REVISION HISTORY

Rev	P/N	Description	Date
V01	VZ0402 Green Material series	First Version	2004-08-27
V02	VZ0402 Green Material series	Change Tape Spec : Length Dimension "A" from 1.12 ± 0.10 mm to 1.15 ± 0.03 mm Width Dimension "B" from 0.62 ± 0.10 mm to 0.65 ± 0.03 mm	2004-09-24
V03	VZ0402 Green Material series	The term "Electrical Characteristics" of Page 4 should be deleted	2005-01-19
V04	VZ0402 Green Material series	Change Tape Spec.: Index "A" dimension from 1.15 ± 0.03 mm to 1.12 ± 0.03 mm Index "B" dimension from 0.65 ± 0.03 mm to 0.62 ± 0.03 mm Index "T" dimension from 0.60 ± 0.15 mm to 0.60 ± 0.03 mm	2005-03-01
V05	VZ0402 Green Material series	The reflow profile revised for Pb free products on Page-6	2005-06-13
V06	VZ0402 Green Material series	Change the Product specifications of Typical Capacitance on Page 4	2005-11-29

DESCRIPTION

Walsin Multilayer Chip Varistor is a family of Transient Voltage Surge Suppression products.Today , electronic circuits are becoming smaller and more sentive to external interference. Walsin Multilayer Chip Varistor is designed to protect components from destruction of transients and ESD(Electronic Static Discharge). The wide operating voltage and energy rage make Walsin Multilayer Chip Varistor suitable for numerous applications on I/O protection , Vcc protectiion , Keyboard protection , LCD protection , Sensor protection…etc. The Walsin 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.

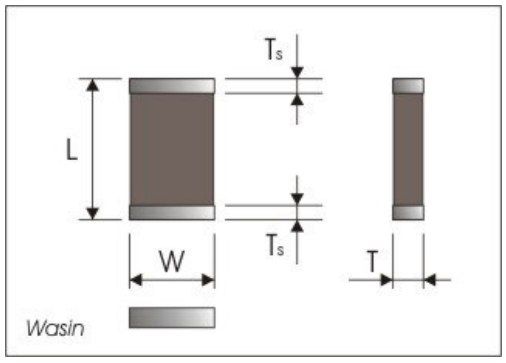
FEATURES

1. Multilayer fabrication technology
2. -55℃to 125℃ operating temperature Range
3. Operating voltage range $V_{M(DC)}$ at 5.5V ~ 18V
4. Able to withstand ESD test of IEC-61000-4-2
5. Bi-directional clamping characteristic

APPLICATIONS

1. Protection of cellular phones, PDA, High Speed Data Line…etc.
2. ESD Protection for components sensitive to IEC 61000-4-2, Provides Circuit Board Transient Voltage Protection for Transistors.
3. Protection of Video & Audio Ports.

DIMENSIONS

Figure	Symbol	VZ0402 Series
	L	1.00 ± 0.10 mm
	W	0.50 ± 0.10 mm
	T	0.50 ± 0.10 mm
	Ts	0.25 ± 0.15 mm

*Terminal electrode：Ni / Sn electrode

DEVICE RATING AND SPECIFICATIONS

Part Number	MAXIMUM RATINGS					SPECIFICATIONS		
	Max. Continuous Working Voltage		Maximum Non-Repetitive Surge Current (8/20 μs)	Maximum Non-Repetitive Surge Energy (10/1000 μs)	Max. Claming Voltage at Specified Current (8/20 μs)	Nominal Voltage At 1mA (DC) Current		Typical Capacitance @1KHz
	$V_{M(DC)}$	$V_{M(AC)}$	I_{TM}	W_{TM}	Vc	$V_{N(DC)}$Mi.	$V_{N(DC)}$Max.	C
	(V)	(V)	(A)	(J)	(V)	(V)	(V)	(pF)
VZ0402M050AGT	5	4	20	0.05	23 at 1A	8.0	11.0	290
VZ0402M090AGT	9	7	20	0.05	32 at 1A	10.0	15.0	190
VZ0402M140AGT	14	11	20	0.05	41 at 1A	16.2	19.8	130
VZ0402M180AGT	18	14	20	0.05	49 at 1A	19.8	24.2	90

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

STANDARD TESTING CONDITION

Unless otherwise specified

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

SPECIFICATION

1. Electrical Reliability

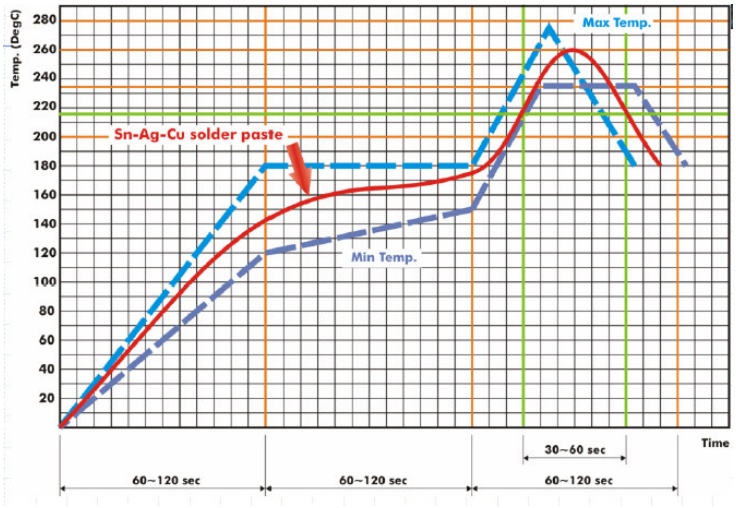
Test item	Test condition / Test method	Specification
High temperature storage	+125±3℃ for 1000 hours Measurement to be made after keeping at room temp. for 24 ±2hr	△V at 1mA ＜ 10%
Low temperature storage	-40±3℃ for 1000 hours Measurement to be made after keeping at room temp. for 24 ±2hr	△V at 1mA ＜ 10%
Humidity storage	40±2℃ , 90 ~95%RH for 500 hours Measurement to be made after keeping at room temp. for 24 ±2hr	△V at 1mA ＜ 10%
Temperature cycles	Times：5 cycles Step Temp.(℃) Time(min.) 1 -55±3 30±3 2 room temp. 2~3 3 +125±3℃ 30±2 4 room temp. 2~3 Measurement to be made after keeping at room temp. for 24 ±2hr	△V at 1mA ＜ 10%

2. 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~ 150℃ , 60 sec Solder temp.：260±5°C Immersion time：10±1 sec Measurement to be made after keeping at room temp. for 24 ±2h	△V at 1mA ＜ 10% Disappearance of electrode due to immersion into solder shall not exceed 25% of edges of each electrode.
Adhesive Strength of Termination	Solder chip on PCB and applied 0805/1206 Series: 10N(1Kgf) for 10 sec 0402/0603 Series: 5N(0.5Kgf) for 10 sec Chip varistor 	No visible damage
Vibration	Solder chip on PCB. Frequency：10 Hz～55 Hz～10 Hz (1min) Oscillation amplitude：1.5 mm Times：2 hrs in each of three perpendicular direction	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 1 mm and then the pressure shall be maintained for 5 sec..	No visible damage △V at 1mA ＜ 10%

SOLDERING CONDITION

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



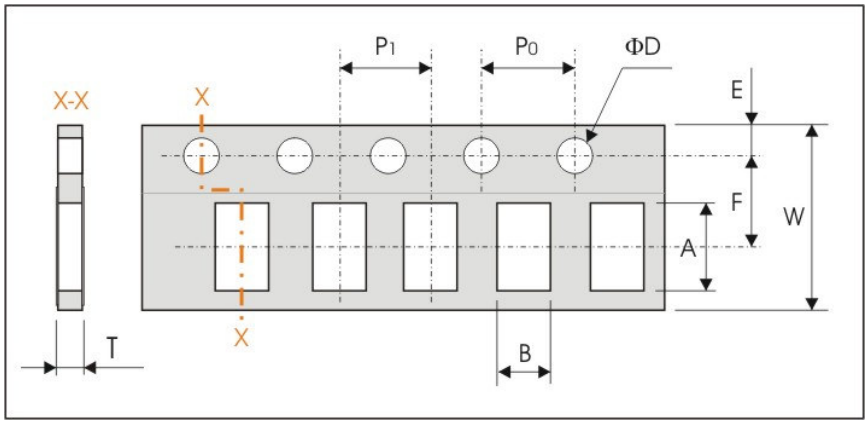
Infrared soldering profile

ORDERING CODE

VZ	0402	M	050	A	G	T
Type Code	**Chip Size**	**Style**	**Rated Voltage**	**Capacitance Tolerance**	**Termination**	**Packing**
VZ: Walsin Varistor	0402 0603	M: Multilayer A: Array	050 = 5.5V 070 = 7V 090 = 9V 140 = 14V 180 = 18V	A: Standard	G: Green Material	T: Reeled B: Bulk

PACKAGING

Paper Tape specifications (unit :mm) **and Packaging quantity**

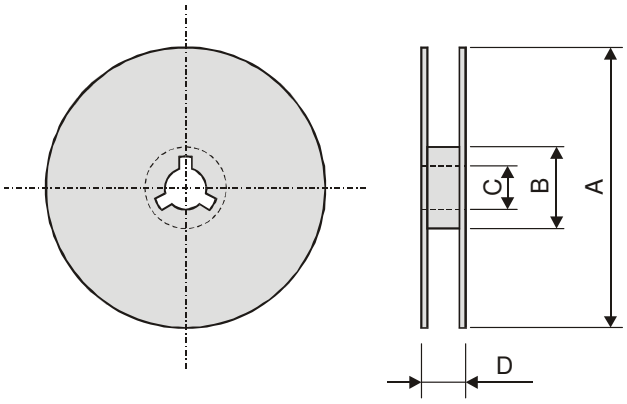


Series	A	B	E	F	ΦD
VH0402 Series	1.12 ± 0.03	0.62 ± 0.03	1.75 ± 0.05	3.50 ± 0.05	1.55 ± 0.05

Series	P0	P1	T	W	Quantity/Reel
VH0402 Series	4.00 ± 0.10	2.00 ± 0.10	0.60 ± 0.03	8.00 ± 0.20	10Kpcs

- Tape Material : Paper tape.

Reel dimensions



Symbol	A	B	C	D
Dimension	Φ178.0±2.0	Φ60.0±1.0	13.0±0.2	10.0±1.5

CAUTION OF HANDLING

Limitation of Applications

Please contact us before using our products for the applications listed below which require especially high reliability for the prevention of defects, which might directly cause damage to the third party's life, body or property.

(1) Aircraft equipment
(2) Aerospace equipment
(3) Undersea equipment
(4) Medical equipment
(5) Traffic signal equipment
(6) Applications of similar complexity and /or reliability requirements to the applications listed in the above.

Storage condition

(1) Products should be used in 6 months from the day of WALSIN outgoing inspection, which can be confirmed.
(2) Storage environment condition.

- Products should be storage in the warehouse on the following conditions.
- Temperature : -10 to +40°C
- Humidity : 30 to 70% relative humidity
- Don't keep products in corrosive gases such as sulfur. Chlorine gas or acid or it may cause oxidization of electrode, resulting in poor solderability.
- Products should be storage on the palette for the prevention of the influence from humidity, dust and son on.
- Products should be storage in the warehouse without heat shock, vibration, direct sunlight and so on.
- Products should be storage under the airtight packaged condition.