

**General Description:**

The LWS6060AD3 uses advanced SGT 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 PDFN3.3\*3.3-8L, 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:**

- Battery switching application
- Hard switched and high frequency circuits
- Power Management

**100% DVDS Tested**

**100% Avalanche Tested**


**Package Marking and Ordering Information:**

Marking	Part Number	Package	Packing	Qty.
S6060A/LW D3/D.C.	LWS6060AD3	PDFN3.3*3.3-8L	Reel	5000 Pcs

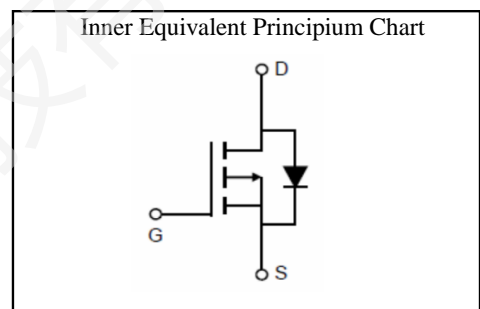
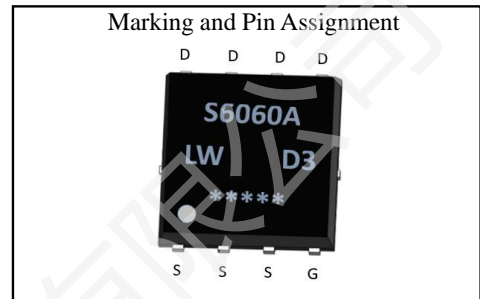
**Absolute Maximum Ratings:**

Symbol	Parameter	Value	Units
$V_{DSS}$	Drain-to-Source Voltage	-60	V
$I_D$	Continuous Drain Current	$T_C=25^\circ\text{C}$	-18
	Continuous Drain Current	$T_C=100^\circ\text{C}$	-11
$I_{DM}^{a1}$	Pulsed Drain Current	-72	A
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$P_D$	Power Dissipation	30	W
$E_{AS}^{a2}$	Single pulse avalanche energy	29	mJ
$T_J, T_{STG}$	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
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	4.16	$^\circ\text{C}/\text{W}$
$R_{\theta JA}^{a3}$	Thermal Resistance, Junction-to-Ambient	75	$^\circ\text{C}/\text{W}$

$V_{DSS}$	-60	V
$I_D$	-18	A
$P_D$	30	W
$R_{DS(ON) \text{ TYPE}}$	40	$\text{m}\Omega$



**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	$V_{GS}=0V, I_D=-250\mu A$	-60	--	--	V
$I_{DSS}$	Drain to Source Leakage Current	$V_{DS}=-60V, V_{GS}=0V$	--	--	-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	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.3	-1.7	-2.3	V
$R_{DS(ON)1}$	Drain-to-Source On-Resistance	$V_{GS}=-10V, I_D=-10A$	--	40	52	$m\Omega$
$R_{DS(ON)2}$	Drain-to-Source On-Resistance	$V_{GS}=-4.5V, I_D=-8.0A$	--	51	65	$m\Omega$

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$C_{iss}$	Input Capacitance	$V_{GS}=0V$	--	660	--	pF
$C_{oss}$	Output Capacitance	$V_{DS}=-30V$	--	114	--	
$C_{riss}$	Reverse Transfer Capacitance	$f=1.0MHz$	--	7.1	--	
$R_G$	Gate resistance	$V_{GS}=0V, V_{DS}=0V, f=1MHz$	--	5.0	--	$\Omega$

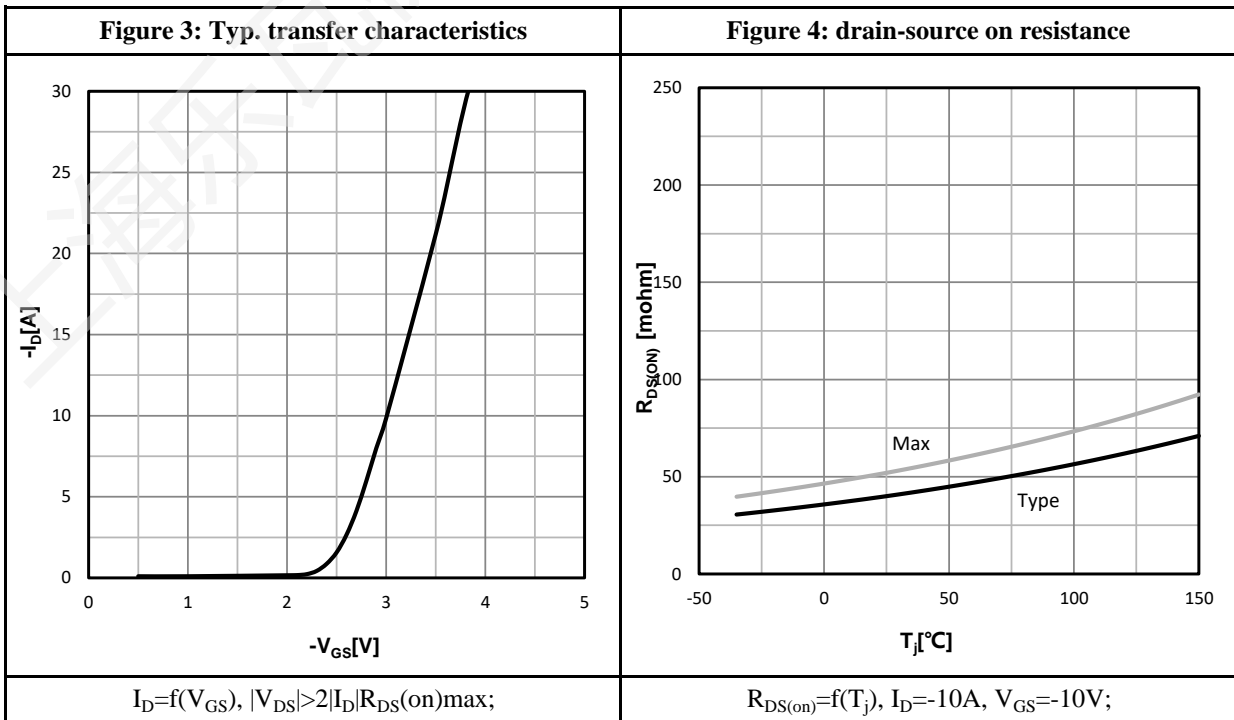
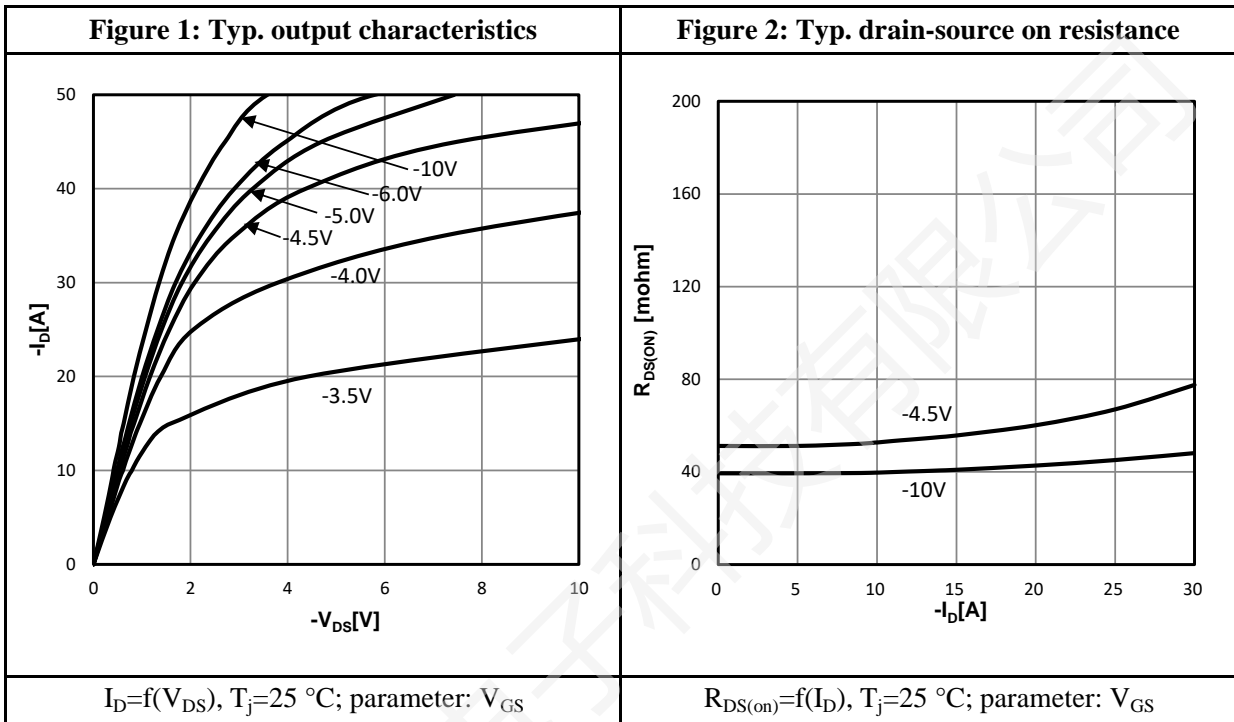
Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$I_D=-10A$	--	10	--	ns
$t_r$	Rise Time	$V_{DS}=-30V$	--	6.0	--	
$t_{d(OFF)}$	Turn-Off Delay Time	$V_{GS}=-10V$	--	40	--	
$t_f$	Fall Time	$R_G=3.0\Omega$	--	13	--	
$Q_g$	Total Gate Charge	$V_{GS}=-10V$	--	12.5	--	nC
$Q_{gs}$	Gate to Source Charge	$V_{DS}=-30V$	--	2.2	--	
$Q_{gd}$	Gate to Drain Charge	$I_D=-10A$	--	1.9	--	

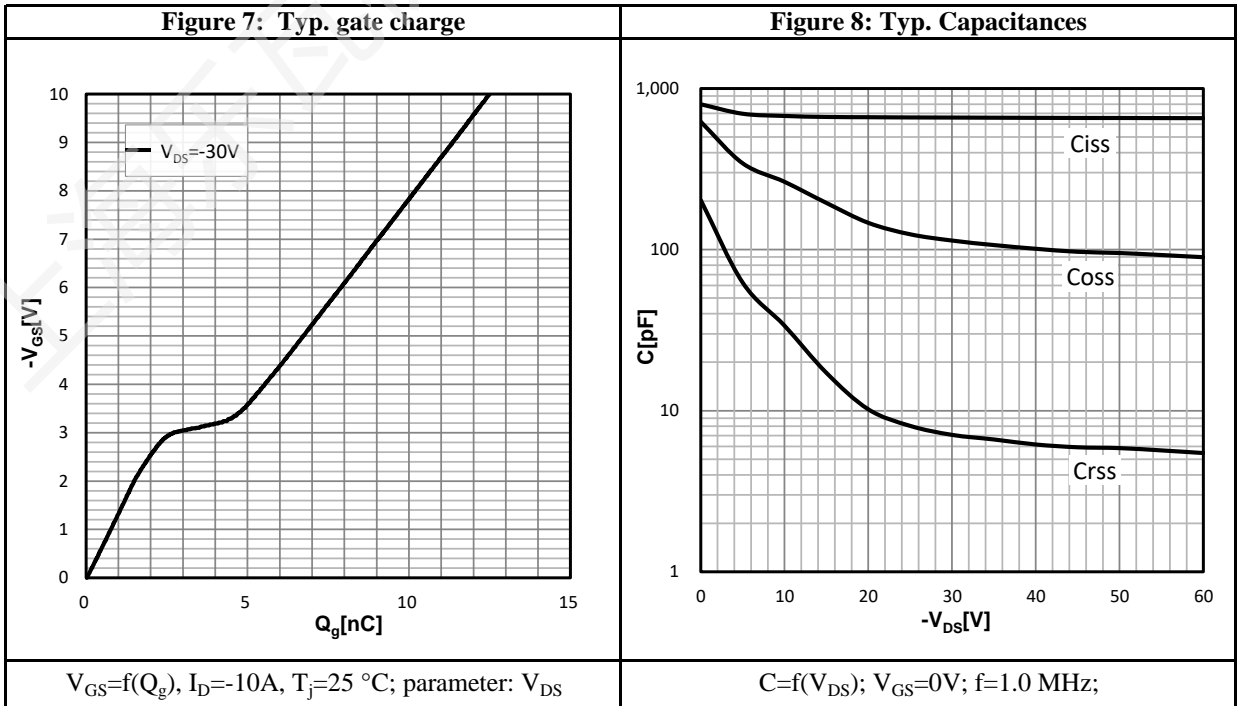
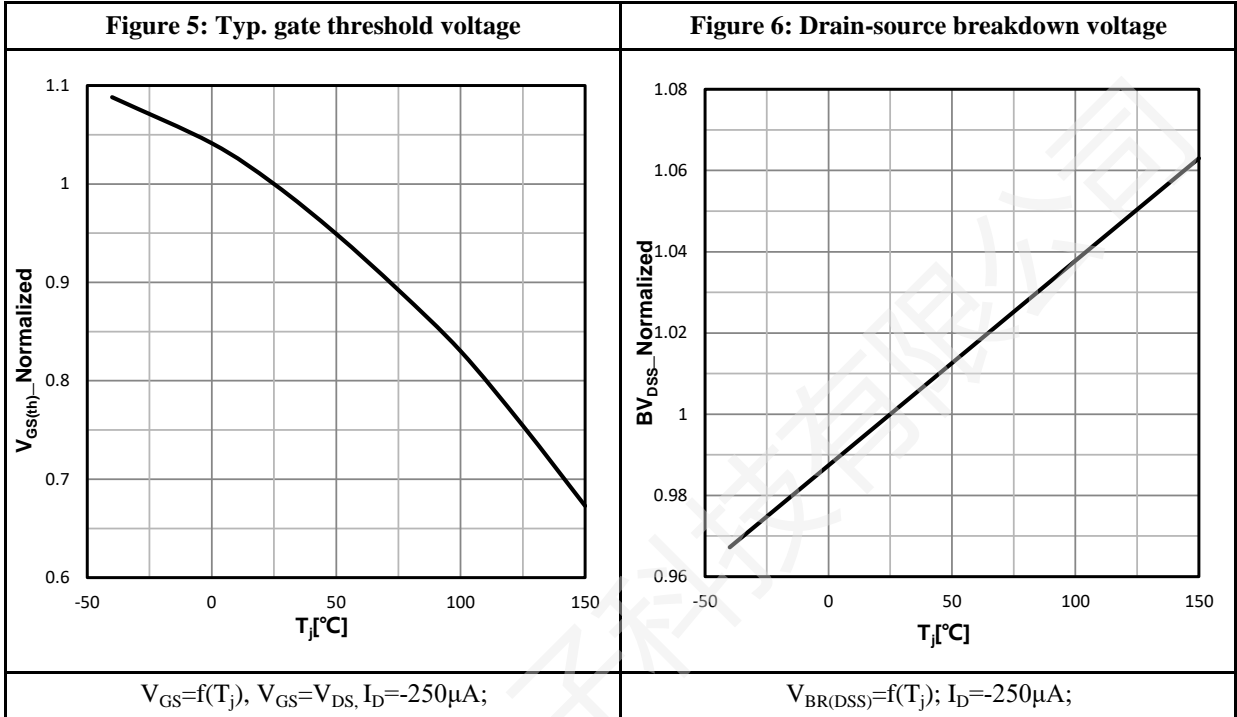
Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$I_S$	Diode Forward Current	$T_C=25\text{ }^\circ\text{C}$	--	--	-18	A
$I_{SM}$	Diode Pulse Current		--	--	-72	A
$V_{SD}$	Diode Forward Voltage	$I_S=-10A, V_{GS}=0V$	--	--	-1.2	V

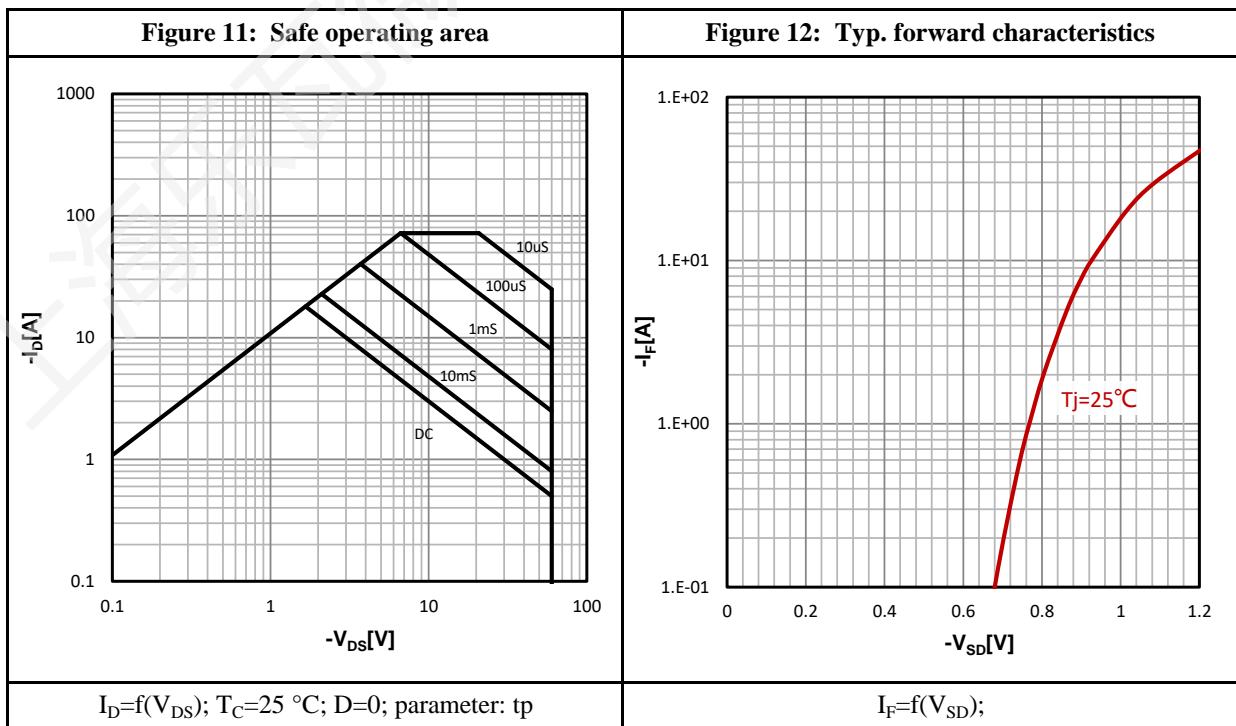
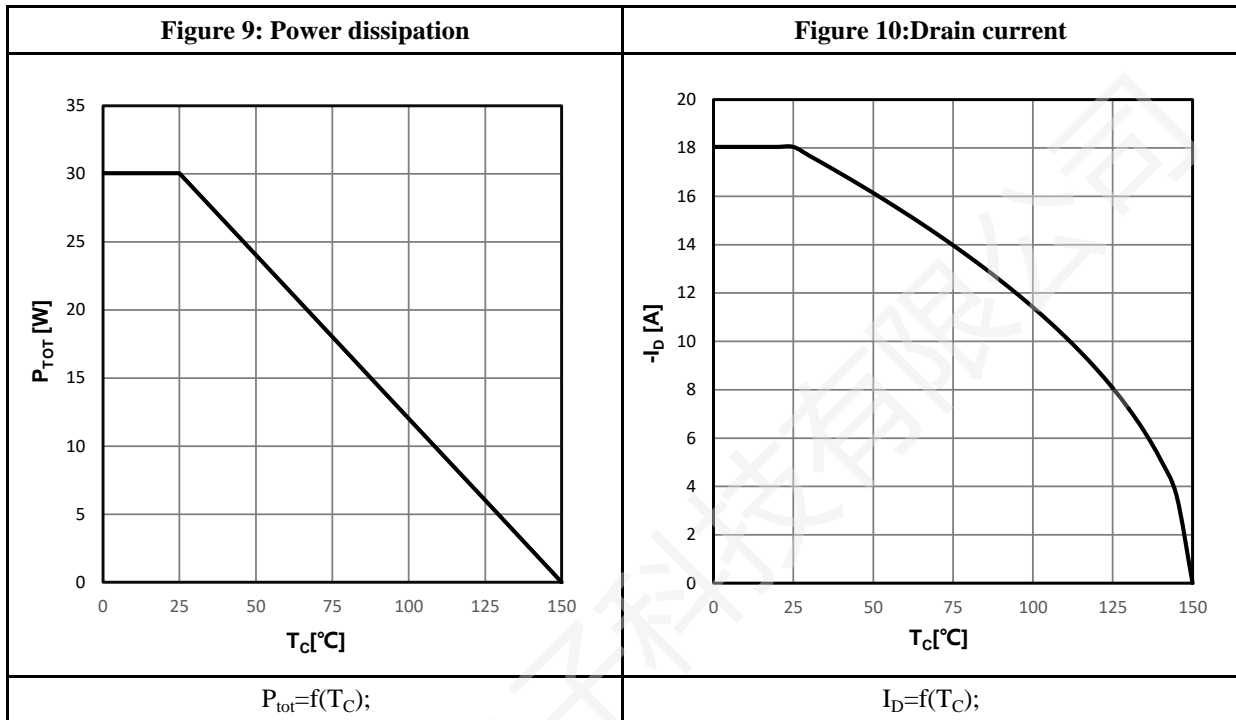
a1: Repetitive rating; pulse width limited by maximum junction temperature

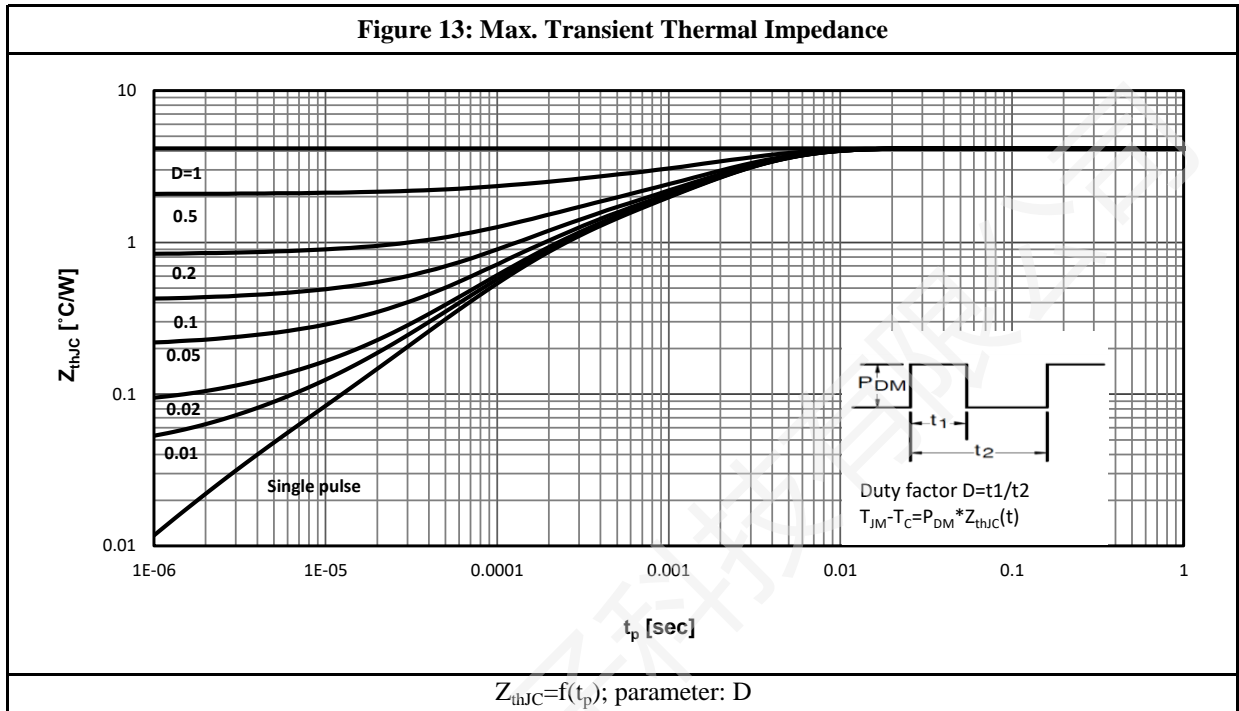
a2:  $V_{DD}=-30V, L=0.1mH, R_G=25\Omega$ , Starting  $T_j=25\text{ }^\circ\text{C}$

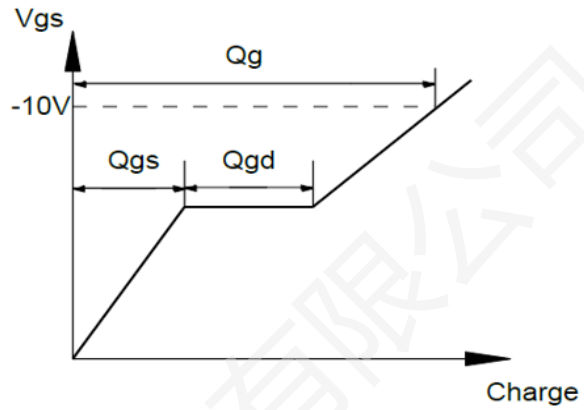
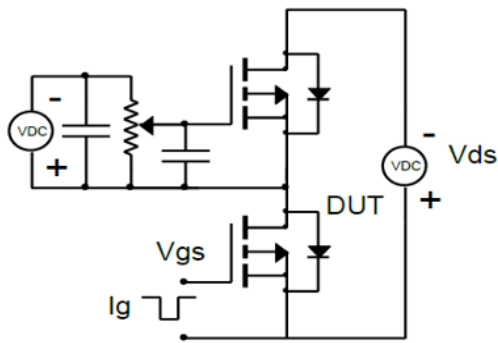
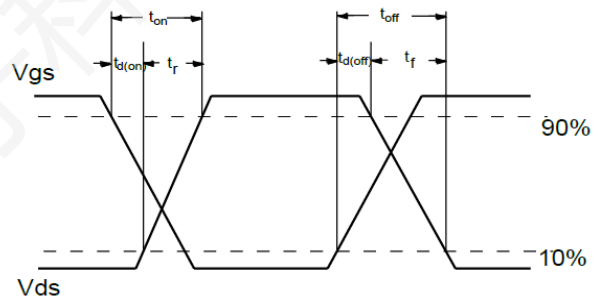
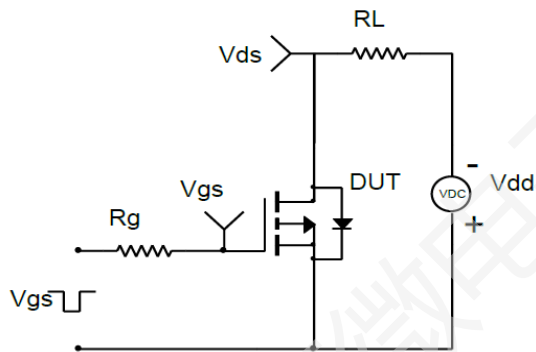
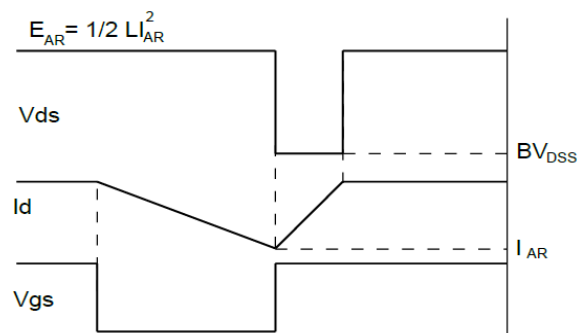
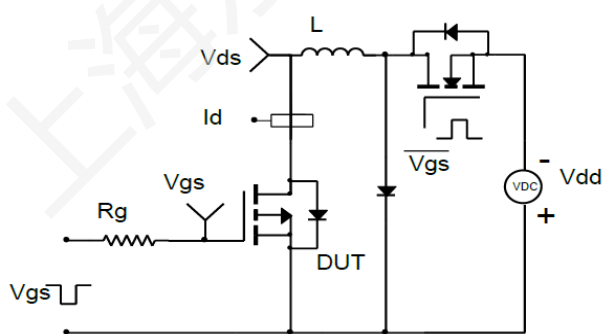
a3: Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm<sup>2</sup> (one layer, 70  $\mu m$  thick) copper area for drain connection.

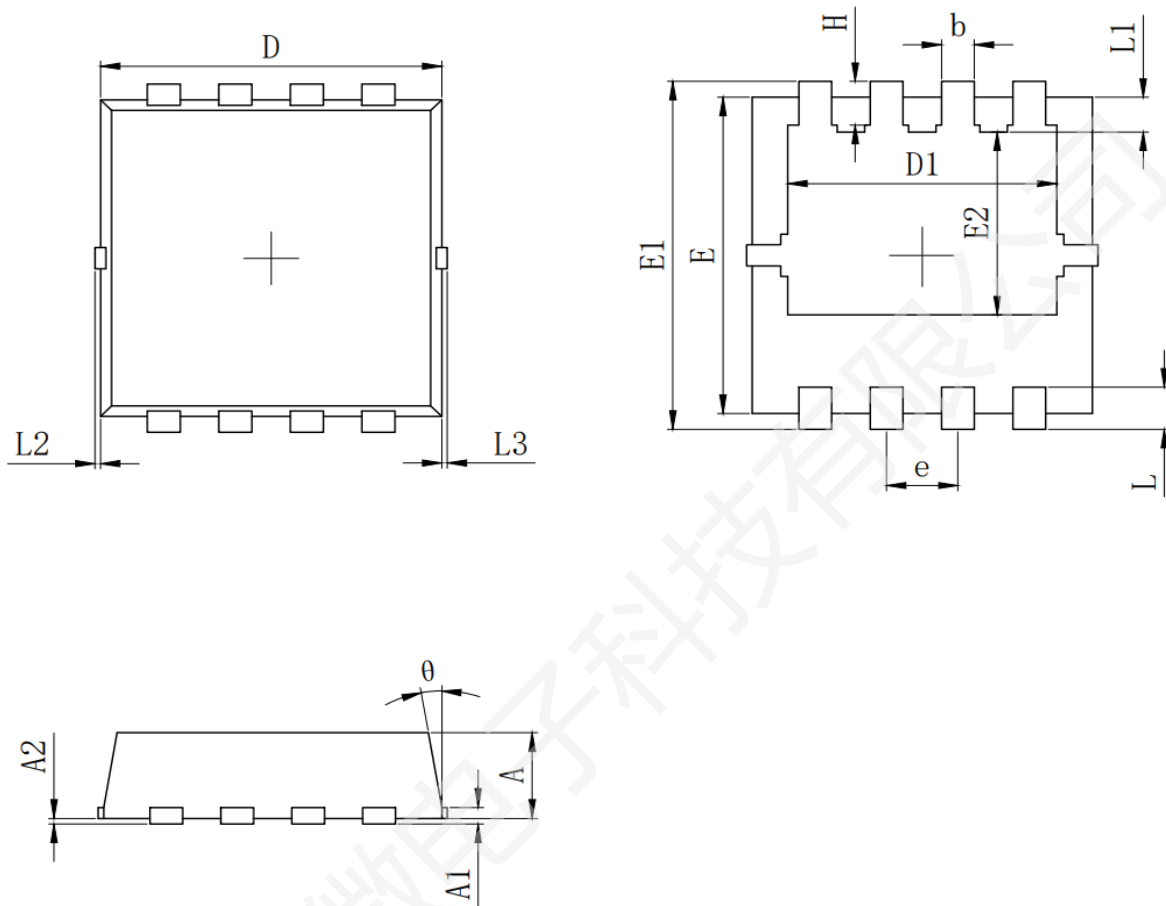
**Characteristics Curve:**








**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	MILLIMETER		
	Min	Nom	Max
A	0.700	0.800	0.900
A1	0.152 REF		
A2	0~0.05		
D	3.000	3.100	3.200
D1	2.300	2.450	2.600
E	2.900	3.000	3.100
E1	3.150	3.300	3.450
E2	1.535	1.735	1.935
b	0.200	0.300	0.400
e	0.550	0.650	0.750
L	0.300	0.400	0.500
L1	0.180	0.330	0.480
L2	0~0.100		
L3	0~0.100		
H	0.315	0.415	0.515
θ	8°	10°	12°

**Revision History:**

<b>Revison</b>	<b>Date</b>	<b>Descriptions</b>
Rev 1.1	Dec.2025	Formal Version

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