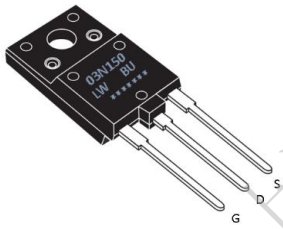
General Description:

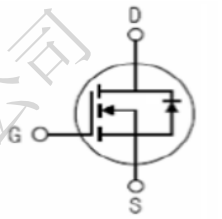
The LW03N150BU uses advanced VDMOS technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications. The package form is TO-3P(F), which accords with the ROHS standard.

V_{DSS}	1500	V
I_D	3.0	A
P_D (T_C=25℃)	32	W
$R_{DS(ON)\ TYPE}$	5.6	Ω

Marking and Pin Assignment



Inner Equivalent Principium Chart



Features:

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

Applications:

- Power switching application
- Hard switched and high frequency circuits

100% DVDS Tested

100% Avalanche Tested

RoHS HF

Package Marking and Ordering Information:

Marking	Part Number	Package	Packing	Qty.
03N150/LW BU/D.C.	LW03N150BU	TO-3P(F)	Tube	30 Pcs

Absolute Maximum Ratings:

Symbol	Parameter		Value	Units
V_{DSS}	Drain-to-Source Voltage		1500	V
I_D	Continuous Drain Current	T_C=25℃	3.0	A
	Continuous Drain Current	T_C=100℃	1.8	A
I_{DM}[a1]	Pulsed Drain Current		12	A
E_{AS}[a2]	Single pulse avalanche energy		179	mJ
V_{GS}	Gate-to-Source Voltage		±20	V
P_D	Power Dissipation		32	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	3.8	℃/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	40	℃/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	1500	--	--	V
I_{DSS}	Drain to Source Leakage Current	V_{DS}=1500V, V_{GS}=0V, T_A=25℃	--	--	25	μA
		V_{DS}=1200V, V_{GS}=0V, T_A=125℃	--	--	500	
$I_{GSS(F)}$	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	4.0	5.0	V
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=10V, I_D=1.5A	--	5.6	7.0	Ω
Pulse width tp≤380μs,δ≤2%						

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1.0MHz	--	1106	--	pF
C_{oss}	Output Capacitance		--	84	--	
C_{rss}	Reverse Transfer Capacitance		--	8.3	--	
R_G	Gate input resistance	V_{GS}=0V,V_{DS} Short	--	2.5	--	Ω

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-On Delay Time	I_D =3.0A V_{DS} =750V V_{GS} = 10V R_G = 4.7Ω	--	25	--	ns
t_r	Rise Time		--	48	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	57	--	
t_f	Fall Time		--	52	--	
Q_g	Total Gate Charge	V_{GS} =10V V_{DS} =750V I_D =3.0A	--	37.9	--	nC
Q_{gs}	Gate Source Charge		--	8.7	--	
Q_{gd}	Gate Drain (“Miller”) Charge		--	21	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	T_C =25 °C	--	--	3.0	A
V_{SD}	Diode Forward Voltage	I_S=3.0A, V_{GS}=0V	--	--	1.4	V
t_{rr}	Reverse Recovery time	I_S=3.0A, T_j=25℃ dI/dt=100A/μs,VGS=0V	--	750	--	ns
Q_{rr}	Reverse Recovery Charge		--	6.3	--	uC

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

a2： V_{DD}=100V,L=10.0mH, R_G=25Ω, Starting T_J=25 °C

Characteristics Curve：

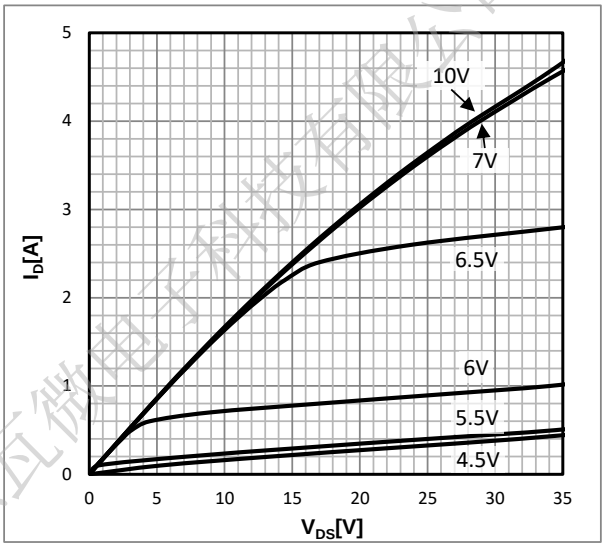
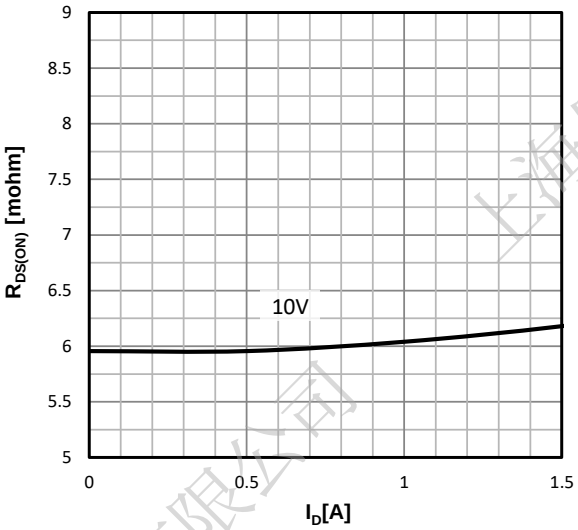
Figure 1: Typ. output characteristics	Figure 2: Typ. drain-source on resistance
	
$I_D=f(V_{DS})$, T_j=25 °C; parameter: V_{GS}	$R_{DS(on)}=f(I_D)$, T_j=25 °C; parameter: V_{GS}

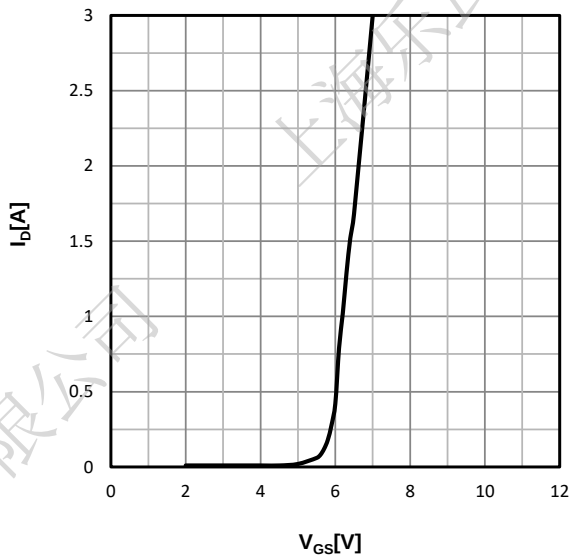
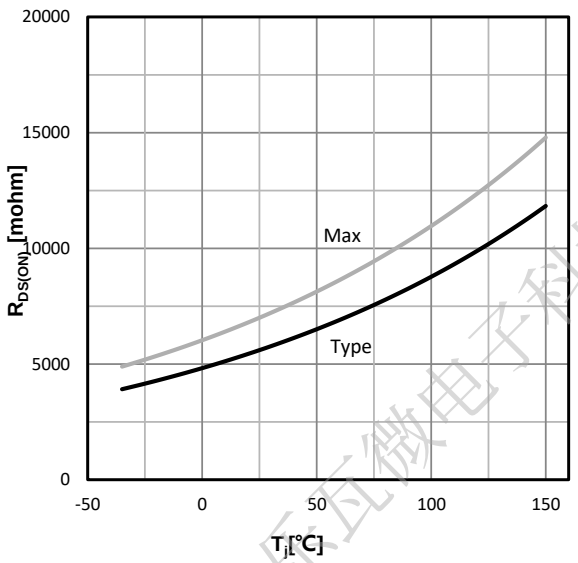
Figure 3: Typ. transfer characteristics	Figure 4: drain-source on resistance
	
$I_D=f(V_{GS})$, $\|V_{DS}\|>2\|I_D\|R_{DS}(on)max$;	$R_{DS(on)}=f(T_j)$, I_D=1.5A, V_{GS}=10V;

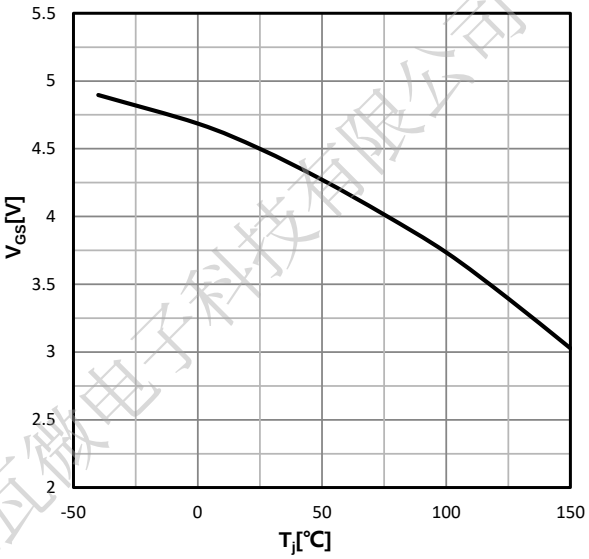
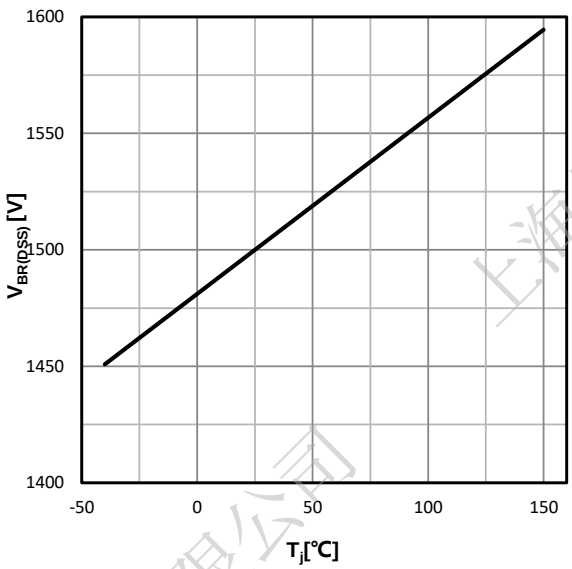
Figure 5: Typ. gate threshold voltage	Figure 6: Drain-source breakdown voltage
	
$V_{GS}=f(T_j)$,I $V_{GS}=V_{DS,}I_D=250\mu A$;	$V_{BR(DSS)}=f(T_j)$; $I_D=250\mu A$;

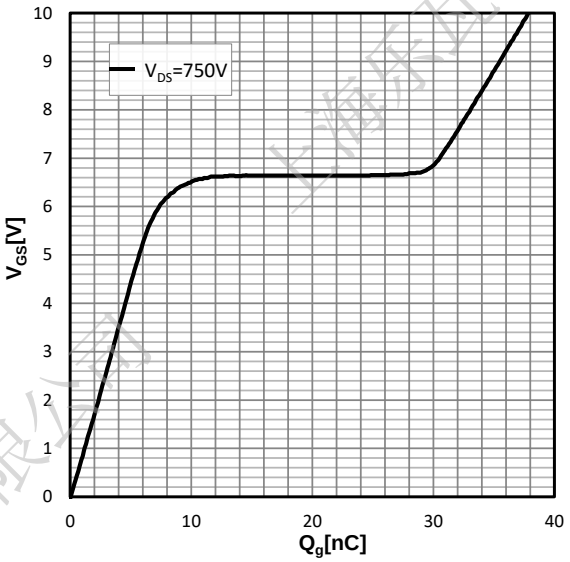
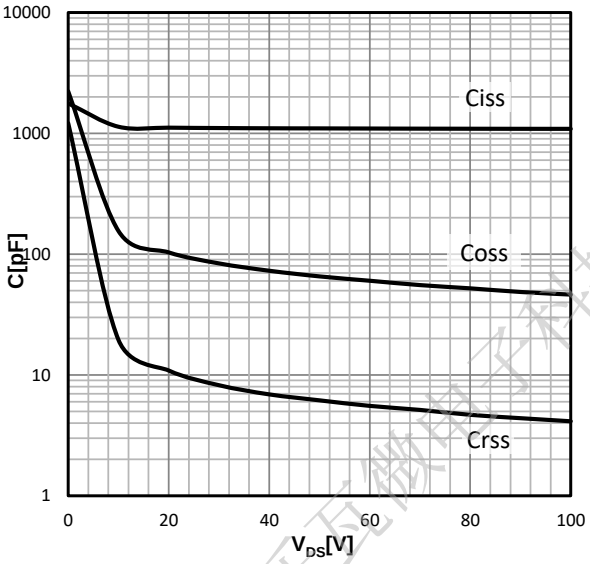
Figure 7: Typ. gate charge	Figure 8: Typ. Capacitances
	
$V_{GS}=f(Q_g)$, $I_D=3.0A$, $T_j=25$ °C; parameter: V_{DS}	$C=f(V_{DS})$; $V_{GS}=0V$; f=1.0 MHz;

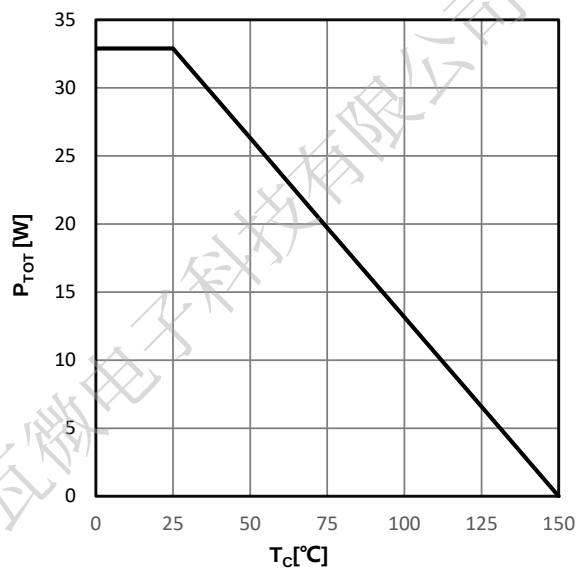
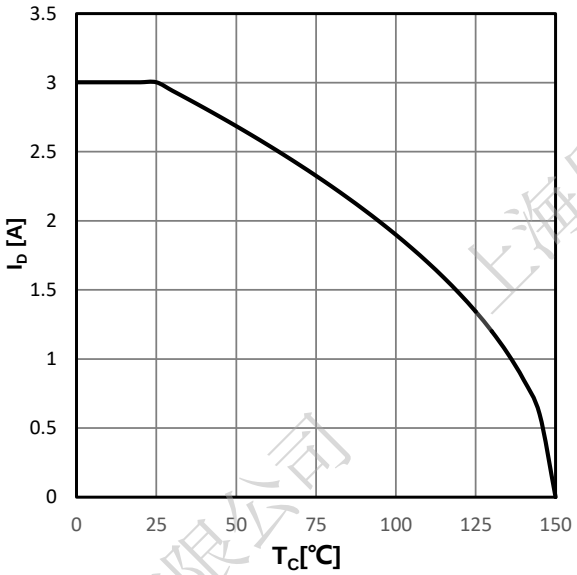
Figure 9: Power dissipation	Figure 10:Drain current
	
$P_{tot}=f(T_C)$;	$I_D=f(T_C)$;

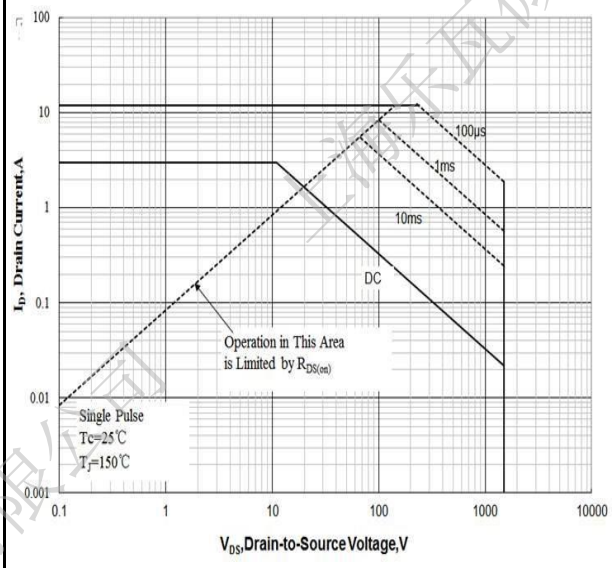
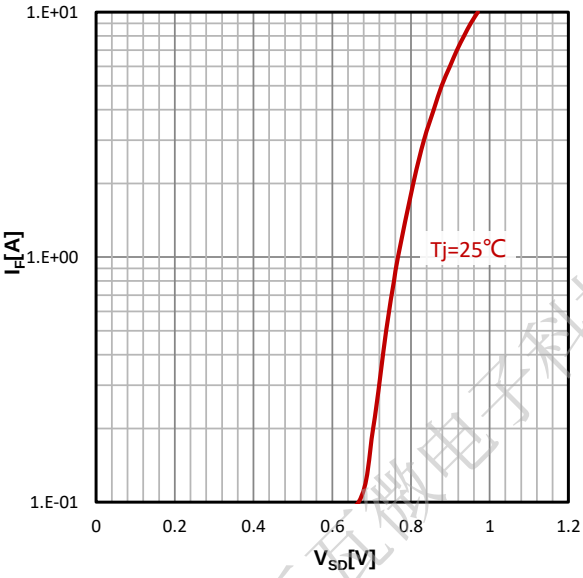
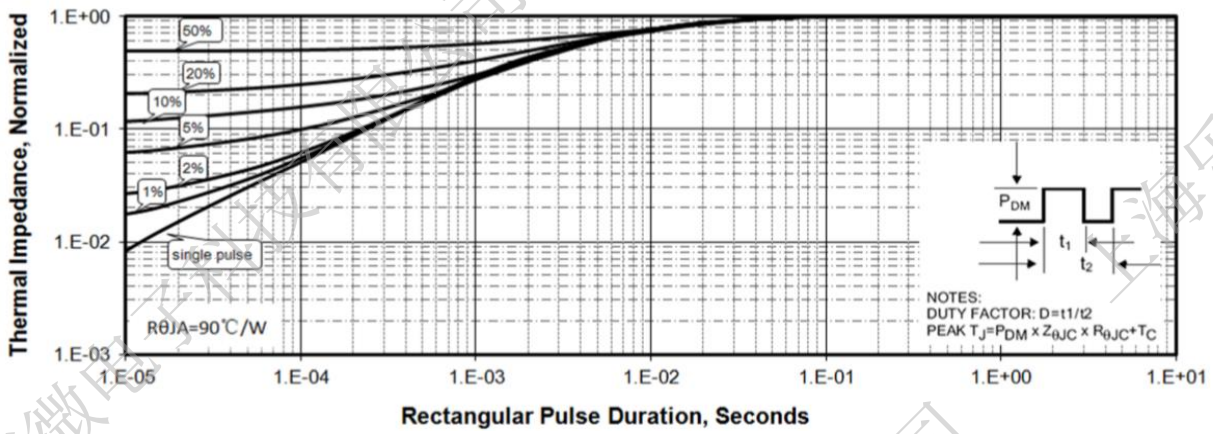
Figure 11: Safe operating area	Figure 12: Typ. forward characteristics
	
$I_D=f(V_{DS})$; T_C=25 °C; D=0; parameter: tp	$I_F=f(V_{SD})$;

Figure 13: Max. Transient Thermal Impedance



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

Test Circuit & Waveform:

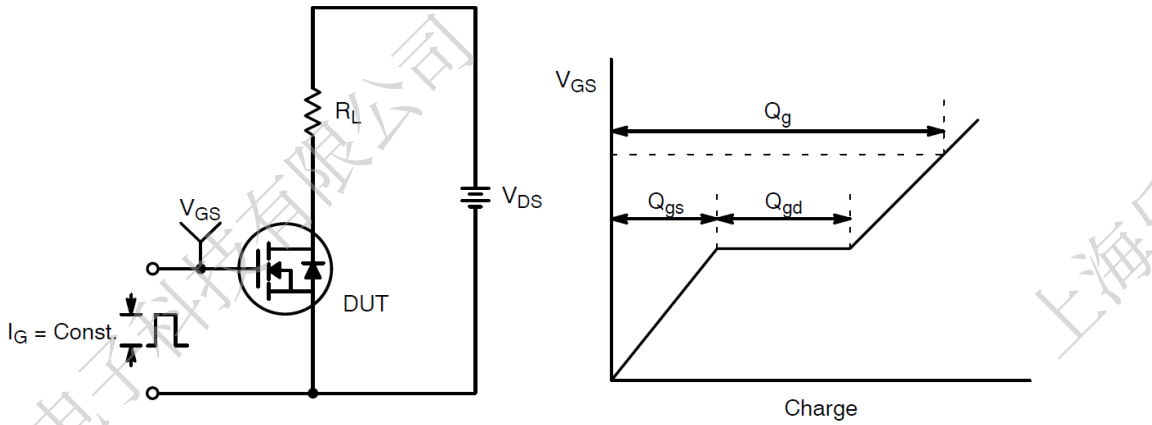


Figure 14: Gate Charge Test Circuit & Waveform

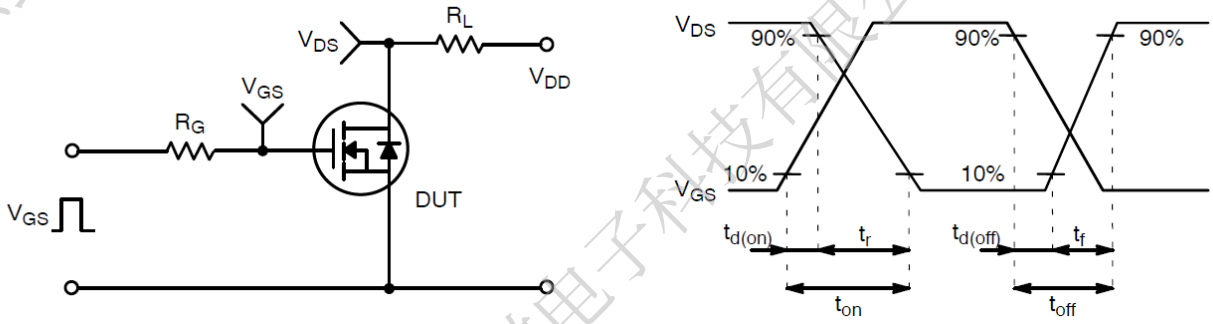


Figure 15: Resistive Switching Test Circuit & Waveforms

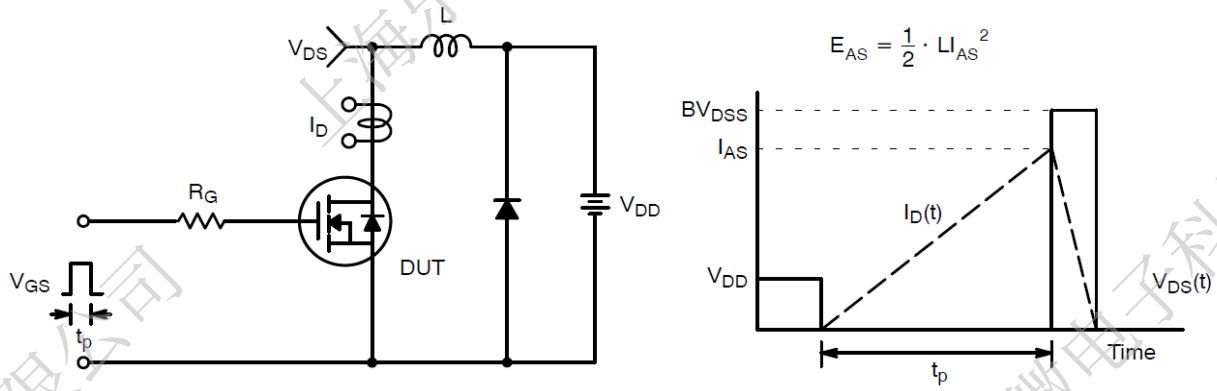
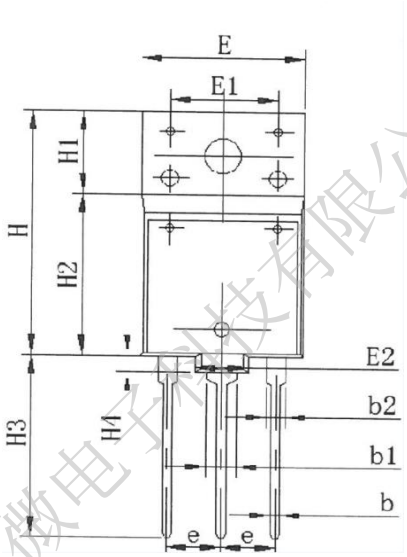
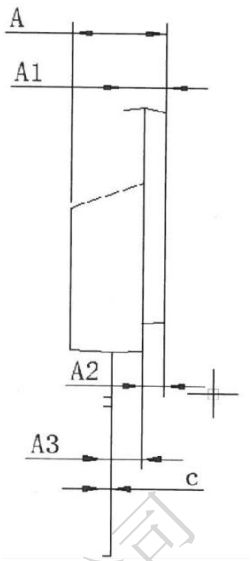
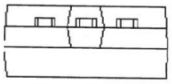


Figure 16: Unclamped Inductive Switching Test Circuit & Waveforms

Package Outline:







SYMBOL	基本尺寸		
	MIN	NOM	MAX
A	5.35	5.55	5.75
A1	2.8	3	3.2
A2	1.9	2.1	2.3
A3	1	1.2	1.4
b	0.78	0.9	1
b1	1.8	2	2.2
b2	1.8	2	2.2
c	0.7	0.9	1.1
e	5.25	5.45	5.65
E	15.2	15.4	15.6
E1	9.8	10	10.2
E2	3.8	4	4.2
H	24.3	24.5	24.7
H1	9.8	10	10.2
H2	14.3	14.5	14.7
H3	18.5	19	19.5
H4	2	2.2	2.4
G	4.5	4.7	4.9

Revision History:

Revison	Date	Descriptions
Rev 1.0	May.2023	Initial Version

Disclaimer:

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