

## Varistors (ZNR Surge Absorber) SC type



Varistors (ZNR Surge Absorber) Type SC protects power supply facilities, communications equipment from steep lightning surges, and it is a suitable product to incorporate it in a surge protective device corresponding to the Japanese Industrial Standards (JIS C 5381-1).

### Features

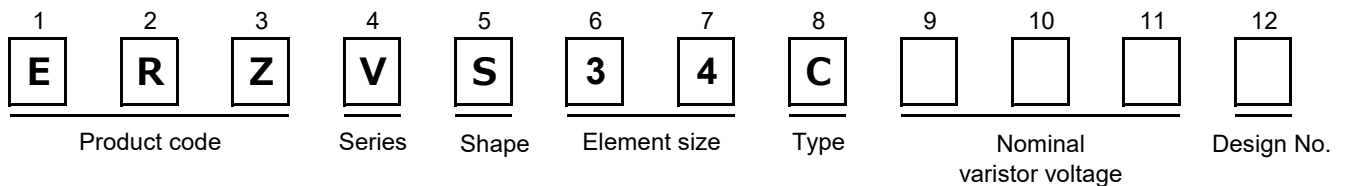
- Very large surge withstanding capability with a compact size
- Fast response to steep impulse voltage
- Low clamping voltage for better surge protection
- No follow-on current
- RoHS compliant

### Recommended applications

- Power suppliers for OA, FA, telecommunication or industrial equipment
- Traffic or railroad systems
- Surge protection of automatic control devices for power distribution line

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

### Explanation of part numbers



### Ratings and characteristics

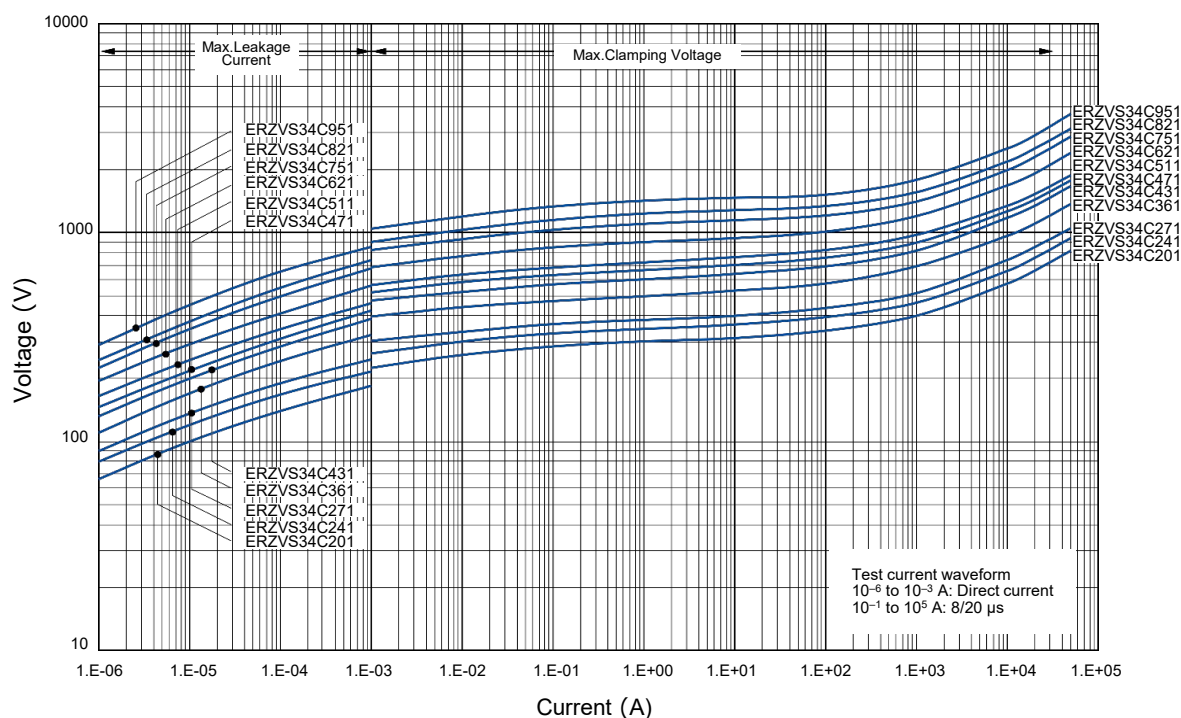
● Operating temperature range : -40 to 85 °C

● Storage temperature range : -40 to 125 °C

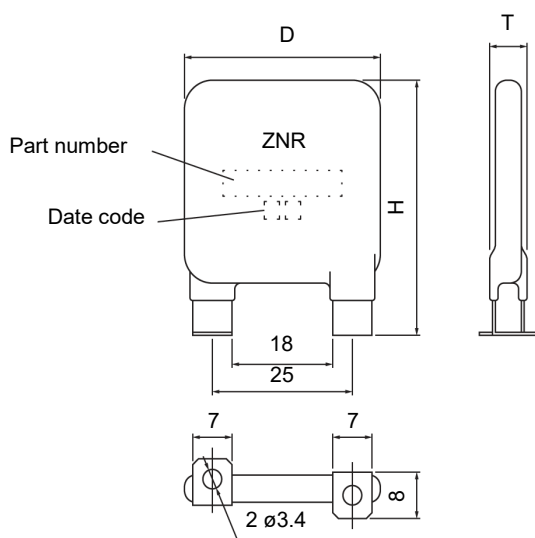
Part No.	Varistor voltage at 1 m A	Maximum allowable voltage		Maximum clamping voltage	Voltage protection level	Nominal discharge current	Maximum discharge current
	(V)	Acrms (V)	DC (V)	V250 A	UP(V) (at In)	In(8/20 μS)	I <sub>max</sub> (8/20 μS)
ERZVS34C201	200(185 to 225)	130	170	340	800	20kA	40kA
ERZVS34C241	240(216 to 264)	150	200	395	900		
ERZVS34C271	270(247 to 303)	175	225	455	1000		
ERZVS34C361	360(324 to 396)	230	300	595	1200		
ERZVS34C431	430(387 to 473)	275	350	710	1500		
ERZVS34C471	470(423 to 517)	300	385	775	1500		
ERZVS34C511	510(459 to 561)	320	415	845	1500		
ERZVS34C621	620(558 to 682)	385	505	1025	2000		
ERZVS34C751	750(675 to 825)	460	615	1240	2500		
ERZVS34C821	820(738 to 902)	510	670	1355	2500		
ERZVS34C951	950(855 to 1045)	575	765	1570	3000		

## Typical characteristics

### Voltage vs. Current (ERZVS34C201 to ERZVS34C951)



## Dimensions in mm (not to scale)



Unit : mm

Part No.	D max.	H max.	T max.
ERZVS34C201	36	47	9.0
ERZVS34C241			9.2
ERZVS34C271			9.5
ERZVS34C361			10.4
ERZVS34C431			11.1
ERZVS34C471			11.3
ERZVS34C511			9.7
ERZVS34C621			9.7
ERZVS34C751			10.5
ERZVS34C821			11.0
ERZVS34C951			11.5

## Minimum quantity / Packing unit

Product	Series / Type	Part number	Minimum quantity / Packing unit	Packing quantity in carton	Carton (about) L×W×H (mm)
"ZNR" Transient/surge absorbers	SC type	ERZVS34C□□□	10	200	320×430×65

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 (E, CK,SC type)

### 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

- Across-the-line use  
When the ZNR is used across a line, put a current fuse in series with the ZNR (Refer to Table 1).
- 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 short-circuit of the ZNR ; hence, ground the metal case to the ground or keep it from the human body.
- 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.

#### 2.3 The live part shall be equipped with a protective cover for preventing electric shock.

#### 2.4 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
- (2) In cases that surges are intermittently applied at short intervals (for example, in the case that the voltage of the noise simulator test is impressed), do not cause them to exceed the ZNR's rated pulse power.
- (3) Select a ZNR recommended in Table 1.

##### ① Across-the-Line Use

Use the part numbers marked with \* for A.C.100 and A.C.120 V 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 Line to ground Use

- When DC500V insulation resistance test of the circuits employing ZNR is conducted, the ZNR shall be removed after getting approval from the customer, or the ZNR \*\* with the Maximum Allowable voltage exceeding to the test voltage shall be applied.
- When AC1000V dielectric with standing test is conducted, ZNR shall be removed after getting approval from the customer according to the relevant regulations, or the ZNR \*\*\* with the Maximum Allowable voltage exceeding to the test voltage shall be applied.

##### ● Example of fuse selection

Series	ERZC20EK□□□(□)	ERZC32EK□□□(□)	ERZVS34C□□□	ERZC□□CK□□□W
Current fuse (Line - Line)	10 A max.	20 A max.	20 A max.	20 A max.
Thermal fuse (Line - Ground)	100 to 120 °C 5 A	100 to 120 °C 10 A	100 to 120 °C 10 A	100 to 120 °C 10 A

- ◆ Fuses shall use rated voltages appropriate for circuits.
- ◆ The examples of fuse selection shown above are only for reference and may vary depending on the operating circuit conditions. Therefore, confirm the fuse selection by testing, etc.
- ◆ Set a thermal fuse to get high thermal conductivity with ZNR.
- ◆ Finally, confirm that a secondary disaster will not occur if the ZNR breaks in the actual unit.

The recommended fuse insertion point is the application example shown in Table 1. However, insert a current fuse as shown in the figure below if the load current of the protected equipment is large and exceeds the rated current of the example of fuse selection shown on the previous page.

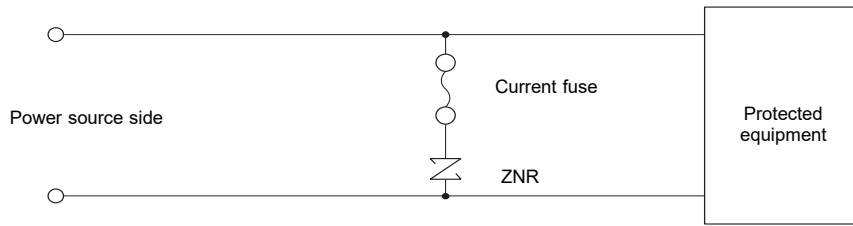


Table 1 Example of ZNR application

		Across-the-Line use		Use between Line to ground																										
Connections example	DC/AC Single-phase																													
	AC 3-phase																													
	Selection Examples		<table border="1"> <thead> <tr> <th>ZNR</th> <th>Nominal line voltage [AC]</th> <th colspan="2">Part Number of ZNR</th> </tr> <tr> <td></td> <td></td> <th colspan="2">E, CK, SC type</th> </tr> </thead> <tbody> <tr> <td rowspan="4">ZNR 1 ZNR 3</td> <td>100 V</td> <td rowspan="4">ERZC□□EK ERZC□□CK ERZVS34C</td> <td>201</td> <td rowspan="4">471 511 821 and more ** Regarding the part applying to AC withstanding voltage test, please ask us.</td> </tr> <tr> <td>120 V</td> <td>241</td> </tr> <tr> <td>200 V to 220 V</td> <td>271*</td> </tr> <tr> <td>240 V</td> <td>471</td> </tr> <tr> <td></td> <td></td> <td></td> <td>511</td> <td></td> </tr> </tbody> </table>	ZNR	Nominal line voltage [AC]	Part Number of ZNR				E, CK, SC type		ZNR 1 ZNR 3	100 V	ERZC□□EK ERZC□□CK ERZVS34C	201	471 511 821 and more ** Regarding the part applying to AC withstanding voltage test, please ask us.	120 V	241	200 V to 220 V	271*	240 V	471				511				
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### 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. and element may occur.
- (3) When coating the ZNR with resin(including molding), do not use such resin.
- (4) Do not bend the ZNR lead wires at the position close to its ZNR exterior resin, or apply external force to the position.
- (5) When soldering the ZNR lead wires, follow the recommended condition and do not melt the solder and insulating materials constituting the ZNR.
- (6) Keep the wiring of the ZNR as short and straight as possible.

### 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 About rated voltage for UL, etc.

In order to meet the leakage current regulation, the rated voltage is specified along with the maximum allowable circuit voltage. When applying for certification of the equipment with ZNR installed, the working voltage of the equipment should not exceed the rated voltage for UL, etc. of ZNR.

### 3.1-6 Fall

Do not drop the product on the floor or other surfaces. Do not use a ZNR that has been dropped as it may be mechanically or electrically damaged.

## 4. Notices

- In cases that the ZNR is used in equipment (aerospace equipment, medical equipment, etc.) requiring extremely high reliability, ask us for selection of part No., and protection coordination, etc. in advance.
- There is possibility that the ZNR will unexpectedly smoke or ignite because of 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.
- 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.
- Package marking includes the product number, quantity, and country of origin. As a rule, country of origin should be indicated in English.

## 5. Applicable laws and regulations , others

- This product not been manufactured with any ozone depleting chemical controlled under the Montreal Protocol.
- Specified brominated flame retardants (including PBB (polybromobiphenyl) and PBDE (polybromodiphenyl ether)) are not intentionally used in the components of this product.
- This product comply with RoHS(Restriction of the use of certain Hazardous Substance in electrical and electronic equipment) (DIRECTIVE 2011/65/EU and 2015/863/EU).
- 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.