

### 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 8/20μS 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 crowbarring 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 2<sup>nd</sup> 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 8/20μS surge capability pulse as defined by IEC 61000-4-5 2<sup>nd</sup> 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 ( $<150\text{ms}$ )	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) <sup>1</sup>  1 Shot at 2kA	10 Shots (@ 100A/4kV) <sup>2</sup>	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.

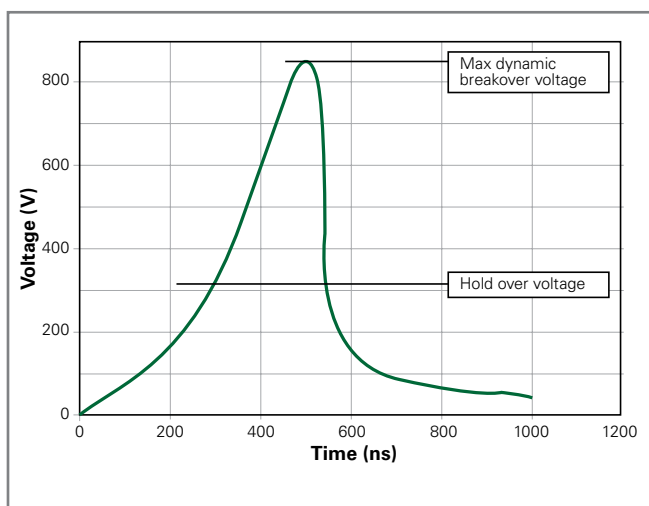
1. 5 x (+) and 5 x (-) applications of 1kA 8/20μs sec.

2. 5 x (+) and 5 x (-) applications of 100A 10/700μs sec.

### Product Characteristics

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

### Voltage Vs. Time Characteristic



Note: Tested per 1kV/μs waveform

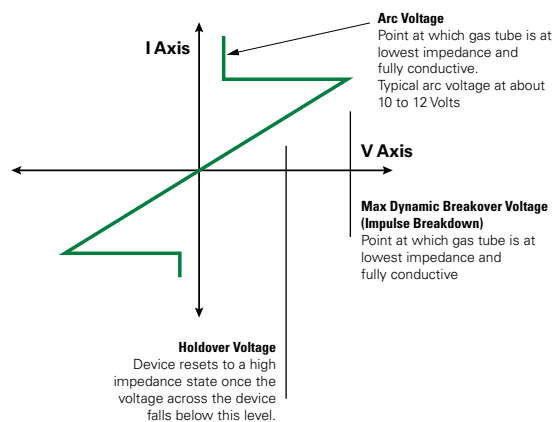
### Typical Insertion Loss

@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.

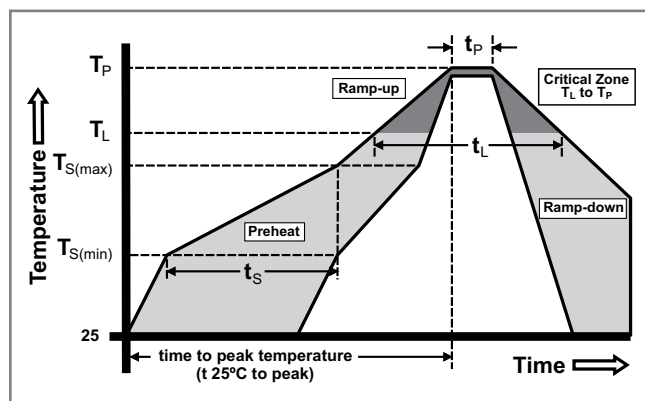
### V-I Characteristic Curve

Characteristics of Gas Plasma -response to transient condition



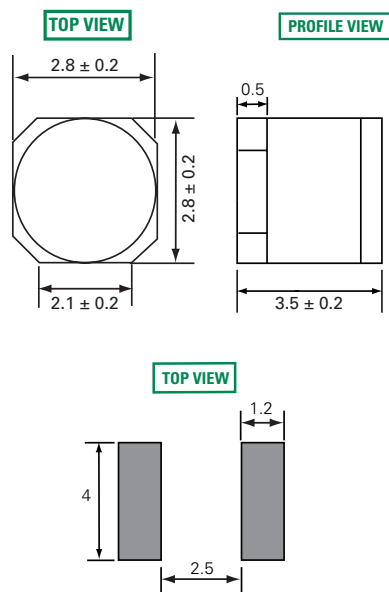
### Soldering Parameters - Reflow Soldering (Surface Mount Devices)

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 <sup>+0/-5</sup> °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



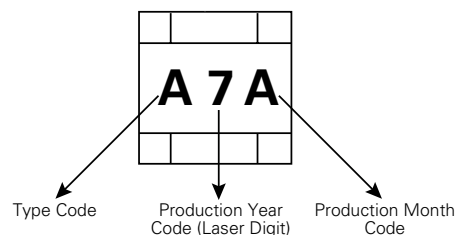
### Device Dimensions

Dimensions in millimeters



Recommended Soldering Pad Layout

### Product Marking



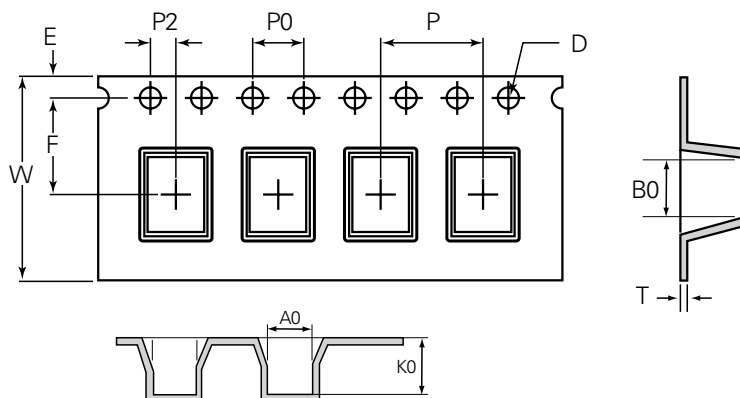
Type Code	
A	CG775
B	CG790
T	CG7120
C	CG7150
O	CG7200
D	CG7230
R	CG7250
G	CG7350
I	CG7400
P	CG7470

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	$8.0 \pm 0.1$	E	$1.75 \pm 0.1$
P0	$4.0 \pm 0.1$	D	$1.50 + 0.1/-0.0$
P2	$2.0 \pm 0.1$	B0	$3.9 \pm 0.1$
W	$12.0 \pm 0.3$	K0	$3.2 \pm 0.1$
F	$5.5 \pm 0.1$	T	$0.4 \pm 0.1$
A0	$3.2 \pm 0.1$	10P0	$4.0 \pm 0.2$



**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

**CG7 XXX MS**

**Series**

CG7

**Breakdown Voltage**

70 = 70V

90 = 90V

120 = 120V

150 = 150V

200 = 200V

230 = 230V

350 = 350V

400 = 400V

470 = 470V

**Surface Mount**

**Disclaimer Notice** - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at: [www.littelfuse.com/disclaimer-electronics](http://www.littelfuse.com/disclaimer-electronics).