# **ROHS @ CG5 and SL0902A Series**

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Agency Approvals				
AGENCY	AGENCY FILE NUMBER			
LR.	E128662			

# 2 Electrode GDT Graphical Symbol



# Description

Littelfuse Broadband Optimized<sup>™</sup> SL0902A Series offers high surge ratings in a miniature package. Special design features provide high levels of protection against fast rising transients in the 100V/µs to 1kV/µs range usually caused by lightning disturbances. Low insertion loss is perfectly suited to broadband equipment applications. The capacitance does not vary with voltage, and will not cause operational problems with ADSL2+, where capacitance variation across Tip and Ring is undesirable. These devices are extremely robust and are able to divert a 2500A pulse without destruction. For AC Power Cross of long duration, overcurrent protection is recommended.

Littelfuse CG5 MS mini surge arresters are specifically designed for protection of electrical and communication equipment against over voltage transients in surface mount assembly applications. This series offers the most cutting edge protection using non-radioactive elements.

## Features

- RoHS compliant and Lead-free
- GHz working frequency
- Excellent stability on multiple pulse duty cycle
- Excellent response to fast rising transients.
- Ultra Low Insertion Loss
- 2.5KA surge capability tested with 8/20µS pulse as defined by IEC 61000-4-5
- Ultra small devices offered in a variety of mounting lead forms
- Non-Radioactive
- Low capacitance (<1pF)
- Voltage Ranges 90V to 600V
- UL recognized
- Conforms to ITU-T K12, IEC 1000-4-5

# Applications

- Communication
  equipment
- CATV equipment
- Test equipment
- Data lines
- Power supplies
- Telecom SLIC protection

- Broadband equipment
- ADSL equipment, including ADSL2+
- XDSL equipment
- Satellite and CATV equipment
- General telecom
  equipment



## **Electrical Characteristics**

	Device Specifications (at 25°C)					Life Ratings						
	DC Breakdown in Volts (@100V/s)		Impulse Breakdown in Volts (@100V/µs)	Impulse Breakdown In Volts (@1 Kv/µsec)	Insulation Resistance		Surge Life (10/1000µs)	Nominal Impulse Discharge Current (8/20µs)	Nominal AC Discharge Current (10x1sec @50-60Hz)	AC Dischage Current (9 cycle @50Hz)	Max Impulse Discharge Current (1 Application @ 10/350µs)	
Part Number	MIN	TYP	MAX	MAX		MIN	MAX					
SL0902A90 CG590	72	90	108	550	700	10 <sup>10</sup> Ω (at 50V)	300 shots (@100A)	10 shots (@5kA)⁵	5 A	10 A	0.5kA	
CG5145	116	145	174	550	650			(@100A)	(@3104)			
CG5150	120	150	180	550				300 shots (@100A)	10 shots (@5kA)⁵	5 5 A	10 A	0.5kA
SL0902A230 CG5230	184	230	276	550	650							
CG5250	200	250	300	600								
CG5270	216	270	324	650		10 <sup>10</sup> Ω						
SL0902A350 CG5350	280	350	420	800	900	(at 100V)						
CG5400	320	400	480	900								
SL0902A420	336	420	504	900	1000							
CG5550	440	550	660	1350								
SL0902A600 CG5600	480	600	720	1350	1500							

## **Product Characteristics**

Materials	CG5xxxLS (Outline 500), CG5xxxLTR & CG5350L-03TR (Outline 502), and CG5xxxL-02 (Outline 503): Device Nickel Plated 2–5 Microns Wire Tin Plated 17.5±12.5 Microns Construction Ceramic Insulator. CG5xxx (Outline 501), and CG5xxxMS & SL0902AxxxSM (Outline 505): Device Tin Plated 17.5±12.5 Microns Construction Ceramic Insulator.
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Product Marking	LF Logo, Voltage and date code		
Glow to arc transition current	< 0.5Amps		
Glow Voltage	140 Volts		
Storage and Operational Temperature	-40 to +90		



### Voltage vs. Time Characteristic

# **Typical Insertion Loss**

@ 1.0 GHz = 0.01 dB
@ 1.4GHz = 0.1 dB
@ 1.8 GHz = 0.53 dB
@ 2.1 GHz = 0.81 dB
@ 2.45 GHz= 1 dB
@ 2.8 GHz = 1.2 dB
@ 3.1 GHz = 1.5 dB
@ 3.5 GHz = 2.1 dB



## **Device Dimensions**

#### Outline 500 - CG5xxxLS



### Outline 501 - CG5xxx



Outline 502 - CG5xxxLTR (also CG5350L-03TR, CG5600L-02)



#### Outline 503 - CG5xxxL-02 (except CG5600L-02, see Outline 502)



#### Outline 505 - CG5xxxMS and SL0902AxxxSM





# 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 (T <sub>L</sub> ) to pea	amp up rate (LiquidusTemp k	3°C/second max		
$T_{S(max)}$ to $T_L$	- Ramp-up Rate	5°C/second max		
Reflow	-Temperature (T <sub>L</sub> ) (Liquidus)	217°C		
	-Temperature (t <sub>L</sub> )	60 – 150 seconds		
PeakTemp	erature (T <sub>P</sub> )	260 <sup>+0/-5</sup> °C		
Time with Temperatu	in 5°C of actual peak ıre (t <sub>p</sub> )	10 – 30 seconds		
Ramp-dov	vn Rate	6°C/second max		
Time 25°C	to peakTemperature (T <sub>P</sub> )	8 minutes Max.		
Do not exc	ceed	260°C		



### **Soldering Parameters - Hand Soldering**

Solder Iron Temperature: 350° C +/- 5°C Heating Time: 5 seconds max.

## 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 Pot Temperature:	280° C Maximum		
Solder Dwell Time:	2-5 seconds		

Note: These devices are not recommended for IR or Convection Reflow process.

# Part Numbering System and Ordering Information



# Packaging

TR = Tape & Reel

Part Number and	Device Type	Device Dimensions Reference	Quantity and Packaging Description		
CG5xxx	Core	Outline 501	1000pcs/bag in bulk packaging		
CG5xxxLS	Shaped Leads	Outline 500	900pcs/reel in carrier and tape*		
CG5xxxLTR CG5xxxL-03TR**	Straight Axial Leads	Outline 502	1000pcs/reel in tape and reel*		
CG5xxxL-02**	Bent Radial Leads	Outline 503	50pcs/tray in tray and cover		
CG5xxxMS SL0902AxxxSM	Surface mount	Outline 505	900pcs/reel in carrier and tape*		

\* For tape specifications and dimensions, please contact factory. \*\* Special order items not available for general sale. Please contact Littelfuse for details.