

General Description:

The LW03N150BK 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-247, which accords with the ROHS standard.

Features:

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

Applications:

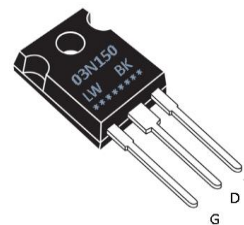
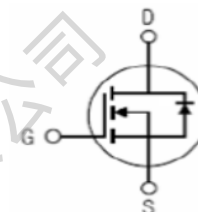
- Power switching application
- Hard switched and high frequency circuits

100% DVDS Tested

100% Avalanche Tested



V_{DSS}	1500	V
I_D	3.0	A
P_D ($T_C=25^\circ\text{C}$)	140	W
$R_{DS(ON)}$ TYPE	5.6	Ω

Marking and Pin Assignment

Inner Equivalent Principium Chart

Package Marking and Ordering Information:

Marking	Part Number	Package	Packing	Qty.
03N150/LW BK/D.C.	LW03N150BK	TO-247	Tube	30 Pcs

Absolute Maximum Ratings:

Symbol	Parameter	Value	Units
V_{DSS}	Drain-to-Source Voltage	1500	V
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$	3.0
	Continuous Drain Current	$T_C=100^\circ\text{C}$	1.8
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	140	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
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.89	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	50	$^\circ\text{C}/\text{W}$

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

Static Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	1500	--	--	V
I_{DSS}	Drain to Source Leakage Current	$V_{DS}=1500V, V_{GS}=0V, T_A=25^\circ C$	--	--	25	μA
		$V_{DS}=1200V, V_{GS}=0V, T_A=125^\circ C$	--	--	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	$V_{DS}=V_{GS}, I_D=250\mu A$	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 $t_p \leq 380\mu s, \delta \leq 2\%$

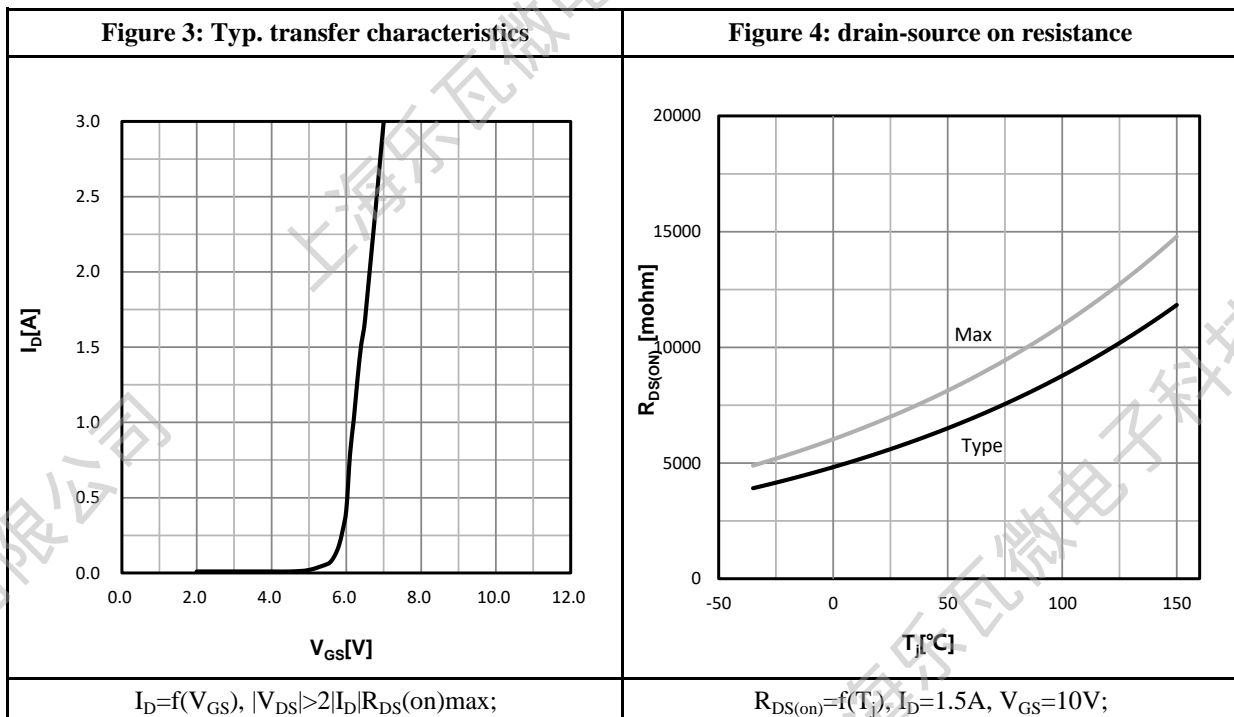
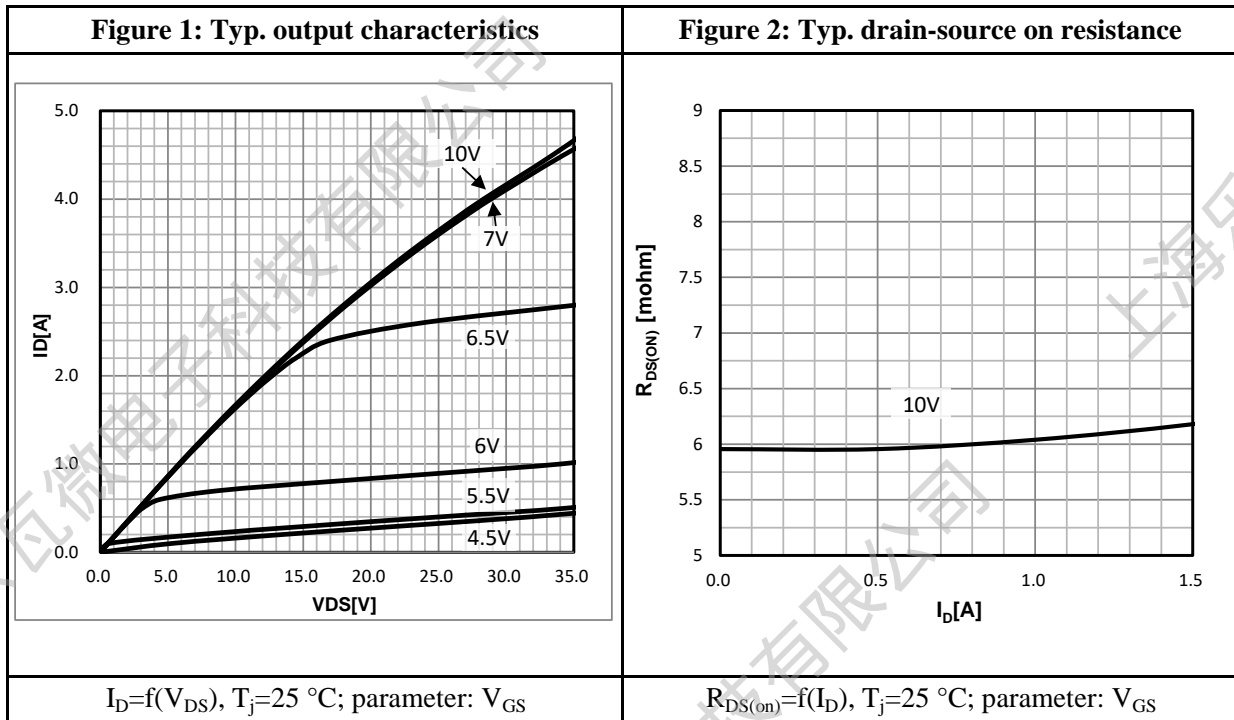
Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	$V_{GS} = 0V$	--	1106	--	pF
C_{oss}	Output Capacitance	$V_{DS} = 25V$	--	84	--	
C_{rss}	Reverse Transfer Capacitance	$f = 1.0MHz$	--	8.3	--	
R_G	Gate input resistance	$V_{GS}=0V,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

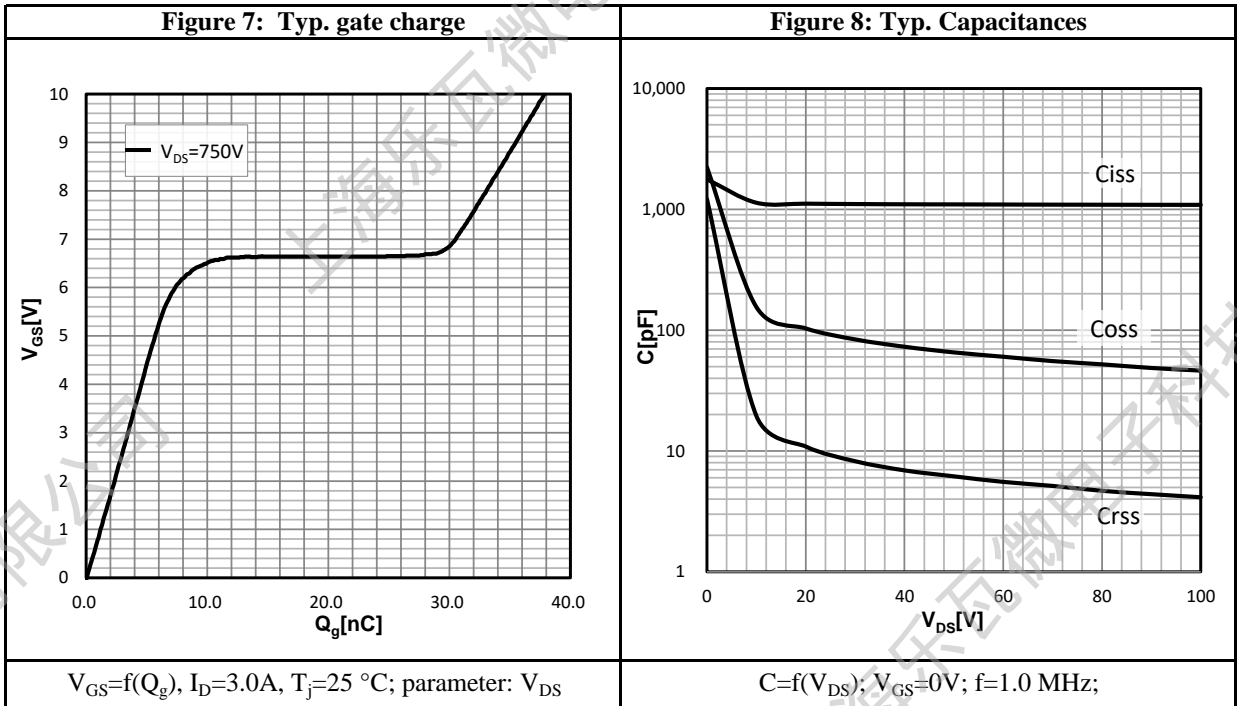
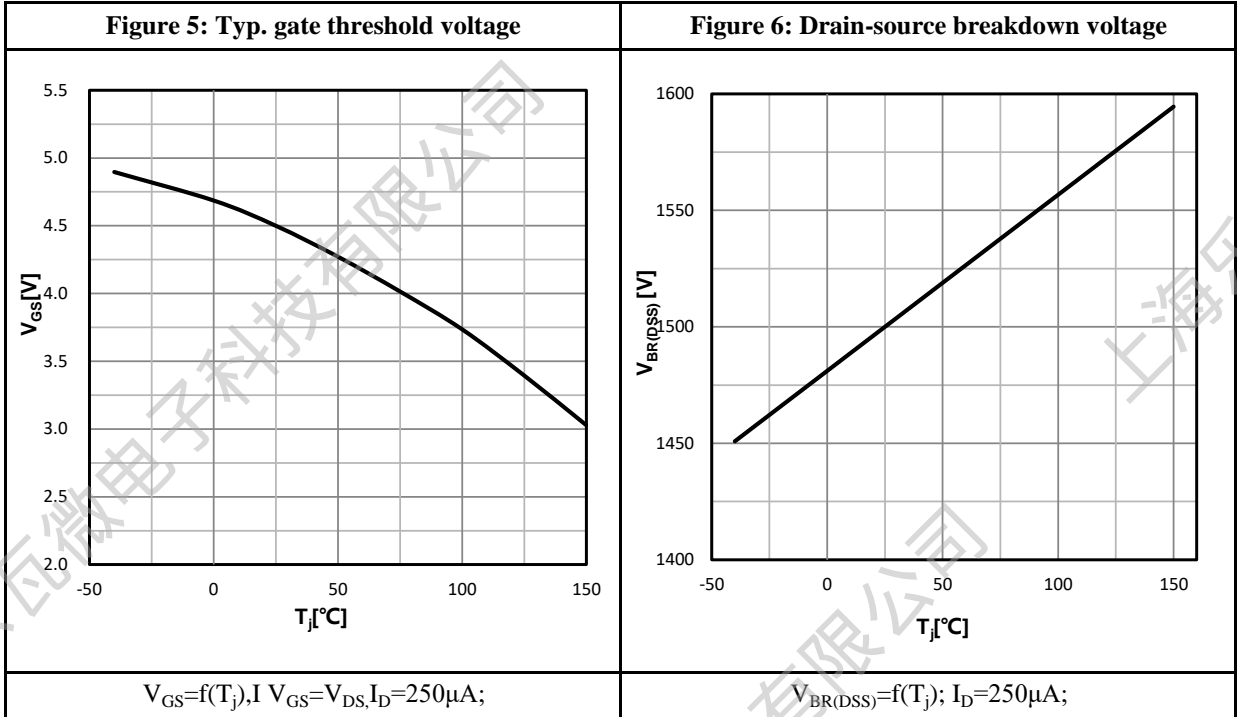
Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-On Delay Time	$I_D = 3.0A$ $V_{DS} = 750V$ $V_{GS} = 10V$ $R_G = 4.7\Omega$	--	25	--	ns
t_r	Rise Time		--	48	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	57	--	
t_f	Fall Time		--	52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

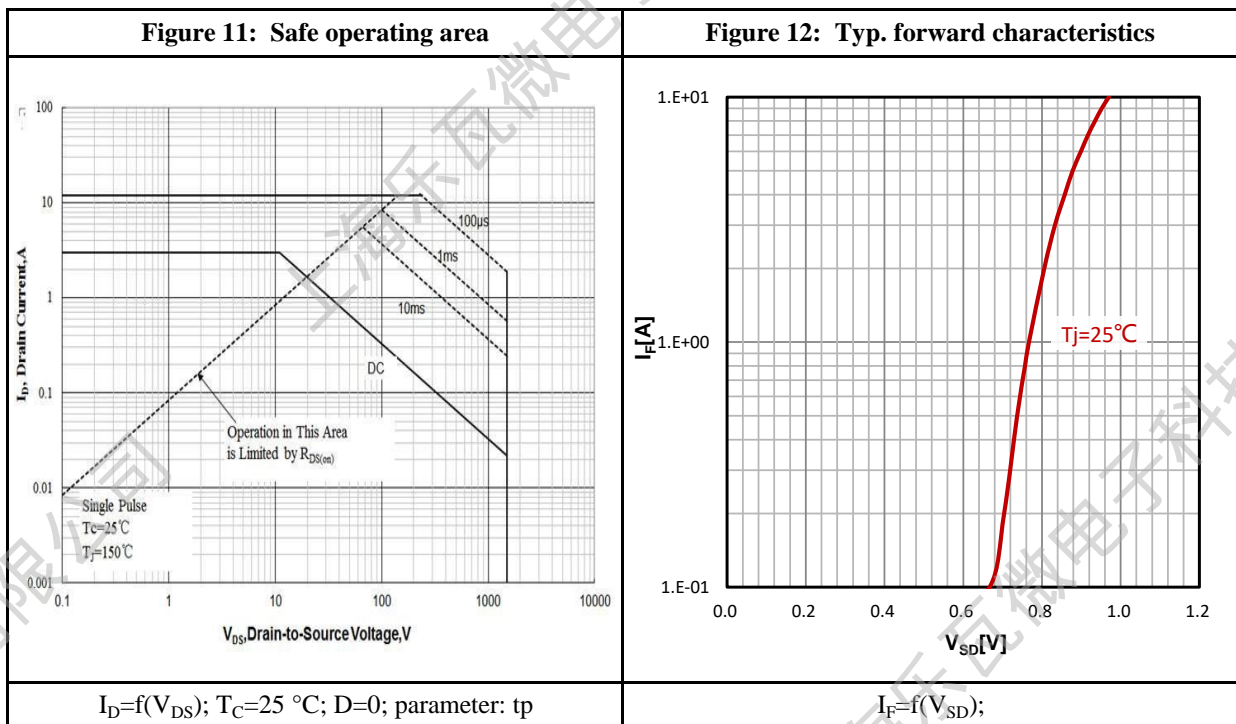
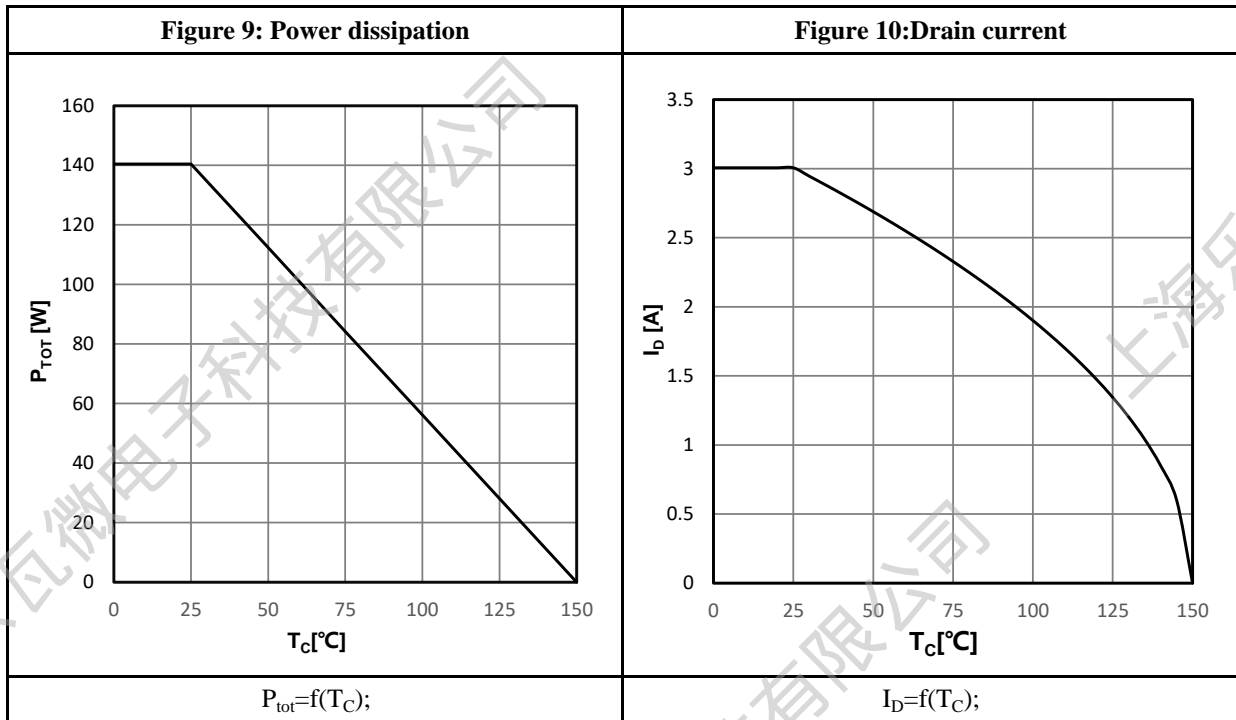
Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	$T_C = 25\text{ }^\circ\text{C}$	--	--	3.0	A
V_{SD}	Diode Forward Voltage	$I_S = 3.0A, V_{GS} = 0V$	--	--	1.4	V
t_{rr}	Reverse Recovery time	$I_S = 3.0A, T_j = 25^\circ C$	--	750	--	ns
Q_{rr}	Reverse Recovery Charge	$dI/dt = 100A/\mu s, V_{GS} = 0V$	--	6.3	--	μC

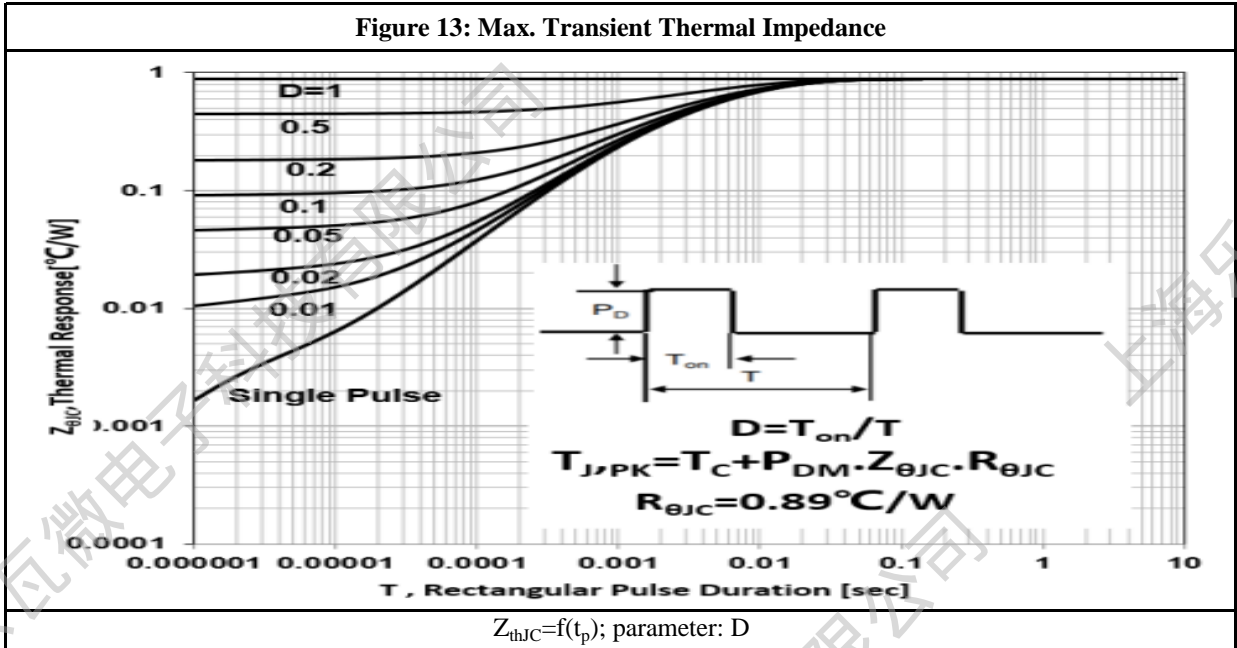
a1: Repetitive rating; pulse width limited by maximum junction temperature

a2: $V_{DD} = 100V, L = 10.0mH, R_G = 25\Omega$, Starting $T_j = 25\text{ }^\circ\text{C}$

Characteristics Curve:








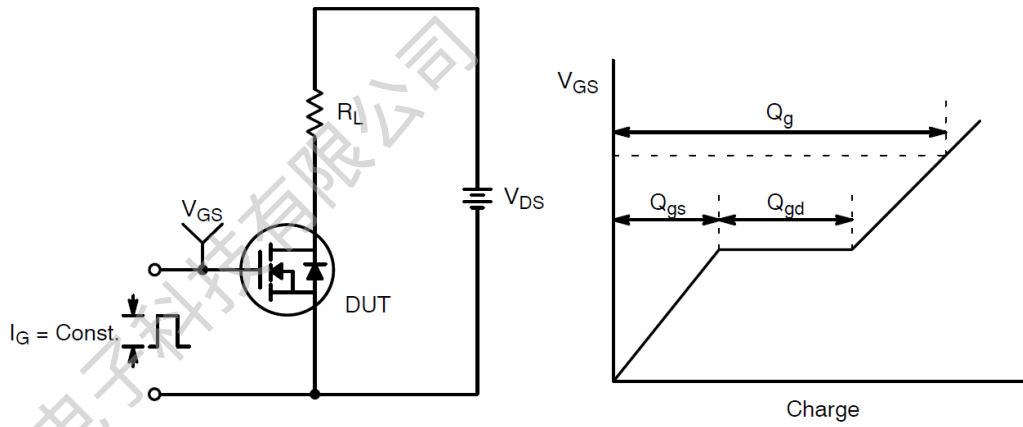
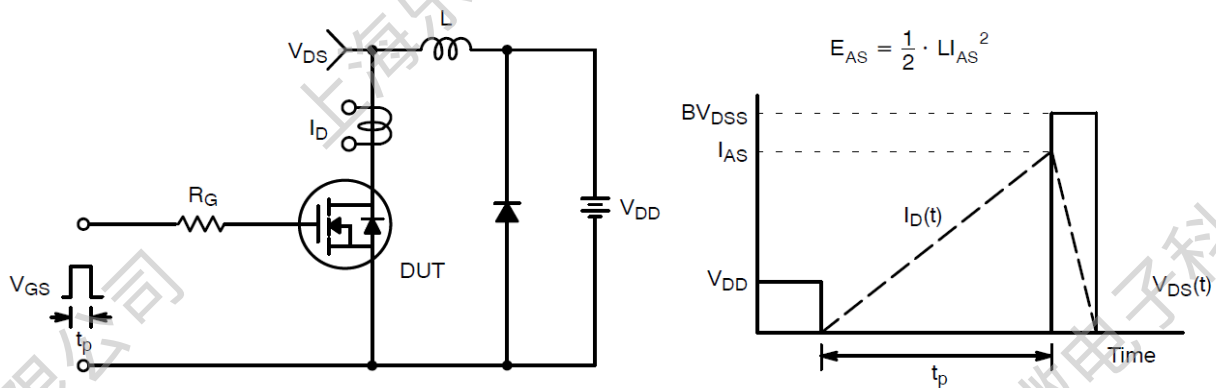
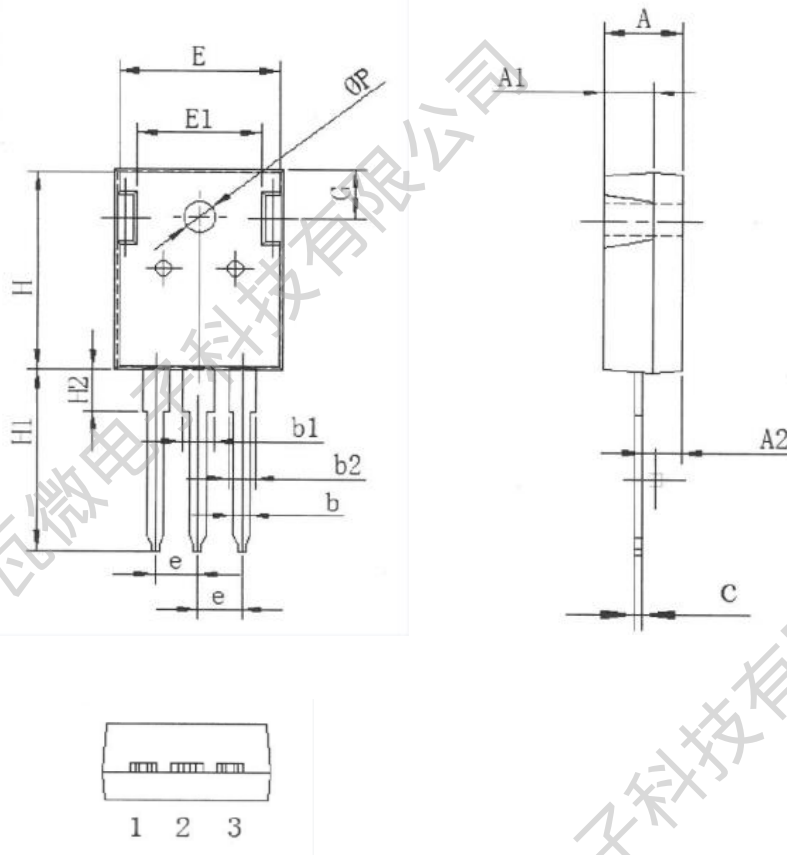
Test Circuit & Waveform:

Figure 14: Gate Charge Test Circuit & Waveform

Figure 15: Resistive Switching Test Circuit & Waveforms

Figure 16: Unclamped Inductive Switching Test Circuit & Waveforms

Package Outline:


基本尺寸			
SYMBOL	单位:mm		
	MIN	NOM	MAX
A	4.8	5	5.2
A1	3.3	3.5	3.7
A2	2.2	2.4	2.6
b	1	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	5.25	5.45	5.65
E	15.2	15.7	16.2
E1	10.2	10.7	11.2
H	20.8	21	21.2
H1	19.5	20	20.5
H2	4	4.2	4.4
G	5.6	5.8	6
θ_p	3.3	3.5	3.7

Revision History:

Revison	Date	Descriptions
Rev 1.0	Nov.2023	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.

Mailing Address: Room 301, Building 2, No.1690 CaiLun Road, China (Shanghai) Pilot Free Trade Zone
Shanghai Lewa Micro-electronics Technology Co., Ltd