

## High Energy Varistors - E Series

### Description

The E types are heavy-duty metal oxide varistors designed mainly for industrial applications. They offer excellent surge protection for various electronic equipment such as: traffic and railway signal systems, communication equipment, waterworks, automatic control devices for power distribution, oil drilling and mining equipment (dredgers, cranes, etc.). The E housings offer excellent protection also when they are exposed to different kinds of vibrations, dust, moisture, etc. The advantages of the E Series are: rigid terminals for good wire contact, solid plastic housing for secure mounting, higher insulation resistance (polyurethane filling and plastic housing).



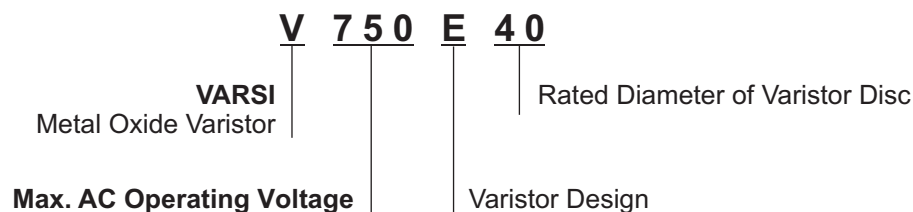
### Main Features

Wide Operating Voltage Range $V_{RMS}$	130 V to 750 V
Three Model Sizes Available	25 mm, 32 mm, square 33 mm
High Energy Absorption Capability $W_{max}$ (2 ms)	150 J to 1230 J
High Peak Current Capability $I_{max}$ (8/20 $\mu$ s)	15000 A to 40000 A
Rigid Terminals for Secure Wire Contact	
Case Design Provides Complete Electrical Isolation of Disc Assembly	
<b>UL Specification #1449 File No.: E103662;</b>	Models E40, E32, prefixed by: V130, V140, V150, 175, V230, V250, V275, V300, V320, V350, V385, V420, V440, V460, V510, V550, V625, V680, V750

### General Technical Data

Climatic Category	40/85/56	in accordance with IEC 68-1
LCT	-40°C	
UCT	+85°C	
Damp Heat, Steady State (93% r.h., 40°C)	56 days	in accordance with IEC 68-2-3
Operating Temperature	-40 ... +85°C	in accordance with CECC 42 000
Storage Temperature	-40 ... +110°C	
Electric Strength	$\geq 2.5$ kV	in accordance with CECC 42 000
Insulation Resistance	$\geq 1.0$ G $\Omega$	in accordance with CECC 42 000
Response Time	< 25 ns	
Max. Torque	1.0 Nm	

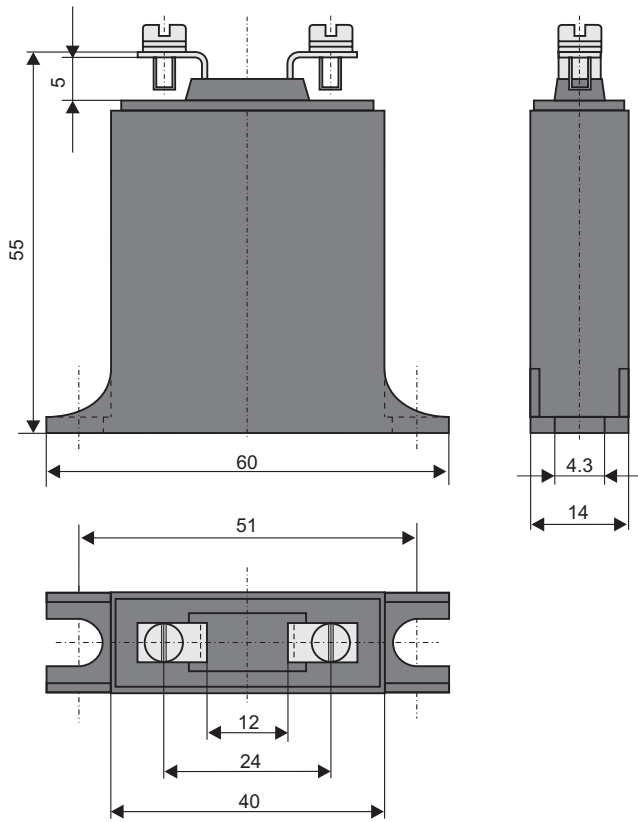
### Type Designation



**Table of Standard Values**

Part Number	Maximum Ratings TA = +85°C (+185°F)					Characteristics TA = +25°C (+77°F)					V - I Characteristic Page	Derating curve Page
	Operating Voltage		Average Power Dissipation P <sub>max</sub> (W)	Permissible Peak Current I <sub>max</sub> (A) (8/20 μs)	Energy Absorption W <sub>max</sub> (J)	Varistor Voltage V <sub>N</sub> (1 mA) (V)	Standard Tolerance of V <sub>N</sub> ΔV <sub>N</sub> (±%)	Maximum Clamping Voltage at Test Current (8/20 μs)		Typical Capacitance C (pF) (f=1kHz)		
	RMS Voltage V <sub>RMS</sub> (V)	DC Voltage V <sub>DC</sub> (V)						V <sub>C</sub> (V)	I (A)			
V130E25	130	170	1.0	15000	150	205	10	340	150	2600	10	13
V130E32	130	170	1.2	25000	220	205	10	340	200	4400	10	13
V130E40	130	170	1.4	40000	320	205	10	340	300	5800	11	13
V140E25	140	180	1.0	15000	155	220	10	360	150	2400	10	13
V140E32	140	180	1.2	25000	235	220	10	360	200	4100	10	13
V140E40	140	180	1.4	40000	340	220	10	360	300	5400	11	13
V150E25	150	200	1.0	15000	160	240	10	395	150	2200	10	13
V150E32	150	200	1.2	25000	250	240	10	395	200	3700	10	13
V150E40	150	200	1.4	40000	370	240	10	395	300	5000	11	13
V175E25	175	225	1.0	15000	170	270	10	455	150	2000	10	13
V175E32	175	225	1.2	25000	270	270	10	455	200	3000	10	13
V175E40	175	225	1.4	40000	410	270	10	455	300	4200	11	13
V230E25	230	300	1.0	15000	190	360	10	595	150	1600	10	13
V230E32	230	300	1.2	25000	310	360	10	595	200	2500	10	13
V230E40	230	300	1.4	40000	470	360	10	595	300	3400	11	13
V250E25	250	320	1.0	15000	210	390	10	650	150	1400	10	13
V250E32	250	320	1.2	25000	340	390	10	650	200	2200	10	13
V250E40	250	320	1.4	40000	505	390	10	650	300	3100	11	13
V275E25	275	350	1.0	15000	230	430	10	710	150	1300	10	13
V275E32	275	350	1.2	25000	370	430	10	710	200	2000	10	13
V275E40	275	350	1.4	40000	565	430	10	710	300	2900	11	13
V300E25	300	385	1.0	15000	240	470	10	775	150	1200	10	13
V300E32	300	385	1.2	25000	400	470	10	775	200	1900	10	13
V300E40	300	385	1.4	40000	600	470	10	775	300	2700	11	13
V320E25	320	420	1.0	15000	275	510	10	840	150	1100	10	13
V320E32	320	420	1.2	25000	440	510	10	840	200	1700	10	13
V320E40	320	420	1.4	40000	655	510	10	840	300	2400	11	13
V385E25	385	505	1.0	15000	320	620	10	1025	150	900	10	13
V385E32	385	505	1.2	25000	560	620	10	1025	200	1400	10	13
V385E40	385	505	1.4	40000	815	620	10	1025	300	2000	11	13
V420E25	420	560	1.0	15000	360	680	10	1120	150	800	10	13
V420E32	420	560	1.2	25000	615	680	10	1120	200	1300	10	13
V420E40	420	560	1.4	40000	930	680	10	1120	300	1900	11	13
V440E25	440	585	1.0	15000	380	715	10	1180	150	750	10	13
V440E32	440	585	1.2	25000	630	715	10	1180	200	1250	10	13
V440E40	440	585	1.4	40000	950	715	10	1180	300	1800	11	13
V460E25	460	615	1.0	15000	390	750	10	1240	150	700	10	13
V460E32	460	615	1.2	25000	670	750	10	1240	200	1200	10	13
V460E40	460	615	1.4	40000	1010	750	10	1240	300	1700	11	13
V510E25	510	670	1.0	15000	410	820	10	1355	150	650	10	13
V510E32	510	670	1.2	25000	690	820	10	1355	200	1100	10	13
V510E40	510	670	1.4	40000	1040	820	10	1355	300	1600	11	13
V550E25	550	745	1.0	15000	425	910	10	1500	150	600	10	13
V550E32	550	745	1.2	25000	710	910	10	1500	200	1000	10	13
V550E40	550	745	1.4	40000	1080	910	10	1500	300	1500	11	13
V625E25	625	825	1.2	25000	435	1000	10	1650	200	550	10	13
V625E32	625	825	1.2	25000	730	1000	10	1650	200	950	10	13
V625E40	625	825	1.4	40000	1100	1000	10	1650	300	1400	11	13
V680E25	680	895	1.2	25000	465	1100	10	1815	200	530	10	13
V680E32	680	895	1.2	25000	780	1100	10	1815	200	850	10	13
V680E40	680	895	1.4	40000	1130	1100	10	1815	300	1200	11	13
V750E25	750	1060	1.0	15000	485	1200	10	2000	150	500	10	13
V750E32	750	1060	1.2	25000	820	1200	10	2000	200	800	10	13
V750E40	750	1060	1.4	40000	1230	1200	10	2000	300	1100	11	13

Dimensions



Part Number	Approx. Weight (g)
V130E25	52
V130E32	55
V130E40	58
V140E25	53
V140E32	56
V140E40	59
V150E25	54
V150E32	57
V150E40	60
V175E25	56
V175E32	57
V175E40	60
V230E25	55
V230E32	58
V230E40	61
V250E25	55
V250E32	58
V250E40	61
V275E25	56
V275E32	59
V275E40	62
V300E25	57
V300E32	60
V300E40	63
V320E25	58
V320E32	61
V320E40	64
V385E25	59
V385E32	62
V385E40	65
V420E25	60
V420E32	63
V420E40	66
V440E25	61
V440E32	64
V440E40	67
V460E25	62
V460E32	65
V460E40	68
V510E25	62
V510E32	67
V510E40	70
V550E25	64
V550E32	68
V550E40	72
V625E25	65
V625E32	70
V625E40	73
V680E25	65
V680E32	70
V680E40	74
V750E25	66
V750E32	71
V750E40	76

All dimensions are maximum except where noted. Dimensions are in millimeters.

## High Energy Varistors - E60 Series

### Description

The E60 types are heavy-duty metal oxide varistors designed mainly for industrial applications. They offer excellent surge protection for various electronic equipment such as: traffic and railway signal systems, communication equipment, waterworks, automatic control devices for power distribution, oil drilling and mining equipment (dredgers, cranes, etc.). The E60 housings offer excellent protection also when they are exposed to different kinds of vibrations, dust, moisture, etc. The advantages of the E60 Series are: rigid terminals for good wire contact, solid plastic housing for secure mounting, higher insulation resistance (polyurethane filling and plastic housing).



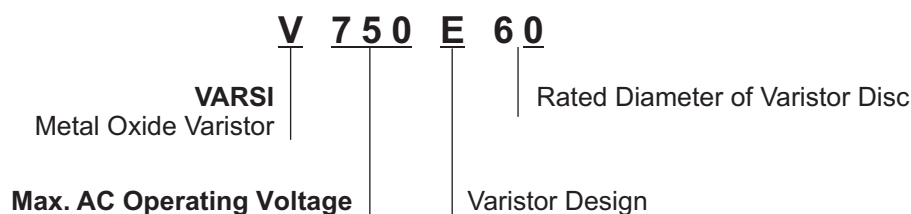
### Main Features

Wide Operating Voltage Range $V_{RMS}$	130 V to 1100 V
High Energy Absorption Capability $W_{max}$ (2 ms)	490 J to 3000 J
High Peak Current Capability $I_{max}$ (8/20 $\mu$ s)	70000 A
Rigid Terminals for Secure Wire Contact	
Case Design Provides Complete Electrical Isolation of Disc Assembly	
Flame-retardant Housing (UL 94 V-0)	
Flame-retardant Filling (UL 94 V-0)	

### General Technical Data

Climatic Category	40/85/56	in accordance with IEC 68-1
LCT	-40°C	
UCT	+85°C	
Damp Heat, Steady State (93% r.h., 40°C)	56 days	in accordance with IEC 68-2-3
Operating Temperature	-40 ... +85°C	in accordance with CECC 42 000
Storage Temperature	-40 ... +110°C	
Electric Strength	$\geq 2.5$ kV	in accordance with CECC 42 000
Insulation Resistance	$\geq 1.0$ G $\Omega$	in accordance with CECC 42 000
Response Time	< 25 ns	
Max. Torque	2.5 Nm	

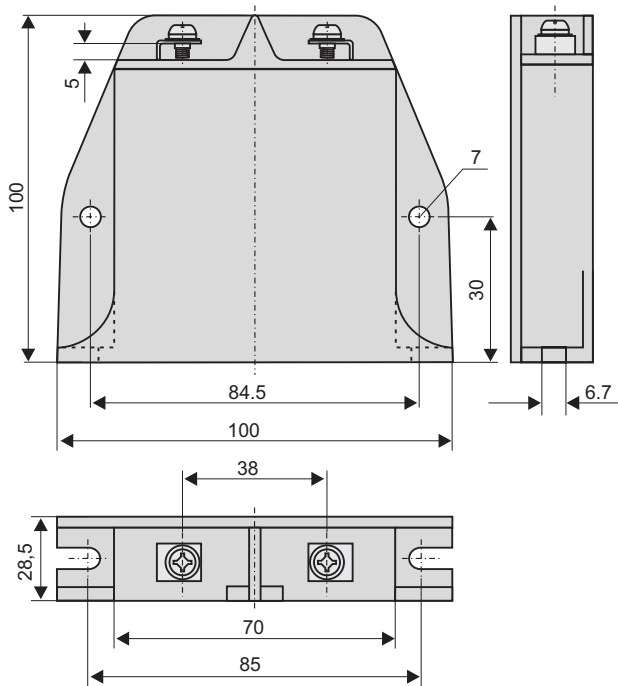
### Type Designation



**Table of Standard Values**

Part Number	Maximum Ratings $T_A = +85^\circ\text{C}$ (+185°F)					Characteristics $T_A = +25^\circ\text{C}$ (+77°F)					V - I Characteristic	Pulse Rating
	Operating Voltage		Average Power Dissipation $P_{max}$ (W)	Permissible Peak Current (8/20 $\mu\text{s}$ ) $I_{max}$ (A)	Energy Absorption (2 ms) $W_{max}$ (J)	Varistor Voltage (1 mA) $V_N$ (V)	Standard Tolerance of $V_N$ $\Delta V_N$ ( $\pm\%$ )	Maximum Clamping Voltage at Test Current (8/20 $\mu\text{s}$ )		Typical Capacitance $f=1\text{kHz}$ $C$ (pF)		
	RMS Voltage $V_{RMS}$ (V)	DC Voltage $V_{DC}$ (V)						$V_C$ (V)	$I$ (A)			
V130E60	130	170	1.6	70000	490	205	10	340	500	15000	11	14
V140E60	140	180	1.6	70000	445	220	10	360	500	12500	11	14
V150E60	150	200	1.6	70000	485	240	10	395	500	11500	11	14
V175E60	175	225	1.6	70000	545	270	10	455	500	9800	11	14
V230E60	230	300	1.6	70000	725	360	10	595	500	8000	11	14
V250E60	250	320	1.6	70000	785	390	10	650	500	7200	11	14
V275E60	275	350	1.6	70000	870	430	10	710	500	6800	11	14
V300E60	300	385	1.6	70000	950	470	10	840	500	6300	11	14
V320E60	320	420	1.6	70000	1050	510	10	840	500	5800	11	14
V385E60	385	505	1.6	70000	1250	620	10	1025	500	4800	11	14
V420E60	420	560	1.6	70000	1500	680	10	1120	500	4500	11	14
V440E60	440	585	1.6	70000	1550	715	10	1180	500	4300	11	14
V460E60	460	615	1.6	70000	1600	750	10	1240	500	4100	11	14
V510E60	510	670	1.6	70000	1650	820	10	1355	500	3800	11	14
V550E60	550	745	1.6	70000	1700	910	10	1500	500	3500	11	14
V625E60	625	825	1.6	70000	1750	1000	10	1650	500	3200	11	14
V680E60	680	895	1.6	70000	1800	1100	10	1815	500	2800	11	14
V750E60	750	1060	1.6	70000	2000	1200	10	2000	500	2600	11	14
V1100E60	1100	1465	1.6	70000	3000	1800	10	2970	500	1800	11	14

**Dimensions**



All dimensions are maximum except where noted. Dimensions are in millimeters.

**Part Number**

**Approx. Weight (g)**

V130E60	190
V140E60	190
V150E60	195
V175E60	200
V230E60	205
V250E60	210
V275E60	215
V300E60	220
V320E60	225
V385E60	230
V420E60	230
V440E60	230
V460E60	240
V510E60	250
V550E60	260
V625E60	280
V680E60	310
V750E60	330
V1100E60	380

## High Energy Varistors - E80 Series

### Description

The E80 types are heavy-duty metal oxide varistors designed mainly for industrial applications. They offer excellent surge protection for various electronic equipment such as: traffic and railway signal systems, communication equipment, waterworks, automatic control devices for power distribution, oil drilling and mining equipment (dredgers, cranes, etc.). The E60 housings offer excellent protection also when they are exposed to different kinds of vibrations, dust, moisture, etc. The advantages of the E60 Series are: rigid terminals for good wire contact, solid plastic housing for secure mounting, higher insulation resistance (polyurethane filling and plastic housing).



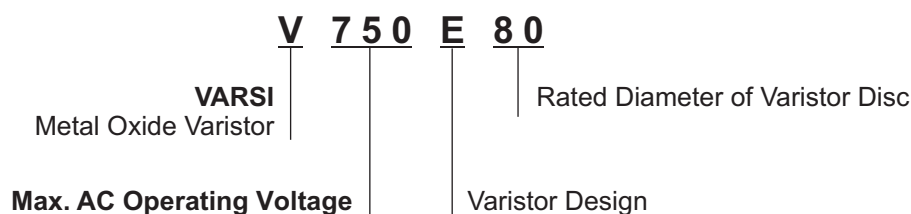
### Main Features

Wide Operating Voltage Range $V_{RMS}$	130 V to 1100 V
High Energy Absorption Capability $W_{max}$ (2 ms)	660 J to 6000 J
High Peak Current Capability $I_{max}$ (8/20 $\mu$ s)	100000 A
Rigid Terminals for Secure Wire Contact	
Case Design Provides Complete Electrical Isolation of Disc Assembly	
Flame-retardant Housing (UL 94 V-0)	
Flame-retardant Filling (UL 94 V-0)	

### General Technical Data

Climatic Category	40/85/56	in accordance with IEC 68-1
LCT	-40°C	
UCT	+85°C	
Damp Heat, Steady State (93% r.h., 40°C)	56 days	in accordance with IEC 68-2-3
Operating Temperature	-40 ... +85°C	in accordance with CECC 42 000
Storage Temperature	-40 ... +110°C	
Electric Strength	$\geq 2.5$ kV	in accordance with CECC 42 000
Insulation Resistance	$\geq 1.0$ G $\Omega$	in accordance with CECC 42 000
Response Time	< 25 ns	
Max. Torque	2.5 Nm	

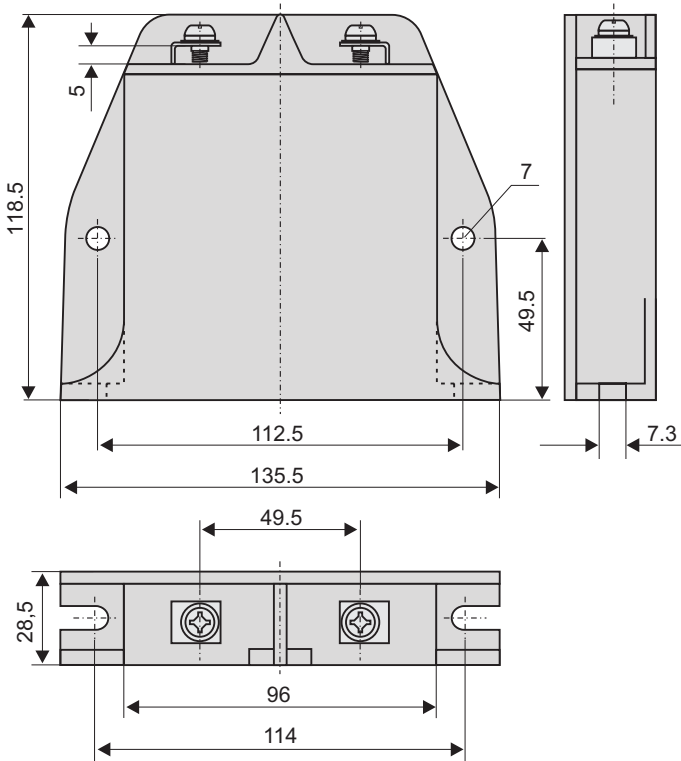
### Type Designation



**Table of Standard Values**

Part Number	Maximum Ratings TA = +85°C (+185°F)					Characteristics TA = +25°C (+77°F)					V - I Characteristic	Pulse Rating
	Operating Voltage		Average Power Dissipation P <sub>max</sub> (W)	Permissible Peak Current (8/20 μs) I <sub>max</sub> (A)	Energy Absorption (2 ms) W <sub>max</sub> (J)	Varistor Voltage (1 mA) V <sub>N</sub> (V)	Standard Tolerance of V <sub>N</sub> ΔV <sub>N</sub> (±%)	Maximum Clamping Voltage at Test Current (8/20 μs)		Typical Capacitance f=1kHz C (pF)		
	RMS Voltage V <sub>RMS</sub> (V)	DC Voltage V <sub>DC</sub> (V)						V <sub>C</sub> (V)	I (A)			
V130D80E	130	170	2.0	100000	660	205	10	340	800	28000	12	14
V140D80E	140	180	2.0	100000	710	220	10	360	800	26000	12	14
V150D80E	150	200	2.0	100000	800	240	10	395	800	23000	12	14
V175D80E	175	225	2.0	100000	890	270	10	455	800	20000	12	14
V230D80E	230	300	2.0	100000	1200	360	10	595	800	16000	12	14
V250D80E	250	320	2.0	100000	1300	390	10	650	800	14100	12	14
V275D80E	275	350	2.0	100000	1400	430	10	710	800	13000	12	14
V300D80E	300	385	2.0	100000	1500	470	10	755	800	12000	12	14
V320D80E	320	420	2.0	100000	1600	510	10	840	800	11000	12	14
V385D80E	385	505	2.0	100000	2000	620	10	1025	800	9000	12	14
V420D80E	420	560	2.0	100000	2200	680	10	1120	800	8600	12	14
V440D80E	440	585	2.0	100000	2350	715	10	1180	800	8200	12	14
V460D80E	460	615	2.0	100000	2500	750	10	1240	800	7800	12	14
V510D80E	510	670	2.0	100000	2600	820	10	1355	800	7000	12	14
V550D80E	550	745	2.0	100000	3100	910	10	1500	800	6600	12	14
V625D80E	625	825	2.0	100000	3300	1000	10	1650	800	6000	12	14
V680D80E	680	895	2.0	100000	3600	1100	10	1815	800	5200	12	14
V750D80E	750	1060	2.0	100000	4000	1200	10	2000	800	4900	12	14
V1100D80E	1100	1465	2.0	100000	6000	1800	10	2970	800	3300	12	14

**Dimensions**

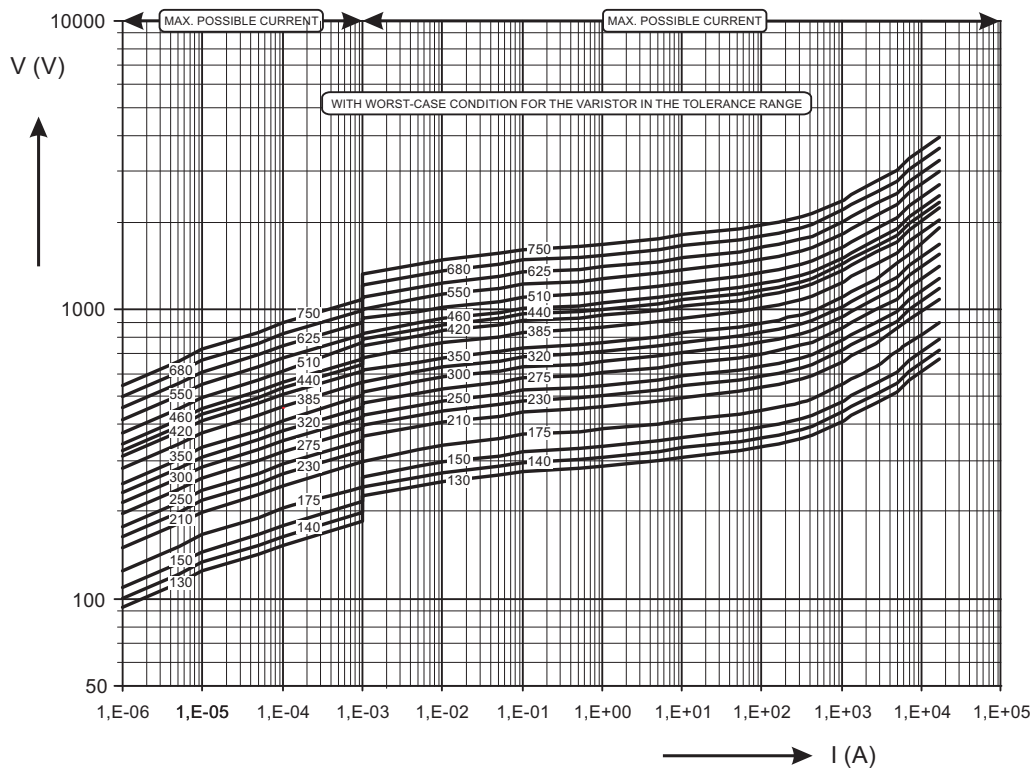


Part Number	Approx. Weight (g)
V130E80	490
V140E80	495
V150E80	500
V175E80	505
V230E80	510
V250E80	520
V275E80	530
V300E80	540
V320E60	550
V385E80	560
V420E80	580
V440E80	600
V460E80	610
V510E80	620
V550E80	630
V625E80	640
V680E80	650
V750E80	660
V1100E80	690

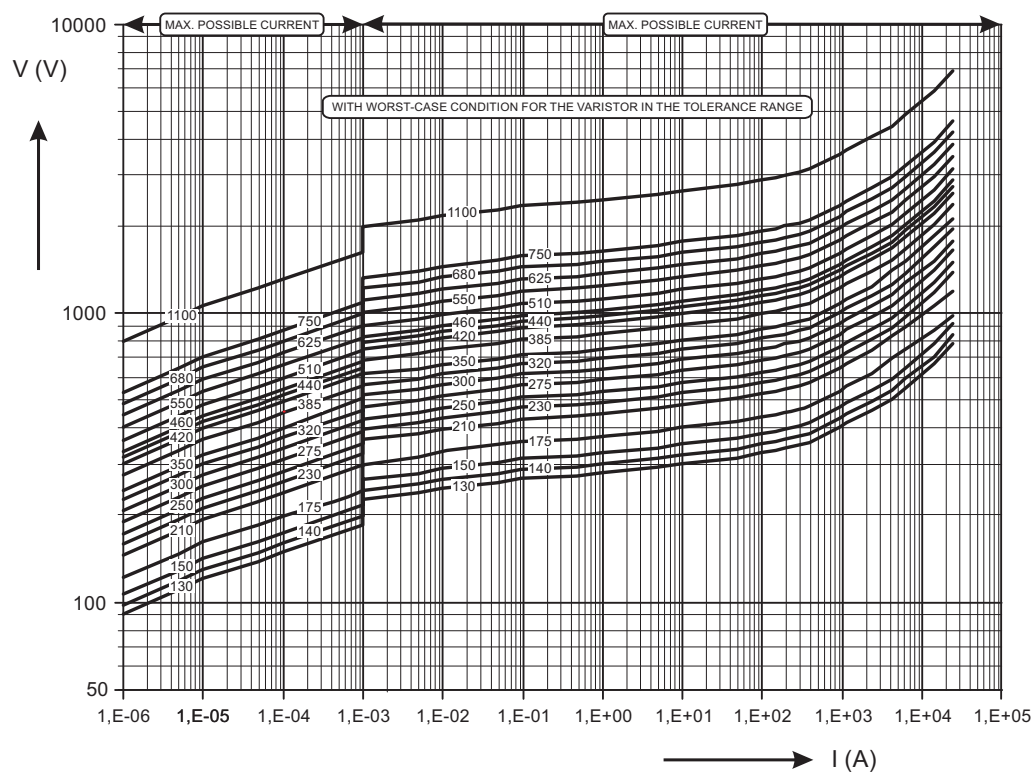
All dimensions are maximum except where noted. Dimensions are in millimeters.

V-I Characteristics

V130-V750E25



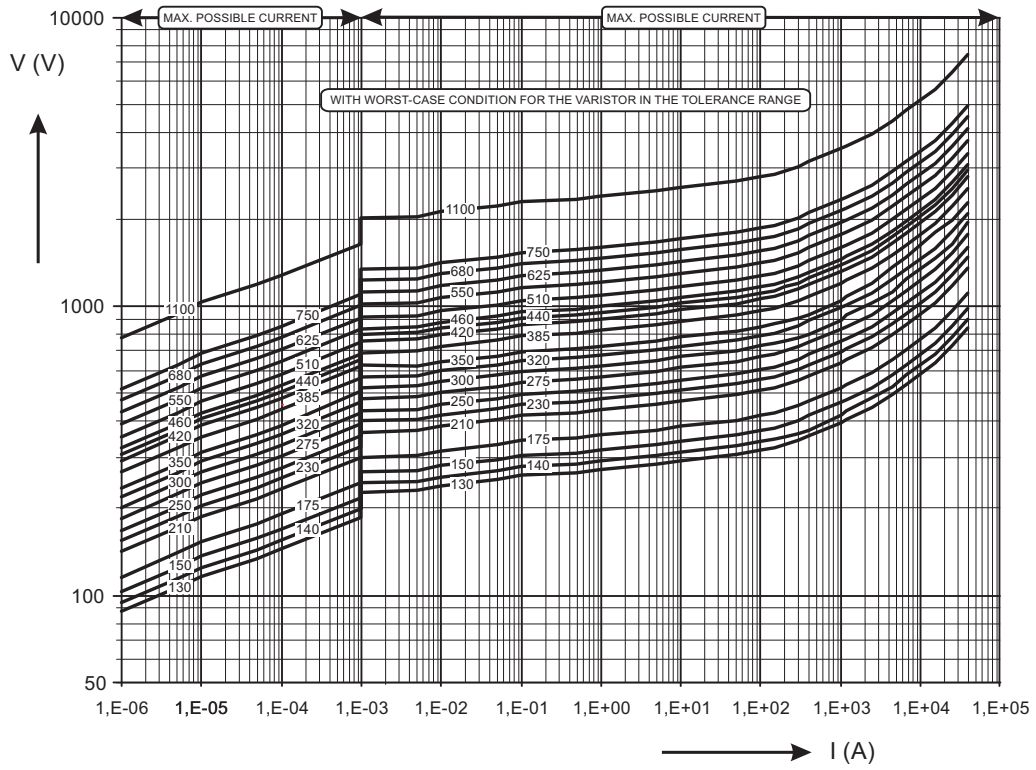
V130-V750E32



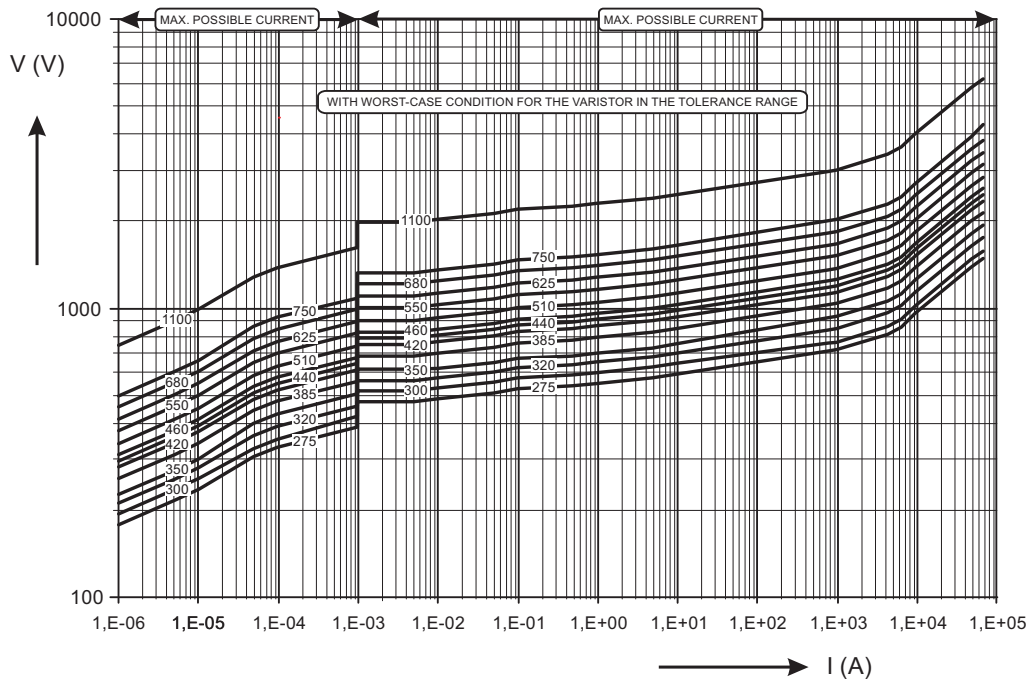


V-I Characteristics

V130-V750E40

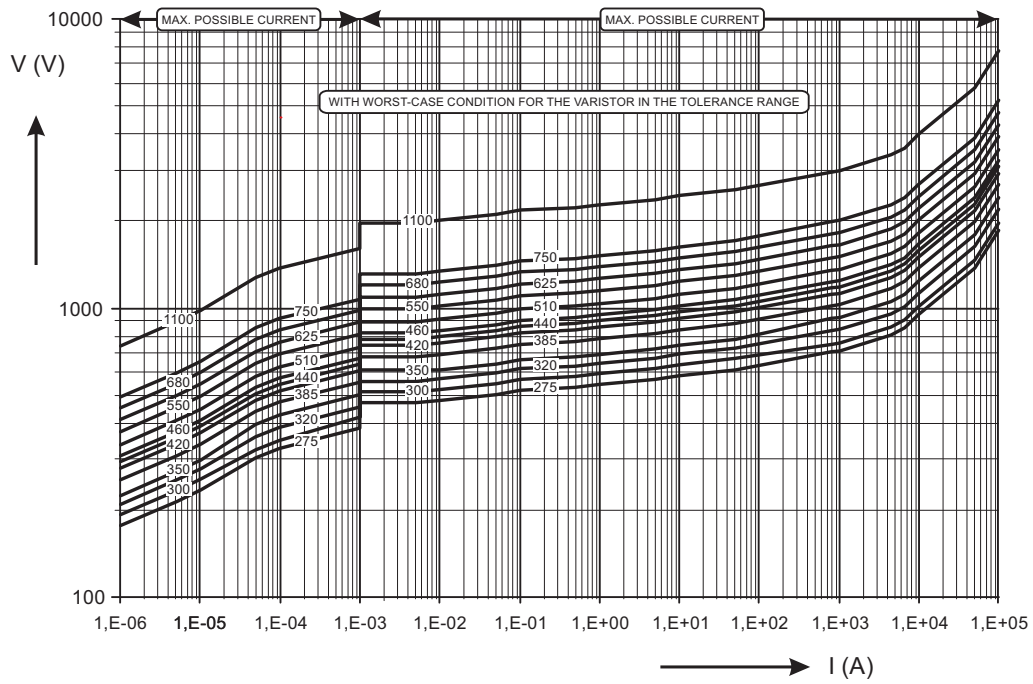


V275-V1100E60



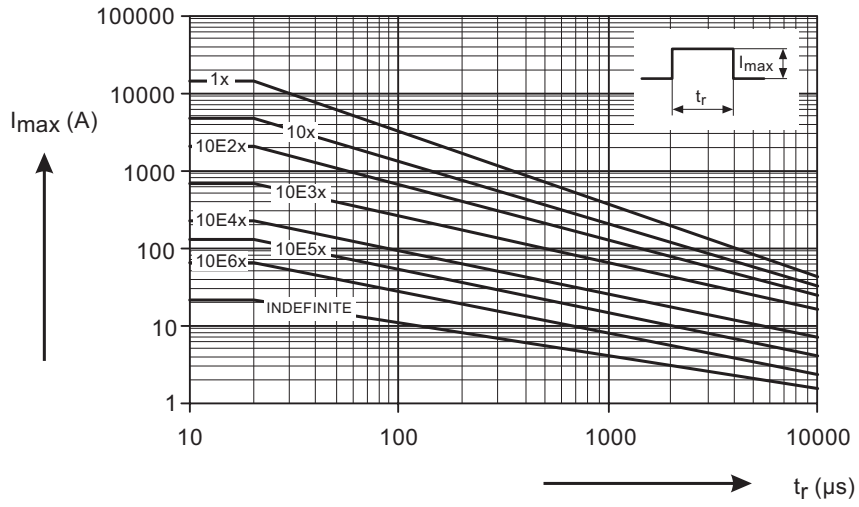
V-I Characteristics

V275-V1100D80E

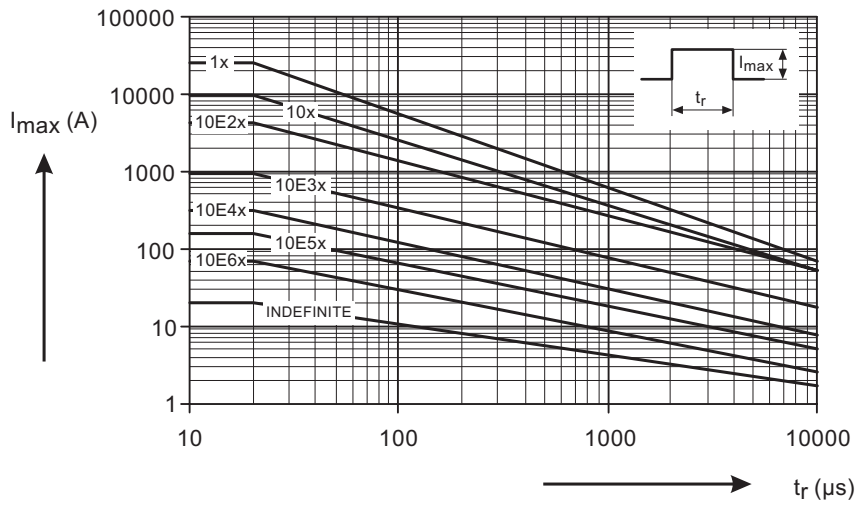


Pulse Ratings

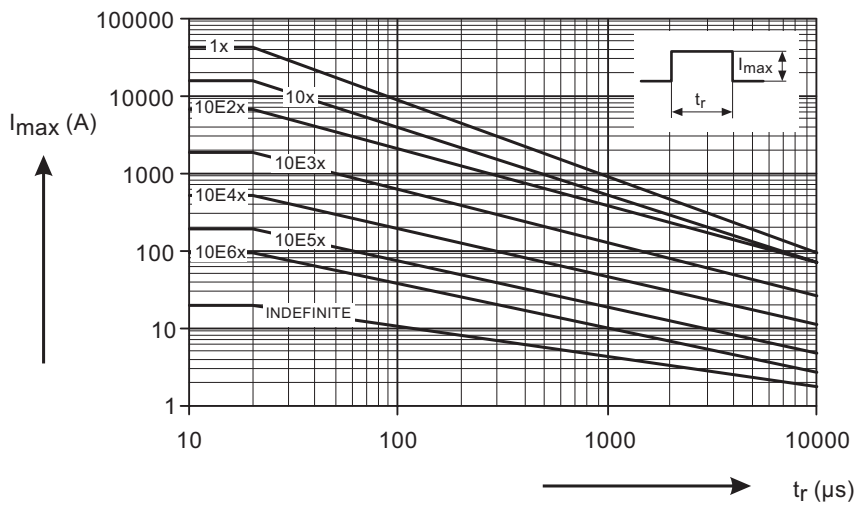
V130-V750E25



V130-V750E32

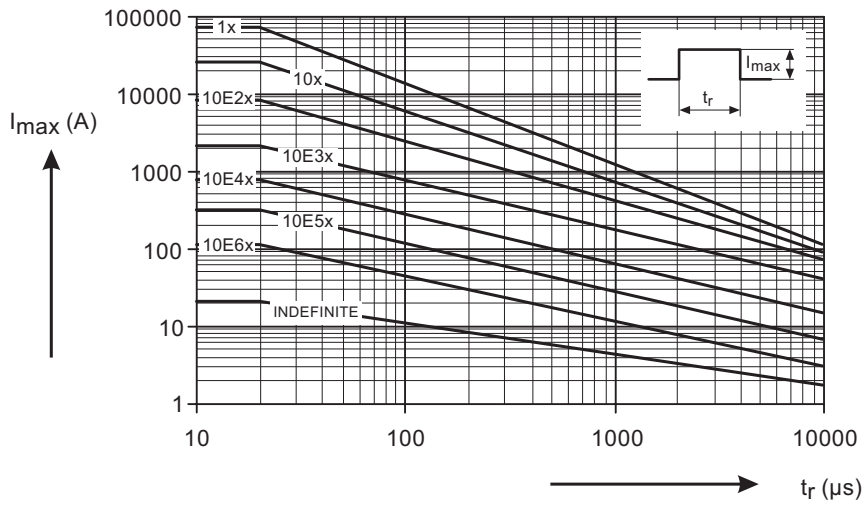


V130-V750E40



Pulse Ratings

V275-V1100E60



V275-V1100D80E

