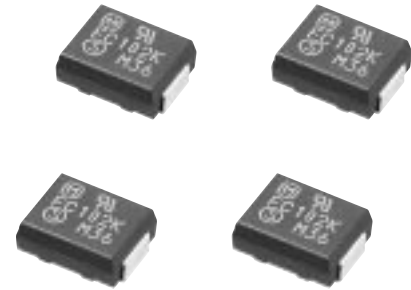


Ceramic Capacitors (safety Regulations) For Surface Mountings Types BC and FC



■ Features

- Resin molded SMD type for reflow soldering
- High reliability through disc capacitor element molded construction
- Safety requirement approved by UL, SEMKO, NEMKO, FIMKO, DEMKO and KTL (for Type FC)
- Addition new smaller type (Type FC 5.7 × 4.5mm)

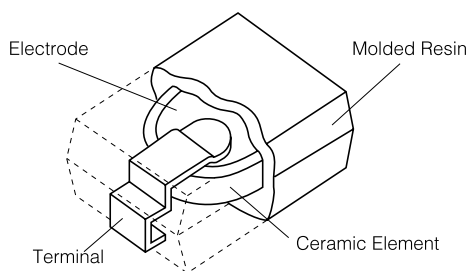
■ Recommended Application

- IT equipment as analog MODEM, XDSL MODEM
- AC primary circuit of AC adapter, Charger, DC-DC converter, On-board type power modul Etc.

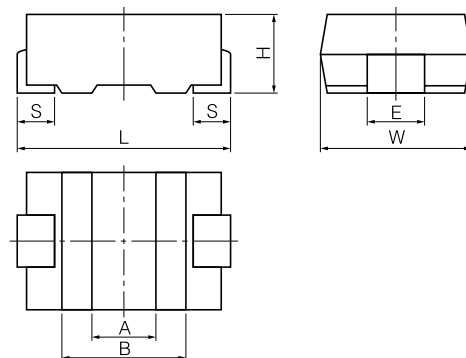
■ Explanation of Part Numbers

| | | | | | | | | | | | | |
|--------------|--------|-----------------|------------|------|---------|---------------------|-------------|----------------|----------|-------------|-------------|------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | (Examples) |
| E | C | K | T | B | C | 1 | 0 | 2 | M | E | | |
| Product Code | | Packaging Style | | Type | | Nominal Capacitance | | Cap. Tolerance | | Temp. Char. | | Suffix |
| Code | Class | Code | Style | Code | Type | (Ex.) | Capacitance | Code | Tol. | Code | Temp. Char. | |
| ECC | Class1 | S | Bulk | BC | Type BC | 050 | 5 pF | C | ±0.25 pF | G | SL/GP | |
| ECK | Class2 | T | Taped type | FC | Type FC | 100 | 10 pF | D | ±0.5 pF | B | B/Y5P | |
| | | | | | | 470 | 47 pF | F | ±1 pF | E | E/Y5U | |
| | | | | | | 101 | 100 pF | J | ±5 % | F | F/Y5V | |
| | | | | | | 221 | 220 pF | K | ±10 % | | | |
| | | | | | | 102 | 1000 pF | M | ±20 % | | | |

■ Construction



■ Dimensions in mm (not to scale)



Unit: (mm)

| Symbol | L | W | H | S | E | A | B |
|--------------|---------|---------|---------|-----------|---------|-------|-------|
| Dim 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) |
| (mm) Type FC | 5.7±0.5 | 4.5±0.3 | 2.3max | 0.85±0.30 | 2.5±0.2 | (1.7) | (3.1) |

■ Precaution for Handling

See Page 93 to 95

■ Packaging Informations

See Page 96 to 97

Specifications

| | | |
|---------------------------------|---|---|
| Characteristics | Temp. Char. SL/GP | Temp. Char. B/Y5P, E/Y5U, F/Y5V |
| Operating Temperature Range | -25 to 100 °C (-25 to 85 °C for UL approved) | |
| 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 M Ω 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 to 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 BC | Type FC | | | | |
| UL (USA) | UL 1414* | E62674 | — | — | 250 VAC | 1500 VAC | -25 to 85 °C |
| | UL 1414 6th Ed. | — | E62674 | Y2 | | 2000 VAC | |
| | CSA C22.2 No.1* | E62674 | — | — | | 1500 VAC | |
| SEMKO (Sweden) | EN132 400:1994 Sub-class Y2 (IEC 60384-14 2nd.Ed.) | 0026049/01 | 0101074/01 0126276/01 | Y2 | 250 VAC | 1500 VAC | -25 to 100 °C |
| FIMKO (Finland) | | — | FI 16588 FI 17348 | | | | |
| DEMKO (Denmark) | | — | 310914-01 310698-01 | | | | |
| NEMKO (Norway) | | — | P01101830 P01100665 | | | | |
| KTL (Korea) | | K60384-14 (IEC60384-14 2nd Ed.) | — | | | | |

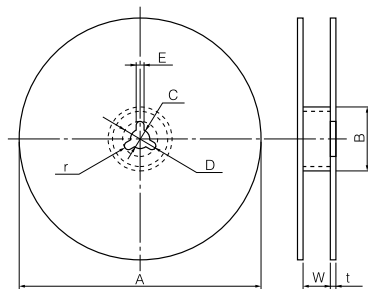
Note : * is for Line-by-pass capacitors. Certification Number sometimes changes with the change of the approval contents so on.
KTL mark is indicated on the label.

Packaging Specifications

Standard Packing Quantity

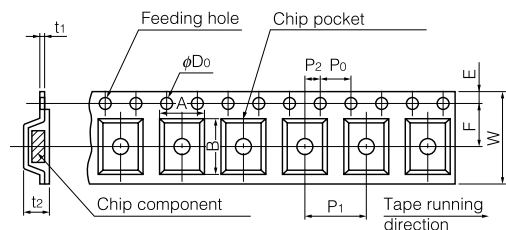
Embossed taping: 2000 pcs./reel for Type BC
3000 pcs./reel for Type FC

Reel



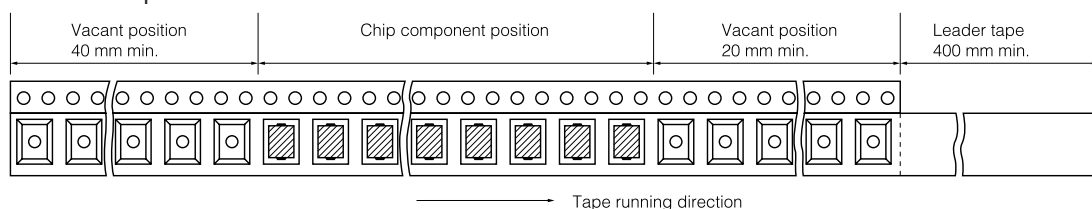
| Symbol | A | B | C | D | E | W | t | r |
|-----------|-------|---------|----------|----------|---------|----------|---------|------|
| Dim. (mm) | 330±5 | 60 min. | 13.0±0.5 | 21.0±1.0 | 2.0±0.5 | 13.5±1.5 | 2.0±0.5 | R1.0 |

Embossed taping



| Symbol | A | B | W | F | E | P1 | P2 | P0 | φD0 | t1 | t2 |
|-----------|---------|----------|----------|-----------|----------|------------|----------|------------|----------|----------|----------|
| Dim. (mm) | Type BC | 6.5 ±0.2 | 7.5 ±0.2 | 12.0 ±0.3 | 5.5 ±0.1 | 1.75 ±0.10 | 8.0 ±0.1 | 2.00 ±0.05 | 4.0 ±0.1 | 1.5 ±0.1 | 3.2 ±0.3 |
| | Type FC | 4.8 ±0.2 | 6.0 ±0.2 | — | — | — | — | — | — | 0 ±0.1 | 2.8 ±0.3 |

Leader Part and Taped End



Rating and Characteristics

| Type Name | Part Number | Capacitance (pF) | Cap. Tolerance | Temp. Char | Dimensions in mm |
|-------------|-------------|------------------|----------------|------------|------------------|
| Type BC | ECCTBC100DG | 10 | ±0.5 pF | SL/GP | 7.1L×6.3W×2.5H |
| | ECCTBC150JG | 15 | ±5 % | SL/GP | |
| | ECCTBC220JG | 22 | ±5 % | SL/GP | |
| | ECCTBC330JG | 33 | ±5 % | SL/GP | |
| | ECCTBC470JG | 47 | ±5 % | SL/GP | |
| | ECCTBC680JG | 68 | ±5 % | SL/GP | |
| | ECKTBC101KB | 100 | ±10 % | B/Y5P | |
| | ECKTBC151KB | 150 | ±10 % | B/Y5P | |
| | ECKTBC221KB | 220 | ±10 % | B/Y5P | |
| | ECKTBC331KB | 330 | ±10 % | B/Y5P | |
| | ECKTBC471KB | 470 | ±10 % | B/Y5P | |
| | ECKTBC681KB | 680 | ±10 % | B/Y5P | |
| | ECKTBC102ME | 1000 | ±20 % | E/Y5U | |
| | ECKTBC152ME | 1500 | ±20 % | E/Y5U | |
| | ECKTBC222ME | 2200 | ±20 % | E/Y5U | |
| Type FC | ECKTBC332MF | 3300 | ±20 % | F/Y5V | 5.7L×4.5W×2.3H |
| | ECKTBC472MF | 4700 | ±20 % | F/Y5V | |
| | ECCTFC050DG | 5 | ±0.5 pF | SL/GP | |
| | ECCTFC100DG | 10 | ±0.5 pF | SL/GP | |
| | ECCTFC150JG | 15 | ±5 % | SL/GP | |
| | ECCTFC220JG | 22 | ±5 % | SL/GP | |
| | ECCTFC330JG | 33 | ±5 % | SL/GP | |
| | ECKTFC470KB | 47 | ±10 % | B/Y5P | |
| | ECKTFC680KB | 68 | ±10 % | B/Y5P | |
| | ECKTFC101KB | 100 | ±10 % | B/Y5P | |
| | ECKTFC151KB | 150 | ±10 % | B/Y5P | |
| | ECKTFC221KB | 220 | ±10 % | B/Y5P | |
| | ECKTFC331KB | 330 | ±10 % | B/Y5P | |
| | ECKTFC471KB | 470 | ±10 % | B/Y5P | |
| | ECKTFC681KB | 680 | ±10 % | B/Y5P | |
| ECKTFC821KB | 820 | ±10 % | B/Y5P | | |
| ECKTFC102KB | 1000 | ±10 % | B/Y5P | | |
| ECKTFC102ME | 1000 | ±20 % | E/Y5U | | |
| ECKTFC152KB | 1500 | ±10 % | B/Y5P | | |
| ECKTFC152MF | 1500 | ±20 % | F/Y5V | | |
| ECKTFC222KB | 2200 | ±10 % | B/Y5P | | |
| ECKTFC222MF | 2200 | ±20 % | F/Y5V | | |

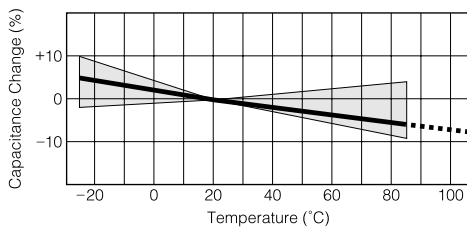
Notes *: Other capacitance values are available by special order.

Typical Characteristics

Temperature Characteristics

Char. SL/GP

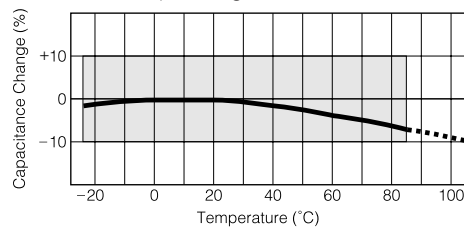
(Temp.Coeff.: +350 to -1000 ppm/°C)



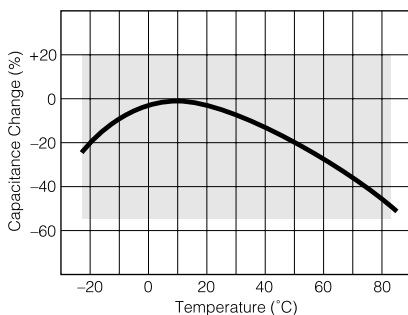
Char. B/Y5P

Temp.Range: -25 to 85 °C

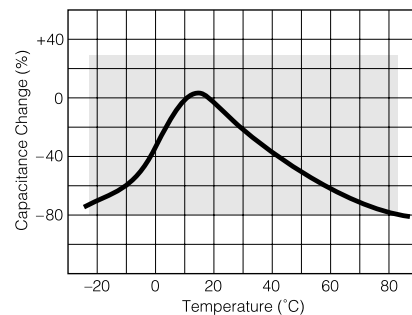
Max.Cap.Change: ±10 %



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

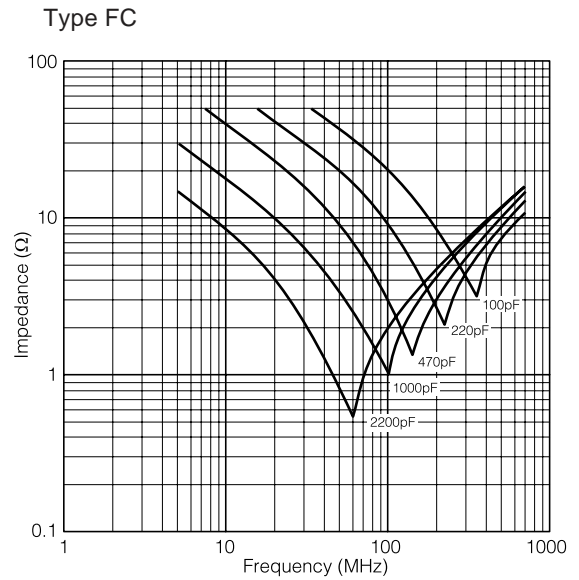
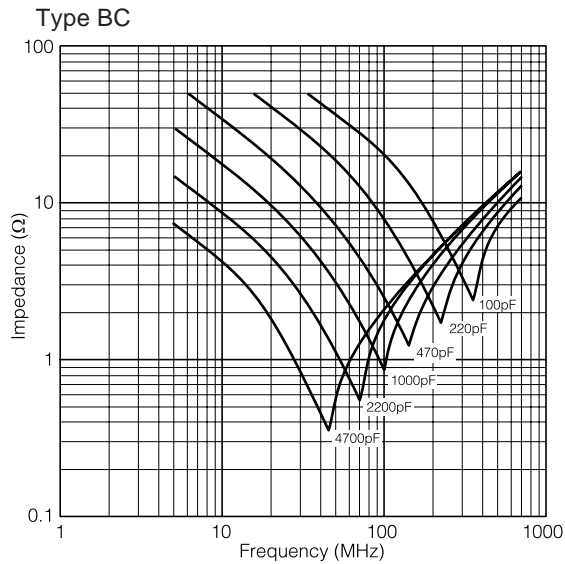


Char. F/Y5V (Temp.Range: -25 to 85 °C
max.Cap.Change: +30, -80 %)

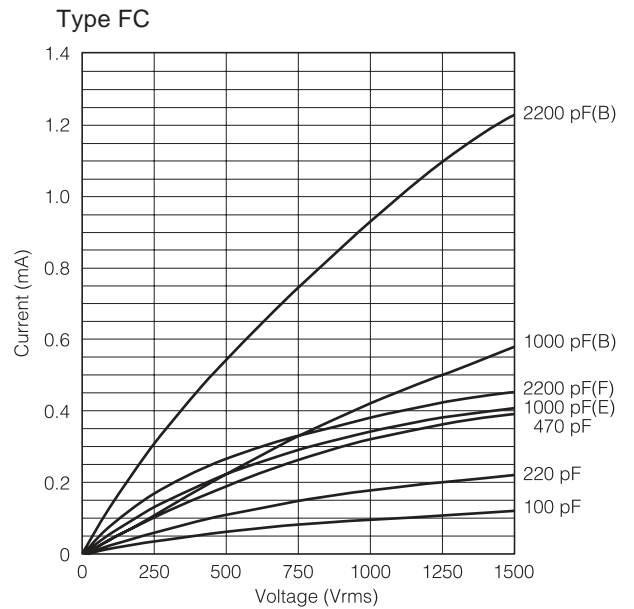
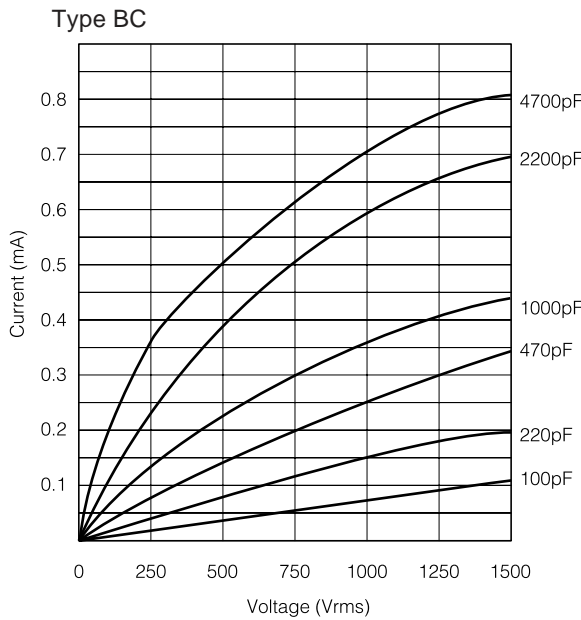


Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use. Should a safety concern arise regarding this product, please be sure to contact us immediately.

● Impedance vs. Frequency Characteristics

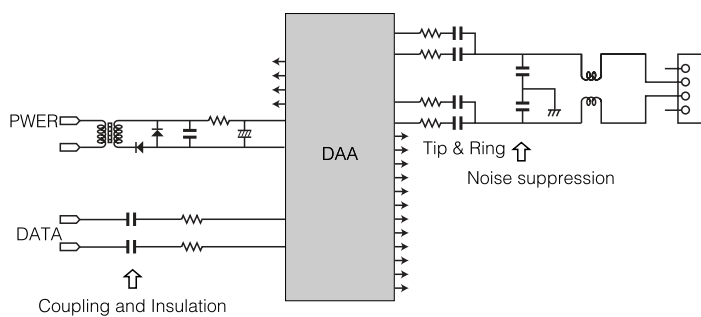


● Current vs. Voltage (Leakage Current Characteristics)



■ Application Examples

● MODEM



● Primary circuit of Switching Power Supply

