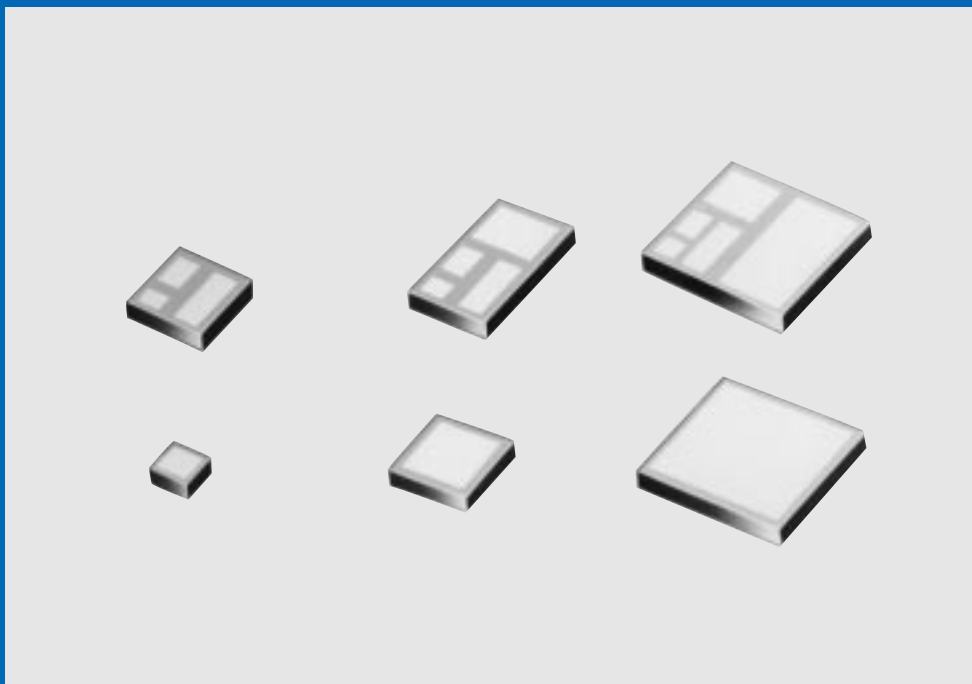


# High Frequency Microchip Capacitors

## CERAMIC CAPACITORS



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## ● Part Numbering (The structures of the "Global Part Numbers" that have been adopted since June 2001 and the meaning of each code are described herein.) (If you have any questions about details, please inquire at your usual Murata sales office or distributor.)

### High Frequency Microchip Capacitors

(Global Part Number) 

CL	B	05	B5	390	K	1	000	TC1
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                                     ①   ②   ③   ④   ⑤   ⑥   ⑦   ⑧   ⑨

#### ① Product ID

Product ID	
CL	High Frequency Microchip Capacitors

#### ② Series

Code	Series
B	with Border on Both Sides

#### ③ Size

Code	Size (L×W)
0A	0.25×0.25mm
0B	0.30×0.25mm
0C	0.35×0.25mm
0D	0.38×0.38mm
0E	0.55×0.38mm
0H	0.71×0.38mm
05	0.50×0.50mm
0G	0.70×0.50mm
0K	0.90×0.50mm
0F	0.64×0.64mm
1A	1.00×0.64mm
0J	0.76×0.76mm
1B	1.09×0.76mm
09	0.90×0.90mm
1E	1.49×0.90mm
1C	1.27×1.27mm
1G	1.73×1.27mm
2C	2.19×1.27mm
1H	1.78×1.78mm
2L	2.95×1.78mm
2E	2.29×2.29mm
3G	3.71×2.29mm

#### ④ Temperature Characteristics

Code	Temperature Range	Capacitance Change
5C	-25 to 85°C	0±30ppm/°C
6U	-25 to 85°C	-750±60ppm/°C
7K	-25 to 85°C	-2200±500ppm/°C
B5	-25 to 85°C	±10%
F9	-25 to 85°C	+30,-80%
W1	-25 to 85°C	+30,-90%

\*Reference Temp. : 25°C

#### ⑤ Capacitance

Expressed by three figures. The unit is pico-farad (pF). The first and second figures are significant digits, and the third figure expresses the number of zeros which follow the two numbers. If there is a decimal point, it is expressed by the capital letter "R". In this case, all figures are significant digits.

#### ⑥ Capacitance Tolerance

Code	Capacitance Tolerance
B	±0.1pF
K	±10%
M	±20%
Z	+80%, -20%

#### ⑦ Number of Electrodes

Code	Number of Electrodes
1	1
3	3
4	4
5	5

#### ⑧ Individual Specification Code

Code	Individual Specification Code
000	Standard

#### ⑨ Packaging

Code	Packaging
TC1	Tray

# High Frequency Microchip Capacitors



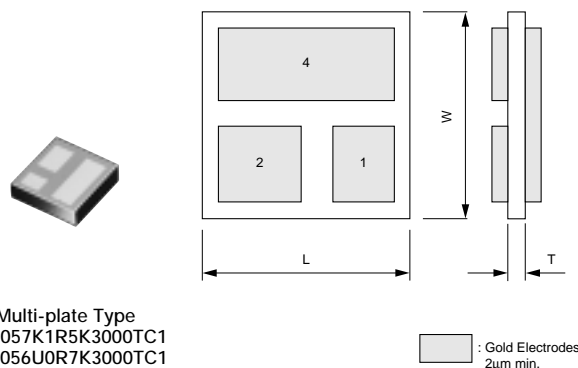
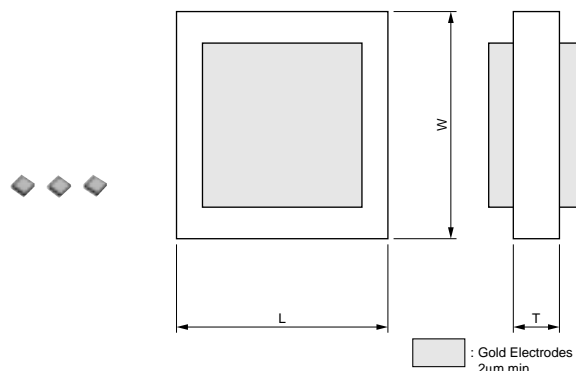
## High Frequency Microchip Capacitors

### ■ Features

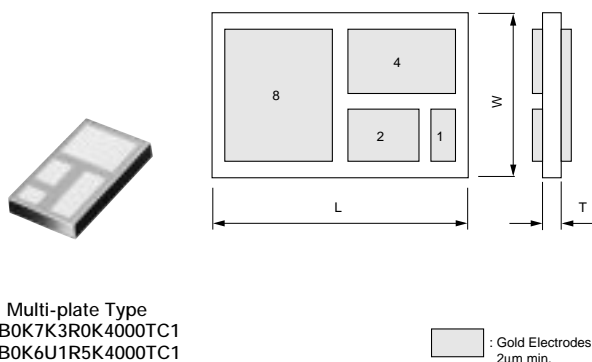
1. Fine grained high-density ceramic dielectric, pure gold electrode and simple single layer structure provide very reliable performance and excellent frequency characteristics.
2. A wide selection of sizes from very miniature 0.25mm square is suited to high-density mounting.
3. For compatibility with gold electrodes, die bonding with Au-Sn and wire bonding with gold wire are possible.
4. To improve handling of bonding, Au-Sn coating is available on one side or both sides.
5. Custom made types (dimensions, cap. values, etc.) are also available upon request.

### ■ Applications

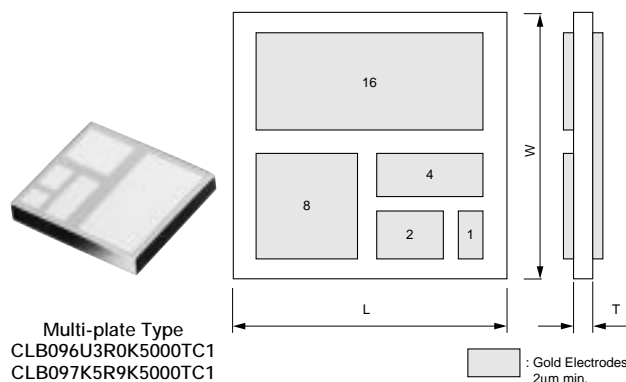
1. Microwave Integrated Circuits
2. Microwave Devices
3. Optical Devices
4. Measuring Equipment



Multi-plate Type  
CLB057K1R5K3000TC1  
CLB056U0R7K3000TC1



Multi-plate Type  
CLB0K7K3R0K4000TC1  
CLB0K6U1R5K4000TC1



Multi-plate Type  
CLB096U3R0K5000TC1  
CLB097K5R9K5000TC1

## Temperature Compensating 5C Characteristics (0 ±30ppm/°C)

Part Number	CLB																			
Size Code	0A	0C	0D	05	0E	0F	0G	0H	0J	09	1A	1B	1C	1E	1G	1H	2C	2E	2L	3G
L	0.25	0.35	0.38	0.50	0.55	0.64	0.70	0.71	0.76	0.90	1.00	1.09	1.27	1.49	1.73	1.78	2.19	2.29	2.95	3.71
W	0.25	0.25	0.38	0.50	0.38	0.64	0.50	0.38	0.76	0.90	0.64	0.76	1.27	0.90	1.27	1.78	1.27	2.29	1.78	2.29
T (max.)	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.45	0.45	0.45	0.45	0.45
Capacitance and Tolerance																				
0.1pF (0R1)	B																			
0.2pF (0R2)		B	B																	
0.3pF (0R3)			B	B		B														
0.4pF (0R4)			B	B		B			B											
0.5pF (0R5)				B	B	B			B	B										
0.6pF (0R6)				B	B	B			B	B										
0.7pF (0R7)						B	B	B	B	B										

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Part Number	CLB																			
Size Code	0A	0C	0D	05	0E	0F	0G	0H	0J	09	1A	1B	1C	1E	1G	1H	2C	2E	2L	3G
L	0.25	0.35	0.38	0.50	0.55	0.64	0.70	0.71	0.76	0.90	1.00	1.09	1.27	1.49	1.73	1.78	2.19	2.29	2.95	3.71
W	0.25	0.25	0.38	0.50	0.38	0.64	0.50	0.38	0.76	0.90	0.64	0.76	1.27	0.90	1.27	1.78	1.27	2.29	1.78	2.29
T (max.)	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.45	0.45	0.45	0.45	0.45
Capacitance and Tolerance																				
0.8pF (0R8)						B	B	B	B	B										
0.9pF (0R9)						B	B		B	B										
1.0pF (1R0)						K	K		K	K			K							
1.1pF (1R1)									K	K	K		K							
1.2pF (1R2)									K	K	K		K							
1.3pF (1R3)									K	K	K		K							
1.5pF (1R5)										K	K	K	K							
1.6pF (1R6)										K	K	K	K							
1.8pF (1R8)										K		K	K			K				
2.0pF (2R0)												K	K	K		K				
2.2pF (2R2)													K	K		K				
2.4pF (2R4)													K	K		K				
2.7pF (2R7)													K	K		K				
3.0pF (3R0)													K			K		K		
3.3pF (3R3)													K			K		K		
3.6pF (3R6)													K			K		K		
3.9pF (3R9)															K	K		K		
4.3pF (4R3)															K	K		K		
4.7pF (4R7)															K	K		K		
5.1pF (5R1)																K	K	K		
5.6pF (5R6)																K		K		
6.2pF (6R2)																K		K		
6.8pF (6R8)																K		K		
7.5pF (7R5)																		K	K	
8.2pF (8R2)																		K	K	
9.1pF (9R1)																		K	K	
10pF (100)																		K	K	
11pF (110)																				K
12pF (120)																				K
13pF (130)																				K
15pF (150)																				K
16pF (160)																				K

Custom capacitors (dimensions, capacitance, etc.) are available upon request. Please consult us for details.

The digits shown in ( ) following capacitance are part numbering codes.

Dimensions are shown in mm.

Capacitance Tolerance B:  $\pm 0.1\text{pF}$ , K:  $\pm 10\%$

## Temperature Compensating 6U Characteristics ( $-750 \pm 60\text{ppm}/^\circ\text{C}$ )

Part Number	CLB																			
Size Code	0A	0B	0C	0D	05	0E	0F	0G	0H	0J	1B	09	1A	1C	1E	1G	1H	2E	2L	3G
L	0.25	0.30	0.35	0.38	0.50	0.55	0.64	0.70	0.71	0.76	1.09	0.90	1.00	1.27	1.49	1.73	1.78	2.29	2.95	3.71
W	0.25	0.25	0.25	0.38	0.50	0.38	0.64	0.50	0.38	0.76	0.76	0.90	0.64	1.27	0.90	1.27	1.78	2.29	1.78	2.29
T (max.)	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.45	0.45	0.45	0.45
Capacitance and Tolerance																				
0.3pF (0R3)	B																			
0.4pF (0R4)	B																			
0.5pF (0R5)	B																			
0.6pF (0R6)	B																			
0.7pF (0R7)	B																			
0.8pF (0R8)		B																		
0.9pF (0R9)			B	B																
1.0pF (1R0)				K	K															
1.1pF (1R1)				K	K															

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Part Number	CLB																			
Size Code	0A	0B	0C	0D	05	0E	0F	0G	0H	0J	1B	09	1A	1C	1E	1G	1H	2E	2L	3G
L	0.25	0.30	0.35	0.38	0.50	0.55	0.64	0.70	0.71	0.76	1.09	0.90	1.00	1.27	1.49	1.73	1.78	2.29	2.95	3.71
W	0.25	0.25	0.25	0.38	0.50	0.38	0.64	0.50	0.38	0.76	0.76	0.90	0.64	1.27	0.90	1.27	1.78	2.29	1.78	2.29
T (max.)	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.45	0.45	0.45	0.45
Capacitance and Tolerance																				
1.2pF (1R2)				K	K															
1.3pF (1R3)				K	K															
1.5pF (1R5)				K	K															
1.6pF (1R6)				K	K															
1.8pF (1R8)					K	K														
2.0pF (2R0)					K	K	K													
2.2pF (2R2)					K	K	K													
2.4pF (2R4)					K	K	K													
2.7pF (2R7)							K	K	K											
3.0pF (3R0)							K	K		K										
3.3pF (3R3)							K			K		K								
3.6pF (3R6)							K			K		K								
3.9pF (3R9)							K			K		K								
4.3pF (4R3)							K			K		K								
4.7pF (4R7)										K		K	K							
5.1pF (5R1)										K		K	K							
5.6pF (5R6)										K		K	K							
6.2pF (6R2)										K		K	K							
6.8pF (6R8)											K	K								
7.5pF (7R5)											K			K	K					
8.2pF (8R2)														K	K					
9.1pF (9R1)														K	K					
10pF (100)														K						
11pF (110)														K						
12pF (120)														K						
13pF (130)														K			K			
15pF (150)														K			K			
16pF (160)																K	K			
18pF (180)																K	K			
20pF (200)																K	K	K		
22pF (220)																	K	K		
24pF (240)																	K	K		
27pF (270)																	K	K		
30pF (300)																		K	K	
33pF (330)																		K	K	
36pF (360)																		K	K	
39pF (390)																		K	K	
43pF (430)																		K		
47pF (470)																				K
51pF (510)																				K
56pF (560)																				K

Custom capacitors (dimensions, capacitance, etc.) are available upon request. Please consult us for details.


The digits shown in ( ) following capacitance are part numbering codes.

Dimensions are shown in mm.

Capacitance Tolerance B:  $\pm 0.1\text{pF}$ , K:  $\pm 10\%$

## Temperature Compensating 7K Characteristics (-2200 ± 500ppm/°C)

Part Number	CLB																			
Size Code	0A	0B	0C	0D	05	0E	0F	0G	0H	0J	09	1A	1B	1C	1E	1G	1H	2E	2L	3G
L	0.25	0.30	0.35	0.38	0.50	0.55	0.64	0.70	0.71	0.76	0.90	1.00	1.09	1.27	1.49	1.73	1.78	2.29	2.95	3.71
W	0.25	0.25	0.25	0.38	0.50	0.38	0.64	0.50	0.38	0.76	0.90	0.64	0.76	1.27	0.90	1.27	1.78	2.29	1.78	2.29
T (max.)	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.45	0.45	0.45	0.45
Capacitance and Tolerance																				
0.8pF (0R8)	B																			
0.9pF (0R9)	B																			
1.0pF (1R0)	K																			
1.1pF (1R1)	K																			
1.2pF (1R2)	K																			
1.3pF (1R7)	K																			
1.5pF (1R5)		K																		
1.6pF (1R6)		K																		
1.8pF (1R8)			K	K																
2.0pF (2R0)				K																
2.2pF (2R2)				K	K															
2.4pF (2R4)				K	K															
2.7pF (2R7)				K	K															
3.0pF (3R0)				K	K															
3.3pF (3R3)					K	K														
3.6pF (3R6)					K	K	K													
3.9pF (3R9)					K	K	K													
4.3pF (4R3)					K	K	K													
4.7pF (4R7)					K		K		K											
5.1pF (5R1)							K	K	K											
5.6pF (5R6)							K	K		K										
6.2pF (6R2)							K			K	K									
6.8pF (6R8)							K			K	K									
7.5pF (7R5)							K			K	K									
8.2pF (8R2)										K	K	K								
9.1pF (9R1)										K	K	K								
10pF (100)										K	K	K								
11pF (110)										K	K	K								
12pF (120)											K		K							
13pF (130)											K		K							
15pF (150)													K	K	K					
16pF (160)														K	K					
18pF (180)														K	K					
20pF (200)														K						
22pF (220)														K						
24pF (240)														K						
27pF (270)														K			K			
30pF (300)																K	K			
33pF (330)																K	K			
36pF (360)																K	K			
39pF (390)																	K	K		
43pF (430)																	K	K		
47pF (470)																	K	K		
51pF (510)																		K	K	
56pF (560)																		K	K	
62pF (620)																		K	K	
68pF (680)																		K	K	
75pF (750)																		K	K	
82pF (820)																				K
91pF (910)																				K
100pF (101)																				K

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Part Number	CLB																			
Size Code	0A	0B	0C	0D	05	0E	0F	0G	0H	0J	09	1A	1B	1C	1E	1G	1H	2E	2L	3G
L	0.25	0.30	0.35	0.38	0.50	0.55	0.64	0.70	0.71	0.76	0.90	1.00	1.09	1.27	1.49	1.73	1.78	2.29	2.95	3.71
W	0.25	0.25	0.25	0.38	0.50	0.38	0.64	0.50	0.38	0.76	0.90	0.64	0.76	1.27	0.90	1.27	1.78	2.29	1.78	2.29
T (max.)	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.45	0.45	0.45	0.45
Capacitance and Tolerance																				
110pF (111)																				K

Custom capacitors (dimensions, capacitance, etc.) are available upon request. Please consult us for details.


The digits shown in ( ) following capacitance are part numbering codes.

Dimensions are shown in mm.

Capacitance Tolerance B:  $\pm 0.1\text{pF}$ , K:  $\pm 10\%$

## High Dielectric B5 Characteristics ( $\pm 10\%$ )

Part Number	CLB																				
Size Code	0A	0B	0C	0D	05	0E	0F	0G	0H	0J	09	1A	1B	1C	1E	1G	1H	2C	2E	2L	3G
L	0.25	0.30	0.35	0.38	0.50	0.55	0.64	0.70	0.71	0.76	0.90	1.00	1.09	1.27	1.49	1.73	1.78	2.19	2.29	2.95	3.71
W	0.25	0.25	0.25	0.38	0.50	0.38	0.64	0.50	0.38	0.76	0.90	0.64	0.76	1.27	0.90	1.27	1.78	1.27	2.29	1.78	2.29
T (max.)	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.45	0.45	0.45	0.45	0.45
Capacitance and Tolerance																					
2.0pF (2R0)	K																				
2.2pF (2R2)	K																				
2.4pF (2R4)	K																				
2.7pF (2R7)	K																				
3.0pF (3R0)	K																				
3.3pF (3R3)		K																			
3.6pF (3R6)		K																			
3.9pF (3R9)			K																		
4.3pF (4R3)			K																		
4.7pF (4R7)	K																				
5.1pF (5R1)	K			K																	
5.6pF (5R6)	K			K	K																
6.2pF (6R2)	K			K	K																
6.8pF (6R8)	K			K	K																
7.5pF (7R5)	K			K	K																
8.2pF (8R2)	K				K	K															
9.1pF (9R1)	K				K	K															
10pF (100)	K				K	K	K														
11pF (110)	K			K	K		K														
12pF (120)	K			K	K		K														
13pF (130)		K		K	K		K														
15pF (150)		K		K	K		K			K											
16pF (160)			K	K	K		K			K	K										
18pF (180)			K	K	K		K			K	K										
20pF (200)				K	K		K			K	K										
22pF (220)				K	K		K			K	K										
24pF (240)				K	K		K			K	K										
27pF (270)				K	K		K			K	K										
30pF (300)				K	K		K			K	K										
33pF (330)					K	K	K			K	K			K							
36pF (360)					K	K	K			K	K			K							
39pF (390)					K	K	K			K	K			K							
43pF (430)					K	K	K			K	K			K							
47pF (470)							K	K	K	K	K			K							
51pF (510)							K	K	K	K	K			K							
56pF (560)							K	K	K	K	K			K							
62pF (620)							K	K		K	K			K			K				
68pF (680)							K	K		K	K					K	K				
75pF (750)							K			K	K			K			K				
82pF (820)										K	K	K		K			K				

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Part Number	CLB																				
Size Code	0A	0B	0C	0D	05	0E	0F	0G	0H	0J	09	1A	1B	1C	1E	1G	1H	2C	2E	2L	3G
L	0.25	0.30	0.35	0.38	0.50	0.55	0.64	0.70	0.71	0.76	0.90	1.00	1.09	1.27	1.49	1.73	1.78	2.19	2.29	2.95	3.71
W	0.25	0.25	0.25	0.38	0.50	0.38	0.64	0.50	0.38	0.76	0.90	0.64	0.76	1.27	0.90	1.27	1.78	1.27	2.29	1.78	2.29
T (max.)	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.45	0.45	0.45	0.45	0.45
Capacitance and Tolerance																					
91pF (910)										K	K	K		K			K		K		
100pF (101)										K	K	K		K			K		K		
110pF (111)										K	K	K		K			K		K		
120pF (121)											K	K	K	K			K		K		
130pF (131)											K		K	K			K		K		
150pF (151)														K	K		K		K		
160pF (161)														K	K		K		K		
180pF (181)														K	K		K		K		
200pF (201)														K			K		K		
220pF (221)														K			K		K		
240pF (241)														K			K		K		
270pF (271)														K			K		K		
300pF (301)																K	K		K		
330pF (331)																K	K		K		
360pF (361)																K	K		K		
390pF (391)																	K	K	K		
430pF (431)																	K		K		
470pF (471)																	K		K		
510pF (511)																			K	K	
560pF (561)																			K	K	
620pF (621)																			K	K	
680pF (681)																			K	K	
750pF (751)																			K	K	
820pF (821)																					K
910pF (911)																					K
1000pF (102)																					K
1100pF (112)																					K
1200pF (122)																					K

Custom capacitors (dimensions, capacitance, etc.) are available upon request. Please consult us for details.

The digits shown in ( ) following capacitance are part numbering codes.

Dimensions are shown in mm.

Capacitance Tolerance K:  $\pm 10\%$

## High Dielectric F9 Characteristics (+30%, -80%)

Part Number	CLB																				
Size Code	0A	0B	0C	0D	05	0E	0F	0G	0H	0J	09	1A	1B	1C	1E	1G	1H	2C	2E	2L	3G
L	0.25	0.30	0.35	0.38	0.50	0.55	0.64	0.70	0.71	0.76	0.90	1.00	1.09	1.27	1.49	1.73	1.78	2.19	2.29	2.95	3.71
W	0.25	0.25	0.25	0.38	0.50	0.38	0.64	0.50	0.38	0.76	0.90	0.64	0.76	1.27	0.90	1.27	1.78	1.27	2.29	1.78	2.29
T (max.)	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.45	0.45	0.45	0.45	0.45
Capacitance and Tolerance																					
27pF (270)	M																				
30pF (300)	M																				
33pF (330)	M																				
36pF (360)		M																			
39pF (390)		M																			
43pF (430)			M																		
47pF (470)			M																		
51pF (510)			M																		
62pF (620)				M																	
68pF (680)				M																	
75pF (750)				M	M																
82pF (820)				M	M																
91pF (910)					M	M															

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Part Number	CLB																				
Size Code	0A	0B	0C	0D	05	0E	0F	0G	0H	0J	09	1A	1B	1C	1E	1G	1H	2C	2E	2L	3G
L	0.25	0.30	0.35	0.38	0.50	0.55	0.64	0.70	0.71	0.76	0.90	1.00	1.09	1.27	1.49	1.73	1.78	2.19	2.29	2.95	3.71
W	0.25	0.25	0.25	0.38	0.50	0.38	0.64	0.50	0.38	0.76	0.90	0.64	0.76	1.27	0.90	1.27	1.78	1.27	2.29	1.78	2.29
T (max.)	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.45	0.45	0.45	0.45	0.45
Capacitance and Tolerance																					
100pF (101)					M	M															
110pF (111)					M	M															
120pF (121)					M	M															
130pF (131)					M		M		M												
150pF (151)							M	M	M												
160pF (161)							M	M													
180pF (181)							M	M													
200pF (201)							M	M		M	M										
220pF (221)							M			M	M										
240pF (241)										M	M	M									
270pF (271)										M	M	M									
300pF (301)										M	M	M									
330pF (331)											M	M	M								
360pF (361)											M	M	M								
390pF (391)											M		M								
430pF (431)														M	M						
470pF (471)														M	M						
510pF (511)														M	M						
560pF (561)														M	M						
620pF (621)														M							
680pF (681)														M							
750pF (751)														M			M				
820pF (821)																M	M				
910pF (911)																M	M				
1000pF (102)																M	M				
1100pF (112)																	M	M			
1200pF (122)																	M	M	M		
1300pF (132)																	M	M	M		
1500pF (152)																			M	M	
1600pF (162)																			M	M	
1800pF (182)																			M	M	
2000pF (202)																			M		
2200pF (222)																			M		
2400pF (242)																					M
2700pF (272)																					M
3000pF (302)																					M

Custom capacitors (dimensions, capacitance, etc.) are available upon request. Please consult us for details.

The digits shown in ( ) following capacitance are part numbering codes.

Dimensions are shown in mm.

Capacitance Tolerance M: ±20%

## High Dielectric W1 Characteristics (+30%, -90%)

Part Number	CLB								
Size Code	0A	0D	05	0F	0J	09	1C	1H	2E
L	0.25	0.38	0.50	0.64	0.76	0.90	1.27	1.78	2.29
W	0.25	0.38	0.50	0.64	0.76	0.90	1.27	1.78	2.29
T (max.)	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.45	0.45
Capacitance and Tolerance									
36pF (360)	Z								
39pF (390)	Z								
43pF (430)	Z								
47pF (470)	Z								
51pF (510)	Z								

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Part Number	CLB								
Size Code	0A	0D	05	0F	0J	09	1C	1H	2E
L	0.25	0.38	0.50	0.64	0.76	0.90	1.27	1.78	2.29
W	0.25	0.38	0.50	0.64	0.76	0.90	1.27	1.78	2.29
T (max.)	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.45	0.45
Capacitance and Tolerance									
56pF (560)	Z								
91pF (910)		Z							
100pF (101)		Z							
110pF (111)		Z							
120pF (121)		Z							
130pF (131)		Z	Z						
150pF (151)		Z	Z						
160pF (161)			Z						
180pF (181)			Z						
200pF (201)			Z						
220pF (221)			Z	Z					
240pF (241)				Z					
270pF (271)				Z					
300pF (301)				Z					
330pF (331)				Z	Z				
360pF (361)				Z	Z				
390pF (391)				Z	Z	Z			
430pF (431)					Z	Z			
470pF (471)					Z	Z			
510pF (511)					Z	Z			
560pF (561)					Z	Z			
620pF (621)						Z			
680pF (681)						Z			
820pF (820)							Z		
910pF (911)							Z		
1000pF (102)							Z		
1100pF (112)							Z		
1200pF (122)							Z		
1300pF (132)							Z		
1500pF (152)								Z	
1600pF (162)								Z	
1800pF (182)								Z	
2000pF (202)								Z	
2200pF (222)								Z	
2400pF (242)								Z	Z
2700pF (272)								Z	Z
3000pF (302)									Z
3300pF (332)									Z
3600pF (362)									Z
3900pF (392)									Z
4300pF (432)									Z

Custom capacitors (dimensions, capacitance, etc.) are available upon request. Please consult us for details.

The digits shown in ( ) following capacitance are part numbering codes.

Dimensions are shown in mm.

Capacitance Tolerance Z: +80%, -20%

## Multi-plate Type

Part Number	Size (mm)	Capacitance (pF)	Temperature Coefficient	Rated Voltage (Vdc)
<b>CLB056U0R7K3000TC1</b>	L 0.50 X W 0.50 X T(max) 0.35	0.7	-750±60ppm/°C	100
<b>CLB057K1R5K3000TC1</b>	L 0.50 X W 0.50 X T(max) 0.35	1.5	-2200±500ppm/°C	100
<b>CLB0K6U1R5K4000TC1</b>	L 0.90 X W 0.50 X T(max) 0.35	1.5	-750±60ppm/°C	100
<b>CLB0K7K3R0K4000TC1</b>	L 0.90 X W 0.50 X T(max) 0.35	3.0	-2200±500ppm/°C	100
<b>CLB096U3R0K5000TC1</b>	L 0.90 X W 0.90 X T(max) 0.35	3.0	-750±60ppm/°C	100
<b>CLB097K5R9K5000TC1</b>	L 0.90 X W 0.90 X T(max) 0.35	5.9	-2200±500ppm/°C	100

Custom capacitors (dimensions, capacitance, etc.) are available upon request. Please consult us for details.

Capacitance Tolerance K: ±10%

Capacitance values are of longest plates.

## Specifications and Test Methods

No.	Item		Specifications	Test Methods												
1	Operating Temperature Range		-55 to +125°C													
2	Appearance		No visual damage	Magnification at 20x												
3	Rated Voltage		100Vdc													
4	Capacitance		Within the specified tolerance	MIL-STD-202 Method 305 Test Frequency: Temp. Comp. : 1MHz±10% High K : 1kHz±10% Test Voltage : 1Vrms												
5	Q/Dissipation Factor (D. F.)		5C : Q≥200 6U : Q≥100 7K : Q≥80 B5, F9 : D. F.≤2.5% W1 : D. F.≤4%	MIL-STD-202 Method 306 Test frequency and voltage are the same as those for the capacitance test.												
6	Insulation Resistance (I. R.)		25°C : 100000MΩ min. 125°C : 10000MΩ min.	MIL-STD-202 Method 302 Apply 100Vdc for a max. of 2 minutes with a max. of 50mA limiting the charging current.												
7	Dielectric Withstanding Voltage (D. W. V.)		No damage	MIL-STD-202 Method 301 250Vdc for 1 to 5 seconds with a max. of 50mA limiting the surge current.												
8	Temperature Characteristics (Temperature Coefficient)		5C : 0±30ppm/°C 6U : -750±60ppm/°C 7K : -2200±500ppm/°C B5 : ±10% F9 : +30, -80% W1 : +30, -90%	Capacitance should be measured at the steps shown in the table below. <table><tr><th>Step</th><th>Temp (°C)</th></tr><tr><td>1</td><td>25±2</td></tr><tr><td>2</td><td>-25±3</td></tr><tr><td>3</td><td>25±2</td></tr><tr><td>4</td><td>85±3</td></tr><tr><td>5</td><td>25±2</td></tr></table>	Step	Temp (°C)	1	25±2	2	-25±3	3	25±2	4	85±3	5	25±2
Step	Temp (°C)															
1	25±2															
2	-25±3															
3	25±2															
4	85±3															
5	25±2															
9	Mechanical Strength	Bond Strength	Pull force: 3.0g min. No termination lifting	MIL-STD-883 Method 2011Condition D Mount the capacitors on a gold metallized alumina substrate with AuSn (80/20) and bond a 25µm gold wire to the capacitor electrode using wedge bonding. Then, pull the wire.												
		Die Shear Strength	Exceed MIL-STD-883 Method 2019	MIL-STD-883 Method 2019 Mount the capacitors on a gold metallized alumina substrate with AuSn (80/20). Apply force parallel to the substrate.												
10	Vibration	Appearance	No mechanical damage	MIL-STD-202 Method 201 Ramp frequency from 10 to 55Hz then return to 10Hz all within 1 minute. Amplitude: 1.5mm max. total excursion. Apply this motion for a period of 2 hours in each of 3 mutually perpendicular directions (total 6 hours).												
		Capacitance	Within the specified tolerance													
		Q/D. F.	Initial requirement													
11	Thermal Shock	Appearance	No mechanical damage	MIL-STD-202 Method 107Condition A-1 Note : Temperature in step 3 is +125±3 °C and time for steps 1 and 3 is 30 minutes.												
		Capacitance Change	5C, 6U, 7K : ≤±5% or ≤±0.5pF (whichever is greater) B5, F9, W1 : ≤±10%													
		Q/D. F.	Initial requirement													
		I. R.	1000MΩ min.													
		D. W. V.	No damage													
12	Humidity (No Load)	Appearance	No mechanical damage	MIL-STD-202 Method 103 1000±12 hours at 60±5°C in 90 to 95% relative humidity												
		Capacitance Change	5C, 6U, 7K : ≤±5% or ≤±0.5pF (whichever is greater) B5, F9, W1 : ≤±10%													
		Q/D. F.	5C, 6U : Q≥100 7K : Q≥80 B5, F9 : D. F.≤2.5% W1 : D. F.≤4%													
		I. R.	≥30% of initial requirement													
		D. W. V.	No damage													

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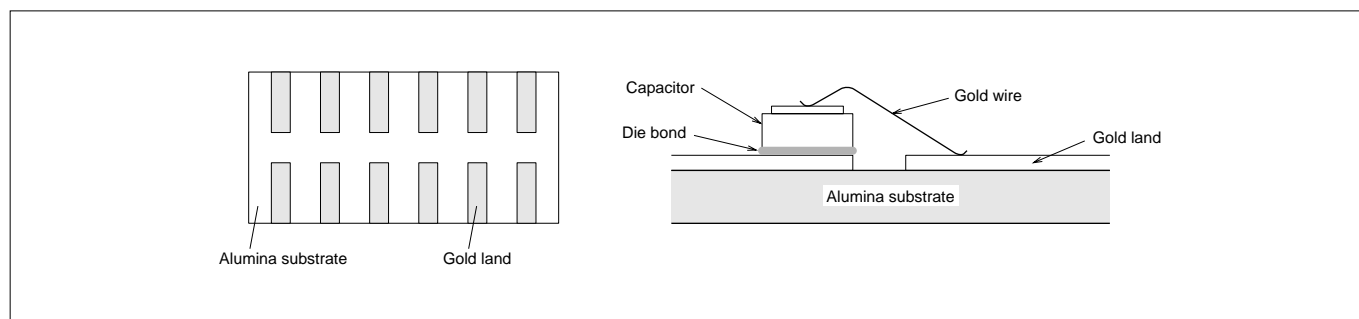
## Specifications and Test Methods

Continued from the preceding page.

No.	Item		Specifications	Test Methods
13	High Temperature Load	Appearance	No mechanical damage	MIL-STD-202 Method 108 1000±12 hours at 125±3°C with 200% of the rated voltage applied
		Capacitance Change	5C, 6U, 7K : $\leq \pm 5\%$ or $\leq \pm 0.5\text{pF}$ (whichever is greater) B5, F9, W1 : $\leq \pm 10\%$	
		Q/D. F.	5C, 6U : $Q \geq 100$ 7K : $Q \geq 80$ B5, F9 : D. F. $\leq 2.5\%$ W1 : D. F. $\leq 4\%$	
		I. R.	$\geq 30\%$ of initial requirement	
		D. W. V.	No damage	
14	Humidity Load	Appearance	No mechanical damage	240 hours at 85±2°C in 85±5% relative humidity with applied bias voltage of 1.5Vdc±10%
		Capacitance Change	5C, 6U, 7K : $\leq \pm 5\%$ or $\leq \pm 0.5\text{pF}$ (whichever is greater) B5, F9, W1 : $\leq \pm 10\%$	
		Q/D. F.	5C, 6U : $Q \geq 100$ 7K : $Q \geq 50$ B5, F9 : D. F. $\leq 2.5\%$ W1 : D. F. $\leq 4\%$	
		I. R.	$\geq 10000\text{M}\Omega$	
		D. W. V.	No damage	

Final measurement of tests No. 11 to 14 should be taken after stabilization at room temperature for 24±2 hours (5C, 6U, 7K) or 48±4 hours (B5, F9, W1).

Mounting for testing: The capacitors should be mounted on the substrate as shown below using die bonding and wire bonding when tests No.10 to14 are performed.



## Notice

### ■ Notice (Storage and Operating Condition)

Note the following to prevent poor die bonding and poor wire bonding.

1. Store the capacitors in manufacturer's package in the following conditions without a rapid thermal change in an indoor room.
  - Temperature : -10 to 40 degree C
  - Humidity : 30 to 70%RH
2. Avoid storing the capacitors in the following conditions.
  - (a) Ambient air containing corrosive gas.  
(Chlorine gas, Hydrogen sulfide gas,

Ammonia gas, Sulfuric acid gas, Nitric oxide gas, etc.)

- (b) Ambient air containing volatile or combustible gas
- (c) In environments with a high concentration of airborne particles
- (d) In liquid (water, oil, chemical solution, organic solvents, etc.)
- (e) In environments where condensation may occur
- (f) In direct sunlight
- (g) In freezing environments

### ■ Notice (Soldering and Mounting)

1. Die bonding of capacitors

- (1) Using materials and bonding conditions

- Solders : Au-20%Sn
- Bonding temperature : 300 to 320 degree C
- Bonding time : less than 1 minute
- Bonding atmosphere : N2 atmosphere

- (2) Notice

- (a) Please scrub the capacitors while mounting.
    - (b) Die bonding condition is affected by what kind of solder and base substrate are used. Please evaluate die bonding condition in advance with the same materials as mass production materials and make sure that

there is no effect, especially cracking of the ceramics.

2. Wire Bonding

- (1) Using materials and bonding conditions

- Wire lead : 25 microns diameter gold wire
- Bonding temperature : 150 to 250 degree C
- Bonding methods : Thermocompression or thermosonic bonding

- (2) Notice

Please do not bond closer than 25 microns from the edge of the electrode.

PLEASE CONTACT US BEFORE USING OUR PRODUCTS IN OTHER BONDING CONDITIONS NOT LISTED ABOVE.

### ■ Notice (Handling)

Do not directly touch capacitors with hand to prevent poor die bonding and poor wire bonding.

**⚠Note:**

**1. Export Control**

⌋For customers outside Japan⌋

No muRata products should be used or sold, through any channels, for use in the design, development, production, utilization, maintenance or operation of, or otherwise contribution to (1) any weapons (Weapons of Mass Destruction (nuclear, chemical or biological weapons or missiles) or conventional weapons) or (2) goods or systems specially designed or intended for military end-use or utilization by military end-users.

⌋For customers in Japan⌋

For products which are controlled items subject to the "Foreign Exchange and Foreign Trade Law" of Japan, the export license specified by the law is required for export.

**2. Please contact our sales representatives or product engineers before using the products in this catalog for the applications listed below, which require especially high reliability for the prevention of defects which might directly damage a third party's life, body or property, or when one of our products is intended for use in applications other than those specified in this catalog.**

- |                             |  |
|-----------------------------|--|
| ① Aircraft equipment        | ② Aerospace equipment  |
| ③ Undersea equipment        | ④ Power plant equipment  |
| ⑤ Medical equipment         | ⑥ Transportation equipment (vehicles, trains, ships, etc.)   |
| ⑦ Traffic signal equipment  | ⑧ Disaster prevention / crime prevention equipment   |
| ⑨ Data-processing equipment | ⑩ Application of similar complexity and/or reliability requirements to the applications listed above |

**3. Product specifications in this catalog are as of November 2002. They are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering. If there are any questions, please contact our sales representatives or product engineers.**

**4. Please read rating and ⚠CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.**

**5. This catalog has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.**

**6. Please note that unless otherwise specified, we shall assume no responsibility whatsoever for any conflict or dispute that may occur in connection with the effect of our and/or a third party's intellectual property rights and other related rights in consideration of your use of our products and/or information described or contained in our catalogs. In this connection, no representation shall be made to the effect that any third parties are authorized to use the rights mentioned above under licenses without our consent.**

**7. No ozone depleting substances (ODS) under the Montreal Protocol are used in our manufacturing process.**



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