

## Varistors (ZNR Surge Absorber)

D type

E series



Varistors (ZNR 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
- 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

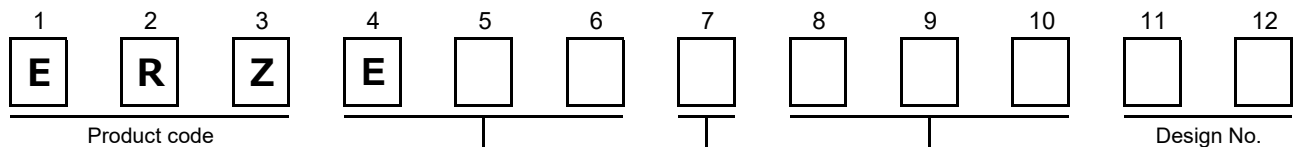
- UL1449 (VZCA2/UL, VZCA8/C-UL)
- VDE IEC61051-1, -2, -2-2, IEC60950-1 Annex.Q, IEC62368-1 G8.2
- CQC (GB/T10193, GB/T10194, GB4943.1, GB8898)

Refer to "Standard Products" , and "Application Note for Safety Standards" , for the details.

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■ As for handling precautions and minimum quantity / Packing unit please see related information.

### Explanation of part numbers



Code	Series
E05	E 5
E07	E7
E08	E8
E10	E10
E11	E11
E14	E14

Lead configuration		
Code	Configuration	Packaging
A	Straight lead	Bulk
B <sup>*1</sup>	Crimped lead	Bulk
E <sup>*2</sup>	Straight lead	Taped
F <sup>*2</sup>	Crimped lead	Taped

\*1: Excluding E14, only the lead cut  
\*2: Excluding E14

Normal varistor voltage
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The first two digits are significant figures and the third one denotes the number of zeros following.

Reference guide to standard products

Part No.	Applicable standards		Varistor voltage at 1 mA (V)	Maximum allowable voltage		Clamping voltage at 8/20 μs		Maximum peak current at 8/20 μs (A)	
	Type name	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
ERZE07A201	E7201	○☆◇				340	25	2500	1250
ERZE08A201	E8201	○☆◇				340	25	3500	2500
ERZE10A201	E10201	○☆◇				340	50	4500	3000
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
ERZE10A221	E10221	○☆◇				360	50	4500	3000
ERZE11A221	E11221	○☆★◇◆				360	50	6000	5000
ERZE14A221	E14221	○☆★◇◆				360	100	10000	7000
ERZE05A241	E241	○☆◇	240 (216 to 264)	150	200	395	10	1200	600
ERZE07A241	E7241	○☆◇				395	25	2500	1250
ERZE08A241	E8241	○☆◇				395	25	3500	2500
ERZE10A241	E10241	○☆◇				395	50	4500	3000
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
ERZE10A271	E10271	○☆◇				455	50	4500	3000
ERZE11A271	E11271	○☆★◇◆				455	50	6000	5000
ERZE14A271	E14271	○☆★◇◆				455	100	10000	7000
ERZE05A331	E331	○☆◇	330 (297 to 363)	210	270	545	10	1200	600
ERZE07A331	E7331	○☆◇				545	25	2500	1250
ERZE08A331	E8331	○☆◇				545	25	3500	2500
ERZE10A331	E10331	○☆◇				545	50	4500	3000
ERZE11A331	E11331	○☆★◇◆				545	50	6000	4500
ERZE14A331	E14331	○☆★◇◆				545	100	10000	6500
ERZE05A361	E361	○☆◇	360 (324 to 396)	230	300	595	10	1200	600
ERZE07A361	E7361	○☆◇				595	25	2500	1250
ERZE08A361	E8361	○☆◇				595	25	3500	2500
ERZE10A361	E10361	○☆◇				595	50	4500	3000
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
ERZE10A391	E10391	○☆◇				650	50	4500	3000
ERZE11A391	E11391	○☆★◇◆				650	50	6000	4500
ERZE14A391	E14391	○☆★◇◆				650	100	10000	6500
ERZE05A431	E431	○☆◇	430 (387 to 473)	275	350	710	10	1200	600
ERZE07A431	E7431	○☆◇				710	25	2500	1250
ERZE08A431	E8431	○☆◇				710	25	3500	2500
ERZE10A431	E10431	○☆◇				710	50	4500	3000
ERZE11A431	E11431	○☆★◇◆				710	50	6000	4500
ERZE14A431	E14431	○☆★◇◆				710	100	10000	6500

○: UL1449 (VZCA2/UL, VZCA8/C-UL), ☆: VDE (IEC61051-1, -2, -2-2) ★: VDE (IEC60950-1 Annex.Q, IEC62368-1 G8.2),

◇: CQC (GB/T10193, GB/T10194), ◆: CQC (GB4943.1, GB8898)

※Approval number (File No.) of safety regulations are subject to revision without notice. Ask factory for a copy of the latest file No.

Reference guide to standard products

Part No.	Applicable standards		Varistor voltage at 1 mA (V)	Maximum allowable voltage		Clamping voltage at 8/20 μs		Maximum peak current at 8/20 μs (A)	
	Type name	Approvals		Acrms (V)	DC (V)	max.(V)	Ip (A)	1 time	2 times
ERZE05A471	E471	○☆◇	470 (423 to 517)	300	385	775	10	1200	600
ERZE07A471	E7471	○☆◇				775	25	2500	1250
ERZE08A471	E8471	○☆★◇◆				775	25	3500	2500
ERZE10A471	E10471	○☆★◇◆				775	50	4500	3000
ERZE11A471	E11471	○☆★◇◆				775	50	6000	4500
ERZE14A471	E14471	○☆★◇◆				775	100	10000	6500
ERZE07A511	E7511	○☆◇	510 (459 to 561)	320	410	845	25	2500	1250
ERZE08A511	E8511	○☆★◇◆				845	25	3500	2500
ERZE10A511	E10511	○☆★◇◆				845	50	4500	3000
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
ERZE10A561	E10561	○☆★◇◆				930	50	4500	3000
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
ERZE10A621	E10621	○☆★◇◆				1025	50	4500	3000
ERZE11A621	E11621	○☆★◇◆				1025	50	5000	4500
ERZE14A621	E14621	○☆★◇◆				1025	100	7500	6500
ERZE08A681	E8681	○☆★◇◆	680 (612 to 748)	420	560	1120	25	3500	2500
ERZE10A681	E10681	○☆★◇◆				1120	50	4500	3000
ERZE11A681	E11681	○☆★◇◆				1120	50	5000	4500
ERZE14A681	E14681	○☆★◇◆				1120	100	7500	6500
ERZE08A751	E8751	○☆★◇◆	750 (675 to 825)	460	615	1240	25	3500	2500
ERZE10A751	E10751	○☆★◇◆				1240	50	4500	3000
ERZE11A751	E11751	○☆★◇◆				1240	50	5000	4500
ERZE14A751	E14751	○☆★◇◆				1240	100	7500	6500
ERZE10A821	E10821	○☆★◇◆	820 (738 to 902)	510	670	1355	50	4500	3000
ERZE11A821	E11821	○☆★◇◆				1355	50	5000	4500
ERZE14A821	E14821	○☆★◇◆				1355	100	7500	6500
ERZE10A911	E10911	○☆★◇◆	910 (819 to 1001)	550	745	1500	50	4500	3000
ERZE11A911	E11911	○☆★◇◆				1500	50	5000	4500
ERZE14A911	E14911	○☆★◇◆				1500	100	7500	6500
ERZE10A102	E10102	○☆★◇◆	1000 (900 to 1100)	625	825	1650	50	4500	3000
ERZE11A102	E11102	○☆★◇◆				1650	50	5000	4500
ERZE14A102	E14102	○☆★◇◆				1650	100	7500	6500
ERZE10A112	E10112	○☆★◇◆	1100 (990 to 1210)	680	895	1815	50	4500	3000
ERZE11A112	E11112	○☆★◇◆				1815	50	5000	4500
ERZE14A112	E14112	○☆★◇◆				1815	100	7500	6500

○: UL1449 (VZCA2/UL, VZCA8/C-UL), ☆: VDE (IEC61051-1, -2, -2-2) ★: VDE (IEC60950-1 Annex.Q, IEC62368-1 G8.2),

◇: CQC (GB/T10193, GB/T10194), ◆: CQC (GB4943.1, GB8898)

※Approval number (File No.) of safety regulations are subject to revision without notice. Ask factory for a copy of the latest file No.

## Ratings and characteristics

●Operating temperature range : -40 to 85 °C

●Storage temperature range : -40 to 125 °C

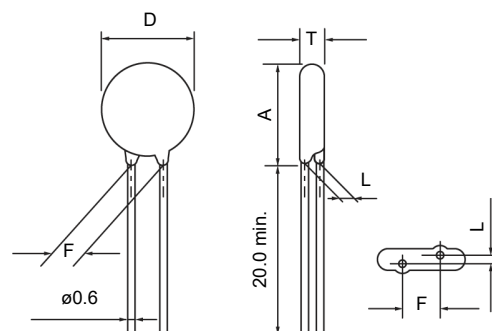
Part No.	Varistor voltage at 1 mA	Maximum allowable voltage		Clamping voltage (max.) **Ip	Rated power	Maximum energy		Maximum peak current (8/20 μs)		Capacitance (max.) at 1 kHz
		ACrms (V)	DC (V)			(10/1000 μs)	(2 ms)	1 time	2 times	
	(V)	(V)	(V)	(V)	(W)	(J)	(J)	(A)	(A)	(pF)
ERZE05A201	200(185 to 225)	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

\*Ip Measuring current of clamping voltage : 10 A

## Dimensions in mm (not to scale)

Unit : mm

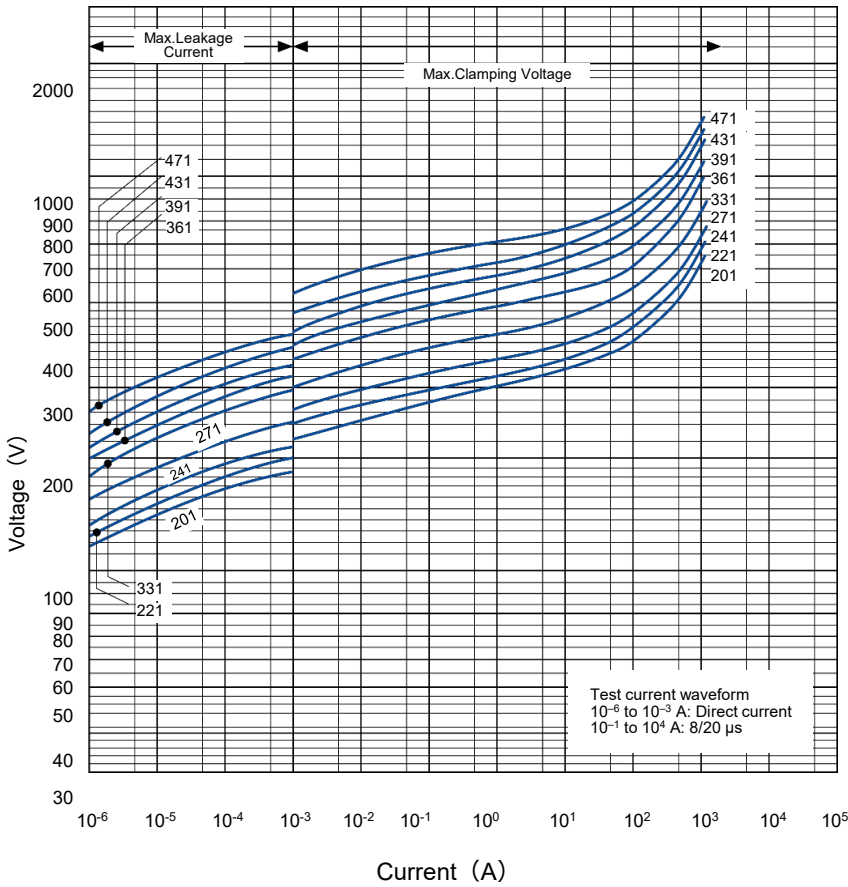
Part No.	D max.	T max.	F±1.0	A max.	L±1.0
ERZE05A201	7.0	4.8	5.0	10.0	2.1
ERZE05A221	7.0	4.9	5.0	10.0	2.3
ERZE05A241	7.0	5.0	5.0	10.0	2.4
ERZE05A271	7.0	5.2	5.0	10.0	2.5
ERZE05A331	7.0	5.5	5.0	10.0	2.9
ERZE05A361	7.0	5.8	5.0	10.0	3.1
ERZE05A391	7.0	5.9	5.0	10.0	3.2
ERZE05A431	7.0	6.1	5.0	10.0	3.3
ERZE05A471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



**Typical characteristics**

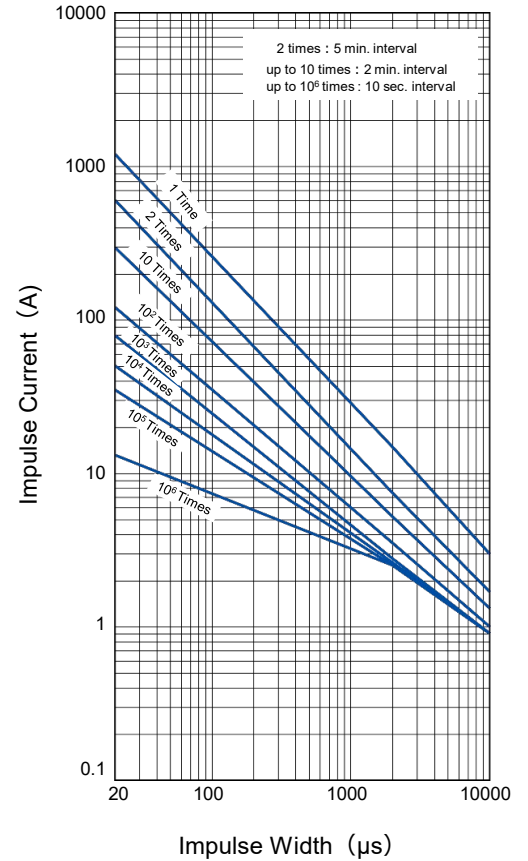
**Voltage vs. Current**

ERZE05A201 to ERZE05A471



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

ERZE05A201 to ERZE05A471



## Ratings and characteristics

●Operating temperature range : -40 to 85 °C

●Storage temperature range : -40 to 125 °C

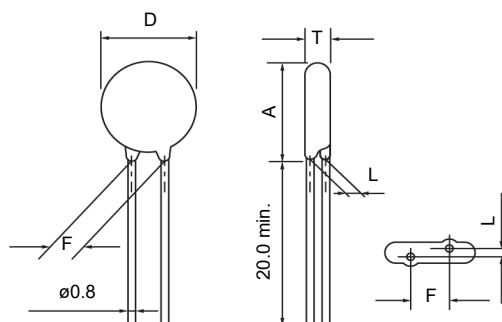
Part No.	Varistor voltage at 1 mA	Maximum allowable voltage		Clamping voltage (max.) **Ip	Rated power	Maximum energy		Maximum peak current (8/20 μs)		Capacitance (max.) at 1 kHz
		ACrms (V)	DC (V)			(10/1000 μs)	(2 ms)	1 time	2 times	
						(J)	(J)	(A)	(A)	
(V)	(V)	(V)	(W)	(J)	(J)	(A)	(A)	(pF)		
ERZE07A201	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

\*Ip Measuring current of clamping voltage : 25 A

## Dimensions in mm (not to scale)

Unit : mm

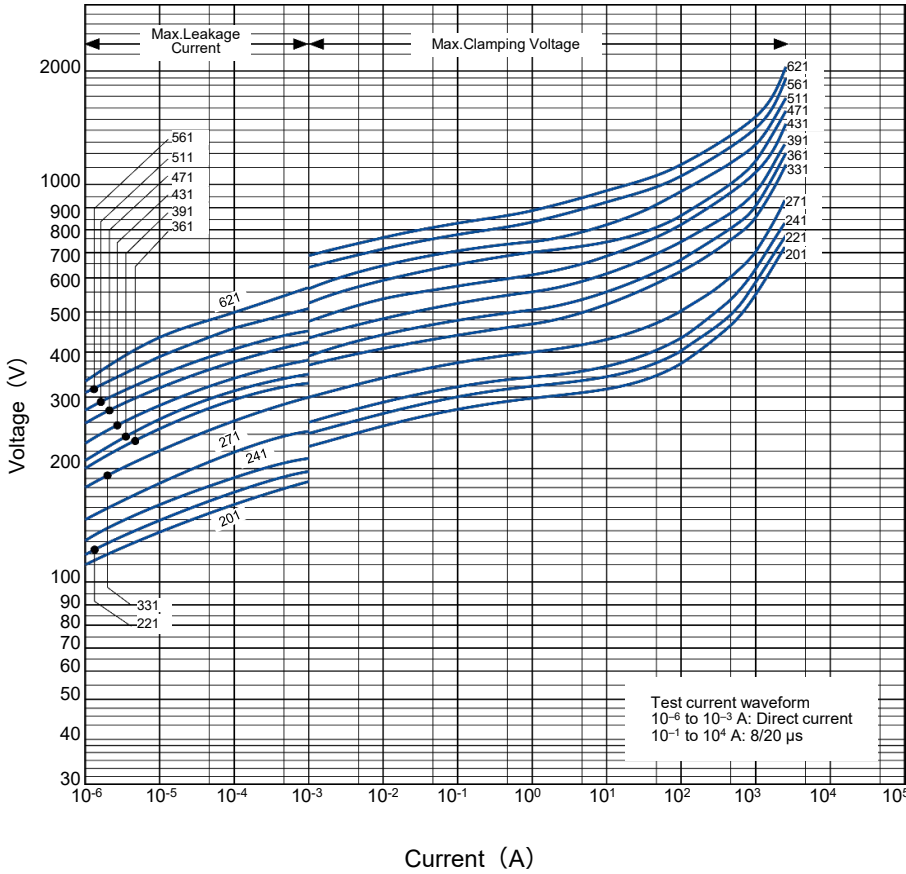
Part No.	D max.	T max.	F±1.0	A max.	L±1.0
ERZE07A201	9.0	5.3	7.5	12.5	2.1
ERZE07A221	9.0	5.4	7.5	12.5	2.3
ERZE07A241	9.0	5.5	7.5	12.5	2.4
ERZE07A271	9.0	5.7	7.5	12.5	2.5
ERZE07A331	9.0	6.0	7.5	12.5	2.8
ERZE07A361	9.0	6.2	7.5	12.5	2.9
ERZE07A391	9.0	6.3	7.5	12.5	3.0
ERZE07A431	9.0	6.5	7.5	12.5	3.1
ERZE07A471	9.0	6.8	7.5	12.5	3.3
ERZE07A511	9.0	7.0	7.5	12.5	3.5
ERZE07A561	9.0	7.4	7.5	13.5	3.8
ERZE07A621	10.0	7.8	7.5	13.5	4.0



**Typical characteristics**

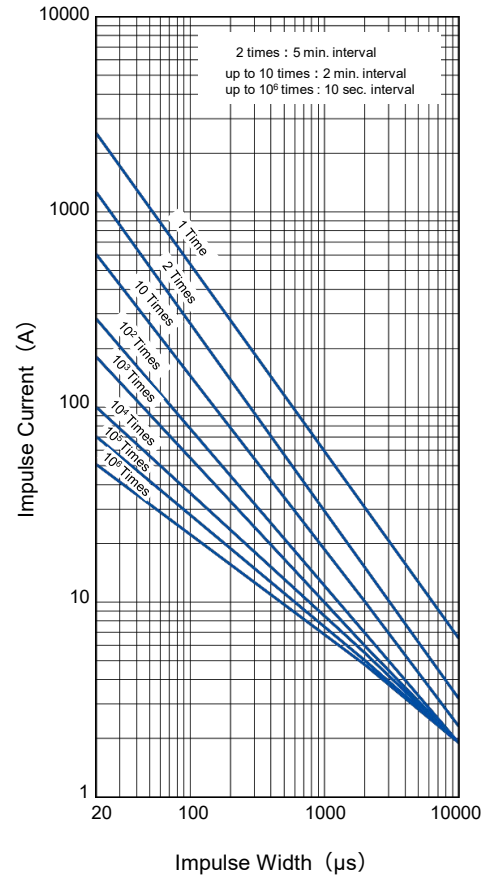
**Voltage vs. Current**

ERZE07A201 to ERZE07A621



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

ERZE07A201 to ERZE07A621



## Ratings and characteristics

● Operating temperature range : -40 to 85 °C ● Storage temperature range : -40 to 125 °C

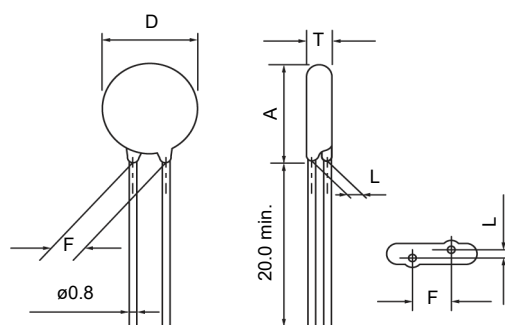
Part No.	Varistor voltage at 1 mA	Maximum allowable voltage		Clamping voltage (max.) **Ip	Rated power	Maximum energy		Maximum peak current (8/20 μs)		Capacitance (max.) at 1 kHz
		ACrms (V)	DC (V)			(10/1000 μs)	(2 ms)	1 time	2 times	
	(V)	(V)	(V)	(W)	(J)	(J)	(A)	(A)	(pF)	
ERZE08A201	200(185 to 225)	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)

Unit : mm

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

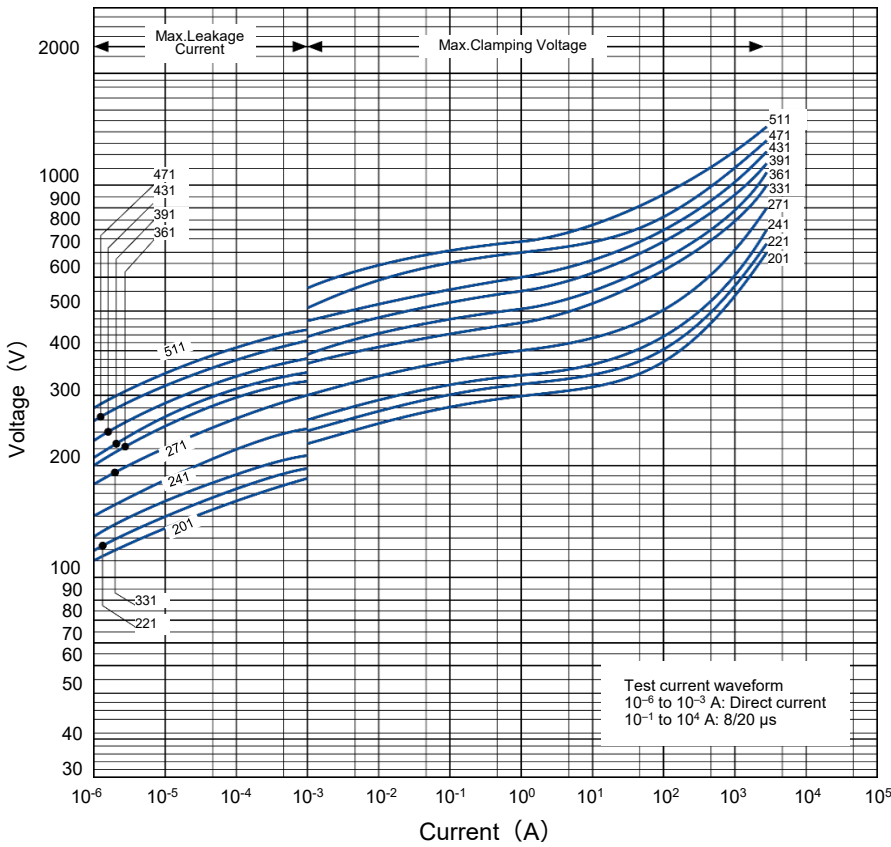




**Typical characteristics**

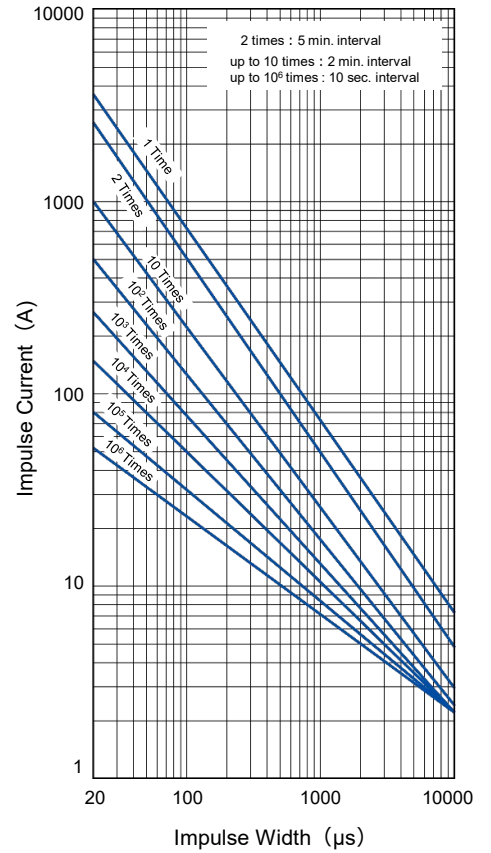
**Voltage vs. Current**

ERZE08A201 to ERZE08A511

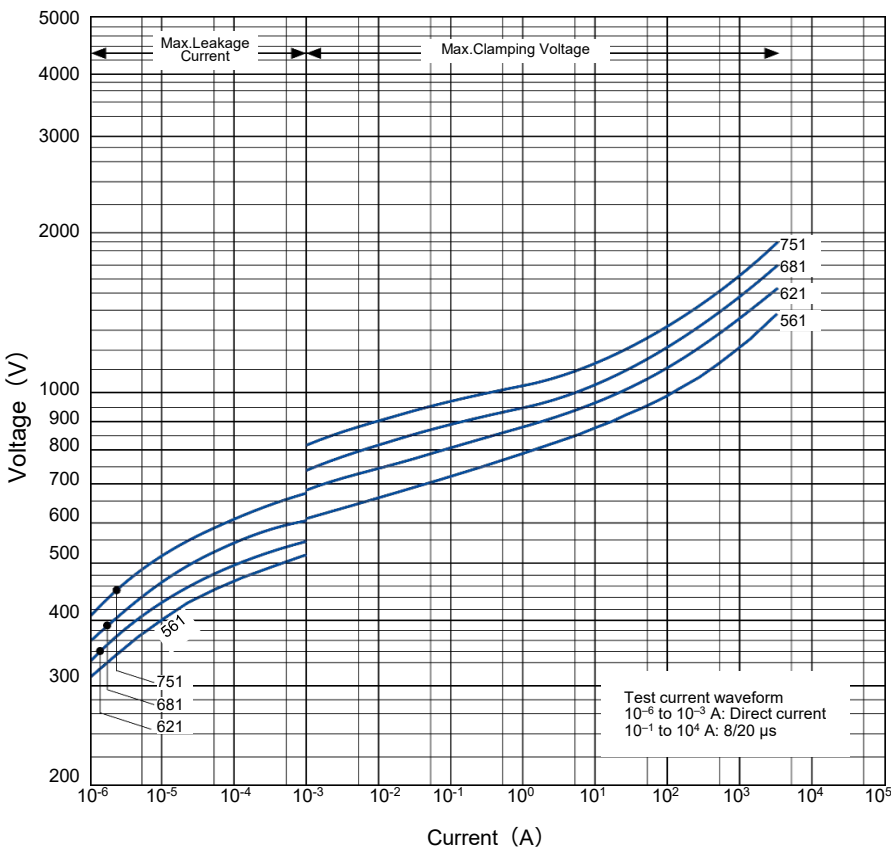


**Impulse Derating** (Relation between impulse width and impulse current multiple)

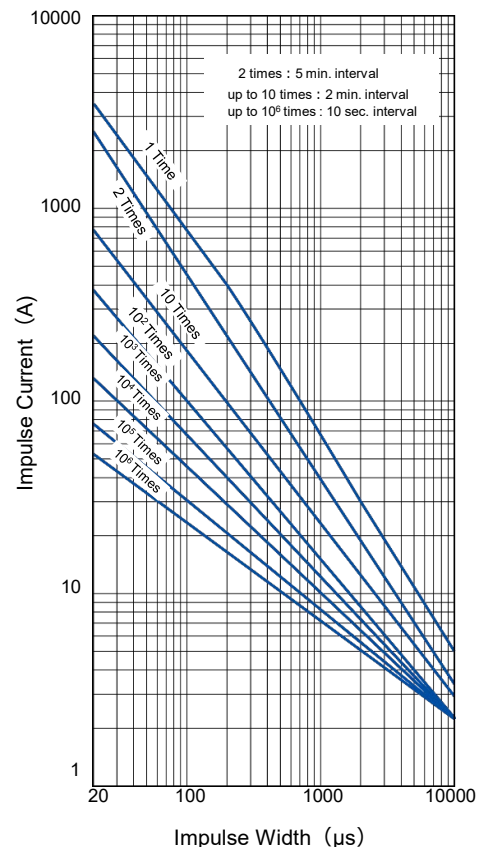
ERZE08A201 to ERZE08A511



ERZE08A561 to ERZE08A751



ERZE08A561 to ERZE08A751



## Ratings and characteristics

●Operating temperature range : -40 to 85 °C

●Storage temperature range : -40 to 125 °C

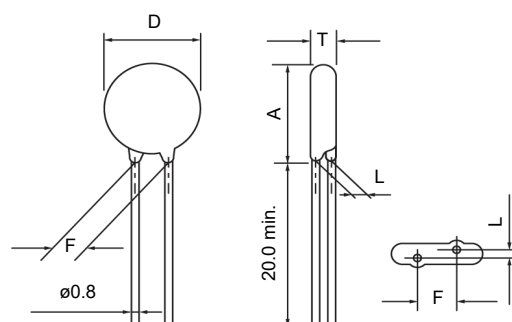
Part No.	Varistor voltage at 1 mA	Maximum allowable voltage		Clamping voltage (max.) **Ip	Rated power	Maximum energy		Maximum peak current (8/20 μs)		Capacitance (max.) at 1 kHz
		ACrms (V)	DC (V)			(10/1000 μs)	(2 ms)	1 time	2 times	
	(V)	(V)	(V)	(W)	(J)	(J)	(A)	(A)	(pF)	
ERZE10A201	200(185 to 225)	130	170	340	0.5	47	34	4500	3000	630
ERZE10A221	220(198 to 242)	140	180	360	0.5	50	36	4500	3000	600
ERZE10A241	240(216 to 264)	150	200	395	0.5	56	40	4500	3000	570
ERZE10A271	270(247 to 303)	175	225	455	0.5	64	46	4500	3000	530
ERZE10A331	330(297 to 363)	210	270	545	0.5	72	52	4500	3000	470
ERZE10A361	360(324 to 396)	230	300	595	0.5	84	60	4500	3000	430
ERZE10A391	390(351 to 429)	250	320	650	0.5	91	65	4500	3000	400
ERZE10A431	430(387 to 473)	275	350	710	0.5	99	71	4500	3000	350
ERZE10A471	470(423 to 517)	300	385	775	0.5	106	76	4500	3000	320
ERZE10A511	510(459 to 561)	320	410	845	0.5	117	84	4500	3000	300
ERZE10A561	560(504 to 616)	350	450	930	0.5	120	86	4500	3000	290
ERZE10A621	620(558 to 682)	385	505	1025	0.5	126	88	4500	3000	280
ERZE10A681	680(612 to 748)	420	560	1120	0.5	133	95	4500	3000	260
ERZE10A751	750(675 to 825)	460	615	1240	0.5	140	100	4500	3000	250
ERZE10A821	820(738 to 902)	510	670	1355	0.5	154	110	4500	3000	230
ERZE10A911	910(819 to 1001)	550	745	1500	0.5	168	112	4500	3000	220
ERZE10A102	1000(900 to 1100)	625	825	1650	0.5	182	130	4500	3000	200
ERZE10A112	1100(990 to 1210)	680	895	1815	0.5	196	140	4500	3000	180

\*Ip Measuring current of clamping voltage : 50 A

## Dimensions in mm (not to scale)

Unit : mm

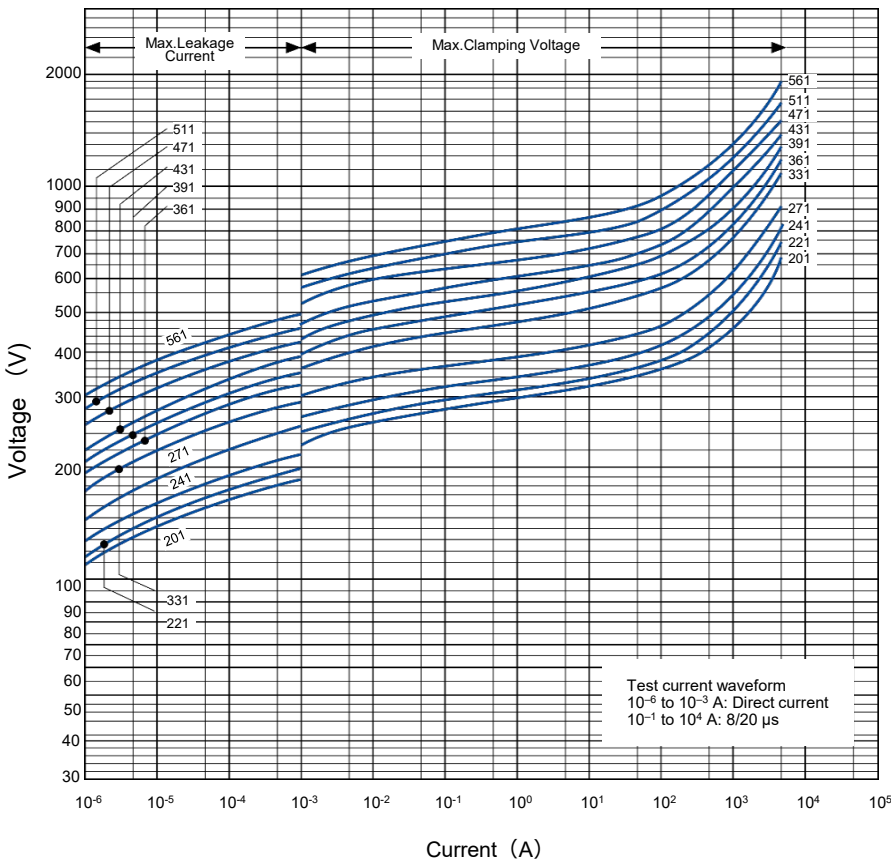
Part No.	D max.	T max.	F±1.0	A max.	L±1.0
ERZE10A201	11.5	5.3	7.5	15.0	2.1
ERZE10A221	11.5	5.4	7.5	15.0	2.3
ERZE10A241	11.5	5.5	7.5	15.0	2.4
ERZE10A271	11.5	5.7	7.5	15.0	2.5
ERZE10A331	11.5	6.0	7.5	15.0	2.8
ERZE10A361	11.5	6.2	7.5	15.0	2.9
ERZE10A391	11.5	6.3	7.5	15.0	3.0
ERZE10A431	11.5	6.5	7.5	15.0	3.1
ERZE10A471	11.5	6.8	7.5	15.0	3.3
ERZE10A511	11.5	7.0	7.5	15.0	3.5
ERZE10A561	11.5	7.4	7.5	15.0	3.8
ERZE10A621	12.5	7.8	7.5	16.0	4.0
ERZE10A681	12.5	8.1	7.5	16.0	4.2
ERZE10A751	12.5	8.6	7.5	16.0	4.6
ERZE10A821	12.5	8.9	7.5	16.0	5.0
ERZE10A911	12.5	9.5	7.5	16.0	5.7
ERZE10A102	12.5	10.0	7.5	16.0	6.2
ERZE10A112	12.5	10.6	7.5	16.0	6.8



Typical characteristics

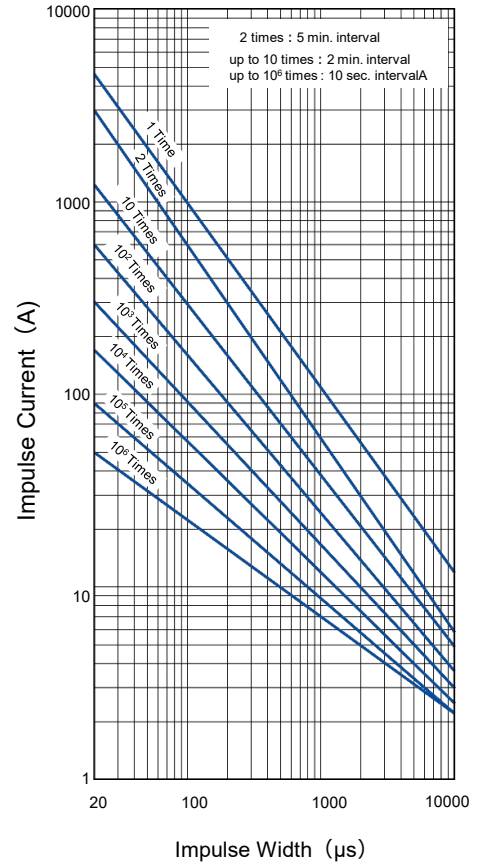
Voltage vs. Current

ERZE10A201 to ERZE10A561

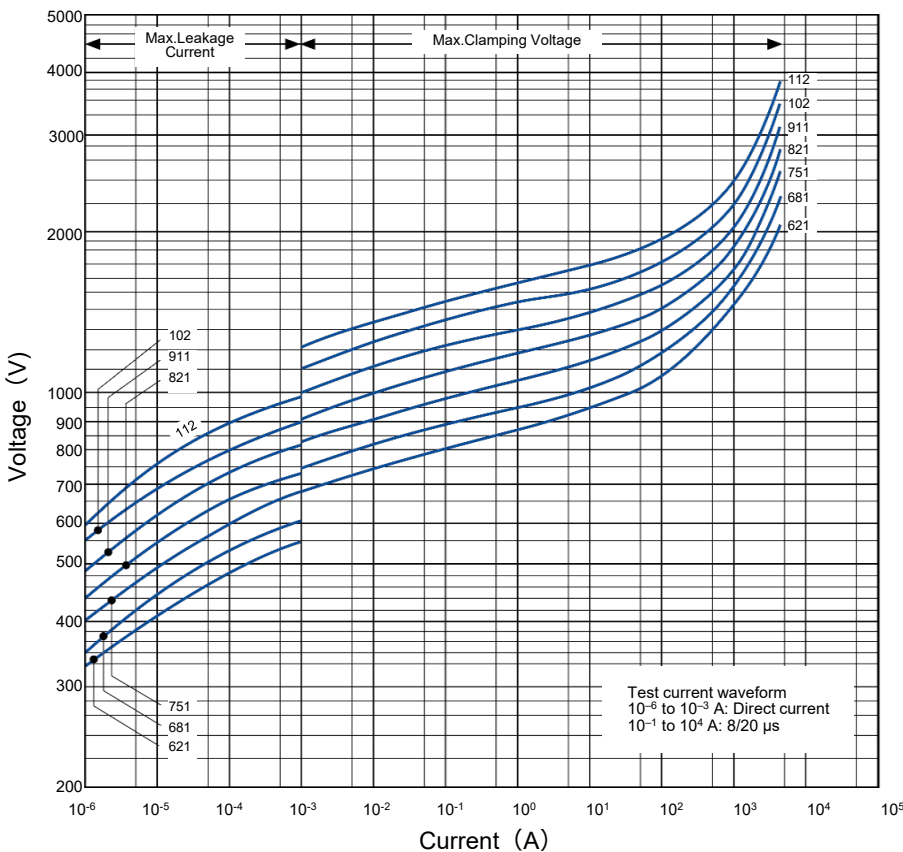


Impulse Derating (Relation between impulse width and impulse current multiple)

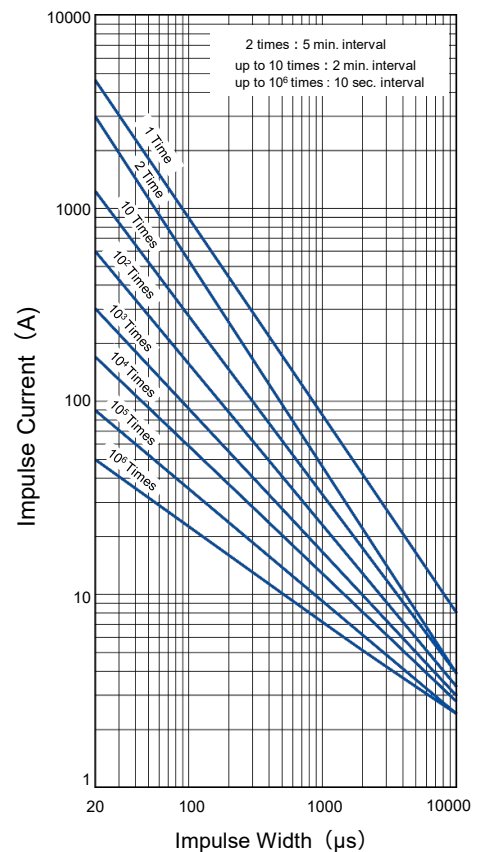
ERZE10A201 to ERZE10A561



ERZE10A621 to ERZE10A112



ERZE10A621 to ERZE10A112



## Ratings and characteristics

●Operating temperature range : -40 to 85 °C

●Storage temperature range : -40 to 125 °C

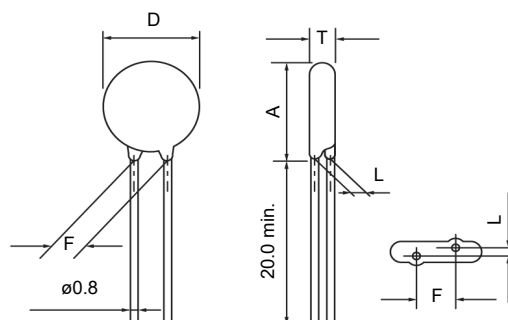
Part No.	Varistor voltage at 1 mA	Maximum allowable voltage		Clamping voltage (max.) **Ip	Rated power	Maximum energy		Maximum peak current (8/20 $\mu$ s)		Capacitance (max.) at 1 kHz
		ACrms (V)	DC (V)			(10/1000 $\mu$ s)	(2 ms)	1 time	2 times	
	(V)	(V)	(V)	(W)	(J)	(J)	(A)	(A)	(pF)	
ERZE11A201	200(185 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)

Unit : mm

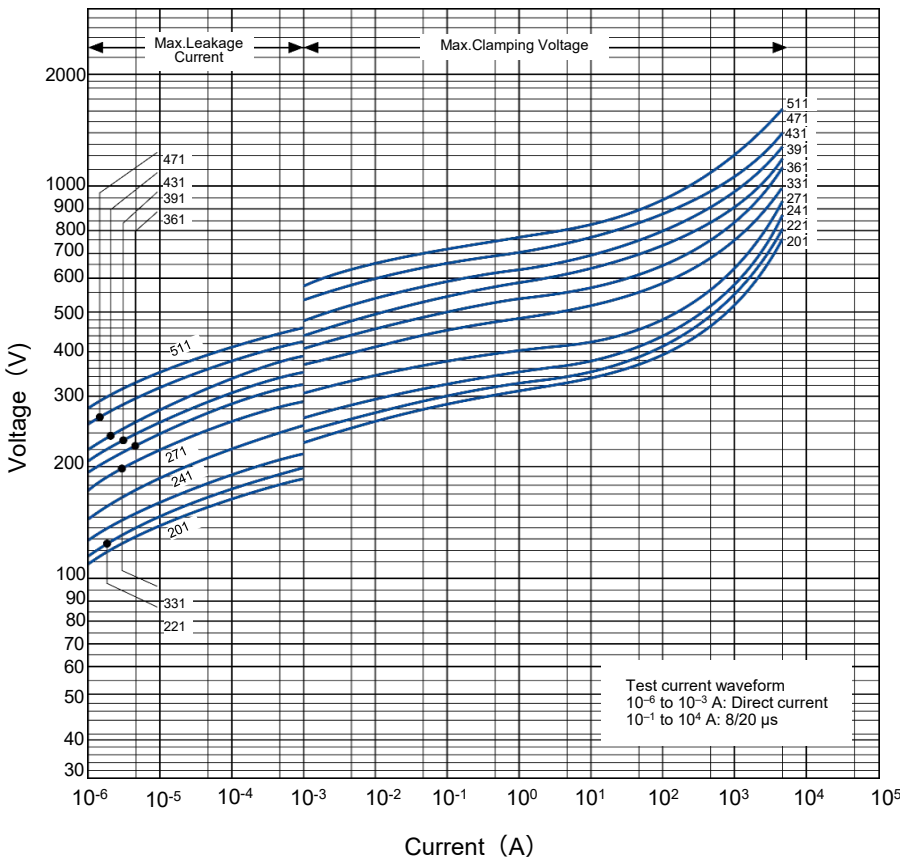
Part No.	D max.	T max.	F $\pm$ 1.0	A max.	L $\pm$ 1.0
ERZE11A201	13.0	5.2	7.5	17.0	1.9
ERZE11A221	13.0	5.3	7.5	17.0	2.0
ERZE11A241	13.0	5.4	7.5	17.0	2.1
ERZE11A271	13.0	5.6	7.5	17.0	2.3
ERZE11A331	13.0	5.9	7.5	17.0	2.6
ERZE11A361	13.0	6.1	7.5	17.0	2.8
ERZE11A391	13.0	6.2	7.5	17.0	2.9
ERZE11A431	13.0	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



**Typical characteristics**

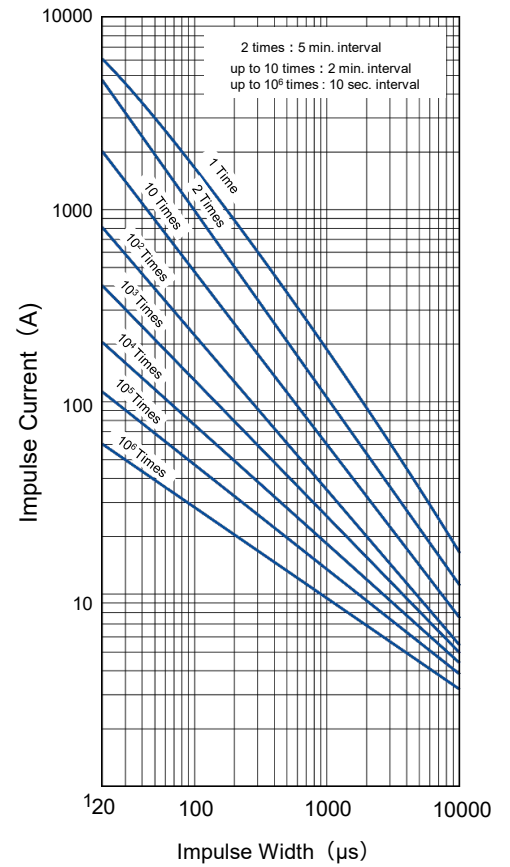
**Voltage vs. Current**

ERZE11A201 to ERZE11A511

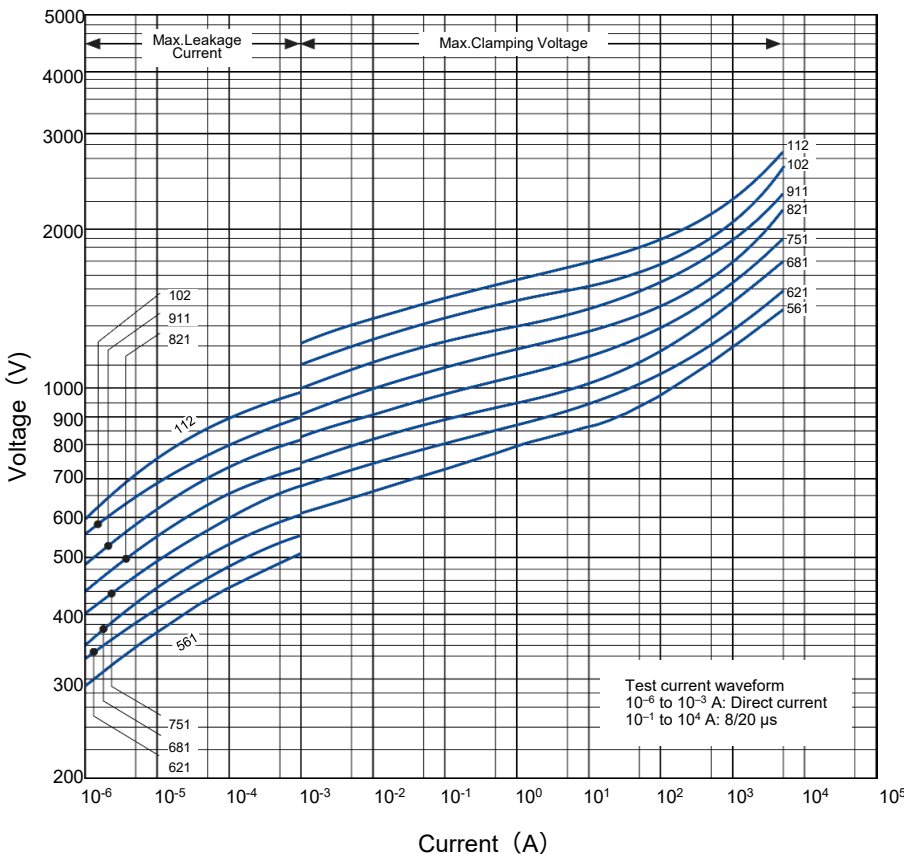


**Impulse Derating** (Relation between impulse width and impulse current multiple)

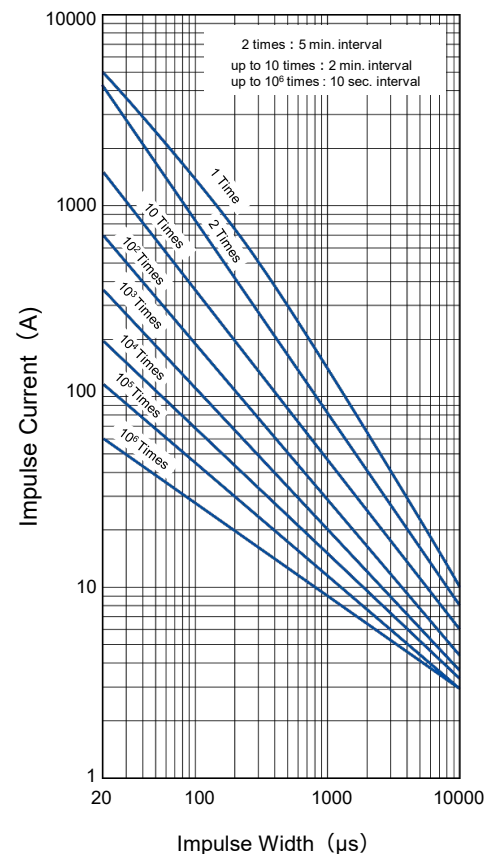
ERZE11A201 to ERZE11A511



ERZE11A561 to ERZE11A112



ERZE11A561 to ERZE11A112



## Ratings and characteristics

●Operating temperature range : -40 to 85 °C

●Storage temperature range : -40 to 125 °C

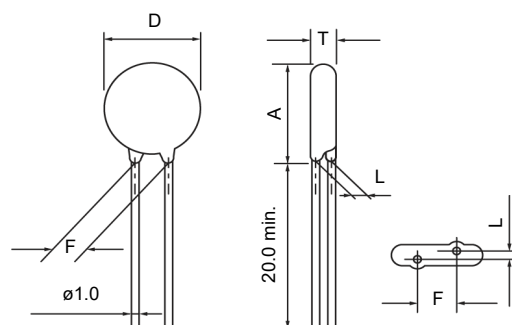
Part No.	Varistor voltage at 1 mA	Maximum allowable voltage		Clamping voltage (max.) **Ip	Rated power	Maximum energy		Maximum peak current (8/20 μs)		Capacitance (max.) at 1 kHz
		ACrms (V)	DC (V)			(10/1000 μs)	(2 ms)	1 time	2 times	
	(V)	(V)	(V)	(W)	(J)	(J)	(A)	(A)	(pF)	
ERZE14A201	200(185 to 225)	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)

Unit : mm

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

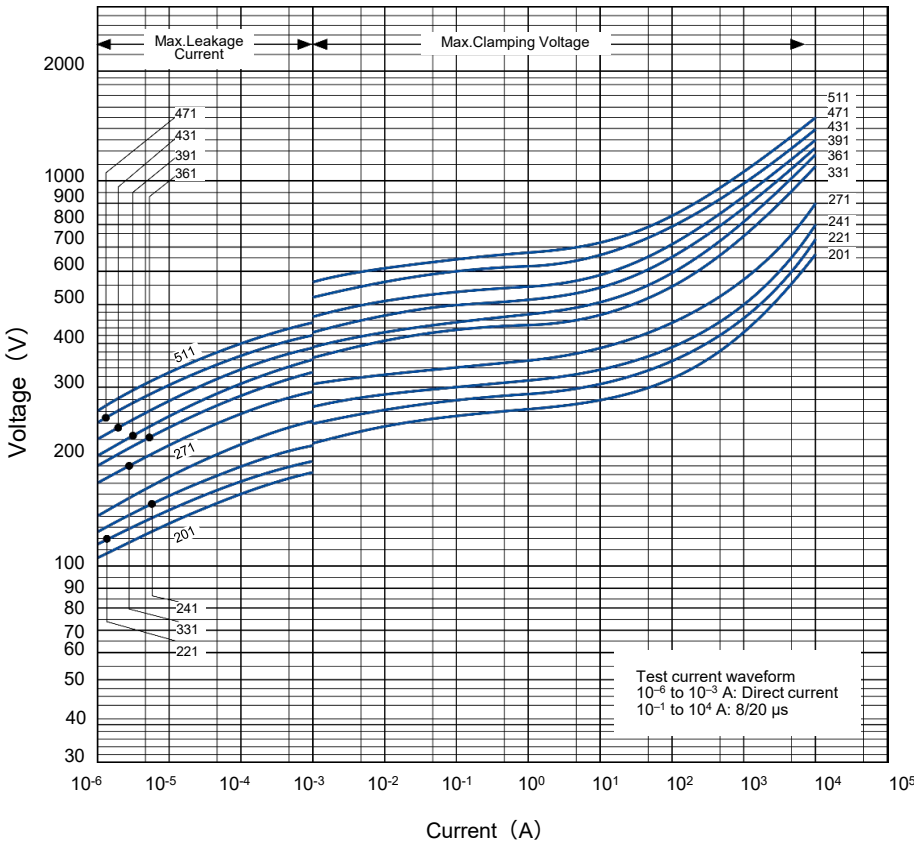




**Typical characteristics**

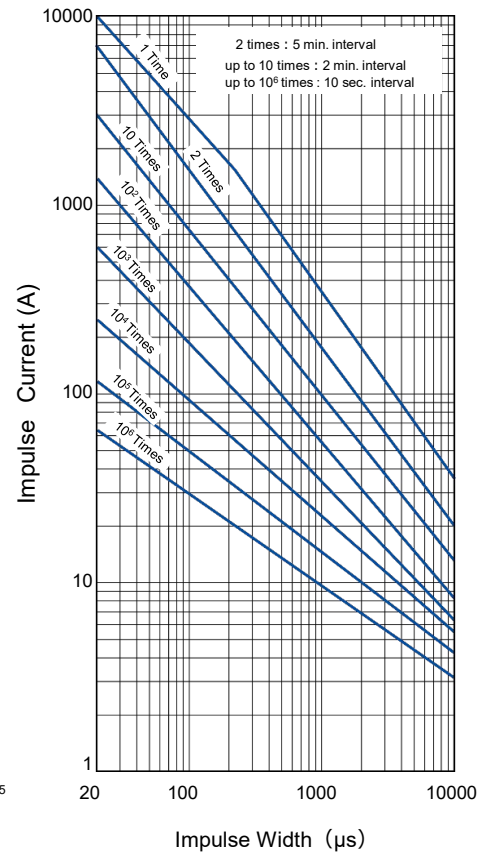
**Voltage vs. Current**

ERZE14A201 to ERZE14A511

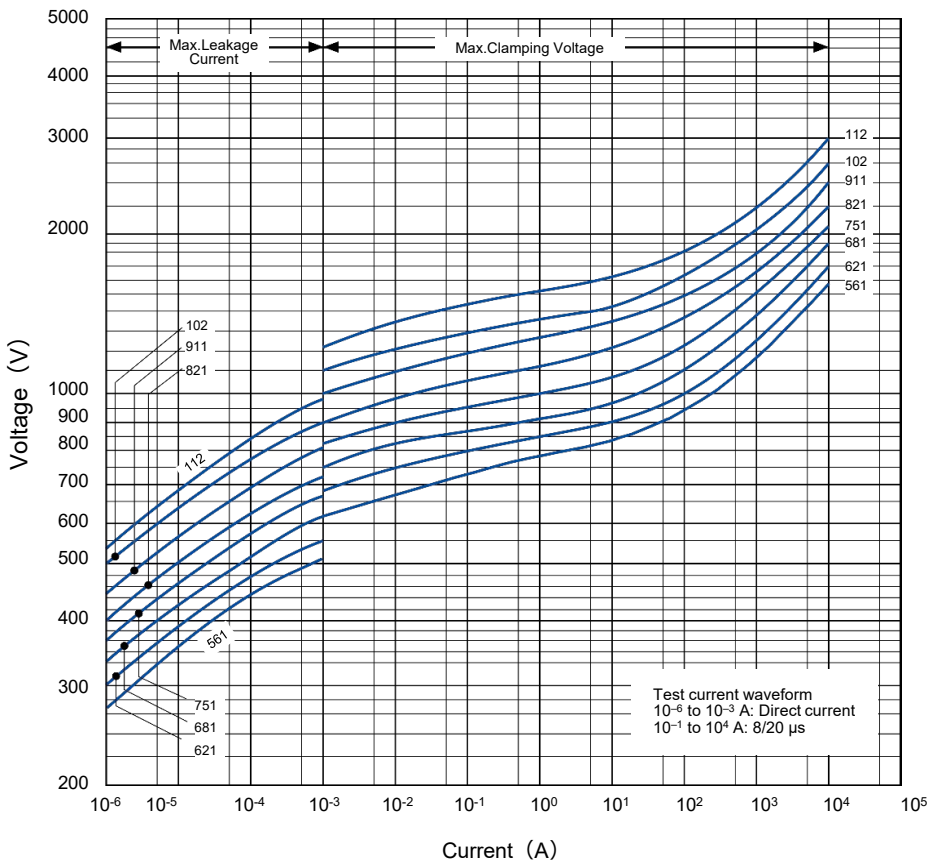


**Impulse Derating** (Relation between impulse width and impulse current multiple)

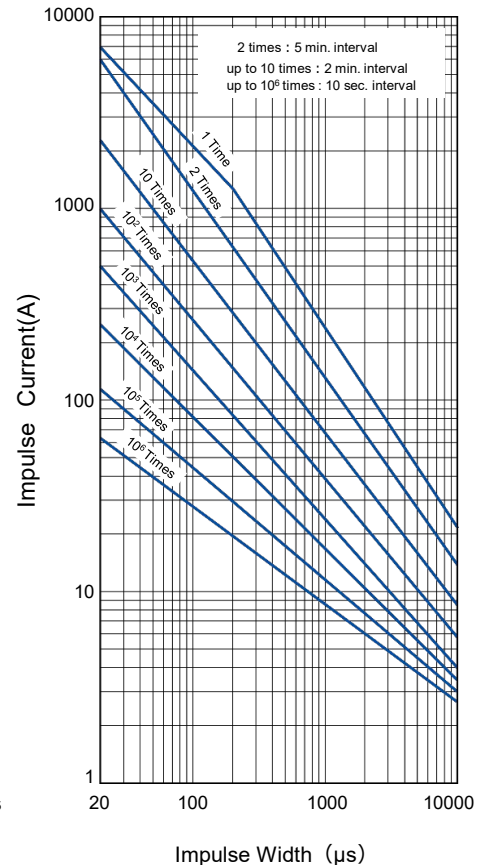
ERZE14A201 to ERZE14A511



ERZE14A561 to ERZE14A112



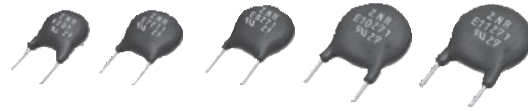
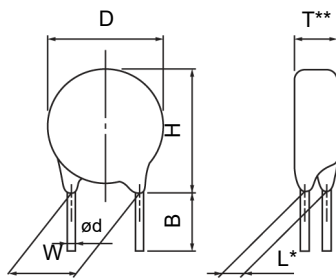
ERZE14A561 to ERZE14A112



**Straight leads cut type (Bulk type)**

※ Ratings and characteristics is refer to bulk standard type.

**Dimensions in mm (not to scale)**



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

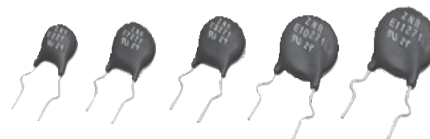
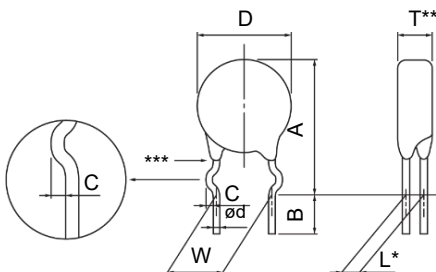
Unit : mm

Series	E5		E7		E8		E10		E11	
Varister Voltage	201 to 471	201 to 511	561	621	201 to 561	621 to 751	201 to 561	621 to 112	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.	11.5 max.	12.5 max.	13.0 max.	14.0 max.
H	10.0 max.	12.5 max.	13.5 max.	13.5 max.	13.5 max.	14.5 max.	15.0 max.	16.0 max.	17.0 max.	18.0 max.
W	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	7.5±1.0	7.5±1.0
ød	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
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	4.0±1.0	4.0±1.0
Standard products part No.	ERZE05A□□□CS	ERZE07A□□□CS		ERZE08A□□□CS		ERZE10A□□□CS		ERZE11A□□□CS		

**Crimped leads cut type (Bulk Type)**

※ Ratings and characteristics is refer to bulk standard type.

**Dimensions in mm (not to scale)**



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

Unit : mm

Series	E5		E7		E8		E10			E11	
Varister Voltage	201 to 471	201 to 511	561	621	201 to 561	621 to 751	201 to 561	621 to 681	751 to 112	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.	11.5 max.	12.5 max.	12.5 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.	18.0 max.	19.5 max..	20.5 max.	20.5 max.	21.5 max.
C	1.2±1.4	1.4±1.4	1.4±1.4	1.4±1.4	1.4±1.4	1.4±1.4	1.4±1.4	1.4±1.4	1.4±1.4	1.4±1.4	1.4±1.4
W	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	7.5±1.0	7.5±1.0	7.5±1.0
ød	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	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	4.0±1.0	4.0±1.0	4.0±1.0
Standard products part No.	ERZE05B□□□CS	ERZE07B□□□CS		ERZE08B□□□CS		ERZE10B□□□CS			ERZE11B□□□CS		

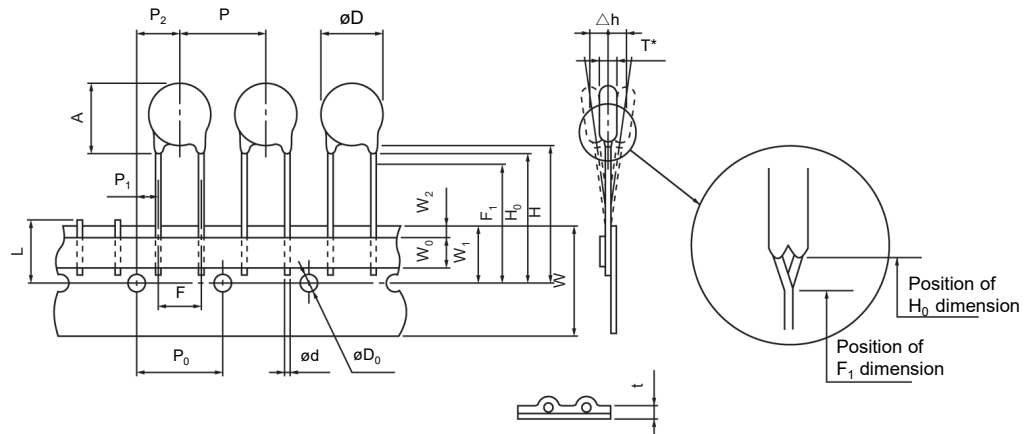


## D type / E series (Taping specifications)

### Taping specifications for automated assembly (Straight leads and taping)

※ Ratings and characteristics is refer to bulk standard type.

### Dimensions in mm (not to scale)



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

Unit : mm

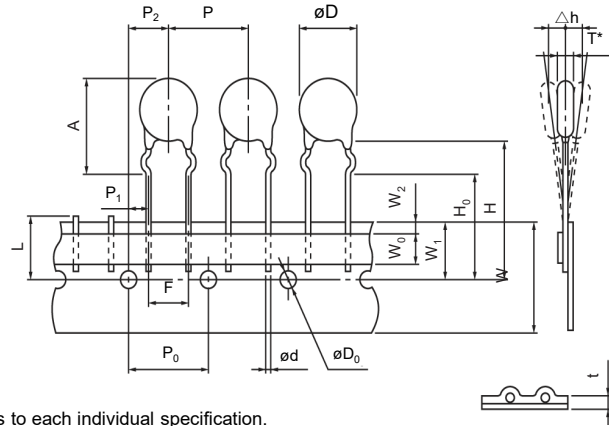
Series	E5					E7					E8			E10			E11		
Symbol	201 to 471	201 to 271	331 to 551	561	621	201 to 221	241 to 561	621 to 751	201 to 221	241 to 561	621 to 112	201 to 221	241 to 561	621 to 112	201 to 221	241 to 561	621 to 112		
P	12.7±1.0	15.0±1.0	15.0±1.0	15.0±1.0	15.0±1.0	15.0±1.0	15.0±1.0	15.0±1.0	15.0±1.0	15.0±1.0	15.0±1.0	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 <sub>0</sub>	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	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 <sub>1</sub>	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	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 <sub>2</sub>	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	7.5±1.3	7.5±1.3	7.5±1.3	7.5±1.3	7.5±1.3	7.5±1.3		
ød	0.60 <sup>+0.06</sup> / <sub>-0.05</sub>	0.80 <sup>+0.08</sup> / <sub>-0.05</sub>	0.80 <sup>+0.08</sup> / <sub>-0.05</sub>	0.80 <sup>+0.08</sup> / <sub>-0.05</sub>	0.80 <sup>+0.08</sup> / <sub>-0.05</sub>	0.80 <sup>+0.08</sup> / <sub>-0.05</sub>	0.80 <sup>+0.08</sup> / <sub>-0.05</sub>	0.80 <sup>+0.08</sup> / <sub>-0.05</sub>	0.80 <sup>+0.08</sup> / <sub>-0.05</sub>	0.80 <sup>+0.08</sup> / <sub>-0.05</sub>	0.80 <sup>+0.08</sup> / <sub>-0.05</sub>	0.80 <sup>+0.08</sup> / <sub>-0.05</sub>	0.80 <sup>+0.08</sup> / <sub>-0.05</sub>	0.80 <sup>+0.08</sup> / <sub>-0.05</sub>	0.80 <sup>+0.08</sup> / <sub>-0.05</sub>	0.80 <sup>+0.08</sup> / <sub>-0.05</sub>	0.80 <sup>+0.08</sup> / <sub>-0.05</sub>		
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	7.5±0.5	7.5±0.5	7.5±0.5	7.5±0.5	7.5±0.5	7.5±0.5		
Δh	0±2	0±2	0±2	0±2	0±2	0±2	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 <sup>+1.0</sup> / <sub>-0.5</sub>	18.0 <sup>+1.0</sup> / <sub>-0.5</sub>	18.0 <sup>+1.0</sup> / <sub>-0.5</sub>	18.0 <sup>+1.0</sup> / <sub>-0.5</sub>	18.0 <sup>+1.0</sup> / <sub>-0.5</sub>	18.0 <sup>+1.0</sup> / <sub>-0.5</sub>	18.0 <sup>+1.0</sup> / <sub>-0.5</sub>	18.0 <sup>+1.0</sup> / <sub>-0.5</sub>	18.0 <sup>+1.0</sup> / <sub>-0.5</sub>	18.0 <sup>+1.0</sup> / <sub>-0.5</sub>	18.0 <sup>+1.0</sup> / <sub>-0.5</sub>	18.0 <sup>+1.0</sup> / <sub>-0.5</sub>	18.0 <sup>+1.0</sup> / <sub>-0.5</sub>	18.0 <sup>+1.0</sup> / <sub>-0.5</sub>	18.0 <sup>+1.0</sup> / <sub>-0.5</sub>	18.0 <sup>+1.0</sup> / <sub>-0.5</sub>	18.0 <sup>+1.0</sup> / <sub>-0.5</sub>		
W <sub>0</sub>	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.	5.0 min.	5.0 min.	5.0 min.	5.0 min.	5.0 min.	5.0 min.		
W <sub>1</sub>	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	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 <sub>2</sub>	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.	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	Approx. 22	Approx. 22	Approx. 22	Approx. 22	Approx. 22	Approx. 22		
H <sub>0</sub>	17.0±0.5	18.0 <sup>+2.0</sup> / <sub>0</sub>	---	---	---	18.0 <sup>+2.0</sup> / <sub>0</sub>	---	---	18.0 <sup>+2.0</sup> / <sub>0</sub>	---	---	18.0 <sup>+2.0</sup> / <sub>0</sub>	---	---	18.0 <sup>+2.0</sup> / <sub>0</sub>	---	---		
F <sub>1</sub>	---	---	16.0 <sup>+0.75</sup> / <sub>-0.50</sub>	16.0 <sup>+0.75</sup> / <sub>-0.50</sub>	16.0 <sup>+0.75</sup> / <sub>-0.50</sub>	---	16.0 <sup>+0.75</sup> / <sub>-0.50</sub>	16.0 <sup>+0.75</sup> / <sub>-0.50</sub>	---	16.0 <sup>+0.75</sup> / <sub>-0.50</sub>	16.0 <sup>+0.75</sup> / <sub>-0.50</sub>	---	16.0 <sup>+0.75</sup> / <sub>-0.50</sub>	16.0 <sup>+0.75</sup> / <sub>-0.50</sub>	---	16.0 <sup>+0.75</sup> / <sub>-0.50</sub>	16.0 <sup>+0.75</sup> / <sub>-0.50</sub>		
øD <sub>0</sub>	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±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	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.	11.0 max.	11.0 max.	11.0 max.	11.0 max.	11.0 max.	11.0 max.		
øD	7.0 max.	9.0 max.	9.0 max.	9.0 max.	10.0 max.	10.5 max.	10.5 max.	11.5 max.	11.5 max.	11.5 max.	12.5 max.	13.0 max.	13.0 max.	14.0 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.	15.0 max.	15.0 max.	16.0 max.	17.0 max.	17.0 max.	18.0 max.	17.0 max.	17.0 max.	18.0 max.		
Standard products part	ERZE05E □□	ERZE07E □□□□					ERZE08E □□□□			ERZE10E □□□□			ERZE11E □□□□						

## D type / E series (Taping specifications)

### Taping specifications for automated assembly (Crimped leads and taping)

※ Ratings and characteristics is refer to bulk standard type.

### Dimensions in mm (not to scale)



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

Unit : mm

Series Symbol	E5		E7				E8			E10			E11								
	201 to 471		201 to 551		561	621	201 to 221		241 to 561	621 to 751		201 to 561		621 to 681	751 to 112		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	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 <sub>0</sub>	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	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 <sub>1</sub>	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	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 <sub>2</sub>	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	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
ø d	0.60 <sup>+0.06</sup> <sub>-0.05</sub>	0.80 <sup>+0.08</sup> <sub>-0.05</sub>	0.80 <sup>+0.08</sup> <sub>-0.05</sub>	0.80 <sup>+0.08</sup> <sub>-0.05</sub>	0.80 <sup>+0.08</sup> <sub>-0.05</sub>	0.80 <sup>+0.08</sup> <sub>-0.05</sub>	0.80 <sup>+0.08</sup> <sub>-0.05</sub>	0.80 <sup>+0.08</sup> <sub>-0.05</sub>	0.80 <sup>+0.08</sup> <sub>-0.05</sub>	0.80 <sup>+0.08</sup> <sub>-0.05</sub>	0.80 <sup>+0.08</sup> <sub>-0.05</sub>	0.80 <sup>+0.08</sup> <sub>-0.05</sub>	0.80 <sup>+0.08</sup> <sub>-0.05</sub>	0.80 <sup>+0.08</sup> <sub>-0.05</sub>	0.80 <sup>+0.08</sup> <sub>-0.05</sub>	0.80 <sup>+0.08</sup> <sub>-0.05</sub>	0.80 <sup>+0.08</sup> <sub>-0.05</sub>	0.80 <sup>+0.08</sup> <sub>-0.05</sub>	0.80 <sup>+0.08</sup> <sub>-0.05</sub>	0.80 <sup>+0.08</sup> <sub>-0.05</sub>	0.80 <sup>+0.08</sup> <sub>-0.05</sub>
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	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	0±2	0±2	0±2	0±2	0±2	0±2	0±2	0±2	0±2	0±2
W	18.0 <sup>+1.0</sup> <sub>-0.5</sub>	18.0 <sup>+1.0</sup> <sub>-0.5</sub>	18.0 <sup>+1.0</sup> <sub>-0.5</sub>	18.0 <sup>+1.0</sup> <sub>-0.5</sub>	18.0 <sup>+1.0</sup> <sub>-0.5</sub>	18.0 <sup>+1.0</sup> <sub>-0.5</sub>	18.0 <sup>+1.0</sup> <sub>-0.5</sub>	18.0 <sup>+1.0</sup> <sub>-0.5</sub>	18.0 <sup>+1.0</sup> <sub>-0.5</sub>	18.0 <sup>+1.0</sup> <sub>-0.5</sub>	18.0 <sup>+1.0</sup> <sub>-0.5</sub>	18.0 <sup>+1.0</sup> <sub>-0.5</sub>	18.0 <sup>+1.0</sup> <sub>-0.5</sub>	18.0 <sup>+1.0</sup> <sub>-0.5</sub>	18.0 <sup>+1.0</sup> <sub>-0.5</sub>	18.0 <sup>+1.0</sup> <sub>-0.5</sub>	18.0 <sup>+1.0</sup> <sub>-0.5</sub>	18.0 <sup>+1.0</sup> <sub>-0.5</sub>	18.0 <sup>+1.0</sup> <sub>-0.5</sub>	18.0 <sup>+1.0</sup> <sub>-0.5</sub>	18.0 <sup>+1.0</sup> <sub>-0.5</sub>
W <sub>0</sub>	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.	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 <sub>1</sub>	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	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 <sub>2</sub>	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.	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	Approx. 22	Approx. 22	Approx. 22	Approx. 22	Approx. 22	Approx. 22	Approx. 22	Approx. 22	Approx. 22	Approx. 22
H <sub>0</sub>	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	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	16.0±0.5	16.0±0.5
ø D <sub>0</sub>	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±0.2	ø4.0±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	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.	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.
ø D	7.0 max.	9.0 max.	9.0 max.	10.0 max.	10.5 max.	10.5 max.	11.5 max.	11.5 max.	12.5 max.	12.5 max.	13.0 max.	13.0 max.	14.0 max.								
A	13.0 max.	15.5 max.	16.5 max.	16.5 max.	17.0 max.	17.0 max.	18.0 max.	18.0 max.	19.5 max.	20.5 max.	20.5 max.	21.5 max.									
Standard products part	ERZE05F□□□		ERZE07F□□□				ERZE08F□□□			ERZE10F□□□			ERZE11F□□□								

## Application note for safety standards

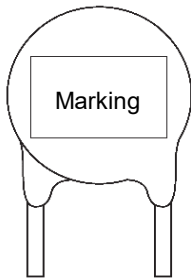
- Approvals products lists in "Reference Guide to Standard Products."
- UL and VDE : Registered in "Type name", it isn't registered in "Panasonic Part No."
- CQC : Registered in "Panasonic Part No."
- "Rated Voltages" are specified for UL recognized components in list shown below.

## The AC rated voltage and maximum allowable voltage

Type name	Maximum allowable voltage		Rated voltage (Vrms)
	ACrms (V)	DC (V)	UL1449
E*201	130	170	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

\* : 5 Series is blank, 7 series is 7, 8 series is 8, 10 series is 10, 11 series is 11, 14 series is 14

**Explanation of the contents**



Mark	Explanation of the content	
E*□□□	Abbreviation of part No. (Type Name)	[ □□□ Nominal varistor volage ]
○	Factory identification mark	None : Japan Q : Indonesia
◆ <sup>*1</sup>	Year code	2019 : 9, 2020 : K, 2021 : A 2022 : B, 2023 : C, 2024 : D
◇	Monthly code	Jan : 1 to Sep : 9, Oct. : 0, Nov. : N, Dec. : D
UL	UL Recognized components mark	

\* : 5 series is blank, 7 series is 7, 8 series is 8, 10 series is 10, 11 series is 11, 14 series is 14

\*1: If the 10's digit of a Christian year is an even year, as an end abbreviation, an alphabetic character is used.

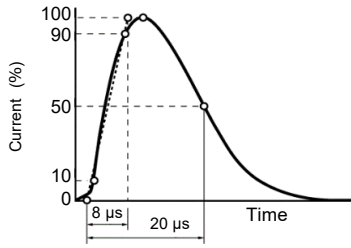
1 : A, 2 : B, 3 : C, 4 : D, 5 : E, 6 : F, 7 : G, 8 : H, 9 : J, 0 : K

If the 10's digit of a Christian year is an odd year, as an end abbreviation, a number is used.

**Marking contents**

Series (Example) Varistor voltage	5 (ERZE05A□□□)	7 (ERZE07A□□□)	8 (ERZE08A□□□)	10 (ERZE10A□□□)	11 (ERZE11A□□□)	14 (ERZE14A□□□)
201 or more	ZNR E□□□ UL ○ ◆ ◆	ZNR E7□□□ UL ○ ◆ ◆	ZNR E8□□□ UL ○ ◆ ◆	ZNR E10□□□ UL ○ ◆ ◆	ZNR E11□□□ UL ○ ◆ ◆	ZNR E14□□□ UL ○ ◆ ◆

**Performance characteristics**

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 1mA DC applied is called $V_1$ or $V_{1mA}$ . 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 $\mu$ 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 $\pm 10$ % when a single impulse current of 2 ms or 10/1000 $\mu$ s is applied.																											
	Maximum peak current (Withstanding surge current)	2 times		The maximum current within the varistor voltage change of $\pm 10$ % when a standard impulse current of 8/20 $\mu$ s is applied two times with an interval of 5 minutes.																									
		1 time		The maximum current within the varistor voltage change of $\pm 10$ % with a single standard impulse current of 8/20 $\mu$ s is applied.																									
	Temperature coefficient of varistor voltage	$\frac{V_{1mA} \text{ at } 85^\circ\text{C} - V_{1mA} \text{ at } 25^\circ\text{C}}{V_{1mA} \text{ at } 25^\circ\text{C}} \times \frac{1}{60} 100(\%/^\circ\text{C})$		0 to -0.05 %/ °C max.																									
	Capacitance	Capacitance shall be measured at 1 kHz $\pm 10$ %, 1 Vrms max. (1 MHz $\pm 10$ % 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="411 1662 1197 2060"> <thead> <tr> <th>Item</th> <th>Impulse Life( I )</th> <th>Impulse Life( II )</th> </tr> <tr> <th>Times</th> <td><math>\times 10^4</math> Times</td> <td><math>\times 10^5</math> Times</td> </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 <math>\mu</math>s)</td> <td>35 A (8/20 <math>\mu</math>s)</td> </tr> <tr> <td>ERZE07A201 to ERZE07A471</td> <td>100 A (8/20 <math>\mu</math>s)</td> <td>70 A (8/20 <math>\mu</math>s)</td> </tr> <tr> <td>ERZE08A201 to ERZE08A751</td> <td>150 A (8/20 <math>\mu</math>s)</td> <td>85 A (8/20 <math>\mu</math>s)</td> </tr> <tr> <td>ERZE10A201 to ERZE10A112</td> <td>170 A (8/20 <math>\mu</math>s)</td> <td>90 A (8/20 <math>\mu</math>s)</td> </tr> <tr> <td>ERZE11A201 to ERZE11A112</td> <td>200 A (8/20 <math>\mu</math>s)</td> <td>110 A (8/20 <math>\mu</math>s)</td> </tr> <tr> <td>ERZE14A201 to ERZE14A112</td> <td>250 A (8/20 <math>\mu</math>s)</td> <td>120 A (8/20 <math>\mu</math>s)</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 $\mu$ s)	35 A (8/20 $\mu$ s)	ERZE07A201 to ERZE07A471	100 A (8/20 $\mu$ s)	70 A (8/20 $\mu$ s)	ERZE08A201 to ERZE08A751	150 A (8/20 $\mu$ s)	85 A (8/20 $\mu$ s)	ERZE10A201 to ERZE10A112	170 A (8/20 $\mu$ s)	90 A (8/20 $\mu$ s)	ERZE11A201 to ERZE11A112	200 A (8/20 $\mu$ s)	110 A (8/20 $\mu$ s)	ERZE14A201 to ERZE14A112	250 A (8/20 $\mu$ s)	120 A (8/20 $\mu$ s)	$\Delta V_{1mA}/V_{1mA} \leq 0$ to +20%
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## Performance characteristics

Characteristics		Test methods / description		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.		No remarkable mechanical damage													
		<u>Terminal diameter</u> ø0.6 mm, ø0.8 mm ø1.0 mm	<u>Force</u> 9.8 N 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.															
		<u>Terminal diameter</u> ø0.6 mm, ø0.8 mm ø1.0 mm	<u>Force</u> 4.9 N 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 3 mm 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 VCmA and mechanical damages shall be examined.		$\Delta V_{1mA}/V_{1mA} \leq \pm 5 \%$														
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 VCmA shall be measured.		$\Delta V_{1mA}/V_{1mA} \leq \pm 5 \%$													
	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 VCmA shall be measured.		$\Delta V_{1mA}/V_{1mA} \leq \pm 5 \%$													
	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 VCmA and mechanical damage shall be examined.		$\Delta V_{1mA}/V_{1mA} \leq \pm 5 \%$ No remarkable mechanical damage													
		<table border="1"> <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
	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 VCmA shall be measured.		$\Delta V_{1mA}/V_{1mA} \leq \pm 10 \%$														
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 VCmA 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 VCmA shall be measured.		$\Delta V_{1mA}/V_{1mA} \leq \pm 5 \%$														

## Minimum quantity / Packing unit

Product	Series / Type	Part number	Minimum quantity / Packing unit	Packing quantity in carton	Carton (about) L×W×H (mm)
Varistors (ZNR Surge Absorber)	D type E series	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
		ERZE10A201 to 241	50	3000	210×340×110
		ERZE10A271 to 431	50	3000	210×340×110
		ERZE10A471 to 112	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
		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
		ERZE10A(B)201CS to 241CS	100	4000	210×340×110
		ERZE10A(B)271CS to 431CS	50	4000	210×340×110
		ERZE10A(B)471CS to 112CS	50	3000	210×340×110
		ERZE11A(B)201CS to 361CS	50	3000	210×340×110
		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	2500	500	360×270×320
		ERZE10E201 to 241	1000	5000	360×310×320
		ERZE10E271 to 471	1000	5000	360×310×320
		ERZE10E511 to 561	1000	5000	360×310×320
		ERZE10E621 to 112	2500	500	360×270×320
		ERZE11E201 to 271	1000	5000	360×310×320
		ERZE11E331 to 511	1000	5000	360×310×320
		ERZE11E561 to 112	2500	500	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
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ERZE10F271 to 471	1000	5000	360×310×320		
ERZE10F511 to 561	1000	5000	360×310×320		
ERZE10F621 to 112	2500	500	360×270×320		
ERZE11F201 to 271	1000	5000	360×310×320		
ERZE11F331 to 511	1000	5000	360×310×320		
ERZE11F561 to 112	2500	500	360×270×320		

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

※Please contact local sales office about packing specifications.

## **Guidelines and precautions regarding the technical information and use of our products described in this online catalog.**

- If you want to use our products described in this online catalog for applications requiring special qualities or reliability, or for applications where the failure or malfunction of the products may directly jeopardize human life or potentially cause personal injury (e.g. aircraft and aerospace equipment, traffic and transportation equipment, combustion equipment, medical equipment, accident prevention, anti-crime equipment, and/or safety equipment), it is necessary to verify whether the specifications of our products fit to such applications. Please ensure that you will ask and check with our inquiry desk as to whether the specifications of our products fit to such applications use before you use our products.
- The quality and performance of our products as described in this online catalog only apply to our products when used in isolation. Therefore, please ensure you evaluate and verify our products under the specific circumstances in which our products are assembled in your own products and in which our products will actually be used.
- Please ensure the safety by means of protection circuit, redundant circuit etc. in your system design in order to prevent the occurrence of life crisis and other serious damages due to the failure of our products.
- The products and product specifications described in this online catalog are subject to change for improvement without prior notice. Therefore, please be sure to request and confirm the latest product specifications which explain the specifications of our products in detail, before you finalize the design of your applications, purchase, or use our products.
- The technical information in this online catalog provides examples of our products' typical operations and application circuits. We do not guarantee the non-infringement of third party's intellectual property rights and we do not grant any license, right, or interest in our intellectual property.
- If any of our products, product specifications and/or technical information in this catalog is to be exported, the laws and regulations of the exporting country, especially with regard to security and export control, shall be observed.

## **<Regarding the Certificate of Compliance with the EU RoHS Directive/REACH Regulations>**

- The switchover date for compliance with the RoHS Directive/REACH Regulations varies depending on the part number or series of our products.
- When you use the inventory of our products for which it is unclear whether those products are compliant with the RoHS Directive/REACH Regulation, please select "Sales Inquiry" in the website inquiry form and contact us.

**Please note that we do not owe any liability and responsibility if our products are used beyond the description of this catalog or without complying with precautions in this catalog.**





## Handling Precautions (D type / E, E-S1 series)

### 1. Safety precautions

In case that a Varistors (ZNR Surge Absorber) (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.

If there's any uncertainty/doubt/products safety items, please contact us. When a dogma shall be occurred about safety for this products, be sure to inform us rapidly, operate your technical examination.

### 2. Precautions to be strictly observed

#### 2.1 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 degrade and have element fracture, which may result in smoking and ignition.

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

- In the event of fracture of the ZNR, its pieces may scatter ; hence, put the case or cover of the set product in place.
- Do not install the ZNR near combustible substances(polyvinyl chloride wires, resin moldings, etc.). If it is difficult to do, install a nonflammable cover.
- Across-the-line use  
When the ZNR is used across a line, put a current fuse in series with the ZNR(Refer to Item 3.1-1). (4) .
- Use between line to ground
  - (1) If 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) If 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.

#### 2.3 If ZNR is shorted out and happen smoke or ignition, please cut provided current to ZNR immediately.

### 3. Application notes

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

##### 3.1-1 Circuit conditions

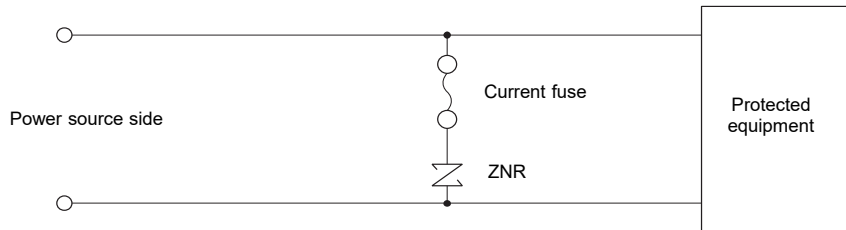
- (1) Select a ZNR of which the maximum voltage including fluctuations in source voltage allows for the maximum permissible circuit voltage. (Refer to Table 1.)
- (2) In cases that surges are intermittently applied at short intervals(for example, in case that the voltage of the noise simulator test is 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  
Use the part numbers marked with \* in Table 1 if the power supply voltage is expected to rise temporarily due to load unbalance in a single wiring load in the case of a single-phase three-wire, short-circuit accident between voltage line and neutral line, missing neutral line accident, or resonance at switch opening/closing in the case of capacitive load, etc.
  - 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).
- (4) Concerning current fuse
  - ① Select the rated current of the ZNR and current fuse as follows.  
Finally, please be sure that there is no danger if the ZNR mounted on the equipment breaks.  
The following fuse selection examples are for reference only and may vary depending on the operating circuit conditions. Therefore, use the fuses after confirming by testing, etc.

●D type / E, E-S1 series

Standard Part No.	ERZE05A□□□	ERZE07A□□□	ERZE08A□□□	ERZE10A□□□	ERZE11A□□□	ERZE14A□□□
Fuse rated current	5 A max.	7 A max.	7 A max.	10 A max.	10 A max.	10 A max.

◆ Fuses shall use rated voltages appropriate for circuits.

② The recommended fuse insertion point is shown in Table 1. However, if the load current of the equipment to be protected is large and exceeds the rated current of the fuse shown above, insert the current fuse as shown below.



(5) Concerning thermal fuse

① When connecting a thermal fuse to the ZNR, select a connection and fuse that provide good thermal coupling.

Table 1 Example of ZNR application

	Across-the-Line use	Use between Line to ground																																											
Connections example	<p>DC/AC Single-phase</p>	<p>DC/AC Single-phase</p>																																											
	<p>AC 3-phase</p>	<p>AC 3-phase</p>																																											
Example of varistor voltage	<table border="1"> <thead> <tr> <th>ZNR</th> <th>Source voltage [AC]</th> <th>Nominal varistor voltage</th> </tr> </thead> <tbody> <tr> <td rowspan="2">ZNR 1</td> <td>100 V</td> <td>201 to 361*</td> </tr> <tr> <td>120 V</td> <td>241 to 431*</td> </tr> <tr> <td rowspan="4">ZNR 3</td> <td>200 V</td> <td>471 to 621*</td> </tr> <tr> <td>220 V</td> <td>471 to 621*</td> </tr> <tr> <td>240 V</td> <td>511, 621*</td> </tr> <tr> <td>380 V</td> <td>751, 821*</td> </tr> </tbody> </table>	ZNR	Source voltage [AC]	Nominal varistor voltage	ZNR 1	100 V	201 to 361*	120 V	241 to 431*	ZNR 3	200 V	471 to 621*	220 V	471 to 621*	240 V	511, 621*	380 V	751, 821*	<table border="1"> <thead> <tr> <th>ZNR</th> <th>Source voltage [AC]</th> <th colspan="2">Nominal varistor voltage</th> </tr> </thead> <tbody> <tr> <td rowspan="3">ZNR 2</td> <td rowspan="3">100 V 220 V</td> <td>471</td> <td>471</td> </tr> <tr> <td>511</td> <td>-</td> </tr> <tr> <td>621*</td> <td>-</td> </tr> <tr> <td rowspan="4">ZNR 4</td> <td rowspan="4">230 V 240 V 380 V</td> <td>821 and more**</td> <td>-</td> </tr> <tr> <td>511</td> <td>-</td> </tr> <tr> <td>621*</td> <td>-</td> </tr> <tr> <td>821 and more**</td> <td>-</td> </tr> <tr> <td></td> <td></td> <td>112**</td> <td>-</td> </tr> </tbody> </table> <p>Note : Element size is selected by impulse condition.</p>	ZNR	Source voltage [AC]	Nominal varistor voltage		ZNR 2	100 V 220 V	471	471	511	-	621*	-	ZNR 4	230 V 240 V 380 V	821 and more**	-	511	-	621*	-	821 and more**	-			112**	-
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		112**	-																																										

(6) On use for equipment

The catalog guarantees the quality as individual component.

Before you use the products, please make sure to check and evaluate the products in the circumstance where they are installed in your product.

**3.1-2 Operating environments**

(1) The ZNR is designed and manufactured for application in general purpose electronic devices.

The ZNR shall not be exposed to the weather, except for usage inside unit.

(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 salinity environment and atmospheres polluted by corrosive gases, in liquids such as water, oil, chemical, organic solvent.

**3.1-3 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.

(6) When designing the hole on the board for mounting, refer to the center value of the lead wire interval and check it with an actual machine.

Note that dimensional tolerances are large, so use caution when accuracy is required.

	Soldering method	Recommended condition	Attention item
D type	Flow soldering	260 °C, within 10 seconds.	D type is not reflow soldering object part.

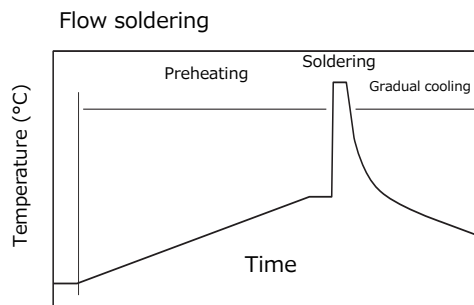
\*1: Soldering iron temperature should not exceed 400 °C and should not be applied for mor than 5 seconds.

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

\*3: The temperature varies depending on the board size and mounting density.

Check the temperature for each board type.

●Soldering temperature-time profile to recommend



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

**3.1-4 Long-term storage**

(1) Do not store the ZNR under high temperature and high humidity. Store it indoor environment 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.

**3.1-5 Rated Voltage for UL or other safety certifications**

Our ZNR define “ Max. Allowable Voltage ” and “Rated Voltage “ to keep leakage current specification and others.

When applying for certification of equipment with ZNR installed, the working voltage of the equipment should not exceed the rated voltage of UL, etc. for ZNR.

**3.1-6 Dropped product**

Do not drop this product on the floor. If this product is dropped, it can be damaged mechanically or electrically.

#### 4. Notices

- Our ZNR was designed and manufactured for standard applications such as general electronics devices, office equipment, information and communications equipment, measuring instruments, household appliances and audio-video equipment.
- For applications in which special quality and reliability are required, or if the failure or malfunction of the products may directly jeopardize life or cause threat of personal injury (such as for aircraft and aerospace equipment, traffic and transport equipment, combustion equipment, medical equipment, accident prevention and anti-theft devices, and safety equipment), please be sure to consult with our sales representative in advance and to exchange product specifications which conform to such applications.
- Applications in which special quality and reliability are required, or if the failure or malfunction of the products may.
- We shall not be responsible for any failure or abnormality caused by the use of this product that deviates from the contents of this catalog or does not comply with the precautions.
- 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 flame-retardant materials for housing parts and structural parts.

#### 5. Applicable laws and regulations , others

- This product not been manufactured with any ozone depleting chemical controlled under the Montreal Protocol.
- This product comply with RoHS (Restriction of the use of certain Hazardous Substance in electrical and electronic equipment) (DIRECTIVE 2011/65/EU and (EU)2015/863).
- All the materials used in this part are registered material under the Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substance.
- If you need the notice by letter of "A preliminary judgement on the Laws of Japan foreign exchange and Foreign Trade Control", be sure to let us know.
- These products are not dangerous goods on the transportation as identified by UN(United nations) numbers or UN classification.

#### 6. Others

- As to the disposal of ZNR, check the method of disposal in each country or origin where the ZNR are incorporated in your products to be used.
- The technical information in this specification provides example of our products' typical operations and application circuit. We do not guarantee the non-infringement of third party's intellectual property rights and we do not grant any license, right or interest in our intellectual property.