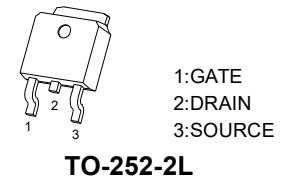
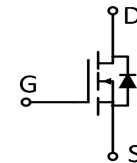
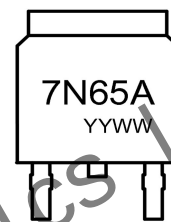


650V N-channel Enhancement Mode Power MOSFET
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
650V	1.1 Ω @10V	7.5A


Features

- ◆ Low gate charge (typical 26nC)
- ◆ High ruggedness
- ◆ Fast switching
- ◆ 100% avalanche tested
- ◆ Improved dv/dt capability


Circuit diagram


7N65A : Device Code
YY : Year Code
WW : Week Code

Marking (Top View)
Order information

Device	Package	Shipping
AN7N65FL0	TO-252-2L	2500/Tape&Reel

Absolute maximum ratings

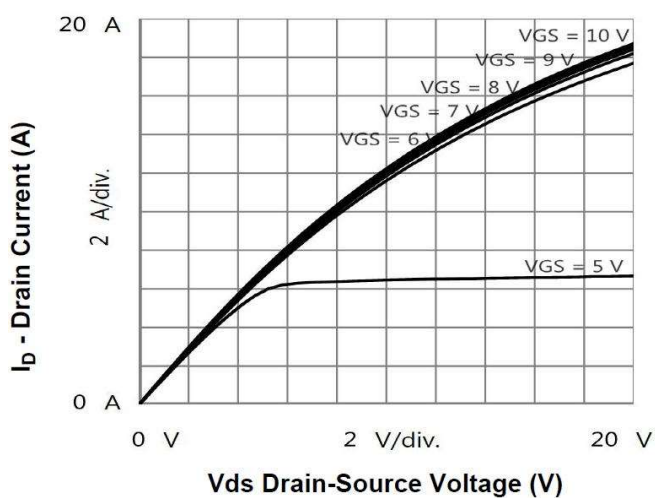
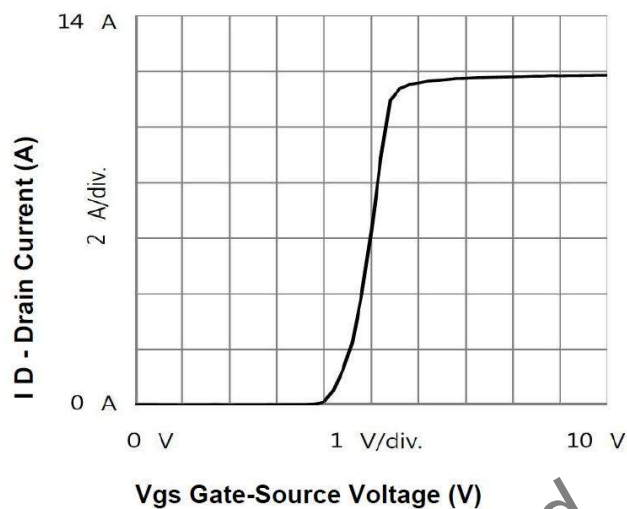
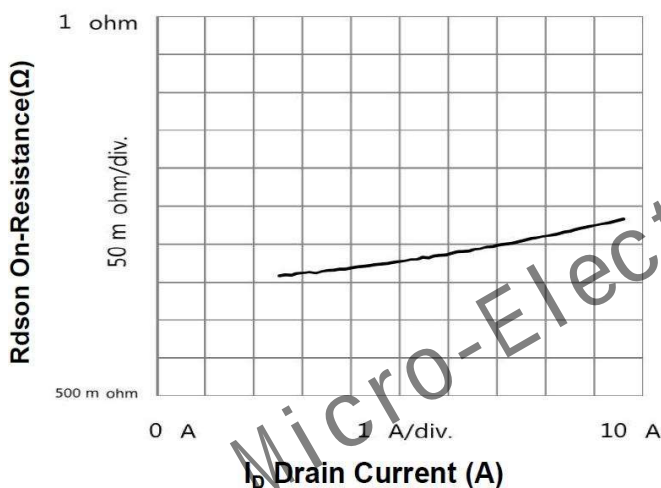
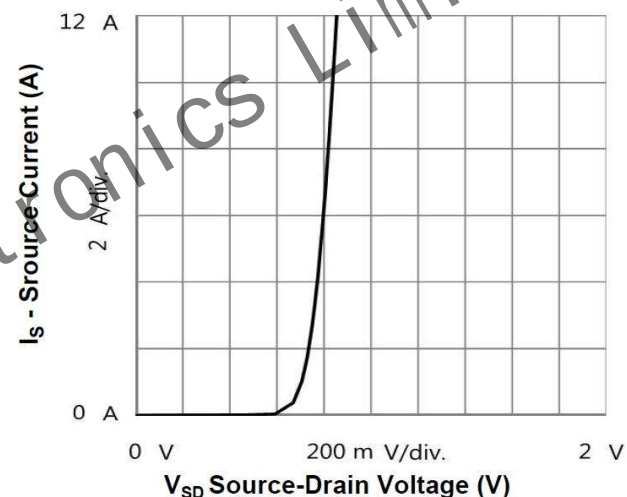
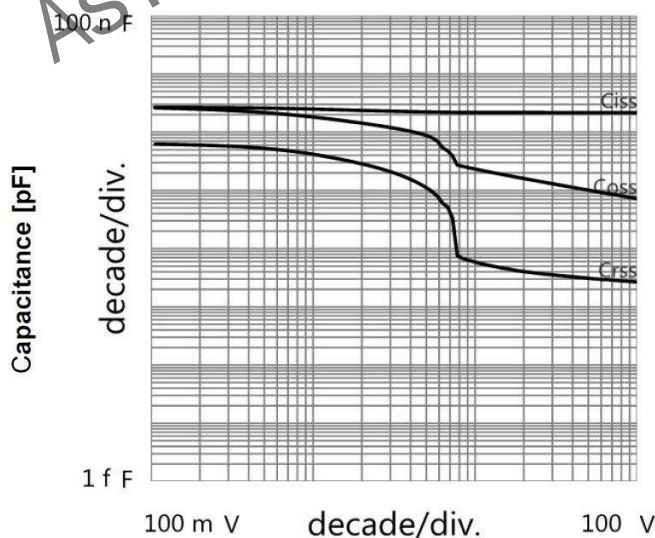
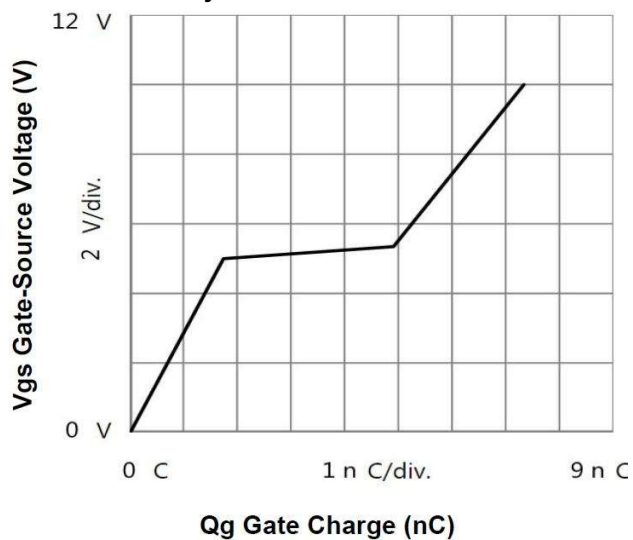
Parameter	Symbol	Value	Units
Drain-Source Voltage	V_{DSS}	650	V
Drain Current	I_D	7.5	A
Drain Current - Pulsed ¹	I_{DM}	16	A
Gate-Source Voltage	V_{GSS}	±30	V
Single Pulsed Avalanche Energy ²	E_{AS}	602	mJ
Avalanche Current ¹	I_{AR}	8	A
Repetitive Avalanche Energy ¹	E_{AR}	141	mJ
Power Dissipation	P_D	250	W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.5	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	T_L	300	°C

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

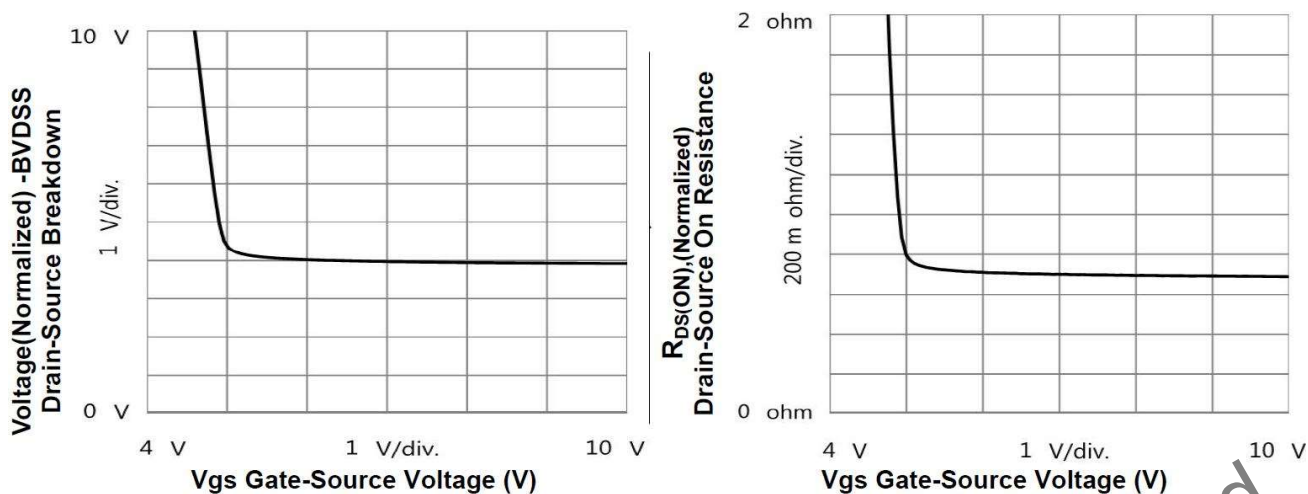
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain - Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250μA	650			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 650V, V _{GS} = 0V			10	μA
Gate - Body Leakage Current	I _{GSS}	V _{GS} = ±30V, V _{DS} = 0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2	3	4	V
Drain-source On-resistance	R _{DS(on)}	V _{GS} =10V, I _D = 3.5A		1.1	1.35	Ω
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = 25 V, V _{GS} = 0 V, f = 1.0 MHz		1130		pF
Output Capacitance	C _{oss}			86.8		
Reverse Transfer Capacitance	C _{rss}			4.08		
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} = 520 V, I _D = 8A, V _{GS} = 10 V		26		nC
Gate-source Charge	Q _{gs}			4.78		
Gate-drain Charge	Q _{gd}			5.82		
Turn-on Delay Time	t _{d(on)}	V _{DS} = 100 V,V _{GS} = 10V, I _D =8 A,R _G = 25 Ω		12		ns
Turn-on Rise Time	t _r			20		
Turn-off Delay Time	t _{d(off)}			74		
Turn-off Fall Time	t _f			33		
Source - Drain Diode Characteristics						
Drain to Source Diode Forward Voltage	V _{SD}	V _{GS} = 0V, I _{SD} = 7A,T _J = 25℃			1.4	V
Reverse Recovery Time	t _{rr}	V _{GS} = 0 V, I _S =7A,		506		ns
Reverse Recovery Charge	Q _{rr}	di _F / dt = 100 A/us		2.7		uC

Notes:

- Drain current limited by maximum junction temperature.
- E_{AS} condition: $T_J = 25^\circ\text{C}$, $V_{DD} = 50V$, $V_G = 10V$, $R_G = 25\Omega$, $L = 0.5\text{mH}$

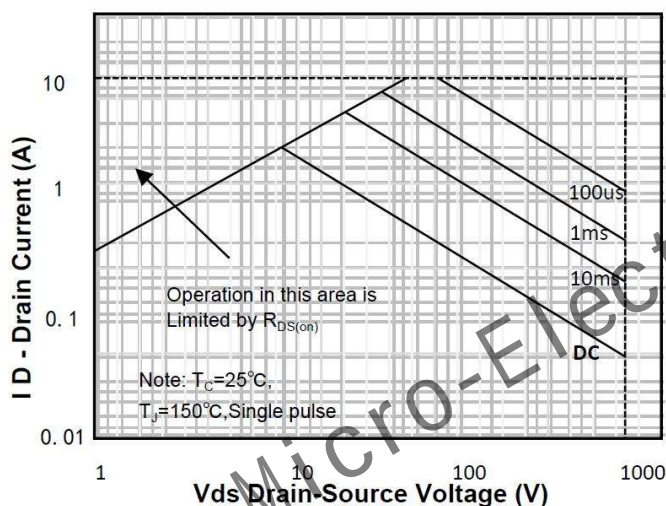
Typical characteristics ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Output Characteristics

Transfer Characteristics

On Resistance vs. Drain Current

Body-Diode Characteristics

Capacitance Characteristics

Gate Charge

Typical characteristics ($T_A = 25^\circ\text{C}$, unless otherwise noted)

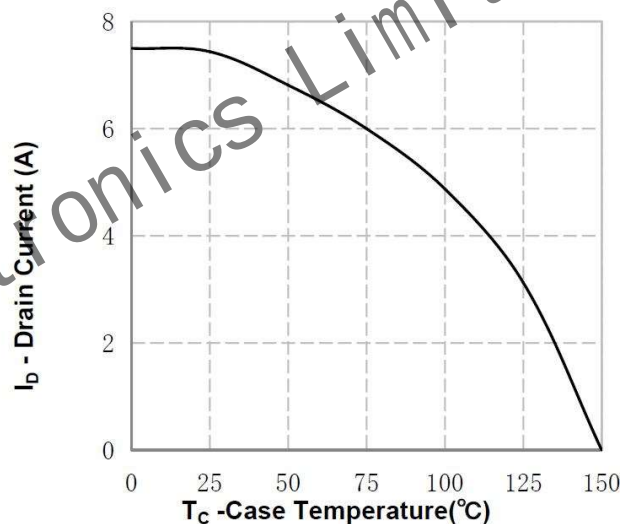


Breakdown Voltage Variation vs Gate Voltage

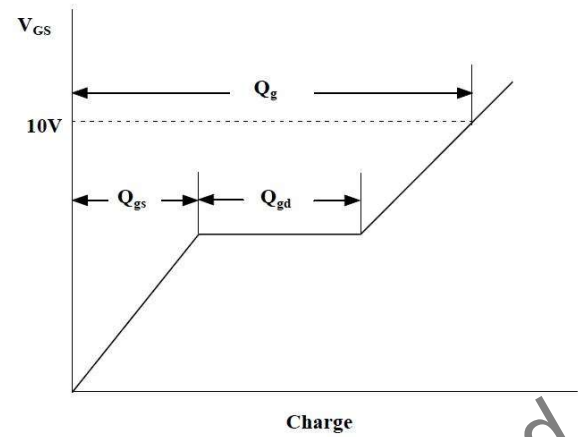
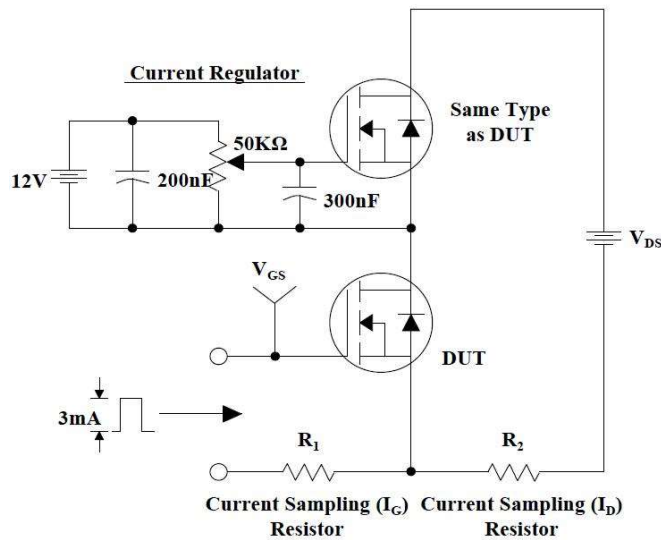
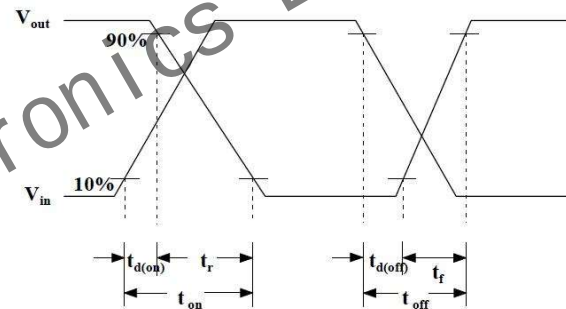
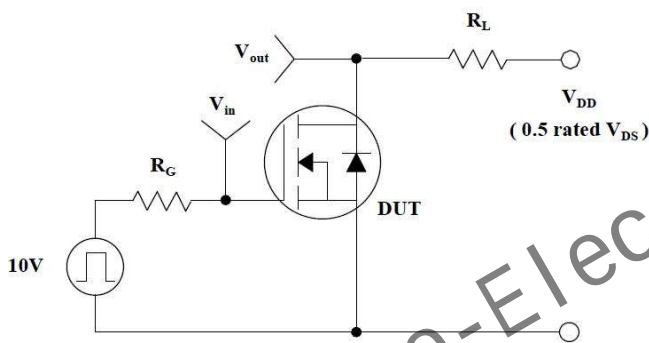
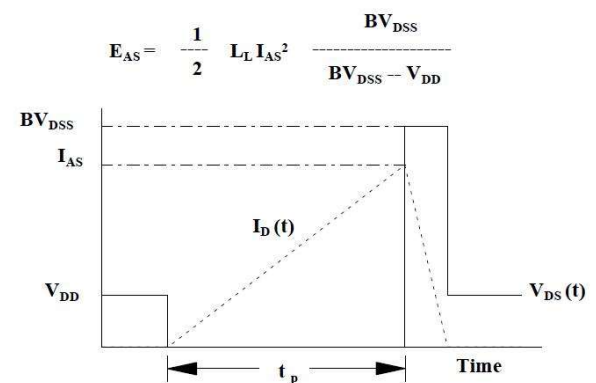
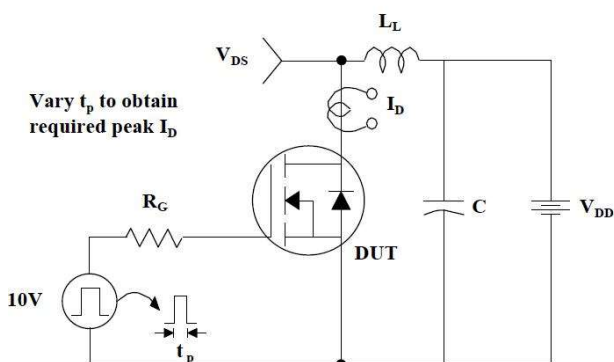
On-Resistance Variation vs Gate Voltage



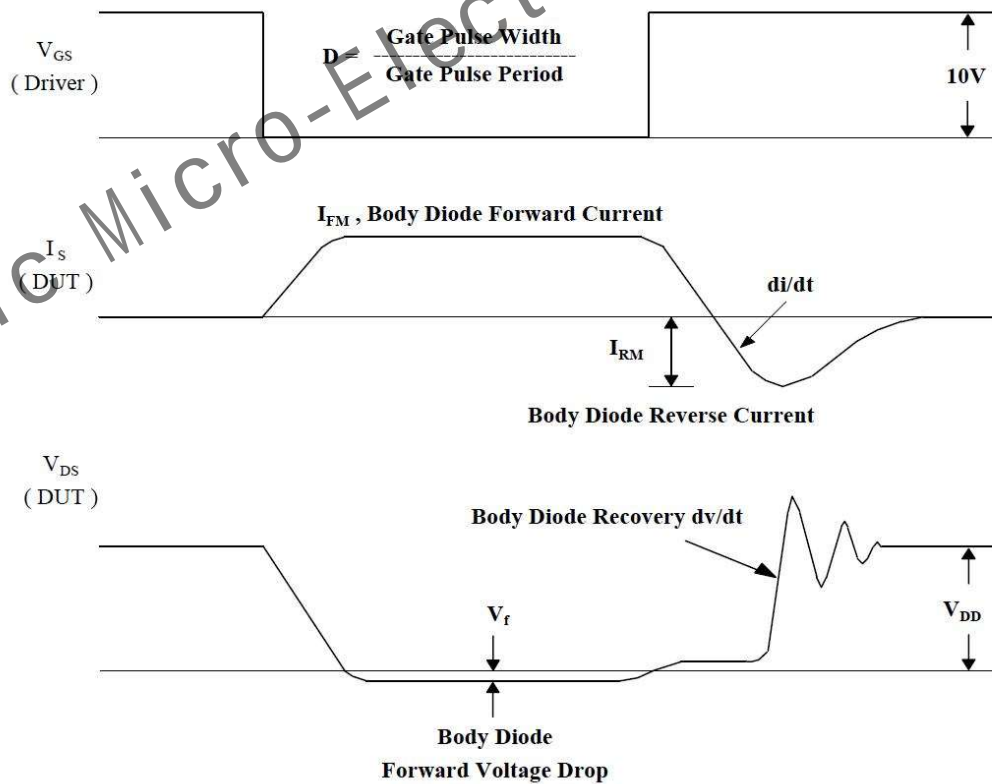
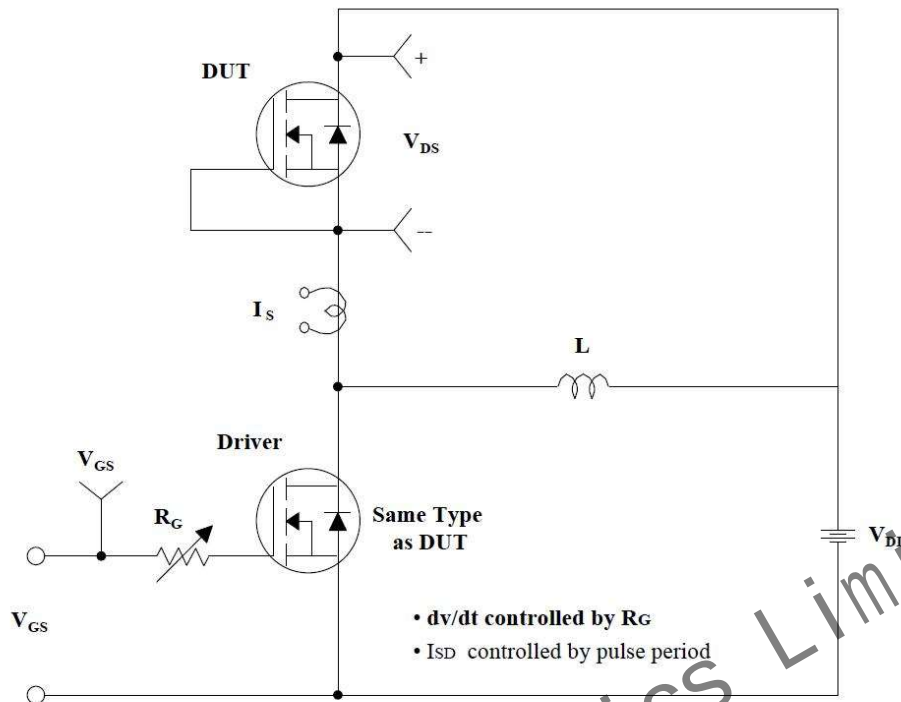
Maximum Safe Operating Area

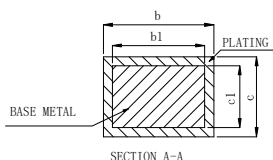
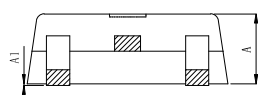
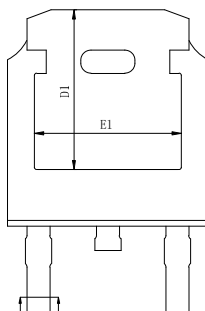
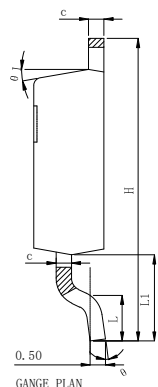
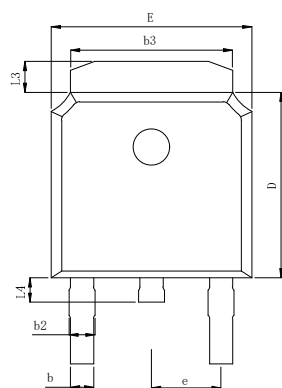


Current De-rating

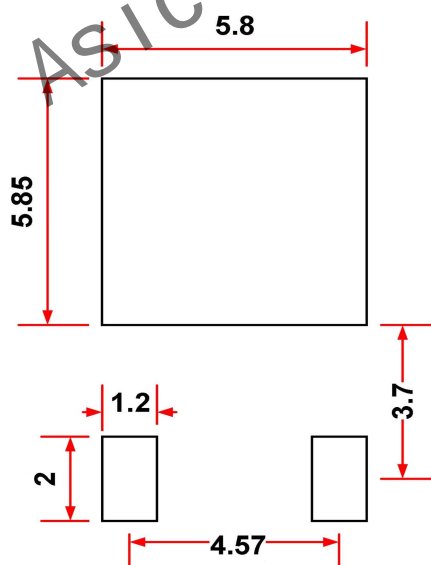
Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveforms

Unclamped Inductive Switching Test Circuit & Waveforms


Peak Diode Recovery dv/dt Test Circuit & Waveforms



PACKAGE OUTLINE DIMENSIONS
TO-252-2L


Symbol	Dimensions in millimeters		
	Min.	Typ.	Max.
A	2.20	2.30	2.40
A1	0.00	-	0.12
b	0.65	-	0.89
b1	0.64	0.76	0.79
b2	0.76	0.86	1.10
b3	5.20	5.33	5.46
c	0.48	-	0.60
c1	0.47	0.51	0.55
D	6.00	6.10	6.20
D1	5.21	-	-
E	6.50	6.60	6.70
E1	4.32	-	-
e	2.29BSC		
H	9.70	9.95	10.20
L	1.40	1.50	1.60
L1	2.84REF		
L3	0.90	-	1.27
L4	0.60	0.80	1.00
θ1	0°	-	10°
θ2	0°	-	15°

Recommended PCB Layout (Unit: mm)

Notes:

This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met.