

General Description:

The LWS6028AS 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



Package Marking and Ordering Information:

Marking	Part Number	Package	Packing	Qty.
S6028/LW AS/D.C.	LWS6028AS	SOP-8	Reel	4000 Pcs

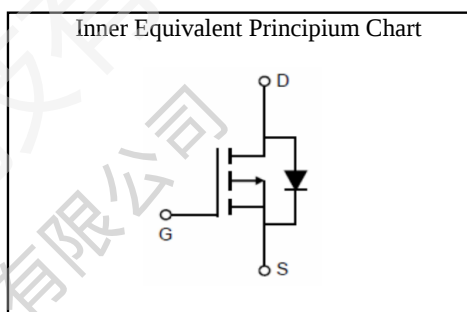
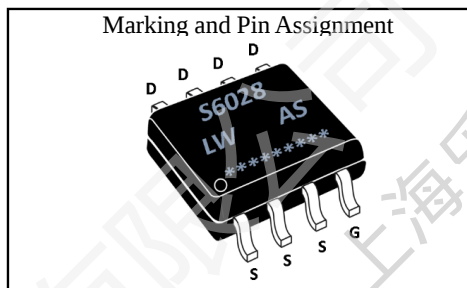
Absolute Maximum Ratings:

Symbol	Parameter		Value	Units
V_{DSS}	Drain-to-Source Voltage		-60	V
I_D	Continuous Drain Current	$T_C=25^{\circ}\text{C}$	-12	A
	Continuous Drain Current	$T_C=100^{\circ}\text{C}$	-7.6	A
I_{DM}^{a1}	Pulsed Drain Current		-48	A
V_{GS}	Gate-to-Source Voltage		± 20	V
P_D	Power Dissipation		3.5	W
E_{AS}^{a2}	Single pulse avalanche energy		200	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	35	$^{\circ}\text{C}/\text{W}$

V_{DSS}	-60	V
I_D	-12	A
P_D	3.5	W
$R_{DS(ON) \text{ TYPE}}$	20	$\text{m}\Omega$



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	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.3	-1.8	-2.3	V
$R_{DS(ON)1}$	Drain-to-Source On-Resistance	$V_{GS}=-10V, I_D=-10A$	--	20	25	m Ω
$R_{DS(ON)2}$	Drain-to-Source On-Resistance	$V_{GS}=-4.5V, I_D=-8A$	--	25	32	m Ω
g_{FS}	Forward Transconductance	$V_{DS}=-5V, I_D=-5A$	--	20	--	S

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	$V_{GS} = 0V$	--	1500	--	pF
C_{oss}	Output Capacitance	$V_{DS} = -30V$	--	248	--	
C_{rss}	Reverse Transfer Capacitance	$f = 1.0MHz$	--	12	--	
R_G	Gate resistance	$V_{GS}=0V, V_{DS}$ Open	--	8.0	--	Ω

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$I_D = -10A$	--	15	--	ns
t_r	Rise Time	$V_{DS} = -30V$	--	17	--	
$t_{d(OFF)}$	Turn-Off Delay Time	$V_{GS} = -10V$	--	40	--	
t_f	Fall Time	$R_G = 3\Omega$	--	45	--	
Q_g	Total Gate Charge	$V_{GS} = -10V$	--	22	--	nC
Q_{gs}	Gate Source Charge	$V_{DS} = -30V$	--	3.7	--	
Q_{gd}	Gate Drain Charge	$I_D = -10A$	--	3.0	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	$T_C = 25\text{ }^{\circ}\text{C}$	--	--	-12	A
I_{SM}	Diode Pluse Current		--	--	-48	A
V_{SD}	Diode Forward Voltage	$I_S = -10A, V_{GS} = 0V$	--	--	-1.2	V
t_{rr}	Reverse Recovery time	$I_S = -10A, V_{DD} = -30V,$	--	60	--	ns
Q_{rr}	Reverse Recovery Charge	$dI/dt = 100A/\mu s$	--	105	--	nC

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

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

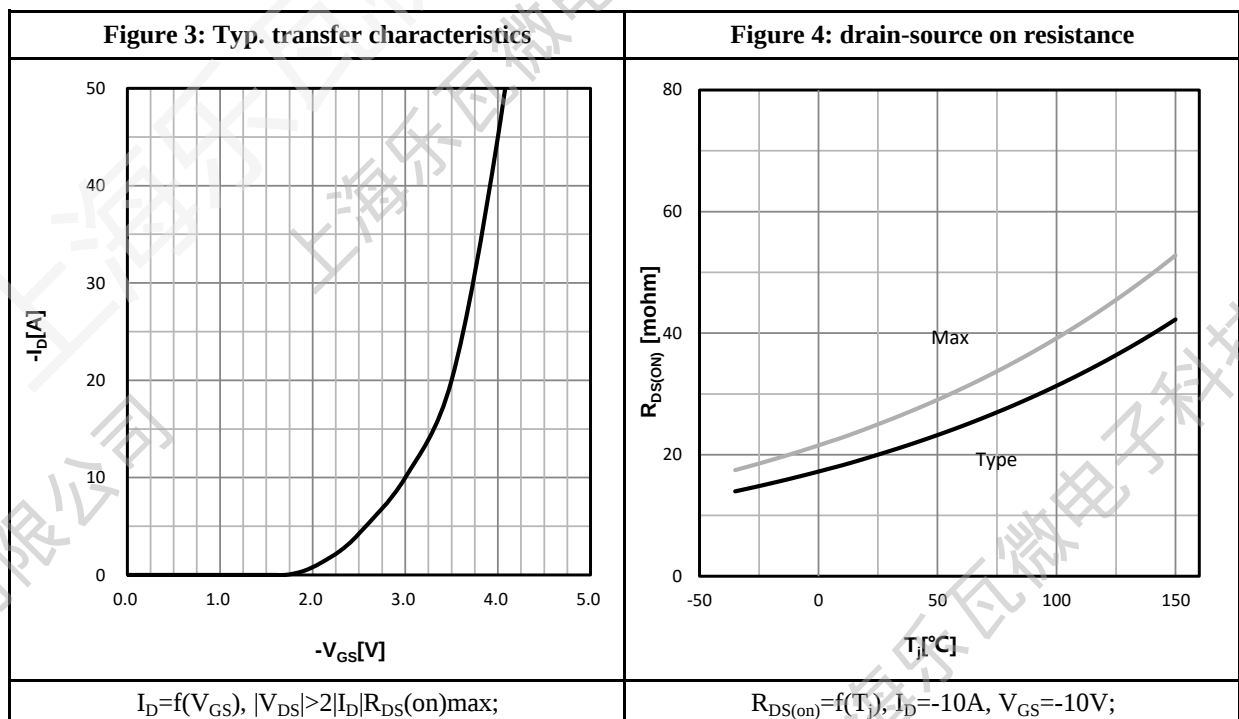
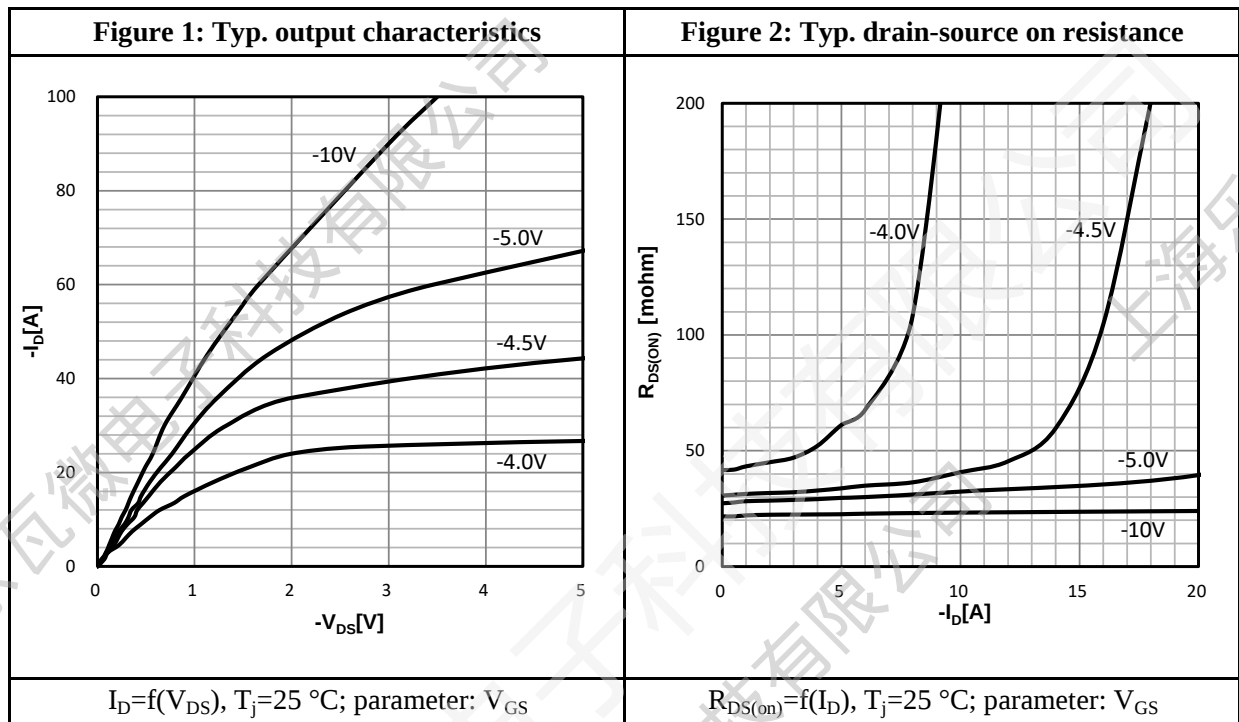
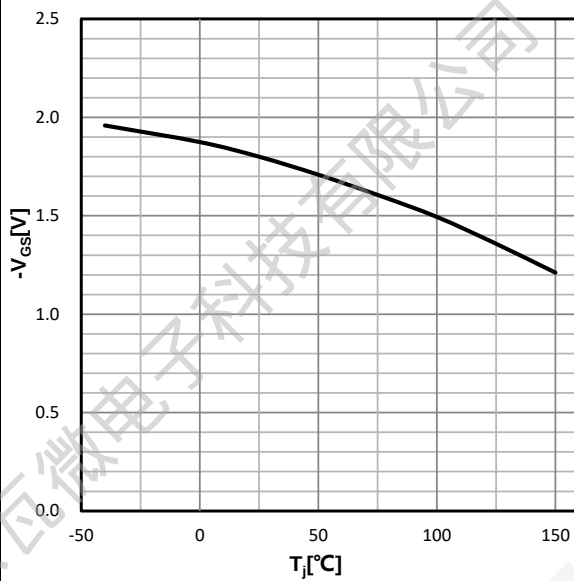
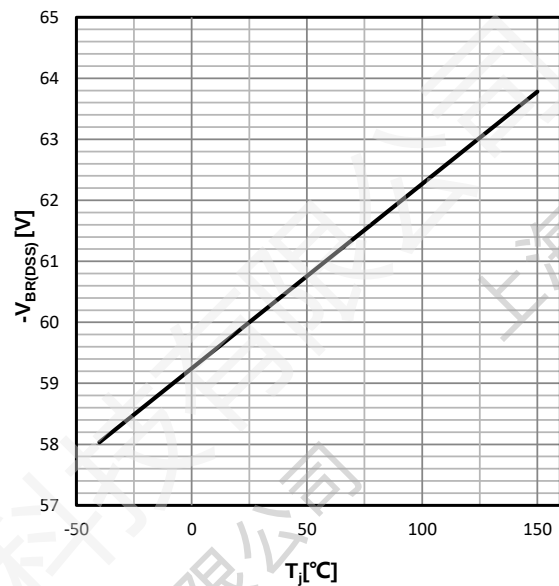
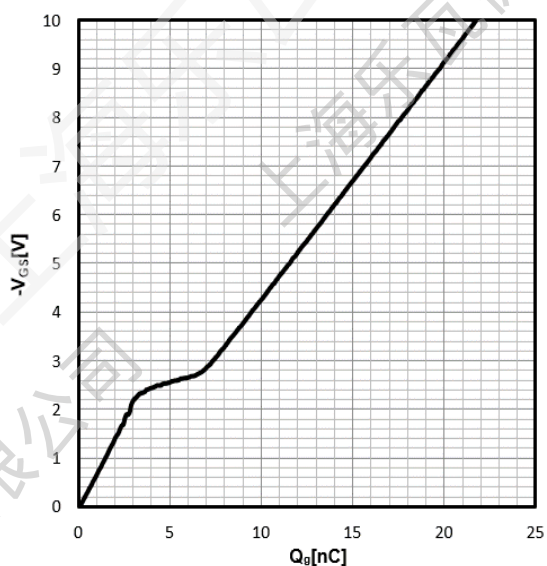
Characteristics Curve:


Figure 5: Typ. gate threshold voltage


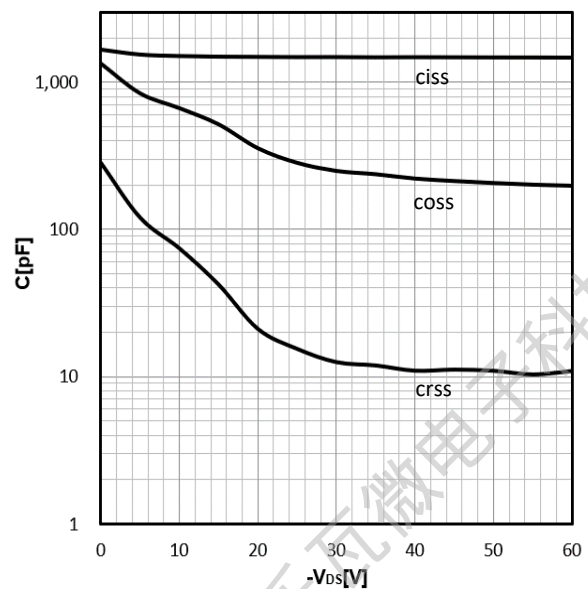
$$V_{GS}=f(T_j), V_{GS}=V_{DS}, I_D=-250\mu A;$$

Figure 6: Drain-source breakdown voltage


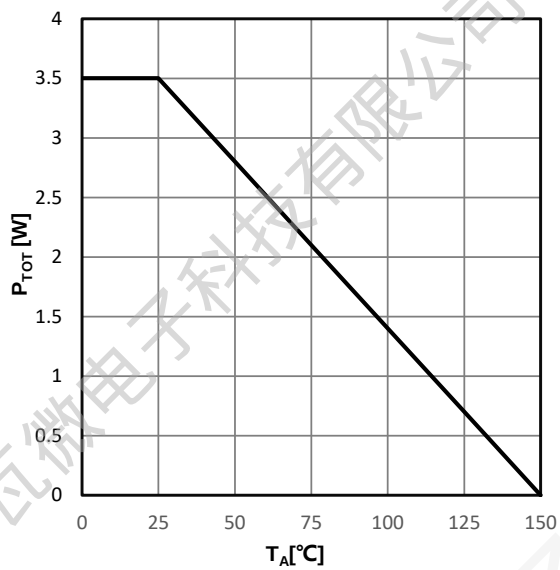
$$V_{BR(DSS)}=f(T_j); I_D=-250\mu A;$$

Figure 7: Typ. gate charge


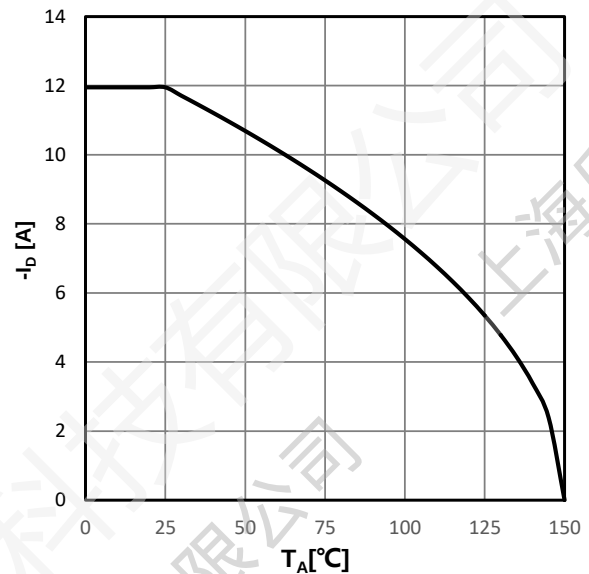
$$V_{GS}=f(Q_g), I_D=-10A, T_j=25\text{ }^{\circ}\text{C}; \text{ parameter: } V_{DS}$$

Figure 8: Typ. Capacitances


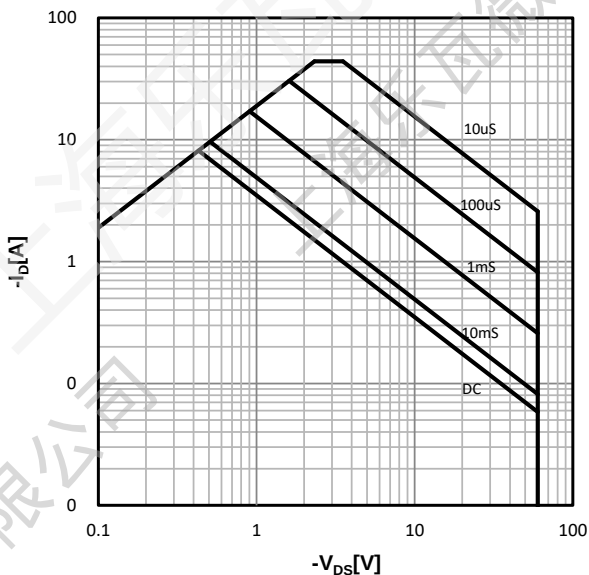
$$C=f(V_{DS}); V_{GS}=0V; f=1.0\text{ MHz};$$

Figure 9: Power dissipation


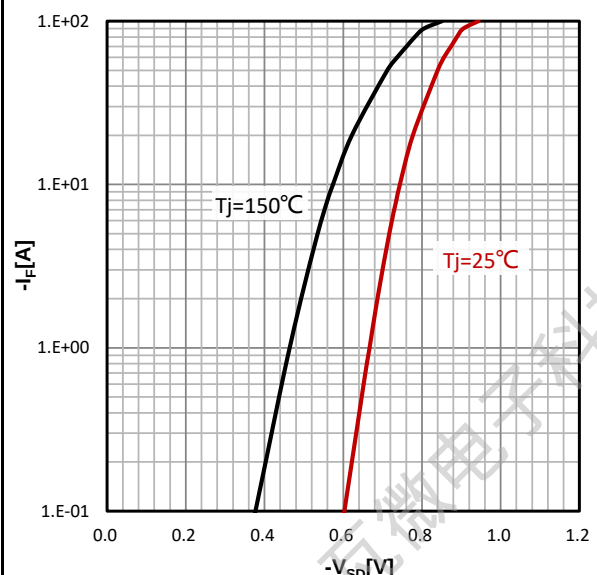
$$P_{tot}=f(T_A);$$

Figure 10: Drain current


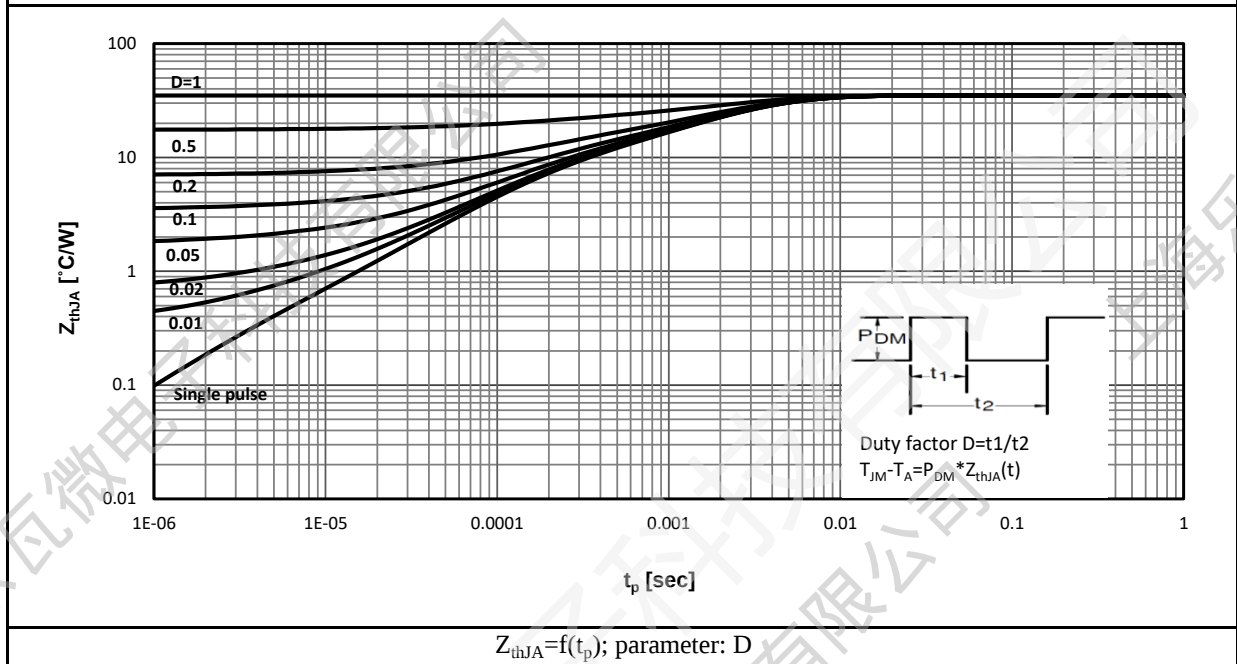
$$I_D=f(T_A);$$

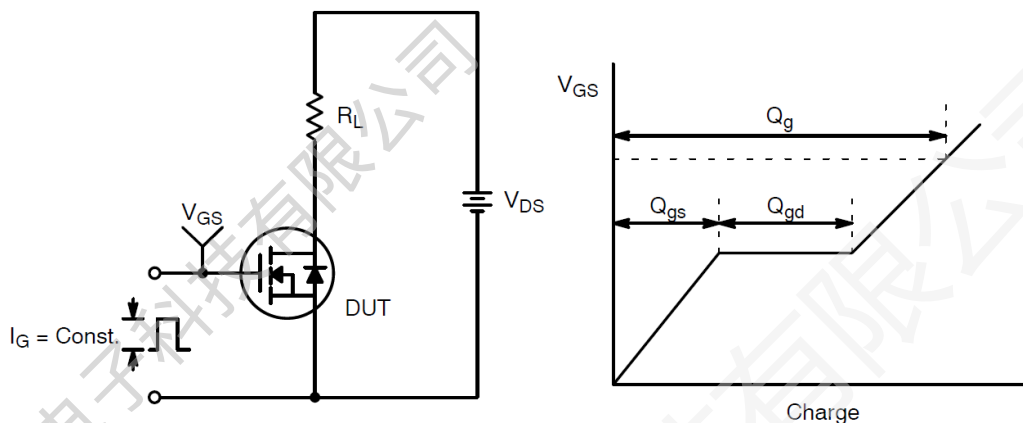
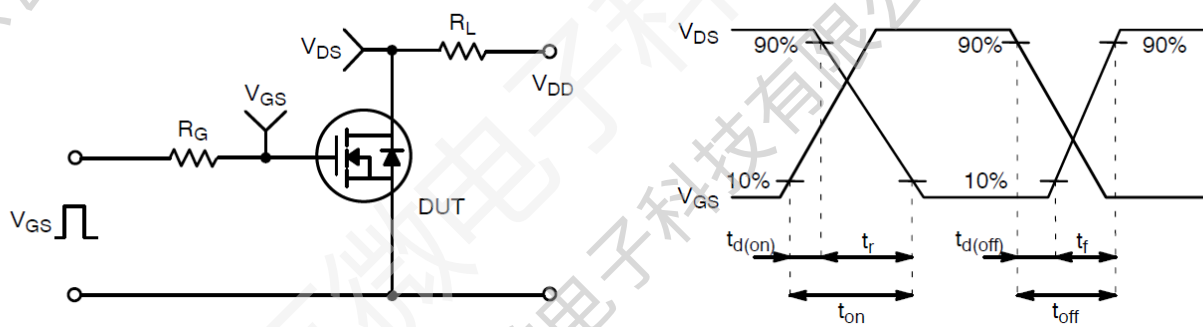
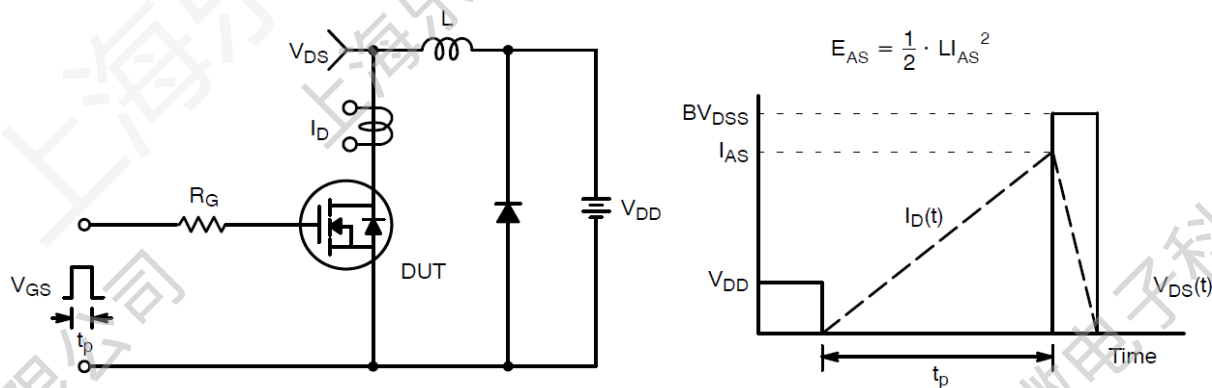
Figure 11: Safe operating area


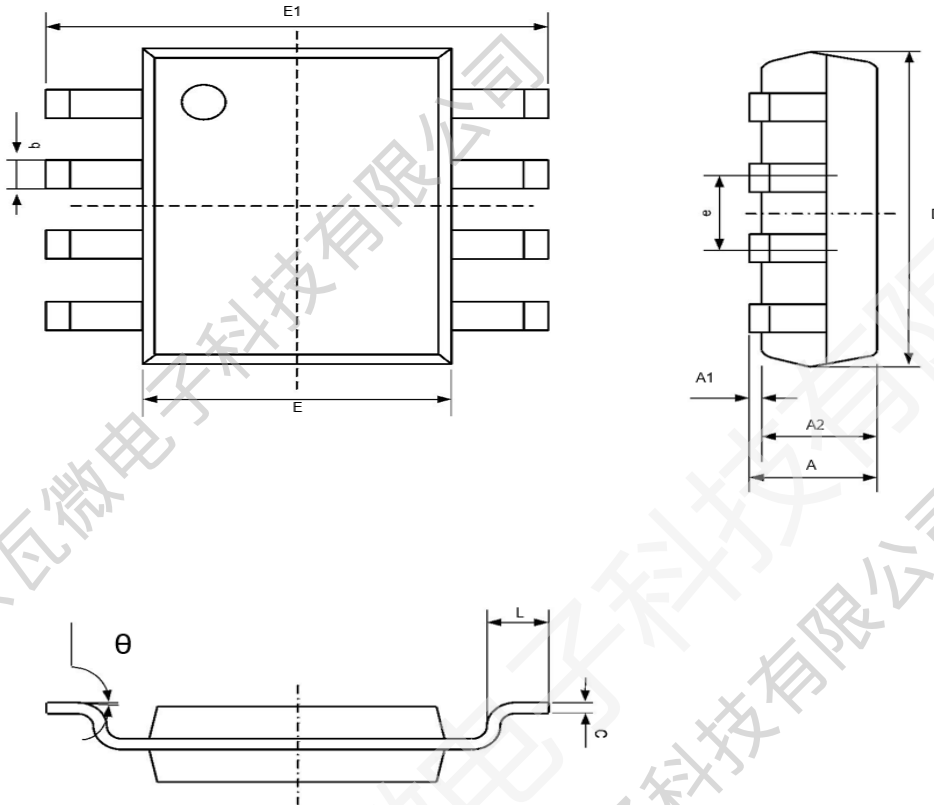
$$I_D=f(V_{DS}); T_C=25\text{ }^{\circ}\text{C}; D=0; \text{parameter: tp}$$

Figure 12: Typ. forward characteristics


$$I_F=f(V_{SD});$$

Figure 13: Max. Transient Thermal Impedance


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:

Revision	Date	Descriptions
Rev 1.0	May.2022	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.

Mailing Address: Room 301, Building 2, No.1690 CaiLun Road, China (Shanghai) Pilot Free Trade Zone
Shanghai Lewa Micro-electronics Technology Co., Ltd