

## General Description:

The LWS6008A8 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 TO-220AB, 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:

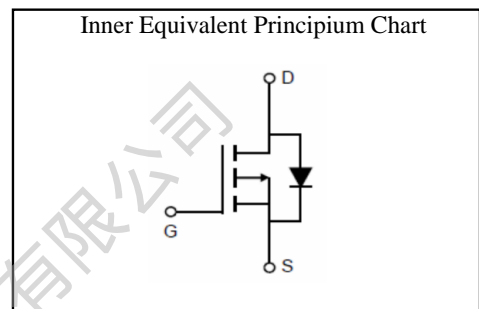
- Battery switching application
- Hard switched and high frequency circuits
- Power Management

**100% DVDS Tested**

**100% Avalanche Tested**



$V_{DSS}$	-60	V
$I_D$	-110	A
$P_D$	180	W
$R_{DS(ON)}$ TYPE	5.5	m $\Omega$



## Package Marking and Ordering Information:

Marking	Part Number	Package	Packing	Qty.
S6008/LW A8/D.C.	LWS6008A8	TO-220AB	Tube	50 Pcs

## Absolute Maximum Ratings:

Symbol	Parameter	Value	Units
$V_{DSS}$	Drain-to-Source Voltage	-60	V
$I_D$	Continuous Drain Current	$T_C=25^\circ\text{C}$	-110
	Continuous Drain Current	$T_C=100^\circ\text{C}$	-70
$I_{DM}^{a1}$	Pulsed Drain Current	-440	A
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$P_D$	Power Dissipation	180	W
$E_{AS}^{a2}$	Single pulse avalanche energy	960	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	0.69	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	60	$^\circ\text{C}/\text{W}$

**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	$\mu A$
$I_{GSS(F)}$	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	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.6	-2.0	-2.4	V
$R_{DS(ON)}$	Drain-to-Source On-Resistance	$V_{GS}=-10V, I_D=-15A$	--	5.5	7.0	m $\Omega$

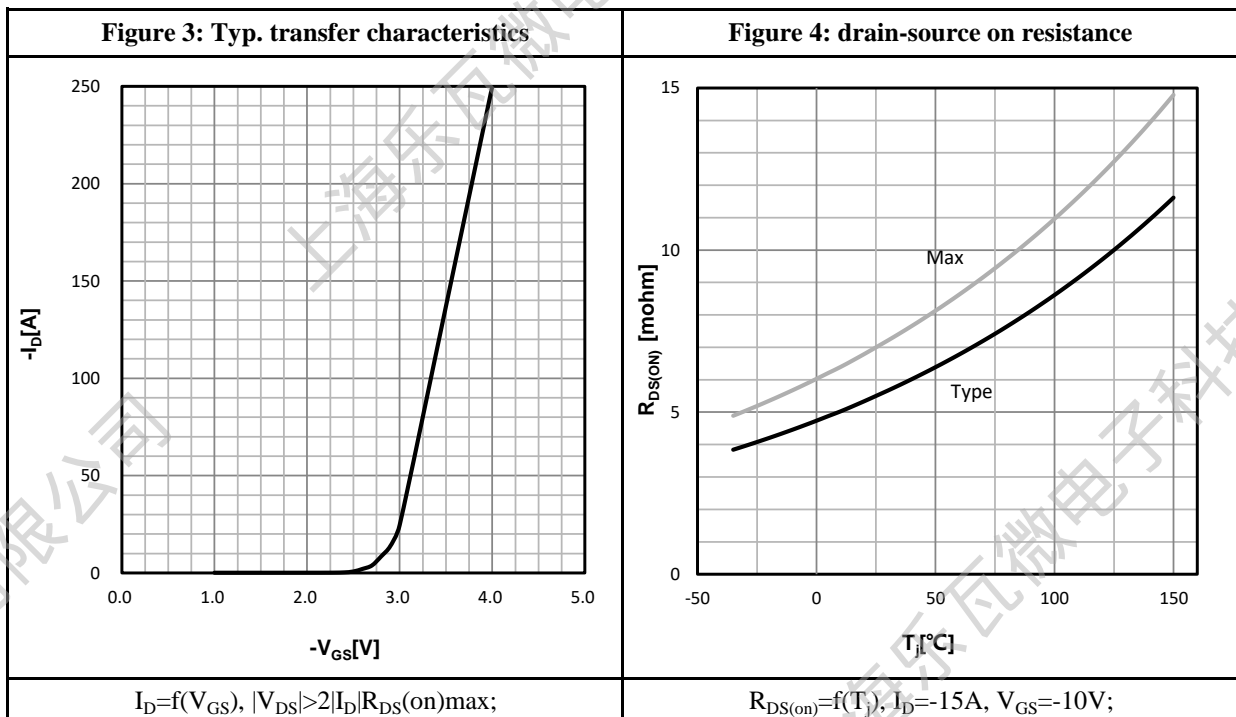
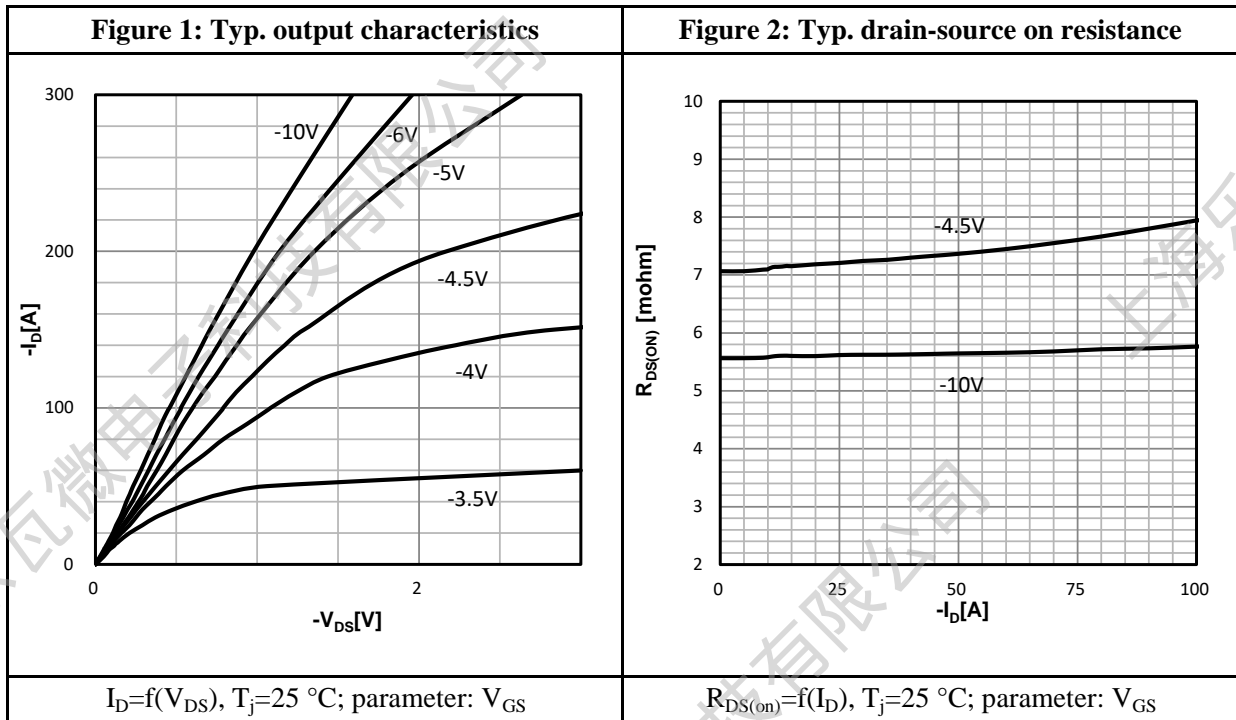
Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$C_{iss}$	Input Capacitance	$V_{GS} = 0V$	--	5403	--	pF
$C_{oss}$	Output Capacitance	$V_{DS} = -30V$	--	941	--	
$C_{rss}$	Reverse Transfer Capacitance	$f = 1.0MHz$	--	48	--	
$R_G$	Gate resistance	$V_{GS}=0V, V_{DS}$ Open	--	2.0	--	$\Omega$

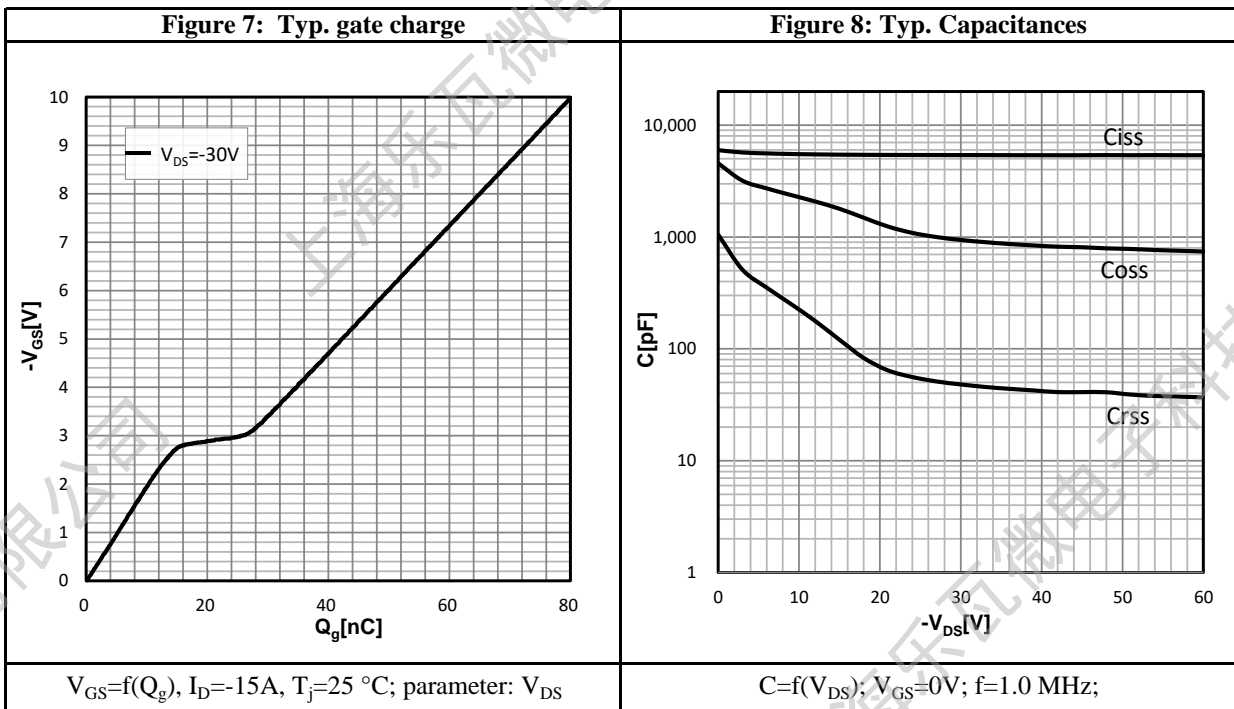
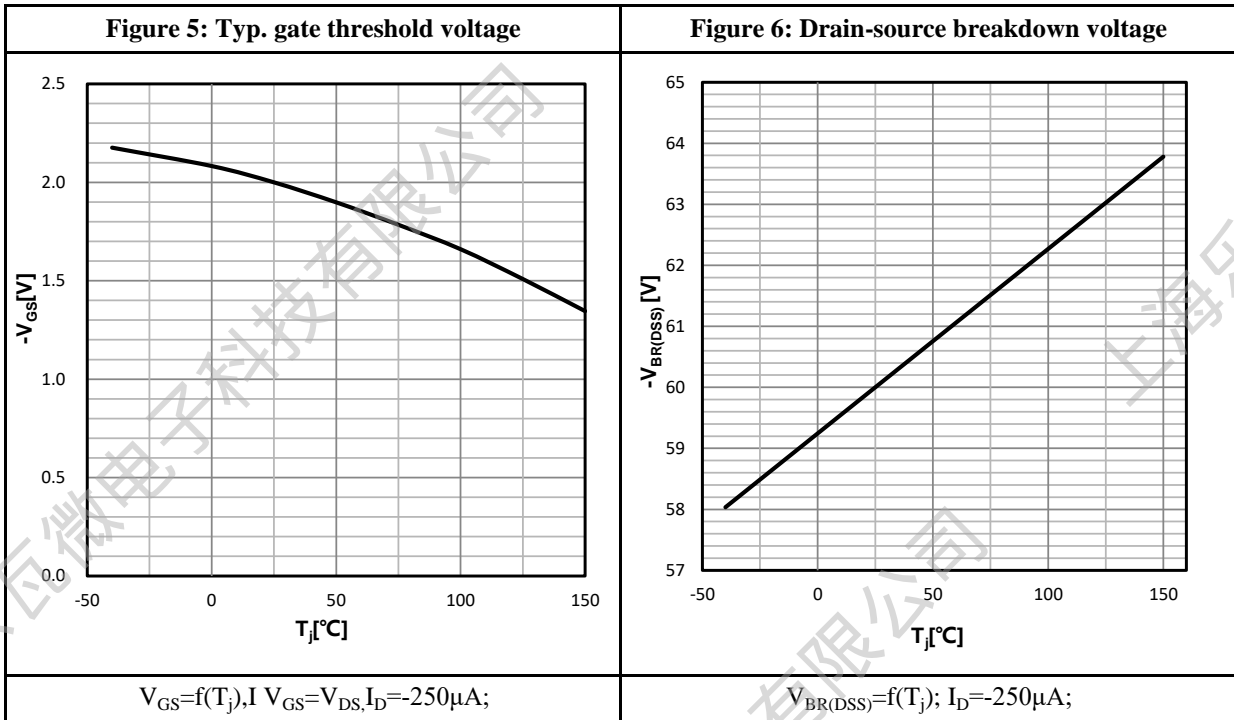
Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$I_D = -15A$	--	4.5	--	ns
$t_r$	Rise Time	$V_{DS} = -30V$	--	2.5	--	
$t_{d(OFF)}$	Turn-Off Delay Time	$V_{GS} = -10V$	--	14.5	--	
$t_f$	Fall Time	$R_G = 3\Omega$	--	3.5	--	
$Q_g$	Total Gate Charge	$V_{GS} = -10V$	--	80	--	nC
$Q_{gs}$	Gate Source Charge	$V_{DS} = -30V$	--	15	--	
$Q_{gd}$	Gate Drain Charge	$I_D = -15A$	--	11	--	

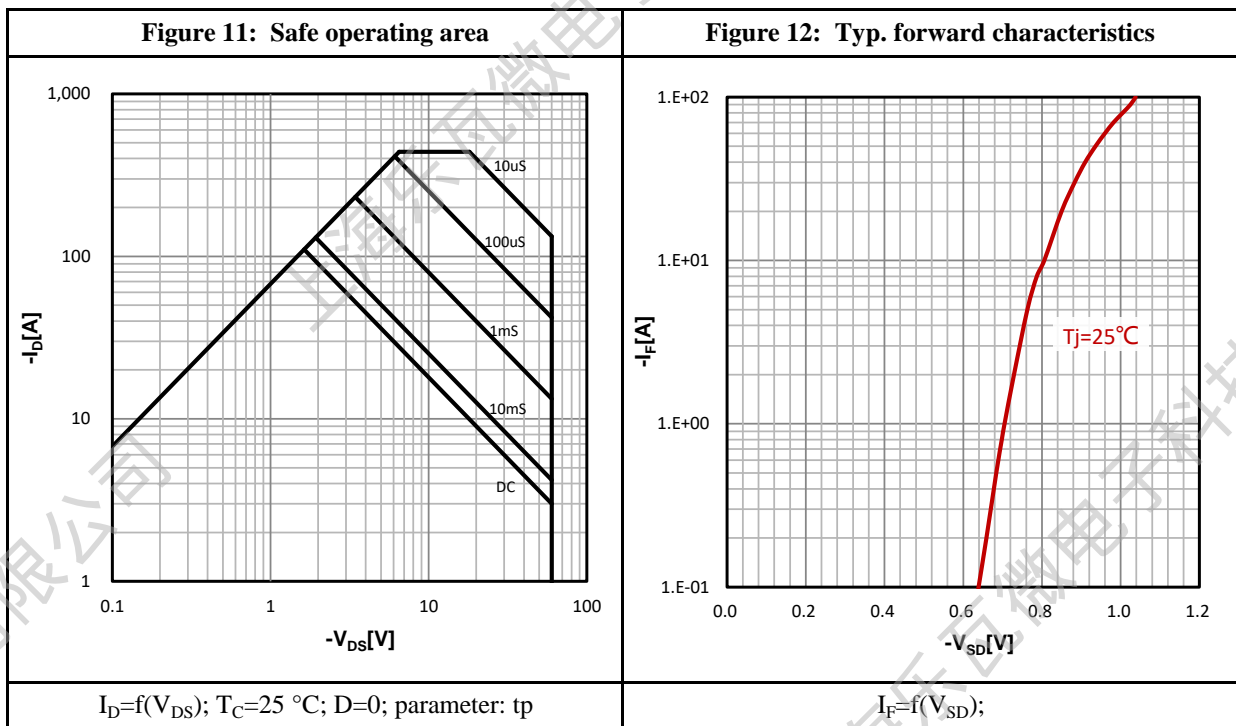
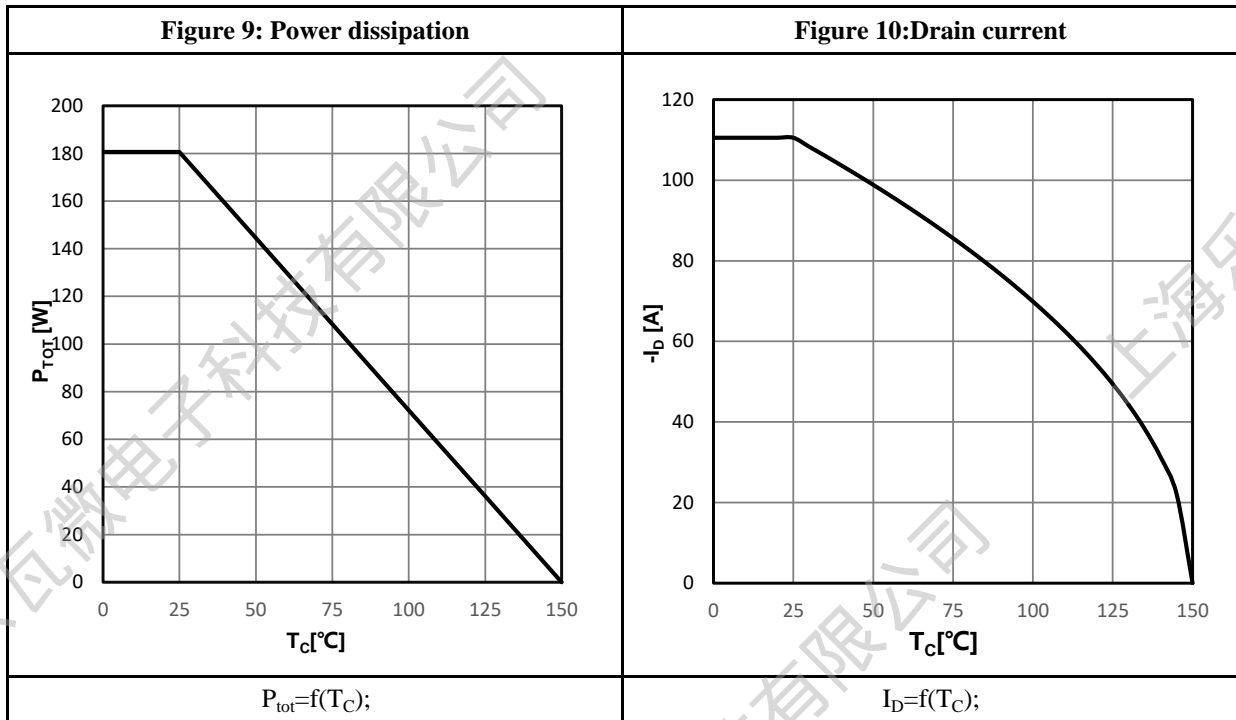
Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$I_S$	Diode Forward Current	$T_C = 25\text{ }^\circ\text{C}$	--	--	-110	A
$V_{SD}$	Diode Forward Voltage	$I_S = -15A, V_{GS} = 0V$	--	--	-1.2	V
$t_{rr}$	Reverse Recovery time	$I_S = -15A, V_{DD} = -30V,$	--	60	--	ns
$Q_{rr}$	Reverse Recovery Charge	$dI/dt = 100A/\mu s$	--	105	--	nC

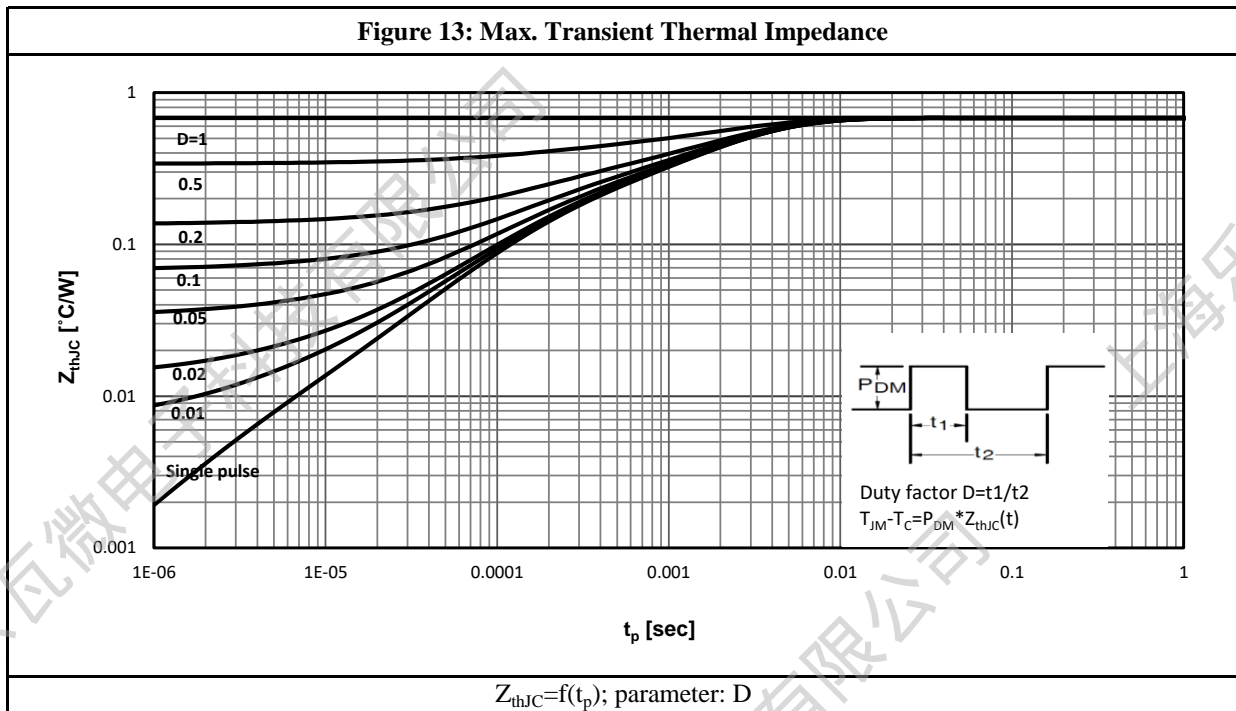
a1: Repetitive rating; pulse width limited by maximum junction temperature

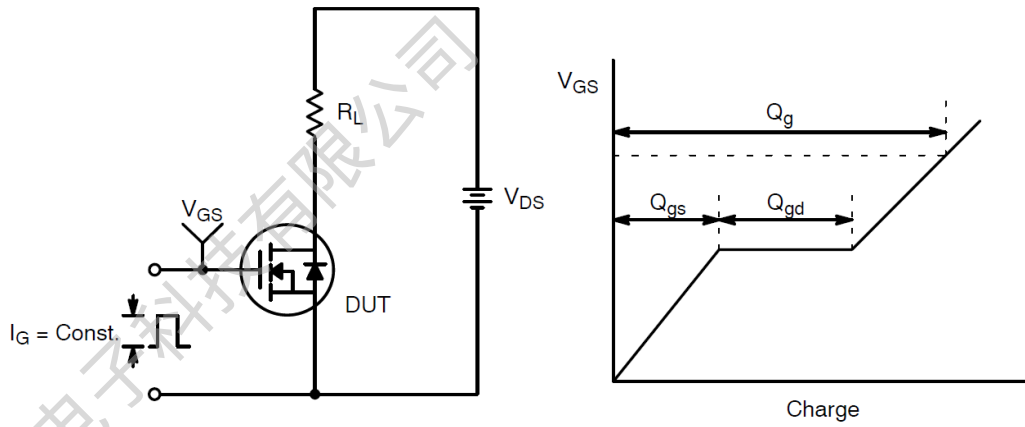
a2:  $V_{DD} = -30V, L = 1.0mH, R_G = 25\Omega, \text{Starting } T_j = 25\text{ }^\circ\text{C}$

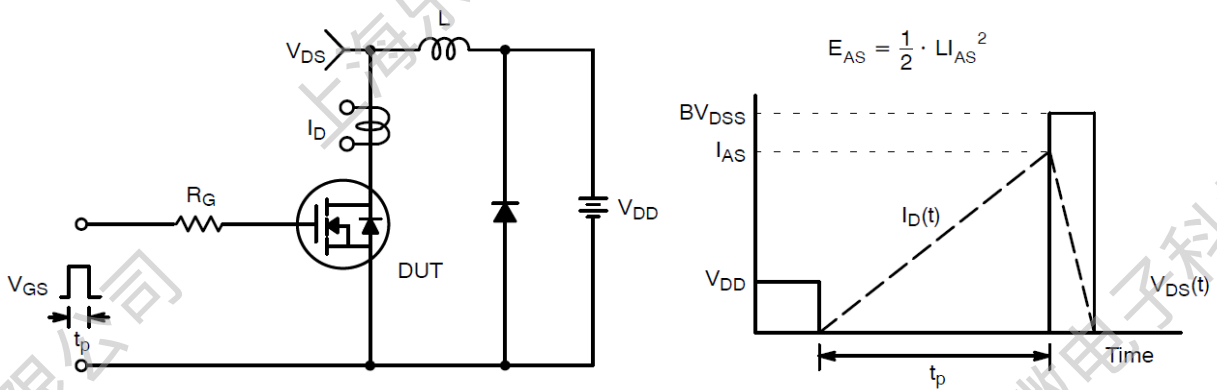
**Characteristics Curve:**


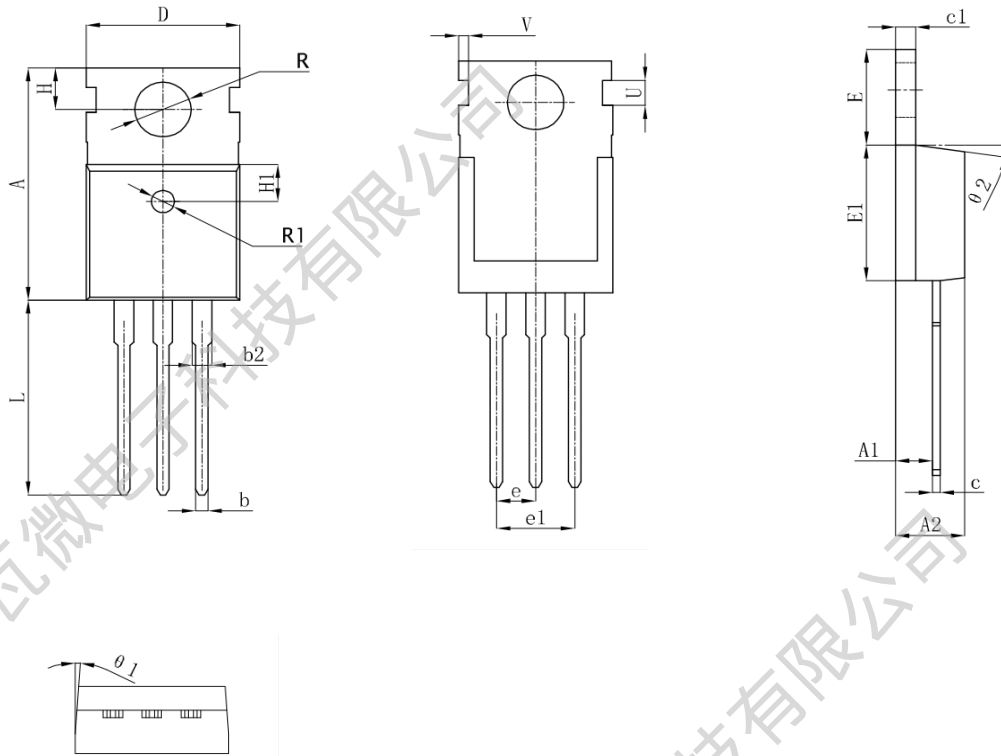






**Test Circuit & Waveform:**

**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	MILLIMETER		
	MIN	NOM	MAX
A	15.4	15.6	15.8
A1	2.3	2.4	2.5
A2	4.4	4.5	4.7
b	0.7	0.8	0.9
b2	1.18	1.31	1.44
c	0.44	0.5	0.56
c1	1.28	1.3	1.32
D	9.8	10	12.2
E	6.4	6.5	6.6
E1	9	9.1	9.2
e	2.42	2.54	2.66
e1	4.84	5.08	5.32
H	2.73	2.8	2.87
H1	2.4	2.5	2.6
L	13.02	13.37	13.72
R	3.5	3.6	3.63
R1	1.4	1.5	1.6
U	1.65	1.75	1.85
V	0.58	0.68	0.78
q 1	2°	2.5°	3°
q 2	6.5°	7°	7.5°



**Revision History:**

<b>Revison</b>	<b>Date</b>	<b>Descriptions</b>
Rev 1.0	Mar.2022	Initial Version

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