chanhvinh.com



Features

- Thick film technology
- Power rating up to 1.5 watts @ 70 °C
- High power surge withstanding
- RoHS compliant*
- Halogen free**
- AEC-Q200 compliant

Applications

- Power supplies
- Digital meters
- Consumer electronics
- LED lighting
- Industry control boards

CMP-A Series High Power Anti-Surge Chip Resistors

Electrical Characteristics

Characteristic	Model				
	CMP0603A	CMP0805A	CMP1206A	CMP2010A	CMP2512A
Power Rating @ 70 °C	0.25 W	0.5 W	0.75 W	1 W	1.5 W
Operating Temperature Range	-55 °C to +155 °C				
Derated to Zero Load at	+155 °C				
Maximum Working Voltage	75 V	200 V	250 V	200 V	300 V
Maximum Overload Voltage	125 V	300 V	500 V	400 V	600 V
Resistance Tolerance	±1 %, ±5 %				
Temperature Coefficient					
10 Ω to 1 MΩ (±1 %, E24 & E96 Series)	±100 ppm/°C	±100 ppm/°C	±100 ppm/°C	±100 ppm/°C	±100 ppm/°C
10 Ω to 1 MΩ (±5 %, E24 Series	±200 ppm/°C	±200 ppm/°C	±200 ppm/°C	±200 ppm/°C	±200 ppm/°C

Note: Solder pad and trace size should be evaluated and board surface temperature should not exceed +105 °C when applying full rated power.

Additional Information

Click these links for more information:

PRODUCT SELECTOR | TECHNICAL LIBRARY | INVENTORY | SAMPLES | CONTACT

BOURNS®

Americas: Tel: +1 951-781-5500 • Email: americus@bourns.com
Mexico: Tel: +52-614-478-0400 • Email: mexicus@bourns.com
Asia: Tel: +886-2-2562-4117 • Email: asiacus@bourns.com
EMEA: Tel: +36 88 885 877 • Email: eurocus@bourns.com
www.bourns.com

WARNING Cancer and Reproductive Harm - www.P65Warnings.ca.gov

* RoHS Directive 2015/863, Mar 31, 2015 and Annex.
** Bourns considers a product to be "halogen free" if (a) the Bromine (Br) content is 900 ppm or less; (b) the Chlorine (Cl) content is 900 ppm or less; and (c) the total Bromine (Br) and Chlorine (Cl) content is 1500 ppm or less.

Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.
The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf.

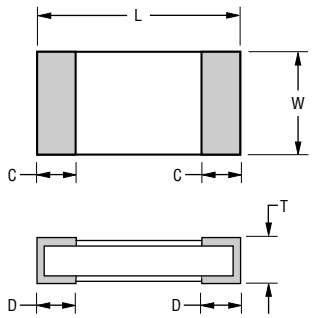
chanhvinh.com

CMP-A Series High Power Anti-Surge Chip Resistors

BOURNS®

Product Dimensions

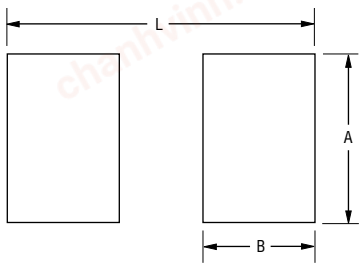
Model	L	W	C	D	T
CMP0603A	1.60 ± 0.10 (.063 ± .004)	0.80 ± 0.10 (.031 ± .004)	0.30 ± 0.20 (.012 ± .008)	0.30 ± 0.20 (.012 ± .008)	0.45 ± 0.10 (.018 ± .004)
CMP0805A	2.00 ± 0.10 (.079 ± .004)	1.25 ± 0.10 (.049 ± .004)	0.40 ± 0.20 (.016 ± .008)	0.40 ± 0.20 (.016 ± .008)	0.50 ± 0.10 (.020 ± .004)
CMP1206A	3.10 ± 0.10 (.122 ± .004)	1.60 ± 0.10 (.063 ± .004)	0.50 ± 0.25 (.020 ± .010)	0.50 ± 0.25 (.020 ± .010)	0.55 ± 0.10 (.022 ± .004)
CMP2010A	5.00 ± 0.20 (.197 ± .008)	2.50 ± 0.20 (.098 ± .008)	0.65 ± 0.25 (.026 ± .010)	0.60 ± 0.25 (.023 ± .010)	0.60 ± 0.10 (.024 ± .004)
CMP2512A	6.40 ± 0.20 (.252 ± .008)	3.10 ± 0.20 (.122 ± .008)	0.60 ± 0.25 (.024 ± .010)	1.80 ± 0.25 (.071 ± .010)	0.60 ± 0.15 (.024 ± .006)



DIMENSIONS: MM (INCHES)

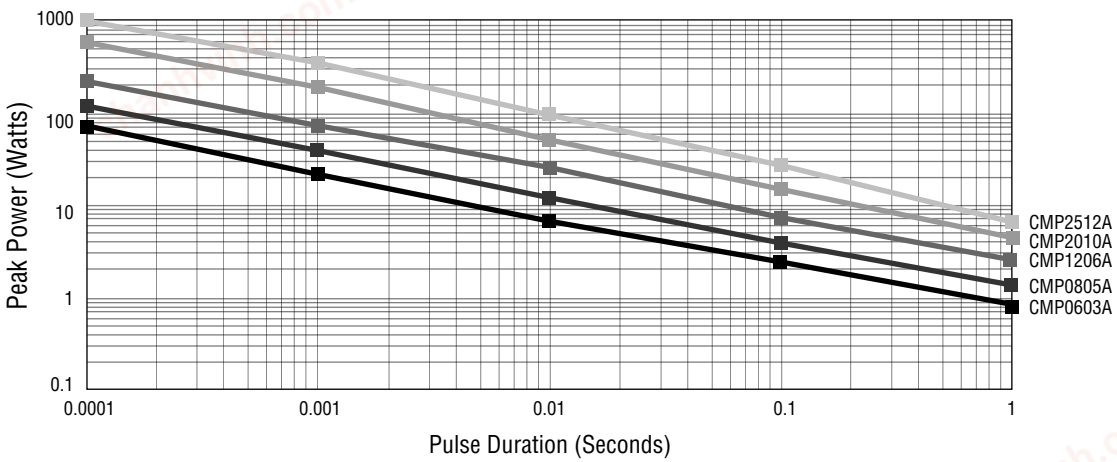
Recommended Solder Pad Layout

Model	A	B	L
CMP0603A	0.90 (.035)	1.00 (.039)	3.00 (.118)
CMP0805A	1.30 (.051)	1.15 (.045)	3.50 (.138)
CMP1206A	1.80 (.071)	1.30 (.051)	4.70 (.185)
CMP2010A	3.00 (.118)	1.50 (.059)	6.80 (.268)
CMP2512A	3.70 (.146)	2.45 (.096)	7.60 (.299)



DIMENSIONS: MM (INCHES)

Surge Performance



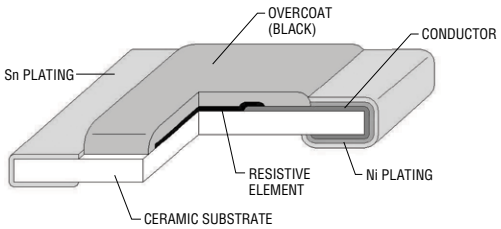
Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.
The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf.

chanhvinh.com

CMP-A Series High Power Anti-Surge Chip Resistors

BOURNS®

Construction



Rated Voltage

The rated voltage is calculated by the following formula:

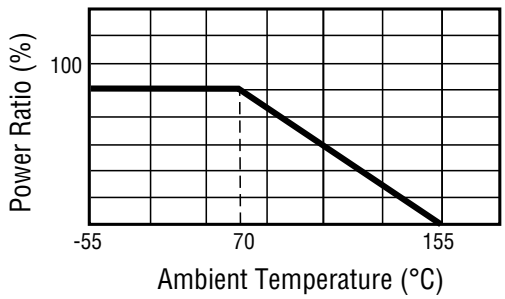
$V=\sqrt{P \times R}$

V: Rated Voltage (V)
P: Rated Power (W)
R: Resistance Value (Ω)

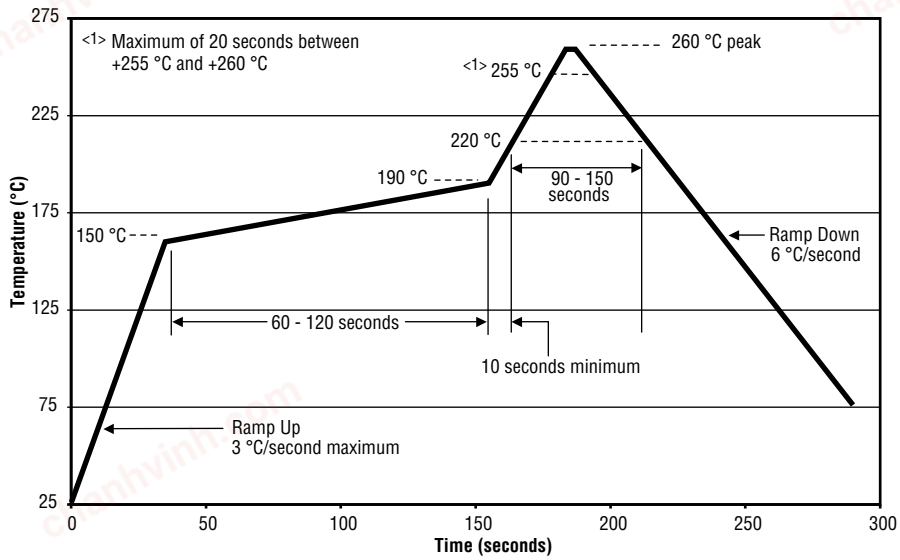
Environmental Characteristics

Moisture Sensitivity Level.....1

Derating Curve



Soldering Profile



Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.
The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf.

chanhvinh.com

CMP-A Series High Power Anti-Surge Chip Resistors

BOURNS®

How to Order

CMP 0603 A F X - 1002 E LF

Model
- CMP = High Power Anti-Surge Resistor

Size
- 0603 = 0603 Size
- 0805 = 0805 Size
- 1206 = 1206 Size
- 2010 = 2010 Size
- 2512 = 2512 Size

Feature
- A = AEC-Q200 Compliant

Resistance Tolerance
- F = ±1 %
- J = ±5 %

TCR (See Electrical Characteristics chart)
- W = ±200 PPM/°C
- X = ±100 PPM/°C

Resistance Value

1 % Tolerance:
- <100 Ω.....“R” represents decimal point *(example: 24R3 = 24.3 Ω)*
- ≥100 Ω.....First three digits are significant, fourth digit represents number of zeros to follow *(example: 8252 = 82.5K Ω)*

5 % Tolerance:
- ≥10 Ω.....First two digits are significant, third digit represents number of zeros to follow *(example: 474 = 470K Ω)*

Packaging
- E = 5,000 pieces on 180 mm (7 inch) plastic reel, paper tape - CMP0603, CMP0805, CMP1206
  4,000 pieces on 180 mm (7 inch) reel, plastic tape - CMP2010, CMP2512

Termination
- LF = Tin-plated (RoHS Compliant)

Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.
The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf.

chanhvinh.com

CMP-A Series High Power Anti-Surge Chip Resistors

BOURNS®

Performance Characteristics

Test Item	Method	Procedure	Test Limits ΔR
Electrical Characteristics	AEC-Q200 Table 7.1	Measure the resistance value	DC Resistance: F: ±1 % : J : ±5 % TCR: Within the specified
High Temperature Exposure (Storage)	AEC-Q200 Table 7.3	1000 hours @ T = 125 °C unpowered; Measurement at 24 ±2 hours after test conclusion	J: Δ R ≤ ±(3 % + 0.1 Ω) F: Δ R ≤ ±(1 % + 0.05 Ω)
Temperature Cycling	AEC-Q200 Table 7.4	1000 cycles (-55 °C to +125 °C); Measurement at 24 ±2 hours after test conclusion	J: Δ R ≤ ±(1 % + 0.1 Ω) F: Δ R ≤ ±(0.5 % + 0.05 Ω) No mechanical damage
Moisture Resistance	AEC-Q200 Table 7.6	Test 65 °C / 80-100 % RH / 10 cycles; Measurement at 24 ±2 hours after test conclusion (t = 24 hours/cycle)	J: Δ R ≤ ±(1 % + 0.1 Ω) F: Δ R ≤ ±(0.5 % + 0.05 Ω)
Biased Humidity	AEC-Q200 Table 7.7	1000 hours 85 °C / 85 % RH, 10 % of operating power; Measurement at 24 ±2 hours after test conclusion	J: Δ R ≤ ±(3 % + 0.1 Ω) F: Δ R ≤ ±(1 % + 0.05 Ω)
Operational Life	AEC-Q200 Table 7.8	Test 1000 hours @ TA = 125 °C at specified rated power; Measurement at 24 ±2 hours after test conclusion	J: Δ R ≤ ±(3 % + 0.1 Ω) F: Δ R ≤ ±(1 % + 0.05 Ω)
Mechanical Shock	AEC-Q200 Table 7.13	Test peak value: 100 g's, wave: hail-sine; Duration: 6 ms, Velocity: 12.3 ft/sec.	Within product specification tolerance and no visible damage
Vibration	AEC-Q200 Table 7.14	5 g's for 20 min., 12 cycles each of 3 orientations; Test from 10-2000 Hz	J: Δ R ≤ ±(1 % + 0.1 Ω) F: Δ R ≤ ±(0.5 % + 0.05 Ω) No mechanical damage
Resistance to Solder Heat	AEC-Q200 Table 7.15	Solder dipping @ 270 °C ±5 °C for 10 sec. ±1 sec.	J: Δ R ≤ ±(1 % + 0.1 Ω) F: Δ R ≤ ±(0.5 % + 0.05 Ω) No mechanical damage
Thermal Shock	AEC-Q200 Table 7.16	-55 to 155 °C / dwell time 15 min / max transfer time 20 sec / 300 cycles	J: Δ R ≤ ±(1 % + 0.1 Ω) F: Δ R ≤ ±(0.5 % + 0.05 Ω) No mechanical damage
ESD	AEC-Q200-002	Test contact min. 1 KV	Δ R ≤ ±(1 % + 0.1 Ω)
Solderability	AEC-Q200 Table 7.18	a) Baking 155 °C 4H, dipping 235 °C 5 sec b) Steam 8H, dipping 215 °C 5 sec c) Steam 8H, dipping 260 °C 7 sec	Over 95 % of termination must be covered with solder
Flammability	AEC-Q200 Table 7.20	UL-94 V-0 or V-1 are acceptable	Refer UL-94
Board Flex	AEC-Q200 Table 7.21	Bending 2 mm (2512, 1206), 3 mm (0805, 0603)	J: Δ R ≤ ±(1 % + 0.1 Ω) F: Δ R ≤ ±(0.5 % + 0.05 Ω) No mechanical damage
Terminal Strength	AEC-Q200 Table 7.22	Force 1.8 Kg for 60 sec	No mechanical damage
Sulfur-Resistant	ASTM B-809	+50 °C ±2 °C, 1000 hours	Δ R ≤ ±(1 % + 0.1 Ω)

Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.
The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf.

chanhvinh.com

CMP-A Series High Power Anti-Surge Chip Resistors

BOURNS®

Typical Part Marking

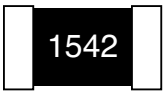
±5 % (E24): **CMP0603A, CMP0805A, CMP1206A, CMP2010A, CMP2512A**



Resistance value is expressed by 3 digits. The first two digits represent the significant figures of the nominal resistance value in ohms; the third digit represents the exponent for a base of 10.

*Example: **301** = 30 x 10^1 = 300 ohms*

±1 % (E24/E96): **CMP0805A, CMP1206A, CMP2010A, CMP2512A**



Resistance value is expressed by 4 digits. The first three digits represent the significant figures of the nominal resistance value in ohms; the third digit represents the exponent for a base of 10.

*Example: **1542** = 154 x 10^2 = 15.4K ohms*

±1 % (E24): **CMP0603A**



Resistance value is expressed by 3 digits. The first two digits represent the significant figures of the nominal resistance value in ohms; the third digit represents the exponent for a base of 10.

*Example: **222** = 22 x 10^2 = 2.2K ohms*

±1 % (E96): **CMP0603A**



Resistance value is expressed by 2 digits followed by an alpha character multiplier. (Refer to marking table below.)

*Example: **01B** = 100 x 10^1 = 1K ohms*

This table shows the first two digits for the three-digit E96 part marking scheme. The third character is a letter multiplier:

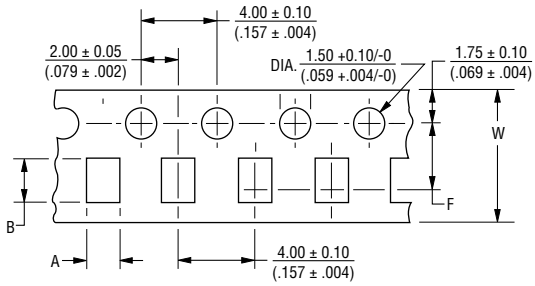
A=10^0
B=10^1
C=10^2
D=10^3
E=10^4
F=10^5
G=10^6
H=10^7
X=10^{-1}
Y=10^{-2}
Z=10^{-3}

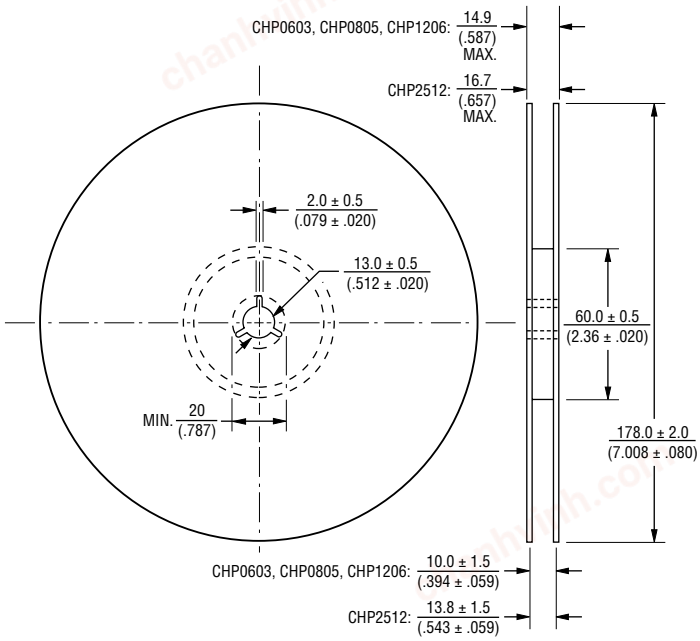
Code	R Value	Code	R Value	Code	R Value	Code	R Value	Code	R Value
01	100	21	162	41	261	61	422	81	681
02	102	22	165	42	267	62	432	82	698
03	105	23	169	43	274	63	442	83	715
04	107	24	174	44	280	64	453	84	732
05	110	25	178	45	287	65	464	85	750
06	113	26	182	46	294	66	475	86	768
07	115	27	187	47	301	67	487	87	787
08	118	28	191	48	309	68	499	88	806
09	121	29	196	49	316	69	511	89	825
10	124	30	200	50	324	70	523	90	845
11	127	31	205	51	332	71	536	91	866
12	130	32	210	52	340	72	549	92	887
13	133	33	215	53	348	73	562	93	909
14	137	34	221	54	357	74	576	94	931
15	140	35	226	55	365	75	590	95	953
16	143	36	232	56	374	76	604	96	976
17	147	37	237	57	383	77	619		
18	150	38	243	58	392	78	634		
19	154	39	249	59	402	79	649		
20	158	40	255	60	412	80	665		

Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.
The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf.

chanhvinh.com

Packaging Dimensions (Conforms to EIA RS-481A)





Model	Tape Type	Pieces per Reel	A	B	W	F
CMP0603A	Paper	5,000	1.10 ± 0.20 (.043 ± .008)	1.90 ± 0.20 (.075 ± .008)	8.00 ± 0.30 (.315 ± .012)	3.50 ± 0.05 (.138 ± .020)
CMP0805A			1.65 ± 0.20 (.065 ± .008)	2.40 ± 0.20 (.094 ± .008)		
CMP1206A			2.00 ± 0.20 (.079 ± .008)	3.60 ± 0.20 (.142 ± .008)		
CMP2010A	Plastic	4,000	2.80 ± 0.20 (.110 ± .008)	5.50 ± 0.20 (.216 ± .008)	12.00 ± 0.30 (.472 ± .012)	5.50 ± 0.05 (.217 ± .020)
CMP2512A			3.50 ± 0.20 (.138 ± .008)	6.70 ± 0.20 (.264 ± .008)		

DIMENSIONS: MM / (INCHES)

Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.
The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf.

chanhvinh.com

Legal Disclaimer Notice

BOURNS®

This legal disclaimer applies to purchasers and users of Bourns® products manufactured by or on behalf of Bourns, Inc. and its affiliates (collectively, "Bourns").

Unless otherwise expressly indicated in writing, Bourns® products and data sheets relating thereto are subject to change without notice. Users should check for and obtain the latest relevant information and verify that such information is current and complete before placing orders for Bourns® products.

The characteristics and parameters of a Bourns® product set forth in its data sheet are based on laboratory conditions, and statements regarding the suitability of products for certain "typical" applications are based on Bourns' knowledge of typical requirements in generic applications. Bourns assumes that "typical" applications include failsafe/backup features to address critical risks to users and are designed to allow rework of Bourns® product to avoid scrap of a device solely due to malfunctioning Bourns® product. The characteristics and parameters of a Bourns® product in a user application may vary from the data sheet characteristics and parameters due to (i) the combination of the Bourns® product with other components in the user's application, or (ii) the environment of the user application itself. The characteristics and parameters of a Bourns® product also can and do vary in different applications and actual performance may vary over time. Thus, users should always verify the actual performance of the Bourns® product in their specific devices and applications and make their own independent judgments regarding the suitability of Bourns® product and the amount of additional test margin to design into their device or application to compensate for differences between laboratory and real-world conditions.

Unless Bourns has explicitly designated an individual Bourns® product as meeting the requirements of a particular industry standard (e.g., IATF 16949) or a particular qualification (e.g., UL listed or recognized), Bourns is not responsible for any failure of an individual Bourns® product to meet the requirements of such industry standard or particular qualification even if such industry standard or qualification is a "state of art". Users of Bourns® products are responsible for ensuring compliance with safety-related requirements and standards applicable to their devices or applications.

Bourns® products are not recommended, authorized or intended for use in applications where failure or malfunction may result in personal injury, death, or severe property or environmental damage, such as without limitation nuclear, life-critical medical and certain automotive and aviation applications. Except as set forth in the bullet points below or unless expressly and specifically approved in writing on a case-by-case basis by an authorized Bourns' representative, use of any Bourns® products in such unauthorized high-risk applications is at the user's sole risk.

- Bourns considers implantable/invasive devices and devices/procedures designed as life-supporting or life-sustaining by the U.S. Food and Drug Administration or equivalent organizations outside of the United States as "life-critical" medical applications. Bourns expressly identifies those Bourns® standard products that are suitable for use in typical medical applications that are not life-critical in its publication entitled "Bourns Medical Grade Component Guide."

- Bourns expressly identifies those Bourns® standard products that are suitable for use in typical automotive applications associated with any Automate Safety Integrity Level (ASIL) in its publication entitled "Bourns Automotive Grade Component Guide." Bourns' designation of Bourns® product as compliant with the AEC-Q standard does not by itself mean that Bourns has approved such product for use in an automotive application.

- Bourns expressly identifies Bourns® standard products that are suitable for use in the typical aviation applications/systems requiring System Design Assurance Level (RTCA DO-254 DAL) of C, D or E in its publication entitled "Bourns Civilian Aerospace/Aviation Grade Component Guide." Bourns does not test its products for compliance with United States Federal Aviation Administration standards or any other generally equivalent governmental organization standard applicable to products designed or manufactured for use in aviation applications. Use of Bourns® standard components in aviation applications associated with RTCA DO-254 DAL A or B without proper approval noted above shall be at the user's sole risk.

- Bourns will review and authorize on a case-by-case basis the use of Bourns® standard products which are at least AEC-Q compliant in space-related civil applications (rockets, satellites) with a negotiated cross-waiver and indemnity agreement.

The use and level of testing applicable to Bourns® custom products shall be negotiated on a case-by-case basis by Bourns and the user for which such Bourns® custom products are specially designed. Absent a written agreement between Bourns and the user regarding the use and level of such testing, the above provisions applicable to Bourns® standard products shall also apply to such Bourns® custom products.

Use of Bourns® products or Bourns' technology in military/defense applications must be reviewed with Bourns for compliance with applicable export control laws and embargoes. Users shall not sell, transfer, export or re-export (which includes transfers within a country) any Bourns® products or technology or technical data for use in activities which involve the design, development, production, use or stockpiling of nuclear, chemical or biological weapons or missiles, nor shall they use Bourns® products or technology or technical data in any facility which engages in activities relating to such devices. Further, Bourns® products and Bourns' technology and technical data may not under any circumstance be exported or re-exported to countries subject to international sanctions or embargoes. Bourns® products and technology may not, without prior authorization from Bourns and/or the Government of a country where such product/technology is designed and/or manufactured, be resold, transferred, or re-exported (including within the same country) to any party not eligible to receive commodities, software, and technical data originating in such country.

To the maximum extent permitted by applicable law, Bourns disclaims (i) any and all liability for special, punitive, consequential, incidental or indirect damages or lost revenues or lost profits, and (ii) any and all implied warranties (those not based on parameters specified in Bourns' data sheets and/or specifications), including implied warranties of fitness for particular purpose, non-infringement and merchantability.

For your convenience, copies of this Legal Disclaimer Notice with German, Spanish, Japanese, Traditional Chinese and Simplified Chinese bilingual versions are available at:

Web Page: https://www.bourns.com/legal/disclaimers-terms-and-policies
PDF: https://www.bourns.com/docs/Legal/disclaimer.pdf