



Features

- Fast response time
- Wide temperature range
- High surge current rating
- Low capacitance and insertion loss
- Stable performance throughout life
- Small surface mount package
- RoHS compliant*

Applications

- Set top boxes
- Industrial communications
- HVAC controls
- xDSL, POTS, G.Fast
- Antennae

GDT21 Series – Next-generation 2-Electrode Gas Discharge Tube Arrestor

General Information

Bourns' new chip size surface mount 2-electrode GDT surge protection devices offer maximum impulse voltage limiting specifications in a very small, surface mount package. The performance delivered in the Bourns® GDT21 Series helps to significantly heighten protection against induced voltage transients such as lightning and AC induction. Plus, the enhanced level of protection with tighter voltage limiting provided during fast-rising events will reduce stress on downstream components compared to current GDT designs in the same application.

Product Characteristics

Storage Temperature Range -40 °C to +105 °C
 Operating Temperature Range -40 °C to +105 °C
 Climate Category (*IEC 60068-1*) 40 / 105 / 21
 Moisture Sensitivity Level (MSL) 1
 ESD Classification - HBM N/A

How to Order

GDT 2 1 - xx - S1 - RP

Description _____
 GDT = Gas Discharge Tube - Next-Generation Series

Electrodes _____
 2 = 2-Electrode

Size _____
 1 = 3.2 mm L x 1.6 mm W x 1.6 mm H

Voltage _____
 15 = 150 V 42 = 420 V
 20 = 200 V 50 = 500 V
 40 = 400 V 60 = 600 V

Package Designator _____
 S1 = 3.2 mm L x 1.6 mm W x 1.6 mm H SMD (Standard)

Packaging _____
 RP = Reel Pack (Standard)

Additional Information

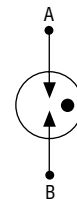
Click these links for more information:



Agency Recognition

Agency	Category	Agency File No.
UL	497B - 4th Edition	E313168

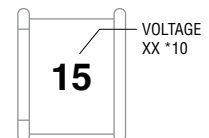
Circuit Diagram



Note: Gas discharge tubes are bidirectional and non-polarized.

Typical Part Marking

Represents total content. Layout may vary.



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. 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.

GDT21 Series – Next-generation 2-Electrode Gas Discharge Tube Arrestor



Electrical Characteristics

Test Methods per ITU-T K.12, IEEE C62.31

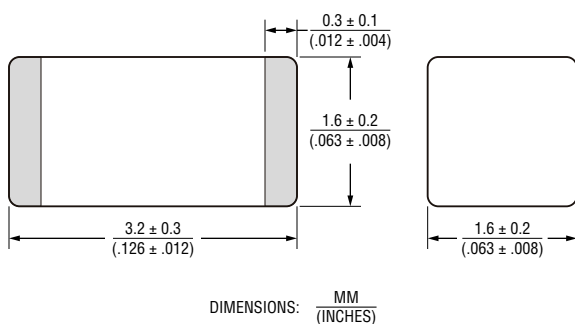
Bourns Part No.	Device Specifications ⁽¹⁾		
	DC Sparkover Voltage ±30 % (2) (3)	Insulation Resistance (IR) (4)	Capacitance
	100 V/s		1 MHz
GDT21-15	150 V	> 100 MΩ	< 0.3 pF
GDT21-20	200 V		
GDT21-40	400 V		
GDT21-42	420 V		
GDT21-50	500 V		
GDT21-60	600 V		

Bourns Part No.	Life Ratings ⁽⁵⁾			
	Nominal Impulse Discharge Current			Nominal AC Discharge Current
	8/20 μs	Impulse Life 8/20 μs, 100 A	10/700 μs	1 Second @ 50 Hz
GDT21-15	500 A 10 Operations (5 per polarity)	300 times	6 kV R= 40 Ω 10 times	0.5 Arms 10 Operations
GDT21-20				
GDT21-40				
GDT21-42				
GDT21-50				
GDT21-60				

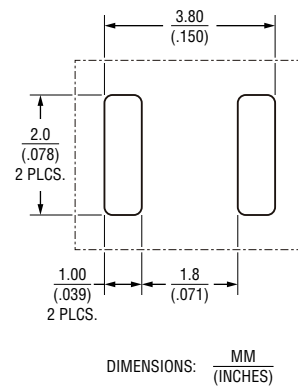
Notes:

- (1) At delivery AQL 0.65 Level II, DIN ISO 2859.
- (2) Bourns recommends reflowing surface mount devices per *IPC/JEDEC J-STD-020 rev. D*.
- (3) Surface mount GDTs may exhibit a temporary increase in the DC Sparkover Voltage after the solder reflow process. The DC Sparkover Voltage will recover within 24 hours. There is no quality defect nor change in protection levels during the temporary increase in DC Sparkover Voltage.
- (4) IR Test Voltage: 50 V for GDT21-15, 100 V for GDT21-200 to GDT21-40, 250 V for GDT21-42 and GDT21-60
- (5) DC Sparkover Voltage limits after Life Ratings may exceed +20 % but will continue to protect without venting (per *ITU-T K.12 Edition 9.0, Section 6*, where applicable).

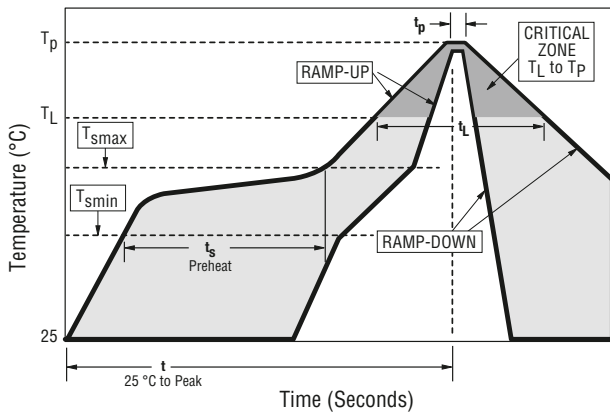
Product Dimensions



Recommended Pad Layout



Soldering Parameters - Reflow Soldering



Reflow Condition		Pb-free Assembly
Preheat	Temperature Min. ($T_{S(min)}$)	150 °C
	Temperature Max. ($T_{S(max)}$)	200 °C
	Time (Min. to Max.) (T_S)	60 – 120 seconds
Average Ramp-up Rate (Liquidus Temperature (T_L) to Peak)		3 °C / second max.
$T_{S(max)}$ to T_L - Ramp-up Rate		5 °C / second max.
Reflow	Temperature (T_L) (Liquidus)	217 °C
	Temperature (T_L)	60 – 150 seconds
Peak Temperature (T_p)		260 +0/-5 °C
Time within 5 °C of Actual Peak Temperature (T_p)		10 – 30 seconds
Ramp-down rate		6 °C / second max.
Time from 25 °C to Peak Temperature (T_p)		8 minutes max.
Do not Exceed		260 °C

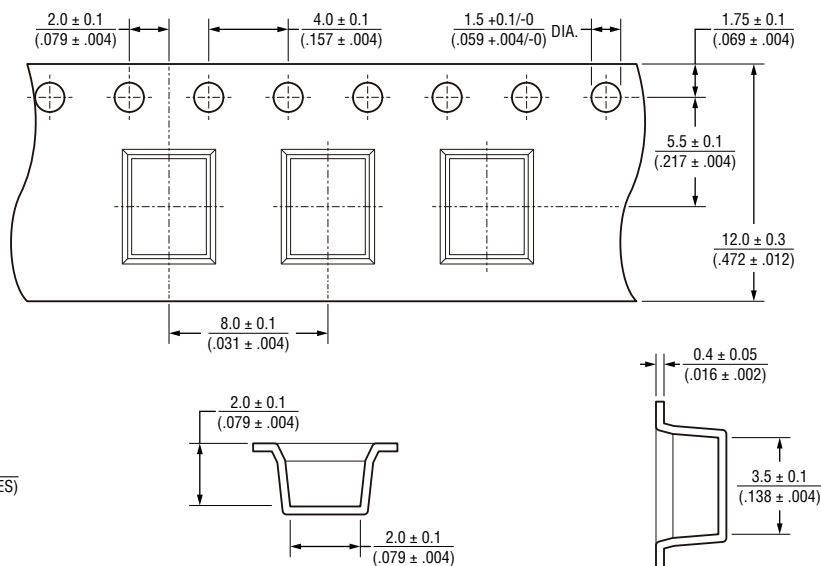
Notes:

Bourns recommends reflowing surface mount devices per *IPC/JEDEC J-STD-020 rev D*.

Surface mounted components (SMD) may exhibit a temporary increase in the DC Sparkover Voltage after the solder reflow process. The components should recover within 24 hours. There is no quality defect nor change in protection levels during the temporary change in DC Sparkover Voltage.

Packaging Specifications

Model	Standard Packaging Quantity			
	Bulk (Bag)	Box	Reel	Cut Tape
GDT21-RP	N/A	9000	3000	N/A



DIMENSIONS: $\frac{\text{MM}}{\text{(INCHES)}}$

REV. 1 – 11/24

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.

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 types of applications are based on Bourns' knowledge of typical requirements in generic applications. 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. 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 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. 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 nuclear, lifesaving, life-critical or life-sustaining applications, nor in any other applications where failure or malfunction may result in personal injury, death, or severe property or environmental damage. Unless expressly and specifically approved in writing by two authorized Bourns representatives on a case-by-case basis, use of any Bourns® products in such unauthorized applications might not be safe and thus is at the user's sole risk. Life-critical applications include devices identified by the U.S. Food and Drug Administration as Class III devices and generally equivalent classifications outside of the United States.

Bourns expressly identifies those Bourns® standard products that are suitable for use in automotive applications on such products' data sheets in the section entitled "Applications." Unless expressly and specifically approved in writing by two authorized Bourns representatives on a case-by-case basis, use of any other Bourns® standard products in an automotive application might not be safe and thus is not recommended, authorized or intended and is at the user's sole risk. If Bourns expressly identifies a sub-category of automotive application in the data sheet for its standard products (such as infotainment or lighting), such identification means that Bourns has reviewed its standard product and has determined that if such Bourns® standard product is considered for potential use in automotive applications, it should only be used in such sub-category of automotive applications. Any reference to Bourns® standard product in the data sheet as compliant with the AEC-Q standard or "automotive grade" does not by itself mean that Bourns has approved such product for use in an automotive application.

Bourns® standard products are not tested to comply with United States Federal Aviation Administration standards generally or any other generally equivalent governmental organization standard applicable to products designed or manufactured for use in aircraft or space applications. Bourns expressly identifies Bourns® standard products that are suitable for use in aircraft or space applications on such products' data sheets in the section entitled "Applications." Unless expressly and specifically approved in writing by two authorized Bourns representatives on a case-by-case basis, use of any other Bourns® standard product in an aircraft or space application might not be safe and thus is not recommended, authorized or intended and is at the user's sole risk.

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.

Users shall not sell, transfer, export or re-export any Bourns® products or technology 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 in any facility which engages in activities relating to such devices. The foregoing restrictions apply to all uses and applications that violate national or international prohibitions, including embargos or international regulations. 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 may not, without prior authorization from Bourns and/or the U.S. Government, be resold, transferred, or re-exported to any party not eligible to receive U.S. commodities, software, and technical data.

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, 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: <http://www.bourns.com/legal/disclaimers-terms-and-policies>

PDF: <http://www.bourns.com/docs/Legal/disclaimer.pdf>