

General Description:

The LWS60110AS 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 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:

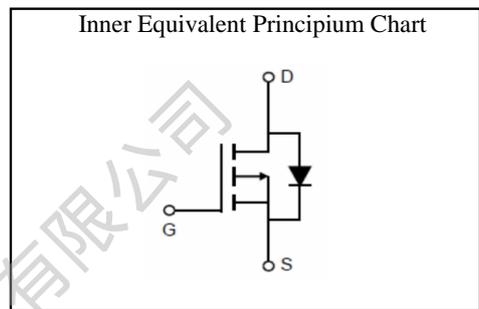
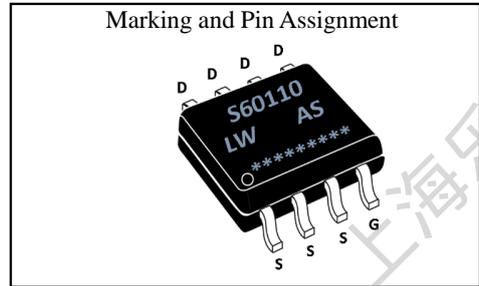
- Battery switching application
- Hard switched and high frequency circuits
- Power Management

100% DVDS Tested

100% Avalanche Tested



V_{DSS}	-60	V
I_D	-4.0	A
P_D	3.0	W
$R_{DS(ON)}$ TYPE	90	m Ω



Package Marking and Ordering Information:

Marking	Part Number	Package	Packing	Qty.
S60110/LW AS/D.C.	LWS60110AS	SOP-8	Reel	4000 Pcs

Absolute Maximum Ratings:

Symbol	Parameter	Value	Units
V_{DSS}	Drain-to-Source Voltage	-60	V
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$	-4.0
	Continuous Drain Current	$T_C=100^\circ\text{C}$	-2.5
I_{DM}^{a1}	Pulsed Drain Current	-16	A
V_{GS}	Gate-to-Source Voltage	± 20	V
P_D	Power Dissipation	3.0	W
E_{AS}^{a2}	Single pulse avalanche energy	30	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
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	41.6	$^\circ\text{C}/\text{W}$

Electrical Characteristic ($T_A = 25\text{ }^\circ\text{C}$, 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	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	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.2	-1.6	-2.0	V
$R_{DS(ON)1}$	Drain-to-Source On-Resistance	$V_{GS}=-10V, I_D=-3.0A$	--	90	110	$m\Omega$
$R_{DS(ON)2}$	Drain-to-Source On-Resistance	$V_{GS}=-4.5V, I_D=-2.0A$	--	110	150	$m\Omega$

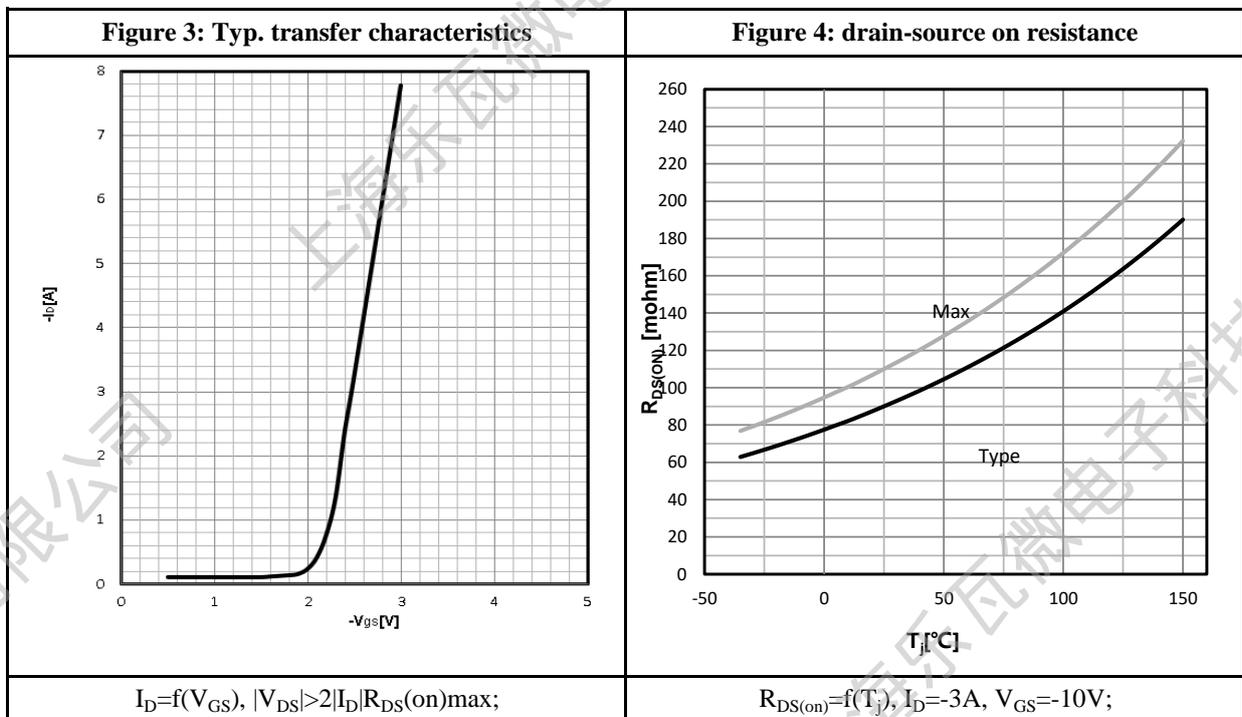
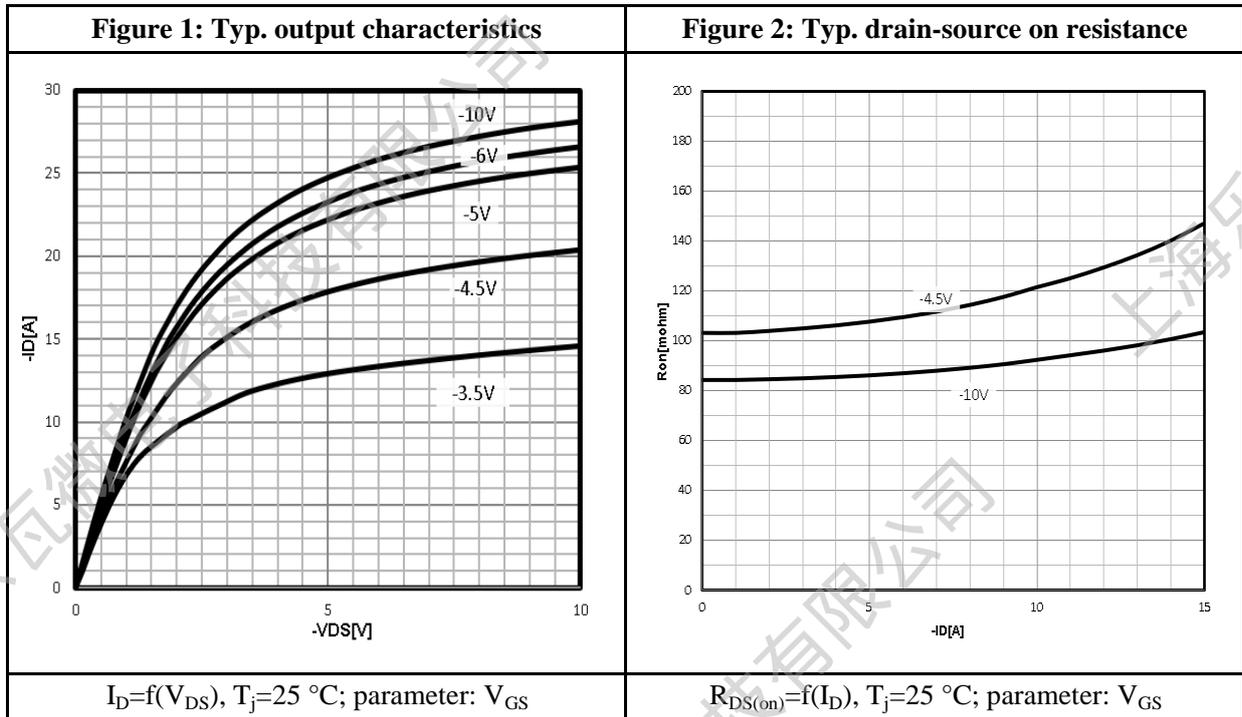
Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	$V_{GS} = 0V$	--	315	--	pF
C_{oss}	Output Capacitance	$V_{DS} = -30V$	--	58	--	
C_{rss}	Reverse Transfer Capacitance	$f = 1.0MHz$	--	2.9	--	

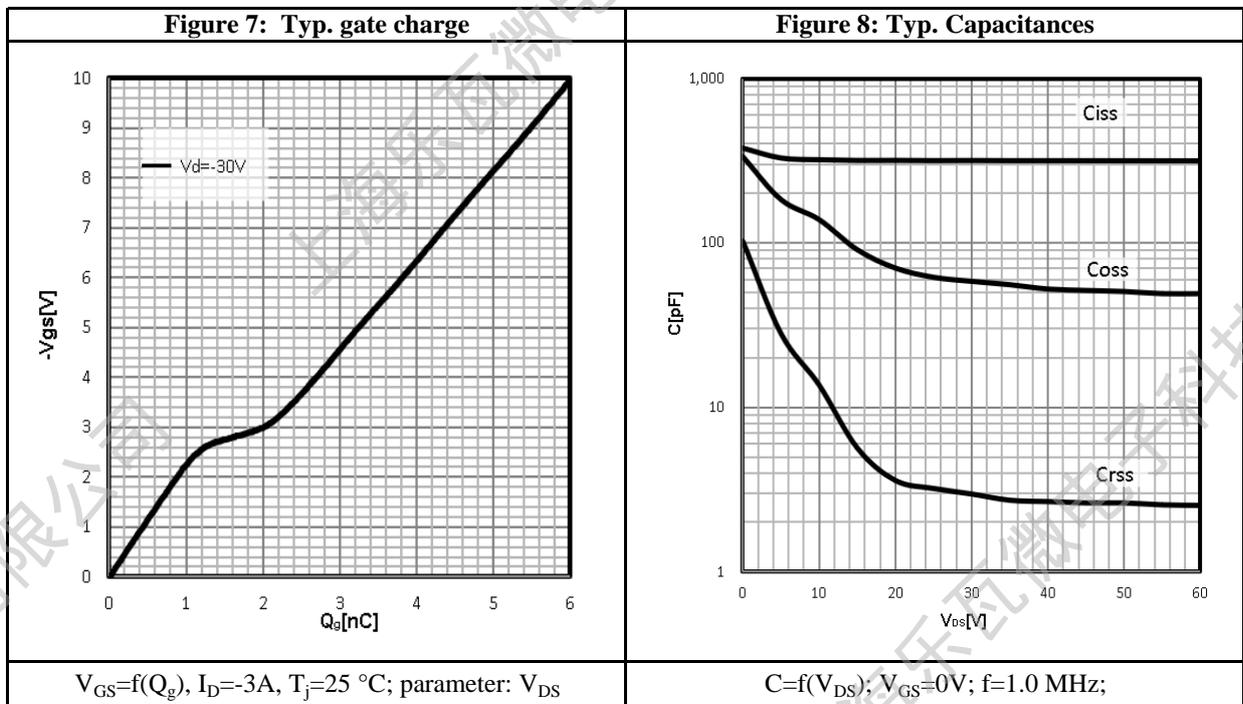
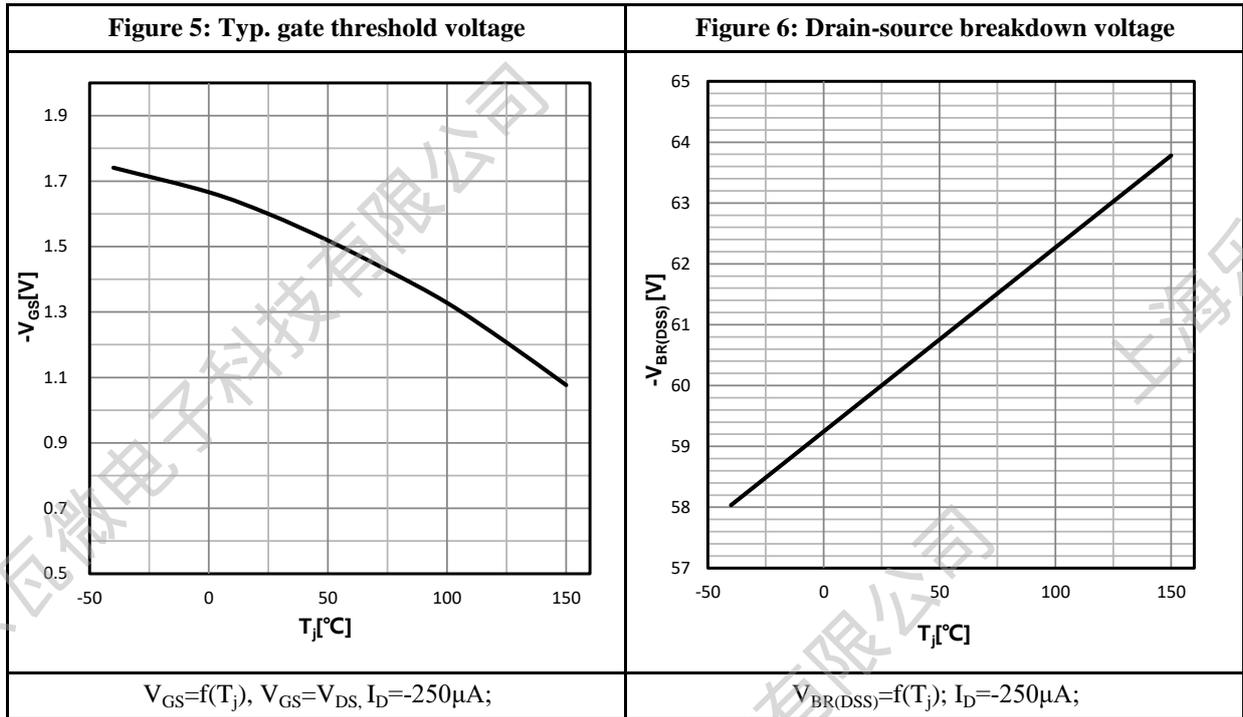
Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$I_D = -3A$	--	7	--	ns
t_r	Rise Time	$V_{DS} = -30V$	--	8	--	
$t_{d(OFF)}$	Turn-Off Delay Time	$V_{GS} = -10V$	--	16	--	
t_f	Fall Time	$R_G = 3\Omega$	--	4	--	
Q_g	Total Gate Charge	$V_{GS} = -10V$	--	4.9	--	nC
Q_{gs}	Gate Source Charge	$V_{DS} = -30V$	--	0.97	--	
Q_{gd}	Gate Drain Charge	$I_D = -3A$	--	0.72	--	

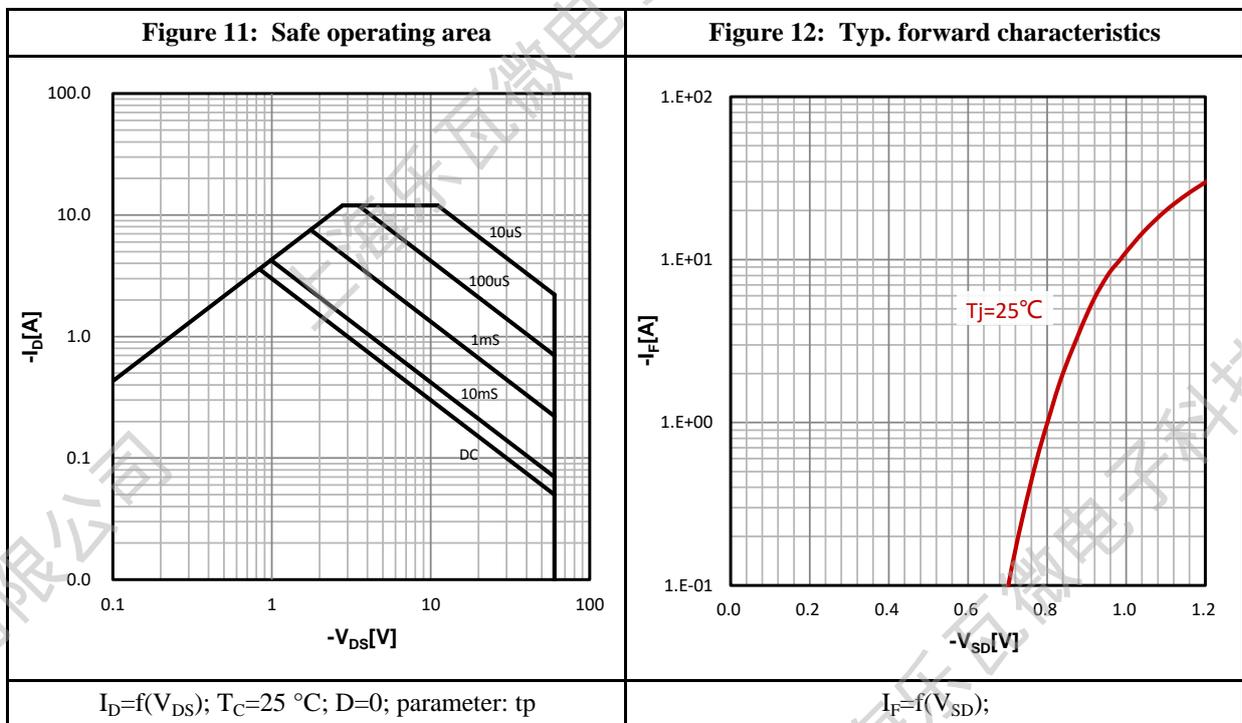
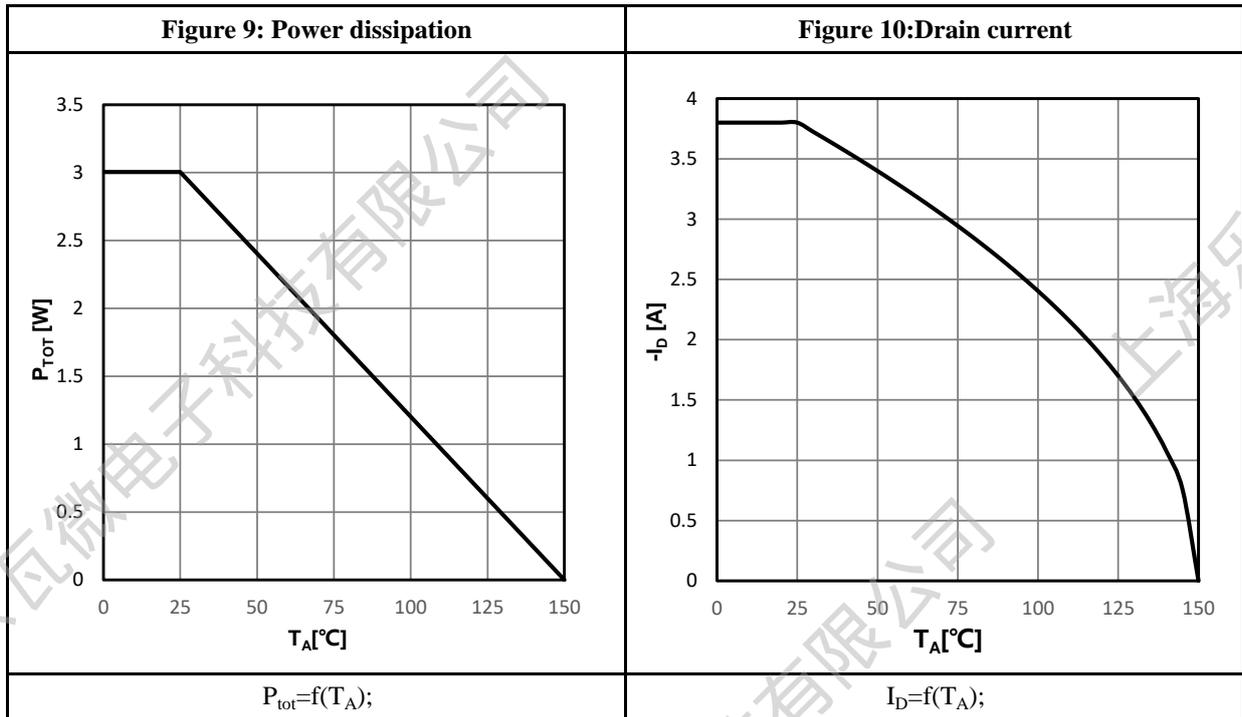
Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	$T_C = 25\text{ }^\circ\text{C}$	--	--	-4.0	A
I_{SM}	Diode Pluse Current		--	--	-16	A
V_{SD}	Diode Forward Voltage	$I_S = -3A, V_{GS} = 0V$	--	--	-1.2	V

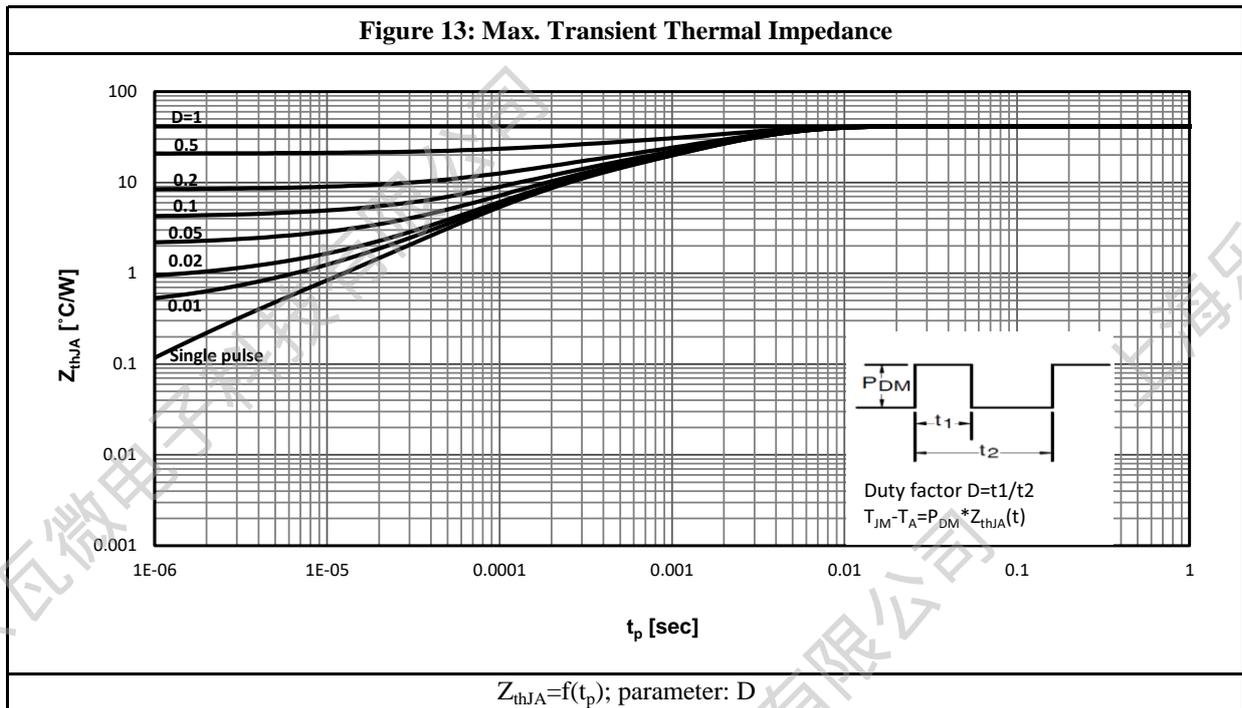
a1: Repetitive rating; pulse width limited by maximum junction temperature

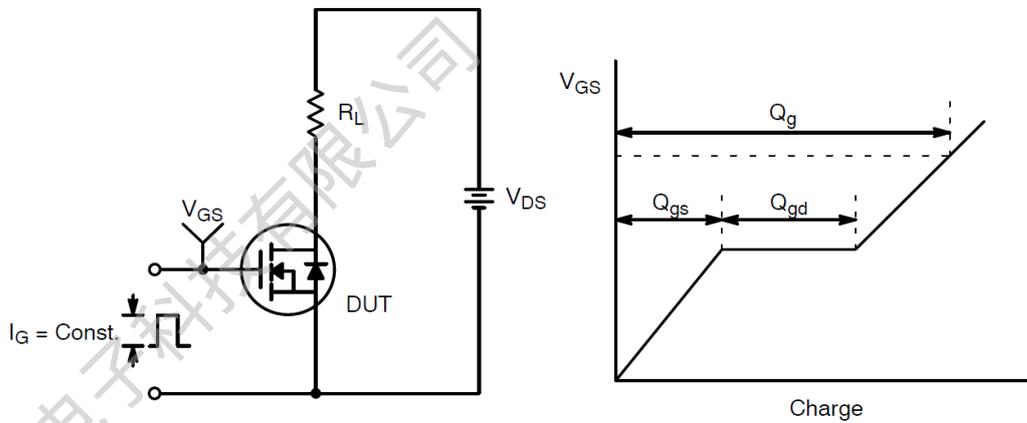
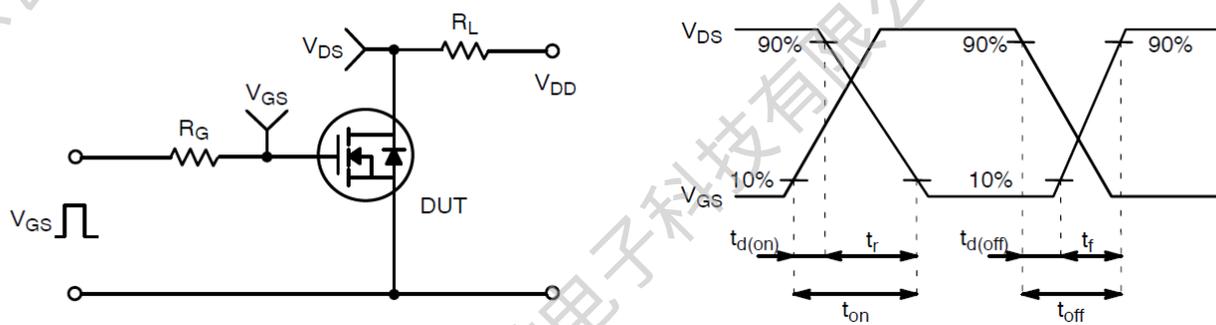
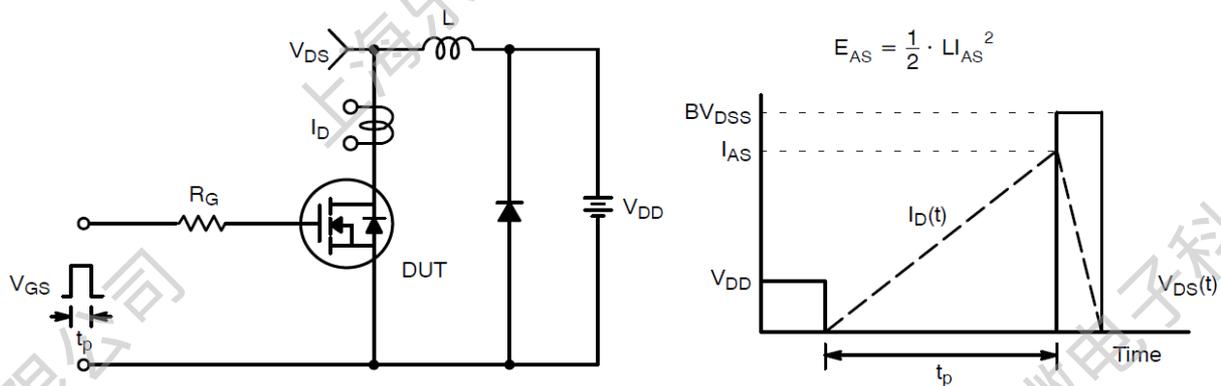
a2: $V_{DD} = -30V, L = 1.0mH, R_G = 25\Omega$, Starting $T_j = 25\text{ }^\circ\text{C}$

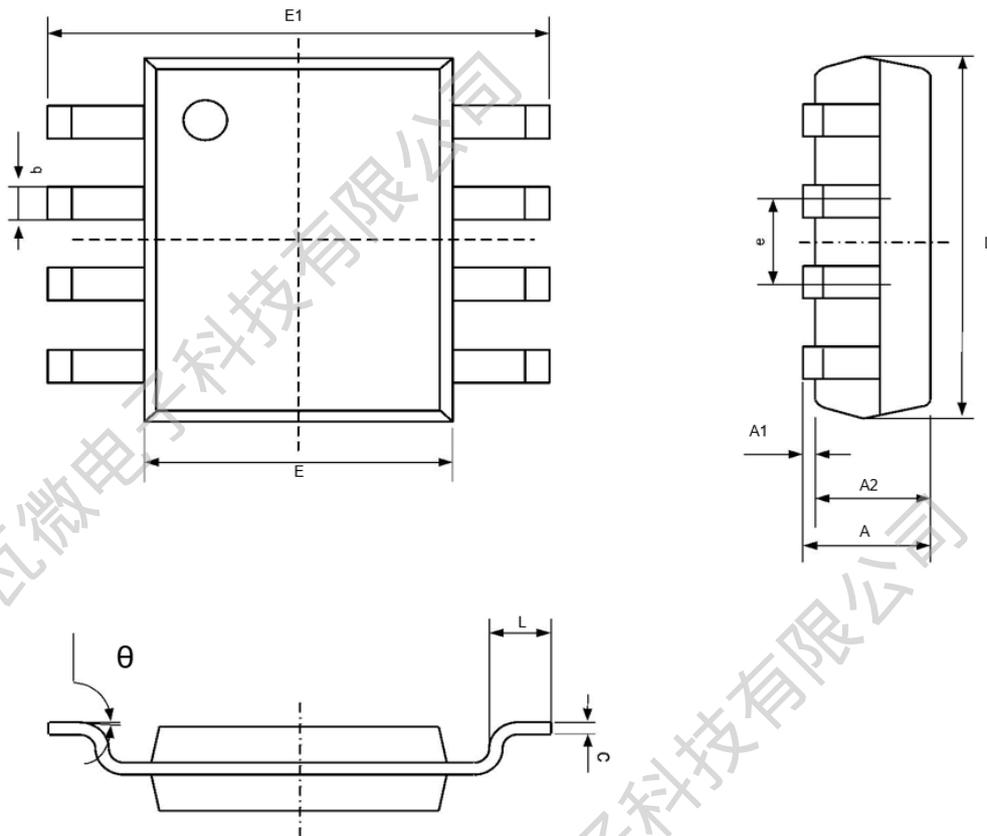
Characteristics Curve:








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
A	1.350	1.550	1.750
A1	0.050	0.150	0.250
A2	1.350	1.450	1.550
b	0.330	0.420	0.510
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°

Revision History:

Revison	Date	Descriptions
Rev 1.0	Apr.2023	Initial Version

Disclaimer:

The information in this document is believed to be accurate and reliable. However, no responsibility is assumed by LW-Micro for its use. All operating parameters must be designed, validated and tested to ensure they meet the requirements of your application. LW-Micro reserves the right to make any specification and/or circuitry changes without prior notification. Before starting a brand-new project, please contact LW-Micro Sales to get the most recent relevant information.

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