

SDM065G15LV

150V SGT N-Channel MOSFETs

Rev A.0

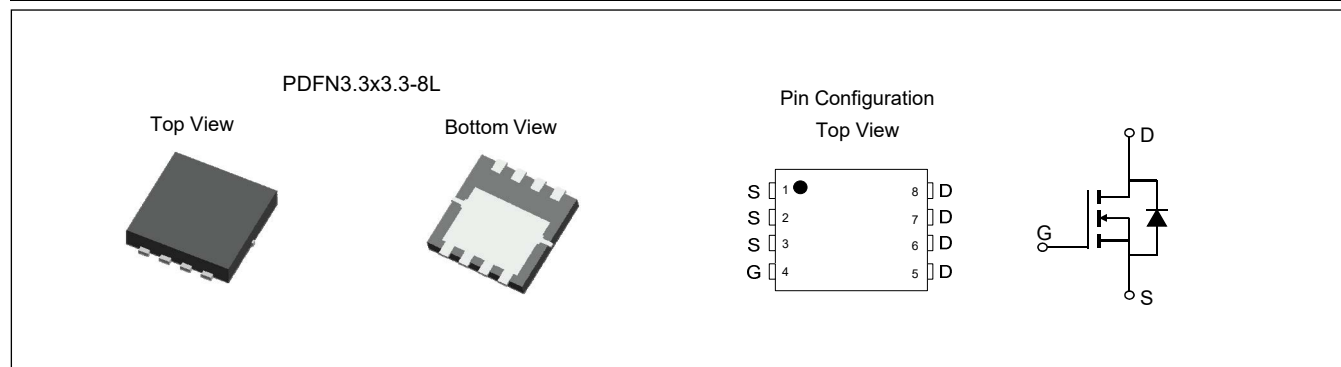
Feature

- ✧ Ultra-low $R_{DS(ON)}$
- ✧ Low Gate Charge
- ✧ High current Capability
- ✧ Enhanced body diode performance.
- ✧ Green product (RoHS compliant), 100% lead free
- ✧ 100% UIS Tested, 100% Rg Tested
- ✧ AEC-Q101 qualified

Product Summary

V_{DS}	150	V
$R_{DS(ON)_{Typ}}$ (at $V_{GS} = 10V$)	54	m Ω
$V_{GS(th)_{Typ}}$	3.2	V
I_D (at $V_{GS} = 10V$) ⁽¹⁾	14	A

Type	Package	Marking	Outline	Media	Quantity (pcs)
SDM065G15LV	PDFN3.3x3.3-8L	H1565AS	Tape	13" Reel	5000



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

Parameter		Symbol	Maximum	Unit
Drain-Source Voltage		V _{DS}	150	V
Gate-Source Voltage		V _{GS}	±20	V
Continuous Drain Current ⁽¹⁾	T _C =25°C	I _D	14	A
	T _C =100°C		8.6	
Pulsed Drain Current ⁽²⁾		I _{DM}	37	A
Avalanche Current ⁽³⁾		I _{AS}	20	A
Avalanche Energy ⁽³⁾		E _{AS}	20	mJ
Power Dissipation ⁽⁴⁾	T _C =25°C	P _D	28	W
	T _C =100°C		11	
Junction and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°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	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	150	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=120\text{V}$, $V_{GS}=0\text{V}$ $T_J=55^{\circ}\text{C}$	-	-	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	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	2.5	3.2	4.5	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}$, $I_D=7\text{A}$	-	54	65	m Ω
g_{FS}	Forward Transconductance	$V_{DS}=5\text{V}$, $I_D=7\text{A}$	-	10	-	S
V_{SD}	Diode Forward Voltage	$I_S=1\text{A}$, $V_{GS}=0\text{V}$	-	0.73	1.0	V
I_S	Maximum Body-Diode Continuous Current		-	-	28	A
DYNAMIC PARAMETERS ⁽⁵⁾						
C_{iss}	Input Capacitance	$V_{GS}=0\text{V}$, $V_{DS}=75\text{V}$, $f=1\text{MHz}$	-	305	-	pF
C_{oss}	Output Capacitance		-	71	-	pF
C_{rss}	Reverse Transfer Capacitance		-	3.7	-	pF
R_g	Gate Resistance	$V_{GS}=0\text{V}$, $V_{DS}=0\text{V}$, $f=1\text{MHz}$	-	1.6	-	Ω
SWITCHING PARAMETERS ⁽⁵⁾						
$Q_g(10\text{V})$	Total Gate Charge	$V_{GS}=0\sim 10\text{V}$, $V_{DS}=75\text{V}$, $I_D=7\text{A}$	-	5.1	-	nC
$Q_g(6.0\text{V})$	Total Gate Charge		-	3.5	-	nC
Q_{gs}	Gate Source Charge		-	1.7	-	nC
Q_{gd}	Gate Drain Charge		-	1.7	-	nC
$t_{D(on)}$	Turn-On Delay Time	$V_{GS}=10\text{V}$, $V_{DS}=75\text{V}$, $R_L=10\Omega$, $R_{GEN}=6\Omega$	-	4.5	-	ns
t_r	Turn-On Rise Time		-	3.3	-	ns
$t_{D(off)}$	Turn-Off Delay Time		-	7.5	-	ns
t_f	Turn-Off Fall Time		-	3.7	-	ns
t_{rr}	Body Diode Reverse Recovery Time	$I_F=7\text{A}$, $di/dt=100\text{A}/\mu\text{s}$	-	73	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_F=7\text{A}$, $di/dt=100\text{A}/\mu\text{s}$	-	97	-	nC

Thermal Resistances

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JC}$	Thermal resistance from junction to case	3.5	4.5	$^{\circ}\text{C} / \text{W}$
$R_{\theta JA}$	Thermal resistance from junction to ambient	55	65	$^{\circ}\text{C} / \text{W}$

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 [$L=100\mu\text{H}$, $V_{GS}=10\text{V}$, $V_{DS}=75\text{V}$] 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

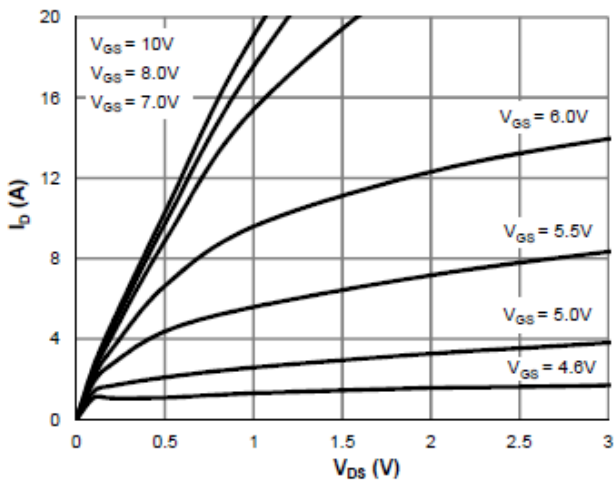


Figure 2: Transfer Characteristics

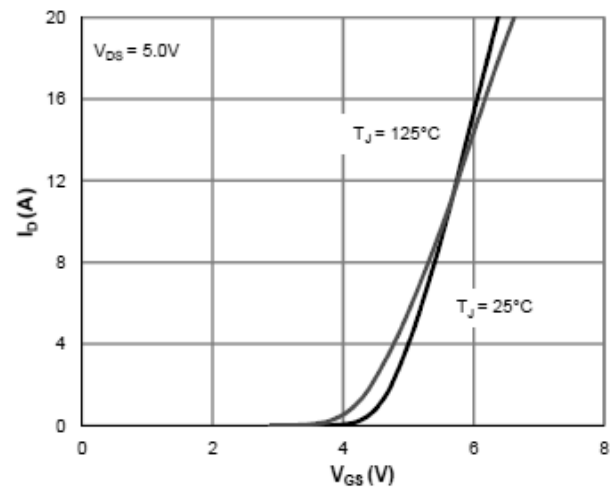
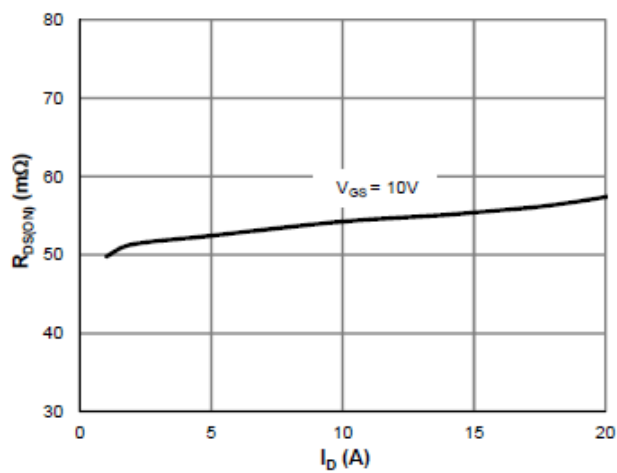
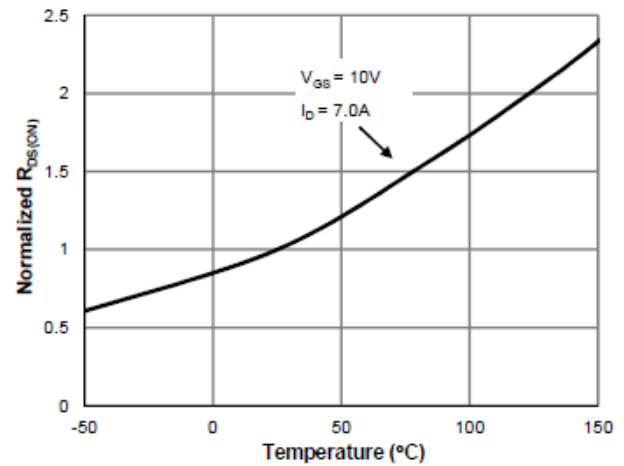
Figure 3: $R_{DS(ON)}$ vs. Drain CurrentFigure 4: $R_{DS(ON)}$ vs. Junction Temperature

Figure 5: Body-Diode Characteristics

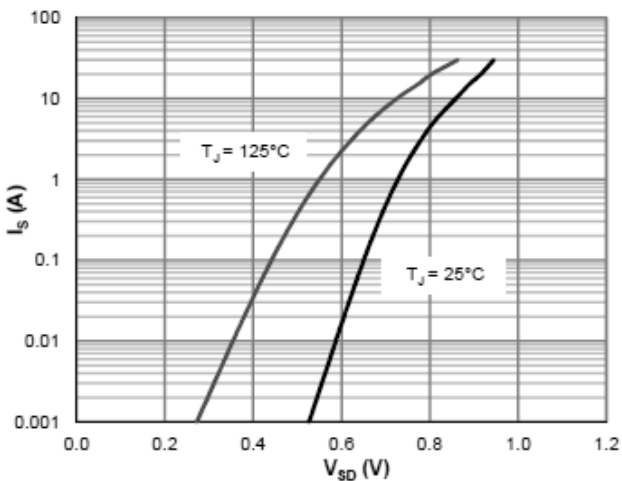
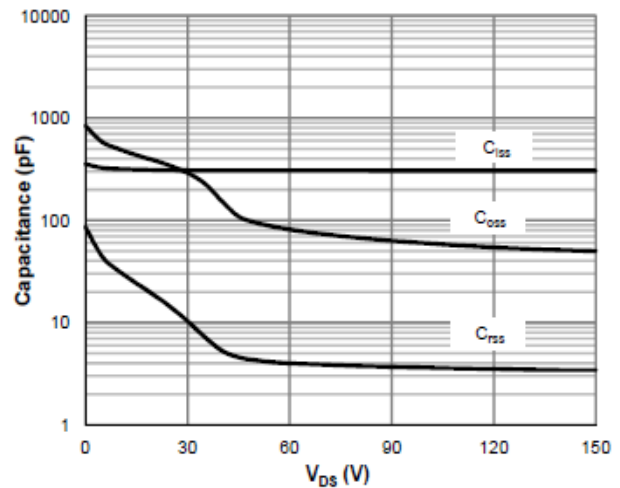


Figure 6: Capacitance characteristics



Typical Electrical and Thermal Characteristics

Figure 7: Current De-rating

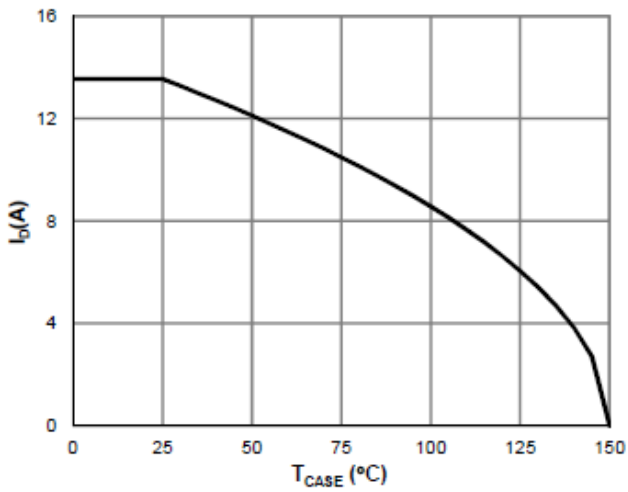


Figure 8: Power De-rating

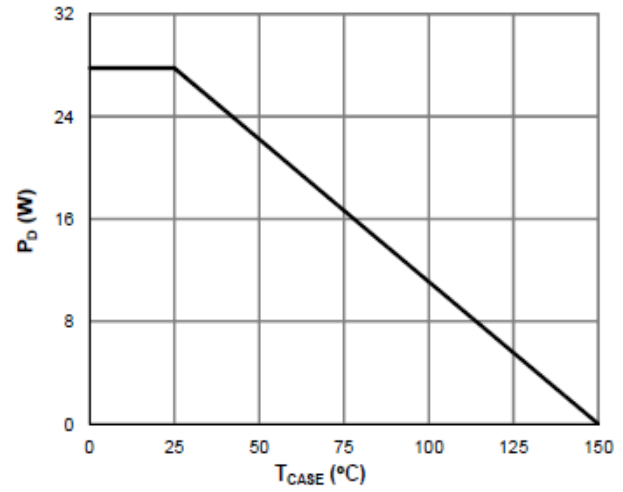


Figure 9: Maximum Safe Operating Area

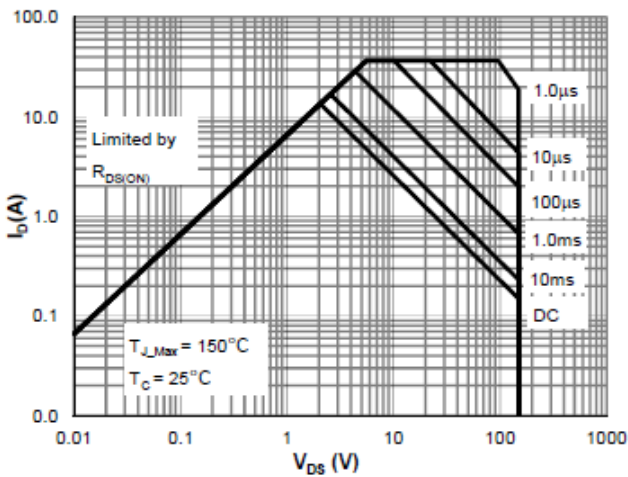


Figure 10: Single Pulse Power Rating, Junction-to-Case

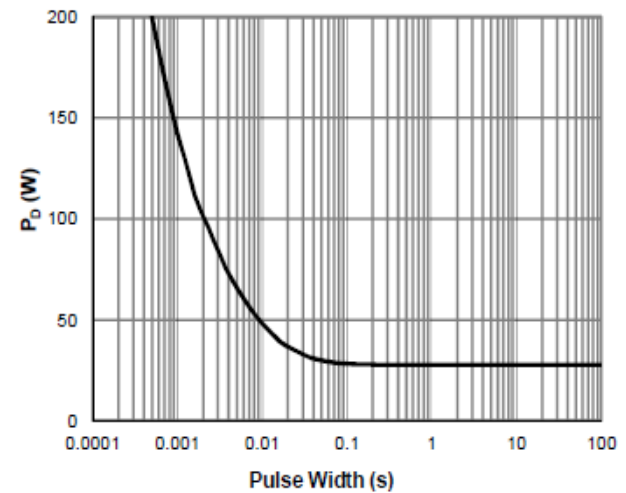
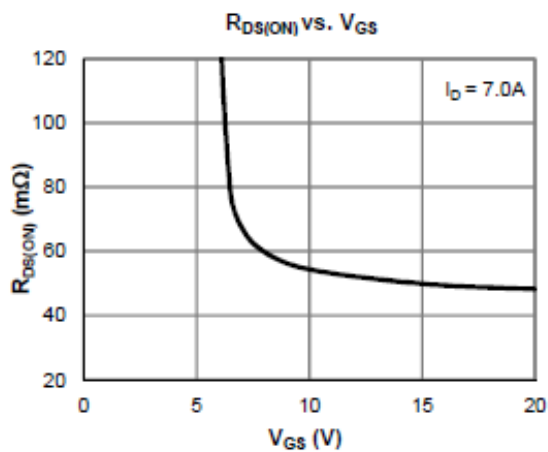
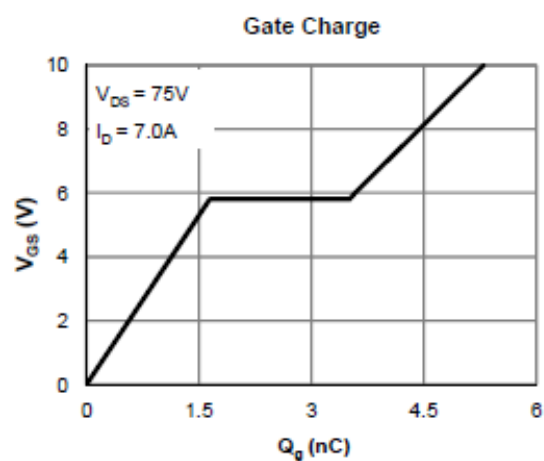
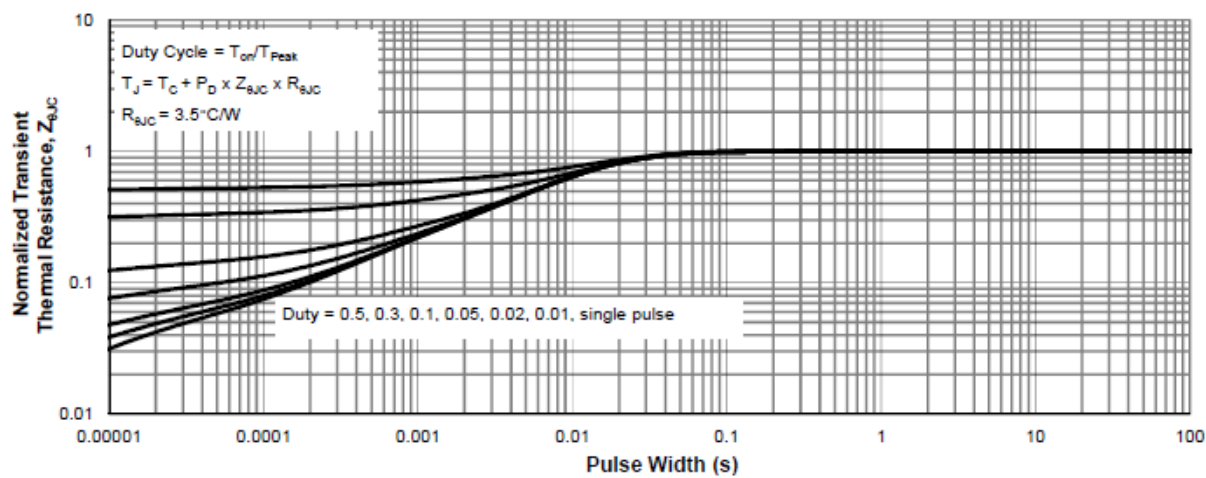
Figure 11: $R_{DS(ON)}$ vs. Gate-Source Voltage

Figure 12: Gate-Charge characteristics



Typical Electrical and Thermal Characteristics

Figure 13: Normalized Maximum Transient Thermal Impedance



Test Circuit

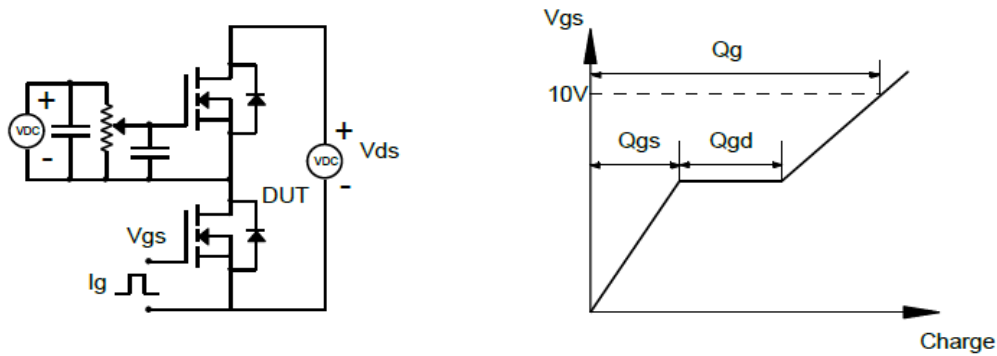


Figure1: Gate Charge Test Circuit & Waveforms

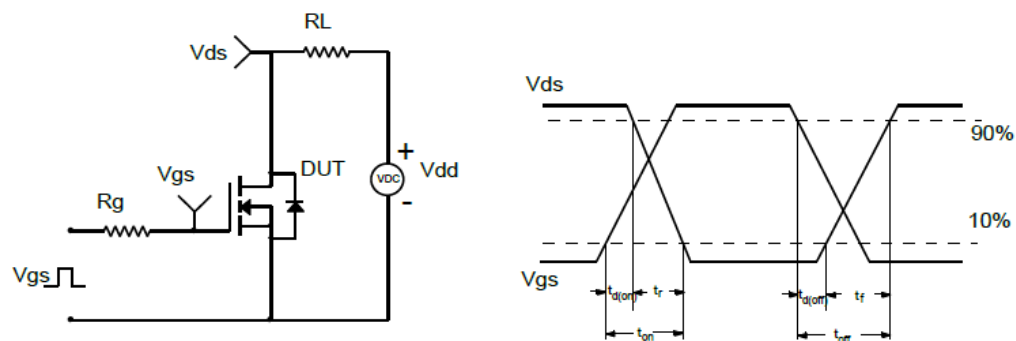


Figure2: Resistive Switching Test Circuit & Waveforms

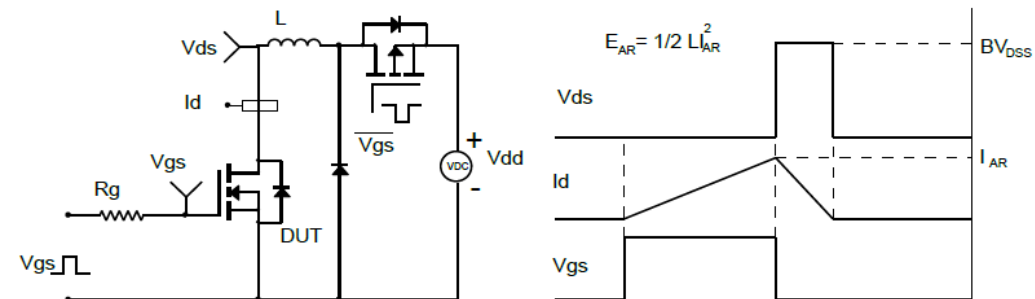


Figure3: Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

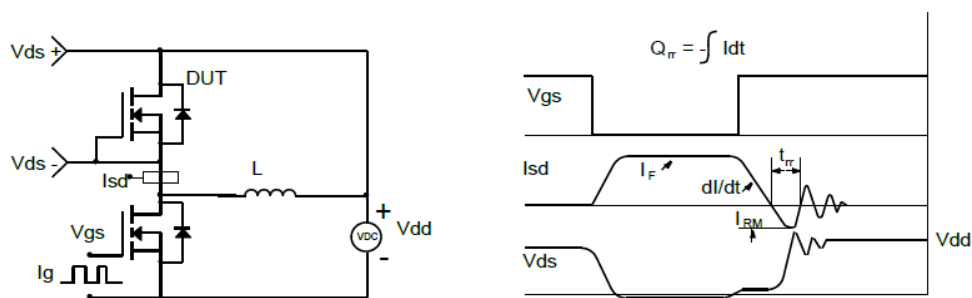
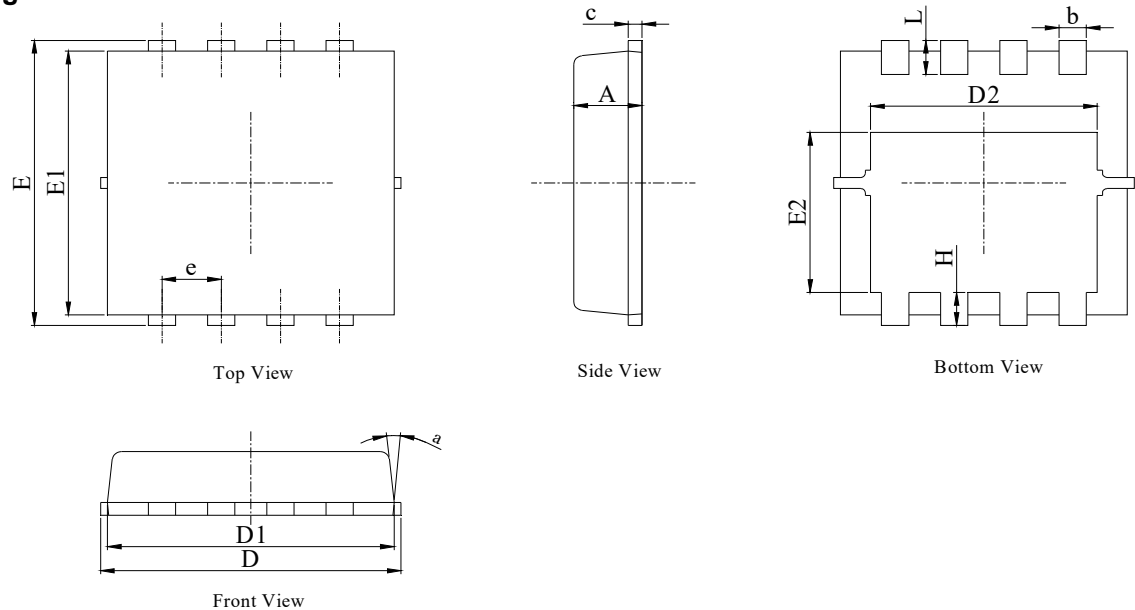


Figure4: Diode Recovery Test Circuit & Waveforms

PDFN3.3x3.3-8L Package Information

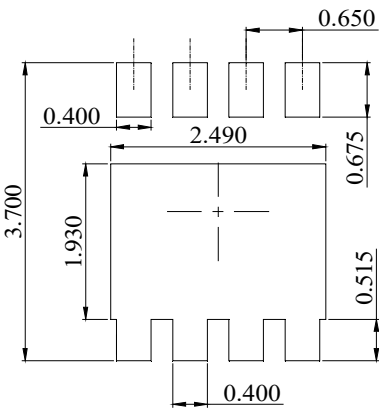
Package Outline



- NOTES:
- 1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M,1994.
 - 2. ALL DIMNESIONS IN MILLIMETER (ANNGLE IN DEGREE).
 - 3. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS.

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.20	0.25
D	3.05	3.25	3.35
D1	2.95	3.05	3.15
D2	2.39	2.49	2.59
E	3.20	3.30	3.40
E1	2.95	3.05	3.15
E2	1.70	1.80	1.90
e	0.65 BSC		
H	0.30	0.40	0.50
L	0.25	0.40	0.50
a	---	---	15°

Recommend Footprint



DIMENSIONS: MILLIMETERS