



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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N-Channel Power MOSFET

30V, 62A, 6mΩ

FEATURES

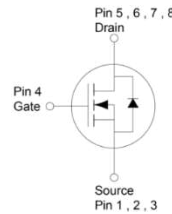
- Low $R_{DS(on)}$ to minimize conductive Loss
- Low gate charge for fast power switching
- 100% UIS and R_g tested
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition

APPLICATIONS

- DC-DC Converters
- Battery Power Management
- Oring FET/Load Switch



PDFN33



Notes: MSL 1 (Moisture Sensitivity Level) 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	$T_C = 25^\circ\text{C}$	A
		$T_A = 25^\circ\text{C}$	
Pulsed Drain Current (Note 1)	I_{DM}	248	A
Single Pulse Avalanche Current (Note 2)	I_{AS}	29	A
Single Pulse Avalanche Energy (Note 2)	E_{AS}	42	mJ
Total Power Dissipation	P_D	$T_C = 25^\circ\text{C}$	W
		$T_C = 125^\circ\text{C}$	
Total Power Dissipation	P_D	$T_A = 25^\circ\text{C}$	W
		$T_A = 125^\circ\text{C}$	
Operating Junction and Storage Temperature Range	T_J, T_{STG}	- 55 to +150	$^\circ\text{C}$

THERMAL RESISTANCE

PARAMETER	SYMBOL	LIMIT	UNIT
Thermal Resistance – Junction to Case	$R_{\theta JC}$	3.1	$^\circ\text{C/W}$
Thermal Resistance – Junction to Ambient	$R_{\theta JA}$	53	$^\circ\text{C/W}$

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.

ELECTRICAL CHARACTERISTICS (T _A = 25°C unless otherwise noted)						
PARAMETER	CONDITIONS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	BV _{DSS}	30	--	--	V
Gate Threshold Voltage	V _{GS} = V _{DS} , I _D = 250μA	V _{GS(TH)}	1.2	1.6	2.5	V
Gate-Source Leakage Current	V _{GS} = ±20V, V _{DS} = 0V	I _{GSS}	--	--	±100	nA
Drain-Source Leakage Current	V _{GS} = 0V, V _{DS} = 30V	I _{DSS}	--	--	1	μA
Drain-Source On-State Resistance (Note 3)	V _{GS} = 10V, I _D = 15A	R _{DS(on)}	--	4.8	6	mΩ
	V _{GS} = 4.5V, I _D = 15A		--	6.7	9	
Forward Transconductance (Note 3)	V _{DS} = 5V, I _D = 15A	g _{fs}	--	38	--	S
Dynamic (Note 4)						
Total Gate Charge	V _{GS} = 10V, V _{DS} = 15V, I _D = 15A	Q _g	--	25.4	--	nC
Total Gate Charge	V _{GS} = 4.5V, V _{DS} = 15V, I _D = 15A	Q _g		12.9		
Gate-Source Charge		Q _{gs}	--	3.8	--	
Gate-Drain Charge		Q _{gd}	--	5.7	--	
Input Capacitance	V _{GS} = 0V, V _{DS} = 15V, f = 1.0MHz	C _{iss}	--	1342	--	pF
Output Capacitance		C _{oss}	--	227	--	
Reverse Transfer Capacitance		C _{rss}	--	169	--	
Gate Resistance	f = 1.0MHz, open drain	R _g	0.8	2.7	5.4	Ω
Switching (Note 4)						
Turn-On Delay Time	V _{GS} = 10V, V _{DS} = 15V, I _D = 15A, R _G = 3.3Ω,	t _{d(on)}	--	7.5	--	ns
Rise Time		t _r	--	14.5	--	
Turn-Off Delay Time		t _{d(off)}	--	35.2	--	
Fall Time		t _f	--	9.6	--	
Source-Drain Diode						
Diode Forward Voltage (Note 3)	V _{GS} = 0V, I _S = 15A	V _{SD}	--	--	1	V
Reverse Recovery Time	I _S = 15A, di/dt = 100A/μs	t _{rr}	--	8.8	--	ns
Reverse Recovery Charge		Q _{rr}	--	26	--	nC

Notes:

1. Current limited by package.
2. $L = 0.1\text{mH}, V_{GS} = 10V, V_{DS} = 25V, R_G = 25\Omega, I_{AS} = 29A$, Starting $T_J = 25^\circ\text{C}$
3. Pulse test: Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Switching time is essentially independent of operating temperature.

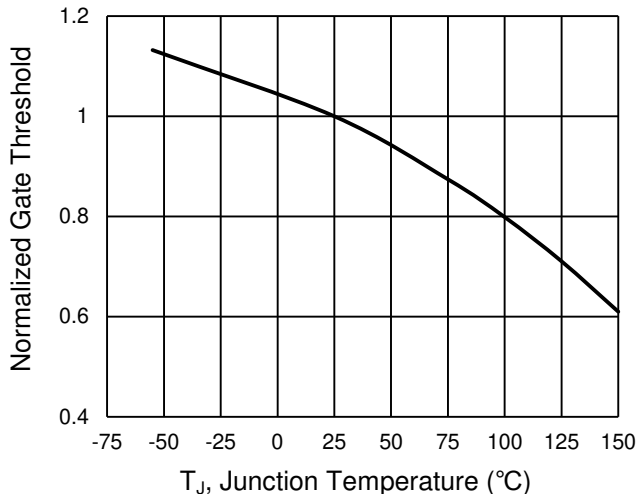
ORDERING INFORMATION

PART NO.	PACKAGE	PACKING
TSM060N03PQ33 RGG	PDFN33	5,000pcs / 13" Reel

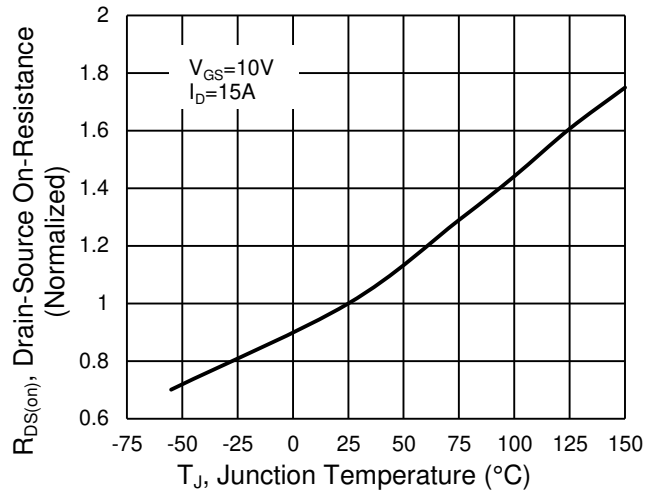
CHARACTERISTICS CURVES

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

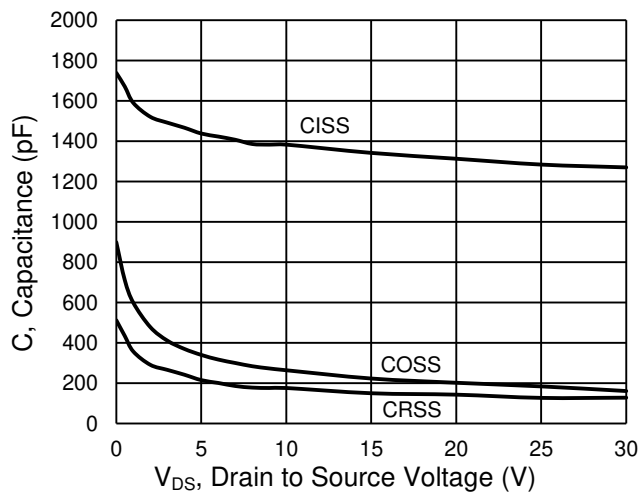
Normalized V_{th} vs. T_J



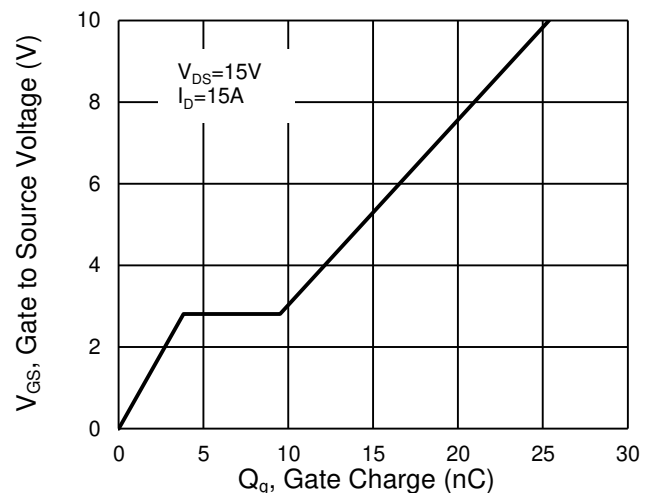
On-Resistance vs. Junction Temperature



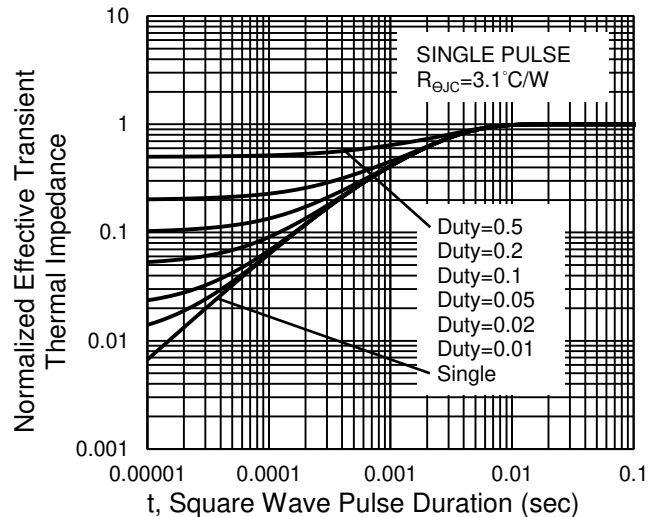
Capacitance vs. Drain-Source Voltage



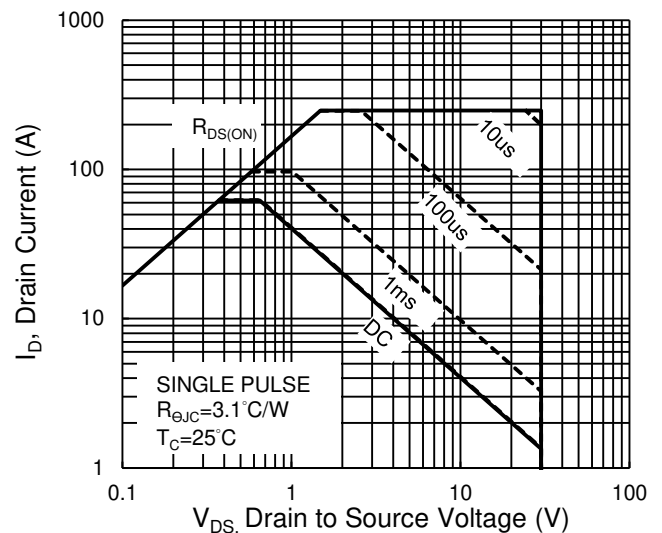
Gate-Source Voltage vs. Gate Charge



Normalized Thermal Transient Impedance, Junction-to-Case

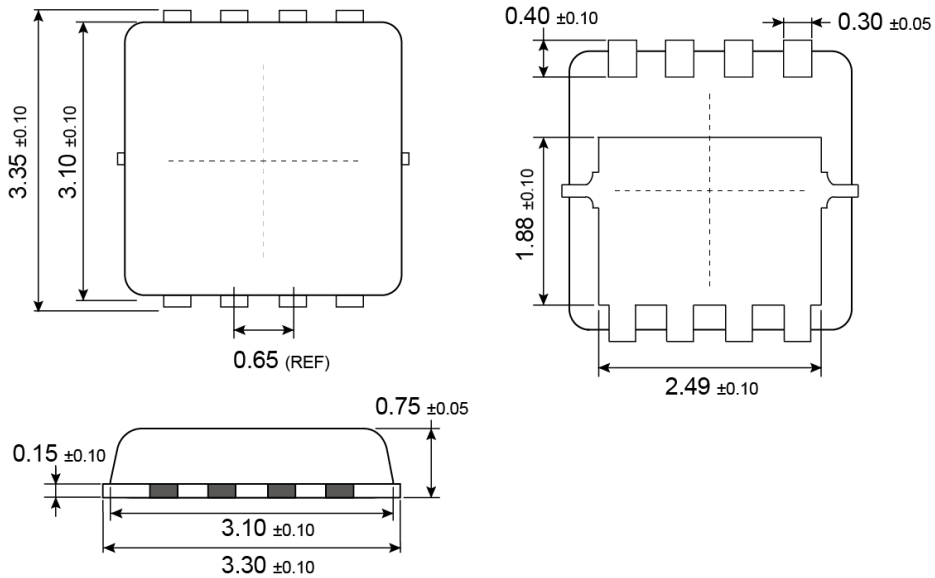


Maximum Safe Operating Area, Junction-to-Case

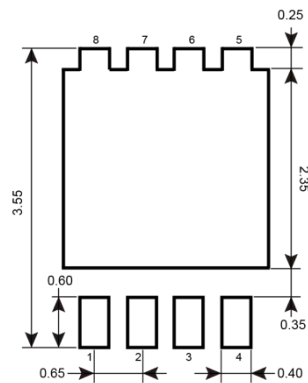


PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

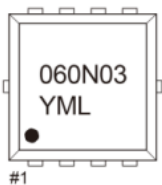
PDFN33



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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