

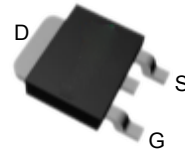
Features

- 30V/80A,
 $R_{DS(ON)} = 4.2m\Omega$ (typ.) @ $V_{GS} = 10V$
 $R_{DS(ON)} = 6.5m\Omega$ (typ.) @ $V_{GS} = 4.5V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)
- Moisture Sensitivity Level MSL1
(per JEDEC J-STD-020D)

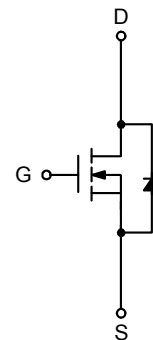
Applications

- Power Management in Desktop Computer or DC/DC Converters.

Pin Description



Top View of TO-252-2



N-Channel MOSFET

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
Common Ratings				
V _{DSS}	Drain-Source Voltage		30	V
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	°C
I _S	Diode Continuous Forward Current	T _C =25°C	80	A
I _D	Continuous Drain Current	T _C =25°C	80	A
		T _C =100°C	48	
I _{DM} ^b	Pulse Drain Current	T _C =25°C	240	A
P _D	Maximum Power Dissipation	T _C =25°C	50	W
		T _C =100°C	20	
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	2.5	°C/W
R _{θJA} ^c	Thermal Resistance-Junction to Ambient	t ≤ 10s	20	°C/W
		Steady State	60	
I _{AS} ^d	Avalanche Current, Single pulse	L=0.5mH	36	A
E _{AS} ^d	Avalanche Energy, Single pulse	L=0.5mH	324	mJ

Note a : Max. continuous current is limited by bonding wire.

Note b : Pulse width is limited by max. junction temperature.

Note c : Surface mounted on 1in^2 pad area, steady state $t = 999\text{s}$.

Note d : UIS tested and pulse width are limited by maximum junction temperature 150°C (initial temperature $T_J = 25^\circ\text{C}$).

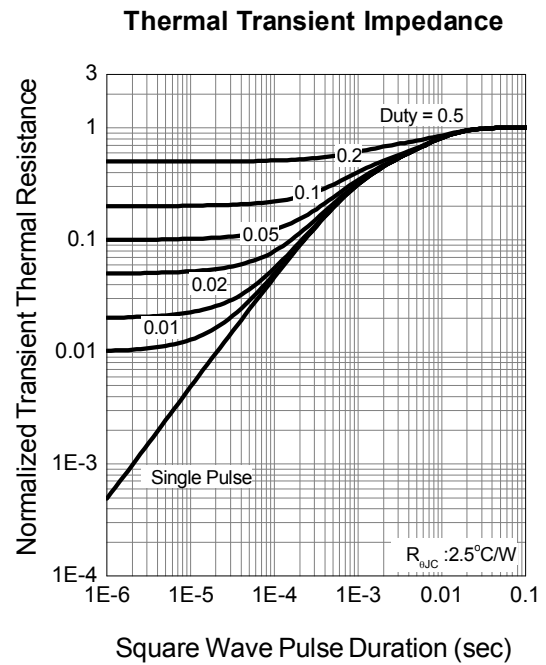
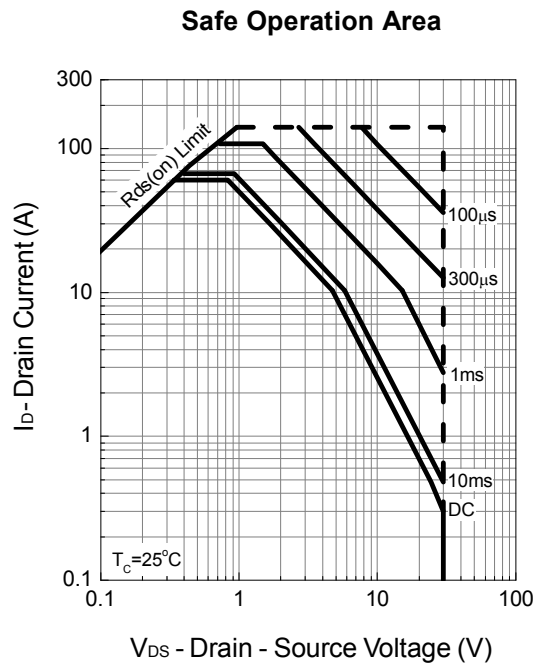
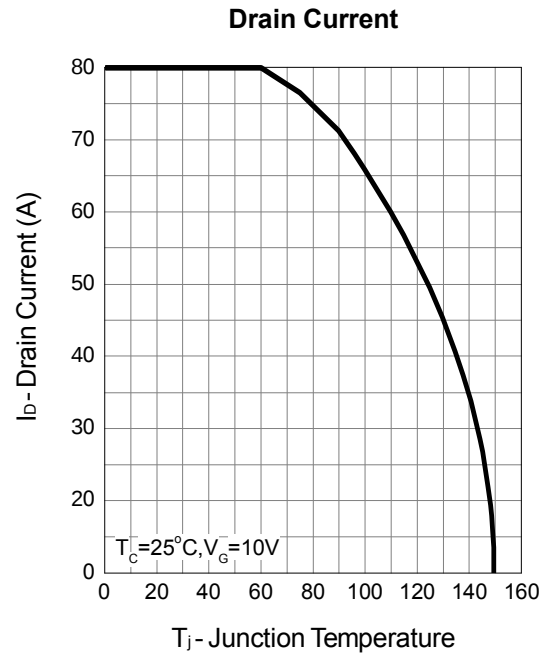
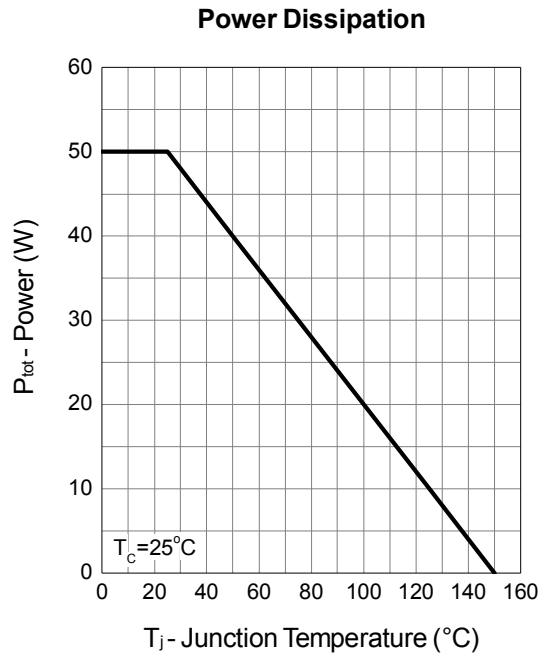
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	30	-	-	V
BV _{DSS(t)}	Drain-Source Breakdown Voltage (transient)	V _{GS} =0V, I _{D(aval)} =20A T _{case} =25°C, t _{transient} =100ns	34	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V, V _{GS} =0V	-	-	1	μA
		T _J =85°C	-	-	30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	0.8	1.1	1.5	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^e	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =40A	-	4.2	6.5	mΩ
		T _J =125°C	-	6.9	-	
		V _{GS} =4.5V, I _{DS} =20A	-	6.5	10	
G _{fs}	Forward Transconductance	V _{DS} =5V, I _{DS} =40A	-	95	-	S
Diode Characteristics						
V _{SD} ^e	Diode Forward Voltage	I _{SD} =20A, V _{GS} =0V	-	0.8	1.1	V
t _{rr}	Reverse Recovery Time	I _{DS} =40A, dI _{SD} /dt=100A/μs	-	21	-	ns
t _a	Charge Time		-	13.2	-	
t _b	Discharge Time		-	7.8	-	
Q _{rr}	Reverse Recovery Charge		-	17	-	nC
Dynamic Characteristics ^f						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	3	4.5	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Frequency=1.0MHz	2200	2300	2820	pF
C _{oss}	Output Capacitance		410	460	510	
C _{rss}	Reverse Transfer Capacitance		200	230	275	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =15V, R _L =15Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	15	28	ns
t _r	Turn-on Rise Time		-	13	24	
t _{d(OFF)}	Turn-off Delay Time		-	32	57	
t _f	Turn-off Fall Time		-	9	17	
Gate Charge Characteristics ^f						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =4.5V, I _{DS} =40A	-	12	17	nC
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _{DS} =40A	-	25	37	
Q _{gth}	Threshold Gate Charge		-	1.5	-	
Q _{gs}	Gate-Source Charge		-	3	-	
Q _{gd}	Gate-Drain Charge		-	7.5	-	

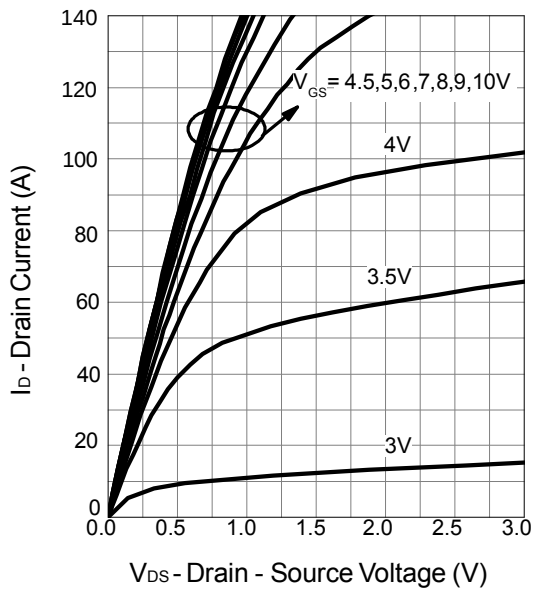
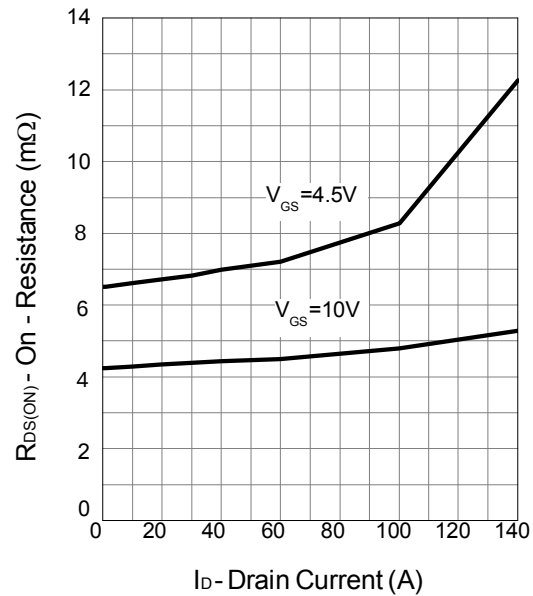
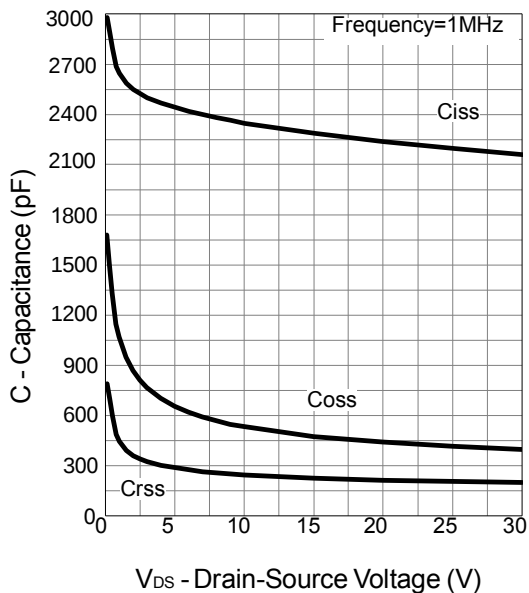
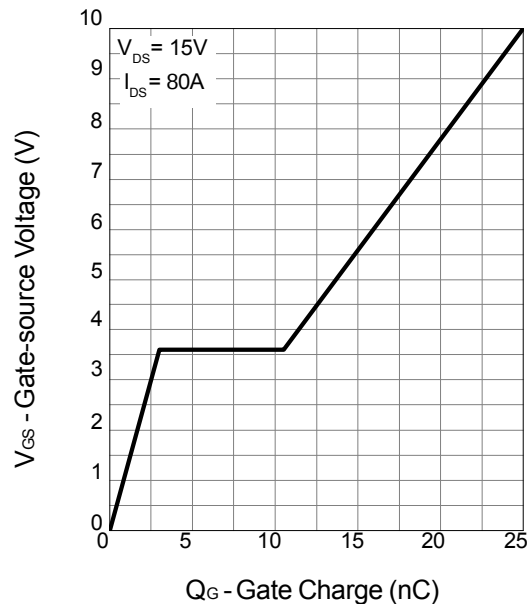
Note e : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Note f : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

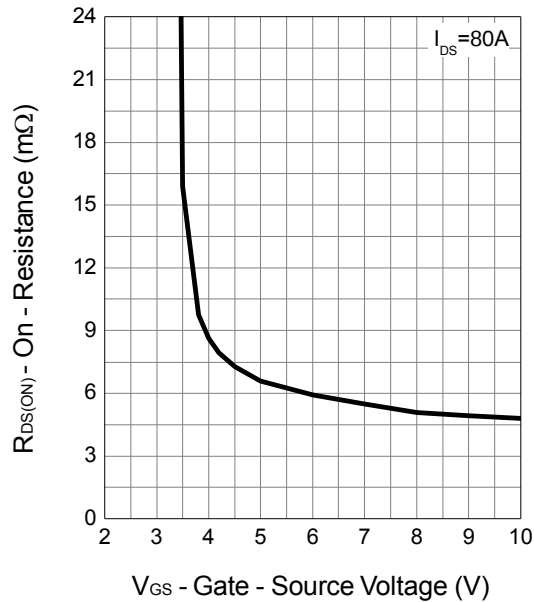


Typical Operating Characteristics (Cont.)

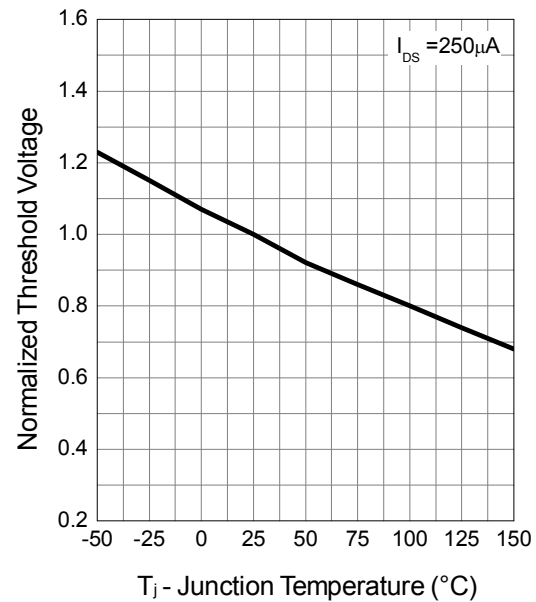
Output Characteristics

Drain-Source On Resistance

Capacitance

Gate Charge


Typical Operating Characteristics (Cont.)

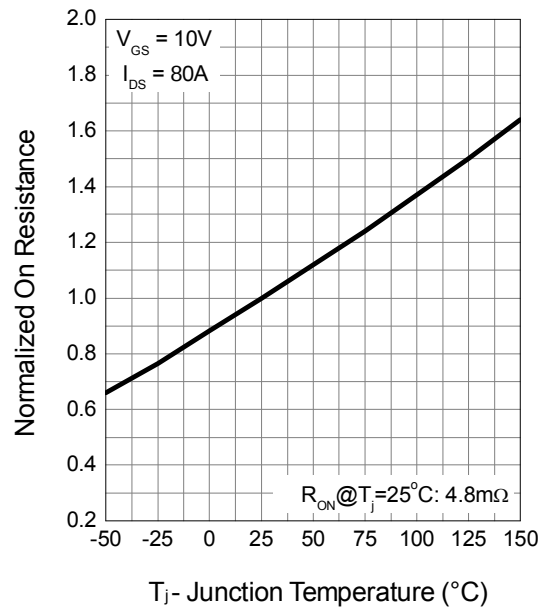
Gate-Source On Resistance



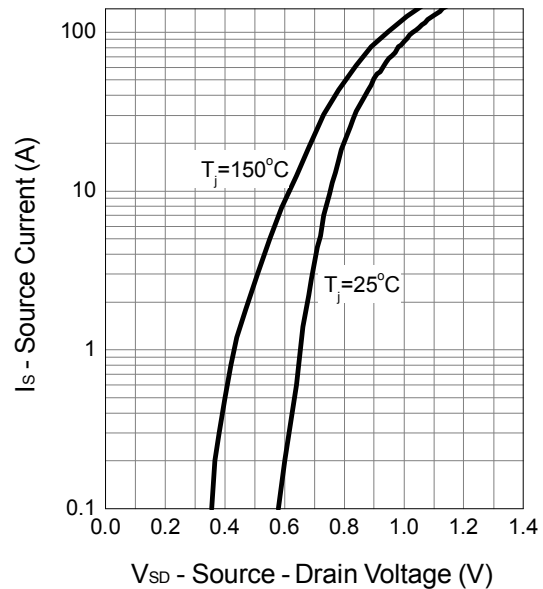
Gate Threshold Voltage



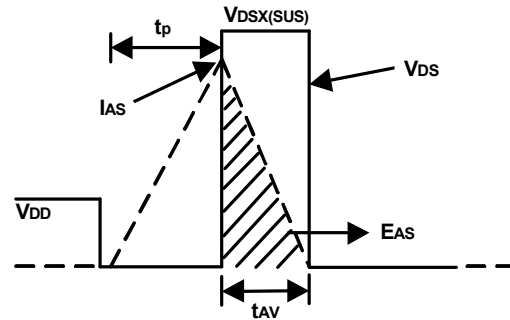
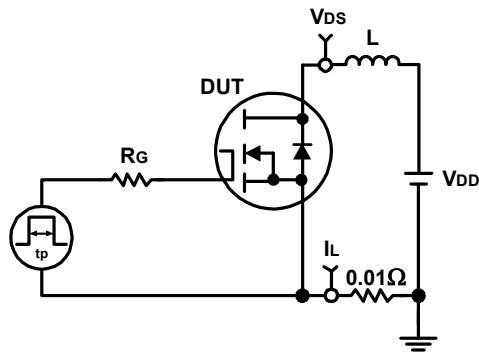
Drain-Source On Resistance



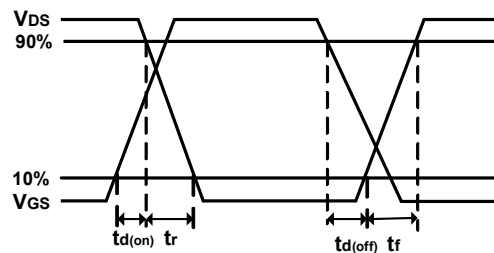
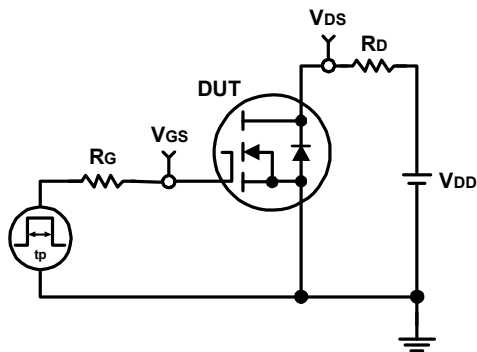
Source-Drain Diode Forward



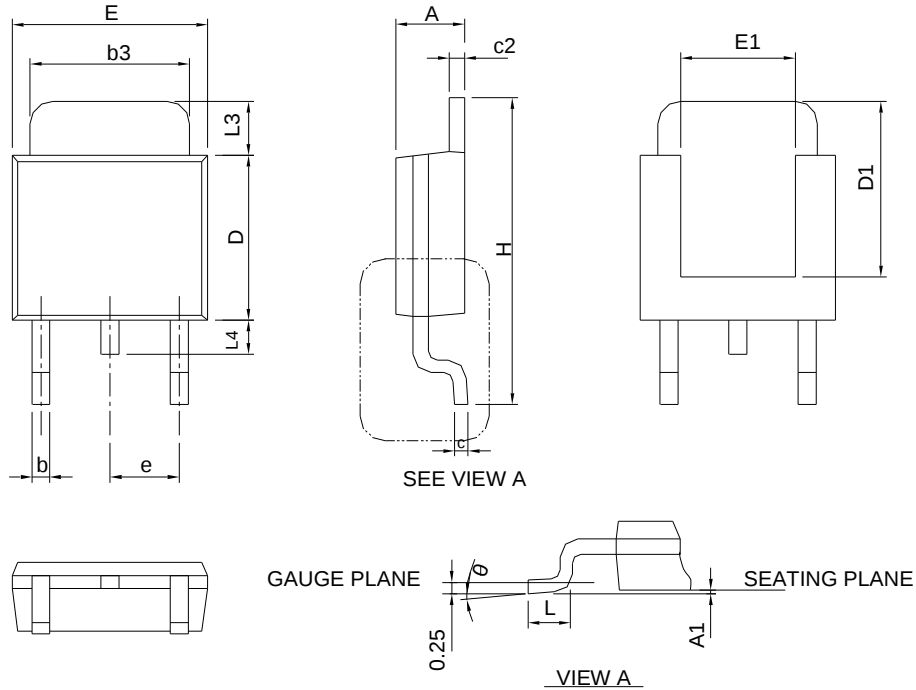
Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



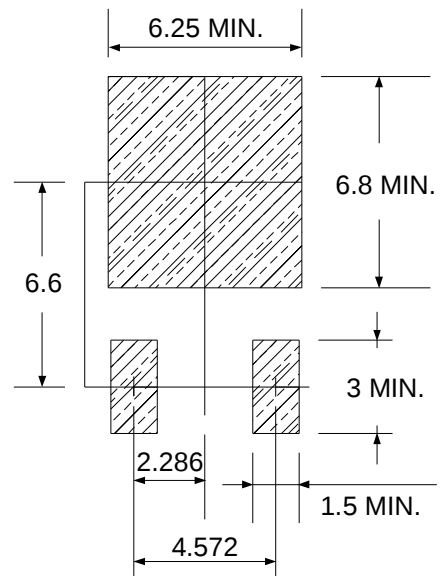
Package Information



SYMBOL	TO-252-2			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.18	2.39	0.086	0.094
A1	-	0.13	-	0.005
b	0.50	0.89	0.020	0.035
b3	4.95	5.46	0.195	0.215
c	0.46	0.61	0.018	0.024
c2	0.46	0.89	0.018	0.035
D	5.33	6.22	0.210	0.245
D1	4.57	6.00	0.180	0.236
E	6.35	6.73	0.250	0.265
E1	3.81	6.00	0.150	0.236
e	2.29 BSC		0.090 BSC	
H	9.40	10.41	0.370	0.410
L	0.90	1.78	0.035	0.070
L3	0.89	2.03	0.035	0.080
L4	-	1.02	-	0.040
θ	0°	8°	0°	8°

Note : Follow JEDEC TO-252-2 .

RECOMMENDED LAND PATTERN



UNIT: mm