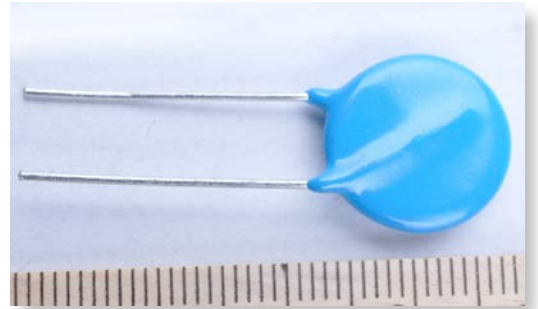


Metal Oxide Varistors - 20K Series

Features

1. Wide operating voltage (V1mA) range from 18V to 1800V.
2. Fast responding to transient over-voltage.
3. Large absorbing transient energy capability.
4. Low clamping ratio and no following-on current.



General Information

The KSE-20Kxxx Series of 20mm radial leaded varistor devices protects against overvoltage transients such as lightning, power contact and power induction. The metal oxide varistors offer a choice of varistor voltages from 18 V to 1800 V and Vrms voltages from 11 V to 1000 V. The devices have a high current handling, high energy absorption capability and fast response times to protect against transient faults up to rated limits.

General Characteristics

No Radioactive Material Storage Temperature: -55°C to +125°C

Operating Temperature: -55°C to +85°C

Body: Nickel Plated

Leads: Surface-mount, Axial Devices: Tin Plated

Devices with No Leads: Nickel Plated

Product Name

2	0	K	4	7	1
↓	↓	↓			
Disc Diameter	Varistor Voltage Tolerance		Nominal Varistor Voltage		
20=20MM	K = 10 %		471=47*10 ¹ V		

Metal Oxide Varistors - 20K Series

Electrical Characteristics

PNs	Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Withstanding Surge Current		Maximum Energy (10/1000µs)		Rated Power	Typical Capacitance (Reference)
	V _{AC} (V)	V _{DC} (V)	V _{1mA} (V)	I _P (A)	V _C (V)	I(A) Standard	I(A) High Surge	(J) Standard	(J) High Surge	(W)	@1KHz(pf)
KSE-20K180	11	14	18(15~21.6)	20	36	2000	3000	11	13	0.2	28500
KSE-20K220	14	18	22(19.5~26)	20	43	2000	3000	14	16	0.2	18500
KSE-20K270	17	22	27(24~30)	20	53	2000	3000	16	19	0.2	13000
KSE-20K330	20	26	33(29.5~36.5)	20	65	2000	3000	23	24	0.2	11500
KSE-20K390	25	31	39(35~43)	20	77	2000	3000	26	28	0.2	8500
KSE-20K470	30	38	47(42~54)	20	93	2000	3000	30	34	0.2	7400
KSE-20K560	35	45	56(50~62)	20	100	2000	3000	41	41	0.2	6500
KSE-20K680	40	56	68(61~75)	20	135	2000	3000	46	49	0.2	5800
KSE-20K820	50	65	82(74~90)	100	135	6500	10000	38	56	1.0	4900
KSE-20K101	60	85	100(90~110)	100	165	6500	10000	45	70	1.0	4000
KSE-20K121	75	100	120(108~132)	100	200	6500	10000	55	85	1.0	3300
KSE-20K151	95	125	150(135~165)	100	250	6500	10000	70	106	1.0	2700
KSE-20K181	115	150	180(162~198)	100	300	6500	10000	85	130	1.0	2200
KSE-20K201	130	170	200(180~220)	100	340	6500	10000	95	140	1.0	2000
KSE-20K221	140	180	220(198~242)	100	360	6500	10000	100	155	1.0	1800
KSE-20K241	150	200	240(216~264)	100	395	6500	10000	108	168	1.0	1650
KSE-20K271	175	225	270(243~297)	100	455	6500	10000	127	190	1.0	1500
KSE-20K301	190	250	300(270~330)	100	500	6500	10000	136	210	1.0	1300
KSE-20K331	210	275	330(297~363)	100	550	6500	10000	150	228	1.0	1200
KSE-20K361	230	300	360(324~396)	100	595	6500	10000	163	255	1.0	1100
KSE-20K391	250	320	390(351~429)	100	650	6500	10000	180	275	1.0	1000
KSE-20K431	275	350	430(387~473)	100	710	6500	10000	190	305	1.0	930
KSE-20K471	300	385	470(423~517)	100	775	6500	10000	220	350	1.0	850
KSE-20K511	320	415	510(459~561)	100	845	6500	10000	220	360	1.0	780
KSE-20K561	350	460	560(504~616)	100	925	6500	10000	220	380	1.0	710
KSE-20K621	385	505	620(558~682)	100	1025	6500	10000	220	390	1.0	650
KSE-20K681	420	560	680(612~748)	100	1120	6500	10000	230	400	1.0	600
KSE-20K751	460	615	750(675~825)	100	1240	6500	10000	255	420	1.0	580
KSE-20K781	485	640	780(702~858)	100	1290	6500	10000	265	440	1.0	560
KSE-20K821	510	670	820(738~902)	100	1355	6500	10000	282	460	1.0	525
KSE-20K911	550	745	910(819~1001)	100	1500	6500	10000	310	510	1.0	495
KSE-20K102	625	825	1000(900~1100)	100	1650	6500	10000	342	565	1.0	480
KSE-20K112	680	895	1100(990~1210)	100	1815	6500	10000	383	620	1.0	460
KSE-20K122	740	975	1200(1080~1320)	100	2010	6500	10000	412	660	1.0	440
KSE-20K142	850	1100	1400(1260~1540)	100	2255	6500	10000	470	725	1.0	415
KSE-20K152	900	1220	1500(135~1650)	100	2475	6500	10000	529	815	1.0	400
KSE-20K162	1000	1280	1600(1440~1760)	100	2640	6500	10000	606	896	1.0	330
KSE-20K182	1000	1465	1800(1620~1980)	100	2970	6500	10000	625	660	1.0	320

Metal Oxide Varistors - 20K Series

Electrical Rating				
Item	Test Condition / Description			Requirement
Varistor Voltage	The voltage between two terminals with the specified measuring current 1mA. DC applied is call Vb.			To meet the specified value
Maximum Allowable Voltage	The recommended maximum sine wave voltage (RMS) or the maximum DC voltage can be applied continuously.			
Rated Wattaget	The maximum average power that can be applied within the specified ambient temperature.			
IEnergy	The maximum energy within the varistor voltage change of $\pm 10\%$ when one impulse of 10/1000 μ sec. or 2 msec. is applied.			
Withstanding Surge Current	The maximum current within the varistor voltage change of $\pm 10\%$ with the standard impulse current (8/20 μ sec.) applied one time.			$\frac{\Delta V_b}{V_b} \leq \pm 10\%$
Surge Life	The change of Vb shall be measured after the impulse listed below is applied 10,000 times continuously with the interval of ten seconds at room temperature.			
	5K series	180K to 680K	10A (8/20 μ sec.)	
		820K to 751K	20A (8/20 μ sec.)	
	7K series	180K to 680K	25A (8/20 μ sec.)	
		820K to 821K	50A (8/20 μ sec.)	
	10K series	180K to 680K	50A (8/20 μ sec.)	
		820K to 182K	100A (8/20 μ sec.)	
	14K series	180K to 680K	75A (8/20 μ sec.)	
		820K to 182K	150A (8/20 μ sec.)	
	20K series	180K to 680K	100A (8/20 μ sec.)	
820K to 182K		200A (8/20 μ sec.)		

Metal Oxide Varistors - 20K Series

Current Energy and Power Dissipation Ratings

Should transients occur in rapid succession, the average power dissipation is the energy (watt-seconds) per pulse times the number of pulses per second. The power so developed must be within the specifications shown on the Device Ratings and Specifications Table for the specific device. The operating values of a MOV need to be derated at high temperatures as shown above. Because varistors only dissipate a relatively small amount of average power they are not suitable for repetitive applications that involve substantial amounts of average power dissipation.

Figure 1A - Power Derating for Epoxy Coated

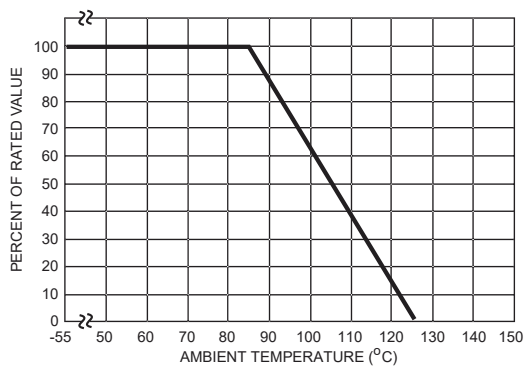
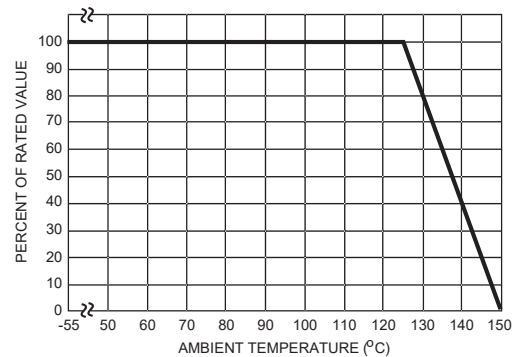
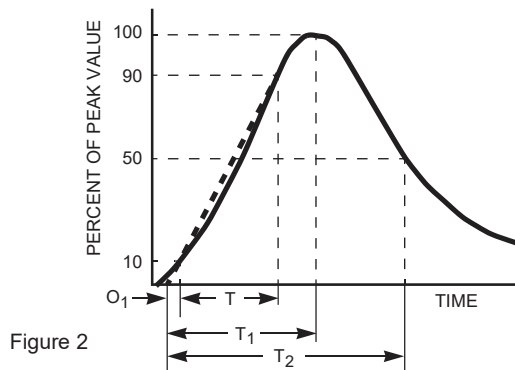


Figure 1B - Power Derating for Pholenic Coated



Peak Pulse Current Test Waveform



O_1 = Virtual Origin of Wave
 T = Time from 10% to 90% of Peak
 T_1 = Rise Time = $1.25 \times T$
 T_2 = Decay Time

Example - For an $8/20 \mu\text{s}$ Current Waveform:

$8\mu\text{s} = T_1$ = Rise Time

$20\mu\text{s} = T_2$ = Decay Time

Packaging

Part Number	Component Package	Quantity	Packaging Option	Packaging Specification
20K	20.0	200	BOX	400PCS

Metal Oxide Varistors - 20K Series

Package Dimensions

Unit:mm

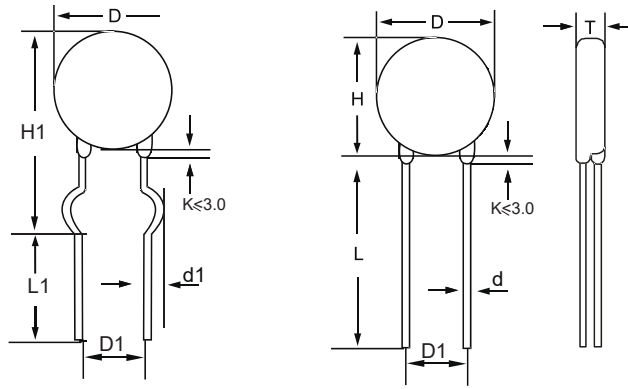


TABLE 1

Symbol	Dimensions
H(max.)	26.5
H1(max.)	28.0
L(min.)	20.0
L1(min.)	15.0
D(max.)	23.0
D1(±0.8)	7.5+0.8/10.0+1.0
T(max.)	TABLE 2
d(±0.05)	0.8
d1(±0.4)	1.4

TABLE 2

Model	T(max.)	Model	T(max.)
180K	4.8	301K	5.8
220K	4.9	331K	6.0
270K	5.0	361K	6.2
330K	5.2	391K	6.5
390K	5.5	431K	6.7
470K	5.6	471K	6.9
560K	5.7	511K	7.0
680K	5.08	561K	7.2
820K	4.9	621K	7.5
101K	5.1	681K	8.2
121K	5.3	751K	5.3
151K	5.6	781K	8.5
181K	5.0	821K	9.0
201K	5.2	911K	9.5
221K	5.3	102K	10.1
241K	5.4	112K	10.6
271K	5.6	182K	13.2
301K	5.7	-	-

Warehouse Storage Conditions of Products

• Storage Conditions:

1. Storage Temperature: -10°C~+40°C
2. Relative Humidity: ≤75%RH
3. Keep away from corrosive atmosphere and sunlight.

• Period of Storage: 1 year