Innovative Service Around the Globe YAGEO

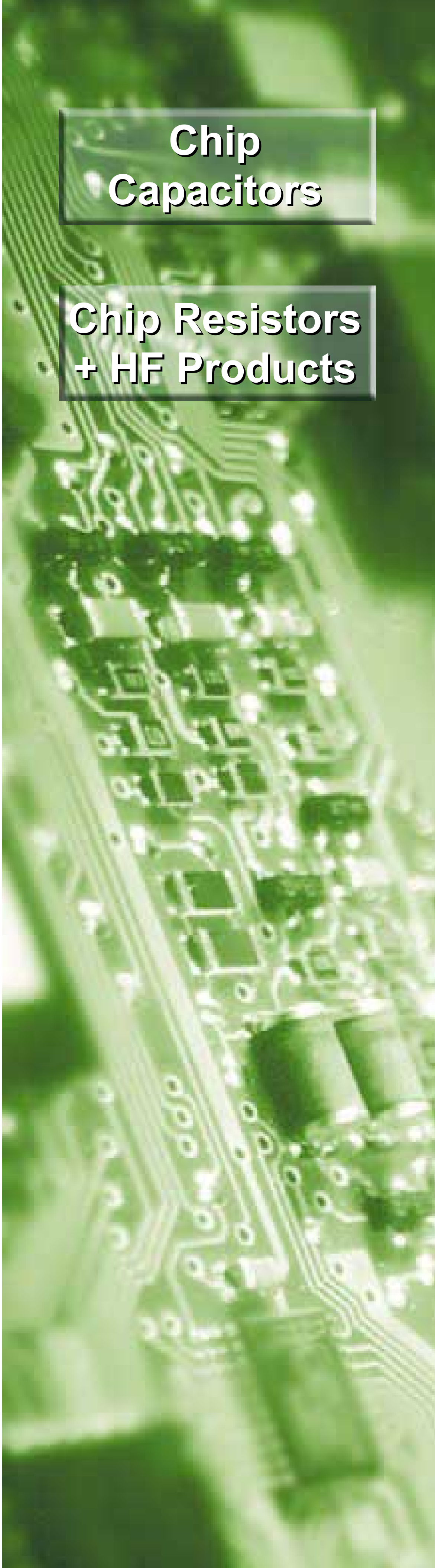
# PRODUCT SELECTION GUIDE
# 2002

**MULTILAYER CERAMIC CAPACITORS**

**RESISTOR CHIPS**

**HF PRODUCTS**

www.phycomp-components.com



**Part numbering system and ordering**
You can order components from this catalogue in two ways. Both ways give logistic and packing information.

- **Clear text ordering code (preferred)**
  This unique number is an easily-readable 15-digit code.
- **12-digit ordering code**
  This unique 12NC number forms the basis of the Phycomp logistic system.

You will find details for ordering in the *Ordering* section next to each selection chart.

Minimum shipment quantities, prices and delivery details can be obtained from the Phycomp sales organization in your country or from one of our franchised distributors.

**Case size codes**
Throughout this catalogue, inch-based codes are used for the component sizes. According to IEC 60384-10, amendment 2 of Sept. 2000 for MLCCs, and IEC 60115-8, amendment 1 of July 2000 for R-chip, values for length and width should be in millimetres rather than in inches. To distinguish between inch-based codes and metric-based codes, metric-based codes will temporarily have the suffix "M". The table below shows the relation between inch-based case sizes versus the recommended metric case size designators.

Case size cross-reference

| Case size designation | |
|---|---|
| Inch-based | Metric |
| 0201 | 0603M |
| 0402 | 1005M |
| 0508 | 1220M |
| 0603 | 1608M |
| 0612 | 1632M |
| 0805 | 2012M |
| 1206 | 3216M |
| 1210 | 3225M |
| 1812 | 4532M |

**CD-ROM**
The CD-ROM at the end of this product selection guide provides detailed data sheets for the individual product ranges, application notes and a copy of this Product Selection Guide in PDF format. A later version of any product information may be available from our website: **www.phycomp-components.com**

**Contacting us**
Contact details about the global Phycomp sales organisation can be found on the backcover of this catalogue. For most up-to-date information, as well as contact details of our franchised distributors, please refer to our website: **www.phycomp-components.com**

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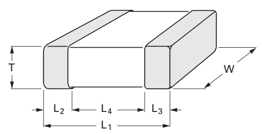
| Quick reference data | | |
|---|---|---|
| Rated voltage | NP0 (CG) | 16 V, 25 V, 50 V, 100 V, 500 V, 1 kV, 2 kV, 3 kV, 4 kV |
| | X5R (BJ) | 6.3 V, 10 V |
| | X7R (2R) | 10 V, 16 V, 25 V, 50 V, 100 V, 200 V, 500 V, 1 kV, 2 kV |
| | Y5V (2F) | 6.3 V, 0 V, 16 V, 25 V, 50 V |
| | Z5U (2E) | 25 V, 50 V |
| Tolerance | NP0 <10 pF | ±0.1 pF, ±0.25 pF, ±0.5 pF |
| | NP0 ≥10 pF | ±1%, ±2%, ±5% |
| | X5R | ±10%, ±20% |
| | X7R | ±5%, ±10% |
| | Y5V | ±20%, –20 to +80% |
| | Z5U | ±20%, –20 to +80% |
| Dissipation factor | NP0 <10 pF | $\leq 10(3/C + 0.7)10^{-4}$; max. $30.10^{-4}$ |
| | NP0 ≥10 pF | $\leq 10.10^{-4}$ |
| | X5R 6.3 V | ≤7% |
| | X5R 10 V | ≤5% |
| | X7R 10 V | ≤5% |
| | X7R 16 V | ≤3.5% |
| | X7R ≥25 V | ≤2.5% |
| | Y5V 10 V | ≤12.5% |
| | Y5V 16 V | ≤9% or ≤12.5% depending on capacitance value |
| | Y5V ≥25 V | ≤5% or ≤7% depending on capacitance value |
| | Z5U 16 V | ≤9% |
| | Z5U 25 V | ≤6% |
| | Z5U 50 V | ≤4% |
| Temperature coefficient | NP0 16 V | 0 ±60 ppm/K |
| | NP0 >16 V | 0 ±30 ppm/K |
| Temperature characteristic | X5R | ±15% |
| | X7R | ±15% |
| | Y5V | +22 to –82% |
| | Z5U | +22 to –56% |
| Climatic category | NP0 | –55 to +125 °C |
| | X5R | –55 to +85 °C |
| | X7R | –55 to +125 °C |
| | Y5V | –25 to +85 °C |
| | Z5U | +10 to +85 °C |
| Measuring conditions | NP0 <1000 pF | 1 V, 1 MHz |
| | NP0 ≥1000 pF | 1 V, 1 kHz |
| | X5R < 22 µF | 1 V, 1 kHz |
| | X5R ≥ 22 µF | 1 V, 120 Hz |
| | X7R | 1 V, 1 kHz |
| | Y5V | 1 V, 1 kHz |
| | Z5U | 0.5 V, 1 kHz |

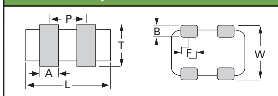
## Case dimensions

### Discrete capacitors



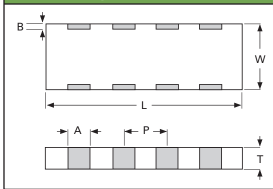

| Case size designation | | Dimensions in mm | | | | | | |
|---|---|---|---|---|---|---|---|---|
| inch-based | Metric | $L_1$ | W | $T_{min}$ | $T_{max}$ | $L_2$, $L_{3min}$ | $L_2$, $L_{3max}$ | $L_{4min}$ |
| 0201 | 0603M | 0.6 ±0.03 | 0.3 ±0.03 | 0.27 | 0.33 | 0.10 | 0.20 | 0.20 |
| 0402 | 1005M | 1.0 ±0.05 | 0.5 ±0.05 | 0.45 | 0.55 | 0.20 | 0.30 | 0.40 |
| 0603 | 1608M | 1.6 ±0.10 | 0.8 ±0.07 | 0.73 | 0.87 | 0.20 | 0.60 | 0.40 |
| 0805 | 2012M | 2.0 ±0.10 | 1.25 ±0.10 | 0.50 | 1.35 | 0.25 | 0.75 | 0.55 |
| 1206 | 3216M | 3.2 ±0.15 | 1.6 ±0.15 | 0.50 | 1.75 | 0.25 | 0.75 | 1.40 |
| 1210 | 3225M | 3.2 ±0.20 | 2.5 ±0.20 | 0.50 | 1.80 | 0.25 | 0.75 | 1.40 |
| 1812 | 4532M | 4.5 ±0.20 | 3.2 ±0.20 | 0.50 | 1.80 | 0.25 | 0.75 | 2.20 |

### 2-C arrays



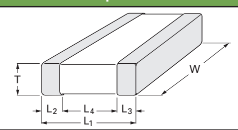

| Case size designation | | Dimensions in mm | | | | | | |
|---|---|---|---|---|---|---|---|---|
| inch-based | Metric | L | W | T | A | P | B | F |
| 0405 | 1012M | 1.37 ±0.15 | 1.0 ±0.15 | 0.65 ±0.10 | 0.25 ±0.1 | 0.64 ±0.1 | 0.20 ±0.1 | 0 ±0.1 |

### 4-C arrays



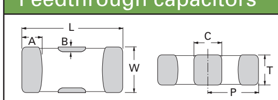

| Case size designation | | Dimensions in mm | | | | | | |
|---|---|---|---|---|---|---|---|---|
| inch-based | Metric | L | W | $T_{min}$ | $T_{max}$ | A | B | P |
| 0508 (4 x 0402) | 1220M (4 x 0402) | 2.0 ±0.15 | 1.25 ±0.15 | 0.50 | 0.70 | 0.28 ±0.10 | 0.2 ±0.10 | 0.5 ±0.10 |
| 0612 (4 x 0603) | 1632M (4 x 0603) | 3.2 ±0.15 | 1.6 ±0.15 | 0.50 | 1.20 | 0.4 ±0.10 | 0.3 ±0.20 | 0.8 ±0.10 |

### Discrete capacitors (Low-inductance types only)



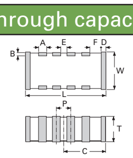

| Case size designation | | Dimensions in mm | | | | | | |
|---|---|---|---|---|---|---|---|---|
| inch-based | Metric | $L_1$ | W | $T_{min}$ | $T_{max}$ | $L_2$, $L_{3min}$ | $L_2$, $L_{3max}$ | $L_{4min}$ |
| 0508 | 1220M | 1.25 ±0.20 | 2.0 ±0.20 | 0.75 | 0.95 | 0.13 | 0.46 | 0.38 |
| 0612 | 1632M | 1.6 ±0.20 | 3.2 ±0.20 | 0.75 | 0.95 | 0.13 | 0.46 | 0.50 |

### Feedthrough capacitors



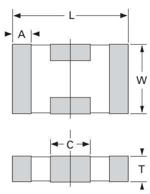

| Case size designation | | Dimensions in mm | | | | | | |
|---|---|---|---|---|---|---|---|---|
| inch-based | Metric | L | W | T | A | B | C | P |
| 1206 | 3216M | 3.2 ±0.20 | 1.6 ±0.20 | 0.8 ±0.10 | 0.5 ±0.20 | 0.3 ±0.15 | 0.9 ±0.20 | 1.6 ±0.15 |

### Feedthrough capacitor arrays



| Case size designation | | Dimensions in mm | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| inch-based | Metric | L | W | T | A | B | C | D | E | $F_{min}$ | P |
| 0612 (4 x 0603) | 1632M (4 x 0603) | 3.2 ±0.15 | 1.6 ±0.15 | 0.8 ±0.10 | 0.36 ±0.10 | 0.3 ±0.20 | 1.65 ±0.15 | 0.2 ±0.15 | 0.27 ±0.10 | 0.15 | 0.63 ±0.10 |

### Filter capacitors X2Y




| Case size designation | | Dimensions in mm | | | | | | |
|---|---|---|---|---|---|---|---|---|
| inch-based | Metric | L | W | $T_{min}$ | $T_{max}$ | $A_{min}$ | $A_{max}$ | C |
| 0603 | 1608M | 1.6 ±0.15 | 0.8 ±0.10 | 0.50 | 0.70 | 0.25 | 0.50 | 0.40 ±0.2 |
| 0805 | 2012M | 2.0 ±0.15 | 1.25 ±0.15 | 0.75 | 0.95 | 0.25 | 0.55 | 0.60 ±0.2 |
| 1206 | 3216M | 3.2 ±0.20 | 1.6 ±0.20 | 0.80 | 1.35 | 0.25 | 0.65 | 1.20 ±0.3 |
| 1210 | 3225M | 3.2 ±0.20 | 2.5 ±0.20 | 1.10 | 1.70 | 0.25 | 0.65 | 1.20 ±0.3 |
| 1812 | 4532M | 4.5 ±0.20 | 3.2 ±0.20 | 1.10 | 1.70 | 0.25 | 0.65 | 1.30 ±0.3 |

| NP0 - 16 V | | | | | |
|---|---|---|---|---|---|
| | | General purpose | | | |
| Capacitance (pF) | Last two digits of 12NC | 0402 | 0603 | 0805 | 1206 |
| 270 | 42 | 0.5 ±0.05 | | | |
| 330 | 43 | | | | |
| 390 | 44 | | | | |
| 470 | 45 | | | | |
| 560 | - | | | | |
| 680 | - | | | | |
| 820 | - | | | | |
| 1 000 | - | | | | |
| 1 200 | - | | | | |
| 1 500 | - | | | | |
| 1 800 | 53 | | 0.8 ±0.07 | | |
| 2 200 | 54 | | | | |
| 2 700 | 55 | | | | |
| 3 300 | 56 | | | | |
| 3 900 | - | | | | |
| 4 700 | - | | | | |
| 5 600 | 59 | | | 0.85 ±0.10 | |
| 6 800 | 61 | | | | |
| 8 200 | 62 | | | | |
| 10 000 | 63 | | | | |
| 12 000 | 64 | | | | 0.6 ±0.10 |
| 15 000 | 65 | | | | 0.85 ±0.10 |
| 18 000 | 66 | | | | |
| 22 000 | 67 | | | | |
| 27 000 | 68 | | | | 1.15 ±0.10 |
| 33 000 | 69 | | | | |
| Tape width | | 8 mm | | | |

**Note 1**: Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2**: Values in shaded cells indicate thickness class.

| Thickness classes and packing quantities | | | | | | | |
|---|---|---|---|---|---|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel | | | | Quantity per bulk case | | |
| | 180 mm / 7" | 180 mm / 7" | 330 mm / 13" | 330 mm / 13" | | | |
| | Paper | Blister | Paper | Blister | 0402 | 0603 | 0805 |
| 0.5 ± 0.05 | 10 000 | - | 50 000 | - | 50 000 | - | - |
| 0.6 ± 0.10 | 4 000 | - | 20 000 | - | - | - | - |
| 0.8 ± 0.07 | 4 000 | - | 15 000 | - | - | 15 000 | - |
| 0.85 ± 0.10 | 4 000 | - | 15 000 | - | - | - | 8 000 |
| 1.15 ± 0.10 | - | 3 000 | - | 10 000 | - | - | - |

| Ordering information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clear text code (preferred) | | | | | | | | |
| 0603CH271J7B200 (example) | | | | | | | | |
| 0603 | CH | 271 | J | 7 | B | 2 | 0 | 0 |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0402<br>0603<br>0805<br>1206 | CH = NP0 | 271 = 270 pF<br>The third digit signifies the multiplying factor:<br>1 = x 10<br>2 = x 100<br>3 = x 1000 | G = ±2%<br>J = ±5% | 7 = 16 V | B = NiSn | 2 = 180 mm / 7" paper<br>3 = 330 mm / 13" paper<br>B = 180 mm / 7" blister<br>F = 330 mm / 13" blister<br>P = bulk case | 0 = no marking | 0 = conv. ceramic |

**Ordering code 12NC**

**2 2 X X  X X X  X 1 X X X**

Carrier tape
22 = blister
38 = paper
54 = bulk

Voltage
78 = 16 V

Size
7 = 0402
6 = 0603
0 = 0805
1 = 1206

Capacitance value
see selection chart

Tolerance
4 = ±2%
5 = ±5%

Packing
1 = 180 mm / 7" reel
5 = 330 mm / 13" reel
4 = bulk case

| NP0 - 25 V | | | | | | |
|---|---|---|---|---|---|---|
| | | General purpose | | | | |
| Capacitance (pF) | Last two digits of 12NC | 0402 | 0603 | 0805 | 1206 | 1210 |
| 150 | 38 | 0.5 ±0.05 | | | | |
| 180 | 39 | | | | | |
| 220 | 41 | | | | | |
| 270 | 42 | | | | | |
| 330 | - | | | | | |
| 390 | - | | | | | |
| 470 | - | | | | | |
| 560 | - | | | | | |
| 680 | - | | | | | |
| 820 | 48 | | 0.8 ±0.07 | | | |
| 1 000 | 49 | | | | | |
| 1 200 | 51 | | | | | |
| 1 500 | 52 | | | | | |
| 1 800 | - | | | | | |
| 2 200 | - | | | | | |
| 2 700 | - | | | | | |
| 3 300 | 56 | | | 0.85 ±0.1 | | |
| 3 900 | 57 | | | 1.25 ±0.1 | | |
| 4 700 | 58 | | | | | |
| 5 600 | - | | | | | |
| 6 800 | - | | | | | |
| 8 200 | 62 | | | | 0.85 ±0.1 | |
| 10 000 | 63 | | | | | |
| 12 000 | 64 | | | | | 0.5 to 1.0 |
| 15 000 | 65 | | | | | |
| 18 000 | 66 | | | | | |
| 22 000 | 67 | | | | | 0.9 to 1.3 |
| Tape width | | 8 mm | | | | |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

| Thickness classes and packing quantities | | | | | | | |
|---|---|---|---|---|---|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel | | | | Quantity per bulk case | | |
| | 180 mm / 7" | 180 mm / 7" | 330 mm / 13" | 330 mm / 13" | | | |
| | Paper | Blister | Paper | Blister | 0402 | 0603 | 0805 |
| 0.5 ±0.05 | 10 000 | - | 50 000 | - | 50 000 | - | - |
| 0.8 ±0.07 | 4 000 | - | 15 000 | - | - | 15 000 | 10 000 |
| 0.85 ±0.1 | 4 000 | - | 15 000 | - | - | - | 8 000 |
| 0.5 to 1.0 | - | 4 000 | - | 10 000 | - | - | - |
| 0.9 to 1.3 | - | 3 000 | - | 10 000 | - | - | - |
| 1.25 ±0.1 | - | 3 000 | - | 10 000 | - | - | 5 000 |

| Ordering information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clear text code (preferred) | | | | | | | | |
| 0603CG102J8B200 (example) | | | | | | | | |
| 0603 | CG | 102 | J | 8 | B | 2 | 0 | 0 |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0402<br>0603<br>0805<br>1206<br>1210 | CG = NP0 | 102 = 1000 pF<br>The third digit signifies the multiplying factor:<br>1 = x 10<br>2 = x 100<br>3 = x 1000 | F = ±1%<br>G = ±2%<br>J = ±5% | 8 = 25 V | B = NiSn | 2 = 180 mm / 7" paper<br>3 = 330 mm / 13" paper<br>B = 180 mm / 7" blister<br>F = 330 mm / 13" blister<br>P = bulk case | 0 = no marking | 0 = conv. ceramic |

**Ordering code 12NC**

**2 2 X X  X X X  X 1 X X X**

Carrier tape
22 = blister
38 = paper
54 = bulk

Voltage
91 = 25 V

Size
7 = 0402
6 = 0603
0 = 0805
1 = 1206
2 = 1210

Capacitance value
see selection chart

Tolerance
3 = ±1%
4 = ±2%
5 = ±5%

Packing
1 = 180 mm / 7" reel
5 = 330 mm / 13" reel
4 = bulk case

# PRODUCT SELECTION CHART

## NPO - 50 V, general purpose

| NP0 - 50 V | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | General purpose | | | | | |
| Capacitance (pF) | Last three digits of 12NC | 0402 | 0603 | 0805 | 1206 | 1210 | 1812 |
| 0.47 | 477 | | | | | | |
| 0.56 | 567 | | | | | | |
| 0.68 | 687 | | | | | | |
| 0.82 | 827 | | | | | | |
| 1.0 | 108 | | | | | | |
| 1.2 | 128 | | | | | | |
| 1.5 | 158 | | | | | | |
| 1.8 | 188 | | | | | | |
| 2.2 | 228 | | | | | | |
| 2.7 | 278 | | | | | | |
| 3.3 | 338 | | | | | | |
| 3.9 | 398 | | | | | | |
| 4.7 | 478 | | | | | | |
| 5.6 | 568 | | | | | | |
| 6.8 | 688 | | | | | | |
| 8.2 | 828 | | | | | | |
| 10 | 109 | 0.5 ±0.05 | | | | | |
| 12 | 129 | | | | | | |
| 15 | 159 | | | | | | |
| 18 | 189 | | 0.8 ±0.07 | | | | |
| 22 | 229 | | | | | | |
| 27 | 279 | | | | | | |
| 33 | 339 | | | 0.6 ±0.1 | | | |
| 39 | 399 | | | | | | |
| 47 | 479 | | | | | | |
| 56 | 569 | | | | 0.6 ±0.1 | | |
| 68 | 689 | | | | | | |
| 82 | 829 | | | | | | |
| 100 | 101 | | | | | | |
| 120 | 121 | | | | | | |
| 150 | 151 | | | | | | |
| 180 | 181 | | | | | | |
| 220 | 221 | | | | | | |
| 270 | 271 | | | | | | |
| 330 | 331 | | | | | | |
| 390 | 391 | | | | | | |
| 470 | 471 | | | | | | |
| 560 | 561 | | | | | | |
| 680 | 681 | | | | | 0.5 to 1.0 | |
| 820 | 821 | | | | | | |
| 1 000 | 102 | | | | | | |
| 1 200 | 122 | | | | | | |
| 1 500 | 152 | | | 0.85 ±0.1 | | | |
| 1 800 | 182 | | | | | | |
| 2 200 | 222 | | | 1.25 ±0.1 | | | 0.5 to 1.0 |
| 2 700 | 272 | | | | | | |
| 3 300 | 332 | | | | | | |
| 3 900 | 392 | | | | 0.85 ±0.1 | | |
| 4 700 | 472 | | | | | | |
| 5 600 | 562 | | | | 1.15 ±0.1 | | |
| 6 800 | 682 | | | | | | |
| 8 200 | 822 | | | | | | |
| 10 000 | 103 | | | | | | |
| 12 000 | 123 | | | | | | |
| 15 000 | 153 | | | | | | |
| 18 000 | 183 | | | | | | 0.9 to 1.3 |
| 22 000 | 223 | | | | | | |
| Tape width | | 8 mm | | | | | 12 mm |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

| Thickness classes and packing quantities | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel | | | | 12 mm tape width quantity per reel | Quantity per bulk case | | |
| | 180 mm / 7" | 180 mm / 7" | 330 mm / 13" | 330 mm / 13" | 180 mm / 7" blister | | | |
| | Paper | Blister | Paper | Blister | 1812 | 0402 | 0603 | 0805 |
| 0.5 ±0.05 | 10 000 | - | 50 000 | - | - | 50 000 | - | - |
| 0.6 ±0.1 | 4 000 | - | 20 000 | - | - | - | - | 10 000 |
| 0.8 ±0.07 | 4 000 | - | 15 000 | - | - | - | 15 000 | - |
| 0.85 ±0.1 | 4 000 | - | 15 000 | - | - | - | - | 8 000 |
| 0.5 to 1.0 | - | 4 000 | - | 10 000 | 2 000 | - | - | - |
| 0.9 to 1.3 | - | 3 000 | - | 10 000 | 1 500 | - | - | - |
| 1.15 ±0.1 | - | 3 000 | - | 10 000 | - | - | - | - |
| 1.25 ±0.1 | - | 3 000 | - | 10 000 | - | - | - | 5 000 |

| Ordering information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clear text code (preferred) | | | | | | | | |
| 0805CG102J9B200 (example) | | | | | | | | |
| 0805 | CG | 102 | J | 9 | B | 2 | 0 | 0 |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0402(1)<br>0603(1)<br>0805(1)<br>1206(1)<br>1210<br>1812 | CG = NP0 | 102 = 1000 pF<br>The third digit signifies the multiplying factor:<br>8 = x 0.01<br>9 = x 0.1<br>0 = x 1<br>1 = x 10<br>2 = x 100<br>3 = x 1000 | B = ±0.1 pF<br>C = ±0.25 pF<br>D = ±0.5 pF<br>F = ±1%<br>G = ±2%<br>J = ±5% | 9 = 50 V | B = NiSn | 2 = 180 mm / 7" paper<br>3 = 330 mm / 13" paper<br>B = 180 mm / 7" blister<br>F = 330 mm / 13" blister<br>P = bulk | 0 = no marking | 0 = conv. ceramic |

**Note 1:** ±1% only available in 0402, 0603, 0805 and 1206.

### Ordering code 12NC

**2 2 X X  X X X  X X X X X**

Carrier tape (X X)
- 22 = blister
- 38 = paper
- 54 = bulk

Voltage (X X)
- 86 = 50 V

Size (X)
- 9 = 0402
- 7 = 0603
- 1 = 0805
- 3 = 1206
- 2 = 1210
- 5 = 1812

Packing (X)
- 1 = 180 mm / 7" reel
- 7 = 330 mm / 13" reel
- 4 = bulk case

Tolerance (X)
- 4 = ±0.1 pF for 0.47 pF ≤ C < 5 pF
  ±0.25 pF for 5 pF ≤ C < 10 pF
  ±2% for C ≥10 pF
- 5 = ±0.25 pF for C < 5 pF
  ±0.5 pF for 5 pF ≤ C < 10 pF
  ±5% for C ≥10 pF
- 8 = ±0.1 pF for 5 pF ≤ C < 10 pF (see note 1)
  ±1% for C ≥10 pF

Capacitance value (X X X)
- see selection chart

**Note 1:** ±1% only available in 0402, 0603, 0805 and 1206.

## NPO - 100 V, general purpose

| NP0 - 100 V | | | | | | |
|---|---|---|---|---|---|---|
| | | General purpose | | | | |
| Capacitance (pF) | Last two digits of 12NC | 0603 | 0805 | 1206 | 1210 | 1812 |
| 10 | 23 | | | | | |
| 12 | 24 | | | | | |
| 15 | 25 | | | | | |
| 18 | 26 | | | | | |
| 22 | 27 | | | | | |
| 27 | 28 | | | | | |
| 33 | 29 | | | | | |
| 39 | 31 | | | | | |
| 47 | 32 | | | | | |
| 56 | 33 | | | | | |
| 68 | 34 | | | | | |
| 82 | 35 | | | | | |
| 100 | 36 | | | | | |
| 120 | 37 | 0.8 ±0.07 | 0.6 ±0.1 | 0.6 ±0.1 | | |
| 150 | 38 | | | | | |
| 180 | 39 | | | | | |
| 220 | 41 | | | | | |
| 270 | 42 | | | | | |
| 330 | 43 | | | | | |
| 390 | 44 | | | | | |
| 470 | 45 | | | | | |
| 560 | 46 | | | | | |
| 680 | 47 | | | | | |
| 820 | 48 | | | | | |
| 1 000 | 49 | | | | | |
| 1 200 | 51 | | | | | |
| 1 500 | 52 | | 0.85 ±0.1 | | | |
| 1 800 | 53 | | | | | |
| 2 200 | 54 | | 1.25 ±0.1 | | | |
| 2 700 | 55 | | | | | |
| 3 300 | 56 | | | | | |
| 3 900 | 57 | | | 0.85 ±0.1 | | |
| 4 700 | 58 | | | | | |
| 5 600 | 59 | | | 1.15 ±0.1 | | |
| 6 800 | 61 | | | | | |
| 8 200 | 62 | | | | 0.5 to 1.0 | |
| 10 000 | 63 | | | | | |
| 12 000 | 64 | | | | | 0.5 to 1.0 |
| 15 000 | 65 | | | | | |
| 18 000 | 66 | | | | | 0.9 to 1.3 |
| 22 000 | 67 | | | | | |
| Tape width | | 8 mm | | | | 12 mm |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

### Thickness classes and packing quantities

| Thickness class (mm) | 8 mm tape width quantity per reel | | | | 12 mm tape width quantity per reel | Quantity per bulk case | |
|---|---|---|---|---|---|---|---|
| | 180 mm / 7" | 180 mm / 7" | 330 mm / 13" | 330 mm / 13" | 180 mm / 7" | | |
| | Paper | Blister | Paper | Blister | 1812 | 0603 | 0805 |
| 0.6 ±0.1 | 4 000 | - | 20 000 | - | - | - | 10 000 |
| 0.8 ±0.07 | 4 000 | - | 15 000 | - | - | 15 000 | - |
| 0.85 ±0.1 | 4 000 | - | 15 000 | - | - | - | 8 000 |
| 0.5 to 1.0 | - | 4 000 | - | 10 000 | 2 000 | - | - |
| 0.9 to 1.3 | - | 3 000 | - | 10 000 | 1 500 | - | - |
| 1.15 ±0.1 | - | 3 000 | - | 10 000 | - | - | - |
| 1.25 ±0.1 | - | 3 000 | - | 10 000 | - | - | 5 000 |

### Ordering information

Clear text code (preferred)

0805CG102G0B200 (example)

| 0805 | CG | 102 | G | 0 | B | 2 | 0 | 0 |
|---|---|---|---|---|---|---|---|---|
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0603<br>0805<br>1206<br>1210<br>1812 | CG = NP0 | 102 = 1000 pF<br>The third digit signifies the multiplying factor:<br>0 = x 1<br>1 = x 10<br>2 = x 100<br>3 = x 1000 | G = ±2%<br>J = ±5% | 0 = 100 V | B = NiSn | 2 = 180 mm / 7" paper<br>3 = 330 mm / 13" paper<br>B = 180 mm / 7" blister<br>F = 330 mm / 13" blister<br>P = bulk case | 0 = no marking | 0 = conv. ceramic |

### Ordering code 12NC

**2 2 X X  X X X  X 1 X X X**

Carrier tape
- 22 = blister
- 38 = paper
- 54 = bulk

Voltage
- 60 = 100 V

Size
- 6 = 0603
- 0 = 0805
- 1 = 1206
- 2 = 1210
- 4 = 1812

Capacitance value
- see selection chart

Tolerance
- 4 = ±2%
- 5 = ±5%

Packing
- 1 = 180 mm / 7" reel
- 5 = 330 mm / 13" reel
- 4 = bulk case

# PRODUCT SELECTION CHART

## NPO - 200 V and 500 V, high voltage

| NP0 - 200 V and 500 V | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | High voltage | | | | | | |
| Capacitance (pF) | Last two digits of 12NC | 200 V | | | | 500 V | | |
| | | 0805 | 1206 | 1210 | 1812 | 1206 | 1210 | 1812 |
| 10 | 23 | | | | | | | |
| 12 | 24 | | | | | | | |
| 15 | 25 | | | | | | | |
| 18 | 26 | | | | | | | |
| 22 | 27 | | | | | | | |
| 27 | 28 | | | | | | | |
| 33 | 29 | | | | | | | |
| 39 | 31 | | | | | | | |
| 47 | 32 | 0.6 ±0.1 | 0.6 ±0.1 | | | 0.6 ±0.1 | | |
| 56 | 33 | | | | | | | |
| 68 | 34 | | | | | | | |
| 82 | 35 | | | | | | | |
| 100 | 36 | | | | | | | |
| 120 | 37 | | | | | | | |
| 150 | 38 | | | | | | | |
| 180 | 39 | | | | | | 0.8 to 1.0 | |
| 220 | 41 | | | | | | | |
| 270 | 42 | | | | | | | |
| 330 | 43 | 0.85 ±0.1 | | | | 0.85 ±0.1 | | |
| 390 | 44 | | | | | | | |
| 470 | 45 | | 0.85 ±0.1 | | | | | |
| 560 | 46 | 1.25 ±0.1 | | | | | | |
| 680 | 47 | | | | | 1.15 ±0.1 | | |
| 820 | 48 | | | | | | | |
| 1 000 | 49 | | | | | | | |
| 1 200 | 51 | | | | | | 0.9 to 1.3 | |
| 1 500 | 52 | | 1.15 ±0.1 | | | | | |
| 1 800 | 53 | | | 0.8 to 1.0 | | | 1.2 to 1.75 | |
| 2 200 | 54 | | | | | | | |
| 2 700 | 55 | | | 0.9 to 1.3 | | | | 0.9 to 1.3 |
| 3 300 | 56 | | | | | | | |
| 3 900 | 57 | | | | 0.8 to 1.0 | | | |
| 4 700 | 58 | | | | 0.9 to 1.3 | | | |
| 5 600 | 59 | | | | | | | |
| Tape width | | 8 mm | | | 12 mm | 8 mm | | 12 mm |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

**Thickness classes and packing quantities**

| Thickness class (mm) | 8 mm tape width quantity per reel | | | | 12 mm tape width quantity per reel | Quantity per bulk case |
|---|---|---|---|---|---|---|
| | 180 mm / 7" | 180 mm / 7" | 330 mm / 13" | 330 mm / 13" | 180 mm / 7" blister | |
| | Paper | Blister | Paper | Blister | 1812 | 0805 |
| 0.6 ±0.1 | 4 000 | - | 20 000 | - | - | 10 000 |
| 0.85 ±0.1 | 4 000 | - | 15 000 | - | - | 8 000 |
| 0.8 to 1.0 | - | 4 000 | - | 10 000 | 2 000 | - |
| 0.9 to 1.3 | - | 3 000 | - | 10 000 | 1 500 | - |
| 1.15 ±0.1 | - | 3 000 | - | 10 000 | - | - |
| 1.25 ±0.1 | - | 3 000 | - | 10 000 | - | 5 000 |
| 1.2 to 1.75 | - | 2 500 | - | 10 000 | 1 200 | - |

**Ordering information**

Clear text code (preferred)

1206CG102GBB200 (example)

| 1206 | CG | 102 | G | B | B | 2 | 0 | 0 |
|---|---|---|---|---|---|---|---|---|
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0805<br>1206<br>1210<br>1812 | CG = NP0 | 102 = 1000 pF<br>The third digit signifies the multiplying factor:<br>0 = x 1<br>1 = x 10<br>2 = x 100<br>3 = x 1000 | G = ±2%<br>J = ±5% | B = 200 V<br>D = 500 V | B = NiSn | 2 = 180 mm / 7" paper<br>3 = 330 mm / 13" paper<br>B = 180 mm / 7" blister<br>F = 330 mm / 13" blister<br>P = bulk case | 0 = no marking | 0 = conv. ceramic |

**Ordering code 12NC**

2 2 X X  X X X  X 1 X X X

Carrier tape
- 22 = blister
- 38 = paper
- 54 = bulk

Voltage
- 93 = 200 V
- 97 = 500 V

Size
- 0 = 0805
- 1 = 1206
- 2 = 1210
- 4 = 1812

Capacitance value
- see selection chart

Tolerance
- 4 = ±2%
- 5 = ±5%

Packing
- 1 = 180 mm / 7"reel
- 5 = 330 mm / 13" reel
- 4 = bulk case

## NPO - 1 kV to 4 kV, high voltage

| NP0 - 1 kV to 4 kV | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | High voltage | | | | | | |
| Capacitance (pF) | Last two digits of 12NC | 1 kV | | 2 kV | 3 kV | | 4 kV | |
| | | 1206 | 1812 | 1206 | 1808 | 1812 | 1808 | 1812 |
| 3.3 | 16 | | | | | | | |
| 3.9 | 17 | | | | | | | |
| 4.7 | 18 | | | | | | | |
| 5.6 | 19 | | | | | | | |
| 6.8 | 21 | | | | | | | |
| 8.2 | 22 | | | | | | | |
| 10 | 23 | | | | | | | |
| 12 | 24 | | | | | | | |
| 15 | 25 | | | | | | 1.2 to 1.75 | |
| 18 | 26 | | | | 0.9 to 1.3 | | | |
| 22 | 27 | | | | | | | 1.2 to 1.75 |
| 27 | 28 | | | | | | | |
| 33 | 29 | | | | | | | |
| 39 | 31 | | | | | | | |
| 47 | 32 | | | 0.9 to 1.3 | | 0.9 to 1.3 | | |
| 56 | 33 | | | | | | | |
| 68 | 34 | | | | | | | |
| 82 | 35 | | | | | | | |
| 100 | 36 | | | | | | | |
| 120 | 37 | | | | | | | |
| 150 | 38 | | | | | | | |
| 180 | 39 | | | | | | | |
| 220 | 41 | 0.9 to 1.3 | | | | | | |
| 270 | 42 | | 0.5 to 1.0 | | | | | |
| 330 | 43 | | | | | | | |
| 390 | 44 | | | | | | | |
| 470 | 45 | | | | | | | |
| 560 | 46 | | | | | | | |
| 680 | 47 | | | | | | | |
| 820 | 48 | | | | | | | |
| 1 000 | 49 | | | | | | | |
| 1 200 | 51 | | 0.9 to 1.3 | | | | | |
| 1 500 | 52 | | | | | | | |
| Tape width | | 8 mm | 12 mm | 8 mm | 12 mm | | | |

**Note 1**: Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2**: Values in shaded cells indicate thickness class.

| Thickness classes and packing quantities | | | |
|---|---|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel | 12 mm tape width quantity per reel | |
| | 180 mm / 7" blister | 180 mm / 7" blister | |
| | 1206 | 1808 | 1812 |
| 0.5 to 1.0 | - | - | 2 000 |
| 0.9 to 1.3 | 3 000 | 1 500 | 1 500 |
| 1.2 to 1.75 | - | 1 000 | 1 000 |

| Ordering information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clear text code (preferred) | | | | | | | | |
| 1206CG220JFBB00 (example) | | | | | | | | |
| 1206 | CG | 220 | J | F | B | B | 0 | 0 |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 1206<br>1808<br>1812 | CG = NP0 | 220 = 22 pF<br>The third digit signifies the multiplying factor:<br>0 = x 1<br>1 = x 10<br>2 = x 100 | J = ±5% | E = 1 kV<br>F = 2 kV<br>G = 3 kV<br>H = 4 kV | B = NiSn | B = 180 mm / 7" blister | 0 = no marking | 0 = conv. ceramic |

### Ordering code 12NC

**2 2 X X X X X X 1 X X X**

Carrier tape
50 = blister

Voltage
00 = 1 kV
02 = 2 kV
04 = 3 kV
50 = 4 kV

Size
1 = 1206
3 = 1808
4 = 1812

Capacitance value
see selection chart

Tolerance
5 = ±5%

Packing
1 = 180 mm / 7" reel

## NPO - 50 V, microwave

| NP0 - 50 V | | | | |
|---|---|---|---|---|
| | | Microwave | | |
| Capacitance (pF) | Last two digits of 12NC | 0603 | 0805 | 1206 |
| 0.47 | 05 | | | |
| 0.56 | 06 | | | |
| 0.68 | 07 | | | |
| 0.82 | 08 | | | |
| 1.0 | 09 | | | |
| 1.2 | 11 | | | |
| 1.5 | 12 | | | |
| 1.8 | 13 | | | |
| 2.2 | 14 | | | |
| 2.7 | 15 | | | |
| 3.3 | 16 | | | |
| 3.9 | 17 | 0.8 ±0.07 | 0.6 ±0.1 | 0.6 ±0.1 |
| 4.7 | 18 | | | |
| 5.6 | 19 | | | |
| 6.8 | 21 | | | |
| 8.2 | 22 | | | |
| 10 | 23 | | | |
| 12 | 24 | | | |
| 15 | 25 | | | |
| 18 | 26 | | | |
| 22 | 27 | | | |
| 27 | 28 | | | |
| 33 | 29 | | | |
| 39 | 31 | | | |
| 47 | 32 | | | |
| 56 | 33 | | | |
| 68 | 34 | | | |
| 82 | 35 | | | |
| 100 | 36 | | | |
| 120 | 37 | | | |
| Tape width | | 8 mm | | |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

| Thickness classes and packing quantities | | | | |
|---|---|---|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel | | Quantity per bulk case | |
| | 180 mm / 7" | 330 mm / 13" | | |
| | Paper | Paper | 0603 | 0805 |
| 0.6 ±0.1 | 4 000 | 20 000 | - | 10 000 |
| 0.8 ±0.07 | 4 000 | 15 000 | 15 000 | - |

| Ordering information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clear text code (preferred) | | | | | | | | |
| 0805CG100G9B20M (example) | | | | | | | | |
| 0805 | CG | 100 | G | 9 | B | 2 | 0 | M |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0603<br>0805<br>1206 | CG = NP0 | 100 = 100 pF<br>The third digit signifies the multiplying factor:<br>8 = x 0.01<br>9 = x 0.1<br>0 = x 1<br>1 = x 10 | B = ±0.1 pF<br>C = ±0.25 pF<br>D = ±0.5 pF<br>F = ±1%<br>G = ±2%<br>J = ±5% | 9 = 50 V | B = NiSn | 2 = 180 mm / 7" paper<br>3 = 330 mm / 13" paper<br>P = bulk case | 0 = no marking | M = microwave |

## Ordering code 12NC

**2 2 X X  X X X  X 1 X X X**

Carrier tape
38 = paper
54 = bulk

Size
578 = 0603
574 = 0805
576 = 1206

Capacitance value
see selection chart

Tolerance
0 = ±0.1 pF for C <10 pF
1 = ±0.25 pF for C <10 pF
2 = ±0.5 pF for 5 pF ≤ C <10 pF
3 = ±1% for C ≥10 pF
4 = ±2% for C ≥10 pF
5 = ±5% for C ≥10 pF

Packing
1 = 180 mm / 7" reel
5 = 330 mm / 13" reel
4 = bulk case

## X5R - 6.3 V and 10 V, general purpose

| X5R - 6.3 V and 10 V | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | General purpose | | | | | | | | | | |
| Capacitance (nF) | Last two digits of 12NC | 6.3 V | | | | | | 10 V | | | | |
| | | 0402 | 0603 | 0805 | 1206 | 1210 | 1812 | 0603 | 0805 | 1206 | 1210 | 1812 |
| 68 | 47 | 0.5 ±0.05 | | | | | | | | | | |
| 100 | 49 | | | | | | | | | | | |
| 150 | 52 | | | | | | | | | | | |
| 220 | 54 | | | | | | | | | | | |
| 330 | 56 | | | | | | | 0.8 ±0.07 | | | | |
| 470 | 58 | | | | | | | | | | | |
| 680 | 61 | | 0.8 ±0.07 | | | | | | | | | |
| 1 000 | 63 | | | | | | | | | | | |
| 1 500 | 65 | | | | | | | | | | | |
| 2 200 | 67 | | | | | | | | 1.25 ±0.1 | | | |
| 3 300 | 69 | | | 1.25 ±0.1 | | | | | | 1.6 ±0.2 | | |
| 4 700 | 72 | | | | 1.6 ±0.2 | | | | | | | |
| 6 800 | 74 | | | | | | | | | | | |
| 10 000 | 76 | | | | 1.6 ±0.2 | | | | | | 2.5 ±0.2 | |
| 15 000 | 78 | | | | | | | | | | | |
| 22 000 | 81 | | | | | 2.5 ±0.2 | | | | | | 2.5 ±0.2 |
| 33 000 | 83 | | | | | | | | | | | |
| 47 000 | 85 | | | | | | 2.5 ±0.2 | | | | | |
| Tape width | | 8 mm | | | | | 12 mm | 8 mm | | | | 12 mm |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

| Thickness classes and packing quantities | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel | | | | 12 mm tape width quantity per reel | Quantity per bulk case | | |
| | 180 mm / 7" | 180 mm / 7" | 330 mm / 13" | 330 mm / 13" | 180 mm / 7" | | | |
| | Paper | Blister | Paper | Blister | Blister | 0402 | 0603 | 0805 |
| 0.5 ± 0.05 | 10 000 | - | 50 000 | - | - | 50 000 | - | - |
| 0.8 ± 0.07 | 4 000 | - | 15 000 | - | - | - | 15 000 | - |
| 1.25 ± 0.1 | - | 3 000 | - | 10 000 | - | - | - | 5 000 |
| 1.6 ± 0.2 | - | 2 500 | - | 8 000 | - | - | - | - |
| 2.5 ± 0.2 | - | | - | | 1 000 | - | - | - |

| Ordering information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clear text code (preferred) | | | | | | | | |
| 06032B334M6B20D (example) | | | | | | | | |
| 0603 | 2B | 334 | M | 6 | B | 2 | 0 | D |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0402<br>0603<br>0805<br>1206<br>1210<br>1812 | 2B = X5R | 334 =<br>330 000 pF<br>The third digit signifies the multiplying factor:<br>4 = x 10 000<br>5 = x 100 000<br>6 = x 1 000 000 | K = ±10%<br>M = ±20% | 5 = 6.3 V<br>6 = 10 V | B = NiSn | 2 = 180 mm / 7" paper<br>3 = 330 mm / 13" paper<br>B = 180 mm / 7" blister<br>F = 330 mm / 13" blister<br>P = bulk case | 0 = no marking | D = BME |

**Ordering code 12NC**

**2 2 X X  X X X  X 3 X X X**

Carrier tape (X X, digits 3–4)
- 38 = paper (10 V)
- 22 = blister (10 V)
- 50 = blister (6.3 V)
- 55 = paper (6.3 V)
- 54 = bulk

Voltage (X X, digits 5–6)
- 20 = 6.3 V
- 24 = 10 V

Size (X, digit 7)
- 7 = 0402
- 6 = 0603
- 0 = 0805
- 1 = 1206
- 2 = 1210
- 4 = 1812

Packing (X, digit 8)
- 1 = 180 mm / 7" reel
- 5 = 330 mm / 13" reel
- 4 = bulk case

Tolerance (X, digit 10)
- 6 = ±10%
- 7 = ±20%

Capacitance value (X X, digits 11–12)
- see selection chart

## X7R - 10 V, general purpose

| X7R - 10 V | | | | | |
|---|---|---|---|---|---|
| | | General purpose | | | |
| Capacitance (pF) | Last two digits of 12NC | 0402 | 0603 | 0805 | 1206 |
| 27 000 | 42 | 0.5 ±0.05 | | | |
| 33 000 | - | | | | |
| 39 000 | - | 0.5 ±0.05 | | | |
| 47 000 | 45 | | | | |
| 56 000 | - | | | | |
| 68 000 | - | | | | |
| 82 000 | - | | | | |
| 100 000 | - | | | | |
| 120 000 | - | | | | |
| 150 000 | 52 | | | | |
| 180 000 | 53 | | 0.8 ±0.07 | | |
| 220 000 | 54 | | | 0.6 ±0.1 | |
| 270 000 | 55 | | | | |
| 330 000 | 56 | | | | |
| 390 000 | 57 | | | 0.85 ±0.1 | |
| 470 000 | 58 | | | | |
| 560 000 | 59 | | | | |
| 680 000 | 61 | | | 1.25 ±0.1 | |
| 820 000 | 62 | | | | |
| 1 000 000 | 63 | | | | 0.85 ±0.1 |
| 1 200 000 | 64 | | | | |
| 1 500 000 | 65 | | | | |
| 1 800 000 | 66 | | | | 1.15 ±0.1 |
| 2 200 000 | 67 | | | | |
| Tape width | | 8 mm | | | |

**Note 1**: Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2**: Values in shaded cells indicate thickness class.

### Thickness classes and packing quantities

| Thickness class (mm) | 8 mm tape width quantity per reel | | | | Quantity per bulk case | | |
|---|---|---|---|---|---|---|---|
| | 180 mm / 7" | 180 mm / 7" | 330 mm / 13" | 330 mm / 13" | | | |
| | Paper | Blister | Paper | Blister | 0402 | 0603 | 0805 |
| 0.5 ±0.05 | 10 000 | - | 50 000 | - | 50 000 | - | - |
| 0.6 ±0.1 | 4 000 | - | 20 000 | - | - | - | 10 000 |
| 0.8 ±0.07 | 4 000 | - | 15 000 | - | - | 15 000 | - |
| 0.85 ±0.1 | 4 000 | - | 15 000 | - | - | - | 8 000 |
| 1.15 ±0.1 | - | 3 000 | - | 10 000 | - | - | - |
| 1.25 ±0.1 | - | 3 000 | - | 10 000 | - | - | 5 000 |

### Ordering information

Clear text code (preferred)

06032R154K6BB0D (example)

| 0603 | 2R | 154 | K | 6 | B | B | 0 | D |
|---|---|---|---|---|---|---|---|---|
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0603<br>0805<br>1206 | 2R = X7R | 154 = 150 000 pF<br>The third digit signifies the multiplying factor:<br>4 = x 10 000<br>5 = x 100 000 | K = ±10% | 6 = 10 V | B = NiSn | 2 = 180 mm / 7" paper<br>3 = 330 mm / 13" paper<br>B = 180 mm / 7" blister<br>F = 330 mm / 13" blister<br>P = bulk case | 0 = no marking | D = BME |

### Ordering code 12NC

**2 2 X X X X X X 5 X X X**

Carrier tape
22 = blister
38 = paper
54 = bulk

Voltage
24 = 10 V

Size
6 = 0603
0 = 0805
1 = 1206

Capacitance value
see selection chart

Tolerance
6 = ±10%

Packing
1 = 180 mm / 7" reel
5 = 330 mm / 13" reel
4 = bulk case

# PRODUCT SELECTION CHART

## X7R - 16 V and 25 V, general purpose

| X7R - 16 V and 25 V | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | General purpose | | | | | | | | | |
| Capacitance (pF) | Last two digits of 12NC | 16 V | | | | | 25 V | | | | |
| | | 0402 | 0603 | 0805 | 1206 | 1210 | 0402 | 0603 | 0805 | 1206 | 1210 |
| 3 300 | 29 | | | | | | | | | | |
| 3 900 | 31 | | | | | | 0.5 ±0.05 | | | | |
| 4 700 | 32 | | | | | | | | | | |
| 5 600 | 33 | | | | | | | | | | |
| 6 800 | 34 | | | | | | | | | | |
| 8 200 | 35 | | | | | | | | | | |
| 10 000 | 36 | 0.5 ±0.05 | | | | | | | | | |
| 12 000 | 37 | | | | | | | | | | |
| 15 000 | 38 | | | | | | | 0.8 ±0.07 | | | |
| 18 000 | 39 | | | | | | | | 0.6 ±0.1 | | |
| 22 000 | 41 | | | | | | | | | | |
| 27 000 | 42 | | | | | | | | | | |
| 33 000 | 43 | | | | | | | | | | |
| 39 000 | 44 | | | | | | | | | | |
| 47 000 | 45 | | 0.8 ±0.07 | | | | | | | | |
| 56 000 | 46 | | | 0.6 ±0.1 | | | | | 0.85 ±0.1 | | |
| 68 000 | 47 | | | | | | | | | | |
| 82 000 | 48 | | | | | | | | | | |
| 100 000 | 49 | | | | | | | | | | |
| 120 000 | 51 | | | | | | | | | | |
| 150 000 | 52 | | | 0.85 ±0.1 | | | | | | 0.85 ±0.1 | |
| 180 000 | 53 | | | | | | | | | | |
| 220 000 | 54 | | | | | | | | | | |
| 270 000 | 55 | | | | 0.85 ±0.1 | | | | | 1.15 ±0.1 | 0.5 to 1.0 |
| 330 000 | 56 | | | | | | | | | | |
| 390 000 | 57 | | | 1.25 ±0.1 | | | | | | | |
| 470 000 | 58 | | | | | | | | | | 0.9 to 1.3 |
| 560 000 | 59 | | | | | | | | | | |
| 680 000 | 61 | | | | 1.15 ±0.1 | | | | | | |
| 820 000 | 62 | | | | | | | | | | |
| 1 000 000 | 63 | | | | | | | | | | 1.2 to 1.75 |
| 4 700 000 | 72 | | | | | 1.9 ±0.2 | | | | | |
| Tape width | | 8 mm | | | | | 8 mm | | | | |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

| Thickness classes and packing quantities | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel | | | | 12 mm tape width quantity per reel | Quantity per bulk case | | |
| | 180 mm / 7" | 180 mm / 7" | 330 mm / 13" | 330 mm / 13" | 180 mm / 7" blister | | | |
| | Paper | Blister | Paper | Blister | 1812 | 0402 | 0603 | 0805 |
| 0.5 ±0.05 | 10 000 | - | 50 000 | - | - | 50 000 | - | - |
| 0.6 ±0.1 | 4 000 | - | 20 000 | - | - | - | - | 10 000 |
| 0.8 ±0.07 | 4 000 | - | 15 000 | - | - | - | 15 000 | - |
| 0.85 ±0.1 | 4 000 | - | 15 000 | - | - | - | - | 8 000 |
| 0.5 to 1.0 | - | 3 000 | - | 10 000 | - | - | - | - |
| 0.9 to 1.3 | - | 3 000 | - | 10 000 | 1 500 | - | - | - |
| 1.15 ±0.1 | - | 3 000 | - | 10 000 | - | - | - | - |
| 1.25 ±0.1 | - | 3 000 | - | 10 000 | - | - | - | 5 000 |
| 1.2 to 1.75 | - | 2 000 | - | - | - | - | - | - |
| 1.9 ±0.2 | - | - | - | - | 2 000 | - | - | - |

| Ordering information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clear text code (preferred) | | | | | | | | |
| 12062R104K8BB0D (example) | | | | | | | | |
| 1206 | 2R | 104 | K | 8 | B | B | 0 | D |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0402<br>0603<br>0805<br>1206<br>1210<br>1812 | 2R = X7R | 104 = 100 000 pF<br>The third digit signifies the multiplying factor:<br>1 = x 10<br>2 = x 100<br>3 = x 1 000<br>4 = x 10 000<br>5 = x 100 000 | J = ±5%<br>K = ±10% | 7 = 16 V<br>8 = 25 V | B = NiSn | 2 = 180 mm / 7" paper<br>3 = 330 mm / 13" paper<br>B = 180 mm / 7" blister<br>F = 330 mm / 13" blister<br>P = bulk case | 0 = no marking | D = BME |

## Ordering code 12NC

**2 2 X X   X X X   X 5 X X X**

Carrier tape
22 = blister
38 = paper
54 = bulk

Voltage
78 = 16 V
91 = 25 V

Size
7 = 0402
6 = 0603
0 = 0805
1 = 1206
2 = 1210

Capacitance value
see selection chart

Tolerance
5 = ± 5%
6 = ±10%

Packing
1 = 180 mm / 7" reel
5 = 330 mm / 13" reel
4 = bulk case

## X7R - 50 V and 100 V, general purpose

| X7R - 50 V and 100 V | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | General purpose | | | | | | | | | |
| Capacitance (pF) | Last two digits of 12NC | 50 V | | | | | | 100 V | | | |
| | | 0402 | 0603 | 0805 | 1206 | 1210 | 1812 | 0805 | 1206 | 1210 | 1812 |
| 100 | 09 | | | | | | | | | | |
| 120 | 11 | | | | | | | | | | |
| 150 | 12 | | | | | | | | | | |
| 180 | 13 | | | | | | | | | | |
| 220 | 14 | | | | | | | | | | |
| 270 | 15 | | | | | | | | | | |
| 330 | 16 | | | | | | | | | | |
| 390 | 17 | | | | | | | | | | |
| 470 | 18 | | | | | | | | | | |
| 560 | 19 | 0.5 ±0.05 | | | | | | | | | |
| 680 | 21 | | | | | | | | | | |
| 820 | 22 | | | | | | | | | | |
| 1 000 | 23 | | | | | | | | | | |
| 1 200 | 24 | | | | | | | | | | |
| 1 500 | 25 | | | | | | | 0.6 ±0.1 | | | |
| 1 800 | 26 | | 0.8 ±0.07 | | | | | | | | |
| 2 200 | 27 | | | | | | | | | | |
| 2 700 | 28 | | | 0.6 ±0.1 | | | | | | | |
| 3 300 | 29 | | | | | | | | 0.85 ±0.1 | | |
| 3 900 | 31 | | | | 0.85 ±0.1 | | | | | | |
| 4 700 | 32 | | | | | | | | | | |
| 5 600 | 33 | | | | | | | | | | |
| 6 800 | 34 | | | | | | | | | | |
| 8 200 | 35 | | | | | | | | | | |
| 10 000 | 36 | | | | | | | | | | |
| 12 000 | 37 | | | | | | | | | | |
| 15 000 | 38 | | | | | | | 0.85 ±0.1 | | | |
| 18 000 | 39 | | | | | | | | | | |
| 22 000 | 41 | | | | | | | | | | |
| 27 000 | 42 | | | | | | | | | | |
| 33 000 | 43 | | | | | 0.5 to 1.0 | | | | | |
| 39 000 | 44 | | | 0.85 ±0.1 | | | | | | | |
| 47 000 | 45 | | | | | | | | | | |
| 56 000 | 46 | | | | | | | | | | |
| 68 000 | 47 | | | | | | | | 1.15 ±0.1 | 0.5 to 1.0 | |
| 82 000 | 48 | | | 1.25 ±0.1 | | | | | | | |
| 100 000 | 49 | | | | | | | | | | |
| 120 000 | 51 | | | | | | | | | | |
| 150 000 | 52 | | | | | | | | | 0.9 to 1.3 | |
| 180 000 | 53 | | | | 1.15 ±0.1 | 0.9 to 1.3 | | | | | 0.9 to 1.3 |
| 220 000 | 54 | | | | | | 0.9 to 1.3 | | | | |
| 270 000 | 55 | | | | | | | | | | |
| 330 000 | 56 | | | | | | | | | | |
| 390 000 | 57 | | | | | | | | | | |
| 470 000 | 58 | | | | | | | | | | 1.2 to 1.75 |
| 560 000 | 59 | | | | | | | | | | |
| 680 000 | 61 | | | | | | | | | | |
| 820 000 | 62 | | | | | | 1.2 to 1.75 | | | | |
| 1 000 000 | 63 | | | | | | | | | | |
| Tape width | | 8 mm | | | | | 12 mm | 8 mm | | | 12 mm |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

| Thickness classes and packing quantities | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel | | | | 12 mm tape width quantity per reel | | | |
| | 180 mm / 7" | 180 mm / 7" | 330 mm / 13" | 330 mm / 13" | 180 mm / 7" blister | Quantity per bulk case | | |
| | Paper | Blister | Paper | Blister | 1812 | 0402 | 0603 | 0805 |
| 0.5 ±0.05 | 10 000 | - | 50 000 | - | - | 50 000 | - | - |
| 0.6 ±0.1 | 4 000 | - | 20 000 | - | - | - | - | 10 000 |
| 0.8 ±0.07 | 4 000 | - | 15 000 | - | - | - | 15 000 | - |
| 0.85 ±0.1 | 4 000 | - | 15 000 | - | - | - | - | 8 000 |
| 0.5 to 1.0 | - | 3 000 | - | 10 000 | - | - | - | - |
| 0.9 to 1.3 | - | 3 000 | - | 10 000 | 1 500 | - | - | - |
| 1.15 ±0.1 | - | 3 000 | - | 10 000 | - | - | - | - |
| 1.25 ±0.1 | - | 3 000 | - | 10 000 | - | - | - | 5 000 |
| 1.2 to 1.75 | - | - | - | - | 1 200 | - | - | - |

## Ordering information

Clear text code (preferred)

18122R104K0BB0D (example)

| 1812 | 2R | 104 | K | 0 | B | B | 0 | D |
|---|---|---|---|---|---|---|---|---|
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0402<br>0603<br>0805<br>1206<br>1210<br>1812 | 2R = X7R | 104 = 100 000 pF<br>The third digit signifies the multiplying factor:<br>1 = x 10<br>2 = x 100<br>3 = x 1 000<br>4 = x 10 000<br>5 = x 100 000 | J = ± 5%<br>K = ±10% | 9 = 50 V<br>0 = 100 V | B = NiSn | 2 = 180 mm / 7" paper<br>3 = 330 mm / 13" paper<br>B = 180 mm / 7" blister<br>F = 330 mm / 13" blister<br>P = bulk case | 0 = no marking | D = BME |

## Ordering code 12NC

**2 2 X X  X X X  X 5 X X X**

Carrier tape
22 = blister
38 = paper
54 = bulk

Voltage
58 = 50 V
60 = 100 V

Size
7 = 0402
6 = 0603
0 = 0805
1 = 1206
2 = 1210
4 = 1812

Capacitance value
see selection chart

Tolerance
5 = ± 5%
6 = ±10%

Packing
1 = 180 mm / 7" reel
5 = 330 mm / 13" reel
4 = bulk case

## X7R - 200 V and 500 V, high voltage

| X7R - 200 V and 500 V | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | High voltage | | | | | | |
| Capacitance (pF) | Last two digits of 12NC | 200 V | | | | 500 V | | |
| | | 0805 | 1206 | 1210 | 1812 | 1206 | 1210 | 1812 |
| 220 | 14 | | | | | | | |
| 270 | 15 | | | | | | | |
| 330 | 16 | | | | | | | |
| 390 | 17 | | | | | | | |
| 470 | 18 | | | | | | | |
| 560 | 19 | | | | | | | |
| 680 | 21 | | | | | | | |
| 820 | 22 | | | | | | | |
| 1 000 | 23 | | | | | | | |
| 1 200 | 24 | 0.85 ±0.1 | | | | 1.15 ±0.1 | | |
| 1 500 | 25 | | | | | | | |
| 1 800 | 26 | | | | | | | |
| 2 200 | 27 | | | | | | | |
| 2 700 | 28 | | | | | | | |
| 3 300 | 29 | | 0.85 ±0.1 | | | | | |
| 3 900 | 31 | | | | | | | |
| 4 700 | 32 | | | | | | 0.9 to 1.3 | |
| 5 600 | 33 | | | | | | | |
| 6 800 | 34 | 1.25 ±0.1 | | | | | | |
| 8 200 | 35 | | | | | | | |
| 10 000 | 36 | | | | | | | |
| 12 000 | 37 | | | | | | | 0.9 to 1.3 |
| 15 000 | 38 | | | | | | | |
| 18 000 | 39 | | | | | | | |
| 22 000 | 41 | | 1.15 ±0.1 | | | | | |
| 27 000 | 42 | | | | | | | |
| 33 000 | 43 | | | | | | | |
| 39 000 | 44 | | | 0.9 to 1.3 | | | | |
| 47 000 | 45 | | | | | | | |
| 56 000 | 46 | | | | | | | |
| 68 000 | 47 | | | | 0.9 to 1.3 | | | |
| 82 000 | 48 | | | | | | | |
| 100 000 | 49 | | | | | | | |
| 120 000 | - | | | | | | | |
| 150 000 | 52 | | | | 0.9 to 1.3 | | | |
| Tape width | | 8 mm | | | 12 mm | 8 mm | | 12 mm |

**Note 1**: Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2**: Values in shaded cells indicate thickness class.

## X7R - 200 V and 500 V, high voltage

| Thickness classes and packing quantities | | | | | | |
|---|---|---|---|---|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel | | | | 12 mm tape width quantity per reel | Quantity per bulk case |
| | 180 mm / 7" | 180 mm / 7" | 330 mm / 13" | 330 mm / 13" | 180 mm / 7" blister | |
| | Paper | Blister | Paper | Blister | 1812 | 0805 |
| 0.85 ±0.1 | 4 000 | | 15 000 | | - | 8 000 |
| 0.9 to 1.3 | - | 3 000 | - | 10 000 | 1 500 | - |
| 1.15 ±0.1 | - | 3 000 | - | 10 000 | - | - |
| 1.25 ±0.1 | - | 3 000 | - | 10 000 | - | 5 000 |

| Ordering information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clear text code (preferred) | | | | | | | | |
| 18122R104KBBB0D (example) | | | | | | | | |
| 1812 | 2R | 104 | K | B | B | B | 0 | D |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0805<br>1206<br>1210<br>1812 | 2R = X7R | 104 = 100 000 pF<br>The third digit signifies the multiplying factor:<br>1 = x 10<br>2 = x 100<br>3 = x 1 000<br>4 = x 10 000 | J = ± 5%<br>K = ±10% | B = 200 V<br>D = 500 V | B = NiSn | 2 = 180 mm / 7" paper<br>3 = 330 mm / 13" paper<br>B = 180 mm / 7" blister<br>F = 330 mm / 13" blister<br>P = bulk case | 0 = no marking | D = BME |

### Ordering code 12NC

**2 2 X X X X X X 5 X X X**

Carrier tape
22 = blister
38 = paper
54 = bulk

Voltage
93 = 200 V
97 = 500 V

Size
0 = 0805
1 = 1206
2 = 1210
4 = 1812

Capacitance value
see selection chart

Tolerance
5 = ± 5%
6 = ±10%

Packing
1 = 180 mm / 7" reel
5 = 330 mm / 13" reel
4 = bulk case

## X7R - 1 kV and 2 kV, high voltage

<table>
<tr><th colspan="7">X7R - 1 kV and 2 kV</th></tr>
<tr><th colspan="2"></th><th colspan="5">High voltage</th></tr>
<tr><th rowspan="2">Capacitance (pF)</th><th rowspan="2">Last two digits of 12NC</th><th colspan="3">1 kV</th><th colspan="2">2 kV</th></tr>
<tr><th>1206</th><th>1808</th><th>1812</th><th>1808</th><th>1812</th></tr>
<tr><td>470</td><td>18</td><td rowspan="11">0.9 to 1.3</td><td rowspan="11">1.2 to 1.75</td><td></td><td rowspan="9">1.2 to 1.75</td><td></td></tr>
<tr><td>560</td><td>19</td><td></td><td></td></tr>
<tr><td>680</td><td>21</td><td></td><td></td></tr>
<tr><td>820</td><td>22</td><td></td><td></td></tr>
<tr><td>1 000</td><td>23</td><td rowspan="13">1.2 to 1.75</td><td rowspan="9">1.2 to 1.75</td></tr>
<tr><td>1 200</td><td>24</td></tr>
<tr><td>1 500</td><td>25</td></tr>
<tr><td>1 800</td><td>26</td></tr>
<tr><td>2 200</td><td>27</td></tr>
<tr><td>2 700</td><td>28</td><td></td></tr>
<tr><td>3 300</td><td>29</td><td></td></tr>
<tr><td>3 900</td><td>31</td><td></td><td></td><td></td></tr>
<tr><td>4 700</td><td>32</td><td></td><td></td><td></td></tr>
<tr><td>5 600</td><td>33</td><td></td><td></td><td></td><td></td></tr>
<tr><td>6 800</td><td>34</td><td></td><td></td><td></td><td></td></tr>
<tr><td>8 200</td><td>35</td><td></td><td></td><td></td><td></td></tr>
<tr><td>10 000</td><td>36</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Tape width</td><td></td><td>8 mm</td><td colspan="2">12 mm</td><td colspan="2">12 mm</td></tr>
</table>

**Note 1**: Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2**: Values in shaded cells indicate thickness class.

<table>
<tr><th colspan="5">Thickness classes and packing quantities</th></tr>
<tr><th rowspan="3">Thickness class (mm)</th><th colspan="2">8 mm tape width quantity per reel</th><th colspan="2">12 mm tape width quantity per reel</th></tr>
<tr><th>180 mm / 7" blister</th><th>330 mm / 13" blister</th><th colspan="2">180 mm / 7" blister</th></tr>
<tr><th>1206</th><th>1206</th><th>1808</th><th>1812</th></tr>
<tr><td>0.9 to 1.3</td><td>3 000</td><td>10 000</td><td>-</td><td>-</td></tr>
<tr><td>1.2 to 1.75</td><td>-</td><td>-</td><td>1 000</td><td>1 000</td></tr>
</table>

<table>
<tr><th colspan="9">Ordering information</th></tr>
<tr><th colspan="9">Clear text code (preferred)</th></tr>
<tr><th colspan="9">12062R102KEBB0D (example)</th></tr>
<tr><th>1206</th><th>2R</th><th>102</th><th>K</th><th>E</th><th>B</th><th>B</th><th>0</th><th>D</th></tr>
<tr><th>Size code</th><th>Temp. char.</th><th>Cap. in pF</th><th>Tolerance</th><th>Voltage</th><th>Termination</th><th>Packing</th><th>Marking</th><th>Range identifier</th></tr>
<tr><td>1206<br>1808<br>1812</td><td>2R = X7R</td><td>102 = 1000 pF<br>The third digit signifies the multiplying factor:<br>1 = x 10<br>2 = x 100<br>3 = x 1000</td><td>K = ±10%</td><td>E = 1 kV<br>F = 2 kV</td><td>B = NiSn</td><td>B = 180 mm / 7" blister<br>F = 330 mm / 13" blister</td><td>0 = no marking</td><td>D = BME</td></tr>
</table>

### Ordering code 12NC

**2 2 X X  X X X  X 5 X X X**

Carrier tape
50 = blister

Voltage
00 = 1 kV
02 = 2 kV

Size
1 = 1206
3 = 1808
4 = 1812

Capacitance value
see selection chart

Tolerance
6 = ±10%

Packing
1 = 180 mm / 7" reel
5 = 330 mm / 13" reel

| X7R - 16 V to 50 V | | | | |
|---|---|---|---|---|
| | | Low inductance | | |
| Capacitance (pF) | Last two digits of 12NC | 16 V 0508 | 25 V 0508 | 50 V 0612 |
| 10 000 | 36 | | | |
| 12 000 | 37 | | | |
| 15 000 | 38 | | | |
| 18 000 | 39 | | | |
| 22 000 | 41 | | | |
| 27 000 | 42 | | | |
| 33 000 | 43 | | 0.85 ±0.1 | 0.85 ±0.1 |
| 39 000 | 44 | | | |
| 47 000 | 45 | | | |
| 56 000 | 46 | | | |
| 68 000 | 47 | | | |
| 82 000 | 48 | | | |
| 100 000 | 49 | | | |
| 120 000 | 51 | | | |
| 150 000 | 52 | 0.85 ±0.1 | | |
| 180 000 | 53 | | | |
| 220 000 | 54 | | | |
| Tape width | | 8 mm | | |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

| Thickness classes and packing quantities | | |
|---|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel | |
| | 180 mm / 7" | 330 mm / 13" |
| | Paper | Paper |
| 0.85 ±0.1 | 4 000 | 15 000 |

| Ordering information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clear text code (preferred) | | | | | | | | |
| 06122R103K9BB0L (example) | | | | | | | | |
| 0612 | 2R | 103 | K | 9 | B | B | 0 | L |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0508<br>0612 | 2R = X7R | 103 = 10 000 pF<br>The third digit signifies the multiplying factor:<br>3 = x 1 000<br>4 = x 10 000 | K = ±10% | 7 = 16 V<br>8 = 25 V<br>9 = 50 V | B = NiSn | 2 = 180 mm / 7" paper<br>3 = 330 mm / 13" paper | 0 = no marking | L = low inductance |

Ordering code 12NC

**2 2 X X   X X X   X 5 X X X**

Carrier tape
55 = paper

Voltage
08 = 16 V
07 = 25 V
06 = 50 V

Size
1 = 0508
0 = 0612

Capacitance value
see selection chart

Tolerance
6 = ±10%

Packing
1 = 180 mm / 7" reel
5 = 330 mm / 13" reel

| Y5V - 6.3 V and 10 V | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| General purpose | | | | | | | | | | | | |
| Capacitance (nF) | Last two digits of 12NC | 6.3 V | | | | | | 10 V | | | | |
| | | 0402 | 0603 | 0805 | 1206 | 1210 | 1812 | 0402 | 0603 | 0805 | 1206 | 1812 |
| 220 | 54 | | | | | | | 0.5 ±0.05 | | | | |
| 330 | - | | | | | | | | | | | |
| 470 | 58 | 0.5 ±0.05 | | | | | | | 0.8 ±0.07 | | | |
| 680 | - | | | | | | | | | | | |
| 1 000 | 63 | | | | | | | | 0.8 ±0.07 | | | |
| 1 500 | 65 | | | | | | | | | | | |
| 2 200 | 67 | | 0.8 ±0.07 | | | | | | | | | |
| 3 300 | 69 | | | | | | | | | 1.25 ±0.1 | 1.15 ±0.1 | |
| 4 700 | 72 | | | | | | | | | | | |
| 6 800 | 74 | | | | | | | | | | | |
| 10 000 | 76 | | | 1.25 ±0.1 | | | | | | | | |
| 15 000 | 78 | | | | | | | | | | 1.6 ±0.15 | |
| 22 000 | 81 | | | | 1.6 ±0.15 | | | | | | | |
| 33 000 | - | | | | | | | | | | | |
| 47 000 | 85 | | | | | 2.0 ±0.2 | | | | | | 2.5 ±0.2 |
| 68 000 | - | | | | | | | | | | | |
| 100 000 | 89 | | | | | | 2.5 ±0.2 | | | | | |
| Tape width | 8 mm | | | | | | | | | | | |

**Note 1**: Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2**: Values in shaded cells indicate thickness class.

**Thickness classes and packing quantities**

| Thickness class (mm) | 8 mm tape width quantity per reel | | | | Quantity per bulk case | |
|---|---|---|---|---|---|---|
| | 180 mm / 7" | 180 mm / 7" | 330 mm / 13" | 330 mm / 13" | | |
| | Paper | Blister | Paper | Blister | 0603 | 0805 |
| 0.5 ±0.05 | 10 000 | - | 50 000 | - | 50 000 | - |
| 0.8 ±0.07 | 4 000 | - | 15 000 | - | 15 000 | - |
| 0.85 ±0.1 | 4 000 | - | 15 000 | - | - | - |
| 1.15 ±0.1 | - | 3 000 | - | 10 000 | - | - |
| 1.25 ±0.1 | - | 3 000 | - | 10 000 | - | 5 000 |
| 1.6 ±0.15 | - | 2 500 | - | 7 000 | - | - |
| 2.0 ±0.2 | - | 10 000 | - | - | - | - |
| 2.5 ±0.2 | - | 10 000 | - | - | - | - |

**Ordering information**

Clear text code (preferred)

| 12062F105Z6BB0D (example) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1206 | 2F | 105 | Z | 6 | B | B | 0 | D |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0603<br>0805<br>1206 | 2F = Y5V | 105 =<br>1 000 000 pF<br>The third digit signifies the multiplying factor:<br>5 = x 100 000<br>6 = x 1 000 000 | Z =<br>–20 to +80% | 5 = 6.3 V<br>6 = 10 V | B = NiSn | 2 = 180 mm / 7" paper<br>3 = 330 mm / 13" paper<br>B = 180 mm / 7" bliste r<br>F = 330 mm / 13" blister<br>P = bulk case | 0 = no marking | D = BME |

**Ordering code 12NC**

**2 2 X X X X X X 9 X X X**

Carrier tape
- 22 = blister
- 38 = paper
- 50 = blister (6.3 V)
- 54 = bulk

Voltage
- 20 = 6.3 V
- 24 = 10 V

Size
- 7 = 0402
- 6 = 0603
- 0 = 0805
- 1 = 1206
- 2 = 1210
- 4 = 1812

Capacitance value
see selection chart

Tolerance
8 = –20 to +80%

Packing
- 1 = 180 mm / 7" reel
- 5 = 330 mm / 13" reel
- 4 = bulk case

## Y5V - 16 V to 50 V, general purpose

| Y5V - 16 V and 25 V | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | General purpose | | | | | | | | |
| Capacitance | Last two digits | 16 V | | | | | 25 V | | | |
| (nF) | of 12NC | 0402 | 0603 | 0805 | 1206 | 1210 | 0603 | 0805 | 1206 | 1210 |
| 10 | 36 | | | | | | | | | |
| 15 | 38 | | | | | | | | | |
| 22 | 41 | | | | | | | | | |
| 33 | 43 | 0.5 ±0.05 | | | | | 0.8 ±0.07 | | | |
| 47 | 45 | | | | | | | | | |
| 68 | 47 | | | | | | | | | |
| 100 | 49 | | | | | | | 0.6 ±0.1 | | |
| 150 | 52 | | | | | | | 0.85 ±0.1 | 0.6 ±0.1 | |
| 220 | 54 | | | | | | | | | |
| 330 | 56 | | 0.8 ±0.07 | | | | | | | |
| 470 | 58 | | | 0.85 ±0.1 | | | | | 0.85 ±0.1 | |
| 680 | 61 | | | | | | | 1.25 ±0.1 | | |
| 1 000 | 63 | | | 1.25 ±0.1 | 0.85 ±0.1 | | | | 1.15 ±0.1 | |
| 1 500 | 65 | | | | | | | | | |
| 2 200 | 67 | | | | | | | | | |
| 3 300 | 69 | | | | 1.15 ±0.1 | | | | | |
| 4 700 | 72 | | | | | | | | | |
| 10 000 | 76 | | | | | 1.2 to 1.75 | | | | 1.5 ±0.1 |
| Tape width | | 8 mm | | | | | 8 mm | | | |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

| Y5V - 50 V | | | | |
|---|---|---|---|---|
| | | General purpose | | |
| Capacitance | Last two digits | 50 V | | |
| (pF) | of 12NC | 0603 | 0805 | 1206 |
| 10 000 | 05 | | | |
| 15 000 | 06 | | | |
| 22 000 | 07 | | | |
| 33 000 | 08 | 0.8 ±0.07 | 0.6 ±0.1 | |
| 47 000 | 09 | | | |
| 68 000 | 11 | | | |
| 100 000 | 12 | | | |
| 150 000 | 13 | | 0.85 ±0.1 | 0.6 ±0.1 |
| 220 000 | 14 | | | |
| 330 000 | 15 | | | 0.85 ±0.1 |
| 470 000 | 16 | | | |
| 680 000 | 17 | | | 1.15 ±0.1 |
| 1 000 000 | 18 | | | |
| Tape width | | 8 mm | | |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

Thickness classes and packing quantities

| Thickness class (mm) | 8 mm tape width quantity per reel | | | | 12 mm tape width quantity per reel | Quantity per bulk case | | |
|---|---|---|---|---|---|---|---|---|
| | 180 mm / 7" | 180 mm / 7" | 330 mm / 13" | 330 mm / 13" | 180 mm / 7" | | | |
| | Paper | Blister | Paper | Blister | Blister | 0402 | 0603 | 0805 |
| 0.5 ±0.05 | 10 000 | - | 50 000 | - | - | 50 000 | - | - |
| 0.6 ±0.1 | 4 000 | - | 20 000 | - | - | - | - | 10 000 |
| 0.8 ±0.07 | 4 000 | - | 15 000 | - | - | - | 15 000 | - |
| 0.85 ±0.1 | 4 000 | - | 15 000 | - | - | - | - | 8 000 |
| 1.15 ±0.1 | - | 3 000 | - | 10 000 | - | - | - | - |
| 1.25 ±0.1 | - | 3 000 | - | 10 000 | - | - | - | 5 000 |
| 1.5 ±0.1 | - | 3 000 | - | - | - | - | - | - |
| 1.2 to 1.75 | - | - | - | - | 1 200 | - | - | - |

Ordering information

Clear text code (preferred)

12062F684M8BB0D (example)

| 1206 | 2F | 684 | M | 8 | B | B | 0 | D |
|---|---|---|---|---|---|---|---|---|
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0402<br>0603<br>0805<br>1206 | 2F = Y5V | 684 = 680 000 pF<br>The third digit signifies the multiplying factor:<br>2 = x 100<br>3 = x 1 000<br>4 = x 10 000<br>5 = x 100 000 | M = ±20%<br>Z = –20 to +80% | 7 = 16 V<br>8 = 25 V<br>9 = 50 V | B = NiSn | 2 = 180 mm / 7" paper<br>3 = 330 mm / 13" paper<br>B = 180 mm / 7" blister<br>F = 330 mm / 13" blister<br>P = bulk case | 0 = no marking | D = BME |

Ordering code 12NC

**2 2 X X X X X X 9 X X X**

Carrier tape
22 = blister
38 = paper
54 = bulk

Voltage
78 = 16 V
91 = 25 V
58 = 50 V

Size
7 = 0402
6 = 0603
0 = 0805
1 = 1206
2 = 1210

Capacitance value
see selection chart

Tolerance
7 = ±20%
8 = –20 to +80%

Packing
1 = 180 mm / 7" reel
5 = 330 mm / 13" reel
4 = bulk case

## Z5U - 25 V and 50 V, general purpose

<table>
<tr><th colspan="7">Z5U - 25 V and 50 V</th></tr>
<tr><th colspan="2"></th><th colspan="5">General purpose</th></tr>
<tr><th rowspan="2">Capacitance (pF)</th><th rowspan="2">Last two digits of 12NC</th><th colspan="2">25 V</th><th colspan="3">50 V</th></tr>
<tr><th>0603</th><th>1206</th><th>0805</th><th>1206</th><th>1210</th></tr>
<tr><td>10 000</td><td>36</td><td rowspan="4">0.8 ±0.07</td><td></td><td rowspan="4">0.6 ±0.1</td><td rowspan="5">0.6 ±0.1</td><td></td></tr>
<tr><td>22 000</td><td>41</td><td></td><td></td></tr>
<tr><td>47 000</td><td>45</td><td></td><td></td></tr>
<tr><td>100 000</td><td>49</td><td></td><td rowspan="3">0.5 to 1.0</td></tr>
<tr><td>220 000</td><td>54</td><td></td><td></td><td>1.25 ±0.1</td></tr>
<tr><td>470 000</td><td>58</td><td></td><td rowspan="2">1.15 ±0.1</td><td></td><td></td></tr>
<tr><td>1 000 000</td><td>63</td><td></td><td></td><td></td><td>0.9 to 1.3</td></tr>
<tr><td>Tape width</td><td></td><td colspan="2">8 mm</td><td colspan="3">8 mm</td></tr>
</table>

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

| Thickness classes and packing quantities | | | | | | |
|---|---|---|---|---|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel | | | | Quantity per bulk case | |
| | 180 mm / 7" | 180 mm / 7" | 330 mm / 13" | 330 mm / 13" | | |
| | Paper | Blister | Paper | Blister | 0603 | 0805 |
| 0.6 ±0.1 | 4 000 | - | 20 000 | - | - | 10 000 |
| 0.8 ±0.07 | 4 000 | - | 15 000 | - | 15 000 | - |
| 0.5 to 1.0 | - | 4 000 | - | 10 000 | - | - |
| 0.9 to 1.3 | - | 3 000 | - | 10 000 | - | - |
| 1.15 ±0.1 | - | 3 000 | - | 10 000 | - | - |
| 1.25 ±0.1 | - | 3 000 | - | 10 000 | - | 5 000 |

### Ordering information

Clear text code (preferred)

06032E104Z8B20D (example)

| 0603 | 2E | 104 | Z | 8 | B | 2 | 0 | D |
|---|---|---|---|---|---|---|---|---|
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0603<br>0805<br>1206<br>1210 | 2E = Z5U | 104 = 100 000 pF<br>The third digit signifies the multiplying factor:<br>3 = x 1 000<br>4 = x 10 000<br>5 = x 100 000 | M = ±20%<br>Z = –20 to +80% | 8 = 25 V<br>9 = 50 V | B = NiSn | 2 = 180 mm / 7" paper<br>3 = 330 mm / 13" paper<br>B = 180 mm / 7" blister<br>F = 330 mm / 13" blister<br>P = bulk case | 0 = no marking | D = BME |

### Ordering code 12NC

**2 2 X X 6 2 X X 8 X X X**

Carrier tape
22 = blister
38 = paper
54 = bulk

Size
5 = 0603 (25 V)
0 = 0805 (50 V)
1 = 1206 (50 V)
7 = 1206 (25 V)
2 = 1210 (50 V)

Capacitance value
see selection chart

Tolerance
7 = ±20%
8 = –20 to +80%

Packing
1 = 180 mm / 7" reel
5 = 330 mm / 13" reel
4 = bulk case

## NPO - 16 V to 50 V, 2-C arrays

| NPO - 16 V to 50 V | | | | |
|---|---|---|---|---|
| 2-C arrays | | | | |
| Capacitance (pF) | Last two digits of 12NC | 0405 | | |
| | | 16 V | 25 V | 50 V |
| 10 | 23 | | | |
| 12 | 24 | | | |
| 15 | 25 | | | |
| 18 | 26 | | | |
| 22 | 27 | | | |
| 27 | 28 | | | |
| 33 | 29 | | | |
| 39 | 31 | | | |
| 47 | 32 | | | |
| 56 | 33 | | | 0.65 ±0.1 |
| 68 | 34 | | | |
| 82 | 35 | | | |
| 100 | 36 | | | |
| 120 | 37 | | | |
| 150 | 38 | | | |
| 180 | 39 | | | |
| 220 | 41 | | | |
| 270 | 42 | | | |
| 330 | 43 | | | |
| 390 | 44 | | | |
| 470 | 45 | | 0.65 ±0.1 | |
| 560 | 46 | | | |
| 680 | 47 | 0.65 ±0.1 | | |
| 820 | 48 | | | |
| 1 000 | 49 | | | |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

| Thickness classes and packing quantities | | |
|---|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel | |
| | 180 mm / 7" | 330 mm / 13" |
| | Paper | Paper |
| 0.65 ±0.1 | 4 000 | 15 000 |

| Ordering information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clear text code (preferred) | | | | | | | | |
| 0405CG271J7B200 (example) | | | | | | | | |
| 0405 | CG | 271 | J | 7 | B | 2 | 0 | 0 |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0405 | CG = NPO | 271 = 270 pF<br>The third digit signifies the multiplying factor:<br>0 = x 1<br>1 = x 10<br>2 = x 100 | J = ±5%<br>K = ±10% | 7 = 16 V<br>8 = 25 V<br>9 = 50 V | B = NiSn | 2 = 180 mm / 7" paper<br>3 = 330 mm / 13" paper<br>P = bulk case | 0 = no marking | 0 = conv. ceramic |

## Ordering code 12NC

**2 2 X X  X X  2  X  1 X  X X**

Carrier tape
55 = paper
56 = bulk

Voltage
70 = 16 V
72 = 25 V
74 = 50 V

Capacitance value
see selection chart

Tolerance
5 = ±5%
6 = ±10%

Packing
1 = 180 mm / 7" reel
5 = 330 mm / 13" reel
4 = bulk case

| X7R - 10 V to 50 V | | | | | |
|---|---|---|---|---|---|
| 2-C arrays | | | | | |
| Capacitance (pF) | Last two digits of 12NC | 0405 | | | |
| | | 10 V | 16 V | 25 V | 50 V |
| 100 | 09 | | | | |
| 120 | 11 | | | | |
| 150 | 12 | | | | |
| 180 | 13 | | | | |
| 220 | 14 | | | | |
| 270 | 15 | | | | |
| 330 | 16 | | | | |
| 390 | 17 | | | | |
| 470 | 18 | | | | |
| 560 | 19 | | | | |
| 680 | 21 | | | | |
| 820 | 22 | | | | 0.65 ±0.1 |
| 1 000 | 23 | | | | |
| 1 200 | 24 | | | | |
| 1 500 | 25 | | | | |
| 1 800 | 26 | | | | |
| 2 200 | 27 | | | | |
| 2 700 | 28 | | | | |
| 3 300 | 29 | | | | |
| 3 900 | 31 | | | | |
| 4 700 | 32 | | | | |
| 5 600 | 33 | | | | |
| 6 800 | 34 | | | | |
| 8 200 | 35 | | | | |
| 10 000 | 36 | | | | |
| 12 000 | 37 | | | | |
| 15 000 | 38 | | | 0.65 ±0.1 | |
| 18 000 | 39 | | | | |
| 22 000 | 41 | | | | |
| 27 000 | 42 | | | | |
| 33 000 | 43 | | | | |
| 39 000 | 44 | | 0.65 ±0.1 | | |
| 47 000 | 45 | | | | |
| 56 000 | 46 | | | | |
| 68 000 | 47 | | | | |
| 82 000 | 48 | | | | |
| 100 000 | 49 | | | | |
| 120 000 | 51 | 0.65 ±0.1 | | | |
| 150 000 | 52 | | | | |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

### Thickness classes and packing quantities

| Thickness class (mm) | 8 mm tape width quantity per reel | |
|---|---|---|
| | 180 mm / 7" | 330 mm / 13" |
| | Paper | Paper |
| 0.65 ±0.1 | 4 000 | 15 000 |

### Ordering information

Clear text code (preferred)

04052R473J7B20D (example)

| 0405 | 2R | 473 | J | 7 | B | 2 | 0 | D |
|---|---|---|---|---|---|---|---|---|
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0405 | 2R = X7R | 473 = 47 000 pF<br>The third digit signifies the multiplying factor:<br>1 = x 10<br>2 = x 100<br>3 = x 1 000<br>4 = x 10 000 | J = ±5%<br>K = ±10% | 6 = 10 V<br>7 = 16 V<br>8 = 25 V<br>9 = 50 V | B = NiSn | 2 = 180 mm / 7" paper | 0 = no marking | D = BME |

### Ordering code 12NC

**2 2 X X X X 2 X 1 X X X**

Carrier tape
55 = paper
56 = bulk

Voltage
79 = 10 V
70 = 16 V
72 = 25 V
74 = 50 V

Capacitance value
see selection chart

Tolerance
5 = ±5%
6 = ±10%

Packing
1 = 180 mm / 7" reel
5 = 330 mm / 13" reel
4 = bulk case

| NP0 - 50 V | | | |
|---|---|---|---|
| | 4-C arrays | | |
| Capacitance (pF) | Last two digits of 12NC | 50 V | |
| | | 0508 (4 x 0402) | 0612 (4 x 0603) |
| 10 | 23 | | |
| 12 | 24 | | |
| 15 | 25 | | |
| 18 | 26 | | |
| 22 | 27 | | |
| 27 | 28 | | |
| 33 | 29 | | |
| 39 | 31 | | |
| 47 | 32 | 0.6 ±0.1 | 0.8 ±0.1 |
| 56 | 33 | | |
| 68 | 34 | | |
| 82 | 35 | | |
| 100 | 36 | | |
| 120 | 37 | | |
| 150 | 38 | | |
| 180 | 39 | | |
| 220 | 41 | | |
| 270 | 42 | | |
| 330 | 43 | | |
| 390 | 44 | | |
| 470 | 45 | | |
| 560 | 46 | | |
| 680 | 47 | | |
| 820 | 48 | | |
| 1 000 | 49 | | |
| Tape width | | 8 mm | |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.
**Note 3:** On request, 0805 also available in 0.85 ±0.1 mm.

| Thickness classes and packing quantities | |
|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel |
| | 180 mm / 7" |
| | Paper |
| 0.6 ±0.1 | 4 000 |
| 0.8 ±0.1 | 4 000 |

| Ordering information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clear text code (preferred) | | | | | | | | |
| 0508CG221J9B100 (example) | | | | | | | | |
| 0508 | CG | 221 | J | 9 | B | 1 | 0 | 0 |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0508 (4 x 0402) 0612 (4 x 0603) | CG = NP0 | 221 = 220 pF The third digit signifies the multiplying factor: 0 = x 1 1 = x 10 2 = x 100 | J = ± 5% K = ±10% | 9 = 50 V | B = NiSn | 2 = 180 mm / 7" paper | 0 = no marking | 0 = conv. ceramic |

**Ordering code 12NC**

**2 2 X X X X X X 1 X X X**

Carrier tape
55 = paper

Voltage
14 = 50 V

Size
7 = 0508 (4 x 0402)
6 = 0612 (4 x 0603)

Capacitance value
see selection chart

Tolerance
5 = ± 5%
6 = ±10%

Packing
1 = 180 mm / 7" reel

## X7R - 16 V, 4-C arrays

| X7R - 16 V | | | |
|---|---|---|---|
| Capacitance | 4-C arrays | | |
| (pF) | Last two digits of 12NC | 16 V | |
| | | 0508 (4 x 0402) | 0612 (4 x 0603) |
| 10 000 | 36 | | |
| 15 000 | 38 | | |
| 22 000 | 41 | 0.6 ±0.1 | 0.8 ±0.1 |
| 33 000 | 43 | | |
| 47 000 | 45 | | |
| 68 000 | 47 | | |
| 100 000 | 49 | | |
| Tape width | | 8 mm | |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.
**Note 3:** On request, 0805 also available in 0.85 ±0.1 mm.

| Thickness classes and packing quantities | |
|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel |
| | 180 mm / 7" |
| | Paper |
| 0.6 ±0.1 | 4 000 |
| 0.8 ±0.1 | 4 000 |

| Ordering information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clear text code (preferred) | | | | | | | | |
| 06122R103K7B10D (example) | | | | | | | | |
| 0612 | 2R | 103 | K | 7 | B | 1 | 0 | D |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0508 (4 x 0402) 0612 (4 x 0603) | 2R = X7R | 103 = 10 000 pF The third digit signifies the multiplying factor: 3 = x 1 000 4 = x 10 000 | K = ±10% | 7 = 16 V | B = NiSn | 2 = 180 mm / 7" paper | 0 = no marking | D = BME |

### Ordering code 12NC

**2 2 X X X X X X 5 X X X**

Carrier tape
55 = paper

Voltage
10 = 16 V

Size
7 = 0508 (4 x 0402)
6 = 0612 (4 x 0603)

Capacitance value
see selection chart

Tolerance
6 = ±10%

Packing
1 = 180 mm / 7" reel

| X7R - 25 V and 50 V | | | | |
|---|---|---|---|---|
| | | 4-C arrays | | |
| Capacitance (pF) | Last two digits of 12NC | 25 V 0612 (4 x 0603) | 50 V 0508 (4 x 0402) | 50 V 0612 (4 x 0603) |
| 220 | 14 | | | |
| 330 | 16 | | | |
| 470 | 18 | | | |
| 680 | 21 | | | |
| 1 000 | 23 | | 0.6 ±0.1 | |
| 1 500 | 25 | | | 0.8 ±0.1 |
| 2 200 | 27 | | | |
| 3 300 | 29 | | | |
| 4 700 | 32 | | | |
| 6 800 | 34 | | | |
| 10 000 | 36 | | | |
| 15 000 | 38 | | | |
| 22 000 | 41 | 0.8 ±0.1 | | |
| 33 000 | 43 | | | |
| 47 000 | 45 | | | |
| 68 000 | 47 | 1.2 ±0.1 | | |
| Tape width | | 8 mm | | |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

| Thickness classes and packing quantities | | |
|---|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel | |
| | 180 mm / 7" | 180 mm / 7" |
| | Paper | Blister |
| 0.6 ±0.1 | 4 000 | - |
| 0.8 ±0.1 | 4 000 | - |
| 1.2 ±0.1 | - | 3 000 |

| Ordering information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clear text code (preferred) | | | | | | | | |
| 06122R104K7B20D (example) | | | | | | | | |
| 0612 | 2R | 104 | K | 7 | B | 2 | 0 | D |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0508 (4x 0402) 0612 (4 x 0603) | 2R = X7R | 104 = 100 000 pF The third digit signifies the multiplying factor: 1 = x 10 2 = x 100 3 = x 1 000 4 = x 10 000 | K = ±10% M = ±20% | 8 = 25 V 9 = 50 V | B = NiSn | 2 = 180 mm / 7" paper B = 180 mm / 7" blister | 0 = no marking | D = BME |

Ordering code 12NC

**2 2 X X X X X X 5 X X X**

Carrier tape
50 = blister
55 = paper

Voltage
12 = 25 V
14 = 50 V

Size
6 = 0612 (4 x 0603)
7 = 0508 (4 x 0402)

Capacitance value
see selection chart

Tolerance
6 = ±10%
7 = ±20%

Packing
1 = 180 mm / 7" reel

## Y5V - 25 V, 4-C arrays

| Y5V - 25 V | | |
|---|---|---|
| | 4-C arrays | |
| Capacitance (pF) | Last two digits of 12NC | 0612 (4 x 0603) |
| 10 000 | 36 | 0.6 ±0.1 |
| 22 000 | 41 | |
| 47 000 | 45 | |
| 100 000 | 49 | |
| Tape width | | 8 mm |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

| Thickness classes and packing quantities | |
|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel |
| | 180 mm / 7" |
| | Paper |
| 0.6 ±0.1 | 4 000 |

| Ordering information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clear text code (preferred) | | | | | | | | |
| 06122F104Z8B20D (example) | | | | | | | | |
| 0612 | 2F | 104 | Z | 8 | B | 2 | 0 | D |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0612<br>(4 x 0603) | 2F = Y5V | 104 = 100 000 pF<br>The third digit signifies the multiplying factor:<br>3 = 1 000<br>4 = 10 000 | Z =<br>–20 to +80% | 8 = 25 V | B = NiSn | 2 = 180 mm / 7" paper | 0 = no marking | D = BME |

Ordering code 12NC

**2 2 X X X X X X 9 X X X**

Carrier tape
55 = paper

Voltage
12 = 25 V

Size
6 = 0612 (4 x 0603)

Capacitance value
see selection chart

Tolerance
8 = –20 to +80%

Packing
1 = 180 mm / 7" reel

| NP0 - 50 V | | |
|---|---|---|
| | Feedthrough capacitors | |
| Capacitance (pF) | Last two digits of 12NC | 1206 |
| 47 | 32 | |
| 68 | 34 | |
| 100 | 36 | |
| 150 | 38 | |
| 220 | 41 | 0.8 ±0.1 |
| 330 | 43 | |
| 470 | 45 | |
| 680 | 47 | |
| 1 000 | 49 | |
| Tape width | | 8 mm |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

| Thickness classes and packing quantities | |
|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel |
| | 180 mm / 7" |
| | Paper |
| 0.8 ±0.1 | 4 000 |

| Ordering information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clear text code (preferred) | | | | | | | | |
| 1206CG102J9B20F (example) | | | | | | | | |
| 1206 | CG | 102 | J | 9 | B | 2 | 0 | F |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 1206 | CG = NP0 | 102 = 1000 pF<br>The third digit signifies the multiplying factor:<br>0 = x 1<br>1 = x 10<br>2 = x 100 | J = ± 5%<br>K = ±10% | 9 = 50 V | B = NiSn | 2 = 180 mm / 7" paper | 0 = no marking | F = feedthrough |

### Ordering code 12NC

**2 2 X X  X X X  X 1 X X X**

Carrier tape
55 = paper

Voltage
23 = 50 V

Size
1 = 1206

Capacitance value
see selection chart

Tolerance
5 = ± 5%
6 = ±10%

Packing
1 = 180 mm / 7" reel

| X7R - 16 V to 50 V | | | | |
|---|---|---|---|---|
| | | Feedthrough capacitors | | |
| Capacitance (pF) | Last two digits of 12NC | 16 V | 25 V | 50 V |
| | | 1206 | 1206 | 1206 |
| 4 700 | 32 | | | |
| 6 800 | 34 | | | 0.8 ±0.1 |
| 10 000 | 36 | | | |
| 15 000 | 38 | | | |
| 22 000 | 41 | | | |
| 33 000 | 43 | | 0.8 ±0.1 | |
| 47 000 | 45 | | | |
| 68 000 | 47 | | | |
| 100 000 | 49 | | | |
| 680 000 | 61 | 1.2 ±0.15 | | |
| 1 000 000 | 63 | | | |
| Tape width | | 8 mm | | |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

| Thickness classes and packing quantities | | |
|---|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel | 8 mm tape width quantity per reel |
| | 180 mm / 7" | 180 mm / 7" |
| | Paper | Blister |
| 0.8 ±0.1 | 4 000 | - |
| 1.2 ±0.1 | - | 3 000 |

| Ordering information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clear text code (preferred) | | | | | | | | |
| 12062R104K9BB0F (example) | | | | | | | | |
| 1206 | 2R | 104 | K | 9 | B | B | 0 | F |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 1206 | 2R = X7R | 104 = 100 000 pF<br>The third digit signifies the multiplying factor:<br>2 = x 100<br>3 = x 1 000<br>4 = x 10 000<br>5 = x 100 000 | K = ±10%<br>M = ±20% | 7 = 16 V<br>8 = 25 V<br>9 = 50 V | B = NiSn | 2 = 180 mm / 7" paper<br>B = 180 mm / 7" blister | 0 = no marking | F = feedthrough |

### Ordering code 12NC

**2 2 X X  X X X  X 5 X X X**

Carrier tape
50 = blister
55 = paper

Voltage
53 = 16 V
52 = 25 V
23 = 50 V

Size
1 = 1206

Capacitance value
see selection chart

Tolerance
6 = ±10%
7 = ±20%

Packing
1 = 180 mm / 7" reel

## NPO - 50 V, feedthrough 4-C arrays

| NP0 - 50 V | | |
|---|---|---|
| | Feedthrough 4-C arrays | |
| Capacitance (pF) | Last two digits of 12NC | 0612 (4 x 0603) |
| 47 | 32 | |
| 56 | 33 | |
| 68 | 34 | |
| 82 | 35 | |
| 100 | 36 | |
| 120 | 37 | 0.8 ±0.1 |
| 150 | 38 | |
| 180 | 39 | |
| 220 | 41 | |
| 270 | 42 | |
| 330 | 43 | |
| 390 | 44 | |
| 470 | 45 | |
| Tape width | | 8 mm |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

| Thickness classes and packing quantities | |
|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel |
| | 180 mm / 7" |
| | Paper |
| 0.8 ±0.1 | 4 000 |

| Ordering information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clear text code (preferred) | | | | | | | | |
| 0612CG101J9B20F (example) | | | | | | | | |
| 0612 | CG | 101 | J | 9 | B | 2 | 0 | F |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0612 (4 x 0603) | CG = NP0 | 101 = 100 pF The third digit signifies the multiplying factor: 0 = x 1 1 = x 10 | J = ± 5% K = ±10% | 9 = 50 V | B = NiSn | 2 = 180 mm / 7" paper | 0 = no marking | F = feedthrough |

### Ordering code 12NC

**2 2 X X  X X X  X 1 X X X**

Carrier tape
55 = paper

Voltage
26 = 50 V

Size
6 = 0612 (4 x 0603)

Capacitance value
see selection chart

Tolerance
5 = ± 5%
6 = ±10%

Packing
1 = 180 mm / 7" reel

| X7R - 50 V | | |
|---|---|---|
| | Feedthrough 4-C arrays | |
| Capacitance (pF) | Last two digits of 12NC | 0612 (4 x 0603) |
| 1 000 | 23 | 0.8 ±0.1 |
| 1 500 | 25 | 0.8 ±0.1 |
| 2 200 | 27 | 0.8 ±0.1 |
| 3 300 | 29 | 0.8 ±0.1 |
| 4 700 | 32 | 0.8 ±0.1 |
| 6 800 | 34 | 0.8 ±0.1 |
| 10 000 | 36 | 0.8 ±0.1 |
| Tape width | | 8 mm |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

| Thickness classes and packing quantities | |
|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel |
| | 180 mm / 7" |
| | Paper |
| 0.8 ±0.1 | 4 000 |

| Ordering information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clear text code (preferred) | | | | | | | | |
| 06122R102K9B20G (example) | | | | | | | | |
| 0612 | 2R | 102 | K | 9 | B | 2 | 0 | G |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0612 (4 x 0603) | 2R = X7R | 102 = 1 000 pF The third digit signifies the multiplying factor: 2 = x 100 3 = x 1 000 | K = ±10% M = ±20% | 9 = 50 V | B = NiSn | 2 = 180 mm / 7" paper | 0 = no marking | G = FTC BME |

Ordering code 12NC

**2 2 X X X X X X 5 X X X**

Carrier tape
55 = paper

Voltage
26 = 50 V

Size
6 = 0612 (4 x 0603)

Capacitance value
see selection chart

Tolerance
6 = ±10%
7 = ±20%

Packing
1 = 180 mm / 7" reel

| NP0 - 25 V | | |
|---|---|---|
| | Ultra small MLCCs | |
| Capacitance (pF) | Last three digits of 12NC | 0201 |
| 27 | 28 | |
| 33 | 29 | |
| 39 | 31 | |
| 47 | 32 | 0.3 ±0.03 |
| 56 | 33 | |
| 68 | 34 | |
| 82 | 35 | |
| 100 | 36 | |
| Tape width | | 8 mm |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

| NP0 - 50 V | | |
|---|---|---|
| | Ultra small MLCCs | |
| Capacitance (pF) | Last three digits of 12NC | 0201 |
| 1.0 | 108 | |
| 1.2 | 128 | |
| 1.5 | 158 | |
| 1.8 | 188 | |
| 2.2 | 228 | |
| 2.7 | 278 | |
| 3.3 | 338 | |
| 3.9 | 398 | |
| 4.7 | 478 | 0.3 ±0.03 |
| 5.6 | 568 | |
| 6.8 | 688 | |
| 8.2 | 828 | |
| 10 | 109 | |
| 12 | 129 | |
| 15 | 159 | |
| 18 | 189 | |
| 22 | 229 | |
| Tape width | | 8 mm |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.
**Note 3:** on request, 1 pF to 10 pF also available in E24.

| Thickness classes and packing quantities | | | |
|---|---|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel | | Quantity per bulk case |
| | 180 mm / 7" | 330 mm / 13" | |
| | Paper | Paper | 0201 |
| 0.3 ±0.03 | 15 000 | t.b.d. | t.b.d. |

| Ordering information NPO - 25 V | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clear text code (preferred) | | | | | | | | |
| 0201CG101J8B200 (example) | | | | | | | | |
| 0201 | CG | 101 | J | 8 | B | 2 | 0 | 0 |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0201 | CG = NP0 | 101 = 100 pF<br>The third digit signifies the multiplying factor:<br>1 = x 10<br>2 = x 100<br>3 = x 1 000 | G = ±2%<br>J = ±5% | 8 = 25 V | B = NiSn | 2 = 180 mm / 7" paper<br>3 = 330 mm / 7" paper<br>P = bulk case | 0 = no marking | 0 = conv. ceramic |

Ordering code 12NC

2 2 X X X X X X 1 X X X

Carrier tape
38 = paper
54 = bulk

Voltage
91 = 25 V

Size
8 = 0201

Capacitance value
see selection chart

Tolerance
4 = ±2%
5 = ±5%

Packing
1 = 180 mm / 7" reel
7 = 330 mm / 13" reel
4 = bulk case

| Ordering information NPO - 50 V | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clear text code (preferred) | | | | | | | | |
| 0201CG479J9B200 (example) | | | | | | | | |
| 0201 | CG | 479 | J | 9 | B | 2 | 0 | 0 |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0201 | CG = NP0 | 479 = 4.7 pF<br>The third digit signifies the multiplying factor:<br>9 = x 0.1<br>0 = x 1 | C = ±0.25 pF<br>D = ±0.5 pF<br>G = ±2%<br>J = ±5% | 9 = 50 V | B = NiSn | 2 = 180 mm / 7" paper<br>3 = 330 mm / 7" paper<br>P = bulk case | 0 = no marking | 0 = conv. ceramic |

Ordering code 12NC

2 2 X X X X X X X X X X

Carrier tape
38 = paper
54 = bulk

Voltage
86 = 50 V

Size
8 = 0201

Capacitance value
see selection chart

Tolerance
4 = ±2% for C ≥10 pF
= ±0.25 pF for C <10 pF
5 = ±5% for C ≥10 pF
= ±0.5 pF for 5 pF < C <10 pF
= ±0.25 pF for C <5 pF

Packing
1 = 180 mm / 7" reel
7 = 330 mm / 13" reel
4 = bulk case

## X7R - 16 V to 50 V, ultra small MLCCs

| X7R - 16 V to 50 V | | | | |
|---|---|---|---|---|
| | | Ultra small MLCCs | | |
| Capacitance (pF) | Last two digits of 12NC | 16 V<br>0201 | 25 V<br>0201 | 50 V<br>0201 |
| 47 | 05 | | | |
| 56 | 06 | | | |
| 68 | 07 | | | |
| 82 | 08 | | | |
| 100 | 09 | | | |
| 120 | 11 | | | |
| 150 | 12 | | | 0.3 ±0.03 |
| 180 | 13 | | | |
| 220 | 14 | | | |
| 270 | 15 | | | |
| 330 | 16 | | | |
| 390 | 17 | | | |
| 470 | 18 | | | |
| 560 | 19 | | | |
| 680 | 21 | | | |
| 820 | 22 | | 0.3 ±0.03 | |
| 1 000 | 23 | | | |
| 1 200 | 24 | | | |
| 1 500 | 25 | | | |
| 1 800 | 26 | | | |
| 2 200 | 27 | 0.3 ±0.03 | | |
| 2 700 | 28 | | | |
| 3 300 | 29 | | | |
| Tape width | | 8 mm | | |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.
**Note 2:** Values in shaded cells indicate thickness class.

| Thickness classes and packing quantities | | | |
|---|---|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel | | |
| | 180 mm / 7" | 330 mm / 13" | Quantity per bulk case |
| | Paper | Paper | 0201 |
| 0.3 ±0.03 | 15 000 | t.b.d. | t.b.d. |

| Ordering information | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Clear text code (preferred) | | | | | | | | |
| 02012R102J8B20D (example) | | | | | | | | |
| 0201 | 2R | 102 | J | 7 | B | 2 | 0 | D |
| Size code | Temp. char. | Cap. in pF | Tolerance | Voltage | Termination | Packing | Marking | Range identifier |
| 0201 | 2R = X7R | 102 = 1 000 pF<br>The third digit signifies the multiplying factor:<br>0 = x 1<br>1 = x 10<br>3 = x 100 | J = ± 5%<br>K = ±10% | 7 = 16 V<br>8 = 25 V<br>9 = 50 V | B = NiSn | 2 = 180 mm / 7" paper<br>3 = 330 mm / 13" paper<br>P = bulk case | 0 = no marking | D = BME |

**Ordering code 12NC**

**2 2 X X X X X X 5 X X X**

Carrier tape
38 = paper
54 = bulk

Voltage
78 = 16 V
91 = 25 V
58 = 50 V

Size
8 = 0201

Capacitance value
see selection chart

Tolerance
5 = ± 5%
6 = ±10%

Packing
1 = 180 mm / 7" reel
5 = 330 mm / 13" reel
4 = bulk case

## NP0, X7R and Y5V - X2Y series EMI filter capacitors

| NP0 | | | | | |
|---|---|---|---|---|---|
| Size | y-capacitor | | x-capacitor | | Thickness (mm) |
| | Capacitance (pF) | $U_R$ (V) | Capacitance (pF) | $U_R$ (V) | |
| 0603 | 33 | 100 | 17 | 200 | 0.60 |
| 0603 | 100 | 100 | 50 | 200 | 0.60 |
| 0805 | 33 | 100 | 17 | 200 | 0.85 |
| 0805 | 100 | 100 | 50 | 200 | 0.85 |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.

| X7R | | | | | |
|---|---|---|---|---|---|
| Size | y-capacitor | | x-capacitor | | Thickness (mm) |
| | Capacitance (nF) | $U_R$ (V) | Capacitance (nF) | $U_R$ (V) | |
| 0603 | 10 | 25 | 5 | 50 | 0.60 |
| 0603 | 100 | 10 | 50 | 16 | 0.60 |
| 0805 | 10 | 63 | 5 | 100 | 0.85 |
| 0805 | 100 | 16 | 50 | 25 | 0.85 |
| 1206 | 100 | 63 | 50 | 100 | 1.20 |
| 1206 | 180 | 25 | 90 | 50 | 1.20 |
| 1206 | 470 | 16 | 235 | 25 | 1.20 |
| 1210 | 220 | 63 | 110 | 100 | 1.60 |
| 1210 | 560 | 25 | 280 | 50 | 1.60 |
| 1210 | 1 000 | 16 | 500 | 25 | 1.60 |
| 1812 | 470 | 63 | 235 | 100 | 1.60 |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.

| Y5V | | | | | |
|---|---|---|---|---|---|
| Size | y-capacitor | | x-capacitor | | Thickness (mm) |
| | Capacitance (nF) | $U_R$ (V) | Capacitance (nF) | $U_R$ (V) | |
| 0603 | 220 | 16 | 110 | 25 | 0.60 |
| 0805 | 470 | 16 | 235 | 25 | 0.85 |
| 1206 | 2 200 | 16 | 1 100 | 25 | 1.20 |
| 1210 | 4 700 | 16 | 2 350 | 25 | 1.60 |

**Note 1:** Case size designators are inch-based; see General Information section for metric-based case size designators.

| Thickness classes and packing quantities | | | | | |
|---|---|---|---|---|---|
| Thickness class (mm) | 8 mm tape width quantity per reel | | | | 12 mm tape width quantity per reel |
| | 0603 to 1210 | | | | 1812 |
| | 180 mm / 7" | 180 mm / 7" | 330 mm / 13" | 330 mm / 13" | 180 mm / 7" |
| | Paper | Blister | Paper | Blister | Blister |
| 0.6 ±0.1 | 4 000 | - | 25 000 | - | - |
| 0.85±0.1 | 4 000 | - | 15 000 | - | - |
| 1.2±0.15 | - | 2 500 | - | 10 000 | - |
| 1.6 ±0.15 | - | 2 500 | - | 7 000 | 1 200 |

## Ordering information

### Clear text code to 12NC cross reference

| TC | Size | y-capacitor Capacitance | Tolerance % | $U_R$ (V) | CTC ordering code | 12NC ordering code |
|---|---|---|---|---|---|---|
| NP0 | 0603 | 33 pF | ±10 | 100 | X 0603 KR NP0 0BN 330 | 2259 096 11629 |
| NP0 | 0603 | 47 pF | ±10 | 100 | X 0603 KR NP0 0BN 470 | 2259 096 11632 |
| NP0 | 0603 | 100 pF | ±10 | 100 | X 0603 KR NP0 0BN 101 | 2259 096 11636 |
| NP0 | 0805 | 33 pF | ±10 | 100 | X 0805 KR NP0 0BN 330 | 2259 090 11629 |
| NP0 | 0805 | 47 pF | ±10 | 100 | X 0805 KR NP0 0BN 470 | 2259 090 11632 |
| NP0 | 0805 | 100 pF | ±10 | 100 | X 0805 KR NP0 0BN 101 | 2259 090 11636 |
| X7R | 0603 | 10 nF | ±10 | 25 | X 0603 KR X7R 8BB 103 | 2259 076 15636 |
| X7R | 0603 | 22 nF | ±10 | 25 | X 0603 KR X7R 8BB 223 | 2259 076 15641 |
| X7R | 0603 | 47 nF | ±10 | 16 | X 0603 KR X7R 7BB 473 | 2259 056 15645 |
| X7R | 0603 | 100 nF | ±10 | 10 | X 0603 KR X7R 6BB 104 | 2259 056 15649 |
| X7R | 0805 | 10 nF | ±10 | 100 | X 0805 KR X7R 0BB 103 | 2259 090 15636 |
| X7R | 0805 | 15 nF | ±10 | 100 | X 0805 KR X7R 0BB 153 | 2259 090 15638 |
| X7R | 0805 | 39 nF | ±10 | 25 | X 0805 KR X7R 8BB 393 | 2259 070 15644 |
| X7R | 0805 | 47 nF | ±10 | 16 | X 0805 KR X7R 7BB 473 | 2259 060 15645 |
| X7R | 0805 | 100 nF | ±10 | 16 | X 0805 KR X7R 7BB 104 | 2259 060 15649 |
| X7R | 1206 | 22 nF | ±10 | 100 | X 1206 KK X7R 0BB 223 | 2259 091 25641 |
| X7R | 1206 | 47 nF | ±10 | 63 | X 1206 KK X7R 9BB 473 | 2259 081 25645 |
| X7R | 1206 | 100 nF | ±10 | 63 | X 1206 KK X7R 9BB 104 | 2259 081 25649 |
| X7R | 1206 | 180 nF | ±10 | 25 | X 1206 KK X7R 8BB 184 | 2259 071 25653 |
| X7R | 1206 | 470 nF | ±10 | 16 | X 1206 KK X7R 7BB 474 | 2259 061 25658 |
| X7R | 1210 | 100 nF | ±10 | 100 | X 1210 KK X7R 0BB 104 | 2259 092 25649 |
| X7R | 1210 | 220 nF | ±10 | 63 | X 1210 KK X7R 9BB 224 | 2259 082 25654 |
| X7R | 1210 | 560 nF | ±10 | 25 | X 1210 KK X7R 8BB 564 | 2259 072 25659 |
| X7R | 1210 | 1000 nF | ±10 | 16 | X 1210 KK X7R 7BB 105 | 2259 062 25663 |
| X7R | 1812 | 220 nF | ±10 | 100 | X 1812 KK X7R 0BB 224 | 2259 094 25654 |
| X7R | 1812 | 270 nF | ±10 | 100 | X 1812 KK X7R 0BB 274 | 2259 094 25655 |
| X7R | 1812 | 330 nF | ±10 | 100 | X 1812 KK X7R 0BB 334 | 2259 094 25656 |
| X7R | 1812 | 470 nF | ±10 | 63 | X 1812 KK X7R 9BB 474 | 2259 084 25658 |
| X7R | 1812 | 680 nF | ±10 | 25 | X 1812 KK X7R 8BB 684 | 2259 074 25661 |
| Y5V | 0603 | 220 nF | +20%/-80% | 16 | X 0603 ZR Y5V 7BB 244 | 2259 066 19854 |
| Y5V | 0805 | 470 nF | +20%/-80% | 16 | X 0805 ZR Y5V 7BB 474 | 2259 060 19858 |
| Y5V | 1206 | 2.2 µF | +20%/-80% | 16 | X 1206 ZK Y5V 7BB 225 | 2259 061 19867 |
| Y5V | 1210 | 4.7 µF | +20%/-80% | 16 | X 1210 ZK Y5V 7BB 475 | 2259 062 19872 |

**Note**: X2Y products are coded according to the properties of the y-capacitors.

### Clear text code (CTC)

**X 0805 K K X7R 9 B B 104**

Series name
X = X2Y series

Size code, inches (mm)
0603 (1608)
0805 (2012)
1206 (3216)
1210 (3225)
1812 (4532)

Capacitance tolerance
K = ±10%
Z = -20 to 80%

Packing
R = paper; 180 mm / 7"
P = paper; 330 mm / 13" reel
K = blister; 330 mm / 13" reel

Temperature characteristic
NP0
X7R
Y5V

Capacitance value pF
223 = 22 000 pF
The third digit signifies
the multiplying factor:
0 = x 1 4 = x 10 000
1 = x 10 5 = x 100 000
2 = x 100 6 = x 1 000 000
3 = x 1 000

B = X7R/Y5V
N = NP0

Termination material
B = NiSn

Rated voltage
6 = 10 V
7 = 16 V
8 = 25 V
9 = 50 V / 63 V
0 = 100 V

### 0201 sample kit

| NP0 50 V | | NP0 25 V | |
|---|---|---|---|
| Capacitance (pF) | Tolerance | Capacitance (pF) | Tolerance |
| 1 | ±0.25 pF | 27 | ±5% |
| 1.2 | ±0.25 pF | 33 | ±5% |
| 1.5 | ±0.25 pF | 39 | ±5% |
| 1.8 | ±0.25 pF | 47 | ±5% |
| 2.2 | ±0.25 pF | 56 | ±5% |
| 2.7 | ±0.25 pF | 68 | ±5% |
| 3.3 | ±0.25 pF | 82 | ±5% |
| 3.9 | ±0.25 pF | 100 | ±5% |
| 4.7 | ±0.25 pF | **X7R 50 V** | |
| 5.6 | ±0.50 pF | Capacitance (pF) | Tolerance |
| 6.8 | ±0.50 pF | 47 | ±10% |
| 8.2 | ±0.50 pF | 68 | ±10% |
| 10 | ±5% | 100 | ±10% |
| 12 | ±5% | 150 | ±10% |
| 15 | ±5% | 220 | ±10% |
| 18 | ±5% | 330 | ±10% |
| 22 | ±5% | 470 | ±10% |
| **X7R 25 V** | | **X7R 16 V** | |
| Capacitance (pF) | Tolerance | Capacitance (pF) | Tolerance |
| 680 | ±10% | 1 500 | ±10% |
| 1 000 | ±10% | 2 200 | ±10% |
| | | 3 300 | ±10% |

100 pieces per value; Ordering code:4322 044 07111.

### 0402 sample kit

| NP0 50 V | | X7R 50 V | |
|---|---|---|---|
| Capacitance (pF) | Tolerance | Capacitance (pF) | Tolerance |
| 0.47 | ±0.25 pF | 100 | ±10% |
| 0.68 | ±0.25 pF | 150 | ±10% |
| 1 | ±0.25 pF | 220 | ±10% |
| 1.5 | ±0.25 pF | 330 | ±10% |
| 2.2 | ±0.25 pF | 470 | ±10% |
| 3.3 | ±0.25 pF | 680 | ±10% |
| 4.7 | ±0.25 pF | 1 000 | ±10% |
| 6.8 | ±0.50 pF | 1 500 | ±10% |
| 10 | ±5% | 2 200 | ±10% |
| 15 | ±5% | 3 300 | ±10% |
| 22 | ±5% | **X7R 25 V** | |
| 33 | ±5% | Capacitance (pF) | Tolerance |
| 47 | ±5% | 4 700 | ±10% |
| 68 | ±5% | **X7R 16 V** | |
| 100 | ±5% | Capacitance (pF) | Tolerance |
| 150 | ±5% | 6 800 | ±10% |
| 220 | ±5% | 10 000 | ±10% |
| **Y5V 16 V** | | 15 000 | ±10% |
| Capacitance (pF) | Tolerance | 22 000 | ±10% |
| 10 000 | ±20% | | |
| 22 000 | ±20% | | |
| 47 000 | ±20% | | |
| 100 000 | ±20% | | |

95 pieces per value; Ordering code:4322 044 09911.

**0603 sample kit**

| NP0 50 V | | NP0 25 V | | X7R 16 V | |
|---|---|---|---|---|---|
| Capacitance (pF) | Tolerance | Capacitance (pF) | Tolerance | Capacitance (pF) | Tolerance |
| 0.47 | ±0.25 pF | 1 000 | ±5% | 33 000 | ±10% |
| 0.68 | ±0.25 pF | 1 500 | ±5% | 47 000 | ±10% |
| 1 | ±0.25 pF | **X7R 50 V** | | 68 000 | ±10% |
| 1.5 | ±0.25 pF | Capacitance (pF) | Tolerance | 100 000 | ±10% |
| 2.2 | ±0.25 pF | 100 | ±10% | **Y5V 50 V** | |
| 3.3 | ±0.25 pF | 150 | ±10% | Capacitance (pF) | Tolerance |
| 4.7 | ±0.25 pF | 220 | ±10% | 10 000 | ±20% |
| 6.8 | ±0.50 pF | 330 | ±10% | 22 000 | ±20% |
| 10 | ±5% | 470 | ±10% | 47 000 | ±20% |
| 15 | ±5% | 680 | ±10% | 100 000 | ±20% |
| 22 | ±5% | 1 000 | ±10% | **Y5V 16 V** | |
| 33 | ±5% | 1 500 | ±10% | Capacitance (pF) | Tolerance |
| 47 | ±5% | 2 200 | ±10% | 220 000 | ±20% |
| 68 | ±5% | 3 300 | ±10% | 470 000 | ±20% |
| 100 | ±5% | 4 700 | ±10% | | |
| 150 | ±5% | 6 800 | ±10% | | |
| 220 | ±5% | 10 000 | ±10% | | |
| 330 | ±5% | **X7R 25 V** | | | |
| 470 | ±5% | Capacitance (pF) | Tolerance | | |
| 680 | ±5% | 15 000 | ±10% | | |
| | | 22 000 | ±10% | | |

48 pieces per value; Ordering code: 4322 044 07121.

**0805 sample kit**

| NP0 50 V | | NP0 25 V | | X7R 16 V | |
|---|---|---|---|---|---|
| Capacitance (pF) | Tolerance | Capacitance (pF) | Tolerance | Capacitance (pF) | Tolerance |
| 0.47 | ±0.25 pF | 3 300 | ±5% | 150 000 | ±10% |
| 0.68 | ±0.25 pF | 4 700 | ±5% | 220 000 | ±10% |
| 1 | ±0.25 pF | **X7R 50 V** | | 330 000 | ±10% |
| 1.5 | ±0.25 pF | Capacitance (pF) | Tolerance | 470 000 | ±10% |
| 2.2 | ±0.25 pF | 220 | ±10% | **Y5V 50 V** | |
| 3.3 | ±0.25 pF | 330 | ±10% | Capacitance (pF) | Tolerance |
| 4.7 | ±0.25 pF | 470 | ±10% | 10 000 | ±20% |
| 6.8 | ±0.50 pF | 680 | ±10% | 22 000 | ±20% |
| 10 | ±5% | 1 000 | ±10% | 47 000 | ±20% |
| 15 | ±5% | 1 500 | ±10% | 100 000 | ±20% |
| 22 | ±5% | 2 200 | ±10% | 220 000 | ±20% |
| 33 | ±5% | 3 300 | ±10% | **Y5V 16 V** | |
| 47 | ±5% | 4 700 | ±10% | Capacitance (pF) | Tolerance |
| 68 | ±5% | 6 800 | ±10% | 470 000 | ±20% |
| 100 | ±5% | 10 000 | ±10% | 1 000 000 | ±20% |
| 150 | ±5% | 15 000 | ±10% | | |
| 220 | ±5% | 22 000 | ±10% | | |
| 330 | ±5% | 33 000 | ±10% | | |
| 470 | ±5% | 47 000 | ±10% | | |
| 680 | ±5% | 68 000 | ±10% | | |
| 1 000 | ±5% | 100 000 | ±10% | | |
| 1 500 | ±5% | | | | |
| 2 200 | ±5% | | | | |

48 pieces per value; Ordering code: 4322 044 07131.

## 1206 sample kit

**1206 sample kit**

**NP0 50 V**

| Capacitance (pF) | Tolerance |
|---|---|
| 0.47 | ±0.25 pF |
| 0.68 | ±0.25 pF |
| 1 | ±0.25 pF |
| 1.5 | ±0.25 pF |
| 2.2 | ±0.25 pF |
| 3.3 | ±0.25 pF |
| 4.7 | ±0.25 pF |
| 6.8 | ±0.50 pF |
| 10 | ±5% |
| 15 | ±5% |
| 22 | ±5% |
| 33 | ±5% |
| 47 | ±5% |
| 68 | ±5% |
| 100 | ±5% |
| 150 | ±5% |
| 220 | ±5% |
| 330 | ±5% |
| 470 | ±5% |
| 680 | ±5% |
| 1 000 | ±5% |
| 1 500 | ±5% |
| 2 200 | ±5% |
| 3 300 | ±5% |
| 4 700 | ±5% |
| 6 800 | ±5% |

**NP0 25 V**

| Capacitance (pF) | Tolerance |
|---|---|
| 10 000 | ±5% |

**X7R 50 V**

| Capacitance (pF) | Tolerance |
|---|---|
| 220 | ±10% |
| 330 | ±10% |
| 470 | ±10% |
| 680 | ±10% |
| 1 000 | ±10% |
| 1 500 | ±10% |
| 2 200 | ±10% |
| 3 300 | ±10% |
| 4 700 | ±10% |
| 6 800 | ±10% |
| 10 000 | ±10% |
| 15 000 | ±10% |
| 22 000 | ±10% |
| 33 000 | ±10% |
| 47 000 | ±10% |
| 68 000 | ±10% |
| 100 000 | ±10% |
| 150 000 | ±10% |
| 220 000 | ±10% |

**X7R 16 V**

| Capacitance (pF) | Tolerance |
|---|---|
| 330 000 | ±10% |
| 470 000 | ±10% |
| 680 000 | ±10% |
| 1 000 000 | ±10% |

**Y5V 50 V**

| Capacitance (pF) | Tolerance |
|---|---|
| 100 000 | ±20% |
| 220 000 | ±20% |
| 470 000 | ±20% |
| 1 000 000 | ±20% |

48 pieces per value; Ordering code: 4322 044 07141.

all sizes, all types, E1 series only

| 0402 | |
|---|---|
| **NP0 50 V** | |
| Capacitance (pF) | Tolerance |
| 1 | ±0.25 pF |
| 10 | ±5% |
| 100 | ±5% |
| **X7R 50 V** | |
| Capacitance (pF) | Tolerance |
| 100 | ±10% |
| 1 000 | ±10% |
| **X7R 16 V** | |
| Capacitance (pF) | Tolerance |
| 10 000 | ±10% |
| **Y5V 16 V** | |
| Capacitance (pF) | Tolerance |
| 100 000 | ±20% |

| 0805 | |
|---|---|
| **NP0 50 V** | |
| Capacitance (pF) | Tolerance |
| 1 | ±0.25 pF |
| 10 | ±5% |
| 100 | ±5% |
| 1 000 | ±5% |
| **X7R 50 V** | |
| Capacitance (pF) | Tolerance |
| 1 000 | ±10% |
| 10 000 | ±10% |
| 100 000 | ±10% |
| **X7R 10 V** | |
| Capacitance (pF) | Tolerance |
| 1 000 000 | ±10% |
| **Y5V 10 V** | |
| Capacitance (pF) | Tolerance |
| 4 700 000 | –20/+80% |

| 0603 | |
|---|---|
| **NP0 50 V** | |
| Capacitance (pF) | Tolerance |
| 1 | ±0.25 pF |
| 10 | ±5% |
| 100 | ±5% |
| **X7R 50 V** | |
| Capacitance (pF) | Tolerance |
| 100 | ±10% |
| 1 000 | ±10% |
| 10 000 | ±10% |
| **X7R 16 V** | |
| Capacitance (pF) | Tolerance |
| 100 000 | ±10% |
| **Y5V 10 V** | |
| Capacitance (pF) | Tolerance |
| 1 000 000 | –20/+80% |

| 1206 | |
|---|---|
| **NP0 50 V** | |
| Capacitance (pF) | Tolerance |
| 1 | ±0.25 pF |
| 10 | ±5% |
| 100 | ±5% |
| 1 000 | ±5% |
| **X7R 50 V** | |
| Capacitance (pF) | Tolerance |
| 1 000 | ±10% |
| 10 000 | ±10% |
| 100 000 | ±10% |
| **X7R 16 V** | |
| Capacitance (pF) | Tolerance |
| 1 000 000 | ±10% |
| **Y5V 10 V** | |
| Capacitance (pF) | Tolerance |
| 10 000 000 | –20/+80% |

| **Microwave 50 V** | | | | |
|---|---|---|---|---|
| Capacitance (pF) | Tolerance | Voltage | Size | Dilectric |
| 1 | ±0,25 pF | 50 V | 0603 | NP0 |
| 10 | ±5% | 50 V | 0805 | NP0 |
| 100 | ±5% | 50 V | 1206 | NP0 |
| **Array (4 x 0603)** | | | | |
| Capacitance (pF) | Tolerance | Voltage | Size | Dilectric |
| 100 | ±5% | 50 V | 1206 | NP0 |
| 1 000 | ±5% | 50 V | 1206 | NP0 |
| 10 000 | ±10% | 25 V | 1206 | X7R |
| 100 000 | ±10% | 16 V | 1206 | X7R |
| **High voltage** | | | | |
| Capacitance (pF) | Tolerance | Voltage | Size | Dilectric |
| 10 | ±5% | 3 kV | 1808 | NP0 |
| 100 | ±5% | 3 kV | 1812 | NP0 |
| 10 000 | ±10% | 1 kV | 1812 | X7R |

48 Pieces per value (95 pieces for 0402 and 25 pieces for 1812); Ordering code: 4322 045 00581.

## 12NC to description cross reference

| 12NC to description cross reference | | | | | |
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| 2222 20. .9. . . | Y5V 6.3 V, General purpose | 34 | 2250 52. .5. . . | X7R 25 V, Feedthrough capacitors | 53 |
| 2222 24. .3. . . | X5R 10 V, General purpose | 22 | 2250 53. .5. . . | X7R 16 V, Feedthrough capacitors | 53 |
| 2222 24. .5. . . | X7R 10 V, General purpose | 24 | 2254 20. .9. . . | Y5V 6.3 V, General purpose | 34 |
| 2222 24. .9. . . | Y5V 10 V, General purpose | 34 | 2254 24. .5. . . | X7R 10 V, General purpose | 24 |
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| 2222 60. .1. . . | NP0 100 V, General purpose | 14 | 2254 576 .1. . . | NP0 50 V, Microwave | 20 |
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| 2222 62. .8. . . | Z5U 25 V and 50 V, General purpose | 38 | 2254 58. . 5. . . | X7R 50 V, Ultra small MLCCs | 58 |
| 2222 78. .1. . . | NP0 16 V, General purpose | 8 | 2254 58. .5. . . | X7R 50 V, General purpose | 28 |
| 2222 78. .5. . . | X7R 16 V, General purpose | 26 | 2254 58. .9. . . | Y5V 50 V, General purpose | 36 |
| 2222 78. .9. . . | Y5V 16 V, General purpose | 36 | 2254 60. .1. . . | NP0 100 V, General purpose | 14 |
| 2222 86. . . . . . | NP0 50 V, General purpose | 12 | 2254 60. .5. . . | X7R 100 V, General purpose | 28 |
| 2222 91. .1. . . | NP0 25 V, General purpose | 10 | 2254 62. .8. . . | Z5U 25 V and 50 V, General purpose | 38 |
| 2222 91. .5. . . | X7R 25 V, General purpose | 26 | 2254 78. . 5. . . | X7R 16 V, Ultra small MLCCs | 58 |
| 2222 91. .9. . . | Y5V 25 V, General purpose | 36 | 2254 78. .1. . . | NP0 16 V, General purpose | 8 |
| 2222 93. .1. . . | NP0 200 V, High voltage | 16 | 2254 78. .5. . . | X7R 16 V, General purpose | 26 |
| 2222 93. .5. . . | X7R 200 V, High voltage | 30 | 2254 78. .9. . . | Y5V 16 V, General purpose | 36 |
| 2222 97. .1. . . | NP0 500 V, High voltage | 16 | 2254 86. . . . . . | NP0 50 V, General purpose | 12 |
| 2222 97. .5. . . | X7R 500 V, High voltage | 30 | 2254 86. . . . . . | NP0 50 V, Ultra small MLCCs | 56 |
| 2238 20. .9. . . | Y5V 6.3 V, General purpose | 34 | 2254 91. . . . . . | NP0 25 V, Ultra small MLCCs | 56 |
| 2238 24. .3. . . | X5R 10 V, General purpose | 22 | 2254 91. .5. . . | X7R 25 V, Ultra small MLCCs | 58 |
| 2238 24. .5. . . | X7R 10 V, General purpose | 24 | 2254 91. .1. . . | NP0 25 V, General purpose | 10 |
| 2238 24. .9. . . | Y5V 10 V, General purpose | 34 | 2254 91. .5. . . | X7R 25 V, General purpose | 28 |
| 2238 574 .1. . . | NP0 50 V, Microwave | 20 | 2254 91. .9. . . | Y5V 25 V, General purpose | 36 |
| 2238 576 .1. . . | NP0 50 V, Microwave | 20 | 2254 93. .1. . . | NP0 200 V, High voltage | 16 |
| 2238 578 .1. . . | NP0 50 V, Microwave | 20 | 2254 93. .5. . . | X7R 200 V, High voltage | 30 |
| 2238 58. . 5. . . | X7R 50 V, Ultra small MLCCs | 58 | 2254 97. .1. . . | NP0 500 V, High voltage | 16 |
| 2238 58. .5. . . | X7R 50 V, General purpose | 28 | 2254 97. .5. . . | X7R 500 V, High voltage | 30 |
| 2238 58. .9. . . | Y5V 50 V, General purpose | 36 | 2255 06. .5. . . | X7R 50 V, Low inductance | 33 |
| 2238 60. .1. . . | NP0 100 V, General purpose | 14 | 2255 07. .5. . . | X7R 25 V, Low inductance | 33 |
| 2238 60. .5. . . | X7R 100 V, General purpose | 28 | 2255 08. .5. . . | X7R 16 V, Low inductance | 33 |
| 2238 62. .8. . . | Z5U 25 V and 50 V, General purpose | 38 | 2255 10. .5. . . | X7R 16 V, 4-C arrays | 46 |
| 2238 78. . 5. . . | X7R 16 V, Ultra small MLCCs | 58 | 2255 12. .5. . . | X7R 25 V, 4-C arrays | 48 |
| 2238 78. .1. . . | NP0 16 V, General purpose | 8 | 2255 12. .9. . . | Y5V 25 V, 4-C arrays | 50 |
| 2238 78. .5. . . | X7R 16 V, General purpose | 26 | 2255 14. .1. . . | NP0 50 V, 4-C arrays | 44 |
| 2238 78. .9. . . | Y5V 16 V, General purpose | 36 | 2255 14. .5. . . | X7R 50 V, 4-C arrays | 48 |
| 2238 86. . . . . . | NP0 50 V, General purpose | 12 | 2255 20. .3. . . | X5R 6.3 V, General purpose | 22 |
| 2238 86. . . . . . | NP0 50 V, Ultra small MLCCs | 56 | 2255 23. .1. . . | NP0 50 V, Feedthrough capacitors | 52 |
| 2238 91. . . . . . | NP0, 25 V, Ultra small MLCCs | 56 | 2255 23. .5. . . | X7R 50 V, Feedthrough capacitors | 53 |
| 2238 91. . 5. . . | X7R 25 V, Ultra small MLCCs | 58 | 2255 26. .1. . . | NP0 50 V, Feedthrough 4-C arrays | 54 |
| 2238 91. .1. . . | NP0 25 V, General purpose | 10 | 2255 26. .5. . . | X7R 50 V, Feedthrough 4-C arrays | 55 |
| 2238 91. .5. . . | X7R 25 V, General purpose | 26 | 2255 52. .5. . . | X7R 25 V, Feedthrough capacitors | 53 |
| 2238 91. .9. . . | Y5V 25 V, General purpose | 36 | 2255 53. .5. . . | X7R 16 V, Feedthrough capacitors | 53 |
| 2238 93. .1. . . | NP0 200 V, High voltage | 16 | 2255 702 .1. . . | NP0 16 V, 2-C arrays | 40 |
| 2238 93. .5. . . | X7R 200 V, High voltage | 30 | 2255 702 .5. . . | X7R 16 V, 2-C arrays | 42 |
| 2238 97. .1. . . | NP0 500 V, High voltage | 16 | 2255 722 .1. . . | NP0 25 V, 2-C arrays | 40 |
| 2238 97. .5. . . | X7R 500 V, High voltage | 30 | 2255 722 .5. . . | X7R 25 V, 2-C arrays | 42 |
| 2250 00. .1. . . | NP0 1 kV, High voltage | 18 | 2255 742 .1. . . | NP0 50 V, 2-C arrays | 40 |
| 2250 00. .5. . . | X7R 1 kV, High voltage | 32 | 2255 742 . 5. . . | X7R 50 V, 2-C arrays | 42 |
| 2250 01. . . . . . | NP0 2 kV, High voltage | 18 | 2255 792 .5. . . | X7R 10 V, 2-C arrays | 42 |
| 2250 02. .5. . . | X7R 2 kV, High voltage | 32 | 2259 . . . . . . . . | NP0, X7R and Y5V EMI filters | 60 |
| 2250 04. .1. . . | NP0 3 kV, High voltage | 18 | 4322 044 07111 | MLCC sample kit, 0201 | 62 |
| 2250 12. .5. . . | X7R 25 V, 4-C arrays | 48 | 4322 044 07121 | MLCC sample kit, 0603 | 63 |
| 2250 14. .5. . . | X7R 50 V, 4-C arrays | 48 | 4322 044 07131 | MLCC sample kit, 0805 | 63 |
| 2250 20. .3. . . | X5R 6.3 V, General purpose | 22 | 4322 044 07141 | MLCC sample kit, 1206 | 64 |
| 2250 20. .9. . . | Y5V 6.3 V, General purpose | 34 | 4322 044 09911 | MLCC sample kit, 0402 | 62 |
| 2250 23. .5. . . | X7R 50 V, Feedthrough capacitors | 53 | 4322 045 00581 | MLCC sample kit, all sizes | 65 |
| 2250 50. .1. . . | NP0 4 kV, High voltage | 18 | | | |

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| NP0 16 V, General purpose | 2222 78. .1. . . | 8 | Y5V 6.3 V, General purpose | 2222 20. .9 . . . | 34 |
| NP0 16 V, General purpose | 2238 78. .1. . . | 8 | Y5V 6.3 V, General purpose | 2238 20. .9 . . . | 34 |
| NP0 16 V, General purpose | 2254 78. .1 . . . | 8 | Y5V 6.3 V, General purpose | 2250 20. .9 . . . | 34 |
| NP0 25 V, General purpose | 2222 91. .1 . . . | 10 | Y5V 6.3 V, General purpose | 2254 20. .9 . . . | 34 |
| NP0 25 V, General purpose | 2238 91. .1 . . . | 10 | Y5V 10 V, General purpose | 2222 24. .9 . . . | 34 |
| NP0 25 V, General purpose | 2254 91. .1 . . . | 10 | Y5V 10 V, General purpose | 2238 24. .9 . . . | 34 |
| NP0 50 V, General purpose | 2222 86. . . . . . | 12 | Y5V 10 V, General purpose | 2254 24. .9 . . . | 34 |
| NP0 50 V, General purpose | 2238 86. . . . . . | 12 | Y5V 16 V, General purpose | 2222 78. .9 . . . | 36 |
| NP0 50 V, General purpose | 2254 86. . . . . . | 12 | Y5V 16 V, General purpose | 2238 78. .9 . . . | 36 |
| NP0 100 V, General purpose | 2222 60. .1 . . . | 14 | Y5V 16 V, General purpose | 2254 78. .9 . . . | 36 |
| NP0 100 V, General purpose | 2238 60. .1 . . . | 14 | Y5V 25 V, General purpose | 2222 91. .9 . . . | 36 |
| NP0 100 V, General purpose | 2254 60. .1 . . . | 14 | Y5V 25 V, General purpose | 2238 91. .9 . . . | 36 |
| NP0 200 V, High voltage | 2222 93. .1 . . . | 16 | Y5V 25 V, General purpose | 2254 91. .9 . . . | 36 |
| NP0 200 V, High voltage | 2238 93. .1 . . . | 16 | Y5V 50 V, General purpose | 2222 58. .9 . . . | 36 |
| NP0 200 V, High voltage | 2254 93. .1 . . . | 16 | Y5V 50 V, General purpose | 2238 58. .9 . . . | 36 |
| NP0 500 V, High voltage | 2222 97. .1 . . . | 16 | Y5V 50 V, General purpose | 2254 58. .9 . . . | 36 |
| NP0 500 V, High voltage | 2238 97. .1 . . . | 16 | Z5U 25 V and 50 V, General purpose | 2222 62. .8 . . . | 38 |
| NP0 500 V, High voltage | 2254 97. .1 . . . | 16 | Z5U 25 V and 50 V, General purpose | 2238 62. .8 . . . | 38 |
| NP0 1 kV, High voltage | 2250 00. .1 . . . | 18 | Z5U 25 V and 50 V, General purpose | 2254 62. .8 . . . | 38 |
| NP0 2 kV, High voltage | 2250 02. .1 . . . | 18 | NP0 16 V, 2-C arrays | 2255 702 .1. . . | 40 |
| NP0 3 kV, High voltage | 2250 04. .1 . . . | 18 | NP0 25 V, 2-C arrays | 2255 722 .1. . . | 40 |
| NP0 4 kV, High voltage | 2250 50. .1 . . . | 18 | NP0 50 V, 2-C arrays | 2255 742 .1. . . | 40 |
| NP0 50 V, Microwave | 2238 578 .1 . . . | 20 | X7R 10 V, 2-C arrays | 2255 792 .5. . . | 42 |
| NP0 50 V, Microwave | 2254 578 .1 . . . | 20 | X7R 16 V, 2-C arrays | 2255 702 .5. . . | 42 |
| NP0 50 V, Microwave | 2238 574 .1 . . . | 20 | X7R 25 V, 2-C arrays | 2255 722 .5. . . | 42 |
| NP0 50 V, Microwave | 2254 574 .1 . . . | 20 | X7R 50 V, 2-C arrays | 2255 742 . 5. . . | 42 |
| NP0 50 V, Microwave | 2238 576 .1 . . . | 20 | NP0 50 V, 4-C arrays | 2255 14. .1 . . . | 44 |
| NP0 50 V, Microwave | 2254 576 .1 . . . | 20 | X7R 16 V, 4-C arrays | 2255 10. .5 . . . | 46 |
| X5R 6.3 V, General purpose | 2250 20. .3 . . . | 22 | X7R 25 V, 4-C arrays | 2250 12. .5 . . . | 48 |
| X5R 6.3 V, General purpose | 2255 20. .3 . . . | 22 | X7R 25 V, 4-C arrays | 2255 12. .5 . . . | 48 |
| X5R 10 V, General purpose | 2222 24. .3 . . . | 22 | X7R 50 V, 4-C arrays | 2250 14. .5 . . . | 48 |
| X5R 10 V, General purpose | 2238 24. .3 . . . | 22 | X7R 50 V, 4-C arrays | 2255 14. .5 . . . | 48 |
| X7R 10 V, General purpose | 2222 24. .5 . . . | 24 | Y5V 25 V, 4-C arrays | 2255 12. .9 . . . | 50 |
| X7R 10 V, General purpose | 2238 24. .5 . . . | 24 | NP0 50 V, Feedthrough capacitors | 2255 23. .1 . . . | 52 |
| X7R 10 V, General purpose | 2254 24. .5 . . . | 24 | X7R 16 V, Feedthrough capacitors | 2250 53. .5 . . . | 53 |
| X7R 16 V, General purpose | 2222 78. .5 . . . | 26 | X7R 16 V, Feedthrough capacitors | 2255 53. .5 . . . | 53 |
| X7R 16 V, General purpose | 2238 78. .5 . . . | 26 | X7R 25 V, Feedthrough capacitors | 2250 52. .5 . . . | 53 |
| X7R 16 V, General purpose | 2254 78. .5 . . . | 26 | X7R 25 V, Feedthrough capacitors | 2255 52. .5 . . . | 53 |
| X7R 25 V, General purpose | 2222 91. .5 . . . | 26 | X7R 50 V, Feedthrough capacitors | 2250 23. .5 . . . | 53 |
| X7R 25 V, General purpose | 2238 91. .5 . . . | 26 | X7R 50 V, Feedthrough capacitors | 2255 23. .5 . . . | 53 |
| X7R 25 V, General purpose | 2254 91. .5 . . . | 26 | NP0 50 V, Feedthrough 4-C arrays | 2255 26. .1 . . . | 54 |
| X7R 50 V, General purpose | 2222 58. .5 . . . | 28 | X7R 50 V, Feedthrough 4-C arrays | 2255 26. .5 . . . | 55 |
| X7R 50 V, General purpose | 2238 58. .5 . . . | 28 | NP0 25 V, Ultra small MLCCs | 2238 91. . . . . . | 56 |
| X7R 50 V, General purpose | 2254 58. .5 . . . | 28 | NP0 25 V, Ultra small MLCCs | 2254 91. . . . . . | 56 |
| X7R 100 V, General purpose | 2222 60. .5 . . . | 28 | NP0 50 V, Ultra small MLCCs | 2238 86. . . . . . | 56 |
| X7R 100 V, General purpose | 2238 60. .5 . . . | 28 | NP0 50 V, Ultra small MLCCs | 2254 86. . . . . . | 56 |
| X7R 100 V, General purpose | 2254 60. .5 . . . | 28 | X7R 16 V, Ultra small MLCCs | 2238 78. . 5 . . . | 58 |
| X7R 200 V, High voltage | 2222 93. .5 . . . | 30 | X7R 16 V, Ultra small MLCCs | 2254 78. . 5 . . . | 58 |
| X7R 200 V, High voltage | 2238 93. .5 . . . | 30 | X7R 25 V, Ultra small MLCCs | 2238 91. . 5 . . . | 58 |
| X7R 200 V, High voltage | 2254 93. .5 . . . | 30 | X7R 25 V, Ultra small MLCCs | 2254 91. . 5 . . . | 58 |
| X7R 500 V, High voltage | 2222 97. .5 . . . | 30 | X7R 50 V, Ultra small MLCCs | 2238 58. . 5 . . . | 58 |
| X7R 500 V, High voltage | 2238 97. .5 . . . | 30 | X7R 50 V, Ultra small MLCCs | 2254 58. . 5 . . . | 58 |
| X7R 500 V, High voltage | 2254 97. .5 . . . | 30 | NP0, X7R and Y5V EMI filters | 2259 . . . . . . . . | 60 |
| X7R 1 kV, High voltage | 2250 00. .5 . . . | 32 | MLCC sample kit 0201 | 4322 044 07111 | 62 |
| X7R 2 kV, High voltage | 2250 01. .5 . . . | 32 | MLCC sample kit 0402 | 4322 044 09911 | 62 |
| X7R 16 V, Low inductance | 2255 08. .5 . . . | 33 | MLCC sample kit 0603 | 4322 044 07121 | 63 |
| X7R 25 V, Low inductance | 2255 07. .5 . . . | 33 | MLCC sample kit 0805 | 4322 044 07131 | 63 |
| X7R 50 V, Low inductance | 2255 06. .5 . . . | 33 | MLCC sample kit 1206 | 4322 044 07141 | 64 |
| | | | MLCC sample kit, all sizes | 4322 045 00581 | 65 |

# COMPETITOR CROSS REFERENCE

## MLCC cross reference

| | Manufacturer | Yageo | Phycomp | AVX | Kemet | Murata | NIC | Panasonic | Rohm | Samsung | TDK | Vishay Vitramon |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Series** | CC | - | - | C | GRM | NMC | ECU | MCH | CL | CC | VJ |
| 2 | **Case size** | | | | | | | | | | | |
| | 0402 | 0402 | 0402 | 0402 | 0402 | 36 | 0402 | Q | 15 | 5 | 0402 | 0402 |
| | 0603 | 0603 | 0603 | 0603 | 0603 | 39 | 0603 | V | 18 | 10 | 0603 | 0603 |
| | 0805 | 0805 | 0805 | 0805 | 0805 | 40 | 0805 | N/G | 21 | 21 | 0805 | 0805 |
| | 1206 | 1206 | 1206 | 1206 | 1206 | 42-6 | 1206 | M/H | 31 | 31 | 1206 | 1206 |
| 3 | **Temperature coefficient** | | | | | | | | | | | |
| | NP0 | NP0 | CG | A | G | C0G | NP0 | C | A | C | NP0 | A |
| | X7R | X7R | 2R | C | R | X7R | X7R | B | C | B | X7R | X |
| | Z5U | Z5U | 2E | E | U | Z5U | Z5U | - | E | E | Z5U | U |
| | Y5V | Y5V | 2F | G | V | Y5V | Y5V | F | F | F | Y5V | - |
| 4 | **Nominal capacitance** | (examples) | | | | | | | | | | |
| | | 0.01 µF = 103 | | 470 pF = 471 | | | 2.2 pF = 2R2 | | | 0.5 pF = 0R5 | | |
| 5 | **Capacitance tolerance** | | B | C | D | F | G | J | K | M | Z | |
| | | | ±0.1 pF | ±0.25 pF | ±0.50 pF | ±1.0% | ±2.0% | ±5.0% | ±10% | ±20% | 80% - 20% | |
| 6 | **Rated voltage** | | | | | | | | | | | |
| | 16 V | 7 | 7 | Y | 4 | 016 | 16 | 1C | 3 | O | C | - |
| | 25 V | 8 | 8 | 3 | 3 | 025 | 25 | 1E | 2 | A | E | X |
| | 50 V | 9 | 9 | 5 | 5 | 050 | 50 | 1H | 5 | B | H | A |
| | 100 V | 0 | 0 | 1 | 1 | 100 | 100 | - | - | C | - | B |
| 7 | **Termination** | | | | | | | | | | | |
| | NiBar | B | B | T | C | (GRM) | - | - | (MCH) | N | - | X |
| | AgPd | - | - | 1 | - | (GR) | - | - | (MC) | - | - | F |
| 8 | **Packing** | | | | | | | | | | | |
| | Bulk | - | - | B | - | B | - | X | - | B | B | B |
| | Paper tape 7" reel | R | 2 | N | - | D | - | V | K | C | - | C |
| | Paper tape 13" reel | P | 3 | S | - | J | - | Y | L | D | - | P |
| | Blister tape 7" reel | K | B | M | - | L | - | W | P | E | T | T |
| | Blister tape 13" reel | F | F | R | - | K | - | Z | Q | F | - | R |
| | Bulk cassette | C | P | 7 | - | - | - | C | C | P | M | - |

| Company | Sample P/N | Description | MLCC | 0402 | 20% | 25 V | Y5V | NiBar | | 22nF |
|---|---|---|---|---|---|---|---|---|---|---|
| Yageo | CC0402MRY5V7BN223 | 1 | 2 | 5 | 8 | 3 | 6 | 7 | BME | 4 |
| | | CC | 0402 | M | R | Y5V | 8 | B | B | 223 |
| Phycomp | 04022F223M8B20D | 2 | 3 | 4 | 5 | 6 | 7 | 8 | BME | |
| | | 0402 | 2F | 223 | M | 8 | B | 2 | D | |
| AVX | 04023E223AT2 | 2 | 6 | 3 | 4 | - | 7 | 8 | | |
| | | 0402 | 3 | E | 223 | A | T | 2 | | |
| Kemet | C0402C223M3VAC | 1 | 2 | Std. | 4 | 5 | 6 | 3 | N/A | 7 |
| | | C | 0402 | C | 223 | M | 3 | V | A | C |
| Murata | GRM36Y5V223M016D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | |
| | | GRM | 36 | Y5V | 223 | M | 025 | D | | |
| Panasonic | ECUE1E223MFQ | 1 | 8 | 6 | 4 | 5 | 3 | 2 | | |
| | | ECU | E | 1E | 223 | M | F | Q | | |
| Rohm | MCH15016F223ZK | 1 | 2 | 6 | 3 | 4 | 5 | 8 | | |
| | | MCH | 15 | 025 | F | 223 | M | K | | |
| Vishay Vitramon | VJ0402-223MXXC | 1 | 2 | 3 | 4 | 5 | 7 | 6 | 8 | |
| | | VJ | 0402 | - | 223 | M | X | X | C | |

| Standard series of values in a decade according to IEC 63 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E6 series: | 10 | 15 | 22 | 33 | 47 | 68 | | | | | | |
| E12 series: | 10 | 12 | 15 | 18 | 22 | 27 | 33 | 39 | 47 | 56 | 68 | 82 |
| E24 series: | 10 | 11 | 12 | 13 | 15 | 16 | 18 | 20 | 22 | 24 | 27 | 30 |
| | 33 | 36 | 39 | 43 | 47 | 51 | 56 | 62 | 68 | 75 | 82 | 91 |
| E96 series: | 100 | 102 | 105 | 107 | 110 | 113 | 115 | 118 | 121 | 124 | 127 | 130 |
| | 133 | 137 | 140 | 143 | 147 | 150 | 154 | 158 | 162 | 165 | 169 | 174 |
| | 178 | 182 | 187 | 191 | 196 | 200 | 205 | 210 | 215 | 221 | 226 | 232 |
| | 237 | 243 | 249 | 255 | 261 | 267 | 274 | 280 | 287 | 294 | 301 | 309 |
| | 316 | 324 | 332 | 340 | 348 | 357 | 365 | 374 | 383 | 392 | 402 | 412 |
| | 422 | 432 | 442 | 453 | 464 | 475 | 487 | 499 | 511 | 523 | 536 | 549 |
| | 562 | 576 | 590 | 604 | 619 | 634 | 649 | 665 | 681 | 698 | 715 | 732 |
| | 750 | 769 | 787 | 806 | 825 | 845 | 866 | 887 | 909 | 931 | 953 | 976 |

## Ordering information 12NC

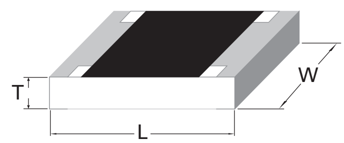
The first 8 or 9 digits of the 12 digit catalogue number are given under "Ordering information - preferred types" (see following pages).
The remaining 4 or 3 digits represent the resistance value with the last digit indicating the multiplier as shown in the table.

Example:

| | |
|---|---|
| 0.02 Ω | = 0200 or 200 |
| 0.3 Ω | = 3007 or 307 |
| 1 Ω | = 1008 or 108 |
| 33 kΩ | = 3303 or 333 |
| 10 MΩ | = 1006 or 106 |

| Last digit of 12NC | |
|---|---|
| Resistance | Last digit |
| 0.01 to 0.0976 Ω | 0 |
| 0.1 to 0.976 Ω | 7 |
| 1 to 9.76 Ω | 8 |
| 10 to 97.6 Ω | 9 |
| 100 to 976 Ω | 1 |
| 1 to 9.76 kΩ | 2 |
| 10 to 97.6 kΩ | 3 |
| 100 to 976 kΩ | 4 |
| 1 to 9.76 MΩ | 5 |
| 10 to 97.6 MΩ | 6 |

## Case size dimensions




| Size code | L (mm) | W (mm) | T (mm) | Mass (g) |
|---|---|---|---|---|
| 0201 | 0.6 | 0.3 | 0.3 | 0.02 |
| 0402 | 1.0 | 0.5 | 0.35 | 0.06 |
| 0603 | 1.6 | 0.8 | 0.45 | 0.20 |
| 0805 | 2.0 | 1.25 | 0.55 | 0.55 |
| 1206 | 3.2 | 1.6 | 0.55 | 1.0 |
| 1210 | 3.1 | 2.6 | 0.55 | 1.67 |
| 1218 | 3.0 | 4.6 | 0.44 | 3.0 |
| 2010 | 5.0 | 2.5 | 0.55 | 2.5 |
| 2512 | 6.4 | 3.1 | 0.55 | 4.25 |

## Ordering information - Clear text code (North America ONLY)

| 1-2 | 3-6 | 7-8 | 9-12 | 13 | 14 | 15-16 | 17 |
|---|---|---|---|---|---|---|---|
| X X | X X X X | X X | X X X X | X | X | X X | X |

**Series** — **Name (code1-2)**

| Series | Name |
|---|---|
| 9C | Thick film chip resistors |
| 9T | Thin film chip resistors |

**Size code (standard resistors, code 3-6)**

| | |
|---|---|
| 0201 | 0201 ( 0603 ) |
| 0402 | 0402 ( 1005 ) |
| 0603 | 0603 ( 1608 ) |
| 0805 | 0805 ( 2012 ) |
| 1206 | 1206 ( 3216 ) |
| 1210 | 1210 ( 3225 ) |
| 1218 | 1218 ( 3248 ) |
| 2010 | 2010 ( 5025 ) |
| 2512 | 2512 ( 6432 ) |
| AC34 | 0603 (1608) 4R concave array |
| AV34 | 0603 (1608) 4R convex array |
| AV22 | 0402 (1005) 2R convex array |
| AV24 | 0402 (1005) 4R convex array |
| AV28 | 0402 (1005) 8R convex array |
| RN31 | 10P8R in convex network |
| RC21 | 10P4C4R in 1608 concave network |
| FR01 | 1206 (3216) Fusible |
| FR21 | 0603 (1608) Fusible |
| SR01 | 1206 (3216) Surge |
| VR01 | 1206 (3216) High voltage 5% |
| VR02 | 1206 (3216) High voltage 1% |
| VR11 | 0805 (2012) High voltage 5% |
| VR12 | 0805 (2012) High voltage 1% |
| VR21 | 2512 (6432) High voltage 5% |
| MR22 | 2512 (6432) Power metal strip |
| V321 | 0404 (1010) RF attenuator |

**Power rating (code 7-8)**

| | | | |
|---|---|---|---|
| 1A | 1/16 W | 0.063 W | |
| 1A | 1/10 W | 0.10 W | ← upgraded from 1/16 W (0603) |
| 2A | 1/8 W | 0.125 W | |
| 3A | 1/4 W | 0.250 W | |
| 4A | 1/10 W | 0.10 W | |
| 5A | 1/3 W | 0.33 W | |
| 7A | 1/20 W | 0.05 W | |
| 8A | 1/32 W | 0.03125 W | |
| 12 | 1/2 W | 0.5 W | |
| 1W | 1 W | 1 W | |

**Resistance value (code 9-12)**

| | |
|---|---|
| 0R00 | Jumper |
| R0XX | < 0.1R |
| RXXX | 0.1R - 0.976R |
| XRXX | 1R - 9.76R |
| XXRX | 10R - 97.6R |
| XXX0 | 100R - 976R |
| XXX1 | 1K - 9.76K |
| XXX2 | 10K - 97.6K |
| XXX3 | 100K - 976K |
| XXX4 | 1M - 9.76M |
| XXX5 | 10M - 97.6M |
| XXX6 | 100M+ |
| XXdB | 1 - 20 dB |
| NXXX | RCB210 |

**Packing (code 17)**

| | |
|---|---|
| T | 5K paper |
| 3 | 10K paper |
| 4 | 20K paper |
| 5 | 4K blister |
| 6 | 5K blister |
| 7 | 50K paper |
| P | 25K bulk case |

**Special coding (code 15-16)**

| | |
|---|---|
| HF | SnPb |
| PF | 100% Sn 2372 |
| AF | NiAu |

**TCR (code 14)**

| | |
|---|---|
| A | ±25 ppm/°C |
| B | ±50 ppm/°C |
| K | ±100 ppm/°C |
| L | ±200 ppm/°C |
| E | ±250 ppm/°C |
| M | ±300 ppm/°C |
| G | ±500 ppm/°C |
| P | ±750 ppm/°C |
| H | ±1000 ppm/°C |
| I | ±1500 ppm/°C |
| J | ±2000 ppm/°C |
| N | ±3000 ppm/°C |
| - | Base on spec. |

**Tolerance (code 13)**

| | |
|---|---|
| A | ±0.05% |
| B | ±0.1%; ±0.2 dB |
| C | ±0.25%; ±0.3 dB |
| D | ±0.5 %; ±0.5 dB |
| F | ±1%; ±1 dB |
| G | ±2%; ±2 dB |
| J | ±5% |
| K | ±10% |
| N | ±20%; 0/-20% |
| R | ±30%; 0/-30% |

dB values apply to Attenuators → (B, C, D, F, G)

Right values apply to trimmable resistors → (N, R)

Example:
R-chip 0603 (RC22H), 10R0, 1%, 5K reel = 9C06031A10R0FKHFT

| General Purpose / Precison Resistors | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **SMD** | | | | | **R-Array (note)** | | | | **R-network** | **RC-network** |
| | **Thick film** | | | | | | | | | | |
| | **1206** | **0805** | **0603** | **0402** | **0201** | **4 x 0603** | **8 x 0402** | **4 x 0402** | **2 x 0402** | **1206** | **1608** |
| 5% | RC01 | RC11 | RC21 | RC31 | RC41 | ARC241<br>ARV241 | ARV381 | ARV341 | ARV321 | RNA310 | RCB210 |
| 1% (TC200) | | | | RC32 | RC42 | ARV242 | ARV382 | ARV342 | ARV322 | RNA310 | |
| 1% (TC100) | RC02H | RC12H | RC22H | | | ARC242 | | | | | |
| 1% (TC50) | RC02G | RC12G | | | | | | | | | |

TC = Temperature coefficient : ARC = conCave type termination; ARV = conVex type termination.

| High Precision Resistors | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Thick film** | | | | **Thin film** | | | | | |
| | | 0.5% | 0.25% | 0.1% | | 1% | 0.5% | 0.25% | 0.1% | 0.05% |
| 1210 | | | | | TC50 | TF520 | TF521 | TF522 | TF523 | TF524 |
| | | | | | TC25 | TF510 | TF511 | TF512 | TF513 | TF514 |
| 1206 | TC100 | | RC04H | RC05H | TC50 | TF020 | TF021 | TF022 | TF023 | TF024 |
| | TC50 | RC03G | RC04G | RC05G | TC25 | TF010 | TF011 | TF012 | TF013 | TF014 |
| 0805 | TC100 | | RC14H | RC15H | TC50 | TF120 | TF121 | TF122 | TF123 | TF124 |
| | TC50 | RC13G | RC14G | RC15G | TC25 | TF110 | TF111 | TF112 | TF113 | TF114 |
| 0603 | TC100 | RC23H | RC24H | RC25H | TC50 | TF220 | TF221 | TF222 | TF223 | TF224 |
| | | | | | TC25 | TF210 | TF211 | TF212 | TF213 | TF214 |
| 0402 | TC200 | RC33 | | | TC50 | TF320 | TF321 | TF322 | TF323 | TF324 |
| | | | | | TC25 | TF310 | TF311 | TF312 | TF313 | TF314 |

| Power Resistors | | |
|---|---|---|
| $P_{nom}$ at 70 °C | SMD | |
| | Thick film | |
| | 5% | 1% |
| 0.33 W | PRC101 | PRC102 |
| | LPRC101 | LPRC102 |
| 0.5 W | PRC111 | PRC111 |
| | LPRC111 | LPRC111 |
| 1.0 W | PRC201 | PRC201 |
| | LPRC201 | LPRC201 |
| | PRC221 | PRC221 |
| | LPRC221 | LPRC221 |
| | VPRC221 | |
| | SMD | |
| | Metal strip | |
| | 5% | 1% |
| | MPRC221 | MPRC221 |

| Application Specific Resistors | | | | |
|---|---|---|---|---|
| | 1206 | 0805 | 0603 | 0402 |
| High ohmic / High voltage | HRC01 | HRC11 | HRC21 | |
| Low ohmic | LRC01(5%) - LRC02 (1%) | LRC11/11P - LRC12/12P | LRC21(5%) - LRC22 (1%) | |
| Fusible | FRC01 | | FRC21 | |
| Surge | SRC01 | | | |
| Trimmable | RC02TR | RC12TR | RC22TR | RC32TR |
| High voltage | VRC01(5%) - VRC02 (1%) | VRC11(5%) - VRC12 (1%) | | |
| NiAu - termination* | RC01 - RC02H | RC11 - RC12 | RC21 - RC22H | RC31/RC32 |

* = Special termination for hybrid board gluing / replace AgPd termination.

| | General purpose and Precision | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Series | RC01 | RC02G | RC02H | RC11 | RC12G | RC12H | RC21 | RC22H | RC31 | RC32 | RC41 | RC42 |
| Case size | **1206** | | | **0805** | | | **0603** | | **0402** | | **0201** | |
| Tolerance | 5% | 1% | | 5% | 1% | | 5% | 1% | 5% | 1% | 5% | 1% |
| Power $P_{70}$ | 0.25 W | | | 0.125 W | | | 0.1 W | | 0.063 W | | 0.05 W | |
| Temp range (°C) | –55 to 155 | | | –55 to 155 | | | –55 to 155 | | –55 to 125 | | –55 to 125 | |
| $U_{max}$ | 200 V | | | 150 V | | | 50 V | | 50 V | | 15 V | |
| E-Series | E24 | E24/E96 | | E24 | E24/E96 | | E24 | E24/E96 | E24 | E24/E96 | E24 | E24/E96 |
| Resistance range including temperature coefficient (TC)<br>0 Ω, 0.1 Ω, 1 Ω, 10 Ω, 100 Ω, 1 kΩ, 10 kΩ, 100 kΩ, 1 MΩ, 10 MΩ, 100 MΩ | jumper<br>1 Ω<br>TC 0/+500<br>TC 200<br>10 MΩ | 90 Ω<br>TC 50<br>2.74 MΩ | jumper<br>1 Ω<br>TC 0/+500<br>TC 100<br>10 MΩ | jumper<br>1 Ω<br>TC 0/+500<br>TC 200<br>10 MΩ | 90 Ω<br>TC 50<br>2.74 MΩ | jumper<br>1 Ω<br>TC 0/+500<br>TC 100<br>10 MΩ | jumper<br>1 Ω<br>TC 0/+500<br>TC 200<br>10 MΩ | jumper<br>1 Ω<br>TC 0/+500<br>TC 100<br>10 MΩ | jumper<br>1 Ω<br>TC 0/+500<br>TC 200<br>10 MΩ | 1 Ω<br>TC 0/+500<br>TC 200<br>10 MΩ | jumper<br>10 Ω<br>TC 0/+500<br>TC 250<br>1 MΩ | 10 Ω<br>TC 0/+500<br>TC 250<br>1 MΩ |
| Remarks | | | | | | | | | | | | |

| Ordering information - Phycomp world wide - preferred types | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Series | | RC01 | RC02G | RC02H | RC11 | RC12G | RC12H | RC21 | RC22H | RC31 | RC32 | RC41 | RC42 |
| Range | | E24<br>5%<br>1 Ω-10 MΩ | E24/E96<br>1%<br>90 Ω-2.74 MΩ | E24/E96<br>1%<br>1 Ω-10 MΩ | E24<br>5%<br>1 Ω-10 MΩ | E24/E96<br>1%<br>90 Ω-2.74 MΩ | E24/E96<br>1%<br>1 Ω-10 MΩ | E24<br>5%<br>1 Ω-10 MΩ | E24/E96<br>1%<br>1 Ω-10 MΩ | E24<br>5%<br>1 Ω-10 MΩ | E24/E96<br>1%<br>1 Ω-10 MΩ | E24<br>5%<br>10 Ω-1 MΩ | E24/E96<br>1%<br>10 Ω-1 MΩ |
| Packing | | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape |
| Quantity | 5 000 | 2322 711 61... | 2322 722 2.... | 2322 724 6.... | 2322 730 61... | 2322 732 6.... | 2322 734 6.... | 2322 702 60... | 2322 704 6.... | --- | --- | --- | --- |
| | 10 000 | 2322 711 51... | 2322 722 3.... | 2322 724 7.... | 2322 730 71... | 2322 732 7.... | 2322 734 7.... | 2322 702 70... | 2322 704 7.... | 2322 705 70... | 2322 706 7.... | 2322 803 70... | 2322 804 7.... |
| | 20 000 | 2322 711 81... | --- | 2322 724 8.... | 2322 730 81... | --- | 2322 734 8.... | 2322 702 81... | 2322 704 8.... | --- | --- | --- | --- |
| | 50 000 | --- | --- | --- | --- | --- | --- | --- | --- | 2322 705 87... | 2322 706 8.... | --- | --- |
| Jumper | 5 000 | 2322 711 91032 | --- | 2322 724 92006 | 2322 730 91002 | --- | 2322 734 92006 | 2322 702 96001 | 2322 704 92006 | --- | --- | --- | --- |
| | 10 000 | 2322 711 91005 | --- | 2322 724 92007 | 2322 730 91003 | --- | 2322 734 92007 | 2322 702 97001 | 2322 704 92007 | 2322 705 91001 | --- | 2322 803 91001 | --- |
| | 20 000 | 2322 711 92004 | --- | --- | 2322 730 92002 | --- | --- | 2322 702 92002 | --- | --- | --- | --- | --- |
| | 50 000 | --- | --- | --- | --- | --- | --- | --- | --- | 2322 705 91007 | --- | --- | --- |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

| Ordering information - Phycomp North America - preferred types | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Series | | RC01 | RC02G | RC02H | RC11 | RC12G | RC12H | RC21 | RC22H | RC31 | RC32 | RC41 | RC42 |
| Range | | E24<br>5%<br>1 Ω-10 MΩ | E24/E96<br>1%<br>90 Ω-2.74 MΩ | E24/E96<br>1%<br>1 Ω-10 MΩ | E24<br>5%<br>1 Ω-10 MΩ | E24/E96<br>1%<br>90 Ω-2.74 MΩ | E24/E96<br>1%<br>1 Ω-10 MΩ | E24<br>5%<br>1 Ω-10 MΩ | E24/E96<br>1%<br>1 Ω-10 MΩ | E24<br>5%<br>1 Ω-10 MΩ | E24/E96<br>1%<br>1 Ω-10 MΩ | E24<br>5%<br>10 Ω-1 MΩ | E24/E96<br>1%<br>10 Ω-1 MΩ |
| Packing | | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape |
| Quantity | 5 000 | 9C12063A...J.HFT | 9C12063A...FBHFT | 9C12063A...F.HFT | 9C08052A...J.HFT | 9C08052A...FBHFT | 9C08052A...F.HFT | 9C06031A...J.HFT | 9C06031A...F.HFT | --- | --- | --- | --- |
| | 10 000 | 9C12063A...J.HF3 | 9C12063A...FBHF3 | 9C12063A...F.HF3 | 9C08052A...J.HF3 | 9C08052A...FBHF3 | 9C08052A...F.HF3 | 9C06031A...J.HF3 | 9C06031A...F.HF3 | 9C04021A...J.HF3 | 9C04021A...F.HF3 | 9C02017A...F.HF3 | 9C02017A...F.HF3 |
| | 20 000 | 9C12063A...J.HF4 | 9C12063A...FBHF4 | 9C12063A...F.HF4 | 9C08052A...J.HF4 | 9C08052A...FBHF4 | 9C08052A...F.HF4 | 9C06031A...J.HF4 | 9C06031A...F.HF4 | --- | --- | --- | --- |
| | 50 000 | --- | --- | --- | --- | --- | --- | --- | --- | 9C04021A...J.HF7 | 9C04021A...F.HF7 | --- | --- |
| Jumper | 5 000 | 9C12063A0R00--HFT | --- | 9C12063A0R00--HFT | 9C08052A0R00--HFT | --- | 9C08052A0R00--HFT | 9C06031A0R00--HFT | 9C06031A0R00--HFT | --- | --- | --- | --- |
| | 10 000 | 9C12063A0R00--HF3 | --- | 9C12063A0R00--HF3 | 9C08052A0R00--HF3 | --- | 9C08052A0R00--HF3 | 9C06031A0R00--HF3 | 9C06031A0R00--HF3 | 9C04021A0R00--HF3 | --- | 9C02017A0R00--HF3 | --- |
| | 20 000 | 9C12063A0R00--HF4 | --- | --- | 9C08052A0R00--HF4 | --- | --- | 9C06031A0R00--HF4 | --- | --- | --- | --- | --- |
| | 50 000 | --- | --- | --- | --- | --- | --- | --- | --- | 9C04021A0R00--HF7 | --- | --- | --- |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.

| | High precision | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Series | RC03G | RC04G | RC04H | RC05G | RC05H | RC13G | RC14G | RC14H | RC15G | RC15H |
| Case size | 1206 | | | | | 0805 | | | | |
| Tolerance | 0.5% | 0.25% | | 0.1% | | 0.5 % | 0.25 % | | 0.1 % | |
| Power $P_{70}$ | 0.25 W | 0.125 W | | | | 0.125 W | 0.1 W | | | |
| Temp range (°C) | –55 to 125 | | | | | –55 to 125 | | | | |
| $U_{max}$ | 200 V | | | | | 150 V | | | | |
| E-Series | E24/E96 | | | | | E24/E96 | | | | |
| Resistance range including temperature coefficient (TC) (0 Ω / 0.1 Ω / 1 Ω / 10 Ω / 100 Ω / 1 kΩ / 10 kΩ / 100 kΩ / 1 MΩ / 10 MΩ / 100 MΩ) | 90 Ω | 90 Ω | 100 Ω | 90 Ω | 100 Ω | 90 Ω | 90 Ω | 100 Ω | 90 Ω | 100 Ω |
| | TC 50 | TC 50 | TC 100 | TC 50 | TC 100 | TC 50 | TC 50 | TC 100 | TC 50 | TC 100 |
| | 2.74 MΩ | 2.74 MΩ | 1 MΩ | 2.74 MΩ | 1 MΩ | 2.74 MΩ | 2.74 MΩ | 1 MΩ | 2.74 MΩ | 1 MΩ |
| Remarks | thick-film technology | | | | | | | | | |

| Ordering information - Phycomp world wide - preferred types | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Series | RC03G | RC04G | RC04H | RC05G | RC05H | RC13G | RC14G | RC14H | RC15G | RC15H |
| Range | E24/E96<br>0.5%<br>90 Ω-2.74 MΩ | E24/E96<br>0.25%<br>90 Ω-2.74 MΩ | E24/E96<br>0.25%<br>100 Ω-1 MΩ | E24/E96<br>0.1%<br>90 Ω-2.74 MΩ | E24/E96<br>0.1%<br>100 Ω-1 MΩ | E24/E96<br>0.5%<br>90 Ω-2.74 MΩ | E24/E96<br>0.25%<br>90 Ω-2.74 MΩ | E24/E96<br>0.25%<br>100 Ω-1 MΩ | E24/E96<br>0.1%<br>90 Ω-2.74 MΩ | E24/E96<br>0.1%<br>100 Ω-1 MΩ |
| Packing | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape |
| Quantity 5 000 | 2322 725 2.... | 2322 707 2.... | 2350 541 0.... | 2322 708 2.... | 2350 542 0.... | 2322 738 2.... | 2322 709 2.... | 2350 544 0.... | 2322 710 2.... | 2350 545 0.... |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

| Ordering information - Phycomp North America - preferred types | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Series | RC03G | RC04G | RC04H | RC05G | RC05H | RC13G | RC14G | RC14H | RC15G | RC15H |
| Range | E24/E96<br>0.5%<br>90 Ω-2.74 MΩ | E24/E96<br>0.25%<br>90 Ω-2.74 MΩ | E24/E96<br>0.25%<br>100 Ω-1 MΩ | E24/E96<br>0.1%<br>90 Ω-2.74 MΩ | E24/E96<br>0.1%<br>100 Ω-1 MΩ | E24/E96<br>0.5%<br>90 Ω-2.74 MΩ | E24/E96<br>0.25%<br>90 Ω-2.74 MΩ | E24/E96<br>0.25%<br>100 Ω-1 MΩ | E24/E96<br>0.1%<br>90 Ω-2.74 MΩ | E24/E96<br>0.1%<br>100 Ω-1 MΩ |
| Packing | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape |
| Quantity 5 000 | 9C12063A...DBHFT | 9C12062A...CBHFT | 9C12062A...CKHFT | 9C12062A...BBHFT | 9C12062A...BKHFT | 9C08052A...DBHFT | 9C08051A...CBHFT | 9C08051A...CKHFT | 9C08051A...BBHFT | 9C08051A...CKHFT |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.

| | High precision | | | | High precision – High stability | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Series | RC23H | RC24H | RC25H | RC33 | TF510/520 | TF511/521 | TF512/522 | TF513/523 | TF514/524 |
| Case size | **0603** | | | **0402** | **1210** | | | | |
| Tolerance | 0.5 % | 0.25 % | 0.1 % | 0.5 % | 1.0 % | 0.5 % | 0.25 % | 0.1 % | 0.05 % |
| Power $P_{70}$ | 0.063 W | | | 0.063 W | 0.250 W | | | | |
| Temp range (°C) | –55 to 125 | | | –55 to 125 | –55 to 125 | | | | |
| $U_{max}$ | 50 V | | | 50 V | 200 V | | | | |
| E-Series | E24/E96 | | | E24/E96 | E24/E96 | | | | |
| Resistance range including temperature coefficient (TC) (scale: 0 Ω, 0.1 Ω, 1 Ω, 10 Ω, 100 Ω, 1 kΩ, 10 kΩ, 100 kΩ, 1 MΩ, 10 MΩ, 100 MΩ) | 100 Ω | 100 Ω | 100 Ω | 100 Ω | 10 Ω | 10 Ω | 10 Ω | 10 Ω | 10 Ω |
| | TC 100 | TC 100 | TC 100 | TC 200 | TC 25 / TC 50 | TC 25 / TC 50 | TC 25 / TC 50 | TC 25 / TC 50 | TC 25 / TC 50 |
| | 1 MΩ | 1 MΩ | 1 MΩ | 1 MΩ | 1 MΩ | 1 MΩ | 1 MΩ | 1 MΩ | 1 MΩ |
| Remarks | thick-film technology | | | | thin-film technology | | | | |

| Ordering information - Phycomp world wide - preferred types | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Series | RC23H | RC24H | RC25H | RC33 | TF510/520 | TF511 /521 | TF512/522 | TF513/523 | TF514/524 |
| Range | E24/E96<br>0.5%<br>100 Ω-1 MΩ | E24/E96<br>0.25%<br>100 Ω-1 MΩ | E24/E96<br>0.1%<br>100 Ω-1 MΩ | E24/E96<br>0.5%<br>100 Ω-1 MΩ | E24/E96<br>1%<br>10 Ω-1 MΩ | E24/E96<br>0.5%<br>10 Ω-1 MΩ | E24/E96<br>0.25%<br>10 Ω-1 MΩ | E24/E96<br>0.1%<br>10 Ω-1 MΩ | E24/E96<br>0.05%<br>10 Ω-1 MΩ |
| Packing | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape |
| Quantity 5 000 | 2350 546 0.... | 2350 547 0.... | 2350 548 0.... | --- | --- | --- | --- | --- | --- |
| 10 000 | --- | --- | --- | 2350 549 7.... | --- | --- | --- | --- | --- |
| 5 000 TC 25 | --- | --- | --- | --- | 2390 612 7.... | 2390 612 6.... | 2390 612 5.... | 2390 612 4.... | 2390 612 3.... |
| 5 000 TC 50 | --- | --- | --- | --- | 2390 412 7.... | 2390 412 6.... | 2390 412 5.... | 2390 412 4.... | 2390 412 3.... |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

| Ordering information - Phycomp North America - preferred types | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Series | RC23H | RC24H | RC25H | RC33 | TF510/520 | TF511 /521 | TF512/522 | TF513/523 | TF514/524 |
| Range | E24/E96<br>0.5%<br>100 Ω-1 MΩ | E24/E96<br>0.25%<br>100 Ω-1 MΩ | E24/E96<br>0.1%<br>100 Ω-1 MΩ | E24/E96<br>0.5%<br>100 Ω-1 MΩ | E24/E96<br>1%<br>10 Ω-1 MΩ | E24/E96<br>0.5%<br>10 Ω-1 MΩ | E24/E96<br>0.25%<br>10 Ω-1 MΩ | E24/E96<br>0.1%<br>10 Ω-1 MΩ | E24/E96<br>0.05%<br>10 Ω-1 MΩ |
| Packing | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape |
| Quantity 5 000 | 9C06031A...DKHFT | 9C06031A...CKHFT | 9C06031A...BKHFT | --- | --- | --- | --- | --- | --- |
| 10 000 | --- | --- | --- | 9C04021A...DLHFT | --- | --- | --- | --- | --- |
| 5 000 TC 25 | --- | --- | --- | --- | 9T12103A...FAHFT | 9T12103A...DAHFT | 9T12103A..CAHFT | 9T12103A...BAHFT | 9T12103A...AAHFT |
| 5 000 TC 50 | --- | --- | --- | --- | 9T12103A...FBHFT | 9T12103A...BBHFT | 9T12103A...CBHFT | 9T12103A...BBHFT | 9T12103A...ABHFT |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.

| | High precision – High stability | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Series | TF010/020 | TF011/021 | TF012/022 | TF013/023 | TF014/024 | TF110/120 | TF111/121 | TF112/122 | TF113/123 | TF114/124 |
| Case size | **1206** | | | | | **0805** | | | | |
| Tolerance | 1.0 % | 0.5 % | 0.25 % | 0.1 % | 0.05 % | 1.0 % | 0.5 % | 0.25 % | 0.1 % | 0.05 % |
| Power $P_{70}$ | 0.125 W | | | | | 0.125 W | | | | |
| Temp range (°C) | –55 to 125 | | | | | –55 to 125 | | | | |
| $U_{max}$ | 200 V | | | | | 150 V | | | | |
| E-Series | E24/E96 | | | | | E24/E96 | | | | |
| Resistance range including temperature coefficient (TC)<br>0 Ω<br>0.1 Ω<br>1 Ω<br>10 Ω<br>100 Ω<br>1 kΩ<br>10 kΩ<br>100 kΩ<br>1 MΩ<br>10 MΩ<br>100 MΩ | 10 Ω<br>TC 25 / TC 50<br>1 MΩ | 10 Ω<br>TC 25 / TC 50<br>1 MΩ | 10 Ω<br>TC 25 / TC 50<br>1 MΩ | 10 Ω<br>TC 25 / TC 50<br>1 MΩ | 10 Ω<br>TC 25 / TC 50<br>1 MΩ | 10 Ω<br>TC 25 / TC 50<br>1 MΩ | 10 Ω<br>TC 25 / TC 50<br>1 MΩ | 10 Ω<br>TC 25 / TC 50<br>1 MΩ | 10 Ω<br>TC 25 / TC 50<br>1 MΩ | 10 Ω<br>TC 25 / TC 50<br>1 MΩ |
| Remarks | thin-film technology | | | | | | | | | |

| Ordering information - Phycomp world wide - preferred types | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Series | TF010/020 | TF011/021 | TF012/022 | TF013/023 | TF014/024 | TF110/120 | TF111/121 | TF112/122 | TF113/123 | TF114/124 |
| Range | E24/E96<br>1.0%<br>10 Ω-1 MΩ | E24/E96<br>0.5%<br>10 Ω-1 MΩ | E24/E96<br>0.25%<br>10 Ω-1 MΩ | E24/E96<br>0.1%<br>10 Ω-1 MΩ | E24/E96<br>0.05%<br>10 Ω-1 MΩ | E24/E96<br>1%<br>10 Ω-1 MΩ | E24/E96<br>0.5%<br>10 Ω-1 MΩ | E24/E96<br>0.25%<br>10 Ω-1 MΩ | E24/E96<br>0.1%<br>10 Ω-1 MΩ | E24/E96<br>0.05%<br>10 Ω-1 MΩ |
| Packing | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape |
| QTY 5 000 TC 25 | 2390 611 7.... | 2390 611 6.... | 2390 611 5.... | 2390 611 4.... | 2390 611 3.... | 2390 601 7... | 2390 601 6... | 2390 601 5... | 2390 601 4... | 2390 601 3... |
| 5 000 TC 50 | 2390 411 7.... | 2390 411 6.... | 2390 411 5.... | 2390 411 4.... | 2390 411 3.... | 2390 401 7... | 2390 401 6... | 2390 401 5... | 2390 401 4... | 2390 401 3... |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

| Ordering information - Phycomp North America - preferred types | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Series | TF010/020 | TF011/021 | TF012/022 | TF013/023 | TF014/024 | TF110/120 | TF111/121 | TF112/122 | TF113/123 | TF114/124 |
| Range | E24/E96<br>1.0%<br>10 Ω-1 MΩ | E24/E96<br>0.5%<br>10 Ω-1 MΩ | E24/E96<br>0.25%<br>10 Ω-1 MΩ | E24/E96<br>0.1%<br>10 Ω-1 MΩ | E24/E96<br>0.05%<br>10 Ω-1 MΩ | E24/E96<br>1%<br>10 Ω-1 MΩ | E24/E96<br>0.5%<br>10 Ω-1 MΩ | E24/E96<br>0.25%<br>10 Ω-1 MΩ | E24/E96<br>0.1%<br>10 Ω-1 MΩ | E24/E96<br>0.05%<br>10 Ω-1 MΩ |
| Packing | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape |
| QTY 5 000 TC 25 | 9T12062A...FAHFT | 9T12062A...DAHFT | 9T12062A...CAHFT | 9T12062A...BAHFT | 9T12062A...AAHFT | 9T08052A...FAHFT | 9T08052A...DAHFT | 9T08052A...CAHFT | 9T08052A...BAHFT | 9T08052A...AAHFT |
| 5 000 TC 50 | 9T12062A...FBHFT | 9T12062A...DBHFT | 9T12062A...CBHFT | 9T12062A...BBHFT | 9T12062A...ABHFT | 9T08052A...FBHFT | 9T08052A...DBHFT | 9T08052A...CBHFT | 9T08052A...BBHFT | 9T08052A...ABHFT |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.

| | High precision – High stability | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Series | TF210/220 | TF211/221 | TF212/222 | TF213/223 | TF214/224 | TF310/320 | TF311/321 | TF312/322 | TF313/323 | TF314/324 |
| Case size | **0603** | | | | | **0402** | | | | |
| Tolerance | 1.0 % | 0.5 % | 0.25 % | 0.1 % | 0.05 % | 1.0 % | 0.5 % | 0.25 % | 0.1 % | 0.05 % |
| Power $P_{70}$ | 0.1 W | | | | | 0.063 W | | | | |
| Temp range (°C) | –55 to 125 | | | | | –55 to 125 | | | | |
| $U_{max}$ | 75 V | | | | | 50 V | | | | |
| E-Series | E24/E96 | | | | | E24/E96 | | | | |
| Resistance range including temperature coefficient (TC) | | | | | | | | | | |
| 0 Ω | | | | | | | | | | |
| 0.1 Ω | | | | | | | | | | |
| 1 Ω | | | | | | | | | | |
| 10 Ω | 10 Ω | 10 Ω | 10 Ω | 10 Ω | 10 Ω | 10 Ω | 10 Ω | 10 Ω | 10 Ω | 10 Ω |
| 100 Ω | | | | | | | | | | |
| 1 kΩ | TC 25 / TC 50 | TC 25 / TC 50 | TC 25 / TC 50 | TC 25 / TC 50 | TC 25 / TC 50 | TC 25 / TC 50 | TC 25 / TC 50 | TC 25 / TC 50 | TC 25 / TC 50 | TC 25 / TC 50 |
| 10 kΩ | | | | | | | | | | |
| 100 kΩ | | | | | | 100 kΩ | 100 kΩ | 100 kΩ | 100 kΩ | 100 kΩ |
| 1 MΩ | 332 kΩ | 332 kΩ | 332 kΩ | 332 kΩ | 332 kΩ | | | | | |
| 10 MΩ | | | | | | | | | | |
| 100 MΩ | | | | | | | | | | |
| Remarks | thin-film technology | | | | | | | | | |

| Ordering information - Phycomp world wide - preferred types | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Series | TF210/220 | TF211/221 | TF212/222 | TF213/223 | TF214/224 | TF310/320 | TF311/321 | TF312/322 | TF313/523 | TF314/324 |
| Range | E24/E96 1.0% 10 Ω-332 kΩ | E24/E96 0.5% 10 Ω-332 KkΩ | E24/E96 0.25% 10 Ω-332 kΩ | E24/E96 0.1% 10 Ω-332 kΩ | E24/E96 0.05% 10 Ω-332 kΩ | E24/E96 1% 10 Ω-100 kΩ | E24/E96 0.5% 10 Ω-100 kΩ | E24/E96 0.25% 10 Ω-100 kΩ | E24/E96 0.1% 10 Ω-100 kΩ | E24/E96 0.05% 10 Ω-100 kΩ |
| Packing | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape |
| QTY 5 000 TC 25 | 2390 604 7.... | 2390 604 6.... | 2390 604 5.... | 2390 604 4.... | 2390 604 3.... | --- | --- | --- | --- | --- |
| 5 000 TC 50 | 2390 404 7.... | 2390 404 6.... | 2390 404 5.... | 2390 404 4.... | 2390 404 3.... | --- | --- | --- | --- | --- |
| 10 000 TC 25 | --- | --- | --- | --- | --- | 2390 607 7.... | 2390 607 6.... | 2390 607 5.... | 2390 607 4.... | 2390 607 3.... |
| 10 000 TC 50 | --- | --- | --- | --- | --- | 2390 407 7.... | 2390 407 6.... | 2390 407 5.... | 2390 407 4.... | 2390 407 3.... |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

| Ordering information - Phycomp North America - preferred types | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Series | TF210/220 | TF211/221 | TF212/222 | TF213/223 | TF214/224 | TF310/320 | TF311/321 | TF312/322 | TF313/323 | TF314/324 |
| Range | E24/E96 1.0% 10 Ω-332 kΩ | E24/E96 0.5% 10 Ω-332 kΩ | E24/E96 0.25% 10 Ω-332 kΩ | E24/E96 0.1% 10 Ω-332 kΩ | E24/E96 0.05% 10 Ω-332 kΩ | E24/E96 1% 10 Ω-100 kΩ | E24/E96 0.5% 10 Ω-100 kΩ | E24/E96 0.25% 10 Ω-100 kΩ | E24/E96 0.1% 10 Ω-100 kΩ | E24/E96 0.05% 10 Ω-100 kΩ |
| Packing | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape |
| QTY 5 000 TC 25 | 9T06034A...FAHFT | 9T06034A...DAHFT | 9T06034A...CAHFT | 9T06034A...BAHFT | 9T06034A...AAHFT | --- | --- | --- | --- | --- |
| 5 000 TC 50 | 9T06034A...FBHFT | 9T06034A...DBHFT | 9T06034A...CBHFT | 9T06034A...BBHFT | 9T06034A...ABHFT | --- | --- | --- | --- | --- |
| 10 000 TC 25 | --- | --- | --- | --- | --- | 9T04021A...FAHF3 | 9T04021A...DAHF3 | 9T04021A...CAHF3 | 9T04021A...BAHF3 | 9T04021A...AAHF3 |
| 10 000 TC 50 | --- | --- | --- | --- | --- | 9T04021A...FBHF3 | 9T04021A...DBHF3 | 9T04021A...CBHF3 | 9T04021A...BBHF3 | 9T04021A...ABHF3 |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.

| | Arrays | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Series | ARC241 | ARV241 | ARC242 | ARV242 | ARV321 | ARV322 | ARV341 | ARV342 | ARV381 | ARV382 |
| Case size | 4 x 0603 (3.2 x 1.6 mm) | | | | 2 x 0402 (1.0 x 1.0 mm) | | 4 x 0402 (2.0 x 1.0 mm) | | 8 x 0402 (4.0 x 1.6 mm) | |
| Tolerance | 5 % | | 1 % | | 5 % | 1 % | 5 % | 1 % | 5 % | 1 % |
| Power $P_{70}$ | 0.063 W | | | | 0.063 W | | 0.063 W | | 0.063 W | |
| Temp range (°C) | –55 to 155 | | | | –55 to 125 | | –55 to 125 | | –55 to 125 | |
| $U_{max}$ | 50 V | | | | 50 V | | 50 V | | 50 V | |
| E-Series | E24 | | E96 | | E24 | E96 | E96 | E24 | E24 | |
| Resistance range including temperature coefficient (TC) | | | | | | | | | | |
| 0 Ω | jumper | jumper | | | jumper | | jumper | | jumper | |
| 0.1 Ω | | | | | | | | | | |
| 1 Ω | | | | | | | | | | |
| 10 Ω | 10 Ω | 10 Ω | 10 Ω | 10 Ω | 10 Ω | 10 Ω | 10 Ω | 10 Ω | 10 Ω | 10 Ω |
| 100 Ω | | | | | | | | | | |
| 1 kΩ | TC 200 | TC 200 | TC 100 | TC 200 | TC 200 | TC 200 | TC 300 | TC 300 | TC 200 | TC 200 |
| 10 kΩ | | | | | | | | | | |
| 100 kΩ | | | | | | | | | 100 kΩ | 100 kΩ |
| 1 MΩ | 1 MΩ | 1 MΩ | 1 MΩ | 1 MΩ | 1 MΩ | 1 MΩ | 1 MΩ | 1 MΩ | | |
| 10 MΩ | | | | | | | | | | |
| 100 MΩ | | | | | | | | | | |
| Remarks | Concave terminations | Convex terminations | Concave terminations | Convex terminations | Convex terminations | Convex terminations | Convex terminations | Convex terminations | Convex terminations | Convex terminations |

**Note:** On request, ARC241 and ARC242 also available in values < 10 Ω.

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| Ordering information - Phycomp world wide - preferred types | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Series | ARC241 | ARV241 | ARC242 | ARV242 | ARV321 | ARV322 | ARV341 | ARV342 | ARV381 | ARV382 |
| Range | E24<br>5%<br>10 Ω-1 MΩ | E24<br>5%<br>10 Ω-1 MΩ | E96<br>1%<br>10 Ω-1 MΩ | E24/E96<br>1%<br>10 Ω-1 MΩ | E24<br>5%<br>10 Ω-1 MΩ | E24/E96<br>1%<br>10 Ω-1 MΩ | E96<br>5%<br>10 Ω-1 MΩ | E24<br>1%<br>10 Ω-1 MΩ | E24<br>5%<br>10 Ω-100 kΩ | E24<br>1%<br>10 Ω-100 kΩ |
| Packing | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape |
| Quantity 5 000 | 2350 034 10.... | 2350 035 10.... | 2350 024 1.... | 2350 023 1.... | --- | --- | 2350 033 10.... | 2350 023 1.... | 2350 053 10.... | 2350 043 1..... |
| 10 000 | --- | --- | --- | --- | 2350 013 11... | .2350 013 2.... | 2350 033 11.... | 2350 023 2.... | --- | --- |
| Jumper 5 000 | 2350 034 91001 | 2350 035 91001 | --- | --- | 2350 013 91002 | --- | 2350 033 91002 | --- | 2350 053 91001 | --- |
| 10 000 | --- | --- | --- | --- | 2530 013 91001 | --- | 2350 033 91001 | --- | --- | --- |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

| Ordering information - Phycomp North America - preferred types | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Series | ARC241 | ARV241 | ARC242 | ARV242 | ARV321 | ARV322 | ARV341 | ARV342 | ARV381 | ARV382 |
| Range | E24<br>5%<br>10 Ω-1 MΩ | E24<br>5%<br>10 Ω-1 MΩ | E96<br>1%<br>10 Ω-1 MΩ | E24/E96<br>1%<br>10 Ω-1 MΩ | E24<br>5%<br>10 Ω-1 MΩ | E24/E96<br>1%<br>10 Ω-1 MΩ | E96<br>5%<br>10 Ω-1 MΩ | E24<br>1%<br>10 Ω-1 MΩ | E24<br>5%<br>10 Ω-100 kΩ | E24<br>1%<br>10 Ω-100 kΩ |
| Packing | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape |
| Quantity 5 000 | 9CAC341A....JLHFT | 9CAV341A....JLHFT | 9CAC341A....FKHFT | 9CAV341A....FKHFT | --- | --- | 9CAV241A....JMHFT | 9CAV241A....FMHFT | 9CAV281A....JLHFT | 9CAV281A....FLHFT |
| 10 000 | --- | --- | --- | --- | 9CAV221A....JLHF3 | 9CAV221A....FKHF3 | 9CAV241A....JMHF3 | 9CAV241A....FMHF3 | --- | --- |
| Jumper 5 000 | 9CAC341A0R00--HFT | 9CAV341A0R00--HFT | --- | --- | 9CAV221A0R00--HFT | --- | 9CAV241A0R00--HFT | --- | 9CAV281A0R00--HFT | --- |
| 10 000 | --- | --- | --- | --- | 9CAV221A0R00--HF3 | --- | 9CAV241A0R00--HF3 | --- | --- | --- |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.

| | R-Networks | | RC-Networks |
|---|---|---|---|
| Series | RNA310 | RNA310 | RCB210 |
| Case size | 8R-Network (3.3 x 1.6 mm) | | RC-Network (5.1 x 3.4 mm) |
| Tolerance | 5 % | 1 % | 5 % |
| Power $P_{70}$ | 0.031 W | | 0.063 W |
| Temp range (°C) | –55 to 125 | | –55 to 85 |
| $U_{max}$ | 25 V | | 25 V |
| E-Series | E24 | E24/E96 | E6 |
| Resistance range including temperature coefficient (TC) 0 Ω | jumper | | |
| 0.1 Ω | | | |
| 1 Ω | | | |
| 10 Ω | 10 Ω TC 0/+500 | 10 Ω TC 0/+500 | 10 Ω |
| 100 Ω | | | TC 200 |
| 1 kΩ | TC 200 | TC 200 | 1 kΩ |
| 10 kΩ | | | |
| 100 kΩ | 100 kΩ | 100 kΩ | |
| 1 MΩ | | | |
| 10 MΩ | | | |
| 100 MΩ | | | |
| Remarks | Convex terminations | | Concave terminations |

| Ordering information - Phycomp world wide - preferred types | | | |
|---|---|---|---|
| Series | RNA310 | RNA310 | RCB210 |
| Range | E24<br>5%<br>10 Ω-100 kΩ | E24 / E96<br>1%<br>10 Ω-100 kΩ | E6<br>5%<br>10 Ω-1 kΩ |
| Packing | paper tape | paper tape | blister tape |
| Quantity 5 000 | 2350 230 10.. | 2350 230 2.... | 2350 321 2.... see table (*) |
| Jumper 5 000 | 2350 230 91001 | --- | --- |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

| Ordering information - Phycomp North America - preferred types | | | |
|---|---|---|---|
| Series | RNA310 | RNA310 | RCB210 |
| Range | E24<br>5%<br>10 Ω-100 kΩ | E24 / E96<br>1%<br>10 Ω-100 kΩ | E6<br>5%<br>10 Ω-1 kΩ |
| Packing | paper tape | paper tape | blister tape |
| Quantity 5 000 | 9CRN318A....JLHFT | 9CRN318A....FLHFT | 9CRC211A....J-HF6 see table (*) |
| Jumper 5 000 | 9CRN318A0R00--HFT | --- | --- |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.

| RC networks R and C values for 12NCs and CTC codes for North America | | | | | | | |
|---|---|---|---|---|---|---|---|
| 12NC (*) | R (Ω) | C (pF) | NA(**) | 12NC (*) | R (Ω) | C (pF) | NA(**) |
| 2350 321 20001 | 33 | 180 | N001 | 2350 321 20043 | 10 | 22 | N043 |
| 2350 321 20002 | 22 | 100 | N002 | 2350 321 20044 | 10 | 47 | N044 |
| 2350 321 20003 | 100 | 47 | N003 | 2350 321 20045 | 1k | 10 | N045 |
| 2350 321 20004 | 22 | 10 | N004 | 2350 321 20046 | 220 | 10 | N046 |
| 2350 321 20005 | 47 | 22 | N005 | 2350 321 20047 | 470 | 10 | N047 |
| 2350 321 20006 | 22 | 22 | N006 | 2350 321 20048 | 22 | 180 | N048 |
| 2350 321 20007 | 22 | 47 | N007 | 2350 321 20049 | 47 | 180 | N049 |
| 2350 321 20008 | 47 | 47 | N008 | 2350 321 20051 | 4.7k | 180 | N051 |
| 2350 321 20009 | 47 | 100 | N009 | 2350 321 20052 | 100 | 180 | N052 |
| 2350 321 20011 | 100 | 100 | N011 | 2350 321 20053 | 82 | 100 | N053 |
| 2350 321 20012 | 220 | 22 | N012 | 2350 321 20054 | 68 | 10 | N054 |
| 2350 321 20013 | 220 | 47 | N013 | 2350 321 20055 | 22 | 15 | N055 |
| 2350 321 20014 | 220 | 100 | N014 | 2350 321 20056 | 33 | 15 | N056 |
| 2350 321 20015 | 470 | 22 | N015 | 2350 321 20057 | 47 | 15 | N057 |
| 2350 321 20016 | 470 | 47 | N016 | 2350 321 20058 | 68 | 15 | N058 |
| 2350 321 20017 | 470 | 100 | N017 | 2350 321 20059 | 100 | 15 | N059 |
| 2350 321 20018 | 1k | 22 | N018 | 2350 321 20061 | 33 | 22 | N061 |
| 2350 321 20019 | 1k | 47 | N019 | 2350 321 20062 | 68 | 22 | N062 |
| 2350 321 20021 | 100k | 22 | N021 | 2350 321 20063 | 10 | 33 | N063 |
| 2350 321 20022 | 33 | 47 | N022 | 2350 321 20064 | 15 | 33 | N064 |
| 2350 321 20023 | 33 | 33 | NO23 | 2350 321 20065 | 68 | 33 | N065 |
| 2350 321 20024 | 100 | 33 | N024 | 2350 321 20066 | 15 | 47 | N066 |
| 2350 321 20025 | 1k | 33 | N025 | 2350 321 20067 | 68 | 47 | N067 |
| 2350 321 20026 | 47 | 33 | N026 | 2350 321 20068 | 15 | 100 | N068 |
| 2350 321 20027 | 2.2k | 47 | N027 | 2350 321 20069 | 68 | 100 | N069 |
| 2350 321 20028 | 82k | 33 | NO28 | 2350 321 20071 | 180 | 180 | N071 |
| 2350 321 20029 | 22 | 33 | NO29 | 2350 321 20072 | 68 | 27 | N072 |
| 2350 321 20031 | 15k | 47 | N031 | 2350 321 20073 | 75 | 47 | N073 |
| 2350 321 20032 | 33 | 10 | N032 | 2350 321 20074 | 33 | 220 | N074 |
| 2350 321 20033 | 47 | 10 | N033 | 2350 321 20075 | 47 | 220 | N075 |
| 2350 321 20034 | 330 | 100 | N034 | 2350 321 20076 | 100 | 22 | N076 |
| 2350 321 20035 | 10 | 10 | N035 | 2350 321 20077 | 1k | 100 | N077 |
| 2350 321 20036 | 15 | 15 | N036 | 2350 321 20078 | 47k | 100 | N078 |
| 2350 321 20037 | 10 | 15 | N037 | 2350 321 20079 | 33 | 100 | N079 |
| 2350 321 20038 | 15 | 10 | N038 | 2350 321 20081 | 68 | 180 | N081 |
| 2350 321 20039 | 27 | 47 | N039 | 2350 321 20082 | 15 | 22 | N082 |
| 2350 321 20041 | 100 | 10 | N041 | 2350 321 20083 | 150 | 10 | N083 |
| 2350 321 20042 | 10 | 100 | N042 | | | | |

| | Power | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Series | PRC101 | | PRC111 | | PRC201 | | PRC221 | |
| Case size | **1210** | | **2010** | | **1218** | | **2512** | |
| Tolerance | 5% | 1% | 5% | 1% | 5% | 1% | 5% | 1% |
| Power $P_{70}$ | 0.33 W | | 0.5 W | | 1.0 W | | 1.0 W | |
| Temp range (°C) | –55 to 125 | | –55 to 125 | | –55 to 125 | | –55 to 125 | |
| $U_{max}$ | 200 V | | 200 V | | 200 V | | 250 V | |
| E-Series | E24 | E96 | E24 | E96 | E24 | E96 | E24 | E96 |
| Resistance range including temperature coefficient (TC)<br>0 Ω<br>0.1 Ω<br>1 Ω<br>10 Ω<br>100 Ω<br>1 kΩ<br>10 kΩ<br>100 kΩ<br>1 MΩ<br>10 MΩ<br>100 MΩ | jumper<br>1 Ω<br>TC 200<br>TC 100<br>TC 200<br>22 MΩ | 100 Ω<br>TC 100<br>TC 200<br>2.2 MΩ | jumper<br>1 Ω<br>TC 300<br>TC 200<br>TC 100<br>TC 200<br>10 MΩ | 1 Ω<br>TC 300<br>TC 200<br>TC 100<br>TC 200<br>10 MΩ | jumper<br>1 Ω<br>TC 200<br>TC 100<br>1 MΩ | 1 Ω<br>TC 200<br>TC 100<br>1 MΩ | jumper<br>1 Ω<br>TC 300<br>TC 200<br>TC 100<br>TC 200<br>10 MΩ | 1 Ω<br>TC 300<br>TC 200<br>TC 100<br>TC 200<br>10 MΩ |
| | | | SURGE POWER ON REQUEST | | | | | |
| Remarks | | | | | Termination on the long sides improves heat transfer and reduces stress | | | |

| Ordering information - Phycomp world wide - preferred types | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Series | | PRC101 | | PRC111 | | PRC201 | | PRC221 | |
| Range | | E24<br>5%<br>1 Ω-22 MΩ | E96<br>1%<br>100 Ω-2.2 MΩ | E24<br>5%<br>1 Ω-10 MΩ | E96<br>1%<br>1 Ω-10 MΩ | E24<br>5%<br>1 Ω-1 MΩ | E96<br>1%<br>1 Ω-1 MΩ | E24<br>5%<br>1 Ω-10 MΩ | E96<br>1%<br>1 Ω-10 MΩ |
| Packing | | paper tape | paper tape | blister tape | blister tape | blister tape | blister tape | blister tape | blister tape |
| Quantity | 4 000 | --- | --- | 2322 760 60... | 2322 761 6.... | --- | --- | 2322 762 60... | 2322 763 6.... |
| | 5 000 | 2390 735 70... | 2390 735 3.... | --- | --- | 2322 735 60... | 2322 735 2.... | --- | --- |
| Jumper | 4 000 | --- | --- | 2322 760 90003 | --- | --- | --- | 2322 762 90000 | --- |
| | 5 000 | 2390 735 90001 | --- | --- | --- | 2322 735 90006 | --- | --- | --- |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

| Ordering information - Phycomp North America - preferred types | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Series | | PRC101 | | PRC111 | | PRC201 | | PRC221 | |
| Range | | E24<br>5%<br>1 Ω-22 MΩ | E96<br>1%<br>100 Ω-2.2 MΩ | E24<br>5%<br>1 Ω-10 MΩ | E96<br>1%<br>1 Ω-10 MΩ | E24<br>5%<br>1 Ω-1 MΩ | E96<br>1%<br>1 Ω-1 MΩ | E24<br>5%<br>1 Ω-10 MΩ | E96<br>1%<br>1 Ω-10 MΩ |
| Packing | | paper tape | paper tape | blister tape | blister tape | blister tape | blister tape | blister tape | blister tape |
| Quantity | 4 000 | --- | --- | 9C1201012....F.HF5 | 9C1201012....J.HF5 | --- | --- | 9C25121W....J.HF5 | 9C25121W....F.HF5 |
| | 5 000 | 9C12105A....J.HFT | 9C12105A....F.HFT | --- | --- | 9C12181W....J.HF6 | 9C12181W....F.HF6 | --- | --- |
| Jumper | 4 000 | --- | --- | 9C1201120R00..HF5 | --- | --- | --- | 9C25121W0R00..HF5 | --- |
| | 5 000 | 9C12105A0R00..HFT | --- | --- | --- | 9C12181W0R00..HF6 | --- | --- | --- |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.

# PRODUCT SELECTION CHART

## Power - low ohmic

| | Power - low ohmic | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Series | LPRC101 | | LPRC111 | | LPRC201 | | LPRC221 | |
| Case size | **2512** | | **2010** | | **1218** | | **2512** | |
| Tolerance | 5% | 1% | 5% | 1% | 5% | 1% | 5% | 1% |
| Power $P_{70}$ | 0.33 W | | 0.5 W | | 1.0 W | | 1.0 W | |
| Temp range (°C) | –55 to 125 | | –55 to 125 | | –55 to 125 | | –55 to 125 | |
| $U_{max}$ | 200 V | | 200 V | | 200 V | | 250 V | |
| E-Series | E24 | E96 | E24 | E96 | E24 | E96 | E24 | E96 |
| Resistance range including temperature coefficient (TC) 0 Ω | 0.01 Ω | 0.01 Ω | 0.01 Ω | 0.02 Ω | 0.01 Ω | 0.02 Ω | 0.01 Ω | 0.05 Ω |
| 0.1 Ω | TC 2000 to TC 300 | TC 2000 to TC 300 | TC 2000 to TC 300 | TC 2000 to TC 300 | TC 2000 to TC 250 | TC 2000 to TC 250 | TC 1500 to TC 75 | TC 2000 to TC 300 |
| 1 Ω | 0.976 Ω | 0.976 Ω | 0.976 Ω | 0.976 Ω | 0.976 Ω | 0.976 Ω | 0.976 Ω | 0.976 Ω |
| 10 Ω | | | | | | | | |
| 100 Ω | | | | | | | | |
| 1 kΩ | | | | | | | | |
| 10 kΩ | | | | | | | | |
| 100 kΩ | | | | | | | | |
| 1 MΩ | | | | | | | | |
| 10 MΩ | | | | | | | | |
| 100 MΩ | | | | | | | | |
| | SURGE POWER ON REQUEST | | | | | | | |
| Remarks | | | | | Termination on the long sides improves heat transfer and reduces stress | | | |

| Ordering information - Phycomp world wide - preferred types | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Series | | LPRC101 | | LPRC111 | | LPRC201 | | LPRC221 | |
| Range | | E24 5% 0.01 Ω-0.976 Ω | E24/E96 1% 0.01 Ω-0.976 Ω | E24 5% 0.01 Ω-0.976 Ω | E24/E96 1% 0.02 Ω-0.976 Ω | E24 5% 0.01 Ω-0.976 Ω | E24/E96 1% 0.02 Ω-0.976 Ω | E24 5% 0.01 Ω-0.976 Ω | E24/E96 1% 0.05 Ω-0.976 Ω |
| Packing | | paper tape | paper tape | blister tape | blister tape | blister tape | blister tape | blister tape | blister tape |
| Quantity | 4 000 | --- | --- | 2322 760 90..0/ 60..7 | 2322 761 90..0/ 6…7 | --- | --- | 2322 762 90..0/ 60..7 | 2322 763 90..0/ 6…7 |
| | 5 000 | 2390 735 90..0/60..7 | 2390 735 3....0 | --- | --- | 2322 735 60... | 2322 735 2.... | --- | --- |
| Jumper | 4 000 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 5 000 | --- | --- | --- | --- | --- | --- | --- | --- |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

| Ordering information - Phycomp North America - preferred types | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Series | | LPRC101 | | LPRC111 | | LPRC201 | | LPRC221 | |
| Range | | E24 5% 0.01 Ω-0.976 Ω | E24/E96 1% 0.01 Ω-0.976 Ω | E24 5% 0.01 Ω-0.976 Ω | E24/E96 1% 0.02 Ω-0.976 Ω | E24 5% 0.01 Ω-0.976 Ω | E24/E96 1% 0.02 Ω-0.976 Ω | E24 5% 0.01 Ω-0.976 Ω | E24/E96 1% 0.05 Ω-0.976 Ω |
| Packing | | paper tape | paper tape | blister tape | blister tape | blister tape | blister tape | blister tape | blister tape |
| Quantity | 4 000 | 9C12105A....J.HFT | 9C12105A....F.HFT | 9C1201012....F.HF5 | 9C121012....J.HF5 | --- | --- | 9C25121W....J.HF5 | 9C25121W....F.HF5 |
| | 5 000 | --- | --- | --- | --- | 9C12181W....J.HF6 | 9C12181W....F.HF6 | --- | --- |
| Jumper | 4 000 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 5 000 | --- | --- | --- | --- | --- | --- | --- | --- |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.

| | High voltage | Metal strip | | High voltage | | | |
|---|---|---|---|---|---|---|---|
| Series | VPRC221 | MPRC221 | | VRC01 | VRC02 | VRC11 | VRC12 |
| Case size | **2512** | **2512** | | **1206** | | **0805** | |
| Tolerance | 5% | 5% | 1% | 5% | 1% | 5% | 1% |
| Power $P_{70}$ | 1.0 W | 1.0 W | | 0.25 W | | 0.125 W | |
| Temp range (°C) | –55 to 125 | –55 to 155 | | –55 to 125 | | –55 to 125 | |
| $U_{max}$ | 250 V | 250 V | | 400 V | | 300 V | |
| E-Series | E24 | 1 mΩ -10 mΩ | | E24 | E96 | E24 | E96 |
| Resistance range including temperature coefficient (TC) | | | | | | | |
| 0 Ω | | 1-2 mΩ TC200 | 1-2 mΩ TC200 | | | | |
| 0.1 Ω | | 3-10 mΩ TC75 | 3-10 mΩ TC75 | | | | |
| 1 Ω | | | | | | | |
| 10 Ω | | | | | | | |
| 100 Ω | | | | | | | |
| 1 kΩ | | | | | | | |
| 10 kΩ | | | | | | | |
| 100 kΩ | | | | 100 kΩ | 100 kΩ | 100 kΩ | 100 kΩ |
| 1 MΩ | 4.7 MΩ | | | TC 300 | TC 300 | TC 300 | TC 300 |
| | TC 200 | | | | | | |
| 10 MΩ | 16 MΩ | | | 27 MΩ | 10 MΩ | 10 MΩ | 10 MΩ |
| 100 MΩ | | | | | | | |
| Remarks | Max. overload voltage 2500 V for 1 min. | Metal strip | | Max. overload voltage 400 V for 1 min. | | Max. overload voltage 300 V for 1 min. | |

| Ordering information - Phycomp world wide - preferred types | | | | | | | |
|---|---|---|---|---|---|---|---|
| Series | VPRC221 | MPRC221 | | VRC01 | VRC02 | VRC11 | VRC12 |
| Range | E24<br>5%<br>4.7 MΩ-16 MΩ | 5%<br>1 mΩ - 10 mΩ | 1%<br>1 mΩ - 10 mΩ | E24<br>5%<br>100 kΩ-27 MΩ | E96<br>1%<br>100 kΩ-10 MΩ | E24<br>5%<br>100 kΩ - 10 MΩ | E96<br>1%<br>100 kΩ-10 MΩ |
| Packing | blister tape | blister tape | blister tape | paper tape | paper tape | paper tape | paper tape |
| Quantity 4 000 | 2322 762 98... | 2322 762 94..0 | 2322 763 95..0 | --- | --- | 2322 792 61.... | 2322 793 6.... |
| 5 000 | --- | --- | --- | 2322 790 61... | 2322 791 6.... | --- | --- |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

| Ordering information - Phycomp North America - preferred types | | | | | | | |
|---|---|---|---|---|---|---|---|
| Series | VPRC221 | MPRC221 | | VRC01 | VRC02 | VRC11 | VRC12 |
| Range | E24<br>5%<br>4.7 MΩ-16 MΩ | 5%<br>1 mΩ - 10 mΩ | 1%<br>1 mΩ - 10 mΩ | E24<br>5%<br>100 kΩ-27 MΩ | E96<br>1%<br>100 kΩ-10 MΩ | E24<br>5%<br>100 kΩ - 10 MΩ | E96<br>1%<br>100 kΩ-10 MΩ |
| Packing | blister tape | blister tape | blister tape | paper tape | paper tape | paper tape | paper tape |
| Quantity 4 000 | 9CVR211W...JLHF5 | 9CMR221W...J.HF5 | 9CMR221W...F.HF5 | --- | --- | --- | --- |
| 5 000 | --- | --- | --- | 9CVR013A...JMHFT | 9CVR023A...FMHFT | 9CVR112A...JMHFT | 9CVR122A...FMHFT |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.

| | High ohmic | | | Low ohmic | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Series | HRC01 | HRC11 | HRC21 | LRC01 | LRC02 | LRC11 | LRC12 | LRC11P | LRC12P | LRC21 | LRC22 |
| Case size | **1206** | **0805** | **0603** | **1206** | | **0805** | | **0805** | | **0603** | |
| Tolerance | 5% | 5% | 5% | 5% | 1% | 5% | 1% | 5% | 1% | 5% | 1% |
| Power $P_{70}$ | 0.25 W | 0.125 W | 0.1 W | 0.25 W | | 0.125 W | 0.1 W | 0.25 W | | 0.063 W | |
| Temp range (°C) | –55 to 125 | –55 to 125 | –55 to 155 | –55 to 125 | | –55 to 125 | | –55 to 125 | | –55 to 155 | |
| $U_{max}$ | 200 V | 150 V | 50 V | 200 V | | 150 V | | 150 V | | 50 V | |
| E-Series | E24 | E24 | E24 | E24 | E96 | E24 | E96 | E24 | E96 | E24 | E96 |
| Resistance range including temperature coefficient (TC)<br>0 Ω<br>0.1 Ω<br>1 Ω<br>10 Ω<br>100 Ω<br>1 kΩ<br>10 kΩ<br>100 kΩ<br>1 MΩ<br>10 MΩ<br>100 MΩ | 11 MΩ<br>TC 250<br>100 MΩ | 11 MΩ<br>TC 300<br>100 MΩ | 11 MΩ<br>TC 300<br>22 MΩ | 0.01 Ω<br>TC 1500 to TC 75<br>0.976 Ω | 0.01 Ω<br>TC 1500 to TC 75<br>0.976 Ω | 0.02 Ω<br>TC 1500 to TC 75<br>0.976 Ω | 0.02 Ω<br>TC 1500 to TC 75<br>0.976 Ω | 0.02 Ω<br>TC 1500 to TC 75<br>0.976 Ω | 0.02 Ω<br>TC 1500 to TC 75<br>0.976 Ω | 0.1 Ω<br>TC 600 to TC 300<br>0.976 Ω | 0.1 Ω<br>TC 600 to TC 300<br>0.976 Ω |
| Remarks | | | | | | | | | | | |

| Ordering information - Phycomp world wide - preferred types | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Series | HRC01 | HRC11 | HRC21 | LRC01 | LRC02 | LRC11 | LRC12 | LRC11P | LRC12P | LRC21 | LRC22 |
| Range | E24<br>5%<br>11 MΩ-100 MΩ | E24<br>5%<br>11 MΩ-100 MΩ | E24<br>5%<br>11 MΩ-22 MΩ | E24<br>5%<br>0.01 Ω-0.976 Ω | E96<br>1%<br>0.01 Ω-0.976 Ω | E24<br>5%<br>0.02 Ω-0.976 Ω | E96<br>1%<br>0.02 Ω-0.976 Ω | E24<br>5%<br>0.02 Ω-0.976 Ω | E96<br>1%<br>0.02 Ω-0.976 Ω | E24<br>5%<br>0.1 Ω-0.976 Ω | E96<br>1%<br>0.1 Ω-0.976 Ω |
| Packing | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape |
| Quantity 5 000 | 2350 520 10... | 2350 521 10... | 2350 522 10... | 2350 510 10... | 2350 510 12... | 2350 511 10... | 2350 510 12... | 2350 511 15... | 2350 511 17... | 2350 512 10... | 2350 512 12... |
| 5 000 | for 100 MΩ<br>2350 520 91001 | for 100 MΩ<br>2350 521 91001 | | | | | | | | | |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

| Ordering information - Phycomp North America - preferred types | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Series | HRC01 | HRC11 | HRC21 | LRC01 | LRC02 | LRC11 | LRC12 | LRC11P | LRC12P | LRC21 | LRC22 |
| Range | E24<br>5%<br>11 MΩ-100 MΩ | E24<br>5%<br>11 MΩ-100 MΩ | E24<br>5%<br>11 MΩ-22 MΩ | E24<br>5%<br>0.01 Ω-0.976 Ω | E96<br>1%<br>0.01 Ω-0.976 Ω | E24<br>5%<br>0.02 Ω-0.976 Ω | E96<br>1%<br>0.02 Ω-0.976 Ω | E24<br>5%<br>0.02 Ω-0.976 Ω | E96<br>1%<br>0.02 Ω-0.976 Ω | E24<br>5%<br>0.1 Ω-0.976 Ω | E96<br>1%<br>0.1 Ω-0.976 Ω |
| Packing | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape |
| Quantity 5 000 | 9C12063A....JEHFT | 9C08052A....JEHFT | 9C06031A....JMHFT | 9C12063A....J.HFT | 9C12063A....F.HFT | 9C08052A....J.HFT | 9C08051A....F.HFT | 9C08053A....F.HFT | 9C08053A....F.HFT | 9C06031A....J.HFT | 9C06031A....F.HFT |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.

| | Trimmable | | | | Surge | Fusible | |
|---|---|---|---|---|---|---|---|
| Series | RC02TR | RC12TR | RC22TR | RC32TR | SRC01 | FRC01 | FRC21 |
| Case size | **1206** | **0805** | **0603** | **0402** | **1206** | **1206** | **0603** |
| Tolerance | | | | | 5% | 5% | 5% |
| Power $P_{70}$ | 0.25 W | 0.125 W | 0.063 W | 0.063 W | 0.25 W | 0.125 W | 0.063 W |
| Temp range (°C) | –55 to 155 | –55 to 155 | –55 to 125 | –55 to 125 | –55 to 155 | –55 to 125 | –55 to 155 |
| $U_{max}$ | 200 V | 150 V | 50 V | 50 V | 200 V | 200 V | 50 V |
| E-Series | E24 | E24 | E24 | E24 | E24 | E24/E96 | E24 |
| Resistance range including temperature coefficient (TC)<br>0 Ω<br>0.1 Ω<br>1 Ω<br>10 Ω<br>100 Ω<br>1 kΩ<br>10 kΩ<br>100 kΩ<br>1 MΩ<br>10 MΩ<br>100 MΩ | 1 Ω<br>TC 0/+500<br>TC 100<br>TC 200<br>10 MΩ | 1 Ω<br>TC 0/+500<br>TC 100<br>TC 200<br>10 MΩ | 1 Ω<br>TC 0/+500<br>TC 100<br>TC 200<br>10 MΩ | 1 Ω<br>TC 0/+500<br>TC 100<br>TC 200<br>10 MΩ | 1 Ω<br>TC 200<br>100 kΩ | 1 Ω<br>TC 250<br>4.7 Ω<br>TC 200<br>510 Ω | 1 Ω<br>TC 0/+500<br>TC 200<br>240 Ω |
| Remarks | Tolerance<br>0 / –20% and 0 / –30% | | | | | Non flammable<br>specified interruptions | |

| Ordering information - Phycomp world wide - preferred types | | | | | | | |
|---|---|---|---|---|---|---|---|
| Series | RC02TR | RC12TR | RC22TR | RC32TR | SRC01 | FRC01 | FRC21 |
| Range | E24<br>1 Ω -10 MΩ | E24<br>1 Ω -10 MΩ | E24<br>1 Ω -10 MΩ | E24<br>1 Ω -10 MΩ | E24<br>5%<br>1 Ω -100 kΩ | E24/E96<br>5%<br>1 Ω -510 kΩ | E24<br>5%<br>1 Ω -240 kΩ |
| Packing | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape |
| Quantity 5 000 0/-20% | 2350 500 11... | 2350 501 11... | 2350 502 11... | 2350 503 21... | --- | --- | --- |
| 5 000 0/-30% | 2350 500 10... | 2350 511 10... | 2350 502 10... | 2350 503 2.... | --- | --- | --- |
| Europe 5 000 | 2322 724 94... | 2322 734 94... | on request | --- | --- | --- | --- |
| Quantity 5 000 | --- | --- | --- | --- | 2350 550 10... | 2322 750 6.... | 2322 756 60... |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

| Ordering information - Phycomp North America - preferred types | | | | | | | |
|---|---|---|---|---|---|---|---|
| Series | RC02TR | RC12TR | RC22TR | RC32TR | SRC01 | FRC01 | FRC21 |
| Range | E24<br>1 Ω -10 MΩ | E24<br>1 Ω -10 MΩ | E24<br>1 Ω -10 MΩ | E24<br>1 Ω -10 MΩ | E24<br>5%<br>1 Ω -100 kΩ | E24/E96<br>5%<br>1 Ω -510 kΩ | E24<br>5%<br>1 Ω -240 kΩ |
| Packing | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape |
| Quantity 5 000 0/-20% | 9C12063A...N.HFT | 9C08052A...N.HFT | 9C06031A...N.HFT | 9C04021A...N.HFT | --- | --- | --- |
| 5 000 0/-30% | 9C12063A...R.HFT | 9C08052A...R.HFT | 9C06031A...R.HFT | 9C04021A...R.HFT | --- | --- | --- |
| Quantity 5 000 | --- | --- | --- | --- | 9CSR013A...JLHFT | 9CFR012A...J.HFT | 9CFR211A...J.HFT |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.

# PRODUCT SELECTION CHART

## NiAu terminations

| | NiAu terminations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Series | RC01 | RC02H | RC11 | RC12 | RC21 | RC22H | RC31 | RC32 |
| Case size | **1206** | | **0805** | | **0603** | | **0402** | |
| Tolerance | 5% | 1% | 5% | 1% | 5% | 1% | 5% | 1% |
| Power $P_{70}$ | 0.25 W | | 0.125 W | | 0.063 W | | 0.063 W | |
| Temp range (°C) | –55 to 155 | | –55 to 155 | | –55 to 155 | | –55 to 155 | |
| $U_{max}$ | 200 V | | 150 V | | 50 V | | 50 V | |
| E-Series | E24 | E24/E96 | E24 | E96 | E24 | E96 | E24 | E96 |
| Resistance range including temperature coefficient (TC)<br>0 Ω<br>0.1 Ω<br>1 Ω<br>10 Ω<br>100 Ω<br>1 kΩ<br>10 kΩ<br>100 kΩ<br>1 MΩ<br>10 MΩ<br>100 MΩ | 1 Ω | 1 Ω | 1 Ω | 1 Ω | 1 Ω | 1 Ω | 1 Ω | 6.8 Ω |
| | TC 0/+500 | TC 0/+500 | TC 0/+500 | TC 0/+500 | TC 0/+500 | TC 0/+500 | TC 0/+500 | TC 0/+500 |
| | TC 200 | TC 200 | TC 200 | TC 200 | TC 200 | TC 200 | TC 200 | TC 200 |
| | 10 MΩ | 10 MΩ | 10 MΩ | 10 MΩ | 10 MΩ | 10 MΩ | 10 MΩ | 10 MΩ |
| Remarks | Special terminations for hybrid board gluing / replaces AgPd terminations | | | | | | | |

| Ordering information - Phycomp world wide - preferred types | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Series | | RC01 | RC02H | RC11 | RC12 | RC21 | RC22H | RC31 | RC32 |
| Range | | E24<br>5%<br>1 Ω -10 MΩ | E24/E96<br>1%<br>1 Ω -10 MΩ | E24<br>5%<br>1 Ω -10 MΩ | E96<br>1%<br>1 Ω -10 MΩ | E24<br>5%<br>1 Ω -10 MΩ | E96<br>1%<br>1 Ω -10 MΩ | E24<br>5%<br>1 Ω -10 MΩ | E96<br>1%<br>6.8 Ω -10 MΩ |
| Packing | | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape |
| Quantity | 5 000 | 2322 711 11... | 2322 729 1.... | 2322 730 11... | 2322 734 1.... | 2322 702 11... | 2322 704 1.... | --- | --- |
| | 10 000 | 2322 711 12... | 2322 729 2.... | 2322 730 12... | 2322 734 2.... | 2322 702 12... | 2322 704 2.... | 2322 705 12... | 2322 706 2.... |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits of the 12NC catalogue number.

| Ordering information - Phycomp North America - preferred types | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Series | | RC01 | RC02H | RC11 | RC12 | RC21 | RC22H | RC31 | RC32 |
| Range | | E24<br>5%<br>1 Ω -10 MΩ | E24/E96<br>1%<br>1 Ω -10 MΩ | E24<br>5%<br>1 Ω -10 MΩ | E96<br>1%<br>1 Ω -10 MΩ | E24<br>5%<br>1 Ω -10 MΩ | E96<br>1%<br>1 Ω -10 MΩ | E24<br>5%<br>1 Ω -10 MΩ | E96<br>1%<br>6.8 Ω -10 MΩ |
| Packing | | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape | paper tape |
| Quantity | 5 000 | 9C12063A...J.AFT | 9C12063A...F.AFT | 9C08052A....J.AFT | --- | 9C06031A...J.AFT | 9C06031A...F.AFT | --- | --- |
| | 10 000 | --- | --- | --- | --- | 9C06031A...J.AF3 | --- | 9C04021A...J.AF3 | 9C04021A....F.AF3 |

**For ordering rules:** See page 70 for E24/E96 values and the last 4 or 3 digits for the resistance value; see page 71 for the TC values in clear text code.

| Sample kit data | | | | | |
|---|---|---|---|---|---|
| Phycomp order code: 3322 073 ….. | 30092 | 30095 | 30093 | 30096 | 30094 |
| Type | RC01 | RC01 | RC11 | RC11 | RC21 |
| Size | 1206 | 1206 | 0805 | 0805 | 0603 |
| Series | E6+jumper | E24+jumper | E6+jumper | E24+jumper | E6+jumper |
| Tolerance | 5% | 5% | 5% | 5% | 5% |
| Resistor Range | 1 Ω - 10 MΩ | 1 Ω - 10 MΩ | 1 Ω - 10 MΩ | 1 Ω - 10 MΩ | 1 Ω - 10 MΩ |
| Resistance Values | 38 | 170 | 38 | 170 | 38 |
| Resistor pieces | 50 | 50 | 50 | 50 | 50 |
| Maximum Wattage | 1/4 W | 1/4 W | 1/10 W | 1/10 W | 1/16 W |
| Temp Coeff (ppm) | ± 200 | ± 200 | ± 200 | ± 200 | ± 200 |
| Maximum Voltage | 200 | 200 | 150 | 150 | 50 |

| Sample kit data | | | | |
|---|---|---|---|---|
| Phycomp order code: 3322 073 ….. | 30098 | 30099 | 30101 | 30107 |
| Type | RC02H | RC12H | RC22H | RC32H |
| Size | 1206 | 0805 | 0603 | 0402 |
| Series | E24+jumper | E24+jumper | E24+jumper | E12+jumper |
| Tolerance | 1% | 1% | 1% | 1% |
| Resistor Range | 1 Ω - 10 MΩ | 1 Ω - 10 MΩ | 1 Ω - 10 MΩ | 10 Ω - 1 MΩ |
| Resistance Values | 170 | 170 | 170 | 62 |
| Resistor pieces | 50 | 50 | 50 | 100 |
| Maximum Wattage | 1/4 W | 1/10 W | 1/16 W | 1/16 W |
| Temp Coeff (ppm) | ± 100 | ± 100 | ± 100 | ± 200 |
| Maximum Voltage | 200 | 150 | 50 | 50 |

| Sample kit data | | | | |
|---|---|---|---|---|
| Phycomp order code: 3322 073 ….. | 30097 | 30104 | 30105 | 30106 |
| Type | RC21 | RC31 | RC31 | RC31 |
| Size | 0603 | 0402 | 0402 | 0402 |
| Series | E24+jumper | E12+jumper | E24-E12 | E24+jumper |
| Tolerance | 5% | 5% | 5% | 5% |
| Resistor Range | 1 Ω - 10 MΩ | 10 Ω - 2M2 Ω | 10 Ω - 2M2 Ω | 10 Ω - 2M2 Ω |
| Resistance Values | 170 | 62 | 62 | 122 |
| Resistor pieces | 50 | 100 | 100 | 100 |
| Maximum Wattage | 1/16 W | 1/16 W | 1/16 W | 1/16 W |
| Temp Coeff (ppm) | ± 200 | ± 200 | ± 200 | ± 200 |
| Maximum Voltage | 50 | 50 | 50 | 50 |

| Sample kit data | | | | |
|---|---|---|---|---|
| Phycomp order code: 3322 073 ….. | 30108 | 30109 | 30102 | 30103 |
| Type | RC32H | RC32H | ARC241 | ARC241 |
| Size | 0402 | 0402 | 0603X4 | 0603X4 |
| Series | E24-E12 | E24+jumper | E6+jumper | E12+jumper |
| Tolerance | 1% | 1% | 5% | 5% |
| Resistor Range | 10 Ω - 1 MΩ | 10 Ω - 1 MΩ | 10 Ω - 1 MΩ | 10 Ω - 1 MΩ |
| Resistance Values | 61 | 122 | 32 | 62 |
| Resistor pieces | 100 | 100 | 50 | 50 |
| Maximum Wattage | 1/16 W | 1/16 W | 1/16 W | 1/16 W |
| Temp Coeff (ppm) | ± 200 | ± 200 | ± 200 | ± 200 |
| Maximum Voltage | 50 | 50 | 50 | 50 |

# COMPETITOR CROSS REFERENCE

## Chip resistor cross reference

| | Manufacturer | | Yageo | Vitrohm | Phycomp | AVX | BC Comp | Kamaya | KOA | Panasonic | Rohm | Vishay | Vishay dale |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Series** | | RC | RGC | RC | CR | DC. | RMC | RM73/RK73 | ERJ | MCR | D | CR/CRCW |
| 2 | 0402 | 1/16 W | 0402 | 512-0 | 31 | 05 | - | RMC | 1E | 2GE | 01 | 10 | 0402 |
| | 0603 | 1/16 W | 0603 | 513-0 | 21/22H | 10 | DCT 0603 | 1/16 | 1J | 3GS | 03 | 11 | 0603 |
| | 0805 | 1/10 W | 0805 | 503-0 | 11/12H | 21 | DCU 0805 | 1/10 | 2A | 6GE | 10 | 12 | 0805 |
| | 0805 | 1/8 W | 0805 | 503-0 | 11/12H | - | DCU 0805 | 1/8 | 2A | - | - | 12 | 0805 |
| | 1206 | 1/8 W | 1206 | 502-0 | 01/02H | 32 | DCA 1206 | - | 2B | 8GE | 18 | 25 | 1206 |
| | 1206 | 1/4 W | 1206 | 502-0 | 01/02H | - | DCA 1206 | - | 2B | 8GC | - | 25 | 1206 |
| | 1210 | 1/4 W | 1210 | 507-0 | - | - | - | 1/4 | 2E | 14 | 25 | - | 1210 |
| | 2010 | 1/2 W | 2010 | 508-0 | - | - | - | 1/2 | 2H | 12(1812) | 50 | - | 2010 |
| | 2512 | 1 W | 2512 | 509-0 | - | 63 | - | 1 | 3A | 1W | 100 | - | 2512 |
| 3 | **Tolerance** | | K | | J | | G | | F | | | | |
| | | | ±10% | | ±5% | | ±2% | | ±1% | | | | |
| 4 | **Nominal resistance value** | | 3-digit code | | | | | | 4-digit code | | | | |
| | | | 103 =10k, 471 = 470R | | | | | | 1002 = 10k, 1471 = 1k47 | | | | |
| 5 | **Packing** | | | | | | | | | | | | |
| | Paper tape | | R | 7A | - | T | PA | TP | TD | V | EZH | - | RT1 |
| | Plastic tape | | K | 7D | - | H | - | TE | TE | U | JZH | - | RT2 |
| | 7" Reel | | 07 | 7A | - | | PA | - | - | - | - | - | - |
| | 10" Reel | | 10 | - | - | D | - | - | - | - | FHZ | - | RT3 |
| | 13" Reel | | 13 | 7Q | - | S | - | - | - | - | QZH | - | - |
| | Cassette | | C | - | - | - | - | - | - | - | PZHI | - | - |
| 6 | **Marking (except 0402)** | | | | | | | | | | | | |
| | **Top** | | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |

| Company | Sample P/N | Description | Chip resistor | | 0603 | 1K47 | 1% |
|---|---|---|---|---|---|---|---|
| Yageo | RC0603FR-071K47 | 1 | 2 | 3 | 5 | 5 | 4 |
| | | RC | 0603 | F | R | 07 | 1K47 |
| Vitrohm | 513-0 1K47 1% 7A | | 1 2 | 4 | 3 | 5 | |
| | | | 513-0 | 1K47 | 1% | 7A | |
| AVX | CR10-1471F-T | 1 | 2 | 4 | 3 | 5 | |
| | | CR | 10 | 1471 | F | T | |
| KOA | RK73H1JT1471F | 1 | - | 2 | 5 | 4 | 3 |
| | | RK73 | H | 1J | T | 1471 | F |
| Panasonic | ERJ3ENF1471V | 1 | 2 | 6 | 3 | 4 | 5 |
| | | ERJ | 3E | N | F | 1471 | V |
| Rohm | MCR3EZHF1471 | 1 | 2 | 5 | 3 | 4 | |
| | | MCR | 3 | EZH | F | 1471 | |
| Vishay | D11 1K47 1% 7" | 1 | 2 | 4 | 3 | 5 | |
| | | D | 11 | 1K47 | 1% | 7" | |
| Vishay Dale | CRCW06031471FRT1 | 1 | 2 | 4 | 3 | 5 | |
| | | CRCW | 0603 | 1471 | F | RT1 | |

| Part number to 12NC cross reference | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| P/N | 12NC | Description | Size | Tol | Power | Qty | Reel size | TC | Page |
| RC01 | 232271161… | General 1206 5% Reel (7inch) | 1206 | 5% | 0.250 | 5 000 | 7" | - | 74 |
| RC01 | 232271151… | General 1206 5% Reel (10inch) | 1206 | 5% | 0.250 | 10 000 | 10" | - | 74 |
| RC01 | 232271181… | General 1206 5% Reel (13inch) | 1206 | 5% | 0.250 | 20 000 | 13" | - | 74 |
| RC01 | 232271191032 | General 1206 5% Reel (7inch) | 1206 | jumper | 0.250 | 5 000 | 7" | - | 74 |
| RC01 | 232271191005 | General 1206 5% Reel (10inch) | 1206 | jumper | 0.250 | 10 000 | 10" | - | 74 |
| RC01 | 232271192004 | General 1206 5% Reel (13inch) | 1206 | jumper | 0.250 | 20 000 | 13" | - | 74 |
| RC02G | 23227222…. | General 1206 1% Reel (7inch) TC50 | 1206 | 1% | 0.250 | 5 000 | 7" | 50 | 74 |
| RC02G | 23227223…. | General 1206 1% Reel (10inch) TC50 | 1206 | 1% | 0.250 | 10 000 | 10" | 50 | 74 |
| RC02H | 23227246…. | General 1206 1% Reel (7inch) | 1206 | 1% | 0.250 | 5 000 | 7" | - | 74 |
| RC02H | 23227247…. | General 1206 1% Reel (10inch) | 1206 | 1% | 0.250 | 10 000 | 10" | - | 74 |
| RC02H | 23227248…. | General 1206 1% Reel (13inch) | 1206 | 1% | 0.250 | 20 000 | 13" | - | 74 |
| RC02H | 232272492006 | General 1206 1% Reel (7inch) | 1206 | jumper | 0.250 | 5 000 | 7" | - | 74 |
| RC02H | 232272492007 | General 1206 1% Reel (10inch) | 1206 | jumper | 0.250 | 10 000 | 10" | - | 74 |
| RC11 | 232273061… | General 0805 5% Reel (7inch) | 0805 | 5% | 0.125 | 5 000 | 7" | - | 74 |
| RC11 | 232273071… | General 0805 5% Reel (10inch) | 0805 | 5% | 0.125 | 10 000 | 10" | - | 74 |
| RC11 | 232273081… | General 0805 5% Reel (13inch) | 0805 | 5% | 0.125 | 20 000 | 13" | - | 74 |
| RC11 | 232273091002 | General 0805 5% Reel (7inch) | 0805 | jumper | 0.125 | 5 000 | 7" | - | 74 |
| RC11 | 232273091003 | General 0805 5% Reel (10inch) | 0805 | jumper | 0.125 | 10 000 | 10" | - | 74 |
| RC11 | 232273092002 | General 0805 5% Reel (13inch) | 0805 | jumper | 0.125 | 20 000 | 13" | - | 74 |
| RC12G | 23227326…. | General 0805 1% Reel (7inch) TC50 | 0805 | 1% | 0.125 | 5 000 | 7" | 50 | 74 |
| RC12G | 23227327…. | General 0805 1% Reel (10inch) TC50 | 0805 | 1% | 0.125 | 10 000 | 10" | 50 | 74 |
| RC12H | 23227346…. | General 0805 1% Reel (7inch) | 0805 | 1% | 0.125 | 5 000 | 7" | - | 74 |
| RC12H | 23227347…. | General 0805 1% Reel (10inch) | 0805 | 1% | 0.125 | 10 000 | 10" | - | 74 |
| RC12H | 23227348…. | General 0805 1% Reel (13inch) | 0805 | 1% | 0.125 | 20 000 | 13" | - | 74 |
| RC12H | 232273492006 | General 0805 1% Reel (7inch) | 0805 | jumper | 0.125 | 5 000 | 7" | - | 74 |
| RC12H | 232273492007 | General 0805 1% Reel (10inch) | 0805 | jumper | 0.125 | 10 000 | 10" | - | 74 |
| RC21 | 232270260… | General 0603 5% Reel (7inch) | 0603 | 5% | 0.100 | 5 000 | 7" | - | 74 |
| RC21 | 232270270… | General 0603 5% Reel (10inch) | 0603 | 5% | 0.100 | 10 000 | 10" | - | 74 |
| RC21 | 232270281… | General 0603 5% Reel (13inch) | 0603 | 5% | 0.100 | 20 000 | 13" | - | 74 |
| RC21 | 232270296001 | General 0603 5% Reel (7inch) | 0603 | jumper | 0.100 | 5 000 | 7" | - | 74 |
| RC21 | 232270297001 | General 0603 5% Reel (10inch) | 0603 | jumper | 0.100 | 10 000 | 10" | - | 74 |
| RC21 | 232270292002 | General 0603 5% Reel (13inch) | 0603 | jumper | 0.100 | 20 000 | 13" | - | 74 |
| RC22H | 23227046…. | General 0603 1% Reel (7inch) | 0603 | 1% | 0.100 | 5 000 | 7" | - | 74 |
| RC22H | 23227047…. | General 0603 1% Reel (10inch) | 0603 | 1% | 0.100 | 10 000 | 10" | - | 74 |
| RC22H | 23227048…. | General 0603 1% Reel (13inch) | 0603 | 1% | 0.100 | 20 000 | 13" | - | 74 |
| RC22H | 232270492006 | General 0603 1% Reel (7inch) | 0603 | jumper | 0.100 | 5 000 | 7" | - | 74 |
| RC22H | 232270492007 | General 0603 1% Reel (10inch) | 0603 | jumper | 0.100 | 10 000 | 10" | - | 74 |
| RC31 | 232270570… | General 0402 5% Reel (7inch) | 0402 | 5% | 0.063 | 10 000 | 7" | - | 74 |
| RC31 | 232270587… | General 0402 5% Reel (10inch) | 0402 | 5% | 0.063 | 5 0000 | 10" | - | 74 |
| RC31 | 232270591001 | General 0402 5% Reel (7inch) | 0402 | jumper | 0.063 | 10 000 | 7" | - | 74 |
| RC31 | 232270591007 | General 0402 5% Reel (10inch) | 0402 | jumper | 0.063 | 5 0000 | 10" | - | 74 |
| RC32 | 23227067…. | General 0402 1% Reel (7inch) | 0402 | 1% | 0.063 | 10 000 | 7" | - | 74 |
| RC32 | 23227068…. | General 0402 1% Reel (10inch) | 0402 | 1% | 0.063 | 5 0000 | 10" | - | 74 |
| RC41 | 232280370… | General 0201 5% Reel (7inch) | 0201 | 5% | 0.050 | 10 000 | 7" | - | 74 |
| RC41 | 232280391001 | General 0201 5% Reel (7inch) | 0201 | jumper | 0.050 | 10 000 | 7" | - | 74 |
| RC42 | 23228047…. | General 0201 1% Reel (7inch) | 0201 | 1% | 0.050 | 10 000 | 7" | - | 74 |
| RC03G | 23227252…. | High-precision 1206 0.5% Reel (7inch) TC50 | 1206 | 0.5% | 0.250 | 5 000 | 7" | 50 | 75 |
| RC04G | 23227072…. | High-precision 1206 0.25% Reel (7inch) TC50 | 1206 | 0.25% | 0.125 | 5 000 | 7" | 50 | 75 |
| RC04H | 23505410…. | High-precision 1206 0.25% Reel (7inch) TC100 | 1206 | 0.25% | 0.250 | 5 000 | 7" | 100 | 75 |
| RC05G | 23227082…. | High-precision 1206 0.1% Reel (7inch) TC50 | 1206 | 0.1% | 0.125 | 5 000 | 7" | 50 | 75 |
| RC05H | 23505420…. | High-precision 1206 0.1% Reel (7inch) TC100 | 1206 | 0.1% | 0.125 | 5 000 | 7" | 100 | 75 |
| RC13G | 23227382…. | High-precision 0805 0.5% Reel (7inch) TC50 | 0805 | 0.5% | 0.125 | 5 000 | 7" | 50 | 75 |
| RC14G | 23227092…. | High-precision 0805 0.25% Reel (7inch) TC50 | 0805 | 0.25% | 0.100 | 5 000 | 7" | 50 | 75 |
| RC14H | 23505440…. | High-precision 0805 0.25% Reel (7inch) TC100 | 0805 | 0.25% | 0.100 | 5 000 | 7" | 100 | 75 |
| RC15G | 23227102…. | High-precision 0805 0.1% Reel (7inch) TC50 | 0805 | 0.1% | 0.100 | 5 000 | 7" | 50 | 75 |
| RC15H | 23505450…. | High-precision 0805 0.1% Reel (7inch) TC100 | 0805 | 0.1% | 0.100 | 5 000 | 7" | 100 | 75 |
| RC23H | 23505460…. | High-precision 0603 0.5% Reel (7inch) TC100 | 0603 | 0.5% | 0.063 | 5 000 | 7" | 100 | 76 |
| RC24H | 23505470…. | High-precision 0603 0.25% Reel (7inch) TC100 | 0603 | 0.25% | 0.063 | 5 000 | 7" | 100 | 76 |
| RC25H | 23505480…. | High-precision 0603 0.1% Reel (7inch) TC100 | 0603 | 0.1% | 0.063 | 5 000 | 7" | 100 | 76 |
| RC33 | 23505497…. | High-precision 0402 0.5% Reel (7inch) TC200 | 0402 | 0.5% | 0.063 | 5 000 | 7" | 200 | 76 |
| TF510 | 23906127…. | High-precision Thin Film 1210 1.0% Reel (7inch) TC25 | 1210 | 1.0% | 0.250 | 5 000 | 7" | 25 | 76 |
| TF520 | 23904127…. | High-precision Thin Film 1210 1.0% Reel (7inch) TC50 | 1210 | 1.0% | 0.250 | 5 000 | 7" | 50 | 76 |
| TF511 | 23906126…. | High-precision Thin Film 1210 0.5% Reel (7inch) TC25 | 1210 | 0.5% | 0.250 | 5 000 | 7" | 25 | 76 |
| TF521 | 23904126…. | High-precision Thin Film 1210 0.5% Reel (7inch) TC50 | 1210 | 0.5% | 0.250 | 5 000 | 7" | 50 | 76 |
| TF512 | 23906125…. | High-precision Thin Film 1210 0.25% Reel (7inch) TC25 | 1210 | 0.25% | 0.250 | 5 000 | 7" | 25 | 76 |
| TF522 | 23904125…. | High-precision Thin Film 1210 0.25% Reel (7inch) TC50 | 1210 | 0.25% | 0.250 | 5 000 | 7" | 50 | 76 |
| TF513 | 23906124…. | High-precision Thin Film 1210 0.1% Reel (7inch) TC25 | 1210 | 0.1% | 0.250 | 5 000 | 7" | 25 | 76 |
| TF523 | 23904124…. | High-precision Thin Film 1210 0.1% Reel (7inch) TC50 | 1210 | 0.1% | 0.250 | 5 000 | 7" | 50 | 76 |
| TF514 | 23906123…. | High-precision Thin Film 1210 0.05% Reel (7inch) TC25 | 1210 | 0.05% | 0.250 | 5 000 | 7" | 25 | 76 |

| Part number to 12NC cross reference | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| P/N | 12NC | Description | Size | Tol | Power | Qty | Reel size | TC | Page |
| TF524 | 23904123.... | High-precision Thin Film 1210 0.05% Reel (7inch) TC50 | 1210 | 0.05% | 0.250 | 5 000 | 7" | 50 | 76 |
| TF010 | 23906117.... | High-precision Thin Film 1206 1.0% Reel (7inch) TC25 | 1206 | 1.0% | 0.125 | 5 000 | 7" | 25 | 77 |
| TF020 | 23904117.... | High-precision Thin Film 1206 1.0% Reel (7inch) TC50 | 1206 | 1.0% | 0.125 | 5 000 | 7" | 50 | 77 |
| TF011 | 23906116.... | High-precision Thin Film 1206 0.5% Reel (7inch) TC25 | 1206 | 0.5% | 0.125 | 5 000 | 7" | 25 | 77 |
| TF021 | 23904116.... | High-precision Thin Film 1206 0.5% Reel (7inch) TC50 | 1206 | 0.5% | 0.125 | 5 000 | 7" | 50 | 77 |
| TF012 | 23906115.... | High-precision Thin Film 1206 0.25% Reel (7inch) TC25 | 1206 | 0.25% | 0.125 | 5 000 | 7" | 25 | 77 |
| TF022 | 23904115.... | High-precision Thin Film 1206 0.25% Reel (7inch) TC50 | 1206 | 0.25% | 0.125 | 5 000 | 7" | 50 | 77 |
| TF013 | 23906114.... | High-precision Thin Film 1206 0.1% Reel (7inch) TC25 | 1206 | 0.1% | 0.125 | 5 000 | 7" | 25 | 77 |
| TF023 | 23904114.... | High-precision Thin Film 1206 0.1% Reel (7inch) TC50 | 1206 | 0.1% | 0.125 | 5 000 | 7" | 50 | 77 |
| TF014 | 23906113.... | High-precision Thin Film 1206 0.05% Reel (7inch) TC25 | 1206 | 0.05% | 0.125 | 5 000 | 7" | 25 | 77 |
| TF024 | 23904113.... | High-precision Thin Film 1206 0.05% Reel (7inch) TC50 | 1206 | 0.05% | 0.125 | 5 000 | 7" | 50 | 77 |
| TF110 | 23906017.... | High-precision Thin Film 0805 1.0% Reel (7inch) TC25 | 0805 | 1.0% | 0.125 | 5 000 | 7" | 25 | 77 |
| TF120 | 23904017.... | High-precision Thin Film 0805 1.0% Reel (7inch) TC50 | 0805 | 1.0% | 0.125 | 5 000 | 7" | 50 | 77 |
| TF111 | 23906016.... | High-precision Thin Film 0805 0.5% Reel (7inch) TC25 | 0805 | 0.5% | 0.125 | 5 000 | 7" | 25 | 77 |
| TF121 | 23904016.... | High-precision Thin Film 0805 0.5% Reel (7inch) TC50 | 0805 | 0.5% | 0.125 | 5 000 | 7" | 50 | 77 |
| TF112 | 23906015.... | High-precision Thin Film 0805 0.25% Reel (7inch) TC25 | 0805 | 0.25% | 0.125 | 5 000 | 7" | 25 | 77 |
| TF122 | 23904015.... | High-precision Thin Film 0805 0.25% Reel (7inch) TC50 | 0805 | 0.25% | 0.125 | 5 000 | 7" | 50 | 77 |
| TF113 | 23906014.... | High-precision Thin Film 0805 0.1% Reel (7inch) TC25 | 0805 | 0.1% | 0.125 | 5 000 | 7" | 25 | 77 |
| TF123 | 23904014.... | High-precision Thin Film 0805 0.1% Reel (7inch) TC50 | 0805 | 0.1% | 0.125 | 5 000 | 7" | 50 | 77 |
| TF114 | 23906013.... | High-precision Thin Film 0805 0.05% Reel (7inch) TC25 | 0805 | 0.05% | 0.125 | 5 000 | 7" | 25 | 77 |
| TF124 | 23904013.... | High-precision Thin Film 0805 0.05% Reel (7inch) TC50 | 0805 | 0.05% | 0.125 | 5 000 | 7" | 50 | 77 |
| TF210 | 23906047.... | High-precision Thin Film 0603 1.0% Reel (7inch) TC25 | 0603 | 1.0% | 0.063 | 5 000 | 7" | 25 | 78 |
| TF220 | 23904047.... | High-precision Thin Film 0603 1.0% Reel (7inch) TC50 | 0603 | 1.0% | 0.063 | 5 000 | 7" | 50 | 78 |
| TF211 | 23906046.... | High-precision Thin Film 0603 0.5% Reel (7inch) TC25 | 0603 | 0.5% | 0.063 | 5 000 | 7" | 25 | 78 |
| TF221 | 23904046.... | High-precision Thin Film 0603 0.5% Reel (7inch) TC50 | 0603 | 0.5% | 0.063 | 5 000 | 7" | 50 | 78 |
| TF212 | 23906045..... | High-precision Thin Film 0603 0.25% Reel (7inch) TC25 | 0603 | 0.25% | 0.063 | 5 000 | 7" | 25 | 78 |
| TF222 | 23904045.... | High-precision Thin Film 0603 0.25% Reel (7inch) TC50 | 0603 | 0.25% | 0.063 | 5 000 | 7" | 50 | 78 |
| TF213 | 23906044.... | High-precision Thin Film 0603 0.1% Reel (7inch) TC25 | 0603 | 0.1% | 0.063 | 5 000 | 7" | 25 | 78 |
| TF223 | 23904044.... | High-precision Thin Film 0603 0.1% Reel (7inch) TC50 | 0603 | 0.1% | 0.063 | 5 000 | 7" | 50 | 78 |
| TF214 | 23906043.... | High-precision Thin Film 0603 0.05% Reel (7inch) TC25 | 0603 | 0.05% | 0.063 | 5 000 | 7" | 25 | 78 |
| TF224 | 23904043.... | High-precision Thin Film 0603 0.05% Reel (7inch) TC50 | 0603 | 0.05% | 0.063 | 5 000 | 7" | 50 | 78 |
| TF310 | 23906077.... | High-precision Thin Film 0402 1.0% Reel (7inch) TC25 | 0402 | 1.0% | 0.063 | 10 000 | 7" | 25 | 78 |
| TF320 | 23904077.... | High-precision Thin Film 0402 1.0% Reel (7inch) TC50 | 0402 | 1.0% | 0.063 | 10 000 | 7" | 50 | 78 |
| TF311 | 23906076.... | High-precision Thin Film 0402 0.5% Reel (7inch) TC25 | 0402 | 0.5% | 0.063 | 10 000 | 7" | 25 | 78 |
| TF321 | 23904076.... | High-precision Thin Film 0402 0.5% Reel (7inch) TC50 | 0402 | 0.5% | 0.063 | 10 000 | 7" | 50 | 78 |
| TF312 | 23906075.... | High-precision Thin Film 0402 0.25% Reel (7inch) TC25 | 0402 | 0.25% | 0.063 | 10 000 | 7" | 25 | 78 |
| TF322 | 23904075.... | High-precision Thin Film 0402 0.25% Reel (7inch) TC50 | 0402 | 0.25% | 0.063 | 10 000 | 7" | 50 | 78 |
| TF313 | 23906074.... | High-precision Thin Film 0402 0.1% Reel (7inch) TC25 | 0402 | 0.1% | 0.063 | 10 000 | 7" | 25 | 78 |
| TF323 | 23904074.... | High-precision Thin Film 0402 0.1% Reel (7inch) TC50 | 0402 | 0.1% | 0.063 | 10 000 | 7" | 50 | 78 |
| TF314 | 23906073.... | High-precision Thin Film 0402 0.05% Reel (7inch) TC25 | 0402 | 0.05% | 0.063 | 10 000 | 7" | 25 | 78 |
| TF324 | 23904073.... | High-precision Thin Film 0402 0.05% Reel (7inch) TC50 | 0402 | 0.05% | 0.063 | 10 000 | 7" | 50 | 78 |
| ARC241 | 235003410... | Array 4x0603 5% Reel (7inch) concave | 1206 | 5% | 0.063 | 5 000 | 7" | 200 | 79 |
| ARC241 | 235003491001 | Array 4x0603 5% Reel (7inch) concave | 1206 | jumper | 0.063 | 5 000 | 7" | - | 79 |
| ARV241 | 235003510... | Array 4x0603 5% Reel (7inch) concex | 1206 | 5% | 0.063 | 5 000 | 7" | 200 | 79 |
| ARV241 | 235003591001 | Array 4x0603 5% Reel (7inch) concex | 1206 | jumper | 0.063 | 5 000 | 7" | - | 79 |
| ARC242 | 23500241.... | Array 4x0603 1% Reel (7inch) concave | 1206 | 1% | 0.063 | 5 000 | 7" | 100 | 79 |
| ARV242 | 23500251.... | Array 4x0603 1% Reel (7inch) convex | 1206 | 1% | 0.063 | 5 000 | 7" | 200 | 79 |
| ARV321 | 235001311... | Array 2x0402 5% Reel (10inch) convex | 0202 | 5% | 0.063 | 10 000 | 10" | 200 | 79 |
| ARV321 | 235001391002 | Array 2x0402 5% Reel (7inch) convex | 0202 | jumper | 0.063 | 5 000 | 7" | - | 79 |
| ARV321 | 235001391001 | Array 2x0402 5% Reel (10inch) convex | 0202 | jumper | 0.063 | 10 000 | 10" | - | 79 |
| ARV322 | 23500132.... | Array 2x0402 1% Reel (7inch) convex | 0202 | 1% | 0.063 | 10 000 | 7" | 100 | 79 |
| ARV341 | 235003310... | Array 4x0402 5% Reel (7inch) convex | 0402 | 5% | 0.063 | 5 000 | 7" | 300 | 79 |
| ARV341 | 235003311... | Array 4x0402 5% Reel (10inch) convex | 0402 | 5% | 0.063 | 10 000 | 10" | 300 | 79 |
| ARV341 | 235003391002 | Array 4x0402 5% Reel (7inch) convex | 0402 | jumper | 0.063 | 5 000 | 7" | - | 79 |
| ARV341 | 235003391001 | Array 4x0402 5% Reel (10inch) convex | 0402 | jumper | 0.063 | 10 000 | 10" | - | 79 |
| ARV342 | 23500231.... | Array 4x0402 1% Reel (7inch) convex | 0402 | 1% | 0.063 | 5 000 | 7" | 300 | 79 |
| ARV342 | 23500232.... | Array 4x0402 1% Reel (7inch) convex | 0402 | 1% | 0.063 | 10 000 | 10" | 300 | 79 |
| ARV381 | 235005310... | Array 8x0402 5% Reel (7inch) convex | 1608 | 5% | 0.063 | 5 000 | 7" | 200 | 79 |
| ARV381 | 235005391001 | Array 8x0402 5% Reel (7inch) convex | 1608 | jumper | 0.063 | 5 000 | 7" | - | 79 |
| ARV382 | 23500431.... | Array 8x0402 1% Reel (7inch) convex | 1608 | 1% | 0.063 | 5 000 | 7" | 200 | 79 |
| RNA310 | 235023010... | 8R-network 5% Reel (7inch) convex | 1206 | 5% | 0.031 | 5 000 | 7" | - | 80 |
| RNA310 | 235023091001 | 8R-network 5% Reel (7inch) convex | 1206 | jumper | 0.031 | 5 000 | 7" | - | 80 |
| RNA310 | 23502302.... | 8R-network 1% Reel (7inch) convex | 1206 | 1% | 0.031 | 5 000 | 7" | - | 80 |
| RCB210 | 23503122.... | Network 4R4C 5% (7inch) concave | 1608 | 5% | 0.062 | 5 000 | 7" | 200 | 80 |
| PRC101 | 2390 735 70.... | 1210 power resistor 5% (7inch) | 1210 | 5% | 0.330 | 5 000 | 7" | - | 81 |
| PRC101 | 2390 735 90001 | 1210 power resistor 5% (7inch) | 1210 | jumper | 0.330 | 5 000 | 7" | - | 81 |
| PRC102 | 2390 735 3.... | 1210 power resistor 1% (7inch) | 1210 | 1% | 0.330 | 5 000 | 7" | - | 81 |
| PRC111 | 232276060... | 2010 power resistor 5% (10 inch) | 2010 | 5% | 0.500 | 4 000 | 10" | - | 81 |
| PRC111 | 232276090003 | 2010 power resistor 5%  (10inch) | 2010 | jumper | 0.500 | 4 000 | 10" | - | 81 |

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| PRC111 | 23227616…. | 2010 power resisitor 1% (10inch) | 2010 | 1% | 0.500 | 4 000 | 10" | - | 81 |
| PRC201 | 232273560… | 1218 power resistor 5% (10inch) | 1218 | 5% | 1.000 | 5 000 | 10" | - | 81 |
| PRC201 | 232273590006 | 1218 power resistor 5% (10inch) | 1218 | jumper | 1.000 | 5 000 | 10" | - | 81 |
| PRC201 | 23227352…. | 1218 power resistor 5% (10inch) | 1218 | 1% | 1.000 | 5 000 | 10" | - | 81 |
| PRC221 | 232276260… | 2512 power resistor 5% (10inch) | 2512 | 5% | 1.000 | 4 000 | 10" | - | 81 |
| PRC221 | 232276290000 | 2512 power resistor 5% (10inch) | 2512 | jumper | 1.000 | 4 000 | 10" | - | 81 |
| PRC221 | 23227636…. | 2512 power resistor 1% (10inch) | 2512 | 1% | 1.000 | 4 000 | 10" | - | 81 |
| LPRC101 | 2390 735 70…. | 1210 power resistor 5% (7inch) | 1210 | 5% | 0.330 | 5 000 | 7" | - | 82 |
| LPRC102 | 2390 735 3…. | 1210 power resistor 1% (7inch) | 1210 | 1% | 0.330 | 5 000 | 7" | - | 82 |
| LPRC111 | 232276090..0 | 2010 power resistor 5% (10inch) low ohmic | 2010 | 5% | 0.500 | 4 000 | 10" | - | 82 |
| LPRC111 | 232276060…7 | 2010 power resistor 5% (10 inch) low ohmic | 2010 | 5% | 0.500 | 4 000 | 10" | - | 82 |
| LPRC111 | 232276190..0 | 2010 power resistor 1% (10inch) low ohmic | 2010 | 1% | 0.500 | 4 000 | 10" | - | 82 |
| LPRC111 | 23227616…7 | 2010 power resistor 1% (10inch) low ohmic | 2010 | 1% | 0.500 | 4 000 | 10" | - | 82 |
| LPRC201 | 232273560… | 1218 power resistor 5% (10 inch) low ohmic | 1218 | 5% | 1.000 | 5 000 | 10" | - | 82 |
| LPRC201 | 23227352…. | 1218 power resistor 1% (10inch) low ohmic | 1218 | 1% | 1.000 | 5 000 | 10" | - | 82 |
| LPRC221 | 232276290..0 | 2512 power resistor 5% (10inch) low ohmic | 2512 | 5% | 1.000 | 4 000 | 10" | - | 82 |
| LPRC221 | 232276260…7 | 2512 power resistor 5% (10 inch) low ohmic | 2512 | 5% | 1.000 | 4 000 | 10" | - | 82 |
| LPRC221 | 232276390..0 | 2512 power resistor 1% (10inch) low ohmic | 2512 | 1% | 1.000 | 4 000 | 10" | - | 82 |
| LPRC221 | 23227636…7 | 2512 power resistor 1% (10inch) low ohmic | 2512 | 1% | 1.000 | 4 000 | 10" | - | 82 |
| VPRC221 | 232276298… | 2512 high voltage power resistor 5% (10inch) | 2512 | 5% | 1.000 | 4 000 | 10" | 200 | 83 |
| MPRC221 | 232276294..0 | 2512 power metal strip resistor 5% (10inch) | 2512 | 5% | 1.000 | 4 000 | 10" | - | 83 |
| MPRC221 | 232276395..0 | 2512 power metal strip resistor 1% (10inch) | 2512 | 1% | 1.000 | 4 000 | 10" | - | 83 |
| VRC01 | 232279061… | High voltage resistor 1206 5% (7inch) | 1206 | 5% | 0.250 | 5 000 | 7" | 300 | 83 |
| VRC02 | 23227916…. | High voltage resistor 1206 1% (7 inch) | 1206 | 1% | 0.250 | 5 000 | 7" | 300 | 83 |
| VRC11 | 232279261… | High voltage resistor 0805 5% (7inch) | 0805 | 5% | 0.125 | 5 000 | 7" | 300 | 83 |
| VRC12 | 23227936…. | High voltage resistor 0805 1% (7inch) | 0805 | 1% | 0.125 | 5 000 | 7" | 300 | 83 |
| HRC01 | 235052010… | High Ohmic resistor 1206 5% (7inch) | 1206 | 5% | 0.250 | 5 000 | 7" | 250 | 84 |
| HRC01 | 235052091001 | High Ohmic resistor 1206 5% - 100M (7inch) | 1206 | 5% | 0.250 | 5 000 | 7" | 250 | 84 |
| HRC11 | 235052110… | High Ohmic resistor 0805 5% (7inch) | 0805 | 5% | 0.125 | 5 000 | 7" | 250 | 84 |
| HRC11 | 235052191001 | High Ohmic resistor 0805 5% - 100M (7inch) | 0805 | 5% | 0.125 | 5 000 | 7" | 250 | 84 |
| HRC21 | 235052210… | High Ohmic resistor 0603 5% (7inch) | 0603 | 5% | 0.100 | 5 000 | 7" | 300 | 84 |
| LRC01 | 235051010… | Low Ohmic resistor 1206 5% (7inch) | 1206 | 5% | 0.250 | 5 000 | 7" | - | 84 |
| LRC02 | 235051012… | Low Ohmic resistor 1206 1% (7inch) | 1206 | 1% | 0.250 | 5 000 | 7" | - | 84 |
| LRC11 | 235051110… | Low Ohmic resistor 0805 5% (7inch) | 0805 | 5% | 0.125 | 5 000 | 7" | - | 84 |
| LRC12 | 235051112… | Low Ohmic resistor 0805 1% (7inch) | 0805 | 1% | 0.100 | 5 000 | 7" | - | 84 |
| LRC11P | 235051115… | Low Ohmic resistor 0805 5% power (7inch) | 0805 | 5% | 0.250 | 5 000 | 7" | - | 84 |
| LRC12P | 235051117… | Low Ohmic resistor 0805 1% power (7inch) | 0805 | 1% | 0.250 | 5 000 | 7" | - | 84 |
| LRC21 | 235051210… | Low Ohmic resistor 0603 5% (7inch) | 0603 | 5% | 0.063 | 5 000 | 7" | - | 84 |
| LRC22 | 235051212… | Low Ohmic resistor 0603 1% (7inch) | 0603 | 1% | 0.063 | 5 000 | 7" | - | 84 |
| RC02TR | 235050011… | Trimmable resistor 1206 0/-20% (7inch) | 1206 | 0/-20 | 0.250 | 5 000 | 7" | - | 85 |
| RC02TR | 235050010… | Trimmable resistor 1206 0/-30% (7inch) | 1206 | 0/-30 | 0.250 | 5 000 | 7" | - | 85 |
| RC02TR | 232272494. | Trimmable resistor 1206 (Europe style) (7inch) | 1206 | - | 0.250 | 5 000 | 7" | - | 85 |
| RC12TR | 235050111… | Trimmable resistor 0805 0/-20% (7inch) | 0805 | 0/-20 | 0.125 | 5 000 | 7" | - | 85 |
| RC12TR | 235051110… | Trimmable resistor 0805 0/-30% (7inch) | 0805 | 0/-30 | 0.125 | 5 000 | 7" | - | 85 |
| RC12TR | 232273494… | Trimmable resistor 0805 (Europe style) (7inch) | 0805 | - | 0.125 | 5 000 | 7" | - | 85 |
| RC22TR | 235050211… | Trimmable resistor 0603 0/-20% (7inch) | 0603 | 0/-20 | 0.063 | 5 000 | 7" | - | 85 |
| RC22TR | 235050210… | Trimmable resistor 0603 0/-30% (7inch) | 0603 | 0/-30 | 0.063 | 5 000 | 7" | - | 85 |
| RC32TR | 235050321… | Trimmable resistor 0402 0/-20% (7inch) | 0402 | 0/-20 | 0.063 | 10 000 | 7" | - | 85 |
| RC32TR | 23505032…. | Trimmable resistor 0402 0/-30% (7inch) | 0402 | 0/-30 | 0.063 | 10 000 | 7" | - | 85 |
| SRC01 | 235055010… | Surge resistor 1206 5% (7inch) | 1206 | 5% | 0.250 | 5 000 | 7" | 200 | 85 |
| FRC01 | 23227506…. | Fuse resistor 1206 5% (7inch) | 1206 | 5% | 0.125 | 5 000 | 7" | - | 85 |
| FRC21 | 232275660… | Fuse resistor 0603 5% (7inch) | 0603 | 1% | 0.063 | 5 000 | 7" | - | 85 |
| RC01 | 232271111… | General 1206 5% Reel - NiAu termination (7inch) | 1206 | 5% | 0.250 | 5 000 | 7" | - | 86 |
| RC01 | 232271112… | General 1206 5% Reel - NiAu termination (10inch) | 1206 | 5% | 0.250 | 10 000 | 10" | - | 86 |
| RC02H | 23227291…. | General 1206 1% Reel - NiAu termination (7inch) | 1206 | 1% | 0.250 | 5 000 | 7" | - | 86 |
| RC02H | 23227292…. | General 1206 1% Reel - NiAu termination (10inch) | 1206 | 1% | 0.250 | 10 000 | 10" | - | 86 |
| RC11 | 232273011…. | General 0805 5% Reel - NiAu termination (7inch) | 0805 | 5% | 0.125 | 5 000 | 7" | - | 86 |
| RC11 | 232273012…. | General 0805 5% Reel - NiAu termination (10inch) | 0805 | 5% | 0.125 | 10 000 | 10" | - | 86 |
| RC12 | 23227341…. | General 0805 1% Reel - NiAu termination (7inch) | 0805 | 1% | 0.125 | 5 000 | 7" | - | 86 |
| RC12 | 23227342…. | General 0805 1% Reel - NiAu termination (10inch) | 0805 | 1% | 0.125 | 10 000 | 10" | - | 86 |
| RC21 | 232270211… | General 0603 5% Reel - NiAu termination (7inch) | 0603 | 5% | 0.063 | 5 000 | 7" | - | 86 |
| RC21 | 232270212… | General 0603 5% Reel - NiAu termination (10inch) | 0603 | 5% | 0.063 | 10 000 | 10" | - | 86 |
| RC22H | 23227041…. | General 0603 1% Reel - NiAu termination (7inch) | 0603 | 1% | 0.063 | 5 000 | 7" | - | 86 |
| RC22H | 23227042…. | General 0603 1% Reel - NiAu termination (10inch) | 0603 | 1% | 0.063 | 10 000 | 10" | - | 86 |
| RC31 | 232270512… | General 0402 5% Reel - NiAu termination (7inch) | 0402 | - | 0.063 | 10 000 | 7" | - | 86 |
| RC32 | 23227062…. | Genaral 0402 1% Reel - NiAu termination (7inch) | 0402 | 5% | 0.063 | 10 000 | 7" | - | 86 |
| Sample kits | 332207330… | Samples kits | - | 1% | - | - | - | - | 87 |
| ATV321 | 235070310… | Attenuator 50Ω - 1 to 20 dB | 0404 | - | 0.040 | 5 000 | 7" | - | 97 |
| ATV321 | 235070311… | Attenuator 50Ω - 1 to 20 dB | 0404 | - | 0.040 | 10 000 | 10" | - | 97 |

## 12NC to part number cross reference

| 12NC to part number cross reference | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 12NC | P/N | Description | Size | Tol | Power | Qty | Reel size | TC | Page |
| 232270292002 | RC21 | General 0603 5% Reel (13inch) | 0603 | jumper | 0.100 | 20 000 | 13" | - | 74 |
| 232270296001 | RC21 | General 0603 5% Reel (7inch) | 0603 | jumper | 0.100 | 5000 | 7" | - | 74 |
| 232270297001 | RC21 | General 0603 5% Reel (10inch) | 0603 | jumper | 0.100 | 10 000 | 10" | - | 74 |
| 232270492006 | RC22H | General 0603 1% Reel (7inch) | 0603 | jumper | 0.100 | 5 000 | 7" | - | 74 |
| 232270492007 | RC22H | General 0603 1% Reel (10inch) | 0603 | jumper | 0.100 | 10 000 | 10" | - | 74 |
| 232270591001 | RC31 | General 0402 5% Reel (7inch) | 0402 | jumper | 0.063 | 10 000 | 7" | - | 74 |
| 232270591007 | RC31 | General 0402 5% Reel (10inch) | 0402 | jumper | 0.063 | 5 0000 | 10" | - | 74 |
| 232271191005 | RC01 | General 1206 5% Reel (10inch) | 1206 | jumper | 0.250 | 10 000 | 10" | - | 74 |
| 232271191032 | RC01 | General 1206 5% Reel (7inch) | 1206 | jumper | 0.250 | 5 000 | 7" | - | 74 |
| 232271192004 | RC01 | General 1206 5% Reel (13inch) | 1206 | jumper | 0.250 | 20 000 | 13" | - | 74 |
| 232272492006 | RC02H | General 1206 1% Reel (7inch) | 1206 | jumper | 0.250 | 5 000 | 7" | - | 74 |
| 232272492007 | RC02H | General 1206 1% Reel (10inch) | 1206 | jumper | 0.250 | 10 000 | 10" | - | 74 |
| 232273091002 | RC11 | General 0805 5% Reel (7inch) | 0805 | jumper | 0.125 | 5 000 | 7" | - | 74 |
| 232273091003 | RC11 | General 0805 5% Reel (10inch) | 0805 | jumper | 0.125 | 10 000 | 10" | - | 74 |
| 232273092002 | RC11 | General 0805 5% Reel (13inch) | 0805 | jumper | 0.125 | 20 000 | 13" | - | 74 |
| 232273492006 | RC12H | General 0805 1% Reel (7inch) | 0805 | jumper | 0.125 | 5 000 | 7" | - | 74 |
| 232273492007 | RC12H | General 0805 1% Reel (10inch) | 0805 | jumper | 0.125 | 10 000 | 10" | - | 74 |
| 232273590006 | PRC201 | 1218 power resistor 5% (10inch) | 1218 | jumper | 1.000 | 5 000 | 10" | - | 81 |
| 232276090003 | PRC111 | 2010 power resistor 5% (10inch) | 2010 | jumper | 0.500 | 4000 | 10" | - | 81 |
| 232276290000 | PRC221 | 2512 power resistor 5% (10inch) | 2512 | jumper | 1.000 | 4000 | 10" | - | 81 |
| 232280391001 | RC41 | General 0201 5% Reel (7inch) | 0201 | jumper | 0.050 | 10 000 | 7" | - | 74 |
| 235001391001 | ARV321 | Array 2x0402 5% Reel (10inch) convex | 0202 | jumper | 0.063 | 10 000 | 10" | - | 79 |
| 235001391002 | ARV321 | Array 2x0402 5% Reel (7inch) convex | 0202 | jumper | 0.063 | 5 000 | 7" | - | 79 |
| 235003391001 | ARV341 | Array 4x0402 5% Reel (10inch) convex | 0402 | jumper | 0.063 | 10 000 | 10" | - | 79 |
| 235003391002 | ARV341 | Array 4x0402 5% Reel (7inch) convex | 0402 | jumper | 0.063 | 5 000 | 7" | - | 79 |
| 235003491001 | ARC241 | Array 4x0603 5% Reel (7inch) concave | 1206 | jumper | 0.063 | 5 000 | 7" | - | 79 |
| 235003591001 | ARV241 | Array 4x0603 5% Reel (7inch) concex | 1206 | jumper | 0.063 | 5 000 | 7" | - | 79 |
| 235005391001 | ARV381 | Array 8x0402 5% Reel (7inch) convex | 1608 | jumper | 0.063 | 5 000 | 7" | - | 79 |
| 235023091001 | RNA310 | 8R-network 5% Reel (7inch) convex | 1206 | jumper | 0.031 | 5 000 | 7" | - | 80 |
| 235052091001 | HRC01 | High Ohmic resistor 1206 5% - 100M (7inch) | 1206 | 5% | 0.250 | 5 000 | 7" | 250 | 84 |
| 235052191001 | HRC11 | High Ohmic resistor 0805 5% - 100M (7inch) | 0805 | 5% | 0.125 | 5 000 | 7" | 250 | 84 |
| 232270211... | RC21 | General 0603 5% Reel - NiAu termination (7inch) | 0603 | 5% | 0.063 | 5 000 | 7" | - | 86 |
| 232270212... | RC21 | General 0603 5% Reel - NiAu termination (10inch) | 0603 | 5% | 0.063 | 10 000 | 10" | - | 86 |
| 232270260... | RC21 | General 0603 5% Reel (7inch) | 0603 | 5% | 0.100 | 5 000 | 7" | - | 74 |
| 232270270... | RC21 | General 0603 5% Reel (10inch) | 0603 | 5% | 0.100 | 10 000 | 10" | - | 74 |
| 232270281... | RC21 | General 0603 5% Reel (13inch) | 0603 | 5% | 0.100 | 20 000 | 13" | - | 74 |
| 23227041.... | RC22H | General 0603 1% Reel - NiAu termination (7inch) | 0603 | 1% | 0.063 | 5 000 | 7" | - | 86 |
| 23227042.... | RC22H | General 0603 1% Reel - NiAu termination (10inch) | 0603 | 1% | 0.063 | 10 000 | 10" | - | 86 |
| 23227046.... | RC22H | General 0603 1% Reel (7inch) | 0603 | 1% | 0.100 | 5 000 | 7" | - | 74 |
| 23227047.... | RC22H | General 0603 1% Reel (10inch) | 0603 | 1% | 0.100 | 10 000 | 10" | - | 74 |
| 23227048.... | RC22H | General 0603 1% Reel (13inch) | 0603 | 1% | 0.100 | 20 000 | 13" | - | 74 |
| 232270512... | RC31 | General 0402 5% Reel - NiAu termination (7inch) | 0402 | 5% | 0.063 | 10 000 | 7" | - | 86 |
| 232270570... | RC31 | General 0402 5% Reel (7inch) | 0402 | 5% | 0.063 | 10 000 | 7" | - | 74 |
| 232270587... | RC31 | General 0402 5% Reel (10inch) | 0402 | 5% | 0.063 | 5 0000 | 10" | - | 74 |
| 23227062.... | RC32 | Genaral 0402 1% Reel - NiAu termination (7inch) | 0402 | 1% | 0.063 | 10 000 | 7" | - | 86 |
| 23227067.... | RC32 | General 0402 1% Reel (7inch) | 0402 | 1% | 0.063 | 10 000 | 7" | - | 74 |
| 23227068.... | RC32 | General 0402 1% Reel (10inch) | 0402 | 1% | 0.063 | 5 0000 | 10" | - | 74 |
| 23227072.... | RC04G | High-precision 1206 0.25% Reel (7inch) TC50 | 1206 | 0.25% | 0.125 | 5 000 | 7" | 50 | 75 |
| 23227082.... | RC05G | High-precision 1206 0.1% Reel (7inch) TC50 | 1206 | 0.1% | 0.125 | 5 000 | 7" | 50 | 75 |
| 23227092.... | RC14G | High-precision 0805 0.25% Reel (7inch) TC50 | 0805 | 0.25% | 0.100 | 5 000 | 7" | 50 | 75 |
| 23227102.... | RC15G | High-precision 0805 0.1% Reel (7inch) TC50 | 0805 | 0.1% | 0.100 | 5 000 | 7" | 50 | 75 |
| 232271111... | RC01 | General 1206 5% Reel - NiAu termination (7inch) | 1206 | 5% | 0.250 | 5 000 | 7" | - | 86 |
| 232271112... | RC01 | General 1206 5% Reel - NiAu termination (10inch) | 1206 | 5% | 0.250 | 10 000 | 10" | - | 86 |
| 232271151... | RC01 | General 1206 5% Reel (10inch) | 1206 | 5% | 0.250 | 10 000 | 10" | - | 74 |
| 232271161... | RC01 | General 1206 5% Reel (7inch) | 1206 | 5% | 0.250 | 5 000 | 7" | - | 74 |
| 232271181... | RC01 | General 1206 5% Reel (13inch) | 1206 | 5% | 0.250 | 20 000 | 13" | - | 74 |
| 23227222.... | RC02G | General 1206 1% Reel (7inch) TC50 | 1206 | 1% | 0.250 | 5 000 | 7" | 50 | 74 |
| 23227223.... | RC02G | General 1206 1% Reel (10inch) TC50 | 1206 | 1% | 0.250 | 10 000 | 10" | 50 | 74 |
| 23227246.... | RC02H | General 1206 1% Reel (7inch) | 1206 | 1% | 0.250 | 5 000 | 7" | - | 74 |
| 23227247.... | RC02H | General 1206 1% Reel (10inch) | 1206 | 1% | 0.250 | 10 000 | 10" | - | 74 |
| 23227248.... | RC02H | General 1206 1% Reel (13inch) | 1206 | 1% | 0.250 | 20 000 | 13" | - | 74 |
| 232272494. | RC02TR | Trimmable resistor 1206 (Europe style) (7inch) | 1206 | - | 0.250 | 5 000 | 7" | - | 85 |
| 23227252.... | RC03G | High-precision 1206 0.5% Reel (7inch) TC50 | 1206 | 0.5% | 0.250 | 5 000 | 7" | 50 | 75 |
| 23227291.... | RC02H | General 1206 1% Reel - NiAu termination (7inch) | 1206 | 1% | 0.250 | 5 000 | 7" | - | 86 |
| 23227292.... | RC02H | General 1206 1% Reel - NiAu termination (10inch) | 1206 | 1% | 0.250 | 10 000 | 107" | - | 86 |
| 232273011.... | RC11 | General 0805 5% Reel - NiAu termination (7inch) | 0805 | 5% | 0.125 | 5 000 | 7" | - | 86 |
| 232273012.... | RC11 | General 0805 5% Reel - NiAu termination (10inch) | 0805 | 5% | 0.125 | 10 000 | 10" | - | 86 |
| 232273061... | RC11 | General 0805 5% Reel (7inch) | 0805 | 5% | 0.125 | 5 000 | 7" | - | 74 |
| 232273071... | RC11 | General 0805 5% Reel (10inch) | 0805 | 5% | 0.125 | 10 000 | 10" | - | 74 |

| 12NC to part number cross reference | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 12NC | P/N | Description | Size | Tol | Power | Qty | Reel size | TC | Page |
| 232273081... | RC11 | General 0805 5% Reel (13inch) | 0805 | 5% | 0.125 | 20 000 | 13" | - | 74 |
| 23227326.... | RC12G | General 0805 1% Reel (7inch) TC50 | 0805 | 1% | 0.125 | 5 000 | 7" | 50 | 74 |
| 23227327.... | RC12G | General 0805 1% Reel (10inch) TC50 | 0805 | 1% | 0.125 | 10 000 | 10" | 50 | 74 |
| 23227341.... | RC12 | General 0805 1% Reel - NiAu termination (7inch) | 0805 | 1% | 0.125 | 5 000 | 7" | - | 86 |
| 23227342.... | RC12 | General 0805 1% Reel - NiAu termination (10inch) | 0805 | 1% | 0.125 | 10 000 | 10" | - | 86 |
| 23227346.... | RC12H | General 0805 1% Reel (7inch) | 0805 | 1% | 0.125 | 5 000 | 7" | - | 74 |
| 23227347.... | RC12H | General 0805 1% Reel (10inch) | 0805 | 1% | 0.125 | 10 000 | 10" | - | 74 |
| 23227348.... | RC12H | General 0805 1% Reel (13inch) | 0805 | 1% | 0.125 | 20 000 | 13" | - | 74 |
| 232273494... | RC12TR | Trimmable resistor 0805 (Europe style) (7inch) | 0805 | - | 0.125 | 5 000 | 7" | - | 85 |
| 23227352.... | PRC201 | 1218 power resistor 5% (10inch) | 1218 | 1% | 1.000 | 5 000 | 10" | - | 81 |
| 23227352.... | LPRC201 | 1218 power resistor 1% (10inch) low ohmic | 1218 | 1% | 1.000 | 5 000 | 10" | - | 82 |
| 232273560... | PRC201 | 1218 power resistor 5% (10inch) | 1218 | 5% | 1.000 | 5 000 | 10" | - | 83 |
| 232273560... | LPRC201 | 1218 power resistor 5% (10 inch) low ohmic | 1218 | 5% | 1.000 | 5 000 | 10" | - | 82 |
| 23227382.... | RC13G | High-precision 0805 0.5% Reel (7inch) TC50 | 0805 | 0.5% | 0.125 | 5 000 | 7" | 50 | 75 |
| 23227506.... | FRC01 | Fuse resistor 1206 5% (7inch) | 1206 | 5% | 0.125 | 5 000 | 7" | - | 85 |
| 232275660... | FRC21 | Fuse resistor 0603 5% (7inch) | 0603 | 1% | 0.063 | 5 000 | 7" | - | 85 |
| 232276060... | PRC111 | 2010 power resistor 5% (10 inch) | 2010 | 5% | 0.500 | 4 000 | 10" | - | 81 |
| 232276060...7 | LPRC111 | 2010 power resistor 5% (10 inch) low ohmic | 2010 | 5% | 0.500 | 4 000 | 10" | - | 82 |
| 232276090..0 | LPRC111 | 2010 power resistor 5% (10inch) low ohmic | 2010 | 5% | 0.500 | 4 000 | 10" | - | 82 |
| 23227616.... | PRC111 | 2010 power resisitor 1% (10inch) | 2010 | 1% | 0.500 | 4 000 | 10" | - | 81 |
| 23227616...7 | LPRC111 | 2010 power resistor 1% (10inch) low ohmic | 2010 | 1% | 0.500 | 4 000 | 10" | - | 82 |
| 232276190..0 | LPRC111 | 2010 power resistor 1% (10inch) low ohmic | 2010 | 1% | 0.500 | 4 000 | 10" | - | 82 |
| 232276260... | PRC221 | 2512 power resistor 5% (10inch) | 2512 | 5% | 1.000 | 4 000 | 10" | - | 81 |
| 232276260...7 | LPRC221 | 2512 power resistor 5% (10 inch) low ohmic | 2512 | 5% | 1.000 | 4 000 | 10" | - | 82 |
| 232276290..0 | LPRC221 | 2512 power resistor 5% (10inch) low ohmic | 2512 | 5% | 1.000 | 4 000 | 10" | - | 82 |
| 232276294..0 | MPRC221 | 2512 power metal strip resistor 5% (10inch) | 2512 | 5% | 1.000 | 4 000 | 10" | - | 83 |
| 232276298... | VPRC221 | 2512 high voltage power resistor 5% (10inch) | 2512 | 5% | 1.000 | 4 000 | 10" | 200 | 83 |
| 23227636.... | PRC221 | 2512 power resistor 1% (10inch) | 2512 | 1% | 1.000 | 4 000 | 10" | - | 81 |
| 23227636...7 | LPRC221 | 2512 power resistor 1% (10inch) low ohmic | 2512 | 1% | 1.000 | 4 000 | 10" | - | 82 |
| 232276390..0 | LPRC221 | 2512 power resistor 1% (10inch) low ohmic | 2512 | 1% | 1.000 | 4 000 | 10" | - | 82 |
| 232276395..0 | MPRC221 | 2512 power metal strip resistor 1% (10inch) | 2512 | 1% | 1.000 | 4 000 | 10" | - | 83 |
| 232279061... | VRC01 | High voltage resistor 1206 5% (7inch) | 1206 | 5% | 0.250 | 5 000 | 7" | 300 | 83 |
| 23227916.... | VRC02 | High voltage resistor 1206 1% (7 inch) | 1206 | 1% | 0.250 | 5 000 | 7" | 300 | 83 |
| 232279261... | VRC11 | High voltage resistor 0805 5% (7inch) | 0805 | 5% | 0.125 | 5 000 | 7" | 300 | 83 |
| 23227936.... | VRC12 | High voltage resistor 0805 1% (7inch) | 0805 | 1% | 0.125 | 5 000 | 7" | 300 | 83 |
| 232280370... | RC41 | General 0201 5% Reel (7inch) | 0201 | 5% | 0.050 | 10 000 | 7" | - | 74 |
| 23228047.... | RC42 | General 0201 1% Reel (7inch) | 0201 | 1% | 0.050 | 10 000 | 7" | - | 74 |
| 235001311... | ARV321 | Array 2x0402 5% Reel (10inch) convex | 0202 | 5% | 0.063 | 10 000 | 10" | 200 | 79 |
| 23500132.... | ARV322 | Array 2x0402 1% Reel (7inch) convex | 0202 | 1% | 0.063 | 10 000 | 7" | 100 | 79 |
| 23500231.... | ARV342 | Array 4x0402 1% Reel (7inch) convex | 0402 | 1% | 0.063 | 5 000 | 7" | 300 | 79 |
| 23500232.... | ARV342 | Array 4x0402 1% Reel (7inch) convex | 0402 | 1% | 0.063 | 10 000 | 10" | 300 | 79 |
| 23500241.... | ARC242 | Array 4x0603 1% Reel (7inch) concave | 1206 | 1% | 0.063 | 5 000 | 7" | 100 | 79 |
| 23500251.... | ARV242 | Array 4x0603 1% Reel (7inch) convex | 1206 | 1% | 0.063 | 5 000 | 7" | 200 | 79 |
| 235003310... | ARV341 | Array 4x0402 5% Reel (7inch) convex | 0402 | 5% | 0.063 | 5 000 | 7" | 300 | 79 |
| 235003311... | ARV341 | Array 4x0402 5% Reel (10inch) convex | 0402 | 5% | 0.063 | 10 000 | 10" | 300 | 79 |
| 235003410... | ARC241 | Array 4x0603 5% Reel (7inch) concave | 1206 | 5% | 0.063 | 5 000 | 7" | 200 | 79 |
| 235003510... | ARV241 | Array 4x0603 5% Reel (7inch) concex | 1206 | 5% | 0.063 | 5 000 | 7" | 200 | 79 |
| 23500431.... | ARV382 | Array 8x0402 1% Reel (7inch) convex | 1608 | 1% | 0.063 | 5 000 | 7" | 200 | 79 |
| 235005310... | ARV381 | Array 8x0402 5% Reel (7inch) convex | 1608 | 5% | 0.063 | 5 000 | 7" | 200 | 79 |
| 235023010... | RNA310 | 8R-network 5% Reel (7inch) convex | 1206 | 5% | 0.031 | 5 000 | 7" | - | 80 |
| 23502302.... | RNA310 | 8R-network 1% Reel (7inch) convex | 1206 | 1% | 0.031 | 5 000 | 7" | - | 80 |
| 23503122.... | RCB210 | Network 4R4C 5% (7inch) concave | 1608 | 5% | 0.062 | 5 000 | 7" | 200 | 80 |
| 235050010... | RC02TR | Trimmable resistor 1206 0/-30% (7inch) | 1206 | 0/-30 | 0.250 | 5 000 | 7" | - | 85 |
| 235050011... | RC02TR | Trimmable resistor 1206 0/-20% (7inch) | 1206 | 0/-20 | 0.250 | 5 000 | 7" | - | 85 |
| 235050111... | RC12TR | Trimmable resistor 0805 0/-20% (7inch) | 0805 | 0/-20 | 0.125 | 5 000 | 7" | - | 85 |
| 235050210... | RC22TR | Trimmable resistor 0603 0/-30% (7inch) | 0603 | 0/-30 | 0.063 | 5 000 | 7" | - | 85 |
| 235050211... | RC22TR | Trimmable resistor 0603 0/-20% (7inch) | 0603 | 0/-20 | 0.063 | 5 000 | 7" | - | 85 |
| 23505032.... | RC32TR | Trimmable resistor 0402 0/-30% (7inch) | 0402 | 0/-30 | 0.063 | 10 000 | 7" | - | 85 |
| 235050321... | RC32TR | Trimmable resistor 0402 0/-20% (7inch) | 0402 | 0/-20 | 0.063 | 10 000 | 7" | - | 85 |
| 235051010... | LRC01 | Low Ohmic resistor 1206 5% (7inch) | 1206 | 5% | 0.250 | 5 000 | 7" | - | 84 |
| 235051012... | LRC02 | Low Ohmic resistor 1206 1% (7inch) | 1206 | 1% | 0.250 | 5 000 | 7" | - | 84 |
| 235051110... | LRC11 | Low Ohmic resistor 0805 5% (7inch) | 0805 | 5% | 0.125 | 5 000 | 7" | - | 84 |
| 235051110... | RC12TR | Trimmable resistor 0805 0/-30% (7inch) | 0805 | 0/-30 | 0.125 | 5 000 | 7" | - | 85 |
| 235051112... | LRC12 | Low Ohmic resistor 0805 1% (7inch) | 0805 | 1% | 0.100 | 5 000 | 7" | - | 84 |
| 235051115... | LRC11P | Low Ohmic resistor 0805 5% power (7inch) | 0805 | 5% | 0.250 | 5 000 | 7" | - | 84 |
| 235051117... | LRC12P | Low Ohmic resistor 0805 1% power (7inch) | 0805 | 1% | 0.250 | 5 000 | 7" | - | 84 |
| 235051210... | LRC21 | Low Ohmic resistor 0603 5% (7inch) | 0603 | 5% | 0.063 | 5 000 | 7" | - | 84 |
| 235051212... | LRC22 | Low Ohmic resistor 0603 1% (7inch) | 0603 | 1% | 0.063 | 5 000 | 7" | - | 84 |
| 235052010... | HRC01 | High Ohmic resistor 1206 5% (7inch) | 1206 | 5% | 0.250 | 5 000 | 7" | 250 | 84 |

| 12NC to part number cross reference | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 12NC | P/N | Description | Size | Tol | Power | Qty | Reel size | TC | Page |
| 235052110... | HRC11 | High Ohmic resistor 0805 5% (7inch) | 0805 | 5% | 0.125 | 5 000 | 7" | 250 | 84 |
| 235052210... | HRC21 | High Ohmic resistor 0603 5% (7inch) | 0603 | 5% | 0.100 | 5 000 | 7" | 300 | 84 |
| 23505410.... | RC04H | High-precision 1206 0.25% Reel (7inch) TC100 | 1206 | 0.25% | 0.250 | 5 000 | 7" | 100 | 75 |
| 23505420.... | RC05H | High-precision 1206 0.1% Reel (7inch) TC100 | 1206 | 0.1% | 0.125 | 5 000 | 7" | 100 | 75 |
| 23505440.... | RC14H | High-precision 0805 0.25% Reel (7inch) TC100 | 0805 | 0.25% | 0.100 | 5 000 | 7" | 100 | 75 |
| 23505450.... | RC15H | High-precision 0805 0.1% Reel (7inch) TC100 | 0805 | 0.1% | 0.100 | 5 000 | 7" | 100 | 75 |
| 23505460.... | RC23H | High-precision 0603 0.5% Reel (7inch) TC100 | 0603 | 0.5% | 0.063 | 5 000 | 7" | 100 | 76 |
| 23505470.... | RC24H | High-precision 0603 0.25% Reel (7inch) TC100 | 0603 | 0.25% | 0.063 | 5 000 | 7" | 100 | 76 |
| 23505480.... | RC25H | High-precision 0603 0.1% Reel (7inch) TC100 | 0603 | 0.1% | 0.063 | 5 000 | 7" | 100 | 76 |
| 23505497.... | RC33 | High-precision 0402 0.5% Reel (7inch) TC200 | 0402 | 0.5% | 0.063 | 5 000 | 7" | 200 | 76 |
| 235055010... | SRC01 | Surge resistor 1206 5% (7inch) | 1206 | 5% | 0.250 | 5 000 | 7" | 200 | 85 |
| 235070310... | ATV321 | Attenuator 50Ω - 1 to 20 dB | 0404 | - | 0.040 | 5 000 | 7" | - | 97 |
| 235070311... | ATV321 | Attenuator 50Ω - 1 to 20 dB | 0404 | - | 0.040 | 10 000 | 10" | - | 97 |
| 2390 735 3.... | PRC102 | 1210 power resistor 1% (7inch) | 1210 | 1% | 0.330 | 5 000 | 7" | - | 81 |
| 2390 735 3.... | LPRC102 | 1210 power resistor 1% (7inch) | 1210 | 1% | 0.330 | 5 000 | 7" | - | 82 |
| 2390 735 70.... | PRC101 | 1210 power resistor 5% (7inch) | 1210 | 5% | 0.330 | 5 000 | 7" | - | 81 |
| 2390 735 70.... | LPRC101 | 1210 power resistor 5% (7inch) | 1210 | 5% | 0.330 | 5 000 | 7" | - | 82 |
| 2390 735 90001 | PRC101 | 1210 power resistor 5% (7inch) | 1210 | jumper | 0.330 | 5 000 | 7" | - | 81 |
| 23904013.... | TF124 | High-precision Thin Film 0805 0.05% Reel (7inch) TC50 | 0805 | 0.05% | 0.125 | 5 000 | 7" | 50 | 77 |
| 23904014.... | TF123 | High-precision Thin Film 0805 0.1% Reel (7inch) TC50 | 0805 | 0.1% | 0.125 | 5 000 | 7" | 50 | 77 |
| 23904015.... | TF122 | High-precision Thin Film 0805 0.25% Reel (7inch) TC50 | 0805 | 0.25% | 0.125 | 5 000 | 7" | 50 | 77 |
| 23904016.... | TF121 | High-precision Thin Film 0805 0.5% Reel (7inch) TC50 | 0805 | 0.5% | 0.125 | 5 000 | 7" | 50 | 77 |
| 23904017.... | TF120 | High-precision Thin Film 0805 1.0% Reel (7inch) TC50 | 0805 | 1.0% | 0.125 | 5 000 | 7" | 50 | 77 |
| 23904043.... | TF224 | High-precision Thin Film 0603 0.05% Reel (7inch) TC50 | 0603 | 0.05% | 0.063 | 5 000 | 7" | 50 | 78 |
| 23904044.... | TF223 | High-precision Thin Film 0603 0.1% Reel (7inch) TC50 | 0603 | 0.1% | 0.063 | 5 000 | 7" | 50 | 78 |
| 23904045.... | TF222 | High-precision Thin Film 0603 0.25% Reel (7inch) TC50 | 0603 | 0.25% | 0.063 | 5 000 | 7" | 50 | 78 |
| 23904046.... | TF221 | High-precision Thin Film 0603 0.5% Reel (7inch) TC50 | 0603 | 0.5% | 0.063 | 5 000 | 7" | 50 | 78 |
| 23904047.... | TF220 | High-precision Thin Film 0603 1.0% Reel (7inch) TC50 | 0603 | 1.0% | 0.063 | 5 000 | 7" | 50 | 78 |
| 23904073.... | TF324 | High-precision Thin Film 0402 0.05% Reel (7inch) TC50 | 0402 | 0.05% | 0.063 | 10 000 | 7" | 50 | 78 |
| 23904074.... | TF323 | High-precision Thin Film 0402 0.1% Reel (7inch) TC50 | 0402 | 0.1% | 0.063 | 10 000 | 7" | 50 | 78 |
| 23904075.... | TF322 | High-precision Thin Film 0402 0.25% Reel (7inch) TC50 | 0402 | 0.25% | 0.063 | 10 000 | 7" | 50 | 78 |
| 23904076.... | TF321 | High-precision Thin Film 0402 0.5% Reel (7inch) TC50 | 0402 | 0.5% | 0.063 | 10 000 | 7" | 50 | 78 |
| 23904077.... | TF320 | High-precision Thin Film 0402 1.0% Reel (7inch) TC50 | 0402 | 1.0% | 0.063 | 10 000 | 7" | 50 | 78 |
| 23904113.... | TF024 | High-precision Thin Film 1206 0.05% Reel (7inch) TC50 | 1206 | 0.05% | 0.125 | 5 000 | 7" | 50 | 77 |
| 23904114.... | TF023 | High-precision Thin Film 1206 0.1% Reel (7inch) TC50 | 1206 | 0.1% | 0.125 | 5 000 | 7" | 50 | 77 |
| 23904115.... | TF022 | High-precision Thin Film 1206 0.25% Reel (7inch) TC50 | 1206 | 0.25% | 0.125 | 5 000 | 7" | 50 | 77 |
| 23904116.... | TF021 | High-precision Thin Film 1206 0.5% Reel (7inch) TC50 | 1206 | 0.5% | 0.125 | 5 000 | 7" | 50 | 77 |
| 23904117.... | TF020 | High-precision Thin Film 1206 1.0% Reel (7inch) TC50 | 1206 | 1.0% | 0.125 | 5 000 | 7" | 50 | 77 |
| 23904123.... | TF524 | High-precision Thin Film 1210 0.05% Reel (7inch) TC50 | 1210 | 0.05% | 0.250 | 5 000 | 7" | 50 | 76 |
| 23904124.... | TF523 | High-precision Thin Film 1210 0.1% Reel (7inch) TC50 | 1210 | 0.1% | 0.250 | 5 000 | 7" | 50 | 76 |
| 23904125.... | TF522 | High-precision Thin Film 1210 0.25% Reel (7inch) TC50 | 1210 | 0.25% | 0.250 | 5 000 | 7" | 50 | 76 |
| 23904126.... | TF521 | High-precision Thin Film 1210 0.5% Reel (7inch) TC50 | 1210 | 0.5% | 0.250 | 5 000 | 7" | 50 | 76 |
| 23904127.... | TF520 | High-precision Thin Film 1210 1.0% Reel (7inch) TC50 | 1210 | 1.0% | 0.250 | 5 000 | 7" | 50 | 76 |
| 23906013.... | TF114 | High-precision Thin Film 0805 0.05% Reel (7inch) TC25 | 0805 | 0.05% | 0.125 | 5 000 | 7" | 25 | 77 |
| 23906014.... | TF113 | High-precision Thin Film 0805 0.1% Reel (7inch) TC25 | 0805 | 0.1% | 0.125 | 5 000 | 7" | 25 | 77 |
| 23906015.... | TF112 | High-precision Thin Film 0805 0.25% Reel (7inch) TC25 | 0805 | 0.25% | 0.125 | 5 000 | 7" | 25 | 77 |
| 23906016.... | TF111 | High-precision Thin Film 0805 0.5% Reel (7inch) TC25 | 0805 | 0.5% | 0.125 | 5 000 | 7" | 25 | 77 |
| 23906017.... | TF110 | High-precision Thin Film 0805 1.0% Reel (7inch) TC25 | 0805 | 1.0% | 0.125 | 5 000 | 7" | 25 | 77 |
| 23906043.... | TF214 | High-precision Thin Film 0603 0.05% Reel (7inch) TC25 | 0603 | 0.05% | 0.063 | 5 000 | 7" | 25 | 78 |
| 23906044.... | TF213 | High-precision Thin Film 0603 0.1% Reel (7inch) TC25 | 0603 | 0.1% | 0.063 | 5 000 | 7" | 25 | 78 |
| 23906045..... | TF212 | High-precision Thin Film 0603 0.25% Reel (7inch) TC25 | 0603 | 0.25% | 0.063 | 5 000 | 7" | 25 | 78 |
| 23906046.... | TF211 | High-precision Thin Film 0603 0.5% Reel (7inch) TC25 | 0603 | 0.5% | 0.063 | 5 000 | 7" | 25 | 78 |
| 23906047.... | TF210 | High-precision Thin Film 0603 1.0% Reel (7inch) TC25 | 0603 | 1.0% | 0.063 | 5 000 | 7" | 25 | 78 |
| 23906073.... | TF314 | High-precision Thin Film 0402 0.05% Reel (7inch) TC25 | 0402 | 0.05% | 0.063 | 10 000 | 7" | 25 | 78 |
| 23906074.... | TF313 | High-precision Thin Film 0402 0.1% Reel (7inch) TC25 | 0402 | 0.1% | 0.063 | 10 000 | 7" | 25 | 78 |
| 23906075.... | TF312 | High-precision Thin Film 0402 0.25% Reel (7inch) TC25 | 0402 | 0.25% | 0.063 | 10 000 | 7" | 25 | 78 |
| 23906076.... | TF311 | High-precision Thin Film 0402 0.5% Reel (7inch) TC25 | 0402 | 0.5% | 0.063 | 10 000 | 7" | 25 | 78 |
| 23906077.... | TF310 | High-precision Thin Film 0402 1.0% Reel (7inch) TC25 | 0402 | 1.0% | 0.063 | 10 000 | 7" | 25 | 78 |
| 23906113.... | TF014 | High-precision Thin Film 1206 0.05% Reel (7inch) TC25 | 1206 | 0.05% | 0.125 | 5 000 | 7" | 25 | 77 |
| 23906114.... | TF013 | High-precision Thin Film 1206 0.1% Reel (7inch) TC25 | 1206 | 0.1% | 0.125 | 5 000 | 7" | 25 | 77 |
| 23906115.... | TF012 | High-precision Thin Film 1206 0.25% Reel (7inch) TC25 | 1206 | 0.25% | 0.125 | 5 000 | 7" | 25 | 77 |
| 23906116.... | TF011 | High-precision Thin Film 1206 0.5% Reel (7inch) TC25 | 1206 | 0.5% | 0.125 | 5 000 | 7" | 25 | 77 |
| 23906117.... | TF010 | High-precision Thin Film 1206 1.0% Reel (7inch) TC25 | 1206 | 1.0% | 0.125 | 5 000 | 7" | 25 | 77 |
| 23906123.... | TF514 | High-precision Thin Film 1210 0.05% Reel (7inch) TC25 | 1210 | 0.05% | 0.250 | 5 000 | 7" | 25 | 76 |
| 23906124.... | TF513 | High-precision Thin Film 1210 0.1% Reel (7inch) TC25 | 1210 | 0.1% | 0.250 | 5 000 | 7" | 25 | 76 |
| 23906125.... | TF512 | High-precision Thin Film 1210 0.25% Reel (7inch) TC25 | 1210 | 0.25% | 0.250 | 5 000 | 7" | 25 | 76 |
| 23906126.... | TF511 | High-precision Thin Film 1210 0.5% Reel (7inch) TC25 | 1210 | 0.5% | 0.250 | 5 000 | 7" | 25 | 76 |
| 23906127.... | TF510 | High-precision Thin Film 1210 1.0% Reel (7inch) TC25 | 1210 | 1.0% | 0.250 | 5 000 | 7" | 25 | 76 |
| 332207330... | Sample kits | Samples kits | - | - | - | - | - | - | 87 |

# PRODUCT SELECTION CHART

## HF products - Antennas

| Description | UHF antenna ceramic | TDMA antenna ceramic | Dual-band antenna (900/ 1800 MHz) PCB | Dual-band antenna (900/1800 MHz) ceramic | Triple-band antenna (900/1800/1900 MHz) PCB vertical | GPS antenna (CP mode) (1.575 GHz) | GPS antenna (CP mode) (1.575 GHz) | GPS antenna (LP mode) (1.575 GHz) | DECT/ WCDMA antenna |
|---|---|---|---|---|---|---|---|---|---|
| Dimensions (mm) | 37.5x6.8x0.9 | 16.5x14x0.9 | 24x10x6 | 21x12x0.9 | 30x9.4x0.8 | 12x12x4 | 18x18x4 | 12,5x6.6x0.9 | 8.8x6.8x0.9 |
| Frequencecy range | 421 to 445 MHz | 850 to 950 MHz | 880 to 960 MHz<br>1710 to 1880 MHz | 880 to 960 MHz<br>1710 to 1880 MHz | 880 to 960 MHz<br>1710 to 1880 MHz | 1.580 GHz | 1.580 GHz | 1.597 GHz | 1.88 to 2.1 GHz |
| Bandwidth (MHz) | 20 MHz | 80 MHz | 80 MHz<br>170 MHz | 80 MHz<br>170 MHz | 80 MHz<br>170 MHz | 6 MHz | 6 MHz | 100 MHz | 100 MHz |
| Gain (dBi max) | 0.5 | 1.5 | 0 to 0.5<br>0.5 to 1 | 0 to 0.5<br>0.5 to 1 | 0 to 0.5<br>0.5 to 1 | 3 | 4 | 1.5 | 2 |
| Polarization | Linear | Linear | Linear | Linear | Linear | Right-hand circular polarization | Right-hand circular polarization | Linear | Linear |
| Azimuth | Omni-directional | Omni-directional | Omni-directional | Omni-directional | Omni-directional | - | - | Omni-directional | Omni-directional |
| VSWR | <2.0 | <2.0 | <2.7 | <2.7 | <2.5 | <2.5 | <2.5 | <2.0 | <2 |
| Temp range (°C) | -55 to 125 | -55 to 125 | -55 to 125 | -55 to 125 | -55 to 125 | -55 to 125 | -55 to 125 | -55 to 125 | -55 to 125 |

| Packing | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Bulk | 4313 121 200043 | 4313 119 00087 | 4313 316 00918 | 4313 118 00918 | 4313 324 00918 | 4313 213 06158 | 4313 423 06158 | 4313 114 00158 | --- |
| Tape 1000 pcs | --- | 4311 119 00087 | --- | 4311 118 00918 | --- | --- | --- | --- | 4311 112 00188 |
| Tape 2500 pcs | 4311 121 20043 | --- | --- | --- | --- | --- | --- | --- | --- |

| Description | Bluetooth antenna - long shape | | | Bluetooth antenna | | | | HyperLan 5.265 GHz | Bluetooth/WLAN IEE802.11 Antenna FR4 w/cable conn. | Dual-band WLAN 2.45 / 5.2 GHz | Bluetooth/WLAN IEE802.11 Antenna FR4 w/cable conn. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dimensions (mm) | 8x3.5x0.9 | 8x3.5x0.9 | 8x3.5x0.9 | 7.3x5.5x1.3 | 7.3x5.5x1.3 | 7.3x5.5x1.3 | 7.3x5.5x1.3 | 12x12x4 | 28x5.6x0.8 | 8.7x8x0.9 | 28x5.6x0.4 |
| Frequencecy range (GHz) | 2.45 | 2.60 | 2.70 | 2.45 | 2.60 | 2.70 | 2.80 | 5.150 to 5.350 | 2.4 - 2.5 | 2.45/ 5.2 | 2.4-2.5/ 5.1-5.3 |
| Bandwidth (MHz) | > 100 | > 100 | > 100 | > 100 | > 100 | > 100 | > 100 | 200 | 100 | > 100 | 100/ 200 |
| Gain (dBi max) | 0 | 0 | 0 | 1.2 | 1.2 | 1.2 | 1.2 | 3 | 1 | 0 | 1 |
| Polarization | Linear | Linear | Linear | Linear | Linear | Linear | Linear | Linear | Linear | Linear | Linear |
| Azimuth | Omni-directional | Omni-directional | Omni-directional | Omni-directional | Omni-directional | Omni-directional | Omni-directional | - | Omni-directional | Omni-directional | Omni-directional |
| VSWR | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.5 | <2.0 | <2.5 |
| Temp range (°C) | -55 to 125 | -55 to 125 | -55 to 125 | -55 to 125 | -55 to 125 | -55 to 125 | -55 to 125 | -55 to 125 | -55 to 125 | -55 to 125 | -55 to 125 |

| Packing | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bulk | 4313 115 00245 | 4313 115 00260 | 4313 115 00270 | 4313 111 00245 | 4313 111 00260 | 4313 111 00270 | 4313 111 00280 | 4313 222 00520 | 4313 325 00245 | 4313 117 00252 | 4313 326 00252 |
| Tape 1000 pcs | 4311 115 00245 | 4311 115 00260 | 4311 115 00270 | 4311 111 00245 | 4311 111 00260 | 4311 111 00270 | 4311 111 00280 | --- | --- | 4311 117 00252 | --- |
| Tape 4000 pcs | 4312 115 00245 | 4312 115 00260 | 4312 115 00270 | 4312 111 00245 | 4312 111 00260 | 4312 111 00270 | 4312 111 00280 | --- | --- | --- | --- |

| | | Attenuator |
|---|---|---|
| Series | | ATV321 |
| Case size | | **0404** |
| Attenuation range | | 1 dB / 20 dB |
| Attenuation tolerance | 1 to 5 dB | ±0.3 dB / ±0.2 dB |
| | 6 to 10 dB | ±0.5 dB / ±0.3 dB |
| | 15 dB | ±1 dB / ±0.5 dB |
| | 20 dB | ±2 dB / ±1.0 dB |
| Frequency range | 1 to 10 dB | DC tot 2.5 GHz |
| | 15 and 20 dB | DC to 2.0 GHz |
| Maximum permissible voltage (V) | | 50 |
| Power rating (mW) | | 40 |
| Temp range (°C) | | –55 to 125 |

| Ordering information - Phycomp world wide - preferred types | | |
|---|---|---|
| Series | | **ATV321** |
| Packing | | paper tape |
| Quantity | 5 000 | 2350 703 10... |
| | 10 000 | 2350 703 11... |
| Remark | | for last three digits see table 12NC |

| Ordering information - Phycomp North America - preferred types | | |
|---|---|---|
| Series | | **ATV321** |
| Packing | | paper tape |
| Quantity | 5 000 | 9CV3218Axxxxx-HFT |
| | 10 000 | 9CV3218Axxxxx-HF3 |
| Remark | | for xxxxx see table NA code |

| Attenuation | | | | | | |
|---|---|---|---|---|---|---|
| | Standard | | | Optional | | |
| Value (dB) | Tolerance (dB) | 12NC | NA code | Tolerance (dB) | 12NC | NA code |
| 1 | ±0.3 | 012 | 01dBC | ±0.2 | 011 | 01dBB |
| 2 | ±0.3 | 022 | 02dBC | ±0.2 | 021 | 02dBB |
| 3 | ±0.3 | 032 | 03dBC | ±0.2 | 031 | 03dBB |
| 4 | ±0.3 | 042 | 04dBC | ±0.2 | 041 | 04dBB |
| 5 | ±0.3 | 052 | 05dBC | ±0.2 | 051 | 05dBB |
| 6 | ±0.5 | 063 | 06dBD | ±0.3 | 062 | 06dBC |
| 7 | ±0.5 | 073 | 07dBD | ±0.3 | 072 | 07dBC |
| 8 | ±0.5 | 083 | 08dBD | ±0.3 | 082 | 08dBC |
| 9 | ±0.5 | 093 | 09dBD | ±0.3 | 092 | 09dBC |
| 10 | ±0.5 | 103 | 10dBD | ±0.3 | 102 | 10dBC |
| 15 | ±1.0 | 154 | 15dBF | ±0.5 | 153 | 15dBD |
| 20 | ±2.0 | 205 | 20dBG | ±1.0 | 204 | 20dBF |

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