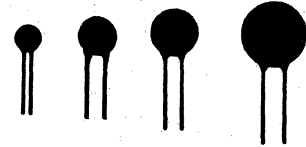


GE-MOV® II Metal Oxide Varistors for Transient Voltage Protection



RATINGS AND CHARACTERISTICS TABLE: Z SERIES

NOTE: Power dissipation of transients not to exceed 0.25, 0.4, 0.6, 1.0 watts for sizes 7, 10, 14 and 20mm respectively

MODEL NUMBER	MODEL SIZE DIA. (mm)	DEVICE MARKING	MAXIMUM RATINGS (25°C)				CHARACTERISTICS					
			CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE @ 1.0 mA DC TEST CURRENT			MAXIMUM CLAMPING VOLTAGE, V _C @ TEST CURRENT (8/20 μs)		TYPICAL CAPACITANCE f = 0.1-1 MHz
			RMS VOLTAGE	DC VOLTAGE	ENERGY (10/1000 μs)	PEAK CURRENT (8/20 μs)						
			V _{m(ac)}	V _{m(dc)}	W _{tm}	I _{tm}						
			VOLTS	VOLTS	JOULES	AMPERES	MIN. VOLTS	V _{N(dc)} VOLTS	MAX. VOLTS	V _C VOLTS	I _P AMPS	PICOFARADS
V8ZA1	7	08Z1	4	5.5	.4	100	6	8.2	11	22	5	4500
V8ZA2	10	08Z2	4	5.5	.8	250	6	8.2	11	20	5	12000
V12ZA1	7	12Z1	6	8	.6	250	9	12	16	34	5	3000
V12ZA2	10	12Z2	6	8	1.2	250	9	12	16	30	5	7500
V18ZA1	7	18Z1	10	14	0.8	250	14.4	18	21.6	42	5	2500
V18ZA2	10	18Z2			1.5	500				39	5	6000
V18ZA3	14	18Z3			3.5	1000				39	10	12000
V18ZA40	20	18Z40			80.0*	2000		18†		37	20	25000
V22ZA1	7	22Z1	14	18‡	0.9	250	18.7	22	26.0	47	5	2000
V22ZA2	10	22Z2			2.0	500				43	5	5000
V22ZA3	14	22Z3			4.0	1000				43	10	10000
V24ZA50	20	24Z50	14	18‡	100.0*	2000	19.2	24†	26.0	43	20	20000
V27ZA1	7	27Z1	17	22	1.0	250	23.0	27	31.1	57	5	1700
V27ZA4	14	27Z4			5.0	1000				53	10	8500
V27ZA60	20	27Z60		22	120.0*	2000		27†		50	20	18000
V33ZA1	7	33Z1	20	26	1.2	250	29.5	33	36.5	68	5	1400
V33ZA5	14	33Z5			6.0	1000				64	10	7000
V33ZA70	20	33Z70	21	27	150.0*	2000		33†		58	20	15000
V36ZA80	20	36Z80	23	31	160.0*	2000	32.0	36†	40.0	63	20	12000
V39ZA1	7	39Z1	25	31	1.5	250	35.0	39	43.0	79	5	1200
V39ZA6	14	39Z6			7.2	1000				76	10	6000
V47ZA1	7	47Z1	30	38	1.8	250	42.0	47	52.0	92	5	1000
V47ZA7	14	47Z7			8.8	1000				89	10	5000
V56ZA2	7	56Z2	35	45	2.3	250	50.0	56	62.0	107	5	800
V56ZA8	14	56Z8			10.0	1000				103	10	4000
V68ZA2	7	68Z2	40	56	3.0	250	61.0	68	75.0	127	5	700
V68ZA10	14	68Z10			13.0	1000				123	10	3500
V82ZA2	7	82Z2	50	66	4.0	250	74.0	82	91.0	152	5	600
V82ZA12	14	82Z12			15.0	1000				147	10	3000
V100ZA3	7	100Z	60	81	5.0	250	90.0	100	110.0	180	5	500
V100ZA15	14	100Z15			20.0	1000				175	10	2500
V120ZA1	7	120Z	75	102	6.0	1200	108.0	120	132.0	205	10	200
V120ZA6	14	120Z6			22.0	4500				210	50	1200
V150ZA1	7	150Z	95	127	8.0	1200	135.0	150	165.0	250	10	170
V150ZA8	14	150Z8			30.0	4500				255	50	1000
V180ZA1	7	180Z	115	153	10.0	1200	162.0	180	198.0	295	10	140
V180ZA10	14	180Z10			35.0	4500				300	50	800

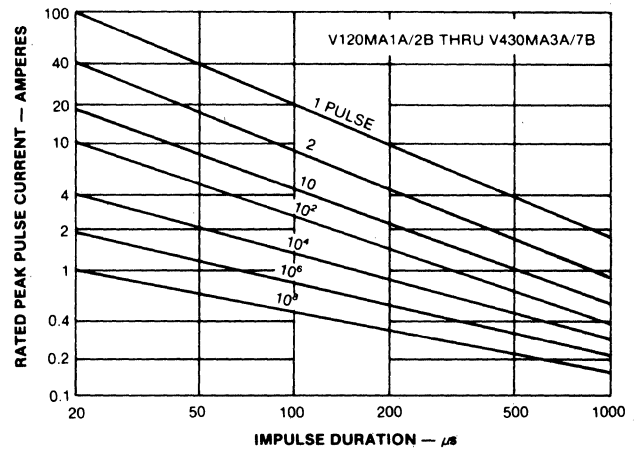
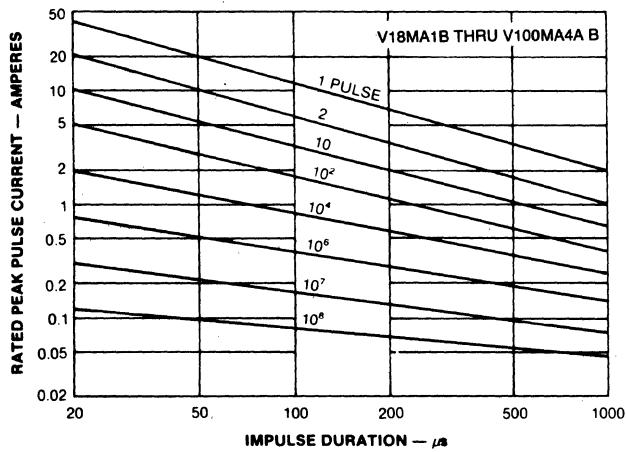
*Energy rating for impulse duration of 30 milliseconds minimum to one half of peak current value.

†10mA dc test current.

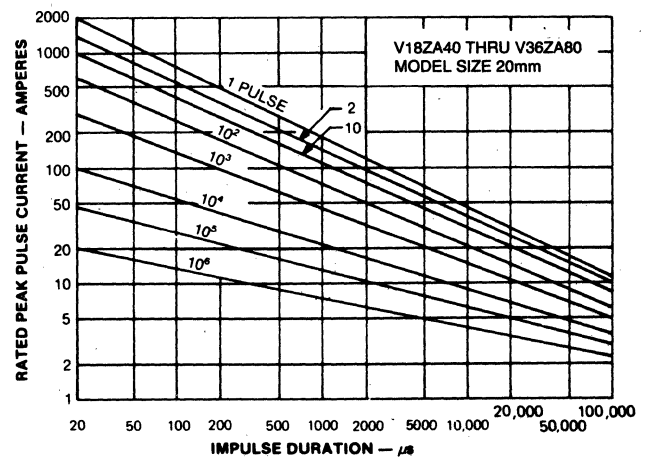
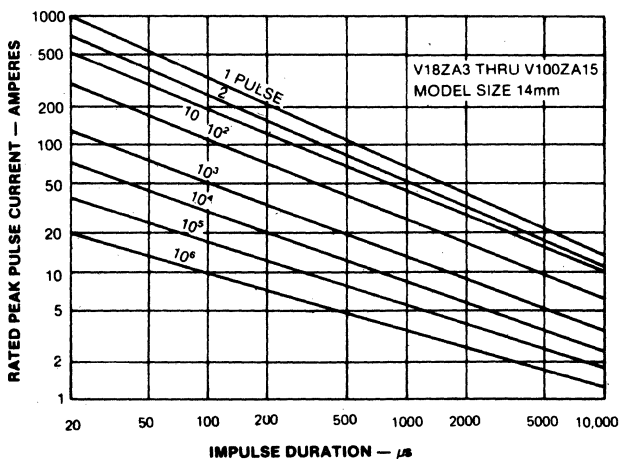
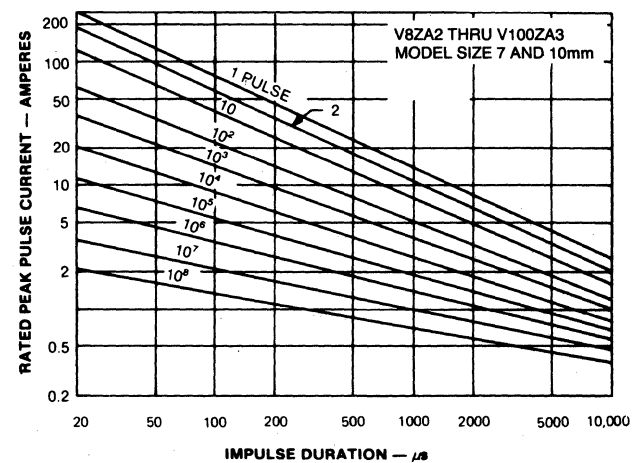
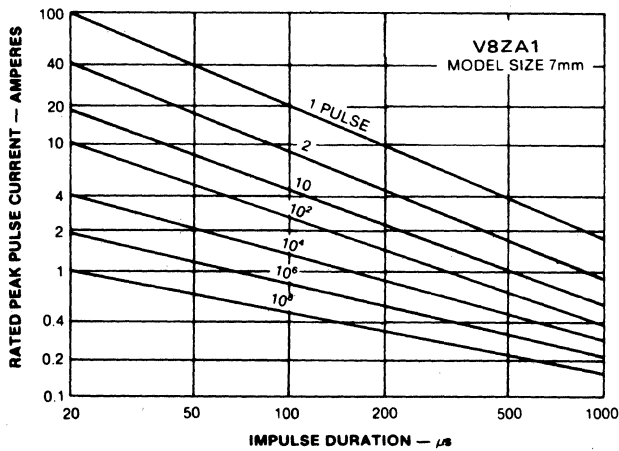
‡Also rated to withstand 24V for 5 minutes.

GE-MOV® II Metal Oxide Varistors for Transient Voltage Protection

*PULSE RATINGS: MA SERIES



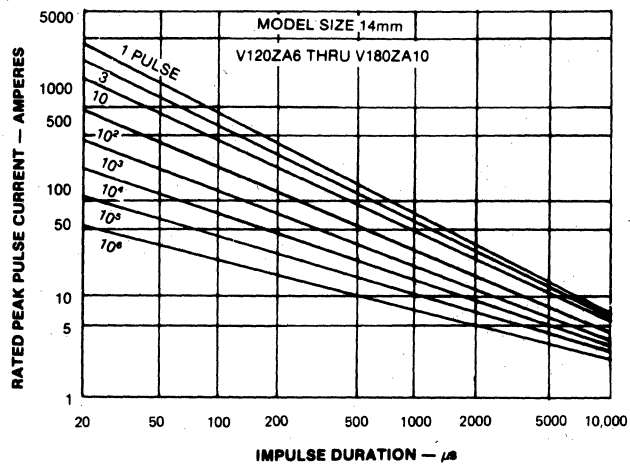
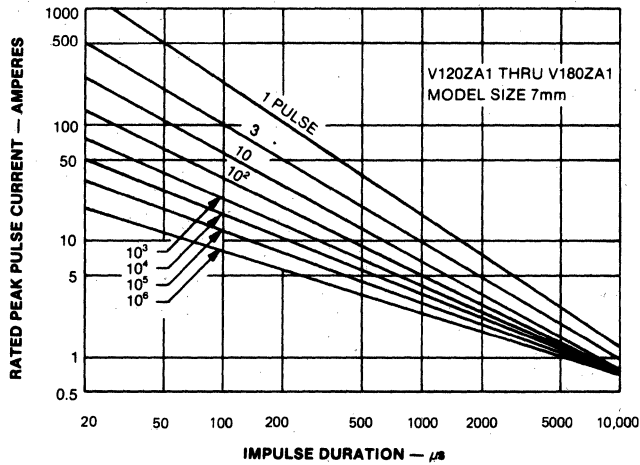
Z SERIES



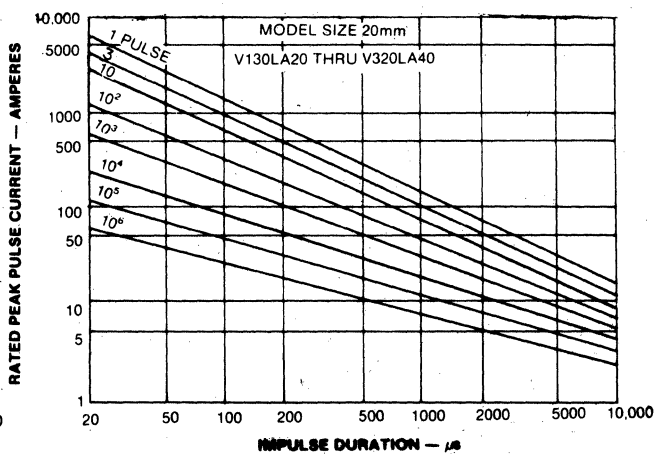
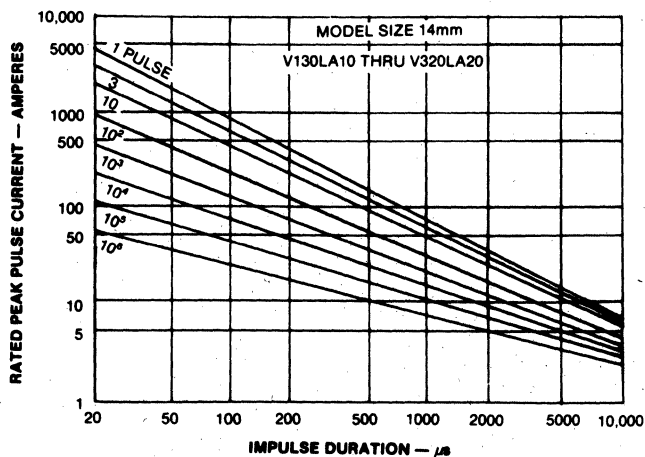
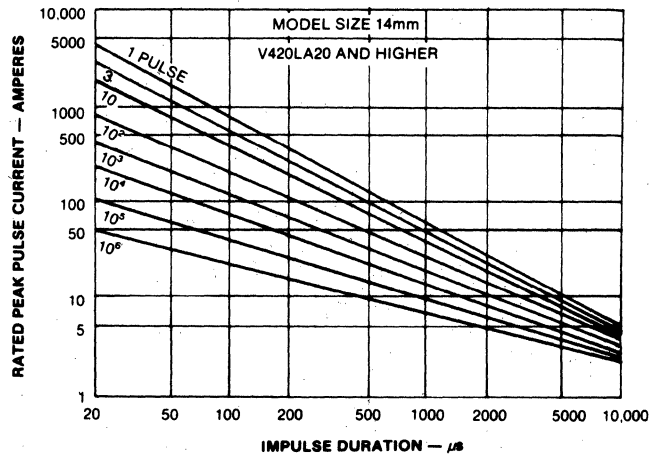
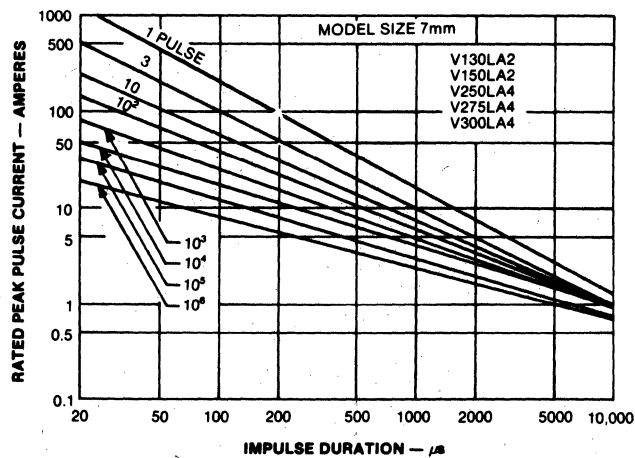
*See note on page 149

GE-MOV® II Metal Oxide Varistors for Transient Voltage Protection

* PULSE RATINGS: Z SERIES (cont'd)



L SERIES



*See note on page 149

GE-MOV®II Metal Oxide Varistors for Transient Voltage Protection

MECHANICAL AND ENVIRONMENTAL TESTING: HIGH RELIABILITY SERIES

The High Reliability GE-MOV®II Varistor is the latest step in increased product performance. Applications requiring guaranteed quality in extreme ambients can now be served. The new series of varistors are 100% prescreened and process conditioned to meet stringent mechanical and electrical requirements.

100% PRESCREEN

Pre-encapsulation Inspection	Visual Inspection of Lead Frame and Disc Prior to Coating
Electrical	I_L , $V_{N(dc)}$, $V_C(8 \times 20\mu s)$
Final Inspection	Coating Integrity, Leads, Marking, Outline

100% PROCESS CONDITIONING

TEST NAME	TEST METHOD(MIL-STD-750)	DESCRIPTION
High Temperature Life	Method 1032.1	125°C, 24 Hr. Bake
Thermal Shock	Method 1051.1	Air-Air; -55°C to 125°C, 5 Cycles
Constant Acceleration	Method 2006	20,000 G, Z_1
Humidity Life	No Equivalent	85°C, 85% RH, 168 Hr. Exposure
Burn-In	Method 1038, Cond B	96 Hr, 85°C, Rated $V_{m(ac)}$
Post Burn-In Screen	No Equivalent	$V_{n(dc)}$ and V_C Screen; 10% PDA
Visual Inspection	Method 2071	Encapsulation, Marking, Outline, Leads

QUALITY ASSURANCE TESTS AFTER PROCESSING CONDITIONING

■ Electrical (Bi-Directional), $V_{n(dc)}$, V_C	0.1% AQL LEVEL II
■ Dielectric BV (MIL-STD 202-301)	0.65% AQL LEVEL I
■ Capacitance @ 1MHz	1.0% AQL LEVEL S-4
■ Solderability (Non Activated)	1.0% AQL LEVEL S-4

ADDITIONAL CAPABILITIES

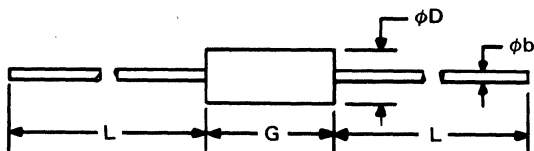
TEST NAME	TEST METHOD(MIL-STD-750)	DESCRIPTION
Terminal Strength	Method 2036.3	3 Bends; 90° Arc; 16 oz. Weight
Shock	Method 2016.2	1500 G's; .5 ms; 5 pulses; X_1 , Y_1 , Z_1
Variable Frequency Vibration	Method 2056	20 G's; 100-2000Hz; X_1 , Y_1 , Z_1
Salt Atmosphere	Method 1041	35°C; 24 Hr.; 10-50 G/M ² /Day
Soldering Heat	Method 2031	260°C; 10 Sec.; 3 Cycles; Test
Resistance to Solvents	MIL-202E, Method 215	Marking Permanence; 3 Solvents
Flammability	MIL-202E, Method 111A	15 Sec. Torching; 10 Sec. to Flame Out

Note: High reliability varistors are rated to withstand a low temperature storage of -65°C.

Please contact your local General Electric Sales Office for any specific high reliability requirement or for types presently available.

GE-MOV®II Metal Oxide Varistors for Transient Voltage Protection

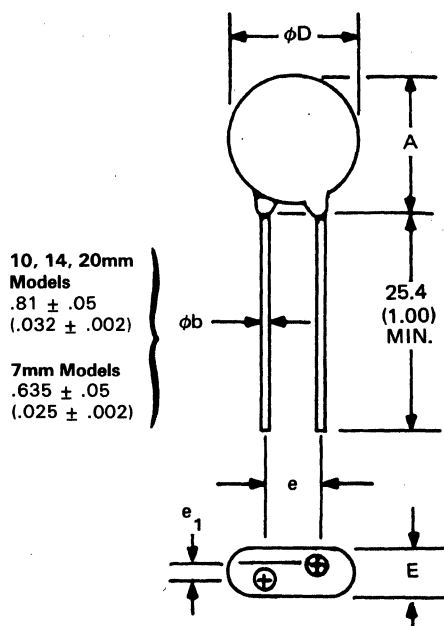
OUTLINES AND DIMENSIONS: MA SERIES



SYMBOL	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
ϕb	.60	.83	0.024	.033
ϕD	3.43	3.68	.135	.145
G	8.01	8.50	.315	.335
L	26.0	29.0	1.03	1.14

Typical Weight - 0.35g.

Z AND L SERIES



10, 14, 20mm
Models
.81 ± .05
(.032 ± .002)

7mm Models
.635 ± .05
(.025 ± .002)

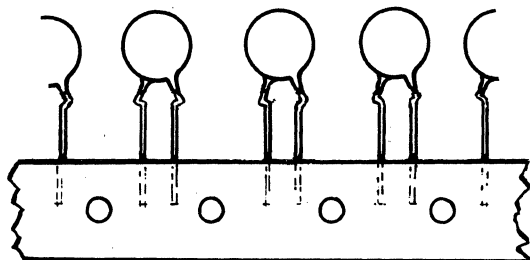
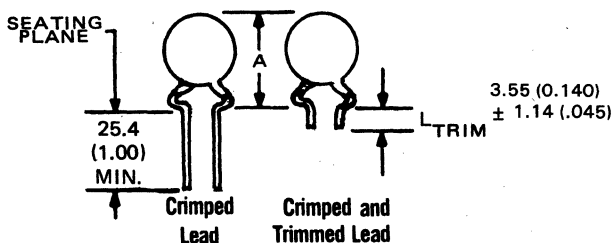
* ± 1 MM
(.039)
† ± 1.5 MM
(0.59)

Dimensions: MM (IN.)

SYMBOL	VARISTOR MODEL SIZE			
	7MM	10MM	14MM	20MM
A (MAX)†	11.7 (0.461)	16.0 (0.630)	18.9 (0.744)	25.5 (1.01)
ϕD (MAX)	8.7 (0.343)	12.5 (0.492)	16.4 (0.646)	22.5 (0.886)
$e \pm 1MM$ (.039)	5.0 (.197)	7.5 (0.296)	7.5 (0.296)	7.5 (0.296)
Typ. Weight (g)	0.5	1.2	2	3

SYMBOL	VARISTOR MODEL			
	V8ZA — V56ZA V120ZA — V180ZA	V68ZA — V100ZA V130LA — V320LA	V420LA V575LA	V1000LA
e_1	* 2.0 (.079)	* 2.5 (.098)	‡ 4.0 (.157)	‡ 7.3 (.287)
E (MAX)	5.0 (.197)	5.6 (.220)	7.3 (.287)	10.8 (.425)

AVAILABLE LEAD STYLE CHANGES



Tape and Reel*

Dimension A: MM (IN.)

SYMBOL	VARISTOR MODEL SIZE			
	7MM	10MM	14MM	20MM
A (MAX)	15.0 (.591)	19.5 (.768)	22.5 (.890)	29.0 (1.140)

*For Tape and Reel availability and specifications, Contact Factory.

†For Models V420LA-V1000LA, A(MAX) for 10, 14, 20MM is 17.0(.669), 20.0(.787), 28.0(1.10) respectively.