MOV Size Selection

Figure 1

The disk diameter of a metal-oxide varistor (Varistor=Variable Resistor) determines the surge current capability of the device to divert transients. A typical 20mm varistor is rated to handle a surge up to 6,500 amperes based on the standard 8 x 20 us waveform defined by IEEE C62.41. Likewise, a 40mm varistor is rated to handle surge currents at 40,000 amps.

Figure 2

It should be noted that as varistors are connected in parallel the clamping level for the array of multiple components will lower the overall let-thru voltage.

However, the designer of such surge suppression circuitry must consider the compromise that if more than 3 or 4 varistors are connected in parallel equal sharing of surge current diversion may be severely compromised. Most component manufacturers can provide “matched” lots of MOV’s however matched typically means at 1 milliampere. True matching of an array of varistors should be over a wide range of surge currents. Due to the fact that MOV’s are non-linear this may be considered virtually impossible. Thus, equal surge current sharing can only be assumed and weak links in the chain to be more likely; shortening the life of the surge protector and diminishing its ability to suppress larger magnitudes of surge current.

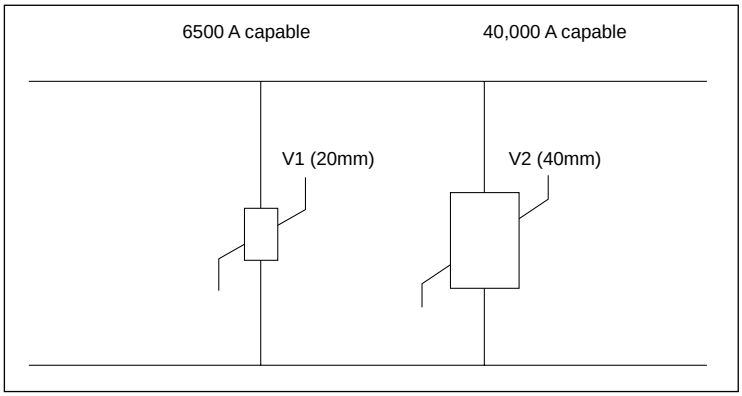

Figure 1.

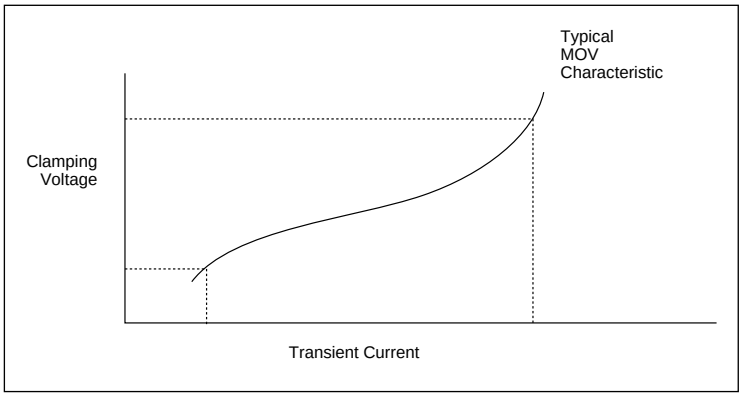

Figure 2.

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TYPICAL MOV DATA SHEET:

Large Metal Oxide Surge Absorbers with Tabs - 32mm, 40mm, 53mm
Available with straight tab or formed foot

NOM SIZE MM	MINIMUM MARKING	MAXIMUM CONTINUOUS RATINGS		MAXIMUM ENERGY SINGLE PULSE	PEAK CURRENT SINGLE PULSE	VARISTOR VOLTAGE VDC@1mA		CLAMPING VOLTAGE @ CURRENT SHOWN		CAPACITANCE pF 1KHz@25C +/-30%
		VAC	VDC	10x1000 usec	8x20 usec	Vmin	Vmax	VCLmax	ICL	
32	Z750-120	75	100	120	25000	108	132	200	200	8200
40	Z750-190	75	100	190	40000	108	132	200	300	16000
32	Z950-135	95	125	135	25000	135	165	250	200	6500
40	Z950-230	95	125	230	40000	135	165	250	300	14000
32	Z131-210UL	130	175	210	25000	184	224	340	200	4700
40	Z131-310UL	130	175	310	40000	184	224	340	300	10000
53	Z131-490UL	130	175	490	70000	184	224	340	500	18000
32	Z141-225UL	140	180	225	25000	198	242	365	200	4300
40	Z141-330UL	140	180	330	40000	198	242	365	300	9000
53	Z141-530UL	140	180	530	70000	198	242	365	500	16000
32	Z151-240U L	150	20	240	25000	212	259	395	200	4000
40mm 40	Z151-360UL	150	200	360	40000	212	259	395	300	8000
53	Z151-570UL	150	200	570	70000	212	259	395	500	14000
32	Z181-250UL	180	230	250	25000	255	311	470	200	3500
40	Z181-390UL	180	230	390	40000	255	311	470	300	7100
53	Z181-630UL	180	230	630	70000	255	311	470	500	12500

ZOV RATINGS: D65 Series (20mm)

MINIMUM MARKING	MAXIMUM RATINGS				ELECTRICAL CHARACTERISTICS				
	CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE (@1.0mA DC)		MAX CLAMPING VOLTAGE @ TEST CURRENT (8x20µS)		TYPICAL CAPACITANCE $1KH_z25^{\circ}C$
	APPLICABLE VOLTAGE (AC)	APPLICABLE VOLTAGE (DC)	ENERGY (10x1000µS)	PEAK CURRENT (8x20µS)	MIN	MAX			
	VOLTS	VOLTS	JOULES	AMPERES	VOLTS	VOLTS	VOLTS	AMPERES	PICOFARADS
Z110-10	11	14	10	2000	16	20	36	20	37000
Z140-13	14	18	13	2000	20	24	43	20	30000
Z170-15	17	22	15	2000	24	30	53	20	22000
Z200-20	20	26	20	2000	30	36	65	20	17000
Z250-24	25	31	24	2000	35	43	77	20	15000
Z300-30	30	38	30	2000	42	52	93	20	13000
Z350-35	35	45	35	2000	50	62	110	20	11000
Z400-40 UL	40	56	40	2000	61	75	135	20	7000
Z500-42 UL	50	65	42	6500	74	90	135	100	5500
Z600-45 UL	60	85	45	6500	90	110	165	100	4800
Z750-55 UL	75	100	55	6500	108	132	200	100	3800
Z950 65 UL	95	125	65	6500	135	165	250	100	3000
Z121-20 UL	120	160	65	6500	170	207	320	100	2300
Z131-20 UL	130	175	70	6500	184	224	340	100	2000
Z141-20 UL	140	180	75	6500	198	242	360	100	1900
20mm Z151-20 UL	150	200	80	6500	212	259	395	100	1800
Z181-20 UL	180	230	100	6500	255	311	465	100	1600

Courtesy Maida Development Corp.

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