

High Power Chip Resistors / Wide Terminal Type



Type: **ERJ A1, B1, B2, B3**

Features

- High solder-joint reliability by wide terminal construction
- Excellent heat dissipation characteristics by wide terminal construction
- AEC-Q200 qualified
- RoHS compliant

Recommended Applications

- Automotive electronic circuits including ECUs (Electrical control unit), anti-lock breaking systems and air-bag systems
- Current sensing for power supply circuits in a variety of equipment

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

Explanation of Part Numbers

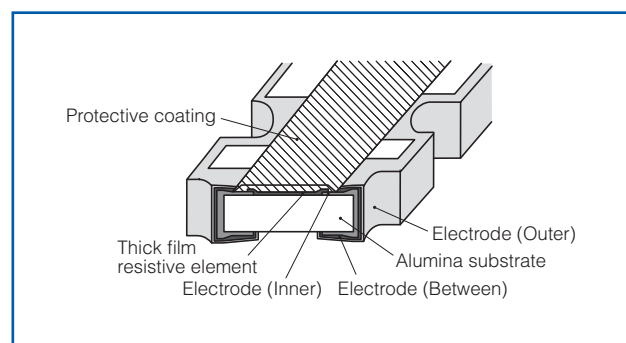
		1	2	3	4	5	6	7	8	9	10	11
		E	R	J	A	1	A	J	1	0	2	U
Product Code Thick Film Chip Resistors	Size, Power Rating			Resistance Value Region		Resistance Tolerance		Packaging Methods				
	Code	Inch	Power R.	A	10 Ω ≤ R	F	± 1 %	Code	Packaging	Part No.		
	A1	1225	1.33 W	B	0.22 Ω ≤ R < 10 Ω	G	± 2 %	V	Punched Carrier Taping 4 mm pitch, 5,000 pcs.	ERJB2 ERJB3		
	B1	1020	1 W, 2 W (R ≤ 10 Ω)	C	0.01 Ω ≤ R < 0.22 Ω	J	± 5 %	U	Embossed Carrier Taping 4 mm pitch, 5,000 pcs.	ERJB1		
	B2	0612	0.75 W, 1 W (R ≤ 10 Ω)	D	0.005 Ω ≤ R < 0.01 Ω				Embossed Carrier Taping 4 mm pitch, 4,000 pcs.	ERJA1		
B3	0508	0.33 W, 0.5 W (R ≤ 1 Ω)	Resistance Value									
Shown by 3 digits or letters. Only when it is impossible, shown by 4 digits or letters. (Ex.) 102 : 1.0k Ω R01 : 0.01 Ω = 10m Ω 4R7 : 4.7 Ω R015 : 0.015 Ω = 15m Ω												

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)	AEC-Q200 Grade
ERJA1 (1225)	1.33	200	400	±1	100m to 10k (E24)	±100	-55 to +155	Grade 0
				±2, ±5	10m to 10k (E24)	R < 100m Ω : ±350 100m Ω ≤ R : ±200		
ERJB1 (1020)	1 2(R ≤ 10 Ω)	200	400	±1	10m to 10k (E24)	R < 22m Ω : ±350 22m Ω ≤ R < 47m Ω : ±200 47m Ω ≤ R < 100m Ω : ±150 100m Ω ≤ R : ±100	-55 to +155	Grade 0
				±2, ±5	10m to 10k (E24)	R < 22m Ω : ±350 22m Ω ≤ R : ±200		
ERJB2 (0612)	0.75 1(R ≤ 10 Ω)	200	400	±1	10m to 1M (E24)	R < 22m Ω : 0 to +300 22m Ω ≤ R < 47m Ω : 0 to +200 47m Ω ≤ R < 100m Ω : 0 to +150 100m Ω ≤ R < 220m Ω : 0 to +100 220m Ω ≤ R : ±100	-55 to +155	Grade 0
				±2	10m to 1M (E24)	R < 22m Ω : 0 to +300 22m Ω ≤ R < 47m Ω : 0 to +200 47m Ω ≤ R < 100m Ω : 0 to +150 100m Ω ≤ R < 220m Ω : 0 to +200 220m Ω ≤ R : ±200		
				±5	5m, 6m, 7m, 8m, 9m, 10m to 1M (E24)	R < 22m Ω : 0 to +300 22m Ω ≤ R < 47m Ω : 0 to +200 47m Ω ≤ R < 100m Ω : 0 to +150 100m Ω ≤ R < 220m Ω : 0 to +200 220m Ω ≤ R : ±200		
ERJB3 (0508)	0.33 0.5(R ≤ 1 Ω)	150	200	±1	20m to 10 (E24)	R < 47m Ω : 0 to +300 47m Ω ≤ R < 1 Ω : 0 to +200 1 Ω ≤ R : ±100	-55 to +155	Grade 0
				±2, ±5	20m to 10 (E24)	R < 47m Ω : 0 to +300 47m Ω ≤ R < 1 Ω : 0 to +200 1 Ω ≤ R : ±200		

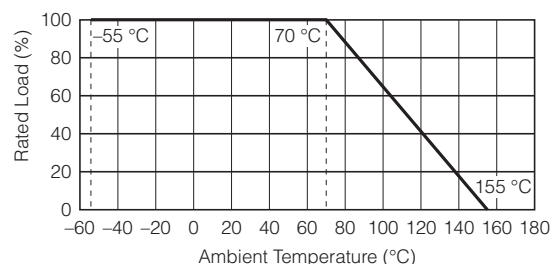
- (1) Rated Continuous Working Voltage (RCWV) shall be determined from $\text{RCWV} = \sqrt{\text{Power Rating} \times \text{Resistance Value}}$, or Limiting Element Voltage listed above, whichever less.
(2) Overload Test Voltage (OTV) shall be determined from $\text{OTV} = \text{Specified Magnification (refer to performance)} \times \text{RCWV}$ or Maximum Overload Voltage listed above, whichever less.
(3) Use it on the condition that the case temperature is below the upper category temperature.

Construction (Example : ERJA1 type)



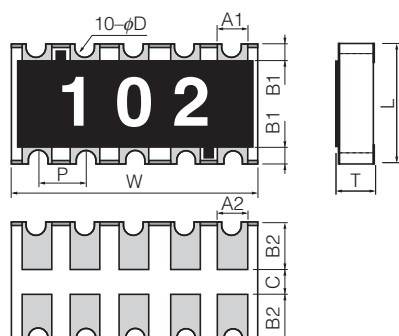
Power Derating Curve

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



Dimensions in mm (not to scale)

ERJA1 type

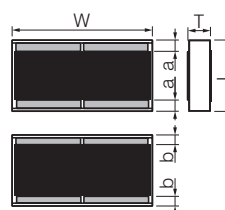


Mass (Weight) [1000 pcs.] : 40 g

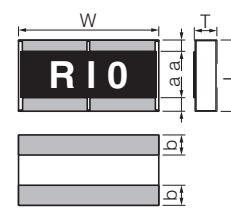
Dimensions (mm)	L	W	T	A ₁	B ₁
	3.20±0.20	6.40±0.20	0.55±0.10	0.70±0.20	0.45±0.20
Dimensions (mm)	A ₂	B ₂	P	φD	C
	0.70±0.20	1.25±0.15	1.27±0.10	0.30 ^{+0.10} _{-0.20}	0.4 min.

ERJB2 type

($R < 10m\Omega$)



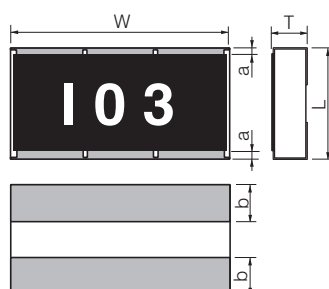
($10m\Omega \leq R \leq 1M\Omega$)



Mass (Weight) [1000 pcs.] : 11 g

Dimensions (mm)	L	W	T	a	b
5mΩ ≤ R < 10mΩ	1.60±0.15	3.20±0.20	0.65±0.15	0.30±0.20	0.30±0.20
10mΩ ≤ R < 220mΩ			0.55±0.15	0.30±0.20	0.50±0.20
220mΩ ≤ R ≤ 1MΩ					
				0.25±0.20	

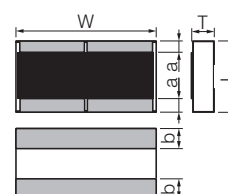
ERJB1 type



Mass (Weight) [1000 pcs.] : 27 g

Dimensions (mm)	L	W	T	a	b
	2.50±0.20	5.00±0.20	0.55±0.20	0.25±0.20	0.90±0.20

ERJB3 type

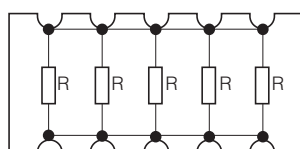


Mass (Weight) [1000 pcs.] : 4.8 g

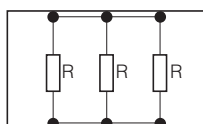
Dimensions (mm)	L	W	T	a	b
	1.25±0.10	2.00±0.15	0.50±0.10	0.25±0.20	0.40±0.20

Circuit Configuration

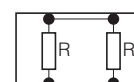
ERJA1 type



ERJB1 type

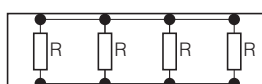


ERJB3 type

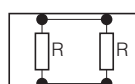


ERJB2 type

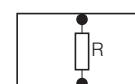
< Less than 10mΩ >



< Low resistance zone >



< High resistance zone >



Performance		
Test Item	Performance Requirements	Test Conditions
Resistance	Within Specified Tolerance	20 °C
T. C. R.	Within Specified T. C. R.	+25 °C/+125 °C
Overload	±2%	ERJA1, ERJB1 (R > 10), ERJB3 (R > 1) : Rated Voltage × 2.5, 5 s ERJB2 (R > 10) : Rated Voltage × 2.2, 5 s ERJB1 (R ≤ 10), ERJB2 (R ≤ 10), ERJB3 (R ≤ 1) : Rated Voltage × 2.0, 5 s
Resistance to Soldering Heat	±1%	270 °C, 10 s
Rapid Change of Temperature	±2%	−55 °C (30min.) / +125 °C (30min.), 1000 cycles
High Temperature Exposure	±1%	+155 °C, 1000 h
Damp Heat, Steady State	±1%	60 °C, 90% to 95 %RH, 1000 h
Load Life in Humidity	±3%	60 °C, 90% to 95 %RH, Rated Voltage, 1.5 h ON/0.5 h OFF cycle, 1000 h
Endurance at 70 °C	±3%	70 °C, Rated Voltage, 1.5 h ON/0.5 h OFF cycle, 1000 h