Prisemi®

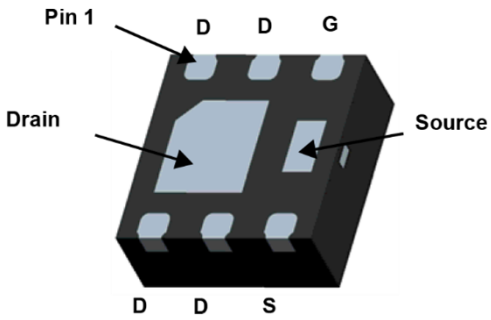
PSM6N03R6L

N-Channel MOSFET

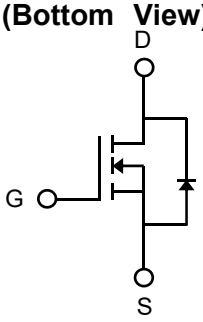
Description

The PSM6N03R6L uses split gate trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for power management and high efficiency applications at high switching frequencies applications.

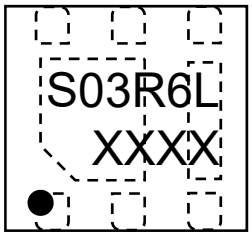
MOSFET Product Summary		
V_{DS}(V)	$R_{DS(on)}$(mΩ)(Typ)	I_D(A)
30	4.7@ V_{GS} = 10V	23
	6.8@ V_{GS} = 4.5V	



DFN2020-6L
(Bottom 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}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuous[1]	T_C=25℃	I_D	23	A
	T_C=100℃		14.6	
Pulsed Drain Current[2]		I_{DM}	92	A
Total Power Dissipation[3]		P_D	4.6	W
Avalanche Current[4]		I_{AS}	16	A
Avalanche Energy[4]		E_{AS}	67	mJ
Thermal Resistance , Junction-to-Case[5]		$R_{\theta JC}$	12.3	℃/W
Thermal Resistance Junction-to-Ambient[6]		$R_{\theta JA}$	61.8	℃/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	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30V,V_{GS} = 0V	-	-	1.0	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±20V,V_{DS} = 0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS},I_D = 250μA	1.0	1.5	2.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS} = 10V,I_D = 8A	-	4.7	6.0	mΩ
		V_{GS} = 4.5V,I_D = 6A	-	6.8	9.0	
Dynamic Characteristics[7)]						
Input Capacitance	C_{lss}	V_{DS} = 15V,V_{GS} = 0V, f = 1.0MHz	-	820	-	pF
Output Capacitance	C_{oss}		-	216	-	
Reverse Transfer Capacitance	C_{rss}		-	15	-	
Switching Characteristics[7)]						
Turn-on Delay Time	$t_{d(on)}$	V_{DS} = 15V, V_{GS} = 10V, R_G = 10Ω, I_D = 10A	-	5.0	-	ns
Turn-on Rise Time	t_r		-	6.0	-	
Turn-Off Delay Time	$t_{d(off)}$		-	33	-	
Turn-Off Fall Time	t_f		-	17	-	
Total Gate Charge	Q_g	V_{DS} = 15V, V_{GS} = 10V, I_D = 10A	-	12.4	-	nC
Gate-Source Charge	Q_{gs}		-	1.7	-	
Gate-Drain Charge	Q_{gd}		-	3.9	-	
Gate Resistance	R_g	f=1MHz, Open Drain	-	4.0	-	Ω
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V,I_S = 1A	-	0.7	1.2	V

Notes:
1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. Repetitive Rating: Pulse width limited by maximum junction temperature(T_{J_Max}=150℃).
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. This single-pulse measurement was taken under the following condition (L=0.1mH,V_{GS}=10V,V_{DS}=30V)while it's value is limited by T_{J_Max}=150℃.
5. Device mounted on infinite heatsink.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
7. Guaranteed by design, not subject to production.

Typical Characteristics

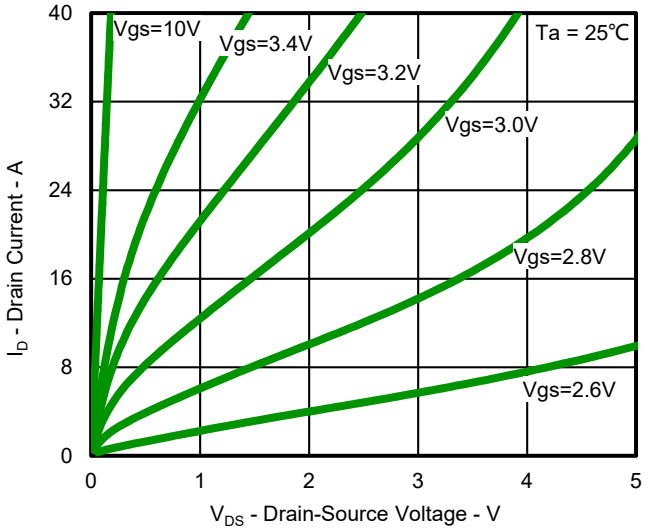


Fig.1 Output Characteristics

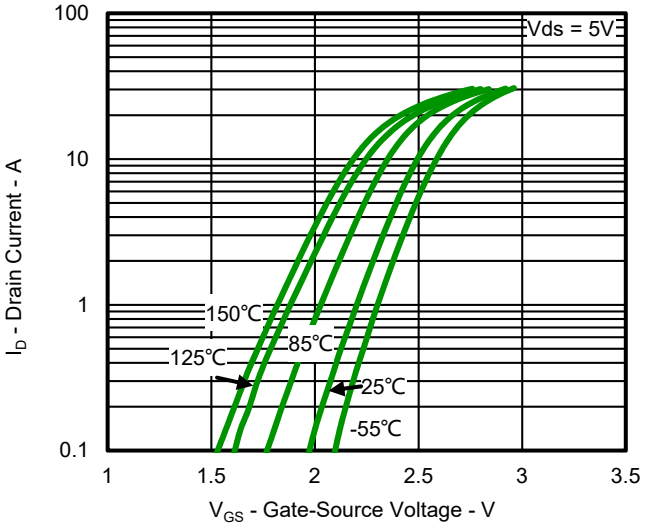


Fig.2 Typical Transfer Characteristic

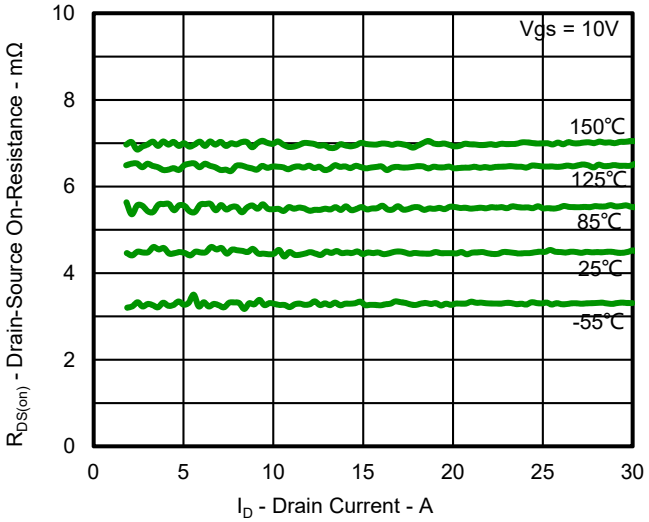


Fig.3 Typical On-Resistance vs Drain Current and Temperature

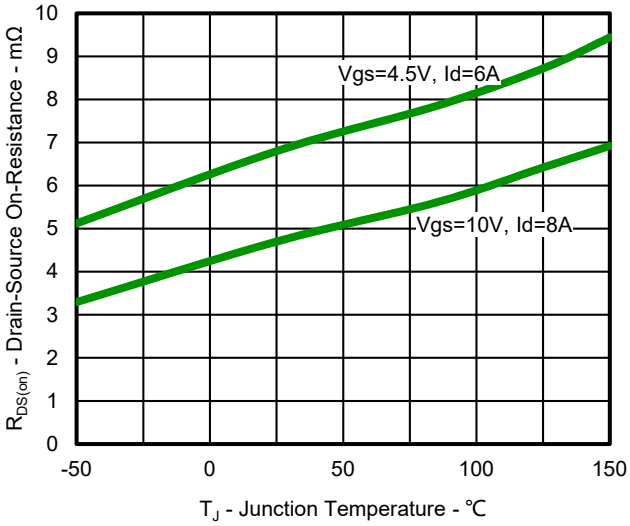


Fig.4 On-Resistance Variation with Temperature

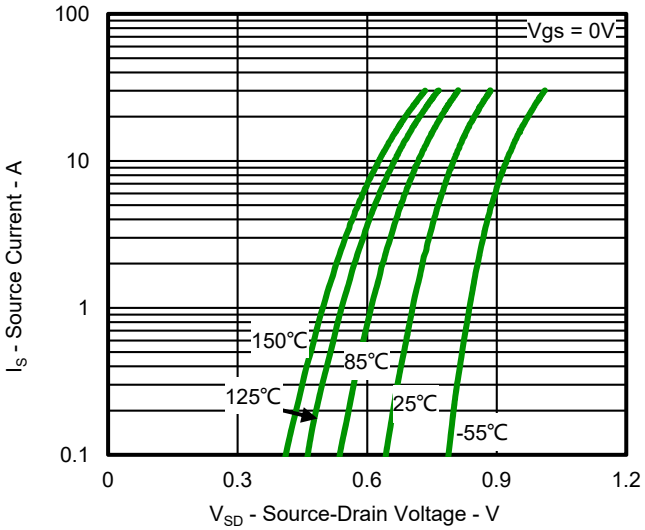


Fig.5 Diode Forward Voltage vs. Current

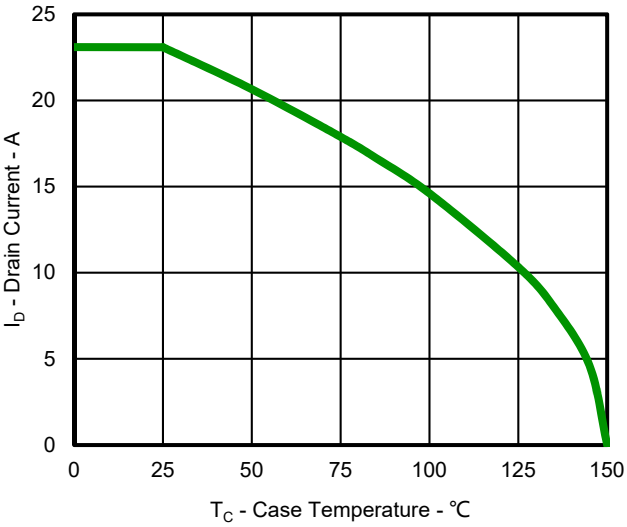


Fig.6 Maximum Drain Current vs. Case Temperature

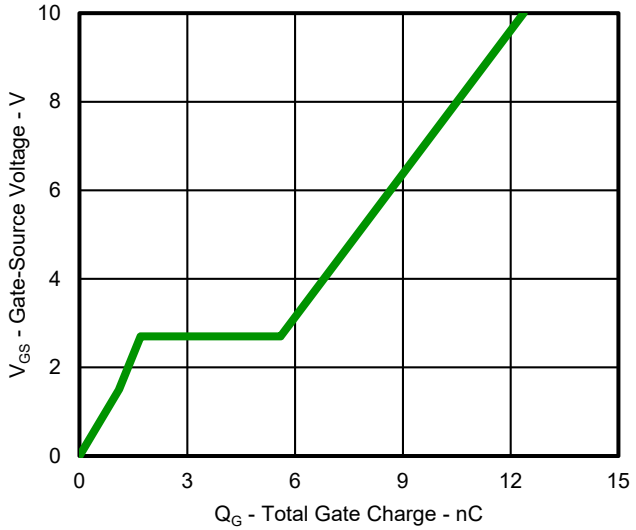


Fig.7 Gate Charge Characteristics

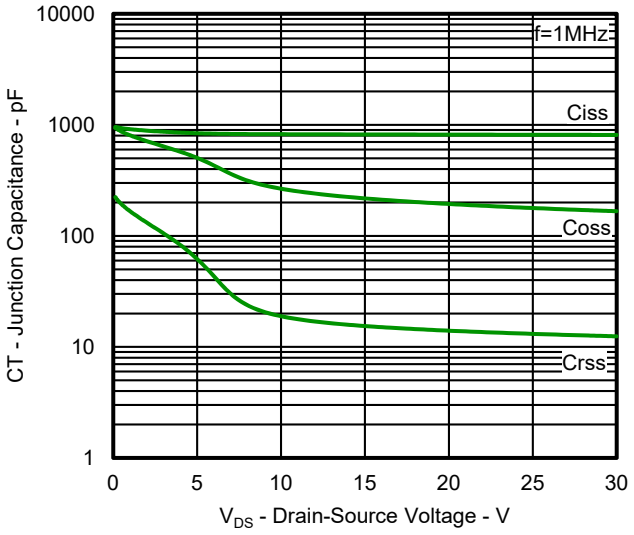


Fig.8 Typical Junction Capacitance

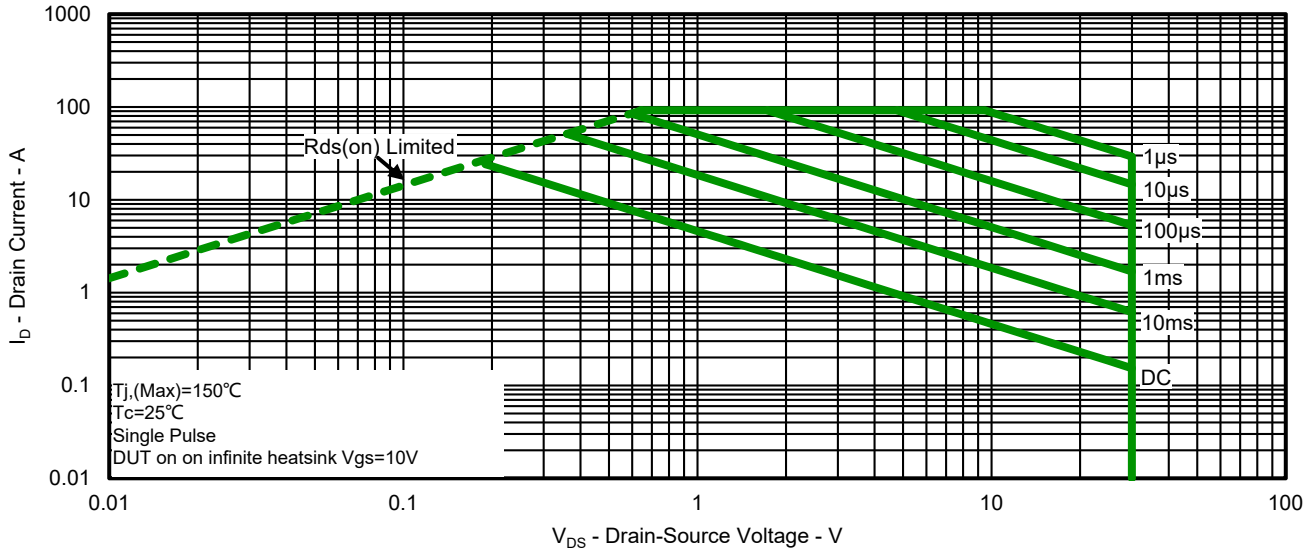


Fig.9 Safe Operation Area

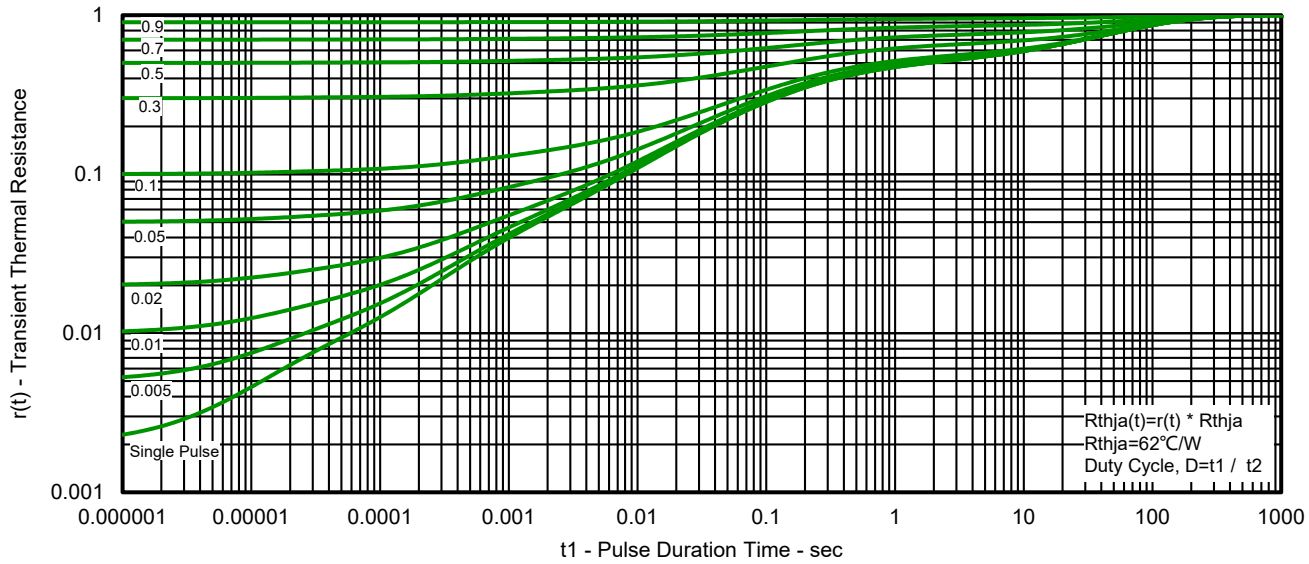
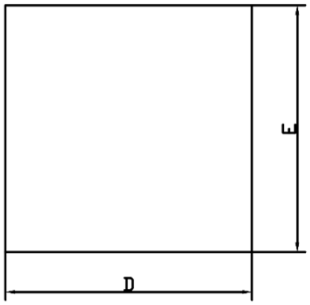
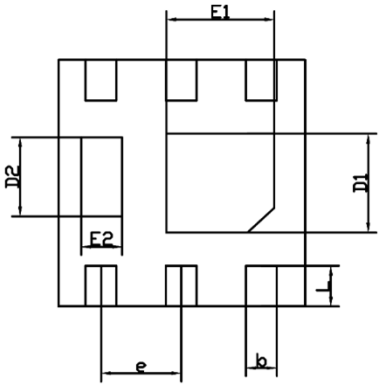


Fig.10 Transient Thermal Resistance

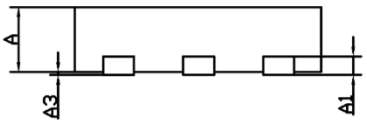
Product Dimension (DFN2020-6L)



Top View



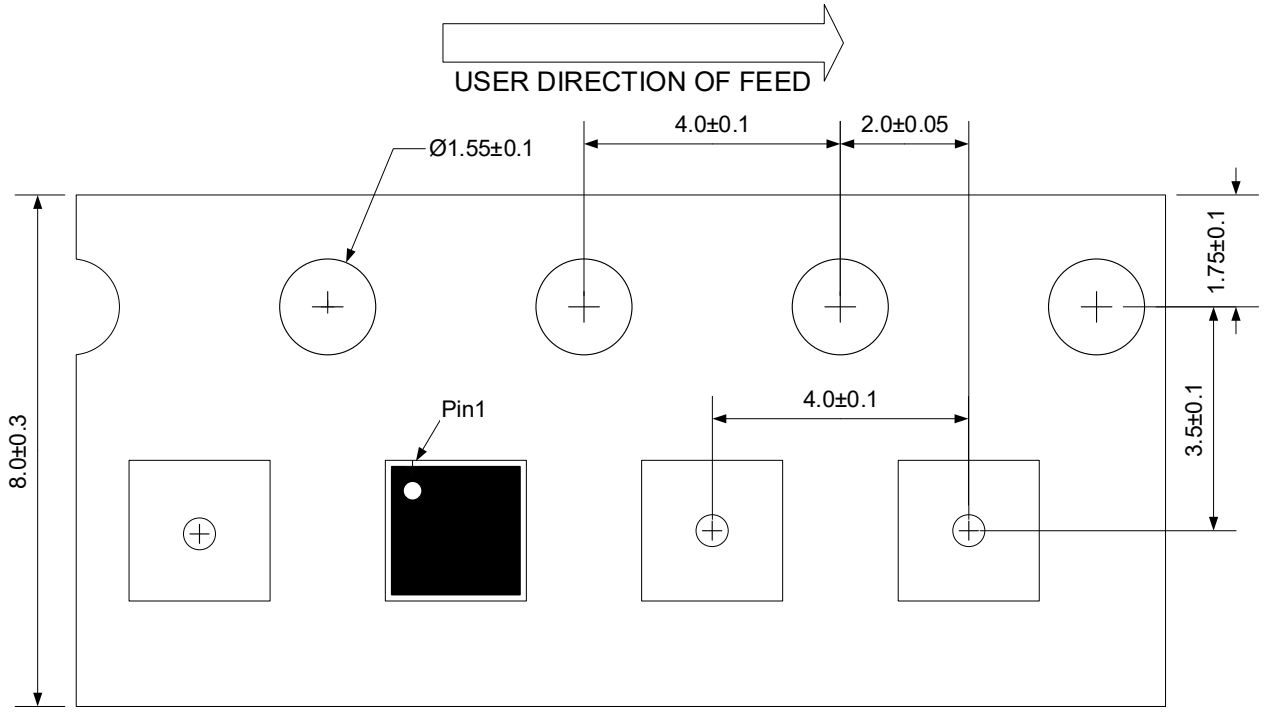
Bottom View



Side View

Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	0.50	0.60	0.020	0.024
A1	0.15 Ref.		0.006 Ref.	
A3	0.00	0.05	0.000	0.002
D	1.95	2.05	0.077	0.081
E	1.95	2.05	0.077	0.081
D1	0.875	0.925	0.034	0.036
D2	0.675	0.725	0.027	0.029
E1	0.875	0.925	0.034	0.036
E2	0.275	0.325	0.011	0.013
b	0.30 Ref.		0.012 Ref.	
e	0.65 Ref.		0.026 Ref.	
L	0.25	0.35	0.010	0.014

Load with information



Unit:mm

Ordering information

Package	Reel	Shipping
DFN2020-6L	7"	3000 / Tape & Reel

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