

### • General Description

The AGM305A 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 2<sup>nd</sup> Synchronous Rectifier
- POL application
- BLDC Motor driver

### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM305A	AGM305A	PDFN5*6	330mm	12mm	3000

**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) <b>(Note 1)</b>	80	A
	Drain Current-Continuous(Tc=100°C)	60	A
IDM (pulse)	Drain Current-Continuous@ Current-Pulsed <b>(Note 2)</b>	320	A
PD	Maximum Power Dissipation(Tc=25°C)	70	w
	Maximum Power Dissipation(Tc=100°C)	28	w
EAS	Avalanche energy <b>(Note 3)</b>	172	mJ
IJ, ISTG	Operating Junction and Storage Temperature Range	-55 To 150	°C

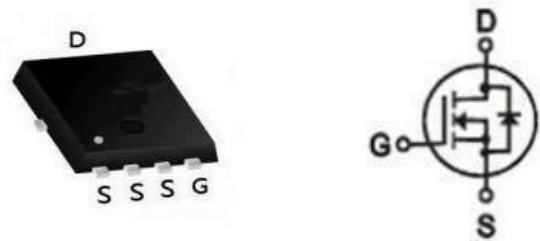
**Table 2. Thermal Characteristic**

Symbol	Parameter	Typ	Max	Unit
RθJA	Thermal Resistance Junction-ambient (Steady State) <sup>1</sup>	---	20	°C/W
RθJC	Thermal Resistance Junction-Case <sup>1</sup>	---	1.8	°C/W

### Product Summary

BVDSS	RDSON	ID
30V	4.5mΩ	80A

### PDFN5\*6 Pin Configuration



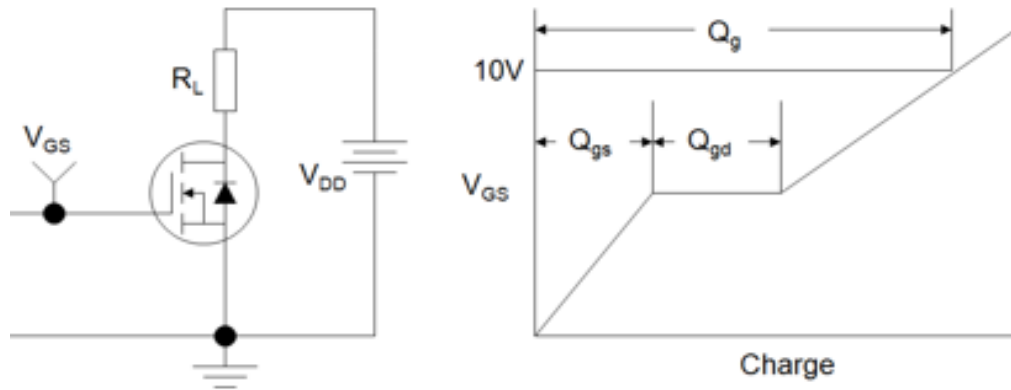
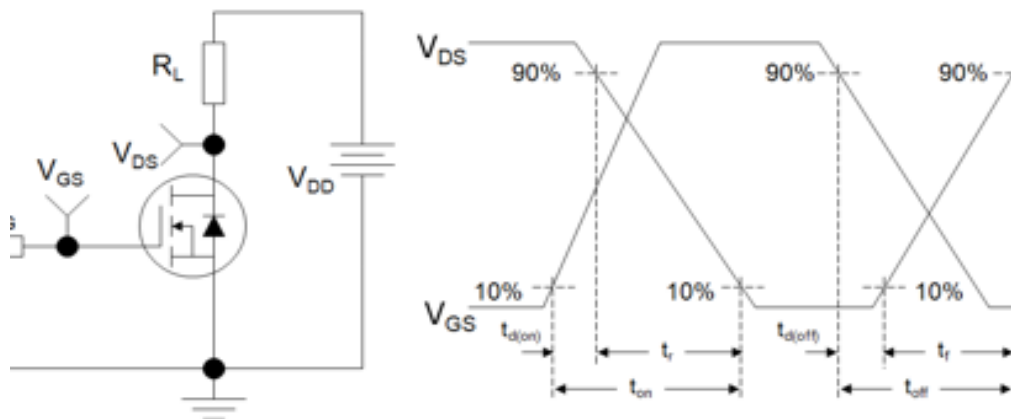
**Table 3. Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>On/Off States</b>						
BVDSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V ID=250μA	30	--	--	V
IDSS	Zero Gate Voltage Drain Current	V <sub>DS</sub> =30V,V <sub>GS</sub> =0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	V <sub>GS</sub> =±20V,V <sub>DS</sub> =0V	--	--	±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> ,ID=250μA	1.0	1.5	2.5	V
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =5V,ID=10A	--	13	--	S
R <sub>DS(on)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =10V, ID=20A	--	4.5	5.4	mΩ
		V <sub>GS</sub> =4.5V, ID=15A	--	5.8	8.2	mΩ
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V,V <sub>GS</sub> =0V, F=1MHZ	--	1240	--	pF
C <sub>oss</sub>	Output Capacitance		--	235	--	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		--	185	--	pF
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V,f=1.0MHz	--	3.7	--	Ω
<b>Switching Times</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>GS</sub> =10V,V <sub>DS</sub> =10V, ID=30A,R <sub>GEN</sub> =2.7Ω, R <sub>L</sub> =1Ω	--	18	--	nS
t <sub>r</sub>	Turn-on Rise Time		--	14	--	nS
t <sub>d(off)</sub>	Turn-Off Delay Time		--	55	--	nS
t <sub>f</sub>	Turn-Off Fall Time		--	8	--	nS
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> =10V, V <sub>DS</sub> =10V, ID=30A	--	27	--	nC
Q <sub>gs</sub>	Gate-Source Charge		--	6.3	--	nC
Q <sub>gd</sub>	Gate-Drain Charge		--	3.6	--	nC
<b>Source-Drain Diode Characteristics</b>						
I <sub>SD</sub>	Source-Drain Current(Body Diode)		--	--	80	A
V <sub>SD</sub>	Forward on Voltage	V <sub>GS</sub> =0V,IS=20A	--	--	1.2	V
t <sub>rr</sub>	Reverse Recovery Time	IF=20A , dI/dt=100A/μs , T <sub>J</sub> =25°C	--	--	--	ns
Q <sub>rr</sub>	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<sub>J</sub>=25°C

**Figure A: Gate Charge Test Circuit and Waveform**

**Figure B: Resistive Switching Test Circuit and Waveform**

**Figure C: Unclamped Inductive Switching Test Circuit and Waveform**


TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure 1. Output Characteristics

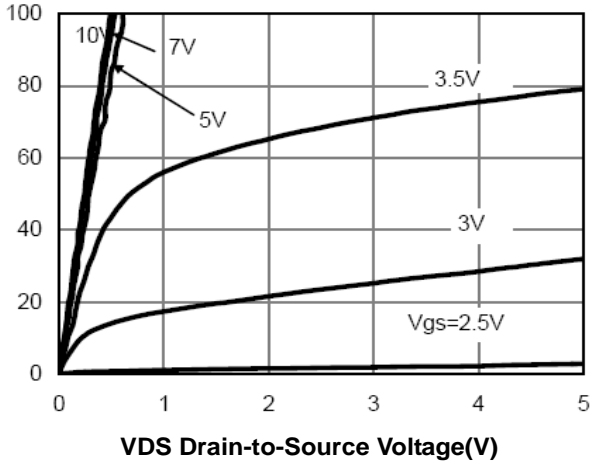


Figure 2. Transfer Characteristics

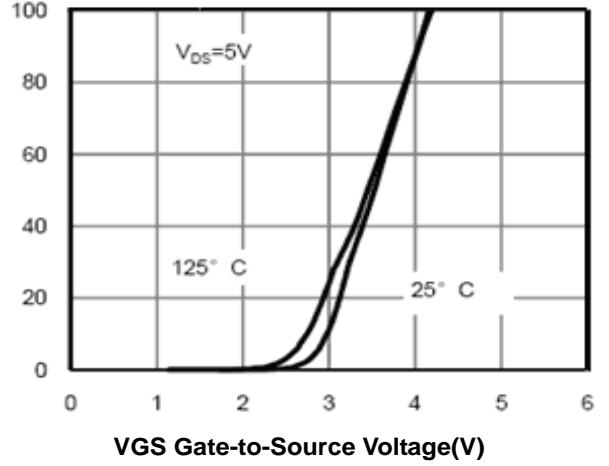


Figure 3. Max BV<sub>DSS</sub> vs Junction Temperature

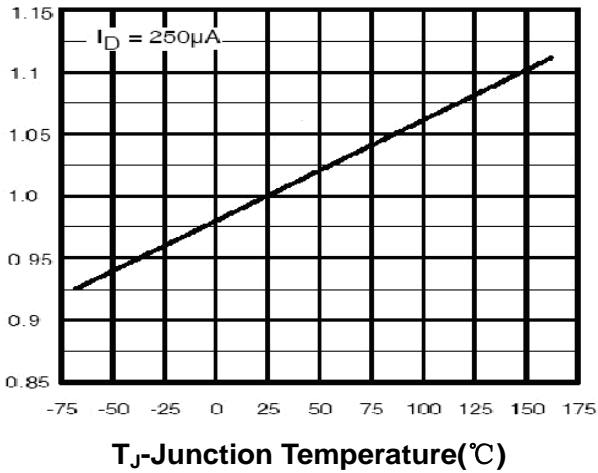


Figure 4. Drain Current

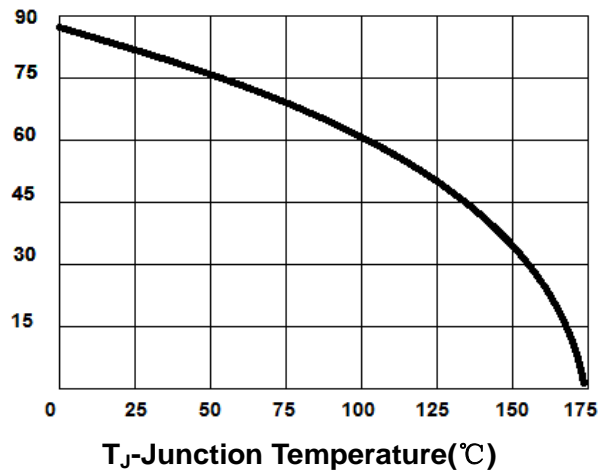


Figure 5. V<sub>GS(th)</sub> vs Junction Temperature

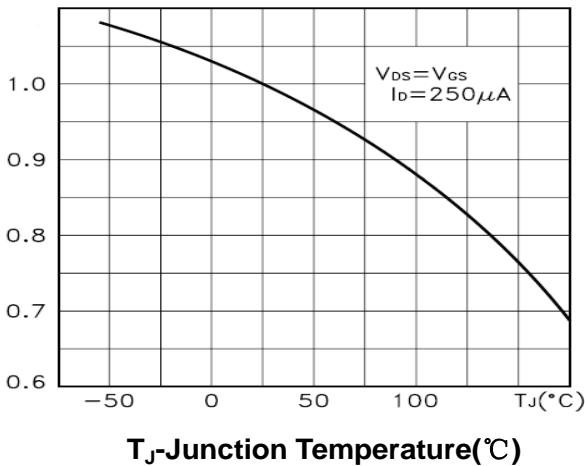


Figure 6. R<sub>DS(ON)</sub> vs Junction Temperature

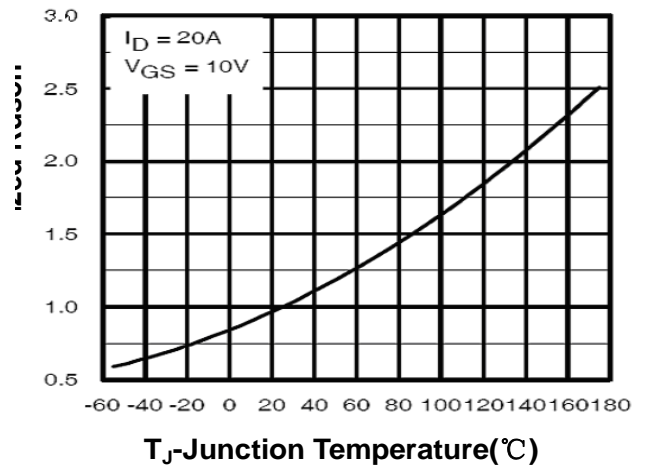


Figure 7. Gate Charge Waveforms

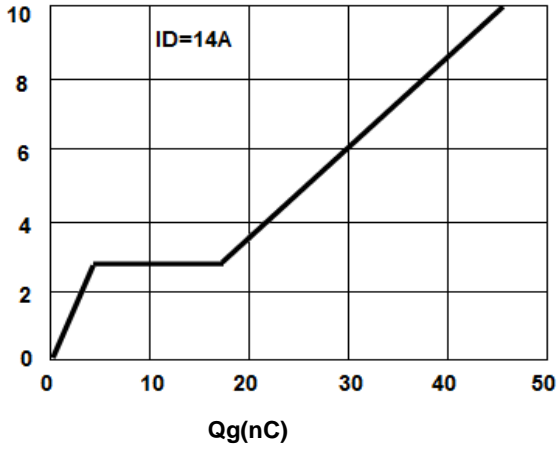


Figure 8. Capacitance

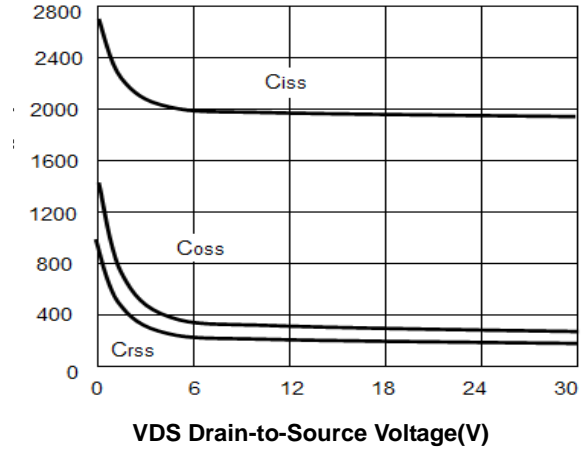


Figure 9. Body-Diode Characteristics

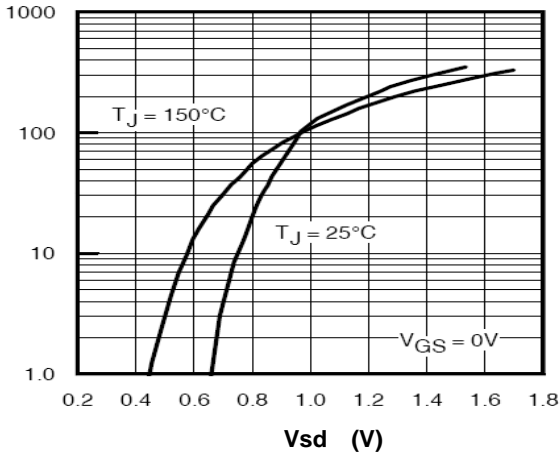


Figure 10. Maximum Safe Operating Area

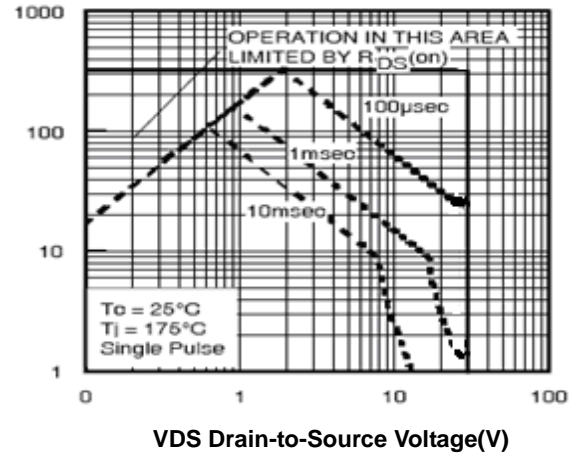
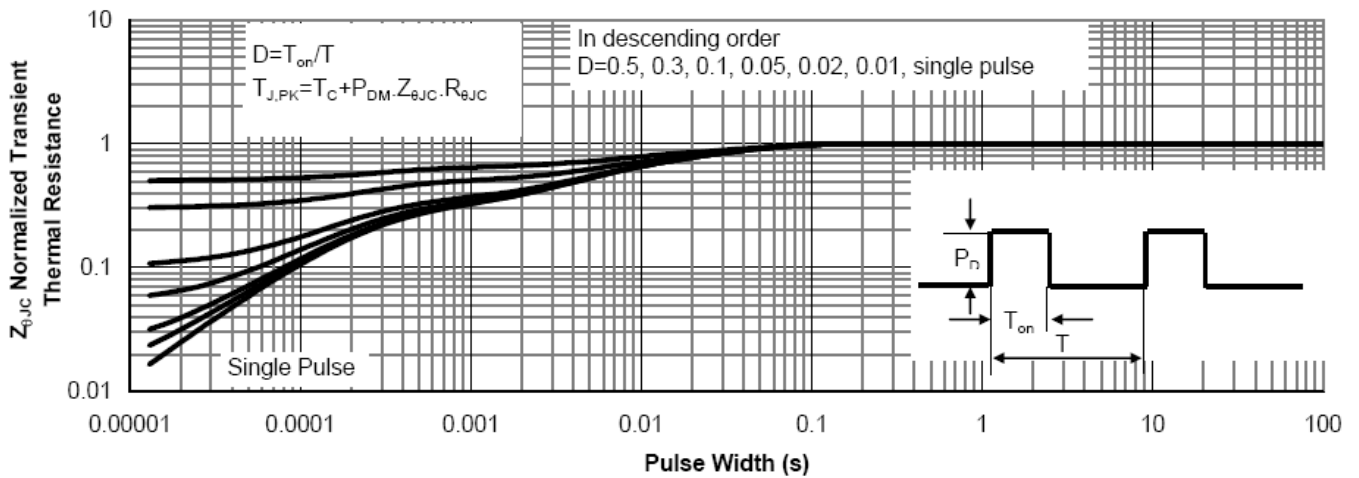
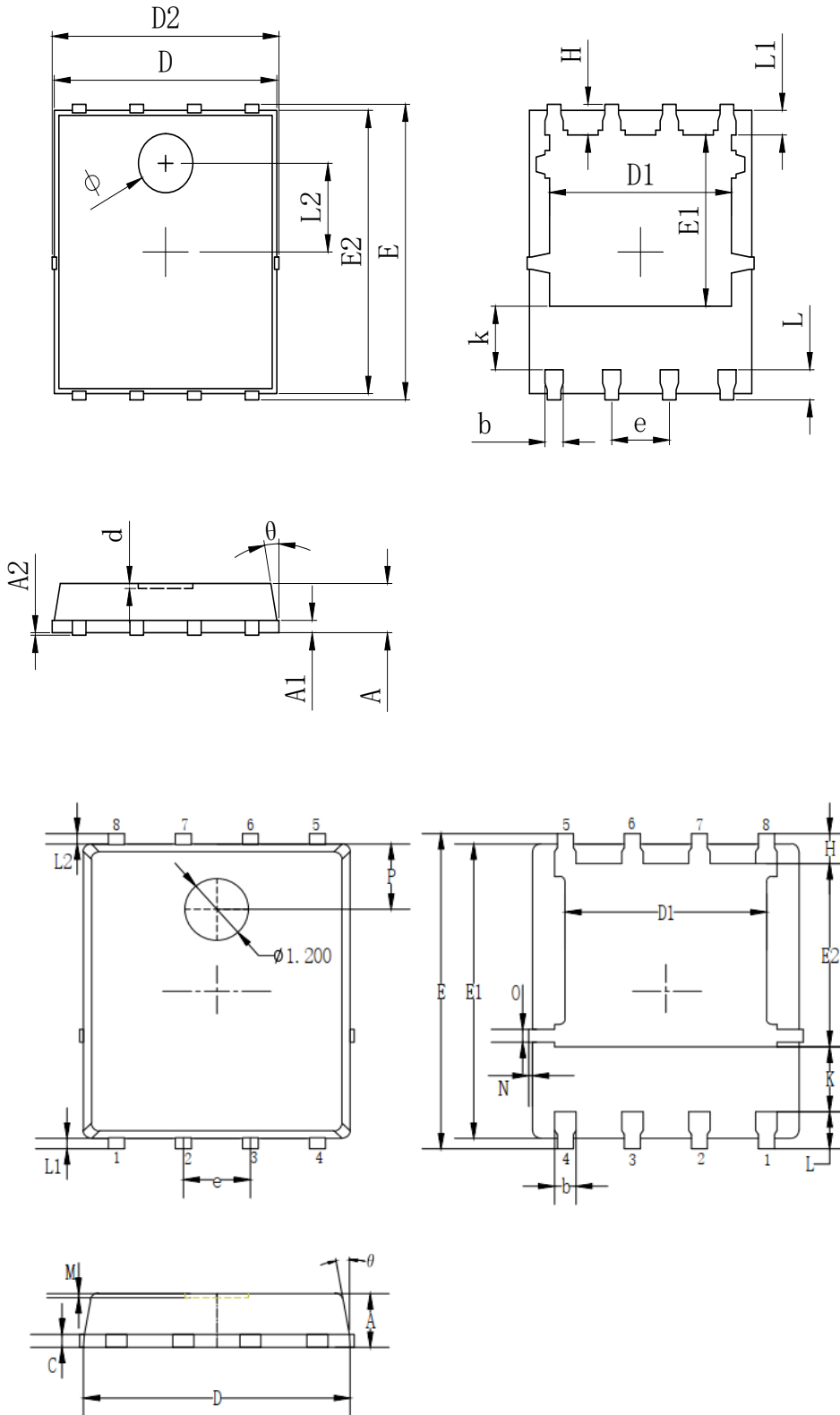


Figure 11. Normalized Maximum Transient Thermal Impedance



**•Dimensions (PDFN5\*6)**


SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	0.900	1.000	1.100
A1	0.254 REF.		
A2	0°0.05		
D	4.824	4.900	4.976
D1	3.910	4.010	4.110
D2	4.924	5.000	5.076
E	5.924	6.000	6.076
E1	3.375	3.475	3.575
E2	5.674	5.750	5.826
b	0.350	0.400	0.450
e	1.270 TYP.		
L	0.534	0.610	0.686
L1	0.424	0.500	0.576
L2	1.800 REF.		
k	1.190	1.290	1.390
H	0.549	0.625	0.701
$\theta$	8°	10°	12°
$\phi$	1.100	1.200	1.300
d			0.100

Symbols	Millimeters		
	MIN.	NOM.	MAX.
A	0.90	1.05	1.20
b	0.35	0.40	0.50
C	0.20	0.25	0.35
D	4.90	5.05	5.20
D1	3.72	3.82	3.92
E	6.00	6.15	6.30
E1	5.60	5.75	5.90
E2	3.47	3.57	3.67
e	1.27 BSC.		
H	0.48	0.58	0.68
K	1.17	1.27	1.37
L	0.64	0.74	0.84
L1/L2	0.20 REF.		
$\theta$	8°	10°	12°
M	0.08 REF.		
N	0	-	0.15
O	0.25 REF.		
P	1.28 REF.		


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