

KEKOVARICON

Varistors

SMD, THD, High Energy

Varicons

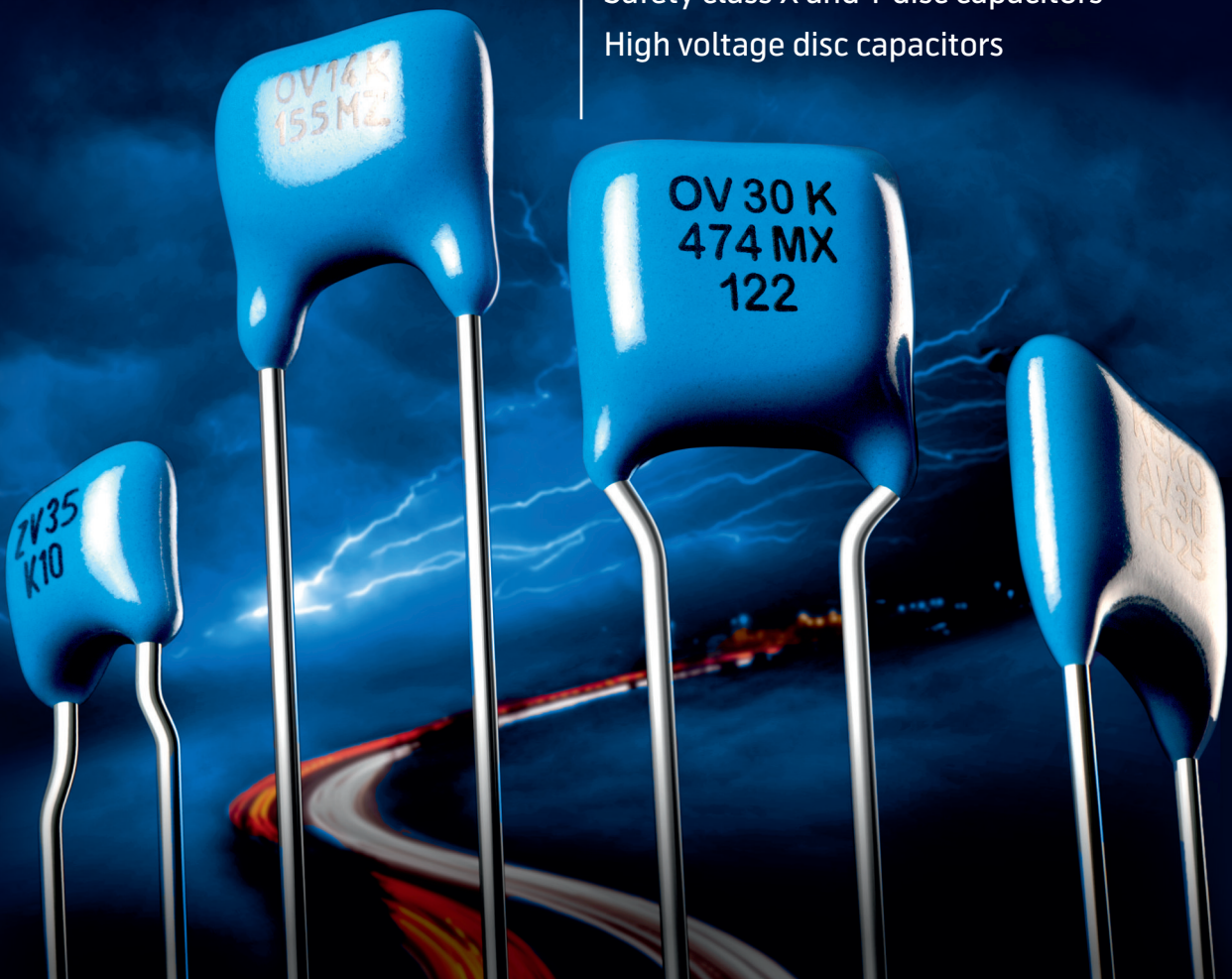
Multilayer SMD and THD

Dual Function Varicons

Capacitors

Safety class X and Y disc capacitors

High voltage disc capacitors

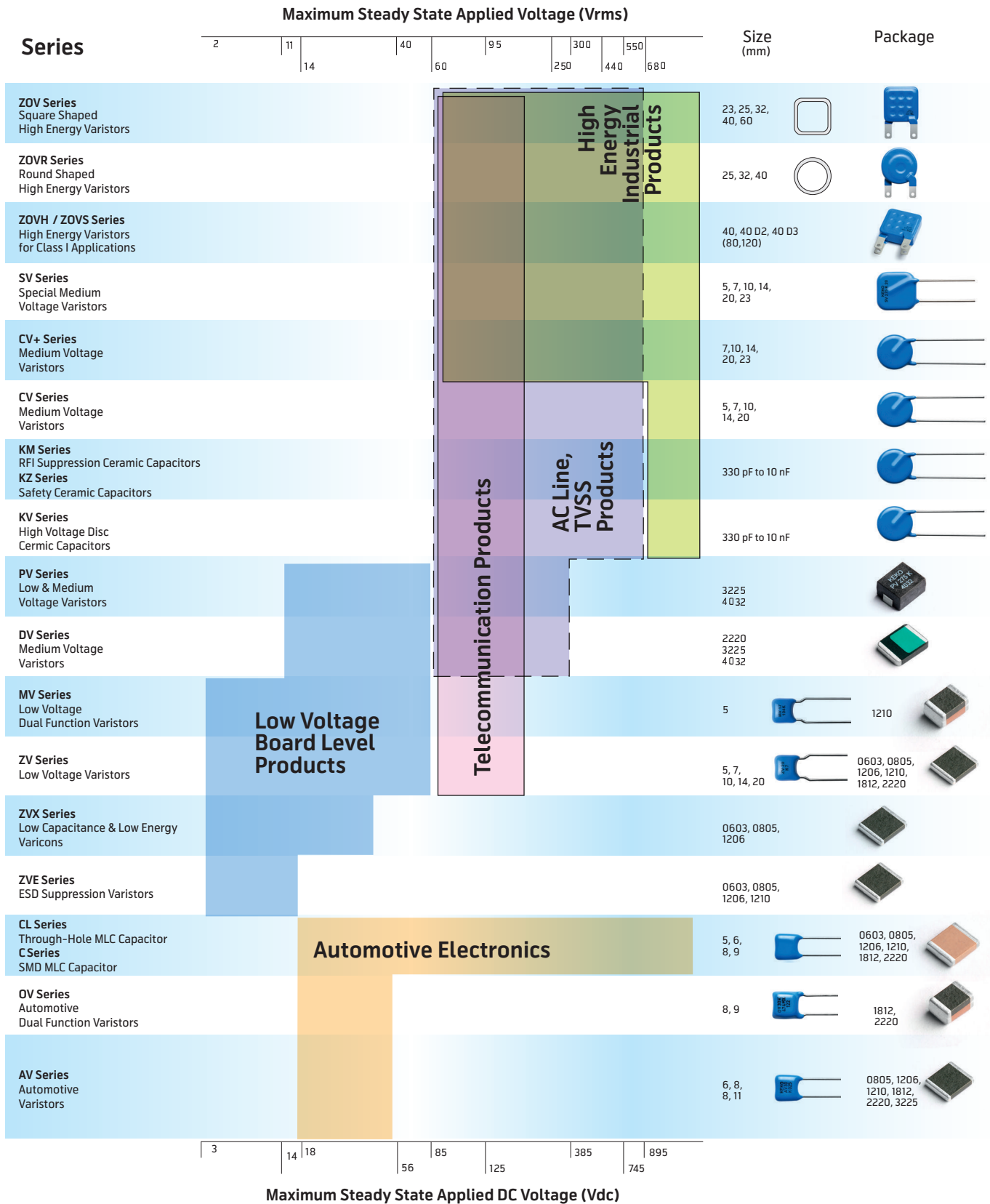


OVERVIEW OF PROTECTIVE DEVICES

Basic Electrical Parameters	Maximum Steady State Applied Voltage (Vrms)										Size (mm)	Package
	2	14	40	60	95	250	300	440	550	680		
<p>$I_{max} = 13000$ to 80000 A, $W_{max} = 90$ to 4140 J $I_{max} > 5500$ A/cm², $W_{max} > 400$ J/cm³</p>						<p>ZOV Series Square Shaped High Energy Varistors</p>					23, 25, 32, 40, 60	
<p>$I_{max} = 15000$ to 40000 A, $W_{max} = 30$ to 2590 J</p>						<p>ZOVR Series Round Shaped High Energy Varistors</p>					25, 32, 40	
<p>I_{max} (8/20μs) up to 150 kA, limp (10/350μs) up to 25 kA Custom Design</p>						<p>ZOVH / ZOVS Series High Energy Varistors for class I applications</p>					40, 40 D2, 40 D4 (80,120)	
<p>$I_{max} = 600$ to 15000 A, $W_{max} = 4$ to 815 J $I_{max} > 5500$ A/cm², $W_{max} > 400$ J/cm³</p>						<p>SV Series Special Medium Voltage Varistors</p>					5, 7, 10, 14, 20, 23	
<p>$I_{max} = 1750$ to 15000 A, $W_{max} = 9$ to 627 J</p>						<p>CV+ Series Medium Voltage Varistors</p>					7, 10, 14, 20, 23	
<p>$I_{max} = 400$ to 6500 A, $W_{max} = 2,7$ to 620 J</p>						<p>CV Series Medium Voltage Varistors</p>					5, 7, 10, 14, 20	
<p>KM - C = 10 to 15 nF, Class X1, 300 VAC KM - C = 1 to 10 nF, Class Y2, 300 VAC KZL, KZH - C = 330 to 4700 pF, Class X1/Y1/Y2, 300/500 VAC</p>						<p>KM Series RFI Suppression Ceramic Capacitors KZ Series Safety Ceramic Capacitors</p>					330 pF to 10 nF	
<p>C = 300pF to 10nF Vr = 1kV to 6kV</p>						<p>KV Series High Voltage Disc Ceramic Capacitors</p>					330 pF to 10 nF	
<p>$I_{max} = 100$ to 1200 A, $W_{max} = 0,6$ to 30 J</p>						<p>PV Series Low & Medium Voltage Varistors</p>					3225 4032	
<p>$I_{max} = 100$ to 1200 A, $W_{max} = 0,6$ to 30 J</p>						<p>DV Series Medium Voltage Varicons</p>					2220 3225 4032	
<p>$I_{max} = 1500$ A, $W_{max} = 0,1$ to $2,6$ J C (@ 1kHz) = 10 nF to 1000 nF</p>						<p>MV Series Low Voltage Dual Function Varicons</p>					5	
<p>$I_{max} = 20$ to 2000 A, $W_{max} = 0,1$ to $37,8$ J</p>						<p>ZV Series Low Voltage Varicons</p>					5, 7, 10, 14, 20	
<p>$I_{max} = 30$ to 40 A $W_{max} = 1,0$ J</p>						<p>ZVX Series Low Capacitance & Low Energy Varicons</p>					0603, 0805, 1206	
<p>tr < 1 ns, $W_{max} = 0,05$ to $0,1$ J</p>						<p>ZVE Series ESD Suppression Varicons</p>					0603, 0805, 1206, 1210	
<p>CL and C Series: C = 1pF to $4,7\mu$F, V = from 16 V to 630 V X7R, C series: AgPd, Barrier End Terminations, Ni / Sn End terminations</p>						<p>CL Series Through-Hole MLC Capacitor C Series SMD MLC Capacitor</p>					5, 6, 8, 9	
<p>$I_{max} = 800$ to 1200 A, WLD = 6 to 12 J C (@ 1kHz) = 470 nF to 1500 nF Custom Design</p>						<p>OV Series Automotive Dual Function Varicons</p>					8, 9	
<p>$I_{max} = 120$ to 2000 A, WLD = 3 to 100 J Custom Design</p>						<p>AV Series Automotive Varicons</p>					6, 8, 8, 11	
	3	14	18	56	85	125	385	745	895			
	Maximum Steady State Applied DC Voltage (Vdc)											

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APPLICATION FIELDS



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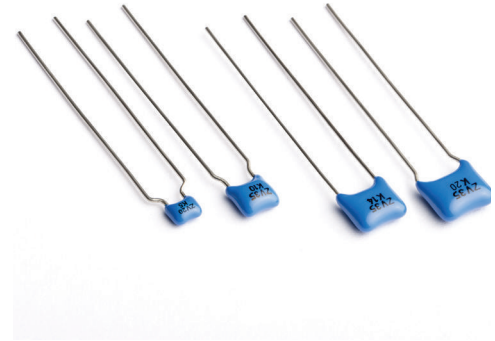
LOW VOLTAGE LEADED STYLE VARISTORS – ZV SERIES

Description

The ZV series of low voltage varistors is designed to protect sensitive electronic devices against high voltage and current surges in the low voltage region.

They offer excellent transient energy absorption due to improved energy volume distribution and power dissipation.

Low voltage varistors cover a wide DC operating voltage range from 3 V to 56 V.



Features

- Operating voltage range V_{dc}3 V to 56 V.
- 5 Model sizes available5, 7, 10, 14, 20.
- Low clamping voltage.
- Broad range of current and energy handling capabilities.
- + 125 °C continuous operating temperature
- Dimensional and weight savings on the board.
- Available in tape and reel for automatic insertion
- Lead free components.
- AEC-Q200 qualified Grade 3.
- **UL** UL 1449, 3rd edition & CSA C22.2. File E326499 Section 7.

Applications

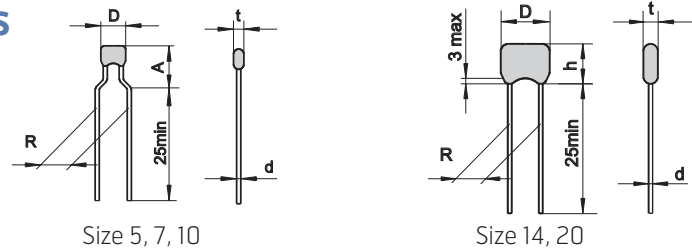
- Suppression of inductive switching or other transient events such as surge voltage at the circuit board level.
- Provides on-board transient voltage protection for ICs and transistors.
- Helps to achieve electromagnetic compliance of end products.
- Replaces larger TVS Zener diodes in many applications.

Absolute Maximum Ratings

Continuous:	Units	Value
Steady State Applied Voltage:		
DC Voltage Range (V_{dc})	V	3 to 56 *
AC Voltage Range (V_{rms})	V	2 to 40 *
Transient:		
Peak Single Pulse Surge Current, 8/20 μ s Waveform (I_{max})	A	100 to 2000
Single Pulse Surge Energy, 10/1000 μ s Waveform (W_{max})	J	0,1 to 37,8
Operating Ambient Temperature	°C	-55 to +125
Storage Temperature	°C	-55 to +150
Threshold Voltage Temperature Coefficient	%/°C	< + 0,05
Insulation Resistance	G Ω	> 1
Isolation Voltage Capability	kV	> 1,25
Response Time	ns	< 25
Climatic Category		55 / 125 / 56

* Higher operating voltages are available upon request.

Device Ratings and Characteristics



ZV 2 M 5.....ZV 40 K 20

Type	V_{rms} V	V_{dc} V	V_n @ 1 mA V	V_c V	I_c A	W_{max} 10/1000 μ s J	P max W	I_{max} 8/20 μ s A	C typ. @ 1 kHz pF	D max mm	t max mm	R mm	d mm	h max mm
ZV 2 M 5	2	3	4	10	1	0,1	0,005	100	1300	6	3,5	5	0,6	7
ZV 2 M 7	2	3	4	10	2,5	0,2	0,008	200	5000	7	3,5	5	0,6	8
ZV 4 M 5	4	5,5	8	14	1	0,1	0,005	100	1066	6	3,5	5	0,6	7
ZV 4 M 7	4	5,5	8	14	2,5	0,3	0,008	200	3720	7	3,5	5	0,6	8
ZV 4 M 10	4	5,5	8	14	5	0,4	0,010	300	5000	7	3,5	5	0,6	9
ZV 4 M 14	4	5,5	8	14	10	0,8	0,015	500	10000	8	3,5	5	0,6	12
ZV 4 M 20	4	5,5	8	14	20	1,5	0,020	1000	17000	9	3,5	5	0,6	12
ZV 6 M 5	6	8	11	21	1	0,2	0,005	100	1066	6	3,5	5	0,6	7
ZV 6 M 7	6	8	11	21	2,5	0,5	0,008	200	3720	7	3,5	5	0,6	8
ZV 6 M 10	6	8	11	21	5	0,8	0,010	300	5000	7	3,5	5	0,6	9
ZV 6 M 14	6	8	11	21	10	1	0,015	500	10000	8	3,5	5	0,6	12
ZV 6 M 20	6	8	11	21	20	3,8	0,020	1000	17000	9	3,5	5	0,6	12
ZV 8 L 5	8	11	15	25	1	0,2	0,005	100	650	6	3,5	5	0,6	7
ZV 8 L 7	8	11	15	25	2,5	0,6	0,008	250	2020	7	3,5	5	0,6	8
ZV 8 L 10	8	11	15	25	5	1,1	0,010	500	3200	7	3,5	5	0,6	9
ZV 8 L 14	8	11	15	25	10	1,9	0,015	800	6260	8	3,5	5	0,6	12
ZV 8 L 20	8	11	15	25	20	4,3	0,020	1500	11070	9	3,5	5	0,6	12
ZV 11 M 5	11	14	18	33	1	0,3	0,005	100	480	6	3,5	5	0,6	7
ZV 11 M 7	11	14	18	33	2,5	0,8	0,008	250	1400	7	3,5	5	0,6	8
ZV 11 M 10	11	14	18	33	5	1,7	0,010	500	2420	7	3,5	5	0,6	9
ZV 11 M 14	11	14	18	33	10	3,3	0,015	1000	5000	8	3,5	5	0,6	12
ZV 11 M 20	11	14	18	33	20	10,5	0,020	2000	9270	9	3,5	5	0,6	12
ZV 14 M 5	14	18	22	38	1	0,4	0,005	100	377	6	3,5	5	0,6	7
ZV 14 M 7	14	18	22	38	2,5	0,9	0,008	250	1050	7	3,5	5	0,6	8
ZV 14 M 10	14	18	22	38	5	2,2	0,010	500	1770	7	3,5	5	0,6	9
ZV 14 M 14	14	18	22	38	10	4,2	0,015	1000	3850	8	3,5	5	0,6	12
ZV 14 M 20	14	18	22	38	20	12	0,020	2000	7670	9	3,5	5	0,6	12
ZV 17 M 5	17	22	27	44	1	0,5	0,005	100	335	6	3,5	5	0,6	7
ZV 17 M 7	17	22	27	44	2,5	1,2	0,008	250	850	7	3,5	5	0,6	8
ZV 17 M 10	17	22	27	44	5	2,6	0,010	500	1370	7	3,5	5	0,6	9
ZV 17 M 14	17	22	27	44	10	5,2	0,015	1000	3050	8	3,5	5	0,6	12
ZV 17 M 20	17	22	27	44	20	14,2	0,020	2000	6600	9	3,5	5	0,6	12
ZV 20 M 5	20	26	33	54	1	0,6	0,005	100	325	6	4,5	5	0,6	7
ZV 20 M 7	20	26	33	54	2,5	1,4	0,008	250	790	7	4,5	5	0,6	8
ZV 20 M 10	20	26	33	54	5	3,2	0,010	500	1090	7	4,5	5	0,6	9
ZV 20 M 14	20	26	33	54	10	6,4	0,015	1000	2490	8	4,5	5	0,6	12
ZV 20 M 20	20	26	33	54	20	18,2	0,020	2000	5670	9	4,5	5	0,6	12
ZV 25 M 5	25	31	39	65	1	0,7	0,005	100	315	6	4,5	5	0,6	7
ZV 25 M 7	25	31	39	65	2,5	1,6	0,008	250	790	7	4,5	5	0,6	8
ZV 25 M 10	25	31	39	65	5	3,8	0,010	500	870	7	4,5	5	0,6	9
ZV 25 M 14	25	31	39	65	10	7,2	0,015	1000	1890	8	4,5	5	0,6	12
ZV 25 M 20	25	31	39	65	20	22,4	0,020	2000	4670	9	4,5	5	0,6	12
ZV 30 M 5	30	38	47	77	1	0,9	0,005	100	315	6	4,5	5	0,6	7
ZV 30 M 7	30	38	47	77	2,5	2,2	0,008	250	790	7	4,5	5	0,6	8
ZV 30 M 10	30	38	47	77	5	4,4	0,010	500	770	7	4,5	5	0,6	9
ZV 30 M 14	30	38	47	77	10	9,4	0,015	1000	1530	8	4,5	5	0,6	12
ZV 30 M 20	30	38	47	77	20	25,8	0,020	2000	3870	9	4,5	5	0,6	12
ZV 35 M 5	35	45	56	90	1	1,2	0,005	100	315	6	4,5	5	0,6	7
ZV 35 M 7	35	45	56	90	2,5	2,6	0,008	250	790	7	4,5	5	0,6	8
ZV 35 M 10	35	45	56	90	5	5,4	0,010	500	680	7	4,5	5	0,6	9
ZV 35 M 14	35	45	56	90	10	10,2	0,015	1000	1260	8	4,5	5	0,6	12
ZV 35 M 20	35	45	56	90	20	33,4	0,020	2000	3470	9	4,5	5	0,6	12
ZV 40 M 5	40	56	68	110	1	1,4	0,005	100	315	6	4,5	5	0,6	7
ZV 40 M 7	40	56	68	110	2,5	3,2	0,008	250	790	7	4,5	5	0,6	8
ZV 40 M 10	40	56	68	110	5	6,4	0,010	500	660	7	4,5	5	0,6	9
ZV 40 M 14	40	56	68	110	10	13,4	0,015	1000	1070	8	4,5	5	0,6	12
ZV 40 M 20	40	56	68	110	20	37,8	0,020	2000	3130	9	4,5	5	0,6	12

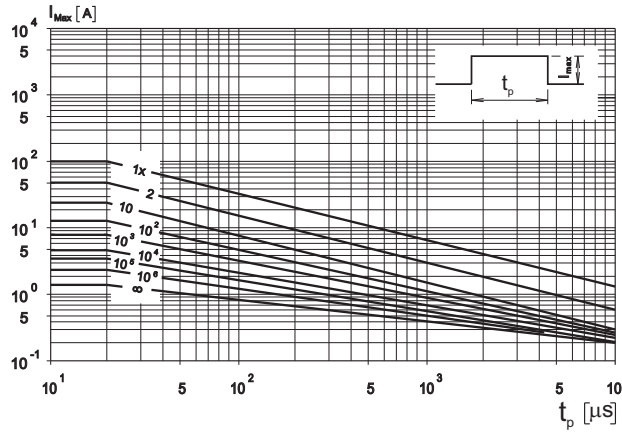
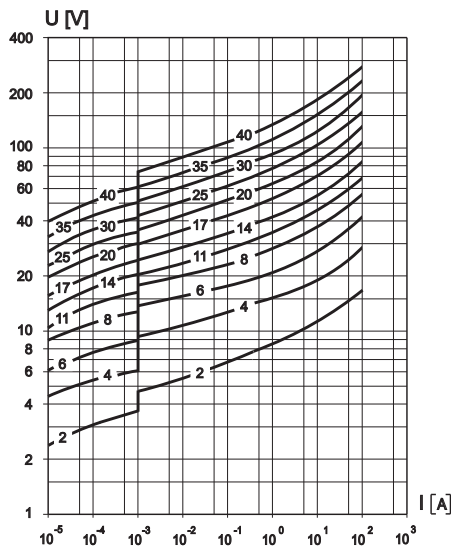
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Protection Level

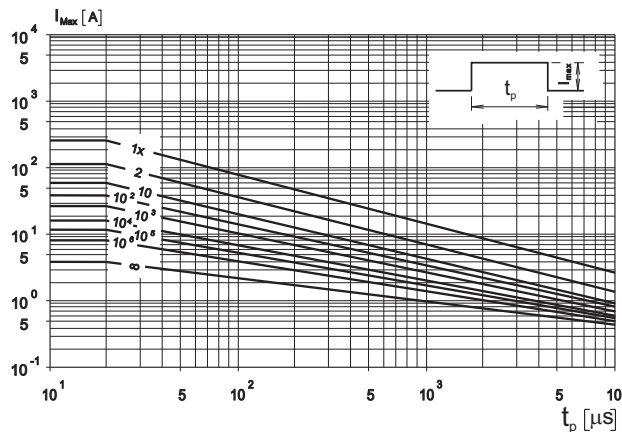
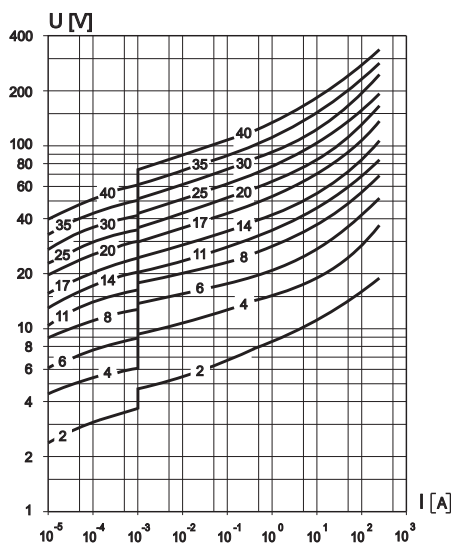
Pulse Rating Curves

* With the worst-case condition in the tolerance region

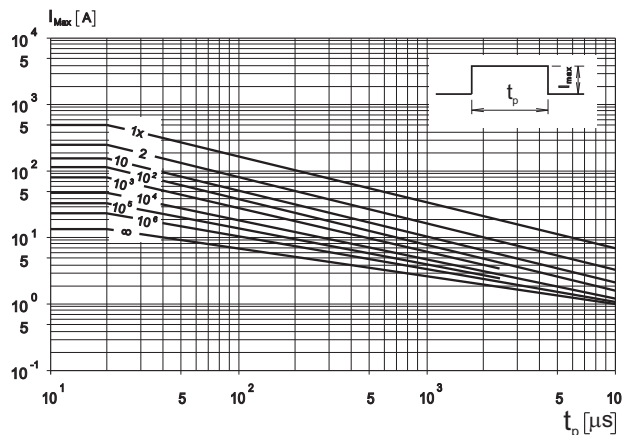
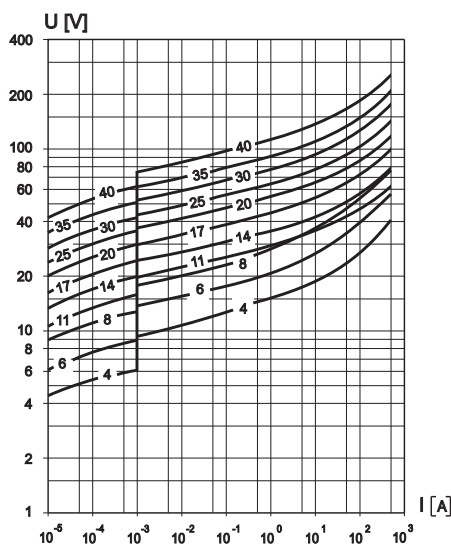
Model Size 5
ZV 2...40



Model Size 7
ZV 2...40



Model Size 10
ZV 4...40



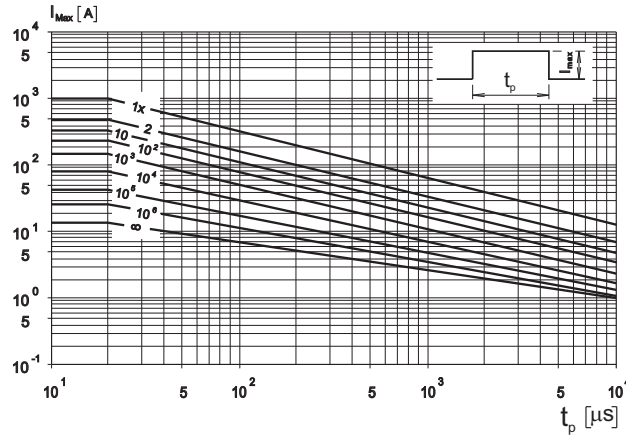
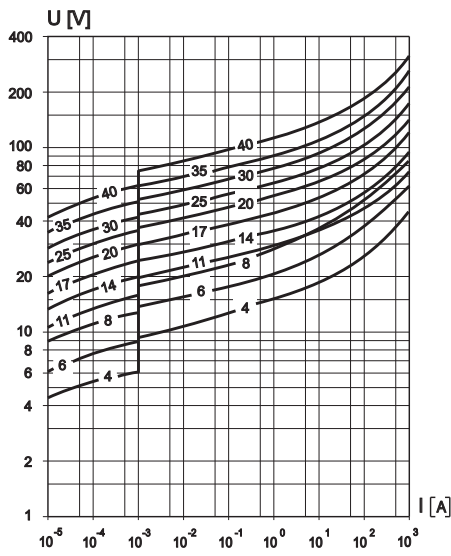
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Protection Level

Pulse Rating Curves

* With the worst-case condition in the tolerance region

Model Size 14
ZV 4...40



Model Size 20
ZV 4...40

