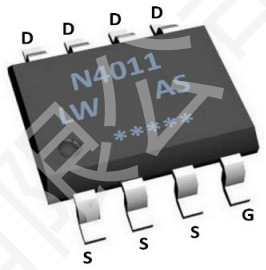
General Description:

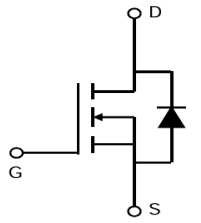
The LWN4011AS uses trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications. The package form is SOP-8, which accords with the ROHS standard and Halogen Free standard.

V_{DSS}	40	V
I_D	11	A
P_D	2.5	W
$R_{DS(ON)\ TYPE}$	7.0	mΩ

Marking and Pin Assignment



Inner Equivalent Principium Chart



Features:

- Fast Switching
- Low Gate Charge and $R_{DS(ON)}$
- Low Reverse transfer capacitances

Applications:

- DC-DC Converter
- Portable Equipment
- Power Management

100% DVDS Tested

100% Avalanche Tested

RoHS HF

Package Marking and Ordering Information:

Marking	Part Number	Package	Packing	Qty.
N4011/LW AS/D.C.	LWN4011AS	SOP-8	Reel	4000 Pcs

Absolute Maximum Ratings:

Symbol	Parameter		Value	Units
V_{DSS}	Drain-to-Source Voltage		40	V
I_D	Continuous Drain Current	T_A=25℃	11	A
	Continuous Drain Current	T_A=100℃	7.0	A
I_{DM}[a1]	Pulsed Drain Current		44	A
E_{AS}[a2]	Single pulse avalanche energy		68	mJ
V_{GS}	Gate-to-Source Voltage		±20	V
P_D	Power Dissipation		2.5	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		150, -55 to 150	℃
T_L	Maximum Temperature for Soldering		260	℃

Thermal Characteristics:

Symbol	Parameter	Value	Units
$R_{\theta JA}$[a3]	Thermal Resistance, Junction-to-Ambient	50	℃/W

Electrical Characteristic (T_J = 25 °C, unless otherwise specified):

Static Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	40	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=40V, V_{GS}=0V	--	--	1.0	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS}=+20V, V_{DS}=0V	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS}=-20V, V_{DS}=0V	--	--	-100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1.2	1.5	2.0	V
$R_{DS(ON)1}$	Drain-to-Source On-Resistance	V_{GS}=10V, I_D=10A	--	7.0	9.5	mΩ
$R_{DS(ON)2}$	Drain-to-Source On-Resistance	V_{GS}=4.5V, I_D=8.0A	--	10	13	mΩ

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	V_{GS} =0V V_{DS} =20V f =1.0MHz	--	1221	--	pF
C_{oss}	Output Capacitance		--	137	--	
C_{rss}	Reverse Transfer Capacitance		--	109	--	
R_G	Gate resistance	V_{GS}=0V,V_{DS}=0V,f=1MHz	--	3.0	--	Ω

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D =10A V_{DS} =20V V_{GS} =10V R_G =3.0Ω	--	5.3	--	ns
t_r	Rise Time		--	14	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	24	--	
t_f	Fall Time		--	11	--	
Q_g	Total Gate Charge	V_{GS} =10V V_{DS} =20V I_D =10A	--	26	--	nC
Q_{gs}	Gate to Source Charge		--	4.4	--	
Q_{gd}	Gate to Drain Charge		--	5.9	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	T_A =25 °C	--	--	11	A
V_{SD}	Diode Forward Voltage	I_S=10A, V_{GS}=0V	--	--	1.2	V

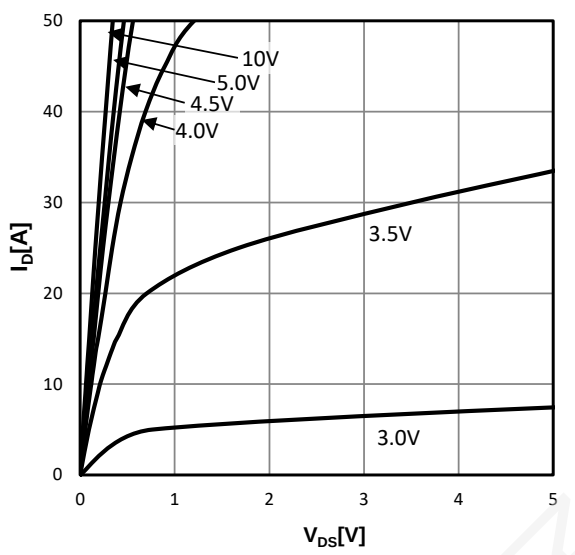
a1：Repetitive rating; pulse width limited by maximum junction temperature

a2：V_{DD}=20V, L=0.1mH, RG=25Ω, Starting T_J=25 ℃

a3：Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm^2 (one layer, 70 μm thick) copper area for drain connection.

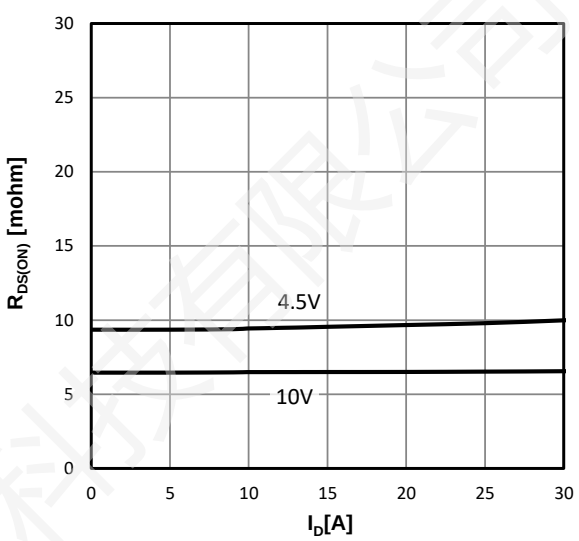
Characteristics Curve：

Figure 1: Typ. output characteristics



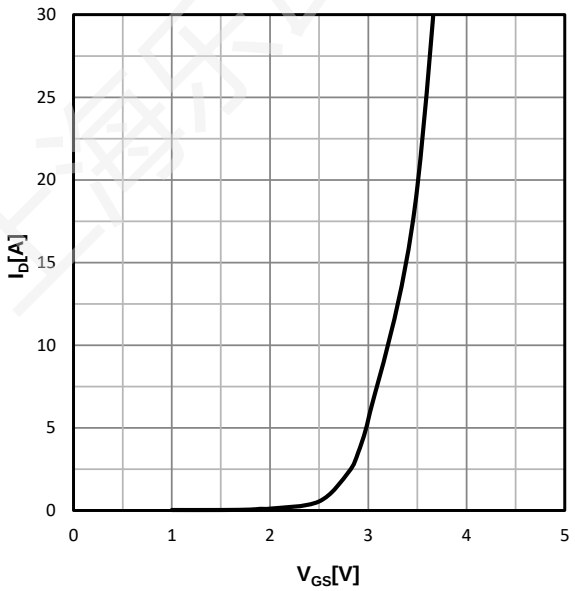
$I_D=f(V_{DS})$, T_j=25 °C; parameter: V_{GS}

Figure 2: Typ. drain-source on resistance



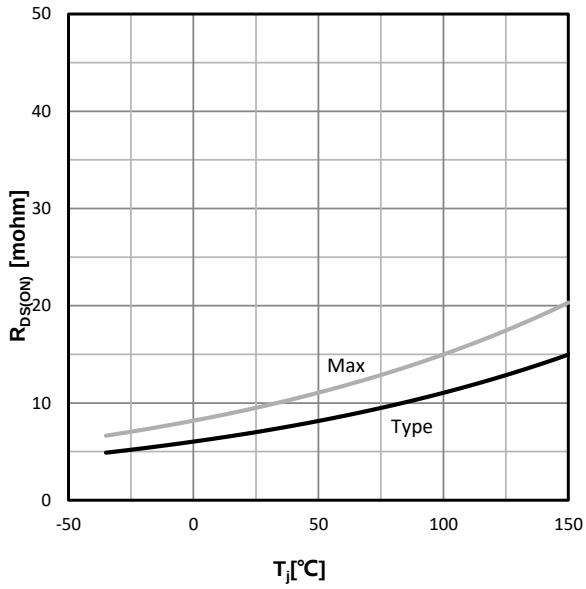
$R_{DS(on)}=f(I_D)$, T_j=25 °C; parameter: V_{GS}

Figure 3: Typ. transfer characteristics



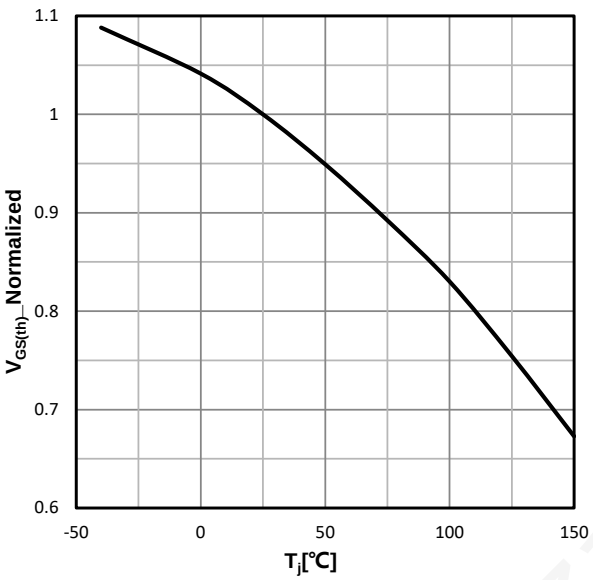
$I_D=f(V_{GS})$, $|V_{DS}|>2|I_D|R_{DS}(on)max$;

Figure 4: drain-source on resistance



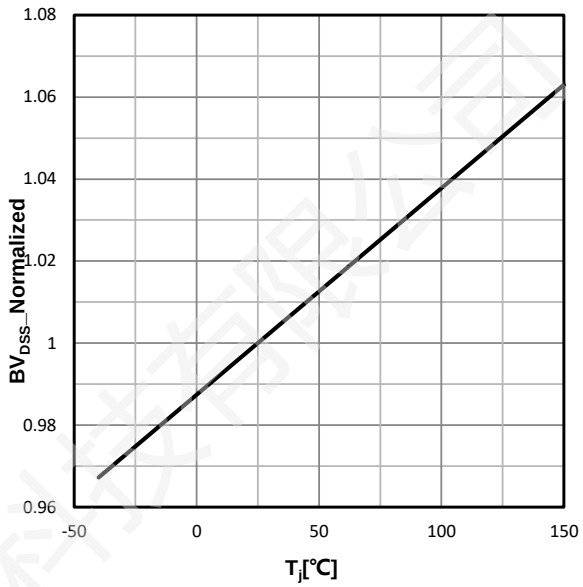
$R_{DS(on)}=f(T_j)$, I_D=10A, V_{GS}=10V;

Figure 5: Typ. gate threshold voltage



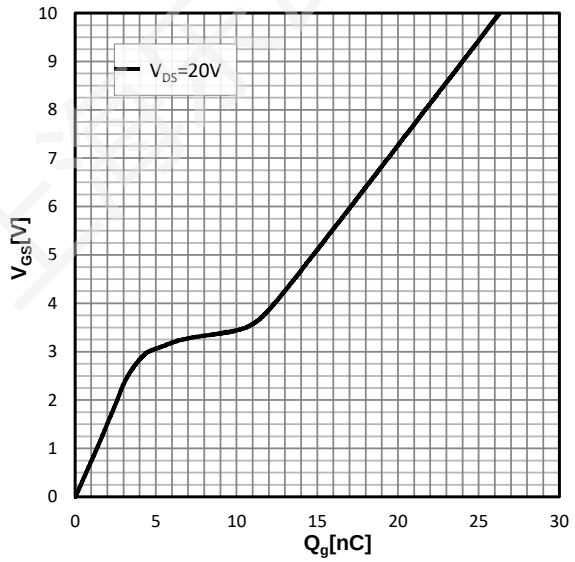
$V_{GS}=f(T_j)$,$V_{GS}=V_{DS}$,$I_D=250\mu A$;

Figure 6: Drain-source breakdown voltage



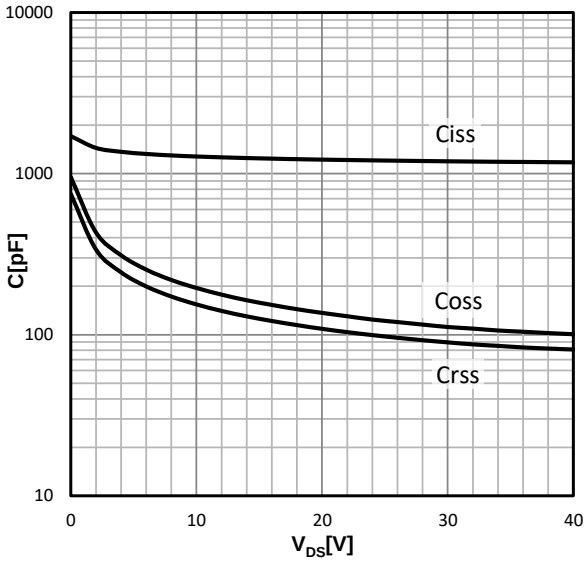
$V_{BR(DSS)}=f(T_j)$; $I_D=250\mu A$;

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;

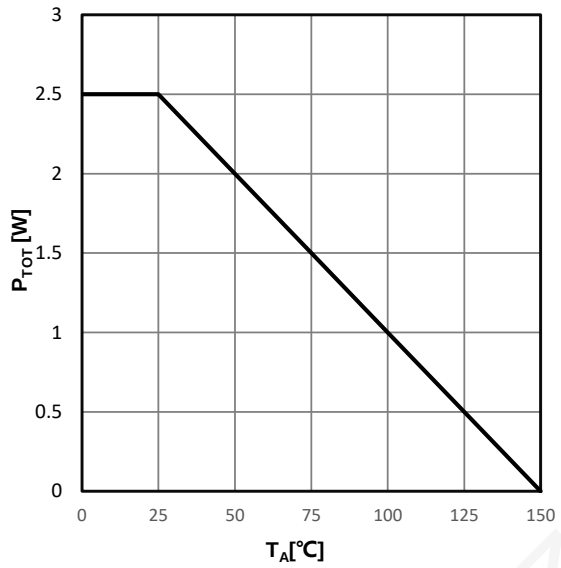
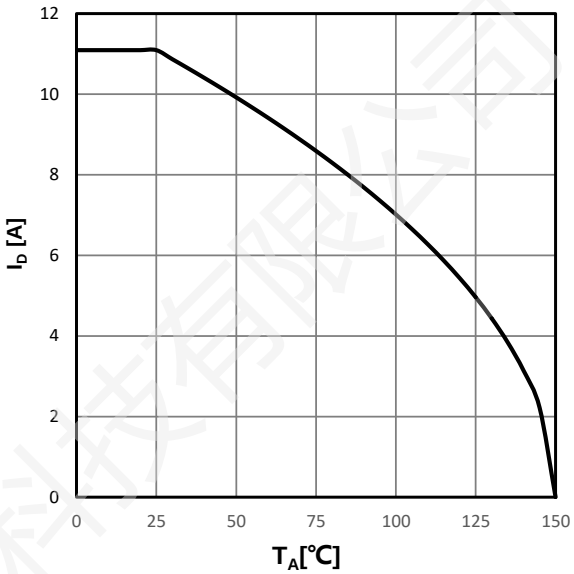
Figure 9: Power dissipation	Figure 10:Drain current
	
$P_{tot}=f(T_A)$;	$I_D=f(T_A)$;

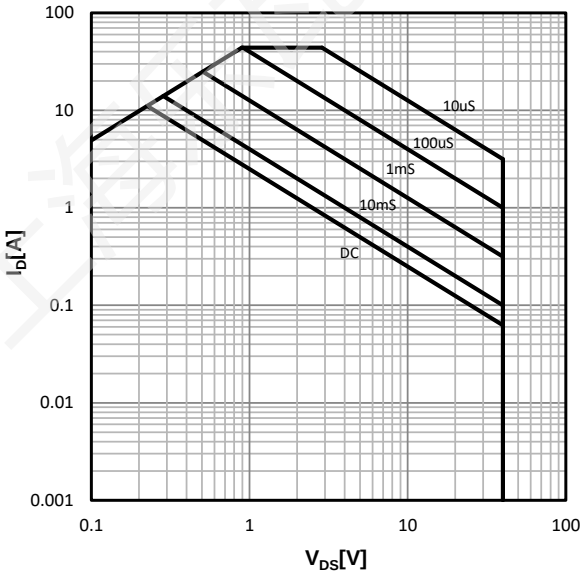
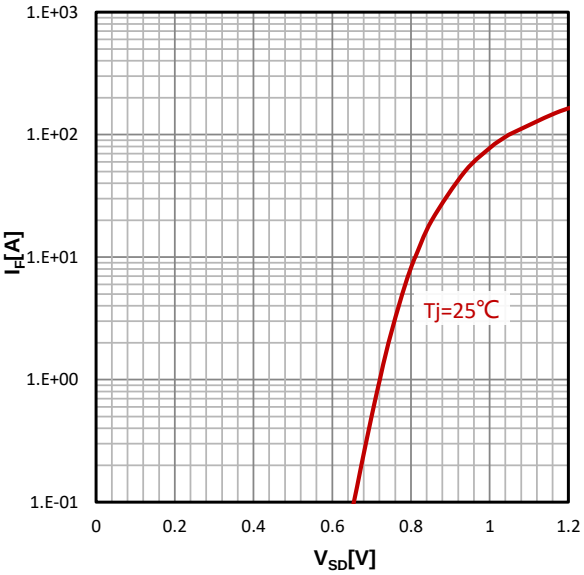
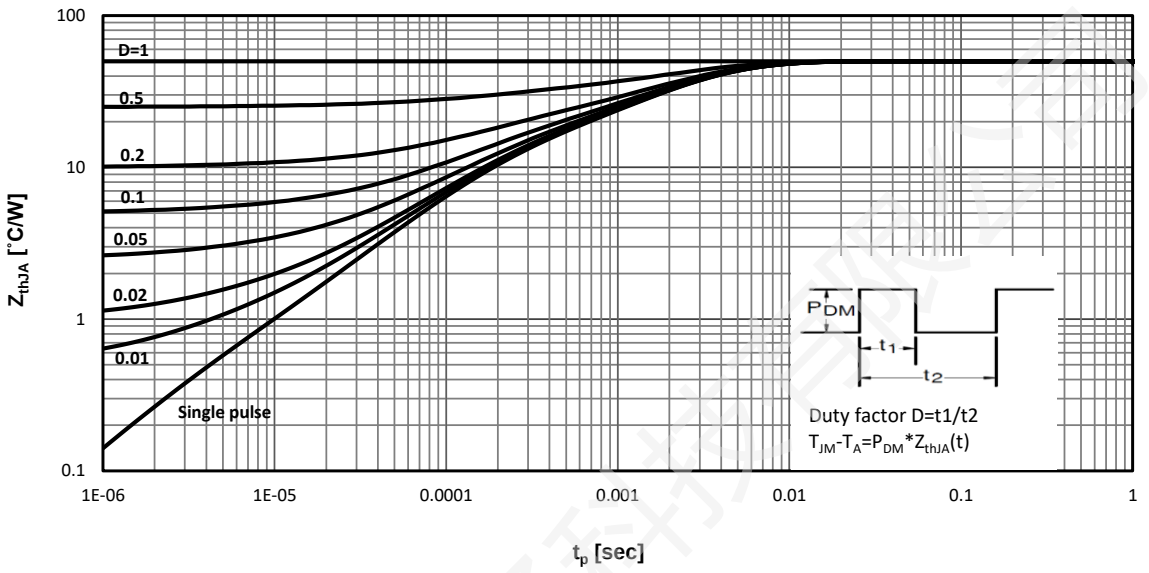
Figure 11: Safe operating area	Figure 12: Typ. forward characteristics
	
$I_D=f(V_{DS})$; T_A=25 °C; D=0; parameter: tp	$I_F=f(V_{SD})$;

Figure 13: Max. Transient Thermal Impedance



$Z_{thJA}=f(t_p)$; parameter: D

Test Circuit & Waveform:

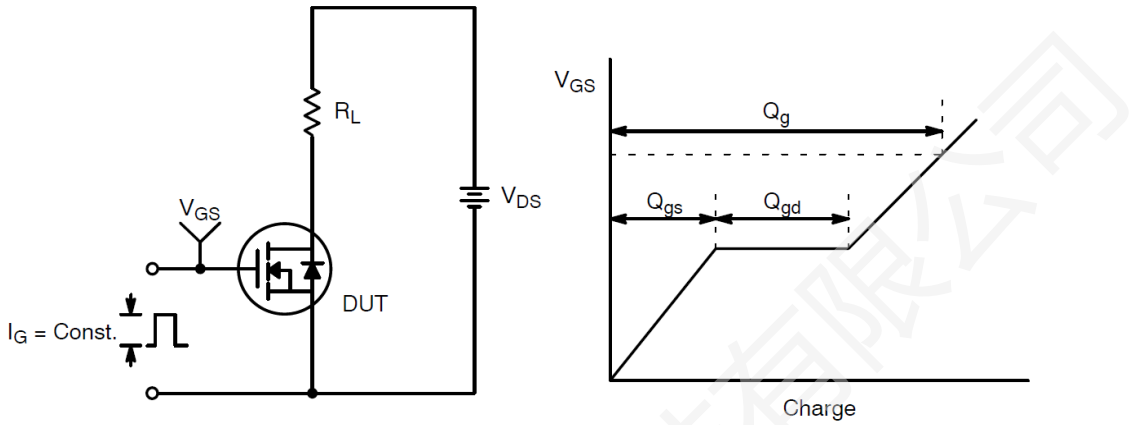


Figure 14: Gate Charge Test Circuit & Waveform

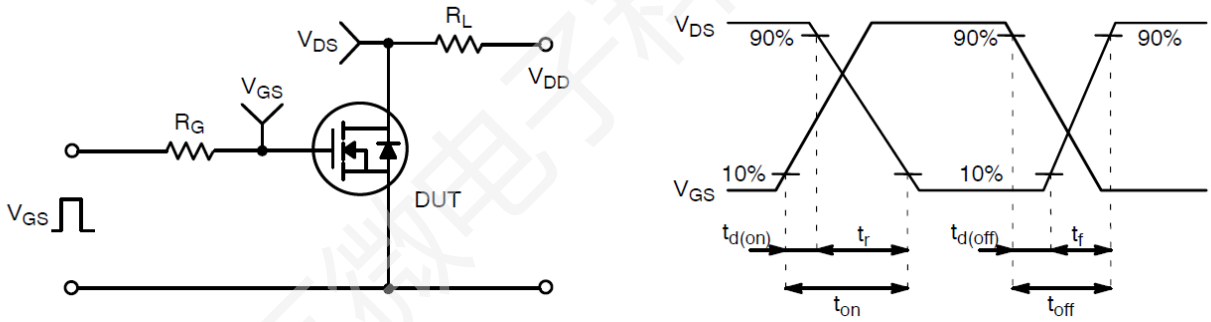


Figure 15: Resistive Switching Test Circuit & Waveforms

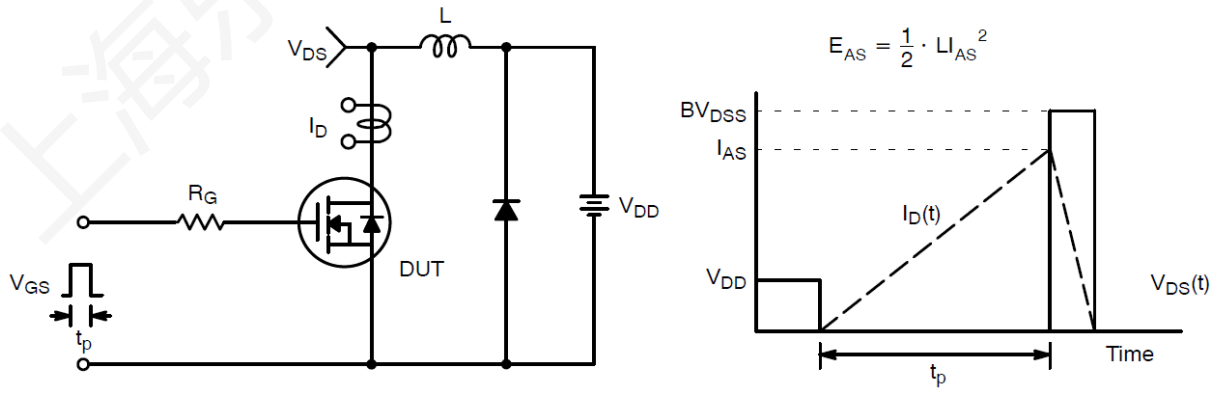
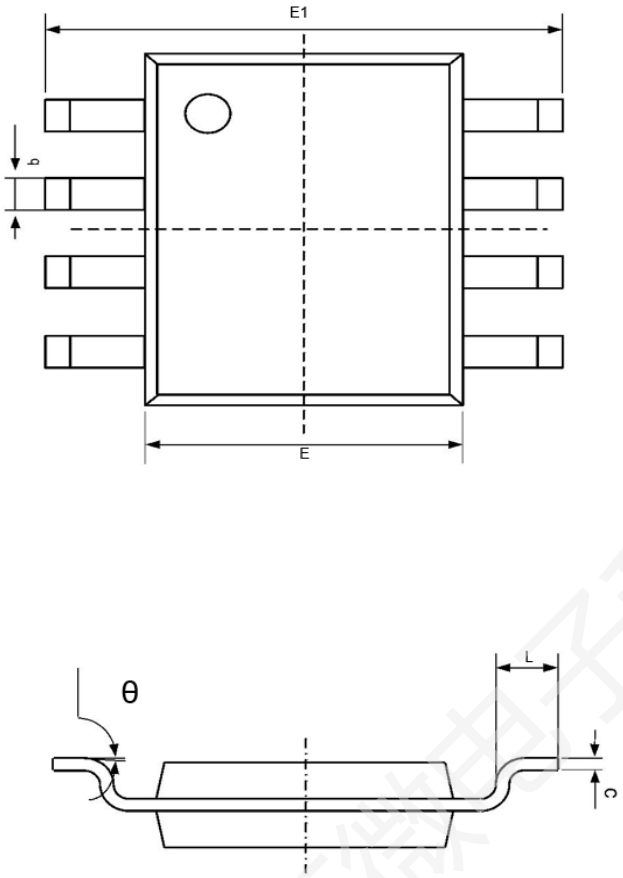


Figure 16: Unclamped Inductive Switching Test Circuit & Waveforms

Package Outline:



Symbol	Dimensions In Millimeters		
	Min	Ref	Max
A	1.350	1.550	1.750
A1	0.030	0.140	0.250
A2	1.350	1.450	1.550
b	0.330	0.430	0.530
c	0.160	0.205	0.250
D	4.700	5.000	5.300
E	3.800	3.900	4.000
E1	5.800	6.000	6.200
e	1.270(BSC)		
L	0.400	0.835	1.270
θ	0°	4°	8°

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Revision History:

Revison	Date	Descriptions
Rev 1.2	Aug.2026	“Electrical Characteristic ” Update
Rev 1.1	July.2025	Initial Version

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