Chip Monolithic Ceramic Capacitors

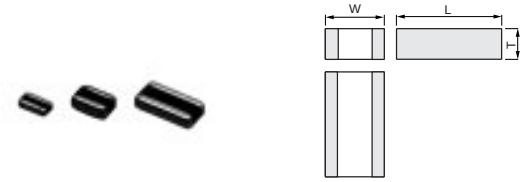
Low ESL LLL/LLA/LLM Series

■ Features (Reversed geometry Low ESL Type)

1. Low ESL, good for noise reduction for high frequency
2. Small, high cap

■ Applications

1. High speed micro processor
2. High frequency digital equipment



Part Number	Dimensions (mm)		
	L	W	T
LLL185	1.6 ±0.1	0.8 ±0.1	0.6 max.
LLL216	2.0 ±0.1	1.25 ±0.1	0.6 ±0.1
LLL219			0.85 ±0.1
LLL317	3.2 ±0.15	1.6 ±0.15	0.7 ±0.1
LLL31M			1.15 ±0.1

Reversed geometry Low ESL Type

Part Number	LLL18						LLL21						LLL31					
L x W	1.6x0.8						2.0x1.25						3.2x1.6					
TC	X7R (**R7**)					X7S (**C7**)	X7R (**R7**)					X7S (**C7**)	X7R (**R7**)					X5R (**R6**)
Rated Volt.	50 (**1H**)	25 (**1E**)	16 (**1C**)	10 (**1A**)	6.3 (**0J**)	4 (**0G**)	50 (**1H**)	25 (**1E**)	16 (**1C**)	10 (**1A**)	6.3 (**0J**)	4 (**0G**)	50 (**1H**)	25 (**1E**)	16 (**1C**)	10 (**1A**)	6.3 (**0J**)	6.3 (**0J**)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)																		
2200pF (**222**)	0.5 (**5**)																	
3300pF (**332**)	0.5 (**5**)																	
4700pF (**472**)	0.5 (**5**)						0.6 (**6**)											
6800pF (**682**)		0.5 (**5**)					0.6 (**6**)											
10000pF (**103**)		0.5 (**5**)	0.5 (**5**)				0.6 (**6**)						0.7 (**7**)					
15000pF (**153**)		0.5 (**5**)	0.5 (**5**)				0.6 (**6**)						0.7 (**7**)	0.7 (**7**)				
22000pF (**223**)		0.5 (**5**)	0.5 (**5**)				0.6 (**6**)	0.6 (**6**)					0.7 (**7**)	0.7 (**7**)				
33000pF (**333**)			0.5 (**5**)				0.85 (**9**)	0.6 (**6**)	0.6 (**6**)				0.7 (**7**)	0.7 (**7**)				
47000pF (**473**)			0.5 (**5**)					0.6 (**6**)	0.6 (**6**)				0.7 (**7**)	0.7 (**7**)				
68000pF (**683**)			0.5 (**5**)					0.6 (**6**)	0.6 (**6**)				0.7 (**7**)	0.7 (**7**)				
0.10µF (**104**)				0.5 (**5**)				0.6 (**6**)	0.6 (**6**)				1.15 (**M**)	0.7 (**7**)				
0.15µF (**154**)					0.5 (**5**)			0.85 (**9**)	0.6 (**6**)				1.15 (**M**)	0.7 (**7**)				
0.22µF (**224**)					0.5 (**5**)					0.6 (**6**)				1.15 (**M**)				
0.33µF (**334**)						0.5 (**5**)				0.6 (**6**)				1.15 (**M**)	0.7 (**7**)			
0.47µF (**474**)						0.5 (**5**)				0.85 (**9**)				1.15 (**M**)	0.7 (**7**)			

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Part Number	LLL18						LLL21						LLL31					
L x W	1.6x0.8						2.0x1.25						3.2x1.6					
TC	X7R (**R7**)					X7S (**C7**)	X7R (**R7**)					X7S (**C7**)	X7R (**R7**)					X5R (**R6**)
Rated Volt.	50 (**1H**)	25 (**1E**)	16 (**1C**)	10 (**1A**)	6.3 (**0J**)	4 (**0G**)	50 (**1H**)	25 (**1E**)	16 (**1C**)	10 (**1A**)	6.3 (**0J**)	4 (**0G**)	50 (**1H**)	25 (**1E**)	16 (**1C**)	10 (**1A**)	6.3 (**0J**)	6.3 (**0J**)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)																		
0.68µF (**684**)											0.85 (**9**)				1.15 (**M**)	0.7 (**7**)		
1.0µF (**105**)						0.5 (**5**)					0.85 (**9**)				1.15 (**M**)	0.7 (**7**)		
1.5µF (**155**)											0.85 (**9**)					1.15 (**M**)	0.7 (**7**)	
2.2µF (**225**)												0.85 (**9**)				1.15 (**M**)	0.7 (**7**)	
4.7µF (**475**)																	1.15 (**M**)	
10µF (**106**)																		1.25 (**B**)

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

Reversed geometry Low ESL Type Low Profile

Part Number	LLL18				LLL21						LLL31			
L x W	1.6x0.8				2.0x1.25						3.2x1.6			
TC	X7R (**R7**)			X7S (**C7**)	X7R (**R7**)					X7S (**C7**)	X7R (**R7**)			
Rated Volt.	25 (**1E**)	16 (**1C**)	10 (**1A**)	4 (**0G**)	50 (**1H**)	25 (**1E**)	16 (**1C**)	10 (**1A**)	6.3 (**0J**)	4 (**0G**)	50 (**1H**)	25 (**1E**)	16 (**1C**)	10 (**1A**)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)														
680pF(**681**)					0.5(**5**)									
1000pF(**102**)					0.5(**5**)									
1500pF(**152**)					0.5(**5**)									
2200pF(**222**)					0.5(**5**)									
3300pF(**332**)					0.5(**5**)									
4700pF(**472**)					0.5(**5**)									
6800pF(**682**)					0.5(**5**)									
10000pF(**103**)	0.5(**5**)	0.5(**5**)			0.5(**5**)	0.5(**5**)					0.5(**5**)			
15000pF(**153**)	0.5(**5**)	0.5(**5**)			0.5(**5**)	0.5(**5**)					0.5(**5**)	0.5(**5**)		
22000pF(**223**)		0.5(**5**)				0.5(**5**)	0.5(**5**)				0.5(**5**)	0.5(**5**)		
33000pF(**333**)		0.5(**5**)				0.5(**5**)	0.5(**5**)				0.5(**5**)	0.5(**5**)		
47000pF(**473**)		0.5(**5**)					0.5(**5**)					0.5(**5**)	0.5(**5**)	
68000pF(**683**)			0.5(**5**)				0.5(**5**)					0.5(**5**)	0.5(**5**)	
0.10µF(**104**)			0.5(**5**)				0.5(**5**)					0.5(**5**)	0.5(**5**)	
0.15µF(**154**)								0.5(**5**)					0.5(**5**)	
0.22µF(**224**)				0.5(**5**)				0.5(**5**)					0.5(**5**)	
0.33µF(**334**)				0.5(**5**)				0.5(**5**)					0.5(**5**)	
0.47µF(**474**)									0.5(**5**)					0.5(**5**)
0.68µF(**684**)														0.5(**5**)
1.0µF(**105**)										0.5(**5**)				

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

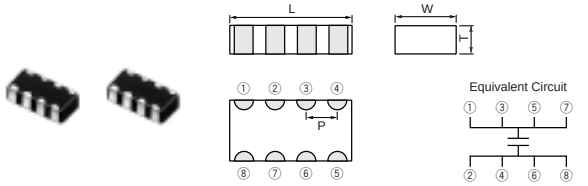
12

■ Features (Eight Terminals Low ESL Type)

1. Low ESL (100pH) , suitable to decoupling capacitor for 1GHz clock speed IC.
2. Small, large cap

■ APPLICATIONS

1. High speed micro processor
2. High frequency digital equipment.



Part Number	Dimensions (mm)			
	L	W	T	P
LLA185	1.6 ±0.1	0.8 ±0.1	0.5 +0.05/-0.1	0.4 ±0.1
LLA215	2.0 ±0.1	1.25 ±0.1	0.5 +0.05/-0.1	0.5 ±0.05
LLA219	2.0 ±0.1	1.25 ±0.1	0.85 ±0.1	0.5 ±0.05
LLA315	3.2 ±0.15	1.6 ±0.15	0.5 +0.05/-0.1	0.8 ±0.1
LLA319	3.2 ±0.15	1.6 ±0.15	0.85 ±0.1	0.8 ±0.1
LLA31M	3.2 ±0.15	1.6 ±0.15	1.15±0.1	0.8 ±0.1

Eight Terminals Low ESL Type

Part Number	**LLA18**	**LLA21**					**LLA31**		
L x W	1.6x0.8	2.0x1.25					3.2x1.6		
TC	X7S (**C7**)	X7R (**R7**)				X7S (**C7**)	X7R (**R7**)		
Rated Volt.	4 (**0G**)	25 (**1E**)	16 (**1C**)	10 (**1A**)	6.3 (**0J**)	4 (**0G**)	16 (**1C**)	10 (**1A**)	4 (**0G**)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)									
10000pF(**103**)		0.85(**9**)							
15000pF(**153**)		0.85(**9**)							
22000pF(**223**)		0.85(**9**)							
33000pF(**333**)		0.85(**9**)							
47000pF(**473**)		0.85(**9**)							
68000pF(**683**)			0.85(**9**)						
0.10µF(**104**)			0.85(**9**)				0.85(**9**)		
0.15µF(**154**)			0.85(**9**)				1.15(**M**)		
0.22µF(**224**)			0.85(**9**)				0.85(**9**)		
0.33µF(**334**)	0.5(**5**)			0.85(**9**)			0.85(**9**)		
0.47µF(**474**)	0.5(**5**)			0.85(**9**)			0.85(**9**)		
0.68µF(**684**)				0.85(**9**)			0.85(**9**)		
1.0µF(**105**)	0.5(**5**)				0.85(**9**)			0.85(**9**)	
1.5µF(**155**)					0.85(**9**)			0.85(**9**)	
2.2µF(**225**)						0.85(**9**)			0.85(**9**)
4.7µF(**475**)						0.85(**9**)			

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

Eight Terminals Low ESL Type Low Profile

Part Number	**LLA21**					**LLA31**		
L x W	2.0x1.25					3.2x1.6		
TC	X7R (**R7**)				X7S (**C7**)	X7R (**R7**)		
Rated Volt.	25 (**1E**)	16 (**1C**)	10 (**1A**)	6.3 (**0J**)	4 (**0G**)	16 (**1C**)	10 (**1A**)	6.3 (**0J**)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)								
10000pF(**103**)	0.5(**5**)							
15000pF(**153**)	0.5(**5**)							
22000pF(**223**)	0.5(**5**)							
33000pF(**333**)		0.5(**5**)						
47000pF(**473**)		0.5(**5**)						
68000pF(**683**)		0.5(**5**)						
0.10µF(**104**)		0.5(**5**)				0.5(**5**)		
0.15µF(**154**)			0.5(**5**)	0.5(**5**)		0.5(**5**)		
0.22µF(**224**)			0.5(**5**)	0.5(**5**)		0.5(**5**)		

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Part Number	LLA21					LLA31		
L x W	2.0x1.25					3.2x1.6		
TC	X7R (**R7**)				X7S (**C7**)	X7R (**R7**)		
Rated Volt.	25 (**1E**)	16 (**1C**)	10 (**1A**)	6.3 (**0J**)	4 (**0G**)	16 (**1C**)	10 (**1A**)	6.3 (**0J**)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)								
0.33µF(**334**)			0.5(**5**)	0.5(**5**)			0.5(**5**)	
0.47µF(**474**)				0.5(**5**)			0.5(**5**)	
0.68µF(**684**)				0.5(**5**)			0.5(**5**)	
1.0µF(**105**)					0.5(**5**)			0.5(**5**)
1.5µF(**155**)					0.5(**5**)			0.5(**5**)
2.2µF(**225**)					0.5(**5**)			0.5(**5**)

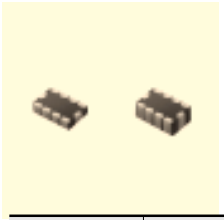
The part numbering code is shown in ( ).
Dimensions are shown in mm and Rated Voltage in Vdc.

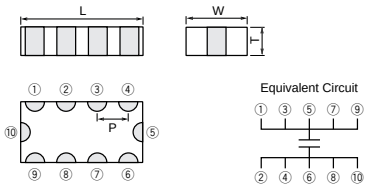
■ Features (Ten Terminals Low ESL Type)

1. Low ESL (45pH), suitable to decoupling capacitor for 2GHz clock speed IC.
2. Small, large cap

■ APPLICATIONS

1. High speed micro processor
2. High frequency digital equipment





Part Number	Dimensions (mm)			
	L	W	T	P
LLM215	2.0 ±0.1	1.25 ±0.1	0.5 +0.05/-0.1	0.5 ±0.05
LLM219	2.0 ±0.1	1.25 ±0.1	0.85 ±0.1	0.5 ±0.05
LLM315	3.2 ±0.15	1.6 ±0.15	0.5 +0.05/-0.1	0.8 ±0.1
LLM31M	3.2 ±0.15	1.6 ±0.15	1.15±0.1	0.8 ±0.1

Ten Terminals Low ESL Type

Part Number	LLM21				LLM31		
L x W	2.0x1.25				3.2x1.6		
TC	X7R (**R7**)			X7S (**C7**)	X7R (**R7**)		
Rated Volt.	25 (**1E**)	16 (**1C**)	6.3 (**0J**)	4 (**0G**)	16 (**1C**)	10 (**1A**)	6.3 (**0J**)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)							
10000pF(**103**)	0.85(**9**)						
15000pF(**153**)	0.85(**9**)						
22000pF(**223**)	0.85(**9**)						
33000pF(**333**)	0.85(**9**)						
47000pF(**473**)	0.85(**9**)						
68000pF(**683**)		0.85(**9**)					
0.10µF(**104**)		0.85(**9**)			1.15(**M**)		
0.15µF(**154**)		0.85(**9**)			1.15(**M**)		
0.22µF(**224**)		0.85(**9**)			1.15(**M**)		
0.33µF(**334**)			0.85(**9**)		1.15(**M**)		
0.47µF(**474**)			0.85(**9**)		1.15(**M**)		
0.68µF(**684**)			0.85(**9**)		1.15(**M**)		
1.0µF(**105**)			0.85(**9**)		1.15(**M**)		
1.5µF(**155**)			0.85(**9**)			1.15(**M**)	
2.2µF(**225**)				0.85(**9**)		1.15(**M**)	
3.3µF(**335**)							1.15(**M**)
4.7µF(**475**)							1.15(**M**)

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

Ten Terminals Low ESL Type Low Profile

Part Number	LLM21				LLM31		
L x W	2.0x1.25				3.2x1.6		
TC	X7R (**R7**)			X7S (**C7**)	X7R (**R7**)		
Rated Volt.	25 (**1E**)	16 (**1C**)	6.3 (**0J**)	4 (**0G**)	16 (**1C**)	10 (**1A**)	6.3 (**0J**)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)							
10000pF(**103**)	0.5(**5**)						
15000pF(**153**)	0.5(**5**)						
22000pF(**223**)	0.5(**5**)						
33000pF(**333**)		0.5(**5**)					
47000pF(**473**)		0.5(**5**)					
68000pF(**683**)		0.5(**5**)					
0.10µF(**104**)		0.5(**5**)			0.5(**5**)		
0.15µF(**154**)			0.5(**5**)		0.5(**5**)		

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Part Number	LLM21				LLM31		
L x W	2.0x1.25				3.2x1.6		
TC	X7R (**R7**)			X7S (**C7**)	X7R (**R7**)		
Rated Volt.	25 (**1E**)	16 (**1C**)	6.3 (**0J**)	4 (**0G**)	16 (**1C**)	10 (**1A**)	6.3 (**0J**)
Capacitance (Capacitance part numbering code) and T (mm) Dimension (T Dimension part numbering code)							
0.22µF(**224**)			0.5(**5**)		0.5(**5**)		
0.33µF(**334**)			0.5(**5**)			0.5(**5**)	
0.47µF(**474**)			0.5(**5**)			0.5(**5**)	
0.68µF(**684**)			0.5(**5**)			0.5(**5**)	
1.0µF(**105**)				0.5(**5**)			
1.5µF(**155**)				0.5(**5**)			
2.2µF(**225**)				0.5(**5**)			0.5(**5**)

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

Specifications and Test Methods

<table>
<tr><th>No.</th><th colspan="2">Item</th><th>Specifications</th><th>Test Method</th></tr>
<tr><td>1</td><td colspan="2">Operating Temperature Range</td><td>R6 : −55 to +85°C
R7, C7 : −55 to +125°C</td><td></td></tr>
<tr><td>2</td><td colspan="2">Rated Voltage</td><td>See the previous pages.</td><td>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.</td></tr>
<tr><td>3</td><td colspan="2">Appearance</td><td>No defects or abnormalities</td><td>Visual inspection</td></tr>
<tr><td>4</td><td colspan="2">Dimensions</td><td>Within the specified dimension</td><td>Using calipers</td></tr>
<tr><td>5</td><td colspan="2">Dielectric Strength</td><td>No defects or abnormalities</td><td>No failure should be observed when 250% of the rated voltage is applied between the terminations for 1 to 5 seconds, provided the charge/discharge current is less than 50mA.</td></tr>
<tr><td>6</td><td colspan="2">Insulation Resistance</td><td>More than 10,000MΩ or 500Ω · F
(Whichever is smaller)</td><td>The insulation resistance should be measured with a DC voltage not exceeding the rated voltage at 25°C and 75%RH max. and within 2 minutes of charging.</td></tr>
<tr><td>7</td><td colspan="2">Capacitance</td><td>Within the specified tolerance</td><td rowspan="2">The capacitance/D.F. should be measured at 25°C at the frequency and voltage shown in the table.
<table><tr><th>Capacitance</th><th>Frequency</th><th>Voltage</th></tr><tr><td>C≦10μF (10V min.)</td><td>1±0.1kHz</td><td>1.0±0.2Vrms</td></tr><tr><td>C≦10μF (6.3V max.)</td><td>1±0.1kHz</td><td>0.5±0.1Vrms</td></tr><tr><td>C>10μF</td><td>120±24kHz</td><td>0.5±0.1Vrms</td></tr></table></td></tr>
<tr><td>8</td><td colspan="2">Dissipation Factor (D.F.)</td><td>W.V.: 25V min.; 0.025 max.
W.V.: 16V max.; 0.035 max. *1</td></tr>
<tr><td>9</td><td colspan="2">Capacitance Temperature Characteristics</td><td><table><tr><th>Char.</th><th>Temp. Range (°C)</th><th>Reference Temp.</th><th>Cap.Change</th></tr><tr><td>R6</td><td>−55 to +85</td><td>25°C</td><td>Within ±15%</td></tr><tr><td>R7</td><td>−55 to +125</td><td>25°C</td><td>Within ±15%</td></tr><tr><td>C7</td><td>−55 to +125</td><td>25°C</td><td>Within ±22%</td></tr></table></td><td>The capacitance change should be measured after 5 min. at each specified temperature stage.
<table><tr><th>Step</th><th>Temperature (°C)</th></tr><tr><td>1</td><td>25±2</td></tr><tr><td>2</td><td>−55±3</td></tr><tr><td>3</td><td>25±2</td></tr><tr><td>4</td><td>125±3</td></tr><tr><td>5</td><td>25±2</td></tr></table>The ranges of capacitance change compared with the 25°C value over the temperature ranges shown in the table should be within the specified ranges.</td></tr>
<tr><td>10</td><td colspan="2">Adhesive Strength of Termination</td><td>No removal of the terminations or other defect should occur.</td><td>Solder the capacitor to the test jig (glass epoxy board) using a eutectic solder. Then apply 5N force in parallel with the test jig for 10±1 sec. The soldering should be done either with an iron or using the reflow method and should be conducted with care so that the soldering is uniform and free of defects such as heat shock.</td></tr>
<tr><td rowspan="3">11</td><td rowspan="3">Vibration Resistance</td><td>Appearance</td><td>No defects or abnormalities</td><td rowspan="3">Solder the capacitor to the test jig (glass epoxy board) in the same manner and under the same conditions as (10). 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 3 mutually perpendicular directions (total of 6 hours).</td></tr>
<tr><td>Capacitance</td><td>Within the specified tolerance</td></tr>
<tr><td>D.F.</td><td>W.V.: 25V min.; 0.025 max.
W.V.: 16V max.; 0.035 max. *1</td></tr>
<tr><td>12</td><td colspan="2">Solderability of Termination</td><td>75% of the terminations are to be soldered evenly and continuously.</td><td>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°C for 10 to 30 seconds. After preheating, immerse in eutectic solder solution for 2±0.5 seconds at 230±5°C, or Sn-3.0Ag-0.5Cu solder solution for 2±0.5 seconds at 245±5°C.</td></tr>
<tr><td rowspan="5">13</td><td rowspan="5">Resistance to Soldering Heat</td><td>Appearance</td><td>No marking defects</td><td rowspan="5">Preheat the capacitor at 120 to 150°C for 1 minute. Immerse the capacitor in a eutectic solder or Sn-3.0Ag-0.5Cu solder solution at 270±5°C for 10±0.5 seconds solution at 270±5°C for 10±0.5 seconds. Let sit at room temperature for 48±4 hours, then measure.
• Initial measurement.
Perform a heat treatment at 150 $^{+0}_{-10}$°C for one hour and then let sit for 48±4 hours at room temperature. Perform the initial measurement.</td></tr>
<tr><td>Capacitance Change</td><td>Within ±7.5%</td></tr>
<tr><td>D.F.</td><td>W.V.: 25V min.; 0.025 max.
W.V.: 16V max.; 0.035 max. *1</td></tr>
<tr><td>I.R.</td><td>More than 10,000MΩ or 500Ω · F (Whichever is smaller)</td></tr>
<tr><td>Dielectric Strength</td><td>No failure</td></tr>
</table>

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Specifications and Test Methods

Continued from the preceding page.

No.	Item		Specifications	Test Method
14	Temperature Cycle	Appearance	No marking defects	Fix the capacitor to the supporting jig in the same manner and under the same conditions as (10). Perform the five cycles according to the four heat treatments listed in the following table. Let sit for 48±4 hours at room temperature, then measure. Step: 1 / 2 / 3 / 4 Temp. (°C): Min. Operating Temp. $^{+0}_{-3}$ / Room Temp. / Max. Operating Temp. $^{+3}_{-0}$ / Room Temp. Time (min.): 30±3 / 2 to 3 / 30±3 / 2 to 3 • Initial measurement. Perform a heat treatment at 150 $^{+0}_{-10}$°C for one hour and then let sit for 48±4 hours at room temperature. Perform the initial measurement.
		Capacitance Change	Within ±7.5% *1	
		D.F.	W.V.: 25V min.; 0.025 max. W.V.: 16V max.; 0.035 max. *1	
		I.R.	More than 10,000MΩ or 500Ω · F (Whichever is smaller)	
		Dielectric Strength	No failure	
15	Humidity (Steady State)	Appearance	No marking defects	Sit the capacitor at 40±2°C and 90 to 95% humidity for 500±12 hours. Remove and let sit for 48±4 hours at room temperature, then measure.
		Capacitance Change	Within ±12.5% *1	
		D.F.	0.05 max. *1	
		I.R.	More than 1,000MΩ or 50Ω · F (Whichever is smaller)	
16	Humidity Load	Appearance	No marking defects	Apply the rated voltage at 40±2°C and 90 to 95% humidity for 500±12 hours. Remove and let sit for 48±4 hours at room temperature, then measure. The charge/discharge current is less than 50mA.
		Capacitance Change	Within ±12.5% *1	
		D.F.	0.05 max. *1	
		I.R.	More than 500MΩ or 25Ω · F *1 (Whichever is smaller)	
		Dielectric Strength	No failure	
17	High Temperature Load	Appearance	No marking defects	Apply 200% of the rated voltage for 1000±12 hours at the maximum operating temperature ±3°C. Let sit for 48±4 hours at room temperature, then measure. The charge/discharge current is less than 50mA. •Initial measurement. Apply 200% (*2) of the rated DC voltage for one hour at the maximum operating temperature ±3°C. Remove and let sit for 48±4 hours at room temperature. Perform initial measurement. (*1)
		Capacitance Change	Within ±12.5% *1	
		D.F.	W.V.: 25V min.; 0.04 max. W.V.: 16V max.; 0.05 max. *1	
		I.R.	More than 1,000MΩ or 50Ω · F *1 (Whichever is smaller)	
		Dielectric Strength	No failure	

*1 : The ligure Indicates typical inspection.Please refer to individual specifications.
*2 : Some of the parts are applicable in rated voltage×150%. Please refer to individual specifications.

12