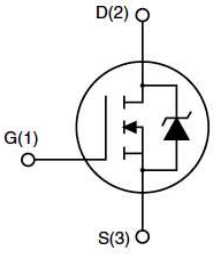
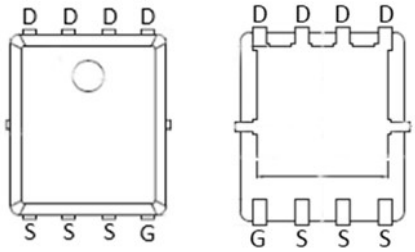
Features

- 60V,160A
  $R_{DS(ON)}$ <2.9mΩ @V_{GS}=10V TYP:2.4mΩ
  $R_{DS(ON)}$ <3.6mΩ @V_{GS}=4.5V TYP:3.0mΩ
- Super Trench
- Extremely low on-resistance RDS(on)
- Excellent Qg x RDS(on) product(FOM)
- Qualified according to JEDEC criteria





PDFN5X6

Applications

- Synchronous Rectification for AC/DC Quick Charger
- Battery management
- UPS (Uninterrupible Power Supplies)

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
G029N06G	APG029N06G	PDFN5X6	-	-	5000

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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current (Silicon Limited)	Tc=25℃	I_D	160	A
	Tc=100℃		101	A
Continuous Drain Current (Package Limited) Tc=25℃			80	A
Pulsed Drain Current		I_{DM}	640	A
Single Pulsed Avalanche Energy (Tc=25℃,L=0.3mH) (2)		E_{AS}	189	mJ
Drain Power Dissipation		P_D	113	W
Thermal Resistance from Junction to Case		$R_{\theta JC}$	1.11	℃/W
Thermal Resistance- Junction to Ambient		$R_{\theta JA}$	56	℃/W
Junction Temperature		T_J	150	℃
Storage Temperature		T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS(T_J=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	60	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =60V, V_{GS} = 0V	-	0.02	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V	-	±10	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1.2	-	2.2	V
Drain-source on-resistance[a]	$R_{DS(on)}$	V_{GS} =10V, I_D =40A	-	2.4	2.9	mΩ
		V_{GS} =4.5V, I_D =32A		3.0	3.6	mΩ
Gate Resistance	Rg	V_{GS}=0V, V_{DS} Open, f=1MHz		0.93		Ω
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =30V, V_{GS} =0V, f =1.0MHz	-	4610	6915	pF
Output Capacitance	C_{oss}		-	2188	3282	
Reverse Transfer Capacitance	C_{rss}		-	66	132	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=30V, I_D=40A, R_G=2.7Ω, V_G=10V	-	14.1	-	ns
Turn-on rise time	t_r		-	63.7	-	
Turn-off delay time	$t_{d(off)}$		-	46.8	-	
Turn-off fall time	t_f		-	105.1	-	
Total Gate Charge	Qg	V_{DS}=30V, I_D=40A, V_{GS}=10V	-	74.4	111.6	nC
Gate-Source Charge	Qgs		-	17.3	-	
Gate-Drain Charge	Qgd		-	9.5	18.9	
Source-Drain Diode characteristics						
Diode Forward voltage[a]	V_{SD}	T_J=25℃, V_{GS} =0V, I_S=40A	-	0/82	1.23	V
Diode Forward current	I_S	T_C=25℃	-	-	160	A
Body Diode Reverse Recovery Time	trr	T_J=25℃，IF=40A,di/dt=300A/us		52.8	105.6	ns
Body Diode Reverse Recovery Charge	Qrr	T_J=25℃，IF=440A,di/dt=300A/us		253	56.3	nc

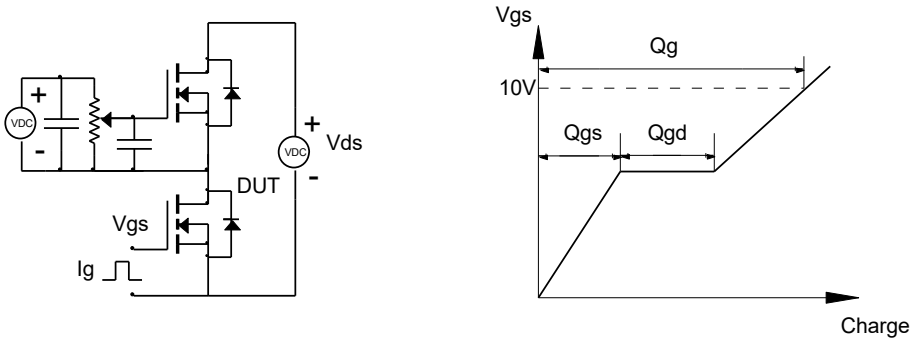
Notes:

a) Pulse width ≤ 300 μs, duty cycle ≤ 2%

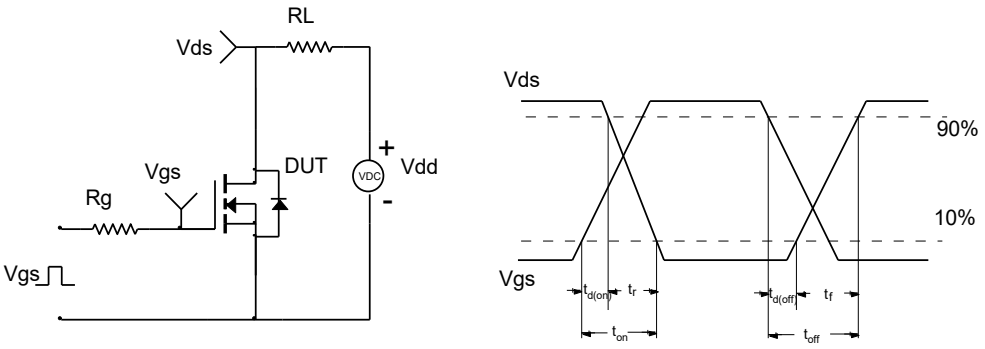
b) Guaranteed by design, not subject to production testing

Test Circuit

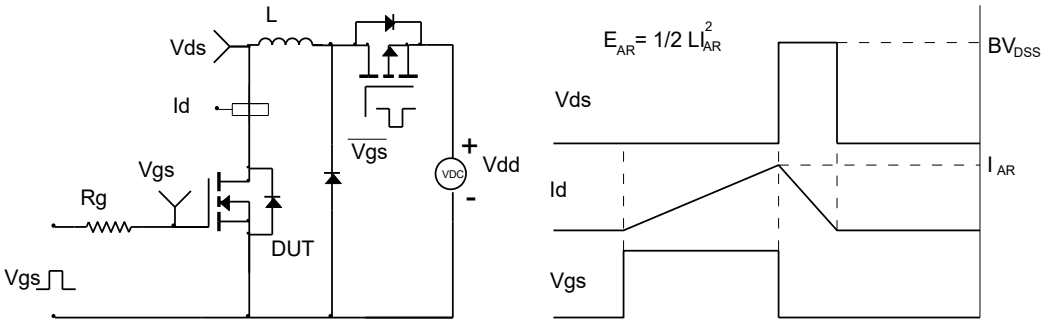
Gate Charge Test Circuit & Waveform



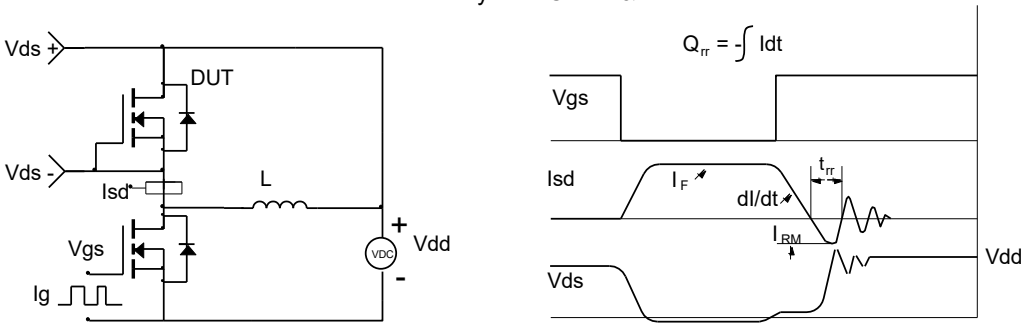
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Typical Performance Characteristics

Fig 1: Output Characteristics

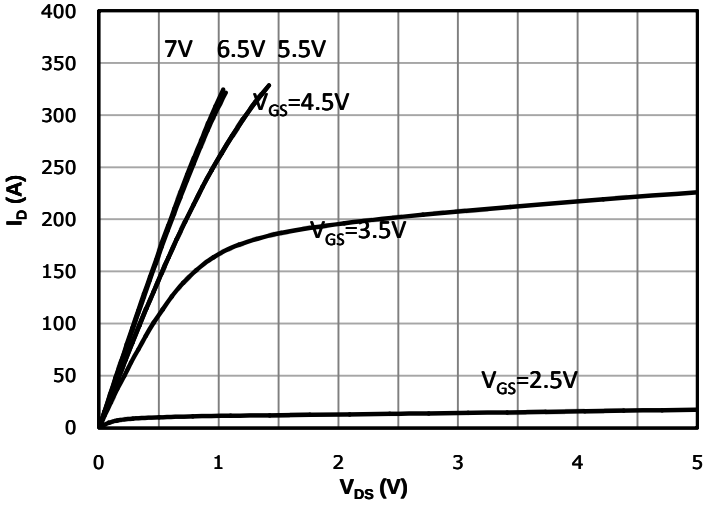


Fig 2: Transfer Characteristics

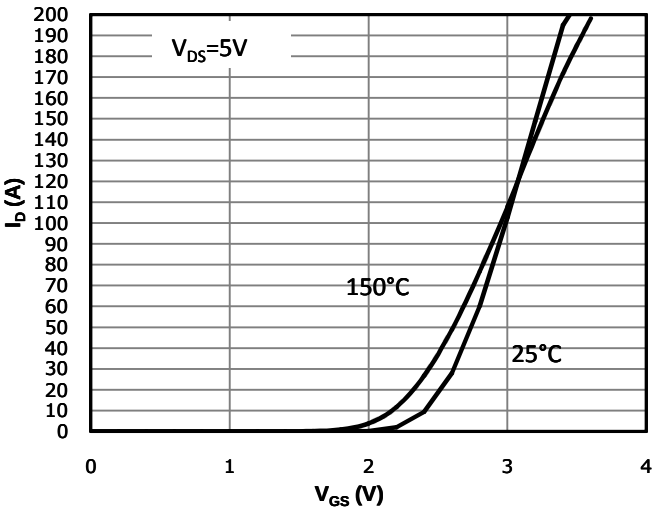


Fig 3: Rds(on) vs Drain Current and Gate Voltage

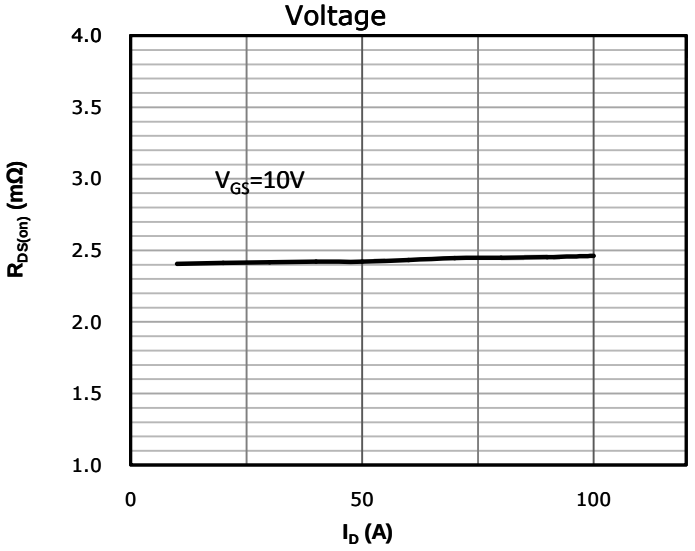


Fig 4: Rds(on) vs Gate Voltage

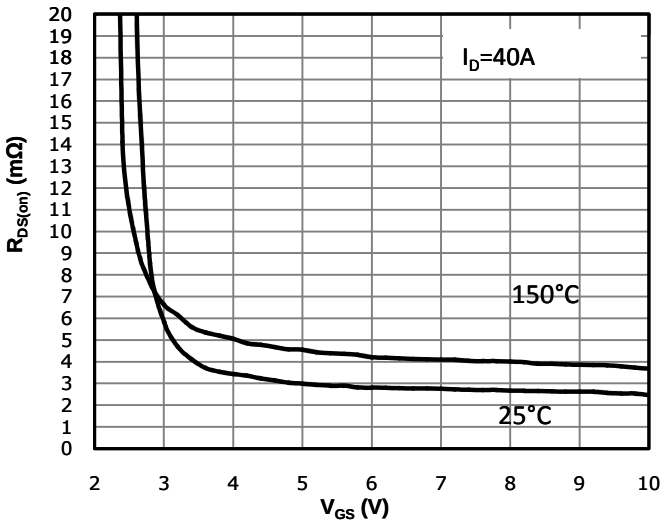


Fig 5: Rds(on) vs. Temperature

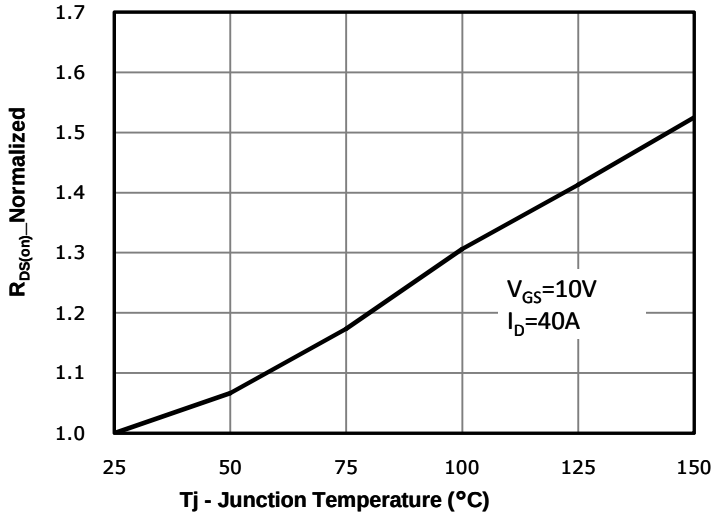
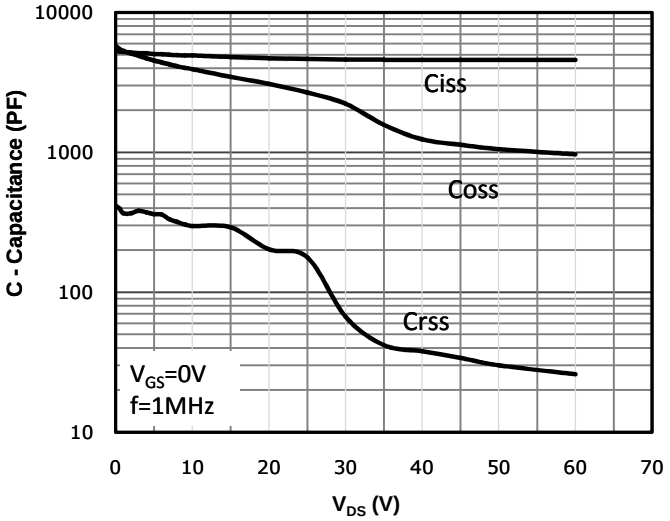


Fig 6: Capacitance Characteristics



Typical Performance Characteristics

Fig 7: Gate ChargeCharacteristics

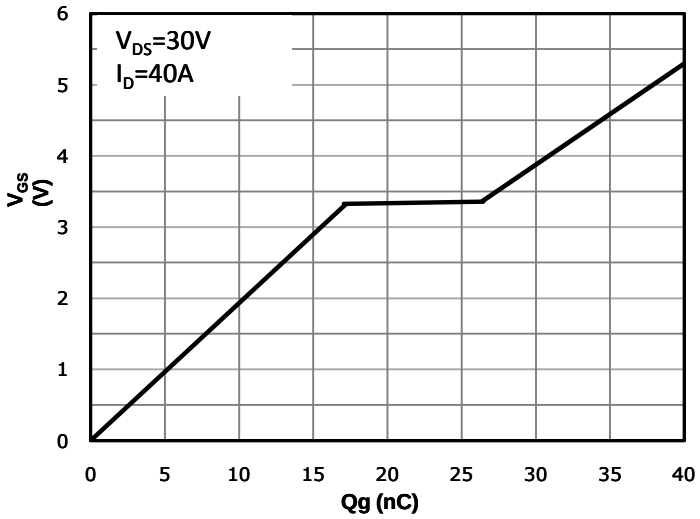


Fig 8: Body-diode Forward Characteristics

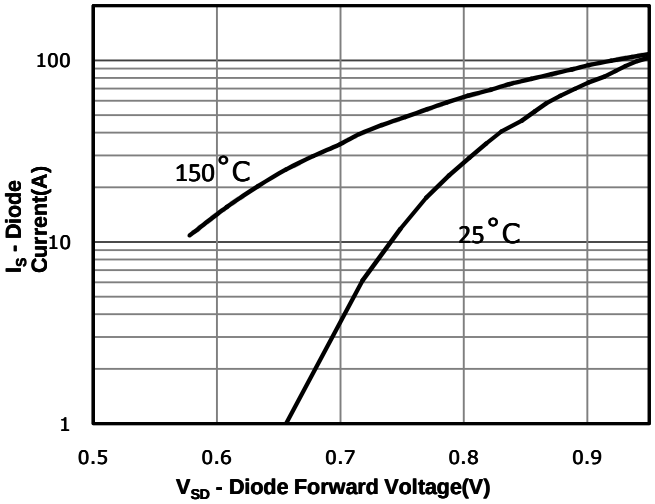


Fig 9: Power Dissipation

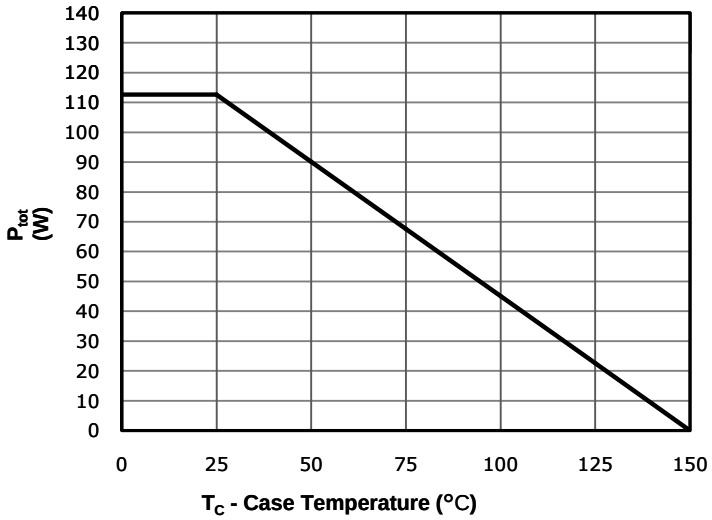


Fig 10: Drain Current Derating

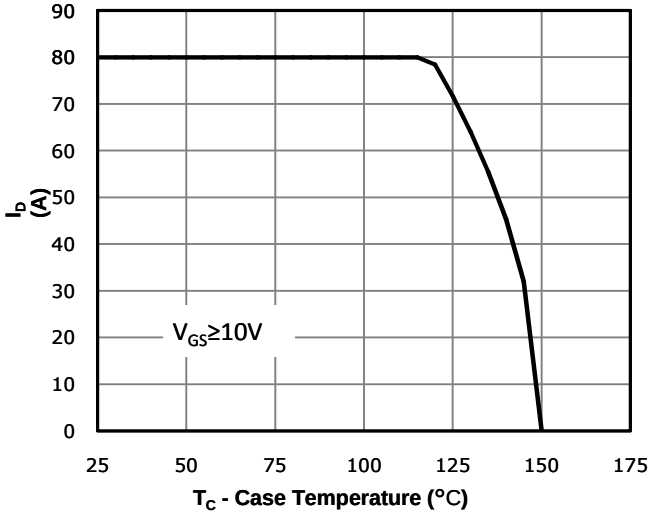
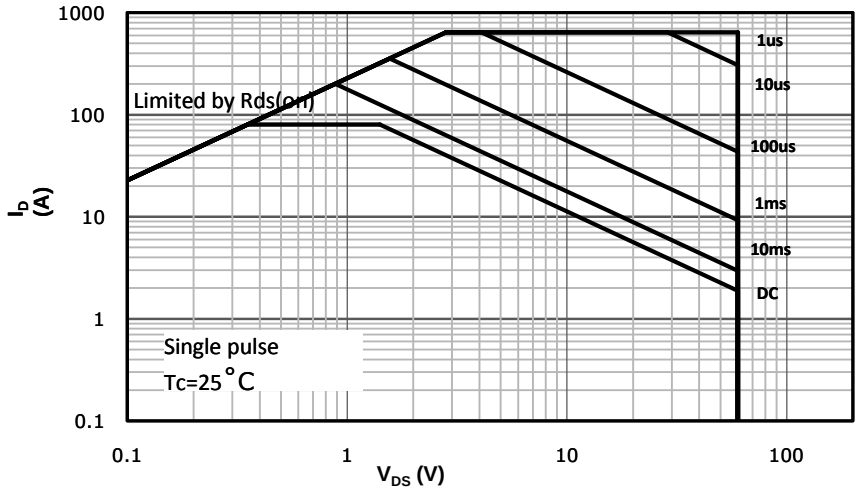
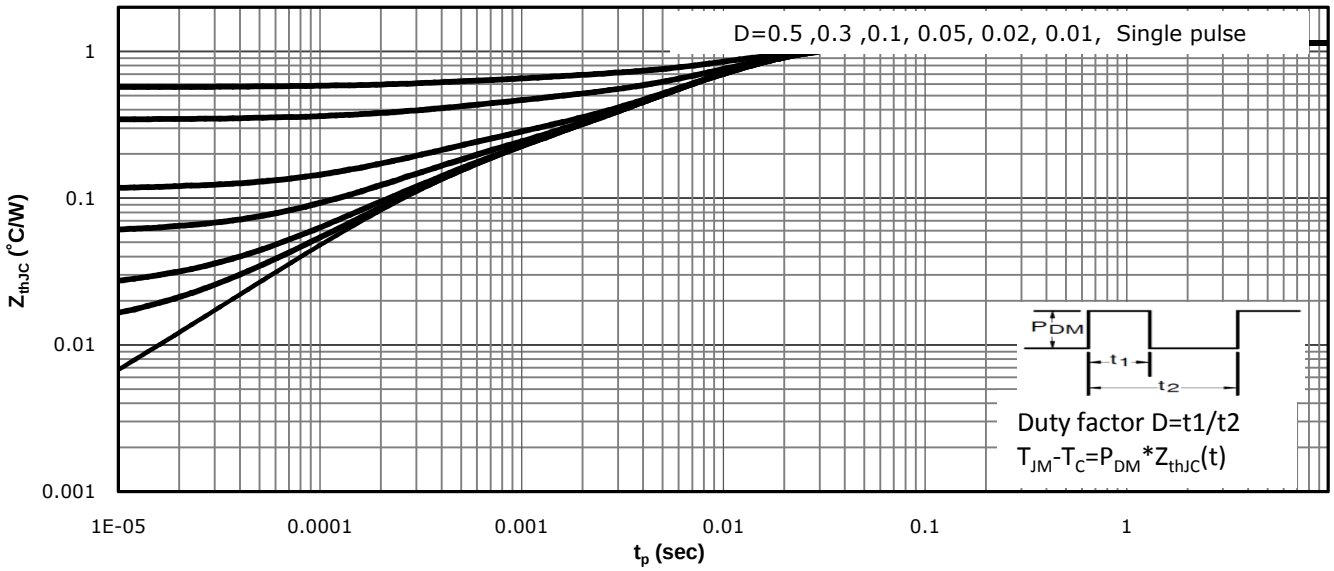


Fig 11: Safe Operating Area

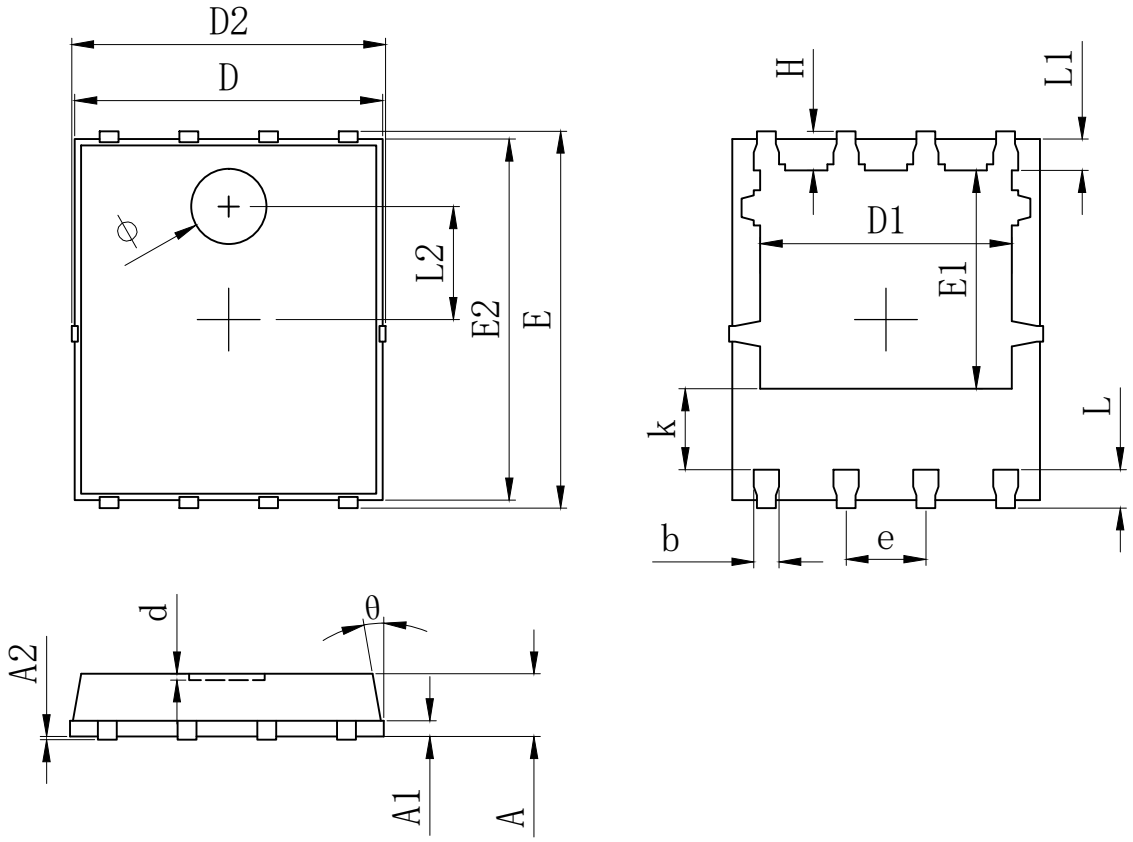


Typical Performance Characteristics

Fig 12: Max. Transient Thermal Impedance



PDFN5X6 Package Information



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
θ	8°	10°	12°
Φ	1.100	1.200	1.300
d			0.100

Revision History

Revision	Release	Remark
V1.0	2023/05/17	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.

Due to product or technical improvements,the information described or contained herein may be changed without prior notice.