APPROVAL SHEET

MULTILAYER CHIP VARISTOR

For Surge Protection

Size 0402

VZ0402 Green Material Series

*Contents in this sheet are subject to change without prior notice.

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.

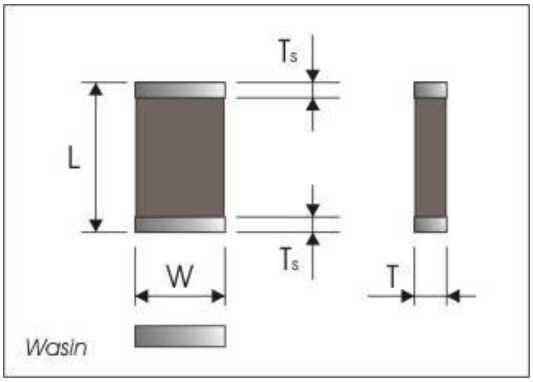
FEATURES

1. Multilayer fabrication technology
2. -40℃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	0.96 ± 0.14 mm
	W	0.50 ± 0.10 mm
	T	0.60 mm (max.)
	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	$V_{N(DC)}$Min.	$V_{N(DC)}$Max.	C
	(V)	(V)	(A)	(J)	(V)	(V)	(V)	(pF)
VZ0402M050AGTN	5.5	4	20	0.05	24 at 1A	8.0	18.0	270
VZ0402M090AGTN	9	6	20	0.05	41 at 1A	11.5	21.5	130
VZ0402M180AGTN	18	14	20	0.05	54 at 1A	23	33	85
VZ0402M200AGTN	20	17	20	0.05	70 at 1A	32	42	35
VZ0402M120AGTN	12	-	-	-	110 at 1A	25	40	7
VZ0402M12LAGTN	12	-	-	-	150 at 1A	45	65	3.5
VZ0402M18LAGTN	18	-	-	-	150 at 1A	45	65	3.5
VZ0402M26LAGTN	26	-	-	-	145 at 1A	45	65	4

- 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

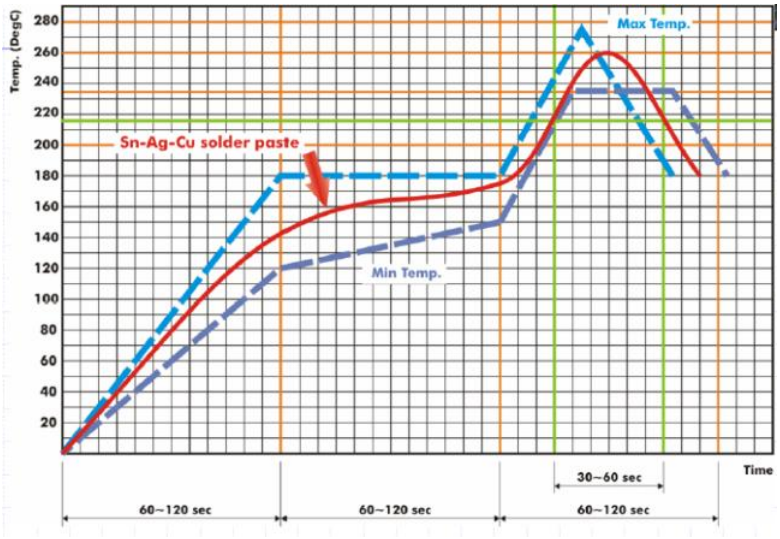
Test item	Test condition / Test method	Specification
High temperature storage	+125±3℃ for 1000 hours Measurement to be made after keeping at room temp. for 24 ±2hr	△V at 1mA ＜ 10%
Low temperature storage	-40±3℃ for 1000 hours Measurement to be made after keeping at room temp. for 24 ±2hr	△V at 1mA ＜ 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:



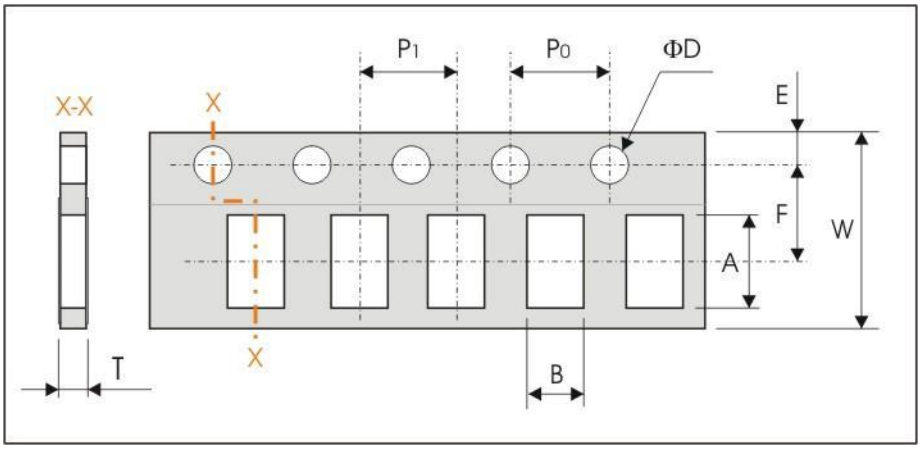
Infrared soldering profile

ORDERING CODE

VZ	0402	M	050	A	G	T	
Type Code	**Chip Size**	**Style**	**Rated Voltage**	**Capacitance Tolerance**	**Termination**	**Packing**	**Internal Code**
VZ: Walsin Varistor	0402 0603	M:Multilayer A: Array	050 = 5.5V 070 = 7V 090 = 9V 140 = 14V 180 = 18V 260 = 26V	A: Standard	G: Green Material	T: Reeled B: Bulk	Blank: None N: New item

PACKAGING

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

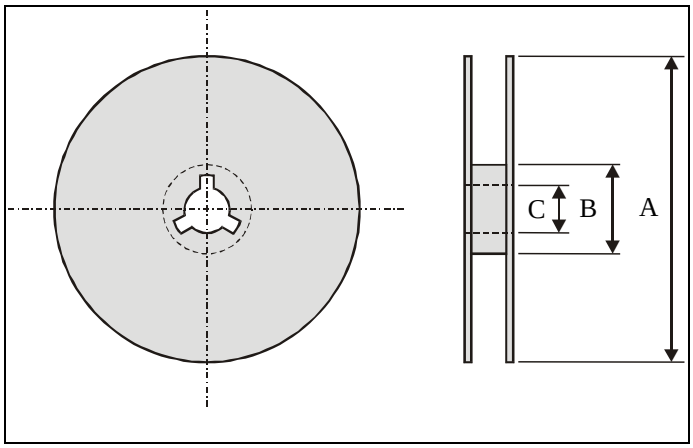


Series	A	B	E	F	ΦD
VH0402 Series	1.12 ± 0.03	0.62 ± 0.03	1.75 ± 0.05	3.50 ± 0.05	1.55 ± 0.05

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



Index	A	B	C
Dimension (mm)	Φ178	Φ60.0	Φ13.5

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.

APPROVAL SHEET

MULTILAYER CHIP VARISTOR

For Surge Protection

Size 0603

VZ0603 Green Material Series

*Contents in this sheet are subject to change without prior notice.

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.

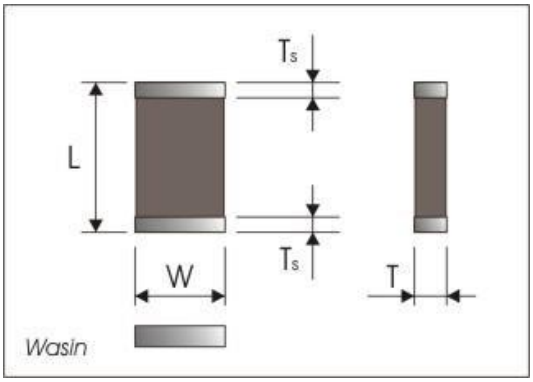
FEATURES

1. Multilayer fabrication technology
2. -40℃to 125℃ operating temperature Range
3. Operating voltage range $V_{M(DC)}$ at 5.5V ~ 38V
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	VZ0603 Series
	L	1.60 ± 0.15 mm
	W	0.80 ± 0.15 mm
	T	0.90 mm (max.)
	Ts	0.30 ± 0.20 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	$V_{N(DC)}$Min.	$V_{N(DC)}$Max.	C
	(V)	(V)	(A)	(J)	(V)	(V)	(V)	(pF)
VZ0603M050AGTN	5.5	4	30	0.1	24 at 1A	8	18	270
VZ0603M090AGTN	9	6	30	0.1	41 at 1A	11.5	21.5	210
VZ0603M180AGTN	18	14	30	0.1	54 at 1A	23	33	150
VZ0603M260AGTN	26	20	30	0.1	70 at 1A	32	42	100
VZ0603M120AGTN	12	-	-	-	110 at 1A	25	40	40
VZ0603M12LAGTN	12	-	-	-	150 at 1A	45	65	3.5
VZ0603M26LAGTN	26	-	-	-	145 at 1A	45	65	4

STANDARD TESTING CONDITION

Unless otherwise specified

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

SPECIFICATION

1. Electrical Reliability

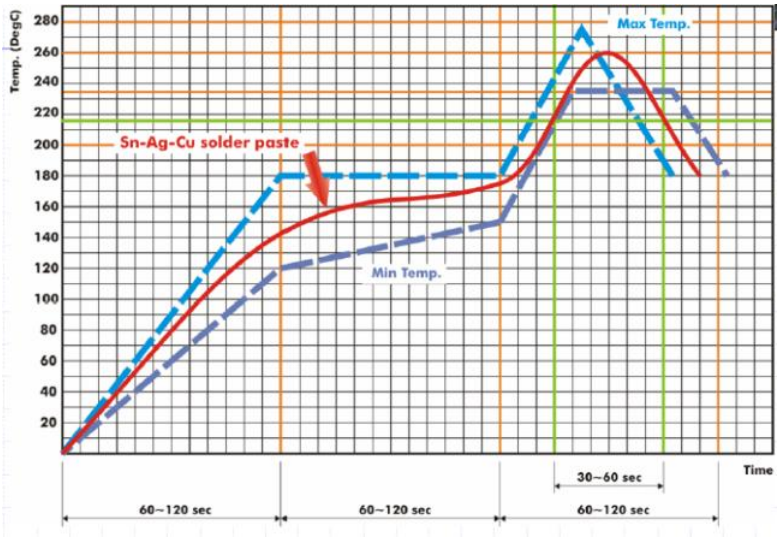
Test item	Test condition / Test method	Specification
High temperature storage	+125±3℃ for 1000 hours Measurement to be made after keeping at room temp. for 24 ±2hr	△V at 1mA ＜ 10%
Low temperature storage	-40±3℃ for 1000 hours Measurement to be made after keeping at room temp. for 24 ±2h	△V at 1mA ＜ 10%
Humidity storage	40±2℃ , 90 ~95%RH for 500 hours Measurement to be made after keeping at room temp. for 24 ±2h	△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 axt room temp. for 24 ±2h	△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:



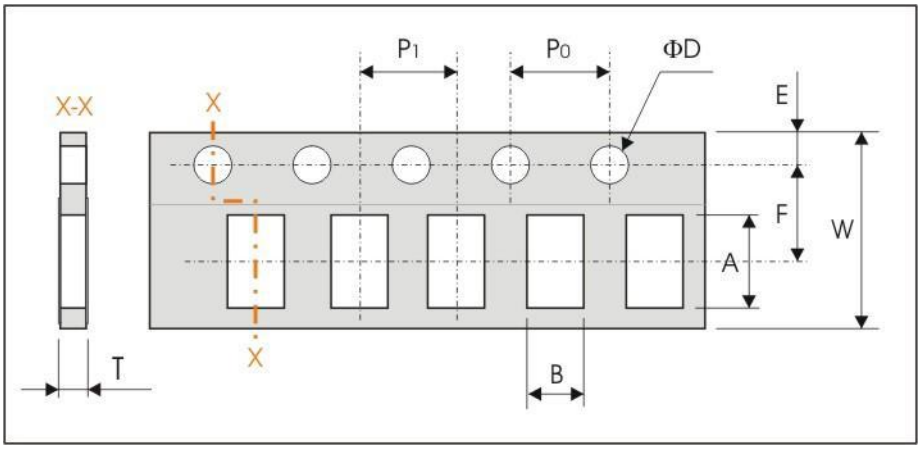
Infrared soldering profile

ORDERING CODE

VZ	0603	M	050	A	G	T	
Type Code	**Chip Size**	**Style**	**Rated Voltage**	**Capacitance Tolerance**	**Termination**	**Packing**	**Internal Code**
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	Blank: None N: New item

PACKAGING

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

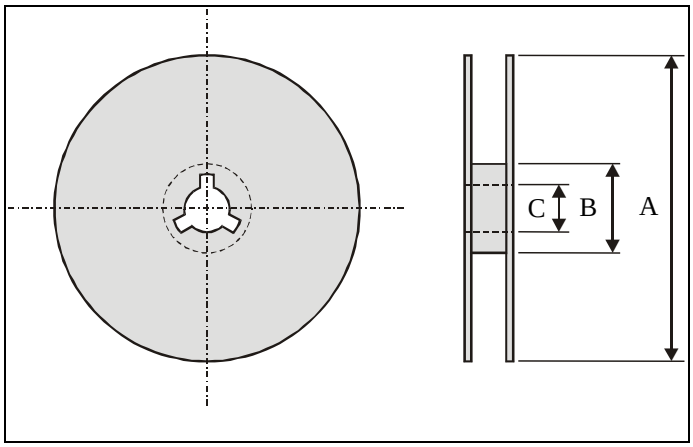


Label	A	B	E	F	ΦD
VZ0603 Series	1.80 ± 0.05	0.95 ± 0.05	1.75 ± 0.05	3.50 ± 0.05	1.55 ± 0.05

Label	P0	P1	T	W	Quantity/Reel
VZ0603 Series	4.00 ± 0.10	2.00 ± 0.10	0.87 ± 0.05	8.00 ± 0.20	4Kpcs

- Tape Material : Paper tape.

Reel dimensions



Index	A	B	C
Dimension (mm)	Φ178	Φ60.0	Φ13.5

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.

APPROVAL SHEET

MULTILAYER CHIP VARISTOR

For Surge Protection

Size 0805

VZ0805 Series

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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.

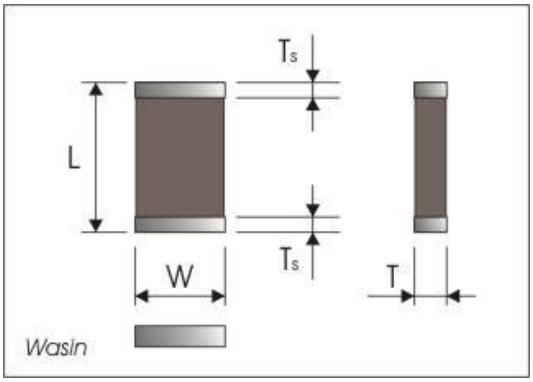
FEATURES

1. Multilayer fabrication technology
2. -40℃to 125℃ operating temperature Range
3. Operating voltage range $V_{M(DC)}$ at 5.5V ~ 38V
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	VZ0805 Series
	L	2.00 ± 0.20 mm
	W	1.25 ± 0.20 mm
	T	1.20 mm (max.)
	Ts	0.50 ± 0.30 mm

*Terminal electrode：Ni / Sn electrode

DEVICE RATING AND SPECIFICATIONS

Part Number	MAXIMUM RATINGS					SPECIFICATIONS		
	Max. Continuous Working Voltage		Maximum Non-Repetitive Surge Current	Maximum Non-Repetitive Surge Energy	Max. Claming Voltage at Specified Current	Nominal Voltage		Typical Capacitance
			(8/20 μs)	(10/1000 μs)	(8/20 μs)	At 1mA (DC) Current		@1KHz
	$V_{M(DC)}$	$V_{M(AC)}$	I_{TM}	W_{TM}	Vc	$V_{N(DC)}$Min.	$V_{N(DC)}$Max.	C
	(V)	(V)	(A)	(J)	(V)	(V)	(V)	(pF)
VZ0805M050AGTN	5.5	4	80	0.1	22 at 1A	7.8	12	500
VZ0805M090AGTN	9	6	80	0.2	30 at 1A	10.8	18	420
VZ0805M110AGTN	11	8	100	0.3	32 at 1A	14	20	360
VZ0805M140AGTN	14	11	100	0.1	38 at 1A	17.2	21	400
VZ0805M160AGTN	16	14	120	0.3	46 at 1A	22	28	400
VZ0805M180AGTN	18	14	120	0.3	44 at 1A	19.8	25.2	350
VZ0805M22LAGTN	22	17	30	0.1	54 at 1A	25	34	100
VZ0805M220AGTN	22	17	120	0.3	50 at 1A	24.3	30.7	400
VZ0805M260AGTN	26	20	100	0.4	56 at 1A	29.7	37.3	220
VZ0805M300AGTN	30	25	100	0.3	71 at 1A	35.1	43.9	250
VZ0805M380AGTN	38	30	100	0.3	81 at 1A	42.3	52.7	200
VZ0805M450AGTN	45	35	80	0.1	93 at 1A	55	61	170

STANDARD TESTING CONDITION

Unless otherwise specified

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

SPECIFICATION

1. Electrical Reliability

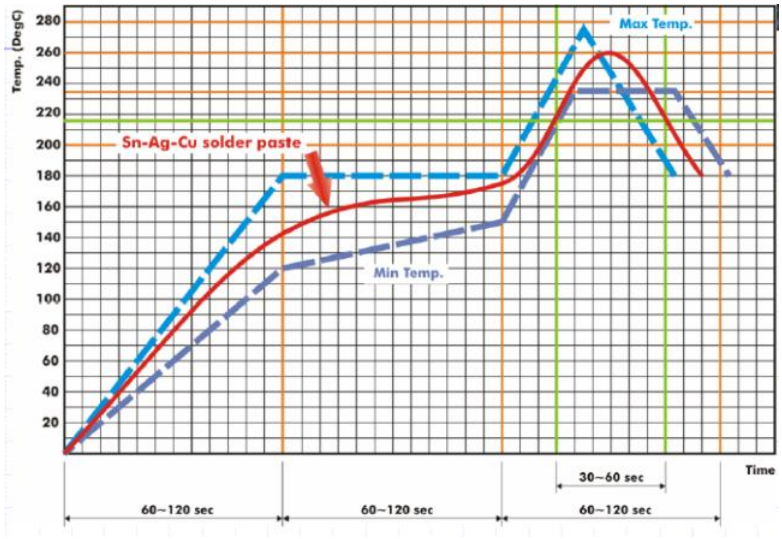
Test item	Test condition / Test method	Specification
High temperature storage	+125±3℃ for 1000 hours Measurement to be made after keeping at room temp. for 24 ±2hr	△V at 1mA ＜ 10%
Low temperature storage	-40±3℃ for 1000 hours Measurement to be made after keeping at room temp. for 24 ±2h	△V at 1mA ＜ 10%
Humidity storage	40±2℃，90 ~95%RH for 500 hours Measurement to be made after keeping at room temp. for 24 ±2h	△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 axt room temp. for 24 ±2h	△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:



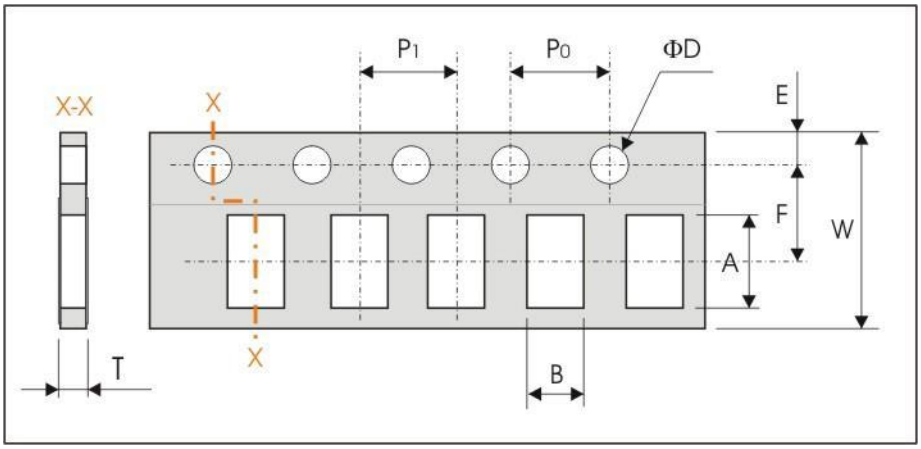
Infrared soldering profile

ORDERING CODE

VZ	0805	M	050	A	G	T	
Type Code	**Chip Size**	**Style**	**Rated Voltage**	**Capacitance Tolerance**	**Termination**	**Packing**	**Internal Code**
VZ: Walsin Varistor	0402 0603 0805	M: Multilayer	050 = 5.5V 070 = 7V 090 = 9V 140 = 14V 180 = 18V	A: Standard C: High Surge	G: Green Material	T: Reeled B: Bulk	Blank: None N: New item

PACKAGING

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

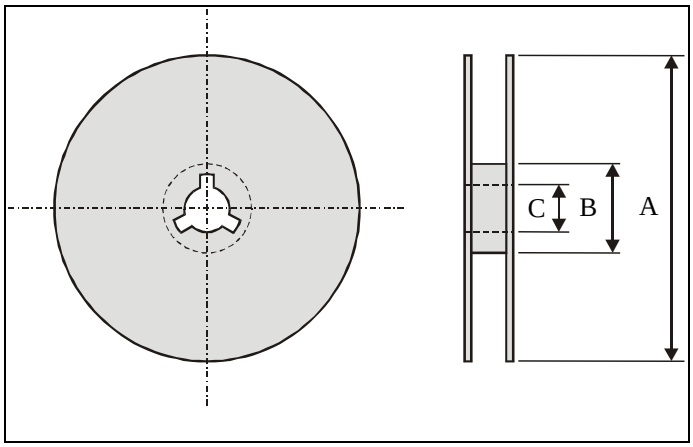


Label	A	B	E	F	ΦD
VZ0805 Series	2.30 ± 0.10	1.50 ± 0.10	1.75 ± 0.10	3.50 ± 0.05	1.55 ± 0.05

Label	P0	P1	T	W	Quantity/Reel
VZ0805 Series	4.00 ± 0.10	4.00 ± 0.10	1.52 ± 0.05	8.00 ± 0.20	3Kpcs

- Tape Material : Paper tape.

Reel dimensions



Index	A	B	C
Dimension (mm)	Φ178	Φ60.0	Φ13.5

CAUTION OF HANDLING

Limitation of Applications

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(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.

APPROVAL SHEET

MULTILAYER CHIP VARISTOR

For Surge Protection

Size 1206

VZ1206 Green Material Series

*Contents in this sheet are subject to change without prior notice.

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.

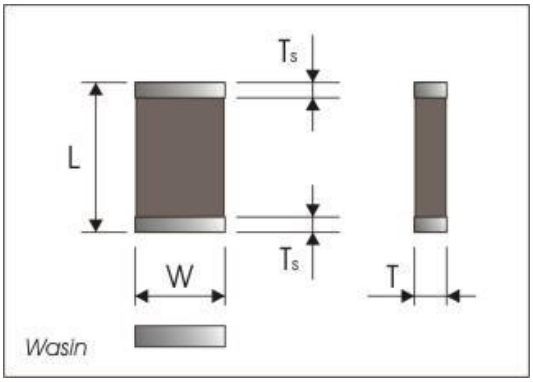
FEATURES

1. Multilayer Fabrication Technology
2. Small size (0402, 0603, 0805and 1206 Available)
3. –40℃ to +125℃ Operating Temperature Range
4. Operating Voltage Range (DC) from 5.5V~85V
5. Able to withstand high surge current
6. Bi-directional Clamping Characteristic
7. Low Capacitance Chip Varistor Types Available
8. Environmentally conscious design

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	VZ1206 Series
	L	3.20 ± 0.20 mm
	W	1.60 ± 0.20 mm
	T	1.70 mm (max.)
	Ts	0.60 ± 0.35 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	$V_{N(DC)}$Min.	$V_{N(DC)}$Max.	C
	(V)	(V)	(A)	(J)	(V)	(V)	(V)	(pF)
VZ1206M050CGTN	5.5	4.0	200	0.3	23 at 1A	8	13	1500
VZ1206M140CGTN	14	10	200	0.5	36 at 1A	18	21.6	640
VZ1206M180AGTN	18	14	150	0.4	40 at 1A	19.8	24.2	1800
VZ1206M180CGTN	18	14	200	0.4	40 at 1A	19.8	24.2	650
VZ1206M220CGTN	22	17	200	0.3	48 at 1A	24.3	30.7	650
VZ1206M300CGTN	30	25	200	1.0	69 at 1A	35.1	43.9	550
VZ1206M380CGTN	38	30	200	1.1	81 at 1A	42.3	52.7	500
VZ1206M560CGTN	56	40	200	1.0	110 at 1A	63	77	180
VZ1206M650AGTN	65	50	100	0.5	138 at 1A	76	92	250

STANDARD TESTING CONDITION

Unless otherwise specified

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

SPECIFICATION

1. Electrical Reliability

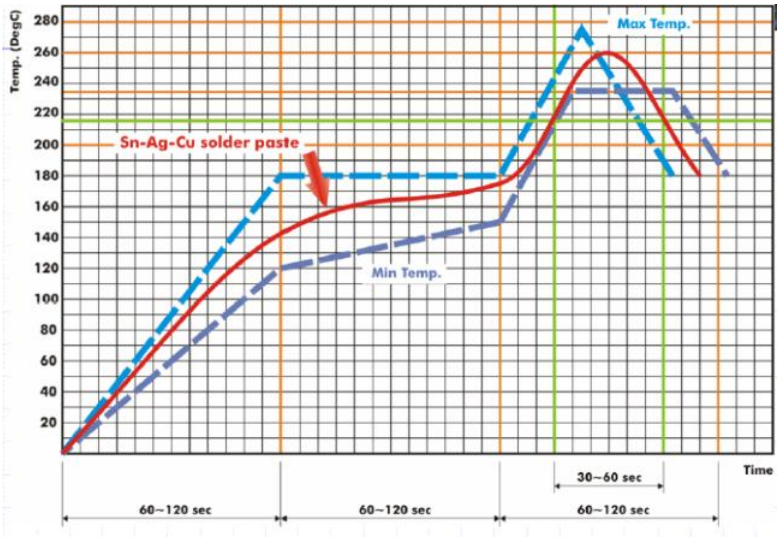
Test item	Test condition / Test method	Specification
High temperature storage	+125±3℃ for 1000 hours Measurement to be made after keeping at room temp. for 24 ±2hr	△V at 1mA ＜ 10%
Low temperature storage	-40±3℃ for 1000 hours Measurement to be made after keeping at room temp. for 24 ±2h	△V at 1mA ＜ 10%
Humidity storage	40±2℃ , 90 ~95%RH for 500 hours Measurement to be made after keeping at room temp. for 24 ±2h	△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 axt room temp. for 24 ±2h	△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:



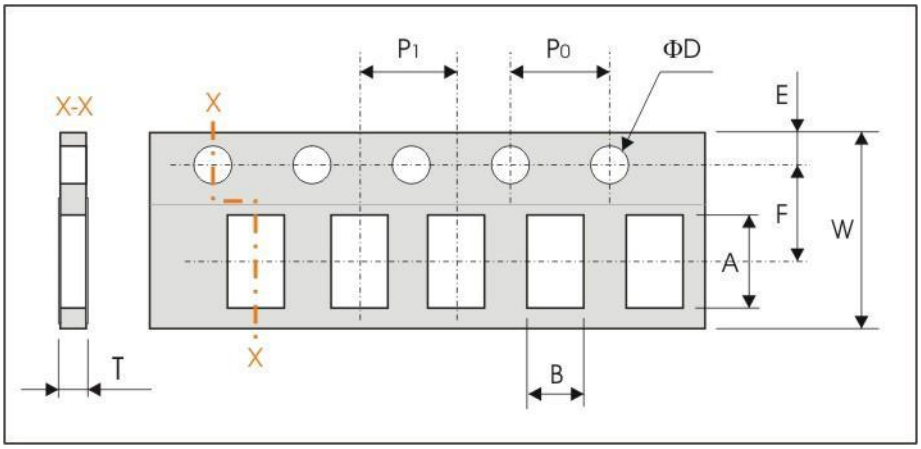
Infrared soldering profile

ORDERING CODE

VZ	1206	M	050	A	G	T	
Type Code	**Chip Size**	**Style**	**Rated Voltage**	**Capacitance Tolerance**	**Termination**	**Packing**	**Internal Code**
VZ: Walsin Varistor	1206 = 1.2 * 0.6 inch	M: Multilayer A: Array	050 = 5.5V 070 = 7V 090 = 9V 140 = 14V 180 = 18V	A: Standard C: High Current	G: Green Material	T: Reeled B: Bulk	Blank: None N: New item

PACKAGING

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

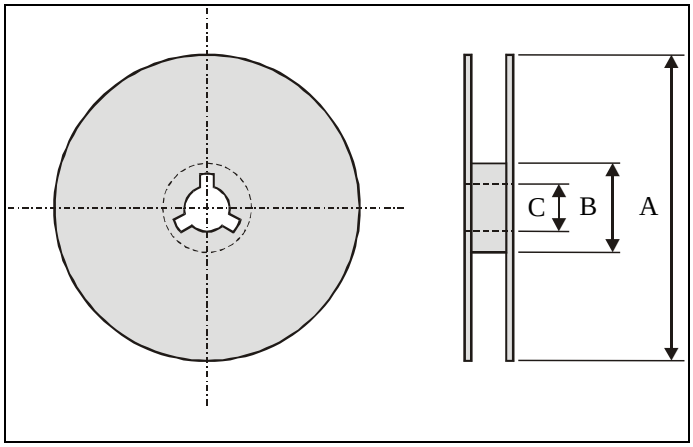


Label	A	B	E	F	ΦD
VZ1206 Series	3.50 ± 0.05	1.88 ± 0.05	1.75 ± 0.05	3.50 ± 0.05	1.55 ± 0.05

Label	G0	G1	T	W	Quantity/Reel
VZ1206 Series	4.00 ± 0.10	2.00 ± 0.10	1.24 ± 0.05	8.00 ± 0.20	3Kpcs

- Tape Material : Paper tape.

Reel dimensions



Index	A	B	C
Dimension (mm)	Φ178	Φ60.0	Φ13.5

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.

APPROVAL SHEET

MULTILAYER CHIP VARISTOR

For Surge Protection

Size 1210

VZ1210 Green Material Series

*Contents in this sheet are subject to change without prior notice.

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.

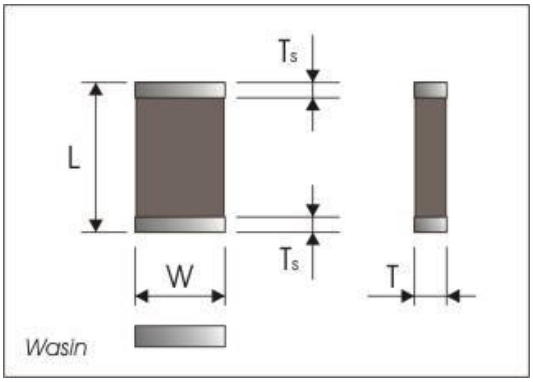
FEATURES

1. Multilayer Fabrication Technology
2. Small size (0402, 0603, 0805 and 1206 Available)
3. –40℃ to +125℃ Operating Temperature Range
4. Operating Voltage Range (DC) from 5.5V~56V
5. Able to withstand high surge current
6. Bi-directional Clamping Characteristic
7. Low Capacitance Chip Varistor Types Available
8. Environmentally conscious design

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	VZ1210 Series
	L	3.20 ± 0.20 mm
	W	2.50 ± 0.20 mm
	T	1.50 mm (max.)
	Ts	0.50 ± 0.20 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	$V_{N(DC)}$Min.	$V_{N(DC)}$Max.	C
	(V)	(V)	(A)	(J)	(V)	(V)	(V)	(pF)
VZ1210M050AGT	5.5	4	250	0.4	20	7.5	10.5	5200
VZ1210M180AGT	18	14	250	0.8	39	21.6	26.4	1150
VZ1210M180CGT	18	14	400	1.4	39	21.6	26.4	1600
VZ1210M220CGT	22	17	400	1.7	44	24.3	29.7	1500
VZ1210M260AGT	26	20	250	1.2	54	29.7	36.3	610
VZ1210M260CGT	26	20	400	1.9	54	29.7	36.3	880
VZ1210M300AGT	30	25	250	1.4	65	35.1	42.9	550
VZ1210M300CGT	30	25	400	1.7	65	35.1	42.9	800
VZ1210M380CGT	38	30	400	2.0	77	42.3	51.7	530
VZ1210M450AGT	45	35	250	2.0	90	50.4	61.6	400
VZ1210M560AGT	56	40	250	2.3	110	61.2	74.8	300

STANDARD TESTING CONDITION

Unless otherwise specified

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

SPECIFICATION

1. Electrical Reliability

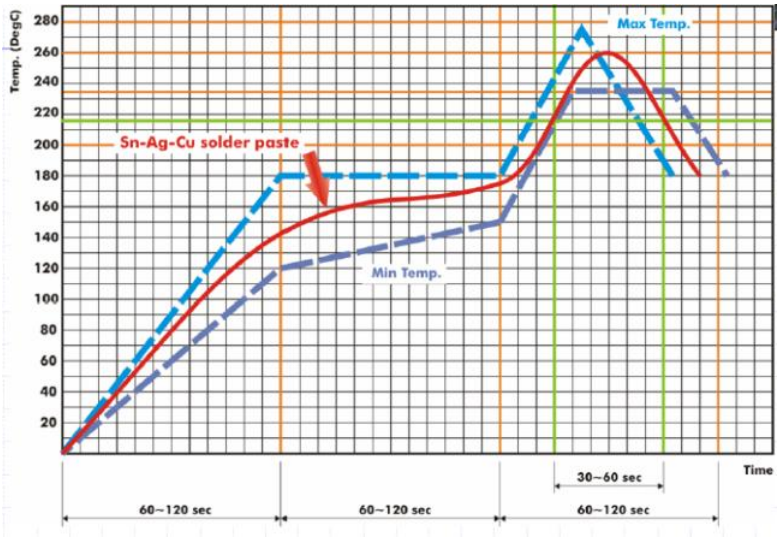
Test item	Test condition / Test method	Specification
High temperature storage	+125±3℃ for 1000 hours Measurement to be made after keeping at room temp. for 24 ±2hr	△V at 1mA ＜ 10%
Low temperature storage	-40±3℃ for 1000 hours Measurement to be made after keeping at room temp. for 24 ±2h	△V at 1mA ＜ 10%
Humidity storage	40±2℃ , 90 ~95%RH for 500 hours Measurement to be made after keeping at room temp. for 24 ±2h	△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 axt room temp. for 24 ±2h	△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 0805/1206/1210/1812/2220 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:

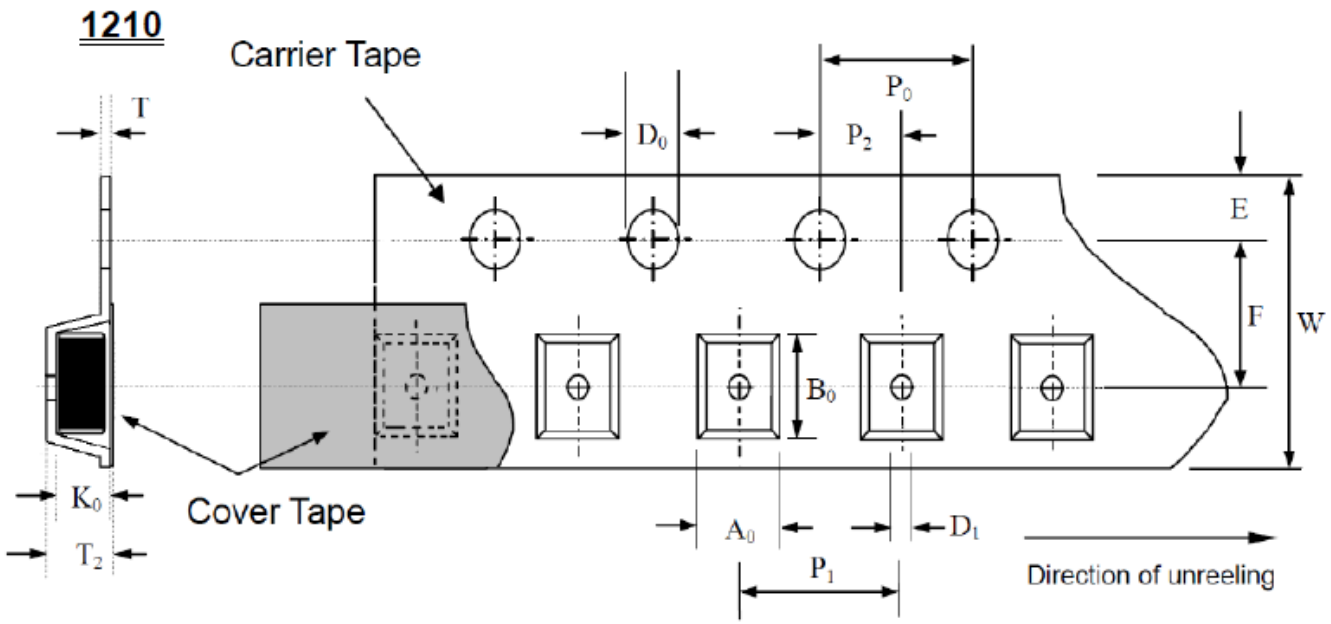


Infrared soldering profile

ORDERING CODE

VZ	1210	M	050	A	G	T	
Type Code	**Chip Size**	**Style**	**Rated Voltage**	**Capacitance Tolerance**	**Termination**	**Packing**	**Internal Code**
VZ: Walsin Varistor	1210 = 1.2 * 1.0 inch	M: Multilayer	050 = 5.5V 070 = 7V 090 = 9V 140 = 14V 180 = 18V	A: Standard C: High Current	G: Green Material	T: Reeled B: Bulk	Blank: None N: New item

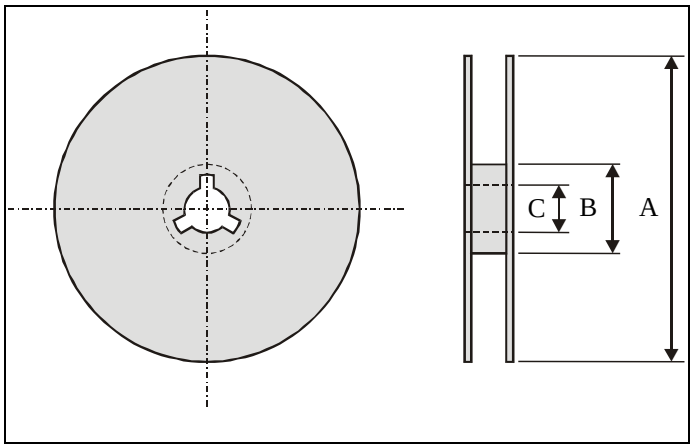
PACKAGING



(Unit : mm)

Symbol	A_0 ±0.10	B_0 ±0.10	K_0 ±0.10	T ±0.05	T_2 ±0.05	D_0 +0.10 -0.00	D_1 ±0.05	P_1 ±0.10	P_2 ±0.05	P_0 ±0.05	W ±0.20	E ±0.10	F ±0.05
1210	2.78	3.46	1.55	0.22	1.77	1.50	1.00	4.00	2.00	4.00	8.00	1.75	3.50

Reel dimensions



Index	A	B	C
Dimension (mm)	Φ178	Φ60.0	Φ13.5

Packaging Quantity: 2000pcs

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.

APPROVAL SHEET

MULTILAYER CHIP VARISTOR

For Surge Protection

Size 1812

VZ1812 Green Material Series

*Contents in this sheet are subject to change without prior notice.

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.

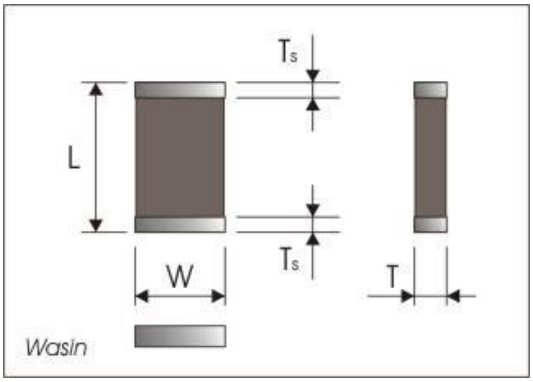
FEATURES

1. Multilayer Fabrication Technology
2. Small size (0402, 0603, 0805 and 1206 Available)
3. –40℃ to +125℃ Operating Temperature Range
4. Operating Voltage Range (DC) from 18V~127V
5. Able to withstand high surge current
6. Bi-directional Clamping Characteristic
7. Low Capacitance Chip Varistor Types Available
8. Environmentally conscious design

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	VZ1812 Series
	L	4.50 ± 0.20 mm
	W	3.20 ± 0.20 mm
	T	2.00 mm (max.)
	Ts	0.5 ± 0.30 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	$V_{N(DC)}$Min.	$V_{N(DC)}$Max.	C
	(V)	(V)	(A)	(J)	(V)	(V)	(V)	(pF)
VZ1812M180CGT	18	14	800	2.3	39	21.6	26.4	3500
VZ1812M300CGT	30	25	800	3.7	65	35.1	42.9	2350
VZ1812M380AGT	38	30	500	3.5	77	42.3	51.7	2200
VZ1812M380CGT	38	30	800	4.2	77	42.3	51.7	1600
VZ1812M450AGT	45	35	500	4.2	90	50.4	61.6	1000
VZ1812M450CGT	45	35	800	5.0	90	50.4	61.6	1200
VZ1812M127AGT	127	95	600	4.2	270	135.0	165	330

STANDARD TESTING CONDITION

Unless otherwise specified

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

SPECIFICATION

1. Electrical Reliability

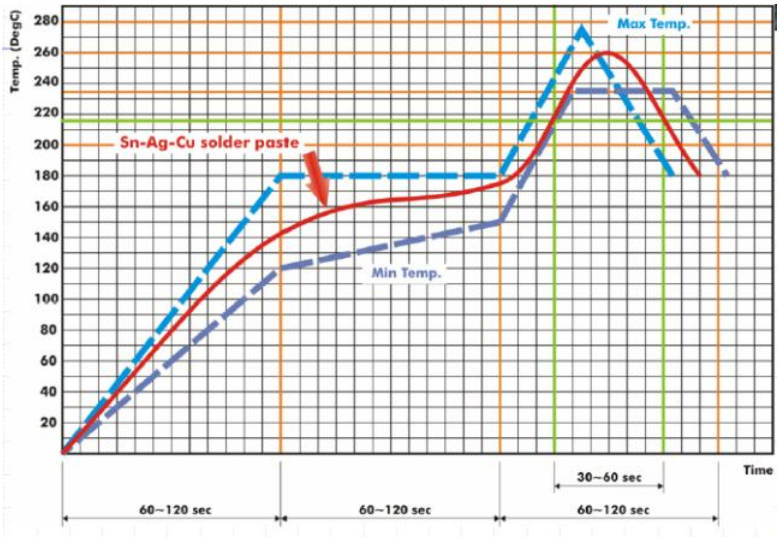
Test item	Test condition / Test method	Specification
High temperature storage	+125±3℃ for 1000 hours Measurement to be made after keeping at room temp. for 24 ±2hr	△V at 1mA ＜ 10%
Low temperature storage	-40±3℃ for 1000 hours Measurement to be made after keeping at room temp. for 24 ±2h	△V at 1mA ＜ 10%
Humidity storage	40±2℃ , 90 ~95%RH for 500 hours Measurement to be made after keeping at room temp. for 24 ±2h	△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 axt room temp. for 24 ±2h	△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 0805/1206/1210/1812/2220 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:



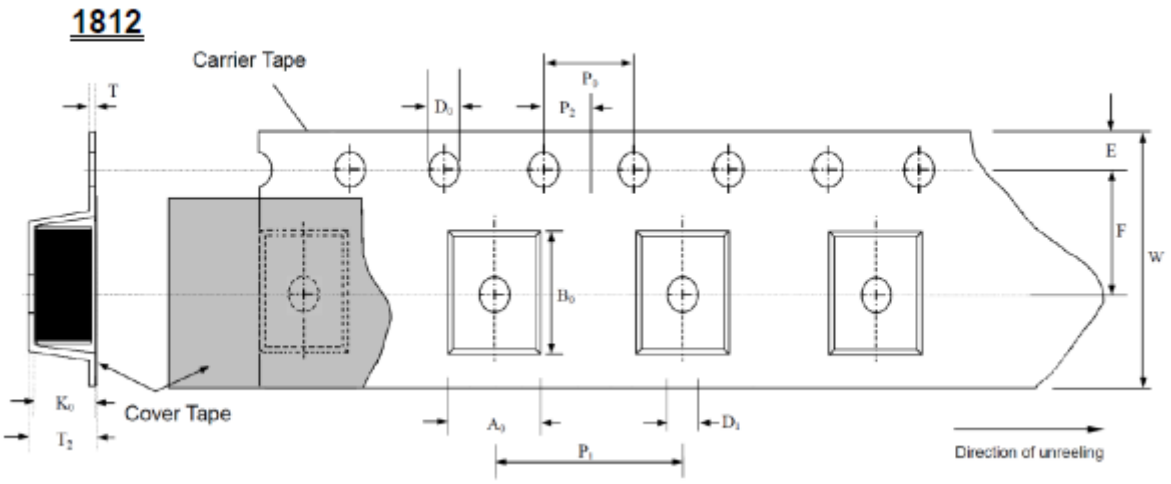
Infrared soldering profile

ORDERING CODE

VZ	1812	M	180	A	G	T	
Type Code	**Chip Size**	**Style**	**Rated Voltage**	**Capacitance Tolerance**	**Termination**	**Packing**	**Internal Code**
VZ: Walsin Varistor	1812 = 1.8 * 1.2 inch	M: Multilayer	090 = 9V 140 = 14V 180 = 18V 127= 127V	A: Standard C: High Current	G: Green Material	T: Reeled B: Bulk	Blank: None N: New item

PACKAGING

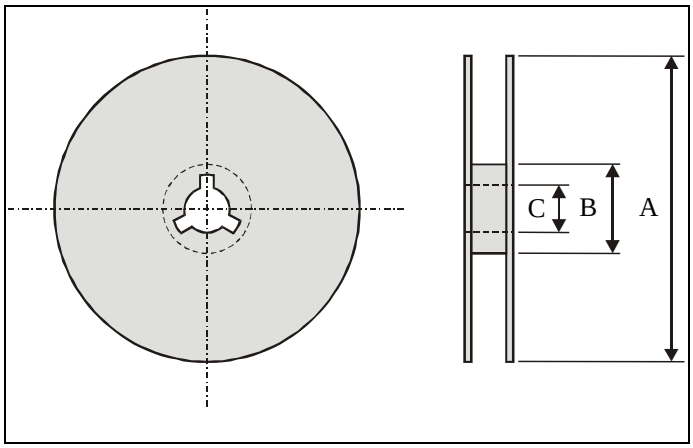
Carrier Tape specifications (unit :mm) **and Packaging quantity**



(Unit : mm)

Symbol	A_0 ±0.10	B_0 ±0.10	K_0 ±0.10	T ±0.05	T_2 ±0.05	D_0 +0.10 -0.00	D_1 ±0.05	P_1 ±0.10	P_2 ±0.05	P_0 ±0.05	W ±0.20	E ±0.10	F ±0.05
1812	3.50	4.80	2.10	0.25	2.35	1.50	1.50	8.00	2.00	4.00	12.00	1.75	5.50

Reel dimensions



Index	A	B	C
Dimension (mm)	Φ178	Φ60.0	Φ13.5

CAUTION OF HANDLING

Limitation of Applications

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APPROVAL SHEET

MULTILAYER CHIP VARISTOR

For Surge Protection

Size 2220

VZ2220 Green Material Series

*Contents in this sheet are subject to change without prior notice.

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.

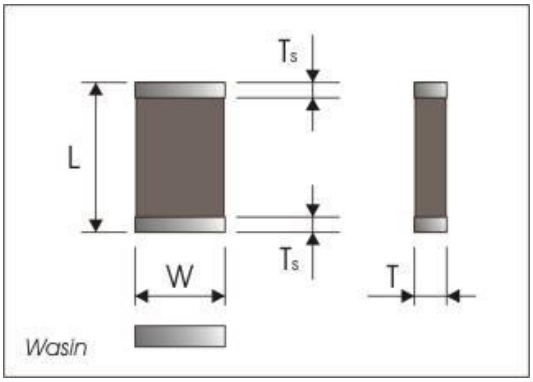
FEATURES

1. Multilayer Fabrication Technology
2. Small size (0402, 0603, 0805 and 1206 Available)
3. –40℃ to +125℃ Operating Temperature Range
4. Operating Voltage Range (DC) from 5.5V~85V
5. Able to withstand high surge current
6. Bi-directional Clamping Characteristic
7. Low Capacitance Chip Varistor Types Available
8. Environmentally conscious design

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	VZ2220 Series
	L	5.70 ± 0.20 mm
	W	5.00 ± 0.20 mm
	T	2.50 mm (max.)
	Ts	0.50 ± 0.30 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	$V_{N(DC)}$Min.	$V_{N(DC)}$Max.	C
	(V)	(V)	(A)	(J)	(V)	(V)	(V)	(pF)
VZ2220M140CGT	14	11	1200	5.4	30	15.3	20.7	10500
VZ2220M180CGT	18	14	1200	5.8	39	21.6	26.4	8500
VZ2220M220AGT	22	17	1000	3.8	44	24.3	29.7	6600
VZ2220M220CGT	22	17	1200	7.2	44	24.3	29.7	8300
VZ2220M260AGT	26	20	1000	4.3	54	29.7	36.3	6300
VZ2220M260CGT	26	20	1200	7.8	54	29.7	36.3	8000
VZ2220M300AGT	30	25	1000	5.5	65	35.1	42.9	6000
VZ2220M300CGT	30	25	1200	9.6	65	35.1	42.9	7500
VZ2220M380AGT	38	30	1000	6.3	77	42.3	51.7	4000
VZ2220M380CGT	38	30	1200	12.0	77	42.3	51.7	4600
VZ2220M450CGT	45	35	1200	12.0	90	50.4	61.6	3500
VZ2220M560AGT	56	40	1000	8.8	110	61.2	74.8	2000

STANDARD TESTING CONDITION

Unless otherwise specified

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

SPECIFICATION

1. Electrical Reliability

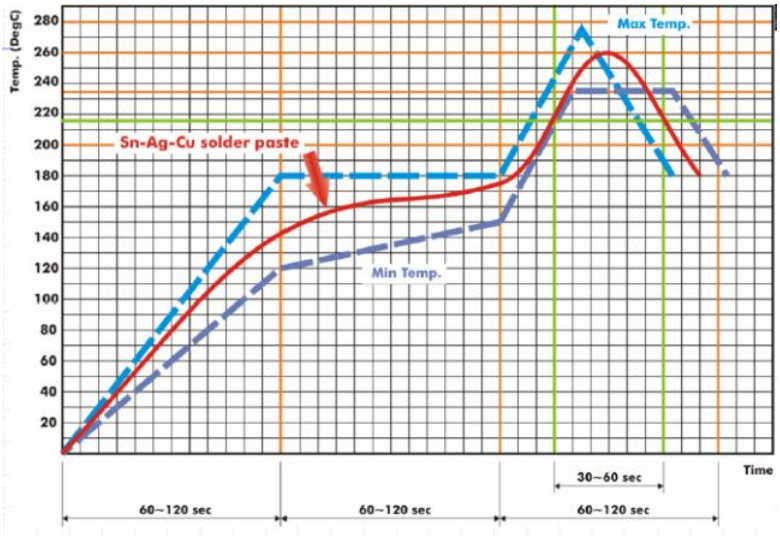
Test item	Test condition / Test method	Specification
High temperature storage	+125±3℃ for 1000 hours Measurement to be made after keeping at room temp. for 24 ±2hr	△V at 1mA ＜ 10%
Low temperature storage	-40±3℃ for 1000 hours Measurement to be made after keeping at room temp. for 24 ±2h	△V at 1mA ＜ 10%
Humidity storage	40±2℃ , 90 ~95%RH for 500 hours Measurement to be made after keeping at room temp. for 24 ±2h	△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 axt room temp. for 24 ±2h	△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 0805/1206/1210/1812/2220 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:



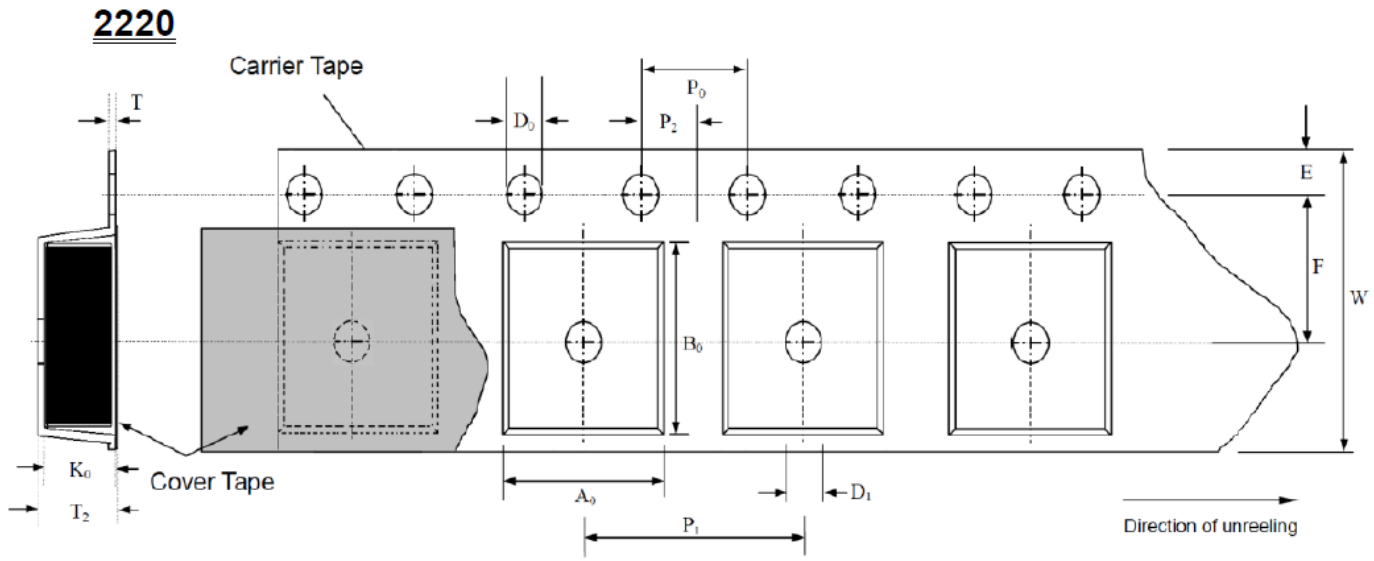
Infrared soldering profile

ORDERING CODE

VZ	2220	M	140	A	G	T	
Type Code	**Chip Size**	**Style**	**Rated Voltage**	**Capacitance Tolerance**	**Termination**	**Packing**	**Internal Code**
VZ: Walsin Varistor	2220 = 2.2 * 2.0 inch	M: Multilayer	140 = 14V 180 = 18V 560 = 56V	A: Standard C: High Current	G: Green Material	T: Reeled B: Bulk	Blank: None N: New item

PACKAGING

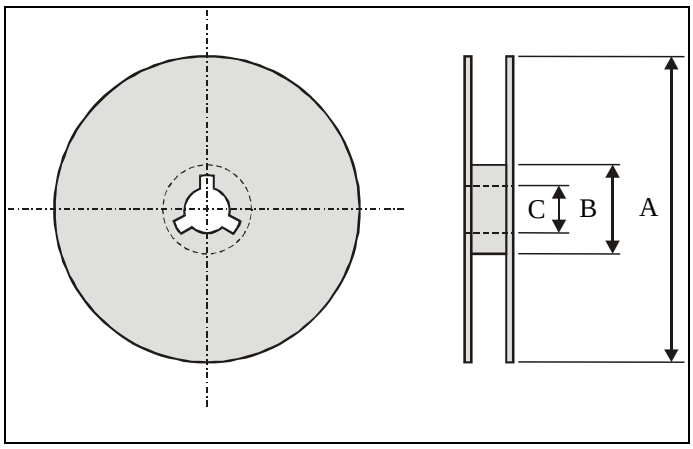
Carrier Tape specifications and Packaging quantity



(Unit : mm)

Symbol	A_0 ±0.10	B_0 ±0.10	K_0 ±0.10	T ±0.05	T_2 ±0.05	D_0 +0.10 -0.00	D_1 ±0.05	P_1 ±0.10	P_2 ±0.05	P_0 ±0.05	W ±0.20	E ±0.10	F ±0.05
2220	5.30	6.00	2.60	0.25	2.85	1.50	1.50	8.00	2.00	4.00	12.00	1.75	5.50

Reel dimensions



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Standard packaging” 1000pcs

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