



**THE DATASHEET OF
ECJ-TVC1H221K**



Multilayer Ceramic Capacitors (4 Array Type)

Series: **ECJR, ECJT**



■ Features

- 4 miniature capacitors built within 0805 and 1206 case sizes
- Improved placement time on mounting machines
- Low self-inductance and excellent frequency characteristics
- RoHS compliant

■ Recommended Applications

- Input/Output circuit for computer motherboards
 - Serial port
 - Video port
 - Parallel port

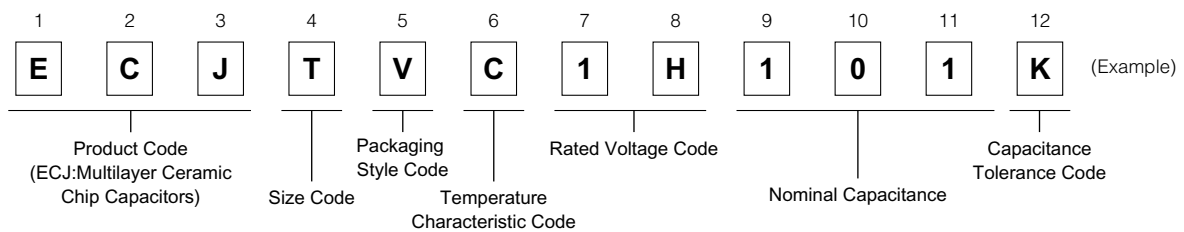
■ Handling Precautions

See Page 48 to 53

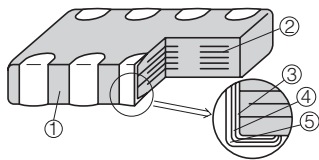
■ Packaging Specifications

See Page 45, 46, 56

■ Explanation of Part Numbers

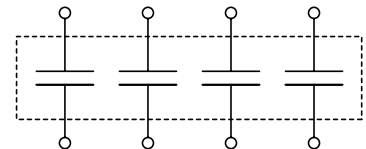


■ Construction

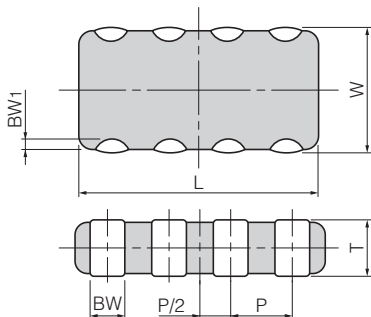


| No | Name |
|----|------------------------|
| ① | Ceramic dielectric |
| ② | Internal electrode |
| ③ | Substrate electrode |
| ④ | Intermediate electrode |
| ⑤ | External electrode |

Schematic



■ Dimensions in mm (not to scale)



| Size Code | Size (EIA) | L | W | T | BW | BW ₁ | P |
|-----------|------------|-----------|-----------|-----------|-----------|-------------------------------------|----------|
| T | 0805 | 2.00±0.15 | 1.25±0.15 | 0.85±0.10 | 0.25±0.10 | 0.2 ^{+0.3} _{-0.1} | 0.5±0.1 |
| R | 1206 | 3.2±0.2 | 1.6±0.2 | 0.85±0.10 | 0.40±0.15 | 0.2 ^{+0.3} _{-0.1} | 0.80±0.1 |

■ Packaging Styles and Standard Packaging Quantity

Quantity: pcs./reel

| Packaging Style Code | Packaging Styles | | Size | 0805 | 1206 |
|----------------------|------------------|-----------|--------------------------------|-------|------|
| | V | φ180 reel | Paper taping (Pitch : 4 mm) | 4,000 | |

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

Temperature Characteristics

● Class 1

| Temperature Characteristic Code | Temperature Characteristics | Temp. Coeff. (ppm/°C) | Rate of Capacitance change at each Temp. (%) | | | |
|---------------------------------|-----------------------------|-----------------------|--|-------|-------|-------|
| | | | -25 °C | | 85 °C | |
| | | | max. | min. | max. | min. |
| C | CH | 0 ± 60 | 0.49 | -0.27 | 0.39 | -0.39 |

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

● 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 31 to 32.

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. | 100 | 101 | 104 | 105 |
|---------------------|-------|--------|---------------------|-----------------------|
| Nominal Capacitance | 10 pF | 100 pF | 100,000 pF (0.1 μF) | 1,000,000 pF (1.0 μF) |

Capacitance tolerance

| Class | Temperature Characteristics | | Tolerance Code | Capacitance Tolerance | |
|-------|-----------------------------|-------------------|----------------|-----------------------|-------|
| 1 | CH | Capacitance range | C=10 pF | F | ±1 pF |
| | | | C>10 pF | K | ±10 % |
| 2 | B, X7R, X5R | | M | ±20 % | |
| | F, Y5V | | Z | +80, -20 % | |

Specifications and Testing Methods

| Item | Specifications | | Test Method | |
|--|---|--|---|---------------|
| | Class 1 | Class 2 | | |
| Operating Temperature Range | Temp. Char. CH: -55 to 125 °C | Temp. Char. B, X7R: -55 to 125 °C X5R: -55 to 85 °C 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 (IR) | 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+20 C 30 pF≤C≤1000 pF: Q≥1000 C: Nominal Cap. in pF | tan δ: Temp. Char. B, X7R: 0.025 max. X5R: 0.075 max. F, Y5V: 0.125 max. Please see the technical specifications for details. | Class 1 | |
| | | | Measuring frequency | 1 MHz ± 10 % |
| | | | Measuring voltage | 0.5 to 5 Vrms |
| | | | Class 2 Preconditioning: The capacitors shall be kept in temperature of 150 +0/-10 ± for 1 hour and subject to standard conditions* for 48±4 hours before initial measurement. | |
| | | | Measuring frequency | 1 kHz ± 10 % |
| | | | Measuring voltage | 1.0±0.2 Vrms |

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

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.

■ Standard Products for EIA "0805", Taped Version

● Class 1

- ◆ Temperature Characteristic Code: C (Temperature Characteristics: CH)

| Rated voltage | | DC 50 V | | |
|------------------|-----------------------|--------------|-------------|-------------|
| Capacitance (pF) | Capacitance Tolerance | Part No. | Dim. T (mm) | Temp. Char. |
| 10 | ±1 pF (F) | ECJTVC1H100F | 0.85 | ○ |
| 22 | ±10 % (K) | ECJTVC1H220K | 0.85 | ○ |
| 47 | | ECJTVC1H470K | 0.85 | ○ |
| 100 | | ECJTVC1H101K | 0.85 | ○ |
| 220 | | ECJTVC1H221K | 0.85 | ○ |

Standard packaging quantity of Packaging Style Code "V" (T = 0.85 mm): 4,000 pcs./reel
Avoid flow soldering.

● 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. | | | |
| | | | | B | X7R | | | B | X7R | | | B | X7R | Part No. | Dim. T (mm) |
| 470 | ±20 % (M) | ECJTVB1H471M | 0.85 | ○ | ○ | | | | | | | | | | |
| 1000 | | ECJTVB1H102M | 0.85 | ○ | ○ | | | | | | | | | | |
| 2200 | | ECJTVB1H222M | 0.85 | ○ | ○ | | | | | | | | | | |
| 4700 | | ECJTVB1E472M | 0.85 | ○ | ○ | | | | | | | | | | |
| 10000 | | | | | | | | | | ECJTVB1C103M | 0.85 | ○ | ○ | | |
| 47000 | | | | | | | | | | | | | | ECJTVB1A473M | 0.85 |
| 100000 | | | | | | | | | | | | | ECJTVB1A104M | 0.85 | ○ |

| Rated voltage | | DC 6.3 V | | |
|------------------|-----------------------|--------------|-------------|-------------|
| Capacitance (μF) | Capacitance Tolerance | Part No. | Dim. T (mm) | Temp. Char. |
| 1.0 | ±20 % (M) | ECJTVB0J105M | 0.85 | ○ |

Standard packaging quantity of Packaging Style Code "V" (T = 0.85 mm): 4,000 pcs./reel
Avoid flow soldering.

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

| Rated voltage | | DC 16 V | | | |
|------------------|-----------------------|--------------|-------------|-------------|-----|
| Capacitance (μF) | Capacitance Tolerance | Part No. | Dim. T (mm) | Temp. Char. | |
| | | | | F | Y5V |
| 0.1 | +80, -20 % (Z) | ECJTVF1C104Z | 0.85 | ○ | ○ |

Standard packaging quantity of Packaging Style Code "V" (T = 0.85 mm): 4,000 pcs./reel
Avoid flow soldering.

Standard Products for EIA "1206", Taped Version

Class 1

- Temperature Characteristic Code: C (Temperature Characteristics: CH)

| Rated voltage | | DC 50 V | | |
|------------------|-----------------------|--------------|-------------|-------------|
| Capacitance (pF) | Capacitance Tolerance | Part No. | Dim. T (mm) | Temp. Char. |
| 10 | ±1 pF (F) | ECJRVC1H100F | 0.85 | ○ |
| 15 | ±10 % (K) | ECJRVC1H150K | 0.85 | ○ |
| 22 | | ECJRVC1H220K | 0.85 | ○ |
| 33 | | ECJRVC1H330K | 0.85 | ○ |
| 47 | | ECJRVC1H470K | 0.85 | ○ |
| 68 | | ECJRVC1H680K | 0.85 | ○ |
| 100 | | ECJRVC1H101K | 0.85 | ○ |
| 150 | | ECJRVC1H151K | 0.85 | ○ |
| 220 | | ECJRVC1H221K | 0.85 | ○ |
| 330 | | ECJRVC1H331K | 0.85 | ○ |
| 470 | | ECJRVC1H471K | 0.85 | ○ |

Standard packaging quantity of Packaging Style Code "V" (T = 0.85 mm): 4,000 pcs./reel
Avoid flow soldering.

Class 2

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

| Rated voltage | | DC 50 V | | | | DC 16 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. |
| | | | | B | X7R | | | B | X7R | | | |
| 470 | ±20 % (M) | ECJRVB1H471M | 0.85 | ○ | ○ | | | | | | | |
| 680 | | ECJRVB1H681M | 0.85 | ○ | ○ | | | | | | | |
| 1000 | | ECJRVB1H102M | 0.85 | ○ | ○ | | | | | | | |
| 1500 | | ECJRVB1H152M | 0.85 | ○ | ○ | | | | | | | |
| 2200 | | ECJRVB1H222M | 0.85 | ○ | ○ | | | | | | | |
| 3300 | | ECJRVB1H332M | 0.85 | ○ | ○ | | | | | | | |
| 4700 | | ECJRVB1H472M | 0.85 | ○ | ○ | | | | | | | |
| 6800 | | ECJRVB1H682M | 0.85 | ○ | ○ | | | | | | | |
| 10000 | | ECJRVB1H103M | 0.85 | ○ | ○ | | | | | | | |
| 100000 | | | | | | ECJRVB1C104M | 0.85 | ○ | ○ | | | |
| 1000000 | | | | | | | | | ECJRVB0J105M | 0.85 | ○ | |

Standard packaging quantity of Packaging Style Code "V" (T = 0.85 mm): 4,000 pcs./reel
Avoid flow soldering.

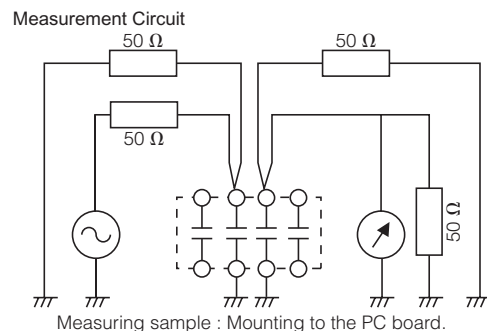
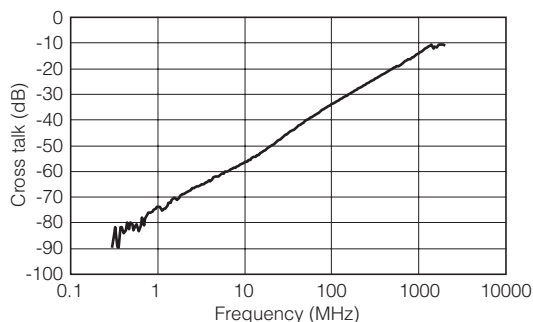
- Temperature Characteristic Code: F (Temperature Characteristics: F, Y5V)

| Rated voltage | | DC 25 V | | | | DC 10 V | | | |
|------------------|-----------------------|--------------|-------------|-------------|-----|----------|-------------|-------------|-----|
| Capacitance (μF) | Capacitance Tolerance | Part No. | Dim. T (mm) | Temp. Char. | | Part No. | Dim. T (mm) | Temp. Char. | |
| | | | | F | Y5V | | | F | Y5V |
| 0.1 | +80, -20 % | ECJRVF1E104Z | 0.85 | ○ | ○ | | | | |
| 1.0 | (Z) | | | | | | | | |

Standard packaging quantity of Packaging Style Code "V" (T = 0.85 mm): 4,000 pcs./reel
Avoid flow soldering.



Cross talk characteristics [Ex.]

Size: 0805, Temperature Characteristics: CH, 100 pF



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