Thick Film Chip Resistors / Low Resistance Type

ERJ R, B : 0402, 0603, 0805, 1206, 1210, 1812, 2010, 2512
ERJ BW, CW : 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, 8CW
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, 8CW Type
- Low TCR : ±50×10^{-6}/°C (ERJ8CW)
- Low Resistance Value
  10 mΩ to 50 mΩ : ERJ8CW
  10 mΩ to 100 mΩ : ERJ6BW, 8BW
  20 mΩ to 100 mΩ : ERJ3BW, ERJL14, L12
  40 mΩ to 100 mΩ : ERJL1D, L1W
  47 mΩ to 100 mΩ : ERJ2BW, ERJL03, L06, L08
- Reference Standards : IEC 60115-8, JIS C 5201-8, JEITA RC-2144
- RoHS compliant

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

Please see Data Files

■ 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	
Type: inch	Power R.
2B : 0402	0.166 W
3R : 0603	0.1 W
3B : 0603	0.25 W
6R : 0805	0.125 W
6B : 0805	0.33 W
8R : 1206	0.25 W
8B : 1206	0.5 W
14R : 1210	0.25 W
14B : 1210	0.5 W
12R : 1812	0.5 W
12Z : 2010	0.5 W
1TR : 2512	1 W

Resistance Value	
Code	Res. Value
S	0.1 Ω to 0.2 Ω
Q	0.22 Ω to 9.1 Ω*

* 2B : 0.22 Ω to 1.0 Ω

Resistance Tolerance	
Code	Tolerance
F	± 1 %
G	± 2 %
J	± 5 %

Resistance Value
Shown by 3 digits or letters. (Ex.) R22 : 0.22 Ω

Packaging Methods		
Code	Packaging	Type
X	Punched Carrier Taping 2 mm pitch, 10,000 pcs.	ERJ2B
V	Punched Carrier Taping 4 mm pitch, 5,000 pcs.	ERJ3R/3B ERJ6R/6B ERJ8R/8B
U	Embossed Carrier Taping 4 mm pitch, 5,000 pcs.	ERJ14R/14B ERJ12R ERJ12Z
	Embossed Carrier Taping 4 mm pitch, 4,000 pcs.	ERJ1TR

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● ERJ2BW, 3BW, 6BW, 8BW, 8CW 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
2BW	0402	0.25 W	47 mΩ to 100 mΩ
3BW	0603	0.33 W	20 mΩ to 100 mΩ
6BW	0805	0.5 W	10 mΩ to 100 mΩ
8BW	1206	1 W	10 mΩ to 100 mΩ
8CW	1206	1 W	10 mΩ to 50 mΩ

Resistance Tolerance	
Code	Tolerance
F	± 1 %
G	± 2 %
J	± 5 %

Resistance Value
Shown by 4 digits or letters. (Ex.) R047 : 0.047 Ω=47 mΩ

Packaging Methods		
Code	Packaging	Type
X	Pressed Carrier Taping 2 mm pitch, 10,000 pcs.	ERJ2BW
V	Punched Carrier Taping 4 mm pitch, 5,000 pcs.	ERJ3BW ERJ6BW ERJ8BW ERJ8CW

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

1	2	3	4	5	6	7	8	9	10	11	12
E	R	J	L	1	4	K	J	5	0	M	U

Product Code
Thick Film Chip Resistors

Size, Power Rating	
Type: inch	Power R.
L03 : 0603	0.2 W
L06 : 0805	0.25 W
L08 : 1206	0.33 W
L14 : 1210	0.33 W
L12 : 1812	0.5 W
L1D : 2010	0.5 W
L1W : 2512	1 W

Code	Res. Value
K	Std. (20 mΩ, 22 mΩ, 33 mΩ, 39 mΩ, 47 mΩ, 50 mΩ, 100 mΩ) *
U	20 mΩ to 100 mΩ*

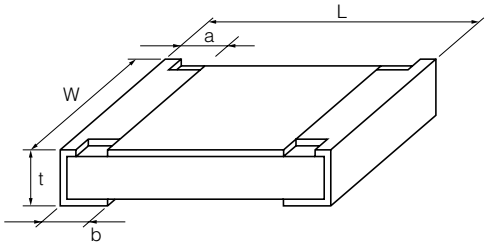
* L03, L06, L08 : 47 mΩ to 100 mΩ
L1D, L1W : 40 mΩ to 100 mΩ

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

Resistance Value
Shown by 3 digits or letters. (Ex.) 50 M:50 mΩ, 10 C:100 mΩ

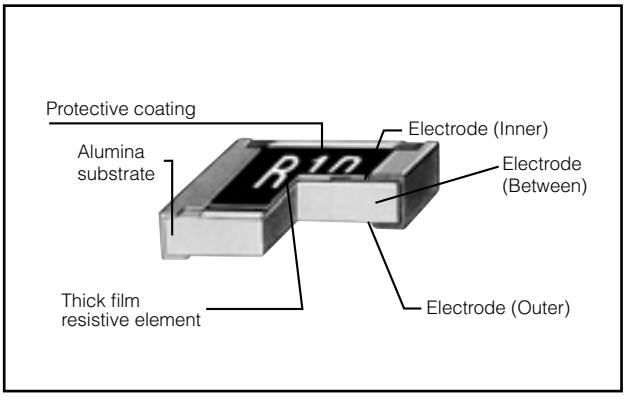
Packaging Methods		
Code	Packaging	Type
V	Punched Carrier Taping 4 mm pitch, 5,000 pcs.	ERJL03 ERJL06 ERJL08
U	Embossed Carrier Taping 4 mm pitch, 5,000 pcs.	ERJL14 ERJL12 ERJL1D
	Embossed Carrier Taping 4 mm pitch, 4,000 pcs.	ERJL1W

■ Dimensions in mm (not to scale)



Type (inch size)	Dimensions (mm) L	W	a	b	t	Mass(Weight) [g/1000pcs.]
ERJ2BW (0402)	$1.00^{\pm0.10}$	$0.50^{+0.10}_{-0.05}$	$0.24^{\pm0.10}$	$0.24^{\pm0.10}$	$0.35^{\pm0.05}$	0.8
ERJ2BS ERJ2BQ (0402)	$1.00^{\pm0.10}$	$0.50^{+0.10}_{-0.05}$	$0.20^{\pm0.10}$	$0.27^{\pm0.10}$	$0.35^{\pm0.05}$	0.8
ERJ3BW (0603)	$1.60^{\pm0.15}$	$0.80^{\pm0.15}$	$0.40^{\pm0.20}$	$0.40^{\pm0.20}$	$0.55^{\pm010}$	3
ERJ3R ERJ3B (0603) ERJL03	$1.60^{\pm0.15}$	$0.80^{+0.15}_{-0.05}$	$0.30^{\pm0.20}$	$0.30^{\pm0.15}$	$0.45^{\pm0.10}$	2
ERJ6BW(0805)	$2.00^{\pm0.20}$	$1.25^{\pm0.20}$	$0.55^{\pm0.20}$	$0.55^{\pm0.20}$	$0.65^{\pm0.10}$	6
ERJ6R ERJ6B (0805) ERJL06	$2.00^{\pm0.20}$	$1.25^{\pm0.10}$	$0.40^{\pm0.20}$	$0.40^{\pm0.20}$	$0.60^{\pm0.10}$	4
ERJ8BW(1206)	$3.20^{\pm0.20}$	$1.60^{\pm0.20}$	$1.00^{\pm0.20}$	$1.00^{\pm0.20}$	$0.65^{\pm0.10}$	13
ERJ8CW (10 to 16 mΩ)	$3.20^{\pm0.20}$	$1.60^{\pm0.20}$	$1.10^{\pm0.20}$	$1.10^{\pm0.20}$	$0.65^{\pm0.10}$	13
ERJ8CW (18 to 50 mΩ)	$3.20^{\pm0.20}$	$1.60^{\pm0.20}$	$0.60^{\pm0.20}$	$0.60^{\pm0.20}$	$0.65^{\pm0.10}$	13
ERJ8R ERJ8B (1206) ERJL08	$3.20^{+0.05}_{-0.20}$	$1.60^{+0.05}_{-0.15}$	$0.50^{\pm0.20}$	$0.50^{\pm0.20}$	$0.60^{\pm0.10}$	10
ERJ14R ERJ14B (1210) ERJL14	$3.20^{\pm0.20}$	$2.50^{\pm0.20}$	$0.50^{\pm0.20}$	$0.50^{\pm0.20}$	$0.60^{\pm0.10}$	16
ERJ12R ERJL12 (1812)	$4.50^{\pm0.20}$	$3.20^{\pm0.20}$	$0.50^{\pm0.20}$	$0.50^{\pm0.20}$	$0.60^{\pm0.10}$	27
ERJ12Z ERJL1D (2010)	$5.00^{\pm0.20}$	$2.50^{\pm0.20}$	$0.60^{\pm0.20}$	$0.60^{\pm0.20}$	$0.60^{\pm0.10}$	27
ERJ1TR ERJL1W (2512)	$6.40^{\pm0.20}$	$3.20^{\pm0.20}$	$0.65^{\pm0.20}$	$0.60^{\pm0.20}$	$0.60^{\pm0.10}$	45
	$6.40^{\pm0.20}$	$3.20^{\pm0.20}$	$0.65^{\pm0.20}$	$1.30^{\pm0.20}$	$1.10^{\pm0.10}$	79

■ Construction



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■ Ratings

<High power type>

Type (inch size)	Power Rating at 70 °C (W)	Resistance Tolerance (%)	Resistance [1] Range (Ω)	T.C.R. (×10⁻⁶/°C)	Category Temperature Range (°C)
ERJ2BS (0402)	0.166	±1, ±2, ±5	0.10 to 0.20 (E24)	±300	–55 to +125
ERJ2BQ (0402)			0.22 to 1.0 (E24)	±250	
ERJ3BS (0603)	0.25	±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)	0.33	±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)	0.5	±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 of irregular series are needed.

<Standard type>

Type (inch size)	Power Rating at 70 °C (W)	Resistance Tolerance (%)	Resistance Range (Ω)	T.C.R. (×10⁻⁶/°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)	±200	
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)	±200	
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)	±200	
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)	±100	
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)	±100	
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)	±100	
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)	±100	

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

Type (inch size)	Power Rating at 70 °C (W)	Resistance Tolerance (%)	Resistance [1] Range (Ω)	T.C.R. (×10⁻⁶/°C)	Category Temperature Range (°C)
ERJ2BW (0402)	0.25	±1, ±2, ±5	47 m to 100 m(E24)	±300	–55 to +155
ERJ3BW (0603)	0.33	±1, ±2, ±5	20 m to 100 m(E24)	R<39m Ω : ±250 R≧39m Ω : ±150	–55 to +155
ERJ6BW (0805)	0.5	±1, ±2, ±5	10 m to 100 m(E24)	R<15m Ω : ±300 R≧15m Ω : ±200	–55 to +155
ERJ8BW (1206)	1	±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
ERJ8CW (1206)	1	±1, ±2, ±5	10 m to 50 m(E24)	±50	–55 to +155 (10 m to 33 mΩ) –55 to +125 (36 m to 50 mΩ)

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■ Ratings

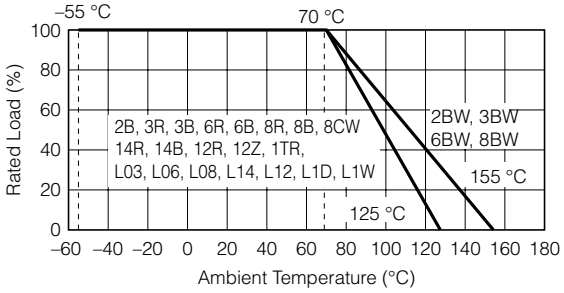
<Low TCR type>

Type (inch size)	Power Rating at 70 °C (W)	Resistance Tolerance (%)	Resistance [(1)] Range (Ω)	T.C.R. ($\times10^{-6}$/°C)	Category Temperature Range (°C)
ERJL03 (0603)	0.2	±1, ±5	47 m to 100 m	±200	−55 to +125
ERJL06 (0805)	0.25	±1, ±5	47 m to 100 m	±100	−55 to +125
ERJL08 (1206)	0.33	±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) 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.



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