

**20V Dual N-Channel MOSFET**

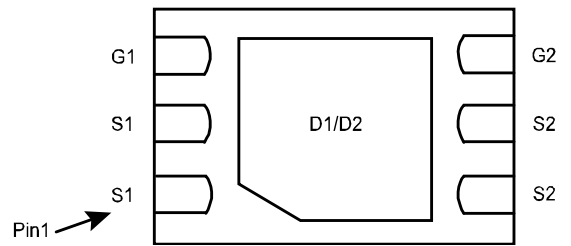
**Description**

The PM8233 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

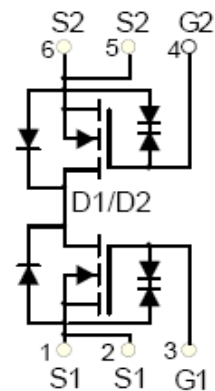
**MOSFET Product Summary**

$V_{(BR)DSS}$	$R_{DS(on)}$ TYP	$I_D$
20V	8 mΩ @ 4.5V	11A
	8.2 mΩ @ 4.0V	
	9 mΩ @ 3.7V	
	9.5 mΩ @ 3.1V	
	10 mΩ @ 2.5V	

**Dimensions and Pin Configuration**



**Circuit diagram**



**Pin Configuration**

**Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$  unless otherwise noted)**

Parameter		Symbol	Value	Unit
Drain-Source Voltage		$V_{DS}$	20	V
Gate-Source Voltage		$V_{GS}$	$\pm 12$	V
Continuous Drain Current <sup>c</sup>	$T_A=25^\circ\text{C}$	$I_D$	11	A
	$T_A=70^\circ\text{C}$		8.8	
Pulsed Drain Current <sup>a, c</sup>		$I_{DM}$	70	A
Power Dissipation <sup>b</sup>	$T_A=25^\circ\text{C}$	$P_D$	1.56	W
	$T_A=70^\circ\text{C}$		1.00	
Junction and Storage Temperature Range		$T_J, T_{STG}$	-55 To 150	$^\circ\text{C}$
Maximum Junction-to-Ambient	Steady-State	$R_{\theta JA}$	80	$^\circ\text{C} / \text{W}$

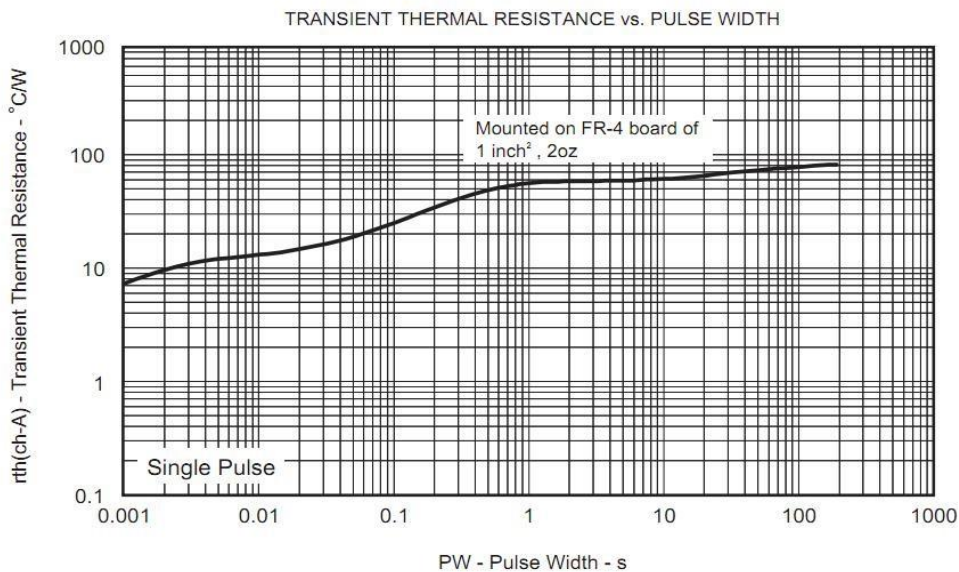
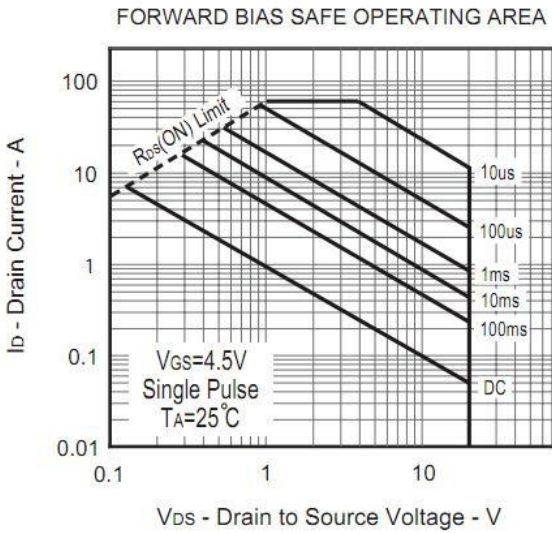
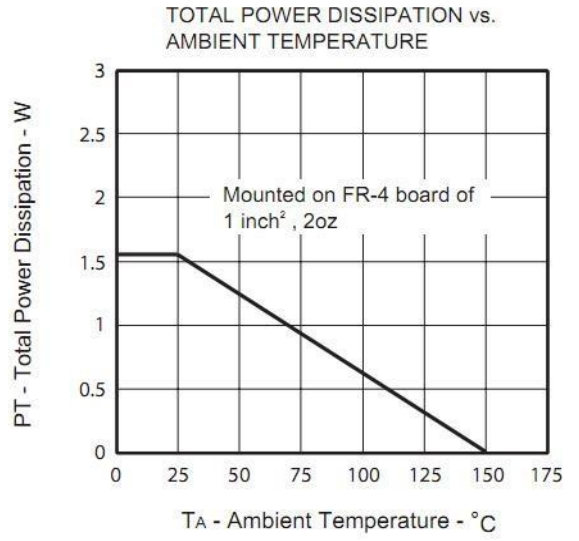
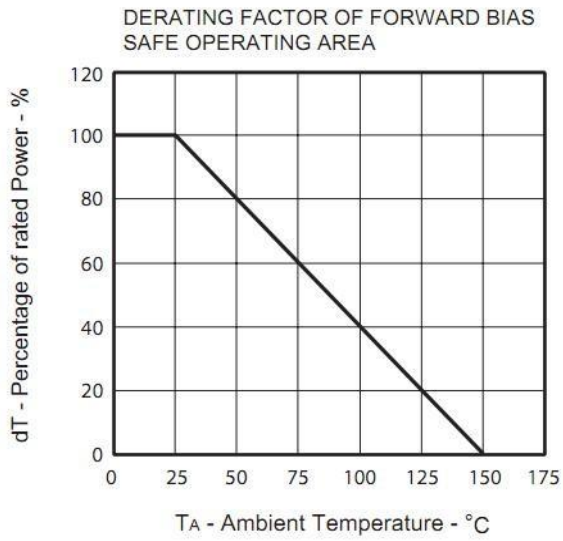
**Electrical Characteristics ( T<sub>A</sub> = 25°C unless otherwise noted )**

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	20	-	-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V	-	-	1	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V	-	-	±10	μA
<b>On Characteristics</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.5	0.85	1.5	V
Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =4.5A	6	8	8.5	mΩ
		V <sub>GS</sub> =4.0V, I <sub>D</sub> =4.5A	6.2	8.2	9	mΩ
		V <sub>GS</sub> =3.7V, I <sub>D</sub> =4.5A	7	9	10	mΩ
		V <sub>GS</sub> =3.1V, I <sub>D</sub> =4.5A	7.6	9.5	11	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =3.5A	8	10	11	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =4.75A	-	28	-	S
<b>Dynamic Characteristics <sup>b</sup></b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, F=1.0MHz	-	1767	-	pF
Output Capacitance	C <sub>OSS</sub>		-	184	-	pF
Reverse Transfer Capacitance	C <sub>RSS</sub>		-	155	-	pF
<b>Switching Characteristics <sup>b</sup></b>						
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =16V, I <sub>D</sub> =4.5A V <sub>GS</sub> =5.5V, R <sub>GEN</sub> =6Ω ,	-	10.2	-	nS
Turn-on Rise Time	t <sub>r</sub>		-	41	-	nS
Turn-Off Delay Time	t <sub>d(off)</sub>		-	67	-	nS
Turn-Off Fall Time	t <sub>f</sub>		-	31	-	nS
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =16V, I <sub>D</sub> =10A, V <sub>GS</sub> =4.5V	-	23	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	3.5	-	nC
Gate-Drain Charge	Q <sub>gd</sub>		-	8.4	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =11A	-	0.8	1.2	V
Maximum Body-Diode Continuous	I <sub>S</sub>	-	-	-	11	A

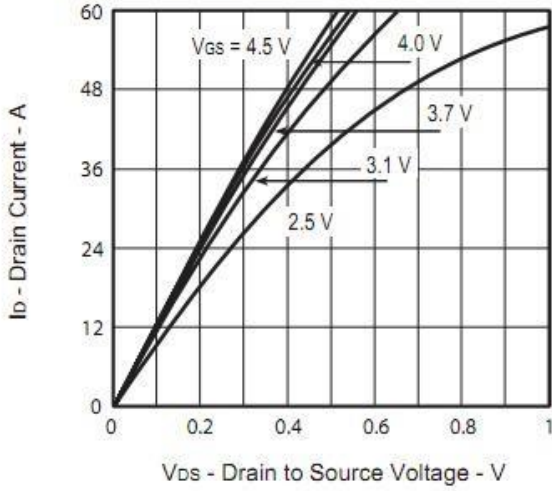
**Notes**

- Pulse Test: Pulse Width < 10us, Duty Cycle < 1%.
- Guaranteed by design, not subject to production testing.
- Drain current limited by maximum junction temperature.
- Mounted on FR4 Board of 1 inch<sup>2</sup> , 2oz.

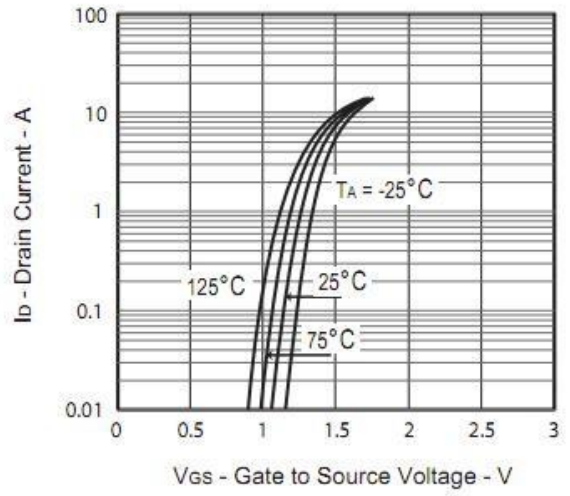
**Typical Characteristics**



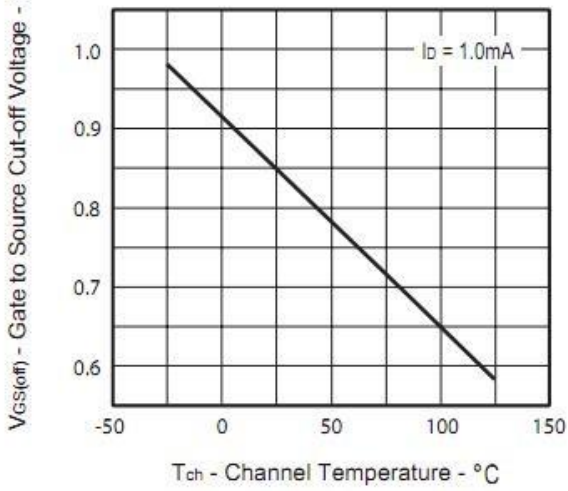
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



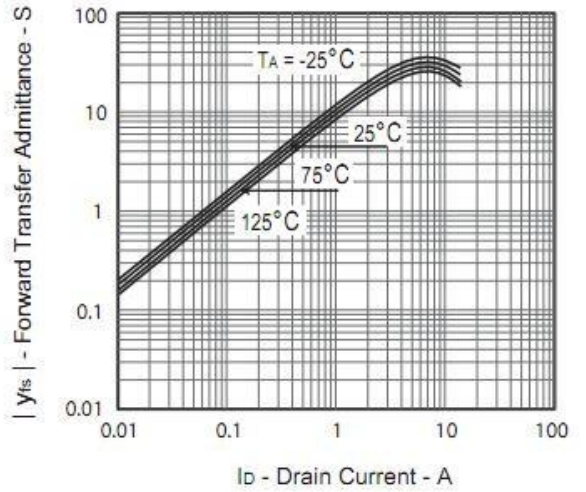
FORWARD TRANSFER CHARACTERISTICS



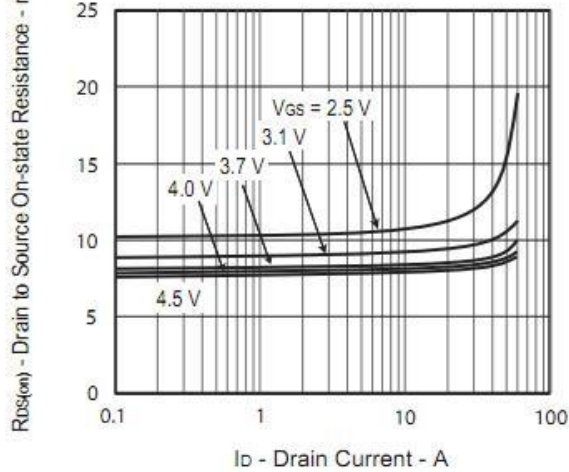
GATE TO SOURCE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



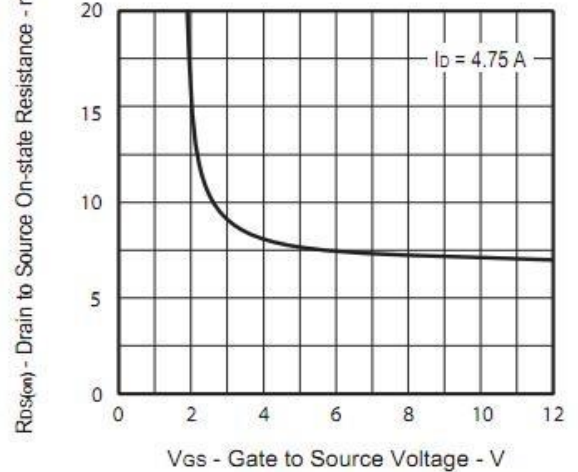
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT

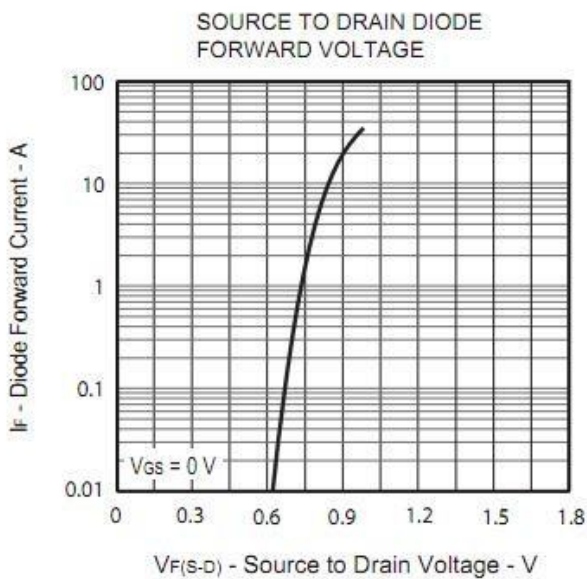
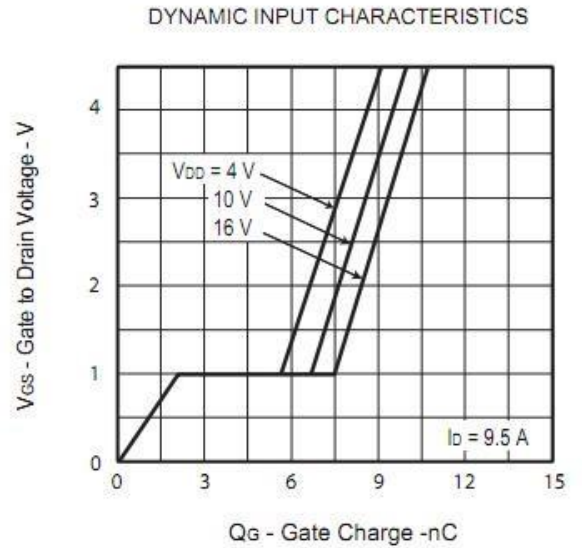
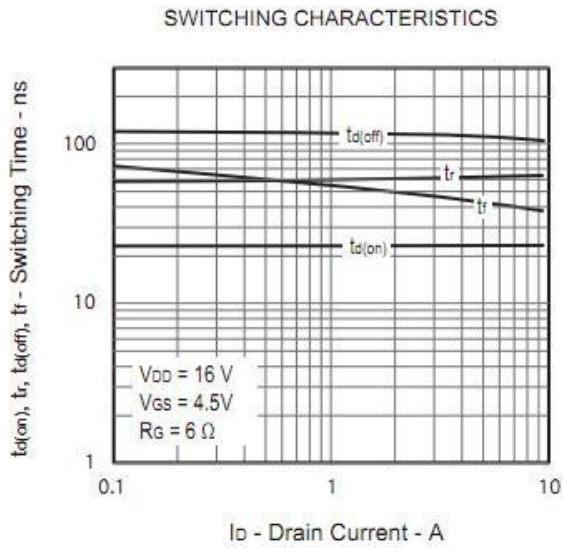
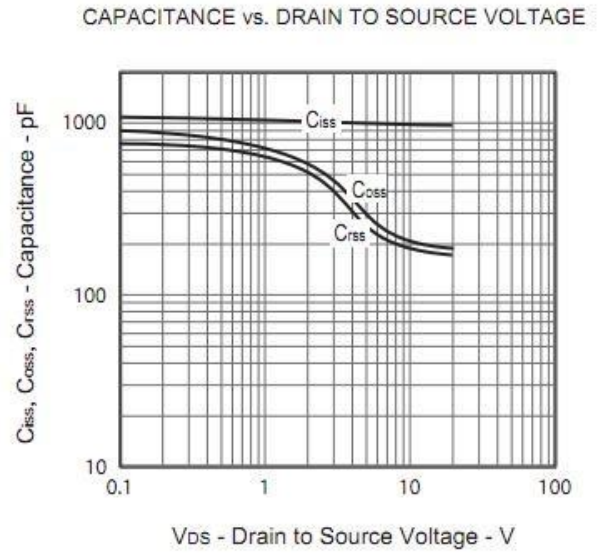
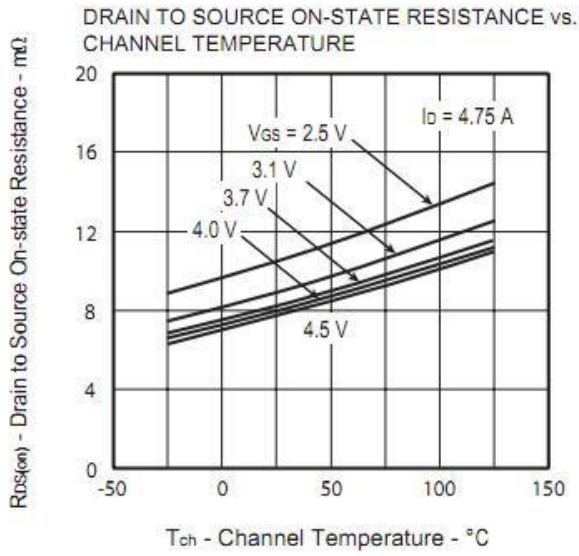


DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



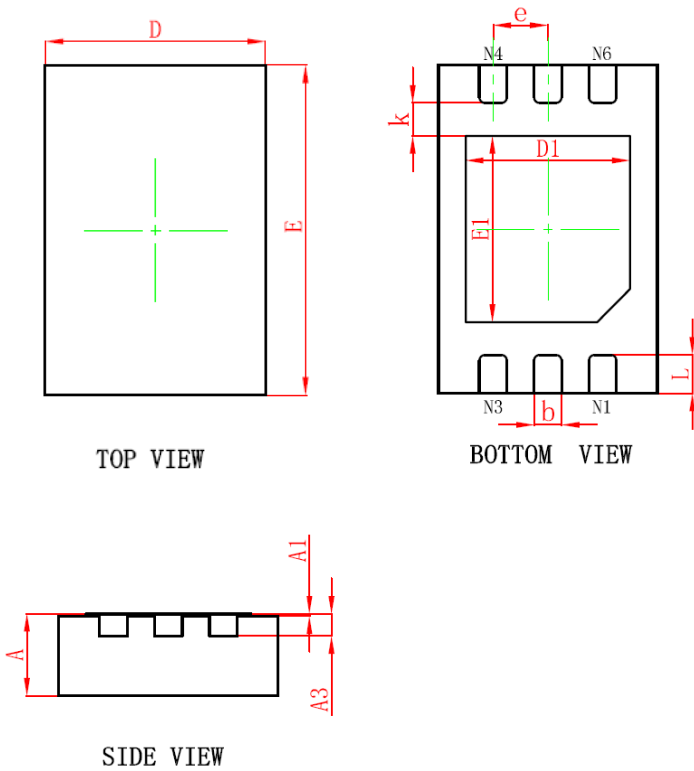
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE





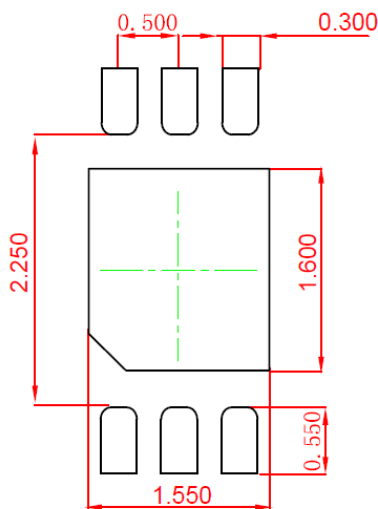


**DFNWB 2X3-6L Package Outline Drawing**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	1.950	2.050	0.077	0.081
E	2.950	3.050	0.116	0.120
D1	1.450	1.550	0.057	0.061
E1	1.650	1.750	0.065	0.069
k	0.200MIN.		0.008MIN.	
b	0.200	0.300	0.008	0.012
e	0.500TYP.		0.020TYP.	
L	0.300	0.400	0.012	0.016

**Suggested Land Pattern**



- Note:
1. Controlling dimension: in millimeters.
  2. General tolerance:  $\pm 0.050$ mm.
  3. The pad layout is for reference purposes only.