

Anti-Surge Thick Film Chip Resistors

Type: **ERJ PA2, P03, PA3, P06, P08, P14**



Features

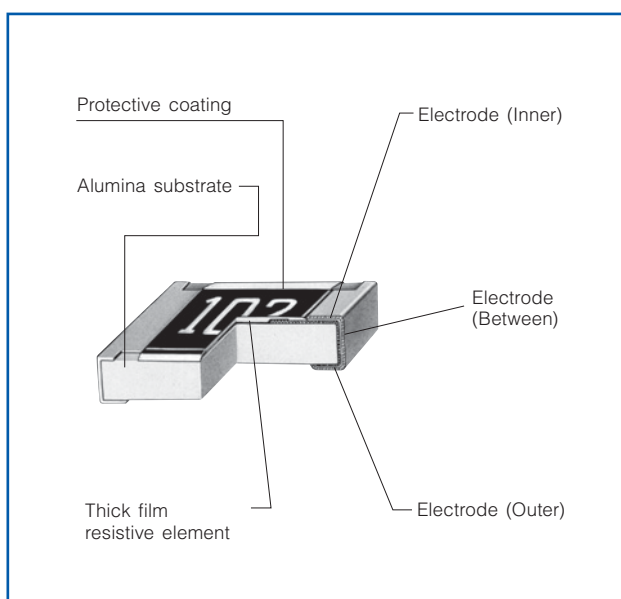
- ESD surge characteristics superior to standard metal film resistors
- High reliability
Metal glaze thick film resistive element and three layers of electrodes
- Suitable for both reflow and flow soldering
- High power ... 0.20 W : 0402 inch / 1005 mm size (ERJPA2), 0603 inch / 1608 mm size (ERJP03)
0.25 W : 0603 inch / 1608 mm size (ERJPA3)
0.50 W : 0805 inch / 2012 mm size (ERJP06), 1210 inch / 3225 mm size (ERJP14)
0.66 W : 1206 inch / 3216 mm size (ERJP08)
- Reference Standards... IEC 60115-8, JIS C 5201-8, EIAJ RC-2134B
- AEC-Q200 qualified
- RoHS compliant

■ **As for Packaging Methods, Land Pattern, Soldering Conditions and Safety Precautions,**
Please see Data Files

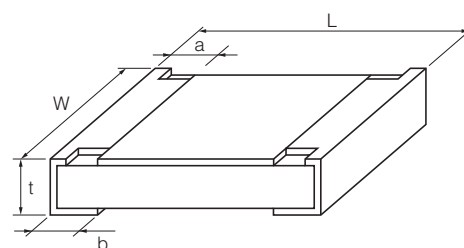
Explanation of Part Numbers

1	2	3	4	5	6	7	8	9	10	11	12
E	R	J	P	0	6	D	1	0	0	2	V
Product Code Thick Film Chip Resistors	Size, Power Rating		Resistance Tolerance		Resistance Value			Packaging Methods			
	Code	Inch	Power R.	Code	Tolerance	The first two or three digits are significant figures of resistance and the third or 4th one denotes number of zeros following. Three digit type ($\pm 5\%$), four digit type ($\pm 1\%$, $\pm 0.5\%$) Example: 222→2.2 k Ω , 1002→10 k Ω			Code	Packaging	Part No.
	PA2	0402	0.20 W	D	$\pm 0.5\%$				X	Punched Carrier Taping 2 mm pitch, 10,000 pcs.	ERJPA2
	P03	0603	0.20 W	F	$\pm 1\%$				V	Punched Carrier Taping 4 mm pitch, 5,000 pcs.	ERJP03 ERJPA3 ERJP06 ERJP08
	PA3	0603	0.25 W	J	$\pm 5\%$				U	Embossed Carrier Taping 4 mm pitch, 5,000 pcs.	ERJP14
	P06	0805	0.50 W								
	P08	1206	0.66 W								
	P14	1210	0.50 W								

Construction



Dimensions in mm (not to scale)



Part No. (inch size)	Dimensions (mm)					Mass (Weight) [g/1000 pcs.]
	L	W	a	b	t	
ERJPA2 (0402)	1.00 ± 0.05	0.50 ± 0.05	0.25 ± 0.10	0.25 ± 0.05	0.35 ± 0.05	0.8
ERJP03 (0603)	1.60 ± 0.15	0.80 ± 0.15 -0.05	0.15 ± 0.15 -0.10	0.30 ± 0.15	0.45 ± 0.10	2
ERJPA3 (0603)	1.60 ± 0.15	0.80 ± 0.15 -0.05	0.15 ± 0.15 -0.10	0.25 ± 0.10	0.45 ± 0.10	2
ERJP06 (0805)	2.00 ± 0.20	1.25 ± 0.10	0.25 ± 0.20	0.40 ± 0.20	0.60 ± 0.10	4
ERJP08 (1206)	3.20 ± 0.05 -0.20	1.60 ± 0.05 -0.15	0.40 ± 0.20	0.50 ± 0.20	0.60 ± 0.10	10
ERJP14 (1210)	3.20 ± 0.20	2.50 ± 0.20	0.35 ± 0.20	0.50 ± 0.20	0.60 ± 0.10	16

Ratings

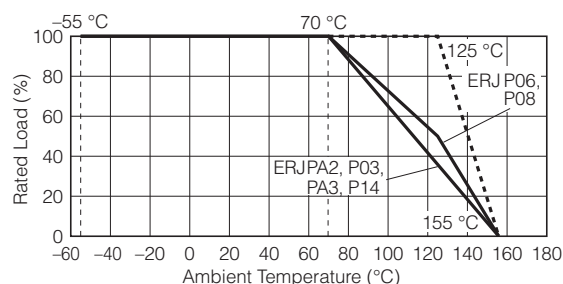
Part No. (inch size)	Power Rating ⁽³⁾ at 70 °C (W)	Limiting Element Voltage ⁽¹⁾ (V)	Maximum Overload Voltage ⁽²⁾ (V)	Resistance Tolerance (%)	Resistance Range (Ω)	T.C.R. ($\times 10^{-6}/^{\circ}\text{C}$)	Category Temperature Range (°C)
ERJPA2 (0402)	0.20	50	100	±0.5, ±1	10 to 1M (E24, E96)	±100	-55 to +155
				±5	1 to 10M (E24)	±200	
ERJP03 (0603)	0.20	150	200	±0.5	10 to 1M (E24, E96)	±150	-55 to +155
				±1	10 to 1M (E24, E96)	±200	
				±5	1 to 1M (E24)	$R < 10 \Omega : -150 \text{ to } +400$ $10 \Omega \leq R : \pm 200$	
ERJPA3 (0603)	0.25	150	200	±0.5, ±1	10 to 1M (E24, E96)	±100	-55 to +155
				±5	1 to 1.5M (E24)	±200	
ERJP06 (0805)	0.50	400	600	±0.5, ±1	10 to 1M (E24, E96)	$R < 33 \Omega : \pm 300$ $33 \Omega \leq R : \pm 100$	-55 to +155
				±5	1 to 3.3M (E24)	$R < 10 \Omega : -100 \text{ to } +600$ $10 \Omega \leq R < 33 \Omega : \pm 300$ $33 \Omega \leq R : \pm 200$	
ERJP08 (1206)	0.66	500	1000	±0.5, ±1	10 to 1M (E24, E96)	±100	-55 to +155
				±5	1 to 10M (E24)	$R < 10 \Omega : -100 \text{ to } +600$ $10 \Omega \leq R : \pm 200$	
ERJP14 (1210)	0.50	200	400	±0.5, ±1	10 to 1M (E24, E96)	±100	-55 to +155
				±5	1 to 1M (E24)	$R < 10 \Omega : -100 \text{ to } +600$ $10 \Omega \leq R : \pm 200$	

(1) Rated Continuous Working Voltage (RCWW) shall be determined from $\text{RCWW} = \sqrt{\text{Power Rating} \times \text{Resistance Values}}$, or Limiting Element Voltage listed above, whichever less.
(2) Overload (Short-time Overload) Test Voltage (SOTV) shall be determined from $\text{SOTV} = 2.5 \times \text{RCWW}$ or max. Overload Voltage listed above whichever less.
(3) Use it on the condition that the case temperature is below 155 °C.

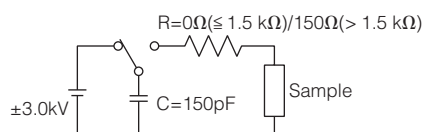
Power Derating Curve

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

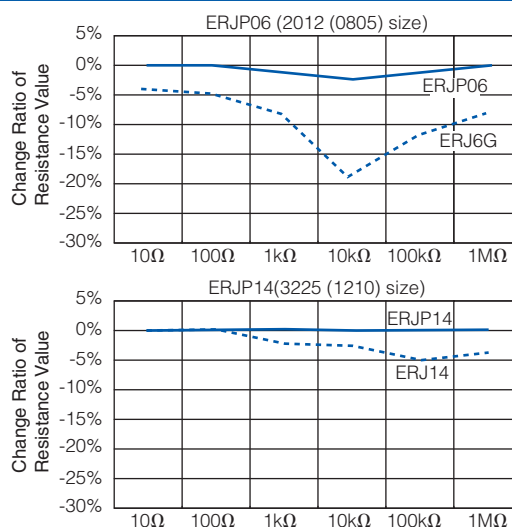
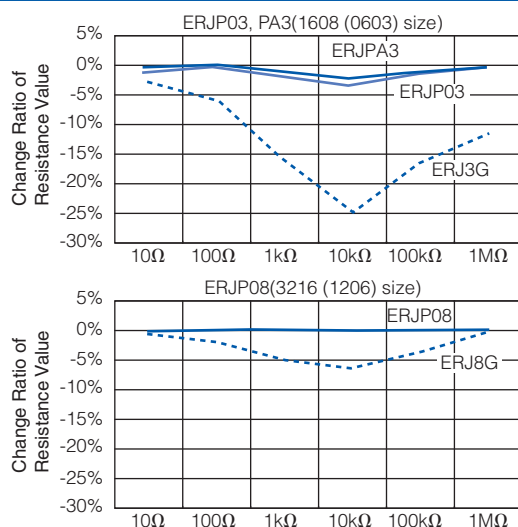
* When the temperature of ERJP14 is 155 °C or less, the derating start temperature can be changed to 125 °C. (See the dotted line)



ESD Characteristic



— Anti-Surge Thick Film Chip Resistors (ERJP Type)
- - - Thick Film Chip Resistors (ERJ Type)



Anti-Pulse Thick Film Chip Resistors



Type: **ERJ T06, T08, T14**
ERJ T14L

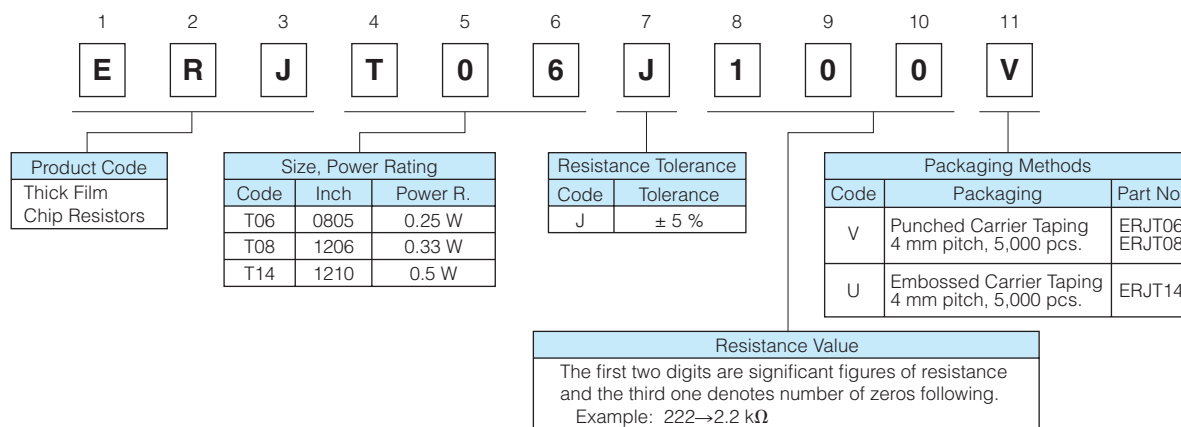
Features

- Anti-Pulse characteristics
High pulse characteristics achieved by the optimized trimming specifications (ERJT06, T08, T14)
- Further high pulse characteristics achieved by trimming-less specifications (ERJT14L)
- High reliability
Metal glaze thick film resistive element and three layers of electrodes
- Suitable for both reflow and flow soldering
- High power ... 0.25W : 0805 inch / 2012 mm size (ERJT06)
0.33W : 1206 inch / 3216 mm size (ERJT08)
0.50W : 1210 inch / 3225 mm size (ERJT14, ERJT14L)
- Reference Standards...IEC 60115-8, JIS C 5201-8, EIAJ RC-2134B
- AEC-Q200 qualified
- RoHS compliant

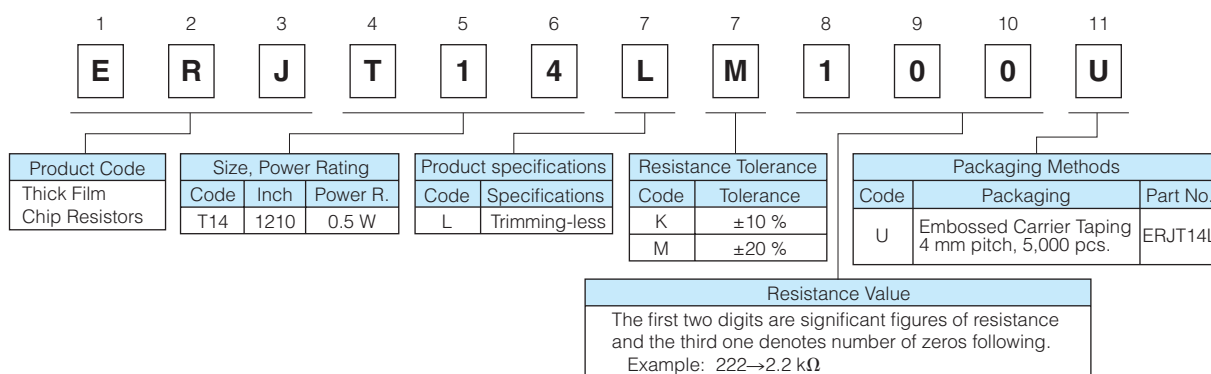
■ **As for Packaging Methods, Land Pattern, Soldering Conditions and Safety Precautions,**
Please see Data Files

Explanation of Part Numbers

- ERJT06, T08, T14 Type

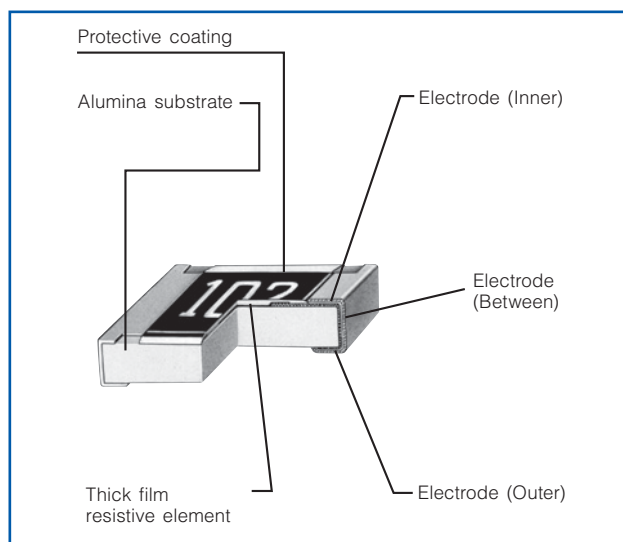


- ERJT14L Type

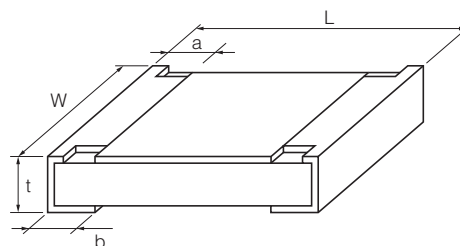


* Please contact us for 2012 (mm) and 3216 (mm) size trimming-less types.

Construction



Dimensions in mm (not to scale)



Part No. (inch size)	Dimensions (mm)					Mass (Weight) [g/1000pcs.]
	L	W	a	b	t	
ERJT06 (0805)	2.00 $\pm$ 0.20	1.25 $\pm$ 0.10	0.25 $\pm$ 0.20	0.40 $\pm$ 0.20	0.60 $\pm$ 0.10	4
ERJT08 (1206)	3.20 $\pm$ 0.05 -0.20	1.60 $\pm$ 0.05 -0.15	0.40 $\pm$ 0.20	0.50 $\pm$ 0.20	0.60 $\pm$ 0.10	10
ERJT14 ERJT14L (1210)	3.20 $\pm$ 0.20	2.50 $\pm$ 0.20	0.35 $\pm$ 0.20	0.50 $\pm$ 0.20	0.60 $\pm$ 0.10	16

Ratings

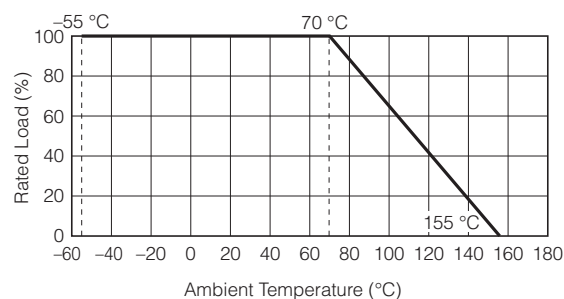
Part No. (inch size)	Power Rating at 70 °C (W)	Limiting Element Voltage ⁽¹⁾ (V)	Maximum Overload Voltage ⁽²⁾ (V)	Resistance Tolerance (%)	Resistance Range (Ω)	T.C.R. ($\times 10^{-6}/^{\circ}\text{C}$)	Category Temperature Range ($^{\circ}\text{C}$)
ERJT06 (0805)	0.25	150	200	± 5	1 to 1 M (E24)	Less than 10 Ω : -100 to +600 Less than 33 Ω : ± 300 More than 33 Ω : ± 200	-55 to +155
ERJT08 (1206)	0.33	200	400	± 5	1 to 1 M (E24)	Less than 10 Ω : -100 to +600 More than 10 Ω : ± 200	-55 to +155
ERJT14 (1210)	0.50	200	400	± 5	1 to 1 M (E24)	Less than 10 Ω : -100 to +600 More than 10 Ω : ± 200	-55 to +155
ERJT14L (1210)	0.50	200	400	± 10 ± 20	1 to 1 M (E12)	Less than 10 Ω : -100 to +600 More than 10 Ω : ± 200	-55 to +155

(1) Rated Continuous Working Voltage (RCWV) shall be determined from $\text{RCWV} = \sqrt{\text{Power Rating} \times \text{Resistance Values}}$, or Limiting Element Voltage listed above, whichever less.

(2) Overload (Short-time Overload) Test Voltage (SOTV) shall be determined from $\text{SOTV} = 2.5 \times \text{RCWV}$ or max. Overload Voltage listed above whichever less.

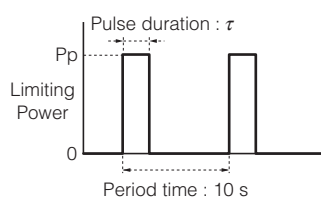
Power Derating Curve

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



Limiting Power Curve

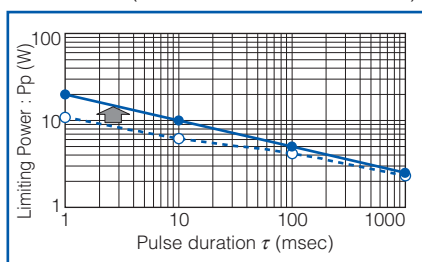
- In rush pulse Characteristic



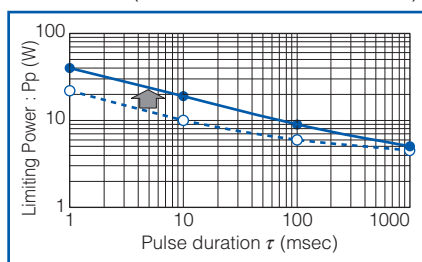
Test cycle : 1000 cycles
Spec : Resistance value = within $\pm 5\%$

- ▲ : Anti-Pulse Thick Film Chip Resistors (ERJT14L Type)
- : Anti-Pulse Thick Film Chip Resistors (ERJT Type)
- : Thick Film Chip Resistors (ERJ Type)

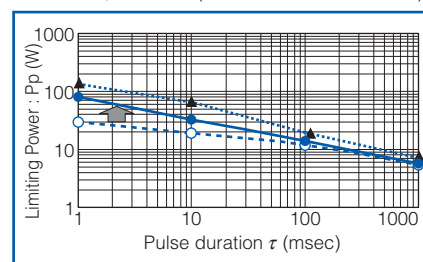
- ERJT06 (0805 inch/2012 mm size)



- ERJT08 (1206 inch/3216 mm size)



- ERJT14,ERJT14L (1210 inch/3225 mm size)



* Please contact us for 2012 (mm) and 3216 (mm) size trimming-less types.

Anti-Surge Thick Film Chip Resistors (Double-sided resistive elements structure) 0805

Type: **ERJ P6W**

■ Features

- ESD surge characteristics superior to standard metal film resistors
- High reliability
Metal glaze thick film resistive element and three layers of electrodes
- Suitable for both reflow and flow soldering
- High power···0.50 W : 2012(0805) size(ERJP6W)
- High pulse characteristics···1.5 times higher than 0805 inch size Anti-Surge Thick Film Chip Resistors (ERJP06)
- Reference Standards···IEC 60115-8, JIS C 5201-8, EIAJ RC-2134B
- AEC-Q200 qualified
- RoHS compliant

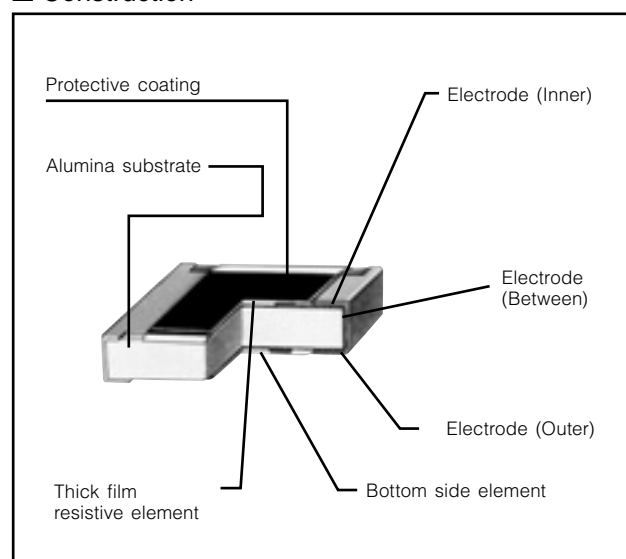
■ Packaging Methods, Land Pattern, Soldering Conditions and Safety Precautions

Please see Data Files

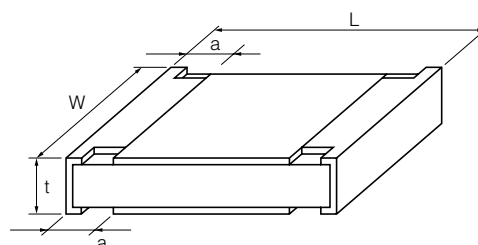
■ Explanation of Part Numbers

1	2	3	4	5	6	7	8	9	10	11	12
E	R	J	P	6	W	F	1	0	0	2	V
Product Code		Size, Power Rating		Resistance Tolerance		Resistance Value				Packaging Methods	
Thick Film Chip Resistors		Type: inch	Power R.	Code	Tolerance	The first two or three digits are significant figures of resistance and the third or 4th one denotes number of zeros following. Three digit type ($\pm 5\%$), four digit type ($\pm 1\%$) Example: 222→2.2 k Ω , 1002→10 k Ω				Code	Packaging
		P6W : 0805	0.50 W	F	$\pm 1\%$					V	Punched Carrier Taping 4 mm pitch, 5,000 pcs.
				J	$\pm 5\%$						

■ Construction



■ Dimensions in mm (not to scale)



Type (inch size)	Dimensions (mm)				Mass (Weight) [g/1000 pcs.]
	L	W	a	t	
ERJP6W (0805)	2.00 ± 0.20	1.25 ± 0.20	0.35 ± 0.20	0.65 ± 0.10	6

■ Ratings

Type (inch size)	Power Rating ⁽³⁾ at 70 °C (W)	Limiting Element Voltage ⁽¹⁾ (V)	Maximum Overload Voltage ⁽²⁾ (V)	Resistance Tolerance (%)	Resistance Range (Ω)	T.C.R. ($\times 10^{-6}/^{\circ}\text{C}$)	Category Temperature Range (°C)
ERJP6W (0805)	0.50	150	200	±1	10 to 1 M (E24, E96)	±200	-55 to +155
				±5	1 to 1 M (E24)	R < 10 Ω : -100 to +600 10 Ω ≤ R : ±200	

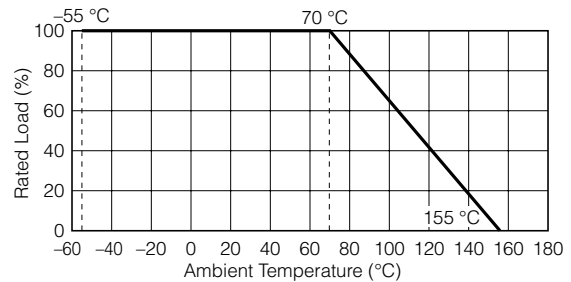
(1) Rated Continuous Working Voltage (RCWV) shall be determined from $\text{RCWV} = \sqrt{\text{Power Rating} \times \text{Resistance Values}}$, or Limiting Element Voltage listed above, whichever less.

(2) Overload (Short-time Overload) Test Voltage (SOTV) shall be determined from $\text{SOTV} = 2.5 \times \text{Power Rating}$ or max. Overload Voltage listed above whichever less.

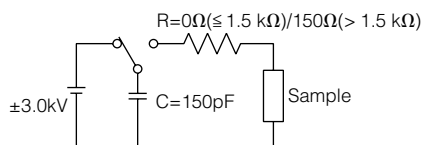
(3) Use it on the condition that the case temperature is below 155 °C.

Power Derating Curve

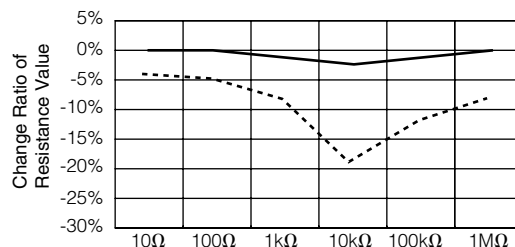
For resistors operated in ambient temperatures above 70 °C, power rating shall be derated in accordance with the figure on the right.



■ ESD Characteristic

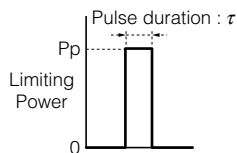


— Anti-Surge Thick Film Chip Resistors(ERJP6W Type)
 - - - Thick Film Chip Resistors(ERJ6G Type)



■ Limiting Power Curve

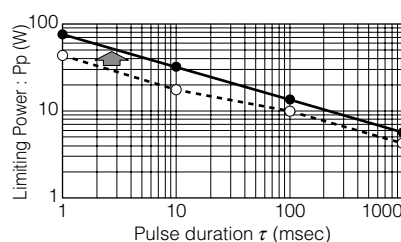
● In rush pulse Characteristic



Test cycle : 1 cycles

Spec : Resistance value = within ±1%

— Anti-Surge Thick Film Chip Resistors(ERJP6W Type)
 - - - Anti-Surge Thick Film Chip Resistors(ERJP06 Type)



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[P08J180V](#) [ERJ-P14F4700U](#) [ERJ-P14J112U](#) [ERJ-P14J821U](#) [ERJ-P06D2000V](#) [ERJ-P06D20R0V](#) [ERJ-P06J301V](#)
[ERJ-P08D4991V](#) [ERJ-P08J100V](#) [ERJ-P08J201V](#) [ERJ-P08J241V](#) [ERJ-P08J911V](#) [ERJ-P06D2103V](#) [ERJ-](#)
[P06D4991V](#) [ERJ-P06D6652V](#) [ERJ-P06F4530V](#) [ERJ-P06D2153V](#) [ERJ-P06F2211V](#) [ERJ-P06F8062V](#) [ERJ-](#)
[P06F5110V](#) [ERJ-P06F4753V](#) [ERJ-P06F3831V](#) [ERJ-P06F3161V](#) [ERJ-P06F31R6V](#) [ERJ-P06F3011V](#) [ERJ-](#)
[P06F2491V](#) [ERJ-P06F2003V](#) [ERJ-P06D2003V](#) [ERJ-P06F9531V](#) [ERJ-P06F2611V](#) [ERJ-P06F3301V](#) [ERJ-](#)
[P06F5100V](#) [ERJ-P03F1000V](#) [ERJ-P03F1001V](#) [ERJ-P03F1003V](#) [ERJ-P03F1004V](#) [ERJ-P03F1020V](#) [ERJ-](#)
[P03F1021V](#) [ERJ-P03F1022V](#) [ERJ-P03F1023V](#) [ERJ-P03F1050V](#) [ERJ-P03F1051V](#) [ERJ-P03F1052V](#) [ERJ-](#)
[P03F1053V](#) [ERJ-P03F1070V](#) [ERJ-P03F1071V](#) [ERJ-P03F1072V](#) [ERJ-P03F1073V](#) [ERJ-P03F10R2V](#) [ERJ-](#)
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