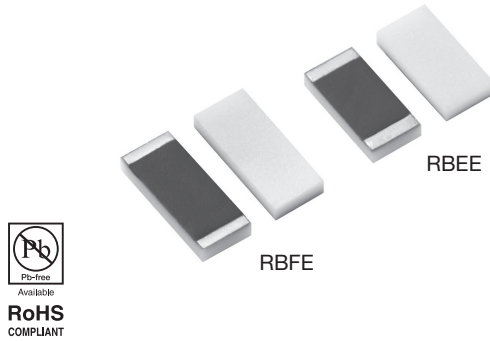


High-Precision Bulk Metal® Foil Chip Resistor (Flip-Chip) with Extended Range over 0.5Ω

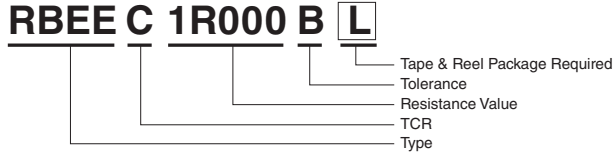


TCR, RESISTANCE RANGE, TOLERANCE, RATED POWER				
Type	TCR (ppm/°C) -25°C to 125°C*	Resistance Range (Ω)	Resistance Tolerance (%)*	Rated Power (W) at 70°C
RBEE	0±10 (C)	0.5 to 1	±0.5 (D) ±1.0 (F)	0.5
	0±25 (J)	1 to 100	±0.1 (B) ±0.5 (D)	
	0±5 (X) 0±10 (C)	100 to 10k	±0.05 (A) ±0.1 (B) ±0.5 (D)	
RBFE	0±10 (C)	0.5 to 1	±0.5 (D) ±1.0 (F)	1
	0±25 (J)	1 to 100	±0.1 (B) ±0.5 (D)	
	0±5 (X) 0±10 (C)	100 to 10k	±0.05 (A) ±0.1 (B) ±0.5 (D)	

*Symbols parenthesized are for type number composition.

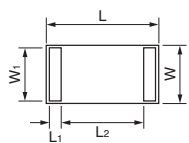
COMPOSITION OF TYPE NUMBER

Example:



Resistance value in ohm is expressed by a series of four significant digits and an R designates the decimal point.

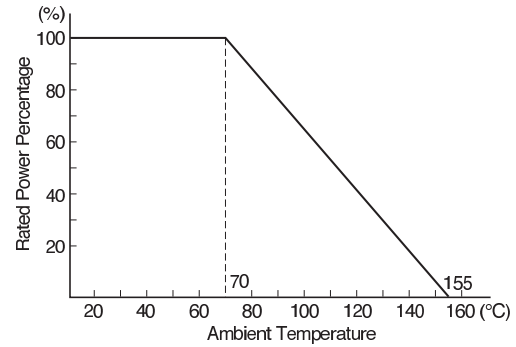
CONFIGURATION (DIMENSIONS IN mm)



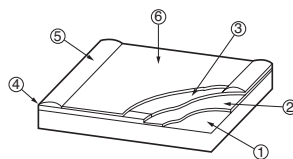
Type	RBEE	RBFE
L	5.0±0.1	6.3±0.1
W	2.5±0.1	3.2±0.1
L ₁	0.4±0.2	0.7±0.2
L ₂	4.0±0.2	4.7±0.2
W ₁	2.3±0.2	3.0±0.2
T	1.05 max.	

Dimensions in mm

POWER DERATING CURVE



CONSTRUCTION



- 1 Ceramic Substrate (High-Purity Alumina)
- 2 Heat-Resistant Bonding Layer
- 3 Bulk Metal® Foil
- 4 Metal Plating
- 5 Solder Bump (Sn-Ag-Cu)
- 6 Solder-Resist

PERFORMANCE			
Parameters	Test Condition	ALPHA Specification	ALPHA Typical Test Data
Maximum Rated Operating Temperature Working Temperature Range		70°C -65°C to +155°C	
Thermal Shock	-65°C/30 min. ↔ +155°C/30 min., 100 cycles	±0.1%	±0.03%
Overload	Rated Voltage x 2.5, 5 sec.	±0.1%	±0.03%
Low Temperature Storage and Operation	-65°C, No Load, 24 hrs. → Rated Voltage, 45 min.	±0.1%	±0.05%
Dielectric Withstanding Voltage Insulation Resistance Resistance to Soldering Heat	Atmo. Pres.: AC 200V, 1 min. DC 100V, 1 min. 260°C, 10 sec.	±0.05% over 10,000 MΩ ±0.5%	±0.01% over 10,000 MΩ ±0.03%
Shock Vibration, High Frequency	100G, 6 ms, Sawtooth Wave, X, Y, Z, each 10 shocks 20G, 10 Hz to 2,000 Hz to 10 Hz, 20 min., X, Y, Z, each 2.5 hrs.	±0.1% ±0.1%	±0.01% ±0.01%
Moisture Resistance	+65°C to -10°C, 90% RH to 98% RH, Rated Voltage, 10 cycles (240 hrs.)	±0.1%	±0.03%
Load Life	+70°C, Rated Power, ON-OFF (75% duty), 1,000 hrs.	±0.1%	±0.05%
High Temperature Exposure	155°C, No Load, 1,000 hrs.	±0.1%	±0.05%

TAPE AND REEL PACKAGE (BASED ON EIA-481-1) (DIMENSIONS IN mm)

Tape Dimensions										Reel Dimensions Reel Capacity RBEE 2,000 pieces/reel RBFE: 4,000pcs/reel								
<p>RBEE: 0.30±0.05 RBFE: 0.25±0.05</p> <p>RBEE: 1.5±0.1 RBFE: 1.2±0.1</p>																		
Type	A0	B0	W	F	E	P1	P2	P0	D0	Type	A	N	B	C	D	W1	W2	r
RBEE	2.7 ±0.1	5.2 ±0.1	12.0 ±0.2	5.5 ±0.05	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	4.0 ±0.1	Dia.1.5 +0.1-0	RBEE	Dia.178 ±2	Dia.60 min.	Dia.13 ±0.5	Dia.21 ±0.8	2.0 ±0.5	12.4 ±0.3	18.4 max.	1.0 ±0.5
RBFE	3.4 ±0.1	6.7 ±0.1	12.0 ±0.2	5.5 ±0.05	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	4.0 ±0.1	Dia.1.5 +0.1-0	RBFE								

PRECAUTION IN USING SMD CURRENT SENSE RESISTORS

1. Storage

Storage condition or environment may adversely affect solderability of the exterior terminals. Do not store in high temperature and humidity. The recommended storage environment is lower than 40°C, has less than 70% RH humidity and is free from harmful gases such as sulphur and chlorine.

2. Caution in Soldering

① Solder Reflow in Furnace

Recommended

- Peak Temperature: 250+0/-5°C
- Holding time: 10 sec. max.
- To cool gradually at room temperature.

② Dipping in Solder (Wave or Still)

Recommended

- Temp. of Solder: 260°C max.
- Length of Dipping: 10 sec.

③ Other

Soldering iron is never recommended. Corrosion-free flux such as rosin is recommended.

3. Cleaning

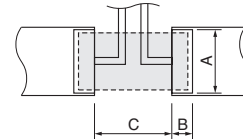
Use volatile cleaner such as methylalcohol or propylalcohol.

4. Circuit Board Design

① Solder Land Dimensions

The dimensions of solder land must be determined in conformity with the size of resistors and with the soldering method. They are also subject to the mounting machine and the material of the substrate. See example at right.

RBEE, RBFE



Type	Dimensions in mm		
	A	B	C
RBEE	2.5 to 2.6	0.6	3.9
RBFE	3.4 to 3.6	1.2	4.5