



CG7 Series



Agency Approvals

| AGENCY | AGENCY FILE NUMBER |
|---|--------------------|
|  | E128662 |
|  | E320116 |

Two Electrode GDT Graphical Symbol



Additional Information



Datasheet



Resources



Samples

Description

The Littelfuse CG7 series GDT is a miniature surface mount device with a 1kA 8/20 μ S surge rating. Its low insertion loss and thus low off-state capacitance makes it compatible with high bandwidth applications up to the GHz RF range. This GDT's crowbar characteristic protects sensitive ICs from surges as defined in ITU K.20/21/45 Basic and Enhanced Recommendations, GR-1089-CORE first level lightning Port Type 1 and 3, and IEC 61000-4-5 2nd edition. It is hermetically sealed using non-radioactive materials Classes 1-3 and some Class 4 & 5 cases and is thus environmentally safe. Its 2.8mm diameter size makes it the world's smallest two-electrode single chamber GDT available.

Features

- RoHS compliant and Lead-free
- Excellent Surge Withstanding Capability
- Excellent response to fast rising transients.
- Ultra Low Insertion Loss and low off-state capacitance for GHz bandwidth compatibility
- Ultra small devices offered in SMD package
- 1kA 8/20 μ S surge capability pulse as defined by IEC 61000-4-5 2nd edition
- Ultra Low capacitance (<0.3pF)
- Voltage Range 75V to 470V
- UL recognized

Applications

- Set top box
- Cable Modem
- Embedded Multimedia Terminal Adapter (EMTA)
- RF Connector
- Multimedia over Coax Alliance (MoCA)
- Base Station RF antenna transmitter
- G.Fast 106MHz and 212 MHz bandplans compatible
- CATV/Broadband equipment
- Data lines and Ethernet (up to 10GbE)
- Telecom line protection
- Broadband equipment
- xDSL equipment, including ADSL2, ADSL, VDSL, VDSL2 30a bandplan compatible
- IAD (Integrated Access Device)
- Aerospace and Automotive

Electrical Characteristics

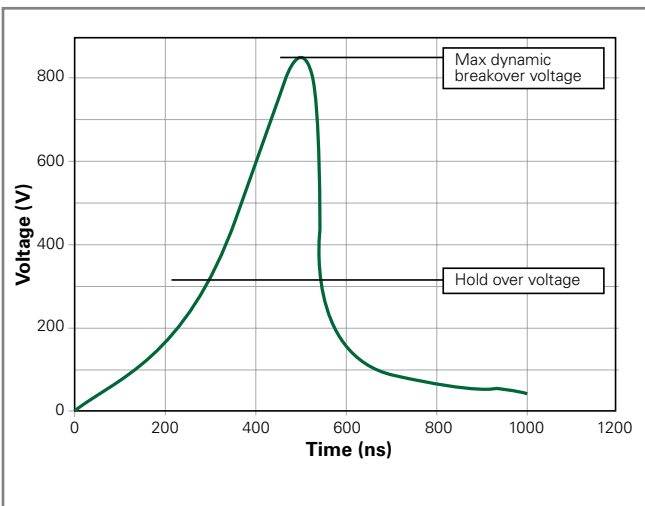
| Part Number | Device Specifications (at 25°C) | | | | | | Life Ratings | | | | | |
|-------------|---------------------------------|-----|-----|--|---------------------------------------|-----------------------|---------------------|---|--|--------------------------------------|------------------------------|------------------------------|
| | DC Breakdown in Volts (@100V/s) | | | Impulse Break-down in Volts (@100V/μs) | Impulse Break-down In Volts (@1kV/μs) | Insulation Resistance | Capacitance (@1MHz) | Max Impulse Discharge Current (8/20μs) | Max Impulse Discharge Current (10/700μs) | AC Discharge Current (9 cycle @50Hz) | DC Holdover Voltage (<150ms) | Impulse Life (8/20μs) (100A) |
| | MIN | TYP | MAX | MAX | | MIN | MAX | | | MIN | | MIN |
| CG775 | 60 | 75 | 90 | 600 | 700 | 1GΩ@50V | 0.3pf | 10 Shots (@1kA) ¹ 1 Shot at 2kA | 10 Shots (@ 100A/4kV) ² | 1A | 52V | 300 Shots |
| CG790 | 72 | 90 | 108 | 600 | 700 | | | | | | 52V | |
| CG7120 | 96 | 120 | 144 | 600 | 700 | 80V | | | | | | |
| CG7150 | 120 | 150 | 180 | 600 | 700 | 80V | | | | | | |
| CG7200 | 160 | 200 | 240 | 600 | 700 | 135V | | | | | | |
| CG7230 | 186 | 230 | 276 | 600 | 700 | 135V | | | | | | |
| CG7250 | 200 | 250 | 300 | 600 | 700 | 135V | | | | | | |
| CG7350 | 280 | 350 | 420 | 750 | 900 | 135V | | | | | | |
| CG7400 | 360 | 400 | 480 | 850 | 1000 | 135V | | | | | | |
| CG7470 | 376 | 470 | 564 | 900 | 1100 | 1GΩ@250V | | | | | 135V | |

- Notes:
UL Pending for CG775 and CG7470.
1. 5 x (+) and 5 x (-) applications of 1kA 8/20μs sec.
2. 5 x (+) and 5 x (-) applications of 100A 10/700μs sec.

Product Characteristics

| | |
|--|--|
| Materials | Device Tin Plated 17.5 ± 12.5 Microns Construction: Ceramic Insulator |
| Storage and Operational Temperature | -40 to +90°C |

Voltage Vs. Time Characteristic



Note: Tested per 1kV/μs waveform

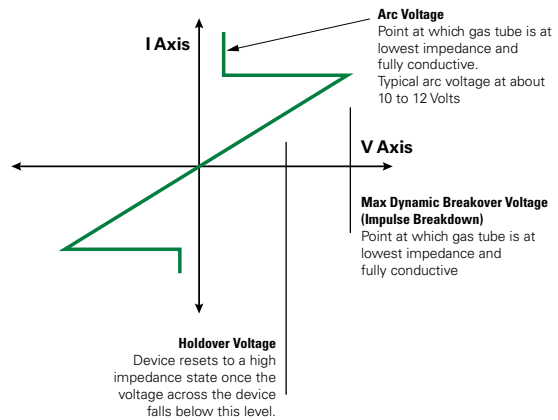
Typical Insertion Loss

| |
|------------------|
| @1.0GHz = 0.02dB |
| @1.4GHz = 0.03dB |
| @1.8GHz = 0.05dB |
| @2.0GHz = 0.06dB |
| @2.4GHz = 0.07dB |
| @2.8GHz = 0.08dB |
| @3.1GHz = 0.09dB |
| @3.5GHz = 0.10dB |
| @4.0GHz = 0.12dB |

Note: Insertion data for customer reference only, application testing needed for verification.

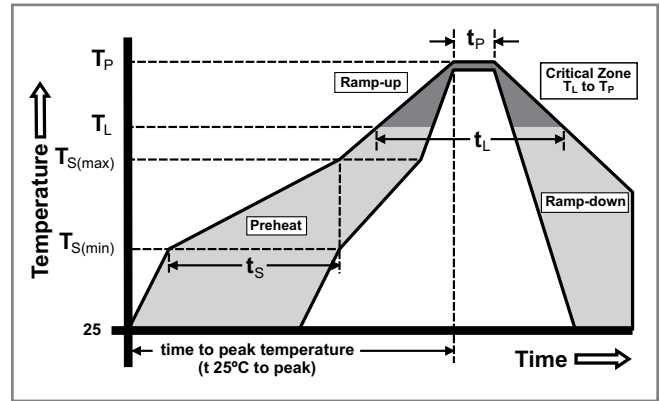
V-I Characteristic Curve

Characteristics of Gas Plasma -response to transient condition



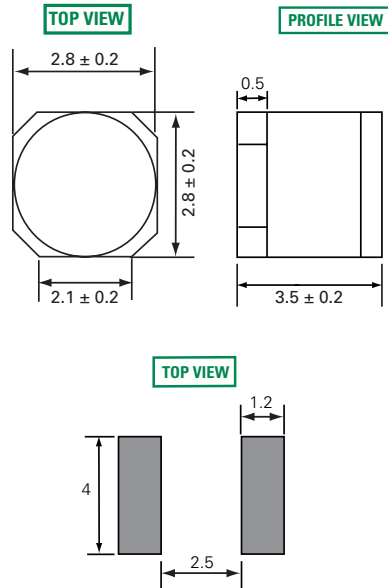
Soldering Parameters - Reflow Soldering (Surface Mount Devices)

| | | |
|--|------------------------------------|-------------------------|
| Reflow Condition | | Pb – Free assembly |
| Pre Heat | - Temperature Min ($T_{s(min)}$) | 150°C |
| | - Temperature Max ($T_{s(max)}$) | 200°C |
| | - Time (Min to Max) (t_s) | 60 – 180 secs |
| Average ramp up rate (Liquidus Temp (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 25°C to peak Temperature (T_p) | | 8 minutes Max. |
| Do not exceed | | 260°C |



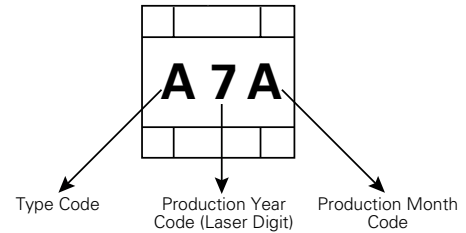
Device Dimensions

Dimensions in millimeters



Recommended Soldering Pad Layout

Product Marking



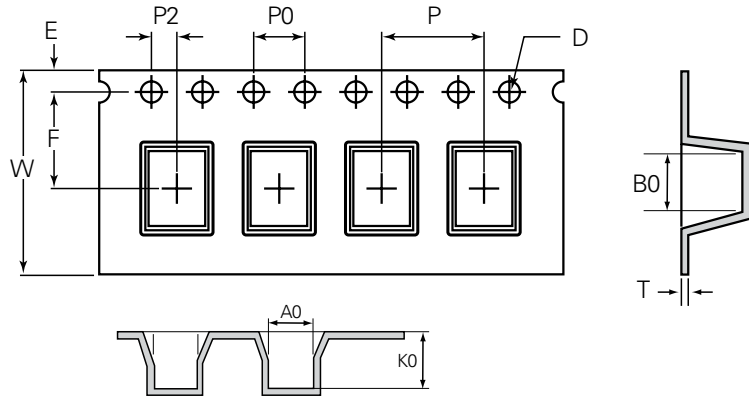
| Type Code | |
|-----------|--------|
| A | CG775 |
| B | CG790 |
| T | CG7120 |
| C | CG7150 |
| O | CG7200 |
| D | CG7230 |
| R | CG7250 |
| G | CG7350 |
| I | CG7400 |
| P | CG7470 |

| Month Code | |
|------------|-----------|
| A | January |
| B | February |
| C | March |
| D | April |
| E | May |
| F | June |
| G | July |
| H | August |
| I | September |
| J | October |
| K | November |
| L | December |

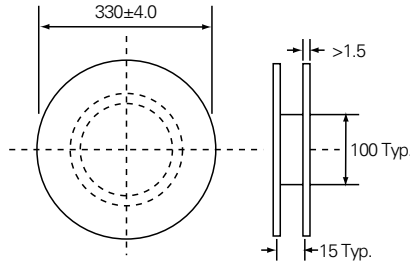
Taping and Reel Specifications

Unit = mm

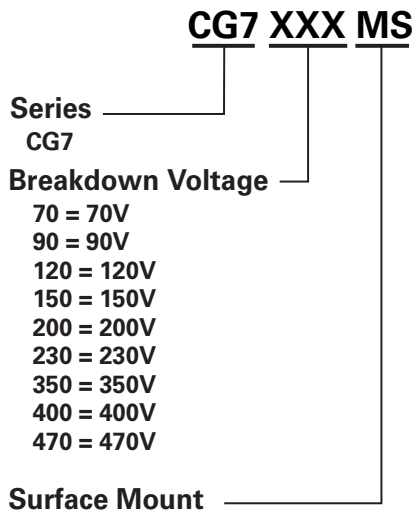
| Item | Spec | Item | Spec |
|------|------------|------|-----------------|
| P | 8.0 ± 0.1 | E | 1.75 ± 0.1 |
| P0 | 4.0 ± 0.1 | D | 1.50 + 0.1/-0.0 |
| P2 | 2.0 ± 0.1 | B0 | 3.9 ± 0.1 |
| W | 12.0 ± 0.3 | K0 | 3.2 ± 0.1 |
| F | 5.5 ± 0.1 | T | 0.4 ± 0.1 |
| A0 | 3.2 ± 0.1 | 10P0 | 4.0 ± 0.2 |



Packaging Quantity:
2500 pcs per reel (13")
1 reels per inner box
10 inner boxes per carton
25,000 pcs per full carton



Part Numbering System and Ordering Information



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