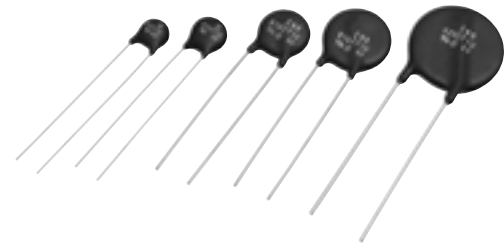


“ZNR” Transient/Surge Absorbers

Type: **D**

Series: **E**



“ZNR” Transient/Surge Absorber, Series E, Type D features large surge current and energy handling capability for absorbing transient overvoltage in a compact size.

■ Features

- Large withstanding surge current capability in compact sizes
- Large “Energy Handling Capability” absorbing transient overvoltages in compact sizes
- Wide range of varistor voltages
- The standard products shown below have received UL and VDE standards
Varistor voltage 200V over : UL, VDE
- RoHS compliant

■ Recommended Applications

- Transistor, diode, IC, thyristor or triac semiconductor protection
- Surge protection in consumer electronic equipment
- Surge protection in communication, measuring or controller electronics
- Surge protection in electronic home appliances, gas or petroleum appliances

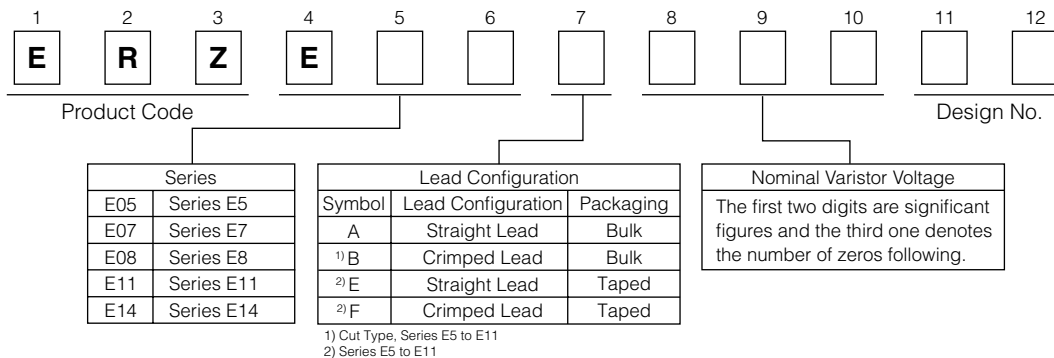
■ Applicable Standards

- UL1449 Ed.3
- VDE IEC61051-1, -2, -2-2, IEC60950-1 Ed.2 Annex.Q
- Type designation(UL), Style reference(VDE)
Are not registered by product Part No..
(Refer to pages 2, and 16 for the details)

■ Handling Precautions and Minimum Quantity / Packing Unit

Please see Related Information

■ Explanation of Part Numbers



NEW

■ Reference Guide to Standard Products

Part No.	Applicable Standards		Varistor Voltage at 1 mA (V)	Maximum Allowable Voltage		Clamping Voltage at 8/20μs		Maximum Peak Current at 8/20μs(A)		Recommended Applications	
	Standard Registration No.	Approvals		ACrms (V)	DC (V)	max.(V)	Ip (A)	1 time	2 times		
ERZE05A201	E201	○☆	200 (185 to 225)	130	170	340	10	1200	600	AC 100 V Line-Line Applications	
ERZE07A201	E7201	○☆				340	25	2500	1250		
ERZE08A201	E8201	○☆				340	25	3500	2500		
ERZE11A201	E11201	○◎☆★				340	50	6000	5000		
ERZE14A201	E14201	○◎☆★	340	100	10000	7000					
ERZE05A221	E221	○☆	220 (198 to 242)	140	180	360	10	1200	600		
ERZE07A221	E7221	○☆				360	25	2500	1250		
ERZE08A221	E8221	○☆				360	25	3500	2500		
ERZE11A221	E11221	○◎☆★				360	50	6000	5000		
ERZE14A221	E14221	○◎☆★	360	100	10000	7000					
ERZE05A241	E241	○☆	240 (216 to 264)	150	200	395	10	1200	600		AC 100 V to 120 V, Line-Line Applications
ERZE07A241	E7241	○☆				395	25	2500	1250		
ERZE08A241	E8241	○☆				395	25	3500	2500		
ERZE11A241	E11241	○◎☆★				395	50	6000	5000		
ERZE14A241	E14241	○◎☆★	395	100	10000	7000					
ERZE05A271	E271	○☆	270 (247 to 303)	175	225	455	10	1200	600		
ERZE07A271	E7271	○☆				455	25	2500	1250		
ERZE08A271	E8271	○☆				455	25	3500	2500		
ERZE11A271	E11271	○◎☆★				455	50	6000	5000		
ERZE14A271	E14271	○◎☆★	455	100	10000	7000					
ERZE05A331	E331	○☆	330 (297 to 363)	210	270	545	10	1200	600	AC 100 V to 120 V, Line-Line Applications	
ERZE07A331	E7331	○☆				545	25	2500	1250		
ERZE08A331	E8331	○☆				545	25	3500	2500		
ERZE11A331	E11331	○◎☆★				545	50	6000	4500		
ERZE14A331	E14331	○◎☆★	545	100	10000	7000					
ERZE05A361	E361	○☆	360 (324 to 396)	230	300	595	10	1200	600		
ERZE07A361	E7361	○☆				595	25	2500	1250		
ERZE08A361	E8361	○☆				595	25	3500	2500		
ERZE11A361	E11361	○◎☆★				595	50	6000	4500		
ERZE14A361	E14361	○◎☆★	595	100	10000	6500					
ERZE05A391	E391	○☆	390 (351 to 429)	250	320	650	10	1200	600		
ERZE07A391	E7391	○☆				650	25	2500	1250		
ERZE08A391	E8391	○☆				650	25	3500	2500		
ERZE11A391	E11391	○◎☆★				650	50	6000	4500		
ERZE14A391	E14391	○◎☆★	650	100	10000	6500					
ERZE05A431	E431	○☆	430 (387 to 473)	275	350	710	10	1200	600		AC 100 V to 220 V, Line-Line and Line-Ground Applications
ERZE07A431	E7431	○☆				710	25	2500	1250		
ERZE08A431	E8431	○☆				710	25	3500	2500		
ERZE11A431	E11431	○◎☆★				710	50	6000	4500		
ERZE14A431	E14431	○◎☆★	710	100	10000	6500					
ERZE05A471	E471	○☆	470 (423 to 517)	300	385	775	10	1200	600		
ERZE07A471	E7471	○☆				775	25	2500	1250		
ERZE08A471	E8471	○◎☆★				775	25	3500	2500		
ERZE11A471	E11471	○◎☆★				775	50	6000	4500		
ERZE14A471	E14471	○◎☆★	775	100	10000	6500					
ERZE07A511	E7511	○☆	510 (459 to 561)	320	410	845	25	2500	1250	AC 100 V to 240 V, Line-Line and Line-Ground Applications	
ERZE08A511	E8511	○◎☆★				845	25	3500	2500		
ERZE11A511	E11511	○◎☆★				845	50	6000	4500		
ERZE14A511	E14511	○◎☆★				845	100	10000	6500		
ERZE07A561	E7561	○☆	560 (504 to 616)	350	450	930	25	2500	1250		
ERZE08A561	E8561	○◎☆★				930	25	3500	2500		
ERZE11A561	E11561	○◎☆★				930	50	6000	4500		
ERZE14A561	E14561	○◎☆★				930	100	10000	6500		
ERZE07A621	E7621	○☆	620 (558 to 682)	385	505	1025	25	2500	1250		
ERZE08A621	E8621	○◎☆★				1025	25	3500	2500		
ERZE11A621	E11621	○◎☆★				1025	50	5000	4500		
ERZE14A621	E14621	○◎☆★				1025	100	7500	6500		
ERZE08A681	E8681	○◎☆★	680 (612 to 748)	420	560	1120	25	3500	2500		AC 380 V, Line-Line and Line-Ground Applications (For DC 500 V Insulating Test)
ERZE11A681	E11681	○◎☆★				1120	50	5000	4500		
ERZE14A681	E14681	○◎☆★				1120	100	7500	6500		
ERZE08A751	E8751	○◎☆★				1240	25	3500	2500		
ERZE11A751	E11751	○◎☆★	750 (675 to 825)	460	615	1240	50	5000	4500		
ERZE14A751	E14751	○◎☆★				1240	100	7500	6500		
ERZE11A821	E11821	○◎☆★				1355	50	5000	4500		
ERZE14A821	E14821	○◎☆★				1355	100	7500	6500		
ERZE11A911	E11911	○◎☆★	910 (819 to 1001)	550	745	1500	50	5000	4500		
ERZE14A911	E14911	○◎☆★				1500	100	7500	6500		
ERZE11A102	E11102	○◎☆★	1000 (900 to 1100)	625	825	1650	50	5000	4500	AC 480 V, Line-Line and Line-Ground Applications (For DC 500 V Insulating Test)	
ERZE14A102	E14102	○◎☆★				1650	100	7500	6500		
ERZE11A112	E11112	○◎☆★	1100 (990 to 1210)	680	895	1815	50	5000	4500		
ERZE14A112	E14112	○◎☆★				1815	100	7500	6500		

○ : UL1449 Ed.3, ● : UL1449 Type3 (or Code-Connected and Direct plug-in), ◎ : UL1449 Type2 (or Permanently Connected), ☆ : VDE (IEC61051-1, -2, -2-2), ★ : VDE (IEC60950-1 Ed.2 Annex.Q)
 ※ Approval number (File No.) of safety regulations are subject to revision without notice. Ask factory for a copy of the latest file No.

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use. Should a safety concern arise regarding this product, please be sure to contact us immediately.

Series E5

■ Ratings and Characteristics

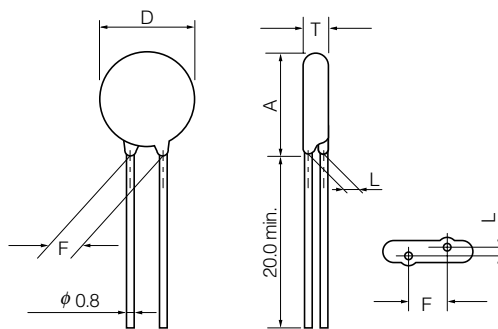
● Operating Temperature Range : -40 to 85 °C ● Storage Temperature Range : -40 to 125 °C

Part No.	Varistor Voltage	Maximum Allowable Voltage		Clamping Voltage (max.) *I _p	Rated Power	Maximum Energy		Maximum Peak Current (8/20 μs)		Capacitance (max.) at 1 kHz (pF)
						(10/1000 μs)	(2 ms)	1 time	2 times	
	V _{1 mA} (V)	ACrms (V)	DC (V)	(V)	(W)	(J)	(J)	(A)	(A)	
ERZE05A201	200(185 to 225)	130	170	340	0.25	13	9.5	1200	600	200
ERZE05A221	220(198 to 242)	140	180	360	0.25	14	10	1200	600	190
ERZE05A241	240(216 to 264)	150	200	395	0.25	15	11	1200	600	170
ERZE05A271	270(247 to 303)	175	225	455	0.25	18	13	1200	600	150
ERZE05A331	330(297 to 363)	210	270	545	0.25	21	15	1200	600	130
ERZE05A361	360(324 to 396)	230	300	595	0.25	23	17	1200	600	130
ERZE05A391	390(351 to 429)	250	320	650	0.25	26	19	1200	600	130
ERZE05A431	430(387 to 473)	275	350	710	0.25	29	21	1200	600	120
ERZE05A471	470(423 to 517)	300	385	775	0.25	32	23	1200	600	100

*I_p Measuring current of clamping voltage : 10 A

■ Dimensions in mm (not to scale)

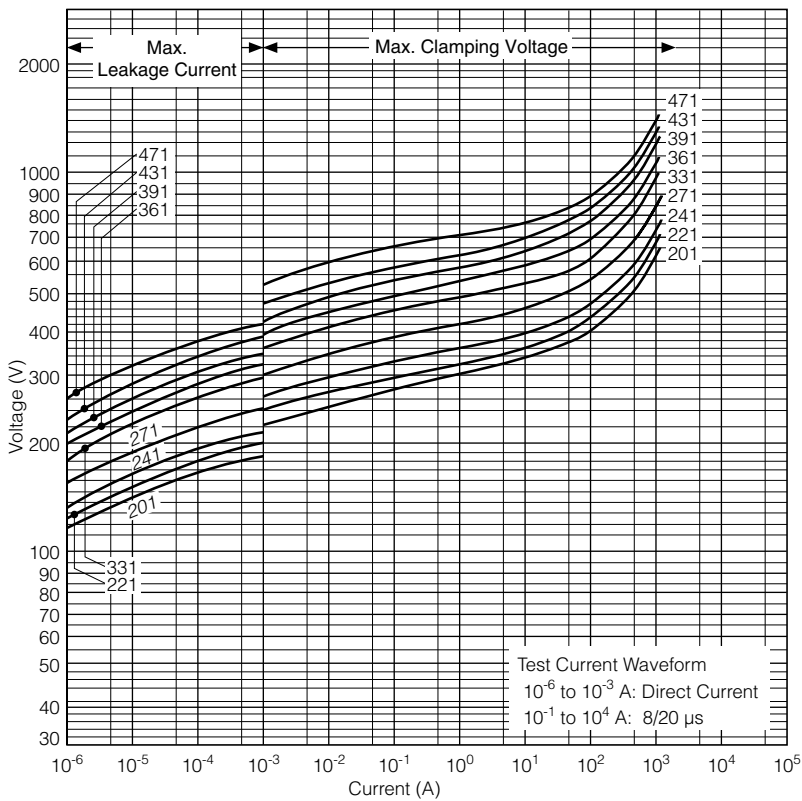
Part No.	D max.	T max.	F±1.0	A max.	L±1.0
ERZE05A201	7.0	4.8	5.0	10.0	2.1
ERZE05A221	7.0	4.9	5.0	10.0	2.3
ERZE05A241	7.0	5.0	5.0	10.0	2.4
ERZE05A271	7.0	5.2	5.0	10.0	2.5
ERZE05A331	7.0	5.5	5.0	10.0	2.9
ERZE05A361	7.0	5.8	5.0	10.0	3.1
ERZE05A391	7.0	5.9	5.0	10.0	3.2
ERZE05A431	7.0	6.1	5.0	10.0	3.3
ERZE05A471	7.0	6.3	5.0	10.0	3.5



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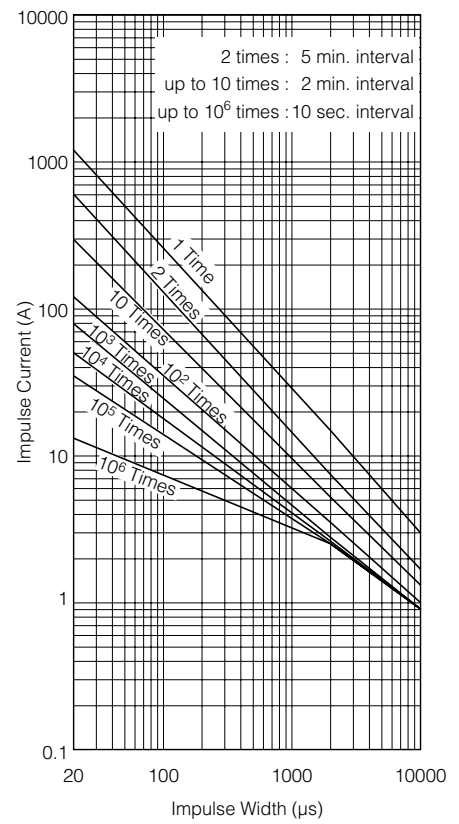
Typical Characteristics
Voltage vs. Current

ERZE05A201 to ERZE05A471



Impulse Derating (Relation between impulse width and impulse current multiple)

ERZE05A201 to ERZE05A471



Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use. Should a safety concern arise regarding this product, please be sure to contact us immediately.

Series E7

■ Ratings and Characteristics

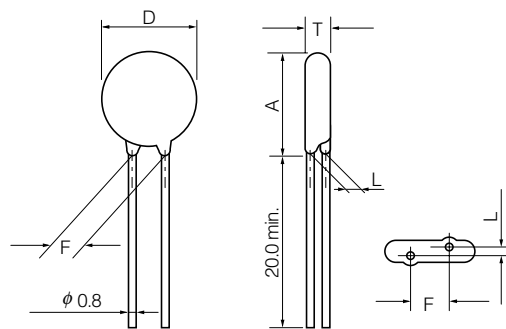
● Operating Temperature Range : -40 to 85 °C ● Storage Temperature Range : -40 to 125 °C

Part No.	Varistor Voltage	Maximum Allowable Voltage		Clamping Voltage (max.) *I _p	Rated Power (W)	Maximum Energy		Maximum Peak Current (8/20 μs)		Capacitance (max.) at 1 kHz (pF)
		ACrms (V)	DC (V)			(10/1000 μs) (J)	(2 ms) (J)	1 time (A)	2 times (A)	
	V _{1 mA} (V)			(V)	(W)	(J)	(J)	(A)	(A)	
ERZE07A201	200(185 to 225)	130	170	340	0.3	26	19	2500	1250	360
ERZE07A221	220(198 to 242)	140	180	360	0.3	30	22	2500	1250	350
ERZE07A241	240(216 to 264)	150	200	395	0.3	33	24	2500	1250	340
ERZE07A271	270(247 to 303)	175	225	455	0.3	39	28	2500	1250	310
ERZE07A331	330(297 to 363)	210	270	545	0.3	44	32	2500	1250	280
ERZE07A361	360(324 to 396)	230	300	595	0.3	50	36	2500	1250	260
ERZE07A391	390(351 to 429)	250	320	650	0.3	53	38	2500	1250	240
ERZE07A431	430(387 to 473)	275	350	710	0.3	60	43	2500	1250	210
ERZE07A471	470(423 to 517)	300	385	775	0.3	65	47	2500	1250	170
ERZE07A511	510(459 to 561)	320	410	845	0.3	70	50	2500	1250	140
ERZE07A561	560(504 to 616)	350	450	930	0.3	75	55	2500	1250	140
ERZE07A621	620(558 to 682)	385	505	1025	0.3	80	60	2500	1250	135

*I_p Measuring current of clamping voltage : 25 A

■ Dimensions in mm (not to scale)

Part No.	D max.	T max.	F±1.0	A max.	L±1.0
ERZE07A201	9.0	5.3	7.5	12.5	3.1
ERZE07A221	9.0	5.4	7.5	12.5	3.3
ERZE07A241	9.0	5.5	7.5	12.5	3.4
ERZE07A271	9.0	5.7	7.5	12.5	3.5
ERZE07A331	9.0	6.0	7.5	12.5	3.8
ERZE07A361	9.0	6.2	7.5	12.5	3.9
ERZE07A391	9.0	6.3	7.5	12.5	4.0
ERZE07A431	9.0	6.5	7.5	12.5	4.1
ERZE07A471	9.0	6.8	7.5	12.5	4.3
ERZE07A511	9.0	7.0	7.5	12.5	4.5
ERZE07A561	9.0	7.4	7.5	13.5	4.8
ERZE07A621	10.0	7.8	7.5	13.5	5.0



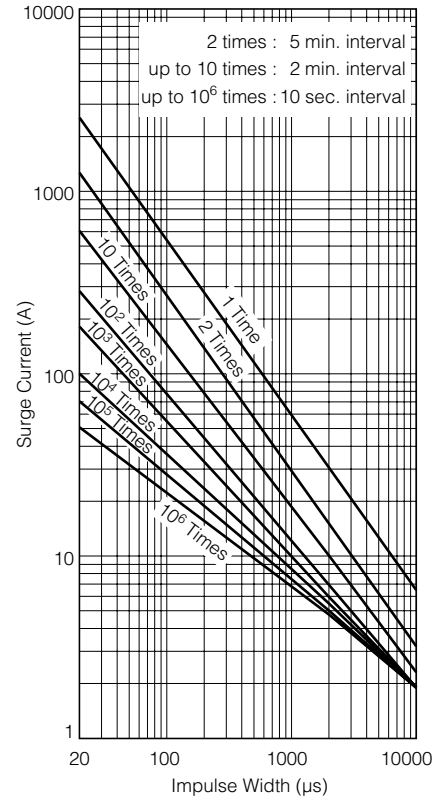
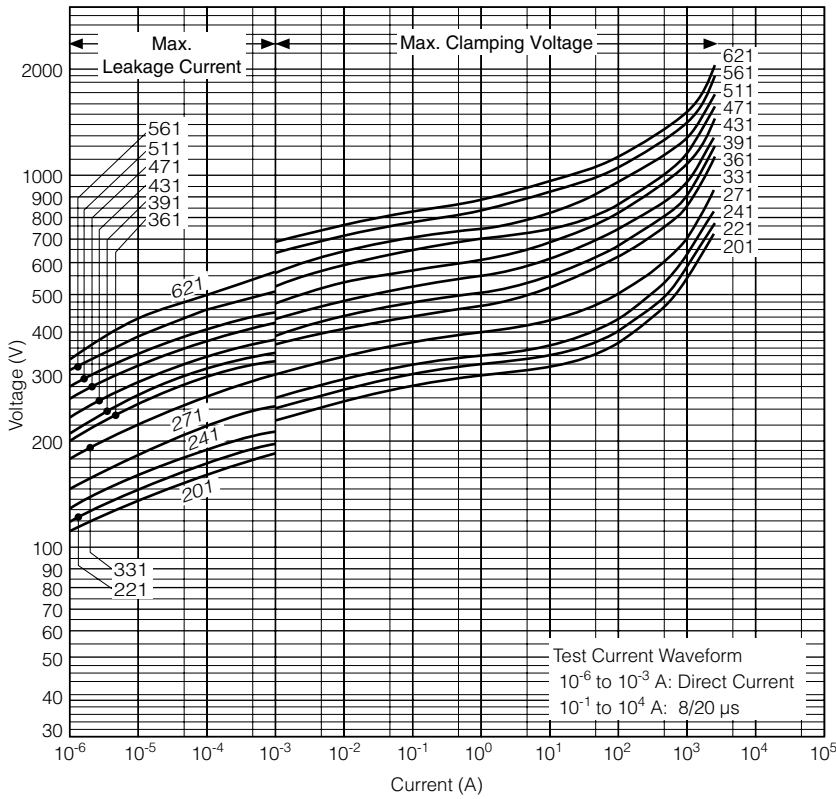
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Typical Characteristics Voltage vs. Current

Impulse Derating (Relation between impulse width and impulse current multiple)

ERZE07A201 to ERZE07A621

ERZE07A201 to ERZE07A621



Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use. Should a safety concern arise regarding this product, please be sure to contact us immediately.

Series E8

■ Ratings and Characteristics

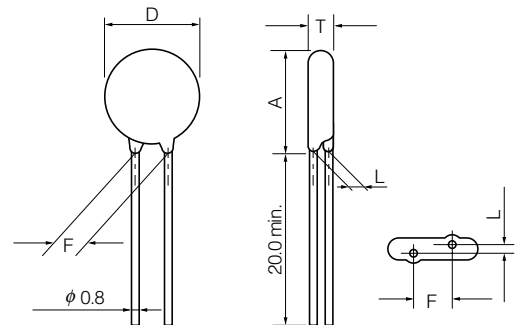
● Operating Temperature Range : -40 to 85 °C ● Storage Temperature Range : -40 to 125 °C

Part No.	Varistor Voltage	Maximum Allowable Voltage		Clamping Voltage (max.) *Ip	Rated Power	Maximum Energy		Maximum Peak Current (8/20 μs)		Capacitance (max.) at 1 kHz (pF)
						(10/1000 μs)	(2 ms)	1 time	2 times	
	V _{1 mA} (V)	ACrms (V)	DC (V)	(V)	(W)	(J)	(J)	(A)	(A)	
ERZE08A201	200(185 to 225)	130	170	340	0.4	35	25	3500	2500	390
ERZE08A221	220(198 to 242)	140	180	360	0.4	39	27.5	3500	2500	380
ERZE08A241	240(216 to 264)	150	200	395	0.4	42	30	3500	2500	360
ERZE08A271	270(247 to 303)	175	225	455	0.4	49	35	3500	2500	330
ERZE08A331	330(297 to 363)	210	270	545	0.4	58	42	3500	2500	300
ERZE08A361	360(324 to 396)	230	300	595	0.4	65	45	3500	2500	280
ERZE08A391	390(351 to 429)	250	320	650	0.4	70	50	3500	2500	260
ERZE08A431	430(387 to 473)	275	350	710	0.4	80	55	3500	2500	230
ERZE08A471	470(423 to 517)	300	385	775	0.4	85	60	3500	2500	180
ERZE08A511	510(459 to 561)	320	410	845	0.4	92	67	3500	2500	150
ERZE08A561	560(504 to 616)	350	450	930	0.4	92	67	3500	2500	150
ERZE08A621	620(558 to 682)	385	505	1025	0.4	92	67	3500	2500	140
ERZE08A681	680(612 to 748)	420	560	1120	0.4	92	67	3500	2500	130
ERZE08A751	750(675 to 825)	460	615	1240	0.4	100	70	3500	2500	130

*Ip Measuring current of clamping voltage : 25 A

■ Dimensions in mm (not to scale)

Part No.	D max.	T max.	F±1.0	A max.	L±1.0
ERZE08A201	10.5	5.1	7.5	13.5	1.9
ERZE08A221	10.5	5.2	7.5	13.5	2.0
ERZE08A241	10.5	5.3	7.5	13.5	2.1
ERZE08A271	10.5	5.5	7.5	13.5	2.3
ERZE08A331	10.5	5.9	7.5	13.5	2.6
ERZE08A361	10.5	6.1	7.5	13.5	2.8
ERZE08A391	10.5	6.3	7.5	13.5	2.9
ERZE08A431	10.5	6.5	7.5	13.5	3.1
ERZE08A471	10.5	7.3	7.5	13.5	3.6
ERZE08A511	10.5	7.8	7.5	13.5	4.0
ERZE08A561	10.5	8.1	7.5	13.5	4.3
ERZE08A621	11.5	8.7	7.5	14.5	4.7
ERZE08A681	11.5	9.0	7.5	14.5	5.0
ERZE08A751	11.5	9.7	7.5	14.5	5.6



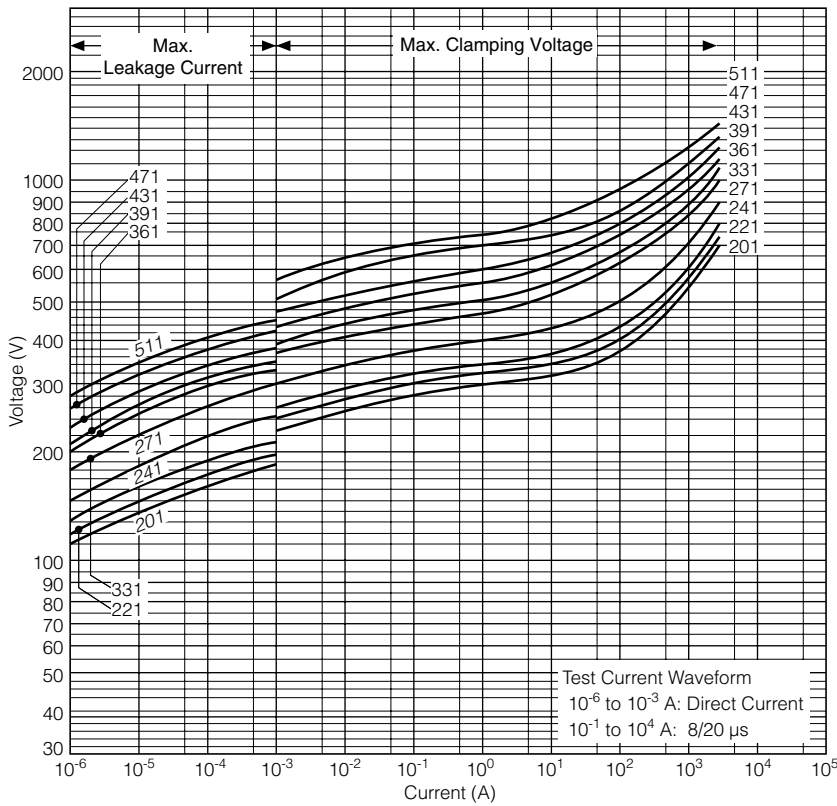
Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use. Should a safety concern arise regarding this product, please be sure to contact us immediately.

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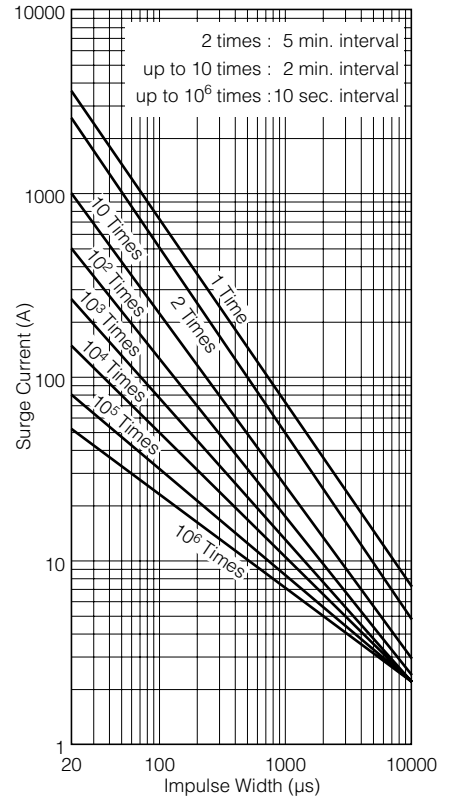
■ Typical Characteristics
Voltage vs. Current

Impulse Derating (Relation between impulse width and impulse current multiple)

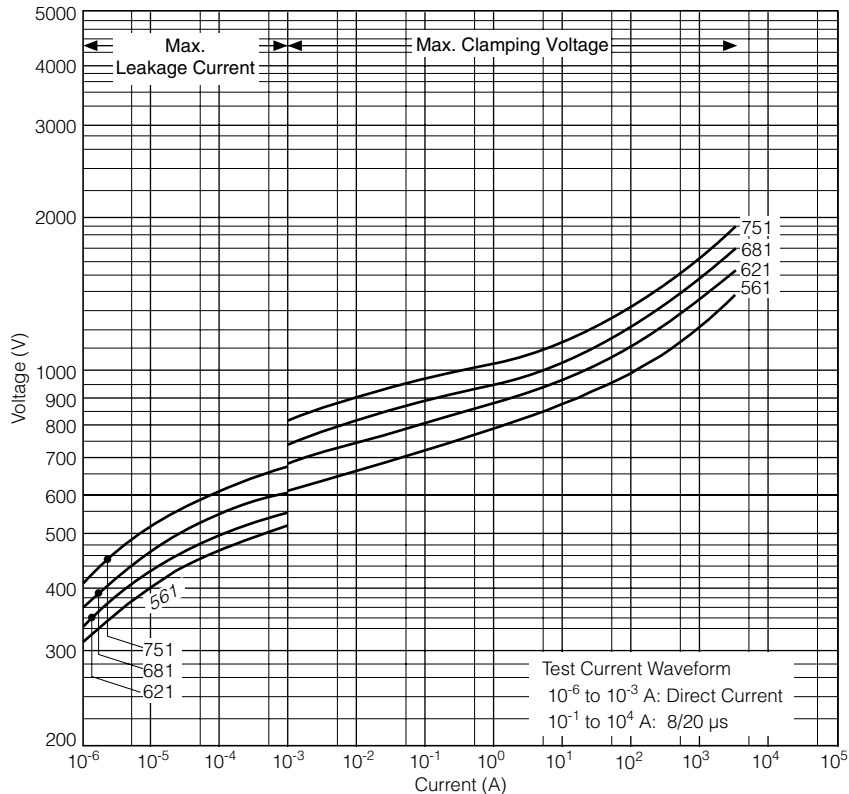
ERZE08A201 to ERZE08A511



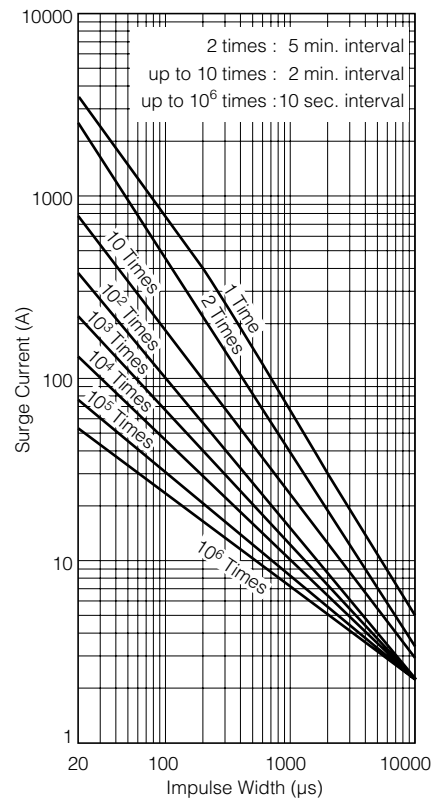
ERZE08A201 to ERZE08A511



ERZE08A561 to ERZE08A751



ERZE08A561 to ERZE08A751



Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use. Should a safety concern arise regarding this product, please be sure to contact us immediately.

Series E11

■ Ratings and Characteristics

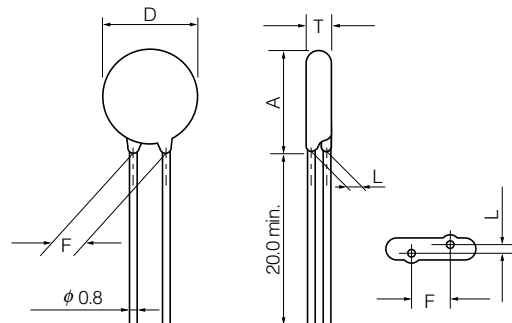
● Operating Temperature Range : -40 to 85 °C ● Storage Temperature Range : -40 to 125 °C

Part No.	Varistor Voltage	Maximum Allowable Voltage		Clamping Voltage (max.) *Ip	Rated Power	Maximum Energy		Maximum Peak Current (8/20 μs)		Capacitance (max.) at 1 kHz (pF)
		ACrms (V)	DC (V)			(10/1000 μs)	(2 ms)	1 time	2 times	
	V _{1mA} (V)			(V)	(W)	(J)	(J)	(A)	(A)	
ERZE11A201	200(185 to 225)	130	170	340	0.6	70	50	6000	5000	690
ERZE11A221	220(198 to 242)	140	180	360	0.6	78	55	6000	5000	660
ERZE11A241	240(216 to 264)	150	200	395	0.6	84	60	6000	5000	620
ERZE11A271	270(247 to 303)	175	225	455	0.6	99	70	6000	5000	580
ERZE11A331	330(297 to 363)	210	270	545	0.6	115	80	6000	4500	520
ERZE11A361	360(324 to 396)	230	300	595	0.6	130	90	6000	4500	480
ERZE11A391	390(351 to 429)	250	320	650	0.6	140	100	6000	4500	450
ERZE11A431	430(387 to 473)	275	350	710	0.6	155	110	6000	4500	400
ERZE11A471	470(423 to 517)	300	385	775	0.6	175	125	6000	4500	360
ERZE11A511	510(459 to 561)	320	410	845	0.6	190	136	6000	4500	310
ERZE11A561	560(504 to 616)	350	450	930	0.6	190	136	6000	4500	310
ERZE11A621	620(558 to 682)	385	505	1025	0.6	190	136	5000	4500	300
ERZE11A681	680(612 to 748)	420	560	1120	0.6	190	136	5000	4500	290
ERZE11A751	750(675 to 825)	460	615	1240	0.6	210	150	5000	4500	280
ERZE11A821	820(738 to 902)	510	670	1355	0.6	235	165	5000	4500	260
ERZE11A911	910(819 to 1001)	550	745	1500	0.6	255	180	5000	4500	240
ERZE11A102	1000(900 to 1100)	625	825	1650	0.6	280	200	5000	4500	220
ERZE11A112	1100(990 to 1210)	680	895	1815	0.6	310	220	5000	4500	200

*Ip Measuring current of clamping voltage : 50 A

■ Dimensions in mm (not to scale)

Part No.	D max.	T max.	F±1.0	A max.	L±1.0
ERZE11A201	13.0	5.2	7.5	17.0	1.9
ERZE11A221	13.0	5.3	7.5	17.0	2.0
ERZE11A241	13.0	5.4	7.5	17.0	2.1
ERZE11A271	13.0	5.6	7.5	17.0	2.3
ERZE11A331	13.0	5.9	7.5	17.0	2.6
ERZE11A361	13.0	6.1	7.5	17.0	2.8
ERZE11A391	13.0	6.2	7.5	17.0	2.9
ERZE11A431	13.0	6.4	7.5	17.0	3.1
ERZE11A471	13.0	6.6	7.5	17.0	3.3
ERZE11A511	13.0	6.8	7.5	17.0	3.5
ERZE11A561	13.0	7.2	7.5	17.0	3.8
ERZE11A621	14.0	7.5	7.5	18.0	4.2
ERZE11A681	14.0	7.8	7.5	18.0	4.5
ERZE11A751	14.0	8.2	7.5	18.0	4.9
ERZE11A821	14.0	8.5	7.5	18.0	5.2
ERZE11A911	14.0	9.0	7.5	18.0	5.7
ERZE11A102	14.0	9.5	7.5	18.0	6.2
ERZE11A112	14.0	10.1	7.5	18.0	6.8



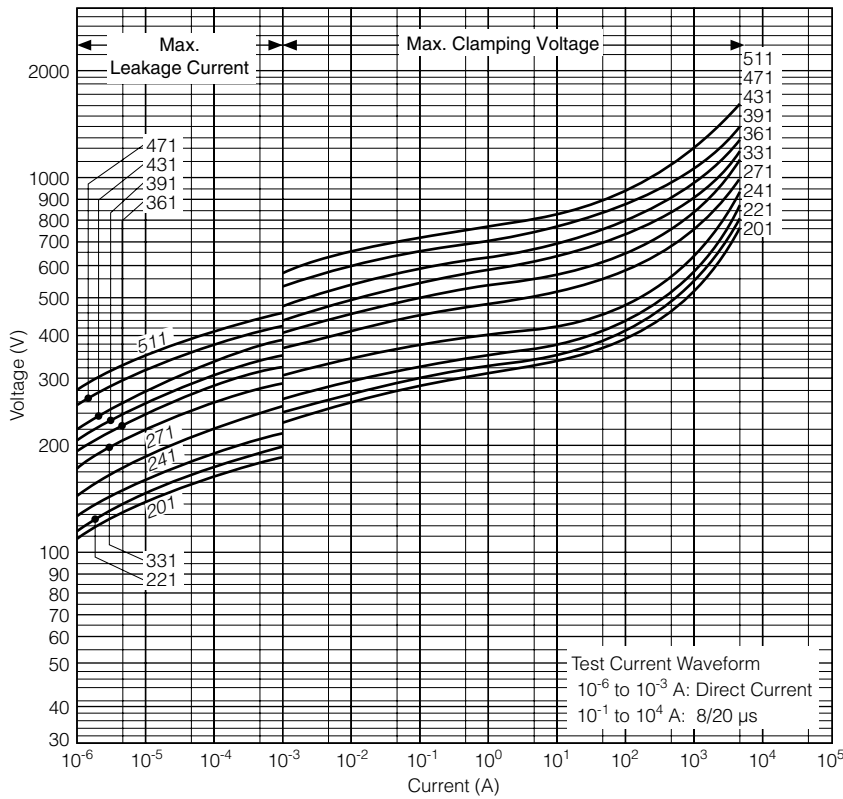
Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use. Should a safety concern arise regarding this product, please be sure to contact us immediately.

NEW

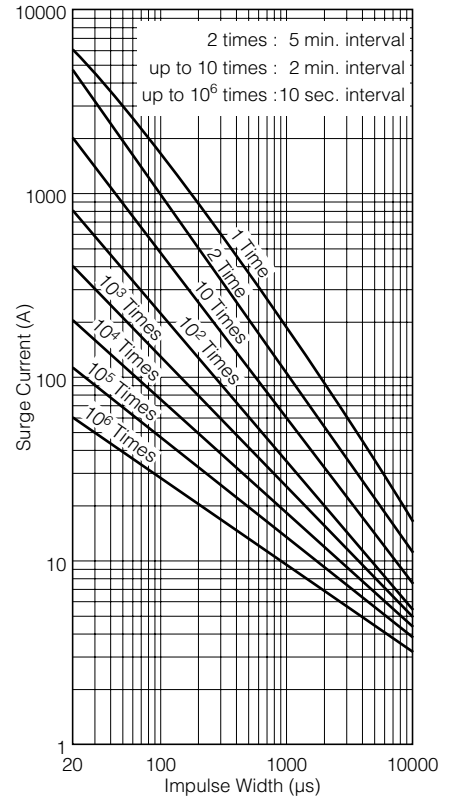
■ Typical Characteristics
Voltage vs. Current

Impulse Derating (Relation between impulse width and impulse current multiple)

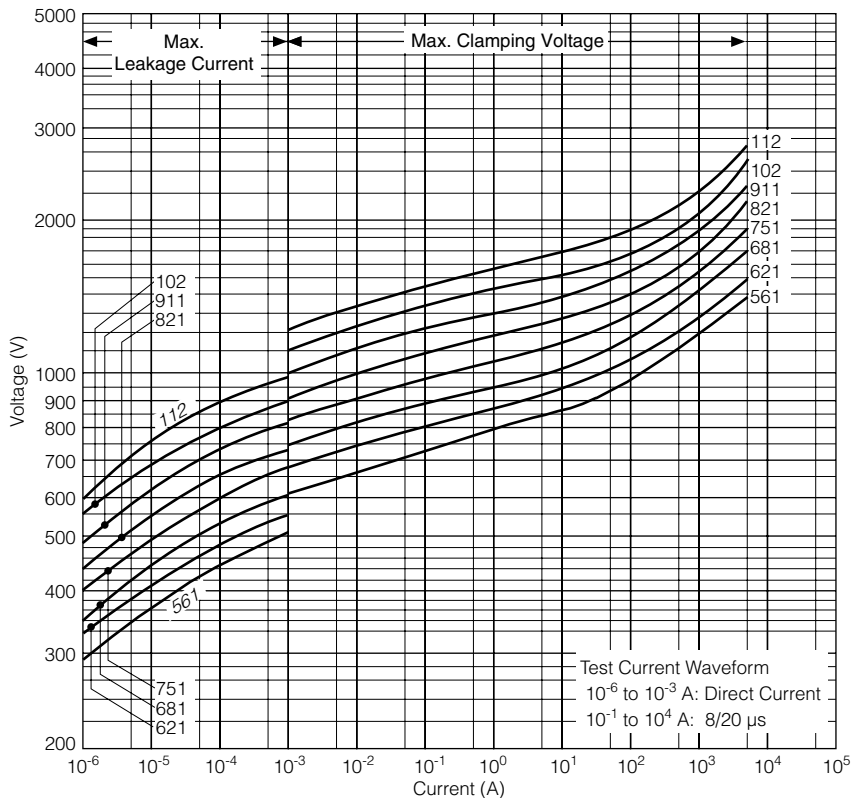
ERZE11A201 to ERZE11A511



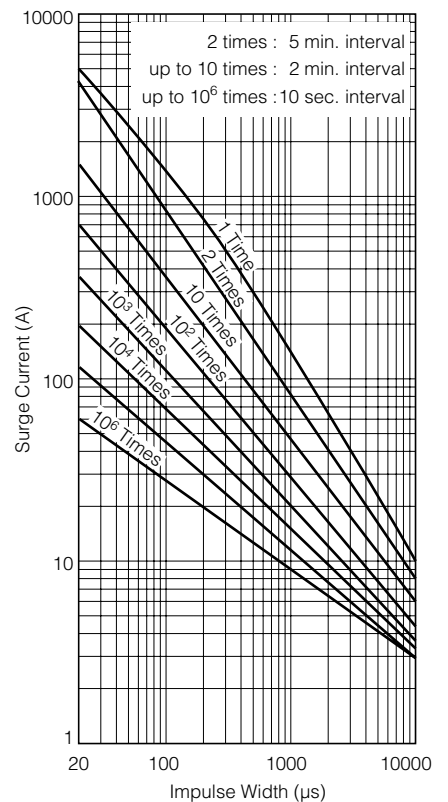
ERZE11A201 to ERZE11A511



ERZE11A561 to ERZE11A112



ERZE11A561 to ERZE11A112



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Series E14

■ Ratings and Characteristics

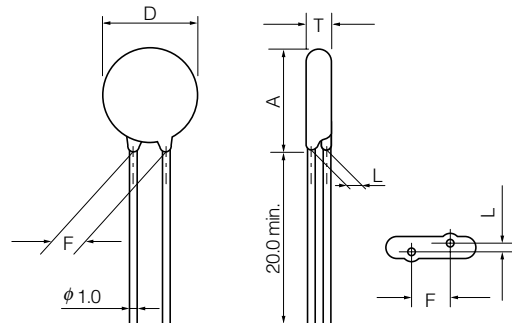
● Operating Temperature Range : -40 to 85 °C ● Storage Temperature Range : -40 to 125 °C

Part No.	Varistor Voltage	Maximum Allowable Voltage		Clamping Voltage (max.) *Ip	Rated Power	Maximum Energy		Maximum Peak Current (8/20 μs)		Capacitance (max.) at 1 kHz (pF)
		ACrms (V)	DC (V)			(10/1000 μs)	(2 ms)	1 time	2 times	
	V _{1mA} (V)			(V)	(W)	(J)	(J)	(A)	(A)	
ERZE14A201	200(185 to 225)	130	170	340	1.0	140	100	10000	7000	1300
ERZE14A221	220(198 to 242)	140	180	360	1.0	155	110	10000	7000	1200
ERZE14A241	240(216 to 264)	150	200	395	1.0	168	120	10000	7000	1100
ERZE14A271	270(247 to 303)	175	225	455	1.0	190	135	10000	7000	1000
ERZE14A331	330(297 to 363)	210	270	545	1.0	228	160	10000	6500	900
ERZE14A361	360(324 to 396)	230	300	595	1.0	255	180	10000	6500	900
ERZE14A391	390(351 to 429)	250	320	650	1.0	275	195	10000	6500	800
ERZE14A431	430(387 to 473)	275	350	710	1.0	303	215	10000	6500	800
ERZE14A471	470(423 to 517)	300	385	775	1.0	350	250	10000	6500	750
ERZE14A511	510(459 to 561)	320	410	845	1.0	382	273	10000	6500	700
ERZE14A561	560(504 to 616)	350	450	930	1.0	382	273	10000	6500	700
ERZE14A621	620(558 to 682)	385	505	1025	1.0	382	273	7500	6500	650
ERZE14A681	680(612 to 748)	420	560	1120	1.0	382	273	7500	6500	600
ERZE14A751	750(675 to 825)	460	615	1240	1.0	420	300	7500	6500	530
ERZE14A821	820(738 to 902)	510	670	1355	1.0	460	325	7500	6500	500
ERZE14A911	910(819 to 1001)	550	745	1500	1.0	510	360	7500	6500	400
ERZE14A102	1000(900 to 1100)	625	825	1650	1.0	565	400	7500	6500	400
ERZE14A112	1100(990 to 1210)	680	895	1815	1.0	620	440	7500	6500	350

*Ip Measuring current of clamping voltage : 100 A

■ Dimensions in mm (not to scale)

Part No.	D max.	T max.	F±1.0	A max.	L±1.0
ERZE14A201	16.5	5.2	10.0	20.0	2.1
ERZE14A221	16.5	5.3	10.0	20.0	2.2
ERZE14A241	16.5	5.4	10.0	20.0	2.3
ERZE14A271	16.5	5.6	10.0	20.0	2.5
ERZE14A331	16.5	5.9	10.0	20.0	2.8
ERZE14A361	16.5	6.1	10.0	20.0	3.0
ERZE14A391	16.5	6.2	10.0	20.0	3.1
ERZE14A431	16.5	6.4	10.0	20.0	3.3
ERZE14A471	16.5	6.6	10.0	20.0	3.5
ERZE14A511	16.5	6.8	10.0	20.0	3.7
ERZE14A561	16.5	7.2	10.0	20.0	4.0
ERZE14A621	17.5	7.5	10.0	20.5	4.4
ERZE14A681	17.5	7.8	10.0	20.5	4.7
ERZE14A751	17.5	8.2	10.0	20.5	5.1
ERZE14A821	17.5	8.5	10.0	20.5	5.4
ERZE14A911	17.5	9.0	10.0	20.5	5.9
ERZE14A102	17.5	9.5	10.0	20.5	6.4
ERZE14A112	17.5	10.1	10.0	20.5	7.2



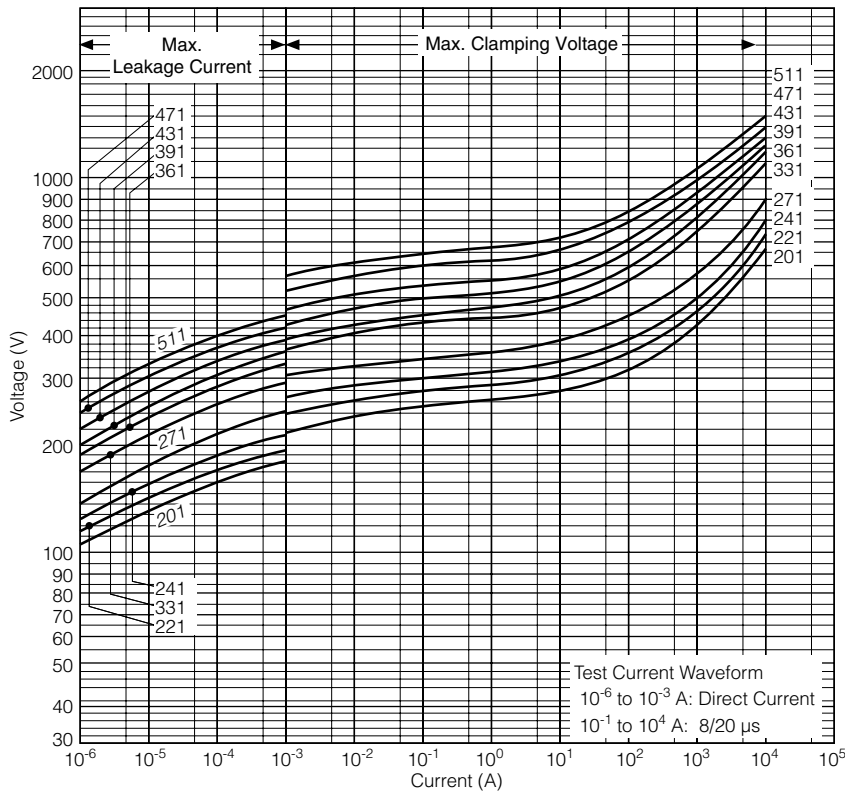
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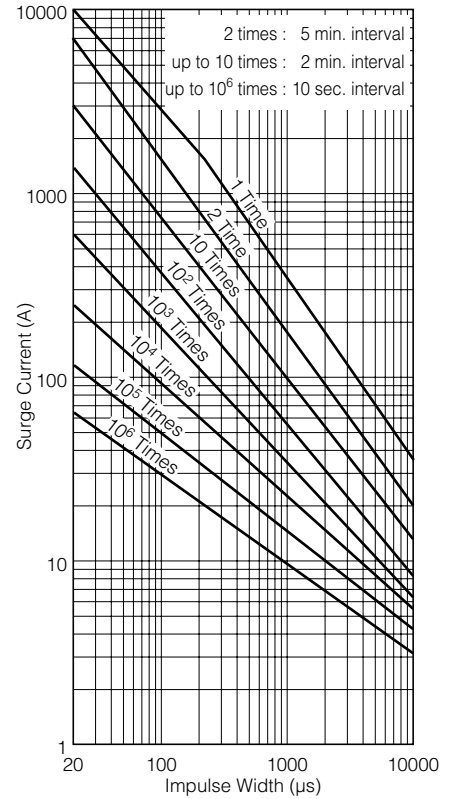
■ Typical Characteristics
Voltage vs. Current

Impulse Derating (Relation between impulse width and impulse current multiple)

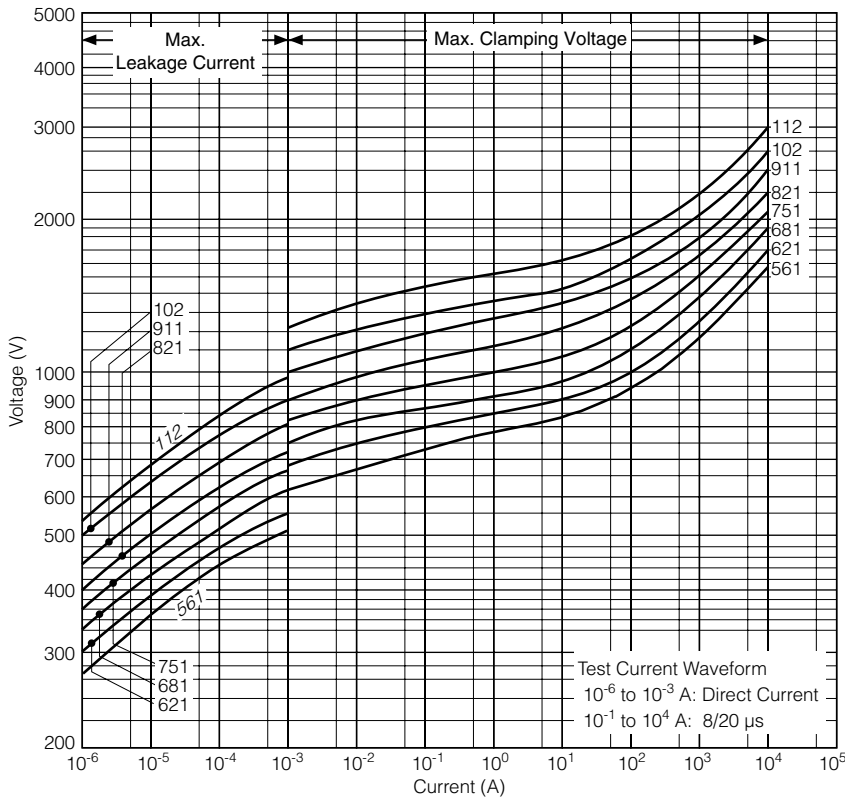
ERZE14A201 to ERZE14A511



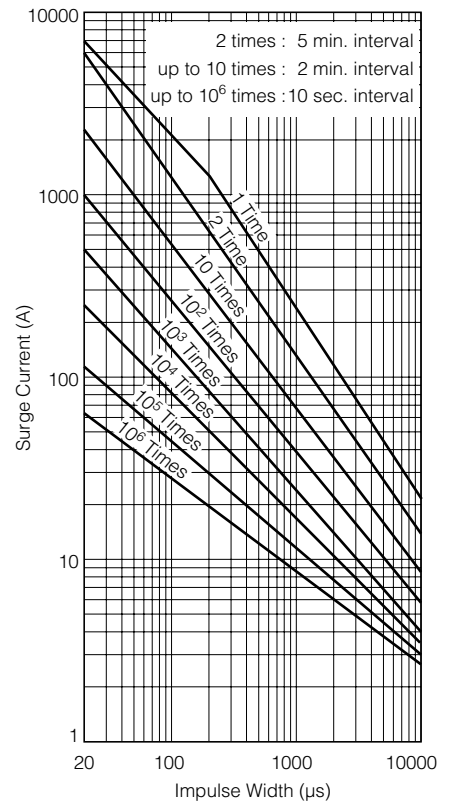
ERZE14A201 to ERZE14A511



ERZE14A561 to ERZE14A112



ERZE14A561 to ERZE14A112



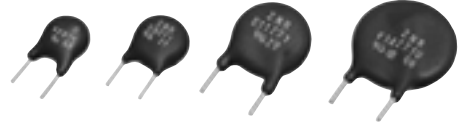
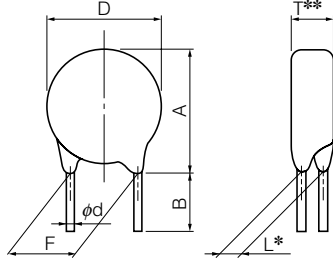
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Straight Leads Cut Type (Bulk Type)

■ Ratings and Characteristics

* Refer to bulk standard type part no. (P3 to P10).

■ Dimensions in mm (not to scale)



notes * Dimension "L": Conforms to each individual specification.
 ** Dimension "T": Conforms to each individual specification.

Unit (mm)

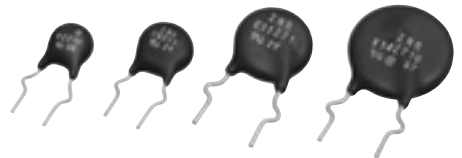
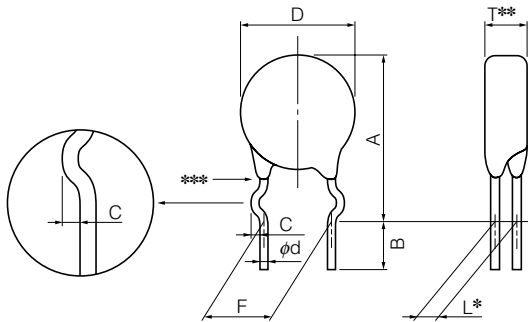
Series	E5	E7		E8		E11		
Varistor Voltage	201 to 471	201 to 511	561	621	201 to 561	621 to 751	201 to 561	621 to 112
D	7.0 max.	9.0 max.	9.0 max.	10.0 max.	10.5 max.	11.5 max.	13.0 max.	14.0 max.
A	10.0 max.	12.5 max.	13.5 max.	13.5 max.	13.5 max.	14.5 max.	17.0 max.	18.0 max.
F	5.0±1.0	7.5±1.0	7.5±1.0	7.5±1.0	7.5±1.0	7.5±1.0	7.5±1.0	7.5±1.0
φd	0.60 ^{+0.06} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}
B	4.0±1.0	4.0±1.0	4.0±1.0	4.0±1.0	4.0±1.0	4.0±1.0	4.0±1.0	4.0±1.0
Standard Products Part No.	ERZE05A□□□CS	ERZE07A□□□CS		ERZE08A□□□CS		ERZE11A□□□CS		

Crimped Leads Cut Type (Bulk Type)

■ Ratings and Characteristics

* Refer to bulk standard type part no. (P3 to P10).

■ Dimensions in mm (not to scale)



notes * Dimension "L": Conforms to each individual specification.
 ** Dimension "T": Conforms to each individual specification.
 *** Resin extenytions : No resin below the center of the hook.

Unit (mm)

Series	E5	E7		E8		E11		
Varistor Voltage	201 to 471	201 to 511	561	621	201 to 561	621 to 751	201 to 561	621 to 112
D	7.0 max.	9.0 max.	9.0 max.	10.0 max.	10.5 max.	11.5 max.	13.0 max.	14.0 max.
A	13.0 max.	15.5 max.	16.5 max.	16.5 max.	17.0 max.	18.0 max.	20.5 max.	21.5 max.
C	1.2±0.4	1.4±0.4	1.4±0.4	1.4±0.4	1.4±0.4	1.4±0.4	1.4±0.4	1.4±0.4
F	5.0±1.0	7.5±1.0	7.5±1.0	7.5±1.0	7.5±1.0	7.5±1.0	7.5±1.0	7.5±1.0
φd	0.60 ^{+0.06} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}
B	4.0±1.0	4.0±1.0	4.0±1.0	4.0±1.0	4.0±1.0	4.0±1.0	4.0±1.0	4.0±1.0
Standard Products Part No.	ERZE05B□□□CS	ERZE07B□□□CS		ERZE08B□□□CS		ERZE11B□□□CS		

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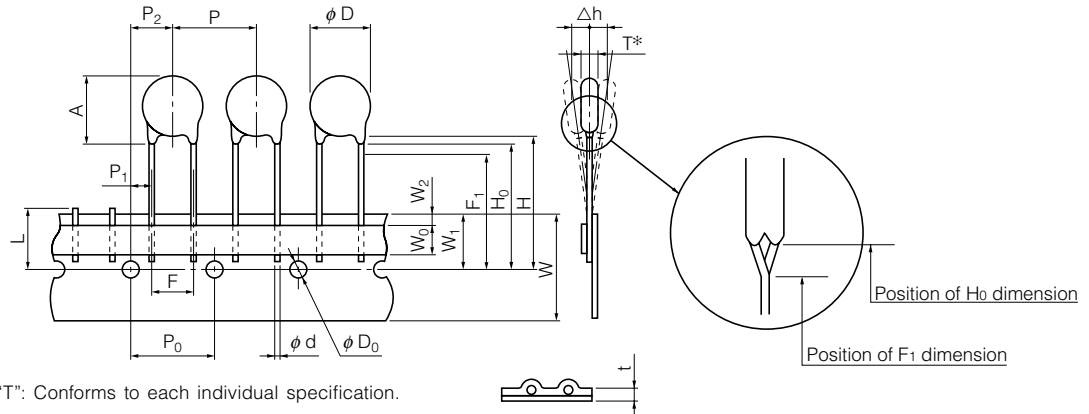
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**Taping Specifications for Automated Assembly
(Straight Leads and Taping)**

■ Ratings and Characteristics

* Refer to bulk standard type part no. (P3 to P10).

■ Taping Dimensions in mm (not to scale)



		Unit (mm)											
Series		E5	E7				E8			E11			
Symbol	Varistor Voltage	201 to 471	201 to 271	331 to 551	561	621	201 to 221	241 to 561	621 to 751	201 to 221	241 to 561	621 to 112	
P		12.7±1.0	15.0±1.0	15.0±1.0	15.0±1.0	15.0±1.0	15.0±1.0	15.0±1.0	15.0±1.0	15.0±1.0	15.0±1.0	15.0±1.0	
P ₀		12.7±0.3	15.0±0.3	15.0±0.3	15.0±0.3	15.0±0.3	15.0±0.3	15.0±0.3	15.0±0.3	15.0±0.3	15.0±0.3	15.0±0.3	
P ₁		3.85±0.70	3.75±0.70	3.75±0.70	3.75±0.70	3.75±0.70	3.75±0.70	3.75±0.70	3.75±0.70	3.75±0.70	3.75±0.70	3.75±0.70	
P ₂		6.36±1.30	7.5±1.3	7.5±1.3	7.5±1.3	7.5±1.3	7.5±1.3	7.5±1.3	7.5±1.3	7.5±1.3	7.5±1.3	7.5±1.3	
φ d		0.60 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	
F		5.0±0.5	7.5±0.5	7.5±0.5	7.5±0.5	7.5±0.5	7.5±0.5	7.5±0.5	7.5±0.5	7.5±0.5	7.5±0.5	7.5±0.5	
Δ h		0±2	0±2	0±2	0±2	0±2	0±2	0±2	0±2	0±2	0±2	0±2	
W		18.0 ^{+1.0} _{-0.5}	18.0 ^{+1.0} _{-0.5}	18.0 ^{+1.0} _{-0.5}	18.0 ^{+1.0} _{-0.5}	18.0 ^{+1.0} _{-0.5}	18.0 ^{+1.0} _{-0.5}	18.0 ^{+1.0} _{-0.5}	18.0 ^{+1.0} _{-0.5}	18.0 ^{+1.0} _{-0.5}	18.0 ^{+1.0} _{-0.5}	18.0 ^{+1.0} _{-0.5}	
W ₀		5.0 min.	5.0 min.	5.0 min.	5.0 min.	5.0 min.	5.0 min.	5.0 min.	5.0 min.	5.0 min.	5.0 min.	5.0 min.	
W ₁		9.0±0.5	9.0±0.5	9.0±0.5	9.0±0.5	9.0±0.5	9.0±0.5	9.0±0.5	9.0±0.5	9.0±0.5	9.0±0.5	9.0±0.5	
W ₂		3.0 max.	3.0 max.	3.0 max.	3.0 max.	3.0 max.	3.0 max.	3.0 max.	3.0 max.	3.0 max.	3.0 max.	3.0 max.	
H		Approx. 22	Approx. 22	Approx. 22	Approx. 22	Approx. 22	Approx. 22	Approx. 22	Approx. 22	Approx. 22	Approx. 22	Approx. 22	
H ₀		17.0±0.5	18.0 ^{+2.0} ₀	—	—	—	18.0 ^{+2.0} ₀	—	—	18.0 ^{+2.0} ₀	—	—	
F ₁		—	—	16.00 ^{+0.75} _{-0.5}	16.00 ^{+0.75} _{-0.5}	16.00 ^{+0.75} _{-0.5}	—	16.00 ^{+0.75} _{-0.5}	16.00 ^{+0.75} _{-0.5}	—	16.00 ^{+0.75} _{-0.5}	16.00 ^{+0.75} _{-0.5}	
φ D ₀		φ 4.0±0.2	φ 4.0±0.2	φ 4.0±0.2	φ 4.0±0.2	φ 4.0±0.2	φ 4.0±0.2	φ 4.0±0.2	φ 4.0±0.2	φ 4.0±0.2	φ 4.0±0.2	φ 4.0±0.2	
t		0.6±0.3	0.6±0.3	0.6±0.3	0.6±0.3	0.6±0.3	0.6±0.3	0.6±0.3	0.6±0.3	0.6±0.3	0.6±0.3	0.6±0.3	
L		11.0 max.	11.0 max.	11.0 max.	11.0 max.	11.0 max.	11.0 max.	11.0 max.	11.0 max.	11.0 max.	11.0 max.	11.0 max.	
φ D		7.0 max.	9.0 max.	9.0 max.	9.0 max.	10.0 max.	10.5 max.	10.5 max.	11.5 max.	13.0 max.	13.0 max.	14.0 max.	
A		10.0 max.	12.5 max.	12.5 max.	13.5 max.	13.5 max.	13.5 max.	13.5 max.	14.5 max.	17.0 max.	17.0 max.	18.0 max.	
Standard Products Part No.		ERZE05E□□□	ERZE07E□□□				ERZE08E□□□			ERZE11E□□□			

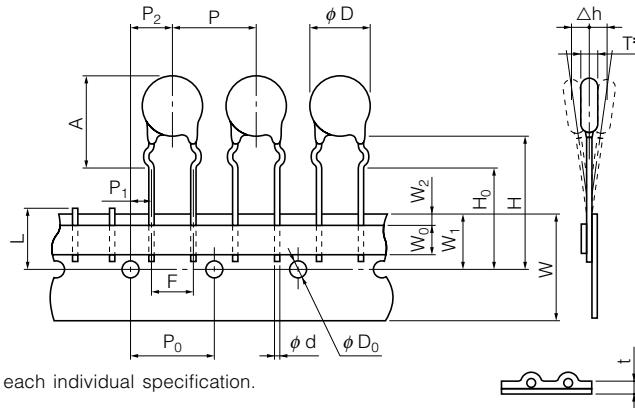
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Taping Specifications for Automated Assembly (Crimped Leads and Taping)

■ Ratings and Characteristics

* Refer to bulk standard type part no. (P3 to P10).

■ Taping Dimensions in mm
(not to scale)



* Dimension "T": Conforms to each individual specification.

Unit (mm)

Series	E5	E7			E8			E11		
Symbol	201 to 471	201 to 511	561	621	201 to 221	241 to 561	621 to 751	201 to 221	241 to 561	621 to 112
P	12.7±1.0	15.0±1.0	15.0±1.0	15.0±1.0	15.0±1.0	15.0±1.0	15.0±1.0	15.0±1.0	15.0±1.0	15.0±1.0
P ₀	12.7±0.3	15.0±0.3	15.0±0.3	15.0±0.3	15.0±0.3	15.0±0.3	15.0±0.3	15.0±0.3	15.0±0.3	15.0±0.3
P ₁	3.85±0.70	3.75±0.70	3.75±0.70	3.75±0.70	3.75±0.70	3.75±0.70	3.75±0.70	3.75±0.70	3.75±0.70	3.75±0.70
P ₂	6.35±1.30	7.5±1.3	7.5±1.3	7.5±1.3	7.5±1.3	7.5±1.3	7.5±1.3	7.5±1.3	7.5±1.3	7.5±1.3
φ d	0.60 ^{+0.06} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}	0.80 ^{+0.08} _{-0.05}
F	5.0±0.5	7.5±0.5	7.5±0.5	7.5±0.5	7.5±0.5	7.5±0.5	7.5±0.5	7.5±0.5	7.5±0.5	7.5±0.5
Δ h	0±2	0±2	0±2	0±2	0±2	0±2	0±2	0±2	0±2	0±2
W	18.0 ^{+1.0} _{-0.5}	18.0 ^{+1.0} _{-0.5}	18.0 ^{+1.0} _{-0.5}	18.0 ^{+1.0} _{-0.5}	18.0 ^{+1.0} _{-0.5}	18.0 ^{+1.0} _{-0.5}	18.0 ^{+1.0} _{-0.5}	18.0 ^{+1.0} _{-0.5}	18.0 ^{+1.0} _{-0.5}	18.0 ^{+1.0} _{-0.5}
W ₀	5.0 min.	5.0 min.	5.0 min.	5.0 min.	5.0 min.	5.0 min.	5.0 min.	5.0 min.	5.0 min.	5.0 min.
W ₁	9.0±0.5	9.0±0.5	9.0±0.5	9.0±0.5	9.0±0.5	9.0±0.5	9.0±0.5	9.0±0.5	9.0±0.5	9.0±0.5
W ₂	3.0 max.	3.0 max.	3.0 max.	3.0 max.	3.0 max.	3.0 max.	3.0 max.	3.0 max.	3.0 max.	3.0 max.
H	Approx. 22	Approx. 22	Approx. 22	Approx. 22	Approx. 22	Approx. 22	Approx. 22	Approx. 22	Approx. 22	Approx. 22
H ₀	17.0±0.5	16.0±0.5	16.0±0.5	16.0±0.5	16.0±0.5	16.0±0.5	16.0±0.5	16.0±0.5	16.0±0.5	16.0±0.5
φ D ₀	φ 4.0±0.2	φ 4.0±0.2	φ 4.0±0.2	φ 4.0±0.2	φ 4.0±0.2	φ 4.0±0.2	φ 4.0±0.2	φ 4.0±0.2	φ 4.0±0.2	φ 4.0±0.2
t	0.6±0.3	0.6±0.3	0.6±0.3	0.6±0.3	0.6±0.3	0.6±0.3	0.6±0.3	0.6±0.3	0.6±0.3	0.6±0.3
L	11.0 max.	11.0 max.	11.0 max.	11.0 max.	11.0 max.	11.0 max.	11.0 max.	11.0 max.	11.0 max.	11.0 max.
φ D	7.0 max.	9.0 max.	9.0 max.	10.0 max.	10.5 max.	10.5 max.	11.5 max.	13.0 max.	13.0 max.	14.0 max.
A	13.0 max.	12.5 max.	13.5 max.	13.5 max.	17.0 max.	17.0 max.	18.0 max.	20.5 max.	20.5 max.	21.5 max.
Standard Products Part No.	ERZE05F□□□	ERZE07F□□□			ERZE08F□□□			ERZE11F□□□		

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use. Should a safety concern arise regarding this product, please be sure to contact us immediately.

NEW**Application Note for UL and VDE Recognized Components (For Series E)**

Note: Register “Standard Registration No.” when registering as the safe standard part, because it isn't registered in “Panasonic Part No.”

■ Related Standard, The AC Rated Voltage and Maximum Allowable Voltage

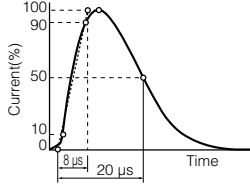
Stadard Registration **No.	Maximum Allowable Voltage		Rated Voltage (Vrms)	
	ACrms (V)	DC (V)	VDE	UL1449
E*201	130	170	It is the same with the Maximum Allowable Voltage.	118
E*221	140	180		127
E*241	150	200		136
E*271	175	225		159
E*331	210	270		189
E*361	230	300		209
E*391	250	320		227
E*431	275	350		250
E*471	300	385		272
E*511	320	410		291
E*561	350	450		320
E*621	385	505		350
E*681	420	560		381
E*751	460	615		418
E*821	510	670		463
E*911	550	745		500
E*102	625	825		568
E*112	680	895		600

** UL : Type Designation *: 5 series is 5, 7 series is 7, 8 series is 8, 11 series is 11, 14 series is 14
 VDE : Style reference

■ Application Notes

- 1) “Rated Voltages” are specified for UL/CSA recognized components besides “Maximum Allowable Voltage” because of conforming to the Standby Current specified in safety standard.
 In case of making an application to UL/CSA approval for equipment with ZNR, the maximum AC operating voltage of equipment shall be lower than the ZNR Rated Voltage.

■ Performance Characteristics (Series E)

Characteristics		Test Methods/Description	Specifications																							
Standard Test Condition		Electrical measurements (initial/after tests) shall be conducted at temperature of 5 to 35 °C, relative humidity of maximum 85 %	_____																							
Electrical	Varistor Voltage	The voltage between two terminals with the specified measuring current C_{mA} DC applied is called VC or V_{CmA} . The measurement shall be made as fast as possible to avoid heat affection.	To meet the specified value.																							
	Maximum Allowable Voltage	The maximum sinusoidal RMS voltage or maximum DC voltage that can be applied continuously.																								
	Clamping Voltage	The maximum voltage between two terminals with the specified standard impulse current (8/20 μ s) illustrated below applied. 																								
	Rated Power	The power that can be applied in the specified ambient temperature.																								
	Maximum Energy	The maximum energy within the varistor voltage change of ± 10 % when a single impulse current of 2 ms or 10/1000 μ s is applied.																								
	Maximum Peak Current (Withstanding Surge Current)	2 times		The maximum current within the varistor voltage change of ± 10 % when a standard impulse current of 8/20 μ s is applied two times with an interval of 5 minutes.																						
		1 time	The maximum current within the varistor voltage change of ± 10 % with a single standard impulse current of 8/20 μ s is applied.																							
	Temperature Coefficient of Varistor Voltage	$\frac{V_{CmA} \text{ at } 85 \text{ }^\circ\text{C} - V_{CmA} \text{ at } 25 \text{ }^\circ\text{C}}{V_{CmA} \text{ at } 25 \text{ }^\circ\text{C}} \times \frac{1}{60} \times 100 \text{ (\%/}^\circ\text{C)}$	0 to -0.05 %/°C max.																							
	Capacitance	Capacitance shall be measured at 1 kHz ± 10 %, 1 Vrms max. (1 MHz ± 10 % below 100 pF), 0 V bias and 20 \pm 2 °C.	To meet the specified value																							
	Withstanding Voltage (Body Insulation)	AC 1500 Vrms shall be applied between both terminals of the specimen connected together and metal foil closely wrapped round its body for 1 minute.	No breakdown																							
Impulse Life	The change of VC shall be measured after the impulse current listed below is applied 10000 or 100000 times continuously with the interval of 10 seconds at room temperature. <table border="1" data-bbox="443 1608 1189 1854"> <thead> <tr> <th rowspan="2">Item</th> <th>Impulse Life (I)</th> <th>Impulse Life (II)</th> </tr> <tr> <th>Times</th> <th>$\times 10^4$ Times</th> <th>$\times 10^5$ Times</th> </tr> <tr> <th>Part No.</th> <th colspan="2">Impulse Current</th> </tr> </thead> <tbody> <tr> <td>ERZE05A201 to ERZE05A471</td> <td>50 A (8/20 μs)</td> <td>35 A (8/20 μs)</td> </tr> <tr> <td>ERZE07A201 to ERZE07A621</td> <td>100 A (8/20 μs)</td> <td>70 A (8/20 μs)</td> </tr> <tr> <td>ERZE08A201 to ERZE08A751</td> <td>150 A (8/20 μs)</td> <td>85 A (8/20 μs)</td> </tr> <tr> <td>ERZE11A201 to ERZE11A112</td> <td>200 A (8/20 μs)</td> <td>110 A (8/20 μs)</td> </tr> <tr> <td>ERZE14A201 to ERZE14A112</td> <td>250 A (8/20 μs)</td> <td>120 A (8/20 μs)</td> </tr> </tbody> </table>	Item	Impulse Life (I)	Impulse Life (II)	Times	$\times 10^4$ Times	$\times 10^5$ Times	Part No.	Impulse Current		ERZE05A201 to ERZE05A471	50 A (8/20 μ s)	35 A (8/20 μ s)	ERZE07A201 to ERZE07A621	100 A (8/20 μ s)	70 A (8/20 μ s)	ERZE08A201 to ERZE08A751	150 A (8/20 μ s)	85 A (8/20 μ s)	ERZE11A201 to ERZE11A112	200 A (8/20 μ s)	110 A (8/20 μ s)	ERZE14A201 to ERZE14A112	250 A (8/20 μ s)	120 A (8/20 μ s)	$\Delta V_{CmA}/V_{CmA} \leq 0$ to 20 %
Item	Impulse Life (I)		Impulse Life (II)																							
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Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use. Should a safety concern arise regarding this product, please be sure to contact us immediately.

NEW

■ Performance Characteristics (Series E)

Characteristics	Test Methods	Specifications															
Mechanical	Robustness of Terminations (Tensile) After gradually applying the force specified below and keeping the unit fixed for 10 seconds, the terminal shall be visually examined for any damage. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Terminal diameter</th> <th>Force</th> </tr> </thead> <tbody> <tr> <td>φ0.6 mm</td> <td>9.8 N</td> </tr> <tr> <td>φ0.8 mm</td> <td>9.8 N</td> </tr> <tr> <td>φ1.0 mm</td> <td>19.6 N</td> </tr> </tbody> </table>	Terminal diameter	Force	φ0.6 mm	9.8 N	φ0.8 mm	9.8 N	φ1.0 mm	19.6 N	No remarkable mechanical damage							
	Terminal diameter	Force															
	φ0.6 mm	9.8 N															
	φ0.8 mm	9.8 N															
	φ1.0 mm	19.6 N															
Robustness of Terminations (Bending) The unit shall be secured with its terminal kept vertical and the force specified below shall be applied in the axial direction. The terminal shall gradually be bent by 90 ° in one direction, then 90 ° in the opposite direction, and again back to the original position. The damage of the terminal shall be visually examined. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Terminal diameter</th> <th>Force</th> </tr> </thead> <tbody> <tr> <td>φ0.6 mm</td> <td>4.9 N</td> </tr> <tr> <td>φ0.8 mm</td> <td>4.9 N</td> </tr> <tr> <td>φ1.0 mm</td> <td>9.8 N</td> </tr> </tbody> </table>	Terminal diameter	Force	φ0.6 mm	4.9 N	φ0.8 mm	4.9 N	φ1.0 mm	9.8 N									
Terminal diameter	Force																
φ0.6 mm	4.9 N																
φ0.8 mm	4.9 N																
φ1.0 mm	9.8 N																
Vibration After repeatedly applying a single harmonic vibration (amplitude: 0.75 mm, double amplitude: 1.5 mm) with 1 minute vibration frequency cycles (10 Hz to 55 Hz to 10 Hz) to each of three perpendicular directions for 2 hours. Thereafter, the unit shall be visually examined.																	
Solderability After dipping the terminals to a depth of approximately 3mm from the body in a soldering bath of 235±5°C for 2±0.5 seconds, the terminal shall be visually examined.	Approximately 95 % of the terminals shall be covered with new solder uniformly.																
Resistance to Soldering Heat After each lead shall be dipped into a solder bath having a temperature of 260±5 °C to a point 2.0 to 2.5 mm from the body of the unit, using shielding board (t=1.5 mm), be held there for 10±1 s and then be stored at room temperature and normal humidity for 1 to 2 hours. The change of V _{CmA} and mechanical damages shall be examined.	ΔV _{CmA} /V _{CmA} < ±5 % No remarkable mechanical damage																
Environmental	High Temperature Storage/Dry Heat The specimen shall be subjected to 125±2 °C for 1000 hours in a thermostatic bath without load and then stored at room temperature and normal humidity for 1 to 2 hours. Thereafter, the change of V _{CmA} shall be measured.	ΔV _{CmA} /V _{CmA} < ±5 %															
	Humidity The specimen shall be subjected to 40±2 °C, 90 to 95 % RH for 1000 hours without load and then stored at room temperature and normal humidity for 1 to 2 hours. Thereafter, the change of V _{CmA} shall be measured.	ΔV _{CmA} /V _{CmA} < ±5 %															
	Temperature Cycle The temperature cycle shown below shall be repeated five cycles and then stored at room temperature and normal humidity for 1 to 2 hours. The change of V _{CmA} and mechanical damage shall be examined. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Period (minutes)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-40±3</td> <td>30±3</td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>15±3</td> </tr> <tr> <td>3</td> <td>125±2</td> <td>30±3</td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>15±3</td> </tr> </tbody> </table>	Step	Temperature (°C)	Period (minutes)	1	-40±3	30±3	2	Room temperature	15±3	3	125±2	30±3	4	Room temperature	15±3	ΔV _{CmA} /V _{CmA} < ±5 % No remarkable mechanical damage
	Step	Temperature (°C)	Period (minutes)														
	1	-40±3	30±3														
2	Room temperature	15±3															
3	125±2	30±3															
4	Room temperature	15±3															
High Temperature Load/Dry Heat Load After being continuously applied the Maximum Allowable Voltage at 85±2 °C for 1000 hours, the specimen shall be stored at room temperature and normal humidity for 1 to 2 hours. Thereafter, the change of V _{CmA} shall be measured.	ΔV _{CmA} /V _{CmA} < ±10 %																
Damp Heat Load/Humidity Load The specimen shall be subjected to 40±2 °C, 90 to 95 % RH and the Maximum Allowable Voltage for 1000 hours and then stored at room temperature and normal humidity for 1 to 2 hours. Thereafter, the change of V _{CmA} shall be measured.																	
Low Temperature Storage/Cold The specimen shall be subjected to -40±2 °C without load for 1000 hours and then stored at room temperature and normal humidity for 1 to 2 hours. Thereafter, the change of V _{CmA} shall be measured.	ΔV _{CmA} /V _{CmA} < ±5 %																

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use. Should a safety concern arise regarding this product, please be sure to contact us immediately.

“ZNR” Transient/Surge Absorbers, Type D, Series E

Handling Precautions

⚠ Safety Precautions

In case that a ZNR Surge Absorber (Type D Series E)(hereafter referred to as the ZNR, or product name) is used, if an abnormality takes place because of peripheral conditions of the ZNR(material, environments, power source conditions, circuit conditions, etc. in equipment design), fire, electric shock, burn, or product failure may occur. The precautions for this product are described below, understand the content thoroughly before usage. For more questions, contact us.

1. ⚠ Precautions to be strictly observed

1.1 Confirmation of performance ratings

Use the ZNR within its rated range of performance such as the Max. allowable voltage, withstanding surge current, withstanding energy, impulse life(surge life), average pulse power, and operating temperature range. If used outside the range, the ZNR can be degraded and have element fracture, which may result in smoking and ignition.

1.2 To avoid accidents due to unexpected phenomena, take the following measures

- 1) In the event of fracture of the ZNR, its pieces may scatter; hence, put the case or cover of the set product in place.
- 2) Do not install the ZNR near combustible substances(polyvinyl chloride wires, resin moldings, etc.). If it is difficult to do, install a nonflammable cover.
- 3) Across-the-line use
When the ZNR is used across a line, put a current fuse in series with the ZNR (Refer to Item 2.1.1). (4) and Table 1.
- 4) Use between line to ground
 - (1) In the case that the ZNR is used between a line to the ground, the short-circuit of the ZNR may not blow the current fuse because of grounding resistance, which may cause smoking and ignition of the ZNR's exterior resin. As the measure against it, install an earth leakage breaker on the power supply side of the ZNR position. If no earth leakage breaker is installed, use a thermal fuse together with a current fuse in series. (Refer to Table 1.)
 - (2) In the case that the ZNR is used between a live part to metal case, an electric shock may develop at a shortcircuit of the ZNR; hence, ground the metal case to the ground or keep it from the human body.

2. Application notes

2.1 Pay attention to the following items to avoid the shortened life and failure of the ZNR

1) Circuit conditions

- (1) Select a ZNR of which the maximum voltage including fluctuations in source voltage allows for the maximum permissible circuit voltage. (Refer to Table 1.)
- (2) In cases that surges are intermittently applied at short intervals(for example, in case that the voltage of the noise simulator test is implemented etc.), do not let them exceed the ZNR's rated power.
- (3) Select a ZNR recommended in Table 1.

<1> Across-the-line use

If possible, use a Part No. marked with * in case of voltage temporarily rises load unbalance of separately-wired loads, short between hot and neutral-line, open of neutral line in single-phase-three-wired system, and due to resonance at switching for a capacitive, inductive load.

<2> Used between line to ground

Use a different Part No. from “Across-the-line use” as table 1, because of raising voltage in case of “Line to Ground Fault”.

Use a Part No. marked with ** in table 1, in case of the insulation resistance test(500 VDC) for equipment. When using a Part of the varistor voltage that the insulation efficiency examination can not be cleared, there is a case where the surge absorber can be done by removing it from the circuit depending on the circuit condition(Refer examination of Japan Domestic Safety Regulations).

Use a Part No. marked with *** in table 1, in case of the withstanding voltage test(1000 VAC or 1200 VAC) for equipment.

(4) Concerning current fuse

<1> We recommend selecting a ZNR and the rated current of a current fuse as follows.

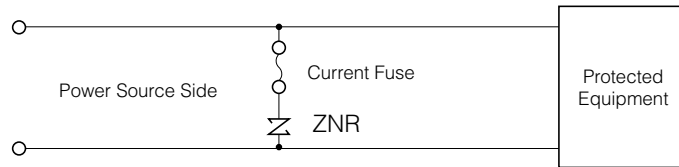
Finally, please be sure that there is no danger if the ZNR mounted on the equipment breaks.

● Type D, Series E

Standard Part No.	ERZE05A□□□□	ERZE07A□□□□	ERZE08A□□□□	ERZE11A□□□□	ERZE14A□□□□
Fuse rated current	5 A max.	7 A max.	7 A max.	10 A max.	10 A max.

* Fuses shall use rated voltages appropriate for circuits.

<2> The recommended fuse position is shown in table 1, “Example of ZNR application”, however, if the load current of protected equipment is larger than that of the above recommended fuse rated current, install a current fuse at the position shown below.



(5) Concerning thermal fuse

Set a thermal fuse to get high thermal conductivity with ZNR.

Table 1 Example of ZNR application

Connections example	Across-the-Line use			Use between Line to ground		
	<p>DC/AC Single-phase</p> <p>AC 3-phase</p>	<p>DC/AC Single-phase</p> <p>AC 3-phase</p>				
Example of varistor voltage	ZNR	Source voltage	Nominal varistor voltage	ZNR	Source voltage	Nominal varistor voltage
	ZNR1 ZNR3	AC100 V	201 to 361*	ZNR2 ZNR4	AC100 V	471
AC120 V		241 to 431*	AC220 V		511	
AC200 V		471 to 621*			621*	
AC220 V		471 to 621*			821**	
AC240 V		511, 621*			AC230 V	511
AC380 V		751, 821*			AC240 V	621*
				AC380 V	112**	

Note : Element size is selected by impulse Condition.

2) Operating environments

- (1) The ZNR is designed to be used indoors. Do not use it exposed outdoors.
- (2) Do not use the ZNR in places exposed to temperatures beyond the operating temperature range, such as places exposed to sunlight and vicinities of heating equipment.
- (3) Do not use the ZNR in places exposed to high temperatures and high humidity, such as places exposed directly to rain, wind, dew condensation, and vapor.
- (4) Do not use the ZNR in dusty and salty places and atmospheres polluted by corrosive gases.

3) Processing conditions

- (1) Do not wash the ZNR by such solvents(thinner, acetone, etc.) as its exterior resin deteriorates.
- (2) Do not apply a strong vibration or shock (by falling, etc.) to the ZNR, cracking to its exterior resin and element may occur.
- (3) When coating the ZNR with resin(including molding), do not use such resin.
- (4) Do not bend the ZNR type D lead wires at the position close to its ZNR type D exterior resin, or apply external force to the position.
- (5) When soldering the ZNR lead wires, follow the recommended conditions and do not melt the solder and insulating materials constituting the ZNR.

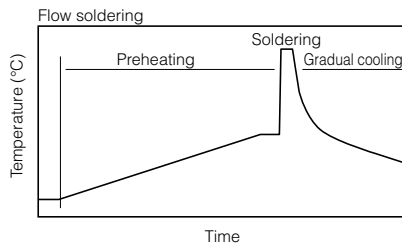
	Soldering Method	Recommended Condition	Attention Item
Type D	Flow soldering	260 °C, within 10 sec.	Type D is not Reflow soldering object part.

*1 Soldering iron temperature should not exceed 400 °C and should not be applied for mor than 5 seconds.

*2 Profile be careful because there is a margin of error in the way of measuring.

*3 The temperature depend on the size and the package density of the substrate. Therefore, confirm every kind of the substrate.

● Soldering temperature-time profile to recommend



Preheating	The normal to 130 °C	max. 120s
Soldering	max. 260 °C	max. 10s
Gradual cooling	Gradual cooling	

4) Long-term storage

- (1) Do not store the ZNR under high temperature and high humidity. Store it at a temperature up to 40 °C and at humidity below 75 %RH, and use it within two years.
Before using the ZNR that has been stored for a long period(two years or longer), confirm the solderability.
- (2) Avoid atmospheres full of corrosive gases(hydrogen sulfide, sulfurous acid, chlorine, ammonia, etc.).
- (3) Avoid direct sunlight and dew condensation.

3. Notices

- 3.1 In cases that the ZNR is used in equipment(aerospace equipment, medical equipment, etc.) requiring extremely high reliability, ask us for a selection of Part No., and protection coordination, etc. in advance.
- 3.2 Note that we do not take any responsibility for faults and abnormalities resulting from the use not in conformity with the contents of entries in the delivery specification.
- 3.3 There is a possibility that the ZNR will unexpectedly cause smoke or ignite because of an abnormal rise of the circuit voltage and invasion of excessive surge. To prevent that accident from spreading over the equipment and not to expand the damage, use multiplex protection such as the adoption of frame-retardant materials for housing parts and structural parts.

Minimum Quantity / Packing Unit

* Please contact local sales office about packing specifications.

Product	Series/Type	Part Number	Minimum Quantity / Packing Unit	Packing Quantity in Carton	Carton (about) L×W×H (mm)	
"ZNR" Transient/ Surge Absorbers	Type D Series E	Straight Leads <Bulk>	ERZE05A201 to 471	100	10000	210×340×180
			ERZE07A201 to 391	50	3000	210×340×110
			ERZE07A431 to 621	50	3000	210×340×110
			ERZE08A201 to 331	50	3000	210×340×110
			ERZE08A361 to 511	50	3000	210×340×110
			ERZE08A561 to 751	50	2000	210×340×110
			ERZE11A201 to 361	50	3000	210×340×110
			ERZE11A391 to 561	50	2000	210×340×110
			ERZE11A621 to 112	50	1000	210×340×110
			ERZE14A201 to 221	50	2000	210×340×110
			ERZE14A241 to 431	50	2000	210×340×110
		ERZE14A471 to 112	50	1000	210×340×110	
		Leads Cut Type <Bulk>	ERZE05A(B)201CS to 471CS	100	10000	210×340×180
			ERZE07A(B)201CS to 391CS	100	4000	210×340×110
			ERZE07A(B)431CS to 621CS	50	4000	210×340×110
			ERZE08A(B)201CS to 331CS	100	4000	210×340×110
			ERZE08A(B)361CS to 511CS	50	4000	210×340×110
			ERZE08A(B)561CS to 751CS	50	3000	210×340×110
			ERZE11A(B)201CS to 361CS	50	3000	210×340×110
		Straight Leads and Taped	ERZE11A(B)391CS to 561CS	50	2000	210×340×110
			ERZE11A(B)621CS to 112CS	50	2000	210×340×110
			ERZE05E201 to 471	1000	10000	400×360×260
	ERZE07E201 to 271		1000	10000	400×360×260	
	ERZE07E331 to 471		1000	10000	470×360×260	
	ERZE07E511 to 621		500	5000	400×360×260	
	ERZE08E201 to 271		1000	5000	360×310×320	
	ERZE08E331 to 431		1000	5000	360×310×320	
	ERZE08E471 to 511		1000	5000	360×310×320	
	ERZE08E561 to 751		500	2500	360×270×320	
	ERZE11E201 to 271		1000	5000	360×310×320	
	Crimped Lead and Taped	ERZE11E331 to 511	1000	5000	360×310×320	
		ERZE11E561 to 621	1000	5000	360×310×320	
		ERZE11E681 to 112	500	2500	360×270×320	
		ERZE05F201 to 471	1000	10000	400×360×260	
		ERZE07F201 to 271	1000	10000	400×360×260	
		ERZE07F331 to 471	1000	10000	470×360×260	
		ERZE07F511 to 621	500	5000	400×360×260	
		ERZE08F201 to 271	1000	5000	360×310×320	
		ERZE08F331 to 431	1000	5000	360×310×320	
		ERZE08F471 to 511	1000	5000	360×310×320	
		ERZE08F561 to 751	500	2500	360×270×320	
		ERZE11F201 to 271	1000	5000	360×310×320	
ERZE11F331 to 511		1000	5000	360×310×320		
ERZE11F561 to 621		1000	5000	360×310×320		
ERZE11F681 to 112		500	2500	360×270×320		

Part No., quantity and country of origin are designated on outer packages in English.

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