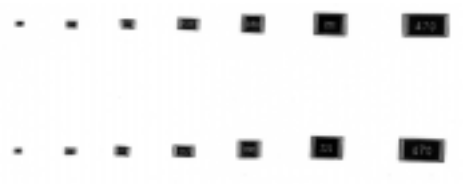
Thick Film Chip Resistors

Type: **ERJ**

ERJ 2G, 3G, 6G, 8G, 14, 12, 1W



■ Features

- Small size and lightweight
  For PCB size reduction and lightweight products
- High reliability
  Metal glaze thick film resistive element and three layers of electrodes result in high reliability
- Matching with placement machine
  Bulk, taping and bulk case packagings for automatic placement machine
- Solderability
  Suitable for both reflow soldering and flow soldering
- High power
  One rank up approval of power rating is available for 3G, 6G, 8G type
- Approved under the ISO-9001 system
  Approved under the QS-9000 system

■ Conforming to:

IEC115-8, JIS C5223

■ Explanation of Part Numbers

1	2	3	4	5	6	7	8	9	10	11	12
E	R	J	3	G	E	Y	J	1	0	2	V

Product Code
Thick Film Chip Resistors

Power Rating	
Code	Power R.
2GE	1/16 W
3GE	1/16 W
6GE	1/10 W
8GE	1/8 W
14	1/4 W
12	1/2 W
12Z	1/2 W
1W	1 W

Marking	
Code	Marking
Y	Value Marking on black side
✻Nil	No marking

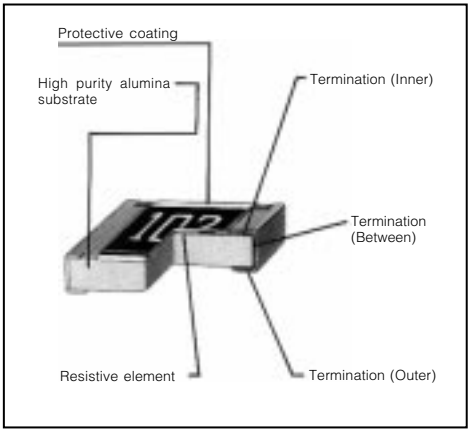
Resistance Tolerance	
Code	Tolerance
J	± 5 %
O	Jumper

Packaging Methods	
Code	Packaging
V	Std. Taped & reel
U	Plastic embossed taped & reel (14, 12, 1W Only)
B	Bulk case (3G, 6G, 8G Only)
X	2 mm pitch T. & R. (Only 2G,3G type)

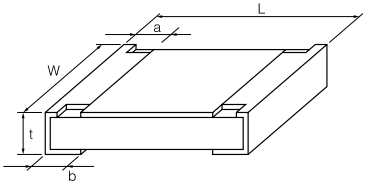
Nominal Resistance Value
The first two digits are significant figures of resistance and the third one denotes number of zeros following. Jumper is expressed by R00.

✻ When omitted, all the rest P/N factors shall be moved up respectively.

■ Construction



■ Dimensions in mm (not to scale)



Part No.	Dimensions (mm)					Weight (1000 pcs.)
	L	W	a	b	t	
ERJ2G	$1.00^{\pm0.05}$	$0.50^{\pm0.05}$	$0.20^{\pm0.10}$	$0.25^{\pm0.05}$	$0.35^{\pm0.05}$	0.8 g
ERJ3G	$1.60^{\pm0.15}$	$0.80^{+0.15}_{-0.05}$	$0.30^{\pm0.20}$	$0.30^{\pm0.15}$	$0.45^{\pm0.10}$	2 g
ERJ6G	$2.00^{\pm0.20}$	$1.25^{\pm0.10}$	$0.40^{\pm0.20}$	$0.40^{\pm0.20}$	$0.60^{\pm0.10}$	4 g
ERJ8G	$3.20^{+0.05}_{-0.20}$	$1.60^{+0.05}_{-0.15}$	$0.50^{\pm0.20}$	$0.50^{\pm0.20}$	$0.60^{\pm0.10}$	10 g
ERJ14	$3.20^{\pm0.20}$	$2.50^{\pm0.20}$	$0.50^{\pm0.20}$	$0.50^{\pm0.20}$	$0.60^{\pm0.10}$	16 g
ERJ12	$4.50^{\pm0.20}$	$3.20^{\pm0.20}$	$0.50^{\pm0.20}$	$0.50^{\pm0.20}$	$0.60^{\pm0.10}$	27 g
ERJ12Z	$5.00^{\pm0.20}$	$2.50^{\pm0.20}$	$0.60^{\pm0.20}$	$0.60^{\pm0.20}$	$0.60^{\pm0.10}$	27 g
ERJ1W	$6.40^{\pm0.20}$	$3.20^{\pm0.20}$	$0.65^{\pm0.20}$	$1.30^{\pm0.20}$	$1.10^{\pm0.10}$	79 g

■ Ratings

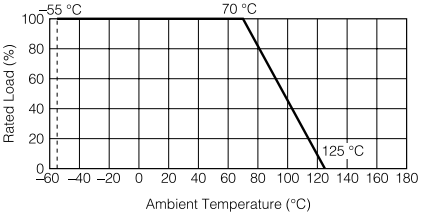
Part No.	Power Rating at 70 °C	Maximum RCWV*	Maximum Overload Voltage****	Resistance Tolerance***(%)	Resistance Range (Ω)		T.C.R (ppm/°C)	Standard Resistance Values
					min.	max.		
ERJ2G	1/16 W	50 V	100 V	± 5	1.0	2.2 M	<10 Ω −100 to 600 10 Ω to 1 MΩ ±200 1 MΩ< −400 to +150	E-24
ERJ3G	1/16 W (1/10 W)**	50 V	100 V	± 5	1.0	10 M		E-24
ERJ6G	1/10 W (1/8 W)**	150 V	200 V	± 5	1.0	10 M		E-24
ERJ8G	1/8 W (1/4 W)**	200 V	400 V	± 5	1.0	10 M		E-24
ERJ14	1/4 W	200 V	400 V	± 5	1.0	10 M		E-24
ERJ12, 12Z	1/2 W	200 V	400 V	± 5	1.0	10 M		E-24
ERJ1W	1 W	250 V	500 V	± 5	1.0	1.0 M		E-24

		Rated Current	Maximum Overload Current
(Ω) Jumper	2G · 3G	1.0 A	2 A
	6G · 8G · 14 · 12	2.0 A	4 A
	1 W	2.5 A	5 A

* Rated Continuous Working Voltage (RCWV) shall be determined from RCWV= $\sqrt{\text{Power Rating} \times \text{Resistance Values}}$, or max. RCWV listed above, whichever less.
** Available for reduction of load of pulse characteristic (RCWV × 2.5 RCW × 2.0, R≥1.1 kΩ)
*** Available for ±1 % or ±2 % of resistance tolerance.
**** Short-time Overload Test Voltage (SOTV) shall be determined from SOTV=2.5 × Power Rating 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 right figure.

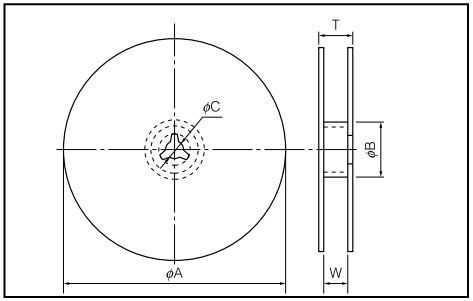


■ Packaging Methods

● Standard Quantity

Type \ Style / Thickness	Paper Taping (4 mm pitch)	Embossed Taping (4 mm pitch)	Bulk Case
ERJ2G 0.35	10000(2 mm pitch)		50000 pcs./case
ERJ3G 0.45	10000(2 mm pitch) 5000,10000		25000 pcs./case
ERJ6G 0.60	5000,10000		10000 pcs./case
ERJ8G 0.60	5000,10000		
ERJ14 0.60		5000 pcs./reel	
ERJ12,12Z 0.60		5000 pcs./reel	
ERJ1W 1.10		3000 pcs./reel	

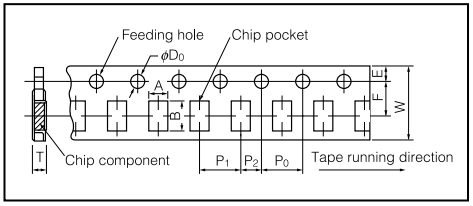
● Taping Reel



	Type	φA	φB	φC	W	T
Dimensions (mm)	2G,3G,6G, 8G,14	$180.0^{0}_{-3.0}$	60 min.	$13.0^{\pm1.0}$	$9.0^{\pm1.0}$	$11.4^{\pm1.0}$
	12,12Z,1W				$13.0^{\pm1.0}$	$15.4^{\pm1.0}$

Note φA: 10000 pcs./reel=225 20000 pcs./reel=330

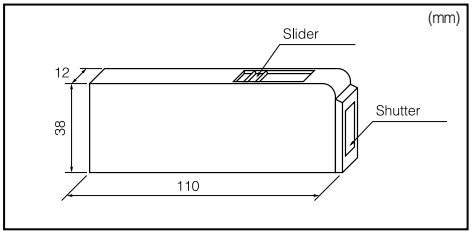
● Paper Taping



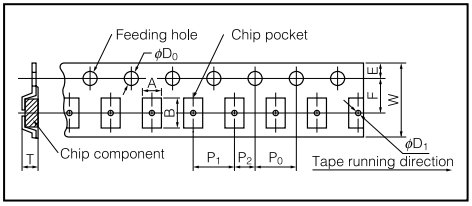
	Type	A	B	W	F	E
Dimensions (mm)	2G	$0.70^{\pm0.05}$	$1.20^{\pm0.05}$	$8.00^{\pm0.20}$	$3.50^{\pm0.05}$	$1.75^{\pm0.10}$
	3G	$1.10^{\pm0.10}$	$1.90^{\pm0.10}$			
	6G	$1.65^{\pm0.15}$	$2.50^{\pm0.20}$			
	8G	$2.00^{\pm0.15}$	$3.60^{\pm0.20}$			

	Type	P_1	P_2	P_0	ϕD_0	T
Dimensions (mm)	2G	$2.00^{\pm0.10}$	$2.00^{\pm0.05}$	$4.00^{\pm0.10}$	$1.50^{+0.10}_{0}$	$0.45^{\pm0.05}$
	3G	$4.00^{\pm0.10}$				$0.64^{\pm0.05}$
	6G					$0.84^{\pm0.05}$
	8G					

● Bulk Case



● Embossed Taping

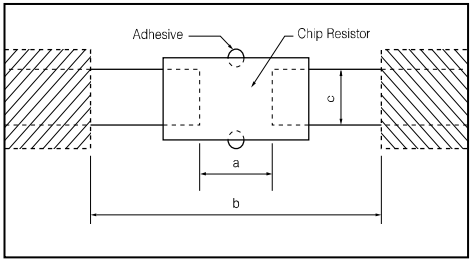


	Type	A	B	W	F	E	P_1
Dimensions (mm)	14	$2.80^{\pm0.20}$	$3.50^{\pm0.20}$	$8.00^{\pm0.30}$	$3.50^{\pm0.05}$	$1.75^{\pm0.10}$	$4.00^{\pm0.10}$
	12	$3.50^{\pm0.20}$	$4.80^{\pm0.20}$	$12.0^{\pm0.30}$	$5.50^{\pm0.05}$		$4.00^{\pm0.10}$
	12Z	$2.80^{\pm0.20}$	$5.30^{\pm0.20}$				
	1W	$3.60^{\pm0.20}$	$6.90^{\pm0.20}$				

	Type	P_2	P_0	ϕD_0	t	ϕD_1
Dimensions (mm)	14	$2.00^{\pm0.05}$	$4.00^{\pm0.10}$	$1.50^{+0.10}_{0}$	$1.00^{\pm0.10}$	1.00min.
	12					1.50min.
	12Z					
	1W				$1.60^{\pm0.10}$	

⚠Safety Precautions

In the case of flow soldering, the land width must be smaller than the Chip Resistor width to properly control the amount of solder. Generally, the land width should be chip resistor width (W) 0.7 to 0.8 times of the width of chip resistor (W). In the case of reflow soldering, solder amount can be adjusted, therefor the land width should be set to 1.0 to 1.3 times chip resistor width (W).



Part No.	Dimensions (mm)		
	a	b	c
ERJ2G	0.5 to 0.6	1.4 to 1.6	0.4 to 0.6
ERJ3G	0.7 to 0.9	2.0 to 2.2	0.8 to 1.0
ERJ6G	1.0 to 1.4	3.2 to 3.8	0.9 to 1.4
ERJ8G	2.0 to 2.4	4.4 to 5.0	1.2 to 1.8
ERJ14	2.0 to 2.4	4.4 to 5.0	1.8 to 2.8
ERJ12	3.3 to 3.7	5.7 to 6.5	2.3 to 3.5
ERJ1W	3.6 to 4.0	7.6 to 8.6	2.3 to 3.5

1. If transient load (heavy load in a short time) like pulse is expected to be applied, carry out evaluation and confirmation test with the resistors actually mounted on your own board.
   When the load of more than rated power is applied under the load condition at steady state, it may impair performance and/or reliability of resistor.
   Never exceed the rated power.
2. Chlorine type or other high-activity flux is not recommended as the residue may affect performance or reliability of resistors.
3. When soldering with soldering iron, never touch the body of the chip resistor with a tip of the soldering iron. When using a soldering iron with a tip at high temperature, solder for a time as short as possible (three seconds or less up to 350 °C).
4. Avoid physical shock to the resistor and nipping of the resistor with hard tool (a pair of pliers or tweezers) as it may damage protective film or the body of resistor and may affect resistor's performance.