

• General Description

The AGM30P25AP combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.

This device is ideal for load switch and battery protection applications.

• Features

- Advance high cell density Trench technology
- Low $R_{DS(ON)}$ to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance
- 100% Avalanche tested
- 100% DVDS tested

• Application

- MB/VGA Vcore
- SMPS 2nd Synchronous Rectifier
- POL application
- BLDC Motor driver

Product Summary

BVDSS	RDSON	ID
-30V	20mΩ	-10A

PDFN3.3*3.3 Pin Configuration

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM30P25AP	AGM30P25AP	PDFN3.3*3.3	330mm	12mm	5000

Table 1. Absolute Maximum Ratings (TA=25°C)

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	-30	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25°C) (Note 1)	-10	A
	Drain Current-Continuous(Tc=100°C)	-6.7	A
IDM (pluse)	Drain Current-Pulsed (Note 2)	-40	A
PD	Maximum Power Dissipation(Tc=25°C)	28	w
	Maximum Power Dissipation(Tc=100°C)	11	w
EAS	Avalanche energy (Note 3)	56	mJ
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 150	°C

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
RθJA	Thermal Resistance Junction-ambient (Steady State) ¹	---	50	°C/W
RθJC	Thermal Resistance Junction-Case ¹	---	4.4	°C/W

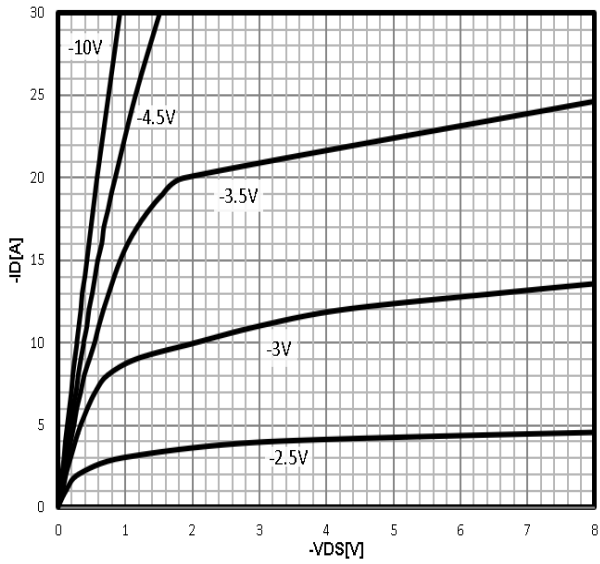
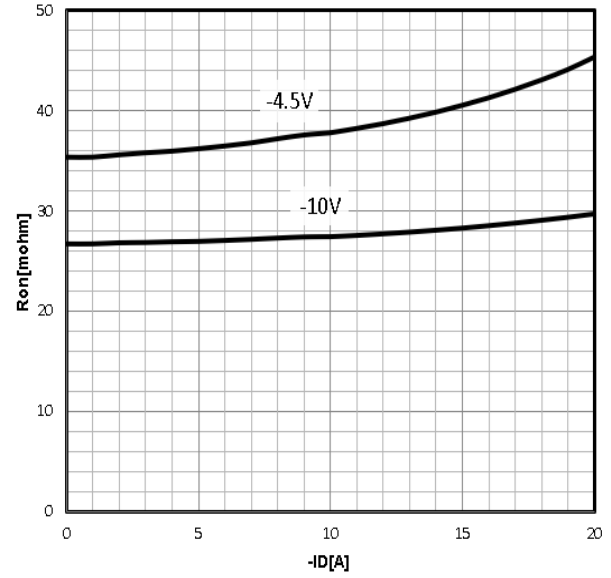
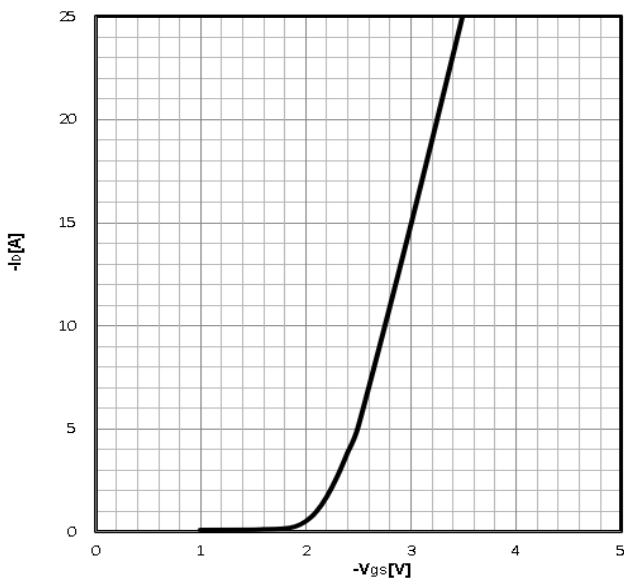
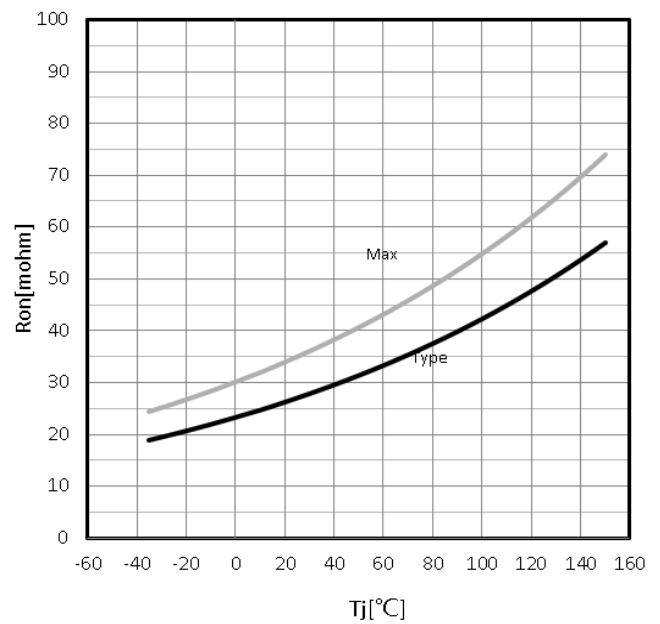
Table 2. P-Channel Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-30	--	--	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =-30V, V _{GS} =0V	--	--	-1	μA
IGSS	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-1.2	-1.5	-2.2	V
g _{FS}	Forward Transconductance	V _{DS} =-10V, I _D =-4A	--	6	--	S
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D =-5A	--	20	28	mΩ
		V _{GS} =-4.5V, I _D =-4A	--	30	40	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, F=1MHZ	--	681	--	pF
C _{oss}	Output Capacitance		--	102	--	pF
C _{rss}	Reverse Transfer Capacitance		--	89	--	pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1.0MHz	--	11.2	--	Ω
Switching Times						
t _{d(on)}	Turn-on Delay Time	V _{GS} =-10V, V _{DS} =-15V, I _D =-4A, R _{GEN} =3Ω, R _L =3.6Ω	--	8.0	--	nS
t _r	Turn-on Rise Time		--	4.0	--	nS
t _{d(off)}	Turn-Off Delay Time		--	26	--	nS
t _f	Turn-Off Fall Time		--	12.5	--	nS
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-15V, I _D =-1A	--	14	--	nC
Q _{gs}	Gate-Source Charge		--	1.3	--	nC
Q _{gd}	Gate-Drain Charge		--	3.0	--	nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current(Body Diode)		--	--	-10	A
V _{SD}	Forward on Voltage	V _{GS} =0V, I _S =-5A	--	--	-1.2	V
t _{rr}	Reverse Recovery Time	I _F =-5A, dI/dt=100A/μs, T _J =25°C	--	--	--	ns
Q _{rr}	Reverse Recovery Charge		--	--	--	nc

Notes 1. The maximum current rating is package limited.

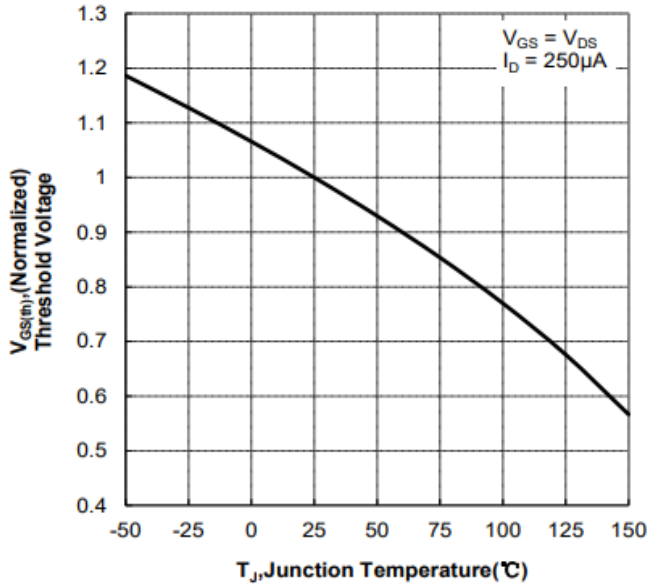
Notes 2. Repetitive Rating: Pulse width limited by maximum junction temperature Notes

3. EAS condition: T_J=25°C, V_{DD}=-15V, V_{GS}=-10V, I_D=-15A, L=0.5mH, R_G=25ohm

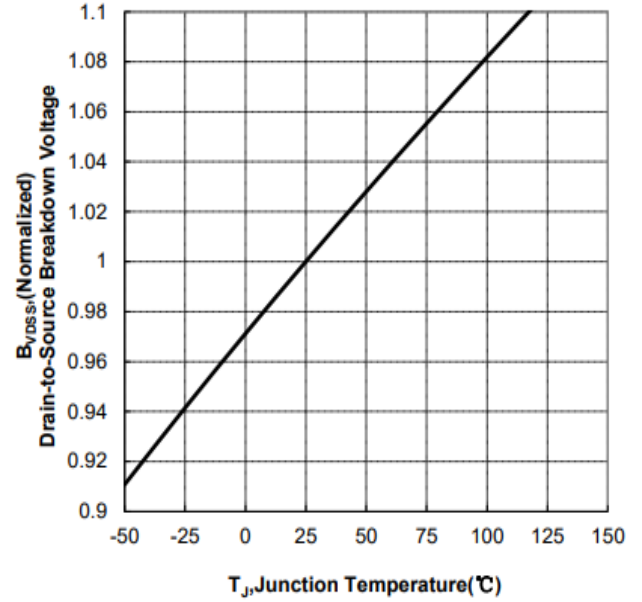
Characteristics Curve:
Typ. output characteristics
 $I_D = f(V_{DS})$

Typ. drain-source on resistance
 $R_{DS(on)} = f(I_D)$

Typ. transfer characteristics
 $I_D = f(V_{GS})$

Drain-source on-state resistance
 $R_{DS(on)} = f(T_j); I_D = -5A; V_{GS} = -10V$


Gate Threshold Voltage

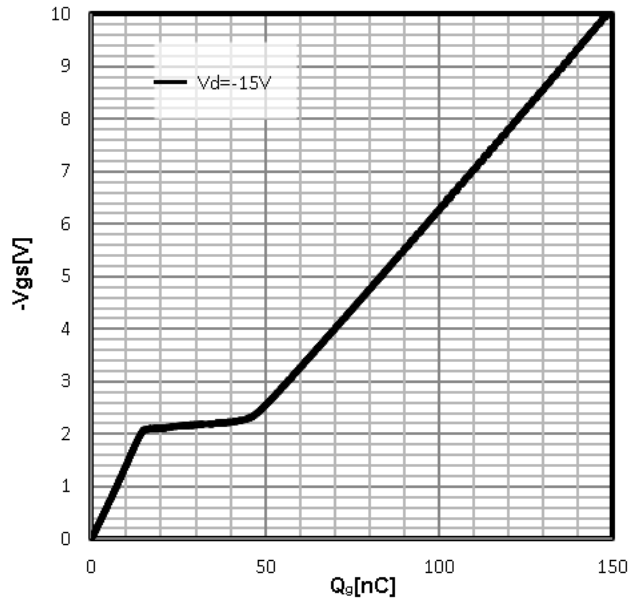
$$-V_{TH} = f(T_j); I_D = -250\mu A$$


Drain-source breakdown voltage

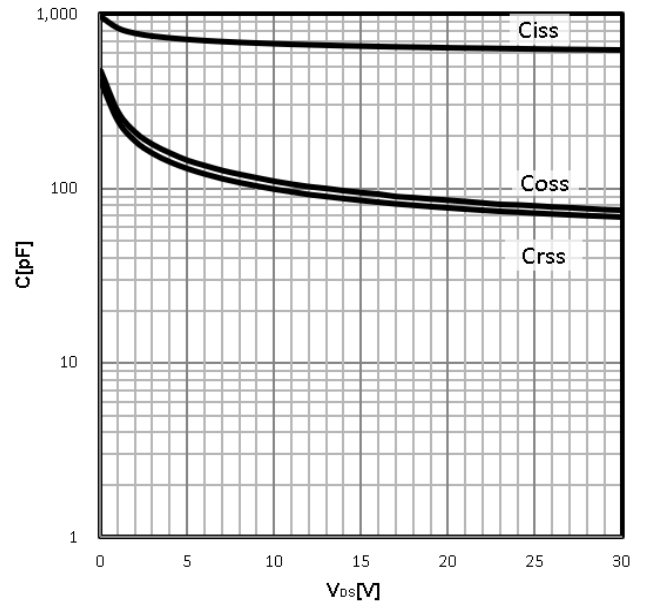
$$V_{BR(DSS)} = f(T_j); I_D = -250\mu A$$


Typ. gate charge

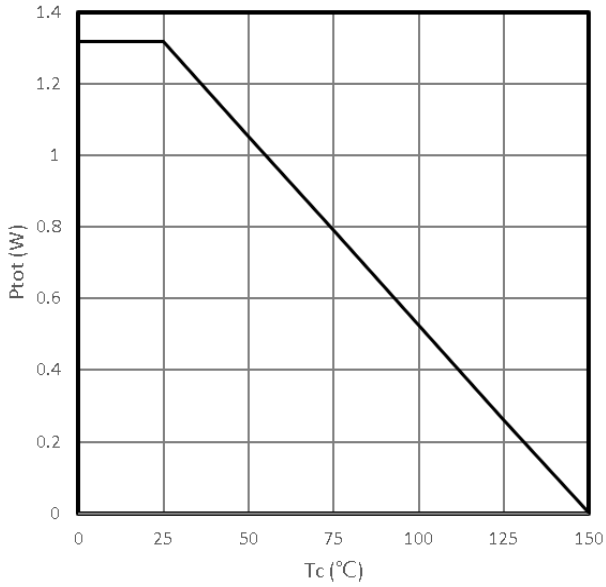
$$V_{GS} = f(Q_{gate}); I_D = -1A$$


Typ. capacitances

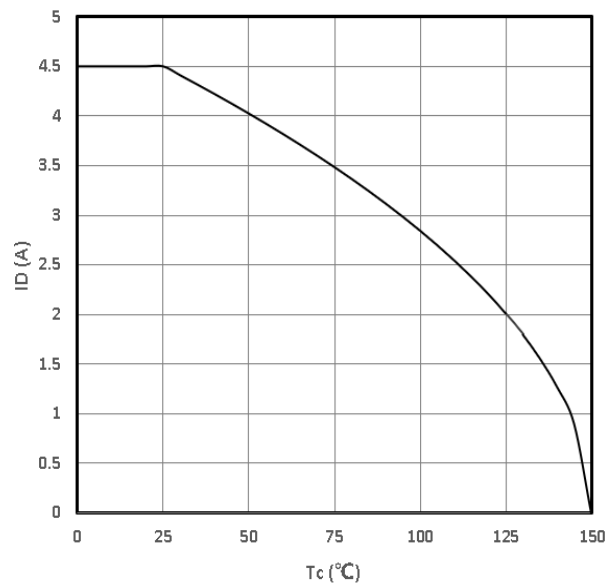
$$C = f(V_{DS}); V_{GS} = 0V; f = 1MHz$$



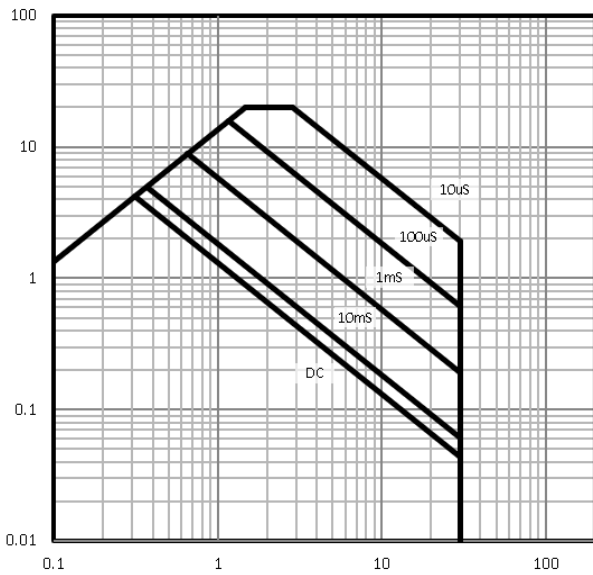
Power Dissipation
 $P_{tot}=f(T_C)$



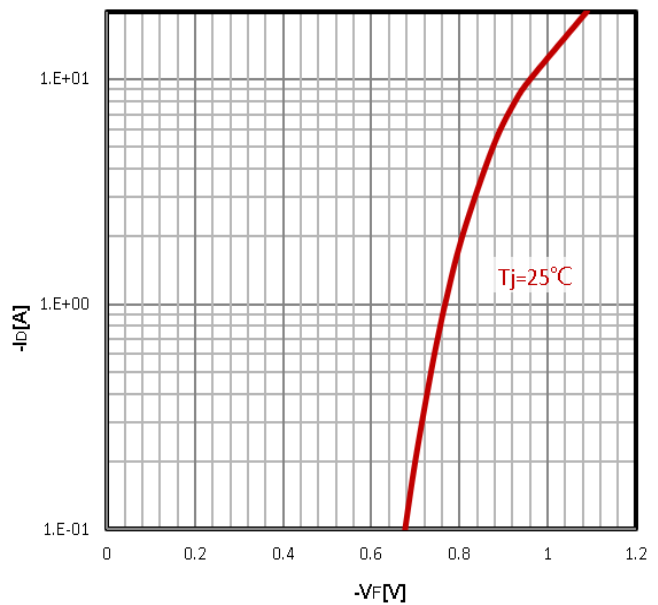
Maximum Drain Current
 $-I_D=f(T_C)$



Safe operating area
 $-I_D=f(-V_{DS})$

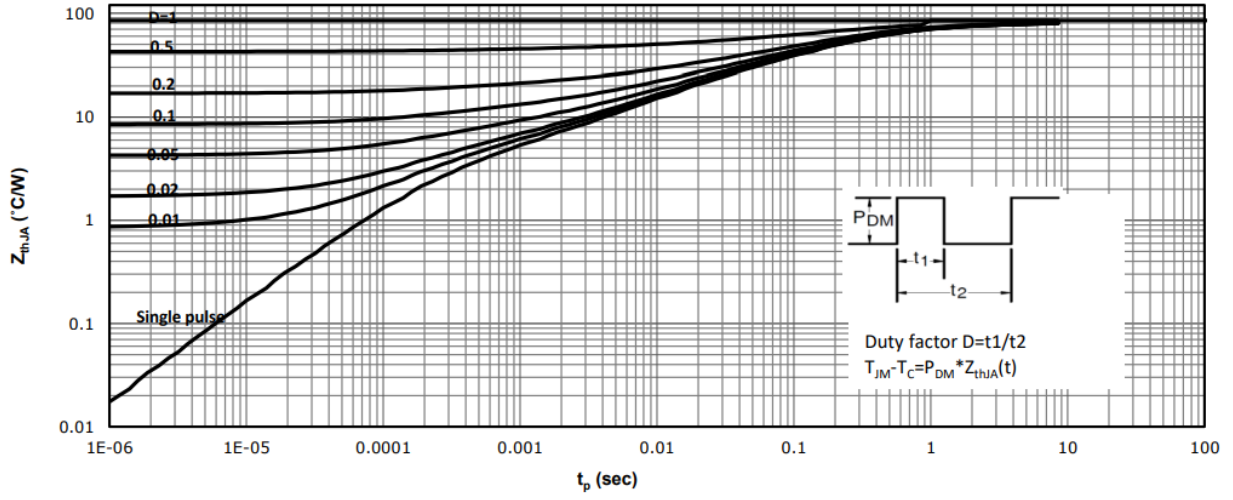


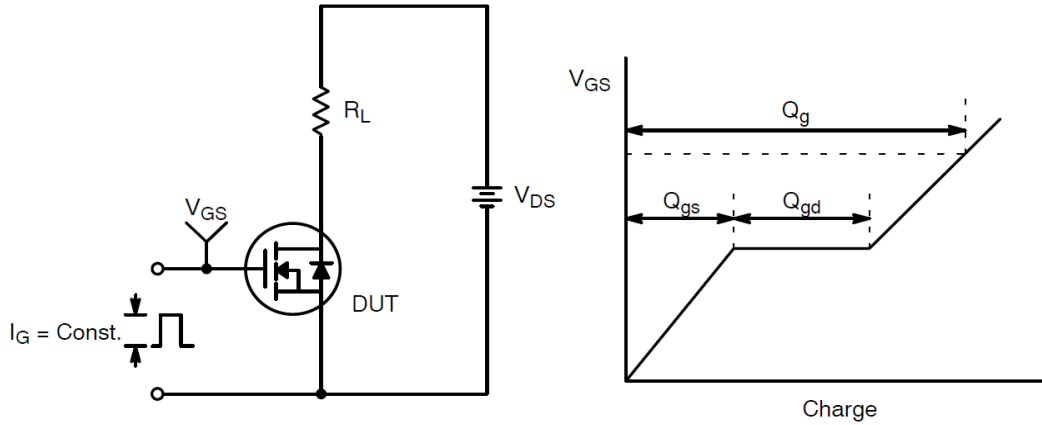
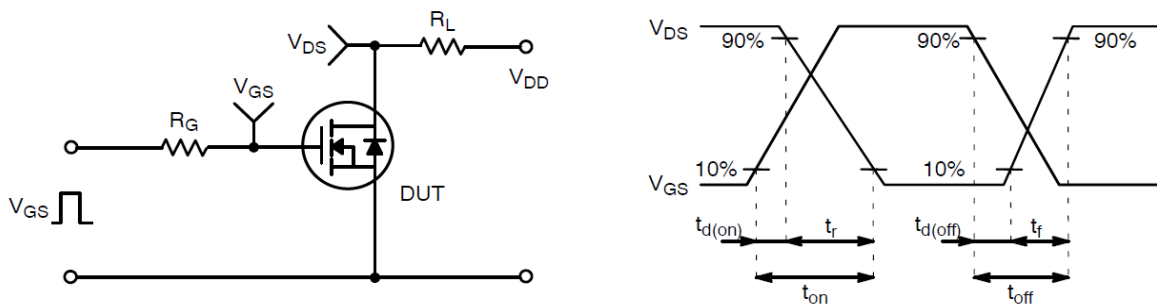
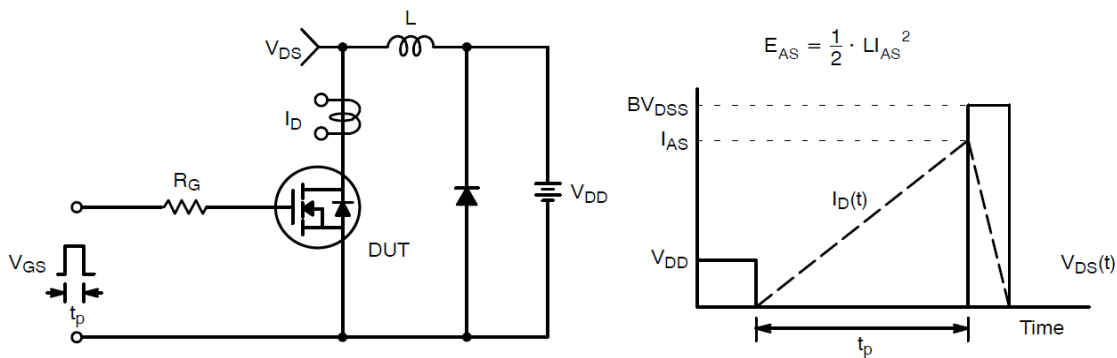
Body Diode Forward Voltage Variation
 $-I_F=f(-V_{DS})$

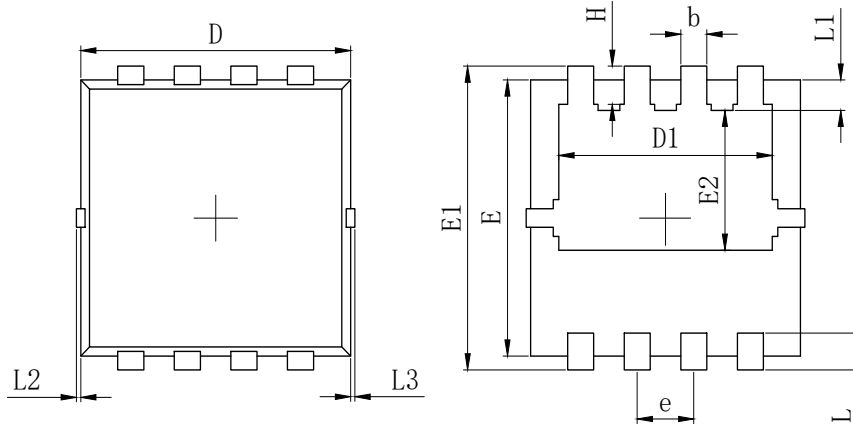


Max. transient thermal impedance

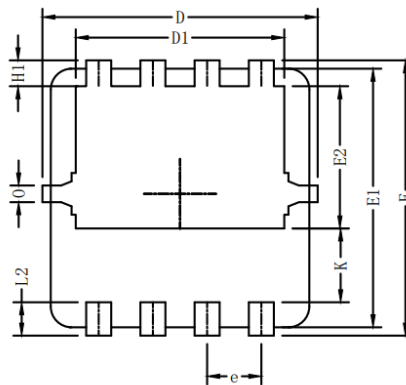
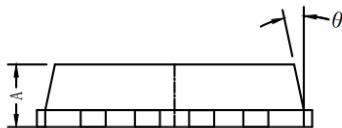
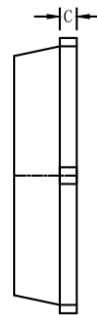
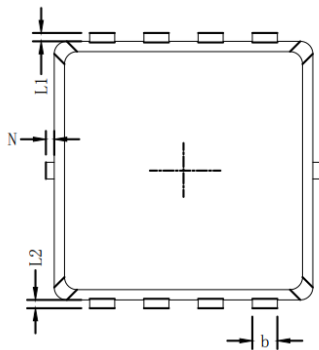
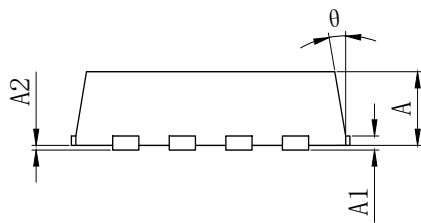
$$Z_{thJC} = f(t_p)$$



Test Circuit and Waveform:

Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveforms

Unclamped Inductive Switching Test Circuit & Waveforms

•Dimensions (PDFN3.3×3.3)


SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	0.700	0.800	0.900
A1	0.152 REF.		
A2	0°0.05		
D	3.000	3.100	3.200
D1	2.300	2.450	2.600
E	2.900	3.000	3.100
E1	3.150	3.300	3.450
E2	1.320	1.520	1.720
b	0.200	0.300	0.400
e	0.550	0.650	0.750
L	0.300	0.400	0.500
L1	0.180	0.330	0.480
L2	0°0.100		
L3	0°0.100		
H	0.315	0.415	0.515
θ	8°	10°	12°



Symbols	Millimeters		
	MIN.	NOM.	MAX.
A	0.65	0.75	0.85
b	0.25	0.30	0.35
C	0.15	0.20	0.25
D	3.00	3.10	3.20
D1	2.40	2.50	2.60
E	3.20	3.30	3.40
E1	3.00	3.10	3.20
E2	1.60	1.70	1.80
e	0.65 BSC.		
H1	0.21	0.31	0.41
H2	0.30	0.40	0.50
K	0.78	0.88	0.98
L1/L2	0.10 REF.		
θ	11°	12°	13°
N	0	-	0.15
0	0.2 REF.		


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