

# Radial Lead Type Monolithic Ceramic Capacitors



**muRata**

*Innovator  
in Electronics*

Murata  
Manufacturing Co., Ltd.

## ● Part Numbering

### Radial Lead Type Monolithic Ceramic Capacitors

(Part Number)

|    |   |    |    |     |   |   |    |     |   |
|----|---|----|----|-----|---|---|----|-----|---|
| RP | E | R7 | 1H | 104 | K | 2 | M1 | A03 | A |
| ①  | ② | ③  | ④  | ⑤   | ⑥ | ⑦ | ⑧  | ⑨   | ⑩ |

① Product ID

② Series/Terminal

| Product ID | Series/Terminal |                                                                                           |
|------------|-----------------|-------------------------------------------------------------------------------------------|
| RP         | E               | Radial Lead Type Monolithic Ceramic Capacitors (DC25V-DC100V)                             |
| RH         | E/D             | Radial Lead Type Monolithic Ceramic Capacitors 150°C max. (for Automotive) (DC50V-DC100V) |
| RD         | E               | Radial Lead Type Monolithic Ceramic Capacitors (For Commercial Use Only) (DC25V-DC630V)   |

③ Temperature Characteristics

| Code | Temperature Characteristics | Reference Temperature | Temperature Range | Capacitance Change or Temperature Coefficient | Operating Temperature Range |
|------|-----------------------------|-----------------------|-------------------|-----------------------------------------------|-----------------------------|
| 5C   | C0G*                        | 25°C                  | 25 to 125°C       | 0±30ppm/°C                                    | -55 to 125°C                |
| 5G   | X8G*                        | 25°C                  | 25 to 150°C       | 0±30ppm/°C                                    | -55 to 150°C                |
| C7   | X7S                         | 25°C                  | -55 to 125°C      | ±22%                                          | -55 to 125°C                |
| D7   | X7T                         | 25°C                  | -55 to 125°C      | +22, -33%                                     | -55 to 125°C                |
| F1   | F                           | 20°C                  | -25 to 85°C       | +30, -80%                                     | -25 to 85°C                 |
| F5   | Y5V                         | 25°C                  | -30 to 85°C       | +22, -82%                                     | -30 to 85°C                 |
| L8   | X8L                         | 25°C                  | -55 to 125°C      | ±15%                                          | -55 to 150°C                |
|      |                             |                       | 125 to 150°C      | +15, -40%                                     |                             |
| R7   | X7R                         | 25°C                  | -55 to 125°C      | ±15%                                          | -55 to 125°C                |

\* Please refer to table for Capacitance change under reference temperature.

• Capacitance change from each temperature

| Char. | Nominal Values (ppm/°C) *1 | Capacitance Change from 25°C (%) |       |       |       |       |       |
|-------|----------------------------|----------------------------------|-------|-------|-------|-------|-------|
|       |                            | -55°C                            |       | -30°C |       | -10°C |       |
|       |                            | Max.                             | Min.  | Max.  | Min.  | Max.  | Min.  |
| C0G   | 0±30                       | 0.58                             | -0.24 | 0.40  | -0.17 | 0.25  | -0.11 |
| X8G   |                            |                                  |       |       |       |       |       |

\*1: Nominal values denote the temperature coefficient within a range of 25 to 125°C.

④ Rated Voltage

| Code | Rated Voltage |
|------|---------------|
| 1E   | DC25V         |
| 1H   | DC50V         |
| 2A   | DC100V        |
| 2E   | DC250V        |
| 2W   | DC450V        |
| 2J   | DC630V        |

⑤ Capacitance

Expressed by three-digit alphanumerics. The unit is pico-farad (pF). The first and second figures are significant digits, and the third figure expresses the number of zeros that follow the two numbers.

If there is a decimal point, it is expressed by the capital letter "R."  
 In this case, all figures are significant digits.

⑥ Capacitance Tolerance

| Code | Capacitance Tolerance | Temperature Characteristics | Capacitance Step    |
|------|-----------------------|-----------------------------|---------------------|
| C    | ±0.25pF               | C0G                         | ≤5pF : 1pF Step     |
| D    | ±0.5pF                |                             | 6 to 9pF : 1pF Step |
| J    | ±5%                   | C0G/X8G                     | ≥10 : E12 Series    |
| K    | ±10%                  | X7S/X7T/X7R/<br>X8L         | E6 Series           |
| M    | ±20%                  | X7S/X7T/X7R/<br>X8L         | E3 Series           |
| Z    | +80%, -20%            | F/Y5V                       | E3 Series           |

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⑦ Dimensions (LxW)

| Code     | Dimensions (LxW)                                                  |
|----------|-------------------------------------------------------------------|
| <b>0</b> | 4.0×3.5mm or 5.0×3.5mm (Depends on Part Number List)              |
| <b>1</b> | 4.0×3.5mm or 4.5×3.5mm or 5.0×3.5mm (Depends on Part Number List) |
| <b>2</b> | 5.0×3.5mm or 5.5×4.0mm or 5.7×4.5mm (Depends on Part Number List) |
| <b>3</b> | 5.0×4.5mm or 5.5×5.0mm or 6.0×5.5mm (Depends on Part Number List) |
| <b>5</b> | 7.5×7.5mm*                                                        |
| <b>6</b> | 10.0×10.0mm                                                       |
| <b>7</b> | 12.5×12.5mm                                                       |
| <b>8</b> | 7.5×5.5mm                                                         |
| <b>U</b> | 7.7×12.5mm*                                                       |
| <b>W</b> | 5.5×7.5mm                                                         |

\* DC630V: W+0.5mm

⑨ Lead Style

| Code         | Lead Style           | Lead Spacing |
|--------------|----------------------|--------------|
| <b>A2</b>    | Straight Long        | 2.5mm        |
| <b>B1</b>    | Straight Long        | 5.0mm        |
| <b>C1</b>    | Straight Long        | 10.0mm       |
| <b>DB</b>    | Straight Taping      | 2.5mm        |
| <b>E1/E2</b> | Straight Taping      | 5.0mm        |
| <b>K1</b>    | Inside Crimp         | 5.0mm        |
| <b>M1/M2</b> | Inside Crimp Taping  | 5.0mm        |
| <b>P1</b>    | Outside Crimp        | 2.5mm        |
| <b>S1/S2</b> | Outside Crimp Taping | 2.5mm        |

Lead distance between reference and bottom planes.

M1, S1: H<sub>0</sub> = 16.0±0.5mm

M2, S2: H<sub>0</sub> = 20.0±0.5mm

E1: H = 17.5±0.5mm

E2: H = 20.0±0.5mm

⑩ Individual Specification Code

Expressed by three-digit alphanumerics

⑩ Packaging

| Code     | Packaging |
|----------|-----------|
| <b>A</b> | Ammo Pack |
| <b>B</b> | Bulk      |

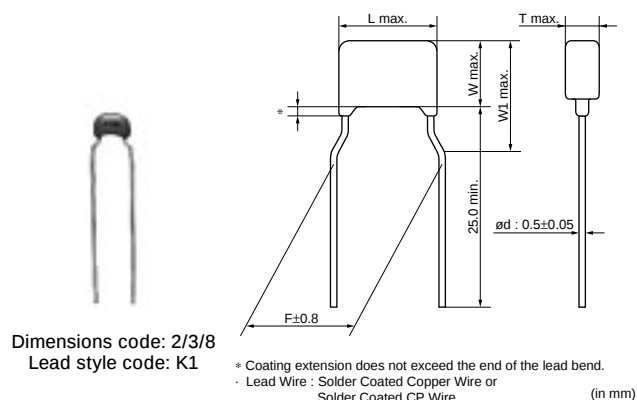
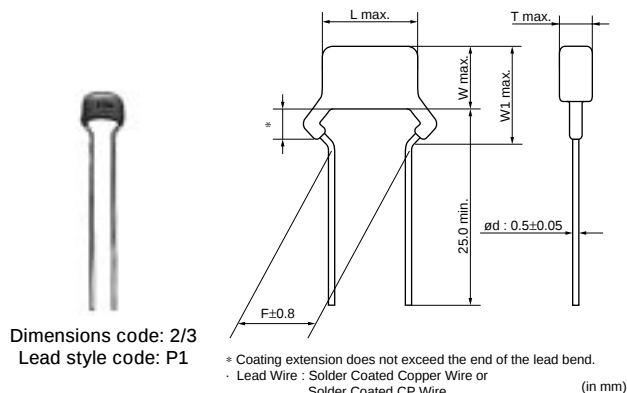
# Radial Lead Type Monolithic Ceramic Capacitors



## RPE Series (DC25V-DC100V)

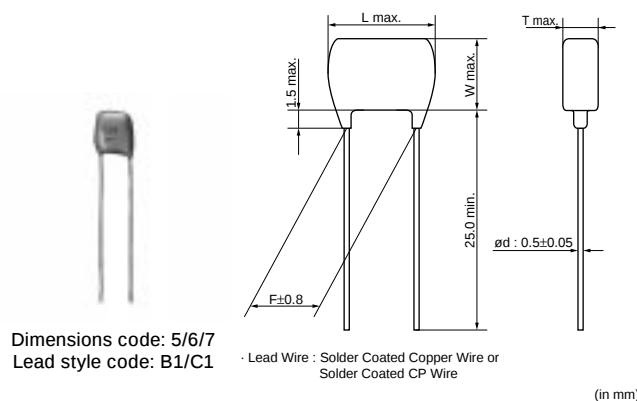
### ■ Features

1. The RPE series capacitors have small dimensions, large capacitance, and a capacity volume ratio of 10 micro F/cm cubed, close to that of electrolytic capacitors. They do not have polarity.
2. Excellent frequency characteristics and due to their small internal inductance are suitable for high frequencies.
3. Not coated with wax so there is no change in their exterior appearance due to the outflow of wax during soldering or solvent during cleansing.
4. They are highly nonflammable, having characteristics equivalent to the UL94V-0 standard.



### ■ Dimensions

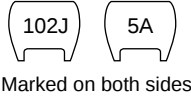
| Dimensions and Lead Style Code | Dimensions (mm) |      |     |                                           |      |     |
|--------------------------------|-----------------|------|-----|-------------------------------------------|------|-----|
|                                | L               | W    | W1  | T                                         | F    | d   |
| 2P1/2S1/2S2                    | 5.0             | 3.5  | 5.0 | See the individual product specifications | 2.5  | 0.5 |
| 2K1/2M1/2M2                    | 5.0             | 3.5  | 5.0 |                                           | 5.0  | 0.5 |
| 3P1/3S1/3S2                    | 5.0             | 4.5  | 6.3 |                                           | 2.5  | 0.5 |
| 3K1/3M1/3M2                    | 5.0             | 4.5  | 6.3 |                                           | 5.0  | 0.5 |
| 5B1/5E1/5E2                    | 7.5             | 7.5  | -   |                                           | 5.0  | 0.5 |
| 6B1/6E1/6E2                    | 10.0            | 10.0 | -   |                                           | 5.0  | 0.5 |
| 7C1                            | 12.5            | 12.5 | -   |                                           | 10.0 | 0.5 |
| 8K1/8M1/8M2                    | 7.5             | 5.5  | 8.0 |                                           | 5.0  | 0.5 |



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## ■ Marking

| Dimensions<br>Code            | Type                                                               | Temperature Compensating Type                                                                                                                               | High Dielectric Constant Type                                                      |                                                                                     |
|-------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                               | Temp. Char.                                                        | C0G                                                                                                                                                         | X7R                                                                                | Y5V                                                                                 |
| 2                             | Individual<br>Specification<br>Code<br>A□□<br>B□□<br>Z□□           | <br>Marked on both sides                                                   |   |  |
|                               | Individual<br>Specification<br>Code<br>Except<br>A□□<br>B□□<br>Z□□ |                                                                            |   |  |
| 3, 8                          |                                                                    | —                                                                                                                                                           |  | —                                                                                   |
| 5, 6, 7                       |                                                                    | —                                                                                                                                                           |   | —                                                                                   |
| Temperature Characteristics   |                                                                    | Marked with code (C0G char.: A, X7R char.: C, Y5V char.: F)<br>A part is omitted (Please refer to the marking example.)                                     |                                                                                    |                                                                                     |
| Nominal Capacitance           |                                                                    | Under 100pF: Actual value    100pF and over: marked with 3 figures                                                                                          |                                                                                    |                                                                                     |
| Capacitance Tolerance         |                                                                    | Marked with code                                                                                                                                            |                                                                                    |                                                                                     |
| Rated Voltage                 |                                                                    | Marked with code (DC25V: 2, DC50V: 5, DC100V: 1)<br>A part is omitted (Please refer to the marking example.)                                                |                                                                                    |                                                                                     |
| Manufacturer's Identification |                                                                    | Marked with <br>A part is omitted (Please refer to the marking example.) |                                                                                    |                                                                                     |

## Temperature Compensating Type, C0G Characteristics

| Part Number        | Temp. Char. | Rated Voltage (Vdc) | Capacitance (pF) | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping (1) | Lead Style Code Taping (2) |
|--------------------|-------------|---------------------|------------------|---------------------|------------------|-------------------|----------------------|----------------------------|----------------------------|
| RPE5C1H1R0C2□□B03□ | C0G         | 50                  | 1.0 ±0.25pF      | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H1R0C2□□B03□ | C0G         | 50                  | 1.0 ±0.25pF      | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H2R0C2□□B03□ | C0G         | 50                  | 2.0 ±0.25pF      | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H2R0C2□□B03□ | C0G         | 50                  | 2.0 ±0.25pF      | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H3R0C2□□B03□ | C0G         | 50                  | 3.0 ±0.25pF      | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H3R0C2□□B03□ | C0G         | 50                  | 3.0 ±0.25pF      | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H4R0C2□□B03□ | C0G         | 50                  | 4.0 ±0.25pF      | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H4R0C2□□B03□ | C0G         | 50                  | 4.0 ±0.25pF      | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H5R0C2□□B03□ | C0G         | 50                  | 5.0 ±0.25pF      | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H5R0C2□□B03□ | C0G         | 50                  | 5.0 ±0.25pF      | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H6R0D2□□B03□ | C0G         | 50                  | 6.0 ±0.5pF       | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H6R0D2□□B03□ | C0G         | 50                  | 6.0 ±0.5pF       | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H7R0D2□□Z03□ | C0G         | 50                  | 7.0 ±0.5pF       | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H7R0D2□□Z03□ | C0G         | 50                  | 7.0 ±0.5pF       | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H8R0D2□□Z03□ | C0G         | 50                  | 8.0 ±0.5pF       | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H8R0D2□□Z03□ | C0G         | 50                  | 8.0 ±0.5pF       | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H9R0D2□□Z03□ | C0G         | 50                  | 9.0 ±0.5pF       | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H9R0D2□□Z03□ | C0G         | 50                  | 9.0 ±0.5pF       | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H100J2□□Z03□ | C0G         | 50                  | 10 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H100J2□□Z03□ | C0G         | 50                  | 10 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H120J2□□Z03□ | C0G         | 50                  | 12 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H120J2□□Z03□ | C0G         | 50                  | 12 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H150J2□□Z03□ | C0G         | 50                  | 15 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H150J2□□Z03□ | C0G         | 50                  | 15 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H180J2□□Z03□ | C0G         | 50                  | 18 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H180J2□□Z03□ | C0G         | 50                  | 18 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H220J2□□Z03□ | C0G         | 50                  | 22 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H220J2□□Z03□ | C0G         | 50                  | 22 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H270J2□□Z03□ | C0G         | 50                  | 27 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H270J2□□Z03□ | C0G         | 50                  | 27 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H330J2□□Z03□ | C0G         | 50                  | 33 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H330J2□□Z03□ | C0G         | 50                  | 33 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H390J2□□Z03□ | C0G         | 50                  | 39 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H390J2□□Z03□ | C0G         | 50                  | 39 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H470J2□□Z03□ | C0G         | 50                  | 47 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H470J2□□Z03□ | C0G         | 50                  | 47 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H560J2□□Z03□ | C0G         | 50                  | 56 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H560J2□□Z03□ | C0G         | 50                  | 56 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H680J2□□Z03□ | C0G         | 50                  | 68 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H680J2□□Z03□ | C0G         | 50                  | 68 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H820J2□□Z03□ | C0G         | 50                  | 82 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H820J2□□Z03□ | C0G         | 50                  | 82 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H101J2□□A03□ | C0G         | 50                  | 100 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H101J2□□A03□ | C0G         | 50                  | 100 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H121J2□□A03□ | C0G         | 50                  | 120 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H121J2□□A03□ | C0G         | 50                  | 120 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H151J2□□A03□ | C0G         | 50                  | 150 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H151J2□□A03□ | C0G         | 50                  | 150 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H181J2□□A03□ | C0G         | 50                  | 180 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H181J2□□A03□ | C0G         | 50                  | 180 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H221J2□□A03□ | C0G         | 50                  | 220 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H221J2□□A03□ | C0G         | 50                  | 220 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H271J2□□A03□ | C0G         | 50                  | 270 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H271J2□□A03□ | C0G         | 50                  | 270 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |

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| Part Number        | Temp. Char. | Rated Voltage (Vdc) | Capacitance (pF) | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping (1) | Lead Style Code Taping (2) |
|--------------------|-------------|---------------------|------------------|---------------------|------------------|-------------------|----------------------|----------------------------|----------------------------|
| RPE5C1H331J2□□A03□ | C0G         | 50                  | 330 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H331J2□□A03□ | C0G         | 50                  | 330 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H391J2□□A03□ | C0G         | 50                  | 390 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H391J2□□A03□ | C0G         | 50                  | 390 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H471J2□□A03□ | C0G         | 50                  | 470 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H471J2□□A03□ | C0G         | 50                  | 470 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H561J2□□A03□ | C0G         | 50                  | 560 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H561J2□□A03□ | C0G         | 50                  | 560 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H681J2□□A03□ | C0G         | 50                  | 680 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H681J2□□A03□ | C0G         | 50                  | 680 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H821J2□□A03□ | C0G         | 50                  | 820 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H821J2□□A03□ | C0G         | 50                  | 820 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H102J2□□A03□ | C0G         | 50                  | 1000 ±5%         | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H102J2□□A03□ | C0G         | 50                  | 1000 ±5%         | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H122J2□□A03□ | C0G         | 50                  | 1200 ±5%         | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H122J2□□A03□ | C0G         | 50                  | 1200 ±5%         | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H152J2□□A03□ | C0G         | 50                  | 1500 ±5%         | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H152J2□□A03□ | C0G         | 50                  | 1500 ±5%         | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H182J2□□C03□ | C0G         | 50                  | 1800 ±5%         | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H182J2□□A03□ | C0G         | 50                  | 1800 ±5%         | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H222J2□□C03□ | C0G         | 50                  | 2200 ±5%         | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H222J2□□A03□ | C0G         | 50                  | 2200 ±5%         | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H272J2□□C03□ | C0G         | 50                  | 2700 ±5%         | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H272J2□□A03□ | C0G         | 50                  | 2700 ±5%         | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H332J2□□C03□ | C0G         | 50                  | 3300 ±5%         | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H332J2□□A03□ | C0G         | 50                  | 3300 ±5%         | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H392J2□□C03□ | C0G         | 50                  | 3900 ±5%         | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H392J2□□A03□ | C0G         | 50                  | 3900 ±5%         | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H472J2□□C03□ | C0G         | 50                  | 4700 ±5%         | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H472J2□□A03□ | C0G         | 50                  | 4700 ±5%         | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H562J2□□C03□ | C0G         | 50                  | 5600 ±5%         | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPE5C1H562J2□□A03□ | C0G         | 50                  | 5600 ±5%         | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H682J2□□C03□ | C0G         | 50                  | 6800 ±5%         | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H822J2□□C03□ | C0G         | 50                  | 8200 ±5%         | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPE5C1H103J2□□C03□ | C0G         | 50                  | 10000 ±5%        | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A1R0C2□□B03□ | C0G         | 100                 | 1.0 ±0.25pF      | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A1R0C2□□B03□ | C0G         | 100                 | 1.0 ±0.25pF      | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A2R0C2□□B03□ | C0G         | 100                 | 2.0 ±0.25pF      | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A2R0C2□□B03□ | C0G         | 100                 | 2.0 ±0.25pF      | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A3R0C2□□B03□ | C0G         | 100                 | 3.0 ±0.25pF      | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A3R0C2□□B03□ | C0G         | 100                 | 3.0 ±0.25pF      | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A4R0C2□□B03□ | C0G         | 100                 | 4.0 ±0.25pF      | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A4R0C2□□B03□ | C0G         | 100                 | 4.0 ±0.25pF      | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A5R0C2□□B03□ | C0G         | 100                 | 5.0 ±0.25pF      | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A5R0C2□□B03□ | C0G         | 100                 | 5.0 ±0.25pF      | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A6R0D2□□B03□ | C0G         | 100                 | 6.0 ±0.5pF       | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A6R0D2□□B03□ | C0G         | 100                 | 6.0 ±0.5pF       | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A7R0D2□□Z03□ | C0G         | 100                 | 7.0 ±0.5pF       | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A7R0D2□□Z03□ | C0G         | 100                 | 7.0 ±0.5pF       | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A8R0D2□□Z03□ | C0G         | 100                 | 8.0 ±0.5pF       | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A8R0D2□□Z03□ | C0G         | 100                 | 8.0 ±0.5pF       | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A9R0D2□□Z03□ | C0G         | 100                 | 9.0 ±0.5pF       | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A9R0D2□□Z03□ | C0G         | 100                 | 9.0 ±0.5pF       | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A100J2□□Z03□ | C0G         | 100                 | 10 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A100J2□□Z03□ | C0G         | 100                 | 10 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A120J2□□Z03□ | C0G         | 100                 | 12 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A120J2□□Z03□ | C0G         | 100                 | 12 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |

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| Part Number        | Temp. Char. | Rated Voltage (Vdc) | Capacitance (pF) | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping (1) | Lead Style Code Taping (2) |
|--------------------|-------------|---------------------|------------------|---------------------|------------------|-------------------|----------------------|----------------------------|----------------------------|
| RPE5C2A150J2□□Z03□ | C0G         | 100                 | 15 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A150J2□□Z03□ | C0G         | 100                 | 15 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A180J2□□Z03□ | C0G         | 100                 | 18 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A180J2□□Z03□ | C0G         | 100                 | 18 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A220J2□□Z03□ | C0G         | 100                 | 22 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A220J2□□Z03□ | C0G         | 100                 | 22 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A270J2□□Z03□ | C0G         | 100                 | 27 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A270J2□□Z03□ | C0G         | 100                 | 27 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A330J2□□Z03□ | C0G         | 100                 | 33 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A330J2□□Z03□ | C0G         | 100                 | 33 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A390J2□□Z03□ | C0G         | 100                 | 39 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A390J2□□Z03□ | C0G         | 100                 | 39 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A470J2□□Z03□ | C0G         | 100                 | 47 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A470J2□□Z03□ | C0G         | 100                 | 47 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A560J2□□Z03□ | C0G         | 100                 | 56 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A560J2□□Z03□ | C0G         | 100                 | 56 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A680J2□□Z03□ | C0G         | 100                 | 68 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A680J2□□Z03□ | C0G         | 100                 | 68 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A820J2□□Z03□ | C0G         | 100                 | 82 ±5%           | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A820J2□□Z03□ | C0G         | 100                 | 82 ±5%           | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A101J2□□A03□ | C0G         | 100                 | 100 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A101J2□□A03□ | C0G         | 100                 | 100 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A121J2□□A03□ | C0G         | 100                 | 120 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A121J2□□A03□ | C0G         | 100                 | 120 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A151J2□□A03□ | C0G         | 100                 | 150 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A151J2□□A03□ | C0G         | 100                 | 150 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A181J2□□A03□ | C0G         | 100                 | 180 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A181J2□□A03□ | C0G         | 100                 | 180 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A221J2□□A03□ | C0G         | 100                 | 220 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A221J2□□A03□ | C0G         | 100                 | 220 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A271J2□□A03□ | C0G         | 100                 | 270 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A271J2□□A03□ | C0G         | 100                 | 270 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A331J2□□A03□ | C0G         | 100                 | 330 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A331J2□□A03□ | C0G         | 100                 | 330 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A391J2□□A03□ | C0G         | 100                 | 390 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A391J2□□A03□ | C0G         | 100                 | 390 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A471J2□□A03□ | C0G         | 100                 | 470 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A471J2□□A03□ | C0G         | 100                 | 470 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A561J2□□A03□ | C0G         | 100                 | 560 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A561J2□□A03□ | C0G         | 100                 | 560 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A681J2□□A03□ | C0G         | 100                 | 680 ±5%          | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A681J2□□A03□ | C0G         | 100                 | 680 ±5%          | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A821J2□□A03□ | C0G         | 100                 | 820 ±5%          | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A821J2□□A03□ | C0G         | 100                 | 820 ±5%          | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A102J2□□A03□ | C0G         | 100                 | 1000 ±5%         | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A102J2□□A03□ | C0G         | 100                 | 1000 ±5%         | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A122J2□□A03□ | C0G         | 100                 | 1200 ±5%         | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A122J2□□A03□ | C0G         | 100                 | 1200 ±5%         | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPE5C2A152J2□□A03□ | C0G         | 100                 | 1500 ±5%         | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPE5C2A152J2□□A03□ | C0G         | 100                 | 1500 ±5%         | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |

Two blank columns are filled with the lead style code. Please refer to the 3 columns on the right for the appropriate code.  
The last blank column is filled with the packaging code. (B: bulk, A: ammo pack)

## High Dielectric Constant Type, X7R Characteristics

| Part Number        | Temp. Char. | Rated Voltage (Vdc) | Capacitance  | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping (1) | Lead Style Code Taping (2) |
|--------------------|-------------|---------------------|--------------|---------------------|------------------|-------------------|----------------------|----------------------------|----------------------------|
| RPER71E474K2□□A03□ | X7R         | 25                  | 0.47μF ±10%  | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPER71E684K2□□C03□ | X7R         | 25                  | 0.68μF ±10%  | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPER71E105K2□□C03□ | X7R         | 25                  | 1.0μF ±10%   | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPER71E155K3□□C07□ | X7R         | 25                  | 1.5μF ±10%   | 5.0 x 4.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPER71E225K3□□C07□ | X7R         | 25                  | 2.2μF ±10%   | 5.0 x 4.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPER71H221K2□□A03□ | X7R         | 50                  | 220pF ±10%   | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER71H221K2□□A03□ | X7R         | 50                  | 220pF ±10%   | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER71H331K2□□A03□ | X7R         | 50                  | 330pF ±10%   | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER71H331K2□□A03□ | X7R         | 50                  | 330pF ±10%   | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER71H471K2□□A03□ | X7R         | 50                  | 470pF ±10%   | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER71H471K2□□A03□ | X7R         | 50                  | 470pF ±10%   | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER71H681K2□□A03□ | X7R         | 50                  | 680pF ±10%   | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER71H681K2□□A03□ | X7R         | 50                  | 680pF ±10%   | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER71H102K2□□A03□ | X7R         | 50                  | 1000pF ±10%  | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER71H102K2□□A03□ | X7R         | 50                  | 1000pF ±10%  | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER71H152K2□□A03□ | X7R         | 50                  | 1500pF ±10%  | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER71H152K2□□A03□ | X7R         | 50                  | 1500pF ±10%  | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER71H222K2□□A03□ | X7R         | 50                  | 2200pF ±10%  | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER71H222K2□□A03□ | X7R         | 50                  | 2200pF ±10%  | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER71H332K2□□A03□ | X7R         | 50                  | 3300pF ±10%  | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER71H332K2□□A03□ | X7R         | 50                  | 3300pF ±10%  | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER71H472K2□□A03□ | X7R         | 50                  | 4700pF ±10%  | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER71H472K2□□A03□ | X7R         | 50                  | 4700pF ±10%  | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER71H682K2□□A03□ | X7R         | 50                  | 6800pF ±10%  | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER71H682K2□□A03□ | X7R         | 50                  | 6800pF ±10%  | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER71H103K2□□A03□ | X7R         | 50                  | 10000pF ±10% | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER71H103K2□□A03□ | X7R         | 50                  | 10000pF ±10% | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER71H153K2□□A03□ | X7R         | 50                  | 15000pF ±10% | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER71H153K2□□A03□ | X7R         | 50                  | 15000pF ±10% | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER71H223K2□□A03□ | X7R         | 50                  | 22000pF ±10% | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER71H223K2□□A03□ | X7R         | 50                  | 22000pF ±10% | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER71H333K2□□A03□ | X7R         | 50                  | 33000pF ±10% | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPER71H333K2□□A03□ | X7R         | 50                  | 33000pF ±10% | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPER71H473K2□□A03□ | X7R         | 50                  | 47000pF ±10% | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPER71H473K2□□A03□ | X7R         | 50                  | 47000pF ±10% | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPER71H683K2□□A03□ | X7R         | 50                  | 68000pF ±10% | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPER71H683K2□□A03□ | X7R         | 50                  | 68000pF ±10% | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPER71H104K2□□A03□ | X7R         | 50                  | 0.10μF ±10%  | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPER71H104K2□□A03□ | X7R         | 50                  | 0.10μF ±10%  | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPER71H154K2□□C03□ | X7R         | 50                  | 0.15μF ±10%  | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPER71H154K2□□C03□ | X7R         | 50                  | 0.15μF ±10%  | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPER71H224K2□□C03□ | X7R         | 50                  | 0.22μF ±10%  | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPER71H224K2□□C03□ | X7R         | 50                  | 0.22μF ±10%  | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPER71H334K2□□C03□ | X7R         | 50                  | 0.33μF ±10%  | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER71H334K2□□C03□ | X7R         | 50                  | 0.33μF ±10%  | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER71H474K2□□C03□ | X7R         | 50                  | 0.47μF ±10%  | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPER71H474K2□□C03□ | X7R         | 50                  | 0.47μF ±10%  | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPER71H684K3□□C03□ | X7R         | 50                  | 0.68μF ±10%  | 5.0 x 4.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPER71H684K3□□C03□ | X7R         | 50                  | 0.68μF ±10%  | 5.0 x 4.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPER71H105K3□□C07□ | X7R         | 50                  | 1.0μF ±10%   | 5.0 x 4.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPER71H105K3□□C07□ | X7R         | 50                  | 1.0μF ±10%   | 5.0 x 4.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPER71H155K8□□C03□ | X7R         | 50                  | 1.5μF ±10%   | 7.5 x 5.5           | 4.0              | 5.0               | K1                   | M1                         | M2                         |
| RPER71H225K8□□C03□ | X7R         | 50                  | 2.2μF ±10%   | 7.5 x 5.5           | 4.0              | 5.0               | K1                   | M1                         | M2                         |
| RPER71H335K5□□C03□ | X7R         | 50                  | 3.3μF ±10%   | 7.5 x 7.5           | 5.0              | 5.0               | B1                   | E1                         | E2                         |

Continued on the following page. 

Continued from the preceding page.

| Part Number        | Temp. Char. | Rated Voltage (Vdc) | Capacitance  | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping (1) | Lead Style Code Taping (2) |
|--------------------|-------------|---------------------|--------------|---------------------|------------------|-------------------|----------------------|----------------------------|----------------------------|
| RPER71H475K5□□C03□ | X7R         | 50                  | 4.7μF ±10%   | 7.5 x 7.5           | 4.0              | 5.0               | B1                   | E1                         | E2                         |
| RPER72A221K2□□B03□ | X7R         | 100                 | 220pF ±10%   | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER72A221K2□□B03□ | X7R         | 100                 | 220pF ±10%   | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER72A331K2□□B03□ | X7R         | 100                 | 330pF ±10%   | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER72A331K2□□B03□ | X7R         | 100                 | 330pF ±10%   | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER72A471K2□□B03□ | X7R         | 100                 | 470pF ±10%   | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER72A471K2□□B03□ | X7R         | 100                 | 470pF ±10%   | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER72A681K2□□B03□ | X7R         | 100                 | 680pF ±10%   | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER72A681K2□□B03□ | X7R         | 100                 | 680pF ±10%   | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER72A102K2□□A03□ | X7R         | 100                 | 1000pF ±10%  | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER72A102K2□□A03□ | X7R         | 100                 | 1000pF ±10%  | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER72A152K2□□A03□ | X7R         | 100                 | 1500pF ±10%  | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER72A152K2□□A03□ | X7R         | 100                 | 1500pF ±10%  | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER72A222K2□□A03□ | X7R         | 100                 | 2200pF ±10%  | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER72A222K2□□A03□ | X7R         | 100                 | 2200pF ±10%  | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER72A332K2□□A03□ | X7R         | 100                 | 3300pF ±10%  | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER72A332K2□□A03□ | X7R         | 100                 | 3300pF ±10%  | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER72A472K2□□A03□ | X7R         | 100                 | 4700pF ±10%  | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER72A472K2□□A03□ | X7R         | 100                 | 4700pF ±10%  | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER72A682K2□□A03□ | X7R         | 100                 | 6800pF ±10%  | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPER72A682K2□□A03□ | X7R         | 100                 | 6800pF ±10%  | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPER72A103K2□□A03□ | X7R         | 100                 | 10000pF ±10% | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPER72A103K2□□A03□ | X7R         | 100                 | 10000pF ±10% | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPER72A153K2□□A03□ | X7R         | 100                 | 15000pF ±10% | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPER72A153K2□□A03□ | X7R         | 100                 | 15000pF ±10% | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPER72A223K2□□A03□ | X7R         | 100                 | 22000pF ±10% | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPER72A223K2□□A03□ | X7R         | 100                 | 22000pF ±10% | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPER72A333K2□□C03□ | X7R         | 100                 | 33000pF ±10% | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPER72A333K2□□C03□ | X7R         | 100                 | 33000pF ±10% | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPER72A473K2□□C03□ | X7R         | 100                 | 47000pF ±10% | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPER72A473K2□□C03□ | X7R         | 100                 | 47000pF ±10% | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPER72A683K3□□C07□ | X7R         | 100                 | 68000pF ±10% | 5.0 x 4.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPER72A683K3□□C07□ | X7R         | 100                 | 68000pF ±10% | 5.0 x 4.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPER72A104K3□□C07□ | X7R         | 100                 | 0.10μF ±10%  | 5.0 x 4.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPER72A104K3□□C07□ | X7R         | 100                 | 0.10μF ±10%  | 5.0 x 4.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPER72A154K8□□C03□ | X7R         | 100                 | 0.15μF ±10%  | 7.5 x 5.5           | 4.0              | 5.0               | K1                   | M1                         | M2                         |
| RPER72A224K8□□C03□ | X7R         | 100                 | 0.22μF ±10%  | 7.5 x 5.5           | 4.0              | 5.0               | K1                   | M1                         | M2                         |
| RPER72A334K5□□C03□ | X7R         | 100                 | 0.33μF ±10%  | 7.5 x 7.5           | 4.0              | 5.0               | B1                   | E1                         | E2                         |
| RPER72A474K8□□C03□ | X7R         | 100                 | 0.47μF ±10%  | 7.5 x 5.5           | 4.0              | 5.0               | K1                   | M1                         | M2                         |
| RPER72A684K6□□F14□ | X7R         | 100                 | 0.68μF ±10%  | 10.0 x 10.0         | 4.0              | 5.0               | B1                   | E1                         | E2                         |
| RPER72A105K5□□C03□ | X7R         | 100                 | 1.0μF ±10%   | 7.5 x 7.5           | 4.0              | 5.0               | B1                   | E1                         | E2                         |
| RPER72A155K7□□F03□ | X7R         | 100                 | 1.5μF ±10%   | 12.5 x 12.5         | 5.0              | 10.0              | C1                   | -                          | -                          |
| RPER72A225K7□□F03□ | X7R         | 100                 | 2.2μF ±10%   | 12.5 x 12.5         | 5.0              | 10.0              | C1                   | -                          | -                          |

Two blank columns are filled with the lead style code. Please refer to the 3 columns on the right for the appropriate code.  
 The last blank column is filled with the packaging code. (B: bulk, A: ammo pack)

## High Dielectric Constant Type, Y5V Characteristics

| Part Number        | Temp. Char. | Rated Voltage (Vdc) | Capacitance     | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping (1) | Lead Style Code Taping (2) |
|--------------------|-------------|---------------------|-----------------|---------------------|------------------|-------------------|----------------------|----------------------------|----------------------------|
| RPEF51H102Z2□□A03□ | Y5V         | 50                  | 1000pF +80/-20% | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPEF51H102Z2□□A03□ | Y5V         | 50                  | 1000pF +80/-20% | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPEF51H222Z2□□A03□ | Y5V         | 50                  | 2200pF +80/-20% | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPEF51H222Z2□□A03□ | Y5V         | 50                  | 2200pF +80/-20% | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPEF51H472Z2□□A03□ | Y5V         | 50                  | 4700pF +80/-20% | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPEF51H472Z2□□A03□ | Y5V         | 50                  | 4700pF +80/-20% | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |

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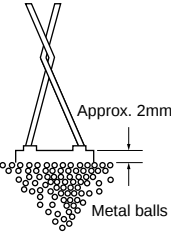
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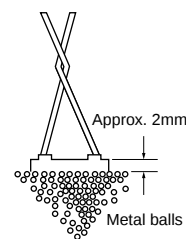
| Part Number        | Temp. Char. | Rated Voltage (Vdc) | Capacitance      | Dimensions LxW (mm) | Dimension T (mm) | Lead Space F (mm) | Lead Style Code Bulk | Lead Style Code Taping (1) | Lead Style Code Taping (2) |
|--------------------|-------------|---------------------|------------------|---------------------|------------------|-------------------|----------------------|----------------------------|----------------------------|
| RPEF51H103Z2□□A03□ | Y5V         | 50                  | 10000pF +80/-20% | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPEF51H103Z2□□A03□ | Y5V         | 50                  | 10000pF +80/-20% | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPEF51H223Z2□□A03□ | Y5V         | 50                  | 22000pF +80/-20% | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPEF51H223Z2□□A03□ | Y5V         | 50                  | 22000pF +80/-20% | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPEF51H473Z2□□A03□ | Y5V         | 50                  | 47000pF +80/-20% | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPEF51H473Z2□□A03□ | Y5V         | 50                  | 47000pF +80/-20% | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPEF51H104Z2□□A03□ | Y5V         | 50                  | 0.10μF +80/-20%  | 5.0 x 3.5           | 2.5              | 2.5               | P1                   | S1                         | S2                         |
| RPEF51H104Z2□□A03□ | Y5V         | 50                  | 0.10μF +80/-20%  | 5.0 x 3.5           | 2.5              | 5.0               | K1                   | M1                         | M2                         |
| RPEF51H224Z2□□A03□ | Y5V         | 50                  | 0.22μF +80/-20%  | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPEF51H224Z2□□A03□ | Y5V         | 50                  | 0.22μF +80/-20%  | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |
| RPEF51H474Z2□□C03□ | Y5V         | 50                  | 0.47μF +80/-20%  | 5.0 x 3.5           | 3.15             | 2.5               | P1                   | S1                         | S2                         |
| RPEF51H474Z2□□C03□ | Y5V         | 50                  | 0.47μF +80/-20%  | 5.0 x 3.5           | 3.15             | 5.0               | K1                   | M1                         | M2                         |

Two blank columns are filled with the lead style code. Please refer to the 3 columns on the right for the appropriate code.

The last blank column is filled with the packaging code. (B: bulk, A: ammo pack)

## Specifications and Test Methods

| No.                     | Item                                                            |                         | Specifications                                                                                                                               |                                                         | Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                  |                  |                  |            |                |                |         |                      |                         |             |   |            |
|-------------------------|-----------------------------------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------|------------------|------------|----------------|----------------|---------|----------------------|-------------------------|-------------|---|------------|
|                         |                                                                 |                         | Temperature Compensating Type                                                                                                                | High Dielectric Constant Type                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                  |                  |            |                |                |         |                      |                         |             |   |            |
| 1                       | Operating Temperature Range                                     |                         | -55 to +125°C                                                                                                                                | Char. X7R : -55 to +125°C<br>Char. Y5V : -30 to +85°C   | —                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                  |            |                |                |         |                      |                         |             |   |            |
| 2                       | Rated Voltage                                                   |                         | See previous pages                                                                                                                           |                                                         | The rated voltage is defined as the maximum voltage that may be applied continuously to the capacitor. When AC voltage is superimposed on DC voltage, $V_{P-P}$ or $V_{O-P}$ , whichever is larger, should be maintained within the rated voltage range.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |                  |                  |            |                |                |         |                      |                         |             |   |            |
| 3                       | Appearance                                                      |                         | No defects or abnormalities                                                                                                                  |                                                         | Visual inspection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                  |            |                |                |         |                      |                         |             |   |            |
| 4                       | Dimension and Marking                                           |                         | See previous pages                                                                                                                           |                                                         | Visual inspection, Vernier Caliper                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                  |                  |                  |            |                |                |         |                      |                         |             |   |            |
| 5                       | Dielectric Strength                                             | Between Terminals       | No defects or abnormalities                                                                                                                  |                                                         | The capacitors should not be damaged when DC voltages of 300%* of the rated voltage are applied between the terminals for 1 to 5 sec. (Charge/Discharge current $\leq 50\text{mA}$ )<br>*250% for char. X7R, Y5V<br><br>The capacitor is placed in a container with metal balls of 1mm diameter so that each terminal, short-circuited, is kept approximately 2mm from the balls as shown in the figure, and 250% of the rated DC voltage is impressed for 1 to 5 sec. between capacitor terminals and metal balls. (Charge/Discharge current $\leq 50\text{mA}$ )<br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                  |                  |                  |            |                |                |         |                      |                         |             |   |            |
|                         |                                                                 | Body Insulation         | No defects or abnormalities                                                                                                                  |                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                  |                  |            |                |                |         |                      |                         |             |   |            |
| 6                       | Insulation Resistance                                           | Between Terminals       | C $\leq 0.047\mu\text{F}$ : 10,000M $\Omega$ min.<br>C > 0.047 $\mu\text{F}$ : 500M $\Omega$ • $\mu\text{F}$ min.<br>C : Nominal capacitance |                                                         | The insulation resistance should be measured with a DC voltage not exceeding the rated voltage at normal temperature and humidity and within 2 min. of charging (Charge/Discharge current $\leq 50\text{mA}$ )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |                  |                  |            |                |                |         |                      |                         |             |   |            |
| 7                       | Capacitance                                                     |                         | Within the specified tolerance                                                                                                               |                                                         | The capacitance, Q/D.F. should be measured at 25°C at the frequency and voltage shown in the table.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                  |                  |                  |            |                |                |         |                      |                         |             |   |            |
| 8                       | Q/Dissipation Factor (D.F.)                                     |                         | 30pF min. : Q $\geq 1,000$<br>30pF max. : Q $\geq 400+20C$<br>C : Nominal capacitance (pF)                                                   | Char. X7R : 0.025 max.<br>Char. Y5V : 0.05 max.         | <table><tr><th>Capacitance Item</th><th>1000pF and below</th><th>more than 1000pF</th></tr><tr><td>Frequency</td><td>1<math>\pm</math>0.1MHz</td><td>1<math>\pm</math>0.1kHz</td></tr><tr><td>Voltage</td><td>AC0.5 to 5V (r.m.s.)</td><td>AC1<math>\pm</math>0.2V (r.m.s.)</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Capacitance Item | 1000pF and below | more than 1000pF | Frequency  | 1 $\pm$ 0.1MHz | 1 $\pm$ 0.1kHz | Voltage | AC0.5 to 5V (r.m.s.) | AC1 $\pm$ 0.2V (r.m.s.) |             |   |            |
| Capacitance Item        | 1000pF and below                                                | more than 1000pF        |                                                                                                                                              |                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                  |                  |            |                |                |         |                      |                         |             |   |            |
| Frequency               | 1 $\pm$ 0.1MHz                                                  | 1 $\pm$ 0.1kHz          |                                                                                                                                              |                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                  |                  |            |                |                |         |                      |                         |             |   |            |
| Voltage                 | AC0.5 to 5V (r.m.s.)                                            | AC1 $\pm$ 0.2V (r.m.s.) |                                                                                                                                              |                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                  |                  |            |                |                |         |                      |                         |             |   |            |
| 9                       | Capacitance Temperature Characteristics                         | Capacitance Change      | Within the specified tolerance (Table A on last column)                                                                                      | Within the specified tolerance (Table B on last column) | The capacitance change should be measured after 5 min. at each specified temperature stage.<br>(1) Temperature Compensating Type<br>The temperature coefficient is determined using the capacitance measured in step 3 as a reference. When cycling the temperature sequentially from step 1 through 5 (-55 to +125°C) the capacitance should be within the specified tolerance for the temperature coefficient and capacitance change as shown in Table A. The capacitance drift is calculated by dividing the differences between the maximum and minimum measured values in step 1, 3 and 5 by the cap. value in step 3.<br><table><tr><th>Step</th><th>Temperature (°C)</th></tr><tr><td>1</td><td>25<math>\pm</math>2</td></tr><tr><td>2</td><td>-55<math>\pm</math>3</td></tr><tr><td>3</td><td>25<math>\pm</math>2</td></tr><tr><td>4</td><td>125<math>\pm</math>3</td></tr><tr><td>5</td><td>25<math>\pm</math>2</td></tr></table><br>(2) High Dielectric Constant Type<br>The ranges of capacitance change compared with the 25°C value over the temperature ranges as shown in Table B should be within the specified ranges. | Step             | Temperature (°C) | 1                | 25 $\pm$ 2 | 2              | -55 $\pm$ 3    | 3       | 25 $\pm$ 2           | 4                       | 125 $\pm$ 3 | 5 | 25 $\pm$ 2 |
|                         |                                                                 | Step                    | Temperature (°C)                                                                                                                             |                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                  |                  |            |                |                |         |                      |                         |             |   |            |
|                         |                                                                 | 1                       | 25 $\pm$ 2                                                                                                                                   |                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                  |                  |            |                |                |         |                      |                         |             |   |            |
| 2                       | -55 $\pm$ 3                                                     |                         |                                                                                                                                              |                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                  |                  |            |                |                |         |                      |                         |             |   |            |
| 3                       | 25 $\pm$ 2                                                      |                         |                                                                                                                                              |                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                  |                  |            |                |                |         |                      |                         |             |   |            |
| 4                       | 125 $\pm$ 3                                                     |                         |                                                                                                                                              |                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                  |                  |            |                |                |         |                      |                         |             |   |            |
| 5                       | 25 $\pm$ 2                                                      |                         |                                                                                                                                              |                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                  |                  |            |                |                |         |                      |                         |             |   |            |
| Temperature Coefficient | Within the specified tolerance (Table A on last column)         |                         |                                                                                                                                              |                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                  |                  |            |                |                |         |                      |                         |             |   |            |
| Capacitance Drift       | Within $\pm 0.2\%$ or $\pm 0.05\text{pF}$ , whichever is larger |                         |                                                                                                                                              |                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |                  |                  |            |                |                |         |                      |                         |             |   |            |

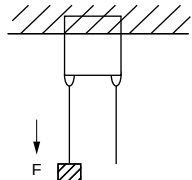


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## Specifications and Test Methods

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| No. | Item                            |                                         | Specifications                                                                                                      |                                                      | Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----|---------------------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                 |                                         | Temperature Compensating Type                                                                                       | High Dielectric Constant Type                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 10  | Terminal Strength               | Tensile Strength                        | Termination not to be broken or loosened                                                                            |                                                      | As in the figure, fix the capacitor body, apply the force gradually to each lead in the radial direction of the capacitor until reaching 10N and then keep the force applied for 10±1 sec.<br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|     |                                 | Bending Strength                        | Termination not to be broken or loosened                                                                            |                                                      | Each lead wire should be subjected to a force of 2.5N and then bent 90° at the point of egress in one direction. Each wire is then returned to the original position and bent 90° in the opposite direction at the rate of one bend per 2 to 3 sec.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 11  | Vibration Resistance            | Appearance                              | No defects or abnormalities                                                                                         |                                                      | The capacitor is soldered securely to a supporting terminal and a 10 to 55Hz vibration of 1.5mm peak-peak amplitude is applied for 6 hrs. total, 2 hrs. in each mutually perpendicular direction. Allow 1 min. to cycle the frequency from 10Hz to 55Hz and the converse.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|     |                                 | Capacitance                             | Within the specified tolerance                                                                                      |                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|     |                                 | Q/D.F.                                  | 30pF min. : Q ≥ 1,000<br>30pF max. : Q ≥ 400+20C<br>C : Nominal capacitance (pF)                                    | Char. X7R : 0.025 max.<br>Char. Y5V : 0.05 max.      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 12  | Solderability of Leads          |                                         | Lead wire should be soldered with uniform coating on the axial direction over 3/4 of the circumferential direction. |                                                      | The terminal of a capacitor is dipped into a 25% ethanol (JIS-K-8101) solution of rosin (JIS-K-5902) and then into molten solder for 2±0.5 sec. In both cases the depth of dipping is up to about 1.5mm to 2mm from the terminal body.<br>Temp. of solder: 245±5°C Lead Free Solder (Sn-3.0Ag-0.5Cu)<br>235±5°C H60A or H63A Eutectic Solder                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 13  | Resistance to Soldering Heat    | Appearance                              | No defects or abnormalities                                                                                         |                                                      | The lead wire is immersed in the melted solder 1.5mm to 2mm from the main body at 350±10°C for 3.5±0.5 sec. The specified items are measured after 24±2 hrs. (temperature compensating type) or 48±4 hrs. (high dielectric type).<br><br>• Initial measurement for high dielectric constant type<br><br>The capacitors are heat treated for 1 hr. at 150 <sup>+10</sup> <sub>-10</sub> °C, allowed to set at room temperature for 48±4 hrs., and given an initial measurement.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|     |                                 | Capacitance Change                      | Within ±2.5% or ±0.25pF (whichever is larger)                                                                       | Char. X7R : Within ±7.5%<br>Char. Y5V : Within ±20%  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|     |                                 | Dielectric Strength (Between Terminals) | No defects                                                                                                          |                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 14  | Temperature and Immersion Cycle | Appearance                              | No defects or abnormalities                                                                                         |                                                      | First, repeat the following temperature/time cycle 5 times:<br>» lowest operating temperature ±3°C/30±3 min.<br>» ordinary temperature/3 min. max.<br>» highest operating temperature ±3°C/30±3 min.<br>» ordinary temperature/3 min. max.<br>Next, repeat twice the successive cycles of immersion, each cycle consisting of immersion in a fresh water at 65 <sup>+5</sup> <sub>-8</sub> °C for 15 min. and immersion in a saturated aqueous solution of salt at 0±3°C for 15 min.<br>The capacitor is then promptly washed in running water, dried with a drying cloth, and allowed to sit at room temperature for 24±2 hrs. (temperature compensating type) or 48±4 hrs. (high dielectric type).<br><br>• Initial measurement for high dielectric constant type<br><br>The capacitors are heat treated for 1 hr. at 150 <sup>+10</sup> <sub>-10</sub> °C, allowed to sit at room temperature for 48 ±4 hrs., and given an initial measurement. |
|     |                                 | Capacitance Change                      | Within ±5% or ±0.5pF (whichever is larger)                                                                          | Char. X7R : Within ±12.5%<br>Char. Y5V : Within ±30% |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|     |                                 | Q/D.F.                                  | 30pF min. : Q ≥ 350<br>10pF to 30pF : Q ≥ 275+5C/2<br>10pF max. : Q ≥ 200+10C<br>C : Nominal capacitance (pF)       | Char. X7R : 0.05 max.<br>Char. Y5V : 0.075 max.      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|     |                                 | Insulation Resistance                   | 1,000MΩ or 50MΩ • μF min. (whichever is smaller)                                                                    |                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|     |                                 | Dielectric Strength (Between Terminals) | No defects or abnormalities                                                                                         |                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

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## Specifications and Test Methods

Continued from the preceding page.

| No. | Item                    | Specifications                |                                                                                                                                                                                     | Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----|-------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                         | Temperature Compensating Type | High Dielectric Constant Type                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 15  | Humidity (Steady State) | Appearance                    | No defects or abnormalities                                                                                                                                                         | Set the capacitor for $500 \pm 24$ hrs. at $40 \pm 2^\circ\text{C}$ in 90 to 95% humidity. Remove and set for $24 \pm 2$ hrs. (temperature compensating type) and $48 \pm 4$ hrs. (high dielectric constant type) at room temperature, then measure.                                                                                                                                                                                                                                                                                                                                                                                                |
|     |                         | Capacitance Change            | Within $\pm 5\%$ or $\pm 0.5\text{pF}$ (whichever is larger)<br>Char. X7R : Within $\pm 12.5\%$<br>Char. Y5V : Within $\pm 30\%$                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|     |                         | Q/D.F.                        | 30pF min. : $Q \geq 350$<br>10pF to 30pF : $Q \geq 275 + 5C/2$<br>10pF max. : $Q \geq 200 + 10C$<br>C : Nominal capacitance (pF)<br>Char. X7R : 0.05 max.<br>Char. Y5V : 0.075 max. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|     |                         | Insulation Resistance         | 1,000M $\Omega$ or 50M $\Omega \cdot \mu\text{F}$ min. (whichever is smaller)                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 16  | Humidity Load           | Appearance                    | No defects or abnormalities                                                                                                                                                         | Apply the rated voltage for $500 \pm 24$ hrs. at $40 \pm 2^\circ\text{C}$ and in 90 to 95% humidity. Remove and set for $24 \pm 2$ hrs. (temperature compensating type) and $48 \pm 4$ hrs. (high dielectric constant type) at room temperature, then measure. (Charge/Discharge current $\leq 50\text{mA}$ )                                                                                                                                                                                                                                                                                                                                       |
|     |                         | Capacitance Change            | Within $\pm 7.5\%$ or $\pm 0.75\text{pF}$ (whichever is larger)<br>Char. X7R : Within $\pm 12.5\%$<br>Char. Y5V : Within $\pm 30\%$                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|     |                         | Q/D.F.                        | 30pF min. : $Q \geq 200$<br>30pF max. : $Q \geq 100 + 10C/3$<br>C : Nominal capacitance (pF)<br>Char. X7R : 0.05 max.<br>Char. Y5V : 0.075 max.                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|     |                         | Insulation Resistance         | 500M $\Omega$ or 25M $\Omega \cdot \mu\text{F}$ min. (whichever is smaller)                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 17  | High Temperature Load   | Appearance                    | No defects or abnormalities                                                                                                                                                         | Apply 200% of the rated voltage for $1000 \pm 48$ hrs. at the maximum operating temperature. Remove and set for $24 \pm 2$ hrs. (temperature compensating type) and $48 \pm 4$ hrs. (high dielectric constant type) at room temperature, then measure. (Charge/Discharge current $\leq 50\text{mA}$ )<br><br>• Initial measurement for high dielectric constant type<br>A voltage treatment should be given to the capacitor in which a DC voltage of 200% of the rated voltage is applied for 1 hr. at the maximum operating temperature $\pm 3^\circ\text{C}$ . Then set for $48 \pm 4$ hrs. at room temperature and conduct initial measurement. |
|     |                         | Capacitance Change            | Within $\pm 3\%$ or $\pm 0.3\text{pF}$ (whichever is larger)<br>Char. X7R : Within $\pm 12.5\%$<br>Char. Y5V : Within $\pm 30\%$                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|     |                         | Q/D.F.                        | 30pF min. : $Q \geq 350$<br>10pF to 30pF : $Q \geq 275 + 5C/2$<br>10pF max. : $Q \geq 200 + 10C$<br>C : Nominal capacitance (pF)<br>Char. X7R : 0.04 max.<br>Char. Y5V : 0.075 max. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|     |                         | Insulation Resistance         | 1,000M $\Omega$ or 50M $\Omega \cdot \mu\text{F}$ min. (whichever is smaller)                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 18  | Solvent Resistance      | Appearance                    | No defects or abnormalities                                                                                                                                                         | The capacitor should be fully immersed, unagitated, in reagent at $20$ to $25^\circ\text{C}$ for $30 \pm 5$ sec. and then removed gently. Marking on the surface of the capacitor should immediately be visually examined.<br>Reagent:<br>• Isopropyl alcohol                                                                                                                                                                                                                                                                                                                                                                                       |
|     |                         | Marking                       | Legible                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

Table A

| Char. | Nominal Values (ppm/ $^\circ\text{C}$ ) *1 | Capacitance Change from $25^\circ\text{C}$ (%) |       |                     |       |                     |       |
|-------|--------------------------------------------|------------------------------------------------|-------|---------------------|-------|---------------------|-------|
|       |                                            | $-55^\circ\text{C}$                            |       | $-30^\circ\text{C}$ |       | $-10^\circ\text{C}$ |       |
|       |                                            | Max.                                           | Min.  | Max.                | Min.  | Max.                | Min.  |
| C0G   | $0 \pm 30$                                 | 0.58                                           | -0.24 | 0.40                | -0.17 | 0.25                | -0.11 |

\*1: Nominal values denote the temperature coefficient within a range of  $25$  to  $125^\circ\text{C}$

Table B

| Char. | Temp. Range                   | Reference Temp.    | Cap. Change Rate  |
|-------|-------------------------------|--------------------|-------------------|
| X7R   | $-55$ to $+125^\circ\text{C}$ | $25^\circ\text{C}$ | Within $\pm 15\%$ |
| Y5V   | $-30$ to $+85^\circ\text{C}$  |                    | Within $\pm 22\%$ |

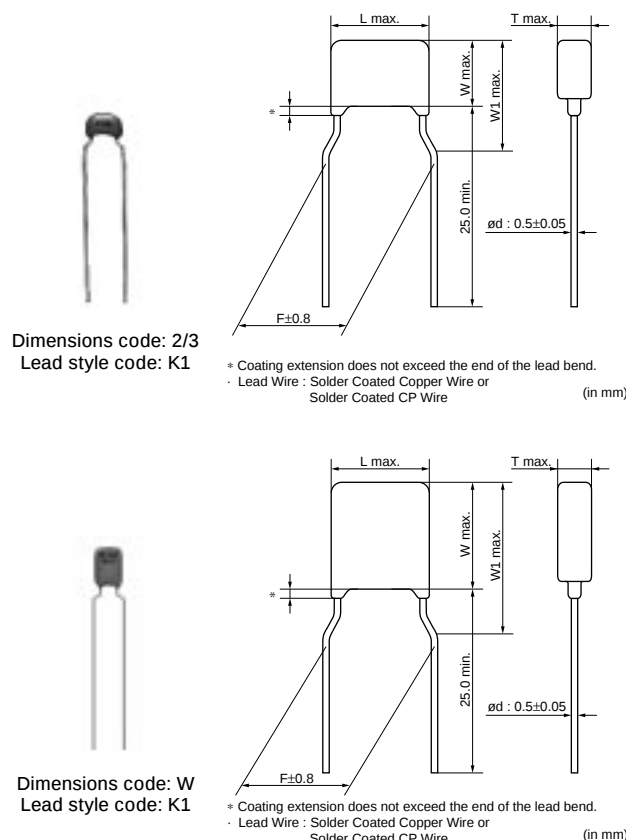
# Radial Lead Type Monolithic Ceramic Capacitors



## RPE Series Small Size, Large Capacitance (DC50V)

### ■ Features

1. The RPE series capacitors have small dimensions, large capacitance, and a capacity volume ratio of 10 micro F/cm cubed, close to that of electrolytic capacitors. They do not have polarity.
2. Excellent frequency characteristics and due to their small internal inductance are suitable for high frequencies.
3. They are not coated with wax so there is no change in their exterior appearance due to the outflow of wax during soldering or solvent during cleansing.
4. They are highly nonflammable, having characteristics equivalent to the UL94V-0 standard.
5. We design capacitors in much more compact size than current RPE Series, having reduced the diameter by 70% max.



### ■ Dimensions

| Dimensions and Lead Style Code | Dimensions (mm) |     |      |                             |     |     |
|--------------------------------|-----------------|-----|------|-----------------------------|-----|-----|
|                                | L               | W   | W1   | T                           | F   | d   |
| 2K1/2M1                        | 5.5             | 4.0 | 6.0  | Depends on Part Number List | 5.0 | 0.5 |
| 3K1/3M1                        | 5.5             | 5.0 | 7.5  |                             | 5.0 | 0.5 |
| WK1/MM1                        | 5.5             | 7.5 | 10.0 |                             | 5.0 | 0.5 |

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## Marking

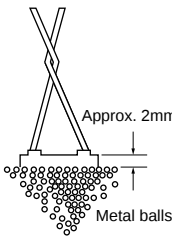
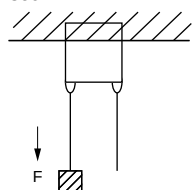
| Dimensions<br>Code            | Rated Voltage | DC50V                                                                                         |
|-------------------------------|---------------|-----------------------------------------------------------------------------------------------|
|                               | Temp. Char.   | X7R                                                                                           |
| 2                             |               |             |
| 3                             |               |             |
| W                             |               |             |
| Temperature Characteristics   |               | Marked with code (X7R char.: C)                                                               |
| Nominal Capacitance           |               | Marked with 3 figures                                                                         |
| Capacitance Tolerance         |               | Marked with code                                                                              |
| Rated Voltage                 |               | Marked with code (DC50V: 5)                                                                   |
| Manufacturer's Identification |               | Marked with  |

## High Dielectric Constant Type, X7R Characteristics

| Part Number        | Temp.<br>Char. | Rated<br>Voltage<br>(Vdc) | Capacitance<br>(μF) | Dimensions<br>LxW<br>(mm) | Dimension<br>T<br>(mm) | Lead<br>Space F<br>(mm) | Lead Style<br>Code<br>Bulk | Lead Style<br>Code<br>Taping (1) | Lead Style<br>Code<br>Taping (2) |
|--------------------|----------------|---------------------------|---------------------|---------------------------|------------------------|-------------------------|----------------------------|----------------------------------|----------------------------------|
| RPER71H105K2□□C60□ | X7R            | 50                        | 1.0 ±10%            | 5.5 x 4.0                 | 3.15                   | 5.0                     | K1                         | M1                               | -                                |
| RPER71H155K2□□C60□ | X7R            | 50                        | 1.5 ±10%            | 5.5 x 4.0                 | 3.15                   | 5.0                     | K1                         | M1                               | -                                |
| RPER71H225K2□□C60□ | X7R            | 50                        | 2.2 ±10%            | 5.5 x 4.0                 | 3.15                   | 5.0                     | K1                         | M1                               | -                                |
| RPER71H335K3□□C60□ | X7R            | 50                        | 3.3 ±10%            | 5.5 x 5.0                 | 4.0                    | 5.0                     | K1                         | M1                               | -                                |
| RPER71H475K3□□C60□ | X7R            | 50                        | 4.7 ±10%            | 5.5 x 5.0                 | 4.0                    | 5.0                     | K1                         | M1                               | -                                |
| RPER71H106MW□□C60□ | X7R            | 50                        | 10 ±20%             | 5.5 x 7.5                 | 4.0                    | 5.0                     | K1                         | M1                               | -                                |

Two blank columns are filled with the lead style code. Please refer to the 3 columns on the right for the appropriate code.  
 The last blank column is filled with the packaging code. (B: bulk, A: ammo pack)

## Specifications and Test Methods

| No.  | Item                                    |                   | Specifications                           | Test Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                  |   |      |   |       |   |      |   |       |   |      |
|------|-----------------------------------------|-------------------|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------|---|------|---|-------|---|------|---|-------|---|------|
| 1    | Operating Temperature Range             |                   | -55 to +125°C                            | —                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                  |   |      |   |       |   |      |   |       |   |      |
| 2    | Appearance                              |                   | No defects or abnormalities              | Visual inspection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                  |   |      |   |       |   |      |   |       |   |      |
| 3    | Dimension and Marking                   |                   | See previous pages                       | Visual inspection, Vernier Caliper                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |                  |   |      |   |       |   |      |   |       |   |      |
| 4    | Dielectric Strength                     | Between Terminals | No defects or abnormalities              | The capacitor should not be damaged when DC voltage of 250% of the rated voltage is applied between the terminations for 1 to 5 sec. (Charge/Discharge current ≤ 50mA)<br><br>The capacitor is placed in a container with metal balls of 1mm diameter so that each terminal, short-circuit, is kept approximately 2mm from the balls as shown in the figure, and 250% of the rated DC voltage is impressed for 1 to 5 sec. between capacitor terminals and metal balls. (Charge/Discharge current ≤ 50mA)<br> |      |                  |   |      |   |       |   |      |   |       |   |      |
|      |                                         | Body Insulation   | No defects or abnormalities              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 5    | Insulation Resistance                   | Between Terminals | 500MΩ · μF min.                          | The insulation resistance should be measured with a DC voltage not exceeding the rated voltage at normal temperature and humidity and within 2 min. of charging. (Charge/Discharge current ≤ 50mA)                                                                                                                                                                                                                                                                                                                                                                                               |      |                  |   |      |   |       |   |      |   |       |   |      |
| 6    | Capacitance                             |                   | Within the specified tolerance           | The capacitance/D.F. should be measured at the frequency of 1±0.1kHz and a voltage of AC1±0.2V(r.m.s.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |                  |   |      |   |       |   |      |   |       |   |      |
| 7    | Dissipation Factor (D.F.)               |                   | 0.025 max.                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 8    | Capacitance Temperature Characteristics |                   | Within ±15%                              | The capacitance change should be measured after 5 min. at each specified temperature stage. <table><tr><th>Step</th><th>Temperature (°C)</th></tr><tr><td>1</td><td>25±2</td></tr><tr><td>2</td><td>-55±3</td></tr><tr><td>3</td><td>25±2</td></tr><tr><td>4</td><td>125±3</td></tr><tr><td>5</td><td>25±2</td></tr></table>                                                                                                                                                                                                                                                                     | Step | Temperature (°C) | 1 | 25±2 | 2 | -55±3 | 3 | 25±2 | 4 | 125±3 | 5 | 25±2 |
| Step | Temperature (°C)                        |                   |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 1    | 25±2                                    |                   |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 2    | -55±3                                   |                   |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 3    | 25±2                                    |                   |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 4    | 125±3                                   |                   |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 5    | 25±2                                    |                   |                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 9    | Terminal Strength                       | Tensile Strength  | Termination not to be broken or loosened | As in the figure, fix the capacitor body, apply the force gradually to each lead in the radial direction of the capacitor until reaching 10N and then keep the force applied for 10±1 sec.<br>                                                                                                                                                                                                                                                                                                              |      |                  |   |      |   |       |   |      |   |       |   |      |
|      |                                         | Bending Strength  | Termination not to be broken or loosened |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |                  |   |      |   |       |   |      |   |       |   |      |
| 10   | Vibration Resistance                    | Appearance        | No defects or abnormalities              | The capacitor should be firmly soldered to the supporting lead wire and vibrated at a frequency range of 10 to 55Hz, 1.5mm in total amplitude, with about a 1 minute rate of vibration change from 10Hz to 55Hz and back to 10Hz. Apply for a total of 6 hrs., 2 hrs. each in 3 mutually perpendicular directions.                                                                                                                                                                                                                                                                               |      |                  |   |      |   |       |   |      |   |       |   |      |
|      |                                         | Capacitance       | Within the specified tolerance           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |                  |   |      |   |       |   |      |   |       |   |      |
|      |                                         | D.F.              | 0.025 max.                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |                  |   |      |   |       |   |      |   |       |   |      |

Continued on the following page. 

## Specifications and Test Methods

Continued from the preceding page.

| No.                                     | Item                         |                                         | Specifications                                                                                                      | Test Method                                                                                                                                                                                                                                                                                                                                                                                       |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|-----------------------------------------|------------------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------|------------|---|-------|------|---|------------|--------|---|-------|------|---|------------|--------|
| 11                                      | Solderability of Leads       |                                         | Lead wire should be soldered with uniform coating on the axial direction over 3/4 of the circumferential direction. | The terminal of a capacitor is dipped into a solution of ethanol (JIS-K-8101) and rosin (JIS-K-5902) (25% rosin in weight proportion) and then into molten solder (JIS-Z-3282) for 2±0.5 sec. In both cases the depth of dipping is up to about 1.5 to 2mm from the terminal body.<br>Temp. of solder: 245±5°C Lead Free Solder (Sn-3.0Ag-0.5Cu) 235±5°C H60A or H63A Eutectic Solder             |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
| 12                                      | Resistance to Soldering Heat | Appearance                              | No defects or abnormalities                                                                                         | The lead wire is immersed in the melted solder 1.5 to 2mm from the main body at 350±10°C for 3.5±0.5 sec. The specified items are measured after 48±4 hrs.<br><br>• Pretreatment<br>Perform a heat treatment at 150+0/-10°C for 1 hr., and then let sit at room temperature for 48±4 hrs.                                                                                                         |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                              | Capacitance Change                      | Within ±7.5%                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                   |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                              | Dielectric Strength (Between Terminals) | No defects                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                   |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
| 13                                      | Temperature Cycle            | Appearance                              | No defects or abnormalities                                                                                         | The capacitor should be subjected to 200 temperature cycles. (5 temperature cycles for dimensions code W) <table><tr><th>Step</th><th>Temperature (°C)</th><th>Time (min)</th></tr><tr><td>1</td><td>-55±3</td><td>30±3</td></tr><tr><td>2</td><td>Room Temp.</td><td>3 max.</td></tr><tr><td>3</td><td>125±3</td><td>30±3</td></tr><tr><td>4</td><td>Room Temp.</td><td>3 max.</td></tr></table> | Step       | Temperature (°C) | Time (min) | 1 | -55±3 | 30±3 | 2 | Room Temp. | 3 max. | 3 | 125±3 | 30±3 | 4 | Room Temp. | 3 max. |
|                                         |                              | Step                                    | Temperature (°C)                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                   | Time (min) |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                              | 1                                       | -55±3                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                   | 30±3       |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                              | 2                                       | Room Temp.                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                   | 3 max.     |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                              | 3                                       | 125±3                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                   | 30±3       |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
| 4                                       | Room Temp.                   | 3 max.                                  |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                   |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
| Capacitance Change                      | Within ±12.5%                |                                         |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                   |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
| D.F.                                    | 0.05 max.                    |                                         |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                   |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
| Insulation Resistance                   | 50MΩ · μF min.               |                                         |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                   |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
| Dielectric Strength (Between Terminals) | No defects or abnormalities  |                                         |                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                   |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
| 14                                      | Humidity (Steady State)      | Appearance                              | No defects or abnormalities                                                                                         | Set the capacitor at 40±2°C and relative humidity of 90 to 95% for 500 ± <sup>24</sup> <sub>8</sub> hrs. Remove and set for 48±4 hrs. at room temperature, then measure.                                                                                                                                                                                                                          |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                              | Capacitance Change                      | Within ±12.5%                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                   |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                              | D.F.                                    | 0.05 max.                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                   |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                              | Insulation Resistance                   | 50MΩ · μF min.                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                   |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
| 15                                      | Humidity Load                | Appearance                              | No defects or abnormalities                                                                                         | Apply the rated voltage at 40±2°C and relative humidity of 90 to 95% for 500 ± <sup>24</sup> <sub>8</sub> hrs. Remove and set for 48±4 hrs. at room temperature, then measure. (Charge/Discharge current ≤ 50mA)                                                                                                                                                                                  |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                              | Capacitance Change                      | Within ±12.5%                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                   |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                              | D.F.                                    | 0.05 max.                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                   |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                              | Insulation Resistance                   | 50MΩ · μF min.                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                   |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
| 16                                      | High Temperature Load        | Appearance                              | No defects or abnormalities                                                                                         | Apply a DC voltage of 150% of the rated voltage for 1000 ± <sup>48</sup> <sub>8</sub> hrs. at the maximum operating temperature. Remove and set for 48±4 hrs. at room temperature, then measure. (Charge/Discharge current ≤ 50mA)<br><br>• Pretreatment<br>Apply test voltage for 1 hr., at test temperature. Remove and set for 48±4 hrs. at room temperature.                                  |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                              | Capacitance Change                      | Within ±12.5%                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                   |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                              | D.F.                                    | 0.04 max.                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                   |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                              | Insulation Resistance                   | 50MΩ · μF min.                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                   |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
| 17                                      | Solvent Resistance           | Appearance                              | No defects or abnormalities                                                                                         | The capacitor should be fully immersed, unagitated, in reagent at 20 to 25 °C for 30±5 sec. and then removed gently. Marking on the surface of the capacitor should immediately be visually examined.<br>Reagent :<br>• Isopropyl alcohol                                                                                                                                                         |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |
|                                         |                              | Marking                                 | Legible                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                   |            |                  |            |   |       |      |   |            |        |   |       |      |   |            |        |

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