

SDM45AN03D

30V N-Channel MOSFETs

Rev A.0

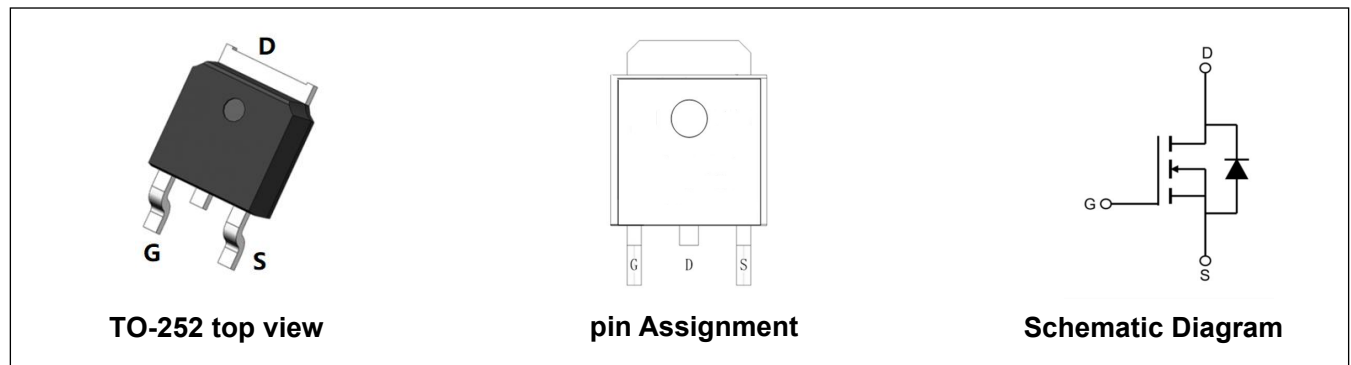
Feature

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

Product Summary

V_{DS}	30	V
$V_{GS(th_Typ)}$	1.9	V
$R_{DS(ON)_Typ}$ (at $V_{GS} = 10V$)	3.4	m Ω
I_D (at $V_{GS} = 10V$) ⁽¹⁾	100	A

Type	Package	Marking	Outline	Media	Quantity (pcs)
SDM45AN03D	TO-252	M45AN03	Tape	13" Reel	2500



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

Parameter		Symbol	Maximum	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current ⁽¹⁾	$T_C=25^\circ C$	I_D	100	A
	$T_C=100^\circ C$		63	
Pulsed Drain Current ⁽²⁾		I_{DM}	400	A
Maximum Body-Diode Continuous Current		I_S	100	A
Avalanche Energy ⁽³⁾		E_{AS}	110	mJ
Power Dissipation ⁽⁴⁾	$T_C=25^\circ C$	P_D	52	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	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=30\text{V}$, $V_{GS}=0\text{V}$	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{DS}=0\text{V}$, $V_{GS}=\pm 20\text{V}$	-	-	± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	1.0	1.9	2.5	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}$, $I_D=30\text{A}$	-	3.4	4.4	m Ω
		$V_{GS}=4.5\text{V}$, $I_D=20\text{A}$	-	5.7	7.4	
V_{SD}	Diode Forward Voltage	$I_S=30\text{A}$, $V_{GS}=0\text{V}$	-	-	1.2	V
DYNAMIC PARAMETERS ⁽⁵⁾						
C_{iss}	Input Capacitance	$V_{GS}=0\text{V}$, $V_{DS}=15\text{V}$, $f=1\text{MHz}$	-	2261	-	pF
C_{oss}	Output Capacitance		-	297	-	pF
C_{rss}	Reverse Transfer Capacitance		-	233	-	pF
SWITCHING PARAMETERS ⁽⁵⁾						
Q_g	Total Gate Charge	$V_{GS}=0$ to 10V , $V_{DS}=15\text{V}$, $I_D=30\text{A}$	-	43	-	nC
Q_{gs}	Gate Source Charge		-	11	-	nC
Q_{gd}	Gate Drain Charge		-	13	-	nC
$t_{D(on)}$	Turn-On Delay Time	$V_{GS}=10\text{V}$, $V_{DD}=15\text{V}$, $I_D=30\text{A}$, $R_{GEN}=3\Omega$	-	11	-	ns
t_r	Turn-On Rise Time		-	17	-	ns
$t_{D(off)}$	Turn-Off Delay Time		-	37	-	ns
t_f	Turn-Off Fall Time		-	13	-	ns
t_{rr}	Body Diode Reverse Recovery Time	$I_F=20\text{A}$, $di/dt=100\text{A}/\mu\text{s}$	-	13	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_F=20\text{A}$, $di/dt=100\text{A}/\mu\text{s}$	-	2.7	-	nC

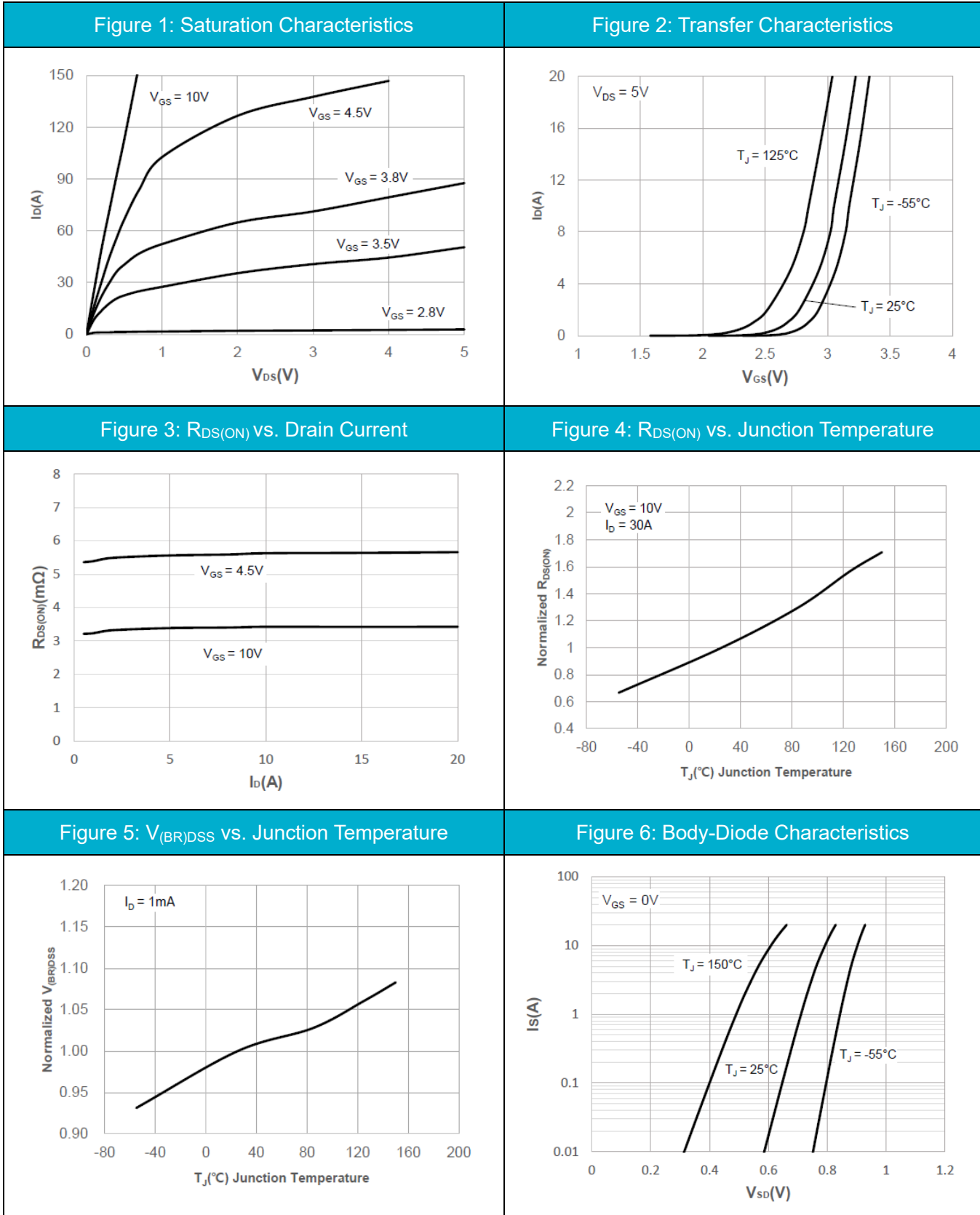
Thermal Resistances

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Thermal resistance from junction to ambient	-	33	°C /W
$R_{\theta JC}$	Thermal resistance from junction to Case	-	2.4	°C /W

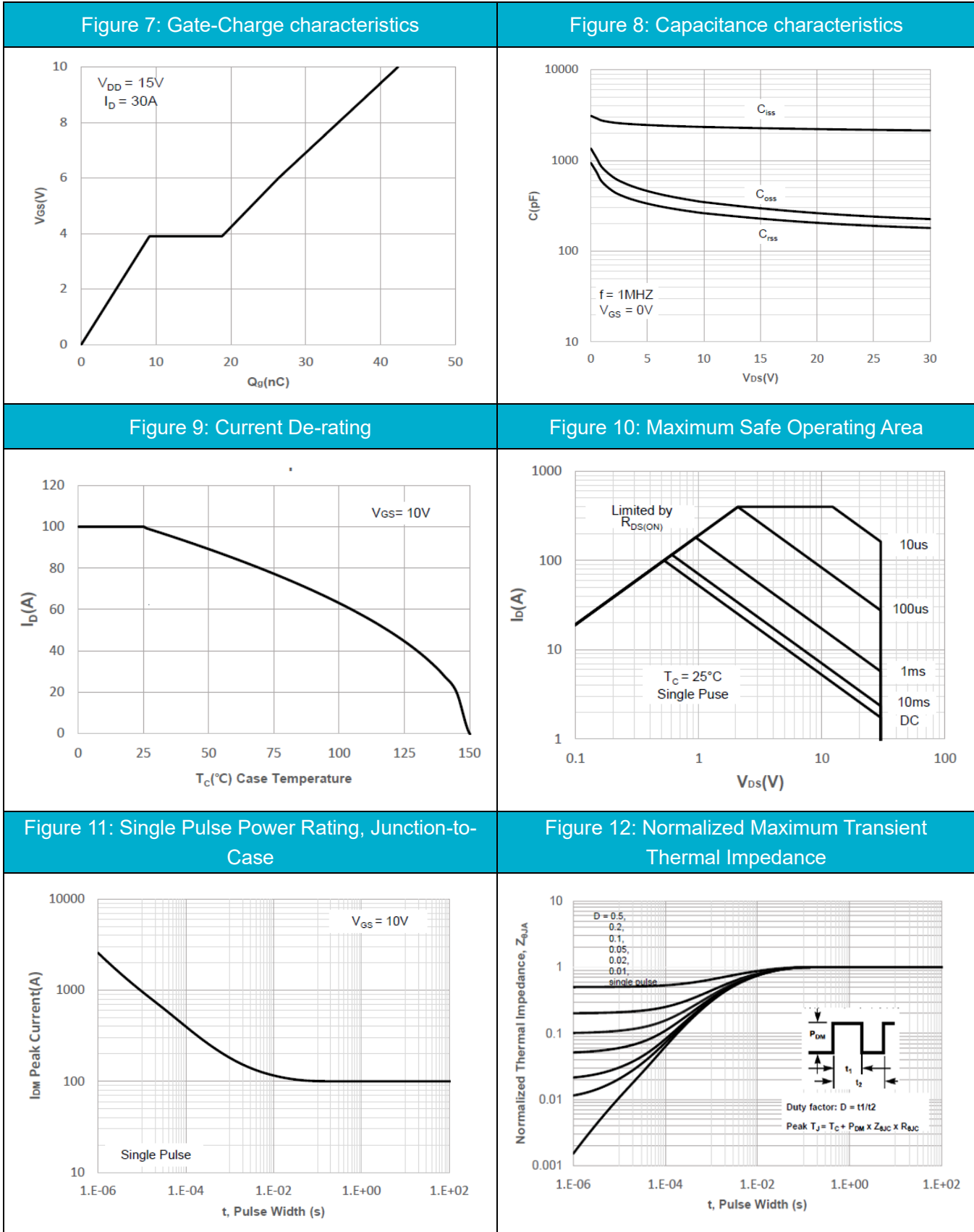
Notes:

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 $T_{J_Max}=150^{\circ}C$.
3. This single-pulse measurement was taken under the following condition [$L=0.5mH$, $V_{GS}=10V$, $V_{DD}=15V$, $I_{AS}=21A$] while its value is limited by $T_{J_Max}=150^{\circ}C$.
4. The power dissipation P_D is based on $T_{J_Max}=150^{\circ}C$.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Electrical and Thermal Characteristics



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Test Circuit

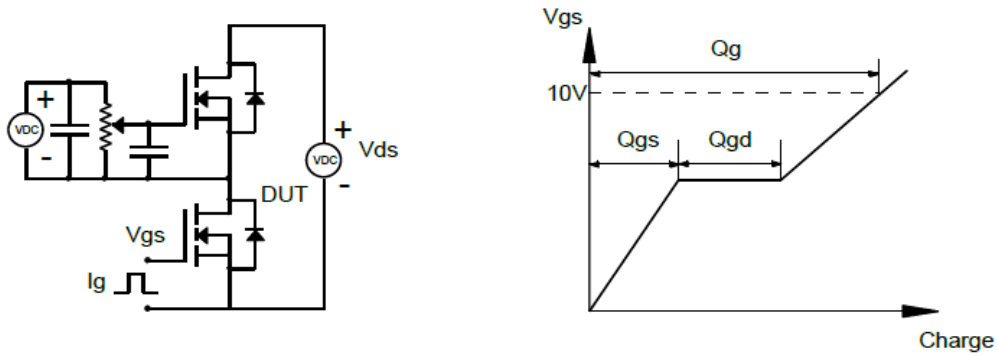


Figure1: Gate Charge Test Circuit & Waveforms

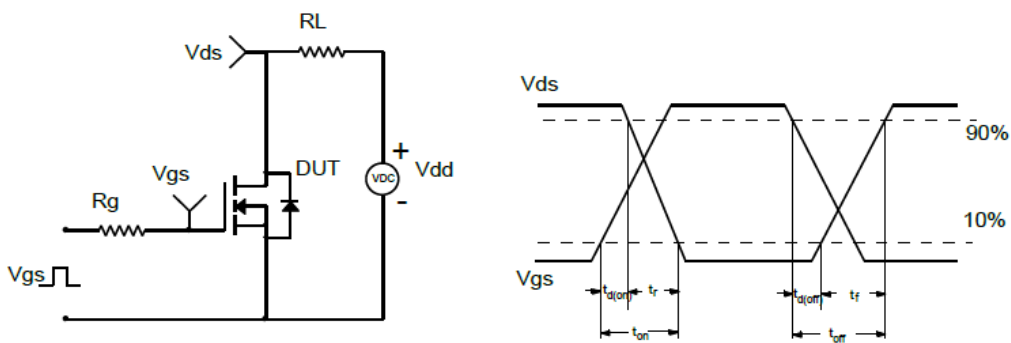


Figure2: Resistive Switching Test Circuit & Waveforms

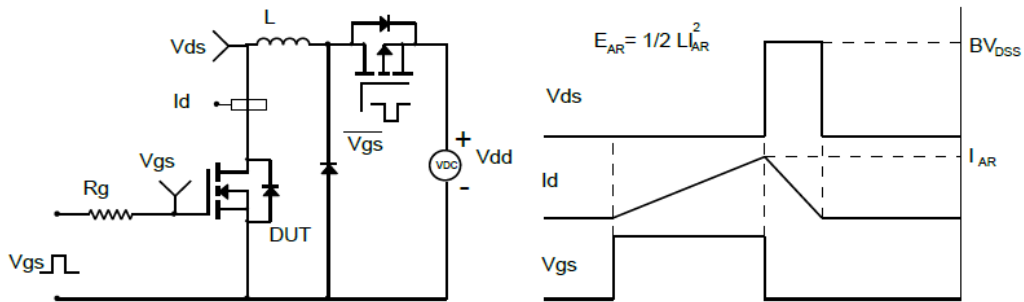


Figure3: Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

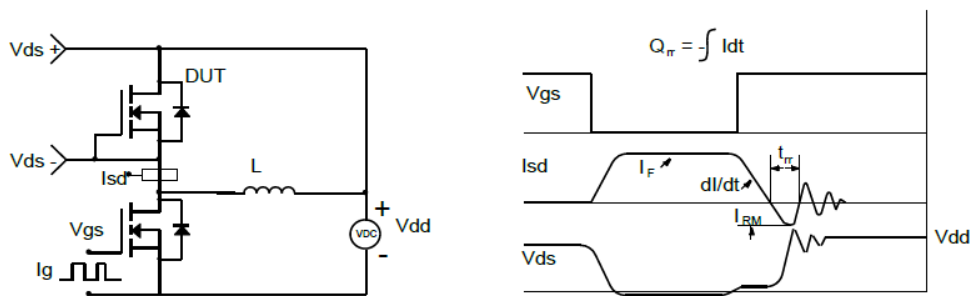
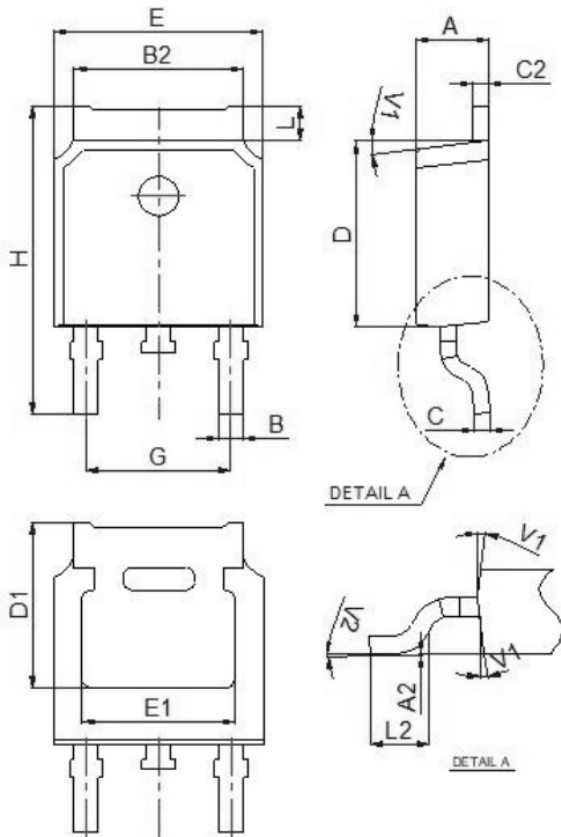


Figure4: Diode Recovery Test Circuit & Waveforms

SDM45AN03D

TO-252 Package Information



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°