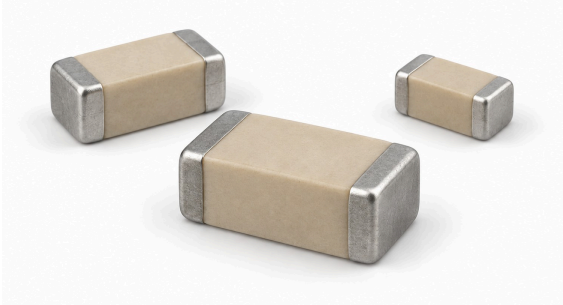


# Multilayer Chip Ceramic Capacitors

Datasheet (condensed) — full specification and application notes available separately



TABULATED DIELECTRICS (CAPACITY CHARTS / SECTION 6)  
C0G · X5R · X6S · X7R · X7S · X7T ②

TABULATED CASE SIZES  
0105 – 2220 ③

RATED VOLTAGE  
2.5 – 2000 V

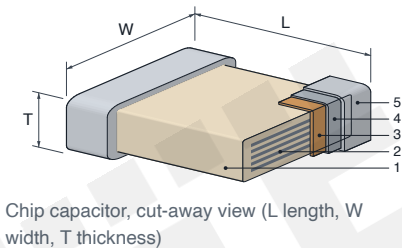
CAPACITANCE  
0.1 pF – 220 μF

## Capacitor and dielectric types ①

C0G: capacitors with this dielectric are Class I capacitors, including general-purpose and high-frequency C0G capacitors. Their electrical properties are the most stable and change very little with temperature, voltage and time. They are suited to applications that require low losses and high stability, such as filters, oscillators and timing circuits.

X7R, X5R, X6S, X7T, X7S: these dielectrics have a high dielectric constant; capacitors made with them are Class II capacitors, with higher capacitance than Class I. They have a semi-stable temperature characteristic and are used over a wide temperature range, in circuits such as DC blocking, decoupling, bypassing and frequency discrimination.

### Product structure



| No. | Name               |
|-----|--------------------|
| 1   | Ceramic dielectric |
| 2   | Inner electrode    |
| 3   | Outer electrode    |
| 4   | Nickel layer       |
| 5   | Tin layer          |

## Part numbering

|                                 |                                    |                                            |                                         |                                  |                                         |                                               |                                     |
|---------------------------------|------------------------------------|--------------------------------------------|-----------------------------------------|----------------------------------|-----------------------------------------|-----------------------------------------------|-------------------------------------|
| <b>0805</b><br>1 · Size<br>0805 | <b>CG</b><br>2 · Dielectric<br>C0G | <b>3</b><br>3 · Digits ②<br>100 = 3 digits | <b>101</b><br>4 · Capacitance<br>100 pF | <b>J</b><br>5 · Tolerance<br>±5% | <b>500</b><br>6 · Rated voltage<br>50 V | <b>N</b><br>7 · Termination<br>Nickel barrier | <b>T</b><br>8 · Packaging<br>Taping |
|---------------------------------|------------------------------------|--------------------------------------------|-----------------------------------------|----------------------------------|-----------------------------------------|-----------------------------------------------|-------------------------------------|

Ordering example as given on the original sheet; positions 1 to 8 are explained in the tables below.

### 1 · Size code ③

| Size code    | 0105      | 0201      | 0402      | 0603      | 0805      | 1206      | 1210      | 1808      | 1812      | 2220      | 2225      | 3035      |
|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| L × W (inch) | —         | —         | 0.04×0.02 | 0.06×0.03 | 0.08×0.05 | 0.12×0.06 | 0.12×0.10 | 0.18×0.08 | 0.18×0.12 | 0.22×0.20 | 0.22×0.25 | 0.3×0.35  |
| L × W (mm)   | 0.40×0.20 | 0.60×0.30 | 1.00×0.50 | 1.60×0.80 | 2.00×1.25 | 3.20×1.60 | 3.20×2.50 | 4.50×2.00 | 4.50×3.20 | 5.70×5.00 | 5.70×6.30 | 7.60×9.00 |

0105 = 01005 (inch) = 0402 (metric); 0201 = 0603 (metric). Inch L × W of 0105 and 0201 not given in the source.

### 2 · Dielectric

| Code       | CG  | D   | B   | E   | G   | S   | F   |
|------------|-----|-----|-----|-----|-----|-----|-----|
| Dielectric | C0G | X5R | X7R | X7T | X7S | X6S | Y5V |

### 3 · Number of digits ②

Total number of characters of the capacitance value in pF, e.g. 102 = 1000 = 4

### 4 · Nominal capacitance (pF)

| Code | Value (pF)           |
|------|----------------------|
| 0R5  | 0.5                  |
| 1R0  | 1.0                  |
| 102  | 10 × 10 <sup>2</sup> |
| 224  | 22 × 10 <sup>4</sup> |
| ...  | ...                  |

The first two digits are significant figures; the third digit is the number of zeros; R = decimal point.

### 6 · Rated voltage (V)

| Code | Value (V)            |
|------|----------------------|
| 6R3  | 6.3                  |
| 500  | 50 × 10 <sup>0</sup> |
| 201  | 20 × 10 <sup>1</sup> |
| 102  | 10 × 10 <sup>2</sup> |
| ...  | ...                  |

The first two digits are significant figures; the third digit is the number of zeros; R = decimal point.

5 · Capacitance tolerance

| Code      | B       | C        | D       | F     | G     | J   | K    | M    | Z         |
|-----------|---------|----------|---------|-------|-------|-----|------|------|-----------|
| Tolerance | ±0.1 pF | ±0.25 pF | ±0.5 pF | ±1.0% | ±2.0% | ±5% | ±10% | ±20% | +80% –20% |

Tolerances B, C and D apply only to capacitance values of 10 pF or less.

7 · Termination

| Termination                                     | Code |
|-------------------------------------------------|------|
| Silver termination (solderable)                 | S    |
| Copper termination (solderable)                 | C    |
| Nickel barrier termination (three-layer plated) | N    |

8 · Packaging

| Code      | B          | T      |
|-----------|------------|--------|
| Packaging | Bulk (bag) | Taping |

Temperature characteristics ④

| Dielectric | Reference temperature | Temperature coefficient / characteristic | Operating temperature range |
|------------|-----------------------|------------------------------------------|-----------------------------|
| C0G        | 20 °C                 | 0 ±30 ppm/°C                             | –55 °C ~ +125 °C            |
| X5R        | 20 °C                 | ±15%                                     | –55 °C ~ +85 °C             |
| X7R        | 20 °C                 | ±15%                                     | –55 °C ~ +125 °C            |
| X7T        | 20 °C                 | +22/–33%                                 | –55 °C ~ +125 °C            |
| X7S        | 20 °C                 | ±22%                                     | –55 °C ~ +125 °C            |
| Y5V        | 20 °C                 | –80% +30%                                | –25 °C ~ +85 °C             |
| X6S        | 20 °C                 | ±22%                                     | –55 °C ~ +105 °C            |

Class I: the nominal temperature coefficient and its tolerance are determined from the capacitance change between 20 °C and 85 °C. Class II: the nominal temperature characteristic is determined from the capacitance change over the operating temperature range relative to the capacitance at 20 °C.

Packaging (summary)

Bulk packaging

Standard packing: 10000 pcs (10 Kpcs) per bag; other quantities according to customer request.

Tape packaging

| Size | Chip size (mm) |      |                 | Quantity (pcs/reel)    |                          |                                                  |                                            |
|------|----------------|------|-----------------|------------------------|--------------------------|--------------------------------------------------|--------------------------------------------|
|      | L              | W    | T               | Small reel, paper tape | Small reel, plastic tape | Large reel, paper tape                           | Large reel, plastic tape                   |
| 0105 | 0.4            | 0.2  | 0.2             | 20,000                 | —                        | —                                                | —                                          |
| 0201 | 0.6            | 0.3  | 0.3             | 15,000                 | —                        | 60,000 (0201, 105 and above);<br>70,000 (others) | —                                          |
| 0402 | 1.0            | 0.5  | 0.5             | 10,000                 | —                        | 50,000                                           | —                                          |
| 0603 | 1.6            | 0.8  | 0.8             | 4,000                  | —                        | 15,000                                           | —                                          |
| 0805 | 2.0            | 1.25 | ≤ 0.85          | 4,000                  | —                        | 15,000                                           | —                                          |
|      |                |      | > 0.85          | —                      | 3,000                    | —                                                | 15,000 (thickness E); 10,000 (thickness F) |
| 1206 | 3.2            | 1.6  | ≤ 0.85          | 4,000                  | —                        | 15,000                                           | —                                          |
|      |                |      | 0.85 < T ≤ 1.25 | —                      | 3,000                    | —                                                | 10,000                                     |
|      |                |      | 1.6             | —                      | 2,000                    | —                                                | 8,000                                      |
| 1210 | 3.2            | 2.5  | ≤ 2.0           | —                      | 2,000                    | —                                                | —                                          |
|      |                |      | > 2.0           | —                      | 1,000                    | —                                                | —                                          |
| 1812 | 4.5            | 3.2  | ≤ 2.0           | —                      | 1,000                    | —                                                | —                                          |
|      |                |      | > 2.0           | —                      | 1,000                    | —                                                | —                                          |
| 2220 | 5.7            | 5.0  | ≤ 1.25          | —                      | 1,000                    | —                                                | —                                          |
|      |                |      | > 1.25          | —                      | 700                      | —                                                | —                                          |

— = not offered in this reel / tape type (printed as “N/A” in the KOMÉ original).

Tape, reel, label and outer-packaging details: MLCC application notes, section 7 (as in the full specification).

## Dimensions

Chip sizes: 0105, 0201, 0402, 0603, 0805, 1206, 1210, 1812 and 2220. ③

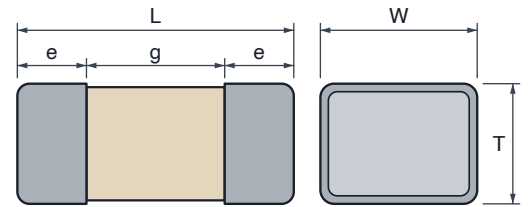
\*1 Dimensions of parts of this size with a capacitance of 1  $\mu\text{F}$  and above.

\*2 Dimensions of parts of this size with a capacitance of 100 nF and above.

\*3 Dimensions of parts of this size with a capacitance of 4.7  $\mu\text{F}$  and above.

\*4 Dimensions of parts of this size with a capacitance of 10 nF and above.

\*5 Dimensions of parts of this size with a capacitance of 10  $\mu\text{F}$  and above.



Outline: length L, width W, thickness T, termination e, gap between terminations g

| Size               | L (mm)          | W (mm)          | e (mm)    | g min. (mm) | T (mm)          | T code |
|--------------------|-----------------|-----------------|-----------|-------------|-----------------|--------|
| 0105               | 0.40±0.02       | 0.20±0.02       | 0.06~0.15 | 0.1         | 0.20±0.02       | Y      |
| 0105* <sup>4</sup> | 0.40-0.03/+0.1  | 0.20-0.03/+0.1  | 0.06~0.15 | 0.1         | 0.20-0.03/+0.1  | Y      |
| 0201               | 0.60±0.03       | 0.30±0.03       | 0.1~0.2   | 0.2         | 0.30±0.03       | Z      |
| 0201* <sup>2</sup> | 0.60-0.03/+0.1  | 0.30-0.03/+0.1  | 0.1~0.2   | 0.2         | 0.30-0.03/+0.1  | Z      |
| 0402               | 1.00±0.10       | 0.50±0.10       | 0.15~0.3  | 0.4         | 0.50±0.10       | A      |
| 0402* <sup>2</sup> | 1.00-0.05/+0.2  | 0.50-0.05/+0.2  | 0.15~0.3  | 0.4         | 0.50-0.05/+0.2  | A      |
| 0402* <sup>5</sup> | 1.00-0.05/+0.25 | 0.50-0.05/+0.25 | 0.15~0.3  | 0.4         | 0.50-0.05/+0.25 | A      |
| 0603               | 1.60±0.10       | 0.80±0.10       | 0.2~0.6   | 0.5         | 0.80±0.10       | C      |
| 0603* <sup>1</sup> | 1.60±0.20       | 0.80±0.20       | 0.2~0.6   | 0.5         | 0.80±0.20       | C      |
| 0603* <sup>3</sup> | 1.60-0.1/+0.3   | 0.80-0.1/+0.3   | 0.2~0.6   | 0.5         | 0.80-0.1/+0.3   | C      |
| 0805               | 2.00±0.10       | 1.25±0.10       | 0.2~0.7   | 0.7         | 0.60±0.10       | B      |
|                    |                 |                 |           |             | 0.85±0.10       | D      |
|                    |                 |                 |           |             | 1.25±0.10       | F      |
| 0805* <sup>1</sup> | 2.00±0.20       | 1.25±0.20       | 0.2~0.7   | 0.7         | 0.60±0.10       | B      |
|                    |                 |                 |           |             | 0.85±0.20       | D      |
|                    |                 |                 |           |             | 1.25±0.20       | F      |
| 0805* <sup>3</sup> | 2.00-0.1/+0.3   | 1.25-0.1/+0.3   | 0.2~0.7   | 0.7         | 1.25-0.1/+0.3   | F      |
| 1206               | 3.20±0.20       | 1.60±0.20       | 0.3~0.8   | 1.6         | 0.85±0.10       | D      |
|                    |                 |                 |           |             | 1.00±0.10       | E      |
|                    |                 |                 |           |             | 1.25±0.20       | F      |
|                    |                 |                 |           |             | 1.60±0.20       | H      |
| 1206* <sup>1</sup> | 3.20±0.30       | 1.60±0.30       | 0.3~0.8   | 1.6         | 0.85±0.10       | D      |
|                    |                 |                 |           |             | 1.00±0.10       | E      |
|                    |                 |                 |           |             | 1.25±0.20       | F      |
|                    |                 |                 |           |             | 1.60±0.30       | H      |
| 1210               | 3.20±0.30       | 2.5±0.20        | 0.3~0.8   | 1.6         | 0.85±0.10       | D      |
|                    |                 |                 |           |             | 1.25±0.20       | F      |
|                    |                 |                 |           |             | 1.60±0.20       | H      |
|                    |                 |                 |           |             | 2.00±0.20       | G      |
|                    |                 |                 |           |             | 2.50±0.30       | M      |
| 1210* <sup>1</sup> | 3.20±0.40       | 2.5±0.30        | 0.3~0.8   | 1.6         | 0.85±0.10       | D      |
|                    |                 |                 |           |             | 1.25±0.20       | F      |
|                    |                 |                 |           |             | 1.60±0.30       | H      |
|                    |                 |                 |           |             | 2.00±0.30       | G      |
|                    |                 |                 |           |             | 2.50±0.30       | M      |

| Size               | L (mm)    | W (mm)   | e (mm)  | g min. (mm) | T (mm)    | T code |
|--------------------|-----------|----------|---------|-------------|-----------|--------|
| 1812               | 4.50±0.30 | 3.2±0.30 | 0.3~1.5 | 2.5         | 1.25±0.20 | F      |
|                    |           |          |         |             | 1.60±0.20 | H      |
|                    |           |          |         |             | 2.00±0.20 | G      |
|                    |           |          |         |             | 2.50±0.30 | M      |
| 1812 <sup>*1</sup> | 4.50±0.40 | 3.2±0.40 | 0.3~1.5 | 2.5         | 1.25±0.20 | F      |
|                    |           |          |         |             | 1.60±0.20 | H      |
|                    |           |          |         |             | 2.00±0.20 | G      |
|                    |           |          |         |             | 2.50±0.30 | M      |
| 2220               | 5.70±0.40 | 5.0±0.40 | 0.3~1.1 | 3.5         | 1.25±0.20 | F      |
|                    |           |          |         |             | 1.60±0.20 | H      |
|                    |           |          |         |             | 2.00±0.20 | G      |
|                    |           |          |         |             | 2.50±0.30 | M      |



## Capacitance range

0105 (0402) — inch 01005

| Dielectric |                        | C0G |    |    |    |    |     | X7R |    |    |    |    |     | X5R |    |    |    |    |     |
|------------|------------------------|-----|----|----|----|----|-----|-----|----|----|----|----|-----|-----|----|----|----|----|-----|
| Code       | Cap. / V <sub>DC</sub> | 50  | 35 | 25 | 16 | 10 | 6.3 | 50  | 35 | 25 | 16 | 10 | 6.3 | 50  | 35 | 25 | 16 | 10 | 6.3 |
| 0R1        | 0.1 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 0R2        | 0.2 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 0R3        | 0.3 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 0R4        | 0.4 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 0R5        | 0.5 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 0R6        | 0.6 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 0R7        | 0.7 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 0R8        | 0.8 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 0R9        | 0.9 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 1R0        | 1.0 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 1R1        | 1.1 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 1R2        | 1.2 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 1R3        | 1.3 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 1R5        | 1.5 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 1R6        | 1.6 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 1R8        | 1.8 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 2R0        | 2.0 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 2R2        | 2.2 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 2R4        | 2.4 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 2R7        | 2.7 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 3R0        | 3.0 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 3R3        | 3.3 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 3R6        | 3.6 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 3R9        | 3.9 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 4R0        | 4.0 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 4R3        | 4.3 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 4R7        | 4.7 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 5R0        | 5.0 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 5R1        | 5.1 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 5R6        | 5.6 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 6R0        | 6.0 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 6R2        | 6.2 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 6R8        | 6.8 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 7R0        | 7.0 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 7R5        | 7.5 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 8R0        | 8.0 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 8R2        | 8.2 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 9R0        | 9.0 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 9R1        | 9.1 pF                 | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 100        | 10 pF                  | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 120        | 12 pF                  | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 160        | 16 pF                  | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 180        | 18 pF                  | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 220        | 22 pF                  | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 330        | 33 pF                  | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 390        | 39 pF                  | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 470        | 47 pF                  | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 560        | 56 pF                  | Y   | Y  | Y  | Y  | Y  | Y   |     |    |    |    |    |     |     |    |    |    |    |     |
| 680        | 68 pF                  |     |    |    |    |    |     | Y   | Y  | Y  | Y  | Y  | Y   | Y   | Y  | Y  | Y  | Y  | Y   |
| 101        | 100 pF                 |     |    |    |    |    |     | Y   | Y  | Y  | Y  | Y  | Y   | Y   | Y  | Y  | Y  | Y  | Y   |
| 181        | 180 pF                 |     |    |    |    |    |     | Y   | Y  | Y  | Y  | Y  | Y   | Y   | Y  | Y  | Y  | Y  | Y   |
| 221        | 220 pF                 |     |    |    |    |    |     | Y   | Y  | Y  | Y  | Y  | Y   | Y   | Y  | Y  | Y  | Y  | Y   |
| 241        | 240 pF                 |     |    |    |    |    |     | Y   | Y  | Y  | Y  | Y  | Y   | Y   | Y  | Y  | Y  | Y  | Y   |
| 271        | 270 pF                 |     |    |    |    |    |     | Y   | Y  | Y  | Y  | Y  | Y   | Y   | Y  | Y  | Y  | Y  | Y   |
| 331        | 330 pF                 |     |    |    |    |    |     | Y   | Y  | Y  | Y  | Y  | Y   | Y   | Y  | Y  | Y  | Y  | Y   |
| 471        | 470 pF                 |     |    |    |    |    |     | Y   | Y  | Y  | Y  | Y  | Y   | Y   | Y  | Y  | Y  | Y  | Y   |
| 681        | 680 pF                 |     |    |    |    |    |     | Y   | Y  | Y  | Y  | Y  | Y   | Y   | Y  | Y  | Y  | Y  | Y   |
| 751        | 750 pF                 |     |    |    |    |    |     | Y   | Y  | Y  | Y  | Y  | Y   | Y   | Y  | Y  | Y  | Y  | Y   |
| 102        | 1 nF                   |     |    |    |    |    |     | Y   | Y  | Y  | Y  | Y  | Y   | Y   | Y  | Y  | Y  | Y  | Y   |
| 152        | 1.5 nF                 |     |    |    |    |    |     |     |    |    |    |    |     |     |    | Y  | Y  | Y  | Y   |
| 222        | 2.2 nF                 |     |    |    |    |    |     |     |    |    |    |    |     |     |    | Y  | Y  | Y  | Y   |
| 332        | 3.3 nF                 |     |    |    |    |    |     |     |    |    |    |    |     |     |    | Y  | Y  | Y  | Y   |
| 472        | 4.7 nF                 |     |    |    |    |    |     |     |    |    |    |    |     |     |    | Y  | Y  | Y  | Y   |
| 682        | 6.8 nF                 |     |    |    |    |    |     |     |    |    |    |    |     |     |    | Y  | Y  | Y  | Y   |
| 103        | 10 nF                  |     |    |    |    |    |     |     |    |    |    |    |     |     |    | Y  | Y  | Y  | Y   |

Code = capacitance in pF (two significant digits + number of zeros; R = decimal point). Letters = thickness code T, see the Dimensions table; blank = not listed.  
 Values are for reference only; the actual capacitance range depends on the use requirement.

| Dielectric |                        | C0G |    |    |    |    |     |    | X7R |    |    |    |     |    |    | X7S |    |    |     |    |    |    | X7T |    |     |   |    |    |    |    | X6S |     |   |     |    |    |    |    | X5R |     |   |  |  |  |  |  |
|------------|------------------------|-----|----|----|----|----|-----|----|-----|----|----|----|-----|----|----|-----|----|----|-----|----|----|----|-----|----|-----|---|----|----|----|----|-----|-----|---|-----|----|----|----|----|-----|-----|---|--|--|--|--|--|
| Code       | Cap. / V <sub>OC</sub> | 50  | 35 | 25 | 16 | 10 | 6.3 | 50 | 35  | 25 | 16 | 10 | 6.3 | 50 | 35 | 25  | 16 | 10 | 6.3 | 50 | 35 | 25 | 16  | 10 | 6.3 | 4 | 50 | 35 | 25 | 16 | 10  | 6.3 | 4 | 2.5 | 50 | 35 | 25 | 16 | 10  | 6.3 | 4 |  |  |  |  |  |
| 0R1        | 0.1 pF                 | Z   | Z  | Z  | Z  | Z  | Z   |    |     |    |    |    |     |    |    |     |    |    |     |    |    |    |     |    |     |   |    |    |    |    |     |     |   |     |    |    |    |    |     |     |   |  |  |  |  |  |
| 0R2        | 0.2 pF                 | Z   | Z  | Z  | Z  | Z  | Z   |    |     |    |    |    |     |    |    |     |    |    |     |    |    |    |     |    |     |   |    |    |    |    |     |     |   |     |    |    |    |    |     |     |   |  |  |  |  |  |
| 0R3        | 0.3 pF                 | Z   | Z  | Z  | Z  | Z  | Z   |    |     |    |    |    |     |    |    |     |    |    |     |    |    |    |     |    |     |   |    |    |    |    |     |     |   |     |    |    |    |    |     |     |   |  |  |  |  |  |
| 0R4        | 0.4 pF                 | Z   | Z  | Z  | Z  | Z  | Z   |    |     |    |    |    |     |    |    |     |    |    |     |    |    |    |     |    |     |   |    |    |    |    |     |     |   |     |    |    |    |    |     |     |   |  |  |  |  |  |
| 0R5        | 0.5 pF                 | Z   | Z  | Z  | Z  | Z  | Z   |    |     |    |    |    |     |    |    |     |    |    |     |    |    |    |     |    |     |   |    |    |    |    |     |     |   |     |    |    |    |    |     |     |   |  |  |  |  |  |
| 0R6        | 0.6 pF                 | Z   | Z  | Z  | Z  | Z  | Z   |    |     |    |    |    |     |    |    |     |    |    |     |    |    |    |     |    |     |   |    |    |    |    |     |     |   |     |    |    |    |    |     |     |   |  |  |  |  |  |
| 0R7        | 0.7 pF                 | Z   | Z  | Z  | Z  | Z  | Z   |    |     |    |    |    |     |    |    |     |    |    |     |    |    |    |     |    |     |   |    |    |    |    |     |     |   |     |    |    |    |    |     |     |   |  |  |  |  |  |
| R75        | .75 pF                 | Z   | Z  | Z  | Z  | Z  | Z   |    |     |    |    |    |     |    |    |     |    |    |     |    |    |    |     |    |     |   |    |    |    |    |     |     |   |     |    |    |    |    |     |     |   |  |  |  |  |  |
| 0R8        | 0.8 pF                 | Z   | Z  | Z  | Z  | Z  | Z   |    |     |    |    |    |     |    |    |     |    |    |     |    |    |    |     |    |     |   |    |    |    |    |     |     |   |     |    |    |    |    |     |     |   |  |  |  |  |  |
| 0R9        | 0.9 pF                 | Z   | Z  | Z  | Z  | Z  | Z   |    |     |    |    |    |     |    |    |     |    |    |     |    |    |    |     |    |     |   |    |    |    |    |     |     |   |     |    |    |    |    |     |     |   |  |  |  |  |  |
| 1R0        | 1.0 pF                 | Z   | Z  | Z  | Z  | Z  | Z   |    |     |    |    |    |     |    |    |     |    |    |     |    |    |    |     |    |     |   |    |    |    |    |     |     |   |     |    |    |    |    |     |     |   |  |  |  |  |  |
| 1R1        | 1.1 pF                 | Z   | Z  | Z  | Z  | Z  | Z   |    |     |    |    |    |     |    |    |     |    |    |     |    |    |    |     |    |     |   |    |    |    |    |     |     |   |     |    |    |    |    |     |     |   |  |  |  |  |  |
| 1R2        | 1.2 pF                 | Z   | Z  | Z  | Z  | Z  | Z   |    |     |    |    |    |     |    |    |     |    |    |     |    |    |    |     |    |     |   |    |    |    |    |     |     |   |     |    |    |    |    |     |     |   |  |  |  |  |  |
| 1R3        | 1.3 pF                 | Z   | Z  | Z  | Z  | Z  | Z   |    |     |    |    |    |     |    |    |     |    |    |     |    |    |    |     |    |     |   |    |    |    |    |     |     |   |     |    |    |    |    |     |     |   |  |  |  |  |  |
| 1R4        | 1.4 pF                 | Z   | Z  | Z  | Z  | Z  | Z   |    |     |    |    |    |     |    |    |     |    |    |     |    |    |    |     |    |     |   |    |    |    |    |     |     |   |     |    |    |    |    |     |     |   |  |  |  |  |  |
| 1R5        | 1.5 pF                 | Z   | Z  | Z  | Z  | Z  | Z   |    |     |    |    |    |     |    |    |     |    |    |     |    |    |    |     |    |     |   |    |    |    |    |     |     |   |     |    |    |    |    |     |     |   |  |  |  |  |  |
| 1R6        | 1.6 pF                 | Z   | Z  | Z  | Z  | Z  | Z   |    |     |    |    |    |     |    |    |     |    |    |     |    |    |    |     |    |     |   |    |    |    |    |     |     |   |     |    |    |    |    |     |     |   |  |  |  |  |  |
| 1R8        | 1.8 pF                 | Z   | Z  | Z  | Z  | Z  | Z   |    |     |    |    |    |     |    |    |     |    |    |     |    |    |    |     |    |     |   |    |    |    |    |     |     |   |     |    |    |    |    |     |     |   |  |  |  |  |  |
| 2R0        | 2.0 pF                 | Z   | Z  | Z  | Z  |    |     |    |     |    |    |    |     |    |    |     |    |    |     |    |    |    |     |    |     |   |    |    |    |    |     |     |   |     |    |    |    |    |     |     |   |  |  |  |  |  |

KOME Multilayer Chip Ceramic Capacitors · Rev. 2026-10 · Specifications are subject to change without notice.

## 0402 (1005)

[illegible]



[illegible]

| Dielectric |                        | C0G |     |       |      |    | X7R |    |     |       |      | X7S |    |    |    |     | X7T |     |       |      |    | X6S |    |    |     |   | X5R |     |       |      |    |    |    |    |     |    |     |       |      |    |    |    |    |     |  |  |
|------------|------------------------|-----|-----|-------|------|----|-----|----|-----|-------|------|-----|----|----|----|-----|-----|-----|-------|------|----|-----|----|----|-----|---|-----|-----|-------|------|----|----|----|----|-----|----|-----|-------|------|----|----|----|----|-----|--|--|
| Code       | Cap. / V <sub>DC</sub> | 50  | 025 | 02001 | 0050 | 35 | 25  | 50 | 025 | 02001 | 0050 | 35  | 25 | 16 | 10 | 6.3 | 50  | 025 | 02001 | 0050 | 35 | 25  | 16 | 10 | 6.3 | 4 | 50  | 025 | 02001 | 0050 | 35 | 25 | 16 | 10 | 6.3 | 50 | 025 | 02001 | 0050 | 35 | 25 | 16 | 10 | 6.3 |  |  |
| 512        | 5.1 nF                 |     |     |       |      | C  | C   | C  | C   | C     | C    | C   | C  | C  | C  | C   |     | C   | C     | C    | C  | C   | C  | C  | C   | C |     | C   | C     | C    | C  | C  | C  | C  | C   | C  | C   | C     | C    | C  | C  | C  | C  | C   |  |  |
| 562        | 5.6 nF                 |     |     |       |      | C  | C   | C  | C   | C     | C    | C   | C  | C  | C  | C   |     | C   | C     | C    | C  | C   | C  | C  | C   | C |     | C   | C     | C    | C  | C  | C  | C  | C   | C  | C   | C     | C    | C  | C  | C  | C  | C   |  |  |
| 682        | 6.8 nF                 |     |     |       |      | C  | C   | C  | C   | C     | C    | C   | C  | C  | C  | C   |     | C   | C     | C    | C  | C   | C  | C  | C   | C |     | C   | C     | C    | C  | C  | C  | C  | C   | C  | C   | C     | C    | C  | C  | C  | C  | C   |  |  |
| 822        | 8.2 nF                 |     |     |       |      | C  | C   | C  | C   | C     | C    | C   | C  | C  | C  | C   |     | C   | C     | C    | C  | C   | C  | C  | C   | C |     | C   | C     | C    | C  | C  | C  | C  | C   | C  | C   | C     | C    | C  | C  | C  | C  | C   |  |  |
| 103        | 10 nF                  |     |     |       |      | C  | C   | C  | C   | C     | C    | C   | C  | C  | C  | C   |     | C   | C     | C    | C  | C   | C  | C  | C   | C |     | C   | C     | C    | C  | C  | C  | C  | C   | C  | C   | C     | C    | C  | C  | C  | C  | C   |  |  |
| 123        | 12 nF                  |     |     |       |      |    |     | C  | C   | C     | C    | C   | C  | C  | C  | C   |     | C   | C     | C    | C  | C   | C  | C  | C   | C |     | C   | C     | C    | C  | C  | C  | C  | C   | C  | C   | C     | C    | C  | C  | C  | C  | C   |  |  |
| 153        | 15 nF                  |     |     |       |      |    |     | C  | C   | C     | C    | C   | C  | C  | C  | C   |     | C   | C     | C    | C  | C   | C  | C  | C   | C |     | C   | C     | C    | C  | C  | C  | C  | C   | C  | C   | C     | C    | C  | C  | C  | C  | C   |  |  |
| 183        | 18 nF                  |     |     |       |      |    |     | C  | C   | C     | C    | C   | C  | C  | C  | C   |     | C   | C     | C    | C  | C   | C  | C  | C   | C |     | C   | C     | C    | C  | C  | C  | C  | C   | C  | C   | C     | C    | C  | C  | C  | C  | C   |  |  |
| 203        | 20 nF                  |     |     |       |      |    |     | C  | C   | C     | C    | C   | C  | C  | C  | C   |     | C   | C     | C    | C  | C   | C  | C  | C   | C |     | C   | C     | C    | C  | C  | C  | C  | C   | C  | C   | C     | C    | C  | C  | C  | C  | C   |  |  |
| 223        | 22 nF                  |     |     |       |      |    |     | C  | C   | C     | C    | C   | C  | C  | C  | C   |     | C   | C     | C    | C  | C   | C  | C  | C   | C |     | C   | C     | C    | C  | C  | C  | C  | C   | C  | C   | C     | C    | C  | C  | C  | C  | C   |  |  |
| 273        | 27 nF                  |     |     |       |      |    |     | C  | C   | C     | C    | C   | C  | C  | C  | C   |     | C   | C     | C    | C  | C   | C  | C  | C   | C |     | C   | C     | C    | C  | C  | C  | C  | C   | C  | C   | C     | C    | C  | C  | C  | C  | C   |  |  |
| 333        | 33 nF                  |     |     |       |      |    |     | C  | C   | C     | C    | C   | C  | C  | C  | C   |     | C   | C     | C    | C  | C   | C  | C  | C   | C |     | C   | C     | C    | C  | C  | C  | C  | C   | C  | C   | C     | C    | C  | C  | C  | C  | C   |  |  |
| 393        | 39 nF                  |     |     |       |      |    |     | C  | C   | C     | C    | C   | C  | C  | C  | C   |     | C   | C     | C    | C  | C   | C  | C  | C   | C |     | C   | C     | C    | C  | C  | C  | C  | C   | C  | C   | C     | C    | C  | C  | C  | C  | C   |  |  |
| 473        | 47 nF                  |     |     |       |      |    |     | C  | C   | C     | C    | C   | C  | C  | C  | C   |     | C   | C     | C    | C  | C   | C  | C  | C   | C |     | C   | C     | C    | C  | C  | C  | C  | C   | C  | C   | C     | C    | C  | C  | C  | C  | C   |  |  |
| 513        | 51 nF                  |     |     |       |      |    |     | C  | C   | C     | C    | C   | C  | C  | C  | C   |     | C   | C     | C    | C  | C   | C  | C  | C   | C |     | C   | C     | C    | C  | C  | C  | C  | C   | C  | C   | C     | C    | C  | C  | C  | C  | C   |  |  |
| 563        | 56 nF                  |     |     |       |      |    |     | C  | C   | C     | C    | C   | C  | C  | C  | C   |     | C   | C     | C    | C  | C   | C  | C  | C   | C |     | C   | C     | C    | C  | C  | C  | C  | C   | C  | C   | C     | C    | C  | C  | C  | C  | C   |  |  |
| 683        | 68 nF                  |     |     |       |      |    |     | C  | C   | C     | C    | C   | C  | C  | C  | C   |     | C   | C     | C    | C  | C   | C  | C  | C   | C |     | C   | C     | C    | C  | C  | C  | C  | C   | C  | C   | C     | C    | C  | C  | C  | C  | C   |  |  |
| 823        | 82 nF                  |     |     |       |      |    |     | C  | C   | C     | C    | C   | C  | C  | C  | C   |     | C   | C     | C    | C  | C   | C  | C  | C   | C |     | C   | C     | C    | C  | C  | C  | C  | C   | C  | C   | C     | C    | C  | C  | C  | C  | C   |  |  |
| 104        | 100 nF                 |     |     |       |      |    |     | C  | C   | C     | C    | C   | C  | C  | C  | C   |     | C   | C     | C    | C  | C   | C  | C  | C   | C |     | C   | C     | C    | C  | C  | C  | C  | C   | C  | C   | C     | C    | C  | C  | C  | C  | C   |  |  |
| 124        | 120 nF                 |     |     |       |      |    |     |    | C   | C     | C    | C   | C  | C  | C  | C   |     |     |       |      |    |     |    |    |     |   |     |     |       |      |    |    |    |    |     |    |     |       |      |    |    |    |    |     |  |  |
| 154        | 150 nF                 |     |     |       |      |    |     |    | C   | C     | C    | C   | C  | C  | C  | C   |     |     |       |      |    |     |    |    |     |   |     |     |       |      |    |    |    |    |     |    |     |       |      |    |    |    |    |     |  |  |
| 184        | 180 nF                 |     |     |       |      |    |     |    | C   | C     | C    | C   | C  | C  | C  | C   |     |     |       |      |    |     |    |    |     |   |     |     |       |      |    |    |    |    |     |    |     |       |      |    |    |    |    |     |  |  |
| 204        | 200 nF                 |     |     |       |      |    |     |    | C   | C     | C    | C   | C  | C  | C  | C   |     |     |       |      |    |     |    |    |     |   |     |     |       |      |    |    |    |    |     |    |     |       |      |    |    |    |    |     |  |  |
| 224        | 220 nF                 |     |     |       |      |    |     |    | C   | C     | C    | C   | C  | C  | C  | C   |     |     |       |      |    |     |    |    |     |   |     |     |       |      |    |    |    |    |     |    |     |       |      |    |    |    |    |     |  |  |
| 274        | 270 nF                 |     |     |       |      |    |     |    | C   | C     | C    | C   | C  | C  | C  | C   |     |     |       |      |    |     |    |    |     |   |     |     |       |      |    |    |    |    |     |    |     |       |      |    |    |    |    |     |  |  |
| 334        | 330 nF                 |     |     |       |      |    |     |    | C   | C     | C    | C   | C  | C  | C  | C   |     |     |       |      |    |     |    |    |     |   |     |     |       |      |    |    |    |    |     |    |     |       |      |    |    |    |    |     |  |  |
| 394        | 390 nF                 |     |     |       |      |    |     |    | C   | C     | C    | C   | C  | C  | C  | C   |     |     |       |      |    |     |    |    |     |   |     |     |       |      |    |    |    |    |     |    |     |       |      |    |    |    |    |     |  |  |
| 474        | 470 nF                 |     |     |       |      |    |     |    | C   | C     | C    | C   | C  | C  | C  | C   |     |     |       |      |    |     |    |    |     |   |     |     |       |      |    |    |    |    |     |    |     |       |      |    |    |    |    |     |  |  |
| 564        | 560 nF                 |     |     |       |      |    |     |    | C   | C     | C    | C   | C  | C  | C  | C   |     |     |       |      |    |     |    |    |     |   |     |     |       |      |    |    |    |    |     |    |     |       |      |    |    |    |    |     |  |  |
| 684        | 680 nF                 |     |     |       |      |    |     |    | C   | C     | C    | C   | C  | C  | C  | C   |     |     |       |      |    |     |    |    |     |   |     |     |       |      |    |    |    |    |     |    |     |       |      |    |    |    |    |     |  |  |
| 824        | 820 nF                 |     |     |       |      |    |     |    | C   | C     | C    | C   | C  | C  | C  | C   |     |     |       |      |    |     |    |    |     |   |     |     |       |      |    |    |    |    |     |    |     |       |      |    |    |    |    |     |  |  |
| 105        | 1 μF                   |     |     |       |      |    |     | C  | C   | C     | C    | C   | C  | C  | C  | C   |     |     |       |      |    |     |    |    |     |   |     |     |       |      |    |    |    |    |     |    |     |       |      |    |    |    |    |     |  |  |
| 155        | 1.5 μF                 |     |     |       |      |    |     |    | C   | C     | C    | C   | C  | C  | C  | C   |     |     |       |      |    |     |    |    |     |   |     |     |       |      |    |    |    |    |     |    |     |       |      |    |    |    |    |     |  |  |
| 225        | 2.2 μF                 |     |     |       |      |    |     |    | C   | C     | C    | C   | C  | C  | C  | C   |     |     |       |      |    |     |    |    |     |   |     |     |       |      |    |    |    |    |     |    |     |       |      |    |    |    |    |     |  |  |
| 335        | 3.3 μF                 |     |     |       |      |    |     |    |     | C     | C    | C   | C  | C  | C  | C   |     |     |       |      |    |     |    |    |     |   |     |     |       |      |    |    |    |    |     |    |     |       |      |    |    |    |    |     |  |  |
| 475        | 4.7 μF                 |     |     |       |      |    |     |    |     |       | C    | C   | C  | C  | C  | C   |     |     |       |      |    |     |    |    |     |   |     |     |       |      |    |    |    |    |     |    |     |       |      |    |    |    |    |     |  |  |
| 106        | 10 μF                  |     |     |       |      |    |     |    |     |       |      | C   | C  | C  | C  | C   |     |     |       |      |    |     |    |    |     |   |     |     |       |      |    |    |    |    |     |    |     |       |      |    |    |    |    |     |  |  |
| 226        | 22 μF                  |     |     |       |      |    |     |    |     |       |      |     | C  | C  | C  | C   |     |     |       |      |    |     |    |    |     |   |     |     |       |      |    |    |    |    |     |    |     |       |      |    |    |    |    |     |  |  |

Code = capacitance in pF (two significant digits + number of zeros; R = decimal point). Letters = thickness code T, see the Dimensions table; blank = not listed. \* = the customer must provide the usage scenario and related conditions for factory confirmation (original chart note). Values are for reference only; the actual capacitance range depends on the use requirement.

[illegible]

| Dielectric |                        | C0G |     |     |     |     |    |    |    |    | X7R  |     |     |     |     |     |     |     |     | X7S |     |     |      |     |     |     |     |     |     |     |     |     |     |     |     |    |
|------------|------------------------|-----|-----|-----|-----|-----|----|----|----|----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| Code       | Cap. / V <sub>DC</sub> | 630 | 500 | 250 | 200 | 100 | 50 | 35 | 25 | 16 | 1000 | 630 | 500 | 250 | 200 | 100 | 50  | 35  | 25  | 16  | 10  | 6.3 | 1000 | 630 | 500 | 250 | 200 | 100 | 50  | 35  | 25  | 16  | 10  | 6.3 |     |    |
| 393        | 39 nF                  |     |     |     |     |     |    |    |    |    |      |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D   | D    |     |     |     | F   | D/F | D/F | D   | D   | D   | D   | D   | D   |    |
| 473        | 47 nF                  |     |     |     |     |     |    |    |    |    |      |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D   | D    |     |     |     | F   | D/F | D/F | D   | D   | D   | D   | D   | D   |    |
| 563        | 56 nF                  |     |     |     |     |     |    |    |    |    |      |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D   | D    |     |     |     | F   | D/F | D/F | D   | D   | D   | D   | D   | D   |    |
| 683        | 68 nF                  |     |     |     |     |     |    |    |    |    |      |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D   | D    |     |     |     | F   | D/F | D/F | D   | D   | D   | D   | D   | D   |    |
| 823        | 82 nF                  |     |     |     |     |     |    |    |    |    |      |     |     |     |     | F   | F   | D/F | D   | D   | D   | D   | D    |     |     |     | F   | F   | D/F | D   | D   | D   | D   | D   | D   |    |
| 104        | 100 nF                 |     |     |     |     |     |    |    |    |    |      |     |     |     |     | F   | F   | D/F | D   | D   | D   | D   | D    |     |     |     | F   | F   | D/F | D   | D   | D   | D   | D   | D   |    |
| 124        | 120 nF                 |     |     |     |     |     |    |    |    |    |      |     |     |     |     |     | F   | D   | D   | D   | D   | D   | D    |     |     |     |     | F   | D   | D   | D   | D   | D   | D   | D   |    |
| 154        | 150 nF                 |     |     |     |     |     |    |    |    |    |      |     |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D    |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D   | D   |    |
| 184        | 180 nF                 |     |     |     |     |     |    |    |    |    |      |     |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D    |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D   | D   |    |
| 224        | 220 nF                 |     |     |     |     |     |    |    |    |    |      |     |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D    |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D   | D   |    |
| 274        | 270 nF                 |     |     |     |     |     |    |    |    |    |      |     |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D    |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D   | D   |    |
| 334        | 330 nF                 |     |     |     |     |     |    |    |    |    |      |     |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D    |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D   | D   |    |
| 394        | 390 nF                 |     |     |     |     |     |    |    |    |    |      |     |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D    |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D   | D   |    |
| 474        | 470 nF                 |     |     |     |     |     |    |    |    |    |      |     |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D    |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D   | D   |    |
| 564        | 560 nF                 |     |     |     |     |     |    |    |    |    |      |     |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D    |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D   | D   |    |
| 684        | 680 nF                 |     |     |     |     |     |    |    |    |    |      |     |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D    |     |     |     |     | F   | D/F | D/F | D   | D   | D   | D   | D   |    |
| 824        | 820 nF                 |     |     |     |     |     |    |    |    |    |      |     |     |     |     |     | F   | F   | D/F | D/F | D/F | D/F | D/F  |     |     |     |     | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F |    |
| 105        | 1 μF                   |     |     |     |     |     |    |    |    |    |      |     |     |     |     |     | F   | F   | D/F | D/F | D/F | D/F | D/F  |     |     |     |     | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F |    |
| 155        | 1.5 μF                 |     |     |     |     |     |    |    |    |    |      |     |     |     |     |     | F   | F   | F   | F   | F   | F   | F    |     |     |     |     | F   | F   | F   | F   | F   | F   | F   | F   |    |
| 225        | 2.2 μF                 |     |     |     |     |     |    |    |    |    |      |     |     |     |     |     | F   | F   | F   | F   | F   | F   | F    |     |     |     |     | F   | F   | F   | F   | F   | F   | F   | F   |    |
| 335        | 3.3 μF                 |     |     |     |     |     |    |    |    |    |      |     |     |     |     |     | F*  | F   | F   | F   | F   | F   | F    |     |     |     |     | F*  | F   | F   | F   | F   | F   | F   | F   |    |
| 475        | 4.7 μF                 |     |     |     |     |     |    |    |    |    |      |     |     |     |     |     | F*  | F   | F   | F   | F   | F   | F    |     |     |     |     | F*  | F   | F   | F   | F   | F   | F   | F   |    |
| 685        | 6.8 μF                 |     |     |     |     |     |    |    |    |    |      |     |     |     |     |     |     |     | F*  | F*  | F   | F   | F    |     |     |     |     |     |     | F*  | F   | F   | F   | F   | F   |    |
| 106        | 10 μF                  |     |     |     |     |     |    |    |    |    |      |     |     |     |     |     |     |     | F*  | F*  | F*  | F*  | F*   |     |     |     |     |     |     | F*  | F   | F   | F   | F   | F   |    |
| 206        | 20 μF                  |     |     |     |     |     |    |    |    |    |      |     |     |     |     |     |     |     |     |     |     |     | F*   | F*  |     |     |     |     |     |     |     |     | F*  | F*  | F*  | F* |
| 226        | 22 μF                  |     |     |     |     |     |    |    |    |    |      |     |     |     |     |     |     |     |     |     |     |     | F*   | F*  |     |     |     |     |     |     |     |     |     | F*  | F*  | F* |
| 476        | 47 μF                  |     |     |     |     |     |    |    |    |    |      |     |     |     |     |     |     |     |     |     |     |     | F*   | F*  |     |     |     |     |     |     |     |     |     |     |     |    |

Code = capacitance in pF (two significant digits + number of zeros; R = decimal point). Letters = thickness code T, see the Dimensions table; two or three codes (e.g. B/D) = all listed in the original chart; blank = not listed. \* = the customer must provide the usage scenario and related conditions for factory confirmation (original chart note). Red letters = one of several thickness designs for the same specification; prefer the black entry — red has a long delivery time (original chart note). Values are for reference only; the actual capacitance range depends on the use requirement.

[illegible]

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## 1206 (3216) — C0G, X7R, X7S

[illegible]

Code = capacitance in pF (two significant digits + number of zeros; R = decimal point). Letters = thickness code T, see the Dimensions table; two or three codes (e.g. D/F) = all listed in the original chart; blank = not listed. \* = the customer must provide the usage scenario and related conditions for factory confirmation (original chart note). Red letters = one of several thickness designs for the same specification; prefer the black entry — red has a long delivery time (original chart note). Values are for reference only; the actual capacitance range depends on the use requirement.



| Dielectric |                        | X7T  |      |     |     |     |     |     |     |     |     |     |     | X6S |     |      |      |     |     |     |     |     |     |     |     | X5R |     |     |      |      |     |     |     |     |     |     |     |     |     |     |     |
|------------|------------------------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code       | Cap. / V <sub>DC</sub> | 2000 | 1000 | 630 | 500 | 250 | 200 | 100 | 50  | 35  | 25  | 16  | 10  | 6.3 | 4   | 2000 | 1000 | 630 | 500 | 250 | 200 | 100 | 50  | 35  | 25  | 16  | 10  | 6.3 | 2000 | 1000 | 630 | 500 | 250 | 200 | 100 | 50  | 35  | 25  | 16  | 10  | 6.3 |
| 101        | 100 pF                 | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F |
| 121        | 120 pF                 | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F |
| 151        | 150 pF                 | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F |
| 181        | 180 pF                 | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F |
| 201        | 200 pF                 | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F |
| 221        | 220 pF                 | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F |
| 241        | 240 pF                 | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F |
| 271        | 270 pF                 | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F |
| 331        | 330 pF                 | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F |
| 391        | 390 pF                 | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F |
| 471        | 470 pF                 | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F |
| 511        | 510 pF                 | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F |
| 561        | 560 pF                 | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F |
| 681        | 680 pF                 | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F |
| 821        | 820 pF                 | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F | F    | F    | F   | F   | F   | F   | D/F | D/F | D/F | D/F | D/F | D/F | D/F |
| 102        | 1 nF                   | F    | F    | F   | F   | F   | F   | D   |     |     |     |     |     |     |     |      |      |     |     |     |     |     |     |     |     |     |     |     |      |      |     |     |     |     |     |     |     |     |     |     |     |

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1210 (3225) — X7R, X7S

| Dielectric |                        | X7R   |      |     |     |     |     |     |     |     |     |     |     |     | X7S   |      |     |     |     |     |     |     |     |     |     |     |     |
|------------|------------------------|-------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code       | Cap. / V <sub>DC</sub> | 2000  | 1000 | 630 | 500 | 250 | 200 | 100 | 50  | 35  | 25  | 16  | 10  | 6.3 | 2000  | 1000 | 630 | 500 | 250 | 200 | 100 | 50  | 35  | 25  | 16  | 10  | 6.3 |
| 221        | 220 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 271        | 270 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 331        | 330 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 391        | 390 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 471        | 470 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 561        | 560 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 681        | 680 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 821        | 820 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 102        | 1 nF                   | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 152        | 1.5 nF                 | F#/G# | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F#/G# | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 182        | 1.8 nF                 | F#/G# | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F#/G# | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 222        | 2.2 nF                 | F#/G# | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F#/G# | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 272        | 2.7 nF                 | H#/G# | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | H#/G# | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 332        | 3.3 nF                 | H/G   | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | H/G   | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 472        | 4.7 nF                 | G     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | G     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 562        | 5.6 nF                 | G#    | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | G#    | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 682        | 6.8 nF                 | G#    | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | G#    | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 103        | 10 nF                  | G#    | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | G#    | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 153        | 15 nF                  |       | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |       | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 223        | 22 nF                  |       | H    | H   | H   | H   | H   | H   | H   | H   | H   | H   | H   | H   |       | H    | H   | H   | H   | H   | H   | H   | H   | H   | H   | H   | H   |
| 333        | 33 nF                  |       | M    | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       | M    | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 473        | 47 nF                  |       |      | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |      | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 563        | 56 nF                  |       |      | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |      | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 683        | 68 nF                  |       |      | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |      | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 104        | 100 nF                 |       |      | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |      | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 154        | 150 nF                 |       |      |     |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |      |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 224        | 220 nF                 |       |      |     |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |      |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 334        | 330 nF                 |       |      |     |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |      |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 474        | 470 nF                 |       |      |     |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |      |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 684        | 680 nF                 |       |      |     |     |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |      |     |     |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 105        | 1 µF                   |       |      |     |     |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |      |     |     |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 225        | 2.2 µF                 |       |      |     |     |     |     | M   | M   | M   | M   | M   | M   | M   |       |      |     |     |     |     | M   | M   | M   | M   | M   | M   | M   |
| 475        | 4.7 µF                 |       |      |     |     |     |     | M*  | M*  | M*  | M*  | M*  | M*  | M*  |       |      |     |     |     |     | M   | M   | M   | M   | M   | M   | M   |
| 106        | 10 µF                  |       |      |     |     |     |     |     | M*  | M*  | M*  | M*  | M*  | M*  |       |      |     |     |     |     |     | M   | M   | M   | M   | M   | M   |
| 226        | 22 µF                  |       |      |     |     |     |     |     |     | M*  | M*  | M*  | M*  | M*  |       |      |     |     |     |     |     |     | M   | M   | M   | M   | M   |
| 476        | 47 µF                  |       |      |     |     |     |     |     |     |     | M*  | M*  | M*  | M*  |       |      |     |     |     |     |     |     |     | M   | M   | M   | M   |
| 107        | 100 µF                 |       |      |     |     |     |     |     |     |     |     |     | M*  | M*  |       |      |     |     |     |     |     |     |     |     |     | M*  | M*  |

Code = capacitance in pF (two significant digits + number of zeros; R = decimal point). Letters = thickness code T, see the Dimensions table; two or three codes (e.g. H/G) = all listed in the original chart; blank = not listed. \* = the customer must provide the usage scenario and related conditions for factory confirmation (original chart note). # = can only be shipped in tolerance M (±20 %) (original chart note). Red letters = one of several thickness designs for the same specification; prefer the black entry — red has a long delivery time (original chart note). Orange cell = special specification with a minimum order quantity; for 1210 and above the minimum order quantity is 30,000 pcs (original chart note). Values are for reference only; the actual capacitance range depends on the use requirement.

1210 (3225) — X7T, X6S

| Dielectric |                        | X7T   |      |     |     |     |     |     |     |     |     |     |     |     |     | X6S   |      |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |
|------------|------------------------|-------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Code       | Cap. / V <sub>DC</sub> | 2000  | 1000 | 630 | 500 | 250 | 200 | 100 | 50  | 35  | 25  | 16  | 10  | 6.3 | 4   | 2000  | 1000 | 630 | 500 | 250 | 200 | 100 | 50  | 35  | 25  | 16  | 10  | 6.3 | 4   | 2.5 |  |  |
| 221        | 220 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |  |  |
| 271        | 270 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |  |  |
| 331        | 330 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |  |  |
| 391        | 390 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |  |  |
| 471        | 470 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |  |  |
| 561        | 560 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |  |  |
| 681        | 680 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |  |  |
| 821        | 820 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |  |  |
| 102        | 1 nF                   | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |  |  |
| 152        | 1.5 nF                 | F#/G# | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F#/G# | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |  |  |
| 182        | 1.8 nF                 | F#/G# | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F#/G# | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |  |  |
| 222        | 2.2 nF                 | F#/G# | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F#/G# | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |  |  |
| 272        | 2.7 nF                 | H#/G# | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | H#/G# | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |  |  |
| 332        | 3.3 nF                 | H/G   | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | H/G   | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |  |  |
| 472        | 4.7 nF                 | G     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | G     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |  |  |
| 562        | 5.6 nF                 | G#    | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | G#    | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |  |  |
| 682        | 6.8 nF                 | G#    | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | G#    | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |  |  |
| 103        | 10 nF                  | G#    | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | G#    | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |  |  |
| 153        | 15 nF                  |       | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |       | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |  |  |
| 223        | 22 nF                  |       | H    | H   | H   | H   | H   | H   | H   | H   | H   | H   | H   | H   | H   |       | H    | H   | H   | H   | H   | H   | H   | H   | H   | H   | H   | H   | H   | H   |  |  |
| 333        | 33 nF                  |       | M    | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       | M    | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |  |  |
| 473        | 47 nF                  |       |      | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |      | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |  |  |
| 563        | 56 nF                  |       |      | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |      | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |  |  |
| 683        | 68 nF                  |       |      | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |      | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |  |  |
| 104        | 100 nF                 |       |      | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |      | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |  |  |
| 154        | 150 nF                 |       |      |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |      |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |  |  |
| 224        | 220 nF                 |       |      |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |      |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |  |  |
| 334        | 330 nF                 |       |      |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |      |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |  |  |
| 474        | 470 nF                 |       |      |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |      |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |  |  |
| 684        | 680 nF                 |       |      |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |      |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |  |  |
| 105        | 1 μF                   |       |      |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |      |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |  |  |
| 225        | 2.2 μF                 |       |      |     |     |     | M   | M   | M   | M   | M   | M   | M   | M   | M   |       |      |     |     |     | M   | M   | M   | M   | M   | M   | M   | M   | M   | M   |  |  |
| 475        | 4.7 μF                 |       |      |     |     |     | M   | M   | M   | M   | M   | M   | M   | M   | M   |       |      |     |     |     | M   | M   | M   | M   | M   | M   | M   | M   | M   | M   |  |  |
| 106        | 10 μF                  |       |      |     |     |     |     | M   | M   |     | M   | M   | M   | M   | M   |       |      |     |     |     |     | M   | M   |     | M   | M   | M   | M   | M   | M   |  |  |
| 226        | 22 μF                  |       |      |     |     |     |     |     |     |     | M   | M   | M   | M   | M   |       |      |     |     |     |     |     |     |     | M   | M   | M   | M   | M   | M   |  |  |
| 476        | 47 μF                  |       |      |     |     |     |     |     |     |     |     | M   | M   | M   | M   |       |      |     |     |     |     |     |     |     |     | M   | M   | M   | M   | M   |  |  |
| 107        | 100 μF                 |       |      |     |     |     |     |     |     |     |     |     | M   | M   | M   |       |      |     |     |     |     |     |     |     |     |     |     | M   | M   | M   |  |  |

Code = capacitance in pF (two significant digits + number of zeros; R = decimal point). Letters = thickness code T, see the Dimensions table; two or three codes (e.g. H/G) = all listed in the original chart; blank = not listed. # = can only be shipped in tolerance M (±20 %) (original chart note). Red letters = one of several thickness designs for the same specification; prefer the black entry — red has a long delivery time (original chart note). Orange cell = special specification with a minimum order quantity; for 1210 and above the minimum order quantity is 30,000 pcs (original chart note). Values are for reference only; the actual capacitance range depends on the use requirement.

1210 (3225) — X5R

| Dielectric |                        | X5R   |      |     |     |     |     |     |     |     |     |     |     |     |
|------------|------------------------|-------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code       | Cap. / V <sub>DC</sub> | 2000  | 1000 | 630 | 500 | 250 | 200 | 100 | 50  | 35  | 25  | 16  | 10  | 6.3 |
| 221        | 220 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 271        | 270 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 331        | 330 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 391        | 390 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 471        | 470 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 561        | 560 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 681        | 680 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 821        | 820 pF                 | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 102        | 1 nF                   | F     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 152        | 1.5 nF                 | F#/G# | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 182        | 1.8 nF                 | F#/G# | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 222        | 2.2 nF                 | F#/G# | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 272        | 2.7 nF                 | H#/G# | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 332        | 3.3 nF                 | H/G   | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 472        | 4.7 nF                 | G     | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 562        | 5.6 nF                 | G#    | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 682        | 6.8 nF                 | G#    | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 103        | 10 nF                  | G#    | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 153        | 15 nF                  |       | F    | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 223        | 22 nF                  |       | H    | H   | H   | H   | H   | H   | H   | H   | H   | H   | H   | H   |
| 333        | 33 nF                  |       | M    | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 473        | 47 nF                  |       |      | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 563        | 56 nF                  |       |      | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 683        | 68 nF                  |       |      | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 104        | 100 nF                 |       |      | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 154        | 150 nF                 |       |      |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 224        | 220 nF                 |       |      |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 334        | 330 nF                 |       |      |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 474        | 470 nF                 |       |      |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 684        | 680 nF                 |       |      |     |     |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 105        | 1 μF                   |       |      |     |     |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 225        | 2.2 μF                 |       |      |     |     |     |     | M   | M   | M   | M   | M   | M   | M   |
| 475        | 4.7 μF                 |       |      |     |     |     |     | M   | M   | M   | M   | M   | M   | M   |
| 106        | 10 μF                  |       |      |     |     |     |     | M   | M   | M   | M   | M   | M   | M   |
| 226        | 22 μF                  |       |      |     |     |     |     |     | M   | M   | M   | M   | M   | M   |
| 476        | 47 μF                  |       |      |     |     |     |     |     |     | M   | M   | M   | M   | M   |
| 107        | 100 μF                 |       |      |     |     |     |     |     |     |     |     |     | M   | M   |

Code = capacitance in pF (two significant digits + number of zeros; R = decimal point). Letters = thickness code T, see the Dimensions table; two or three codes (e.g. H/G) = all listed in the original chart; blank = not listed. # = can only be shipped in tolerance M (±20 %) (original chart note). Red letters = one of several thickness designs for the same specification; prefer the black entry — red has a long delivery time (original chart note). Orange cell = special specification with a minimum order quantity; for 1210 and above the minimum order quantity is 30,000 pcs (original chart note). Values are for reference only; the actual capacitance range depends on the use requirement.

1812 (4532) — X7R, X7S

| Dielectric |                        | X7R   |       |       |       |     |     |     |     |     |     |     |     |     | X7S   |       |       |       |     |     |     |     |     |     |     |     |     |
|------------|------------------------|-------|-------|-------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code       | Cap. / V <sub>DC</sub> | 2000  | 1000  | 630   | 500   | 250 | 200 | 100 | 50  | 35  | 25  | 16  | 10  | 6.3 | 2000  | 1000  | 630   | 500   | 250 | 200 | 100 | 50  | 35  | 25  | 16  | 10  | 6.3 |
| 471        | 470 pF                 | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 561        | 560 pF                 | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 681        | 680 pF                 | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 821        | 820 pF                 | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 102        | 1 nF                   | F/H/G | F/H/G | F/H/G | F/H/G | F   | F   | F   | F   | F   | F   | F   | F   | F   | F/H/G | F/H/G | F/H/G | F/H/G | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 222        | 2.2 nF                 | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 332        | 3.3 nF                 | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 472        | 4.7 nF                 | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 562        | 5.6 nF                 | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 682        | 6.8 nF                 | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 103        | 10 nF                  | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 153        | 15 nF                  |       | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |       | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 223        | 22 nF                  |       | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |       | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 333        | 33 nF                  |       | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |       | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 473        | 47 nF                  |       | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |       | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 563        | 56 nF                  |       | G#    | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |       | G#    | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 683        | 68 nF                  |       |       | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |       |       | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 104        | 100 nF                 |       |       | G     | G     | G   | G   | G   | G   | G   | G   | G   | G   | G   |       |       | G     | G     | G   | G   | G   | G   | G   | G   | G   | G   | G   |
| 224        | 220 nF                 |       |       |       |       | G   | G   | G   | G   | G   | G   | G   | G   | G   |       |       |       | G     | G   | G   | G   | G   | G   | G   | G   | G   | G   |
| 334        | 330 nF                 |       |       |       |       | G   | G   | G   | G   | G   | G   | G   | G   | G   |       |       |       |       | G   | G   | G   | G   | G   | G   | G   | G   | G   |
| 474        | 470 nF                 |       |       |       |       |     |     | G   | G   | G   | G   | G   | G   | G   |       |       |       |       |     |     | G   | G   | G   | G   | G   | G   | G   |
| 684        | 680 nF                 |       |       |       |       |     |     | G   | G   | G   | G   | G   | G   | G   |       |       |       |       |     |     | G   | G   | G   | G   | G   | G   | G   |
| 105        | 1 μF                   |       |       |       |       |     |     | G   | G   | G   | G   | G   | G   | G   |       |       |       |       |     |     | G   | G   | G   | G   | G   | G   | G   |
| 225        | 2.2 μF                 |       |       |       |       |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |       |       |       |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 475        | 4.7 μF                 |       |       |       |       |     |     | M   | M   | M   | M   | M   | M   | M   |       |       |       |       |     |     | M   | M   | M   | M   | M   | M   | M   |
| 106        | 10 μF                  |       |       |       |       |     |     |     | M   | M   | M   | M   | M   | M   |       |       |       |       |     |     |     | M   | M   | M   | M   | M   | M   |
| 226        | 22 μF                  |       |       |       |       |     |     |     |     |     | M   | M   | M   | M   |       |       |       |       |     |     |     |     |     | M   | M   | M   | M   |

Code = capacitance in pF (two significant digits + number of zeros; R = decimal point). Letters = thickness code T, see the Dimensions table; two or three codes (e.g. H/G) = all listed in the original chart; blank = not listed. # = can only be shipped in tolerance M (±20 %) (original chart note). Red letters = one of several thickness designs for the same specification; prefer the black entry — red has a long delivery time (original chart note). Orange cell = special specification with a minimum order quantity; for 1210 and above the minimum order quantity is 30,000 pcs (original chart note). Values are for reference only; the actual capacitance range depends on the use requirement.

1812 (4532) — X7T, X6S

| Dielectric |                        | X7T   |       |       |       |     |     |     |     |     |     |     |     |     | X6S   |       |       |       |     |     |     |     |     |     |     |     |     |
|------------|------------------------|-------|-------|-------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code       | Cap. / V <sub>DC</sub> | 2000  | 1000  | 630   | 500   | 250 | 200 | 100 | 50  | 35  | 25  | 16  | 10  | 6.3 | 2000  | 1000  | 630   | 500   | 250 | 200 | 100 | 50  | 35  | 25  | 16  | 10  | 6.3 |
| 471        | 470 pF                 | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 561        | 560 pF                 | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 681        | 680 pF                 | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 821        | 820 pF                 | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 102        | 1 nF                   | F/H/G | F/H/G | F/H/G | F/H/G | F   | F   | F   | F   | F   | F   | F   | F   | F   | F/H/G | F/H/G | F/H/G | F/H/G | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 222        | 2.2 nF                 | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 332        | 3.3 nF                 | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 472        | 4.7 nF                 | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 562        | 5.6 nF                 | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 682        | 6.8 nF                 | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 103        | 10 nF                  | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 153        | 15 nF                  |       | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |       | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 223        | 22 nF                  |       | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |       | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 333        | 33 nF                  |       | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |       | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 473        | 47 nF                  |       | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |       | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 563        | 56 nF                  |       | G#    | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |       | G#    | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 683        | 68 nF                  |       |       | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |       |       | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 104        | 100 nF                 |       |       | G     | G     |     | G   | G   | G   | G   | G   | G   | G   | G   |       |       | G     | G     |     | G   | G   | G   | G   | G   | G   | G   | G   |
| 224        | 220 nF                 |       |       |       |       | G   | G   | G   | G   | G   | G   | G   | G   | G   |       |       |       | G     | G   |     | G   | G   | G   | G   | G   | G   | G   |
| 334        | 330 nF                 |       |       |       |       | G   | G   | G   | G   | G   | G   | G   | G   | G   |       |       |       | G     | G   |     | G   | G   | G   | G   | G   | G   | G   |
| 474        | 470 nF                 |       |       |       |       |     |     | G   | G   | G   | G   | G   | G   | G   |       |       |       |       | G   |     |     | G   | G   | G   | G   | G   | G   |
| 684        | 680 nF                 |       |       |       |       |     |     | G   | G   | G   | G   | G   | G   | G   |       |       |       |       |     |     | G   | G   | G   | G   | G   | G   | G   |
| 105        | 1 μF                   |       |       |       |       |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |       |       |       |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 225        | 2.2 μF                 |       |       |       |       |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G |       |       |       |       |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 475        | 4.7 μF                 |       |       |       |       |     |     | M   | M   | M   | M   | M   | M   | M   |       |       |       |       |     |     | M   | M   | M   | M   | M   | M   | M   |
| 106        | 10 μF                  |       |       |       |       |     |     |     | M   | M   | M   | M   | M   | M   |       |       |       |       |     |     |     | M   | M   | M   | M   | M   | M   |
| 226        | 22 μF                  |       |       |       |       |     |     |     |     |     | M   | M   | M   | M   |       |       |       |       |     |     |     |     |     | M   | M   | M   | M   |

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1812 (4532) — X5R

| Dielectric |                        | X5R   |       |       |       |     |     |     |     |     |     |     |     |     |
|------------|------------------------|-------|-------|-------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code       | Cap. / V <sub>DC</sub> | 2000  | 1000  | 630   | 500   | 250 | 200 | 100 | 50  | 35  | 25  | 16  | 10  | 6.3 |
| 471        | 470 pF                 | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 561        | 560 pF                 | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 681        | 680 pF                 | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 821        | 820 pF                 | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 102        | 1 nF                   | F/H/G | F/H/G | F/H/G | F/H/G | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 222        | 2.2 nF                 | F     | F     | F     | F     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 332        | 3.3 nF                 | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 472        | 4.7 nF                 | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 562        | 5.6 nF                 | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 682        | 6.8 nF                 | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 103        | 10 nF                  | H/G   | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 153        | 15 nF                  |       | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 223        | 22 nF                  |       | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 333        | 33 nF                  |       | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 473        | 47 nF                  |       | G     | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 563        | 56 nF                  |       | G#    | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 683        | 68 nF                  |       |       | G     | G     | F   | F   | F   | F   | F   | F   | F   | F   | F   |
| 104        | 100 nF                 |       |       | G     | G     | G   | G   | G   | G   | G   | G   | G   | G   | G   |
| 224        | 220 nF                 |       |       |       |       | G   | G   | G   | G   | G   | G   | G   | G   | G   |
| 334        | 330 nF                 |       |       |       |       | G   | G   | G   | G   | G   | G   | G   | G   | G   |
| 474        | 470 nF                 |       |       |       |       |     |     | G   | G   | G   | G   | G   | G   | G   |
| 684        | 680 nF                 |       |       |       |       |     |     | G   | G   | G   | G   | G   | G   | G   |
| 105        | 1 µF                   |       |       |       |       |     |     | G   | G   | G   | G   | G   | G   | G   |
| 225        | 2.2 µF                 |       |       |       |       |     |     | H/G | H/G | H/G | H/G | H/G | H/G | H/G |
| 475        | 4.7 µF                 |       |       |       |       |     |     | M   | M   | M   | M   | M   | M   | M   |
| 106        | 10 µF                  |       |       |       |       |     |     |     | M   | M   |     | M   | M   | M   |
| 226        | 22 µF                  |       |       |       |       |     |     |     |     |     | M   | M   | M   | M   |

Code = capacitance in pF (two significant digits + number of zeros; R = decimal point). Letters = thickness code T, see the Dimensions table; two or three codes (e.g. H/G) = all listed in the original chart; blank = not listed. # = can only be shipped in tolerance M (±20 %) (original chart note). Orange cell = special specification with a minimum order quantity; for 1210 and above the minimum order quantity is 30,000 pcs (original chart note). Values are for reference only; the actual capacitance range depends on the use requirement.

2220 (5750) — X7R, X7S

| Dielectric |                        | X7R  |      |     |     |     |     |     |     |     |     | X7S  |      |     |     |     |     |     |     |     |     |
|------------|------------------------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|-----|-----|-----|-----|-----|-----|-----|-----|
| Code       | Cap. / V <sub>DC</sub> | 2000 | 1000 | 630 | 500 | 250 | 200 | 100 | 50  | 35  | 25  | 2000 | 1000 | 630 | 500 | 250 | 200 | 100 | 50  | 35  | 25  |
| 221        | 220 pF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 271        | 270 pF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 331        | 330 pF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 391        | 390 pF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 471        | 470 pF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 561        | 560 pF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 681        | 680 pF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 821        | 820 pF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 102        | 1 nF                   | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 222        | 2.2 nF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 332        | 3.3 nF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 472        | 4.7 nF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 562        | 5.6 nF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 682        | 6.8 nF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 103        | 10 nF                  | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 153        | 15 nF                  | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 223        | 22 nF                  | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 333        | 33 nF                  | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 473        | 47 nF                  | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 563        | 56 nF                  |      | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |      | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 683        | 68 nF                  |      | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |      | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 104        | 100 nF                 |      | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |      | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 224        | 220 nF                 |      |      | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |      |      | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 334        | 330 nF                 |      |      | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |      |      | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 474        | 470 nF                 |      |      | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |      |      | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 684        | 680 nF                 |      |      |     |     | G/M | G/M | G/M | G/M | G/M | G/M |      |      |     |     | G/M | G/M | G/M | G/M | G/M | G/M |
| 105        | 1 μF                   |      |      |     |     | M   | M   | M   | M   | M   | M   |      |      |     |     | M   | M   | M   | M   | M   | M   |
| 225        | 2.2 μF                 |      |      |     |     | M   | M   | M   | M   | M   | M   |      |      |     |     | M   | M   | M   | M   | M   | M   |
| 335        | 3.3 μF                 |      |      |     |     |     | M   | M   | M   | M   | M   |      |      |     |     |     | M   | M   | M   | M   | M   |
| 475        | 4.7 μF                 |      |      |     |     |     | M   | M   | M   | M   | M   |      |      |     |     |     | M   | M   | M   | M   | M   |
| 685        | 6.8 μF                 |      |      |     |     |     |     | M   | M   | M   | M   |      |      |     |     |     |     | M   | M   | M   | M   |
| 106        | 10 μF                  |      |      |     |     |     |     |     | M*  | M   | M   |      |      |     |     |     |     |     | M   | M   | M   |
| 226        | 22 μF                  |      |      |     |     |     |     |     |     | M   | M   |      |      |     |     |     |     |     |     | M   | M   |

Code = capacitance in pF (two significant digits + number of zeros; R = decimal point). Letters = thickness code T, see the Dimensions table; two or three codes (e.g. G/M) = all listed in the original chart; blank = not listed. \* = the customer must provide the usage scenario and related conditions for factory confirmation (original chart note). Red letters = one of several thickness designs for the same specification; prefer the black entry — red has a long delivery time (original chart note). Orange cell = special specification with a minimum order quantity; for 1210 and above the minimum order quantity is 30,000 pcs (original chart note). Values are for reference only; the actual capacitance range depends on the use requirement.

2220 (5750) — X7T, X6S

| Dielectric |                        | X7T  |      |     |     |     |     |     |     |     |     | X6S  |      |     |     |     |     |     |     |     |     |
|------------|------------------------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|-----|-----|-----|-----|-----|-----|-----|-----|
| Code       | Cap. / V <sub>DC</sub> | 2000 | 1000 | 630 | 500 | 250 | 200 | 100 | 50  | 35  | 25  | 2000 | 1000 | 630 | 500 | 250 | 200 | 100 | 50  | 35  | 25  |
| 221        | 220 pF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 271        | 270 pF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 331        | 330 pF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 391        | 390 pF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 471        | 470 pF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 561        | 560 pF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 681        | 680 pF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 821        | 820 pF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 102        | 1 nF                   | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 222        | 2.2 nF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 332        | 3.3 nF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 472        | 4.7 nF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 562        | 5.6 nF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 682        | 6.8 nF                 | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 103        | 10 nF                  | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 153        | 15 nF                  | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 223        | 22 nF                  | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 333        | 33 nF                  | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 473        | 47 nF                  | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M  | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 563        | 56 nF                  |      | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |      | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 683        | 68 nF                  |      | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |      | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 104        | 100 nF                 |      | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |      | G/M  | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 224        | 220 nF                 |      |      | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |      |      | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 334        | 330 nF                 |      |      | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |      |      | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 474        | 470 nF                 |      |      | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |      |      | G/M | G/M | G/M | G/M | G/M | G/M | G/M | G/M |
| 684        | 680 nF                 |      |      |     |     | G/M | G/M | G/M | G/M | G/M | G/M |      |      |     |     | G/M | G/M | G/M | G/M | G/M | G/M |
| 105        | 1 µF                   |      |      |     |     | M   | M   | M   | M   | M   | M   |      |      |     |     | M   | M   | M   | M   | M   | M   |
| 225        | 2.2 µF                 |      |      |     |     | M   | M   | M   | M   | M   | M   |      |      |     |     | M   | M   | M   | M   | M   | M   |
| 335        | 3.3 µF                 |      |      |     |     |     | M   | M   | M   | M   | M   |      |      |     |     |     | M   | M   | M   | M   | M   |
| 475        | 4.7 µF                 |      |      |     |     |     | M   | M   | M   | M   | M   |      |      |     |     |     | M   | M   | M   | M   | M   |
| 685        | 6.8 µF                 |      |      |     |     |     |     | M   | M   | M   | M   |      |      |     |     |     |     | M   | M   | M   | M   |
| 106        | 10 µF                  |      |      |     |     |     |     |     | M   | M   | M   |      |      |     |     |     |     |     | M   | M   | M   |
| 226        | 22 µF                  |      |      |     |     |     |     |     |     | M   | M   |      |      |     |     |     |     |     |     | M   | M   |

Code = capacitance in pF (two significant digits + number of zeros; R = decimal point). Letters = thickness code T, see the Dimensions table; two or three codes (e.g. G/M) = all listed in the original chart; blank = not listed. Red letters = one of several thickness designs for the same specification; prefer the black entry — red has a long delivery time (original chart note). Orange cell = special specification with a minimum order quantity; for 1210 and above the minimum order quantity is 30,000 pcs (original chart note). Values are for reference only; the actual capacitance range depends on the use requirement.

Electrical characteristics and reliability (summary)

Requirements only. The test conditions, measurement remarks and step tables of every item are given in section 6 of the full specification (clause numbers in the first column).

Electrical characteristics

| Item (full spec. clause)  | Dielectric              | Requirement                                                                            |
|---------------------------|-------------------------|----------------------------------------------------------------------------------------|
| 6.3 Capacitance ②         | C0G                     | Within the specified tolerance.<br>B: ±0.1 pF; C: ±0.25 pF; D: ±0.5 pF; J: ±5%         |
|                           | X7R, X5R, X7T, X6S, X7S | Within the specified tolerance.<br>J: ±5%; K: ±10%; M: ±20%                            |
| 6.4 Dissipation factor    | C0G                     | C <sub>p</sub> < 30 pF: Q ≥ 400 + 20C <sub>p</sub><br>C <sub>p</sub> ≥ 30 pF: Q ≥ 1000 |
|                           | X7R, X5R, X7T, X6S, X7S | DF limits: see the table below. ⑤                                                      |
| 6.5 Insulation resistance | C0G                     | More than 10 GΩ or 100 Ω·F/CR, whichever is smaller.                                   |
|                           | X7R, X5R, X7T, X6S, X7S | U <sub>R</sub> ≤ 50 V: more than 10 GΩ or 100 Ω·F/CR, whichever is smaller.            |
|                           | X7R, X5R, X7T, X6S, X7S | U <sub>R</sub> > 50 V: more than 4 GΩ or 100 Ω·F/CR, whichever is smaller.             |

**DF limits, Class II (X7R, X5R, X7T, X6S, X7S) ⑤**

| Size | Rated voltage $U_R$ | Capacitance                     | DF          | Size | Rated voltage $U_R$ | Capacitance                      | DF          |
|------|---------------------|---------------------------------|-------------|------|---------------------|----------------------------------|-------------|
| 0105 | /                   | $C \leq 0.01 \mu F$             | $\leq 7\%$  | 0805 | $\leq 25V$          | $C \leq 1 \mu F$                 | $\leq 7\%$  |
|      |                     | $C > 0.01 \mu F$                | $\leq 10\%$ |      |                     | $C > 1 \mu F$                    | $\leq 10\%$ |
| 0201 | /                   | $C \leq 0.01 \mu F$             | $\leq 7\%$  |      | $> 25V$             | $C \leq 0.47 \mu F$              | $\leq 7\%$  |
|      |                     | $C > 0.01 \mu F$                | $\leq 10\%$ |      |                     | $C > 0.47 \mu F$                 | $\leq 10\%$ |
| 0402 | /                   | $C \leq 0.1 \mu F$              | $\leq 7\%$  | 1206 | $\leq 25V$          | $C < 2.2 \mu F$                  | $\leq 7\%$  |
|      |                     | $C > 0.1 \mu F$                 | $\leq 10\%$ |      |                     | $2.2 \mu F \leq C \leq 47 \mu F$ | $\leq 10\%$ |
| 0603 | $\leq 25V$          | $C \leq 0.47 \mu F$             | $\leq 7\%$  |      | $> 25V$             | $C < 1 \mu F$                    | $\leq 7\%$  |
|      |                     | $C > 0.47 \mu F$                | $\leq 10\%$ |      |                     | $1 \mu F \leq C \leq 47 \mu F$   | $\leq 10\%$ |
|      | $> 25V$             | $C \leq 0.1 \mu F$              | $\leq 5\%$  | 1210 | /                   | $C < 2.2 \mu F$                  | $\leq 7\%$  |
|      |                     | $0.1 \mu F < C \leq 0.22 \mu F$ | $\leq 7\%$  |      |                     | $2.2 \mu F \leq C \leq 47 \mu F$ | $\leq 10\%$ |
|      |                     | $C > 0.22 \mu F$                | $\leq 10\%$ | 1812 | /                   | $C < 2.2 \mu F$                  | $\leq 7\%$  |
|      |                     |                                 |             |      |                     | $2.2 \mu F \leq C \leq 47 \mu F$ | $\leq 10\%$ |
|      |                     |                                 |             | 2220 | /                   | $C < 2.2 \mu F$                  | $\leq 7\%$  |
|      |                     |                                 |             |      |                     | $2.2 \mu F \leq C \leq 47 \mu F$ | $\leq 10\%$ |

**Electrical characteristics (continued)**

| Item (full spec. clause)                              | Dielectric                   | Requirement                                                                                                                         |
|-------------------------------------------------------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <b>6.6 Dielectric strength ⑥</b>                      | C0G                          | $U_R \leq 50 V$ : 300% of rated voltage for 5 s; maximum current 50 mA                                                              |
|                                                       | X7R, X5R, X7T, X6S, X7S      | $U_R \leq 50 V$ : 250% of rated voltage for 5 s; maximum current 50 mA                                                              |
|                                                       | C0G, X7R, X7S, X7T, X6S, X5R | $100 V \leq U_R < 500 V$ : 200% of rated voltage for 5 s; maximum current 50 mA                                                     |
|                                                       |                              | $500 V \leq U_R < 2000 V$ : 150% of rated voltage for 5 s; maximum current 50 mA                                                    |
|                                                       |                              | $U_R \geq 2000 V$ : 120% of rated voltage for 5 s; maximum current 50 mA                                                            |
| <b>6.7 Temperature coefficient of capacitance ④ ⑦</b> | C0G                          | Temperature coefficient within $\pm 30 \text{ ppm}/^\circ\text{C}$<br>Capacitance drift within $\pm 0.2\%$ or $\pm 0.05 \text{ pF}$ |
|                                                       | X7R, X5R                     | Capacitance change within $\pm 15\%$                                                                                                |
|                                                       | X7T                          | Capacitance change within $+22\%$ , $-33\%$                                                                                         |
|                                                       | X6S, X7S                     | Capacitance change within $\pm 22\%$                                                                                                |

**Reliability tests**

| Item (full spec. clause)                   | C0G                                                                                                                                                                                        | X7R, X5R, X7T, X6S, X7S                                                                                                                    |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>6.8 Adhesion</b>                        | No removal of the terminations or other defects shall occur.                                                                                                                               |                                                                                                                                            |
| <b>6.9 Solderability of terminations</b>   | At least 95% coverage of both terminations; less than 5% pinholes or rough spots.                                                                                                          |                                                                                                                                            |
| <b>6.10 Resistance to leaching ①</b>       | At least 95% coverage of both terminations; less than 5% pinholes or rough spots.<br>No visible damage (no cracks).                                                                        |                                                                                                                                            |
| <b>6.11 Bending ①</b>                      | No visible damage<br>Capacitance change within $\pm 5.0\%$ or $\pm 0.5 \text{ pF}$ , whichever is larger.                                                                                  | No visible damage<br>Capacitance change $\leq \pm 10\%$                                                                                    |
| <b>6.12 Resistance to soldering heat ④</b> | No visible damage<br>Capacitance change within $\pm 2.5\%$ or $\pm 0.25 \text{ pF}$ , whichever is larger.<br>DF: meets the initial specification.<br>IR: meets the initial specification. | No visible damage<br>Capacitance change within $\pm 7.5\%$<br>DF: meets the initial specification.<br>IR: meets the initial specification. |
| <b>6.13 Temperature cycle</b>              | No visible damage<br>Capacitance change within $\pm 2.5\%$ or $\pm 0.25 \text{ pF}$ , whichever is larger.                                                                                 | No visible damage<br>Capacitance change within $\pm 7.5\%$                                                                                 |

| Item (full spec. clause)                      | C0G                                                                                                                                                                                                                                                                                                                          | X7R, X5R, X7T, X6S, X7S                                                                                                                                                                       |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>6.14 Moisture resistance, steady state</b> | No visible damage<br>Capacitance change within $\pm 5\%$ or $\pm 0.5$ pF, whichever is larger.<br>$C_p < 10$ pF: $Q \geq 200 + 10C_p$<br>$10 \leq C_p < 30$ pF: $Q \geq 275 + 2.5C_p$<br>$C_p \geq 30$ pF: $Q \geq 350$<br>$IR \geq 1000$ M $\Omega$ or $10$ $\Omega \cdot F/CR$ , whichever is smaller. ⑧                   | No visible damage<br>Capacitance change within $\pm 12.5\%$<br>DF: not more than 2 times the initial value<br>$IR \geq 1000$ M $\Omega$ or $10$ $\Omega \cdot F/CR$ , whichever is smaller. ⑧ |
| <b>6.15 Damp heat with load</b>               | No visible damage<br>Capacitance change $\leq \pm 7.5\%$ or $\pm 0.75$ pF, whichever is larger.<br>$C_p < 30$ pF: $Q \geq 100 + 10/3 \cdot C_p$<br>$C_p \geq 30$ pF: $Q \geq 200$<br>$IR \geq 500$ M $\Omega$ or $5$ $\Omega \cdot F/CR$ , whichever is smaller. ⑧                                                           | No visible damage<br>Capacitance change $\leq \pm 12.5\%$<br>DF: not more than 2 times the initial value<br>$IR \geq 500$ M $\Omega$ or $5$ $\Omega \cdot F/CR$ , whichever is smaller. ⑧     |
| <b>6.16 Life test ⑥</b>                       | No visible damage<br>Capacitance change $\leq \pm 3\%$ or $\pm 0.3$ pF, whichever is larger.<br>$C_p \geq 30$ pF: $Q \geq 350$<br>$10$ pF $\leq C_p < 30$ pF: $Q \geq 275 + (2.5 \cdot C_p)$<br>$C_p < 10$ pF: $Q \geq 200 + 10 \cdot C_p$<br>$IR \geq 1000$ M $\Omega$ or $5$ $\Omega \cdot F/CR$ , whichever is smaller. ⑧ | No visible damage<br>Capacitance change $\leq \pm 12.5\%$<br>DF: not more than 2 times the initial value<br>$IR \geq 1000$ M $\Omega$ or $5$ $\Omega \cdot F/CR$ , whichever is smaller. ⑧    |

A requirement spanning both columns applies to all dielectrics (C0G, X7R, X5R, X7T, X6S, X7S). Remark: the test equipment can apply at most 600 V; 6.15 and 6.16 therefore apply only to low- and medium-voltage products ( $< 630$  V), not to high-voltage products ( $\geq 630$  V).

## Further documents

This datasheet is a summary. Test conditions (section 6), packaging details (section 7), precautions for use (section 8) and characteristic curves: see the full specification (Multilayer Chip Ceramic Capacitors — Full specification). Sections 7 and 8 and the curves are also published as the MLCC Application Notes.

## Notes

- ① The Chinese text differs from the English in: the dielectric descriptions (C0G “standard and medium/high-voltage” products; Class II “wide capacitance range, circuits with lower stability requirements”); the titles of 6.10 (solder resistance) and 6.11 (termination bond strength). The English is printed — subject to manufacturer confirmation.
- ② Part numbering: position 3 is printed only as “NO. OF total character (102=1000=4)”, with no Chinese label; Y5V (code F) is listed under position 2 and in the temperature-characteristics table but has no capacitance range chart and no requirements in section 6 of the full specification. Page 1 “Tabulated dielectrics” = capacity charts and section 6 only. Original print: code F “YSV” (position 2, p. 4), “Y5V” (temperature table, p. 5); Y5V is shown here. Designation and applicability subject to manufacturer confirmation (not confirmed).
- ③ The size-code table (part numbering, position 1) lists 0105 to 3035 (0105 and 0201 from the new KOME book N/3; 1808, 2225 and 3035 from the old book only); the capacitance ranges, the dimensions and tape packaging cover 0105 to 2220 (new KOME book N/3); page 1 “Tabulated case sizes” refers to these tables only — subject to manufacturer confirmation.
- ④ Reference temperature: 20 °C in the temperature-characteristics table, 25 °C in 6.7. De-ageing of Class II parts before measurement is given as 150 °C for 1 h then 48 h (6.3, 6.4), 140 ~ 150 °C for 1 h then 24 h (6.7), 140 ~ 150 °C for 1 h then 48  $\pm$  4 h (6.12–6.14) and 150 °C for 1 h (8.5) — subject to manufacturer confirmation.
- ⑤ The DF limits (6.4) are taken over whole from the new KOME book N/3 (section 6.2), where the old book's overlap at 0.47  $\mu$ F no longer occurs. The table ends at 47  $\mu$ F (1206 to 2220), while the capacitance tables (section 4) include 100  $\mu$ F and 220  $\mu$ F parts; no DF limit is given for  $C > 47$   $\mu$ F — subject to manufacturer confirmation.
- ⑥ No test condition is given for rated voltages above 50 V and below 100 V in 6.6, and 6.16 gives a test voltage only for rated voltages below 100 V — subject to manufacturer confirmation.
- ⑦ 6.7: the C0G drift calculation is given in the full specification as printed (step-3 capacitance divided by the difference between the maximum and minimum errors of steps 1, 3 and 5) — subject to manufacturer confirmation.
- ⑧ 6.14–6.16: insulation-resistance limits as printed in the new KOME book N/3 (“ $IR \geq \dots$  M $\Omega$  or  $\dots$   $\Omega \cdot F/CR$ , whichever is smaller”; Chinese and English agree). The earlier English/Chinese difference noted in the previous book no longer appears in N/3.