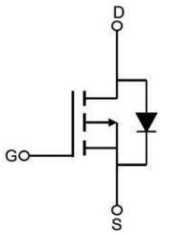
AP25P100K

P-Channel Enhancement Mosfet

DATA SHEET

Features

- -100V,-25A
  $R_{DS(ON)}$ <110mΩ @V_{GS}=-10V TYP:88mΩ
  $R_{DS(ON)}$ <120mΩ @V_{GS}=-4.5V TYP:93mΩ
- Advanced Trench Technology
- Lead free product is acquired
- Low Gate Charge



Schematic Diagram



Marking and pin assignment

Applications

- Load switching
- Motor driver
- Uninterrupible Power Supplies

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
25P100K	AP25P100K	TO-252	-	-	2500

ABSOLUTE MAXIMUM RATINGS (T_J=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 (Tc=25℃) (1)	I_D	-25	A
Continuous Drain Current (Tc=100℃)	I_D	-16	A
Pulsed Drain Current (1)	I_{DM}	-100	A
Drain Power Dissipation	P_D	125	W
Single Pulsed Avalanche Energy (2)	E_{AS}	43	mJ
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	65	℃/W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	1.0	℃/W
Junction Temperature	T_J	-55~ +150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

Notes:

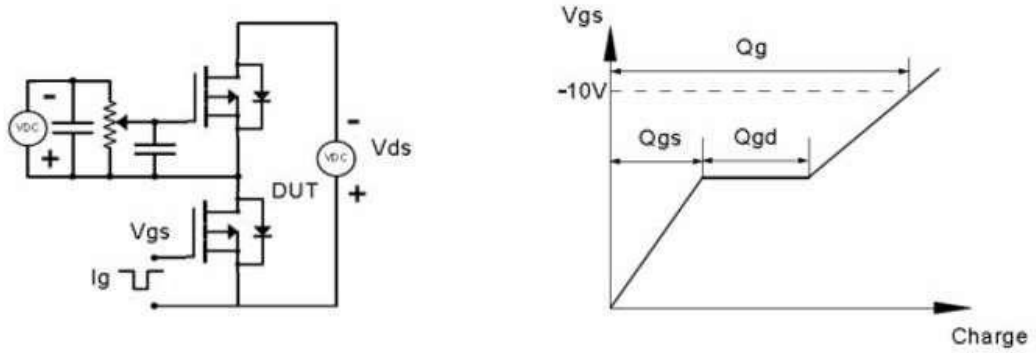
1) Repetitive Rating: pulse width limited by maximum junction temperature
2) EAS condition : T_J=25℃, V_{DD}=20V, V_G=10V, L=1.0mH, R_g=25Ω, I_{AS}=-13A

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

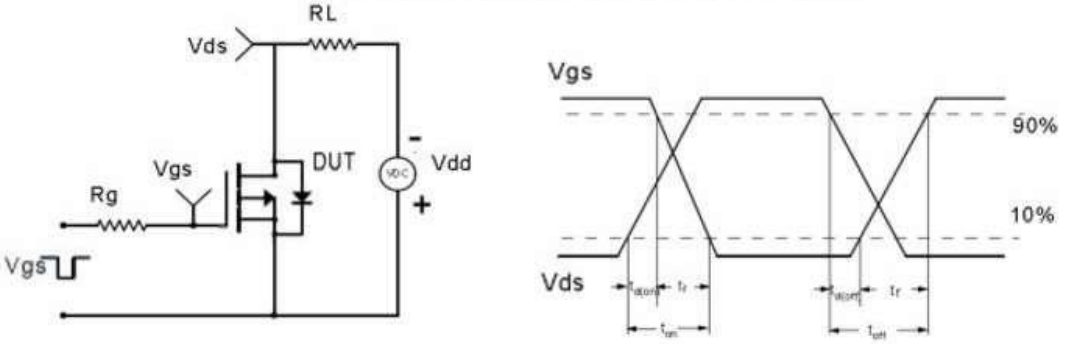
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =-250μA	-100	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =-100V, V_{GS} = 0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-1.5	-1.8	-2.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =-10V, I_D =-10A	-	88	110	mΩ
		V_{GS} =-4.5V, I_D =-8A	-	93	120	
Forward transconductance	R_g	V_{GS}= 0V, V_{DS}= 0V, f=1.0MHz	-	5	-	Ω
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =-50V, VGS=0V, f=1MHz	-	2859	-	pF
Output Capacitance	C_{oss}		-	93	-	
Reverse Transfer Capacitance	C_{rss}		-	68	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=-50V, I_D=-10A, R_G=3Ω, V_{GS}=-10V	-	8	-	nS
Turn-on rise time	t_r		-	27	-	
Turn-off delay time	$t_{d(off)}$		-	115	-	
Turn-off fall time	t_f		-	77	-	
Total Gate Charge	Qg	V_{DS}=-50V, I_D=-10A, V_{GS}=-10V	-	53	-	nC
Gate-Source Charge	Qgs		-	12	-	
Gate-Drain Charge	Qgd		-	10	-	
Source-Drain Diode characteristics						
Diode Forward voltage	V_{SD}	T_J=25℃, V_{GS} =0V, I_S=-10A	-	-0.8	-1.2	V
Diode Forward current	I_S	T_C=25℃	-	-	-25	A
Body Diode Reverse Recovery Time	trr	T_J=25℃, I_F=-10A,di/dt=100A/us	-	36	-	nS
Body Diode Reverse Recovery Charge	Qrr		-	40	-	nC

Test Circuit & Waveform

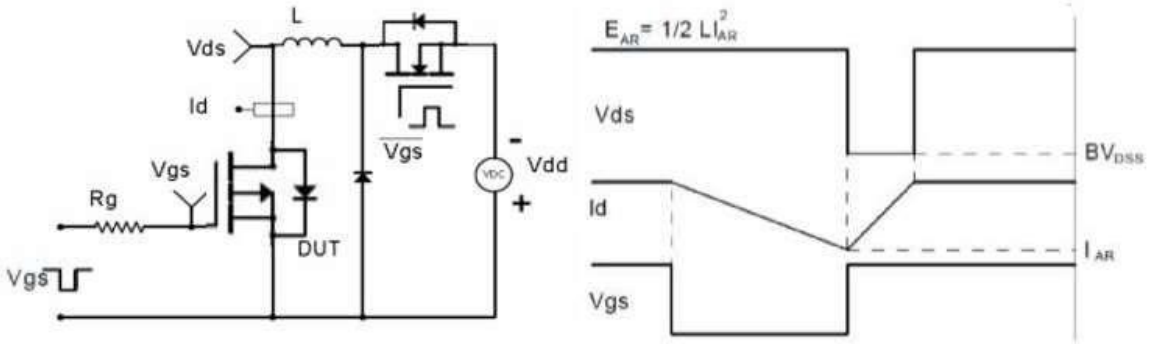
Gate Charge Test Circuit & Waveform



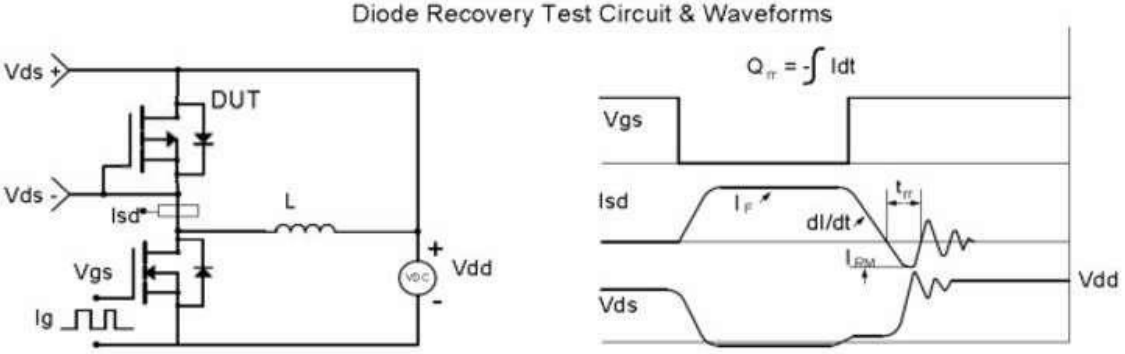
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Typical Characteristics

Fig 1: Output Characteristics

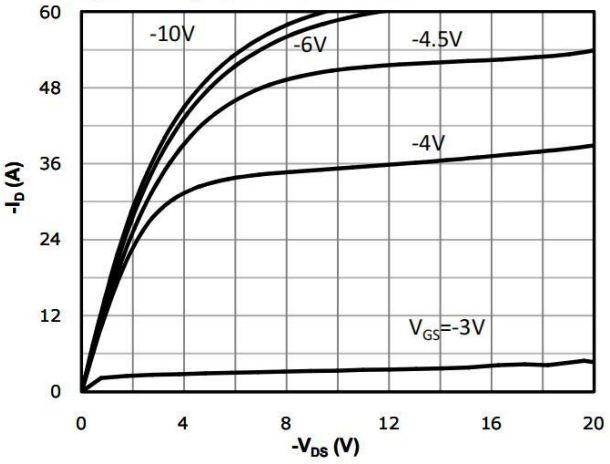


Fig 2: Transfer Characteristics

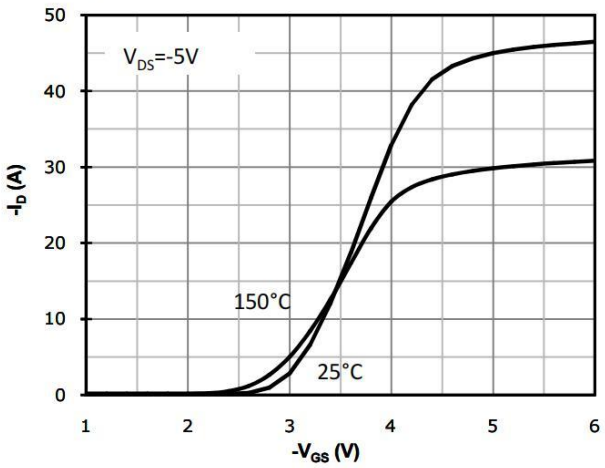


Fig 3: Rds(on) vs Drain Current and Gate Voltage

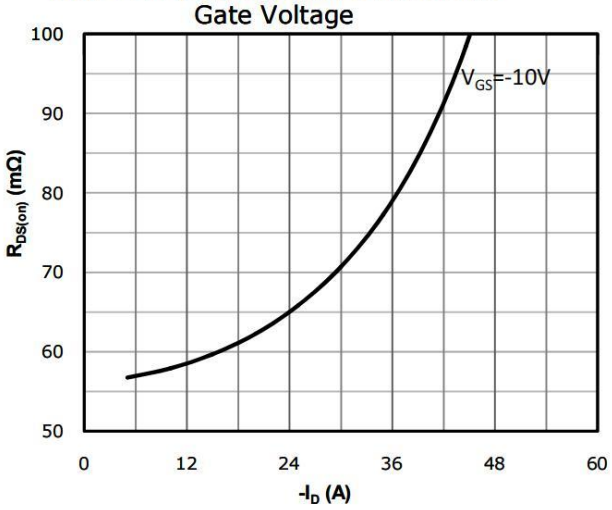


Fig 4: Rds(on) vs Gate Voltage

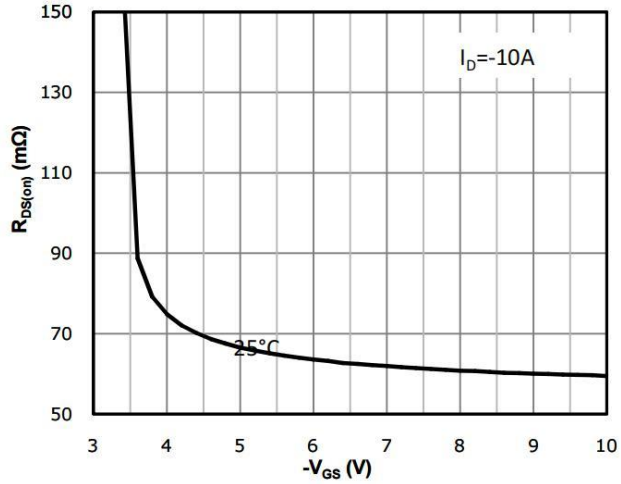


Fig 5: Rds(on) vs. Temperature

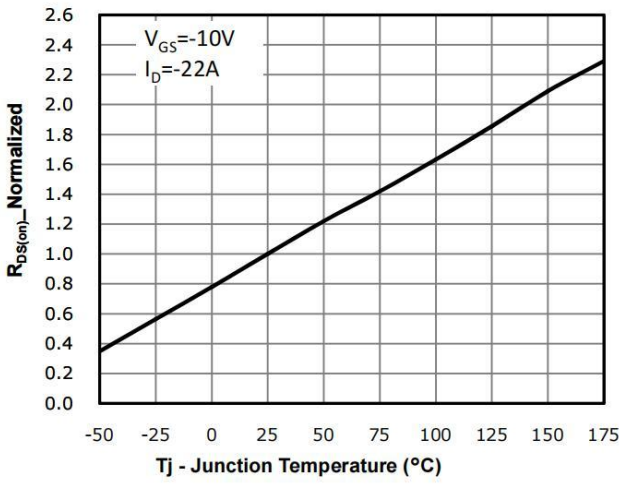
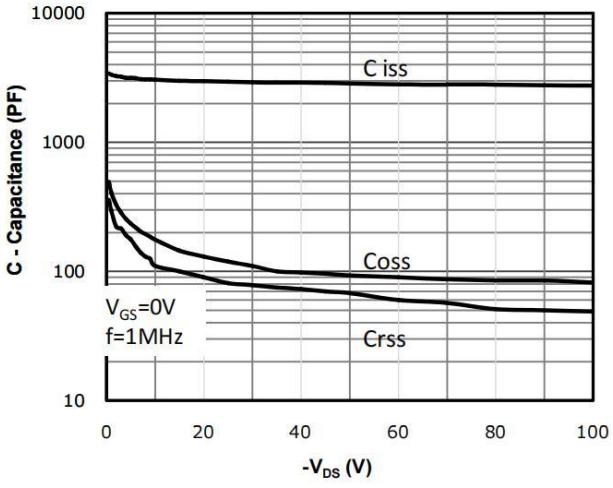


Fig 6: Capacitance Characteristics



Typical Characteristics

Fig 7: Gate Charge Characteristics

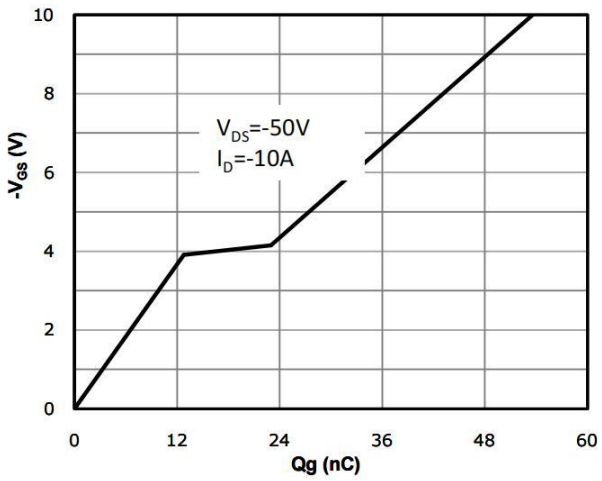


Fig 8: Body-diode Forward Characteristics

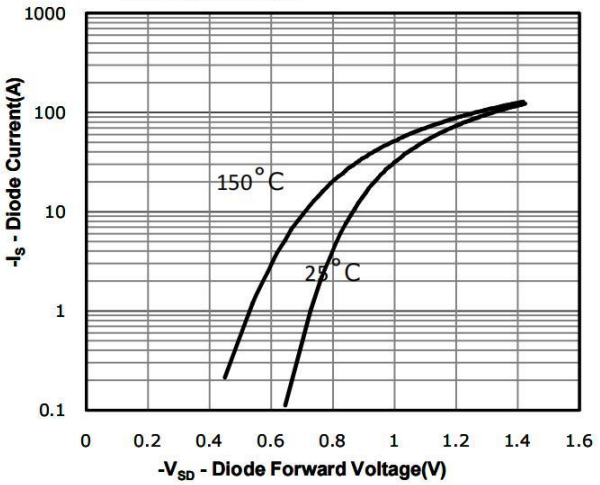


Fig 9: Power Dissipation

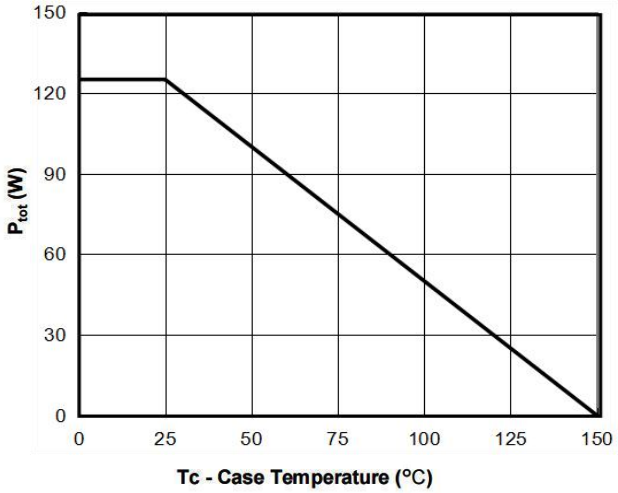


Fig 10: Drain Current Derating

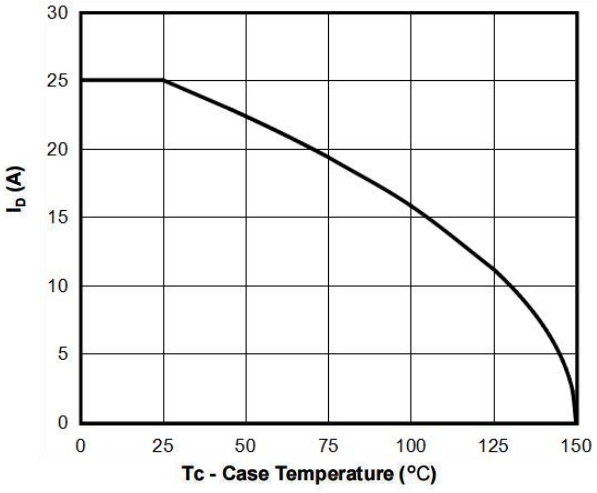
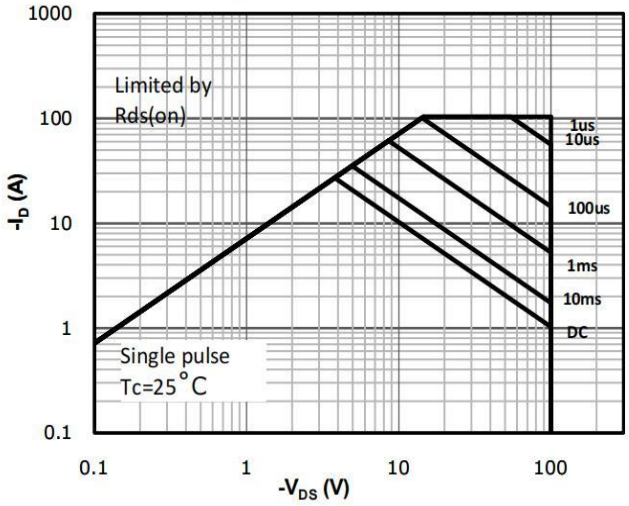
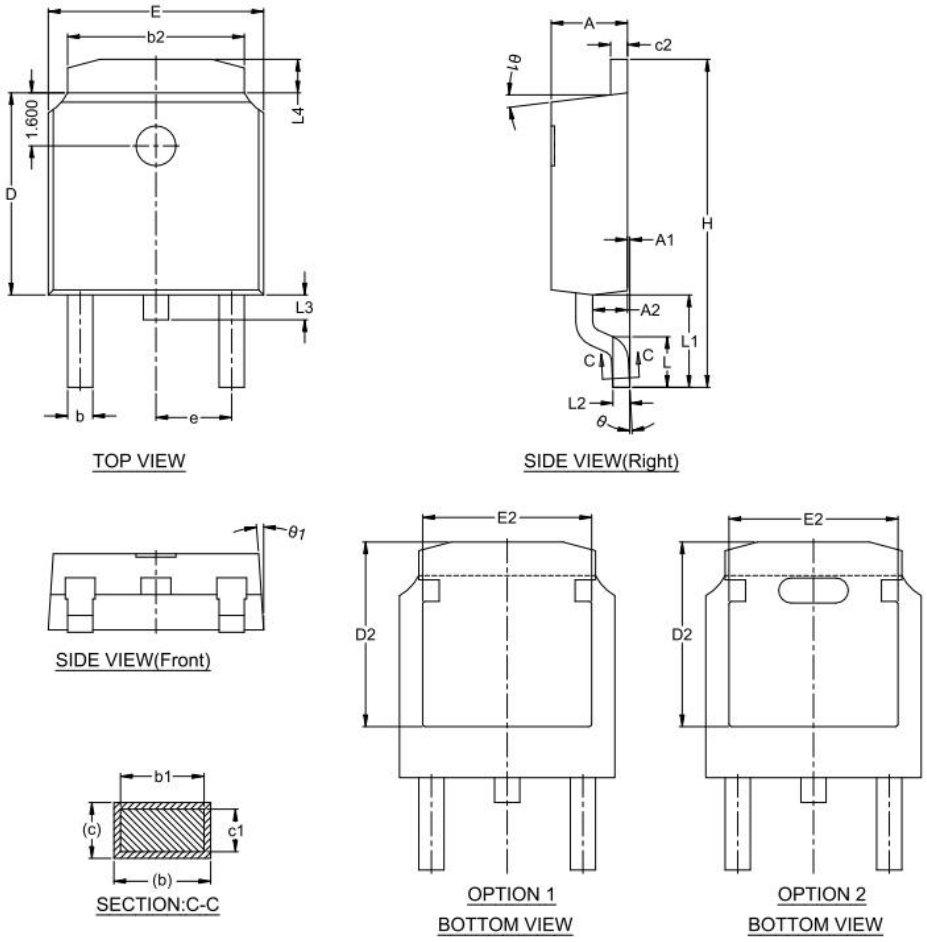


Fig 11: Safe Operating Area



TO-252 Package Information



DIM / SYMBOL	MIN.	NOM.	MAX.
A	2.200	2.300	2.400
A1	0.000	0.070	0.130
A2	0.950	1.050	1.150
b	0.700	0.800	0.900
b1	0.660	0.760	0.860
b2	5.134	5.334	5.534
c	0.448	0.548	0.648
c1	0.458	0.508	0.558
c2	0.448	0.548	0.648
D	6.000	6.100	6.200
D2	5.372	5.572	5.772
E	6.400	6.500	6.600
E2	4.900	5.100	5.300
e	2.286 BSC.		
H	9.700	9.900	10.100
L	1.380	1.525	1.725
L1	2.588	2.788	2.988
L2	0.508 BSC.		
L3	0.600	0.750	0.950
L4	0.812	1.012	1.212
θ	1°	3°	5°
θ1	6°	7°	8°

Revision History

Revision	Release	Remark
V1.0	2024/08/24	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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