

Features

- ◆ Low gate charge
- ◆ 100% UIS Tested, 100% DVDS Tested
- ◆ High Power and current handing capability
- ◆ Lead free product is acquired

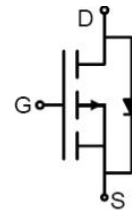
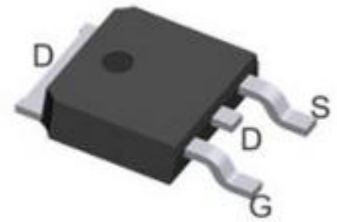
Applications

- ◆ High side switch for full bridge converter
- ◆ DC/DC converter for LCD display

-28A , -100V ,52mΩ P-CHANNEL MOSFET

MOSFET

View and Internal
Schematic Diagram
TO-252-2L



Parameter	Values	Unit
BV_{DSS}	-100	V
I_D	-28	A
$R_{Dson}(max)$	52	mΩ
$V_{GS(th)}(Typ)$	-1.8	V

Ordering Code	Marking	Package	Packaging
X52P10TLE2	X52P10TLE2	TO-252-2L	Tape and reel

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

Parameter	Symbol	Values			Unit	Note/Test Conditions
		Min	Typ	Max		
Drain-Source Voltage	V_{DSS}	-	-	-100	V	-
Gate-Source Voltage	V_{GS}	-20	-	20	V	-
Drain Current-Continuous	I_D	-	-	-28	A	$T_C=25^{\circ}C$
		-	-	-20	A	$T_C=100^{\circ}C$
Pulsed Drain Current(Note1)	I_{DM}	-	-	-112	A	
Single Pulse Avalanche Energy(Note 2)	E_{AS}	-	-	361	mJ	
Maximum Power Dissipation	P_D	-	-	107	W	$T_C=25^{\circ}C$
		-	-	53	W	$T_C=100^{\circ}C$
Operating Junction and Storage Temperature Range	T_j, T_{STG}	-55	-	175	$^{\circ}C$	-

Thermal Characteristics

Parameter	Symbol	Values			Unit	Note/Test Conditions
		Min	Typ	Max		
Thermal resistance , Junction to Case	$R_{th(J-C)}$	-	-	1.4	$^{\circ}C/W$	-

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

Static characteristics

Parameter	Symbol	Values			Unit	Note/Test Conditions
		Min	Typ	Max		
Drain-Source Breakdown Voltage	BV_{DSS}	-100	-	-	V	$V_{GS}=0V, I_D=-250\mu A$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	-1	μA	$V_{DS}=-100V, V_{GS}=0V$
Gate-Body Leakage Current, Forward	I_{GSSF}	-	-	100	nA	$V_{GS}=20V, V_{DS}=0V$
Gate-Body Leakage Current, Reverse	I_{GSSR}	-	-	-100	nA	$V_{GS}=-20V, V_{DS}=0V$
Gate-Source Threshold Voltage	$V_{GS(th)}$	-1	-	-2.5	V	$V_{DS}=V_{GS}, I_D=-250\mu A$
Drain-Source On-State Resistance	$R_{DS(on)}$	-	40	52	m Ω	$V_{GS}=-10V, I_D=-15A$
		-	42	56	m Ω	$V_{GS}=-4.5V, I_D=-10A$
Forward Transconductance	g_{fs}	-	50	-	S	$V_{DS}=-5V, I_D=-15A$

Dynamic characteristics

Parameter	Symbol	Values			Unit	Note/Test Conditions
		Min	Typ	Max		
Input Capacitance	C_{iss}	-	8056	-	pF	$V_{DS}=-10V, V_{GS}=0V, f=1.0\text{MHz}$
Output Capacitance	C_{oss}	-	195	-		
Reverse Transfer Capacitance	C_{rss}	-	70	-		
Turn-On Delay Time	$t_{d(on)}$	-	13	-	ns	$V_{DS}=-50V, R_G=3\Omega, V_{GS}=-10V, R_L=3\Omega$
Turn-On Rise Time	t_r	-	64	-		
Turn-Off Delay Time	$t_{d(off)}$	-	36	-		
Turn-Off Fall Time	t_f	-	52	-		

Gate charge characteristics

Parameter	Symbol	Values			Unit	Note/Test Conditions
		Min	Typ	Max		
Total Gate Charge	Q_g	-	147	-	nC	$V_{DS}=-50V, I_D=-15A, V_{GS}=-10V$
Gate-Source Charge	Q_{gs}	-	17	-		
Gate-Drain Charge	Q_{gd}	-	31	-		

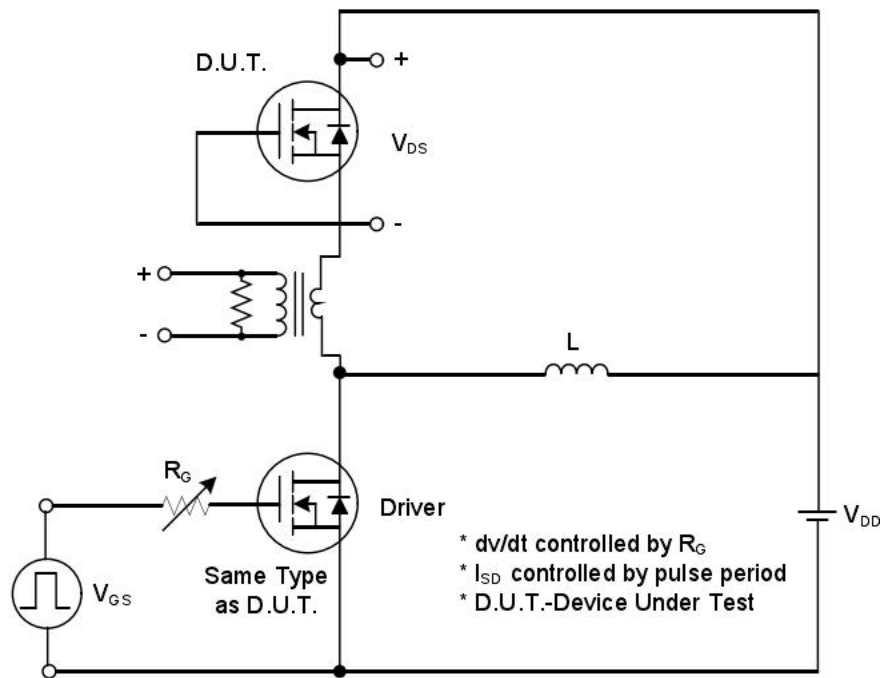
Reverse diode

Parameter	Symbol	Values			Unit	Note/Test Conditions
		Min	Typ	Max		
Continuous Diode Forward Current	I_{SD}	-	-	-28	A	-
Diode Forward Voltage (Note 3)	V_{SD}	-	-	-1.2	V	$I_S=-15A, V_{GS}=0V$
Reverse Recovery Time	t_{rr}	-	72	-	ns	$V_{GS}=0V, I_S=-15A, di/dt=-100A/\mu s$
Reverse Recovery Charge	Q_{rr}	-	120	-	nC	

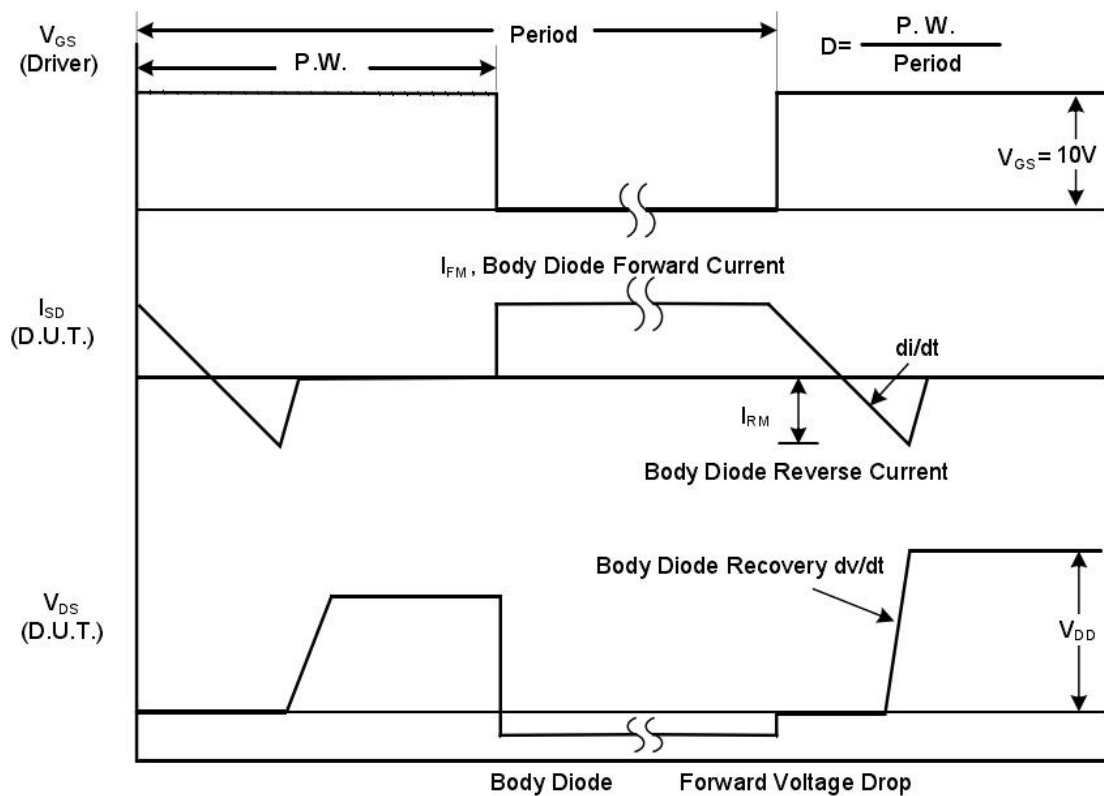
Notes

1. Repetitive Rating: pulse width limited by maximum junction temperature.
2. E_{AS} condition: $T_J=25^{\circ}\text{C}, V_{DD}=-50V, V_G=-10V, R_G=25\Omega, L=0.5\text{mH}$.
3. Repetitive Rating: Pulse width limited by maximum junction temperature.

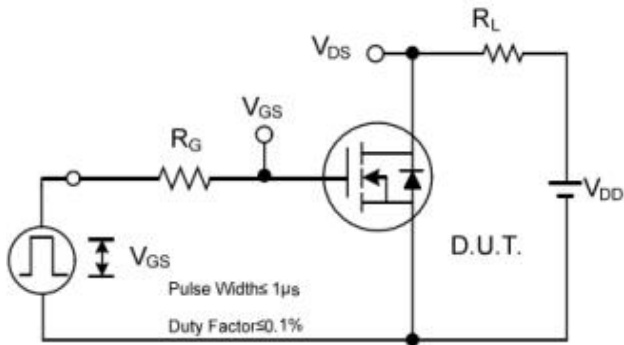
RATING AND CHARACTERISTIC CURVES



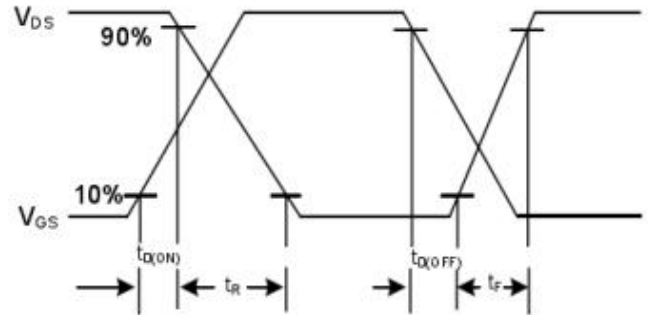
Peak Diode Recovery dv/dt Test Circuit



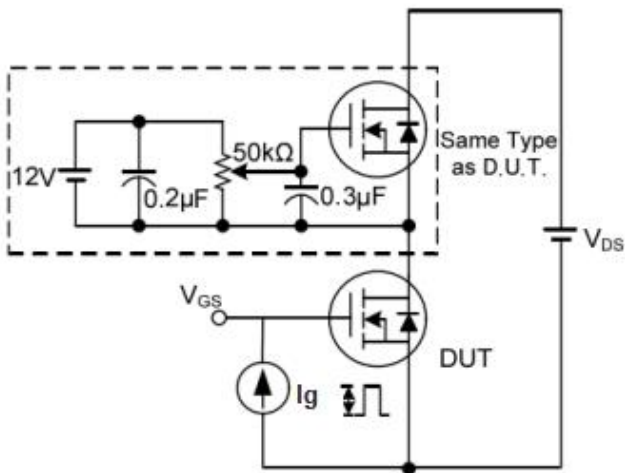
Peak Diode Recovery dv/dt Waveforms



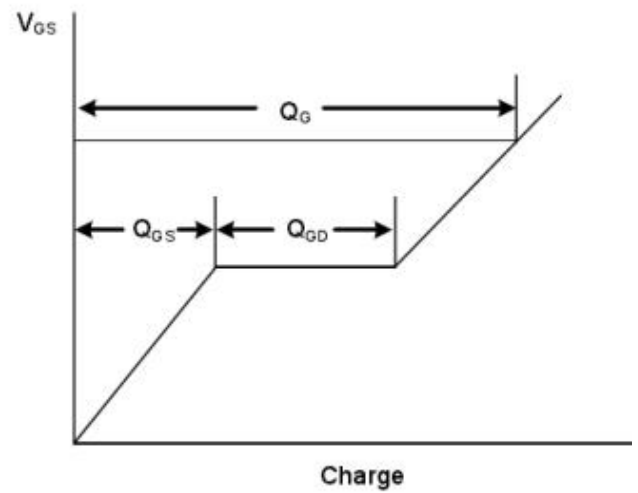
Switching Test Circuit



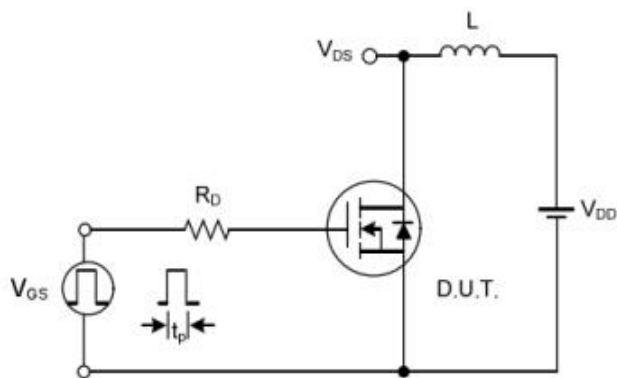
Switching Waveforms



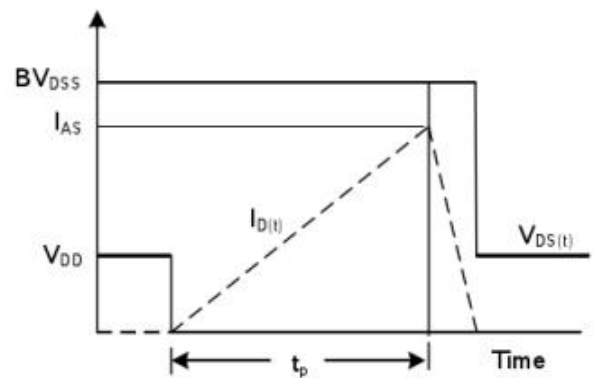
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

RATING AND CHARACTERISTIC CURVES

Figure.1 Output Characteristics

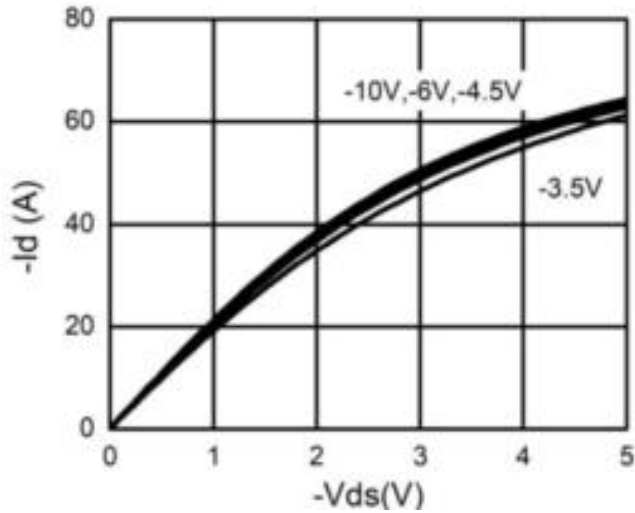


Figure.2 Transfer Characteristics

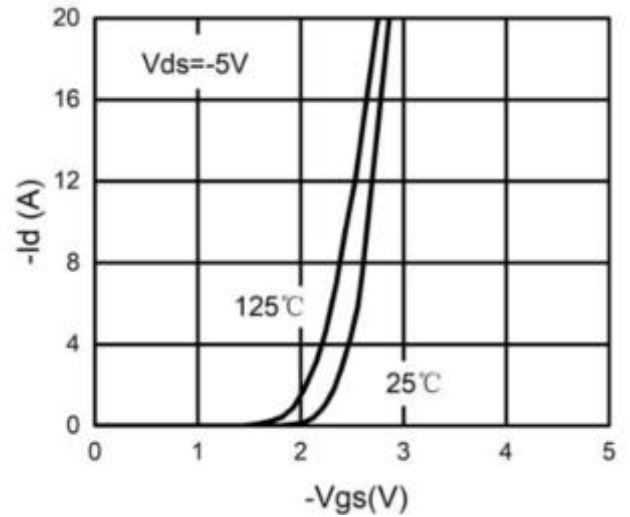


Figure.3 Power Dissipation

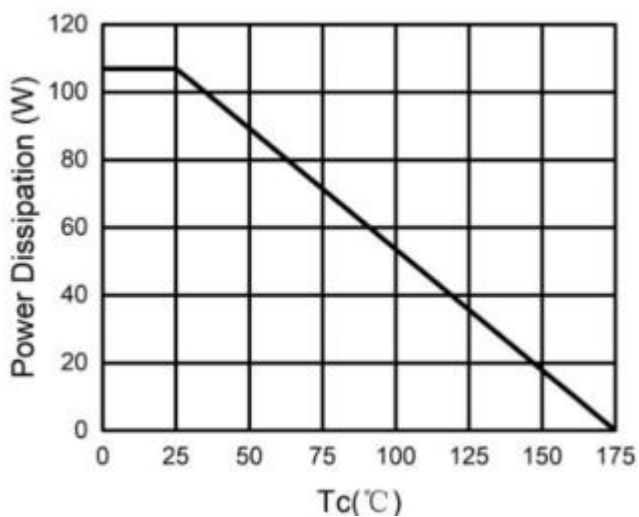


Figure.4 Drain Current

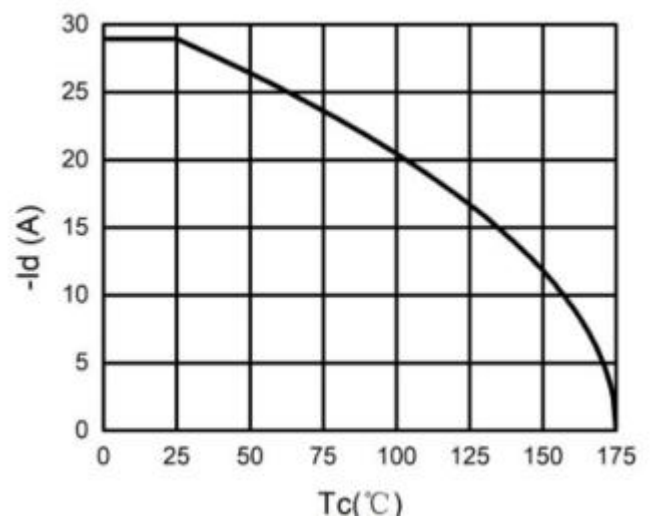


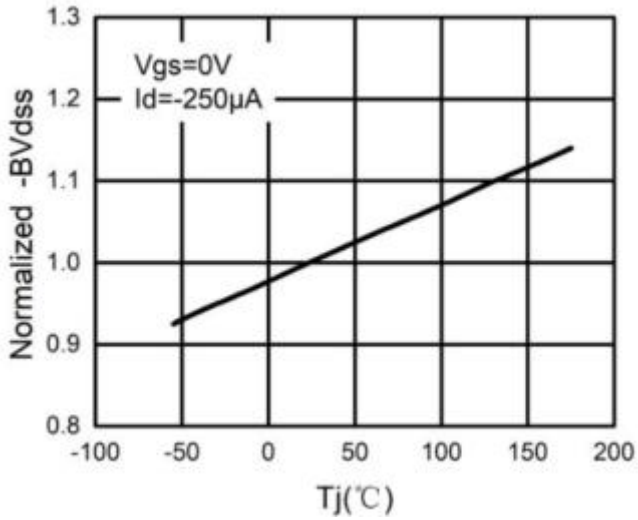
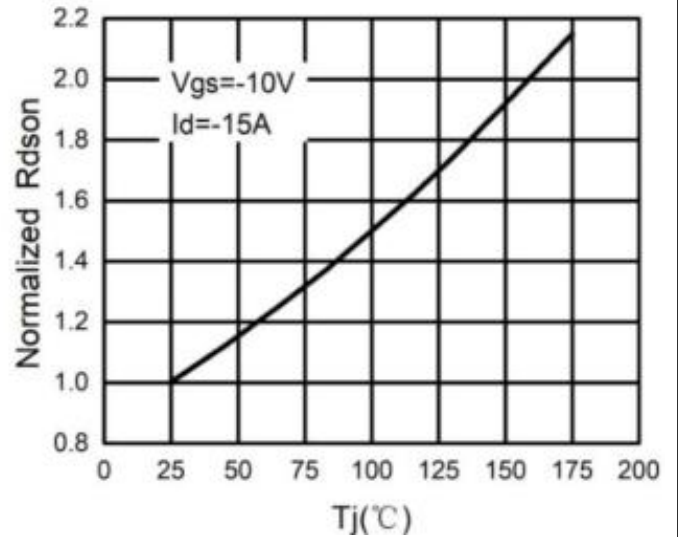
Figure.5 BV_{DSS} vs Junction Temperature

Figure.6 $R_{DS(ON)}$ vs Junction Temperature


Figure.7 Gate Charge Waveforms

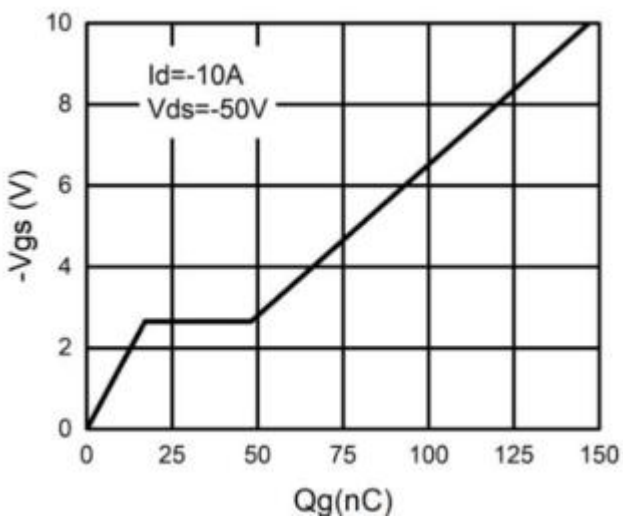


Figure.8 Capacitance

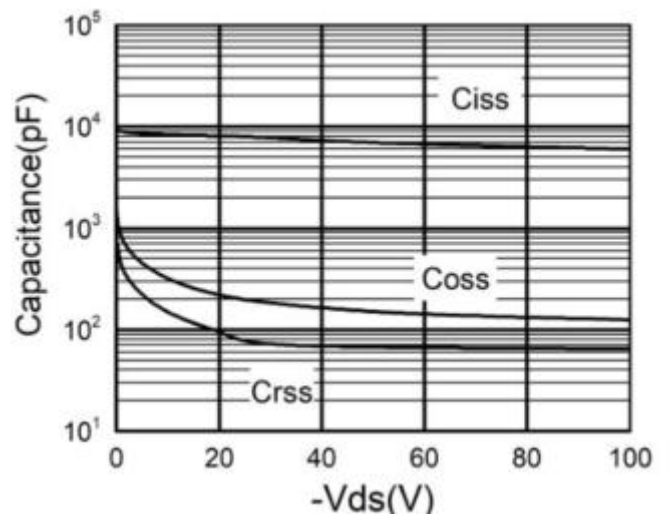


Figure.9 Body-Diode Characteristics

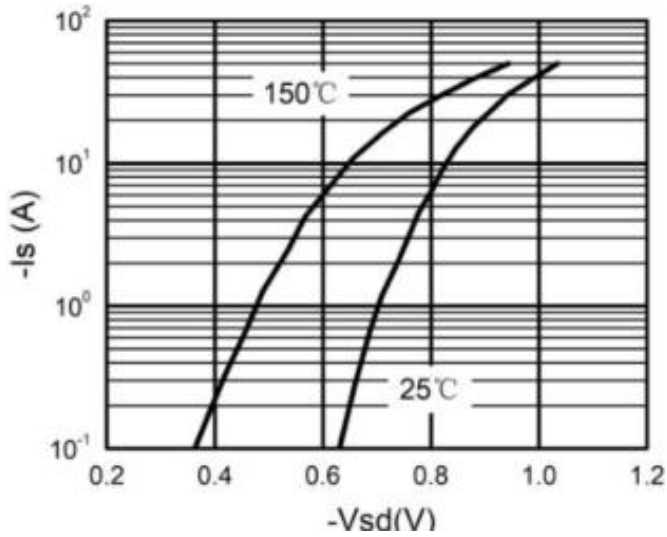
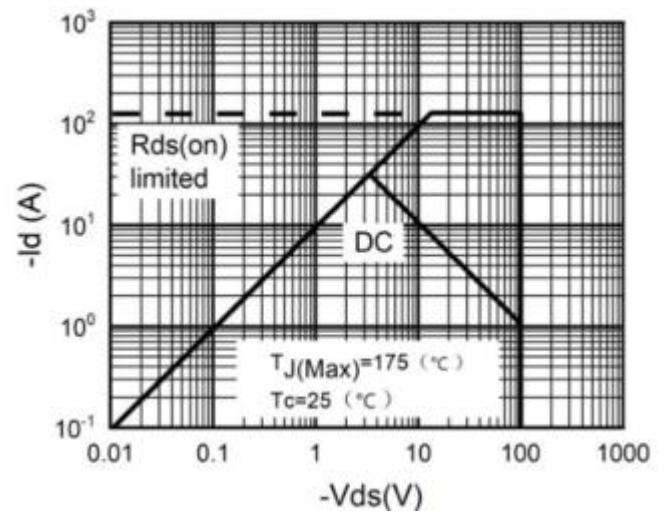
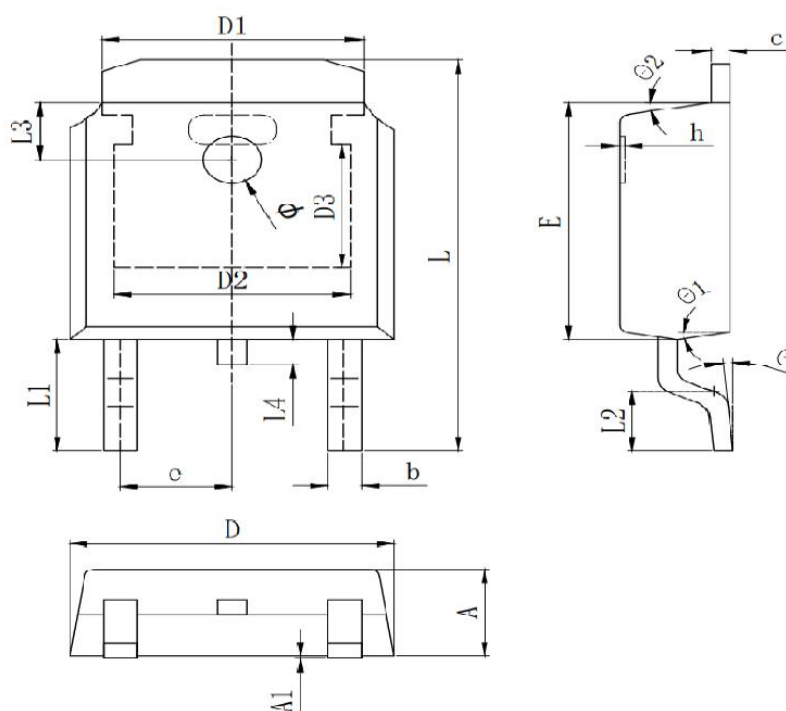


Figure.10 Maximum Safe Operating Area



Package Outline:TO-252-2L



Symbol	Dimensions In Millimeters		
	Min	Typ	Max
A	2.200	2.300	2.400
A1	0.000		0.127
b	0.640	0.690	0.740
c	0.460	0.520	0.580
D	6.500	6.600	6.700
D1	5.334REF		
D2	4.826REF		
D3	3.166REF		
E	6.000	6.100	6.200
e	2.286TYP		
h	0.000	0.100	0.200
L	9.900	10.100	10.300
L1	2.888REF		
L2	1.400	1.550	1.700
L3	1.600REF		
L4	0.600	0.800	1.000
Φ	1.100	1.200	1.300
θ	0°		8°
θ1	9° TYP		
θ2	9° TYP		