HITANO ENTERPRISE CORP.

Data Sheet

Customer:

Product: Multilayer Chip Varistor. K series C, A, H type

Size : 3220

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Edition: Ver. 1

Record of change

Date	Ver.	Description	Page
11-Sep.-2017	1		
11-Aug.-2022	2		

HITANO ENTERPRISE CORP.

7F-7, No. 3, Wu Chuan 1st Road, New Taipei Industrial Park,
New Taipei City, TAIWAN, R.O.C.
Tel: +886 2 2299 1331 (Rep.)
Fax: +886 2 2298 2466, 2298 2969

Prepared by	Checked by	Approved by	Accepted by (customer)
11-Aug.-2022	11-Aug.-2022	11-Aug.-2022	
Andy Hsu	*Hwa Wu*	*Hwa Wu*	

HITANO ENTERPRISE CORP. ®

Multilayer Chip Varistors

Transient voltage surge suppressors

● K Series C type for wide range application

Hitano Part no.	Working Voltage (MAX)		Breakdown Voltage	Peak Current	Clamping Voltage (MAX)	
Condition Unit	AC (V_{RMS})	DC (V)	1mA (V)	8/20μs (A)	(A)	(V)
VCR3220SL560KC	35	45	56(50.4~61.6)	500	5	106
VCR3220SL680KC	40	56	68(61.2~74.8)	500	5	124
VCR3220SL820KC	50	65	82(73.8~90.2)	500	5	135
VCR3220SL121KC	75	102	120(108~132)	500	10	198
VCR3220SL151KC	95	127	150(135~165)	500	10	248
VCR3220SL201KC	130	170	200(185~225)	500	10	340
VCR3220SL221KC	140	180	220(198~242)	500	10	360
VCR3220SL241KC	150	200	240(216~264)	500	10	395
VCR3220SL271KC	225	270	270(243~297)	500	10	650
VCR3220SL391KC	250	320	390(351~429)	500	10	650
VCR3220SL431KC	275	350	430(387~473)	450	10	710
VCR3220SL471KC	300	385	470(423~517)	450	10	775
VCR3220SL511KC	320	415	510(459~561)	450	10	845

● K Series A type for high surge absorption

Hitano Part no.	Working Voltage (MAX)		Breakdown Voltage	Peak Current	Clamping Voltage (MAX)	
Condition Unit	AC (V_{RMS})	DC (V)	1mA (V)	8/20μs (A)	(A)	(V)
VCR3220SL680KA	40	56	68(61.2~74.8)	800	5	124
VCR3220SL121KA	75	102	120(108~132)	800	10	198
VCR3220SL151KA	95	127	150(135~165)	800	10	248
VCR3220SL221KA	140	180	220(198~242)	800	10	360
VCR3220SL241KA	150	200	240(216~264)	1000	10	395
VCR3220SL271KA	225	270	270(243~297)	1000	10	650
VCR3220SL391KA	250	320	390(351~429)	1000	10	650
VCR3220SL431KA	275	350	430(387~473)	1000	10	710
VCR3220SL471KA	300	385	470(423~517)	1000	10	775
VCR3220SL511KA	320	415	510(459~561)	1000	10	845
VCR3220SL561KA	350	460	620(558~682)	1000	10	920

TO BE CONTINUED

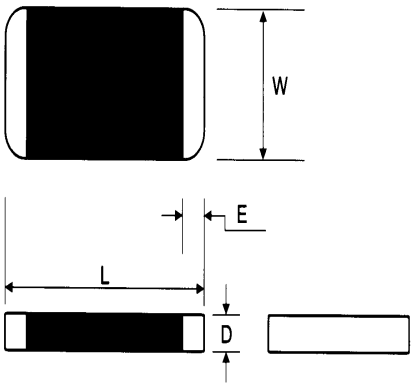
HITANO
ENTERPRISE CORP. ®

Multilayer Chip Varistors

Transient voltage surge suppressors

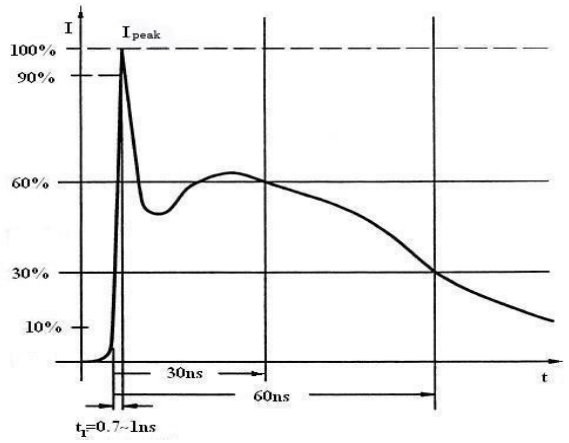
● K Series H type for super high surge absorption

Hitano Part no.	Working Voltage (MAX)		Breakdown Voltage	Peak Current	Clamping Voltage (MAX)	
Condition Unit	AC (V_{RMS})	DC (V)	1mA (V)	8/20μs (A)	(A)	(V)
VCR3220SL220KH	14	18	24(21.6~26.4)	1500	5	38
VCR3220SL270KH	17	22	27(24.3~29.7)	1500	5	44
VCR3220SL330KH	20	26	33(29.7~36.3)	1500	5	54
VCR3220SL390KH	25	30	39(35.1~42.9)	1500	5	65
VCR3220SL470KH	30	38	47(42.3~51.7)	1500	5	77
VCR3220SL560KH	35	45	56(50.4~61.6)	1500	5	106
VCR3220SL680KH	40	56	68(61.2~74.8)	1500	5	124
VCR3220SL820KH	50	65	82(73.8~90.2)	1500	10	135
VCR3220SL121KH	75	102	120(108~132)	1500	10	198
VCR3220SL151KH	95	127	150(135~165)	1200	10	248
VCR3220SL221KH	140	180	220(198~242)	1200	10	360
VCR3220SL241KH	150	200	240(216~264)	1200	10	395
VCR3220SL271KH	225	270	270(243~297)	1200	10	650
VCR3220SL391KH	250	320	390(351~429)	1200	10	650
VCR3220SL431KH	275	350	430(387~473)	1200	10	710
VCR3220SL471KH	300	385	470(423~517)	1200	10	775



Type	L (mm)	W (mm)	D (mm)	E (mm)
3220	8.10±0.30	5.30±0.30	3.20 (max)	1.00±0.30

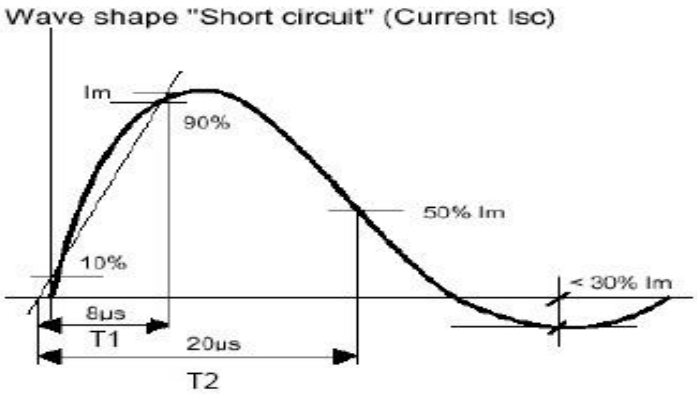
ESD Wave Form



SEVERITY LEVEL	AIRDIRCHARGE	DIRECT ISCHARGE
1	2 kV	2 kV
2	4 kV	4 kV
3	8 kV	6 kV
4	15 kV	8 kV

IEC61000-4-2 Compliant ESD Current Pulse Waveform

Surge Wave Form



IEC61000-4-5 Standards

SEVERITY LEVEL	T1	T2
1	8 µS	20 µS

- **Environmental Characteristics**

Characteristic	Test method and description			
High Temperature Storage	The specimen shall be subjected to 125℃ for 1000 hours in a thermostatic bath without load and then stored at room temperature and humidity for 1 to 2 hours. The change of varistor voltage shall be within 10%.			
Temperature Cycle	The temperature cycle of specified temperature shall be repeated five times and then stored at room temperature and humidity for one two hours. The change of varistor voltage shall be within 10% and mechanical damage shall be examined.	Step	Temperature	Period
		1	-40±3℃	30min±3
		2	Room Temperature	1~2hours
		3	125±2℃	30min±3
		4	Room Temperature	1~2hours
High Temperature Load	After being continuously applied the maximum allowable voltage at 85℃ for 1000hours, the specimen shall be stored at room temperature and humidity for one or hours, the change of varistor voltage shall be within 10%.			
Damp Heat Load/ Humidity Load	The specimen should be subjected to 40℃,90 to 95%RH environment, and the maximum allowable voltage applied for 1000 hours, then stored at room temperature and humidity for one or two hours. The change of varistor voltage shall be within 10%.			
Low Temperature Storage	The specimen should be subjected to -40℃, without load for 1000 hours and then stored at room temperature for one two hours. The change of varistor voltage shall be within 10%.			

Soldering Recommendation

The principal techniques used for the soldering of components in surface mount technology are infrared reflow and wave soldering.

Wave Soldering

When wave soldering, the MLCV is attached to the circuit board by means of an adhesive. The assembly is then place on a conveyor and run though the soldering process to contact the wave. Wave soldering is the most strenuous of the processes. To avoid the possibility of generating stresses due to thermal shock, a preheat stage in the soldering process is recommended, and the peak temperature of the solder process should be rigidly controlled. The following is the typical profiles.

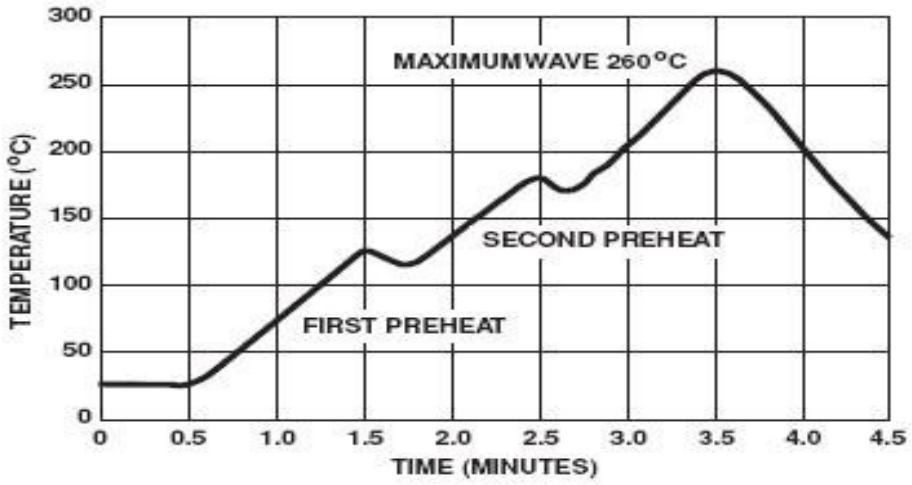


FIGURE 6. WAVE SOLDER PROFILE

Reflow Soldering

When reflow soldering, the device is placed a solder paste on the substrate ,as the solder paste is heated, it re-flows and solders the unite to board. When using a reflow process ,care should be taken to ensure that the MLCV is not subjected to an thermal gradient steeper than 4 degrees per second; the ideal gradient being 2degrees per second. During the soldering process, preheating to within 100 degrees of the soldier's peak temperature is essential to minimize thermal shock. The following is typical profile.

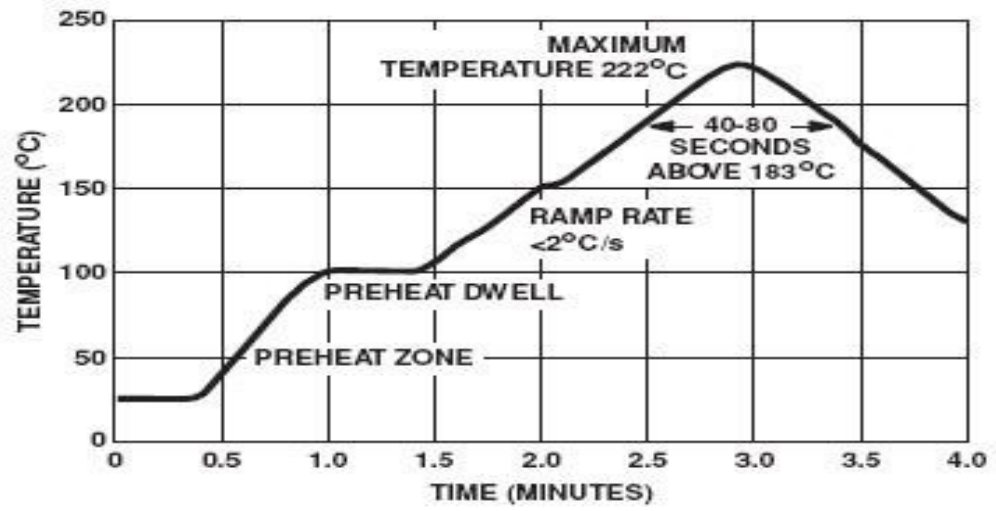
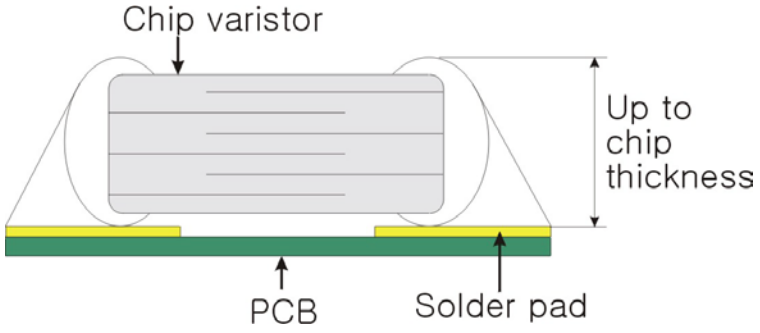


FIGURE 5. REFLOW SOLDER PROFILE

Repair Soldering

1. Allowable time and temperature for making correction with a soldering iron: 350 ± 10 ℃, 3 sec.

2. Optimum solder amount when corrections are made using a soldering iron



3 Soldering guidelines

3.1 Our chip varistors are designed for reflow soldering only. Do not use flow soldering

3.2 Use non-activated flux (Cl content 0.2% max.)

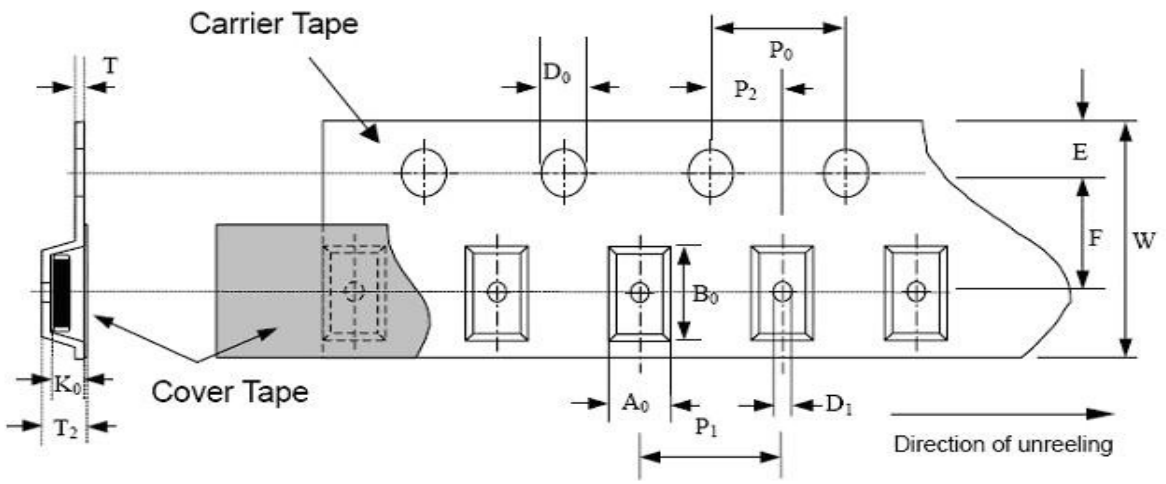
3.3 Follow the recommended soldering conditions to avoid varistor damage.

Packaging Specification

1. Carrier tape transparent cover tape should be heat-sealed to carry the products, and the reel should be used to reel the carrier tape.

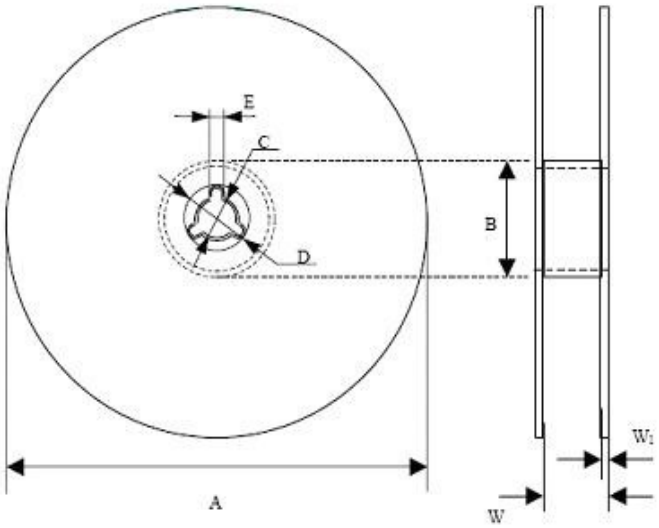
2. The adhesion of the heat-sealed cover tape shall be 40 + 20/ - 15grams.

3. Both the head and the end portion of taping shall be empty for reel package and SMT auto-pickup machine. And a normal paper tape shall be connected in the head of taping for the operator handle.



Size	A0 ±0.10	B0 ±0.10	K0 ±0.10	T ±0.05	T2 ±0.05	D0 +0.1-0	D1 ±0.05	P1 ±0.10	P2 ±0.05	P0 ±0.05	W ±0.20	E ±0.10	F ±0.05
3220	5.50	8.50	2.80	0.30	3.50	1.50	1.50	8.00	2.00	4.00	16.00	1.75	7.50

Reel Dimension



Size	A	B	C	D	E	W	W1
3220	178.0±1.0	60.0±0.5	13.5±0.1	21.0±0.2	2.0±0.5	16.0±0.2	1.5±0.15

Type	3220
Quantity	500