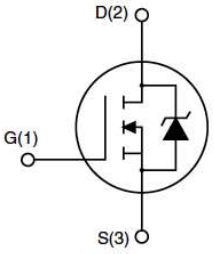
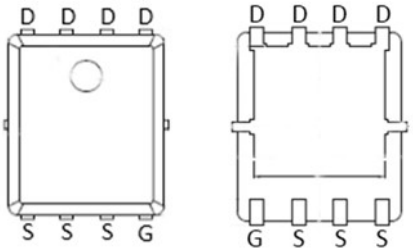
Feature

- 100V,85A
  $R_{DS(ON)}$ <4.6mΩ@V_{GS}=10V (TYP:3.8mΩ)
  $R_{DS(ON)}$ <6.4mΩ@V_{GS}=4.5V (TYP:5.2mΩ)
- Split Gate Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge



Application

- PWM applications
- Load Switch
- Power management



PDFN5X6

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
G046N01G	APG046N01G	PDFN5X6	-	-	5000

ABSOLUTE MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (T_a =25℃)	I_D	85	A
Continuous Drain Current (T_a =100℃)	I_D	53	A
Pulsed Drain Currenr (1)	I_{DM}	260	A
Single Pulsed Avalanche Energy (2)	E_{AS}	256	mJ
Power Dissipation	P_D	56.8	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	2.2	℃/W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	50	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS(T_a=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	100	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =100V, V_{GS} = 0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage(3)	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1.5	1.9	3.0	V
Drain-source on-resistance(3)	$R_{DS(on)}$	V_{GS} =10V, I_D =30A	-	3.8	4.6	mΩ
		V_{GS} =4.5V, I_D =20A	-	5.2	6.4	mΩ
Gate Resistance	R_g	V_{DS} =V_{GS} =0V, f =1MHz	-	2.5	-	Ω
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =50V, V_{GS} =0V, f =1MHz	-	4590	-	pF
Output Capacitance	C_{oss}		-	1060	-	
Reverse Transfer Capacitance	C_{rss}		-	38.4	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=50V, I_D=80A, V_{GS}=10V, R_G=6Ω	-	20.4	-	ns
Turn-on rise time	t_r		-	31	-	
Turn-off delay time	$t_{d(off)}$		-	76.8	-	
Turn-off fall time	t_f		-	36.2	-	
Total Gate Charge	Qg	VDS=50V, ID=40A, VGS=10V	-	79	-	nC
Gate-Source Charge	Qgs		-	16	-	
Gate-Drain Charge	Qgd		-	16.4	-	
Reverse Recovery Chrage	Qrr	I_F=80A,di/dt=100A/us		52.7		nC
Reverse Recovery Time	Trr	I_F=80A,di/dt=100A/us		43.4		ns
Source-Drain Diode characteristics						
Diode Forward voltage(3)	V_{DS}	V_{GS} =0V, I_S=40A	-	0.85	1.3	V
Diode Forward current(4)	I_S		-	-	85	A

Notes:

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:T_J=25℃,V_{DD}=50V,R_G=25Ω,L=0.5Mh,IAS=32A
3. Pulse Test: pulse width≤300μs, duty cycle≤2%
4. Surface Mounted on FR4 Board,t≤10 sec

■ Test circuits and waveforms

Figure A: Gate Charge Test Circuit & Waveforms

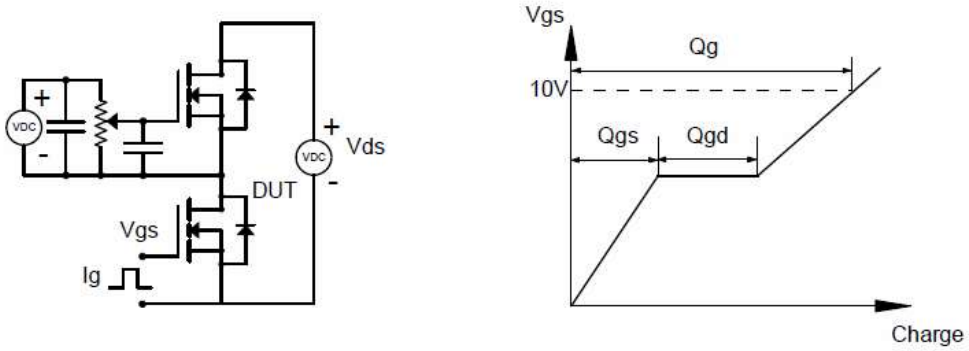


Figure B: Resistive Switching Test Circuit & Waveforms

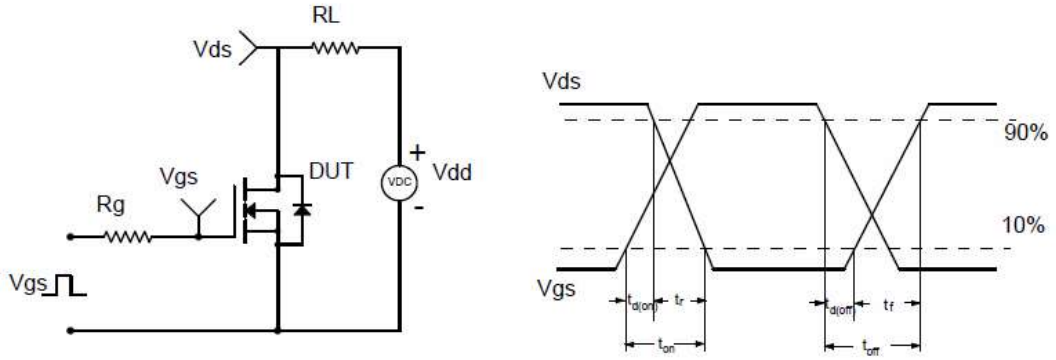


Figure C: Unclamped Inductive Switching (UIS) Test

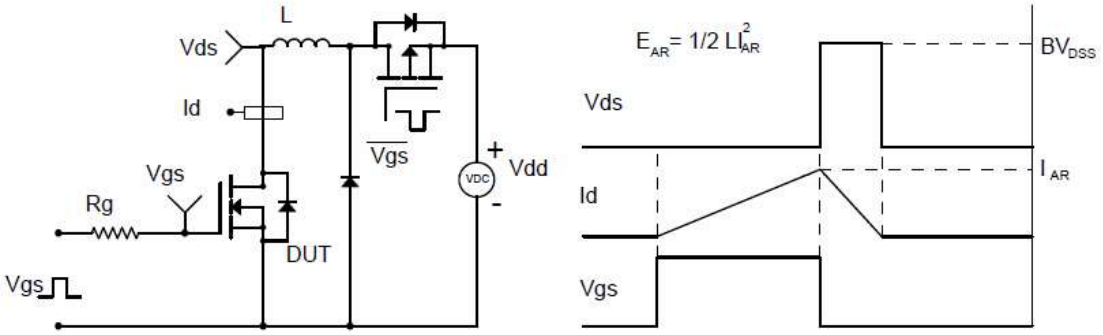
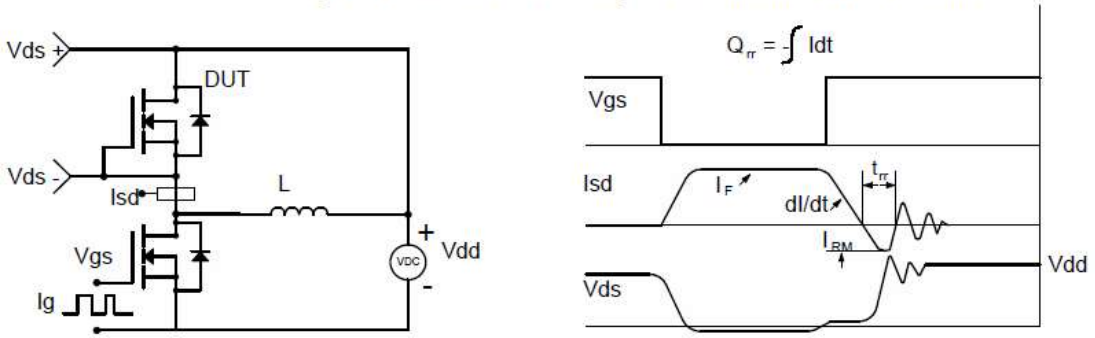


Figure D: Diode Recovery Test Circuit & Waveforms



Typical Electronic and Thermal Characteristics

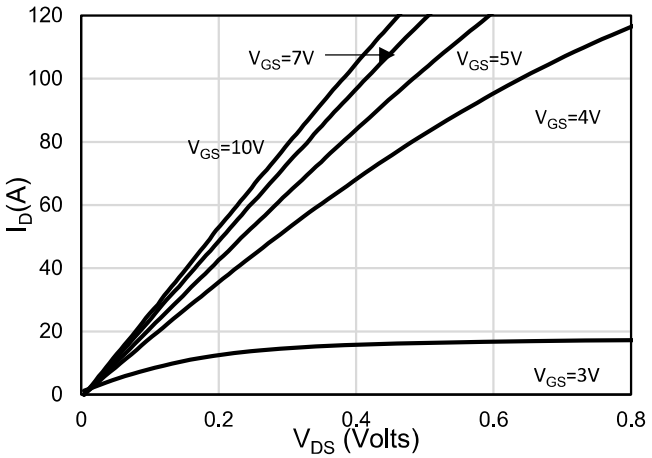


Figure 1: On-Region Characteristics

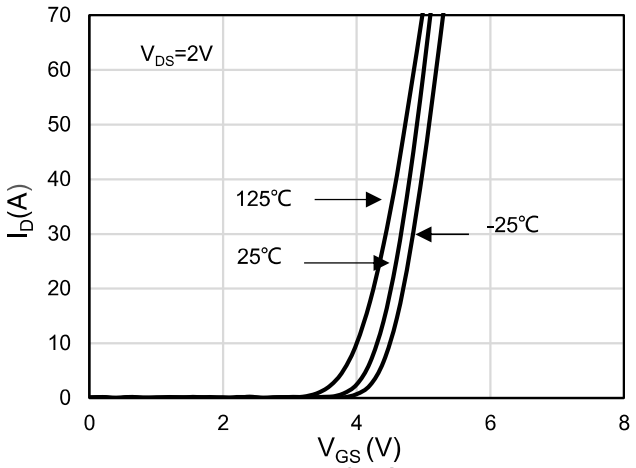


Figure 2: Transfer Characteristics

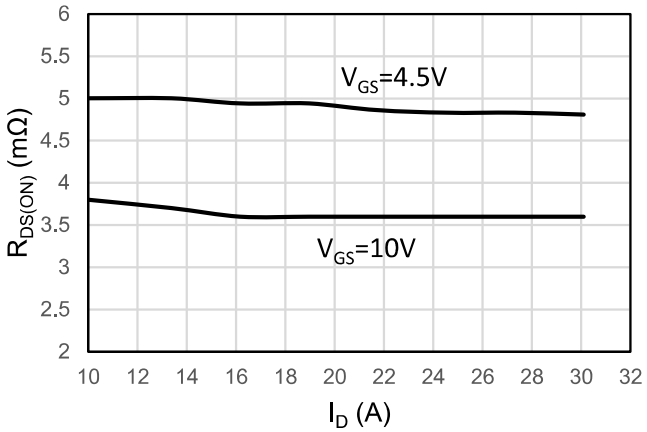


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

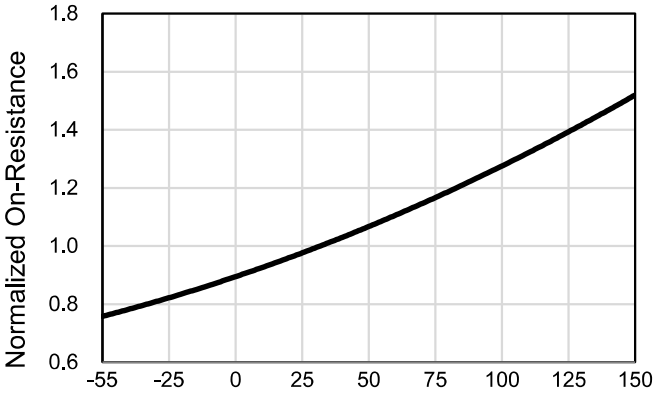


Figure 4: On-Resistance vs. Junction Temperature

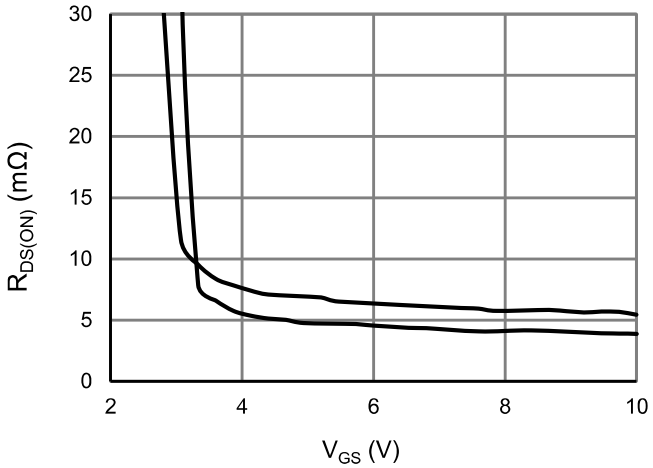


Figure 5: On-Resistance vs. Gate-Source Voltage

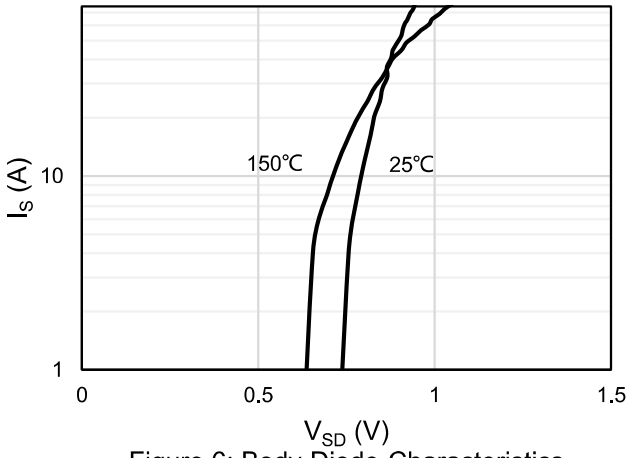


Figure 6: Body-Diode Characteristics

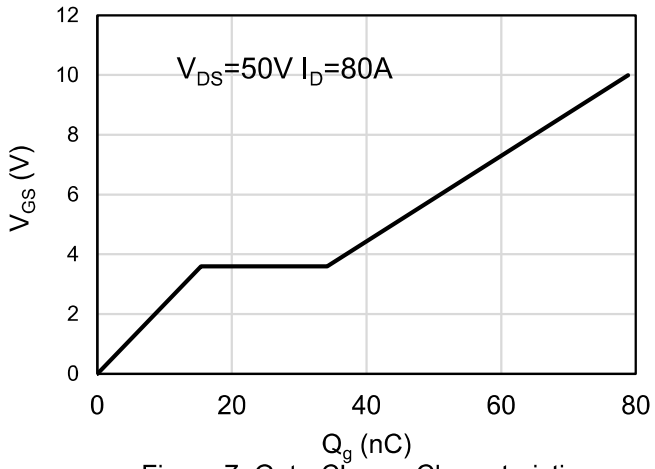


Figure 7: Gate-Charge Characteristics

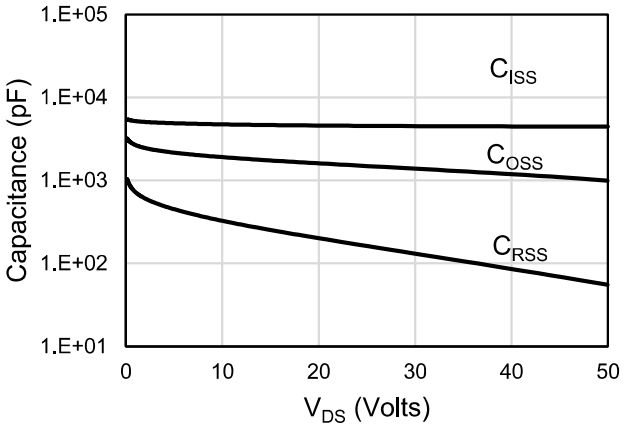


Figure 8: Capacitance Characteristics

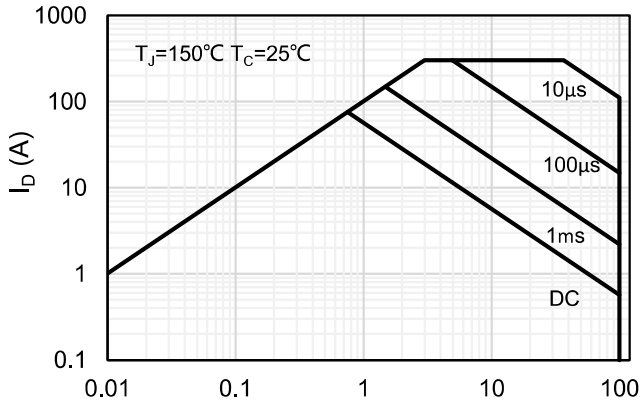


Figure 9: Maximum Forward Biased Safe Operating Area

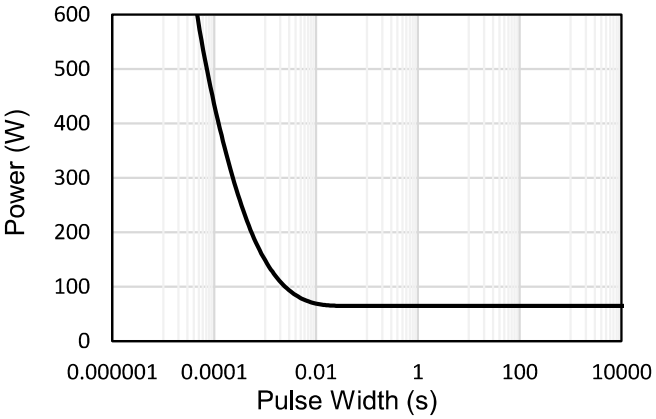


Figure 10: Single Pulse Power Rating Junction-to-Case

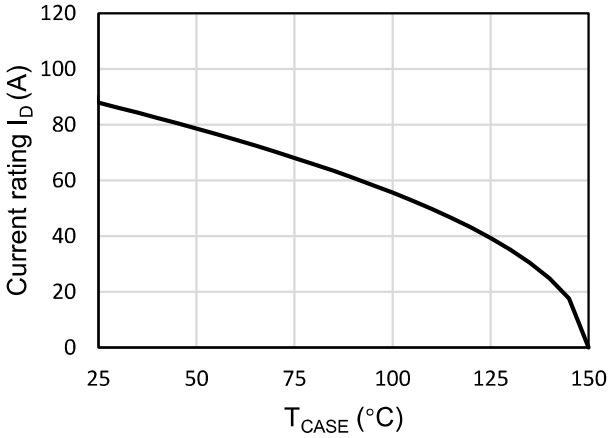


Figure 13: Current De-rating

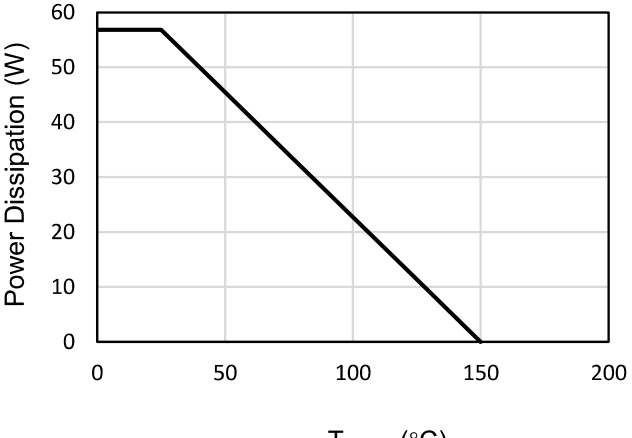


Figure 12: Power De-rating

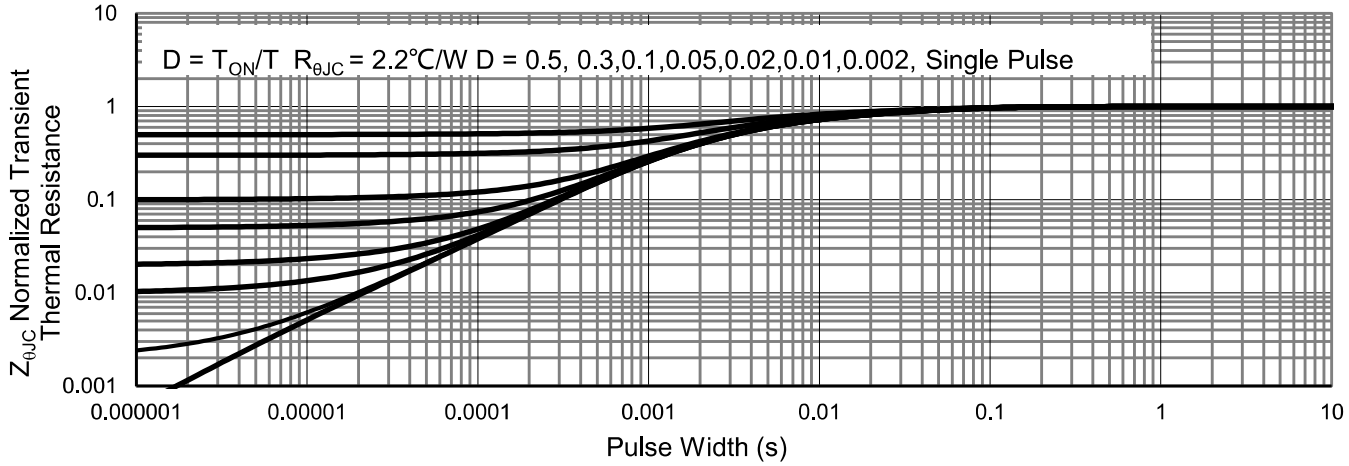
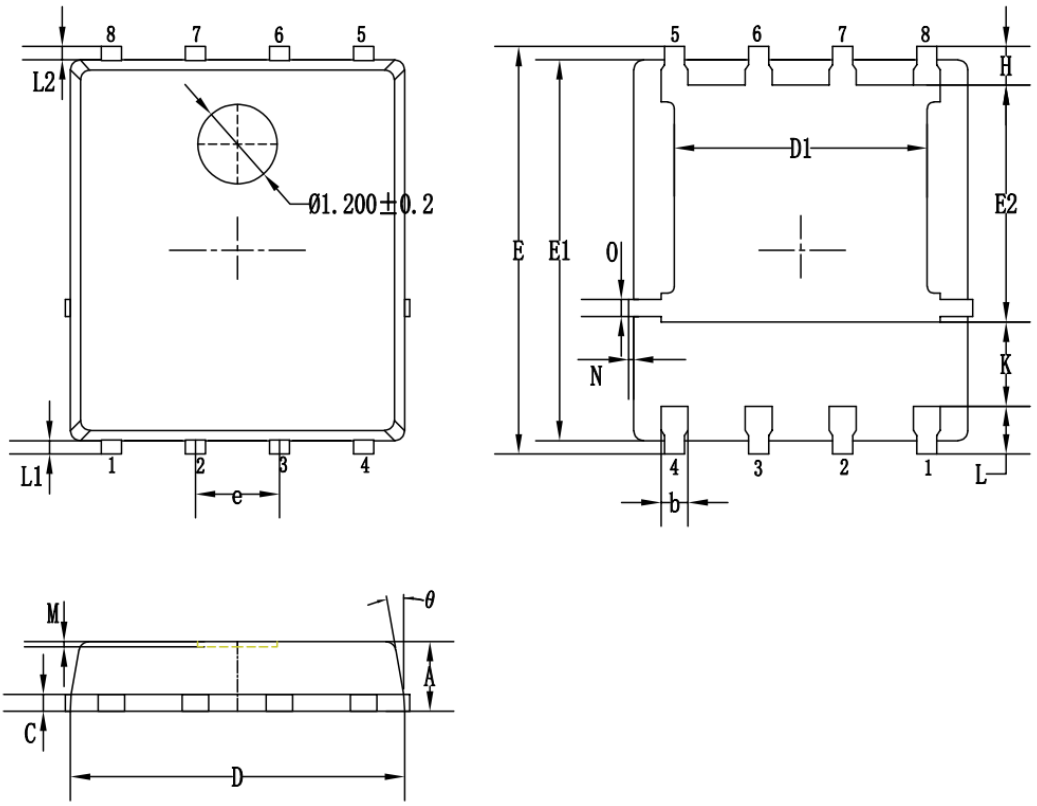


Figure 13: Normalized Maximum Transient Thermal Impedance

PDFN5X6 Package Information



Symbols	Millimeters		
	MIN.	NOM.	MAX.
A	0.90	1.05	1.20
b	0.34	0.40	0.50
C	0.20	0.25	0.35
D	4.80	5.05	5.20
D1	3.72	3.82	3.92
E	5.95	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.		
θ	8°	10°	12°
M	0.08 REF.		
N	0	-	0.15
O	0.25 REF.		

Revision History

Revision	Release	Remark
V1.0	2024/03/13	Initial Release

Disclaimer

The information given in this document describes the independent performance of the product,but similar performance is not guaranteed under other working conditions,and cannot be guaranteed when installed with other products or equipment.To achieve the required performance of the product in actual scenarios,the customer should conduct a complete application test to assess the functionality of the product.

Allpower assumes no responsibility for equipment failures result from using products at values that exceed the ratings,operating conditions,or other parameters listed in the product specifications.

The product described in this specification is not applicable for aerospace or other applications which requires high reliability.Customers using or selling these products for use in medical,life-saving,or life-sustaining applications do so at their own risk and agree to fully indemnify.

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