

P-Channel Power MOSFET

-20V, -11A, 16mΩ

FEATURES

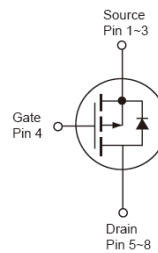
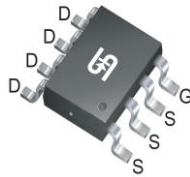
- Improved dV/dt capability
- Fast Switching
- Suitable for 1.8V drive applications
- Pb-free plating
- RoHS compliant
- Halogen-free mold compound

APPLICATION

- Load Switch
- Networking

KEY PERFORMANCE PARAMETERS

PARAMETER		VALUE	UNIT
V_{DS}		-20	V
$R_{DS(on)}$ (max)	$V_{GS} = -4.5V$	16	mΩ
	$V_{GS} = -2.5V$	22	
	$V_{GS} = -1.8V$	28	
Q_g		27	nC


SOP-8

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}	-20	V
Gate-Source Voltage		V_{GS}	± 10	V
Continuous Drain Current ^(Note 1)	$T_C = 25^\circ\text{C}$	I_D	-11	A
	$T_C = 100^\circ\text{C}$		-7	
Pulsed Drain Current ^(Note 2)		I_{DM}	-44	A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$		P_{DTOT}	2.5	W
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	$R_{\theta JC}$	25	$^\circ\text{C/W}$
Junction to Ambient Thermal Resistance	$R_{\theta JA}$	50	$^\circ\text{C/W}$

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°C unless otherwise noted)						
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static ^(Note 3)						
Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = -250μA	BV _{DSS}	-20	--	--	V
Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	V _{GS(TH)}	-0.3	-0.6	-1.0	V
Gate Body Leakage	V _{GS} = ±10V, V _{DS} = 0V	I _{GSS}	--	--	±100	nA
Zero Gate Voltage Drain Current	V _{DS} = -20V, V _{GS} = 0V	I _{DSS}	--	--	-1	μA
Drain-Source On-State Resistance	V _{GS} = -4.5V, I _D = -6A	R _{DS(ON)}	--	12	16	mΩ
	V _{GS} = -2.5V, I _D = -4A			16	22	
	V _{GS} = -1.8V, I _D = -3A		--	21	28	
Dynamic ^(Note 4)						
Total Gate Charge	V _{DS} = -10V, I _D = -6A, V _{GS} = -4.5V	Q _g	--	27	--	nC
Gate-Source Charge		Q _{gs}	--	2.4	--	
Gate-Drain Charge		Q _{gd}	--	5.3	--	
Input Capacitance	V _{DS} = -15V, V _{GS} = 0V, f = 1.0MHz	C _{iss}	--	2320	--	pF
Output Capacitance		C _{oss}	--	280	--	
Reverse Transfer Capacitance		C _{rss}		175		
Switching ^(Note 5)						
Turn-On Delay Time	V _{DD} = -10V, R _{GEN} = 25Ω, I _D = -1A, V _{GS} = -4.5V,	t _{d(on)}	--	16.2	--	ns
Turn-On Rise Time		t _r	--	43.5	--	
Turn-Off Delay Time		t _{d(off)}	--	114	--	
Turn-Off Fall Time		t _f	--	28.8	--	
Source-Drain Diode ^(Note 3)						
Forward On Voltage	I _S = -1 A, V _{GS} = 0V	V _{SD}	--	--	-1	V

Notes:

1. Current limited by package
2. Pulse width limited by the maximum junction temperature
3. Pulse test: $PW \leq 300\mu s$, duty cycle $\leq 2\%$
4. For DESIGN AID ONLY, not subject to production testing.
5. Switching time is essentially independent of operating temperature.

ORDERING INFORMATION

PART NO.	PACKAGE	PACKING
TSM160P02CS RLG	SOP-8	2,500pcs / 13"Reel

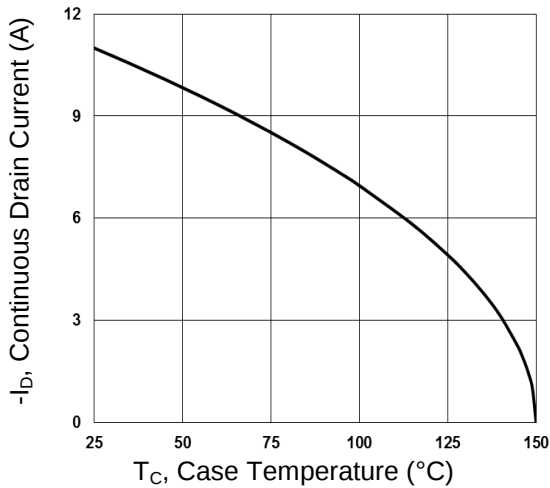
Note:

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

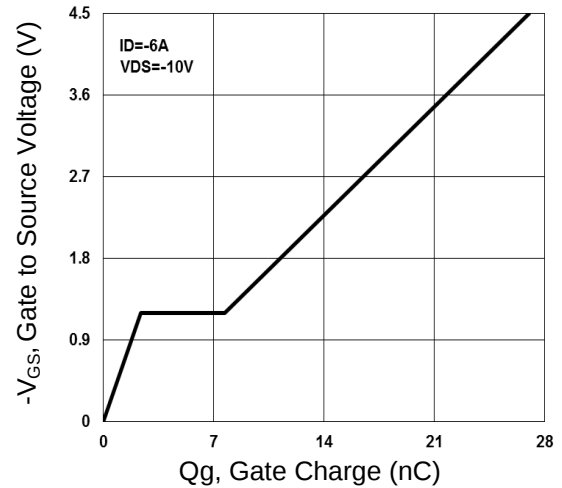
CHARACTERISTICS CURVES

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

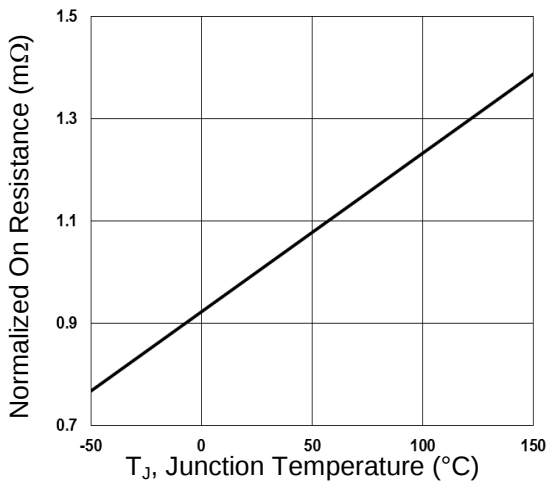
Countinuous Drain Current vs. T_C



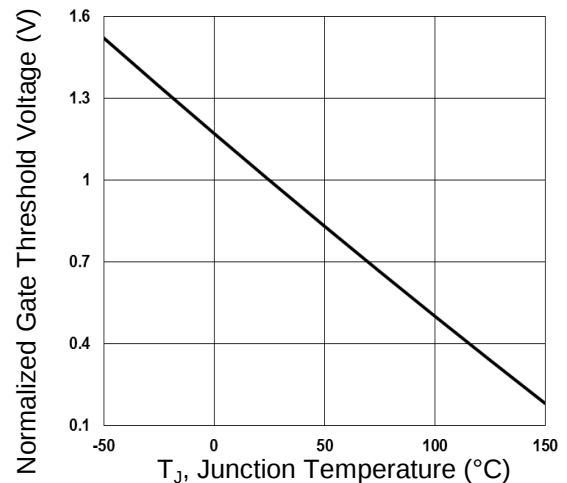
Gate Charge



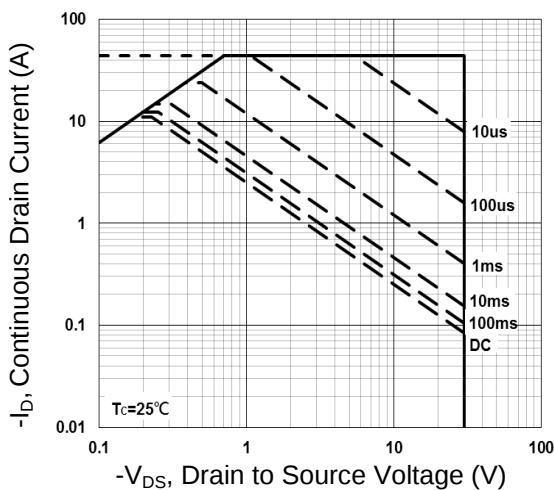
On-Resistance vs. Junction Temperature



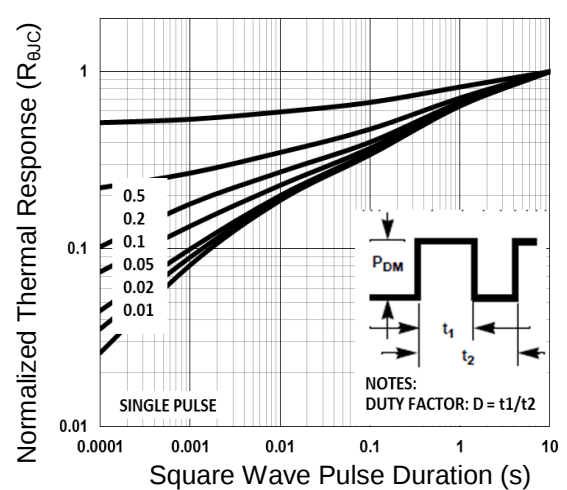
Threshold Voltage vs. Junction Temperature



Maximum Safe Operating Area

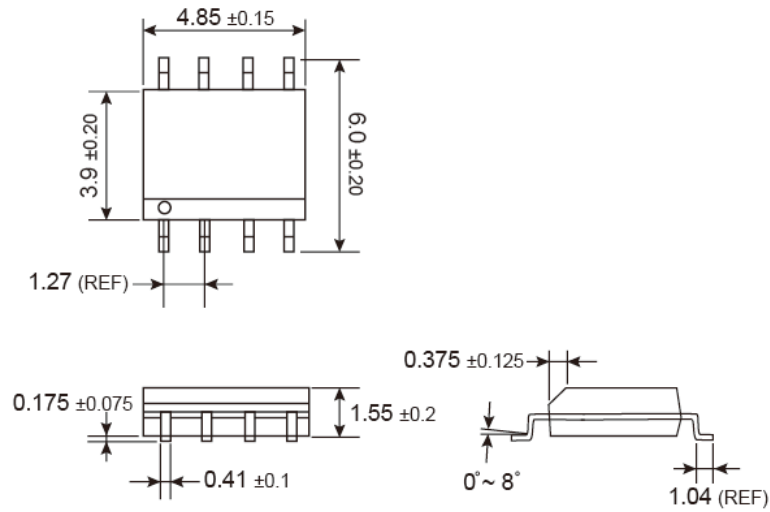


Normalized Thermal Transient Impedance Curve

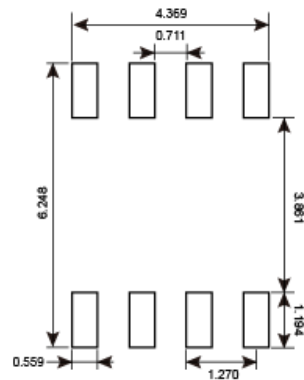


PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

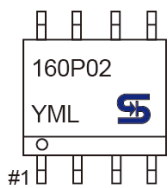
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SUGGESTED PAD LAYOUT



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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