

### General Description:

The LWS6080AL 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 SOT23-3L, 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



### Package Marking and Ordering Information:

Marking	Part Number	Package	Packing	Qty.
S6080A	LWS6080AL	SOT23-3L	Reel	3000 Pcs

### Absolute Maximum Ratings:

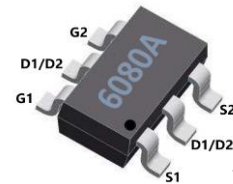
Symbol	Parameter	Value	Units
$V_{DSS}$	Drain-to-Source Voltage	-60	V
$I_D$	Continuous Drain Current	$T_C=25^\circ\text{C}$	-3.5
	Continuous Drain Current	$T_C=100^\circ\text{C}$	-2.2
$I_{DM}^{al}$	Pulsed Drain Current	-14	A
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$P_D$	Power Dissipation	1.7	W
$T_J, T_{STG}$	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:

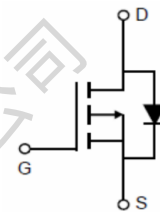
Symbol	Parameter	Value	Units
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	73.5	$^\circ\text{C}/\text{W}$

$V_{DSS}$	-60	V
$I_D$	-3.5	A
$P_D$	1.7	W
$R_{DS(ON) \text{ TYPE}}$	60	$\text{m}\Omega$

### Marking and Pin Assignment



### Inner Equivalent Principium Chart



**Electrical Characteristic** ( $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise specified):

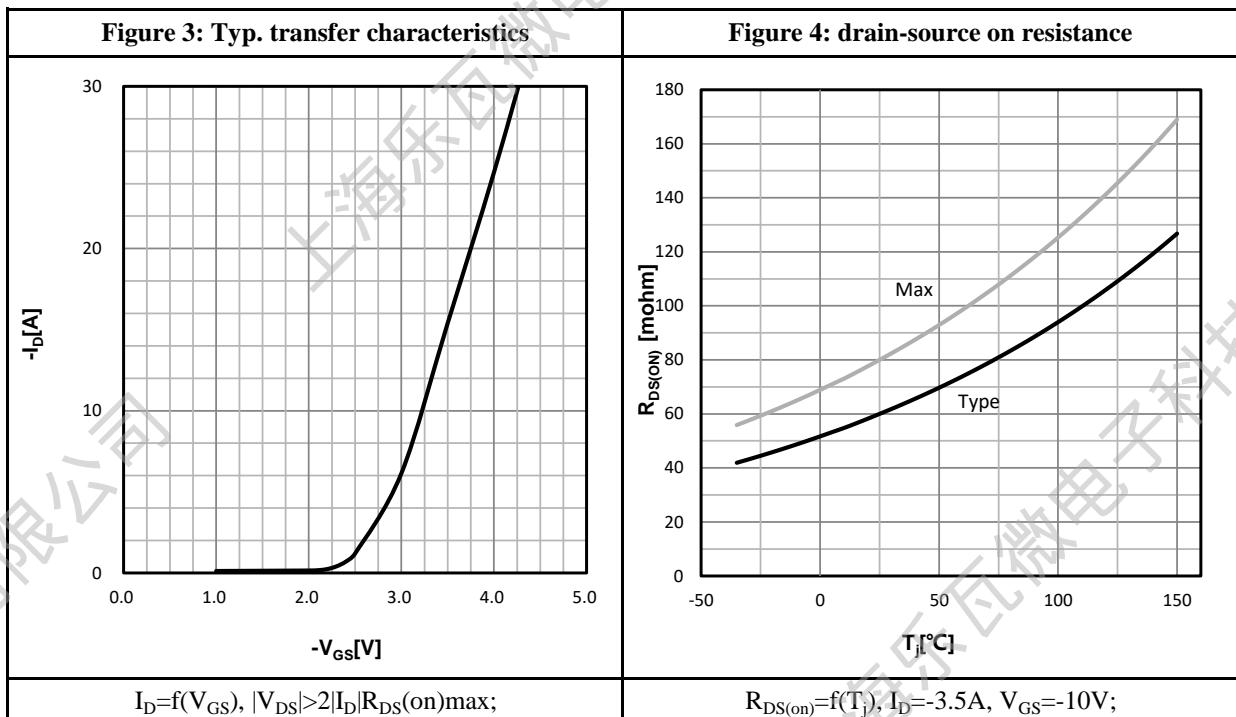
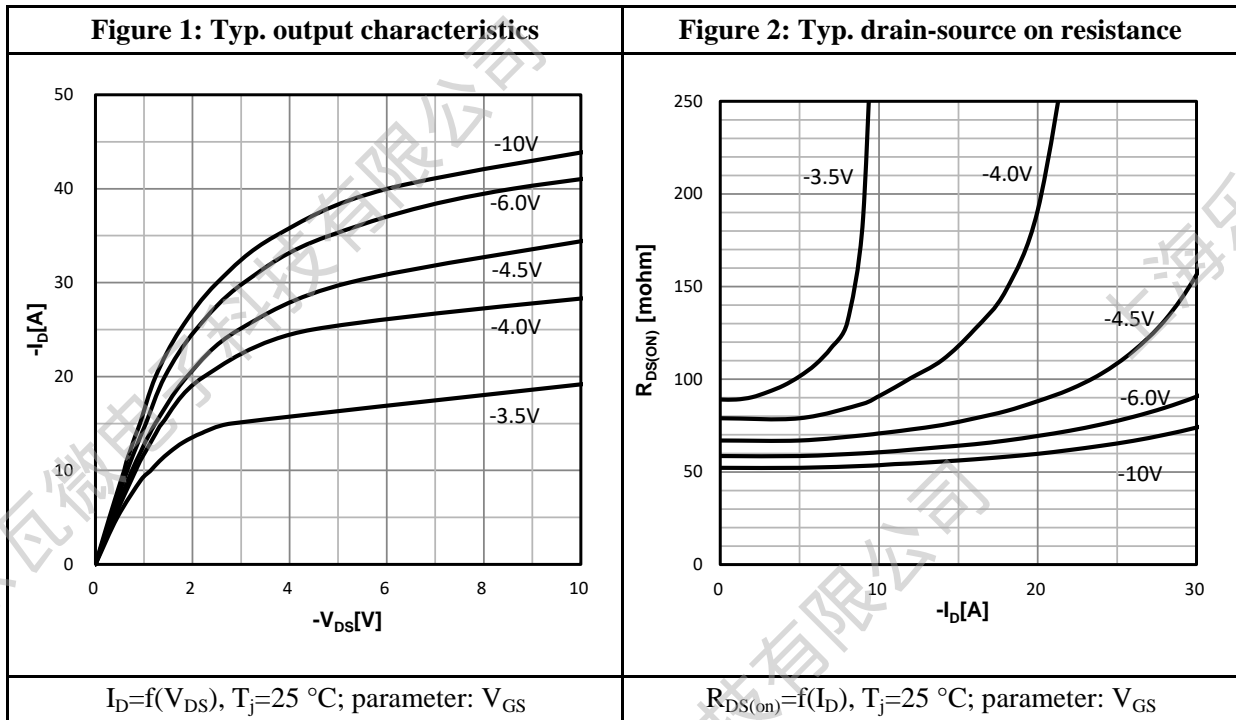
Static Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$V_{DSS}$	Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-60	--	--	V
$I_{DSS}$	Drain to Source Leakage Current	$V_{DS}=-60V, V_{GS}=0V$	--	--	1.0	$\mu A$
$I_{GSS(F)}$	Gate to Source Forward Leakage	$V_{GS}=-20V, V_{DS}=0V$	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	$V_{GS}=+20V, V_{DS}=0V$	--	--	-100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.3	-1.65	-2.1	V
$R_{DS(ON)1}$	Drain-to-Source On-Resistance	$V_{GS}=-10V, I_D=-3.5A$	--	60	80	m $\Omega$
$R_{DS(ON)2}$	Drain-to-Source On-Resistance	$V_{GS}=-4.5V, I_D=-3.0A$	--	75	120	m $\Omega$

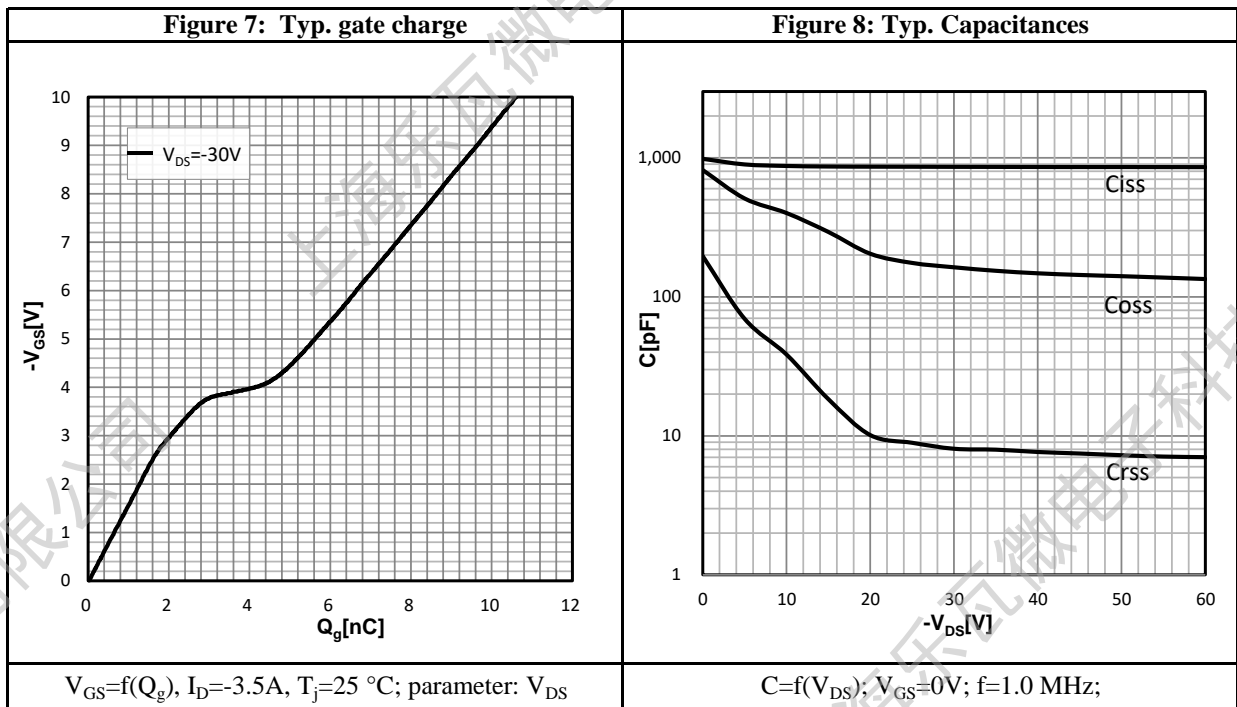
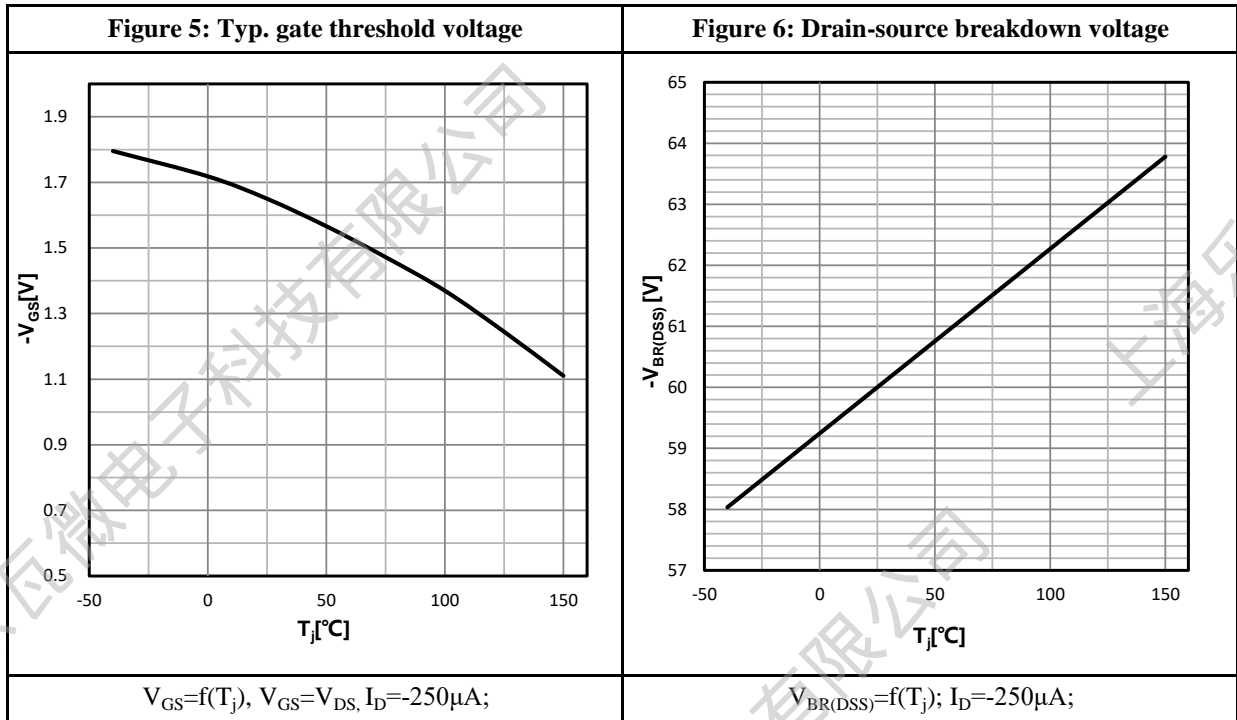
Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$C_{iss}$	Input Capacitance	$V_{GS} = 0V$	--	504	--	pF
$C_{oss}$	Output Capacitance	$V_{DS} = -30V$	--	82	--	
$C_{rss}$	Reverse Transfer Capacitance	$f = 1.0MHz$	--	3.9	--	
$R_G$	Gate resistance	$V_{GS}=0V, V_{DS}$ Open	--	3.0	--	$\Omega$

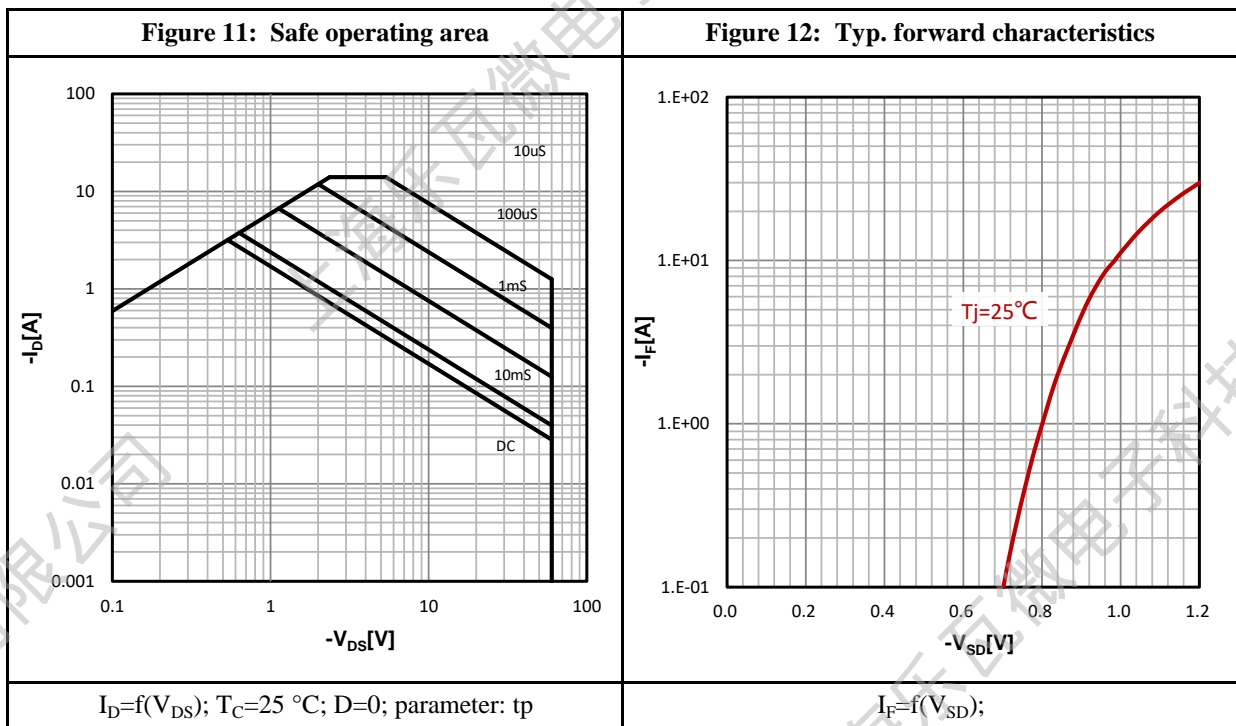
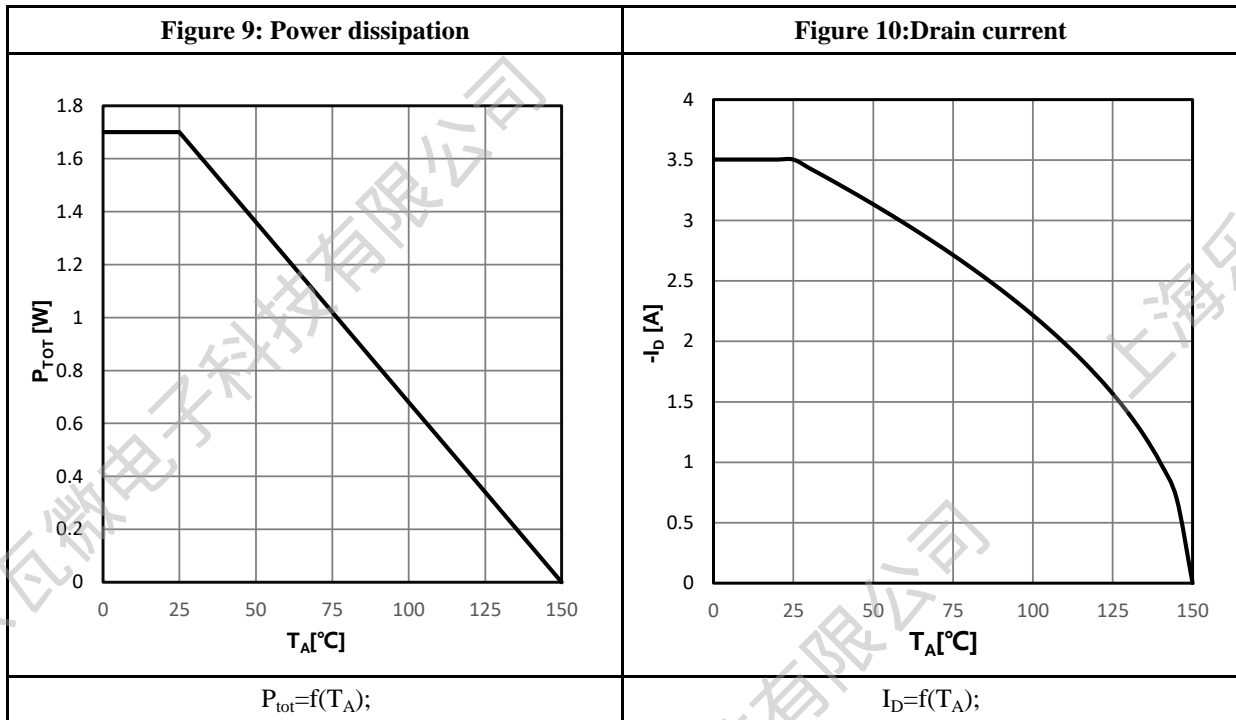
Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$I_D = -3.5A$	--	10	--	ns
$t_r$	Rise Time	$V_{DS} = -30V$	--	6.0	--	
$t_{d(OFF)}$	Turn-Off Delay Time	$V_{GS} = -10V$	--	40	--	
$t_f$	Fall Time	$R_G = 3\Omega$	--	13	--	
$Q_g$	Total Gate Charge	$V_{GS} = -10V$	--	10.5	--	nC
$Q_{gs}$	Gate Source Charge	$V_{DS} = -30V$	--	2.8	--	
$Q_{gd}$	Gate Drain Charge	$I_D = -3.5A$	--	1.5	--	

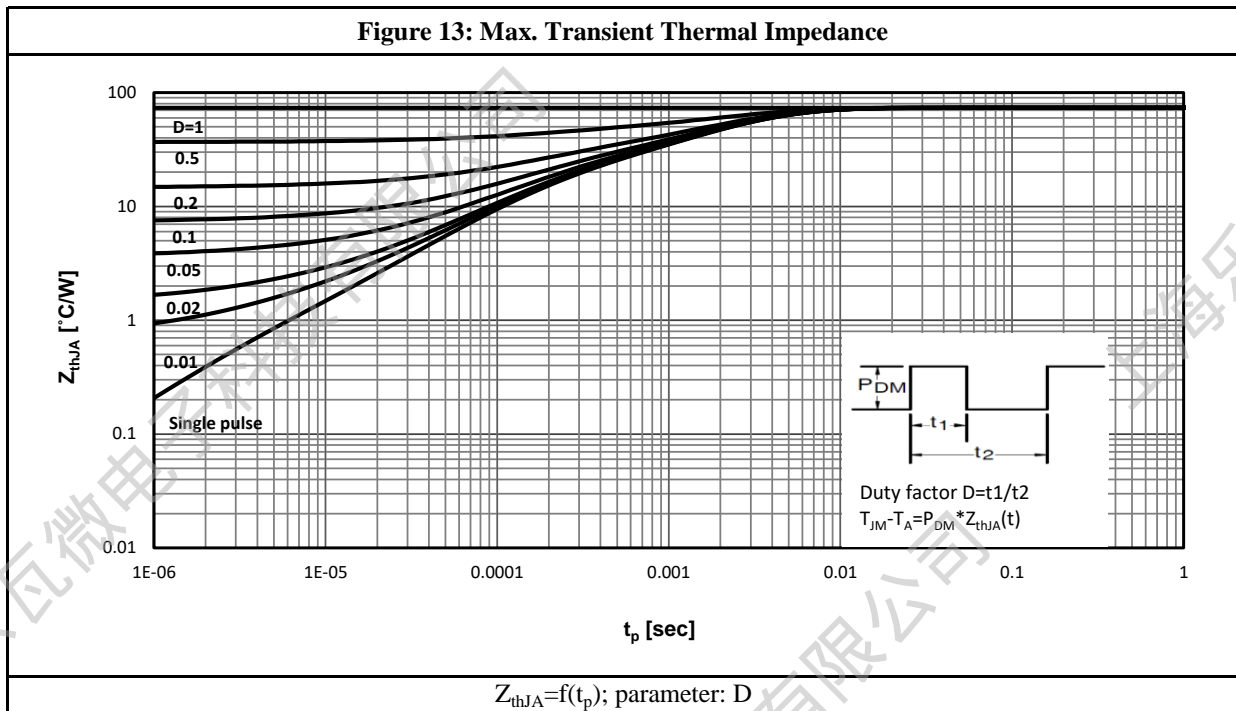
Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$I_S$	Diode Forward Current	$T_C = 25\text{ }^\circ\text{C}$	--	--	-3.5	A
$I_{SM}$	Diode Pulse Current		--	--	-14	A
$V_{SD}$	Diode Forward Voltage	$I_S = -3.5A, V_{GS} = 0V$	--	--	-1.2	V
$t_{rr}$	Reverse Recovery time	$I_S = -3.5A, V_{DD} = -30V,$	--	50	--	ns
$Q_{rr}$	Reverse Recovery Charge	$dI/dt = 100A/us$	--	105	--	nC

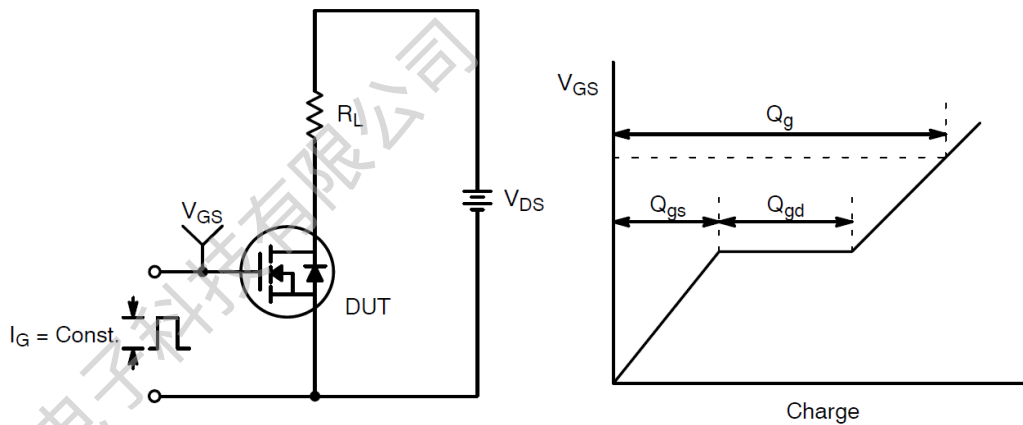
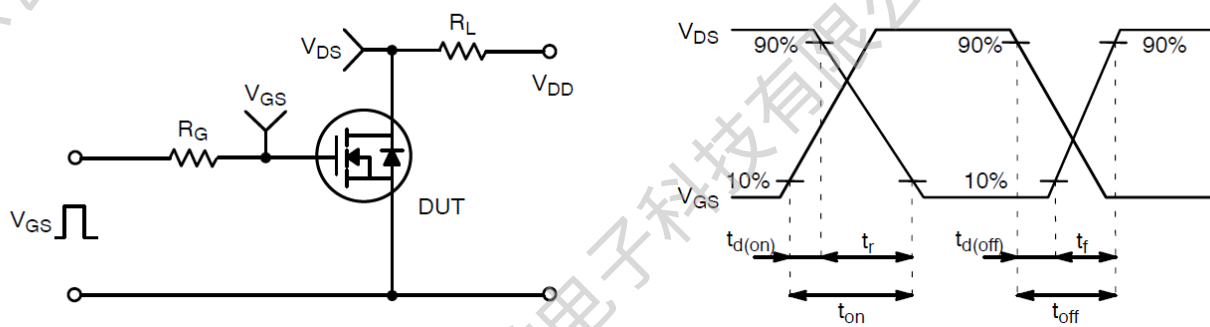
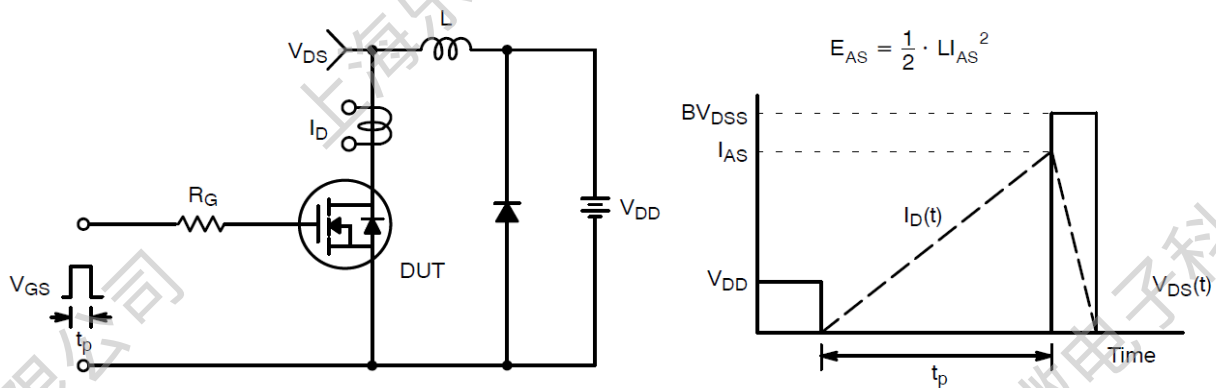
a1: Repetitive rating; pulse width limited by maximum junction temperature

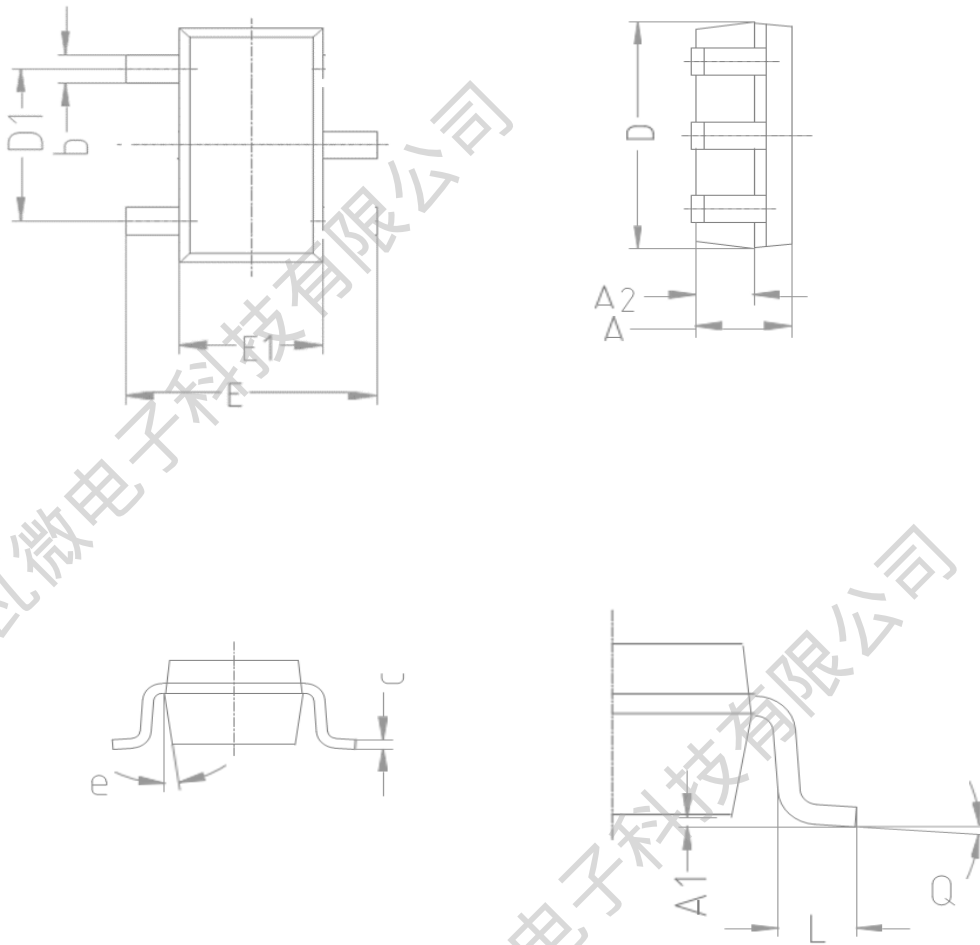
**Characteristics Curve:**








**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:**


COMMON DIMENSION (MM)			
PKG	SOT23-3/5/6		
Symbol	MIN	NOM	MAX
A	1.080	1.100	1.120
A1	0.010	0.060	0.150
A2	0.640	0.470	0.700
b	0.325	0.350	0.375
c	0.125	0.135	0.150
D	2.920	2.930	2.980
D1	1.875	1.900	1.925
E	2.650	2.800	2.950
E1	1.580	1.600	1.670
L	0.300	0.450	0.600
e	8°		
Q	0°	4°	8°



**Revision History:**

<b>Revison</b>	<b>Date</b>	<b>Descriptions</b>
Rev 1.0	Feb.2024	Initial Version

**Disclaimer:**

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