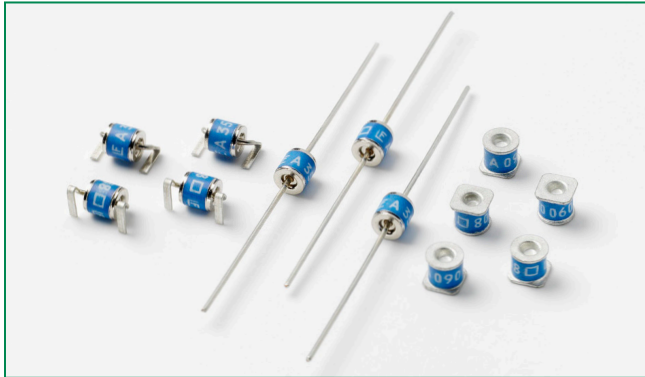


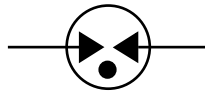
RoHS  **CG5 and SL0902A Series**



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

Electrical Characteristics

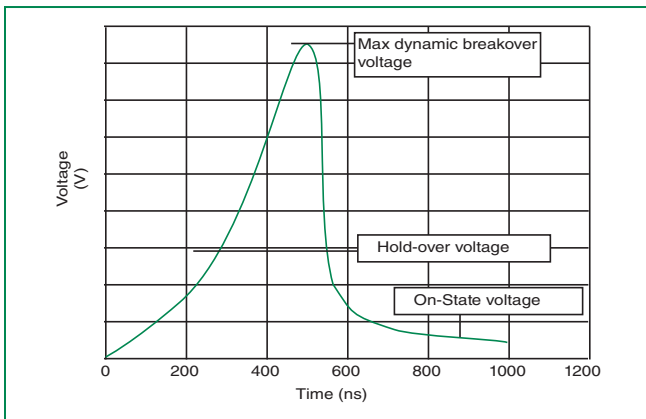
Part Number	Device Specifications (at 25°C)						Life Ratings					
	DC Breakdown in Volts (@100V/s)			Impulse Breakdown in Volts (@100V/μs)	Impulse Breakdown In Volts (@1 Kv/μsec)	Insulation Resistance	Capacitance (@1MHz)	Surge Life (10/1000μs)	Nominal Impulse Discharge Current (8/20μs)	Nominal AC Discharge Current (10x1sec @50-60Hz)	AC Discharge Current (9 cycle @50Hz)	Max Impulse Discharge Current (1 Application @ 10/350μs)
	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	10 ¹⁰ Ω (at 100V)	1.5 pf	300 shots (@100A)	10 shots (@5kA) ⁵	5 A	10 A	0.5kA
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								
SL0902A350 CG5-350	280	350	420	800	900							
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	<p>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.</p> <p>CG5 (Outline 501), CG5MS (Outline 505) & SL0902A SM: Device Tin Plated 17.5±12.5 Microns Construction Ceramic Insulator.</p>
------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

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

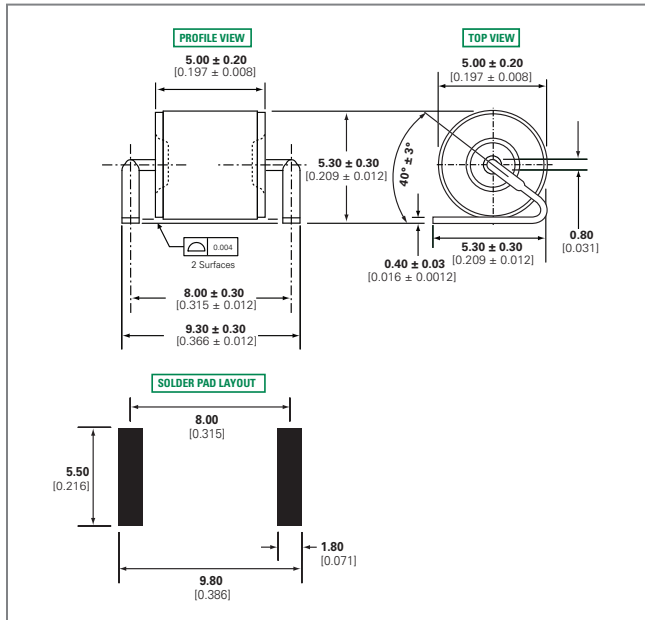


Typical Insertion Loss

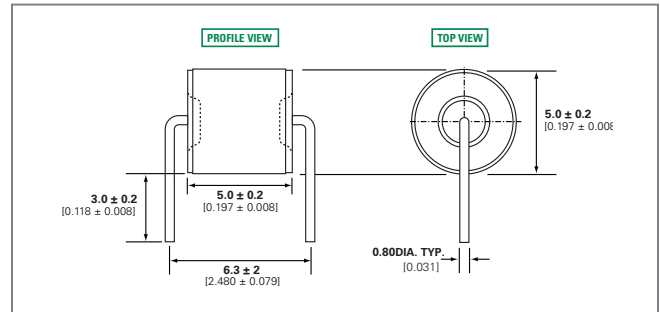
@ 1.0 GHz = 0.01 dB
@ 1.4GHz = 0.1 dB
@ 1.8 GHz = 0.53 dB
@ 2.1 GHz = 0.81 dB
@ 2.45 GHz = 1 dB
@ 2.8 GHz = 1.2 dB
@ 3.1 GHz = 1.5 dB
@ 3.5 GHz = 2.1 dB

Device Dimensions

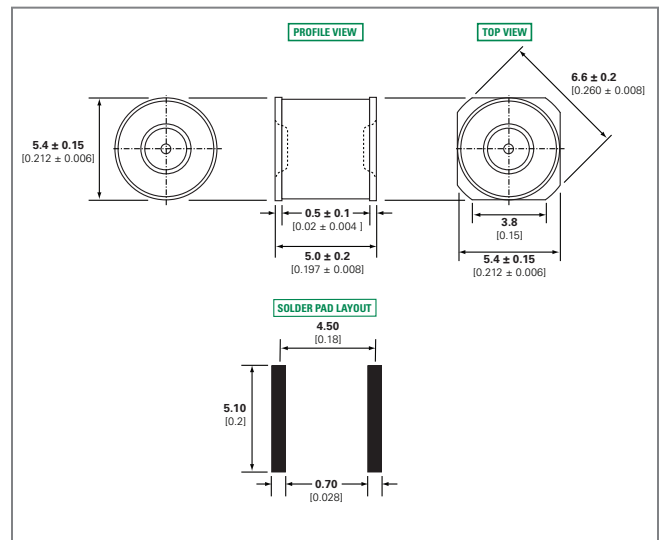
Outline 500 - CG5LS



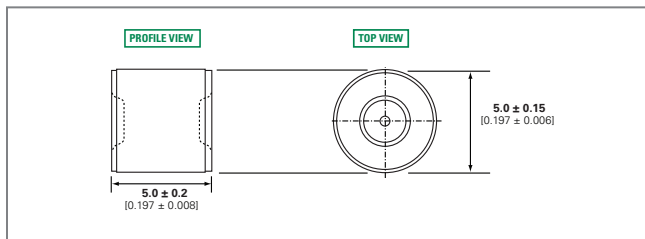
Outline 503 - CG5L-02 (except CG5600L-02, see Outline 502)



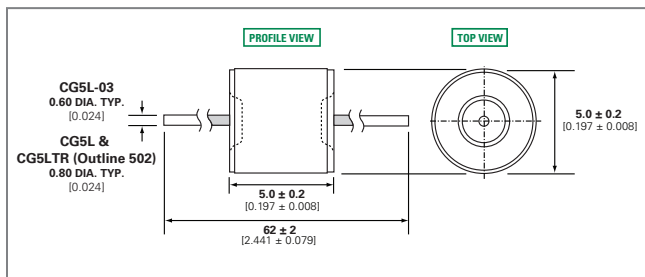
Outline 505 - CG5MS and SL0902A SM



Outline 501 - CG5

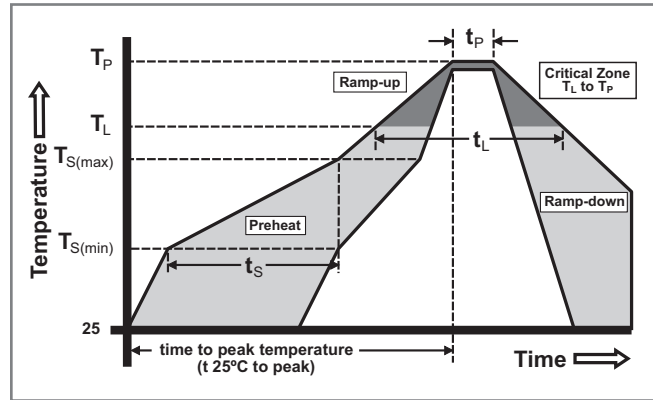


Outline 502 - CG5L-03, CG5L, CG5LTR, CG5600L-02



Soldering Parameters - Reflow Soldering (Surface Mount Devices)

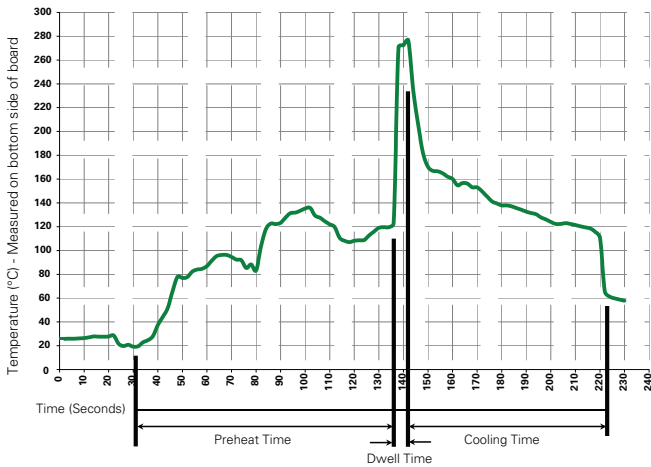
Reflow Condition		Pb – Free assembly
Pre Heat	- Temperature Min ($T_{s(min)}$)	150°C
	- Temperature Max ($T_{s(max)}$)	200°C
	- Time (Min to Max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		5°C/second max
Reflow	- Temperature (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



Soldering Parameters - Hand Soldering

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

Soldering Parameters - Wave Soldering (Thru-Hole Devices)



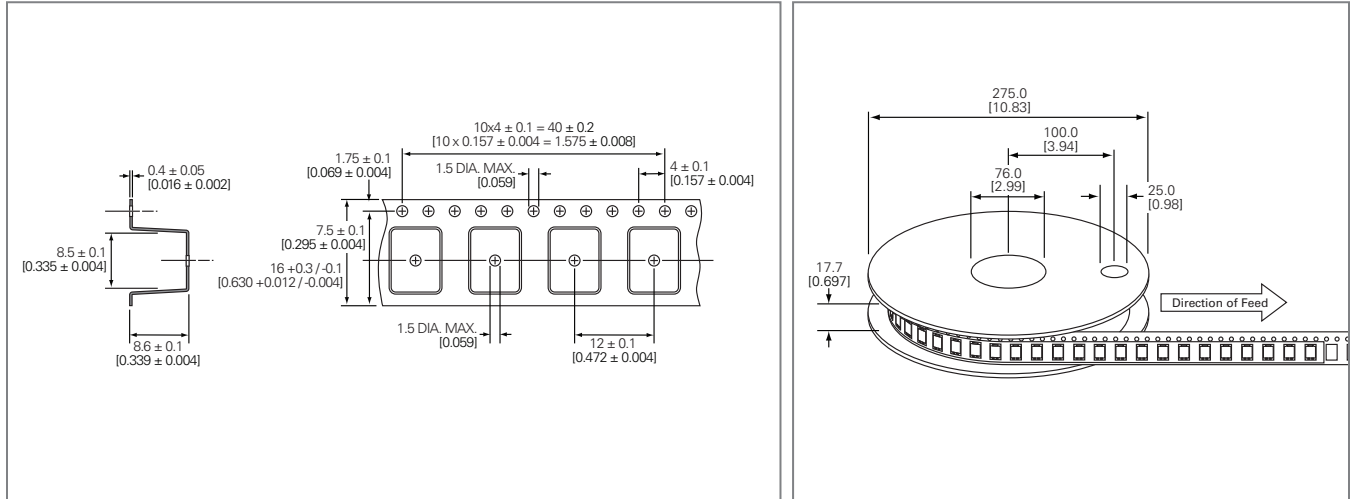
Recommended Process Parameters:

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

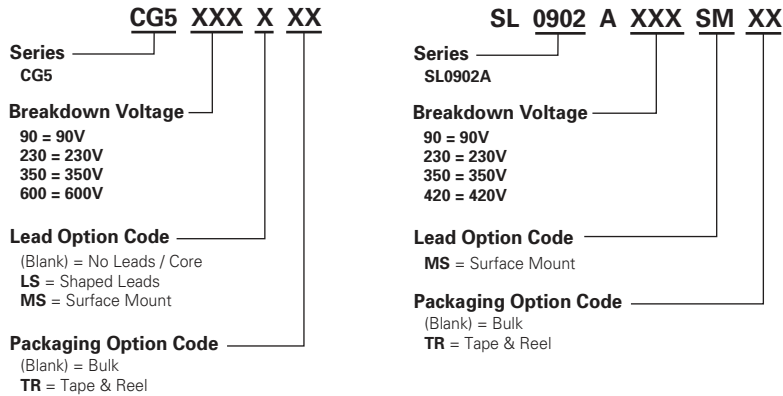
Note: These devices are not recommended for IR or Convection Reflow process.

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.