Prisemi®

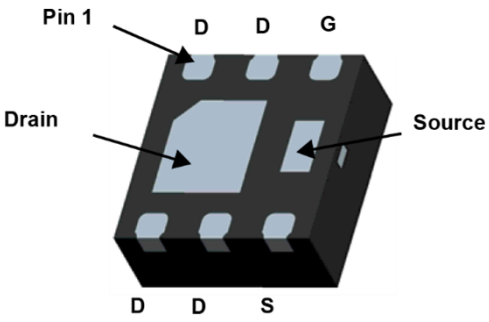
PSM6N30V20

N-Channel MOSFET

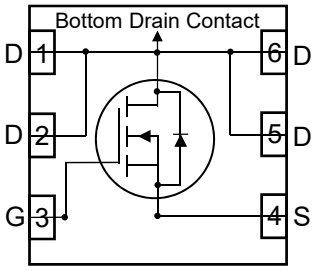
Description

The PSM6N30V20 uses split gate trench technology to provide excellent Rdson low gate charge. This device is suitable for power management and high efficiency applications at high switching frequencies applications.

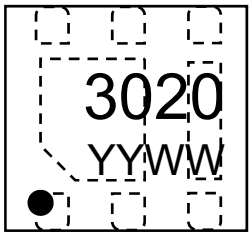
MOSFET Product Summary		
V_{DS}(V)	$R_{DS(on)}$(mΩ)	I_D(A)
30	4.0 @ V_{GS} = 10V	20



DFN2020-6L
(Bottom View)



Circuit Diagram



Marking (Top View)

Feature

- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

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	I_D	20	A
Pulsed Drain Current[1)]	I_{DM}	110	A
Avalanche Energy, Single Pulse	E_{AS}	96	mJ
Total Power Dissipation[2)]	P_D	2.4	W
Thermal Resistance Junction-to-Ambient @ Steady State[2)]	$R_{\theta JA}$	56	℃/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	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	1.1	1.8	2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D= 10A	-	4.0	4.5	mΩ
		V_{GS}= 4.5V, I_D= 10A	-	6.0	8.0	
Dynamic Parameters[4]						
Input Capacitance	C_{iss}	V_{DS}= 15V,V_{GS}= 0V, f= 1MHz	-	1100	-	pF
Output Capacitance	C_{oss}		-	270	-	
Reverse Transfer Capacitance	C_{rss}		-	16	-	
Switching Parameters[4]						
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 15V, I_D= 10A, V_{GEN} = 10V,R_{GEN} = 3Ω	-	1.27	-	ns
Turn-on Rise Time	t_r		-	1.13	-	
Turn-Off Delay Time	$t_{d(off)}$		-	11.2	-	
Turn-Off Fall Time	t_f		-	4.97	-	
Total Gate Charge	Q_g	V_{DS}= 15V,I_D= 10A, V_{GS}= 4.5V	-	5.5	-	nC
Gate-Source Charge	Q_{gs}		-	2.5	-	
Gate-Drain Charge	Q_{gd}		-	0.6	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage[3]	V_{SD}	V_{GS}= 0V,I_S= 0.2A	-	0.65	1.5	V

Notes:
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Typical Characteristics

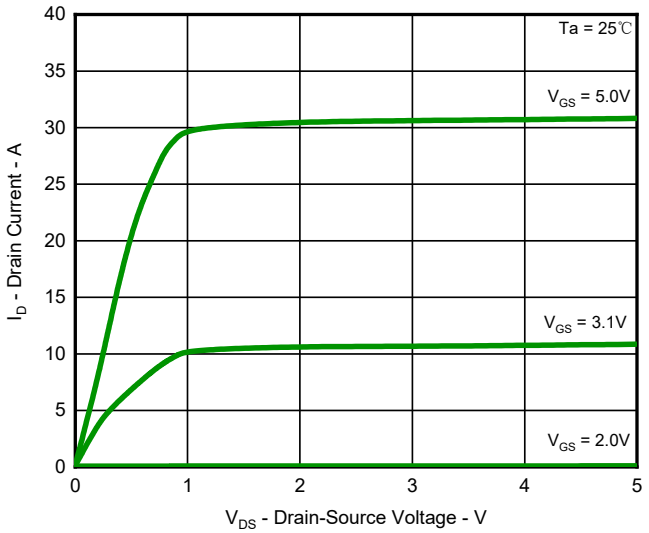


Fig.1 Output Characteristics

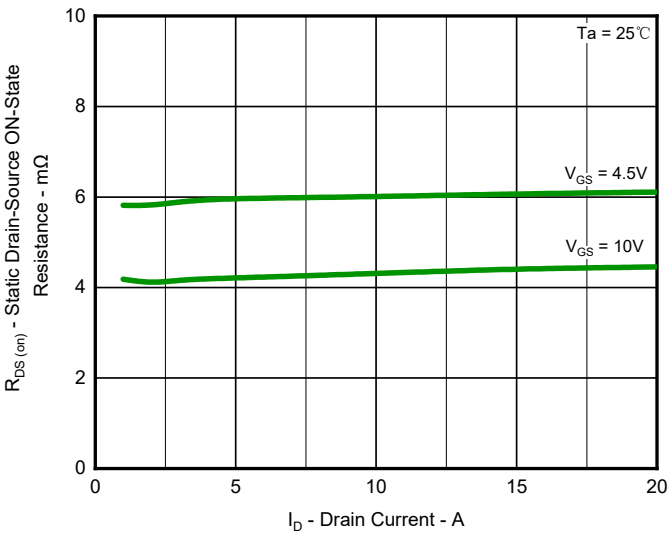


Fig.2 On-Resistance vs. Drain Current (I)

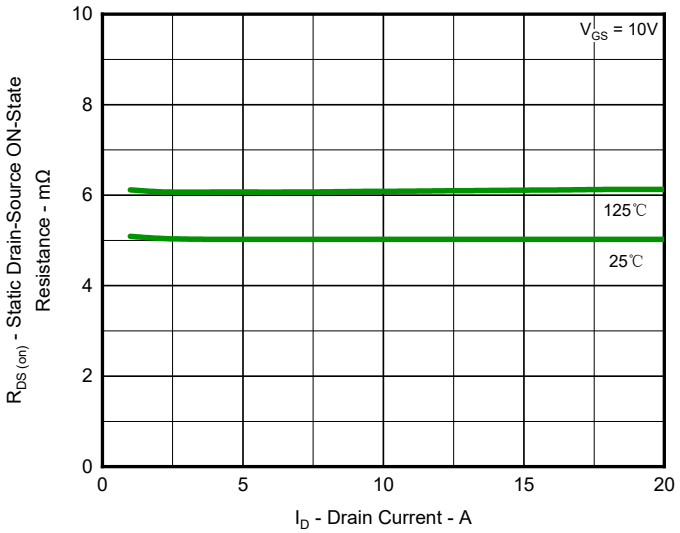


Fig.3 On-Resistance vs. Drain Current (II)

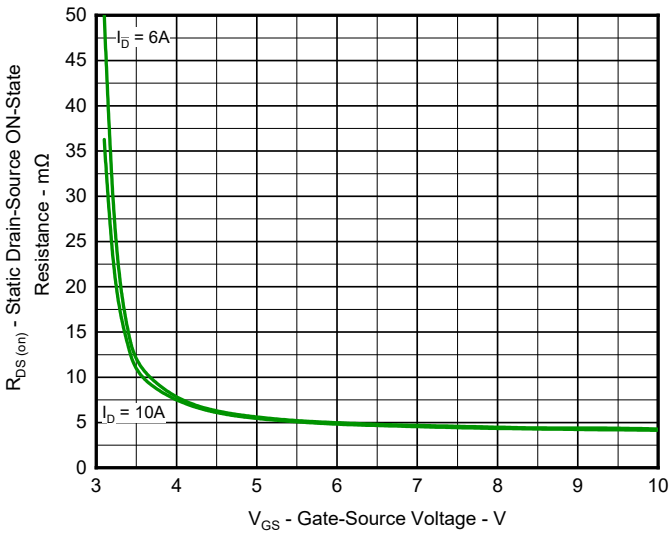


Fig.4 On-Resistance vs. Gate-Source Voltage

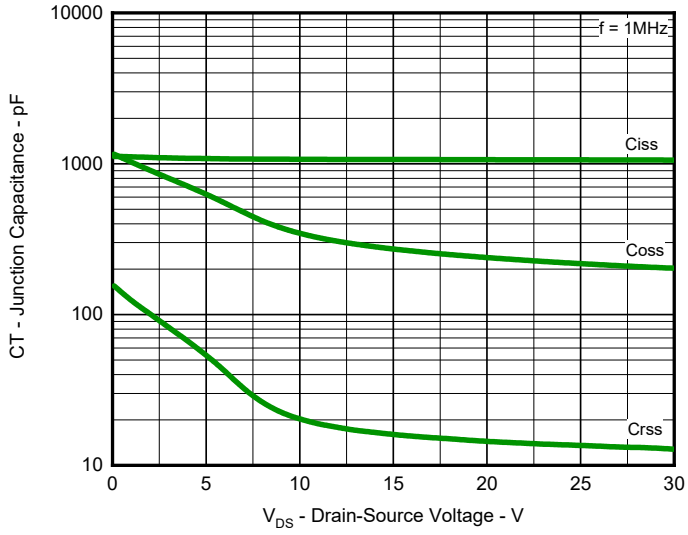


Fig.5 Typical Junction Capacitance

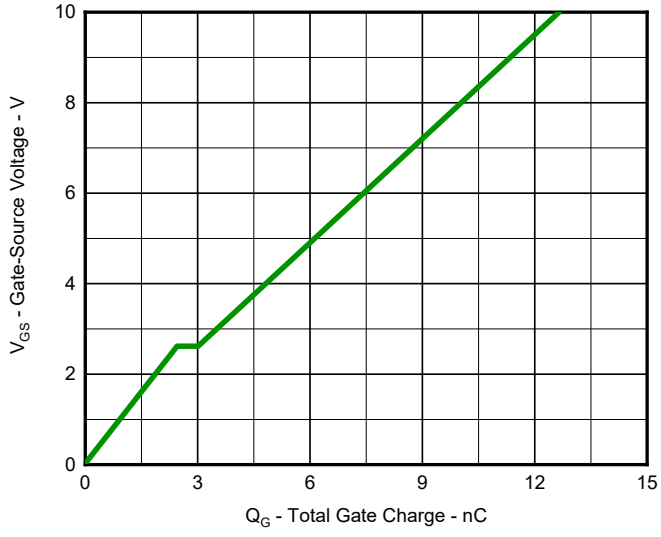


Fig.6 Gate Charge Characteristics

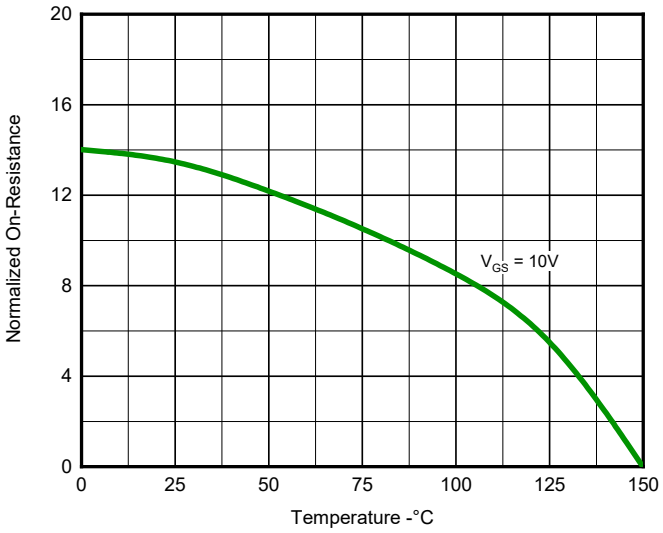


Fig.7 Maximum Drain Current vs. Case Temperature

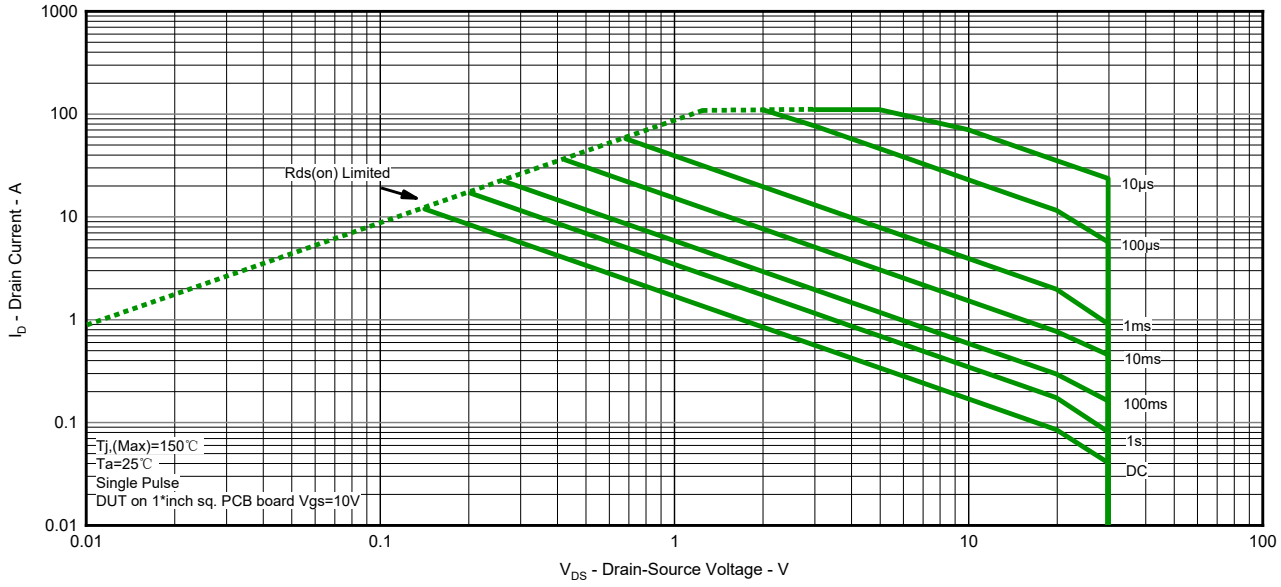


Fig.8 Safe Operation Area

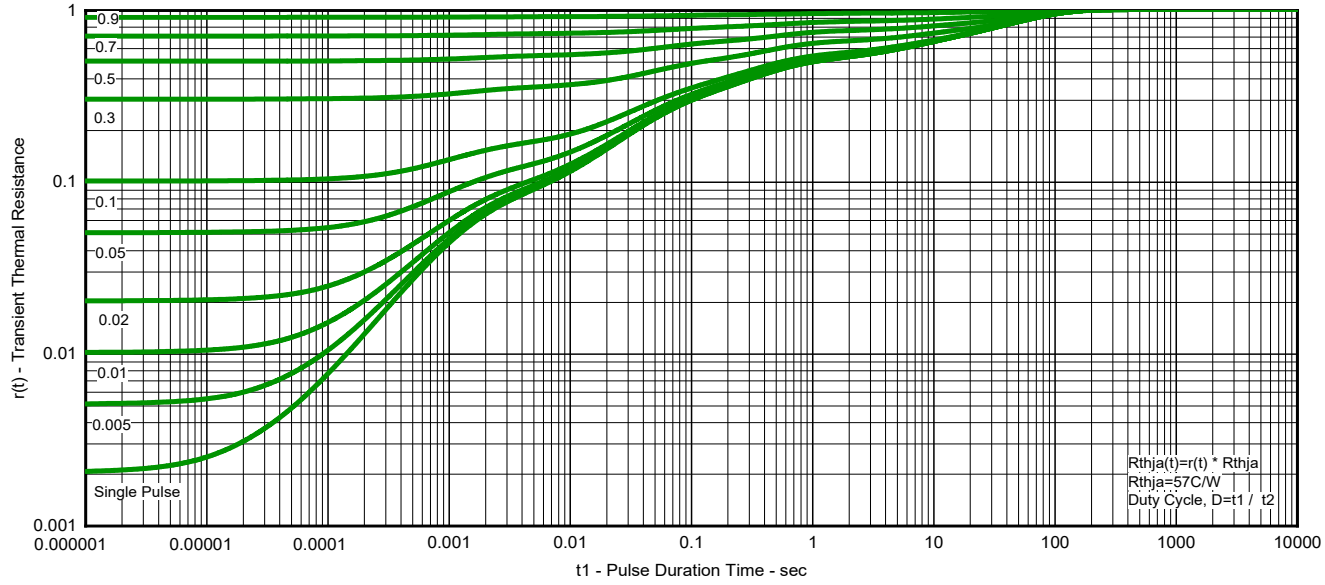
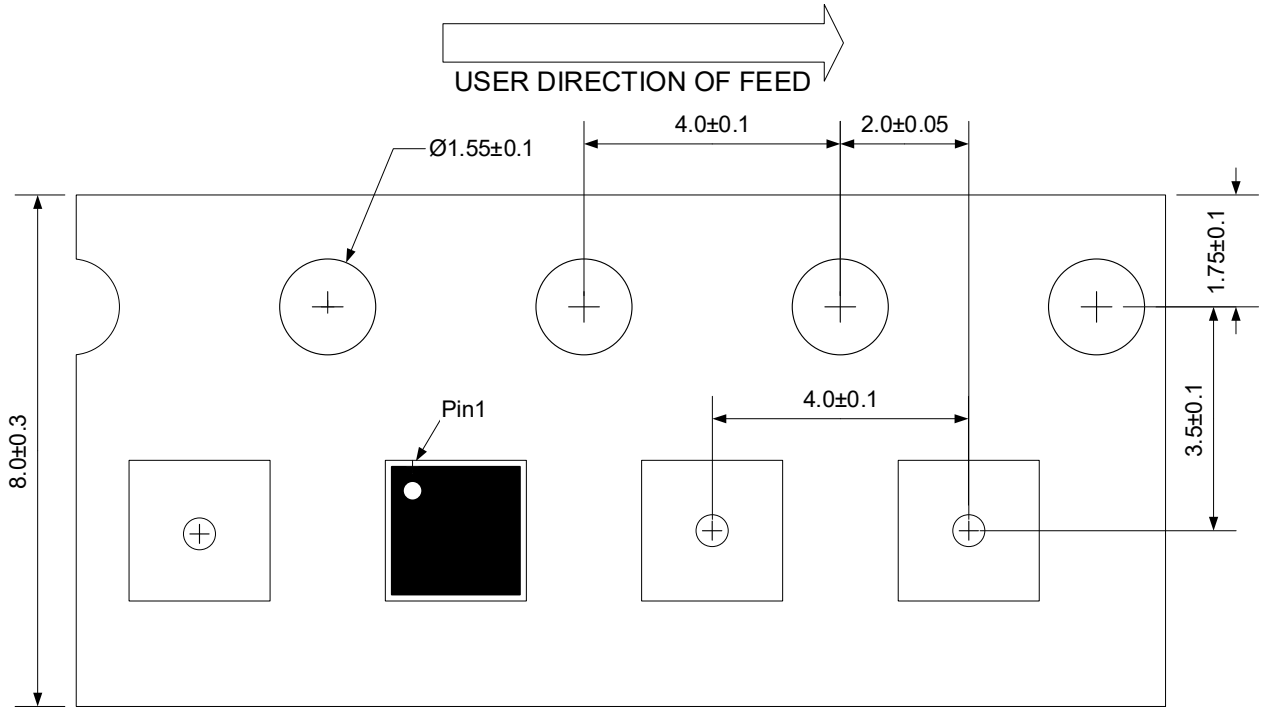


Fig.9 Transient Thermal Resistance

Load with information

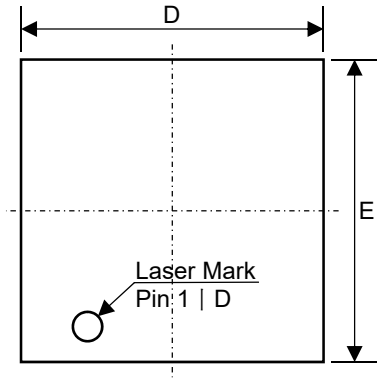


Unit:mm

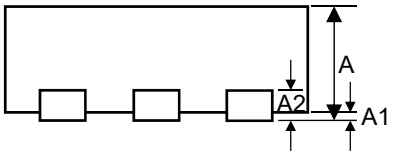
Ordering information

Device	Package	MSL	Reel	Shipping
PSM6N30V20	DFN2020-6L (Pb-Free)	3	7"	3000 / Tape & Reel

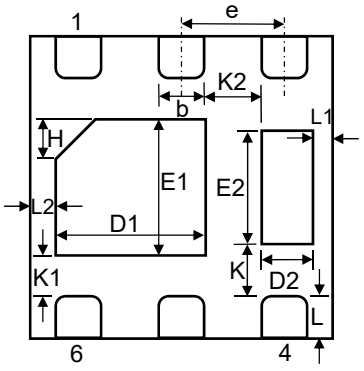
Product dimension (DFN2020-6L)



Top View

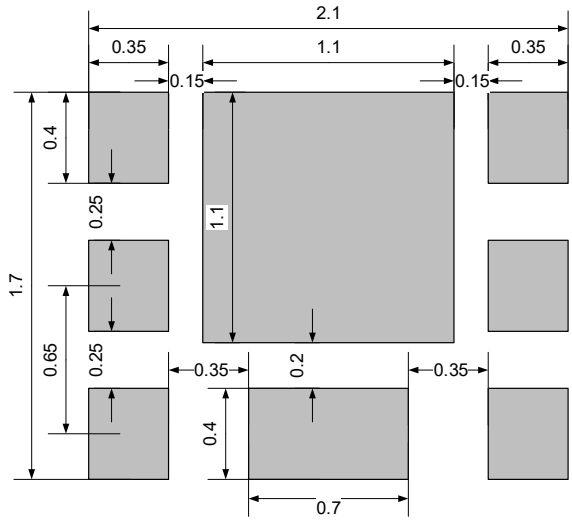


Side View



Bottom View

Dim	Millimeters	
	Min	Max
A	0.50	0.60
A1	0.00	0.05
A2	0.34	0.45
b	0.25	0.35
D	1.90	2.10
E	1.90	2.10
D1	0.80	1.00
E1	0.80	1.00
D2	0.25	0.35
E2	0.46	0.66
e	0.65 Ref.	
H	0.30 Ref.	
K	0.42 Ref.	
K1	0.25 Ref.	
K2	0.35 Ref.	
L	0.25	0.35
L1	0.20 Ref.	
L2	0.25 Ref.	



Unit: mm

Suggested PCB Layout

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