

Features

- Surface Mount SMA package
- Standoff Voltage: 5 to 130 volts
- Power Dissipation: 600 watts
- RoHS compliant*
- AEC-Q101 compliant**

Applications

- Protection of power buses
- Protection of I/O interfaces
- Overvoltage transient protection
- Telecom, computer, industrial and consumer electronics applications

SMA6J-Q Transient Voltage Suppressor Diode Series

General Information

Bourns offers Transient Voltage Suppressor Diodes for surge and ESD protection applications, in compact chip package DO-214AC (SMA) size format. The Transient Voltage Suppressor series offers a choice of Working Peak Reverse Voltage from 5 V up to 130 V. Typical fast response times are less than 1.0 picosecond from 0 V to Breakdown Voltage.

Bourns® Chip Diodes are easy to handle with standard pick and place equipment and the flat configuration minimizes roll away.

Additional Information

Click these links for more information:

PRODUCT SELECTOR | TECHNICAL LIBRARY | INVENTORY | SAMPLES | CONTACT

Electrical Characteristics (@ T_A = 25 °C Unless Otherwise Noted)

Parameter	Symbol	Value	Unit
Minimum Peak Pulse Power Dissipation (T_P = 1 ms) (Note 1,2)	P_{PK}	600	Watts
Peak Forward Surge Current 8.3 ms Single Half Sine Wave Superimposed on Rated Load (JEDEC Method) (Note 3)	I_{FSM}	40	Amps
Operating Temperature Range	T_J	-55 to +150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

1. Non-repetitive current pulse, per Pulse Waveform graph and derated above T_A = 25 °C per Pulse Derating Curve.
2. Mounted on 5.0 mm^2 (0.03 mm thick) copper pads to each terminal.
3. 8.3 ms Single Half-Sine Wave duty cycle = 4 pulses maximum per minute (unidirectional units only).

BOURNS®

Asia-Pacific: Tel: +886-2 2562-4117 • Email: asiacus@bourns.com
EMEA: Tel: +36 88 885 877 • Email: eurocus@bourns.com
The Americas: Tel: +1-951 781-5500 • Email: americus@bourns.com
www.bourns.com

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

*RoHS Directive 2015/863, Mar 31, 2015 and Annex.
**"Q" part number suffix indicates AEC-Q101 compliance.
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.

Electrical Characteristics (@ T_A = 25 °C Unless Otherwise Noted) - Continued

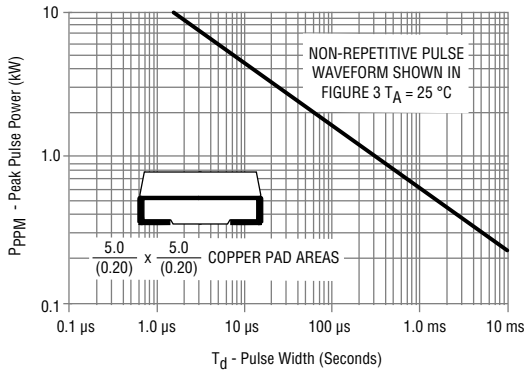
Unidirectional Device		Bidirectional Device		Breakdown Voltage V_{BR} (Volts)			Working Peak Reverse Voltage	Maximum Reverse Leakage @ V_{RWM}	Maximum Reverse Voltage @ I_{RSM}	Maximum Reverse Surge Current
Part No.	Marking	Part No.	Marking	Min.	Max.	@ I_T (mA)	V_{RWM} (V)	I_R (μA)	V_{RSM} (V)	I_{RSM} (A)
SMA6J5.0A-Q	6HEQ	SMA6J5.0CA-Q	6TEQ	6.40	7.00	10	5.0	800	9.2	65.3
SMA6J6.0A-Q	6HGQ	SMA6J6.0CA-Q	6TGQ	6.67	7.37	10	6.0	800	10.3	58.3
SMA6J6.5A-Q	6HKQ	SMA6J6.5CA-Q	6TKQ	7.22	7.98	10	6.5	500	11.2	53.6
SMA6J7.0A-Q	6HMQ	SMA6J7.0CA-Q	6TMQ	7.78	8.60	10	7.0	200	12.0	50.0
SMA6J7.5A-Q	6HPQ	SMA6J7.5CA-Q	6TPQ	8.33	9.21	1.0	7.5	100	12.9	46.6
SMA6J8.0A-Q	6HRQ	SMA6J8.0CA-Q	6TRQ	8.89	9.83	1.0	8.0	50	13.6	44.2
SMA6J8.5A-Q	6HTQ	SMA6J8.5CA-Q	6TTQ	9.44	10.4	1.0	8.5	20	14.4	41.7
SMA6J9.0A-Q	6HVQ	SMA6J9.0CA-Q	6TVQ	10.0	11.1	1.0	9.0	10	15.4	39.0
SMA6J10A-Q	6HXQ	SMA6J10CA-Q	6TXQ	11.1	12.3	1.0	10	5	17.0	35.3
SMA6J11A-Q	6HZQ	SMA6J11CA-Q	6TZQ	12.2	13.5	1.0	11	1.0	18.2	33.0
SMA6J12A-Q	6IEQ	SMA6J12CA-Q	6UEQ	13.3	14.7	1.0	12	1.0	19.9	30.2
SMA6J13A-Q	6IGQ	SMA6J13CA-Q	6UGQ	14.4	15.9	1.0	13	1.0	21.5	28.0
SMA6J14A-Q	6IKQ	SMA6J14CA-Q	6UKQ	15.6	17.2	1.0	14	1.0	23.2	25.9
SMA6J15A-Q	6IMQ	SMA6J15CA-Q	6UMQ	16.7	18.5	1.0	15	1.0	24.4	24.6
SMA6J16A-Q	6IPQ	SMA6J16CA-Q	6UPQ	17.8	19.7	1.0	16	1.0	26.0	23.1
SMA6J17A-Q	6IRQ	SMA6J17CA-Q	6URQ	18.9	20.9	1.0	17	1.0	27.6	21.8
SMA6J18A-Q	6ITQ	SMA6J18CA-Q	6UTQ	20.0	22.1	1.0	18	1.0	29.2	20.6
SMA6J20A-Q	6IVQ	SMA6J20CA-Q	6UVQ	22.2	24.5	1.0	20	1.0	32.4	18.6
SMA6J22A-Q	6IXQ	SMA6J22CA-Q	6UXQ	24.4	26.9	1.0	22	1.0	35.5	16.9
SMA6J24A-Q	6IZQ	SMA6J24CA-Q	6UZQ	26.7	29.5	1.0	24	1.0	38.9	15.5
SMA6J26A-Q	6JEQ	SMA6J26CA-Q	6VEQ	28.9	31.9	1.0	26	1.0	42.1	14.3
SMA6J28A-Q	6JGQ	SMA6J28CA-Q	6VGQ	31.1	34.4	1.0	28	1.0	45.4	13.3
SMA6J30A-Q	6JKQ	SMA6J30CA-Q	6VKQ	33.3	36.8	1.0	30	1.0	48.4	12.4
SMA6J33A-Q	6JMQ	SMA6J33CA-Q	6VMQ	36.7	40.6	1.0	33	1.0	53.3	11.3
SMA6J36A-Q	6JPQ	SMA6J36CA-Q	6VPQ	40.0	44.2	1.0	36	1.0	58.1	10.4
SMA6J40A-Q	6JRQ	SMA6J40CA-Q	6VRQ	44.4	49.1	1.0	40	1.0	64.5	9.3
SMA6J43A-Q	6JTQ	SMA6J43CA-Q	6VTQ	47.8	52.8	1.0	43	1.0	69.4	8.7
SMA6J45A-Q	6JVQ	SMA6J45CA-Q	6VVQ	50.0	55.3	1.0	45	1.0	72.7	8.3
SMA6J48A-Q	6JXQ	SMA6J48CA-Q	6VXQ	53.3	58.9	1.0	48	1.0	77.4	7.8
SMA6J51A-Q	6JZQ	SMA6J51CA-Q	6VZQ	56.7	62.7	1.0	51	1.0	82.4	7.3
SMA6J54A-Q	6KEQ	SMA6J54CA-Q	6WEQ	60.0	66.3	1.0	54	1.0	87.1	6.9
SMA6J58A-Q	6KGQ	SMA6J58CA-Q	6WGQ	64.4	71.2	1.0	58	1.0	93.6	6.5
SMA6J60A-Q	6KKQ	SMA6J60CA-Q	6WKQ	66.7	73.7	1.0	60	1.0	96.8	6.2
SMA6J64A-Q	6KMQ	SMA6J64CA-Q	6WMQ	71.1	78.6	1.0	64	1.0	103.0	5.9
SMA6J70A-Q	6KPQ	SMA6J70CA-Q	6WPQ	77.8	86.0	1.0	70	1.0	113.0	5.3
SMA6J75A-Q	6KRQ	SMA6J75CA-Q	6WRQ	83.3	92.1	1.0	75	1.0	121.0	5.0
SMA6J78A-Q	6KTQ	SMA6J78CA-Q	6WTQ	86.7	95.8	1.0	78	1.0	126.0	4.8
SMA6J85A-Q	6KVQ	SMA6J85CA-Q	6WVQ	94.4	104.0	1.0	85	1.0	137.0	4.4
SMA6J90A-Q	6KXQ	SMA6J90CA-Q	6WXQ	100.0	111.0	1.0	90	1.0	146.0	4.1
SMA6J100A-Q	6KZQ			111.0	123.0	1.0	100	1.0	162.0	3.7
SMA6J110A-Q	6LEQ			122.0	135.0	1.0	110	1.0	177.0	3.4
SMA6J120A-Q	6LGQ			133.0	147.0	1.0	120	1.0	193.0	3.1
SMA6J130A-Q	6LKQ			144.0	159.0	1.0	130	1.0	209.0	2.9

Notes: 1. Suffix 'A' denotes a 5 % tolerance unidirectional device.
2. Suffix 'CA' denotes a 5 % tolerance bidirectional device.
3. For bidirectional devices with a V_{RWM} of 10 volts or less, the I_R limit is double.

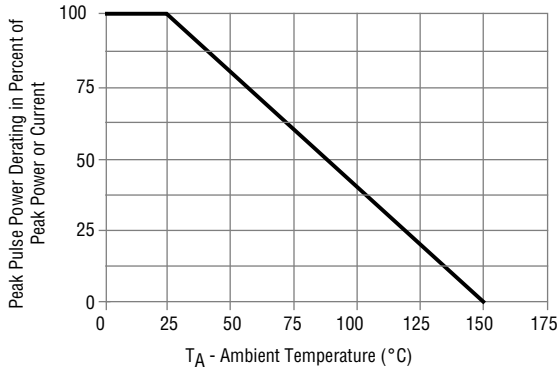
Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.
The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf.

Performance Graphs

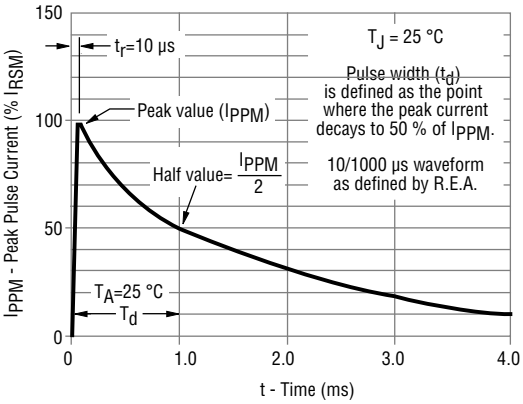
Peak Pulse Power Rating



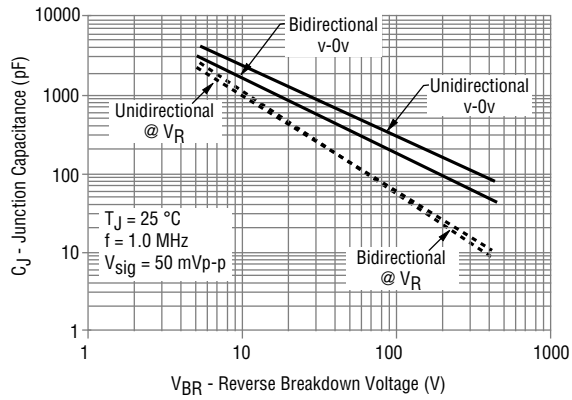
Pulse Derating Curve



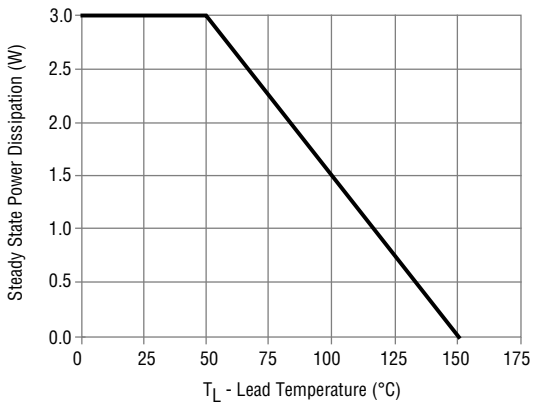
Pulse Waveform



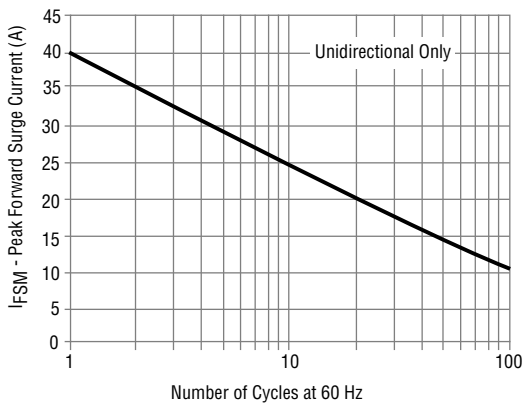
Typical Junction Capacitance



Steady State Power Derating Curve



Maximum Non-repetitive Forward Surge Current

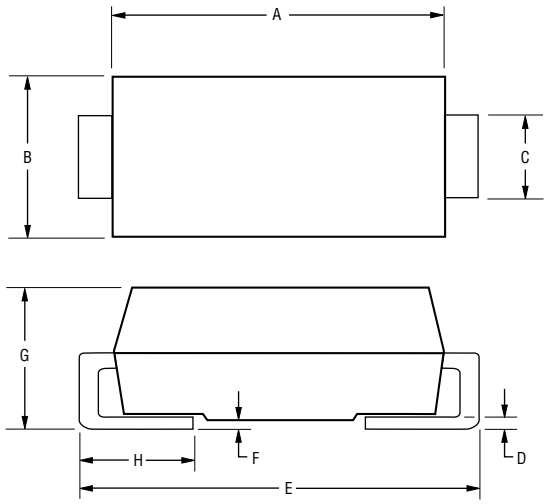


Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.
The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf.

SMA6J-Q Transient Voltage Suppressor Diode Series

BOURNS®

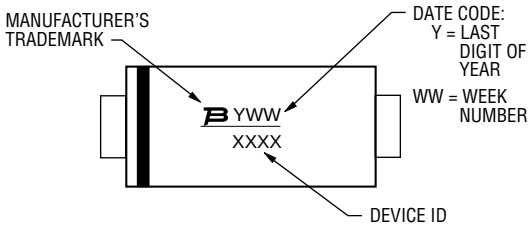
Product Dimensions



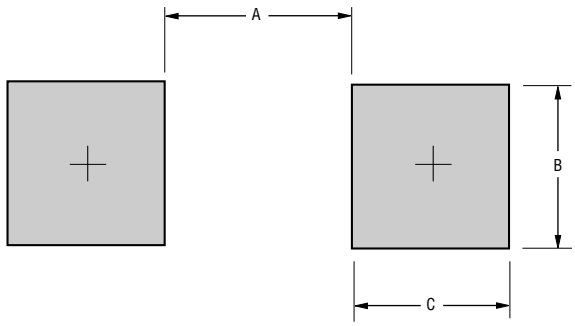
Dimension	SMA (DO-214AC)
A	3.99 - 4.50 (0.157 - 0.177)
B	2.54 - 2.79 (0.100 - 0.110)
C	1.25 - 1.65 (0.049 - 0.065)
D	0.15 - 0.31 (0.006 - 0.012)
E	4.93 - 5.28 (0.194 - 0.208)
F	0.203 (0.008) MAX.
G	1.98 - 2.29 (0.078 - 0.090)
H	0.76 - 1.52 (0.030 - 0.060)

DIMENSIONS: MM (INCHES)

Typical Part Marking



Recommended Footprint



Dimension	SMA (DO-214AC)
A (Max.)	2.70 (0.106)
B (Min.)	2.10 (0.083)
C (Min.)	1.27 (0.050)

DIMENSIONS: MM (INCHES)

Physical Specifications

Case ..... Molded plastic per UL Class 94V-0
Polarity..... Cathode band indicates unidirectional device
No cathode band indicates bidirectional device

How to Order

SMA6J 5.0 CA - Q

Package
SMA6J = 600 W, SMA/DO-214AC

Working Peak Reverse Voltage
5.0 - 130 = 5.0 - 130 V_{RWM} (Volts)

Suffix
A = 5 % Tolerance Unidirectional Device
CA = 5 % Tolerance Bidirectional Device

AEC-Q101 Suffix
Q = AEC-Q101 Compliant, 13-inch Reel

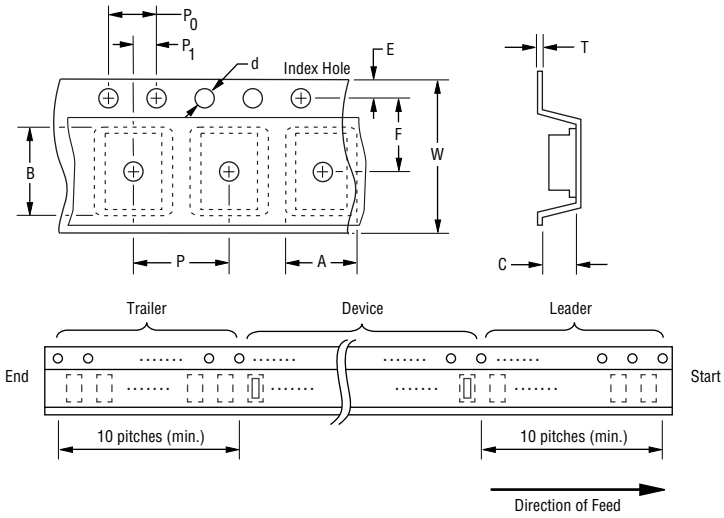
Environmental Specifications

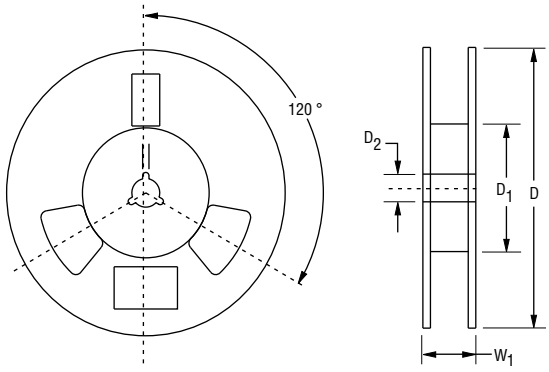
Moisture Sensitivity Level 1
ESD Classification (HBM)..... 3B

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.

Packaging Information

The product will be dispensed in tape and reel format (see diagram below).





DIMENSIONS: MM / (INCHES)

Devices are packed as shown here in compliance with EIA-481-C standard.

Item	Symbol	SMA (DO-214AC) 13-Inch Reel
Carrier Width	A	2.90 ± 0.20 (0.114 ± 0.008)
Carrier Length	B	5.50 ± 0.20 (0.217 ± 0.008)
Carrier Depth	C	2.26 ± 0.20 (0.089 ± 0.008)
Sprocket Hole	d	1.50 ± 0.10 (0.061 ± 0.004)
Reel Outside Diameter	D	330 (12.992)
Reel Inner Diameter	D_1	50.0 (1.969) MIN.
Feed Hole Diameter	D_2	13.0 ± 0.20 (0.512 ± 0.008)
Sprocket Hole Position	E	1.75 ± 0.10 (0.069 ± 0.004)
Punch Hole Position	F	5.50 ± 0.05 (0.217 ± 0.002)
Punch Hole Pitch	P	4.00 ± 0.10 (0.157 ± 0.004)
Sprocket Hole Pitch	P_0	4.00 ± 0.10 (0.157 ± 0.004)
Embossment Center	P_1	2.00 ± 0.05 (0.079 ± 0.002)
Overall Tape Thickness	T	0.30 ± 0.10 (0.012 ± 0.004)
Tape Width	W	12.00 ± 0.30 (0.472 ± 0.012)
Reel Width	W_1	18.4 (0.724) MAX.
Quantity per Reel	--	5,000

REV. 10/20

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.

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