

General Description:

The LWS6T10AF uses 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 SOT-523, which accords with the ROHS standard and Halogen Free standard.

Features:

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

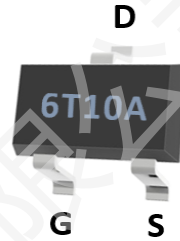
Applications:

- DC-DC Converter
- Portable Equipment
- Power Management

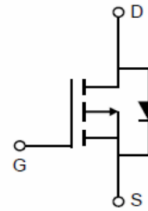


V_{DSS}	-60	V
I_D	-0.26	A
P_D	0.27	W
$R_{DS(ON)}$ TYPE	1.5	Ω

Marking and Pin Assignment



Inner Equivalent Principium Chart



Package Marking and Ordering Information:

Marking	Part Number	Package	Packing	Qty.
6T10A	LWS6T10AF	SOT-523	Reel	3000 Pcs

Absolute Maximum Ratings:

Symbol	Parameter		Value	Units
V_{DSS}	Drain-to-Source Voltage		-60	V
I_D	Continuous Drain Current	$T_A=25^\circ\text{C}$	-0.26	A
	Continuous Drain Current	$T_A=100^\circ\text{C}$	-0.16	A
I_{DM}^{a1}	Pulsed Drain Current		-1.04	A
V_{GS}	Gate-to-Source Voltage		± 20	V
P_D	Power Dissipation		0.27	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
$R_{\theta JA}^{a2}$	Thermal Resistance, Junction-to-Ambient	461	$^\circ\text{C/W}$

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	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.1	-1.5	-2.0	V
$R_{DS(ON)1}$	Drain-to-Source On-Resistance	$V_{GS}=-10V, I_D=-0.2A$	--	1.5	2.5	Ω
$R_{DS(ON)2}$	Drain-to-Source On-Resistance	$V_{GS}=-4.5V, I_D=-0.1A$	--	2.0	4.0	Ω

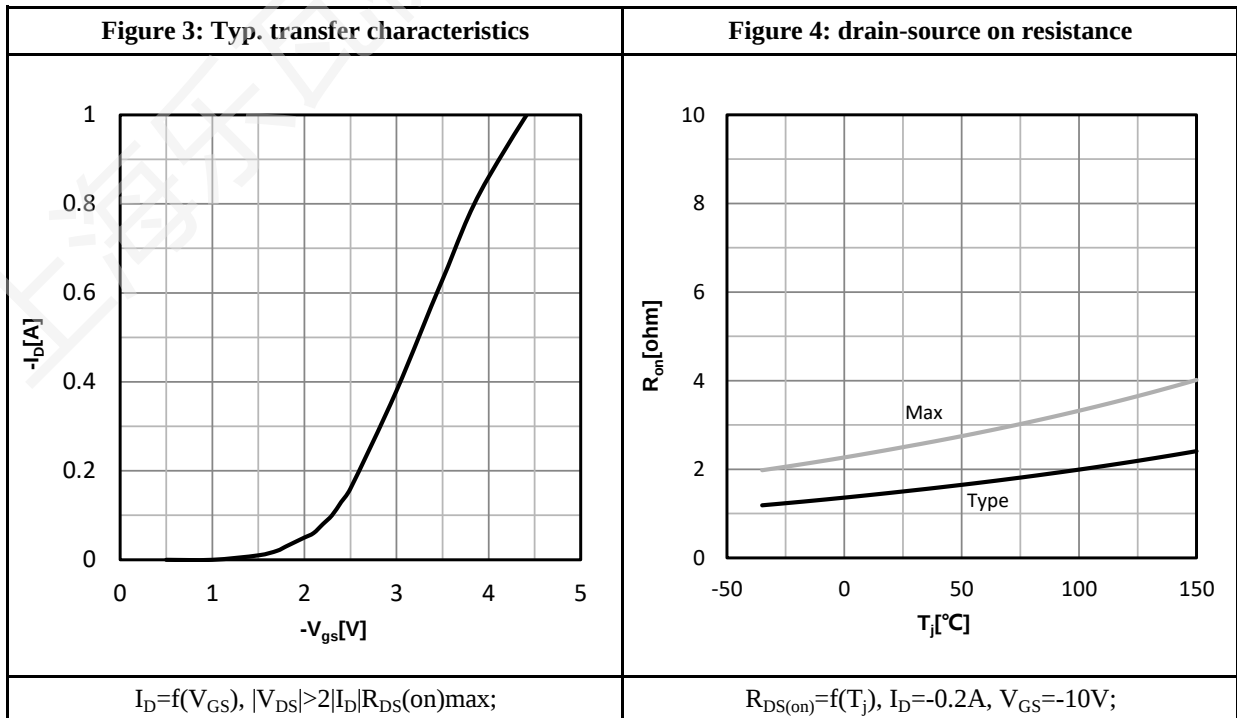
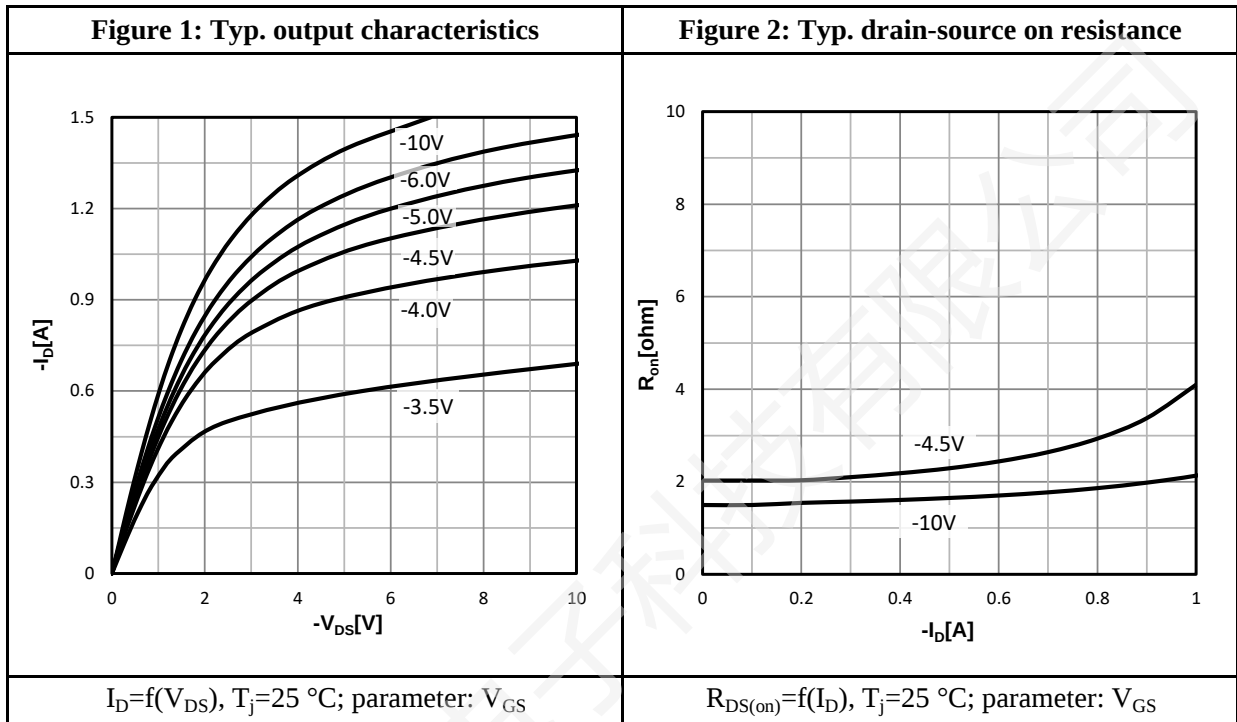
Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	$V_{GS} = 0V$	--	13.8	--	pF
C_{oss}	Output Capacitance	$V_{DS} = -30V$	--	3.7	--	
C_{rss}	Reverse Transfer Capacitance	$f = 1.0MHz$	--	1.4	--	

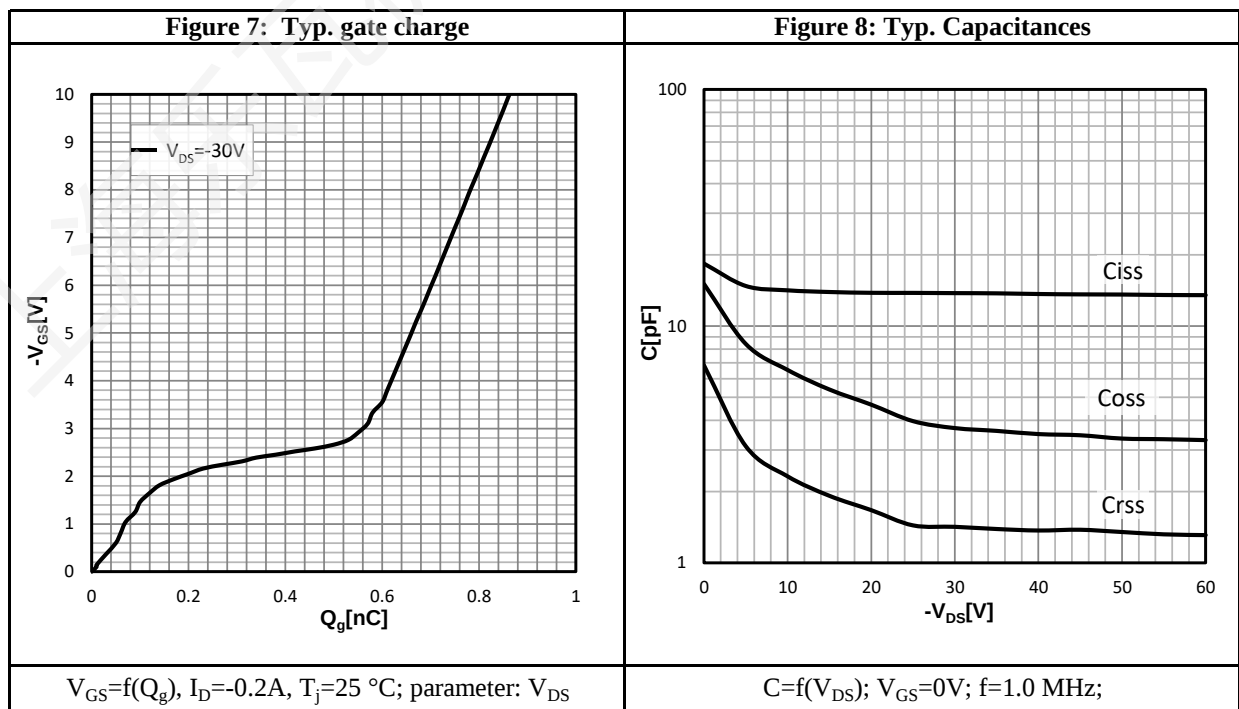
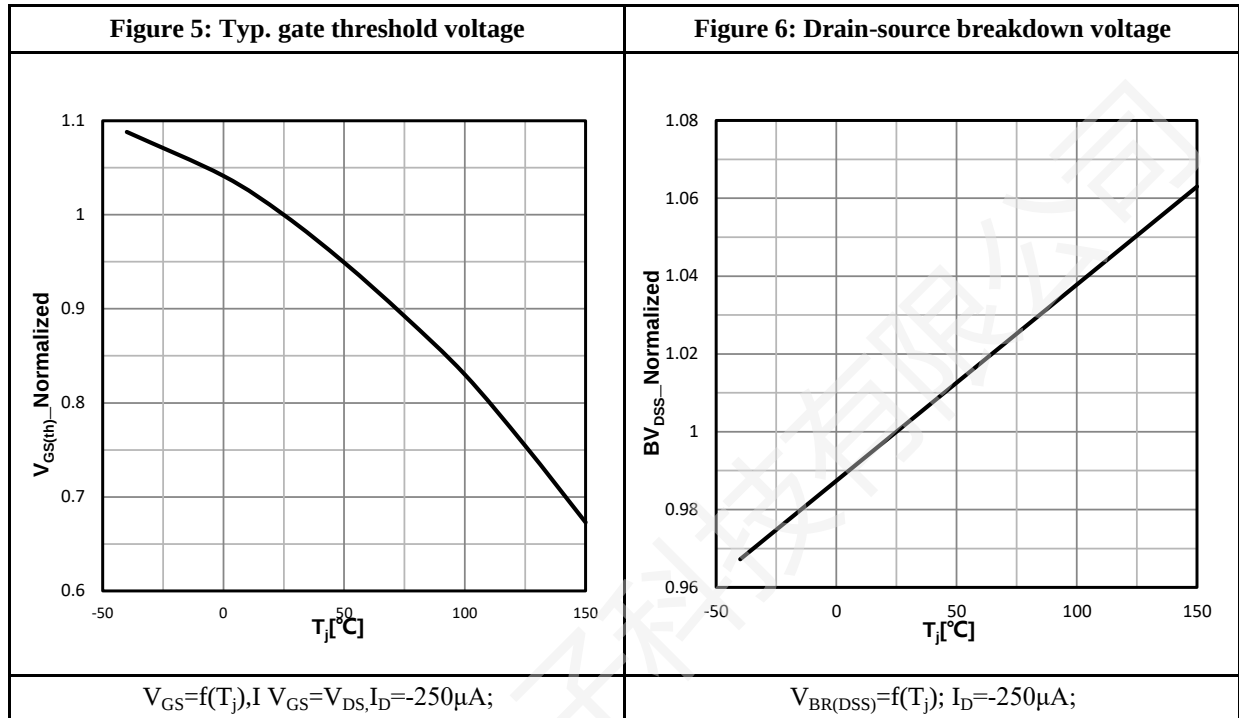
Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$I_D = -0.2A$	--	6.0	--	ns
t_r	Rise Time	$V_{DS} = -30V$	--	5.0	--	
$t_{d(OFF)}$	Turn-Off Delay Time	$V_{GS} = -10V$	--	26	--	
t_f	Fall Time	$R_G = 3.9\Omega$	--	14	--	
Q_g	Total Gate Charge	$V_{GS} = -10V$	--	0.87	--	nC
Q_{gs}	Gate Source Charge	$V_{DS} = -30V$	--	0.20	--	
Q_{gd}	Gate Drain Charge	$I_D = -0.2A$	--	0.35	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	$T_A = 25\text{ }^{\circ}\text{C}$	--	--	-0.26	A
V_{SD}	Diode Forward Voltage	$I_S = -0.2A, V_{GS} = 0V$	--	--	-1.2	V

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

a2: Surface Mounted on FR4 Board, $t \leq 10\text{ sec.}$

Characteristics Curve:




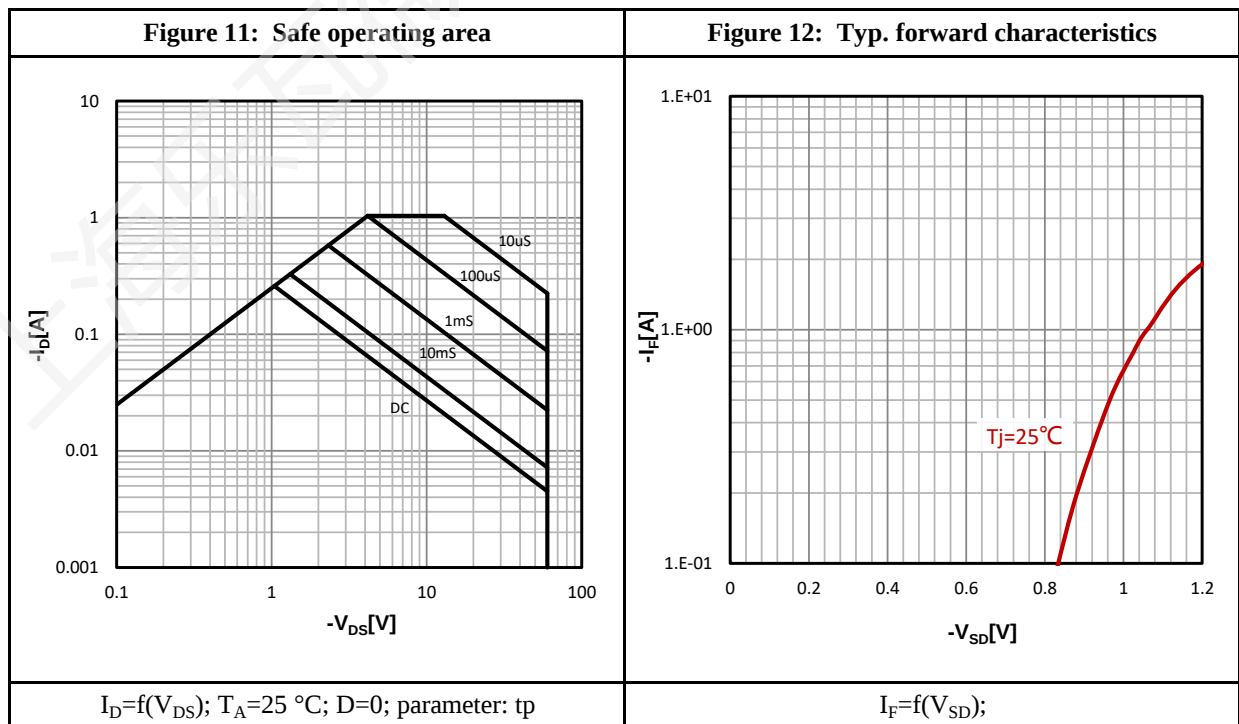
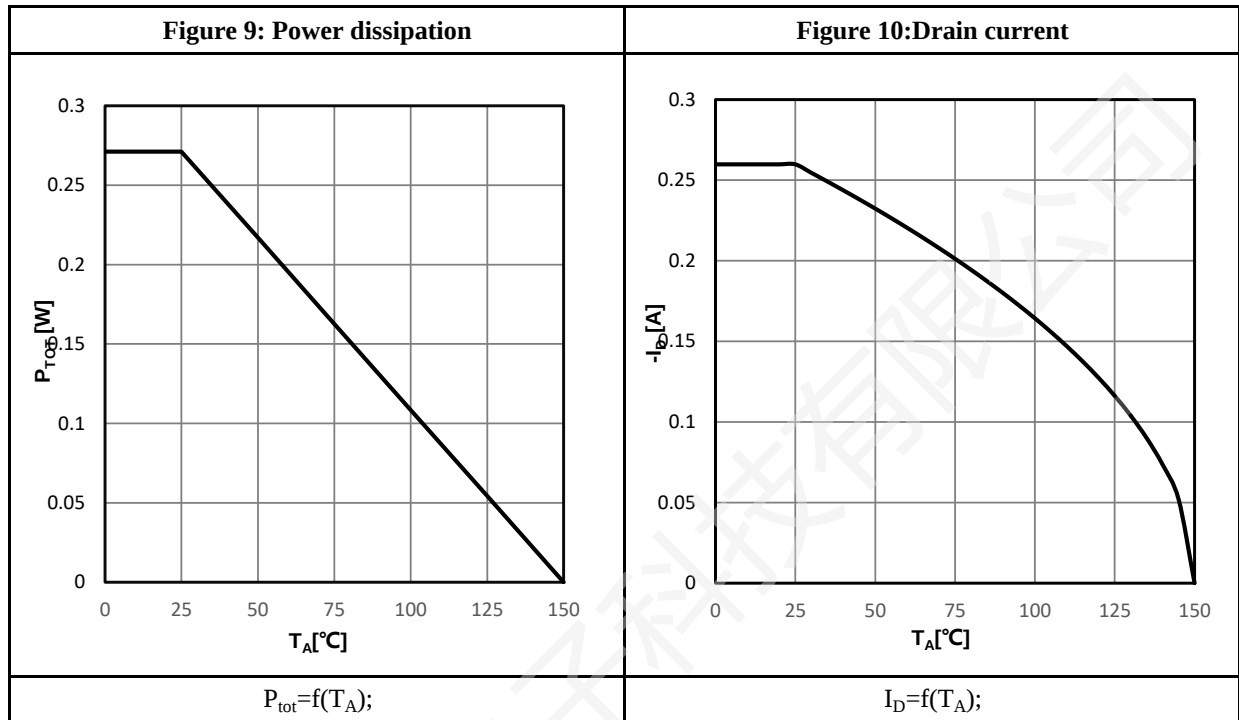
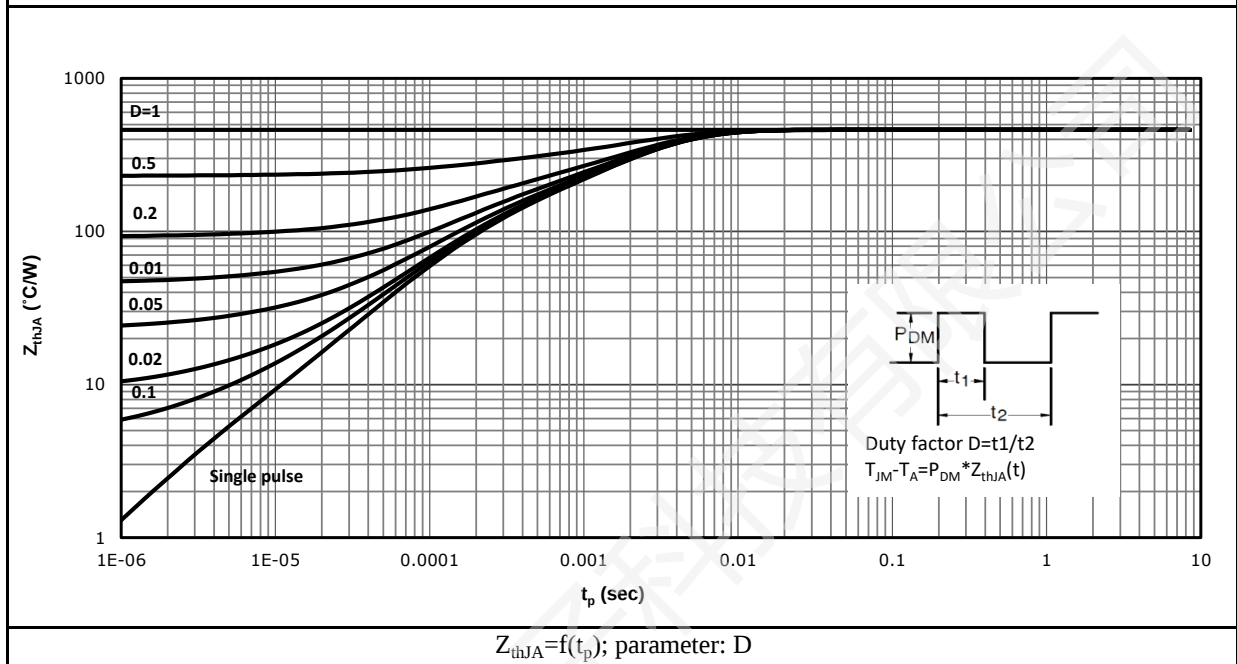
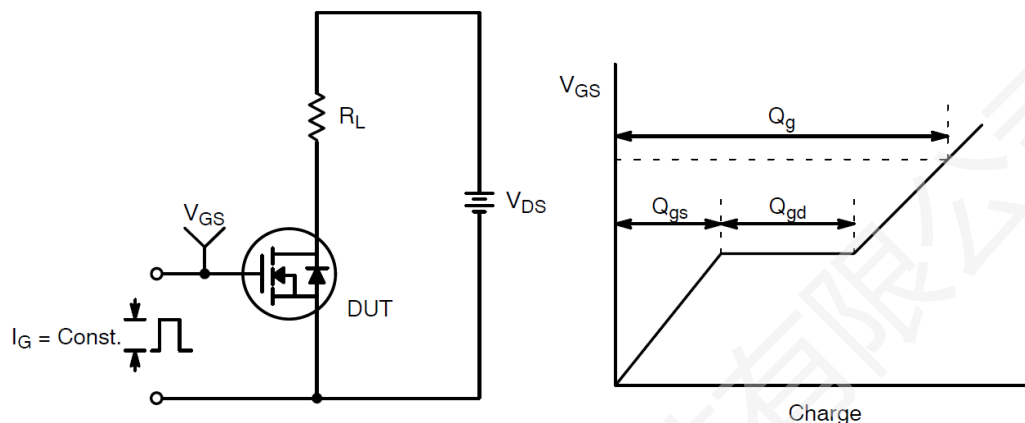
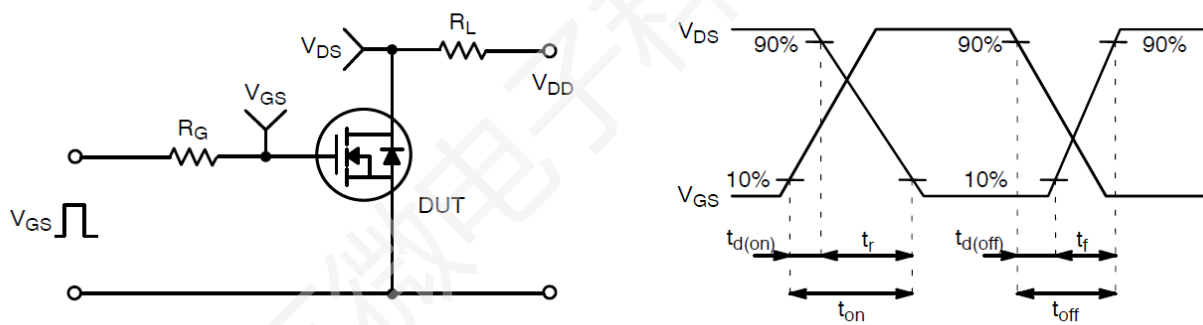
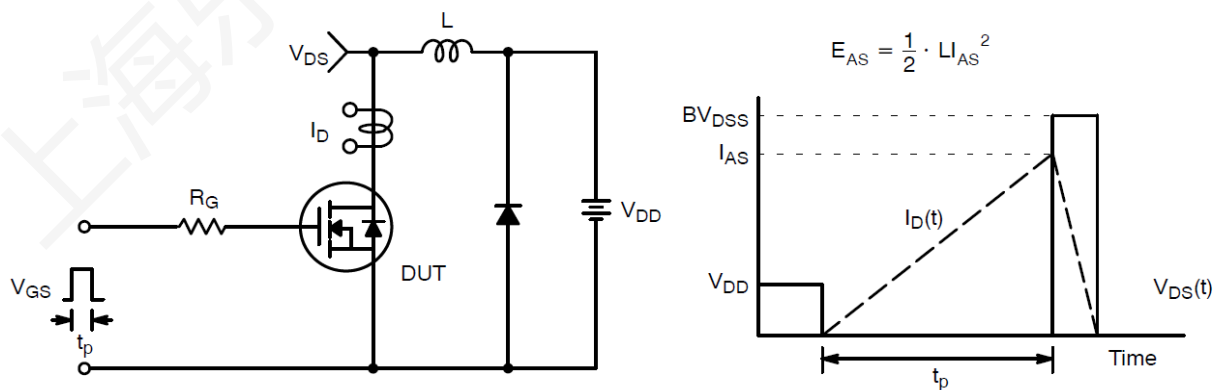
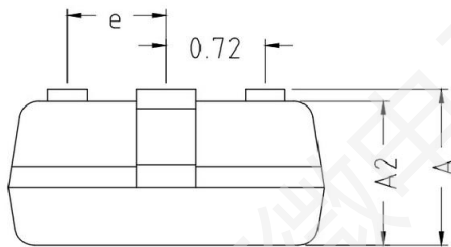
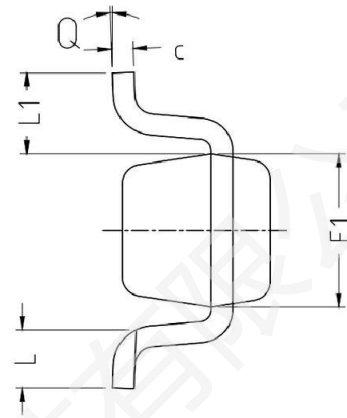
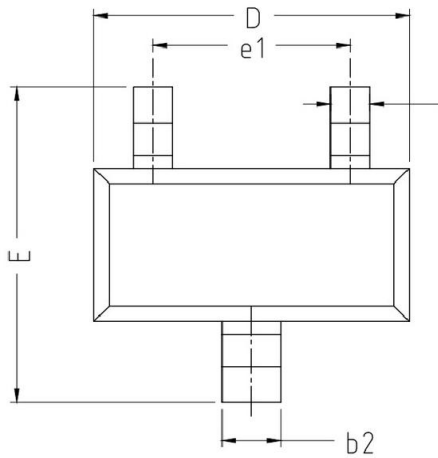


Figure 13: Max. Transient Thermal Impedance


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:


COMMON IN DIMENSION (MM)			
PKG	SOT-523		
Symbol	Min	Nom	Max
A	0.700	0.800	0.890
A1	0.000	0.050	0.100
A2	0.700	0.750	0.800
b1	0.150	0.200	0.250
b2	0.250	0.300	0.350
C	0.100	0.130	0.200
D	1.550	1.600	1.700
E	1.450	1.600	1.750
E1	0.700	0.800	0.900
e	0.500 TYP		
e1	0.900	1.000	1.100
L	0.260	0.360	0.460
L1	0.400 REF		
Q	0°	4°	8°

Revision History:

Revision	Date	Descriptions
Rev 1.1	Oct.2024	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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