HITANO ENTERPRISE CORP.

Data Sheet

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Record of change

Date	Ver.	Description	Page
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HITANO ENTERPRISE CORP.

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HITANO ENTERPRISE CORP. ®

Multilayer Chip Varistors

Transient voltage surge suppressors

● A Series 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)
VCR1206ML050A	2.4	3.3	5(4.0~6.0)	200	1	12
VCR1206ML080A	4	5.5	8(6.6~9.9)	200	1	18
VCR1206ML120A	7	9	12(10.2~13.8)	200	1	24
VCR1206ML150A	8	11	15(12.75~17.25)	200	1	25
VCR1206ML180A	11	14	18(15.3~20.7)	200	1	30
VCR1206ML220A	12	16	22(19.8~24.2)	200	1	36
VCR1206ML240A	14	18	24(21.6~26.4)	200	1	38
VCR1206ML270A	17	22	27(24.3~29.7)	200	1	44
VCR1206ML300A	18	24	30(27.0~33.0)	200	1	48
VCR1206ML330A	20	26	33(29.7~36.3)	200	1	54
VCR1206ML360A	22	28	36(32.7~39.6)	200	1	59
VCR1206ML390A	25	30	39(35.1~42.9)	200	1	65
VCR1206ML420A	26	33	42(38.1~46.2)	200	1	72
VCR1206ML470A	30	38	47(42.3~51.7)	200	1	77
VCR1206ML560A	35	45	56(50.4~61.6)	200	1	90
VCR1206ML680A	40	56	68(61.2~74.8)	200	1	110
VCR1206ML760A	45	60	76(69.1~83.6)	200	1	126
VCR1206ML820A	50	65	82(73.8~90.2)	200	1	135
VCR1206ML101A	60	85	100(90~100)	200	1	165

TO BE CONTINUED

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Multilayer Chip Varistors

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Hitano Part no.	Working Voltage (MAX)		Breakdown Voltage	Peak Current	Clamping Voltage (MAX)	
Unit Condition	AC (V_{RMS})	DC (V)	1mA (V)	8/20μs (A)	(A)	(V)
VCR1210ML050A	2.4	3.3	5(4.0~6.0)	400	1	12
VCR1210ML080A	4	5.5	8(6.6~9.9)	400	1	18
VCR1210ML120A	7	9	12(10.2~13.8)	400	1	24
VCR1210ML150A	8	11	15(12.75~17.25)	400	1	25
VCR1210ML180A	11	14	18(15.3~20.7)	400	1	30
VCR1210ML220A	12	16	22(19.8~24.2)	400	1	36
VCR1210ML240A	14	18	24(21.6~26.4)	400	1	38
VCR1210ML270A	17	22	27(24.3~29.7)	400	1	44
VCR1210ML300A	18	24	30(27.0~33.0)	400	1	48
VCR1210ML330A	20	26	33(29.7~36.3)	400	1	54
VCR1210ML360A	22	28	36(32.7~39.6)	400	1	59
VCR1210ML390A	25	30	39(35.1~42.9)	400	1	65
VCR1210ML420A	26	33	42(38.1~46.2)	400	1	72
VCR1210ML470A	30	38	47(42.3~51.7)	400	1	77
VCR1210ML560A	35	45	56(50.4~61.6)	400	1	90
VCR1210ML680A	40	56	68(61.2~74.8)	400	1	110
VCR1210ML760A	45	60	76(69.1~83.6)	400	1	126
VCR1210ML820A	50	65	82(73.8~90.2)	400	1	135
VCR1210ML101A	60	85	100(90~100)	400	1	165

TO BE CONTINUED

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Multilayer Chip Varistors

Transient voltage surge suppressors

● A Series High Surge Absorption

Hitano Part no.	Working Voltage (MAX)		Breakdown Voltage	Peak Current	Clamping Voltage (MAX)	
Unit Condition	AC (V_{RMS})	DC (V)	1Ma (V)	8/20μs (A)	(A)	(V)
VCR1812ML080A	4	5.5	8(6.6~9.9)	800	1	18
VCR1812ML120A	7	9	12(10.2~13.8)	800	1	24
VCR1812ML150A	8	11	15(12.75~17.25)	800	1	25
VCR1812ML180A	11	14	18(15.3~20.7)	800	1	30
VCR1812ML220A	12	16	22(19.8~24.2)	800	1	36
VCR1812ML240A	14	18	24(21.6~26.4)	800	1	38
VCR1812ML270A	17	22	27(24.3~29.7)	800	1	44
VCR1812ML300A	18	24	30(27.0~33.0)	800	1	48
VCR1812ML330A	20	26	33(29.7~36.3)	800	1	54
VCR1812ML360A	22	28	36(32.7~39.6)	800	1	59
VCR1812ML390A	25	30	39(35.1~42.9)	800	1	65
VCR1812ML420A	26	33	42(38.1~46.2)	800	1	72
VCR1812ML470A	30	38	47(42.3~51.7)	800	1	77
VCR1812ML560A	35	45	56(50.4~61.6)	800	1	90
VCR1812ML680A	40	56	68(61.2~74.8)	800	1	110
VCR1812ML760A	45	60	76(69.1~83.6)	800	1	126
VCR1812ML820A	50	65	82(73.8~90.2)	800	1	135
VCR1812ML101A	60	85	100(90~100)	800	1	165
VCR1812ML121A	75	100	120(108~1032)	800	1	200

TO BE CONTINUED

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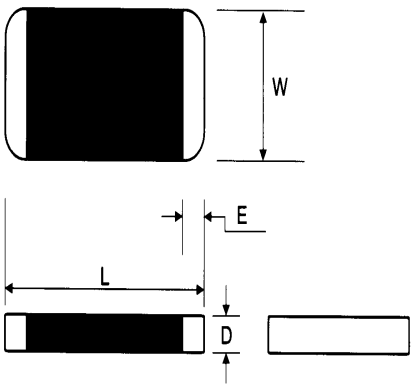
● A Series High Surge Absorption

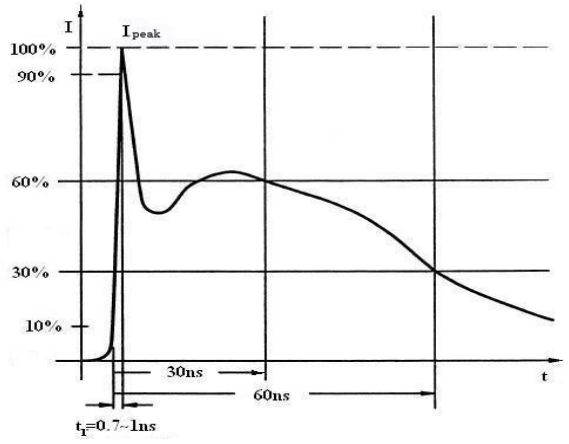
Hitano Part no.	Working Voltage (MAX)		Breakdown Voltage	Peak Current	Clamping Voltage (MAX)	
Unit Condition	AC (V_{RMS})	DC (V)	1Ma (V)	8/20μs (A)	(A)	(V)
VCR2220ML240A	14	18	24(21.6~26.4)	1200	1	38
VCR2220ML270A	17	22	27(24.3~29.7)	1200	1	44
VCR2220ML300A	18	24	30(27.0~33.0)	1200	1	48
VCR2220ML330A	20	26	33(29.7~36.3)	1200	1	54
VCR2220ML360A	22	28	36(32.7~39.6)	1200	1	59
VCR2220ML390A	25	30	39(35.1~42.9)	1200	1	65
VCR2220ML420A	26	33	42(38.1~46.2)	1200	1	72
VCR2220ML470A	30	38	47(42.3~51.7)	1200	1	77
VCR2220ML560A	35	45	56(50.4~61.6)	1200	1	90
VCR2220ML680A	40	56	68(61.2~74.8)	1200	1	110
VCR2220ML760A	45	60	76(69.1~83.6)	1200	1	126
VCR2220ML820A	50	65	82(73.8~90.2)	1200	1	135
VCR2220ML101A	60	85	100(90~100)	1200	1	165



Type	L (mm)	W (mm)	D (mm)	E (mm)
1206	3.20±0.20	1.60±0.15	1.2max.	0.50±0.20
1210	3.20±0.20	2.50±0.20	1.5max	0.50±0.20
1812	4.50±0.20	3.20±0.20	2.0max.	0.5+0.3/-0.1
2220	5.70±0.20	5.00±0.20	3.0max.	0.5+0.3/-0.1

A Series High Surge Absorption

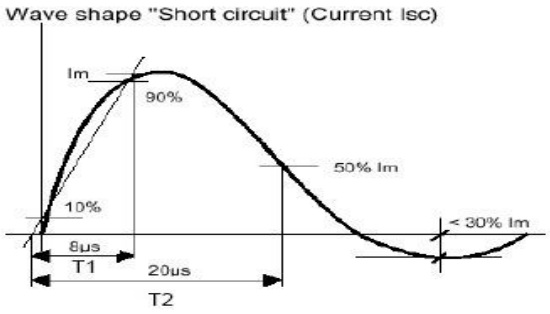
ESD Wave Form



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



SEVERITY LEVEL	T1	T2
1	8 μS	20 μS

IEC61000-4-5 Standards

A Series High Surge Absorption

- **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%.			

● A Series High Surge Absorption

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.

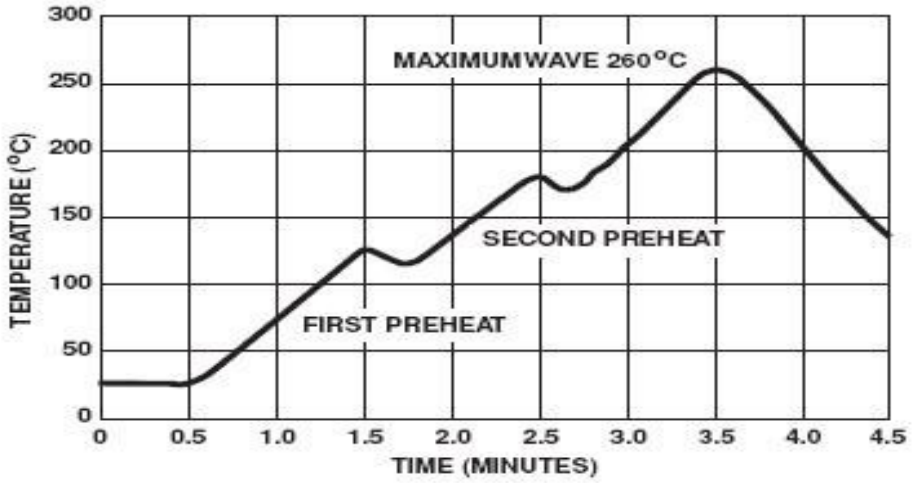


FIGURE 6. WAVE SOLDER PROFILE

● A Series High Surge Absorption

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.

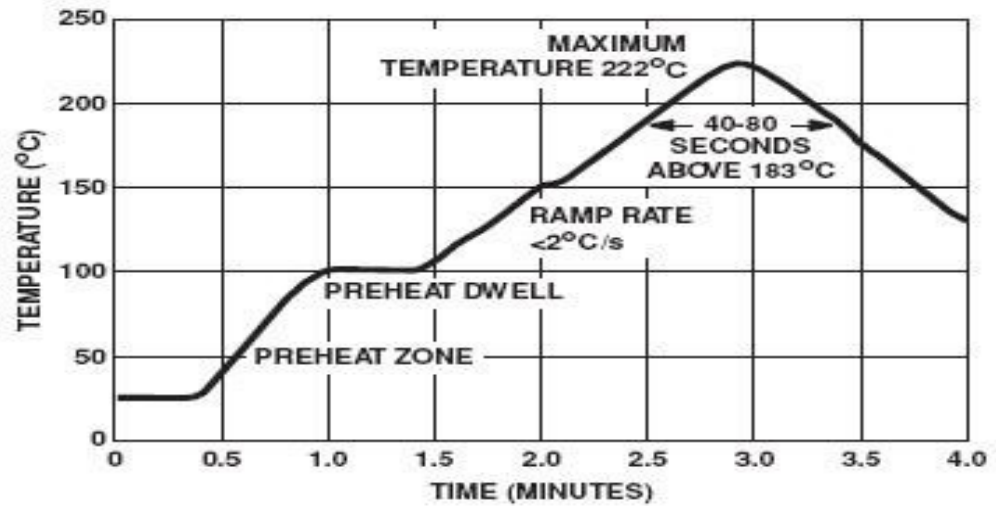


FIGURE 5. REFLOW SOLDER PROFILE

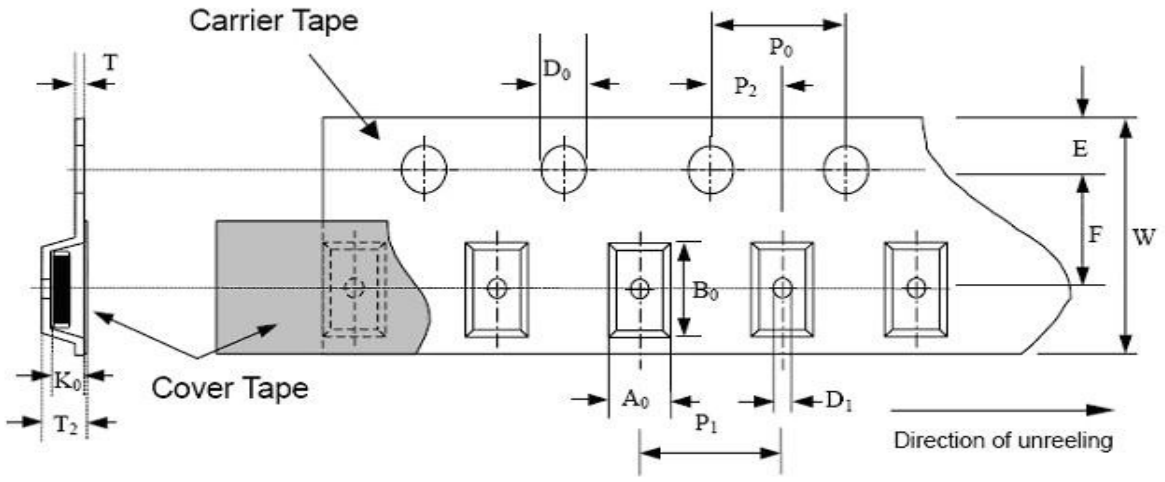
Packaging Specification

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.

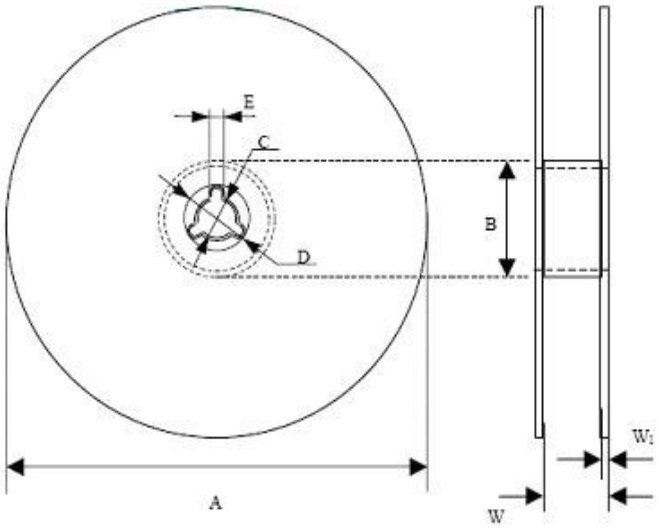
A Series High Surge Absorption



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
1206	1.88	3.50	1.27	0.20	1.49	1.50	1.00	4.00	2.00	4.00	8.00	1.75	3.50
1210	2.18	3.46	1.45	0.22	1.77	1.50	1.00	4.00	2.00	4.00	8.00	1.75	3.50
1812	3.66	4.95	1.74	0.25	1.99	1.50	1.50	8.00	2.00	4.00	12.00	1.75	5.50
2220	5.10	5.97	2.80	0.25	3.05	1.50	1.50	8.00	2.00	4.00	12.00	1.75	5.50

● A Series High Surge Absorption

Reel Dimension



Size	A	B	C	D	E	W	W1
1206	178.0±1.0	60.0±0.5	13.0±0.2	21.0±0.2	2.0±0.5	9.0±0.50	1.5±0.15
1210	178.0±1.0	60.0±0.5	13.0±0.2	21.0±0.2	2.0±0.5	9.0±0.50	1.5±0.15
1812	178.0±1.0	60.0±0.5	13.5±0.1	21.0±0.2	2.0±0.5	13.6±0.2	1.5±0.15
2220	178.0±1.0	60.0±0.5	13.5±0.1	21.0±0.2	2.0±0.5	13.6±0.2	1.5±0.15

Size		1206	1210	1812	2220
Quantity	paper	-	-	-	-
	Plastic	3000	3000	500/1000	500/1000
Minimum ordering		3000	3000	500/1000	500/1000