

Metal Film Fusing Resistors

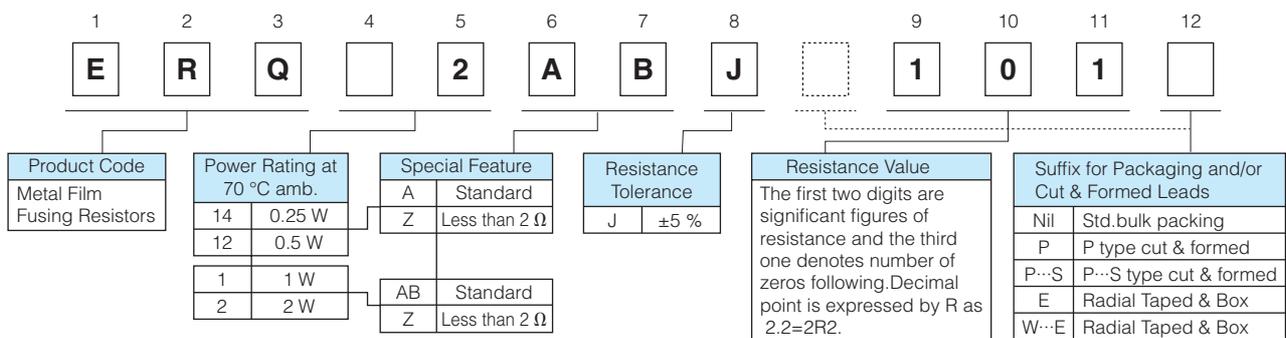
Type: **ERQA**
ERQZ
 (0.25 W, 0.5 W, 1 W, 2 W coating type)



Features

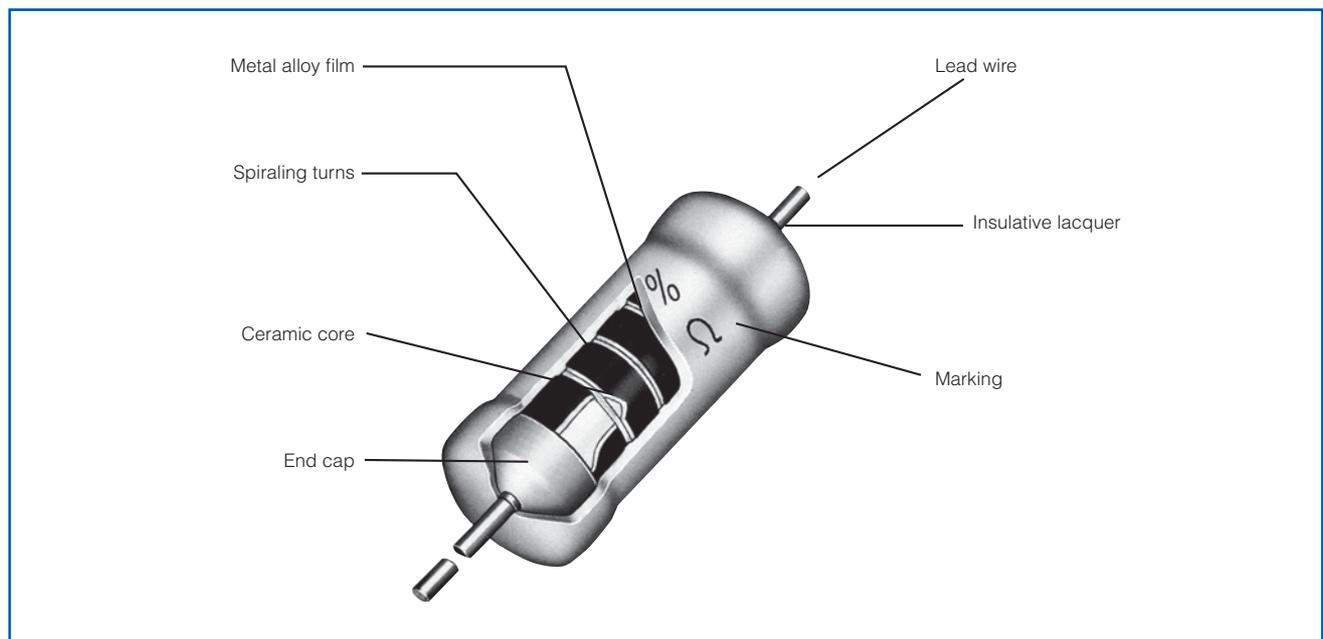
- Accurate fusing
- Small size and lightweight
- Uniform quality, consistent performance and reliability
- Flame retardant, utilizing exclusive silicon insulation material
- Reference Standard
EIAJ RC-2125
- RoHS compliant

Explanation of Part Numbers



The above example shows a standard Metal Film Fusing Resistors, 2 W power rating, resistance value of 100 Ω, tolerance of ±5 %, and package of standard bulk packing.

Construction



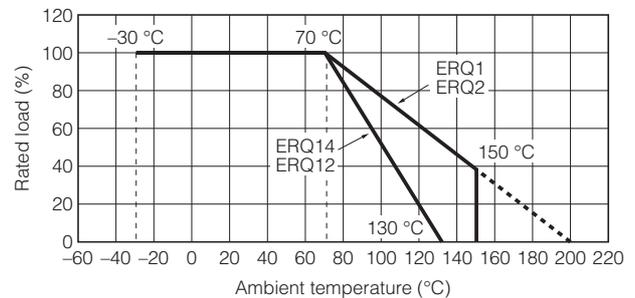
Ratings

Part No.	Power Rating at 70°C (W)	Maximum Open Circuit Voltage ⁽¹⁾ (V)	Maximum Overload Voltage	Dielectric With-standing Voltage (V)	Resistance Tolerance (%)	Resistance Range (Ω)		T.C.R. (× 10 ⁻⁶ /°C)	Standard Resistance Values	Marking Method on Body	Mass (Weight) [g/pc.]
						min.	max.				
ERQ14Z ERQ14A	0.25	200	3 times of rated voltage ⁽²⁾	AC 350	J (± 5)	1.0	1.8	±350	E24	Color code	0.24
2.0						470					
ERQ12Z ERQ12A	0.5	250		AC 350	J (± 5)	1.0	1.8	±350	E24	Stamp	0.32
2.0						560	Color code				
ERQ1Z ERQ1AB	1	250		AC 600	J (± 5)	1.0	1.8	±350	E24	Stamp	0.64
2.0						560					
ERQ2Z ERQ2AB	2	250	AC 1000	J (± 5)	1.0	1.8	±350	E24	Stamp	1.54	
2.0					560						

(1) Maximum Open Circuit Voltage: Referring to the maximum value of the voltage applied between terminals of the resistor when the resistor is opened in an electric circuit 1000 times power rating or voltage specified above whichever less is regarded as the maximum open circuit voltage.
 (2) Rated Continuous Working Voltage (RCWV) shall be determined from $RCWV = \sqrt{\text{Power Rating} \times \text{Resistance Value}}$

Power Derating Curve

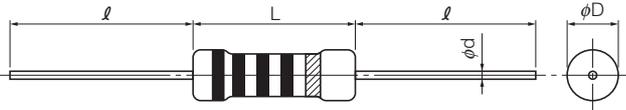
For resistors operated in ambient temperatures above 70 °C, power rating shall be derated in accordance with the figure on the right.



Performance Specifications

Characteristics	Specifications	Test Methods																
Fusing Characteristics	<table border="1"> <thead> <tr> <th>Rated Power</th> <th>Res. Value (Ω)</th> <th>Limit</th> </tr> </thead> <tbody> <tr> <td>0.25 W 0.5 W</td> <td rowspan="2">1 to 1.8</td> <td>Open within 30 seconds at 30 times the rated power</td> </tr> <tr> <td>1 W 2 W</td> <td>Open within 30 seconds at 25 times the rated power</td> </tr> <tr> <td>0.25 W 0.5 W 1 W 2 W</td> <td>2 to 9.1</td> <td>Open within 30 seconds at 16 times the rated power</td> </tr> <tr> <td>0.25 W</td> <td>10 to 470</td> <td rowspan="2">Open within 30 seconds at 12 times the rated power</td> </tr> <tr> <td>0.5 W 1 W 2 W</td> <td>10 to 560</td> </tr> </tbody> </table>	Rated Power	Res. Value (Ω)	Limit	0.25 W 0.5 W	1 to 1.8	Open within 30 seconds at 30 times the rated power	1 W 2 W	Open within 30 seconds at 25 times the rated power	0.25 W 0.5 W 1 W 2 W	2 to 9.1	Open within 30 seconds at 16 times the rated power	0.25 W	10 to 470	Open within 30 seconds at 12 times the rated power	0.5 W 1 W 2 W	10 to 560	<p>The test potential shall be preadjusted using a dummy resistor and then be subjected to the test specimens. The potential shall be readjusted within two seconds to reach the exact value of specified current. This test shall be made under the conditions at 20 °C and 65 % RH (or at a temperature of 5 °C to 35 °C and 45 to 85 % RH, only when any doubt may not be caused), and the use of stabilized power source is suggested. Fusing time shall be measured as the duration until the circuit current is decreased to a 1/50 the initial test current or less.</p>
	Rated Power	Res. Value (Ω)	Limit															
	0.25 W 0.5 W	1 to 1.8	Open within 30 seconds at 30 times the rated power															
	1 W 2 W		Open within 30 seconds at 25 times the rated power															
	0.25 W 0.5 W 1 W 2 W	2 to 9.1	Open within 30 seconds at 16 times the rated power															
0.25 W	10 to 470	Open within 30 seconds at 12 times the rated power																
0.5 W 1 W 2 W	10 to 560																	

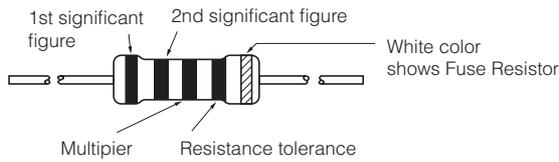
Dimensions in mm (not to scale)



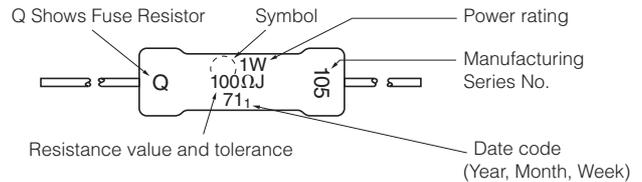
Part No.	Dimensions (mm)			
	L	φD	l	φd
ERQ14	6.3 ^{+1.5} _{-1.0}	2.3 ^{±0.5}	30.0 ^{±3.0}	0.65 ^{±0.05}
ERQ12	9.0 ^{+1.5} _{-1.0}	2.8 ^{±0.5}	30.0 ^{±3.0}	0.65 ^{±0.05}
ERQ1	12.0 ^{+1.5} _{-1.0}	4.0 ^{±1.0}	30.0 ^{±3.0}	0.80 ^{±0.05}
ERQ2	15.0 ^{±1.5}	5.5 ^{±1.0}	38.0 ^{±3.0}	0.80 ^{±0.05}

Explanation of Marking

Type ERQ14, ERQ12 (0.25 W, 0.5 W)

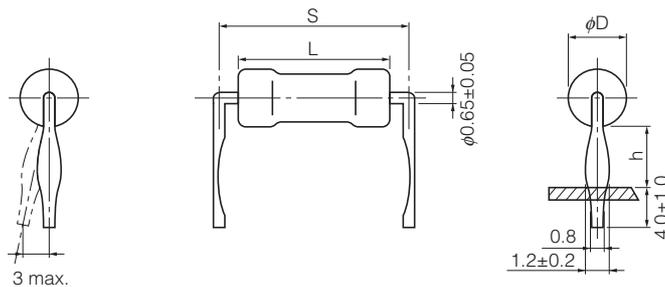


Type ERQ1, ERQ2 (1W, 2W)



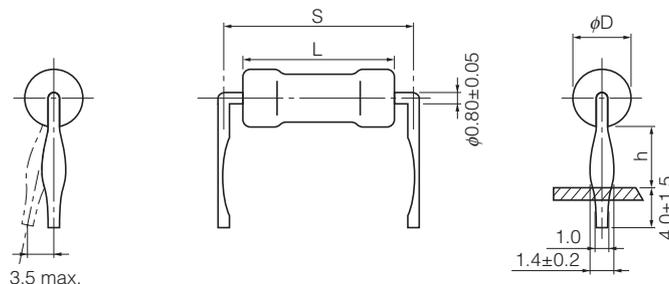
Cut & Formed Type

ERQ□□AJ□□□□P
ERQ□□ZJ□□□□P



Part No.	Power Rating at 70 °C (W)	Standard Q'ty/Packing (pcs.)	Dimensions (mm)			
			L	φD	S	h
ERQ14□J□□□□P	0.25	2,000	6.3 ^{+1.5} _{-1.0}	2.3 ^{±0.5}	10.0 ^{±1.5}	4.0 ^{±1.5}
ERQ12□J□□□□P	0.5	2,000	9.0 ^{+1.5} _{-1.0}	2.8 ^{±0.5}	12.5 ^{±1.5}	4.0 ^{±1.5}

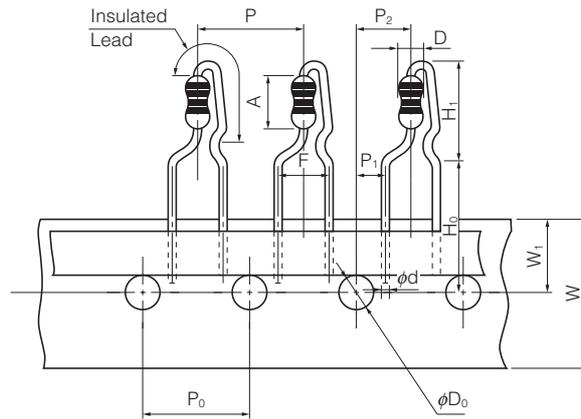
ERQ□□ABJP□□□□S
ERQ□□ZJP□□□□S



Part No.	Power Rating at 70 °C (W)	Standard Q'ty/Packing (pcs.)	Dimensions (mm)			
			L	φD	S	h
ERQ1□□JP□□□□S	1	1,000	12.0 ^{+1.5} _{-1.0}	4.0 ^{±1.0}	15.0 ^{±1.5}	6.0 ^{±1.5}
ERQ2□□JP□□□□S	2	1,000	15.0 ^{±1.5}	5.5 ^{±1.0}	20.0 ^{±2.0}	6.5 ^{±1.5}

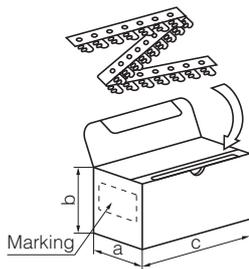
For Panasert Automatic Insertion Machine Radial Taped & Box

ERQ□□AJ□□□□E
ERQ□□ZJ□□□□E
(14A/14Z, 12A/12Z, 1AB/1Z)



Dimensions (mm)		Dimensions (mm)		Dimensions (mm)		Dimensions (mm)		Dimensions (mm)				
P	12.7±1.0	W	18.0±0.5	H ₁	14A/14Z	12 max.	A	14A/14Z	6.35 ^{+0.65} _{-0.35}	D	14A/14Z	2.3±0.5
P ₀	12.7±0.3	W ₁	9.0±0.5		12A/12Z	15.5 max.		12A/12Z	9.0 ^{+1.5} _{-1.0}		12A/12Z	2.8±0.5
P ₁	3.85±0.70				1AB/1Z	19 max.		1AB/1Z	12.0 ^{+1.5} _{-1.0}		1AB/1Z	4.0±1.0
P ₂	6.35±1.00			H ₀	16.0±0.5		phi d	0.65±0.05				
F	5.0±0.8			phi D ₀	4.0±0.2							

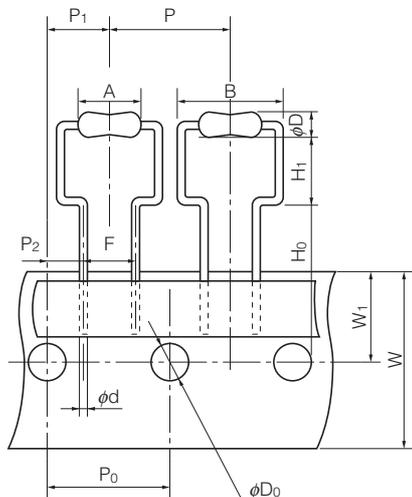
● Radial Tape Packaging Methods



Part Number	Dimensions (mm)			Standard Quantity (pcs./box)
	a	b	c	
ERQ14AJ□□□□E ERQ14ZJ□□□□E	46	130	335	2,000 pcs./box
ERQ12AJ□□□□E ERQ12ZJ□□□□E	46	130	335	2,000 pcs./box
ERQ1ABJ□□□□E ERQ1ZJ□□□□E	49	100	335	1,000 pcs./box

For Panasert Automatic Insertion Machine Radial Taped & Box

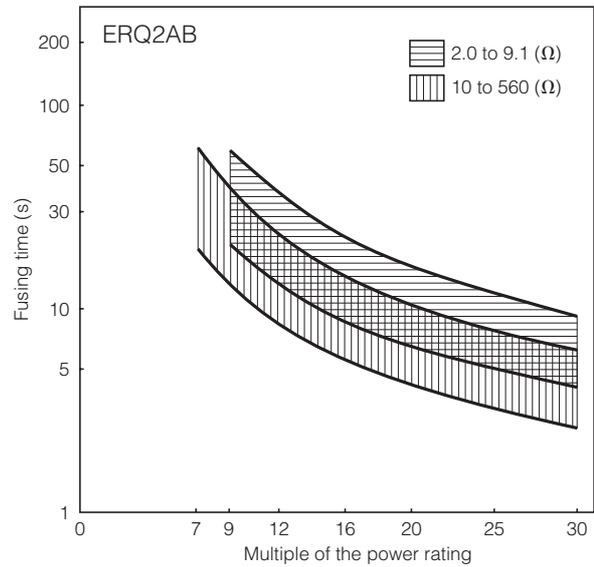
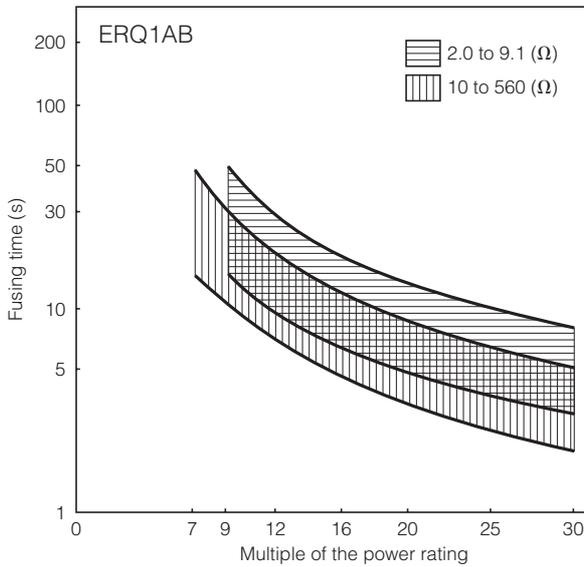
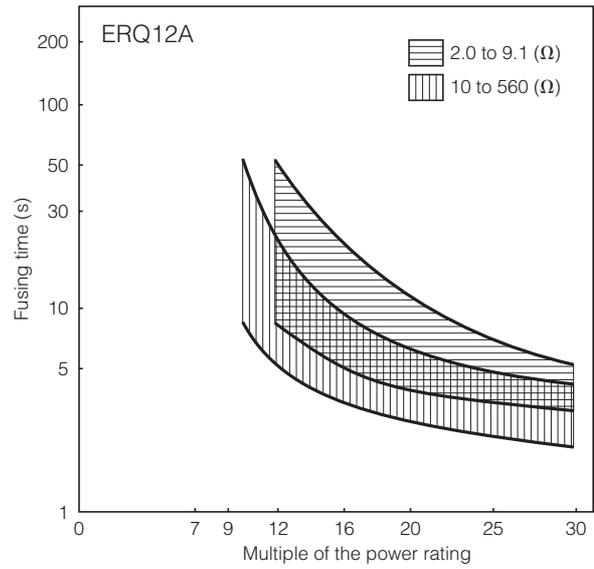
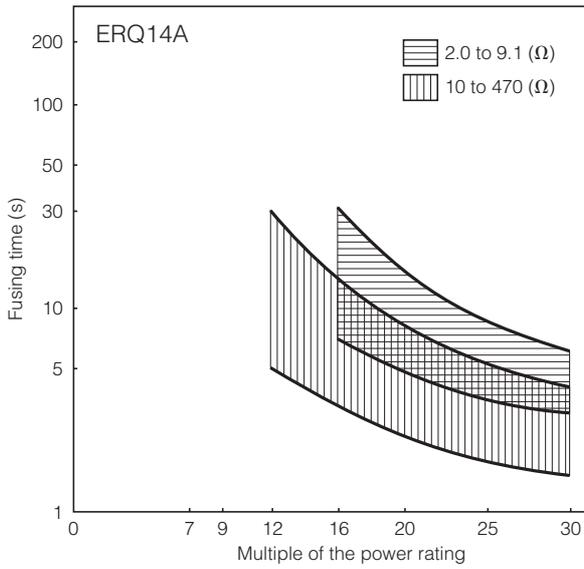
ERQ□□A/ZJW□□□□E (14A/14Z, 12A/12Z, 1AB/1Z)



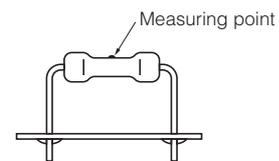
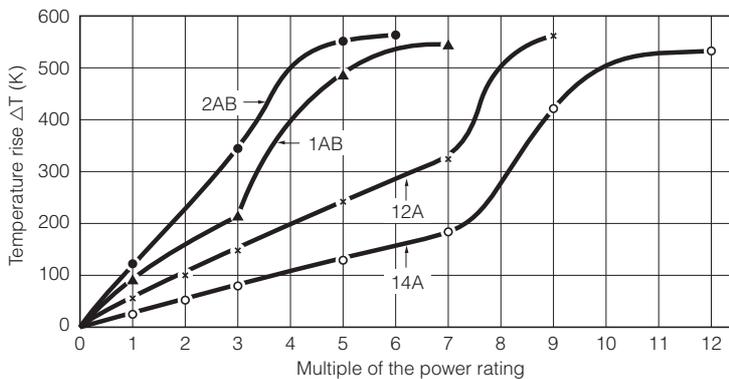
Dimensions (mm)			Dimensions (mm)		
P	14A/14Z	12.7±1.0	H ₁	14A/14Z	6.5 ^{+0.6} _{-0.6}
	12A/12Z, 1AB/1Z	30.0±1.0		12A/12Z	6.5 ^{+1.0} _{-1.0}
P ₀	14A/14Z	12.7±0.3		1AB/1Z	6.5 ^{+1.0} _{-1.0}
	12A/12Z, 1AB/1Z	15.0±0.3	phi D ₀	4.0±0.2	
P ₁	14A/14Z	6.35±1.00	A	14A/14Z	6.35 ^{+0.65} _{-0.35}
	12A/12Z, 1AB/1Z	7.5±1.0		12A/12Z	9.0 ^{+1.5} _{-1.0}
P ₂	14A/14Z	3.85±0.70		1AB/1Z	12.0 ^{+1.5} _{-1.0}
	12A/12Z, 1AB/1Z	3.75±0.50	B	14A/14Z	11.2 max.
F	14A/14Z	5.0 ^{+0.6} _{-0.2}		12A/12Z	14 max.
	12A/12Z, 1AB/1Z	7.5 ^{+0.6} _{-0.2}		1AB/1Z	17 max.
W	18.0±0.5		phi D	14A/14Z	2.3 ^{+0.5} _{-0.3}
W ₁	9.0±0.5			12A/12Z	2.8±0.5
H ₀	14A/14Z	16.0±0.5		1AB/1Z	4.0±1.0
	12A/12Z	18.0±1.0	phi d	14A/14Z	0.65±0.05
	1AB/1Z	18.0±1.0		12A/12Z, 1AB/1Z	0.80±0.05

Fusing Characteristics (Constant Voltage Circuit)

This data is for reference only, specifications should be verified in written form with the engineering division.



Hot Spot Temperature (for reference)



⚠ Safety Precautions

The following are precautions for individual products. Please also refer to the common precautions for Fixed Resistors in this catalog.

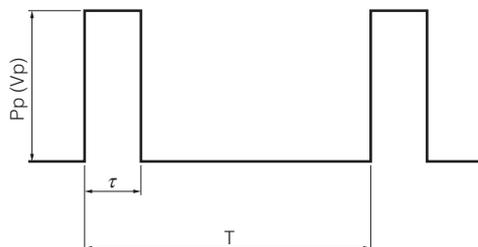
1. Checking the fusing conditions
 - 1) Fusing characteristics differ depending on the type, shape, and resistance. Check the fusing conditions before selecting the type of Metal Film Fusing Resistors (hereafter called the fusing resistor) to be used.
 - 2) Use the fusing resistors under the maximum open circuit voltage. Otherwise, arcing may occur when a voltage much higher than the rated one is applied in the event of an abnormality in the circuit, or when a high voltage is applied after fusing.
 - 3) Under abnormal conditions of a constant voltage circuit, a current of about 2 or 3 times the initial abnormal current passes through, accelerating the speed at which the fusing resistors blows. When using a constant current circuit, carefully check the conditions because the fusing resistors may not blow in a constant current circuit.
2. Checking for pulse voltage, impact voltage, and transient voltage

Make sure to evaluate and check the fusing resistors mounted on your product if they are to be mounted on a circuit that generates an impact voltage, or if there is a possibility that the transient phenomenon (significantly high voltage applied in a short time) may occur or that a pulse voltage with a high peak voltage may be applied. Make sure to consult our sales staff before using the fusing resistors under special conditions.
3. Conditions of use in a steady state

Make sure that the load conditions have a sufficient allowance for the power derating curve. The characteristics of the fusing resistors are set by using a constant voltage circuit.
4. The solvent resistance of the fusing resistors is not assured. If you use a solvent for cleaning after soldering or other processes, make sure to consult our sales staff before use and perform a prior test and evaluation to ensure that the solvent will not affect the reliability of the fusing resistors.

(Data for Reference)

Pulse Characteristics (Usual)



- P_P : Pulse limit power (W)
- V_P : Pulse limit voltage (V)
- τ : Pulse continuous time (s)
- T : Period (s)
- V_R : Rated voltage (V)
- P : Rated power (W)
- R : Resistance value (Ω)
- $V_{pmax.}$: Max. pulse limit voltage (V)

Withstand pulse limit power is calculated by the next method.

$$P_P = K \cdot P \cdot T / \tau$$

$$V_P = \sqrt{K \cdot P \cdot R \cdot T / \tau}$$

Reference to the right about a fixed number of $V_{pmax.}$

Part No.	K	$V_{pmax.}$ (V)
ERQ14A	0.6	200
ERQ12A	0.6	250
ERQ1AB	0.6	250
ERQ2AB	0.4	250

- $T > 1(s) \rightarrow T = 1(s)$
- $T / \tau > 100 \rightarrow T / \tau = 100$
- $P_P < P \rightarrow P$ stands for P_P
($V_P < V_R \rightarrow V_R$ stands for V_P)
- Added voltage $\leq V_{pmax.}$
- P_P or V_P is reference value
Conditions : Pulse added time=1000 h, Resistance change= $\pm 5\%$
Room temperature