

SDM07AG03K

30V SGT N-Channel MOSFETs

Rev A.0

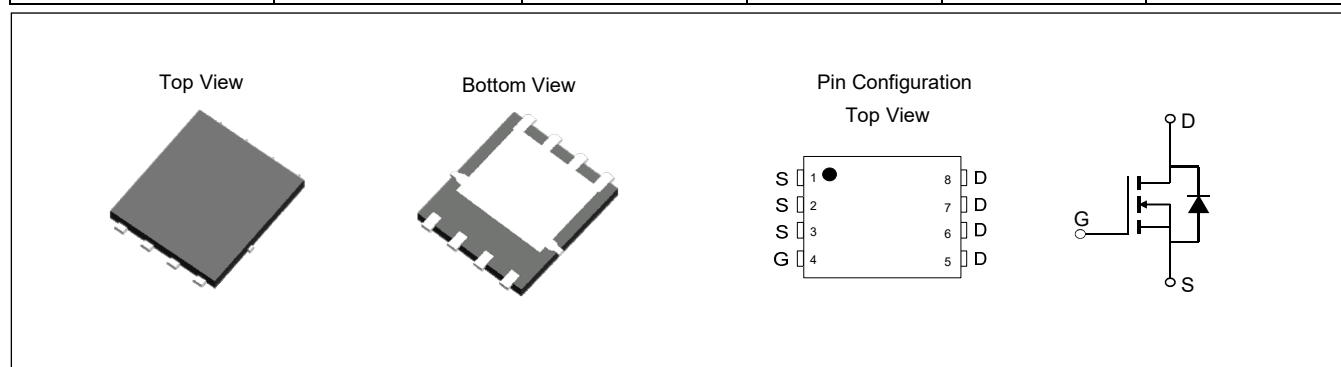
Feature

- ✧ 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}	30	V
$V_{GS(th)}_{Typ}$	1.5	V
$R_{DS(ON)}_{Typ}$ (at $V_{GS} = 10V$)	0.55	m Ω
I_D (at $V_{GS} = 10V$) ⁽¹⁾	327	A

Type	Package	Marking	Outline	Media	Quantity (pcs)
SDM07AG03K	PDFN5x6-8L	M07AG03	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}	30	V
Gate-Source Voltage		V_{GS}	+20/-16	V
Continuous Drain Current ⁽¹⁾	$T_C=25^\circ C$	I_D	327	A
	$T_C=100^\circ C$		207	
Pulsed Drain Current ⁽²⁾		I_{DM}	810	A
Maximum Body-Diode Continuous Current		I_S	104	A
Avalanche Current ⁽³⁾		I_{AS}	37	A
Avalanche Energy ⁽³⁾		E_{AS}	342	mJ
Power Dissipation ⁽⁴⁾	$T_C=25^\circ C$	P_D	104	W
	$T_C=100^\circ C$		42	
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	$V_{DS}=24\text{V}$, $V_{GS}=0\text{V}$ $T_J=55^\circ\text{C}$	-	-	1	μA
			-	-	5	
I_{GSS}	Gate-Body Leakage Current	$V_{DS}=0\text{V}$, $V_{GS}=+20\text{V}/-16$	-	-	± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	1.2	1.5	2.5	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}$, $I_D=20\text{A}$	-	0.55	0.69	m Ω
		$V_{GS}=4.5\text{V}$, $I_D=20\text{A}$	-	0.80	0.99	
V_{SD}	Diode Forward Voltage	$I_S=1\text{A}$, $V_{GS}=0\text{V}$	-	0.65	1.0	V
DYNAMIC PARAMETERS ⁽⁵⁾						
C_{iss}	Input Capacitance	$V_{GS}=0\text{V}$, $V_{DS}=15\text{V}$, $f=1\text{MHz}$	-	7545	-	pF
C_{oss}	Output Capacitance		-	5255	-	pF
C_{rss}	Reverse Transfer Capacitance		-	423	-	pF
R_g	Gate Resistance	$V_{GS}=0\text{V}$, $V_{DS}=0\text{V}$, $f=1\text{MHz}$	-	2.2	-	Ω
SWITCHING PARAMETERS ⁽⁵⁾						
$Q_g(10\text{V})$	Total Gate Charge	$V_{GS}=0$ to 10V , $V_{DS}=15\text{V}$, $I_D=20\text{A}$	-	121	-	nC
$Q_g(4.5\text{V})$	Total Gate Charge		-	65	-	nC
Q_{gs}	Gate Source Charge		-	17.7	-	nC
Q_{gd}	Gate Drain Charge		-	25	-	nC
$t_{D(on)}$	Turn-On Delay Time	$V_{GS}=10\text{V}$, $V_{DS}=15\text{V}$, $R_L=0.75\Omega$, $R_{GEN}=6\Omega$	-	6.5	-	ns
t_r	Turn-On Rise Time		-	19.5	-	ns
$t_{D(off)}$	Turn-Off Delay Time		-	127	-	ns
t_f	Turn-Off Fall Time		-	67	-	ns
t_{rr}	Body Diode Reverse Recovery Time	$I_F=15\text{A}$, $di/dt=100\text{A}/\mu\text{s}$	-	75	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_F=15\text{A}$, $di/dt=100\text{A}/\mu\text{s}$	-	105	-	nC

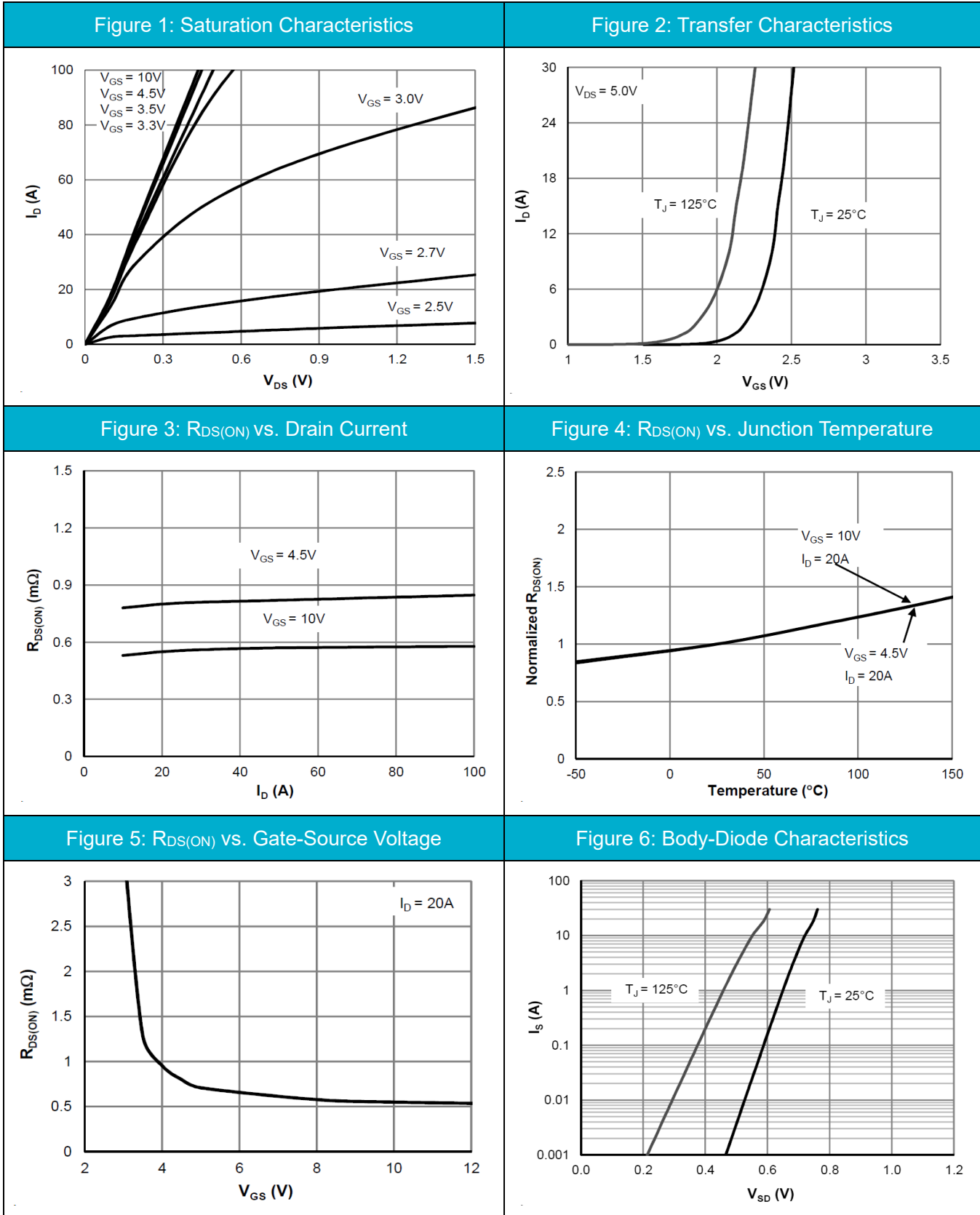
Thermal Resistances

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Thermal resistance from junction to Ambient	50	65	$^{\circ}\text{C} / \text{W}$
$R_{\theta JC}$	Thermal resistance from junction to Case	0.9	1.2	$^{\circ}\text{C} / \text{W}$

Notes:

1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current 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 [$L = 500\mu\text{H}$, $V_{GS} = 10\text{V}$, $V_{DS} = 15\text{V}$] 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



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Figure 7: Gate-Charge characteristics

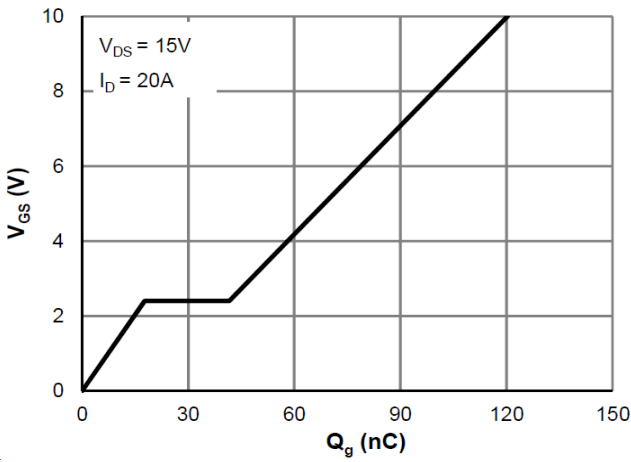


Figure 8: Capacitance characteristics

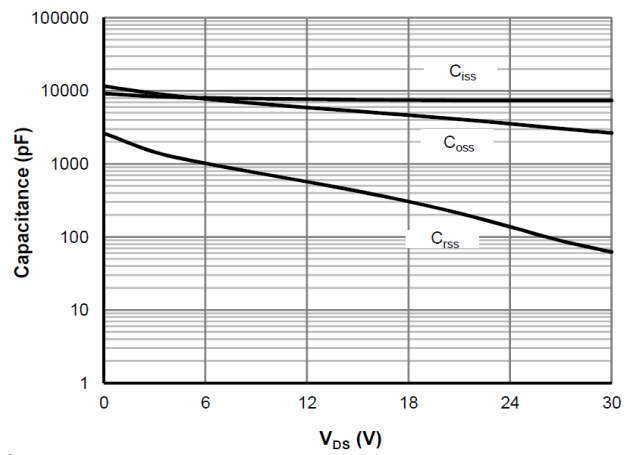


Figure 9: Current De-rating

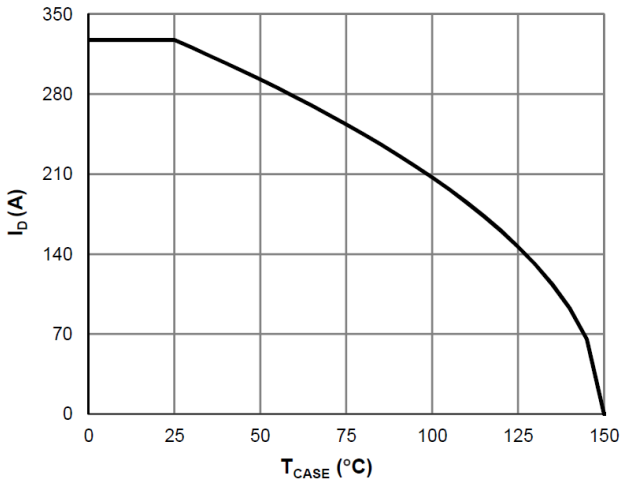


Figure 10: Power De-rating

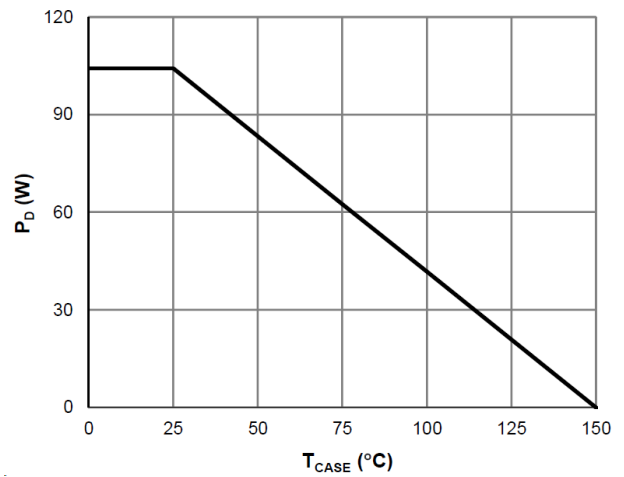


Figure 11: Maximum Safe Operating Area

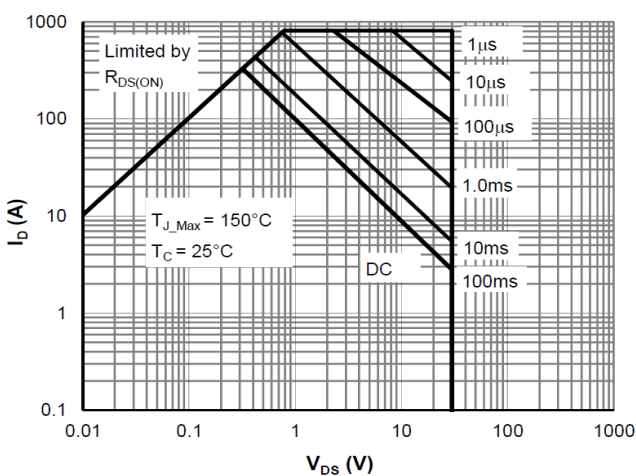
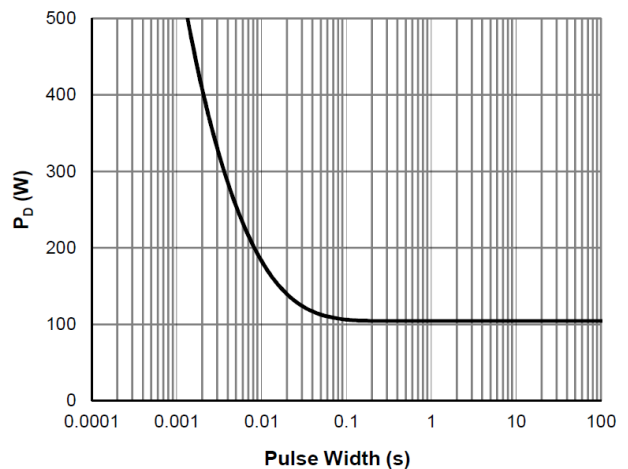
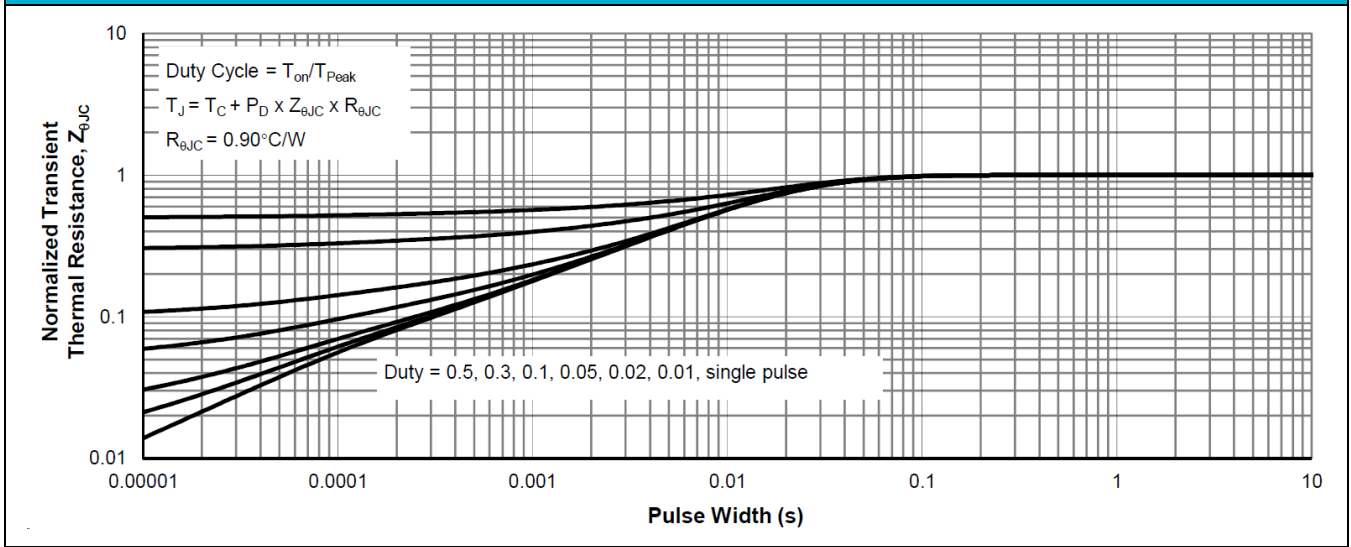


Figure 12: Single Pulse Power Rating, Junction-to-Case



Typical Electrical and Thermal Characteristics

Figure 13: Normalized Maximum Transient Thermal Impedance



Test Circuit

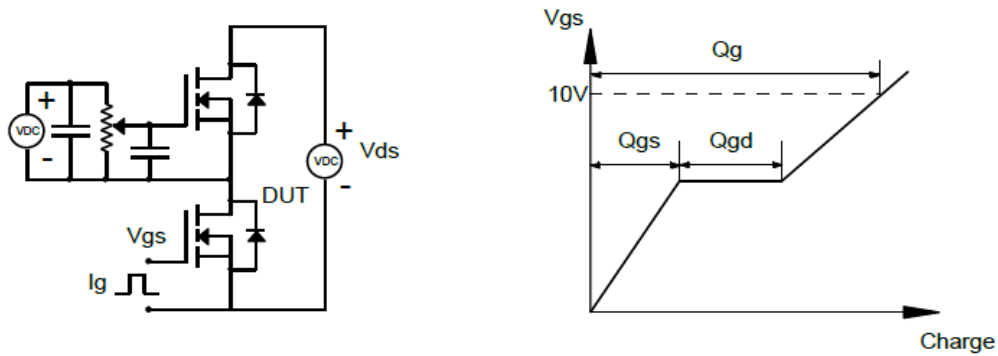


Figure1: Gate Charge Test Circuit & Waveforms

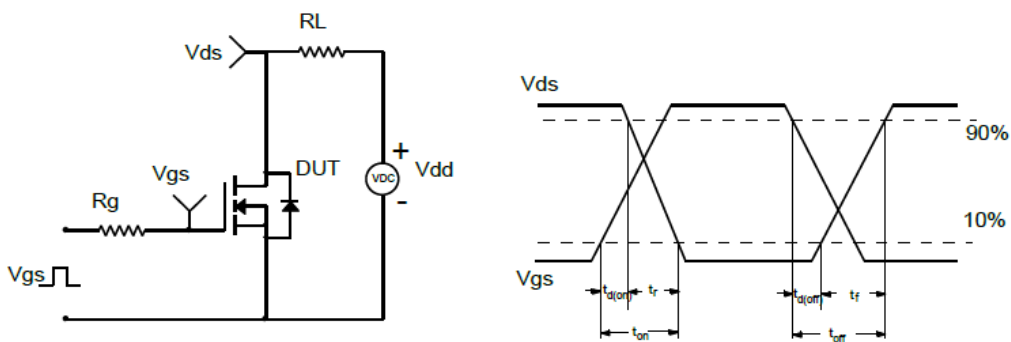


Figure2: Resistive Switching Test Circuit & Waveforms

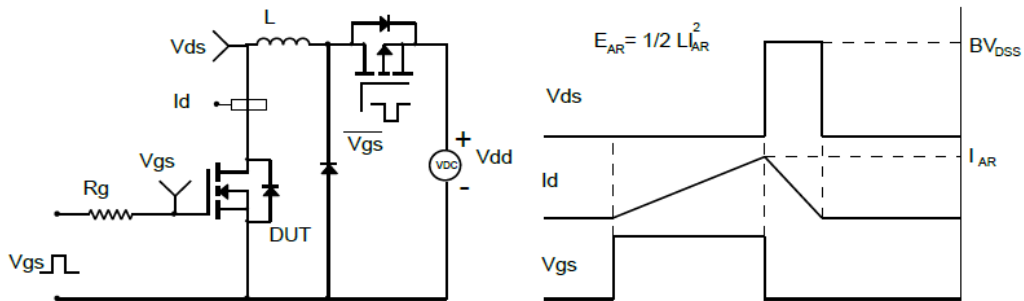


Figure3: Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

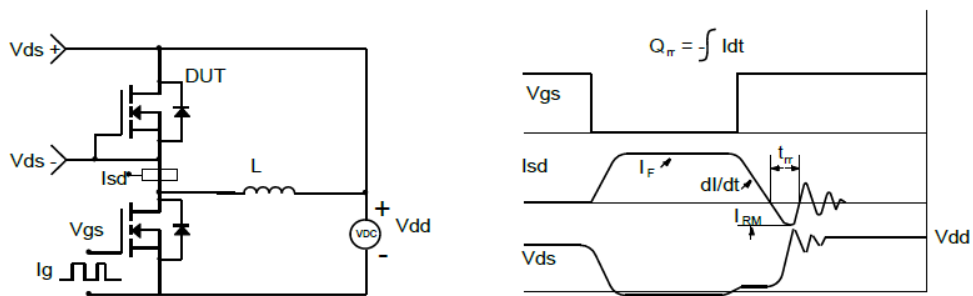
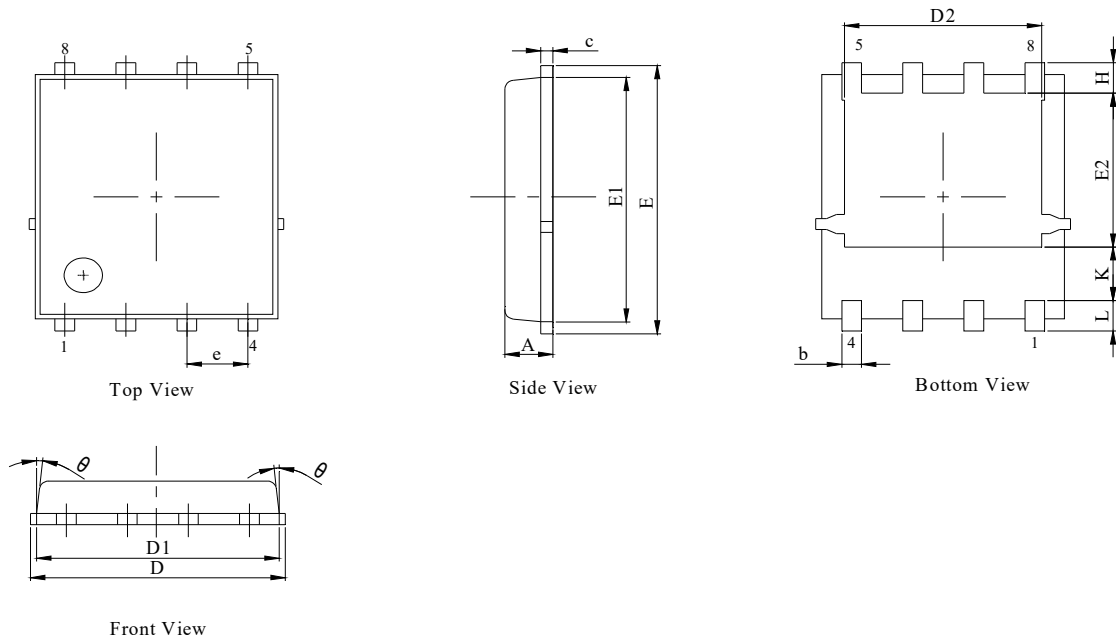


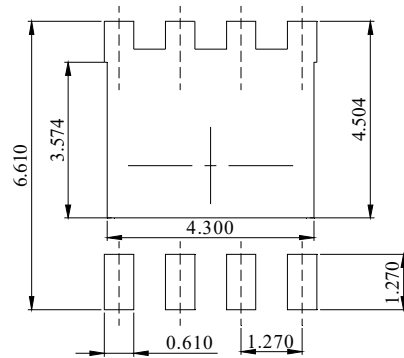
Figure4: Diode Recovery Test Circuit & Waveforms

PDFN5x6-8L Package Information



DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
b	0.31	0.41	0.51
c	0.20	0.25	0.30
D	5.00	5.20	5.40
D1	4.95	5.05	5.15
D2	4.00	4.10	4.20
E	6.05	6.15	6.25
E1	5.50	5.60	5.70
E2	3.42	3.53	3.63
e	1.27BSC		
H	0.60	0.70	0.80
L	0.50	0.70	0.80
K	1.23 REF		
θ	-	-	10°

Recommended Soldering Footprint



DIMENSIONS: MILLIMETERS