

General Description:

The LWT4T015AD5 uses 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 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



Package Marking and Ordering Information:

Marking	Part Number	Package	Packing	Qty.
T4T015A/LW D5/D.C	LWT4T015AD5	PDFN5*6-8L	Reel	5000 Pcs

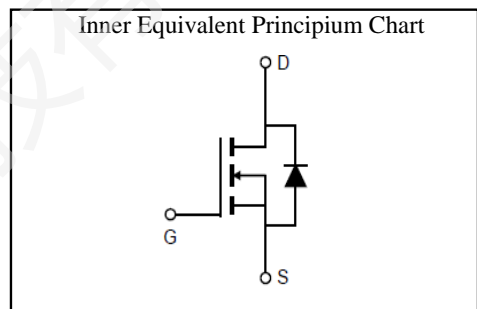
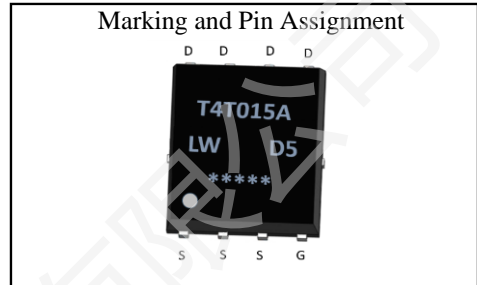
Absolute Maximum Ratings:

Symbol	Parameter	Value	Units
V_{DSS}	Drain-to-Source Voltage	40	V
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$	170
	Continuous Drain Current	$T_C=100^\circ\text{C}$	108
I_{DM}^{a1}	Pulsed Drain Current	680	A
E_{AS}^{a2}	Single pulse avalanche energy	400	mJ
V_{GS}	Gate-to-Source Voltage	± 20	V
P_D	Power Dissipation	135	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	0.92	$^\circ\text{C}/\text{W}$
$R_{\theta JA}^{a3}$	Thermal Resistance, Junction-to-Ambient	47	$^\circ\text{C}/\text{W}$

V_{DSS}	40	V
I_D	170	A
P_D	135	W
$R_{DS(ON) \text{ TYPE}}$	1.4	$\text{m}\Omega$



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	$V_{GS}=0V, I_D=250\mu A$	40	--	--	V
I_{DSS}	Drain to Source Leakage Current	$V_{DS}=40V, V_{GS}=0V$	--	--	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	$V_{DS}=V_{GS}, I_D=250\mu A$	1.3	1.7	2.1	V
$R_{DS(ON)1}$	Drain-to-Source On-Resistance	$V_{GS}=10V, I_D=20A$	--	1.4	2.0	$m\Omega$
$R_{DS(ON)2}$	Drain-to-Source On-Resistance	$V_{GS}=4.5V, I_D=15A$	--	1.9	2.5	$m\Omega$
g_{FS}	Forward Transconductance	$V_{DS}=10V, I_D=20A$	--	45	--	S

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	$V_{GS}=0V$ $V_{DS}=20V$ $f=1.0MHz$	--	5842	--	pF
C_{oss}	Output Capacitance		--	1859	--	
C_{rss}	Reverse Transfer Capacitance		--	210	--	
R_G	Gate resistance	$V_{GS}=0V, V_{DS}=0V, f=1MHz$	--	2.3	--	Ω

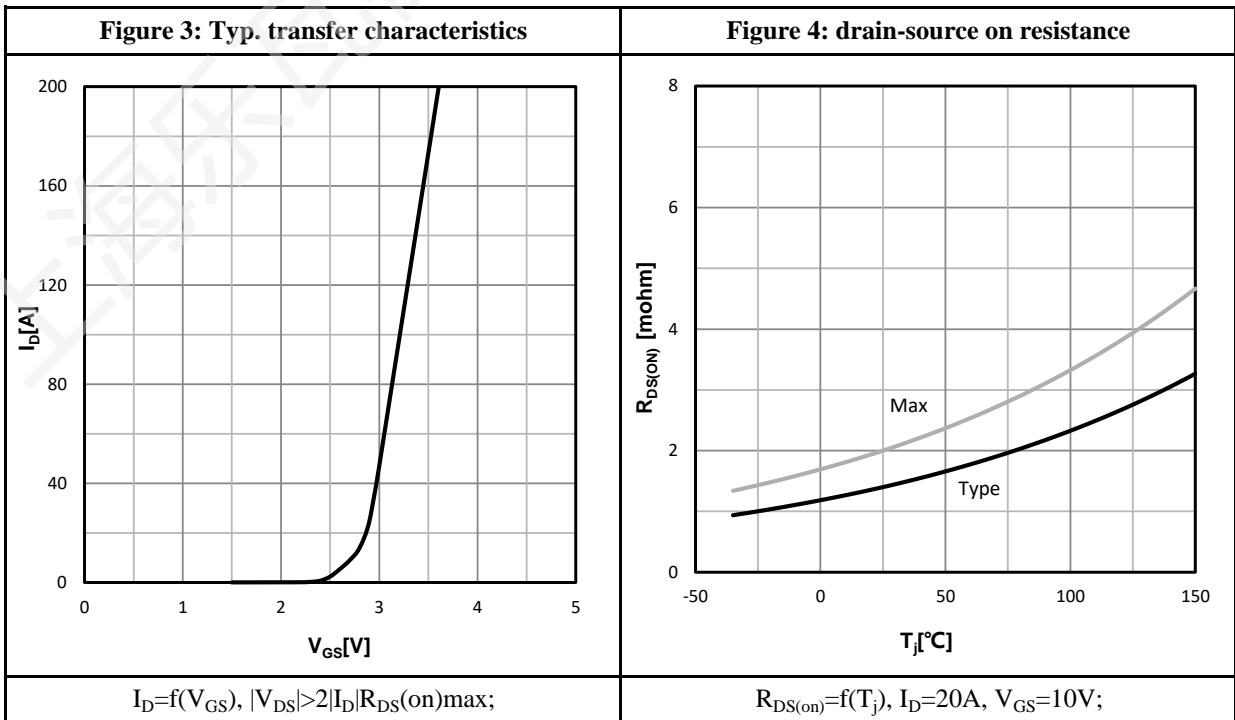
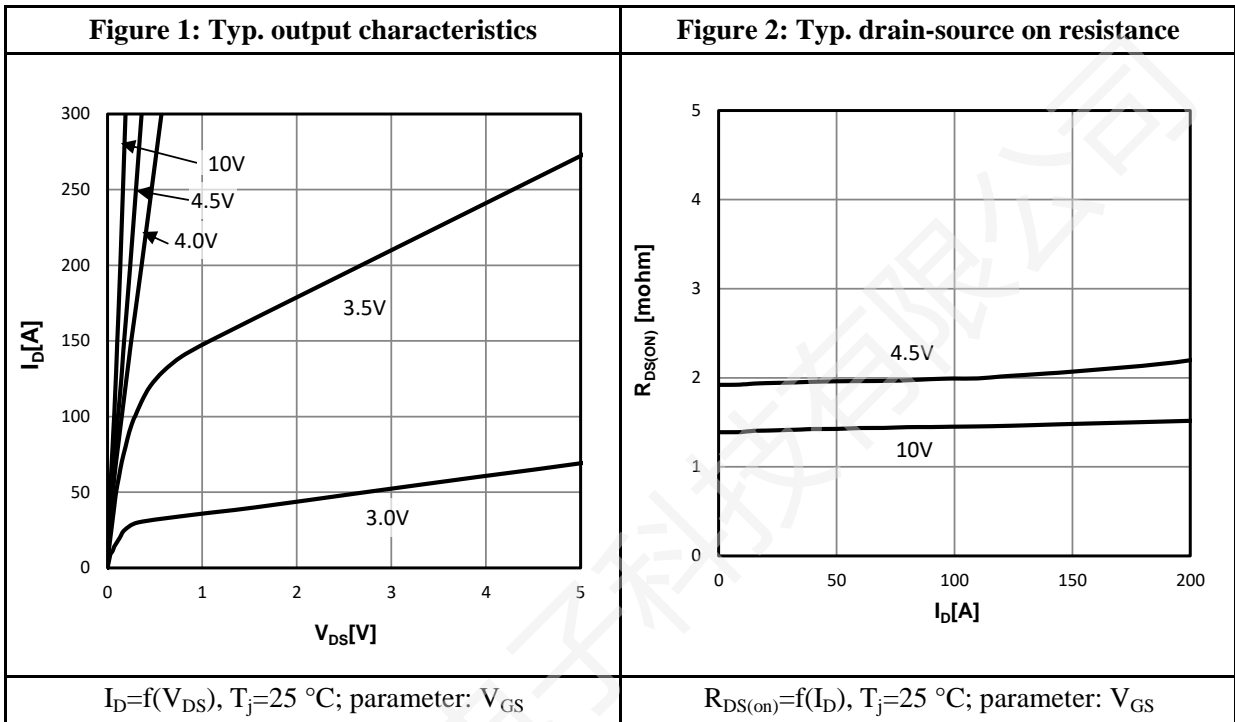
Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$I_D=20A$ $V_{DS}=20V$ $V_{GS}=10V$ $R_G=1.6\Omega$	--	15	--	ns
t_r	Rise Time		--	36	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	68	--	
t_f	Fall Time		--	35	--	
Q_g	Total Gate Charge	$V_{GS}=10V$ $V_{DS}=20V$ $I_D=20A$	--	100	--	nC
Q_{gs}	Gate Source Charge		--	16	--	
Q_{gd}	Gate Drain Charge		--	18	--	

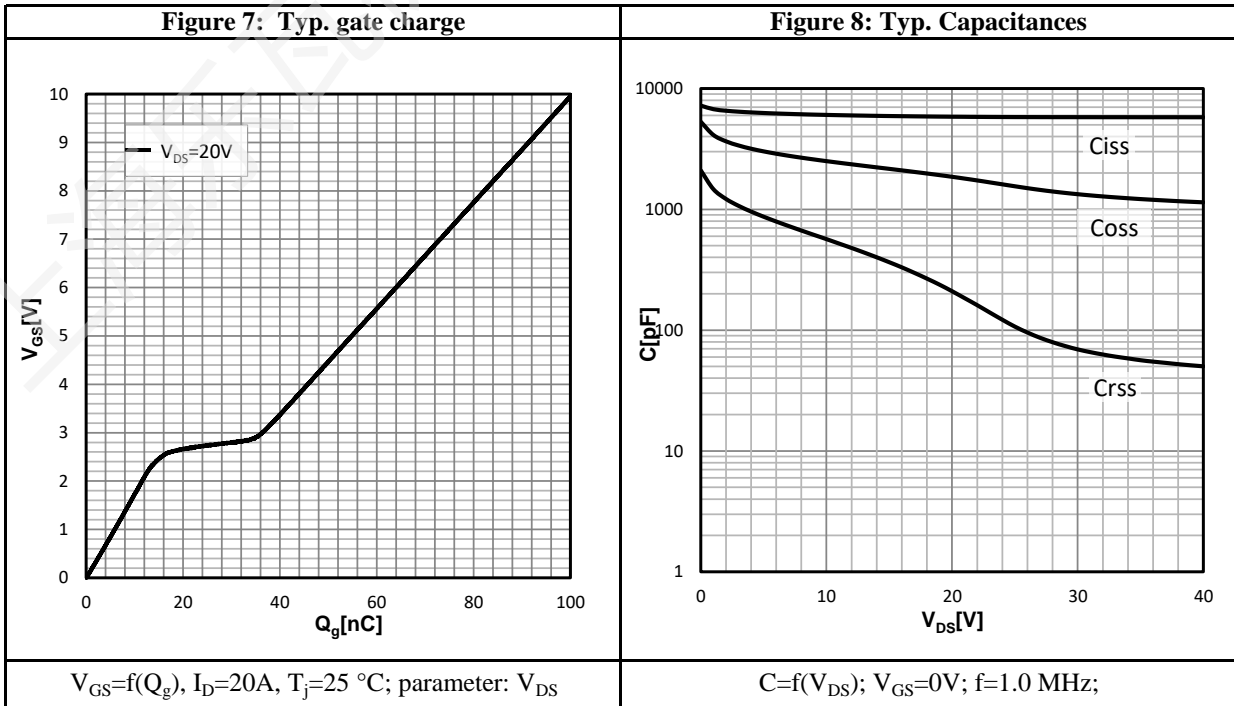
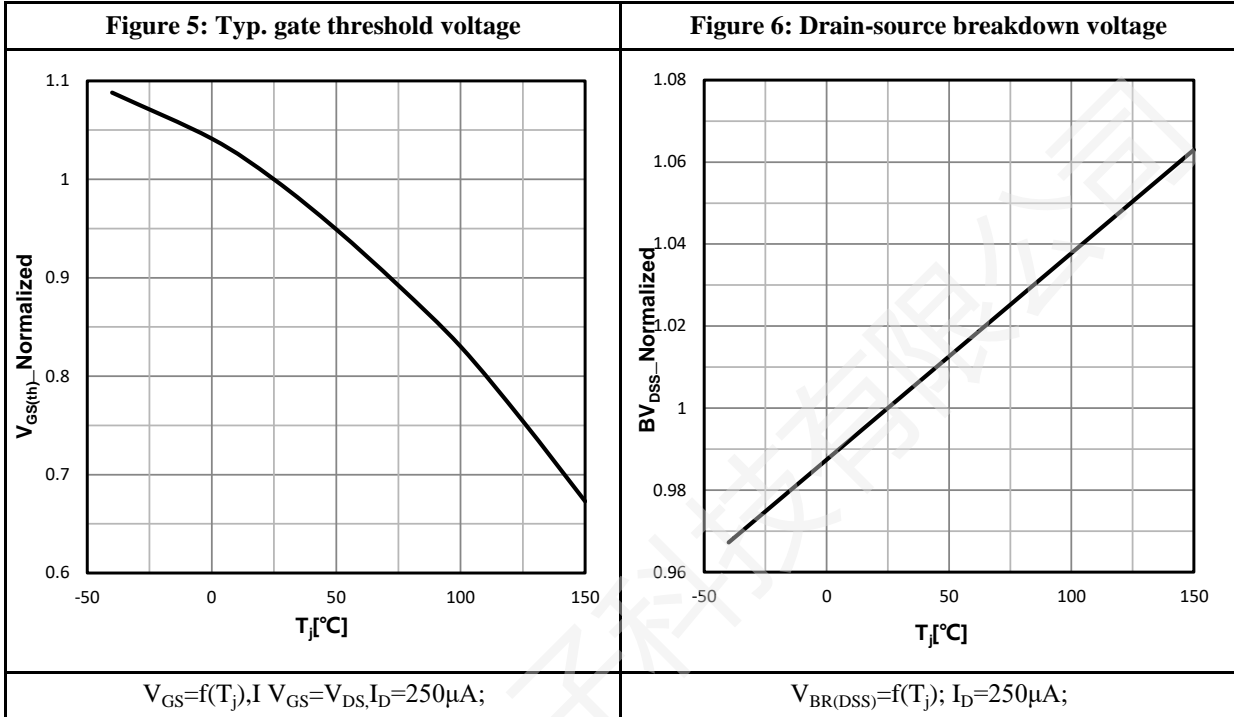
Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	$T_C=25\text{ }^\circ\text{C}$	--	--	170	A
V_{SD}	Diode Forward Voltage	$I_S=20A, V_{GS}=0V$	--	--	1.2	V
t_{rr}	Reverse Recovery Time	$I_S=20A, V_{DD}=20V$ $dI/dt=100A/\mu s$	--	48	--	ns
Q_{rr}	Reverse Recovery Charge		--	39	--	nC

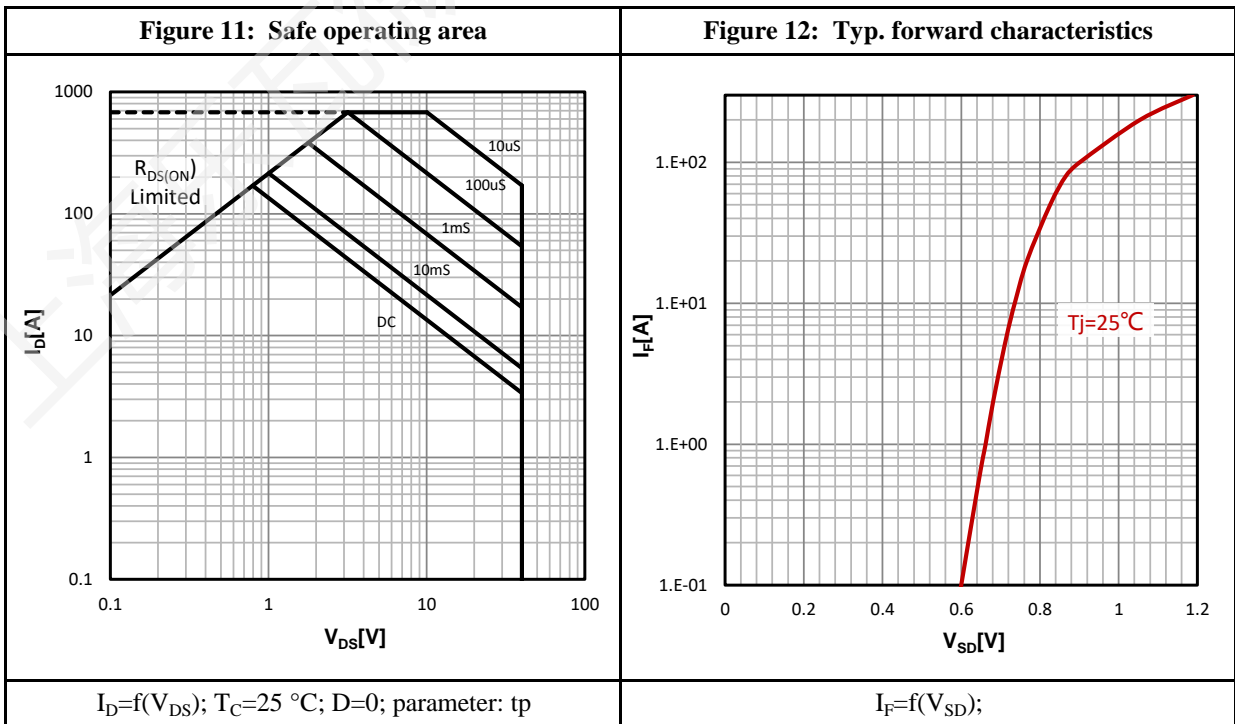
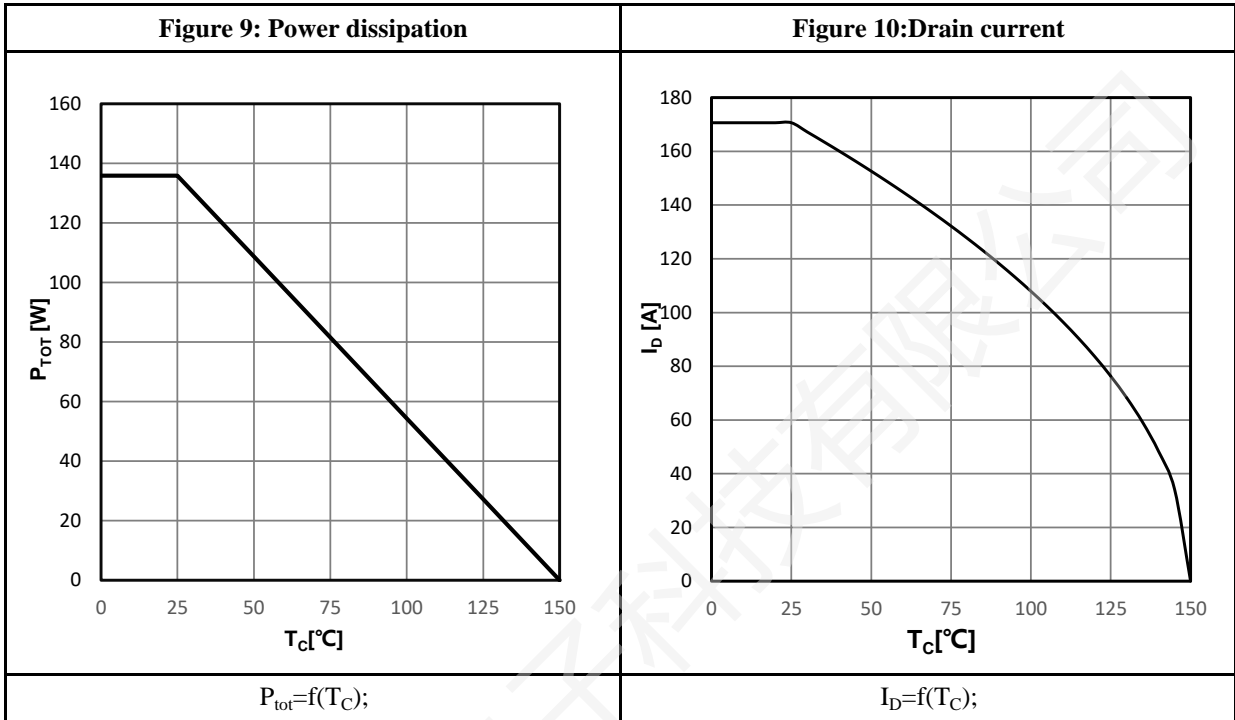
a1: Repetitive rating; pulse width limited by maximum junction temperature

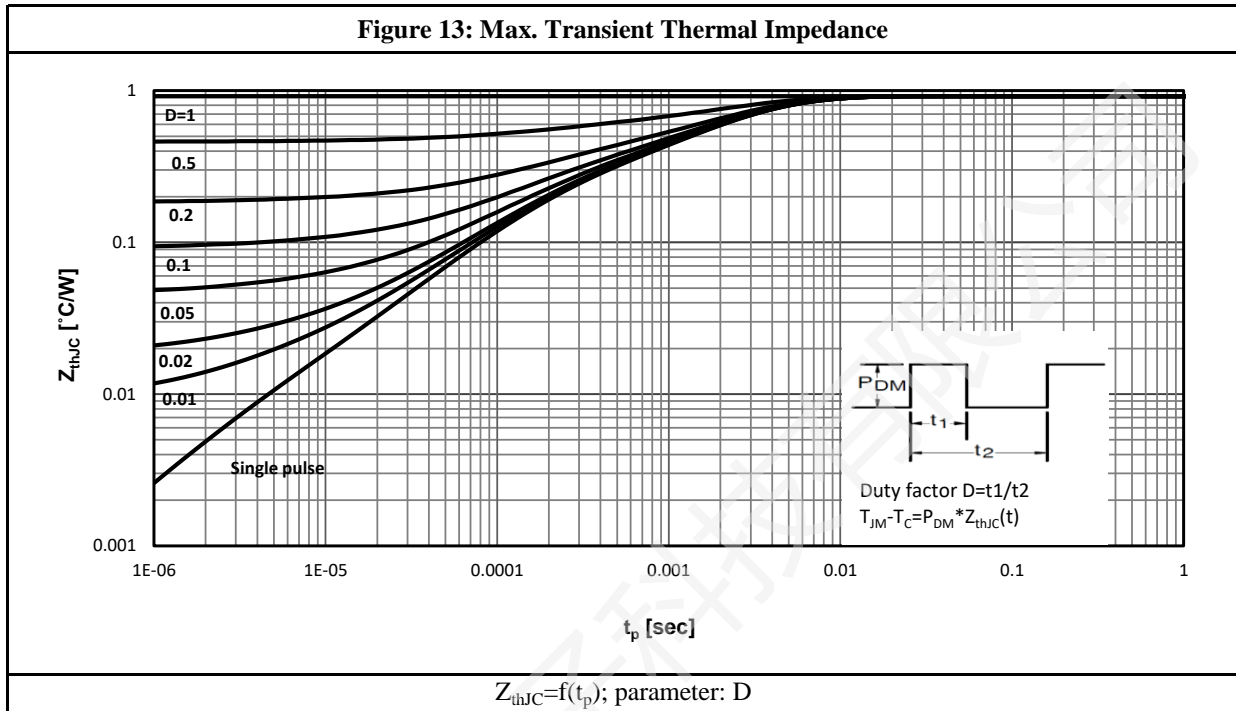
a2: $V_{DD}=30V, L=0.1mH, R_G=25\Omega$, Starting $T_J=25\text{ }^\circ\text{C}$

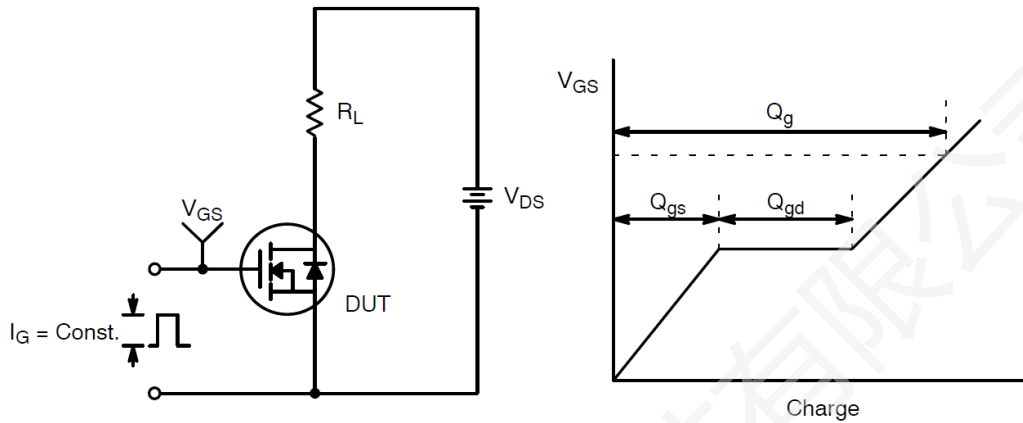
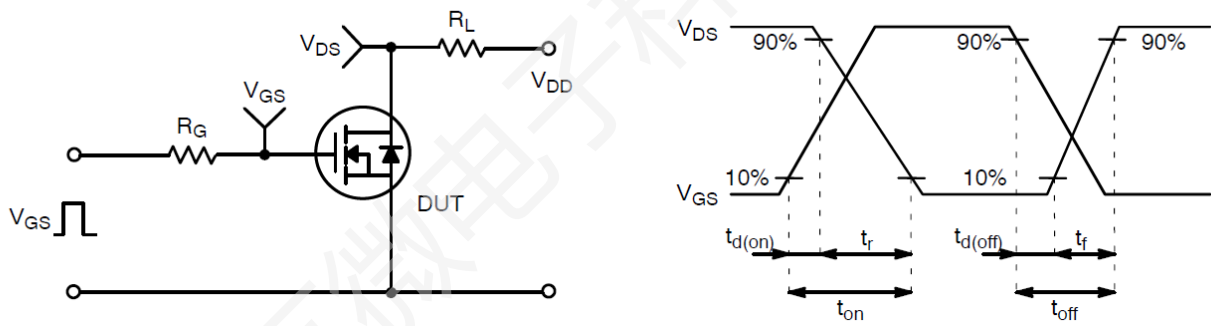
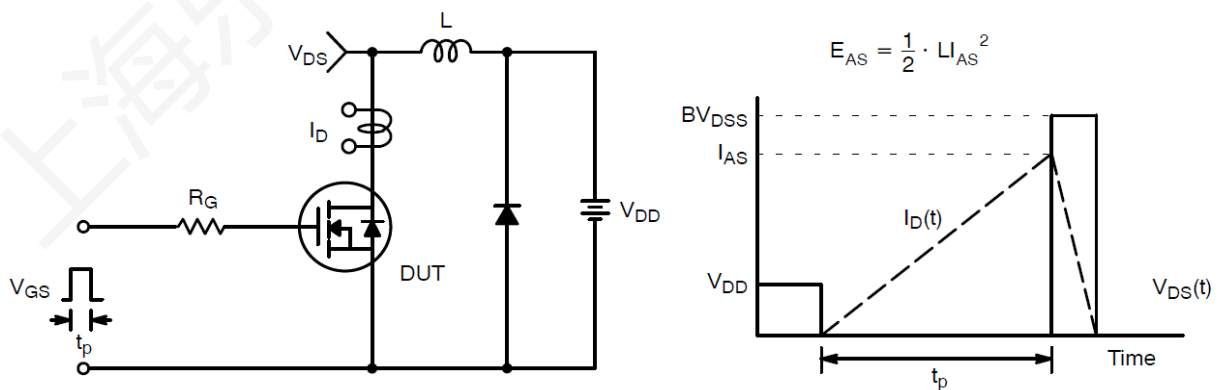
a3: Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm² (one layer, 70 μm thick) copper area for drain connection.

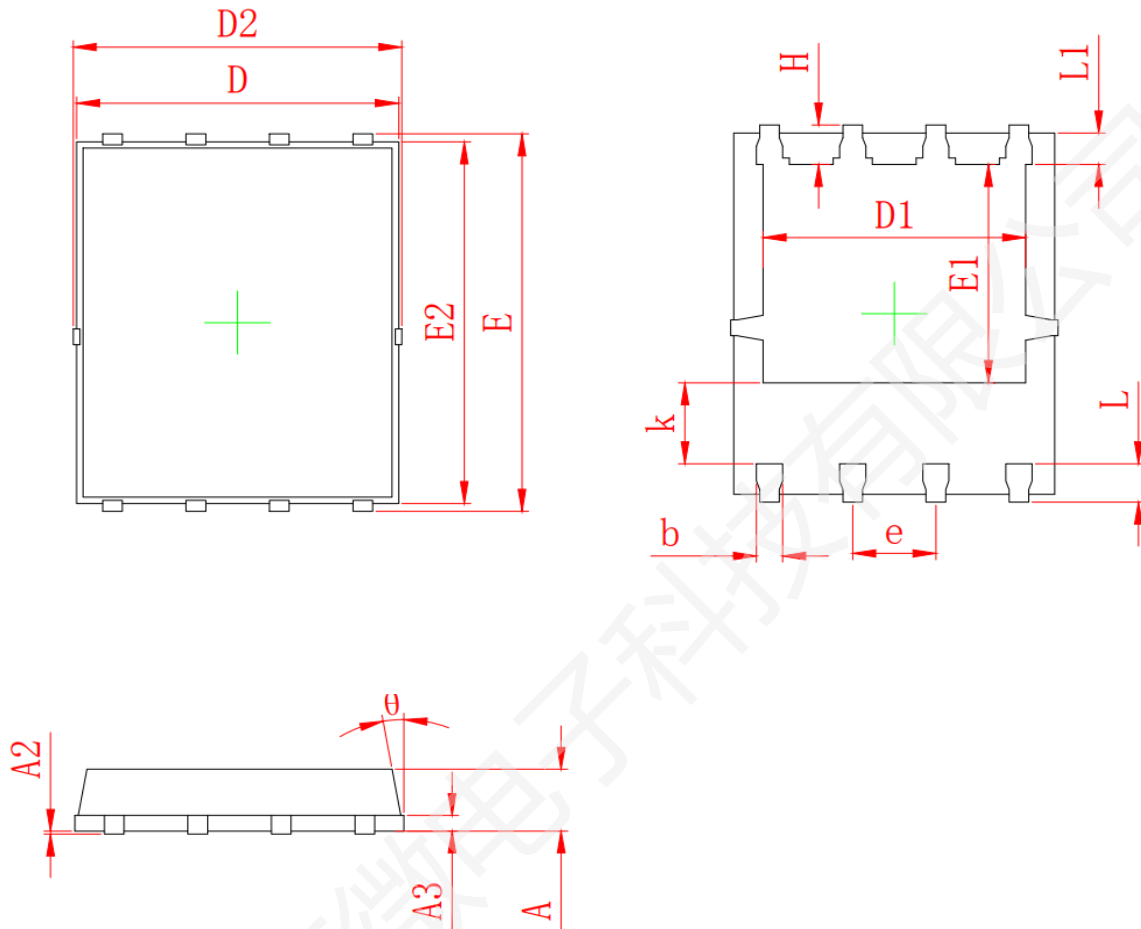
Characteristics Curve:








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	MILLIMETER	
	Min	Max
A	0.900	1.200
A1	0.254 REF	
A2	0~0.050	
D	4.824	4.976
D1	3.910	4.110
D2	4.944	5.076
E	5.924	6.076
E1	3.375	3.575
E2	5.674	5.826
b	0.350	0.450
e	1.270 TYP	
L	0.534	0.686
L1	0.424	0.576
k	1.190	1.390
H	0.549	0.701
θ	8°	12°

Revision History:

Revison	Date	Descriptions
Rev 1.1	June.2024	Initial Version

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