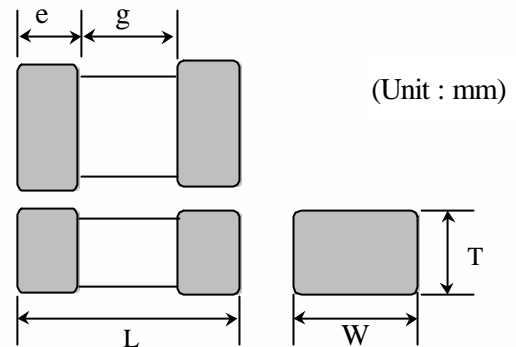


Specification Sheet

<Chip Monolithic Ceramic Capacitor>

Murata Global P/N : GRM31MF51E105ZA01L (1206,Y5V,1uF,25V)



Dimensions(mm)

L	W	T	e	g
3.2+/-0.15	1.6+/-0.15	1.15+/-0.1	0.3 to 0.8	1.5 min.

Rated Value

TC code	TC	DC Rated Voltage (V)	CAP.	CAP.TOL
F5	Y5V	25	1 uF	+80/-20%

Packaging

Specification	Packaging unit [pcs/reel]
φ178 Plastic Tape Carrier Packaging	3000

Specification

Please refer to next page.

<Notice>

- (1) This specification sheet is applied for CHIP MONOLITHIC CERAMIC CAPACITOR used for General Electronics equipment for your design.
- (2) Please contact our sales representative or product engineers before using our products for the application listed below.
 - (1) Aircraft equipment (2) Aerospace equipment (3) Undersea equipment (4) Medical equipment
 - (5) Transportation equipment (6) Traffic signal equipment (7) Disaster prevention / crime prevention equipment
 - (8) Application of similar complexity and/or requirements to the applications listed in the above.
- (3) Please do not use this specification sheet for quality contract.
 If you need to exchange quality contract, please request us to provide the full product specification (including part number construction, available capacitance range, packaging and caution notes) for approval.

Product Engineering Department
 Monolithic Ceramic Capacitor Group
 FUKUI MURATA MFG. CO., LTD.

SPECIFICATIONS AND TEST METHODS				P 1																																															
No.	Item	Specification			Test Method																																														
		Temperature Compensating Type		High Dielectric Type																																															
1	Operating Temperature Range	-55°C to +125°C		R6 : -55°C to +85°C R7 : -55°C to +125°C C8 : -55°C to +105°C E4 : 10°C to +85°C F5 : -30°C to +85°C																																															
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^{D-P} , whichever is larger, shall be maintained within the rated voltage range.																																														
3	Appearance	No defects or abnormalities.			Visual inspection.																																														
4	Dimension	Within the specified dimensions.			Using calipers.																																														
5	Dielectric Strength	No defects or abnormalities.			No failure shall be observed when 300% of the rated voltage (ΔC to 7U and 1X) or 250% of the rated voltage (R6, R7, C8, E4 and F5) is applied between the terminations for 1 to 5 seconds, provided the charge/ discharge current is less than 50mA.																																														
6	Insulation Resistance	More than 10,000M Ω or 500 Ω -F. (whichever is smaller)			The insulation resistance shall be measured with a DC voltage not exceeding the rated voltage at 25°C and 75%RH max. and within 2 minutes of charging.																																														
7	Capacitance	Within the specified tolerance.			The capacitance/Q/D.F. shall be measured at 25°C at the frequency and voltage shown in the table.																																														
8	Q/ Dissipation Factor (D.F.)	30pFmin.: $Q \geq 1000$ 30pFmax.: $Q \geq 400+20C$ C:Nominal Capacitance (pF)	<table border="1"> <thead> <tr> <th>Char</th> <th>25V min.</th> <th>16V</th> <th>10V</th> <th>6.3V</th> <th>4V</th> </tr> </thead> <tbody> <tr> <td>R6 R7 C8</td> <td>0.025 max.</td> <td>0.035 max.</td> <td>0.035 max.</td> <td>0.05max. ($C < 3.3\mu F$) 0.1max. ($C \geq 3.3\mu F$)</td> <td>-</td> </tr> <tr> <td>E4</td> <td>0.025 max.</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>F5</td> <td>0.05 max. ($C < 0.1\mu F$) 0.09 max. ($C \geq 0.1\mu F$)</td> <td>0.07 max. ($C < 1.0\mu F$) 0.09 max. ($C \geq 1.0\mu F$)</td> <td>0.125 max.</td> <td>0.15 max.</td> <td>-</td> </tr> </tbody> </table>			Char	25V min.	16V	10V	6.3V	4V	R6 R7 C8	0.025 max.	0.035 max.	0.035 max.	0.05max. ($C < 3.3\mu F$) 0.1max. ($C \geq 3.3\mu F$)	-	E4	0.025 max.	-	-	-	-	F5	0.05 max. ($C < 0.1\mu F$) 0.09 max. ($C \geq 0.1\mu F$)	0.07 max. ($C < 1.0\mu F$) 0.09 max. ($C \geq 1.0\mu F$)	0.125 max.	0.15 max.	-	<table border="1"> <thead> <tr> <th>Char.</th> <th>ΔC to 7U, 1X (1000pF and below)</th> <th>ΔC to 7U, 1X (more than 1000pF) R6,R7,C8,F5 ($C \leq 10\mu F$)</th> <th>R6,R7,F5 ($C > 10\mu F$)</th> <th>E4</th> </tr> </thead> <tbody> <tr> <td>Item</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Frequency</td> <td>1±0.1MHz</td> <td>1±0.1kHz</td> <td>120±24Hz</td> <td>1±0.1kHz</td> </tr> <tr> <td>Voltage</td> <td>0.5 to 5Vrms</td> <td>1±0.2Vrms</td> <td>0.5±0.1Vrms</td> <td>0.5±0.05Vrms</td> </tr> </tbody> </table>		Char.	ΔC to 7U, 1X (1000pF and below)	ΔC to 7U, 1X (more than 1000pF) R6,R7,C8,F5 ($C \leq 10\mu F$)	R6,R7,F5 ($C > 10\mu F$)	E4	Item					Frequency	1±0.1MHz	1±0.1kHz	120±24Hz	1±0.1kHz	Voltage	0.5 to 5Vrms	1±0.2Vrms	0.5±0.1Vrms	0.5±0.05Vrms
			Char	25V min.	16V	10V	6.3V	4V																																											
R6 R7 C8	0.025 max.	0.035 max.	0.035 max.	0.05max. ($C < 3.3\mu F$) 0.1max. ($C \geq 3.3\mu F$)	-																																														
E4	0.025 max.	-	-	-	-																																														
F5	0.05 max. ($C < 0.1\mu F$) 0.09 max. ($C \geq 0.1\mu F$)	0.07 max. ($C < 1.0\mu F$) 0.09 max. ($C \geq 1.0\mu F$)	0.125 max.	0.15 max.	-																																														
Char.	ΔC to 7U, 1X (1000pF and below)	ΔC to 7U, 1X (more than 1000pF) R6,R7,C8,F5 ($C \leq 10\mu F$)	R6,R7,F5 ($C > 10\mu F$)	E4																																															
Item																																																			
Frequency	1±0.1MHz	1±0.1kHz	120±24Hz	1±0.1kHz																																															
Voltage	0.5 to 5Vrms	1±0.2Vrms	0.5±0.1Vrms	0.5±0.05Vrms																																															
9	Capacitance Temperature Character- istics	Capacitance Change	Within the specified tolerance. (Table A-1)		<table border="1"> <thead> <tr> <th>Char.</th> <th>Temp. Range</th> <th>Reference Temp.</th> <th>Cap. Change</th> </tr> </thead> <tbody> <tr> <td>R6</td> <td>-55°C ~+85°C</td> <td rowspan="3">25°C</td> <td>Within ±15%</td> </tr> <tr> <td>R7</td> <td>-55°C ~+125°C</td> <td>Within ±15%</td> </tr> <tr> <td>C8</td> <td>-55°C ~+105°C</td> <td>Within ±22%</td> </tr> <tr> <td>E4</td> <td>+10°C ~+85°C</td> <td></td> <td>+22 -56 %</td> </tr> <tr> <td>F5</td> <td>-30°C ~+85°C</td> <td></td> <td>+22 -82 %</td> </tr> </tbody> </table>		Char.	Temp. Range	Reference Temp.	Cap. Change	R6	-55°C ~+85°C	25°C	Within ±15%	R7	-55°C ~+125°C	Within ±15%	C8	-55°C ~+105°C	Within ±22%	E4	+10°C ~+85°C		+22 -56 %	F5	-30°C ~+85°C		+22 -82 %																							
Char.	Temp. Range	Reference Temp.	Cap. Change																																																
R6	-55°C ~+85°C	25°C	Within ±15%																																																
R7	-55°C ~+125°C		Within ±15%																																																
C8	-55°C ~+105°C		Within ±22%																																																
E4	+10°C ~+85°C		+22 -56 %																																																
F5	-30°C ~+85°C		+22 -82 %																																																
	Temperature Coefficient	Within the specified tolerance. (Table A-1)		<p>The capacitance change shall be measured after 5 min. at each specified temperature stage.</p> <p>(1) Temperature Compensating Type</p> <p>The temperature coefficient is determined using the capacitance measured in step 3 as a reference. When cycling the temperature sequentially from step1 through 5 (ΔC: +25°C to +125°C, other temp. coeffs.: +25°C to +85°C) the capacitance shall be within the specified tolerance for the temperature coefficient and capacitance change as Table A-1. The capacitance drift is calculated by dividing the differences between the maximum and minimum measured values in the step 1, 3 and 5 by the cap value in step 3.</p> <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature(°C)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>25±2</td> </tr> <tr> <td>2</td> <td>-55±3(for ΔC to 7U/1X/R6/R7/C8) -30±3(for F5), 10±3(for E4)</td> </tr> <tr> <td>3</td> <td>25±2</td> </tr> <tr> <td>4</td> <td>125±3(for ΔC/R7), 105±3(for C8) 85±3(for other TC)</td> </tr> <tr> <td>5</td> <td>25±2</td> </tr> </tbody> </table> <p>(2) High Dielectric Constant Type</p> <p>The ranges of capacitance change compared with the above 25°C value over the temperature ranges shown in the table shall be within the specified ranges.</p> <p>Initial measurement for high dielectric constant type.</p> <p>Perform a heat treatment at 150±0/-10°C for one hour and then set for 48±4 hours at room temperature.</p> <p>Perform the initial measurement.</p>		Step	Temperature(°C)	1	25±2	2	-55±3(for ΔC to 7U/1X/R6/R7/C8) -30±3(for F5), 10±3(for E4)	3	25±2	4	125±3(for ΔC /R7), 105±3(for C8) 85±3(for other TC)	5	25±2																																		
Step	Temperature(°C)																																																		
1	25±2																																																		
2	-55±3(for ΔC to 7U/1X/R6/R7/C8) -30±3(for F5), 10±3(for E4)																																																		
3	25±2																																																		
4	125±3(for ΔC /R7), 105±3(for C8) 85±3(for other TC)																																																		
5	25±2																																																		
	Capacitance Drift	Within ±0.2% or ±0.05 pF (Whichever is larger.) *Not apply to 1X/25V																																																	
10	Adhesive Strength of Termination	No removal of the terminations or other defect shall occur.			<p>Solder the capacitor to the test jig (glass epoxy board) shown in Fig.1 using a eutectic solder. Then apply *10N force in parallel with the test jig for 10±1sec.</p> <p>The soldering shall be done either with an iron or using the reflow method and shall be conducted with care so that the soldering is uniform and free of defects such as heat shock</p> <p>*5N (GR□15, GRM18) 2N (GR□03)</p> <table border="1"> <thead> <tr> <th>Type</th> <th>a</th> <th>b</th> <th>c</th> </tr> </thead> <tbody> <tr> <td>GR□03</td> <td>0.3</td> <td>0.9</td> <td>0.3</td> </tr> <tr> <td>GR□15</td> <td>0.4</td> <td>1.5</td> <td>0.5</td> </tr> <tr> <td>GRM18</td> <td>1.0</td> <td>3.0</td> <td>1.2</td> </tr> <tr> <td>GRM21</td> <td>1.2</td> <td>4.0</td> <td>1.65</td> </tr> <tr> <td>GRM31</td> <td>2.2</td> <td>5.0</td> <td>2.0</td> </tr> <tr> <td>GRM32</td> <td>2.2</td> <td>5.0</td> <td>2.9</td> </tr> <tr> <td>GRM43</td> <td>3.5</td> <td>7.0</td> <td>3.7</td> </tr> <tr> <td>GRM55</td> <td>4.5</td> <td>8.0</td> <td>5.6</td> </tr> </tbody> </table> <p>(in:mm)</p>		Type	a	b	c	GR□03	0.3	0.9	0.3	GR□15	0.4	1.5	0.5	GRM18	1.0	3.0	1.2	GRM21	1.2	4.0	1.65	GRM31	2.2	5.0	2.0	GRM32	2.2	5.0	2.9	GRM43	3.5	7.0	3.7	GRM55	4.5	8.0	5.6									
Type	a	b	c																																																
GR□03	0.3	0.9	0.3																																																
GR□15	0.4	1.5	0.5																																																
GRM18	1.0	3.0	1.2																																																
GRM21	1.2	4.0	1.65																																																
GRM31	2.2	5.0	2.0																																																
GRM32	2.2	5.0	2.9																																																
GRM43	3.5	7.0	3.7																																																
GRM55	4.5	8.0	5.6																																																

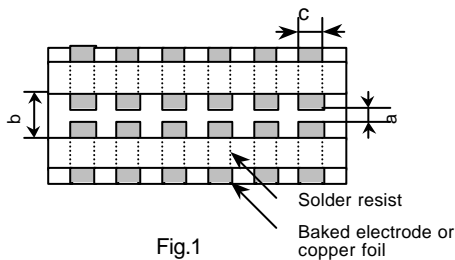


Fig.1

SPECIFICATIONS AND TEST METHODS

P 2

No.	Item	Specification					Test Method																																			
		Temperature Compensating Type		High Dielectric Type																																						
11	Vibration Resistance	Appearance	No defects or abnormalities.					Solder the capacitor to the test jig (glass epoxy board) in the same manner and under the same conditions as(10). The capacitor shall 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, shall be traversed in approximately 1 minute. This motion shall be applied for a period of 2 hours in each 3 mutually perpendicular directions(total of 6 hours).																																		
		Capacitance	Within the specified tolerance.																																							
		Q/D.F.	30pFmin.: $Q \geq 1000$ 30pFmax.: $Q \geq 400+20C$																																							
		C:Nominal Capacitance (pF)	Char.	25V min.	16V	10V	6.3V	4V																																		
			R6 R7 C8	0.025 max.	0.035 max.	0.035 max.	0.05 max. ($C < 3.3\mu F$) 0.1max. ($C \geq 3.3\mu F$)																																			
			E4	0.025 max.	—	—	—																																			
			F5	0.05 max. ($C < 0.1\mu F$) 0.09 max. ($C \geq 0.1\mu F$)	0.07 max. ($C < 1.0\mu F$) 0.09 max. ($C \geq 1.0\mu F$)	0.125 max.	0.15 max.																																			
12	Deflection	No cracking or marking defects shall occur.					Solder the capacitor on the test jig (glass epoxy board) shown in Fig.2 using a eutectic solder. Then apply a force in the direction shown in Fig 3 for 5 ± 1 sec. The soldering shall be done either with an iron or using the reflow method and shall be conducted with care so that the soldering is uniform and free of defects such as heat shock.																																			
		<p align="center">Fig.3</p>																																								
		<p align="center">Fig.2</p>																																								
		<table border="1"> <thead> <tr> <th>Type</th> <th>a</th> <th>b</th> <th>c</th> </tr> </thead> <tbody> <tr> <td>GR<math>\square</math>03</td> <td>0.3</td> <td>0.9</td> <td>0.3</td> </tr> <tr> <td>GR<math>\square</math>15</td> <td>0.4</td> <td>1.5</td> <td>0.5</td> </tr> <tr> <td>GRM18</td> <td>1.0</td> <td>3.0</td> <td>1.2</td> </tr> <tr> <td>GRM21</td> <td>1.2</td> <td>4.0</td> <td>1.65</td> </tr> <tr> <td>GRM31</td> <td>2.2</td> <td>5.0</td> <td>2.0</td> </tr> <tr> <td>GRM32</td> <td>2.2</td> <td>5.0</td> <td>2.9</td> </tr> <tr> <td>GRM43</td> <td>3.5</td> <td>7.0</td> <td>3.7</td> </tr> <tr> <td>GRM55</td> <td>4.5</td> <td>8.0</td> <td>5.6</td> </tr> </tbody> </table> <p align="right">(in mm)</p>					Type	a	b	c	GR\square03	0.3	0.9	0.3	GR\square15	0.4	1.5	0.5	GRM18	1.0	3.0	1.2	GRM21	1.2	4.0	1.65	GRM31	2.2	5.0	2.0	GRM32	2.2	5.0	2.9	GRM43	3.5	7.0	3.7	GRM55	4.5	8.0	5.6
Type	a	b	c																																							
GR\square03	0.3	0.9	0.3																																							
GR\square15	0.4	1.5	0.5																																							
GRM18	1.0	3.0	1.2																																							
GRM21	1.2	4.0	1.65																																							
GRM31	2.2	5.0	2.0																																							
GRM32	2.2	5.0	2.9																																							
GRM43	3.5	7.0	3.7																																							
GRM55	4.5	8.0	5.6																																							
13	Solderability of Termination	75% of the terminations is 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 $120^{\circ}C$ for 10 to 30 seconds. After preheating, immerse in eutectic solder solution for 2 ± 0.5 seconds at $230 \pm 5^{\circ}C$.																																			
14	Resistance to Soldering Heat	The measured and observed characteristics shall satisfy the specifications in the following table.					Preheat the capacitor at 120 to $150^{\circ}C$ for 1 minute. Immerse the capacitor in a eutectic solder solution at $270 \pm 5^{\circ}C$ for 10 ± 0.5 seconds. Let sit at room temperature for 24 ± 2 hours (temperature compensating type) or 48 ± 4 hours (high dielectric constant type), then measure. · Initial measurement for high dielectric constant type Perform a heat treatment at $150_{-10}^{+0}C$ for one hour and then let sit for 48 ± 4 hours at room temperature. Perform the initial measurement. *Preheating for GRM32/43/55																																			
		Appearance	No marking defects.																																							
		Capacitance Change	Within $\pm 2.5\%$ or $\pm 0.25pF$ (Whichever is larger)		R6,R7,C8: Within $\pm 7.5\%$ E4,F5: Within $\pm 20\%$																																					
		Q/D.F.	30pFmin.: $Q \geq 1000$ 30pFmax.: $Q \geq 400+20C$																																							
		C:Nominal Capacitance (pF)	Char.	25V min.	16V	10V		6.3V	4V																																	
	R6 R7 C8	0.025 max.	0.035 max.	0.035 max.	0.05 max. ($C < 3.3\mu F$) 0.1max. ($C \geq 3.3\mu F$)																																					
	E4	0.025 max.	—	—	—																																					
	F5	0.05 max. ($C < 0.1\mu F$) 0.09 max. ($C \geq 0.1\mu F$)	0.07 max. ($C < 1.0\mu F$) 0.09 max. ($C \geq 1.0\mu F$)	0.125 max.	0.15 max.																																					
	I.R.	More than $10,000M\Omega$ or $500\Omega \cdot F$ (Whichever is smaller)																																								
	Dielectric Strength	No failure																																								
		<table border="1"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>$100^{\circ}C$ to $120^{\circ}C$</td> <td>1 min.</td> </tr> <tr> <td>2</td> <td>$170^{\circ}C$ to $200^{\circ}C$</td> <td>1 min.</td> </tr> </tbody> </table>					Step	Temperature	Time	1	$100^{\circ}C$ to $120^{\circ}C$	1 min.	2	$170^{\circ}C$ to $200^{\circ}C$	1 min.																											
Step	Temperature	Time																																								
1	$100^{\circ}C$ to $120^{\circ}C$	1 min.																																								
2	$170^{\circ}C$ to $200^{\circ}C$	1 min.																																								

SPECIFICATIONS AND TEST METHODS

No.	Item	Specification					Test Method															
		Temperature Compensating Type		High Dielectric Type																		
15	Temperature Cycle	The measured and observed characteristics shall satisfy the specifications in the following table.					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 24±2 hours (temperature compensating type) or 48±4 hours (high dielectric constant type) at room temperature, then measure <table border="1"> <thead> <tr> <th>Step</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>Temp.(°C)</td> <td>Min. Operating Temp. +0/-3</td> <td>Room Temp.</td> <td>Max. Operating Temp. +3/-0</td> <td>Room Temp.</td> </tr> <tr> <td>Time (min.)</td> <td>30±3</td> <td>2 to 3</td> <td>30±3</td> <td>2 to 3</td> </tr> </tbody> </table> · Initial measurement for high dielectric constant type Perform a heat treatment at 150 +0°C for one hour and then let sit for 48±4 hours at room temperature. Perform the initial measurement	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
	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																	
	Appearance	No marking defects.																				
	Capacitance Change	Within ±2.5% or ±0.25pF (Whichever is larger)		R6,R7,C8:Within ±7.5% E4,F5:Within ±20%																		
Q/D.F.	30pFmin.:Q _≥ 1000 30pFmax.: Q _≥ 400+20C C:Nominal Capacitance (pF)	Char. R6 R7 C8	25V min. 0.025 max.	16V 0.035 max.	10V 0.035 max.	6.3V 0.05 max. (C<3.3μF) 0.1max. (C _≥ 3.3μF)	4V -															
		E4 F5	0.025 max. 0.05 max. (C<0.1μF) (C _≥ 0.1μF)	- 0.07 max. (C<1.0μF) (C _≥ 1.0μF)	- 0.125 max.	0.15 max. -	-															
I.R.	More than 10,000MΩ or 500Ω·F (Whichever is smaller)																					
Dielectric Strength	No failure																					
16	Humidity Steady State	The measured and observed characteristics shall satisfy the specifications in the following table.					Sit the capacitor at 40±2°C and 90 to 95% humidity for 500±12 hours. Remove and let sit for 24±2 hours (temperature compensating type) or 48±4 hours (high dielectric constant type) at room temperature, then measure.															
	Appearance	No marking defects.																				
	Capacitance Change	Within ±5% or ±0.5pF (Whichever is larger)		R6,R7,C8:Within ±12.5% E4,F5:Within ±30%																		
	Q/D.F.	30pF and over:Q _≥ 350 10pF and over, 30pF and below: Q _≥ 275+ $\frac{30}{2}$ C 10pF and below: Q _≥ 200+10C C:Nominal Capacitance(pF)	Char. R6 R7 C8	25V min. 0.05 max.	16V 0.05 max.	10V 0.05 max.		6.3V 0.075max. (C<3.3μF) 0.125max. (C _≥ 3.3μF)	4V -													
			E4 F5	0.05 max. 0.075 max. (C<0.1μF) 0.125 max. (C _≥ 0.1μF)	- 0.1 max. (C<1.0μF) (C _≥ 1.0μF)	- 0.15 max.		- 0.2 max.	-													
	I.R.	More than 1,000MΩ or 50Ω·F (Whichever is smaller)																				
Dielectric Strength	No failure																					
17	Humidity Load	The measured and observed characteristics shall satisfy the specifications in the following table.					Apply the rated voltage at 40±2°C and 90 to 95% humidity for 500±12 hours. Remove and let sit for 24±2 hours(temperature compensating type) or 48±4 hours (high dielectric constant type) at room temprature, then muasure. The charge/discharge current is less than 50mA. ·Initial measurement for F5/16Vmax. Apply the rated DC voltage for 1 hour at 40±2°C . Remove and let sit for 48±4 hours at room temperature. Perform initial measurement.															
	Appearance	No marking defects.																				
	Capacitance Change	Within ±7.5% or ±0.75pF (Whichever is larger)		R6,R7,C8:Within ±12.5% E4:Within ±30% F5:Within ±30% (W.V.>10V) F5:Within +30/-40% (W.V.≤10V)																		
	Q/D.F.	30pF and over:Q _≥ 200 30pF and below: Q _≥ 100 + $\frac{10}{3}$ C C:Nominal Capacitance(pF)	Char. R6 R7 C8	25V min. 0.05 max.	16V 0.05 max.	10V 0.05 max.		6.3V 0.075max. (C<3.3μF) 0.125max. (C _≥ 3.3μF)	4V -													
			E4 F5	0.05 max. 0.075 max. (C<0.1μF) 0.125 max. (C _≥ 0.1μF)	- 0.1 max. (C<1.0μF) (C _≥ 1.0μF)	- 0.15 max.		- 0.2 max.	-													
	I.R.	More than 500MΩ or 25Ω·F (Whichever is smaller)																				
Dielectric Strength	No failure																					

SPECIFICATIONS AND TEST METHODS						P 4				
No.	Item	Specification				Test Method				
		Temperature Compensating Type		High Dielectric Type						
18	High Temperature Load	The measured and observed characteristics shall satisfy the specifications in the following table.				Apply 200% of the rated voltage for 1000±12 hours at the maximum operating temperature ±3°C . Let sit for 24±2 hours(temperature compensating type) or 48±4 hours(high dielectric constant type) at room temperature, then measure. The charge/discharge current is less than 50mA. ·Initial measurement for high dielectric constant type. Apply 200% 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.				
	Appearance	No marking defects.								
	Capacitance Change	Within ±3% or ±0.3pF (Whichever is larger)		R6,R7,C8:Within ±12.5% E4:Within ±30% F5:Within±30% (Cap<1.0µF) F5:Within +30/-40% (Cap≥1.0µF)						
	Q/D.F.	30pF and over:Q≥350 10pF and over, 30pF and below: $Q \geq 275 + \frac{Q}{2} \cdot C$ 10pF and below: $Q \geq 200 + 10C$ C:Nominal Capacitance(pF)	Char.	25V min.	16V			10V	6.3V	4V
			R6 R7 C8	0.05 max.	0.05 max.			0.05 max.	0.075max. (C<3.3µF) 0.125max. (C≥3.3µF)	
I.R.	More than 1,000MΩ or 50Ω·F(Whichever is smaller)									
Dielectric Strength	No failure									

Table A-1

Char.	Nominal Values (ppm/°C) Note 1	Capacitance Change from 25 °C (%)					
		-55		-30		-10	
		Max.	Min.	Max.	Min.	Max.	Min.
5C	0± 30	0.58	-0.24	0.40	-0.17	0.25	-0.11
6C	0± 60	0.87	-0.48	0.59	-0.33	0.38	-0.21
6P	-150± 60	2.33	0.72	1.61	0.50	1.02	0.32
6R	-220± 60	3.02	1.28	2.08	0.88	1.32	0.56
6S	-330± 60	4.09	2.16	2.81	1.49	1.79	0.95
6T	-470± 60	5.46	3.28	3.75	2.26	2.39	1.44
7U	-750± 120	8.78	5.04	6.04	3.47	3.84	2.21
1X	+350~-1000	—	—	—	—	—	—

Note 1:Nominal values denote the temperature coefficient within a range of 25 °C to 125°C (forΔC)/85°C (for other TC).