

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 and Halogen Free standard.

Features:

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

Applications:

- Power switch circuit Power
- Hard switched and high frequency circuits

100% DVDS Tested

100% Avalanche Tested



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:

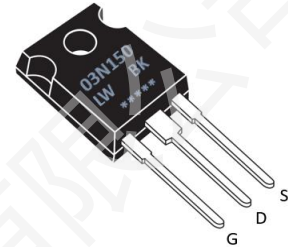
Symbol	Parameter		Value	Units
V_{DSS}	Drain-to-Source Voltage		1500	V
I_D	Continuous Drain Current	$T_C=25^{\circ}C$	3.0	A
	Continuous Drain Current	$T_C=100^{\circ}C$	1.9	A
I_{DM}^{a1}	Pulsed Drain Current		12	A
E_{AS}^{a2}	Single Pulse Avalanche Energy		145	mJ
I_{AS}^{a2}	Avalanche Current		5.4	A
V_{GS}	Gate-to-Source Voltage		± 30	V
P_D	Power Dissipation		140	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		150, -55 to 150	$^{\circ}C$
T_L	Maximum Temperature for Soldering		260	$^{\circ}C$

Thermal Characteristics:

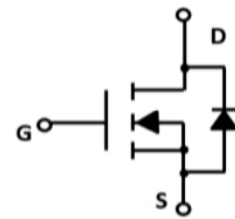
Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.89	$^{\circ}C/W$
$R_{\theta JA}^{a3}$	Thermal Resistance, Junction-to-Ambient	50	$^{\circ}C/W$

V_{DSS}	1500	V
I_D	3.0	A
P_D	140	W
$R_{DS(ON) \text{ TYPE}}$	5.6	Ω

Marking and Pin Assignment



Inner Equivalent Principium Chart



Electrical Characteristic ($T_j = 25\text{ }^{\circ}\text{C}$, 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	$V_{DS}=1500V, V_{GS}=0V$	--	--	1.0	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	$V_{GS}=+30V, V_{DS}=0V$	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	$V_{GS}=-30V, V_{DS}=0V$	--	--	-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

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	$f=1.0MHz$	--	8.2	--	
R_G	Gate resistance	$V_{GS}=0V, V_{DS}=0V, f=1MHz$	--	2.5	--	Ω

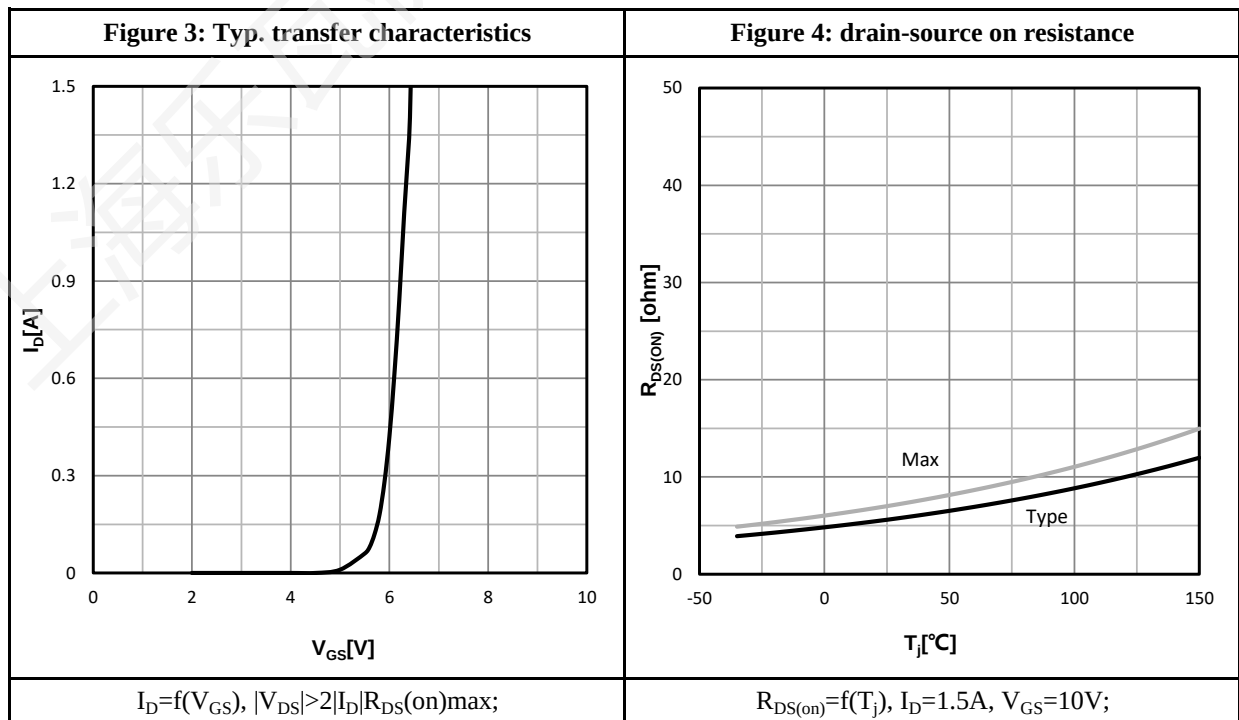
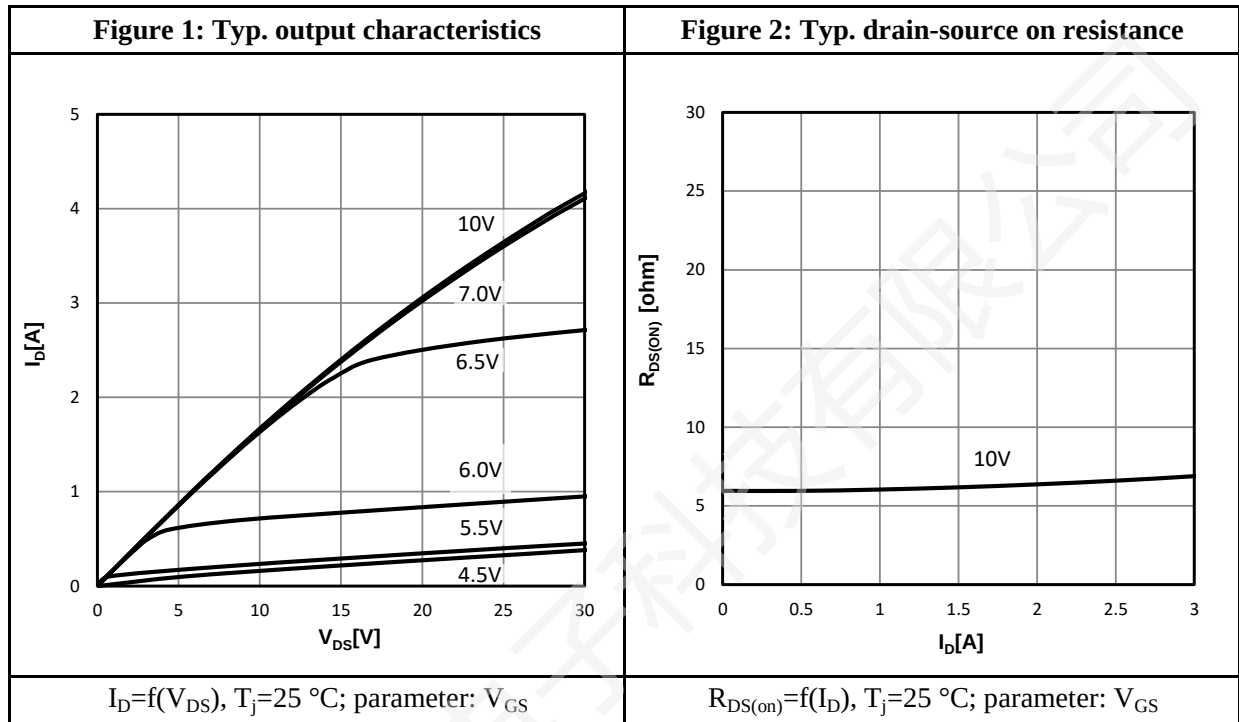
Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$I_D=3.0A$	--	36	--	ns
t_r	Rise Time	$V_{DS}=750V$	--	20	--	
$t_{d(OFF)}$	Turn-Off Delay Time	$V_{GS}=10V$	--	50	--	
t_f	Fall Time	$R_G=4.7\Omega$	--	30	--	
Q_g	Total Gate Charge	$V_{GS}=10V$	--	38	--	nC
Q_{gs}	Gate to Source Charge	$V_{DS}=750V$	--	8.7	--	
Q_{gd}	Gate to Drain Charge	$I_D=3.0A$	--	21	--	

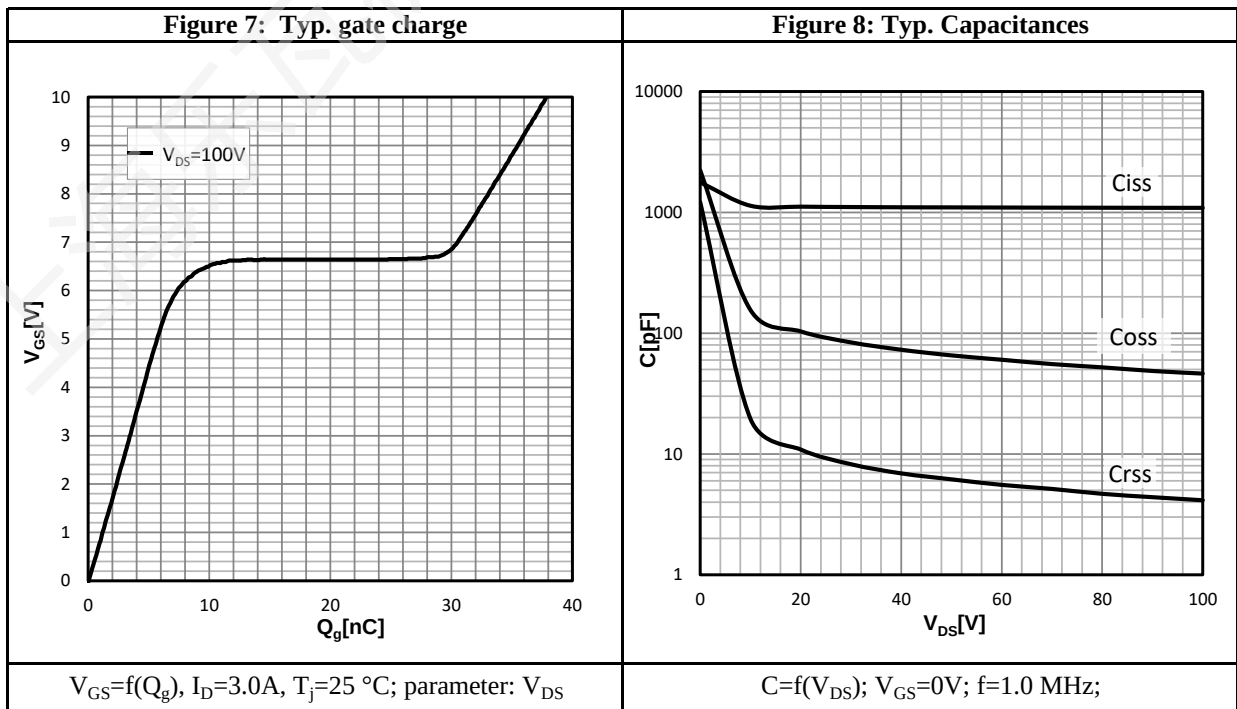
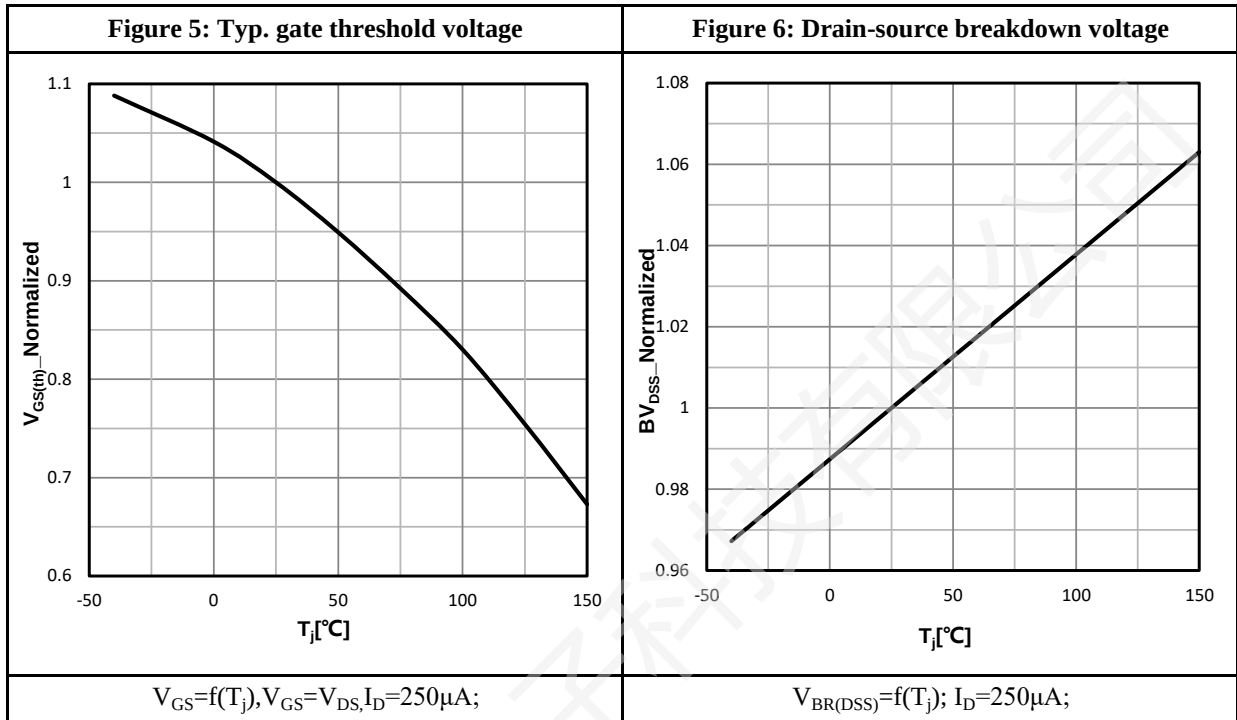
Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	$T_C=25\text{ }^{\circ}\text{C}$	--	--	3.0	A
V_{SD}	Diode Forward Voltage	$I_S=3.0A, V_{GS}=0V$	--	--	1.2	V

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

a2: $V_{DD}=100V, L=10mH, R_G=25\Omega$, Starting $T_j=25\text{ }^{\circ}\text{C}$

a3: Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm² (one layer, 70 μm thick) copper area for drain connection.

Characteristics Curve:




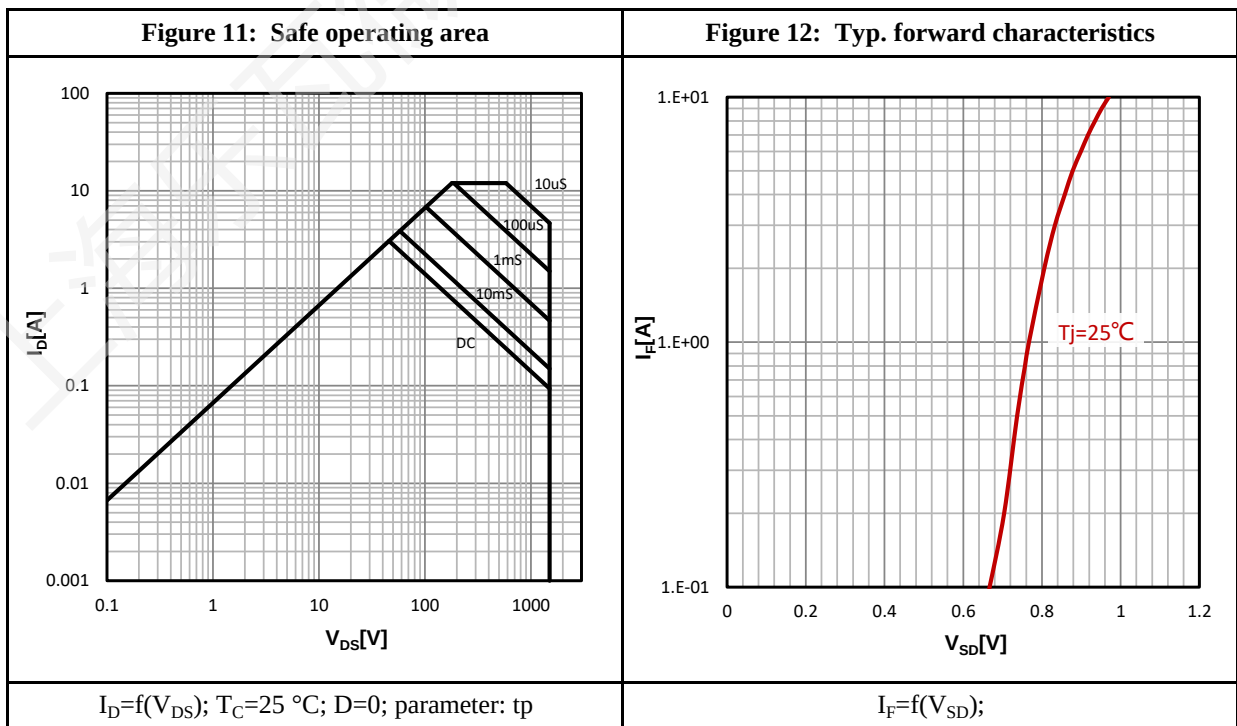
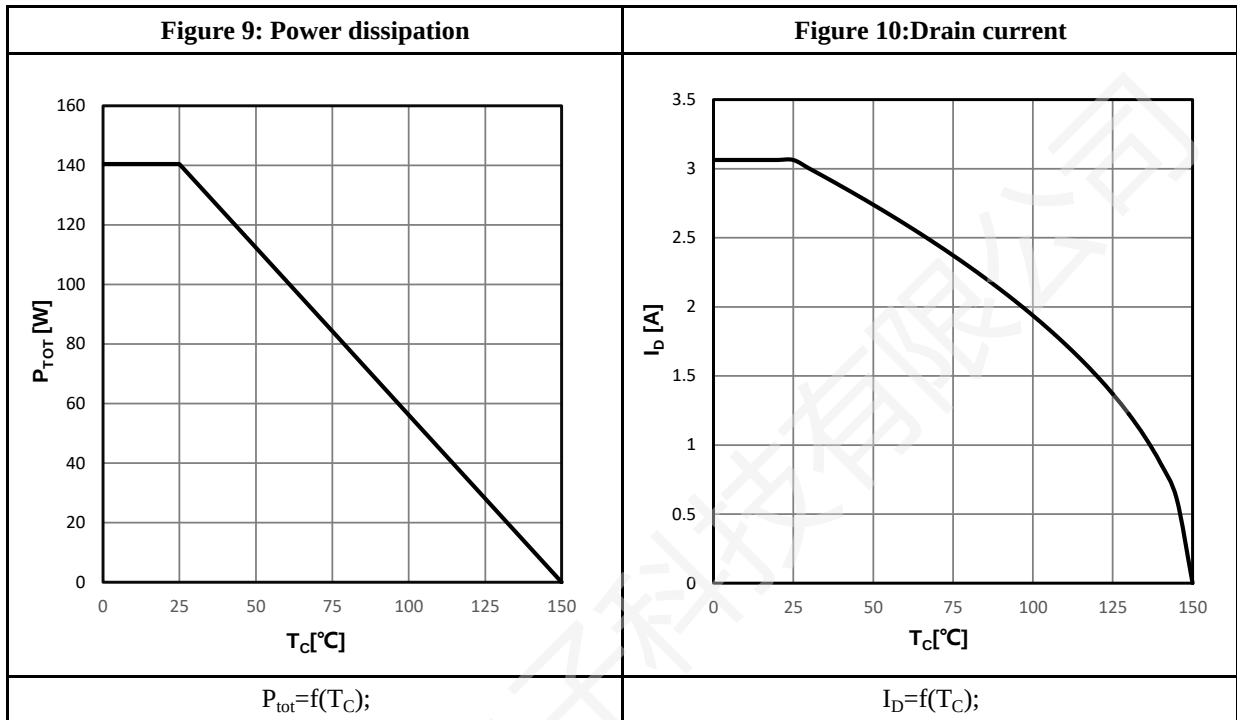
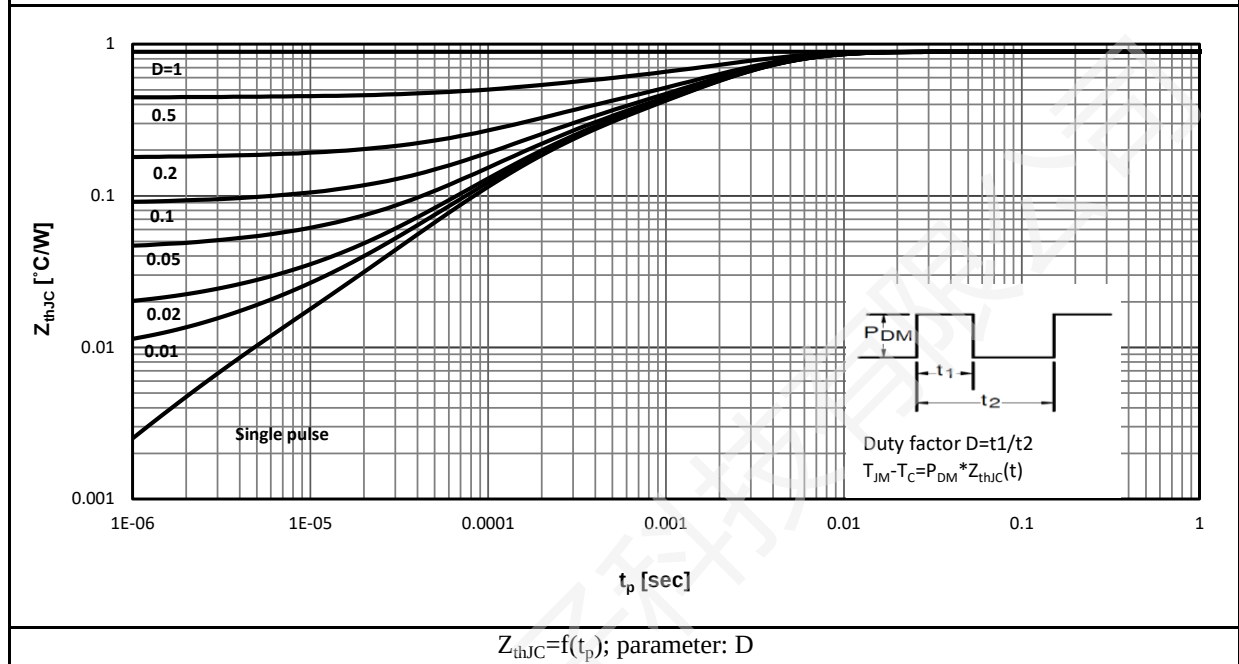
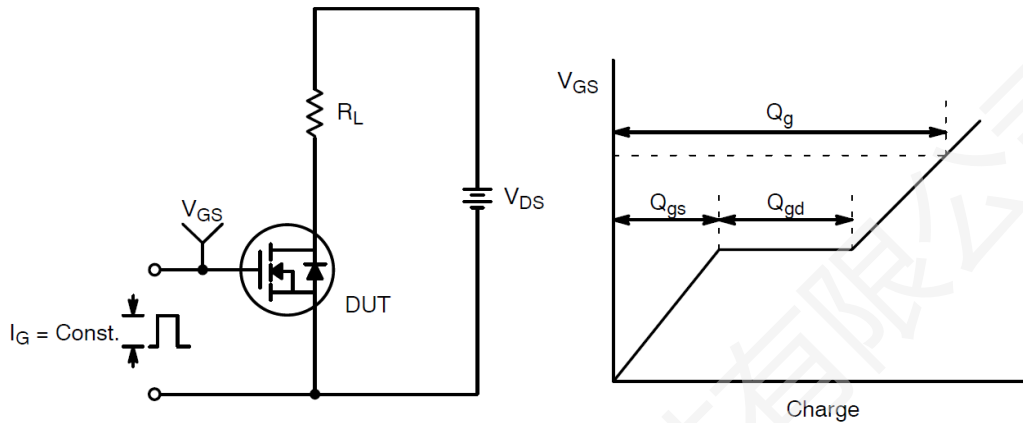
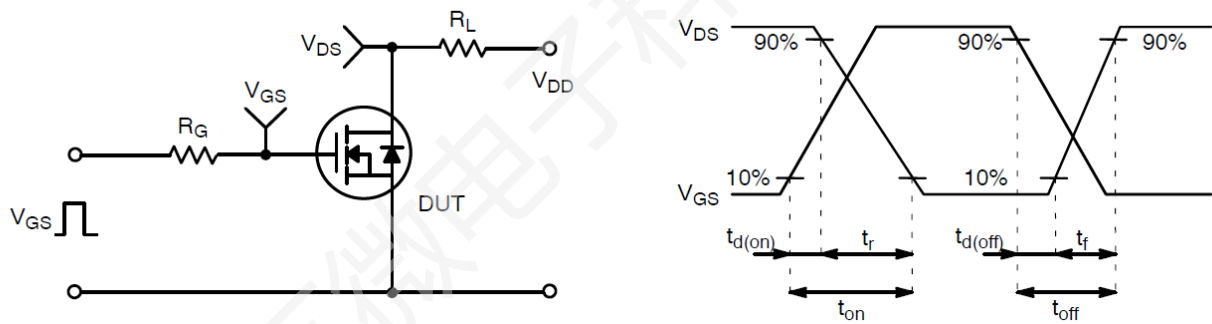
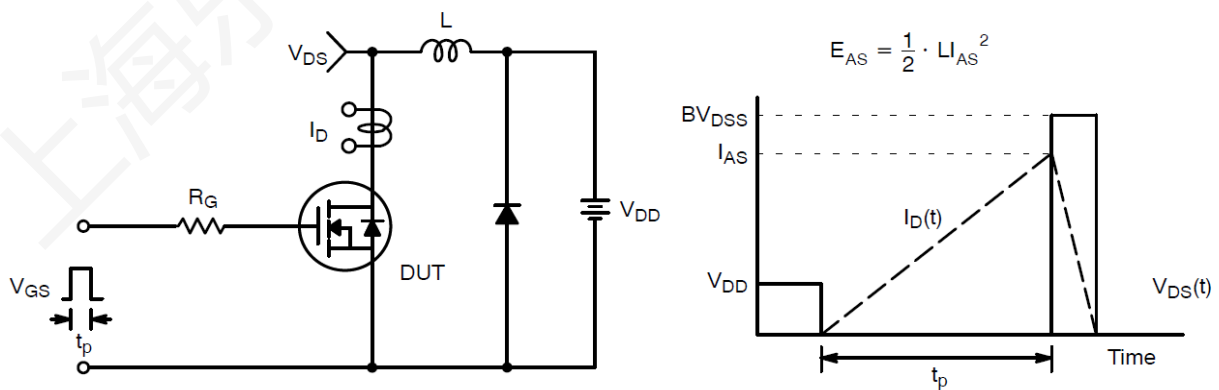
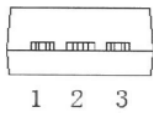
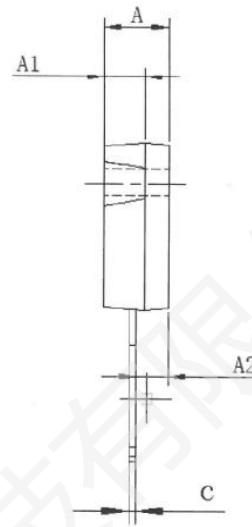
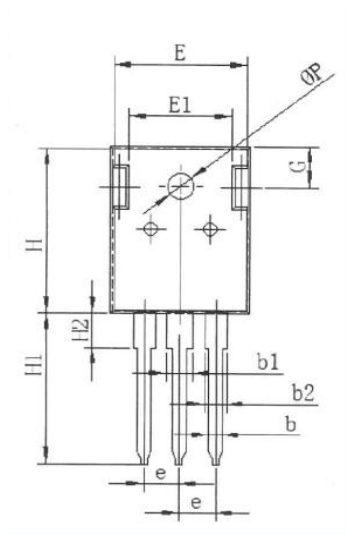


Figure 13: Max. Transient Thermal Impedance


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

Revision History:

Revison	Date	Descriptions
Rev 1.0	Nov.2023	Initial Version

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