

ECJ-0EB1C333K Datasheet

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DiGi Electronics Part Number	ECJ-0EB1C333K-DG
Manufacturer	Panasonic Electronic Components
Manufacturer Product Number	ECJ-0EB1C333K
Description	CAP CER 0.033UF 16V X5R 0402
Detailed Description	0.033 μ F \pm 10% 16V Ceramic Capacitor X5R 0402 (10 05 Metric)

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Purchase and inquiry

Manufacturer Product Number:

ECJ-0EB1C333K

Series:

ECJ

Capacitance:

0.033 μ F

Voltage - Rated:

16V

Operating Temperature:

-55°C ~ 85°C

Ratings:

-

Failure Rate:

-

Package / Case:

0402 (1005 Metric)

Height - Seated (Max):

-

Lead Spacing:

-

Base Product Number:

ECJ-0EB

Manufacturer:

Panasonic Electronic Components

Product Status:

Obsolete

Tolerance:

\pm 10%

Temperature Coefficient:

X5R

Features:

-

Applications:

General Purpose

Mounting Type:

Surface Mount, MLCC

Size / Dimension:

0.039" L x 0.020" W (1.00mm x 0.50mm)

Thickness (Max):

0.022" (0.55mm)

Lead Style:

-

Environmental & Export classification

Moisture Sensitivity Level (MSL):

1 (Unlimited)

HTSUS:

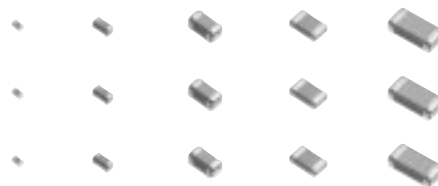
8532.24.0020

ECCN:

EAR99

**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

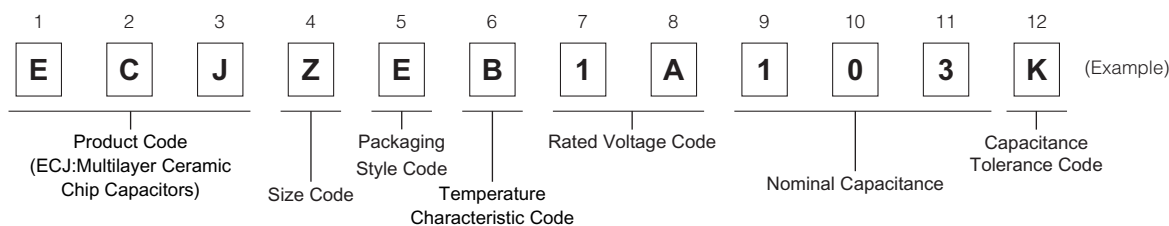
■ **Handling Precautions**

See Page 48 to 53

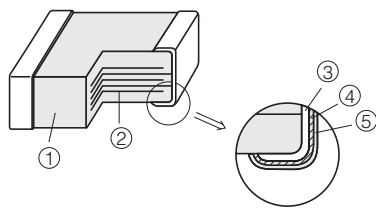
■ **Packaging Specifications**

See Page 45, 46, 56

■ **Explanation of Part Numbers**

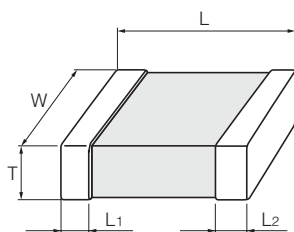


■ **Construction**



No	Name	
①	Ceramic dielectric	
②	Internal electrode	
③	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	

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.

Panasonic**Multilayer Ceramic Capacitors(For General Usage)****■ 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)

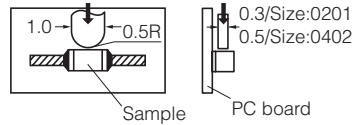
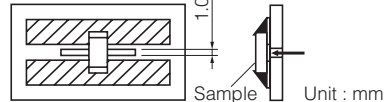
■ Capacitance Tolerance

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

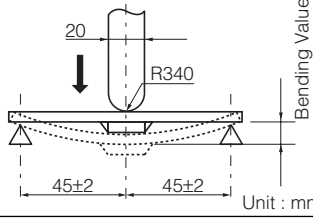
Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.
Should a safety concern arise regarding this product, please be sure to contact us immediately.

00 Sep. 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"> <thead> <tr> <th>Nominal capacitance</th> <th>C ≤ 1000 pF</th> <th>C > 1000 pF</th> </tr> </thead> <tbody> <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> </tbody> </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"> <thead> <tr> <th>Nominal capacitance</th> <th>C < 1 μF</th> </tr> </thead> <tbody> <tr> <td>Measuring frequency</td> <td>1 kHz ± 10 %</td> </tr> <tr> <td>Measuring voltage</td> <td>1.0 ± 0.2 Vrms</td> </tr> </tbody> </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																															
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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  Unit : mm																														

*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 $\pm 5\%$ or ± 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/  Unit : 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 $\pm 2.5\%$ 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 $\pm 7.5\%$ F, Y5V : within $\pm 20\%$ 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 ^(*) Solder temperature:270 \pm 5 °C Dipping period:3.0 \pm 0.5 s Preheat condition: <table border="1" data-bbox="1018 869 1444 987"> <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 ± 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 $\pm 7.5\%$ F, Y5V : within $\pm 20\%$ 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 \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 ± 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 δ : C>1000 pF:tan δ \leq 0.004 C:Nominal capacitance in pF IR: 1000 M Ω or 50/C (M Ω) Whichever is less. C:Nominal capacitance in μ F	Appearance: No mechanical damage Capacitance change: Temp. Char. B, X7R, X5R: Within $\pm 20\%$ F, Y5V: Within $\pm 30\%$ tan δ : Temp. Char. B, X7R, X5R: 0.25 max. F, Y5V: 0.3 max. IR: 1000 M Ω or 50/C (M Ω) Whichever is less. Note:10/C (M Ω) min. for DC 10 V max. C:Nominal capacitance in μ F Please see the technical specifications for details.	Preconditioning:Heat treatment/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									

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

Panasonic**Multilayer Ceramic Capacitors(For General Usage)**

Item	Specification		Test Method
	Class 1	Class 2	
Damp Heat Load	Appearance: No mechanical damage Capacitance change: Within $\pm 7.5\%$ or ± 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 δ : $C > 1000$ 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 μ F)	Appearance: No mechanical damage Capacitance change: Temp. Char. B, X7R, X5R: Within $\pm 20\%$ F, Y5V: Within $\pm 30\%$ tan δ : Temp. Char. B, X7R, X5R: 0.25 max. F, Y5V: 0.3 max. IR: 500 M Ω or $25/C$ (M Ω) Whichever is less. Note: $5/C$ (M Ω) min. for DC 10 V max. C:Nominal capacitance in μ F Please see the technical specifications for details.	Preconditioning: Voltage treatment/Class 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 $\pm 3\%$ or ± 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 δ : $C > 1000$ 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 μ F	Appearance: No mechanical damage Capacitance change: Temp. Char. B, X7R, X5R: Within $\pm 20\%$ F, Y5V: Within $\pm 30\%$ tan δ : Temp. Char. B, X7R, X5R: 0.25 max. F, Y5V: 0.3 max. IR: 1000 M Ω or $50/C$ (M Ω) Whichever is less. Note: $10/C$ (M Ω) min. for DC 10 V max. C:Nominal capacitance in μ F Please see the technical specifications for details.	Preconditioning: Voltage treatment/Class 2 ^(*) Temperature: Maximum operating temp. ± 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 ± 2 h Class 2: 48 ± 4 h

(*1) Heat treatment: 1 h of heat treatment at $150 \pm 0/-10$ °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



Multilayer Ceramic Capacitors(For General Usage)

■ Standard Products for EIA “0201”, Taped Version

● Class 1

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

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	±0.25 pF (C) or ±0.5 pF (D)	ECJZEC1E010□	0.3	○	—	—	—									
1.5		ECJZEC1E1R5□	0.3	○	—	—	—									
2	±0.5 pF (D)	ECJZEC1E020□	0.3	○	—	—	—									
3		ECJZEC1E030□	0.3	—	○	—	—									
4	±0.5 pF (D)	ECJZEC1E040□	0.3	—	—	○	—									
5		ECJZEC1E050□	0.3	—	—	○	—									
6	±0.5 pF (D)	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	±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.			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)	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.

Panasonic**Multilayer Ceramic Capacitors(For General Usage)**

■ Standard Products for EIA "0402", Taped Version

● Class 1

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

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)	ECJ0EC1H010□	0.5	○	—	—	—
1.5		ECJ0EC1H1R5□	0.5	○	—	—	—
2	± 0.5 pF (D)	ECJ0EC1H020□	0.5	○	—	—	—
3		ECJ0EC1H030□	0.5	—	○	—	—
4	± 0.5 pF (D)	ECJ0EC1H040□	0.5	—	—	○	—
5		ECJ0EC1H050□	0.5	—	—	○	—
6		ECJ0EC1H060D	0.5	—	—	○	—
7	± 0.5 pF(D)	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	—	—	○	○	

□: 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	± 0.25 pF (C)	ECJ0EG1H0R5C	0.5	○	
1	± 0.25 pF (C)	ECJ0EG1H010□	0.5	○	
1.5		ECJ0EG1H1R5□	0.5	○	
2	± 0.5 pF (D)	ECJ0EG1H020□	0.5	○	
3		ECJ0EG1H030□	0.5	○	
4	± 0.5 pF (D)	ECJ0EG1H040□	0.5	○	
5		ECJ0EG1H050□	0.5	○	
6		ECJ0EG1H060D	0.5	○	
7	± 0.5 pF(D)	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	○		

Panasonic

Multilayer Ceramic Capacitors(For General Usage)

■ Standard Products for EIA "0603", 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.			
				CK	CJ	CH	CG
0.5	±0.25 pF (C)	ECJ1VC1H0R5C	0.8	○	—	—	—
1	±0.25 pF (C) or	ECJ1VC1H010□	0.8	○	—	—	—
1.5		ECJ1VC1H1R5□	0.8	○	—	—	—
2		ECJ1VC1H020□	0.8	○	—	—	—
3	±0.5 pF (D)	ECJ1VC1H030□	0.8	—	○	—	—
4		ECJ1VC1H040□	0.8	—	—	○	—
5	±0.5 pF (D)	ECJ1VC1H050□	0.8	—	—	○	—
6		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	—	—	○	○	

□: 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	±0.25 pF (C)	ECJ1VG1H0R5C	0.8	○	
1	±0.25 pF (C) or	ECJ1VG1H010□	0.8	○	
1.5		ECJ1VG1H1R5□	0.8	○	
2		ECJ1VG1H020□	0.8	○	
3	±0.5 pF (D)	ECJ1VG1H030□	0.8	○	
4		ECJ1VG1H040□	0.8	○	
5	±0.5 pF (D)	ECJ1VG1H050□	0.8	○	
6		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	○		

Panasonic**Multilayer Ceramic Capacitors(For General Usage)**

■ 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.



Multilayer Ceramic Capacitors(For General Usage)

■ 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	○	○	—	ECJ2VB1E154□	1.25	○	○	—	ECJ2VB1C154□	0.85	○	○	—						
220000	ECJ2FB1H224□	1.25	○	○	—	ECJ2VB1E224□	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					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.

OUR CERTIFICATE

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