



## Features

- Four model sizes available - 7, 10, 14, and 20 mm
- Three lead styles available
- Broad range of current and energy handling capabilities
- 150 to 550 V<sub>rms</sub> AC voltage range
- 200 to 745 V<sub>dc</sub> DC operating voltage range
- RoHS compliant\*

## EV Series - EdgMOV™ High Surge Disc Varistors

### General Information

The EV series of EdgMOV™ disc varistors feature extra high surge capability in reduced case sizes. The EV series consists of 7 mm, 10 mm, 14 mm and 20 mm sized varistors with extremely high current and energy capabilities. This series provides an increased level of protection for the transients expected in telecommunication and AC power networks. The AC operating voltage ranges from 150 V to 550 V.

### Absolute Maximum Ratings

Parameter	Value	Units
<b>Continuous:</b>		
Steady State Applied Voltage		
DC Voltage Range (V <sub>dc</sub> )	200 to 745	V
AC Voltage Range (V <sub>rms</sub> )	150 to 550	V
<b>Transient:</b>		
Peak Single Pulse Surge Current, 8/20 μs Waveform (I <sub>max</sub> )	2500 to 15000	A
Operating Ambient Temperature	-40 to +105	°C
Storage Temperature Range	-40 to +125	°C
Threshold Voltage Temperature Coefficient	< +0.05	%/°C
Insulation Resistance	> 1	GΩ
Isolation Voltage Capability	> 2.5	kV
Response Time	< 25	ns
Climatic Category	40 / 105 / 56	

### Additional Information

Click these links for more information:

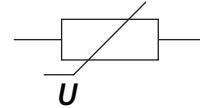


### Agency Recognition

Standard	UL 1449
File Number	<a href="#">E313168**</a>

\*\* Although UL recognition information shows I<sub>n</sub> = 5 kA due to UL 1449 nominal current selection of either 1,3,5,10 or 20 kA, EVxxxK20 models were tested and approved at 8 kA.

### Varistor Symbol



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**WARNING Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)**

\*RoHS Directive 2015/863, Mar 31, 2015 and Annex.

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# EV Series - EdgMOV™ High Surge Disc Varistors

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## Device Ratings

Model	V <sub>rms</sub>	V <sub>dc</sub>	V <sub>n</sub> @ 1 mA	V <sub>c</sub> max.	I <sub>c</sub> (8/20 μs)	I <sub>n</sub> (8/20 μs) 15 Times	I <sub>max</sub> (8/20 μs) 1 Time	C @ 1 kHz
	V	V	V	V	A	A	A	pF
EV150K7	150	200	240	395	25	1500	2500	280
EV150K10	150	200	240	395	50	3000	5000	510
EV150K14	150	200	240	395	100	5000	8000	900
EV150K20**	150	200	240	395	150	8000	12000	1600
EV175K7	175	225	270	455	25	1500	2500	250
EV175K10	175	225	270	455	50	3000	5000	440
EV175K14	175	225	270	455	100	5000	8000	800
EV175K20**	175	225	270	455	150	8000	12000	1400
EV230K7	230	300	360	595	25	1500	2500	190
EV230K10	230	300	360	595	50	3000	5000	350
EV230K14	230	300	360	595	100	5000	8000	650
EV230K20**	230	300	360	595	150	8000	12000	1200
EV250K7	250	320	390	650	25	1500	2500	180
EV250K10	250	320	390	650	50	3000	5000	320
EV250K14	250	320	390	650	100	5000	8000	580
EV250K20**	250	320	390	650	150	8000	12000	1000
EV275K7	275	350	430	710	25	1500	2500	160
EV275K10	275	350	430	710	50	3000	5000	300
EV275K14	275	350	430	710	100	5000	8000	530
EV275K20**	275	350	430	710	150	8000	12000	900
EV300K7	300	385	470	775	25	1000	2500	150
EV300K14	300	385	470	775	100	5000	8000	490
EV300K20**	300	385	470	775	150	8000	12000	850
EV320K7	320	420	510	840	25	1000	2500	140
EV320K14	320	420	510	840	100	5000	8000	460
EV320K20**	320	420	510	840	150	8000	12000	800
EV385K7	385	505	620	1025	25	1000	2500	130
EV385K14	385	505	620	1025	100	5000	8000	400
EV385K20**	385	505	620	1025	150	8000	12000	700
EV420K14	420	560	680	1120	100	5000	8000	350
EV420K20	420	560	680	1120	150	8000	12000	650
EV460K14	460	615	750	1240	100	5000	8000	330
EV460K20**	460	615	750	1240	150	8000	12000	550
EV510K14	510	670	820	1355	100	5000	8000	310
EV510K20**	510	670	820	1355	150	8000	12000	510
EV550K10	550	745	910	1500	50	3000	6000	170
EV550K14	550	745	910	1500	100	5000	10000	290
EV550K20**	550	745	910	1500	150	8000	15000	480

\*\* Although UL recognition information shows I<sub>n</sub> = 5 kA due to UL 1449 nominal current selection of either 1,3,5,10 or 20 kA, EVxxxK20 models were tested and approved at 8 kA.

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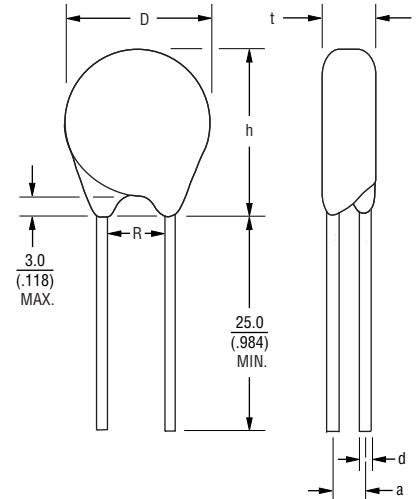
## Product Dimensions

Model	Dimension						
	D (Max.)	t (Max.)	R ± 1.0 (.039)	d ± 0.05 (.002)	h (Max.)	a ± 1.0 (.039)	A (Max.)
EV150K7	9.0 (.35)	4.3 (.17)	5.0 (.20)	0.6 (.02)	11.5 (.45)	2.0 (.08)	15.5 (.61)
EV150K10	12.5 (.49)	4.6 (.18)	7.5 (.30)	0.8 (.03)	15 (.59)	2.2 (.09)	18.0 (.71)
EV150K14	16.5 (.65)	4.8 (.19)	7.5 (.30)	0.8 (.03)	20 (.79)	2.2 (.09)	23.0 (.91)
EV150K20	22.5 (.89)	5.2 (.21)	10 (.39)	1.0 (.04)	26 (1.02)	2.4 (.09)	27.0 (1.06)
EV175K7	9.0 (.35)	4.8 (.19)	5.0 (.20)	0.6 (.02)	11.5 (.45)	2.1 (.08)	15.5 (.61)
EV175K10	12.5 (.49)	4.9 (.19)	7.5 (.30)	0.8 (.03)	15 (.59)	2.3 (.09)	18.0 (.71)
EV175K14	16.5 (.65)	4.9 (.19)	7.5 (.30)	0.8 (.03)	20 (.79)	2.3 (.09)	23.0 (.91)
EV175K20	22.5 (.89)	5.3 (.25)	10 (.39)	1.0 (.04)	26 (1.02)	2.5 (.10)	27.0 (1.06)
EV230K7	9.0 (.35)	4.8 (.19)	5.0 (.20)	0.6 (.02)	11.5 (.45)	2.6 (.10)	15.5 (.61)
EV230K10	12.5 (.49)	5.4 (.21)	7.5 (.30)	0.8 (.03)	15 (.59)	2.8 (.11)	18.0 (.71)
EV230K14	16.5 (.65)	5.5 (.22)	7.5 (.30)	0.8 (.03)	20 (.79)	2.8 (.11)	23.0 (.91)
EV230K20	22.5 (.89)	5.9 (.23)	10 (.39)	1.0 (.04)	26 (1.02)	3.0 (.12)	27.0 (1.06)
EV250K7	9.0 (.35)	5.0 (.20)	5.0 (.20)	0.6 (.02)	11.5 (.45)	2.8 (.11)	15.5 (.61)
EV250K10	12.5 (.49)	5.6 (.22)	7.5 (.30)	0.8 (.03)	15 (.59)	3.0 (.12)	18.0 (.71)
EV250K14	16.5 (.65)	5.7 (.22)	7.5 (.30)	0.8 (.03)	20 (.79)	3.0 (.12)	23.0 (.91)
EV250K20	22.5 (.89)	6.1 (.24)	10 (.39)	1.0 (.04)	26 (1.02)	3.2 (.13)	27.0 (1.06)
EV275K7	9.0 (.35)	5.6 (.22)	5.0 (.20)	0.6 (.02)	11.5 (.45)	3.0 (.12)	15.5 (.61)
EV275K10	12.5 (.49)	5.8 (.23)	7.5 (.30)	0.8 (.03)	15 (.59)	3.2 (.13)	18.0 (.71)
EV275K14	16.5 (.65)	5.9 (.23)	7.5 (.30)	0.8 (.03)	20 (.79)	3.2 (.13)	23.0 (.91)
EV275K20	22.5 (.89)	6.3 (.25)	10 (.39)	1.0 (.04)	26 (1.02)	3.4 (.13)	27.0 (1.06)
EV300K7	9.0 (.35)	5.8 (.23)	5.0 (.20)	0.6 (.02)	11.5 (.45)	3.2 (.13)	15.5 (.61)
EV300K14	16.5 (.65)	6.1 (.24)	7.5 (.30)	0.8 (.03)	20 (.79)	3.4 (.13)	23.0 (.91)
EV300K20	22.5 (.89)	6.6 (.26)	10 (.39)	1.0 (.04)	26 (1.02)	3.6 (.14)	27.0 (1.06)
EV320K7	9.0 (.35)	6.0 (.24)	5.0 (.20)	0.6 (.02)	11.5 (.45)	6.4 (.25)	15.5 (.61)
EV320K14	16.5 (.65)	6.8 (.27)	7.5 (.30)	0.8 (.03)	20 (.79)	3.6 (.14)	23.0 (.91)
EV320K20	22.5 (.89)	6.8 (.27)	10 (.39)	1.0 (.04)	26 (1.02)	3.8 (.15)	27.0 (1.06)

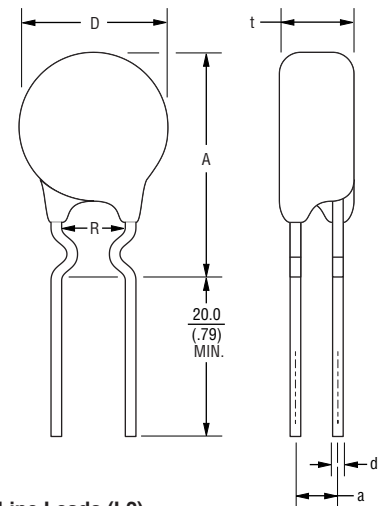
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DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

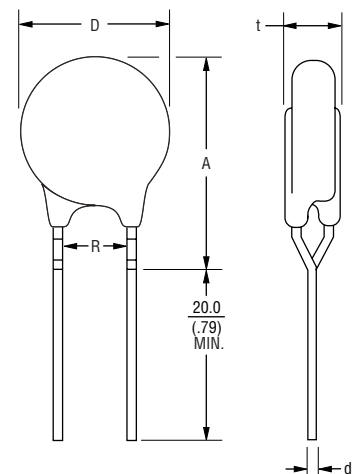
### Straight Leads (L1)



### Crimped Leads (L5)



### In-Line Leads (L2)



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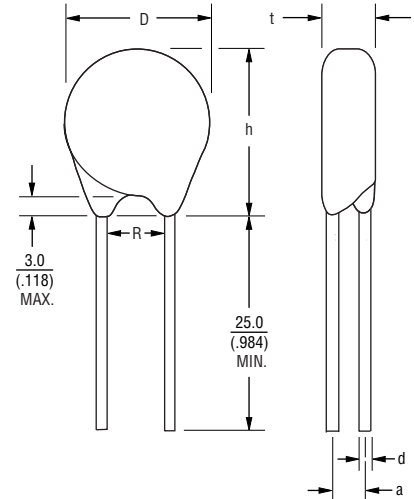
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## Product Dimensions (Continued)

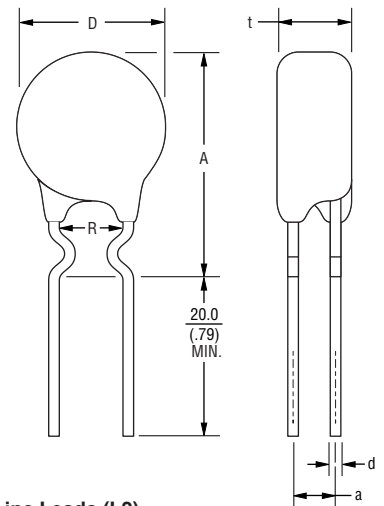
Model	Dimension						
	D (Max.)	t (Max.)	R ± 1.0 (.039)	d ± 0.05 (.002)	h (Max.)	a ± 1.0 (.039)	A (Max.)
EV385K7	9.0 (.35)	6.5 (.26)	5.0 (.20)	0.6 (.02)	11.5 (.45)	6.9 (.27)	15.5 (.61)
EV385K14	16.5 (.65)	7.4 (.29)	7.5 (.30)	0.8 (.03)	20 (.79)	4.2 (.17)	23.0 (.91)
EV385K20	22.5 (.89)	7.5 (.30)	10 (.39)	1.0 (.04)	26 (1.02)	4.4 (.17)	27.0 (1.06)
EV420K14	16.5 (.65)	7.4 (.29)	7.5 (.30)	0.8 (.03)	20 (.79)	4.4 (.17)	23.0 (.91)
EV420K20	22.5 (.89)	7.8 (.31)	10 (.39)	1.0 (.04)	26 (1.02)	4.6 (.18)	27.0 (1.06)
EV460K14	16.5 (.65)	7.8 (.31)	7.5 (.30)	0.8 (.03)	20 (.79)	4.8 (.19)	23.0 (.91)
EV460K20	22.5 (.89)	8.2 (.32)	10 (.39)	1.0 (.04)	26 (1.02)	5.0 (.20)	27.0 (1.06)
EV510K14	16.5 (.65)	8.2 (.32)	7.5 (.30)	0.8 (.03)	20 (.79)	5.1 (.20)	23.0 (.91)
EV510K20	22.5 (.89)	8.7 (.34)	10 (.39)	1.0 (.04)	26 (1.02)	5.3 (.21)	27.0 (1.06)
EV550K10	12.5 (.49)	8.8 (.35)	7.5 (.30)	0.8 (.03)	15 (.59)	5.6 (.22)	18.0 (.71)
EV550K14	16.5 (.65)	8.8 (.35)	7.5 (.30)	0.8 (.03)	20 (.79)	5.6 (.22)	23.0 (.91)
EV550K20	22.5 (.89)	9.2 (.36)	10 (.39)	1.0 (.04)	26 (1.02)	5.8 (.223)	27.0 (1.06)

DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

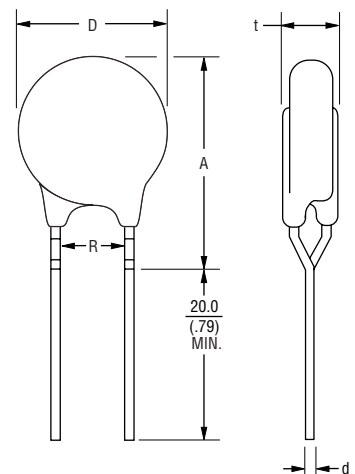
### Straight Leads (L1)



### Crimped Leads (L5)



### In-Line Leads (L2)

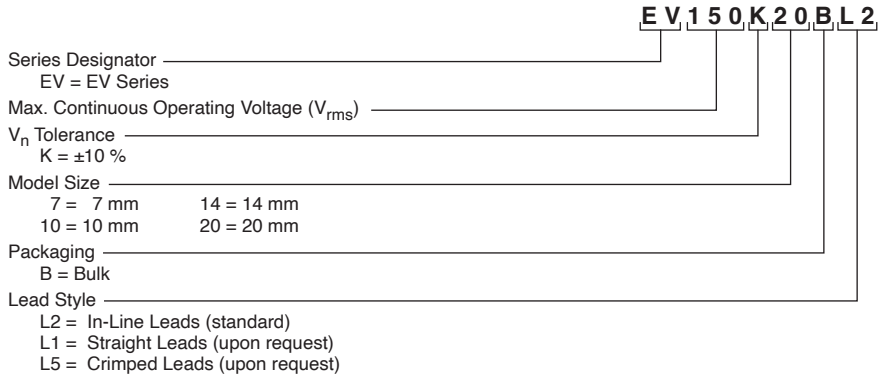


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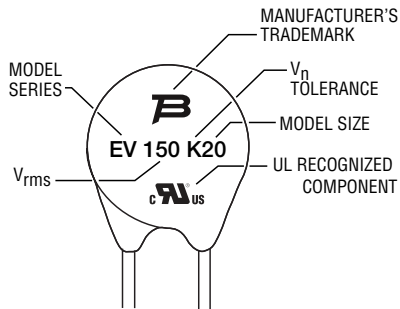
## How to Order



## Instructions for Creating Orderable Part Number:

- 1) Start with base part number in characteristics table  
(example: *EV150K20*).
- 2) Add Packaging: B  
(example part number becomes *EV150K20B*).
- 3) Add Lead Style: L2  
(example part number becomes *EV150K20BL2*).
- 4) Part number can have no spaces or lower case letters.

## Typical Part Marking



## Packaging Quantities - Bulk

Voltage	Model Size			
	7	10	14	20
150	1000	500	400	300
175	1000	500	400	300
230	1000	500	300	300
250	1000	500	300	200
275	1000	500	300	200
300	1000	-	300	200
320	1000	-	300	200
385	1000	-	300	200
420	-	-	300	200
460	-	-	300	200
510	-	-	300	200
550	-	300	300	200

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## Terminology

Term	Symbol	Definition
Rated AC Voltage .....	$V_{rms}$ .....	Maximum continuous sinusoidal AC voltage (<5 % total harmonic distortion) which may be applied to the component under continuous operation conditions at +25 °C
Rated DC Voltage .....	$V_{dc}$ .....	Maximum continuous DC voltage (<5 % ripple) which may be applied to the component under continuous operating conditions at +25 °C
Supply Voltage.....	$V$ .....	The voltage by which the system is designated and to which certain operating characteristics of the system are referred; $V_{rms} = 1.1 \times V$
Leakage Current.....	$I_{dc}$ .....	The current passing through the varistor at $V_{dc}$ and at +25 ° or at any other specified temperature
Varistor Voltage .....	$V_n$ .....	Voltage across the varistor measured at a given reference current ( $I_n$ )
Reference Current.....	$I_n$ .....	Reference current = 1 mA DC
Clamping Voltage .....	$V_c$ .....	The peak voltage developed across the varistor under standard atmospheric conditions, when passing an 8/20 $\mu s$ class current pulse
Protection Level		
Class Current.....	$I_c$ .....	A peak value of current which is 1/10 of the maximum peak current for 100 pulses at two per minute for the 8/20 $\mu s$ pulse
Rated Peak Single Pulse.....	$I_{max}$ .....	Maximum peak current which may be applied for a single 8/20 $\mu s$ pulse, with rated line voltage also applied, without causing device failure
Transient Current		
Capacitance.....	$C$ .....	Capacitance between two terminals of the varistor measured @ 1 kHz
Response Time.....	$t_r$ .....	The time lag between application of a surge and varistor's "turn-on" conduction action
Varistor Voltage Temperature .....	$TC$ .....	$(V_n @ 85 \text{ °C} - V_n @ 25 \text{ °C}) / (V_n @ 25 \text{ °C}) \times 60 \text{ °C} \times 100$
Coefficient		
Insulation Resistance .....	$IR$ .....	Minimum resistance between shorted terminals and varistor surface
Operating Temperature .....		The range of ambient temperature for which the varistor is designed to operate continuously as defined by the temperature limits of its climatic category
Climatic Category .....	LCT/UCT/DHD .....	LCT & UCT = Lower and Upper Category Temperature - the minimum and maximum ambient temperatures for which a varistor has been designed to operate continuously. DHD = Dump Heat Test Duration
Storage Temperature.....		Storage temperature range without voltage applied

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