

## Ceramic Disc Capacitors (Safety Regulations)

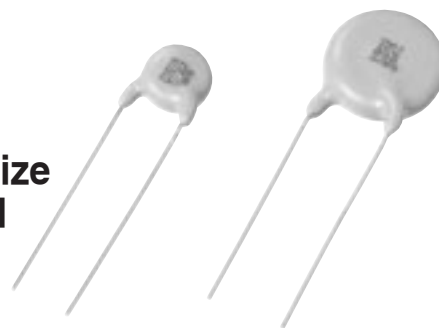
**Type NS-A IEC60384-14 Sub-class Y1/X1**

**Type TS IEC60384-14 Sub-class Y2/X1**

**Type VS IEC60384-14 Sub-class Y2/X1 Smaller size**

**Type BE 250 VAC Electrical Appliance and Material**

**Safety Law compliance (Former Electrical Appliance and Material Control Law)**



### ■ Features

- Related by IEC60384-14 2nd Ed. and approved by European Safety Regulations (Types NS-A, TS and VS)
- Reinforced Body Insulation /0.4mm min. approved by BSI, VDE (Type NS-A)
- Flame-retardant insulating coating applied
- Easy mounting through kinked Lead and Radial Taping

### ■ Recommended Applications

- Interference suppressor for AC Primary Line of electronic equipments.

### ■ Explanation of Part Numbers

| 1            | 2       | 3          | 4                 | 5         | 6         | 7                   | 8        | 9              | 10         | 11         | 12    | (Examples) |
|--------------|---------|------------|-------------------|-----------|-----------|---------------------|----------|----------------|------------|------------|-------|------------|
| E            | C       | K          | N                 | T         | S         | 1                   | 0        | 2              | M          | E          |       |            |
| Product Code |         | Lead Style |                   | Type Name |           | Nominal Capacitance |          | Cap. Tolerance |            | Temp. Char |       | Suffix     |
| Code         | Class   | Code       | Style             | Code      | Type      | Ex.                 | Cap.     | Code           | Cap. Tol.  | Code       | Char. |            |
| ECC          | Class 1 | A          | Kinked Lead Bulk  | NA        | Type NS-A | 101                 | 100 pF   | J              | ±5 %       | G          | SL/GP |            |
| ECK          | Class 2 | N          | Kinked Lead Taped | TS        | Type TS   | 102                 | 1000 pF  | K              | ±10 %      | B          | B/Y5P |            |
|              |         |            |                   | VS        | Type VS   | 222                 | 2200 pF  | M              | ±20 %      | E          | E/Y5U |            |
|              |         |            |                   | BE        | Type BE   | 472                 | 4700 pF  | Z              | +80, -20 % | F          | F/Y5V |            |
|              |         |            |                   |           |           | 103                 | 10000 pF |                |            |            |       |            |

### ■ Specifications

| Characteristics                       | Type NS-A                                                                                                                                                                                                                                                                                                                                    | Type TS                                                                            | Type VS                                                               | Type BE                                                                                                                 |       |                  |                   |       |                      |             |   |       |              |   |           |              |   |            |              |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-------|------------------|-------------------|-------|----------------------|-------------|---|-------|--------------|---|-----------|--------------|---|------------|--------------|
| Related<br>Standaeeds                 | IEC 60384-14(Y1/,X1)<br>BSI, VDE, SEV, SEMKO<br>FIMKO, NEMKO, DEMKO<br>UL,CSA, KTL                                                                                                                                                                                                                                                           | IEC 60384-14(Y2/,X1)<br>BSI, VDE, SEV, SEMKO<br>FIMKO, NEMKO, DEMKO<br>UL,CSA, KTL | IEC 60384-14(Y2/, X1)<br>VDE, SEMKO, FIMKO<br>NEMKO, DEMKO<br>UL, KTL | Electrical Appliance and<br>Material Safety Law compliance<br>(Former Electrical Appliance<br>and Material Control Law) |       |                  |                   |       |                      |             |   |       |              |   |           |              |   |            |              |
| Operating<br>Temperature Range        | -25 to 125 °C                                                                                                                                                                                                                                                                                                                                |                                                                                    |                                                                       | -25 to 105 °C                                                                                                           |       |                  |                   |       |                      |             |   |       |              |   |           |              |   |            |              |
| Rated Voltage                         | 250 VAC/440 VAC                                                                                                                                                                                                                                                                                                                              |                                                                                    |                                                                       | 250 VAC                                                                                                                 |       |                  |                   |       |                      |             |   |       |              |   |           |              |   |            |              |
| Dielectric<br>Withstanding<br>Voltage | 4000 VAC<br>for 1 minute                                                                                                                                                                                                                                                                                                                     | 2600 VAC<br>for 1 minute                                                           | 1500 VAC<br>for 1 minute                                              |                                                                                                                         |       |                  |                   |       |                      |             |   |       |              |   |           |              |   |            |              |
| Capacitance                           | Within the tolerance, when measured at 1 kHz ± 20 %, 1 Vrms, and 20 °C                                                                                                                                                                                                                                                                       |                                                                                    |                                                                       |                                                                                                                         |       |                  |                   |       |                      |             |   |       |              |   |           |              |   |            |              |
| Dissipation<br>Factor<br>(tanδ)       | tan δ ≤ 0.025, when measured at 1 kHz ± 20 %,1 Vrms, and 20 °C                                                                                                                                                                                                                                                                               |                                                                                    |                                                                       | tan δ ≤ 0.025 for Char.E<br>tan δ ≤ 0.05 for Char.F<br>at 1 kHz ±20 %, 1 Vrms, and 20 °C                                |       |                  |                   |       |                      |             |   |       |              |   |           |              |   |            |              |
| Insulation Resistance                 | 10000 MΩ min at 500 VDC 1 minute electrification.                                                                                                                                                                                                                                                                                            |                                                                                    |                                                                       |                                                                                                                         |       |                  |                   |       |                      |             |   |       |              |   |           |              |   |            |              |
| Temperature<br>Characteristics        | <table><tr><th>Char.</th><th>max. Cap. Change</th><th>Temperature Range</th></tr><tr><td>SL/GP</td><td>+350 to -1000 ppm/°C</td><td>20 to 85 °C</td></tr><tr><td>B</td><td>±10 %</td><td>-25 to 85 °C</td></tr><tr><td>E</td><td>+20,-55 %</td><td>-25 to 85 °C</td></tr><tr><td>F</td><td>+30, -80 %</td><td>-25 to 85 °C</td></tr></table> |                                                                                    |                                                                       |                                                                                                                         | Char. | max. Cap. Change | Temperature Range | SL/GP | +350 to -1000 ppm/°C | 20 to 85 °C | B | ±10 % | -25 to 85 °C | E | +20,-55 % | -25 to 85 °C | F | +30, -80 % | -25 to 85 °C |
|                                       | Char.                                                                                                                                                                                                                                                                                                                                        | max. Cap. Change                                                                   | Temperature Range                                                     |                                                                                                                         |       |                  |                   |       |                      |             |   |       |              |   |           |              |   |            |              |
|                                       | SL/GP                                                                                                                                                                                                                                                                                                                                        | +350 to -1000 ppm/°C                                                               | 20 to 85 °C                                                           |                                                                                                                         |       |                  |                   |       |                      |             |   |       |              |   |           |              |   |            |              |
|                                       | B                                                                                                                                                                                                                                                                                                                                            | ±10 %                                                                              | -25 to 85 °C                                                          |                                                                                                                         |       |                  |                   |       |                      |             |   |       |              |   |           |              |   |            |              |
|                                       | E                                                                                                                                                                                                                                                                                                                                            | +20,-55 %                                                                          | -25 to 85 °C                                                          |                                                                                                                         |       |                  |                   |       |                      |             |   |       |              |   |           |              |   |            |              |
| F                                     | +30, -80 %                                                                                                                                                                                                                                                                                                                                   | -25 to 85 °C                                                                       |                                                                       |                                                                                                                         |       |                  |                   |       |                      |             |   |       |              |   |           |              |   |            |              |

### ■ Precautions for Handling

See Page 93 to 95

### ■ Packaging Information

See Page 96 to 97

### ■ Related Standards and Certificate Numbers

#### ● Type NS-A

| Certificated Body | Related Standard                                          | Certificate Number | Sub-class | Rated Voltage            | Dielectric Withstanding Voltage | Operating Temperature Range |
|-------------------|-----------------------------------------------------------|--------------------|-----------|--------------------------|---------------------------------|-----------------------------|
| BSI (UK)          | EN 132 400:1994<br>Sub-class Y2<br>(IEC 60384-14 2nd Ed.) | 226319             | Y1, X1    | Y1:250 VAC<br>X1:440 VAC | Y1:4000 VAC<br>X1:1892 VDC      | -25 to 125°C                |
| VDE (Germany)     |                                                           | 087472             |           |                          |                                 |                             |
| SEV (Switzerland) |                                                           | 00.0587            |           |                          |                                 |                             |
| SEMKO (Sweden)    |                                                           | 9918234/01-02      |           |                          |                                 |                             |
| FIMKO (Finland)   |                                                           | F1 13556           |           |                          |                                 |                             |
| NEMKO (Norway)    |                                                           | P99101676          |           |                          |                                 |                             |
| DEMKO (Denmark)   |                                                           | DK99-02495         |           |                          |                                 |                             |
| CQC (China)       | GB/T14472 (IEC 60384-14 2nd Ed.)                          | CQC03001008315     | -         | 250 VAC                  | 1500 VAC                        | -25 to 85°C                 |
| KTL (Korea)       | K60384-14 (IEC 60384-14 2nd Ed.)                          | SU03012-3002       |           |                          |                                 |                             |
| UL (USA)          | UL1414                                                    | E62674             |           |                          |                                 |                             |
| CSA (Canada)      | CSA C22.2 No.1                                            | LR58064            |           |                          |                                 |                             |

Note: Certification Number sometimes changes with the change of the approval contents and so on. CQC and KTL marks are indicated on the label.

#### ● Type TS

| Certificated Body | Related Standard                                         | Certificate Number |               | Sub-class | Rated Voltage            | Dielectric Withstanding Voltage | Operating Temperature Range |
|-------------------|----------------------------------------------------------|--------------------|---------------|-----------|--------------------------|---------------------------------|-----------------------------|
|                   |                                                          | Plant Code H       | Plant Code M  |           |                          |                                 |                             |
| BSI (UK)          | EN132 400:1994<br>Sub-class Y2<br>(IEC 60384-14 2nd Ed.) | 228035             |               | Y2, X1    | Y2:250 VAC<br>X1:440 VAC | Y2:1500 VAC<br>X1:1892 VDC      | -25 to 125°C                |
| VDE (Germany)     |                                                          | 1220129            | 118911        |           |                          |                                 |                             |
| SEV (Switzerland) |                                                          | 00.0588            |               |           |                          |                                 |                             |
| SEMKO (Sweden)    |                                                          | 9618031/01(Y2)     | 9909196/01-02 |           |                          |                                 |                             |
| FIMKO (Finland)   |                                                          | 9909191/01(X1)     |               |           |                          |                                 |                             |
| NEMKO (Norway)    |                                                          | F13324A1           |               |           |                          |                                 |                             |
| DEMKO (Denmark)   |                                                          | P96102354(Y2)      | P99101190     |           |                          |                                 |                             |
|                   |                                                          | P99101084(X1)      |               |           |                          |                                 |                             |
|                   |                                                          | 305880(Y2)         | DK99-01749    |           |                          |                                 |                             |
|                   |                                                          | DK99-01676(X1)     |               |           |                          |                                 |                             |
| KTL (Korea)       | K60384-14(IEC 60384-14 2nd Ed.)                          | SU03012-3001       | SU03013-3002  |           |                          |                                 |                             |
| UL (USA)          | UL 1414                                                  | E62674             |               |           |                          |                                 |                             |
| CSA (Canada)      | CSA C22.2 No.1                                           | LR58064            | LR31605       | —         | 250 VAC                  | 1500 VAC                        | -25 to 85 °C                |

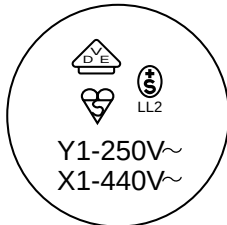
Note: Certification Number sometimes changes with the change of the approval contents and so on. KTL marks are indicated on the label.

#### ● Type VS

| Certificated Body | Related Standard                                          | Certificate Number | Sub-class | Rated Voltage            | Dielectric Withstanding Voltage | Operating Temperature Range |
|-------------------|-----------------------------------------------------------|--------------------|-----------|--------------------------|---------------------------------|-----------------------------|
| VDE (Germany)     | EN 132 400:1994<br>Sub-class Y2<br>(IEC 60384-14 2nd Ed.) | 123139             | Y2, X1    | Y2:250 VAC<br>X1:440 VAC | Y2:1500 VAC<br>X1:1892 VDC      | -25 to 125°C                |
| SEMKO (Sweden)    |                                                           | 0042075/01-02      |           |                          |                                 |                             |
| FIMKO (Finland)   |                                                           | FI16196            |           |                          |                                 |                             |
| NEMKO (Norway)    |                                                           | P00102412          |           |                          |                                 |                             |
| DEMKO (Denmark)   |                                                           | 310308-01          |           |                          |                                 |                             |
| KTL (Korea)       | K60384-14 (IEC 60384-14 2nd Ed.)                          | SU03013-3003       | -         | 250 VAC                  | 1500 VAC                        | -25 to 85°C                 |
| UL (USA)          | UL1414*                                                   | E62674             |           |                          |                                 |                             |
|                   | CSA C22.2 No.1*                                           |                    |           |                          |                                 |                             |

Note: \* is for Line-by-pass capacitors. Certification Number sometimes changes with the change of the approval contents and so on. KTL marks is indicated on the label. Certification contents are subject to differ in capacitance values.

### ■ Marking Examples (Ex. Type NS-A, 4700 pF)

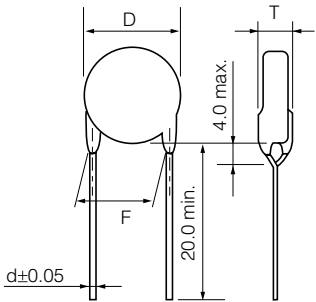
| Marking Items                            |       |                                                                                     | Examples* (Marking of the face and the reverse)                                                                                                                                                  |  |
|------------------------------------------|-------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Manufacturer's Identification            |       |  | <div></div> <div></div> |  |
| Type Designation                         |       | NS-A                                                                                |                                                                                                                                                                                                  |  |
| sub-class and                            |       | Y1-250V ~                                                                           |                                                                                                                                                                                                  |  |
| Rated Voltage                            |       | X1-440V~                                                                            |                                                                                                                                                                                                  |  |
| Capacitance                              |       | 472                                                                                 |                                                                                                                                                                                                  |  |
| Recognized Marking<br>(Logo or Monogram) | BSI   |  |                                                                                                                                                                                                  |  |
|                                          | VDE   |  |                                                                                                                                                                                                  |  |
|                                          | SEV   |  |                                                                                                                                                                                                  |  |
|                                          | SEMKO |  |                                                                                                                                                                                                  |  |
|                                          | FIMKO |  |                                                                                                                                                                                                  |  |
|                                          | NEMKO |  |                                                                                                                                                                                                  |  |
|                                          | DEMKO |  |                                                                                                                                                                                                  |  |
|                                          | UL    |  |                                                                                                                                                                                                  |  |
|                                          | CSA   |  |                                                                                                                                                                                                  |  |
| Plant Code                               |       | H                                                                                   |                                                                                                                                                                                                  |  |
| Date Code (Ex. Sep. 2001)                |       | 19                                                                                  |                                                                                                                                                                                                  |  |

Note: \* The actual marking is sometimes different from the above example with the change of the safety approval contents and so on.

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.

■ Dimensions in mm (not to scale)  
Standard lead style are kinked Lead and Kinked Lead Taping as below.

● Kinked Lead Type

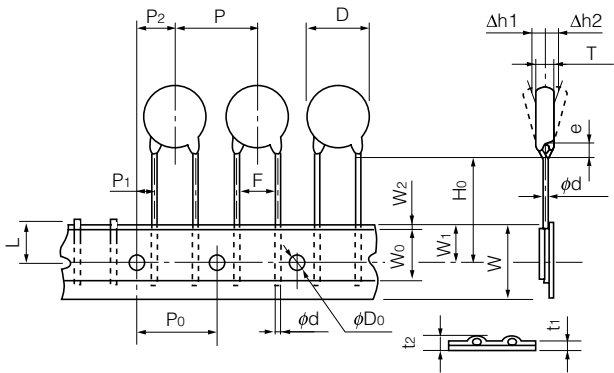


Note:Tolerance of Lead Space

| Dim. F(Nominal) | Tolerance of Dim. F                                      |
|-----------------|----------------------------------------------------------|
| 5.0             | ±1.0                                                     |
| 7.5             | ±1.5                                                     |
| 10.0            | ±1.5<br>( <sup>+1.5</sup> <sub>-1.0</sub> for Type NS-A) |

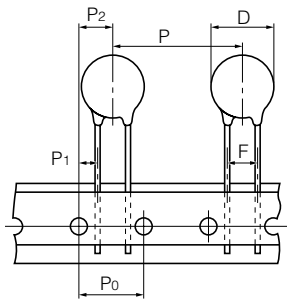
● Kinked Lead Taping

Type N0, N1



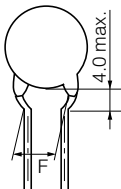
| Taping<br>Type<br>Symbol          | N0                                           | N1        | N2       |
|-----------------------------------|----------------------------------------------|-----------|----------|
| P                                 | 12.7±1.0                                     | 15.0±2.0  | 30.0±2.0 |
| P <sub>0</sub>                    | 12.7±0.3                                     | 15.0±0.3  |          |
| F                                 | 5.0±0.8                                      | 7.5±1.0   |          |
| P <sub>1</sub>                    | 3.85±0.70                                    | 3.75±0.80 |          |
| P <sub>2</sub>                    | 6.35±1.30                                    | 7.5±1.5   |          |
| D                                 | To comply with each individual specification |           |          |
| W                                 | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>         |           |          |
| W <sub>0</sub>                    | 10.0 min.                                    |           |          |
| W <sub>1</sub>                    | 9.0±0.5                                      |           |          |
| W <sub>2</sub>                    | 3.0 max.                                     |           |          |
| H <sub>0</sub>                    | 18.0 <sup>+2.0</sup> <sub>0</sub>            |           |          |
| e                                 | 4.0 max.                                     |           |          |
| φD <sub>0</sub>                   | 4.0±0.2                                      |           |          |
| φd                                | 0.60±0.05                                    | 0.65±0.05 |          |
| t <sub>1</sub>                    | 0.6±0.3                                      |           |          |
| t <sub>2</sub>                    | 1.5 max.                                     |           |          |
| T                                 | To comply with each individual specification |           |          |
| Δh <sub>1</sub> , Δh <sub>2</sub> | 2.0 max.                                     |           |          |
| L                                 | 11.0 max.                                    |           |          |

Type N2 \*



\* Same dimensions as Type N0, N1 except for special dimensions.

Under kinked lead style are applied to only 3300 pF and over have a lead space (F) 7.5 mm of Type TS



## Rating and Characteristics

### ● Type NS-A (IEC60384-14 Sub-class Y1, X1) Rating and Characteristics

| Cap.<br>in pF | Cap.<br>Tol.<br>(%) | Temp.<br>Char. | Dimensions in mm |           | Kinked Lead Type (Bulk) |            |      |
|---------------|---------------------|----------------|------------------|-----------|-------------------------|------------|------|
|               |                     |                | D<br>max.        | T<br>max. | Part Number             | Dim. in mm |      |
|               |                     |                |                  |           |                         | F          | d    |
| 100           | ±10 or ±20          | B              | 11.0             | 8.0       | ECKANA101□B             | 10.0       | 0.65 |
| 150           | ±10 or ±20          | B              | 11.0             | 8.0       | ECKANA151□B             | 10.0       | 0.65 |
| 220           | ±10 or ±20          | B              | 11.0             | 8.0       | ECKANA221□B             | 10.0       | 0.65 |
| 330           | ±10 or ±20          | B              | 11.0             | 8.0       | ECKANA331□B             | 10.0       | 0.65 |
| 470           | ±10 or ±20          | B              | 11.0             | 8.0       | ECKANA471□B             | 10.0       | 0.65 |
| 680           | ±10 or ±20          | B              | 11.0             | 8.0       | ECKANA681□B             | 10.0       | 0.65 |
| 1000          | ±10 or ±20          | B              | 11.0             | 8.0       | ECKANA102□B             | 10.0       | 0.65 |
| 1000          | ±20                 | E              | 10.0             | 8.0       | ECKANA102ME             | 10.0       | 0.65 |
| 1500          | ±20                 | E              | 11.0             | 8.0       | ECKANA152ME             | 10.0       | 0.65 |
| 2200          | ±20                 | E              | 11.0             | 8.0       | ECKANA222ME             | 10.0       | 0.65 |
| 3300          | ±20                 | E              | 13.0             | 8.0       | ECKANA332ME             | 10.0       | 0.65 |
| 4700          | ±20                 | E              | 16.0             | 8.0       | ECKANA472ME             | 10.0       | 0.65 |

Remark

· Type NS-A is approved by BSI and VDE for Reinforced Body Insulation (0.4 mm min.)

CB certification No.

BSI (UK)

GB386W

Certification No.

VDE (Germany)

087469

087472

· Radial Taped version is available.  
(Lead space is available only in 10 mm)

□: Capacitance Tolerance Code  
K: (±10 %) or M: (±20 %)

### ● Type TS (IEC60384-14 Sub-class Y2, X1) Rating and Characteristics

| Cap.<br>in pF | Cap.<br>Tol.<br>(%) | Temp.<br>Char. | Dimensions in mm |           | Kinked Lead Type (Bulk) |            |      | Kinked Lead Taped Type |               |            |      |
|---------------|---------------------|----------------|------------------|-----------|-------------------------|------------|------|------------------------|---------------|------------|------|
|               |                     |                | D max.<br>(Tol.) | T<br>max. | Part Number             | Dim. in mm |      | Part Number            | Taped<br>Type | Dim. in mm |      |
|               |                     |                |                  |           |                         | F          | d    |                        |               | F          | d    |
| 100           | ±10 or ±20          | B/Y5P          | 8.0(7.0±1.0)     | 7.0       | ECKATS101□B             | 7.5        | 0.65 | ECKNTS101□B            | N1            | 7.5        | 0.65 |
| 150           | ±10 or ±20          | B/Y5P          | 8.0(7.0±1.0)     | 7.0       | ECKATS151□B             | 7.5        | 0.65 | ECKNTS151□B            | N1            | 7.5        | 0.65 |
| 220           | ±10 or ±20          | B/Y5P          | 8.0(7.0±1.0)     | 7.0       | ECKATS221□B             | 7.5        | 0.65 | ECKNTS221□B            | N1            | 7.5        | 0.65 |
| 330           | ±10 or ±20          | B/Y5P          | 8.0(7.0±1.0)     | 7.0       | ECKATS331□B             | 7.5        | 0.65 | ECKNTS331□B            | N1            | 7.5        | 0.65 |
| 470           | ±10 or ±20          | B/Y5P          | 8.0(7.0±1.0)     | 7.0       | ECKATS471□B             | 7.5        | 0.65 | ECKNTS471□B            | N1            | 7.5        | 0.65 |
| 680           | ±10 or ±20          | B/Y5P          | 9.0(8.0±1.0)     | 7.0       | ECKATS681□B             | 7.5        | 0.65 | ECKNTS681□B            | N1            | 7.5        | 0.65 |
| 1000          | ±10 or ±20          | B/Y5P          | 10.5(9.5±1.0)    | 7.0       | ECKATS102□B             | 7.5        | 0.65 | ECKNTS102□B            | N1            | 7.5        | 0.65 |
| 1000          | ±20                 | E/Y5U          | 8.0(7.0±1.0)     | 7.0       | ECKATS102ME             | 7.5        | 0.65 | ECKNTS102ME            | N1            | 7.5        | 0.65 |
| 1500          | ±20                 | E/Y5U          | 9.0(8.0±1.0)     | 7.0       | ECKATS152ME             | 7.5        | 0.65 | ECKNTS152ME            | N1            | 7.5        | 0.65 |
| 2200          | ±20                 | E/Y5U          | 9.5(9.0±1.0)     | 7.0       | ECKATS222ME             | 7.5        | 0.65 | ECKNTS222ME            | N1            | 7.5        | 0.65 |
| 3300          | ±20                 | E/Y5U          | 12.5(11.5±1.0)   | 7.0       | ECKATS332ME             | 7.5        | 0.65 | ECKNTS332ME            | N1            | 7.5        | 0.65 |
| 4700          | ±20                 | E/Y5U          | 15.0(14.0±1.0)   | 7.0       | ECKATS472ME             | 10.0       | 0.65 | ECKNTS472ME            | N2            | 7.5        | 0.65 |
| 4700          | ±20                 | F/Y5V          | 12.5(11.5±1.0)   | 7.0       | ECKATS472MF             | 7.5        | 0.65 | ECKNTS472MF            | N1            | 7.5        | 0.65 |
| 10000         | ±20                 | F/Y5V          | 17.0(16.0±1.5)   | 7.0       | ECKATS103MF             | 10.0       | 0.65 | ECKNTS103MF            | N2            | 7.5        | 0.65 |

Note: □-- Capacitance Tolerance Code K (±10 %) or M (±20 %)

### ● Type VS (IEC60384-14 Sub-class Y2, X1 Smaller type) Rating and Characteristics

| Cap.<br>in pF | Capacitance<br>Tolerance<br>(%) | Temp.<br>Char. | Dimensions in mm |           | Kinked Lead Type (Bulk) |            |      | Kinked Lead Taped Type |               |            |      |
|---------------|---------------------------------|----------------|------------------|-----------|-------------------------|------------|------|------------------------|---------------|------------|------|
|               |                                 |                | D<br>max.        | T<br>max. | Part Number             | Dim. in mm |      | Part Number            | Taped<br>Type | Dim. in mm |      |
|               |                                 |                |                  |           |                         | F          | d    |                        |               | F          | d    |
| 10            | ±0.5pF or ±1pF                  | SL/GP          | 8.0              | 6.0       | ECCA VS100□G*           | 5.0        | 0.60 | ECCNVS100□G*           | N0            | 5.0        | 0.60 |
| 15            | ±5 or ±10                       | SL/GP          | 8.0              | 6.0       | ECCA VS150□G*           | 5.0        | 0.60 | ECCNVS150□G*           | N0            | 5.0        | 0.60 |
| 22            | ±5 or ±10                       | SL/GP          | 8.0              | 6.0       | ECCA VS220□G*           | 5.0        | 0.60 | ECCNVS220□G*           | N0            | 5.0        | 0.60 |
| 33            | ±5 or ±10                       | SL/GP          | 8.0              | 6.0       | ECCA VS330□G            | 5.0        | 0.60 | ECCNVS330□G            | N0            | 5.0        | 0.60 |
| 47            | ±5 or ±10                       | SL/GP          | 8.0              | 6.0       | ECCA VS470□G            | 5.0        | 0.60 | ECCNVS470□G            | N0            | 5.0        | 0.60 |
| 68            | ±5 or ±10                       | SL/GP          | 8.0              | 6.0       | ECCA VS680□G            | 5.0        | 0.60 | ECCNVS680□G            | N0            | 5.0        | 0.60 |
| 100           | ±10 or ±20                      | B/Y5P          | 8.0              | 6.0       | ECKA VS101□B            | 5.0        | 0.60 | ECKNVS101□B            | N0            | 5.0        | 0.60 |
| 150           | ±10 or ±20                      | B/Y5P          | 8.0              | 6.0       | ECKA VS151□B            | 5.0        | 0.60 | ECKNVS151□B            | N0            | 5.0        | 0.60 |
| 220           | ±10 or ±20                      | B/Y5P          | 8.0              | 6.0       | ECKA VS221□B            | 5.0        | 0.60 | ECKNVS221□B            | N0            | 5.0        | 0.60 |
| 330           | ±10 or ±20                      | B/Y5P          | 8.0              | 6.0       | ECKA VS331□B            | 5.0        | 0.60 | ECKNVS331□B            | N0            | 5.0        | 0.60 |
| 470           | ±10 or ±20                      | B/Y5P          | 8.0              | 6.0       | ECKA VS471□B            | 5.0        | 0.60 | ECKNVS471□B            | N0            | 5.0        | 0.60 |
| 680           | ±10 or ±20                      | B/Y5P          | 8.0              | 6.0       | ECKA VS681□B            | 5.0        | 0.60 | ECKNVS681□B            | N0            | 5.0        | 0.60 |
| 1000          | ±20                             | E/Y5U          | 8.0              | 6.0       | ECKA VS102ME            | 5.0        | 0.60 | ECKNVS102ME            | N0            | 5.0        | 0.60 |
| 1500          | ±20                             | E/Y5U          | 8.0              | 6.0       | ECKA VS152ME            | 5.0        | 0.60 | ECKNVS152ME            | N0            | 5.0        | 0.60 |
| 2200          | ±20                             | E/Y5U          | 9.0              | 6.0       | ECKA VS222ME            | 5.0        | 0.60 | ECKNVS222ME            | N0            | 5.0        | 0.60 |
| 3300          | ±20                             | E/Y5U          | 10.0             | 6.0       | ECKA VS332ME            | 5.0        | 0.60 | ECKNVS332ME            | N0            | 5.0        | 0.60 |
| 4700          | ±20                             | E/Y5U          | 11.0             | 6.0       | ECKA VS472ME            | 5.0        | 0.60 | ECKNVS472ME            | N0            | 5.0        | 0.60 |
| 4700          | ±20                             | F/Y5V          | 10.0             | 6.0       | ECKA VS472MF            | 5.0        | 0.60 | ECKNVS472MF            | N0            | 5.0        | 0.60 |
| 10000         | ±20                             | F/Y5V          | 14.0             | 6.0       | ECKA VS103MF            | 7.5        | 0.65 | ECKNVS103MF            | N1            | 7.5        | 0.65 |

Note 1: Dimensions "F"(Lead Space) of 7.5mm is available instead of 5.0 mm only by special order.

2: □-- Capacitance Tolerance Code D (±0.5 pF) or F (±1 pF) or J (±5 %) or K (±10 %) or M (±20 %)

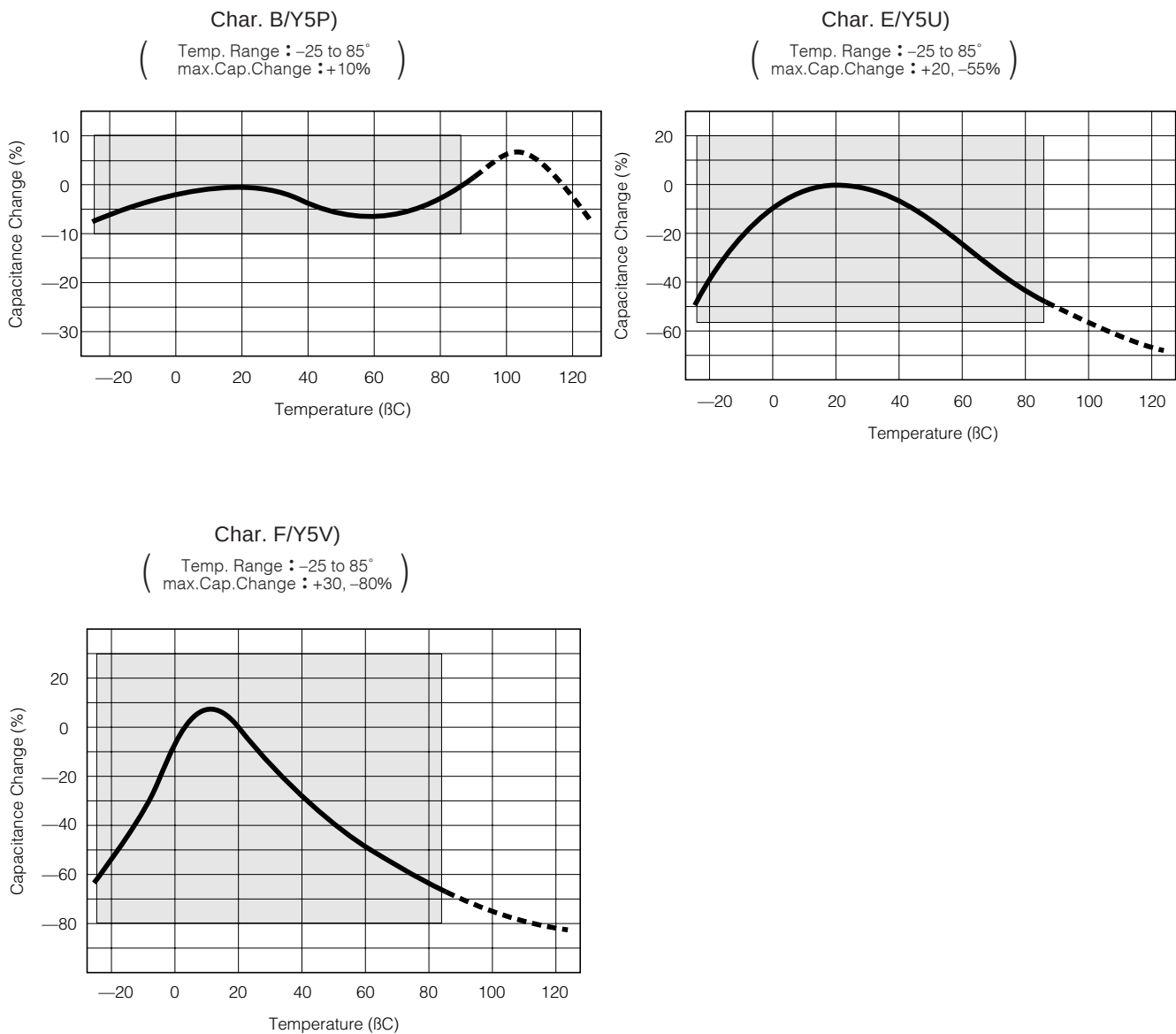
3: \* -- except for VDE and KTL.

- Type BE (250 VAC For Electrical Appliance and Material Safety Law compliance (Former Electrical Appliance and Material Control Law))

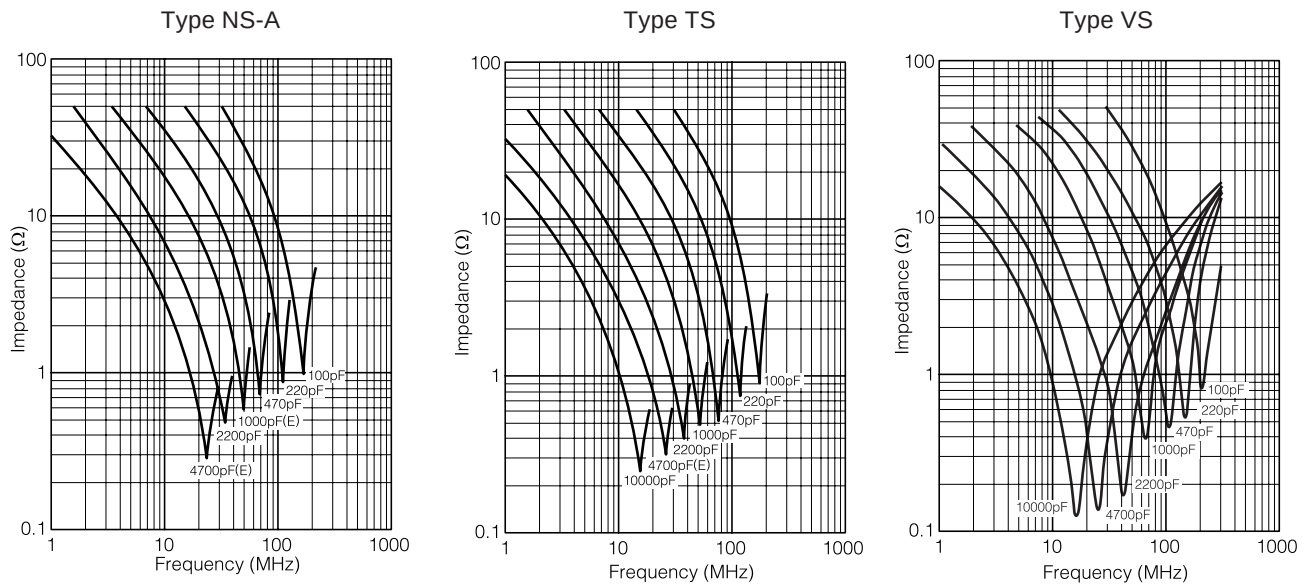
| Cap.<br>in pF | Cap.<br>Tol.<br>(%) | Temp.<br>Char. | Dimensions in mm |           | Kinked Lead Type (Bulk) |            |      | Kinked Lead Taped Type |               |            |      |
|---------------|---------------------|----------------|------------------|-----------|-------------------------|------------|------|------------------------|---------------|------------|------|
|               |                     |                | D<br>max.        | T<br>max. | Part Number             | Dim. in mm |      | Part Number            | Taped<br>Type | Dim. in mm |      |
|               |                     |                |                  |           |                         | F          | d    |                        |               | F          | d    |
| 1000          | +80, -20            | E/Y5U          | 7.0              | 5.0       | ECKABE102ZE             | 7.5        | 0.65 | ECKNBE102ZE            | N1            | 7.5        | 0.65 |
| 2200          | +80, -20            | E/Y5U          | 8.0              | 5.0       | ECKABE222ZE             | 7.5        | 0.65 | ECKNBE222ZE            | N1            | 7.5        | 0.65 |
| 3300          | +80, -20            | E/Y5U          | 9.0              | 5.0       | ECKABE332ZE             | 7.5        | 0.65 | ECKNBE332ZE            | N1            | 7.5        | 0.65 |
| 4700          | +80, -20            | E/Y5U          | 11.0             | 5.0       | ECKABE472ZE             | 7.5        | 0.65 | ECKNBE472ZE            | N1            | 7.5        | 0.65 |
| 4700          | +80, -20            | F/Y5V          | 8.0              | 5.0       | ECKABE472ZF             | 7.5        | 0.65 | ECKNBE472ZF            | N1            | 7.5        | 0.65 |
| 10000         | +80, -20            | F/Y5V          | 11.0             | 5.0       | ECKABE103ZF             | 7.5        | 0.65 | ECKNBE103ZF            | N1            | 7.5        | 0.65 |

Note: Dimensions "F" (Lead space) of 5.0 mm is available instead of 7.5 mm by special order

■ Typical Temperature Characteristics (Type TS, and Type NS-A)



### ■ Impedance vs. Frequency Characteristics



### ■ Current vs. Voltage (Leakage Current Characteristics)

Conditions      Temperature: 20 °C,      Applied Voltage: Sine Wave 60 Hz

