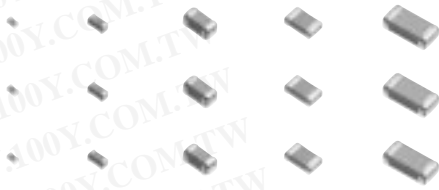


### Multilayer Ceramic Capacitors (For General Electronic Equipment)

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

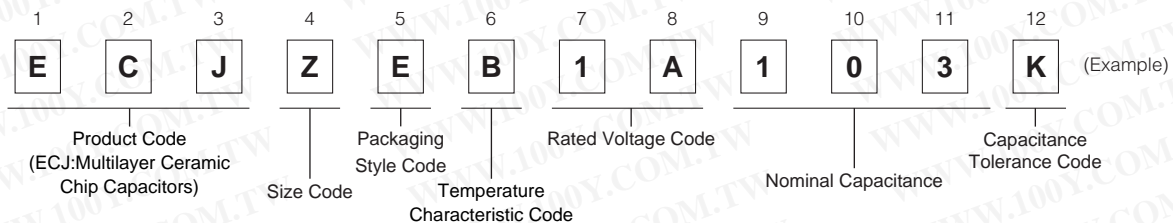
#### ■ Handling Precautions

See Page 48 to 53

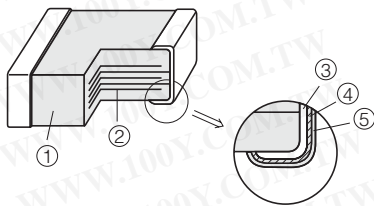
#### ■ Packaging Specifications

See Page 45, 46, 56

#### ■ Explanation of Part Numbers

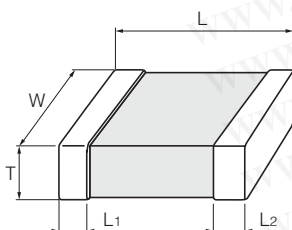


#### ■ Construction



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

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



Size Code	Size (EIA)	L	W	T	L <sub>1</sub> , L <sub>2</sub>
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	

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### ■ 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	≥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.

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#### ● 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)

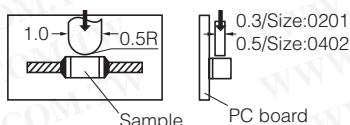
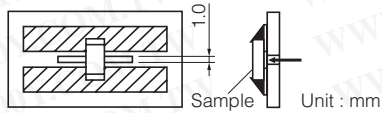
### ■ Capacitance Tolerance

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 %
2	B, X7R, X5R		K ±10 %	±10 %
			M ±20 %	±20 %
	F, Y5V		Z +80, -20 %	+80, -20 %

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use. Should a safety concern arise regarding this product, please be sure to contact us immediately.

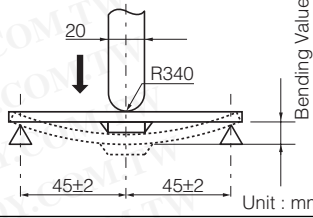
00 Apr. 2008

### ■ Specifications and Testing Methods

Item	Specification		Test Method																														
	Class 1	Class 2																															
Operating Temperature Range	Temp. Char. CΔ : -55 to 125 °C : -25 to 85 °C 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 dielectric breakdown and /or damage		Test voltage: Class 1:Rated voltage ×300 % Class 2:Rated voltage ×250 % Duration:1 to 5 s Charge/discharge current : 50 mA max.																														
Insulation Resistance (I R)	10000 MΩ or 500/C (MΩ) whichever is less. Note:100/C(MΩ)min. for DC 10 V max. C:Nominal Cap. 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																														
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)	tan δ: Temp. Char. B, X7R, X5R: 0.15 max. Temp. Char. F, Y5V: 0.2 max. Please see the technical specifications for details.	Class 1: <table border="1"> <tr> <td>Nominal capacitance</td> <td>C ≤ 1000 pF</td> <td>C &gt; 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 border="1"> <tr> <td>Nominal capacitance</td> <td>C &lt; 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>	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 < 1 μF	Measuring frequency	1 kHz ± 10 %	Measuring voltage	1.0 ± 0.2 Vrms															
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 < 1 μF																																
Measuring frequency	1 kHz ± 10 %																																
Measuring voltage	1.0 ± 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 % X7R : ±15 % X5R : ±15 % F : +30, -80 % Y5V : +22, -82 %	Maximum capacitance change at stage 1 to 5 <table border="1"> <thead> <tr> <th>Temp. Char.</th> <th>CΔ, SL B, F</th> <th>X7R</th> <th>X5R</th> <th>Y5V</th> </tr> </thead> <tbody> <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> </tbody> </table> See the technical specifications for details such as measuring voltage.	Temp. Char.	CΔ, SL B, F	X7R	X5R	Y5V	1	20 °C	25 °C	25 °C	25 °C	2	-25 °C	-55 °C	-55 °C	-30 °C	3 (Ref. Temp.)	20 °C	25 °C	25 °C	25 °C	4	85 °C	125 °C	85 °C	85 °C	5	20 °C	25 °C	25 °C	25 °C
Temp. Char.	CΔ, SL B, F	X7R	X5R	Y5V																													
1	20 °C	25 °C	25 °C	25 °C																													
2	-25 °C	-55 °C	-55 °C	-30 °C																													
3 (Ref. Temp.)	20 °C	25 °C	25 °C	25 °C																													
4	85 °C	125 °C	85 °C	85 °C																													
5	20 °C	25 °C	25 °C	25 °C																													
Adhesion	Terminal electrodes shall be free from peeling or signs of peeling.		Applied force: Size: 0201: 2 N Size: 0402 to 0805: 5N Duration: 10 s Size: 0201 to 0402  Size: 0603 to 0805 																														

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

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Item	Specification		Test Method									
	Class 1	Class 2										
Bending Strength	Appearance: No mechanical damage Capacitance change: Within $\pm 5\%$ or $\pm 0.5$ pF whichever is larger.	Appearance: No mechanical damage Capacitance change: Temp. Char. B, X7R, X5R : within $\pm 12.5\%$ F, Y5V : within $\pm 30\%$	Bending value:1 mm Bending speed:1 mm/ 									
Vibration Proof	Appearance: No mechanical damage. Capacitance: within the specified tolerance Q, tan $\delta$ : 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 $\pm 2.5\%$ or $\pm 0.25$ pF whichever is larger. Q,tan $\delta$ :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 $\pm 7.5\%$ F, Y5V : within $\pm 20\%$ tan $\delta$ :Initial standard value IR:Initial standard value Withstand voltage: No dielectric breakdown and/or damage	Soldering bath method Preconditioning:Heat treatment/Class 2 <sup>(*)</sup> Solder temperature:270 $\pm$ 5 °C Dipping period:3.0 $\pm$ 0.5 s Preheat condition: <table border="1" data-bbox="1018 869 1444 990"> <thead> <tr> <th>Order</th> <th>Temp. (°C)</th> <th>Size 0805 max.</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>80 to 100</td> <td>120 to 180 s</td> </tr> <tr> <td>2</td> <td>150 to 200</td> <td>120 to 180 s</td> </tr> </tbody> </table> Recovery (Standard condition): Class 1:24 $\pm$ 2 h Class 2:48 $\pm$ 4 h	Order	Temp. (°C)	Size 0805 max.	1	80 to 100	120 to 180 s	2	150 to 200	120 to 180 s
Order	Temp. (°C)	Size 0805 max.										
1	80 to 100	120 to 180 s										
2	150 to 200	120 to 180 s										
Solderability	More than 95 % of the soldered area of both terminal electrodes should be covered with fresh solder.		Soldering bath method Solder temperature:230 $\pm$ 5 °C Dipping period:4 $\pm$ 1 s Solder:H63A (JIS Z 3282)									
Temperature Cycle	Appearance: No mechanical damage Capacitance change: Within $\pm 2.5\%$ or $\pm 0.25$ pF whichever is larger. Q,tan $\delta$ :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 $\pm 7.5\%$ F, Y5V : within $\pm 20\%$ tan $\delta$ :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 $\pm$ 3 min Step 2:Room temp. 3 min max. Step 3:Maximum operationing temp. 30 $\pm$ 3 min Step 4:Room temp. 3 min max. Number of cycles:5 cycles Recovery (Standard condition) Class 1:24 $\pm$ 2 h Class 2:48 $\pm$ 4 h									
Damp Heat (Steady state)	Appearance: No mechanical damage Capacitance change: Within $\pm 5\%$ or $\pm 0.5$ pF whichever is larger. Q: 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 tan $\delta$ : C>1000 pF:tan $\delta$ $\leq$ 0.004 C:Nominal capacitance in pF IR: 1000 M $\Omega$ or 50/C (M $\Omega$ ) Whichever is less. C:Nominal capacitance in $\mu$ F	Appearance: No mechanical damage Capacitance change: Temp. Char. B, X7R, X5R: Within $\pm 20\%$ F, Y5V: Within $\pm 30\%$ tan $\delta$ : Temp. Char. B, X7R, X5R: 0.25 max. F, Y5V: 0.3 max. IR: 1000 M $\Omega$ or 50/C (M $\Omega$ ) Whichever is less. Note:10/C (M $\Omega$ ) min. for DC 10 V max. C:Nominal capacitance in $\mu$ F Please see the technical specifications for details.	Preconditioning:Heat treatment/Class 2 <sup>(*)</sup> 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									

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

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

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

(\*2) Voltage treatment: 1 h of voltage treatment under the specified temperature and voltage for testing followed by  $48 \pm 4$  h of recovery under standard conditions

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### ■ 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.				Part No.	Dim. T (mm)	Temp. Char.					
				CK	CJ	CH	CG			CK	CJ	CH	CG		
0.5	±0.25 pF(C)	ECJZEC1E0R5C	0.3	○	—	—	—								
1		ECJZEC1E010□	0.3	○	—	—	—								
1.5		ECJZEC1E1R5□	0.3	○	—	—	—								
2	±0.25 pF (C)	ECJZEC1E020□	0.3	○	—	—	—								
3	or	ECJZEC1E030□	0.3	—	○	—	—								
4	±0.5 pF (D)	ECJZEC1E040□	0.3	—	—	○	—								
5		ECJZEC1E050□	0.3	—	—	○	—								
6		ECJZEC1E060D	0.3	—	—	○	—								
7		ECJZEC1E070D	0.3	—	—	○	—								
8	±0.5 pF (D)	ECJZEC1E080D	0.3	—	—	○	—								
9		ECJZEC1E090D	0.3	—	—	○	—								
10	±0.5 pF (D) or ±1 pF (F)	ECJZEC1E100□	0.3	—	—	○	○								
12		ECJZEC1E120□	0.3	—	—	○	○								
15		ECJZEC1E150□	0.3	—	—	○	○								
18		ECJZEC1E180□	0.3	—	—	○	○								
22		ECJZEC1E220□	0.3	—	—	○	○								
27		ECJZEC1E270□	0.3	—	—	○	○								
33	±5 % (J)	ECJZEC1E330□	0.3	—	—	○	○								
39	or							ECJZEC1C390□	0.3	—	—	○	○		
47	±10 % (K)							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.

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#### ● 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.			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		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	±10 % (K)											ECJZEB1C332□	0.3	○	—	○	ECJZEB1A332□	0.3	○	—	○
4700	or											ECJZEB1A472□	0.3	—	—	○	ECJZEB0J472□	0.3	—	—	○
6800	±20 % (M)											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. :  $\Delta$ )

Rated voltage		DC 50 V					
Capacitance (pF)	Capacitance Tolerance	Part No.	Dim. T (mm)	Temp. Char.			
				CK	CJ	CH	CG
0.5	$\pm 0.25$ pF (C)	ECJ0EC1H0R5C	0.5	○	—	—	—
1	$\pm 0.25$ pF (C)	ECJ0EC1H010□	0.5	○	—	—	—
1.5		ECJ0EC1H1R5□	0.5	○	—	—	—
2	$\pm 0.25$ pF (C) or $\pm 0.5$ pF (D)	ECJ0EC1H020□	0.5	○	—	—	—
3		ECJ0EC1H030□	0.5	—	○	—	—
4	$\pm 0.5$ pF (D)	ECJ0EC1H040□	0.5	—	—	○	—
5		ECJ0EC1H050□	0.5	—	—	○	—
6	$\pm 0.5$ pF(D)	ECJ0EC1H060D	0.5	—	—	○	—
7		ECJ0EC1H070D	0.5	—	—	○	—
8		ECJ0EC1H080D	0.5	—	—	○	—
9		ECJ0EC1H090D	0.5	—	—	○	—
10	$\pm 0.5$ pF (D) or $\pm 1$ pF (F)	ECJ0EC1H100□	0.5	—	—	○	○
12	$\pm 5$ % (J) or $\pm 10$ % (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	—	—	○	○	

□: Capacitance tolerance code.

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

Recommend soldering method: Reflow soldering.

◆ 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	$\pm 0.25$ pF (C)	ECJ0EG1H0R5C	0.5	○	
1	$\pm 0.25$ pF (C)	ECJ0EG1H010□	0.5	○	
1.5		ECJ0EG1H1R5□	0.5	○	
2	$\pm 0.25$ pF (C) or $\pm 0.5$ pF (D)	ECJ0EG1H020□	0.5	○	
3		ECJ0EG1H030□	0.5	○	
4	$\pm 0.5$ pF (D)	ECJ0EG1H040□	0.5	○	
5		ECJ0EG1H050□	0.5	○	
6	$\pm 0.5$ pF(D)	ECJ0EG1H060D	0.5	○	
7		ECJ0EG1H070D	0.5	○	
8		ECJ0EG1H080D	0.5	○	
9		ECJ0EG1H090D	0.5	○	
10	$\pm 0.5$ pF (D) or $\pm 1$ pF (F)	ECJ0EG1H100□	0.5	○	
12	$\pm 5$ % (J) or $\pm 10$ % (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	○		

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

#### ● Class 1

◆ Temperature Characteristic Code : C (Temp. Char. :  $\Delta$ )

Rated voltage		DC 50 V					
Capacitance (pF)	Capacitance Tolerance	Part No.	Dim. T (mm)	Temp. Char.			
				CK	CJ	CH	CG
0.5	$\pm 0.25$ pF (C)	ECJ1VC1H0R5C	0.8	○	—	—	—
1	$\pm 0.25$ pF (C)	ECJ1VC1H010□	0.8	○	—	—	—
1.5		ECJ1VC1H1R5□	0.8	○	—	—	—
2	$\pm 0.25$ pF (C) or $\pm 0.5$ pF (D)	ECJ1VC1H020□	0.8	○	—	—	—
3		ECJ1VC1H030□	0.8	—	○	—	—
4	$\pm 0.5$ pF (D)	ECJ1VC1H040□	0.8	—	—	○	—
5		ECJ1VC1H050□	0.8	—	—	○	—
6	$\pm 0.5$ pF (D)	ECJ1VC1H060D	0.8	—	—	○	—
7		ECJ1VC1H070D	0.8	—	—	○	—
8		ECJ1VC1H080D	0.8	—	—	○	—
9		ECJ1VC1H090D	0.8	—	—	○	—
10		$\pm 0.5$ pF (D) or $\pm 1$ pF (F)	ECJ1VC1H100□	0.8	—	—	○
12	$\pm 5$ % (J) or $\pm 10$ % (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	—	—	○	○	

□: Capacitance tolerance code.

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

Recommend soldering method: Reflow soldering.

◆ 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	$\pm 0.25$ pF (C)	ECJ1VG1H0R5C	0.8	○	
1	$\pm 0.25$ pF (C)	ECJ1VG1H010□	0.8	○	
1.5		ECJ1VG1H1R5□	0.8	○	
2	$\pm 0.25$ pF (C) or $\pm 0.5$ pF (D)	ECJ1VG1H020□	0.8	○	
3		ECJ1VG1H030□	0.8	○	
4	$\pm 0.5$ pF (D)	ECJ1VG1H040□	0.8	○	
5		ECJ1VG1H050□	0.8	○	
6	$\pm 0.5$ pF (D)	ECJ1VG1H060D	0.8	○	
7		ECJ1VG1H070D	0.8	○	
8		ECJ1VG1H080D	0.8	○	
9		ECJ1VG1H090D	0.8	○	
10		$\pm 0.5$ pF (D) or $\pm 1$ pF (F)	ECJ1VG1H100□	0.8	○
12	$\pm 5$ % (J) or $\pm 10$ % (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	○		

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

#### ● Class 1

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

Rated voltage		DC 50 V			
Capacitance (pF)	Capacitance Tolerance	Part No.	Dim. T (mm)	Temp. Char.	
				CH	CG
27		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	±5 % (J)	ECJ2VC1H221□	0.6	○	○
270	or	ECJ2VC1H271□	0.6	○	○
330	±10 % (K)	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.	
				CH	SL
27		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	±5 % (J)	ECJ2VG1H221□	0.6	○	○
270	or	ECJ2VG1H271□	0.6	○	○
330	±10 % (K)	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.

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### ■ 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		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	±10 % (K)	ECJ2VB1H153□	0.6	○	○	—															
18000	or	ECJ2VB1H183K	0.6	○	○	—															
22000	±20 % (M)	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		ECJ2VF1H103Z	0.6	○	○								
22000		ECJ2VF1H223Z	0.6	○	○								
47000		ECJ2VF1H473Z	0.6	○	○								
100000	+80, -20 % (Z)	ECJ2VF1H104Z	0.85	○	○	ECJ2VF1E104Z	0.6	○	○	ECJ2VF1C104Z	0.6	○	○
220000		ECJ2VF1H224Z	0.85	○	○	ECJ2VF1E224Z	0.85	○	○	ECJ2VF1C224Z	0.6	○	○
470000						ECJ2VF1E474Z	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.

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