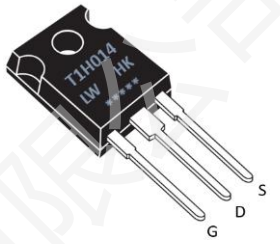
General Description：

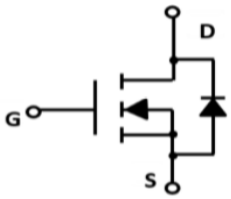
The LWT1H014HK uses advanced SGT technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications. The package form is TO-247, which accords with the ROHS standard and Halogen Free standard.

V_{DSS}	100	V
I_D	385	A
P_D	441	W
$R_{DS(ON)\ TYPE}$	1.8	mΩ

Marking and Pin Assignment



Inner Equivalent Principium Chart



Features：

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

Applications：

- DC-DC Converter
- Portable Equipment
- Power Management

100% DVDS Tested

100% Avalanche Tested

RoHS　　HF

Package Marking and Ordering Information:

Marking	Part Number	Package	Packing	Qty.
T1H014/LW　HK/D.C.	LWT1H014HK	TO-247	Tube	25 Pcs

Absolute Maximum Ratings:

Symbol	Parameter		Value	Units
V_{DSS}	Drain-to-Source Voltage		100	V
I_D	Continuous Drain Current	T_C=25℃	385	A
	Continuous Drain Current	T_C=100℃	272	A
I_{DM}[a1]	Pulsed Drain Current		1200	A
E_{AS}[a2]	Single pulse avalanche energy		1462	mJ
V_{GS}	Gate-to-Source Voltage		±20	V
P_D	Power Dissipation		441	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		175, -55 to 150	℃
T_L	Maximum Temperature for Soldering		260	℃

Thermal Characteristics:

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.34	℃/W
$R_{\theta JA}$[a3]	Thermal Resistance, Junction-to-Ambient	43	℃/W

Electrical Characteristic (T_J = 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	3.0	3.5	4.0	V
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=10V, I_D=100A	--	1.8	2.3	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	--	12039	--	pF
C_{oss}	Output Capacitance		--	4036	--	
C_{rss}	Reverse Transfer Capacitance		--	58	--	
R_G	Gate resistance	V_{GS}=0V,V_{DS}=0V, f=1MHz	--	0.59	--	Ω

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D =100A V_{DS} =50V V_{GS} =10V R_G =5.0Ω	--	35	--	ns
t_r	Rise Time		--	90	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	95	--	
t_f	Fall Time		--	105	--	
Q_g	Total Gate Charge	V_{GS} =10V V_{DS} =50V I_D =100A	--	173	--	nC
Q_{gs}	Gate Source Charge		--	58	--	
Q_{gd}	Gate Drain Charge		--	39	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	T_C =25 °C	--	--	385	A
V_{SD}	Diode Forward Voltage	I_S=100A, V_{GS}=0V	--	--	1.2	V
t_{rr}	Reverse Recovery Time	I_S=100A, V_{DD}=50V dI/dt=100A/μs	--	95	--	ns
Q_{rr}	Reverse Recovery Charge		--	200	--	nC

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

a2：V_{DD}=50V, L=0.3mH, R_G=25Ω, Starting T_J=25 ℃

a3：Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm^2 (one layer, 70 μm thick) copper area for drain connection.

Characteristics Curve：

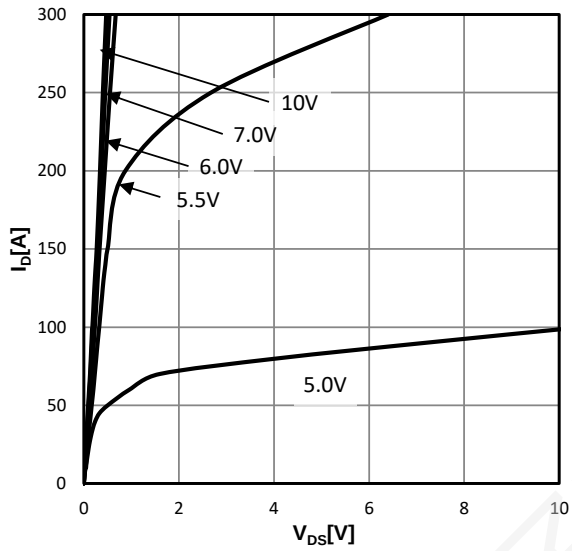
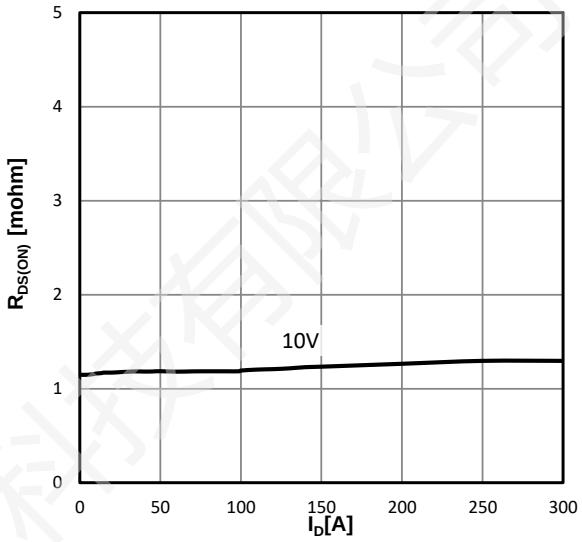
Figure 1: Typ. output characteristics	Figure 2: Typ. drain-source on resistance
	
$I_D=f(V_{DS})$, T_j=25 °C; parameter: V_{GS}	$R_{DS(on)}=f(I_D)$, T_j=25 °C; parameter: V_{GS}

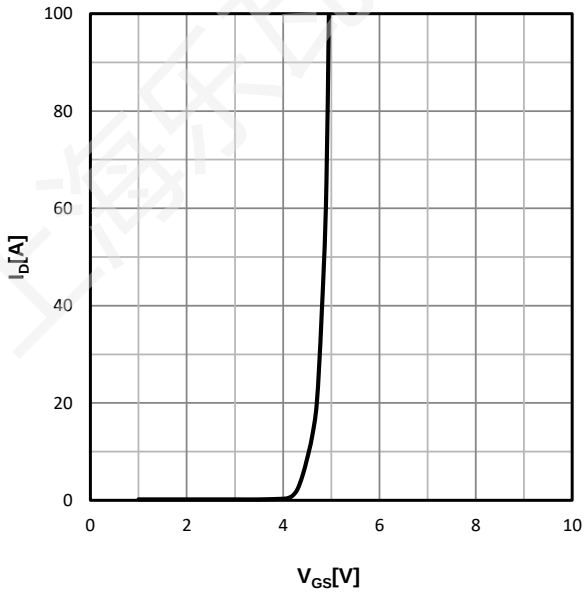
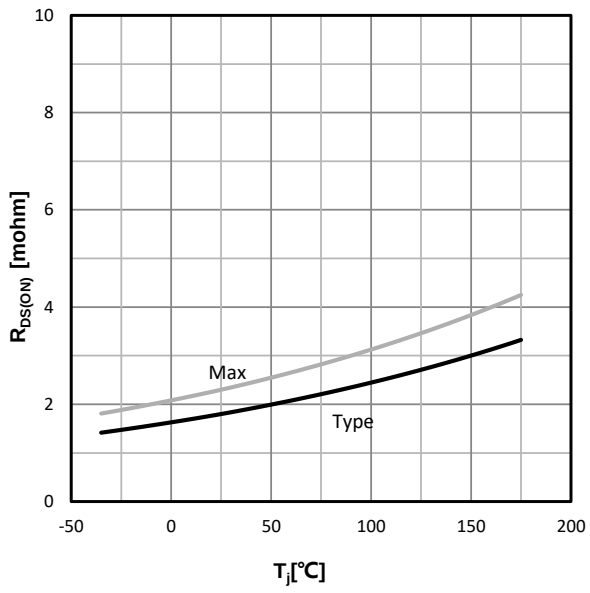
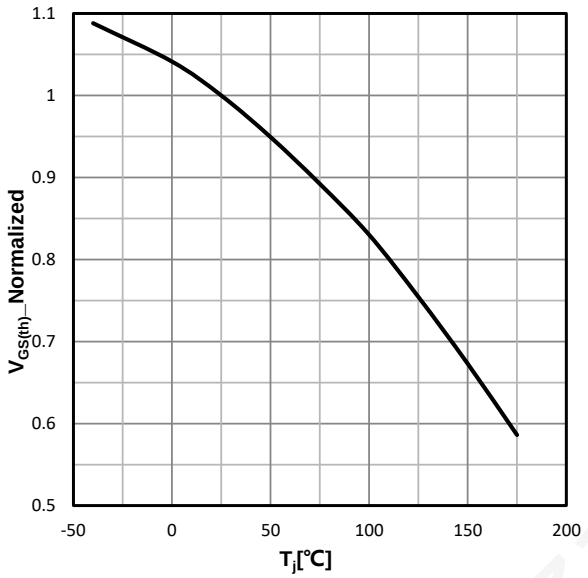
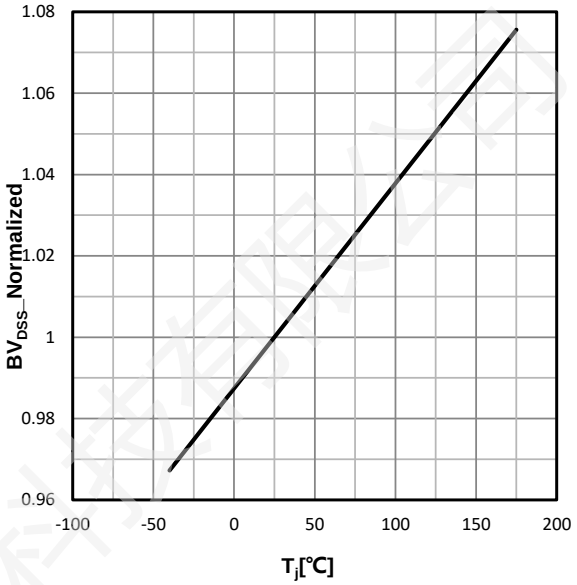
Figure 3: Typ. transfer characteristics	Figure 4: drain-source on resistance
	
$I_D=f(V_{GS})$, $\|V_{DS}\|>2\|I_D\|R_{DS}(on)max$;	$R_{DS(on)}=f(T_j)$, I_D=100A, V_{GS}=10V;

Figure 5: Typ. gate threshold voltage



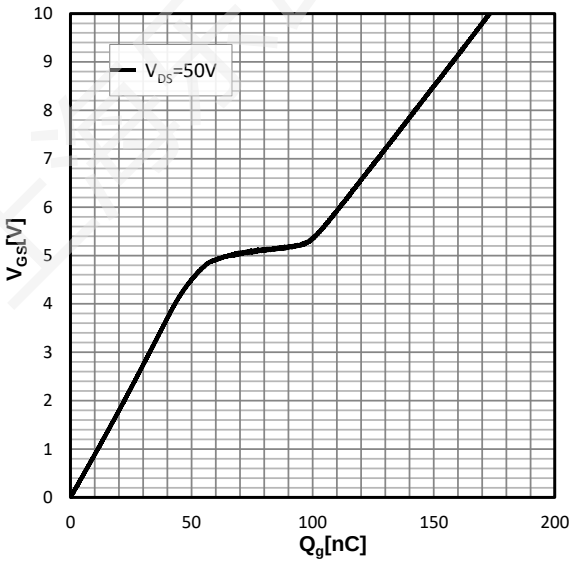
$V_{GS}=f(T_j)$,$V_{GS}=V_{DS,}I_D=250\mu A$;

Figure 6: Drain-source breakdown voltage



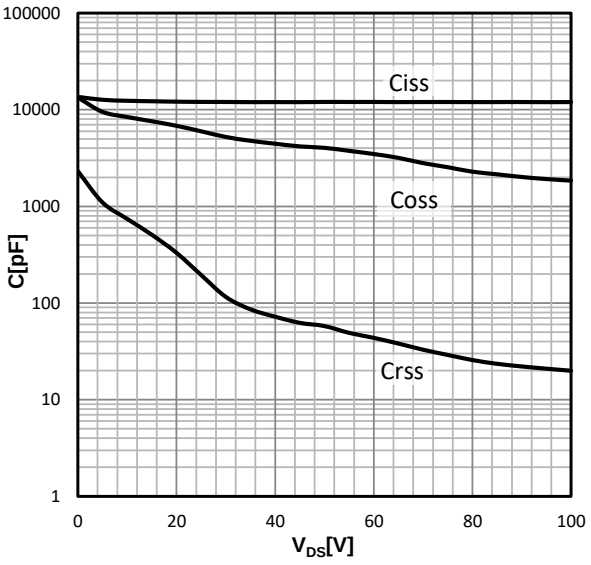
$V_{BR(DSS)}=f(T_j)$; $I_D=250\mu A$;

Figure 7: Typ. gate charge



$V_{GS}=f(Q_g)$, $I_D=100A$, $T_j=25$ °C; parameter: V_{DS}

Figure 8: Typ. Capacitances



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

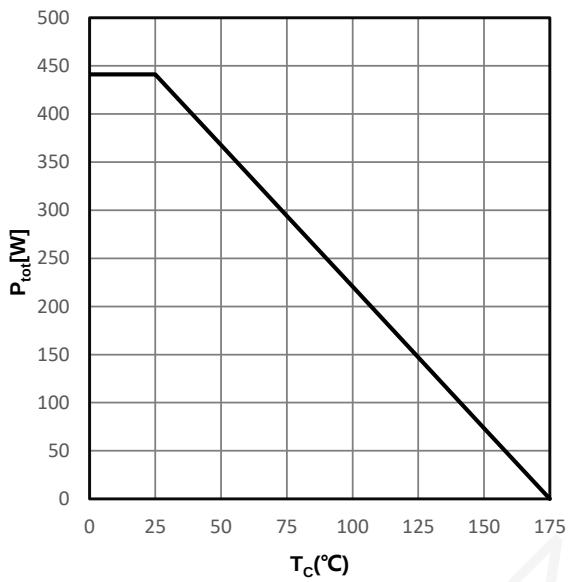
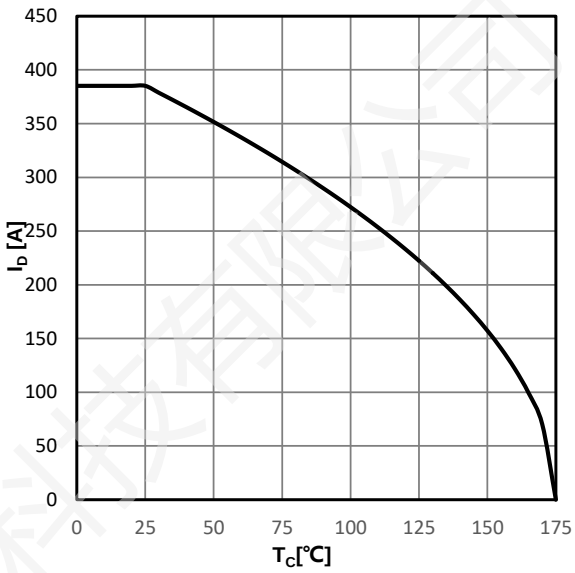
Figure 9: Power dissipation	Figure 10:Drain current
	
$P_{tot}=f(T_C)$;	$I_D=f(T_C)$;

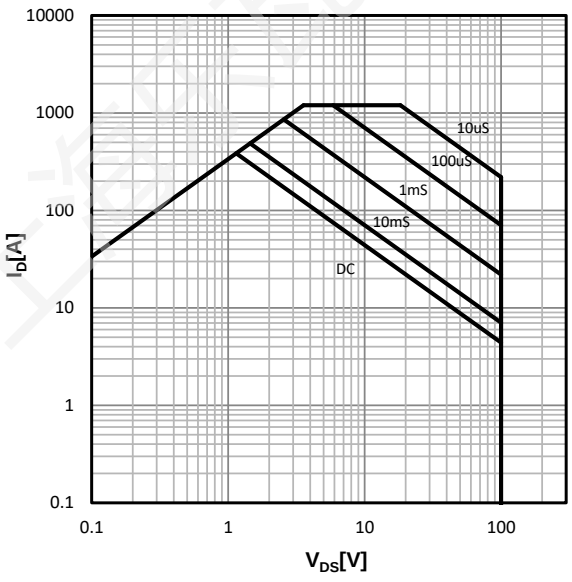
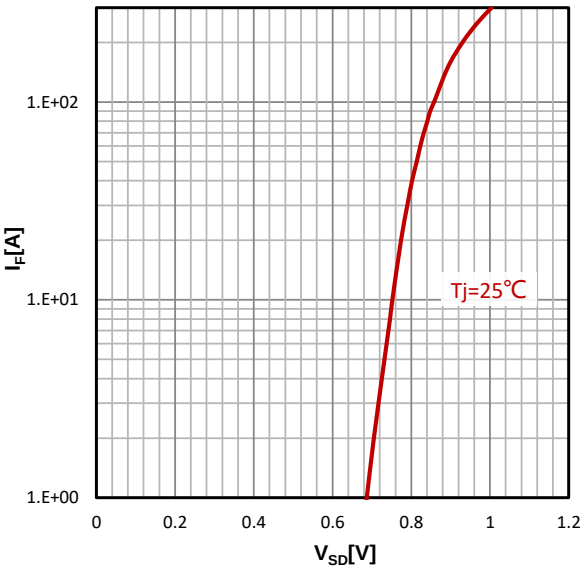
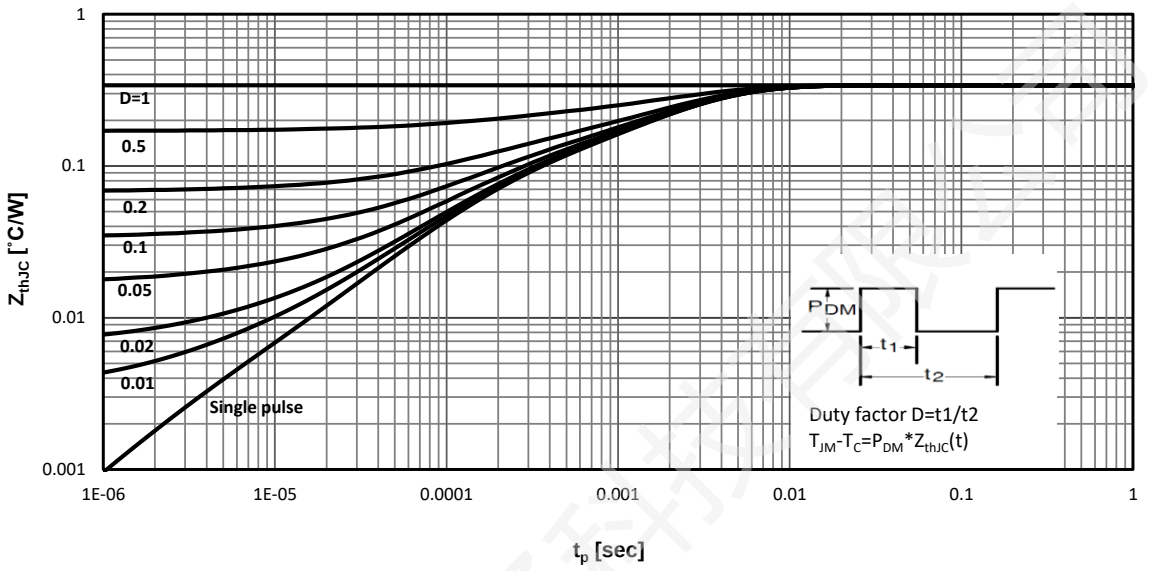
Figure 11: Safe operating area	Figure 12: Typ. forward characteristics
	
$I_D=f(V_{DS})$; T_C=25 °C; D=0; parameter: tp	$I_F=f(V_{SD})$;

Figure 13: Max. Transient Thermal Impedance



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

Test Circuit & Waveform:

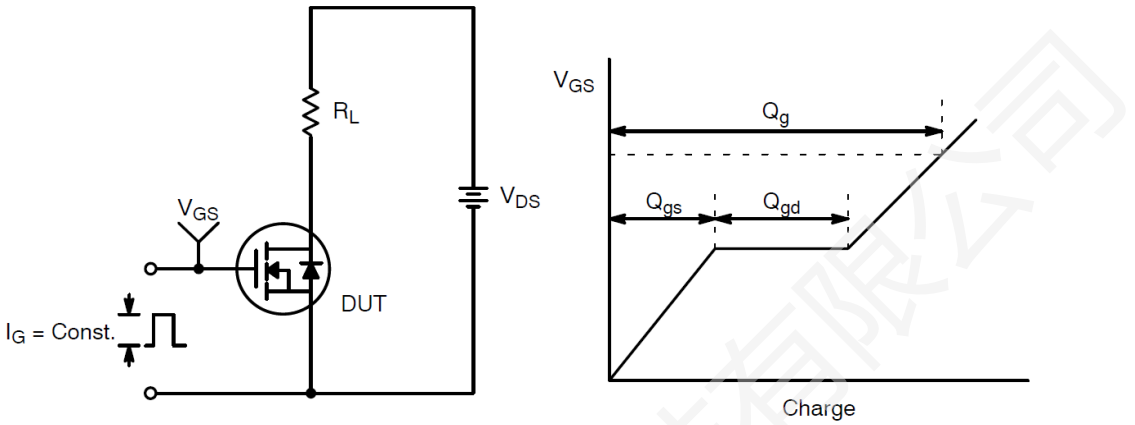


Figure 14: Gate Charge Test Circuit & Waveform

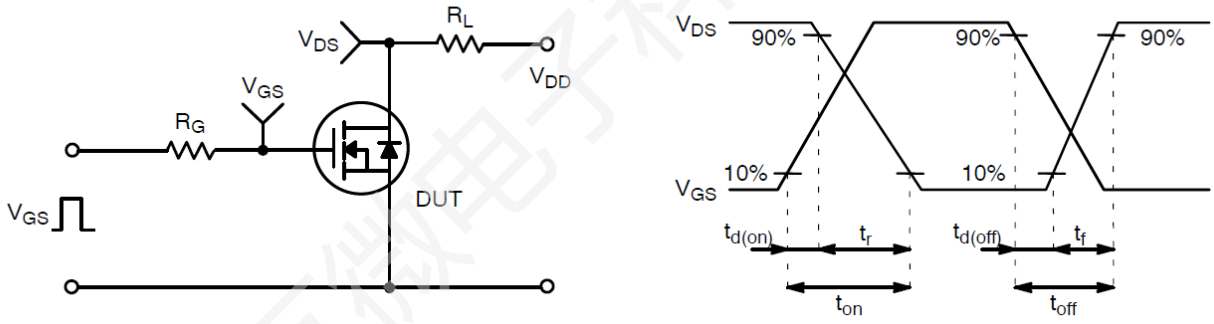


Figure 15: Resistive Switching Test Circuit & Waveforms

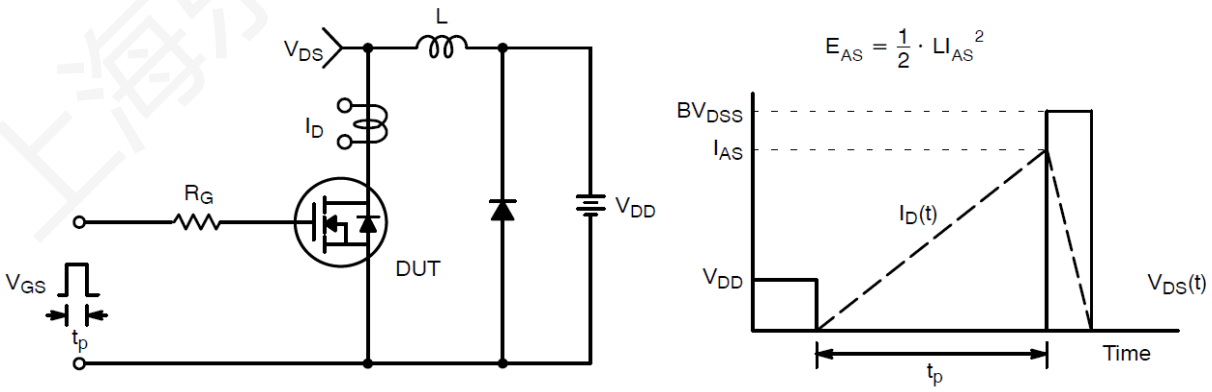
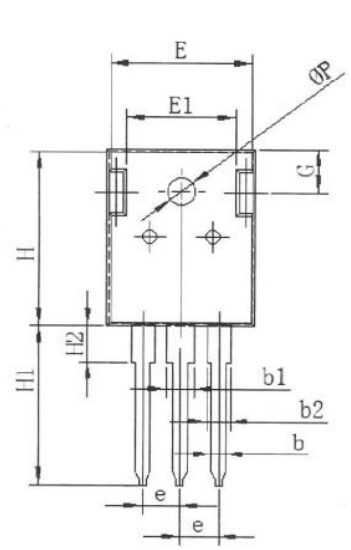
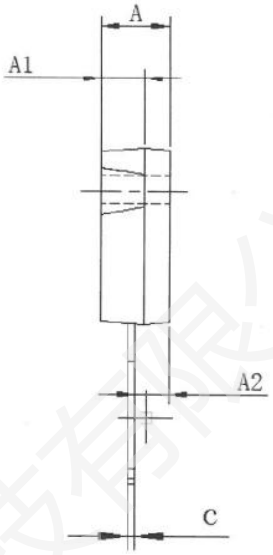
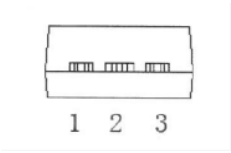


Figure 16: Unclamped Inductive Switching Test Circuit & Waveforms

Package Outline:







基本尺寸			
SYMBOL	单位:mm		
	MIN	NOM	MAX
A	4.8	5.0	5.2
A1	3.3	3.5	3.7
A2	2.2	2.4	2.6
b	1.0	1.2	1.4
b1	2.9	3.1	3.3
b2	1.9	2.1	2.3
c	0.5	0.6	0.7
e	5.3	5.5	5.7
E	15.2	15.7	16.2
E1	10.2	10.7	11.2
H	20.8	21.0	21.2
H1	19.5	20.0	20.5
H2	4.0	4.2	4.4
G	5.6	5.8	6.0
θ p	3.3	3.5	3.7

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Revision History:

Rev 1.0	Jun.2023	Initial Version

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