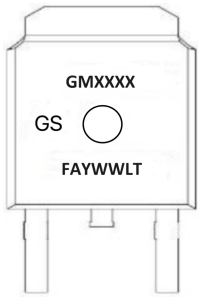
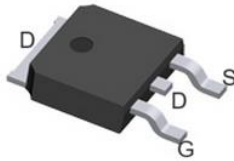


Product Summary

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
20	5.5 @ $V_{GS} = 10V$	60

View and Internal Schematic Diagram



TO-252

NOTE:
 LOGO - GS
 GMXXXXX- Part number code
 F - Fab location code
 A - Assembly location code
 Y - Year code
 WW - Week code
 L&T - Assembly lot code

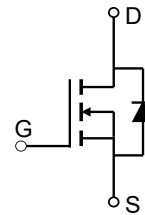
Features

- Low $R_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed
- 100% avalanche tested

Application

- Load Switch
- PWM Application
- Power Management

Equivalent circuit



Absolute maximum rating@25°C

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	60	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	39	A
I_{DM}	Pulsed Drain Current ¹	240	A
EAS	Single Pulse Avalanche Energy ²	64	mJ
$P_D@T_C=25^\circ C$	Total Power Dissipation	37	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Characteristic

Parameter		Symbol	Max.	Unit
Thermal resistance, junction-to-case	Steady state	$R_{\theta JC}$	3.4	°C/W
Thermal resistance, junction-to-ambient ⁽³⁾	Steady state	$R_{\theta JA}$	32	

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

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Static parameter						
Drain to source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0, I _D = 250 μA	20			V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	0.5	0.7	1.1	V
Gate-body leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA
Zero gate voltage drain current	I _{DSS}	V _{DS} = 20 V, V _{GS} = 0 V			1	μA
Drain-source on-resistance	R _{DS(on)}	V _{GS} = 4.5 V, I _D = 30 A		4.8	5.5	mΩ
	R _{DS(on)}	V _{GS} = 2.5 V, I _D = 30 A		6.5	8.2	mΩ
Dynamic						
Total gate charge V _{GS} = 10V	Q _g	V _{DS} = 15 V, I _D = 20 A, V _{GS} = 4.5 V		24		nC
Gate-source charge	Q _{gs}			5		
Gate-drain charge	Q _{gd}			7.2		
Turn-on delay time	t _{d(on)}	V _{DS} = 15 V, I _D = 30 A, V _{GS} = 4.5 V, R _{GEN} = 2.9 Ω		13		ns
Rise time	t _r			34		
Turn-off delay time	t _{d(off)}			47		
Fall time	t _f			94		
Input capacitance	C _{iss}	V _{DS} = 15 V, V _{GS} = 0 V, f = 1 MHz		1950		pF
Output capacitance	C _{oss}			260		
Reverse transfer capacitance	C _{rss}			245		
Diode Characteristics						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I _S	V _G =V _S =0V , Force Current	---	---	60	A
Pulsed Source Current	I _{SM}		---	---	240	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V , I _S =20A , T _J =25°C	---	---	1.2	V
Body Diode Reverse Recovery Time	T _{rr}	di/dt=100A/μs, I _F =20A	---	11	---	ns
Body Diode Reverse Recovery Charge	Q _{rr}		---	2.6	---	nC

Notes

- 1、Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
- 2、EAS condition: Starting T_J=25°C, V_{DD}=10V, V_G=10V, R_G=25ohm, L=0.5mH, I_{AS}=16A
- 3、R_{θJA} is measured with the device mounted on a 1inch² pad of 2oz copper FR4 PCB
- 4、Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

Typical Performance Characteristics

Figure 1: Output Characteristics

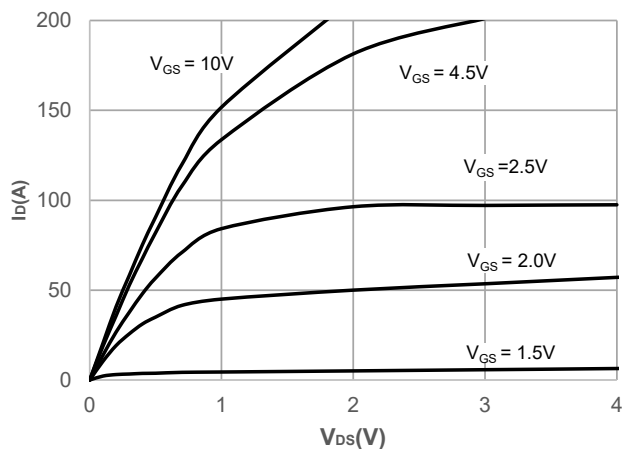


Figure 2: Typical Transfer Characteristics

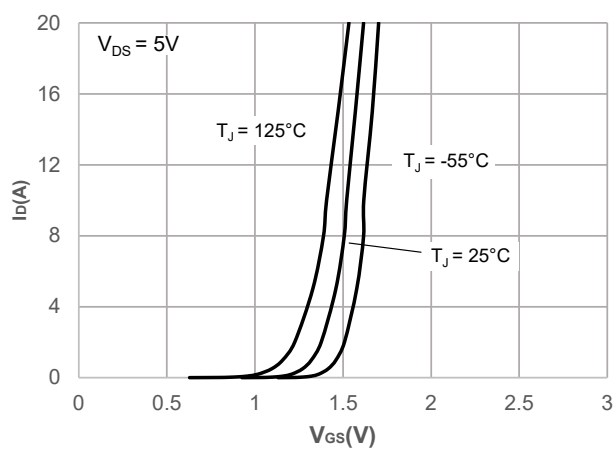


Figure 3: On-resistance vs. Drain Current

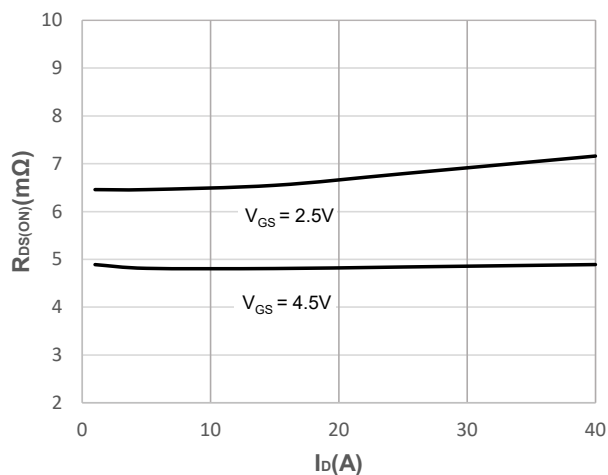


Figure 4: Body Diode Characteristics

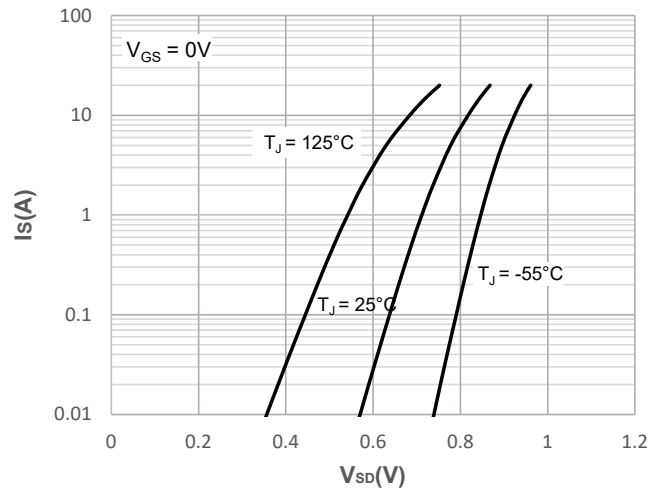


Figure 5: Gate Charge Characteristics

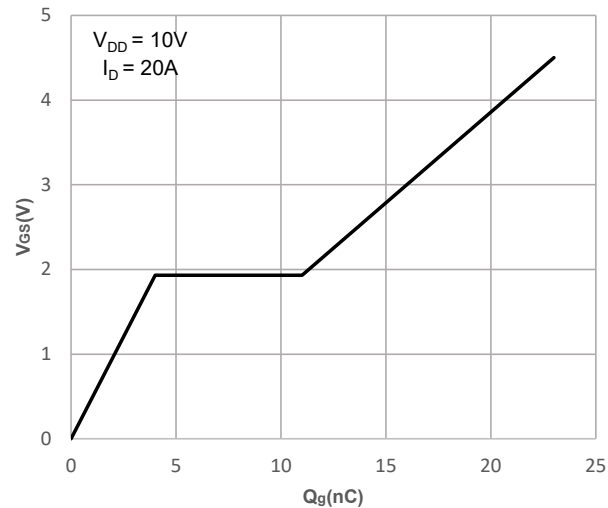
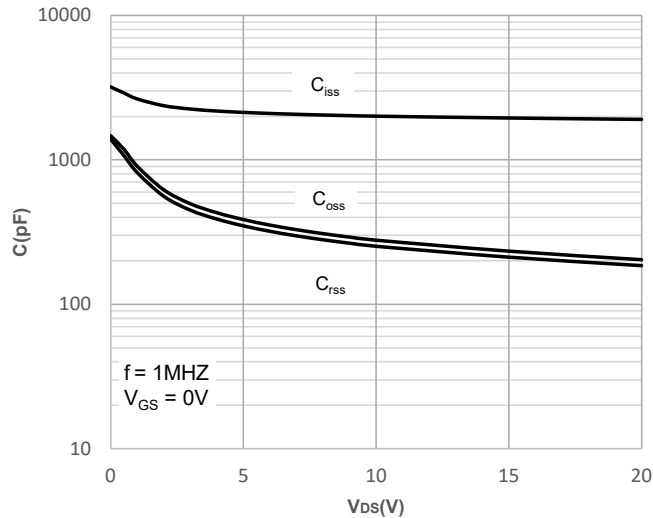


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

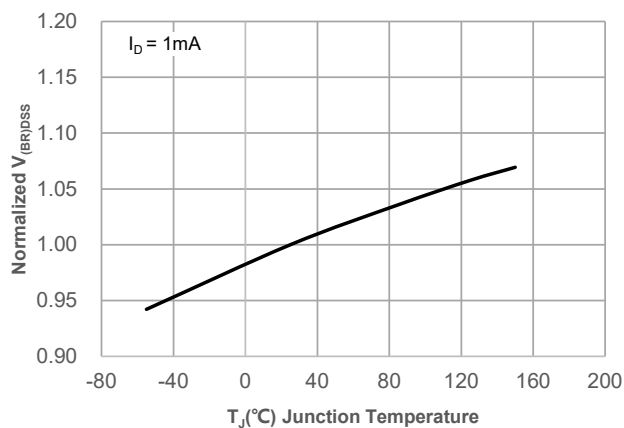


Figure 8: Normalized on Resistance vs. Junction Temperature

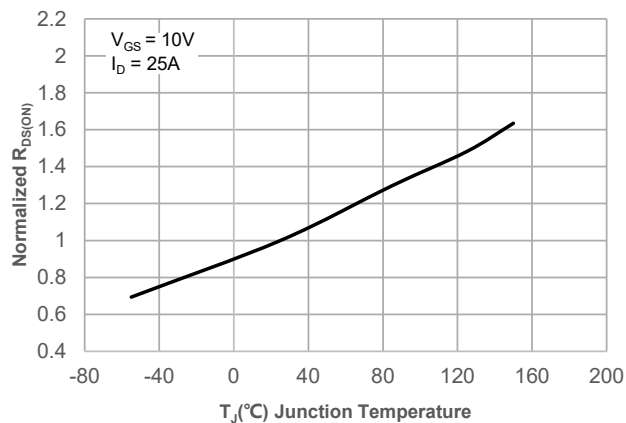


Figure 9: Maximum Safe Operating Area

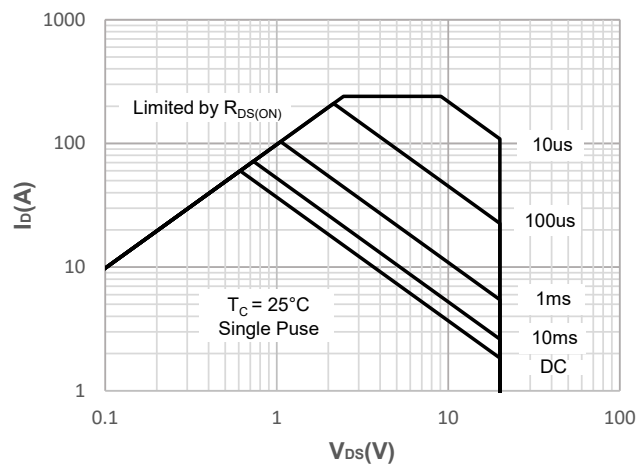


Figure 10: Maximum Continuous Driain Current vs. Case Temperature

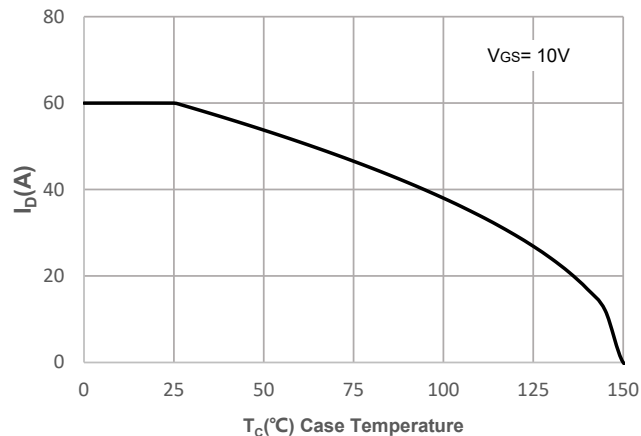


Figure 11: Normalized Maximum Transient Thermal Impedance

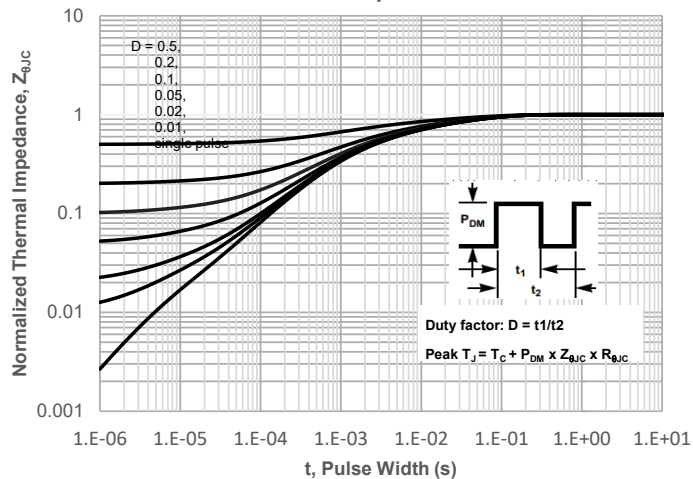
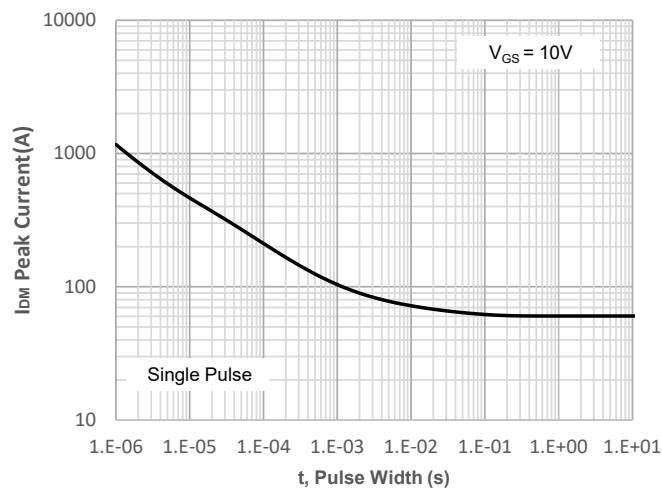
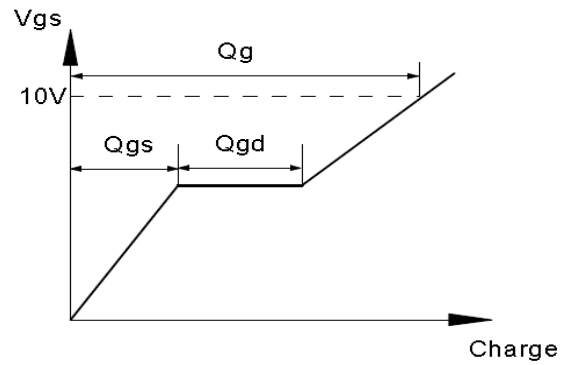
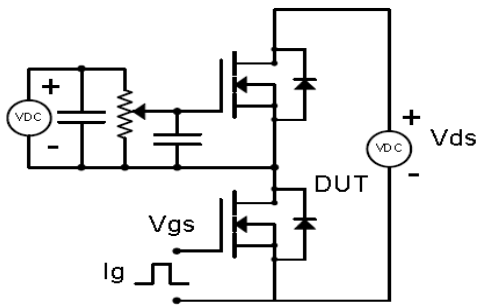


Figure 12: Peak Current Capacity

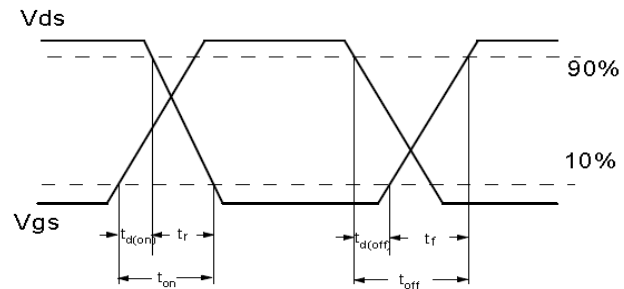
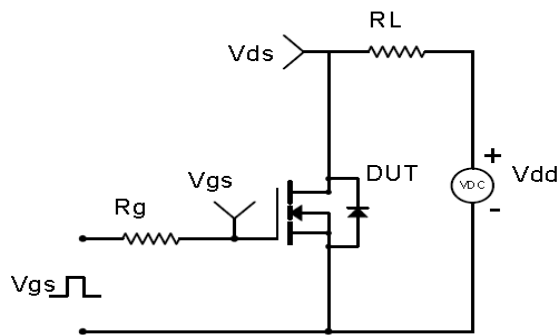


Test Circuit & Waveform

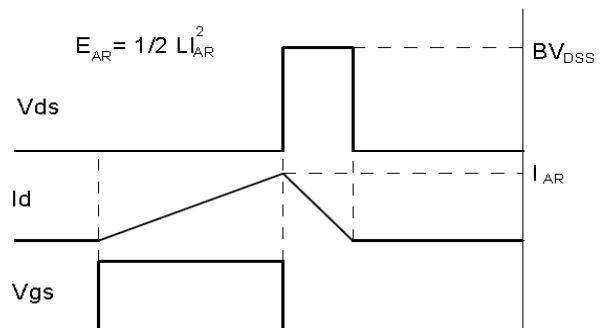
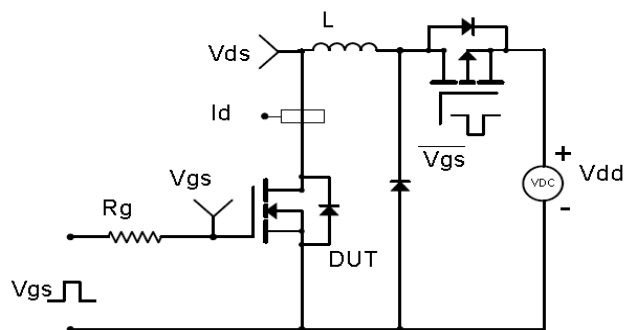
Gate Charge Test Circuit & Waveform



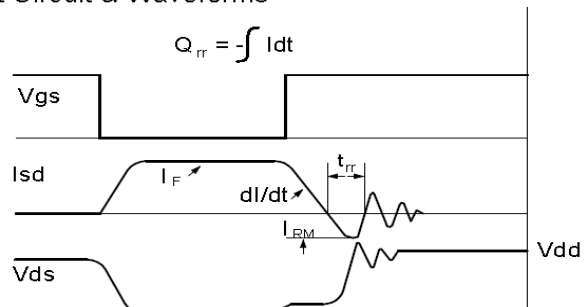
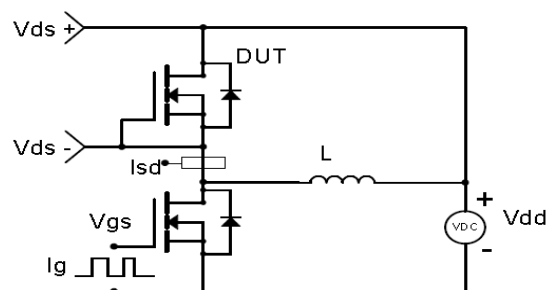
Resistive Switching Test Circuit & Waveforms



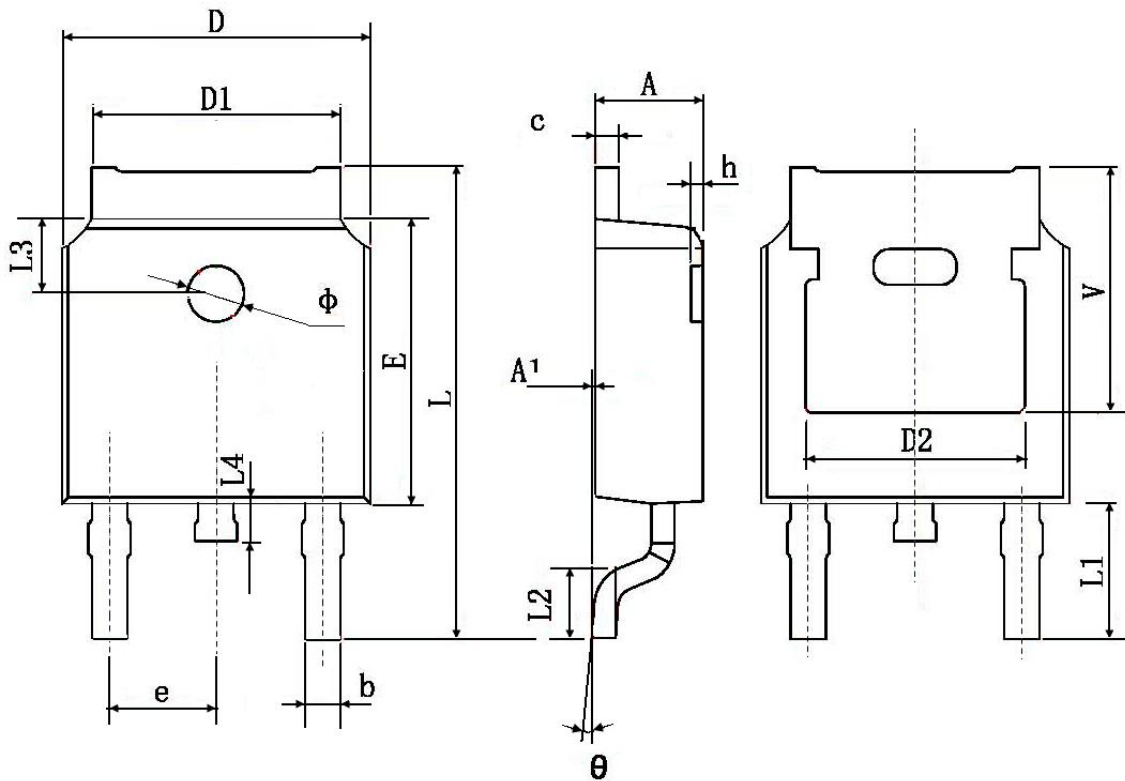
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Outline Drawing TO-252



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	

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