RSTD3080

N-Channel Enhancement Mode MOSFET

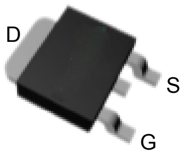
Features

- 30V/80A,
  $R_{DS(ON)}$=4mΩ (typ.) @ V_{GS}=10V
  $R_{DS(ON)}$=5.5mΩ (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)

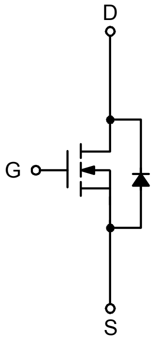
Applications

- 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°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	20	A
I_D	Continuous Drain Current	T_C=25°C	80[a]	A
		T_C=100°C	48	
I_{DM} [b]	Pulse Drain Current	T_C=25°C	140	A
P_D	Maximum Power Dissipation	T_C=25°C	50	W
		T_C=100°C	20	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	2.5	°C/W
I_D	Continuous Drain Current	T_A=25°C	15	A
		T_A=70°C	12	
I_{DM} [b]	Pulse Drain Current	T_A=25°C	60	A
P_D	Maximum Power Dissipation	T_A=25°C	2.1	W
		T_A=70°C	1.3	
$R_{\theta JA}$ [c]	Thermal Resistance-Junction to Ambient	$t \leq 10s$	20	°C/W
		Steady State	60	
I_{AS} [d]	Avalanche Current, Single pulse	L=0.5mH	20	A
E_{AS} [d]	Avalanche Energy, Single pulse	L=0.5mH	100	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 = 999s.
Note d：UIS tested and pulse width are limited by maximum junction temperature 150°C (initial temperature T_j=25°C).

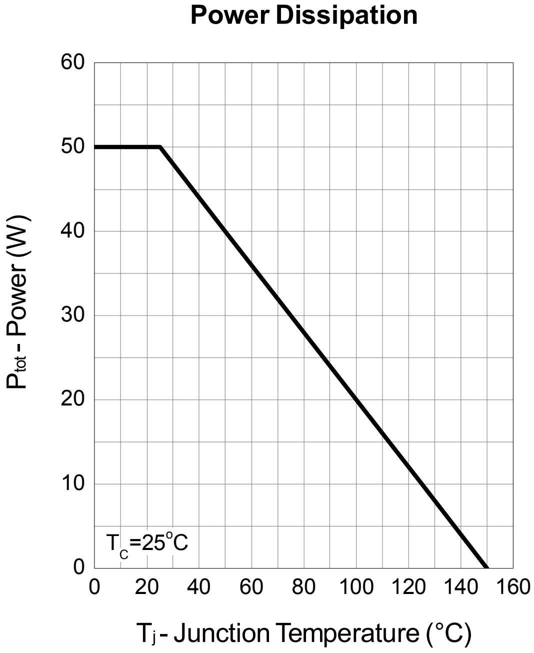
Electrical Characteristics (T$_A$ = 25°C unless otherwise noted)

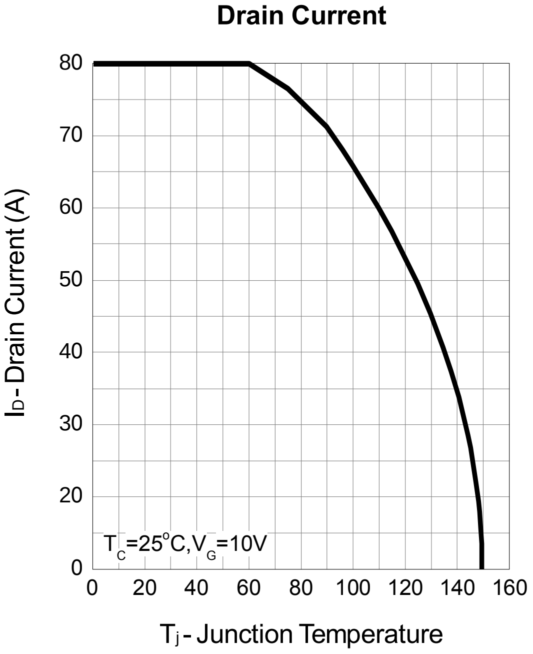
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	30	-	-	V
BV_{DSSt}	Drain-Source Breakdown Voltage (transient)	V_{GS}=0V, $I_{D(aval)}$=20A T_{case}=25°C, $t_{transient}$=100ns	34	-	-	V
I_{DSS}	Zero Gate 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	1.0	1.5	2.5	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	5.5	mΩ
		T_J=125°C	-	5.9	-	
		V_{GS}=4.5V, I_{DS}=20A	-	5.5	7	
Gfs	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	1200	1500	1820	pF
C_{oss}	Output Capacitance		210	260	310	
C_{rss}	Reverse Transfer Capacitance		100	130	175	
$t_{d(ON)}$	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	-	

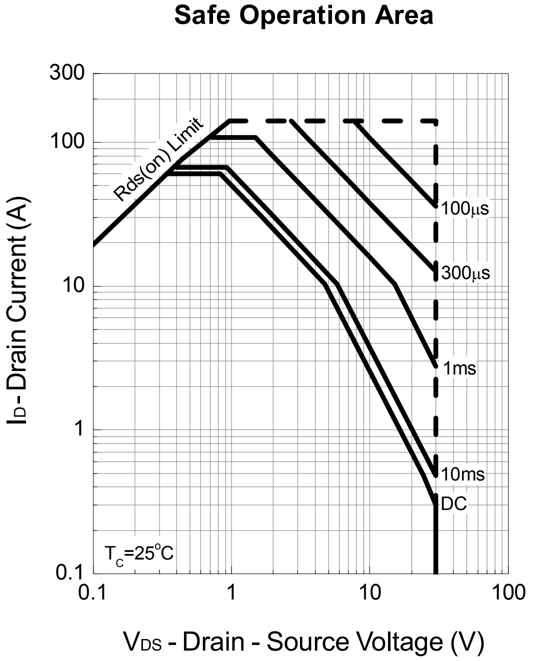
Note e：Pulse test ; pulse width≤300μs, duty cycle≤2%.

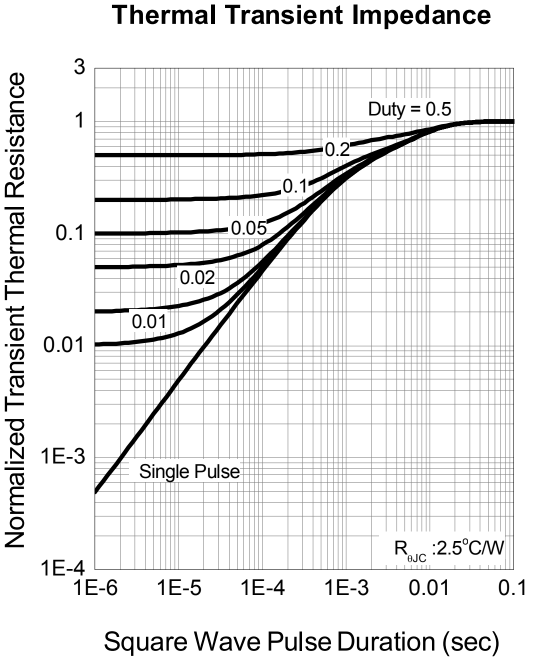
Note f：Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

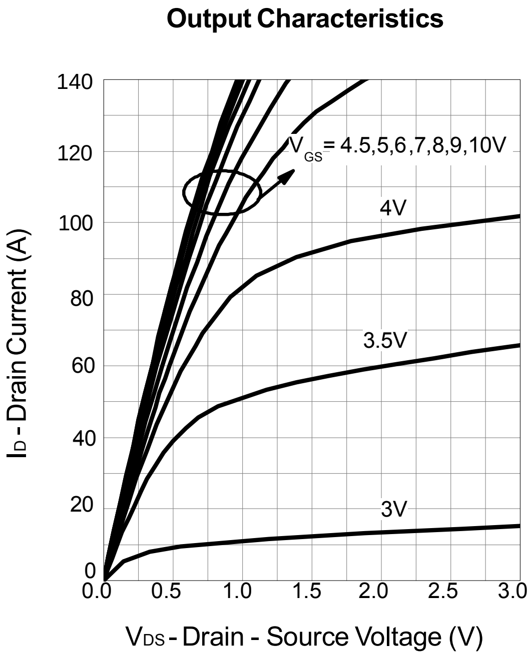


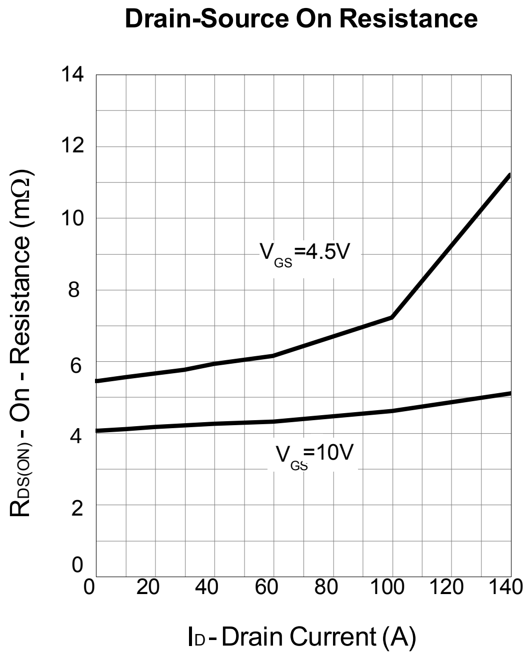


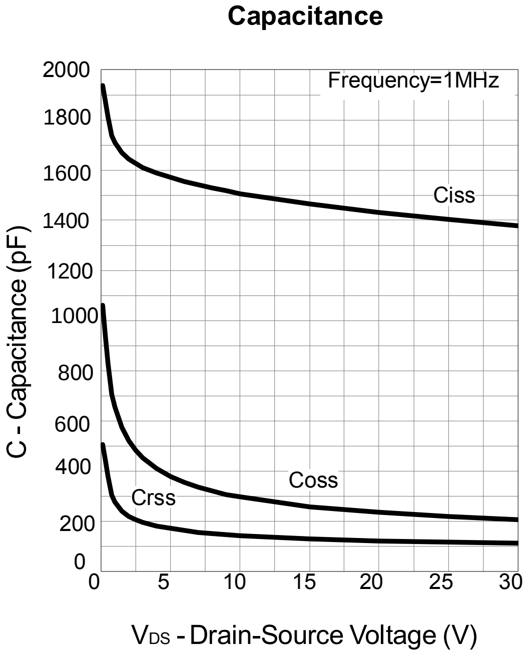


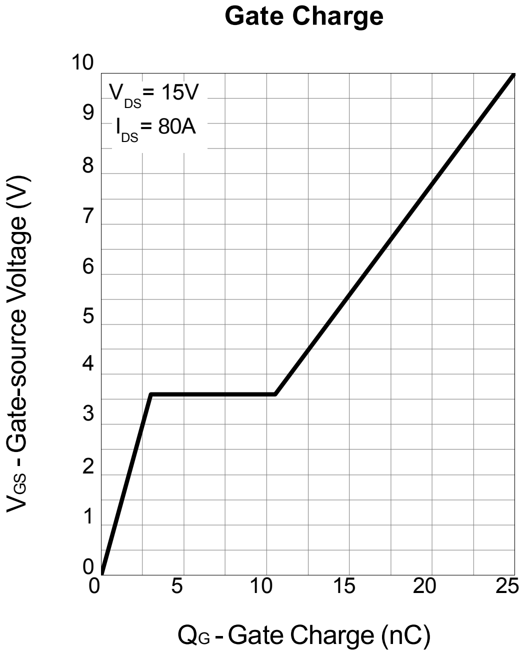


Typical Operating Characteristics (Cont.)



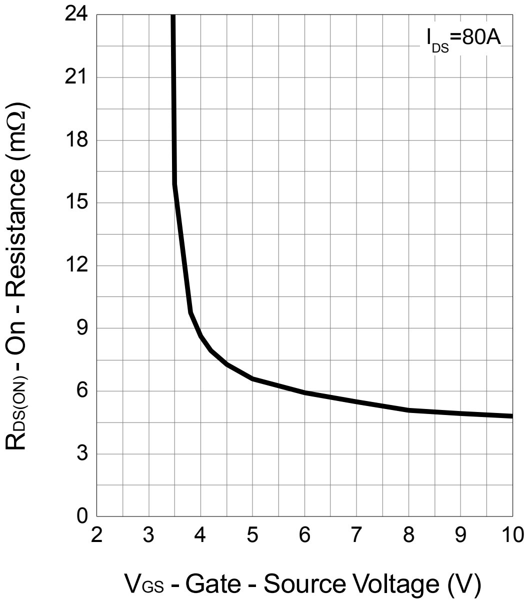




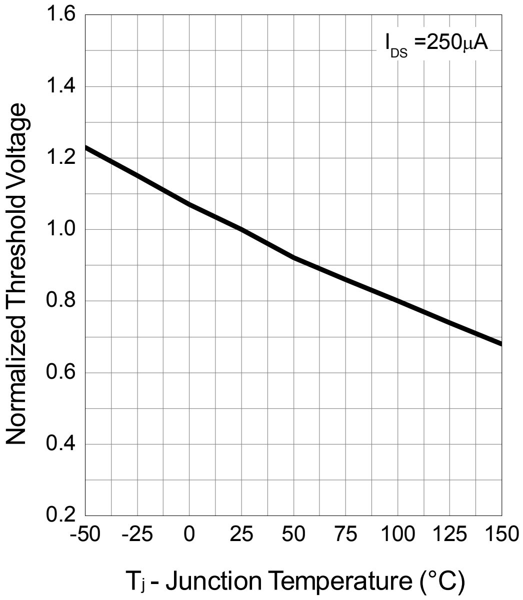


Typical Operating Characteristics (Cont.)

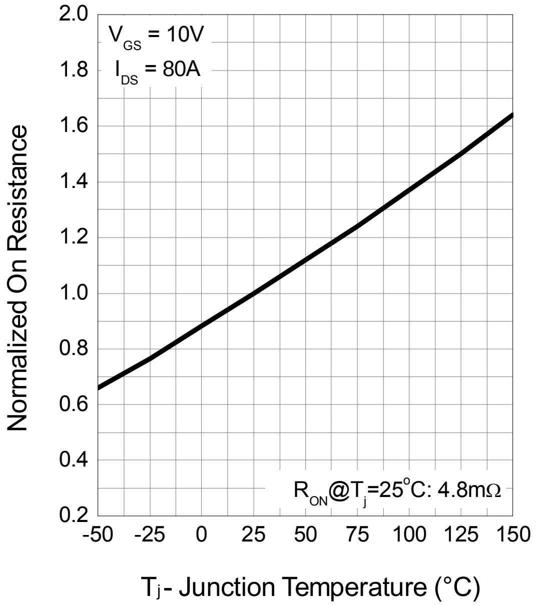
Gate-Source On Resistance



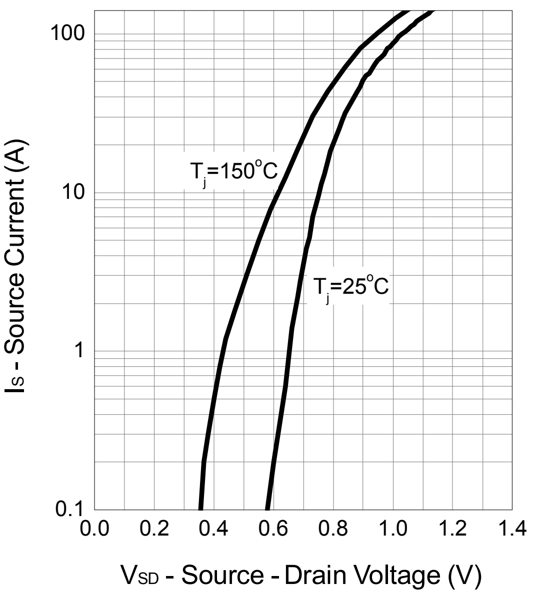
Gate Threshold Voltage



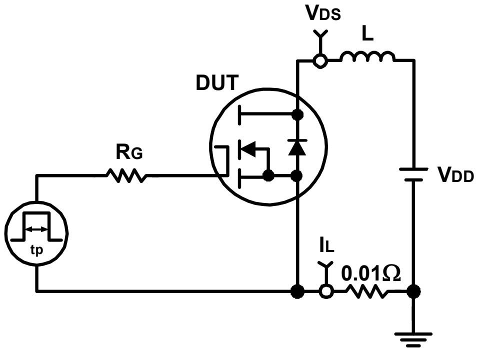
Drain-Source On Resistance

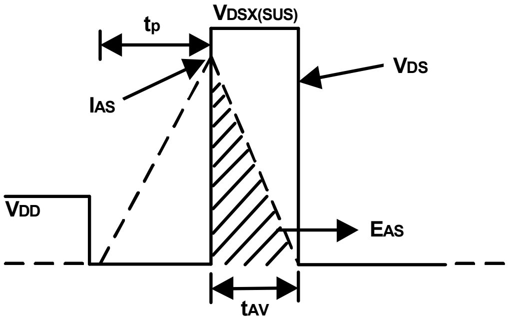


Source-Drain Diode Forward

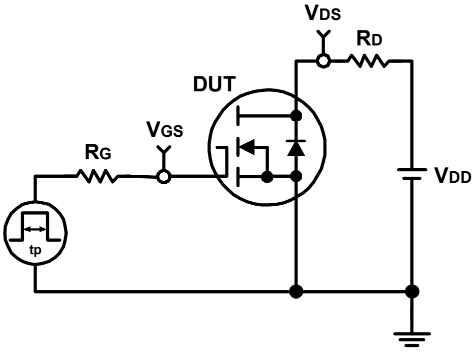


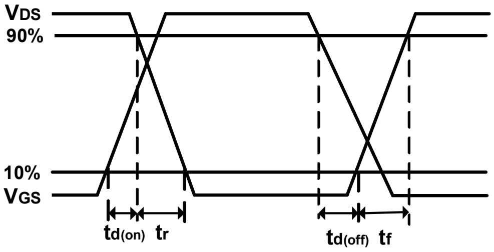
Avalanche Test Circuit and Waveforms



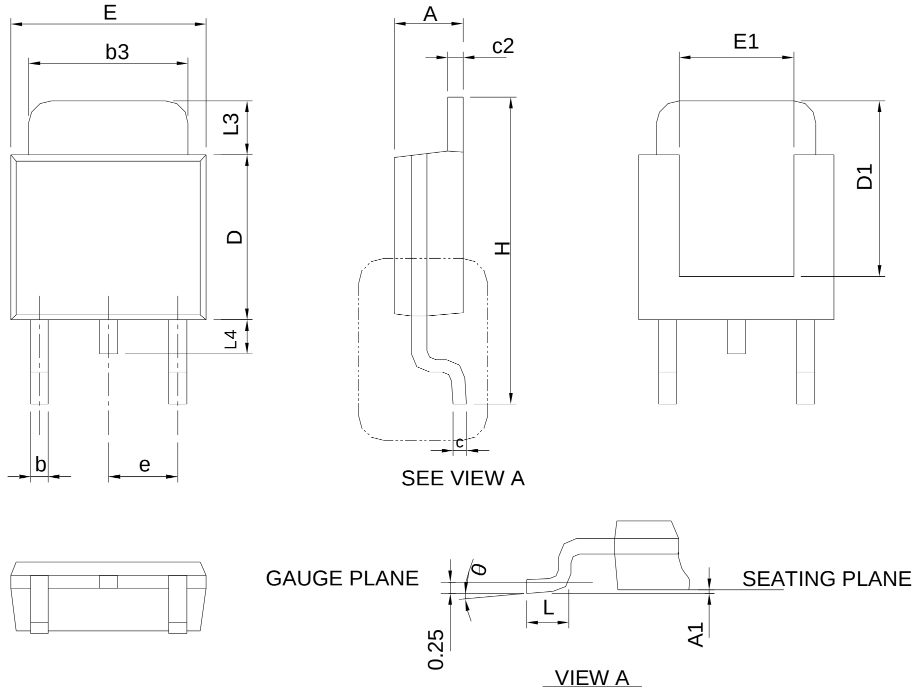


Switching Time Test Circuit and Waveforms



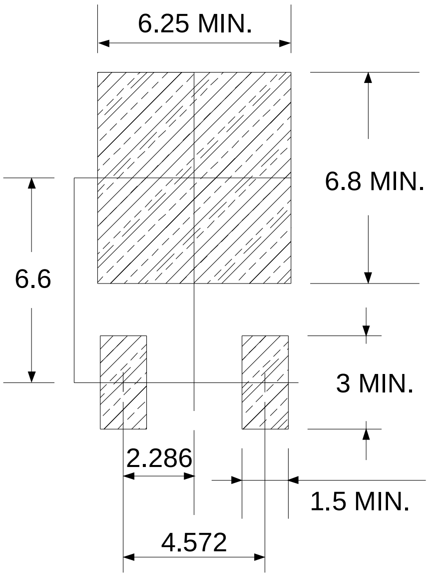


Package Information



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°

RECOMMENDED LAND PATTERN



UNIT: mm

Note : Follow JEDEC TO-252-2 .