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		
Code	Inch	Power R.
PA2	0402	0.20 W
P03	0603	0.20 W
PA3	0603	0.25 W
P06	0805	0.50 W
P08	1206	0.66 W
P14	1210	0.50 W

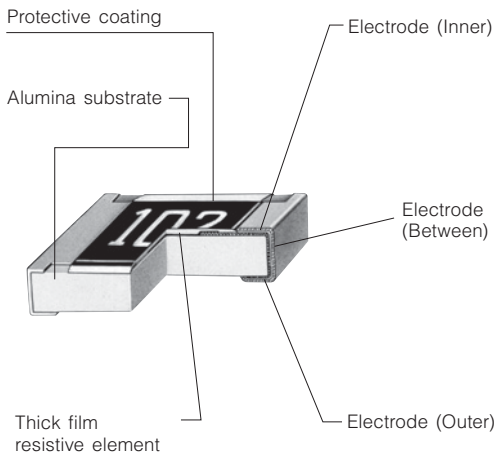
Resistance Tolerance	
Code	Tolerance
D	± 0.5 %
F	± 1 %
J	± 5 %

Resistance Value

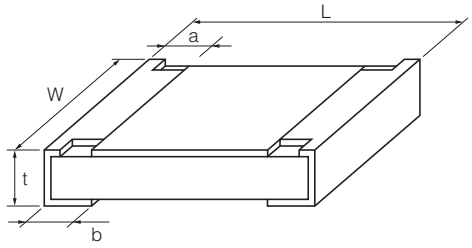
The first two or three digits are significant figures of resistance and the third or 4th one denotes number of zeros following.
Three digit type (±5 %),
four digit type (±1 %, ±0.5 %)
Example: 222→2.2k Ω, 1002→10k Ω

Packaging Methods		
Code	Packaging	Part No.
X	Punched Carrier Taping 2 mm pitch, 10,000 pcs.	ERJPA2
V	Punched Carrier Taping 4 mm pitch, 5,000 pcs.	ERJP03 ERJPA3 ERJP06 ERJP08
U	Embossed Carrier Taping 4 mm pitch, 5,000 pcs.	ERJP14

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)	$1.00^{\pm0.05}$	$0.50^{\pm0.05}$	$0.20^{\pm0.15}$	$0.25^{\pm0.05}$	$0.35^{\pm0.05}$	0.8
ERJP03 (0603)	$1.60^{\pm0.15}$	$0.80^{+0.15}_{-0.05}$	$0.15^{+0.15}_{-0.10}$	$0.30^{\pm0.15}$	$0.45^{\pm0.10}$	2
ERJPA3 (0603)	$1.60^{\pm0.15}$	$0.80^{+0.15}_{-0.05}$	$0.15^{+0.15}_{-0.10}$	$0.25^{\pm0.10}$	$0.45^{\pm0.10}$	2
ERJP06 (0805)	$2.00^{\pm0.20}$	$1.25^{\pm0.10}$	$0.25^{\pm0.20}$	$0.40^{\pm0.20}$	$0.60^{\pm0.10}$	4
ERJP08 (1206)	$3.20^{+0.05}_{-0.20}$	$1.60^{+0.05}_{-0.15}$	$0.40^{\pm0.20}$	$0.50^{\pm0.20}$	$0.60^{\pm0.10}$	10
ERJP14 (1210)	$3.20^{\pm0.20}$	$2.50^{\pm0.20}$	$0.35^{\pm0.20}$	$0.50^{\pm0.20}$	$0.60^{\pm0.10}$	16

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.
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Ratings

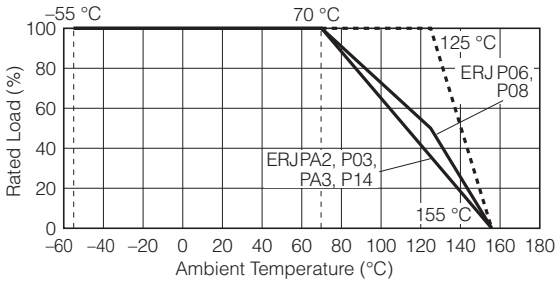
Part No. (inch size)	Power Rating[3] at 70 °C (W)	Limiting Element Voltage[1] (V)	Maximum Overload Voltage[2] (V)	Resistance Tolerance (%)	Resistance Range (Ω)	T.C.R. (×10^{-6}/°C)	Category Temperature Range (°C)
ERJPA2 (0402)	0.20	50	100	±0.5, ±1	10 to 1M (E24, E96)	±100	–55 to +155
				±5	10 to 1M (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 Ω : –150 to +400 10 Ω ≦ R : ±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 Ω : ±300 33 Ω ≦ R : ±100	–55 to +155
				±5	1 to 3.3M (E24)	R < 10 Ω : –100 to +600 10 Ω ≦ R < 33 Ω : ±300 33 Ω ≦ R : ±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 Ω : –100 to +600 10 Ω ≦ R : ±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 Ω : –100 to +600 10 Ω ≦ R : ±200	

(1) Rated Continuous Working Voltage (RCWV) shall be determined from 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 SOTV=2.5 × RCWV or max. Overload Voltage listed above whichever less.
(3) Use it on the condition that the case temperature is below 155 °C.

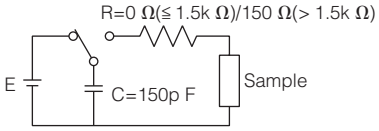
Power Derating Curve

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)

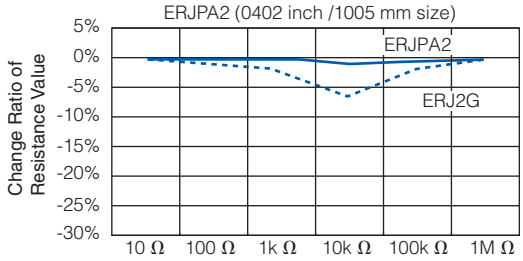


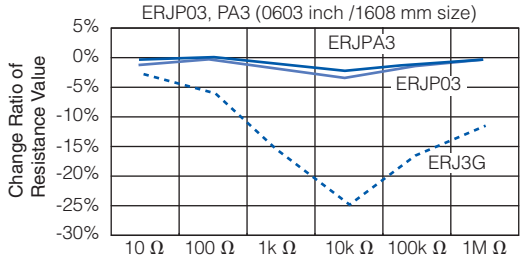
ESD Characteristic

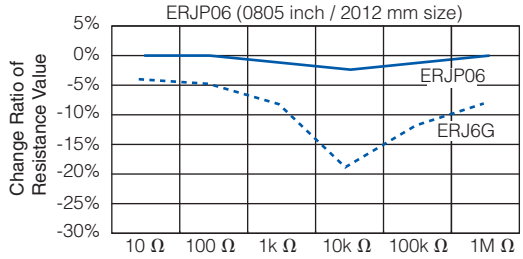


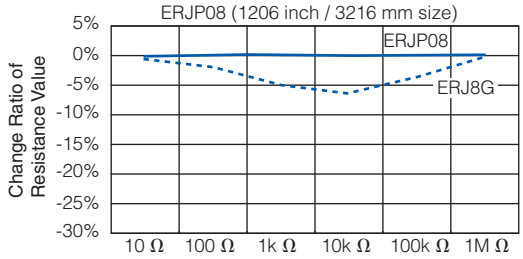
0402 inch size : E=±1k V
0603, 0805, 1206, 1210 inch size : E=±3k V

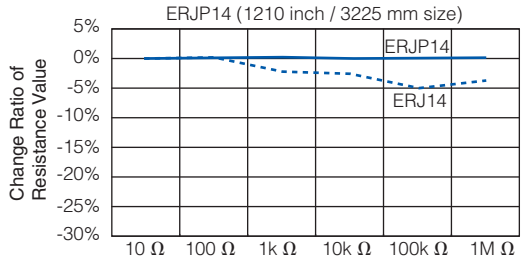
Anti-Surge Thick Film Chip Resistors(ERJP Type)
Thick Film Chip Resistors(ERJ Type)











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

1	2	3	4	5	6	7	8	9	10	11
E	R	J	T	0	6	J	1	0	0	V

Product Code
Thick Film Chip Resistors

Size, Power Rating		
Code	Inch	Power R.
T06	0805	0.25 W
T08	1206	0.33 W
T14	1210	0.5 W

Resistance Tolerance	
Code	Tolerance
J	± 5 %

Packaging Methods		
Code	Packaging	Part No.
V	Punched Carrier Taping 4 mm pitch, 5,000 pcs.	ERJT06 ERJT08
U	Embossed Carrier Taping 4 mm pitch, 5,000 pcs.	ERJT14

Resistance Value
The first two digits are significant figures of resistance and the third one denotes number of zeros following. Example: 222→2.2 kΩ

- ERJT14L Type

1	2	3	4	5	6	7	7	8	9	10	11
E	R	J	T	1	4	L	M	1	0	0	U

Product Code
Thick Film Chip Resistors

Size, Power Rating		
Code	Inch	Power R.
T14	1210	0.5 W

Product specifications	
Code	Specifications
L	Trimming-less

Resistance Tolerance	
Code	Tolerance
K	±10 %
M	±20 %

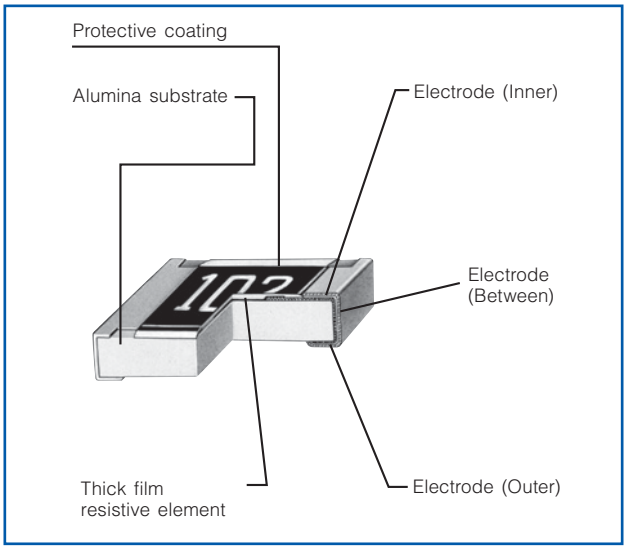
Packaging Methods		
Code	Packaging	Part No.
U	Embossed Carrier Taping 4 mm pitch, 5,000 pcs.	ERJT14L

Resistance Value
The first two digits are significant figures of resistance and the third one denotes number of zeros following. Example: 222→2.2 kΩ

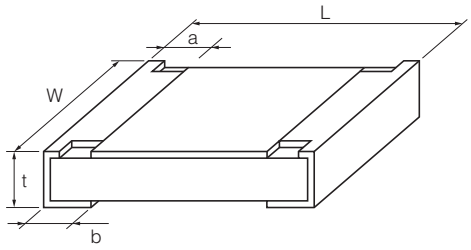
✻ Please contact us for 2012 (mm) and 3216 (mm) size trimming-less types.

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

Construction



Dimensions in mm (not to scale)



Part No. (inch size)	Dimensions (mm)					Mass (Weight) [g/1000 pcs.]
	L	W	a	b	t	
ERJT06 (0805)	$2.00^{\pm0.20}$	$1.25^{\pm0.10}$	$0.25^{\pm0.20}$	$0.40^{\pm0.20}$	$0.60^{\pm0.10}$	4
ERJT08 (1206)	$3.20^{+0.05}_{-0.20}$	$1.60^{+0.05}_{-0.15}$	$0.40^{\pm0.20}$	$0.50^{\pm0.20}$	$0.60^{\pm0.10}$	10
ERJT14 ERJT14L (1210)	$3.20^{\pm0.20}$	$2.50^{\pm0.20}$	$0.35^{\pm0.20}$	$0.50^{\pm0.20}$	$0.60^{\pm0.10}$	16

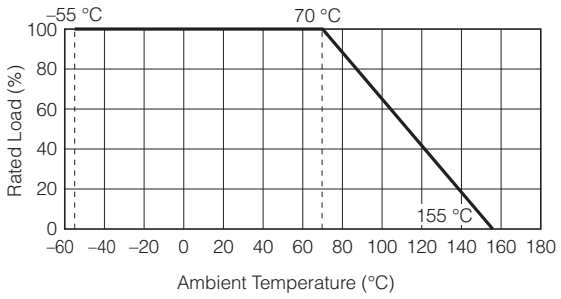
Ratings

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. ($\times10^{-6}$/°C)	Category Temperature Range (°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 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 SOTV=2.5 × RCWV or max. Overload Voltage listed above whichever less.

Power Derating Curve

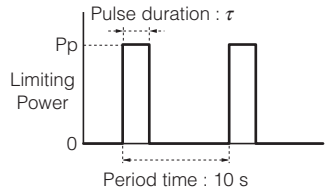
For resistors operated in ambient temperatures above 70 °C, power rating shall be derated in accordance with the figure on the right.



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Limiting Power Curve

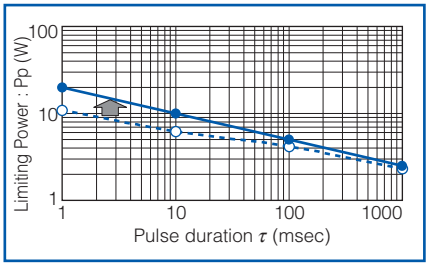
● In rush pulse Characteristic



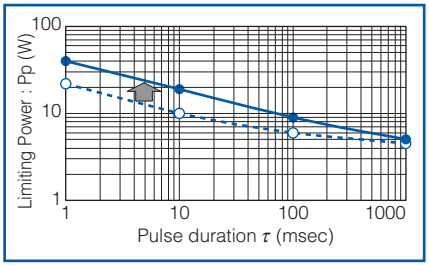
Test cycle : 1000 cycles
Spec : Resistance value = within ±5%

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

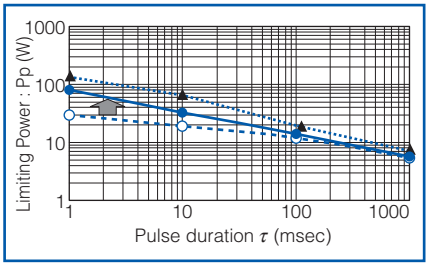
● **ERJT06** (0805 inch/2012 mm size)



● **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 fi lm resistors
- High reliability
  Metal glaze thick fi lm resistive element and three layers of electrodes
- Suitable for both refl ow and fl ow 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
- 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
Thick Film Chip Resistors

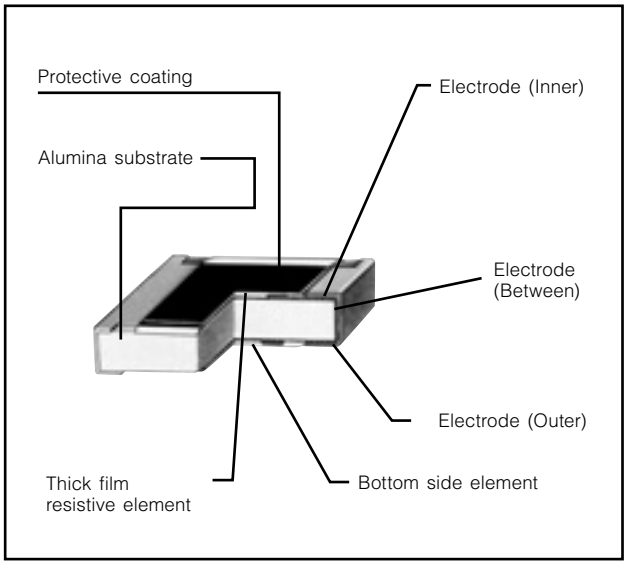
Size, Power Rating	
Type: inch	Power R.
P6W : 0805	0.50 W

Resistance Tolerance	
Code	Tolerance
F	± 1 %
J	± 5 %

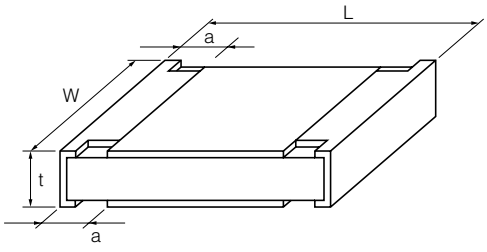
Resistance Value
The first two or three digits are significant figures of resistance and the third or 4th one denotes number of zeros following. Three digit type (±5%), four digit type (±1%) Example: 222→2.2 kΩ, 1002→10 kΩ

Packaging Methods	
Code	Packaging
V	Punched Carrier Taping 4 mm pitch, 5,000 pcs.

■ Construction



■ Dimensions in mm (not to scale)



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

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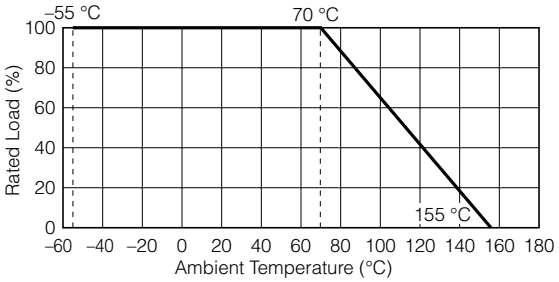
■ Ratings

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. (×10⁻⁶/°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	

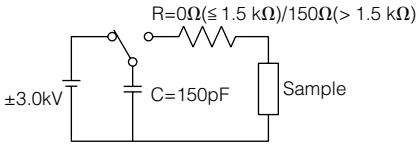
(1) Rated Continuous Working Voltage (RCWV) shall be determined from RCWV=$\sqrt{\text{Power Rating} \times \text{Resistance Values}}$, or Limiting Element Voltage listed above, whichever less.
(2) Overload (Short-time Overload) Test Voltage (SOTV) shall be determined from SOTV=2.5 × Power Rating or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

Power Derating Curve

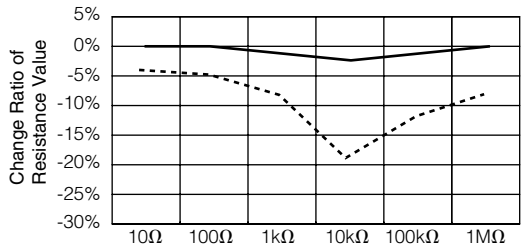
For resistors operated in ambient temperatures above 70 °C, power rating shall be derated in accordance with the figure on the right.



■ ESD Characteristic

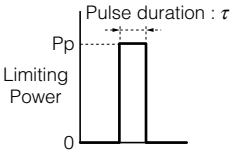


——— Anti-Surge Thick Film Chip Resistors(ERJP6W Type)
- - - - - - - - Thick Film Chip Resistors(ERJ6G Type)



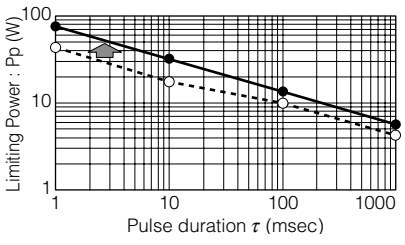
■ Limiting Power Curve

● 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)



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