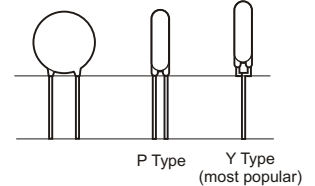


HOW TO SELECT METAL OXIDE VARISTORS

- 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.

20 φ JVR VARSITOR

Part Number	Maximum Allowable Voltage		Varistor Voltage V@0.1mA		Maximum Clamping Voltage V@ 5A	Withstanding Surge Current		Rated Wattage (W)	Energy 10/1000 μs (J)	UL	CSA	VDE
	ACrms (V)	DC (V)	(V)	Tolerance Range		1Time (A)	2 Times (A)					
JVR20N180M11□□△△	11	14	18	+ 20%	*36	2000	1000	0.2	7.0	✓	✓	✓
JVR20N220L 11□□△△	14	18	22	± 15%	* 43				8.0	✓	✓	✓
JVR20N270K11□□△△	17	22	27		* 53				10.0	✓	✓	✓
JVR20N330K11□□△△	20	26	33		* 65				12.0	✓	✓	✓
JVR20N390K11□□△△	25	31	39		* 77				14.0	✓	✓	✓
JVR20N470K11□□△△	30	38	47		* 93				17.0	✓	✓	✓
JVR20N560K11□□△△	35	45	56		* 110				20.0	✓	✓	✓
JVR20N680K11□□△△	40	56	68		* 135				24.0	✓	✓	✓
JVR20N820K11□□△△	50	65	82		135				44.0	✓	✓	✓
JVR20N101K11□□△△	60	85	100		165				56.0	✓	✓	✓
JVR20N121K11□□△△	75	100	120		200	64.0	✓	✓	✓			
JVR20N151K11□□△△	95	125	150		250	88.0	✓	✓	✓			
JVR20N181K11□□△△	115	150	180		300	104.0	✓	✓	✓			
JVR20N201K11□□△△	130	170	200		340	114.0	✓	✓	✓			
JVR20N221K11□□△△	140	180	220	±10%	360	124.0	✓	✓	✓			
JVR20N241K11□□△△	150	200	240		395	134.0	✓	✓	✓			
JVR20N271K11□□△△	175	225	270		455	158.0	✓	✓	✓			
JVR20N301K11□□△△	195	250	300		505	168.0	✓	✓	✓			
JVR20N331K11□□△△	210	275	330		550	184.0	✓	✓	✓			
JVR20N361K11□□△△	230	300	360		595	208.0	✓	✓	✓			
JVR20N391K11□□△△	250	320	390		650	240.0	✓	✓	✓			
JVR20N431K11□□△△	275	350	430		710	264.0	✓	✓	✓			
JVR20N471K11□□△△	300	385	470		775	280.0	✓	✓	✓			
JVR20N511K11□□△△	320	418	510		842	296.0	✓	✓	✓			
JVR20N561K11□□△△	350	460	560		920	312.0	✓	✓	✓			
JVR20N621K11□□△△	385	505	620		1025	328.0	✓	✓	✓			
JVR20N681K11□□△△	420	560	680		1120	344.0	✓	✓	✓			
JVR20N751K11□□△△	460	615	750		1240	360.0	✓	✓	✓			
JVR20N781K11□□△△	485	640	780		1290	368.0	✓	✓	✓			
JVR20N821K11□□△△	510	670	820		1355	376.0	✓	✓	✓			
JVR20N911K11□□△△	550	745	910		1500	408.0	✓	✓	✓			
JVR20N102K11□□△△	625	825	1000		1650	448.0	✓	✓	✓			
JVR20N112K11□□△△	680	895	1100		1815	496.0	✓	✓	✓			
JVR20N182K11□□△△	1000	1465	1800		2970	695.0	✓	✓	✓			

1) The clamping voltage from 180M to 680K are tested with current 20A
For application required ratings not shown, contact RFE application engineering.

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

DIMENSION OF COMPONENT

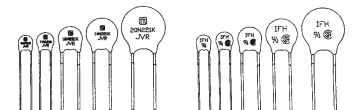
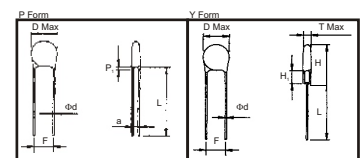
Dimension Table unit: mm

Dimension	20 φ
D max	23.0
d (+0.5)	0.8 / 1.0
F (+1)	7.5 / 10.0
H Max	28 / *29
H ₁ Max	5.0
L Min (Y Type)	24.0
L Min (P Type)	25.0

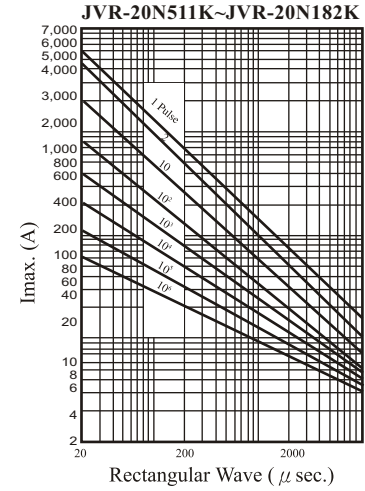
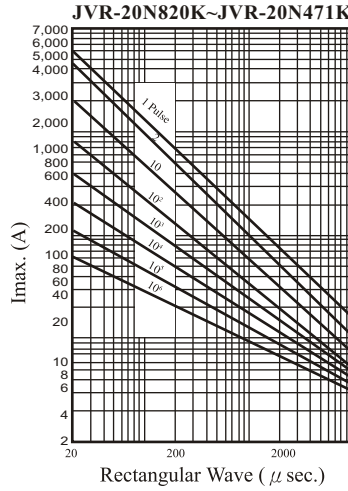
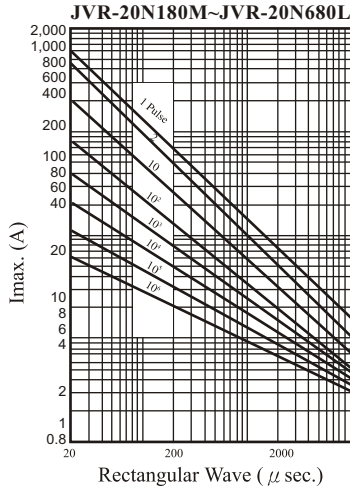
* Just for 182K

Table of T Max, & a

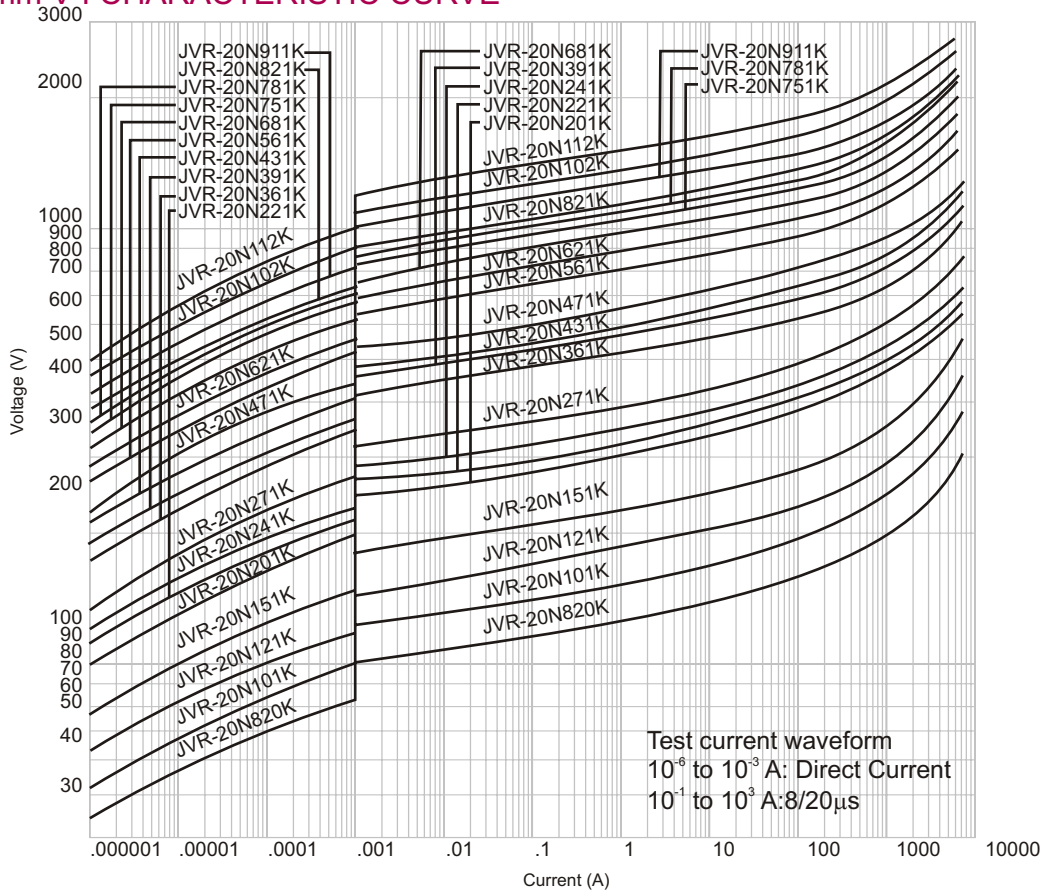
Diameter (φ)	Dimension	Diameter (φ)	Dimension	Diameter (φ)	Dimension			
Code	T Max	a + 0.8	Code	T Max	a + 0.8	Code	T Max	a + 0.8
220M/L	5.3	1.0	201K	5.3	1.4	561K	8.0	3.6
270M/K	5.4	1.1	221K	5.4	1.5	621K	8.3	4.1
330M/K	5.4	1.2	241K	5.5	1.7	681K	8.7	4.4
390L/K	5.4	1.4	271K	5.7	1.9	751K	9.1	4.5
470L/K	5.6	1.4	301K	5.9	2.1	781K	9.3	4.8
560L/K	5.6	1.6	331K	6.0	2.1	821K	9.5	4.8
680L/K	6.1	1.9	361K	6.2	2.3	911K	10.1	5.7
101K	5.1	1.2	391K	6.4	2.4	102K	10.7	5.8
121K	5.3	1.3	431K	7.2	2.7	112K	11.2	6.3
151K	5.6	1.6	471K	7.5	2.9	182K	13.5	10.4
181K	5.2	1.4	511K	7.7	3.3			



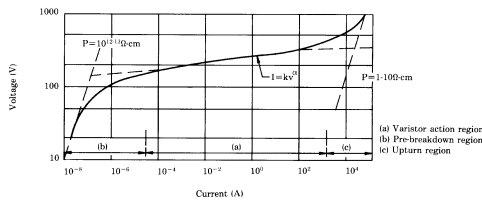
PULSE RATING CURVES



20mm V-I CHARACTERISTIC CURVE

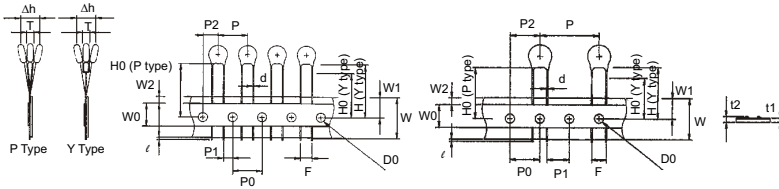


CURRENT - VOLTAGE CHARACTERISTICS



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

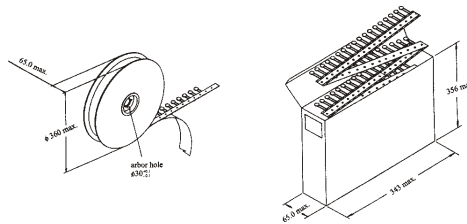
TAPING SPECIFICATIONS



Symbol	Item	Dimensions	Symbol	Item	Dimensions
ℓ	Cut out length	1.1 max	P	Pitch of component	12.7 + 0.3
H (Y Type)	Height of component from hole center	21.5 max	P0	Sprocket hole pitch	12.7 + 0.3
H0 (Y Type)	Height to seating plane	16.0 + 0.5	P1	Lead length from hole center to lead	3.85 + 0.7
H0 (P Type)	Height of component from hole center	16.0 ~ 21.0	P2	Lead length from hole center to disk center	6.35 + 1.3
Δh	Front to back deveation	0 + 2.0	D0	Procket hole diameter	4.0 + 0.2
W	Carrier tape width	18.0 + 1 - .05	D0	Lead wire diameter	0.6 + 0.05
W0	Hold down tape width	12	T	Disk Thickness	See T mak table
W1	Sprocket hole position	9.0 0.75 - 0.5	t1	Total thickness tape	0.7 + 0.05
W2	Adhesive tape position	3.0 max	t2	Total thickness tape with tape	1.6 max
F	Component lead spacing	7.5 + 0.8 - 0.2			

REEL & AMMO SPECIFICATIONS

Voltage Code	Bulk (Box)	Reel	Ammo
180 ~ 331	750	500	500
361	750	500	500
391	750	500	500
431 ~ 471	750	500	500
511 ~ 751	450	500	500
781 ~ 112	450	500	500



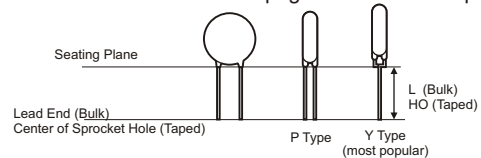
PART NUMBER EXAMPLE

JVR - 20 N 180 K 8 7 Y RW
(1) (2) (3) (4) (5)(6)(7)(8) (9)

- 1- Series (JVR) Metal Oxide Varistor
- 2- Disc Diameter or size
- 3- N for standard
- 4- Varistor Voltage
- 5- Tolerance:
K = $\pm 10\%$
L = $\pm 15\%$
M = $\pm 20\%$
- 6- Lead Diameter
8: 0.8 \pm 0.05mm
1: 1.0 \pm 0.05mm
- 7- Lead Spacing
7: 7.5mm
1: 10mm
- 8 - 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 0.5mm	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 0.5mm	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.