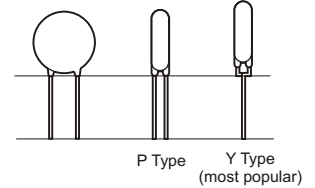


### HOW TO SELECT METAL OXIDE VARISTORS

- What is the range of ACrms or DC Voltage in the application?
- How will the varistor be connected in the circuit?
- Calculate the required varistor voltage at 10% to 25% above the system RMS or DC Voltage.
- Calculate the varistor energy rating needed based on energy in transient voltage.
- Calculate the surge current wave form from the surge voltage and surge impedance.
- Check to make sure the withstanding surge current of the varistor is sufficient.
- Check whether the maximum energy and surge life of the varistor is enough.
- Check the relation:



Maximum withstanding voltage of the protected device > Maximum clamping voltage of the varistor > The real clamping voltage occurred > Breakdown voltage of the varistor > Operating voltage of the protected device.

### 7 φ JVR VARSITOR

Part Number	Maximum Allowable Voltage		Varistor Voltage V@0.1mA		Maximum Clamping Voltage V@ 5A (V)	Withstanding Surge Current		Rated Wattage (W)	Energy 10/1000 μs (J)	UL	CSA	VDE
	ACrms (V)	DC (V)	Tolerance Range (V)	1Time (A)		2 Times (A)						
							± 20%					
JVR07N180M65□△△	11	14	18	± 20%	*36	250	125	0.02	1.2	✓		
JVR07N220L 65□△△	14	18	22	± 15%	* 43				1.4	✓		
JVR07N270K65□△△	17	22	27		* 53				1.7	✓		
JVR07N330K65□△△	20	26	33		* 65				2.2	✓		
JVR07N390K65□△△	25	31	39		* 77				2.4	✓		
JVR07N470K65□△△	30	38	47		* 93				3	✓		
JVR07N560K65□△△	35	45	56		* 110				3.5	✓		
JVR07N680K65□△△	40	56	68		* 135	4.3	✓					
JVR07N820K65□△△	50	65	82		135	5.5	✓		✓			
JVR07N101K65□△△	60	85	100		165	7.0	✓		✓			
JVR07N121K65□△△	75	100	120		200	8.0	✓		✓			
JVR07N151K65□△△	95	125	150		250	11.0	✓		✓			
JVR07N181K65□△△	115	150	180		300	13.0	✓		✓			
JVR07N201K65□△△	130	170	200		340	14.3	✓	✓	✓			
JVR07N221K65□△△	140	180	220	±10%	360	15.5	✓	✓	✓			
JVR07N241K65□△△	150	200	240		395	16.8	✓	✓	✓			
JVR07N271K65□△△	175	225	270		455	19.8	✓	✓	✓			
JVR07N301K65□△△	195	250	300		505	21.0	✓	✓	✓			
JVR07N331K65□△△	210	275	330		550	23.0	✓	✓	✓			
JVR07N361K65□△△	230	300	360		595	26.0	✓	✓	✓			
JVR07N391K65□△△	250	320	390		650	30.0	✓	✓	✓			
JVR07N431K65□△△	275	350	430		710	33.0	✓	✓	✓			
JVR07N471K65□△△	300	385	470		775	35.0	✓	✓	✓			
JVR07N511K65□△△	320	418	510		842	37.0	✓	✓				
JVR07N561K65□△△	350	460	560		920	39.0	✓	✓				
JVR07N621K65□△△	385	505	620		1025	41.0	✓	✓				
JVR07N681K65□△△	420	560	680		1120	43.0	✓	✓				
JVR07N751K65□△△	460	615	750		1240	45.0	✓	✓				
JVR07N781K65□△△	485	640	780		1290	46.0	✓	✓				
JVR07N821K65□△△	510	670	820		1355	47.0	✓	✓				

1) The clamping voltage from 180M to 680K are tested with current 2.5A  
For application required ratings not shown, contact RFE application engineering.

□ : Lead Style  
Y: vertical kink (standard)  
P: straight leads  
△△ : Lead Length / Packing Method

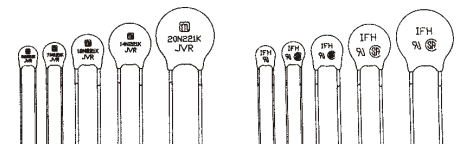
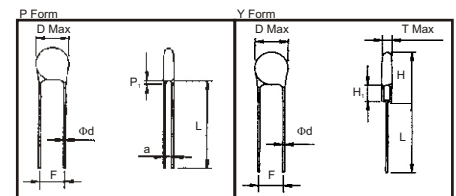
### DIMENSION OF COMPONENT

Dimension Table unit: mm

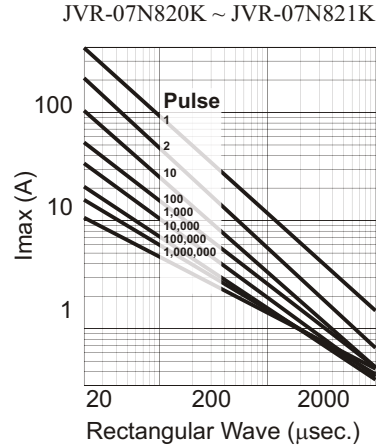
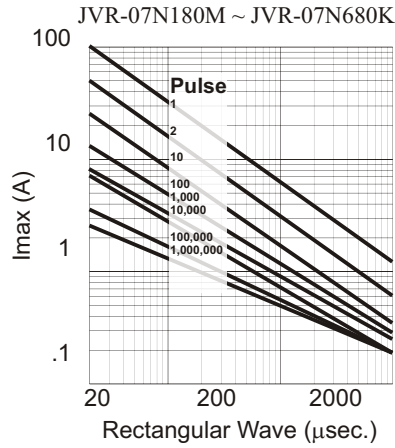
Dimension	7 φ
D max	9.0
d (+0.5)	0.6
F (±1)	5.0
H Max	13.0
H <sub>i</sub> Max	3.5
L Min (Y Type)	24.0
L Min (P Type)	25.0

Table of T Max, & a

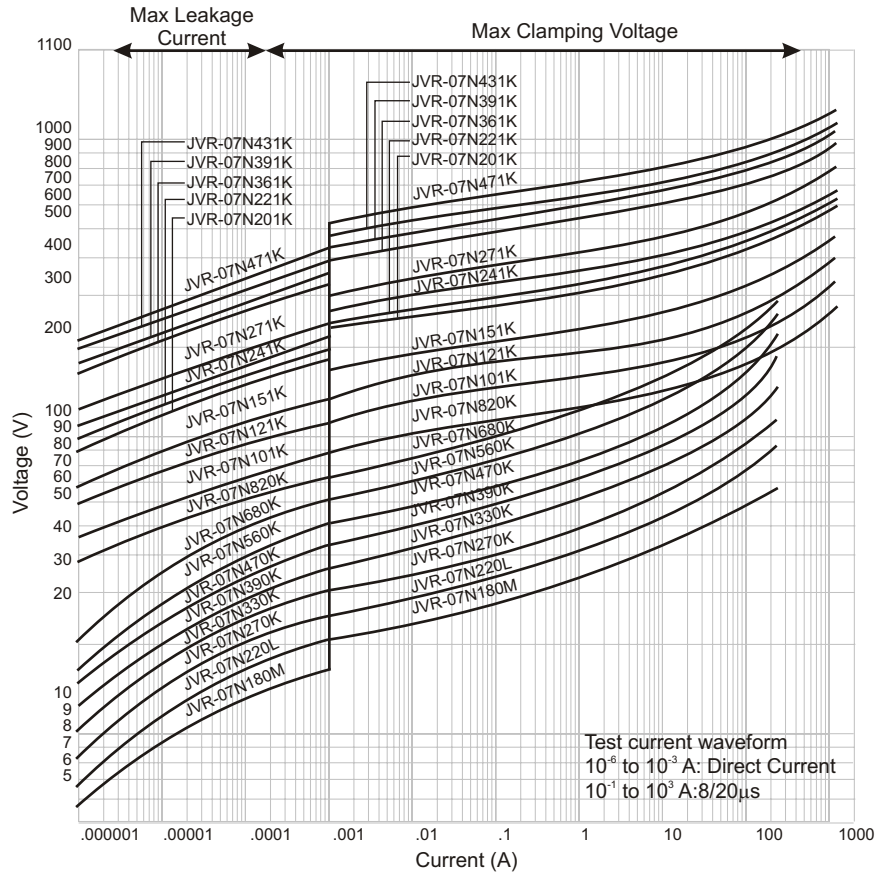
Diameter (φ)	Dimension		Diameter (φ)	Dimension	
Code	T Max	a + 0.8	Code	T Max	a + 0.8
180M	4.5	0.8	241K	4.4	1.3
220M/L	4.5	0.9	271K	4.6	1.4
270M/K	4.7	0.9	301K	4.8	1.5
330M/K	4.7	1.0	331K	4.9	1.5
390L/K	4.7	1.2	361K	5.1	1.9
470L/K	5.0	1.2	391K	5.3	2.0
560L/K	5.0	1.4	431K	6.1	2.0
680L/K	5.5	1.7	471K	6.4	2.3
820K	3.8	0.8	511K	6.6	2.5
101K	3.9	0.8	561K	6.9	2.8
121K	4.1	0.9	621K	7.2	3.1
151K	4.5	1.2	681K	7.5	3.4
181K	4.1	1.0	751K	7.9	3.7
201K	4.2	1.0	781K	8.1	3.9
221K	4.3	1.1	821K	8.3	4.1



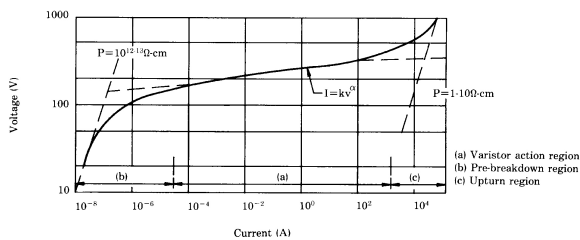
**PULSE RATING CURVES**



**7mm V-I CHARACTERISTIC CURVE**

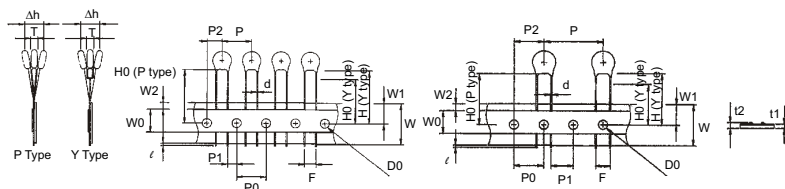


**CURRENT - VOLTAGE CHARACTERISTICS**



•Operating & Storage Temperature Range: -40 to +125°C  
•Temp. Coefficient of voltage: 0 ~ 0.05% / °C max

### TAPING SPECIFICATIONS

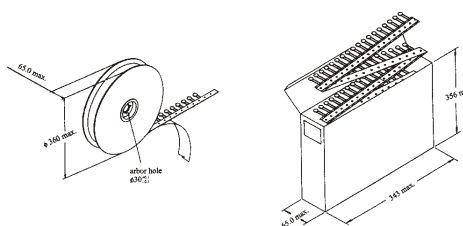


units: mm

Symbol	Item	Dimensions	Symbol	Item	Dimensions
$\ell$	Cut out length	1.1 max	P	Pitch of component	$12.7 \pm 0.3$
H (Y Type)	Height of Component from hole center	20.0 max	P0	Sprocket hole pitch	$12.7 \pm 0.3$
H0 (Y Type)	Height to seating plane	$16.0 \pm 0.5$	P1	Lead length from hold center lead	$3.85 \pm 0.7$
H0 (P Type)	Height of component from hole center	$16.0 \sim 21.0$	P2	Length from hole center to disk center	$6.35 \pm 1.3$
$\Delta h$	Front to back deveation	$0 \pm 2.0$	D0	Procket hole diameter	$4.0 \pm 0.2$
W	Carrier tape width	$18.0 \pm 1-0.5$	d	Lead wire diameter	$0.6 \pm 0.05$
W0	Hold down tape width	10	T	Disk Thickness	See T max table
W1	Sprocket hole position	$9.0 + 0.75 - 0.5$	t1	Total thickness tape	$0.7 \pm 0.05$
W2	Adhesive tape position	3.0 max	t2	Total thickness tape with tape	1.6 max
F	Component lead spacing	$5.0 + 0.8 - 0.2$			

### REEL & AMMO SPECIFICATIONS

Voltage Code	Bulk (Box)	Reel	Ammo
180 ~ 331	5000	1500	1500
361	5000	1500	1000
391	5000	1500	1000
431 ~ 471	5000	1000	1000
511 ~ 751	4000	1000	1000



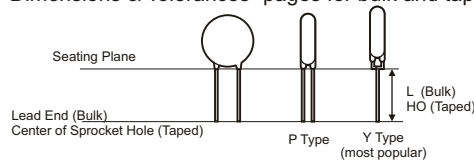
### PART NUMBER EXAMPLE

**JVR - 07 N 180 K 6 5 Y RW**  
(1) (2) (3) (4) (5)(6)(7)(8) (9)

- Series (JVR) Metal Oxide Varistor
- Disc Diameter or size
- N for standard
- Varistor Voltage
- Tolerance:
  - K =  $\pm 10\%$
  - L =  $\pm 15\%$
  - M =  $\pm 20\%$
- Lead Diameter
  - 6:  $0.6 \pm 0.05\text{mm}$
- Lead Spacing
  - 5: 5.0mm
- Y or P Type Lead Configurations

### STANDARD LEAD CONFIGURATIONS

See "Dimensions & Tolerances" pages for bulk and taping specifications



#### 9 - Lead Length / Packaging

Lead Type	Code	Dimension*	Packaging
Y Type Leads	50	L = $5 \pm 0.5\text{mm}$	Bulk
	U4	L = 24mm min.	Bulk
	AW	HO = 16mm	Ammo
	RW	HO = 16mm	Reel
	AX	HO = 18mm	Ammo
	RX	HO = 18mm	Reel
P Type Leads	AZ	HO = 20mm	Ammo
	50	L = $5 \pm 0.5\text{mm}$	Bulk
	U5	L = 25mm min.	Bulk
	AY	HO = 20mm	Ammo
	RY	HO = 20mm	Reel

\* See "Dimensions & Tolerances" pages, for dimension illustration.  
L - From seating plane to end of lead.  
HO - From seating plane to center of sprocket feed hole.