

Ceramic Capacitors (Safety Regulations) For Surface Mounting Types

Discontinued

- Type HC (Sub-Class Y1)
- Type FC (Sub-Class Y2)
- Type BC (Sub-Class Y2)



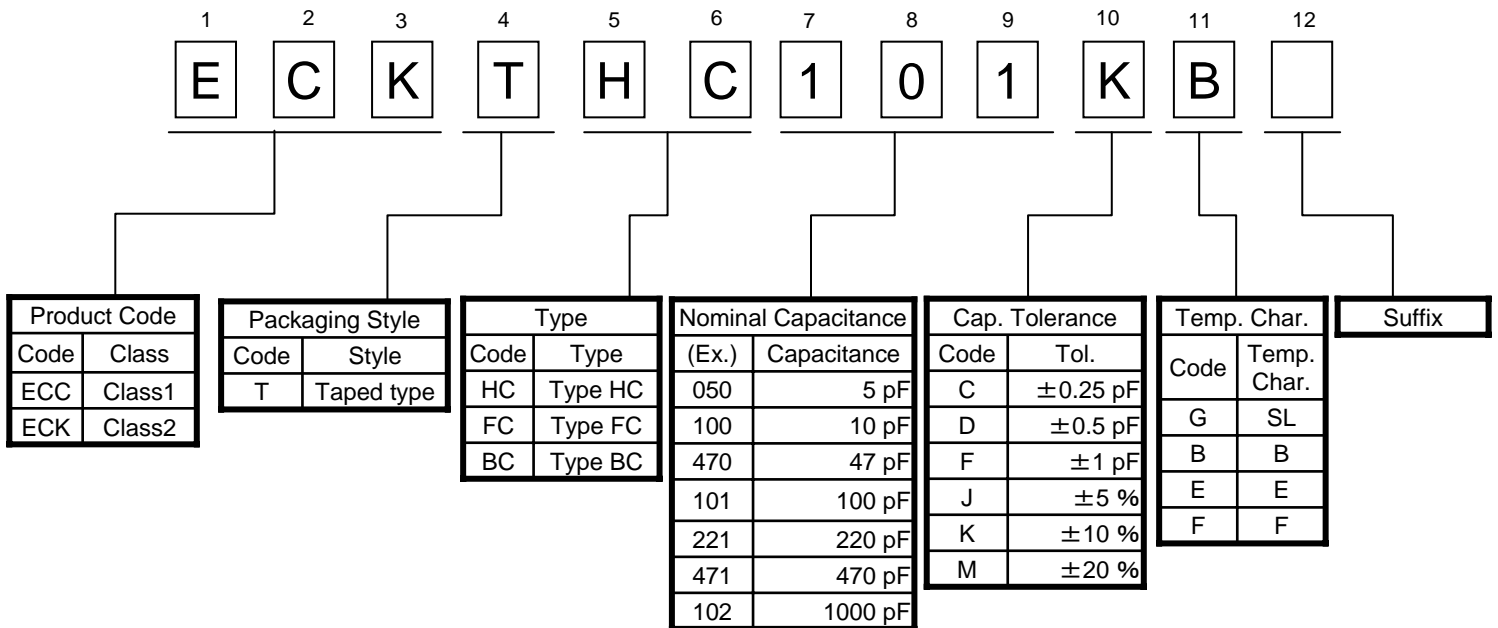
■ Features

- Resin molded SMD type for flow/reflow soldering (HC) and reflow soldering (FC,BC)
- High reliability
- Safety requirement approved by UL, SEMKO, NEMKO, FIMKO, DEMKO and KTL* * KTL: only Type FC

■ Recommended Application

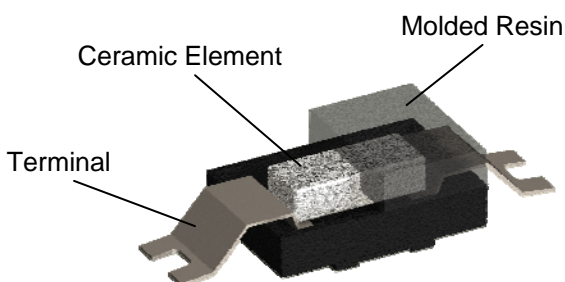
- Interference suppressors circuit and Isolation circuit of IT equipment such as MODEM.
- Interference suppressors circuit of small power supply machinery such as DC-DC converters and power modules.
- Interference suppressors circuit of AC primary side for general electronic equipment.

■ Explanation of Part Numbers

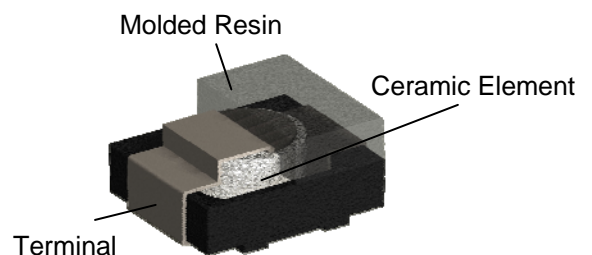


■ Construction

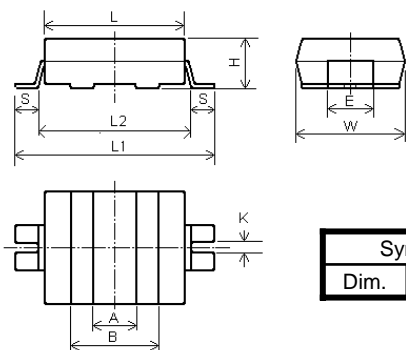
- Type HC



- Type FC,BC



■ Dimensions in mm (not to scale) 【Type HC:Y1】

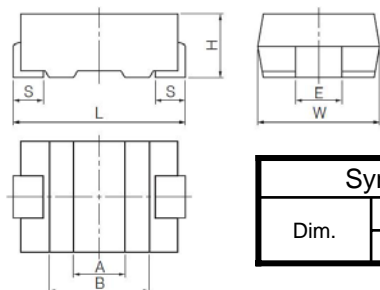


| Symbol | L | W | H | S | E | A | B | L1 | L2 |
|--------------|---------|---------|---------|----------|---------|-------|-------|----------|---------|
| Dim. Type HC | 6.8±0.3 | 4.5±0.2 | 2.5 max | 1.0±0.50 | 2.5±0.2 | (1.7) | (3.1) | 12.0±0.5 | 8.0 min |

■ Specifications 【Type HC:Y1】

| Characteristics | Temp. Char. B/Y5P | | |
|---------------------------------|---|------------------|-------------|
| Operating Temperature Range | -25 to 125 °C | | |
| Rated Voltage | 250 VAC | | |
| Dielectric Withstanding Voltage | 4000 VAC for 1 minute | | |
| Capacitance | Within the specified tolerance, when measured at 1kHz±20%, 1 to 5 Vrms. and 20 °C | | |
| Q or Dissipation Factor (tan δ) | tan δ < 0.025 at 1 kHz±20 %, 1 to 5 Vrms. and 20 °C | | |
| Insulation Resistance | 10000 MΩ min. at 500 VDC and 1 minute electrification | | |
| Temperature Characteristics | Char. | Max. Cap. Change | Temp. Range |
| | B/Y5P | ±10% | -25 ~ 85 °C |

■ Dimensions in mm (not to scale) 【Type BC,FC:Y2】



| Symbol | L | W | H | S | E | A | B |
|--------|---------|---------|---------|---------|-----------|---------|-------------|
| Dim. | Type FC | 5.7±0.5 | 4.5±0.3 | 2.3 max | 0.85±0.30 | 2.5±0.2 | (1.7) (3.1) |
| | Type BC | 7.1±0.5 | 6.3±0.3 | 2.5±0.3 | 1.45±0.30 | 2.5±0.2 | (2.0) (3.7) |

■ Specifications 【Type BC,FC:Y2】

| Characteristics | Temp. Char. SL/GP | Temp. Char. B/Y5P, E/Y5U, F/Y5V | | |
|---------------------------------|---|---|------------------|-------------|
| Operating Temperature Range | -25 to 100 °C | | | |
| Rated Voltage | 250 VAC | | | |
| Dielectric Withstanding Voltage | 1500 VAC for 1 minute | | | |
| Capacitance | Within the specified tolerance, when measured at 1 MHz±20 %, 1 to 5 Vrms. and 20 °C | Within the specified tolerance, when measured at 1 kHz±20 %, 1 to 5 Vrms. and 20 °C | | |
| Q or Dissipation Factor (tan δ) | 30 pF or under Q > 200+10 C (C:Cap.pF) over 30 pF Q > 500 at 1 MHz±20 %, 1 to 5 Vrms. and 20 °C | tan δ < 0.025 at 1 kHz±20 %, 1 to 5 Vrms. and 20 °C | | |
| Insulation Resistance | 10000 MΩ min. at 500 VDC and 1 minute electrification | | | |
| Temperature Characteristics | Temperature Coefficient:+350 to -1000 ppm/ °C over the temperature range 20 to 85 °C | Char. | Max. Cap. Change | Temp. Range |
| | | B/Y5P | ±10% | -25 ~ 85 °C |
| | | E/Y5U | +20,-55% | |
| F/Y5V | +30,-80% | | | |

■ Related Standards and Certificate Number

| Certification Body | Related Standard | Certificate Number | | | Sub-Class | Rated Voltage | Dielectric Withstanding Voltage | Operating Temperature Range |
|--------------------|--------------------|--------------------|--------------------------|---------------------------------|-------------------|---------------|---------------------------------------|---|
| | | Type HC | Type FC | Type BC | | | | |
| UL(USA) | UL60384-14 | E62674 | E62674 | E62674 | HC:Y1 BC/FC:Y2 | 250 VAC | HC: 4000 VAC BC/FC: 1500 VAC | HC: -25 ~ 125°C BC/FC: -25 ~ 100°C |
| | CAN/CSA –E60384-14 | ----- | ----- | E62674 | Y2 | | 1500 VAC | |
| SEMKO(Sweden) | EN60384-14 2005 | 1025027 | 806189 | 1025267 | HC:Y1 BC/FC:Y2 | 250 VAC | HC: 4000 VAC BC/FC: 1500 VAC | |
| FIMKO(Finland) | | FI 26683 | FI 16588A1 FI 17348A2 | FI 26770 | | | | |
| DEMKO(Denmark) | | D-00043 | 310914-01 310698-01 | Issuing certification now | | | | |
| NEMKO(Norway) | | P11213874 | P01100665 P01101830 | P11214054 | | | | |
| KTL(Korea) | K60384-14 | ----- | SU03013- 3001 | ----- | | | | |

■ Ratings and Characteristics

| Type Name | Part Number | Capacitance (pF) | Cap. Tolerance | Temp. Char | Dimensions in mm |
|-----------|-------------|------------------|----------------|------------|--------------------|
| Type HC | ECKTHC101KB | 100 | ±10 % | B/Y5P | 6.8L × 4.5W × 2.5H |
| | ECKTHC221KB | 220 | | | |
| | ECKTHC471KB | 470 | | | |
| | ECKTHC101MB | 100 | ±20 % | | |
| | ECKTHC221MB | 220 | | | |
| | ECKTHC471MB | 470 | | | |
| Type FC | ECCTFC100DG | 10 | ±0.5 pF | SL/GP | 5.7L × 4.5W × 2.3H |
| | ECCTFC150JG | 15 | ±5 % | | |
| | ECCTFC220JG | 22 | | | |
| | ECCTFC330JG | 33 | ±10 % | B/Y5P | |
| | ECKTFC470KB | 47 | | | |
| | ECKTFC101KB | 100 | | | |
| | ECKTFC151KB | 150 | | | |
| | ECKTFC221KB | 220 | | | |
| | ECKTFC331KB | 330 | | | |
| | ECKTFC471KB | 470 | ±20 % | E/Y5U | |
| | ECKTFC102ME | 1000 | | F/Y5V | |
| | ECKTFC152MF | 1500 | | | |
| | ECKTFC222MF | 2200 | | | |
| Type BC | ECCTBC100DG | 10 | ±0.5 pF | SL/GP | 7.1L × 6.3W × 2.5H |
| | ECCTBC150JG | 15 | ±5 % | | |
| | ECCTBC220JG | 22 | | | |
| | ECCTBC330JG | 33 | | | |
| | ECCTBC470JG | 47 | | | |
| | ECCTBC680JG | 68 | | | |
| | ECKTBC101KB | 100 | | ±10 % | |
| | ECKTBC151KB | 150 | | | |
| | ECKTBC221KB | 220 | | | |
| | ECKTBC331KB | 330 | | | |
| | ECKTBC471KB | 470 | | | |
| | ECKTBC681KB | 680 | | | |
| | ECKTBC102ME | 1000 | ±20 % | E/Y5U | |
| | ECKTBC152ME | 1500 | | | |
| | ECKTBC222ME | 2200 | | | |
| | | | | | |

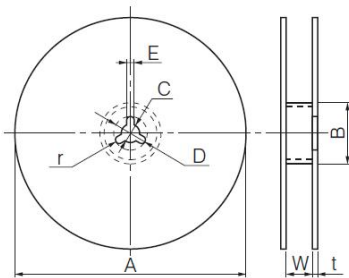
Notes * Other capacitance values are available by special order.

■ Packaging Methods (Taping)

● Minimum Quantity/Packing Unit

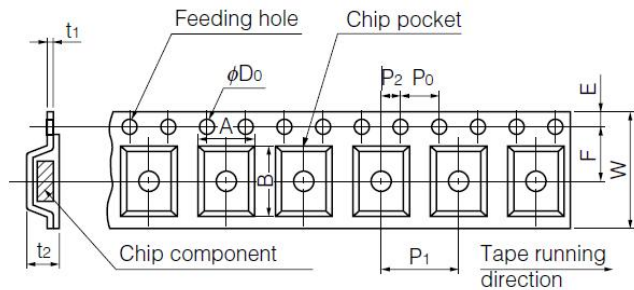
| Type | Packaging style | Part Number | | Minimum Packing Quantity | Packing Quantity in Carton | Carton Dimensions in mm (LWH) |
|---------|-------------------------|--------------|--------------|--------------------------|----------------------------|-------------------------------|
| Type HC | Embossed Carrier Taping | EC□□THC□□□□□ | 100~470pF | 3000 pcs./reel | 6000 pcs | 350 × 350 × 62 |
| Type FC | Embossed Carrier Taping | EC□□TFC□□□□□ | 10 to 2200pF | 3000 pcs./reel | 9000 pcs. | 350 × 350 × 62 |
| Type BC | Embossed Carrier Taping | EC□□TBC□□□□□ | 10 to 2200pF | 2000 pcs./reel | 6000 pcs. | 350 × 350 × 62 |

● Reel



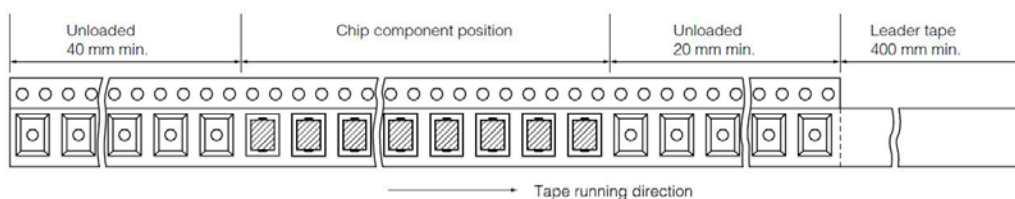
| Symbol | | A | B | C | D | E | W | t | r |
|-----------|---------|--------|--------|-----------|-----------|----------|-----------|----------|------|
| Dim. (mm) | Type HC | 330 ±5 | 60 min | 13.0 ±0.5 | 21.0 ±1.0 | 2.0 ±0.5 | 25.5 ±1.5 | 2.0 ±0.5 | R1.0 |
| | Type FC | | | | | | 13.5 ±1.5 | | |
| | Type BC | | | | | | | | |

● Embossed carrier taping



| Symbol | | A | B | W | F | E | P ₁ | P ₂ | P ₀ | φD ₀ | t ₁ | t ₂ |
|-----------|---------|----------|-----------|-----------|-----------|------------|----------------|----------------|----------------|-----------------|----------------|----------------|
| Dim. (mm) | Type HC | 4.8 ±0.2 | 12.3 ±0.2 | 24.0 ±0.3 | 11.5 ±0.1 | 1.75 ±0.10 | 8.0 ±0.1 | 2.00 ±0.05 | 4.1 ±0.1 | 1.5 +0.1 -0 | 0.3 ±0.1 | 2.8 ±0.3 |
| | Type FC | | 6.0 ±0.2 | 12.0 ±0.3 | 5.5 ±0.1 | | | | | | | 3.2 ±0.3 |
| | Type BC | 6.5 ±0.2 | 7.5 ±0.2 | | | | | | | | | |

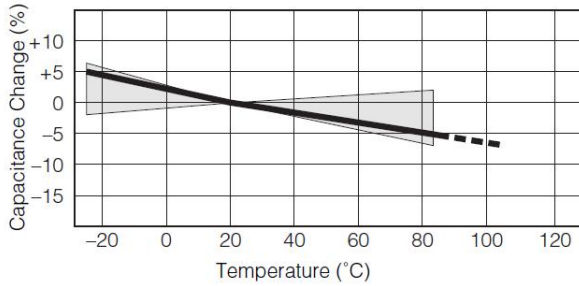
● Leader Part and Taped End



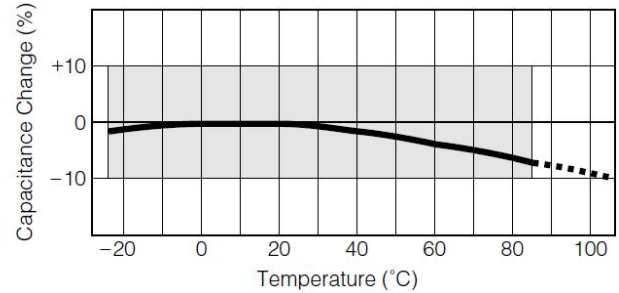
■ Typical Characteristics

● Temperature Characteristics

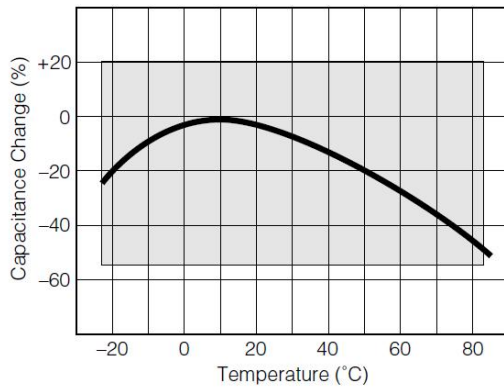
Char. SL/GP
(Temp.Coeff.: +350 to -1000 ppm/°C)



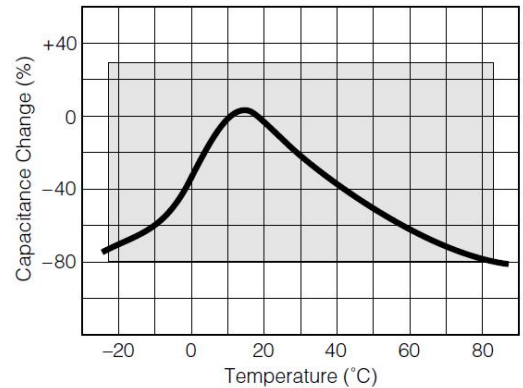
Char. B/Y5P
Temp.Range: -25 to 85 °C
Max.Cap.Change: ± 10 %



Char. E/Y5U (Temp.Range: -25 to 85 °C
max.Cap.Change: +20, -55 %)

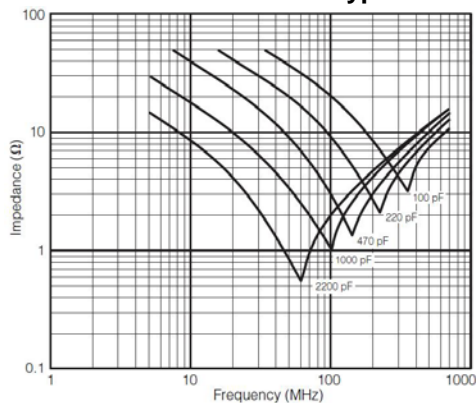


Char. F/Y5V (Temp. Range : -25 to 85 °C
max.Cap.Change: +30, -80 %)

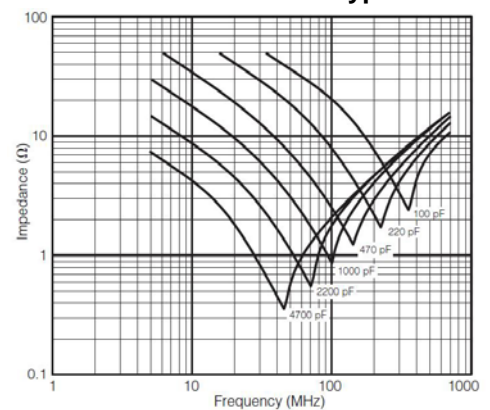


● Impedance vs. Frequency Characteristics

Type FC

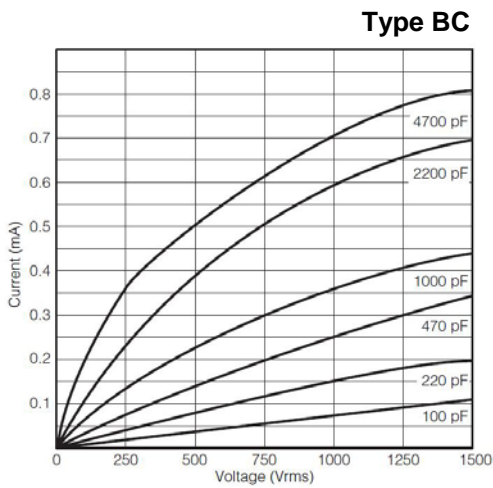
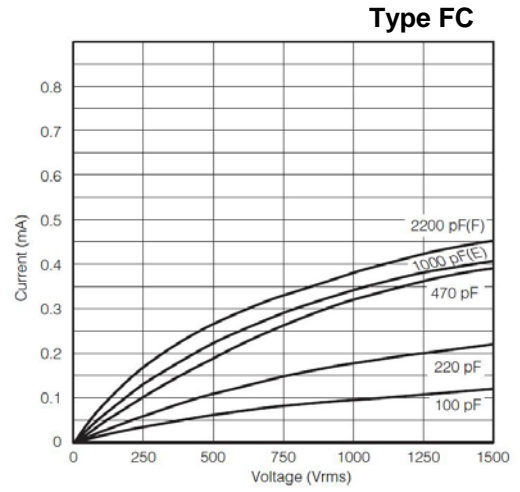
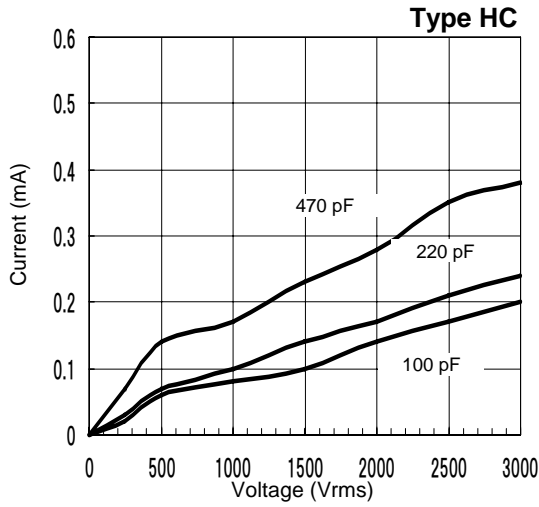


Type BC



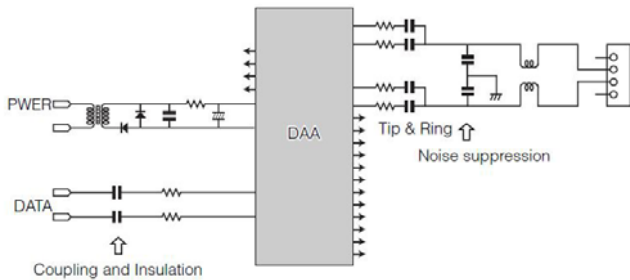
■ Typical Characteristics

● Current vs. Voltage (Leakage Current Characteristics)



■ Application Examples

● MODEM



● Primary circuit of Switching Power Supply

