ERB Product Summary

ERB Series: Exhibiting a capacitance range of 0.5 to 1,000pF, the ERB series of capacitors comes with higher Q and lower ESR which is better than the standard products of equivalent packages. For high performance, medium power RF designs, this series offers low ESR in the 1MHz to 1GHz frequency range. The temperature stability of the C0G dielectrics ensures low power dissipation. The ERB series is designed with precious metal inner electrodes. These surface mount capacitors are available in voltages up to 500VDC in a 1210 EIA size.

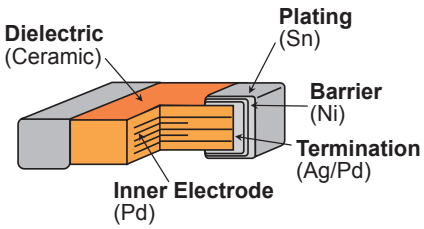
Features:

- Size: 0603, 0805, and 1210
- Voltage: 50, 100, 250, 300, 500VDC
- Cap Range: 0.5 to 1000pF
- Internal Electrode: Pd/Ag
- Termination: Pd/Ag + Ni/Sn plating
- ESR: Low
- Power: Medium Power (5-15W)
- Frequency Range: 1MHz –1GHz
- Tolerance: Tight Tolerance Available ([W]=+/-0.05pF for <=5pF, [[B]=+/-0.1pF for 5 - 9.1pF, [C]=+/-0.25pF for 5 - 9.1pF, [F]=+/-1% for 10 - 20pF)
- Temp. Characteristics: C0G (-55°C to 125°C with 0 ±30ppm/°C)

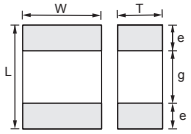
Applications: General purpose high frequency circuits, wireless equipment, high frequency radios, broadcast satellites, terminals, RF and base station power amplifiers

ERB Data Sheet

Chip Structure



Chip Dimensions



Chip Dimensions — Unit: mm

Series	EIA size	L	W	T max.	e max.	g min.
ERB18	0603	1.6+/-0.1	0.8+/-0.1	0.9	0.2	0.5
ERB21	0805	2.0+/-0.3	1.25+/-0.3	1.35	0.25	0.7
ERB32	1210	3.2+0.5/-0.4	2.5+0.5/-0.4	1.7	0.3	1.0

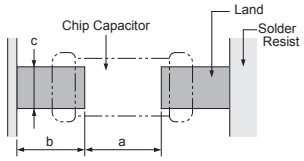
Flow Soldering

Series	a	b	c
ERB18	0.6 ~ 1.0	0.8 ~ 0.9	0.6 ~ 0.8
ERB21	1.0 ~ 1.2	0.9 ~ 1.0	0.8 ~ 1.1

Re-Flow Soldering

Series	a	b	c
ERB18	0.6 ~ 0.8	0.6 ~ 0.7	0.6 ~ 0.8
ERB21	1.0 ~ 1.2	0.6 ~ 0.7	0.8 ~ 1.1
ERB31	2.0 ~ 2.4	1.0 ~ 1.2	1.8 ~ 2.3

Land Pattern Dimensions



Capacitance Range

Series	TC	WV	Capacitance Range	
			1pF / 10pF / 100pF / 1000pF	pF
ERB18	C0G	250V	■■■■■■■■■■■■	0.5 to 100 pF
ERB21	C0G	250V	■■■■■■■■■■■■	0.5 to 100 pF
		100V	■	110 to 130 pF
		50V	■	150 to 160 pF
ERB32	C0G	500V	■■■■■■■■■■■■	0.5 to 120 pF
		300V	■	130 to 150 pF
		250V	■	160 to 220 pF
		100V	■■	240 to 470 pF
		50V	■■■■	510 to 1000 pF

Global Part Numbering

ER	B	18	8	5C	2D	100	J	DX5	B
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩

① Product ID

Code	Product
ER	Hi-Freq Type

② Series

Code	Product
B	Tin Plated Termination

③ Dimension (LxW)

Code	Dimension (LxW)
18	1.6x0.8mm
21	2.0x1.25mm
31	2.0x1.25mm

④ Dimension (T)

Code	Dimension (T)
8	0.8mm
B	1.25mm
Q	1.5mm

⑤ Temperature Characteristics

Code	TC	Cap.Change	Operating Temp. Range
5C	C0G	0+/-30ppm/C	25 to 125C

⑥ Rated Voltage

Code	Rated Voltage
1H	DC 50V
2A	DC 100V
2E	DC 250V
YD	DC 300V
2H	DC 500V

⑦ Capacitance

Code	Capacitance
R50	0.5pF
1R0	1.0pF
5R6	5.6pF
100	10pF

⑧ Capacitance Tolerance

Code	Cap. Tol.	TC
W	+/-0.05pF	C0G (<=5pF)
B	+/-0.1pF	C0G (<=5pF)
C	+/-0.25pF	C0G (<=9pF)
D	+/-0.5pF	C0G (6 to 9pF)
F	+/-1%	C0G (>=10pF)
G	+/-2%	
J	+/-5%	

⑨ Individual Specification Code

⑩ Packaging

Code	Packaging
B	Bulk in nylon bag
D	ϕ180mm Paper Taping
J	ϕ330mm Paper Taping
L	ϕ180mm Plastic Taping
K	ϕ330mm Plastic Taping

ERB Product Offering

ERB18 Series

Size	TC	WV	Cap	Cap Tol	Murata Global P/N
0603	C0G	250V	0.5pF	+/-0.1pF	ERB1885C2ER50BDX1D
0603	C0G	250V	0.5pF	+/-0.25pF	ERB1885C2ER50CDX1D
0603	C0G	250V	0.75pF	+/-0.1pF	ERB1885C2ER75BDX1D
0603	C0G	250V	0.75pF	+/-0.25pF	ERB1885C2ER75CDX1D
0603	C0G	250V	1pF	+/-0.1pF	ERB1885C2E1R0BDX1D
0603	C0G	250V	1pF	+/-0.25pF	ERB1885C2E1R0CDX1D
0603	C0G	250V	1.1pF	+/-0.1pF	ERB1885C2E1R1BDX1D
0603	C0G	250V	1.2pF	+/-0.1pF	ERB1885C2E1R2BDX1D
0603	C0G	250V	1.3pF	+/-0.1pF	ERB1885C2E1R3BDX1D
0603	C0G	250V	1.5pF	+/-0.1pF	ERB1885C2E1R5BDX1D
0603	C0G	250V	1.5pF	+/-0.25pF	ERB1885C2E1R5CDX1D
0603	C0G	250V	1.6pF	+/-0.1pF	ERB1885C2E1R6BDX1D
0603	C0G	250V	1.8pF	+/-0.1pF	ERB1885C2E1R8BDX1D
0603	C0G	250V	2pF	+/-0.1pF	ERB1885C2E2R0BDX1D
0603	C0G	250V	2pF	+/-0.25pF	ERB1885C2E2R0CDX1D
0603	C0G	250V	2.2pF	+/-0.1pF	ERB1885C2E2R2BDX1D
0603	C0G	250V	2.4pF	+/-0.1pF	ERB1885C2E2R4BDX1D
0603	C0G	250V	2.7pF	+/-0.1pF	ERB1885C2E2R7BDX1D
0603	C0G	250V	3pF	+/-0.1pF	ERB1885C2E3R0BDX1D
0603	C0G	250V	3pF	+/-0.25pF	ERB1885C2E3R0CDX1D
0603	C0G	250V	3.3pF	+/-0.1pF	ERB1885C2E3R3BDX1D
0603	C0G	250V	3.6pF	+/-0.1pF	ERB1885C2E3R6BDX1D
0603	C0G	250V	3.9pF	+/-0.1pF	ERB1885C2E3R9BDX1D
0603	C0G	250V	4pF	+/-0.1pF	ERB1885C2E4R0BDX1D
0603	C0G	250V	4pF	+/-0.25pF	ERB1885C2E4R0CDX1D
0603	C0G	250V	4.3pF	+/-0.1pF	ERB1885C2E4R3BDX1D
0603	C0G	250V	4.7pF	+/-0.1pF	ERB1885C2E4R7BDX1D
0603	C0G	250V	5pF	+/-0.1pF	ERB1885C2E5R0BDX1D
0603	C0G	250V	5pF	+/-0.25pF	ERB1885C2E5R0CDX1D
0603	C0G	250V	5.1pF	+/-0.25pF	ERB1885C2E5R1CDX1D
0603	C0G	250V	5.6pF	+/-0.25pF	ERB1885C2E5R6CDX1D
0603	C0G	250V	6pF	+/-0.25pF	ERB1885C2E6R0CDX1D
0603	C0G	250V	6pF	+/-0.5pF	ERB1885C2E6R0DDX1D
0603	C0G	250V	6.2pF	+/-0.25pF	ERB1885C2E6R2CDX1D
0603	C0G	250V	6.8pF	+/-0.25pF	ERB1885C2E6R8CDX1D

ERB Product Offering

ERB18 Series

Size	TC	WV	Cap	Cap Tol	Murata Global P/N
0603	C0G	250V	7pF	+/-0.25pF	ERB1885C2E7R0CDX5D
0603	C0G	250V	7pF	+/-0.5pF	ERB1885C2E7R0DDX5D
0603	C0G	250V	7.5pF	+/-0.25pF	ERB1885C2E7R5CDX5D
0603	C0G	250V	8pF	+/-0.25pF	ERB1885C2E8R0CDX5D
0603	C0G	250V	8pF	+/-0.5pF	ERB1885C2E8R0DDX5D
0603	C0G	250V	8.2pF	+/-0.25pF	ERB1885C2E8R2CDX5D
0603	C0G	250V	9pF	+/-0.25pF	ERB1885C2E9R0CDX5D
0603	C0G	250V	9pF	+/-0.5pF	ERB1885C2E9R0DDX5D
0603	C0G	250V	9.1pF	+/-0.25pF	ERB1885C2E9R1CDX5D
0603	C0G	250V	10pF	+/-2%	ERB1885C2E100GDX5D
0603	C0G	250V	10pF	+/-5%	ERB1885C2E100JDX5D
0603	C0G	250V	12pF	+/-2%	ERB1885C2E120GDX5D
0603	C0G	250V	12pF	+/-5%	ERB1885C2E120JDX5D
0603	C0G	250V	15pF	+/-2%	ERB1885C2E150GDX5D
0603	C0G	250V	15pF	+/-5%	ERB1885C2E150JDX5D
0603	C0G	250V	18pF	+/-2%	ERB1885C2E180GDX5D
0603	C0G	250V	18pF	+/-5%	ERB1885C2E180JDX5D
0603	C0G	250V	22pF	+/-2%	ERB1885C2E220GDX5D
0603	C0G	250V	22pF	+/-5%	ERB1885C2E220JDX5D
0603	C0G	250V	27pF	+/-2%	ERB1885C2E270GDX5D
0603	C0G	250V	27pF	+/-5%	ERB1885C2E270JDX5D
0603	C0G	250V	33pF	+/-2%	ERB1885C2E330GDX5D
0603	C0G	250V	33pF	+/-5%	ERB1885C2E330JDX5D
0603	C0G	250V	39pF	+/-2%	ERB1885C2E390GDX5D
0603	C0G	250V	39pF	+/-5%	ERB1885C2E390JDX5D
0603	C0G	250V	47pF	+/-2%	ERB1885C2E470GDX5D
0603	C0G	250V	47pF	+/-5%	ERB1885C2E470JDX5D
0603	C0G	250V	56pF	+/-2%	ERB1885C2E560GDX5D
0603	C0G	250V	56pF	+/-5%	ERB1885C2E560JDX5D
0603	C0G	250V	68pF	+/-2%	ERB1885C2E680GDX5D
0603	C0G	250V	68pF	+/-5%	ERB1885C2E680JDX5D
0603	C0G	250V	82pF	+/-2%	ERB1885C2E820GDX5D
0603	C0G	250V	82pF	+/-5%	ERB1885C2E820JDX5D
0603	C0G	250V	100pF	+/-2%	ERB1885C2E101GDX5D
0603	C0G	250V	100pF	+/-5%	ERB1885C2E101JDX5D

ERB Product Offering

ERB21 Series

Size	TC	WV	Cap	Cap Tol	Murata Global P/N
0805	C0G	250V	0.5pF	+/-0.1pF	ERB21B5C2ER50BDX1L
0805	C0G	250V	0.5pF	+/-0.25pF	ERB21B5C2ER50CDX1L
0805	C0G	250V	0.75pF	+/-0.1pF	ERB21B5C2ER75BDX1L
0805	C0G	250V	0.75pF	+/-0.25pF	ERB21B5C2ER75CDX1L
0805	C0G	250V	1pF	+/-0.1pF	ERB21B5C2E1R0BDX1L
0805	C0G	250V	1pF	+/-0.25pF	ERB21B5C2E1R0CDX1L
0805	C0G	250V	1.1pF	+/-0.1pF	ERB21B5C2E1R1BDX1L
0805	C0G	250V	1.2pF	+/-0.1pF	ERB21B5C2E1R2BDX1L
0805	C0G	250V	1.3pF	+/-0.1pF	ERB21B5C2E1R3BDX1L
0805	C0G	250V	1.5pF	+/-0.1pF	ERB21B5C2E1R5BDX1L
0805	C0G	250V	1.5pF	+/-0.25pF	ERB21B5C2E1R5CDX1L
0805	C0G	250V	1.6pF	+/-0.1pF	ERB21B5C2E1R6BDX1L
0805	C0G	250V	1.8pF	+/-0.1pF	ERB21B5C2E1R8BDX1L
0805	C0G	250V	2pF	+/-0.1pF	ERB21B5C2E2R0BDX1L
0805	C0G	250V	2pF	+/-0.25pF	ERB21B5C2E2R0CDX1L
0805	C0G	250V	2.2pF	+/-0.1pF	ERB21B5C2E2R2BDX1L
0805	C0G	250V	2.4pF	+/-0.1pF	ERB21B5C2E2R4BDX1L
0805	C0G	250V	2.7pF	+/-0.1pF	ERB21B5C2E2R7BDX1L
0805	C0G	250V	3pF	+/-0.1pF	ERB21B5C2E3R0BDX1L
0805	C0G	250V	3pF	+/-0.25pF	ERB21B5C2E3R0CDX1L
0805	C0G	250V	3.3pF	+/-0.1pF	ERB21B5C2E3R3BDX1L
0805	C0G	250V	3.6pF	+/-0.1pF	ERB21B5C2E3R6BDX1L
0805	C0G	250V	3.9pF	+/-0.1pF	ERB21B5C2E3R9BDX1L
0805	C0G	250V	4pF	+/-0.1pF	ERB21B5C2E4R0BDX1L
0805	C0G	250V	4pF	+/-0.25pF	ERB21B5C2E4R0CDX1L
0805	C0G	250V	4.3pF	+/-0.1pF	ERB21B5C2E4R3BDX1L
0805	C0G	250V	4.7pF	+/-0.1pF	ERB21B5C2E4R7BDX1L
0805	C0G	250V	5pF	+/-0.1pF	ERB21B5C2E5R0BDX1L
0805	C0G	250V	5pF	+/-0.25pF	ERB21B5C2E5R0CDX1L
0805	C0G	250V	5.1pF	+/-0.25pF	ERB21B5C2E5R1CDX1L
0805	C0G	250V	5.6pF	+/-0.25pF	ERB21B5C2E5R6CDX1L
0805	C0G	250V	6pF	+/-0.25pF	ERB21B5C2E6R0CDX1L
0805	C0G	250V	6pF	+/-0.5pF	ERB21B5C2E6R0DDX1L
0805	C0G	250V	6.2pF	+/-0.25pF	ERB21B5C2E6R2CDX1L
0805	C0G	250V	6.8pF	+/-0.25pF	ERB21B5C2E6R8CDX1L
0805	C0G	250V	7pF	+/-0.25pF	ERB21B5C2E7R0CDX1L
0805	C0G	250V	7pF	+/-0.5pF	ERB21B5C2E7R0DDX1L
0805	C0G	250V	7.5pF	+/-0.25pF	ERB21B5C2E7R5CDX1L

ERB Product Offering

ERB21 Series

Size	TC	WV	Cap	Cap Tol	Murata Global P/N
0805	C0G	250V	8pF	+/-0.25pF	ERB21B5C2E8R0CDX1L
0805	C0G	250V	8pF	+/-0.5pF	ERB21B5C2E8R0DDX1L
0805	C0G	250V	8.2pF	+/-0.25pF	ERB21B5C2E8R2CDX1L
0805	C0G	250V	9pF	+/-0.25pF	ERB21B5C2E9R0CDX1L
0805	C0G	250V	9pF	+/-0.5pF	ERB21B5C2E9R0DDX1L
0805	C0G	250V	10pF	+/-2%	ERB21B5C2E100GDX1L
0805	C0G	250V	10pF	+/-5%	ERB21B5C2E100JDX1L
0805	C0G	250V	12pF	+/-2%	ERB21B5C2E120GDX1L
0805	C0G	250V	12pF	+/-5%	ERB21B5C2E120JDX1L
0805	C0G	250V	15pF	+/-2%	ERB21B5C2E150GDX1L
0805	C0G	250V	15pF	+/-5%	ERB21B5C2E150JDX1L
0805	C0G	250V	18pF	+/-2%	ERB21B5C2E180GDX1L
0805	C0G	250V	18pF	+/-5%	ERB21B5C2E180JDX1L
0805	C0G	250V	22pF	+/-2%	ERB21B5C2E220GDX1L
0805	C0G	250V	22pF	+/-5%	ERB21B5C2E220JDX1L
0805	C0G	250V	27pF	+/-2%	ERB21B5C2E270GDX1L
0805	C0G	250V	27pF	+/-5%	ERB21B5C2E270JDX1L
0805	C0G	250V	33pF	+/-2%	ERB21B5C2E330GDX1L
0805	C0G	250V	33pF	+/-5%	ERB21B5C2E330JDX1L
0805	C0G	250V	39pF	+/-2%	ERB21B5C2E390GDX1L
0805	C0G	250V	39pF	+/-5%	ERB21B5C2E390JDX1L
0805	C0G	250V	47pF	+/-2%	ERB21B5C2E470GDX1L
0805	C0G	250V	47pF	+/-5%	ERB21B5C2E470JDX1L
0805	C0G	250V	56pF	+/-2%	ERB21B5C2E560GDX1L
0805	C0G	250V	56pF	+/-5%	ERB21B5C2E560JDX1L
0805	C0G	250V	68pF	+/-2%	ERB21B5C2E680GDX1L
0805	C0G	250V	68pF	+/-5%	ERB21B5C2E680JDX1L
0805	C0G	250V	82pF	+/-2%	ERB21B5C2E820GDX1L
0805	C0G	250V	82pF	+/-5%	ERB21B5C2E820JDX1L
0805	C0G	250V	100pF	+/-2%	ERB21B5C2E101GDX1L
0805	C0G	250V	100pF	+/-5%	ERB21B5C2E101JDX1L
0805	C0G	100V	120pF	+/-2%	ERB21B5C2A121GDX1L
0805	C0G	100V	120pF	+/-5%	ERB21B5C2A121JDX1L
0805	C0G	50V	150pF	+/-2%	ERB21B5C1H151GDX1L
0805	C0G	50V	150pF	+/-5%	ERB21B5C1H151JDX1L

ERB Product Offering

ERB32 Series

Size	TC	WV	Cap	Cap Tol	Murata Global P/N
1210	C0G	500V	0.5pF	+/-0.1pF	ERB32Q5C2HR50BDX1L
1210	C0G	500V	0.75pF	+/-0.1pF	ERB32Q5C2HR75BDX1L
1210	C0G	500V	1pF	+/-0.1pF	ERB32Q5C2H1R0BDX1L
1210	C0G	500V	1.1pF	+/-0.1pF	ERB32Q5C2H1R1BDX1L
1210	C0G	500V	1.2pF	+/-0.1pF	ERB32Q5C2H1R2BDX1L
1210	C0G	500V	1.3pF	+/-0.1pF	ERB32Q5C2H1R3BDX1L
1210	C0G	500V	1.5pF	+/-0.1pF	ERB32Q5C2H1R5BDX1L
1210	C0G	500V	1.6pF	+/-0.1pF	ERB32Q5C2H1R6BDX1L
1210	C0G	500V	1.8pF	+/-0.1pF	ERB32Q5C2H1R8BDX1L
1210	C0G	500V	2pF	+/-0.1pF	ERB32Q5C2H2R0BDX1L
1210	C0G	500V	2.2pF	+/-0.1pF	ERB32Q5C2H2R2BDX1L
1210	C0G	500V	2.4pF	+/-0.1pF	ERB32Q5C2H2R4BDX1L
1210	C0G	500V	2.7pF	+/-0.1pF	ERB32Q5C2H2R7BDX1L
1210	C0G	500V	3pF	+/-0.1pF	ERB32Q5C2H3R0BDX1L
1210	C0G	500V	3.3pF	+/-0.1pF	ERB32Q5C2H3R3BDX1L
1210	C0G	500V	3.6pF	+/-0.1pF	ERB32Q5C2H3R6BDX1L
1210	C0G	500V	3.9pF	+/-0.1pF	ERB32Q5C2H3R9BDX1L
1210	C0G	500V	4pF	+/-0.1pF	ERB32Q5C2H4R0BDX1L
1210	C0G	500V	4.3pF	+/-0.1pF	ERB32Q5C2H4R3BDX1L
1210	C0G	500V	4.7pF	+/-0.1pF	ERB32Q5C2H4R7BDX1L
1210	C0G	500V	5pF	+/-0.1pF	ERB32Q5C2H5R0BDX1L
1210	C0G	500V	5.1pF	+/-0.25pF	ERB32Q5C2H5R1CDX1L
1210	C0G	500V	5.6pF	+/-0.25pF	ERB32Q5C2H5R6CDX1L
1210	C0G	500V	6pF	+/-0.25pF	ERB32Q5C2H6R0CDX1L
1210	C0G	500V	6.2pF	+/-0.25pF	ERB32Q5C2H6R2CDX1L
1210	C0G	500V	6.8pF	+/-0.25pF	ERB32Q5C2H6R8CDX1L
1210	C0G	500V	7pF	+/-0.25pF	ERB32Q5C2H7R0CDX1L
1210	C0G	500V	7.5pF	+/-0.25pF	ERB32Q5C2H7R5CDX1L
1210	C0G	500V	8pF	+/-0.25pF	ERB32Q5C2H8R0CDX1L

ERB Product Offering

ERB32 Series

Size	TC	WV	Cap	Cap Tol	Murata Global P/N
1210	C0G	500V	8.2pF	+/-0.25pF	ERB32Q5C2H8R2CDX1L
1210	C0G	500V	9pF	+/-0.25pF	ERB32Q5C2H9R0CDX1L
1210	C0G	500V	9.1pF	+/-0.25pF	ERB32Q5C2H9R1CDX1L
1210	C0G	500V	10pF	+/-5%	ERB32Q5C2H100JDX1L
1210	C0G	500V	12pF	+/-5%	ERB32Q5C2H120JDX1L
1210	C0G	500V	15pF	+/-5%	ERB32Q5C2H150JDX1L
1210	C0G	500V	18pF	+/-5%	ERB32Q5C2H180JDX1L
1210	C0G	500V	20pF	+/-5%	ERB32Q5C2H200JDX1L
1210	C0G	500V	22pF	+/-5%	ERB32Q5C2H220JDX1L
1210	C0G	500V	27pF	+/-5%	ERB32Q5C2H270JDX1L
1210	C0G	500V	33pF	+/-5%	ERB32Q5C2H330JDX1L
1210	C0G	500V	39pF	+/-5%	ERB32Q5C2H390JDX1L
1210	C0G	500V	47pF	+/-5%	ERB32Q5C2H470JDX1L
1210	C0G	500V	56pF	+/-5%	ERB32Q5C2H560JDX1L
1210	C0G	500V	68pF	+/-5%	ERB32Q5C2H680JDX1L
1210	C0G	500V	82pF	+/-5%	ERB32Q5C2H820JDX1L
1210	C0G	500V	100pF	+/-5%	ERB32Q5C2H101JDX1L
1210	C0G	500V	120pF	+/-5%	ERB32Q5C2H121JDX1L
1210	C0G	300V	150pF	+/-5%	ERB32Q5CYD151JDX1L
1210	C0G	250V	180pF	+/-5%	ERB32Q5C2E181JDX1L
1210	C0G	250V	220pF	+/-5%	ERB32Q5C2E221JDX1L
1210	C0G	100V	270pF	+/-5%	ERB32Q5C2A271JDX1L
1210	C0G	100V	330pF	+/-5%	ERB32Q5C2A331JDX1L
1210	C0G	100V	390pF	+/-5%	ERB32Q5C2A391JDX1L
1210	C0G	100V	470pF	+/-5%	ERB32Q5C2A471JDX1L
1210	C0G	50V	560pF	+/-5%	ERB32Q5C1H561JDX1L
1210	C0G	50V	680pF	+/-5%	ERB32Q5C1H681JDX1L
1210	C0G	50V	820pF	+/-5%	ERB32Q5C1H821JDX1L
1210	C0G	50V	1000pF	+/-5%	ERB32Q5C1H102JDX1L

ERB Specifications and Test Methods

Item	Specifications	Test Method
Operating Temperature	- 55°C to 125°C	Reference Temperature: 25°C
Appearance	No defects or abnormalities.	Visual inspection.
Dimension	Within the specified dimensions.	Using calipers.
Dielectric Strength	No defects or abnormalities.	300%* of the rated voltage *250V/300V: 250%, 500V: 200%
Insulation Resistance	1,000,000MΩmin.(C≦470pF) 100,000 MΩmin. (C > 470pF) C: Nominal capacitance (pF)	DC voltage not exceeding the rated voltage at 25°C and 75%RH max. and within 2 minutes of charging.
Q	C≦220pF: Q≧10,000 220pF < C≦470pF: Q≧5,000 470pF < C≦1000pF: Q≧3,000 C: Nominal capacitance (pF)	Frequency 1±0.1MHz Voltage 1±0.2Vrms
Capacitance Temperature Characteristics	Capacitance Change: Within the specified tolerance. (Table A-1) Temperature Coefficent: Within the specified tolerance. (Table A-1) Capacitance Drift: Within ±0.2% or ±0.5pF (Whichever is larger)	The temperature coefficient is determined using the capacitance measured in step 3 as a reference. When cycling the temperature sequentially from step 1 through 5 the capacitance should be within the specified tolerance for the temperature coefficient and capacitance change as in Table A-1. The capacitance drift is calculated by dividing the differences between the maximum and minimum measured values in steps 1, 3 and 5 by the cap. value in step 3.
Adhesive Strength of Termination	No removal of the terminations or other defect should occur.	Solder the capacitor to the test jig (glass epoxy board) then apply 10N force in parallel with the test jig for 10±1sec.
Vibration Resistance	Appearance: No defects or abnormalities. Capacitance: Within the specified tolerance. C≦220pF: Q≧10,000 220pF < C≦470pF: Q≧5,000 470pF < C≦1000pF: Q≧3,000 C: Nominal capacitance (pF)	Frequency range, from 10 to 55Hz and return to 10Hz, should be traversed in approximately 1 minute. This motion should be applied for a period of 2 hours in each of 3 mutually perpendicular directions total of 6 hours).
Deflection	No crack or marked defect should occur.	Flexure: 1mm
Solderability of Termination	95% of the terminations are to be soldered evenly and continuously.	Immerse in eutectic solder solution for 5±0.5 seconds at 245±5°C or Sn-3.0Ag-0.5Cu solder solution for 5±0.5 seconds at 245±5°C.
Resistance to Soldering Heat	Appearance: No marking defects Capacitance Change: Within ±2.5% or ±0.25 pF (Whichever is larger) C≦220pF: Q≧10,000 220pF < C≦470pF: Q≧5,000 470pF < C≦1000pF: Q≧3,000 C: Nominal capacitance (pF)	Immerse the capacitor in a eutectic solder solution or Sn-3.0Ag-0.5Cu solder solution at 270±5°C for 10±0.5 seconds. Let sit at room temperature for 24±2 hours.
Temperature Cycle	Appearance: No marking defects Capacitance Change: Within ±5% or ±0.5 pF (Whichever is larger) C≦220pF: Q≧10,000 220pF < C≦470pF: Q≧5,000 470pF < C≦1000pF: Q≧3,000 C: Nominal capacitance (pF)	- 55°C to 125°C Five cycles

Step	Temperature (°C)
1	25±2
2	-55±3
3	25±2
4	125±3
5	25±2

ERB Specifications and Test Methods

Item	Specification	Test Method
Humidity Steady State	Appearance: No marking defects Capacitance Change: Within ±5% or ±0.5 pF (Whichever is larger) C≦30pF: Q ≧350, 10pF≦C<30pF: Q≧275+5°C/2C<10pF:Q ≧200+10C C: Nominal Capacitance (puff)	Apply the 24-hour heat (-10 to +65°C) and humidity (80 to 100%) treatment, 10 consecutive times.
High Temperature Load	Appearance: No marking defects Capacitance Change Within ±3% or ±0.3pF (Whichever is larger) C≦30pFmin≧Q350 10pF≦C<30pF: Q≧275+5C/2C <10pF: Q ≧200+10C C: Nominal Capacitance (pF)	Apply 200% (500V only 150%) of the rated voltage for 1000±12 hours at the maximum operating temperature ±3°C.

Table A-1

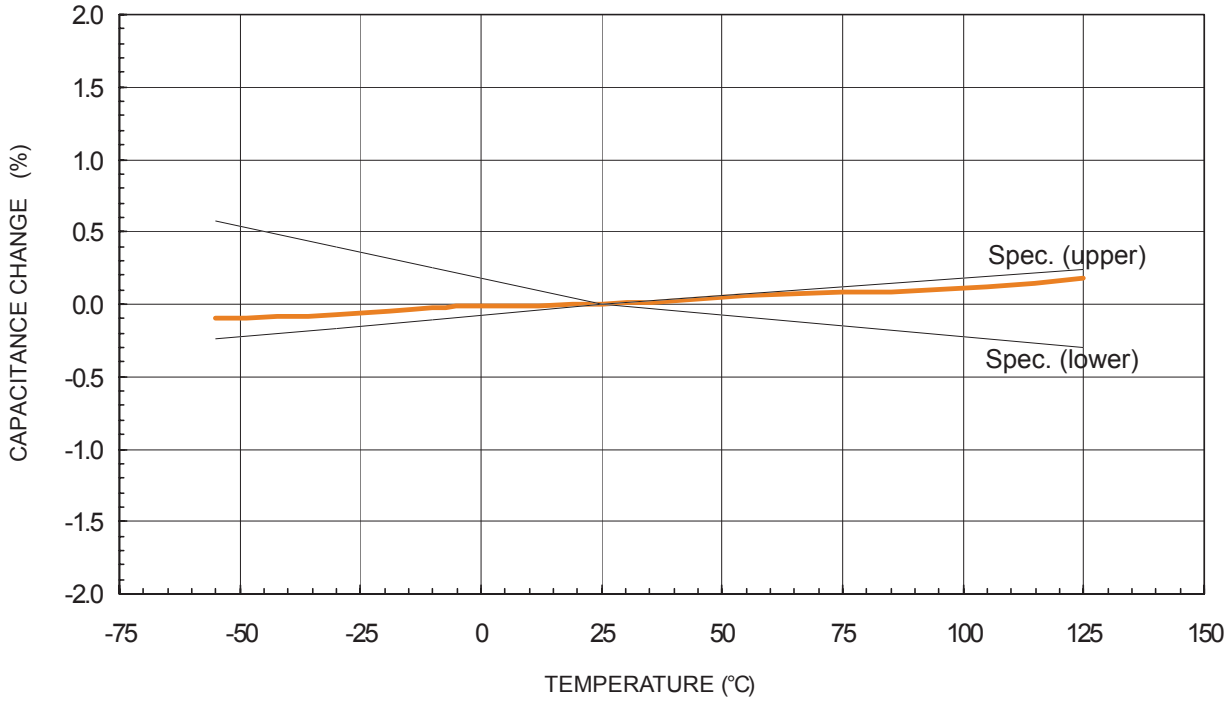
Char.	Nominal Values (ppm/°C) Note	Capacitance Change from 25°C (%)					
		−55C		−30C		−10C	
		Max.	Min.	Max.	Min.	Max.	Min.
5C	0 ± 30	0.58	-0.24	0.4C	-0.17	0.25	-0.11

Note: Nominal values denote the temperature coefficient within a range of 25°C to 125°C.

ERB Technical Data (Typical)

Capacitance - Temperature Characteristics

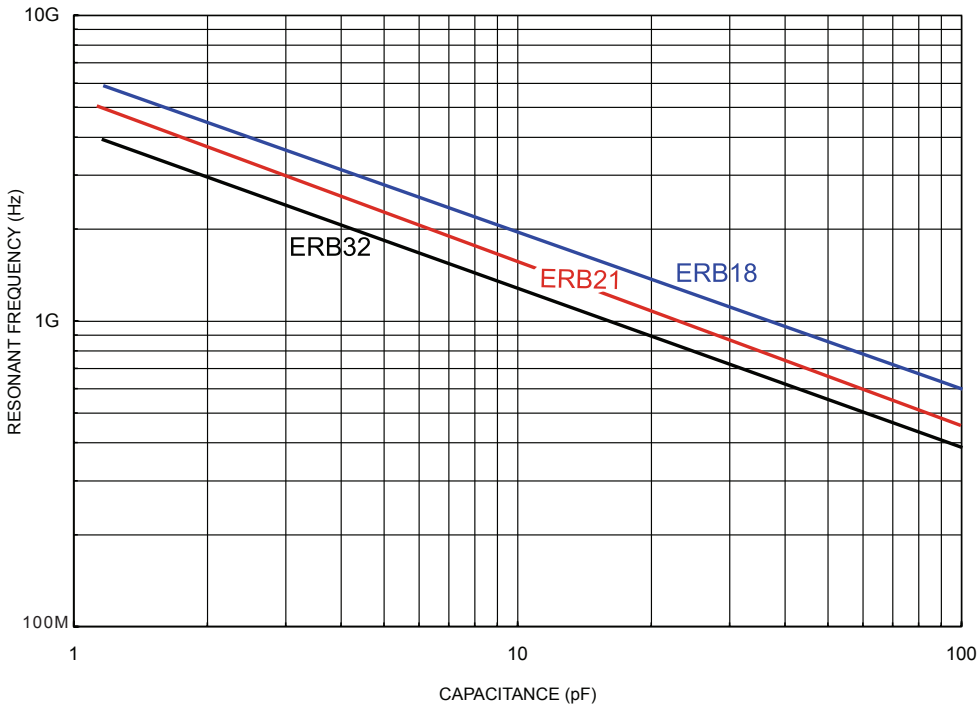
C0G Characteristics (ERB)



Resonant Frequency Characteristics

ERB Series

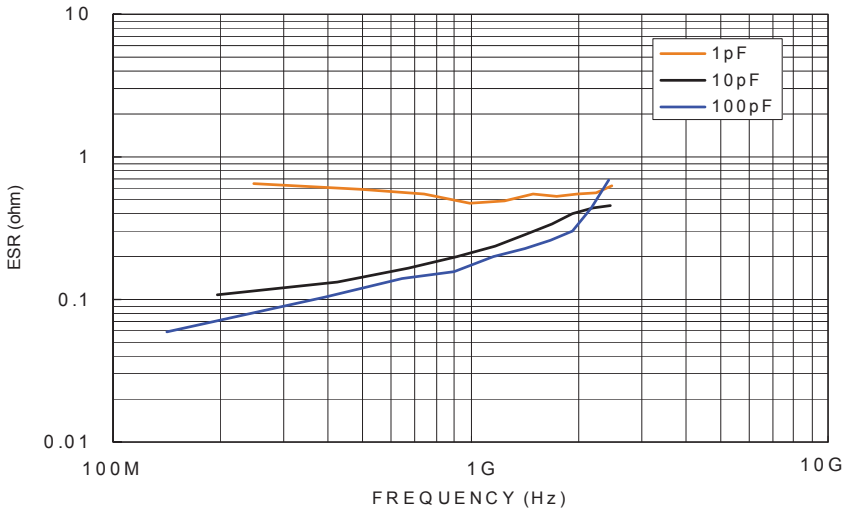
Measurement Equipment HP8753D



ERB Technical Data (Typical)

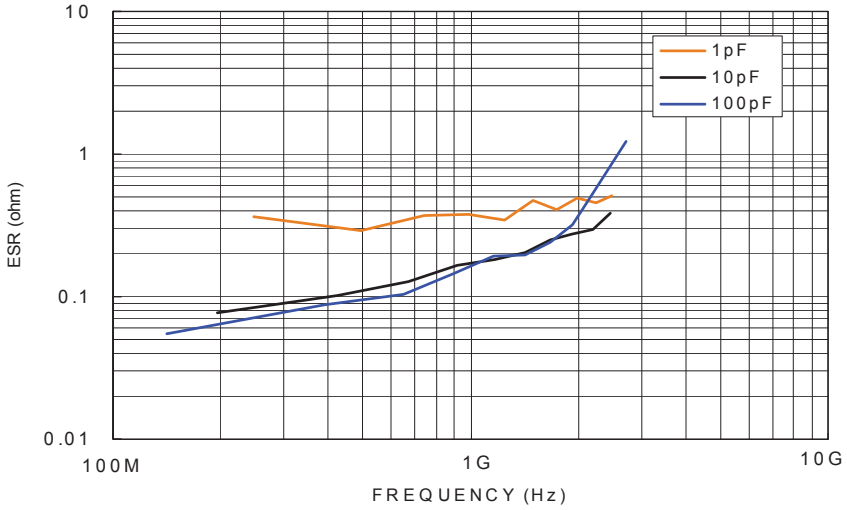
ESR - Frequency Characteristics

ERB18 Series

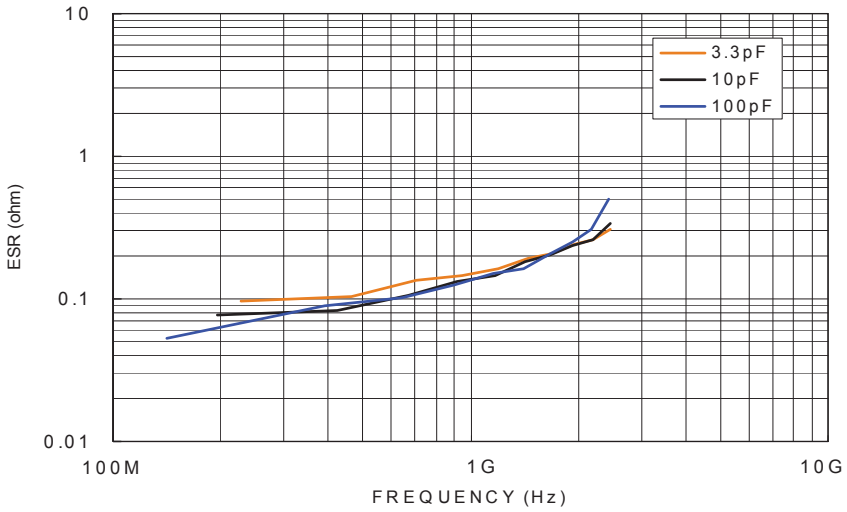


Measurement Equipment
Boontoon Resonant Coaxial Line 34A

ERB21 Series



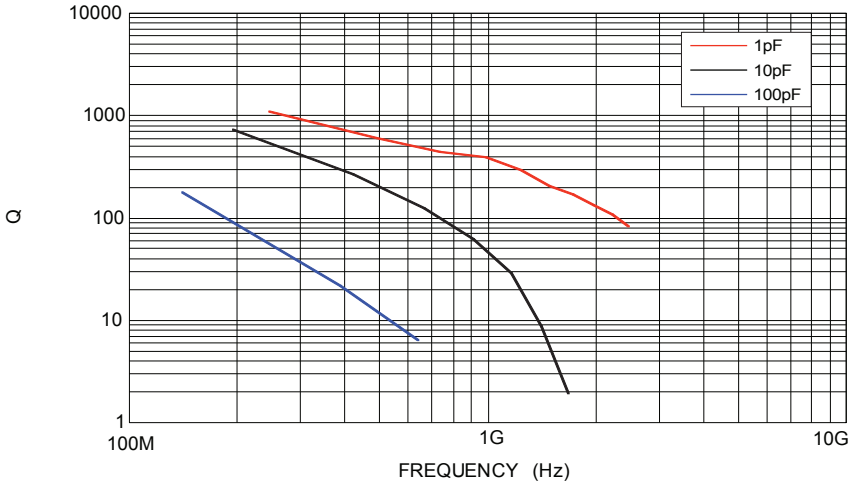
ERB32 Series



ERB Technical Data (Typical)

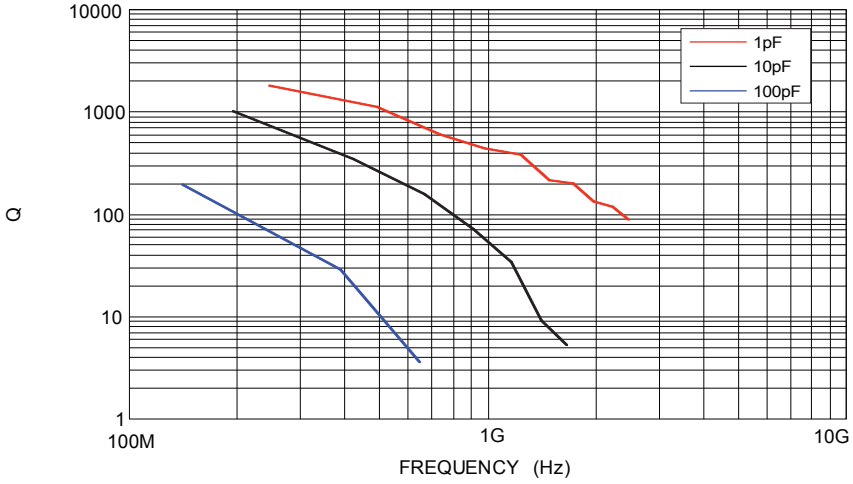
Q - Frequency Characteristics

ERB18 Series

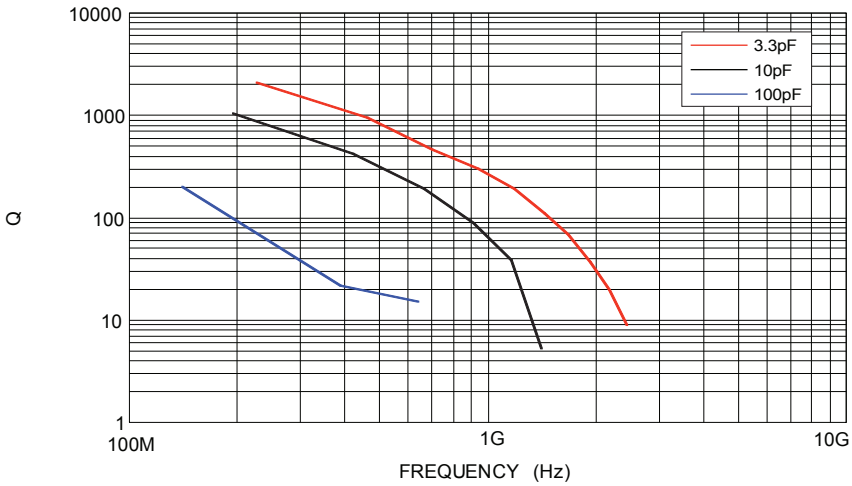


Measurement Equipment
Boonton Resonant Coaxial-Line 34A

ERB21 Series



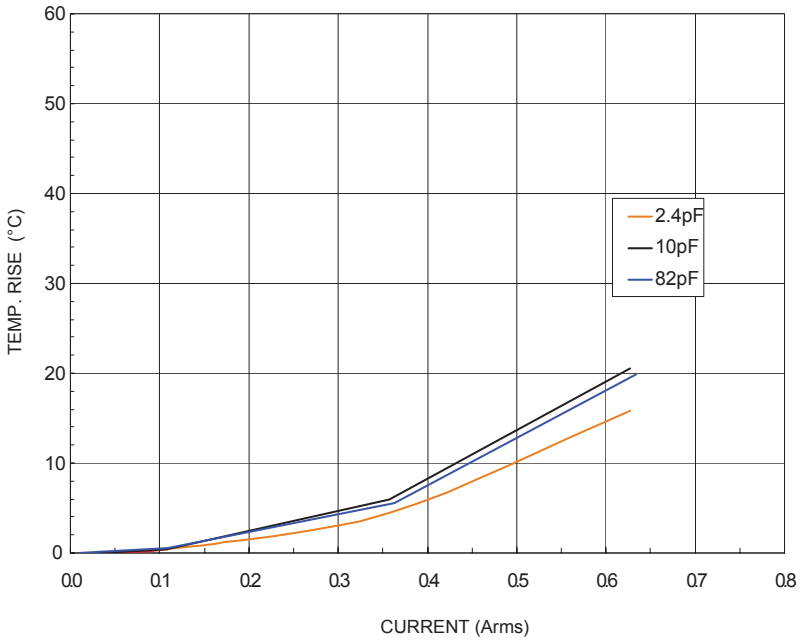
ERB32 Series



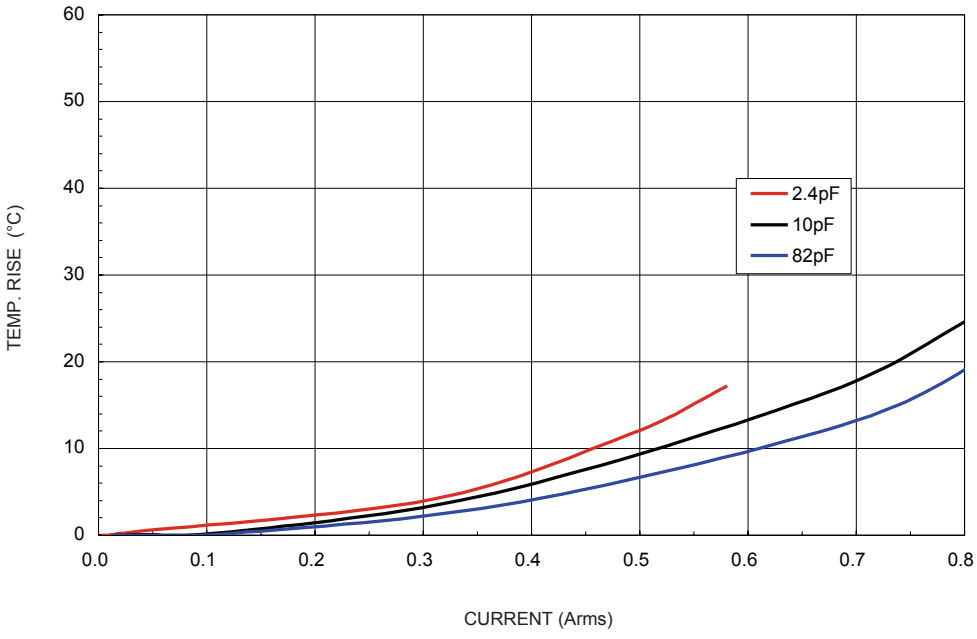
ERB Technical Data (Typical)

Temperature Rise - Current Characteristics

ERB18 Series (1GHz)



ERB21 Series (1GHz)

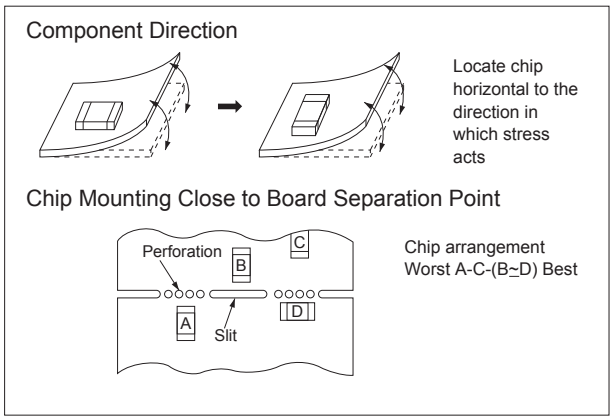


ERB Soldering and Mounting

■ ⚠Caution (Soldering and Mounting)

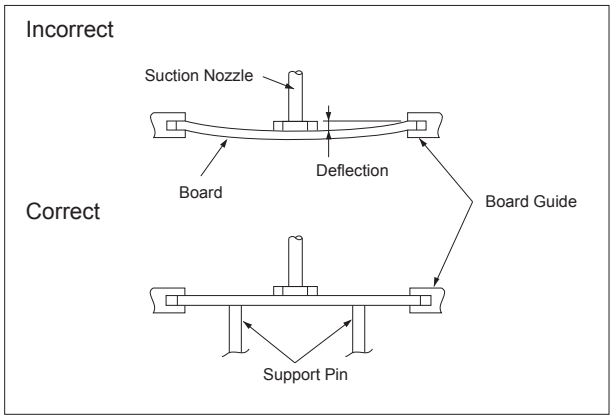
1. Mounting Position

Choose a mounting position that minimizes the stress imposed on the chip during flexing or bending of the board.



2. Chip Placing

- An excessively low bottom dead point of the suction nozzle imposes great force on the chip during mounting, causing cracked chips. So adjust the suction nozzle's bottom dead point by correcting warp in the board. Normally, the suction nozzle's bottom dead point must be set on the upper surface of the board. Nozzle pressure for chip mounting must be a 1 to 3N static load.
- Dirt particles and dust accumulated between the suction nozzle and the cylinder inner wall prevent the nozzle from moving smoothly. This imposes great force on the chip during mounting, causing cracked chips. And the locating claw, when worn out, imposes uneven forces on the chip when positioning, causing cracked chips. The suction nozzle and the locating claw must be maintained, checked and replaced periodically.



Continued on the following page.

ERB Soldering and Mounting

3. Reflow Soldering

- When sudden heat is applied to the components, the mechanical strength of the components should go down because remarkable temperature change causes deformity inside components. In order to prevent mechanical damage in the components, preheating should be required for both of the components and the PCB board. Preheating conditions are shown in Table 1. It is required to keep temperature differential between the soldering and the components surface (ΔT) as small as possible.
- Solderability of Tin plating termination chip might be deteriorated when low temperature soldering profile where peak solder temperature is below the Tin melting point is used. Please confirm the solderability of Tin plating termination chip before use.
- When components are immersed in solvent after mounting, be sure to maintain the temperature difference (ΔT) between the component and solvent within the range shown in the Table 1.

Table 1

Part Number	Temperature Differential
ERB18/21	ΔT≦190℃
ERB32	ΔT≦130℃

Recommended Conditions

	Pb-Sn Solder		Lead Free Solder
	Infrared Reflow	Vapor Reflow	
Peak Temperature	230-250°C	230-240°C	240-260°C
Atmosphere	Air	Air	Air or N_2

Pb-Sn Solder: Sn-37Pb
Lead Free Solder: Sn-3.0Ag-0.5Cu

4. Optimum Solder Amount for Reflow Soldering

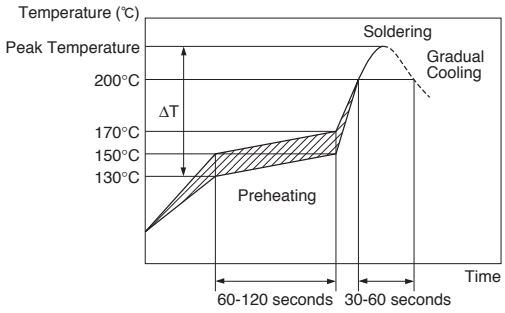
- Overly thick application of solder paste results in excessive fillet height solder.
  This makes the chip more susceptible to mechanical and thermal stress on the board and may cause cracked chips.
- Too little solder paste results in a lack of adhesive strength on the outer electrode, which may result in chips breaking loose from the PCB.
- Make sure the solder has been applied smoothly to the end surface to a height of 0.2mm min.

Inverting the PCB

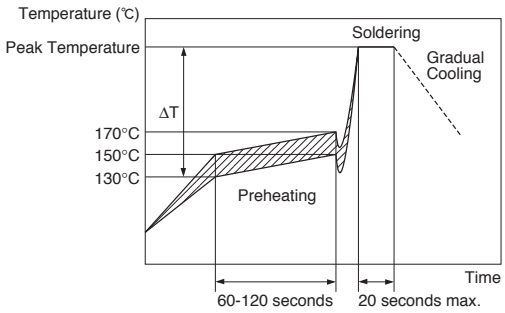
Make sure not to impose an abnormal mechanical shock on the PCB.

Standard Conditions for Reflow Soldering

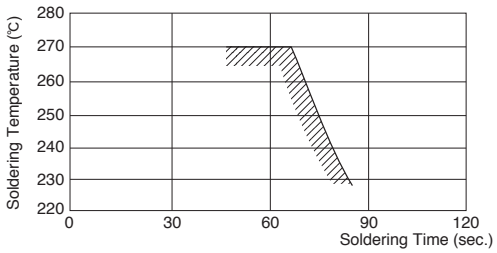
Infrared Reflow



Vapor Reflow

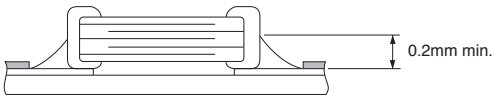


Allowable Soldering Temperature and Time



In case of repeated soldering, the accumulated soldering time must be within the range shown above.

Optimum Solder Amount for Reflow Soldering



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ERB Soldering and Mounting

5. Flow Soldering

- When sudden heat is applied to the components, the mechanical strength of the components should go down because remarkable temperature change causes deformity inside components. And an excessively long soldering time or high soldering temperature results in leaching of the outer electrodes, causing poor adhesion or a reduction in capacitance value due to loss of contact between electrodes and end termination.
- In order to prevent mechanical damage in the components, preheating shoud be required for the both components and the PCB board. Preheating conditions are shown in Table 2. It is required to keep temperature differential between the soldering and the components surface (ΔT) as small as possible.
  When components are immersed in solvent after mounting, be sure to maintain the temperature difference between the component and solvent within the range shown in Table 2.
  Do not apply flow soldering to chips not listed in Table 2.

Table 2

Part Number	Temperature Differential
ERB18/21	ΔT≦150℃

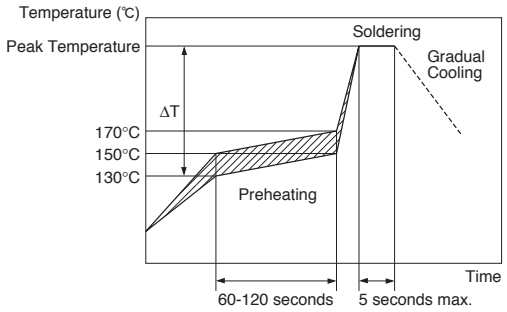
Recommended Conditions

	Pb-Sn Solder	Lead Free Solder
Peak Temperature	240-250°C	250-260°C
Atmosphere	Air	N_2

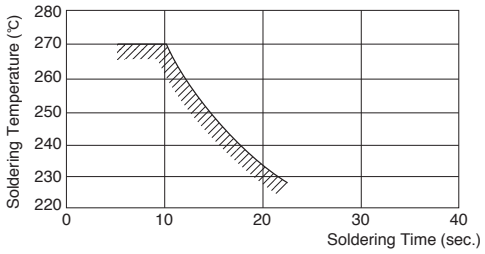
Pb-Sn Solder: Sn-37Pb
Lead Free Solder: Sn-3.0Ag-0.5Cu

- Optimum Solder Amount for Flow Soldering
  The top of the solder fillet should be lower than the thickness of components. If the solder amount is excessively big, the risk of cracking is higher during board bending or under any other stressful conditions.

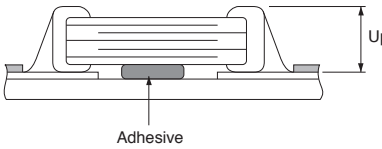
Standard Conditions for Flow Soldering



Allowable Soldering Temperature and Time



In case of repeated soldering, the accumulated soldering time must be within the range shown above.



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ERB Soldering and Mounting

6. Correction with a Soldering Iron

(1) For Chip Type Capacitors

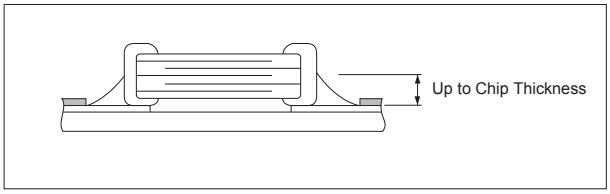
- When sudden heat is applied to the components by soldering iron, the mechanical strength of the components should go down because remarkable temperature change causes deformity inside components. In order to prevent mechanical damage in the components, preheating should be required for both of the components and the PCB board. Preheating conditions are shown in Table 3. It is required to keep temperature differential between the soldering and the components surface (ΔT) as small as possible. After soldering, it is not allowed to cool it down rapidly.

Table 3

Part Number	Temperature Differential	Peak Temperature	Atmosphere
ERB18/21	ΔT≦190℃	300°C max. 3 seconds max. / termination	Air
ERB32	ΔT≦130℃	270°C max. 3 seconds max. / termination	Air

*Applicable for both Pb-Sn and Lead Free Solder.
Pb-Sn Solder: Sn-37Pb
Lead Free Solder: Sn-3.0Ag-0.5Cu

- Optimum Solder Amount when Corrections Are Made Using a Soldering Iron
  The top of the solder fillet should be lower than the thickness of components. If the solder amount is excessively big, the risk of cracking is higher during board bending or under any other stressful conditions. Soldering iron ø3mm or smaller should be required. And it is necessary to keep a distance between the soldering iron and the components without direct touch. Thread solder with ø0.5mm or smaller is required for soldering.



7. Washing

Excessive output of ultrasonic oscillation during cleaning causes PCBs to resonate, resulting in cracked chips or broken solder. Take note not to vibrate PCBs.

FAILURE TO FOLLOW THE ABOVE CAUTIONS MAY RESULT, WORST CASE, IN A SHORT CIRCUIT AND FUMING WHEN THE PRODUCT IS USED.

ERB Design Engineering Kits

CERAMIC CHIP CAPACITORS

ASCAP Hi-Frequency

- Miniature sizes & stable C0G temperature coefficient
- Very high Q at high frequencies
- 0603, 0805 and 1210 sizes
- Low Power Consumption for Mobile Telecommunication
- Base Station, Terminal applications, Wireless equipment and High frequency radio

- Miniature sizes & stable C0G temperature coefficient
- Very high Q at high frequencies
- 0603, 0805 and 1210 sizes
- Low Power Consumption for Mobile Telecommunication
- Base Station, Terminal applications, Wireless equipment and High frequency radio

ERB18-HIQ0603KIT-E 0603 - (250 VDC)

No.	Description	Murata Global P/N	Qty.
1	0603/COG/1.0pF/250V	ERB1885C2E1R0BDX1	10
2	0603/COG/1.1pF/250V	ERB1885C2E1R1BDX1	10
3	0603/COG/1.2pF/250V	ERB1885C2E1R2BDX1	10
4	0603/COG/1.3pF/250V	ERB1885C2E1R3BDX1	10
5	0603/COG/1.5pF/250V	ERB1885C2E1R5BDX1	10
6	0603/COG/1.6pF/250V	ERB1885C2E1R6BDX1	10
7	0603/COG/1.8pF/250V	ERB1885C2E1R8BDX1	10
8	0603/COG/2.0pF/250V	ERB1885C2E2R0BDX1	10
9	0603/COG/2.4pF/250V	ERB1885C2E2R4BDX1	10
10	0603/COG/2.7pF/250V	ERB1885C2E2R7BDX1	10
11	0603/COG/3.0pF/250V	ERB1885C2E3R0CDX1	10
12	0603/COG/3.3pF/250V	ERB1885C2E3R3CDX1	10
13	0603/COG/3.6pF/250V	ERB1885C2E3R6CDX1	10
14	0603/COG/3.9pF/250V	ERB1885C2E3R9CDX1	10
15	0603/COG/4.3pF/250V	ERB1885C2E4R3CDX1	10
16	0603/COG/4.7pF/250V	ERB1885C2E4R7CDX1	10
17	0603/COG/5.1pF/250V	ERB1885C2E5R1CDX1	10
18	0603/COG/5.6pF/250V	ERB1885C2E5R6CDX1	10
19	0603/COG/6.2pF/250V	ERB1885C2E6R2CDX1	10
20	0603/COG/6.8pF/250V	ERB1885C2E6R8CDX1	10
21	0603/COG/7.5pF/250V	ERB1885C2E7R5CDX5	10
22	0603/COG/8.2pF/250V	ERB1885C2E8R2CDX5	10
23	0603/COG/9.1pF/250V	ERB1885C2E9R1CDX5	10
24	0603/COG/10pF/250V	ERB1885C2E100JDX5	10
25	0603/COG/12pF/250V	ERB1885C2E120JDX5	10
26	0603/COG/15pF/250V	ERB1885C2E150JDX5	10
27	0603/COG/18pF/250V	ERB1885C2E180JDX5	10
28	0603/COG/22pF/250V	ERB1885C2E220JDX5	10
29	0603/COG/27pF/250V	ERB1885C2E270JDX5	10
30	0603/COG/33pF/250V	ERB 1885C2E330JDX5	10
31	0603/COG/39pF/250V	ERB1885C2E390JDX5	10
32	0603/COG/47pF/250V	ERB1885C2E470JDX5	10
33	0603/COG/56pF/250V	ERB1885C2E560JDX5	10
34	0603/COG/68pF/250V	ERB1885C2E680JDX5	10
35	0603/COG/82pF/250V	ERB1885C2E820JDX5	10
36	0603/COG/100pF/250V	ERB1885C2E101JDX5	10

ERB21-HIQ0805KIT-E 0805 - (250VDC)

No.	Description	Murata Global P/N	Qty.
1	0805/COG/1.2pF/250V	ERB21 B5C2E1R2CDX1	10
2	0805/COG/1.5pF/250V	ERB21 B5C2E1R5CDX1	10
3	0805/COG/1.8pF/250V	ERB21 B5C2E1R8CDX1	10
4	0805/COG/2.2pF/250V	ERB21B5C2E2R2CDX1	10
5	0805/COG/2.7pF/250V	ERB21B5C2E2R7CDX1	10
6	0805/COG/3.3pF/250V	ERB21B5C2E3R3CDX1	10
7	0805/COG/3.9pF/250V	ERB21B5C2E3R9CDX1	10
8	0805/COG/4.7pF/250V	ERB21B5C2E4R7CDX1	10
9	0805/COG/5.6pF/250V	ERB21B5C2E5R6DDX1	10
10	0805/COG/6.8pF/250V	ERB21B5C2E6R8DDX1	10
11	0805/COG/8.2pF/250V	ERB82185C2E8R2DDX1	10
12	0805/COG/10pF/250V	ERB21B5C2E100JDX1	10
13	0805/COG/12pF/250V	ERB21B5C2E120JDX1	10
14	0805/COG/15pF/250V	ERB21B5C2E150JDX1	10
15	0805/COG/18pF/250V	ERB21B5C2E180JDX1	10
16	0805/COG/22pF/250V	ERB21B5C2E220JDX1	10
17	0805/COG/27pF/250V	ERB21B5C2E270JDX1	10
18	0805/COG/33pF/250V	ERB21B5C2E330JDX1	10
19	0805/COG/39pF/250V	ERB21B5C2E390JDX1	10
20	0805/COG/47pF/250V	ERB21B5C2E470JDX1	10
21	0805/COG/56pF/250V	ERB21B5C2E560JDX1	10
22	0805/COG/68pF/250V	ERB21B5C2E680JDX1	10
23	0805/COG/82pF/250V	ERB21B5C2E820JDX1	10
24	0805/COG/100pF/250V	ERB21B5C2E101JDX1	10

ERB32-HIQ1210KIT-E 1210 - (500VDC)

No.	Description	Murata Global P/N	Qty.
1	1210/C0G/3.3pF/500V	ERB32Q5C2H3R3CDX1	10
2	1210/C0G/3.9pF/500V	ERB32Q5C2H3R9CDX1	10
3	1210/C0G/4.7pF/500V	ERB32Q5C2H4R7CDX1	10
4	1210/C0G/5.6pF/500V	ERB32Q5C2H5R6DDX1	10
5	1210/C0G/6.8pF/500V	ERB32Q5C2H6R8DDX1	10
6	1210/C0G/8.2pF/500V	ERB32Q5C2H8R2DDX1	10
7	1210/C0G/10pF/500V	ERB32Q5C2H100JDX1	10
8	1210/C0G/12pF/500V	ERB32Q5C2H120JDX1	10
9	1210/C0G/15pF/500V	ERB32Q5C2H150JDX1	10
10	1210/C0G/18pF/500V	ERB32Q5C2H180JDX1	10
11	1210/C0G/22pF/500V	ERB32Q5C2H220JDX1	10
12	1210/C0G/27pF/500V	ERB32Q5C2H270JDX1	10
13	1210/C0G/33pF/500V	ERB32Q5C2H330JDX1	10
14	1210/C0G/39pF/500V	ERB32Q5C2H390JDX1	10
15	1210/C0G/47pF/500V	ERB32Q5C2H470JDX1	10
16	1210/C0G/56pF/500V	ERB32Q5C2H560JDX1	10
17	1210/C0G/68pF/500V	ERB32Q5C2H680JDX1	10
18	1210/C0G/82pF/500V	ERB32Q5C2H820JDX1	10
19	1210/C0G/100pF/500V	ERB32Q5C2H101JDX1	10

ERB Notes