

Description:

The ZV Series of low voltage varistors is designed to protect sensitive electronics devices against high voltage surges in the low voltage region. They offer excellent transient energy absorption due to improved energy volume distribution and power dissipation. Low voltage varistors cover wide DC operating voltage range from 3V to 125V. The ZVY Series is the same except for higher operating temperatures up to 150°C.

ZV varistors are typically applied to protect components at the circuit board level.



Features:

- "B" termination type provides nickel barrier terminations
- AC operating voltage (Vrms) from 2V to 95V
- DC operating voltage (Vdc) from 3V to 125V
- No plastic coating guarantees better flammability rating
- Bi-directional, low clamping voltages
- Broad range of current and energy handling capabilities
- +125°C continuous operating temperature, +150°C for ZVY
- Dimensional and weight savings on PC board
- AgPd end terminations also available
- ZVY high temperature product will have performance characteristics different from the ZV.
Contact Factory for specific details.

Applications:

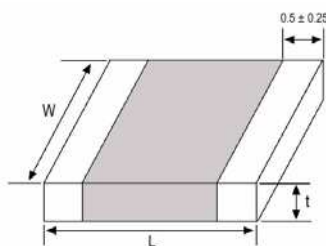
- ESD protection for components sensitive to IEC 1000-4-2, MIL-STD 883C Method 3015.7 and other industry specifications
- Suppression of inductive switching or other low to medium transient events at the circuit board level
- Provides on-board transient voltage protection of ICs and transistors
- Replace larger surface mount TVS Zeners in many applications
- Used to help achieve electromagnetic compliance of end products
- 6 model sizes available 0603, 0805, 1206, 1210, 1812 and 2220

General Technical Data

Operating Temperature - ZV	-55°C to +125°C	In accordance with CECC 42 000
Operating Temperature - ZVY	-55°C to +150°C	
Storage Temperature Range	-55°C to +150°C	
Threshold Voltage Temperature Coefficient	<-0.05% / °C	
Response time	< 2 ns	
Standard Termination - Ag/Pb	Recommended and suitable for Pb-containing soldering	
Barrier Termination ("N" Type)	Recommended and suitable for Pb-containing and Pb-free soldering	
Barrier Termination ("B" Type)	Provides nickel barrier terminations	

Standard Packaging Options / Quantities

Series	Voltage Range (Vrms)	Chip Size								
		0603			0805			1206		
		K	T	G	K	T	G	K	T	G
		180mm	180mm	330mm	180mm	180mm	330mm	180mm	180mm	330mm
		7"	7"	13"	7"	7"	13"	7"	7"	13"
ZV, ZVY	2 - 14	1,000	4,000	15,000	1,000	4,000	15,000	1,000	4,000	15,000
	17	1,000	3,500	14,000	1,000	3,500	14,000	1,000	2,500	14,000
	20 - 40	1,000	3,500	14,000	1,000	3,500	14,000	1,000	2,500	10,000
	50 - 95	N/A	N/A	N/A	N/A	N/A	N/A	1,000	2,000	8,000
	Voltage Range (Vrms)	1210			1812			2220		
		K	T	G	K	T	G	K	T	G
		180mm	180mm	330mm	180mm	180mm	330mm	180mm	180mm	330mm
		7"	7"	13"	7"	7"	13"	7"	7"	13"
	2 - 14	1,000	4,000	15,000	1,000	1,500	6,000	1,000	1,500	5,000
	17	1,000	2,500	14,000	1,000	1,500	6,000	1,000	1,500	5,000
	20 - 40	1,000	2,500	9,000	N/A	1,000	4,000	N/A	1,000	4,000
	50 - 95	1,000	2,000	8,000	N/A	1,000	4,000	N/A	1,000	4,000



Device Ratings and Dimensions

Part Number	V _{RMS} (volts)	V _{DC} (volts)	V _N (volts)	V _C (volts)	I _C (amps)	W _{MAX} (joules)	P _{MAX} (watts)	I _{MAX} (amps)	C _{TYP} (pF)	L _{TYP} (nH)	L (mm)	W (mm)	t _{MAX} (mm)
ZV2M0603...300	2	3	4	10	1	0.10	0.003	30	360	1.0	1.6 ± 0.20	0.80 ± 0.10	0.95
ZV2M0805...101	2	3	4	10	1	0.10	0.005	100	930	1.5	2.0 ± 0.25	1.25 ± 0.20	0.80
ZV2M1206...151	2	3	4	10	1	0.20	0.008	150	4,000	1.8	3.2 ± 0.30	1.60 ± 0.20	0.85
ZV4M0603...300	4	5.5	8	14	1	0.10	0.003	30	295	1.0	1.6 ± 0.20	0.80 ± 0.10	0.95
ZV4M0805...101	4	5.5	8	14	1	0.10	0.005	100	695	1.5	2.0 ± 0.25	1.25 ± 0.20	0.80
ZV4M1206...151	4	5.5	8	14	1	0.30	0.008	150	3,300	1.8	3.2 ± 0.30	1.60 ± 0.20	0.85
ZV4M1210...251	4	5.5	8	14	3	0.40	0.010	250	5,000	1.8	3.2 ± 0.30	2.50 ± 0.25	0.85
ZV4M1812...501	4	5.5	8	14	5	0.80	0.015	500	10,000	2.5	4.7 ± 0.40	3.20 ± 0.30	1.25
ZV4M2220...102	4	5.5	8	14	10	1.50	0.020	1000	19,500	3.0	5.7 ± 0.50	5.00 ± 0.40	1.25
ZV6M0603...300	6	8	11	21	1	0.10	0.003	30	260	1.0	1.6 ± 0.20	0.80 ± 0.10	0.95
ZV6M0805...101	6	8	11	21	1	0.20	0.005	100	560	1.5	2.0 ± 0.25	1.25 ± 0.20	0.80
ZV6M1206...151	6	8	11	21	1	0.50	0.008	150	2,600	1.8	3.2 ± 0.30	1.60 ± 0.20	0.85
ZV6M1210...301	6	8	11	21	3	0.80	0.010	300	4,100	1.8	3.2 ± 0.30	2.50 ± 0.25	0.85
ZV6M1812...501	6	8	11	21	5	1.00	0.015	500	7,500	2.5	4.7 ± 0.40	3.20 ± 0.30	1.25
ZV6M2220...122	6	8	11	21	10	3.80	0.020	1200	17,000	3.0	5.7 ± 0.50	5.00 ± 0.40	1.25
ZV8L0603...300	8	11	15	25	1	0.10	0.003	30	240	1.0	1.6 ± 0.20	0.80 ± 0.10	0.95
ZV8L0805...121	8	11	15	25	1	0.20	0.005	120	475	1.5	2.0 ± 0.25	1.25 ± 0.20	0.80
ZV8L1206...201	8	11	15	25	1	0.60	0.008	200	2,000	1.8	3.2 ± 0.30	1.60 ± 0.20	0.85
ZV8L1210...401	8	11	15	25	3	1.10	0.010	400	3,400	1.8	3.2 ± 0.30	2.50 ± 0.25	0.85
ZV8L1812...501	8	11	15	25	5	1.90	0.015	500	6,300	2.5	4.7 ± 0.40	3.20 ± 0.30	1.25
ZV8L2220...122	8	11	15	25	10	4.30	0.020	1200	15,000	3.0	5.7 ± 0.50	5.00 ± 0.40	1.25
ZV11K0603...300	11	14	18	33	1	0.20	0.003	30	210	1.0	1.6 ± 0.20	0.80 ± 0.10	0.95
ZV11K0805...121	11	14	18	33	1	0.30	0.005	120	400	1.5	2.0 ± 0.25	1.25 ± 0.20	0.80
ZV11K1206...201	11	14	18	33	1	0.60	0.008	200	1,300	1.8	3.2 ± 0.30	1.60 ± 0.20	0.85
ZV11K1210...401	11	14	18	33	3	1.30	0.010	400	2,600	1.8	3.2 ± 0.30	2.50 ± 0.25	0.85
ZV11K1812...801	11	14	18	33	5	2.00	0.015	800	5,100	2.5	4.7 ± 0.40	3.20 ± 0.30	1.25
ZV11K2220...122	11	14	18	33	10	5.50	0.020	1200	12,000	3.0	5.7 ± 0.50	5.00 ± 0.40	1.25
ZV14K0603...300	14	18	22	38	1	0.30	0.003	30	195	1.0	1.6 ± 0.20	0.80 ± 0.10	0.95
ZV14K0805...121	14	18	22	38	1	0.40	0.005	120	355	1.5	2.0 ± 0.25	1.25 ± 0.20	0.80
ZV14K1206...201	14	18	22	38	1	0.60	0.008	200	950	1.8	3.2 ± 0.30	1.60 ± 0.20	0.85
ZV14K1210...401	14	18	22	38	3	1.60	0.010	400	2,000	1.8	3.2 ± 0.30	2.50 ± 0.25	0.85
ZV14K1812...801	14	18	22	38	5	2.40	0.015	800	4,200	2.5	4.7 ± 0.40	3.20 ± 0.30	1.25
ZV14K2220...122	14	18	22	38	10	6.00	0.020	1200	9,400	3.0	5.7 ± 0.50	5.00 ± 0.40	1.25
ZV17K0603...300	17	22	27	44	1	0.30	0.003	30	185	1.0	1.6 ± 0.20	0.80 ± 0.10	0.95
ZV17K0805...121	17	22	27	44	1	0.40	0.005	120	315	1.5	2.0 ± 0.25	1.25 ± 0.20	1.05
ZV17K1206...201	17	22	27	44	1	0.70	0.008	200	740	1.8	3.2 ± 0.30	1.60 ± 0.20	1.25
ZV17K1210...401	17	22	27	44	3	1.80	0.010	400	1,700	1.8	3.2 ± 0.30	2.50 ± 0.25	1.35
ZV17K1812...801	17	22	27	44	5	2.80	0.015	800	3,500	2.5	4.7 ± 0.40	3.20 ± 0.30	1.25
ZV17K2220...122	17	22	27	44	10	7.50	0.020	1200	7,700	3.0	5.7 ± 0.50	5.00 ± 0.40	1.25
ZV20K0603...300	20	26	33	54	1	0.30	0.003	30	175	1.0	1.6 ± 0.20	0.80 ± 0.10	0.95
ZV20K0805...121	20	26	33	54	1	0.40	0.005	120	290	1.5	2.0 ± 0.25	1.25 ± 0.20	1.05
ZV20K1206...201	20	26	33	54	1	0.80	0.008	200	620	1.8	3.2 ± 0.30	1.60 ± 0.20	1.25
ZV20K1210...401	20	26	33	54	3	2.00	0.010	400	1,400	1.8	3.2 ± 0.30	2.50 ± 0.25	1.35
ZV20K1812...801	20	26	33	54	5	3.00	0.015	800	3,000	2.5	4.7 ± 0.40	3.20 ± 0.30	1.55
ZV20K2220...122	20	26	33	54	10	8.00	0.020	1200	6,500	3.0	5.7 ± 0.50	5.00 ± 0.40	1.45

Device Ratings and Dimensions													
Part Number	V _{RMS}	V _{DC}	V _N	V _C	I _C	W _{MAX}	P _{MAX}	I _{MAX}	C _{TYP}	L _{TYP}	L	W	t _{MAX}
	(volts)	(volts)	(volts)	(volts)	(amps)	(joules)	(watts)	(amps)	(pF)	(nH)	(mm)	(mm)	(mm)
ZV25K0603...300	25	31	39	65	1	0.10	0.003	30	165	1.0	1.6 ± 0.20	0.80 ± 0.10	0.95
ZV25K0805...121	25	31	39	65	1	0.20	0.005	120	260	1.5	2.0 ± 0.25	1.25 ± 0.20	1.05
ZV25K1206...201	25	31	39	65	1	1.00	0.008	200	510	1.8	3.2 ± 0.30	1.60 ± 0.20	1.25
ZV25K1210...401	25	31	39	65	3	1.80	0.010	400	1,060	1.8	3.2 ± 0.30	2.50 ± 0.25	1.45
ZV25K1812...801	25	31	39	65	5	3.90	0.015	800	2,300	2.5	4.7 ± 0.40	3.20 ± 0.30	1.55
ZV25K2220...122	25	31	39	65	10	9.50	0.020	1200	5,000	3.0	5.7 ± 0.50	5.00 ± 0.40	1.45
ZV30K0603...300	30	38	47	77	1	0.10	0.003	30	160	1.0	1.6 ± 0.20	0.80 ± 0.10	0.95
ZV30K0805...121	30	38	47	77	1	0.20	0.005	120	230	1.5	2.0 ± 0.25	1.25 ± 0.20	1.05
ZV30K1206...201	30	38	47	77	1	1.20	0.008	200	450	1.8	3.2 ± 0.30	1.60 ± 0.20	1.25
ZV30K1210...301	30	38	47	77	3	2.10	0.010	400	850	1.8	3.2 ± 0.30	2.50 ± 0.25	1.45
ZV30K1812...801	30	38	47	77	5	4.40	0.015	800	1,800	2.5	4.7 ± 0.40	3.20 ± 0.30	1.55
ZV30K2220...122	30	38	47	77	10	12.20	0.020	1200	4,000	3.0	5.7 ± 0.50	5.00 ± 0.40	1.45
ZV35K1206...121	35	45	56	90	1	0.60	0.008	120	400	1.8	3.2 ± 0.30	1.60 ± 0.20	1.25
ZV35K1210...251	35	45	56	90	3	2.20	0.010	250	670	1.8	3.2 ± 0.30	2.50 ± 0.25	1.45
ZV35K1812...601	35	45	56	90	5	4.20	0.015	600	1,340	2.5	4.7 ± 0.40	3.20 ± 0.30	1.55
ZV35K2220...102	35	45	56	90	10	7.60	0.020	1000	3,000	3.0	5.7 ± 0.50	5.00 ± 0.40	1.45
ZV40K1206...121	40	56	68	110	1	0.80	0.008	120	370	1.8	3.2 ± 0.30	1.60 ± 0.20	1.25
ZV40K1210...251	40	56	68	110	3	2.40	0.010	250	570	1.8	3.2 ± 0.30	2.50 ± 0.25	1.45
ZV40K1812...601	40	56	68	110	5	4.80	0.015	600	1,000	2.5	4.7 ± 0.40	3.20 ± 0.30	1.55
ZV40K2220...102	40	56	68	110	10	9.20	0.020	1000	2,200	3.0	5.7 ± 0.50	5.00 ± 0.40	1.45
ZV50K1206...121	50	65	82	135	1	0.80	0.008	120	340	1.8	3.2 ± 0.30	1.60 ± 0.20	1.65
ZV50K1210...251	50	65	82	135	3	1.70	0.010	250	470	1.8	3.2 ± 0.30	2.50 ± 0.25	1.75
ZV50K1812...401	50	65	82	135	5	4.80	0.015	400	710	2.5	4.7 ± 0.40	3.20 ± 0.30	1.85
ZV50K2220...801	50	65	82	135	10	5.80	0.020	800	1,500	3.0	5.7 ± 0.50	5.00 ± 0.40	1.85
ZV60K1206...121	60	85	100	165	1	0.90	0.008	120	330	1.8	3.2 ± 0.30	1.60 ± 0.20	1.65
ZV60K1210...251	60	85	100	165	3	2.20	0.010	250	390	1.8	3.2 ± 0.30	2.50 ± 0.25	1.75
ZV60K1812...401	60	85	100	165	5	5.80	0.015	400	580	2.5	4.7 ± 0.40	3.20 ± 0.30	1.85
ZV60K2220...801	60	85	100	165	10	6.20	0.020	800	1,000	3.0	5.7 ± 0.50	5.00 ± 0.40	1.85
ZV75K1206...121	75	100	120	200	1	0.90	0.008	120	240	1.8	3.2 ± 0.30	1.60 ± 0.20	1.70
ZV75K1210...251	75	100	120	200	3	2.20	0.010	250	330	1.8	3.2 ± 0.30	2.50 ± 0.25	1.80
ZV75K1812...401	75	100	120	200	5	5.80	0.015	400	440	2.5	4.7 ± 0.40	3.20 ± 0.30	1.90
ZV75K2220...801	75	100	120	200	10	6.20	0.020	800	700	3.0	5.7 ± 0.50	5.00 ± 0.40	1.90
ZV95K1210...201	95	125	150	250	3	2.60	0.010	200	240	1.8	3.2 ± 0.30	2.50 ± 0.25	1.80
ZV95K1812...301	95	125	150	250	5	5.20	0.015	300	340	2.5	4.7 ± 0.40	3.20 ± 0.30	1.90
ZV95K2220...501	59	125	150	250	10	7.40	0.020	500	600	3.0	5.7 ± 0.50	5.00 ± 0.40	1.90
ZV115K1210...201	115	150	180	300	3	2.60	0.010	200	200	1.8	3.2 ± 0.30	2.50 ± 0.25	1.80
ZV115K1812...301	115	150	180	300	5	5.20	0.015	300	310	2.5	4.7 ± 0.40	3.20 ± 0.30	1.90
ZV115K2220...501	115	150	180	300	10	7.40	0.020	500	560	3.0	5.7 ± 0.50	5.00 ± 0.40	1.90
ZV130K1210...201	130	170	205	340	3	2.60	0.010	200	150	1.8	3.2 ± 0.30	2.50 ± 0.25	1.80
ZV130K1812...301	130	170	205	340	5	5.20	0.015	300	240	2.5	4.7 ± 0.40	3.20 ± 0.30	1.90
ZV130K2220...501	130	170	205	340	10	7.40	0.020	500	500	3.0	5.7 ± 0.50	5.00 ± 0.40	1.90

How to Order

1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Z	V	2	0	K	1	2	1	0	T	4	0	1	N	
Product Series		Voltage Range		Tolerance		Size	Packaging				Surge Current		Termination Type	
ZV	Standard	Code	Vrms	Code	Tol	Code	Code	Description	Size	Quantity	Code	Amps	Code	Description
ZVY	High Temp	2 to 130	2 to 130	K	10%	0603	K	7" Plastic Reel	180mm	See Standard Packaging Options	401	400	(blank)	Standard Termination Ag/Pb
				L	15%	0805	T						N	Barrier Termination
				M	20%	1206	G	13" Plastic Reel	330mm				B	Nickel Barrier
						1210								
						1812								
						2220								

Legacy Part Number (before January 3, 2011):

SEI Type		Vrms	Tolerance	Chip Size	Surge Current (Amps)	Termination Type	Packaging
ZV		20	K	1210	401	N	R1
Type	Description		Code	Tolerance		Code	Description
ZV	Standard		K	10%		N	Barrier Termination
ZVY	High Temp		L	15%		-	Pd-Ag
			M	20%			
				Size			
				0603			R0, R1 180 mm (7") Plastic Reel
				0805			R2 330 mm (13") Plastic Reel
				1206			
				1210			
				1812			
				2200			