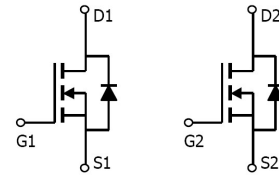


**Features**

- HEXBOE
- $r_{DS(on)} < 11.5m\Omega @ V_{GS}=10V$  TYP:9m $\Omega$
- $R_{DS(on)} < 18m\Omega @ V_{GS}=4.5V$  TYP:11m $\Omega$
- Advanced Trench technology
- Excellent RDS(ON) and Low Gate Charge
- Fast switching speed



Schematic diagram



Marking and pin assignment

**Applications**

- Load Switch
- PWM Application
- Power management

**Package Marking and Ordering Information**

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
0803QD	AP0803QD	PDFN3X3-D	-	-	5000

**ABSOLUTE MAXIMUM RATINGS (T<sub>J</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	30	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current (T <sub>C</sub> =25°C)	I <sub>D</sub>	30	A
Continuous Drain Current (T <sub>C</sub> =100°C)	I <sub>D</sub>	21	A
Pulsed Drain Current <sup>(1)</sup>	I <sub>DM</sub>	90	A
Single Pulsed Avalanche Energy <sup>(2)</sup>	E <sub>AS</sub>	65	mJ
Power Dissipation (T <sub>C</sub> =25°C)	P <sub>D</sub>	20	W
Thermal Resistance from Junction to Case <sup>(3)</sup>	R <sub>θJC</sub>	6.25	°C/W
Thermal Resistance from Junction to Ambient	R <sub>θJA</sub>	62.5	°C/W
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>STG</sub>	-50~ +150	°C

**MOSFET ELECTRICAL CHARACTERISTICS(T<sub>J</sub>=25°C unless otherwise noted)**

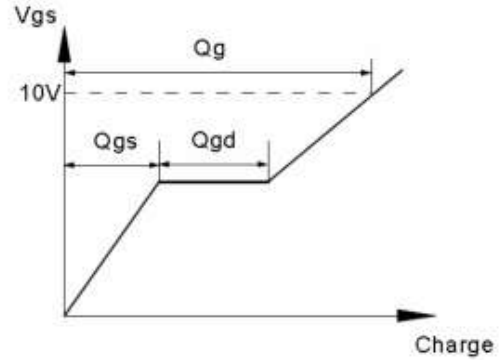
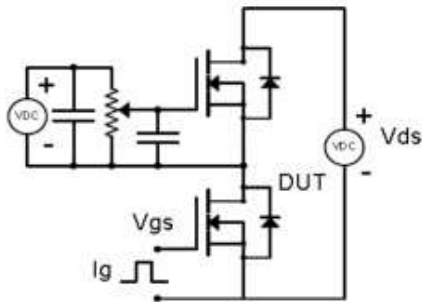
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	30	-	-	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> = 0V, T <sub>J</sub> =25°C	-	-	1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V	-	-	±100	nA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.5	2.2	V
Drain-source on-resistance <sup>(3)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =10A	-	9	11.5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A		11	18	
<b>Dynamic characteristics</b>						
Input Capacitance	C <sub>iSS</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f =1.0MHz	-	790	-	pF
Output Capacitance	C <sub>oss</sub>		-	225	-	
Reverse Transfer Capacitance	C <sub>rSS</sub>		-	160	-	
Gate Resistance	R <sub>G</sub>	f =1.0MHz		2.5		Ω
<b>Switching characteristics</b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =15V, I <sub>D</sub> =1A, R <sub>G</sub> =3.3Ω V <sub>GS</sub> =10V	-	9	-	ns
Turn-on rise time	t <sub>r</sub>		-	8	-	
Turn-off delay time	t <sub>d(off)</sub>		-	29	-	
Turn-off fall time	t <sub>f</sub>		-	9	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =15V, I <sub>D</sub> =5A, V <sub>GS</sub> =10V	-	22.4	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	4.4	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	5.4	-	
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage	V <sub>SD</sub>	T <sub>J</sub> =25°C, V <sub>GS</sub> =0V, I <sub>S</sub> =1.7A	-	-	1.2	V
Diode Forward current	I <sub>S</sub>	T <sub>C</sub> =25°C	-	-	20	A
Body Diode Reverse Recovery Time	t <sub>rr</sub>	T <sub>J</sub> =25°C, I <sub>F</sub> =10A, di/dt=100A/us		11		ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	T <sub>J</sub> =25°C, I <sub>F</sub> =10A, di/dt=100A/us		4		uc

Notes:

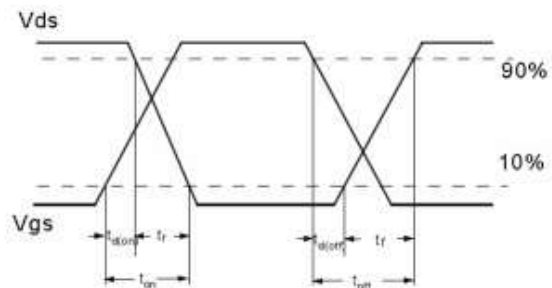
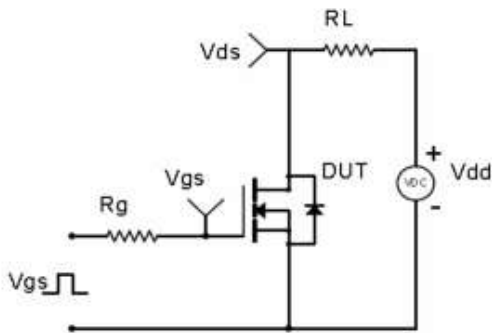
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=15V, V<sub>G</sub>=10V, R<sub>G</sub>=25Ω, L=0.5mH I<sub>AS</sub>=16A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

**Test Circuit & Waveform**

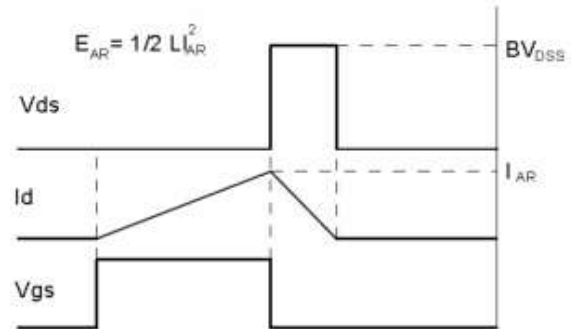
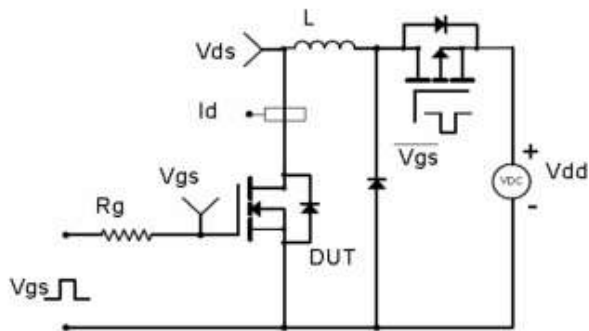
Gate Charge Test Circuit & Waveform



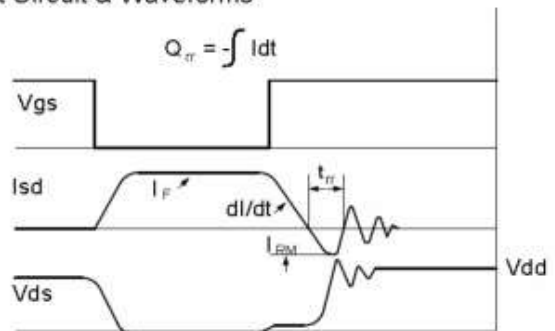
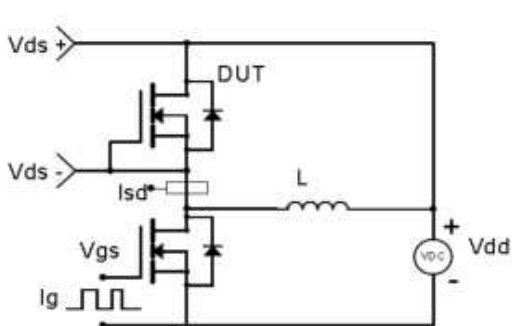
Resistive Switching Test Circuit & Waveforms



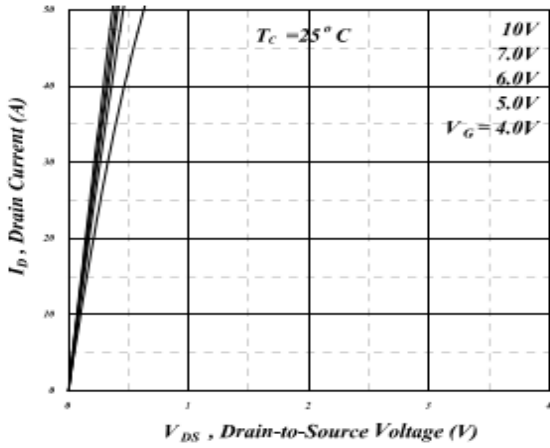
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



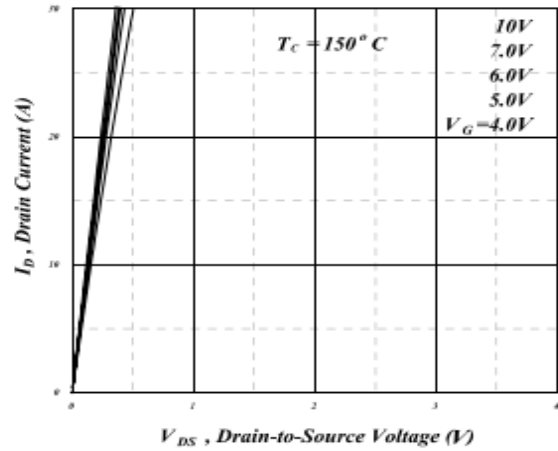
Diode Recovery Test Circuit & Waveforms



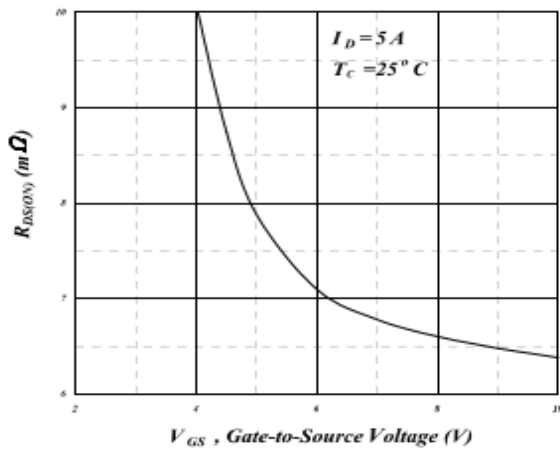
**Typical Electrical and Thermal Characteristics**



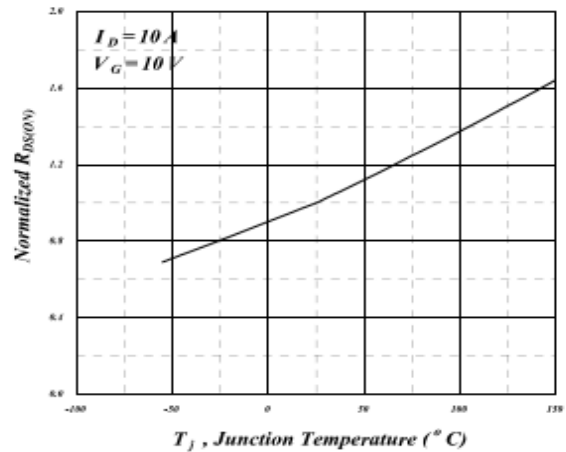
**Fig 1. Typical Output Characteristics**



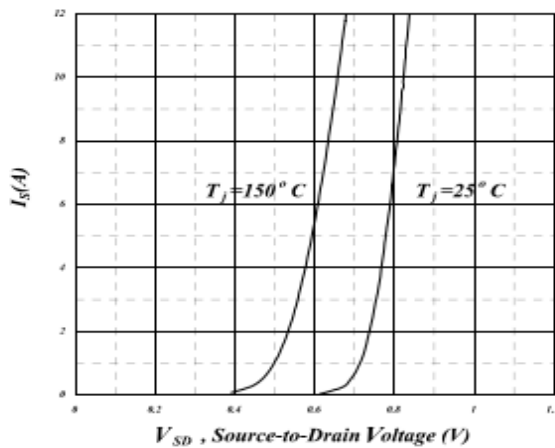
**Fig 2. Typical Output Characteristics**



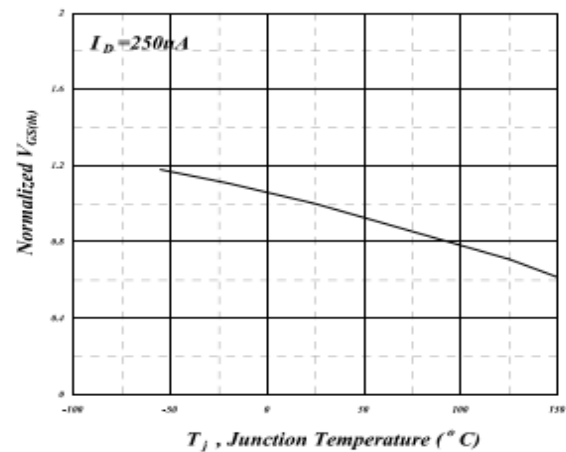
**Fig 3. On-Resistance v.s. Gate Voltage**



**Fig 4. Normalized On-Resistance v.s. Junction Temperature**

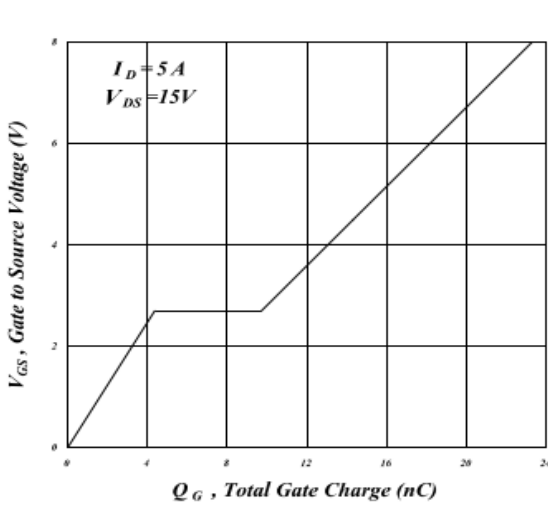


**Fig 5. Forward Characteristic of Reverse Diode**

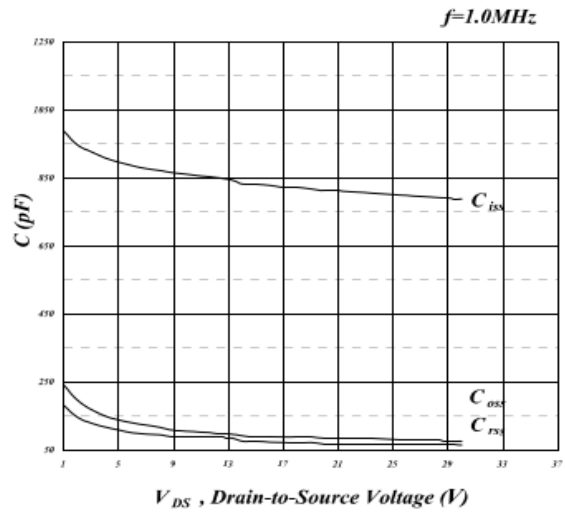


**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**

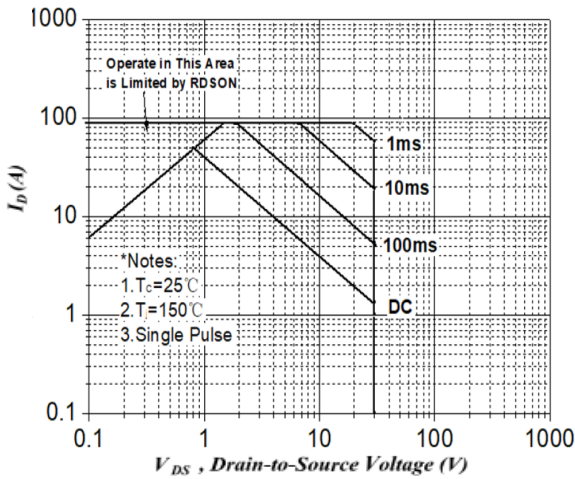
**Typical Electrical and Thermal Characteristics**



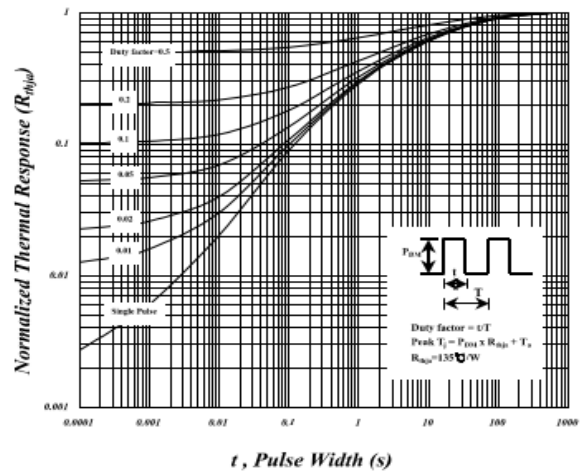
**Fig 7. Gate Charge Characteristics**



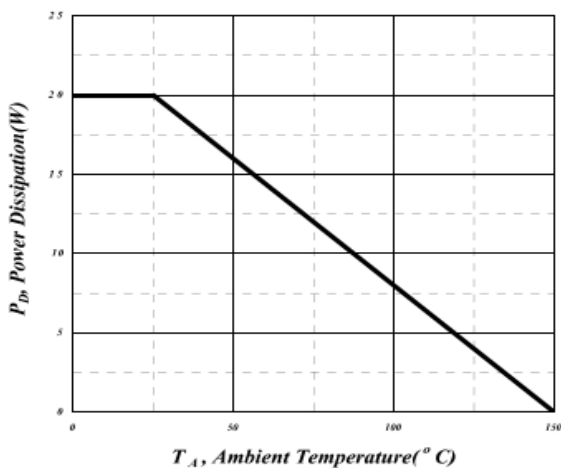
**Fig 8. Typical Capacitance Characteristics**



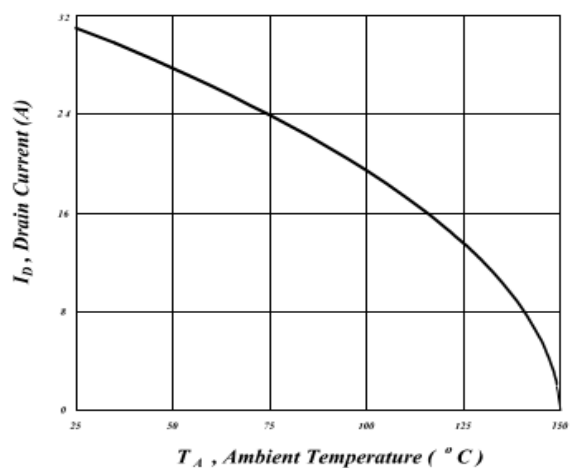
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**

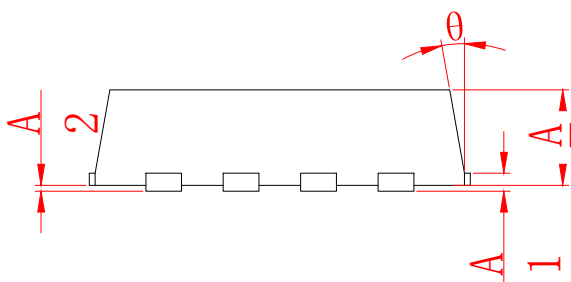
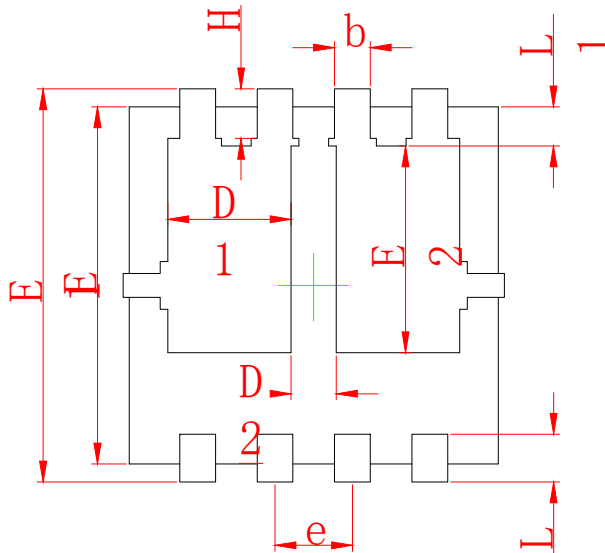
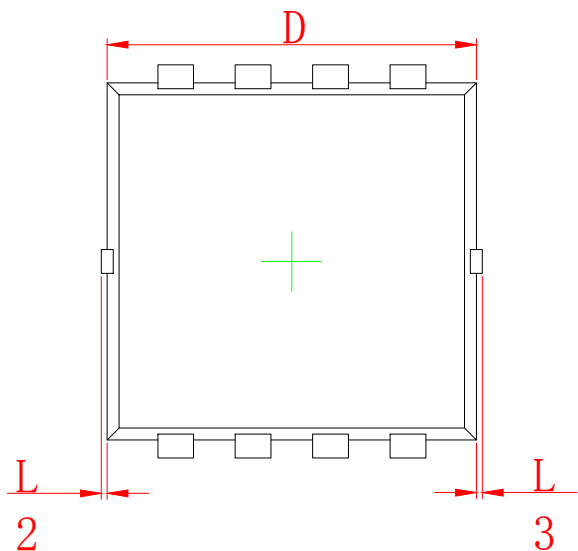


**Fig 11. Total Power Dissipation**



**Fig 12. Drain Current v.s. Ambient Temperature**

**PDFN3X3-D Package Information**



SYMBOL	MILLIMETER	
	MIN	MAX
A	0.700	0.900
A1	0.152 REF.	
A2	$0 \sim 0.05$	
D	3.000	3.200
D1	0.935	1.135
D2	0.280	0.480
E	2.900	3.100
E1	3.150	3.450
E2	1.535	1.935
b	0.200	0.400
e	0.550	0.750
L	0.300	0.500
L1	0.180	0.480
L2	$0 \sim 0.100$	
L3	$0 \sim 0.100$	
H	0.315	0.515
$\theta$	$8^\circ$	$12^\circ$

## Revision History

Revision	Release	Remark
V1.0	2023/04/10	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.