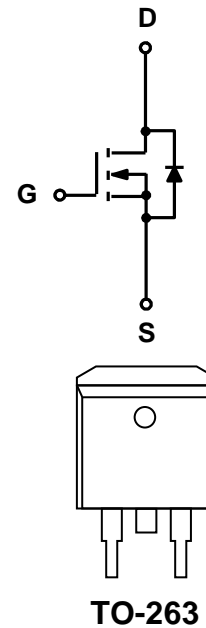


Feature

- 40V,160A
 $R_{DS(ON)} < 2.8m\Omega @ V_{GS}=10V$ TYP:2.4 m Ω
 $R_{DS(ON)} < 4.0m\Omega @ V_{GS}=4.5V$ TYP:3.2m Ω
- Advanced Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- $T_{jmax}=175^{\circ}C$
- AEC-Q101 qualified

Application

- PWM applications
- Load Switch
- Power management



Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
200N04D-AU	AP200N04D-AU	TO-263	13 Inch	-	800

ABSOLUTE MAXIMUM RATINGS ($T_J=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_c=25^{\circ}C$)	I_D	160	A
Continuous Drain Current ($T_c=100^{\circ}C$)	I_D	112	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	520	A
Single Pulsed Avalanche Energy ⁽²⁾	E_{AS}	260	mJ
Power Dissipation	P_D	180	W
Thermal Resistance from Junction to Case ⁽⁴⁾	$R_{\theta JC}$	0.83	$^{\circ}C/W$
Thermal Resistance- from Junction to Ambient	$R_{\theta JA}$	45	$^{\circ}C/W$
Junction Temperature	T_J	175	$^{\circ}C$
Storage Temperature	T_{STG}	-55~ +175	$^{\circ}C$

MOSFET ELECTRICAL CHARACTERISTICS(T_J=25°C unless otherwise noted)

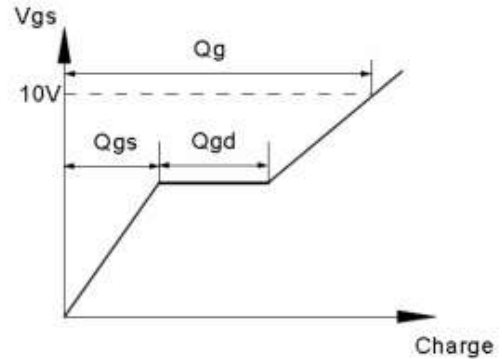
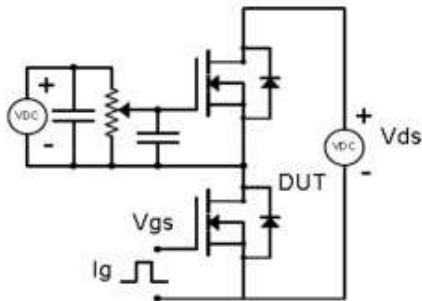
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	40	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =40V, V _{GS} = 0V	-	-	1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V	-	-	±100	nA
Gate threshold voltage ⁽³⁾	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.5	2.2	V
Drain-source on-resistance ⁽³⁾	R _{DS(on)}	V _{GS} =10V, I _D =50A	-	2.4	2.8	mΩ
		V _{GS} =4.5V, I _D =30A	-	3.2	4.0	
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f =1MHz	-	6260	-	pF
Output Capacitance	C _{oss}		-	523	-	
Reverse Transfer Capacitance	C _{rss}		-	727	-	
Switching characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} =20V, I _D =30A, R _L =1Ω V _{GS} =10V, R _G =3Ω	-	16.8	-	ns
Turn-on rise time	t _r		-	38.1	-	
Turn-off delay time	t _{d(off)}		-	116.4	-	
Turn-off fall time	t _f		-	33.4	-	
Total Gate Charge	Q _g	V _{DS} =20V, I _D =30A, V _{GS} =10V	-	129.6	-	nC
Gate-Source Charge	Q _{gs}		-	20.3	-	
Gate-Drain Charge	Q _{gd}		-	27.4	-	
Source-Drain Diode characteristics						
Diode Forward voltage ⁽³⁾	V _{DS}	V _{GS} =0V, I _S =10A	-	-	1.2	V
Diode Forward current ⁽⁴⁾	I _S		-	-	160	A
Body Diode Reverse Recovery Time	t _{rr}	T _J =25° , IF=30A,di/dt=100A/us		23.5		ns
Body Diode Reverse Recovery Charge	Q _{rr}	T _J =25° , IF=30A,di/dt=100A/us		12.8		nc

Notes:

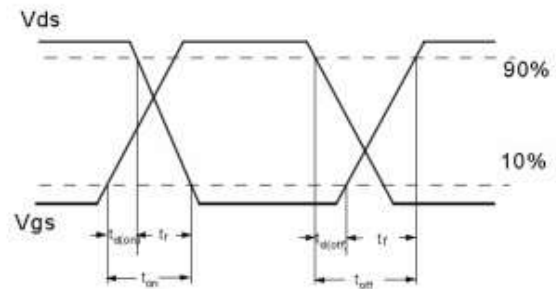
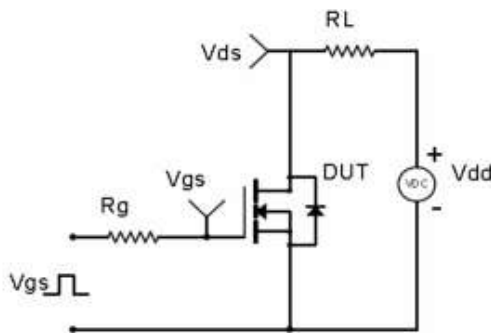
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:T_J=25°C, V_{DD}=20V, R_G=25 Ω , L=0.5mH , I_{AS}=32A,
3. Pulse Test: pulse width≤300μs, duty cycle≤2%
4. Surface Mounted on FR4 Board,t≤10 sec

Test Circuit & Waveform

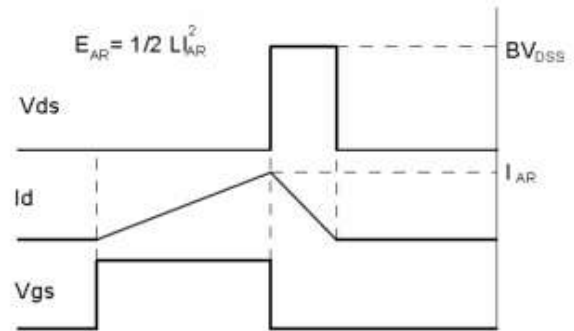
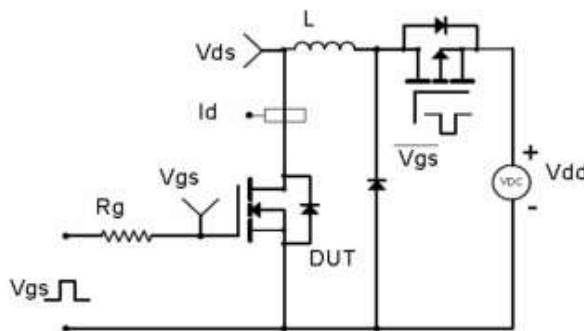
Gate Charge Test Circuit & Waveform



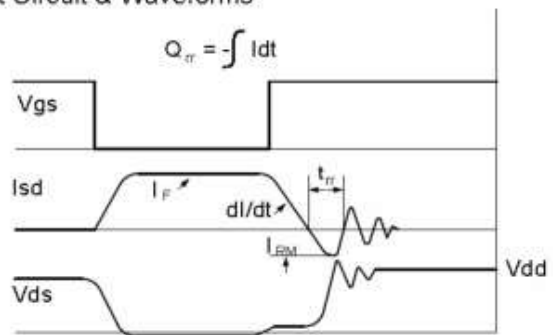
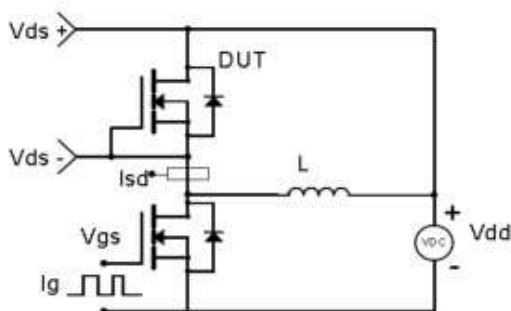
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Typical Performance Characteristics

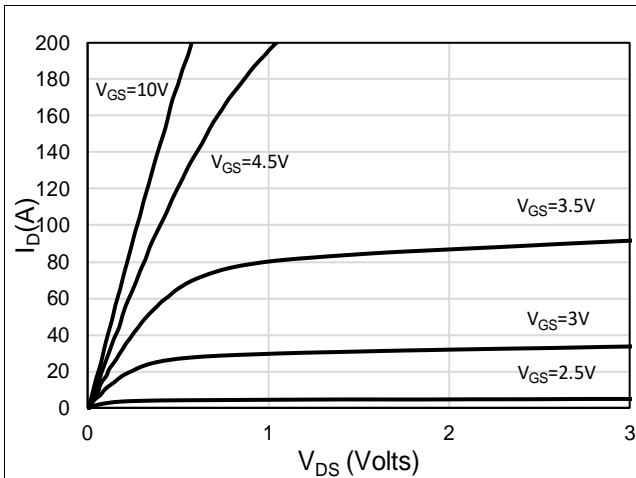


Figure 1: On-Region Characteristics

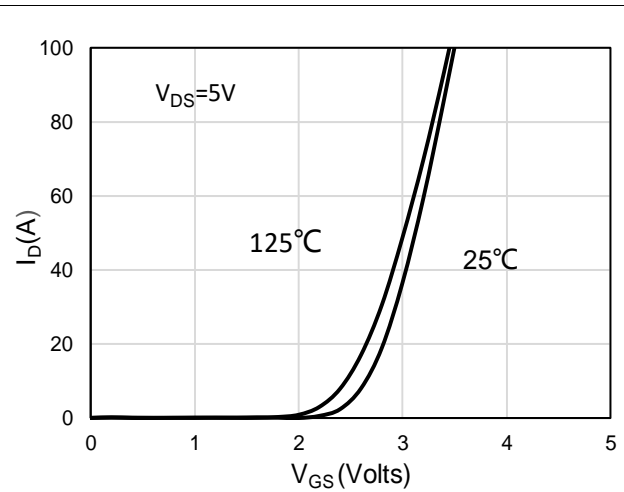


Figure 2: Transfer Characteristics

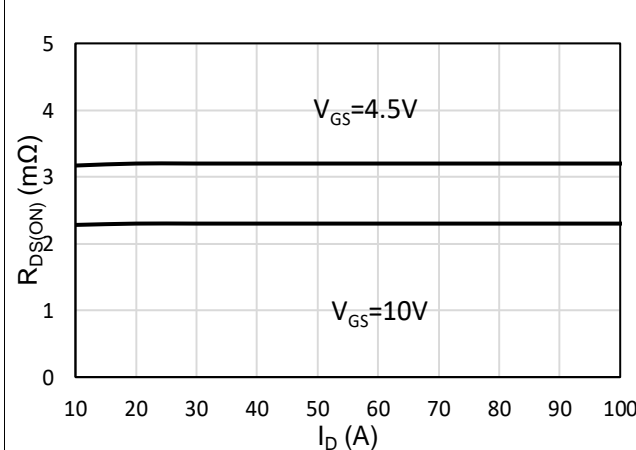


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

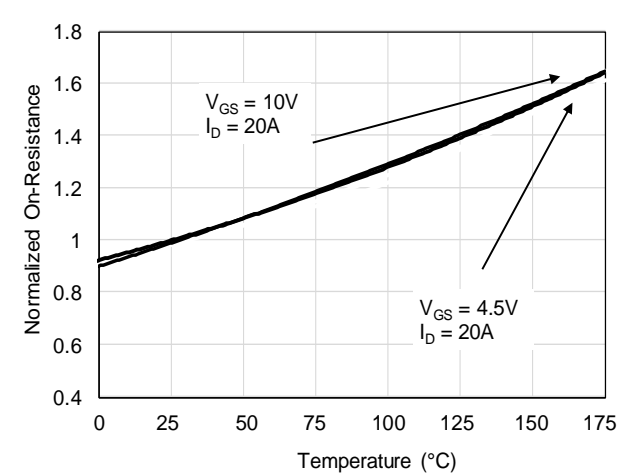


Figure 4: On-Resistance vs. Junction Temperature

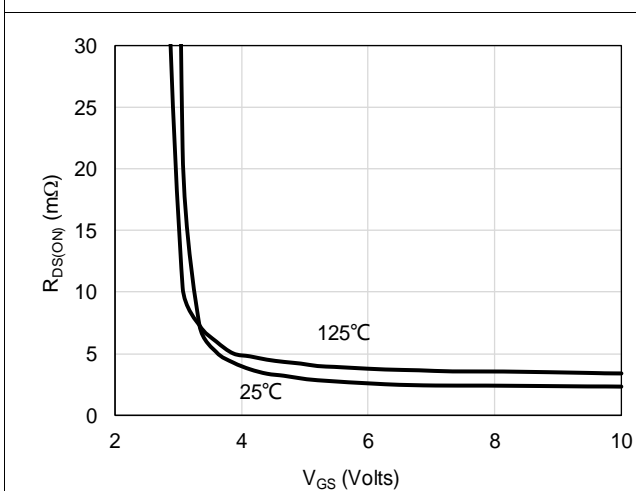


Figure 5: On-Resistance vs. Gate-Source Voltage

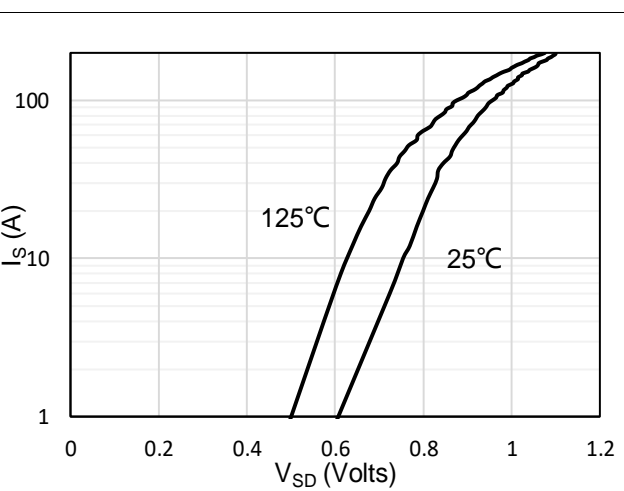
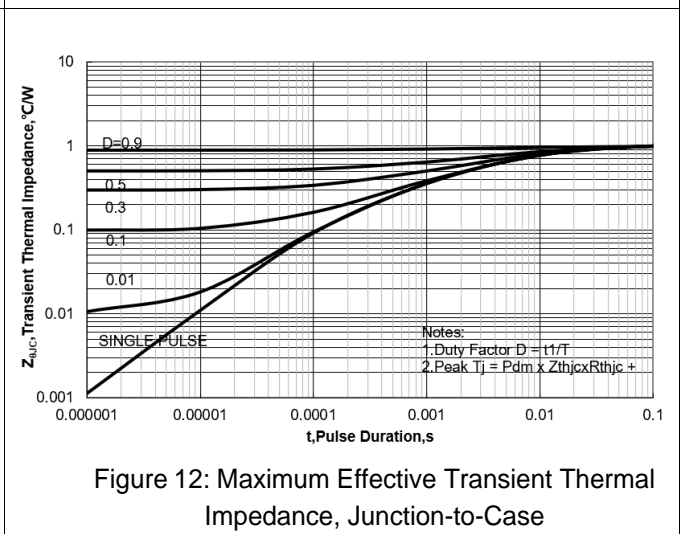
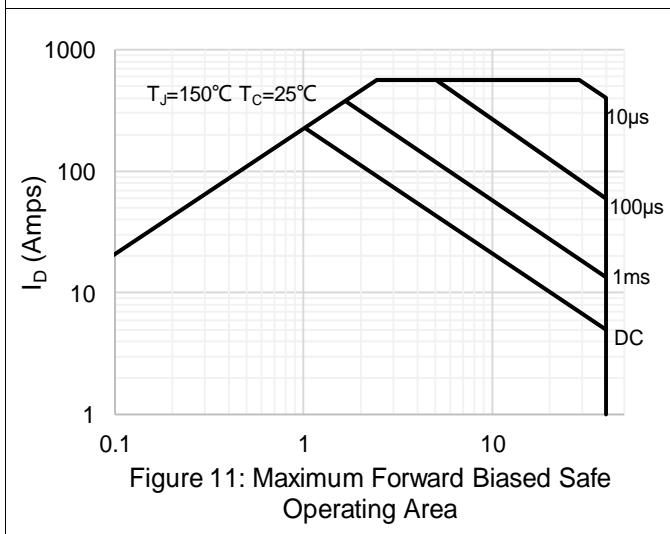
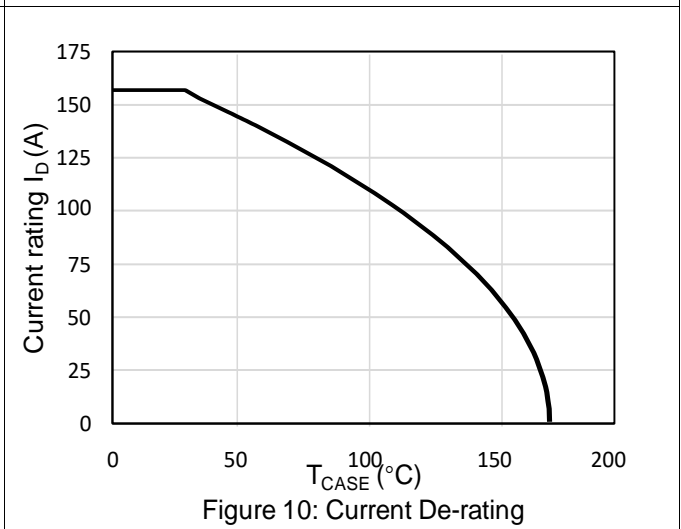
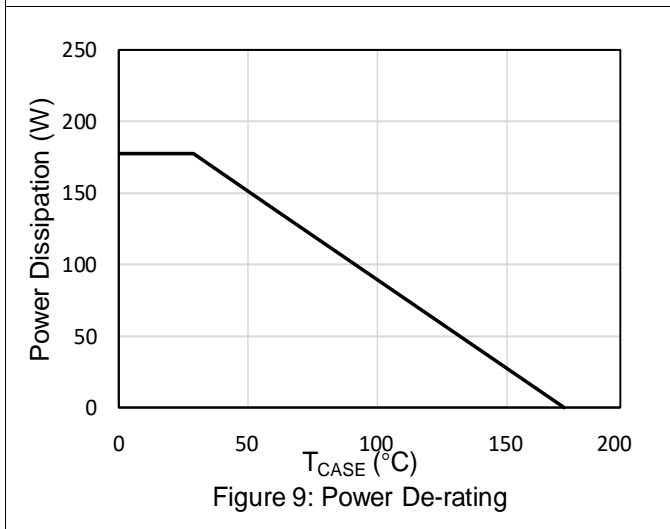
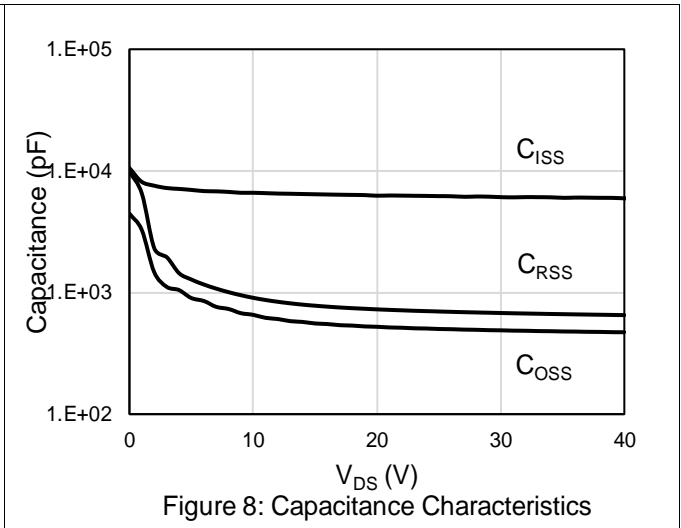
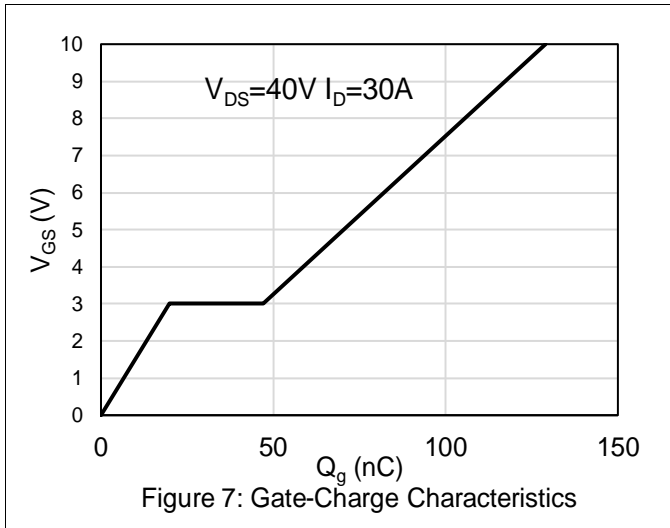
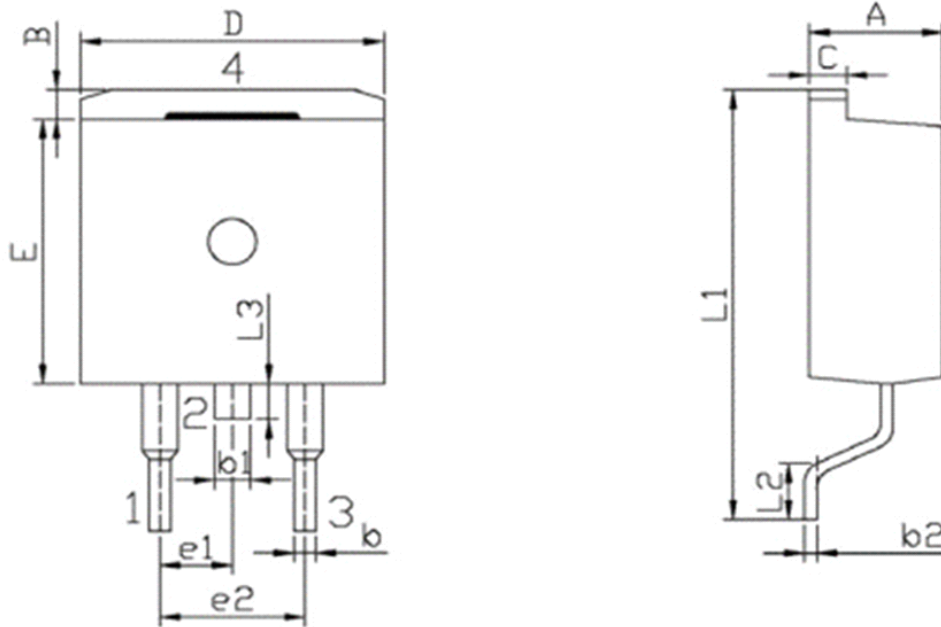


Figure 6: Body-Diode Characteristics

Typical Performance Characteristics



TO-263 Package Information



单位: mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	4.30	4.70	E	9.00	9.40
B	1.00	1.40	e1	2.34	2.74
b	0.70	0.90	e2	4.88	5.28
b1	1.15	1.35	L1	15.00	16.00
b2	0.40	0.60	L2	2.24	2.84
C	1.20	1.40	L3	1.20	1.60
D	9.80	10.20			

Revision History

Revision	Release	Remark
V1.0	2023/01/13	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.

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