

Multilayer Ceramic Chip Capacitors (For General Electronic Equipment)

Series: **ECJ**

■ Features

- Small in size and wide capacitance range
- High humidity characteristic and long life
- Excellent solderability and resistance to soldering heat
- Low self-inductance and excellent frequency characteristics

■ Handling Precautions

See Pages 44 to 48

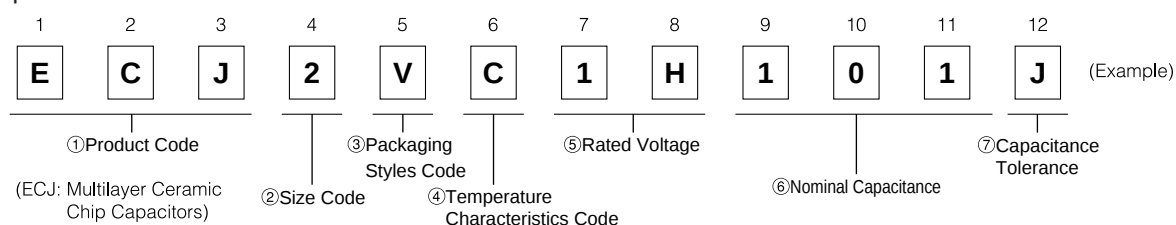
■ Recommended Applications

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

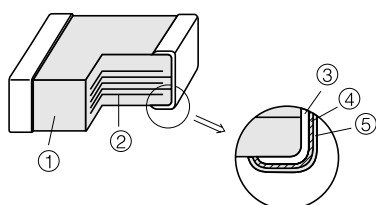
■ Packaging Specifications

See Page 82

■ Explanation of Part Numbers



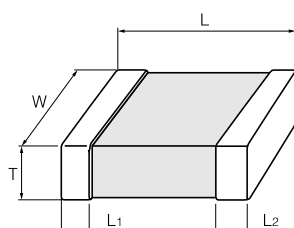
■ Construction



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
Z	Type "06" (0201)	0.60±0.03	0.30±0.03	0.30±0.03	0.15±0.05
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	0.6±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	
3	Type "13" (1206)	2.0±0.2	1.25±0.20	1.25±0.20	0.6±0.3
				0.6±0.1	
				0.85±0.10	
		3.20±0.15	1.60±0.15	1.15±0.10	
		3.2±0.2	1.6±0.2	1.6±0.2	

Rev.02/04

■ Packaging Styles and Standard Packaging Quantity

T: Thickness (mm)

Code	Packaging Styles		Type"06" (0201)	Type"10" (0402)	Type"11" (0603)	Type"12" (0805)			Type"13" (1206)			
			T=0.3	T=0.5	T=0.8	T=0.6	T=0.85	T=1.25	T=0.6	T=0.85	T=1.15	T=1.6
E	φ180 reel	Paper taping (Pitch: 2 mm)	15,000	10,000	—	—	—	—	—	—	—	—
V		Paper taping (Pitch: 4 mm)	—	—	4,000	5,000	4,000	—	5,000	4,000	—	—
F		Embossed taping (Pitch: 4 mm)	—	—	—	—	—	3,000	—	—	3,000	—
Y			—	—	—	—	—	—	—	—	—	2,000
W	φ330 reel*	Paper taping (Pitch: 2 mm)	—	50,000	—	—	—	—	—	—	—	—
Z		Paper taping (Pitch: 4 mm)	—	—	10,000	20,000	10,000	—	20,000	10,000	—	—
C	Bulk case		—	50,000	15,000	10,000	—	—	—	—	—	—

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

■ Temperature Characteristics

● Class 1 Capacitors

Code	Temp. Char. Code	Temp. Char. Tolerance (ppm/°C)			
		≤2 pF	3 pF	≥4 pF	≥10 pF
C	C4	CK(0±250)	CJ(0±120)	CH(0±60)	CG(0±30)*
G	SL	+350 to -1000			

Note: Measurement of capacitance at 20 °C and 85 °C should be made to calculate temperature characteristic * Not applicable to Type "06"

Temp. Char.	Temp. Coeff. (1) (ppm/°C)	Rate of Capacitance change at each Temperature (%)			
		-25 °C		85 °C	
		Max.	Min.	Max.	Min.
CG	0± 30	0.33	-0.14	0.20	-0.20
CH	0± 60	0.49	-0.27	0.39	-0.39
CJ	0±120	0.82	-0.54	0.78	-0.78
CK	0±250	1.54	-1.13	1.63	-1.63
SL	+350 to -1000	—	—	2.28	-6.50

(1) These temperature coefficients are calculated between 20 °C and 85 °C

For applicable "Temperature Characteristics", see the lists of standard products on page 15 to 22.

● 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 15 to 22.

■ 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	105
Nominal Capacitance	0.5 pF	1 pF	10 pF	100000 pF (0.1μF)	1000000 pF (1μF)

■ Capacitance tolerance

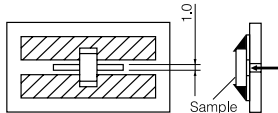
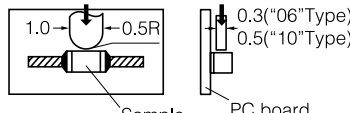
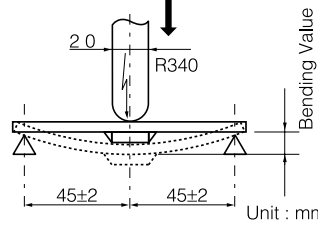
Class	Temp. Char.	Tol. Code	Capacitance tolerance	
1	C4, SL	C	C ≤ 5 pF	±0.25 pF
		D	C ≤ 10 pF	±0.5 pF
		F	C = 10 pF	±1 pF
		J	C > 10 pF	±5 %
		K		±10 %
2	B, X7R, X5R	K	±10 %	
		M	±20 %	
	F, Y5V	Z	+80, -20 %	

Design, Specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.
Whenever a doubt about safety arises from this product, please inform us immediately for technical consultation without fail.

■ Specification and Test Method

Item	Specification		Test Method																																														
	Class 1	Class 2																																															
Operating Temperature Range	Temp. Char. C4 :-55 to 125 °C -25 to 85 °C (Type"13", 5600 to 10000 pF) Temp. Char. SL :-55 to 125 °C	Temp. Char. B, X7R :-55 to 125 °C Temp. Char. B, X5R :-55 to 85 °C Temp. Char. F, Y5V :-30 to 85 °C																																															
Dielectric Withstanding Voltage	No breakdown		Test Voltage: Class 1:Rated Voltage ×300 % Class 2:Rated Voltage ×250 % Electrification time:1 to 5s Charge/discharge current:within 50 mA																																														
Insulation Resistance (I R)	10000 MΩ or 500/C (MΩ) whichever is less. Note:DC10V, DC6.3V:100/C(MΩ)min. (C:Nominal Cap. in μF)		Measuring voltage:Rated voltage Measuring voltage time: 60±5s Charge/discharge current:within 50 mA																																														
Capacitance	within the specified tolerance		Reference Temperature: 20±2 °C Class 1:																																														
Q Factor or Dissipation Factor (tan δ)	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)	<table><tr><th>Rated Voltage</th><th colspan="2">Temperature Characteristics</th></tr><tr><td rowspan="2">50V</td><td>B, X7R, X5R</td><td>F, Y5V</td></tr><tr><td>0.025max.</td><td>0.05max. 0.07max. (Type"13":C=1μF)</td></tr><tr><td rowspan="2">25V</td><td>0.025max. 0.05max. (Type"13":C=4.7μF)</td><td>0.05max. 0.07max. (Type"13":C=1μF, 2.2μF) 0.1max. (Type"12":C≥1μF Type"13":C=4.7μF)</td></tr><tr><td>0.025max. 0.05max. (Type"12":C≥0.68μF Type"13":C≥4.7μF)</td><td>0.07max. 0.09max. (Type"10") 0.1max. (Type"12":C=1μF, 2.2μF Type"13":C=1μF to 4.7μF)</td></tr><tr><td rowspan="2">16V</td><td>0.025max. 0.05max. (Type"12":C≥0.68μF Type"13":C≥4.7μF)</td><td>0.07max. 0.09max. (Type"10") 0.1max. (Type"12":C=1μF, 2.2μF Type"13":C=10μF)</td></tr><tr><td>0.075max. (Type"11":C=1μF)</td><td>0.125max. (Type"11":C=1μF Type"12":C=4.7μF Type"13":C=10μF)</td></tr><tr><td rowspan="2">10V</td><td>0.05max. 0.075max. (Type"11":C=1μF)</td><td>0.125max. 0.2max. (Type"11":C=2.2μF Type"12":C=10μF Type"13":C=22μF)</td></tr><tr><td>0.05max. 0.075max. (Type"11":C=1μF)</td><td>0.2max.</td></tr><tr><td rowspan="3">6.3V</td><td>0.05max. 0.075max. (Type"11":C=1μF)</td><td></td></tr><tr><td>0.1max. (Type"11":C=2.2μF Type"12":C≥4.7μF Type"13":C=22μF)</td><td></td></tr></table>	Rated Voltage	Temperature Characteristics		50V	B, X7R, X5R	F, Y5V	0.025max.	0.05max. 0.07max. (Type"13":C=1μF)	25V	0.025max. 0.05max. (Type"13":C=4.7μF)	0.05max. 0.07max. (Type"13":C=1μF, 2.2μF) 0.1max. (Type"12":C≥1μF Type"13":C=4.7μF)	0.025max. 0.05max. (Type"12":C≥0.68μF Type"13":C≥4.7μF)	0.07max. 0.09max. (Type"10") 0.1max. (Type"12":C=1μF, 2.2μF Type"13":C=1μF to 4.7μF)	16V	0.025max. 0.05max. (Type"12":C≥0.68μF Type"13":C≥4.7μF)	0.07max. 0.09max. (Type"10") 0.1max. (Type"12":C=1μF, 2.2μF Type"13":C=10μF)	0.075max. (Type"11":C=1μF)	0.125max. (Type"11":C=1μF Type"12":C=4.7μF Type"13":C=10μF)	10V	0.05max. 0.075max. (Type"11":C=1μF)	0.125max. 0.2max. (Type"11":C=2.2μF Type"12":C=10μF Type"13":C=22μF)	0.05max. 0.075max. (Type"11":C=1μF)	0.2max.	6.3V	0.05max. 0.075max. (Type"11":C=1μF)		0.1max. (Type"11":C=2.2μF Type"12":C≥4.7μF Type"13":C=22μF)		<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: Pretreatment: The capacitors should be kept in a temperature of 150+0/-10 °C for 1 hour and be stored in standard condition* for 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>	Nominal Capacitance	C ≤ 1000 pF	C > 1000 pF	Measuring Frequency	1 MHz ± 10%	1 kHz ± 10%	Measuring Voltage	0.5 to 5 Vrms	0.5 to 5 Vrms	Nominal 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
Rated Voltage	Temperature Characteristics																																																
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	0.025max.	0.05max. 0.07max. (Type"13":C=1μF)																																															
25V	0.025max. 0.05max. (Type"13":C=4.7μF)	0.05max. 0.07max. (Type"13":C=1μF, 2.2μF) 0.1max. (Type"12":C≥1μF Type"13":C=4.7μF)																																															
	0.025max. 0.05max. (Type"12":C≥0.68μF Type"13":C≥4.7μF)	0.07max. 0.09max. (Type"10") 0.1max. (Type"12":C=1μF, 2.2μF Type"13":C=1μF to 4.7μF)																																															
16V	0.025max. 0.05max. (Type"12":C≥0.68μF Type"13":C≥4.7μF)	0.07max. 0.09max. (Type"10") 0.1max. (Type"12":C=1μF, 2.2μF Type"13":C=10μF)																																															
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6.3V	0.05max. 0.075max. (Type"11":C=1μF)																																																
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Nominal 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																																															
Temperature Characteristics	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	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)	Maximum capacitance change at stage 1 to 5 <table><tr><td>Temp. Char.</td><td>C4, SL 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 (Reference 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 "06", "10", "11", "12" of Temp. Char. B, X5R of DC6.3V: 0.20 ± 0.02) Vrms measurement voltage.	Temp. Char.	C4, SL 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 (Reference 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.	C4, SL B, F	X7R	X5R	Y5V																																													
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Stage 4	85 °C	125 °C	85 °C	85 °C																																													
Stage 5	20 °C	25 °C	25 °C	25 °C																																													

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

Item	Specification		Test Method									
	Class 1	Class 2										
Adhesion	The terminal electrode should be free from peeling or signs of peeling.		Applied force: 2 N(Type "06") 5 N(Type "10", "11", "12" and "13") Arrow direction for 10 seconds. Test of Type "11", "12" and "13"  Test of Type "06" and "10"  Unit : mm									
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/s  Unit : mm									
Solderability	More than 95 % of the soldered area of both terminal electrodes should be covered with fresh solder.		Solder bath method Solder temperature: 230 ± 5 °C Dipping period: 4 ± 1 s Solder: H63A (JIS-Z-3282)									
Resistance to Solder Heat	Appearance: no mechanical damage Capacitance Change: Within ± 2.5 % or ± 0.25 pF whichever is larger. Q: initial value IR: initial value Withstand voltage: no dielectric breakdown or damage	Appearance: no mechanical damage Capacitance Change: Temp. Char. B, X7R, X5R : within ± 7.5 % F, Y5V : within ± 20 % $\tan \delta$: initial value IR: initial value Withstand voltage: no dielectric breakdown or damage	Preconditioning: Heat Treatment (150 °C, 1h)/Class 2 Solder temperature: 270 ± 5 °C Dipping period: 3.0 ± 0.5 s Preheat Condition: <table><tr><th>Temp.</th><th>Type "06", "10", "11", "12"</th><th>"13"</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) Class 1: 24 ± 2 h Class 2: 48 ± 4 h	Temp.	Type "06", "10", "11", "12"	"13"	80 to 100 °C	120 to 180s	300 to 360s	150 to 200 °C	120 to 180s	300 to 360s
Temp.	Type "06", "10", "11", "12"	"13"										
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 Capacitance Change: Within ± 2.5 % or ± 0.25 pF whichever is larger. Q: initial value IR: initial value Withstand voltage: no dielectric breakdown or damage	Appearance: no mechanical damage Capacitance Change: Temp. Char. B, X7R, X5R : within ± 7.5 % F, Y5V : within ± 20 % $\tan \delta$: initial value IR: initial value Withstand voltage: no dielectric breakdown or damage	Preconditioning: Heat Treatment (150 °C, 1h) /Class 2 Condition of one cycle Step 1: Minimum operation temp. 30 ± 3 min. Step 2: Room temp. 3 min. Step 3: Maximum operation temp. 30 ± 3 min. Step 4: Room temp. 3 min. Number of cycles: 5 cycles Recovery (Standard condition) Class 1: 24 ± 2 h Class 2: 48 ± 4 h									

Item	Specification		Test Method																								
	Class 1	Class 2																									
Damp Heat (Steady state)	Appearance: no mechanical damage Capacitance Change: Within $\pm 5\%$ or $\pm 0.5\text{ pF}$ whichever is larger. Q tan δ : C<10 pF:Q $\geq$ 200+10C 10 pF $\leq$ C<30 pF:Q $\geq$ 275+5C/2 30 pF $\leq$ C $\leq$ 1000 pF:Q $\geq$ 350 C>1000 pF:tan $\delta\leq$ 0.004 (C:Nominal capacitance in pF) IR: 1000 M Ω or 50/C (M Ω) Whichever is less. (C:Nominal capacitance in μF)	Appearance: no mechanical damage Capacitance Change: Temp. Char. B, X7R, X5R: Within $\pm 12.5\%$ F, Y5V: Within $\pm 30\%$ tan δ : <table><tr><th>Rated Voltage</th><th colspan="2">Temperature Characteristics</th></tr><tr><th></th><th>B, X7R, X5R</th><th>F, Y5V</th></tr><tr><td>50V</td><td>0.05max.</td><td>0.075max. 0.1max. (Type*13*:C=1μF)</td></tr><tr><td>25V</td><td>0.05max. 0.075max. (Type*13*:C=4.7μF)</td><td>0.075max. 0.1max. (Type*13*:C=1μF, 2.2μF) 0.15max. (Type*12*:C$\geq$1μF) (Type*13*:C=4.7μF)</td></tr><tr><td>16V</td><td>0.05max. 0.075max. (Type*12*:C$\geq$0.68μF) (Type*13*:C$\geq$4.7μF)</td><td>0.1max. 0.11max. (Type*10") 0.15max. (Type*12*:C=1μF, 2.2μF) (Type*13*:C=1μF to 4.7μF)</td></tr><tr><td></td><td>0.125max. (Type*11*:C=1μF)</td><td>0.2max. (Type*11*:C=1μF) (Type*12*:C=4.7μF) (Type*13*:C=10μF)</td></tr><tr><td>10V</td><td>0.075max. 0.125max. (Type*11*:C=1μF)</td><td>0.15max. 0.3max. (Type*11*:C=2.2μF) (Type*12*:C=10μF) (Type*13*:C=22μF)</td></tr><tr><td>6.3V</td><td>0.075max. 0.125max. (Type*11*:C=1μF) 0.15max. (Type*11*:C=2.2μF) (Type*12*:C$\geq$4.7μF) (Type*13*:C=22μF)</td><td>0.3max.</td></tr></table> IR: 1000 M Ω or 50/C (M Ω) Whichever is less. Note:DC10V, DC6.3V:10/C(M Ω) min. (C:Nominal capacitance in μF)	Rated Voltage	Temperature Characteristics			B, X7R, X5R	F, Y5V	50V	0.05max.	0.075max. 0.1max. (Type*13*:C=1 μF)	25V	0.05max. 0.075max. (Type*13*:C=4.7 μF)	0.075max. 0.1max. (Type*13*:C=1 μF , 2.2 μF) 0.15max. (Type*12*:C $\geq$ 1 μF) (Type*13*:C=4.7 μF)	16V	0.05max. 0.075max. (Type*12*:C $\geq$ 0.68 μF) (Type*13*:C $\geq$ 4.7 μF)	0.1max. 0.11max. (Type*10") 0.15max. (Type*12*:C=1 μF , 2.2 μF) (Type*13*:C=1 μF to 4.7 μF)		0.125max. (Type*11*:C=1 μF)	0.2max. (Type*11*:C=1 μF) (Type*12*:C=4.7 μF) (Type*13*:C=10 μF)	10V	0.075max. 0.125max. (Type*11*:C=1 μF)	0.15max. 0.3max. (Type*11*:C=2.2 μF) (Type*12*:C=10 μF) (Type*13*:C=22 μF)	6.3V	0.075max. 0.125max. (Type*11*:C=1 μF) 0.15max. (Type*11*:C=2.2 μF) (Type*12*:C $\geq$ 4.7 μF) (Type*13*:C=22 μF)	0.3max.	Preconditioning:Heat Treatment (150°C, 1h)/Class 2 Temperature:40 $\pm$ 2 °C Relative humidity:90 to 95% Test period:500+24/0 h Recovery (Standard condition) Class 1:24 $\pm$ 2 h Class 2:48 $\pm$ 4 h
Rated Voltage	Temperature Characteristics																										
	B, X7R, X5R	F, Y5V																									
50V	0.05max.	0.075max. 0.1max. (Type*13*:C=1 μF)																									
25V	0.05max. 0.075max. (Type*13*:C=4.7 μF)	0.075max. 0.1max. (Type*13*:C=1 μF , 2.2 μF) 0.15max. (Type*12*:C $\geq$ 1 μF) (Type*13*:C=4.7 μF)																									
16V	0.05max. 0.075max. (Type*12*:C $\geq$ 0.68 μF) (Type*13*:C $\geq$ 4.7 μF)	0.1max. 0.11max. (Type*10") 0.15max. (Type*12*:C=1 μF , 2.2 μF) (Type*13*:C=1 μF to 4.7 μF)																									
	0.125max. (Type*11*:C=1 μF)	0.2max. (Type*11*:C=1 μF) (Type*12*:C=4.7 μF) (Type*13*:C=10 μF)																									
10V	0.075max. 0.125max. (Type*11*:C=1 μF)	0.15max. 0.3max. (Type*11*:C=2.2 μF) (Type*12*:C=10 μF) (Type*13*:C=22 μF)																									
6.3V	0.075max. 0.125max. (Type*11*:C=1 μF) 0.15max. (Type*11*:C=2.2 μF) (Type*12*:C $\geq$ 4.7 μF) (Type*13*:C=22 μF)	0.3max.																									
Loading Under Damp Heat	Appearance: no mechanical damage Capacitance Change: Within $\pm 7.5\%$ or $\pm 0.75\text{ pF}$ whichever is larger. Q tan δ : C<30 pF:Q $\geq$ 100+10C/3 30 pF $\leq$ C $\leq$ 1000 pF:Q $\geq$ 200 C>1000 pF:tan $\delta\leq$ 0.004 (C:Nominal capacitance in pF) IR: 500 M Ω or 25/C (M Ω) Whichever is less. (C:Nominal capacitance in μF)	Appearance: no mechanical damage Capacitance Change: Temp. Char. B, X7R, X5R: Within $\pm 12.5\%$ F, Y5V: Within $\pm 30\%$ tan δ : <table><tr><th>Rated Voltage</th><th colspan="2">Temperature Characteristics</th></tr><tr><th></th><th>B, X7R, X5R</th><th>F, Y5V</th></tr><tr><td>50V</td><td>0.05max.</td><td>0.075max. 0.1max. (Type*13*:C=μF)</td></tr><tr><td>25V</td><td>0.05max. 0.075max. (Type*13*:C=4.7μF)</td><td>0.075max. 0.1max. (Type*13*:C=1μF, 2.2μF) 0.15max. (Type*12*:C$\geq$1μF) (Type*13*:C=4.7μF)</td></tr><tr><td>16V</td><td>0.05max. 0.075max. (Type*12*:C$\geq$0.68μF) (Type*13*:C$\geq$4.7μF)</td><td>0.1max. 0.11max. (Type*10") 0.15max. (Type*12*:C=1μF, 2.2μF) (Type*13*:C=1μF to 4.7μF)</td></tr><tr><td></td><td>0.125max. (Type*11*:C=1μF)</td><td>0.2max. (Type*11*:C=1μF) (Type*12*:C=4.7μF) (Type*13*:C=10μF)</td></tr><tr><td>10V</td><td>0.075max. 0.125max. (Type*11*:C=1μF)</td><td>0.15max. 0.3max. (Type*11*:C=2.2μF) (Type*12*:C=10μF) (Type*13*:C=22μF)</td></tr><tr><td>6.3V</td><td>0.075max. 0.125max. (Type*11*:C=1μF) 0.15max. (Type*11*:C=2.2μF) (Type*12*:C$\geq$4.7μF) (Type*13*:C=22μF)</td><td>0.3max.</td></tr></table> IR: 500 M Ω or 25/C (M Ω) Whichever is less. Note:DC10V, DC6.3V:5/C(M Ω) min. (C:Nominal capacitance in μF)	Rated Voltage	Temperature Characteristics			B, X7R, X5R	F, Y5V	50V	0.05max.	0.075max. 0.1max. (Type*13*:C= μF)	25V	0.05max. 0.075max. (Type*13*:C=4.7 μF)	0.075max. 0.1max. (Type*13*:C=1 μF , 2.2 μF) 0.15max. (Type*12*:C $\geq$ 1 μF) (Type*13*:C=4.7 μF)	16V	0.05max. 0.075max. (Type*12*:C $\geq$ 0.68 μF) (Type*13*:C $\geq$ 4.7 μF)	0.1max. 0.11max. (Type*10") 0.15max. (Type*12*:C=1 μF , 2.2 μF) (Type*13*:C=1 μF to 4.7 μF)		0.125max. (Type*11*:C=1 μF)	0.2max. (Type*11*:C=1 μF) (Type*12*:C=4.7 μF) (Type*13*:C=10 μF)	10V	0.075max. 0.125max. (Type*11*:C=1 μF)	0.15max. 0.3max. (Type*11*:C=2.2 μF) (Type*12*:C=10 μF) (Type*13*:C=22 μF)	6.3V	0.075max. 0.125max. (Type*11*:C=1 μF) 0.15max. (Type*11*:C=2.2 μF) (Type*12*:C $\geq$ 4.7 μF) (Type*13*:C=22 μF)	0.3max.	Preconditioning : Voltage Treatment /Class 2 Temperature:40 $\pm$ 2 °C Relative humidity:90 to 95% Applied voltage:Rated voltage Charge/discharge current: within 50mA Test period:500+24/0 h Recovery (Standard condition) Class 1:24 $\pm$ 2 h Class 2:48 $\pm$ 4 h
Rated Voltage	Temperature Characteristics																										
	B, X7R, X5R	F, Y5V																									
50V	0.05max.	0.075max. 0.1max. (Type*13*:C= μF)																									
25V	0.05max. 0.075max. (Type*13*:C=4.7 μF)	0.075max. 0.1max. (Type*13*:C=1 μF , 2.2 μF) 0.15max. (Type*12*:C $\geq$ 1 μF) (Type*13*:C=4.7 μF)																									
16V	0.05max. 0.075max. (Type*12*:C $\geq$ 0.68 μF) (Type*13*:C $\geq$ 4.7 μF)	0.1max. 0.11max. (Type*10") 0.15max. (Type*12*:C=1 μF , 2.2 μF) (Type*13*:C=1 μF to 4.7 μF)																									
	0.125max. (Type*11*:C=1 μF)	0.2max. (Type*11*:C=1 μF) (Type*12*:C=4.7 μF) (Type*13*:C=10 μF)																									
10V	0.075max. 0.125max. (Type*11*:C=1 μF)	0.15max. 0.3max. (Type*11*:C=2.2 μF) (Type*12*:C=10 μF) (Type*13*:C=22 μF)																									
6.3V	0.075max. 0.125max. (Type*11*:C=1 μF) 0.15max. (Type*11*:C=2.2 μF) (Type*12*:C $\geq$ 4.7 μF) (Type*13*:C=22 μF)	0.3max.																									

Item	Specification		Test Method																			
	Class 1	Class 2																				
Loading at High Temperature	Appearance: no mechanical damage	Appearance: no mechanical damage	Preconditioning:VoltageTreatment /Class 2 Temperature: Maximum operation temp. ±3 °C Applied voltage:Rated voltage ×200% Charge/discharge current:within 50mA Test period:1000+48/0 h Recovery (Standard condition) Class 1:24±2 h Class 2:48±4 h																			
	Capacitance Change: Within ±3 % or ±0.3 pF whichever is larger. Q tan δ: C<10 pF:Q≥200+10C 10 pF≤C≤30 pF:Q≥275+5C/2 30 pF≤C≤1000 pF:Q≥350 C>1000 pF:tan δ≤0.004 (C:Nominal capcitance in pF) IR: 1000 MΩ or 50/C (MΩ) Whichever is less. (C:Nominal capacitance in μF)	Capacitance Change: Temp. Char. B, X7R, X5R: Within ±12.5 % F, Y5V: Within ±30 % tanδ: <table><tr><th>Rated Voltage</th><th colspan="2">Temperature Characteristics</th></tr><tr><th></th><th>B, X7R, X5R</th><th>F, Y5V</th></tr><tr><td>50V</td><td>0.05max.</td><td>0.075max. 0.1max. (Type*13":C=1μF)</td></tr><tr><td>25V</td><td>0.05max. 0.075max. (Type*13":C=4.7μF)</td><td>0.075max. 0.1max. (Type*13":C=1μF, 2.2μF) 0.15max. (Type*12":C≥1μF) (Type*13":C=4.7μF)</td></tr><tr><td>16V</td><td>0.05max. 0.075max. (Type*12":C≥0.68μF) (Type*13":C≥4.7μF)</td><td>0.1max. (Type*10") 0.15max. (Type*12":C=1μF, 2.2μF) (Type*13":C=1μF to 4.7μF) 0.2max. (Type*11":C=1μF) (Type*12":C=4.7μF) (Type*13":C=10μF)</td></tr><tr><td>10V</td><td>0.075max. 0.125max. (Type*11":C=1μF)</td><td>0.15max. 0.3max. (Type*11":C=2.2μF) (Type*12":C=10μF) (Type*13":C=22μF)</td></tr><tr><td>6.3V</td><td>0.075max. 0.125max. (Type*11":C=1μF) 0.15max. (Type*11":C=2.2μF) (Type*12":C≥4.7μF) (Type*13":C=22μF)</td><td>0.3max.</td></tr></table> IR: 1000 MΩ or 50/C (MΩ) Whichever is less. Note:DC10V, DC6.3V:10/C(MΩ) min. (C:Nominal capacitance in μF)		Rated Voltage	Temperature Characteristics			B, X7R, X5R	F, Y5V	50V	0.05max.	0.075max. 0.1max. (Type*13":C=1μF)	25V	0.05max. 0.075max. (Type*13":C=4.7μF)	0.075max. 0.1max. (Type*13":C=1μF, 2.2μF) 0.15max. (Type*12":C≥1μF) (Type*13":C=4.7μF)	16V	0.05max. 0.075max. (Type*12":C≥0.68μF) (Type*13":C≥4.7μF)	0.1max. (Type*10") 0.15max. (Type*12":C=1μF, 2.2μF) (Type*13":C=1μF to 4.7μF) 0.2max. (Type*11":C=1μF) (Type*12":C=4.7μF) (Type*13":C=10μF)	10V	0.075max. 0.125max. (Type*11":C=1μF)	0.15max. 0.3max. (Type*11":C=2.2μF) (Type*12":C=10μF) (Type*13":C=22μF)	6.3V
Rated Voltage	Temperature Characteristics																					
	B, X7R, X5R	F, Y5V																				
50V	0.05max.	0.075max. 0.1max. (Type*13":C=1μF)																				
25V	0.05max. 0.075max. (Type*13":C=4.7μF)	0.075max. 0.1max. (Type*13":C=1μF, 2.2μF) 0.15max. (Type*12":C≥1μF) (Type*13":C=4.7μF)																				
16V	0.05max. 0.075max. (Type*12":C≥0.68μF) (Type*13":C≥4.7μF)	0.1max. (Type*10") 0.15max. (Type*12":C=1μF, 2.2μF) (Type*13":C=1μF to 4.7μF) 0.2max. (Type*11":C=1μF) (Type*12":C=4.7μF) (Type*13":C=10μF)																				
10V	0.075max. 0.125max. (Type*11":C=1μF)	0.15max. 0.3max. (Type*11":C=2.2μF) (Type*12":C=10μF) (Type*13":C=22μF)																				
6.3V	0.075max. 0.125max. (Type*11":C=1μF) 0.15max. (Type*11":C=2.2μF) (Type*12":C≥4.7μF) (Type*13":C=22μF)	0.3max.																				

Note 1) Heat treatment: 1 h of heat treatment at 150+0/-10 $^{\circ}\text{C}$ followed by 48 $\pm$ 4 h recovery under the standard 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 standard condition

■ Standard Products for Type "06" (EIA "0201") , Taped Version
● Class 1

Capacitance (pF)	Code		C									
	Rated voltage		DC25V					DC16V				
	Capacitance Tolerance	Part No	Dim. T (mm)	Temp. Char.			Part No	Dim. T (mm)	Temp. Char.			
				CK	CJ	CH			CK	CJ	CH	
0.5	±0.25pF(C)	ECJZEC1E0R5C	0.3	○	—	—						
1	±0.25pF	ECJZEC1E010□	0.3	○	—	—						
1.5	(C)	ECJZEC1E1R5□	0.3	○	—	—						
2	or	ECJZEC1E020□	0.3	○	—	—						
3	±0.5pF	ECJZEC1E030□	0.3	—	○	—						
4	(D)	ECJZEC1E040□	0.3	—	—	○						
5		ECJZEC1E050□	0.3	—	—	○						
6		ECJZEC1E060D	0.3	—	—	○						
7	±0.5pF	ECJZEC1E070D	0.3	—	—	○						
8	(D)	ECJZEC1E080D	0.3	—	—	○						
9		ECJZEC1E090D	0.3	—	—	○						
10	±0.5pF(D) or ±1pF(F)	ECJZEC1E100□	0.3	—	—	○						
12		ECJZEC1E120□	0.3	—	—	○						
15		ECJZEC1E150□	0.3	—	—	○						
18		ECJZEC1E180□	0.3	—	—	○						
22		ECJZEC1E220□	0.3	—	—	○						
27	±5%(J)	ECJZEC1E270□	0.3	—	—	○						
33	or	ECJZEC1E330□	0.3	—	—	○						
39	±10%(K)						ECJZEC1C390□	0.3	—	—	○	
47							ECJZEC1C470□	0.3	—	—	○	
56							ECJZEC1C560□	0.3	—	—	○	
68							ECJZEC1C680□	0.3	—	—	○	
82							ECJZEC1C820□	0.3	—	—	○	
100							ECJZEC1C101□	0.3	—	—	○	

● Class 2

Capacitance (pF)	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.		
				B	X7R	X5R			B	X7R	X5R			B	X7R	X5R			B	X7R	X5R
150	±10%(K) or ±20%(M)	ECJZEB1E151□	0.3	○	○	—															
220		ECJZEB1E221□	0.3	○	○	—															
330		ECJZEB1E331□	0.3	○	○	—															
470		ECJZEB1E471□	0.3	○	○	—															
680		ECJZEB1E681□	0.3	○	○	—															
1000		ECJZEB1E102□	0.3	○	○	—															
1500							ECJZEB1C152□	0.3	○	○	—										
2200							ECJZEB1C222□	0.3	○	○	—										
3300												ECJZEB1A332□	0.3	○	—	○					
4700																		ECJZEB0J472□	0.3	○	—
6800																	ECJZEB0J682□	0.3	○	—	○
10000																	ECJZEB0J103□	0.3	○	—	○

□: Capacitance Tolerance Code.
Packaging Style Code: "E" for Taped Version. (φ180 reel, Taping pitch: 2 mm)
Recommend soldering method: Reflow soldering.

■ Standard Products for Type “10” (EIA “0402”) , Taped Version

● Class 1

Capacitance (pF)	Code	C						G		
	Rated voltage	DC50V						DC50V		
	Capacitance Tolerance	Part No	Dim. T (mm)	Temp. Char.				Part No	Dim. T (mm)	Temp. Char.
				CK	CJ	CH	CG			
0.5	±0.25pF(C)	ECJ0EC1H0R5C	0.5	○	—	—	—	ECJ0EG1H0R5C	0.5	○
1	±0.25pF	ECJ0EC1H010□	0.5	○	—	—	—	ECJ0EG1H010□	0.5	○
1.5	(C)	ECJ0EC1H1R5□	0.5	○	—	—	—	ECJ0EG1H1R5□	0.5	○
2	or	ECJ0EC1H020□	0.5	○	—	—	—	ECJ0EG1H020□	0.5	○
3	±0.5pF	ECJ0EC1H030□	0.5	—	○	—	—	ECJ0EG1H030□	0.5	○
4	(D)	ECJ0EC1H040□	0.5	—	—	○	—	ECJ0EG1H040□	0.5	○
5		ECJ0EC1H050□	0.5	—	—	○	—	ECJ0EG1H050□	0.5	○
6		ECJ0EC1H060D	0.5	—	—	○	—	ECJ0EG1H060D	0.5	○
7	±0.5pF	ECJ0EC1H070D	0.5	—	—	○	—	ECJ0EG1H070D	0.5	○
8	(D)	ECJ0EC1H080D	0.5	—	—	○	—	ECJ0EG1H080D	0.5	○
9		ECJ0EC1H090D	0.5	—	—	○	—	ECJ0EG1H090D	0.5	○
10	±0.5pF(D) or ±1pF(F)	ECJ0EC1H100□	0.5	—	—	○	○	ECJ0EG1H100□	0.5	○
12		ECJ0EC1H120□	0.5	—	—	○	○	ECJ0EG1H120□	0.5	○
15		ECJ0EC1H150□	0.5	—	—	○	○	ECJ0EG1H150□	0.5	○
18		ECJ0EC1H180□	0.5	—	—	○	○	ECJ0EG1H180□	0.5	○
22		ECJ0EC1H220□	0.5	—	—	○	○	ECJ0EG1H220□	0.5	○
27		ECJ0EC1H270□	0.5	—	—	○	○	ECJ0EG1H270□	0.5	○
33		ECJ0EC1H330□	0.5	—	—	○	○	ECJ0EG1H330□	0.5	○
39	±5%(J)	ECJ0EC1H390□	0.5	—	—	○	○	ECJ0EG1H390□	0.5	○
47	or	ECJ0EC1H470□	0.5	—	—	○	○	ECJ0EG1H470□	0.5	○
56	±10%(K)	ECJ0EC1H560□	0.5	—	—	○	○	ECJ0EG1H560□	0.5	○
68		ECJ0EC1H680□	0.5	—	—	○	○	ECJ0EG1H680□	0.5	○
82		ECJ0EC1H820□	0.5	—	—	○	○	ECJ0EG1H820□	0.5	○
100		ECJ0EC1H101□	0.5	—	—	○	○	ECJ0EG1H101□	0.5	○
120		ECJ0EC1H121□	0.5	—	—	○	○	ECJ0EG1H121□	0.5	○
150		ECJ0EC1H151□	0.5	—	—	○	○	ECJ0EG1H151□	0.5	○
180		ECJ0EC1H181□	0.5	—	—	○	○	ECJ0EG1H181□	0.5	○
220		ECJ0EC1H221□	0.5	—	—	○	○	ECJ0EG1H221□	0.5	○

□: Capacitance Tolerance Code.

Packaging Style Code: “E” for Taped Version. (φ180 reel, Taping pitch: 2 mm)

Recommend soldering method: Reflow soldering.

■ Standard Products for Type “10” (EIA “0402”) , Taped Version

● Class 2

Capacitance (pF)	Code		B																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	Rated voltage	DC50V						DC25V						DC16V						DC10V						DC6.3V																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		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	B		X7R	X5R	B	X7R	X5R																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
100	±10%(K) or ±20%(M)	ECJ0EB1H101□	0.5	○	○	—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			

Capacitance (pF)	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.		
				F	Y5V			F	Y5V			F	Y5V			F	Y5V	
1000	+80, -20% (Z)	ECJ0EF1H102Z	0.5	○	○	ECJ0EF1E102Z	0.5	○	○									
2200		ECJ0EF1H222Z	0.5	○	○	ECJ0EF1E222Z	0.5	○	○									
4700		ECJ0EF1H472Z	0.5	○	○	ECJ0EF1E472Z	0.5	○	○									
10000		ECJ0EF1H103Z	0.5	○	○	ECJ0EF1E103Z	0.5	○	○									
22000						ECJ0EF1E223Z	0.5	○	○	ECJ0EF1C223Z	0.5	○	○					
47000										ECJ0EF1C473Z	0.5	○	○					
100000										ECJ0EF1C104Z	0.5	○	○					
220000													ECJ0EF1A224Z	0.5	○	○		

□: Capacitance Tolerance Code.

Packaging Style Code: "E" for Taped Version. (φ180 reel, Taping pitch: 2 mm)

Recommend soldering method: Reflow soldering.

Design, Specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.
Whenever a doubt about safety arises from this product, please inform us immediately for technical consultation without fail.

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

● Class 2

Capacitance (pF)	Code		C					G		
	Rated voltage		DC50V					DC50V		
	Capacitance Tolerance	Part No	Dim. T (mm)	Temp. Char.				Part No	Dim. T (mm)	Temp. Char. SL
				CK	CJ	CH	CG			
0.5	±0.25pF(C)	ECJ1VC1H0R5C	0.8	○	—	—	—	ECJ1VG1H0R5C	0.8	○
1	±0.25pF	ECJ1VC1H010□	0.8	○	—	—	—	ECJ1VG1H010□	0.8	○
1.5	(C)	ECJ1VC1H1R5□	0.8	○	—	—	—	ECJ1VG1H1R5□	0.8	○
2	or	ECJ1VC1H020□	0.8	○	—	—	—	ECJ1VG1H020□	0.8	○
3	±0.5pF	ECJ1VC1H030□	0.8	—	○	—	—	ECJ1VG1H030□	0.8	○
4	(D)	ECJ1VC1H040□	0.8	—	—	○	—	ECJ1VG1H040□	0.8	○
5		ECJ1VC1H050□	0.8	—	—	○	—	ECJ1VG1H050□	0.8	○
6	±0.5pF (D)	ECJ1VC1H060D	0.8	—	—	○	—	ECJ1VG1H060D	0.8	○
7		ECJ1VC1H070D	0.8	—	—	○	—	ECJ1VG1H070D	0.8	○
8		ECJ1VC1H080D	0.8	—	—	○	—	ECJ1VG1H080D	0.8	○
9		ECJ1VC1H090D	0.8	—	—	○	—	ECJ1VG1H090D	0.8	○
10	±0.5pF(D) or ±1pF(F)	ECJ1VC1H100□	0.8	—	—	○	○	ECJ1VG1H100□	0.8	○
12	±5%(J) or ±10%(K)	ECJ1VC1H120□	0.8	—	—	○	○	ECJ1VG1H120□	0.8	○
15		ECJ1VC1H150□	0.8	—	—	○	○	ECJ1VG1H150□	0.8	○
18		ECJ1VC1H180□	0.8	—	—	○	○	ECJ1VG1H180□	0.8	○
22		ECJ1VC1H220□	0.8	—	—	○	○	ECJ1VG1H220□	0.8	○
27		ECJ1VC1H270□	0.8	—	—	○	○	ECJ1VG1H270□	0.8	○
33		ECJ1VC1H330□	0.8	—	—	○	○	ECJ1VG1H330□	0.8	○
39		ECJ1VC1H390□	0.8	—	—	○	○	ECJ1VG1H390□	0.8	○
47		ECJ1VC1H470□	0.8	—	—	○	○	ECJ1VG1H470□	0.8	○
56		ECJ1VC1H560□	0.8	—	—	○	○	ECJ1VG1H560□	0.8	○
68		ECJ1VC1H680□	0.8	—	—	○	○	ECJ1VG1H680□	0.8	○
82		ECJ1VC1H820□	0.8	—	—	○	○	ECJ1VG1H820□	0.8	○
100		ECJ1VC1H101□	0.8	—	—	○	○	ECJ1VG1H101□	0.8	○
120		ECJ1VC1H121□	0.8	—	—	○	○	ECJ1VG1H121□	0.8	○
150		ECJ1VC1H151□	0.8	—	—	○	○	ECJ1VG1H151□	0.8	○
180		ECJ1VC1H181□	0.8	—	—	○	○	ECJ1VG1H181□	0.8	○
220		ECJ1VC1H221□	0.8	—	—	○	○	ECJ1VG1H221□	0.8	○
270		ECJ1VC1H271□	0.8	—	—	○	○	ECJ1VG1H271□	0.8	○
330		ECJ1VC1H331□	0.8	—	—	○	○	ECJ1VG1H331□	0.8	○
390		ECJ1VC1H391□	0.8	—	—	○	○	ECJ1VG1H391□	0.8	○
470		ECJ1VC1H471□	0.8	—	—	○	○	ECJ1VG1H471□	0.8	○
560		ECJ1VC1H561□	0.8	—	—	○	○	ECJ1VG1H561□	0.8	○
680		ECJ1VC1H681□	0.8	—	—	○	○	ECJ1VG1H681□	0.8	○
820		ECJ1VC1H821□	0.8	—	—	○	○	ECJ1VG1H821□	0.8	○
1000		ECJ1VC1H102□	0.8	—	—	○	○	ECJ1VG1H102□	0.8	○

□: Capacitance Tolerance Code.

Packaging Style Code: “V” for Taped Version. (ø 180 reel, Taping pitch: 4 mm).

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

● Class 2

Capacitance (pF)	Code	B																									
	Rated voltage	DC50V					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.								
				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								ECJ1VB1E563K	0.8	○	○	—	ECJ1VB1C563K	0.8	○	○	—										
68000								ECJ1VB1E683□	0.8	○	○	—	ECJ1VB1C683□	0.8	○	○	—										
82000								ECJ1VB1E823K	0.8	○	○	—	ECJ1VB1C823K	0.8	○	○	—										
100000								ECJ1VB1E104□	0.8	○	○	—	ECJ1VB1C104□	0.8	○	○	—										
150000																		ECJ1VB1A154□	0.8	○	—	○					
220000																		ECJ1VB1A224□	0.8	○	—	○					
330000																		ECJ1VB1A334□	0.8	—	—	○					
470000																		ECJ1VB1A474□	0.8	—	—	○	ECJ1VB0J474□	0.8	○	—	○
680000																		ECJ1VB1A684□	0.8	—	—	○	ECJ1VB0J684□	0.8	○	—	○
1000000											ECJ1VB1C105□	0.8	—	—	○	ECJ1VB1A105□	0.8	—	—	○	ECJ1VB0J105□	0.8	○	—	○		
2200000																					ECJ1VB0J225□	0.8	—	—	○		

Capacitance (pF)	Code		F																				
	Rated voltage	DC50V					DC25V				DC16V				DC10V				DC6.3V				
	Capacitance Tolerance	Part No	Dim. T	Temp. Char.		Part No	Dim. T	Temp. Char.		Part No	Dim. T	Temp. Char.		Part No	Dim. T	Temp. Char.		Part No	Dim. T	Temp. Char.			
			(mm)	F	Y5V		(mm)	F	Y5V		(mm)	F	Y5V		(mm)	F	Y5V		(mm)	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	○	○										
1000000										ECJ1VF1C105Z	0.8	○	—	ECJ1VF1A105Z	0.8	○	○						
2200000													ECJ1VF1A225Z	0.8	○	—	ECJ1VF0J225Z	0.8	○	—			

□: Capacitance Tolerance Code.

Packaging Style Code: “V” for Taped Version. (φ 180 reel, Taping pitch: 4 mm)

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

● Class 1

Capacitance (pF)	Code	C				G			
	Rated voltage	DC50V				DC50V			
	Capacitance Tolerance	Part No	Dim. T (mm)	Temp. Char.		Part No	Dim. T (mm)	Temp. Char.	
				CH	CG			SL	
27	±5%(J) or ±10%(K)	ECJ2VC1H270□	0.6	○	○	ECJ2VG1H270□	0.6	○	
33		ECJ2VC1H330□	0.6	○	○	ECJ2VG1H330□	0.6	○	
39		ECJ2VC1H390□	0.6	○	○	ECJ2VG1H390□	0.6	○	
47		ECJ2VC1H470□	0.6	○	○	ECJ2VG1H470□	0.6	○	
56		ECJ2VC1H560□	0.6	○	○	ECJ2VG1H560□	0.6	○	
68		ECJ2VC1H680□	0.6	○	○	ECJ2VG1H680□	0.6	○	
82		ECJ2VC1H820□	0.6	○	○	ECJ2VG1H820□	0.6	○	
100		ECJ2VC1H101□	0.6	○	○	ECJ2VG1H101□	0.6	○	
120		ECJ2VC1H121□	0.6	○	○	ECJ2VG1H121□	0.6	○	
150		ECJ2VC1H151□	0.6	○	○	ECJ2VG1H151□	0.6	○	
180		ECJ2VC1H181□	0.6	○	○	ECJ2VG1H181□	0.6	○	
220		ECJ2VC1H221□	0.6	○	○	ECJ2VG1H221□	0.6	○	
270		ECJ2VC1H271□	0.6	○	○	ECJ2VG1H271□	0.6	○	
330		ECJ2VC1H331□	0.6	○	○	ECJ2VG1H331□	0.6	○	
390		ECJ2VC1H391□	0.6	○	○	ECJ2VG1H391□	0.6	○	
470		ECJ2VC1H471□	0.6	○	○	ECJ2VG1H471□	0.6	○	
560		ECJ2VC1H561□	0.6	○	○	ECJ2VG1H561□	0.6	○	
680		ECJ2VC1H681□	0.6	○	○	ECJ2VG1H681□	0.6	○	
820		ECJ2VC1H821□	0.6	○	○	ECJ2VG1H821□	0.6	○	
1000		ECJ2VC1H102□	0.6	○	○	ECJ2VG1H102□	0.6	○	
1200		ECJ2VC1H122□	0.6	○	—	ECJ2VG1H122□	0.6	○	
1500		ECJ2VC1H152□	0.6	○	—	ECJ2VG1H152□	0.6	○	
1800		ECJ2VC1H182□	0.6	○	—	ECJ2VG1H182□	0.6	○	
2200		ECJ2VC1H222□	0.6	○	—	ECJ2VG1H222□	0.6	○	
2700		ECJ2VC1H272□	0.85	○	—	ECJ2VG1H272□	0.6	○	

□: Capacitance Tolerance Code.

Packaging Style Code: “V” for Taped Version. (φ 180 reel, Taping pitch: 4 mm)

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

● class 2

Capacitance (pF)	Code	B																								
	Rated voltage	DC50V					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.							
				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							ECJ2FB1E154□	1.25	○	○	—	ECJ2VB1C154□	0.85	○	○	—										
220000							ECJ2FB1E224□	1.25	○	○	—	ECJ2VB1C224□	0.85	○	○	—										
330000												ECJ2FB1C334□	1.25	○	○	—										
470000												ECJ2FB1C474□	1.25	○	○	—										
680000												ECJ2FB1C684□*	1.25	—	—	○	ECJ2FB1A684□	1.25	○	—	○					
1000000						Under development	1.25	—	—	○	ECJ2FB1C105□*	1.25	—	—	○	ECJ2FB1A105□	1.25	○	—	○						
2200000						Under development	1.25	—	—	○	Under development	1.25	—	—	○	ECJ2FB1A225□*	1.25	—	—	○	ECJ2FB0J225□	1.25	○	—	○	
3300000																ECJ2FB1A335□*	1.25	—	—	○	ECJ2FB0J335□	1.25	○	—	○	
4700000																Under development	1.25	—	—	○	ECJ2FB0J475□*	1.25	—	—	○	
10000000																				ECJ2FB0J106□**	1.25	—	—	○		

Capacitance (PF)	Code	F																								
	Rated voltage	DC50V					DC25V					DC16V					DC10V					DC6.3V				
	Capacitance Tolerance	Part No	Dim. T	Temp. Char.		Part No	Dim. T	Temp. Char.		Part No	Dim. T	Temp. Char.		Part No	Dim. T	Temp. Char.		Part No	Dim. T	Temp. Char.						
			(mm)	F	Y5V		(mm)	F	Y5V		(mm)	F	Y5V		(mm)	F	Y5V		(mm)	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	○	○													
1000000						ECJ2FF1E105Z*	1.25	○	—	ECJ2VF1C105Z	0.85	○	○													
2200000						ECJ2FF1E225Z*	1.25	○	—	ECJ2FF1C225Z	1.25	○	○													
4700000										ECJ2FF1C475Z*	1.25	○	—	ECJ2FF1A475Z	1.25	○	○									
10000000														ECJ2FF1A106Z*	1.25	○	—	ECJ2FF0J106Z*	1.25	○	—					

□: Capacitance Tolerance Code.

Packaging Style Code: “V” or “F” for Taped Version. (φ 180 reel, Taping pitch: 4 mm)

*：“L” “W” “T” Dimension Tolerance ±0.15 mm

**：“L” “W” “T” Dimension Tolerance ±0.2 mm

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

Design, Specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.
Whenever a doubt about safety arises from this product, please inform us immediately for technical consultation without fail.

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

● class 1

Capacitance (pF)	Code	C			G		
	Rated voltage	DC50V			DC50V		
	Capacitance Tolerance	Part No	Dim. T (mm)	Temp. Char.	Part No	Dim. T (mm)	Temp. Char.
				CH			SL
3300	±5%(J) or	ECJ3VC1H332□	0.6	○	ECJ3VG1H332□	0.6	○
3900		ECJ3VC1H392□	0.6	○	ECJ3VG1H392□	0.6	○
4700		ECJ3VC1H472□	0.6	○	ECJ3VG1H472□	0.6	○
5600		ECJ3VC1H562□	0.85	○	ECJ3VG1H562□	0.6	○
6800	±10%(K)	ECJ3VC1H682□	0.85	○			
8200		ECJ3FC1H822□	1.15	○			
10000		ECJ3FC1H103□	1.15	○			

● class 2

Capacitance (pF)	Code	B														
	Rated voltage	DC50V			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.	Part No	Dim. T (mm)	Temp. Char.
				B X7R X5R			B X7R X5R			B X7R X5R			B X7R X5R			B X7R X5R
100000	±10%(K) or ±20%(M)				ECJ3VB1E104□	0.85	○ ○	ECJ3VB1C104□	0.85	○ ○						
150000					ECJ3VB1E154□	0.85	○ ○	ECJ3VB1C154□	0.85	○ ○						
220000		ECJ3YB1H224□	1.6	○ ○	ECJ3VB1E224□	0.85	○ ○	ECJ3VB1C224□	0.85	○ ○						
330000					ECJ3VB1E334□	0.85	○ ○	ECJ3VB1C334□	0.85	○ ○						
470000					ECJ3FB1E474□	1.15	○ ○	ECJ3VB1C474□	0.85	○ ○						
680000					ECJ3YB1E684□	1.6	○ ○	ECJ3VB1C684□	0.85	○ ○						
1000000					ECJ3YB1E105□	1.6	○ ○	ECJ3FB1C105□	1.15	○ ○						
1500000											ECJ3YB1A155□	1.6	○ —	○		
2200000					ECJ3YB1E225□	1.6	— —	○	ECJ3YB1C225□	1.6	○ ○	ECJ3YB1A225□	1.6	○ —	○	
3300000											ECJ3YB1A335□	1.6	○ —	○		
4700000					ECJ3YB1E475□	1.6	— —	○	ECJ3YB1C475□	1.6	— —	○	ECJ3YB1A475□	1.6	— —	○
10000000					Under development	1.6	— —	○	ECJ3YB1C106M	1.6	— —	○	ECJ3YB1A106M	1.6	— —	○
22000000													ECJ3YB0J226M	1.6	— —	○

Capacitance (pF)	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.	
				F	Y5V			F	Y5V			F	Y5V			F	Y5V
470000	+80, -20% (Z)					ECJ3VF1E474Z	0.85	○	○								
1000000		ECJ3FF1H105Z	1.15	○	—	ECJ3FF1E105Z	1.15	○	○	ECJ3VF1C105Z	0.85	○	○				
2200000						ECJ3FF1E225Z	1.15	○	○	ECJ3VF1C225Z	0.85	○	○				
4700000						ECJ3FF1E475Z	1.15	○	—	ECJ3FF1C475Z	1.15	○	○				
10000000										ECJ3YF1C106Z	1.6	○	—	ECJ3YF1A106Z	1.6	○	○
22000000														ECJ3YF1A226Z	1.6	○	—

□: Capacitance Tolerance Code.

Packaging Style Code: “V”, “F” and “Y” for Taped Version. (ø 180 reel, Taping pitch: 4 mm)

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