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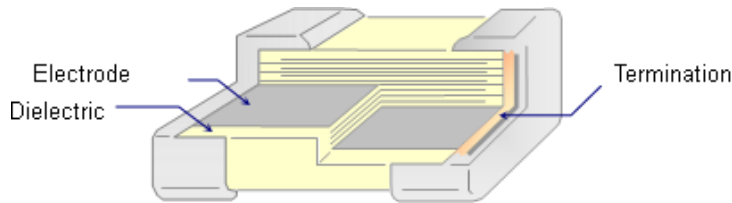
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|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| E3  | 1.0 |     |     |     | 2.2 |     |     |     |     |     | 4.7 |     |     |     |     |     |     |     |     |     |     |     |     |     |
| E6  | 1.0 |     | 1.5 |     | 2.2 |     |     | 3.3 |     |     | 4.7 |     | 6.8 |     |     |     |     |     |     |     |     |     |     |     |
| E12 | 1.0 | 1.2 | 1.5 | 1.8 | 2.2 | 2.7 | 3.3 | 3.9 | 4.7 | 5.6 | 6.8 | 8.2 |     |     |     |     |     |     |     |     |     |     |     |     |
| E24 | 1.0 | 1.1 | 1.2 | 1.3 | 1.5 | 1.6 | 1.8 | 2.0 | 2.2 | 2.4 | 2.7 | 3.0 | 3.3 | 3.6 | 3.9 | 4.3 | 4.7 | 5.1 | 5.6 | 6.2 | 6.8 | 7.5 | 8.2 | 9.1 |

MLCC

## Structure



## Ordering Code

**C 1608 NP0 102 J H T S Δ**

### PRODUCT CODE

C = MLCC

### SIZE in mm (EIA CODE, in inch)

|             |            |             |             |             |
|-------------|------------|-------------|-------------|-------------|
| 0402(01005) | 0603(0201) | 1005 (0402) | 1608 (0603) | 2012 (0805) |
| 3216 (1206) | 3225(1210) | 4520 (1808) | 4532 (1812) |             |

### T. C.

|  |                 |                    |                 |
|--|-----------------|--------------------|-----------------|
| NP0: $0 \pm 30\text{ppm}/^\circ\text{C}$ | -55°C to +125°C |                    |                 |
| X7R: $\pm 15\%$                          | -55°C to +125°C | X6S: $\pm 22\%$    | -55°C to +105°C |
| X5R: $\pm 15\%$                          | -55°C to +85°C  | Y5V: $+22\%/-82\%$ | -30°C to +85°C  |

### CAPACITANCE CODE

Expressed in pico-farads and identified by a three-digit number.  
 First two digits represent significant figures.  
 Last digit specifies the number of zeros.  
 (Use 9 for 1.0 through 9.9pF ; Use 8 for 0.20 through 0.99pF)

Examples:

| Code | Cap (pF) |
|------|----------|
| 478  | 0.47     |
| 229  | 2.2      |
| 101  | 100      |
| 102  | 1000     |

### TOLERANCE CODE

|                        |                       |                        |                       |              |              |
|------------------------|-----------------------|------------------------|-----------------------|--------------|--------------|
| A: $\pm 0.05\text{pF}$ | B: $\pm 0.1\text{pF}$ | C: $\pm 0.25\text{pF}$ | D: $\pm 0.5\text{pF}$ | F: $\pm 1\%$ | G: $\pm 2\%$ |
| J: $\pm 5\%$           | K: $\pm 10\%$         | M: $\pm 20\%$          | Z: $+80/-20\%$        |              |              |

### VOLTAGE CODE

|         |         |         |         |        |        |        |         |
|---------|---------|---------|---------|--------|--------|--------|---------|
| B: 4V   | C: 6.3V | D: 10V  | E: 16V  | F: 25V | N: 35V | G: 50V | H: 100V |
| J: 200V | K: 250V | L: 500V | M: 630V | P: 1KV | Q: 2KV | R: 3KV | S: 4KV  |

### PACKAGING CODE

|                                 |                                    |
|---------------------------------|------------------------------------|
| T: Paper tape reel Ø180mm (7")  | P: Embossed tape reel Ø180mm (7")  |
| N: Paper tape reel Ø250mm (10") | D: Embossed tape reel Ø250mm (10") |
| A: Paper tape reel Ø330mm (13") | E: Embossed tape reel Ø330mm (13") |
| W: Special Packing              |                                    |

### Application Code

S: Standard    Q: High Q/Low ESR    F: Microwave    A: Automotive infotainment with AEC-Q200

### Thickness Code

| Code    | Thick (mm)     | Code | Thick(mm) | Code | Thick (mm) |
|---------|----------------|------|-----------|------|------------|
| (blank) | Standard Thick | M    | 0.70      | G    | 1.25       |
| Z       | 0.20           | D    | 0.80      | H    | 1.50       |
| A       | 0.30           | E    | 0.85      | L    | 1.60       |
| Q       | 0.45           | I    | 0.95      | N    | 2.00       |
| B       | 0.50           | J    | 1.00      | P    | 2.50       |
| C       | 0.60           | F    | 1.15      | R    | 3.20       |

## Middle-High Voltage (100V~3kV)

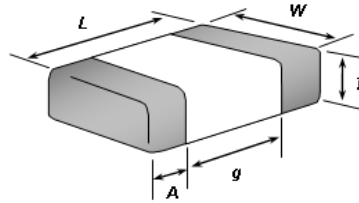
### ■ Feature

1. A monolithic structure ensures high reliability and mechanical strength.
2. Suitable for high speed SMT placement on PCBs.
3. RoHS compliant
4. Halogen Free

### ■ Application

1. Input filtering circuit of modem and LAN Interface.
2. DC-DC Converters
3. Backlighting inverters of LCD screen.
4. Switching circuit.
5. General high voltage circuit.

### ■ Standard External Dimensions



| TYPE            |             | Dimension (mm) |             |          |         |             |
|-----------------|-------------|----------------|-------------|----------|---------|-------------|
| (EIA Size)      | Kind        | L (Length)     | W (Width)   | T (Max.) | g (Min) | A (Min/Max) |
| C0603<br>(0201) | Standard    | 0.6 ± 0.03     | 0.30 ± 0.03 | 0.33     | 0.15    | 0.10 / 0.20 |
| C1005<br>(0402) | Standard    | 1.0 ± 0.05     | 0.50 ± 0.05 | 0.55     | 0.30    | 0.15 / 0.35 |
| C1608<br>(0603) | Standard    | 1.6 ± 0.10     | 0.80 ± 0.10 | 0.90     | 0.50    | 0.25 / 0.65 |
|                 | Special (1) | 1.6 ± 0.15     | 0.80 ± 0.15 | 0.95     | 0.50    | 0.25 / 0.65 |
| C2012<br>(0805) | Standard    | 2.0 ± 0.15     | 1.25 ± 0.15 | 1.45     | 0.70    | 0.25 / 0.75 |
| C3216<br>(1206) | Standard    | 3.2 ± 0.15     | 1.60 ± 0.15 | 1.80     | 1.50    | 0.25 / 0.75 |
| C3225<br>(1210) | Standard    | 3.2 ± 0.30     | 2.50 ± 0.20 | 2.70     | 1.50    | 0.25 / 0.75 |
| C4520<br>(1808) | Standard    | 4.6 ± 0.30     | 2.00 ± 0.20 | 2.20     | 1.50    | 0.25 / 0.75 |
|                 | Special (1) | 4.6 +0.5-0.3   | 2.00 ± 0.30 | 2.30     | 1.50    | 0.25 / 0.75 |
|                 | Special (2) | 4.6 ± 0.40     | 2.00 ± 0.30 | 2.30     | 1.50    | 0.25 / 0.75 |
| C4532<br>(1812) | Standard    | 4.6 ± 0.30     | 3.20 ± 0.30 | 2.80     | 1.50    | 0.25 / 0.75 |
|                 | Special (1) | 4.6 +0.5-0.3   | 3.20 ± 0.40 | 2.80     | 1.50    | 0.25 / 0.75 |
|                 | Special (2) | 4.6 ± 0.40     | 3.20 ± 0.30 | 2.80     | 1.50    | 0.25 / 0.75 |

For some special parts, please see the "Part Number & Characteristic" for detail specification.

## Part Number & Characteristic

### NP0 Series

#### C0603NP0 Series (EIA0201)

| RV              | DARFON P/N      | DARFON P/N 2   | Measuring Condition | Capacitance |                       | Available Tolerance    | Thick. (mm) | Tolerance(mm) |        | DF (max.) | Standard Packing | Test Spec. |
|-----------------|-----------------|----------------|---------------------|-------------|-----------------------|------------------------|-------------|---------------|--------|-----------|------------------|------------|
|                 |                 |                |                     | Value       | Unit                  |                        |             | L/W           | Thick. |           |                  |            |
| 100V            | C0603NP0208□HTS | C0603NP0208□HT | 1V, 1MHz            | 0.20        | pF                    | ±0.25pF,±0.1pF,±0.05pF | 0.30        | ±0.03         | ±0.03  | 0.25%     | Paper,15Kpcs     | (I)        |
|                 | C0603NP0308□HTS | C0603NP0308□HT | 1V, 1MHz            | 0.30        | pF                    | ±0.25pF,±0.1pF,±0.05pF | 0.30        | ±0.03         | ±0.03  | 0.25%     |                  | (I)        |
|                 | C0603NP0408□HTS | C0603NP0408□HT | 1V, 1MHz            | 0.40        | pF                    | ±0.25pF,±0.1pF,±0.05pF | 0.30        | ±0.03         | ±0.03  | 0.25%     |                  | (I)        |
|                 | C0603NP0508□HTS | C0603NP0508□HT | 1V, 1MHz            | 0.50        | pF                    | ±0.25pF,±0.1pF,±0.05pF | 0.30        | ±0.03         | ±0.03  | 0.24%     |                  | (I)        |
|                 | C0603NP0608□HTS | C0603NP0608□HT | 1V, 1MHz            | 0.60        | pF                    | ±0.25pF,±0.1pF,±0.05pF | 0.30        | ±0.03         | ±0.03  | 0.24%     |                  | (I)        |
|                 | C0603NP0708□HTS | C0603NP0708□HT | 1V, 1MHz            | 0.70        | pF                    | ±0.25pF,±0.1pF,±0.05pF | 0.30        | ±0.03         | ±0.03  | 0.24%     |                  | (I)        |
|                 | C0603NP0758□HTS | C0603NP0758□HT | 1V, 1MHz            | 0.75        | pF                    | ±0.25pF,±0.1pF,±0.05pF | 0.30        | ±0.03         | ±0.03  | 0.24%     |                  | (I)        |
|                 | C0603NP0808□HTS | C0603NP0808□HT | 1V, 1MHz            | 0.80        | pF                    | ±0.25pF,±0.1pF,±0.05pF | 0.30        | ±0.03         | ±0.03  | 0.24%     |                  | (I)        |
|                 | C0603NP0908□HTS | C0603NP0908□HT | 1V, 1MHz            | 0.90        | pF                    | ±0.25pF,±0.1pF,±0.05pF | 0.30        | ±0.03         | ±0.03  | 0.24%     |                  | (I)        |
|                 | C0603NP0109□HTS | C0603NP0109□HT | 1V, 1MHz            | 1.0         | pF                    | ±0.25pF,±0.1pF,±0.05pF | 0.30        | ±0.03         | ±0.03  | 0.24%     |                  | (I)        |
|                 | C0603NP0119□HTS | C0603NP0119□HT | 1V, 1MHz            | 1.1         | pF                    | ±0.25pF,±0.1pF         | 0.30        | ±0.03         | ±0.03  | 0.24%     |                  | (I)        |
|                 | C0603NP0129□HTS | C0603NP0129□HT | 1V, 1MHz            | 1.2         | pF                    | ±0.25pF,±0.1pF         | 0.30        | ±0.03         | ±0.03  | 0.24%     |                  | (I)        |
|                 | C0603NP0139□HTS | C0603NP0139□HT | 1V, 1MHz            | 1.3         | pF                    | ±0.25pF,±0.1pF         | 0.30        | ±0.03         | ±0.03  | 0.23%     |                  | (I)        |
|                 | C0603NP0159□HTS | C0603NP0159□HT | 1V, 1MHz            | 1.5         | pF                    | ±0.25pF,±0.1pF         | 0.30        | ±0.03         | ±0.03  | 0.23%     |                  | (I)        |
|                 | C0603NP0169□HTS | C0603NP0169□HT | 1V, 1MHz            | 1.6         | pF                    | ±0.25pF,±0.1pF         | 0.30        | ±0.03         | ±0.03  | 0.23%     |                  | (I)        |
|                 | C0603NP0189□HTS | C0603NP0189□HT | 1V, 1MHz            | 1.8         | pF                    | ±0.25pF,±0.1pF         | 0.30        | ±0.03         | ±0.03  | 0.23%     |                  | (I)        |
|                 | C0603NP0209□HTS | C0603NP0209□HT | 1V, 1MHz            | 2.0         | pF                    | ±0.25pF,±0.1pF         | 0.30        | ±0.03         | ±0.03  | 0.23%     |                  | (I)        |
|                 | C0603NP0229□HTS | C0603NP0229□HT | 1V, 1MHz            | 2.2         | pF                    | ±0.25pF,±0.1pF         | 0.30        | ±0.03         | ±0.03  | 0.23%     |                  | (I)        |
|                 | C0603NP0249□HTS | C0603NP0249□HT | 1V, 1MHz            | 2.4         | pF                    | ±0.25pF,±0.1pF         | 0.30        | ±0.03         | ±0.03  | 0.22%     |                  | (I)        |
|                 | C0603NP0279□HTS | C0603NP0279□HT | 1V, 1MHz            | 2.7         | pF                    | ±0.25pF,±0.1pF         | 0.30        | ±0.03         | ±0.03  | 0.22%     |                  | (I)        |
|                 | C0603NP0309□HTS | C0603NP0309□HT | 1V, 1MHz            | 3.0         | pF                    | ±0.25pF,±0.1pF         | 0.30        | ±0.03         | ±0.03  | 0.22%     |                  | (I)        |
|                 | C0603NP0339□HTS | C0603NP0339□HT | 1V, 1MHz            | 3.3         | pF                    | ±0.25pF,±0.1pF         | 0.30        | ±0.03         | ±0.03  | 0.21%     |                  | (I)        |
|                 | C0603NP0359□HTS | C0603NP0359□HT | 1V, 1MHz            | 3.5         | pF                    | ±0.25pF,±0.1pF         | 0.30        | ±0.03         | ±0.03  | 0.21%     |                  | (I)        |
|                 | C0603NP0399□HTS | C0603NP0399□HT | 1V, 1MHz            | 3.9         | pF                    | ±0.25pF,±0.1pF         | 0.30        | ±0.03         | ±0.03  | 0.21%     |                  | (I)        |
|                 | C0603NP0409□HTS | C0603NP0409□HT | 1V, 1MHz            | 4.0         | pF                    | ±0.25pF,±0.1pF         | 0.30        | ±0.03         | ±0.03  | 0.21%     |                  | (I)        |
|                 | C0603NP0439□HTS | C0603NP0439□HT | 1V, 1MHz            | 4.3         | pF                    | ±0.25pF,±0.1pF         | 0.30        | ±0.03         | ±0.03  | 0.21%     |                  | (I)        |
|                 | C0603NP0479□HTS | C0603NP0479□HT | 1V, 1MHz            | 4.7         | pF                    | ±0.25pF,±0.1pF         | 0.30        | ±0.03         | ±0.03  | 0.20%     |                  | (I)        |
|                 | C0603NP0509□HTS | C0603NP0509□HT | 1V, 1MHz            | 5.0         | pF                    | ±0.5pF,±0.25pF,±0.1pF  | 0.30        | ±0.03         | ±0.03  | 0.20%     |                  | (I)        |
|                 | C0603NP0519□HTS | C0603NP0519□HT | 1V, 1MHz            | 5.1         | pF                    | ±0.5pF,±0.25pF,±0.1pF  | 0.30        | ±0.03         | ±0.03  | 0.20%     |                  | (I)        |
|                 | C0603NP0569□HTS | C0603NP0569□HT | 1V, 1MHz            | 5.6         | pF                    | ±0.5pF,±0.25pF,±0.1pF  | 0.30        | ±0.03         | ±0.03  | 0.20%     |                  | (I)        |
| C0603NP0609□HTS | C0603NP0609□HT  | 1V, 1MHz       | 6.0                 | pF          | ±0.5pF,±0.25pF,±0.1pF | 0.30                   | ±0.03       | ±0.03         | 0.19%  | (I)       |                  |            |
| C0603NP0689□HTS | C0603NP0689□HT  | 1V, 1MHz       | 6.8                 | pF          | ±0.5pF,±0.25pF,±0.1pF | 0.30                   | ±0.03       | ±0.03         | 0.19%  | (I)       |                  |            |
| C0603NP0709□HTS | C0603NP0709□HT  | 1V, 1MHz       | 7.0                 | pF          | ±0.5pF,±0.25pF,±0.1pF | 0.30                   | ±0.03       | ±0.03         | 0.19%  | (I)       |                  |            |
| C0603NP0759□HTS | C0603NP0759□HT  | 1V, 1MHz       | 7.5                 | pF          | ±0.5pF,±0.25pF,±0.1pF | 0.30                   | ±0.03       | ±0.03         | 0.18%  | (I)       |                  |            |
| C0603NP0809□HTS | C0603NP0809□HT  | 1V, 1MHz       | 8.0                 | pF          | ±0.5pF,±0.25pF,±0.1pF | 0.30                   | ±0.03       | ±0.03         | 0.18%  | (I)       |                  |            |
| C0603NP0829□HTS | C0603NP0829□HT  | 1V, 1MHz       | 8.2                 | pF          | ±0.5pF,±0.25pF,±0.1pF | 0.30                   | ±0.03       | ±0.03         | 0.18%  | (I)       |                  |            |
| C0603NP0909□HTS | C0603NP0909□HT  | 1V, 1MHz       | 9.0                 | pF          | ±0.5pF,±0.25pF,±0.1pF | 0.30                   | ±0.03       | ±0.03         | 0.17%  | (I)       |                  |            |
| C0603NP0100□HTS | C0603NP0100□HT  | 1V, 1MHz       | 10                  | pF          | ±5%,±2%,±1%           | 0.30                   | ±0.03       | ±0.03         | 0.17%  | (I)       |                  |            |

#### C1005NP0 Series (EIA0402)

| RV              | DARFON P/N      | DARFON P/N 2   | Measuring Condition | Capacitance |                       | Available Tolerance    | Thick. (mm) | Tolerance(mm) |        | DF (max.) | Standard Packing | Test Spec. |
|-----------------|-----------------|----------------|---------------------|-------------|-----------------------|------------------------|-------------|---------------|--------|-----------|------------------|------------|
|                 |                 |                |                     | Value       | Unit                  |                        |             | L/W           | Thick. |           |                  |            |
| 100V            | C1005NP0208□HTS | C1005NP0208□HT | 1V, 1MHz            | 0.20        | pF                    | ±0.25pF,±0.1pF,±0.05pF | 0.50        | ±0.05         | ±0.05  | 0.25%     | Paper, 10Kpcs    | (I)        |
|                 | C1005NP0308□HTS | C1005NP0308□HT | 1V, 1MHz            | 0.30        | pF                    | ±0.25pF,±0.1pF,±0.05pF | 0.50        | ±0.05         | ±0.05  | 0.25%     |                  | (I)        |
|                 | C1005NP0408□HTS | C1005NP0408□HT | 1V, 1MHz            | 0.40        | pF                    | ±0.25pF,±0.1pF,±0.05pF | 0.50        | ±0.05         | ±0.05  | 0.25%     |                  | (I)        |
|                 | C1005NP0508□HTS | C1005NP0508□HT | 1V, 1MHz            | 0.50        | pF                    | ±0.25pF,±0.1pF,±0.05pF | 0.50        | ±0.05         | ±0.05  | 0.24%     |                  | (I)        |
|                 | C1005NP0608□HTS | C1005NP0608□HT | 1V, 1MHz            | 0.60        | pF                    | ±0.25pF,±0.1pF,±0.05pF | 0.50        | ±0.05         | ±0.05  | 0.24%     |                  | (I)        |
|                 | C1005NP0708□HTS | C1005NP0708□HT | 1V, 1MHz            | 0.70        | pF                    | ±0.25pF,±0.1pF,±0.05pF | 0.50        | ±0.05         | ±0.05  | 0.24%     |                  | (I)        |
|                 | C1005NP0808□HTS | C1005NP0808□HT | 1V, 1MHz            | 0.80        | pF                    | ±0.25pF,±0.1pF,±0.05pF | 0.50        | ±0.05         | ±0.05  | 0.24%     |                  | (I)        |
|                 | C1005NP0908□HTS | C1005NP0908□HT | 1V, 1MHz            | 0.90        | pF                    | ±0.25pF,±0.1pF,±0.05pF | 0.50        | ±0.05         | ±0.05  | 0.24%     |                  | (I)        |
|                 | C1005NP0109□HTS | C1005NP0109□HT | 1V, 1MHz            | 1.0         | pF                    | ±0.25pF,±0.1pF,±0.05pF | 0.50        | ±0.05         | ±0.05  | 0.24%     |                  | (I)        |
|                 | C1005NP0129□HTS | C1005NP0129□HT | 1V, 1MHz            | 1.2         | pF                    | ±0.25pF,±0.1pF         | 0.50        | ±0.05         | ±0.05  | 0.24%     |                  | (I)        |
|                 | C1005NP0159□HTS | C1005NP0159□HT | 1V, 1MHz            | 1.5         | pF                    | ±0.25pF,±0.1pF         | 0.50        | ±0.05         | ±0.05  | 0.23%     |                  | (I)        |
|                 | C1005NP0189□HTS | C1005NP0189□HT | 1V, 1MHz            | 1.8         | pF                    | ±0.25pF,±0.1pF         | 0.50        | ±0.05         | ±0.05  | 0.23%     |                  | (I)        |
|                 | C1005NP0229□HTS | C1005NP0229□HT | 1V, 1MHz            | 2.2         | pF                    | ±0.25pF,±0.1pF         | 0.50        | ±0.05         | ±0.05  | 0.23%     |                  | (I)        |
|                 | C1005NP0279□HTS | C1005NP0279□HT | 1V, 1MHz            | 2.7         | pF                    | ±0.25pF,±0.1pF         | 0.50        | ±0.05         | ±0.05  | 0.22%     |                  | (I)        |
|                 | C1005NP0339□HTS | C1005NP0339□HT | 1V, 1MHz            | 3.3         | pF                    | ±0.25pF,±0.1pF         | 0.50        | ±0.05         | ±0.05  | 0.21%     |                  | (I)        |
|                 | C1005NP0399□HTS | C1005NP0399□HT | 1V, 1MHz            | 3.9         | pF                    | ±0.25pF,±0.1pF         | 0.50        | ±0.05         | ±0.05  | 0.21%     |                  | (I)        |
|                 | C1005NP0409□HTS | C1005NP0409□HT | 1V, 1MHz            | 4.0         | pF                    | ±0.25pF,±0.1pF         | 0.50        | ±0.05         | ±0.05  | 0.21%     |                  | (I)        |
|                 | C1005NP0479□HTS | C1005NP0479□HT | 1V, 1MHz            | 4.7         | pF                    | ±0.25pF,±0.1pF         | 0.50        | ±0.05         | ±0.05  | 0.20%     |                  | (I)        |
|                 | C1005NP0509□HTS | C1005NP0509□HT | 1V, 1MHz            | 5.0         | pF                    | ±0.5pF,±0.25pF,±0.1pF  | 0.50        | ±0.05         | ±0.05  | 0.20%     |                  | (I)        |
|                 | C1005NP0569□HTS | C1005NP0569□HT | 1V, 1MHz            | 5.6         | pF                    | ±0.5pF,±0.25pF,±0.1pF  | 0.50        | ±0.05         | ±0.05  | 0.20%     |                  | (I)        |
| C1005NP0689□HTS | C1005NP0689□HT  | 1V, 1MHz       | 6.8                 | pF          | ±0.5pF,±0.25pF,±0.1pF | 0.50                   | ±0.05       | ±0.05         | 0.19%  | (I)       |                  |            |
| C1005NP0809□HTS | C1005NP0809□HT  | 1V, 1MHz       | 8.0                 | pF          | ±0.5pF,±0.25pF,±0.1pF | 0.50                   | ±0.05       | ±0.05         | 0.18%  | (I)       |                  |            |
| C1005NP0829□HTS | C1005NP0829□HT  | 1V, 1MHz       | 8.2                 | pF          | ±0.5pF,±0.25pF,±0.1pF | 0.50                   | ±0.05       | ±0.05         | 0.18%  | (I)       |                  |            |

| RV              | DARFON P/N      | DARFON P/N 2   | Measuring Condition | Capacitance |      | Available Tolerance | Thick. (mm) | Tolerance(mm) |        | DF (max.) | Standard Packing | Test Spec. |
|-----------------|-----------------|----------------|---------------------|-------------|------|---------------------|-------------|---------------|--------|-----------|------------------|------------|
|                 |                 |                |                     | Value       | Unit |                     |             | LW            | Thick. |           |                  |            |
| 100V            | C1005NP0100□HTS | C1005NP0100□HT | 1V, 1MHz            | 10          | pF   | ±5%,±2%,±1%         | 0.50        | ±0.05         | ±0.05  | 0.17%     | Paper, 10Kpcs    | (I)        |
|                 | C1005NP0120□HTS | C1005NP0120□HT | 1V, 1MHz            | 12          | pF   | ±5%,±2%,±1%         | 0.50        | ±0.05         | ±0.05  | 0.16%     |                  | (I)        |
|                 | C1005NP0150□HTS | C1005NP0150□HT | 1V, 1MHz            | 15          | pF   | ±5%,±2%,±1%         | 0.50        | ±0.05         | ±0.05  | 0.14%     |                  | (I)        |
|                 | C1005NP0180□HTS | C1005NP0180□HT | 1V, 1MHz            | 18          | pF   | ±5%,±2%,±1%         | 0.50        | ±0.05         | ±0.05  | 0.13%     |                  | (I)        |
|                 | C1005NP0220□HTS | C1005NP0220□HT | 1V, 1MHz            | 22          | pF   | ±5%,±2%,±1%         | 0.50        | ±0.05         | ±0.05  | 0.12%     |                  | (I)        |
|                 | C1005NP0270□HTS | C1005NP0270□HT | 1V, 1MHz            | 27          | pF   | ±5%,±2%,±1%         | 0.50        | ±0.05         | ±0.05  | 0.11%     |                  | (I)        |
|                 | C1005NP0330□HTS | C1005NP0330□HT | 1V, 1MHz            | 33          | pF   | ±5%,±2%,±1%         | 0.50        | ±0.05         | ±0.05  | 0.10%     |                  | (I)        |
|                 | C1005NP0390□HTS | C1005NP0390□HT | 1V, 1MHz            | 39          | pF   | ±5%,±2%,±1%         | 0.50        | ±0.05         | ±0.05  | 0.10%     |                  | (I)        |
|                 | C1005NP0470□HTS | C1005NP0470□HT | 1V, 1MHz            | 47          | pF   | ±5%,±2%,±1%         | 0.50        | ±0.05         | ±0.05  | 0.10%     |                  | (I)        |
|                 | C1005NP0560□HTS | C1005NP0560□HT | 1V, 1MHz            | 56          | pF   | ±5%,±2%,±1%         | 0.50        | ±0.05         | ±0.05  | 0.10%     |                  | (I)        |
|                 | C1005NP0680□HTS | C1005NP0680□HT | 1V, 1MHz            | 68          | pF   | ±5%,±2%,±1%         | 0.50        | ±0.05         | ±0.05  | 0.10%     |                  | (I)        |
|                 | C1005NP0820□HTS | C1005NP0820□HT | 1V, 1MHz            | 82          | pF   | ±5%,±2%,±1%         | 0.50        | ±0.05         | ±0.05  | 0.10%     |                  | (I)        |
|                 | C1005NP0101□HTS | C1005NP0101□HT | 1V, 1MHz            | 100         | pF   | ±5%,±2%,±1%         | 0.50        | ±0.05         | ±0.05  | 0.10%     |                  | (I)        |
|                 | C1005NP0121JHTS | C1005NP0121JHT | 1V, 1MHz            | 120         | pF   | ±5%                 | 0.50        | ±0.05         | ±0.05  | 0.10%     |                  | (I)        |
|                 | C1005NP0151JHTS | C1005NP0151JHT | 1V, 1MHz            | 150         | pF   | ±5%                 | 0.50        | ±0.05         | ±0.05  | 0.10%     |                  | (I)        |
| C1005NP0181JHTS | C1005NP0181JHT  | 1V, 1MHz       | 180                 | pF          | ±5%  | 0.50                | ±0.05       | ±0.05         | 0.10%  | (I)       |                  |            |
| C1005NP0221JHTS | C1005NP0221JHT  | 1V, 1MHz       | 220                 | pF          | ±5%  | 0.50                | ±0.05       | ±0.05         | 0.10%  | (I)       |                  |            |

● C1608NP0 Series (EIA0603)

| RV              | DARFON P/N      | DARFON P/N 2   | Measuring Condition | Capacitance |      | Available Tolerance | Thick. (mm) | Tolerance(mm) |        | DF (max.) | Standard Packing | Test Spec. |
|-----------------|-----------------|----------------|---------------------|-------------|------|---------------------|-------------|---------------|--------|-----------|------------------|------------|
|                 |                 |                |                     | Value       | Unit |                     |             | LW            | Thick. |           |                  |            |
| 250V            | C1608NP0109□KTS | C1608NP0109□KT | 1V, 1MHz            | 1.0         | pF   | ±0.25pF,±0.1pF      | 0.80        | ±0.10         | ±0.10  | 0.24%     | Paper, 4Kpcs     | (I)        |
|                 | C1608NP0129□KTS | C1608NP0129□KT | 1V, 1MHz            | 1.2         | pF   | ±0.25pF,±0.1pF      | 0.80        | ±0.10         | ±0.10  | 0.24%     |                  | (I)        |
|                 | C1608NP0159□KTS | C1608NP0159□KT | 1V, 1MHz            | 1.5         | pF   | ±0.25pF,±0.1pF      | 0.80        | ±0.10         | ±0.10  | 0.23%     |                  | (I)        |
|                 | C1608NP0189□KTS | C1608NP0189□KT | 1V, 1MHz            | 1.8         | pF   | ±0.25pF,±0.1pF      | 0.80        | ±0.10         | ±0.10  | 0.23%     |                  | (I)        |
|                 | C1608NP0229□KTS | C1608NP0229□KT | 1V, 1MHz            | 2.2         | pF   | ±0.25pF,±0.1pF      | 0.80        | ±0.10         | ±0.10  | 0.23%     |                  | (I)        |
|                 | C1608NP0279□KTS | C1608NP0279□KT | 1V, 1MHz            | 2.7         | pF   | ±0.25pF,±0.1pF      | 0.80        | ±0.10         | ±0.10  | 0.22%     |                  | (I)        |
|                 | C1608NP0339□KTS | C1608NP0339□KT | 1V, 1MHz            | 3.3         | pF   | ±0.25pF,±0.1pF      | 0.80        | ±0.10         | ±0.10  | 0.21%     |                  | (I)        |
|                 | C1608NP0399□KTS | C1608NP0399□KT | 1V, 1MHz            | 3.9         | pF   | ±0.25pF,±0.1pF      | 0.80        | ±0.10         | ±0.10  | 0.21%     |                  | (I)        |
|                 | C1608NP0479□KTS | C1608NP0479□KT | 1V, 1MHz            | 4.7         | pF   | ±0.25pF,±0.1pF      | 0.80        | ±0.10         | ±0.10  | 0.20%     |                  | (I)        |
|                 | C1608NP0569□KTS | C1608NP0569□KT | 1V, 1MHz            | 5.6         | pF   | ±0.5pF,±0.25pF      | 0.80        | ±0.10         | ±0.10  | 0.20%     |                  | (I)        |
|                 | C1608NP0689□KTS | C1608NP0689□KT | 1V, 1MHz            | 6.8         | pF   | ±0.5pF,±0.25pF      | 0.80        | ±0.10         | ±0.10  | 0.19%     |                  | (I)        |
|                 | C1608NP0829□KTS | C1608NP0829□KT | 1V, 1MHz            | 8.2         | pF   | ±0.5pF,±0.25pF      | 0.80        | ±0.10         | ±0.10  | 0.18%     |                  | (I)        |
|                 | C1608NP0100JKTS | C1608NP0100JKT | 1V, 1MHz            | 10          | pF   | ±5%                 | 0.80        | ±0.10         | ±0.10  | 0.17%     |                  | (I)        |
|                 | C1608NP0120JKTS | C1608NP0120JKT | 1V, 1MHz            | 12          | pF   | ±5%                 | 0.80        | ±0.10         | ±0.10  | 0.16%     |                  | (I)        |
|                 | C1608NP0150JKTS | C1608NP0150JKT | 1V, 1MHz            | 15          | pF   | ±5%                 | 0.80        | ±0.10         | ±0.10  | 0.14%     |                  | (I)        |
|                 | C1608NP0180JKTS | C1608NP0180JKT | 1V, 1MHz            | 18          | pF   | ±5%                 | 0.80        | ±0.10         | ±0.10  | 0.13%     |                  | (I)        |
|                 | C1608NP0220JKTS | C1608NP0220JKT | 1V, 1MHz            | 22          | pF   | ±5%                 | 0.80        | ±0.10         | ±0.10  | 0.12%     |                  | (I)        |
|                 | C1608NP0270JKTS | C1608NP0270JKT | 1V, 1MHz            | 27          | pF   | ±5%                 | 0.80        | ±0.10         | ±0.10  | 0.11%     |                  | (I)        |
|                 | C1608NP0330JKTS | C1608NP0330JKT | 1V, 1MHz            | 33          | pF   | ±5%                 | 0.80        | ±0.10         | ±0.10  | 0.10%     |                  | (I)        |
|                 | C1608NP0390JKTS | C1608NP0390JKT | 1V, 1MHz            | 39          | pF   | ±5%                 | 0.80        | ±0.10         | ±0.10  | 0.10%     |                  | (I)        |
|                 | C1608NP0470JKTS | C1608NP0470JKT | 1V, 1MHz            | 47          | pF   | ±5%                 | 0.80        | ±0.10         | ±0.10  | 0.10%     |                  | (I)        |
|                 | C1608NP0560JKTS | C1608NP0560JKT | 1V, 1MHz            | 56          | pF   | ±5%                 | 0.80        | ±0.10         | ±0.10  | 0.10%     |                  | (I)        |
|                 | C1608NP0680JKTS | C1608NP0680JKT | 1V, 1MHz            | 68          | pF   | ±5%                 | 0.80        | ±0.10         | ±0.10  | 0.10%     |                  | (I)        |
|                 | C1608NP0820JKTS | C1608NP0820JKT | 1V, 1MHz            | 82          | pF   | ±5%                 | 0.80        | ±0.10         | ±0.10  | 0.10%     |                  | (I)        |
|                 | C1608NP0101JKTS | C1608NP0101JKT | 1V, 1MHz            | 100         | pF   | ±5%                 | 0.80        | ±0.10         | ±0.10  | 0.10%     |                  | (I)        |
|                 | C1608NP0121JKTS | C1608NP0121JKT | 1V, 1MHz            | 120         | pF   | ±5%                 | 0.80        | ±0.10         | ±0.10  | 0.10%     |                  | (I)        |
|                 | C1608NP0151JKTS | C1608NP0151JKT | 1V, 1MHz            | 150         | pF   | ±5%                 | 0.80        | ±0.10         | ±0.10  | 0.10%     |                  | (I)        |
|                 | C1608NP0181JKTS | C1608NP0181JKT | 1V, 1MHz            | 180         | pF   | ±5%                 | 0.80        | ±0.10         | ±0.10  | 0.10%     |                  | (I)        |
|                 | C1608NP0221JKTS | C1608NP0221JKT | 1V, 1MHz            | 220         | pF   | ±5%                 | 0.80        | ±0.10         | ±0.10  | 0.10%     |                  | (I)        |
|                 | C1608NP0271JKTS | C1608NP0271JKT | 1V, 1MHz            | 270         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.15  | 0.10%     |                  | (I)        |
| C1608NP0331JKTS | C1608NP0331JKT  | 1V, 1MHz       | 330                 | pF          | ±5%  | 0.80                | ±0.15       | ±0.15         | 0.10%  | (I)       |                  |            |
| C1608NP0391JKTS | C1608NP0391JKT  | 1V, 1MHz       | 390                 | pF          | ±5%  | 0.80                | ±0.15       | ±0.15         | 0.10%  | (I)       |                  |            |
| C1608NP0471JKTS | C1608NP0471JKT  | 1V, 1MHz       | 470                 | pF          | ±5%  | 0.80                | ±0.15       | ±0.15         | 0.10%  | (I)       |                  |            |
| 200V            | C1608NP0221JJTS | C1608NP0221JJT | 1V, 1MHz            | 220         | pF   | ±5%                 | 0.80        | ±0.10         | ±0.10  | 0.10%     | Paper, 4Kpcs     | (I)        |

MLCC Middle High Voltage

| RV              | DARFON P/N      | DARFON P/N 2   | Measuring Condition | Capacitance |             | Available Tolerance    | Thick. (mm) | Tolerance(mm) |        | DF (max.) | Standard Packing | Test Spec. |
|-----------------|-----------------|----------------|---------------------|-------------|-------------|------------------------|-------------|---------------|--------|-----------|------------------|------------|
|                 |                 |                |                     | Value       | Unit        |                        |             | L/W           | Thick. |           |                  |            |
| 100V            | C1608NP0308□HTS | C1608NP0308□HT | 1V, 1MHz            | 0.30        | pF          | ±0.25pF,±0.1pF,±0.05pF | 0.80        | ±0.10         | ±0.10  | 0.25%     | Paper, 4Kpcs     | (f)        |
|                 | C1608NP0408□HTS | C1608NP0408□HT | 1V, 1MHz            | 0.40        | pF          | ±0.25pF,±0.1pF,±0.05pF | 0.80        | ±0.10         | ±0.10  | 0.25%     |                  | (f)        |
|                 | C1608NP0508□HTS | C1608NP0508□HT | 1V, 1MHz            | 0.50        | pF          | ±0.25pF,±0.1pF,±0.05pF | 0.80        | ±0.10         | ±0.10  | 0.24%     |                  | (f)        |
|                 | C1608NP0608□HTS | C1608NP0608□HT | 1V, 1MHz            | 0.60        | pF          | ±0.25pF,±0.1pF,±0.05pF | 0.80        | ±0.10         | ±0.10  | 0.24%     |                  | (f)        |
|                 | C1608NP0708□HTS | C1608NP0708□HT | 1V, 1MHz            | 0.70        | pF          | ±0.25pF,±0.1pF,±0.05pF | 0.80        | ±0.10         | ±0.10  | 0.24%     |                  | (f)        |
|                 | C1608NP0758□HTS | C1608NP0758□HT | 1V, 1MHz            | 0.75        | pF          | ±0.25pF,±0.1pF,±0.05pF | 0.80        | ±0.10         | ±0.10  | 0.24%     |                  | (f)        |
|                 | C1608NP0808□HTS | C1608NP0808□HT | 1V, 1MHz            | 0.80        | pF          | ±0.25pF,±0.1pF,±0.05pF | 0.80        | ±0.10         | ±0.10  | 0.24%     |                  | (f)        |
|                 | C1608NP0908□HTS | C1608NP0908□HT | 1V, 1MHz            | 0.90        | pF          | ±0.25pF,±0.1pF,±0.05pF | 0.80        | ±0.10         | ±0.10  | 0.24%     |                  | (f)        |
|                 | C1608NP0109□HTS | C1608NP0109□HT | 1V, 1MHz            | 1.0         | pF          | ±0.25pF,±0.1pF,±0.05pF | 0.80        | ±0.10         | ±0.10  | 0.24%     |                  | (f)        |
|                 | C1608NP0129□HTS | C1608NP0129□HT | 1V, 1MHz            | 1.2         | pF          | ±0.25pF,±0.1pF         | 0.80        | ±0.10         | ±0.10  | 0.24%     |                  | (f)        |
|                 | C1608NP0159□HTS | C1608NP0159□HT | 1V, 1MHz            | 1.5         | pF          | ±0.25pF,±0.1pF         | 0.80        | ±0.10         | ±0.10  | 0.23%     |                  | (f)        |
|                 | C1608NP0189□HTS | C1608NP0189□HT | 1V, 1MHz            | 1.8         | pF          | ±0.25pF,±0.1pF         | 0.80        | ±0.10         | ±0.10  | 0.23%     |                  | (f)        |
|                 | C1608NP0209□HTS | C1608NP0209□HT | 1V, 1MHz            | 2.0         | pF          | ±0.25pF,±0.1pF         | 0.80        | ±0.10         | ±0.10  | 0.23%     |                  | (f)        |
|                 | C1608NP0229□HTS | C1608NP0229□HT | 1V, 1MHz            | 2.2         | pF          | ±0.25pF,±0.1pF         | 0.80        | ±0.10         | ±0.10  | 0.23%     |                  | (f)        |
|                 | C1608NP0249□HTS | C1608NP0249□HT | 1V, 1MHz            | 2.4         | pF          | ±0.25pF,±0.1pF         | 0.80        | ±0.10         | ±0.10  | 0.22%     |                  | (f)        |
|                 | C1608NP0279□HTS | C1608NP0279□HT | 1V, 1MHz            | 2.7         | pF          | ±0.25pF,±0.1pF         | 0.80        | ±0.10         | ±0.10  | 0.22%     |                  | (f)        |
|                 | C1608NP0309□HTS | C1608NP0309□HT | 1V, 1MHz            | 3.0         | pF          | ±0.25pF,±0.1pF         | 0.80        | ±0.10         | ±0.10  | 0.22%     |                  | (f)        |
|                 | C1608NP0339□HTS | C1608NP0339□HT | 1V, 1MHz            | 3.3         | pF          | ±0.25pF,±0.1pF         | 0.80        | ±0.10         | ±0.10  | 0.21%     |                  | (f)        |
|                 | C1608NP0399□HTS | C1608NP0399□HT | 1V, 1MHz            | 3.9         | pF          | ±0.25pF,±0.1pF         | 0.80        | ±0.10         | ±0.10  | 0.21%     |                  | (f)        |
|                 | C1608NP0409□HTS | C1608NP0409□HT | 1V, 1MHz            | 4.0         | pF          | ±0.25pF,±0.1pF         | 0.80        | ±0.10         | ±0.10  | 0.21%     |                  | (f)        |
|                 | C1608NP0439□HTS | C1608NP0439□HT | 1V, 1MHz            | 4.3         | pF          | ±0.25pF,±0.1pF         | 0.80        | ±0.10         | ±0.10  | 0.21%     |                  | (f)        |
|                 | C1608NP0479□HTS | C1608NP0479□HT | 1V, 1MHz            | 4.7         | pF          | ±0.25pF,±0.1pF         | 0.80        | ±0.10         | ±0.10  | 0.20%     |                  | (f)        |
|                 | C1608NP0509□HTS | C1608NP0509□HT | 1V, 1MHz            | 5.0         | pF          | ±0.5pF,±0.25pF,±0.1pF  | 0.80        | ±0.10         | ±0.10  | 0.20%     |                  | (f)        |
|                 | C1608NP0569□HTS | C1608NP0569□HT | 1V, 1MHz            | 5.6         | pF          | ±0.5pF,±0.25pF,±0.1pF  | 0.80        | ±0.10         | ±0.10  | 0.20%     |                  | (f)        |
|                 | C1608NP0609□HTS | C1608NP0609□HT | 1V, 1MHz            | 6.0         | pF          | ±0.5pF,±0.25pF,±0.1pF  | 0.80        | ±0.10         | ±0.10  | 0.19%     |                  | (f)        |
|                 | C1608NP0629□HTS | C1608NP0629□HT | 1V, 1MHz            | 6.2         | pF          | ±0.5pF,±0.25pF,±0.1pF  | 0.80        | ±0.10         | ±0.10  | 0.19%     |                  | (f)        |
|                 | C1608NP0689□HTS | C1608NP0689□HT | 1V, 1MHz            | 6.8         | pF          | ±0.5pF,±0.25pF,±0.1pF  | 0.80        | ±0.10         | ±0.10  | 0.19%     |                  | (f)        |
|                 | C1608NP0709□HTS | C1608NP0709□HT | 1V, 1MHz            | 7.0         | pF          | ±0.5pF,±0.25pF,±0.1pF  | 0.80        | ±0.10         | ±0.10  | 0.19%     |                  | (f)        |
|                 | C1608NP0829□HTS | C1608NP0829□HT | 1V, 1MHz            | 8.2         | pF          | ±0.5pF,±0.25pF,±0.1pF  | 0.80        | ±0.10         | ±0.10  | 0.18%     |                  | (f)        |
|                 | C1608NP0909□HTS | C1608NP0909□HT | 1V, 1MHz            | 9.0         | pF          | ±0.5pF,±0.25pF,±0.1pF  | 0.80        | ±0.10         | ±0.10  | 0.17%     |                  | (f)        |
|                 | C1608NP0919□HTS | C1608NP0919□HT | 1V, 1MHz            | 9.1         | pF          | ±0.5pF,±0.25pF,±0.1pF  | 0.80        | ±0.10         | ±0.10  | 0.17%     |                  | (f)        |
|                 | C1608NP0100□HTS | C1608NP0100□HT | 1V, 1MHz            | 10          | pF          | ±5%,±2%,±1%            | 0.80        | ±0.10         | ±0.10  | 0.17%     |                  | (f)        |
|                 | C1608NP0110□HTS | C1608NP0110□HT | 1V, 1MHz            | 11          | pF          | ±5%,±2%,±1%            | 0.80        | ±0.10         | ±0.10  | 0.16%     |                  | (f)        |
|                 | C1608NP0120□HTS | C1608NP0120□HT | 1V, 1MHz            | 12          | pF          | ±5%,±2%,±1%            | 0.80        | ±0.10         | ±0.10  | 0.16%     |                  | (f)        |
|                 | C1608NP0150□HTS | C1608NP0150□HT | 1V, 1MHz            | 15          | pF          | ±5%,±2%,±1%            | 0.80        | ±0.10         | ±0.10  | 0.14%     |                  | (f)        |
|                 | C1608NP0180□HTS | C1608NP0180□HT | 1V, 1MHz            | 18          | pF          | ±5%,±2%,±1%            | 0.80        | ±0.10         | ±0.10  | 0.13%     |                  | (f)        |
|                 | C1608NP0200□HTS | C1608NP0200□HT | 1V, 1MHz            | 20          | pF          | ±5%,±2%,±1%            | 0.80        | ±0.10         | ±0.10  | 0.13%     |                  | (f)        |
|                 | C1608NP0220□HTS | C1608NP0220□HT | 1V, 1MHz            | 22          | pF          | ±5%,±2%,±1%            | 0.80        | ±0.10         | ±0.10  | 0.12%     |                  | (f)        |
|                 | C1608NP0240□HTS | C1608NP0240□HT | 1V, 1MHz            | 24          | pF          | ±5%,±2%,±1%            | 0.80        | ±0.10         | ±0.10  | 0.11%     |                  | (f)        |
|                 | C1608NP0270□HTS | C1608NP0270□HT | 1V, 1MHz            | 27          | pF          | ±5%,±2%,±1%            | 0.80        | ±0.10         | ±0.10  | 0.11%     |                  | (f)        |
|                 | C1608NP0300□HTS | C1608NP0300□HT | 1V, 1MHz            | 30          | pF          | ±5%,±2%,±1%            | 0.80        | ±0.10         | ±0.10  | 0.10%     |                  | (f)        |
|                 | C1608NP0330□HTS | C1608NP0330□HT | 1V, 1MHz            | 33          | pF          | ±5%,±2%,±1%            | 0.80        | ±0.10         | ±0.10  | 0.10%     |                  | (f)        |
|                 | C1608NP0360□HTS | C1608NP0360□HT | 1V, 1MHz            | 36          | pF          | ±5%,±2%,±1%            | 0.80        | ±0.10         | ±0.10  | 0.10%     |                  | (f)        |
|                 | C1608NP0390□HTS | C1608NP0390□HT | 1V, 1MHz            | 39          | pF          | ±5%,±2%,±1%            | 0.80        | ±0.10         | ±0.10  | 0.10%     |                  | (f)        |
|                 | C1608NP0430□HTS | C1608NP0430□HT | 1V, 1MHz            | 43          | pF          | ±5%,±2%,±1%            | 0.80        | ±0.10         | ±0.10  | 0.10%     |                  | (f)        |
|                 | C1608NP0470□HTS | C1608NP0470□HT | 1V, 1MHz            | 47          | pF          | ±5%,±2%,±1%            | 0.80        | ±0.10         | ±0.10  | 0.10%     |                  | (f)        |
|                 | C1608NP0560□HTS | C1608NP0560□HT | 1V, 1MHz            | 56          | pF          | ±5%,±2%,±1%            | 0.80        | ±0.10         | ±0.10  | 0.10%     |                  | (f)        |
|                 | C1608NP0620□HTS | C1608NP0620□HT | 1V, 1MHz            | 62          | pF          | ±5%,±2%,±1%            | 0.80        | ±0.10         | ±0.10  | 0.10%     |                  | (f)        |
|                 | C1608NP0680□HTS | C1608NP0680□HT | 1V, 1MHz            | 68          | pF          | ±5%,±2%,±1%            | 0.80        | ±0.10         | ±0.10  | 0.10%     |                  | (f)        |
|                 | C1608NP0750□HTS | C1608NP0750□HT | 1V, 1MHz            | 75          | pF          | ±5%,±2%,±1%            | 0.80        | ±0.10         | ±0.10  | 0.10%     |                  | (f)        |
| C1608NP0820□HTS | C1608NP0820□HT  | 1V, 1MHz       | 82                  | pF          | ±5%,±2%,±1% | 0.80                   | ±0.10       | ±0.10         | 0.10%  | (f)       |                  |            |
| C1608NP0910□HTS | C1608NP0910□HT  | 1V, 1MHz       | 91                  | pF          | ±5%,±2%,±1% | 0.80                   | ±0.10       | ±0.10         | 0.10%  | (f)       |                  |            |
| C1608NP0101□HTS | C1608NP0101□HT  | 1V, 1MHz       | 100                 | pF          | ±5%,±2%,±1% | 0.80                   | ±0.10       | ±0.10         | 0.10%  | (f)       |                  |            |
| C1608NP0121JHTS | C1608NP0121JHT  | 1V, 1MHz       | 120                 | pF          | ±5%         | 0.80                   | ±0.10       | ±0.10         | 0.10%  | (f)       |                  |            |
| C1608NP0151JHTS | C1608NP0151JHT  | 1V, 1MHz       | 150                 | pF          | ±5%         | 0.80                   | ±0.10       | ±0.10         | 0.10%  | (f)       |                  |            |
| C1608NP0181JHTS | C1608NP0181JHT  | 1V, 1MHz       | 180                 | pF          | ±5%         | 0.80                   | ±0.10       | ±0.10         | 0.10%  | (f)       |                  |            |
| C1608NP0201JHTS | C1608NP0201JHT  | 1V, 1MHz       | 200                 | pF          | ±5%         | 0.80                   | ±0.10       | ±0.10         | 0.10%  | (f)       |                  |            |
| C1608NP0221JHTS | C1608NP0221JHT  | 1V, 1MHz       | 220                 | pF          | ±5%         | 0.80                   | ±0.10       | ±0.10         | 0.10%  | (f)       |                  |            |
| C1608NP0271JHTS | C1608NP0271JHT  | 1V, 1MHz       | 270                 | pF          | ±5%         | 0.80                   | ±0.10       | ±0.10         | 0.10%  | (f)       |                  |            |
| C1608NP0331JHTS | C1608NP0331JHT  | 1V, 1MHz       | 330                 | pF          | ±5%         | 0.80                   | ±0.10       | ±0.10         | 0.10%  | (f)       |                  |            |
| C1608NP0391JHTS | C1608NP0391JHT  | 1V, 1MHz       | 390                 | pF          | ±5%         | 0.80                   | ±0.10       | ±0.10         | 0.10%  | (f)       |                  |            |
| C1608NP0471JHTS | C1608NP0471JHT  | 1V, 1MHz       | 470                 | pF          | ±5%         | 0.80                   | ±0.10       | ±0.10         | 0.10%  | (f)       |                  |            |
| C1608NP0561JHTS | C1608NP0561JHT  | 1V, 1MHz       | 560                 | pF          | ±5%         | 0.80                   | ±0.10       | ±0.10         | 0.10%  | (f)       |                  |            |
| C1608NP0681JHTS | C1608NP0681JHT  | 1V, 1MHz       | 680                 | pF          | ±5%         | 0.80                   | ±0.10       | ±0.10         | 0.10%  | (f)       |                  |            |
| C1608NP0821JHTS | C1608NP0821JHT  | 1V, 1MHz       | 820                 | pF          | ±5%         | 0.80                   | ±0.10       | ±0.10         | 0.10%  | (f)       |                  |            |
| C1608NP0102JHTS | C1608NP0102JHT  | 1V, 1MHz       | 1.0                 | nF          | ±5%         | 0.80                   | ±0.10       | ±0.10         | 0.10%  | (f)       |                  |            |

● C2012NP0 Series (EIA0805)

| RV               | DARFON P/N        | DARFON P/N 2   | Measuring Condition | Capacitance |      | Available Tolerance | Thick. (mm) | Tolerance(mm) |        | DF (max.) | Standard Packing | Test Spec.      |     |
|------------------|-------------------|----------------|---------------------|-------------|------|---------------------|-------------|---------------|--------|-----------|------------------|-----------------|-----|
|                  |                   |                |                     | Value       | Unit |                     |             | L/W           | Thick. |           |                  |                 |     |
| 1000V            | C2012NP0100JPPSG  | C2012NP0100JPP | 1V,1MHz             | 10          | pF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.17%     | Embossed, 3Kpcs  | (f)             |     |
|                  | C2012NP0120JPPSG  | C2012NP0120JPP | 1V,1MHz             | 12          | pF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.16%     |                  | (f)             |     |
|                  | C2012NP0150JPPSG  | C2012NP0150JPP | 1V,1MHz             | 15          | pF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.14%     |                  | (f)             |     |
|                  | C2012NP0180JPPSG  | C2012NP0180JPP | 1V,1MHz             | 18          | pF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.13%     |                  | (f)             |     |
|                  | C2012NP0220JPPSG  | C2012NP0220JPP | 1V,1MHz             | 22          | pF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.12%     |                  | (f)             |     |
|                  | C2012NP0270JPPSG  | C2012NP0270JPP | 1V,1MHz             | 27          | pF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.11%     |                  | (f)             |     |
|                  | C2012NP0330JPPSG  | C2012NP0330JPP | 1V,1MHz             | 33          | pF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0390JPPSG  | C2012NP0390JPP | 1V,1MHz             | 39          | pF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.10%     |                  | (f)             |     |
| 630V             | C2012NP0470JPPSG  | C2012NP0470JPP | 1V,1MHz             | 47          | pF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.10%     | Paper, 4Kpcs     | (f)             |     |
|                  | C2012NP0560JPPSG  | C2012NP0560JPP | 1V,1MHz             | 56          | pF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0680JPPSG  | C2012NP0680JPP | 1V,1MHz             | 68          | pF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0100JMTSC  | C2012NP0100JMT | 1V,1MHz             | 10          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.17%     |                  | (f)             |     |
|                  | C2012NP0120JMTSC  | C2012NP0120JMT | 1V,1MHz             | 12          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.16%     |                  | (f)             |     |
|                  | C2012NP0150JMTSC  | C2012NP0150JMT | 1V,1MHz             | 15          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.14%     |                  | (f)             |     |
|                  | C2012NP0180JMTSC  | C2012NP0180JMT | 1V,1MHz             | 18          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.13%     |                  | (f)             |     |
|                  | C2012NP0220JMTSC  | C2012NP0220JMT | 1V,1MHz             | 22          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.12%     |                  | (f)             |     |
|                  | C2012NP0270JMTSC  | C2012NP0270JMT | 1V,1MHz             | 27          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.11%     |                  | (f)             |     |
|                  | C2012NP0330JMTSC  | C2012NP0330JMT | 1V,1MHz             | 33          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0390JMTSC  | C2012NP0390JMT | 1V,1MHz             | 39          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0470JMTSC  | C2012NP0470JMT | 1V,1MHz             | 47          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.10%     |                  | (f)             |     |
| 500V             | C2012NP0560JMTSC  | C2012NP0560JMT | 1V,1MHz             | 56          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.10%     | Embossed, 3Kpcs  | (f)             |     |
|                  | C2012NP0680JMTSC  | C2012NP0680JMT | 1V,1MHz             | 68          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0101JMTSD  | C2012NP0101JMT | 1V,1MHz             | 100         | pF   | ±5%                 | 0.80        | ±0.15/±0.10   | ±0.10  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0221JMP    | C2012NP0221JMP | 1V,1MHz             | 220         | pF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0471JMP    | C2012NP0471JMP | 1V,1MHz             | 470         | pF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0102JMP    | C2012NP0102JMP | 1V,1MHz             | 1.0         | nF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.10%     |                  | (f)             |     |
| 250V             | C2012NP0100JLTSC  | C2012NP0100JLT | 1V,1MHz             | 10          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.17%     | Paper, 4Kpcs     | (f)             |     |
|                  | C2012NP0120JLTSC  | C2012NP0120JLT | 1V,1MHz             | 12          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.16%     |                  | (f)             |     |
|                  | C2012NP0150JLTSC  | C2012NP0150JLT | 1V,1MHz             | 15          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.14%     |                  | (f)             |     |
|                  | C2012NP0180JLTSC  | C2012NP0180JLT | 1V,1MHz             | 18          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.13%     |                  | (f)             |     |
|                  | C2012NP0220JLTSC  | C2012NP0220JLT | 1V,1MHz             | 22          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.12%     |                  | (f)             |     |
|                  | C2012NP0270JLTSC  | C2012NP0270JLT | 1V,1MHz             | 27          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.11%     |                  | (f)             |     |
|                  | C2012NP0330JLTSC  | C2012NP0330JLT | 1V,1MHz             | 33          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0390JLTSC  | C2012NP0390JLT | 1V,1MHz             | 39          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.10%     |                  | (f)             |     |
| 100V             | C2012NP0470JLTSC  | C2012NP0470JLT | 1V,1MHz             | 47          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.10%     | Paper, 4Kpcs     | (f)             |     |
|                  | C2012NP0101JLTSD  | C2012NP0101JLT | 1V,1MHz             | 100         | pF   | ±5%                 | 0.80        | ±0.15/±0.10   | ±0.10  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0221JLPSG  | C2012NP0221JLP | 1V,1MHz             | 220         | pF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0471JLPSG  | C2012NP0471JLP | 1V,1MHz             | 470         | pF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0102JLPSG  | C2012NP0102JLP | 1V,1MHz             | 1.0         | nF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0100JKTSC  | C2012NP0100JKT | 1V,1MHz             | 10          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.17%     |                  | Embossed, 3Kpcs | (f) |
|                  | C2012NP0120JKTSC  | C2012NP0120JKT | 1V,1MHz             | 12          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.16%     |                  |                 | (f) |
|                  | C2012NP0150JKTSC  | C2012NP0150JKT | 1V,1MHz             | 15          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.14%     |                  |                 | (f) |
|                  | C2012NP0180JKTSC  | C2012NP0180JKT | 1V,1MHz             | 18          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.13%     |                  |                 | (f) |
|                  | C2012NP0220JKTSC  | C2012NP0220JKT | 1V,1MHz             | 22          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.12%     |                  |                 | (f) |
|                  | C2012NP0270JKTSC  | C2012NP0270JKT | 1V,1MHz             | 27          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.11%     |                  |                 | (f) |
|                  | C2012NP0330JKTSC  | C2012NP0330JKT | 1V,1MHz             | 33          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.10%     |                  |                 | (f) |
| C2012NP0390JKTSC | C2012NP0390JKT    | 1V,1MHz        | 39                  | pF          | ±5%  | 0.60                | ±0.15/±0.10 | ±0.10         | 0.10%  | (f)       |                  |                 |     |
| C2012NP0470JKTSC | C2012NP0470JKT    | 1V,1MHz        | 47                  | pF          | ±5%  | 0.60                | ±0.15/±0.10 | ±0.10         | 0.10%  | (f)       |                  |                 |     |
| C2012NP0560JKTSC | C2012NP0560JKT    | 1V,1MHz        | 56                  | pF          | ±5%  | 0.60                | ±0.15/±0.10 | ±0.10         | 0.10%  | (f)       |                  |                 |     |
| C2012NP0680JKTSC | C2012NP0680JKT    | 1V,1MHz        | 68                  | pF          | ±5%  | 0.60                | ±0.15/±0.10 | ±0.10         | 0.10%  | (f)       |                  |                 |     |
| C2012NP0820JKTSC | C2012NP0820JKT    | 1V,1MHz        | 82                  | pF          | ±5%  | 0.60                | ±0.15/±0.10 | ±0.10         | 0.10%  | (f)       |                  |                 |     |
| 100V             | C2012NP0101JKTSD  | C2012NP0101JKT | 1V,1MHz             | 100         | pF   | ±5%                 | 0.80        | ±0.15/±0.10   | ±0.10  | 0.10%     | Paper, 4Kpcs     | (f)             |     |
|                  | C2012NP0121JKTSD  | C2012NP0121JKT | 1V,1MHz             | 120         | pF   | ±5%                 | 0.80        | ±0.15/±0.10   | ±0.10  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0151JJKPSG | C2012NP0151JJK | 1V,1MHz             | 150         | pF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0221JJKPSG | C2012NP0221JJK | 1V,1MHz             | 220         | pF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0271JJKPSG | C2012NP0271JJK | 1V,1MHz             | 270         | pF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0331JJKPSG | C2012NP0331JJK | 1V,1MHz             | 330         | pF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0471JJKPSG | C2012NP0471JJK | 1V,1MHz             | 470         | pF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0561JJKPSG | C2012NP0561JJK | 1V,1MHz             | 560         | pF   | ±5%                 | 1.25        | ±0.15/±0.10   | ±0.20  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0100JHTSC  | C2012NP0100JHT | 1V,1MHz             | 10          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.17%     |                  | (f)             |     |
|                  | C2012NP0120JHTSC  | C2012NP0120JHT | 1V,1MHz             | 12          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.16%     |                  | (f)             |     |
|                  | C2012NP0150JHTSC  | C2012NP0150JHT | 1V,1MHz             | 15          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.14%     |                  | (f)             |     |
|                  | C2012NP0180JHTSC  | C2012NP0180JHT | 1V,1MHz             | 18          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.13%     |                  | (f)             |     |
|                  | C2012NP0200JHTSC  | C2012NP0200JHT | 1V,1MHz             | 20          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.13%     |                  | (f)             |     |
|                  | C2012NP0220JHTSC  | C2012NP0220JHT | 1V,1MHz             | 22          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.12%     |                  | (f)             |     |
|                  | C2012NP0240JHTSC  | C2012NP0240JHT | 1V,1MHz             | 24          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.11%     |                  | (f)             |     |
|                  | C2012NP0270JHTSC  | C2012NP0270JHT | 1V,1MHz             | 27          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.11%     |                  | (f)             |     |
|                  | C2012NP0300JHTSC  | C2012NP0300JHT | 1V,1MHz             | 30          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.10%     |                  | (f)             |     |
|                  | C2012NP0330JHTSC  | C2012NP0330JHT | 1V,1MHz             | 33          | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.10%     |                  | (f)             |     |
| C2012NP0360JHTSC | C2012NP0360JHT    | 1V,1MHz        | 36                  | pF          | ±5%  | 0.60                | ±0.15/±0.10 | ±0.10         | 0.10%  | (f)       |                  |                 |     |
| C2012NP0390JHTSC | C2012NP0390JHT    | 1V,1MHz        | 39                  | pF          | ±5%  | 0.60                | ±0.15/±0.10 | ±0.10         | 0.10%  | (f)       |                  |                 |     |
| C2012NP0430JHTSC | C2012NP0430JHT    | 1V,1MHz        | 43                  | pF          | ±5%  | 0.60                | ±0.15/±0.10 | ±0.10         | 0.10%  | (f)       |                  |                 |     |
| C2012NP0470JHTSC | C2012NP0470JHT    | 1V,1MHz        | 47                  | pF          | ±5%  | 0.60                | ±0.15/±0.10 | ±0.10         | 0.10%  | (f)       |                  |                 |     |
| C2012NP0560JHTSC | C2012NP0560JHT    | 1V,1MHz        | 56                  | pF          | ±5%  | 0.60                | ±0.15/±0.10 | ±0.10         | 0.10%  | (f)       |                  |                 |     |
| C2012NP0620JHTSC | C2012NP0620JHT    | 1V,1MHz        | 62                  | pF          | ±5%  | 0.60                | ±0.15/±0.10 | ±0.10         | 0.10%  | (f)       |                  |                 |     |
| C2012NP0680JHTSC | C2012NP0680JHT    | 1V,1MHz        | 68                  | pF          | ±5%  | 0.60                | ±0.15/±0.10 | ±0.10         | 0.10%  | (f)       |                  |                 |     |
| C2012NP0750JHTSC | C2012NP0750JHT    | 1V,1MHz        | 75                  | pF          | ±5%  | 0.60                | ±0.15/±0.10 | ±0.10         | 0.10%  | (f)       |                  |                 |     |
| C2012NP0820JHTSC | C2012NP0820JHT    | 1V,1MHz        | 82                  | pF          | ±5%  | 0.60                | ±0.15/±0.10 | ±0.10         | 0.10%  | (f)       |                  |                 |     |
| C2012NP0101JHTSC | C2012NP0101JHT    | 1V,1MHz        | 100                 | pF          | ±5%  | 0.60                | ±0.15/±0.10 | ±0.10         | 0.10%  | (f)       |                  |                 |     |

MLCC Middle High Voltage

| RV               | DARFON P/N       | DARFON P/N 2   | Measuring Condition | Capacitance |      | Available Tolerance | Thick. (mm) | Tolerance(mm) |        | DF (max.)       | Standard Packing | Test Spec. |
|------------------|------------------|----------------|---------------------|-------------|------|---------------------|-------------|---------------|--------|-----------------|------------------|------------|
|                  |                  |                |                     | Value       | Unit |                     |             | L/W           | Thick. |                 |                  |            |
| 100V             | C2012NP0121JHTSC | C2012NP0121JHT | 1V, 1MHz            | 120         | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.10%           | Paper, 4Kpcs     | (f)        |
|                  | C2012NP0151JHTSC | C2012NP0151JHT | 1V, 1MHz            | 150         | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.10%           |                  | (f)        |
|                  | C2012NP0181JHTSC | C2012NP0181JHT | 1V, 1MHz            | 180         | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.10%           |                  | (f)        |
|                  | C2012NP0201JHTSC | C2012NP0201JHT | 1V, 1MHz            | 200         | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.10%           |                  | (f)        |
|                  | C2012NP0221JHTSC | C2012NP0221JHT | 1V, 1MHz            | 220         | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.10%           |                  | (f)        |
|                  | C2012NP0271JHTSC | C2012NP0271JHT | 1V, 1MHz            | 270         | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.10%           |                  | (f)        |
|                  | C2012NP0331JHTSC | C2012NP0331JHT | 1V, 1MHz            | 330         | pF   | ±5%                 | 0.60        | ±0.15/±0.10   | ±0.10  | 0.10%           |                  | (f)        |
|                  | C2012NP0391JHTSD | C2012NP0391JHT | 1V, 1MHz            | 390         | pF   | ±5%                 | 0.80        | ±0.15/±0.10   | ±0.10  | 0.10%           |                  | (f)        |
|                  | C2012NP0471JHTSD | C2012NP0471JHT | 1V, 1MHz            | 470         | pF   | ±5%                 | 0.80        | ±0.15/±0.10   | ±0.10  | 0.10%           |                  | (f)        |
|                  | C2012NP0561JHTSD | C2012NP0561JHT | 1V, 1MHz            | 560         | pF   | ±5%                 | 0.80        | ±0.15/±0.10   | ±0.10  | 0.10%           |                  | (f)        |
|                  | C2012NP0681JHTSD | C2012NP0681JHT | 1V, 1MHz            | 680         | pF   | ±5%                 | 0.80        | ±0.15/±0.10   | ±0.10  | 0.10%           |                  | (f)        |
|                  | C2012NP0821JHTSD | C2012NP0821JHT | 1V, 1MHz            | 820         | pF   | ±5%                 | 0.80        | ±0.15/±0.10   | ±0.10  | 0.10%           |                  | (f)        |
|                  | C2012NP0102JHTSD | C2012NP0102JHT | 1V, 1MHz            | 1.0         | nF   | ±5%                 | 0.80        | ±0.15/±0.10   | ±0.10  | 0.10%           |                  | (f)        |
|                  | C2012NP0122JHTSD | C2012NP0122JHT | 1V, 1kHz            | 1.2         | nF   | ±5%                 | 0.80        | ±0.15/±0.10   | ±0.10  | 0.10%           |                  | (f)        |
|                  | C2012NP0152JHTSD | C2012NP0152JHT | 1V, 1kHz            | 1.5         | nF   | ±5%                 | 0.80        | ±0.15/±0.10   | ±0.10  | 0.10%           |                  | (f)        |
|                  | C2012NP0182JHTSD | C2012NP0182JHT | 1V, 1kHz            | 1.8         | nF   | ±5%                 | 0.80        | ±0.15/±0.10   | ±0.10  | 0.10%           |                  | (f)        |
| C2012NP0222JHTSD | C2012NP0222JHT   | 1V, 1kHz       | 2.2                 | nF          | ±5%  | 0.80                | ±0.15/±0.10 | ±0.10         | 0.10%  | (f)             |                  |            |
| C2012NP0272JHPSG | C2012NP0272JHP   | 1V, 1kHz       | 2.7                 | nF          | ±5%  | 1.25                | ±0.15/±0.10 | ±0.20         | 0.10%  | Embossed, 3Kpcs | (f)              |            |
| C2012NP0332JHPSG | C2012NP0332JHP   | 1V, 1kHz       | 3.3                 | nF          | ±5%  | 1.25                | ±0.15/±0.10 | ±0.20         | 0.10%  |                 | (f)              |            |

● C3216NP0 Series (EIA1206)

| RV               | DARFON P/N       | DARFON P/N 2   | Measuring Condition | Capacitance |      | Available Tolerance | Thick. (mm) | Tolerance(mm) |        | DF (max.)       | Standard Packing | Test Spec.      |     |
|------------------|------------------|----------------|---------------------|-------------|------|---------------------|-------------|---------------|--------|-----------------|------------------|-----------------|-----|
|                  |                  |                |                     | Value       | Unit |                     |             | L/W           | Thick. |                 |                  |                 |     |
| 2000V            | C3216NP0339CQTS  | C3216NP0339CQT | 1V, 1MHz            | 3.3         | pF   | ±0.25pF             | 0.80        | ±0.15         | ±0.10  | 0.21%           | Paper, 4Kpcs     | (f)             |     |
|                  | C3216NP0100JQTS  | C3216NP0100JQT | 1V, 1MHz            | 10          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.17%           |                  | (f)             |     |
|                  | C3216NP0220JQTS  | C3216NP0220JQT | 1V, 1MHz            | 22          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.12%           |                  | (f)             |     |
|                  | C3216NP0470JQPSI | C3216NP0470JQP | 1V, 1MHz            | 47          | pF   | ±5%                 | 0.95        | ±0.15         | ±0.10  | 0.10%           |                  | Embossed, 3Kpcs | (f) |
|                  | C3216NP0101JQPSG | C3216NP0101JQP | 1V, 1MHz            | 100         | pF   | ±5%                 | 1.25        | ±0.15         | ±0.10  | 0.10%           |                  |                 | (f) |
|                  | C3216NP0221JQPSL | C3216NP0221JQP | 1V, 1MHz            | 220         | pF   | ±5%                 | 1.60        | ±0.20         | ±0.20  | 0.10%           |                  | Embossed, 2Kpcs | (f) |
| 1000V            | C3216NP0100JPTS  | C3216NP0100JPT | 1V, 1MHz            | 10          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.17%           | Paper, 4Kpcs     | (f)             |     |
|                  | C3216NP0120JPTS  | C3216NP0120JPT | 1V, 1MHz            | 12          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.16%           |                  | (f)             |     |
|                  | C3216NP0150JPTS  | C3216NP0150JPT | 1V, 1MHz            | 15          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.14%           |                  | (f)             |     |
|                  | C3216NP0180JPTS  | C3216NP0180JPT | 1V, 1MHz            | 18          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.13%           |                  | (f)             |     |
|                  | C3216NP0220JPTS  | C3216NP0220JPT | 1V, 1MHz            | 22          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.12%           |                  | (f)             |     |
|                  | C3216NP0270JPTS  | C3216NP0270JPT | 1V, 1MHz            | 27          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.11%           |                  | (f)             |     |
|                  | C3216NP0330JPTS  | C3216NP0330JPT | 1V, 1MHz            | 33          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%           | (f)              |                 |     |
|                  | C3216NP0390JPTS  | C3216NP0390JPT | 1V, 1MHz            | 39          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%           | (f)              |                 |     |
|                  | C3216NP0470JPPSI | C3216NP0470JPP | 1V, 1MHz            | 47          | pF   | ±5%                 | 0.95        | ±0.15         | ±0.10  | 0.10%           | Embossed, 3Kpcs  | (f)             |     |
|                  | C3216NP0560JPPSI | C3216NP0560JPP | 1V, 1MHz            | 56          | pF   | ±5%                 | 0.95        | ±0.15         | ±0.10  | 0.10%           |                  | (f)             |     |
|                  | C3216NP0680JPPSI | C3216NP0680JPP | 1V, 1MHz            | 68          | pF   | ±5%                 | 0.95        | ±0.15         | ±0.10  | 0.10%           | (f)              |                 |     |
|                  | C3216NP0820JPPSG | C3216NP0820JPP | 1V, 1MHz            | 82          | pF   | ±5%                 | 1.25        | ±0.15         | ±0.20  | 0.10%           | Embossed, 3Kpcs  | (f)             |     |
|                  | C3216NP0101JPPSG | C3216NP0101JPP | 1V, 1MHz            | 100         | pF   | ±5%                 | 1.25        | ±0.15         | ±0.20  | 0.10%           |                  | (f)             |     |
|                  | C3216NP0121JPPSG | C3216NP0121JPP | 1V, 1MHz            | 120         | pF   | ±5%                 | 1.25        | ±0.15         | ±0.20  | 0.10%           | (f)              |                 |     |
|                  | C3216NP0151JPPSG | C3216NP0151JPP | 1V, 1MHz            | 150         | pF   | ±5%                 | 1.25        | ±0.15         | ±0.20  | 0.10%           | (f)              |                 |     |
|                  | C3216NP0181JPPSL | C3216NP0181JPP | 1V, 1MHz            | 180         | pF   | ±5%                 | 1.60        | ±0.15         | ±0.20  | 0.10%           | (f)              |                 |     |
|                  | C3216NP0221JPPSL | C3216NP0221JPP | 1V, 1MHz            | 220         | pF   | ±5%                 | 1.60        | ±0.15         | ±0.20  | 0.10%           | (f)              |                 |     |
|                  | C3216NP0271JPPSL | C3216NP0271JPP | 1V, 1MHz            | 270         | pF   | ±5%                 | 1.60        | ±0.20         | ±0.20  | 0.10%           | (f)              |                 |     |
| C3216NP0331JPPSL | C3216NP0331JPP   | 1V, 1MHz       | 330                 | pF          | ±5%  | 1.60                | ±0.20       | ±0.20         | 0.10%  | Embossed, 2Kpcs | (f)              |                 |     |
| C3216NP0391JPPSL | C3216NP0391JPP   | 1V, 1MHz       | 390                 | pF          | ±5%  | 1.60                | ±0.20       | ±0.20         | 0.10%  |                 | (f)              |                 |     |
| C3216NP0471JPPSL | C3216NP0471JPP   | 1V, 1MHz       | 470                 | pF          | ±5%  | 1.60                | ±0.20       | ±0.20         | 0.10%  | (f)             |                  |                 |     |
| C3216NP0561JPPSL | C3216NP0561JPP   | 1V, 1MHz       | 560                 | pF          | ±5%  | 1.60                | ±0.20       | ±0.20         | 0.10%  | (f)             |                  |                 |     |
| C3216NP0102JPPSL | C3216NP0102JPP   | 1V, 1MHz       | 1.0                 | nF          | ±5%  | 1.60                | ±0.20       | ±0.20         | 0.10%  | (f)             |                  |                 |     |
| 630V             | C3216NP0100JMTSD | C3216NP0100JMT | 1V, 1MHz            | 10          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.17%           | Paper, 4Kpcs     | (f)             |     |
|                  | C3216NP0150JMTSD | C3216NP0150JMT | 1V, 1MHz            | 15          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.14%           |                  | (f)             |     |
|                  | C3216NP0220JMTSD | C3216NP0220JMT | 1V, 1MHz            | 22          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.12%           |                  | (f)             |     |
|                  | C3216NP0270JMTSD | C3216NP0270JMT | 1V, 1MHz            | 27          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.11%           |                  | (f)             |     |
|                  | C3216NP0330JMTSD | C3216NP0330JMT | 1V, 1MHz            | 33          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%           |                  | (f)             |     |
|                  | C3216NP0470JMTSD | C3216NP0470JMT | 1V, 1MHz            | 47          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%           |                  | (f)             |     |
|                  | C3216NP0560JMTSD | C3216NP0560JMT | 1V, 1MHz            | 56          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%           | (f)              |                 |     |
|                  | C3216NP0680JMTSD | C3216NP0680JMT | 1V, 1MHz            | 68          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%           | (f)              |                 |     |
|                  | C3216NP0820JMTSD | C3216NP0820JMT | 1V, 1MHz            | 82          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%           | (f)              |                 |     |
|                  | C3216NP0101JMTSD | C3216NP0101JMT | 1V, 1MHz            | 100         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%           | (f)              |                 |     |
|                  | C3216NP0121JMTSD | C3216NP0121JMT | 1V, 1MHz            | 120         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%           | (f)              |                 |     |
|                  | C3216NP0151JMTSD | C3216NP0151JMT | 1V, 1MHz            | 150         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%           | (f)              |                 |     |
|                  | C3216NP0181JMTSD | C3216NP0181JMT | 1V, 1MHz            | 180         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%           | (f)              |                 |     |
|                  | C3216NP0221JMTSD | C3216NP0221JMT | 1V, 1MHz            | 220         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%           | (f)              |                 |     |
|                  | C3216NP0271JMPSI | C3216NP0271JMP | 1V, 1MHz            | 270         | pF   | ±5%                 | 0.95        | ±0.15         | ±0.10  | 0.10%           | Embossed, 3Kpcs  | (f)             |     |
|                  | C3216NP0331JMPSI | C3216NP0331JMP | 1V, 1MHz            | 330         | pF   | ±5%                 | 0.95        | ±0.15         | ±0.10  | 0.10%           |                  | (f)             |     |
|                  | C3216NP0391JMPSI | C3216NP0391JMP | 1V, 1MHz            | 390         | pF   | ±5%                 | 0.95        | ±0.15         | ±0.10  | 0.10%           | (f)              |                 |     |
|                  | C3216NP0471JMPSI | C3216NP0471JMP | 1V, 1MHz            | 470         | pF   | ±5%                 | 0.95        | ±0.15         | ±0.10  | 0.10%           | (f)              |                 |     |
| C3216NP0102JMPSL | C3216NP0102JMP   | 1V, 1MHz       | 1.0                 | nF          | ±5%  | 1.60                | ±0.30/±0.20 | ±0.20         | 0.10%  | Embossed, 2Kpcs | (f)              |                 |     |
| C3216NP0222JMPSL | C3216NP0222JMP   | 1V, 1kHz       | 2.2                 | nF          | ±5%  | 1.60                | ±0.30/±0.20 | ±0.20         | 0.10%  |                 | (f)              |                 |     |



| RV               | DARFON P/N       | DARFON P/N 2   | Measuring Condition | Capacitance |      | Available Tolerance | Thick. (mm) | Tolerance(mm) |        | DF (max.)      | Standard Packing | Test Spec. |
|------------------|------------------|----------------|---------------------|-------------|------|---------------------|-------------|---------------|--------|----------------|------------------|------------|
|                  |                  |                |                     | Value       | Unit |                     |             | L/W           | Thick. |                |                  |            |
| 500V             | C3216NP0100JLTSD | C3216NP0100JLT | 1V,1MHz             | 10          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.17%          | Paper, 4Kpcs     | (I)        |
|                  | C3216NP0220JLTSD | C3216NP0220JLT | 1V,1MHz             | 22          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.12%          |                  | (I)        |
|                  | C3216NP0270JLTSD | C3216NP0270JLT | 1V,1MHz             | 27          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.11%          |                  | (I)        |
|                  | C3216NP0470JLTSD | C3216NP0470JLT | 1V,1MHz             | 47          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0101JLTSD | C3216NP0101JLT | 1V,1MHz             | 100         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          | Embossed,3Kpcs   | (I)        |
|                  | C3216NP0221JLTSD | C3216NP0221JLT | 1V,1MHz             | 220         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0471JLPSI | C3216NP0471JLP | 1V,1MHz             | 470         | pF   | ±5%                 | 0.95        | ±0.15         | ±0.10  | 0.10%          | Embossed,2Kpcs   | (I)        |
|                  | C3216NP0102JLPSL | C3216NP0102JLP | 1V,1MHz             | 1.0         | nF   | ±5%                 | 1.60        | ±0.30±0.20    | ±0.20  | 0.10%          |                  | (I)        |
| C3216NP0222JLPSL | C3216NP0222JLP   | 1V,1MHz        | 2.2                 | nF          | ±5%  | 1.60                | ±0.30±0.20  | ±0.20         | 0.10%  |                | (I)              |            |
| 250V             | C3216NP0121JKTSD | C3216NP0121JKT | 1V,1MHz             | 120         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          | Paper,4Kpcs      | (I)        |
|                  | C3216NP0151JKTSD | C3216NP0151JKT | 1V,1MHz             | 150         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0181JKTSD | C3216NP0181JKT | 1V,1MHz             | 180         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0221JKTSD | C3216NP0221JKT | 1V,1MHz             | 220         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0271JKPSI | C3216NP0271JKP | 1V,1MHz             | 270         | pF   | ±5%                 | 0.95        | ±0.15         | ±0.10  | 0.10%          | Embossed,3Kpcs   | (I)        |
|                  | C3216NP0331JKPSI | C3216NP0331JKP | 1V,1MHz             | 330         | pF   | ±5%                 | 0.95        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0391JKPSI | C3216NP0391JKP | 1V,1MHz             | 390         | pF   | ±5%                 | 0.95        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0471JKPSI | C3216NP0471JKP | 1V,1MHz             | 470         | pF   | ±5%                 | 0.95        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
| 200V             | C3216NP0102JJPSI | C3216NP0102JJP | 1V, 1MHz            | 1.0         | nF   | ±5%                 | 0.95        | ±0.15         | ±0.10  | 0.10%          | Embossed,3Kpcs   | (I)        |
| 100V             | C3216NP0100JHTSD | C3216NP0100JHT | 1V, 1MHz            | 10          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.17%          | Paper,4Kpcs      | (I)        |
|                  | C3216NP0120JHTSD | C3216NP0120JHT | 1V, 1MHz            | 12          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.16%          |                  | (I)        |
|                  | C3216NP0150JHTSD | C3216NP0150JHT | 1V, 1MHz            | 15          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.14%          |                  | (I)        |
|                  | C3216NP0180JHTSD | C3216NP0180JHT | 1V, 1MHz            | 18          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.13%          |                  | (I)        |
|                  | C3216NP0220JHTSD | C3216NP0220JHT | 1V, 1MHz            | 22          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.12%          |                  | (I)        |
|                  | C3216NP0270JHTSD | C3216NP0270JHT | 1V, 1MHz            | 27          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.11%          |                  | (I)        |
|                  | C3216NP0330JHTSD | C3216NP0330JHT | 1V, 1MHz            | 33          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0390JHTSD | C3216NP0390JHT | 1V, 1MHz            | 39          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0470JHTSD | C3216NP0470JHT | 1V, 1MHz            | 47          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0560JHTSD | C3216NP0560JHT | 1V, 1MHz            | 56          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0680JHTSD | C3216NP0680JHT | 1V, 1MHz            | 68          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0820JHTSD | C3216NP0820JHT | 1V, 1MHz            | 82          | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0101JHTSD | C3216NP0101JHT | 1V, 1MHz            | 100         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0121JHTSD | C3216NP0121JHT | 1V, 1MHz            | 120         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0151JHTSD | C3216NP0151JHT | 1V, 1MHz            | 150         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0181JHTSD | C3216NP0181JHT | 1V, 1MHz            | 180         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0221JHTSD | C3216NP0221JHT | 1V, 1MHz            | 220         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0271JHTSD | C3216NP0271JHT | 1V, 1MHz            | 270         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0331JHTSD | C3216NP0331JHT | 1V, 1MHz            | 330         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0391JHTSD | C3216NP0391JHT | 1V, 1MHz            | 390         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0471JHTSD | C3216NP0471JHT | 1V, 1MHz            | 470         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0561JHTSD | C3216NP0561JHT | 1V, 1MHz            | 560         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0681JHTSD | C3216NP0681JHT | 1V, 1MHz            | 680         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0821JHTSD | C3216NP0821JHT | 1V, 1MHz            | 820         | pF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0102JHTSD | C3216NP0102JHT | 1V, 1MHz            | 1.0         | nF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0122JHTSD | C3216NP0122JHT | 1V, 1kHz            | 1.2         | nF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0152JHTSD | C3216NP0152JHT | 1V, 1kHz            | 1.5         | nF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0182JHTSD | C3216NP0182JHT | 1V, 1kHz            | 1.8         | nF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0222JHTSD | C3216NP0222JHT | 1V, 1kHz            | 2.2         | nF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0272JHTSD | C3216NP0272JHT | 1V, 1kHz            | 2.7         | nF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0332JHTSD | C3216NP0332JHT | 1V, 1kHz            | 3.3         | nF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
|                  | C3216NP0392JHTSD | C3216NP0392JHT | 1V, 1kHz            | 3.9         | nF   | ±5%                 | 0.80        | ±0.15         | ±0.10  | 0.10%          |                  | (I)        |
| C3216NP0472JHTSD | C3216NP0472JHT   | 1V, 1kHz       | 4.7                 | nF          | ±5%  | 0.80                | ±0.15       | ±0.10         | 0.10%  | (I)            |                  |            |
| C3216NP0562JHTSD | C3216NP0562JHT   | 1V, 1kHz       | 5.6                 | nF          | ±5%  | 0.80                | ±0.15       | ±0.10         | 0.10%  | (I)            |                  |            |
| C3216NP0682JHPSI | C3216NP0682JHP   | 1V, 1kHz       | 6.8                 | nF          | ±5%  | 0.95                | ±0.15       | ±0.10         | 0.10%  | Embossed,3Kpcs | (I)              |            |
| C3216NP0822JHPSG | C3216NP0822JHP   | 1V, 1kHz       | 8.2                 | nF          | ±5%  | 1.25                | ±0.15       | ±0.20         | 0.10%  |                | (I)              |            |
| C3216NP0103JHPSG | C3216NP0103JHP   | 1V, 1kHz       | 10                  | nF          | ±5%  | 1.25                | ±0.15       | ±0.20         | 0.10%  |                | (I)              |            |
|                  | C3216NP0333JHTSD | C3216NP0333JHT | 1V, 1kHz            | 33          | nF   | ±5%                 | 0.80        | ±0.15         | ±0.15  | 0.10%          | Paper,4Kpcs      | (I)        |

● C3225NP0Series (EIA1210)

| RV    | DARFON P/N       | DARFON P/N 2   | Measuring Condition | Capacitance |      | Available Tolerance | Thick. (mm) | Tolerance(mm) |        | DF (max.) | Standard Packing | Test Spec. |
|-------|------------------|----------------|---------------------|-------------|------|---------------------|-------------|---------------|--------|-----------|------------------|------------|
|       |                  |                |                     | Value       | Unit |                     |             | L/W           | Thick. |           |                  |            |
| 250V  | C3225NP0103JKPSL | C3225NP0103JKP | 1V, 1kHz            | 10          | nF   | ±5%                 | 1.60        | ±0.40±0.30    | ±0.20  | 0.10%     | Embossed, 2Kpcs  | (I)        |
| 1000V | C3225NP0331JPPSL | C3225NP0331JPP | 1V,1MHz             | 330         | pF   | ±5%                 | 1.60        | ±0.40±0.30    | ±0.20  | 0.10%     | Embossed, 2Kpcs  | (I)        |

MLCC Middle High Voltage

● C4520NP0Series (EIA1808)

| RV    | DARFON P/N       | DARFON P/N 2   | Measuring Condition | Capacitance |      | Available Tolerance | Thick. (mm) | Tolerance(mm) |        | DF (max.) | Standard Packing | Test Spec.      |
|-------|------------------|----------------|---------------------|-------------|------|---------------------|-------------|---------------|--------|-----------|------------------|-----------------|
|       |                  |                |                     | Value       | Unit |                     |             | L/W           | Thick. |           |                  |                 |
| 3000V | C4520NP0509DRPSG | C4520NP0509DRP | 1V,1MHz             | 5.0         | pF   | ±0.5pF              | 1.25        | +0.5-0.3/±0.3 | ±0.20  | 0.20%     | Embossed, 2Kpcs  | (I)             |
|       | C4520NP0100JRPSG | C4520NP0100JRP | 1V,1MHz             | 10          | pF   | ±5%                 | 1.25        | +0.5-0.3/±0.3 | ±0.20  | 0.17%     |                  | (I)             |
|       | C4520NP0470JRPSG | C4520NP0470JRP | 1V,1MHz             | 47          | pF   | ±5%                 | 1.25        | +0.5-0.3/±0.3 | ±0.20  | 0.10%     |                  | (I)             |
|       | C4520NP0560□RPSG | C4520NP0560□RP | 1V,1MHz             | 56          | pF   | ±5%,±2%             | 1.25        | +0.5-0.3/±0.3 | ±0.20  | 0.10%     | Embossed, 3Kpcs  | (I)             |
|       | C4520NP0101JRPSL | C4520NP0101JRP | 1V,1MHz             | 100         | pF   | ±5%                 | 1.25        | +0.5-0.3/±0.3 | ±0.20  | 0.10%     |                  | (I)             |
|       | C4520NP0101□RPSN | C4520NP0101□RP | 1V,1MHz             | 100         | pF   | ±5%, ±10%           | 2.00        | +0.5-0.3/±0.3 | ±0.20  | 0.10%     |                  | Embossed, 1Kpcs |
| 2000V | C4520NP0180JQPSG | C4520NP0180JQP | 1V,1MHz             | 18          | pF   | ±5%                 | 1.25        | +0.5-0.3/±0.3 | ±0.20  | 0.13%     | Embossed, 2Kpcs  | (I)             |
|       | C4520NP0101JQPSG | C4520NP0101JQP | 1V,1MHz             | 100         | pF   | ±5%                 | 1.25        | +0.5-0.3/±0.3 | ±0.20  | 0.10%     |                  | (I)             |
|       | C4520NP0681JQPSN | C4520NP0681JQP | 1V,1MHz             | 680         | pF   | ±5%                 | 2.00        | +0.5-0.3/±0.3 | ±0.20  | 0.10%     | Embossed, 1Kpcs  | (I)             |
| 1000V | C4520NP0330JPPSG | C4520NP0330JPP | 1V,1MHz             | 33          | pF   | ±5%                 | 1.25        | +0.5-0.3/±0.3 | ±0.20  | 0.10%     | Embossed, 2Kpcs  | (I)             |
|       | C4520NP0681JPPSN | C4520NP0681JPP | 1V,1MHz             | 680         | pF   | ±5%                 | 2.00        | +0.5-0.3/±0.3 | ±0.20  | 0.10%     | Embossed, 1Kpcs  | (I)             |
| 250V  | C4520NP0151JKPSG | C4520NP0151JKP | 1V,1MHz             | 150         | pF   | ±5%                 | 1.25        | +0.5-0.3/±0.3 | ±0.20  | 0.10%     | Embossed, 2Kpcs  | (I)             |

● C4532NP0Series (EIA1812)

| RV    | DARFON P/N       | DARFON P/N 2   | Measuring Condition | Capacitance |      | Available Tolerance | Thick. (mm) | Tolerance(mm)  |        | DF (max.) | Standard Packing | Test Spec. |
|-------|------------------|----------------|---------------------|-------------|------|---------------------|-------------|----------------|--------|-----------|------------------|------------|
|       |                  |                |                     | Value       | Unit |                     |             | L/W            | Thick. |           |                  |            |
| 2000V | C4532NP0102KQPSN | C4520NP0102KQP | 1V,1MHz             | 1.0         | nF   | ±10%                | 2.00        | +0.5-0.3/±0.30 | ±0.20  | 0.10%     | Embossed, 1Kpcs  | (I)        |

□ Tolerance Code: C=±0.25pF ,D=±0.5pF, G=±2%, J=±5%; Special tolerance on the request.

## X7R Series

### C1005X7R Series (EIA0402)

| RV              | DARFON P/N      | DARFON P/N 2   | Measuring Condition | Capacitance |      | Available Tolerance | Thick. (mm) | Tolerance(mm) |        | DF (max.) | Standard Packing | Test Spec. |
|-----------------|-----------------|----------------|---------------------|-------------|------|---------------------|-------------|---------------|--------|-----------|------------------|------------|
|                 |                 |                |                     | Value       | Unit |                     |             | L/W           | Thick. |           |                  |            |
| 100V            | C1005X7R101KHTS | C1005X7R101KHT | 1V, 1kHz            | 100         | pF   | ±10%                | 0.50        | ±0.05         | ±0.05  | 3.0%      | Paper, 10Kpcs    | (I)        |
|                 | C1005X7R121KHTS | C1005X7R121KHT | 1V, 1kHz            | 120         | pF   | ±10%                | 0.50        | ±0.05         | ±0.05  | 3.0%      |                  | (I)        |
|                 | C1005X7R151KHTS | C1005X7R151KHT | 1V, 1kHz            | 150         | pF   | ±10%                | 0.50        | ±0.05         | ±0.05  | 3.0%      |                  | (I)        |
|                 | C1005X7R181KHTS | C1005X7R181KHT | 1V, 1kHz            | 180         | pF   | ±10%                | 0.50        | ±0.05         | ±0.05  | 3.0%      |                  | (I)        |
|                 | C1005X7R221KHTS | C1005X7R221KHT | 1V, 1kHz            | 220         | pF   | ±10%                | 0.50        | ±0.05         | ±0.05  | 3.0%      |                  | (I)        |
|                 | C1005X7R271KHTS | C1005X7R271KHT | 1V, 1kHz            | 270         | pF   | ±10%                | 0.50        | ±0.05         | ±0.05  | 3.0%      |                  | (I)        |
|                 | C1005X7R331KHTS | C1005X7R331KHT | 1V, 1kHz            | 330         | pF   | ±10%                | 0.50        | ±0.05         | ±0.05  | 3.0%      |                  | (I)        |
|                 | C1005X7R391KHTS | C1005X7R391KHT | 1V, 1kHz            | 390         | pF   | ±10%                | 0.50        | ±0.05         | ±0.05  | 3.0%      |                  | (I)        |
|                 | C1005X7R471KHTS | C1005X7R471KHT | 1V, 1kHz            | 470         | pF   | ±10%                | 0.50        | ±0.05         | ±0.05  | 3.0%      |                  | (I)        |
|                 | C1005X7R561KHTS | C1005X7R561KHT | 1V, 1kHz            | 560         | pF   | ±10%                | 0.50        | ±0.05         | ±0.05  | 3.0%      |                  | (I)        |
|                 | C1005X7R681KHTS | C1005X7R681KHT | 1V, 1kHz            | 680         | pF   | ±10%                | 0.50        | ±0.05         | ±0.05  | 3.0%      |                  | (I)        |
|                 | C1005X7R821KHTS | C1005X7R821KHT | 1V, 1kHz            | 820         | pF   | ±10%                | 0.50        | ±0.05         | ±0.05  | 3.0%      |                  | (I)        |
|                 | C1005X7R102KHTS | C1005X7R102KHT | 1V, 1kHz            | 1.0         | nF   | ±10%                | 0.50        | ±0.05         | ±0.05  | 3.0%      |                  | (I)        |
|                 | C1005X7R122KHTS | C1005X7R122KHT | 1V, 1kHz            | 1.2         | nF   | ±10%                | 0.50        | ±0.05         | ±0.05  | 3.0%      |                  | (I)        |
|                 | C1005X7R152KHTS | C1005X7R152KHT | 1V, 1kHz            | 1.5         | nF   | ±10%                | 0.50        | ±0.05         | ±0.05  | 3.0%      |                  | (I)        |
|                 | C1005X7R182KHTS | C1005X7R182KHT | 1V, 1kHz            | 1.8         | nF   | ±10%                | 0.50        | ±0.05         | ±0.05  | 3.0%      |                  | (I)        |
|                 | C1005X7R222KHTS | C1005X7R222KHT | 1V, 1kHz            | 2.2         | nF   | ±10%                | 0.50        | ±0.05         | ±0.05  | 3.0%      |                  | (I)        |
|                 | C1005X7R272KHTS | C1005X7R272KHT | 1V, 1kHz            | 2.7         | nF   | ±10%                | 0.50        | ±0.05         | ±0.05  | 3.0%      |                  | (I)        |
|                 | C1005X7R332KHTS | C1005X7R332KHT | 1V, 1kHz            | 3.3         | nF   | ±10%                | 0.50        | ±0.05         | ±0.05  | 3.0%      |                  | (I)        |
|                 | C1005X7R392KHTS | C1005X7R392KHT | 1V, 1kHz            | 3.9         | nF   | ±10%                | 0.50        | ±0.05         | ±0.05  | 3.0%      |                  | (I)        |
| C1005X7R472KHTS | C1005X7R472KHT  | 1V, 1kHz       | 4.7                 | nF          | ±10% | 0.50                | ±0.05       | ±0.05         | 3.0%   | (I)       |                  |            |
| C1005X7R562KHTS | C1005X7R562KHT  | 1V, 1kHz       | 5.6                 | nF          | ±10% | 0.50                | ±0.05       | ±0.05         | 3.0%   | (I)       |                  |            |
| C1005X7R682KHTS | C1005X7R682KHT  | 1V, 1kHz       | 6.8                 | nF          | ±10% | 0.50                | ±0.05       | ±0.05         | 3.0%   | (I)       |                  |            |

### C1608X7R Series (EIA0603)

| RV              | DARFON P/N      | DARFON P/N 2   | Measuring Condition | Capacitance |      | Available Tolerance | Thick. (mm) | Tolerance(mm) |        | DF (max.) | Standard Packing | Test Spec. |
|-----------------|-----------------|----------------|---------------------|-------------|------|---------------------|-------------|---------------|--------|-----------|------------------|------------|
|                 |                 |                |                     | Value       | Unit |                     |             | L/W           | Thick. |           |                  |            |
| 250V            | C1608X7R101KKTS | C1608X7R101KKT | 1V, 1kHz            | 100         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      | Paper, 4Kpcs     | (I)        |
|                 | C1608X7R121KKTS | C1608X7R121KKT | 1V, 1kHz            | 120         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      |                  | (I)        |
|                 | C1608X7R151KKTS | C1608X7R151KKT | 1V, 1kHz            | 150         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      |                  | (I)        |
|                 | C1608X7R181KKTS | C1608X7R181KKT | 1V, 1kHz            | 180         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      |                  | (I)        |
|                 | C1608X7R221KKTS | C1608X7R221KKT | 1V, 1kHz            | 220         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      |                  | (I)        |
|                 | C1608X7R271KKTS | C1608X7R271KKT | 1V, 1kHz            | 270         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      |                  | (I)        |
|                 | C1608X7R331KKTS | C1608X7R331KKT | 1V, 1kHz            | 330         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      |                  | (I)        |
|                 | C1608X7R391KKTS | C1608X7R391KKT | 1V, 1kHz            | 390         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      |                  | (I)        |
|                 | C1608X7R471KKTS | C1608X7R471KKT | 1V, 1kHz            | 470         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      |                  | (I)        |
|                 | C1608X7R561KKTS | C1608X7R561KKT | 1V, 1kHz            | 560         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      |                  | (I)        |
|                 | C1608X7R681KKTS | C1608X7R681KKT | 1V, 1kHz            | 680         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      |                  | (I)        |
|                 | C1608X7R821KKTS | C1608X7R821KKT | 1V, 1kHz            | 820         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      |                  | (I)        |
|                 | C1608X7R102KKTS | C1608X7R102KKT | 1V, 1kHz            | 1.0         | nF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      |                  | (I)        |
|                 | C1608X7R122KKTS | C1608X7R122KKT | 1V, 1kHz            | 1.2         | nF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      |                  | (I)        |
|                 | C1608X7R152KKTS | C1608X7R152KKT | 1V, 1kHz            | 1.5         | nF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      |                  | (I)        |
|                 | C1608X7R182KKTS | C1608X7R182KKT | 1V, 1kHz            | 1.8         | nF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      |                  | (I)        |
|                 | C1608X7R222KKTS | C1608X7R222KKT | 1V, 1kHz            | 2.2         | nF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      |                  | (I)        |
|                 | C1608X7R272KKTS | C1608X7R272KKT | 1V, 1kHz            | 2.7         | nF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      |                  | (I)        |
|                 | C1608X7R332KKTS | C1608X7R332KKT | 1V, 1kHz            | 3.3         | nF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      |                  | (I)        |
|                 | C1608X7R392KKTS | C1608X7R392KKT | 1V, 1kHz            | 3.9         | nF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      |                  | (I)        |
| C1608X7R472KKTS | C1608X7R472KKT  | 1V, 1kHz       | 4.7                 | nF          | ±10% | 0.80                | ±0.10       | ±0.10         | 2.5%   | (I)       |                  |            |
| C1608X7R562KKTS | C1608X7R562KKT  | 1V, 1kHz       | 5.6                 | nF          | ±10% | 0.80                | ±0.10       | ±0.10         | 2.5%   | (I)       |                  |            |
| C1608X7R682KKTS | C1608X7R682KKT  | 1V, 1kHz       | 6.8                 | nF          | ±10% | 0.80                | ±0.10       | ±0.10         | 2.5%   | (I)       |                  |            |
| C1608X7R103KKTS | C1608X7R103KKT  | 1V, 1kHz       | 10                  | nF          | ±10% | 0.80                | ±0.15       | ±0.15         | 2.5%   | (I)       |                  |            |
| 200V            | C1608X7R331KJTS | C1608X7R331KJT | 1V, 1kHz            | 330         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      | Paper, 4Kpcs     | (I)        |
|                 | C1608X7R472KJTS | C1608X7R472KJT | 1V, 1kHz            | 4.7         | nF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 2.5%      |                  | (I)        |

MLCC  
Middle High Voltage

| RV              | DARFON P/N      | DARFON P/N 2   | Measuring Condition | Capacitance |      | Available Tolerance | Thick. (mm) | Tolerance(mm) |        | DF (max.) | Standard Packing | Test Spec. |
|-----------------|-----------------|----------------|---------------------|-------------|------|---------------------|-------------|---------------|--------|-----------|------------------|------------|
|                 |                 |                |                     | Value       | Unit |                     |             | LW            | Thick. |           |                  |            |
| 100V            | C1608X7R101KHTS | C1608X7R101KHT | 1V, 1kHz            | 100         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      | Paper, 4Kpcs     | (I)        |
|                 | C1608X7R121KHTS | C1608X7R121KHT | 1V, 1kHz            | 120         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R151KHTS | C1608X7R151KHT | 1V, 1kHz            | 150         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R181KHTS | C1608X7R181KHT | 1V, 1kHz            | 180         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R221KHTS | C1608X7R221KHT | 1V, 1kHz            | 220         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R271KHTS | C1608X7R271KHT | 1V, 1kHz            | 270         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R331KHTS | C1608X7R331KHT | 1V, 1kHz            | 330         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R391KHTS | C1608X7R391KHT | 1V, 1kHz            | 390         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R471KHTS | C1608X7R471KHT | 1V, 1kHz            | 470         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R561KHTS | C1608X7R561KHT | 1V, 1kHz            | 560         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R681KHTS | C1608X7R681KHT | 1V, 1kHz            | 680         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R821KHTS | C1608X7R821KHT | 1V, 1kHz            | 820         | pF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R102KHTS | C1608X7R102KHT | 1V, 1kHz            | 1.0         | nF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R122KHTS | C1608X7R122KHT | 1V, 1kHz            | 1.2         | nF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R152KHTS | C1608X7R152KHT | 1V, 1kHz            | 1.5         | nF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R182KHTS | C1608X7R182KHT | 1V, 1kHz            | 1.8         | nF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R222KHTS | C1608X7R222KHT | 1V, 1kHz            | 2.2         | nF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R272KHTS | C1608X7R272KHT | 1V, 1kHz            | 2.7         | nF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R332KHTS | C1608X7R332KHT | 1V, 1kHz            | 3.3         | nF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R392KHTS | C1608X7R392KHT | 1V, 1kHz            | 3.9         | nF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R472KHTS | C1608X7R472KHT | 1V, 1kHz            | 4.7         | nF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R562KHTS | C1608X7R562KHT | 1V, 1kHz            | 5.6         | nF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R682KHTS | C1608X7R682KHT | 1V, 1kHz            | 6.8         | nF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
|                 | C1608X7R822KHTS | C1608X7R822KHT | 1V, 1kHz            | 8.2         | nF   | ±10%                | 0.80        | ±0.10         | ±0.10  | 3.0%      |                  | (I)        |
| C1608X7R103KHTS | C1608X7R103KHT  | 1V, 1kHz       | 10                  | nF          | ±10% | 0.80                | ±0.10       | ±0.10         | 3.0%   | (I)       |                  |            |
| C1608X7R223KHTS | C1608X7R223KHT  | 1V, 1kHz       | 22                  | nF          | ±10% | 0.80                | ±0.10       | ±0.10         | 3.0%   | (I)       |                  |            |
| C1608X7R473KHTS | C1608X7R473KHT  | 1V, 1kHz       | 47                  | nF          | ±10% | 0.80                | ±0.15       | ±0.15         | 3.0%   | (I)       |                  |            |
| C1608X7R104KHTS | C1608X7R104KHT  | 1V, 1kHz       | 100                 | nF          | ±10% | 0.80                | ±0.15       | ±0.15         | 10.0%  | (I)       |                  |            |

● C2012X7R Series (EIA0805)

| RV               | DARFON P/N        | DARFON P/N 2     | Measuring Condition | Capacitance |      | Available Tolerance | Thick. (mm) | Tolerance(mm) |        | DF (max.)       | Standard Packing | Test Spec.      |              |     |
|------------------|-------------------|------------------|---------------------|-------------|------|---------------------|-------------|---------------|--------|-----------------|------------------|-----------------|--------------|-----|
|                  |                   |                  |                     | Value       | Unit |                     |             | L/W           | Thick. |                 |                  |                 |              |     |
| 1000V            | C2012X7R101PTSD   | C2012X7R101PT    | 1V, 1kHz            | 100         | pF   | ±10%, ±20%          | 0.80        | ±0.15         | ±0.10  | 2.5%            | Paper, 4Kpcs     | (I)             |              |     |
|                  | C2012X7R101KMTSD  | C2012X7R101KMT   | 1V, 1kHz            | 100         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            | Paper, 4Kpcs     | (I)             |              |     |
|                  | C2012X7R181KMTSD  | C2012X7R181KMT   | 1V, 1kHz            | 180         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R221KMTSD  | C2012X7R221KMT   | 1V, 1kHz            | 220         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R271KMTSD  | C2012X7R271KMT   | 1V, 1kHz            | 270         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R331KMTSD  | C2012X7R331KMT   | 1V, 1kHz            | 330         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R391KMTSD  | C2012X7R391KMT   | 1V, 1kHz            | 390         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R471KMTSD  | C2012X7R471KMT   | 1V, 1kHz            | 470         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R561KMTSD  | C2012X7R561KMT   | 1V, 1kHz            | 560         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R681KMTSD  | C2012X7R681KMT   | 1V, 1kHz            | 680         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R821KMTSD  | C2012X7R821KMT   | 1V, 1kHz            | 820         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R102KMTSD  | C2012X7R102KMT   | 1V, 1kHz            | 1.0         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R122KMTSD  | C2012X7R122KMT   | 1V, 1kHz            | 1.2         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R152KMTSD  | C2012X7R152KMT   | 1V, 1kHz            | 1.5         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R182KMTSD  | C2012X7R182KMT   | 1V, 1kHz            | 1.8         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R222KMTSD  | C2012X7R222KMT   | 1V, 1kHz            | 2.2         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R272KMTSD  | C2012X7R272KMT   | 1V, 1kHz            | 2.7         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
| C2012X7R332KMTSD | C2012X7R332KMT    | 1V, 1kHz         | 3.3                 | nF          | ±10% | 0.80                | ±0.15       | ±0.10         | 2.5%   | (I)             |                  |                 |              |     |
| C2012X7R472KMPSG | C2012X7R472KMP    | 1V, 1kHz         | 4.7                 | nF          | ±10% | 1.25                | ±0.15       | ±0.20         | 2.5%   | Embossed, 3Kpcs | (I)              |                 |              |     |
| C2012X7R103KMPSG | C2012X7R103KMP    | 1V, 1kHz         | 10                  | nF          | ±10% | 1.25                | ±0.15       | ±0.20         | 2.5%   |                 | (I)              |                 |              |     |
| C2012X7R223KMPSG | C2012X7R223KMP    | 1V, 1kHz         | 22                  | nF          | ±10% | 1.25                | ±0.15       | ±0.20         | 2.5%   |                 | (I)              |                 |              |     |
| 630V             | C2012X7R101KLTSD  | C2012X7R101KLT   | 1V, 1kHz            | 100         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            | Paper, 4Kpcs     | (I)             |              |     |
|                  | C2012X7R181KLTSD  | C2012X7R181KLT   | 1V, 1kHz            | 180         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R221KLTSD  | C2012X7R221KLT   | 1V, 1kHz            | 220         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R271KLTSD  | C2012X7R271KLT   | 1V, 1kHz            | 270         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R331KLTSD  | C2012X7R331KLT   | 1V, 1kHz            | 330         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R471KLTSD  | C2012X7R471KLT   | 1V, 1kHz            | 470         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R561KLTSD  | C2012X7R561KLT   | 1V, 1kHz            | 560         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R681KLTSD  | C2012X7R681KLT   | 1V, 1kHz            | 680         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R102KLTSD  | C2012X7R102KLT   | 1V, 1kHz            | 1.0         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R222KLTSD  | C2012X7R222KLT   | 1V, 1kHz            | 2.2         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R272KLTSD  | C2012X7R272KLT   | 1V, 1kHz            | 2.7         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            |                  | (I)             |              |     |
|                  | C2012X7R472KLPSPG | C2012X7R472KLP   | 1V, 1kHz            | 4.7         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | Embossed, 3Kpcs | (I)          |     |
|                  | C2012X7R103KLPSPG | C2012X7R103KLP   | 1V, 1kHz            | 10          | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  |                 | (I)          |     |
|                  | C2012X7R223KLPSPG | C2012X7R223KLP   | 1V, 1kHz            | 22          | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  |                 | (I)          |     |
|                  | 500V              | C2012X7R121KKTSD | C2012X7R121KKT      | 1V, 1kHz    | 120  | pF                  | ±10%        | 0.80          | ±0.15  | ±0.10           |                  | 2.5%            | Paper, 4Kpcs | (I) |
|                  |                   | C2012X7R181KKTSD | C2012X7R181KKT      | 1V, 1kHz    | 180  | pF                  | ±10%        | 0.80          | ±0.15  | ±0.10           |                  | 2.5%            |              | (I) |
|                  |                   | C2012X7R221KKTSD | C2012X7R221KKT      | 1V, 1kHz    | 220  | pF                  | ±10%        | 0.80          | ±0.15  | ±0.10           | 2.5%             | (I)             |              |     |
| C2012X7R331KKTSD |                   | C2012X7R331KKT   | 1V, 1kHz            | 330         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            | (I)              |                 |              |     |
| C2012X7R471KKTSD |                   | C2012X7R471KKT   | 1V, 1kHz            | 470         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            | (I)              |                 |              |     |
| C2012X7R561KKTSD |                   | C2012X7R561KKT   | 1V, 1kHz            | 560         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            | (I)              |                 |              |     |
| C2012X7R681KKTSD |                   | C2012X7R681KKT   | 1V, 1kHz            | 680         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            | (I)              |                 |              |     |
| C2012X7R102KKTSD |                   | C2012X7R102KKT   | 1V, 1kHz            | 1.0         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            | (I)              |                 |              |     |
| C2012X7R152KKTSD |                   | C2012X7R152KKT   | 1V, 1kHz            | 1.5         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            | (I)              |                 |              |     |
| C2012X7R222KKTSD |                   | C2012X7R222KKT   | 1V, 1kHz            | 2.2         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            | (I)              |                 |              |     |
| C2012X7R332KKTSD |                   | C2012X7R332KKT   | 1V, 1kHz            | 3.3         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            | (I)              |                 |              |     |
| C2012X7R392KKTSD |                   | C2012X7R392KKT   | 1V, 1kHz            | 3.9         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            | (I)              |                 |              |     |
| C2012X7R472KKTSD |                   | C2012X7R472KKT   | 1V, 1kHz            | 4.7         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 2.5%            | (I)              |                 |              |     |
| C2012X7R562KKPSG |                   | C2012X7R562KKP   | 1V, 1kHz            | 5.6         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            | Embossed, 3Kpcs  | (I)             |              |     |
| C2012X7R682KKPSG |                   | C2012X7R682KKP   | 1V, 1kHz            | 6.8         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (I)             |              |     |
| C2012X7R822KKPSG |                   | C2012X7R822KKP   | 1V, 1kHz            | 8.2         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (I)             |              |     |
| C2012X7R103KKPSG |                   | C2012X7R103KKP   | 1V, 1kHz            | 10          | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (I)             |              |     |
| C2012X7R123KKPSG | C2012X7R123KKP    | 1V, 1kHz         | 12                  | nF          | ±10% | 1.25                | ±0.15       | ±0.20         | 2.5%   | (I)             |                  |                 |              |     |
| C2012X7R223KKPSG | C2012X7R223KKP    | 1V, 1kHz         | 22                  | nF          | ±10% | 1.25                | ±0.20       | ±0.20         | 2.5%   | Embossed, 3Kpcs | (I)              |                 |              |     |
| 200V             | C2012X7R223KJPSG  | C2012X7R223KJP   | 1V, 1kHz            | 22          | nF   | ±10%                | 1.25        | ±0.20         | ±0.20  | 2.5%            | Embossed, 3Kpcs  | (I)             |              |     |

MLCC

Middle High Voltage

| RV               | DARFON P/N       | DARFON P/N 2   | Measuring Condition | Capacitance |      | Available Tolerance | Thick. (mm) | Tolerance(mm) |        | DF (max.) | Standard Packing | Test Spec. |
|------------------|------------------|----------------|---------------------|-------------|------|---------------------|-------------|---------------|--------|-----------|------------------|------------|
|                  |                  |                |                     | Value       | Unit |                     |             | L/W           | Thick. |           |                  |            |
| 100V             | C2012X7R151KHTSD | C2012X7R151KHT | 1V, 1kHz            | 150         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      | Paper, 4Kpcs     | (I)        |
|                  | C2012X7R181KHTSD | C2012X7R181KHT | 1V, 1kHz            | 180         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      |                  | (I)        |
|                  | C2012X7R221□HTSD | C2012X7R221KHT | 1V, 1kHz            | 220         | pF   | ±5%, ±10%           | 0.80        | ±0.15         | ±0.10  | 3.0%      |                  | (I)        |
|                  | C2012X7R271KHTSD | C2012X7R271KHT | 1V, 1kHz            | 270         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      |                  | (I)        |
|                  | C2012X7R331KHTSD | C2012X7R331KHT | 1V, 1kHz            | 330         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      |                  | (I)        |
|                  | C2012X7R391KHTSD | C2012X7R391KHT | 1V, 1kHz            | 390         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      |                  | (I)        |
|                  | C2012X7R471KHTSD | C2012X7R471KHT | 1V, 1kHz            | 470         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      |                  | (I)        |
|                  | C2012X7R561KHTSD | C2012X7R561KHT | 1V, 1kHz            | 560         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      |                  | (I)        |
|                  | C2012X7R681KHTSD | C2012X7R681KHT | 1V, 1kHz            | 680         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      |                  | (I)        |
|                  | C2012X7R821KHTSD | C2012X7R821KHT | 1V, 1kHz            | 820         | pF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      |                  | (I)        |
|                  | C2012X7R102KHTSD | C2012X7R102KHT | 1V, 1kHz            | 1.0         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      |                  | (I)        |
|                  | C2012X7R122KHTSD | C2012X7R122KHT | 1V, 1kHz            | 1.2         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      |                  | (I)        |
|                  | C2012X7R152KHTSD | C2012X7R152KHT | 1V, 1kHz            | 1.5         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      |                  | (I)        |
|                  | C2012X7R182KHTSD | C2012X7R182KHT | 1V, 1kHz            | 1.8         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      |                  | (I)        |
|                  | C2012X7R222KHTSD | C2012X7R222KHT | 1V, 1kHz            | 2.2         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      |                  | (I)        |
|                  | C2012X7R272KHTSD | C2012X7R272KHT | 1V, 1kHz            | 2.7         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      |                  | (I)        |
|                  | C2012X7R332KHTSD | C2012X7R332KHT | 1V, 1kHz            | 3.3         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      |                  | (I)        |
|                  | C2012X7R392KHTSD | C2012X7R392KHT | 1V, 1kHz            | 3.9         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      |                  | (I)        |
|                  | C2012X7R472KHTSD | C2012X7R472KHT | 1V, 1kHz            | 4.7         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      |                  | (I)        |
|                  | C2012X7R562KHTSD | C2012X7R562KHT | 1V, 1kHz            | 5.6         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      |                  | (I)        |
|                  | C2012X7R682KHTSD | C2012X7R682KHT | 1V, 1kHz            | 6.8         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      | (I)              |            |
|                  | C2012X7R822KHTSD | C2012X7R822KHT | 1V, 1kHz            | 8.2         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      | (I)              |            |
|                  | C2012X7R103KHTSD | C2012X7R103KHT | 1V, 1kHz            | 10          | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      | (I)              |            |
|                  | C2012X7R123KHTSD | C2012X7R123KHT | 1V, 1kHz            | 12          | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      | (I)              |            |
|                  | C2012X7R153KHTSD | C2012X7R153KHT | 1V, 1kHz            | 15          | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      | (I)              |            |
|                  | C2012X7R183KHTSD | C2012X7R183KHT | 1V, 1kHz            | 18          | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      | (I)              |            |
|                  | C2012X7R223KHTSD | C2012X7R223KHT | 1V, 1kHz            | 22          | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.0%      | (I)              |            |
|                  | C2012X7R333KHPSG | C2012X7R333KHP | 1V, 1kHz            | 33          | nF   | ±10%                | 1.25        | ±0.15/±0.10   | ±0.10  | 2.5%      | Embossed, 3Kpcs  | (I)        |
|                  | C2012X7R473KHPSG | C2012X7R473KHP | 1V, 1kHz            | 47          | nF   | ±10%                | 1.25        | ±0.15/±0.10   | ±0.10  | 2.5%      |                  | (I)        |
|                  | C2012X7R563KHPSG | C2012X7R563KHP | 1V, 1kHz            | 56          | nF   | ±10%                | 1.25        | ±0.15/±0.10   | ±0.10  | 2.5%      |                  | (I)        |
| C2012X7R683KHPSG | C2012X7R683KHP   | 1V, 1kHz       | 68                  | nF          | ±10% | 1.25                | ±0.15/±0.10 | ±0.10         | 2.5%   | (I)       |                  |            |
| C2012X7R823KHPSG | C2012X7R823KHP   | 1V, 1kHz       | 82                  | nF          | ±10% | 1.25                | ±0.15/±0.10 | ±0.10         | 2.5%   | (I)       |                  |            |
| C2012X7R104KHPSG | C2012X7R104KHP   | 1V, 1kHz       | 100                 | nF          | ±10% | 1.25                | ±0.20       | ±0.20         | 5.0%   | (I)       |                  |            |
| C2012X7R224KHPJ  | C2012X7R224KHP   | 1V, 1kHz       | 220                 | nF          | ±10% | 1.00                | ±0.20       | ±0.10         | 2.5%   | (II)      |                  |            |
| C2012X7R224KHPJ  | C2012X7R224KHP   | 1V, 1kHz       | 220                 | nF          | ±10% | 1.25                | ±0.20       | ±0.20         | 5.0%   | (I)       |                  |            |
| C2012X7R474KHPJ  | C2012X7R474KHP   | 1V, 1kHz       | 470                 | nF          | ±10% | 1.25                | ±0.20       | ±0.20         | 5.0%   | (II)      |                  |            |
| C2012X7R474KHPJ  | C2012X7R474KHP   | 1V, 1kHz       | 470                 | nF          | ±10% | 1.25                | ±0.20       | ±0.20         | 5.0%   | (II)      |                  |            |

● C3216X7R Series (EIA1206)

| RV    | DARFON P/N       | DARFON P/N 2   | Measuring Condition | Capacitance |      | Available Tolerance | Thick. (mm) | Tolerance(mm) |        | DF (max.) | Standard Packing | Test Spec. |
|-------|------------------|----------------|---------------------|-------------|------|---------------------|-------------|---------------|--------|-----------|------------------|------------|
|       |                  |                |                     | Value       | Unit |                     |             | L/W           | Thick. |           |                  |            |
| 2000V | C3216X7R101KQPSG | C3216X7R101KQP | 1V, 1kHz            | 100         | pF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%      | Embossed, 3Kpcs  | (I)        |
|       | C3216X7R151KQPSG | C3216X7R151KQP | 1V, 1kHz            | 150         | pF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%      |                  | (I)        |
|       | C3216X7R181KQPSG | C3216X7R181KQP | 1V, 1kHz            | 180         | pF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%      |                  | (I)        |
|       | C3216X7R221KQPSG | C3216X7R221KQP | 1V, 1kHz            | 220         | pF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%      |                  | (I)        |
|       | C3216X7R271KQPSG | C3216X7R271KQP | 1V, 1kHz            | 270         | pF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%      |                  | (I)        |
|       | C3216X7R331KQPSG | C3216X7R331KQP | 1V, 1kHz            | 330         | pF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%      |                  | (I)        |
|       | C3216X7R471KQPSG | C3216X7R471KQP | 1V, 1kHz            | 470         | pF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%      |                  | (I)        |
|       | C3216X7R561KQPSG | C3216X7R561KQP | 1V, 1kHz            | 560         | pF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%      |                  | (I)        |
|       | C3216X7R681KQPSG | C3216X7R681KQP | 1V, 1kHz            | 680         | pF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%      |                  | (I)        |
|       | C3216X7R821KQPSG | C3216X7R821KQP | 1V, 1kHz            | 820         | pF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%      |                  | (I)        |
|       | C3216X7R821KQPJ  | C3216X7R821KQP | 1V, 1kHz            | 820         | pF   | ±10%                | 1.60        | ±0.30         | ±0.20  | 2.5%      | Embossed, 2Kpcs  | (I)        |
|       | C3216X7R102KQPSG | C3216X7R102KQP | 1V, 1kHz            | 1.0         | nF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%      | Embossed, 3Kpcs  | (I)        |
|       | C3216X7R102KQPJ  | C3216X7R102KQP | 1V, 1kHz            | 1.0         | nF   | ±10%                | 1.60        | ±0.30         | ±0.20  | 2.5%      | Embossed, 2Kpcs  | (I)        |
|       | C3216X7R122KQPJ  | C3216X7R122KQP | 1V, 1kHz            | 1.2         | nF   | ±10%                | 1.60        | ±0.30         | ±0.20  | 2.5%      |                  | (I)        |
|       | C3216X7R152KQPJ  | C3216X7R152KQP | 1V, 1kHz            | 1.5         | nF   | ±10%                | 1.60        | ±0.30         | ±0.20  | 2.5%      |                  | (I)        |
|       | C3216X7R182KQPJ  | C3216X7R182KQP | 1V, 1kHz            | 1.8         | nF   | ±10%                | 1.60        | ±0.30         | ±0.20  | 2.5%      |                  | (I)        |
|       | C3216X7R222□QPJ  | C3216X7R222□QP | 1V, 1kHz            | 2.2         | nF   | ±10%, ±20%          | 1.60        | ±0.30         | ±0.20  | 2.5%      | (I)              |            |
|       | C3216X7R222KQPSG | C3216X7R222KQP | 1V, 1kHz            | 2.2         | nF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%      | Embossed, 3Kpcs  | (I)        |
|       | C3216X7R332KQPSG | C3216X7R332KQP | 1V, 1kHz            | 3.3         | nF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%      |                  | (I)        |
|       | C3216X7R472□QPJ  | C3216X7R472□QP | 1V, 1kHz            | 4.7         | nF   | ±10%, ±20%          | 1.60        | ±0.30         | ±0.20  | 2.5%      | Embossed, 2Kpcs  | (I)        |

□ Tolerance Code: J=±5%, K=±10%, M=±20%; Special tolerance on the request.

| RV               | DARFON P/N       | DARFON P/N 2   | Measuring Condition | Capacitance |      | Available Tolerance | Thick. (mm) | Tolerance(mm) |        | DF (max.)       | Standard Packing | Test Spec.      |      |
|------------------|------------------|----------------|---------------------|-------------|------|---------------------|-------------|---------------|--------|-----------------|------------------|-----------------|------|
|                  |                  |                |                     | Value       | Unit |                     |             | L/W           | Thick. |                 |                  |                 |      |
| 1000V            | C3216X7R101PPSG  | C3216X7R101PP  | 1V, 1kHz            | 100         | pF   | ±5%, ±10%           | 1.25        | ±0.30         | ±0.20  | 2.5%            | Embossed, 3Kpcs  | (I)             |      |
|                  | C3216X7R151KPPSG | C3216X7R151KPP | 1V, 1kHz            | 150         | pF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R181KPPSG | C3216X7R181KPP | 1V, 1kHz            | 180         | pF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R221KPPSG | C3216X7R221KPP | 1V, 1kHz            | 220         | pF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R271KPPSG | C3216X7R271KPP | 1V, 1kHz            | 270         | pF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R331KPPSG | C3216X7R331KPP | 1V, 1kHz            | 330         | pF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R391KPPSG | C3216X7R391KPP | 1V, 1kHz            | 390         | pF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R471KPPSG | C3216X7R471KPP | 1V, 1kHz            | 470         | pF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R561KPPSG | C3216X7R561KPP | 1V, 1kHz            | 560         | pF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R681KPPSG | C3216X7R681KPP | 1V, 1kHz            | 680         | pF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R821KPPSG | C3216X7R821KPP | 1V, 1kHz            | 820         | pF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R102PPSG  | C3216X7R102PP  | 1V, 1kHz            | 1.0         | nF   | ±5%, ±10%           | 1.25        | ±0.30         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R122KPPSG | C3216X7R122KPP | 1V, 1kHz            | 1.2         | nF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R152KPPSG | C3216X7R152KPP | 1V, 1kHz            | 1.5         | nF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R182KPPSG | C3216X7R182KPP | 1V, 1kHz            | 1.8         | nF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R222KPPSG | C3216X7R222KPP | 1V, 1kHz            | 2.2         | nF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R272KPPSG | C3216X7R272KPP | 1V, 1kHz            | 2.7         | nF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R332KPPSG | C3216X7R332KPP | 1V, 1kHz            | 3.3         | nF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R392KPPSG | C3216X7R392KPP | 1V, 1kHz            | 3.9         | nF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R472KPPSG | C3216X7R472KPP | 1V, 1kHz            | 4.7         | nF   | ±10%                | 1.25        | ±0.30         | ±0.20  | 2.5%            |                  | (I)             |      |
| C3216X7R562KPPSG | C3216X7R562KPP   | 1V, 1kHz       | 5.6                 | nF          | ±10% | 1.25                | ±0.30       | ±0.20         | 2.5%   | (I)             |                  |                 |      |
| C3216X7R682KPPSG | C3216X7R682KPP   | 1V, 1kHz       | 6.8                 | nF          | ±10% | 1.25                | ±0.30       | ±0.20         | 2.5%   | (I)             |                  |                 |      |
| C3216X7R822KPPSG | C3216X7R822KPP   | 1V, 1kHz       | 8.2                 | nF          | ±10% | 1.25                | ±0.30       | ±0.20         | 2.5%   | (I)             |                  |                 |      |
| C3216X7R103KPPSG | C3216X7R103KPP   | 1V, 1kHz       | 10                  | nF          | ±10% | 1.25                | ±0.30       | ±0.20         | 2.5%   | (I)             |                  |                 |      |
| 630V             | C3216X7R101KMPSG | C3216X7R101KMP | 1V, 1kHz            | 100         | pF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            | Embossed, 3Kpcs  | (II)            |      |
|                  | C3216X7R181KMPSG | C3216X7R181KMP | 1V, 1kHz            | 180         | pF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (II)            |      |
|                  | C3216X7R221KMPSG | C3216X7R221KMP | 1V, 1kHz            | 220         | pF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (II)            |      |
|                  | C3216X7R271KMPSG | C3216X7R271KMP | 1V, 1kHz            | 270         | pF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (II)            |      |
|                  | C3216X7R331KMPSG | C3216X7R331KMP | 1V, 1kHz            | 330         | pF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (II)            |      |
|                  | C3216X7R391KMPSG | C3216X7R391KMP | 1V, 1kHz            | 390         | pF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (II)            |      |
|                  | C3216X7R471KMPSG | C3216X7R471KMP | 1V, 1kHz            | 470         | pF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (II)            |      |
|                  | C3216X7R561KMPSG | C3216X7R561KMP | 1V, 1kHz            | 560         | pF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (II)            |      |
|                  | C3216X7R681KMPSG | C3216X7R681KMP | 1V, 1kHz            | 680         | pF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (II)            |      |
|                  | C3216X7R821KMPSG | C3216X7R821KMP | 1V, 1kHz            | 820         | pF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (II)            |      |
|                  | C3216X7R102KMPSG | C3216X7R102KMP | 1V, 1kHz            | 1.0         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (II)            |      |
|                  | C3216X7R122KMPSG | C3216X7R122KMP | 1V, 1kHz            | 1.2         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (II)            |      |
|                  | C3216X7R152KMPSG | C3216X7R152KMP | 1V, 1kHz            | 1.5         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (II)            |      |
|                  | C3216X7R182KMPSG | C3216X7R182KMP | 1V, 1kHz            | 1.8         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (II)            |      |
|                  | C3216X7R222KMPSG | C3216X7R222KMP | 1V, 1kHz            | 2.2         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (II)            |      |
|                  | C3216X7R272KMPSG | C3216X7R272KMP | 1V, 1kHz            | 2.7         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (II)            |      |
|                  | C3216X7R332KMPSG | C3216X7R332KMP | 1V, 1kHz            | 3.3         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (II)            |      |
|                  | C3216X7R392KMPSG | C3216X7R392KMP | 1V, 1kHz            | 3.9         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (II)            |      |
|                  | C3216X7R472KMTSE | C3216X7R472KMT | 1V, 1kHz            | 4.7         | nF   | ±10%                | 0.85        | ±0.15         | ±0.15  | 2.5%            |                  | Paper, 4Kpcs    | (II) |
|                  | C3216X7R472KMPSG | C3216X7R472KMP | 1V, 1kHz            | 4.7         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | Embossed, 3Kpcs | (II) |
| C3216X7R562KMPSG | C3216X7R562KMP   | 1V, 1kHz       | 5.6                 | nF          | ±10% | 1.25                | ±0.15       | ±0.20         | 2.5%   | (II)            |                  |                 |      |
| C3216X7R682KMPSG | C3216X7R682KMP   | 1V, 1kHz       | 6.8                 | nF          | ±10% | 1.25                | ±0.15       | ±0.20         | 2.5%   | (II)            |                  |                 |      |
| C3216X7R822KMPSG | C3216X7R822KMP   | 1V, 1kHz       | 8.2                 | nF          | ±10% | 1.25                | ±0.15       | ±0.20         | 2.5%   | (II)            |                  |                 |      |
| C3216X7R103KMPSG | C3216X7R103KMP   | 1V, 1kHz       | 10                  | nF          | ±10% | 1.25                | ±0.15       | ±0.20         | 2.5%   | (II)            |                  |                 |      |
| C3216X7R123KMPSG | C3216X7R123KMP   | 1V, 1kHz       | 12                  | nF          | ±10% | 1.25                | ±0.15       | ±0.20         | 2.5%   | (II)            |                  |                 |      |
| C3216X7R153KMPSG | C3216X7R153KMP   | 1V, 1kHz       | 15                  | nF          | ±10% | 1.25                | ±0.15       | ±0.20         | 2.5%   | (II)            |                  |                 |      |
| C3216X7R183KMPSG | C3216X7R183KMP   | 1V, 1kHz       | 18                  | nF          | ±10% | 1.25                | ±0.15       | ±0.20         | 2.5%   | (II)            |                  |                 |      |
| C3216X7R223KMPSL | C3216X7R223KMP   | 1V, 1kHz       | 22                  | nF          | ±10% | 1.60                | ±0.30/±0.20 | ±0.20         | 2.5%   | Embossed, 2Kpcs | (II)             |                 |      |
| C3216X7R273KMPSL | C3216X7R273KMP   | 1V, 1kHz       | 27                  | nF          | ±10% | 1.60                | ±0.30/±0.20 | ±0.20         | 2.5%   |                 | (II)             |                 |      |
| C3216X7R333KMPSL | C3216X7R333KMP   | 1V, 1kHz       | 33                  | nF          | ±10% | 1.60                | ±0.30/±0.20 | ±0.20         | 2.5%   |                 | (II)             |                 |      |
| C3216X7R473KMPSL | C3216X7R473KMP   | 1V, 1kHz       | 47                  | nF          | ±10% | 1.60                | ±0.30/±0.20 | ±0.20         | 2.5%   | (II)            |                  |                 |      |
| 500V             | C3216X7R101KLPSG | C3216X7R101KLP | 1V, 1kHz            | 100         | pF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            | Embossed, 3Kpcs  | (I)             |      |
|                  | C3216X7R181KLPSG | C3216X7R181KLP | 1V, 1kHz            | 180         | pF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R221KLPSG | C3216X7R221KLP | 1V, 1kHz            | 220         | pF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R471KLPSG | C3216X7R471KLP | 1V, 1kHz            | 470         | pF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R102KLPSG | C3216X7R102KLP | 1V, 1kHz            | 1.0         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R222KLPSG | C3216X7R222KLP | 1V, 1kHz            | 2.2         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R272KLPSG | C3216X7R272KLP | 1V, 1kHz            | 2.7         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R332KLPSG | C3216X7R332KLP | 1V, 1kHz            | 3.3         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R392KLPSG | C3216X7R392KLP | 1V, 1kHz            | 3.9         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R472KLPSG | C3216X7R472KLP | 1V, 1kHz            | 4.7         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R682KLPSG | C3216X7R682KLP | 1V, 1kHz            | 6.8         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R103KLPSG | C3216X7R103KLP | 1V, 1kHz            | 10          | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R223KLPSL | C3216X7R223KLP | 1V, 1kHz            | 22          | nF   | ±10%                | 1.60        | ±0.30/±0.20   | ±0.20  | 2.5%            |                  | Embossed, 2Kpcs | (I)  |
|                  | C3216X7R473KLPSL | C3216X7R473KLP | 1V, 1kHz            | 47          | nF   | ±10%                | 1.60        | ±0.30/±0.20   | ±0.20  | 2.5%            |                  |                 | (I)  |
| 250V             | C3216X7R181KKPSG | C3216X7R181KKP | 1V, 1kHz            | 180         | pF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            | Embossed, 3Kpcs  | (I)             |      |
|                  | C3216X7R221KKPSG | C3216X7R221KKP | 1V, 1kHz            | 220         | pF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R471KKPSG | C3216X7R471KKP | 1V, 1kHz            | 470         | pF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R561KKPSG | C3216X7R561KKP | 1V, 1kHz            | 560         | pF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R102KKPSG | C3216X7R102KKP | 1V, 1kHz            | 1.0         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (I)             |      |
|                  | C3216X7R222KKPSG | C3216X7R222KKP | 1V, 1kHz            | 2.2         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%            |                  | (I)             |      |

MLCC Middle High Voltage

| RV               | DARFON P/N        | DARFON P/N 2   | Measuring Condition | Capacitance |      | Available Tolerance | Thick. (mm) | Tolerance(mm) |        | DF (max.) | Standard Packing | Test Spec. |
|------------------|-------------------|----------------|---------------------|-------------|------|---------------------|-------------|---------------|--------|-----------|------------------|------------|
|                  |                   |                |                     | Value       | Unit |                     |             | L/W           | Thick. |           |                  |            |
| 250V             | C3216X7R472KKPSG  | C3216X7R472KKP | 1V, 1kHz            | 4.7         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%      | Embossed, 3Kpcs  | (I)        |
|                  | C3216X7R472KKTSE  | C3216X7R472KKT | 1V, 1kHz            | 4.7         | nF   | ±10%                | 0.85        | ±0.15         | ±0.15  | 2.5%      | Paper, 4Kpcs     | (I)        |
|                  | C3216X7R103KKPSG  | C3216X7R103KKP | 1V, 1kHz            | 10          | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%      | Embossed, 3Kpcs  | (I)        |
|                  | C3216X7R103KKTSE  | C3216X7R103KKT | 1V, 1kHz            | 10          | nF   | ±10%                | 0.85        | ±0.15         | ±0.15  | 2.5%      | Paper, 4Kpcs     | (I)        |
|                  | C3216X7R153KKPSG  | C3216X7R153KKP | 1V, 1kHz            | 15          | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%      | Embossed, 3Kpcs  | (I)        |
|                  | C3216X7R223KKPSG  | C3216X7R223KKP | 1V, 1kHz            | 22          | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%      | Embossed, 3Kpcs  | (I)        |
|                  | C3216X7R473KKPSL  | C3216X7R473KKP | 1V, 1kHz            | 47          | nF   | ±10%                | 1.60        | ±0.20         | ±0.20  | 2.5%      | Embossed, 2Kpcs  | (I)        |
| 200V             | C3216X7R104KKPSL  | C3216X7R104KKP | 1V, 1kHz            | 100         | nF   | ±10%                | 1.60        | ±0.20         | ±0.20  | 2.5%      | Embossed, 2Kpcs  | (I)        |
|                  | C3216X7R102KJTSE  | C3216X7R102KJT | 1V, 1kHz            | 1.0         | nF   | ±10%                | 0.85        | ±0.15         | ±0.15  | 2.5%      | Paper, 4Kpcs     | (I)        |
|                  | C3216X7R102KJPSG  | C3216X7R102KJP | 1V, 1kHz            | 1.0         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%      | Embossed, 3Kpcs  | (I)        |
|                  | C3216X7R332KJPSG  | C3216X7R332KJP | 1V, 1kHz            | 3.3         | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%      | Embossed, 3Kpcs  | (I)        |
|                  | C3216X7R473KJPSL  | C3216X7R473KJP | 1V, 1kHz            | 47          | nF   | ±10%                | 1.60        | ±0.20         | ±0.20  | 2.5%      | Embossed, 2Kpcs  | (I)        |
| 100V             | C3216X7R104KJPSL  | C3216X7R104KJP | 1V, 1kHz            | 100         | nF   | ±10%                | 1.60        | ±0.20         | ±0.20  | 2.5%      | Embossed, 2Kpcs  | (I)        |
|                  | C3216X7R102KHPSPG | C3216X7R102KHP | 1V, 1kHz            | 1           | nF   | ±10%                | 1.25        | ±0.15         | ±0.20  | 2.5%      | Embossed, 3Kpcs  | (I)        |
|                  | C3216X7R103KHTSD  | C3216X7R103KHT | 1V, 1kHz            | 10          | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.5%      | Paper, 4Kpcs     | (I)        |
|                  | C3216X7R123KHTSD  | C3216X7R123KHT | 1V, 1kHz            | 12          | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.5%      |                  | (I)        |
|                  | C3216X7R153KHTSD  | C3216X7R153KHT | 1V, 1kHz            | 15          | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.5%      |                  | (I)        |
|                  | C3216X7R183KHTSD  | C3216X7R183KHT | 1V, 1kHz            | 18          | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.5%      |                  | (I)        |
|                  | C3216X7R223KHTSD  | C3216X7R223KHT | 1V, 1kHz            | 22          | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.5%      |                  | (I)        |
|                  | C3216X7R273KHTSD  | C3216X7R273KHT | 1V, 1kHz            | 27          | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.5%      |                  | (I)        |
|                  | C3216X7R333KHTSD  | C3216X7R333KHT | 1V, 1kHz            | 33          | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.5%      |                  | (I)        |
|                  | C3216X7R393KHTSD  | C3216X7R393KHT | 1V, 1kHz            | 39          | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.5%      |                  | (I)        |
|                  | C3216X7R473KHTSD  | C3216X7R473KHT | 1V, 1kHz            | 47          | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.5%      |                  | (I)        |
|                  | C3216X7R563KHTSD  | C3216X7R563KHT | 1V, 1kHz            | 56          | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.5%      |                  | (I)        |
|                  | C3216X7R683KHTSD  | C3216X7R683KHT | 1V, 1kHz            | 68          | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.5%      | (I)              |            |
|                  | C3216X7R823KHTSD  | C3216X7R823KHT | 1V, 1kHz            | 82          | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.5%      | (I)              |            |
|                  | C3216X7R823KHPSPG | C3216X7R823KHP | 1V, 1kHz            | 82          | nF   | ±10%                | 1.25        | ±0.15         | ±0.10  | 3.5%      | Embossed, 3Kpcs  | (I)        |
|                  | C3216X7R104KHTSD  | C3216X7R104KHT | 1V, 1kHz            | 100         | nF   | ±10%                | 0.80        | ±0.15         | ±0.10  | 3.5%      | Paper, 4Kpcs     | (I)        |
|                  | C3216X7R104KHPSG  | C3216X7R104KHP | 1V, 1kHz            | 100         | nF   | ±10%                | 1.25        | ±0.15         | ±0.10  | 3.5%      | Embossed, 3Kpcs  | (I)        |
|                  | C3216X7R154KHPSL  | C3216X7R154KHP | 1V, 1kHz            | 150         | nF   | ±10%                | 1.60        | ±0.20         | ±0.20  | 2.5%      | Embossed, 2Kpcs  | (I)        |
|                  | C3216X7R224KHPSL  | C3216X7R224KHP | 1V, 1kHz            | 220         | nF   | ±10%                | 1.60        | ±0.20         | ±0.20  | 2.5%      |                  | (I)        |
|                  | C3216X7R474KHPSL  | C3216X7R474KHP | 1V, 1kHz            | 470         | nF   | ±10%                | 1.60        | ±0.20         | ±0.20  | 3.0%      |                  | (I)        |
| C3216X7R105KHPSL | C3216X7R105KHP    | 1V, 1kHz       | 1.0                 | uF          | ±10% | 1.60                | ±0.30       | ±0.30         | 10.0%  | (I)       |                  |            |
| C3216X7R225KHPSL | C3216X7R225KHP    | 1V, 1kHz       | 2.2                 | uF          | ±10% | 1.60                | ±0.30       | ±0.30         | 10.0%  | (II)      |                  |            |

● C3225X7R Series (EIA1210)

| RV    | DARFON P/N       | DARFON P/N 2   | Measuring Condition | Capacitance |      | Available Tolerance | Thick. (mm) | Tolerance(mm) |             | DF (max.) | Standard Packing | Test Spec. |
|-------|------------------|----------------|---------------------|-------------|------|---------------------|-------------|---------------|-------------|-----------|------------------|------------|
|       |                  |                |                     | Value       | Unit |                     |             | L/W           | Thick.      |           |                  |            |
| 2000V | C3225X7R102KQPSG | C3225X7R102KQP | 1V, 1kHz            | 1.0         | nF   | ±10%                | 1.25        | ±0.40/±0.30   | ±0.20       | 2.50%     | Embossed, 3Kpcs  | (I)        |
|       | C3225X7R222KQPSN | C3225X7R222KQP | 1V, 1kHz            | 2.2         | nF   | ±10%                | 2.00        | ±0.40/±0.30   | ±0.20       | 2.50%     | Embossed, 2Kpcs  | (I)        |
| 1000V | C3225X7R472□QSPS | C3225X7R472□QP | 1V, 1kHz            | 4.7         | nF   | ±10%, ±20%          | 2.50        | ±0.40/±0.30   | ±0.30       | 2.50%     | Embossed, 1Kpcs  | (I)        |
|       | C3225X7R103KPPSL | C3225X7R103KPP | 1V, 1kHz            | 10          | nF   | ±10%                | 1.60        | ±0.40/±0.30   | ±0.20       | 2.50%     | Embossed, 1Kpcs  | (I)        |
| 630V  | C3225X7R102KMPSG | C3225X7R102KMP | 1V, 1kHz            | 1.0         | nF   | ±10%                | 1.25        | ±0.30/±0.20   | ±0.20       | 2.50%     | Embossed, 3Kpcs  | (I)        |
|       | C3225X7R222KMPSG | C3225X7R222KMP | 1V, 1kHz            | 2.2         | nF   | ±10%                | 1.25        | ±0.30/±0.20   | ±0.20       | 2.50%     |                  | (I)        |
|       | C3225X7R472KMPSG | C3225X7R472KMP | 1V, 1kHz            | 4.7         | nF   | ±10%                | 1.25        | ±0.30/±0.20   | ±0.20       | 2.50%     |                  | (I)        |
|       | C3225X7R103KMPSG | C3225X7R103KMP | 1V, 1kHz            | 10          | nF   | ±10%                | 1.25        | ±0.30/±0.20   | ±0.20       | 2.50%     |                  | (I)        |
|       | C3225X7R223KMPSG | C3225X7R223KMP | 1V, 1kHz            | 22          | nF   | ±10%                | 1.25        | ±0.30/±0.20   | ±0.20       | 2.50%     |                  | (I)        |
|       | C3225X7R473KMPSL | C3225X7R473KMP | 1V, 1kHz            | 47          | nF   | ±10%                | 1.60        | ±0.40/±0.30   | ±0.20       | 2.50%     | Embossed, 2Kpcs  | (I)        |
| 500V  | C3225X7R683KMPSL | C3225X7R683KMP | 1V, 1kHz            | 68          | nF   | ±10%                | 1.60        | ±0.40/±0.30   | ±0.20       | 2.50%     | Embossed, 2Kpcs  | (I)        |
|       | C3225X7R103KLPSG | C3225X7R103KLP | 1V, 1kHz            | 10          | nF   | ±10%                | 1.25        | ±0.30/±0.20   | ±0.20       | 2.50%     | Embossed, 3Kpcs  | (I)        |
|       | C3225X7R223KLPSG | C3225X7R223KLP | 1V, 1kHz            | 22          | nF   | ±10%                | 1.25        | ±0.30/±0.20   | ±0.20       | 2.50%     | Embossed, 3Kpcs  | (I)        |
|       | C3225X7R104KLPSN | C3225X7R104KLP | 1V, 1kHz            | 100         | nF   | ±10%                | 2.00        | ±0.40/±0.30   | ±0.20       | 2.50%     | Embossed, 2Kpcs  | (I)        |
| 250V  | C3225X7R224KKPSP | C3225X7R224KKP | 1V, 1kHz            | 220         | nF   | ±10%                | 2.50        | ±0.40/±0.30   | ±0.30       | 2.50%     | Embossed, 1Kpcs  | (I)        |
|       | C3225X7R274KKPSP | C3225X7R274KKP | 1V, 1kHz            | 270         | nF   | ±10%                | 2.50        | ±0.40/±0.30   | ±0.30       | 2.50%     |                  | (I)        |
|       | C3225X7R474KKPSP | C3225X7R474KKP | 1V, 1kHz            | 470         | nF   | ±10%                | 2.50        | ±0.40/±0.30   | ±0.30       | 2.50%     |                  | (I)        |
| 100V  | C3225X7R104KHPSI | C3225X7R104KHP | 1V, 1kHz            | 100         | nF   | ±10%                | 0.95        | ±0.30/±0.20   | ±0.10       | 2.50%     | Embossed, 3Kpcs  | (I)        |
|       | C3225X7R224KHPSG | C3225X7R224KHP | 1V, 1kHz            | 220         | nF   | ±10%                | 1.25        | ±0.30/±0.20   | ±0.20       | 2.50%     | Embossed, 3Kpcs  | (I)        |
|       | C3225X7R474KHPSI | C3225X7R474KHP | 1V, 1kHz            | 470         | nF   | ±10%                | 0.95        | ±0.30/±0.20   | +0.15/-0.10 | 2.50%     | Embossed, 3Kpcs  | (II)       |
|       | C3225X7R474KHPSP | C3225X7R474KHP | 1V, 1kHz            | 470         | nF   | ±10%                | 2.50        | ±0.30/±0.20   | ±0.30       | 3.00%     | Embossed, 1Kpcs  | (I)        |
|       | C3225X7R564KHPSP | C3225X7R564KHP | 1V, 1kHz            | 560         | nF   | ±10%                | 2.50        | ±0.30/±0.20   | ±0.30       | 3.00%     |                  | (I)        |
|       | C3225X7R824KHWSN | C3225X7R824KHW | 1V, 1kHz            | 820         | nF   | ±10%                | 2.00        | ±0.40/±0.30   | ±0.20       | 3.00%     | Embossed, 2Kpcs  | (I)        |
|       | C3225X7R105KHPSN | C3225X7R105KHP | 1V, 1kHz            | 1.0         | uF   | ±10%                | 2.00        | ±0.30/±0.20   | ±0.20       | 10.0%     |                  | (I)        |
|       | C3225X7R225KHPSN | C3225X7R225KHP | 1V, 1kHz            | 2.2         | uF   | ±10%                | 2.00        | ±0.30/±0.20   | ±0.20       | 10.0%     |                  | (I)        |
|       | C3225X7R225KHPSP | C3225X7R225KHP | 1V, 1kHz            | 2.2         | uF   | ±10%                | 2.50        | ±0.30/±0.20   | ±0.20       | 5.0%      | Embossed, 1Kpcs  | (I)        |



## ● C4520X7R Series (EIA1808)

| RV    | DARFON P/N       | DARFON P/N     | Measuring Condition | Capacitance |      | Available Tolerance | Thick. (mm) | Tolerance(mm) |        | DF (max.) | Standard Packing | Test Spec. |
|-------|------------------|----------------|---------------------|-------------|------|---------------------|-------------|---------------|--------|-----------|------------------|------------|
|       |                  |                |                     | Value       | Unit |                     |             | L/W           | Thick. |           |                  |            |
| 3000V | C4520X7R102KRPSG | C4520X7R102KRP | 1V, 1kHz            | 1.0         | nF   | ±10%                | 1.25        | ±0.30/±0.20   | ±0.20  | 2.50%     | Embossed, 3Kpcs  | (I)        |
|       | C4520X7R102KRPSN | C4520X7R102KRP | 1V, 1kHz            | 1.0         | nF   | ±10%                | 2.00        | ±0.40/±0.30   | ±0.20  | 2.50%     | Embossed, 1Kpcs  | (I)        |
| 2000V | C4520X7R102KQPSG | C4520X7R102KQP | 1V, 1kHz            | 1.0         | nF   | ±10%                | 1.25        | ±0.40/±0.30   | ±0.20  | 2.50%     | Embossed, 2Kpcs  | (I)        |
|       | C4520X7R102KQPSN | C4520X7R102KQP | 1V, 1kHz            | 1.0         | nF   | ±10%                | 2.00        | ±0.40/±0.30   | ±0.20  | 2.50%     | Embossed, 1Kpcs  | (I)        |
|       | C4520X7R152KQPSN | C4520X7R152KQP | 1V, 1kHz            | 1.5         | nF   | ±10%                | 2.00        | ±0.40/±0.30   | ±0.20  | 2.50%     | Embossed, 1Kpcs  | (I)        |
|       | C4520X7R222KQPSL | C4520X7R222KQP | 1V, 1kHz            | 2.2         | nF   | ±10%                | 1.60        | ±0.30/±0.20   | ±0.20  | 2.50%     | Embossed, 2Kpcs  | (I)        |
| 250V  | C4520X7R471KKPSG | C4520X7R471KKP | 1V, 1kHz            | 470         | pF   | ±10%                | 1.25        | ±0.40/±0.30   | ±0.25  | 2.50%     | Embossed, 2Kpcs  | (I)        |

## ● C4532X7R Series (EIA1812)

| RV    | DARFON P/N       | DARFON P/N       | Measuring Condition | Capacitance |      | Available Tolerance | Thick. (mm) | Tolerance(mm) |        | DF (max.) | Standard Packing  | Test Spec. |
|-------|------------------|------------------|---------------------|-------------|------|---------------------|-------------|---------------|--------|-----------|-------------------|------------|
|       |                  |                  |                     | Value       | Unit |                     |             | L/W           | Thick. |           |                   |            |
| 3000V | C4532X7R102□RPSN | C4532X7R102□RPSN | 1V, 1kHz            | 1.0         | nF   | ±10%, ±20%          | 2.00        | +0.5-0.3/±0.3 | ±0.20  | 2.50%     | Embossed, 1kpcs   | (I)        |
|       | C4532X7R152KRPSN | C4532X7R152KRP   | 1V, 1kHz            | 1.5         | nF   | ±10%                | 2.00        | +0.5-0.3/±0.3 | ±0.20  | 2.50%     | Embossed, 1kpcs   | (I)        |
|       | C4532X7R222KRPSL | C4532X7R222KRP   | 1V, 1kHz            | 2.2         | nF   | ±10%                | 2.50        | +0.5-0.3/±0.4 | ±0.30  | 2.50%     | Embossed, 0.5kpcs | (I)        |
|       | C4532X7R332KRPSL | C4532X7R332KRP   | 1V, 1kHz            | 3.3         | nF   | ±10%                | 2.50        | +0.5-0.3/±0.4 | ±0.30  | 2.50%     | Embossed, 0.5kpcs | (I)        |
| 2000V | C4532X7R102KQPSG | C4532X7R102KQP   | 1V, 1kHz            | 1.0         | nF   | ±10%                | 1.25        | ±0.40/±0.30   | ±0.10  | 2.50%     | Embossed, 1kpcs   | (I)        |
|       | C4532X7R222KQPSG | C4532X7R222KQP   | 1V, 1kHz            | 2.2         | nF   | ±10%                | 1.25        | ±0.40/±0.30   | ±0.10  | 2.50%     |                   | (I)        |
|       | C4532X7R222KQPSL | C4532X7R222KQP   | 1V, 1kHz            | 2.2         | nF   | ±10%                | 1.60        | ±0.30         | ±0.20  | 2.50%     |                   | (II)       |
|       | C4532X7R472KQPSN | C4532X7R472KQP   | 1V, 1kHz            | 4.7         | nF   | ±10%                | 2.00        | +0.5-0.3/±0.3 | ±0.20  | 2.50%     |                   | (I)        |
|       | C4532X7R103KQPSN | C4532X7R103KQP   | 1V, 1kHz            | 10          | nF   | ±10%                | 2.00        | ±0.40/±0.20   | ±0.20  | 2.50%     |                   | (I)        |
|       | C4532X7R103KQPSL | C4532X7R103KQP   | 1V, 1kHz            | 10          | nF   | ±10%                | 2.50        | +0.5-0.3/±0.4 | ±0.30  | 2.50%     | Embossed, 0.5kpcs | (I)        |
| 1000V | C4532X7R472KPPSG | C4532X7R472KPP   | 1V, 1kHz            | 4.7         | nF   | ±10%                | 1.25        | +0.5-0.3/±0.3 | ±0.10  | 2.50%     | Embossed, 1kpcs   | (I)        |
| 630V  | C4532X7R104KMPSN | C4532X7R104KMP   | 1V, 1kHz            | 100         | nF   | ±10%                | 2.00        | +0.5-0.3/±0.3 | ±0.20  | 2.50%     | Embossed, 1kpcs   | (II)       |
|       | C4532X7R154KMPSL | C4532X7R154KMP   | 1V, 1kHz            | 150         | nF   | ±10%                | 2.50        | +0.5-0.3/±0.4 | ±0.30  | 2.50%     | Embossed, 0.5kpcs | (II)       |
| 250V  | C4532X7R474KKPSN | C4532X7R474KKP   | 1V, 1kHz            | 470         | nF   | ±10%                | 2.00        | +0.5-0.3/±0.3 | ±0.20  | 2.50%     | Embossed, 1kpcs   | (I)        |
| 200V  | C4532X7R105KJPSP | C4532X7R105KJP   | 1V, 1kHz            | 1.0         | uF   | ±10%                | 2.50        | +0.5-0.3/±0.4 | ±0.30  | 2.50%     | Embossed, 0.5kpcs | (I)        |
| 100V  | C4532X7R225KHWSP | C4532X7R105KHW   | 1V, 1kHz            | 2.2         | uF   | ±10%                | 2.50        | +0.5-0.3/±0.4 | ±0.30  | 2.50%     | Embossed, 0.7kpcs | (II)       |

□ Tolerance Code: K=±10%, M=±20%; Special tolerance on the request.

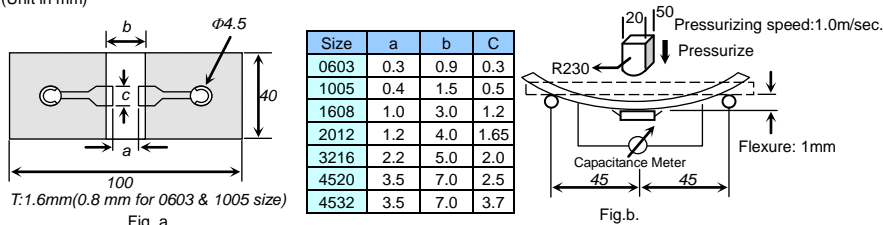
■ X7S Series

■ C2012X7S Series (EIA0805)

| RV   | DARFON P/N        | DARFON P/N 2    | Measuring Condition | Capacitance |      | Available Tolerance | Thick. (mm) | Tolerance(mm) |        | DF (max.) | Standard Packing | Test Spec. |
|------|-------------------|-----------------|---------------------|-------------|------|---------------------|-------------|---------------|--------|-----------|------------------|------------|
|      |                   |                 |                     | Value       | Unit |                     |             | L/W           | Thick. |           |                  |            |
| 100V | C2012X7S105□ HPSG | C2012X7S105□ HP | 1V , 1kHz           | 1           | uF   | ±10%, ±20%          | 1.25        | ± 0.20        | ±0.20  | 10.0%     | Embossed, 3Kpcs  | (II)       |

□ Tolerance Code: K=±10%, M=±20%; Special tolerance on the request.

- Test Spec.
- Middle-High Voltage (I)

| Item | Specification  |                               | Test Method   |
|------|--|-------------------------------|---|
|      | Temp. compensation type  | High dielectric constant type |   |
| 1    | Operation Temperature Range  |                               | ---   |
| 2    | Rated Voltage  |                               | The rated voltage is defined as the maximum voltage, which may be applied continuously to the capacitor.  |
| 3    | Appearance   |                               | Visual inspection   |
| 4    | Dimensions   |                               | Using calipers  |
| 5    | Dielectric Strength  |                               | No failure shall be observed when 250% of the rated voltage (150% for 500V, 120% for above 1KV) is applied between the terminations for 1 to 5 seconds. The charge and discharge current is less than 50mA.   |
| 6    | Rated Voltage <200V  | To apply rated voltage.       | The insulation resistance shall be measured with a DC voltage not exceeding the rated voltage at 25°C and 75%RH max, and within 1 minute of charging.   |
|      | Rated Voltage <500V  | To apply rated voltage.       |   |
|      | Rated Voltage ≥500V  | To apply 500V.                |   |
| 7    | Capacitance  |                               | The capacitance / D.F. shall be measured at 25°C at the frequency and voltage shown in the table of "Part Number & Characteristic".   |
| 8    | Q/Dissipation Factor ( D.F.)   |                               |   |
| 9    | Capacitance change   |                               | 1. Temperature compensation type:<br>The capacitance value at 25°C and 85°C shall be measured and calculated from the formula given below.<br>$T.C. = (C_{85} - C_{25}) / C_{25} \cdot \Delta T \cdot 10^6$ (PPM/°C)<br>2. High dielectric constant type:<br>The ranges of capacitance change compared with the 25°C value over the temperature ranges shall be within the specified ranges.  |
|      | Capacitance Temperature Characteristics  |                               |   |
| 10   | Termination Strength   |                               | Apply a parallel force of 5N to a PCB mounted sample for 10±1sec.   |
| 11   | Deflection (Bending Strength)  |                               | Solder the capacitor to the test jig (glass epoxy boards) shown in Fig.a using a SAC305(Sn96.5Ag3.0Cu0.5) solder (then let sit for 24±2 hours for X7R).<br>Then apply a force in the direction shown in Fig.b. The soldering shall be done with the reflow method and shall be conducted with care so that the soldering is uniform and free of defects such as heat shock.   |
|      |  |                               |   |
| 12   | Solderability of Termination   |                               | Immerse the test capacitor into a methanol solution containing rosin for 3 to 5 seconds, preheat it 150 to 180°C for 2 to 3 minutes and immerse it into SAC305(Sn96.5Ag3.0Cu0.5) solder of 245 ± 5°C for 3±1seconds.  |
| 13   | Resistance to Soldering Heat   |                               | *Preheat the capacitor at 120 to 150°C for 1 minute.<br>Immerse the capacitor in a SAC305(Sn96.5Ag3.0Cu0.5) solder solution at 270±5°C for 10±1 seconds. Let sit at room temperature for 24±2 hours, then measure.<br>* Preheat 150 to 200°C for size ≥3216.<br>*High dielectric constant type:<br>Initial measurement : perform a heat treatment at 150+0/-10°C for one hour and then let sit for 24±2 hours at room temperature. Perform the initial measurement. |
|      | Appearance   |                               |   |
|      | Cap. Change  |                               |   |
|      | Q/D.F.   |                               |   |
|      |  | I.R.                          |   |

|    | Item                              | Specification           |   | Test Method  |   |
|----|-----------------------------------|-------------------------|---|--|---|
|    |                                   | Temp. compensation type | High dielectric constant type   |  |   |
| 14 | Temperature cycle (Thermal shock) | Appearance              | No marking defects  |  | Solder the capacitor to supporting jig (Glass epoxy board) and perform the five cycles according to the four heat treatments listed in the following table. Let sit for 24±2hrs at room temperature, then measure.<br>Step 1: Minimum operating temperature 30±3min<br>Step 2: Room temperature 2~3 min<br>Step 3: Maximum operating temperature 30±3min<br>Step 4: Room temperature 2~3min<br>*High dielectric constant type:<br>Initial measurement: perform a heat treatment at 150±10°C for one hour and then let sit for 24±2 hours at room temp. Perform the initial measurement.   |
|    |                                   | Cap. Change             | NPO within ±2.5% or 0.25pF ( whichever is larger )  | X7R/X7S within ±7.5%   |   |
|    |                                   | Q/D.F.                  | If C ≤ 30pF, DF ≤ 1/(400+20C)<br>If C > 30pF, DF ≤ 0.1%   | To satisfy the specified initial spec.                               |   |
|    |                                   | I.R.                    | I.R. ≥ 10,000MΩ or R <sub>C</sub> R ≥ 500Ω-F. (whichever is smaller)  | I.R. ≥ 10,000MΩ or R <sub>C</sub> R ≥ 500Ω-F. (whichever is smaller) |   |
| 15 | Humidity load                     | Appearance              | No marking defects  |  | Apply the rated voltage (Max. 500V) at 40±2°C and 90 to 95% humidity for 500±12 hours. The charge / discharge current is less than 50mA.<br>[Temperature compensation type]<br>Remove and let sit for 24±2 hours at room temperature, then measure.<br>[High dielectric constant type]<br>*Initial measurement<br>Perform a heat treatment at 150+0/-10°C for one hour and then let sit for 24±2 hours at room temperature.<br>Perform the initial measurement.<br>*Measurement after test<br>Perform a heat treatment and then let sit for 24±2 hours at room temperature, then measure.   |
|    |                                   | Cap. Change             | NPO within ±7.5% or 0.75pF ( whichever is larger )  | X7R/X7S within ±12.5%  |   |
|    |                                   | Q/D.F.                  | If C > 30pF, DF ≤ 0.5%<br>If C ≤ 30pF, DF ≤ 1/(100+10xC/3)<br>C in pF   | X7R/X7S 200% max of initial spec.                                    |   |
|    |                                   | I.R.                    | I.R. ≥ 500MΩ or R <sub>C</sub> R ≥ 25Ω-F. (whichever is smaller)  | I.R. ≥ 500MΩ or R <sub>C</sub> R ≥ 25Ω-F. (whichever is smaller)     |   |
| 16 | High temperature load life test   | Appearance              | No marking defects  |  | Apply 200%(150% for ≥ 500V; 120% for ≥ 1000V) of the rated voltage for 1000±12 hours at the maximum operating temperature ± 3°C. The charge / discharge current is less than 50mA.<br>[Temperature compensation type]<br>Remove and let sit for 24±2 hours at room temperature, then measure.<br>[High dielectric constant type]<br>*Initial measurement<br>Perform a heat treatment at 150+0/-10°C for one hour and then let sit for 24±2 hours at room temperature.<br>Perform the initial measurement.<br>*Measurement after test<br>Perform a heat treatment and then let sit for 24±2 hours at room temperature, then measure. |
|    |                                   | Cap. Change             | NPO within ±7.5% or 0.75pF ( whichever is larger )  | X7R/X7S within ±12.5%  |   |
|    |                                   | Q/D.F.                  | If C > 30pF, DF ≤ 0.3%<br>If 10pF < C ≤ 30pF, DF ≤ 1/(275+5xC/2)<br>If C ≤ 10pF, DF ≤ 1/(200+10C),<br>C in pF | X7R/X7S 200% max of initial spec.                                    |   |
|    |                                   | I.R.                    | More than 1GΩ or R <sub>C</sub> R ≥ 50Ω-F (whichever is less.)  | More than 1GΩ or R <sub>C</sub> R ≥ 50Ω-F (whichever is less.)       |   |

● Middle-High Voltage (II)

|             | Item                                    | Specification   |  | Test Method   |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
|-------------|---|---|--|---|---|---|---|------|-----|-----|-----|------|-----|-----|-----|------|-----|-----|-----|------|-----|-----|------|------|-----|-----|-----|------|-----|-----|-----|------|-----|-----|-----|--|
|             |   | Temp. compensation type   | High dielectric constant type  |   |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 1           | Operation Temperature Range             | NP0: -55 to 125 °C  | X7R/X7S: -55 to 125 °C   | ---   |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 2           | Rated Voltage                           | Shown in the table of "Part Number & Characteristic"  |  | The rated voltage is defined as the maximum voltage, which may be applied continuously to the capacitor.  |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 3           | Appearance                              | No defects or abnormalities.  |  | Visual inspection   |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 4           | Dimensions                              | Within the specified dimension.   |  | Using calipers  |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 5           | Dielectric Strength                     | No defects or abnormalities.  |  | No failure shall be observed when 250% of the rated voltage (150% for 500V, 120% for above 1KV) is applied between the terminations for 1 to 5 seconds. The charge and discharge current is less than 50mA.   |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 6           | Insulation Resistance ( I.R.)           | C ≤ 0.047µF : More than 10000 MΩ<br>C > 0.047µF : More than 500Ω-F<br>C: Nominal Capacitance  |  | The insulation resistance shall be measured with a DC voltage not exceeding the rated voltage at 25°C and 75%RH max. and within 1 minute of charging.   |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 7           | Capacitance                             | Within the specified tolerance<br>* X7R/X7S at 1000 hours   |  | The capacitance / D.F. shall be measured at 25°C at the frequency and voltage shown in the table of "Part Number & Characteristic".   |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 8           | Q/Dissipation Factor ( D.F.)            | NP0:<br>If C ≤ 30pF, DF ≤ 1/(400+20C),<br>C in pF<br>If C > 30pF, DF ≤ 0.1%.  | Shown in the table of "Part Number & Characteristic"   |   |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 9           | Capacitance Temperature Characteristics | Capacitance change<br>NP0 within 0±30ppm/°C under operating temperature range.  | Capacitance change<br>X7R within ±15%<br>X7S within ±22%   | 1. Temperature compensation type:<br>The capacitance value at 25°C and 85°C shall be measured and calculated from the formula given below.<br>T.C. = (C <sub>85</sub> - C <sub>25</sub> ) / C <sub>25</sub> * ΔT * 10 <sup>6</sup> (PPM/°C)<br>2. High dielectric constant type:<br>The ranges of capacitance change compared with the 25°C value over the temperature ranges shall be within the specified ranges. |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 10          | Termination Strength                    | No removal of the terminations or marking defect.   |  | Apply a parallel force of 5N to a PCB mounted sample for 10±1sec.   |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 11          | Deflection (Bending Strength)           | No cracking or marking defects shall occur at 1mm deflection.<br>Capacitance change:<br>NP0: within ±5% or ± 0.5pF. (whichever is larger)<br>X7R, X5R, X7S :within ±12.5% |  | Solder the capacitor to the test jig (glass epoxy boards) shown in Fig.a using a SAC305(Sn96.5Ag3.0Cu0.5) solder (then let sit for 24±2 hours for X7R).<br>Then apply a force in the direction shown in Fig.b. The soldering shall be done with the reflow method and shall be conducted with care so that the soldering is uniform and free of defects such as heat shock.   |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
|             |   |   |  |   |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
|             |   |   | <table border="1"> <thead> <tr> <th>Size</th> <th>a</th> <th>b</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>0603</td> <td>0.3</td> <td>0.9</td> <td>0.3</td> </tr> <tr> <td>1005</td> <td>0.4</td> <td>1.5</td> <td>0.5</td> </tr> <tr> <td>1608</td> <td>1.0</td> <td>3.0</td> <td>1.2</td> </tr> <tr> <td>2012</td> <td>1.2</td> <td>4.0</td> <td>1.65</td> </tr> <tr> <td>3216</td> <td>2.2</td> <td>5.0</td> <td>2.0</td> </tr> <tr> <td>4520</td> <td>3.5</td> <td>7.0</td> <td>2.5</td> </tr> <tr> <td>4532</td> <td>3.5</td> <td>7.0</td> <td>3.7</td> </tr> </tbody> </table> | Size  | a | b | C | 0603 | 0.3 | 0.9 | 0.3 | 1005 | 0.4 | 1.5 | 0.5 | 1608 | 1.0 | 3.0 | 1.2 | 2012 | 1.2 | 4.0 | 1.65 | 3216 | 2.2 | 5.0 | 2.0 | 4520 | 3.5 | 7.0 | 2.5 | 4532 | 3.5 | 7.0 | 3.7 |  |
| Size        | a                                       | b   | C  |   |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 0603        | 0.3                                     | 0.9   | 0.3  |   |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 1005        | 0.4                                     | 1.5   | 0.5  |   |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 1608        | 1.0                                     | 3.0   | 1.2  |   |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 2012        | 1.2                                     | 4.0   | 1.65   |   |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 3216        | 2.2                                     | 5.0   | 2.0  |   |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 4520        | 3.5                                     | 7.0   | 2.5  |   |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 4532        | 3.5                                     | 7.0   | 3.7  |   |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 12          | Solderability of Termination            | 90% of the terminations are to be soldered evenly and continuously.   |  | Immerse the test capacitor into a methanol solution containing rosin for 3 to 5 seconds, preheat it 150 to 180°C for 2 to 3 minutes and immerse it into SAC305(Sn96.5Ag3.0Cu0.5) solder of 245 ± 5°C for 3±1seconds.  |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| 13          | Resistance to Soldering Heat            | Appearance  | No marking defects   | *Preheat the capacitor at 120 to 150°C for 1 minute.  |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| Cap. Change |   | NP0 within ±2.5% or 0.25pF ( whichever is larger )  | X7R/X7S within ±7.5%   | Immerse the capacitor in a SAC305(Sn96.5Ag3.0Cu0.5) solder solution at 270±5°C for 10±1 seconds. Let sit at room temperature for 24±2 hours, then measure.  |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| Q/D.F.      |   | If C ≤ 30pF, DF ≤ 1/(400+20C)<br>If C > 30pF, DF ≤ 0.1%   | To satisfy the specified initial spec.   | * Preheat 150 to 200°C for size ≥ 3216.   |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |
| I.R.        |   | I.R. ≥ 10,000MΩ or R <sub>C</sub> R <sub>R</sub> ≥ 500Ω-F.<br>(whichever is smaller)  | I.R. ≥ 10,000MΩ or R <sub>C</sub> R <sub>R</sub> ≥ 500Ω-F.<br>(whichever is smaller)   | *High dielectric constant type:<br>Initial measurement : perform a heat treatment at 150+0/-10°C for one hour and then let sit for 24±2 hours at room temperature. Perform the initial measurement.   |   |   |   |      |     |     |     |      |     |     |     |      |     |     |     |      |     |     |      |      |     |     |     |      |     |     |     |      |     |     |     |  |

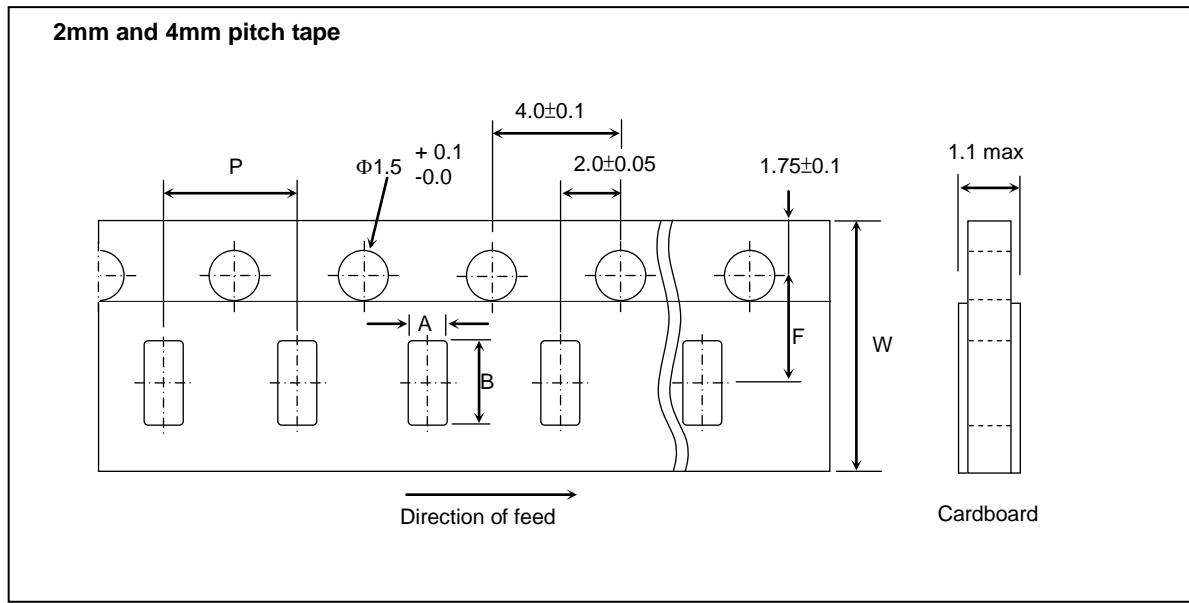
|    | Item                              | Specification           |   | Test Method  |   |
|----|-----------------------------------|-------------------------|---|--|---|
|    |                                   | Temp. compensation type | High dielectric constant type   |  |   |
| 14 | Temperature cycle (Thermal shock) | Appearance              | No marking defects  |  | Solder the capacitor to supporting jig (Glass epoxy board) and perform the five cycles according to the four heat treatments listed in the following table. Let sit for 24±2hrs at room temperature, then measure.<br>Step 1: Minimum operating temperature 30±3min<br>Step 2: Room temperature 2-3 min<br>Step 3: Maximum operating temperature 30±3min<br>Step 4: Room temperature 2-3min<br>*High dielectric constant type:<br>Initial measurement: perform a heat treatment at 150±10°C for one hour and then let sit for 24±2 hours at room temp. Perform the initial measurement.   |
|    |                                   | Cap. Change             | NPO within ±2.5% or 0.25pF ( whichever is larger )  | X7R/X7S within ±7.5%   |   |
|    |                                   | Q/D.F.                  | If C ≤ 30pF, DF ≤ 1/(400+20C)<br>If C > 30pF, DF ≤ 0.1%   | To satisfy the specified initial spec.                               |   |
|    |                                   | I.R.                    | I.R. ≥ 10,000MΩ or R <sub>C</sub> R ≥ 500Ω-F. (whichever is smaller)  | I.R. ≥ 10,000MΩ or R <sub>C</sub> R ≥ 500Ω-F. (whichever is smaller) |   |
| 15 | Humidity load                     | Appearance              | No marking defects  |  | Apply the rated voltage (Max. 500V) at 40±2°C and 90 to 95% humidity for 500±12 hours. The charge / discharge current is less than 50mA.<br>[Temperature compensation type]<br>Remove and let sit for 24±2 hours at room temperature, then measure.<br>[High dielectric constant type]<br>*Initial measurement<br>Perform a heat treatment at 150+0/-10°C for one hour and then let sit for 24±2 hours at room temperature.<br>Perform the initial measurement.<br>*Measurement after test<br>Perform a9 heat treatment and then let sit for 24±2 hours at room temperature, then measure.  |
|    |                                   | Cap. Change             | NPO within ±7.5% or 0.75pF ( whichever is larger )  | X7R/X7S within ±12.5%  |   |
|    |                                   | Q/D.F.                  | If C > 30pF, DF ≤ 0.5%<br>If C ≤ 30pF, DF ≤ 1/(100+10xC/3)<br>C in pF   | X7R/X7S 200% max of initial spec.                                    |   |
|    |                                   | I.R.                    | I.R. ≥ 500MΩ or R <sub>C</sub> R ≥ 25Ω-F. (whichever is smaller)  | I.R. ≥ 500MΩ or R <sub>C</sub> R ≥ 25Ω-F. (whichever is smaller)     |   |
| 16 | High temperature load life test   | Appearance              | No marking defects  |  | Apply 150%(120% for ≥250V; 100% for ≥1000V) of the rated voltage for 1000±12 hours at the maximum operating temperature ± 3°C. The charge / discharge current is less than 50mA.<br>[Temperature compensation type]<br>Remove and let sit for 24±2 hours at room temperature, then measure.<br>[High dielectric constant type]<br>*Initial measurement<br>Perform a heat treatment at 150+0/-10°C for one hour and then let sit for 24±2 hours at room temperature.<br>Perform the initial measurement.<br>*Measurement after test<br>Perform a heat treatment and then let sit for 24±2 hours at room temperature, then measure. |
|    |                                   | Cap. Change             | NPO within ±7.5% or 0.75pF ( whichever is larger )  | X7R/X7S within ±12.5%  |   |
|    |                                   | Q/D.F.                  | If C > 30pF, DF ≤ 0.3%<br>If 10pF < C ≤ 30pF, DF ≤ 1/(275+5xC/2)<br>If C ≤ 10pF, DF ≤ 1/(200+10C),<br>C in pF | X7R/X7S 200% max of initial spec.                                    |   |
|    |                                   | I.R.                    | More than 1GΩ or R <sub>C</sub> R ≥ 50Ω-F (whichever is less.)  | More than 1GΩ or R <sub>C</sub> R ≥ 50Ω-F (whichever is less.)       |   |

## Package

- Tape and reel packaging**

Tape and reel packaging is currently the most promising system for high-speed production. A typical 180mm (7 inch) diameter reel contains 1,500 to 15,000 capacitors, 250mm (10 inch) contains 10,000 capacitors, and 330mm (13 inch) contains 10,000 to 50,000 capacitors. Three standard sizes are available in taped and reeled package either with paper carrier tapes or embossed tapes.

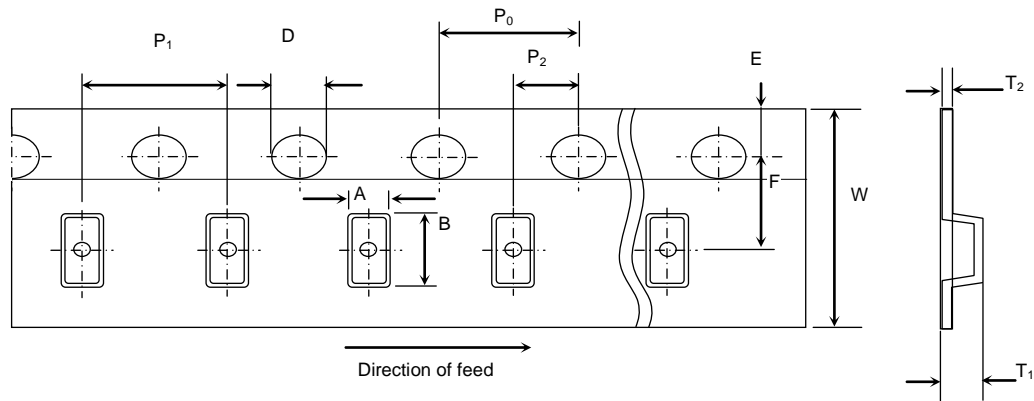
### 【Paper tape specifications】



| SYMBOL | PRODUCT SIZE CODE |        |             |        |              |       |              |       |              |       | UNIT |
|--------|-------------------|--------|-------------|--------|--------------|-------|--------------|-------|--------------|-------|------|
|        | C0603(0201)       |        | C1005(0402) |        | C1608 (0603) |       | C2012 (0805) |       | C3216 (1206) |       |      |
|        | SIZE              | TOL.   | SIZE        | TOL.   | SIZE         | TOL.  | SIZE         | TOL.  | SIZE         | TOL.  |      |
| A      | 0.38              | ± 0.04 | 0.65        | ± 0.10 | 1.0          | ±0.2  | 1.5          | ±0.2  | 1.9          | ±0.2  | mm   |
| B      | 0.68              | ± 0.04 | 1.15        | ± 0.10 | 1.8          | ±0.2  | 2.3          | ±0.2  | 3.6          | ±0.2  | mm   |
| F      | 3.5               | ± 0.05 | 3.5         | ± 0.05 | 3.5          | ±0.05 | 3.5          | ±0.05 | 3.5          | ±0.05 | mm   |
| P      | 2                 | ± 0.10 | 2           | ± 0.10 | 4            | ±0.1  | 4            | ±0.1  | 4            | ±0.1  | mm   |
| W      | 8                 | ± 0.20 | 8           | ± 0.20 | 8            | ±0.2  | 8            | ±0.2  | 8            | ±0.2  | mm   |

## 【 Embossed tape specifications 】

1mm and 4mm and 8mm pitch tape



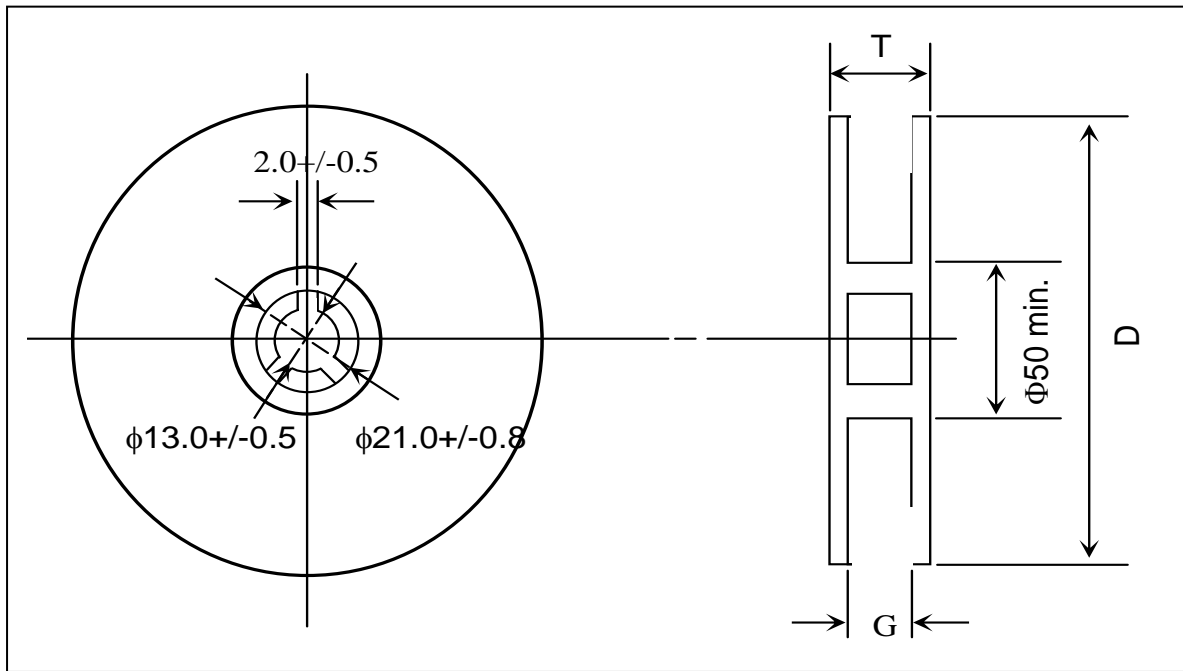
For  $W = 8\text{mm}$ :  $T_1 = 2.5\text{mm max.}$

For  $W = 12\text{mm}$ :  $T_1 = 4.5\text{mm}$

| DIMENSION<br>(mm) | PRODUCT SIZE CODE  |                    |                    |                    |                    |                    |
|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
|                   | 4 mm tape          |                    |                    |                    | 8 mm tape          |                    |
|                   | 1608<br>(0603)     | 2012<br>(0805)     | 3216<br>(1206)     | 3225<br>(1210)     | 4520<br>(1808)     | 4532<br>(1812)     |
| $P_1$             | $4 \pm 0.1$        | $4 \pm 0.1$        | $4 \pm 0.1$        | $4 \pm 0.1$        | $8 \pm 0.1$        | $8 \pm 0.1$        |
| $P_0$             | $4 \pm 0.1$        | $4 \pm 0.1$        | $4 \pm 0.1$        | $4 \pm 0.1$        | $4 \pm 0.1$        | $4 \pm 0.1$        |
| $P_2$             | $2 \pm 0.05$       | $2 \pm 0.05$       | $2 \pm 0.05$       | $2 \pm 0.05$       | $2 \pm 0.05$       | $2 \pm 0.05$       |
| $A$               | $1.2 \pm 0.2$      | $1.45 \pm 0.2$     | $1.9 \pm 0.2$      | $2.8 \pm 0.2$      | $2.3 \pm 0.2$      | $3.6 \pm 0.2$      |
| $B$               | $2.0 \pm 0.2$      | $2.3 \pm 0.2$      | $3.5 \pm 0.2$      | $3.6 \pm 0.2$      | $4.9 \pm 0.2$      | $4.9 \pm 0.2$      |
| $W$               | $8 \pm 0.3$        | $8 \pm 0.2$        | $8 \pm 0.2$        | $8 \pm 0.2$        | $12 \pm 0.2$       | $12 \pm 0.2$       |
| $E$               | $1.75 \pm 0.1$     | $1.75 \pm 0.1$     | $1.75 \pm 0.1$     | $1.75 \pm 0.1$     | $1.75 \pm 0.1$     | $1.75 \pm 0.1$     |
| $F$               | $3.5 \pm 0.05$     | $3.5 \pm 0.05$     | $3.5 \pm 0.05$     | $3.5 \pm 0.05$     | $5.5 \pm 0.05$     | $5.5 \pm 0.05$     |
| $D$               | 1.5<br>(+0.1/-0.0) | 1.5<br>(+0.1/-0.0) | 1.5<br>(+0.1/-0.0) | 1.5<br>(+0.1/-0.0) | 1.5<br>(+0.1/-0.0) | 1.5<br>(+0.1/-0.0) |
| $T_1$             | 1.4 max.           | 2.5 max.           | 2.5 max.           | 2.5 max.           | 4.5 max.           | 4.5 max.           |
| $T_2$             | $0.25 \pm 0.1$     | $0.305 \pm 0.1$    | $0.30 \pm 0.1$     | $0.30 \pm 0.1$     | $0.30 \pm 0.1$     | $0.30 \pm 0.1$     |



**【Reel specifications】**



| TAPE WIDTH<br>(mm) | G<br>(mm)      | T max.<br>(mm) | D<br>(mm) |
|--------------------|----------------|----------------|-----------|
| 4                  | $5.0 \pm 1.5$  | 8.0            | 180       |
| 8                  | $10.0 \pm 1.5$ | 14.5           | 180       |
| 8                  | $10.0 \pm 1.5$ | 14.5           | 250       |
| 8                  | $10.0 \pm 1.5$ | 14.5           | 330       |
| 12                 | $14.0 \pm 1.5$ | 18.5           | 180       |

**【Thickness and Packing Amount】**

| Thickness |           |              | Amount per reel |                   |              |          |
|-----------|-----------|--------------|-----------------|-------------------|--------------|----------|
|           |           |              | 180 mm (7")     |                   | 330 mm (13") |          |
| Code      | Spec.(mm) | Size (EIA)   | Paper           | Embossed          | Paper        | Embossed |
| Z         | 0.20      | 0402 (01005) | 20K             | 40K <sup>#1</sup> |              |          |
| A         | 0.30      | 0603 (0201)  | 15K             |                   | 50K          |          |
|           |           | 1005 (0402)  | 15K             |                   | 50K          |          |
| B         | 0.50      | 1005 (0402)  | 10K             |                   | 50K          |          |
| Q         | 0.45      | 1005 (0402)  | 10K             |                   | 50K          |          |
|           |           | 1608 (0603)  | 4K              |                   | 15K          |          |
| C         | 0.60      | 2012 (0805)  | 4K              |                   | 15K          |          |
|           |           | 3216 (1206)  | 4K              |                   | 15K          |          |
| D         | 0.80      | 1608 (0603)  | 4K              | 4K                | 15K          |          |
| E         | 0.85      | 2012 (0805)  | 4K              |                   | 15K          |          |
|           |           | 3216 (1206)  | 4K              |                   | 15K          |          |
|           |           | 3225 (1210)  |                 | 3K                |              | 10K      |
| I         | 0.95      | 4532 (1812)  |                 | 1K                |              |          |
|           |           | 2012 (0805)  |                 | 3K                |              |          |
| F         | 1.15      | 3216 (1206)  |                 | 3K                |              |          |
|           |           | 4520 (1808)  |                 | 3K                |              | 10K      |
| G         | 1.25      | 3216 (1206)  |                 | 3K                |              | 10K      |
|           |           | 2012 (0805)  |                 | 2K/3K             |              | 10K      |
|           |           | 3225 (1210)  |                 | 3K                |              | 10K      |
|           |           | 4520 (1808)  |                 | 3K                |              |          |
|           |           | 4532 (1812)  |                 | 2K/3K             |              |          |
|           |           | 3225 (1210)  |                 | 1K                |              |          |
| L         | 1.60      | 3216 (1206)  |                 | 3K                |              |          |
|           |           | 3225 (1210)  |                 | 2K                |              |          |
|           |           | 4520 (1808)  |                 | 2K                |              |          |
|           |           | 4532 (1812)  |                 | 1K                |              |          |
| N         | 2.00      | 3216 (1206)  |                 | 2K                |              |          |
|           |           | 3225 (1210)  |                 | 2K/3K             |              |          |
|           |           | 4520 (1808)  |                 | 2K                |              |          |
|           |           | 4532 (1812)  |                 | 1K                |              |          |
| P         | 2.50      | 3216 (1206)  |                 | 1K                |              |          |
|           |           | 3225 (1210)  |                 | 500pcs/1K         |              |          |
|           |           | 4532 (1812)  |                 | 500pcs            |              |          |

#1: 4mm width 1mm pitch Embossed Taping

**【Packing Rule】**

| EIA SIZE | Tape         | Reel Size | Reels/Box | Boxes/ Carton |
|----------|--------------|-----------|-----------|---------------|
| 01005    | Emboss       | 7"        | 8         | 12            |
| 01005    | Paper        | 7"        | 5         | 12            |
| 0201     | Paper        | 7"        | 5         | 12            |
| 0402     | Paper        | 7"        | 5         | 12            |
| 0603     | Paper/Emboss | 7"        | 5         | 12            |
| 0805     | Paper/Emboss | 7"        | 5         | 12            |
| 1206     | Paper/Emboss | 7"        | 5         | 12            |
| 1210     | Emboss       | 7"        | 5         | 12            |
| 1808     | Emboss       | 7"        | 5         | 12            |
| 1812     | Emboss       | 7"        | 5         | 12            |

## Others

### 【Storage】

1. The chip capacitors shall be packaged in carrier tapes or bulk cases.
2. Keep storage place temperatures from +5°C to +35°C, humidity from 45 to 70% RH.
3. The storage atmosphere must be free of gas containing sulfur and chlorine. Also, avoid exposing the product to saline moisture. If the product is exposed to such atmospheres, the terminations will oxidize and solderability will be affected.
4. The solderability is assured for 12 months from our final inspection date if the above storage condition is followed.

### 【Circuit Design】

1. Once application and assembly environments have been checked, the capacitor may be used in conformance with the rating and performance, which are provided in both the catalog and the specifications. Exceeding the specifications listed may result in inferior performance. It may also cause a short, open, smoking, or flaming to occur, etc.
2. Please use the capacitors in conformance with the operating temperature provided in both the catalog and the specifications. Be especially cautious not to exceed the maximum temperature. In the situation the maximum temperature set forth in both the catalog and specifications is exceeded, the capacitor's insulation resistance may deteriorate, power may suddenly surge and short-circuit may occur. The loss of capacitance will occur, and may self-heat due to equivalent series resistance when alternating electric current is passed through. As this effect becomes critical in high frequency circuits, please exercise with caution. When using the capacitor in a (self-heating) circuit, please make sure the surface of the capacitor remains under the maximum temperature for usage. Also, please make certain temperature rise remain below 20°C.
3. Please keep voltage under the rated voltage, which is applied to the capacitor. Also, please make certain the peak voltage remains below the rated voltage when AC voltage is super-imposed to the DC voltage. In the situation where AC or pulse voltage is employed, ensure average peak voltage does not exceed the rated voltage. Exceeding the rated voltage provided in both catalog and specifications may lead to defective withstanding voltage or, in worse case situations, may cause the capacitor to burn out.
4. It's is a common phenomenon of high-dielectric products to have a deteriorated amount of static electricity due to the application of DC voltage.

**【Handling】**

Chip capacitors should be handled with care to avoid contamination or damage. The use of vacuum pick-up or plastic tweezers is recommended for manual placement. Tape and reeled packages are suitable for automatic pick and placement machine.

**【Flux】**

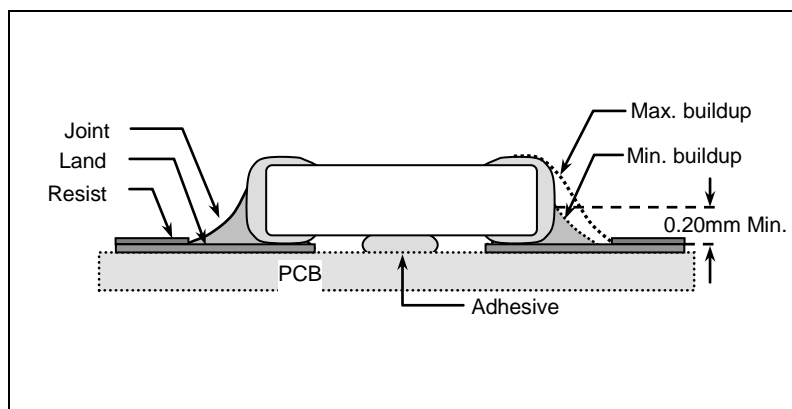
1. An excessive amount of flux or too rapid temperature rise can causes solvent burst, solder can generate a large quantity of gas. The gas can spreads small solder particles to cause solder balling effect or bridging problem.
2. Flux containing too high of a percentage of halide may cause corrosion of termination unless sufficient cleaning is applied.
3. Use rosin-type flux. Highly acidic flux (halide content less than 0.2wt%) is not recommended.
4. The water soluble flux causes deteriorated insulation resistance between outer terminations unless sufficiently cleaned.

**【Component Spacing】**

For wave soldering components, the spacing must be sufficient far apart to prevent bridging or shadowing. This is not so important for reflow process but enough space for rework should be considered. The suggested spacing for reflow soldering and wave soldering is 0.5mm and 1.0mm, respectively.

**【Solder Fillet】**

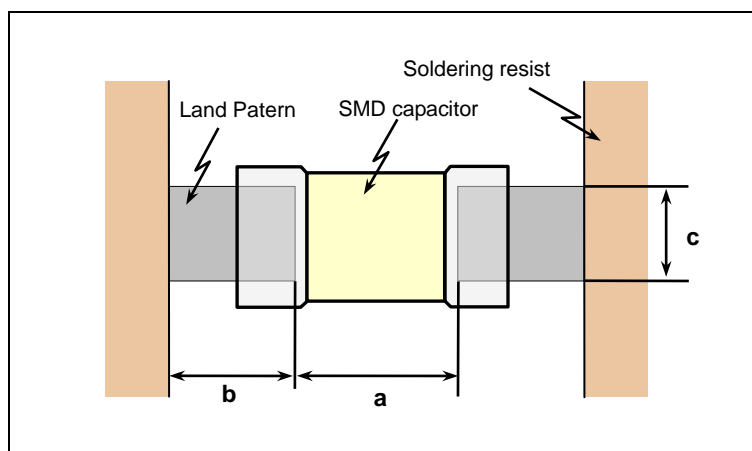
Too much solder amount may increase solder stress and cause crack risk. Insufficient solder amount may reduce adhesive Strength and cause parts falling off PCB. When soldering, confirm that the solder is placed over 0.2mm of the surface of the terminations.



## 【Recommended Land Pattern Dimensions】

When mounting the capacitor to substrate, it's important to consider that the amount of solder (size of fillet) used has a direct effect upon the capacitor once it's mounted.

1. The greater the amount of solder, the greater the stress to the elements, as this may cause the substrate to break or crack.
2. In the situation where two or more devices are mounted onto a common land, separate the device into exclusive pads by using soldering resist.
3. Land width equal to or less than component. It is permissible to reduce land width to 80% of component width.



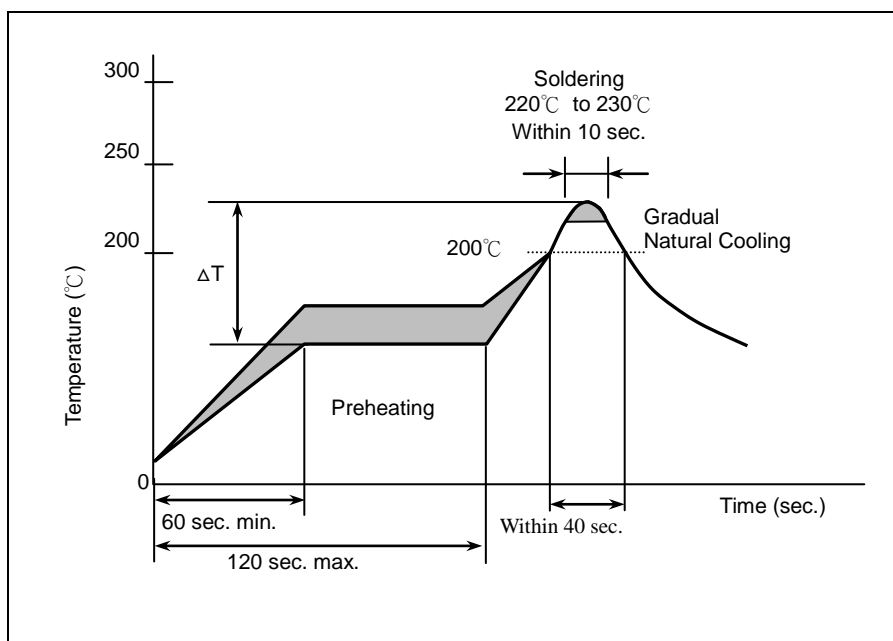
| Size mm (EIA) | L x W (mm)<br>(Dimension tolerance) | a (mm)       | b (mm)       | c (mm)       |
|---------------|-------------------------------------|--------------|--------------|--------------|
| 0402 (01005)  | 0.4*0.2                             | 0.16 to 0.20 | 0.12 to 0.18 | 0.20 to 0.23 |
| 0603 (0201)   | 0.6*0.3                             | 0.15 to 0.35 | 0.2 to 0.3   | 0.25 to 0.3  |
| 1005 (0402)   | 1.0*0.5<br>(within±0.10)            | 0.3 to 0.5   | 0.35 to 0.45 | 0.4 to 0.5   |
|               | 1.0*0.5<br>(±0.15 or ±0.20)         | 0.4 to 0.6   | 0.4 to 0.5   | 0.5 to 0.6   |
| 1608 (0603)   | 1.6*0.8<br>(within±0.10)            | 0.7 to 1.0   | 0.6 to 0.8   | 0.7 to 0.8   |
|               | 1.6*0.8<br>(±0.15 or ±0.20)         | 0.8 to 1.1   | 0.7 to 0.9   | 0.8 to 0.9   |
| 2012 (0805)   | 2.0*1.25                            | 1.0 to 1.3   | 0.7 to 0.9   | 1.0 to 1.2   |
| 3216 (1206)   | 3.2*1.6                             | 2.1 to 2.5   | 1.0 to 1.2   | 1.3 to 1.6   |
| 3225 (1210)   | 3.2*2.5                             | 2.1 to 2.5   | 1.0 to 1.2   | 2.0 to 2.5   |
| 4520 (1808)   | 4.5*2.0                             | 3.2 to 3.8   | 1.2 to 1.4   | 1.7 to 2.0   |
| 4532 (1812)   | 4.5*3.2                             | 3.2 to 3.8   | 1.2 to 1.4   | 2.7 to 3.2   |

## 【Resin Mold】

If a large amount of resin is used for molding the chip, cracks may occur due to contraction stress during curing. To avoid such cracks, use a low shrinkage resin. The insulation resistance of the chip will degrade due to moisture absorption. Use a low moisture absorption resin. Check carefully that the resin does not generate a decomposition gas or reaction gas during the curing process or during normal storage. Such gases may crack the chip capacitor or damage the device itself.

## 【Soldering Profile for SMT Process with SnPb Solder Paste】

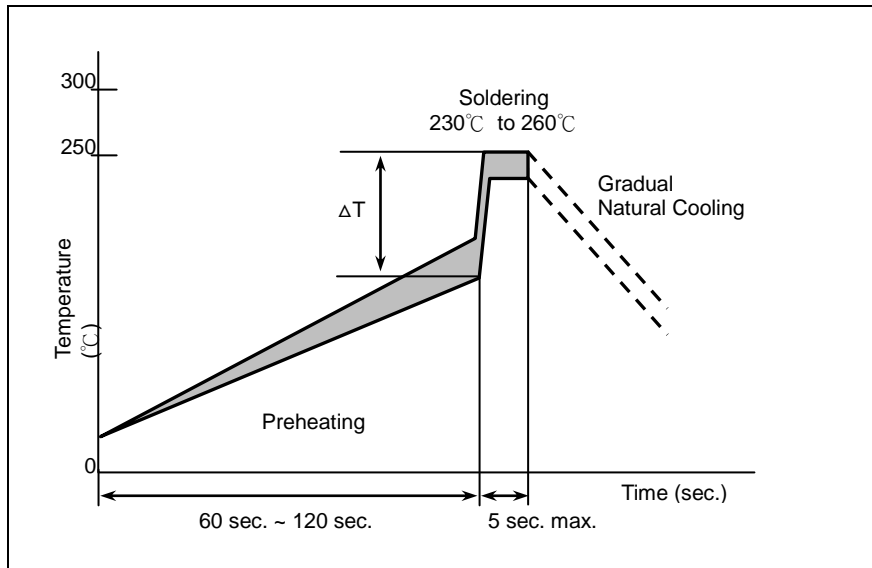
### Reflow Soldering



The difference between solder and chip surface should be controlled as following table. The rate of preheat should not exceed 4°C/sec and a target of 2°C/sec is preferred.

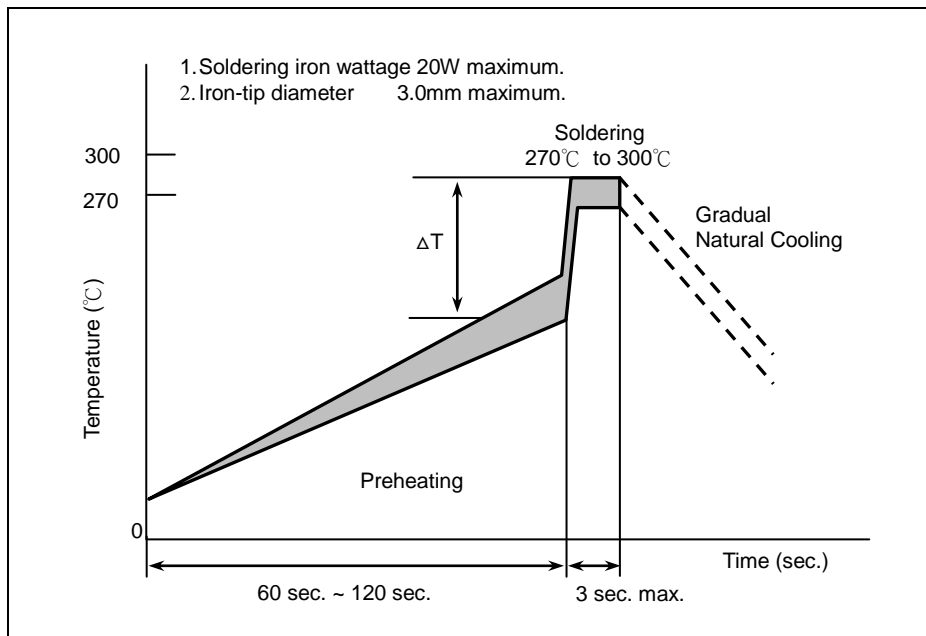
| Chip Size  | 3216 and smaller                  | 3225 and above                    |
|------------|-----------------------------------|-----------------------------------|
| Preheating | $\Delta T \leq 150^\circ\text{C}$ | $\Delta T \leq 130^\circ\text{C}$ |

**Wave Soldering**



| Chip Size  | 3216 and smaller                  | 3225 and above |
|------------|-----------------------------------|----------------|
| Preheating | $\Delta T \leq 150^\circ\text{C}$ | -              |

**Soldering Iron**

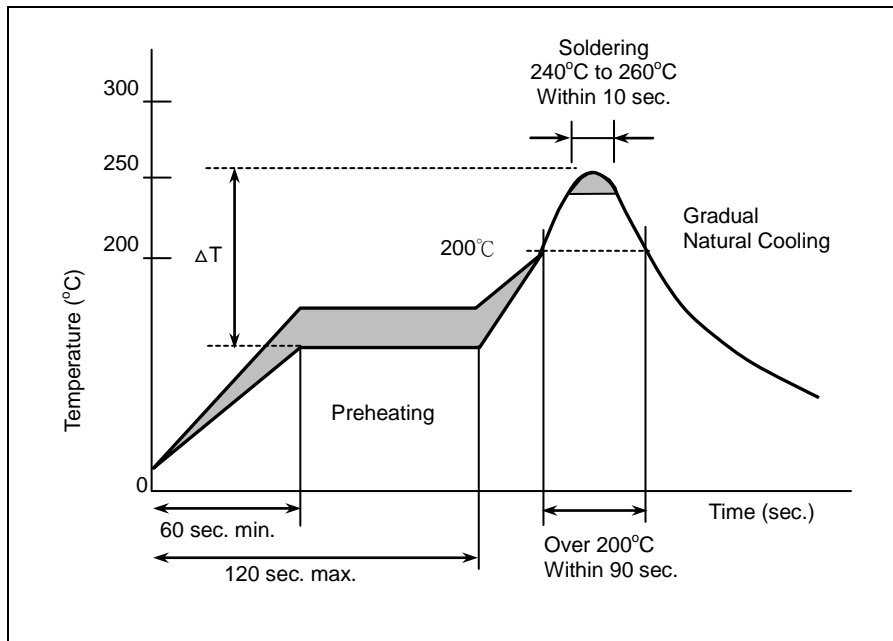


| Chip Size  | 3216 and smaller                  | 3225 and above                    |
|------------|-----------------------------------|-----------------------------------|
| Preheating | $\Delta T \leq 190^\circ\text{C}$ | $\Delta T \leq 130^\circ\text{C}$ |

MLCC

## 【Soldering】

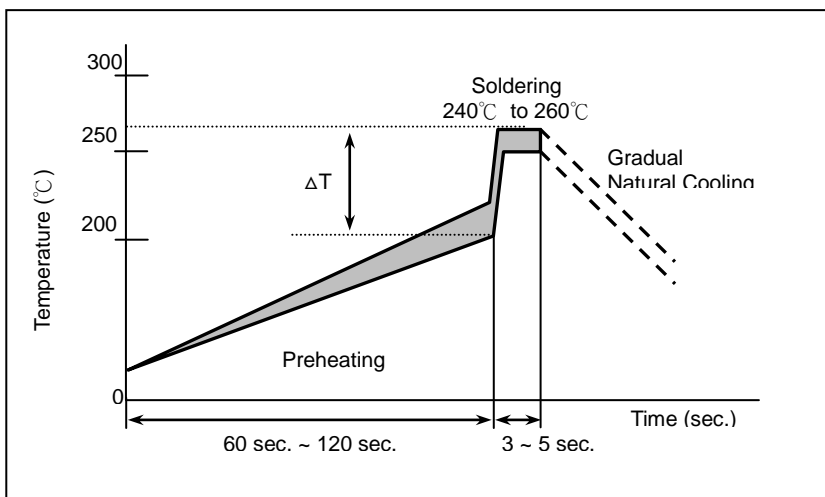
### Reflow Soldering for Lead free Termination



The difference between solder and chip surface should be controlled as following table. The rate of preheat should not exceed 4°C/sec and a target of 2°C/sec is preferred.

| Chip Size  | 3216 and smaller                  | 3225 and above                    |
|------------|-----------------------------------|-----------------------------------|
| Preheating | $\Delta T \leq 150^\circ\text{C}$ | $\Delta T \leq 130^\circ\text{C}$ |

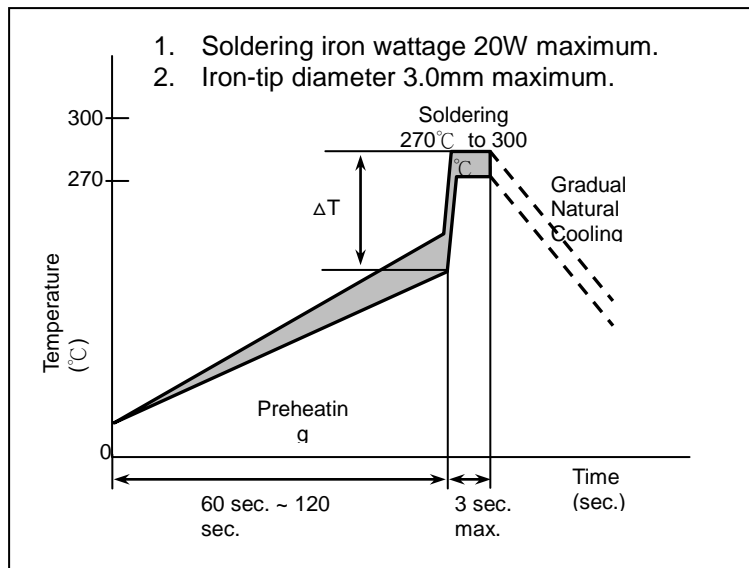
### Flow Soldering for Lead free Termination



| Chip Size  | 3216 and smaller                  | 3225 and above |
|------------|-----------------------------------|----------------|
| Preheating | $\Delta T \leq 150^\circ\text{C}$ | -              |



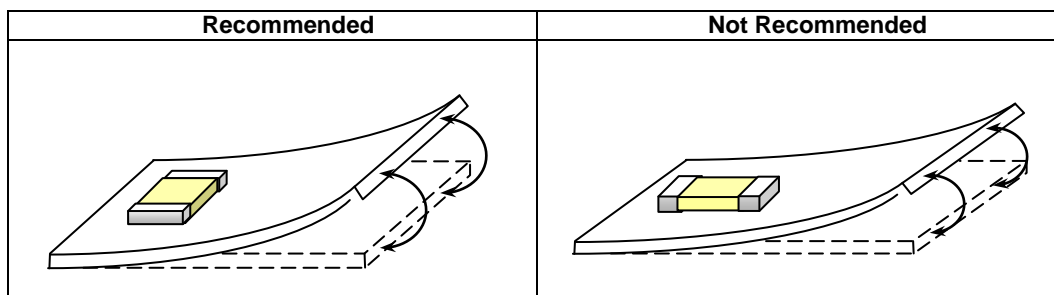
**Soldering Iron**



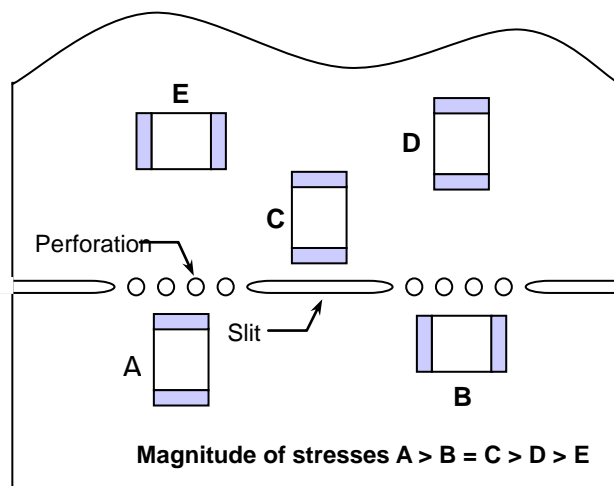
| Chip Size  | 3216 and smaller                  | 3225 and above                    |
|------------|-----------------------------------|-----------------------------------|
| Preheating | $\Delta T \leq 190^\circ\text{C}$ | $\Delta T \leq 130^\circ\text{C}$ |

**【Chip Layout and Breaking PCB】**

- To layout the SMD capacitors for reducing bend stress from board deflection of PCB. The following are examples of Hood and bad layout.

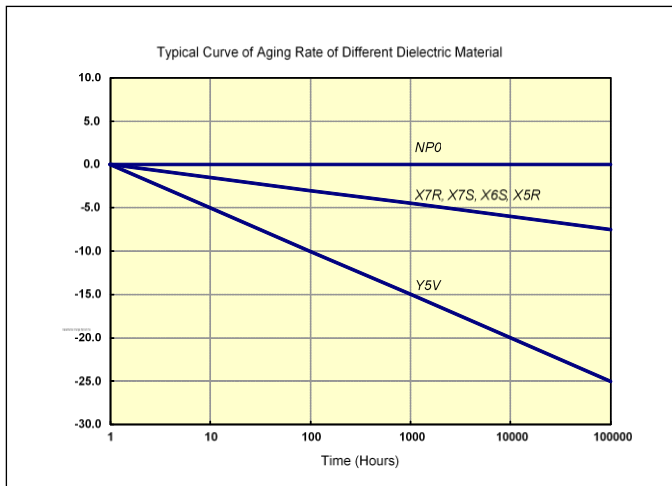


- When breaking PCB, the layout should be noted that the mechanical stresses are depending on the position of capacitors. The following example shows recommendation for better design.



## 【Aging Rate】

The capacitance and dissipation factor of class 2 capacitors decreases with time. It is known as 'aging' that follows a logarithmic law and expressed in terms of an aging constant. Aging is caused by a gradual re-alignment of the crystalline structure of the ceramic. The aging constant is defined as the percentage loss of capacitance at a 'time decade'. The law of capacitance aging is expressed as following equation:



$$C_{t2} = C_{t1} \times (1 - k \times \log_{10}(t_2/t_1))$$

$C_{t1}$ : Capacitance after  $t_1$  hours of start aging.

$C_{t2}$ : Capacitance after  $t_2$  hours of start aging.

$k$ : aging constant (capacitance decrease per decade)

$t_1, t_2$ : time in hours from start of aging.

A typical curve of aging rate is shown in following figure.

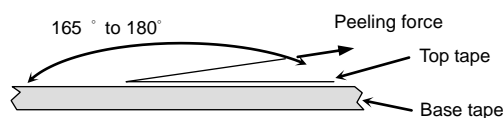
When heating the capacitors above Curie temperature ( $130^{\circ}\text{C} \sim 150^{\circ}\text{C}$ ) the capacitance can be re-new. So capacitance of class 2 capacitors will be complete de-aged by soldering process; subsequently a new aging process begins.

Because of aging, it is specified an age for measurement to meet the prescribed tolerance for class 2 capacitors. Normally, 1000 hours ( $t_2=1000$  hrs) is defined.

## 【Peeling Off Force】

Peeling off force:  $0.1\text{N}$  to  $1.0\text{N}^*$  in the direction shown as below.

The peeling speed:  $300 \pm 10$  mm/min



1. The taped tape on reel is wound clockwise. The sprocket holes are to the right as the tape is pulled toward the user.
2. There are minimum 150 mm as the leader and minimum 40 mm empty tape as the tail is attached to the end of the tape.