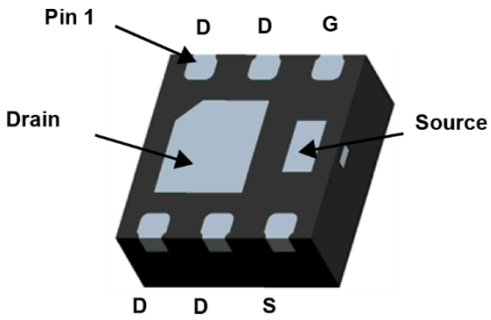
N-Channel MOSFET

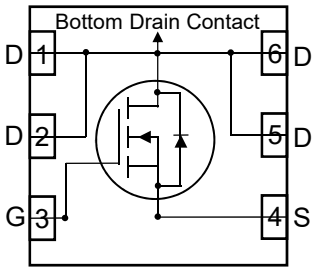
Description

The PNM6N30V20MF uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. This device is suitable for use as a load switch or in PWM applications..



Bottom View

MOSFET Product Summary		
V_{DS}(V)	$R_{DS(on)}$(mΩ)	I_D(A)
30	3.8 @ V_{GS} = 10V	20



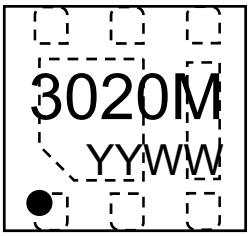
Circuit Diagram

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



Marking (Top View)

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}	60	A
Total Power Dissipation[2)]	P_D	2.4	W
Thermal Resistance Junction-to-Ambient @ Steady State[2)]	$R_{\theta JA}$	52	℃/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	-	-	0.1	μA
On Characteristics[3]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D= 250μA	1.1	1.5	1.9	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D= 10A	-	3.8	4.5	mΩ
		V_{GS}= 4.5V, I_D= 10A	-	5.5	6.5	
Dynamic Parameters[4]						
Input Capacitance	C_{iss}	V_{DS}= 15V,V_{GS}= 0V, f= 1MHz	-	1819	-	pF
Output Capacitance	C_{oss}		-	251	-	
Reverse Transfer Capacitance	C_{rss}		-	234	-	
Switching Parameters[4]						
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 15V, R_L= 250Ω, V_{GEN} = 4.5V,R_{GEN} = 6Ω	-	12	-	ns
Turn-on Rise Time	t_r		-	29	-	
Turn-Off Delay Time	$t_{d(off)}$		-	39	-	
Turn-Off Fall Time	t_f		-	22	-	
Total Gate Charge	Q_g	V_{DS}= 15V,I_D= 10A, V_{GS}= 10V	-	26	-	nC
Gate-Source Charge	Q_{gs}		-	2.6	-	
Gate-Drain Charge	Q_{gd}		-	4.7	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage[3]	V_{SD}	V_{GS}= 0V,I_S= 0.2A	-	0.8	1.2	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

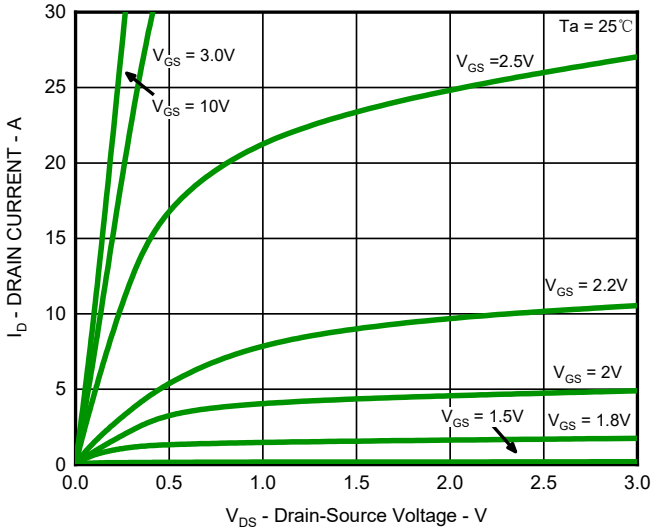


Fig.1 Output Characteristics

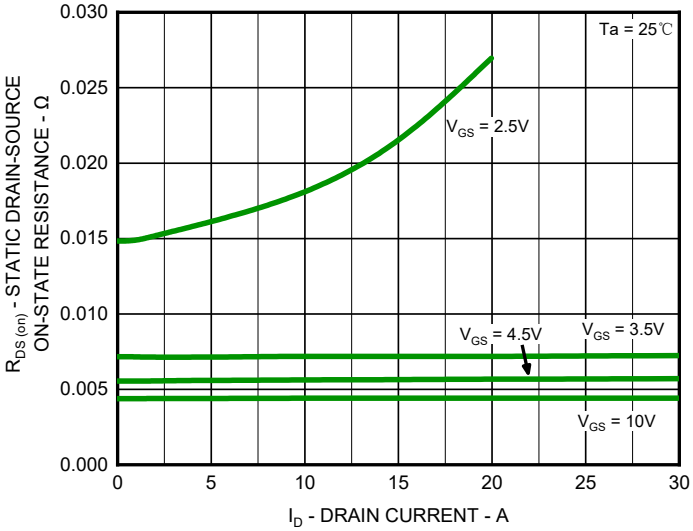


Fig.2 On-Resistance vs. Drain Current (I)

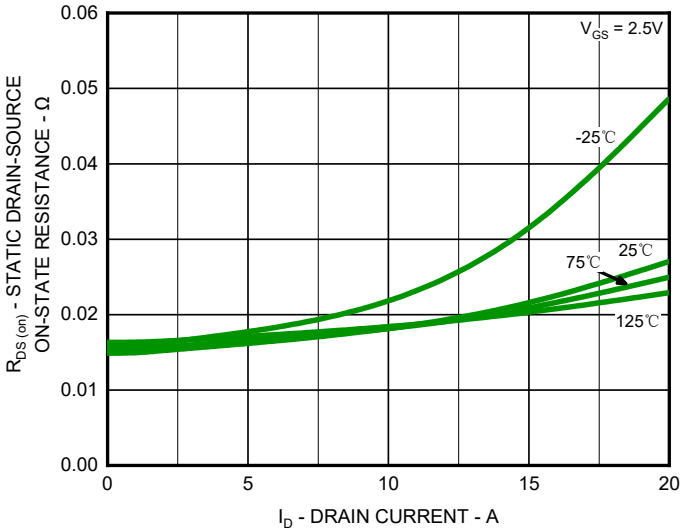


Fig.3 On-Resistance vs. Drain Current (II)

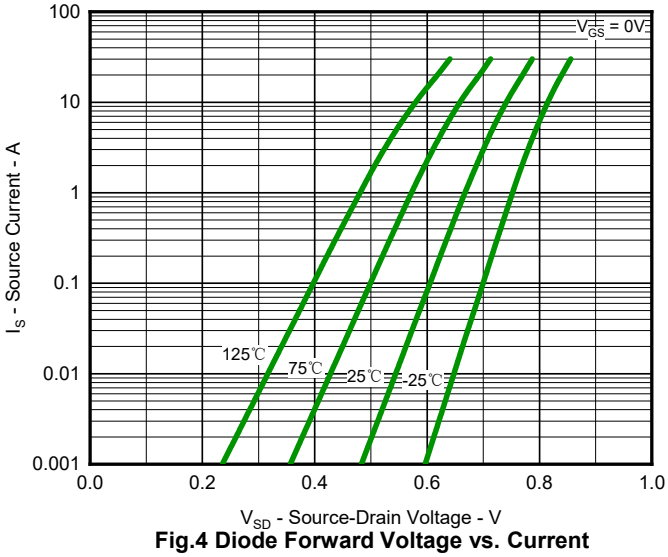


Fig.4 Diode Forward Voltage vs. Current

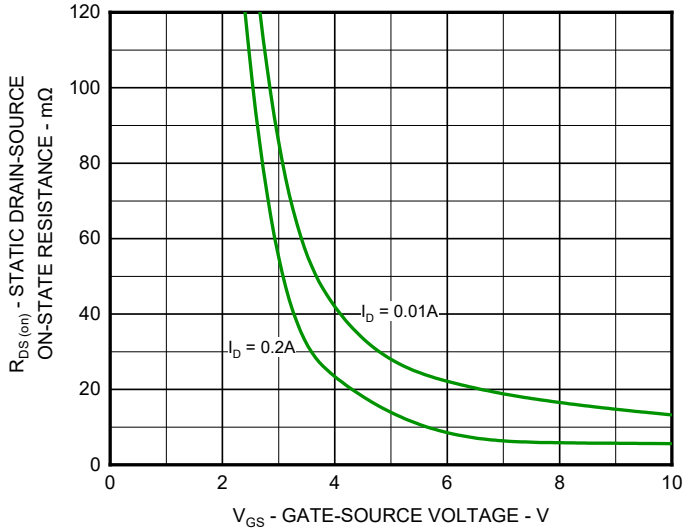


Fig.5 On-Resistance vs. Gate-Source Voltage

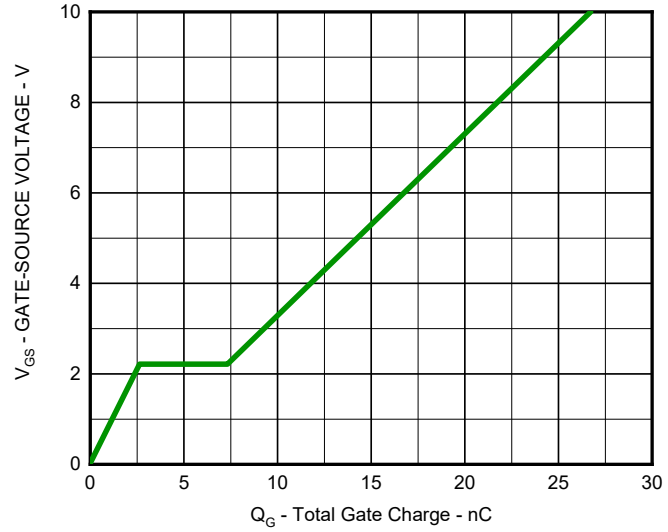


Fig.6 Gate Charge Characteristics

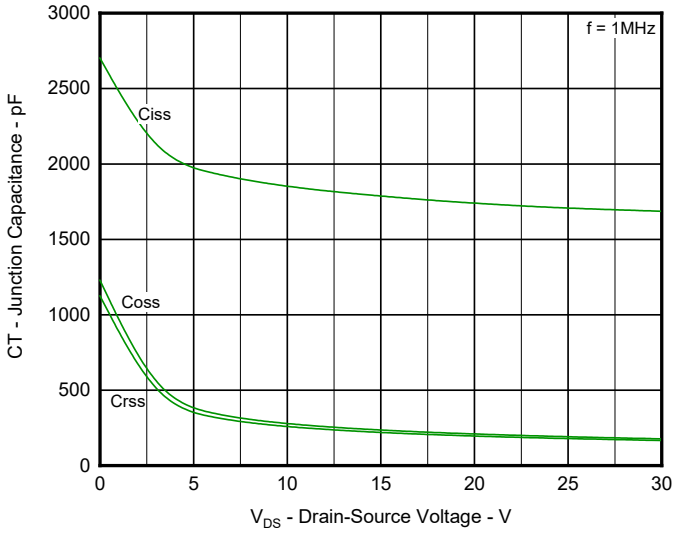


Fig.7 Typical Junction Capacitance

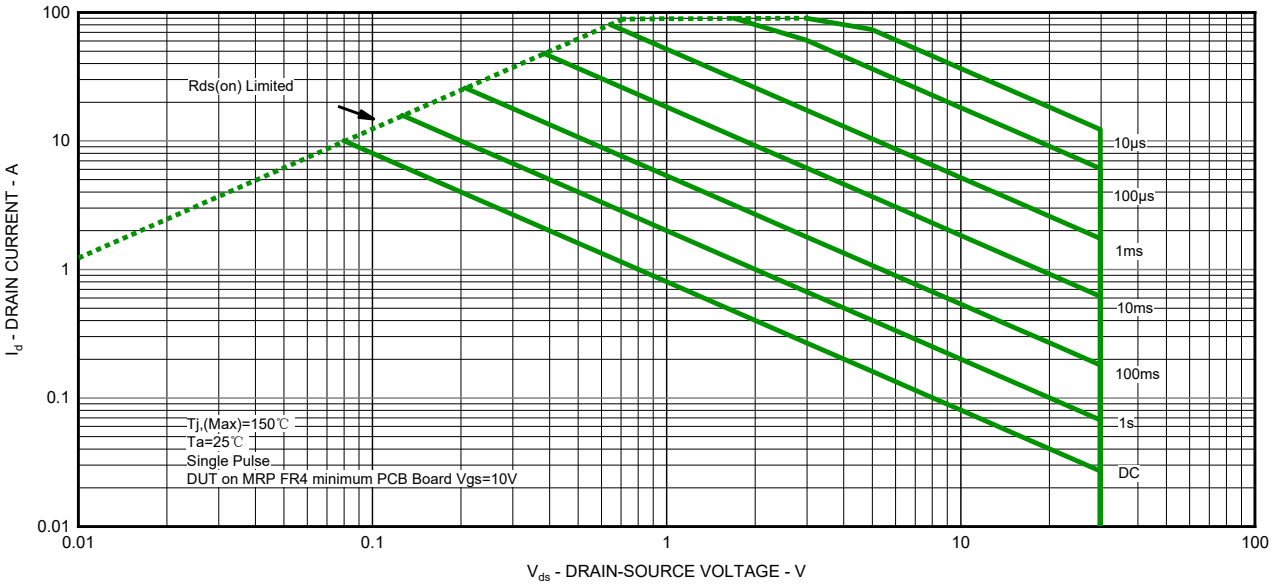


Fig.8 Safe Operation Area

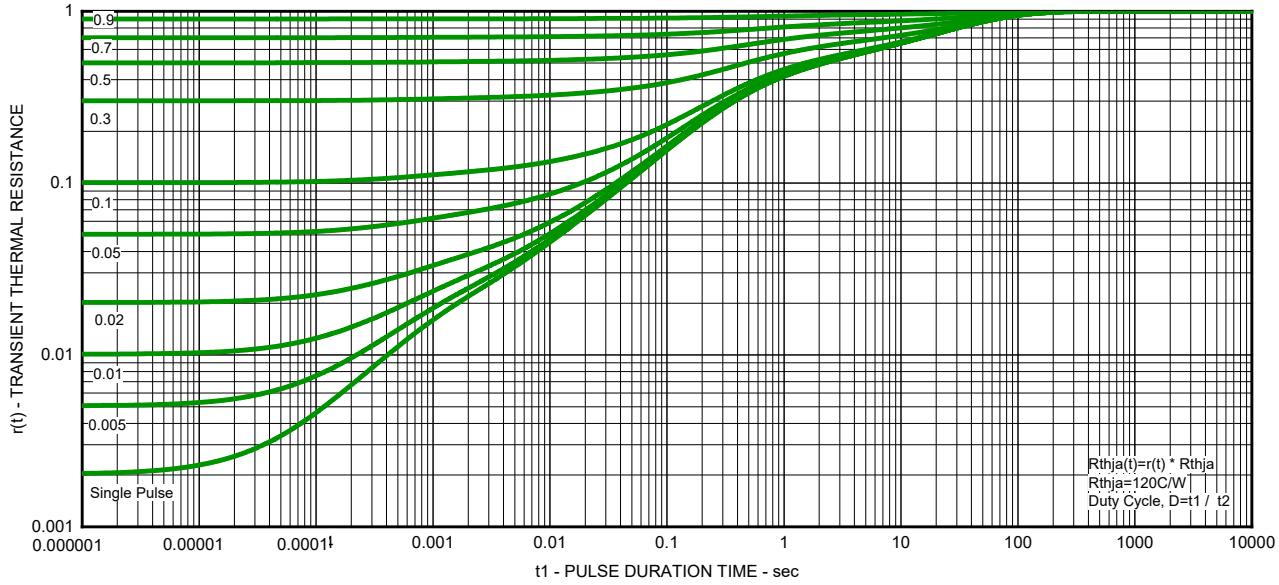
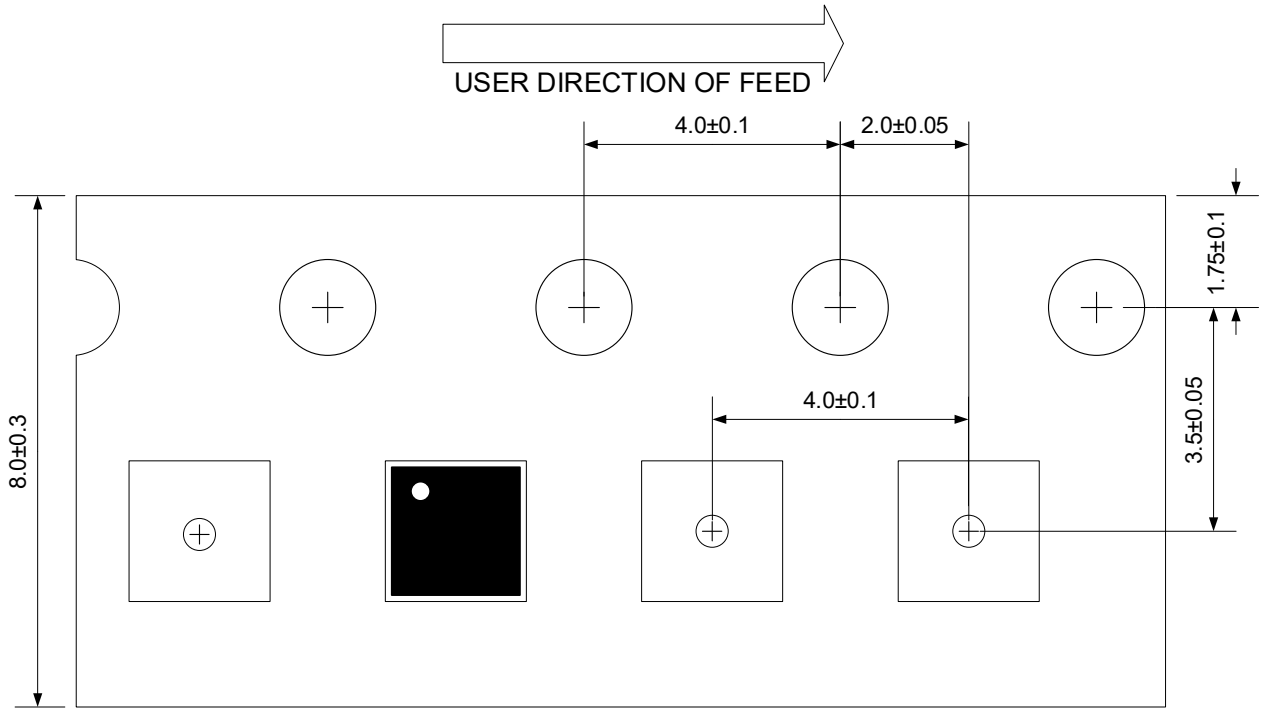


Fig.9 Transient Thermal Resistance

Load with information

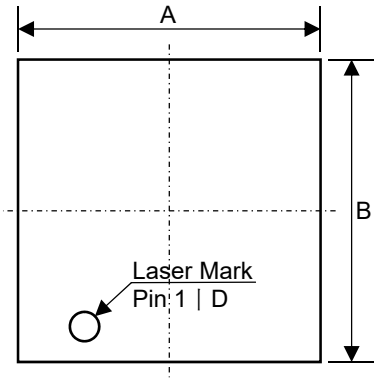


Unit:mm

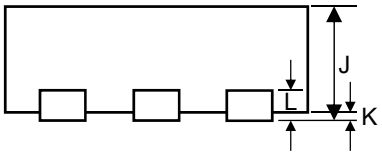
Ordering information

Device	Package	Reel	Shipping
PNM6N30V20MF	DFN2X2-6L (Pb-Free)	7"	3000 / Tape & Reel

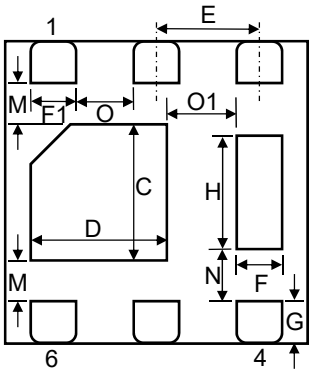
Product dimension (DFN2X2-6L)



Top View

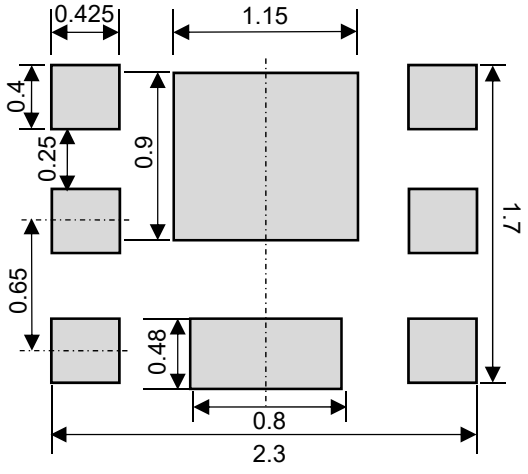


Side View



Bottom View

Dim	Millimeters	
	Min	Max
A	1.90	2.10
B	1.90	2.10
C	1.05	1.25
D	0.80	1.05
E	0.65 BSC	
F	0.33	0.43
F1	0.25	0.35
G	0.22	0.35
H	0.65	0.75
J	0.50	0.60
K	0.00	0.05
L	0.15 Ref.	
M	0.15 Ref.	
N	0.37 Ref.	
O	0.35 Ref.	
O1	0.36 Ref.	



Unit:mm

Suggested PCB Layout

IMPORTANT NOTICE

and Prisemi® are registered trademarks of **Prisemi Electronics Co., Ltd** (Prisemi**),** Prisemi reserves the right to make changes without further notice to any products herein. Prisemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Prisemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. “Typical” parameters which may be provided in Prisemi data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including “Typicals” must be validated for each customer application by customer’s technical experts. Prisemi does not convey any license under its patent rights nor the rights of others. The products listed in this document are designed to be used with ordinary electronic equipment or devices, Should you intend to use these products with equipment or devices which require an extremely high level of reliability and the malfunction of with would directly endanger human life (such as medical instruments, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.

Website: http://www.prisemi.com
For additional information, please contact your local Sales Representative.