Prisemi®

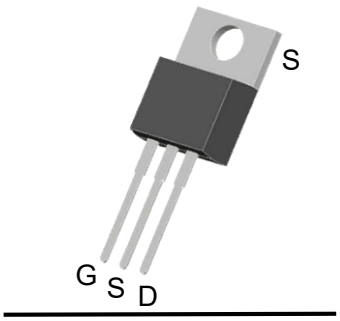
PSMTO06R3L

N-Channel MOSFET

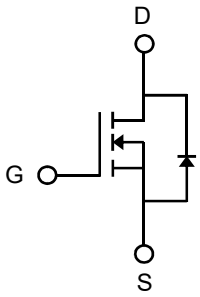
Description

The PSMTO06R3L 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

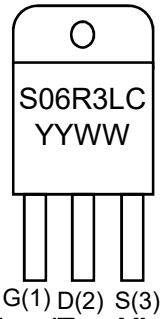
MOSFET Product Summary			
V_{DS}(V)	$R_{DS(on)}$(mΩ)	I_D(A)	
60	3.3@ V_{GS} = 10V	Silicon Limited T_C=25℃	158
		Silicon Limited T_C=100℃	100
		Package Limited T_C=25℃	100



TO-220 (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	-	3.3	4.5	mΩ
		V_{GS}= 4.5V, I_D= 20A	-	4.5	5.5	
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

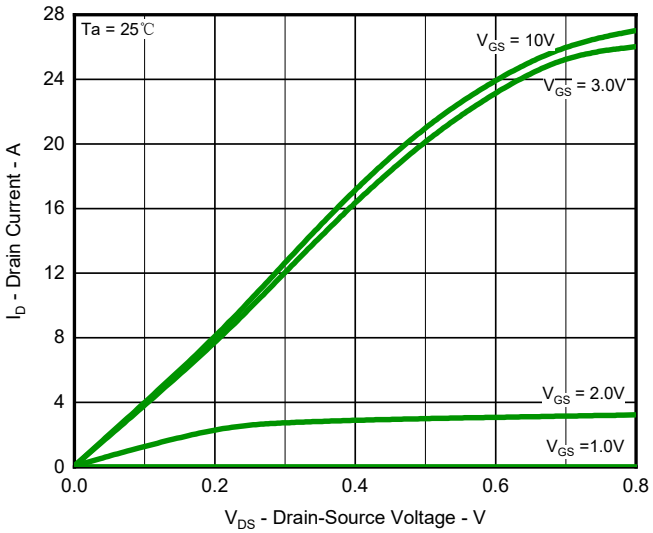


Fig.1 Output Characteristics

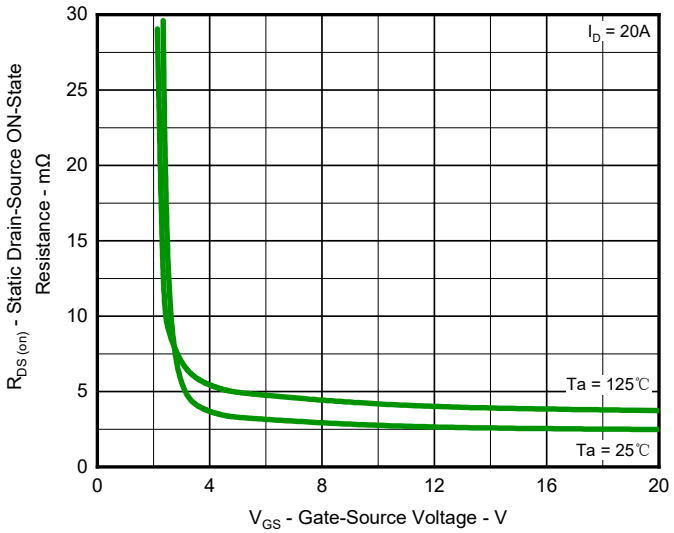


Fig.2 On-Resistance vs. Gate-Source Voltage

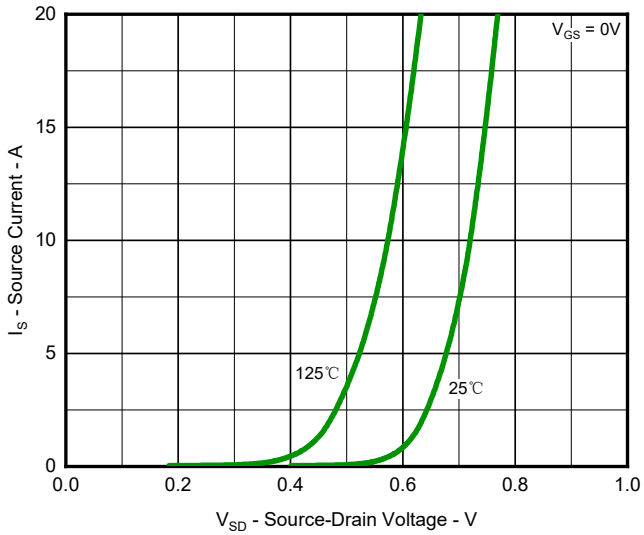


Fig.3 Diode Forward Voltage vs. Current

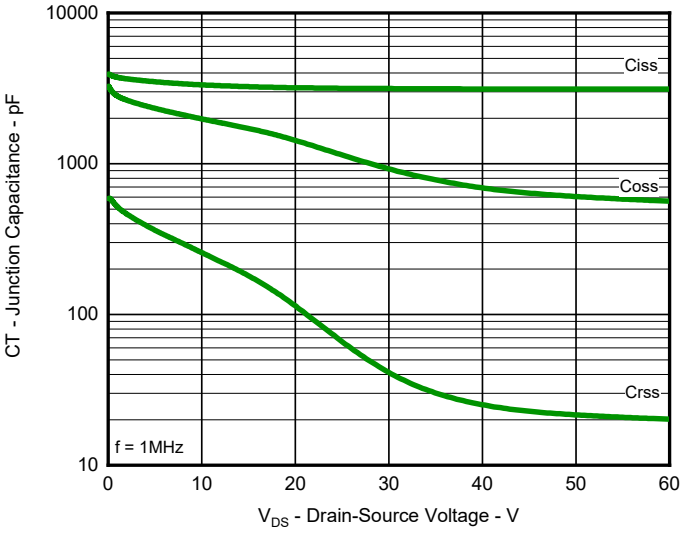


Fig.4 Typical Junction Capacitance

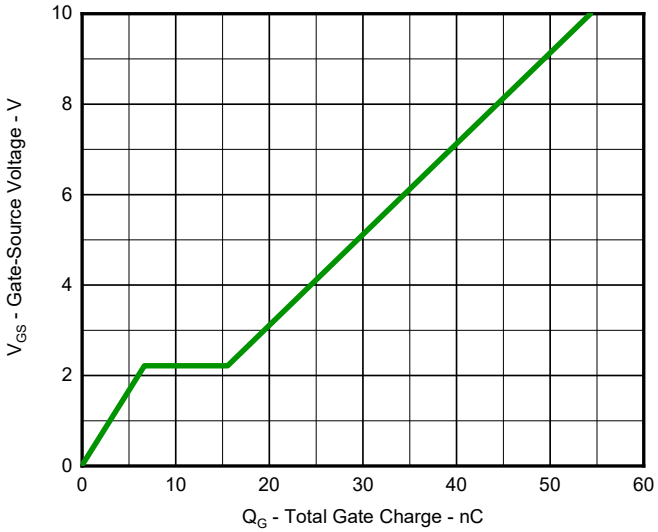


Fig.5 Gate Charge Characteristics

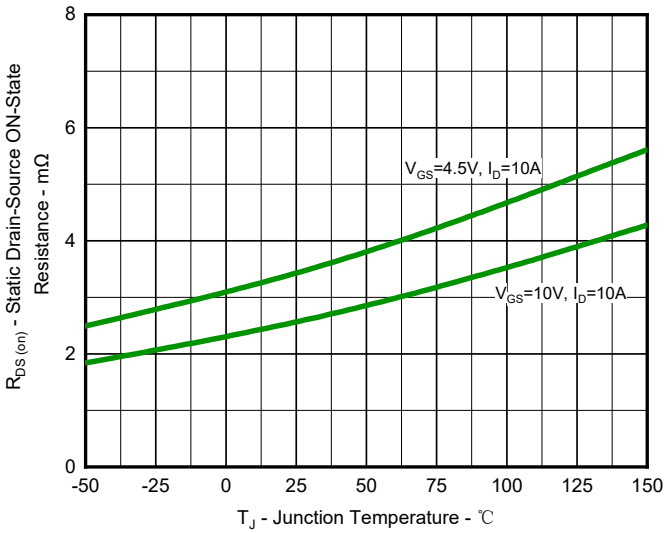


Fig.6 On-Resistance Variation with Temperature

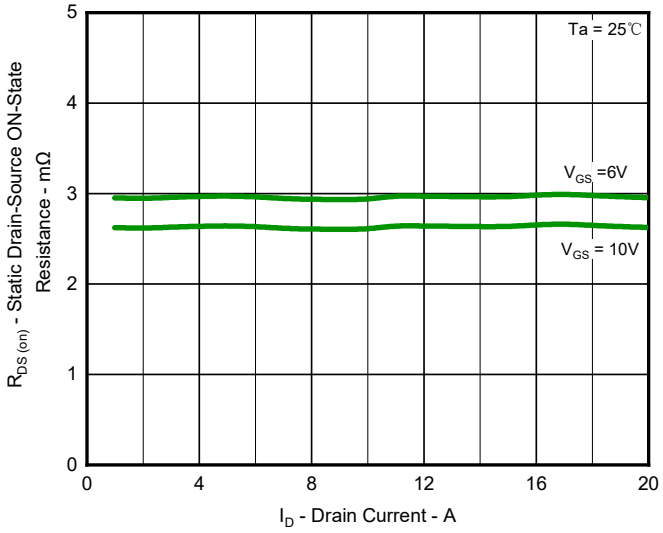


Fig.7 Typical On-Resistance vs Drain Current

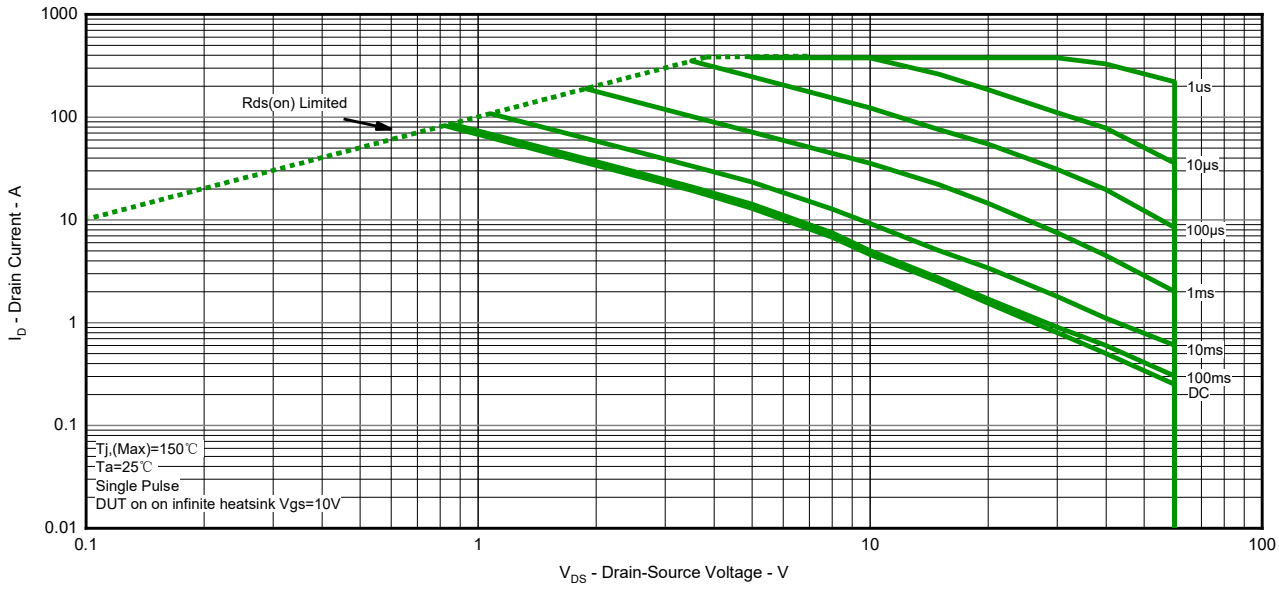


Fig.8 Safe Operation Area

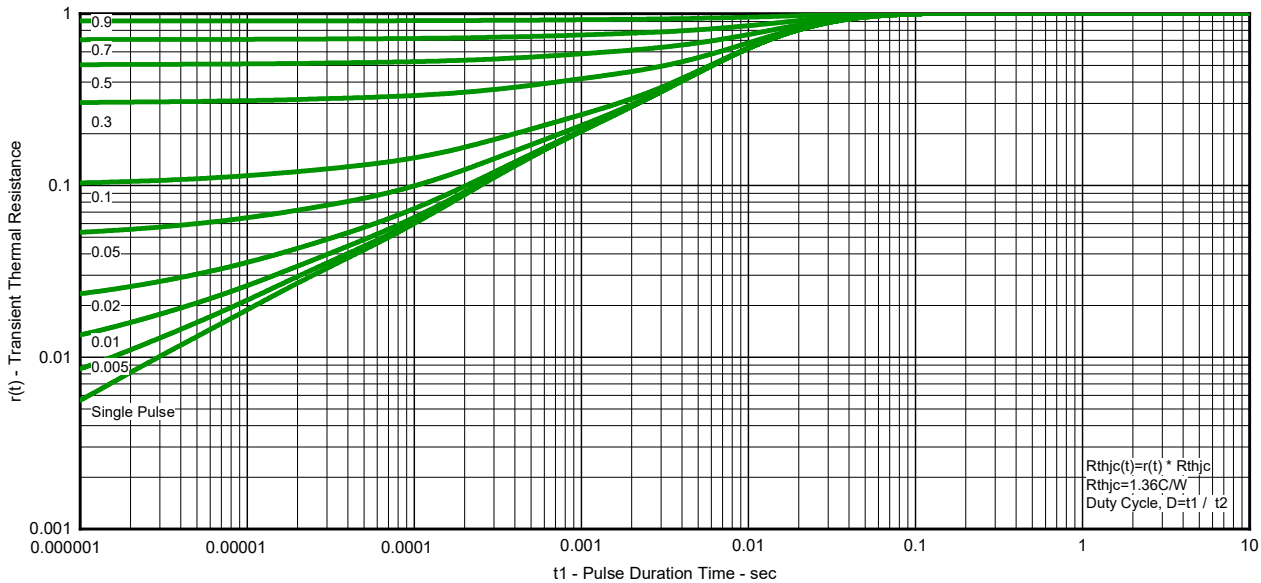
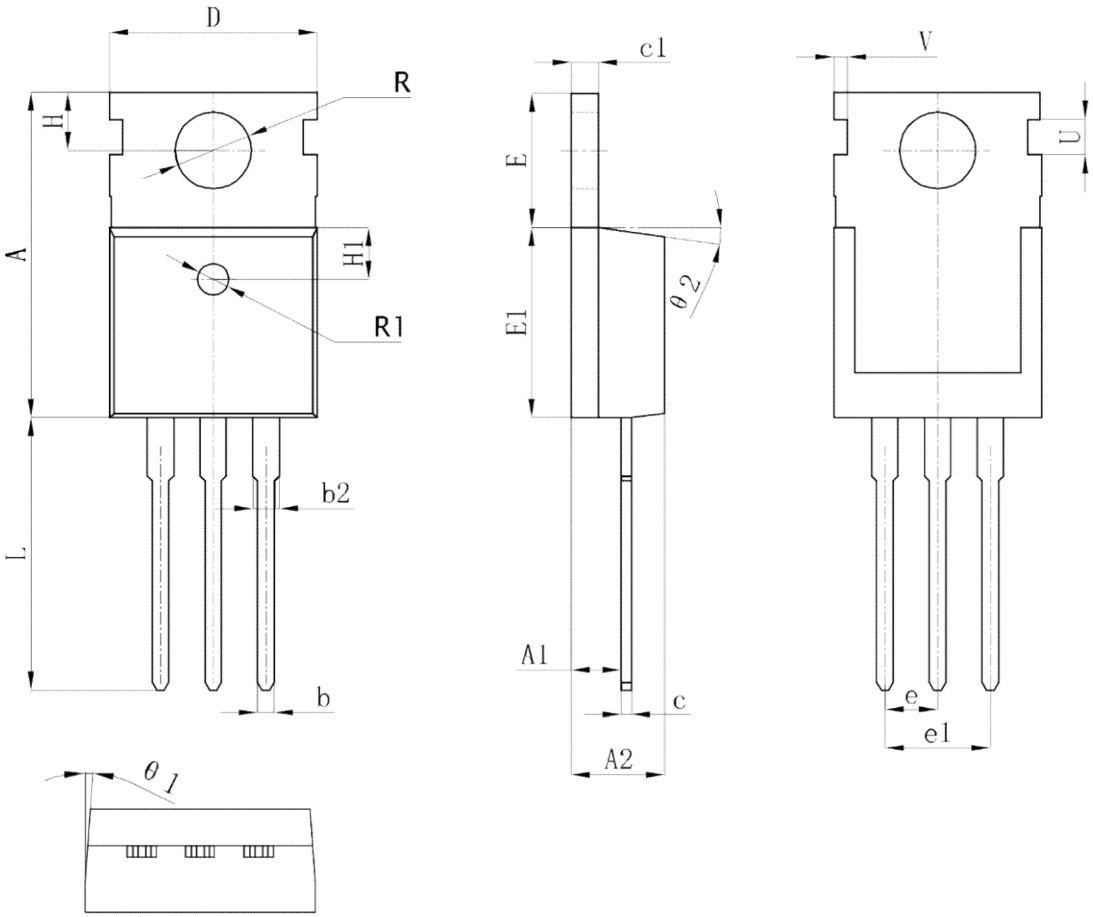


Fig.9 Transient Thermal Resistance

Product Dimension (TO-220)



Dim	Millimeters		Inches		Dim	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	15.40	15.80	0.606	0.622	e1	4.84	5.32	0.191	0.209
A1	2.35	2.50	0.093	0.098	H	2.73	2.87	0.107	0.113
A2	4.40	4.70	0.173	0.185	H1	2.40	2.60	0.094	0.102
b	0.70	0.90	0.028	0.035	L	13.02	13.72	0.513	0.540
b2	1.18	1.44	0.046	0.057	R	3.50	3.63	0.138	0.143
c	0.48	0.56	0.019	0.022	R1	1.40	1.60	0.055	0.063
c1	1.29	1.32	0.051	0.052	U	1.65	1.85	0.065	0.073
D	9.80	10.20	0.386	0.402	V	0.58	0.78	0.023	0.031
E	6.40	6.60	0.252	0.260	θ1	2°	3°	2°	3°
E1	9.00	9.20	0.354	0.362	θ2	6.5°	7.5°	6.5°	7.5°
e	2.42	2.66	0.095	0.105					

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