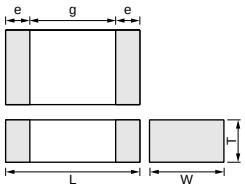
Chip Monolithic Ceramic Capacitors

High Frequency Type

SMD Type



Part Number	Dimensions (mm)				
	L	W	T max.	e	g min.
ERA11A	1.25 +0.5 -0.3	1.0 +0.5 -0.3	1.0±0.2	0.15 min.	0.3
ERA21A	2.0 +0.5 -0.3	1.25 +0.5 -0.3	1.0±0.2	0.2 min.	0.5
ERA21B			1.25±0.2		
ERA32X	3.2 +0.6 -0.4	2.5 +0.5 -0.3	1.7±0.2	0.3 min.	0.5

■ Features (ERA Series)

1. Negligible inductance is achieved by its monolithic structure so the series can be used at frequencies above 1GHz.
2. Nickel barriered terminations of ERA series improve solderability and decrease solder leaching.
3. ERA11A/21A series are designed for both flow and reflow soldering and ERA32 series are designed for reflow soldering.

■ Applications

High frequency and high power circuits

Part Number	ERA11								ERA21								ERA32							
L x W	1.25x1.00								2.00x1.25								3.20x2.50							
TC	C0G (**5C**)			CH (**6C**)			CJ (**7C**)	CK (**8C**)	C0G (**5C**)			CH (**6C**)			CJ (**7C**)	CK (**8C**)	C0G (**5C**)			CH (**6C**)			CJ (**7C**)	CK (**8C**)
Rated Volt.	200 (**2D**)	100 (**2A**)	50 (**1H**)	200 (**2D**)	100 (**2A**)	50 (**1H**)	200 (**2D**)	200 (**2D**)	200 (**2D**)	100 (**2A**)	50 (**1H**)	200 (**2D**)	100 (**2A**)	50 (**1H**)	200 (**2D**)	200 (**2D**)	200 (**2D**)	100 (**2A**)	50 (**1H**)	200 (**2D**)	100 (**2A**)	50 (**1H**)	200 (**2D**)	200 (**2D**)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)																								
0.50pF (**R50**)	1.00 (**A**)							1.20 (**A**)	1.00 (**A**)							1.00 (**A**)	1.70 (**X**)							1.70 (**X**)
0.6pF (**R60**)	1.00 (**A**)								1.00 (**A**)								1.70 (**X**)							
0.7pF (**R70**)	1.00 (**A**)								1.00 (**A**)								1.70 (**X**)							
0.75pF (**R75**)								1.20 (**A**)								1.00 (**A**)								1.70 (**X**)
0.8pF (**R80**)	1.00 (**A**)								1.00 (**A**)								1.70 (**X**)							
0.9pF (**R90**)	1.00 (**A**)								1.00 (**A**)								1.70 (**X**)							
1.0pF (**1R0**)	1.00 (**A**)							1.20 (**A**)	1.00 (**A**)							1.00 (**A**)	1.70 (**X**)							1.70 (**X**)
1.1pF (**1R1**)	1.00 (**A**)								1.00 (**A**)								1.70 (**X**)							
1.2pF (**1R2**)	1.00 (**A**)								1.00 (**A**)								1.70 (**X**)							
1.3pF (**1R3**)	1.00 (**A**)								1.00 (**A**)								1.70 (**X**)							
1.4pF (**1R4**)	1.00 (**A**)								1.00 (**A**)								1.70 (**X**)							
1.5pF (**1R5**)	1.00 (**A**)							1.20 (**A**)	1.00 (**A**)							1.00 (**A**)	1.70 (**X**)							1.70 (**X**)
1.6pF (**1R6**)	1.00 (**A**)								1.00 (**A**)								1.70 (**X**)							
1.7pF (**1R7**)	1.00 (**A**)								1.00 (**A**)								1.70 (**X**)							
1.8pF (**1R8**)	1.00 (**A**)								1.00 (**A**)								1.70 (**X**)							

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Part Number	ERA11								ERA21								ERA32							
L x W	1.25x1.00								2.00x1.25								3.20x2.50							
TC	C0G (5C)			CH (6C)			CJ (7C)	CK (8C)	C0G (5C)			CH (6C)			CJ (7C)	CK (8C)	C0G (5C)			CH (6C)			CJ (7C)	CK (8C)
Rated Volt.	200 (2D)	100 (2A)	50 (1H)	200 (2D)	100 (2A)	50 (1H)	200 (2D)	200 (2D)	200 (2D)	100 (2A)	50 (1H)	200 (2D)	100 (2A)	50 (1H)	200 (2D)	200 (2D)	200 (2D)	100 (2A)	50 (1H)	200 (2D)	100 (2A)	50 (1H)	200 (2D)	200 (2D)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)																								
1.9pF (1R9)	1.00 (A)								1.00 (A)								1.70 (X)							
2.0pF (2R0)	1.00 (A)							1.20 (A)	1.00 (A)							1.00 (A)	1.70 (X)							1.70 (X)
2.1pF (2R1)	1.00 (A)								1.00 (A)								1.70 (X)							
2.2pF (2R2)	1.00 (A)								1.00 (A)								1.70 (X)							
2.4pF (2R4)	1.00 (A)								1.00 (A)								1.70 (X)							
2.7pF (2R7)	1.00 (A)								1.00 (A)								1.70 (X)							
3.0pF (3R0)	1.00 (A)						1.20 (A)		1.00 (A)						1.00 (A)		1.70 (X)						1.70 (X)	
3.3pF (3R3)	1.00 (A)								1.00 (A)								1.70 (X)							
3.6pF (3R6)	1.00 (A)								1.00 (A)								1.70 (X)							
3.9pF (3R9)	1.00 (A)								1.00 (A)								1.70 (X)							
4.0pF (4R0)				1.00 (A)								1.00 (A)								1.70 (X)				
4.3pF (4R3)	1.00 (A)								1.00 (A)								1.70 (X)							
4.7pF (4R7)	1.00 (A)								1.00 (A)								1.70 (X)							
5.0pF (5R0)				1.00 (A)								1.00 (A)								1.70 (X)				
5.1pF (5R1)	1.00 (A)								1.00 (A)								1.70 (X)							
5.6pF (5R6)	1.00 (A)								1.00 (A)								1.70 (X)							
6.0pF (6R0)				1.00 (A)								1.00 (A)								1.70 (X)				
6.2pF (6R2)	1.00 (A)								1.00 (A)								1.70 (X)							
6.8pF (6R8)	1.00 (A)								1.00 (A)								1.70 (X)							
7.0pF (7R0)				1.20 (A)								1.00 (A)								1.70 (X)				
7.5pF (7R5)	1.00 (A)								1.00 (A)								1.70 (X)							
8.0pF (8R0)				1.20 (A)								1.00 (A)								1.70 (X)				
8.2pF (8R2)	1.00 (A)								1.00 (A)								1.70 (X)							
9.0pF (9R0)				1.20 (A)	1.00 (A)							1.25 (B)								1.70 (X)				
9.1pF (9R1)	1.00 (A)								1.25 (B)								1.70 (X)							
10pF (100)	1.00 (A)			1.00 (A)	1.00 (A)				1.25 (B)			1.25 (B)					1.70 (X)			1.70 (X)				

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Part Number	ERA11								ERA21								ERA32							
L x W	1.25x1.00								2.00x1.25								3.20x2.50							
TC	C0G (**5C**)			CH (**6C**)			CJ (**7C**)	CK (**8C**)	C0G (**5C**)			CH (**6C**)			CJ (**7C**)	CK (**8C**)	C0G (**5C**)			CH (**6C**)			CJ (**7C**)	CK (**8C**)
Rated Volt.	200 (**2D**)	100 (**2A**)	50 (**1H**)	200 (**2D**)	100 (**2A**)	50 (**1H**)	200 (**2D**)	200 (**2D**)	200 (**2D**)	100 (**2A**)	50 (**1H**)	200 (**2D**)	100 (**2A**)	50 (**1H**)	200 (**2D**)	200 (**2D**)	200 (**2D**)	100 (**2A**)	50 (**1H**)	200 (**2D**)	100 (**2A**)	50 (**1H**)	200 (**2D**)	200 (**2D**)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)																								
11pF (**110**)	1.00 (**A**)			1.00 (**A**)	1.00 (**A**)				1.25 (**B**)			1.25 (**B**)					1.70 (**X**)			1.70 (**X**)				
12pF (**120**)	1.00 (**A**)			1.00 (**A**)	1.00 (**A**)				1.25 (**B**)			1.25 (**B**)					1.70 (**X**)			1.70 (**X**)				
13pF (**130**)	1.00 (**A**)			1.00 (**A**)	1.00 (**A**)				1.25 (**B**)			1.25 (**B**)					1.70 (**X**)			1.70 (**X**)				
15pF (**150**)		1.00 (**A**)			1.00 (**A**)				1.25 (**B**)			1.25 (**B**)					1.70 (**X**)			1.70 (**X**)				
16pF (**160**)		1.00 (**A**)			1.00 (**A**)	1.00 (**A**)			1.25 (**B**)			1.25 (**B**)					1.00 (**X**)			1.70 (**X**)				
18pF (**180**)		1.00 (**A**)			1.00 (**A**)	1.00 (**A**)			1.25 (**B**)			1.25 (**B**)					1.70 (**X**)			1.70 (**X**)				
20pF (**200**)		1.00 (**A**)			1.00 (**A**)	1.00 (**A**)			1.25 (**B**)			1.25 (**B**)					1.70 (**X**)			1.70 (**X**)				
22pF (**220**)		1.00 (**A**)			1.00 (**A**)	1.00 (**A**)			1.25 (**B**)			1.25 (**B**)					1.70 (**X**)			1.70 (**X**)				
24pF (**240**)			1.00 (**A**)			1.00 (**A**)			1.25 (**B**)			1.25 (**B**)					1.70 (**X**)			1.70 (**X**)				
27pF (**270**)			1.00 (**A**)			1.00 (**A**)			1.25 (**B**)			1.25 (**B**)					1.70 (**X**)			1.70 (**X**)				
30pF (**300**)			1.00 (**A**)			1.00 (**A**)			1.25 (**B**)			1.25 (**B**)					1.70 (**X**)			1.70 (**X**)				
33pF (**330**)			1.00 (**A**)			1.00 (**A**)			1.25 (**B**)			1.25 (**B**)					1.70 (**X**)			1.70 (**X**)				
36pF (**360**)			1.00 (**A**)			1.00 (**A**)			1.25 (**B**)			1.25 (**B**)					1.70 (**X**)			1.70 (**X**)				
39pF (**390**)			1.00 (**A**)			1.00 (**A**)			1.25 (**B**)			1.25 (**B**)					1.70 (**X**)			1.70 (**X**)				
43pF (**430**)			1.00 (**A**)			1.00 (**A**)			1.25 (**B**)			1.25 (**B**)					1.70 (**X**)			1.70 (**X**)				
47pF (**470**)			1.00 (**A**)			1.00 (**A**)			1.25 (**B**)			1.25 (**B**)					1.70 (**X**)			1.70 (**X**)				
51pF (**510**)			1.00 (**A**)			1.00 (**A**)			1.25 (**B**)			1.25 (**B**)					1.70 (**X**)			1.70 (**X**)				
56pF (**560**)										1.25 (**B**)			1.25 (**B**)				1.70 (**X**)			1.70 (**X**)				
62pF (**620**)										1.25 (**B**)			1.25 (**B**)				1.70 (**X**)			1.70 (**X**)				
68pF (**680**)										1.25 (**B**)			1.25 (**B**)				1.70 (**X**)			1.70 (**X**)				
75pF (**750**)										1.25 (**B**)			1.25 (**B**)				1.70 (**X**)			1.70 (**X**)				
82pF (**820**)										1.25 (**B**)			1.25 (**B**)				1.70 (**X**)			1.70 (**X**)				
91pF (**910**)										1.25 (**B**)			1.25 (**B**)				1.70 (**X**)			1.70 (**X**)				
100pF (**101**)											1.00 (**A**)			1.00 (**A**)			1.70 (**X**)			1.70 (**X**)				
110pF (**111**)											1.25 (**B**)			1.25 (**B**)			1.70 (**X**)			1.70 (**X**)				
120pF (**121**)											1.25 (**B**)			1.25 (**B**)			1.70 (**X**)			1.70 (**X**)				

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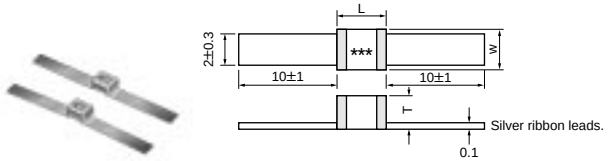
Part Number	ERA11								ERA21								ERA32							
L x W	1.25x1.00								2.00x1.25								3.20x2.50							
TC	C0G (5C)			CH (6C)			CJ (7C)	CK (8C)	C0G (5C)			CH (6C)			CJ (7C)	CK (8C)	C0G (5C)			CH (6C)			CJ (7C)	CK (8C)
Rated Volt.	200 (2D)	100 (2A)	50 (1H)	200 (2D)	100 (2A)	50 (1H)	200 (2D)	200 (2D)	200 (2D)	100 (2A)	50 (1H)	200 (2D)	100 (2A)	50 (1H)	200 (2D)	200 (2D)	200 (2D)	100 (2A)	50 (1H)	200 (2D)	100 (2A)	50 (1H)	200 (2D)	200 (2D)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)																								
130pF (**131**)											1.25 (**B**)			1.25 (**B**)			1.70 (**X**)			1.70 (**X**)				
150pF (**151**)											1.25 (**B**)			1.25 (**B**)			1.70 (**X**)			1.70 (**X**)				
160pF (**161**)											1.25 (**B**)			1.25 (**B**)			1.70 (**X**)			1.70 (**X**)				
180pF (**181**)																		1.70 (**X**)			1.70 (**X**)			
200pF (**201**)																		1.70 (**X**)			1.70 (**X**)			
220pF (**221**)																		1.70 (**X**)			1.70 (**X**)			
240pF (**241**)																		1.70 (**X**)			1.70 (**X**)			
270pF (**271**)																		1.70 (**X**)			1.70 (**X**)			
300pF (**301**)																		1.70 (**X**)			1.70 (**X**)			
330pF (**331**)																		1.70 (**X**)			1.70 (**X**)			
360pF (**361**)																		1.70 (**X**)			1.70 (**X**)			
390pF (**391**)																		1.70 (**X**)			1.70 (**X**)			
430pF (**431**)																		1.70 (**X**)			1.70 (**X**)			
470pF (**471**)																		1.70 (**X**)			1.70 (**X**)			
510pF (**511**)																		1.70 (**X**)			1.70 (**X**)			
560pF (**561**)																			1.70 (**X**)			1.70 (**X**)		
620pF (**621**)																			1.70 (**X**)			1.70 (**X**)		
680pF (**681**)																			1.70 (**X**)			1.70 (**X**)		
750pF (**751**)																			1.70 (**X**)			1.70 (**X**)		
820pF (**821**)																			1.70 (**X**)			1.70 (**X**)		
910pF (**911**)																			1.70 (**X**)			1.70 (**X**)		
1000pF (**102**)																			1.70 (**X**)			1.70 (**X**)		

The part numbering code is shown in ( ).
Dimensions are shown in mm and Rated Voltage in Vdc.

Ribbon Terminal

■ Features (ERD Series)

1. Negligible inductance is achieved by its monolithic structure so the series can be used at frequencies above 1GHz.
2. ERD Series capacitors withstand at high temperatures because ribbon leads are attached with silver paste.
3. ERD Series capacitors are easily soldered and are especially well suited in applications where only a soldering iron can be used.



*** : Capacitance Code

Part Number	Dimensions (mm)		
	L max.	W max.	T max.
ERD32D	4.0	3.0	2.3

■ Application

High frequency and high power circuits

Part Number	**ERD32**							
L x W	4.00x3.00							
TC	C0G (**5C**)			CH (**6C**)			CJ (**7C**)	CK (**8C**)
Rated Volt.	200 (**2D**)	100 (**2A**)	50 (**1H**)	200 (**2D**)	100 (**2A**)	50 (**1H**)	200 (**2D**)	200 (**2D**)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)								
0.50pF(**R50**)	2.30(**D**)							2.30(**D**)
0.6pF(**R60**)	2.30(**D**)							
0.7pF(**R70**)	2.30(**D**)							
0.75pF(**R75**)								2.30(**D**)
0.8pF(**R80**)	2.30(**D**)							
0.9pF(**R90**)	2.30(**D**)							
1.0pF(**1R0**)	2.30(**D**)							2.30(**D**)
1.1pF(**1R1**)	2.30(**D**)							
1.2pF(**1R2**)	2.30(**D**)							
1.3pF(**1R3**)	2.30(**D**)							
1.4pF(**1R4**)	2.30(**D**)							
1.5pF(**1R5**)	2.30(**D**)							2.30(**D**)
1.6pF(**1R6**)	2.30(**D**)							
1.7pF(**1R7**)	2.30(**D**)							
1.8pF(**1R8**)	2.30(**D**)							
1.9pF(**1R9**)	2.30(**D**)							
2.0pF(**2R0**)	2.30(**D**)							2.30(**D**)
2.1pF(**2R1**)	2.30(**D**)							
2.2pF(**2R2**)	2.30(**D**)							
2.4pF(**2R4**)	2.30(**D**)							
2.7pF(**2R7**)	2.30(**D**)							
3.0pF(**3R0**)	2.30(**D**)						2.30(**D**)	
3.3pF(**3R3**)	2.30(**D**)							
3.6pF(**3R6**)	2.30(**D**)							
3.9pF(**3R9**)	2.30(**D**)							
4.0pF(**4R0**)				2.30(**D**)				
4.3pF(**4R3**)	2.30(**D**)							
4.7pF(**4R7**)	2.30(**D**)							
5.0pF(**5R0**)				2.30(**D**)				
5.1pF(**5R1**)	2.30(**D**)							
5.6pF(**5R6**)	2.30(**D**)							
6.0pF(**6R0**)				2.30(**D**)				
6.2pF(**6R2**)	2.30(**D**)							
6.8pF(**6R8**)	2.30(**D**)							
7.0pF(**7R0**)				2.30(**D**)				

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Part Number	ERD32							
L x W	4.00x3.00							
TC	C0G (**5C**)			CH (**6C**)			CJ (**7C**)	CK (**8C**)
Rated Volt.	200 (**2D**)	100 (**2A**)	50 (**1H**)	200 (**2D**)	100 (**2A**)	50 (**1H**)	200 (**2D**)	200 (**2D**)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)								
7.5pF(**7R5**)	2.30(**D**)							
8.0pF(**8R0**)				2.30(**D**)				
8.2pF(**8R2**)	2.30(**D**)							
9.0pF(**9R0**)				2.30(**D**)				
9.1pF(**9R1**)	2.30(**D**)							
10pF(**100**)	2.30(**D**)			2.30(**D**)				
11pF(**110**)	2.30(**D**)			2.30(**D**)				
12pF(**120**)	2.30(**D**)			2.30(**D**)				
13pF(**130**)	2.30(**D**)			2.30(**D**)				
15pF(**150**)	2.30(**D**)			2.30(**D**)				
16pF(**160**)	2.30(**D**)			2.30(**D**)				
18pF(**180**)	2.30(**D**)			2.30(**D**)				
20pF(**200**)	2.30(**D**)			2.30(**D**)				
22pF(**220**)	2.30(**D**)			2.30(**D**)				
24pF(**240**)	2.30(**D**)			2.30(**D**)				
27pF(**270**)	2.30(**D**)			2.30(**D**)				
30pF(**300**)	2.30(**D**)			2.30(**D**)				
33pF(**330**)	2.30(**D**)			2.30(**D**)				
36pF(**360**)	2.30(**D**)			2.30(**D**)				
39pF(**390**)	2.30(**D**)			2.30(**D**)				
43pF(**430**)	2.30(**D**)			2.30(**D**)				
47pF(**470**)	2.30(**D**)			2.30(**D**)				
51pF(**510**)	2.30(**D**)			2.30(**D**)				
56pF(**560**)	2.30(**D**)			2.30(**D**)				
62pF(**620**)	2.30(**D**)			2.30(**D**)				
68pF(**680**)	2.30(**D**)			2.30(**D**)				
75pF(**750**)	2.30(**D**)			2.30(**D**)				
82pF(**820**)	2.30(**D**)			2.30(**D**)				
91pF(**910**)	2.30(**D**)			2.30(**D**)				
100pF(**101**)	2.30(**D**)			2.30(**D**)				
110pF(**111**)	2.30(**D**)			2.30(**D**)				
120pF(**121**)	2.30(**D**)			2.30(**D**)				
130pF(**131**)	2.30(**D**)			2.30(**D**)				
150pF(**151**)	2.30(**D**)			2.30(**D**)				
160pF(**161**)	2.30(**D**)			2.30(**D**)				
180pF(**181**)		2.30(**D**)			2.30(**D**)			
200pF(**201**)		2.30(**D**)			2.30(**D**)			
220pF(**221**)		2.30(**D**)			2.30(**D**)			
240pF(**241**)		2.30(**D**)			2.30(**D**)			
270pF(**271**)		2.30(**D**)			2.30(**D**)			
300pF(**301**)		2.30(**D**)			2.30(**D**)			
330pF(**331**)		2.30(**D**)			2.30(**D**)			
360pF(**361**)		2.30(**D**)			2.30(**D**)			
390pF(**391**)		2.30(**D**)			2.30(**D**)			
430pF(**431**)		2.30(**D**)			2.30(**D**)			
470pF(**471**)		2.30(**D**)			2.30(**D**)			
510pF(**511**)		2.30(**D**)			2.30(**D**)			
560pF(**561**)			2.30(**D**)			2.30(**D**)		
620pF(**621**)			2.30(**D**)			2.30(**D**)		
680pF(**681**)			2.30(**D**)			2.30(**D**)		
750pF(**751**)			2.30(**D**)			2.30(**D**)		
820pF(**821**)			2.30(**D**)			2.30(**D**)		

Continued on the following page.

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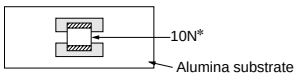
Part Number	ERD32							
L x W	4.00x3.00							
TC	C0G (**5C**)			CH (**6C**)			CJ (**7C**)	CK (**8C**)
Rated Volt.	200 (**2D**)	100 (**2A**)	50 (**1H**)	200 (**2D**)	100 (**2A**)	50 (**1H**)	200 (**2D**)	200 (**2D**)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)								
910pF(**911**)			2.30(**D**)			2.30(**D**)		
1000pF(**102**)			2.30(**D**)			2.30(**D**)		

The part numbering code is shown in ( ).
Dimensions are shown in mm and Rated Voltage in Vdc.

Specifications and Test Methods

No.	Item		Specifications	Test Method
1	Operating Temperature Range		−55℃ to +125℃	
2	Rated Voltage		See the previous pages.	The rated voltage is defined as the maximum voltage which may be applied continuously to the capacitor. When AC voltage is superimposed on DC voltage, V^{P-P} or V^{O-P}, whichever is larger, should be maintained within the rated voltage range.
3	Appearance		No defects or abnormalities	Visual inspection
4	Dimensions		Within the specified dimension	Using calipers
5	Dielectric Strength		No defects or abnormalities	No failure should be observed when 300% of the rated voltage is applied between the terminations for 1 to 5 seconds, provided the charge/discharge current is less than 50mA.
6	Insulation Resistance (I.R.)		10,000MΩ min.	The insulation resistance should be measured with a DC voltage not exceeding the rated voltage at 25℃ and standard humidity and within 2 minutes of charging.
7	Capacitance		Within the specified tolerance	The capacitance/Q should be measured at 25℃ at the frequency and voltage shown in the table. Item / Char. | C0G (1,000pF and below) Frequency | 1±0.1MHz Voltage | 0.5 to 5Vr.m.s.
8	Q		C≦ 220pF : Q≧10,000 220pF<C≦ 470pF : Q≧ 5,000 470pF<C≦1,000pF : Q≧ 3,000 C : Nominal Capacitance (pF)	
9	Capacitance Temperature Characteristics	Capacitance Variation Rate	Within the specified tolerance (Table A-6)	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 Table A. The capacitance drift is calculated by dividing the differences between the maximum and minimum measured values in steps 1, 3 and 5 by the capacitance value in step 3. The capacitance change should be measured after 5 min. at each specified temperature stage. Step | Temperature(℃) 1 | 25±2 2 | −55±3 3 | 25±2 4 | 125±3 5 | 25±2
		Temperature Coefficient	Within the specified tolerance (Table A-6)	
		Capacitance Drift	Within ±0.2% or ±0.05pF (Whichever is larger)	
10	Terminal Strength	Adhesive Strength of Termination (for chip type)	No removal of the terminations or other defects should occur.	Solder the capacitor to the test jig (alumina substrate) shown in Fig.1 using solder containing 2.5% silver. The soldering should be done either with an iron or in furnace and be conducted with care so the soldering is uniform and free of defects such as heat shock. Then apply a 10N* force in the direction of the arrow. *5N (ERA11)  Fig.1
		Tensile Strength (for micro-strip type)	Capacitor should not be broken or damaged.	The capacitor body is fixed and a load is applied gradually in the axial direction until its value reaches 5N.
		Bending Strength of lead wire terminal (for micro-strip type)	Lead wire should not be cut or broken.	Position the main body of the capacitor so the lead wire terminal is perpendicular, and load 2.5N to the lead wire terminal. Bend the main body by 90 degrees, bend back to original position, bend 90 degrees in the reverse direction, and then bend back to original position.

Continued on the following page.

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Specifications and Test Methods

Continued from the preceding page.

No.	Item		Specifications	Test Method
11	Vibration Resistance	Appearance	No defects or abnormalities	Solder the capacitor to the test jig (alumina substrate) shown in Fig. 2 using solder containing 2.5% silver. The soldering should be done either with an iron or using the reflow method and should be conducted with care so the soldering is uniform and free of defects such as heat shock. The capacitor should be subjected to a simple harmonic motion having a total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 55Hz. The 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).
		Capacitance	Within the specified tolerance	
		Q	Satisfies the initial value. C≦ 220pF : Q≧10,000 220pF<C≦ 470pF : Q≧ 5,000 470pF<C≦1,000pF : Q≧ 3,000 C : Nominal Capacitance (pF)	
12	Solderability of Termination		75% of the terminations are to be soldered evenly and continuously.	Immerse the capacitor in a solution of ethanol (JIS-K-8101) and rosin (JIS-K-5902) (25% rosin in weight proportion). Preheat at 80 to 120℃ for 10 to 30 seconds. After preheating immerse in solder containing 2.5% silver for 5±0.5 seconds at 230±5℃. The dipping depth for microstrip type capacitors is up to 1 mm from the root of the terminal.
13	Resistance to Soldering Heat		The measured and observed characteristics should satisfy the specifications in the following table. Item / Specifications Appearance / No marked defect Capacitance Change / Within ±2.5% or ±0.25pF (Whichever is larger) Q / C≦ 220pF : Q≧10,000; 220pF<C≦ 470pF : Q≧ 5,000; 470pF<C≦1,000pF : Q≧ 3,000 Dielectric Strength / No failure C : Nominal Capacitance (pF)	Preheat according to the conditions listed in the table below. Immerse in solder containing 2.5% silver for 3±0.5 seconds at 270±5℃. Set at room temperature for 24±2 hours, then measure. The dipping depth for microstrip type capacitors is up to 2mm from the root of the terminal. Chip Size / Preheat Condition 2.0×1.25mm max. / 1minute at 120 to 150℃ 3.2×2.5mm / Each 1 minute at 100 to 120℃ and then 170 to 200℃
14	Temperature Cycle		The measured and observed characteristics should satisfy the specifications in the following table. Item / Specifications Appearance / No marked defect Capacitance Change / Within ±5% or ±0.5pF (Whichever is larger) Q / C≧30pF : Q≧350; 10pF≦C<30pF : Q≧275+ 5/2 C; C<10pF : Q≧200+10C I.R. / 1,000MΩ min. Dielectric Strength / No failure C : Nominal Capacitance (pF)	Fix the capacitor to the supporting jig in the same manner and under the same conditions as (11). Perform the five cycles according to the four heat treatments listed in the following table. Let sit for 24±2 hours at room temperature, then measure. Step / 1 / 2 / 3 / 4 Temp.(℃) / −55 +0 −3 / RoomTemp. / 125 +3 −0 / RoomTemp. Time(min.) / 30±3 / 2 to 3 / 30±3 / 2 to 3
15	Humidity		The measured and observed characteristics should satisfy the specifications in the following table. Item / Specifications Appearance / No marked defect Capacitance Change / Within ±5% or ±0.5pF (Whichever is larger) Q / C≧30pF : Q≧350; 10pF≦C<30pF : Q≧275+ 5/2 C; C<10pF : Q≧200+10C I.R. / 1,000MΩ min. C : Nominal Capacitance (pF)	Apply the 24-hour heat (−10 to +65℃) and humidity (80 to 98%) treatment shown below, 10 consecutive times. Remove, let sit for 24±2 hours at room temperature, and measure.

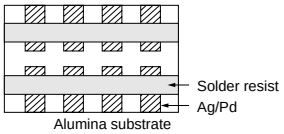
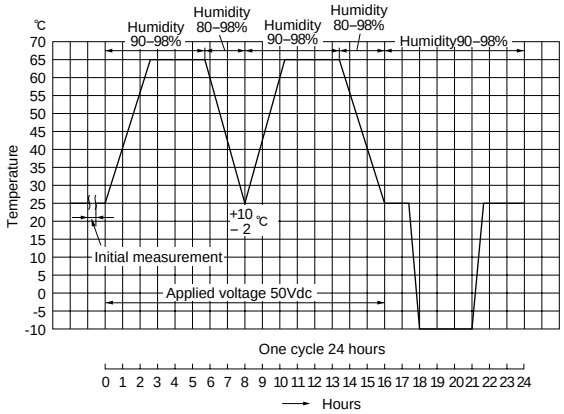


Fig. 2



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Specifications and Test Methods

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<table>
<tr><th>No.</th><th>Item</th><th>Specifications</th><th>Test Method</th></tr>
<tr><td>16</td><td>High Temperature Load</td><td>The measured and observed characteristics should satisfy the specifications in the following table.
<table>
<tr><th>Item</th><th>Specifications</th></tr>
<tr><td>Appearance</td><td>No marked defect</td></tr>
<tr><td>Capacitance Change</td><td>Within ±3% or ±0.3pF (Whichever is larger)</td></tr>
<tr><td>Q</td><td>C≧30pF : Q≧350
10pF≦C<30pF : Q≧275+$\frac{5}{2}$C
C<10pF : Q≧200+10C</td></tr>
<tr><td>I.R.</td><td>1,000MΩ min.</td></tr>
</table>
C : Nominal Capacitance (pF)</td><td>Apply 200% of the rated voltage for 1,000±12 hours at 125±3℃.
Remove and let sit for 24±2 hours at room temperature, then measure.
The charge/discharge current is less than 50mA.</td></tr>
</table>

Table A

Char. Code	Temperature Coefficient (ppm/℃) Note 1	Capacitance Change from 25℃ Value (%)					
		−55℃		−30℃		−10℃	
		Max.	Min.	Max.	Min.	Max.	Min.
5C	0±30	0.58	−0.24	0.40	−0.17	0.25	−0.11

Note 1 : Nominal values denote the temperature coefficient within a range of 25 to 125℃.