Multilayer Ceramic Capacitors (For General Electronic Equipment)

Series: **ECJ**

■ Features

- Small size and wide capacitance range
- High humidity resistance and long life
- Excellent solderability and resistance to soldering heat
- Low inductance (ESL) and excellent frequency characteristics
- RoHS compliant

■ Recommended Applications

- Class 1 (T.C. Type)
  Tuned circuits, and filter circuitry, where low loss and high stability of capacitance and high insulation resistance is required
- Class 2 (Hi-K Type)
  Coupling and By-passing

■ Handling Precautions

See Page 48 to 53

■ Packaging Specifications

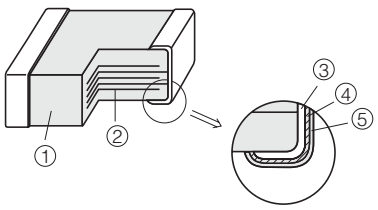
See Page 45, 46, 56

■ Explanation of Part Numbers

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

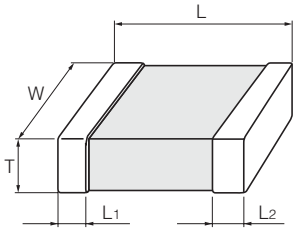
- 1 2 3: Product Code (ECJ:Multilayer Ceramic Chip Capacitors)
- 4: Size Code
- 5: Packaging Style Code
- 6: Temperature Characteristic Code
- 7 8: Rated Voltage Code
- 9 10 11: Nominal Capacitance
- 12: Capacitance Tolerance Code

■ 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)



Size Code	Size (EIA)	L	W	T	L_1, L_2
Z	0201	0.60±0.03	0.30±0.03	0.30±0.03	0.15±0.05
0	0402	1.00±0.05	0.50±0.05	0.50±0.05	0.2±0.1
1	0603	1.6±0.1	0.8±0.1	0.8±0.1	0.3±0.2
2	0805	2.0±0.1	1.25±0.10	0.6±0.1	0.50±0.25
				0.85±0.10	
				1.25±0.10	
		2.00±0.15	1.25±0.15	1.25±0.15	

■ Packaging Styles and Standard Packaging Quantities

Quantity (Taping: pcs./reel)

Packaging Style Code	Packaging Styles \ Size / Thickness (mm)		0201	0402	0603	0805		
			T=0.3	T=0.5	T=0.8	T=0.6	T=0.85	T=1.25
E	φ180 reel	Paper taping (Pitch: 2 mm)	15,000	10,000	—	—	—	—
V		Paper taping (Pitch: 4 mm)	—	—	4,000	5,000	4,000	—
F		Embossed taping (Pitch: 4 mm)	—	—	—	—	—	3,000

φ330 reel and bulk case type : Please contact us

■ Temperature Characteristics

● Class 1

Temperature Characteristic Code	Temperature Characteristics			Temp. Coeff. (ppm/°C)	Rate of Capacitance change at each Temperature (%)			
					–25 °C		85 °C	
					max.	min.	max.	min.
C	CΔ	≧10 pF	CG	0± 30	0.33	–0.14	0.20	–0.20
		≧4 pF	CH	0± 60	0.49	–0.27	0.39	–0.39
		3 pF	CJ	0±120	0.82	–0.54	0.78	–0.78
		≦2 pF	CK	0±250	1.54	–1.13	1.63	–1.63
G	SL			+350 to –1000	—	—	2.28	–6.50

Temperature coefficient: calculated between 20 °C to 85 °C

For applicable “temperature characteristics”, see the lists of standard products on page 13 to 19.

● Class 2

Temperature Characteristic Code	Temperature Characteristics	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 13 to 19.

■ 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	0R5	010	100	104
Nominal Capacitance	0.5 pF	1 pF	10 pF	100,000 pF (0.1 μF)

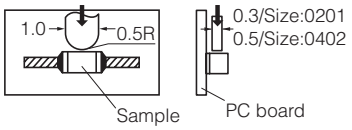
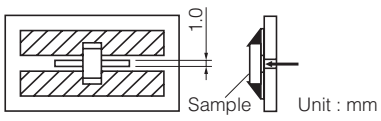
■ Capacitance Tolerance

Class	Temperature Characteristics			Tol. Code	Capacitance Tolerance
1	CΔ, SL	Capacitance range	C ≦ 5 pF	C	±0.25 pF
			C ≦10 pF	D	±0.5 pF
			C =10 pF	F	±1 pF
			C >10 pF	J	±5 %
				K	±10 %
2	B, X7R, X5R			K	±10 %
				M	±20 %
	F, Y5V			Z	+80, –20 %

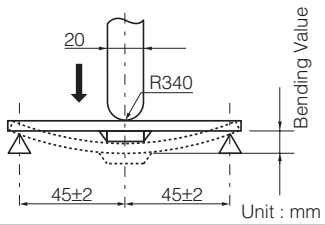
■ Specifications and Testing Methods

<table>
<tr><th rowspan="2">Item</th><th colspan="2">Specification</th><th rowspan="2">Test Method</th></tr>
<tr><th>Class 1</th><th>Class 2</th></tr>
<tr><td>Operating Temperature Range</td><td>Temp. Char. CΔ
: –55 to 125 °C
: –25 to 85 °C
Temp. Char. SL
: –55 to 125 °C</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 colspan="2">No dielectric breakdown and /or damage</td><td>Test voltage:
Class 1:Rated voltage ×300 %
Class 2:Rated voltage ×250 %
Duration:1 to 5 s
Charge/discharge current : 50 mA max.</td></tr>
<tr><td>Insulation Resistance (I R)</td><td colspan="2">10000 MΩ or 500/C (MΩ) whichever is less.
Note:100/C(MΩ)min. for DC 10 V max.
C:Nominal Cap. in µF</td><td>Measuring voltage:Rated voltage
Duration: 60±5 s
Charge/discharge current : 50 mA max.</td></tr>
<tr><td>Capacitance</td><td colspan="2">Within the specified tolerance.</td><td rowspan="2">Measuring temperature: 20±2 °C
Class 1:
<table><tr><td>Nominal capacitance</td><td>C ≦ 1000 pF</td><td>C > 1000 pF</td></tr><tr><td>Measuring frequency</td><td>1 MHz ± 10 %</td><td>1 kHz ± 10 %</td></tr><tr><td>Measuring voltage</td><td>0.5 to 5 Vrms</td><td>0.5 to 5 Vrms</td></tr></table>Class 2:
Preconditioning: The capacitors shall be kept in temperature of 150 +0/–10 °C for 1 hour and subjected to standard condition* 48±4 hours before initial measurement.
<table><tr><td>Nominal capacitance</td><td>C < 1 µF</td></tr><tr><td>Measuring frequency</td><td>1 kHz ± 10 %</td></tr><tr><td>Measuring voltage</td><td>1.0 ± 0.2 Vrms</td></tr></table></td></tr>
<tr><td>Q Factor or Dissipation Factor (tan δ)</td><td>Q:
C<30 pF: Q≧400+20C
30 pF≦C≦1000 pF:Q≧1000

tan δ:
C>1000 pF: tan δ≦0.002

(C:Nominal Cap. in pF)</td><td>tan δ:
Temp. Char. B, X7R, X5R:
0.15 max.
Temp. Char. F, Y5V:
0.2 max.
Please see the technical specifications for details.</td></tr>
<tr><td>Temperature Characteristics</td><td>Temp. Char.
CG : 0± 30 ppm/ °C
CH : 0± 60 ppm/ °C
CJ : 0±120 ppm/ °C
CK : 0±250 ppm/ °C
SL : +350 to –1000 ppm/ °C</td><td>Temp. Char.
B : ±10 %
X7R : ±15 %
X5R : ±15 %
F : +30, –80 %
Y5V : +22, –82 %</td><td>Maximum capacitance change at stage 1 to 5
<table><tr><th>Temp. Char.</th><th>CΔ, SL B, F</th><th>X7R</th><th>X5R</th><th>Y5V</th></tr><tr><td>1</td><td>20 °C</td><td>25 °C</td><td>25 °C</td><td>25 °C</td></tr><tr><td>2</td><td>–25 °C</td><td>–55 °C</td><td>–55 °C</td><td>–30 °C</td></tr><tr><td>3 (Ref. Temp.)</td><td>20 °C</td><td>25 °C</td><td>25 °C</td><td>25 °C</td></tr><tr><td>4</td><td>85 °C</td><td>125 °C</td><td>85 °C</td><td>85 °C</td></tr><tr><td>5</td><td>20 °C</td><td>25 °C</td><td>25 °C</td><td>25 °C</td></tr></table>See the technical specifications for details such as measuring voltage.</td></tr>
<tr><td>Adhesion</td><td colspan="2">Terminal electrodes shall be free from peeling or signs of peeling.</td><td>Applied force:
Size: 0201: 2 N
Size: 0402 to 0805: 5N
Duration: 10 s
Size: 0201 to 0402
 
Size: 0603 to 0805
  </td></tr>
</table>

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

Item	Specification		Test Method
	Class 1	Class 2	
Bending Strength	Appearance: No mechanical damage Capacitance change: Within ±5 % or ±0.5 pF whichever is larger.	Appearance: No mechanical damage Capacitance change: Temp. Char. B, X7R, X5R : within ±12.5 % F ,Y5V : within ±30 %	Bending value:1 mm Bending speed:1 mm/ 
Vibration Proof	Appearance: No mechanical damage. Capacitance: within the specified tolerance Q, tan δ: Initial standard value		Total amplitude : 1.5 mm Vibration frequency : 10 to 55 to 10 Hz for 1 min. 3 perpendicular directions for 2 hours each, a total of 6 hours
Resistance to Soldering Heat	Appearance: No mechanical damage Capacitance change: Within ±2.5 % or ±0.25 pF whichever is larger. Q.tan δ:Initial standard value IR:Initial standard value Withstand voltage: No dielectric breakdown and/or damage	Appearance: No mechanical damage Capacitance change: Temp. Char. B, X7R, X5R : within ±7.5 % F, Y5V : within ±20 % tan δ:Initial standard value IR:Initial standard value Withstand voltage: No dielectric breakdown and/or damage	Soldering bath method Preconditioning:Heat treatment/Class 2(*1) Solder temperature:270±5 °C Dipping period:3.0±0.5 s Preheat condition: Order | Temp. (°C) | Size 0805 max. 1 | 80 to 100 | 120 to 180 s 2 | 150 to 200 | 120 to 180 s Recovery (Standard condition): Class 1:24±2 h Class 2:48±4 h
Solderability	More than 95 % of the soldered area of both terminal electrodes should be covered with fresh solder.		Soldering bath method Solder temperature:230±5 °C Dipping period:4±1 s Solder:H63A (JIS Z 3282)
Temperature Cycle	Appearance: No mechanical damage Capacitance change: Within ±2.5 % or ±0.25 pF whichever is larger. Q.tan δ:Initial standard value IR:Initial standard value Withstand voltage: No dielectric breakdown and/or damage	Appearance: No mechanical damage Capacitance change: Temp. Char. B, X7R, X5R: within ±7.5 % F, Y5V : within ±20 % tan δ:Initial standard value IR:Initial standard value Withstand voltage: No dielectric breakdown and/or damage	Preconditioning:Heat treatment (150 °C, 1h) /Class 2 Condition of one cycle Step 1:Minimum operationing temp. 30±3 min Step 2:Room temp. 3 min max. Step 3:Maximum operationing temp. 30±3 min Step 4:Room temp. 3 min max. Number of cycles:5 cycles Recovery (Standard condition) Class 1:24±2 h Class 2:48±4 h
Damp Heat (Steady state)	Appearance: No mechanical damage Capacitance change: Within ±5 % or ±0.5 pF whichever is larger. Q: C<10 pF:Q≧200+10C 10 pF≦C<30 pF:Q≧275+5C/2 30 pF≦C≦1000 pF:Q≧350 tan δ: C>1000 pF:tan δ≦0.004 C:Nominal capacitance in pF IR: 1000 MΩ or 50/C (MΩ) Whichever is less. C:Nominal capacitance in µF	Appearance: No mechanical damage Capacitance change: Temp. Char. B, X7R, X5R: Within ±20 % F, Y5V: Within ±30 % tan δ: Temp. Char. B, X7R, X5R: 0.25 max. F, Y5V: 0.3 max. IR: 1000 MΩ or 50/C (MΩ) Whichever is less. Note:10/C (MΩ) min. for DC 10 V max. C:Nominal capacitance in µF Please see the technical specifications for details.	Preconditioning:Heat treatment/Class 2(*1) Temperature:40±2 °C Relative humidity:90 to 95 % Test period:500+24/0 h Recovery (Standard condition) Class 1:24±2 h Class 2:48±4 h

(*1) Heat treatment: 1 h of heat treatment at 150 +0/-10 °C followed by 48±4 h recovery under standard conditions.

Item	Specification		Test Method
	Class 1	Class 2	
Damp Heat Load	Appearance: No mechanical damage Capacitance change: Within ±7.5 % or ±0.75 pF whichever is larger. Q: C<30 pF:Q≧100+10C/3 30 pF≦C≦1000 pF:Q≧200 tan δ: C>1000 pF:tan δ≦0.004 (C:Nominal capacitance in pF) IR: 500 MΩ or 25/C (MΩ) Whichever is less. (C:Nominal capacitance in μF)	Appearance: No mechanical damage Capacitance change: Temp. Char. B, X7R, X5R: Within ±20 % F, Y5V: Within ±30 % tan δ: Temp. Char. B, X7R, X5R: 0.25 max. F, Y5V: 0.3 max. IR: 500 MΩ or 25/C (MΩ) Whichever is less. Note:5/C (MΩ) min. for DC 10 V max. C:Nominal capacitance in μF Please see the technical specifications for details.	Preconditioning:Voltage treatment/Class 2(*2) Temperature:40±2 °C Relative humidity:90 to 95 % Applied voltage:Rated voltage Charge/discharge current: 50 mA max. Test period:500+24/0 h Recovery (Standard condition) Class 1:24±2 h Class 2:48±4 h
High Temperature Load	Appearance: No mechanical damage Capacitance change: Within ±3 % or ±0.3 pF whichever is larger. Q: C<10 pF:Q≧200+10C 10 pF≦C≦30 pF:Q≧275+5C/2 30 pF≦C≦1000 pF:Q≧350 tan δ: C>1000 pF:tan δ≦0.004 C:Nominal capacitance in pF IR: 1000 MΩ or 50/C (MΩ) Whichever is less. C:Nominal capacitance in μF	Appearance: No mechanical damage Capacitance change: Temp. Char. B, X7R, X5R: Within ±20 % F, Y5V: Within ±30 % tan δ: Temp. Char. B, X7R, X5R: 0.25 max. F, Y5V: 0.3 max. IR: 1000 MΩ or 50/C (MΩ) Whichever is less. Note:10/C (MΩ) min. for DC 10 V max. C:Nominal capacitance in μF Please see the technical specifications for details.	Preconditioning:Voltage treatment/Class 2(*2) Temperature: Maximum operating temp. ±3 °C Applied voltage: (1) Rated voltage ×200 % (2) Rated voltage ×100 % Please see the technical specifications for details. Charge/discharge current: 50 mA max. Test period:1000+48/0 h Recovery (Standard condition) Class 1:24±2 h Class 2:48±4 h

(*1) Heat treatment:1 h of heat treatment at 150+0/–10 °C followed by 48±4 h recovery under standard conditions
(*2) Voltage treatment:1 h of voltage treatment under the specified temperature and voltage for testing followed by 48±4 h of recovery under standard conditions

■ Standard Products for EIA “0201”, Taped Version

● Class 1

◆ Temperature Characteristic Code : C (Temperature Characteristics : CΔ)

Rated voltage		DC 25 V						DC 16 V					
Capacitance (pF)	Capacitance Tolerance	Part No.	Dim. T (mm)	Temp. Char. CK	CJ	CH	CG	Part No.	Dim. T (mm)	Temp. Char. CK	CJ	CH	CG
0.5	±0.25 pF(C)	ECJZEC1E0R5C	0.3	○	—	—	—						
1	±0.25 pF (C) or ±0.5 pF (D)	ECJZEC1E010□	0.3	○	—	—	—						
1.5		ECJZEC1E1R5□	0.3	○	—	—	—						
2		ECJZEC1E020□	0.3	○	—	—	—						
3		ECJZEC1E030□	0.3	—	○	—	—						
4		ECJZEC1E040□	0.3	—	—	○	—						
5		ECJZEC1E050□	0.3	—	—	○	—						
6	±0.5 pF (D)	ECJZEC1E060D	0.3	—	—	○	—						
7		ECJZEC1E070D	0.3	—	—	○	—						
8		ECJZEC1E080D	0.3	—	—	○	—						
9		ECJZEC1E090D	0.3	—	—	○	—						
10	±0.5 pF (D) or ±1 pF (F)	ECJZEC1E100□	0.3	—	—	○	○						
12	±5 % (J) or ±10 % (K)	ECJZEC1E120□	0.3	—	—	○	○						
15		ECJZEC1E150□	0.3	—	—	○	○						
18		ECJZEC1E180□	0.3	—	—	○	○						
22		ECJZEC1E220□	0.3	—	—	○	○						
27		ECJZEC1E270□	0.3	—	—	○	○						
33		ECJZEC1E330□	0.3	—	—	○	○						
39								ECJZEC1C390□	0.3	—	—	○	○
47								ECJZEC1C470□	0.3	—	—	○	○
56								ECJZEC1C560□	0.3	—	—	○	○
68								ECJZEC1C680□	0.3	—	—	○	○
82								ECJZEC1C820□	0.3	—	—	○	○
100								ECJZEC1C101□	0.3	—	—	○	○

□: Capacitance tolerance code.
Standard packaging quantity of Packaging Style Code “E” (T = 0.3 mm): 15,000 pcs./reel
Recommend soldering method: Reflow soldering.

● Class 2 Capacitors

◆ Temperature Characteristic Code : B (Temperature Characteristics : B, X7R, X5R)

Rated voltage		DC 50 V					DC 25 V					DC 16 V					DC 10 V					DC 6.3 V				
Capacitance (pF)	Capacitance Tolerance	Part No.	Dim. T (mm)	Temp. Char. B	X7R	X5R	Part No.	Dim. T (mm)	Temp. Char. B	X7R	X5R	Part No.	Dim. T (mm)	Temp. Char. B	X7R	X5R	Part No.	Dim. T (mm)	Temp. Char. B	X7R	X5R	Part No.	Dim. T (mm)	Temp. Char. B	X7R	X5R
150	±10 % (K) or ±20 % (M)	ECJZEB1H151□	0.3	○	○	—	ECJZEB1E151□	0.3	○	○	—															
220		ECJZEB1H221□	0.3	○	○	—	ECJZEB1E221□	0.3	○	○	—															
330		ECJZEB1H331□	0.3	○	○	—	ECJZEB1E331□	0.3	○	○	—															
470		ECJZEB1H471□	0.3	○	○	—	ECJZEB1E471□	0.3	○	○	—															
680		ECJZEB1H681□	0.3	○	○	—	ECJZEB1E681□	0.3	○	○	—															
1000		ECJZEB1H102□	0.3	○	○	—	ECJZEB1E102□	0.3	○	○	—															
1500							ECJZEB1E152□	0.3	○	○	—	ECJZEB1C152□	0.3	○	○	—										
2200							ECJZEB1E222□	0.3	○	○	—	ECJZEB1C222□	0.3	○	○	—										
3300												ECJZEB1C332□	0.3	○	—	○	ECJZEB1A332□	0.3	○	—	○					
4700																	ECJZEB1A472□	0.3	—	—	○	ECJZEB0J472□	0.3	—	—	○
6800																	ECJZEB1A682□	0.3	—	—	○	ECJZEB0J682□	0.3	—	—	○
10000																	ECJZEB1A103□	0.3	—	—	○	ECJZEB0J103□	0.3	—	—	○
15000																	ECJZEB1A153□	0.3	—	—	○	ECJZEB0J153□	0.3	—	—	○
22000																	ECJZEB1A223□	0.3	—	—	○	ECJZEB0J223□	0.3	—	—	○
33000																	ECJZEB1A333□	0.3	—	—	○	ECJZEB0J333□	0.3	—	—	○
47000																	ECJZEB1A473□	0.3	—	—	○	ECJZEB0J473□	0.3	—	—	○
68000																	ECJZEB1A683□	0.3	—	—	○	ECJZEB0J683□	0.3	—	—	○
100000																	ECJZEB1A104□	0.3	—	—	○	ECJZEB0J104□	0.3	—	—	○
220000																						ECJZEB0J224M	0.3	—	—	○

□: Capacitance tolerance code : “□” for “K” or “M”
Standard packaging quantity of Packaging Style Code “E” (T = 0.3 mm): 15,000 pcs./reel
Recommend soldering method: Reflow soldering.

■ Standard Products for EIA “0402”, Taped Version

● Class 1

◆ Temperature Characteristic Code : C (Temp. Char. : CΔ)

Rated voltage		DC 50 V					
Capacitance (pF)	Capacitance Tolerance	Part No.	Dim. T (mm)	Temp. Char. CK	CJ	CH	CG
0.5	±0.25 pF (C)	ECJ0EC1H0R5C	0.5	○	—	—	—
1	±0.25 pF (C) or ±0.5 pF (D)	ECJ0EC1H010□	0.5	○	—	—	—
1.5		ECJ0EC1H1R5□	0.5	○	—	—	—
2		ECJ0EC1H020□	0.5	○	—	—	—
3		ECJ0EC1H030□	0.5	—	○	—	—
4		ECJ0EC1H040□	0.5	—	—	○	—
5		ECJ0EC1H050□	0.5	—	—	○	—
6	±0.5 pF(D)	ECJ0EC1H060D	0.5	—	—	○	—
7		ECJ0EC1H070D	0.5	—	—	○	—
8		ECJ0EC1H080D	0.5	—	—	○	—
9		ECJ0EC1H090D	0.5	—	—	○	—
10	±0.5 pF (D) or ±1 pF (F)	ECJ0EC1H100□	0.5	—	—	○	○
12	±5 % (J) or ±10 % (K)	ECJ0EC1H120□	0.5	—	—	○	○
15		ECJ0EC1H150□	0.5	—	—	○	○
18		ECJ0EC1H180□	0.5	—	—	○	○
22		ECJ0EC1H220□	0.5	—	—	○	○
27		ECJ0EC1H270□	0.5	—	—	○	○
33		ECJ0EC1H330□	0.5	—	—	○	○
39		ECJ0EC1H390□	0.5	—	—	○	○
47		ECJ0EC1H470□	0.5	—	—	○	○
56		ECJ0EC1H560□	0.5	—	—	○	○
68		ECJ0EC1H680□	0.5	—	—	○	○
82		ECJ0EC1H820□	0.5	—	—	○	○
100		ECJ0EC1H101□	0.5	—	—	○	○
120		ECJ0EC1H121□	0.5	—	—	○	○
150		ECJ0EC1H151□	0.5	—	—	○	○
180		ECJ0EC1H181□	0.5	—	—	○	○
220		ECJ0EC1H221□	0.5	—	—	○	○

◆ Temperature Characteristic Code : G (Temp. Char. : SL)

Rated voltage		DC 50 V		
Capacitance (pF)	Capacitance Tolerance	Part No.	Dim. T (mm)	Temp. Char. SL
0.5	±0.25 pF (C)	ECJ0EG1H0R5C	0.5	○
1	±0.25 pF (C) or ±0.5 pF (D)	ECJ0EG1H010□	0.5	○
1.5		ECJ0EG1H1R5□	0.5	○
2		ECJ0EG1H020□	0.5	○
3		ECJ0EG1H030□	0.5	○
4		ECJ0EG1H040□	0.5	○
5		ECJ0EG1H050□	0.5	○
6	±0.5 pF(D)	ECJ0EG1H060D	0.5	○
7		ECJ0EG1H070D	0.5	○
8		ECJ0EG1H080D	0.5	○
9		ECJ0EG1H090D	0.5	○
10	±0.5 pF (D) or ±1 pF (F)	ECJ0EG1H100□	0.5	○
12	±5 % (J) or ±10 % (K)	ECJ0EG1H120□	0.5	○
15		ECJ0EG1H150□	0.5	○
18		ECJ0EG1H180□	0.5	○
22		ECJ0EG1H220□	0.5	○
27		ECJ0EG1H270□	0.5	○
33		ECJ0EG1H330□	0.5	○
39		ECJ0EG1H390□	0.5	○
47		ECJ0EG1H470□	0.5	○
56		ECJ0EG1H560□	0.5	○
68		ECJ0EG1H680□	0.5	○
82		ECJ0EG1H820□	0.5	○
100		ECJ0EG1H101□	0.5	○
120		ECJ0EG1H121□	0.5	○
150		ECJ0EG1H151□	0.5	○
180		ECJ0EG1H181□	0.5	○
220		ECJ0EG1H221□	0.5	○

□: Capacitance tolerance code.
Standard packaging quantity of Packaging Style Code “E” (T = 0.5 mm): 10,000 pcs./reel.
Recommend soldering method: Reflow soldering.

■ Standard Products for EIA “0402”, Taped Version

● Class 2

◆ Temperature Characteristic Code : B (Temperature Characteristics : B, X7R, X5R)

Rated voltage		DC 50 V					DC 25 V					DC 16 V					DC 10 V					DC 6.3 V				
Capacitance (pF)	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.			Part No.	Dim. T (mm)	Temp. Char.		
				B	X7R	X5R			B	X7R	X5R			B	X7R	X5R			B	X7R	X5R			B	X7R	X5R
100		ECJ0EB1H101□	0.5	○	○	—																				
120		ECJ0EB1H121K	0.5	○	○	—																				
150		ECJ0EB1H151□	0.5	○	○	—																				
180		ECJ0EB1H181K	0.5	○	○	—																				
220		ECJ0EB1H221□	0.5	○	○	—																				
270		ECJ0EB1H271K	0.5	○	○	—																				
330		ECJ0EB1H331□	0.5	○	○	—																				
390		ECJ0EB1H391K	0.5	○	○	—																				
470		ECJ0EB1H471□	0.5	○	○	—																				
560		ECJ0EB1H561K	0.5	○	○	—																				
680		ECJ0EB1H681□	0.5	○	○	—																				
820		ECJ0EB1H821K	0.5	○	○	—																				
1000		ECJ0EB1H102□	0.5	○	○	—																				
1200		ECJ0EB1H122K	0.5	○	○	—																				
1500		ECJ0EB1H152□	0.5	○	○	—																				
1800		ECJ0EB1H182K	0.5	○	○	—																				
2200		ECJ0EB1H222□	0.5	○	○	—																				
2700		ECJ0EB1H272K	0.5	○	○	—																				
3300	±10 % (K)	ECJ0EB1H332□	0.5	○	○	—																				
3900	or	ECJ0EB1H392K	0.5	○	○	—																				
4700	±20 % (M)	ECJ0EB1H472□	0.5	○	○	—	ECJ0EB1E472□	0.5	○	○	—															
5600		ECJ0EB1H562K	0.5	○	○	—	ECJ0EB1E562K	0.5	○	○	—															
6800		ECJ0EB1H682□	0.5	○	○	—	ECJ0EB1E682□	0.5	○	○	—															
8200		ECJ0EB1H822K	0.5	○	○	—	ECJ0EB1E822K	0.5	○	○	—															
10000		ECJ0EB1H103□	0.5	○	○	—	ECJ0EB1E103□	0.5	○	○	—	ECJ0EB1C103□	0.5	○	○	—										
12000												ECJ0EB1C123K	0.5	○	○	—										
15000												ECJ0EB1C153□	0.5	○	○	—										
18000												ECJ0EB1C183K	0.5	○	○	—										
22000												ECJ0EB1C223□	0.5	○	○	—										
27000												ECJ0EB1C273K	0.5	—	—	○	ECJ0EB1A273K	0.5	○	—	○					
33000												ECJ0EB1C333□	0.5	—	—	○	ECJ0EB1A333□	0.5	○	—	○					
39000												ECJ0EB1C393K	0.5	—	—	○	ECJ0EB1A393K	0.5	○	—	○					
47000												ECJ0EB1C473□	0.5	—	—	○	ECJ0EB1A473□	0.5	○	—	○					
56000												ECJ0EB1C563K	0.5	—	—	○	ECJ0EB1A563K	0.5	○	—	○					
68000												ECJ0EB1C683□	0.5	—	—	○	ECJ0EB1A683□	0.5	○	—	○					
82000												ECJ0EB1C823K	0.5	—	—	○	ECJ0EB1A823K	0.5	○	—	○					
100000												ECJ0EB1C104□	0.5	—	—	○	ECJ0EB1A104□	0.5	○	—	○					
220000												ECJ0EB1C224□	0.5	—	—	○	ECJ0EB1A224□	0.5	—	—	○	ECJ0EB0J224□	0.5	—	—	○
470000												ECJ0EB1C474□	0.5	—	—	○	ECJ0EB1A474□	0.5	—	—	○	ECJ0EB0J474□	0.5	—	—	○

□: Capacitance tolerance code : “□” for “K” or “M”
Standard packaging quantity of Packaging Style Code “E” (T = 0.5 mm): 10,000 pcs./reel.
Recommend soldering method: Reflow soldering.
For capacitance 1 µF or more, see page 6 and 7 for High Capacitance.

◆ Temperature Characteristic Code : F (Temperature Characteristics : F, Y5V)

Rated voltage		DC 50 V				DC 25 V				DC 16 V				DC 10 V			
Capacitance (pF)	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.	
				F	Y5V			F	Y5V			F	Y5V			F	Y5V
1000		ECJ0EF1H102Z	0.5	○	○	ECJ0EF1E102Z	0.5	○	○								
2200		ECJ0EF1H222Z	0.5	○	○	ECJ0EF1E222Z	0.5	○	○								
4700		ECJ0EF1H472Z	0.5	○	○	ECJ0EF1E472Z	0.5	○	○								
10000	+80, –20%	ECJ0EF1H103Z	0.5	○	○	ECJ0EF1E103Z	0.5	○	○								
22000	(Z)					ECJ0EF1E223Z	0.5	○	○	ECJ0EF1C223Z	0.5	○	○				
47000										ECJ0EF1C473Z	0.5	○	○				
100000										ECJ0EF1C104Z	0.5	○	○				
220000														ECJ0EF1A224Z	0.5	○	○

Standard packaging quantity of Packaging Style Code “E” (T = 0.5 mm): 10,000 pcs./reel.
Recommend soldering method: Reflow soldering.
For capacitance 1 µF or more, see page 6 and 7 for High Capacitance.

■ Standard Products for EIA “0603”, Taped Version

● Class 1

◆ Temperature Characteristic Code : C (Temp. Char. : CΔ)

Rated voltage		DC 50 V					
Capacitance (pF)	Capacitance Tolerance	Part No.	Dim. T (mm)	Temp. Char. CK	CJ	CH	CG
0.5	±0.25 pF (C)	ECJ1VC1H0R5C	0.8	○	—	—	—
1	±0.25 pF (C) or ±0.5 pF (D)	ECJ1VC1H010□	0.8	○	—	—	—
1.5		ECJ1VC1H1R5□	0.8	○	—	—	—
2		ECJ1VC1H020□	0.8	○	—	—	—
3		ECJ1VC1H030□	0.8	—	○	—	—
4		ECJ1VC1H040□	0.8	—	—	○	—
5		ECJ1VC1H050□	0.8	—	—	○	—
6	±0.5 pF (D)	ECJ1VC1H060D	0.8	—	—	○	—
7		ECJ1VC1H070D	0.8	—	—	○	—
8		ECJ1VC1H080D	0.8	—	—	○	—
9		ECJ1VC1H090D	0.8	—	—	○	—
10	±0.5 pF (D) or ±1 pF (F)	ECJ1VC1H100□	0.8	—	—	○	○
12	±5 % (J) or ±10 % (K)	ECJ1VC1H120□	0.8	—	—	○	○
15		ECJ1VC1H150□	0.8	—	—	○	○
18		ECJ1VC1H180□	0.8	—	—	○	○
22		ECJ1VC1H220□	0.8	—	—	○	○
27		ECJ1VC1H270□	0.8	—	—	○	○
33		ECJ1VC1H330□	0.8	—	—	○	○
39		ECJ1VC1H390□	0.8	—	—	○	○
47		ECJ1VC1H470□	0.8	—	—	○	○
56		ECJ1VC1H560□	0.8	—	—	○	○
68		ECJ1VC1H680□	0.8	—	—	○	○
82		ECJ1VC1H820□	0.8	—	—	○	○
100		ECJ1VC1H101□	0.8	—	—	○	○
120		ECJ1VC1H121□	0.8	—	—	○	○
150		ECJ1VC1H151□	0.8	—	—	○	○
180		ECJ1VC1H181□	0.8	—	—	○	○
220		ECJ1VC1H221□	0.8	—	—	○	○
270		ECJ1VC1H271□	0.8	—	—	○	○
330		ECJ1VC1H331□	0.8	—	—	○	○
390		ECJ1VC1H391□	0.8	—	—	○	○
470		ECJ1VC1H471□	0.8	—	—	○	○
560		ECJ1VC1H561□	0.8	—	—	○	○
680		ECJ1VC1H681□	0.8	—	—	○	○
820		ECJ1VC1H821□	0.8	—	—	○	○
1000		ECJ1VC1H102□	0.8	—	—	○	○

◆ Temperature Characteristic Code : G (Temp. Char. : SL)

Rated voltage		DC 50 V		
Capacitance (pF)	Capacitance Tolerance	Part No.	Dim. T (mm)	Temp. Char. SL
0.5	±0.25 pF (C)	ECJ1VG1H0R5C	0.8	○
1	±0.25 pF (C) or ±0.5 pF (D)	ECJ1VG1H010□	0.8	○
1.5		ECJ1VG1H1R5□	0.8	○
2		ECJ1VG1H020□	0.8	○
3		ECJ1VG1H030□	0.8	○
4		ECJ1VG1H040□	0.8	○
5		ECJ1VG1H050□	0.8	○
6	±0.5 pF (D)	ECJ1VG1H060D	0.8	○
7		ECJ1VG1H070D	0.8	○
8		ECJ1VG1H080D	0.8	○
9		ECJ1VG1H090D	0.8	○
10	±0.5 pF (D) or ±1 pF (F)	ECJ1VG1H100□	0.8	○
12	±5 % (J) or ±10 % (K)	ECJ1VG1H120□	0.8	○
15		ECJ1VG1H150□	0.8	○
18		ECJ1VG1H180□	0.8	○
22		ECJ1VG1H220□	0.8	○
27		ECJ1VG1H270□	0.8	○
33		ECJ1VG1H330□	0.8	○
39		ECJ1VG1H390□	0.8	○
47		ECJ1VG1H470□	0.8	○
56		ECJ1VG1H560□	0.8	○
68		ECJ1VG1H680□	0.8	○
82		ECJ1VG1H820□	0.8	○
100		ECJ1VG1H101□	0.8	○
120		ECJ1VG1H121□	0.8	○
150		ECJ1VG1H151□	0.8	○
180		ECJ1VG1H181□	0.8	○
220		ECJ1VG1H221□	0.8	○
270		ECJ1VG1H271□	0.8	○
330		ECJ1VG1H331□	0.8	○
390		ECJ1VG1H391□	0.8	○
470		ECJ1VG1H471□	0.8	○
560		ECJ1VG1H561□	0.8	○
680		ECJ1VG1H681□	0.8	○
820		ECJ1VG1H821□	0.8	○
1000		ECJ1VG1H102□	0.8	○

□: Capacitance tolerance code.
Standard packaging quantity of Packaging Style Code “V” (T = 0.8 mm): 4,000 pcs./reel
Recommend soldering method: Reflow soldering.

■ Standard Products for EIA “0603”, Taped Version

● Class 2

◆ Temperature Characteristic Code : B (Temperature Characteristics : B, X7R, X5R)

Rated voltage		DC 50 V					DC 25 V					DC 16 V					DC 10 V					DC 6.3 V				
Capacitance (pF)	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.			Part No.	Dim. T (mm)	Temp. Char.		
				B	X7R	X5R			B	X7R	X5R			B	X7R	X5R			B	X7R	X5R			B	X7R	X5R
1000	±10 %(K) or ±20 %(M)	ECJ1VB1H102□	0.8	○	○	—																				
1200		ECJ1VB1H122K	0.8	○	○	—																				
1500		ECJ1VB1H152□	0.8	○	○	—																				
1800		ECJ1VB1H182K	0.8	○	○	—																				
2200		ECJ1VB1H222□	0.8	○	○	—																				
2700		ECJ1VB1H272K	0.8	○	○	—																				
3300		ECJ1VB1H332□	0.8	○	○	—																				
3900		ECJ1VB1H392K	0.8	○	○	—																				
4700		ECJ1VB1H472□	0.8	○	○	—																				
5600		ECJ1VB1H562K	0.8	○	○	—																				
6800		ECJ1VB1H682□	0.8	○	○	—																				
8200		ECJ1VB1H822K	0.8	○	○	—																				
10000		ECJ1VB1H103□	0.8	○	○	—	ECJ1VB1E103□	0.8	○	○	—	ECJ1VB1C103□	0.8	○	○	—										
12000		ECJ1VB1H123K	0.8	○	○	—	ECJ1VB1E123K	0.8	○	○	—	ECJ1VB1C123K	0.8	○	○	—										
15000		ECJ1VB1H153□	0.8	○	○	—	ECJ1VB1E153□	0.8	○	○	—	ECJ1VB1C153□	0.8	○	○	—										
18000		ECJ1VB1H183K	0.8	○	○	—	ECJ1VB1E183K	0.8	○	○	—	ECJ1VB1C183K	0.8	○	○	—										
22000		ECJ1VB1H223□	0.8	○	○	—	ECJ1VB1E223□	0.8	○	○	—	ECJ1VB1C223□	0.8	○	○	—										
27000		ECJ1VB1H273K	0.8	○	○	—	ECJ1VB1E273K	0.8	○	○	—	ECJ1VB1C273K	0.8	○	○	—										
33000		ECJ1VB1H333□	0.8	○	○	—	ECJ1VB1E333□	0.8	○	○	—	ECJ1VB1C333□	0.8	○	○	—										
39000		ECJ1VB1H393K	0.8	○	○	—	ECJ1VB1E393K	0.8	○	○	—	ECJ1VB1C393K	0.8	○	○	—										
47000		ECJ1VB1H473□	0.8	○	○	—	ECJ1VB1E473□	0.8	○	○	—	ECJ1VB1C473□	0.8	○	○	—										
56000		ECJ1VB1H563K	0.8	○	○	—	ECJ1VB1E563K	0.8	○	○	—	ECJ1VB1C563K	0.8	○	○	—										
68000		ECJ1VB1H683□	0.8	○	○	—	ECJ1VB1E683□	0.8	○	○	—	ECJ1VB1C683□	0.8	○	○	—										
82000		ECJ1VB1H823K	0.8	○	○	—	ECJ1VB1E823K	0.8	○	○	—	ECJ1VB1C823K	0.8	○	○	—										
100000		ECJ1VB1H104□	0.8	○	○	—	ECJ1VB1E104□	0.8	○	○	—	ECJ1VB1C104□	0.8	○	○	—										
150000							ECJ1VB1E154□	0.8	—	—	○	ECJ1VB1C154□	0.8	—	—	○	ECJ1VB1A154□	0.8	○	—	○					
220000							ECJ1VB1E224□	0.8	—	—	○	ECJ1VB1C224□	0.8	—	—	○	ECJ1VB1A224□	0.8	○	—	○					
330000							ECJ1VB1E334□	0.8	—	—	○	ECJ1VB1C334□	0.8	—	—	○	ECJ1VB1A334□	0.8	—	—	○					
470000							ECJ1VB1E474□	0.8	—	—	○	ECJ1VB1C474□	0.8	—	—	○	ECJ1VB1A474□	0.8	—	—	○	ECJ1VB0J474□	0.8	○	—	○
680000							ECJ1VB1E684□	0.8	—	—	○	ECJ1VB1C684□	0.8	—	—	○	ECJ1VB1A684□	0.8	—	—	○	ECJ1VB0J684□	0.8	○	—	○

□: Capacitance tolerance code : “□” for “K” or “M”
Standard packaging quantity of Packaging Style Code “V” (T = 0.8 mm): 4,000 pcs./reel
Recommend soldering method: Reflow soldering.
For capacitance 1 µF or more, see page 6 and 7 for High Capacitance.

◆ Temperature Characteristics Code : F (Temperature Characteristics : F, Y5V)

Rated voltage		DC 50 V				DC 25 V				DC 16 V			
Capacitance (pF)	Capacitance Tolerance	Part No.	Dim. T (mm)	Temp. Char.		Part No.	Dim. T (mm)	Temp. Char.		Part No.	Dim. T (mm)	Temp. Char.	
				F	Y5V			F	Y5V			F	Y5V
10000	+80, –20 % (Z)	ECJ1VF1H103Z	0.8	○	○								
22000		ECJ1VF1H223Z	0.8	○	○								
47000		ECJ1VF1H473Z	0.8	○	○								
100000		ECJ1VF1H104Z	0.8	○	○	ECJ1VF1E104Z	0.8	○	○	ECJ1VF1C104Z	0.8	○	○
220000										ECJ1VF1C224Z	0.8	○	○
470000										ECJ1VF1C474Z	0.8	○	○

Standard packaging quantity of Packaging Style Code “V” (T = 0.8 mm): 4,000 pcs./reel
Recommend soldering method: Reflow soldering.
For capacitance 1 µF or more, see page 6 and 7 for High Capacitance.

■ Standard Products for EIA “0805”, Taped Version

● Class 1

◆ Temperature Characteristic Code : C (Temp. Char. : CΔ)

Rated voltage		DC 50 V			
Capacitance (pF)	Capacitance Tolerance	Part No.	Dim. T (mm)	Temp. Char. CH	Temp. Char. CG
27	±5 %(J) or ±10 %(K)	ECJ2VC1H270□	0.6	○	○
33		ECJ2VC1H330□	0.6	○	○
39		ECJ2VC1H390□	0.6	○	○
47		ECJ2VC1H470□	0.6	○	○
56		ECJ2VC1H560□	0.6	○	○
68		ECJ2VC1H680□	0.6	○	○
82		ECJ2VC1H820□	0.6	○	○
100		ECJ2VC1H101□	0.6	○	○
120		ECJ2VC1H121□	0.6	○	○
150		ECJ2VC1H151□	0.6	○	○
180		ECJ2VC1H181□	0.6	○	○
220		ECJ2VC1H221□	0.6	○	○
270		ECJ2VC1H271□	0.6	○	○
330		ECJ2VC1H331□	0.6	○	○
390		ECJ2VC1H391□	0.6	○	○
470		ECJ2VC1H471□	0.6	○	○
560		ECJ2VC1H561□	0.6	○	○
680		ECJ2VC1H681□	0.6	○	○
820		ECJ2VC1H821□	0.6	○	○
1000		ECJ2VC1H102□	0.6	○	○
1200		ECJ2VC1H122□	0.6	○	—
1500		ECJ2VC1H152□	0.6	○	—
1800		ECJ2VC1H182□	0.6	○	—
2200		ECJ2VC1H222□	0.6	○	—
2700		ECJ2VC1H272□	0.85	○	—

◆ Temperature Characteristic Code : G (Temp. Char. : SL)

Rated voltage		DC 50 V		
Capacitance (pF)	Capacitance Tolerance	Part No.	Dim. T (mm)	Temp. Char. SL
27	±5 %(J) or ±10 %(K)	ECJ2VG1H270□	0.6	○
33		ECJ2VG1H330□	0.6	○
39		ECJ2VG1H390□	0.6	○
47		ECJ2VG1H470□	0.6	○
56		ECJ2VG1H560□	0.6	○
68		ECJ2VG1H680□	0.6	○
82		ECJ2VG1H820□	0.6	○
100		ECJ2VG1H101□	0.6	○
120		ECJ2VG1H121□	0.6	○
150		ECJ2VG1H151□	0.6	○
180		ECJ2VG1H181□	0.6	○
220		ECJ2VG1H221□	0.6	○
270		ECJ2VG1H271□	0.6	○
330		ECJ2VG1H331□	0.6	○
390		ECJ2VG1H391□	0.6	○
470		ECJ2VG1H471□	0.6	○
560		ECJ2VG1H561□	0.6	○
680		ECJ2VG1H681□	0.6	○
820		ECJ2VG1H821□	0.6	○
1000		ECJ2VG1H102□	0.6	○
1200		ECJ2VG1H122□	0.6	○
1500		ECJ2VG1H152□	0.6	○
1800		ECJ2VG1H182□	0.6	○
2200		ECJ2VG1H222□	0.6	○
2700		ECJ2VG1H272□	0.6	○

□: Capacitance tolerance code.
Dimensional tolerance of L, W, T: ± 0.1 mm
Standard packaging quantity of Packaging Style Code “V” (T = 0.6 mm): 5,000 pcs./reel, “V” (T = 0.85 mm): 4,000 pcs./reel
Recommend soldering method: Reflow soldering.

■ Standard Products for EIA "0805", Taped Version

● Class 2

◆ Temperature Characteristic Code : B (Temperature Characteristics : B, X7R, X5R)

Rated voltage		DC 50 V					DC 25 V					DC 16 V					DC 10 V				
Capacitance (pF)	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.		
				B	X7R	X5R			B	X7R	X5R			B	X7R	X5R			B	X7R	X5R
1000	±10 % (K) or ±20 % (M)	ECJ2VB1H102□	0.6	○	○	—															
1200		ECJ2VB1H122K	0.6	○	○	—															
1500		ECJ2VB1H152□	0.6	○	○	—															
1800		ECJ2VB1H182K	0.6	○	○	—															
2200		ECJ2VB1H222□	0.6	○	○	—															
2700		ECJ2VB1H272K	0.6	○	○	—															
3300		ECJ2VB1H332□	0.6	○	○	—															
3900		ECJ2VB1H392K	0.6	○	○	—															
4700		ECJ2VB1H472□	0.6	○	○	—															
5600		ECJ2VB1H562K	0.6	○	○	—															
6800		ECJ2VB1H682□	0.6	○	○	—															
8200		ECJ2VB1H822K	0.6	○	○	—															
10000		ECJ2VB1H103□	0.6	○	○	—															
12000		ECJ2VB1H123K	0.6	○	○	—															
15000		ECJ2VB1H153□	0.6	○	○	—															
18000		ECJ2VB1H183K	0.6	○	○	—															
22000		ECJ2VB1H223□	0.6	○	○	—															
27000		ECJ2VB1H273K	0.85	○	○	—															
33000		ECJ2VB1H333□	0.85	○	○	—															
39000		ECJ2VB1H393K	0.85	○	○	—															
47000		ECJ2FB1H473□	1.25	○	○	—	ECJ2VB1E473□	0.85	○	○	—										
56000		ECJ2FB1H563K	1.25	○	○	—	ECJ2VB1E563K	0.85	○	○	—										
68000		ECJ2FB1H683□	1.25	○	○	—	ECJ2VB1E683□	0.85	○	○	—										
82000		ECJ2FB1H823K	1.25	○	○	—	ECJ2VB1E823K	0.85	○	○	—										
100000		ECJ2FB1H104□	1.25	○	○	—	ECJ2VB1E104□	0.85	○	○	—	ECJ2VB1C104□	0.85	○	○	—					
150000		ECJ2FB1H154□	1.25	○	○	—	ECJ2FB1E154□	1.25	○	○	—	ECJ2VB1C154□	0.85	○	○	—					
220000		ECJ2FB1H224□	1.25	○	○	—	ECJ2FB1E224□	1.25	○	○	—	ECJ2VB1C224□	0.85	○	○	—					
330000							ECJ2FB1E334□	1.25	○	○	—	ECJ2FB1C334□	1.25	○	○	—					
470000							ECJ2FB1E474□	1.25	○	○	—	ECJ2FB1C474□	1.25	○	○	—					
680000							ECJ2FB1E684□	1.25*	—	—	○	ECJ2FB1C684□	1.25*	—	—	○	ECJ2FB1A684□	1.25	—	—	○

□: Capacitance tolerance code : "□" for "K" or "M"
Dimensional tolerance of L, W, T: ± 0.1 mm for no mark, ± 0.15 mm for "✻" mark
Standard packaging quantity of Packaging Style Code "V" (T = 0.6 mm): 5,000 pcs./reel, "V" (T = 0.85 mm): 4,000 pcs./reel, "F" (T = 1.25 mm): 3,000 pcs./reel
Soldering method of dimension T>1 mm: Avoid flow soldering.
For capacitance 1 µF or more, see page 6 and 7 for High Capacitance.

◆ Temperature Characteristic Code : F (Temperature Characteristics : F, Y5V)

Rated voltage		DC 50 V				DC 25 V				DC 16 V			
Capacitance (pF)	Capacitance Tolerance	Part No.	Dim. T (mm)	Temp. Char.		Part No.	Dim. T (mm)	Temp. Char.		Part No.	Dim. T (mm)	Temp. Char.	
				F	Y5V			F	Y5V			F	Y5V
10000	+80, –20 %(Z)	ECJ2VF1H103Z	0.6	○	○								
22000		ECJ2VF1H223Z	0.6	○	○								
47000		ECJ2VF1H473Z	0.6	○	○								
100000		ECJ2VF1H104Z	0.85	○	○	ECJ2VF1E104Z	0.6	○	○	ECJ2VF1C104Z	0.6	○	○
220000		ECJ2VF1H224Z	0.85	○	○	ECJ2VF1E224Z	0.85	○	○	ECJ2VF1C224Z	0.6	○	○
470000						ECJ2FF1E474Z	1.25	○	○	ECJ2VF1C474Z	0.85	○	○

Dimensional tolerance of L, W, T: ± 0.1 mm
Standard packaging quantity of Packaging Style Code "V" (T = 0.6 mm): 5,000 pcs./reel, "V" (T = 0.85 mm): 4,000 pcs./reel, "F" (T = 1.25 mm): 3,000 pcs./reel
Soldering method of dimension T>1 mm: Avoid flow soldering.
For capacitance 1 µF or more, see page 6 and 7 for High Capacitance.

Multilayer Ceramic Capacitors (High Capacitance)

Series: **ECJ**

■ Features

- Small size and high capacitance
- Low ESR/ESL and excellent high-frequency characteristics
- Ideal alternative to TANTALUM CHIP CAPACITORS and ALUMINUM ELECTROLYTIC CAPACITORS
- RoHS compliant

■ Recommended Applications

- Class 2 (Hi-K Type)
  ·Power supply circuitry decoupling applications DC-DC converter power supply circuitry of the high-speed LSI smoothing circuit

■ Handling Precautions

See Page 48 to 53

■ Packaging Specifications

See Page 45, 46, 56

■ Discontinued / Revised Part Numbers, Alternative Part Numbers

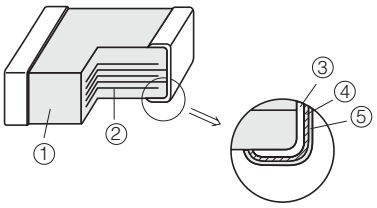
See Page 54, 55

■ Explanation of Part Numbers

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

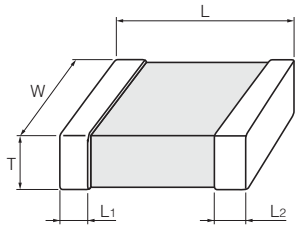
- 1 2 3: Product Code (ECJ:Multilayer Ceramic Chip Capacitors)
- 4: Size Code
- 5: Packaging Style Code
- 6: Temperature Characteristic Code
- 7 8: Rated Voltage Code
- 9 10 11: Nominal Capacitance
- 12: Capacitance Tolerance Code

■ 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)



Size Code	Size (EIA)	L	W	T	L_1, L_2
0	0402	1.00±0.05	0.50±0.05	0.50±0.05	0.2±0.1
		$1.00^{+0.15}_{-0.05}$	$0.50^{+0.15}_{-0.05}$	$0.50^{+0.15}_{-0.05}$	
1	0603	1.6±0.1	0.8±0.1	0.8±0.1	0.3±0.2
		1.60±0.15	0.80±0.15	0.80±0.15	
2	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	
G		2.00±0.15	1.25±0.15	0.85±0.10	
3	1206	3.20±0.15	1.60±0.15	0.85±0.10	0.6±0.3
				1.15±0.10	
D		3.2±0.2	1.6±0.2	0.85±0.10	
M				1.15±0.10	

00 Sep. 2008

■ Packaging Styles and Standard Packaging Quantities

Quantity : pcs./reel

Packaging Style Code	Packaging Styles \ Size / Thickness		0402	0603	0805		1206		
			T=0.5	T=0.8	T=0.85	T=1.25	T=0.85	T=1.15	T=1.6
E	φ180 reel	Paper taping (Pitch : 2 mm)	10,000	—	—	—	—	—	—
V		Paper taping (Pitch : 4 mm)	—	4,000	4,000	—	4,000	—	—
F		Embossed taping (Pitch : 4 mm)	—	—	—	3,000	—	3,000	—
Y			—	—	—	—	—	—	2,000

φ330 reel and Bulk case Type : Please contact us.

■ Temperature Characteristics

● Class 2

Temperature Characteristic Code	Temperature Characteristics	Capacitance Change	Measurement Temperature Range	Reference Temperature
B, X	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 6 to 7.

■ 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

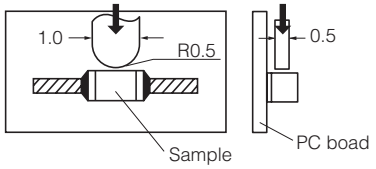
■ Nominal Capacitance

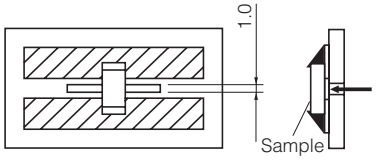
Ex.	105	225	106	226
Nominal Capacitance	1,000,000 pF (1 μF)	2,200,000 pF (2.2 μF)	10,000,000 pF (10 μF)	22,000,000 pF (22 μF)

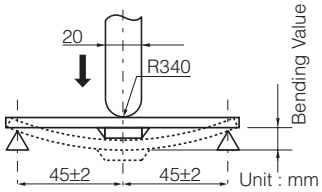
■ Capacitance Tolerance

Class	Temperature Characteristics	Capacitance Tolerance Code	Capacitance Tolerance
2	B, X7R, X5R	K	±10 %
		M	±20 %
	F, Y5V	Z	+80, –20 %

■ Specifications and Testing Methods

<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 dielectric breakdown and/or damage</td><td>Test voltage : Rated voltage ×250 %
Duration:1 to 5 s.
Charge / Discharge current: 50 mA max.</td></tr>
<tr><td>Insulation Resistance (I.R.)</td><td>500/C (MΩ) min.
Note : 100/C(MΩ)min. for DC 10 V max.
C : Nominal Cap. in µF</td><td>Measuring voltage : Rated voltage
Duration : 60±5 s
Charge / Discharge current: 50 mA max.</td></tr>
<tr><td>Capacitance</td><td>Within the specified tolerance</td><td rowspan="2">Measuring temperature: 20±2 °C
Preconditioning: The capacitors shall be kept in temperature of 150 +0/–10 °C for 1 hour and subject to standard condition* 48±4 hours before initial measurement.
<table><tr><td>Nominal capacitance</td><td>C≦10 µF</td><td>C>10 µF</td></tr><tr><td>Measuring frequency</td><td>1 kHz±10 %</td><td>120 Hz±20 %</td></tr><tr><td>Measuring voltage</td><td>1.0±0.2 Vrms</td><td>0.5±0.2 Vrms</td></tr></table></td></tr>
<tr><td>Dissipation Factor (tan δ)</td><td>0.2 max.
Please see the technical specifications for details.</td></tr>
<tr><td>Temperature Characteristics</td><td>Temperature Characteristics
B : ±10 %
X7R : ±15 %
X5R : ±15 %
F : +30, –80 %
Y5V : +22, –82 %</td><td>Maximum capacitance change at stages 1 to 5
<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>See the technical specifications for details such as measuring voltage.</td></tr>
<tr><td>Adhesion</td><td>Terminal electrodes shall be free from peeling or signs of peeling.</td><td>Applied force : 5 N
Duration : 10 s
Size : 0402
 

Size : 0603 to 1206
 

Unit : mm</td></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
 

Unit : mm</td></tr>
<tr><td>Vibration Proof</td><td>Appearance : No mechanical damage.
Capacitance : Within the specified tolerance
tanδ : Initial standard value</td><td>Total amplitude : 1.5 mm
Vibration frequency : 10 to 55 to 10 Hz for 1 min
3 perpendicular directions for 2 hours each, a total of 6 hours</td></tr>
</table>

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

Item	Specification	Test Method
Resistance to Soldering Heat	Appearance : No mechanical damage Capacitance change : Temp. Char. B, X7R, X5R : within ±7.5 % F, Y5V : within ±20 % tanδ : Initial standard value IR : Initial standard value Withstand voltage : No dielectric breakdown or damage	Soldering bath method Preconditioning : Heat treatment(*1) Solder temperature : 270±5 °C Dipping period : 3.0±0.5 s Preheat condition : Order / Temp. (°C) / Size 0805 max. / Size 1206 1 / 80 to 100 / 120 to 180s / 300 to 360s 2 / 150 to 200 / 120 to 180s / 300 to 360s Recovery (Standard condition) : 48±4 h
Solderability	More than 95 % of the soldered area of both terminal electrodes shall be covered with fresh solder.	Soldering bath method Solder temperature : 230±5 °C Dipping period : 4±1 s Solder : H63A (JIS–Z–3282)
Temperature Cycle	Appearance : No mechanical damage Capacitance change : Temp. Char. B, X7R, X5R : within ±7.5 % F, Y5V : within ±20 % tanδ : Initial standard value IR : Initial standard value Withstand voltage : No dielectric breakdown and/or damage	Preconditioning : Heat treatment(*1) Step 1: Minimum operating temp. 30±3 min Step 2: Room temp. 3 min max. Step 3: Maximum operating temp. 30±3 min Step 4: Room temp. 3 min max. Number of cycles : 5 cycles Recovery(Standard condition) : 48±4 h
Damp Heat (steady state)	Appearance : No mechanical damage Capacitance change : Temp. Char. B, X7R, X5R : within ±20 % F, Y5V : within ±30 % tanδ : Temp. Char. B, X7R, X5R : 0.25 max. F, Y5V : 0.3 max. IR : 50/C (MΩ) min. Note : 10/C (MΩ) min. for rated vol. DC 10 V max. C:Nominal cap. in µF Please see the technical specifications for details.	Preconditioning : Heat treatment(*1) Temperature : 40±2 °C Relative humidity : 90 to 95 % Test period : 500+24/0 h Recovery(Standard condition) : 48±4 h
Damp Heat Load	Appearance : No mechanical damage Capacitance change : Temp. Char. B, X7R, X5R : within ±20 % F, Y5V : within ±30 % tanδ : Temp. Char. B, X7R, X5R : 0.25 max. F, Y5V : 0.3 max. IR : 25/C (MΩ) min. Note : 5/C (MΩ) min. for rated vol. DC 10 V max. C:Nominal cap. in µF Please see the technical specifications for details.	Preconditioning : Voltage treatment(*2) Temperature : 40±2 °C Relative humidity : 90 to 95 % Applied voltage : Rated voltage Charge/discharge current : 50 mA max. Test period : 500+24/0 h Recovery(Standard condition) : 48±4 h
High Temperature Load	Appearance : no mechanical damage Capacitance change : Temp. Char. B, X7R, X5R : within ±20 % F, Y5V : within ±30 % tanδ : Temp. Char. B, X7R, X5R : 0.25 max. F, Y5V : 0.3 max. IR : 50/C (MΩ) min. Note : 10/C (MΩ) min. for rated vol. DC 10 V max. C:Nominal cap. in µF Please see the technical specifications for details.	Preconditioning : Voltage treatment(*2) Temperature : Maximum operation temp. ±3 °C Applied voltage : (1)Rated voltage×200 % (2)Rated voltage×150 % (3)Rated voltage×100 % Please see the technical specifications for details. Charge/discharge current : 50 mA max. Test period : 1000+48/0 h Recovery (Standard condition) : 48±4 h

(*1) Heat treatment : 1 h of heat treatment at 150+0/–10 °C followed by 48±4 h recovery under standard conditions.
(*2) Voltage treatment : 1 h of voltage treatment under the specified temperature and voltage for testing followed by 48±4 h of recovery under standard conditions.

■ Standard Products for EIA Size "0402", Taped Version

● Class 2

◆ Temperature Characteristic Code : B (Temperature Characteristics : X5R)

Rated Voltage		DC 16 V			DC 10 V			DC 6.3 V		
Capacitance (μF)	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
1	±10 %(K) or ±20 %(M)	ECJ0EB1C105M	0.5*	○	ECJ0EB1A105□	0.5	○	ECJ0EB0J105□	0.5	○
2.2								ECJ0EB0J225M	0.5	○
4.7								ECJ0EB0J475M	0.5*	○

□ : Capacitance tolerance code : "□" for "K" or "M"
Dimensional tolerance of L, W, T : ±0.05 mm for no mark, $^{+0.15}_{-0.05}$ mm for "✻" mark.
Standard packaging quantity of Packaging Style Code "E" (T = 0.5 mm) : 10,000 pcs./reel.
Recommend soldering method : Reflow soldering.

◆ Temperature Characteristic Code : F (Temperature Characteristics : F, Y5V)

Rated Voltage		DC 6.3 V			
Capacitance (μF)	Capacitance Tolerance	Part No.	Dim. T (mm)	Temp. Char. F	Y5V
1	+80, –20 % (Z)	ECJ0EF0J105Z	0.5	○	○

Standard packaging quantity of Packaging Style Code "E" (T = 0.5 mm): 10,000 pcs./reel.
Recommend soldering method : Reflow soldering.

■ Standard Products for EIA Size "0603", Taped Version

● Class 2

◆ Temperature Characteristic Code : B (Temperature Characteristics : X5R)

Rated Voltage		DC 25 V			DC 16 V			DC 10 V			DC 6.3 V		
Capacitance (μF)	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) or ±20 %(M)	ECJ1VB1E105□	0.8	○	ECJ1VB1C105□	0.8	○	ECJ1VB1A105□	0.8	○	ECJ1VB0J105□	0.8	○
2.2					ECJ1VB1C225□	0.8	○	ECJ1VB1A225□*	0.8	○	ECJ1VB0J225□	0.8	○
4.7					ECJ1VB1C475□	0.8	○	ECJ1VB1A475□*	0.8	○	ECJ1VB0J475□*	0.8	○
10								ECJ1VB1A106M*	0.8**	○	ECJ1VB0J106M*	0.8**	○

□ : Capacitance tolerance code : "□" for "K" or "M"
Standard packaging quantity of Packaging Style Code "V" (T = 0.8 mm): 4,000 pcs./reel.
Recommend soldering method: Reflow soldering.
"✻" : Soldering method ; Flow soldering shall not be applied.
"✻✻" : "L", "W", "T" Dimension Tolerance ±0.15 mm

◆ Temperature Characteristic Code : F (Temperature Characteristics : F, Y5V)

Rated Voltage		DC 25 V			DC 16 V			DC 10 V				DC 6.3 V			
Capacitance (μF)	Capacitance Tolerance	Part No.	Dim. T (mm)	Temp. Char. F	Part No.	Dim. T (mm)	Temp. Char. F	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	○	○

Standard packaging quantity of Packaging Style Code "V" (T = 0.8 mm): 4,000 pcs./reel.
Recommend soldering method: Reflow soldering.

■ Standard Products for EIA Size "0805", Taped Version

● Class 2

◆ Temperature Characteristic Code : B (Temperature Characteristics : B, X5R)

Rated Voltage		DC 25 V			DC 16 V			DC 10 V				DC 6.3 V		
Capacitance (μF)	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) or ±20 %(M)	ECJ2FB1E105□	1.25*	○	ECJ2FB1C105□	1.25*	○	ECJ2FB1A105□	1.25	○	○			
2.2		ECJ2FB1E225□	1.25*	○	ECJ2FB1C225□	1.25*	○	ECJ2FB1A225□	1.25*	—	○	ECJ2FB0J225□	1.25	○
4.7		ECJ2FB1E475□	1.25*	○	ECJ2FB1C475□	1.25*	○	ECJ2FB1A475□	1.25*	—	○	ECJ2FB0J475□	1.25*	○
10					ECJ2FB1C106□	1.25**	○	ECJ2FB1A106□	1.25**	—	○	ECJ2FB0J106□	1.25**	○
22								ECJ2FB1A226M	1.25**	—	○	ECJ2FB0J226M	1.25**	○

□ : Capacitance tolerance code : "□" for "K" or "M"
Dimensional tolerance of L, W, T : ±0.1 mm for no mark, ±0.15 mm for "✻" mark, ±0.2 mm for "✻✻"mark.
Standard packaging quantity of Packaging Style Code "F" (T = 1.25 mm): 3,000 pcs./reel.
Avoid flow soldering.

◆ Temperature Characteristic Code : F (Temperature Characteristics : F, Y5V)

Rated Voltage		DC 50 V			DC 25 V			DC 16 V				DC 10 V			
Capacitance (μF)	Capacitance Tolerance	Part No.	Dim. T (mm)	Temp. Char. F	Part No.	Dim. T (mm)	Temp. Char. F	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*	○	○

Dimensional tolerance of L, W, T : L, W: ±0.15 mm / T : ±0.1 mm for no mark, ±0.15 mm for "✻"mark.
Standard packaging quantity of Packaging Style Code "V" (T = 0.85 mm): 4,000 pcs./reel, "F" (T = 1.25 mm): 3,000 pcs./reel.
Soldering method of dimension T > 1 mm: Avoid flow soldering.

■ Standard Products for EIA Size “1206”, Taped Version

● Class 2

◆ Temperature Characteristic Code : B (Temperature Characteristics : B, X7R, X5R)

Rated Voltage		DC 25 V					DC 16 V					DC 10 V					DC 6.3 V			
Capacitance (μF)	Capacitance Tolerance	Part No.	Dim. T (mm)	Temp. Char. B	X7R	X5R	Part No.	Dim. T (mm)	Temp. Char. B	X7R	X5R	Part No.	Dim. T (mm)	Temp. Char. B	X7R	X5R	Part No.	Dim. T (mm)	Temp. Char. X5R	
1	±10 %(K) or ±20 %(M)	ECJ3YB1E105□	1.6	○	○	—	ECJ3FB1C105□	1.15*	○	○	—									
2.2		ECJ3YB1E225□	1.6	—	—	○	ECJ3YB1C225□	1.6	○	○	—	ECJ3YB1A225□	1.6	○	○	—				
4.7		ECJ3YB1E475□	1.6	—	—	○	ECJ3YB1C475□	1.6	—	—	○	ECJ3YB1A475□	1.6	—	—	○	ECJ3YB0J475□	1.6	○	
10		ECJ3YB1E106□	1.6	—	—	○	ECJ3YB1C106□	1.6	—	—	○	ECJ3YB1A106□	1.6	—	—	○	ECJDV50J106M	0.85**	○	
22							ECJ3YB1C226M	1.6	—	—	○	ECJ3YB1A226M	1.6	—	—	○	ECJDV50J226M	0.85**	○	

□ : Capacitance tolerance code : “□” for “K” or “M”
Dimensional tolerance of L, W, T: ±0.2 mm for no mark, L, W: ±0.15 mm / T: ±0.1 mm for “*” mark, L, W: ±0.2 mm / T: ±0.1 mm for “**” mark.
Standard packaging quantity of Packaging Style Code “V” (T = 0.85 mm) : 4,000 pcs./reel, “F” (T = 1.15 mm): 3,000 pcs./reel, “Y” (T = 1.6 mm): 2,000 pcs./reel
Avoid flow soldering.

◆ High Temperature Series : Temperature Characteristic Code : B, X (Temperature Characteristics : B, Y7R)

Rated Voltage		DC 50 V				DC 25 V				DC 16 V				DC 10 V			
Capacitance (μF)	Capacitance Tolerance	Part No.	Dim. T (mm)	Temp. Char. B	Y7R	Part No.	Dim. T (mm)	Temp. Char. B	Y7R	Part No.	Dim. T (mm)	Temp. Char. B	Y7R	Part No.	Dim. T (mm)	Temp. Char. B	Y7R
1	±10 %(K) or ±20 %(M)	ECJ3YX1H105□	1.6	○	○	ECJ3YB1E105□	1.6	○	○	ECJ3FB1C105□	1.15*	○	○				
2.2										ECJ3YB1C225□	1.6	○	○	ECJ3YB1A225□	1.6	○	○
4.7										ECJ3YX1C475□	1.6	○	○				
10										ECJ3YX1C106□	1.6	○	○				

□ : Capacitance tolerance code : “□” for “K” or “M”
Dimensional tolerance of L, W, T:±0.2 mm for no mark, L, W: ±0.15 mm / T: ±0.1 mm for “*” mark.
Standard packaging quantity of Packaging Style Code “F” (T = 1.15 mm): 3,000 pcs./reel, “Y” (T = 1.6 mm): 2,000 pcs./reel
Avoid flow soldering.

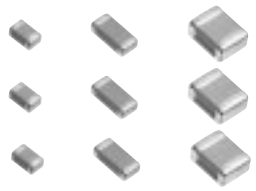
◆ Temperature Characteristic Code : F (Temperature Characteristics : F, Y5V)

Rated Voltage		DC 50 V			DC 25 V			DC 16 V			DC 10 V			
Capacitance (μF)	Capacitance Tolerance	Part No.	Dim. T (mm)	Temp. Char. F	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)	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	1.6	○	—	ECJMFF1C106Z	1.15**	○	○	ECJMFF1A106Z	1.15**	○	○
22													ECJMFF1A226Z	1.15**	○	○

Dimensional tolerance of L, W, T:±0.2 mm for no mark, L, W: ±0.15 mm / T: ±0.1 mm for “*” mark, L, W: ±0.2 mm / T: ±0.1 mm for “**”.
Standard packaging quantity of Packaging Style Code “V” (T = 0.85 mm): 4,000 pcs./reel, “F” (T = 1.15 mm): 3,000 pcs./reel, “Y” (T = 1.6 mm): 2,000 pcs./reel
Avoid flow soldering.

Multilayer Ceramic Capacitors (Low Profile Type)

Series: **ECJ**



■ Features

- Low profile/height with high capacitance values
- For small and thin electronic equipment
- RoHS compliant

■ Recommended Applications

- For slim type HDD, DVD drive, LCD circuit

■ Handling Precautions

See Page 48 to 53

■ Packaging Specifications

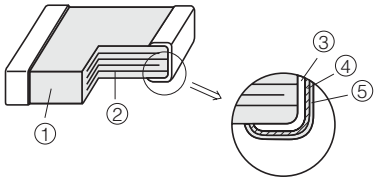
See Page 45, 46, 56

■ Explanation of Part Numbers

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

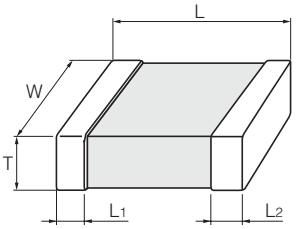
- 1 2 3: Product Code (ECJ:Multilayer Ceramic Chip Capacitors)
- 4: Size Code
- 5: Packaging Style Code
- 6: Temperature Characteristic Code
- 7 8: Rated Voltage Code
- 9 10 11: Nominal Capacitance
- 12: Capacitance Tolerance Code

■ 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)



Size Code	Size (EIA)	L	W	T	L_1, L_2
B	0603	1.6±0.1	0.8±0.1	0.45±0.05	0.3±0.2
G	0805	2.00±0.15	1.25±0.15	0.85±0.10	0.50±0.25
		2.0±0.2	1.25±0.20		
H	1206	3.2±0.2	1.6±0.2	0.85±0.10	0.6±0.3

00 Sep. 2008

■ Packaging Styles and Standard Packaging Quantities

Quantity : pcs. reel

Packaging Style Code	Packaging Styles \ Size / Thickness (mm)		0603	0805	1206
			T=0.45	T=0.85	T=0.85
V	φ180 reel	Paper taping (Pitch : 4 mm)	4,000	4,000	4,000

■ Temperature Characteristics

● Class 2

Temperature Characteristic Code	Temperature Characteristics	Capacitance Change	Measurement Temperature Range	Reference Temperature
B	X5R	±15 %	−55 to 85 °C	25 °C

■ Rated Voltage

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

■ Nominal Capacitance

EX.	105	225	475	106
Nominal Capacitance	1,000,000 pF (1 μF)	2,200,000 pF (2.2 μF)	4,700,000 pF (4.7 μF)	10,000,000 pF (10 μF)

■ Capacitance Tolerance

Class	Temperature Characteristics	Capacitance Tolerance Code	Capacitance Tolerance
2	X5R	K	±10 %
		M	±20 %

■ Specifications and Testing Methods

Item	Specifications	Test Method
Operating Temperature Range	−55 to 85 °C	——
Dielectric Withstanding Voltage	No dielectric breakdown and /or damage	Test voltage:Rated voltage ×250 % Duration : 1 to 5 s. Charge/discharge current: 50 mA max.
Insulation Resistance (I.R.)	500/C (MΩ) min. Note : DC10V, min. ; 100/C (MΩ) min. (C: Nominal capacitance in μF)	Measuring voltage : Rated voltage Duration : 60 ± 5 s Charge/discharge current: 50 mA max.
Capacitance	Within the specified tolerance	Measuring temperature: 20±2 °C Preconditioning: The capacitors shall be kept in temperature of 150 +0 / −10 °C for 1 hour and subjected to standard condition* 48±4 hours, before initial measurement.
Dissipation Factor (tan δ)	0.2 max. Please see the technical reports for details.	

Normal capacitance	C≦10 μF	C>10 μF
Measuring frequency	1 kHz ± 10 %	120 Hz ± 20 %
Measuring voltage	1.0 ± 0.2 Vrms	0.5 ± 0.2 Vrms

✻ Standard condition : Temperature 15 to 35 °C, Relative humidity 45 to 75 %
For further information, see the technical specifications.

■ Standard Products for EIA “0603”, Taped Version

● Class 2

◆ Temperature Characteristic Code : B (Temperature Characteristics : X5R)

Rated voltage		DC 10 V			DC 6.3 V		
Capacitance (μF)	Capacitance Tolerance	Part No.	Dim. T (mm)	Temp. Char. X5R	Part No.	Dim. T (mm)	Temp. Char. X5R
1	±10 % (K) or ±20 % (M)	ECJBVB1A105□	0.45	○	ECJBVB0J105□	0.45	○
2.2					ECJBVB0J225M	0.45	○

□: Capacitance tolerance code : “□” for “K” or “M”
Standard packaging quantity of Packaging Style Code “V” (T = 0.45 mm): 4,000 pcs./reel
Avoid flow soldering.

■ Standard Products for EIA “0805”, Taped Version

● Class 2

◆ Temperature Characteristic Code : B (Temperature Characteristics : X5R)

Rated voltage		DC 25 V			DC 16 V			DC 10 V			DC 6.3 V		
Capacitance (μF)	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
2.2	±10 % (K) or ±20 % (M)	ECJGVB1E225□	0.85	○	ECJGVB1C225□	0.85	○	ECJGVB1A225□	0.85	○			
4.7								ECJGVB1A475□	0.85	○	ECJGVB0J475□	0.85	○
10								ECJGVB1A106□	0.85*	○	ECJGVB0J106□	0.85*	○

□: Capacitance tolerance code : “□” for “K” or “M”
Dimensional tolerance of L, W, T: L/W: ± 0.15 mm / T: ± 0.1 mm for no mark, L/W: ± 0.2 mm / T: ± 0.1 mm for “✻” mark
Standard packaging quantity of Packaging Style Code “V” (T = 0.85 mm): 4,000 pcs./reel
Avoid flow soldering.

■ Standard Products for EIA “1206”, Taped Version

● Class 2

◆ Temperature Characteristic Code : B (Temperature Characteristics : X5R)

Rated voltage		DC 25 V			DC 16 V			DC 10 V			DC 6.3 V		
Capacitance (μF)	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
4.7	±10 % (K) or ±20 % (M)	ECJHVB1E475M	0.85	○	ECJHVB1C475M	0.85	○						
10					ECJHVB1C106□	0.85	○						
22								ECJHVB1A226M	0.85	○	ECJHVB0J226M	0.85	○

□: Capacitance tolerance code : “□” for “K” or “M”
Standard packaging quantity of Packaging Style Code “V” (T = 0.85 mm): 4,000 pcs./reel
Avoid flow soldering.