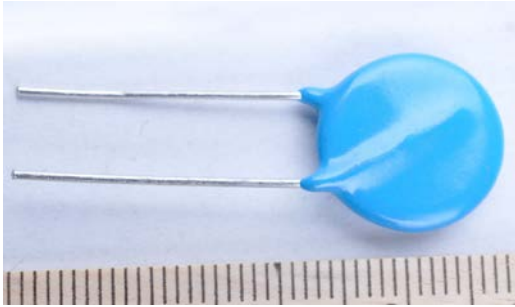


Metal Oxide Varistors - 14K Series



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-14Kxxx Series of 14mm 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

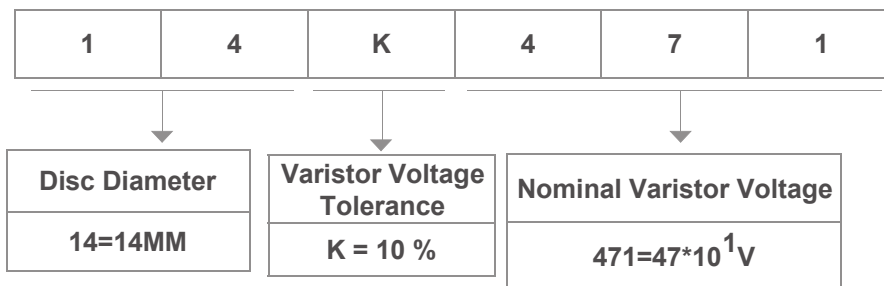
Operating Temperature: -55°C to +85°C

Body: Nickel Plated

Leads: Surface-mount, Axial Devices: Tin Plated

Devices with No Leads: Nickel Plated

Product Name



Metal Oxide Varistors - 14K Series

Electrical Characteristics

Type Number	Maximum Allowable Voltage		Varistor Voltage $V_{1mA}(V)$	Maximum Clamping Voltage		Withstanding Surge Current		Maximum Energy (10/1000 μ s)		Rated Power (W)	Typical Capacitance (Reference) @1KHz(pf)
	$V_{AC}(V)$	$V_{DC}(V)$		$I_P(A)$	$V_C(V)$	I(A) Standard	I(A) High Surge	(J) Standard	(J) High Surge		
KSE-14K180	11	14	18(15~21.6)	10	36	1000	2000	4.0	7.0	0.1	11100
KSE-14K220	14	18	22(19.5~26)	10	43	1000	2000	5.0	8.0	0.1	9100
KSE-14K270	17	22	27(24~30)	10	53	1000	2000	6.0	10.0	0.1	7400
KSE-14K330	20	26	33(29.5~36.5)	10	66	1000	2000	7.5	12.0	0.1	6100
KSE-14K390	25	31	39(35~43)	10	77	1000	2000	8.6	13.0	0.1	5100
KSE-14K470	30	38	47(42~54)	10	93	1000	2000	10.0	17.0	0.1	4300
KSE-14K560	35	45	56(50~62)	10	100	1000	2000	11.0	20.0	0.1	3600
KSE-14K680	40	56	68(61~75)	10	135	1000	2000	14.0	24.0	0.1	2900
KSE-14K820	50	65	82(74~90)	50	135	4500	6000	22.0	27.0	0.6	2400
KSE-14K101	60	85	100(90~110)	50	165	4500	6000	28.0	33.0	0.6	2000
KSE-14K121	75	100	120(108~132)	50	200	4500	6000	32.0	40.0	0.6	1700
KSE-14K151	95	125	150(135~165)	50	250	4500	6000	40.0	53.0	0.6	1300
KSE-14K181	115	150	180(162~198)	50	300	4500	6000	50.0	60.0	0.6	1100
KSE-14K201	130	170	200(180~220)	50	340	4500	6000	57.0	70.0	0.6	1000
KSE-14K221	140	180	220(198~242)	50	360	4500	6000	60.0	78.0	0.6	900
KSE-14K241	150	200	240(216~264)	50	395	4500	6000	63.0	84.0	0.6	830
KSE-14K271	175	225	270(243~297)	50	455	4500	6000	70.0	99.0	0.6	740
KSE-14K301	190	250	300(270~330)	50	500	4500	6000	77.0	108	0.6	670
KSE-14K331	210	275	330(297~363)	50	550	4500	6000	85.0	115	0.6	610
KSE-14K361	230	300	360(324~396)	50	595	4500	6000	93.0	130	0.6	560
KSE-14K391	250	320	390(351~429)	50	650	4500	6000	100	140	0.6	510
KSE-14K431	275	350	430(387~473)	50	710	4500	6000	115	155	0.6	460
KSE-14K471	300	385	470(423~517)	50	775	4500	6000	125	175	0.6	430
KSE-14K511	320	415	510(459~561)	50	845	4500	6000	125	180	0.6	390
KSE-14K561	350	460	560(504~616)	50	925	4500	6000	125	185	0.6	360
KSE-14K621	385	505	620(558~682)	50	1025	4500	6000	125	190	0.6	320
KSE-14K681	420	560	680(612~748)	50	1120	4500	6000	130	200	0.6	290
KSE-14K751	460	615	750(675~825)	50	1240	4500	6000	143	210	0.6	270
KSE-14K781	485	640	780(702~858)	50	1290	4500	6000	148	220	0.6	260
KSE-14K821	510	670	820(738~902)	50	1355	4500	6000	157	235	0.6	240
KSE-14K911	550	745	910(819~1001)	50	1500	4500	6000	175	255	0.6	220
KSE-14K102	625	825	1000(900~1100)	50	1650	4500	6000	190	280	0.6	200
KSE-14K112	680	895	1100(990~1210)	50	1815	4500	6000	213	310	0.6	180
KSE-14K122	750	990	1200(1080_1320)	50	1980	4500	6000	213	310	0.6	150
KSE-14K182	1000	1465	1800(1620~1980)	50	2970	4500	6000	250	335	0.6	130

Metal Oxide Varistors - 14K 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.)	
	7Kseries	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 - 14K 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

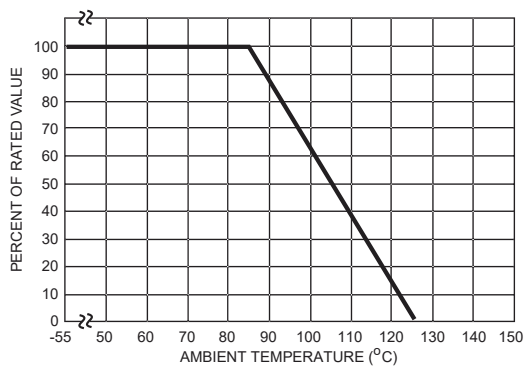
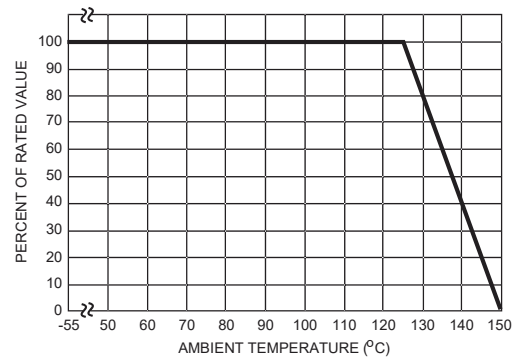
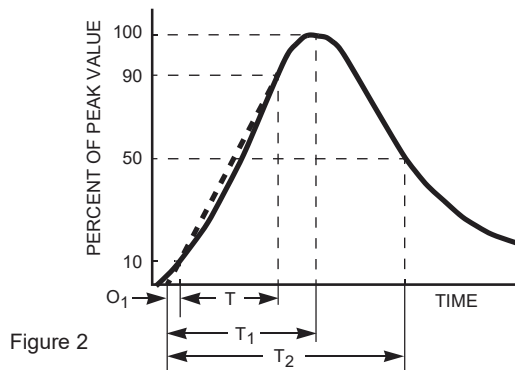


Figure 1B - Power Derating for Pholenic Coated



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
14K	140	500	BOX	1000

Metal Oxide Varistors - 14K Series

Package Dimensions

Unit:mm

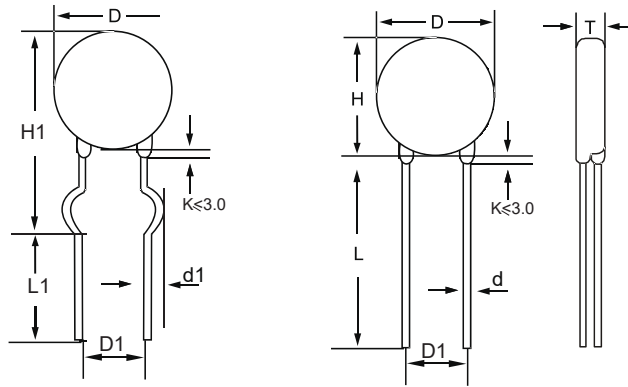


TABLE 1

Symbol	Dimensions
H(max.)	20
H1(max.)	21.0
L(min.)	20.0
L1(min.)	15.0
D(max.)	16.5
D1(±0.8)	7.5
T(max.)	TABLE 2
d(±0.05)	0.8
d1(±0.4)	1.4

TABLE 2

Model	T(max.)	Model	T(max.)
180K	4.5	301K	5.8
220K	4.7	331K	6.0
270K	4.8	361K	6.2
330K	5.0	391K	6.5
390K	5.3	431K	6.7
470K	5.4	471K	6.8
560K	5.5	511K	7.0
680K	5.6	561K	7.3
820K	4.7	621K	7.6
101K	4.9	681K	8.0
121K	5.1	751K	8.1
151K	5.4	781K	8.3
181K	4.8	821K	8.8
201K	5.0	911K	9.3
221K	5.1	102K	9.9
241K	5.2	112K	10.4
271K	5.4	182K	13.0
301K	5.5	-	-

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