

# ZOV Series — High Energy Varistors

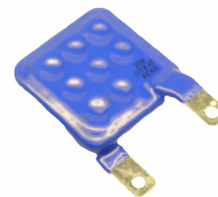
## Description

ZOV Series of varistors are square shaped components that feature a wide range of surge current and energy absorption capabilities over an operating voltage range from 60 to 680 Vrms. There are two versions of these varistors.

The standard version is available in 5 model sizes from 23mm to 60mm, with single-pulse (8/20 us) surge capabilities ranging from 15kA to 80kA. Offered in both block format and rigid leaded construction, these varistors provide excellent protection against high-energy transients such as inductively coupled lightning strikes, line switching load surges, and other transient events where large amounts on current are present.

The second version features a broad range of custom parameters to meet specific over-voltage protection requirements. Customers are given the opportunity to design the optimum varistor with minimum dimensions to satisfy a custom TVS application. Available customized parameters are: non-standard AC/DC operating voltages, maximum surge current, maximum dissipation power and the varistors shape, the dimensions being a function of required electrical parameters and vice-versa.

Both of these groups are offered in two versions: epoxy coated with rigid terminals and metallized varistor blocks. The first version is designed to provide secondary surge protection in outdoor and service entrance environments (distribution panels), in computers and also in industrial applications for motor controls and power supplies for equipment in oil-drilling, mining and transportation. The second version is intended for applications with special contact or installation requirements. The electrode finish of these devices is solderable, and can also be used with pressure contacts for stacking applications.



## Features

### Standard Varistor Types

- AC operating voltage (Vrms) from 60V to 680V
- DC operating voltage (Vdc) from 85V to 895V
- Available either as epoxy coated varistors with rigid terminals or as metallized varistor blocks
- Broad range of current and energy handling capabilities
- Low limiting voltage @  $I_p/2$
- +85°C continuous operating temperature
- 5 model sizes available 23, 25, 32, 40, and 60mm
- In-house testing according to VDE 0675
- UL, CAC, CEDD approved

### Full Custom Parameter Design Varistors

- AC operating voltage range (Vrms) from 60V to 680V
- DC operating voltage (Vdc) from 85V to 895V
- Indefinite number of sizes of both square and rectangular shape, the maximum one being 45x90mm
- Broad range of current and energy handling capabilities
- +85°C continuous operating temperature
- Available customized parameter are: AC/DC operating voltage, leakage current, clamping voltage, maximum surge current, energy absorption level, maximum dissipation power, and threshold voltage temperature coefficient
- Available either as epoxy coated varistors with rigid terminals or as metallized varistor blocks

## General Technical Data

	Standard Values		Custom designed Values
Climatic Category	40 / 85 / 56	In accordance with IEC 60068-1	40 / 85 / 56
Operating Temperature	-40°C to +85°C	In accordance with CECC 42 000	-40°C to +85°C
Storage Temperature Range	-40°C to +125°C		-40°C to +125°C
Threshold Voltage Temperature	<-0.05%/°C		<-0.005%/°C
Isolation Voltage Capability	>2.5kV	In accordance with CECC 42 000	>2.5kV
Response Time	< 25 nS		< 25 nS
Insulation Resistance	>1 Gohm	In accordance with CECC 42 000	>1 Gohm

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## How to Order



## Standard Packaging Options/ Quantities

Series	Voltage Range	Varistor sizes	Varistor Configuration Options (Available on All Sizes)
ZOV	60 – 680	23	Epoxy Coated with Rigid Terminals
	60 – 680	25	
	60 – 680	32	Non-Coated with Rigid Terminals
	60 – 680	40	
	130 – 680	60	

ZOVs will be packaged in resilient polystyrene plastic containers. The quantity per container will depend upon voltage, size, and configuration. Quantities generally range between 50 and 100 pieces per box, contact SEI for exact count.

## Device Ratings and Dimensions

Catalog 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)	t <sub>MAX</sub> (mm)	T <sub>MAX</sub> (mm)
ZOV 60 K 23	60	85	100	155	100	90	1.0	15,000	3,850	1.0	7.7
ZOV 75 K 23	75	100	120	200	100	100	1.0	15,000	3,500	1.2	7.9
ZOV 95 K 23	95	125	150	250	100	135	1.0	15,000	2,950	1.4	8.1
ZOV 130 K 23	130	170	205	340	100	180	1.0	15,000	2,310	1.5	8.1
ZOV 150 K 23	150	200	240	395	100	215	1.0	15,000	1,990	1.6	8.3
ZOV 230 K 23	230	300	360	595	100	320	1.0	15,000	1,320	2.2	9.0
ZOV 250 K 23	250	320	390	650	100	350	1.0	15,000	1,220	2.4	9.2
ZOV 275 K 23	275	350	430	710	100	380	1.0	15,000	1,100	2.6	9.4
ZOV 300 K 23	300	385	470	775	100	440	1.0	15,000	1,010	3.0	9.7
ZOV 320 K 23	320	420	510	840	100	480	1.0	15,000	990	3.2	9.9
ZOV 385 K 23	385	505	620	1,025	100	500	1.0	15,000	810	3.8	10.6
ZOV 420 K 23	420	560	680	1,120	100	530	1.0	15,000	740	4.4	10.9
ZOV 460 K 23	460	615	750	1,240	100	580	1.0	15,000	670	4.8	11.4
ZOV 510 K 23	510	670	820	1,355	100	600	1.0	15,000	610	5.2	11.8
ZOV 550 K 23	550	745	910	1,500	100	650	1.0	15,000	550	5.9	12.5
ZOV 680 K 23	680	895	1,100	1,815	100	770	1.0	15,000	460	6.9	13.5

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ZOV 60 K 25	60	85	100	165	150	125	1.0	18,000	4,850	1.0	7.7
ZOV 75 K 25	75	100	120	200	150	145	1.0	18,000	4,500	1.2	7.9
ZOV 95 K 25	95	125	150	250	150	190	1.0	18,000	3,680	1.4	8.1
ZOV 130 K 25	130	170	205	340	150	250	1.0	18,000	2,900	1.5	8.1
ZOV 150 K 25	150	200	240	395	150	300	1.0	18,000	2,480	1.6	8.3
ZOV 230 K 25	230	300	360	595	150	450	1.0	18,000	1,650	2.2	9.0
ZOV 250 K 25	250	320	390	650	150	490	1.0	18,000	1,530	2.4	9.2
ZOV 275 K 25	275	350	430	710	150	530	1.0	18,000	1,380	2.6	9.4
ZOV 300 K 25	300	385	470	775	150	615	1.0	18,000	1,270	3.0	9.7
ZOV 320 K 25	320	420	510	840	150	680	1.0	18,000	1,240	3.2	9.9
ZOV 385 K 25	385	505	620	1,025	150	690	1.0	18,000	1,020	3.8	10.6
ZOV 420 K 25	420	560	680	1,120	150	740	1.0	18,000	930	4.4	10.9
ZOV 460 K 25	460	615	750	12,404	150	810	1.0	18,000	840	4.8	11.4
ZOV 510 K 25	510	670	820	1,355	150	840	1.0	18,000	770	5.2	11.8
ZOV 550 K 25	550	745	910	1,500	150	900	1.0	18,000	690	5.9	12.5
ZOV 680 K 25	680	895	1,100	1,815	150	1,080	1.0	18,000	570	6.9	13.5
ZOV 60 K 32	60	85	100	165	200	250	1.2	30,000	9,700	1.0	7.7
ZOV 75 K 32	75	100	120	200	200	280	1.2	30,000	8,900	1.2	7.9
ZOV 95 K 32	95	125	150	250	200	380	1.2	30,000	7,470	1.4	8.1
ZOV 130 K 32	130	170	205	340	200	500	1.2	30,000	5,780	1.5	8.1
ZOV 150 K 32	150	200	240	395	200	600	1.2	30,000	4,960	1.6	8.3
ZOV 230 K 32	230	300	360	595	200	900	1.2	30,000	3,300	2.2	9.0
ZOV 250 K 32	250	320	390	650	200	970	1.2	30,000	3,050	2.4	9.2
ZOV 275 K 32	275	350	430	710	200	1,060	1.2	30,000	2,770	2.6	9.4
ZOV 300 K 32	300	385	470	775	200	1,225	1.2	30,000	2,540	3.0	9.7
ZOV 320 K 32	320	420	510	840	200	1,350	1.2	30,000	2,470	3.2	9.9
ZOV 385 K 32	385	505	620	1,025	200	1,390	1.2	30,000	2,040	3.8	10.6
ZOV 420 K 32	420	560	680	1,120	200	1,480	1.2	30,000	1,850	4.4	10.9
ZOV 460 K 32	460	615	750	1,240	200	1,610	1.2	30,000	1,680	4.8	11.4
ZOV 510 K 32	510	670	820	1,355	200	1,680	1.2	30,000	1,530	5.2	11.8
ZOV 550 K 32	550	745	910	1,500	200	1,810	1.2	30,000	1,380	5.9	12.5
ZOV 680 K 32	680	895	1,100	1,815	200	2,160	1.2	30,000	1,150	6.9	13.5

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Catalog 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)	t <sub>MAX</sub> (mm)	T <sub>MAX</sub> (mm)
ZOV 60 K 40	60	85	100	165	300	300	1.4	45,000	12,000	1.0	7.7
ZOV 75 K 40	75	100	120	200	200	340	1.4	45,000	11,000	1.2	7.9
ZOV 95 K 40	95	125	150	250	300	450	1.4	45,000	9,200	1.4	8.1
ZOV 130 K 40	130	170	205	340	300	600	1.4	45,000	7,200	1.5	8.1
ZOV 150 K 40	150	200	240	395	300	720	1.4	45,000	6,100	1.6	8.3
ZOV 230 K 40	230	300	360	595	300	1,080	1.4	45,000	4,060	2.2	9.0
ZOV 250 K 40	250	320	390	650	300	1,160	1.4	45,000	3,760	2.4	9.2
ZOV 275 K 40	275	350	430	710	300	1,280	1.4	45,000	3,400	2.6	9.4
ZOV 300 K 40	300	385	470	775	300	1,470	1.4	45,000	3,130	3.0	9.7
ZOV 320 K 40	320	420	510	840	300	1,620	1.4	45,000	3,050	3.2	9.9
ZOV 385 K 40	385	505	620	1,025	300	1,660	1.4	45,000	2,500	3.8	10.6
ZOV 420 K 40	420	560	680	1,120	300	1,780	1.4	45,000	2,280	4.4	10.9
ZOV 460 K 40	460	615	750	1,240	300	1,930	1.4	45,000	2,060	4.8	11.4
ZOV 510 K 40	510	670	820	1,355	300	2,010	1.4	45,000	1,900	5.2	11.8
ZOV 550 K 40	550	745	910	1,500	300	2,170	1.4	45,000	1,700	5.9	12.5
ZOV 680 K 40	680	895	1,100	1,815	300	2,590	1.4	45,000	1,400	6.9	13.5
ZOV 130 K 60	130	170	205	340	500	960	1.6	80,000	11,520	1.5	8.1
ZOV 150 K 60	150	200	240	395	500	1,150	1.6	80,000	9,760	1.6	8.3
ZOV 230 K 60	230	300	360	595	500	1,730	1.6	80,000	6,490	2.2	9.0
ZOV 250 K 60	250	320	390	650	500	1,860	1.6	80,000	6,050	2.4	9.2
ZOV 275 K 60	275	350	430	710	500	2,050	1.6	80,000	5,440	2.6	9.4
ZOV 300 K 60	300	385	470	775	500	2,350	1.6	80,000	5,000	3.0	9.7
ZOV 320 K 60	320	420	510	840	500	2,600	1.6	80,000	4,880	3.2	9.9
ZOV 385 K 60	385	505	620	1,025	500	2,660	1.6	80,000	4,000	3.8	10.6
ZOV 420 K 60	420	560	680	1,120	500	2,850	1.6	80,000	3,650	4.4	10.9
ZOV 460 K 60	460	615	750	1,240	500	3,090	1.6	80,000	3,300	4.8	11.4
ZOV 510 K 60	510	670	820	1,355	500	3,220	1.6	80,000	3,040	5.2	11.8
ZOV 550 K 60	550	745	910	1,500	500	3,470	1.6	80,000	2,720	5.9	12.5
ZOV 680 K 60	680	895	1,100	1,815	500	4,140	1.6	80,000	2,240	6.9	13.5