

SDM34AG10K

100V SGT N-Channel MOSFETs

Rev A.0

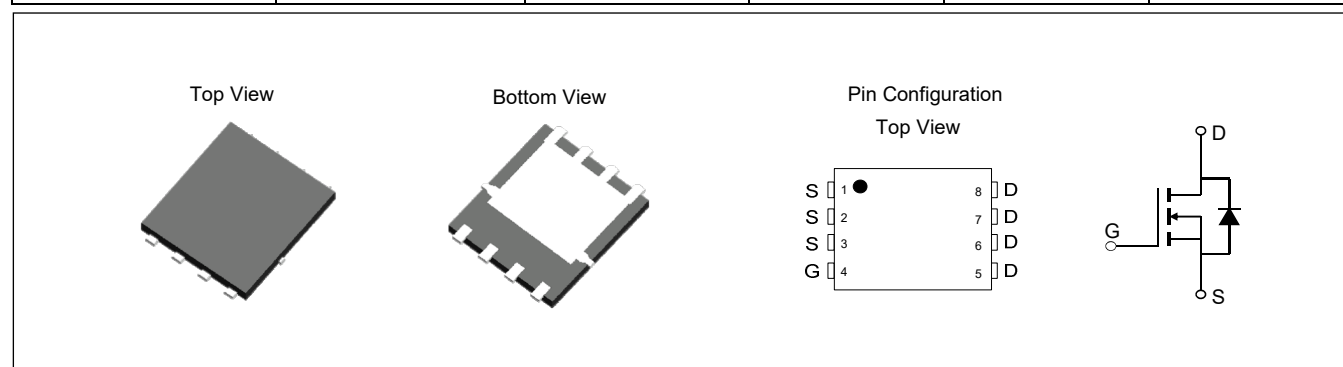
Feature

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

Product Summary

V_{DS}	100	V
$V_{GS(th)}_{Typ}$	1.6	V
$R_{DS(ON)}_{Typ}$ (at $V_{GS} = 10V$)	2.8	mΩ
I_D (at $V_{GS} = 10V$) ⁽¹⁾	135	A

Type	Package	Marking	Outline	Media	Quantity (pcs)
SDM34AG10K	PDFN5x6-8L	M34AG10	Tape	13" Reel	5000



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

Parameter		Symbol	Maximum	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current ⁽¹⁾	$T_C = 25^\circ C$	I_D	135	A
	$T_C = 100^\circ C$		85	
Pulsed Drain Current ⁽²⁾		I_{DM}	483	A
Continuous Drain Current ⁽⁶⁾	$T_C = 25^\circ C$	I_D	100	A
Avalanche Current ⁽³⁾		I_{AS}	72	A
Avalanche Energy ⁽³⁾		E_{AS}	259	mJ
Power Dissipation ⁽⁴⁾	$T_C = 25^\circ C$	P_D	114	W
	$T_C = 100^\circ C$		45	
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	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	100	-	-	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	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	1.2	1.6	2.5	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}$, $I_D=20\text{A}$	-	2.8	3.4	m Ω
		$V_{GS}=4.5\text{V}$, $I_D=15\text{A}$		3.4	4.3	
g_{FS}	Forward Transconductance	$V_{DS}=5\text{V}$, $I_D=20\text{A}$	-	109	-	S
V_{SD}	Diode Forward Voltage	$I_S=1\text{A}$, $V_{GS}=0\text{V}$	-	0.7	1.0	V
I_S	Maximum Body-Diode Continuous Current		-	-	114	A
DYNAMIC PARAMETERS ⁽⁵⁾						
C_{iss}	Input Capacitance	$V_{GS}=0\text{V}$, $V_{DS}=50\text{V}$, $f=1\text{MHz}$	-	4647	-	pF
C_{oss}	Output Capacitance		-	1215	-	pF
C_{rss}	Reverse Transfer Capacitance		-	5.9	-	pF
R_g	Gate Resistance	$V_{GS}=0\text{V}$, $V_{DS}=0\text{V}$, $f=1\text{MHz}$	-	2.5	-	Ω
SWITCHING PARAMETERS ⁽⁵⁾						
$Q_g(10\text{V})$	Total Gate Charge	$V_{GS}=0\sim 10\text{V}$, $V_{DS}=50\text{V}$, $I_D=20\text{A}$	-	79	-	nC
$Q_g(4.5\text{V})$	Total Gate Charge		-	57	-	nC
Q_{gs}	Gate Source Charge		-	11.3	-	nC
Q_{gd}	Gate Drain Charge		-	27	-	nC
$t_{D(on)}$	Turn-On Delay Time	$V_{GS}=10\text{V}$, $V_{DS}=50\text{V}$, $R_L=2.5\Omega$, $R_{GEN}=6\Omega$	-	10.1	-	ns
t_r	Turn-On Rise Time		-	23	-	ns
$t_{D(off)}$	Turn-Off Delay Time		-	85	-	ns
t_f	Turn-Off Fall Time		-	63	-	ns
t_{rr}	Body Diode Reverse Recovery Time	$I_F=20\text{A}$, $di/dt=100\text{A}/\mu\text{s}$	-	85	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_F=20\text{A}$, $di/dt=100\text{A}/\mu\text{s}$	-	217	-	nC

Thermal Resistances

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JC}$	Thermal resistance from junction to case	0.8	1.1	$^{\circ}\text{C} / \text{W}$
$R_{\theta JA}$	Thermal resistance from junction to ambient	48	58	$^{\circ}\text{C} / \text{W}$

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 [$L=100\mu\text{H}$, $V_{GS}=10\text{V}$, $V_{DS}=50\text{V}$] 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.
6. Continuous current rating is limited by the package used.

Typical Electrical and Thermal Characteristics

Figure 1: Saturation Characteristics

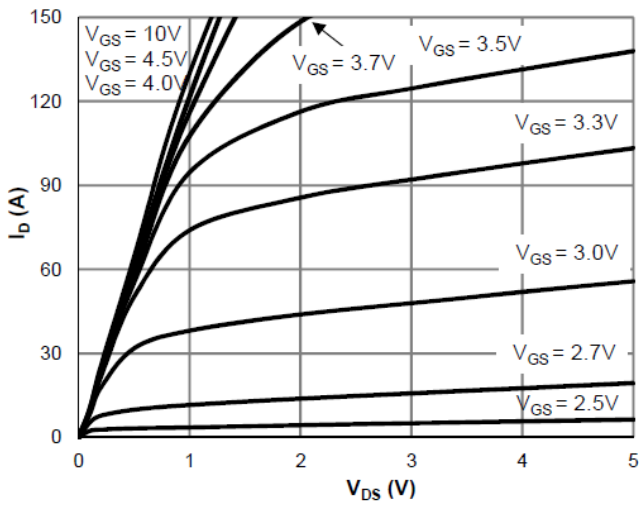


Figure 2: Transfer Characteristics

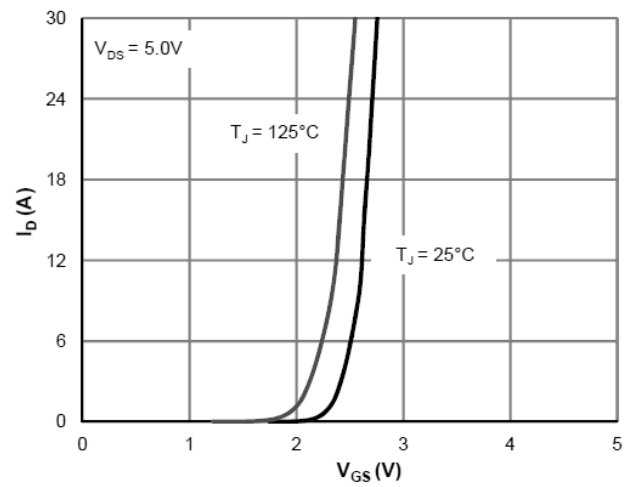
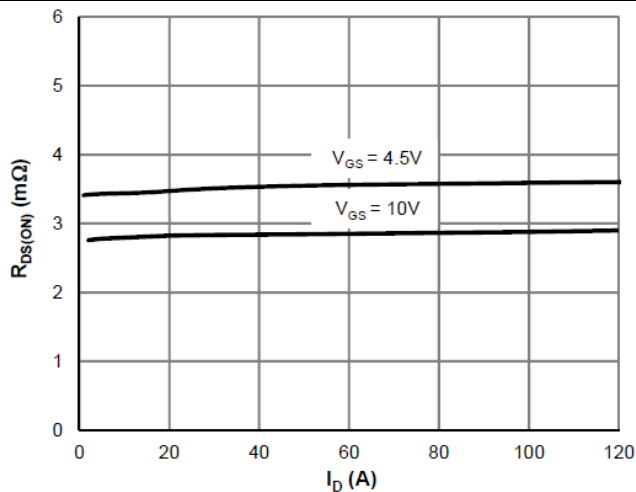
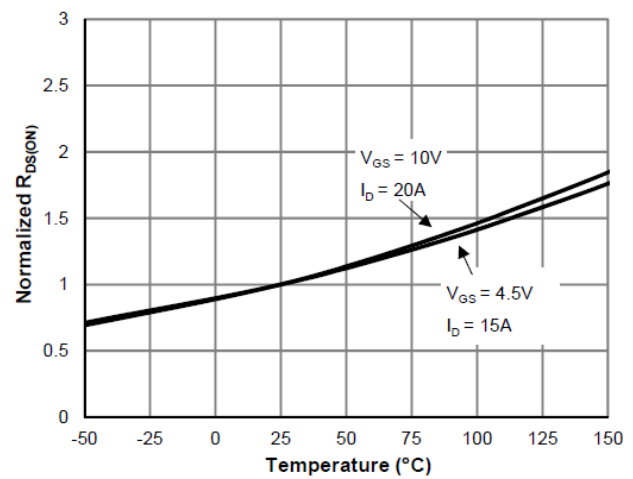
Figure 3: $R_{DS(ON)}$ vs. Drain CurrentFigure 4: $R_{DS(ON)}$ vs. Junction Temperature

Figure 5: Body-Diode Characteristics

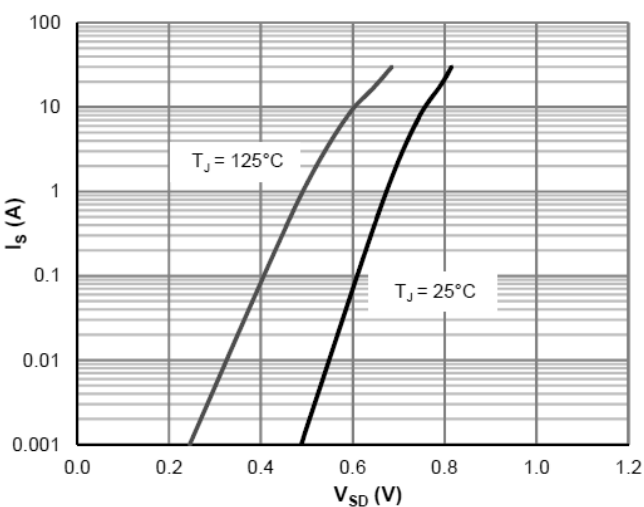
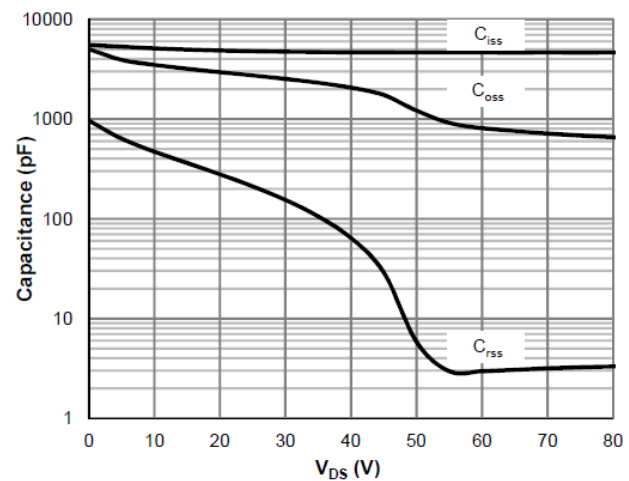


Figure 6: Capacitance characteristics



Typical Electrical and Thermal Characteristics

Figure 7: Current De-rating

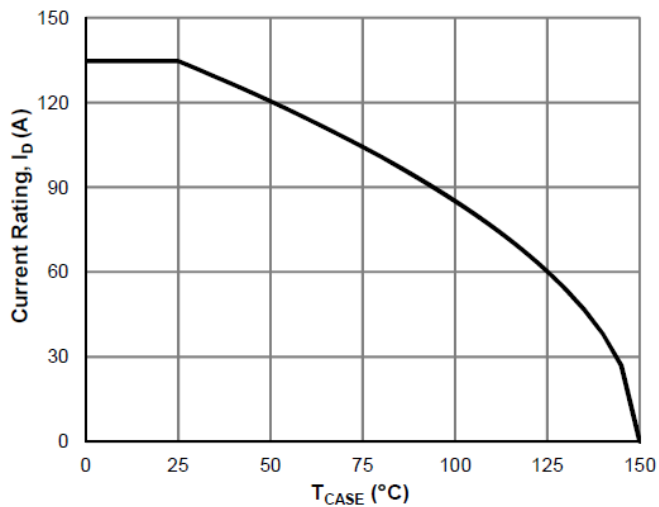


Figure 8: Power De-rating

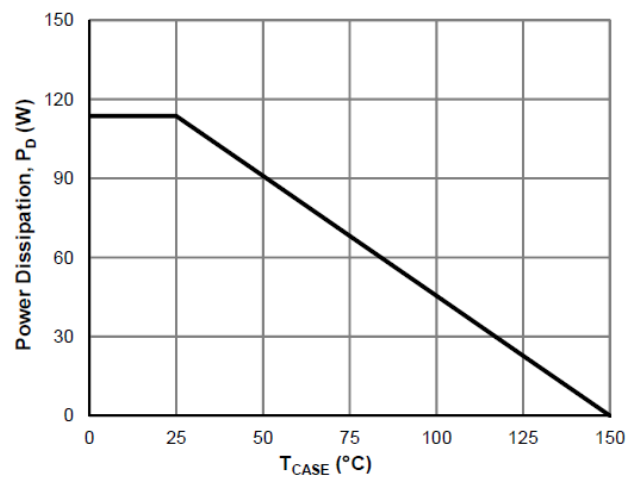


Figure 9: Maximum Safe Operating Area

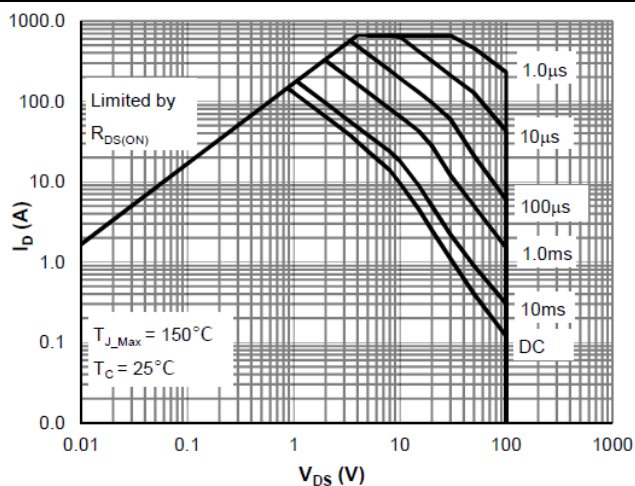


Figure 10: Single Pulse Power Rating, Junction-to-Case

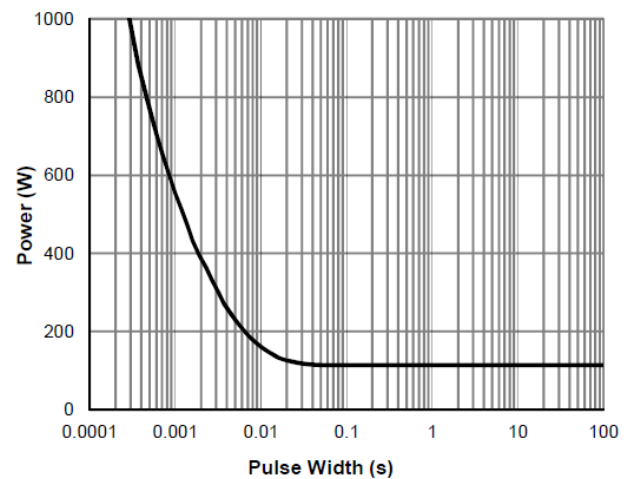
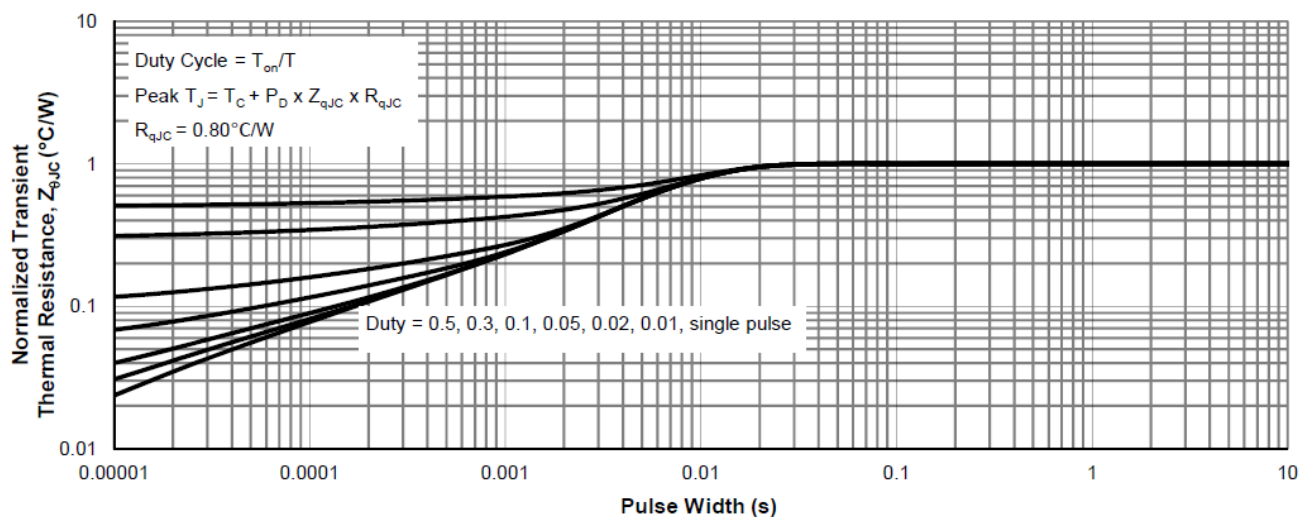


Figure 11: Normalized Maximum Transient Thermal Impedance



Test Circuit

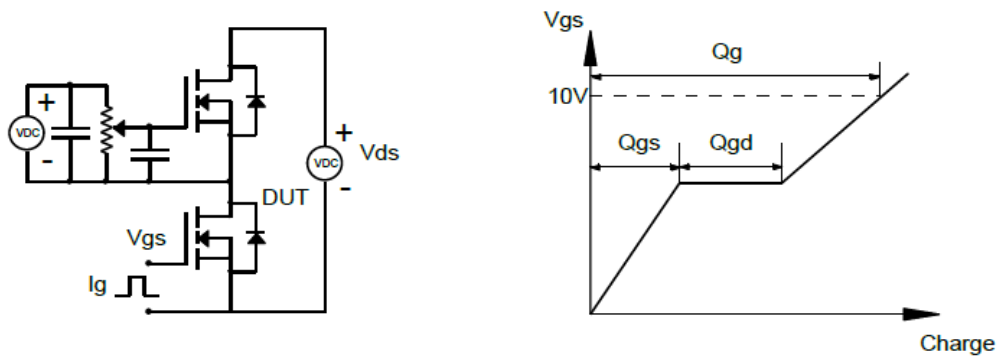


Figure1: Gate Charge Test Circuit & Waveforms

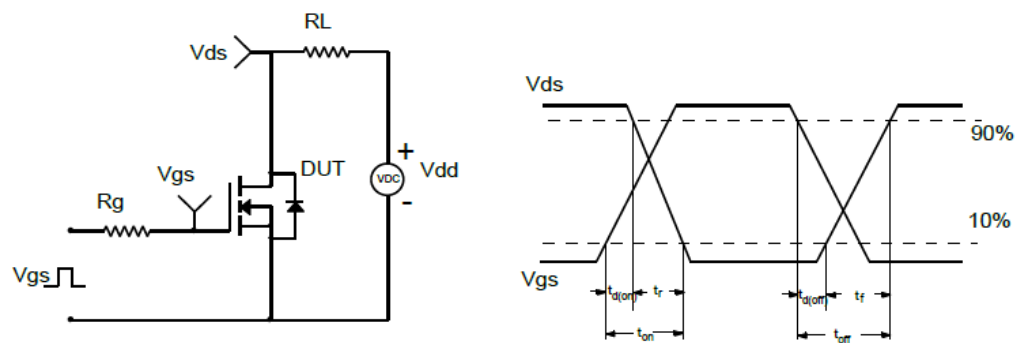


Figure2: Resistive Switching Test Circuit & Waveforms

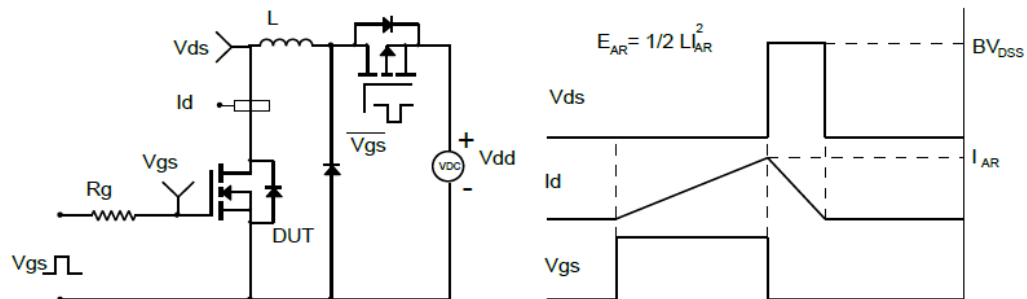


Figure3: Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

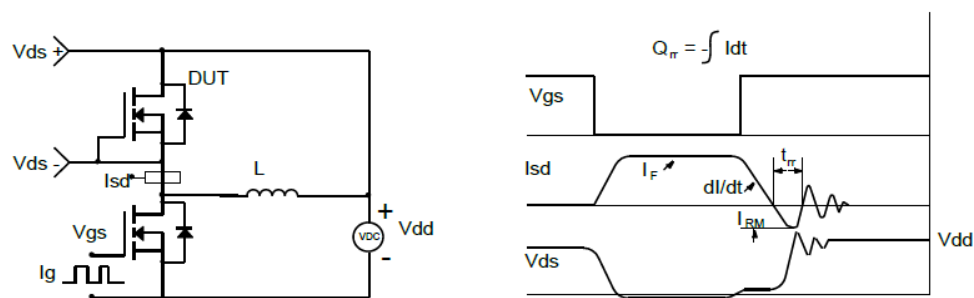
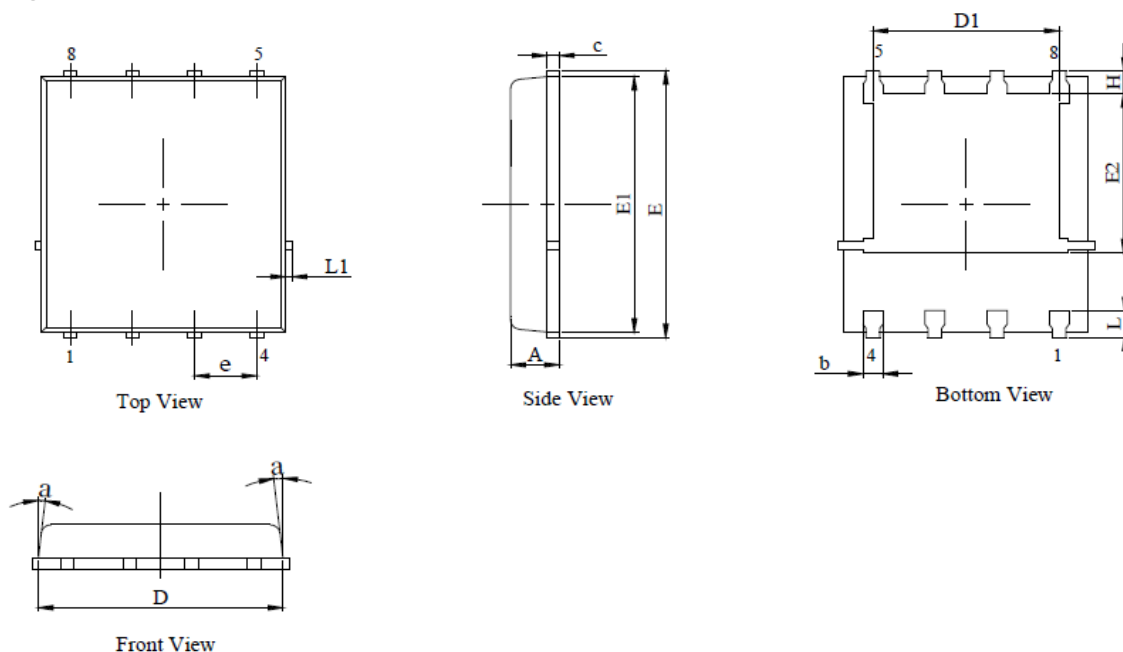


Figure4: Diode Recovery Test Circuit & Waveforms

PDFN5x6-8L Package Information

Package Outline

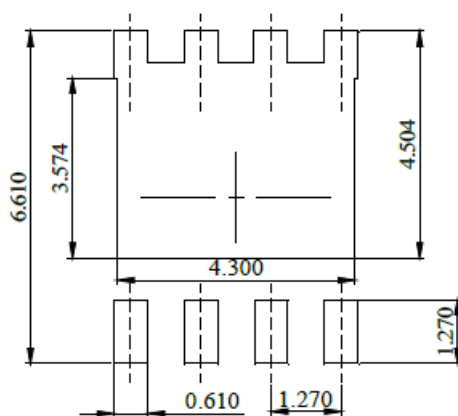


NOTES:

1. Dimension and tolerance per ASME Y14.5M, 1994.
2. All dimensions in millimeter (angle in degree).
3. Dimensions D and E1 do not include mold flash protrusions or gate burrs.

DIM.	MILLIMETER	
	MIN.	MAX.
A	0.90	1.20
b	0.33	0.51
c	0.23	0.33
D	4.80	5.40
D1	3.61	4.25
E	5.90	6.30
E1	5.55	5.95
E2	3.35	3.95
e	1.27 BSC	
H	0.41	0.80
L	0.51	0.80
L1	-	0.15
a	0°	12°

Recommend Footprint



DIMENSIONS: MILLIMETERS