

General Description:

The LWP3020AD2 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 DFN2*2-6L, 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 switching application
- Hard switched and high frequency circuits
- Power Management

100% DVDS Tested

100% Avalanche Tested



Package Marking and Ordering Information:

Marking	Part Number	Package	Packing	Qty.
P3020A/D.C.	LWP3020AD2	DFN2*2-6L	Reel	3000 Pcs

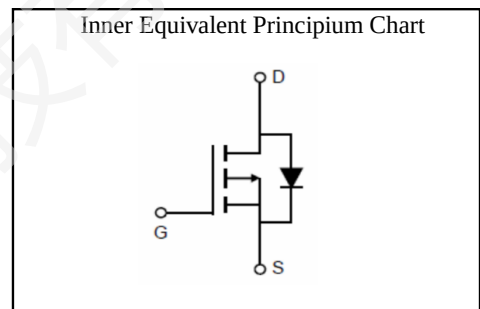
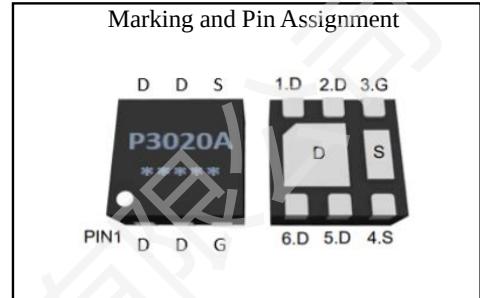
Absolute Maximum Ratings:

Symbol	Parameter		Value	Units
V_{DSS}	Drain-to-Source Voltage		-30	V
I_D	Continuous Drain Current	$T_A=25^{\circ}\text{C}$	-11	A
	Continuous Drain Current	$T_A=100^{\circ}\text{C}$	-6.9	A
I_{DM}^{a1}	Pulsed Drain Current		-44	A
E_{AS}^{a2}	Single pulse avalanche energy		68	mJ
V_{GS}	Gate-to-Source Voltage		± 20	V
P_D	Power Dissipation		2.6	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
$R_{\theta JA}^{a3}$	Thermal Resistance, Junction-to-Ambient	49	$^{\circ}\text{C}/\text{W}$

V_{DSS}	-30	V
I_D	-11	A
P_D	2.6	W
$R_{DS(ON) \text{ TYPE}}$	12	$\text{m}\Omega$



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	$V_{GS}=0V, I_D=-250\mu A$	-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	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.2	-1.6	-2.0	V
$R_{DS(ON)1}$	Drain-to-Source On-Resistance	$V_{GS}=-10V, I_D=-10A$	--	12	15	$m\Omega$
$R_{DS(ON)2}$	Drain-to-Source On-Resistance	$V_{GS}=-4.5V, I_D=-8.0A$	--	18	23	$m\Omega$

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C_{iss}	Input Capacitance	$V_{GS}=0V$	--	1243	--	pF
C_{oss}	Output Capacitance	$V_{DS}=-15V$	--	187	--	
C_{rss}	Reverse Transfer Capacitance	$f=1.0MHz$	--	177	--	
R_G	Gate resistance	$V_{GS}=0V, V_{DS}=0V, f=1MHz$	--	10	--	Ω

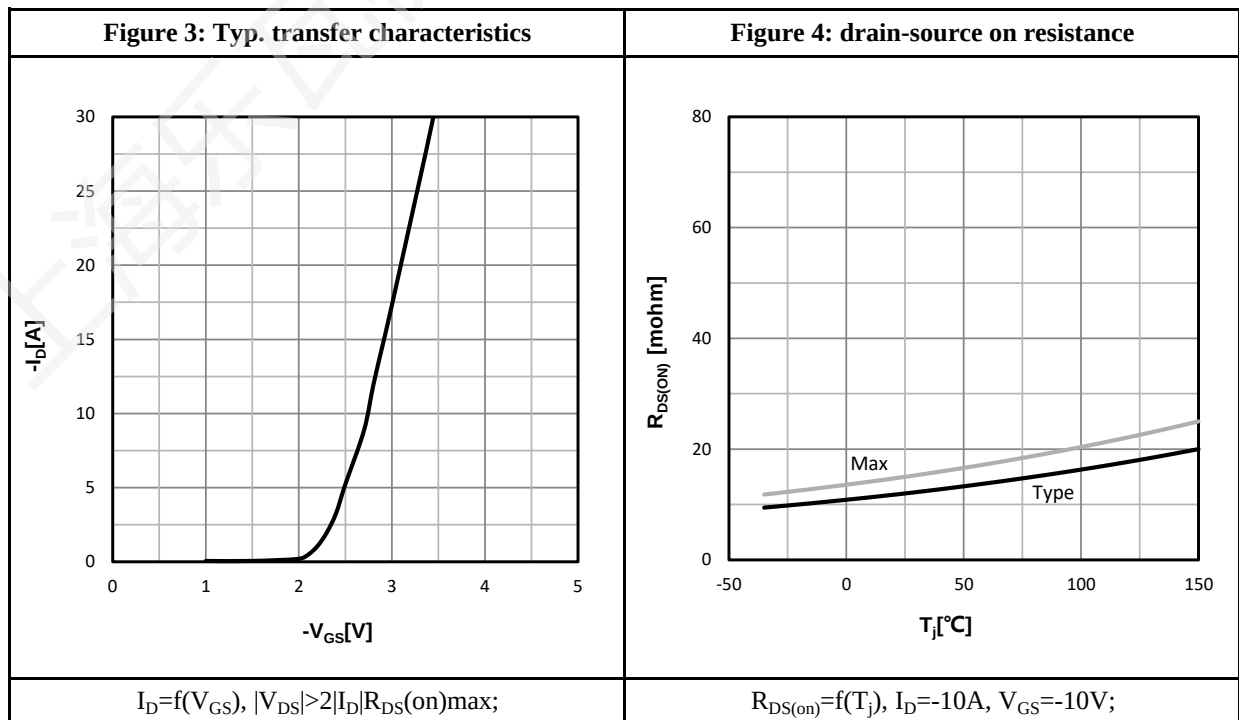
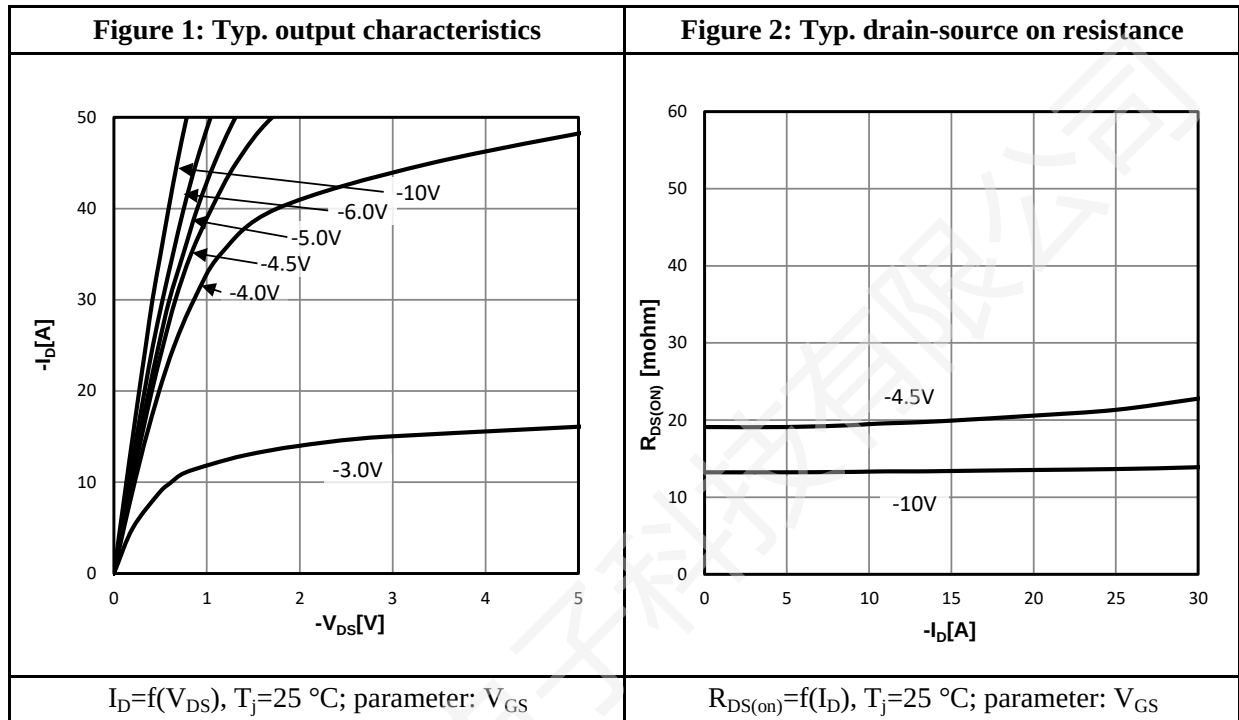
Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$I_D=-10A$	--	10	--	ns
t_r	Rise Time	$V_{DS}=-15V$	--	17	--	
$t_{d(OFF)}$	Turn-Off Delay Time	$V_{GS}=-10V$	--	62	--	
t_f	Fall Time	$R_G=3.0\Omega$	--	38	--	
Q_g	Total Gate Charge	$V_{GS}=-10V$	--	28	--	nC
Q_{gs}	Gate to Source Charge	$V_{DS}=-15V$	--	3.3	--	
Q_{gd}	Gate to Drain Charge	$I_D=-10A$	--	6.0	--	

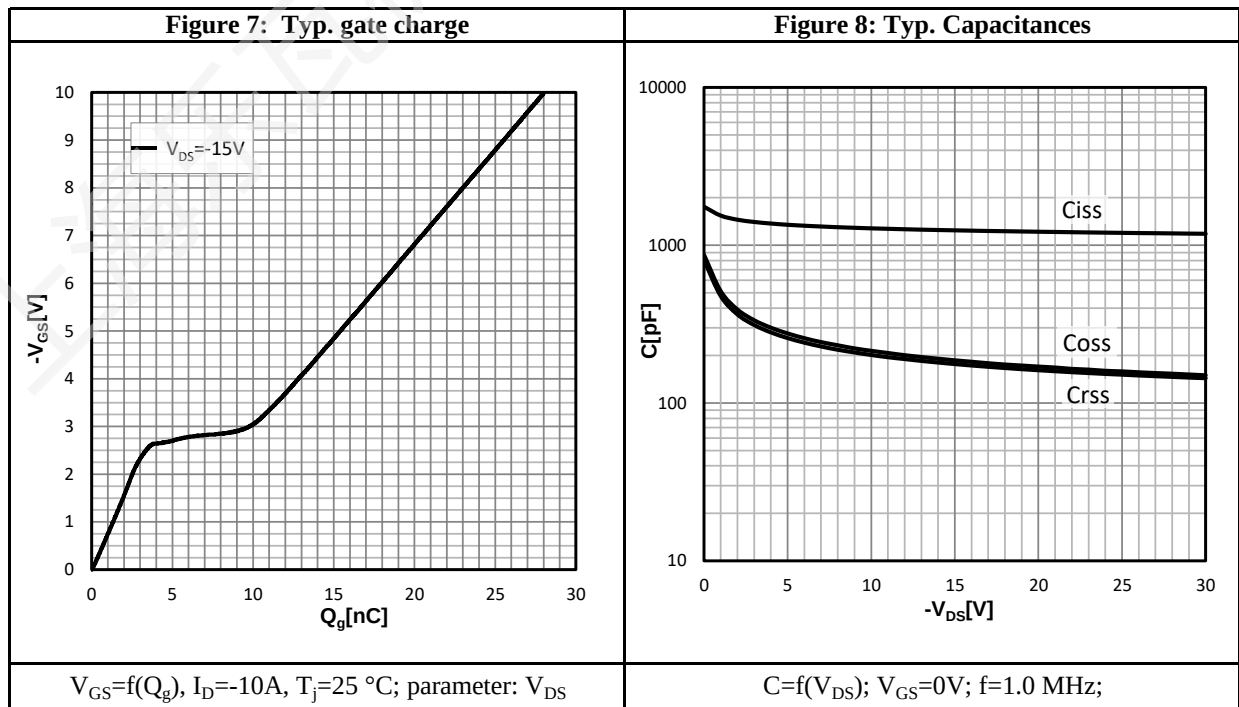
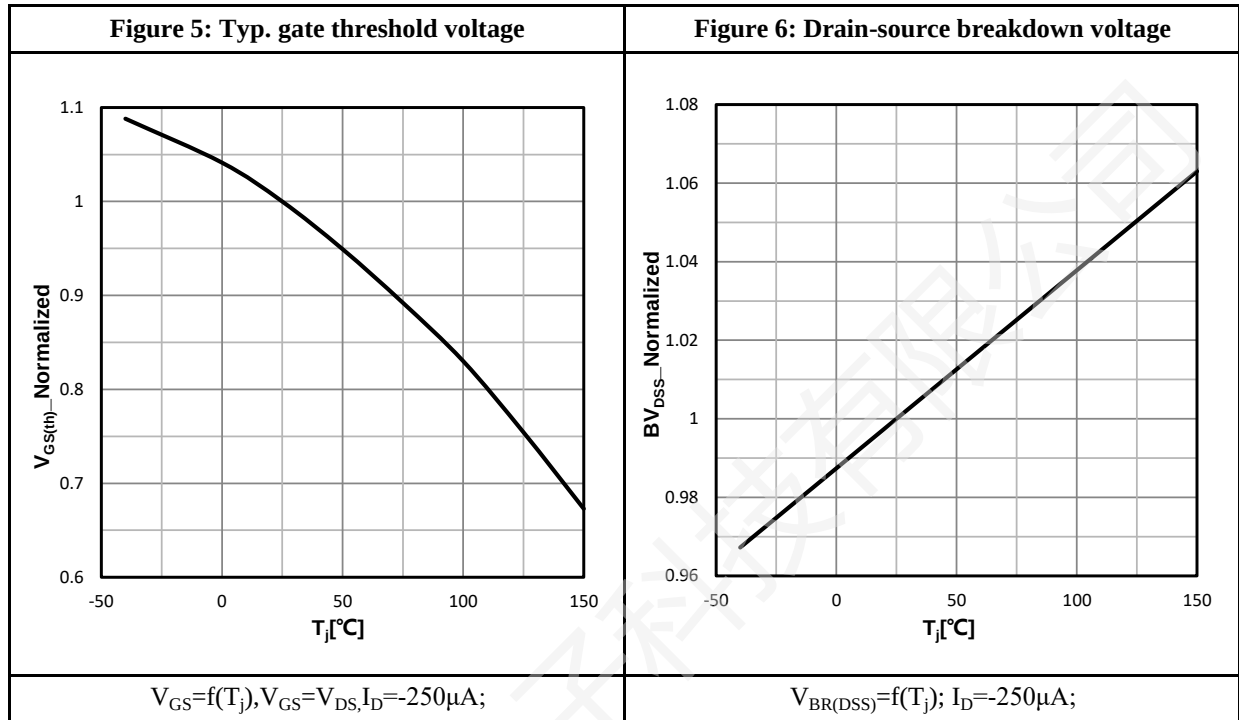
Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	$T_A=25\text{ }^{\circ}\text{C}$	--	--	-11	A
V_{SD}	Diode Forward Voltage	$I_S=-10A, V_{GS}=0V$	--	--	-1.2	V

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

a2: $V_{DD}=-20V, L=0.5mH, R_G=25\Omega$, 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:




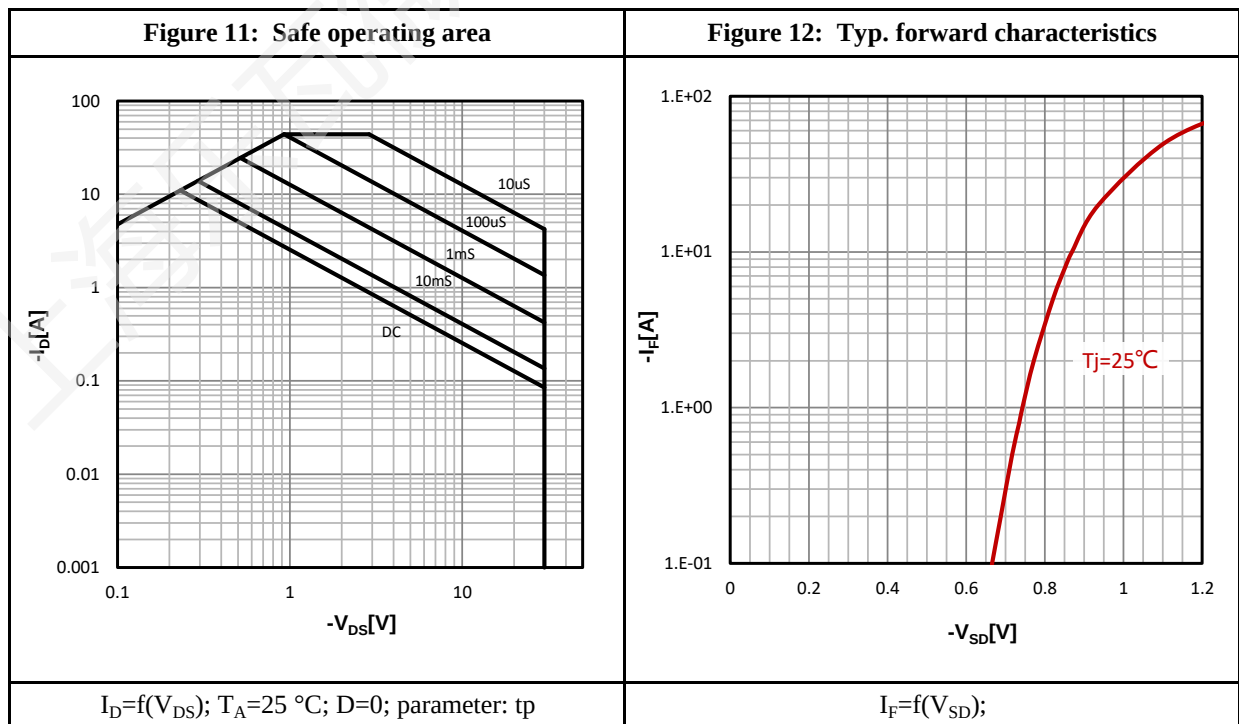
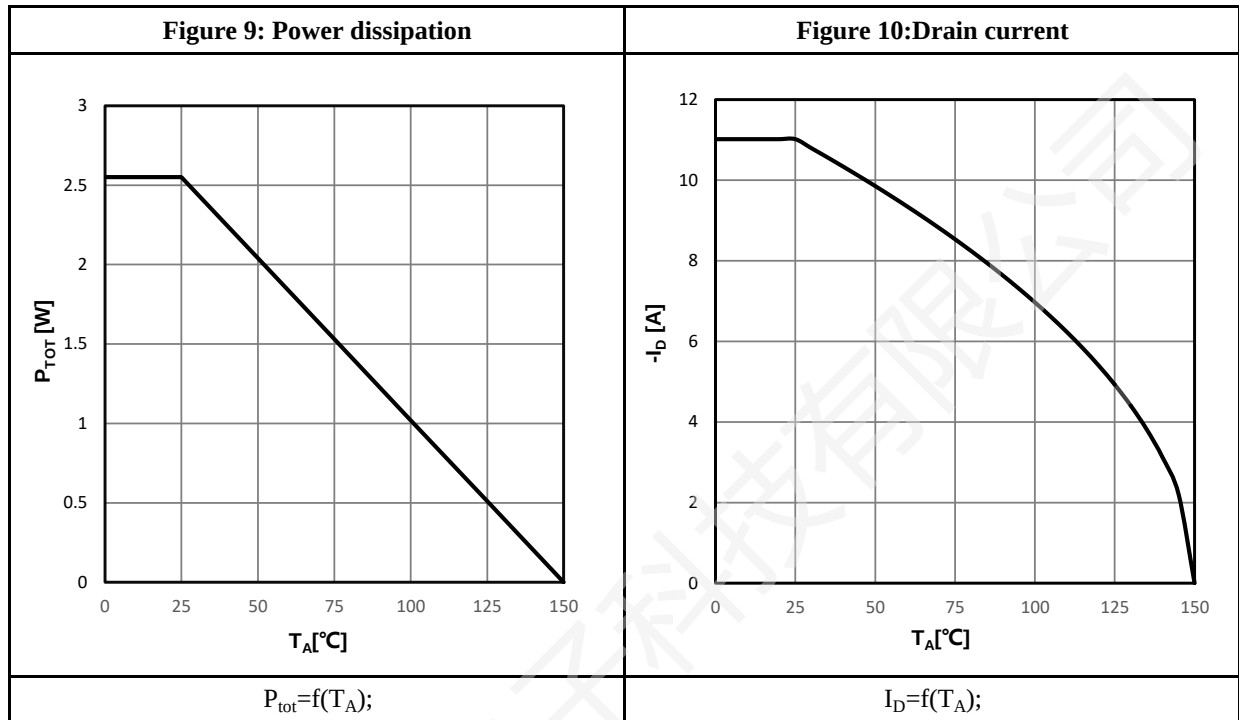
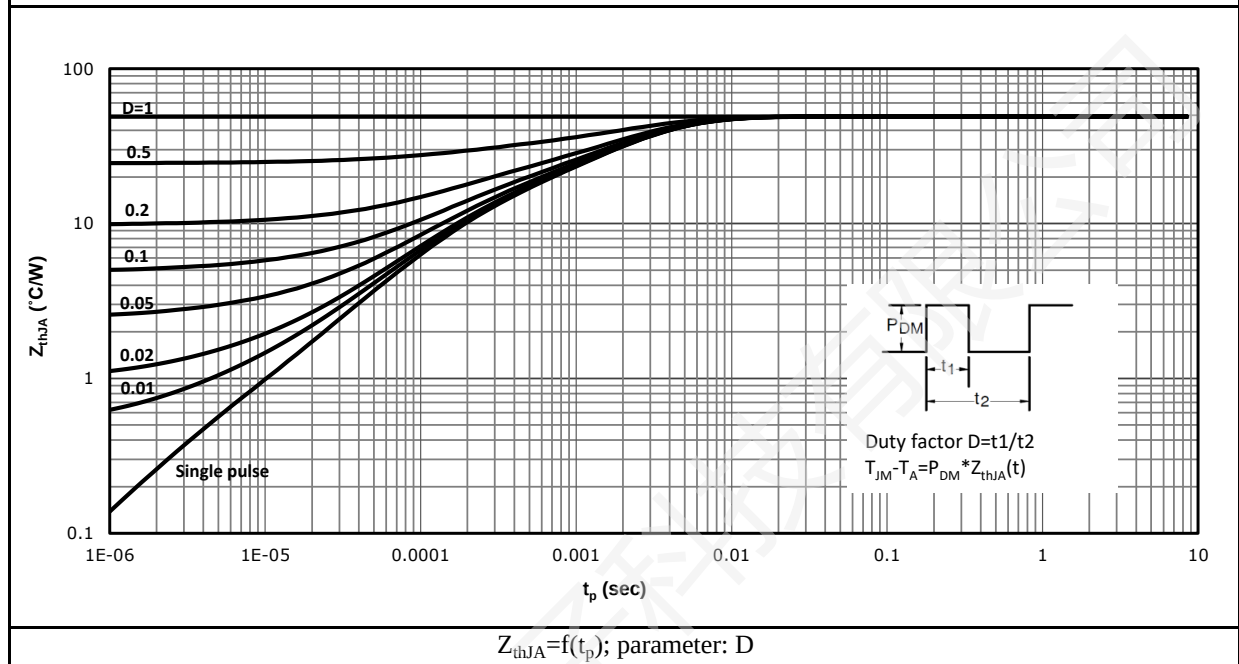
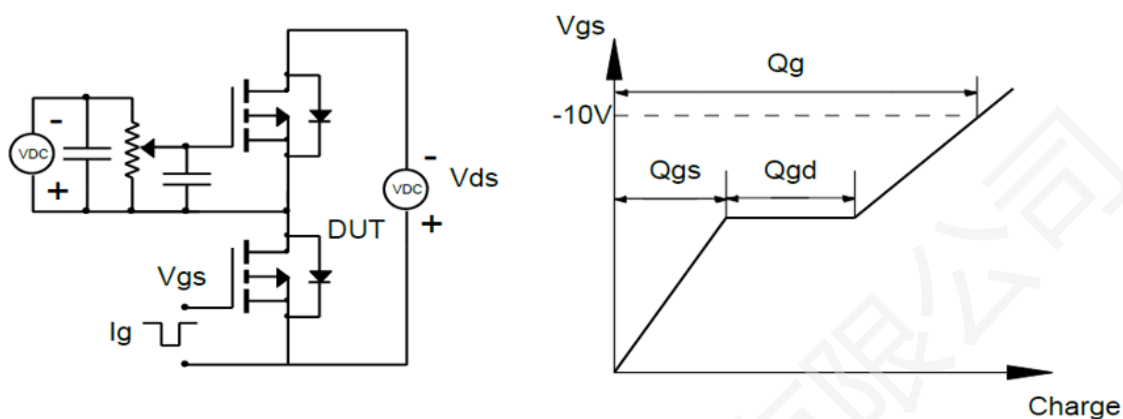
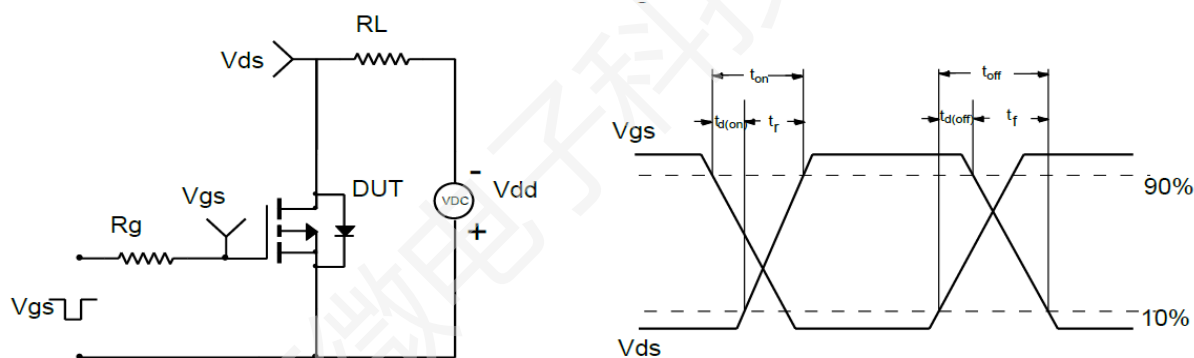
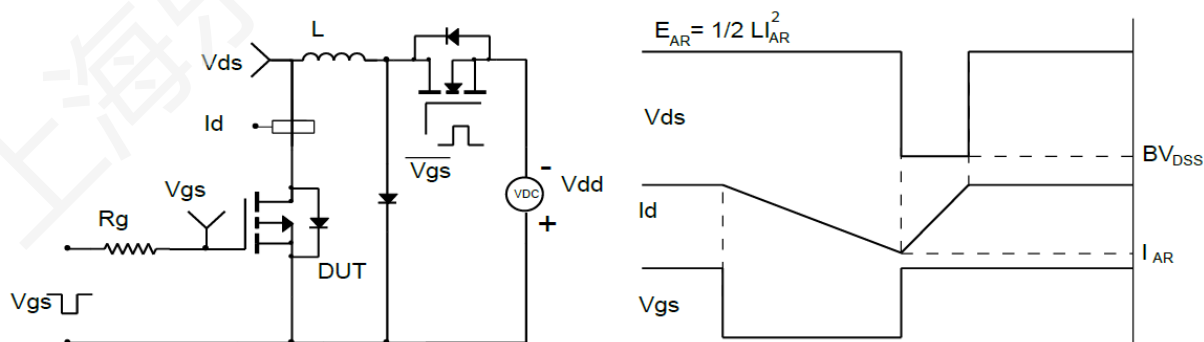
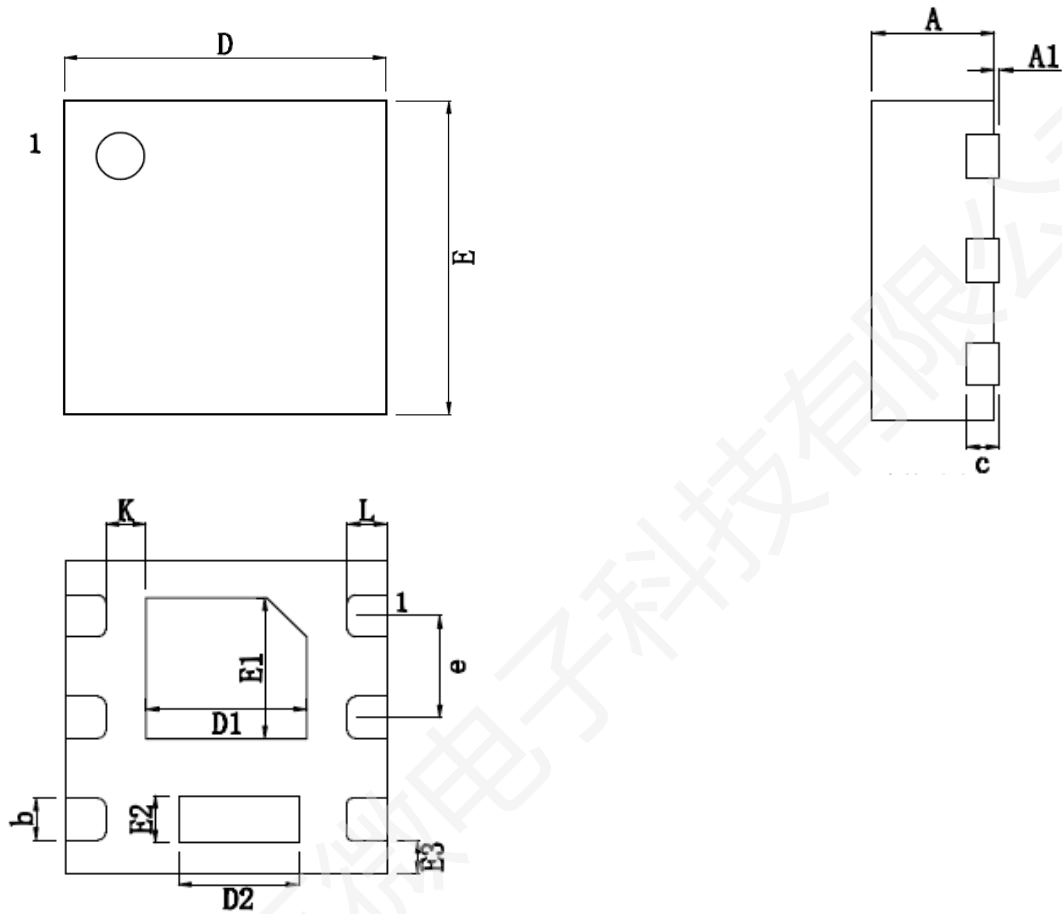


Figure 13: Max. Transient Thermal Impedance


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:


SYMBOL	MILIMETER		
	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	—	0.05
b	0.22	0.29	0.35
c	0.203 TYP		
D	1.95	2.00	2.05
D1	0.90	1.00	1.10
D2	0.55	0.70	0.85
E	1.95	2.00	2.05
E1	0.80	0.90	1.00
E2	0.25	0.30	0.35
E3	0.215 REF		
e	0.65 BSC		
K	0.25 REF		
L	0.20	0.25	0.30

Revision History:

Revison	Date	Descriptions
Rev 1.0	July.2025	Initial Version

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