

# CG/CG2 Series









#### **Agency Approvals**

AGENCY	AGENCY FILE NUMBER			
<b>71</b> 7	E1286621			
c <b>FLL</b> ° us	E320116 <sup>2</sup>			

1. Certified to UL 497B. 2. Only CG2300, CG2470, CG2600, CG2800 and CG221000. Certified to UL 1449.

# 2 Electrode GDT Graphical Symbol



#### **Additional Information**







Resources



### Description

Littelfuse's highly reliable CG/CG2 Series GDTs provide a high degree of surge protection in a small size ideal for board level circuit protection.

GDTs function as switches which dissipate a minimum amount of energy and therefore handle currents that far surpass other types of transient voltage protection. Their gas-filled, rugged ceramic metal construction make them well suited to adverse environments.

The CG/CG2 series comes in a variety of forms including surface mount, core, straight and shaped leads, to serve a variety of mounting methods.

The CG Series (75V-110V) is ideal for protection of test and communication equipment and other devices in which low voltage limits and extremely low arc voltages are required.

The CG2 Series (145V-1000V) is ideal for protecting equipment where higher voltage limits and holdover voltages are necessary.

#### **Features**

- RoHS and Lead-free compliant
- Rugged Ceramic-Metal construction
- Low Capacitance (< 1.5pf)
- Meets REA PE-80
- Available in surface mount, and a variety of lead options options
- RoHS Compliant and Lead-Free

#### **Applications**

- Communication lines and equipment
- CATV equipment
- Test equipment
- Data lines
- Power supplies
- Instrumentation circuits
- Medical electronics
- ADSL equipment
- Telecom SLIC protection



# **Gas Discharge Tubes** CG/CG2 Series

# **Electrical Characteristics**

	Device Specifications (at 25°C)					Life Ratings											
Part		Breakd in Volts @100V/s	s	Impulse Break- down in Volts (@100V/µs)	Impulse Break- down In Volts (@1 Kv/µsec)	Insulation Resistance	Capaci- tance (@1MHz)	Arc Voltage (on state Voltage) @1Amp Min	Surge Life (@500A 10/1000µs)	Nominal Impulse Discharge Current (8/20µs)	Nominal AC Discharge Current (10x1sec @50-60Hz)	AC Dischage Current (9 cycle @50Hz)	DC Holdover Voltage <sup>2</sup>	Max Impulse Discharge Current (1 Application @ 10/350µs)			
Number	MIN	TYP	MAX	MAX		MIN	MAX	TYP					TYP				
CG75	60	75	90	400	650												
CG90	72	90	108	400	600	10¹0 Ω			400 shots	5 shots (@20kA)	20 A	100 A	52 V	4kA			
CG90 SN	72	90	108	400	600	(at 50V)											
CG110	88	110	132	450	600												
CG2145	116	145	174	500	600								80 V				
CG2145 SN	120	145	174	500	600			1.5 pf 15 V									
CG22301	195	230	265	600	700												
CG2230 SN <sup>1</sup>	184	230	276	600	700									2.5kA			
CG2250	213	250	288	625	725		1.5 pf										
CG2250 SN	200	250	300	625	725												
CG2300	255	300	345	700	800												
CG2300 SN	240	300	360	700	800	10¹0 Ω											
CG2350	297	350	403	750	900	(at 100V)	(at 100V)	(at 100V)	(at 100V)	00V)							2.5KA
CG2350 SN	280	350	420	750	900								135 V				
CG2420	357	420	483	800	1000												
CG24701	400	470	540	850	1200												
CG2470 SN <sup>1</sup>	376	470	564	850	1200												
CG26001	510	600	690	1000	1400												
CG2600 SN <sup>1</sup>	480	600	720	1000	1400												
CG28001	680	800	920	1200	1500					10 shots	10 A						
CG210001	850	1000	1150	1500	1600					(@10kA)	10 A	65 A					

- NOTES: 1. Certified to UL 1449.
- 2. Reference REA PE-80, 0.2A. Tested to ITU-T Rec K.12 and REA PE 80 < 150 mSec.
  3. 5 x [5 (+) or 5 (-)] applications 20kA 8/20μSec. (75 to 600 volt devices.)
  10 x [5 (+) and 5 (-)] applications 10kA 8/20μSec. (800 and 100 volt devices.)

#### **Product Characteristics**

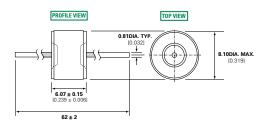
Materials	LS, Axial: Device: Tin Plated 2–5 Microns Lead Wires: Tin Plated 17.5 ± 12.5 Microns Construction: Ceramic Insulator Core: Device: Tin Plated 17.5 ± 12.5 Microns. Construction: Ceramic Insulator MS: Device: Dull Tin Plated 7–9 Microns Construction: Ceramic Insulator
Product Marking	LF Logo, Voltage and date code; Black in positive print

Glow to arc transition current	< 0.5Amps
Glow Voltage	60-160 Volts
Storage and Operational Temperature	-40 to +90
Maximum Follow On Current <sup>1</sup>	230 Volts r.m.s, 200 Amps. (800V and 1000V devices tested to UL1449 3rd edition)

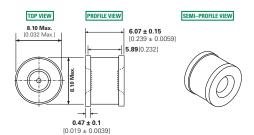


#### **Device Dimensions**

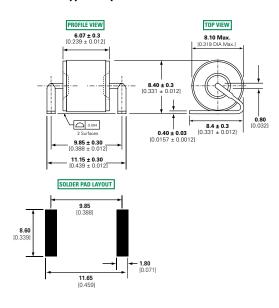
#### Leaded 'L' Type Straight Axial Devices



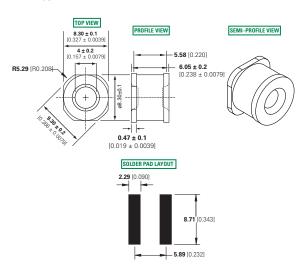
#### **Core Devices**



# Leaded 'LS' Type Shaped Lead Devices



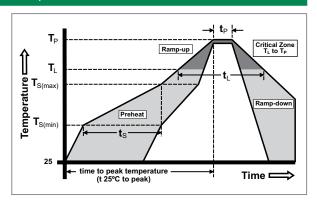
### 'MS' Type Devices



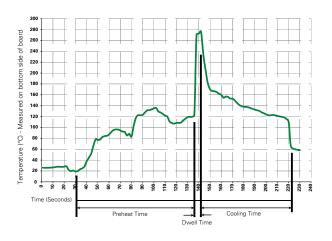
# Gas Discharge Tubes CG/CG2 Series

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

Reflow Co	ndition	Pb – Free assembly		
	-Temperature Min (T <sub>s(min)</sub> )	150°C		
Pre Heat	-Temperature Max (T <sub>s(max)</sub> )	200°C		
	-Time (Min to Max) (t <sub>s</sub> )	60 – 180 secs		
Average ra	amp up rate (Liquidus Temp k	3°C/second max		
T <sub>S(max)</sub> to T <sub>L</sub>	- Ramp-up Rate	5°C/second max		
Reflow	-Temperature (T <sub>L</sub> ) (Liquidus)	217°C		
nellow	-Temperature (t <sub>L</sub> )	60 – 150 seconds		
PeakTemp	perature (T <sub>P</sub> )	260 <sup>+0/-5</sup> °C		
Time with	in 5°C of actual peak ure (t <sub>p</sub> )	10 – 30 seconds		
Ramp-dov	vn Rate	6°C/second max		
Time 25°C	to peak Temperature (T <sub>P</sub> )	8 minutes Max.		
Do not exc	ceed	260°C		



# Soldering Parameters - Wave Soldering (Thru-Hole Devices)



# **Recommended Process Parameters:**

Wave Parameter	Lead-Free Recommendation
Preheat: (Depends on Flux Activation Temperature)	(Typical Industry Recommendation)
Temperature Minimum:	100° C
Temperature Maximum:	150° C
Preheat Time:	60-180 seconds
Solder PotTemperature:	280° C Maximum
Solder DwellTime:	2-5 seconds

# **Soldering Parameters - Hand Soldering**

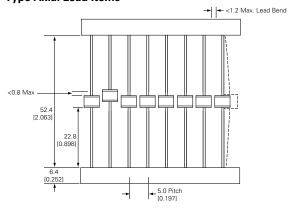
Solder Iron Temperature: 350° C +/- 5°C

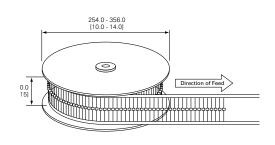
Heating Time: 5 seconds max.



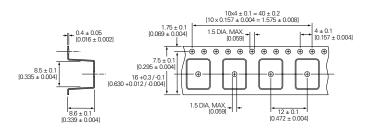
# **Packaging Dimensions**

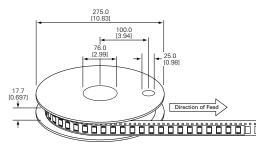
#### For 'L' Type Axial Lead Items



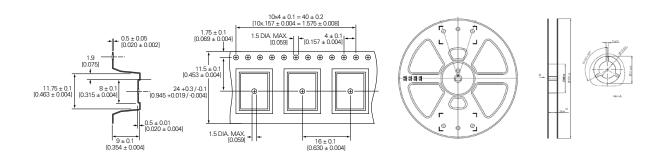


# Core and 'MS' Type Items





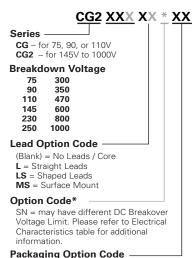
# For 'LS' Type Shaped Lead Items





# **Gas Discharge Tubes** CG/CG2 Series

#### **Part Numbering System and Ordering Information**



Examples:

CG75 -- A non-leaded 75V device

CG2230L - A leaded 230V device

CG2800LTR -- A leaded 800V device, tape-and-reel (per EIA standard RS-296-D)

#### Notes:

CG/CG2 devices with other breakdown voltages in the 75-1000 V range are available upon request.

Packaging Option Code

(Blank) = No Leads / Core, Bulk Bag - 400 pcs L(Blank) = Straight Lead, Tray - 50 pcs

LTR = Straight Lead, Tape & Reel per EIA RS-296-E - 500 per reel LS(Blank) = Shaped Lead (see LS dimensions), Tape & Reel - 500 per reel

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