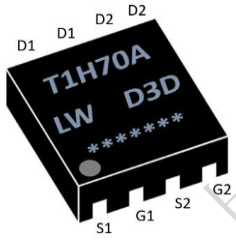
General Description:

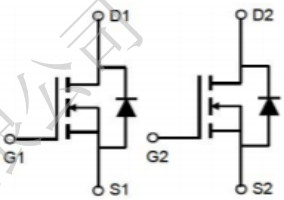
The LWT1H70AD3D uses advanced SGT technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications. The package form is PDFN3.3*3.3-8L, which accords with the ROHS standard and Halogen Free standard.

V_{DSS}	100	V
I_D	15	A
P_D	31	W
$R_{DS(ON)\ TYPE}$	60	mΩ

Marking and Pin Assignment



Inner Equivalent Principium Chart



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

RoHS H F

Package Marking and Ordering Information:

Marking	Part Number	Package	Packing	Qty.
T1H70A/LW D3D/D.C.	LWT1H70AD3D	PDFN3.3*3.3-8L	Reel	5000 Pcs

Absolute Maximum Ratings:

Symbol	Parameter		Value	Units
V_{DSS}	Drain-to-Source Voltage		100	V
I_D	Continuous Drain Current	T_C=25℃	15	A
	Continuous Drain Current	T_C=100℃	10	A
I_{DM}[a1]	Pulsed Drain Current		60	A
E_{AS}[a2]	Single pulse avalanche energy		22	mJ
V_{GS}	Gate-to-Source Voltage		±20	V
P_D	Power Dissipation		31	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		150, -55 to 150	℃
T_L	Maximum Temperature for Soldering		260	℃

Thermal Characteristics:

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	4	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	52	℃/W

Electrical Characteristic (T_C= 25 °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=250μA	100	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=100V, 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=250μA	1.3	1.8	2.3	V
$R_{DS(ON)1}$	Drain-to-Source On-Resistance	V_{GS}=10V, I_D=5.0A	--	60	75	mΩ
$R_{DS(ON)2}$	Drain-to-Source On-Resistance	V_{GS}=4.5V, I_D=4.A	--	80	95	mΩ

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 50V f = 1.0MHz	--	171	--	pF
C_{oss}	Output Capacitance		--	58	--	
C_{rss}	Reverse Transfer Capacitance		--	1.9	--	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D =10A V_{DS} =50V V_{GS} = 10V R_G = 3.0Ω	--	8	--	ns
t_r	Rise Time		--	16	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	17	--	
t_f	Fall Time		--	14	--	
Q_g	Total Gate Charge	V_{GS} =10V V_{DS} = 50V I_D =10A	--	5.0	--	nC
Q_{gs}	Gate Source Charge		--	0.8	--	
Q_{gd}	Gate Drain Charge		--	1.0	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	T_C =25 °C	--	--	15	A
V_{SD}	Diode Forward Voltage	I_S=5.0A, V_{GS}=0V	--	--	1.2	V
t_{rr}	Reverse Recovery time	I_S=10A, V_{DD}=50V dI/dt=100A/μs	--	22	--	ns
Q_{rr}	Reverse Recovery Charge		--	18	--	nC

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

a2：V_{DD}=50V, L=5.0mH, R_G=25Ω, Starting T_J=25 °C

Characteristics Curve：

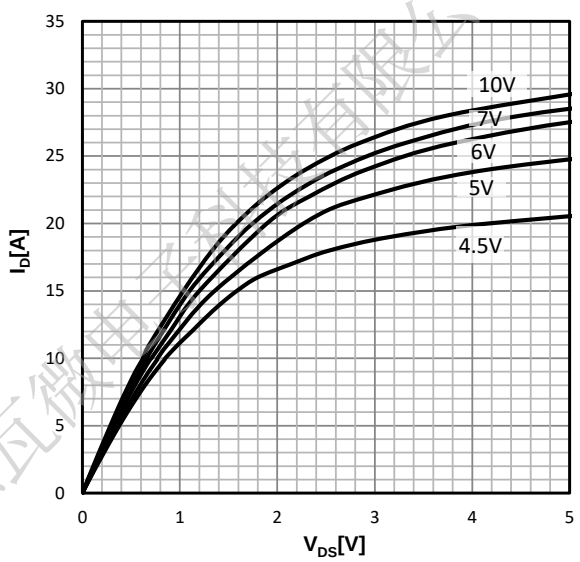
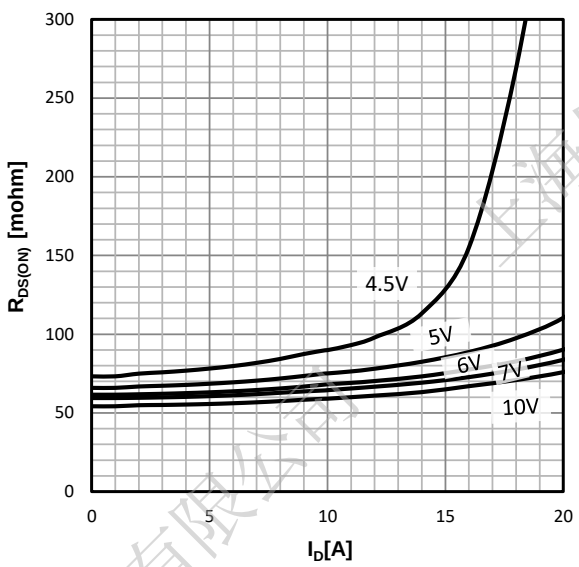
Figure 1: Typ. output characteristics	Figure 2: Typ. drain-source on resistance
	
$I_D=f(V_{DS})$, T_j=25 °C; parameter: V_{GS}	$R_{DS(on)}=f(I_D)$, T_j=25 °C; parameter: V_{GS}

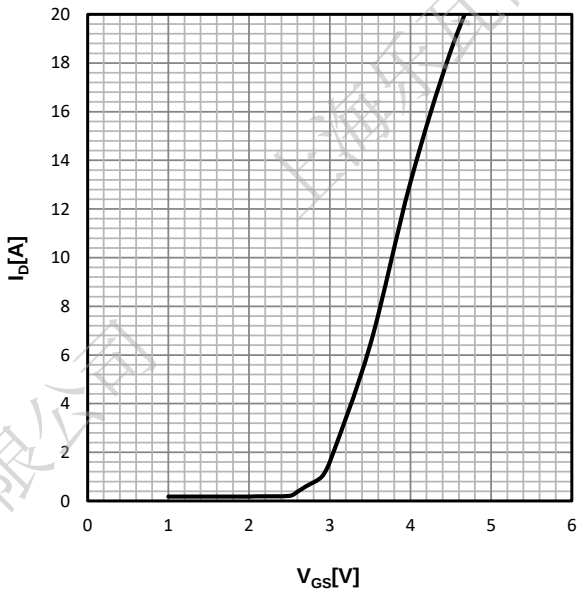
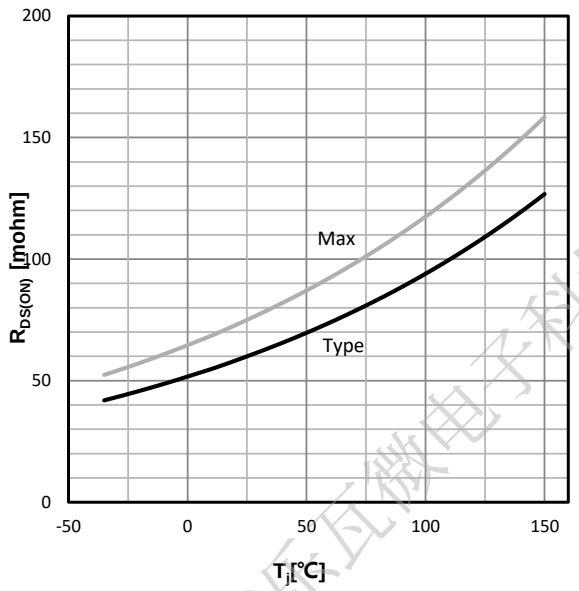
Figure 3: Typ. transfer characteristics	Figure 4: drain-source on resistance
	
$I_D=f(V_{GS})$, $\|V_{DS}\|>2\|I_D\|R_{DS}(on)max$;	$R_{DS(on)}=f(T_j)$, I_D=5.0A, V_{GS}=10V;

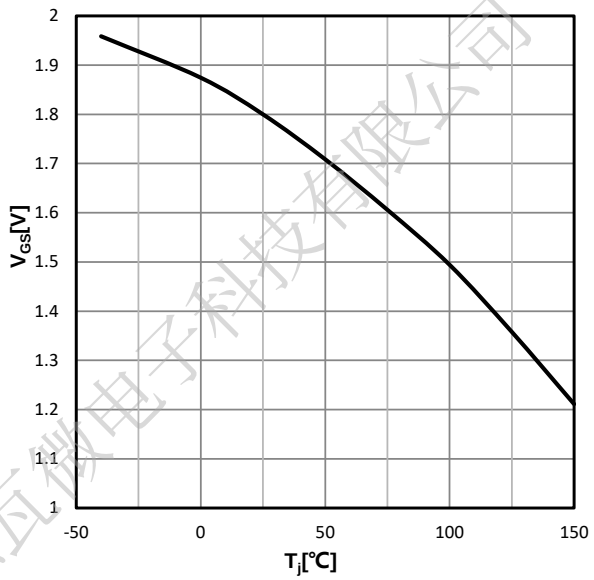
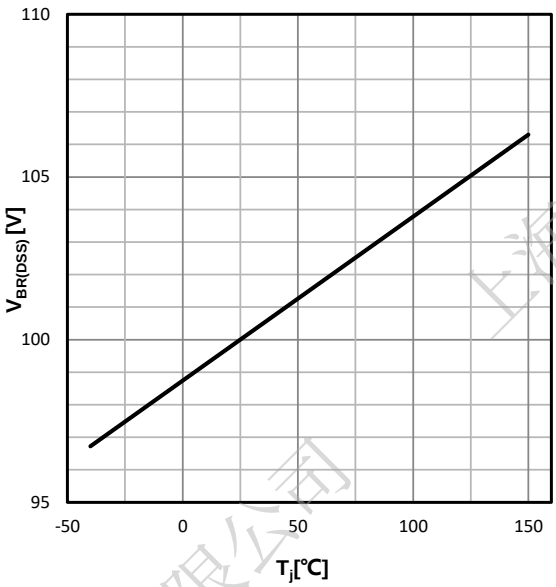
Figure 5: Typ. gate threshold voltage	Figure 6: Drain-source breakdown voltage
	
$V_{GS}=f(T_j)$,I $V_{GS}=V_{DS,}I_D=250\mu A$;	$V_{BR(DSS)}=f(T_j)$; $I_D=250\mu A$;

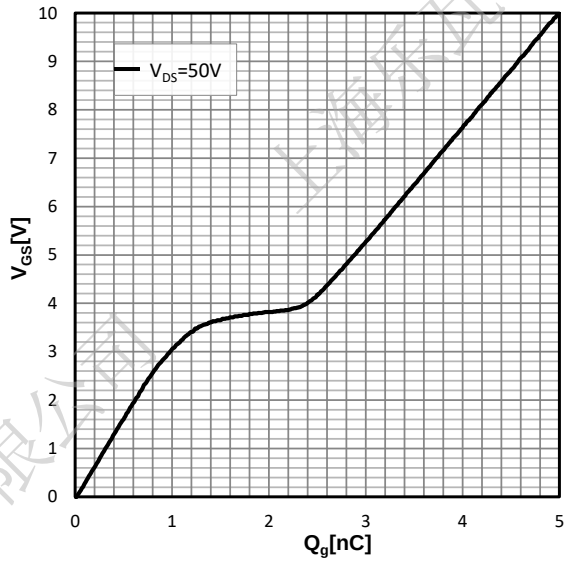
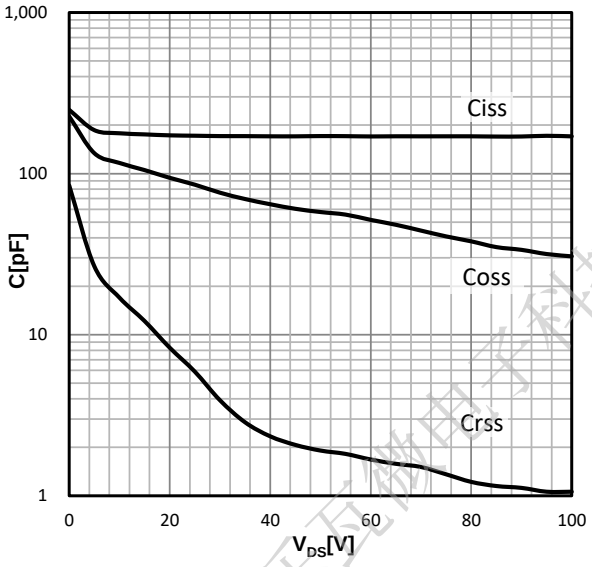
Figure 7: Typ. gate charge	Figure 8: Typ. Capacitances
	
$V_{GS}=f(Q_g)$, $I_D=10A$, $T_j=25$ °C; parameter: V_{DS}	$C=f(V_{DS})$; $V_{GS}=0V$; f=1.0 MHz;

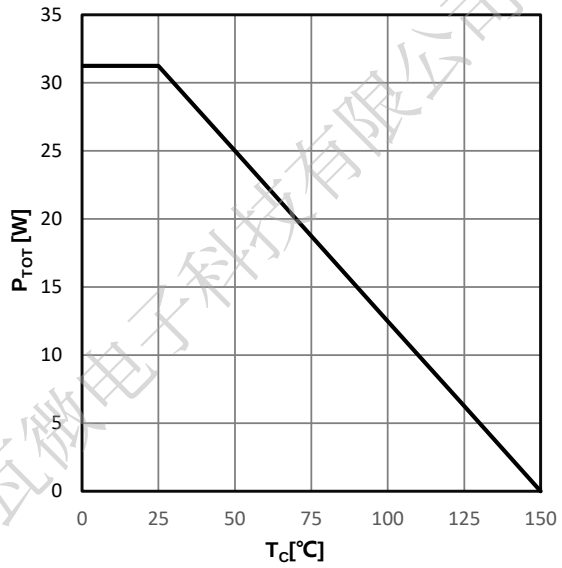
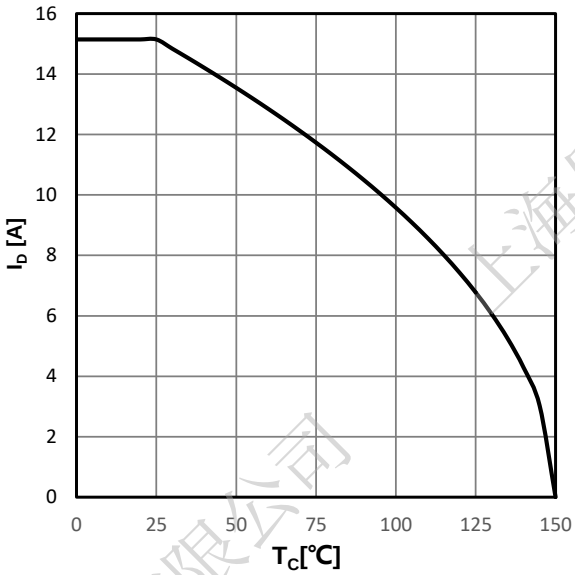
Figure 9: Power dissipation	Figure 10:Drain current
	
$P_{tot}=f(T_C)$;	$I_D=f(T_C)$;

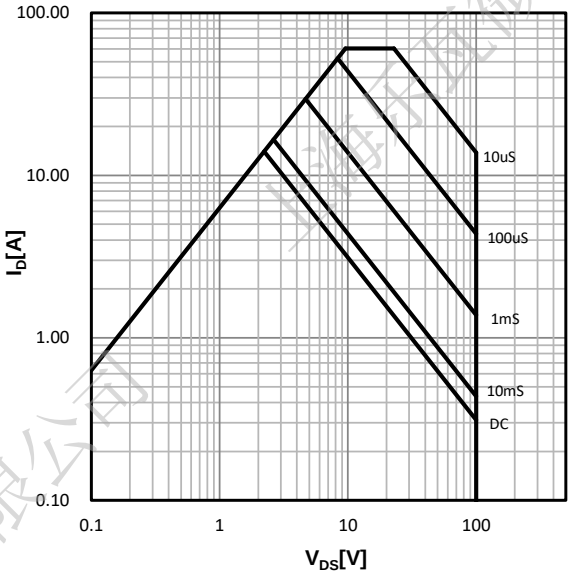
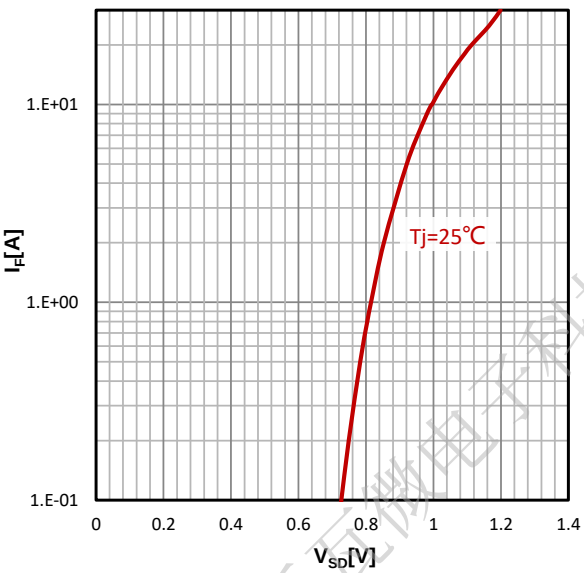
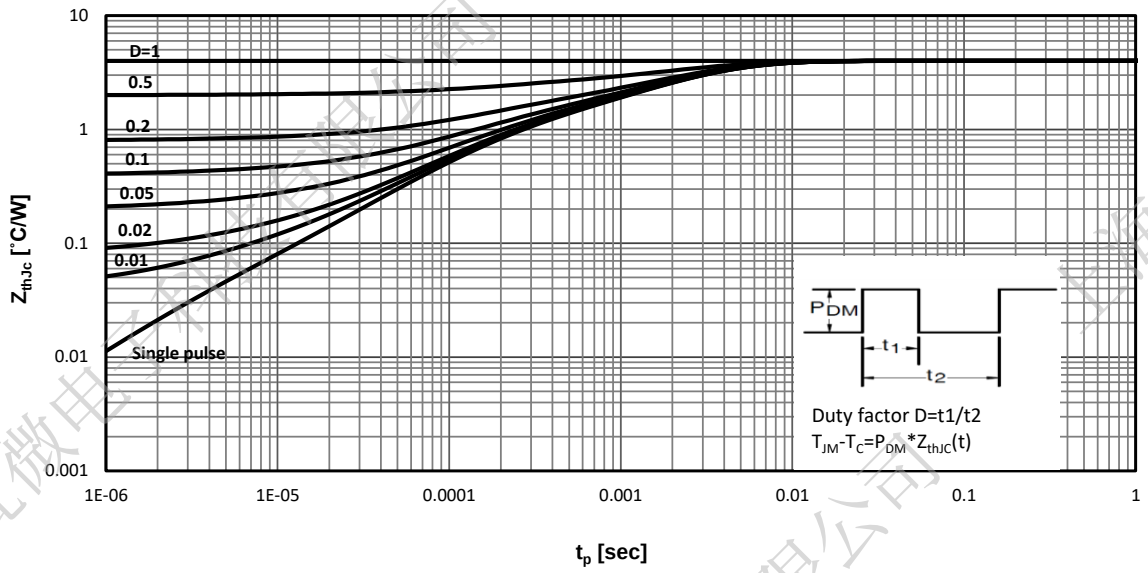
Figure 11: Safe operating area	Figure 12: Typ. forward characteristics
	
$I_D=f(V_{DS})$; T_C=25 °C; D=0; parameter: tp	$I_F=f(V_{SD})$;

Figure 13: Max. Transient Thermal Impedance



$Z_{thJC}=f(t_p)$; parameter: D

Test Circuit & Waveform:

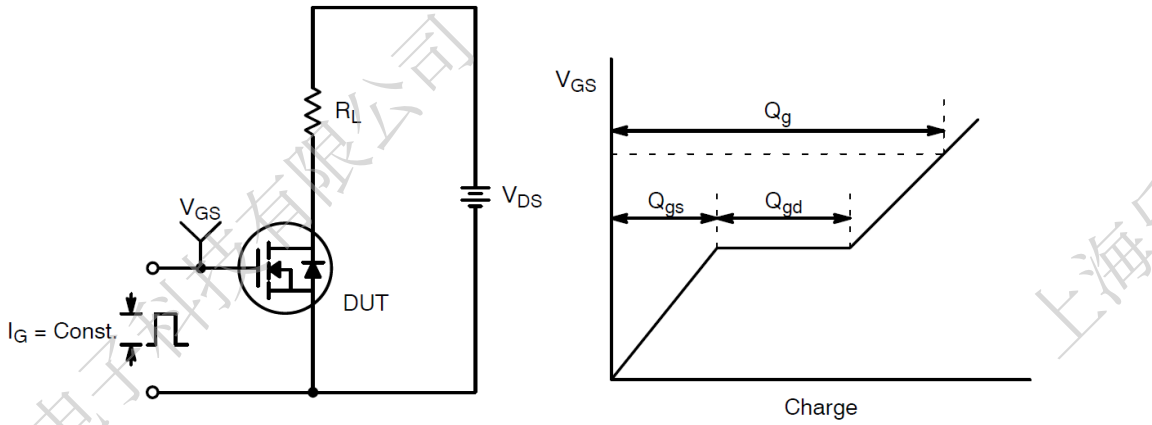


Figure 14: Gate Charge Test Circuit & Waveform

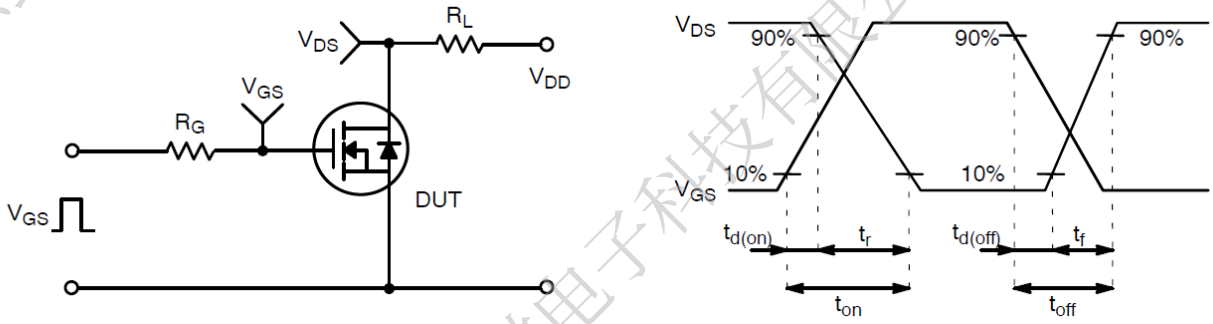


Figure 15: Resistive Switching Test Circuit & Waveforms

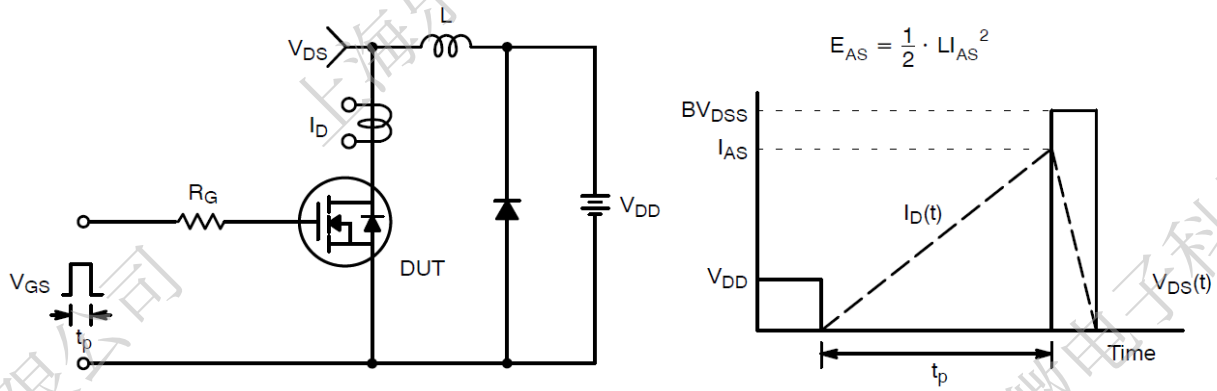
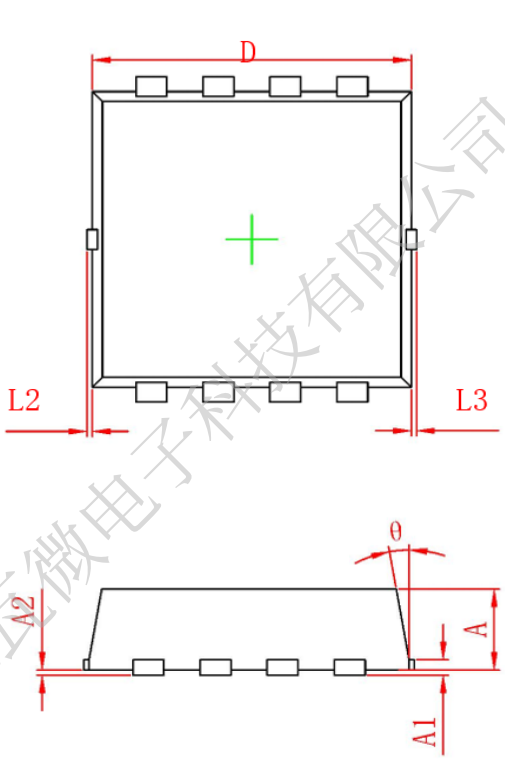
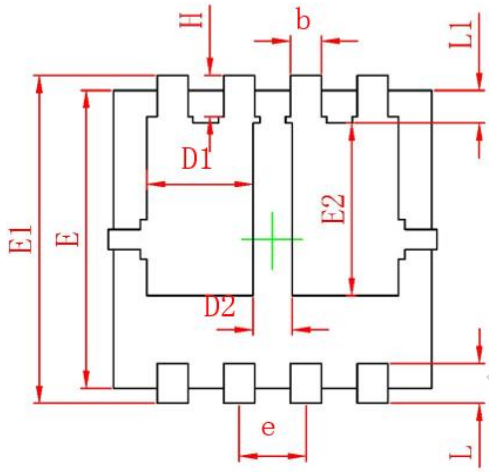


Figure 16: Unclamped Inductive Switching Test Circuit & Waveforms

Package Outline:





Symbol	MILLIMETER	
	MIN	MIN
A	0.700	0.900
A1	0.152 REF	
A2	0~0.05	
D	3.000	3.200
D1	0.935	1.135
D2	0.280	0.480
E	2.900	3.100
E1	3.150	3.450
E2	1.535	1.935
b	0.200	0.400
e	0.550	0.750
L	0.300	0.500
L1	0.180	0.480
L2	0~0.100	
L3	0~0.100	
H	0.315	0.515
θ	8°	12°

Revision History:

Revison	Date	Descriptions
Rev 1.0	Feb.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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