

General Description:

The LWN3016AD5D uses trench 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 PDFN5*6-8L, 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:

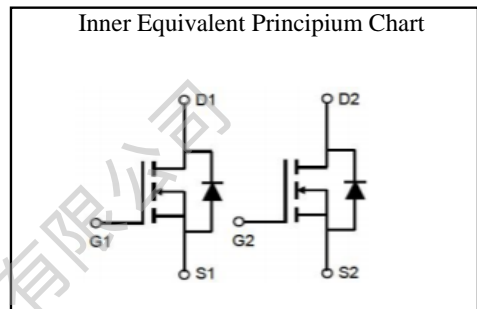
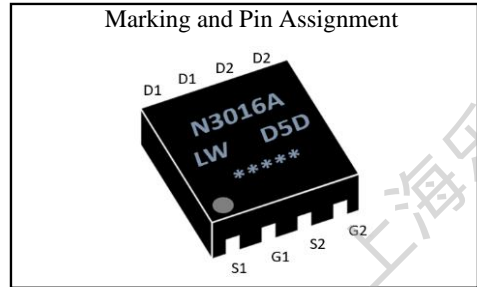
- DC-DC Converter
- Portable Equipment
- Power Management

100% DVDS Tested

100% Avalanche Tested



V_{DSS}	30	V
I_D	36	A
P_D	32	W
$R_{DS(ON)}$ TYPE	8.5	m Ω


Package Marking and Ordering Information:

Marking	Part Number	Package	Packing	Qty.
N3016A/LW D5D/D.C.	LWN3016AD5D	PDFN5*6-8L	Reel	5000 Pcs

Absolute Maximum Ratings:

Symbol	Parameter	Value	Units
V_{DSS}	Drain-to-Source Voltage	30	V
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$	36
	Continuous Drain Current	$T_C=100^\circ\text{C}$	23
I_{DM}^{a1}	Pulsed Drain Current	144	A
E_{AS}^{a2}	Single pulse avalanche energy	50	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	$^\circ\text{C}$
T_L	Maximum Temperature for Soldering	260	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	3.9	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	65	$^\circ\text{C}/\text{W}$

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

Static Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	--	--	V
I_{DSS}	Drain to Source Leakage Current	$V_{DS}=30V, V_{GS}=0V$	--	--	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	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.5	2.0	V
$R_{DS(ON)1}$	Drain-to-Source On-Resistance	$V_{GS}=10V, I_D=20A$	--	8.5	12	$m\Omega$
$R_{DS(ON)2}$	Drain-to-Source On-Resistance	$V_{GS}=4.5V, I_D=10A$	--	12	19.5	$m\Omega$

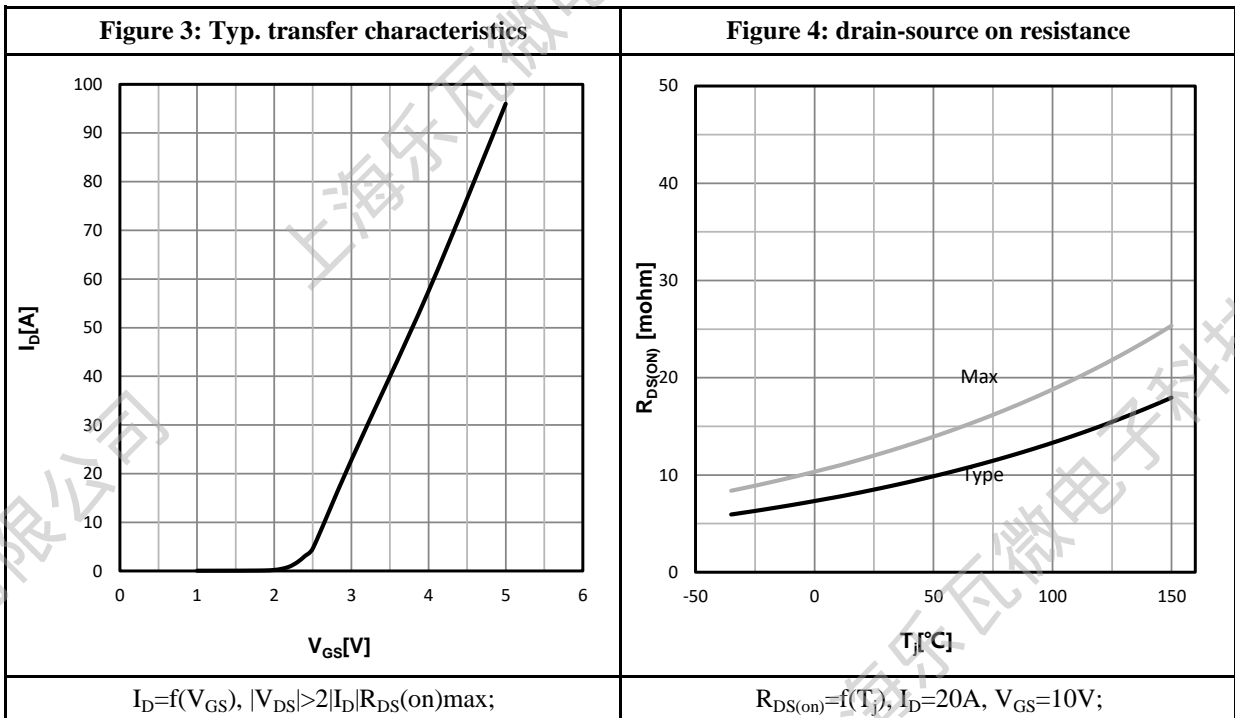
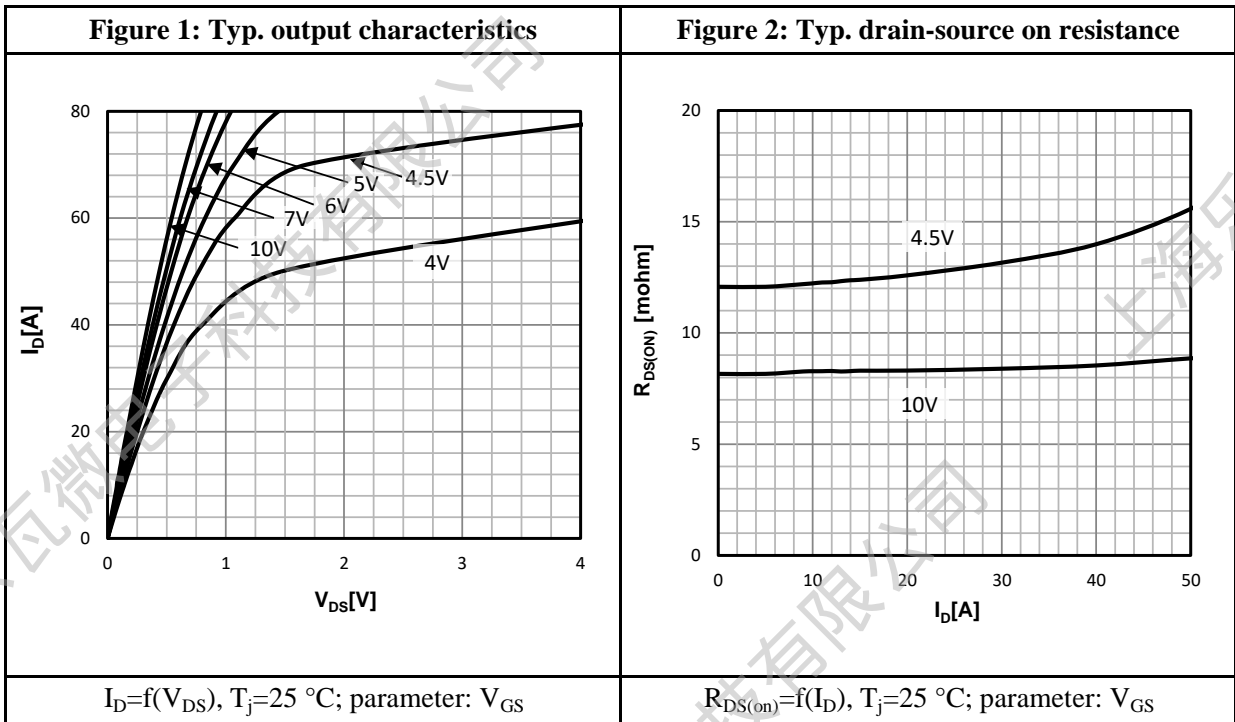
Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	$V_{GS} = 0V$	--	758	--	pF
C_{oss}	Output Capacitance	$V_{DS} = 15V$	--	111	--	
C_{rss}	Reverse Transfer Capacitance	$f = 1.0MHz$	--	99	--	
R_G	Gate resistance	$V_{GS}=0V, V_{DS}$ Open	--	2.0	--	Ω

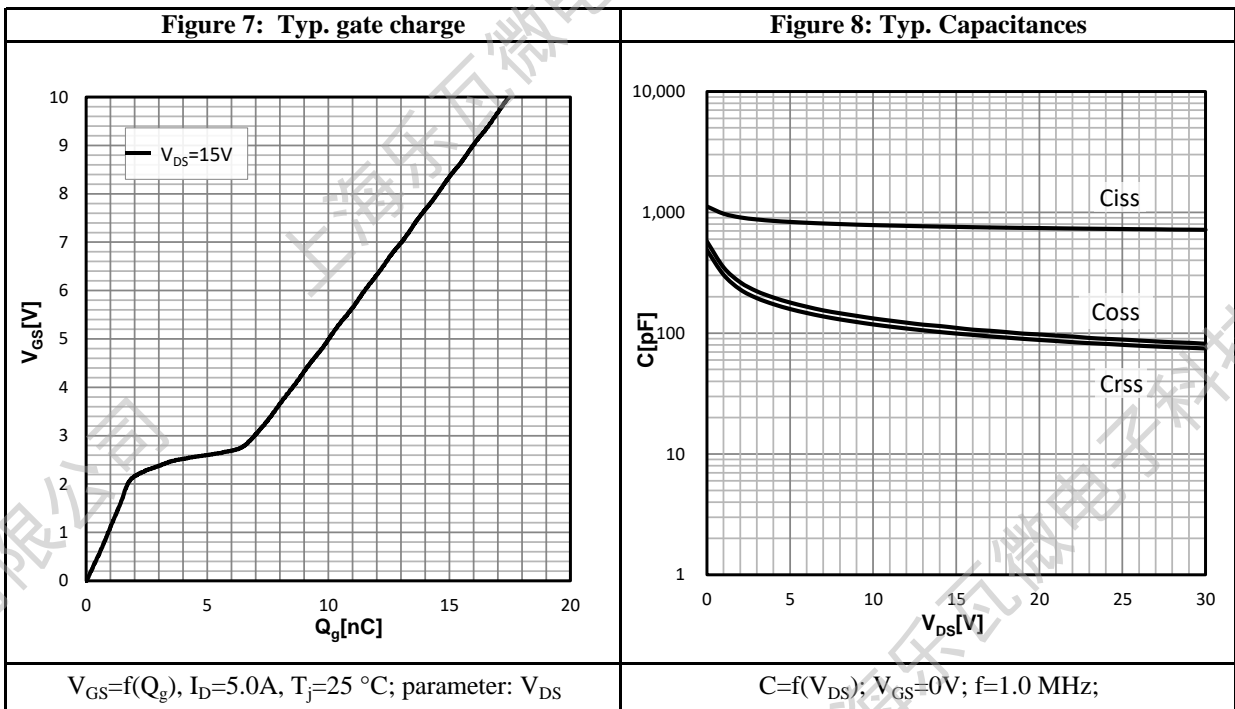
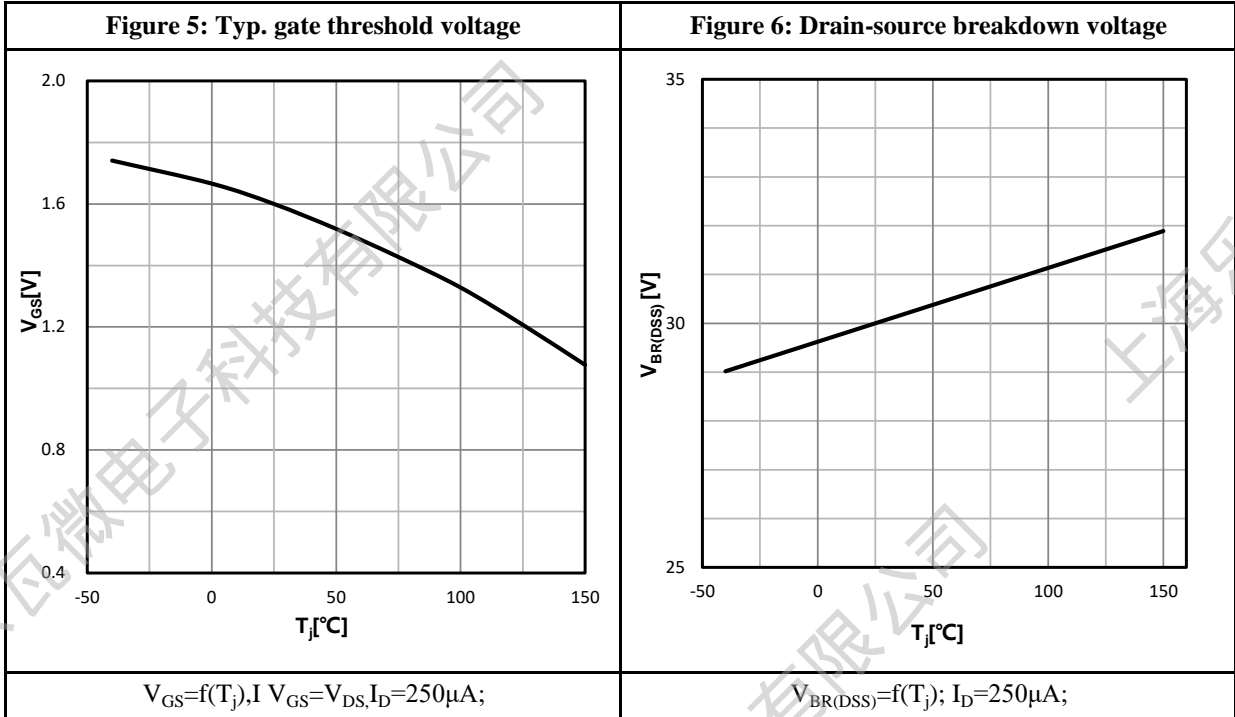
Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$I_D = 10A$	--	5.0	--	ns
t_r	Rise Time	$V_{DS} = 15V$	--	11.0	--	
$t_{d(OFF)}$	Turn-Off Delay Time	$V_{GS} = 10V$	--	13.0	--	
t_f	Fall Time	$R_G = 4.0\Omega$	--	6.0	--	
Q_g	Total Gate Charge	$V_{GS} = 10V$	--	17.5	--	nC
Q_{gs}	Gate Source Charge	$V_{DS} = 15V$	--	2.0	--	
Q_{gd}	Gate Drain Charge	$I_D = 5.0A$	--	4.08	--	

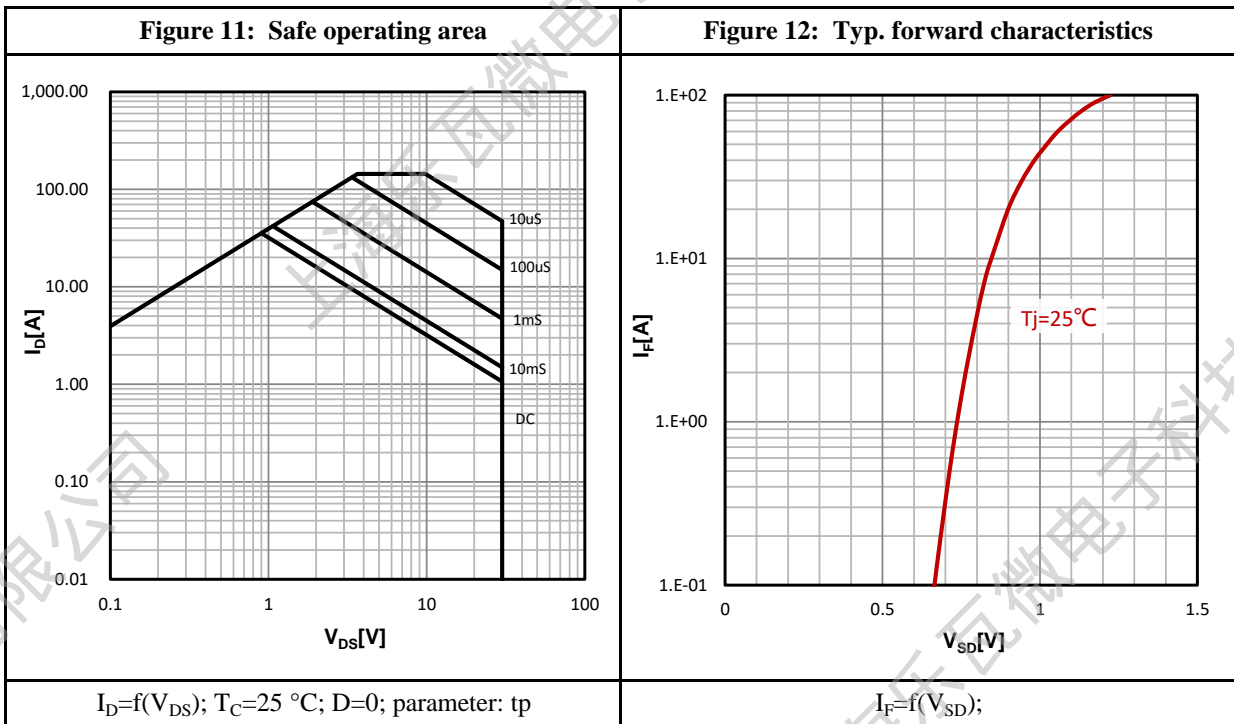
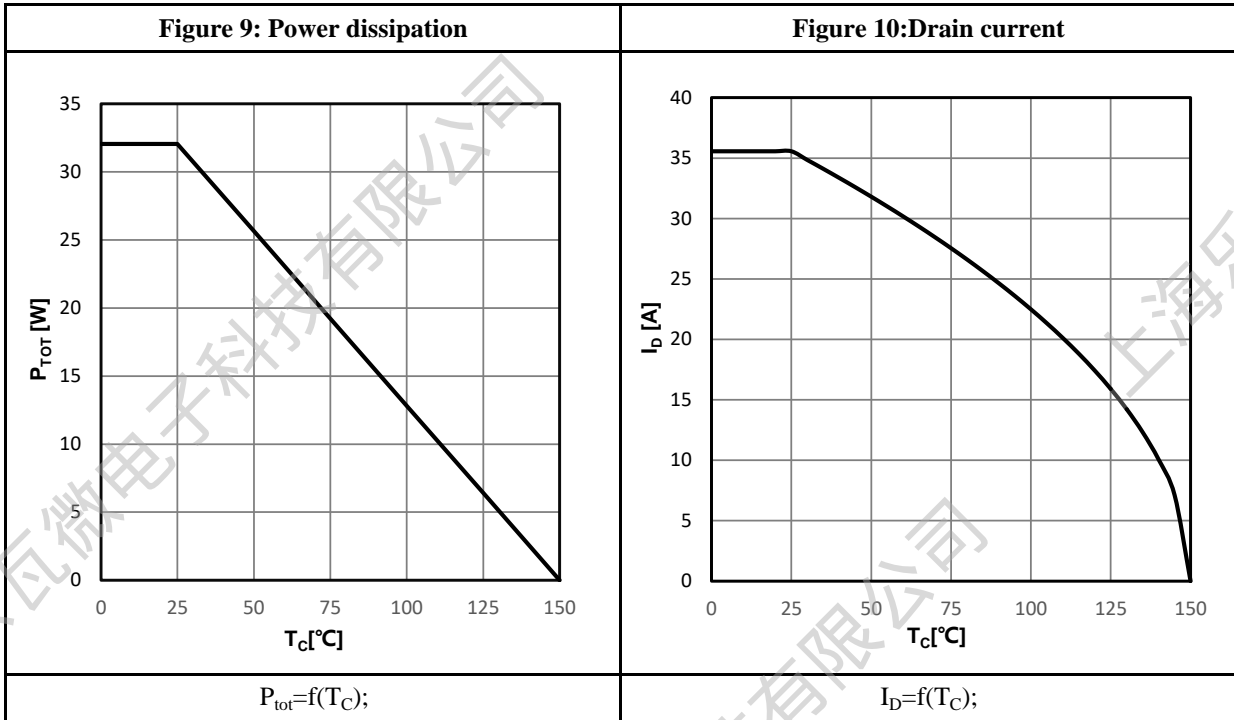
Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	$T_C = 25\text{ }^\circ\text{C}$	--	--	36	A
V_{SD}	Diode Forward Voltage	$I_S=10A, V_{GS}=0V$	--	--	1.2	V
t_{rr}	Reverse Recovery time	$I_S=10A, V_{DD}=15V$	--	20	--	ns
Q_{rr}	Reverse Recovery Charge	$dI/dt=100A/\mu s$	--	10	--	nC

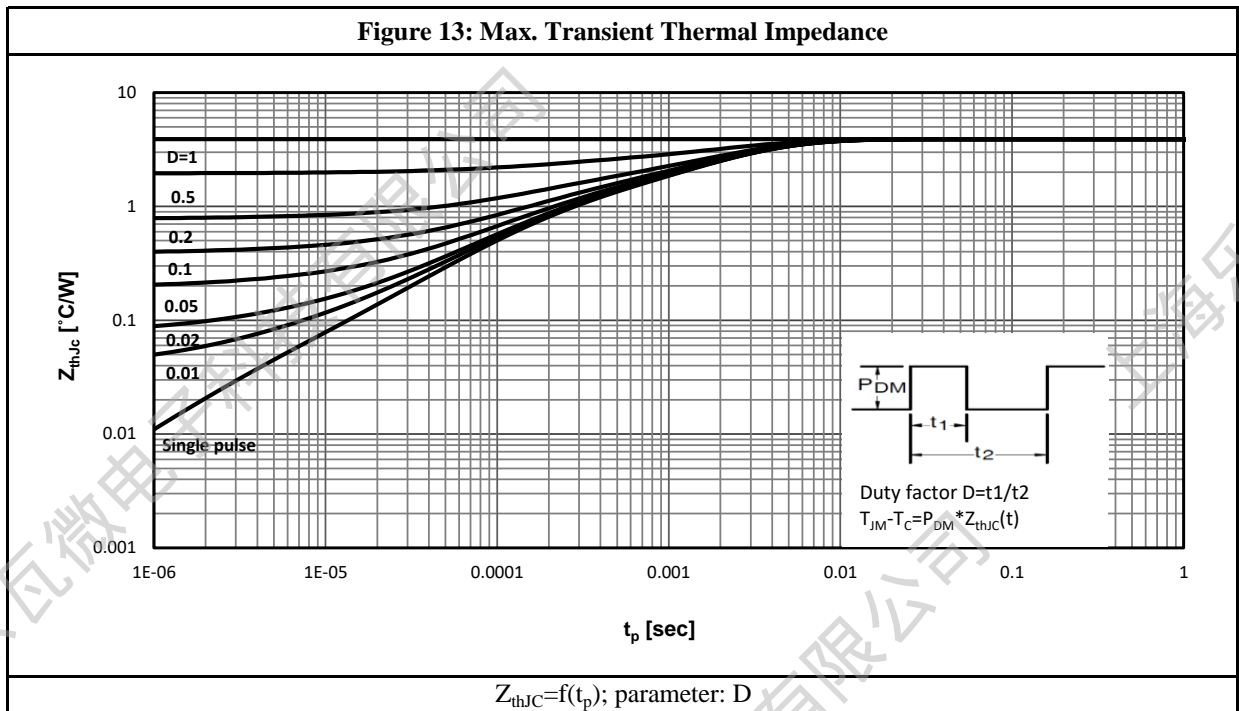
a1: Repetitive rating; pulse width limited by maximum junction temperature

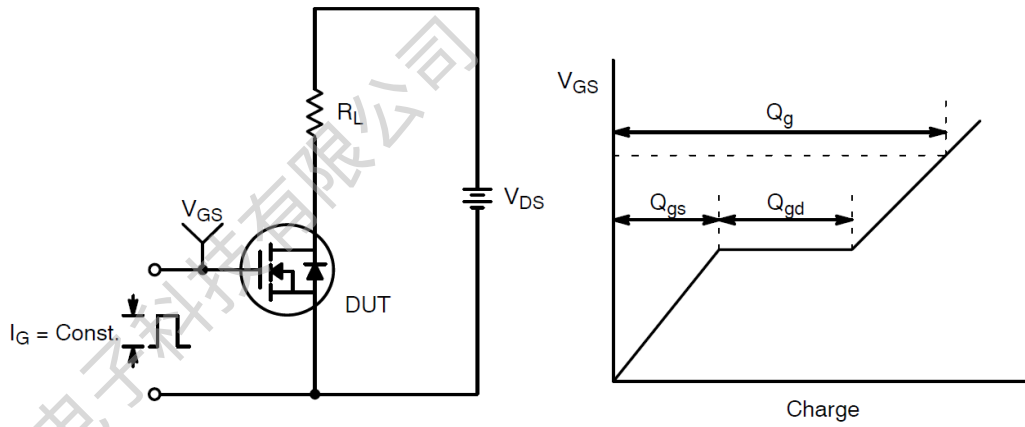
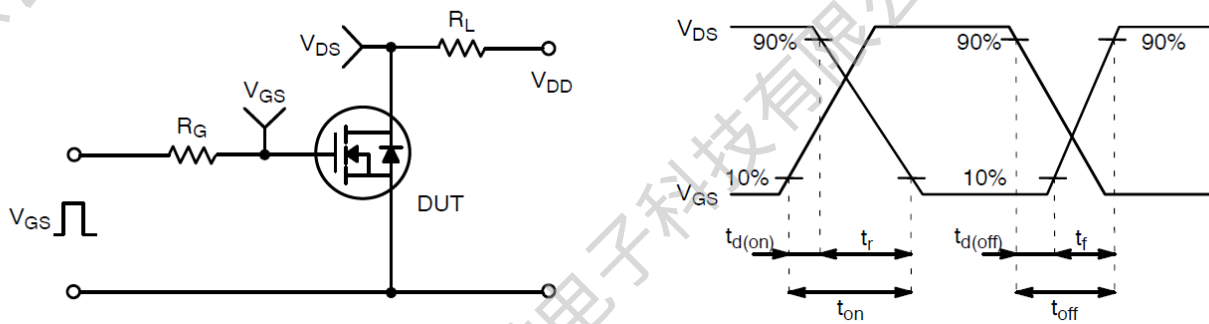
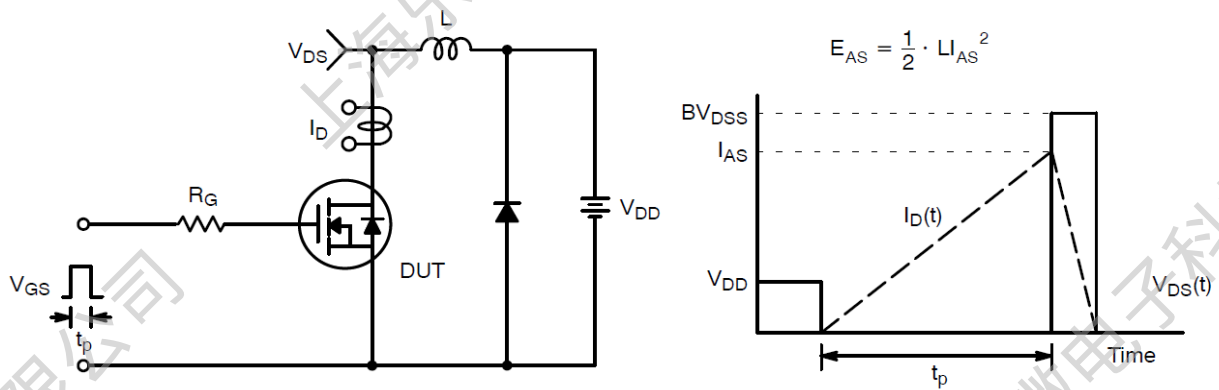
a2: $V_{DD}=15V, L=0.5mH, R_G=25\Omega$, Starting $T_j=25\text{ }^\circ\text{C}$

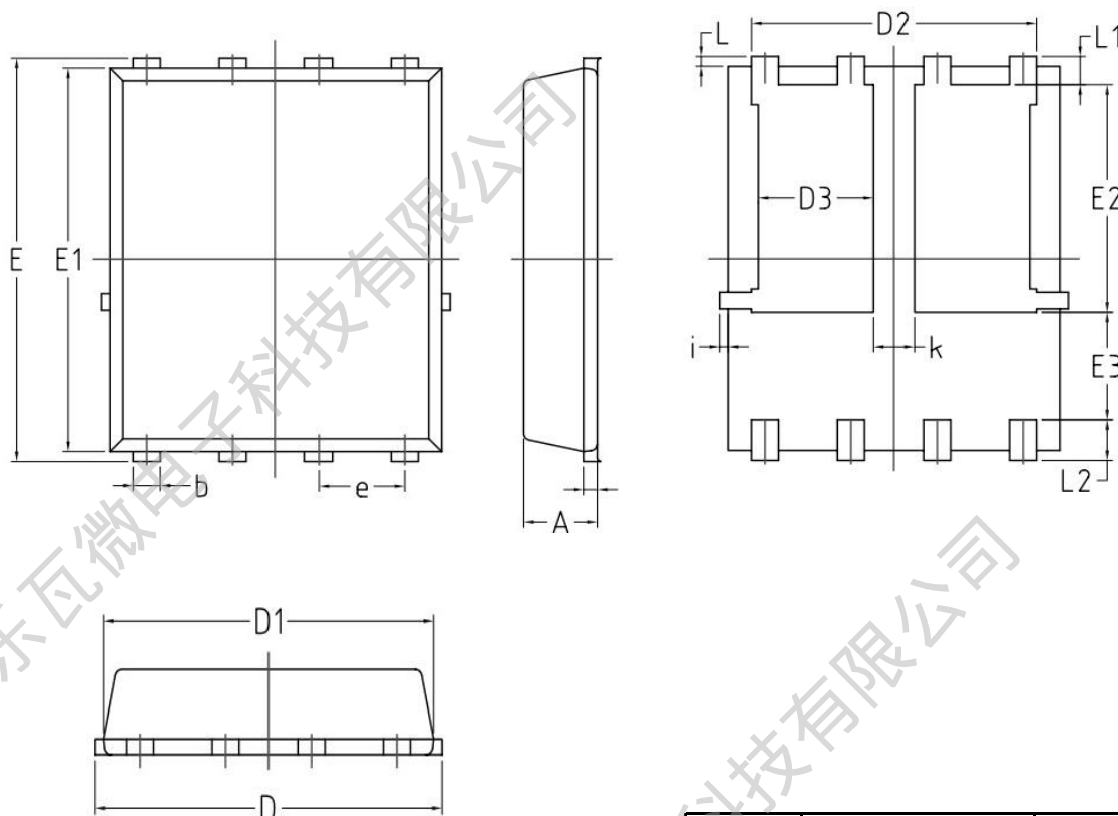
Characteristics Curve:








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:


Symbol	MM		INCH	
	MIN	MAX	MIN	MAX
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
C	0.203 BSC		0.0080 BSC	
D	4.80	5.40	0.1890	0.2126
D1	4.80	5.00	0.1890	0.1969
D2	4.11	4.31	0.1620	0.1700
D3	1.60	1.80	0.0629	0.0708
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	3.30	3.50	0.1300	0.1378
E3	1.40	/	0.0551	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0019	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.71	0.0150	0.0280
l	/	0.18	/	0.0070
k	0.50	0.70	0.0197	0.0276

Revision History:

Revison	Date	Descriptions
Rev 1.0	Feb.2024	Initial Version

Disclaimer:

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Mailing Address: Room 301, Building 2, No.1690 CaiLun Road, China (Shanghai) Pilot Free Trade Zone
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