

SDM005G08YB

80V SGT N-Channel MOSFETs

Rev A.0

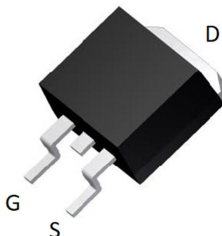
Feature

- ✧ Low $R_{DS(ON)}$
- ✧ Low Gate Charge
- ✧ High current Capability
- ✧ Green product (RoHS compliant) , lead free
- ✧ 100% UIS Tested, 100% Rg Tested

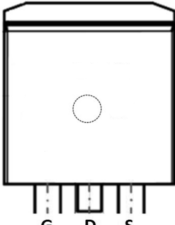
Product Summary

V_{DS}	80	V
$V_{GS(th)}_{Typ}$	3.0	V
$R_{DS(ON)}_{Typ}$ (at $V_{GS} = 10V$)	4.0	m Ω
I_D (at $V_{GS} = 10V$) ⁽¹⁾	154	A

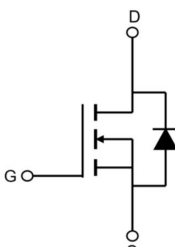
Type	Package	Marking	Outline	Media	Quantity (pcs)
SDM005G08YB	TO-263	M005G08B	Tape	13 "Reel	800



TO-263 top view



Pin Assignment



Schematic Diagram

Absolute Maximum Ratings (Rating at $T_C = 25^\circ C$ unless otherwise noted)

Parameter		Symbol	Maximum	Unit
Drain-Source Voltage		V_{DS}	80	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current ⁽¹⁾	$T_C = 25^\circ C$	I_D	154	A
	$T_C = 100^\circ C$		97	
Pulsed Drain Current ⁽²⁾		I_{DM}	465	A
Maximum Body-Diode Continuous Current		I_S	154	A
Avalanche Energy ⁽³⁾		E_{AS}	338	mJ
Power Dissipation ⁽⁴⁾	$T_C = 25^\circ C$	P_D	208	W
	$T_C = 100^\circ C$		83	
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to +150	$^\circ C$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	80	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=80\text{V}$, $V_{GS}=0\text{V}$ $T_J=55^{\circ}\text{C}$	-	-	1 5	μA
I_{GSS}	Gate-Body Leakage Current	$V_{DS}=0\text{V}$, $V_{GS}=\pm 20\text{V}$	-	-	± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	2	3	4	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}$, $I_D=20\text{A}$	-	4	4.8	m Ω
V_{SD}	Diode Forward Voltage	$I_S=1\text{A}$, $V_{GS}=0\text{V}$	-	0.7	1.0	V
DYNAMIC PARAMETERS ⁽⁵⁾						
C_{iss}	Input Capacitance	$V_{GS}=0\text{V}$, $V_{DS}=40\text{V}$, $f=1\text{MHz}$	-	3367	-	pF
C_{oss}	Output Capacitance		-	1265	-	pF
C_{rss}	Reverse Transfer Capacitance		-	47	-	pF
R_g	Gate Resistance	$V_{GS}=0\text{V}$, $V_{DS}=0\text{V}$, $f=1\text{MHz}$	-	1.1	-	Ω
SWITCHING PARAMETERS ⁽⁵⁾						
$Q_g(10\text{V})$	Total Gate Charge	$V_{GS}=0\sim 10\text{V}$, $V_{DS}=40\text{V}$, $I_D=20\text{A}$	-	57	-	nC
$Q_g(6\text{V})$	Total Gate Charge		-	39	-	nC
Q_{gs}	Gate Source Charge		-	18.5	-	nC
Q_{gd}	Gate Drain Charge		-	15.1	-	nC
$t_{D(on)}$	Turn-On Delay Time	$V_{GS}=10\text{V}$, $V_{DS}=40\text{V}$, $R_L=2.0\Omega$, $R_{GEN}=3\Omega$	-	17.7	-	ns
t_r	Turn-On Rise Time		-	29	-	ns
$t_{D(off)}$	Turn-Off Delay Time		-	33	-	ns
t_f	Turn-Off Fall Time		-	10.9	-	ns
t_{rr}	Body Diode Reverse Recovery Time	$I_F=20\text{A}$, $di/dt=100\text{A}/\mu\text{s}$	-	59	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_F=20\text{A}$, $di/dt=100\text{A}/\mu\text{s}$	-	97	-	nC

Thermal Resistances

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Thermal resistance from junction to ambient	45	55	$^{\circ}\text{C} / \text{W}$
$R_{\theta JC}$	Thermal resistance from junction to Case	0.6	0.78	$^{\circ}\text{C} / \text{W}$

Notes:

1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous depends on the thermal & electro-mechanical application board design.
2. This single-pulse measurement was taken under $T_{J_Max}=150^{\circ}\text{C}$.
3. This single-pulse measurement was taken under the following condition [$L=3.0\text{mH}$, $V_{GS}=10\text{V}$, $V_{DD}=40\text{V}$] while its value is limited by $T_{J_Max}=150^{\circ}\text{C}$.
4. The power dissipation P_D is based on $T_{J_Max}=150^{\circ}\text{C}$.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Electrical and Thermal Characteristics

Figure 1: Saturation Characteristics

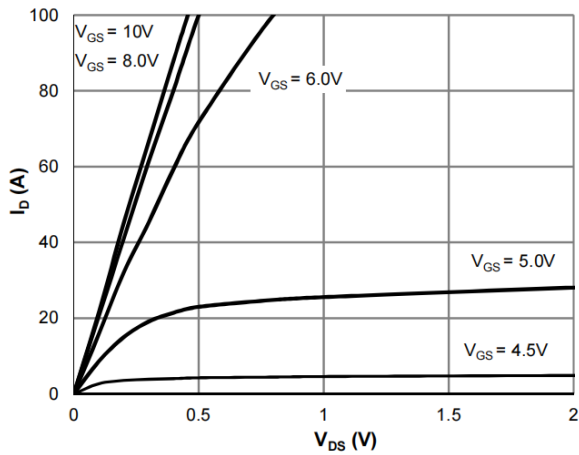


Figure 2: Transfer Characteristics

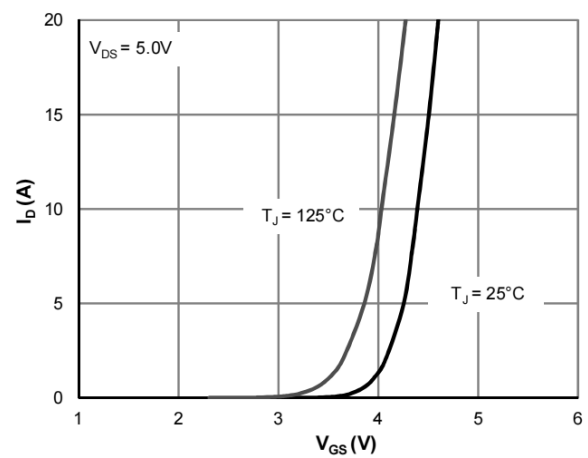
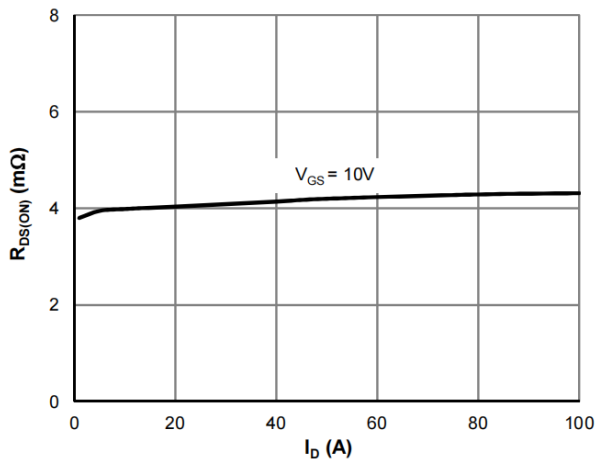
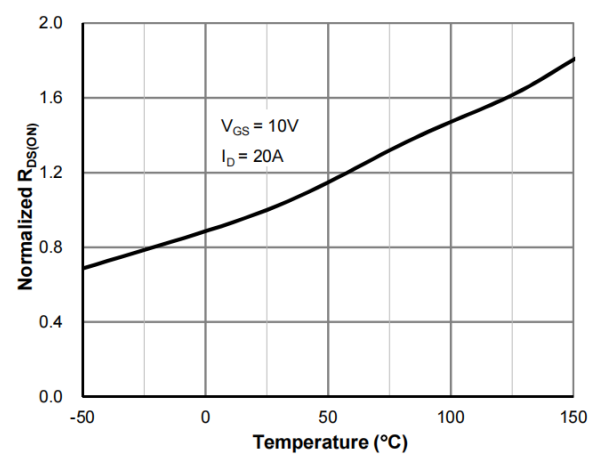
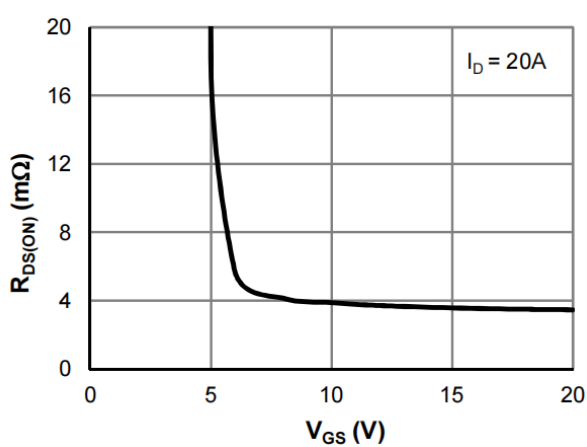
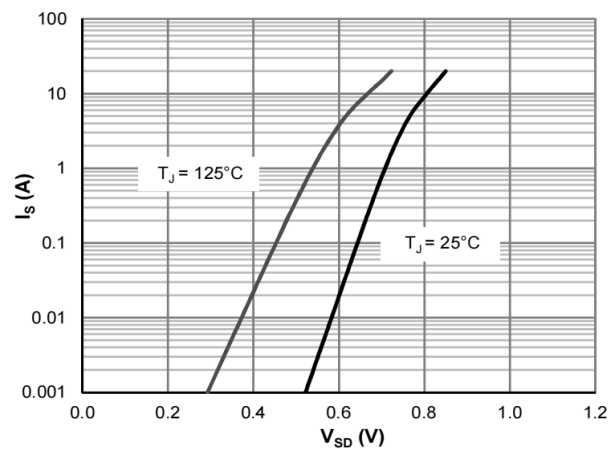
Figure 3: $R_{DS(ON)}$ vs. Drain CurrentFigure 4: $R_{DS(ON)}$ vs. Junction TemperatureFigure 5: $R_{DS(ON)}$ vs. Gate-Source Voltage

Figure 6: Body-Diode Characteristics



Typical Electrical and Thermal Characteristics

Figure 7: Gate-Charge characteristics

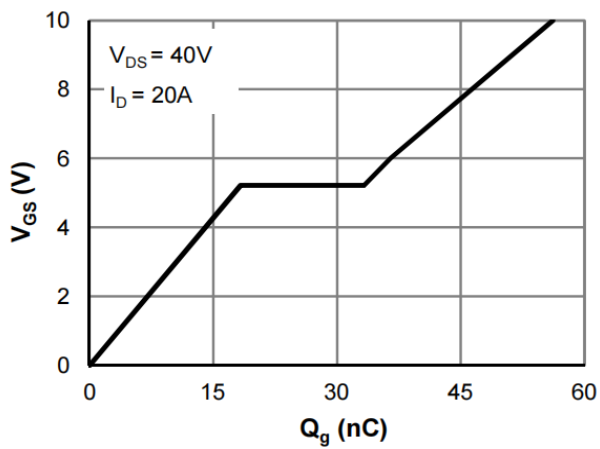


Figure 8: Capacitance characteristics

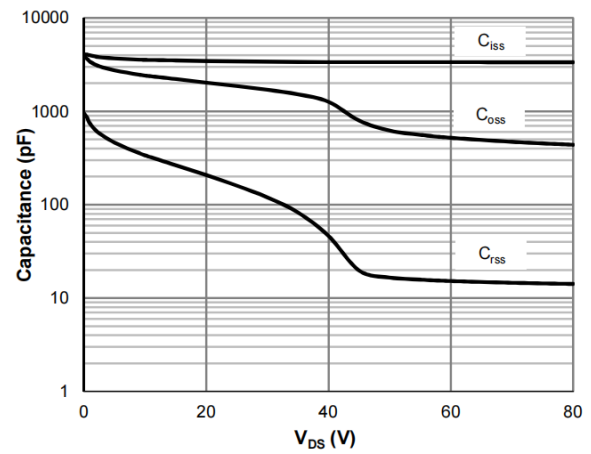


Figure 9: Current De-rating

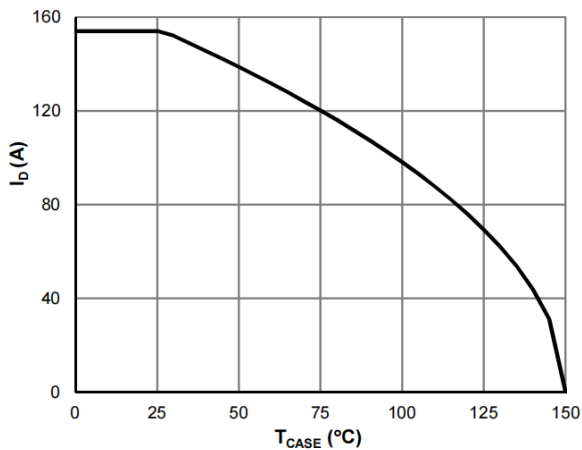


Figure 10: Power De-rating

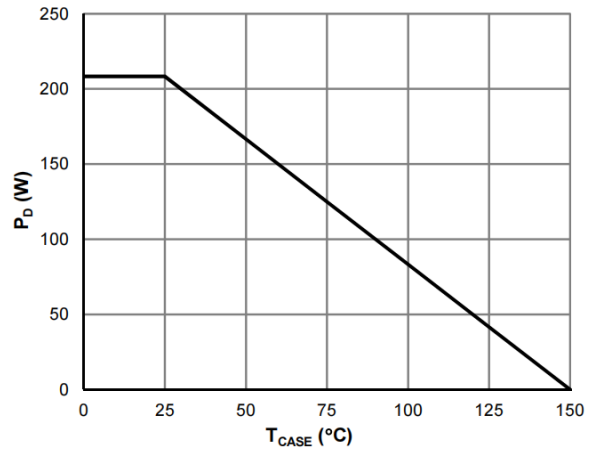


Figure 11: Maximum Safe Operating Area

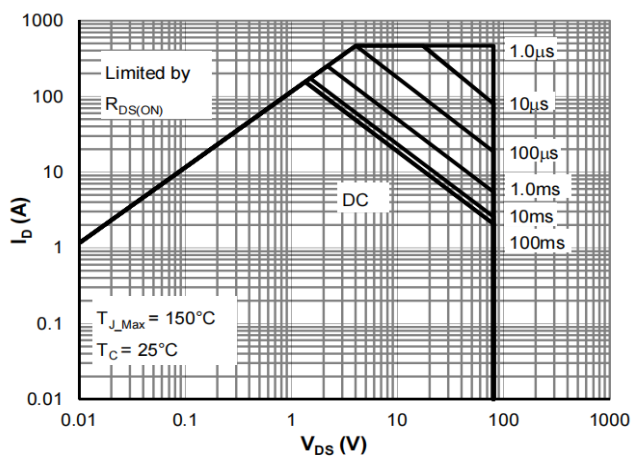
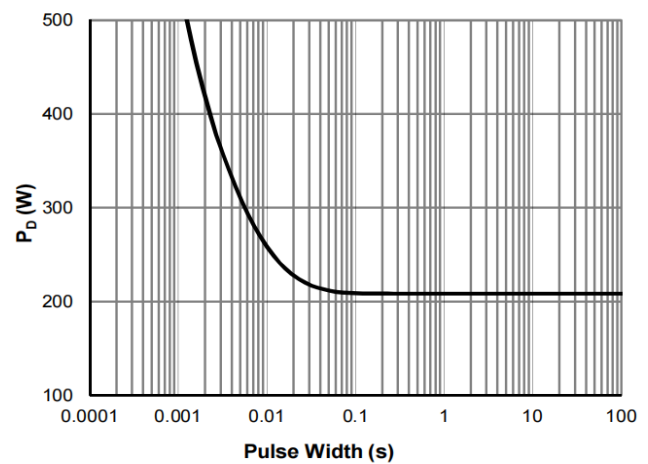
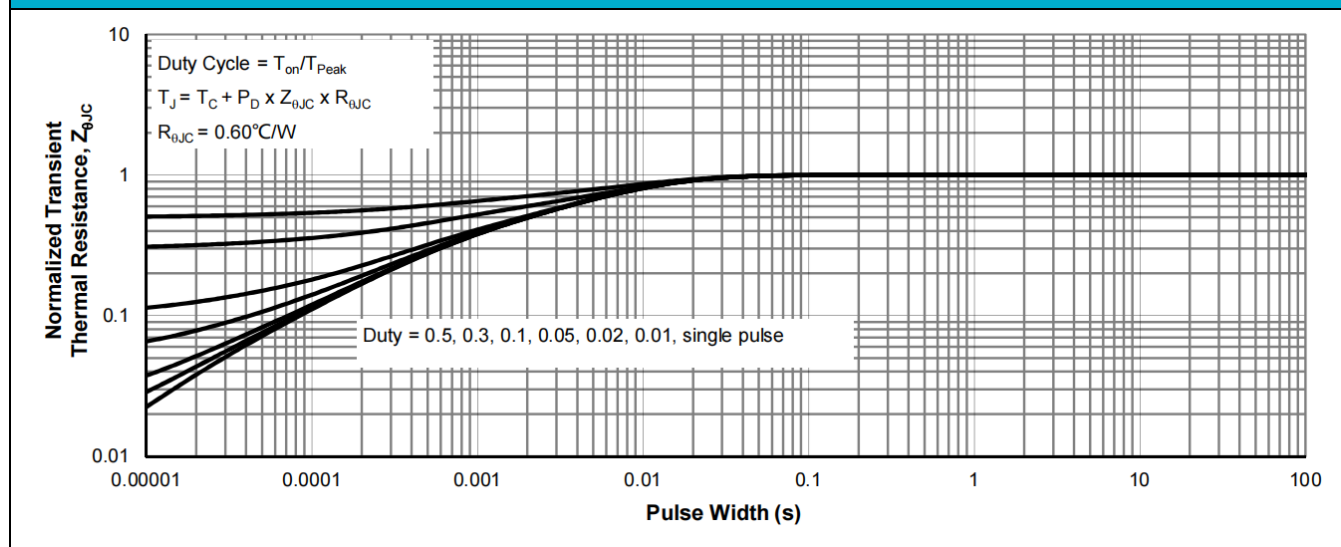


Figure 12: Normalized Maximum Transient Thermal Impedance



Typical Electrical and Thermal Characteristics

Figure 13: Normalized Maximum Transient Thermal Impedance



Test Circuit

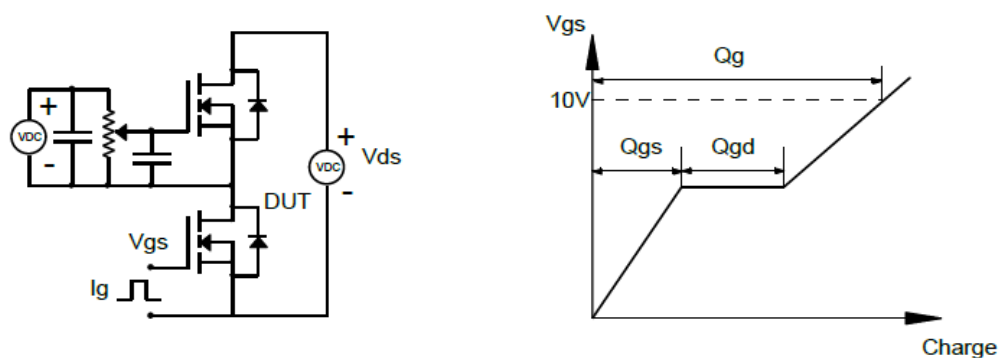


Figure1: Gate Charge Test Circuit & Waveforms

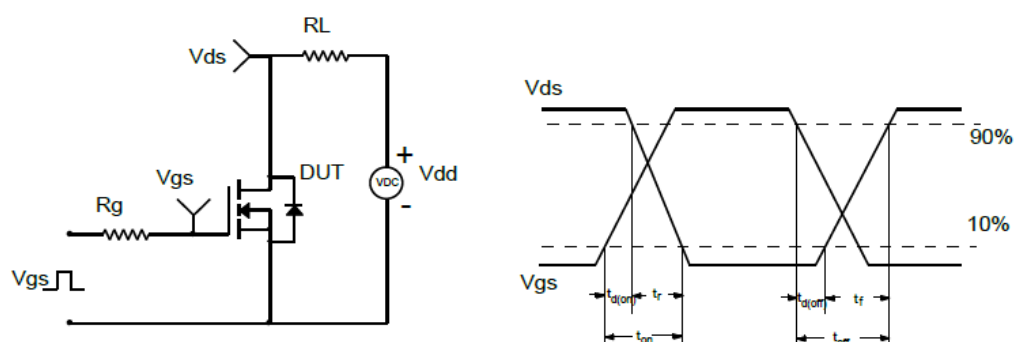


Figure2: Resistive Switching Test Circuit & Waveforms

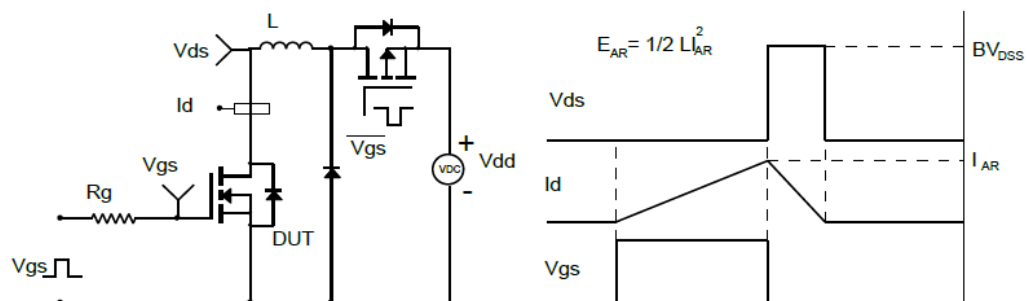


Figure3: Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

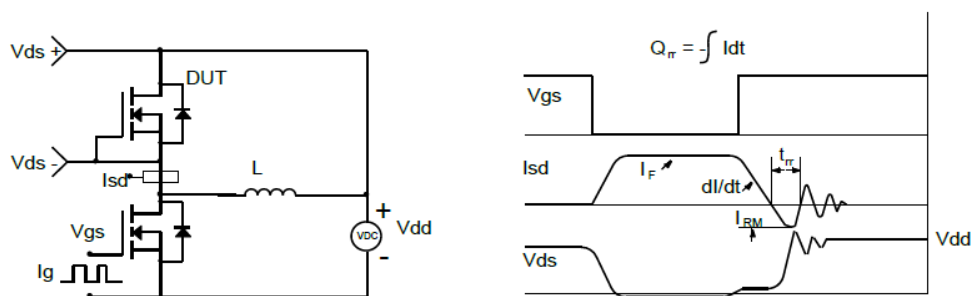
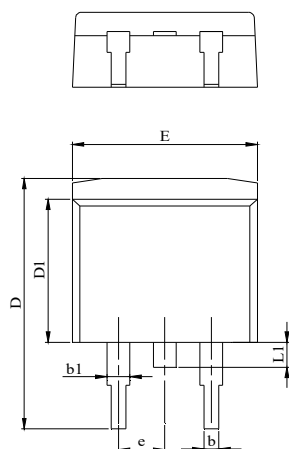


Figure4: Diode Recovery Test Circuit & Waveforms

TO-263 Package Information

Package Outline



DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	4.24		4.77
A1	2.30		2.89
A2	0.00	0.10	0.25
b	0.70		0.96
b1	1.17		1.70
C	0.30		0.60
C1	1.15		1.42
D	14.10		15.88
D1	8.50		9.60
E	9.78		10.36
L	1.78		2.79
L1			1.75
e		2.54	

Recommend Soldering Footprint

