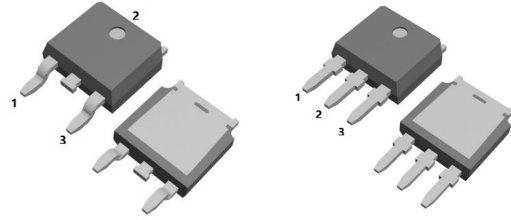
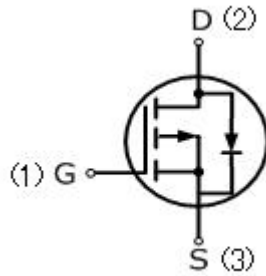


20P10(G,D)L

-20 Amps,-100 Volts P-CHANNEL MOSFET

FEATURE

- -20A,-100V, $R_{DS(ON)MAX}=110m\ \Omega$ @ $V_{GS}=-10V/-10A$
 $R_{DS(ON)MAX}=120m\ \Omega$ @ $V_{GS}=-4.5V/-5A$
- Low gate charge
- Low C_{iss}
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability



TO-252-2L
20P10GL

TO-251-3L
20P10DL

Absolute Maximum Ratings($T_C=25^\circ C$, unless otherwise noted)

Parameter	Symbol	20P10(G,D)L	UNIT
Drain-Source Voltage	V_{DSS}	-100	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current	I_D	-20	A
Pulsed Drain Current(Note 1)	I_{DM}	-52	
Single Pulse Avalanche Energy (Note 2)	E_{AS}	96	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55to+150	$^\circ C$
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	T_L	260	$^\circ C$

Thermal Characteristics

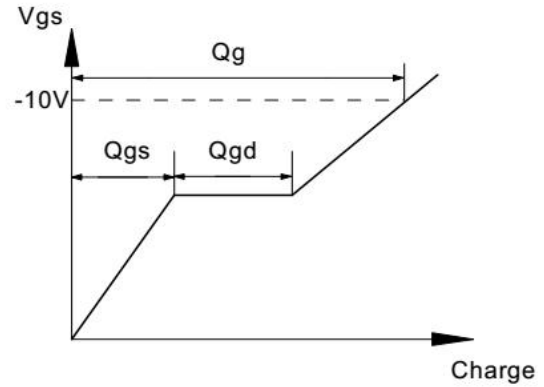
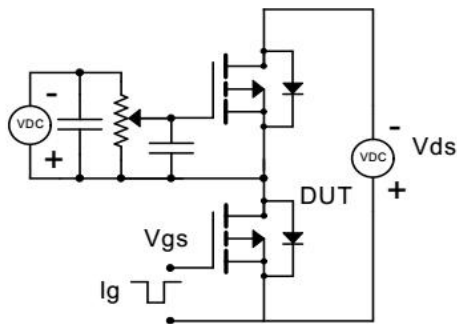
Parameter	Symbol	20P10(G,D)L	Units
Thermal resistance , Junction to Case	$R_{th(J-c)}$	1.8	$^\circ C/W$
Thermal resistance , Junction to Ambient	$R_{th(J-A)}$	62	$^\circ C/W$
Maximum Power Dissipation	$T_C=25^\circ C$ P_D	69.3	W

Electrical Characteristics (T_e=25°C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250uA	-100	—	—	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-100V, V _{GS} =0V	—	—	-1	uA
Gate-Body Leakage Current, Forward	I _{GSSF}	V _{GS} =20V, V _{DS} =0V	—	—	100	nA
Gate-Body Leakage Current, Reverse	I _{GSSR}	V _{GS} =-20V, V _{DS} =0V	—	—	-100	nA
On Characteristics						
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250uA	-1.0	—	-2.5	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-10A	—	83	110	mΩ
		V _{GS} =-4.5V, I _D =-5A	—	95	120	
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =-25V, V _{GS} =0V, f=1.0MHZ	—	1056	—	pF
Output Capacitance	C _{oss}		—	132	—	pF
Reverse Transfer Capacitance	C _{rss}		—	64	—	pF
Switching Characteristics						
Turn-On Delay Time	t _{d(on)}	V _{DD} =-50V, I _D =-20A, V _{GS} =-10V, R _G =10Ω	—	9.0	—	ns
Turn-On Rise Time	t _r		—	1.8	—	ns
Turn-Off Delay Time	t _{d(off)}		—	34.6	—	ns
Turn-Off Fall Time	t _f		—	7.2	—	ns
Total Gate Charge	Q _g	V _{DS} =-80V, V _{GS} =-10V, I _D =-20A	—	18.7	—	nC
Gate-Source Charge	Q _{gs}		—	5.0	—	nC
Gate-Drain Charge	Q _{gd}		—	4.2	—	nC
Drain-Source Body Diode Characteristics and Maximum Ratings						
Continuous Diode Forward Current	I _S		—	—	-20	A
Pulsed Diode Forward Current	I _{SM}		—	—	-52	A
Diode Forward Voltage	V _{SD}	I _S =-1A, V _{GS} =0V	—	—	-1.2	V
Reverse Recovery Time	t _{rr}	V _{GS} =30V, I _S =-1A, dIF/dt=100A/us, (Note3)	—	45.5	—	ns
Reverse Recovery Charge	Q _{rr}		—	50.8	—	nC

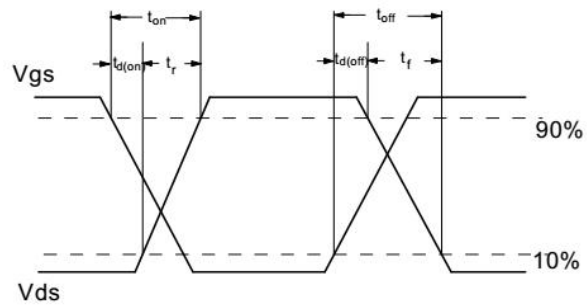
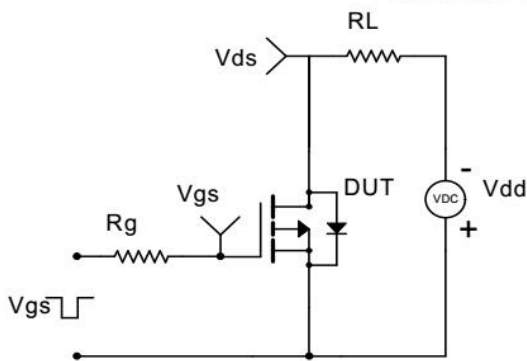
Notes

1. Repetitive Rating; pulse width limited by maximum junction temperature .
2. L=0.5mH, R_g=25Ω, T_J=25°C.
3. Pulse width ≤ 300us; duty cycle ≤ 2%.

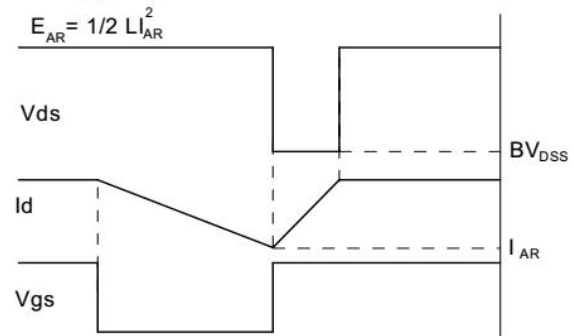
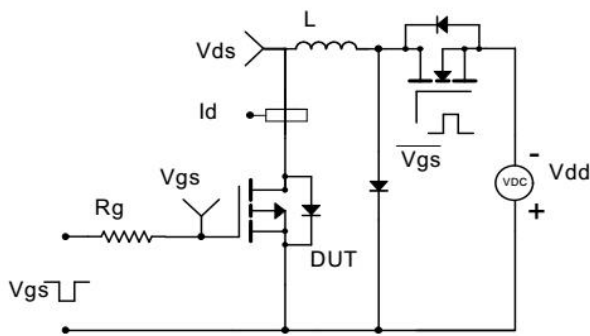
Gate Charge Test Circuit & Waveform



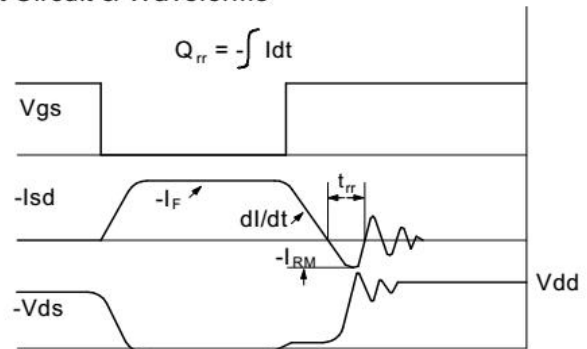
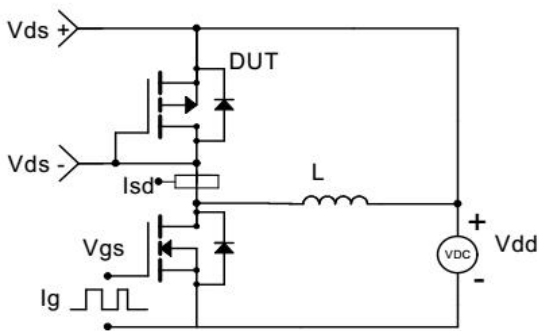
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



RATING AND CHARACTERISTIC CURVES

Figure.1 Typical Output Characteristics

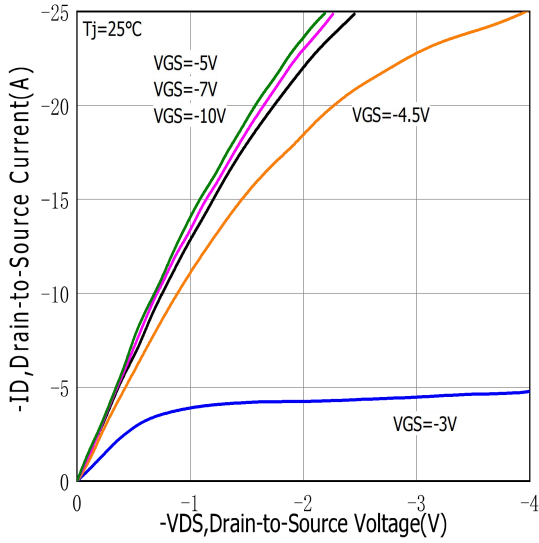


Figure.2 Typical Gate Charge vs Gate to Source Voltage

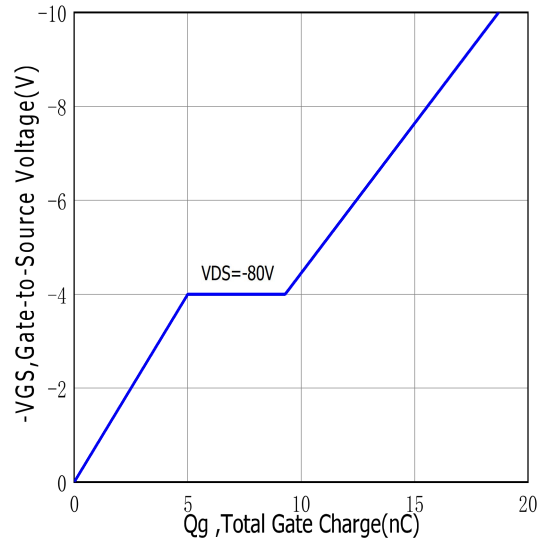


Figure.3 Typical Body Diode Transfer Characteristics

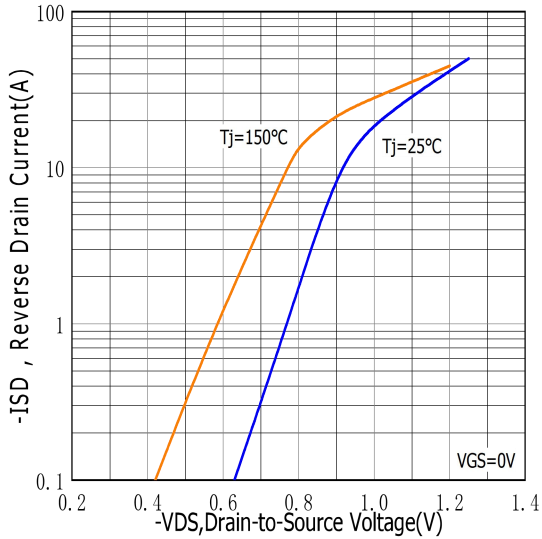


Figure.4 Typical Capacitance vs Drain to Source Voltage

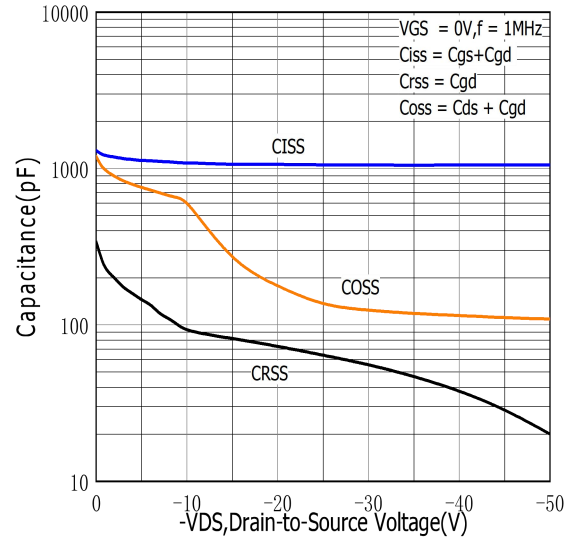


Figure.5 Typical Breakdown Voltage vs Junction Temperature

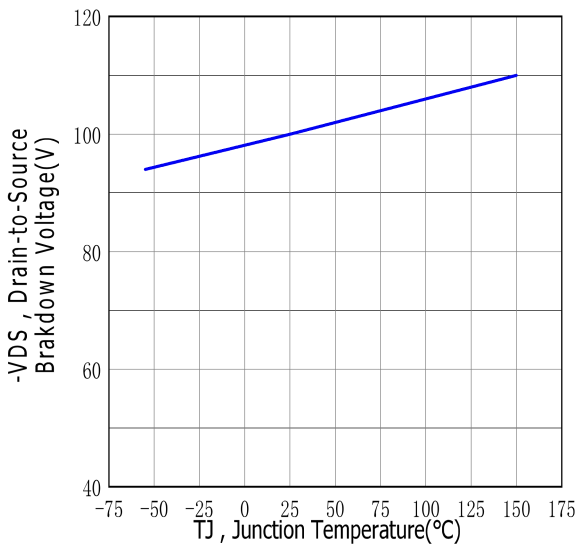


Figure.6 Typical Drain to Source on Resistance vs Junction Temperature

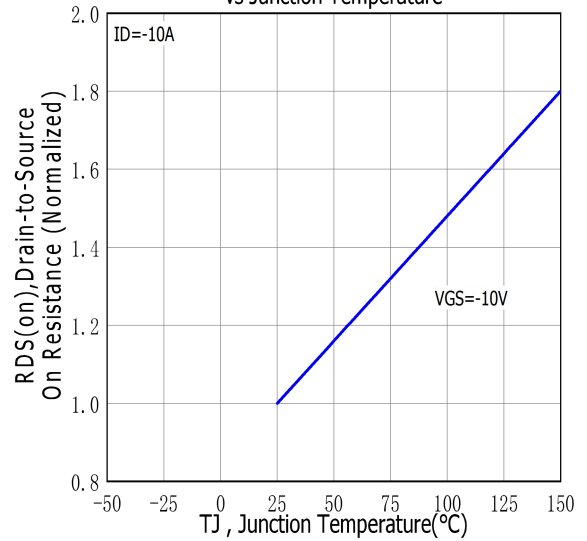


Figure.7 Maximum Forward Bias Safe Operating Area

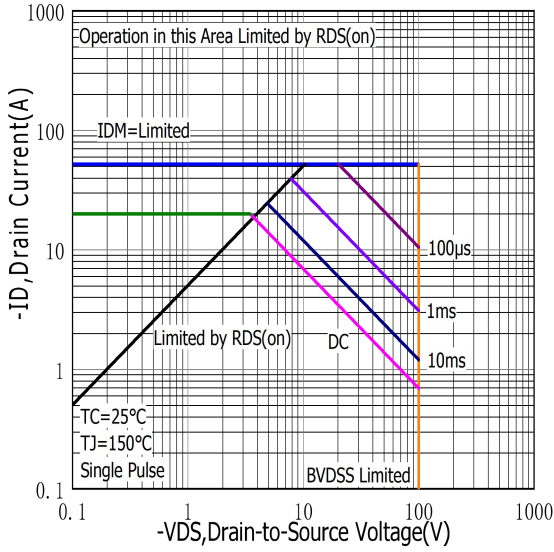


Figure.8 Typical Drain to Source ON Resistance vs Drain Current

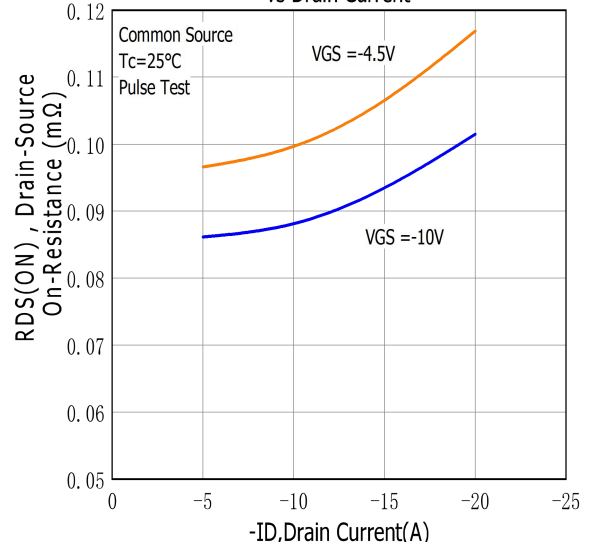


Figure.9 Maximum EAS vs Channel Temperature

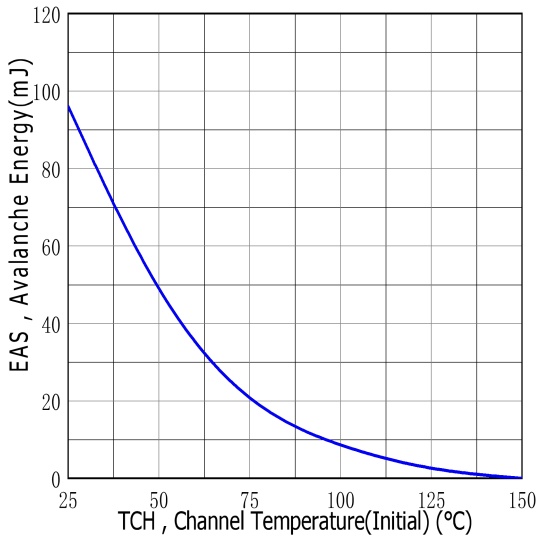


Figure.10 Typical Threshold Voltage vs Case Temperature

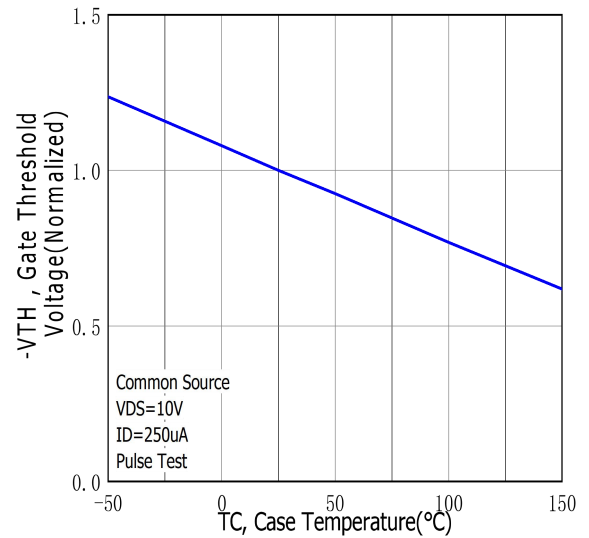


Figure.11 Maximum Effective Thermal Impedance, Junction to Case

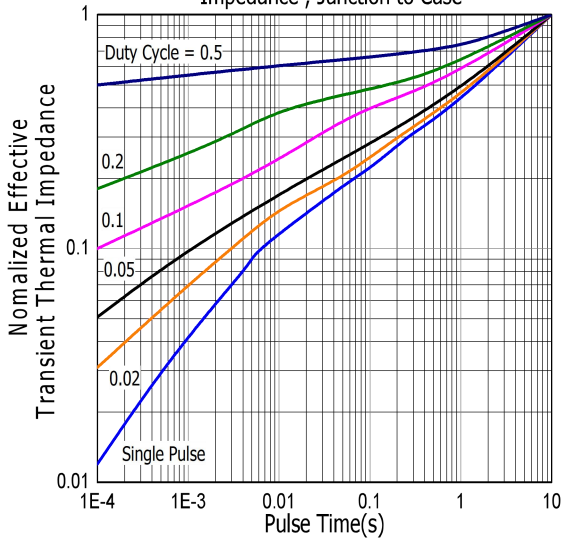
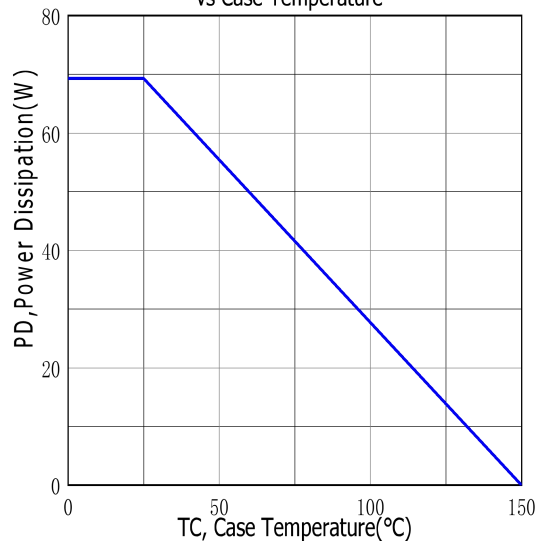
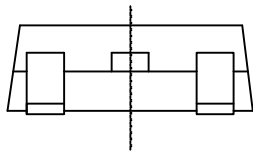
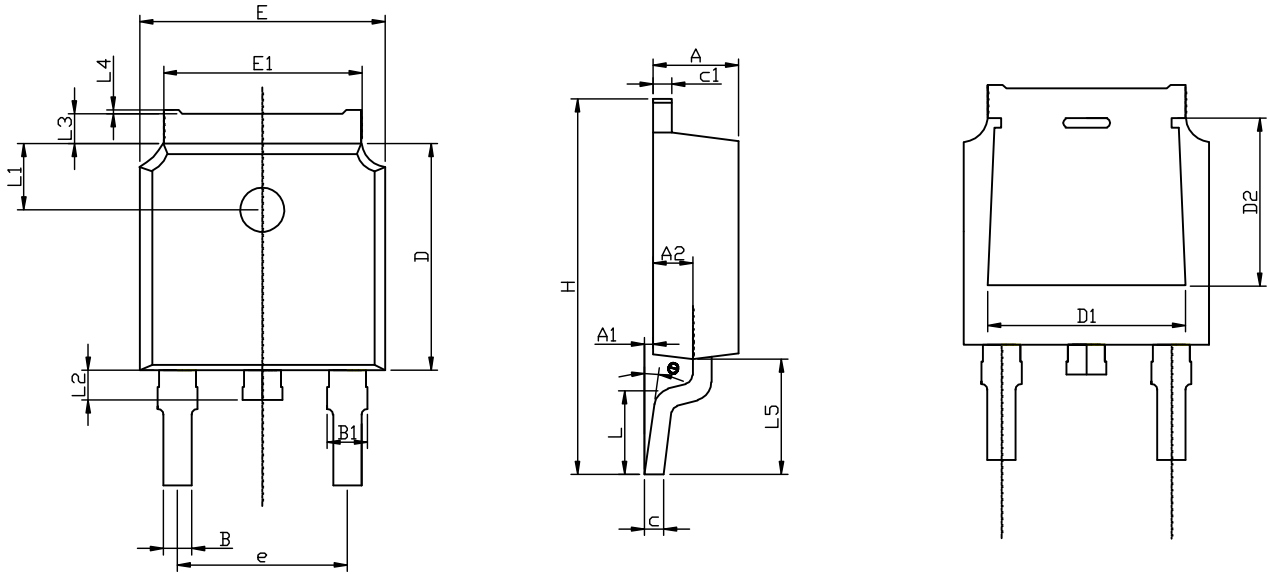


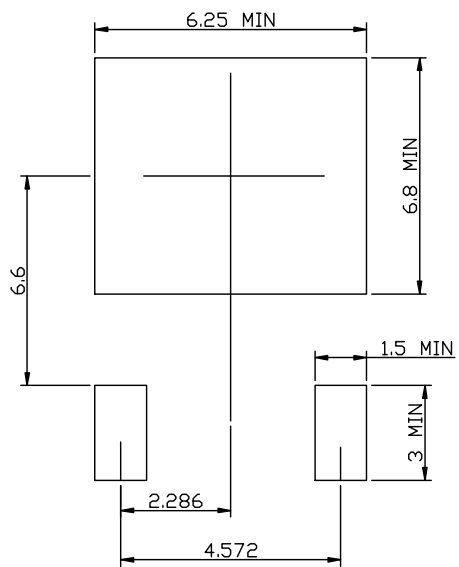
Figure.12 Maximum Power Dissipation vs Case Temperature



TO-252-2L PACKAGE OUTLINE



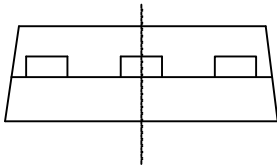
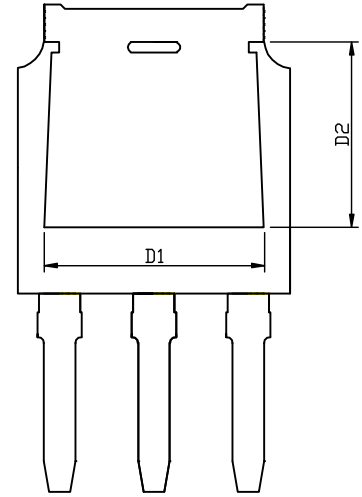
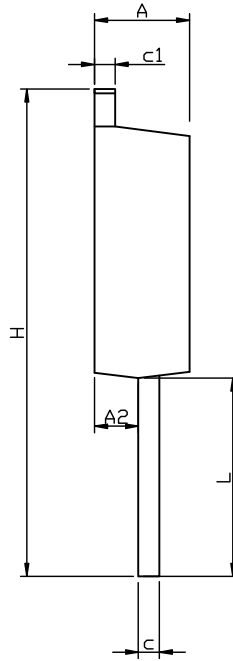
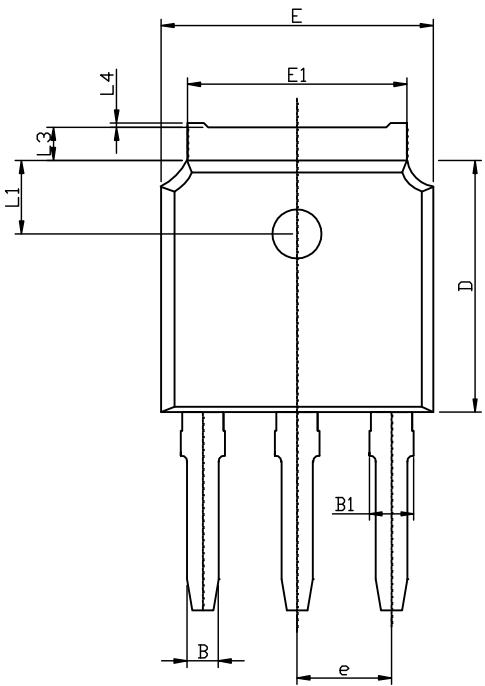
RECOMMENDED LAND PATTERN



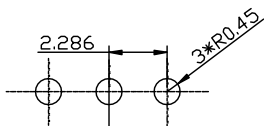
	MIN	NOM	MAX
A	2.15	2.30	2.45
A1	0.05	0.10	0.20
A2	0.91	1.07	1.22
B	0.66	0.76	0.86
B1	0.93	1.08	1.23
C	0.40	0.50	0.60
C1	0.40	0.50	0.60
D	5.95	6.10	6.25
D1	-	4.8REF	-
D2	-	3.8REF	-
E	6.45	6.60	6.75
E1	5.12	5.32	5.52
L		1.65	
L1	1.58	1.78	1.98
L2	0.60	0.80	1.00
L3	0.70	0.85	1.00
L4	0.00	0.05	0.20
L5	2.80	3.10	3.40
H	9.80	10.10	10.40
Θ	0°		8°
e		4.572REF	

UNIT: mm

TO-251-3L PACKAGE OUTLINE



RECOMMENDED LAND PATTERN



UNIT: mm

	MIN	NOM	MAX
A	2.15	2.30	2.45
A2	0.91	1.07	1.22
B	0.66	0.76	0.86
B1	0.93	1.08	1.23
C	0.40	0.50	0.60
C1	0.40	0.50	0.60
D	5.95	6.10	6.25
D1	-	4.8REF	-
D2	-	3.8REF	-
E	6.45	6.60	6.75
E1	5.12	5.32	5.52
L	4.50	4.80	5.10
L1	1.58	1.78	1.98
L3	0.70	0.85	1.00
L4	0.00	0.05	0.20
H	11.50	11.80	12.10
e		2.286REF	