

Description

The PSMD2P10R6H uses split gate trench technology to provide excellent $R_{DS(on)}$ low gate charge. This device is suitable for power management and high efficiency applications at high switching frequencies applications.

MOSFET Product Summary

$V_{DS}(V)$	$R_{DS(on)}(m\Omega)(Typ)$	$I_D(A)$
100	4.7@ $V_{GS} = 10V$	118

Feature

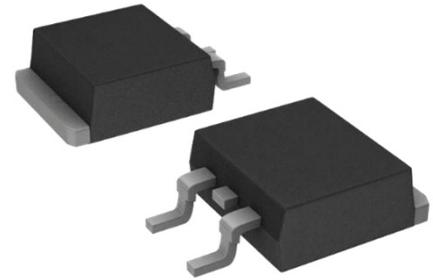
- High Conversion Efficiency
- High Speed Power Switching
- 100% UIS Tested, 100% Rg Tested
- Lead Free, Halogen Free

Applications

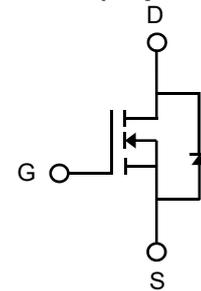
- Motor Control
- Power Management Functions
- DC/DC in Telecoms and Industrial

Mechanical Data

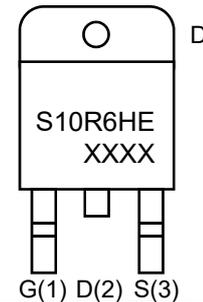
- Case: TO-263
- Case Material: "Green" Molding Compound.
UL-Flammability Classification Rating 94V-0.
- Solderable per MIL-STD-202, Method 208



TO-263 (Top View)



Schematic diagram



Marking (Top View)

Absolute maximum rating@25°C

Rating	Symbol	Value	Units
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous ¹⁾	I_D	$T_C=25^\circ C$	118
		$T_C=100^\circ C$	75
Pulsed Drain Current ²⁾	I_{DM}	450	A
Total Power Dissipation ⁴⁾	P_D	$T_C=25^\circ C$	148
		$T_C=100^\circ C$	58
Avalanche Current @ L=0.5mH	I_{AS}	30	A
Avalanche Energy @ L=0.5mH	E_{AS}	225	mJ
Thermal Resistance , Junction-to-Case ⁴⁾	$R_{\theta JC}$	0.85	$^\circ C/W$
Thermal Resistance Junction-to-Ambient ³⁾	$R_{\theta JA}$	45	$^\circ C/W$
Junction and Storage Temperature Range	T_J, T_{STG}	-55~+150	$^\circ C$

Electrical characteristics per line@25°C (unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units	
Off Characteristics							
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	100	-	-	V	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 100V, V_{GS} = 0V$	$T_J = 25^\circ C$	-	-	1.0	μA
			$T_J = 55^\circ C$	-	-	10	
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 100	nA	
On Characteristics⁵⁾							
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	3.0	4.0	V	
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 20A$	-	4.7	5.8	m Ω	
Forward Transconductance	g_{FS}	$V_{DS} = 5V, I_D = 20A$	-	43	-	S	
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 1A$	-	0.7	1.2	V	
Dynamic Characteristics⁶⁾							
Input Capacitance	C_{iss}	$V_{DS} = 50V, V_{GS} = 0V, f = 1.0MHz$	-	5270	-	μF	
Output Capacitance	C_{oss}		-	1175	-		
Reverse Transfer Capacitance	C_{rss}		-	21	-		
Switching Characteristics⁶⁾							
Turn-on Delay Time	$t_{d(on)}$	$V_{DS} = 50V, V_{GS} = 10V, R_G = 3\Omega, I_D = 20A$	-	21	-	ns	
Turn-on Rise Time	t_r		-	25	-		
Turn-Off Delay Time	$t_{d(off)}$		-	45	-		
Turn-Off Fall Time	t_f		-	22	-		
Total Gate Charge @ $V_{GS} = 10V$	Q_g	$V_{DS} = 50V, I_D = 20A, V_{GS} = 10V$	-	73	-	nC	
Total Gate Charge @ $V_{GS} = 6V$	Q_g		-	48	-		
Gate-Source Charge	Q_{gs}		-	21	-		
Gate-Drain Charge	Q_{gd}		-	13	-		
Gate Resistance	R_g	$V_{GS} = 0V, V_{DS} = 0V, f = 1MHz$	-	1.5	-	Ω	
Drain-Source Diode Characteristics⁷⁾							
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 20A, di/dt = 100A/\mu s, T_J = 25^\circ C$	-	65	-	ns	
Body Diode Reverse Recovery Charge	Q_{rr}		-	120	-	nC	
Diode Forward Current	I_S	-	-	-	148	A	

Notes:

1. Pulse width limited by maximum junction temperature.
2. Pulse Test: Pulse Width $\leq 100\mu s$, Duty Cycle $\leq 2\%$.
3. Device mounted on 1inch FR-4 PCB with 2oz. Copper.
4. Device mounted on infinite heatsink.
5. Measured under pulsed conditions. Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
6. Guaranteed by design, not subject to production.

Typical Characteristics

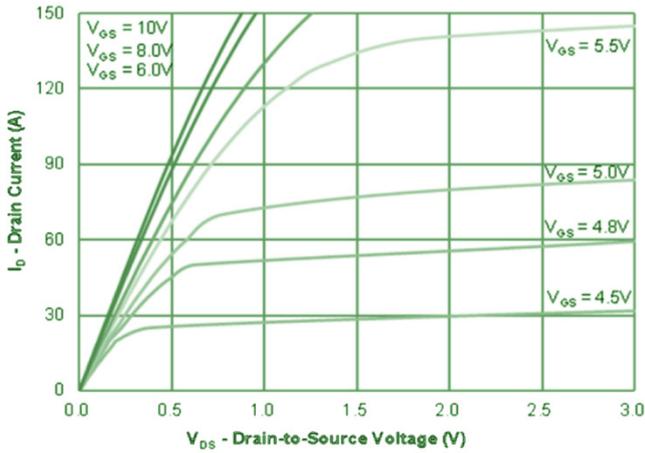


Figure 1: Output Characteristics

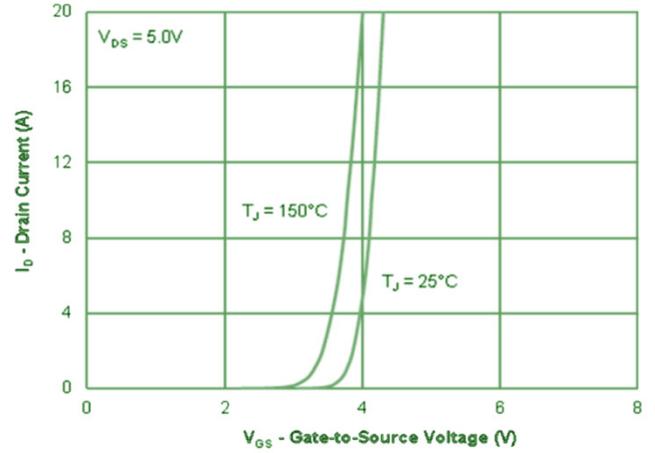


Figure 2: Transfer Characteristics

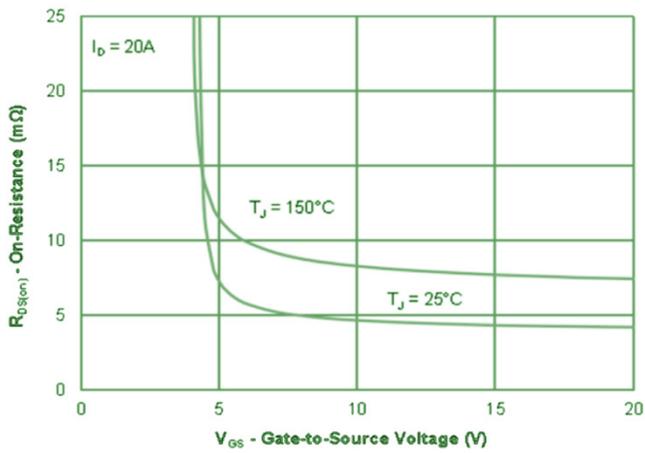


Figure 3: On-Resistance vs. Gate-Source Voltage

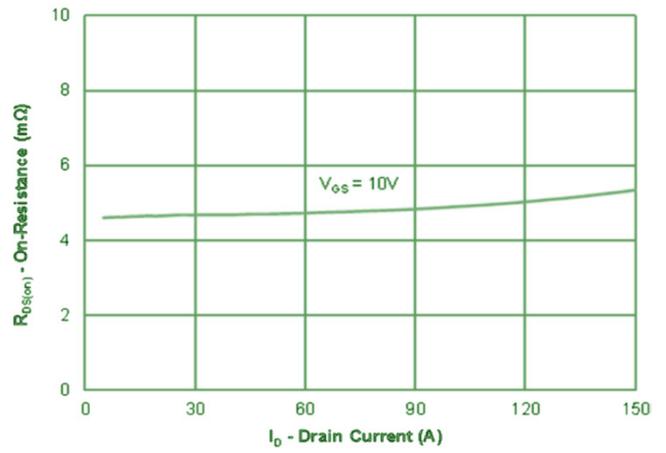


Figure 4: On-Resistance vs. Gate-Source Voltage

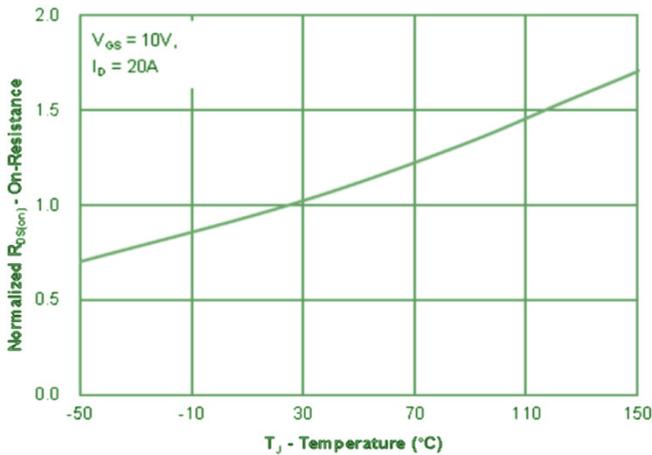


Figure 5: On-Resistance vs. Junction Temperature

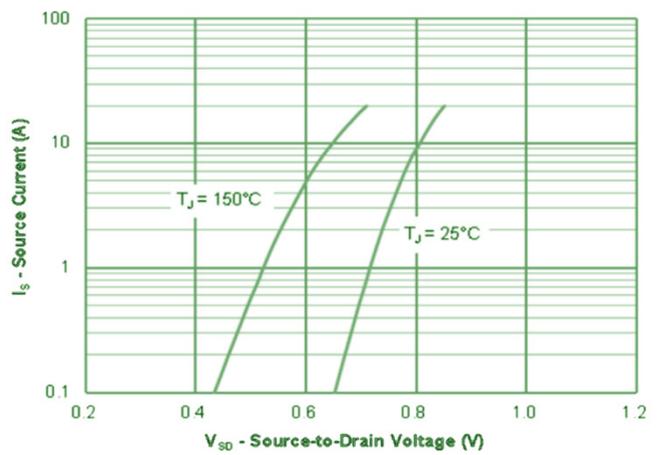


Figure 6: Source-Drain Diode Forward Voltage

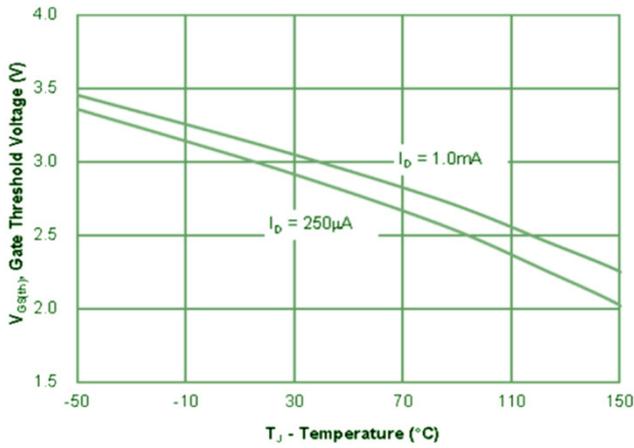


Figure 7: Gate Threshold Variation vs. Junction Temperature

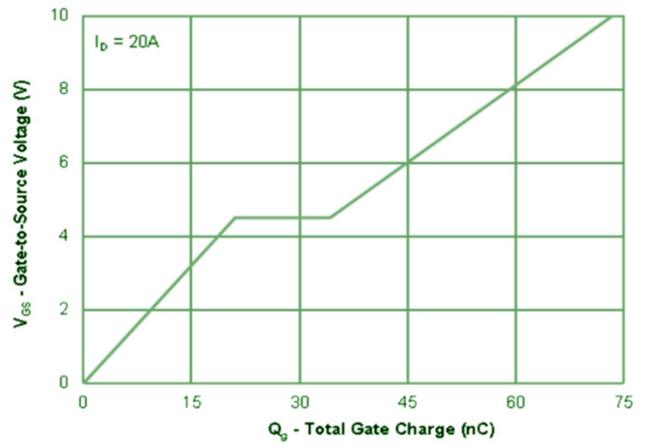


Figure 8: Gate Charge Characteristics

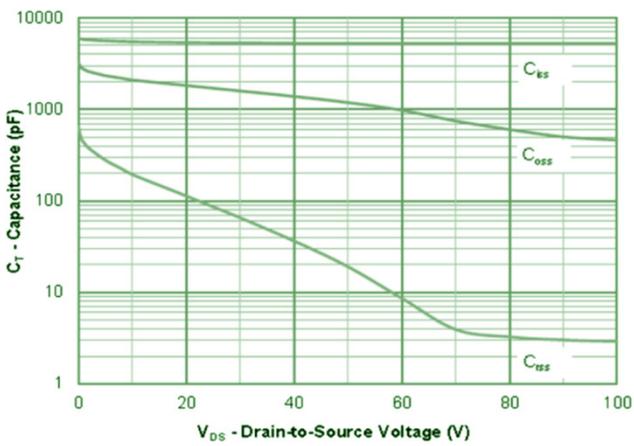


Figure 9: Capacitance Characteristics

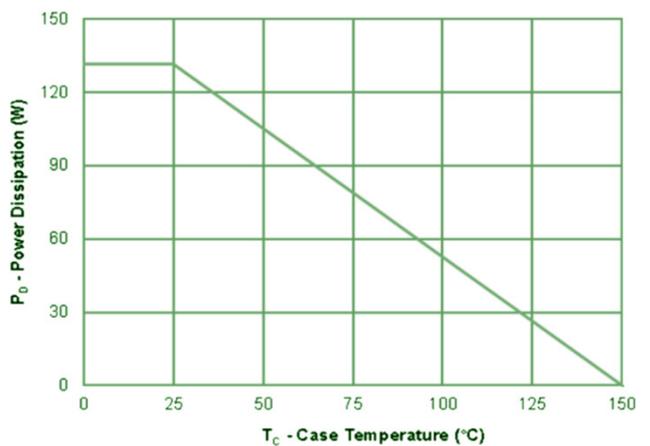


Figure 10: Power Derating

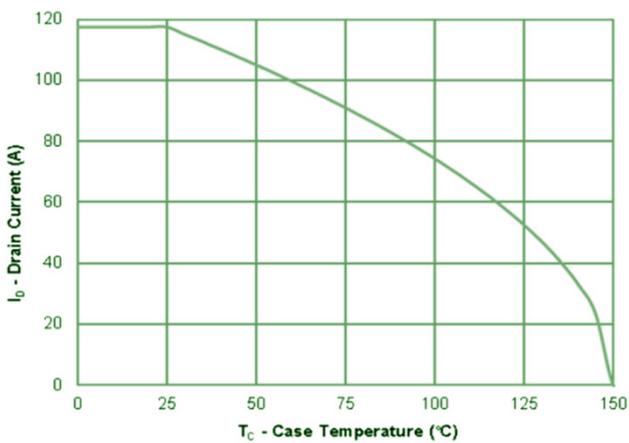


Figure 11: Current Derating

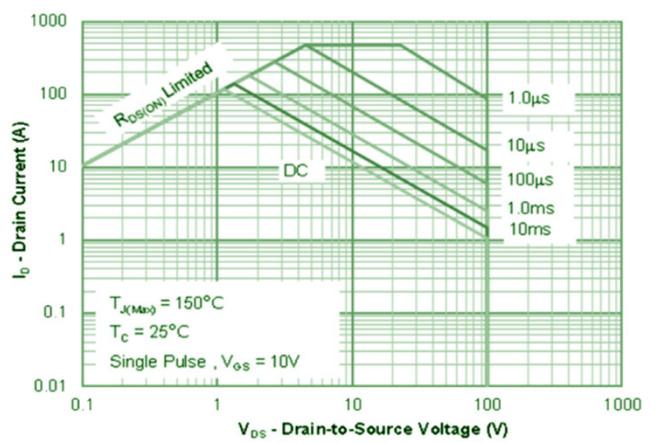
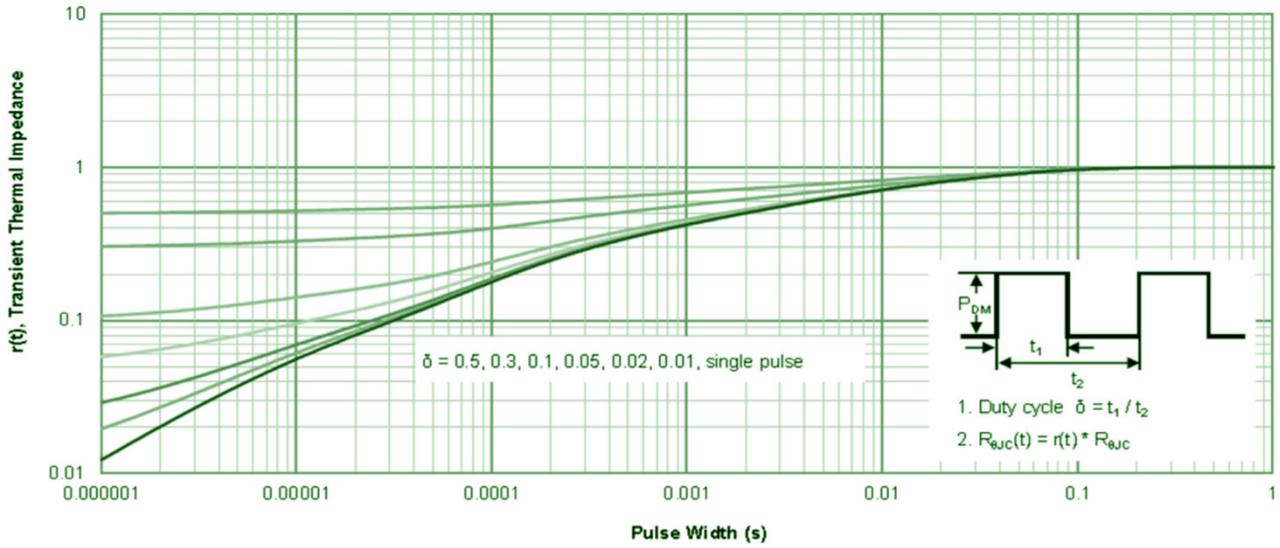
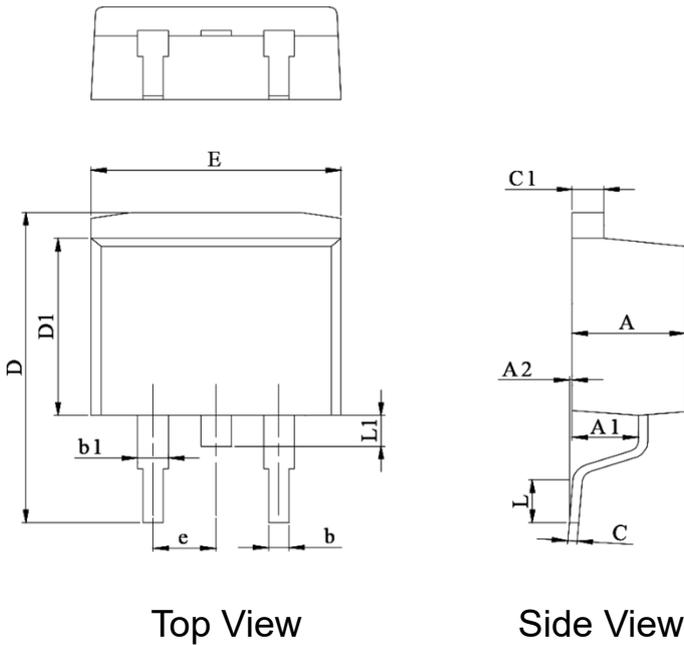


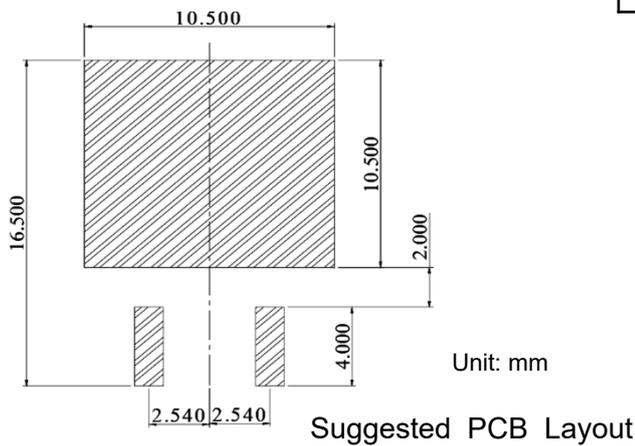
Figure 12: Safe Operating Area



Product dimension (TO-263)



Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	4.24	4.77	0.167	0.188
A1	2.30	2.89	0.091	0.114
A2	0.00	0.25	0.000	0.010
b	0.70	0.96	0.028	0.038
b1	1.17	1.70	0.046	0.067
C	0.30	0.60	0.012	0.024
C1	1.15	1.42	0.045	0.056
D	14.10	15.88	0.555	0.625
D1	8.50	9.60	0.335	0.378
E	9.78	10.36	0.385	0.408
L	1.78	2.79	0.070	0.110
L1	-	1.75	-	0.069
e	2.54 Typ.		0.100 Typ.	



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