

## Description

The PSM8N06R3 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 applications.

### MOSFET Product Summary

$V_{DS}(V)$	$R_{DS(on)}(m\Omega)$	$I_D(A)$	
60	2.5@ $V_{GS} = 10V$	Silicon Limited $T_C=25^\circ C$	158
		Silicon Limited $T_C=100^\circ C$	100
		Package Limited $T_C=25^\circ C$	100

## Feature

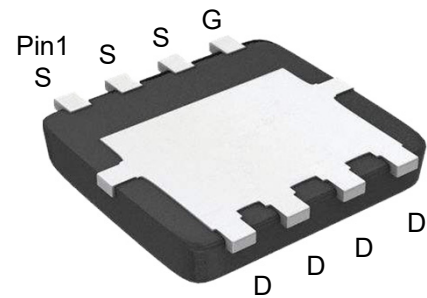
- Low  $R_{DS(ON)}$  - Ensures On-State Losses are Minimized
- Excellent  $Q_{gd} \times R_{DS(ON)}$  Product(FOM)
- Advanced Technology for DC-DC Converts
- Small Form Factor Thermally Efficient Package  
Enables Higher Density End Products
- 100% UIS (Avalanche) Rated
- Lead-Free Finish ; RoHS Compliant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

## Applications

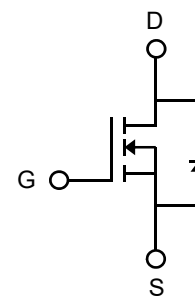
- PWM applications
- Load switch
- Power management
- DC-DC Converters
- Wireless Chargers

## Absolute maximum rating@25°C

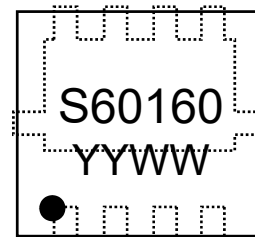
Rating		Symbol	Value	Units
Drain-Source Voltage		$V_{DS}$	60	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	Silicon Limited $T_C=25^\circ C$	$I_D$	158	A
	Silicon Limited $T_C=100^\circ C$		100	
	Package Limited $T_C=25^\circ C$		100	
Pulsed Drain Current <sup>1)</sup>		$I_{DM}$	380	A
Total Power Dissipation <sup>2)</sup>		$P_D$	92	W
Avalanche Current <sup>5)</sup>		$I_{AS}$	75.5	A
Avalanche Energy <sup>5)</sup>		$E_{AS}$	285	mJ
Thermal Resistance , Junction-case		$R_{\theta JC}$	1.36	$^\circ C/W$
Thermal Resistance Junction-to-Ambient @ Steady State <sup>2)</sup>		$R_{\theta JA}$	43.65	$^\circ C/W$
Junction and Storage Temperature Range		$T_J, T_{STG}$	-55~+150	$^\circ C$



**Bottom View**



**Circuit Diagram**



Pin1

**Marking (Top View)**

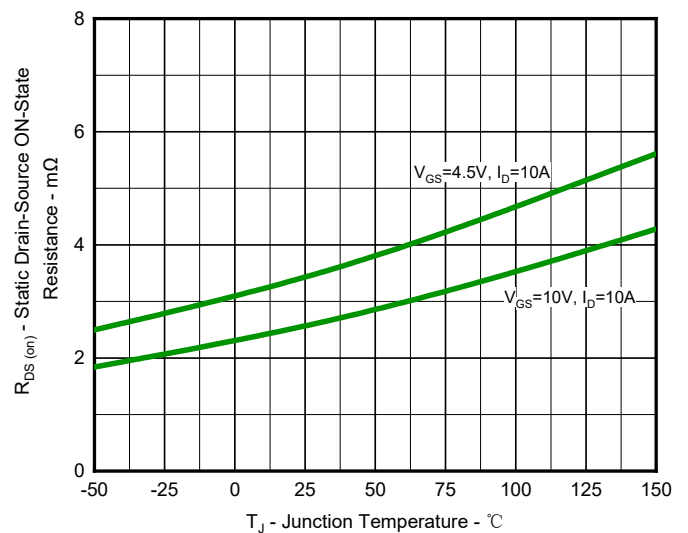
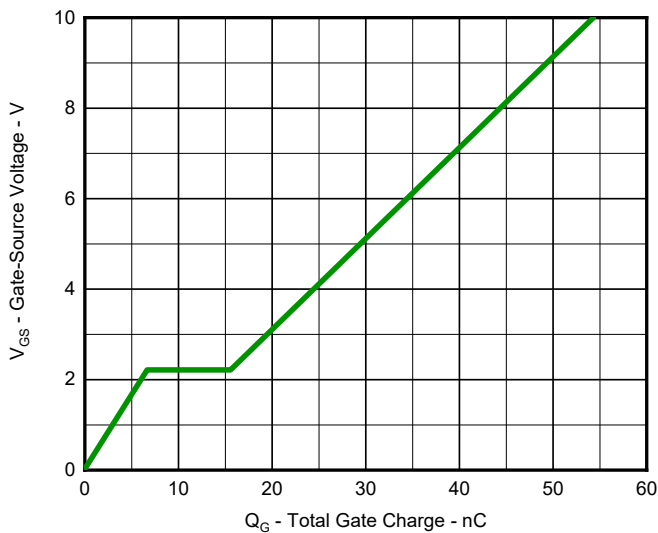
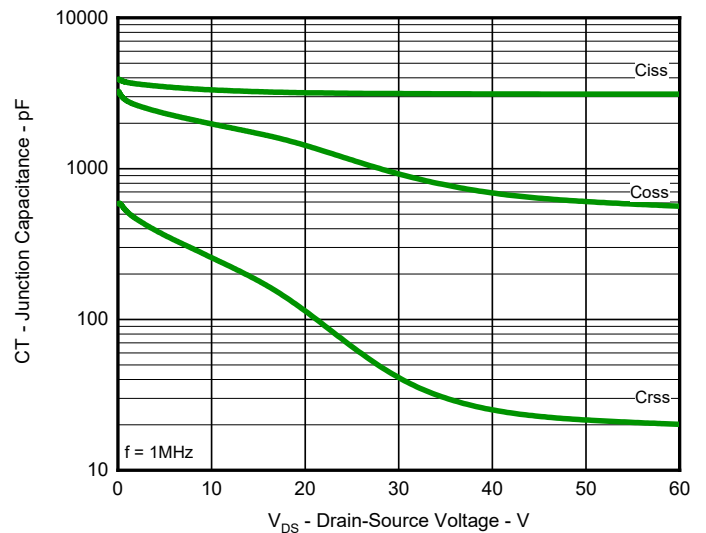
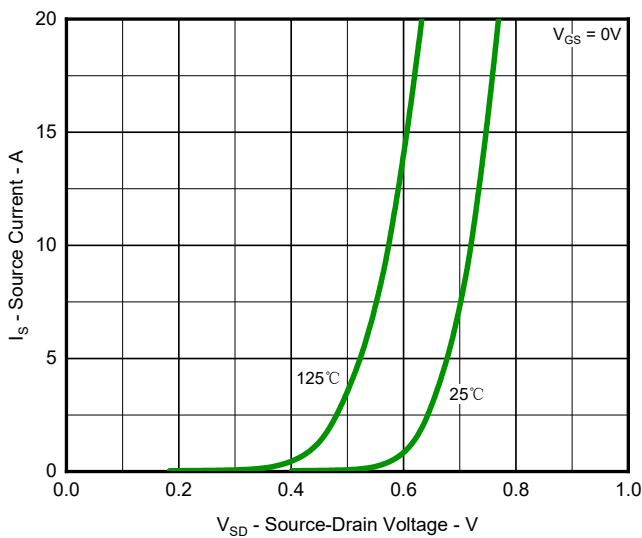
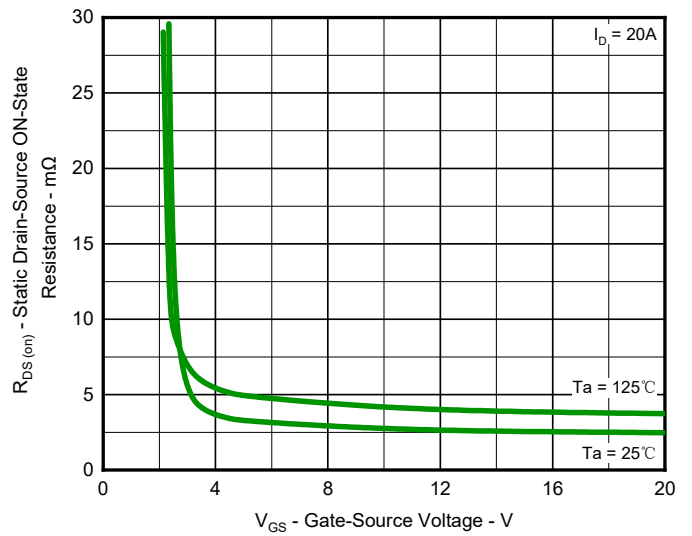
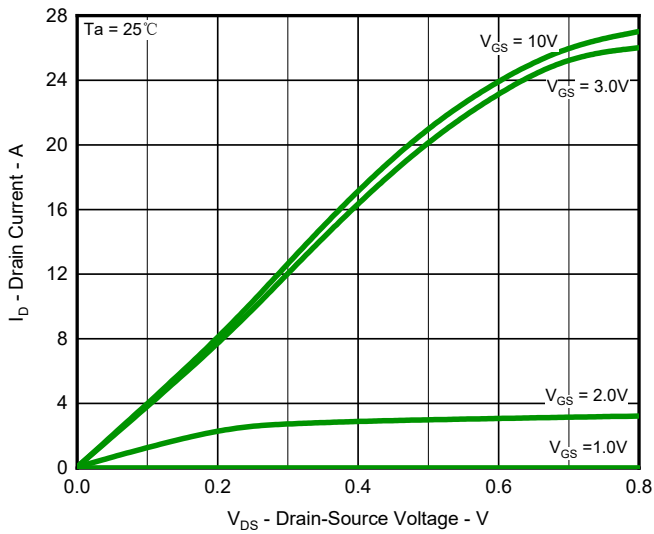
## Electrical characteristics per line@25°C (unless otherwise specified)

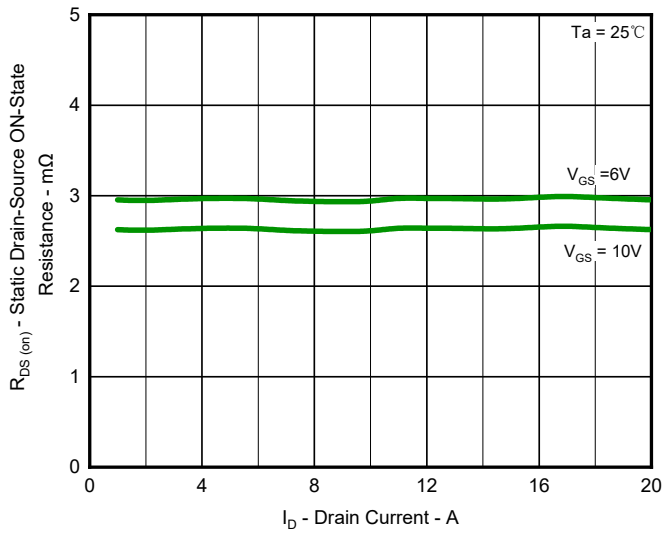
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Off Characteristics						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
On Characteristics <sup>3)</sup>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.5	2.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$	-	2.5	3.5	m $\Omega$
		$V_{GS}=4.5V, I_D=20A$	-	3.5	4.5	
Dynamic Parameters <sup>4)</sup>						
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 <sup>4)</sup>						
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=30V, V_{GS}=10V, R_G=10\Omega, I_D=20A$	-	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	-	$\Omega$
Drain-Source Diode Characteristics						
Diode Forward Voltage <sup>3)</sup>	$V_{SD}$	$V_{GS}=0V, I_S=20A$	-	0.83	1.1	V

Notes:

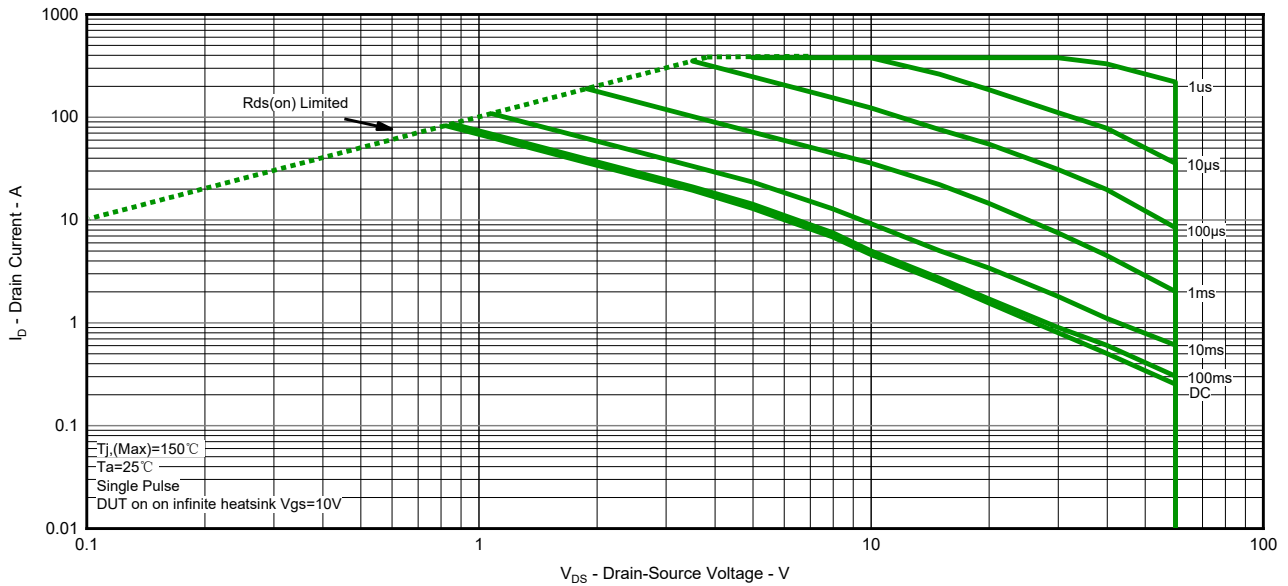
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production.
5. This single-pulse measurement was taken under the following condition ( $L=100\mu H, V_{GS}=10V, V_{DS}=50V$ ) while it's value is limited by  $T_{j,Max}=150^\circ C$ .

## Typical Characteristics

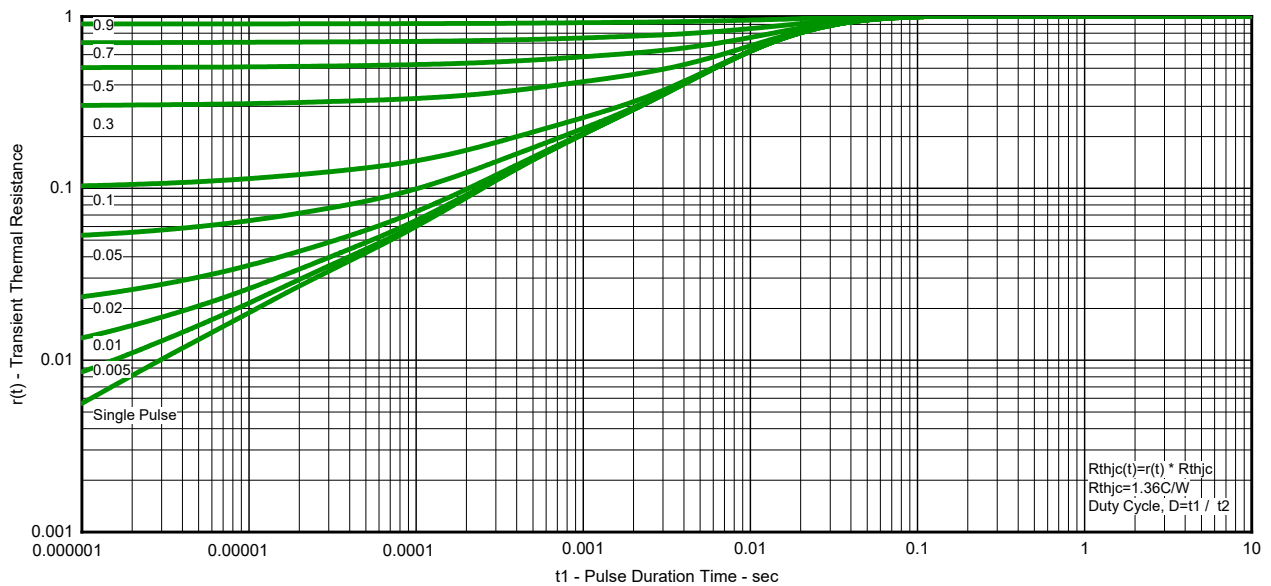




**Fig.7 Typical On-Resistance vs Drain Current**

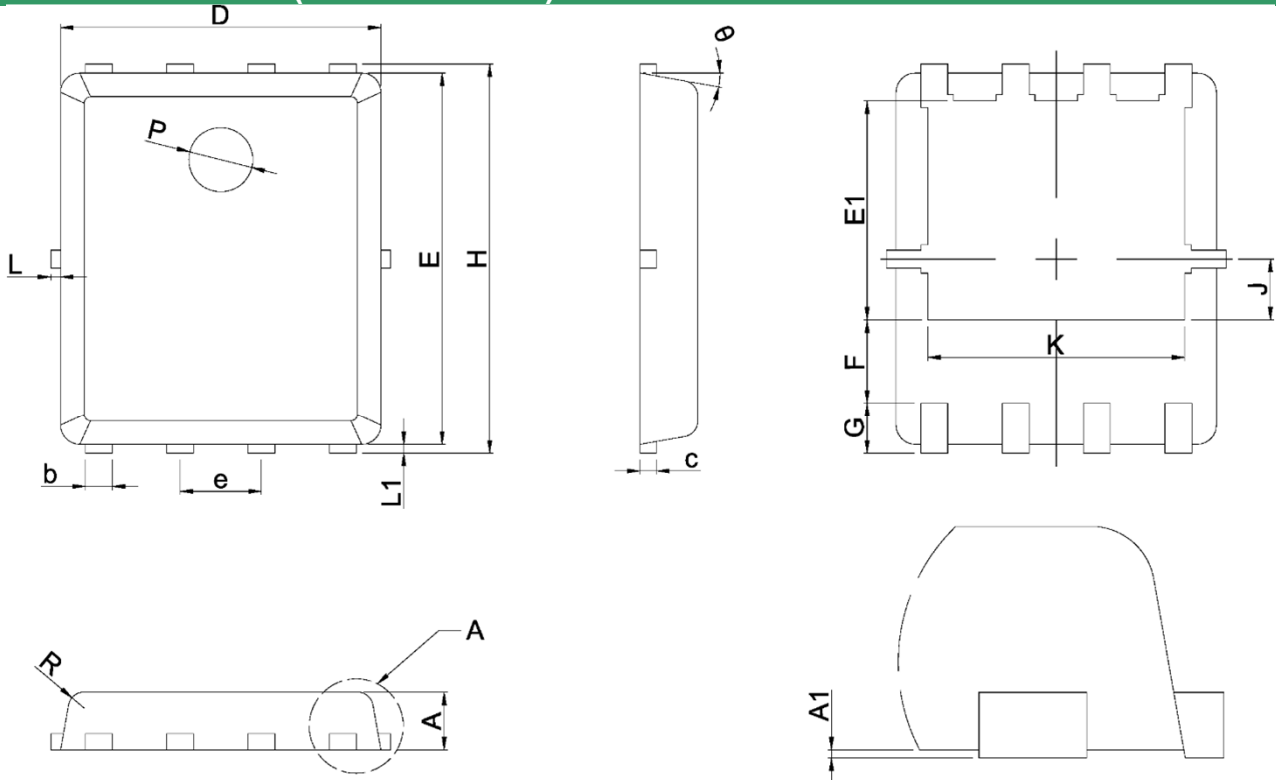


**Fig.8 Safe Operation Area**



**Fig.9 Transient Thermal Resistance**

## Product Dimension (PDFN5060-8L)



DETAIL "A"

Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	0.80	1.00	0.031	0.039
A1	0.00	0.05	0.000	0.002
b	0.35	0.49	0.014	0.019
c	0.254 Ref.		0.010 Ref.	
D	4.90	5.10	0.193	0.201
E	5.70	5.90	0.224	0.232
E1	3.35	3.65	0.132	0.144
e	1.27 BSC.		0.050 BSC.	
F	1.40 Ref.		0.055 Ref.	
G	0.60 Ref.		0.024 Ref.	
H	5.95	6.20	0.234	0.244
J	0.95 BSC.		0.037 BSC.	
K	4.00 Ref.		0.157 Ref.	
L	-	0.15	-	0.006
L1	0.10	0.18	0.004	0.007
P	1.00 Ref.		0.039 Ref.	
R	0.25 Ref.		0.010 Ref.	
$\theta$	6°	14°	6°	14°

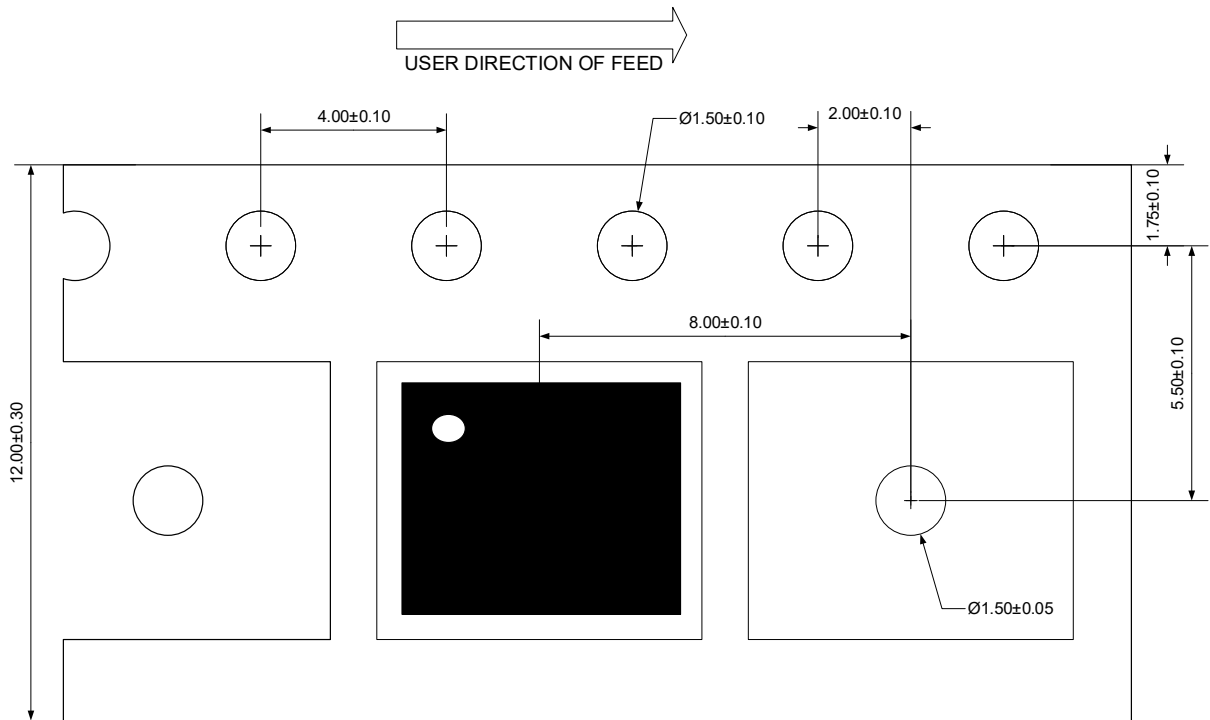
# N-Channel MOSFET

# PSM8N06R3

## Ordering Information


Device	Package	Reel	Shipping
PSM8N06R3	PDFN5060-8L(Pb-Free)	13"	5000 / Tape & Reel

## Load With Information



Unit:mm


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