

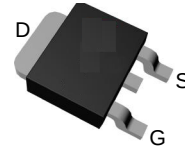
Features

- -40V/-44A,
 $R_{DS(ON)} = 13m\Omega$ (typ.) @ $V_{GS} = -10V$
 $R_{DS(ON)} = 17m\Omega$ (typ.) @ $V_{GS} = -4.5V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

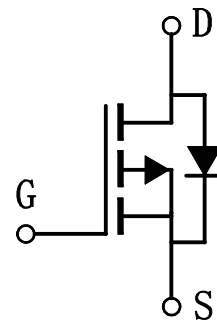
Applications

- Power Management in LCD TV Inverter.

Pin Description



Top View of TO-252



P-Channel MOSFET

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

Symbol	Parameter		Rating	Unit
V_{DSS}	Drain-Source Voltage		-40	V
V_{GSS}	Gate-Source Voltage		± 25	
I_D^a	Continuous Drain Current ($V_{GS} = -10\text{V}$)	$T_A = 25^\circ\text{C}$	-15	A
		$T_A = 70^\circ\text{C}$	-12	
I_{DP}^a	300 μs Pulsed Drain Current Tested	$T_A = 25^\circ\text{C}$	-62	
I_D^c	Continuous Drain Current ($V_{GS} = -10\text{V}$)	$T_C = 25^\circ\text{C}$	-44	
		$T_C = 100^\circ\text{C}$	-28	
I_{DP}^c	300 μs Pulsed Drain Current Tested	$T_C = 25^\circ\text{C}$	-176	
I_S^c	Diode Continuous Forward Current		-40	
I_{AS}^b	Avalanche Current, Single pulse	$L = 0.1\text{mH}$	-30	
		$L = 1\text{mH}$	-13	
E_{AS}^b	Avalanche Energy, Single pulse	$L = 0.1\text{mH}$	45	mJ
		$L = 1\text{mH}$	84	
T_J	Maximum Junction Temperature		150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range		-55 to 150	
P_D^a	Maximum Power Dissipation	$T_A = 25^\circ\text{C}$	6.3	W
		$T_A = 70^\circ\text{C}$	4.0	
P_D^c	Maximum Power Dissipation	$T_C = 25^\circ\text{C}$	50	
		$T_C = 100^\circ\text{C}$	20	
$R_{\theta JA}^a$	Thermal Resistance-Junction to Ambient	$t \leq 10\text{s}$	20	$^\circ\text{C/W}$
		Steady State	50	
$R_{\theta JC}^c$	Thermal Resistance-Junction to Case	Steady State	2.5	

Note a : Surface Mounted on 1in^2 pad area, $t \leq 10\text{sec}$. $R_{\theta JA}$ steady state $t = 100\text{s}$.

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

Note c : The power dissipation P_D is based on $T_{J(\text{MAX})} = 150^\circ\text{C}$, and it is useful for reducing junction-to-case thermal resistance ($R_{\theta JC}$) when additional heat sink is used.

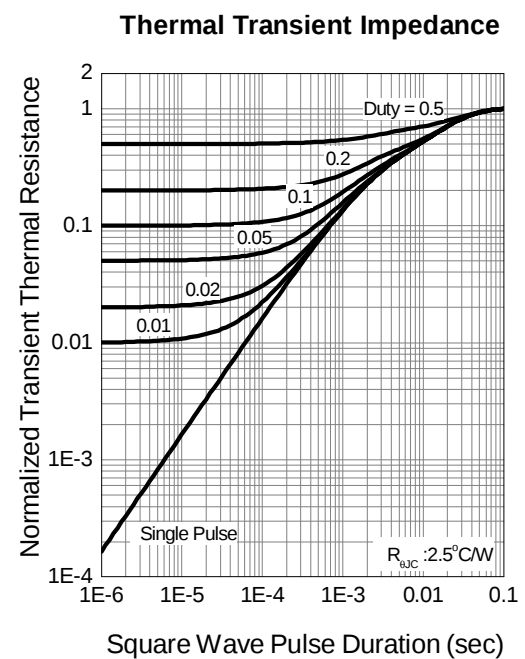
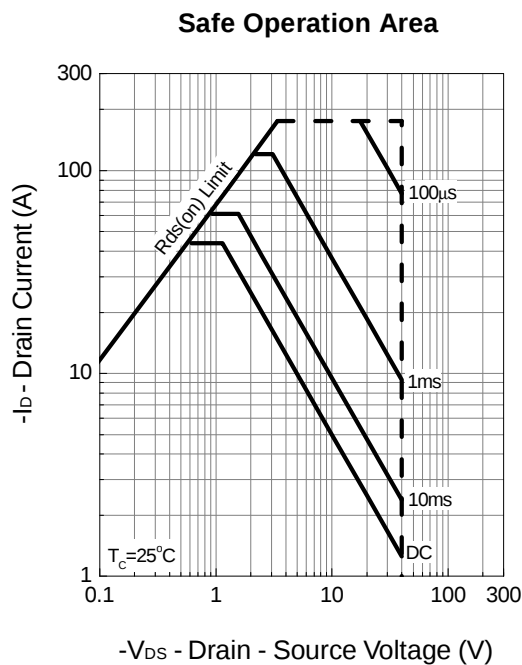
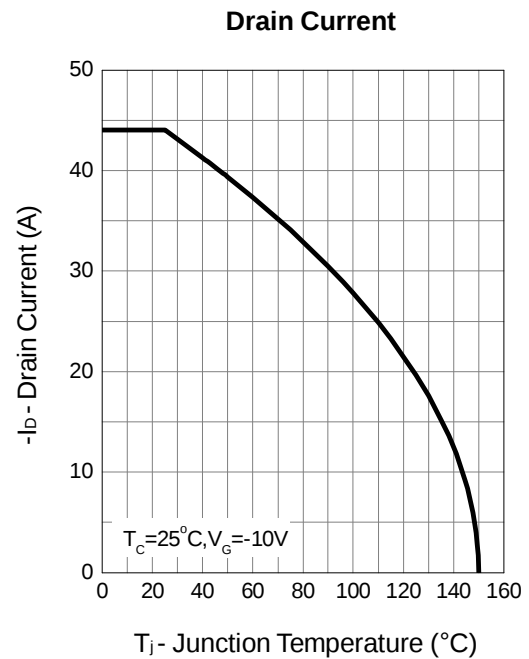
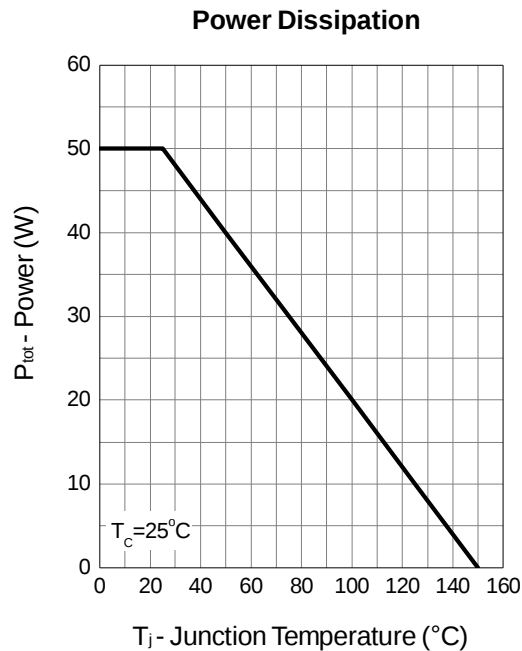
Electrical Characteristics (T_A = 25°C unless otherwise noted)

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	-1.4	-1.9	-2.4	V
I _{GSS}	Gate Leakage Current	V _{GS} =±25V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^d	Drain-Source On-state Resistance	V _{GS} =-10V, I _{DS} =-15A V _{GS} =-4.5V, I _{DS} =-10A	-	13 17	17 23	mΩ
Diode Characteristics						
V _{SD} ^d	Diode Forward Voltage	I _{SD} =-1A, V _{GS} =0V	-	-0.75	-1	V
t _{rr}	Reverse Recovery Time	I _{SD} =-15A,	-	24	-	ns
Q _{rr}	Reverse Recovery Charge	dI _{SD} /dt=100A/μs	-	18	-	nC
Dynamic Characteristics ^e						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	2.3	5	Ω
C _{iSS}	Input Capacitance	V _{GS} =0V, V _{DS} =-20V, Frequency=1.0MHz	-	1500	1950	pF
C _{oSS}	Output Capacitance		-	235	-	
C _{rSS}	Reverse Transfer Capacitance		-	180	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-20V, R _L =20Ω, I _{DS} =-1A, V _{GEN} =-10V, R _G =6Ω	-	14	25	ns
t _r	Turn-on Rise Time		-	12	22	
t _{d(OFF)}	Turn-off Delay Time		-	41	74	
t _f	Turn-off Fall Time		-	22	40	
Gate Charge Characteristics ^e						
Q _g	Total Gate Charge	V _{DS} =-20V, V _{GS} =-10V, I _{DS} =-15A	-	32	45	nC
Q _{gs}	Gate-Source Charge		-	5.2	-	
Q _{gd}	Gate-Drain Charge		-	8	-	

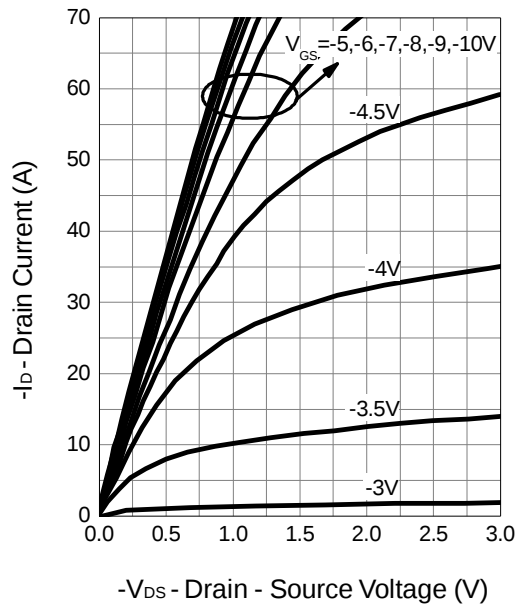
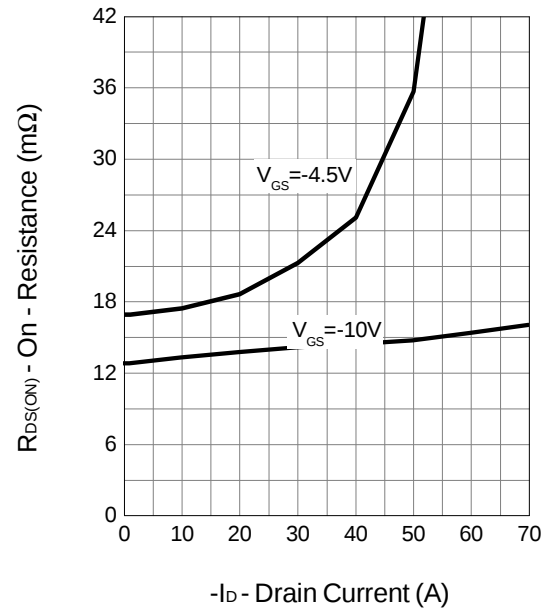
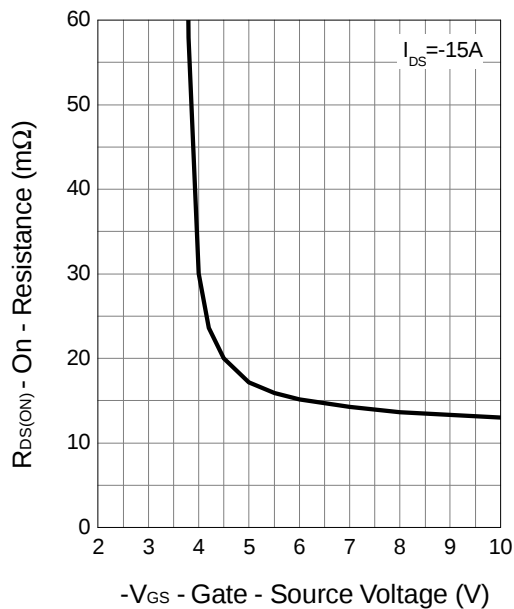
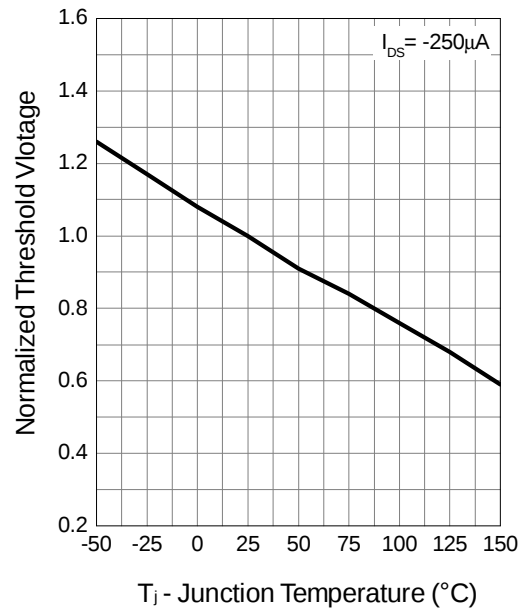
Note d : Pulse test ; pulse width≤300μs, duty cycle≤2%.

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

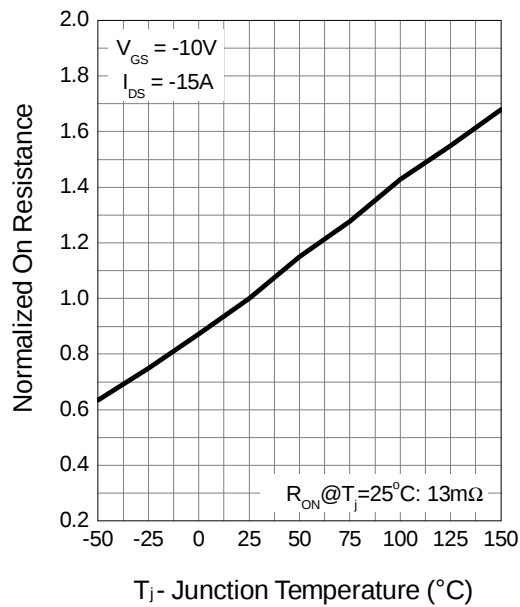
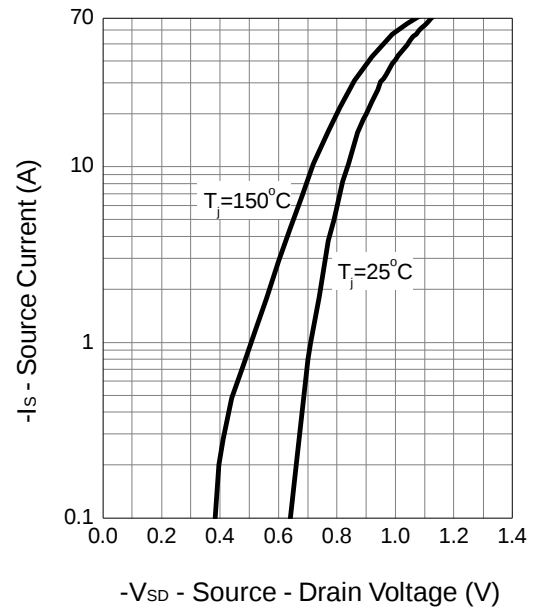
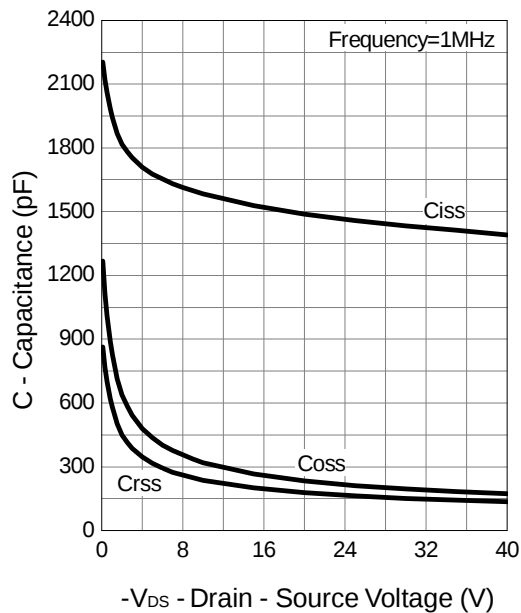
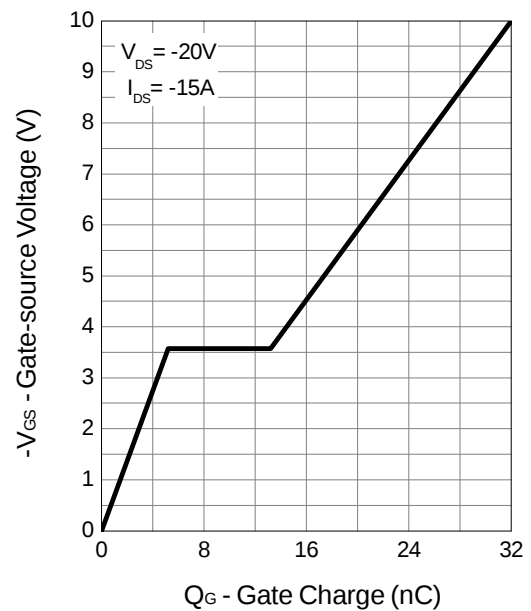
Typical Characteristics



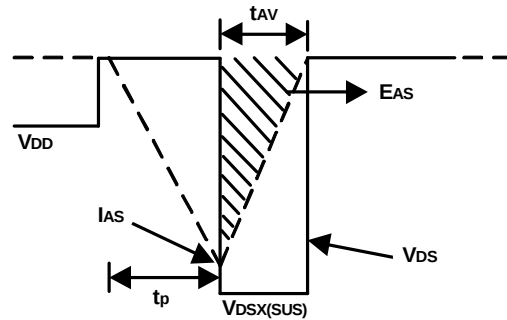
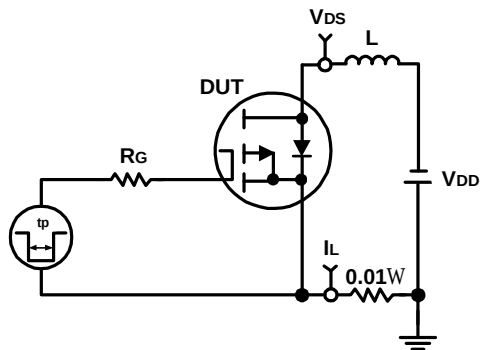
Typical Characteristics (Cont.)

Output Characteristics

Drain-Source On Resistance

Gate-Source On Resistance

Gate Threshold Voltage


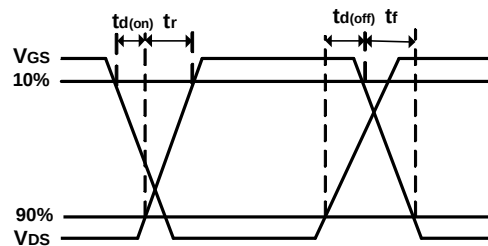
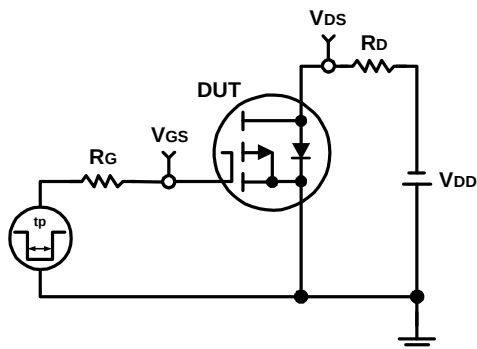
Typical Characteristics (Cont.)

Drain-Source On Resistance

Source-Drain Diode Forward

Capacitance

Gate Charge


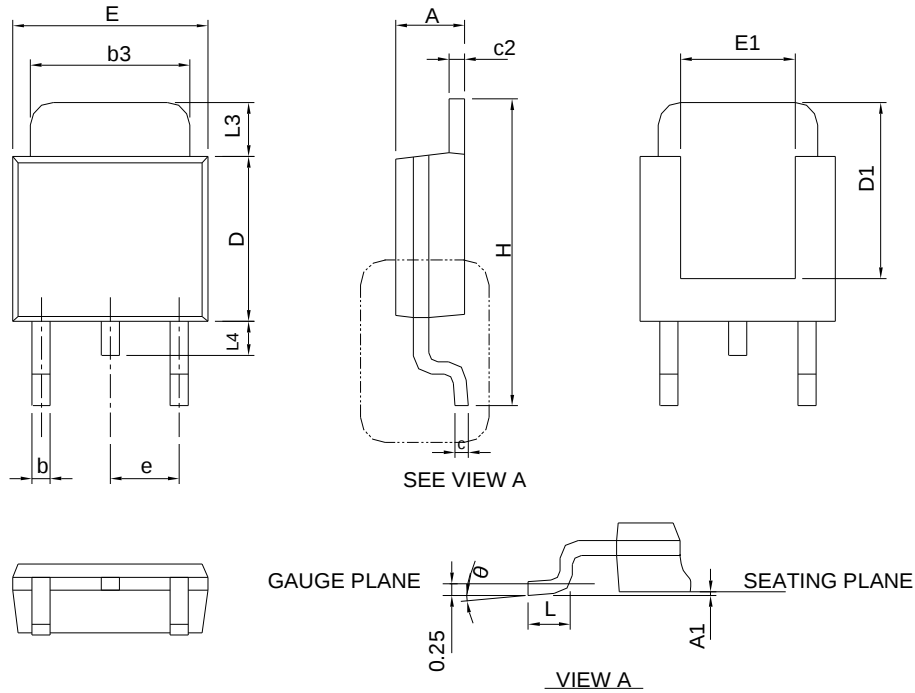
Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

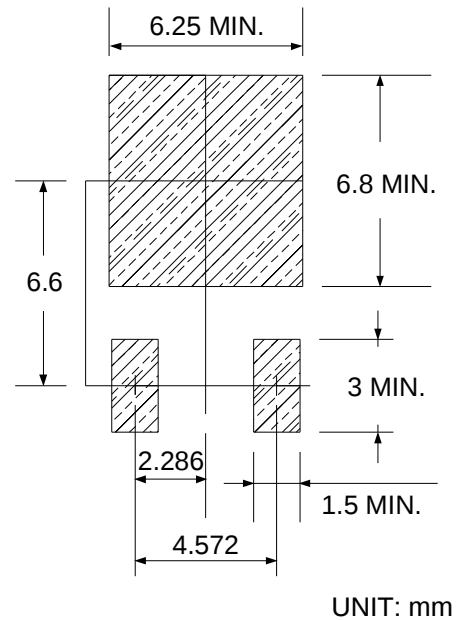


Package Information



DIMENSIONS	TO-252			
	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



Note : Follow JEDEC TO-252 .