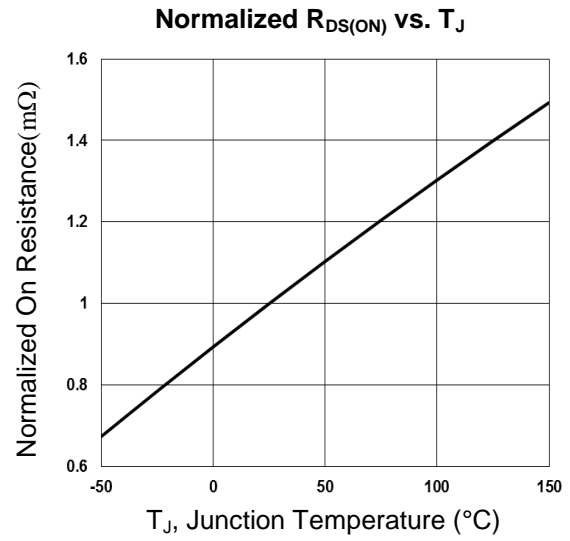
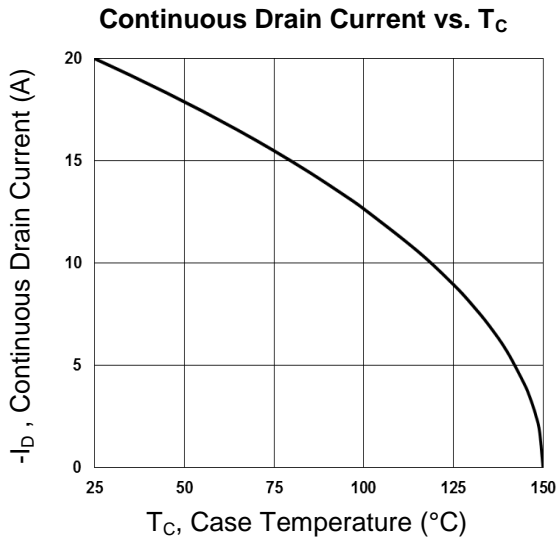
PART NO.	PACKAGE	PACKING
TSM200N03DPQ33 RGG	PDFN33	5Kpcs / 13" Reel

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

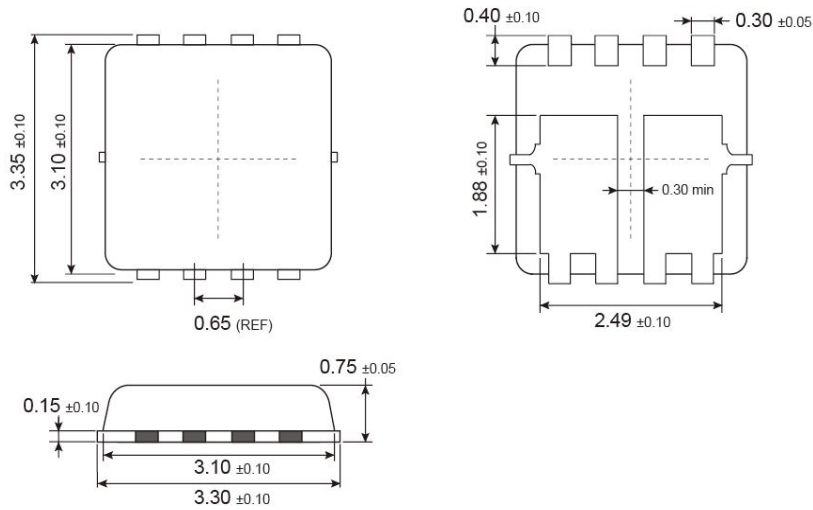
CHARACTERISTICS CURVES

($T_C = 25^\circ\text{C}$ unless otherwise noted)

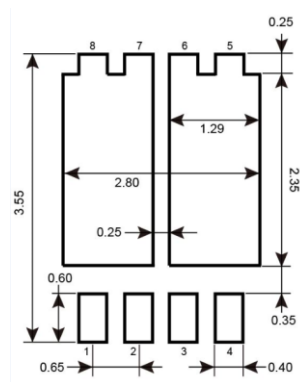


PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

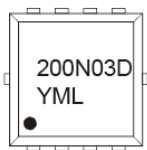
PDFN33 Dual



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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