

Dual N-Channel Enhancement Mode MOSFET

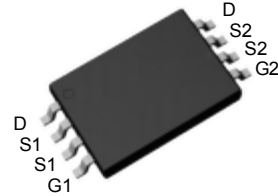
### Features

- 20V/7A,  
 $R_{DS(ON)} = 17m\Omega(\text{typ.}) @ V_{GS} = 4.5V$   
 $R_{DS(ON)} = 20m\Omega(\text{typ.}) @ V_{GS} = 2.5V$
- 100% UIS Tested
- Reliable and Rugged
- Lead Free and Green Devices Available  
 (RoHS Compliant)
- ESD Protection

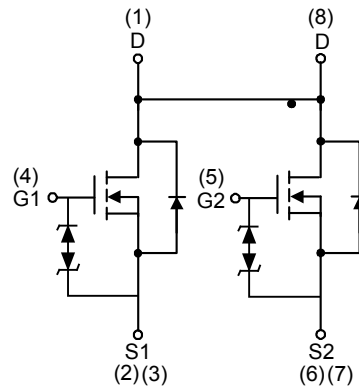
### Applications

- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems.

### Pin Description



Top View of TSSOP-8



N-Channel MOSFET

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

Symbol	Parameter	Rating	Unit	
$V_{DSS}$	Drain-Source Voltage	20	V	
$V_{GSS}$	Gate-Source Voltage	$\pm 12$		
$I_D$	Continue Drain Current	$T_A=25^\circ\text{C}$	7	A
		$T_A=70^\circ\text{C}$	2.8	
$I_{DM}$	Pulsed Drain Current	$T_A=25^\circ\text{C}$	21	
$I_S$	Diode continuous forward current	7	A	
$T_J$	Maximum Junction Temperature	150	$^\circ\text{C}$	
$T_{STG}$	Storage Temperature Range	-55 to 150		
$P_D$	Maximum Power Dissipation	$T_A=25^\circ\text{C}$	1.25	W
		$T_A=70^\circ\text{C}$	0.8	
$R_{\theta JA}^*$	Thermal Resistance-Junction to Ambient	100	$^\circ\text{C/W}$	

Note \* : Surface Mounted on  $1\text{in}^2$  pad area,  $t \leq 10\text{sec}$ .

**Electrical Characteristics** ( $T_A = 25^\circ\text{C}$  Unless Otherwise Noted)

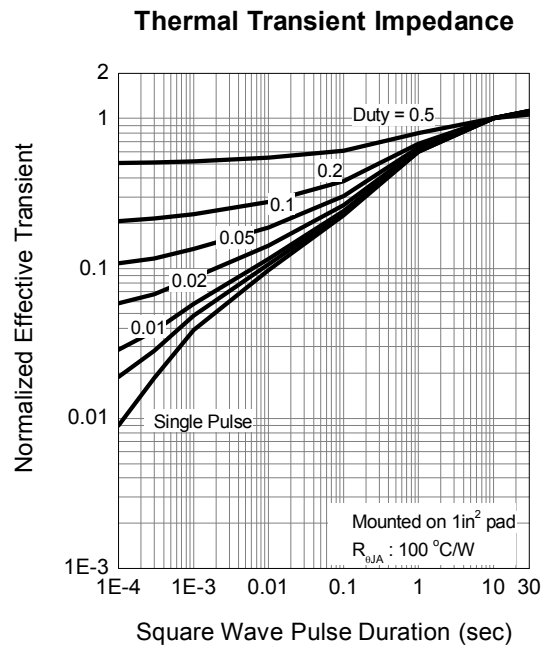
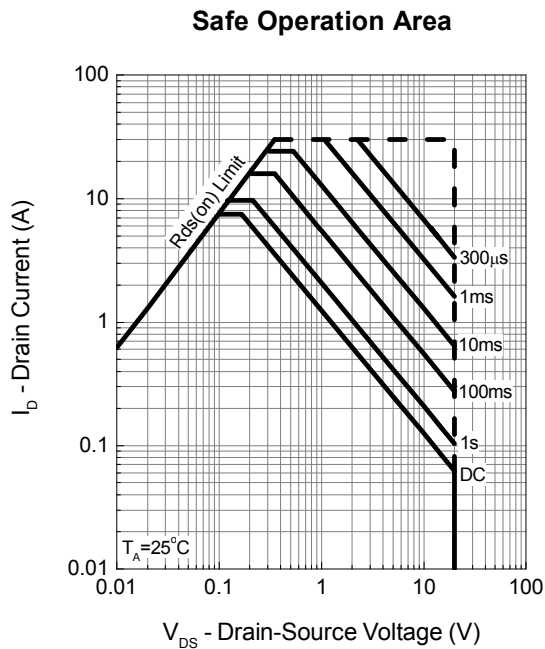
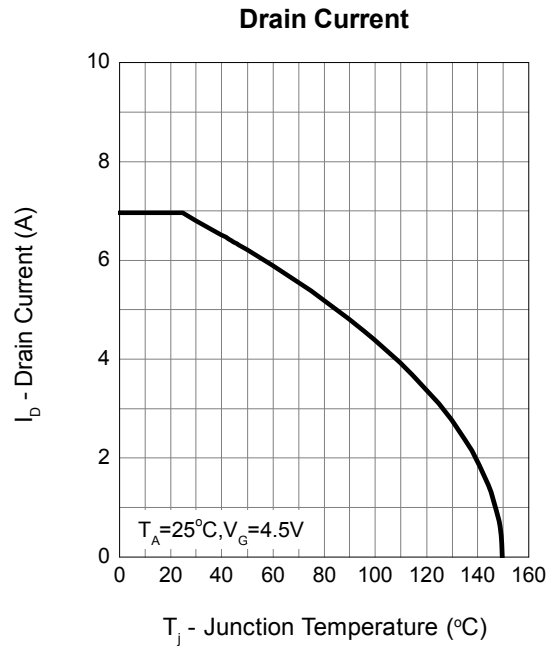
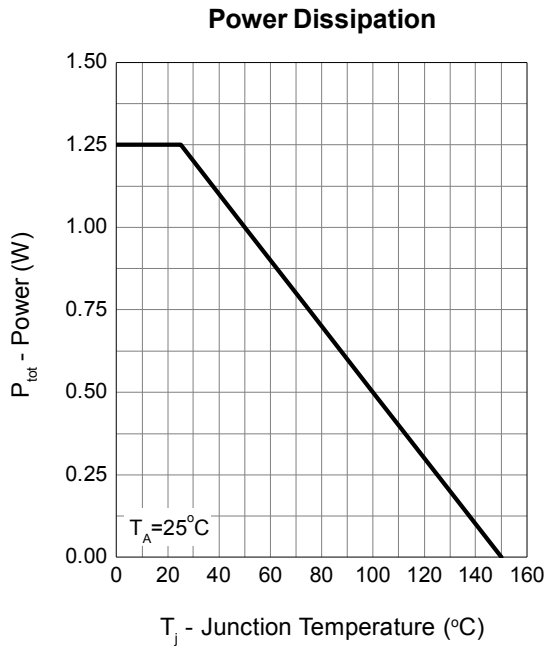
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	20	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=16V, V_{GS}=0V$	-	-	1	$\mu A$
		$T_J=85^\circ C$	-	-	30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	0.5	0.7	1.1	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 10V, V_{DS}=0V$	-	-	$\pm 10$	$\mu A$
$R_{DS(on)}^a$	Drain-Source On-state Resistance	$V_{GS}=4.5V, I_{DS}=7.5A$	-	17	20	$m\Omega$
		$V_{GS}=2.5V, I_{DS}=5A$	-	20	25	
<b>Diode Characteristics</b>						
$V_{SD}^a$	Diode Forward Voltage	$I_{SD}=1A, V_{GS}=0V$	-	0.7	1.3	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=7.5A, dI_{SD}/dt=100A/\mu s$	-	10	-	nS
$Q_{rr}$	Reverse Recovery Charge		-	3.5	-	nC
<b>Dynamic Characteristics<sup>b</sup></b>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$	-	8	-	$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=10V,$ Frequency=1.0MHz	-	592	-	$pF$
$C_{oss}$	Output Capacitance		-	148	-	
$C_{riss}$	Reverse Transfer Capacitance		-	119	-	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=10V, R_L=10\Omega,$ $I_{DS}=1A, V_{GEN}=4.5V,$ $R_G=6\Omega$	-	9	16	ns
$t_r$	Turn-on Rise Time		-	13	23	
$t_{d(OFF)}$	Turn-off Delay Time		-	55	99	
$t_f$	Turn-off Fall Time		-	36	65	
<b>Gate Charge Characteristics<sup>b</sup></b>						
$Q_g$	Total Gate Charge	$V_{DS}=10V, V_{GS}=4.5V,$ $I_{DS}=7.5A$	-	9.8	12.8	nC
$Q_{gs}$	Gate-Source Charge		-	0.5	-	
$Q_{gd}$	Gate-Drain Charge		-	3.6	-	

Note a Pulse test ; pulse width $\leq 300\mu s$ , duty cycle $\leq 2\%$ .

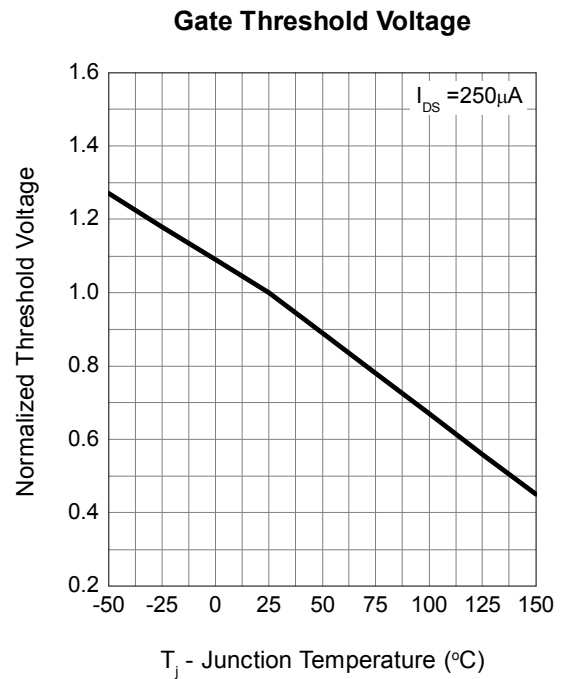
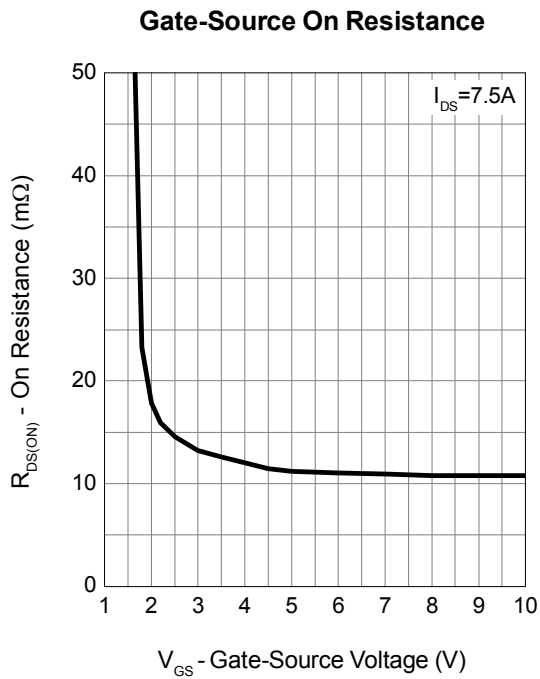
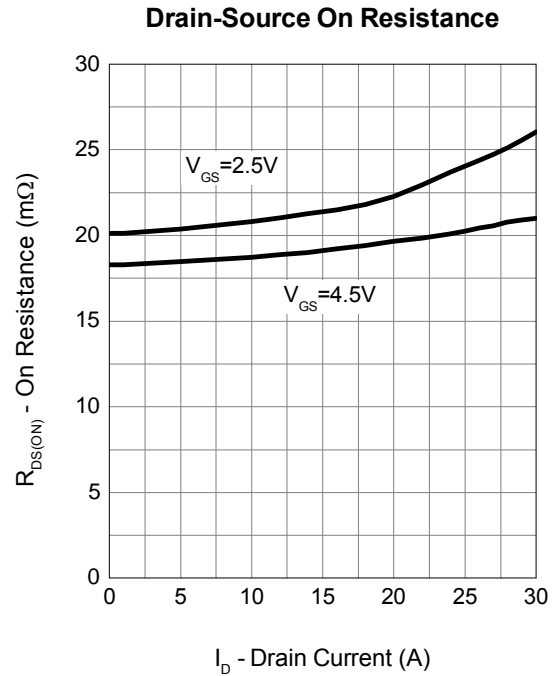
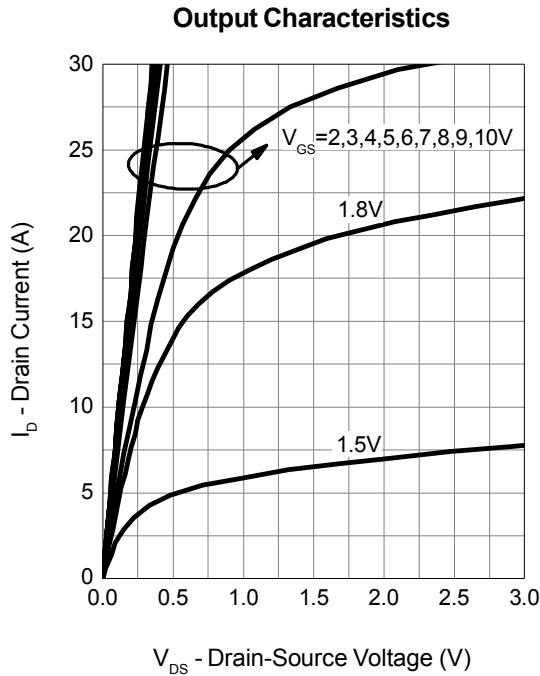
Note b Guaranteed by design, not subject to production testing.

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## Typical Operating Characteristics

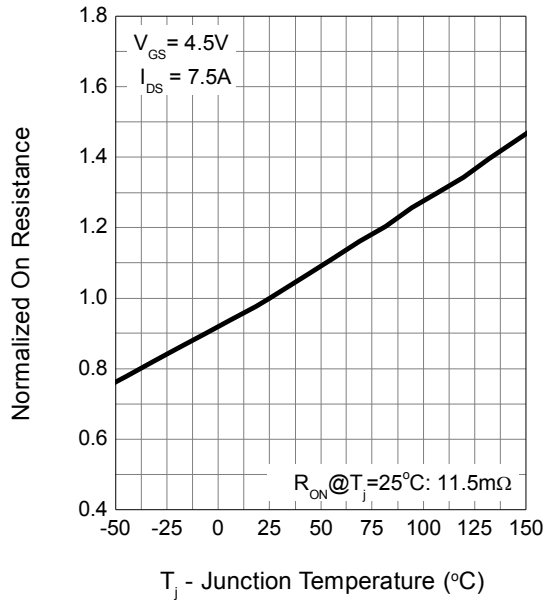


### Typical Operating Characteristics (Cont.)

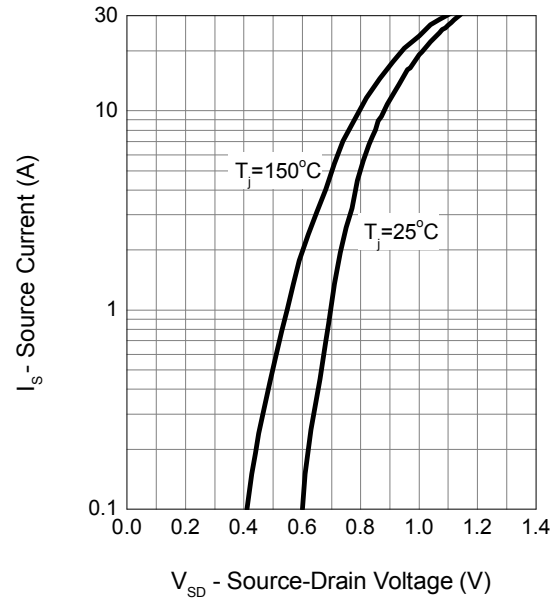


## Typical Operating Characteristics (Cont.)

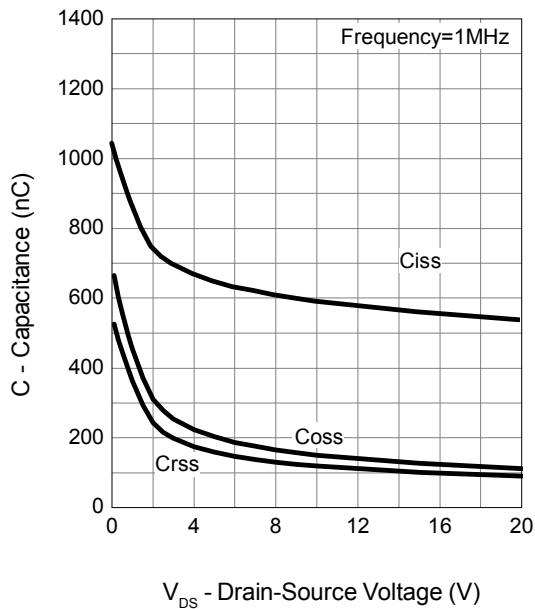
**Drain-Source On Resistance**



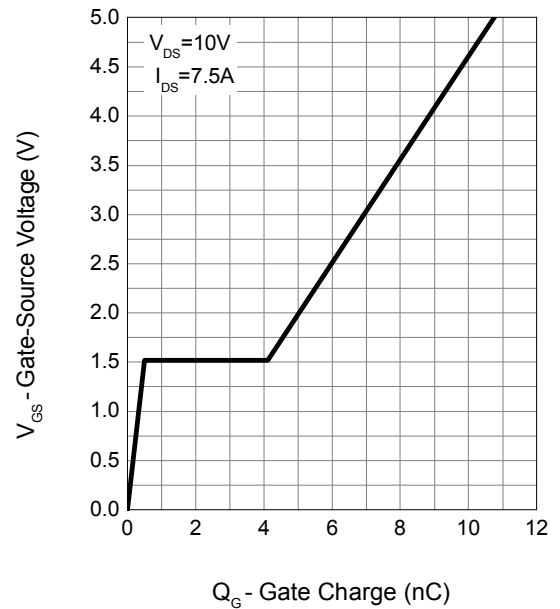
**Source-Drain Diode Forward**



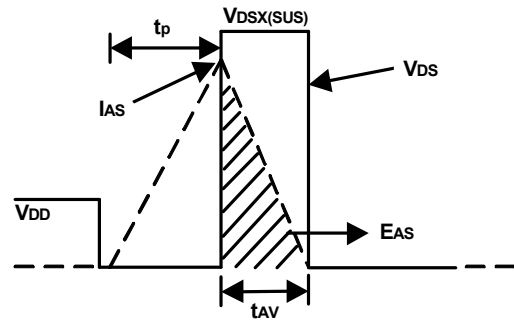
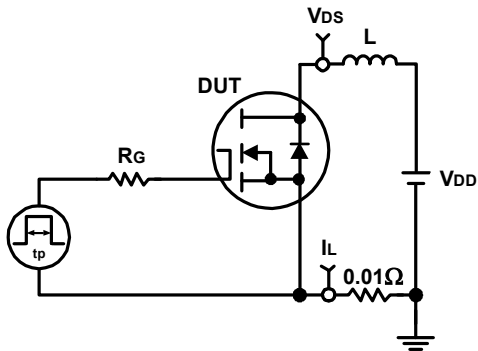
**Capacitance**



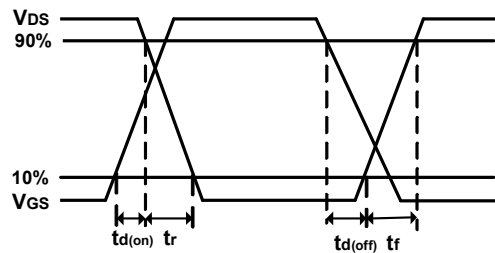
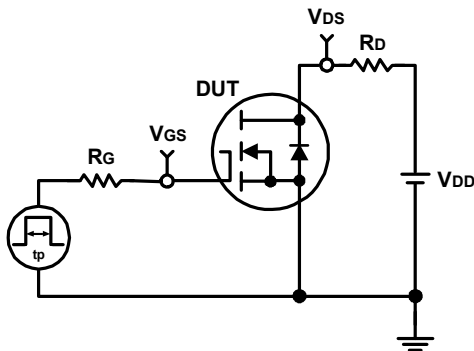
**Gate Charge**

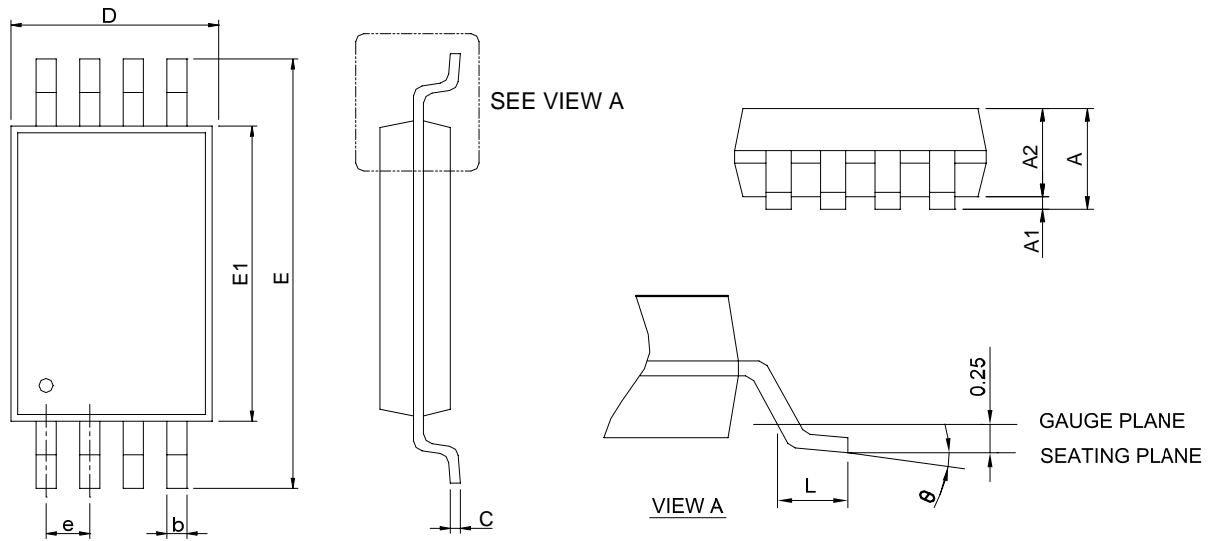


### Avalanche Test Circuit and Waveforms

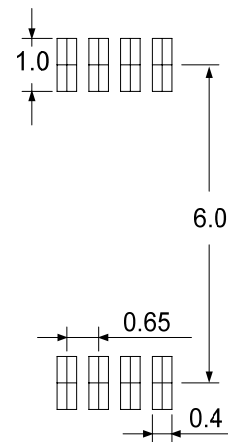


### Switching Time Test Circuit and Waveforms





DIMENSIONS	TSSOP-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	-	1.20	-	0.047
A1	0.05	0.15	0.002	0.006
A2	0.80	1.05	0.031	0.041
b	0.19	0.30	0.007	0.012
c	0.09	0.20	0.004	0.008
D	2.90	3.10	0.114	0.122
E	6.20	6.60	0.244	0.260
E1	4.30	4.50	0.169	0.177
e	0.65 BSC		0.026 BSC	
L	0.45	0.75	0.018	0.030
$\theta$	0°	8°	0°	8°



Note : 1. Follow JEDEC MO-153 AA

2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.
3. Dimension "E1" does not include inter-lead flash or protrusions. Inter-lead flash and protrusions shall not exceed 10 mil per side.

UNIT: mm