Features

● Split Gate Trench MOSFET technology
● Excellent package for heat dissipation
● High density cell design for low $R_{DS(ON)}$

Applications

● DC-DC Converters
● Power management functions
● Synchronous-rectification applications

Product Summery

BVDSS	RDSON	ID
-60V	42mΩ	-10A

SOP8 Pin Configuration
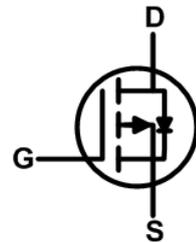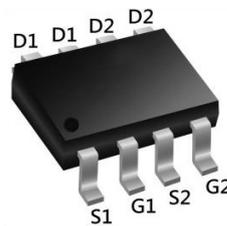
Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1,6]	-10	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1,6]	-5	A
I_{DM}	Pulsed Drain Current[2]	-40	A
EAS	Single Pulse Avalanche Energy[3]	48	mJ
I_{AS}	Avalanche Current	---	A
P_D@T_C=25℃	Total Power Dissipation[4]	40	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{θJA}$	Thermal Resistance Junction-Ambient [1]	---	---	℃/W
$R_{θJC}$	Thermal Resistance Junction-Case[1]	---	3.12	℃/W

Electrical Characteristics (T$_J$=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV$_{DSS}$	Drain-Source Breakdown Voltage	V$_{GS}$=0V , I$_D$=-250uA	-100	---	---	V
$\triangle$BV$_{DSS}$/$\triangle$T$_J$	BV$_{DSS}$ Temperature Coefficient	Reference to 25℃ , I$_D$=1mA	---	---	---	V/℃
R$_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V$_{GS}$=-10V , I$_D$=-4A	---	42	54	mΩ
		V$_{GS}$=-4.5V , I$_D$=-2A	---	54	77	
V$_{GS(th)}$	Gate Threshold Voltage	V$_{GS}$=V$_{DS}$, I$_D$ =-250uA	-1.3	-1.8	-2.3	V
$\triangle$V$_{GS(th)}$	V$_{GS(th)}$ Temperature Coefficient		---	---	---	mV/℃
I$_{DSS}$	Drain-Source Leakage Current	V$_{DS}$=-60V , V$_{GS}$=0V , T$_J$=25℃	---	---	1	uA
		V$_{DS}$=-60V, V$_{GS}$=0V , T$_J$=100℃	---	---	---	
I$_{GSS}$	Gate-Source Leakage Current	V$_{GS}$=±20V , V$_{DS}$=0V	---	---	±100	nA
gfs	Forward Transconductance	V$_{DS}$=-5V , I$_D$=-6A	---	---	---	S
R$_g$	Gate Resistance	V$_{DS}$=0V , V$_{GS}$=0V , f=1MHz	---	5	---	Ω
Q$_g$	Total Gate Charge	V$_{DS}$=-30V , V$_{GS}$=-10V , I$_D$=-4A	---	11.6	---	nC
Q$_{gs}$	Gate-Source Charge		---	2.4	---	
Q$_{gd}$	Gate-Drain Charge		---	1.5	---	
T$_{d(on)}$	Turn-On Delay Time	VGS=-10V, VDD=-30V, RG=3Ω, ID=-4A	---	10	---	ns
T$_r$	Rise Time		---	6	---	
T$_{d(off)}$	Turn-Off Delay Time		---	40	---	
T$_f$	Fall Time		---	13	---	
C$_{iss}$	Input Capacitance	V$_{DS}$=-30V , V$_{GS}$=0V , f=1MHz	---	667	---	pF
C$_{oss}$	Output Capacitance		---	114	---	
C$_{rss}$	Reverse Transfer Capacitance		---	5.2	---	

Diode Characteristics

| Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I$_S$	Continuous Source Current[1,4]	V$_G$=V$_D$=0V , Force Current	---	---	-10	A
V$_{SD}$	Diode Forward Voltage[2]	V$_{GS}$=0V , I$_S$=-4A , T$_J$=25℃	---	---	-1.2	V
t$_{rr}$	Reverse Recovery Time	IF=-4A , di/dt=100A/μs , T$_J$=25℃, VDD=-30V	---	28	---	nS
Q$_{rr}$	Reverse Recovery Charge		---	40	---	nC

a1：Repetitive rating; pulse width limited by maximum junction temperature a2：V$_{DD}$=-30V,L=0.3mH, R$_G$=25Ω, Starting T$_j$=25°C

General Descripion：

Figure 1: Typ. output characteristics
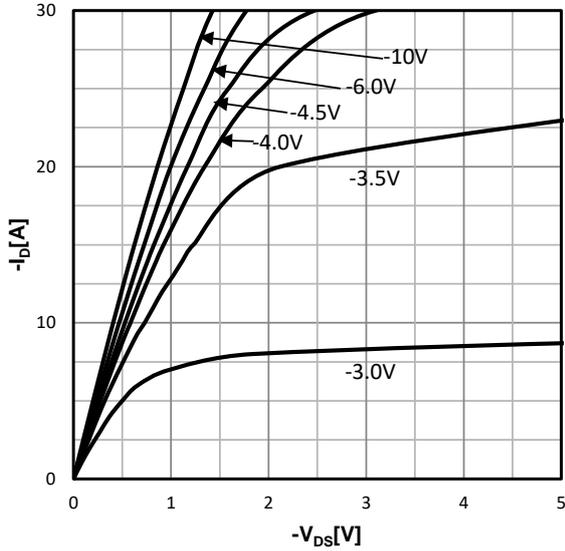
$I_D=f(V_{DS})$, T_j=25 °C; parameter: V_{GS}

Figure 2: Typ. drain-source on resistance
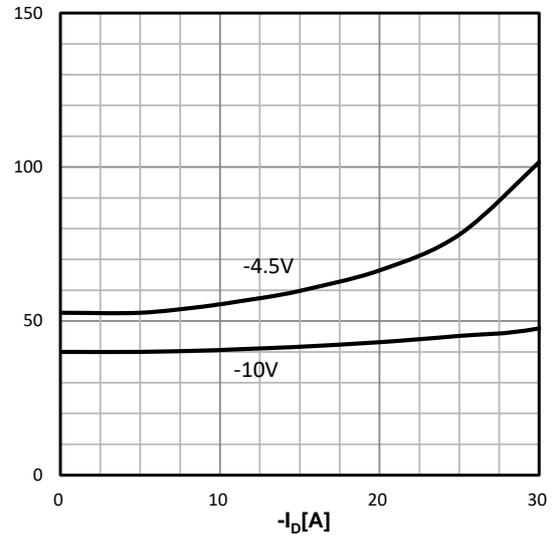
$R_{DS(on)}=f(I_D)$, T_j=25 °C; parameter: V_{GS}

Figure 3: Typ. transfer characteristics
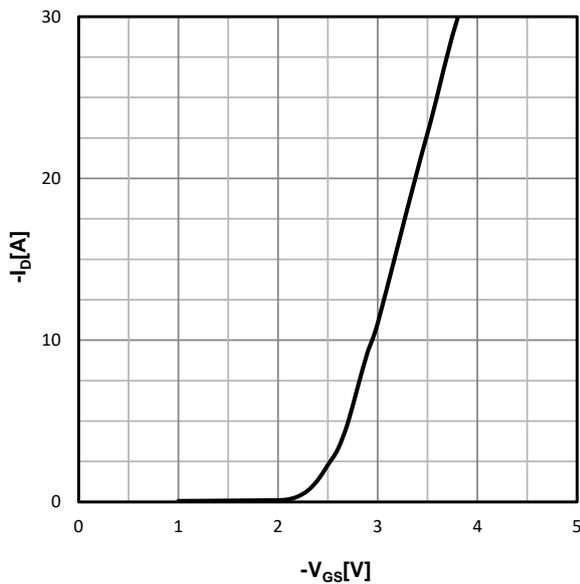
$I_D=f(V_{GS})$, $|V_{DS}|>2|I_D|R_{DS}(on)max$;

Figure 4: drain-source on resistance
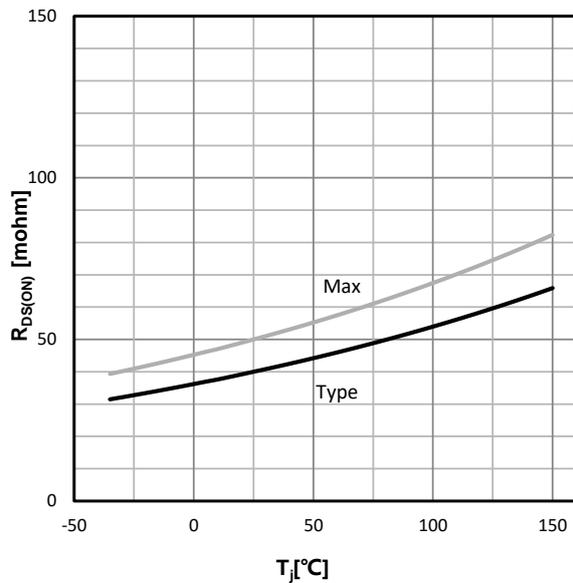
$R_{DS(on)}=f(T_j)$, I_D=-10A, V_{GS}=-10V;

Figure 5: Typ. gate threshold voltage
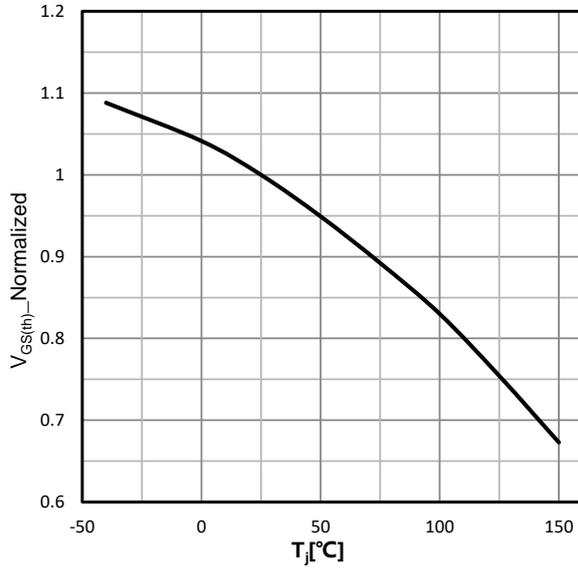
V_{GS}=f(T_j), V_{GS}=V_{DS}, I_D=-250μA;

Figure 6: Drain-source breakdown voltage
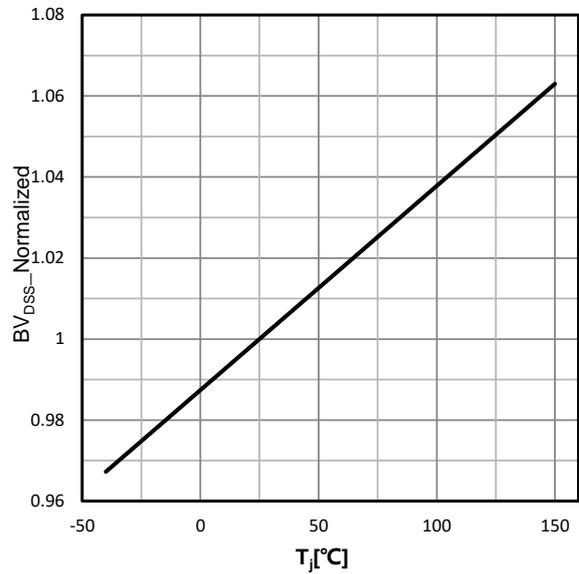
$V_{BR(DSS)}$=f(T_j); I_D=-250μA;

Figure 7: Typ. gate charge
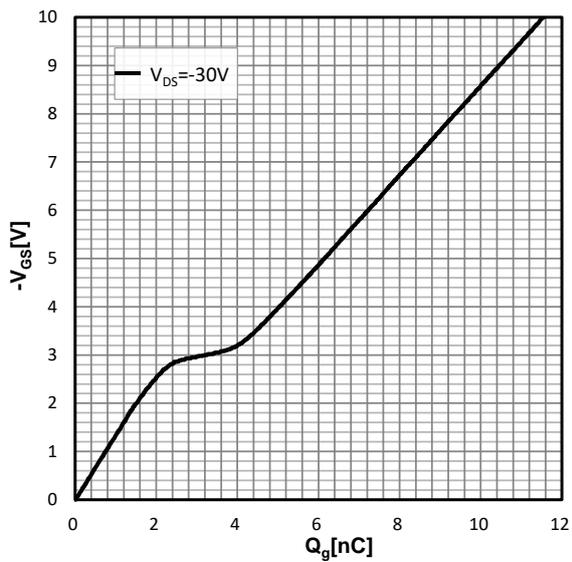
V_{GS}=f(Q_g), I_D=-10A, T_j=25 °C; parameter: V_{DS}

Figure 8: Typ. Capacitances
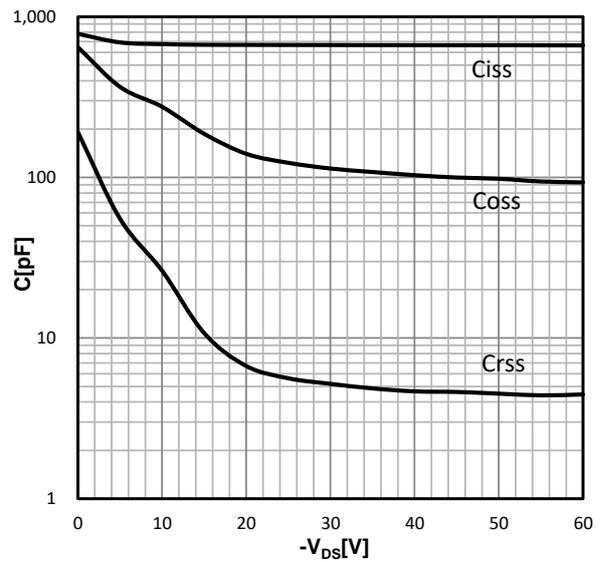
C=f(V_{DS}); V_{GS}=0V; f=1.0 MHz;

Figure 9: Power dissipation

P_{tot}=f(T_C);
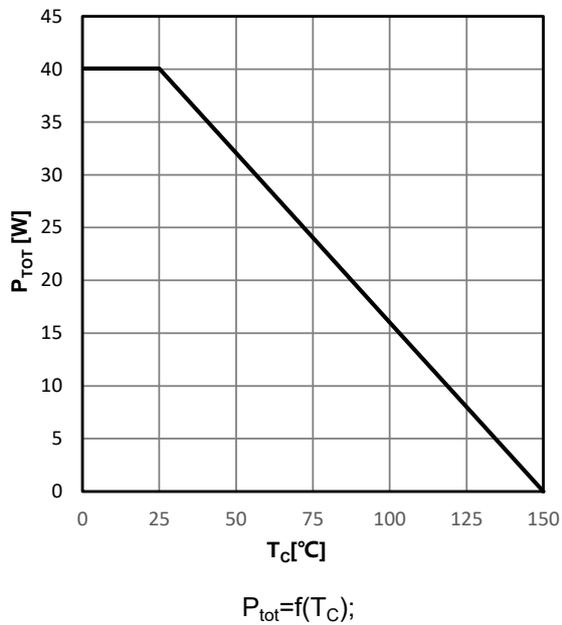
Figure 10:Drain current

I_D=f(T_C);
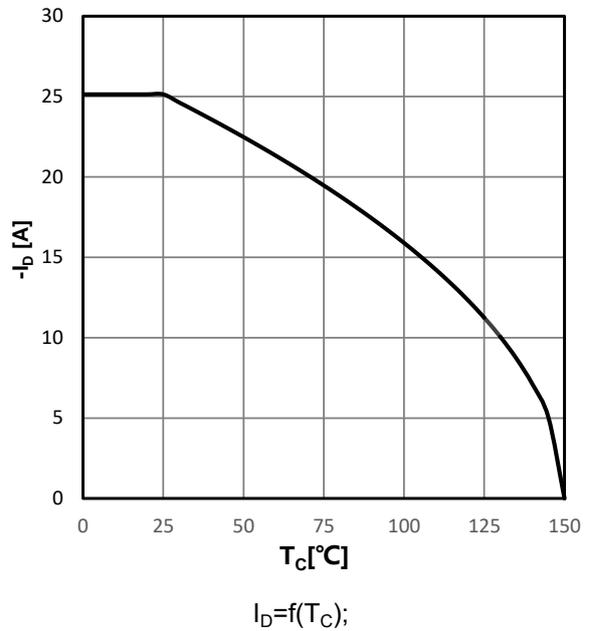
**Figure 11: Safe operating area**

I_D=f(V_{DS}); T_C=25 °C; D=0; parameter: tp
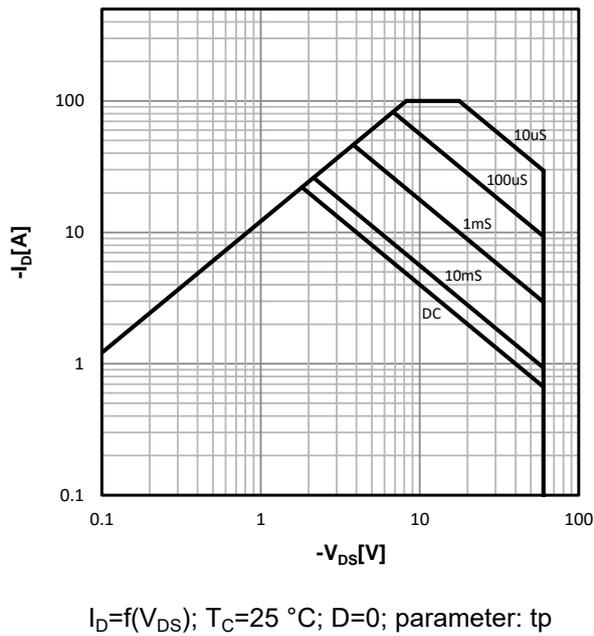
Figure 12: Typ. forward characteristics

Tj=25℃

I_F=f(V_{SD});
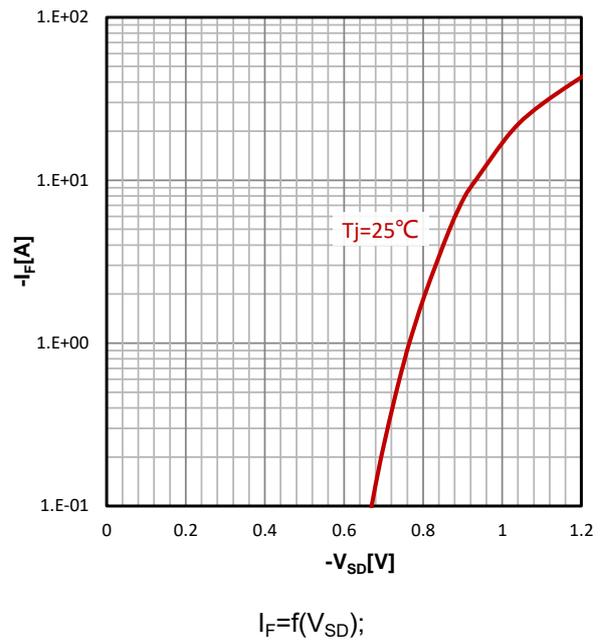
Figure 13: Max. Transient Thermal Impedance
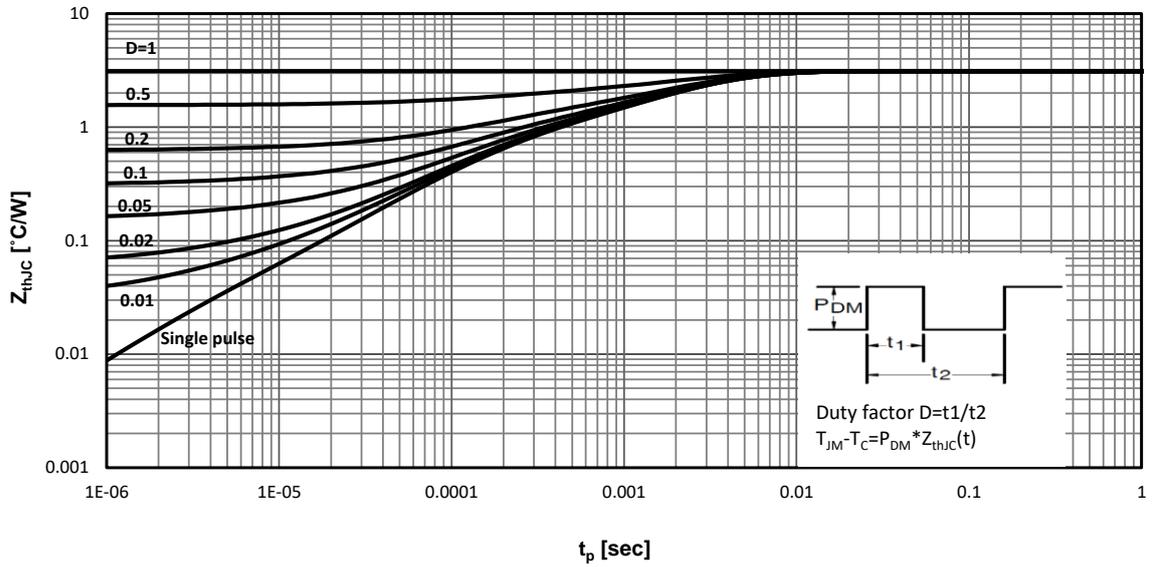
$Z_{thJC}=f(t_p)$; parameter: D

Test Circuit and Waveform:
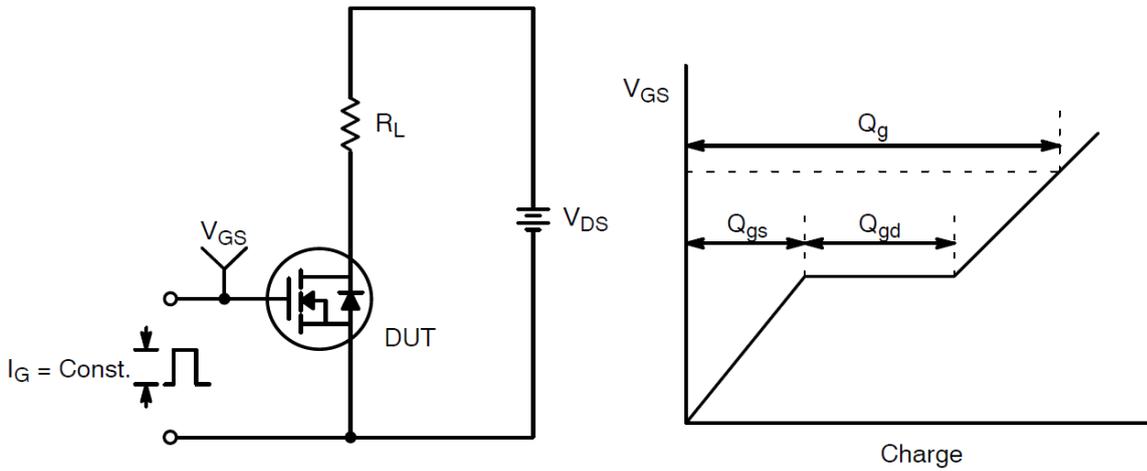
Gate Charge Test Circuit & Waveform
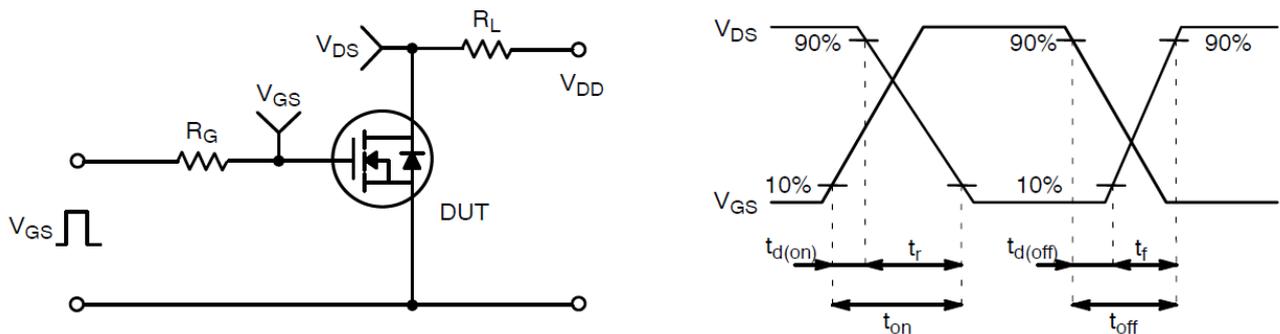
Resistive Switching Test Circuit & Waveforms

$$E_{AS} = \frac{1}{2} \cdot L I_{AS}^2$$
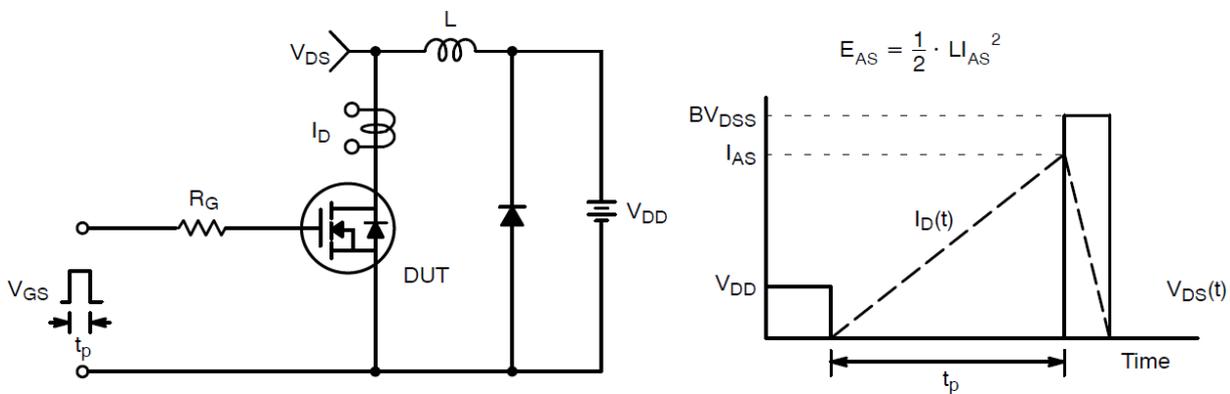
Unclamped Inductive Switching Test Circuit & Waveforms

Package Mechanical Data- SOP8
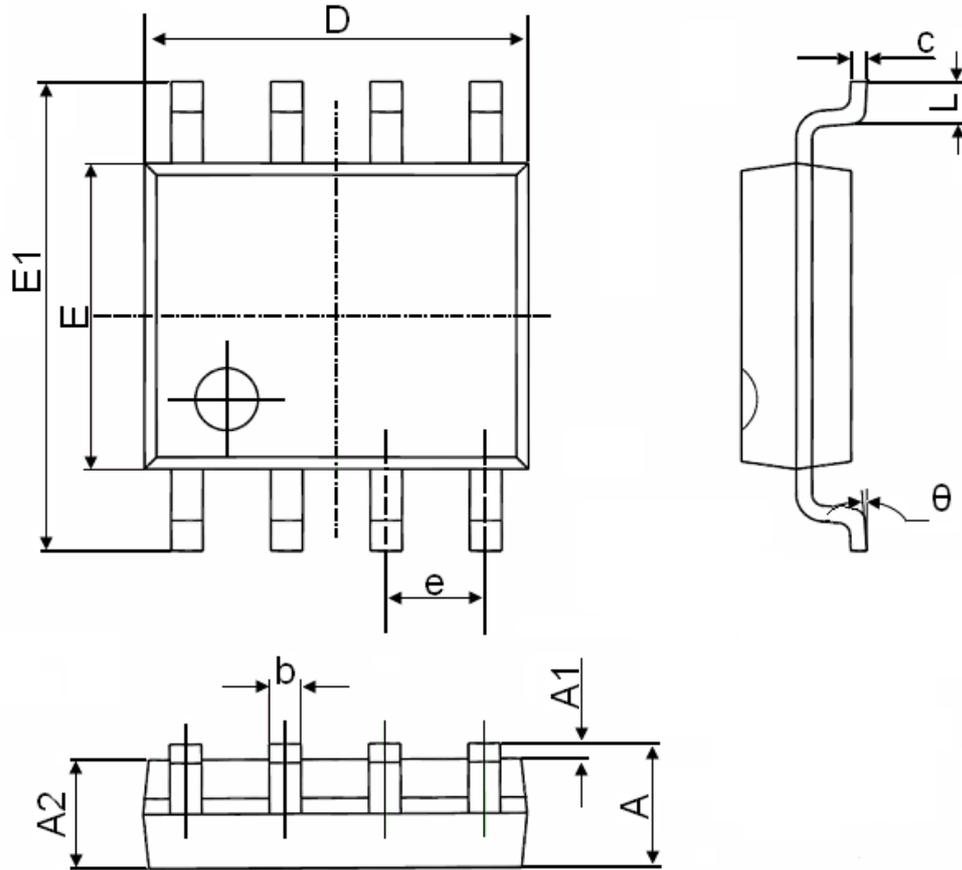
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°