



## 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

- 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

## 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

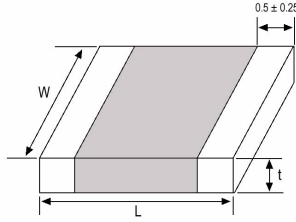
Operating Temperature - ZV	-55°C to +125°C	In accordance with CECC 42 000
Operating Temperature - ZVY	-55°C to +150°C	
Storage Temperature Range	-55°C to +150°C	
Threshold Voltage Temperature Coefficient	<-0.05%/°C	
Response Time	< 2 ns	

## Standard Packaging Options / Quantities

Series	Voltage Range (Vrms)	Chip Size									
		0603			0805			1206			
		R0	R1	R2	R0	R1	R2	R0	R1	R2	
		180mm	180mm	330mm	180mm	180mm	330mm	180mm	180mm	330mm	
		7"	7"	13"	7"	7"	13"	7"	7"	13"	
ZV, ZVY	2 – 14	1000	4000	15000	1000	4000	15000	1,000	4,000	15,000	
	17	1000	3500	14000	1000	3500	14000	1,000	2,500	14,000	
	20 – 40	1000	3500	14000	1000	3500	14000	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			
		R0	R1	R2	R0	R1	R2	R0	R1	R2	
		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

## How to Order

ZV	20	K	1210	401	N	R1	
SEI Type	Vrms	Tolerance	Chip Size	Surge Current (Amps)	Termination Type	Packaging	
SEI Type		Code	Size	Code	Description	Code	Description
ZV		K	0603	N	Barrier Termination	R0, R1	180 mm (7") Plastic Reel
ZVY		L	0805	-	Pd-Ag	R2	330 mm (13") Plastic Reel
		M	1206				
			1210				
			1812				
			2220				



## Device Ratings and Dimensions

Part Number	V <sub>RMS</sub> (volts)	V <sub>DC</sub> (volts)	V <sub>N</sub> (volts)	V <sub>C</sub> (volts)	I <sub>C</sub> (amps)	W <sub>MAX</sub> (joules)	P <sub>MAX</sub> (watts)	I <sub>P</sub> (amps)	C <sub>TYP</sub> (pF)	L <sub>TY</sub> (nH)	L (mm)	W (mm)	t <sub>MAX</sub> (mm)
ZV 2 M 0603 300	2	3	4	10	1	0.1	0.003	30	360	1.0	1.60 ± 0.15	0.80 ± 0.10	1.0
ZV 4 M 0603 300	4	5.5	8	14	1	0.1	0.003	30	295	1.0	1.60 ± 0.15	0.80 ± 0.10	1.0
ZV 6 M 0603 300	6	8	11	21	1	0.1	0.003	30	260	1.0	1.60 ± 0.15	0.80 ± 0.10	1.0
ZV 8 L 0603 300	8	11	15	25	1	0.1	0.003	30	250	1.0	1.60 ± 0.15	0.80 ± 0.10	1.0
ZV 11 K 0603 300	11	14	18	33	1	0.2	0.003	30	210	1.0	1.60 ± 0.15	0.80 ± 0.10	1.0
ZV 14 K 0603 300	14	18	22	38	1	0.3	0.003	30	195	1.0	1.60 ± 0.15	0.80 ± 0.10	1.0
ZV 17 K 0603 300	17	22	27	44	1	0.3	0.003	30	185	1.0	1.60 ± 0.15	0.80 ± 0.10	1.0
ZV 20 K 0603 300	20	26	33	54	1	0.3	0.003	30	175	1.0	1.60 ± 0.15	0.80 ± 0.10	1.0
ZV 25 K 0603 300	25	31	39	65	1	0.1	0.003	30	165	1.0	1.60 ± 0.15	0.80 ± 0.10	1.0
ZV 30 K 0603 300	30	38	47	77	1	0.1	0.003	30	160	1.0	1.60 ± 0.15	0.80 ± 0.10	1.0

ZV 2 M 0805 101	2	3	4	10	1	0.1	0.005	100	1300	1.5	2.00 ± 0.20	1.25 ± 0.15	1.0
ZV 4 M 0805 101	4	5.5	8	14	1	0.1	0.005	100	1100	1.5	2.00 ± 0.20	1.25 ± 0.15	1.0
ZV 6 M 0805 101	6	8	11	21	1	0.2	0.005	100	900	1.5	2.00 ± 0.20	1.25 ± 0.15	1.0
ZV 8 L 0805 121	8	11	15	25	1	0.2	0.005	120	700	1.5	2.00 ± 0.20	1.25 ± 0.15	1.0
ZV 11 K 0805 121	11	14	18	33	1	0.3	0.005	120	500	1.5	2.00 ± 0.20	1.25 ± 0.15	1.0
ZV 14 K 0805 121	14	18	22	38	1	0.4	0.005	120	400	1.5	2.00 ± 0.20	1.25 ± 0.15	1.0
ZV 17 K 0805 121	17	22	27	44	1	0.4	0.005	120	340	1.5	2.00 ± 0.20	1.25 ± 0.15	1.0
ZV 20 K 0805 121	20	26	33	54	1	0.4	0.005	120	300	1.5	2.00 ± 0.20	1.25 ± 0.15	1.0
ZV 25 K 0805 121	25	31	39	65	1	0.2	0.005	120	280	1.5	2.00 ± 0.20	1.25 ± 0.15	1.0
ZV 30 K 0805 121	30	38	47	77	1	0.2	0.005	120	250	1.5	2.00 ± 0.20	1.25 ± 0.15	1.0

ZV 2 M 1206 151	2	3	4	10	1	0.2	0.008	150	5,000	1.8	3.20 ± 0.30	1.60 ± 0.20	1.6
ZV 4 M 1206 151	4	5.5	8	14	1	0.3	0.008	150	3,500	1.8	3.20 ± 0.30	1.60 ± 0.20	1.6
ZV 6 M 1206 151	6	8	11	21	1	0.5	0.008	150	2,600	1.8	3.20 ± 0.30	1.60 ± 0.20	1.6
ZV 8 L 1206 201	8	11	15	25	1	0.6	0.008	200	1,950	1.8	3.20 ± 0.30	1.60 ± 0.20	1.6
ZV 11 K 1206 201	11	14	18	33	1	0.6	0.008	200	1,300	1.8	3.20 ± 0.30	1.60 ± 0.20	1.6
ZV 14 K 1206 201	14	18	22	38	1	0.6	0.008	200	950	1.8	3.20 ± 0.30	1.60 ± 0.20	1.6
ZV 17 K 1206 201	17	22	27	44	1	0.7	0.008	200	740	1.8	3.20 ± 0.30	1.60 ± 0.20	1.6
ZV 20 K 1206 201	20	26	33	54	1	0.8	0.008	200	620	1.8	3.20 ± 0.30	1.60 ± 0.20	1.6
ZV 25 K 1206 201	25	31	39	65	1	1.0	0.008	200	510	1.8	3.20 ± 0.30	1.60 ± 0.20	1.6
ZV 30 K 1206 201	30	38	47	77	1	1.2	0.008	200	450	1.8	3.20 ± 0.30	1.60 ± 0.20	1.6
ZV 35 K 1206 121	35	45	56	90	1	0.6	0.008	120	400	1.8	3.20 ± 0.30	1.60 ± 0.20	1.6
ZV 40 K 1206 121	40	56	68	110	1	0.8	0.008	120	370	1.8	3.20 ± 0.30	1.60 ± 0.20	1.6
ZV 50 K 1206 121	50	65	82	135	1	0.8	0.008	120	320	1.8	3.20 ± 0.30	1.60 ± 0.20	1.6
ZV 60 K 1206 121	60	85	100	165	1	0.9	0.008	120	290	1.8	3.20 ± 0.30	1.60 ± 0.20	1.6

## Device Ratings and Dimensions

Part Number	V <sub>RMS</sub> (volts)	V <sub>DC</sub> (volts)	V <sub>N</sub> (volts)	V <sub>C</sub> (volts)	I <sub>C</sub> (amps)	W <sub>MAX</sub> (joules)	P <sub>MAX</sub> (watts)	I <sub>P</sub> (amps)	C <sub>TYP</sub> (pF)	L <sub>TY</sub> (nH)	L (mm)	W (mm)	t <sub>MAX</sub> (mm)
ZV 4 M 1210 251	4	5.5	8	14	3	0.4	0.010	250	5,000	1.8	3.20 ± 0.30	2.50 ± 0.25	1.7
ZV 6 M 1210 301	6	8	11	21	3	0.8	0.010	300	4,100	1.8	3.20 ± 0.30	2.50 ± 0.25	1.7
ZV 8 L 1210 401	8	11	15	25	3	1.1	0.010	400	3,400	1.8	3.20 ± 0.30	2.50 ± 0.25	1.7
ZV 11 K 1210 401	11	14	18	33	3	1.3	0.010	400	2,600	1.8	3.20 ± 0.30	2.50 ± 0.25	1.7
ZV 14 K 1210 401	14	18	22	38	3	1.6	0.010	400	2,150	1.8	3.20 ± 0.30	2.50 ± 0.25	1.7
ZV 17 K 1210 401	17	22	27	44	3	1.8	0.010	400	1,800	1.8	3.20 ± 0.30	2.50 ± 0.25	1.7
ZV 20 K 1210 401	20	26	33	54	3	2.0	0.010	400	1,500	1.8	3.20 ± 0.30	2.50 ± 0.25	1.7
ZV 25 K 1210 301	25	31	39	65	3	1.8	0.010	400	1,350	1.8	3.20 ± 0.30	2.50 ± 0.25	1.7
ZV 30 K 1210 251	30	38	47	77	3	2.1	0.010	300	1,100	1.8	3.20 ± 0.30	2.50 ± 0.25	1.7
ZV 35 K 1210 251	35	45	56	90	3	2.2	0.010	250	950	1.8	3.20 ± 0.30	2.50 ± 0.25	1.7
ZV 40 K 1210 251	40	56	68	110	3	2.4	0.010	250	750	1.8	3.20 ± 0.30	2.50 ± 0.25	1.7
ZV 50 K 1210 251	50	65	82	135	3	1.7	0.010	250	650	1.8	3.20 ± 0.30	2.50 ± 0.25	1.7
ZV 60 K 1210 251	60	85	100	165	3	2.2	0.010	250	500	1.8	3.20 ± 0.30	2.50 ± 0.25	1.7
ZV 95 K 1210 201	95	125	150	250	3	2.6	0.010	200	300	1.8	3.20 ± 0.30	2.50 ± 0.25	1.7

ZV 4 M 1812 501	4	5.5	8	14	5	0.8	0.015	500	10,000	2.5	4.50 ± 0.35	3.20 ± 0.30	1.8
ZV 6 M 1812 501	6	8	11	21	5	1.0	0.015	500	7,500	2.5	4.50 ± 0.35	3.20 ± 0.30	1.8
ZV 8 L 1812 501	8	11	15	25	5	1.9	0.015	500	6,500	2.5	4.50 ± 0.35	3.20 ± 0.30	1.8
ZV 11 K 1812 801	11	14	18	33	5	2.0	0.015	800	5,100	2.5	4.50 ± 0.35	3.20 ± 0.30	1.8
ZV 14 K 1812 801	14	18	22	38	5	2.4	0.015	800	4,000	2.5	4.50 ± 0.35	3.20 ± 0.30	1.8
ZV 17 K 1812 801	17	22	27	44	5	2.8	0.015	800	3,500	2.5	4.50 ± 0.35	3.20 ± 0.30	1.8
ZV 20 K 1812 801	20	26	33	54	5	3.0	0.015	800	3,000	2.5	4.50 ± 0.35	3.20 ± 0.30	1.8
ZV 25 K 1812 801	25	31	39	65	5	3.9	0.015	800	2,500	2.5	4.50 ± 0.35	3.20 ± 0.30	1.8
ZV 30 K 1812 801	30	38	47	77	5	4.4	0.015	800	2,000	2.5	4.50 ± 0.35	3.20 ± 0.30	1.8
ZV 35 K 1812 601	35	45	56	90	5	4.2	0.015	600	1,450	2.5	4.50 ± 0.35	3.20 ± 0.30	1.8
ZV 40 K 1812 601	40	56	68	110	5	4.8	0.015	600	1,100	2.5	4.50 ± 0.35	3.20 ± 0.30	1.8
ZV 50 K 1812 401	50	65	82	135	5	4.8	0.015	400	800	2.5	4.50 ± 0.35	3.20 ± 0.30	1.8
ZV 60 K 1812 401	60	85	100	165	5	5.8	0.015	400	640	2.5	4.50 ± 0.35	3.20 ± 0.30	1.8
ZV 95 K 1812 301	95	125	150	250	5	5.2	0.015	300	450	2.5	4.50 ± 0.35	3.20 ± 0.30	1.8

ZV 4 M 2220 102	4	5.5	8	14	10	1.5	0.020	1,000	19,500	3.0	5.70 ± 0.40	5.00 ± 0.40	1.8
ZV 6 M 2220 122	6	8	11	21	10	3.8	0.020	1,200	17,000	3.0	5.70 ± 0.40	5.00 ± 0.40	1.8
ZV 8 L 2220 122	8	11	15	25	10	4.3	0.020	1,200	16,000	3.0	5.70 ± 0.40	5.00 ± 0.40	1.8
ZV 11 K 2220 122	11	14	18	33	10	5.5	0.020	1,200	13,000	3.0	5.70 ± 0.40	5.00 ± 0.40	1.8
ZV 14 K 2220 122	14	18	22	38	10	6.0	0.020	1,200	10,000	3.0	5.70 ± 0.40	5.00 ± 0.40	1.8
ZV 17 K 2220 122	17	22	27	44	10	7.5	0.020	1,200	8,000	3.0	5.70 ± 0.40	5.00 ± 0.40	1.8
ZV 20 K 2220 122	20	26	33	54	10	8.0	0.020	1,200	6,500	3.0	5.70 ± 0.40	5.00 ± 0.40	1.8
ZV 25 K 2220 122	25	31	39	65	10	9.5	0.020	1,200	5,000	3.0	5.70 ± 0.40	5.00 ± 0.40	1.8
ZV 30 K 2220 122	30	38	47	77	10	12.2	0.020	1,200	4,000	3.0	5.70 ± 0.40	5.00 ± 0.40	1.8
ZV 35 K 2220 102	35	45	56	90	10	7.6	0.020	1,000	3,000	3.0	5.70 ± 0.40	5.00 ± 0.40	1.8
ZV 40 K 2220 102	40	56	68	110	10	9.2	0.020	1,000	2,200	3.0	5.70 ± 0.40	5.00 ± 0.40	1.8
ZV 50 K 2220 801	50	65	82	135	10	5.8	0.020	800	1,500	3.0	5.70 ± 0.40	5.00 ± 0.40	1.8
ZV 60 K 2220 801	60	85	100	165	10	6.2	0.020	800	1,400	3.0	5.70 ± 0.40	5.00 ± 0.40	1.8
ZV 95 K 2220 501	95	125	150	250	10	7.4	0.020	500	600	3.0	5.70 ± 0.40	5.00 ± 0.40	1.8