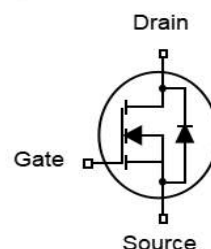


Features

- Ultra low FOM: $R_{DS(on)} \times Q_g$
- Low Effective Output Capacitance
- Excellent Stability and Uniformity
- EMI and performance balanced
- 100% Avalanche Tested
- 100% EAS Tested

V_{DS}	800	V
$R_{DS(on),TYP}@ V_{GS}=10V$	160	m Ω
I_D	23	A

TO-263


Part ID	Package Type	Marking	Packing
ZT80R180B	TO-263	ZT80R180B	1000pcs/Reel

Absolute Maximum Ratings $T_A = 25^\circ\text{C}$, unless otherwise specified

Symbol	Parameter	Rating	Unit	
Common Ratings ($T_c=25^\circ\text{C}$ Unless Otherwise Noted)				
V_{GS}	Gate-Source Voltage	± 30	V	
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	800	V	
T_J	Maximum Junction Temperature	150	$^\circ\text{C}$	
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$	
I_{DM}	Drain Current-Continuous@ Current-Pulsed (Note 2)	$T_c = 25^\circ\text{C}$ 69	A	
Mounted on Large Heat Sink				
I_D	Drain Current-Continuous (Note 1)	$T_c = 25^\circ\text{C}$	23	A
		$T_c = 100^\circ\text{C}$	14	A
P_D	Maximum Power Dissipation	215	W	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	5.9	$^\circ\text{C/W}$	
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	80	$^\circ\text{C/W}$	
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed	1125	mJ	
E_{AR}	Repetitive Avalanche Energy	28	mJ	
dv/dt	MOSFET dv/dt ruggedness (@ $V_{DS}=0\sim 480V$)	50	V/ns	
dv/dt	Reverse Diode dv/dt (Note 3)	15	V/ns	

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

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T_J=25°C (unless otherwise stated)						
V _(BR) DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	800	--	--	V
I _{DSS}	Drain to source leakage current	V _{DS} =800V, V _{GS} =0V	--	--	1	μA
		V _{DS} =800V, T _J =150°C	--	--	100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±30V, V _{DS} =0V	--	--	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	2.5	3.5	4.5	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =5A	--	160	180	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =100V, V _{GS} =0V, f=1MHz	--	2449	--	pF
C _{oss}	Output Capacitance		--	56	--	pF
C _{rss}	Reverse Transfer Capacitance		--	5	--	pF
R _g	Gate Resistance	f=1MHz	--	1.5	--	Ω
Q _g	Total Gate Charge	V _{DD} =640V, I _D =23A, V _{GS} =10V	--	54	--	nC
Q _{gs}	Gate-Source Charge		--	10.2	--	nC
Q _{gd}	Gate-Drain Charge		--	21	--	nC
Switching Characteristics						
T _{d(on)}	Turn-on Delay Time	V _{DD} =400V, I _D =23A, R _G =25Ω, V _{GS} =10V	--	67	--	ns
T _r	Turn-on Rise Time		--	76	--	ns
T _{d(off)}	Turn-Off Delay Time		--	179	--	ns
T _f	Turn-Off Fall Time		--	57	--	ns
Source- Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage	I _S =4A, V _{GS} =0V	--	--	1.2	V
T _{rr}	Reverse Recovery Time	T _J =25°C, I _S =8A, V _R =400V di/dt=100A/μs	--	405	--	ns
Q _{rr}	Reverse Recovery Charge		--	4.6	--	uC
I _{rrm}	Peak reverse recovery current		--	22.8	--	A

Notes:

- Limited by maximum junction temperature.
- Repetitive Rating: Pulse width limited by maximum junction temperature.
- Identical low side and high side switch with identical R_G.

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

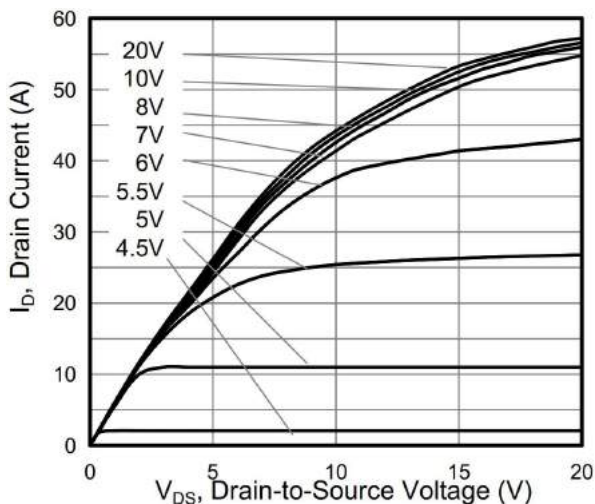


Figure 1. Output Characteristics

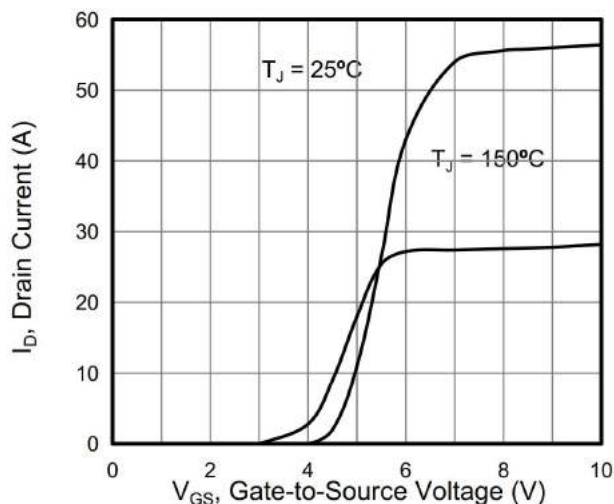


Figure 4. Transfer Characteristics

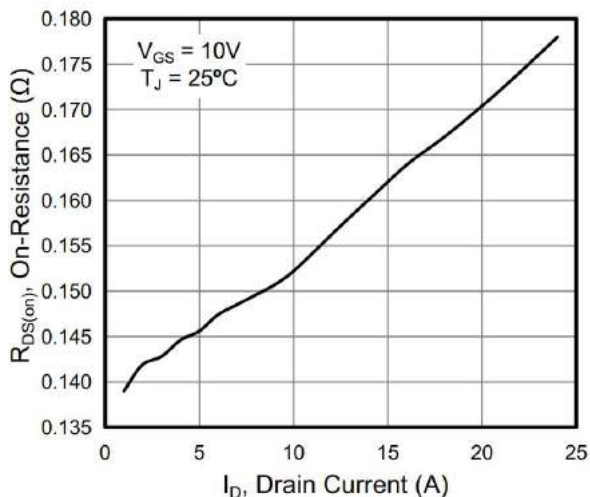


Figure 2. On-Resistance vs Drain Current

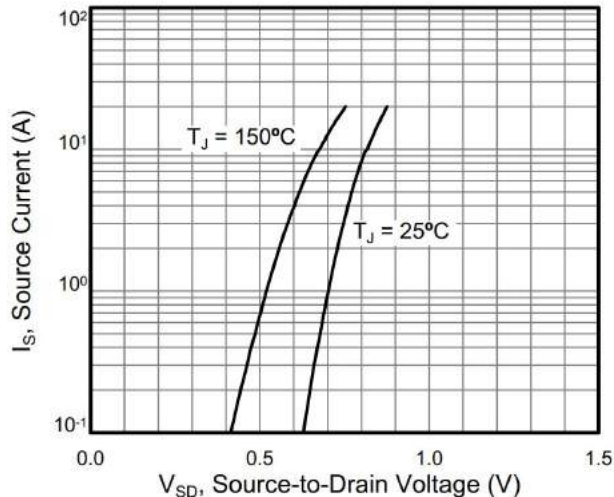


Figure 5. Body Diode Forward Voltage

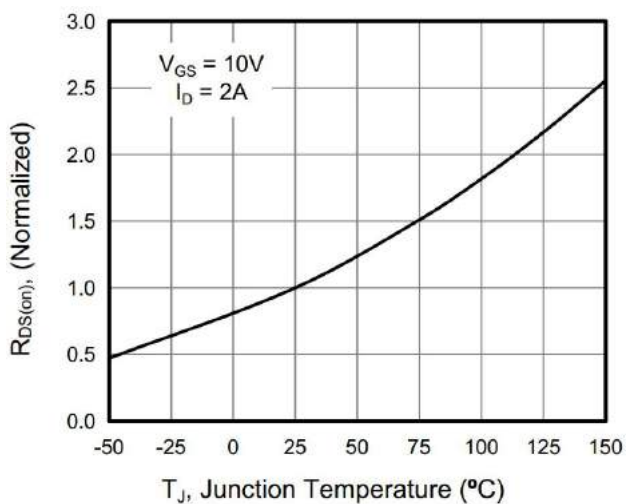


Figure 3. On-Resistance vs Junction Temperature

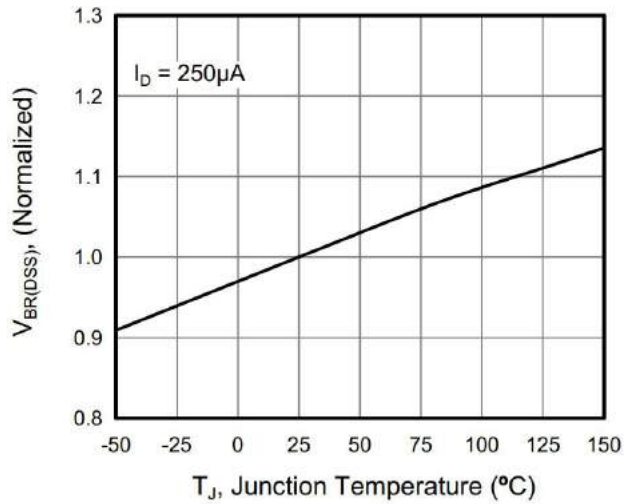


Figure 6. Breakdown Voltage vs Junction Temperature

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

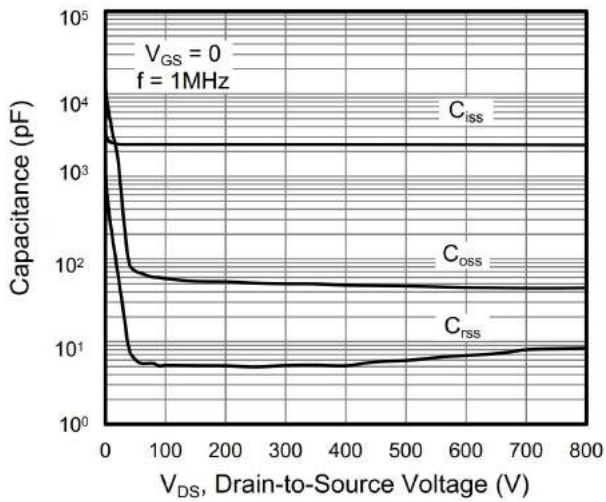


Figure 7. Capacitance

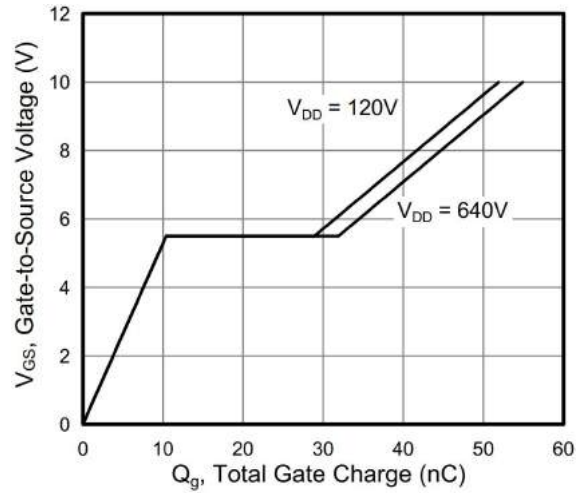


Figure 9. Gate Charge

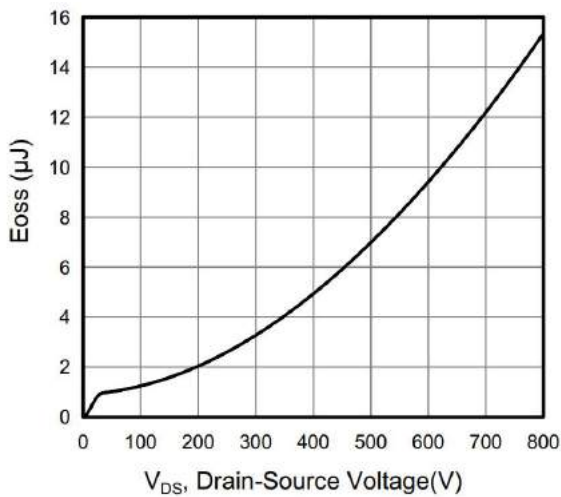


Figure 8 . Typ. Coss Stored Energy

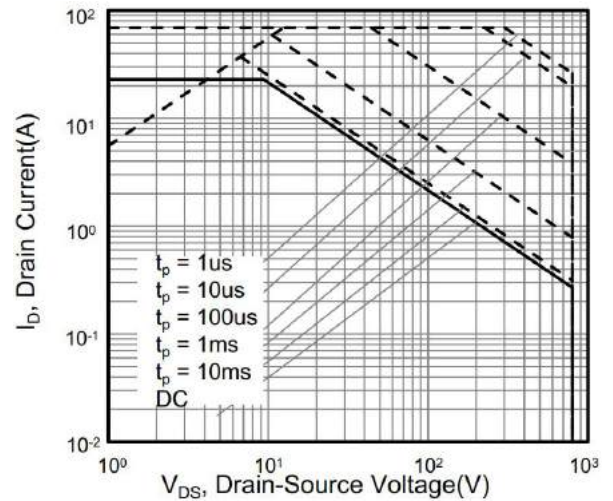


Figure 10. Safe Operation Area

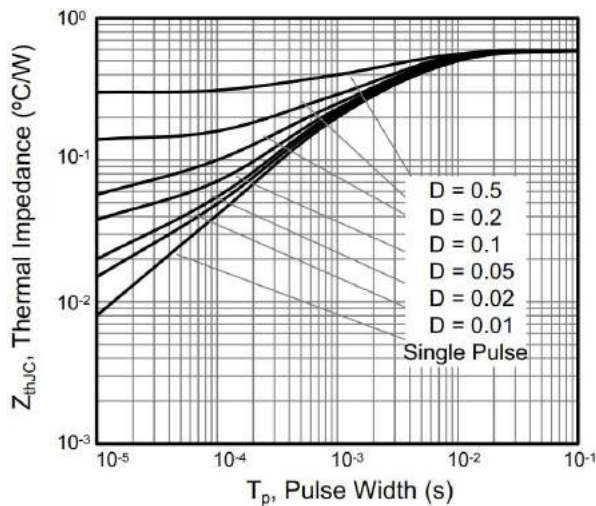


Figure 11. Transient Thermal Impedance

Test Circuits

Figure 1: Gate Charge Test Circuit and Waveform

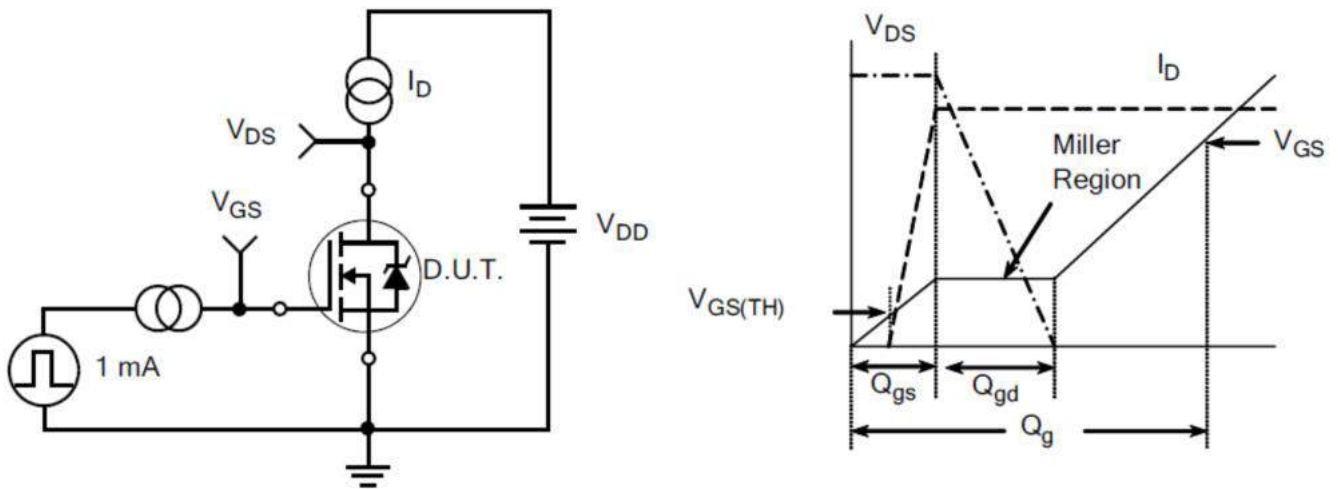


Figure 2: Resistive Switching Test Circuit and Waveform

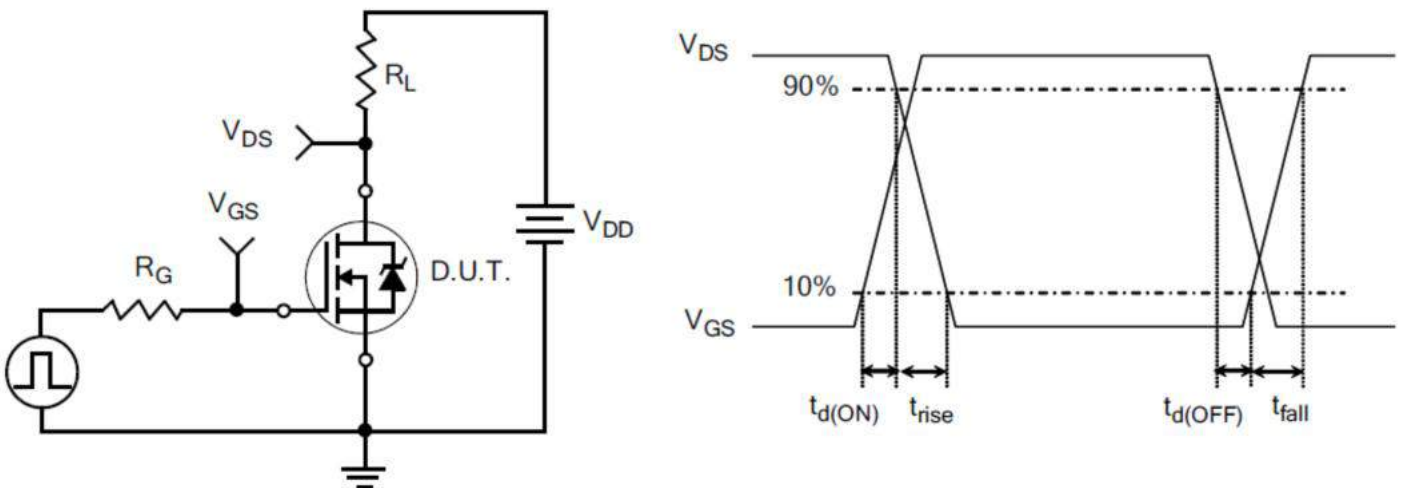
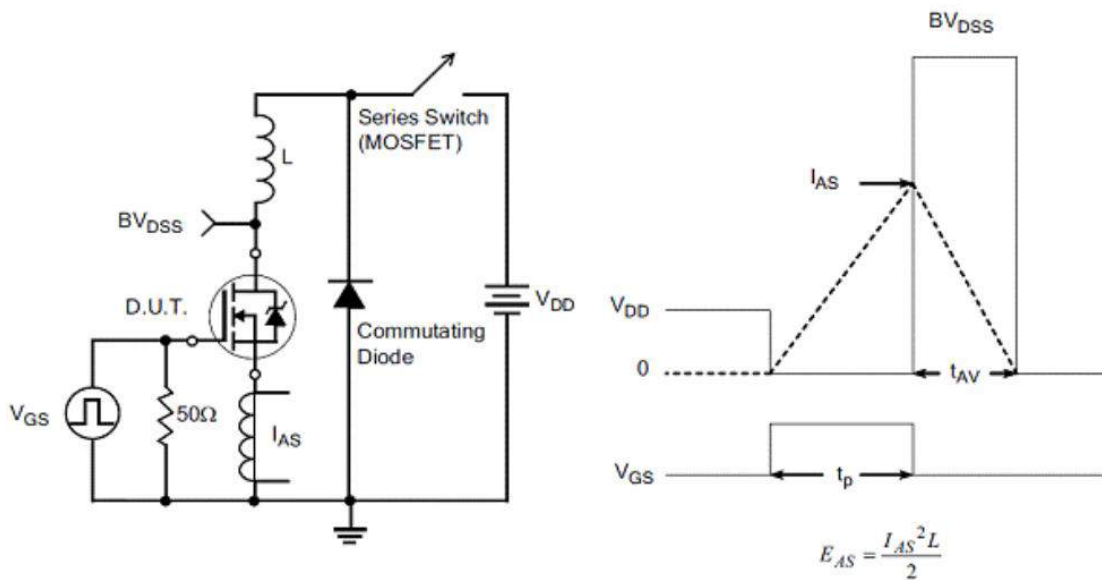
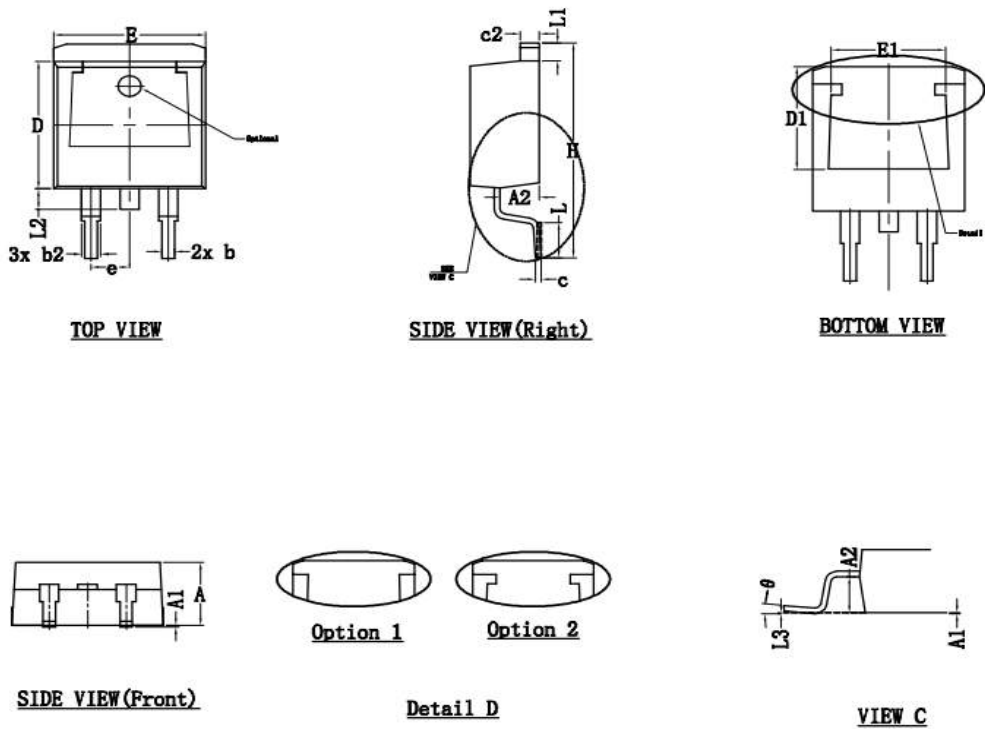


Figure 3: Unclamped Inductive Switching Test Circuit and Waveform



TO-263-2L Package Information



SYMBOL	DIMENSIONS			
	mm		inch	
	MIN.	MAX.	MIN.	MAX.
A	4.30	4.86	0.169	0.191
A1	0.00	0.25	0.00	0.010
A2	2.34	2.79	0.092	0.110
b	0.68	0.94	0.027	0.037
b2	1.15	1.35	0.045	0.053
c	0.33	0.65	0.013	0.026
c2	1.17	1.40	0.046	0.055
D	8.38	9.45	0.330	0.372
D1	6.90	8.17	0.272	0.322
E	9.78	10.50	0.385	0.413
E1	6.50	8.60	0.256	0.339
H	14.61	15.88	0.575	0.625
e	2.54 BSC.		0.100 BSC.	
L	1.78	2.79	0.070	0.110
L1	0.70	1.60	0.028	0.063
L2	1.00	1.78	0.039	0.070
L3	0.254 BSC.		0.010 BSC.	
θ	0°	8°	0.00	0.315

Customer Service

Sales and Service:

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