

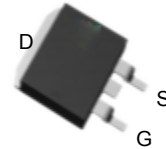
Features

- 40V/150A,
 $R_{DS(ON)} = 2m\Omega$ (typ.) @ $V_{GS}=10V$
 $R_{DS(ON)} = 2.5m\Omega$ (typ.) @ $V_{GS}=4.5V$
- Reliable and Rugged
- Lower Q_g and Q_{gd} for high-speed switching
- Lower $R_{DS(ON)}$ to Minimize Conduction Losses
- 100% UIS + R_g Tested
- Lead Free and Green Devices Available
(RoHS Compliant)

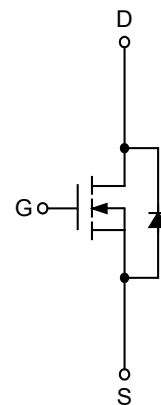
Applications

- SMPS Synchronous Rectification.
- DC-DC Conversion.
- Or-ing.

Pin Description



Top View of TO-263



N-Channel MOSFET

Absolute Maximum Ratings (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
Common Ratings				
V _{DSS}	Drain-Source Voltage		40	V
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		175	°C
T _{STG}	Storage Temperature Range		-55 to 175	
I _S	Diode Continuous Forward Current	T _C =25°C	150	A
I _D	Continuous Drain Current	T _C =25°C	150	
		T _C =100°C	60	
I _{DM} ^b	Pulsed Drain Current	T _C =25°C	450	
P _D	Maximum Power Dissipation	T _C =25°C	100	W
		T _C =100°C	50	
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	1.5	°C/W
I _D ^c	Continuous Drain Current	T _A =25°C	25	A
		T _A =70°C	20	
P _D ^c	Maximum Power Dissipation	T _A =25°C	2.72	W
		T _A =70°C	1.9	
R _{θJA} ^c	Thermal Resistance-Junction to Ambient	t ≤ 10s	18	°C/W
		Steady State	75	
I _{AS} ^d	Avalanche Current, Single pulse	L=0.1mH	120	A
E _{AS} ^d	Avalanche Energy, Single pulse	L=0.1mH	720	mJ

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

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

Note c : R_{θJA} steady state t=999s

Note d : UIS tested and pulse width limited by maximum junction temperature 175°C (initial temperature T_J=25°C).

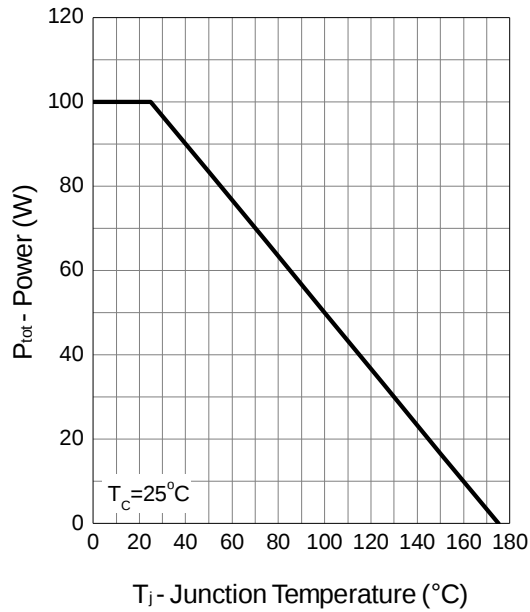
Electrical Characteristics (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =32V, V _{GS} =0V T _J =85°C	-	-	1 30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.0	1.6	2.2	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} =25A T _J =100°C	-	2 3.1	2.7 -	mΩ
		V _{GS} =4.5V, I _{DS} =20A	-	2.5	3.5	
Gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =20A	-	50	-	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 _{SD} =5A, dI _{SD} /dt=100A/μs V _{dd} =20V	-	38	-	ns
t _a	Charge Time		-	21	-	
t _b	Discharge Time		-	17	-	
Q _{rr}	Reverse Recovery Charge		-	35	-	nC
Dynamic Characteristics						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	0.88	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =20V, Frequency=1.0MHz	-	6250	-	pF
C _{oss}	Output Capacitance		-	580	-	
C _{rss}	Reverse Transfer Capacitance		-	570	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =20V, R _L =20Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	17	-	ns
t _r	Turn-on Rise Time		-	11.5	-	
t _{d(OFF)}	Turn-off Delay Time		-	36	-	
t _f	Turn-off Fall Time		-	31	-	
Gate Charge Characteristics						
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =10V, I _{DS} =25A	-	39	50	nC
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =4.5V, I _{DS} =25A	-	17		
Q _{gth}	Threshold Gate Charge		-	3.5	-	
Q _{gs}	Gate-Source Charge		-	7	-	
Q _{gd}	Gate-Drain Charge		-	5.3	-	

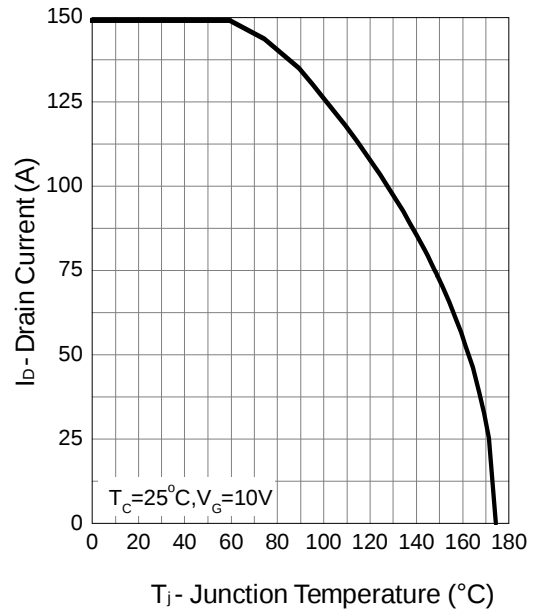
Note e : Pulse test ; pulse width≤300μs, duty cycle≤2%.

Typical Operating Characteristics

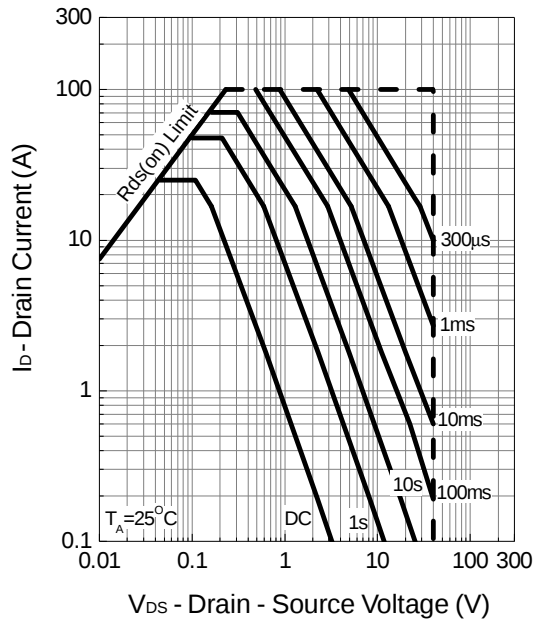
Power Dissipation



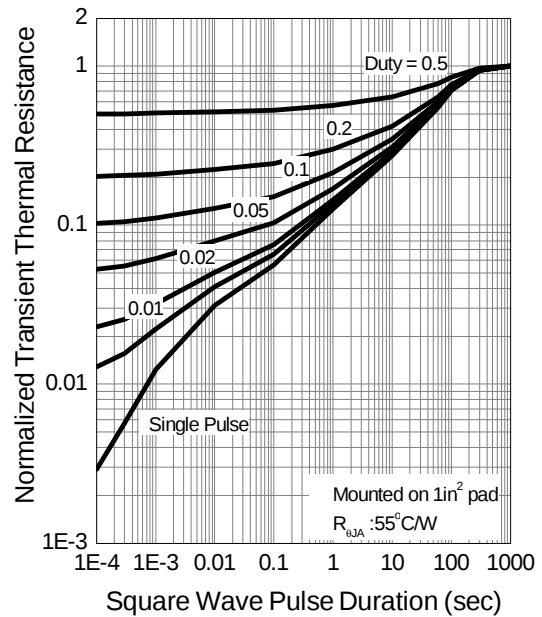
Drain Current



Safe Operation Area

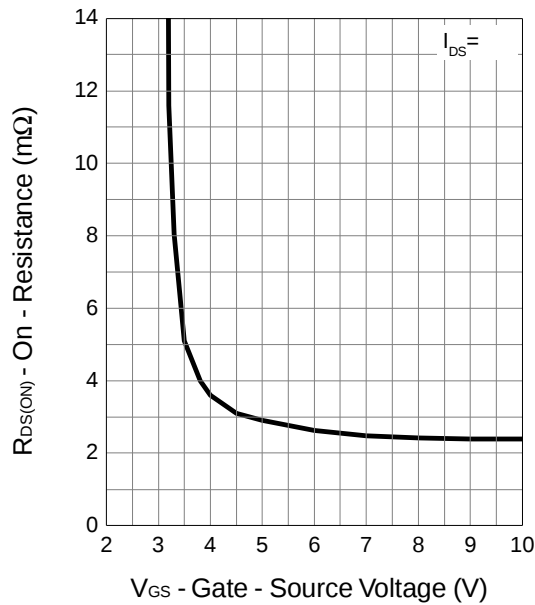


Thermal Transient Impedance

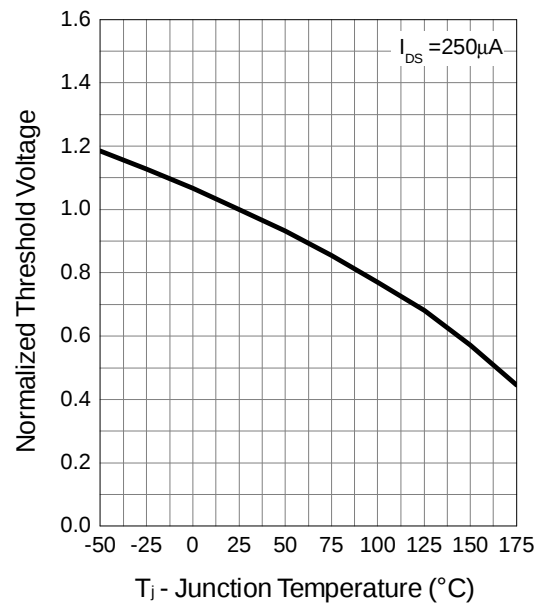


Typical Operating Characteristics (Cont.)

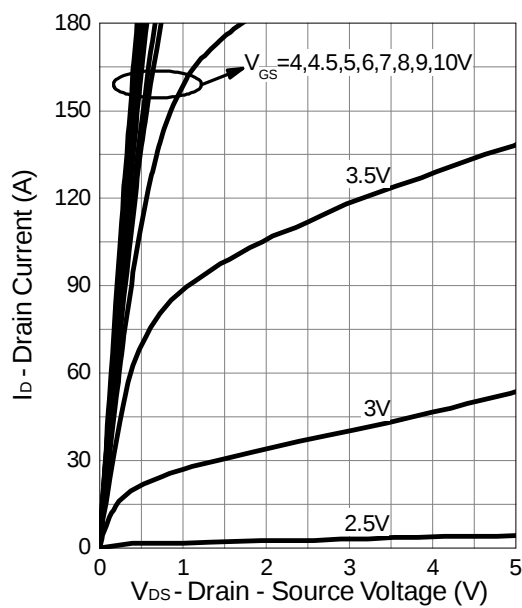
Gate-Source On Resistance



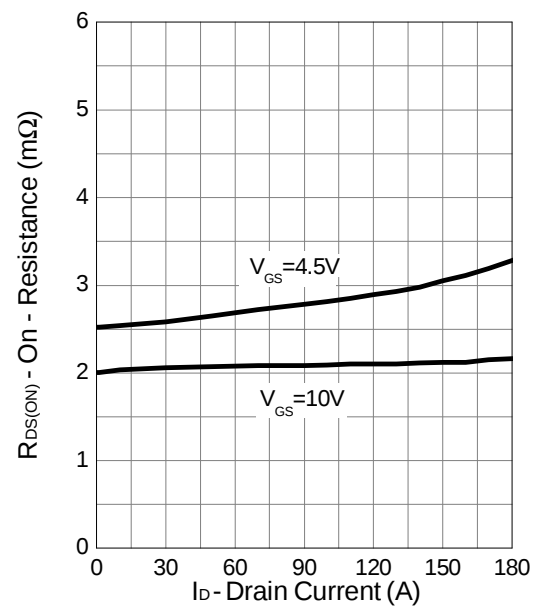
Gate Threshold Voltage



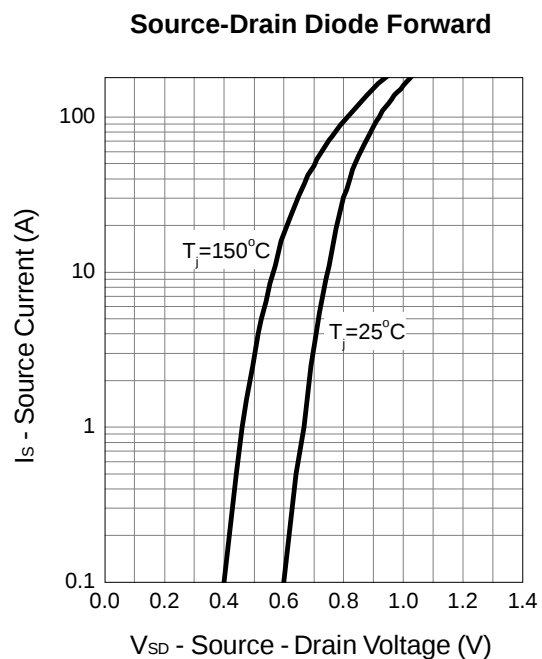
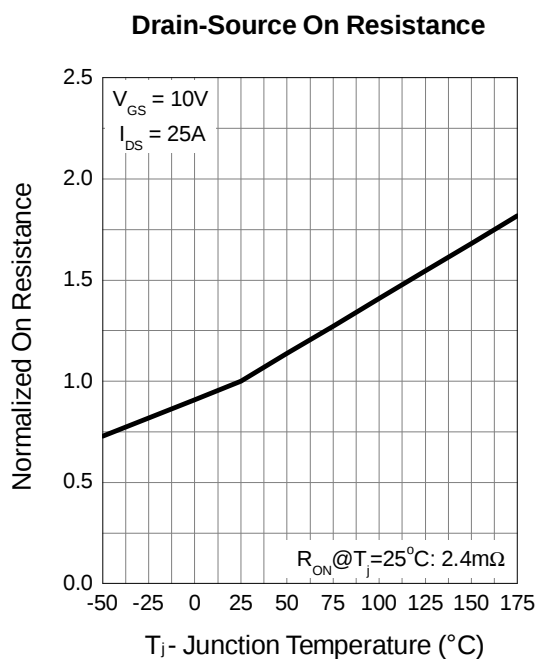
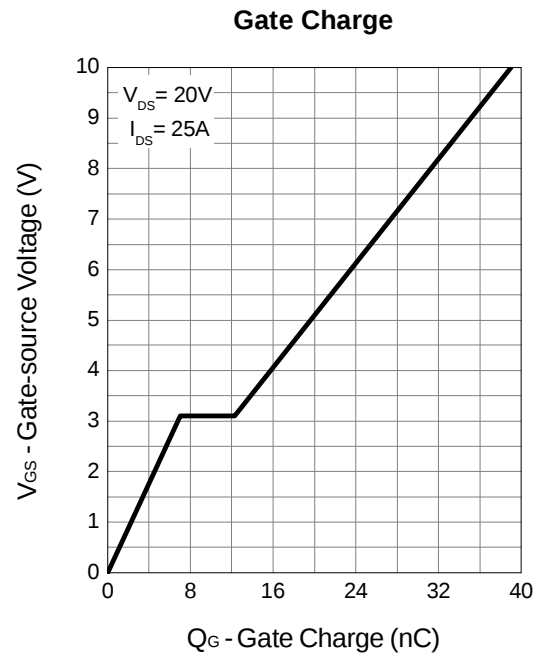
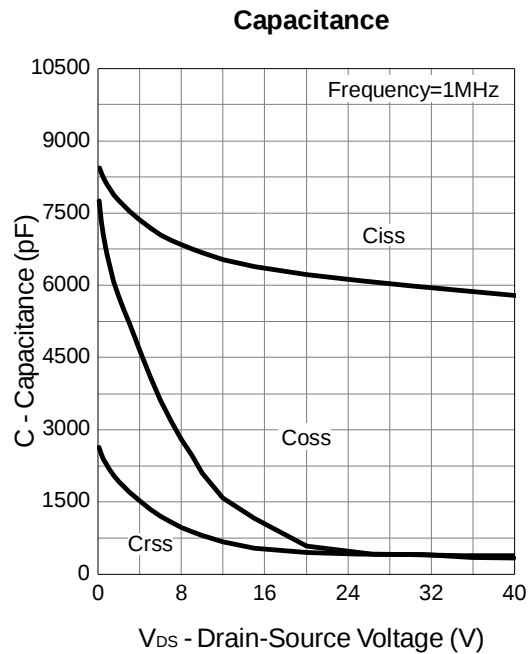
Output Characteristics



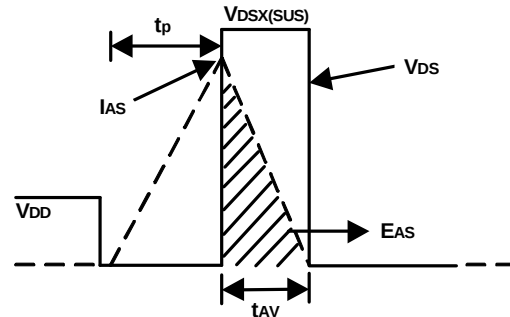
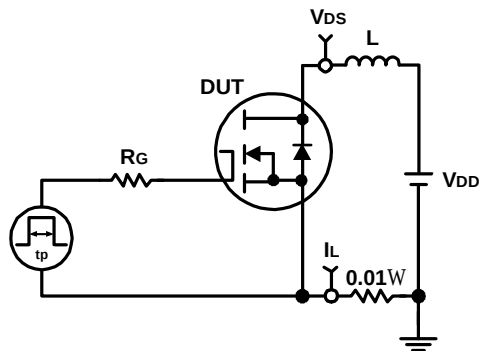
Drain-Source On Resistance



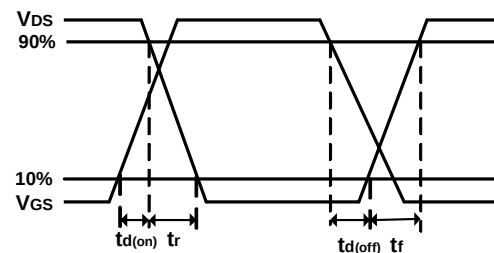
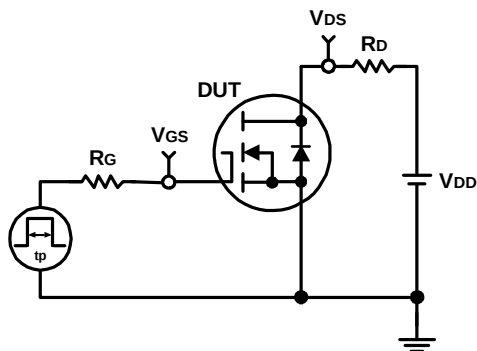
Typical Operating Characteristics (Cont.)



Avalanche Test Circuit and Waveforms

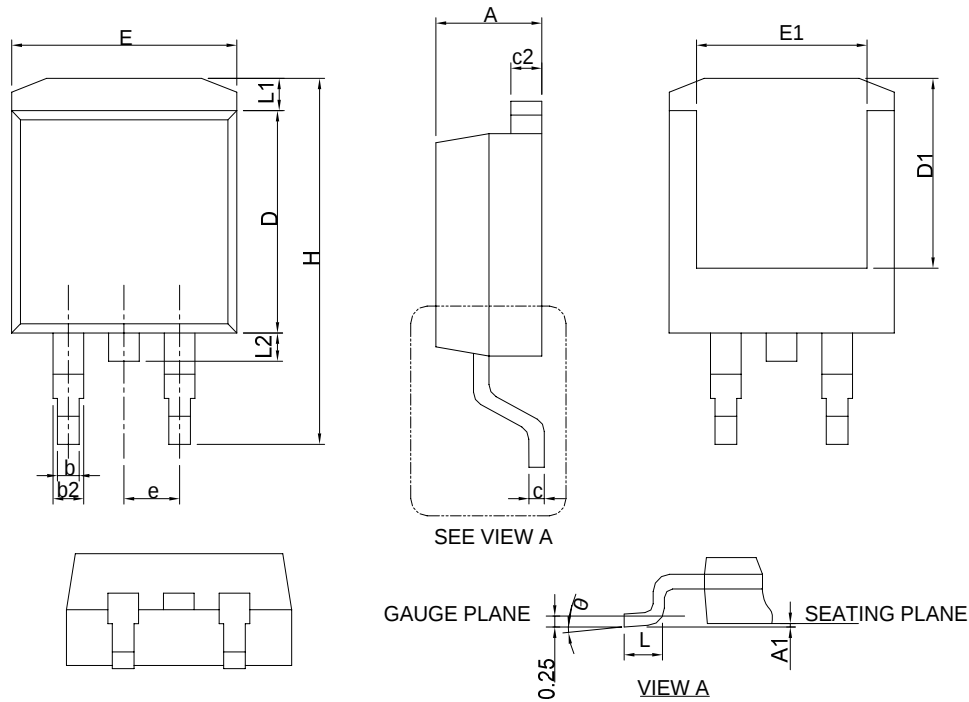


Switching Time Test Circuit and Waveforms



Package Information

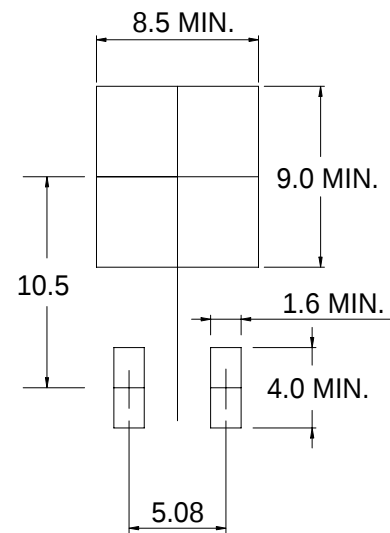
TO-263



SYMBOL	TO-263			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.06	4.83	0.160	0.190
A1	0.00	0.25	0.000	0.010
b	0.51	0.99	0.020	0.039
b2	1.14	1.78	0.045	0.070
c	0.38	0.74	0.015	0.029
c2	1.14	1.65	0.045	0.065
D	8.38	9.65	0.330	0.380
D1	6.00	9.00	0.236	0.354
E	9.65	11.43	0.380	0.450
E1	6.22	9.00	0.245	0.354
e	2.54 BSC		0.100 BSC	
H	14.61	15.88	0.575	0.625
L	1.78	2.79	0.070	0.110
L1	-	1.68	-	0.066
L2	-	1.78	-	0.070
θ	0°	8°	0°	8°

Note : Follow JEDEC TO-263 AB.

RECOMMENDED LAND PATTERN



UNIT: mm