

N-channel Enhancement Mode Power MOSFET

Features

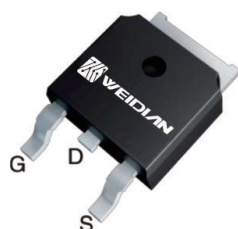
- Halogen-free and RoHS-compliant
- Ultra-low $R_{DS(ON)}$
- Lead free product is acquired
- 100% UIS TESTED
- 100% R_g TESTED

Applications

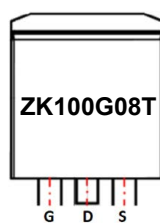
- Load Switch
- PWM Application
- Power Management

Product Summary

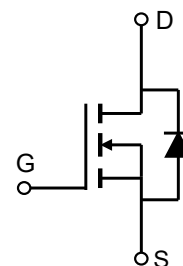
Parameters	Value	Unit
V_{DSS}	100	V
$V_{GS(th)_{Typ}}$	1.7	V
$I_D(@V_{GS}=10V)$	88	A
$R_{DS(ON)_{Typ}}(@V_{GS}=10V)$	5.8	$m\Omega$
$R_{DS(ON)_{Typ}}(@V_{GS}=4.5V)$	7.6	$m\Omega$



TO-252-2L Top View



Marking



Schematic Diagram

Ordering Information

Device	Marking	Package	Packing	Reel Size	Tape Width	Reel (pcs)
ZK100G08T	100G08	TO-252	Reel	N/A	N/A	2500

MAXIMUM RATINGS ($T_a=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	88	A
		62	
Pulsed Drain Current	I_{DM}	Refer to Fig.4	A
Single Pulsed Avalanche Energy	E_{AS}	238	mJ
Power Dissipation	P_D	111	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	40	$^{\circ}C/W$
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150	$^{\circ}C$

MOSFET ELECTRICAL CHARACTERISTICS

$T_a = 25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	V _{(BR) DSS}	V _{GS} = 0V, I _D = 250uA	100			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = 80V, V _{GS} =0V			1.0	μA
Gate-body leakage current	I _{GSS}	V _{DS} = 0V, V _{GS} =±20V			±100	nA
On characteristics ④						
Gate-threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	1.2	1.7	2.5	V
Static drain-source on-sate resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		5.8	6.9	mΩ
		V _{GS} =4.5V, I _D =20A		7.6	9.9	mΩ
Dynamic characteristics ④ ⑤						
Input capacitance	C _{iss}	V _{DS} =50V,V _{GS} =0V f =1MHz		2615		pF
Output capacitance	C _{oss}			806		
Reverse transfer capacitance	C _{rss}			22		
Gate Resistance	R _g	f =1MHz		1.8		Ω
Switching characteristics ④ ⑤						
Total gate charge	Q _g	V _{GS} =0 to 10V V _{DS} =50V, I _D =20A		44		nC
Gate-source charge	Q _{gs}			9		
Gate-drain charge	Q _{gd}			9		
Turn-on delay time	t _{d(on)}	V _{DD} =50V,I _D =50A V _{GS} =10V,R _{GEN} =6.2Ω		11		ns
Turn-on rise time	t _r			18		
Turn-off delay time	t _{d(off)}			50		
Turn-off fall time	t _f			40		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage	V _{SD} ④	V _{GS} =0V, I _S =20A			1.2	V
Continuous drain-source diode forward current	I _S ①				88	A
Pulsed drain-source diode forward current	I _{SM} ②				352	A
Reverse recovery time	t _{rr}	di/dt = 100A/μs, I _F = 20A		49		ns
Reverse recovery charge	Q _{rr}			67		nC

Notes:

- 1.Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. E_{AS} condition: Starting $T_J = 25^\circ\text{C}$, $V_{DD} = 50V$, $V_G = 10V$, $R_G = 25\Omega$, $L = 3mH$, $I_{AS} = 13A$
3. $R_{\theta JA}$ is measured with the device mounted on a 1inch² pad of 2oz copper FR4 PCB
- 4.Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$.

Figure 1: Power De-rating

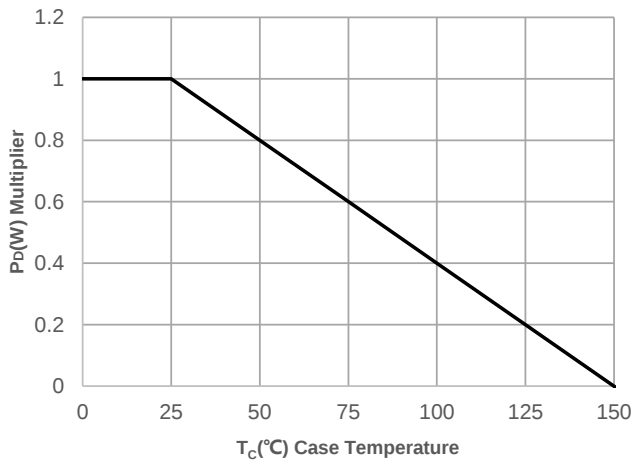


Figure 2: Current De-rating

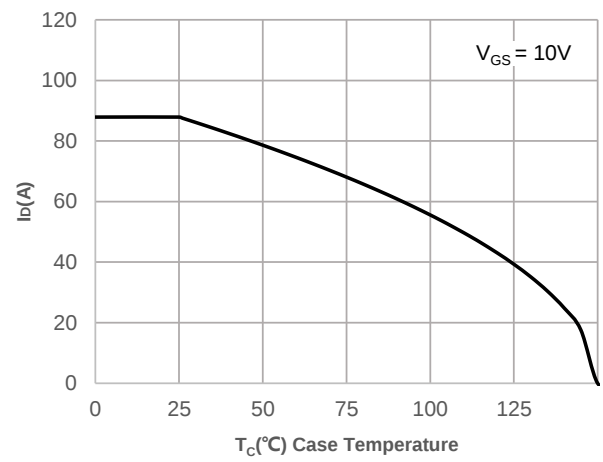


Figure 3: Normalized Maximum Transient Thermal Impedance

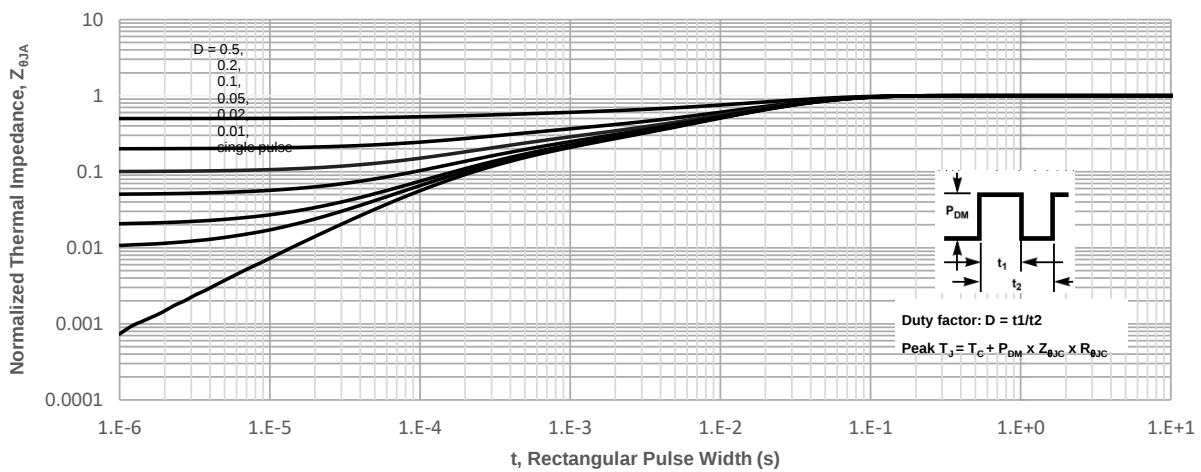


Figure 4: Peak Current Capacity

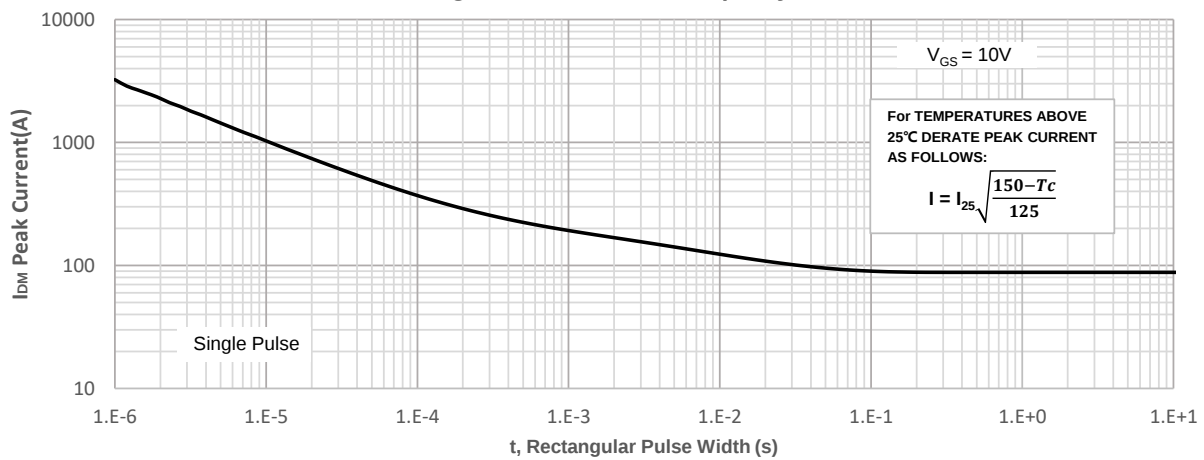


Figure 5: Output Characteristics

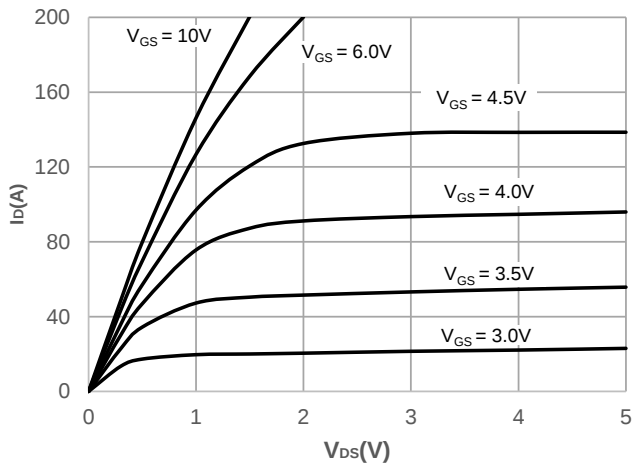


Figure 6: Typical Transfer Characteristics

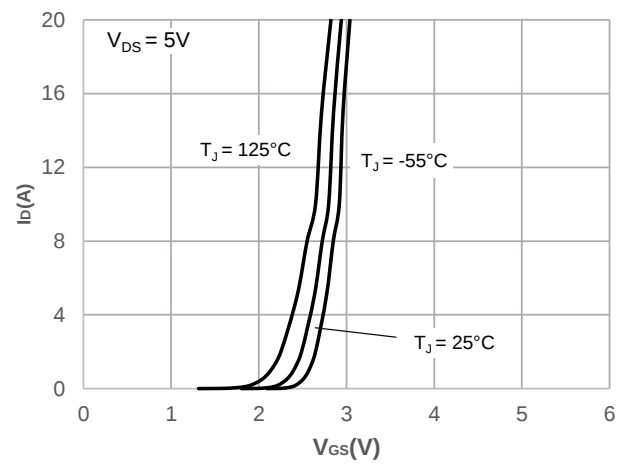


Figure 7: On-resistance vs. Drain Current

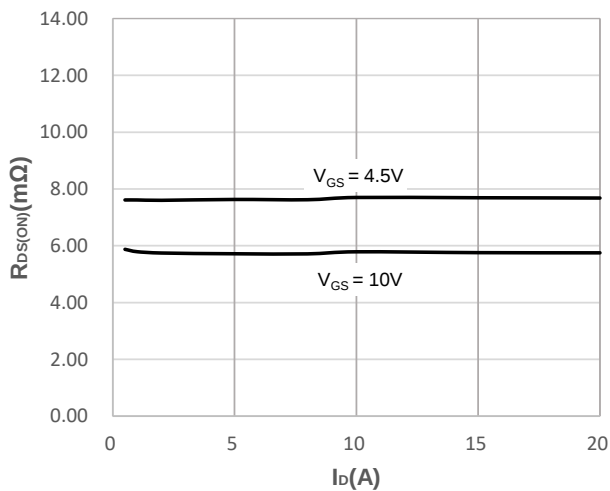


Figure 8: Body Diode Characteristics

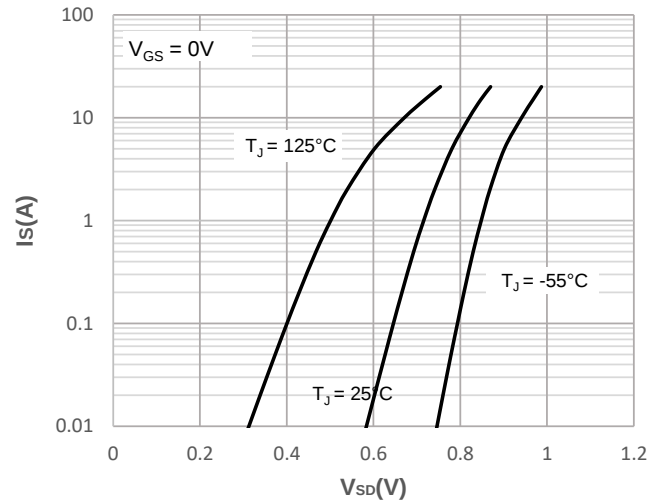


Figure 9: Gate Charge Characteristics

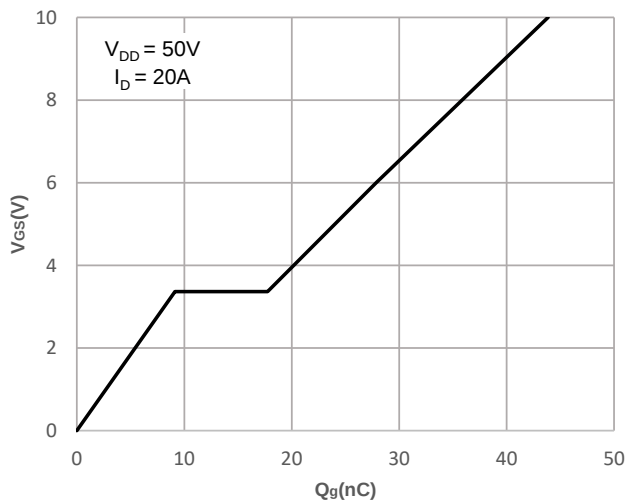
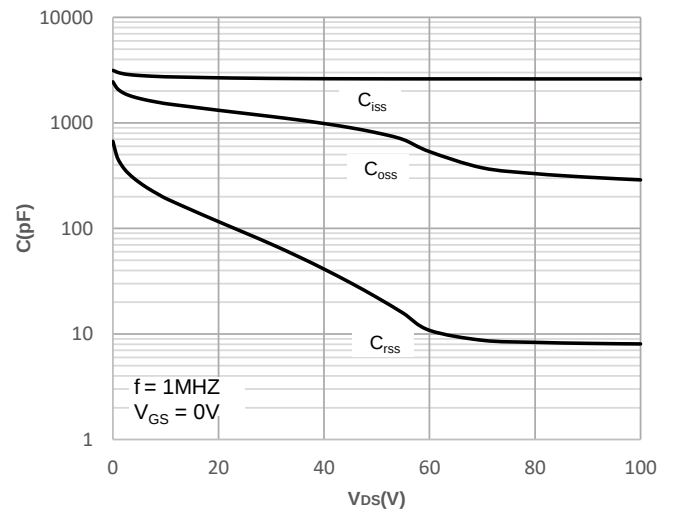


Figure 10: Capacitance Characteristics



Typical Characteristics

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

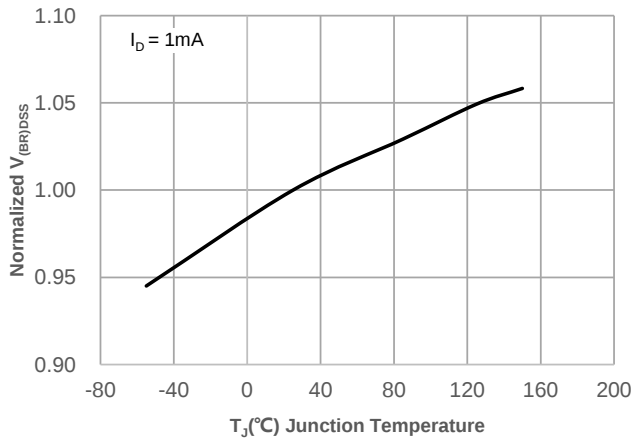


Figure 12: Normalized on Resistance vs. Junction Temperature

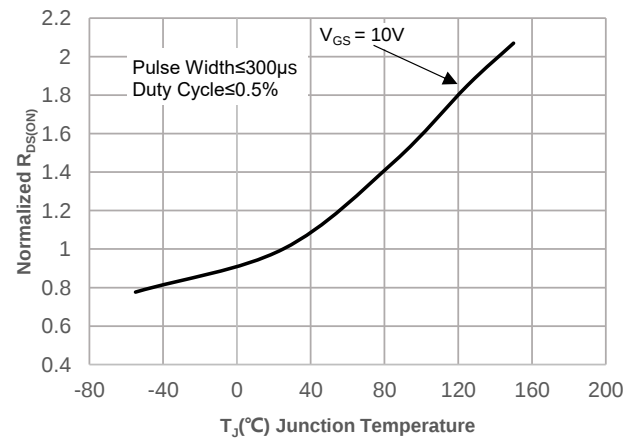


Figure 13: Normalized Threshold Voltage vs. Junction Temperature

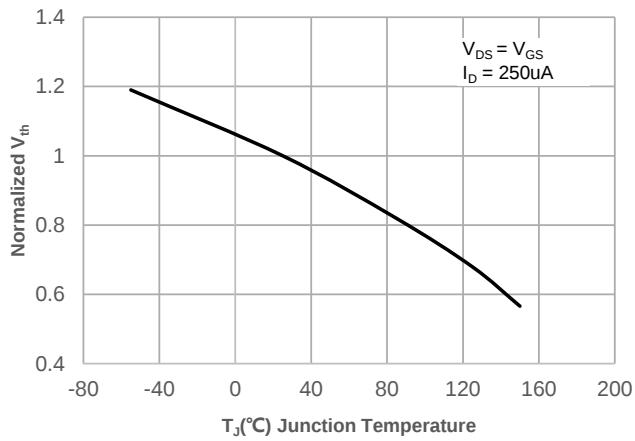


Figure 14: $R_{DS(ON)}$ vs. V_{GS}

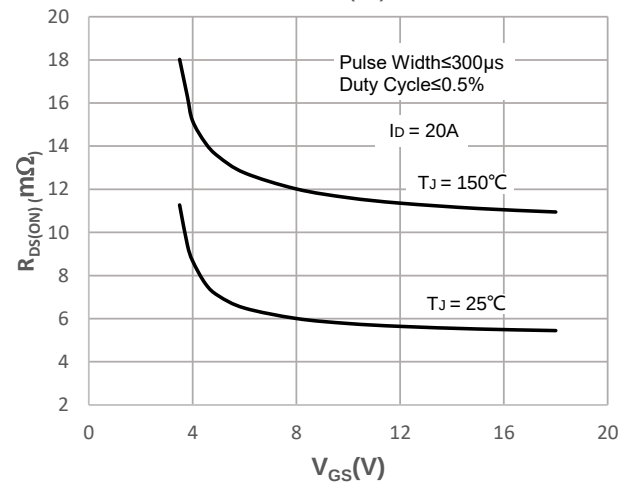
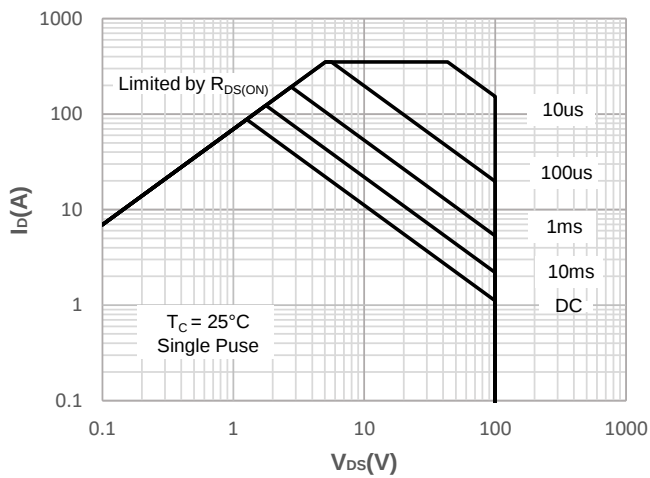


Figure 15: Maximum Safe Operating Area



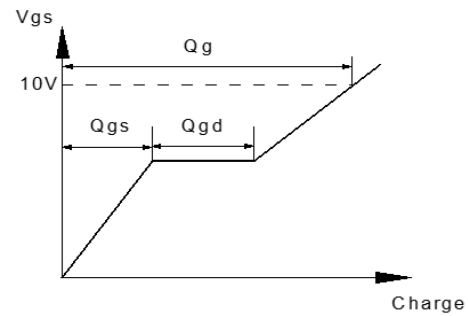
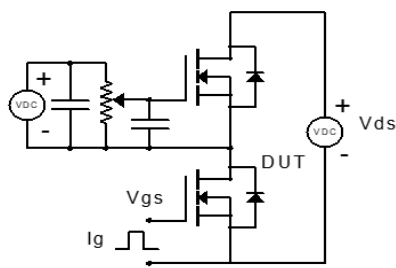


Figure 1: Gate Charge Test Circuit & Waveform

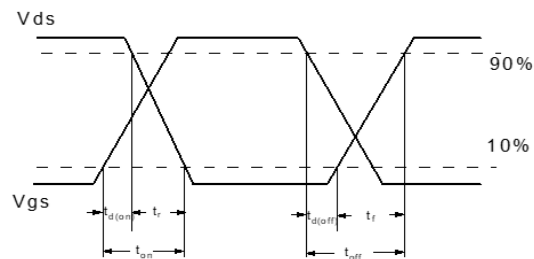
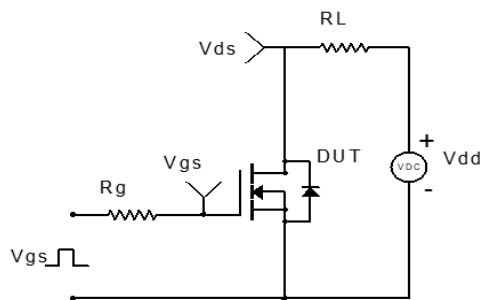


Figure 2: Resistive Switching Test Circuit & Waveform

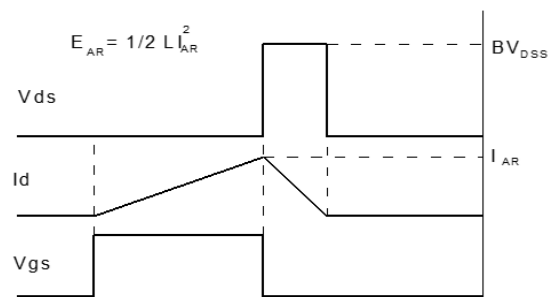
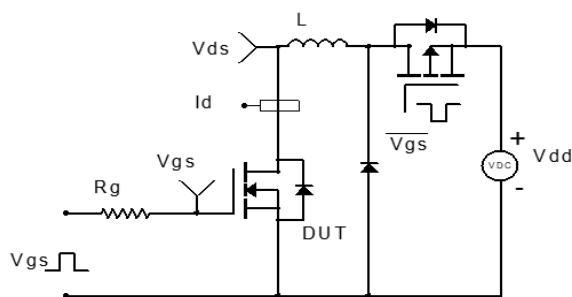


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

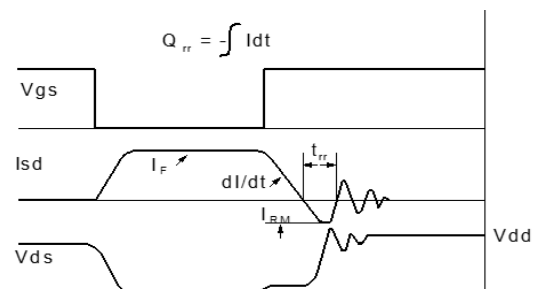
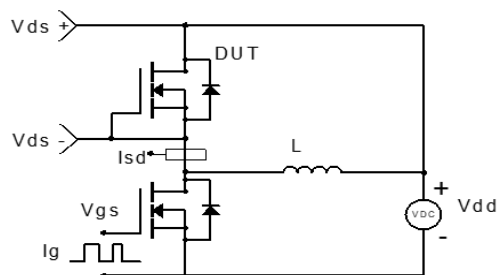
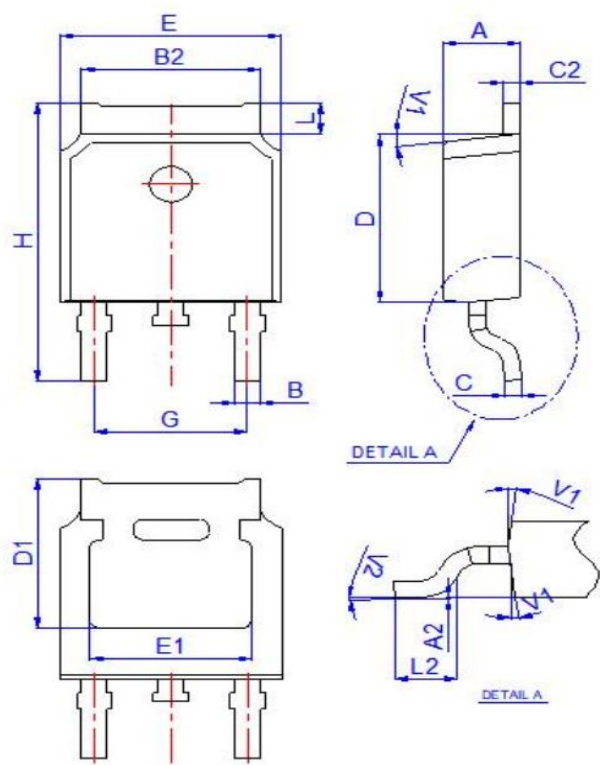


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(TO-252-2L)



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°