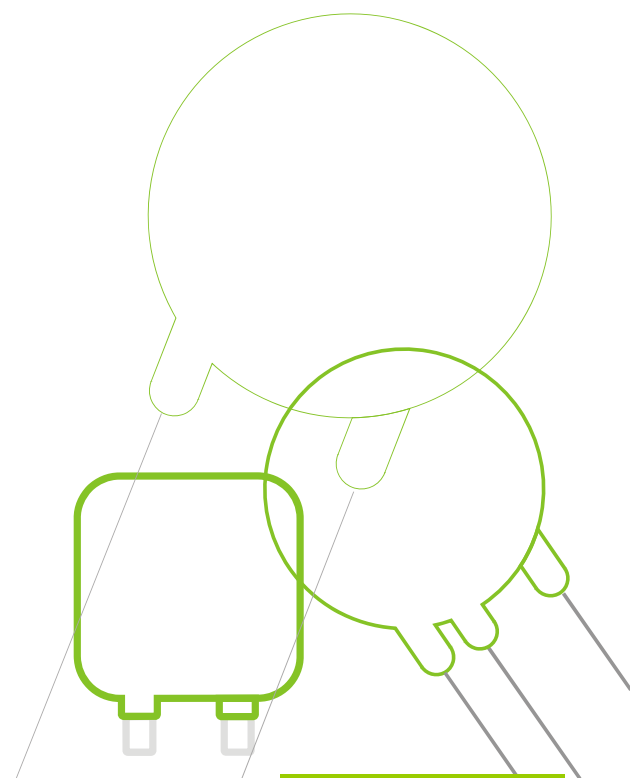




Varistors / MOVs
Varistors for SPD
T - M O V s



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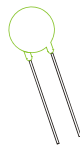
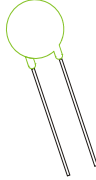
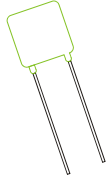


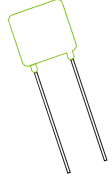
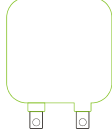
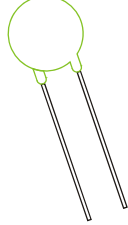
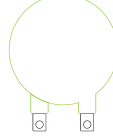
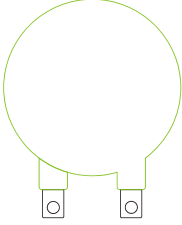


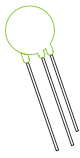
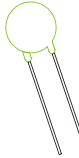
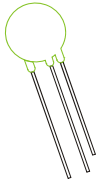
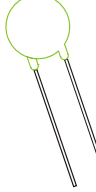
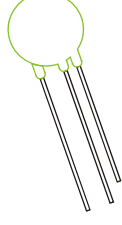
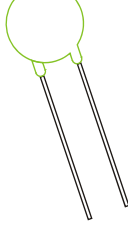
Zinc Oxide Varistors (ZOVs, also known as MOVs and VDRs) are nonlinear two-electrode semiconductor voltage-dependant resistors, which are designed for transient voltage suppression and surge energy absorption. Transient over-voltages are major causes for malfunction or total failure of electronic circuitry and equipment. Therefore, varistors can be widely applied in different areas.

Our product lines carries three type varistors – varistors, varistors for SPD use and T-MOV (thermal cut-off varistors). All of them are RoHS compliant and most of them are UL, CSA or VDE safety approved.

Product Series

Varistors		05D	07D	10D	14D	20D	22S Square
							
Element Diameter		5mm	7mm	10mm	14mm	20mm	22mm
AC Voltage (V)		11~350	11~420	11~680	11~1100	11~1100	11~1100
Max. Surge Current (A)	standard	400	1200	2500	4500	6500	15000
	high surge	800	1750	3500	6000	10000	

SPD Varistors		22S Rectangular	34S	25D	32D	53D
						
Element Diameter		22mm rectangular	34mm	25mm	32mm	53mm
AC Voltage (V)		11~1000	20~1000	11~1000	130~1000	130~1000
Max. Surge Current (A)		23000	40000	18000	25000	70000

T-MOV		14M/E	14N	20M/E	20N	25M/E	25N
							
Element Diameter		14mm	14mm	20mm	20mm	25mm	25mm
AC Voltage (V)		50~700	50~700	50~700	50~700	95~700	95~700
Max. Surge Current (A)		6000	6000	10000	10000	18000	18000
Allowable Current (A)		5	5	10	10	20	20



Most of our parts are recognized by Underwriters Laboratories, Canadian Standards Association and VDE. These safety approvals can also be found on each institution's official website by using the following file no. as the keyword. You're also welcome to contact with our sales office for files in electronic format.



File no. E207368



File no. LR 115266



File no. 4005858

	Varistors															SPD Varistors										T-MOV		
	05D			07D			10D			14D			20D			25D			32D		53D		22S	34S		14	20	25
	U	C	V	U	C	V	U	C	V	U	C	V	U	C	V	U	C	V	U	C	V	U	C	U	U	C	U	U
L	S	D	L	S	D	L	S	D	L	S	D	L	S	D	L	S	D	L	S	D	L	S	L	L	S	L	L	L
	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	E	A	A		A				
180K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*						*	
220K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*						*	
270K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*						*	
330K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*			*		*	
390K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*			*		*	
470K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*			*		*
560K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*			*		*
680K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*			*		*
820K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		*	*	*
101K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
121K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
151K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
181K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
201K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
221K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
241K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
271K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
301K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
331K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
361K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
391K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
431K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
471K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
511K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
561K	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
621K				*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
681K				*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
751K							*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
781K							*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
821K							*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
911K							*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
951K																		*	*	*	*		*	*			*	
102K							*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
112K							*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
122K											*	*		*	*		*	*	*	*	*	*	*	*	*	*	*	
142K																*	*	*	*	*	*	*	*	*	*	*	*	
162K																*	*	*	*	*	*	*	*	*	*	*	*	
182K											*		*															

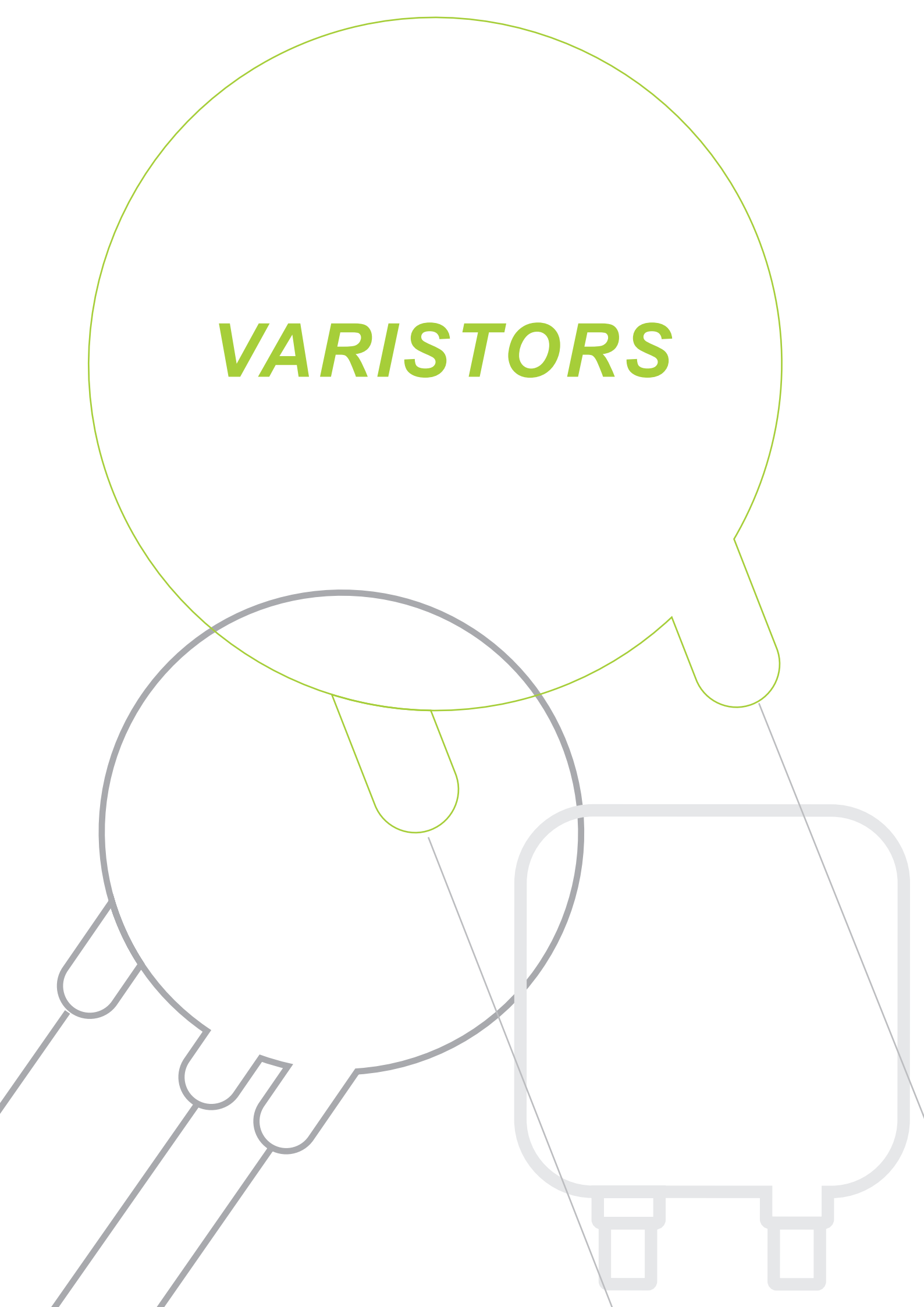


Characteristics		Description	
Standard Test Conditions		Environmental conditions under which every measurement is done without doubt on the measuring results unless specially specified. Temperature relative humidity is 5°C to 35°C, 45% to 85% RH.	N/A.
Maximum Allowable Voltage		The maximum sinusoidal RMS voltage or maximum DC voltage that can be applied continuously in the specified environmental temperature range.	To meet the specified value.
Varistor Voltage		Voltage(Vv) measured @ 1mA VDC across the varistor. The measurement shall be made as fast as possible to avoid heat affection.	To meet the specified value.
Clamping Voltage		The maximum voltage that varistor will pass when a standard 8/20µs surge current is applied.	To meet the specified value.
Maximum Peak Current	1 time	The maximum current (within ±10% voltage range) when one (8/20µs) pulse is applied.	To meet the specified value.
	2 times	The maximum current (within ±10% voltage range) when two (8/20µs) pulses are applied at an interval of 5 minutes. The current will reduced when pulses are applied more.	To meet the specified value.
Maximum Energy		The maximum energy absorbed by a varistor (within ±10% voltage range) when one impulse of 2 ms or 10/1000 µs is applied.	To meet the specified value.
Rated Power (Power Dissipation)		The power that can be applied in the specified ambient temperature.	To meet the specified value.
Capacitance		Nominal pF value measured at 1 kHz.	To meet the specified value.
Temperature Coefficient		$(Vv @ 85^{\circ}C - Vv @ 25^{\circ}C) / Vv @ 25^{\circ}C * 1/60^{\circ}C * 100$	-0.05% / °C
DC Leakage Current		Maximum current with rated DC voltage applied.	200 µA max.
Current / Energy Derating		Derating of maximum values when operating above 85°C.	-2.5% / °C
Standard Pulse Current Waveform	<p>O1=Virtual origin of value T=Time from 10% to 90% peak T1=Virtual front time T2=Virtual time to half value(impulse duration) Ex. For an 8/20 µs waveform, T1=8 µs, T2=20 µs</p>		N/A



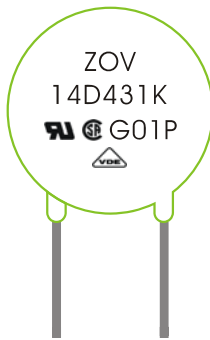
Characteristics	Description			
Impulse Life (I)	The change of Vv shall be measured after the impulse listed below is applied 10,000 times continuously at the interval of ten seconds at room temperature.		$\Delta Vv / Vv \leq \pm 10\%$	
	05D	180K ~ 680K		8A (8/20 μ s)
		820K ~ 561K		40A (8/20 μ s)
	07D	180K ~ 680K		25A (8/20 μ s)
		820K ~ 681K		100A (8/20 μ s)
	10D	180K ~ 680K		50A (8/20 μ s)
		820K ~ 112K		150A (8/20 μ s)
	14D	180K ~ 680K		90A (8/20 μ s)
		820K ~ 122K		300A (8/20 μ s)
		182K		150A (8/20 μ s)
	20D	180K ~ 680K		130A (8/20 μ s)
		820K ~ 122K		250A (8/20 μ s)
182K		200A (8/20 μ s)		
Impulse Life (II)	The change of Vv shall be measured after the impulse listed below is applied 100,000 times continuously at the interval of ten seconds at room temperature.		$\Delta Vv / Vv \leq \pm 10\%$	
	05D	180K ~ 680K		5A (8/20 μ s)
		820K ~ 561K		25A (8/20 μ s)
	07D	180K ~ 680K		15A (8/20 μ s)
		820K ~ 681K		60A (8/20 μ s)
	10D	180K ~ 680K		35A (8/20 μ s)
		820K ~ 112K		85A (8/20 μ s)
	14D	180K ~ 680K		50A (8/20 μ s)
		820K ~ 122K		110A (8/20 μ s)
		182K		80A (8/20 μ s)
	20D	180K ~ 680K		65A (8/20 μ s)
		820K ~ 122K		120A (8/20 μ s)
182K		90A (8/20 μ s)		
Impulse Response Time	Time lag between application of surge and varistor's "turn-on" conduction action .		< 25 nanoseconds	
Non Linear Exponent(α)	<p>The varistor voltage-current characteristic is defined by the equation $I=KV^\alpha$, where K is a constant dependent on geometry and α is the non linear exponent. We usually take two points (V_1, I_1), (V_2, I_2) to estimate the value of α.</p> <p>$\alpha = (\text{Log } I_1/I_2) / (\text{Log } V_1/V_2)$, in which I_1 and I_2 are the current value, corresponding to the voltage value V_1 and V_2.</p>		05D ~ 25D	
			Voltage	α min.
			180 ~ 330K	18
			390 ~ 680K	20
			820 ~ 151K	30
	181 ~ 112K	40		

VARISTORS



Varistors in this section offer satisfying surge protection and are the ones that most applied to electronics. With radial leads, varistors can be mounted to PCB securely.

Standard marking consists of our product brand, type designation, date code and safety approval marks if any.



ZOV

Varistors brand.

14D431K

Type designation.

UL G01P

UL and CSA marking if any.

G01: date code. "G" stands for year 2007("H" for 2008...etc.); "01" stands for calendar week of the year.

P: RoHS standard part.



VDE marking if any.

Green epoxy for RoHS compliant parts.

Part Numbering System

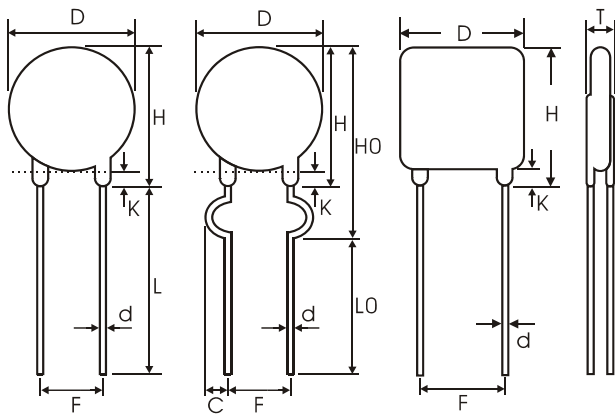
Please refer to the following part numbering system when place your order. If custom made parts or special specification are required, please kindly provide your detailed specification to us.

example **ZOV** **14** **D** **431** **K** - **P** **S** **B**

ZOV	Brand Mark	ZOV is our brand which stands for Zinc Oxide Varistors. This can also be designated brand if you're ODM customer to us.
14	Diameter	These two digits stand for the varistors diameter. Which can be 05 / 07 / 10 / 14 / 20 mm.
D	Disc Type	Which can be D / S / A. D: round disc type S: square disc type A: bare discs(silver discs); no brand mark
431	Varistor Voltage	Varistor voltage is calculated by multiply the first two digits to the ten to the power of the third digit. Ex. 470 => $47 \times 10^0 = 47 \times 1 = 47 \text{ V}$ 241 => $24 \times 10^1 = 24 \times 10 = 240 \text{ V}$
K	Tolerance of Varistor Voltage	Which can be K. Or specially requested. K: $\pm 10\%$ Note: except for 180K which tolerance is $\pm 15\%$
P	Product Type	Which can be P / Z / D. P: RoHS compliant, standard part Z: RoHS compliant, high energy part
S	Lead Style	Which can be S / O / I / Y. S: straight lead O: outside crimped lead I: inside crimped lead Y: vertical crimped lead
B	Packing	Which can be B / A / R / C. B: bulk pack A: ammo pack R: tape & reel C: lead cutted



(mm)



	05D	07D	10D	14D	20D	22S
D Max.	7.5	9.0	12.5	16.5	23.0	22.0
H Max.	10.5	12.0	16.5	20.0	26.5	25.0
H0 Max.	13.0	13.5	17.5	21.0	28.0	
d ±0.1	0.6	0.6	0.8	0.8	0.8	0.8
					1.0	1.0
F ±1.0	5.0	5.0	7.5	7.5	7.5	10.0
					10.0	
C ±0.4	1.2	1.2	1.4	1.4	1.4	1.4
					1.6	1.6

K ≤ 3.0, L0 min. 15.0, L min. 20.0

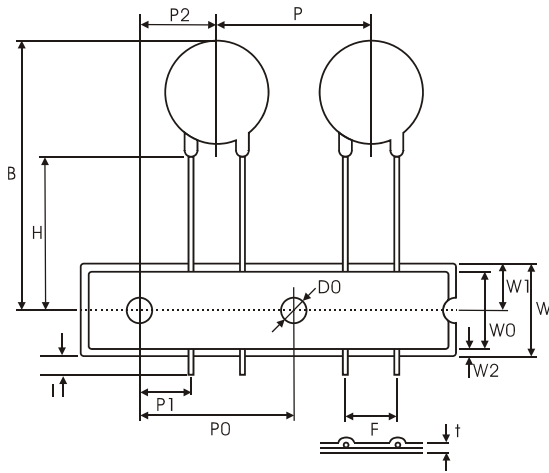
(mm)

T Max.	05D	07D	10D	14D	20D	22S
180K	4.5	4.5	4.6	4.6	4.8	4.6
220K	4.6	4.6	4.7	4.7	4.9	4.7
270K	4.7	4.7	4.8	4.8	5.0	4.8
330K	4.9	4.9	5.0	5.0	5.2	5.0
390K	4.8	4.8	5.3	5.3	5.5	5.2
470K	4.9	4.9	5.4	5.4	5.6	5.5
560K	5.0	5.0	5.5	5.5	5.7	5.8
680K	5.2	5.2	5.6	5.6	5.8	6.2
820K	4.1	4.1	4.7	4.7	4.9	4.7
101K	4.3	4.3	4.9	4.9	5.1	4.9
121K	4.5	4.5	5.1	5.1	5.3	5.0
151K	4.8	4.8	5.4	5.4	5.6	5.4
181K	4.3	4.3	4.8	4.8	5.0	5.1
201K	4.4	4.4	5.0	5.0	5.2	5.3
221K	4.5	4.5	5.1	5.1	5.3	5.4
241K	4.6	4.6	5.2	5.2	5.4	5.5
271K	4.9	4.9	5.4	5.4	5.6	5.7
301K	5.0	5.0	5.5	5.5	5.7	5.9
331K	5.1	5.1	5.8	5.8	6.0	6.1
361K	5.2	5.2	6.0	6.0	6.2	6.4
391K	5.4	5.4	6.2	6.2	6.4	6.6
431K	5.7	5.7	6.5	6.5	6.7	6.9
471K	6.0	6.0	6.7	6.7	6.9	7.2
511K	6.2	6.2	6.8	6.8	7.0	7.6
561K	6.5	6.5	7.0	7.0	7.2	7.9
621K	N/A	7.1	7.3	7.3	7.5	8.3
681K	N/A	7.3	7.6	7.6	7.8	8.4
751K	N/A	N/A	8.0	8.0	8.2	8.9
781K	N/A	N/A	8.1	8.1	8.3	9.1
821K	N/A	N/A	8.3	8.3	8.5	9.4
911K	N/A	N/A	8.8	8.8	9.0	10.0
102K	N/A	N/A	9.3	9.3	9.5	10.6
112K	N/A	N/A	9.9	9.9	10.1	11.3
122K	N/A	N/A	N/A	10.4	10.6	12.0
182K	N/A	N/A	N/A	13.0	13.2	13.2

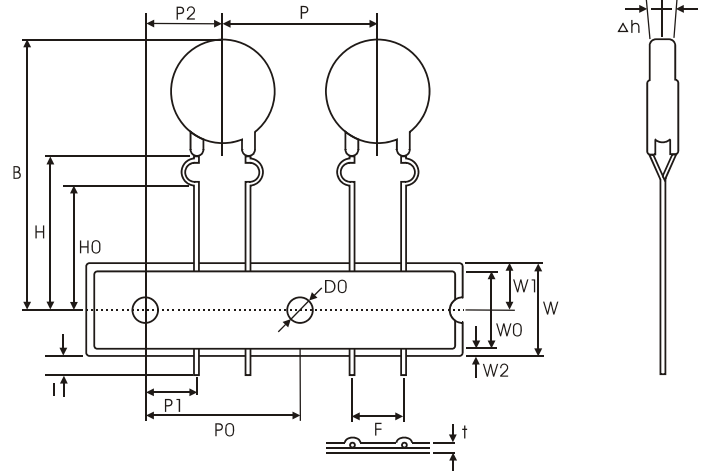


Taping Spec. for 05D and 07D

Straight Leads



Crimped Leads



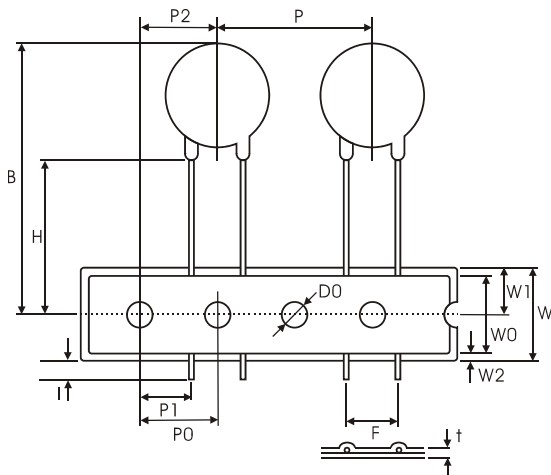
(mm)

Symbol	Parameter (mm)	Element Diameter	
		05D	07D
P	Pitch of component	12.7±1.0	12.7±1.0
P₀	Feed hole pitch	12.7±0.3	12.7±0.3
P₁	Feed hole center to lead	3.85±0.7	3.85±0.7
P₂	Hole center to component center	6.35±1.3	6.35±1.3
F	Lead to lead distance	5.0±1.0	5.0±1.0
h	Component alignment	0±2	0±2
W	Tape width	18.0±1.0	18.0±1.0
W₀	Hold down tape width	12.0±1.0	12.0±1.0
W₁	Hole position	9.0±0.5	9.0±0.5
W₂	Hold down tape position	Max. 3.0	Max. 3.0
H₀	Seating plane height	16.0±1.0	16.0±1.0
H	Height from tape center to bottom of pant-leg	20.0±2.0	20.0±2.0
I	Length of clipped lead	Max. 1.0	Max. 1.0
D₀	Feed hole diameter	4.0±0.2	4.0±0.2
t	Total tape thickness	0.6±0.3	0.6±0.3
B	Component height	Max. 32	Max. 32

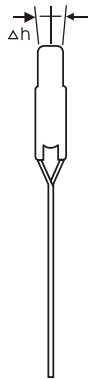
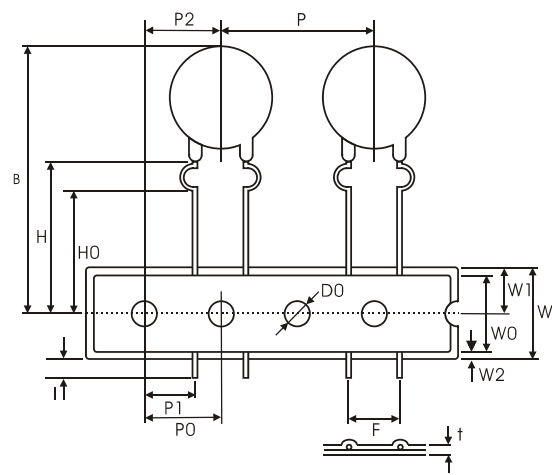


Taping Spec. for 10D, 14D and 20D

Straight Leads



Crimped Leads



(mm)

Symbol	Parameter (mm)	Element Diameter		
		10D	14D	20D
P	Pitch of component	25.4±1.0	25.4±1.0	25.4±1.0
P₀	Feed hole pitch	12.7±1.0	12.7±1.0	12.7±1.0
P₁	Feed hole center to lead	8.95±0.7	8.95±0.7	7.7±0.7
P₂	Hole center to component center	12.7±1.3	12.7±1.3	12.7±1.3
F	Lead to lead distance	7.5±1.0	7.5±1.0	10±1.0
h	Component alignment	0±2	0±4	0±4
W	Tape width	18.0±1.0	18.0±1.0	18.0±1.0
W₀	Hold down tape width	12.0±1.0	12.0±1.0	12.0±1.0
W₁	Hole position	9.0±0.5	9.0±0.5	9.0±0.5
W₂	Hold down tape position	Max. 3.0	Max. 3.0	Max. 3.0
H₀	Seating plane height	16.0±1.0	16.0±1.0	16.0±1.0
H	Height from tape center to the bottom of pant-leg	20.0±2.0	20.0±2.0	20.0±2.0
I	Length of clipped lead	Max. 1.0	Max. 1.0	Max. 1.0
D₀	Feed hole diameter	4.0±0.2	4.0±0.2	4.0±0.2
t	Total tape thickness	0.6±0.3	0.6±0.3	0.6±0.3
B	Component height	Max. 36	Max. 40	Max. 45



Quantity per package

		Bulk		Tape & Reel		Ammo
		Pcs / Bag	Bags / Box	Pcs / Reel	Reels / Box	Pcs / Box
05D	180K~331K	1000	2	2000	1	1500
	361K~391K	1000	2	2000	1	1500
	431K~561K	1000	2	1500	1	1000
07D	180K~331K	1000	2	2000	1	1500
	361K~391K	1000	2	1500	1	1500
	431K~681K	1000	2	1500	1	1000
10D	180K~391K	500	2	1000	1	750
	431K~621K	500	2	750	1	500
	681K~112K	400	2	500	1	300
	182K	300	2	N/A	N/A	N/A
14D	180K~331K	400	2	1000	1	750
	361K~621K	300	2	750	1	500
	681K~112K	250	2	500	1	300
	182K	150	2	N/A	N/A	N/A
20D	180K~301K	250	2	500	1	N/A
	331K~561K	200	2	TBA	1	N/A
22S	621K~112K	150	2	TBA	1	N/A
	182K	100	2	N/A	N/A	N/A

		Bulk		Tape & Reel		Ammo	
		Boxes / Carton	Pcs / Carton	Boxes / Carton	Pcs / Carton	Boxes / Carton	Pcs / Carton
05D	180K~331K	8	16,000	8	16,000	8	12,000
	361K~391K	8	16,000	8	16,000	8	12,000
	431K~561K	8	16,000	8	12,000	8	8,000
07D	180K~331K	8	16,000	8	16,000	8	12,000
	361K~391K	8	16,000	8	12,000	8	12,000
	431K~681K	8	16,000	8	12,000	8	8,000
10D	180K~391K	8	8,000	8	8,000	6	4,500
	431K~621K	8	8,000	8	6,000	6	3,000
	681K~112K	8	6,400	8	4,000	6	1,800
	182K	8	4,800	N/A	N/A	N/A	N/A
14D	180K~331K	8	6,400	8	8,000	6	4,500
	361K~621K	8	4,800	8	6,000	6	3,000
	681K~112K	8	4,000	8	4,000	6	1,800
	182K	8	2,400	N/A	N/A	N/A	N/A
20D 22S	180K~301K	8	3,500	7	3,500	N/A	N/A
	331K~561K	8	3,200	7	TBA	N/A	N/A
	621K~112K	8	2,400	7	TBA	N/A	N/A
	182K	8	1,600	N/A	N/A	N/A	N/A

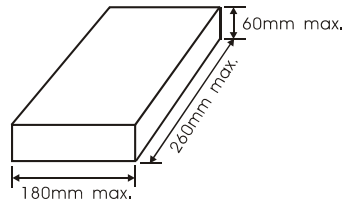
Note: Actual packing quantity may be different from above table. Please kindly contact with our sales office for further confirmation.

Packaging Materials Dimensions

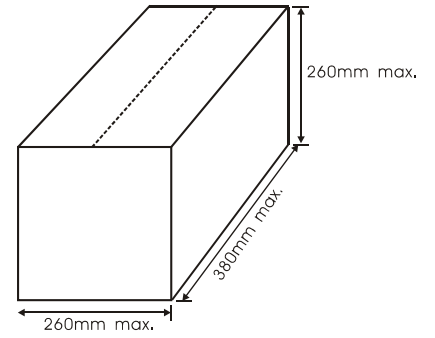
Inside Bulk Box

Transparent Plastic Bag

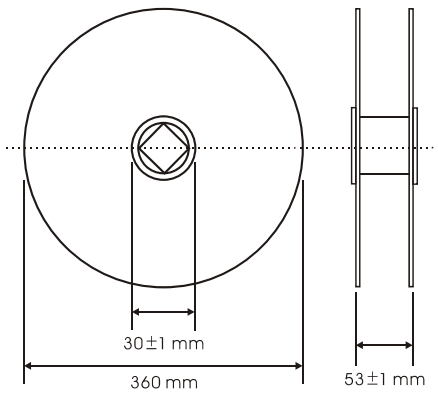
Bulk Box



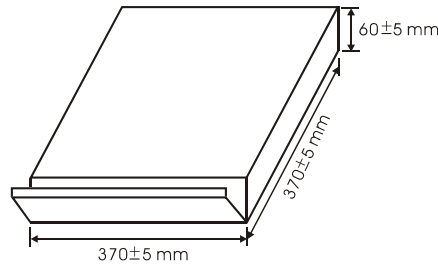
Bulk Carton



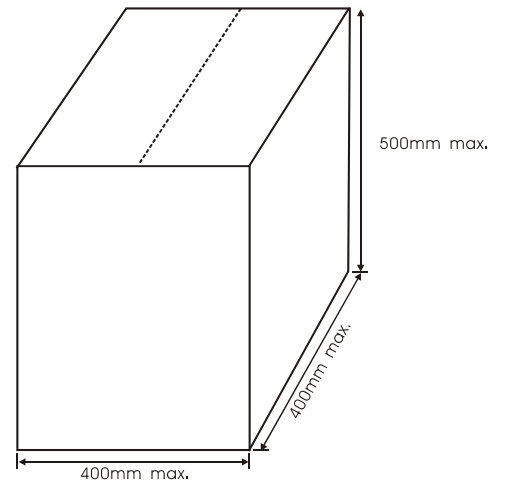
Tape & Reel



Tape & Reel Box

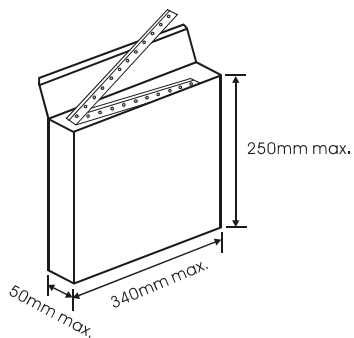


Tape & Reel Carton

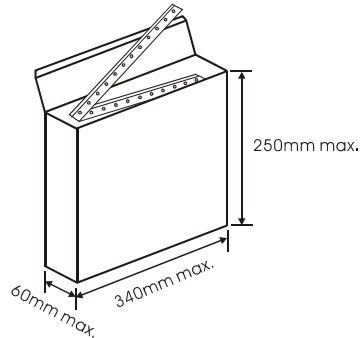


Ammo Box

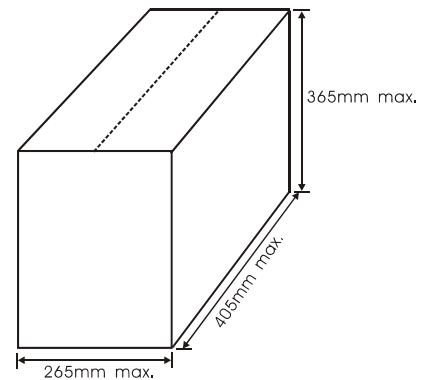
05D & 07D



10D&14D



Ammo Carton





ZOV05D Part No.		Max. Allowable Voltage		Varistor Voltage		Max. Clamping Voltage		Max. Peak Current		Max. Energy		Rated Power (W)	Typical Capacitance @ 1 KHz (pf)	Certificate Status		
		Acrms (V)	DC (V)	V @ 1Ma (V)	VC (V)	IP (A)	@ 8/20µs (A), 1 time		@ 10/1000µs (J)							
							Standard	High Surge	Standard	High Surge	UL			CSA	VDE	
180K	Z	11	14	18	(15-21)	40	1	100	250	0.4	0.6	0.01	1400	*	*	*
220K	Z	14	18	22	(20-24)	48	1	100	250	0.5	0.7	0.01	1150	*	*	*
270K	Z	17	22	27	(24-30)	60	1	100	250	0.6	0.9	0.01	930	*	*	*
330K	Z	20	26	33	(30-36)	73	1	100	250	0.8	1.1	0.01	760	*	*	*
390K	Z	25	31	39	(35-43)	80	1	100	250	0.9	1.2	0.01	640	*	*	*
470K	Z	30	38	47	(42-52)	104	1	100	250	1.1	1.5	0.01	530	*	*	*
560K	Z	35	45	56	(50-62)	123	1	100	250	1.3	1.8	0.01	450	*	*	*
680K	Z	40	56	68	(61-75)	150	1	100	250	1.6	2.2	0.01	370	*	*	*
820K	Z	50	65	82	(74-90)	145	5	400	800	2.5	4.0	0.10	300	*	*	*
101K	Z	60	85	100	(90-110)	175	5	400	800	3.0	4.1	0.10	250	*	*	*
121K	Z	75	100	120	(108-132)	210	5	400	800	4.0	4.9	0.10	210	*	*	*
151K	Z	95	125	150	(135-165)	260	5	400	800	4.8	6.5	0.10	165	*	*	*
181K	Z	115	150	180	(162-198)	320	5	400	800	5.9	7.5	0.10	140	*	*	*
201K	Z	130	170	200	(185-225)	355	5	400	800	6.5	8.5	0.10	125	*	*	*
221K	Z	140	180	220	(198-242)	380	5	400	800	7.0	9.0	0.10	110	*	*	*
241K	Z	150	200	240	(216-264)	415	5	400	800	8.0	10.5	0.10	100	*	*	*
271K	Z	175	225	270	(243-297)	475	5	400	800	8.5	11.0	0.10	95	*	*	*
301K	Z	190	250	300	(270-330)	520	5	400	800	9.0	12.0	0.10	85	*	*	*
331K	Z	210	275	330	(297-363)	570	5	400	800	9.5	13.0	0.10	75	*	*	*
361K	Z	230	300	360	(324-396)	620	5	400	800	10.0	16.0	0.10	70	*	*	*
391K	Z	250	320	390	(351-429)	675	5	400	800	12.0	17.0	0.10	65	*	*	*
431K	Z	275	350	430	(387-473)	745	5	400	800	13.0	20.0	0.10	60	*	*	*
471K	Z	300	385	470	(423-517)	810	5	400	800	15.0	21.0	0.10	55	*	*	*
511K	Z	320	415	510	(459-561)	845	5	400	800	16.0	22.5	0.10	50	*	*	*
561K	Z	350	460	560	(504-616)	920	5	400	800	16.0	24.0	0.10	45	*	*	*

Note: Part no. with "Z" represents high surge parts which peak current and energy values are in gray background.



ZOV07D Part No.		Max. Allowable Voltage		Varistor Voltage		Max. Clamping Voltage		Max. Peak Current		Max. Energy		Rated Power (W)	Typical Capacitance @ 1 KHz (pf)	Certificate Status		
		Acrms (V)	DC (V)	V @ 1Ma (V)	VC (V)	IP (A)	@ 8/20µs (A), 1 time		@ 10/1000µs (J)							
							Standard	High Surge	Standard	High Surge	UL			CSA	VDE	
180K	Z	11	14	18	(15-21)	36	2.5	250	500	0.9	3.0	0.02	2800	*	*	*
220K	Z	14	18	22	(20-24)	43	2.5	250	500	1.1	2.4	0.02	2300	*	*	*
270K	Z	17	22	27	(24-30)	53	2.5	250	500	1.4	3.0	0.02	1800	*	*	*
330K	Z	20	26	33	(30-36)	65	2.5	250	500	1.7	3.5	0.02	1500	*	*	*
390K	Z	25	31	39	(35-43)	77	2.5	250	500	2.1	4.0	0.02	1300	*	*	*
470K	Z	30	38	47	(42-52)	93	2.5	250	500	2.5	5.0	0.02	1100	*	*	*
560K	Z	35	45	56	(50-62)	110	2.5	250	500	3.1	6.0	0.02	890	*	*	*
680K	Z	40	56	68	(61-75)	135	2.5	250	500	3.6	7.0	0.02	740	*	*	*
820K	Z	50	65	82	(74-90)	135	10	1200	1750	5.5	10	0.25	600	*	*	*
101K	Z	60	85	100	(90-110)	165	10	1200	1750	6.5	12	0.25	500	*	*	*
121K	Z	75	100	120	(108-132)	200	10	1200	1750	7.8	13	0.25	420	*	*	*
151K	Z	95	125	150	(135-165)	250	10	1200	1750	9.7	13	0.25	330	*	*	*
181K	Z	115	150	180	(162-198)	300	10	1200	1750	11.7	16	0.25	280	*	*	*
201K	Z	130	170	200	(185-225)	340	10	1200	1750	13.0	17	0.25	250	*	*	*
221K	Z	140	180	220	(198-242)	360	10	1200	1750	14.0	19	0.25	230	*	*	*
241K	Z	150	200	240	(216-264)	395	10	1200	1750	15.0	21	0.25	210	*	*	*
271K	Z	175	225	270	(243-297)	455	10	1200	1750	18.0	24	0.25	185	*	*	*
301K	Z	190	250	300	(270-330)	500	10	1200	1750	20.0	26	0.25	165	*	*	*
331K	Z	210	275	330	(297-363)	550	10	1200	1750	23.0	28	0.25	150	*	*	*
361K	Z	230	300	360	(324-396)	595	10	1200	1750	25.0	32	0.25	140	*	*	*
391K	Z	250	320	390	(351-429)	650	10	1200	1750	25.0	35	0.25	130	*	*	*
431K	Z	275	350	430	(387-473)	710	10	1200	1750	28.0	40	0.25	115	*	*	*
471K	Z	300	385	470	(423-517)	775	10	1200	1750	30.0	42	0.25	105	*	*	*
511K	Z	320	415	510	(459-561)	845	10	1200	1750	30.0	45	0.25	100	*	*	*
561K	Z	350	460	560	(504-616)	925	10	1200	1750	30.0	49	0.25	90	*	*	*
621K	Z	385	505	620	(558-682)	1025	10	1200	1750	33.0	55	0.25	80	*	*	*
681K	Z	420	560	680	(612-748)	1120	10	1200	1750	33.0	60	0.25	75	*	*	*

Note: Part no. with "Z" represents high surge parts which peak current and energy values are in gray background.



ZOV10D Part No.		Max. Allowable Voltage		Varistor Voltage		Max. Clamping Voltage		Max. Peak Current		Max. Energy		Rated Power (W)	Typical Capacitance @ 1 KHz (pf)	Certificate Status		
		Acrms (V)	DC (V)	V @ 1Ma (V)	VC (V)	IP (A)	@ 8/20µs (A), 1 time		@ 10/1000µs (J)							
							Standard	High Surge	Standard	High Surge	UL			CSA	VDE	
180K	Z	11	14	18	(15-21)	36	5	500	1000	2.1	3.0	0.05	5600	*	*	*
220K	Z	14	18	22	(20-24)	43	5	500	1000	2.5	5.0	0.05	4500	*	*	*
270K	Z	17	22	27	(24-30)	53	5	500	1000	3.0	6.0	0.05	3700	*	*	*
330K	Z	20	26	33	(30-36)	65	5	500	1000	4.0	7.0	0.05	3000	*	*	*
390K	Z	25	31	39	(35-43)	77	5	500	1000	4.6	9.0	0.05	2400	*	*	*
470K	Z	30	38	47	(42-52)	93	5	500	1000	5.5	11.0	0.05	2100	*	*	*
560K	Z	35	45	56	(50-62)	110	5	500	1000	7.0	13.0	0.05	1800	*	*	*
680K	Z	40	56	68	(61-75)	135	5	500	1000	8.2	15.0	0.05	1500	*	*	*
820K	Z	50	65	82	(74-90)	135	25	2500	3500	12.0	17.0	0.40	1200	*	*	*
101K	Z	60	85	100	(90-110)	165	25	2500	3500	15.0	18.0	0.40	1000	*	*	*
121K	Z	75	100	120	(108-132)	200	25	2500	3500	18.0	21.0	0.40	830	*	*	*
151K	Z	95	125	150	(135-165)	250	25	2500	3500	22.0	25.0	0.40	670	*	*	*
181K	Z	115	150	180	(162-198)	300	25	2500	3500	27.0	30.0	0.40	560	*	*	*
201K	Z	130	170	200	(185-225)	340	25	2500	3500	30.0	35.0	0.40	500	*	*	*
221K	Z	140	180	220	(198-242)	360	25	2500	3500	32.0	39.0	0.40	450	*	*	*
241K	Z	150	200	240	(216-264)	395	25	2500	3500	35.0	42.0	0.40	420	*	*	*
271K	Z	175	225	270	(243-297)	455	25	2500	3500	40.0	49.0	0.40	370	*	*	*
301K	Z	190	250	300	(270-330)	500	25	2500	3500	40.0	54.0	0.40	330	*	*	*
331K	Z	210	275	330	(297-363)	550	25	2500	3500	43.0	58.0	0.40	300	*	*	*
361K	Z	230	300	360	(324-396)	595	25	2500	3500	47.0	65.0	0.40	280	*	*	*
391K	Z	250	320	390	(351-429)	650	25	2500	3500	60.0	70.0	0.40	260	*	*	*
431K	Z	275	350	430	(387-473)	710	25	2500	3500	65.0	80.0	0.40	230	*	*	*
471K	Z	300	385	470	(423-517)	775	25	2500	3500	70.0	85.0	0.40	210	*	*	*
511K	Z	320	415	510	(459-561)	845	25	2500	3500	70.0	90.0	0.40	200	*	*	*
561K	Z	350	460	560	(504-616)	925	25	2500	3500	70.0	92.0	0.40	180	*	*	*
621K	Z	385	505	620	(558-682)	1025	25	2500	3500	70.0	95.0	0.40	160	*	*	*
681K	Z	420	560	680	(612-748)	1120	25	2500	3500	70.0	98.0	0.40	150	*	*	*
751K	Z	460	615	750	(675-825)	1240	25	2500	3500	75.0	100.0	0.40	130	*	*	*
781K	Z	485	640	780	(702-858)	1290	25	2500	3500	80.0	105.0	0.40	130	*	*	*
821K	Z	510	670	820	(738-902)	1355	25	2500	3500	85.0	110.0	0.40	120	*	*	*
911K	Z	550	745	910	(819-1001)	1500	25	2500	3500	93.0	130.0	0.40	110	*	*	*
102K	Z	625	825	1000	(900-1100)	1650	25	2500	3500	102.0	140.0	0.40	100	*	*	*
112K	Z	680	895	1100	(990-1210)	1815	25	2500	3500	115.0	155.0	0.40	90	*	*	*

Note: Part no. with "Z" represents high surge parts which peak current and energy values are in gray background.



ZOV14D Part No.		Max. Allowable Voltage		Varistor Voltage		Max. Clamping Voltage		Max. Peak Current		Max. Energy		Rated Power (W)	Typical Capacitance @ 1 KHz (pf)	Certificate Status		
		Acrms (V)	DC (V)	V @ 1Ma (V)		VC (V)	IP (A)	@ 8/20µs (A), 1 time		@ 10/1000µs (J)				UL	CSA	VDE
								Standard	High Surge	Standard	High Surge					
180K	Z	11	14	18	(15-21)	36	10	1000	2000	4	7	0.1	11100	*	*	*
220K	Z	14	18	22	(20-24)	43	10	1000	2000	5	8	0.1	9100	*	*	*
270K	Z	17	22	27	(24-30)	53	10	1000	2000	6	10	0.1	7400	*	*	*
330K	Z	20	26	33	(30-36)	65	10	1000	2000	7.5	12	0.1	6100	*	*	*
390K	Z	25	31	39	(35-43)	77	10	1000	2000	8.6	13	0.1	5100	*	*	*
470K	Z	30	38	47	(42-52)	93	10	1000	2000	10	17	0.1	4300	*	*	*
560K	Z	35	45	56	(50-62)	110	10	1000	2000	11	20	0.1	3600	*	*	*
680K	Z	40	56	68	(61-75)	135	10	1000	2000	14	24	0.1	2900	*	*	*
820K	Z	50	65	82	(74-90)	135	50	4500	6000	22	27	0.6	2400	*	*	*
101K	Z	60	85	100	(90-110)	165	50	4500	6000	28	33	0.6	2000	*	*	*
121K	Z	75	100	120	(108-132)	200	50	4500	6000	32	40	0.6	1700	*	*	*
151K	Z	95	125	150	(135-165)	250	50	4500	6000	40	53	0.6	1300	*	*	*
181K	Z	115	150	180	(162-198)	300	50	4500	6000	50	60	0.6	1100	*	*	*
201K	Z	130	170	200	(185-225)	340	50	4500	6000	57	70	0.6	1000	*	*	*
221K	Z	140	180	220	(198-242)	360	50	4500	6000	60	78	0.6	900	*	*	*
241K	Z	150	200	240	(216-264)	395	50	4500	6000	63	84	0.6	830	*	*	*
271K	Z	175	225	270	(243-297)	455	50	4500	6000	70	99	0.6	740	*	*	*
301K	Z	190	250	300	(270-330)	500	50	4500	6000	77	108	0.6	670	*	*	*
331K	Z	210	275	330	(297-363)	550	50	4500	6000	85	115	0.6	610	*	*	*
361K	Z	230	300	360	(324-396)	595	50	4500	6000	93	130	0.6	560	*	*	*
391K	Z	250	320	390	(351-429)	650	50	4500	6000	100	140	0.6	510	*	*	*
431K	Z	275	350	430	(387-473)	710	50	4500	6000	115	155	0.6	460	*	*	*
471K	Z	300	385	470	(423-517)	775	50	4500	6000	125	175	0.6	430	*	*	*
511K	Z	320	415	510	(459-561)	845	50	4500	6000	125	180	0.6	390	*	*	*
561K	Z	350	460	560	(504-616)	925	50	4500	6000	125	185	0.6	360	*	*	*
621K	Z	385	505	620	(558-682)	1025	50	4500	6000	125	190	0.6	320	*	*	*
681K	Z	420	560	680	(612-748)	1120	50	4500	6000	130	200	0.6	290	*	*	*
751K	Z	460	615	750	(675-825)	1240	50	4500	6000	143	210	0.6	270	*	*	*
781K	Z	485	640	780	(702-858)	1290	50	4500	6000	148	220	0.6	260	*	*	*
821K	Z	510	670	820	(738-902)	1355	50	4500	6000	157	235	0.6	240	*	*	*
911K	Z	550	745	910	(819-1001)	1500	50	4500	6000	175	255	0.6	220	*	*	*
102K	Z	625	825	1000	(900-1100)	1650	50	4500	6000	190	280	0.6	200	*	*	*
112K	Z	680	895	1100	(990-1210)	1815	50	4500	6000	213	310	0.6	180	*	*	*
122K	J/z	750	990	1200	(1080-1320)	1880	50	4500	6000	213	310	0.6	150		*	*
182K	J/z	1100	1465	1800	(1620-1980)	2970	50	5000	6000	250	335	0.6	130		*	*

Note: Part no. with "Z" represents high surge parts which peak current and energy values are in gray background.



ZOV20D Part No.		Max. Allowable Voltage		Varistor Voltage		Max. Clamping Voltage		Max. Peak Current		Max. Energy		Rated Power (W)	Typical Capacitance @ 1 KHz (pf)	Certificate Status		
		Acrms (V)	DC (V)	V @ 1Ma (V)	VC (V)	IP (A)	@ 8/20µs (A), 1 time		@ 10/1000µs (J)							
							Standard	High Surge	Standard	High Surge	UL			CSA	VDE	
180K	Z	11	14	18	(15-21)	36	20	2000	3000	11	13	0.2	28500	*	*	*
220K	Z	14	18	22	(20-24)	43	20	2000	3000	14	16	0.2	18500	*	*	*
270K	Z	17	22	27	(24-30)	53	20	2000	3000	16	19	0.2	13000	*	*	*
330K	Z	20	26	33	(30-36)	65	20	2000	3000	23	24	0.2	11500	*	*	*
390K	Z	25	31	39	(35-43)	77	20	2000	3000	26	28	0.2	8500	*	*	*
470K	Z	30	38	47	(42-52)	93	20	2000	3000	30	34	0.2	7400	*	*	*
560K	Z	35	45	56	(50-62)	110	20	2000	3000	41	41	0.2	6500	*	*	*
680K	Z	40	56	68	(61-75)	135	20	2000	3000	46	49	0.2	5800	*	*	*
820K	Z	50	65	82	(74-90)	135	100	6500	10000	38	56	1.0	4900	*	*	*
101K	Z	60	85	100	(90-110)	165	100	6500	10000	45	70	1.0	4000	*	*	*
121K	Z	75	100	120	(108-132)	200	100	6500	10000	55	85	1.0	3300	*	*	*
151K	Z	95	125	150	(135-165)	250	100	6500	10000	70	106	1.0	2700	*	*	*
181K	Z	115	150	180	(162-198)	300	100	6500	10000	85	130	1.0	2200	*	*	*
201K	Z	130	170	200	(185-225)	340	100	6500	10000	95	140	1.0	2000	*	*	*
221K	Z	140	180	220	(198-242)	360	100	6500	10000	100	155	1.0	1800	*	*	*
241K	Z	150	200	240	(216-264)	395	100	6500	10000	108	168	1.0	1650	*	*	*
271K	Z	175	225	270	(243-297)	455	100	6500	10000	127	190	1.0	1500	*	*	*
301K	Z	190	250	300	(270-330)	500	100	6500	10000	136	210	1.0	1300	*	*	*
331K	Z	210	275	330	(297-363)	550	100	6500	10000	150	228	1.0	1200	*	*	*
361K	Z	230	300	360	(324-396)	595	100	6500	10000	163	255	1.0	1100	*	*	*
391K	Z	250	320	390	(351-429)	650	100	6500	10000	180	275	1.0	1000	*	*	*
431K	Z	275	350	430	(387-473)	710	100	6500	10000	190	305	1.0	930	*	*	*
471K	Z	300	385	470	(423-517)	775	100	6500	10000	220	350	1.0	850	*	*	*
511K	Z	320	415	510	(459-561)	845	100	6500	10000	220	360	1.0	780	*	*	*
561K	Z	350	460	560	(504-616)	925	100	6500	10000	220	380	1.0	710	*	*	*
621K	Z	385	505	620	(558-682)	1025	100	6500	10000	220	390	1.0	650	*	*	*
681K	Z	420	560	680	(612-748)	1120	100	6500	10000	230	400	1.0	600	*	*	*
751K	Z	460	615	750	(675-825)	1240	100	6500	10000	255	420	1.0	530	*	*	*
781K	Z	485	640	780	(702-858)	1290	100	6500	10000	265	440	1.0	510	*	*	*
821K	Z	510	670	820	(738-902)	1355	100	6500	10000	282	460	1.0	500	*	*	*
911K	Z	550	745	910	(819-1001)	1500	100	6500	10000	310	510	1.0	440	*	*	*
102K	Z	625	825	1000	(900-1100)	1650	100	6500	10000	342	565	1.0	400	*	*	*
112K	Z	680	895	1100	(990-1210)	1815	100	6500	10000	383	620	1.0	360	*	*	*
122K	Z	750	990	1200	(1080-1320)	1980	100	6500	10000	408	660	1.0	320	*	*	*
182K	Z	1100	1465	1800	(1620-1980)	2970	100	6500	10000	625	660	1.0	320	*	*	*

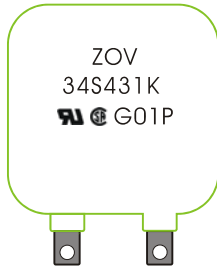
Note: Part no. with "Z" represents high surge parts which peak current and energy values are in gray background.



VARISTORS
FOR SPD USE

Varistors in this section are larger in size and offer greater and more excellent surge protection than varistors in previous section. These varistors are mainly integrated in SPD(surge protection device) for industrial application. With strap terminals, varistors can handle higher currents and energies.

Standard marking consists of our product brand, type designation, date code and safety approval marks if any.



ZOV

Company brand.

34S431K

Type designation

UL G01P

UL and CSA marking if any.

G01: date code. "G" stands for year 2007("H" for 2008...etc.); "01" stands for calendar week of the year.



VDE marking if any.

Green epoxy for RoHS compliant parts.

Part Numbering System

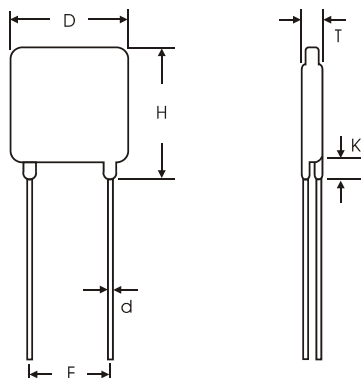
Please refer to the following part numbering system when place your order. If custom made parts or special specification are required, please kindly provide your detailed specification to us.

example **ZOV** **34** **S** **431** **K** : **U** **L** **B**

ZOV	Brand Mark	ZOV is our company brand. This can also be designated brand if you're ODM customer to us.		
34	Diameter	These two digits stand for the varistors diameter. Which can be 22 / 25 / 32 / 34 / 53 mm.		
S	Disc Type	Which can be D / S. D: round disc type S: square disc type		
431	Varistor Voltage	Varistor voltage is calculated by multiply the first two digits to the ten to the power of the third digit. Ex. 470 => $47 \times 10^0 = 47 \times 1 = 47 \text{ V}$ 241 => $24 \times 10^1 = 24 \times 10 = 240 \text{ V}$		
K	Tolerance of Varistor Voltage	Which can be K . Or specially requested. K: $\pm 10\%$ (standard specification)		
U	Product Type	Varistors for SPD use.		
L	Lead Style	20 / 22 / 25mm	22 / 32 / 34 / 53mm	
		Which can be S / O / I / Y. S: straight lead O: outside crimped lead I: inside crimped lead Y: Y kink lead (For O / I / Y detail spec., please contact with our sales office.)	Which can be L for blade type terminal.	
B	Packing	20 mm	22 / 25mm	32 / 34 / 53mm
		Which can be B / A / R / C. B: bulk pack A: ammo pack R: tape & reel C: lead cut (For taping spec. of A and R, please refer to p.11)	Which can be B / C. B: bulk pack C: lead cut	Which can be B for bulk pack.



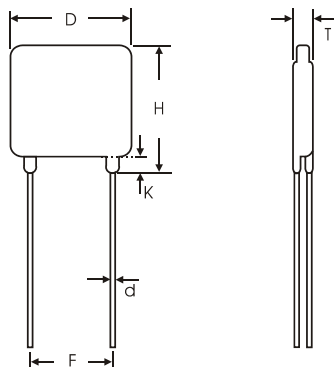
ZOV22S Square Part No.	Max. Allowable Voltage		Varistor Voltage		Max. Clamping Voltage		Max. Peak Current @ 8/20µs		Max. Energy @ 10/1000µs (J)	Rated Power (W)	Typical Capacitance @ 1 KHz (pf)	Certificate Status			T Max. (mm)
	Acrms (V)	DC (V)	V @ 1Ma (V)		VC (V)	IP (A)	In. 10 times (A)	I Max. 2 times (A)				UL	CSA	VDE	
180K	11	14	18	(15-21)	36	25	1500	3000	15.6	0.2	34000				4.6
220K	14	18	22	(20-25)	43	25	1500	3000	19.1	0.2	22200				4.7
240K	15	20	24	(22-27)	48	25	1500	3000	20.0	0.2	20500				4.8
270K	17	22	27	(24-31)	53	25	1500	3000	23.0	0.2	15600				4.8
330K	20	26	33	(30-36)	65	25	2000	4000	29.0	0.2	13800				5.0
390K	25	31	39	(35-43)	77	25	2000	4000	33.5	0.2	10200				5.2
470K	30	38	47	(42-52)	93	25	2500	5000	41.0	0.2	8880	*			5.5
560K	35	45	56	(50-62)	110	25	2500	5000	49.0	0.2	7800				5.8
680K	40	56	68	(61-75)	135	25	2500	5000	59.0	0.2	7000	*			6.2
820K	50	65	82	(74-90)	135	115	6000	12000	67.0	1.0	5880	*			4.7
101K	60	85	100	(90-110)	165	115	6000	12000	84.0	1.0	4800	*			4.9
121K	75	100	120	(108-132)	200	115	10000	15000	102	1.0	4000	*			5.0
151K	95	125	150	(135-165)	250	115	10000	15000	127	1.0	3200				5.4
181K	115	150	180	(162-198)	300	115	10000	15000	156	1.0	2650				5.1
201K	130	170	200	(185-225)	340	115	10000	15000	170	1.0	2400	*			5.3
221K	140	180	220	(198-242)	360	115	10000	15000	185	1.0	2160				5.4
241K	150	200	240	(216-264)	395	115	10000	15000	200	1.0	2000	*			5.5
271K	175	225	270	(243-297)	455	115	10000	15000	230	1.0	1800	*			5.7
301K	190	250	300	(270-330)	500	115	10000	15000	250	1.0	1560				5.9
331K	210	275	330	(297-363)	550	115	7500	15000	270	1.0	1440	*			6.1
361K	230	300	360	(324-396)	595	115	7500	15000	305	1.0	1320	*			6.4
391K	250	320	390	(351-429)	650	115	7500	15000	330	1.0	1200	*			6.6
431K	275	350	430	(387-473)	710	115	7500	15000	365	1.0	1160	*			6.9
471K	300	385	470	(423-517)	775	115	7500	15000	420	1.0	1020	*			7.2
511K	320	415	510	(459-561)	845	115	7500	15000	430	1.0	935	*			7.6
561K	350	460	560	(504-616)	925	115	7500	15000	455	1.0	850	*			7.9
621K	385	505	620	(558-682)	1025	115	7500	15000	465	1.0	780	*			8.3
681K	420	560	680	(612-748)	1120	115	7500	15000	480	1.0	720	*			8.4
751K	460	615	750	(675-825)	1240	115	7500	15000	500	1.0	635	*			8.9
781K	485	640	780	(702-858)	1290	115	7500	15000	525	1.0	610	*			9.1
821K	510	670	820	(738-902)	1355	115	7500	15000	550	1.0	600	*			9.4
911K	550	745	910	(819-1001)	1500	115	7500	15000	610	1.0	525	*			10.0
102K	625	825	1000	(900-1100)	1650	115	7500	15000	675	1.0	480	*			10.6
112K	680	895	1100	(990-1210)	1815	115	7500	15000	740	1.0	430	*			11.3
122K	750	990	1200	(1080-1320)	1980	115	7500	15000	790	1.0	380				12.0
182K	1100	1465	1800	(1620-1980)	2970	115	7500	15000	790	1.0	380				13.2



(mm)	
D Max.	22.0
H Max.	25.0
d ±0.1	1.0
F ±1.0	10.0
T Max.	Please see above table, last column.
K	≤3.0



ZOV22S Rectangular Part No.	Max. Allowable Voltage		Varistor Voltage		Max. Clamping Voltage		Max. Peak Current		Max. Energy	Rated Power	Typical Capacitance	Certificate Status			T Max.
	Ac.Rms (V)	DC (V)	V @ 1Ma (V)		VC (V)	IP (A)	@ 8/20µs (A)		@10/1000µs (J)	(W)	@ 1 KHz (pf)	UL	CSA	VDE	(mm)
							In.	I max.							
22S180K	11	14	18	(15-21)	36	35	2500	5000	23	0.25	45000				4.8
22S220K	14	18	22	(20-25)	43	35	2500	5000	28	0.25	37000				4.9
22S270K	17	22	27	(24-31)	53	35	2500	5000	33	0.25	30000				5.0
22S330K	20	26	33	(30-37)	65	35	2500	5000	42	0.25	24500				5.2
22S390K	25	31	39	(35-44)	77	35	2500	5000	49	0.25	21000				5.4
22S470K	30	38	47	(42-52)	93	35	2500	5000	60	0.25	17250	*			5.7
22S560K	35	45	56	(50-63)	110	35	5000	10000	72	0.25	14500				6.0
22S680K	40	56	68	(61-75)	135	35	5000	10000	85	0.25	9500	*			6.4
22S820K	50	65	82	(74-90)	135	150	7500	15000	98	1.2	8800	*			4.9
22S101K	60	85	100	(90-110)	165	150	7500	15000	122	1.2	7200	*			5.1
22S111K	66	93	110	(99-121)	182	150	7500	15000	135	1.2	6550				5.2
22S121K	75	100	120	(108-132)	200	150	7500	15000	146	1.2	6000	*			5.2
22S131K	82	108	130	(117-143)	216	150	7500	15000	160	1.2	5550				5.4
22S151K	95	125	150	(135-165)	250	150	7500	15000	185	1.2	4400				5.6
22S181K	115	150	180	(162-198)	300	150	7500	15000	218	1.2	3650				5.3
22S201K	130	170	200	(185-225)	340	150	10000	23000	252	1.2	3300	*			5.5
22S221K	140	180	220	(198-242)	360	150	10000	23000	280	1.2	3000				5.6
22S241K	150	200	240	(216-264)	395	150	10000	23000	302	1.2	2800	*			5.7
22S271K	175	225	270	(243-297)	455	150	10000	23000	340	1.2	2450	*			5.9
22S301K	190	250	300	(270-330)	500	150	10000	23000	375	1.2	2200				6.1
22S331K	210	275	330	(297-363)	550	150	10000	23000	410	1.2	2050	*			6.3
22S361K	230	300	360	(324-396)	595	150	10000	23000	465	1.2	1850	*			6.6
22S391K	250	320	390	(351-429)	650	150	10000	23000	520	1.2	1700	*			6.8
22S431K	275	350	430	(387-473)	710	150	10000	23000	575	1.2	1600	*			7.1
22S471K	300	385	470	(423-517)	775	150	10000	23000	630	1.2	1450	*			7.4
22S511K	320	415	510	(459-561)	845	150	10000	23000	665	1.2	1300	*			7.8
22S561K	350	460	560	(504-616)	925	150	10000	23000	720	1.2	1200	*			8.1
22S621K	385	505	620	(558-682)	1025	150	10000	23000	790	1.2	1100	*			8.5
22S681K	420	560	680	(612-748)	1120	150	10000	23000	790	1.2	1000	*			8.6
22S751K	460	615	750	(675-825)	1240	150	10000	23000	825	1.2	900	*			9.1
22S781K	485	640	780	(702-858)	1290	150	10000	23000	860	1.2	850	*			9.3
22S821K	510	670	820	(738-902)	1355	150	10000	23000	900	1.2	810	*			9.6
22S911K	550	745	910	(819-1001)	1500	150	10000	23000	950	1.2	750	*			10.2
22S951K	575	780	950	(855-1045)	1570	150	10000	23000	950	1.2	700				10.2
22S102K	625	825	1000	(900-1100)	1650	150	10000	23000	1040	1.2	660	*			10.8
22S112K	680	895	1100	(990-1210)	1815	150	10000	23000	1130	1.2	605	*			11.5
22S122K	750	980	1200	(1150-1320)	1980	150	10000	23000	1170	1.2	555				12.2
22S142K	850	1120	1400	(1315-1540)	2310	150	10000	23000	1170	1.2	475				14.1
22S152K	930	1220	1500	(1450-1650)	2475	150	10000	23000	1250	1.2	445				12.0
22S162K	1000	1320	1600	(1550-1760)	2640	150	10000	23000	1300	1.2	415				12.4

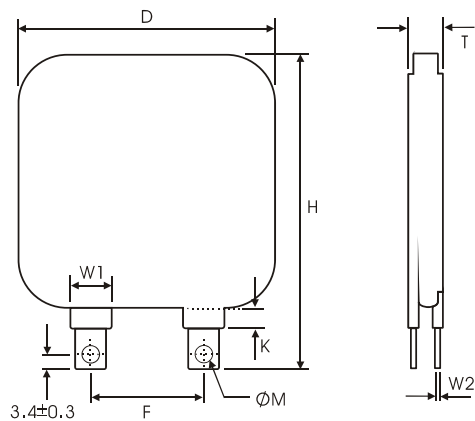


(mm)

D Max.	28.0
H Max.	28.0
d ±0.1	1.0
F ±1.0	10.0
T Max.	Please see above table, last column.
K	≤3.0



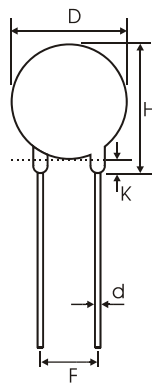
ZOV34S Part No.	Max. Allowable Voltage		Varistor Voltage		Max. Clamping Voltage		Max. Peak Current		Max. Energy	Rated Power	Typical Capacitance	Certificate Status			T Max.
	Ac.Rms (V)	DC (V)	V @ 1Ma (V)		VC (V)	IP (A)	@ 8/20µs (A)		@10/1000µs (J)	(W)	@ 1 KHz (pf)	UL	CSA	VDE	(mm)
							In.	I max.							
330K	20	26	33	(30-37)	65	60	5000	10000	67	0.3	50000				6.1
390K	25	31	39	(35-44)	77	60	5000	10000	78	0.3	42000				6.3
470K	30	38	47	(42-52)	93	60	5000	10000	96	0.3	35000				6.5
560K	35	45	56	(50-63)	110	60	10000	20000	115	0.3	29500				6.8
680K	40	56	68	(61-75)	135	60	10000	20000	136	0.3	24200				7.2
820K	50	65	82	(74-90)	135	300	15000	30000	156	1.4	17950				5.9
101K	60	85	100	(90-110)	165	300	15000	30000	195	1.4	15000				6.1
111K	66	93	110	(99-121)	182	300	15000	30000	215	1.4	13400				6.2
121K	75	100	120	(108-132)	200	300	15000	30000	235	1.4	12200				6.3
131K	82	108	130	(117-143)	216	300	15000	30000	256	1.4	11350				6.4
151K	95	125	150	(135-165)	250	300	20000	40000	296	1.4	10000				6.6
181K	115	150	180	(162-198)	300	300	20000	40000	350	1.4	8250				6.3
201K	130	170	200	(185-225)	340	300	20000	40000	400	1.4	6750	*			6.4
221K	140	180	220	(198-242)	360	300	20000	40000	450	1.4	6400	*			6.6
241K	150	200	240	(216-264)	395	300	20000	40000	480	1.4	5650	*			6.7
271K	175	225	270	(243-297)	455	300	20000	40000	540	1.4	5100	*			6.9
301K	190	250	300	(270-330)	500	300	20000	40000	600	1.4	4510	*			7.1
331K	210	275	330	(297-363)	550	300	20000	40000	656	1.4	4150	*			7.3
361K	230	300	360	(324-396)	595	300	20000	40000	745	1.4	3750	*			7.6
391K	250	320	390	(351-429)	650	300	20000	40000	830	1.4	3500	*			7.8
431K	275	350	430	(387-473)	710	300	20000	40000	920	1.4	2950	*			8.0
471K	300	385	470	(423-517)	775	300	20000	40000	1000	1.4	2880	*			8.3
511K	320	415	510	(459-561)	845	300	20000	40000	1060	1.4	2650	*			8.7
561K	350	460	560	(504-616)	925	300	20000	40000	1150	1.4	2450	*			9.0
621K	385	505	620	(558-682)	1025	300	20000	40000	1250	1.4	2200	*			9.4
681K	420	560	680	(612-748)	1120	300	20000	40000	1250	1.4	2000	*			9.5
751K	460	615	750	(675-825)	1240	300	20000	40000	1280	1.4	1820	*			10.0
781K	485	640	780	(702-858)	1290	300	20000	40000	1350	1.4	1750	*			10.2
821K	510	670	820	(738-902)	1355	300	20000	40000	1395	1.4	1650	*			10.8
911K	550	745	910	(819-1001)	1500	300	20000	40000	1475	1.4	1500	*			11.2
951K	575	760	950	(855-1045)	1570	300	20000	40000	1485	1.4	1430	*			11.0
102K	625	825	1000	(900-1100)	1650	300	20000	40000	1550	1.4	1350	*			11.2
112K	680	895	1100	(990-1210)	1815	300	20000	40000	1700	1.4	1230	*			12.3
122K	750	980	1200	(1150-1320)	1980	300	20000	40000	1750	1.4	1135	*			13.0
142K	850	1120	1400	(1315-1540)	2310	300	20000	40000	1750	1.4	970	*			14.3
152K	930	1220	1500	(1450-1650)	2475	300	20000	40000	1815	1.4	900				12.6
162K	1000	1320	1600	(1550-1760)	2640	300	20000	40000	2000	1.4	840				13.3



	(mm)
D Max.	36.0
H Max.	41.0
W1 ±0.5	7.0
W2 ±0.1	0.5
M ±0.2	3.8
F ±1.0	25.4
T Max.	Please see above table, last column.
K	≤5.0



ZOV25D Part No.	Max. Allowable Voltage		Varistor Voltage		Max. Clamping Voltage		Max. Peak Current		Max. Energy	Rated Power	Typical Capacitance	Certificate Status			T Max.
	Ac.Rms (V)	DC (V)	V @ 1Ma (V)		VC (V)	IP (A)	@ 8/20µs (A)		@10/1000µs (J)	(W)	@ 1 KHz (pf)	UL	CSA	VDE	(mm)
							In.	I max.							
180K	11	14	18	(15-21)	36	30	1500	3000	20	0.25	45000	*	*	4.8	
220K	14	18	22	(20-24)	43	30	1500	3000	25	0.25	29000	*	*	4.9	
270K	17	22	27	(24-30)	53	30	1500	3000	30	0.25	26500	*	*	5.0	
330K	20	26	33	(30-36)	65	30	1500	3000	35	0.25	18000	*	*	5.2	
390K	25	31	39	(35-43)	77	30	1500	3000	40	0.25	13500	*	*	5.4	
470K	30	38	47	(42-52)	93	30	1500	3000	50	0.25	11500	*	*	5.7	
560K	35	45	56	(50-62)	110	30	3000	6000	60	0.25	10500	*	*	6.0	
680K	40	56	68	(61-75)	135	30	3000	6000	70	0.25	9050	*	*	6.4	
820K	50	65	82	(74-90)	135	30	5000	10000	80	1.2	7700	*	*	4.9	
101K	60	85	100	(90-110)	165	150	5000	10000	100	1.2	6300	*	*	5.1	
121K	75	100	120	(108-132)	200	150	5000	10000	120	1.2	5200	*	*	5.2	
151K	95	125	150	(135-165)	250	150	5000	10000	160	1.2	4300	*	*	5.6	
181K	115	150	180	(162-198)	300	150	5000	10000	175	1.2	3500	*	*	5.3	
201K	130	170	200	(185-225)	340	150	10000	18000	190	1.2	3200	*	*	5.5	
221K	140	180	220	(198-242)	360	150	10000	18000	200	1.2	2900	*	*	5.6	
241K	150	200	240	(216-264)	395	150	10000	18000	220	1.2	2650	*	*	5.7	
271K	175	225	270	(243-297)	455	150	10000	18000	255	1.2	2400	*	*	5.9	
301K	190	250	300	(270-330)	500	150	10000	18000	275	1.2	2100	*	*	6.1	
331K	210	275	330	(297-363)	550	150	10000	18000	300	1.2	1900	*	*	6.3	
361K	230	300	360	(324-396)	595	150	10000	18000	330	1.2	1750	*	*	6.6	
391K	250	320	390	(351-429)	650	150	10000	18000	360	1.2	1600	*	*	6.8	
431K	275	350	430	(387-473)	710	150	10000	18000	380	1.2	1500	*	*	7.1	
471K	300	385	470	(423-517)	775	150	10000	18000	400	1.2	1400	*	*	7.4	
511K	320	415	510	(459-561)	845	150	10000	18000	420	1.2	1250	*	*	7.8	
561K	350	460	560	(504-616)	925	150	10000	18000	440	1.2	1150	*	*	8.1	
621K	385	505	620	(558-682)	1025	150	10000	18000	450	1.2	1050	*	*	8.5	
681K	420	560	680	(612-748)	1120	150	10000	18000	460	1.2	950	*	*	8.6	
751K	460	615	750	(675-825)	1240	150	10000	18000	510	1.2	850	*	*	9.1	
781K	485	640	780	(702-858)	1290	150	10000	18000	530	1.2	800	*	*	9.3	
821K	510	670	820	(738-902)	1355	150	10000	18000	570	1.2	750	*	*	9.6	
911K	550	745	910	(819-1001)	1500	150	10000	18000	620	1.2	700	*	*	10.2	
102K	625	825	1000	(900-1100)	1650	150	10000	18000	685	1.2	650	*	*	10.8	
112K	680	895	1100	(990-1210)	1815	150	10000	18000	770	1.2	600	*	*	11.5	
122K	750	990	1200	(1080-1320)	1980	150	10000	18000	770	1.2	550	*	*	12.2	
142K	880	1140	1400	(1260-1540)	2310	150	10000	18000	850	1.2	500	*	*	14.1	
162K	1100	1280	1600	(1440-1760)	2640	150	10000	18000	970	1.2	450	*	*	12.4	

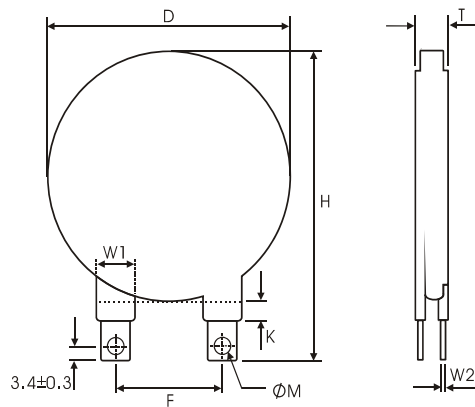


(mm)

D Max.	28.0
H Max.	32.0
d ±0.1	1.0
F ±1.0	10.0
T Max.	Please see above table, last column.
K	≤3.0



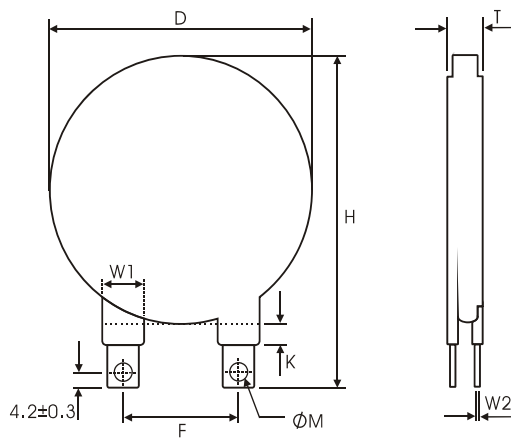
ZOV32D Part No.	Max. Allowable Voltage		Varistor Voltage		Max. Clamping Voltage		Max. Peak Current		Max. Energy	Rated Power	Typical Capacitance	Certificate Status			T Max.
	Ac.Rms (V)	DC (V)	V @ 1Ma (V)		VC (V)	IP (A)	@ 8/20µs (A)		@10/1000µs (J)	(W)	@ 1 KHz (pf)	UL	CSA	VDE	(mm)
							In.	I max.							
201K	130	170	200	(185-225)	340	200	15000	25000	250	1.4	5200	*	*		6.4
221K	140	180	220	(198-242)	360	200	15000	25000	270	1.4	5150	*	*		6.6
241K	150	200	240	(216-264)	395	200	15000	25000	290	1.4	5100	*	*		6.7
271K	175	225	270	(243-297)	455	200	15000	25000	300	1.4	4800	*	*		6.9
301K	190	250	300	(270-330)	500	200	15000	25000	330	1.4	4500	*	*		7.1
331K	210	275	330	(297-363)	550	200	15000	25000	360	1.4	4300	*	*		7.3
361K	230	300	360	(324-396)	595	200	15000	25000	380	1.4	3900	*	*		7.6
391K	250	320	390	(351-429)	650	200	15000	25000	400	1.4	3200	*	*		7.8
431K	275	350	430	(387-473)	710	200	15000	25000	430	1.4	3100	*	*		8.0
471K	300	385	470	(423-517)	775	200	15000	25000	460	1.4	2800	*	*		8.3
511K	320	415	510	(459-561)	845	200	15000	25000	510	1.4	2700	*	*		8.7
621K	385	505	620	(558-682)	1025	200	15000	25000	570	1.4	2400	*	*		9.4
681K	420	560	680	(612-748)	1120	200	15000	25000	600	1.4	2200	*	*		9.5
751K	460	615	750	(675-825)	1240	200	15000	25000	620	1.4	2000	*	*		10.0
781K	485	640	780	(702-858)	1290	200	15000	25000	660	1.4	1900	*	*		10.2
821K	510	670	820	(738-902)	1355	200	15000	25000	700	1.4	1800	*	*		10.8
911K	550	745	910	(819-1001)	1500	200	15000	25000	750	1.4	1300	*	*		11.2
951K	575	765	950	(855-1045)	1570	200	15000	25000	780	1.4	1200	*	*		11.0
102K	625	825	1000	(900-1100)	1650	200	15000	25000	810	1.4	1100	*	*		11.2
112K	680	895	1100	(990-1210)	1815	200	15000	25000	910	1.4	1000	*	*		12.3
122K	750	990	1200	(1080-1320)	1980	200	15000	25000	960	1.4	920	*	*		13.0
142K	880	1140	1400	(1260-1540)	2310	200	15000	25000	1020	1.4	800	*	*		14.3
162K	1000	1280	1600	(1440-1760)	2640	200	15000	25000	1080	1.4	700		*		13.3



	(mm)
D Max.	38.0
H Max.	56.3
W1 ±0.5	7.0
W2 ±0.1	0.5
M ±0.2	3.8
F ±1.0	25.4
T Max.	Please see above table, last column.
K	≤5.0



ZOV53D Part No.	Max. Allowable Voltage		Varistor Voltage		Max. Clamping Voltage		Max. Peak Current		Max. Energy	Rated Power	Typical Capacitance	Certificate Status			T Max.
	Ac.Rms (V)	DC (V)	V @ 1Ma (V)		VC (V)	IP (A)	@ 8/20µs (A)		@10/1000µs (J)	(W)	@ 1 KHz (pf)	UL	CSA	VDE	(mm)
			In.	I max.											
201K	130	170	200	(185-225)	340	500	30000	60000	550	1.6	15000	*	*		6.3
221K	140	180	220	(198-242)	360	500	30000	60000	600	1.6	13750	*	*		6.4
241K	150	200	240	(216-264)	395	500	30000	60000	650	1.6	12500	*	*		6.5
271K	175	225	270	(243-297)	455	500	30000	60000	700	1.6	11000	*	*		6.7
301K	190	250	300	(270-330)	500	500	30000	60000	760	1.6	10000	*	*		6.8
331K	210	275	330	(297-363)	550	500	35000	70000	825	1.6	9000	*	*		7.0
361K	230	300	360	(324-396)	595	500	35000	70000	850	1.6	8500	*	*		7.2
391K	250	320	390	(351-429)	650	500	35000	70000	885	1.6	7500	*	*		7.4
431K	275	350	430	(387-473)	710	500	35000	70000	990	1.6	7000	*	*		7.6
471K	300	385	470	(423-517)	775	500	35000	70000	1080	1.6	6500	*	*		7.9
511K	320	415	510	(459-561)	845	500	35000	70000	1150	1.6	6000	*	*		8.1
561K	350	460	560	(504-616)	925	500	35000	70000	1230	1.6	5500	*	*		8.5
621K	385	505	620	(558-682)	1025	500	35000	70000	1300	1.6	5000	*	*		8.8
681K	420	560	680	(612-748)	1120	500	35000	70000	1350	1.6	4500	*	*		9.1
751K	460	615	750	(675-825)	1240	500	35000	70000	1400	1.6	4000	*	*		9.5
781K	485	640	780	(702-858)	1290	500	35000	70000	1450	1.6	3900	*	*		9.7
821K	510	670	820	(738-902)	1355	500	35000	70000	1600	1.6	3700	*	*		9.9
911K	550	745	910	(819-1001)	1500	500	35000	70000	1700	1.6	3300	*	*		10.5
951K	575	765	950	(855-1045)	1570	500	35000	70000	1800	1.6	3200	*	*		10.7
102K	625	825	1000	(900-1100)	1650	500	35000	70000	1890	1.6	3000	*	*		11.3
112K	680	895	1100	(990-1210)	1815	500	35000	70000	2050	1.6	2700	*	*		11.9
122K	750	990	1200	(1080-1320)	1980	500	35000	70000	2050	1.6	2500	*	*		12.4
142K	880	1140	1400	(1260-1540)	2310	500	30000	60000	2300	1.6	2150	*	*		13.4
162K	1000	1280	1600	(1440-1760)	2640	500	30000	60000	2500	1.6	1900		*		14.4



	(mm)
D Max.	60.0
H Max.	78.2
W1 ±0.5	9.7
W2 ±0.1	0.7
M ±0.2	4.15
F ±1.0	25.4
T Max.	Please see above table, last column.
K	≤5.0

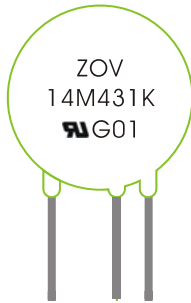


T-MOV

THERMAL CUT-OFF VARISTORS

Varistors in this section are integrated with thermal fuse. With excellent surge protection provided, they're designed to disconnect from circuit to avoid the overheat causing by abnormal overvoltage. Radial leads can be mounted to PCB securely.

Standard marking consists of our product brand, type designation, date code and safety approval marks if any.



ZOV

Varistors brand.

14M431K

Type designation.

ULG01

UL marking.

G01: date code. "G" stands for year 2007("H" for 2008...etc.); "01" stands for calendar week of the year.

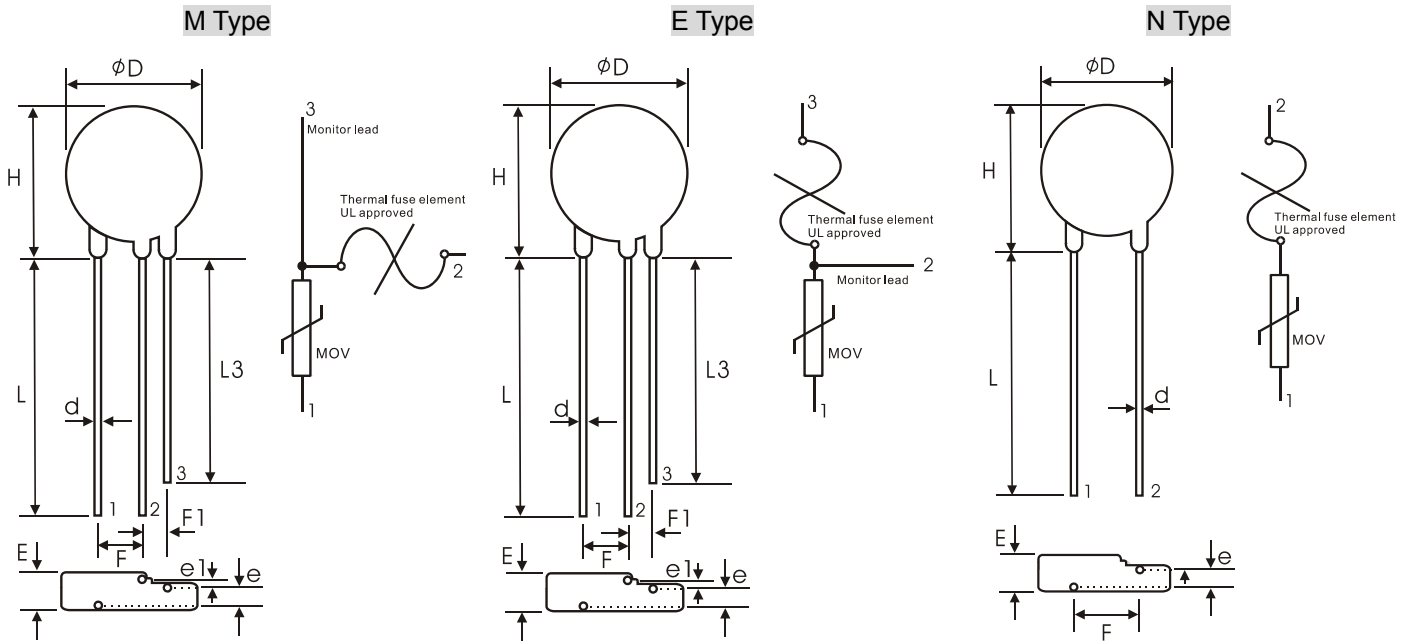
Green epoxy for RoHS compliant parts.

Part Numbering System

Please refer to the following part numbering system when place your order to us. If custom made parts or special specification are required, please kindly provide your detailed specification to us.

example **ZOV** **14** **M** **431** **K** - **S** **B**

<u>ZOV</u>	Brand Mark	ZOV is our product brand.
<u>14</u>	Diameter	These two digits stand for the varistors diameter. Which can be 14 / 20 / 25 mm.
<u>M</u>	Lead Type	Which can be M / E / N. M: 3 lead wires with fuse connecting to lead no. 2 E: 3 lead wires with fuse connecting to lead no. 3 N: 2 lead wires
<u>431</u>	Varistor Voltage	Varistor voltage is calculated by multiply the first two digits to the ten to the power of the third digit. Ex. 470 => $47 \times 10^0 = 47 \times 1 = 47 \text{ V}$ 241 => $24 \times 10^1 = 24 \times 10 = 240 \text{ V}$
<u>K</u>	Tolerance of Varistor Voltage	Which can be K. Or specially requested. K: $\pm 10\%$
<u>S</u>	Lead Style	Which can be S for straight lead. S: straight lead
<u>B</u>	Packing	Which can be B for bulk pack.



(mm)

		14M / E	14N	20M / E	20N	25M / E	25N
D Max.		19.0	19.0	24.0	24.0	29.0	29.0
H Max.		21.0	21.0	26.0	26.0	32.0	32.0
F ±1.0		7.5	7.5	7.5	7.5	7.5 12.5	7.5 12.5
F1 ±1.0		5.0	N/A	5.0	N/A	5.0 6.5	N/A
e	151K ~ 391K	3.8	3.8	3.8	3.8	3.8	3.8
	431K ~ 621K	5.5	5.5	5.5	5.5	5.5	5.5
	681K ~ 911K	7.8	7.8	7.8	7.8	7.8	7.8
	102K ~ 122K	10.0	10.0	10.0	10.0	10.0	10.0
e1 Max.	151K ~ 122K	2.0	N/A	2.2	N/A	3.5	N/A
E	151K ~ 391K	9.8	9.8	9.8	9.8	11.8	11.8
	431K ~ 621K	11.5	11.5	11.5	11.5	13.5	13.5
	681K ~ 911K	13.8	13.8	13.8	13.8	15.8	15.8
	102K ~ 122K	16.0	16.0	16.0	16.0	18.0	18.0
d ±0.05		0.8	0.8	1.0	1.0	1.0	1.0
L min. 20.0, L3 min. 10.0							

Note: The values in above table may be different from actual values. Please kindly contact with our sales office for further confirmation.



Quantity per package

		Bulk		Tape & Reel		Ammo	
		Pcs / Bag	Bags / Box	Pcs / Bag	Bags / Box	Pcs / Bag	Bags / Box
14M/E/N	820K~391K	250	2	TBA	TBA	TBA	TBA
	431K~911K	150	2	TBA	TBA	TBA	TBA
	102K~122K	TBA	TBA	TBA	TBA	TBA	TBA
20M/E/N	180K~331K	200	2	TBA	TBA	TBA	TBA
	361K~621K	150	2	TBA	TBA	TBA	TBA
	681K~112K	TBA	TBA	TBA	TBA	TBA	TBA
25M/E/N	180K~301K	TBA	TBA	N/A	N/A	N/A	N/A
	331K~561K	TBA	TBA	N/A	N/A	N/A	N/A
	621K~112K	TBA	TBA	N/A	N/A	N/A	N/A

Note: Actual packing quantity may be different from above table. Please kindly contact with our sales office for further confirmation.

Packaging Materials Dimensions

Please kindly refer to p. 13.



ZOV 14M/E/N Part No.	Max. Allowable Voltage		Varistor Voltage		Max. Clamping Voltage		Max. Peak Current		Max. Energy		Rated Power	Allowable Current	Typical Capacitance	Certificate Status		
	Acrms (V)	DC (V)	V @ 1Ma (V)		VC (V)	IP (A)	@ 8/20 μ s (A)		10/1000 μ s (J)	2ms (J)	(W)	(A)	@ 1 KHz (pf)	UL	CSA	VDE
							1 time	2 times								
820K	50	65	82	(74-90)	135	50	4500	2500	27	22	0.6	5	2400	*		
101K	60	85	100	(90-110)	165	50	4500	2500	33	28	0.6	5	2000	*		
121K	75	100	120	(108-132)	200	50	4500	2500	40	32	0.6	5	1700	*		
151K	95	125	150	(135-165)	250	50	6000	4500	50	35	0.6	5	1300	*		
181K	115	150	180	(162-198)	300	50	6000	4500	58	40	0.6	5	1100	*		
201K	130	170	200	(185-225)	340	50	6000	4500	70	50	0.6	5	1000	*		
221K	140	180	220	(198-242)	360	50	6000	4500	78	55	0.6	5	900	*		
241K	150	200	240	(216-264)	395	50	6000	4500	85	60	0.6	5	830	*		
271K	175	225	270	(243-297)	455	50	6000	4500	100	70	0.6	5	740	*		
301K	190	250	300	(270-330)	500	50	6000	4500	107	75	0.6	5	670	*		
331K	210	275	330	(297-363)	550	50	6000	4500	115	80	0.6	5	610	*		
361K	230	300	360	(324-396)	595	50	6000	4500	125	90	0.6	5	560	*		
391K	250	320	390	(351-429)	650	50	6000	4500	140	100	0.6	5	510	*		
431K	275	350	430	(387-473)	710	50	6000	4500	155	110	0.6	5	460	*		
471K	300	385	470	(423-517)	775	50	6000	4500	175	125	0.6	5	430	*		
511K	320	415	510	(459-561)	845	50	6000	4500	190	136	0.6	5	390	*		
561K	350	460	560	(504-616)	925	50	6000	4500	200	140	0.6	5	360	*		
621K	385	505	620	(558-682)	1025	50	6000	4500	210	150	0.6	5	320	*		
681K	420	560	680	(612-748)	1120	50	6000	4500	220	155	0.6	5	290	*		
751K	460	615	750	(675-825)	1240	50	6000	4500	225	160	0.6	5	270	*		
781K	485	640	780	(702-858)	1290	50	6000	4500	240	165	0.6	5	260	*		
821K	510	670	820	(738-902)	1355	50	6000	4500	245	170	0.6	5	240	*		
911K	550	745	910	(819-1001)	1500	50	6000	4500	255	180	0.6	5	220	*		
102K	625	825	1000	(900-1100)	1650	50	6000	4500	280	190	0.6	5	200	*		
112K	680	895	1100	(990-1210)	1815	50	6000	4500	310	205	0.6	5	180	*		
122K	750	990	1200	(1080-1320)	1980	50	6000	4500	310	210	0.6	5	150	*		



ZOV 20M/E/N Part No.	Max. Allowable Voltage		Varistor Voltage		Max. Clamping Voltage		Max. Peak Current		Max. Energy		Rated Power	Allowable Current	Typical Capacitance	Certificate Status		
	Acrms (V)	DC (V)	V @ 1Ma (V)		VC (V)	IP (A)	@ 8/20 μ s (A)		10/1000 μ s (J)	2ms (J)	(W)	(A)	@ 1 KHz (pf)	UL	CSA	VDE
							1 time	2 times								
820K	50	65	82	(74-90)	135	100	10000	6500	56	42	1.0	10	4900	*		
101K	60	85	100	(90-110)	165	100	10000	6500	70	52	1.0	10	4000	*		
121K	75	100	120	(108-132)	200	100	10000	6500	85	63	1.0	10	3300	*		
151K	95	125	150	(135-165)	250	100	10000	6000	100	70	1.0	10	2700	*		
181K	115	150	180	(162-198)	300	100	10000	6000	110	80	1.0	10	2200	*		
201K	130	170	200	(185-225)	340	100	10000	6000	140	100	1.0	10	2000	*		
221K	140	180	220	(198-242)	360	100	10000	6000	155	110	1.0	10	1800	*		
241K	150	200	240	(216-264)	395	100	10000	6000	170	120	1.0	10	1650	*		
271K	175	225	270	(243-297)	455	100	10000	6000	190	135	1.0	10	1500	*		
301K	190	250	300	(270-330)	500	100	10000	6000	205	145	1.0	10	1300	*		
331K	210	275	330	(297-363)	550	100	10000	6000	215	150	1.0	10	1200	*		
361K	230	300	360	(324-396)	595	100	10000	6000	225	160	1.0	10	1100	*		
391K	250	320	390	(351-429)	650	100	10000	6000	240	170	1.0	10	1000	*		
431K	275	350	430	(387-473)	710	100	10000	6000	270	190	1.0	10	930	*		
471K	300	385	470	(423-517)	775	100	10000	6000	350	250	1.0	10	850	*		
511K	320	415	510	(459-561)	845	100	10000	6000	380	270	1.0	10	780	*		
561K	350	460	560	(504-616)	925	100	10000	6000	400	280	1.0	10	710	*		
621K	385	505	620	(558-682)	1025	100	10000	6000	425	300	1.0	10	650	*		
681K	420	560	680	(612-748)	1120	100	10000	6000	455	300	1.0	10	600	*		
751K	460	615	750	(675-825)	1240	100	10000	6000	455	320	1.0	10	530	*		
781K	485	640	780	(702-858)	1290	100	10000	6000	455	320	1.0	10	510	*		
821K	510	670	820	(738-902)	1355	100	10000	6000	475	320	1.0	10	500	*		
911K	550	745	910	(819-1001)	1500	100	10000	6000	500	350	1.0	10	440	*		
102K	625	825	1000	(900-1100)	1650	100	10000	6000	560	400	1.0	10	400	*		
112K	680	895	1100	(990-1210)	1815	100	10000	6000	610	430	1.0	10	360	*		
122K	750	990	1200	(1080-1320)	1980	100	10000	6000	650	460	1.0	10	320	*		



ZOV 25M/E/N Part No.	Max. Allowable Voltage		Varistor Voltage		Max. Clamping Voltage		Max. Peak Current		Max. Energy		Rated Power	Allowable Current	Typical Capacitance	Certificate Status		
	Acrms (V)	DC (V)	V @ 1Ma (V)	VC (V)	IP (A)	@ 8/20 μ s (A)		10/1000 μ s (J)	2ms (J)	(W)	(A)	@ 1 KHz (pf)	UL	CSA	VDE	
						1 time	2 times									
151K	95	125	150	(135-165)	250	150	18000	12000	160	105	1.2	20	4300	*		
181K	115	150	180	(162-198)	300	150	18000	12000	175	120	1.2	20	3500	*		
201K	130	170	200	(185-225)	340	150	18000	12000	210	150	1.2	20	3200	*		
221K	140	180	220	(198-242)	360	150	18000	12000	230	165	1.2	20	2900	*		
241K	150	200	240	(216-264)	395	150	18000	12000	255	180	1.2	20	2650	*		
271K	175	225	270	(243-297)	455	150	18000	12000	285	205	1.2	20	2400	*		
301K	190	250	300	(270-330)	500	150	18000	12000	310	225	1.2	20	2100	*		
331K	210	275	330	(297-363)	550	150	18000	12000	325	225	1.2	20	1900	*		
361K	230	300	360	(324-396)	595	150	18000	12000	340	240	1.2	20	1750	*		
391K	250	320	390	(351-429)	650	150	18000	12000	360	250	1.2	20	1600	*		
431K	275	350	430	(387-473)	710	150	18000	12000	440	310	1.2	20	1500	*		
471K	300	385	470	(423-517)	775	150	18000	12000	490	345	1.2	20	1400	*		
511K	320	415	510	(459-561)	845	150	18000	12000	530	370	1.2	20	1250	*		
561K	350	460	560	(504-616)	925	150	18000	12000	560	390	1.2	20	1150	*		
621K	385	505	620	(558-682)	1025	150	18000	12000	590	410	1.2	20	1050	*		
681K	420	560	680	(612-748)	1120	150	18000	12000	620	430	1.2	20	950	*		
751K	460	615	750	(675-825)	1240	150	18000	12000	630	440	1.2	20	850	*		
781K	485	640	780	(702-858)	1290	150	18000	12000	675	470	1.2	20	800	*		
821K	510	670	820	(738-902)	1355	150	18000	12000	690	480	1.2	20	750	*		
911K	550	745	910	(819-1001)	1500	150	18000	12000	715	500	1.2	20	700	*		
102K	625	825	1000	(900-1100)	1650	150	18000	12000	750	505	1.2	20	650	*		
112K	680	895	1100	(990-1210)	1815	150	18000	12000	780	550	1.2	20	600	*		
122K	750	990	1200	(1080-1320)	1980	150	18000	12000	840	590	1.2	20	550	*		

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