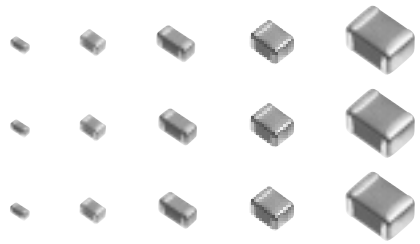
Multilayer Ceramic Chip Capacitors (Large Capacitance)

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

■ Recommended Applications

- Class 2 (Hi-K Type)
  · Power supply circuit decoupling applications
  Power supply circuit of the High-speed LSI
  Smoothing circuit of DC-DC converters

■ Precaution for Handling

See Page 44 to 48

■ Packaging method

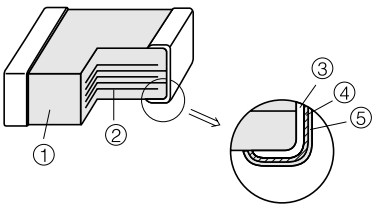
See Page 82

■ Explanation of Part Numbers

1	2	3	4	5	6	7	8	9	10	11	12	
E	C	J	2	F	B	0	J	1	0	6	M	(Example)

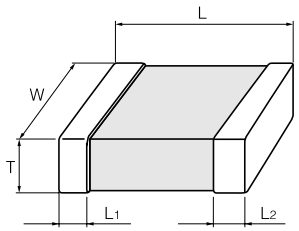
- 1 2 3: ①Product Code (ECJ:Multilayer Ceramic Chip Capacitors)
- 4: ②Size Code
- 5: ③Packaging Styles Code
- 6: ④Temperature Characteristics Code
- 7 8: ⑤Rated Voltage
- 9 10 11: ⑥Nominal Capacitance
- 12: ⑦Capacitance Tolerance

■ 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
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	
		2.0±0.2	1.25±0.20	1.25±0.20	
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	
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	
5	Type“34” (1812)	4.5±0.4	3.2±0.3	2.5±0.3	0.9±0.6
				3.2±0.3	

■ Packaging Styles and Standard Packaging Quantity

T : Thickness (mm)

Code	Packaging Styles		Type"11" (0603)	Type"12" (0805)		Type"13" (1206)			Type"23" (1210)		Type"34" (1812)	
			T=0.8	T=0.85	T=1.25	T=0.85	T=1.15	T=1.6	T=2.0	T=2.5	T=2.5	T=3.2
V	φ180 reel	Paper taping (Pitch:4mm)	4,000	4,000	—	4,000	—	—	—	—	—	—
F		Embossed taping (Pitch:4mm)	—	—	3,000	—	3,000	—	—	—	—	—
Y			—	—	—	—	—	2,000	2,000	1,000	—	—
		Embossed taping (Pitch:8mm)	—	—	—	—	—	—	—	—	500	500
Z	φ330 reel*	Paper taping (Pitch:4mm)	10,000	10,000	—	10,000	—	—	—	—	—	—

* For Part Number applicable to φ330 reel, please contact us.

■ Temperature Characteristics

● Class 2 Capacitors

Code	Temp. Char.	Capacitance Change	Measurement Temperature Range	Reference 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 7 to 8.

■ Rated Voltage

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

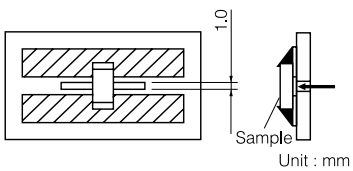
■ Nominal Capacitance

Ex.	105	225	106	226
Nominal Capacitance	1000000 pF (1μF)	2200000 pF (2.2μF)	10000000 pF (10μF)	22000000 pF (22μF)

■ Capacitance tolerance

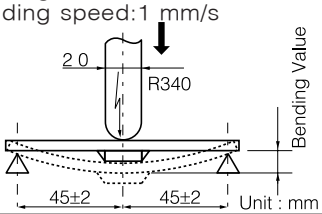
Class	Temp. Char.	Tol. Code	Capacitance tolerance
2	B, X7R, X5R	K	±10 %
		M	±20 %
	F, Y5V	Z	+80, –20 %

■ Specification and Test Method

<table>
<tr><th>Item</th><th>Specification</th><th>Test Method</th></tr>
<tr><td>Operating Temperature Range</td><td>Temp. Char. B, X7R : –55 to 125 ˚C
Temp. Char. B, X5R : –55 to 85 ˚C
Temp. Char. F, Y5V : –30 to 85 ˚C</td><td>————</td></tr>
<tr><td>Dielectric Withstanding Voltage</td><td>No break down</td><td>Test Voltage:
Rated Voltage ×250%
Electrification time:1 to 5s.
Charge/discharge current:within 50 mA</td></tr>
<tr><td>Insulation Resistance (I R)</td><td>500/C (MΩ) min.
Note:DC10V, DC6.3V;100/C(MΩ)min.
(C:Nominal Cap. in µF)</td><td>Measuring voltage:Rated voltage
Measuring voltage time:60±5s
Charge/discharge current:within 50 mA</td></tr>
<tr><td>Cpacitance</td><td>within the specified tolerance</td><td rowspan="2">Reference Temperature:20±2˚C
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.
<table><tr><td>Nominal Capacitance</td><td>C≦10µF</td><td>C>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></td></tr>
<tr><td>Dissipation Factor (tan δ)</td><td><table><tr><th rowspan="2">Rated Voltage</th><th colspan="2">Temperature Characteristics</th></tr><tr><th>B, X7R, X5R</th><th>F, Y5V</th></tr><tr><td>50V</td><td>0.025max.</td><td>0.07max.</td></tr><tr><td rowspan="2">25V</td><td>0.025max.</td><td>0.07max.</td></tr><tr><td>0.05max.
(Type“13”:C=4.7µF
Type“23”, ”34”)</td><td>0.1max.
(Type“12”:C≧1µF
Type“13”:C=4.7µF
Type“23”, ”34”)</td></tr><tr><td rowspan="3">16V</td><td>0.025max.</td><td>0.1max.</td></tr><tr><td>0.05max.
(Type“12”: C=1µF
Type“13”:C≧4.7µF
Type“23”, ”34”)</td><td rowspan="2">0.125max.
(Type“11”: C=1µF
Type“12”:C=4.7µF
Type“13”:C=10µF
Type“23”, ”34”)</td></tr><tr><td>0.075max.
(Type“11”: C=1µF)</td></tr><tr><td rowspan="3">10V</td><td>0.05max.</td><td>0.125max.</td></tr><tr><td>0.075max.
(Type“11”: C=1µF)</td><td rowspan="2">0.2max.
(Type“11”: C=2.2µF
Type“12”:C=10µF
Type“13”:C=22µF
Type“23”, ”34”)</td></tr><tr><td>0.1max.
(Type“23”:C=22µF
Type“34”)</td></tr><tr><td rowspan="3">6.3V</td><td>0.05max.</td><td rowspan="3">0.2max.</td></tr><tr><td>0.075max.
(Type“11”: C=1µF)</td></tr><tr><td>0.1max.
(Type“11”, C=2.2µF
Type“12”, C≧4.7µF
Type“13”, C=22µF
Type“23”, ”34”)</td></tr></table></td></tr>
<tr><td>Temperature Characteristics</td><td>Temp. Char.
B : ±10 % (–25 to 85 ˚C)
X7R: ±15 % (–55 to 125 ˚C)
X5R: ±15 % (–55 to 85 ˚C)
F : +30, –80 % (–25 to 85 ˚C)
Y5V: +22, –82 % (–30 to 85 ˚C)</td><td>Maximum capacitance change at stage 1 to 5
<table><tr><th>Temp. Char.</th><th>B, F</th><th>X7R</th><th>X5R</th><th>Y5V</th></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>(Type “11“ “12“ of Temp. Char. B, X5R of DC6.3V: 0.20±0.02 Vrms measurement voltage.)</td></tr>
<tr><td>Adhesion</td><td>The terminal electrode shall be free from peeling or signs of peeling.</td><td>Applied force:5N
Duration:10s
 

Unit : mm</td></tr>
</table>

*standard condition : Temperature 15 to 35 ˚C, Relative humidity 45 to 75 %

<table>
<tr><th>Item</th><th>Specification</th><th>Test Method</th></tr>
<tr><td>Bending Strength</td><td>Appearance:no mechanical damage
Capacitance Change:
Temp. Char. B, X7R, X5R: within ±12.5 %
F, Y5V: within ±30 %</td><td>Bending value:1 mm
Bending speed:1 mm/s
 
</td></tr>
<tr><td>Solderability</td><td>More than 95 % of the soldered area of both terminal electrodes shall be covered with fresh solder.</td><td>Solder bath method
Solder temperature:230±5 °C
Dipping period:4±1 s
Solder:H63A (JIS–Z–3282)</td></tr>
<tr><td>Resistance to Solder Heat</td><td>Appearance:no mechanical damage
Capacitance Change:
Temp. Char. B, X7R, X5R: within ±7.5 %
F, Y5V: within ±20 %
tanδ initial value
IR:initial value
With-stand voltage:no dielectric breakdown or damage</td><td>(1) Solder bath method
Preconditioning:
Heat Treatment (150°C, 1h)
Solder temperature:270±5 °C
Dipping period:3.0±0.5 s
Preheat Condition:
<table>
<tr><th>Temp.</th><th>Type“11”,“12”</th><th>Type“13”,“23”</th></tr>
<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>
</table>
Recovery(Standard condition):48 ± 4h
(2) Reflow soldering method
Precoditioning:
Heat Treatment(150°C, 1h)
Solder temperature:260±5 °C
Keeping period:10±1 s
Preheat Condition:
<table>
<tr><th>Temp.</th><th>Type“34”</th></tr>
<tr><td>150 ± 10°C</td><td>120 to 180s</td></tr>
</table>
Recovery(Standard condition):48 ± 4h</td></tr>
<tr><td>Temperature Cycle</td><td>Appearance:no mechanical damage
Capacitance Change:
Temp. Char. B, X7R, X5R: within ±7.5 %
F, Y5V: within ±20 %
tanδ initial value
IR:initial value
With-stand voltage: no dielectric breakdown or damage</td><td>Preconditioning:
Heat Treatment (150°C,1h)
Step 1:Minimum operation temp. 30±3 min.
Step 2:Room temp.
Step 3:Maximum operation temp. 30±3 min.
Step 4:Room temp.
Number of cycles:5 cycles
Recovery(Standard condition):48 ± 4h</td></tr>
<tr><td>Damp Heat (steady state)</td><td>Appearance:no mechanical damage
Capacitance Change:
Temp. Char. B, X7R, X5R: within ±12.5 %
F, Y5V: within ±30 %
<table>
<tr><th rowspan="2">Rated Voltage</th><th colspan="2">Temperature Characteristics</th></tr>
<tr><th>B, X7R, X5R</th><th>F, Y5V</th></tr>
<tr><td>50V</td><td>0.05max.</td><td>0.1max.</td></tr>
<tr><td rowspan="2">25V</td><td>0.05max.</td><td>0.1max.</td></tr>
<tr><td>0.075max.
(Type“13”:C=4.7μF
Type“23”, ”34”)</td><td>0.15max.
(Type“12”:C≥1μF
Type“13”:C=4.7μF
Type“23”, ”34”)</td></tr>
<tr><td rowspan="3">16V</td><td>0.05max.</td><td>0.15max.</td></tr>
<tr><td>0.075max.
(Type“12”: C=1μF
Type“13”:C≥4.7μF
Type“23”, ”34”)</td><td rowspan="2">0.2max.
(Type“11”: C=1μF
Type“12”:C=4.7μF
Type“13”:C=10μF
Type“23”, ”34”)</td></tr>
<tr><td>0.125max.
(Type“11“: C=1μF)</td></tr>
<tr><td rowspan="3">10V</td><td>0.075max.</td><td>0.15max.</td></tr>
<tr><td>0.125max.
(Type“11”: C=1μF)</td><td rowspan="2">0.3max.
(Type“11”: C=2.2μF
Type“12”:C=10μF
Type“13”:C=22μF
Type“23”, ”34”)</td></tr>
<tr><td>0.15max.
(Type“23”:C=22μF
Type“34”)</td></tr>
<tr><td rowspan="3">6.3V</td><td>0.075max.</td><td rowspan="3">0.3max.</td></tr>
<tr><td>0.125max.
(Type“11”: C=1μF)</td></tr>
<tr><td>0.15max.
(Type“11”, C=2.2μF
Type“12”, C≥4.7μF
Type“13”, C=22μF
Type“23”, ”34”)</td></tr>
</table>
IR:50/C (MΩ) min.
Note:DC10V, DC6.3V;10/C (MΩ)min.(C:Nominal cap. in μF)</td><td>Preconditioning:
Heat Treatment (150°C,1h)
Temperature:40±2 °C
Relative humidity:90 to 95 %
Test period:500+24/0 h
Recovery(Standard condition):48 ± 4h</td></tr>
</table>

<table>
<tr><th>Item</th><th>Specification</th><th>Test Method</th></tr>
<tr><td>Loading Under Damp Heat</td><td>
Appearance:no mechanical damage
Capacitance Change:
Temp. Char. B, X7R, X5R: within ±12.5 %
F, Y5V: within ±30 %
tanδ:
<table>
<tr><th rowspan="2">Rated Voltage</th><th colspan="2">Temperature Characteristics</th></tr>
<tr><th>B, X7R, X5R</th><th>F, Y5V</th></tr>
<tr><td>50V</td><td>0.05max.</td><td>0.1max.</td></tr>
<tr><td rowspan="2">25V</td><td>0.05max.</td><td>0.1max.</td></tr>
<tr><td>0.075max.
(Type“13”:C=4.7μF
Type“23”, “34”)</td><td>0.15max.
(Type“12”:C≧1μF
Type“13”:C=4.7μF
Type“23”, “34”)</td></tr>
<tr><td rowspan="3">16V</td><td>0.05max.</td><td>0.15max.</td></tr>
<tr><td>0.075max.
(Type“12”: C=1μF
Type“13”:C≧4.7μF
Type“23”, “34”)</td><td rowspan="2">0.2max.
(Type“11”: C=1μF
Type“12”:C=4.7μF
Type“13”:C=10μF
Type“23”, “34”)</td></tr>
<tr><td>0.125max.
(Type“11“: C=1μF)</td></tr>
<tr><td rowspan="3">10V</td><td>0.075max.</td><td>0.15max.</td></tr>
<tr><td>0.125max.
(Type“11”: C=1μF)</td><td rowspan="2">0.3max.
(Type“11”: C=2.2μF
Type“12”:C=10μF
Type“13”:C=22μF
Type“23”, “34”)</td></tr>
<tr><td>0.15max.
(Type“23”:C=22μF
Type“34”)</td></tr>
<tr><td rowspan="3">6.3V</td><td>0.075max.</td><td rowspan="3">0.3max.</td></tr>
<tr><td>0.125max.
(Type“11”: C=1μF)</td></tr>
<tr><td>0.15max.
(Type“11”, C=2.2μF
Type“12”, C≧4.7μF
Type“13”, C=22μF
Type“23”, “34”)</td></tr>
</table>
IR:25/C (MΩ) min.
Note:DC10V, DC6.3V;5/C (MΩ)min.(C:Nominal cap. in μF)
</td><td>
Preconditioning:
Voltage Treatment
Temperature:40±2 ˚C
Relative humidity:90 to 95 %
Applied voltage:Rated voltage
Test period:500+24/0 h
Recovery(Standard condition):48 ± 4h
</td></tr>
<tr><td>Loading at High Temperature</td><td>
Appearance:no mechanical damage
Capacitance Change:
Temp. Char. B, X7R, X5R: within ±12.5 %
F, Y5V: within ±30 %
tanδ:
<table>
<tr><th rowspan="2">Rated Voltage</th><th colspan="2">Temperature Characteristics</th></tr>
<tr><th>B, X7R, X5R</th><th>F, Y5V</th></tr>
<tr><td>50V</td><td>0.05max.</td><td>0.1max.</td></tr>
<tr><td rowspan="2">25V</td><td>0.05max.</td><td>0.1max.</td></tr>
<tr><td>0.075max.
(Type“13”:C=4.7μF
Type“23”, “34”)</td><td>0.15max.
(Type“12”:C≧1μF
Type“13”:C=4.7μF
Type“23”, “34”)</td></tr>
<tr><td rowspan="3">16V</td><td>0.05max.</td><td>0.15max.</td></tr>
<tr><td>0.075max.
(Type“12”: C=1μF
Type“13”:C≧4.7μF
Type“23”, “34”)</td><td rowspan="2">0.2max.
(Type“11”: C=1μF
Type“12”:C=4.7μF
Type“13”:C=10μF
Type“23”, “34”)</td></tr>
<tr><td>0.125max.
(Type“11“: C=1μF)</td></tr>
<tr><td rowspan="3">10V</td><td>0.075max.</td><td>0.15max.</td></tr>
<tr><td>0.125max.
(Type“11”: C=1μF)</td><td rowspan="2">0.3max.
(Type“11”: C=2.2μF
Type“12”:C=10μF
Type“13”:C=22μF
Type“23”, “34”)</td></tr>
<tr><td>0.15max.
(Type“23”:C=22μF
Type“34”)</td></tr>
<tr><td rowspan="3">6.3V</td><td>0.075max.</td><td rowspan="3">0.3max.</td></tr>
<tr><td>0.125max.
(Type“11”: C=1μF)</td></tr>
<tr><td>0.15max.
(Type“11”, C=2.2μF
Type“12”, C≧4.7μF
Type“13”, C=22μF
Type“23”, “34”)</td></tr>
</table>
IR:50/C (MΩ) min.
Note:DC10V, DC6.3V;10/C (MΩ)min.(C:Nominal cap. in μF)
</td><td>
Preconditioning:
Voltage Treatment
Temperature:
Maximum operation temp. ±3 ˚C
Applied voltage:Rated voltage×200%
Test period:1000+48/0 h
Recovery(Standard condition):48 ± 4h
</td></tr>
</table>

Note 1) Heat treatment:1 h of heat treatment at 150+0/–10˚C followed by 48±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 ±4 h of recovery under the standead condition.

■ Standard Products for Type “11” (EIA “0603”), Taped Version

Capacitance (μF)	Code / Rated Voltage / Capacitance Tolerance	B / DC16V Part No.	Dim. T (mm)	Temp. Char. B	Temp. Char. X5R	B / DC10V Part No.	Dim. T (mm)	Temp. Char. B	Temp. Char. X5R	B / DC6.3V Part No.	Dim. T (mm)	Temp. Char. B	Temp. Char. X5R
1	±10%(K)	ECJ1VB1C105□	0.8	—	O	ECJ1VB1A105□	0.8	—	O	ECJ1VB0J105□	0.8	O	O
2.2	or ±20%(M)									ECJ1VB0J225□	0.8	—	O

Capacitance (μF)	Code / Rated Voltage / Capacitance Tolerance	F / DC16V Part No.	Dim. T (mm)	Temp. Char. F	Temp. Char. Y5V	F / DC10V Part No.	Dim. T (mm)	Temp. Char. F	Temp. Char. Y5V	F / DC6.3V Part No.	Dim. T (mm)	Temp. Char. F	Temp. Char. Y5V
1	+80,–20%	ECJ1VF1C105Z	0.8	O	—	ECJ1VF1A105Z	0.8	O	O				
2.2	(Z)					ECJ1VF1A225Z	0.8	O	—	ECJ1VF0J225Z	0.8	O	—

□:Capacitance Tolerance code.
Packaging Style Code: “V” for Taped Version (ϕ180 reel, Taping pitch: 4 mm) .

■ Standard Products for Type “12” (EIA “0805”), Taped Version

Capacitance (μF)	Code / Rated Voltage / Capacitance Tolerance	B / DC25V Part No.	Dim. T (mm)	Temp. Char. B	Temp. Char. X5R	B / DC16V Part No.	Dim. T (mm)	Temp. Char. B	Temp. Char. X5R	B / DC10V Part No.	Dim. T (mm)	Temp. Char. B	Temp. Char. X5R	B / DC6.3V Part No.	Dim. T (mm)	Temp. Char. B	Temp. Char. X5R
1		Under development	1.25	—	O	ECJ2FB1C105□*	1.25	—	O	ECJ2FB1A105□	1.25	O	O				
2.2	±10%(K)	Under development	1.25	—	O	Under development	1.25	—	O	ECJ2FB1A225□*	1.25	—	O	ECJ2FB0J225□	1.25	O	O
3.3	or									ECJ2FB1A335□*	1.25	—	O	ECJ2FB0J335□	1.25	O	O
4.7	±20%(M)									Under development	1.25	—	O	ECJ2FB0J475□*	1.25	—	O
10														ECJ2FB0J106M**	1.25	—	O

Capacitance (μF)	Code / Rated Voltage / Capacitance Tolerance	F / DC25V Part No.	Dim. T (mm)	Temp. Char. F	Temp. Char. Y5V	F / DC16V Part No.	Dim. T (mm)	Temp. Char. F	Temp. Char. Y5V	F / DC10V Part No.	Dim. T (mm)	Temp. Char. F	Temp. Char. Y5V	F / DC6.3V Part No.	Dim. T (mm)	Temp. Char. F	Temp. Char. Y5V
1		ECJ2FF1E105Z*	1.25	O	—	ECJ2VF1C105Z	0.85	O	O								
2.2	+80, –20%	ECJ2FF1E225Z*	1.25	O	—	ECJ2FF1C225Z	1.25	O	O								
4.7	(Z)					ECJ2FF1C475Z*	1.25	O	—	ECJ2FF1A475Z	1.25	O	O				
10										ECJ2FF1A106Z*	1.25	O	—	ECJ2FF0J106Z*	1.25	O	—

□:Capacitance Tolerance code.
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 (μF)	Code / Rated Voltage / Capacitance Tolerance	B / DC25V Part No.	Dim. T (mm)	Temp. Char. B	Temp. Char. X7R	Temp. Char. X5R	B / DC16V Part No.	Dim. T (mm)	Temp. Char. B	Temp. Char. X7R	Temp. Char. X5R	B / DC10V Part No.	Dim. T (mm)	Temp. Char. B	Temp. Char. X7R	Temp. Char. X5R	B / DC6.3V Part No.	Dim. T (mm)	Temp. Char. B	Temp. Char. X7R	Temp. Char. X5R
1		ECJ3YB1E105□	1.6	O	O	—	ECJ3FB1C105□	1.15	O	O	—										
1.5												ECJ3YB1A155□	1.6	O	—	O					
2.2	±10%(K)	ECJ3YB1E225□	1.6	—	—	O	ECJ3YB1C225□	1.6	O	O	—	ECJ3YB1A225□	1.6	O	—	O					
3.3	or											ECJ3YB1A335□	1.6	O	—	O					
4.7	±20%(M)	ECJ3YB1E475□	1.6	—	—	O	ECJ3YB1C475□	1.6	—	—	O	ECJ3YB1A475□	1.6	—	—	O	ECJ3YB0J475□	1.6	—	—	O
10		Under development	1.6	—	—	O	ECJ3YB1C106M	1.6	—	—	O	ECJ3YB1A106M	1.6	—	—	O	ECJ3YB0J106M	1.6	—	—	O
22																	ECJ3YB0J226M	1.6	—	—	O

□:Capacitance Tolerance code.
Packaging Style Code: “F” and “Y” for Taped Version (ϕ180 reel, Taping pitch: 4 mm) .
Soldering method of Dimension T>1mm: Do not use the flow soldering.

■ Standard Products for Type “13” (EIA “1206”), Taped Version

Capacitance (μF)	Code / Rated Voltage / Capacitance Tolerance	F															
		DC50V				DC25V				DC16V				DC10V			
		Part No.	Dim. T (mm)	Temp. Char. F	Temp. Char. Y5V	Part No.	Dim. T (mm)	Temp. Char. F	Temp. Char. Y5V	Part No.	Dim. T (mm)	Temp. Char. F	Temp. Char. Y5V	Part No.	Dim. T (mm)	Temp. Char. F	Temp. Char. Y5V
1	+80, −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										ECJ3YF1C106Z	1.6	○	—	ECJ3YF1A106Z	1.6	○	○
22														ECJ3YF1A226Z	1.6	○	—

Packaging Style Code: “V”, “F” and “Y” for Taped Version (ϕ180 reel, Taping pitch: 4 mm) .
Soldering method of Dimension T>1mm: Do not use the flow soldering.

■ Standard Products for Type “23” (EIA “1210”), Taped Version

Capacitance (μF)	Code / Rated Voltage / Capacitance Tolerance	B																			
		DC50V				DC25V				DC16V				DC10V				DC6.3V			
		Part No.	Dim. T (mm)	Temp. Char. B	Temp. Char. X5R	Part No.	Dim. T (mm)	Temp. Char. B	Temp. Char. X5R	Part No.	Dim. T (mm)	Temp. Char. B	Temp. Char. X5R	Part No.	Dim. T (mm)	Temp. Char. B	Temp. Char. X5R	Part No.	Dim. T (mm)	Temp. Char. B	Temp. Char. X5R
1	±10%(K) or ±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	—	○	ECJ4YB1A106M	2.0	—	○				
22										Under development	2.5	—	○	ECJ4YB1A226M	2.5	—	○	ECJ4YB0J226M	2.5	—	○
47																		ECJ4YB0J476M	2.5	—	○

Capacitance (μF)	Code / Rated Voltage / Capacitance Tolerance	F															
		DC50V			DC25V			DC16V			DC10V			DC6.3V			
		Part No.	Dim. T (mm)	Temp. Char. F	Part No.	Dim. T (mm)	Temp. Char. F	Part No.	Dim. T (mm)	Temp. Char. F	Part No.	Dim. T (mm)	Temp. Char. F	Part No.	Dim. T (mm)	Temp. Char. F
4.7	+80, −20% (Z)	ECJ4YF1H475Z	2.0	○												
10		ECJ4YF1H106Z	2.0	○	ECJ4YF1E106Z	2.0	○	ECJ4YF1C106Z	2.0	○						
22								ECJ4YF1C226Z	2.0	○	ECJ4YF1A226Z	2.0	○			
47														ECJ4YF0J476Z	2.0	○

□:Capacitance Tolerance code.
Packaging Style Code: “Y” for Taped Version (ϕ180 reel, Taping pitch: 4 mm) .
Soldering method of Dimension T>1mm: Do not use the flow soldering.

■ Standard Products for Type “34” (EIA “1812”), Taped Version

Capacitance (μF)	Code / Rated Voltage / Capacitance Tolerance	B																			
		DC50V				DC25V				DC16V				DC10V				DC6.3V			
		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	
3.3	±10%(K) or ±20%(M)	ECJ5YB1H335□	2.5	○																	
10						ECJ5YB1E106M	2.5	○													
22						Under development	2.5	○		ECJ5YB1C226M	2.5	○		ECJ5YB1A226M	2.5	○					
33														Under development	2.5	○					
47														Under development	3.2	○		ECJ5YB0J476M	3.2	○	
100																		ECJ5YB0J107M	3.2	○	

Capacitance (μF)	Code / Rated Voltage / Capacitance Tolerance	F															
		DC25V			DC16V			DC10V			DC6.3V						
		Part No.	Dim. T (mm)	Temp. Char. F	Part No.	Dim. T (mm)	Temp. Char. F	Part No.	Dim. T (mm)	Temp. Char. F	Part No.	Dim. T (mm)	Temp. Char. F				
22	+80, −20% (Z)	ECJ5YF1E226Z	2.5	○	ECJ5YF1C226Z	2.5	○										
47								ECJ5YF1A476Z	2.5	○							
100											ECJ5YF0J107Z	2.5	○				

□:Capacitance Tolerance code.
Packaging Style Code: “Y” for Taped Version (ϕ180 reel, Taping pitch: 8 mm) .
Soldering method of Dimension T>1mm: Do not use the flow soldering.