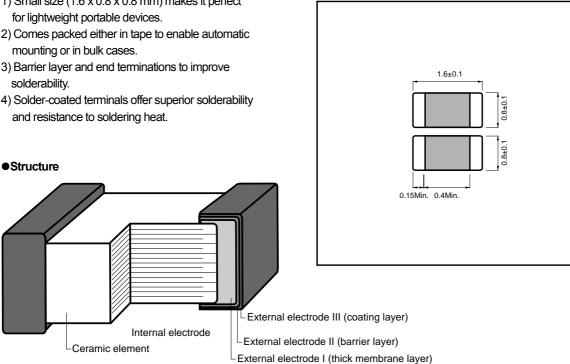
Multi-layer ceramic chip capacitors MCH18 (1608 (0603) size, chip capacitor)

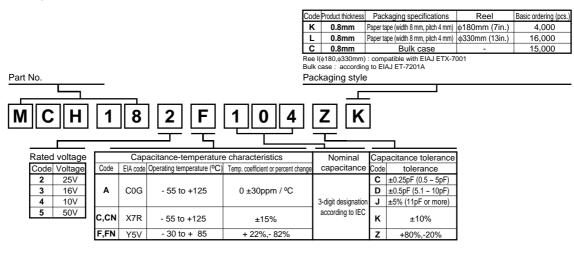
Features

- 1) Small size (1.6 x 0.8 x 0.8 mm) makes it perfect for lightweight portable devices.
- 2) Comes packed either in tape to enable automatic mounting or in bulk cases.
- 3) Barrier layer and end terminations to improve solderability.
- 4) Solder-coated terminals offer superior solderability and resistance to soldering heat.

• External dimensions (Units : mm)



Product designation



ROHM

*The design and specifications are subject to change without prior notice. Befor ordering or using, please check the latest technical specification.

Capacitance range

For thermal compensation

Part number. MCH18							
Part nui							
Capacitance(pF)	A (C0G)						
oupuolitanoo(pr)	Rated voltage Tolerance (V)	50					
0.5							
0.75							
1							
1.1							
1.2 1.3							
1.5							
1.6							
1.8							
2							
2.2	C (±0.25pF)						
2.4							
2.7 3							
3 3.3 3.6 3.9 4 4.3 4.7							
	1						
5							
5.1							
5.6 6 6.2 6.8 7 7.5 D (±0.5							
	D (± 0.5pF)						
8							
8.2							
9 9.1							
10							
11							
12							
13							
15 16							
18							
20							
22							
24							
27 30							
30 33 36 39 43 47 51	1(+5%)						
	J (±5%)	××××					
56							
62							
68 75							
82	-						
91							
100							

Part nur	MCH18	
a 1	Temperature characteristics	A (C0G)
Capacitance (pF)	Rated voltage Tolerance (V)	50
110		
120		****
130		\boxtimes
150		×××××
160		
180		
200		
220		
240		
270		
300	J (± 5%)	
330 360 390		
430		
470		
510 560		
620		
680		
750		
820		
910		
1,000		

Product thickness(mm) 0.8 ± 0.1

*The design and specifications are subject to change without prior notice. Befor ordering or using, please check the latest technical specification.

ROHM

MCH18

High dielectric constant

Part number		MCH18								
Capacitance(pF)	Temperature characteristics	C(X7R)	CN(X7R)		F(Y5V)	FN(Y5V)				
Capacitance(pr.)	Rated voltage (V)	50	50	25	10	50	50	25	16	10
	Tolerance	K(±10%)		K(±10%)		Z(+80%, -20%)		Z(+80%,	-20%)	
220										
270 330										
390 470 560										
680 820 1,000										
1,200 1,500 1,800										
2,200 2,700 3,300										
3,900 4,700 5,600										
6,800 8,200 10,000 (0.01µF)			××××							
12,000 15,000 18,000										
22,000 27,000 33,000				××××						
39,000 47,000 56,000							××××			
68,000 82,000 100,000 (0.1μF)								××××		
120,000 150,000 180,000										
220,000 270,000 330,000										
390,000 470,000 560,000										
680,000 1,000,000 (1μF) 1,200,000										
1,500,000 1,800,000 2,200,000										

Product thickness (mm) 0.8 ± 0.1

*The design and specifications are subject to change without prior notice. Befor ordering or using, please check the latest technical specification.

MCH18

Characteristics

Class 1 (For thermal compensation)

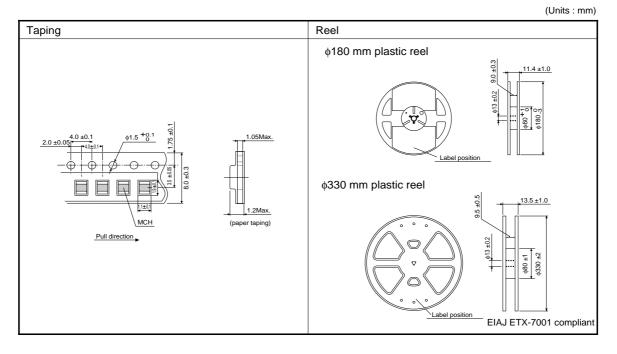
Mathematical standard Appearance There must be no mechanical damage. Appearance There must be no mechanical damage. Chain of the standard from the standard			A (COG)	Test methods / conditions (based on JIS C 5102)	
Nominal capacitance (C) Must be within the specified tolerance range. Based on paragraph 7.8 and paragraph 9 Nominal capacitance (C) Must be within the specified tolerance range. Modulate tolerance range. Modulate tolerance range. Dissipation factor (tan δ) 100 / (400 + 20C)% or less (Less than 30 pF) Over 1000pF rates Measurement frequency: 1± 0.11 Measurement voltage : 1± 0.11 Measurement voltage : 1± 0.11 Measurement frequency: 1± 0.11 Measurement voltage : 1± 0.11 Insulation resistance (IR) 10,000 MΩ or 500MΩ µF, whichever is smaller Based on paragraph 7.6 Measurement is made after rated voltage is applied for 60 ± 58. Withstanding voltage The insulation must not be damaged. Apply 300% of the rated voltage for 110 55 then measure. Temperature characteristics Within 0 ± 30ppm / °C The temperature coefficients in table 12, paragrap 7.12 are calculated at 20°C and high temperature apples 00.051 kg · 10 for 10 a 1s in the direction indicated by the arrow. Resistance to vibration Appearance There must be no mechanical damage. Chip is mounted to a board in the maner shown on the right, subjects 0.17 in the direction indicated by the arrow. Solderability At least 3 / 4 of the surface of the two terminals must be covered with new solder. Based on paragraph 8.13 Soldering temperature : 285 ± 5% Soldering time : 2 ± 0.5\$ Preheating :: 150 ± 10°CT Resistance to vibration (tanb) Must satisfy initial specified value. Based on paragraph 8.14 Soldering temperature : 280 ± 5%C Soldering time : 5 ± 0.5\$ Preheating :: 1	Item				
Nominal capacitance (C) Must be within the specified tolerance range. Measured at room temperature and standard hum 1000 pF or less Measurement frequency : 1± 0.11 Measurement torlage : 1± 0.11 Over 1000 pF or less (30 pF or larger) Measurement trequency : 1± 0.11 Measurement voltage : 1± 0.11 Over 1000 pF Measurement voltage : 1± 0.11 Measurement v	Operating temperature		- 55°C ~ + 125°C		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Nominal capacitance (C)		Must be within the specified tolerance range.	Based on paragraph 7.8 and paragraph 9 Measured at room temperature and standard humidity. 1000pF or less Measurement frequency : 1± 0.1MHz Measurement voltage : 1± 0.1Vrms Over 1000pF Measurement frequency : 1± 0.1KHz Measurement voltage : 1± 0.1Vrms	
Insulation resistance (IR) 10,000 MΩ or 500MΩ μF, whichever is smaller Measurement is made after rated voltage is applied for 60 ± 58. Withstanding voltage The insulation must not be damaged. Apply 300% of the rated voltage for 1 to 5s then measure. Temperature carcleristics Within 0 ± 30ppm / °C The temperature coefficients in table 12, paragra 7.12 are calculated at 20°C and high temperature 7.12 are calculated at 20°	Dissipation factor $(\tan \delta)$		(Less than 30 pF)		
Withstanding voltage The insulation must not be damaged. Apply 300% of the rated voltage for 1 to 5s then measure. Temperature characteristics Within 0 ± 30ppm / °C The temperature coefficients in table 12, paragrap for 1 to 5s then measure. Terminal adherence No detachment or signs of detachment. Based on paragraph 8.11.2 Apply 5N (0.51 kg · f) for 10 ± 1s in the direction indicated by the arrow. Pressure Capacitor Resistance to vibration Appearance There must be no mechanical damage. Chip is mounted to a board in the manner shown on the right, subjected to vibration (type A in paragraph 8.2). UTUE to vibration (type A in paragraph 8.2). Solderability At least 3 / 4 of the surface of the two terminals must be covered with new solder. Based on paragraph 8.13 Soldering temperature : 235 ± 5°C Soldering time : 2 ± 0.5s Resistance to soldering the at or capacitance change At least 3 / 4 of the surface of the two terminals must be covered with new solder. Based on paragraph 8.13 Soldering temperature : 235 ± 5°C Soldering time : 2 ± 0.5s Solderability Appearance There must be no mechanical damage. Based on paragraph 8.14 Soldering time : 2 ± 0.5s Resistance to soldering time Appearance in there must be no mechanical damage. Based on paragraph 8.14 Soldering time : 2 ± 0.5s Solderability At least 3 / 4 of the surface of the two terminals must be covered with new solder. Based on paragraph 8.14 Soldering time : 2 ± 0.5s Resistance to soldering time Ext of cap	Insulation resis	tance (IR)	10,000 M\Omega or 500M $\mu\text{F},$ whichever is smaller	Measurement is made after rated voltage	
Terminal adherence No detachment or signs of detachment. Based on paragraph 8.11.2 Apply 5N (0.51 kg·f) for 10 ± 1s in the direction indicated by the arrow. Based on paragraph 8.11.2 Apply 5N (0.51 kg·f) for 10 ± 1s in the direction indicated by the arrow. Resistance to vibration Appearance There must be no mechanical damage. Chip is mounted to a board in the manner shown on the right, subjected to vibration Chip is mounted to a board in the manner shown on the right, subjected to vibration (type A in paragraph 8.2), Dissipation factor (tanō) Must satisfy initial specified value. Chip is mounted to a board in the manner shown on the right, subjected to vibration (type A in paragraph 8.2), and measured 24 ± 2 hrs. later. Image the right and the sufface of the two terminals must be covered with new solder. Solderability At least 3 / 4 of the sufface of the two terminals must be covered with new solder. Based on paragraph 8.13 Soldering temperature : 235 ± 5°C Soldering time : 2 ± 0.5s Resistance to soldering heat Dissipation factor (tanō) Must satisfy initial specified value. Based on paragraph 8.14 Soldering time : 5 ± 0.5s Resistance to soldering heat Dissipation factor (tanō) Must satisfy initial specified value. Based on paragraph 8.14 Soldering temperature : 260 ± 5°C Soldering time : 5 ± 0.5s Preheating 10,000 MΩ or 500MΩ µF , whichever is smaller Based on paragraph 8.14 Soldering time : 5 ± 0.5s	Withstanding ve	oltage	The insulation must not be damaged.	Apply 300% of the rated voltage	
Terminal adherence No detachment or signs of detachment. Apply 5N (0.51 kg· f) for 10 ± 1s in the direction indicated by the arrow. Resistance to vibration Appearance There must be no mechanical damage. Chip is mounted to a board in the manner shown on the right, subjected to vibration (type A in paragraph 8.12) Dissipation factor (tanö) Chip is mounted to a board in the manner shown on the right, subjected to vibration (type A in paragraph 8.2) and measured 24 ± 2 hrs. later. Import Based on paragraph 8.13 Soldering temperature : 235 ± 5°C Soldering time : 2 ± 0.5s Resistance to soldering heat Appearance There must be no mechanical damage. Based on paragraph 8.13 Soldering temperature : 235 ± 5°C Soldering time : 2 ± 0.5s	Temperature ch	haracteristics	Within 0 ± 30ppm / °C	The temperature coefficients in table 12, paragraph 7.12 are calculated at 20°C and high temperature.	
Resistance to vibration Rate of capacitance change Must be within initial tolerance. manner shown on the right, subjected to vibration (type A in paragraph 8.2), Dissipation factor (tanö) Immediate to the surface of the two terminals must be covered with new solder. Based on paragraph 8.13 Soldering temperature : 235 ± 5°C Soldering time : 2 ± 0.5s Resistance to soldering heat Appearance There must be no mechanical damage. Based on paragraph 8.14 Soldering time : 2 ± 0.5s Resistance to soldering heat Dissipation factor (tanö) Must satisfy initial specified value. Based on paragraph 8.14 Soldering time : 2 ± 0.5s	Terminal adher	rence	No detachment or signs of detachment.	Apply 5N (0.51 kg · f) for 10 ± 1s in the direction indicated by the arrow	
Resistance to vibration Rate of capacitance change Must be within initial tolerance. Infanite strown of ne fugit, subjected to vibration Infanite strown of negatives Infanite strown of negatives <th< td=""><td></td><td>Appearance</td><td>There must be no mechanical damage.</td><td></td></th<>		Appearance	There must be no mechanical damage.		
Dissipation factor (tanδ) Must satisfy initial specified value. Solderability At least 3 / 4 of the surface of the two terminals must be covered with new solder. Based on paragraph 8.13 Soldering temperature : 235 ± 5°C Soldering time : 2 ± 0.5s Resistance to soldering heat Appearance There must be no mechanical damage. Resistance to soldering heat Ease of capacitance change ± 2.5% or ± 0.25 pF, whichever is larger. Dissipation factor (tanδ) Must satisfy initial specified value. Based on paragraph 8.14 Soldering temperature : 260 ± 5°C Soldering time : 5 ± 0.5s Preheating :: 150 ± 10°C1 1 to 2 min.		Rate of capacitance change	Must be within initial tolerance.	to vibration (type A in paragraph 8.2),	
Solderability At least 3 / 4 of the surface of the two terminals must be covered with new solder. Soldering temperature : 235 ± 5°C Soldering time Resistance to soldering heat Appearance There must be no mechanical damage. Resistance to soldering heat Dissipation factor (tanô) Must satisfy initial specified value. Insulation resistance 10,000 MΩ or 500MΩ.µF, whichever is smaller Soldering time		Dissipation factor (tanδ)	Must satisfy initial specified value.	and measured 24 ± 2 hrs. later. Board	
Resistance to soldering heat Dissipation factor (tanδ) Must satisfy initial specified value. Based on paragraph 8.14 Insulation resistance 10,000 MΩ or 500MΩ µF , whichever is smaller Soldering time : 5± 0.5s Preheating : 150± 10°C i	Solderability			Soldering temperature : 235 ± 5°C	
Resistance to soldering heat Dissipation factor (tanδ) Must satisfy initial specified value. Soldering temperature : 260 ± 5°C Soldering time Insulation resistance Soldering temperature : 260 ± 5°C Soldering time 150 ± 10°C Insulation resistance 10,000 MΩ or 500 MΩ·μF , whichever is smaller Preheating :150 ± 10°C		Appearance	There must be no mechanical damage.		
to soldering heat Disspation factor (tano) Must satisfy initial specified value. Soldering time :5 ± 0.5s Insulation resistance 10,000 MΩ or 500MΩ.µF , whichever is smaller 1 to 2 min.	-	Rate of capacitance change	\pm 2.5% or \pm 0.25 pF, whichever is larger.	Based on paragraph 8.14	
heat Insulation resistance $10,000 \text{ M}\Omega \text{ or } 500\text{ M}\Omega \cdot \mu\text{F}$, whichever is smaller Preheating $100^{\circ} \text{ D} \pm 10^{\circ} \text{ C}$ 1 to 2 min.		Dissipation factor (tanδ)	Must satisfy initial specified value.		
		Insulation resistance	10,000 $M\Omega$ or $500 M\Omega {\cdot} \mu F$, whichever is smaller	Preheating : 150 ± 10°C for	
vvitnstanding voltage The insulation must not be damaged.		Withstanding voltage	The insulation must not be damaged.		
Appearance There must be no mechanical damage.		Appearance	There must be no mechanical damage.		
Temperature Rate of capacitance change ± 2.5% ± 0.25 pF, whichever is larger. Based on paragraph 9.3	Temperature Rate of capacitance char		\pm 2.5% \pm 0.25 pF, whichever is larger.		
cycling Number of cycles: 10		Dissipation factor ($tan\delta$)	Must satisfy initial specified value.	 Number of cycles: 10 Capacitance measured after 24 ± 2 hrs. 	
Insulation resistance $10,000 \text{ M}\Omega \text{ or } 500 \text{M}\Omega; \mu\text{F}$, whichever is smaller		Insulation resistance	10,000 M\Omega or 500M\Omega $\cdot \mu F$, whichever is smaller	1	
Appearance There must be no mechanical damage. Based on paragraph 9.9	Humidity load test Dis	Appearance	There must be no mechanical damage.	Based on paragraph 9.9	
Humidity load Rate of capacitance change ± 7.5% or ± 0.75 pF , whichever is larger. Test temperature : 40 ± 2°C Relative humidity : 90% to 95%		Rate of capacitance change	\pm 7.5% or \pm 0.75 pF , whichever is larger.	Test temperature : 40 ± 2°C Relative humidity : 90% to 95%	
		Dissipation factor (tanδ)	0.5% or less	Applied voltage : rated voltage	
		Insulation resistance	500 M\Omega or 25M Ω · μ F, whichever is smaller	Capacitance measured after 24 ± 2 hrs.	
Appearance There must be no mechanical damage.		Appearance	There must be no mechanical damage.	Bread or constraint 0.40	
	High-	Rate of capacitance change	\pm 3.0% or \pm 0.3 pF , whichever is larger.	Test temperature : Max. operating temp.	
load test Dissipation factor (tanδ) 0.3% or less Test time : 1,000 to 1,048 hrs		Dissipation factor (tanδ)	0.3% or less		
Insulation resistance 1,000 MΩ or 50MΩ μF , whichever is smaller		Insulation resistance	1,000 $M\Omega$ or $50 M\Omega {\cdot} \mu F$, whichever is smaller	Capacitance measured after 24 ± 2 hrs.	

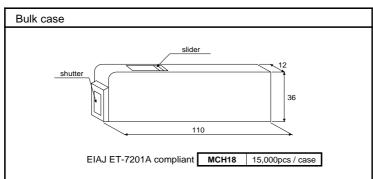
*The design and specifications are subject to change without prior notice. Befor ordering or using, please check the latest technical specification.

Temperature characteristics Item		C.CN (X7R)	F,FN(Y5V)	Test methods / conditions	
		0,011(X11)	1,11(107)	(based on JIS C 5102)	
Operating temperature		- 55°C~ + 125°C - 30°C~ + 85°C			
Nominal capacitance (C)		Must be within the spe	ecified tolerance range.		
tan δ		Rated Voltage Rated Voltage 50V : 3.0% or less 50V : 5.0% or less 25V : 3.0% or less 25V : 7.5% or less 16V : 10.0% or less 16V : 10.0% or less		Based on paragraph 7.8 Measured at room temperature and standard humi Measurement frequency : 1 ± 0.1 kHz Measurement voltage : 1.0 ± 0.2 Vrms.	
Insulation resistance (IR)		10,000 MΩ or 500MΩ-μ (Rated Voltage 16V,10V : 10,000MΩ	Based on paragraph 7.6 Measurement is made after rated voltage is applied for 60 ± 5s.		
Withstanding v	oltage	The insulation mus	Based on paragraph 7.1 Apply 250% of the rated voltage for 1 to 5s then measure.		
Temperature c	haracteristics	Within ± 15%	Within ± 22, - 82%	The temperature coefficients in paragraph 7.12, table 8, condition B, are based on measurements carried out at 20°C, with no voltage applied.	
Terminal adherence		No detachment or s	Based on paragraph 8.11.2 Apply 5N (0.51 kg · for 10 ± 1s in the direction indicated by the arrow.		
Appearance		There must be no n	Chip is mounted to a board in the manner		
Resistance to vibration	Rate of capacitance change	Within ± 7.5%	Within ± 20%	shown on the right, subjected to vibration (type A in paragraph 8.2), and measured	
	Dissipation factor (tan δ)	Must satisfy initia	al specified value.	48 ± 4 hrs. later. Board	
Solderability		At least 3 / 4 of the surface of the two ter	Based on paragraph 8.13 Soldering temperature : 235 ± 5°C Soldering time : 2 ± 0.5s		
	Appearance	There must be no n	nechanical damage.		
	Rate of capacitance change	Within ± 7.5%	Within ± 20.0%	Based on paragraph 8.14	
Resistance to soldering	Dissipation factor (tan $\boldsymbol{\delta})$	Must satisfy 2.0 times of initial specified value.	Must satisfy 1.5 times of initial specified value.	Soldering temperature : 260 ± 5°C Soldering time : 5 ± 0.5s	
heat	Insulation resistance	10,000 MΩ or 500MΩ·μF (Rated Voltage 16V,10V : 10,000MΩ o	Preheating : 150 ± 0.53 1 to 2 min.		
	Withstanding voltage	The insulation mus			
	Appearance	There must be no n			
Temperature	Rate of capacitance change	Within ± 7.5%	Within ± 20.0%	Based on paragraph 9.3 Number of cycles: 5	
cycling	Dissipation factor (tan δ)	Must satisfy 2.0 times of initial specified value. 10,000 MΩ or 500MΩ-μF	, whichever is smaller.	Capacitance measured after 48 ± 4 hr	
	Appearance	(Rated Voltage 16V,10V : 10,000MΩ o There must be no n			
Humidity load . test	Rate of capacitance change	± 12.5% or less	Within ± 30.0%	Based on paragraph 9.9 Test temperature : 40 ± 2°C	
	Dissipation factor (tan δ)	± 12.5% or less Must satisfy 2.0 times of initial specified value.	Must satisfy 1.5 times of initial specified value.	Relative humidity : 90% to 95%	
	Insulation resistance	$\frac{500 \text{ M}\Omega \text{ or } 25 \text{M}\Omega \cdot \text{\mu}\text{F}}{(\text{Rated Voltage 16V,10V}: 500 \text{M}\Omega \text{ or } 25 \text{M}\Omega \cdot \text{\mu}\text{F})}$	Applied voltage : rated voltage Test time : 500 to 524 hrs. Capacitance measured after 48 ±		
	Appearance	There must be no n			
High-	Rate of capacitance change	Within ± 10.0%	Within ± 30.0%	Based on paragraph 9.10 Test temperature : Max. operating to	
temperature load test	Dissipation factor (tan δ)	Must satisfy 2.0 times of initial specified value.	Must satisfy 1.5 times of initial specified value.	Applied voltage : rated voltage Test time : 1,000 to 1,048 hrs.	
load test	Insulation resistance	1,000 MΩ or 50MΩ·μF, (Rated Voltage 16V,10V : 1,000MΩ o		Capacitance measured after 48 ± 4 hr	

*The design and specifications are subject to change without prior notice. Befor ordering or using, please check the latest technical specification.

Packaging specifications



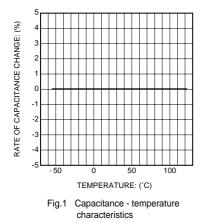


*The design and specifications are subject to change without prior notice. Befor ordering or using, please check the latest technical specification.



Electrical characteristics

A (COG) Characteristics





■F (Y5V) Characteristics

20 10

0

-10

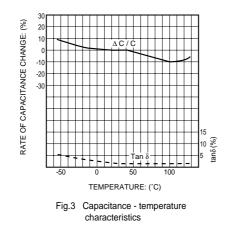
-20 -30 -40 -50 -60 -70

-80

-9(

-40 -20

RATE OF CAPACITANCE CHANGE: (%)



c/c

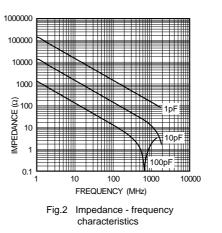
Tan

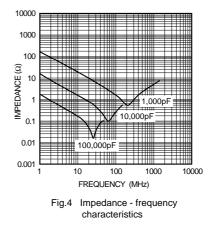
20 40 60 80 100

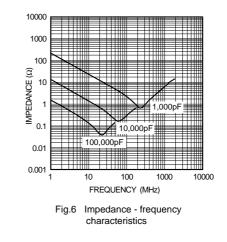
TEMPERATURE: (°C)

Fig.5 Capacitance - temperature

characteristics







*The design and specifications are subject to change without prior notice. Before ordering or using, please check the latest technical specification.

14 12

10

6

4

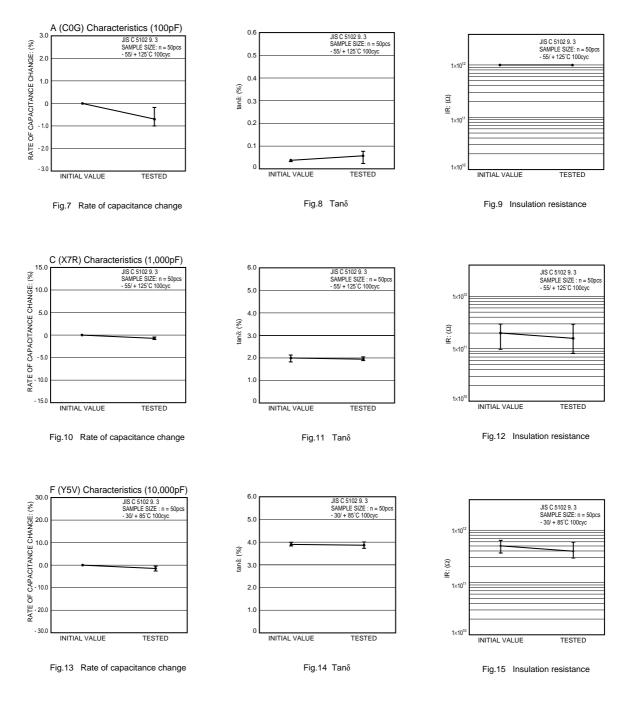
2

tanô (%)

MCH18

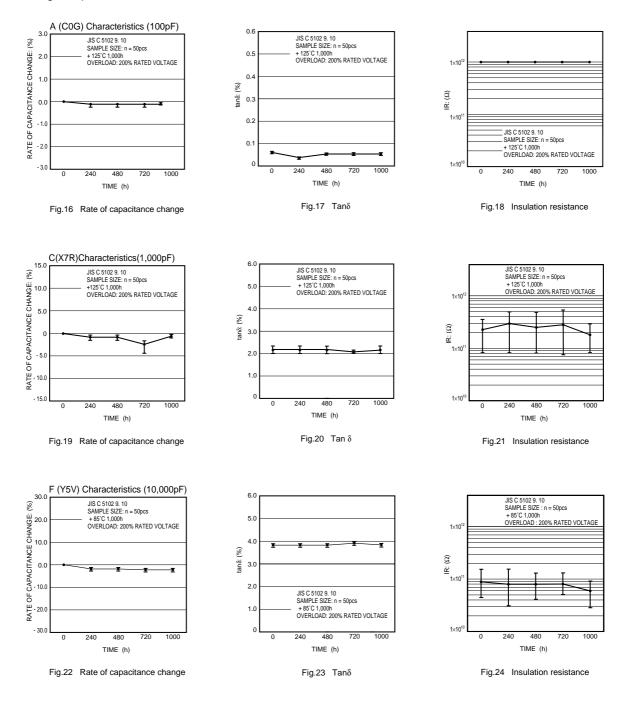
Ceramic capacitors

Temperature cycling test



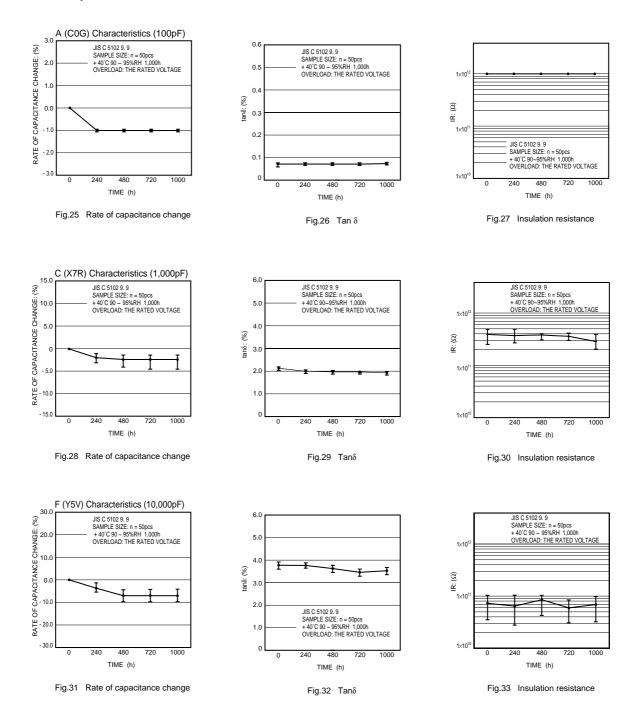
*The design and specifications are subject to change without prior notice. Before ordering or using, please check the latest technical specification.

High-temperature load test



*The design and specifications are subject to change without prior notice. Before ordering or using, please check the latest technical specification.

Humidity load test



*The design and specifications are subject to change without prior notice. Before ordering or using, please check the latest technical specification.