

Description

The PSM8PN03R2 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.

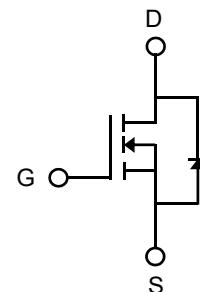
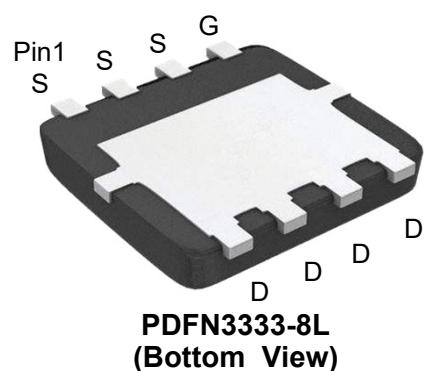
MOSFET Product Summary		
$V_{DS}(V)$	$R_{DS(on)}(m\Omega)(Typ)$	$I_D(A)$
30	1.5@ $V_{GS} = 10V$	119
	2.4@ $V_{GS} = 4.5V$	

Feature

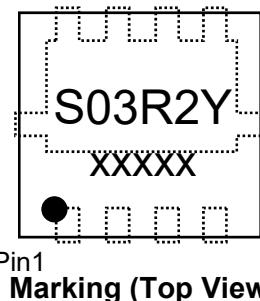
- Low $R_{DS(ON)}$ - Ensures On-State Losses are Minimized
- Excellent $Q_{gd} \times R_{DS(ON)}$ Product(FOM)
- Advanced Technology for DC-DC Converts
- Small Form Factor Thermally Efficient Package Enables Higher Density End Products
- 100% UIS (Avalanche) Rated
- Lead-Free Finish ; RoHS Compliant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

Applications

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



Circuit Diagram



Marking (Top View)

Absolute maximum rating@25°C

Rating	Symbol	Value	Units
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous ¹⁾	I_D	119	A
		75	
Pulsed Drain Current ²⁾	I_{DM}	475	A
Total Power Dissipation ⁴⁾	P_D	38	W
		16	
Avalanche Current @ $L=0.1mH$	I_{AS}	39	A
Avalanche Energy @ $L=0.1mH$	E_{AS}	76	mJ
Thermal Resistance , Junction-to-Case ⁴⁾	$R_{\theta JC}$	3.2	°C/W
Thermal Resistance Junction-to-Ambient ³⁾	$R_{\theta JA}$	50	°C/W
Junction and Storage Temperature Range	T_J, T_{STG}	-55~+150	°C

N-Channel MOSFET

PSM8PN03R2

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30V, V_{GS} = 0V$	$T_J = 25^\circ C$	-	-	1.0
			$T_J = 55^\circ C$	-	-	10
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 100	nA
On Characteristics⁵⁾						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.2	1.7	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 20A$	-	1.5	1.8	$m\Omega$
		$V_{GS} = 4.5V, I_D = 15A$	-	2.4	3.0	
Forward Transconductance	g_{fs}	$V_{DS} = 5V, I_D = 20A$	-	33	-	S
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 2A$	-	0.7	1.2	V
Dynamic Characteristics⁶⁾						
Input Capacitance	C_{iss}	$V_{DS} = 15V, V_{GS} = 0V, f = 1.0MHz$	-	2517	-	pF
Output Capacitance	C_{oss}		-	1731	-	
Reverse Transfer Capacitance	C_{rss}		-	142	-	
Switching Characteristics⁶⁾						
Turn-on Delay Time	$t_{d(on)}$	$V_{DS} = 15V, V_{GS} = 10V, R_G = 3\Omega, I_D = 20A$	-	5.4	-	ns
Turn-on Rise Time	t_r		-	11	-	
Turn-Off Delay Time	$t_{d(off)}$		-	29	-	
Turn-Off Fall Time	t_f		-	12	-	
Total Gate Charge	Q_g	$V_{DS} = 15V, I_D = 20A, V_{GS} = 0 to 10V,$	-	39	-	nC
Gate-Source Charge	Q_{gs}		-	7.2	-	
Gate-Drain Charge	Q_{gd}		-	7.4	-	
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V, f=1MHz$	-	1.3	-	Ω
Drain-Source Diode Characteristics⁶⁾						
Body Diode Reverse Recovery Time	t_{rr}	$I_F=20A, d_i/d_t=100A/\mu s$	-	46	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	37	-	nC
Diode Forward Current	I_S	-	-	-	119	A

Notes:

1. Pulse width limited by maximum junction temperature.
2. Pulse test : Pulse width $\leq 100\mu s$, duty cycle $\leq 2\%$.
3. Device mounted on 1 inch FR4 PCB with 2oz.Copper.
4. Device mounted on infinite heatsink.
5. Measured under pulsed conditions. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
6. Guaranteed by design, not subject to production.

Typical Characteristics

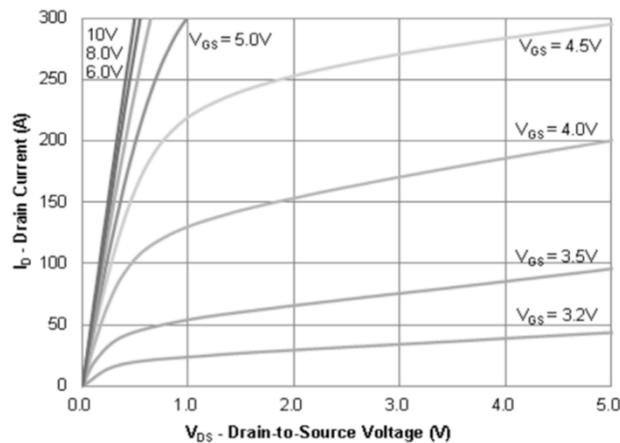


Figure 1: Output Characteristics

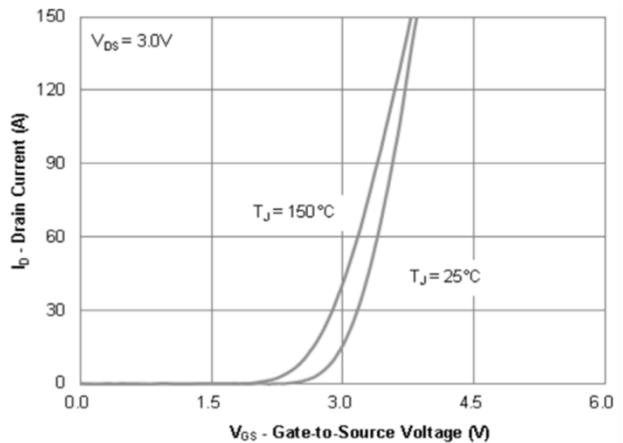


Figure 2: Transfer Characteristics

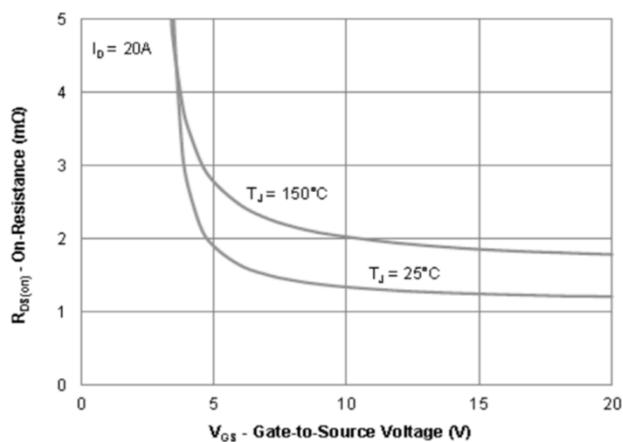


Figure 3: On-Resistance vs. Gate-Source Voltage

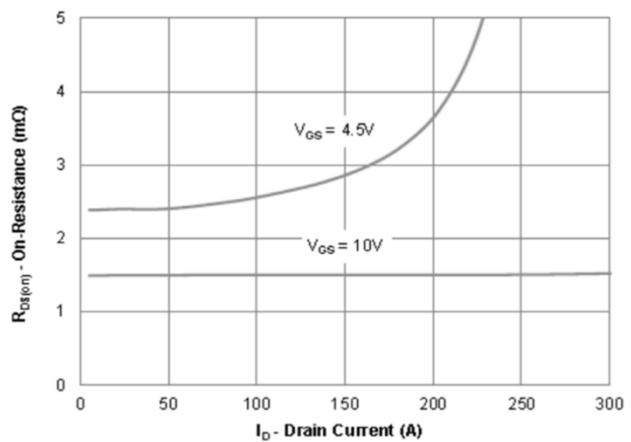


Figure 4: On-Resistance vs. Gate-Source Voltage

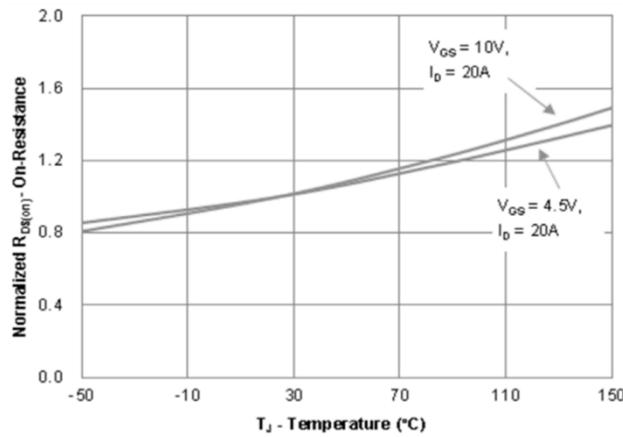


Figure 5: On-Resistance vs. Junction Temperature

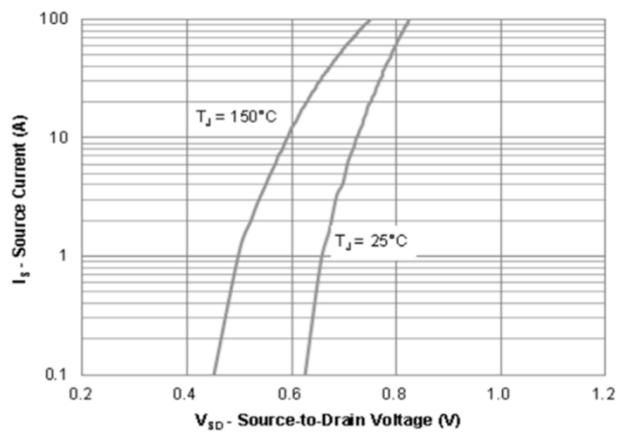


Figure 6: Source-Drain Diode Forward Voltage

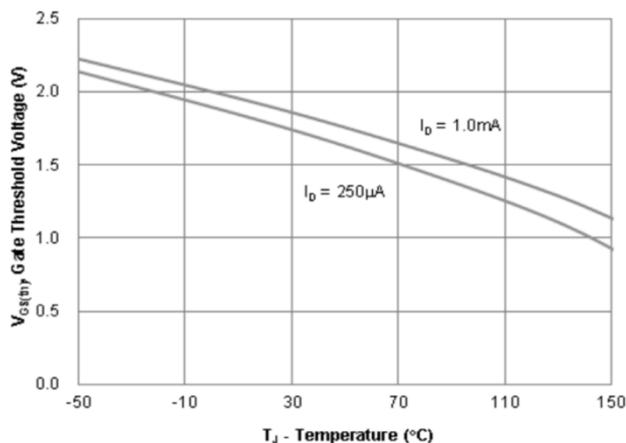


Figure 7: Gate Threshold Variation vs. Junction Temperature

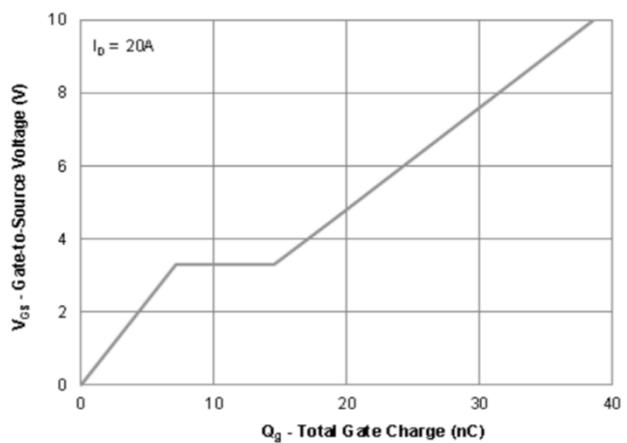


Figure 8: Gate Charge Characteristics

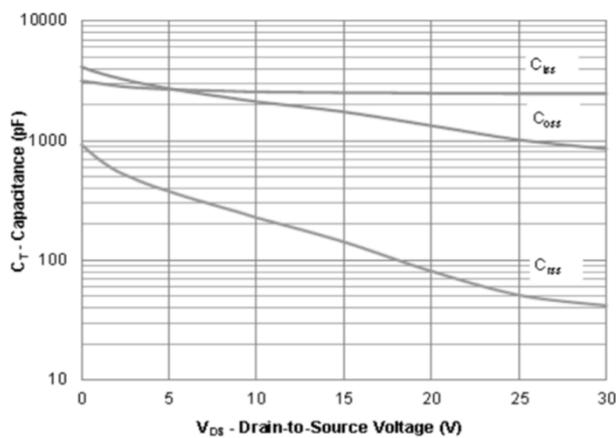


Figure 9: Capacitance Characteristics

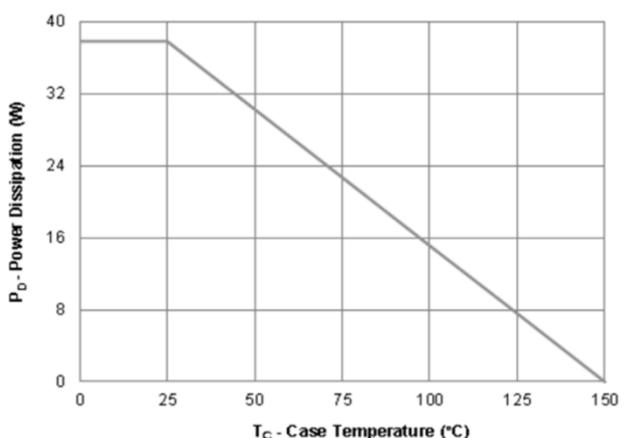


Figure 10: Power Derating

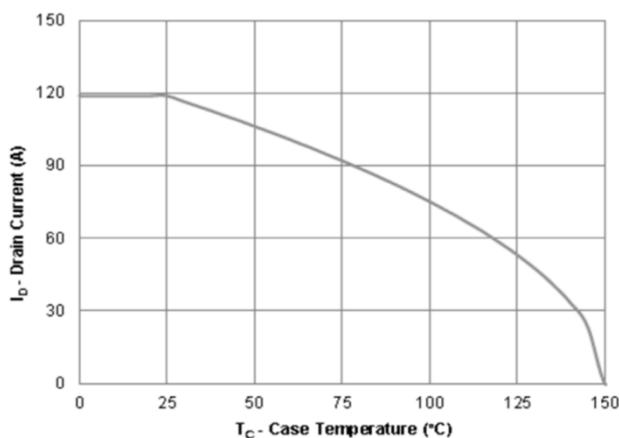


Figure 11: Current Derating

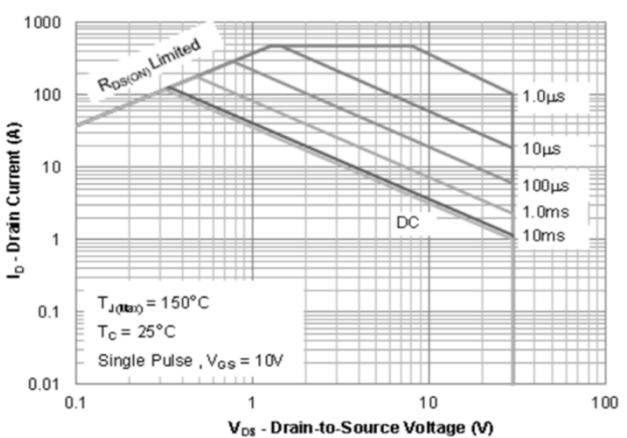


Figure 12: Safe Operating Area

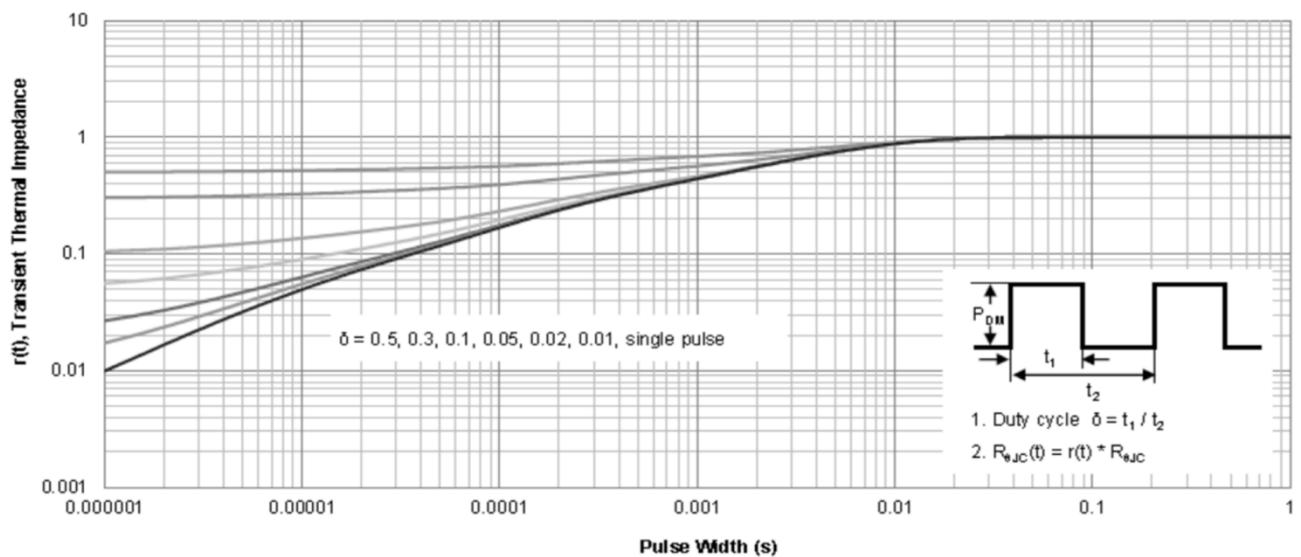
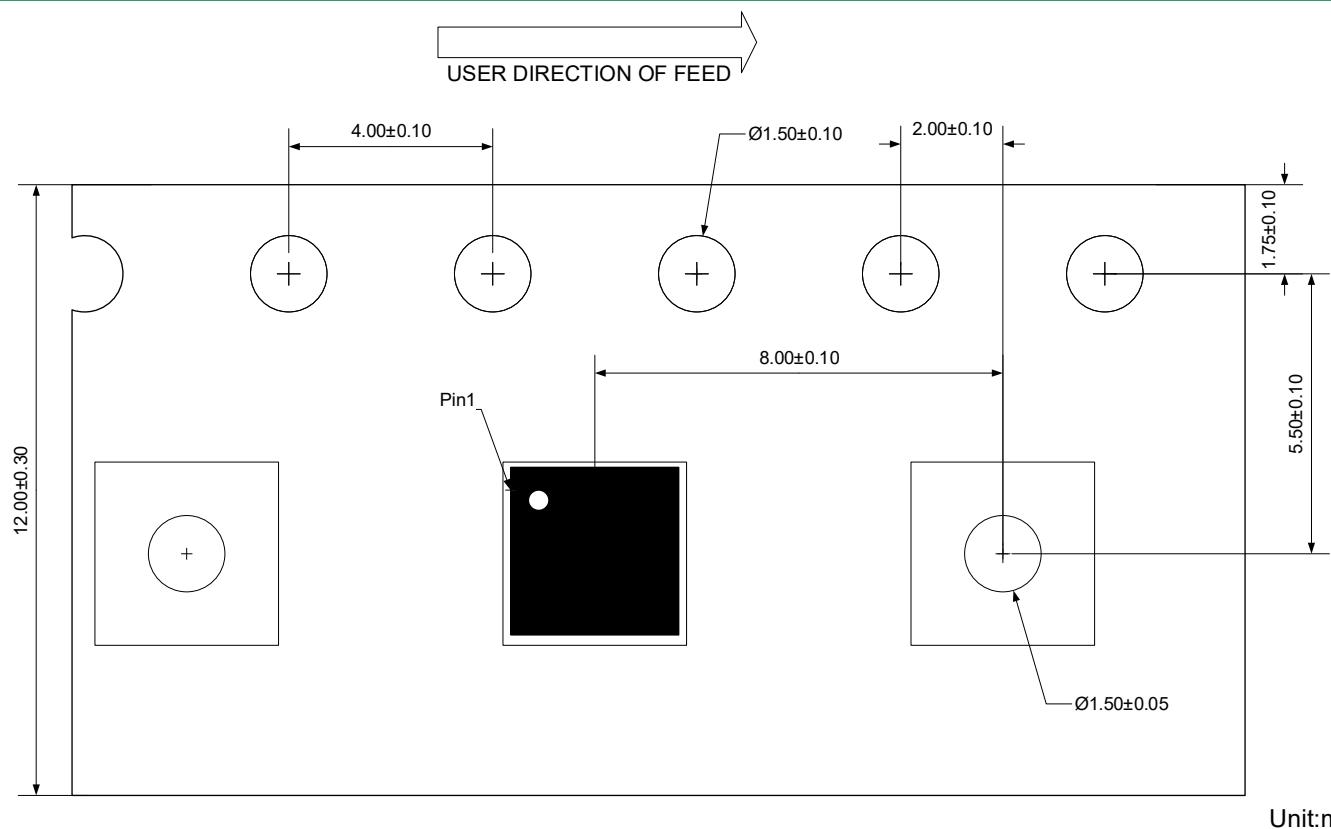


Figure 13: Normalized Maximum Transient Thermal Impedance

Ordering Information

Device	Package	Reel	Shipping
PSM8PN03R2	PDFN3333-8L	13"	5000 / Tape & Reel

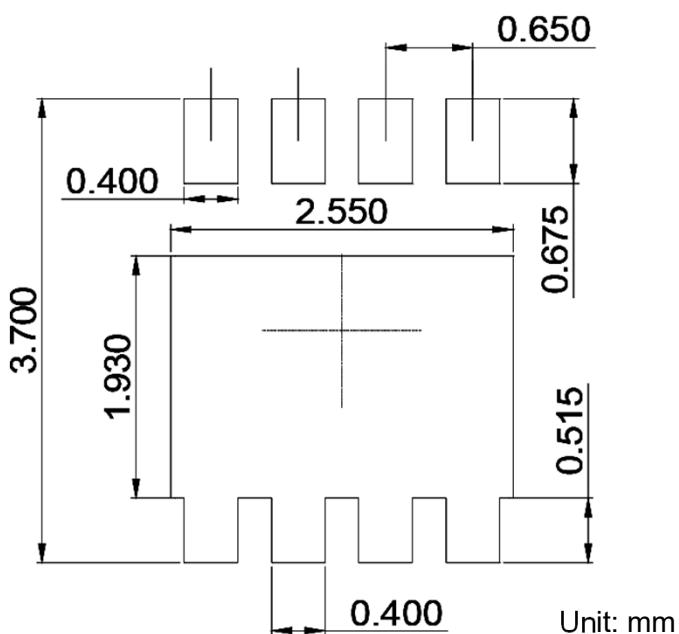
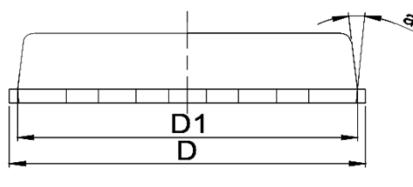
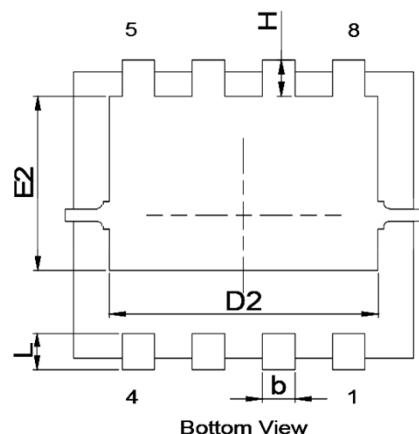
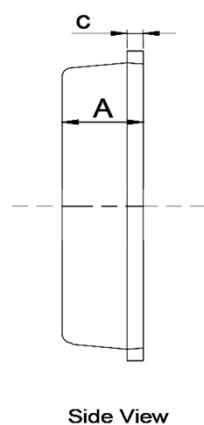
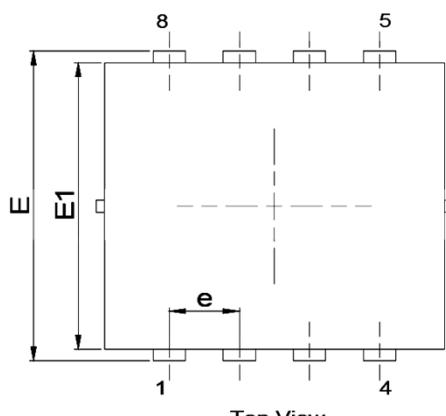
Load With Information



N-Channel MOSFET

PSM8PN03R2

Product Dimension (PDFN3333-8L)



Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	0.70	0.90	0.028	0.035
b	0.20	0.40	0.008	0.016
c	0.10	0.20	0.004	0.008
D	3.20	3.40	0.126	0.134
D1	3.05	3.25	0.120	0.128
D2	2.35	2.69	0.093	0.106
E	3.20	3.45	0.126	0.136
E1	2.85	3.15	0.112	0.124
E2	1.65	1.90	0.065	0.075
e	0.65 BSC.		0.026 BSC.	
H	0.25	0.60	0.010	0.024
L	0.25	0.50	0.010	0.020
a	-	15°	-	15°

Suggested PCB Layout

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