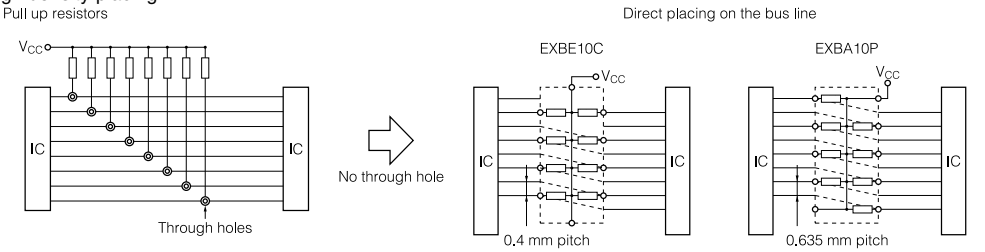
Chip Resistor Networks

Type: **EXBD:1206**
EXBE:1608
EXBA:2512
EXBQ:1506

■ Features

1. High density placing for digital signal circuits
   - Bussed 8 or 15 resistors for pull up/down circuits
     EXBD: 3.2 mm × 1.6 mm × 0.55 mm, 0.635 mm pitch
     EXBE: 4.0 mm × 2.1 mm × 0.55 mm, 0.8 mm pitch
     EXBA: 6.4 mm × 3.1 mm × 0.55 mm, 1.27 mm pitch
     EXBQ: 3.8 mm × 1.6 mm × 0.45 mm, 0.5 mm pitch
   - Available direct placing on the bus line by means of half pitch spacing without through-holes on PWB ("High density placing" is shown below)
2. Superior mountability by unique concave terminal
   - Self-alignment effect to get the adequate placement when reflow-soldering process
   - Firm solder joint (about 2 times stronger than that of convex terminal)
3. High speed mounting by conventional placing machine
4. Approved under the ISO 9001 system

<High density placing>



■ Explanation of Part Numbers

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

Product Code
Thick Film Resistor Network

Dimension Code of Chip Resistor Network

Type: inches	Dimensions
D : 1206	3.2 mm×1.6 mm
E : 1608	4.0 mm×2.1 mm
A : 2512	6.4 mm×3.1 mm
Q : 1506	3.8 mm×1.6 mm

Number of Terminals

10
16

Circuit Configuration

Code	Common Terminal Position
C	Center common circuit EXBD, EXBE
P	Diagonal common circuit (Terminal 5 and Terminal 10) EXBA10P
P	One side common circuit (Terminal 16) EXBQ16P
E	Diagonal common circuit (Terminal 1 and Terminal 6) EXBA10E

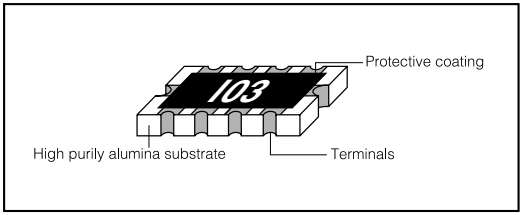
Resistance Value
The first two digits are significant figures of resistance value and the third one denotes the number of zeros following.

Resistance Tolerance

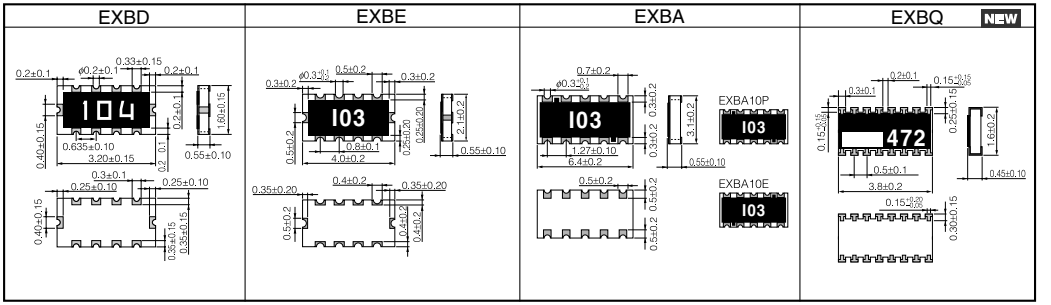
J	±5 %

Suffix for Special Requirements

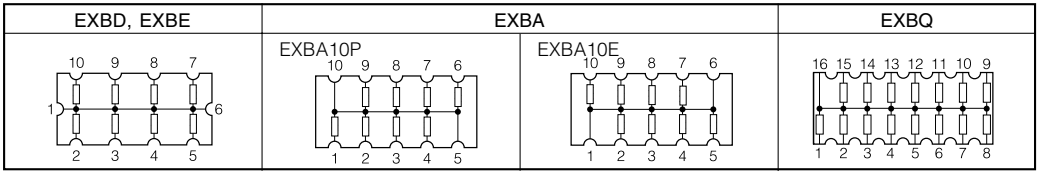
■ Construction (Example : EXBD)



■ Dimensions in mm (not to scale)



■ Circuit Configuration



■ Ratings

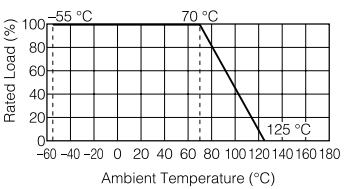
Item	Specifications			
Series	EXBD	EXBE	EXBA	EXBQ
Resistance Range	47 Ω to 1 MΩ (E12 series)			100 Ω to 470 kΩ (E6 series)
Resistance Tolerance	±5 %			
Number of Terminals	10 terminals			16 terminals
Number of Resistors	8 resistors			15 resistors
Power Rating at 70 °C	0.05 W/element	0.063 W/element		0.025 W/element
Limiting Element Voltage (Maximum Rated Continuous Working Voltage)(1)	25 V		50 V	25 V
Maximum Overload Voltage(2)	50 V		100 V	50 V
T.C.R.	±200 ×10⁻⁶/°C(ppm/°C)			
Category Temperature Range (Operating Temperature Range)	–55 °C to +125 °C			

(1) Rated Continuous Working Voltage (RCWV) should be determined from RCWV=$\sqrt{\text{Power Rating} \times \text{Resistance Value}}$, or Limiting Element Voltage (maximum RCWV) listed above, whichever less.

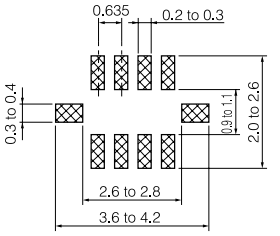
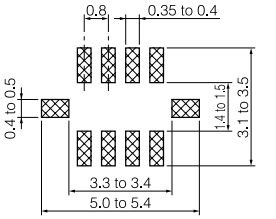
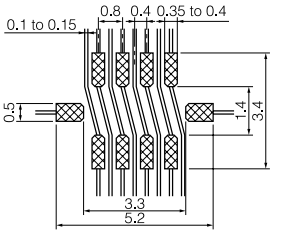
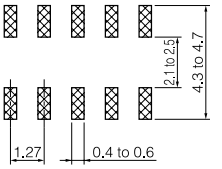
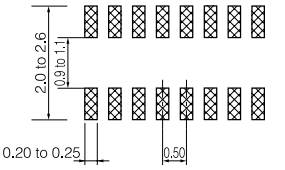
(2) Overload (Short-time Overload) Test Voltage (SOTV) should be determined from SOTV=2.5 × RCWV* or Maximum Overload Voltage listed above whichever less.

Power Derating Curve

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



■ Recommended Land Pattern (mm)

<table>
<tr><th></th><th>EXBD</th><th>EXBE</th></tr>
<tr><td>For popular pattern</td><td rowspan="2">Pitch 0.635 mm
 
</td><td>Pitch 0.8 mm
 
</td></tr>
<tr><td>For high density pattern*</td><td>Pitch 0.4 mm···Through-hole less
 
</td></tr>
<tr><td></td><td>EXBA</td><td>EXBQ</td></tr>
<tr><td>For popular pattern</td><td>Pitch 1.27 mm
 
</td><td rowspan="2"> 
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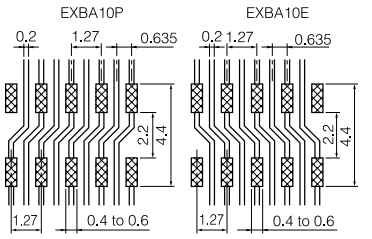
 
</td></tr>
</table>

✻ When designing high density land pattern, examine further the reliability of isolation among the lines and adopt the chip resistor networks.

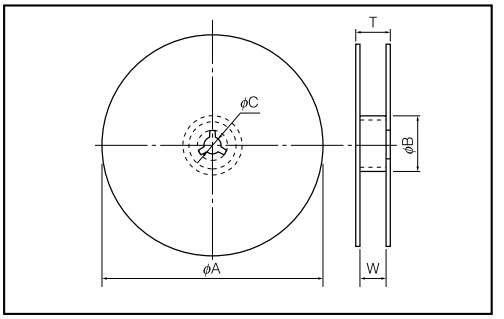
■ Packaging Methods

● Standard Quantity

Type (inches)	Thickness (mm)	Weight (mg)	Punched (Paper) Taping	Embossed Taping
EXBD (1206)	0.55 ± 0.10	10	5000 pcs./reel	
EXBE (1608)		16		4000 pcs./reel
EXBA (2512)		40		
EXBQ (1506)	0.45 ± 0.10	9	5000 pcs./reel	

■ Taping Dimensions

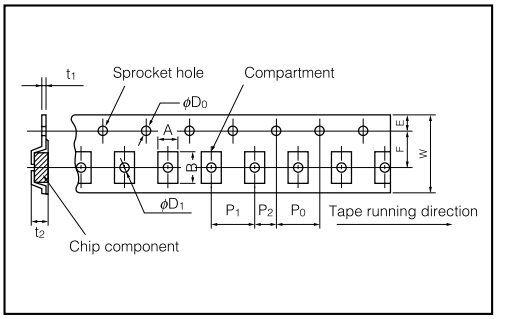
● Embossed Taping Reel



	Type	φA	φB	φC
Dimensions (mm)	EXBE	$180.0^{\ 0}_{-3.0}$	60 min	$13.0^{\pm1.0}$
	EXBA			

	Type	W	T
Dimensions (mm)	EXBE	$13.0^{\pm1.0}$	$15.4^{\pm2.0}$
	EXBA		

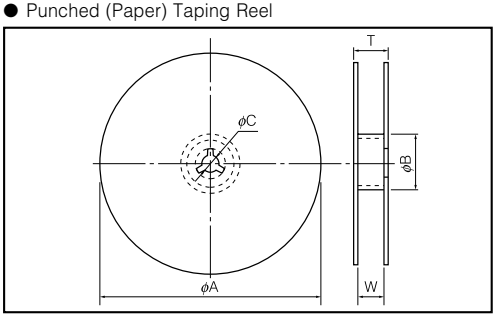
● Embossed Taping



	Type	A	B	W	F	E	P_0
Dimensions (mm)	EXBE	$2.50^{\pm0.20}$	$4.40^{\pm0.20}$	$12.00^{\pm0.30}$	$5.50^{\pm0.10}$	$1.75^{\pm0.20}$	$4.00^{\pm0.10}$
	EXBA	$3.50^{\pm0.20}$	$6.80^{\pm0.20}$				

	Type	P_1	P_2	ϕD_0	t_1	t_2	ϕD_1
Dimensions (mm)	EXBE	$4.00^{\pm0.10}$	$2.00^{\pm0.10}$	$1.50^{+0.10}_{0}$	$0.25^{\pm0.05}$	$1.10^{\pm0.20}$	$1.50^{+0.10}_{0}$
	EXBA						

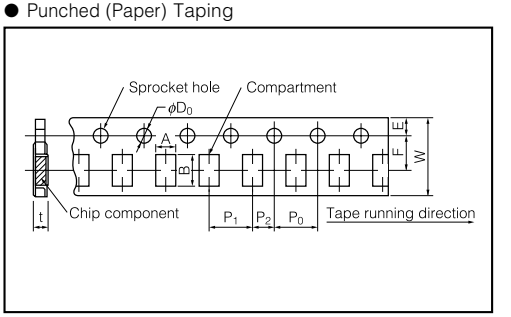
● Punched (Paper) Taping Reel



	Type	φA	φB	φC
Dimensions (mm)	EXBD	$180.0^{\ 0}_{-3.0}$	60 min	$13^{\pm1.0}$
	EXBQ			

	Type	W	T
Dimensions (mm)	EXBD	$9.0^{\pm1.0}$	$11.4^{\pm2.0}$
	EXBQ		

● Punched (Paper) Taping



	Type	A	B	W	F	E	P_0
Dimensions (mm)	EXBD	$2.00^{\pm0.20}$	$3.60^{\pm0.20}$	$8.00^{\pm0.20}$	$3.50^{\pm0.10}$	$1.75^{\pm0.10}$	$4.00^{\pm0.10}$
	EXBQ	$1.90^{\pm0.20}$	$4.10^{\pm0.20}$				

	Type	P_1	P_2	ϕD_0	t
Dimensions (mm)	EXBD	$4.00^{\pm0.10}$	$2.00^{\pm0.10}$	$1.50^{+0.10}_{0}$	$0.84^{\pm0.10}$
	EXBQ				$0.64^{\pm0.05}$

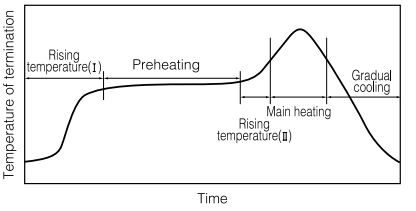
⚠Safety Precautions

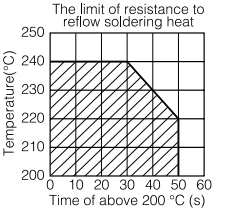
1. Soldering

Recommendation for soldering method is noted below.

- Reflow Soldering

  Precaution and recommendations are described below.
  - Please inquire of us when you use different conditions.
  - Please measure a temperature of terminations and study solderability for every type of board, before actual use.





Rising temperature Ⅰ	The normal to Preheating temperature	30 s to 60 s
Preheating	140 °C to 160 °C	60 s to 120 s
Rising temperature Ⅱ	Preheating to 200 °C	20 s to 40 s
Main heating	(cf. The limits of resistance to reflow soldering heat)	
Gradual cooling	200 °C to 100 °C	1 °C/s to 4 °C/s

(Reflow soldering shall be within two times.)

- Flow soldering

  Contact us about flow soldering of EXBA series. We can not recommend flow soldering for Chip Resistor Networks: EXBD/EXBE/EXBQ, because we are afraid that a solder bridge may occur due to narrow 0.635 mm/0.8 mm/0.5 mm pitch of EXBD/EXBE/EXBQ series.
- Iron soldering

  ① Solder at 280 °C max. and 3 seconds max. with the soldering iron tip.

  ② The soldering iron tip shall not touch the protective coating of the part.
- Use rosin type flux. Do not use high-activity flux (the chlorine content is 0.2 wt% or more).
- Allow enough preheating so that the difference of soldering temperature and temperature of surface of the part is 100 °C or less. This temperature difference shall be kept from rapidly cooling by immersion into solvent.
- More solder gives more mechanical stress to the part resulting in cracking or impaired characteristics. Avoid excessive amount of solder.

2. Cleaning
- Residual flux after board washing may cause solder migration. Carefully check the status of board washing. Study type and amount of flux to be used when no washing is made. Study type of water-soluble flux and cleaning agent and drying condition when water washing is made. Confirm they will not cause any trouble.

3. Others
- Take necessary precautions to avoid any abnormal stress caused by bending of board.
- Do not use the product in dewy atmospheres.