

Description

The PSM8N04R8L 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

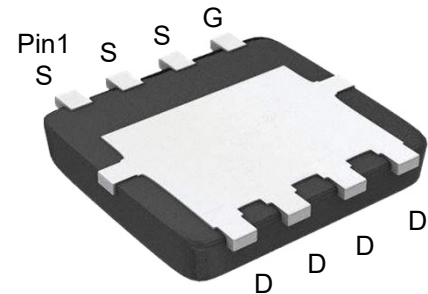
$V_{DS}(V)$	$R_{DS(on)}(m\Omega)(Typ)$	$I_D(A)$
40	6.0@ $V_{GS} = 10V$	60
	9.0@ $V_{GS} = 4.5V$	

Feature

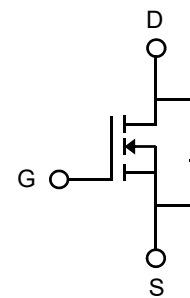
- Low $R_{DS(on)}$ - Ensures On-State Losses are Minimized
- Excellent $Q_{gd} \times R_{DS(on)}$ Product(FOM)
- Advanced Technology for DC-DC Converts
- Small Form Factor Thermally Efficient Package
Enables Higher Density End Products
- 100% UIS (Avalanche) Rated
- Lead-Free Finish ; RoHS Compliant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

Applications

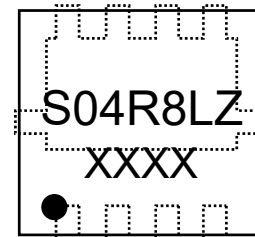
- PWM applications
- Load switch
- Power management
- DC-DC Converters
- Wireless Chargers



**PDFN5060-8L
(Bottom View)**



Circuit Diagram



Pin1

Marking (Top View)

Absolute maximum rating@25°C

Rating		Symbol	Value	Units
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current-Continuous ¹⁾	$T_C = 25^\circ C$	I_D	60	A
	$T_C = 100^\circ C$		38	
Pulsed Drain Current ²⁾		I_{DM}	240	A
Total Power Dissipation ³⁾		P_D	39.8	W
Avalanche Current ⁴⁾		I_{AS}	34	A
Avalanche Energy ⁴⁾		E_{AS}	57.8	mJ
Thermal Resistance Junction-to-Case ⁵⁾		$R_{\theta JC}$	3.1	$^\circ C/W$
Thermal Resistance Junction-to-Ambient ⁶⁾		$R_{\theta JA}$	48.8	$^\circ C/W$
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^\circ C$

Electrical characteristics per line@25°C (unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V,I _D = 250μA	40	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 40V,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	1.6	2.2	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = 10V,I _D = 20A	-	6	7.8	mΩ
		V _{GS} = 4.5V,I _D = 15A	-	9	13	
Dynamic Characteristics ⁷⁾						
Input Capacitance	C _{iss}	V _{DS} = 20V,V _{GS} = 0V, f = 1MHz	-	762	-	pF
Output Capacitance	C _{oss}		-	152	-	
Reverse Transfer Capacitance	C _{rss}		-	17	-	
Switching Characteristics ⁷⁾						
Turn-on Delay Time	t _{d(on)}	V _{DS} = 20V, V _{GS} = 10V, I _D = 20A,R _G = 3Ω	-	4.3	-	ns
Turn-on Rise Time	t _r		-	3	-	
Turn-Off Delay Time	t _{d(off)}		-	13	-	
Turn-Off Fall Time	t _f		-	3	-	
Total Gate Charge	Q _g	V _{DS} = 20V, V _{GS} = 10V, I _D = 20A	-	8.9	-	nC
Gate-Source Charge	Q _{gs}		-	2.2	-	
Gate-Drain Charge	Q _{gd}		-	1.8	-	
Gate Resistance	R _g	f=1MHz, Open Drain	-	2.5	-	Ω
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} = 0V,I _S = 20A	-	0.8	1.2	V
Reverse Recovery Time	t _{rr}	I _F =20A, d _f /d _t =100A/μs	-	12	-	ns
Reverse Recovery Charge	Q _{rr}		-	2.5	-	nC

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($T_{J_Max}=150^\circ C$).
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
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 $T_{J_Max}=150^\circ C$.
5. Device mounted on infinite heatsink.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1 inch square copper pad layout.
7. Guaranteed by design, not subject to production.

Typical Characteristics

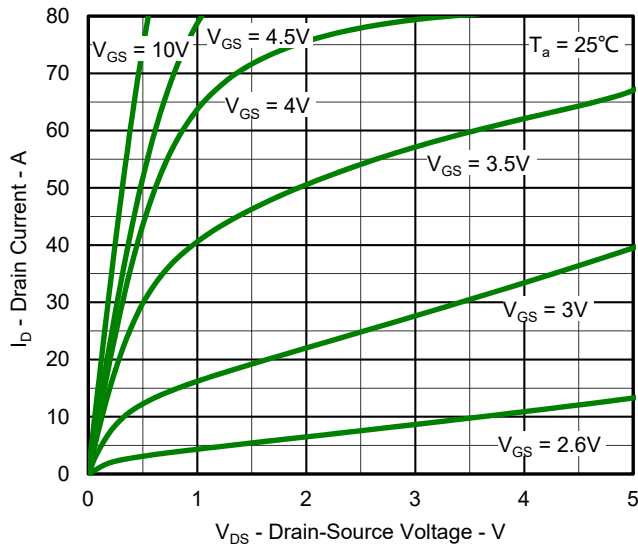


Fig.1 Output Characteristics

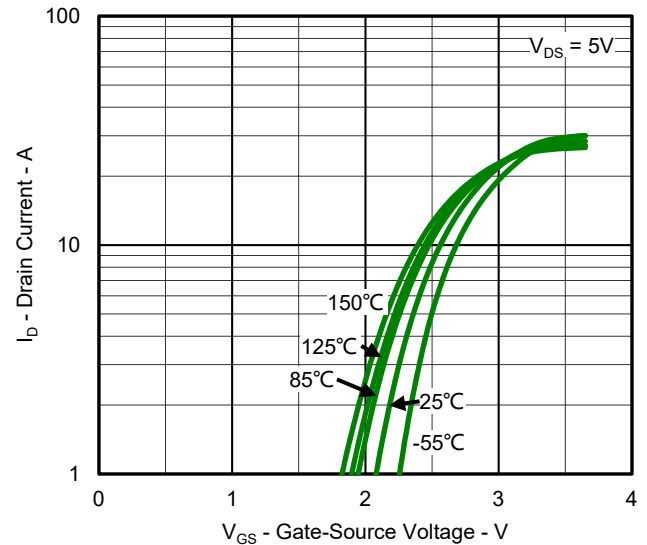


Fig.2 Typical Transfer Characteristic

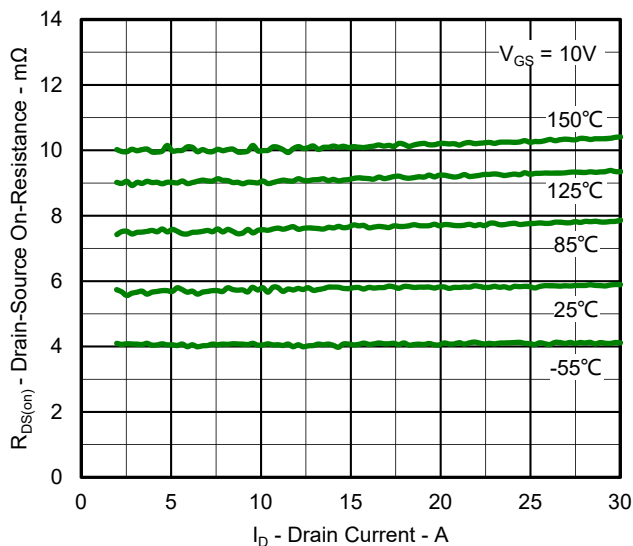


Fig.3 Typical On-Resistance vs Drain Current and Temperature

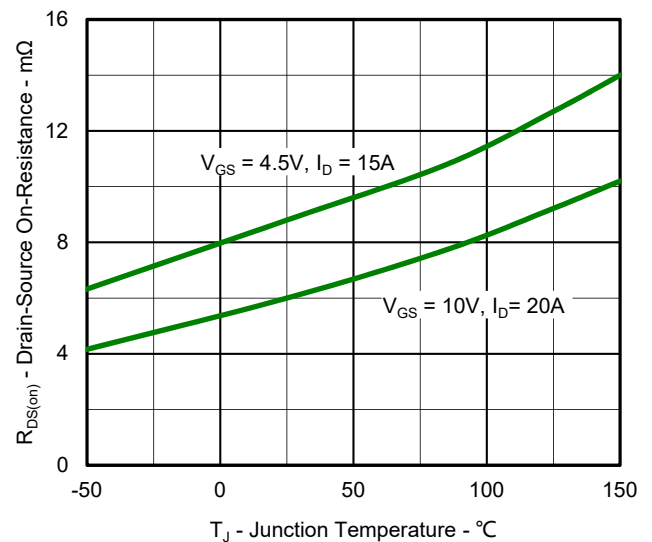


Fig.4 On-Resistance Variation with Temperature

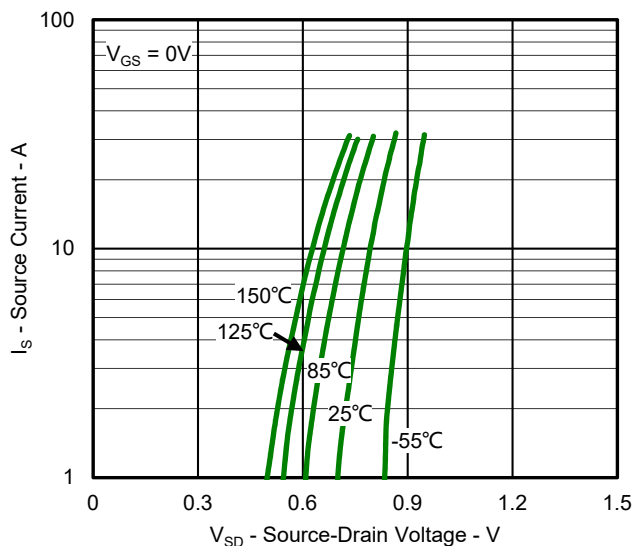


Fig.5 Diode Forward Voltage vs. Current

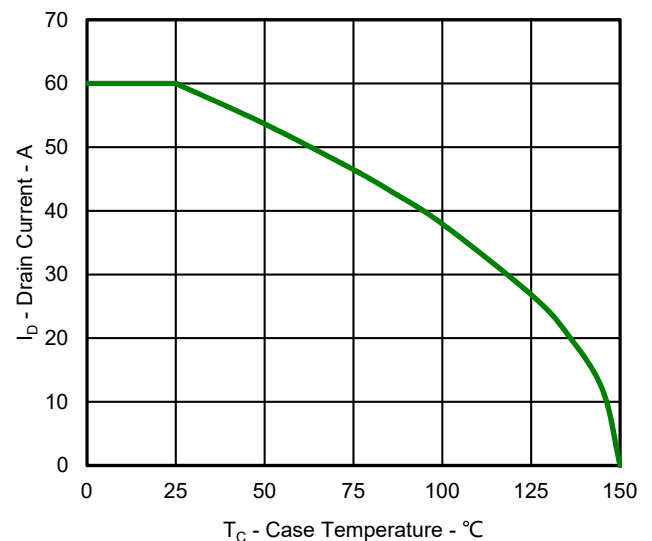


Fig.6 Maximum Drain Current vs. Case Temperature

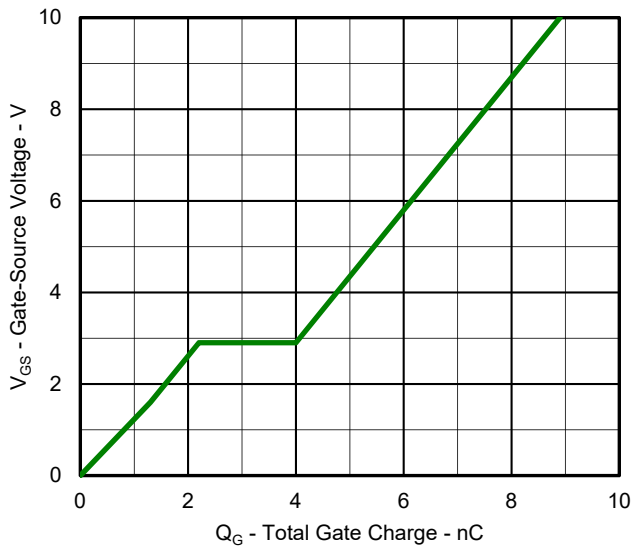


Fig.7 Gate Charge Characteristics

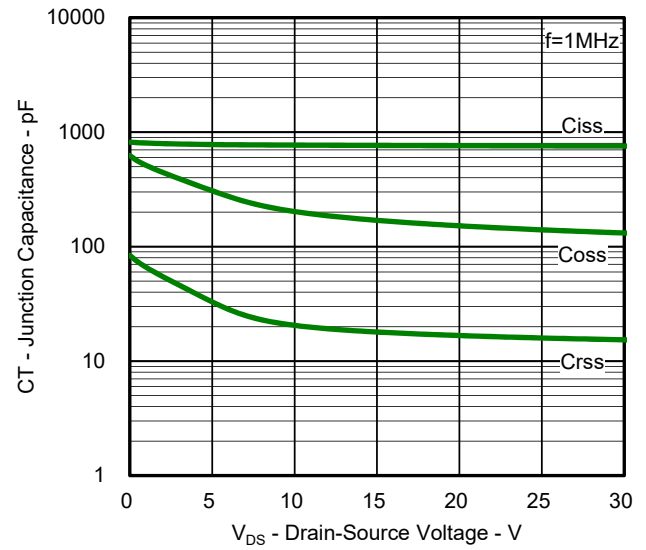


Fig.8 Typical Junction Capacitance

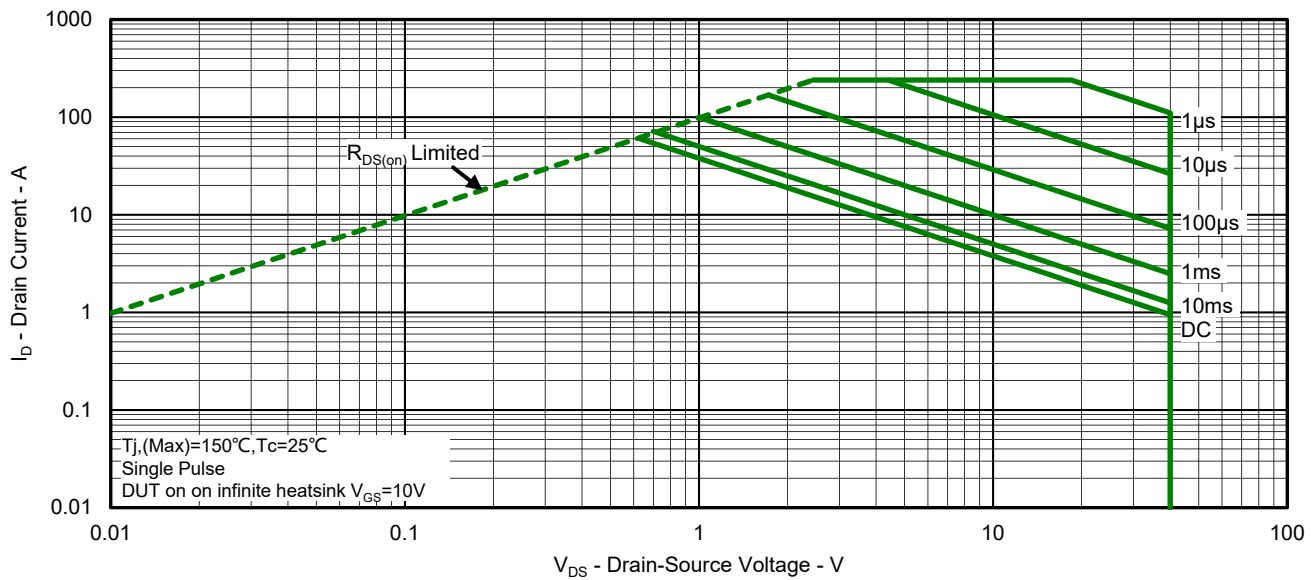


Fig.9 Safe Operation Area

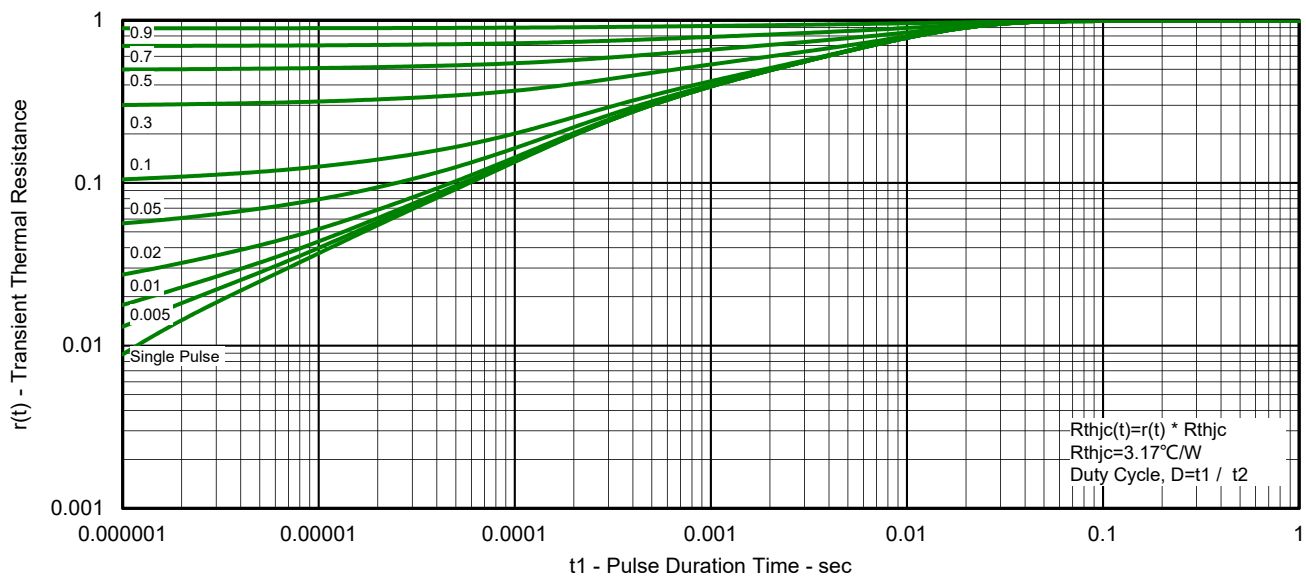
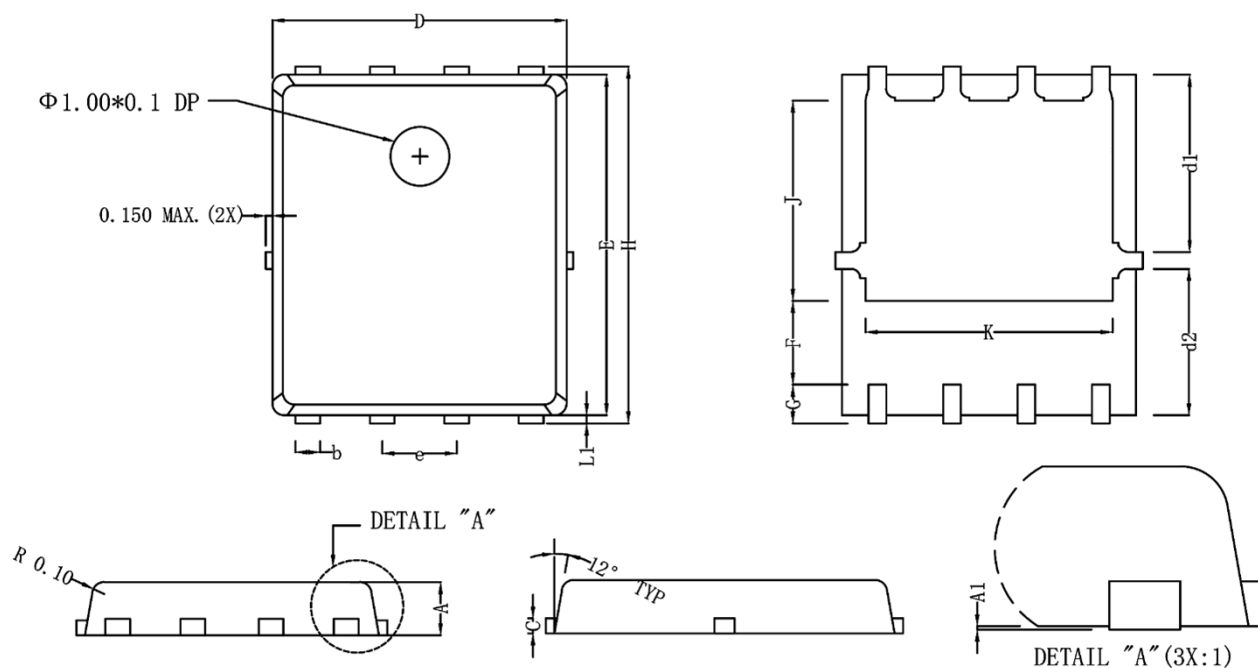


Fig.10 Transient Thermal Resistance

Product Dimension (PDFN5060-8L)



Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	0.90	1.10	0.035	0.043
A1	0.00	0.05	0.000	0.002
b	0.25	0.35	0.010	0.014
c	0.254 Ref.		0.010 Ref.	
D	4.80	5.00	0.189	0.197
d1	3.00 Ref.		0.118 Ref.	
d2	2.50 Ref.		0.098 Ref.	
F	1.35 Ref.		0.053 Ref.	
E	5.65	5.85	0.222	0.230
e	1.27 BSC.		0.050 BSC.	
H	5.90	6.10	0.232	0.240
L1	0.10	0.16	0.004	0.006
G	0.535	0.735	0.021	0.029
K	4.10	4.30	0.161	0.169
J	3.40	3.65	0.134	0.144

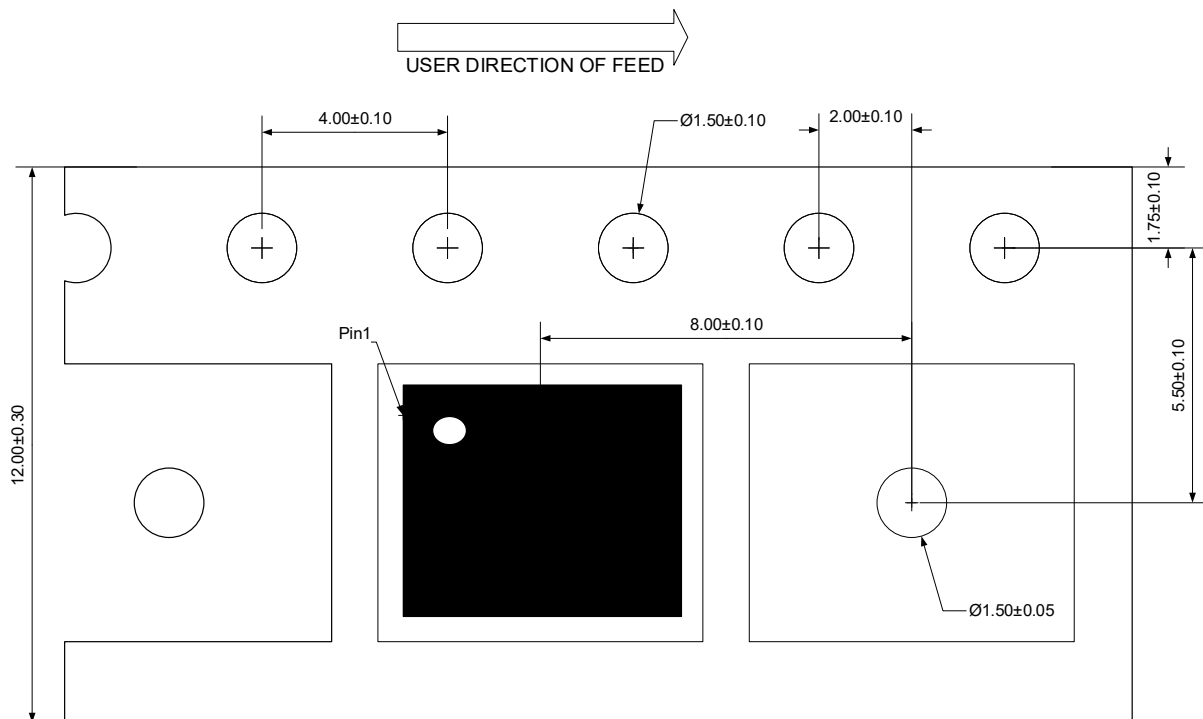
N-Channel MOSFET

PSM8N04R8L

Ordering Information

Package	Reel	Shipping
PDFN5060-8L	13"	5000 / Tape & Reel

Load With Information



Unit:mm

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.

©Copyright 2009, Prisemi Electronics

 **Prisemi**[®] is a registered trademark of Prisemi Electronics.

All rights are reserved.