



Multilayer ceramic capacitors

Chip capacitors, C0G

Date: October 2006

Ordering code system

|  |  |  |  |  |  |  | | | | | | | | | | | | |
|--|---|---|---|---|---|---|--|---------------------|----|-----|-----|--|------|--|---|---|---|--|
| B37940 | K | 5 | 010 | C | 5 | 60 | | | | | | | | | | | | |
| Packaging | | | | | | | | | | | | | | | | | | |
| 60 \triangleq cardboard tape, 180-mm reel 62 \triangleq blister tape, 180-mm reel 70 \triangleq cardboard tape, 330-mm reel 72 \triangleq blister tape, 330-mm reel 01 \triangleq bulk case | | | | | | | | | | | | | | | | | | |
| Decimal place for cap. values < 10 pF, otherwise 0 | | | | | | | | | | | | | | | | | | |
| Capacitance tolerance | | | | | | | | | | | | | | | | | | |
| $C_R < 10$ pF: B $\triangleq \pm 0.1$ pF C $\triangleq \pm 0.25$ pF (standard for capacitance values ≤ 4.7 pF) D $\triangleq \pm 0.5$ pF (standard for capacitance values ≤ 8.2 pF) $C_R > 10$ pF: F $\triangleq \pm 1\%$ G $\triangleq \pm 2\%$ J $\triangleq \pm 5\%$ (standard) K $\triangleq \pm 10\%$ | | | | | | | | | | | | | | | | | | |
| Capacitance , coded (example) | | | | | | | | | | | | | | | | | | |
| $010 \triangleq 1 \cdot 10^0$ pF = 1 pF $100 \triangleq 10 \cdot 10^0$ pF = 10 pF $221 \triangleq 22 \cdot 10^1$ pF = 220 pF | | | | | | | | | | | | | | | | | | |
| Rated voltage | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; text-align: center;"> <tr> <td></td> <th>Rated voltage [VDC]</th> <td>50</td> <td>100</td> <td>200</td> <td></td> </tr> <tr> <td>Code</td> <td></td> <td>5</td> <td>1</td> <td>2</td> <td></td> </tr> </table> | | | | | | | | Rated voltage [VDC] | 50 | 100 | 200 | | Code | | 5 | 1 | 2 | |
| | Rated voltage [VDC] | 50 | 100 | 200 | | | | | | | | | | | | | | |
| Code | | 5 | 1 | 2 | | | | | | | | | | | | | | |
| Termination | | | | | | | | | | | | | | | | | | |
| Standard: K \triangleq nickel barrier for all case sizes On request: J \triangleq silver-palladium for conductive adhesion: all case sizes | | | | | | | | | | | | | | | | | | |
| Type and size | | | | | | | | | | | | | | | | | | |
| Chip size (inch / mm) | Temperature characteristic C0G | | | | | | | | | | | | | | | | | |
| 0402 / 1005 | B37920 | | | | | | | | | | | | | | | | | |
| 0603 / 1608 | B37930 | | | | | | | | | | | | | | | | | |
| 0805 / 2012 | B37940 | | | | | | | | | | | | | | | | | |
| 1206 / 3216 | B37871 | | | | | | | | | | | | | | | | | |
| 1210 / 3225 | B37949 | | | | | | | | | | | | | | | | | |

Features

- Good thermal stability
- High insulation resistance
- Low dissipation factor
- Low inductance
- To AEC-Q200


Applications


- Resonant circuits
- Filter circuits
- Timing elements
- Coupling and filtering, particularly in RF circuits

Termination

- For soldering: Nickel barrier terminations (Ni)
- For conductive adhesion: Silver-palladium terminations (AgPd) on request

Options

- Alternative capacitance tolerances available on request

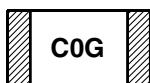
Delivery mode

- Cardboard and blister tape (blister tape for chip thickness $\geq 1.2 \pm 0.1$ mm and case size 1210), 180-mm and 330-mm reel available
- Bulk case for case sizes 0402, 0603 (50 V) and 0805 (50 V) on request

Electrical data

| | | | |
|--|---------------|----------------------------|-----|
| Temperature characteristic | | C0G | |
| Climatic category (IEC 60068-1) | | 55/125/56 | |
| Standard | | EIA | |
| Dielectric | | Class 1 | |
| Rated voltage | V_R | 50, 100, 200 | VDC |
| Test voltage | V_{test} | $2.5 \cdot V_R/5$ s | VDC |
| Capacitance range / E series | C_R | 1 pF ... 10 nF (E6/E12) | |
| Temperature coefficient | $\tan \delta$ | $0 \pm 30 \cdot 10^{-6}/K$ | |
| Dissipation factor (limit value) | | $<1.0 \cdot 10^{-3}$ | |
| Insulation resistance ¹⁾ at + 25 °C | R_{ins} | $>10^5$ | MΩ |
| Insulation resistance ¹⁾ at +125 °C | R_{ins} | $>10^4$ | MΩ |
| Time constant ¹⁾ at + 25 °C | τ | >1000 | s |
| Time constant ¹⁾ at +125 °C | τ | >100 | s |
| Operating temperature range | T_{op} | -55 ... +125 | °C |
| Ageing | | none | |

1) For $C_R > 10$ nF the time constant $\tau = C \cdot R_{ins}$ is given.

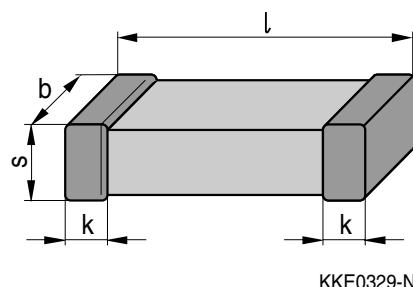


Capacitance tolerances

| | $C_R \leq 4.7 \text{ pF}$ | | | $5.6 \text{ pF} \leq C_R \leq 8.2 \text{ pF}$ | | |
|-------------|--------------------------------------|-----------------------|----------------------|---|---------------------------------------|----------------------|
| Code letter | B | C (standard) | D | B | C | D (standard) |
| Tolerance | $\pm 0.1 \text{ pF}$ (on request) | $\pm 0.25 \text{ pF}$ | $\pm 0.5 \text{ pF}$ | $\pm 0.1 \text{ pF}$ (on request) | $\pm 0.25 \text{ pF}$ (on request) | $\pm 0.5 \text{ pF}$ |

| | $C_R \geq 10 \text{ pF}$ | | | |
|-------------|--|--|-----------------|------------|
| Code letter | F | G | J (standard) | K |
| Tolerance | $\pm 1\%$ (on request for 50 V and 100 V; not available for 200 V) | $\pm 2\%$ (on request for 50 V and 100 V; not available for 200 V) | $\pm 5\%$ | $\pm 10\%$ |

Dimensional drawing



KKE0329-N

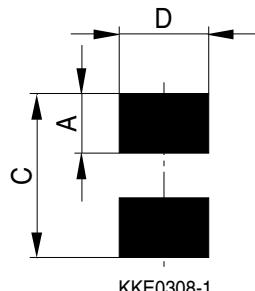
Dimensions (mm)

| Case size (inch) (mm) | 0402 1005 | 0603 1608 | 0805 2012 | 1206 3216 | 1210 3225 |
|-----------------------------|----------------|----------------|-----------------|-----------------|-----------------|
| l | 1.0 ± 0.10 | 1.6 ± 0.15 | 2.00 ± 0.20 | 3.20 ± 0.20 | 3.20 ± 0.30 |
| b | 0.5 ± 0.05 | 0.8 ± 0.10 | 1.25 ± 0.15 | 1.60 ± 0.15 | 2.50 ± 0.30 |
| s | 0.5 ± 0.05 | 0.8 ± 0.10 | 1.30 max. | 1.30 max. | 1.70 max. |
| k | $0.1 - 0.40$ | $0.1 - 0.40$ | $0.13 - 0.75$ | $0.25 - 0.75$ | $0.25 - 0.75$ |

Tolerances to CECC 32101-801



Recommended solder pad



KKE0308-1

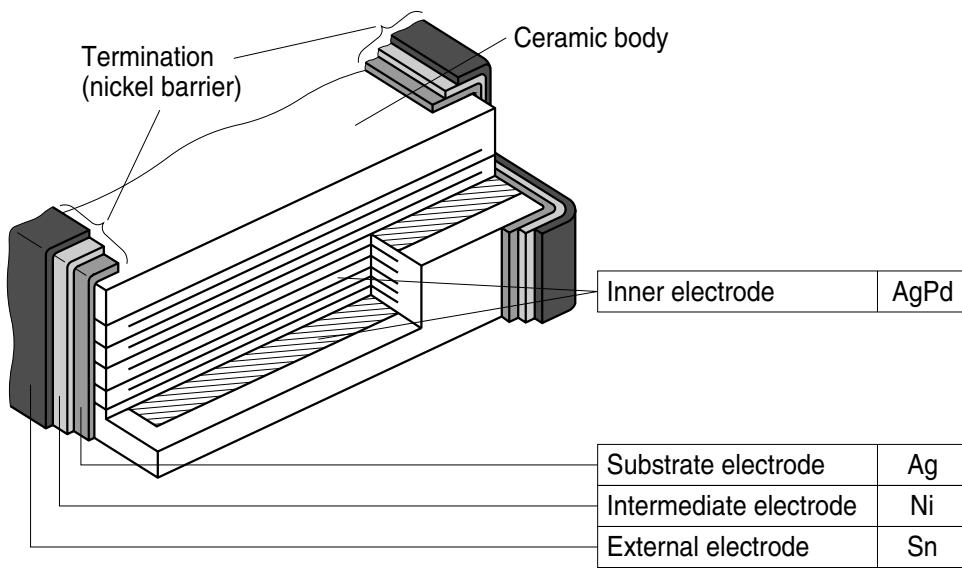
Recommended dimensions (mm) for reflow soldering

| Case size (inch/mm) | Type | A | C | D |
|---------------------|-------------|---------------|--------------|-------------|
| 0402/1005 | single chip | 0.35 ... 0.45 | 1.0 ... 1.40 | 0.4 ... 0.6 |
| 0603/1608 | single chip | 0.60 ... 0.70 | 1.8 ... 2.20 | 0.6 ... 0.8 |
| 0805/2012 | single chip | 0.60 ... 0.70 | 2.2 ... 2.60 | 0.8 ... 1.1 |
| 1206/3216 | single chip | 0.80 ... 0.90 | 3.8 ... 4.32 | 1.0 ... 1.4 |
| 1210/3225 | single chip | 1.00 ... 1.20 | 4.0 ... 4.80 | 1.8 ... 2.3 |

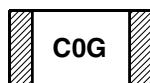
Recommended dimensions (mm) for wave soldering

| Case size (inch/mm) | Type | A | C | D |
|---------------------|-------------|-------------|-------------|-------------|
| 0603/1608 | single chip | 0.8 ... 0.9 | 2.2 ... 2.8 | 0.6 ... 0.8 |
| 0805/2012 | single chip | 0.9 ... 1.0 | 2.8 ... 3.2 | 0.8 ... 1.1 |
| 1206/3216 | single chip | 1.0 ... 1.1 | 4.2 ... 4.8 | 1.0 ... 1.4 |

Termination



KKE0484-W


Product range chip capacitors, C0G

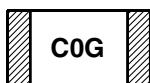
| Size ¹⁾ inch mm | 0402 | | 0603 | | 0805 | | | 1206 | | 1210 | |
|----------------------------------|--------|--|--------|--|--------|--|--|--------|--|--------|--|
| Type | B37920 | | B37930 | | B37940 | | | B37871 | | B37949 | |
| V_R (VDC) | 50 | | 50 | | 50 | | | 50 | | 50 | |
| C_R | 1.0 pF | | | | | | | | | | |
| 1.2 pF | | | | | | | | | | | |
| 1.5 pF | | | | | | | | | | | |
| 1.8 pF | | | | | | | | | | | |
| 2.2 pF | | | | | | | | | | | |
| 2.7 pF | | | | | | | | | | | |
| 3.3 pF | | | | | | | | | | | |
| 3.9 pF | | | | | | | | | | | |
| 4.7 pF | | | | | | | | | | | |
| 5.6 pF | | | | | | | | | | | |
| 6.8 pF | | | | | | | | | | | |
| 8.2 pF | | | | | | | | | | | |
| 10 pF | | | | | | | | | | | |
| 12 pF | | | | | | | | | | | |
| 15 pF | | | | | | | | | | | |
| 18 pF | | | | | | | | | | | |
| 22 pF | | | | | | | | | | | |
| 27 pF | | | | | | | | | | | |
| 33 pF | | | | | | | | | | | |
| 39 pF | | | | | | | | | | | |
| 47 pF | | | | | | | | | | | |
| 56 pF | | | | | | | | | | | |
| 68 pF | | | | | | | | | | | |
| 82 pF | | | | | | | | | | | |

 1) $l \times b$ (inch) / $l \times b$ (mm)

Product range chip capacitors, C0G

| Size ¹⁾ inch mm | 0402 | | 0603 | | 0805 | | | 1206 | | 1210 | |
|----------------------------------|--------|--|--------|-----|--------|-----|-----|--------|-----|--------|-----|
| Type | B37920 | | B37930 | | B37940 | | | B37871 | | B37949 | |
| V_R (VDC) C_R | 50 | | 50 | 100 | 50 | 100 | 200 | 50 | 100 | 50 | 100 |
| 100 pF | | | | | | | | | | | |
| 120 pF | | | | | | | | | | | |
| 150 pF | | | | | | | | | | | |
| 180 pF | | | | | | | | | | | |
| 220 pF | | | | | | | | | | | |
| 270 pF | | | | | | | | | | | |
| 330 pF | | | | | | | | | | | |
| 390 pF | | | | | | | | | | | |
| 470 pF | | | | | | | | | | | |
| 560 pF | | | | | | | | | | | |
| 680 pF | | | | | | | | | | | |
| 820 pF | | | | | | | | | | | |
| 1.0 nF | | | | | | | | | | | |
| 1.2 nF | | | | | | | | | | | |
| 1.5 nF | | | | | | | | | | | |
| 1.8 nF | | | | | | | | | | | |
| 2.2 nF | | | | | | | | | | | |
| 2.7 nF | | | | | | | | | | | |
| 3.3 nF | | | | | | | | | | | |
| 3.9 nF | | | | | | | | | | | |
| 4.7 nF | | | | | | | | | | | |
| 5.6 nF | | | | | | | | | | | |
| 6.8 nF | | | | | | | | | | | |
| 8.2 nF | | | | | | | | | | | |
| 10 nF | | | | | | | | | | | |

¹⁾ $l \times b$ (inch) / $l \times b$ (mm)


Ordering codes and packing for C0G, 50 VDC, nickel barrier terminations
Case size 0402, 50 VDC

| C _R ¹⁾ | Ordering code ²⁾ | Chip thickness mm | Cardboard tape, Ø 180-mm reel | Cardboard tape, Ø 330-mm reel |
|------------------------------|-----------------------------|----------------------|----------------------------------|----------------------------------|
| | | | ** \triangle 60 | ** \triangle 70 |
| | | | pcs/reel | pcs/reel |
| 3.3 pF | B37920K5030C3** | 0.5 \pm 0.05 | 10000 | 50000 |
| 3.9 pF | B37920K5030C9** | 0.5 \pm 0.05 | 10000 | 50000 |
| 4.7 pF | B37920K5040C7** | 0.5 \pm 0.05 | 10000 | 50000 |
| 5.6 pF | B37920K5050D6** | 0.5 \pm 0.05 | 10000 | 50000 |
| 6.8 pF | B37920K5060D8** | 0.5 \pm 0.05 | 10000 | 50000 |
| 8.2 pF | B37920K5080D2** | 0.5 \pm 0.05 | 10000 | 50000 |
| 10 pF | B37920K5100J0** | 0.5 \pm 0.05 | 10000 | 50000 |
| 12 pF | B37920K5120J0** | 0.5 \pm 0.05 | 10000 | 50000 |
| 15 pF | B37920K5150J0** | 0.5 \pm 0.05 | 10000 | 50000 |
| 18 pF | B37920K5180J0** | 0.5 \pm 0.05 | 10000 | 50000 |
| 22 pF | B37920K5220J0** | 0.5 \pm 0.05 | 10000 | 50000 |
| 27 pF | B37920K5270J0** | 0.5 \pm 0.05 | 10000 | 50000 |
| 33 pF | B37920K5330J0** | 0.5 \pm 0.05 | 10000 | 50000 |
| 39 pF | B37920K5390J0** | 0.5 \pm 0.05 | 10000 | 50000 |
| 47 pF | B37920K5470J0** | 0.5 \pm 0.05 | 10000 | 50000 |
| 56 pF | B37920K5560J0** | 0.5 \pm 0.05 | 10000 | 50000 |
| 68 pF | B37920K5680J0** | 0.5 \pm 0.05 | 10000 | 50000 |
| 82 pF | B37920K5820J0** | 0.5 \pm 0.05 | 10000 | 50000 |
| 100 pF | B37920K5101J0** | 0.5 \pm 0.05 | 10000 | 50000 |

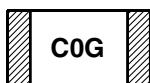
1) Capacitance values < 3.3 pF and > 100 pF on request.

 2) The table contains the ordering codes for the standard capacitance tolerance.
 For other available capacitance tolerances see page 4.

Ordering codes and packing for C0G, 50 VDC, nickel barrier terminations
Case size 0603, 50 VDC

| C _R | Ordering code ¹⁾ | Chip thickness mm | Cardboard tape, Ø 180-mm reel | Cardboard tape, Ø 330-mm reel | Bulk case |
|----------------|-----------------------------|----------------------|----------------------------------|----------------------------------|-------------------|
| | | | ** \triangle 60 | ** \triangle 70 | ** \triangle 01 |
| | | | pcs/reel | pcs/reel | pcs |
| 1.0 pF | B37930K5010C0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 1.2 pF | B37930K5010C2** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 1.5 pF | B37930K5010C5** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 1.8 pF | B37930K5010C8** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 2.2 pF | B37930K5020C2** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 2.7 pF | B37930K5020C7** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 3.3 pF | B37930K5030C3** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 3.9 pF | B37930K5030C9** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 4.7 pF | B37930K5040C7** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 5.6 pF | B37930K5050D6** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 6.8 pF | B37930K5060D8** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 8.2 pF | B37930K5080D2** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 10 pF | B37930K5100J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 12 pF | B37930K5120J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 15 pF | B37930K5150J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 18 pF | B37930K5180J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 22 pF | B37930K5220J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 27 pF | B37930K5270J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 33 pF | B37930K5330J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 39 pF | B37930K5390J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 47 pF | B37930K5470J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 56 pF | B37930K5560J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 68 pF | B37930K5680J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 82 pF | B37930K5820J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 100 pF | B37930K5101J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 120 pF | B37930K5121J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 150 pF | B37930K5151J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 180 pF | B37930K5181J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 220 pF | B37930K5221J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 270 pF | B37930K5271J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 330 pF | B37930K5331J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 390 pF | B37930K5391J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 470 pF | B37930K5471J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |

1) The table contains the ordering codes for the standard capacitance tolerance.
For other available capacitance tolerances see page 4.


Ordering codes and packing for C0G, 100 VDC, nickel barrier terminations
Case size 0603, 100 VDC

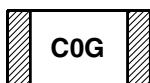
| C _R | Ordering code ¹⁾ | Chip thickness mm | Cardboard tape, Ø 180-mm reel | Cardboard tape, Ø 330-mm reel | Bulk case |
|----------------|-----------------------------|----------------------|----------------------------------|----------------------------------|----------------|
| | | | ** Δ 60 | ** Δ 70 | ** Δ 01 |
| | | | pcs/reel | pcs/reel | pcs |
| 1.0 pF | B37930K1010C0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 1.5 pF | B37930K1010C5** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 2.2 pF | B37930K1020C2** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 3.3 pF | B37930K1030C3** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 4.7 pF | B37930K1040C7** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 6.8 pF | B37930K1060D8** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 10 pF | B37930K1100J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 15 pF | B37930K1150J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 22 pF | B37930K1220J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 33 pF | B37930K1330J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 47 pF | B37930K1470J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 68 pF | B37930K1680J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 100 pF | B37930K1101J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 150 pF | B37930K1151J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |
| 220 pF | B37930K1221J0** | 0.8 \pm 0.1 | 4000 | 16000 | 15000 |

1) The table contains the ordering codes for the standard capacitance tolerance.
For other available capacitance tolerances see page 4.

Ordering codes and packing for C0G, 50 VDC, nickel barrier terminations

| Case size 0805, 50 VDC | | | | | |
|------------------------|-----------------------------|----------------------|----------------------------------|----------------------------------|-------------------|
| C _R | Ordering code ¹⁾ | Chip thickness mm | Cardboard tape, Ø 180-mm reel | Cardboard tape, Ø 330-mm reel | Bulk case |
| | | | ** \triangle 60 | ** \triangle 70 | ** \triangle 01 |
| | | | pcs/reel | pcs/reel | pcs |
| 1.0 pF | B37940K5010C0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 1.2 pF | B37940K5010C2** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 1.5 pF | B37940K5010C5** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 1.8 pF | B37940K5010C8** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 2.2 pF | B37940K5020C2** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 2.7 pF | B37940K5020C7** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 3.3 pF | B37940K5030C3** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 3.9 pF | B37940K5030C9** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 4.7 pF | B37940K5040C7** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 5.6 pF | B37940K5050D6** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 6.8 pF | B37940K5060D8** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 8.2 pF | B37940K5080D2** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 10 pF | B37940K5100J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 12 pF | B37940K5120J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 15 pF | B37940K5150J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 18 pF | B37940K5180J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 22 pF | B37940K5220J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 27 pF | B37940K5270J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 33 pF | B37940K5330J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 39 pF | B37940K5390J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 47 pF | B37940K5470J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 56 pF | B37940K5560J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 68 pF | B37940K5680J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 82 pF | B37940K5820J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 100 pF | B37940K5101J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 120 pF | B37940K5121J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 150 pF | B37940K5151J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 180 pF | B37940K5181J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 220 pF | B37940K5221J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 270 pF | B37940K5271J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 330 pF | B37940K5331J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 390 pF | B37940K5391J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 470 pF | B37940K5471J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |

1) The table contains the ordering codes for the standard capacitance tolerance.
For other available capacitance tolerances see page 4.


Ordering codes and packing for C0G, 50 VDC, nickel barrier terminations
Case size 0805, 50 VDC

| C _R | Ordering code ¹⁾ | Chip thickness mm | Cardboard tape, Ø 180-mm reel | Cardboard tape, Ø 330-mm reel | Bulk case |
|----------------|-----------------------------|----------------------|----------------------------------|----------------------------------|--------------------|
| | | | ** \triangleq 60 | ** \triangleq 70 | ** \triangleq 01 |
| | | | pcs/reel | pcs/reel | pcs |
| 560 pF | B37940K5561J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 680 pF | B37940K5681J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 820 pF | B37940K5821J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 1.0 nF | B37940K5102J0** | 0.6 \pm 0.1 | 5000 | 20000 | 10000 |
| 1.2 nF | B37940K5122J0** | 0.8 \pm 0.1 | 4000 | 16000 | — |
| 1.5 nF | B37940K5152J0** | 0.8 \pm 0.1 | 4000 | 16000 | — |
| 1.8 nF | B37940K5182J0** | 1.2 \pm 0.1 | 3000 ²⁾ | 12000 ³⁾ | — |
| 2.2 nF | B37940K5222J0** | 1.2 \pm 0.1 | 3000 ²⁾ | 12000 ³⁾ | — |

1) The table contains the ordering codes for the standard capacitance tolerance.

For other available capacitance tolerances see page 4.

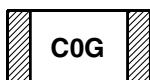
2) Blister tape, 180-mm reel, ordering code ** \triangleq 62

3) Blister tape, 330-mm reel, ordering code ** \triangleq 72

Ordering codes and packing for C0G, 100 VDC, nickel barrier terminations
Case size 0805, 100 VDC

| C _R | Ordering code ¹⁾ | Chip thickness mm | Cardboard tape, Ø 180-mm reel | Cardboard tape, Ø 330-mm reel |
|----------------|-----------------------------|----------------------|----------------------------------|----------------------------------|
| | | | ** \triangle 60 | ** \triangle 70 |
| | | | pcs/reel | pcs/reel |
| 1.0 pF | B37940K1010C0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 1.2 pF | B37940K1010C2** | 0.6 \pm 0.1 | 5000 | 20000 |
| 1.5 pF | B37940K1010C5** | 0.6 \pm 0.1 | 5000 | 20000 |
| 1.8 pF | B37940K1010C8** | 0.6 \pm 0.1 | 5000 | 20000 |
| 2.2 pF | B37940K1020C2** | 0.6 \pm 0.1 | 5000 | 20000 |
| 2.7 pF | B37940K1020C7** | 0.6 \pm 0.1 | 5000 | 20000 |
| 3.3 pF | B37940K1030C3** | 0.6 \pm 0.1 | 5000 | 20000 |
| 3.9 pF | B37940K1030C9** | 0.6 \pm 0.1 | 5000 | 20000 |
| 4.7 pF | B37940K1040C7** | 0.6 \pm 0.1 | 5000 | 20000 |
| 5.6 pF | B37940K1050D6** | 0.6 \pm 0.1 | 5000 | 20000 |
| 6.8 pF | B37940K1060D8** | 0.6 \pm 0.1 | 5000 | 20000 |
| 8.2 pF | B37940K1080D2** | 0.6 \pm 0.1 | 5000 | 20000 |
| 10 pF | B37940K1100J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 12 pF | B37940K1120J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 15 pF | B37940K1150J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 18 pF | B37940K1180J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 22 pF | B37940K1220J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 27 pF | B37940K1270J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 33 pF | B37940K1330J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 39 pF | B37940K1390J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 47 pF | B37940K1470J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 56 pF | B37940K1560J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 68 pF | B37940K1680J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 82 pF | B37940K1820J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 100 pF | B37940K1101J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 120 pF | B37940K1121J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 150 pF | B37940K1151J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 180 pF | B37940K1181J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 220 pF | B37940K1221J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 270 pF | B37940K1271J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 330 pF | B37940K1331J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 390 pF | B37940K1391J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 470 pF | B37940K1471J0** | 0.6 \pm 0.1 | 5000 | 20000 |

1) The table contains the ordering codes for the standard capacitance tolerance.
For other available capacitance tolerances see page 4.



Multilayer ceramic capacitors

C0G; 0805

Ordering codes and packing for C0G, 100 VDC, nickel barrier terminations

Case size 0805, 100 VDC

| C _R | Ordering code ¹⁾ | Chip thickness mm | Cardboard tape, Ø 180-mm reel | Cardboard tape, Ø 330-mm reel |
|----------------|-----------------------------|----------------------|----------------------------------|----------------------------------|
| | | | ** \triangleq 60 | ** \triangleq 70 |
| | | | pcs/reel | pcs/reel |
| 560 pF | B37940K1561J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 680 pF | B37940K1681J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 820 pF | B37940K1821J0** | 1.2 \pm 0.1 | 3000 ³⁾ | 12000 ⁴⁾ |
| 1.0 nF | B37940K1102J0** | 1.2 \pm 0.1 | 3000 ³⁾ | 12000 ⁴⁾ |

Ordering codes and packing for C0G, 200 VDC, nickel barrier terminations

Case size 0805, 200 VDC

| C _R ²⁾ | Ordering code ¹⁾ | Chip thickness mm | Cardboard tape, Ø 180-mm reel | Cardboard tape, Ø 330-mm reel |
|------------------------------|-----------------------------|----------------------|----------------------------------|----------------------------------|
| | | | ** \triangleq 60 | ** \triangleq 70 |
| | | | pcs/reel | pcs/reel |
| 2.2 pF | B37940K2020C2** | 0.6 \pm 0.1 | 5000 | 20000 |
| 3.3 pF | B37940K2030C3** | 0.6 \pm 0.1 | 5000 | 20000 |
| 4.7 pF | B37940K2040C7** | 0.6 \pm 0.1 | 5000 | 20000 |
| 6.8 pF | B37940K2060D8** | 0.6 \pm 0.1 | 5000 | 20000 |
| 10 pF | B37940K2100J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 15 pF | B37940K2150J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 22 pF | B37940K2220J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 33 pF | B37940K2330J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 47 pF | B37940K2470J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 68 pF | B37940K2680J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 100 pF | B37940K2101J0** | 0.6 \pm 0.1 | 5000 | 20000 |
| 150 pF | B37940K2151J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 220 pF | B37940K2221J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 330 pF | B37940K2331J0** | 1.2 \pm 0.1 | 3000 ³⁾ | 12000 ⁴⁾ |

1) Other capacitance values on request.

2) The table contains the ordering codes for the standard capacitance tolerance.

For other available capacitance tolerances see page 4.

3) Blister tape, 180-mm reel, ordering code ** \triangleq 62

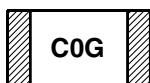
4) Blister tape, 330-mm reel, ordering code ** \triangleq 72

Ordering codes and packing for C0G, 50 VDC, nickel barrier terminations

Case size 1206, 50 VDC

| C _R | Ordering code ¹⁾ | Chip thickness mm | Cardboard tape, Ø 180-mm reel | Cardboard tape, Ø 330-mm reel |
|----------------|-----------------------------|----------------------|----------------------------------|----------------------------------|
| | | | ** Δ 60 | ** Δ 70 |
| | | | pcs/reel | pcs/reel |
| 1.0 pF | B37871K5010C0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 1.2 pF | B37871K5010C2** | 0.8 \pm 0.1 | 4000 | 16000 |
| 1.5 pF | B37871K5010C5** | 0.8 \pm 0.1 | 4000 | 16000 |
| 1.8 pF | B37871K5010C8** | 0.8 \pm 0.1 | 4000 | 16000 |
| 2.2 pF | B37871K5020C2** | 0.8 \pm 0.1 | 4000 | 16000 |
| 2.7 pF | B37871K5020C7** | 0.8 \pm 0.1 | 4000 | 16000 |
| 3.3 pF | B37871K5030C3** | 0.8 \pm 0.1 | 4000 | 16000 |
| 3.9 pF | B37871K5030C9** | 0.8 \pm 0.1 | 4000 | 16000 |
| 4.7 pF | B37871K5040C7** | 0.8 \pm 0.1 | 4000 | 16000 |
| 5.6 pF | B37871K5050D6** | 0.8 \pm 0.1 | 4000 | 16000 |
| 6.8 pF | B37871K5060D8** | 0.8 \pm 0.1 | 4000 | 16000 |
| 8.2 pF | B37871K5080D2** | 0.8 \pm 0.1 | 4000 | 16000 |
| 10 pF | B37871K5100J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 12 pF | B37871K5120J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 15 pF | B37871K5150J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 18 pF | B37871K5180J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 22 pF | B37871K5220J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 27 pF | B37871K5270J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 33 pF | B37871K5330J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 39 pF | B37871K5390J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 47 pF | B37871K5470J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 56 pF | B37871K5560J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 68 pF | B37871K5680J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 82 pF | B37871K5820J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 100 pF | B37871K5101J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 120 pF | B37871K5121J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 150 pF | B37871K5151J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 180 pF | B37871K5181J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 220 pF | B37871K5221J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 270 pF | B37871K5271J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 330 pF | B37871K5331J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 390 pF | B37871K5391J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 470 pF | B37871K5471J0** | 0.8 \pm 0.1 | 4000 | 16000 |

1) The table contains the ordering codes for the standard capacitance tolerance.
For other available capacitance tolerances see page 4.


Ordering codes and packing for C0G, 50 VDC, nickel barrier terminations
Case size 1206, 50 VDC

| C _R | Ordering code ¹⁾ | Chip thickness mm | Cardboard tape, Ø 180-mm reel | Cardboard tape, Ø 330-mm reel |
|----------------|-----------------------------|----------------------|----------------------------------|----------------------------------|
| | | | ** \triangleq 60 | ** \triangleq 70 |
| | | | pcs/reel | pcs/reel |
| 560 pF | B37871K5561J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 680 pF | B37871K5681J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 820 pF | B37871K5821J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 1.0 nF | B37871K5102J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 1.2 nF | B37871K5122J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 1.5 nF | B37871K5152J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 1.8 nF | B37871K5182J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 2.2 nF | B37871K5222J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 2.7 nF | B37871K5272J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 3.3 nF | B37871K5332J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 3.9 nF | B37871K5392J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 4.7 nF | B37871K5472J0** | 1.2 \pm 0.1 | 3000 ²⁾ | 12000 ³⁾ |
| 5.6 nF | B37871K5562J0** | 1.2 \pm 0.1 | 3000 ²⁾ | 12000 ³⁾ |

1) The table contains the ordering codes for the standard capacitance tolerance.
For other available capacitance tolerances see page 4.

2) Blister tape, 180-mm reel, ordering code ** \triangleq 62
3) Blister tape, 330-mm reel, ordering code ** \triangleq 72

Ordering codes and packing for C0G, 100 VDC, nickel barrier terminations

Case size 1206, 100 VDC

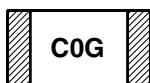
| C _R | Ordering code ¹⁾ | Chip thickness mm | Cardboard tape, Ø 180-mm reel | Cardboard tape, Ø 330-mm reel |
|----------------|-----------------------------|----------------------|----------------------------------|----------------------------------|
| | | | ** \triangleq 60 | ** \triangleq 70 |
| | | | pcs/reel | pcs/reel |
| 1.0 pF | B37871K1010C0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 1.5 pF | B37871K1010C5** | 0.8 \pm 0.1 | 4000 | 16000 |
| 2.2 pF | B37871K1020C2** | 0.8 \pm 0.1 | 4000 | 16000 |
| 3.3 pF | B37871K1030C3** | 0.8 \pm 0.1 | 4000 | 16000 |
| 4.7 pF | B37871K1040C7** | 0.8 \pm 0.1 | 4000 | 16000 |
| 6.8 pF | B37871K1060D8** | 0.8 \pm 0.1 | 4000 | 16000 |
| 10 pF | B37871K1100J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 15 pF | B37871K1150J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 22 pF | B37871K1220J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 33 pF | B37871K1330J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 47 pF | B37871K1470J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 68 pF | B37871K1680J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 100 pF | B37871K1101J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 150 pF | B37871K1151J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 220 pF | B37871K1221J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 330 pF | B37871K1331J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 470 pF | B37871K1471J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 680 pF | B37871K1681J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 1.0 nF | B37871K1102J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 1.5 nF | B37871K1152J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 2.2 nF | B37871K1222J0** | 1.2 \pm 0.1 | 3000 ²⁾ | 12000 ³⁾ |

1) The table contains the ordering codes for the standard capacitance tolerance.

For other available capacitance tolerances see page 4.

2) Blister tape, 180-mm reel, ordering code ** \triangleq 62

3) Blister tape, 330-mm reel, ordering code ** \triangleq 72



Multilayer ceramic capacitors
C0G; 1210

Ordering codes and packing for C0G, 50 VDC, nickel barrier terminations

Case size 1210, 50 VDC

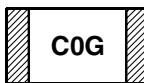
| C _R | Ordering code ¹⁾ | Chip thickness mm | Blister tape, Ø 180-mm reel | Blister tape, Ø 330-mm reel |
|----------------|-----------------------------|----------------------|--------------------------------|--------------------------------|
| | | | ** \triangleq 62 | ** \triangleq 72 |
| | | | pcs/reel | pcs/reel |
| 1.0 nF | B37949K5102J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 1.5 nF | B37949K5152J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 2.2 nF | B37949K5222J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 3.3 nF | B37949K5332J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 4.7 nF | B37949K5472J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 6.8 nF | B37949K5682J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 10 nF | B37949K5103J0** | 1.2 \pm 0.1 | 3000 | 12000 |

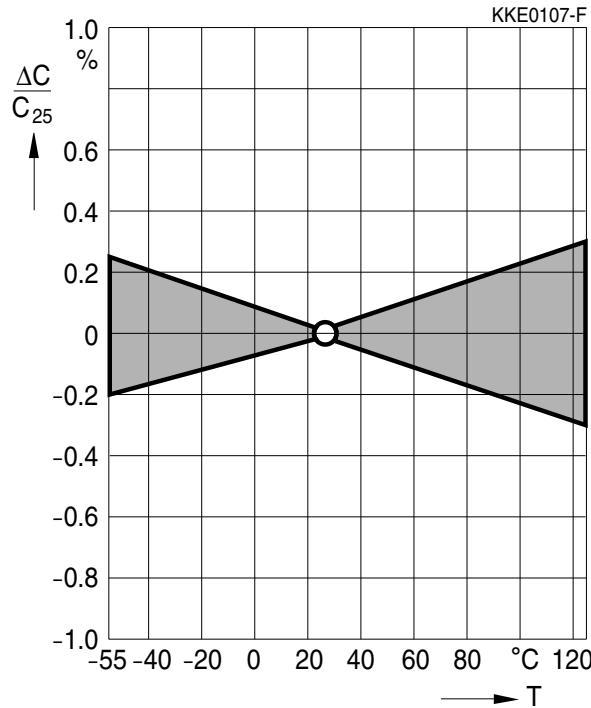
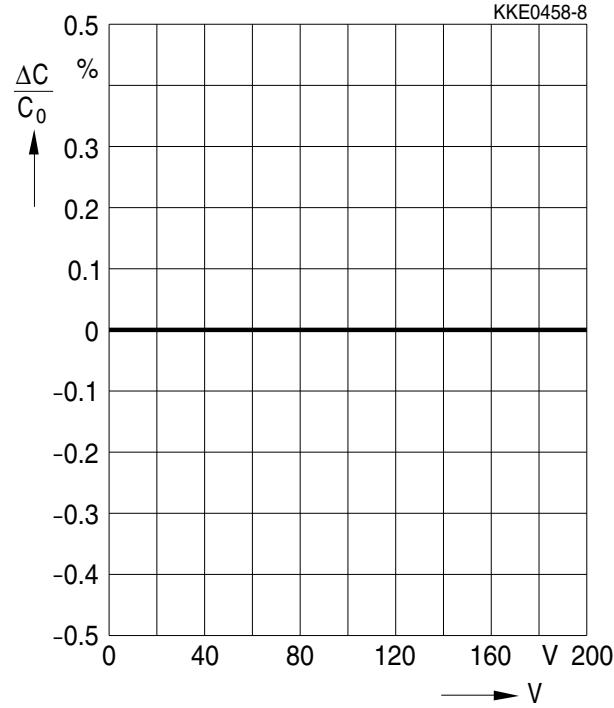
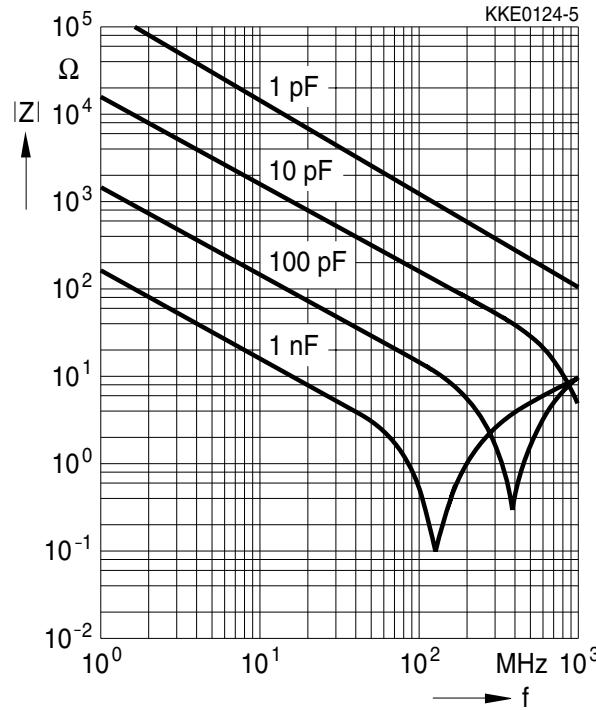
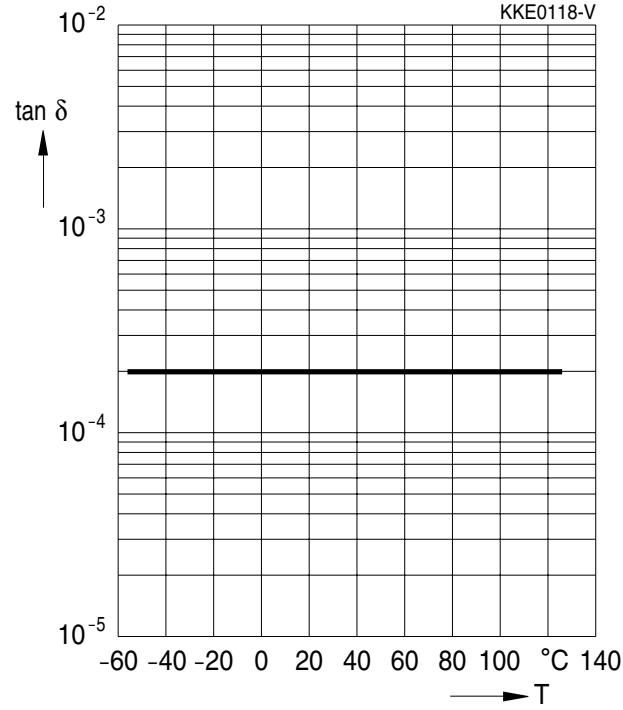
Ordering codes and packing for C0G, 100 VDC, nickel barrier terminations

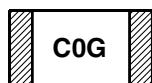
Case size 1210, 100 VDC

| C _R | Ordering code ¹⁾ | Chip thickness mm | Blister tape, Ø 180-mm reel | Blister tape, Ø 330-mm reel |
|----------------|-----------------------------|----------------------|--------------------------------|--------------------------------|
| | | | ** \triangleq 62 | ** \triangleq 72 |
| | | | pcs/reel | pcs/reel |
| 1.0 nF | B37949K1102J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 1.5 nF | B37949K1152J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 2.2 nF | B37949K1222J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 3.3 nF | B37949K1332J0** | 0.8 \pm 0.1 | 4000 | 16000 |
| 4.7 nF | B37949K1472J0** | 1.2 \pm 0.1 | 3000 | 12000 |
| 6.8 nF | B37949K1682J0** | 1.2 \pm 0.1 | 3000 | 12000 |

1) The table contains the ordering codes for the standard capacitance tolerance.
For other available capacitance tolerances see page 4.

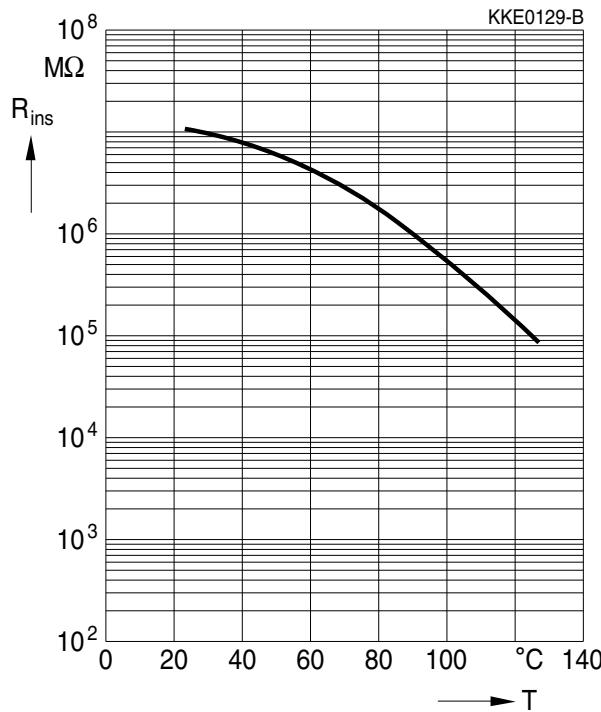

Typical characteristics¹⁾

 Capacitance change $\Delta C/C_{25}$ versus
temperature T (tolerance range )

 Capacitance change $\Delta C/C_0$ versus
superimposed DC voltage V

 Impedance $|Z|$ versus
frequency f

 Dissipation factor $\tan \delta$ versus
temperature T

¹⁾ For more detailed information on frequency behavior and characteristics see www.epcos.com/mlcc_impedance.

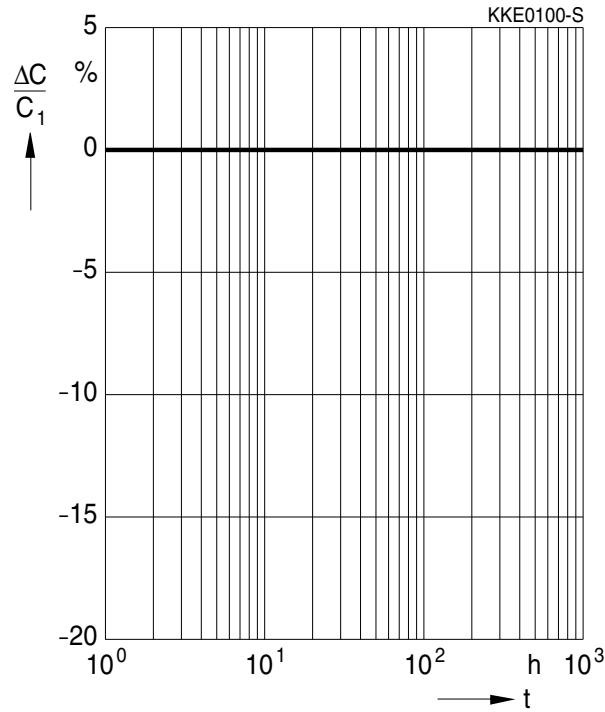


Typical characteristics¹⁾

Insulation resistance R_{ins} versus temperature T



Capacitance change $\Delta C/C_1$ versus time t



1) For more detailed information on frequency behavior and characteristics see www.epcos.com/mlcc_impedance.

Multilayer ceramic capacitors

Cautions and warnings

Notes on the selection of ceramic capacitors

In the selection of ceramic capacitors, the following criteria must be considered:

1. Depending on the application, ceramic capacitors used to meet high quality requirements should at least satisfy the specifications to AEC-Q200. They must meet quality requirements going beyond this level in terms of ruggedness (e.g. mechanical, thermal or electrical) in the case of critical circuit configurations and applications (e.g. in safety-relevant applications such as ABS and airbag equipment or durable industrial goods).
2. At the connection to the battery or power supply (e.g. clamp 15 or 30 in the automobile) and at positions with stranding potential, to reduce the probability of short circuits following a fracture, two ceramic capacitors must be connected in series and/or a ceramic capacitor with integrated series circuit should be used. The MLSC from EPCOS contains such a series circuit in a single component.
3. Ceramic capacitors with the temperature characteristics Z5U and Y5V do not satisfy the requirements to AEC-Q200 and are mechanically and electrically less rugged than C0G or X7R/X8R ceramic capacitors. In applications that must satisfy high quality requirements, therefore, these capacitors should not be used as discrete components (see the chapter "Effects on mechanical, thermal and electrical stress", point 1.4).
4. For ESD protection, preference should be given to the use of multilayer varistors (MLV) (see the chapter "Effects on mechanical, thermal and electrical stress", point 1.4).
5. An application-specific derating or continuous operating voltage must be considered in order to cushion (unexpected) additional stresses (see the chapter "Reliability").

The following should be considered in circuit board design

1. If technically feasible in the application, preference should be given to components having an optimal geometrical design.
2. At least FR4 circuit board material should be used.
3. Geometrically optimal circuit boards should be used, ideally those that cannot be deformed.
4. Ceramic capacitors must always be placed a sufficient minimum distance from the edge of the circuit board. High bending forces may be exerted there when the panels are separated and during further processing of the board (such as when incorporating it into a housing).
5. Ceramic capacitors should always be placed parallel to the possible bending axis of the circuit board.
6. No screw connections should be used to fix the board or to connect several boards. Components should not be placed near screw holes. If screw connections are unavoidable, they must be cushioned (for instance by rubber pads).

Multilayer ceramic capacitors

Cautions and warnings

The following should be considered in the placement process

1. Ensure correct positioning of the ceramic capacitor on the solder pad.
2. Caution when using casting, injection-molded and molding compounds and cleaning agents, as these may damage the capacitor.
3. Support the circuit board and reduce the placement forces.
4. A board should not be straightened (manually) if it has been distorted by soldering.
5. Separate panels with a peripheral saw, or better with a milling head (no dicing or breaking).
6. Caution in the subsequent placement of heavy or leaded components (e.g. transformers or snap-in components): danger of bending and fracture.
7. When testing, transporting, packing or incorporating the board, avoid any deformation of the board not to damage the components.
8. Avoid the use of excessive force when plugging a connector into a device soldered onto the board.
9. Ceramic capacitors must be soldered only by the mode (reflow or wave soldering) permissible for them (see the chapter "Soldering directions").
10. When soldering the most gentle solder profile feasible should be selected (heating time, peak temperature, cooling time) in order to avoid thermal stresses and damage.
11. Ensure the correct solder meniscus height and solder quantity.
12. Ensure correct dosing of the cement quantity.
13. Ceramic capacitors with an AgPd external termination are not suited for the lead-free solder process: they were developed only for conductive adhesion technology.

This listing does not claim to be complete, but merely reflects the experience of EPCOS AG.

Multilayer ceramic capacitors

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