muRata

Chip Multilayer Ceramic Capacitors for Implantable Medical Devices (Non Life support circuit)

GCH21A5C2J100FX01_ (0805, C0G:EIA, 10pF, DC630V)

_: packaging code

Reference Sheet

1.Scope

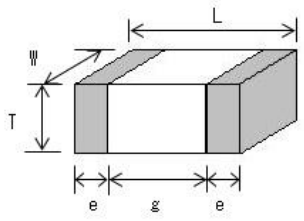
This product specification is applied to Chip Multilayer Ceramic Capacitors used for Implantable Medical Devices (Non Life support circuit).

2.MURATA Part NO. System

(Ex.)

GCH	21	A	5C	2J	100	F	X01	D
	(1)L/W Dimensions	(2)T Dimensions	(3)Temperature Characteristics	(4)Rated Voltage	(5)Nominal Capacitance	(6)Capacitance Tolerance	(7)Murata's Control Code	(8)Packaging Code

3. Type & Dimensions



(Unit:mm)

(1)-1 L	(1)-2 W	(2) T	e	g
2.0±0.2	1.25±0.2	1.0+0/-0.3	0.3 min.	0.7 min.

4.Rated value

(3) Temperature Characteristics (Public STD Code):C0G(EIA)		(4) Rated Voltage	(5) Nominal Capacitance	(6) Capacitance Tolerance	Specifications and Test Methods (Operating Temp. Range)
Temp. coeff or Cap. Change	Temp. Range (Ref.Temp.)				
0±30 ppm/°C	25 to 125 °C (25 °C)	DC 630 V	10 pF	±1 %	-55 to 125 °C

・**Soldering Method**
Flow / Reflow

5.Package

mark	(8) Packaging	Packaging Unit
D	ϕ180mm Reel PAPER W8P4	4000 pcs./Reel
J	ϕ330mm Reel PAPER W8P4	10000 pcs./Reel

Product specifications in this catalog are as of May.29,2020,and are subject to change or obsolescence without notice.
Please consult the approval sheet before ordering.
Please read rating and !Cautions first.

■Specification and Test Methods

No.	Test Item	Specification	Test Method
1	Pre-and Post-Stress Electrical Test	-	
2	Temperature Cycling	The measured and observed characteristics should satisfy the specifications in the following table.	Fix the capacitor to the supporting jig in the same manner and under the same conditions as (12). Perform the 100 cycles according to the four heat treatments listed in the following table. Let sit for 24±2h at room condition*, then measure.
	Appearance	No marking defects	
	Capacitance Change	Within ±2.0% or ±0.3pF (Whichever is larger)	
	Q	Q ≥ 1,000	
	I.R.	More than 10,000MΩ or 100 MΩ·μF (Whichever is smaller)	
3	Destructive Phisical Analysis	No defects or abnormalities	Per EIA-469
4	Biased Humidity	The measured and observed characteristics should satisfy the specifications in the following table.	Apply the rated voltage and DC1.3+0.2/-0 V (add 6.8kΩ resistor) at 85±3°C and 80% to 85% humidity for 240±12h. Remove and let sit for 24±2h at room condition*, then measure. then measure. The charge/discharge current is less than 50mA.
	Appearance	No marking defects	
	Capacitance Change	Within ±3.0% or ±0.3pF (Whichever is larger)	
	Q	Q ≥ 200	
	I.R.	More than 1,000MΩ or 50 MΩ·μF (Whichever is smaller)	
5	Operational Life	The measured and observed characteristics should satisfy the specifications in the following table.	Apply 120% of the rated voltage for 1,000±12h at 125±3°C. Let sit for 24±2h at room condition*, then measure. The charge/discharge current is less than 50mA.
	Appearance	No marking defects	
	Capacitance Change	Within ±3.0% or ±0.3pF (Whichever is larger)	
	Q	Q ≥ 350	
	I.R.	More than 1,000MΩ or 50 MΩ·μF (Whichever is smaller)	
6	External Visual	No defects or abnormalities	Visual inspection
7	Phisical Dimension	Within the specified dimensions	Using Measuring instrument of dimension.
8	Resistance to Soldering Heat	The measured and observed characteristics should satisfy the specifications in the following table.	Immerse the capacitor in a solder solution at 260±5°C for 10±1s.. Let sit at room condition* for 24±2h, then measure.
	Appearance	No marking defects	
	Capacitance Change	Within ±5% or ±0.5pF (Whichever is larger)	
	Q	Q ≥ 1,000	
	I.R.	More than 10,000MΩ or 500 MΩ·μF (Whichever is smaller)	
9	Solderability	95% of the terminations is to be soldered evenly and continuously.	Test Method : Solder bath method Flux : Solution of rosin ethanol 25(mass)% Preheat : 80℃ to 120℃ for 10s to 30s Solder : Sn-3.0Ag-0.5Cu Solder Temp. : 245+/-5℃ Immersion time : 2+/-0.5s

Step	1	2	3	4
Temp.(°C)	-55+0/-3	Room Temp.	125+3/-0	Room Temp.
Time(min.)	15±3	1	15±3	1

*Room Condition : Temperature:15°C to 35°C, Relative humidity:45% to 75%, Atmosphere pressure:86kPa to 106kPa

■Specification and Test Methods

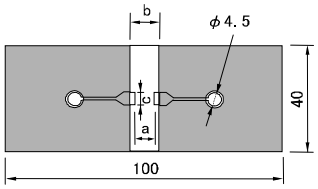
<table>
<tr><th>No.</th><th colspan="2">Test Item</th><th>Specification</th><th>Test Method</th></tr>
<tr><td rowspan="5">10</td><td rowspan="5">Electrical Characte-rization</td><td>Apperance</td><td>No defects or abnormalities</td><td>Visual inspection.</td></tr>
<tr><td>Capacitance Change</td><td>Within the specified tolerance</td><td rowspan="2">The capacitance/Q should be measured at 25°C at the frequency and voltage shown in the table.
<table><tr><th>Item \ Cap.</th><th>less than 1,000pF</th><th>1,000pF or more</th></tr><tr><td>Frequency</td><td>1±0.1MHz</td><td>1±0.1kHz</td></tr><tr><td>Voltage</td><td>0.5 to 5V(r.m.s.)</td><td>1±0.2V(r.m.s.)</td></tr></table></td></tr>
<tr><td>Q</td><td>Q ≥ 1,000</td></tr>
<tr><td>I.R. 25 °C</td><td>More than 100,000MΩ or 1,000 MΩ·μF
(Whichever is smaller)</td><td rowspan="2">The insulation resistance should be measured with a DC500V±50V at 25 °C and 125 °C within 1 min. of charging.</td></tr>
<tr><td>I.R. 125°C</td><td>More than 10,000MΩ or 100 MΩ·μF
(Whichever is smaller)</td></tr>
<tr><td></td><td></td><td>Dielectric Strength</td><td>No failure</td><td>No failure should be observed when voltage in Table is applied between the terminations for 1s to 5s, provided the charge/discharge current is less than 50mA.
<table><tr><th>Rated Voltage</th><th>Test Voltage</th></tr><tr><td>DC630V</td><td>150% of the rated voltage</td></tr></table></td></tr>
<tr><td>11</td><td>Board Flex</td><td>Appearance</td><td>No marking defects</td><td rowspan="3">Solder the capacitor on the test jig (glass epoxy board) shown in Fig1 using a solder. Then apply a force in the direction shown in Fig 2 for 5±1s. The soldering should be done by the reflow method and should be conducted with care so that the soldering is uniform and free of defects such as heat shock.
<table><tr><th>Type</th><th>a</th><th>b</th><th>C</th></tr><tr><td>GCH21</td><td>0.8</td><td>3.0</td><td>1.3</td></tr><tr><td>GCH31</td><td>2.0</td><td>4.4</td><td>1.7</td></tr><tr><td>GCH32</td><td>2.0</td><td>4.4</td><td>2.6</td></tr></table>(in mm)
 

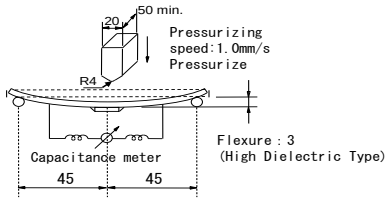
Fig.1 t : 1.6mm
 

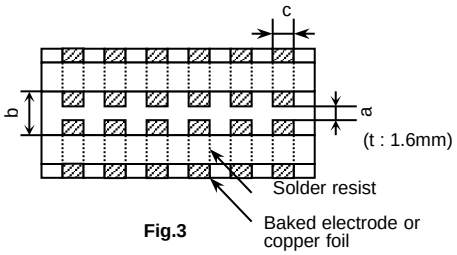
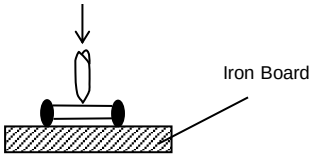
Fig.2</td></tr>
<tr><td>Capacitance Change</td><td>Within ±5.0% or ±0.5pF
(Whichever is larger)</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>12</td><td>Terminal Strength</td><td>Appearance</td><td>No marking defects</td><td rowspan="4">Solder the capacitor to the test jig (glass epoxy board) shown in Fig.3 using a solder. Then apply 18N force in parallel with the test jig for 60s.
The soldering should be done by the reflow method and should be conducted with care so that the soldering is uniform and free of defects such as heat shock.
<table><tr><th>Type</th><th>a</th><th>b</th><th>C</th></tr><tr><td>GCH21</td><td>1.2</td><td>4.0</td><td>1.65</td></tr><tr><td>GCH31</td><td>2.2</td><td>5.0</td><td>2.0</td></tr><tr><td>GCH32</td><td>2.2</td><td>5.0</td><td>2.9</td></tr></table>(in mm)
 

Fig.3</td></tr>
<tr><td>Capacitance Change</td><td>Within specified tolerance</td></tr>
<tr><td>Q</td><td>Q ≥ 1,000</td></tr>
<tr><td>I.R.</td><td>More than 10,000MΩ or 500 MΩ·μF
(Whichever is smaller)</td></tr>
</table>

■Specification and Test Methods

<table>
<tr><th>No.</th><th colspan="2">Test Item</th><th>Specification</th><th>Test Method</th></tr>
<tr><td>13</td><td colspan="2">Beam Load Test</td><td>Destruction value should be exceed following one.
< Chip L dimension : 2.5mm max. >
Chip thickness > 0.5mm rank : 20N
Chip thickness ≤ 0.5mm rank : 8N
< Chip L dimension : 3.2mm min. >
Chip thickness < 1.25mm rank : 15N
Chip thickness ≥ 1.25mm rank : 54.5N</td><td>Place the capacitor in the beam load fixture as Fig 4.
Apply a force.
< Chip L dimension : 2.5mm max. >
 

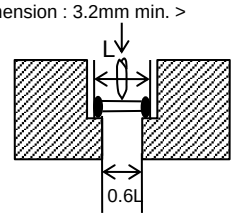
< Chip L dimension : 3.2mm min. >
 

Fig.4
Speed supplied the Stress Load : 2.5mm / s</td></tr>
<tr><td rowspan="2">14</td><td rowspan="2">Capacitance Temperature Characteris-tics</td><td>Capacitance Change</td><td>0±30 ppm/°C
(Temp.Range:+25 to +125°C)
0+30,-72 ppm/°C
(Temp.Range:-55 to +25°C)</td><td rowspan="2">The capacitance change should be measured after 5min. at each specified temperature stage.
The temperature coefficient is determind using the capacitance measured in step 3 as a reference.
When cycling the temperature sequentially from step1 through 5 the capacitance should be within the specified tolerance for the temperature coefficient.
The capacitance drift is caluculated by dividing the differences betweeen the maximum and minimum measured values in the step 1,3 and 5 by the capacitance value in step 3.
<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></td></tr>
<tr><td>Capacitance Drift</td><td>Within ±0.2% or ±0.05 pF
(Whichever is larger.)</td></tr>
</table>

(1) Appearance of taping

(a) Paper Tape

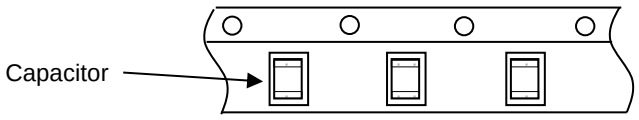
Bottom Tape (Thickness: Around 50μm) is attached below Base Tape with sprocket and put Top Tape (Thickness: Around 50μm) on capacitor.

(b) Plastic Tape

Cover Tape (Thickness: Around 60μm) is put on capacitor on Base Tape (Blister carrier Tape).

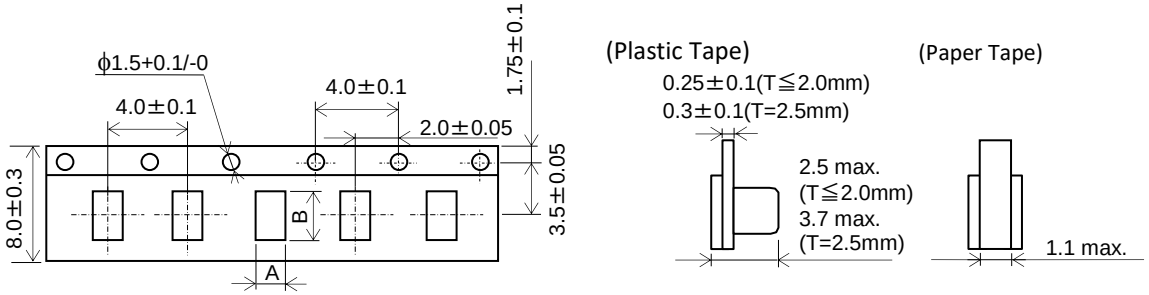
(c) The sprocket holes are to the right as the Tape is pulled toward the user.

(2) Packed chips



(3) Dimensions of Tape

(a) Type A (Dimensions of chip : Apply to 1.6x0.8 , 2.0x1.25 , 3.2x1.6 , 3.2x2.5)

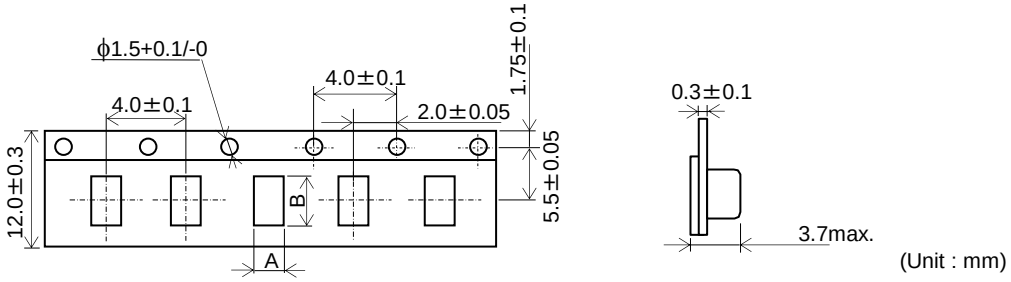


(Unit : mm)

Dimensions of chip [L×W]	A*	B*
1.6×0.8	1.05	1.85
2.0×1.25	1.45	2.25
3.2×1.6	2.0	3.6
3.2×2.5	2.9	3.6

*Dimensions of A,B : Nominal value

(b) Type B (Dimensions of chip : Apply to 4.5x2.0)

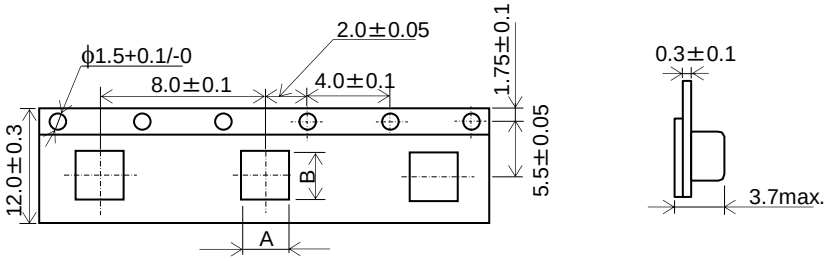


(Unit : mm)

Dimensions of chip [L×W]	A*	B*
4.5×2.0	2.5	5.1

*Dimensions of A,B : Nominal value

(c) Type C (Dimensions of chip : Apply to 4.5x3.2 to 5.7x5.0)

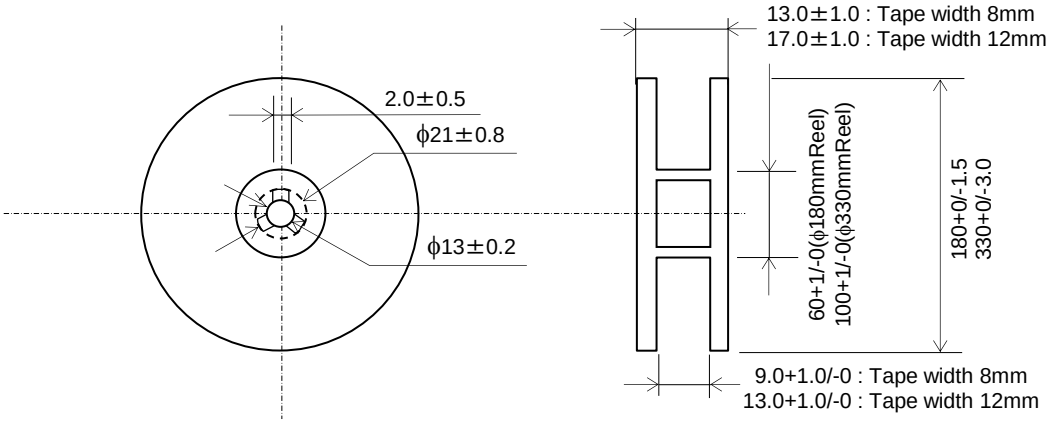


(Unit : mm)

Dimensions of chip [L×W]	A*	B*
4.5×3.2	3.6	4.9
5.7×2.8	3.2	6.1
5.7×5.0	5.4	6.1

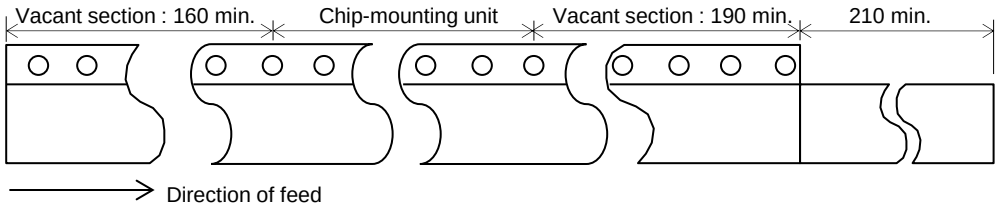
*Dimensions of A,B : Nominal value

(4) Dimensions of Reel



(Unit : mm)

(5) Part of the leader and part of the empty tape shall be attached to the end of the tape as follows.



(Unit : mm)

(6) The top tape or cover tape and base tape are not attached at the end of the tape for a minimum of 5 pitches.

(7) Missing capacitors number within 0.1% of the number per reel or 1pc, whichever is greater, and not continuous.

(8) The top tape or cover tape and bottom tape shall not protrude beyond the edges of the tape and shall not cover sprocket holes.

(9) Cumulative tolerance of sprocket holes, 10 pitches : ±0.3mm.

(10) Peeling off force : 0.1 to 0.6N in the direction shown on the follows.