

## GENERAL DESCRIPTION

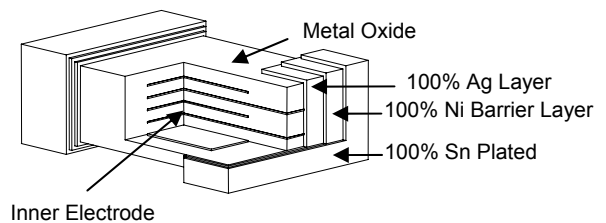
These Multi Layer Varistors are small, leadless, surface mount packages made of multiple layers of Zinc Oxide, with electrodes between them. They are used to help protect integrated circuits and other sensitive equipment. Their small size is ideal for high density printed circuit boards.

## BENEFITS

- Help to protect sensitive equipment against typical ESD, EMC and EOS (Electrical Over Stress) events and transients
- Cost efficient assembly and protection
- Resistance to standard wave solder fluxes, provides excellent solderability
- Space savings
- Longer battery life due to low leakage current

## FEATURES

- Bidirectional clamping
- Compatible with standard surface mount methods
- Low and stable leakage current
- Low clamping voltage
- Quick response time (<1ns)
- High transient current capability
- RoHS Compliant



## APPLICATIONS

ESD, EMC and EOS protection of:

- Computer I/O ports and interfaces (USB, IEEE 1394, etc...)
- Portable devices
- Automotive electronic circuits
- Telecom equipment
- Medical instruments

## SYMBOL



## MATERIALS INFORMATION

ROHS Compliant

Directive 2002/95/EC  
Compliant

ELV Compliant

Directive 2000/53/EC  
Compliant



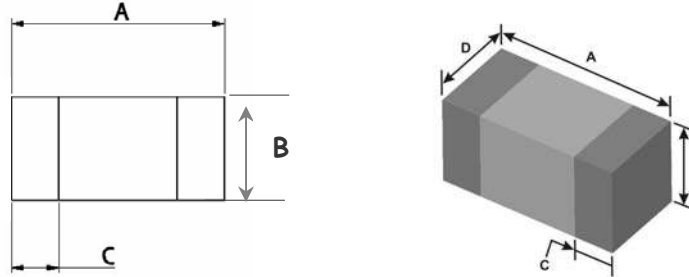
## Multi Layer Varistor Overvoltage Protection Device

*Raychem Circuit Protection Products*

**PRODUCT: MLV0402**

DOCUMENT: SCD 26385  
 PCN : RF0107, RF0545  
 REV LETTER: D  
 REV DATE: AUGUST 10, 2007  
 PAGE NO.: 3 OF 5

### DIMENSIONS



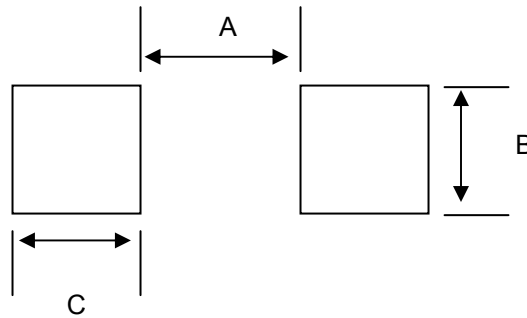
Drawing Not To Scale

	length A		Height B		Terminal Width C		Width D	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
mm:	0.85	1.15	0.4	0.6	0.1	0.4	0.4	0.6
in*:	(0.033)	(0.045)	(0.016)	(0.024)	(0.004)	(0.016)	(0.016)	(0.024)

\* Rounded off approximation

### RECOMMENDED PAD LAYOUT

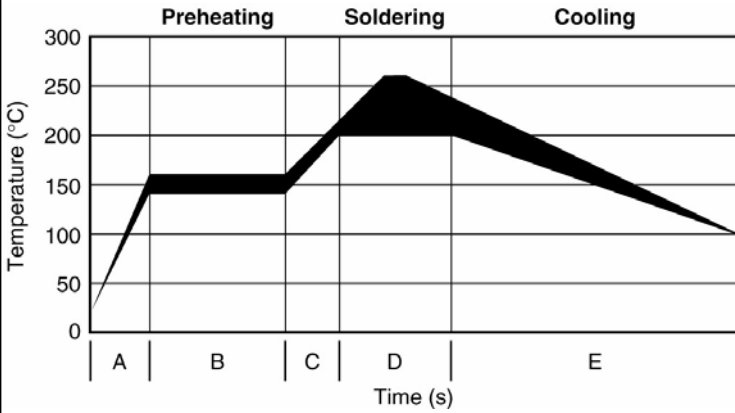
Print solder with a thickness of 150 to 200µm



	A	B	C
mm:	0.35	0.75	0.85
in*:	(0.014)	(0.030)	(0.033)

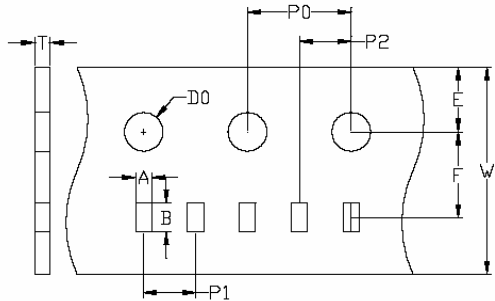
\* Rounded off approximation

**SOLDER REFLOW RECOMMENDATIONS**



A	Temperature ramp up 1	From ambient to Preheating temperature	30s to 60s
B	Preheating	140°C - 160°C	60s to 120s
C	Temperature ramp up 2	From Preheating to Main heating temperature	20s to 40s
D	Main heating	at 200°C at 220°C at 240°C at 260°C	60s ~ 70s 50s ~ 60s 30s ~ 40s 5s ~ 10s
E	Cooling	From main heating temperature to 100°C	max 4°C/s

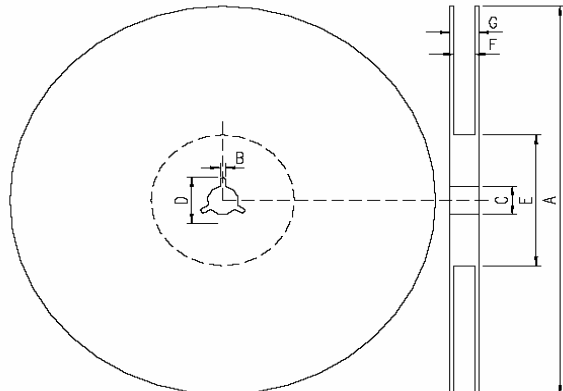
**PACKAGING**



	A		B		W		E		F		P0		P1		P2		D0		T	
mm	0.59	0.65	1.09	1.15	7.7	8.3	1.7	1.8	3.45	3.55	3.9	4.1	1.95	2.05	1.95	2.05	1.4	1.6	0.55	0.65
inch*	(0.023)	(0.025)	(0.042)	(0.045)	(0.303)	(0.326)	(0.066)	(0.070)	(0.135)	(0.139)	(0.153)	(0.161)	(0.076)	(0.080)	(0.076)	(0.080)	(0.055)	(0.062)	(0.021)	(0.025)

\*Rounded off approximation

**Leader & Trailer:** The leader is 180mm in length & consists of empty cavities with sealed cover tape.  
The trailer is 350mm in length & consists of empty cavities with sealed cover tape.



A	178.0±2.0
B	2.0±0.5
C	13.0±0.5
D	21.0±0.8
E	62.0±1.5
F	9.0±0.5
G	13.0±1.0



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### **RECOMMENDED STORAGE CONDITIONS**

Storage time: 12 months max  
Storage temperature: 5 to 40°C  
Storage Relative humidity: 65% max

### **POST REFLOW, CLEANING CONDITIONS**

A 5% saponifier combined with water during wash.

For an Ultrasonic process water temperature should be at 50°C and board should be submerged for a minimum of one minute in the solution, then rinse and dry.

For in-line washing, the temperature of the water sprayed should be at 110°C, rise and drying is done in-line.

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