Prisemi®

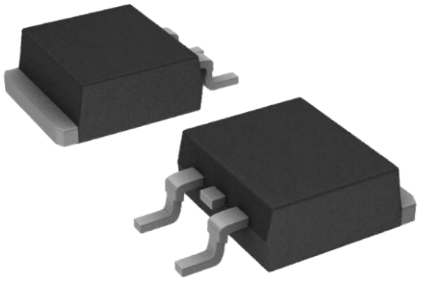
PSMD2P06R3L

N-Channel MOSFET

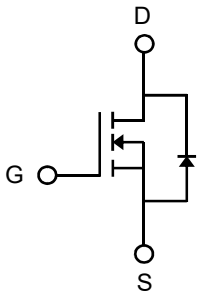
Description

The PSMD2P06R3L 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

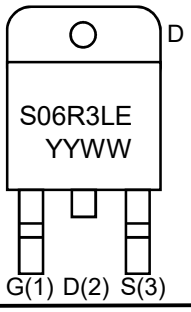
MOSFET Product Summary			
V_{DS}(V)	$R_{DS(on)}$(mΩ)	I_D(A)	
60	2.8@ V_{GS} = 10V	Silicon Limited T_C=25℃	158
		Silicon Limited T_C=100℃	100
		Package Limited T_C=25℃	100



TO-263 (Top View)



Circuit Diagram



Marking (Top View)

Feature

- Low $R_{DS(ON)}$ - Ensures On-State Losses are Minimized
- Excellent Q_{gd} x $R_{DS(ON)}$ Product(FOM)
- Advanced Technology for DC-DC Converts
- Small Form Factor Thermally Efficient Package Enables Higher Density End Products
- 100% UIS (Avalanche) Rated
- Lead-Free Finish ; RoHS Compliant
- Halogen and Antimony Free. "Green" Device

Applications

- PWM applications
- Load switch
- Power management
- DC-DC Converters
- Wireless Chargers

Absolute maximum rating@25℃

Rating		Symbol	Value	Units
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuous	Silicon Limited T_C=25℃	I_D	158	A
	Silicon Limited T_C=100℃		100	
	Package Limited T_C=25℃		100	
Pulsed Drain Current[1)]		I_{DM}	380	A
Total Power Dissipation[2)]		P_D	92	W
Avalanche Current[5)]		I_{AS}	75.5	A
Avalanche Energy[5)]		E_{AS}	285	mJ
Thermal Resistance , Junction-case		$R_{\theta JC}$	1.36	℃/W
Thermal Resistance Junction-to-Ambient @ Steady State[2)]		$R_{\theta JA}$	43.65	℃/W
Junction and Storage Temperature Range		T_J, T_{STG}	-55~+150	℃

Electrical characteristics per line@25℃ (unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D= 250μA	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= 60V,V_{GS}= 0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}= 0V	-	-	±100	nA
On Characteristics[3]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D= 250μA	1.0	1.5	2.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D= 20A	-	2.8	3.8	mΩ
		V_{GS}= 4.5V, I_D= 20A	-	3.7	4.8	
Dynamic Parameters[4]						
Input Capacitance	C_{iss}	V_{DS}= 30V,V_{GS}= 0V, f= 1MHz	-	3122	-	pF
Output Capacitance	C_{oss}		-	888	-	
Reverse Transfer Capacitance	C_{rss}		-	36	-	
Switching Parameters[4]						
Turn-on Delay Time	$t_{d(on)}$	V_{DS} = 30V, V_{GS} = 10V, R_G = 10Ω,I_D = 20A	-	8.7	-	ns
Turn-on Rise Time	t_r		-	14.5	-	
Turn-Off Delay Time	$t_{d(off)}$		-	109.2	-	
Turn-Off Fall Time	t_f		-	46.5	-	
Total Gate Charge	Q_g	V_{DS}= 30V,I_D= 20A, V_{GS}= 10V	-	54.2	-	nC
Gate-Source Charge	Q_{gs}		-	6.7	-	
Gate-Drain Charge	Q_{gd}		-	8.9	-	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V,f=1MHz	-	1.36	-	Ω
Drain-Source Diode Characteristics						
Diode Forward Voltage[3]	V_{SD}	V_{GS}= 0V,I_S= 20A	-	0.83	1.1	V

Notes:
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production.
5. This single-pulse measurement was taken under the following condition (L=100uH,V_{GS}=10V,V_{DS}=50V)while it's value is limited by T_{J_Max}=150℃.

Typical Characteristics

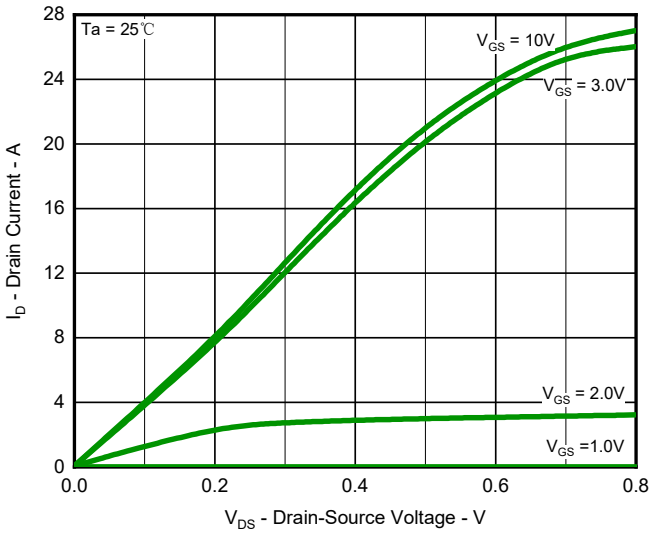


Fig.1 Output Characteristics

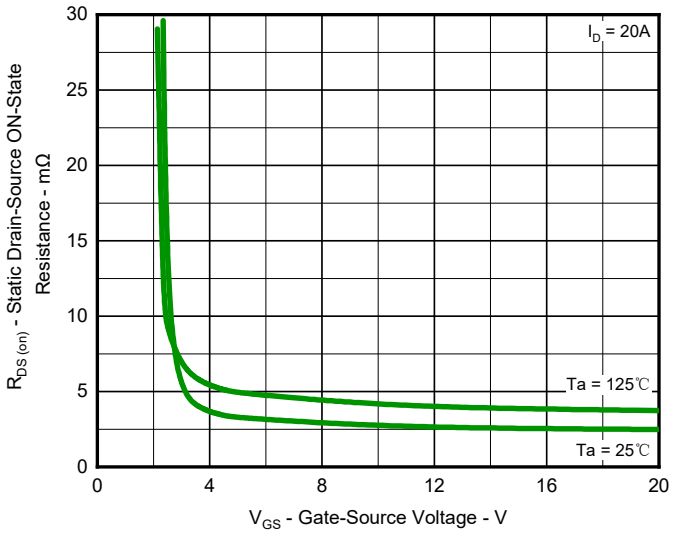


Fig.2 On-Resistance vs. Gate-Source Voltage

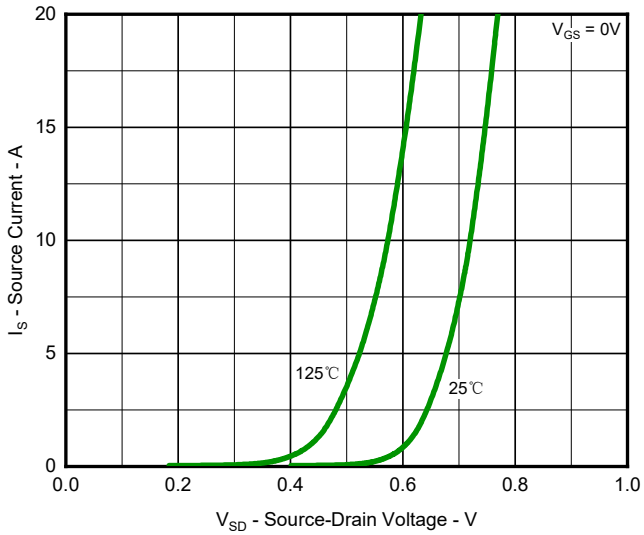


Fig.3 Diode Forward Voltage vs. Current

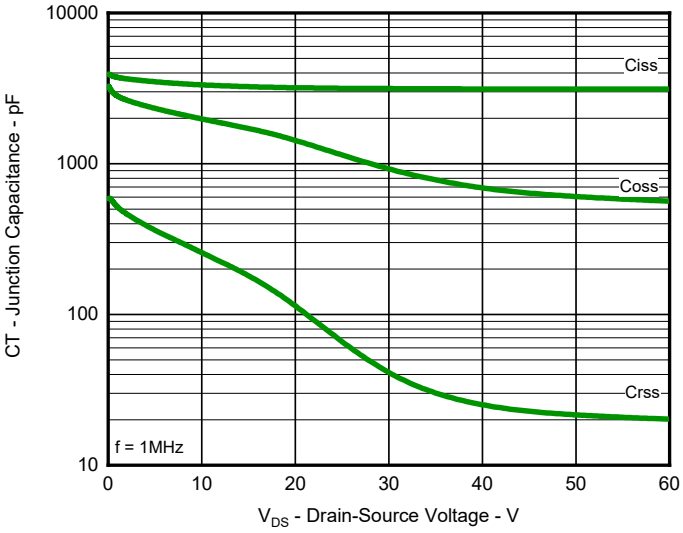


Fig.4 Typical Junction Capacitance

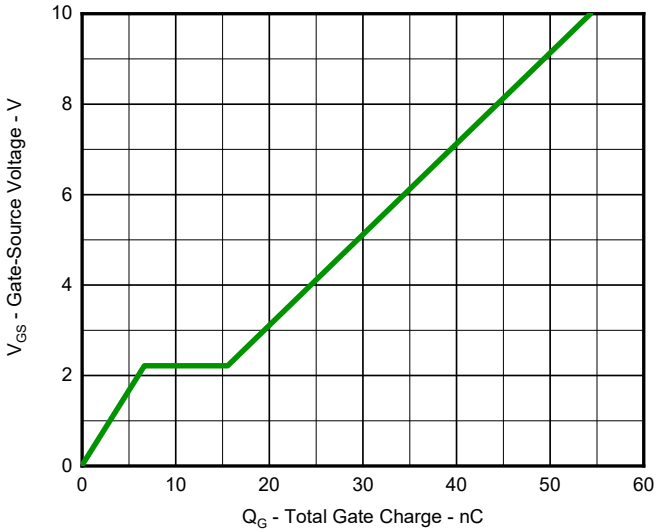


Fig.5 Gate Charge Characteristics

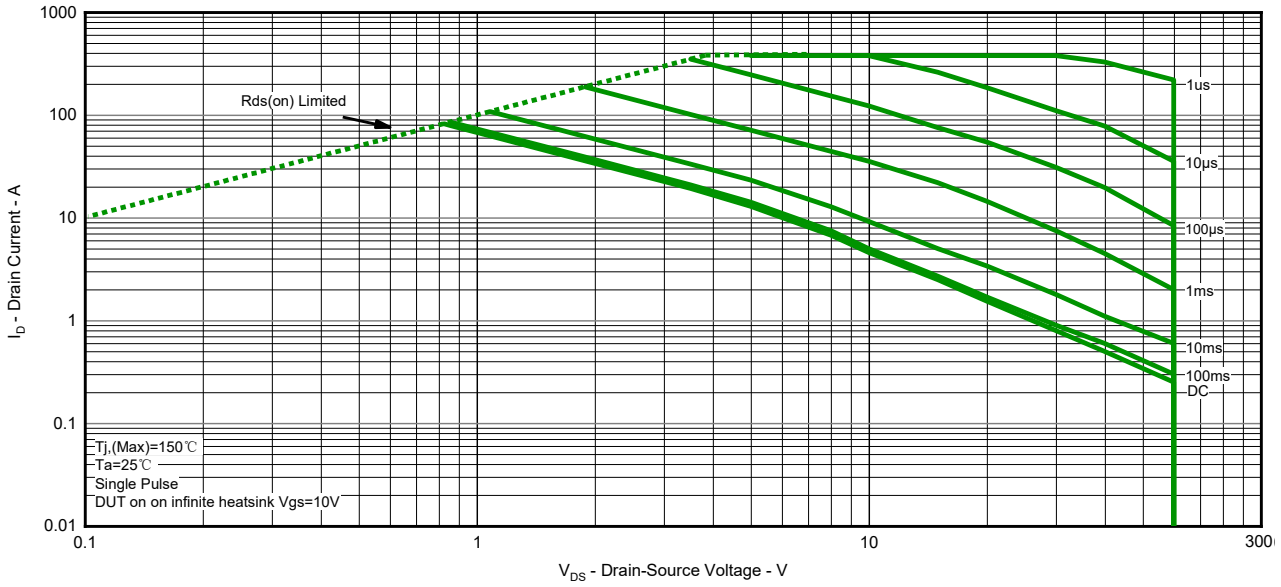


Fig.6 Safe Operation Area

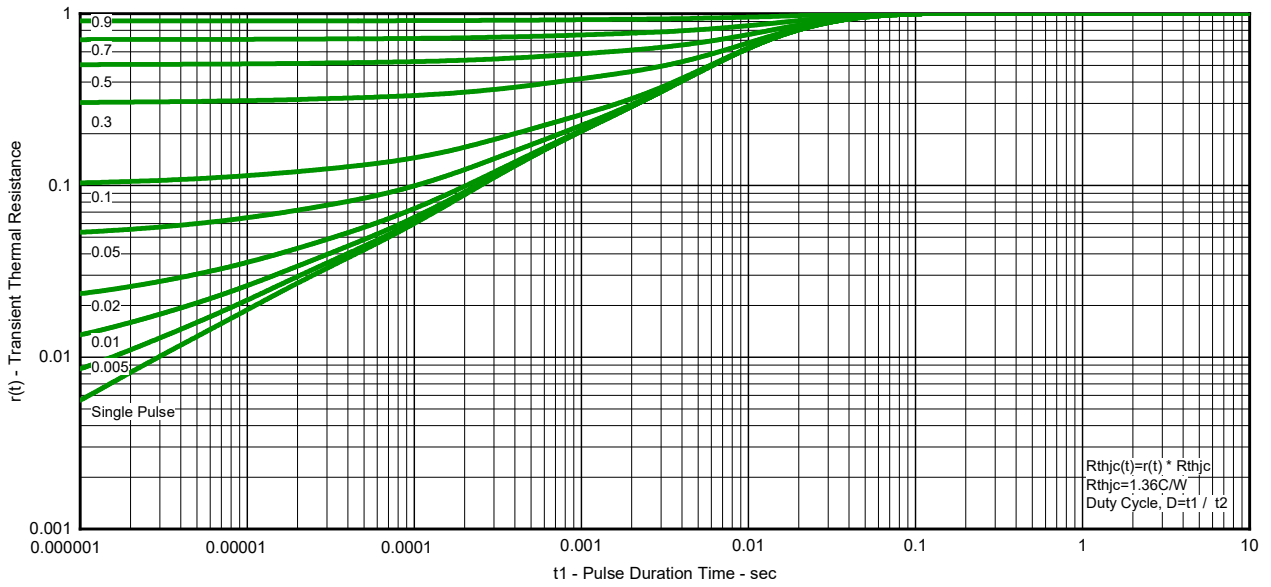
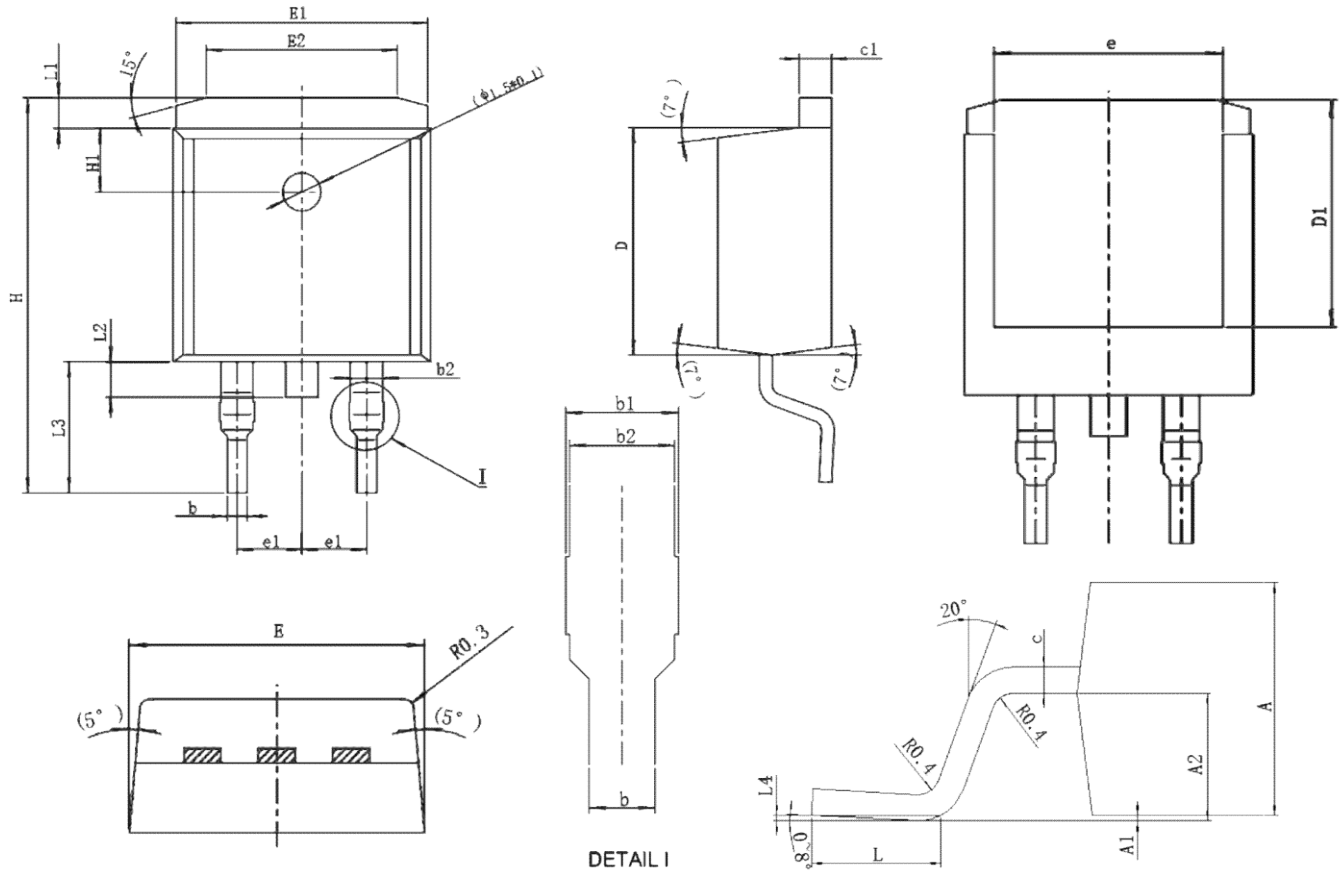


Fig.7 Transient Thermal Resistance

Product dimension (TO-263)



Dim	Millimeters		Inches		Dim	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	4.56	4.58	0.180	0.180	E1	9.85	9.91	0.388	0.390
A1	0.02	0.22	0.001	0.009	E2	7.40	7.60	0.291	0.299
A2	2.34	2.67	0.092	0.105	e	7.50	8.50	0.295	0.335
b	0.75	0.85	0.030	0.033	e1	2.53	2.55	0.100	0.100
b1	1.27	1.47	0.050	0.058	H	15.30	15.70	0.602	0.618
b2	1.22	1.32	0.048	0.052	H1	2.40	2.60	0.094	0.102
c	0.51	0.53	0.020	0.021	L	2.44	2.64	0.096	0.104
c1	1.29	1.32	0.051	0.052	L1	1.10	1.30	0.043	0.051
D	9.14	9.16	0.360	0.361	L2	1.20	1.70	0.047	0.067
D1	7.93	7.95	0.312	0.313	L3	5.14	5.16	0.202	0.203
E	10.00	10.20	0.394	0.402	L4	0.11	0.13	0.004	0.005

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