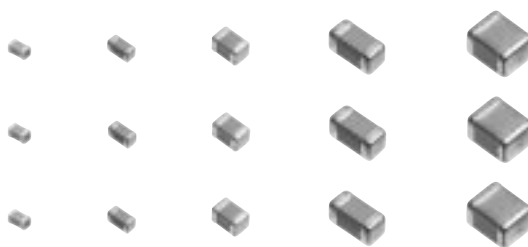


### Multilayer Ceramic Chip Capacitors (High Capacitance)

Series: **ECJ**



#### ■ Features

- Small and Large capacitance Multilayer Ceramic Chip Capacitor by Panasonic creative material technology and high precision lamination technology
- Low ESR, Low ESL and excellent High-frequency
- Optimal to change from TANTALUM CHIP CAPACITORS and ALUMINUM ELECTROLYTIC CAPACITORS

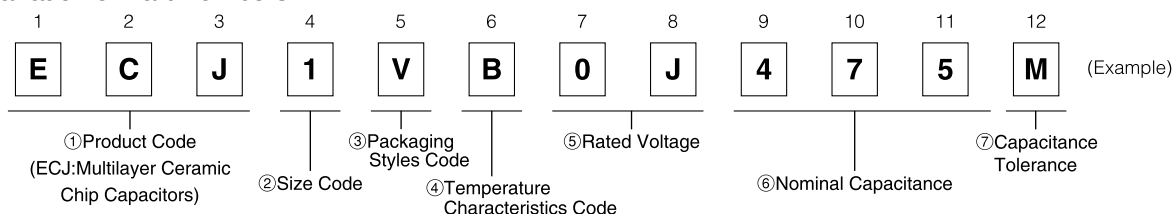
#### ■ Precaution for Handling

See Page 51 to 57

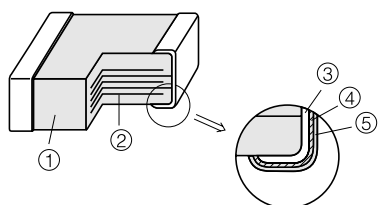
#### ■ Discontinued / Revis Part Numbers

See Page 58

#### ■ Explanation of Part Numbers



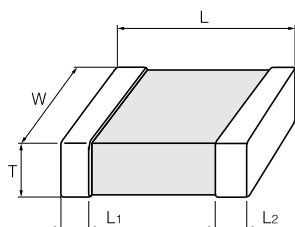
#### ■ Construction



| No | Name               |                        |
|----|--------------------|------------------------|
| ①  | Ceramic dielectric |                        |
| ②  | Internal electrode |                        |
| ③  | Terminal electrode | Substrate electrode    |
| ④  |                    | Intermediate electrode |
| ⑤  |                    | External electrode     |

#### ■ Dimensions in mm (not to scale)

Unit : mm



| Code | Size Code (EIA)  | L         | W         | T         | L1, L2    |
|------|------------------|-----------|-----------|-----------|-----------|
| 0    | Type "10" (0402) | 1.00±0.05 | 0.50±0.05 | 0.50±0.05 | 0.2±0.1   |
| 1    | Type "11" (0603) | 1.6±0.1   | 0.8±0.1   | 0.8±0.1   | 0.3±0.2   |
| 2    | Type "12" (0805) | 2.0±0.1   | 1.25±0.10 | 0.85±0.10 | 0.50±0.25 |
|      |                  |           |           | 1.25±0.10 |           |
|      |                  | 2.00±0.15 | 1.25±0.15 | 1.25±0.15 |           |
| C    |                  | 2.0±0.2   | 1.25±0.20 | 1.25±0.20 |           |
| G    |                  | 2.0±0.2   | 1.25±0.20 | 1.25±0.20 | 0.50±0.25 |
|      |                  | 2.00±0.15 | 1.25±0.15 | 0.85±0.10 |           |
| 3    | Type "13" (1206) | 3.20±0.15 | 1.60±0.15 | 0.85±0.10 | 0.6±0.3   |
|      |                  |           |           | 1.15±0.10 |           |
|      |                  | 3.2±0.2   | 1.6±0.2   | 1.6±0.2   |           |
| D    |                  | 3.2±0.2   | 1.6±0.2   | 0.85±0.10 | 0.6±0.3   |
| M    |                  |           |           | 1.15±0.10 |           |
| 4    | Type "23" (1210) | 3.2±0.3   | 2.5±0.2   | 2.0±0.2   | 0.6±0.3   |
|      |                  |           | 2.5±0.3   | 2.5±0.3   |           |
| 9    |                  | 3.2±0.3   | 2.5±0.2   | 0.85±0.10 | 0.6±0.3   |

## ■ Packaging Styles and Standard Packaging Quantity

T : Thickness (mm)

| Code | Packaging Styles |                                | Quantity      | Type“10”<br>(0402) | Type“11”<br>(0603) | Type“12”<br>(0805) |        | Type“13”<br>(1206) |        |       | Type“23”<br>(1210) |       |       |
|------|------------------|--------------------------------|---------------|--------------------|--------------------|--------------------|--------|--------------------|--------|-------|--------------------|-------|-------|
|      |                  |                                |               | T=0.5              | T=0.8              | T=0.85             | T=1.25 | T=0.85             | T=1.15 | T=1.6 | T=0.85             | T=2.0 | T=2.5 |
| E    | ø180<br>reel     | Paper taping<br>(Pitch:4mm)    | pcs./<br>reel | 10,000             | —                  | —                  | —      | —                  | —      | —     | —                  | —     | —     |
| V    |                  |                                |               | —                  | 4,000              | 4,000              | —      | 4,000              | —      | —     | —                  | —     | —     |
| F    |                  | Embossed taping<br>(Pitch:4mm) |               | —                  | —                  | —                  | 3,000  | —                  | 3,000  | —     | 3,000              | —     | —     |
| Y    |                  |                                |               | —                  | —                  | —                  | —      | —                  | —      | 2,000 | —                  | 2,000 | 1,000 |

## ■ Temperature Characteristics

## ● Class 2 Capacitors

| Code | Temp. Char. | Capacitance Change | Measurement<br>Temperature Range | Reference<br>Temperature |
|------|-------------|--------------------|----------------------------------|--------------------------|
| B    | B           | ±10 %              | –25 to 85 °C                     | 20 °C                    |
|      | X7R         | ±15 %              | –55 to 125 °C                    | 25 °C                    |
|      | X5R         | ±15 %              | –55 to 85 °C                     | 25 °C                    |
| F    | F           | +30, –80 %         | –25 to 85 °C                     | 20 °C                    |
|      | Y5V         | +22, –82 %         | –30 to 85 °C                     | 25 °C                    |

For applicable "Temperature Characteristics", see the lists of standard products on page 8 to 9.

## ■ Rated Voltage

| Code          | 1H      | 1E      | 1C      | 1A      | 0J       | 0G     |
|---------------|---------|---------|---------|---------|----------|--------|
| Rated Voltage | DC 50 V | DC 25 V | DC 16 V | DC 10 V | DC 6.3 V | DC 4 V |

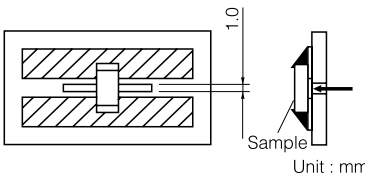
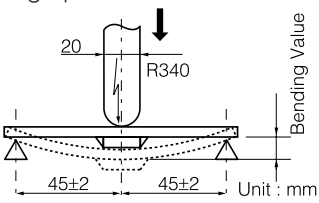
## ■ Nominal Capacitance

| Ex.                 | 105                    | 225                      | 106                      | 226                      | 107                        |
|---------------------|------------------------|--------------------------|--------------------------|--------------------------|----------------------------|
| Nominal Capacitance | 1,000,000 pF<br>(1 µF) | 2,200,000 pF<br>(2.2 µF) | 10,000,000 pF<br>(10 µF) | 22,000,000 pF<br>(22 µF) | 100,000,000 pF<br>(100 µF) |

## ■ Capacitance Tolerance

| Class | Temp. Char. | Tol. Code | Capacitance Tolerance |
|-------|-------------|-----------|-----------------------|
| 2     | B, X7R, X5R | K         | ±10 %                 |
|       |             | M         | ±20 %                 |
|       | F, Y5V      | Z         | +80, –20 %            |

## ■ Specification and Test Method

| Item                            | Specification                                                                                                                                                         | Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |        |        |                     |          |           |                  |             |             |      |         |       |       |       |       |                      |      |      |      |      |         |      |       |      |      |         |      |      |      |      |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------|--------|---------------------|----------|-----------|------------------|-------------|-------------|------|---------|-------|-------|-------|-------|----------------------|------|------|------|------|---------|------|-------|------|------|---------|------|------|------|------|
| Operating Temperature Range     | Temp. Char. B, X7R : -55 to 125 °C<br>Temp. Char. B, X5R : -55 to 85 °C<br>Temp. Char. F, Y5V : -30 to 85 °C                                                          | _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                     |        |        |                     |          |           |                  |             |             |      |         |       |       |       |       |                      |      |      |      |      |         |      |       |      |      |         |      |      |      |      |
| Dielectric Withstanding Voltage | No break down                                                                                                                                                         | Test voltage:<br>Rated voltage ×250%<br>Duration:1 to 5s.<br>Charge/discharge current:within 50 mA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                     |        |        |                     |          |           |                  |             |             |      |         |       |       |       |       |                      |      |      |      |      |         |      |       |      |      |         |      |      |      |      |
| Insulation Resistance (I R)     | 500/C (MΩ) min.<br>Note:DC10V, DC6.3V;100/C(MΩ)min.<br>(C:Nominal Cap. in μF)                                                                                         | Measuring voltage:Rated voltage<br>Duration:60±5s<br>Charge/discharge current:within 50 mA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |        |        |                     |          |           |                  |             |             |      |         |       |       |       |       |                      |      |      |      |      |         |      |       |      |      |         |      |      |      |      |
| Capacitance                     | within the specified tolerance                                                                                                                                        | Measuring temperature:20±2°C<br>Pretreatment:The capacitors shall be kept in a temperature of 150+0/-10°C for 1 hour and then shall be stored in standard condition* 48±4 hours, before initial measurement.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                     |        |        |                     |          |           |                  |             |             |      |         |       |       |       |       |                      |      |      |      |      |         |      |       |      |      |         |      |      |      |      |
| Dissipation Factor (tan δ)      | 0.2 max.<br>Please confirmation to the technical reports for details.                                                                                                 | <table><tr><td>Nominal capacitance</td><td>C≤10μF</td><td>C&gt;10μF</td></tr><tr><td>Measuring frequency</td><td>1kHz±10%</td><td>120Hz±20%</td></tr><tr><td>Mesuring voltage</td><td>1.0±0.2Vrms</td><td>0.5±0.2Vrms</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Nominal capacitance | C≤10μF | C>10μF | Measuring frequency | 1kHz±10% | 120Hz±20% | Mesuring voltage | 1.0±0.2Vrms | 0.5±0.2Vrms |      |         |       |       |       |       |                      |      |      |      |      |         |      |       |      |      |         |      |      |      |      |
| Nominal capacitance             | C≤10μF                                                                                                                                                                | C>10μF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                     |        |        |                     |          |           |                  |             |             |      |         |       |       |       |       |                      |      |      |      |      |         |      |       |      |      |         |      |      |      |      |
| Measuring frequency             | 1kHz±10%                                                                                                                                                              | 120Hz±20%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                     |        |        |                     |          |           |                  |             |             |      |         |       |       |       |       |                      |      |      |      |      |         |      |       |      |      |         |      |      |      |      |
| Mesuring voltage                | 1.0±0.2Vrms                                                                                                                                                           | 0.5±0.2Vrms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |        |        |                     |          |           |                  |             |             |      |         |       |       |       |       |                      |      |      |      |      |         |      |       |      |      |         |      |      |      |      |
| Temperature Characteristics     | Temp. Char.<br>B : ±10 % (-25 to 85 °C)<br>X7R: ±15 % (-55 to 125 °C)<br>X5R: ±15 % (-55 to 85 °C)<br>F : +30, -80 % (-25 to 85 °C)<br>Y5V: +22, -82 % (-30 to 85 °C) | Maximum capacitance change at stage 1 to 5<br><table><tr><td>Temp. Char.</td><td>B, F</td><td>X7R</td><td>X5R</td><td>Y5V</td></tr><tr><td>Stage 1</td><td>20°C</td><td>25°C</td><td>25°C</td><td>25°C</td></tr><tr><td>Stage 2</td><td>-25°C</td><td>-55°C</td><td>-55°C</td><td>-30°C</td></tr><tr><td>Stage 3 (Ref. Temp.)</td><td>20°C</td><td>25°C</td><td>25°C</td><td>25°C</td></tr><tr><td>Stage 4</td><td>85°C</td><td>125°C</td><td>85°C</td><td>85°C</td></tr><tr><td>Stage 5</td><td>20°C</td><td>25°C</td><td>25°C</td><td>25°C</td></tr></table><br>*ECJ0EB0J105□(0402/X5R/6.3V1.0μF),<br>*ECJ1VB0J475□(0603/X5R/6.3V/4.7μF),<br>*ECJ1VB0G106M(0603/X5R/4V/10μF)<br>of 0.50±0.05 Vrms measurement voltage. | Temp. Char.         | B, F   | X7R    | X5R                 | Y5V      | Stage 1   | 20°C             | 25°C        | 25°C        | 25°C | Stage 2 | -25°C | -55°C | -55°C | -30°C | Stage 3 (Ref. Temp.) | 20°C | 25°C | 25°C | 25°C | Stage 4 | 85°C | 125°C | 85°C | 85°C | Stage 5 | 20°C | 25°C | 25°C | 25°C |
| Temp. Char.                     | B, F                                                                                                                                                                  | X7R                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | X5R                 | Y5V    |        |                     |          |           |                  |             |             |      |         |       |       |       |       |                      |      |      |      |      |         |      |       |      |      |         |      |      |      |      |
| Stage 1                         | 20°C                                                                                                                                                                  | 25°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 25°C                | 25°C   |        |                     |          |           |                  |             |             |      |         |       |       |       |       |                      |      |      |      |      |         |      |       |      |      |         |      |      |      |      |
| Stage 2                         | -25°C                                                                                                                                                                 | -55°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -55°C               | -30°C  |        |                     |          |           |                  |             |             |      |         |       |       |       |       |                      |      |      |      |      |         |      |       |      |      |         |      |      |      |      |
| Stage 3 (Ref. Temp.)            | 20°C                                                                                                                                                                  | 25°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 25°C                | 25°C   |        |                     |          |           |                  |             |             |      |         |       |       |       |       |                      |      |      |      |      |         |      |       |      |      |         |      |      |      |      |
| Stage 4                         | 85°C                                                                                                                                                                  | 125°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 85°C                | 85°C   |        |                     |          |           |                  |             |             |      |         |       |       |       |       |                      |      |      |      |      |         |      |       |      |      |         |      |      |      |      |
| Stage 5                         | 20°C                                                                                                                                                                  | 25°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 25°C                | 25°C   |        |                     |          |           |                  |             |             |      |         |       |       |       |       |                      |      |      |      |      |         |      |       |      |      |         |      |      |      |      |
| Adhesion                        | The terminal electrode shall be free from peeling or signs of peeling.                                                                                                | Applied force:5N<br>Duration:10s<br><br>Unit : mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                     |        |        |                     |          |           |                  |             |             |      |         |       |       |       |       |                      |      |      |      |      |         |      |       |      |      |         |      |      |      |      |
| Bending Strength                | Appearance:no mechanical damage<br>Capacitance change:<br>Temp. Char. B, X7R, X5R: within ±12.5 %<br>F, Y5V: within ±30 %                                             | Bending value:1 mm<br>Bending speed:1 mm/s<br><br>Unit : mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |        |        |                     |          |           |                  |             |             |      |         |       |       |       |       |                      |      |      |      |      |         |      |       |      |      |         |      |      |      |      |
| Vibration Proof                 | Appearance: There shall be no cracks and other mechanical damage.<br>Capacitance:Shall be within the specifiedtolerance<br>tanδ:initial value                         | Apply a variable vibration of 1.5mm total amplitude in the 10 to 55 to 10Hz vibration frequency range swept in 1 min. in 3 mutually perpendicular directions for 2 hours each, a total of 6 hours.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                     |        |        |                     |          |           |                  |             |             |      |         |       |       |       |       |                      |      |      |      |      |         |      |       |      |      |         |      |      |      |      |
| Solderability                   | More than 95 % of the soldered area of both terminal electrodes shall be covered with fresh solder.                                                                   | Solder bath method<br>Solder temperature:230±5 °C<br>Dipping period:4±1 s<br>Solder:H63A (JIS-Z-3282)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                     |        |        |                     |          |           |                  |             |             |      |         |       |       |       |       |                      |      |      |      |      |         |      |       |      |      |         |      |      |      |      |

\*Standard condition : Temperature 15 to 35 °C, Relative humidity 45 to 75 %

| Item                        | Specification                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                 |                 |              |             |             |               |             |             |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------------|-----------------|--------------|-------------|-------------|---------------|-------------|-------------|
| Resistance to Solder Heat   | Appearance:no mechanical damage<br>Capacitance change:<br>Temp. Char. B, X7R, X5R: within $\pm 7.5$ %<br>F, Y5V: within $\pm 20$ %<br>$\tan\delta$ initial value<br>IR:initial value<br>With-stand voltage:no dielectric breakdown or damage                                                                                                                                                                                                                                            | Solder bath method<br>Preconditioning:<br>Heat treatment (150°C, 1h)<br>Solder temperature:270 $\pm$ 5 °C<br>Dipping period:3.0 $\pm$ 0.5 s<br>Preheat condition:<br><table border="1"> <thead> <tr> <th>Temp.</th><th>Type "11", "12"</th><th>Type "13", "23"</th></tr> </thead> <tbody> <tr> <td>80 to 100 °C</td><td>120 to 180s</td><td>300 to 360s</td></tr> <tr> <td>150 to 200 °C</td><td>120 to 180s</td><td>300 to 360s</td></tr> </tbody> </table> Recovery(Standard condition):48 $\pm$ 4h | Temp. | Type "11", "12" | Type "13", "23" | 80 to 100 °C | 120 to 180s | 300 to 360s | 150 to 200 °C | 120 to 180s | 300 to 360s |
| Temp.                       | Type "11", "12"                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Type "13", "23"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                 |                 |              |             |             |               |             |             |
| 80 to 100 °C                | 120 to 180s                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 300 to 360s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                 |                 |              |             |             |               |             |             |
| 150 to 200 °C               | 120 to 180s                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 300 to 360s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                 |                 |              |             |             |               |             |             |
| Temperature Cycle           | Appearance:no mechanical damage<br>Capacitance change:<br>Temp. Char. B, X7R, X5R: within $\pm 7.5$ %<br>F, Y5V: within $\pm 20$ %<br>$\tan\delta$ initial value<br>IR:initial value<br>With-stand voltage: no dielectric breakdown or damage                                                                                                                                                                                                                                           | Preconditioning:<br>Heat treatment (150°C,1h)<br>Step 1:Minimum operation temp. 30 $\pm$ 3 min.<br>Step 2:Room temp. 3 min.<br>Step 3:Maximum operation temp. 30 $\pm$ 3 min.<br>Step 4:Room temp. 3 min.<br>Number of cycles:5 cycles<br>Recovery(Standard condition):48 $\pm$ 4h                                                                                                                                                                                                                    |       |                 |                 |              |             |             |               |             |             |
| Damp Heat (steady state)    | Appearance:no mechanical damage<br>Capacitance change:<br>Temp. Char. B, X7R, X5R: within $\pm 12.5$ %<br>F, Y5V: within $\pm 30$ %<br>Note:ECJ0EB0J105□(0402/X5R/6.3V/1.0 $\mu$ F)<br>ECJ1VB0J475□(0603/X5R/6.3V/4.7 $\mu$ F)<br>ECJ1VB0G106M(0603/X5R/4V/10 $\mu$ F)<br>within $\pm 20$ %<br>$\tan\delta$ 0.3 max.<br>Please confirmation to the technical reports for details.<br>IR:50/C (M $\Omega$ ) min.<br>Note:DC10V, DC6.3V;10/C (M $\Omega$ )min.(C:Nominal cap. in $\mu$ F) | Preconditioning:<br>Heat treatment (150°C,1h)<br>Temperature:40 $\pm$ 2 °C<br>Relative humidity:90 to 95 %<br>Test period:500+24/0 h<br>Recovery(Standard condition):48 $\pm$ 4h                                                                                                                                                                                                                                                                                                                      |       |                 |                 |              |             |             |               |             |             |
| Loading Under Damp Heat     | Appearance:no mechanical damage<br>Capacitance change:<br>Temp. Char. B, X7R, X5R: within $\pm 12.5$ %<br>F, Y5V: within $\pm 30$ %<br>Note:ECJ0EB0J105□(0402/X5R/6.3V/1.0 $\mu$ F)<br>ECJ1VB0J475□(0603/X5R/6.3V/4.7 $\mu$ F)<br>ECJ1VB0G106M(0603/X5R/4V/10 $\mu$ F)<br>within $\pm 20$ %<br>$\tan\delta$ 0.3 max.<br>Please confirmation to the technical reports for details.<br>IR:25/C (M $\Omega$ ) min.<br>Note:DC10V, DC6.3V;5/C (M $\Omega$ )min.(C:Nominal cap. in $\mu$ F)  | Preconditioning:<br>Voltage treatment<br>Temperature:40 $\pm$ 2 °C<br>Relative humidity:90 to 95 %<br>Applied voltage:Rated voltage<br>Test period:500+24/0 h<br>Recovery(Standard condition):48 $\pm$ 4h                                                                                                                                                                                                                                                                                             |       |                 |                 |              |             |             |               |             |             |
| Loading at High Temperature | Appearance:no mechanical damage<br>Capacitance change:<br>Temp. Char. B, X7R, X5R: within $\pm 12.5$ %<br>F, Y5V: within $\pm 30$ %<br>Note:ECJ0EB0J105□(0402/X5R/6.3V/1.0 $\mu$ F)<br>ECJ1VB0J475□(0603/X5R/6.3V/4.7 $\mu$ F)<br>ECJ1VB0G106M(0603/X5R/4V/10 $\mu$ F)<br>within $\pm 20$ %<br>$\tan\delta$ 0.3 max.<br>Please confirmation to the technical reports for details.<br>IR:50/C (M $\Omega$ ) min.<br>Note:DC10V, DC6.3V;10/C (M $\Omega$ )min.(C:Nominal cap. in $\mu$ F) | Preconditioning:<br>Voltage treatment<br>Temperature:<br>Maximum operation temp. $\pm 3$ °C<br>Applied voltage:①Rated voltage $\times$ 200%<br>②Rated voltage $\times$ 150%<br>③Rated voltage $\times$ 100%<br>Please confirmation to the technical reports for details.<br>Charge/discharge current: within 50mA<br>Test period:1000+48/0 h<br>Recovery(Standard condition):48 $\pm$ 4h                                                                                                              |       |                 |                 |              |             |             |               |             |             |

Note 1) Heat treatment:1 h of heat treatment at 150+0/-10°C followed by 48 $\pm$ 4 h recovery under the standead condition.

Note 2) Voltage treatment:1 h of voltage treatment under the specified temperature and voltage for testing followed by 48  $\pm$ 4 h of recovery under the standead condition.

## ■ Standard Products for Type "10" (EIA "0402" ), Taped Version

| Capacitance<br>(μF) | Code                  | B            |             |                 |
|---------------------|-----------------------|--------------|-------------|-----------------|
|                     | Rated Voltage         | DC6.3V       |             |                 |
|                     | Capacitance Tolerance | Part No.     | Dim. T (mm) | Temp. Char. X5R |
| 1                   | ±10%(K) or ±20%(M)    | ECJ0EB0J105□ | 0.5         | ○               |

| Capacitance<br>(μF) | Code                  | F            |             |                   |
|---------------------|-----------------------|--------------|-------------|-------------------|
|                     | Rated Voltage         | DC6.3V       |             |                   |
|                     | Capacitance Tolerance | Part No.     | Dim. T (mm) | Temp. Char. F Y5V |
| 1                   | +80, -20%(Z)          | ECJ0EF0J105Z | 0.5         | ○ ○               |

Packaging style code: "E" for taped version (φ180 reel, taping pitch: 2 mm) .

## ■ Standard Products for Type "11" (EIA "0603" ), Taped Version

| Capacitance<br>(μF) | Code                  | B            |             |                 |              |             |                 |              |             |                 |              |             |                 |
|---------------------|-----------------------|--------------|-------------|-----------------|--------------|-------------|-----------------|--------------|-------------|-----------------|--------------|-------------|-----------------|
|                     | Rated Voltage         | DC16V        |             |                 | DC10V        |             |                 | DC6.3V       |             |                 | DC4V         |             |                 |
|                     | Capacitance Tolerance | Part No.     | Dim. T (mm) | Temp. Char. X5R | Part No.     | Dim. T (mm) | Temp. Char. X5R | Part No.     | Dim. T (mm) | Temp. Char. X5R | Part No.     | Dim. T (mm) | Temp. Char. X5R |
| 1                   | ±10%(K)               | ECJ1VB1C105□ | 0.8         | ○               | ECJ1VB1A105□ | 0.8         | ○               | ECJ1VB0J105□ | 0.8         | ○               |              |             |                 |
| 2.2                 | or                    |              |             |                 | ECJ1VB1A225□ | 0.8         | ○               | ECJ1VB0J225□ | 0.8         | ○               |              |             |                 |
| 4.7                 | or                    |              |             |                 |              |             |                 | ECJ1VB0J475□ | 0.8         | ○               |              |             |                 |
| 10                  | ±20%(M)               |              |             |                 |              |             |                 |              |             |                 | ECJ1VB0G106M | 0.8         | ○               |

| Capacitance<br>(μF) | Code                  | F            |             |                   |              |             |                   |              |             |                   |              |             |                   |
|---------------------|-----------------------|--------------|-------------|-------------------|--------------|-------------|-------------------|--------------|-------------|-------------------|--------------|-------------|-------------------|
|                     | Rated Voltage         | DC25V        |             |                   | DC16V        |             |                   | DC10V        |             |                   | DC6.3V       |             |                   |
|                     | Capacitance Tolerance | Part No.     | Dim. T (mm) | Temp. Char. F Y5V | Part No.     | Dim. T (mm) | Temp. Char. F Y5V | Part No.     | Dim. T (mm) | Temp. Char. F Y5V | Part No.     | Dim. T (mm) | Temp. Char. F Y5V |
| 1                   | +80, -20%(Z)          | ECJ1VF1E105Z | 0.8         | ○                 | ECJ1VF1C105Z | 0.8         | ○                 | ECJ1VF1A105Z | 0.8         | ○                 |              |             |                   |
| 2.2                 |                       |              |             |                   |              |             |                   | ECJ1VF1A225Z | 0.8         | ○                 |              |             |                   |
|                     |                       |              |             |                   |              |             |                   |              |             |                   | ECJ1VF0J225Z | 0.8         | ○                 |

□:Capacitance tolerance code : "□" for "K" or "M"

Packaging style code: "V" for taped version (φ180 reel, taping pitch: 4 mm) .

## ■ Standard Products for Type "12" (EIA "0805"), Taped Version

| Capacitance<br>(μF) | Code                  | B             |             |                 |               |             |                 |                   |             |                   |              |                   |                 |
|---------------------|-----------------------|---------------|-------------|-----------------|---------------|-------------|-----------------|-------------------|-------------|-------------------|--------------|-------------------|-----------------|
|                     | Rated Voltage         | DC25V         |             |                 | DC16V         |             |                 | DC10V             |             |                   | DC6.3V       |                   |                 |
|                     | Capacitance Tolerance | Part No.      | Dim. T (mm) | Temp. Char. X5R | Part No.      | Dim. T (mm) | Temp. Char. X5R | Part No.          | Dim. T (mm) | Temp. Char. B X5R | Part No.     | Dim. T (mm)       | Temp. Char. X5R |
| 1                   | ±10%(K)               | ECJ2FB1E105□* | 1.25        | ○               | ECJ2FB1C105□* | 1.25        | ○               | ECJ2FB1A105□*     | 1.25        | ○                 |              |                   |                 |
| 2.2                 | or                    | ECJ2FB1E225□* | 1.25        | ○               | ECJ2FB1C225□* | 1.25        | ○               | ECJ2FB1A225□*     | 1.25        | —                 | ECJCV50J225M | 0.85              | ○               |
| 4.7                 | or                    | ECJ2FB1E475M  | 1.25        | ○               | ECJ2FB1C475□* | 1.25        | ○               | ECJ2FB1A475□*     | 1.25        | —                 | ECJCV50J475M | 0.85              | ○               |
| 10                  | ±20%(M)               |               |             |                 |               |             |                 | Under development | 1.25        | —                 | ECJCV50J106M | 0.85              | ○               |
| 22                  |                       |               |             |                 |               |             |                 |                   |             |                   |              | Under development | 1.25            |

| Capacitance<br>(μF) | Code                  | F            |             |                   |               |             |                   |              |             |                   |               |             |                   |
|---------------------|-----------------------|--------------|-------------|-------------------|---------------|-------------|-------------------|--------------|-------------|-------------------|---------------|-------------|-------------------|
|                     | Rated Voltage         | DC50V        |             |                   | DC25V         |             |                   | DC16V        |             |                   | DC10V         |             |                   |
|                     | Capacitance Tolerance | Part No.     | Dim. T (mm) | Temp. Char. F Y5V | Part No.      | Dim. T (mm) | Temp. Char. F Y5V | Part No.     | Dim. T (mm) | Temp. Char. F Y5V | Part No.      | Dim. T (mm) | Temp. Char. F Y5V |
| 1                   | +80, -20%(Z)          | ECJ2FF1H105Z | 1.25        | ○                 | ECJ2FF1E105Z* | 1.25        | ○                 | ECJ2VF1C105Z | 0.85        | ○                 |               |             |                   |
| 2.2                 |                       |              |             |                   | ECJ2FF1E225Z* | 1.25        | ○                 | ECJGVF1C225Z | 0.85        | ○                 |               |             |                   |
| 4.7                 |                       |              |             |                   |               |             |                   | ECJGVF1C475Z | 0.85        | ○                 | ECJGVF1A475Z  | 0.85        | ○                 |
| 10                  |                       |              |             |                   |               |             |                   |              |             |                   | ECJ2FF1A106Z* | 1.25        | ○                 |

□:Capacitance tolerance code : "□" for "K" or "M"

Packaging style code: "V" or "F" for taped version (φ180 reel, taping pitch: 4 mm) .

\*: "L", "W", "T" Dimension tolerance ±0.15mm

\*\*:"L", "W", "T" Dimension tolerance ±0.2mm

Soldering method of dimension T>1mm: Do not use the flow soldering.

## ■ Standard Products for Type "13" (EIA "1206" ), Taped Version

| Capacitance<br>(μF) | Code                     | B                 |             |             |                   |             |             |                   |             |             |                   |             |             |
|---------------------|--------------------------|-------------------|-------------|-------------|-------------------|-------------|-------------|-------------------|-------------|-------------|-------------------|-------------|-------------|
|                     | Rated Voltage            | DC25V             |             |             | DC16V             |             |             | DC10V             |             |             | DC6.3V            |             |             |
|                     | Capacitance Tolerance    | Part No.          | Dim. T (mm) | Temp. Char. | Part No.          | Dim. T (mm) | Temp. Char. | Part No.          | Dim. T (mm) | Temp. Char. | Part No.          | Dim. T (mm) | Temp. Char. |
| 1                   | ±10%(K)<br>or<br>±20%(M) | ECJ3YB1E105□      | 1.6         | ○           | ECJ3FB1C105□      | 1.15        | ○           | ECJ3YB1A225□      | 1.6         | ○           |                   |             |             |
| 2.2                 |                          | ECJ3YB1E225□      | 1.6         | —           | ECJ3YB1C225□      | 1.6         | ○           | ECJ3YB1A475□      | 1.6         | —           |                   |             |             |
| 4.7                 |                          | ECJ3YB1E475□      | 1.6         | —           | ECJ3YB1C475□      | 1.6         | —           | ECJ3YB1A475□      | 1.6         | —           | ECJ3YB0J475□      | 1.6         | ○           |
| 10                  |                          | ECJ3YB1E106□      | 1.6         | —           | ECJ3YB1C106□      | 1.6         | —           | ECJ3YB1A106M      | 1.6         | —           | ECJDV50J106M      | 0.85        | ○           |
| 22                  |                          | Under development | 1.6         | —           | Under development | 1.6         | —           | Under development | 1.6         | —           | ECJDV50J226M      | 0.85        | ○           |
| 47                  |                          |                   |             |             |                   |             |             |                   |             |             | Under development | 1.6         | ○           |

| Capacitance<br>(μF) | Code                  | F            |             |             |              |             |             |              |             |             |             |             |             |
|---------------------|-----------------------|--------------|-------------|-------------|--------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|-------------|
|                     | Rated Voltage         | DC50V        |             |             | DC25V        |             |             | DC16V        |             |             | DC10V       |             |             |
|                     | Capacitance Tolerance | Part No.     | Dim. T (mm) | Temp. Char. | Part No.     | Dim. T (mm) | Temp. Char. | Part No.     | Dim. T (mm) | Temp. Char. | Part No.    | Dim. T (mm) | Temp. Char. |
| 1                   | +80,<br>-20%(Z)       | ECJ3FF1H105Z | 1.15        | ○           | ECJ3FF1E105Z | 1.15        | ○           | ECJ3VF1C105Z | 0.85        | ○           |             |             |             |
| 2.2                 |                       |              |             |             | ECJ3FF1E225Z | 1.15        | ○           | ECJ3VF1C225Z | 0.85        | ○           |             |             |             |
| 4.7                 |                       |              |             |             | ECJ3FF1E475Z | 1.15        | ○           | ECJ3FF1C475Z | 1.15        | ○           |             |             |             |
| 10                  |                       |              |             |             | ECJ3YF1E106Z | 1.60        | ○           | ECJMF1C106Z  | 1.15        | ○           | ECJMF1A106Z | 1.15        | ○           |
| 22                  |                       |              |             |             |              |             |             |              |             |             | ECJMF1A226Z | 1.15        | ○           |

□:Capacitance tolerance code. : "□" for "K" or "M"

Packaging style code: "F" and "Y" for taped version (φ180 reel, taping pitch: 4 mm) .

Soldering method of dimension T&gt;1mm: Do not use the flow soldering.

## ■ Standard Products for Type "23" (EIA "1210"), Taped Version

| Capacitance<br>(μF) | Code                     | B            |             |                 |              |             |                 |              |             |                 |              |             |                 |              |             |                 |
|---------------------|--------------------------|--------------|-------------|-----------------|--------------|-------------|-----------------|--------------|-------------|-----------------|--------------|-------------|-----------------|--------------|-------------|-----------------|
|                     | Rated Voltage            | DC50V        |             |                 | DC25V        |             |                 | DC16V        |             |                 | DC10V        |             |                 | DC6.3V       |             |                 |
|                     | Capacitance Tolerance    | Part No.     | Dim. T (mm) | Temp. Char. X5R | Part No.     | Dim. T (mm) | Temp. Char. X5R | Part No.     | Dim. T (mm) | Temp. Char. X5R | Part No.     | Dim. T (mm) | Temp. Char. X5R | Part No.     | Dim. T (mm) | Temp. Char. X5R |
| 1                   | ±10%(K)<br>or<br>±20%(M) | ECJ4YB1H105□ | 2.0         | ○               |              |             |                 |              |             |                 |              |             |                 |              |             |                 |
| 2.2                 |                          |              |             |                 | ECJ4YB1E225□ | 2.0         | ○               |              |             |                 |              |             |                 |              |             |                 |
| 4.7                 |                          |              |             |                 | ECJ4YB1E475□ | 2.0         | ○               | ECJ4YB1C475□ | 2.0         | ○               |              |             |                 |              |             |                 |
| 10                  |                          |              |             |                 | ECJ4YB1E106M | 2.5         | ○               | ECJ4YB1C106M | 2.0         | ○               | ECJ4YB1A106□ | 2.0         | ○               |              |             |                 |
| 22                  |                          |              |             |                 | ECJ4YB1E226M | 2.5         | ○               | ECJ4YB1C226M | 2.5         | ○               | ECJ4YB1A226M | 2.5         | ○               | ECJ4YB0J226M | 2.5         | ○               |
| 47                  |                          |              |             |                 |              |             |                 | ECJ4YB1C476M | 2.5         | ○               | ECJ4YB1A476M | 2.5         | ○               | ECJ4YB0J476M | 2.5         | ○               |
| 100                 |                          |              |             |                 |              |             |                 |              |             |                 |              |             |                 | ECJ4YB0J107M | 2.5         | ○               |

| Capacitance<br>(μF) | Code                     | F            |           |                |              |           |                |              |           |                |              |           |                |              |           |                |
|---------------------|--------------------------|--------------|-----------|----------------|--------------|-----------|----------------|--------------|-----------|----------------|--------------|-----------|----------------|--------------|-----------|----------------|
|                     | Rated Voltage            | DC50V        |           |                | DC25V        |           |                | DC16V        |           |                | DC10V        |           |                | DC6.3V       |           |                |
|                     | Capacitance<br>Tolerance | Part No.     | Dim.<br>T | Temp.<br>Char. | Part No.     | Dim.<br>T | Temp.<br>Char. | Part No.     | Dim.<br>T | Temp.<br>Char. | Part No.     | Dim.<br>T | Temp.<br>Char. | Part No.     | Dim.<br>T | Temp.<br>Char. |
|                     |                          |              | (mm)      | F              |              | (mm)      | F              |              | Y5V       | (mm)           |              | F         | Y5V            |              | (mm)      | F              |
| 4.7                 | +80,<br>-20%(Z)          | ECJ4YF1H475Z | 2.0       | ○              | ECJ4YF1E475Z | 2.0       | ○ ○            |              |           |                |              |           |                |              |           |                |
| 10                  |                          | ECJ4YF1H106Z | 2.0       | ○              | ECJ4YF1E106Z | 2.0       | ○ —            | ECJ4YF1C106Z | 2.0       | ○              |              |           |                |              |           |                |
| 22                  |                          |              |           |                | ECJ4YF1E226Z | 2.0       | ○ ○            | ECJ4YF1C226Z | 2.0       | ○              | ECJ9FF1A226Z | 0.85      | ○ —            |              |           |                |
| 47                  |                          |              |           |                |              |           |                |              |           |                | ECJ4YF1A476Z | 2.0       | ○ ○            | ECJ4YF0J476Z | 2.0       | ○ ○            |
| 100                 |                          |              |           |                |              |           |                |              |           |                |              |           |                | ECJ4YF0J107Z | 2.5       | ○ ○            |

□:Capacitance tolerance code. : "□" for "K" or "M"

Packaging style code: "Y" for taped version (φ180 reel, taping pitch: 4 mm) .

Soldering method of dimension T&gt;1mm: Do not use the flow soldering.

## ■ Standard Products for Type "34" (EIA "1812") Will carry out a product end.

With March, 2004. In addition, please refer to this catalog table (58 pages) about alternative goods.