

# Multilayer Chip Varistor

## MCVZ0603 Green Material Series



### Description:

Multilayer Chip Varistor is a family of Transient Voltage Surge Suppression products. Today, electronic circuits are becoming smaller and more sensitive to external interference. Multilayer Chip Varistor is designed to protect components from destruction of transients and ESD (Electronic Static Discharge). The wide operating voltage and energy range make Multilayer Chip Varistor suitable for numerous applications on I/O protection, Vcc protection, Keyboard protection, LCD protection, Sensor protection etc. The Chip Varistor is manufactured by Multilayer fabrication technology providing excellent voltage clamping ability and is supplied in leadless, surface mount form, compatible with modern reflow and wave soldering procedures.

### Features:

- Multilayer fabrication technology
- -55°C to +125°C operating temperature range
- Operating voltage range  $V_{M(DC)}$  at 5.5V to 38V
- Able to withstand ESD test of IEC-61000-4-2
- Bi-directional clamping characteristic

### Applications:

Protection of cellular phones, PDA, High Speed Data Line etc.

ESD Protection for components sensitive to IEC 61000-4-2, provides circuit board transient voltage protection for transistors.

Protection of Video & Audio Ports.

### Device Rating And Specifications:

Part Number	Maximum Ratings					Specifications		
	Max. Continuous Working Voltage		Max. Non-Repetitive Surge Current (8/20 $\mu$ s)	Max. Non- Repetitive Surge Energy (10/1000 $\mu$ s)	Max. Claiming Voltage at Specified Current (8/20 $\mu$ s)	Nominal Voltage At 1mA (DC) Current		Typical Capacitance
	$V_{M(DC)}$	$V_{M(AC)}$	$I_{TM}$	$W_{TM}$	$V_c$	$V_{N(DC) Min.}$	$V_{N(DC) Max.}$	@1KHz
	(V)	(V)	(A)	(J)	(V)	(V)	(V)	C (pF)
MCVZ0603M050AGT	5.5	4	30	0.1	20 at 1A	8	11	800
MCVZ0603M090AGT	9	6	30	0.1	23 at 1A	10.2	13.8	680
MCVZ0603M140AGT	14	11	30	0.1	30 at 1A	15.3	20.7	350
MCVZ0603M180AGT	18	14	30	0.1	39 at 1A	21.6	26.4	270
MCVZ0603M260AGT	26	20	30	0.1	54 at 1A	29.7	36.3	200
MCVZ0603M300AGT	30	25	30	0.1	65 at 1A	35.1	42.9	120
MCVZ0603M380AGT	38	30	30	0.1	77 at 1A	42.3	51.7	100

The capacitance value and energy only for reference. It is not formal specification.

### Standard Testing Condition

Unless otherwise specified

Temperature : +15°C to 35°C  
 Humidity : 25%RH to 85%RH  
 Atmospheric pressure : 86kPa to 106kPa

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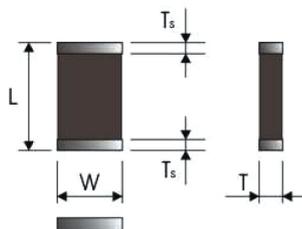


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### Dimensions:



Symbol	MCVZ0603 Series
L	1.6 ± 0.15mm
W	0.8 ± 0.15mm
T	0.9mm (max.)
Ts	0.35 ± 0.15mm

Terminal electrode : Ni / Sn electrode

### Specifications:

#### Electrical Reliability

Test Item	Test condition / Test method	Specification															
High temperature storage	+125±3°C for 1,000 hours Measurement to be made after keeping at room temp. for 24 ±2hr	ΔV at 1mA < 10%															
Low temperature storage	-40±3°C for 1,000 hours Measurement to be made after keeping at room temp. for 24 ±2hr	ΔV at 1mA < 10%															
Humidity storage	40±2°C , 90 to 95%RH for 500 hours Measurement to be made after keeping at room temp. for 24 ±2hr	ΔV at 1mA < 10%															
Temperature cycles	Times : 5 cycles <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Step</th> <th>Temp.(°C)</th> <th>Time(min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55±3</td> <td>30±3</td> </tr> <tr> <td>2</td> <td>Room temp.</td> <td>2~3</td> </tr> <tr> <td>3</td> <td>+125 ±3°C</td> <td>30±2</td> </tr> <tr> <td>4</td> <td>Room temp.</td> <td>2~3</td> </tr> </tbody> </table> Measurement to be made after keeping at room temp. for 24 ±2hr	Step	Temp.(°C)	Time(min.)	1	-55±3	30±3	2	Room temp.	2~3	3	+125 ±3°C	30±2	4	Room temp.	2~3	ΔV at 1mA < 10%
Step	Temp.(°C)	Time(min.)															
1	-55±3	30±3															
2	Room temp.	2~3															
3	+125 ±3°C	30±2															
4	Room temp.	2~3															

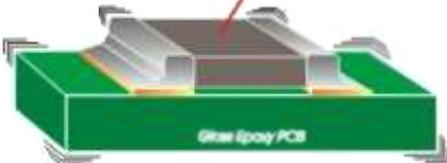
#### Mechanical Reliability

Test Item	Test condition / Test method	Specification
Solderability	Solder temp. : 230±5°C Immersion time : 2±0.5 sec Immersion and emersion rates : 25mm/s	Min 90% electrode shall be covered with solder.
Resistance to Soldering Heat	Pre-heating : 120°C to 150°C, 60sec Solder temp. : 260 ±5°C Immersion time : 10 ±1sec Measurement to be made after keeping at room temp. for 24 ±2h	ΔV at 1mA < 10% Disappearance of electrode due to immersion into solder shall not exceed 25% of edges of each electrode.

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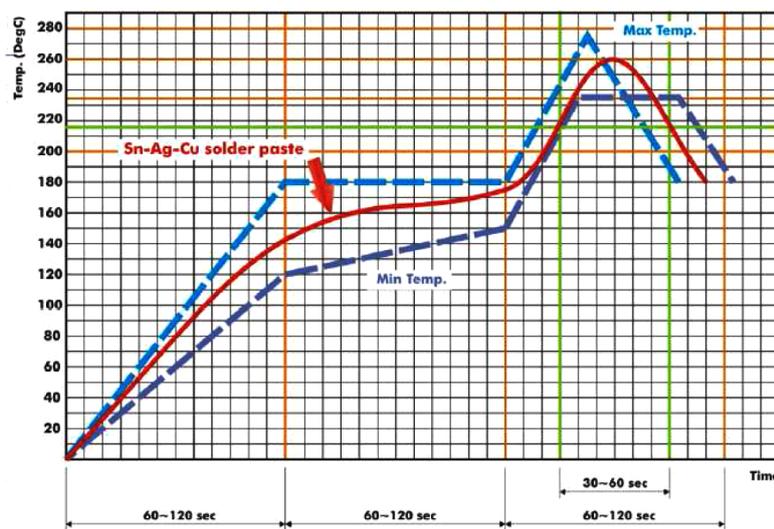
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### Mechanical Reliability

Test Item	Test condition / Test method	Specification
Adhesive Strength of Termination	<p>Solder chip on PCB and applied                      0805/1206 Series: 10N(1Kgf) for 10 sec                      0402/0603 Series: 5N(0.5Kgf) for 10 sec</p> <p style="text-align: center;">Chip varistor</p> 	No visible damage
Vibration	<p>Solder chip on PCB.                      Frequency : 10Hz ~ 55Hz ~ 10 Hz (1min)                      Oscillation amplitude : 1.5mm                      Times : 2hrs in each of three perpendicular direction</p>	No visible damage
Bending Test	The middle part of substrate shall be pressurized by means of the pressurizing rod at a rate of 1mm per second until the deflection becomes 1mm and then the pressure shall be maintained for 5 sec.	No visible damage $\Delta V$ at 1mA < 10%

### Soldering Condition:

Typical examples of soldering processes that provide reliable joints without any damage are given in figure below:



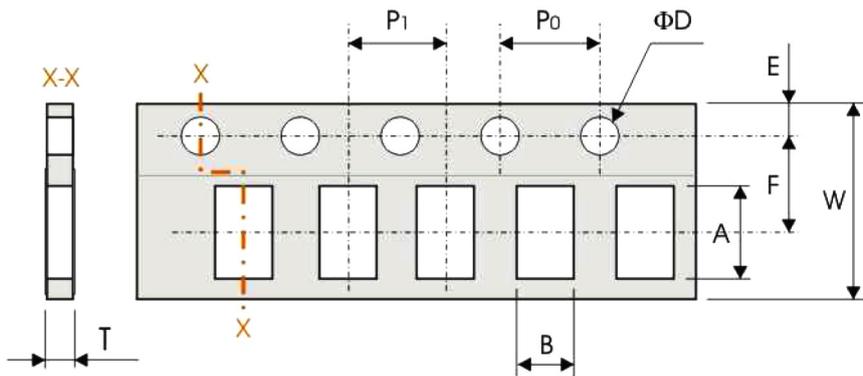
Infrared soldering profile

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### Packaging:

Paper Tape specifications and Packaging quantity



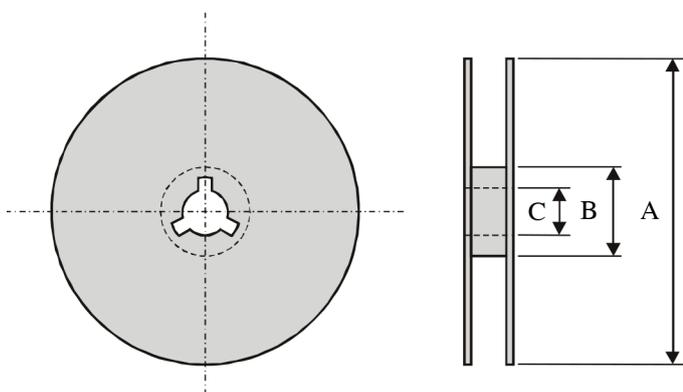
Series	A	B	E	F	ØD
MCVZ0603 Series	1.8 ±0.05	0.95 ±0.05	1.75 ±0.05	3.5 ±0.05	1.55 ±0.05

Series	P0	P1	T	W	Quantity/Reel
MCVZ0603 Series	4 ±0.1	2 ±0.1	0.87 ±0.05	8 ±0.2	4Kpcs

Tape Material : Paper tape

Dimensions : Millimetres

### Reel Dimensions:



Index	A	B	C
Dimension (mm)	178	60	13.5

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