

### Thick Film Chip Resistors / Low Resistance Type

ERJ R, B : 0402, 0603, 0805, 1206, 1210, 1812, 2010, 2512

ERJ BW : 0402, 0603, 0805, 1206

ERJ L : 0603, 0805, 1206, 1210, 1812, 2010, 2512

Type: ERJ 2B, 3B, 6B, 8B, 14B, 3R,  
6R, 8R, 14R, 12R, 12Z, 1TR  
ERJ 2BW, 3BW, 6BW, 8BW  
ERJ L03, L06, L08, L14, L12,  
L1D, L1W



#### Features

- Small size and lightweight
- High reliability : Metal glaze thick film resistive element and three layers of electrodes
- Suitable for both reflow and flow soldering
- Improved high-power/resistance to pulse characteristics  
by double-sided resistive elements structure : ERJ2BW, 3BW, 6BW, 8BW Type
- Low Resistance Value  
ERJ2BS, 2BQ : 0.1 Ω to 1.0 Ω  
ERJ3BS/Q, 6BS/Q, 8BS/Q, 14BS/Q, 3R, 6R, 8R, 14R, 12R, 12Z, 1TR : 0.1 Ω to 9.1 Ω  
ERJ2BW : 47 mΩ to 100 mΩ, ERJ3BW : 20 mΩ to 100 mΩ, ERJ6BW, 8BW : 10 mΩ to 100 mΩ  
ERJL03, L06, L08 : 47 mΩ to 100 mΩ, ERJL14, L12 : 20 mΩ to 100 mΩ, ERJL1D, L1W : 40 mΩ to 100 mΩ
- Reference Standards : IEC 60115-8, JIS C 5201-8, JEITA RC-2144
- RoHS compliant

#### Packaging Methods

Please see Pages 40 to 43

#### Recommended Land Pattern

Please see Pages 44 to 45

#### Recommended Soldering Conditions

Please see Page 46

#### Safety Precautions

Please see Page 47

#### Explanation of Part Numbers

- ERJ2BS/2BQ, 3BS/3BQ, 6BS/6BQ, 8BS/8BQ, 14BS/14BQ, 3R, 6R, 8R, 14R, 12R, 12Z, 1TR Series High power type/Standard type

1	2	3	4	5	6	7	8	9	10	11
E	R	J	8	R	Q	F	R	2	2	V

Product Code Thick Film Chip Resistors	Size, Power Rating		Resistance Value		Resistance Tolerance		Packaging Methods			
	Type: inch	Power R.	Code	Res. Value	Code	Tolerance	Code	Packaging	Type	
Thick Film Chip Resistors	2B : 0402	0.125 W(0.166 W)	S	0.1 Ω to 0.2 Ω	F	± 1 %	X	Punched Carrier Taping 2 mm pitch, 10,000 pcs.	ERJ2B	
	3R : 0603	0.1 W	Q	0.22 Ω to 9.1 Ω*	G	± 2 %				
	3B : 0603	0.2 W(0.25 W)	* 2B : 0.22 Ω to 1.0 Ω		J	± 5 %	V	Punched Carrier Taping 4 mm pitch, 5,000 pcs.	ERJ3R/3B ERJ6R/6B ERJ8R/8B	
	6R : 0805	0.125 W								
	6B : 0805	0.25 W(0.33 W)								
	8R : 1206	0.25 W				U	Embossed Carrier Taping 4 mm pitch, 5,000 pcs.	ERJ14R/14B ERJ12R ERJ12Z		
	8B : 1206	0.33 W(0.5 W)								
	14R : 1210	0.25 W								
	14B : 1210	0.5 W								
	12R : 1812	0.5 W				Resistance Value Shown by 3 digits or letters. (Ex.) R22 : 0.22 Ω		Embossed Carrier Taping 4 mm pitch, 4,000 pcs.		ERJ1TR
	12Z : 2010	0.5 W								
1TR : 2512	1 W									

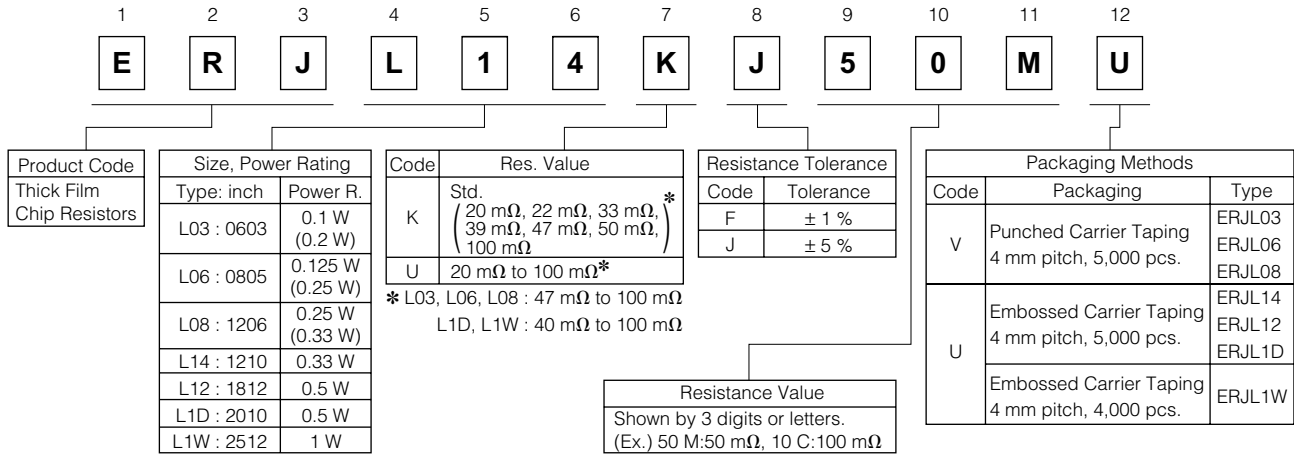
- ERJ2BW, 3BW, 6BW, 8BW Series <High power (double-sided resistive elements structure) type>

1	2	3	4	5	6	7	8	9	10	11	12
E	R	J	2	B	W	G	R	0	4	7	X

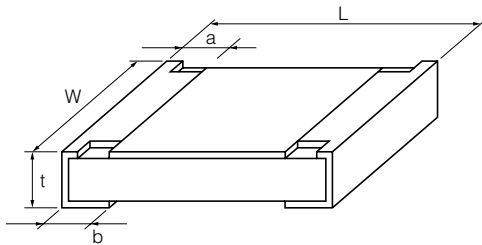
  

Product Code Thick Film Chip Resistors	Code	Size:inch	Power Rating	Resistance Value	Resistance Tolerance		Resistance Value	Packaging Methods		
					Code	Tolerance	Shown by 4 digits or letters. (Ex.) R047 : 0.047 Ω=47 mΩ	Code	Packaging	Type
Thick Film Chip Resistors	2BW	0402	0.125 W (0.25W)	47 mΩ to 100 mΩ	F	± 1 %		X	Pressed Carrier Taping 2 mm pitch, 10,000 pcs.	ERJ2BW
	3BW	0603	0.25 W	20 mΩ to 100 mΩ	G	± 2 %				
	6BW	0805	0.33 W	10 mΩ to 100 mΩ	J	± 5 %		V	Punched Carrier Taping 4 mm pitch, 5,000 pcs.	ERJ3BW ERJ6BW ERJ8BW
	8BW	1206	0.5 W (1W)	10 mΩ to 100 mΩ						

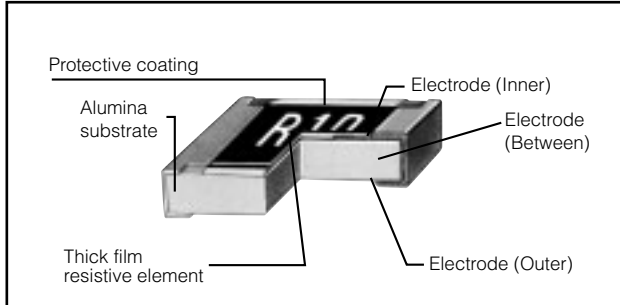
● ERJL03, L06, L08, L14, L12, L1D, L1W Series Low TCR type



■ Dimensions in mm (not to scale)



■ Construction



Type (inch size)	Dimensions (mm)					Mass(Weight) [g/1000pcs.]
	L	W	a	b	t	
ERJ2BW (0402)	1.00 <sup>+0.10</sup>	0.50 <sup>+0.10</sup> <sub>-0.05</sub>	0.24 <sup>+0.10</sup>	0.24 <sup>+0.10</sup>	0.35 <sup>+0.05</sup>	0.8
ERJ2BS ERJ2BQ (0402)	1.00 <sup>+0.10</sup>	0.50 <sup>+0.10</sup> <sub>-0.05</sub>	0.20 <sup>+0.10</sup>	0.27 <sup>+0.10</sup>	0.35 <sup>+0.05</sup>	0.8
ERJ3BW (0603)	1.60 <sup>+0.15</sup>	0.80 <sup>+0.15</sup>	0.40 <sup>+0.20</sup>	0.40 <sup>+0.20</sup>	0.55 <sup>+0.10</sup>	3
ERJ3R ERJ3B (0603) ERJL03	1.60 <sup>+0.15</sup>	0.80 <sup>+0.15</sup> <sub>-0.05</sub>	0.30 <sup>+0.20</sup>	0.30 <sup>+0.15</sup>	0.45 <sup>+0.10</sup>	2
ERJ6BW(0805)	2.00 <sup>+0.20</sup>	1.25 <sup>+0.20</sup>	0.55 <sup>+0.20</sup>	0.55 <sup>+0.20</sup>	0.65 <sup>+0.10</sup>	6
ERJ6R ERJ6B (0805) ERJL06	2.00 <sup>+0.20</sup>	1.25 <sup>+0.10</sup>	0.40 <sup>+0.20</sup>	0.40 <sup>+0.20</sup>	0.60 <sup>+0.10</sup>	4
ERJ8BW(1206)	3.20 <sup>+0.20</sup>	1.60 <sup>+0.20</sup>	1.00 <sup>+0.20</sup>	1.00 <sup>+0.20</sup>	0.65 <sup>+0.10</sup>	13
ERJ8R ERJ8B (1206) ERJL08	3.20 <sup>+0.05</sup> <sub>-0.20</sub>	1.60 <sup>+0.05</sup> <sub>-0.15</sub>	0.50 <sup>+0.20</sup>	0.50 <sup>+0.20</sup>	0.60 <sup>+0.10</sup>	10
ERJ14R ERJ14B (1210) ERJL14	3.20 <sup>+0.20</sup>	2.50 <sup>+0.20</sup>	0.50 <sup>+0.20</sup>	0.50 <sup>+0.20</sup>	0.60 <sup>+0.10</sup>	16
ERJ12R ERJL12 (1812)	4.50 <sup>+0.20</sup>	3.20 <sup>+0.20</sup>	0.50 <sup>+0.20</sup>	0.50 <sup>+0.20</sup>	0.60 <sup>+0.10</sup>	27
ERJ12Z ERJL1D (2010)	5.00 <sup>+0.20</sup>	2.50 <sup>+0.20</sup>	0.60 <sup>+0.20</sup>	0.60 <sup>+0.20</sup>	0.60 <sup>+0.10</sup>	27
ERJ1TR ERJL1W (2512)	6.40 <sup>+0.20</sup>	3.20 <sup>+0.20</sup>	0.65 <sup>+0.20</sup>	0.60 <sup>+0.20</sup>	0.60 <sup>+0.10</sup>	45
	6.40 <sup>+0.20</sup>	3.20 <sup>+0.20</sup>	0.65 <sup>+0.20</sup>	1.30 <sup>+0.20</sup>	1.10 <sup>+0.10</sup>	79

■ Ratings

<High power type>

Type (inch size)	Power Rating at 70 °C (W)	Resistance Tolerance (%)	Resistance Range (Ω)	T.C.R. (×10 <sup>-6</sup> /°C)	Category Temperature Range (°C)
ERJ2BS (0402)	0.125	±1, ±2, ±5	0.10 to 0.20 (E24)	±300	-55 to +125
ERJ2BQ (0402)	(0.166) <sup>(1)</sup>		0.22 to 1.0 (E24)	±250	
ERJ3BS (0603)	0.2 (0.25) <sup>(1)</sup>	±1, ±2, ±5	0.10 to 0.20 (E24)	±300	-55 to +125
ERJ3BQ (0603)			0.22 to 0.91 (E24)		
			1.0 to 9.1 (E24)	±200	
ERJ6BS (0805)	0.25 (0.33) <sup>(1)</sup>	±1, ±2, ±5	0.10 to 0.20 (E24)	±250	-55 to +125
ERJ6BQ (0805)			0.22 to 0.91 (E24)		
			1.0 to 9.1 (E24)	±200	
ERJ8BS (1206)	0.33 (0.5) <sup>(1)</sup>	±1, ±2, ±5	0.10 to 0.20 (E24)	±250	-55 to +125
ERJ8BQ (1206)			0.22 to 0.91 (E24)		
			1.0 to 9.1 (E24)	±200	
ERJ14BS (1210)	0.5	±1, ±2, ±5	0.10 to 0.20 (E24)	±200	-55 to +125
ERJ14BQ (1210)			0.22 to 0.91 (E24)		
			1.0 to 9.1 (E24)	±100	

(1) Please contact us when resistors with guaranteed high power are needed.

### ■ Ratings

<High power (double-sided resistive elements structure) type>

Type (inch size)	Power Rating at 70 °C (W)	Resistance Tolerance (%)	Resistance Range (Ω)	T.C.R. ( $\times 10^{-6}/^{\circ}\text{C}$ )	Category Temperature Range (°C)
ERJ2BW (0402)	0.125 (0.25) <sup>(1)</sup>	±1, ±2, ±5	47 m to 100 m(E24)	±300	-55 to +155
ERJ3BW (0603)	0.25	±1, ±2, ±5	20 m to 100 m(E24)	R<39m Ω:±250 R≥39m Ω:±150	-55 to +155
ERJ6BW (0805)	0.33	±1, ±2, ±5	10 m to 100 m(E24)	R<15m Ω:±300 R≥15m Ω:±200	-55 to +155
ERJ8BW (1206)	0.5 (1) <sup>(1)</sup>	±1, ±2, ±5	10 m to 100 m(E24)	10 mΩ ≤ R < 20 mΩ : ±200 20 mΩ ≤ R < 47 mΩ : ±150 47 mΩ ≤ R ≤ 100 mΩ : ±100	-55 to +155

<Standard type>

Type (inch size)	Power Rating at 70 °C (W)	Resistance Tolerance (%)	Resistance Range <sup>(2)</sup> (Ω)	T.C.R. ( $\times 10^{-6}/^{\circ}\text{C}$ )	Category Temperature Range (°C)
ERJ3RS (0603)	0.1	±1, ±2, ±5	0.10 to 0.20 (E24)	±300	-55 to +125
ERJ3RQ (0603)			0.22 to 0.91 (E24)		
			1.0 to 9.1 (E24)		
ERJ6RS (0805)	0.125	±1, ±2, ±5	0.10 to 0.20 (E24)	±250	-55 to +125
ERJ6RQ (0805)			0.22 to 0.91 (E24)		
			1.0 to 9.1 (E24)		
ERJ8RS (1206)	0.25	±1, ±2, ±5	0.10 to 0.20 (E24)	±250	-55 to +125
ERJ8RQ (1206)			0.22 to 0.91 (E24)		
			1.0 to 9.1 (E24)		
ERJ14RS (1210)	0.25	±1, ±2, ±5	0.10 to 0.20 (E24)	±200	-55 to +125
ERJ14RQ (1210)			0.22 to 0.91 (E24)		
			1.0 to 9.1 (E24)		
ERJ12RS (1812)	0.5	±1, ±2, ±5	0.10 to 0.20 (E24)	±200	-55 to +125
ERJ12RQ (1812)			0.22 to 0.91 (E24)		
			1.0 to 9.1 (E24)		
ERJ12ZS (2010)	0.5	±1, ±2, ±5	0.10 to 0.20 (E24)	±200	-55 ~ +125
ERJ12ZQ (2010)			0.22 to 0.91 (E24)		
			1.0 to 9.1 (E24)		
ERJ1TRS (2512)	1	±1, ±2, ±5	0.10 to 0.20 (E24)	±200	-55 to +125
ERJ1TRQ (2512)			0.22 to 0.91 (E24)		
			1.0 to 9.1 (E24)		

<Low TCR type>

Type (inch size)	Power Rating at 70 °C (W)	Resistance Tolerance (%)	Resistance Range <sup>(2)</sup> (Ω)	T.C.R. ( $\times 10^{-6}/^{\circ}\text{C}$ )	Category Temperature Range (°C)
ERJL03 (0603)	0.1 (0.2) <sup>(1)</sup>	±1, ±5	47 m to 100 m	±200	-55 to +125
ERJL06 (0805)	0.125 (0.25) <sup>(1)</sup>	±1, ±5	47 m to 100 m	±100	-55 to +125
ERJL08 (1206)	0.25 (0.33) <sup>(1)</sup>	±1, ±5	47 m to 100 m	±100	-55 to +125
ERJL14 (1210)	0.33	±1, ±5	20 m to 100 m	R<47 mΩ:±300 R≥47 mΩ:±100	-55 to +125
ERJL12 (1812)	0.5	±1, ±5	20 m to 100 m		-55 to +125
ERJL1D (2010)	0.5	±1, ±5	40 m to 100 m		-55 to +125
ERJL1W (2512)	1	±1, ±5	40 m to 100 m		-55 to +125

(1) Please contact us when resistors with guaranteed high power are needed.

(2) Standard R.V. : 20 mΩ, 22 mΩ, 33 mΩ, 39 mΩ, 47 mΩ, 50 mΩ, 100 mΩ, Custom R.V. : Each 1 mΩ within upper range.

### 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.

