

**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.

**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**


**Package Marking and Ordering Information:**

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

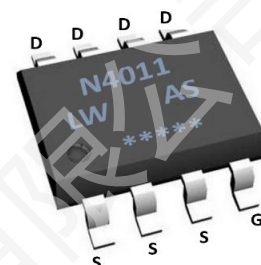
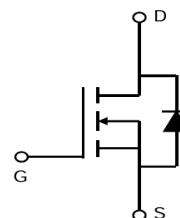
**Absolute Maximum Ratings:**

Symbol	Parameter	Value	Units
$V_{DSS}$	Drain-to-Source Voltage	40	V
$I_D$	Continuous Drain Current	$T_A=25^\circ\text{C}$	11
	Continuous Drain Current	$T_A=100^\circ\text{C}$	6.9
$I_{DM}^{a1}$	Pulsed Drain Current	44	A
$E_{AS}^{a2}$	Single pulse avalanche energy	62	mJ
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$P_D$	Power Dissipation	3.0	W
$T_J, T_{STG}$	Operating Junction and Storage Temperature Range	150, -55 to 150	$^\circ\text{C}$
$T_L$	Maximum Temperature for Soldering	260	$^\circ\text{C}$

**Thermal Characteristics:**

Symbol	Parameter	Value	Units
$R_{\theta JA}^{a3}$	Thermal Resistance, Junction-to-Ambient	41.6	$^\circ\text{C}/\text{W}$

$V_{DSS}$	40	V
$I_D$	11	A
$P_D$	3.0	W
$R_{DS(ON) \text{ TYPE}}$	7.6	$\text{m}\Omega$

**Marking and Pin Assignment**

**Inner Equivalent Principium Chart**


**Electrical Characteristic** ( $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise specified):

Static Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$V_{DSS}$	Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	40	--	--	V
$I_{DSS}$	Drain to Source Leakage Current	$V_{DS}=40V, V_{GS}=0V$	--	--	1.0	$\mu A$
$I_{GSS(F)}$	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	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.5	2.0	V
$R_{DS(ON)1}$	Drain-to-Source On-Resistance	$V_{GS}=10V, I_D=20A$	--	7.6	9.5	$m\Omega$
$R_{DS(ON)2}$	Drain-to-Source On-Resistance	$V_{GS}=4.5V, I_D=10A$	--	11	13	$m\Omega$

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

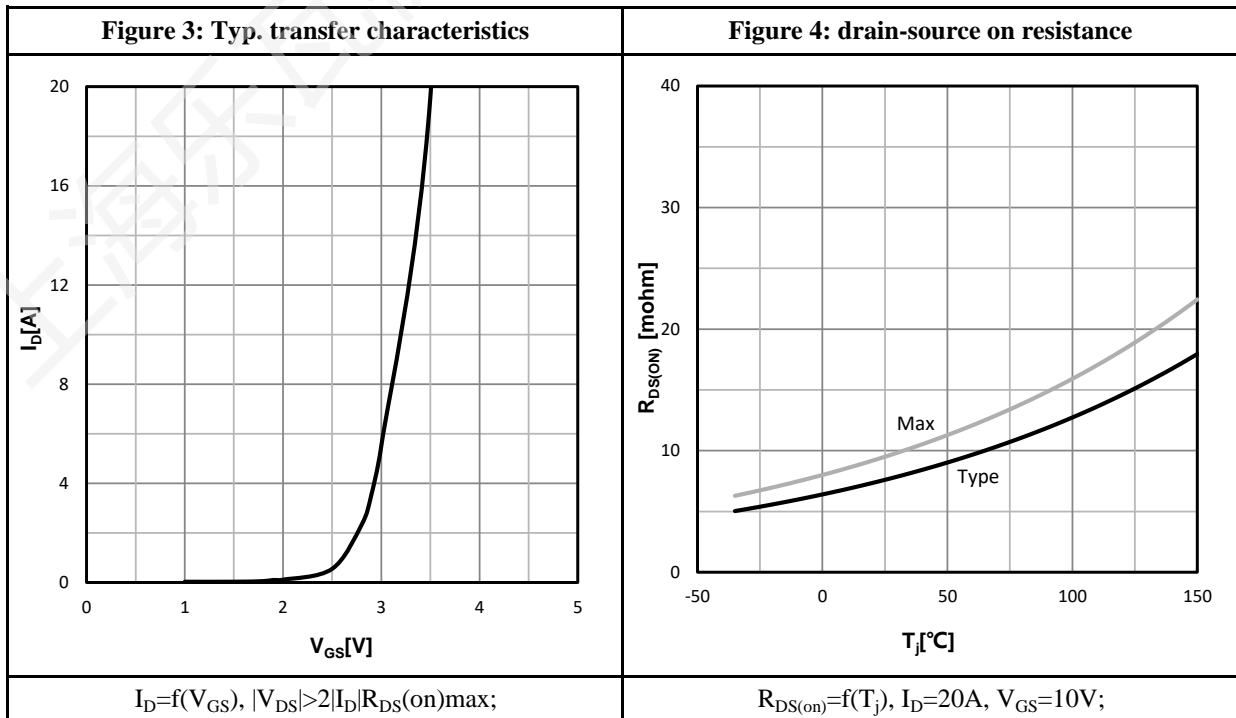
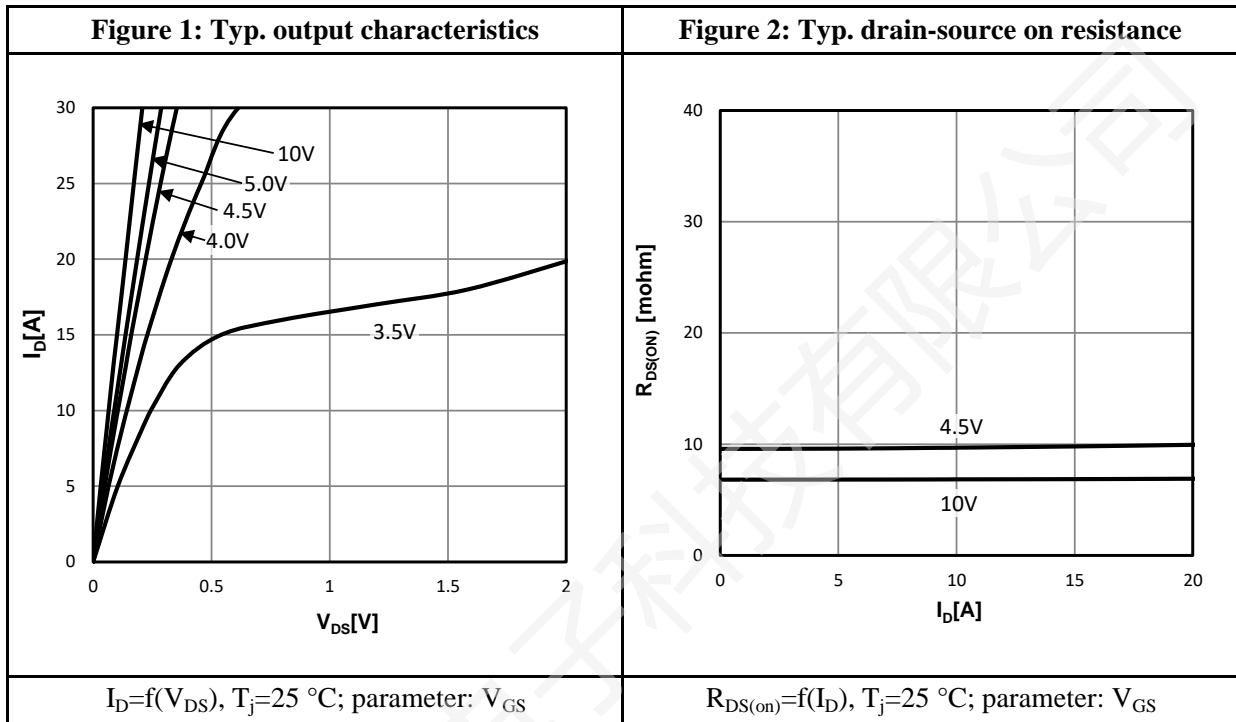
Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$I_D=20A$	--	5.3	--	ns
$t_r$	Rise Time	$V_{DS}=20V$	--	14	--	
$t_{d(OFF)}$	Turn-Off Delay Time	$V_{GS}=10V$	--	24	--	
$t_f$	Fall Time	$R_G=3.0\Omega$	--	11	--	
$Q_g$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

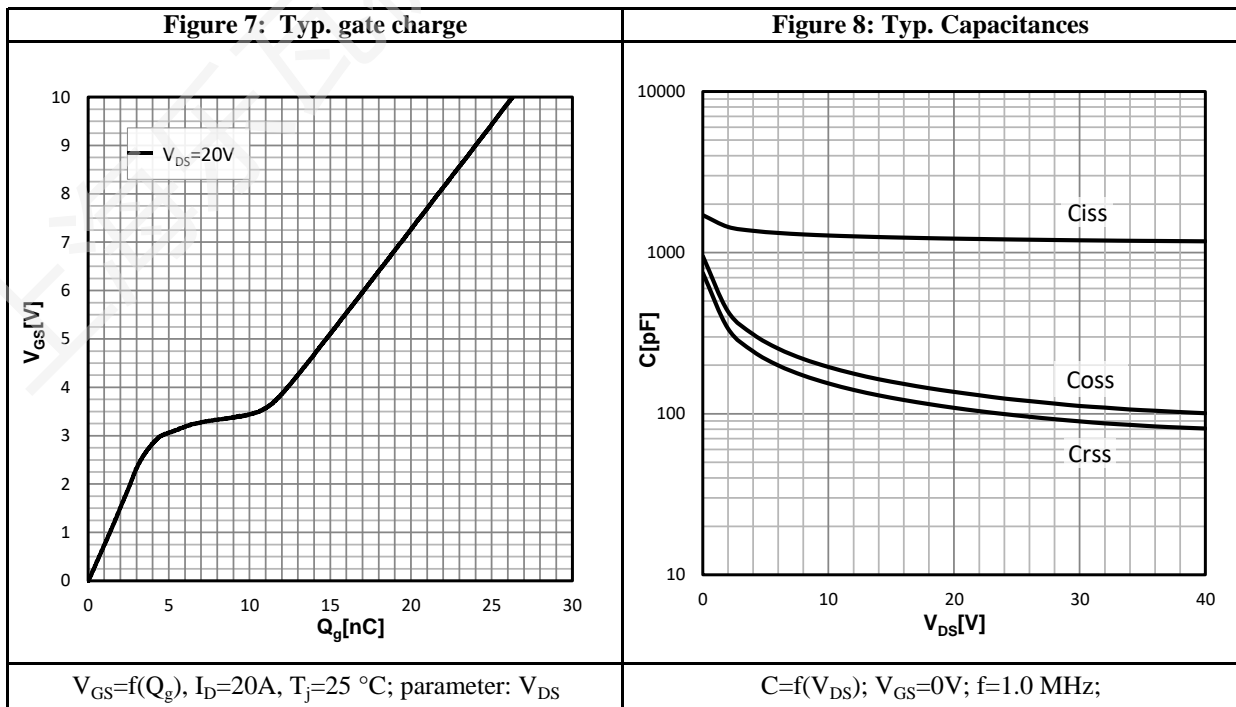
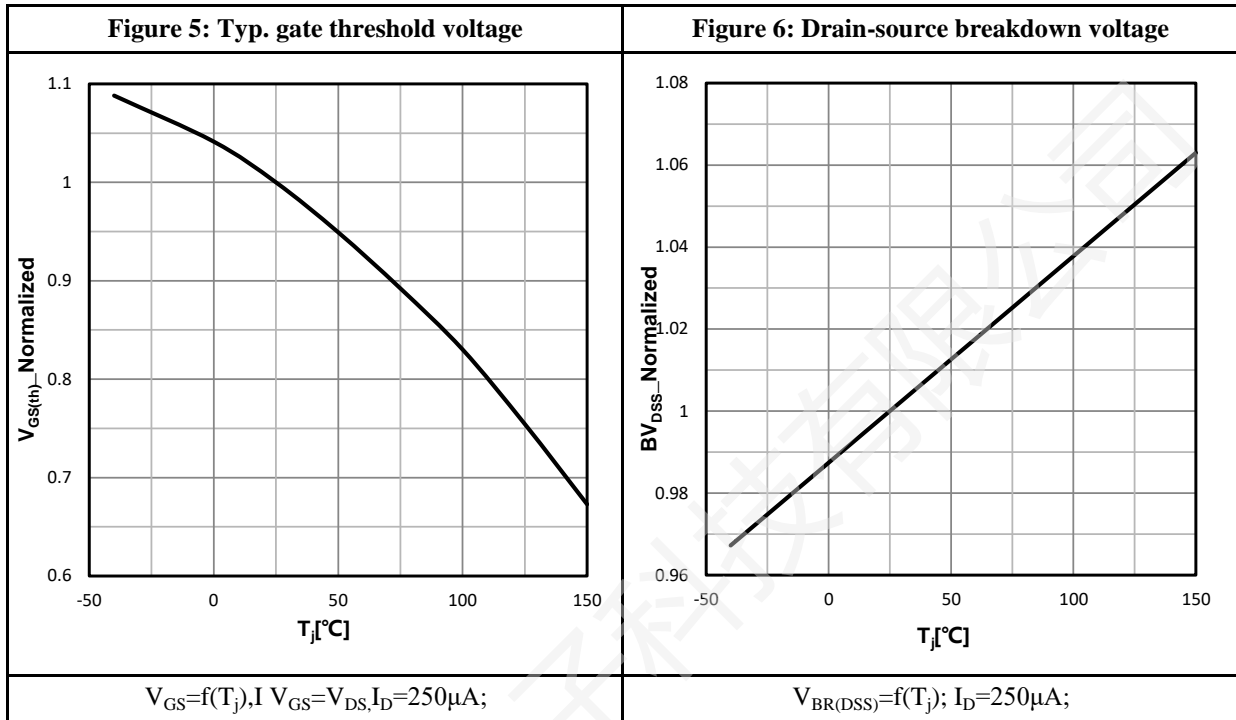
Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$I_S$	Diode Forward Current	$T_A=25\text{ }^\circ\text{C}$	--	--	11	A
$V_{SD}$	Diode Forward Voltage	$I_S=20A, V_{GS}=0V$	--	--	1.2	V

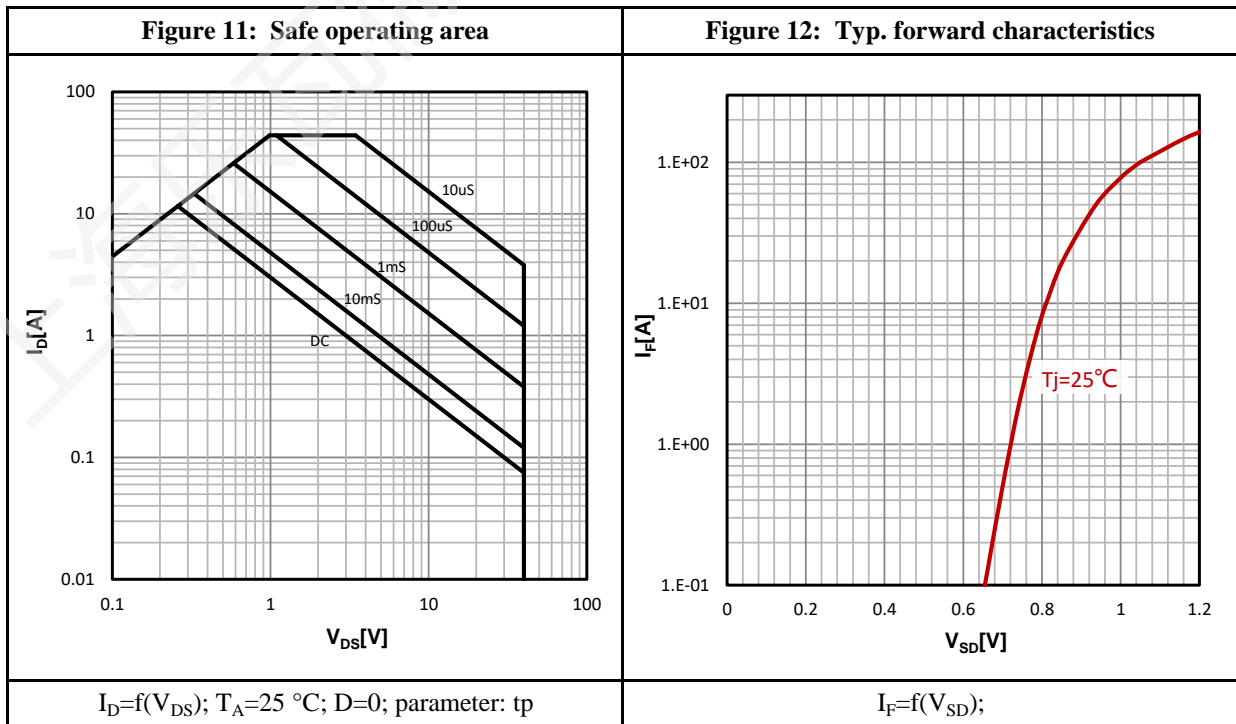
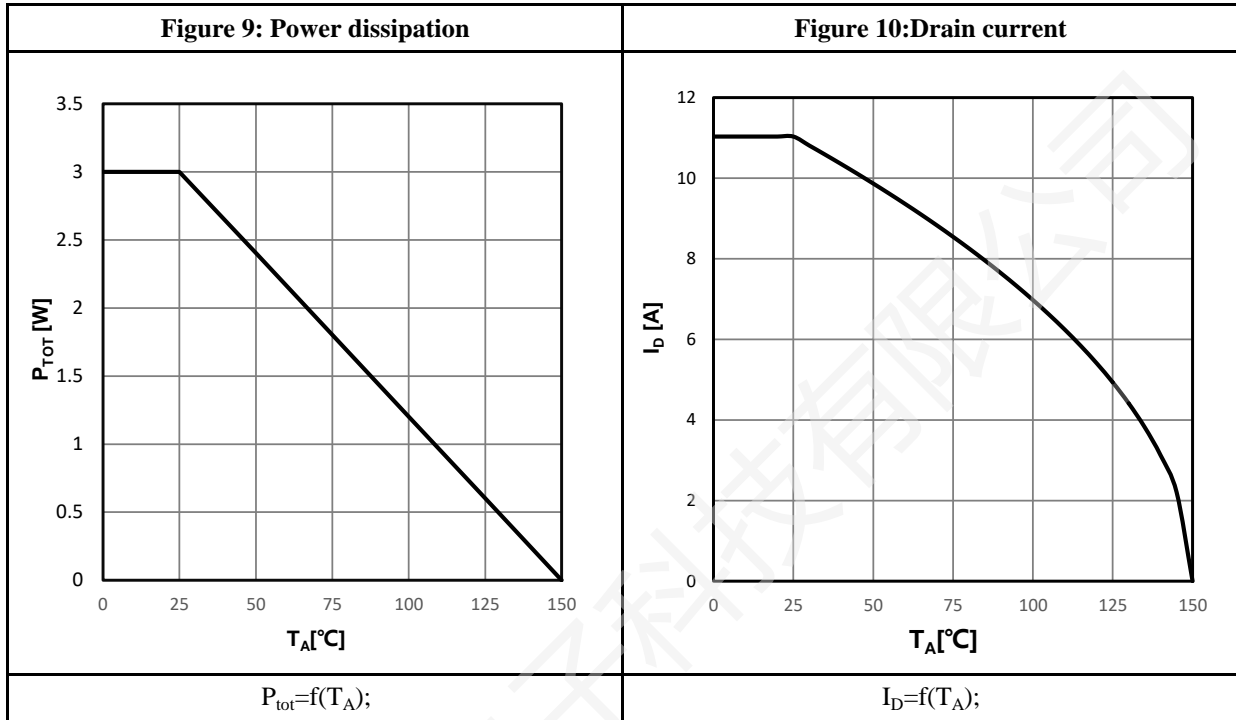
a1: Repetitive rating; pulse width limited by maximum junction temperature

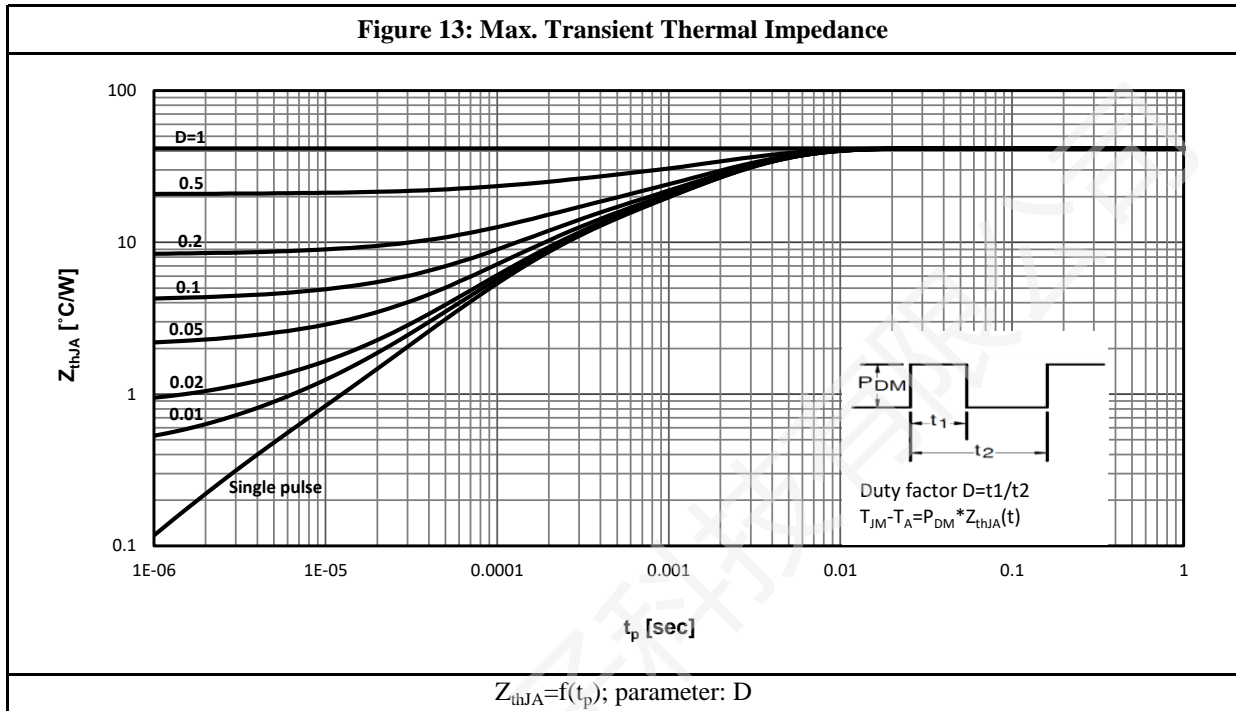
a2:  $V_{DD}=20V, L=0.1mH, R_G=25\Omega$ , Starting  $T_J=25\text{ }^\circ\text{C}$

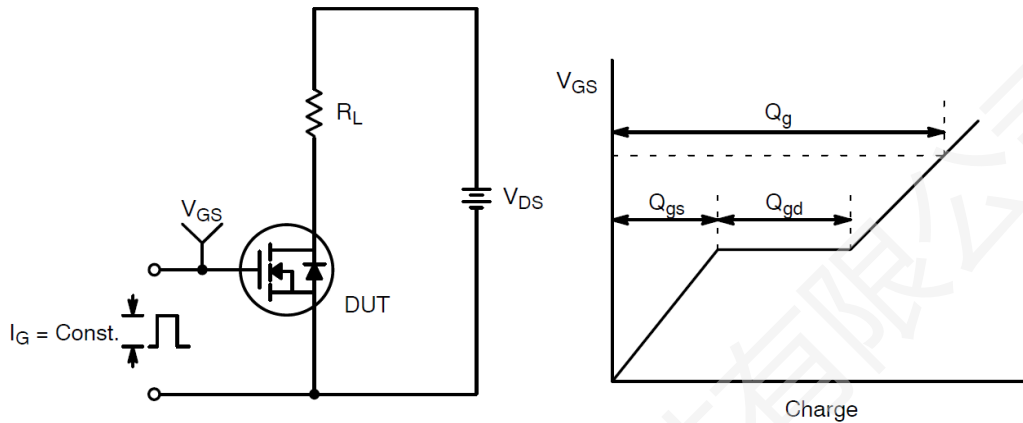
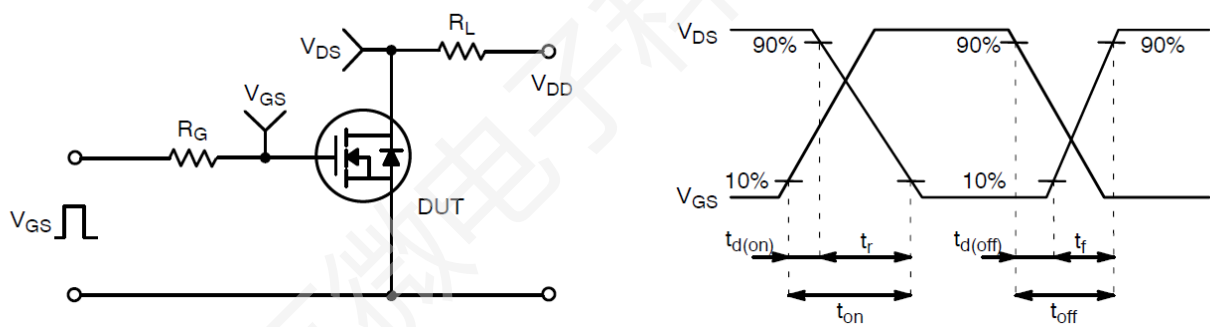
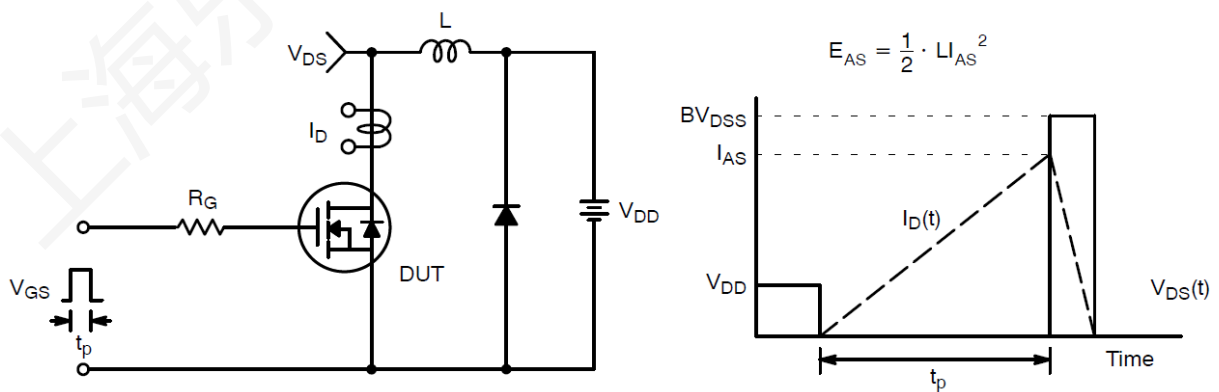
a3: Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm<sup>2</sup> (one layer, 70  $\mu m$  thick) copper area for drain connection.

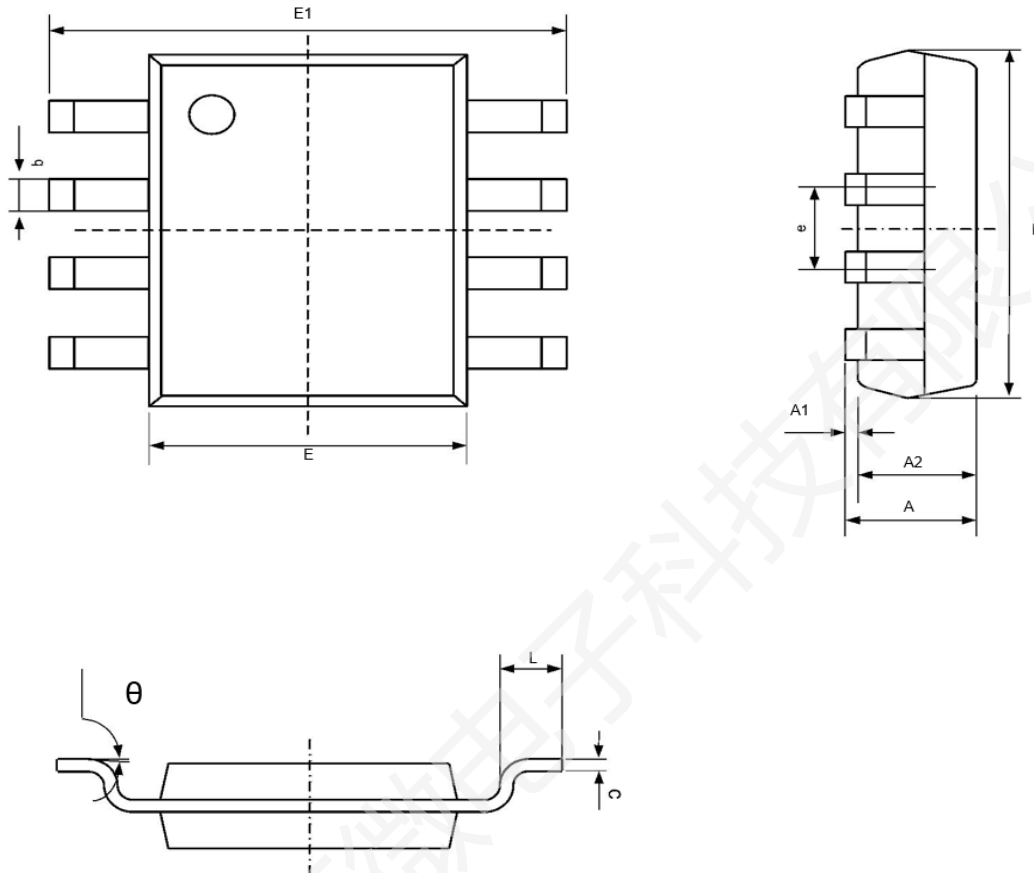
**Characteristics Curve:**








**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
<b>A</b>	1.350	1.550	1.750
<b>A1</b>	0.030	0.140	0.250
<b>A2</b>	1.350	1.450	1.550
<b>b</b>	0.330	0.430	0.530
<b>c</b>	0.160	0.205	0.250
<b>D</b>	4.700	5.000	5.300
<b>E</b>	3.800	3.900	4.000
<b>E1</b>	5.800	6.000	6.200
<b>e</b>	1.270(BSC)		
<b>L</b>	0.400	0.835	1.270
<b>θ</b>	0°	4°	8°

**Revision History:**

<b>Revison</b>	<b>Date</b>	<b>Descriptions</b>
Rev 1.1	July.2025	Initial Version

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