Gas Discharge Tube (GDT) Products CG5 and SL0902A Series

RoHS

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CG5 and SL0902A Series





Agency Approvals

AGENCY AGENCY FILE NUMBER

E128662

2 Electrode GDT Graphical Symbol



Description

Littelfuse Broadband Optimized™ 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

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Electrical Characteristics

	Device Specifications (at 25°C)					Life Ratings						
	i	Breakd in Volts @100V/s	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 CG5-90	72	90	108	550	700	10 ¹⁰ Ω (at 50V)		300 shots (@100A)	10 shots (@5kA) ⁵	5 A	10 A	0.5kA
CG5-145	116	145	174	550	650			(@100/1)	(@0101)			
CG5-150	120	150	180	550								
SL0902A230 CG5-230	184	230	276	550	650							
CG5-250	200	250	300	600								
CG5-270	216	270	324	650		10¹0 Ω	1.5 pf					
SL0902A350 CG5-350	280	350	420	800	900	(at 100V)		300 shots (@100A)	10 shots (@5kA) ⁵	5 A	10 A	0.5kA
CG5-400	320	400	480	900								
SL0902A420	336	420	504	900	1000							
CG5-550	440	550	660	1350								
SL0902A600 CG5-600	480	600	720	1350	1500							

Product Characteristics

Materials

CG5L & CG5LTR (Outline 502), CG5L-02 (Outline 503), CG5LS (Outline 500), CG5L-01 (Outline 504) & CG5L-03: Device Nickel Plated 2–5 Microns

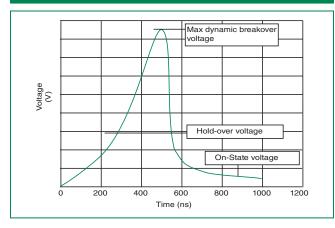
Wire Tin Plated 17.5±12.5 Microns
Construction Ceramic Insulator.

CG5 (Outline 501), CG5MS (Outline

505) & SL0902A SM: Device Tin Plated 17.5±12.5 Microns Construction Ceramic Insulator.

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



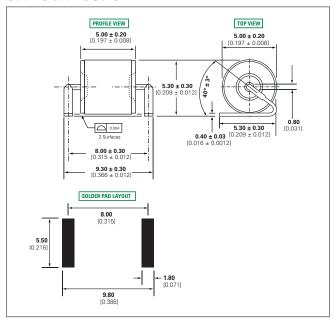
Typical Insertion Loss

@ 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

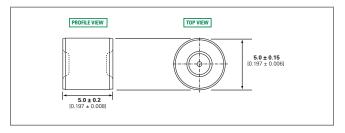


Device Dimensions

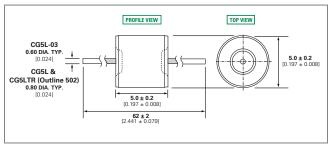
Outline 500 - CG5LS



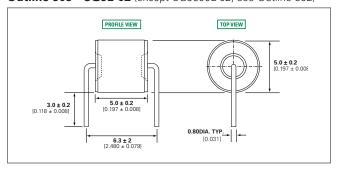
Outline 501 - CG5



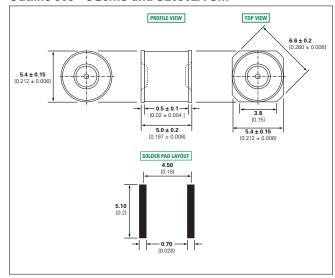
Outline 502 - CG5L-03, CG5L, CG5LTR, CG5600L-02



Outline 503 - CG5L-02 (except CG5600L-02, see Outline 502)



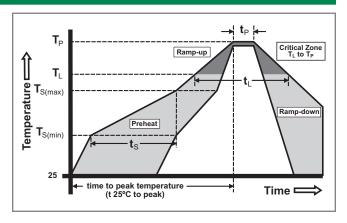
Outline 505 - CG5MS and SL0902A SM





Soldering Parameters - Reflow Soldering (Surface Mount Devices)

Reflow Co	ndition	Pb – Free assembly		
	-Temperature Min (T _{s(min)})	150°C		
Pre Heat	-Temperature Max (T _{s(max)})	200°C		
	-Time (Min to Max) (t _s)	60 – 180 secs		
Average ra	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 _L) (Liquidus)	217°C		
	-Temperature (t _L)	60 – 150 seconds		
PeakTemp	erature (T _P)	260 ^{+0/-5} °C		
Time with	in 5°C of actual peak ure (t _p)	10 – 30 seconds		
Ramp-dov	vn Rate	6°C/second max		
Time 25°C	to peakTemperature (T _P)	8 minutes Max.		
Do not exc	ceed	260°C		

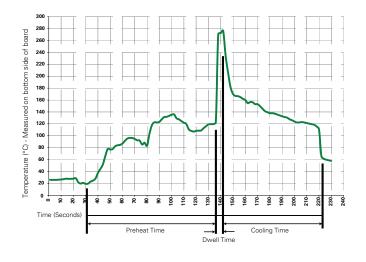


Soldering Parameters - Hand Soldering

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

Heating Time: 5 seconds max.

Soldering Parameters - Wave Soldering (Thru-Hole Devices)



Recommended Process Parameters:

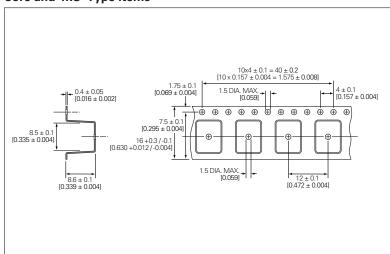
Wave Parameter	Lead-Free Recommendation
Preheat:	
(Depends on Flux Activation Temperature)	(Typical Industry Recommendation)
Temperature Minimum:	100° C
Temperature Maximum:	150° C
Preheat Time:	60-180 seconds
Solder Pot Temperature:	280° C Maximum
Solder DwellTime:	2-5 seconds

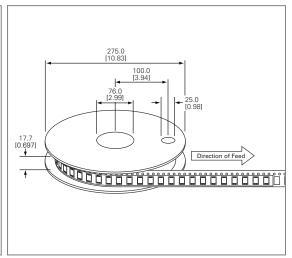
Note: These devices are not recommended for IR or Convection Reflow process.

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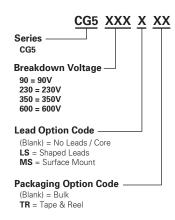
Packaging Dimensions

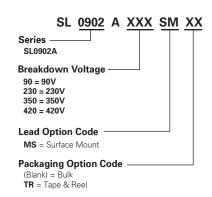
Core and 'MS' Type Items





Part Numbering System and Ordering Information





Packaging

Device Type	Description		
CG5LS (Outline 500), CG5MS (Outline 505), SL0902A SM	900pcs/reel in carrier and tape		
CG5 core (Outline 501)	1000pcs/bag in bulk packaging		
Axial Leaded CG5L-03, CG5L and CG5LTR (Outline 502)	1000pcs/reel in tape and reel		
CG5L-02 (Outline 503)	50pcs/tray in tray and cover		

^{*} For tape and reel specifications, please contact factory.