

FIGURE 63

Type	Voltage Ratings				Energy Joules	Maximum Operating Conditions			Typical Capacitance pf	Figure
	VAC Volts RMS	VDC Volts	Varistor Peak Voltage			Max. Clamping Voltage		Peak Current (8x20µs) Amps		
			Min.	Max.		Volts	Amp.			
			Volts	Volts						
Z130PA20A			184	243		360	100			
Z130PA20C	130	175	184	220	100	325	100	6500	2400	63
Z150PA20A			212	284		420	100			63
Z150PA20C	150	200	212	243	100	360	100	6500	2000	63
Z200PA20A			297	363		550	100			63
Z250PA40A			354	453		675	100			63
Z250PA40C	250	330	354	413	130	620	100	6500	1400	63
Z275PA40A			389	494		740	100			63
Z275PA40C	275	369	389	453	140	680	100	6500	1200	63
Z320PA40A			462	565		850	100			63
Z320PA40C	320	420	462	539	160	800	100	6500	1100	63
Z420PA40A			610	790		1160	100			63
Z420PA40C	420	560	610	690	160	1050	100	6500	1000	63
Z480PA80A			670	860		1280	100			63
Z480PA80C	480	640	670	790	180	1160	100	6500	1000	63
Z510PA80A			735	963		1410	100			63
Z510PA80C	510	675	735	860	190	1280	100	6500	1000	63
Z550PA80A			775	1000		1500	100			63
Z550PA80C	550	700	775	960	200	1400	100	6500	900	63
Z575PA80A			805	1050		1560	100			63
Z575PA80C	575	730	805	960	220	1410	100	6500	900	63
Z625PA80A			900	1100		1650	100			63
Z660PA100A			940	1210		1820	100			63
Z660PA100C	660	850	940	1100	250	1650	100	6500	800	63
Z1000PA100A			1460	1880		2800	100			63
Z1000PA100C	1000	1350	1460	1720	380	2580	100	6500	600	63

Maximum Power Dissipation: PA-1.0 watt

Typical response time is less than 15 nanoseconds.



EH SERIES HIGH ENERGY METAL OXIDE VARISTORS

SUPPRESSION



EH Series

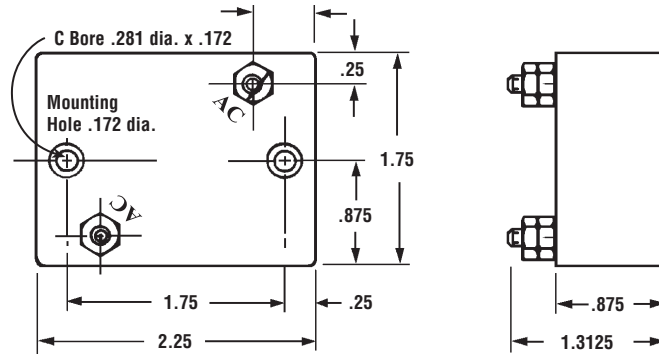


FIGURE 65

Part Number	Continuous		Transient Characteristics								Figure
	RMS Voltage	DC Voltage	(10/1000ms)	Peak Current (8/20 μ s)	Varistors @ 1 mA DC Test Current			Clamping Voltage (8/20 μ s)		Typical Capacitance	
	VAC	VDC			W-Sec.	Ipk	Min.	Nom.	Max.	Vc	
Volts	Volts	Joules	Amperes	Volts	Volts	Volts	Volts	Volts	Amps	Picofarads	
Z130EH4	130	175	200	25000	184	200	228	330	200	6800	65
Z130EH5	130	175	270	32000	184	200	228	325	200	8500	65
Z130EH6	130	175	370	40000	184	200	228	320	200	10200	65
Z150EH4	150	200	220	25000	212	240	268	385	200	6800	65
Z150EH5	150	200	300	32000	212	240	268	380	200	8500	65
Z150EH6	150	200	400	40000	212	240	268	375	200	10200	65
Z250EH4	250	330	330	25000	354	390	429	635	200	4000	65
Z250EH5	250	330	370	32000	354	390	429	630	200	5000	65
Z250EH6	250	330	650	40000	354	390	429	620	200	6000	65
Z275EH4	275	369	360	25000	389	430	473	690	200	3800	65
Z275EH5	275	369	400	32000	389	430	473	685	200	4750	65
Z275EH6	275	369	700	40000	389	430	473	685	200	5700	65
Z320EH4	320	420	390	25000	462	510	539	830	200	3600	65
Z320EH5	320	420	460	32000	462	510	539	820	200	4500	65
Z320EH6	320	420	750	40000	462	510	539	810	200	5400	65
Z420EH4	420	560	400	25000	610	680	748	1050	200	2040	65
Z420EH5	420	560	600	32000	610	680	748	1025	200	2720	65
Z420EH6	420	560	850	40000	610	680	748	1000	200	3780	65
Z480EH4	480	640	450	25000	670	750	824	1160	200	2320	65
Z480EH5	480	640	650	32000	670	750	824	1140	200	2900	65
Z480EH6	480	640	900	40000	670	750	824	1120	200	3480	65
Z510EH4	510	675	500	25000	735	820	910	1280	200	2320	65
Z510EH5	510	675	700	32000	735	820	910	1270	200	2900	65
Z510EH6	510	675	950	40000	735	820	910	1250	200	3480	65
Z575EH4	575	730	550	25000	805	910	1005	1500	200	2320	65
Z575EH5	575	730	770	32000	805	910	1005	1490	200	2900	65
Z575EH6	575	730	1050	40000	805	910	1005	1480	200	3480	65
Z600EH4	600	810	575	25000	900	1000	1100	1650	200	1320	65
Z600EH5	600	810	810	32000	900	1000	1100	1640	200	1640	65
Z600EH6	600	810	1100	40000	900	1000	1100	1620	200	1980	65
Z660EH4	660	850	600	25000	940	1050	1160	1780	200	1320	65
Z660EH5	660	850	900	32000	940	1050	1160	1760	200	1640	65
Z660EH6	660	850	1250	40000	940	1050	1160	1740	200	1980	65



SUPPRESSION

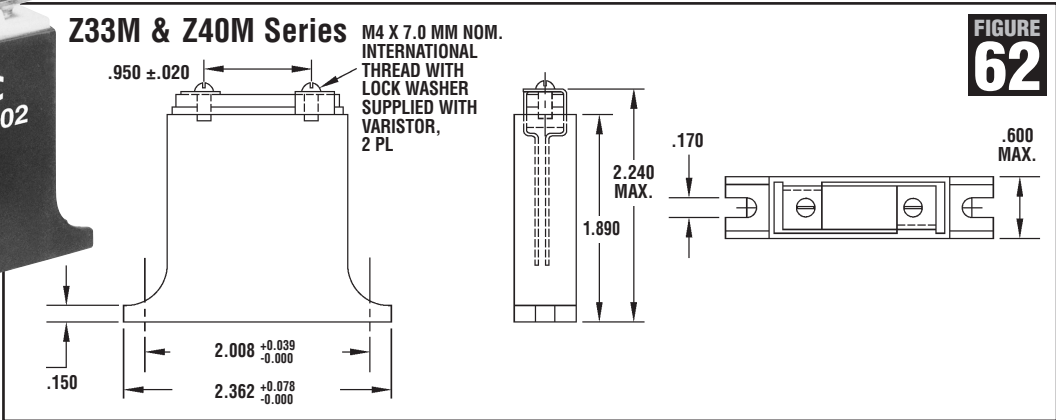
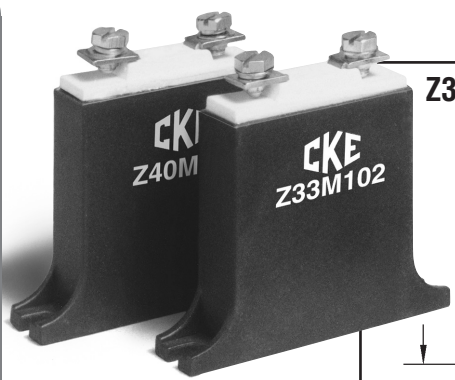
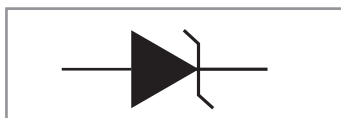


FIGURE 62

Type	Voltage Ratings				Energy Joules	Maximum Operating Conditions			Typical Capacitance pf	Figure
	VAC Volts RMS	VDC Volts	Varistor Peak Voltage			Max. Clamping Voltage		Peak Current (8x20 μ S) Amps		
			Min.	Max.		Volts	Amp.			
			Volts	Volts		Volts	Amp.			
Z33M Series										
Z33M201	130	170	180	220	210	340	200	25000	6600	62
Z33M241	150	200	216	264	240	395	200	25000	6000	62
Z33M271	175	225	243	297	255	455	200	25000	5010	62
Z33M361	230	300	324	396	325	595	200	25000	4200	62
Z33M391	250	320	351	429	350	650	200	25000	3600	62
Z33M431	275	350	387	473	400	710	200	25000	3300	62
Z33M471	300	385	423	517	405	775	200	25000	3100	62
Z33M511	320	415	459	561	415	845	200	25000	3000	62
Z33M621	385	505	558	682	425	1025	200	25000	2640	62
Z33M681	420	560	612	748	450	1120	200	25000	2520	62
Z33M751	460	615	675	825	500	1240	200	25000	2300	62
Z33M781	485	640	702	858	520	1290	200	25000	2300	62
Z33M821	510	670	738	902	545	1355	200	25000	2160	62
Z33M911	550	745	819	1001	600	1500	200	25000	2100	62
Z33M102	625	825	900	1100	655	1650	200	25000	2040	62
Z33M112	680	895	990	1210	725	1815	200	25000	1850	62
Z40M Series										
Z40M201	130	170	180	220	210	340	300	40000	6600	62
Z40M241	150	200	216	264	240	395	300	40000	6000	62
Z40M271	175	225	243	297	255	455	300	40000	5010	62
Z40M361	230	300	324	396	325	595	300	40000	4200	62
Z40M391	250	320	351	429	350	650	300	40000	3600	62
Z40M431	275	350	387	473	400	710	300	40000	3300	62
Z40M471	300	385	423	517	405	775	300	40000	3100	62
Z40M511	320	415	459	561	415	845	300	40000	3000	62
Z40M621	385	505	558	682	425	1025	300	40000	2640	62
Z40M681	420	560	612	748	450	1120	300	40000	2520	62
Z40M751	460	615	675	825	500	1240	300	40000	2300	62
Z40M781	485	640	702	858	520	1290	300	40000	2300	62
Z40M821	510	670	738	902	545	1355	300	40000	2160	62
Z40M911	550	745	819	1001	600	1500	300	40000	2100	62
Z40M102	625	825	900	1100	655	1650	300	40000	2040	62
Z40M112	680	895	990	1210	725	1815	300	40000	1850	62

Maximum Power Dissipation: Z33M - 1.5 watts, Z40M - 2.0 watts

Typical response time is less than 15 nanoseconds.



Z60M Series

FIGURE 66

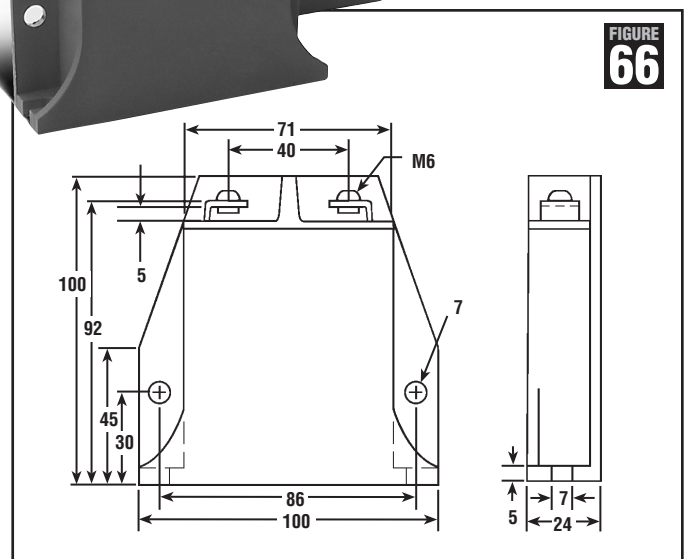
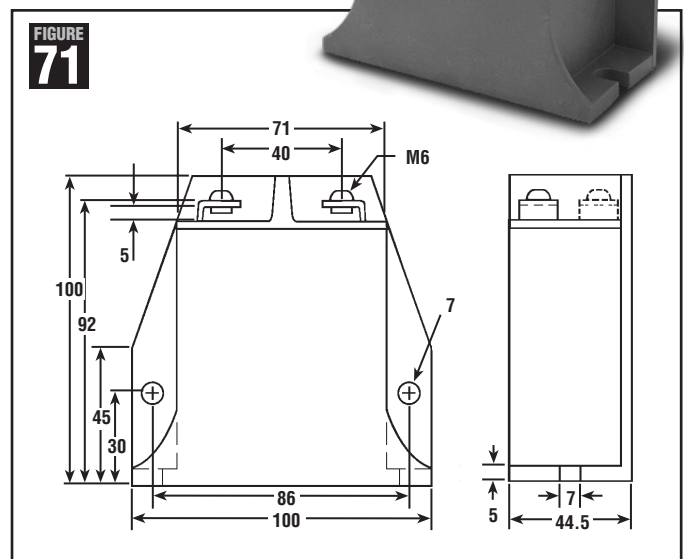
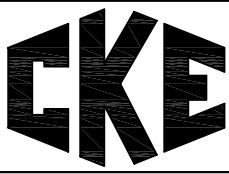


FIGURE 71

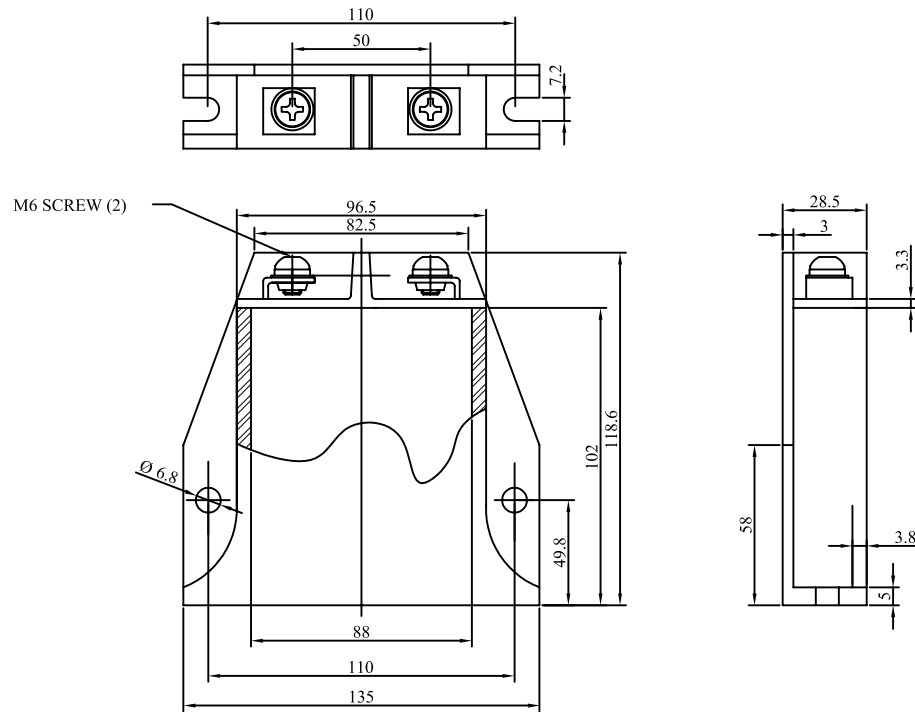


Type	Voltage Ratings				Energy Joules	Maximum Operating Conditions		Peak Current (8x20 μ s) Amps	Typical Capacitance pf	Figure
	VAC Volts RMS	VDC Volts	Varistor Peak Voltage			Max. Clamping Voltage				
			Min. Volts	Max. Volts		Volts	Amp.			
Z60M431	275	369	389	473	950	680	500	50000	9000	66
Z60M511	320	420	462	539	1100	760	500	50000	7500	66
Z60M681	420	560	610	748	1500	1060	500	70000	6000	66
Z60M751	480	640	670	825	1600	1160	500	70000	5500	66
Z60M821	510	675	735	910	1800	1300	500	70000	5000	66
Z60M911	575	730	805	1000	2100	1420	500	70000	4500	66
Z60M102	660	850	940	1160	2300	1640	500	70000	4000	66
Z60M122	750	970	1080	1320	2600	1880	500	70000	3500	66
Z60M182	1100	1400	1620	2060	3800	2940	500	70000	2200	71
Z60M222	1400	1750	2020	2550	5000	3600	500	70000	1800	71
Z60M272	1700	2150	2500	3030	6000	4300	500	70000	1500	71
Z60M332	2000	2500	2970	3630	7500	5200	500	70000	1200	71
Z60M392	2400	3000	3510	4290	8600	6200	500	70000	1000	71
Z60M472	2800	3500	4230	5170	10000	7400	500	70000	800	71

Maximum Power Dissipation: Z60M - 2.5 watts
 Typical response time is less than 15 nanoseconds.



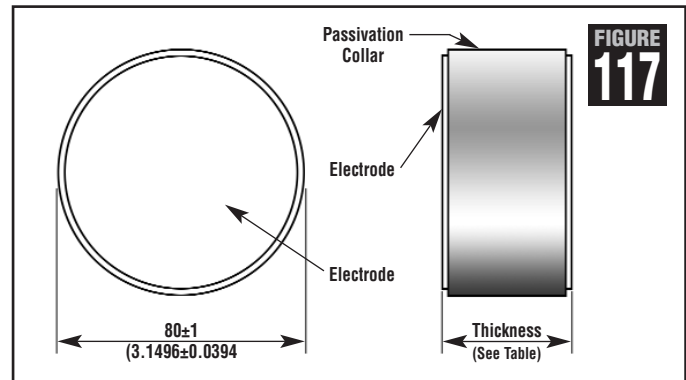
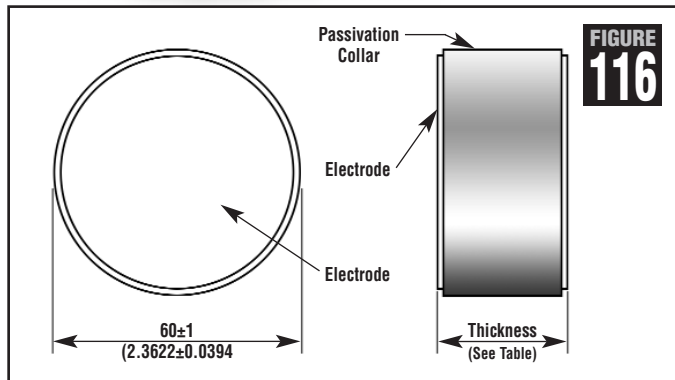
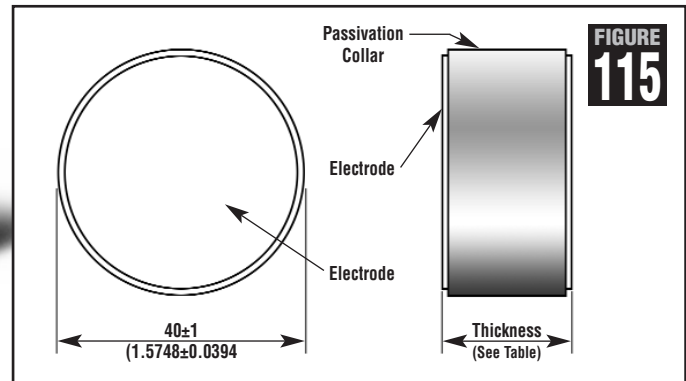
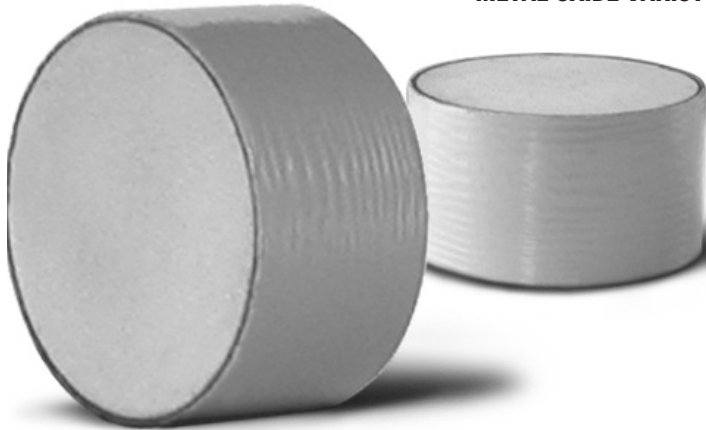
Z80M SERIES HIGH ENERGY MOV



MODEL NUMBER	MAX ALLOWABLE VOLTAGE		VARISTOR VOLTAGE V_{1mA} (V)	CLAMPING VOLTAGE (MAX)		MAX PEAK CURRENT (8/20 μ s)		MAX ENERGY (JOULES) 2ms	TYPICAL CAPACITANCE REFERENCE (@ 1 KHZ) (pf)
	AC _{RMS} (V)	DC (V)		V_C (V)	I_P (A)	1 TIME (A)	2 TIMES (A)		
	Z80M201	130	170	200(185-225)	340	800	100000	80000	660
Z80M241	150	200	240(216-264)	395	800	100000	80000	800	23000
Z80M271	175	225	270(243-297)	455	800	100000	80000	900	20000
Z80M331	210	275	330(297-363)	550	800	100000	80000	1000	18000
Z80M361	230	300	360(324-396)	595	800	100000	80000	1200	16000
Z80M391	250	320	390(351-429)	650	800	100000	80000	1300	14000
Z80M431	275	350	430(387-473)	710	800	100000	80000	1400	13000
Z80M471	300	385	470(423-517)	775	800	100000	80000	1500	12000
Z80M511	320	415	510(459-561)	845	800	100000	80000	1600	11000
Z80M621	385	505	620(558-682)	1025	800	100000	80000	2000	9000
Z80M681	420	560	680(612-748)	1120	800	100000	80000	2200	8500
Z80M751	460	615	750(675-825)	1240	800	100000	80000	2500	7700
Z80M781	485	640	780(702-858)	1290	800	100000	80000	2600	7200
Z80M821	510	670	820(738-902)	1355	800	100000	80000	2800	6900
Z80M911	550	745	910(819-1001)	1500	800	100000	80000	3100	6500
Z80M951	575	765	950(855-1045)	1570	800	100000	80000	3300	6200
Z80M102	625	825	1000(900-1100)	1650	800	100000	80000	3400	5800
Z80M112	680	895	1100(990-1210)	1815	800	100000	80000	3600	5200
Z80M122	750	970	1200(1062-1300)	2100	800	100000	80000	4000	4800
Z80M142	880	1150	1400(1245-1520)	2290	800	100000	80000	5000	4000
Z80M162	1000	1200	1600(1414-1728)	2700	800	100000	80000	6000	3200
Z80M182	1100	1400	1800(1620-2060)	3030	800	100000	80000	7000	2900



METAL OXIDE VARISTOR DISKS



Model Number	Max Allowable Voltage		Varistor Voltage @1mA V _{NOM} V	Clamping Voltage (Max)		Max Peak Current (8/20 μs) A	Max Energy (Joules) 10/1000 μs	Typical Capacitance @KHZ (pf)	Thickness	
	AC _{RMS} V	DC V		V _C V	I _P A				T±1 mm	T±0.0394 inches
Z40BD Series										
Z40BD201	130	170	200 (185-225)	340	300	40000	310	8400	1.140	0.0449
Z40BD241	150	200	240 (216-264)	395	300	40000	360	8000	1.370	0.0539
Z40BD271	175	225	270 (243-297)	455	300	40000	390	7600	1.540	0.0606
Z40BD331	210	275	330 (297-363)	550	300	40000	460	6700	1.890	0.0744
Z40BD361	230	300	360 (324-396)	595	300	40000	475	6200	2.060	0.0811
Z40BD391	250	320	390 (351-429)	650	300	40000	490	5100	2.230	0.0878
Z40BD431	275	350	430 (387-473)	710	300	40000	550	4900	2.460	0.0969
Z40BD471	300	385	470 (423-517)	775	300	40000	600	4300	2.690	0.1059
Z40BD511	320	415	510 (459-561)	845	300	40000	640	4200	2.910	0.1146
Z40BD621	385	505	620 (558-682)	1025	300	40000	720	3800	3.540	0.1394
Z40BD681	420	560	680 (612-748)	1120	300	40000	750	3500	3.890	0.1531
Z40BD751	460	615	750 (675-825)	1240	300	40000	780	3200	4.290	0.1689
Z40BD781	485	640	780 (702-858)	1290	300	40000	820	3000	4.460	0.1756
Z40BD821	510	670	820 (738-902)	1355	300	40000	900	2900	4.690	0.1846
Z40BD911	550	745	910 (819-1001)	1500	300	40000	960	2200	5.200	0.2047
Z40BD951	575	765	950 (855-1045)	1570	300	40000	1000	2000	5.430	0.2138
Z40BD102	625	825	1000 (900-1100)	1650	300	40000	1055	1800	5.710	0.2248
Z40BD112	680	895	1100 (990-1210)	1815	300	40000	1155	1600	6.290	0.2476
Z40BD122	750	970	1200 (1062-1300)	2100	300	40000	1200	1500	6.860	0.2701
Z40BD142	880	1150	1400 (1245-1520)	2290	300	40000	1300	1400	8.000	0.3150
Z40BD162	1000	1200	1600 (1414-1728)	2700	300	40000	1400	1300	9.140	0.3598



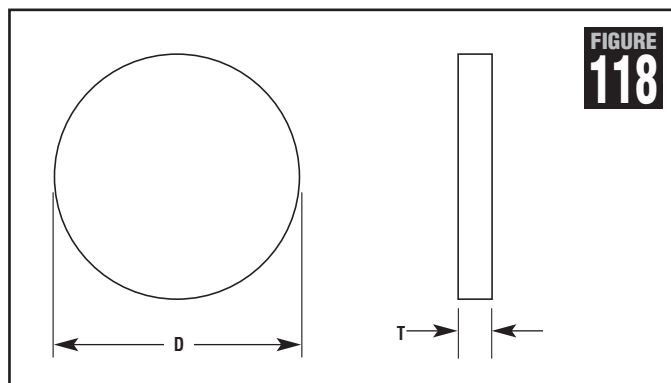
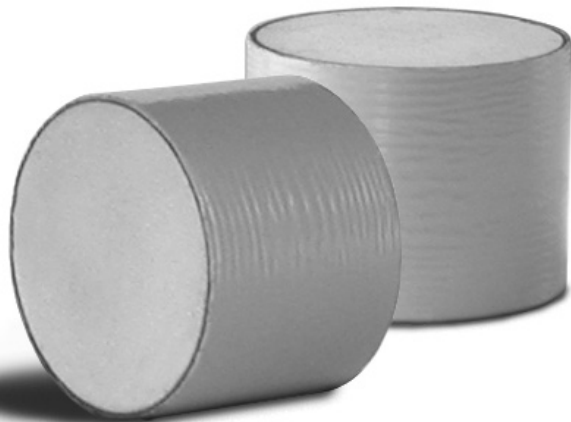
SUPPRESSION

Model Number	Max Allowable Voltage		Varistor Voltage @1mA V _{NOM} V	Clamping Voltage (Max)		Max Peak Current (8/20 μs) A	Max Energy (Joules) μs	Typical Capacitance @KHZ 2ms	Thickness	
	AC _{RMS} V	DC V		V _C V	I _P A				T±1 mm	T±0.0394 inches
Z60BD Series										
									Figure 116	
Z60BD391	250	320	390 (351-429)	650	500	70000	880	9000	2.230	0.0878
Z60BD431	275	350	430 (387-473)	710	500	70000	950	8500	2.460	0.0969
Z60BD471	300	350	470 (423-517)	775	500	70000	1000	7600	2.690	0.1059
Z60BD511	320	415	510 (459-561)	845	500	70000	1100	7000	2.910	0.1146
Z60BD621	385	505	620 (558-682)	1025	500	70000	1200	6600	3.540	0.1394
Z60BD681	420	560	680 (612-748)	1120	500	70000	1500	6200	3.890	0.1531
Z60BD751	460	615	750 (675-825)	1240	500	70000	1650	5800	4.290	0.1689
Z60BD781	485	640	780 (702-858)	1290	500	70000	1700	5500	4.460	0.1756
Z60BD821	510	670	820 (738-902)	1355	500	70000	1800	5000	4.690	0.1846
Z60BD911	550	745	910 (819-1001)	1500	500	70000	1900	4500	5.200	0.2047
Z60BD951	575	765	950 (855-1045)	1570	500	70000	2100	4200	5.430	0.2138
Z60BD102	625	825	1000 (900-1100)	1650	500	70000	2200	4000	5.710	0.2248
Z60BD112	680	895	1100 (990-1210)	1815	500	70000	2300	3800	6.290	0.2476
Z60BD122	750	970	1200 (1062-1300)	2100	500	70000	2600	3500	6.860	0.2701
Z60BD142	880	1150	1400 (1245-1520)	2290	500	70000	3200	3000	8.000	0.3145
Z60BD162	1000	1200	1600 (1414-1728)	2700	500	70000	3200	2500	9.140	0.3598
Z60BD182	1100	1400	1800 (1620-2060)	3030	500	70000	3200	2200	10.290	0.4051
Z60BD222	1400	1750	2200 (2020-2200)	3580	500	70000	5000	1800	12.570	0.4949
Z60BD272	1700	2150	2700 (2500-3030)	4400	500	70000	6000	1500	15.430	0.6075
Z60BD332	2000	2500	3300 (2970-3300)	5375	500	70000	7500	1200	18.890	0.7437
Z60BD392	2400	3000	3900 (3510-4290)	6360	500	70000	8600	1000	22.290	0.8776
Z60BD472	2800	3500	4700 (4230-5170)	7665	500	70000	10000	800	26.890	1.0587

Model Number	Max Allowable Voltage		Varistor Voltage @1mA V _{NOM} V	Clamping Voltage (Max)		Max Peak Current (8/20 μs) A	Max Energy (Joules) μs	Typical Capacitance @KHZ (pf)	Thickness	
	AC _{RMS} V	DC V		V _C V	I _P A				T±1 mm	T±0.0394 inches
Z80BD Series										
									Figure 117	
Z80BD431	275	350	430 (387-473)	710	800	100000	1400	13000	2.460	0.0969
Z80BD471	300	385	470 (423-517)	775	800	100000	1500	12000	2.690	0.1059
Z80BD511	320	415	510 (459-561)	845	800	100000	1600	11000	2.910	0.1146
Z80BD621	385	505	620 (558-682)	1025	800	100000	2000	9000	3.540	0.1394
Z80BD681	420	560	680 (612-748)	1120	800	100000	2200	8500	3.890	0.1531
Z80BD751	460	615	750 (675-825)	1240	800	100000	2500	7700	4.290	0.1689
Z80BD781	485	640	780 (702-858)	1290	800	100000	2600	7200	4.460	0.1756
Z80BD821	510	670	820 (738-902)	1355	800	100000	2800	6900	4.690	0.1846
Z80BD911	550	745	910 (819-1001)	1500	800	100000	3100	6500	5.200	0.2047
Z80BD951	575	765	950 (855-1045)	1570	800	100000	3300	6200	5.430	0.2138
Z80BD102	625	825	1000 (900-1100)	1650	800	100000	3400	5800	5.710	0.2248
Z80BD112	680	895	1100 (990-1210)	1815	800	100000	3600	5200	6.290	0.2476
Z80BD122	750	970	1200 (1062-1300)	2100	800	100000	4000	4800	6.860	0.2701
Z80BD142	880	1150	1400 (1245-1520)	2290	800	100000	5000	4000	8.000	0.3150
Z80BD162	1000	1200	1600 (1414-1728)	2700	800	100000	6000	3200	9.140	0.3598
Z80BD182	1100	1400	1800 (1620-2060)	3030	800	100000	7000	2900	10.290	0.4051
Z80BD222	1400	1750	2200 (2020-2200)	3580	800	100000	8500	2400	12.570	0.4949
Z80BD272	1700	2150	2700 (2500-3030)	4400	800	100000	9800	2000	15.430	0.6075
Z80BD332	2000	2500	3300 (2970-3300)	5375	800	100000	1050	1600	18.890	0.7437
Z80BD392	2400	3000	3900 (3510-4290)	6360	800	100000	1200	1200	22.290	0.8776
Z80BD472	2800	3500	4700 (4230-5170)	7665	800	100000	1300	1000	26.890	1.0587



SURGE ARRESTOR DISCS



Product Features

- Available in several standard voltages
- Can be put in series to attain required voltage
- Meets IEC standard IEC60099-4
- High surge capability and capacity

Applications

- AC transmission or transformation equipment
- Can be enclosed in either porcelain or silicon rubber housing

Part Number	Overall Dimension mm Figure 118		D.C. Reference Voltage U_n (1mA) (kV)	Max Residual Voltage Ratio (8/20 μ s)	Current Impulse Withstand Capacity		Recommended Rated Voltage kV (r.m.s.)	MCOV	
	Diameter "D"	Thickness "T"			4/10 μ s (kA)	2ms (A)		MCOV (kV)	I_R μ A
ARD32x3	32 \pm 1	3 \pm 0.5	0.6 - 0.8	1.88 (@5kA)	40	100	0.28	0.48	150
ARD32x6	32 \pm 1	6 \pm 0.5	1.2 - 1.6	1.88 (@5kA)	40	100	0.50	0.96	150
ARD32x21	31 \pm 1	21 \pm 1	4.0 - 4.8	1.88 (@5kA)	40	100	3.00	3.20	150
ARD32x31	32 \pm 1	31 \pm 1	6.2 - 7.0	1.88 (@5kA)	40	100	4.50	4.96	150
ARD32x42	32 \pm 1	42 \pm 1	8.4 - 9.2	1.88 (@5kA)	40	100	6.00	6.72	150
ARD35x3	35 \pm 1	3 \pm 0.5	0.6 - 0.8	1.85 (@5kA)	65	100	0.28	0.48	150
ARD35x6	35 \pm 1	6 \pm 0.5	1.2 - 1.6	1.85 (@5kA)	65	100	0.50	0.96	150
ARD35x21	35 \pm 1	21 \pm 1	4.0 - 4.8	1.85 (@5kA)	65	100	3.00	3.20	150
ARD35x31	35 \pm 1	31 \pm 1	6.2 - 7.0	1.85 (@5kA)	65	100	4.50	4.96	150
ARD35x42	35 \pm 1	42 \pm 1	8.4 - 9.2	1.85 (@5kA)	65	100	6.00	6.72	150
ARD40x21	40.5 \pm 1	21 \pm 1	4.0 - 4.8	1.80@5kA/1.89@10kA	100	200	3.00	3.20	160
ARD40x31	40.5 \pm 1	31 \pm 1	6.2 - 7.0	1.80@5kA/1.89@10kA	100	200	4.50	4.96	160
ARD45x21	45 \pm 1	21 \pm 1	4.0 - 4.8	1.75@5kA/1.84@10kA	100	300	3.00	3.20	170
ARD45x31	45 \pm 1	31 \pm 1	6.2 - 7.0	1.75@5kA/1.84@10kA	100	300	4.50	4.96	170
ARD52x21	52.5 \pm 1	21 \pm 1	4.0 - 4.8	1.72@5kA/1.81@10kA	100	400	3.00	6.72	180
ARD52x31	52.1 \pm 1	31 \pm 1	6.2 - 7.0	1.72@5kA/1.81@10kA	100	400	4.50	4.96	180
ARD62x21	62.5 \pm 1	21 \pm 1	4.0 - 4.8	1.69@5kA/1.78@10kA	100	600	3.00	3.20	200
ARD62x31	62.5 \pm 1	31 \pm 1	6.2 - 7.0	1.69@5kA/1.78@10kA	100	600	4.50	4.96	200

Note:
 1. Metal Oxide Discs can be used in porcelain housing or silicon rubber housing to assemble various surge arrestors, medium is air or SF6 and etc.
 2. Metal Oxide Discs can meet with the technical requirements of all types of metal oxide surge arrestors for A.C. systems according to IEC standard IEC600 99-4.