

SDM7002KS

60V N-Channel MOSFETs

Rev B.0

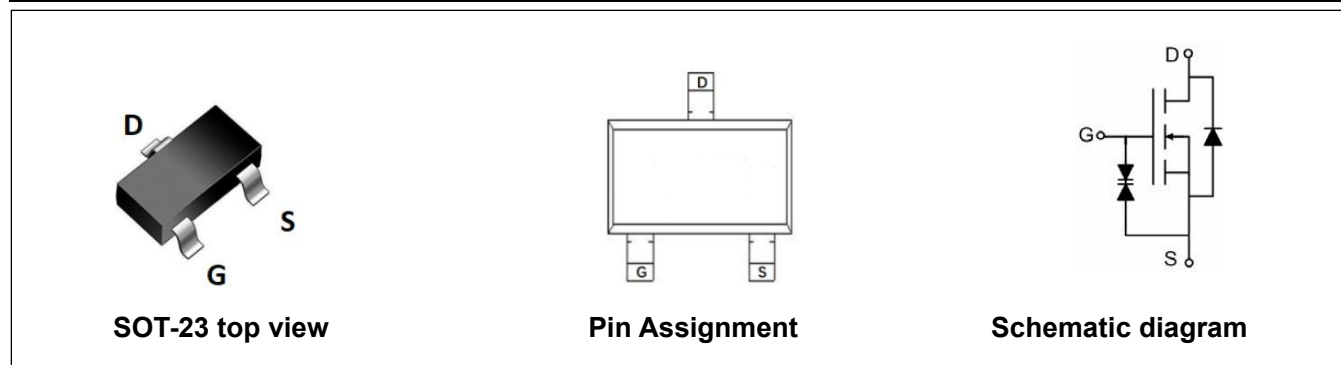
Feature

- ✧ Excellent $R_{DS(ON)}$
- ✧ Low Gate Charge
- ✧ Advanced Trench Technology
- ✧ Green product (RoHS compliant), lead free
- ✧ ESD Protected: 2KV

Product Summary

V_{DS}	60	V
$V_{GS(th)_{Typ}}$	1.5	V
$R_{DS(ON)_{Typ}}$ (at $V_{GS} = 10V$)	1.69	Ω
I_D (at $V_{GS} = 10V$)	0.3	A

Type	Package	Marking	Outline	Media	Quantity (pcs)
SDM7002KS	SOT-23	702K	Tape	7" Reel	3000



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

Parameter		Symbol	Maximum	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_A=25^\circ C$	I_D	0.3	A
	$T_A=100^\circ C$		0.2	
Pulsed Drain Current ⁽¹⁾		I_{DM}	1.2	A
Maximum Body-Diode Continuous Current		I_S	0.3	A
Power Dissipation	$T_A=25^\circ C$	P_D	0.35	W
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	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=60\text{V}$, $V_{GS}=0\text{V}$	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{DS}=0\text{V}$, $V_{GS}=\pm 20\text{V}$	-	-	± 10	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	1	1.5	2.5	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ⁽²⁾	$V_{GS}=10\text{V}$, $I_D=0.3\text{A}$	-	1.69	2.2	Ω
		$V_{GS}=4.5\text{V}$, $I_D=0.2\text{A}$	-	2.05	2.87	Ω
V_{SD}	Diode Forward Voltage	$I_S=0.3\text{A}$, $V_{GS}=0\text{V}$	-	-	1.2	V
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	$V_{GS}=0\text{V}$, $V_{DS}=25\text{V}$, $f=1\text{MHz}$	-	27	-	pF
C_{oss}	Output Capacitance		-	10.9	-	pF
C_{rss}	Reverse Transfer Capacitance		-	4.1	-	pF
SWITCHING PARAMETERS						
Q_g	Total Gate Charge	$V_{GS}=10\text{V}$, $V_{DS}=4.5\text{V}$, $I_D=0.3\text{A}$	-	1.5	-	nC
Q_{gs}	Gate Source Charge		-	0.31	-	nC
Q_{gd}	Gate Drain Charge		-	0.59	-	nC
$t_{D(on)}$	Turn-On Delay Time	$V_{GS}=10\text{V}$, $V_{DS}=10\text{V}$, $I_D=0.2\text{A}$, $R_{GEN}=10\Omega$	-	2.1	-	ns
t_r	Turn-On Rise Time		-	13	-	ns
$t_{D(off)}$	Turn-Off Delay Time		-	6.9	-	ns
t_f	Turn-Off Fall Time		-	19	-	ns

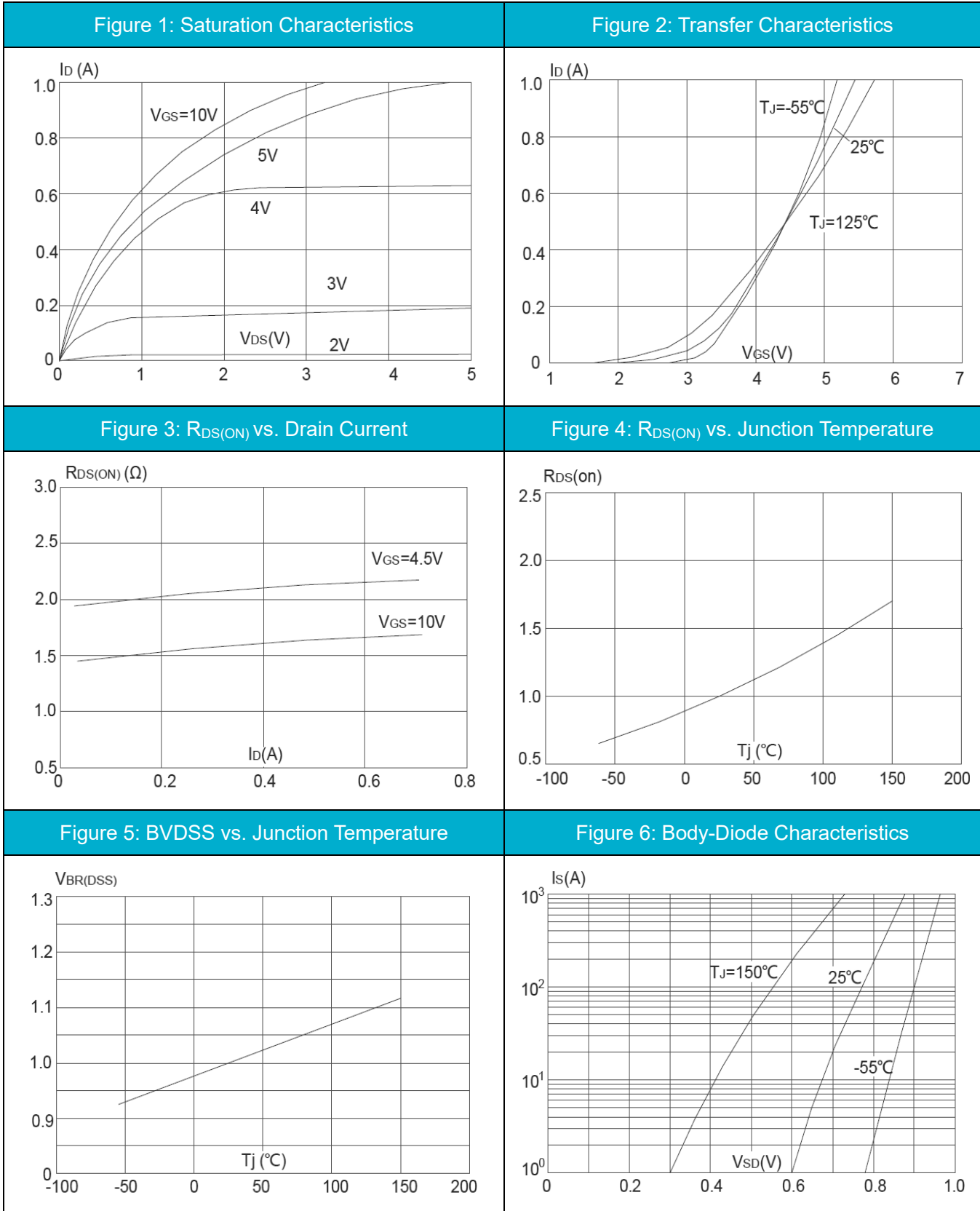
Thermal Resistances

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Thermal resistance from junction to Ambient	-	357	$^{\circ}\text{C}/\text{W}$

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

Typical Electrical and Thermal Characteristics



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Figure 7: Gate-Charge characteristics Figure 8: Capacitance characteristics

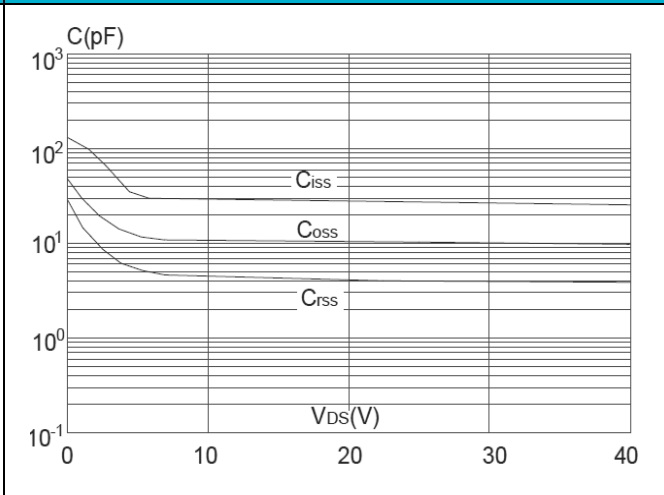
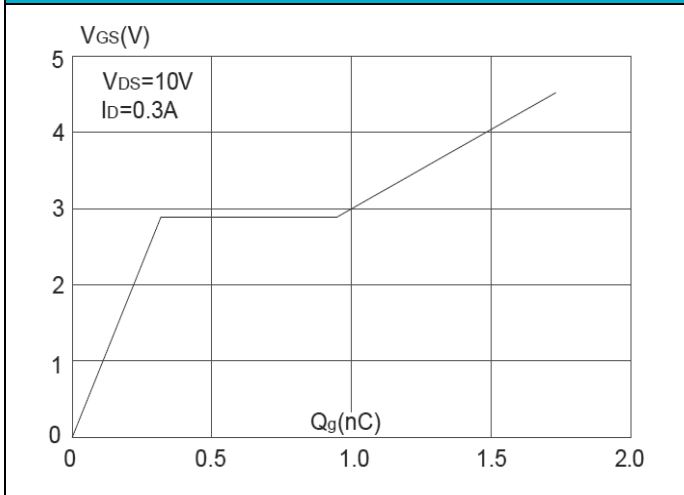


Figure 9: Current De-rating

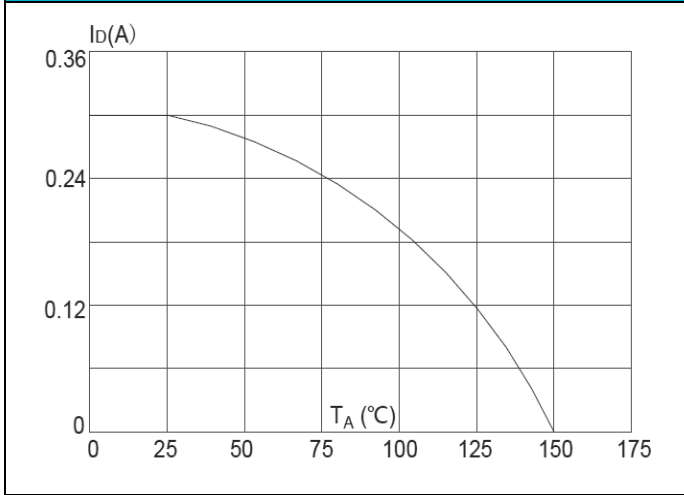


Figure 10: Maximum Safe Operating Area

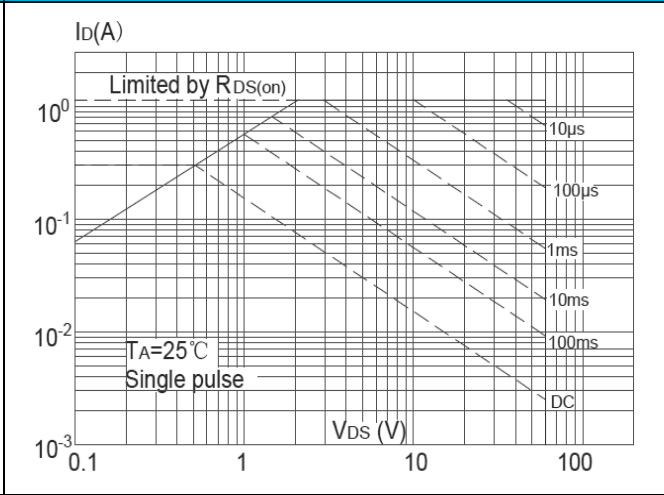
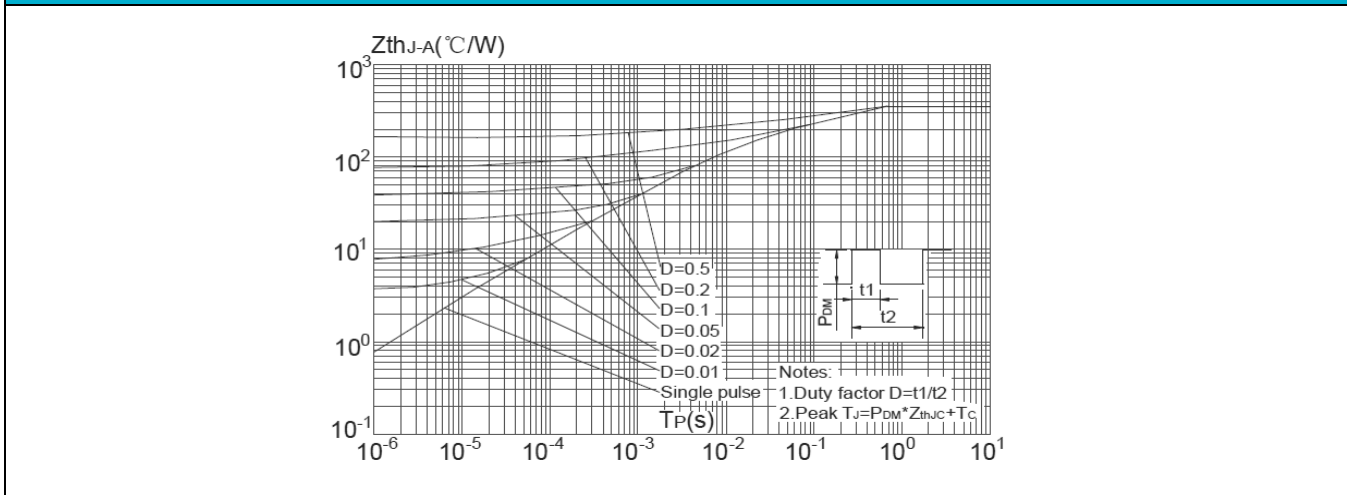


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



Test Circuit

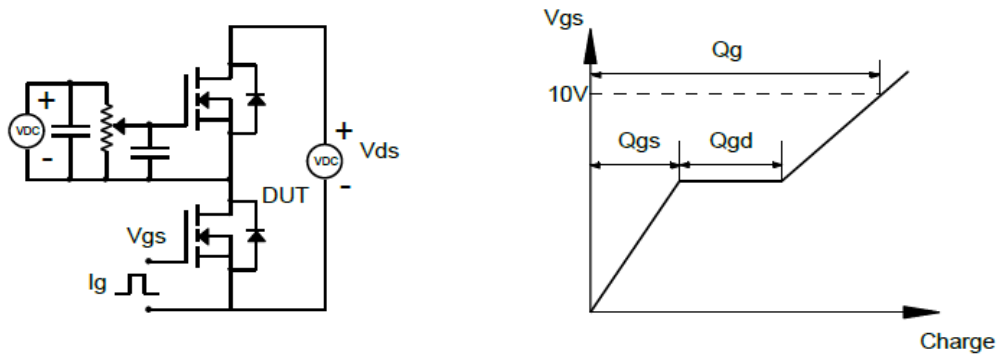


Figure1: Gate Charge Test Circuit & Waveforms

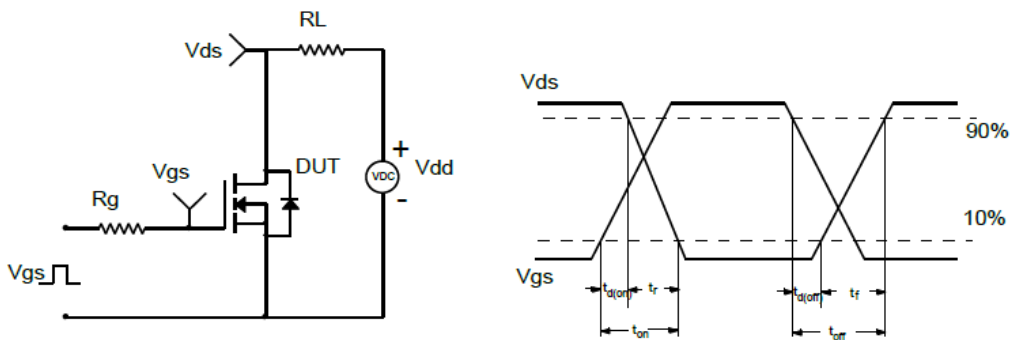


Figure2: Resistive Switching Test Circuit & Waveforms

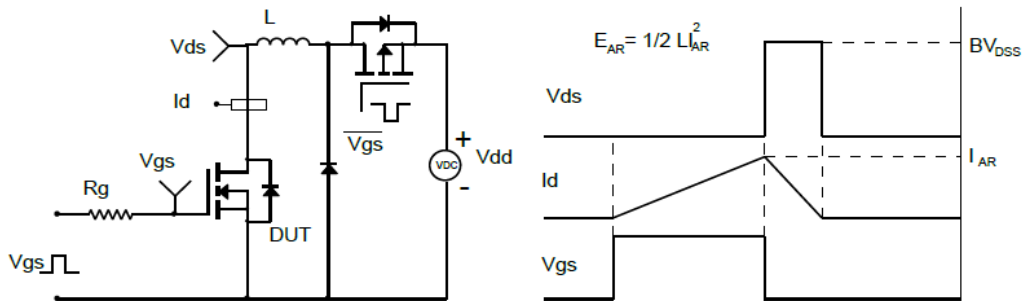


Figure3: Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

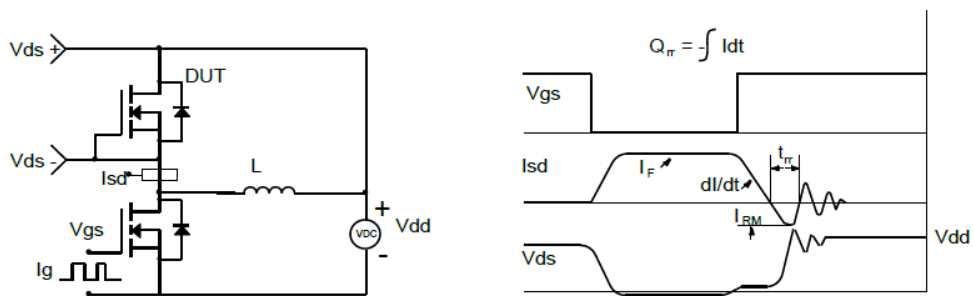
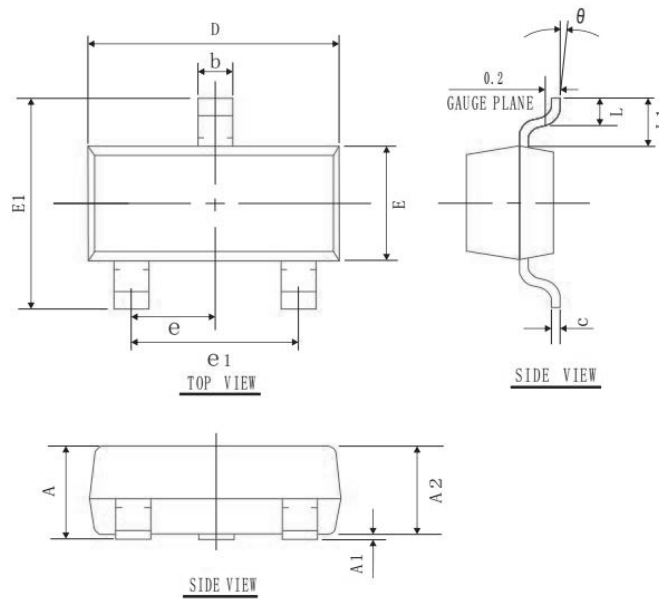


Figure4: Diode Recovery Test Circuit & Waveforms

SOT-23 Package Information



COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	0.90	1.05	1.20
A1	0.00	0.05	0.10
A2	0.90	1.00	1.10
b	0.30	0.40	0.50
c	0.08	0.10	0.15
D	2.80	2.90	3.00
E	1.20	1.30	1.40
E1	2.30	2.40	2.50
L	0.30	0.40	0.50
θ	0°	5°	10°
L1	0.55 REF		
e	0.95 BSC		
e1	1.90 REF		

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