

### ● General Description

The AGM206MAP 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

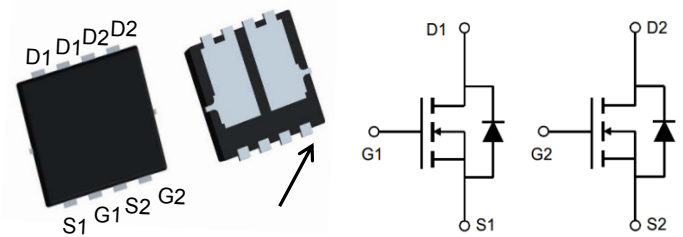
### ● Application

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

### Product Summary

BVDSS	RDSON	ID
20V	4.5mΩ	25A

### PDFN3\*3 Pin Configuration



### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AAGM206MAP	AGM206MAP	PDFN3*3	----	----	5000

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

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	20	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25°C) <b>(Note 1)</b>	25	A
	Drain Current-Continuous(Tc=100°C)	--	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed <b>(Note 2)</b>	64	A
PD	Maximum Power Dissipation(Tc=25°C)	3.0	w
	Maximum Power Dissipation(Tc=100°C)	1.2	w
EAS	Avalanche energy <b>(Note 3)</b>	32	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) <sup>1</sup>	---	42	°C/W
RθJC	Thermal Resistance Junction-Case <sup>1</sup>	---	--	°C/W

**Table 3. Electrical Characteristics (TA=25°C unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>On/Off States</b>						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	20	22	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=20V, VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V, VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=250μA	0.6	0.8	1.2	V
gFS	Forward Transconductance	VDS=5V, ID=10A	--	30	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=4.5V, ID=10A	--	4.5	7.0	mΩ
		VGS=2.5V, ID=5.5A	--	5.0	8.5	mΩ
<b>Dynamic Characteristics</b>						
Ciss	Input Capacitance	VDS=10V, VGS=0V, F=1MHZ	--	1310	--	pF
Coss	Output Capacitance		--	232	--	pF
Crss	Reverse Transfer Capacitance		--	200	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V, f=1.0MHz	--	--	--	Ω
<b>Switching Times</b>						
td(on)	Turn-on Delay Time	VGS=10V, VDS=10V, RL=1Ω, RGEN=3Ω	--	2.5	--	nS
tr	Turn-on Rise Time		--	7.2	--	nS
td(off)	Turn-Off Delay Time		--	49	--	nS
tf	Turn-Off Fall Time		--	10.8	--	nS
Qg	Total Gate Charge	VGS=4.5V, VDS=10V, ID=10A	--	17.5	--	nC
Qgs	Gate-Source Charge		--	1.5	--	nC
Qgd	Gate-Drain Charge		--	4.5	--	nC
<b>Source-Drain Diode Characteristics</b>						
ISD	Source-Drain Current(Body Diode)		--	--	25	A
VSD	Forward on Voltage	VGS=0V, IS=10A	--	--	1.2	V
trr	Reverse Recovery Time	IF=10A , dI/dt=100A/μs , TJ=25°C	--	--	--	ns
Qrr	Reverse Recovery Charge		--	--	--	nc

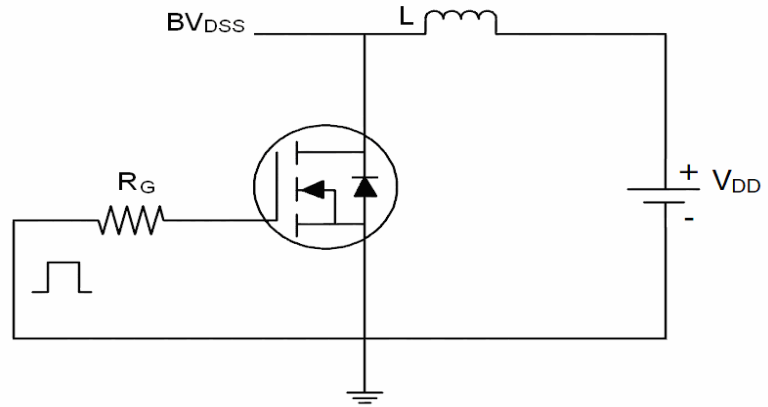
Notes 1.The maximum current rating is package limited.

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

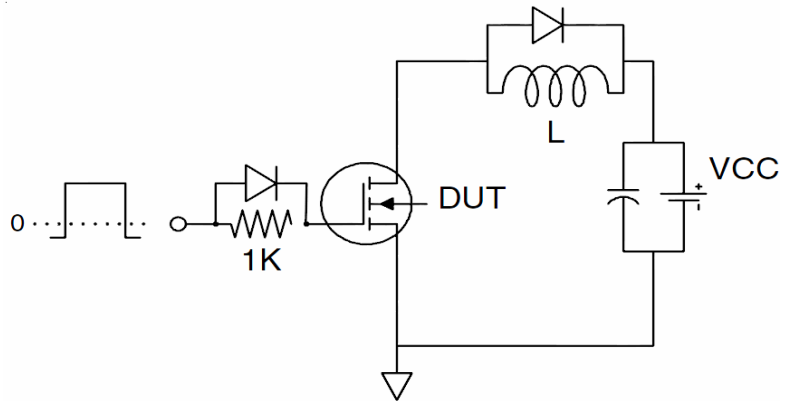
Notes 3.EAS condition: TJ=25°C

## Test Circuit

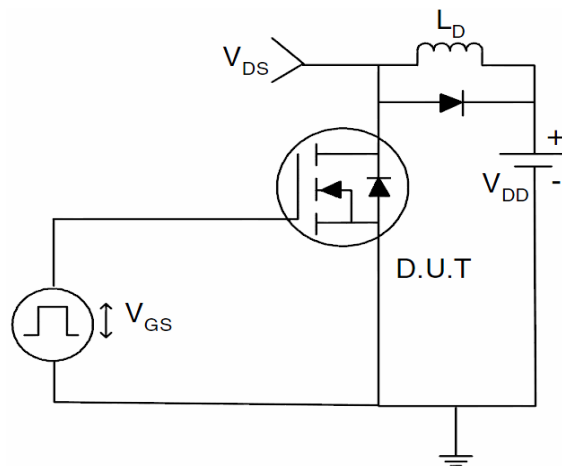
### 1) $E_{AS}$ test Circuits



### 2) Gate charge test Circuit



### 3) Switch Time Test Circuit



Typical Electrical and Thermal Characteristics

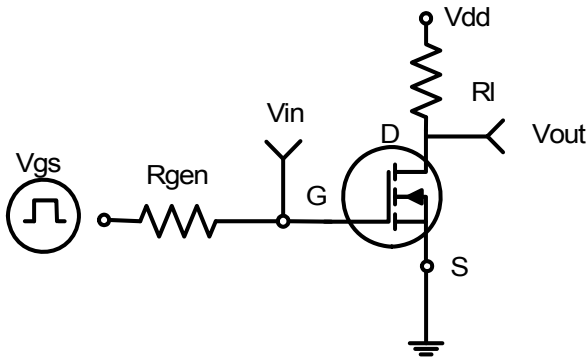


Figure 1: Switching Test Circuit

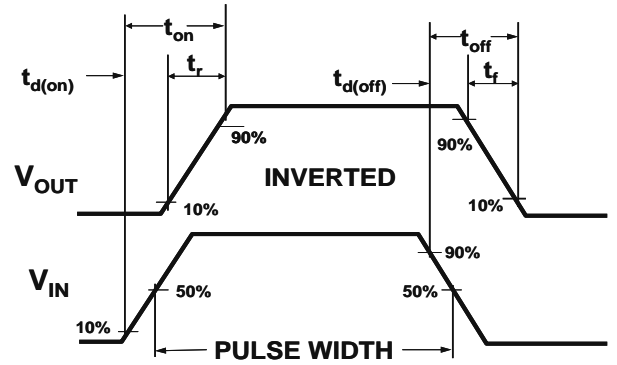
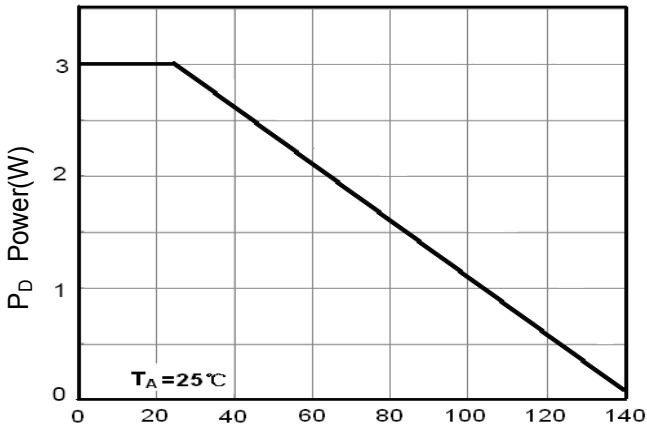
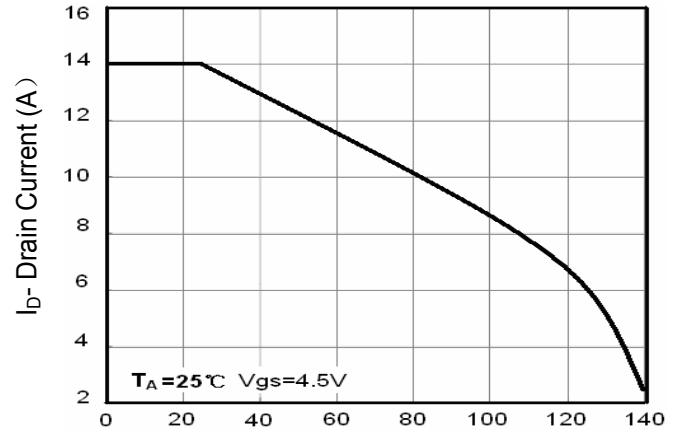


Figure 2: Switching Waveforms



T<sub>J</sub>-Junction Temperature(°C)  
Figure 3 Power Dissipation



T<sub>J</sub>-Junction Temperature(°C)  
Figure 4 Drain Current

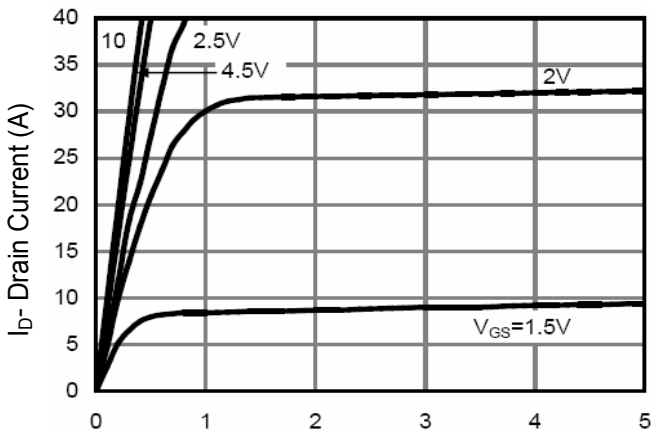


Figure 5 Output Characteristics

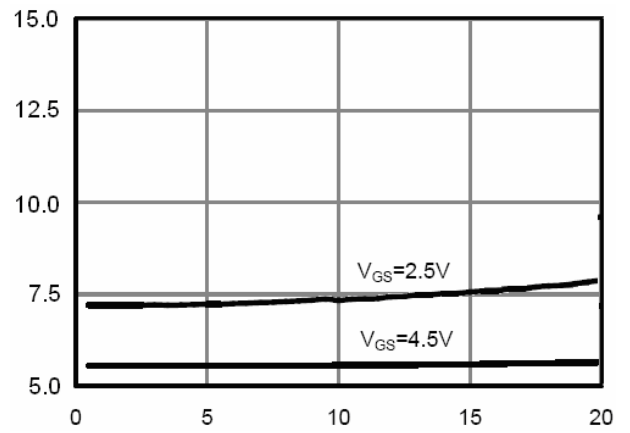
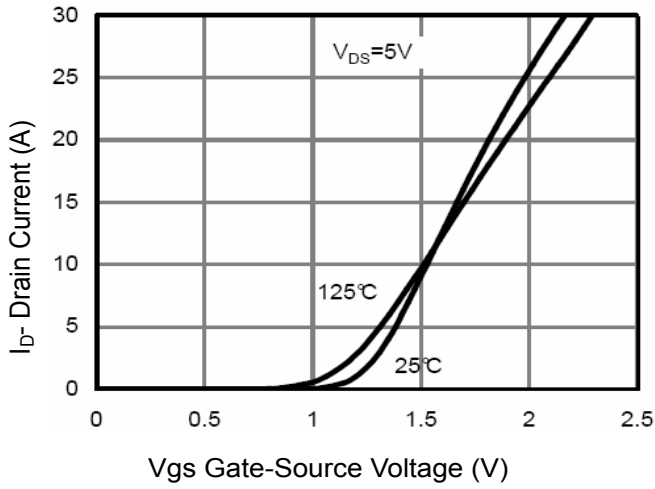
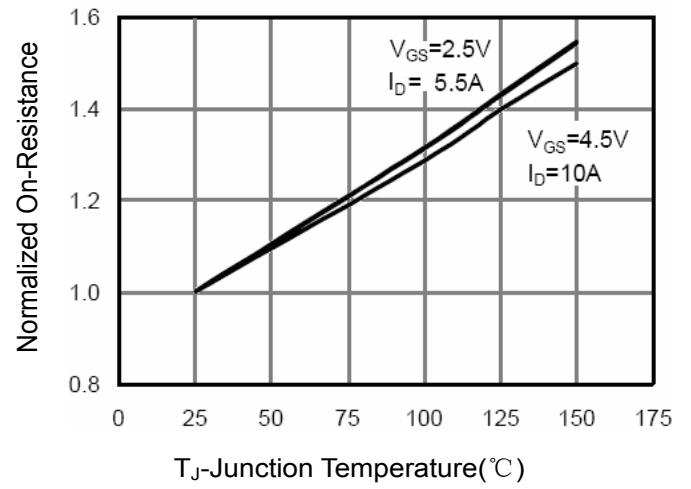
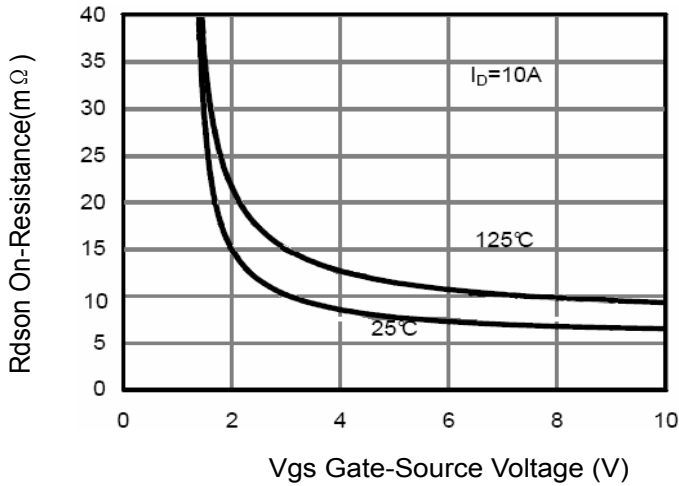
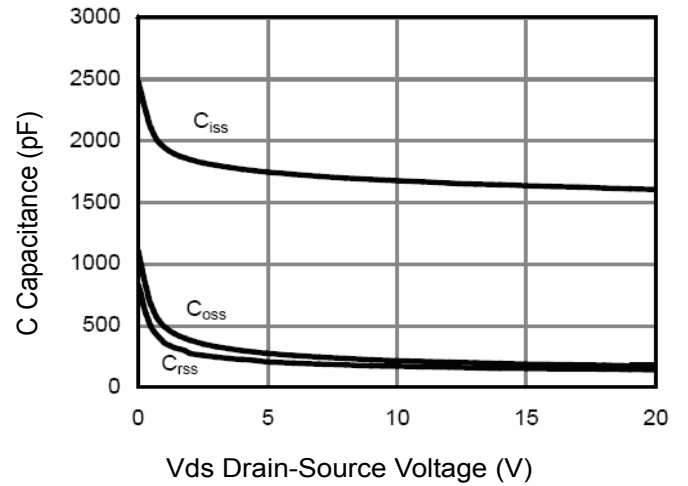
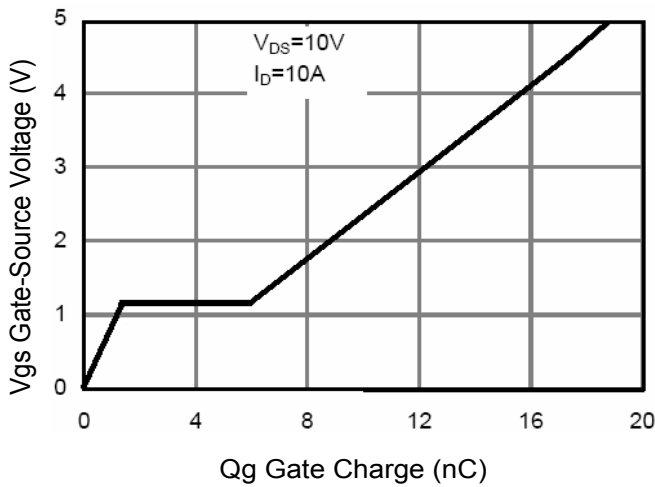
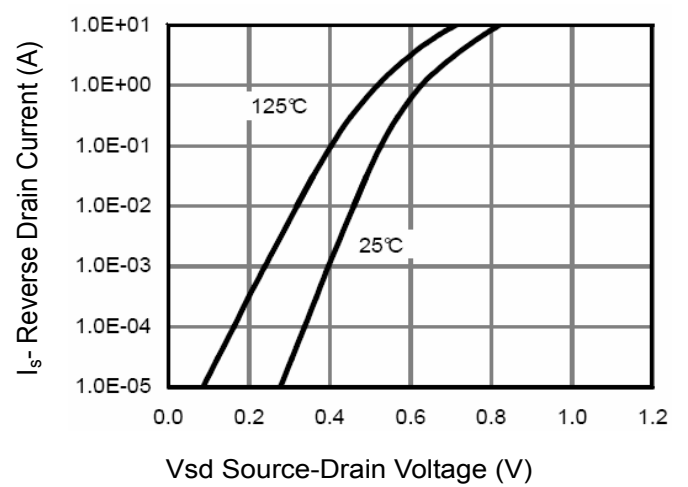


Figure 6 Drain-Source On-Resistance


**Figure 7 Transfer Characteristics**

**Figure 8 Drain-Source On-Resistance**

**Figure 9 Rdson vs Vgs**

**Figure 10 Capacitance vs Vds**

**Figure 11 Gate Charge**

**Figure 12 Source- Drain Diode Forward**

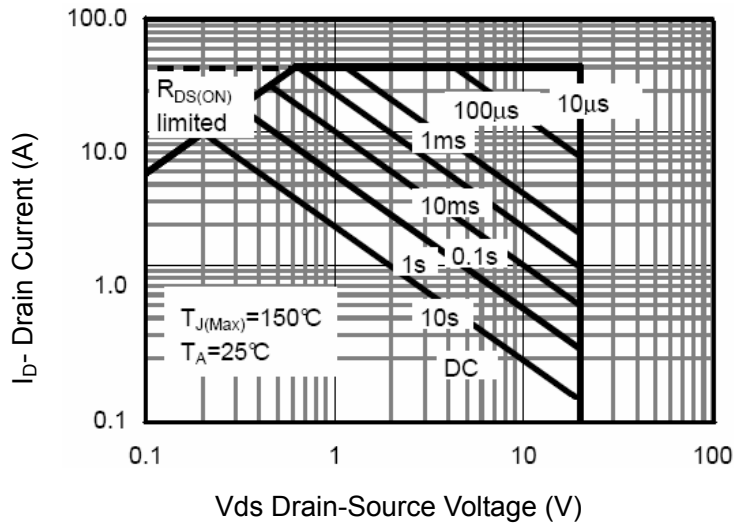


Figure 13 Safe Operation Area

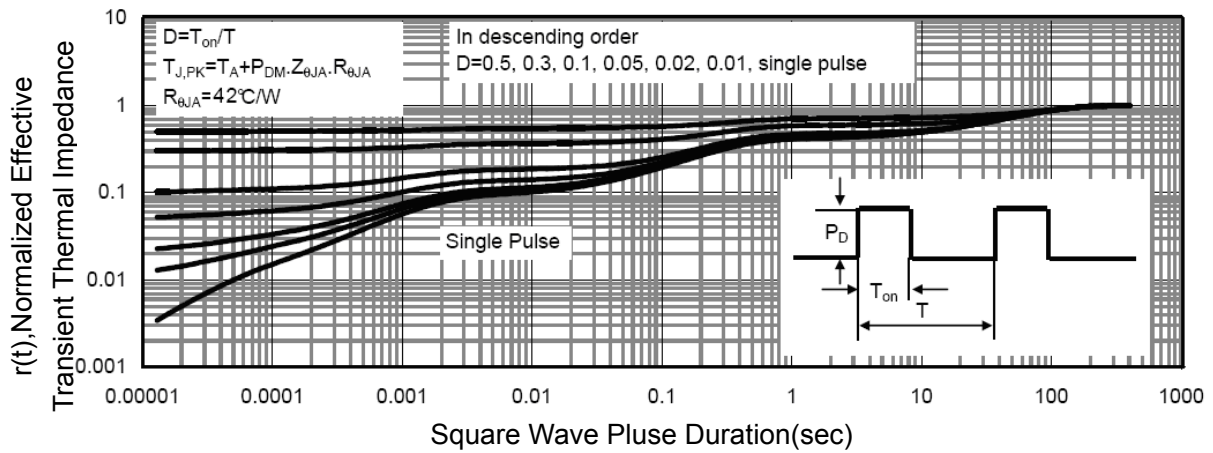
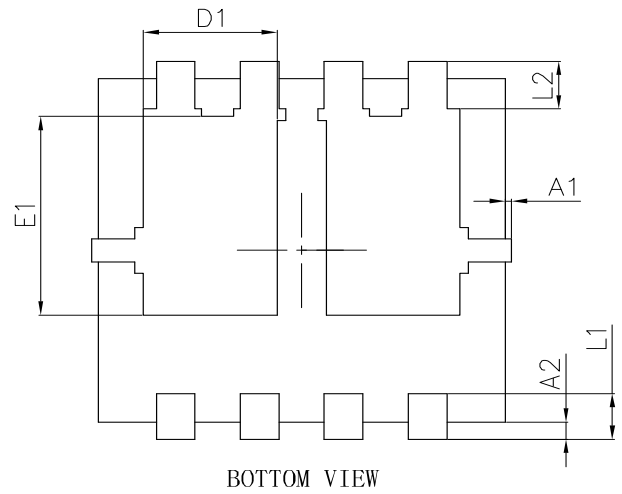
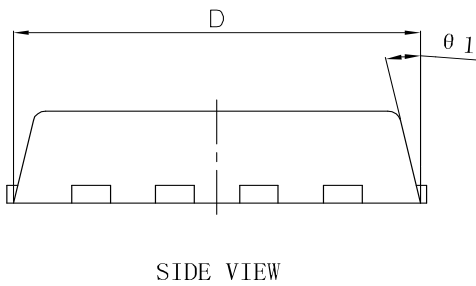
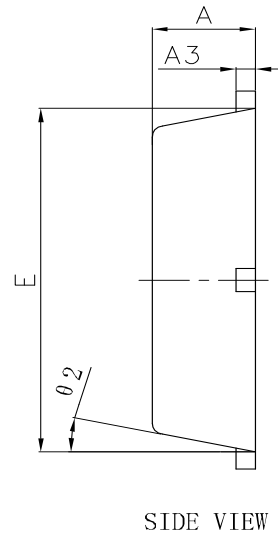
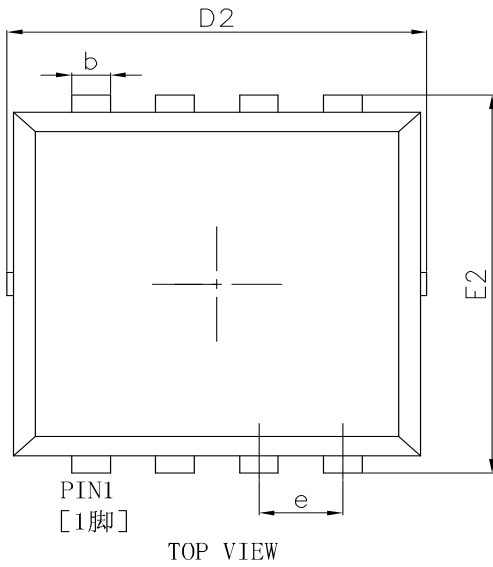


Figure 14 Normalized Maximum Transient Thermal Impedance

**●Dimensions (PDFN3.3×3.3)**


SYMBOL.	MILLIMETER		
	MIN	NOM	MAX
A	0.750	0.800	0.850
A1	0.000	0.050	0.100
A2	0.100	0.150	0.200
A3	0.152REF.		
D	3.050	3.150	3.250
D1	0.935	1.035	1.135
D2	3.200	3.300	3.400
E	2.900	3.000	3.100
E1	1.635	1.735	1.835
E2	3.150	3.250	3.350
b	0.200	0.300	0.400
e	0.625	0.650	0.675
L1	0.350	0.400	0.450
L2	0.365	0.415	0.465
$\theta 1$	10°	12°	14°
$\theta 2$	10°	12°	14°


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