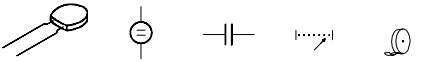
## Ordering code system



**B37979N 1 100 K 0 54**

**Packaging**

51 ≙ cardboard tape, reel packing (360-mm reel)
**54 ≙ Ammo packing (standard)**
00 ≙ bulk

**Internal coding**

**Capacitance tolerance**

J ≙ ± 5 %
**K ≙ ± 10 % (standard for C0G)**
**M ≙ ± 20 % (standard for X7R and Z5U (Y5U))**

**Capacitance**, coded (example)
101 ≙ 10 · $10^1$ pF = 100 pF
222 ≙ 22 · $10^2$ pF = 2,2 nF
473 ≙ 47 · $10^3$ pF = 47 nF

**Rated voltage**

| Rated voltage [VDC] | 50 | 100 |
|---|---|---|
| Code | 5 | 1 |

| **Type and size** | | | |
|---|---|---|---|
| With radial leads<br>EIA standard | Temperature characteristic<br>C0G | X7R | Z5U (Y5U) |
| Lead spacing 2,5 mm | | | |
| 5,5 × 5,0 × 2,5 | B37979N | B37981M | B37982N |
| 6,5 × 5,0 × 2,5 | B37986N | B37987M | B37988N |
| Lead spacing 5,0 mm | | | |
| 5,5 × 5,0 × 2,5 | B37979G | B37981F | B37982G |
| 6,5 × 5,0 × 2,5 | B37986G | B37987F | B37988G |
| 9,0 × 7,5 × 2,5 | — | B37984M | B37985N |

### Features

- High volumetric efficiency
- Non-linear capacitance change
- High insulation resistance
- High pulse strength

### Applications

- Blocking
- Coupling and decoupling
- Interference suppression

### Termination

- Parallel wire leads, iron-nickel, tinned
- Crimped leads
- Non-standard lead lengths on request

### Marking

- Rated capacitance, tolerance, manufacturer's logo, ceramic material, voltage

### Delivery mode

- Cardboard tape in Ammo packing (standard)
- Cardboard tape on 360-mm reel or bulk on request

### Electrical data

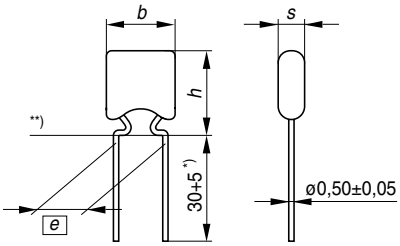
| | | | |
|---|---|---|---|
| Temperature characteristic | | X7R | |
| Climatic category (IEC 60068-1) | | 55/125/56 | |
| Standard | | EIA | |
| Dielectric | | Class 2 | |
| Rated voltage[1)] | $V_R$ | 50, 100 | VDC |
| Test voltage | $V_{test}$ | $2{,}5 \cdot V_R$/5 s | VDC |
| Capacitance range / E series | $C_R$ | 470 pF … 1 µF (E12/E6) | |
| Max. relative capacitance change | $\Delta C/C$ | ±15 | % |
| Dissipation factor (limit value) | tan $\delta$ | $< 25 \cdot 10^{-3}$ | |
| Insulation resistance[2)] at + 25 °C | $R_{ins}$ | $> 10^5$ | MΩ |
| Insulation resistance[2)] at +125 °C | $R_{ins}$ | $> 10^4$ | MΩ |
| Time constant[2)] at + 25 °C | $\tau$ | > 1000 | s |
| Time constant[2)] at +125 °C | $\tau$ | > 100 | s |
| Operating temperature range | $T_{op}$ | −55 … +125 | °C |
| Ageing[3)] | | yes | |

1) Note: No operation on AC line.
2) For $C_R$ > 10 nF the time constant $\tau = C \cdot R_{ins}$ is given.
3) Refer to chapter "General Technical Information", page 197.

### Capacitance tolerances

| Code letter | K | M (standard) |
|---|---|---|
| Tolerance | ±10% | ±20% |

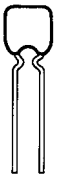
### Dimensional drawing

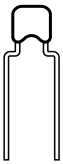
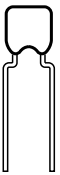



*) Lead length for bulk packaging
**) Seating plane in acc. with IEC 600717

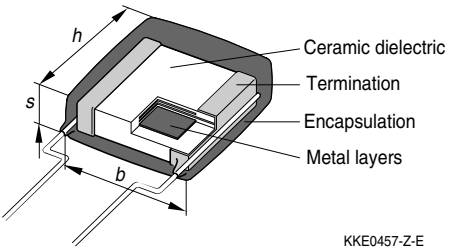
KKE0456-R-E

### Dimensions (mm)

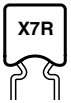
| | Lead spacing e = 2,5 +0,6/−0,1 mm | |
|---|---|---|
| Type | B37981M | B37987M |
| |  |  |
| $h_{max}$ | 5,5 | 6,5 |
| $b_{max}$ | 5,0 | 5,0 |
| $s_{max}$ | 2,5 | 2,5 |

| | Lead spacing e = 5,0 +0,6/−0,1 mm | | |
|---|---|---|---|
| Type | B37981F | B37987F | B37984M |
| |  |  |  |
| $h_{max}$ | 5,5 | 6,5 | 9,0 |
| $b_{max}$ | 5,0 | 5,0 | 7,5 |
| $s_{max}$ | 2,5 | 2,5 | 2,5 |

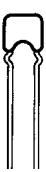
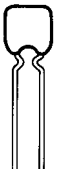
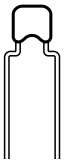
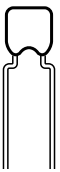
### Termination



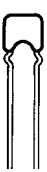
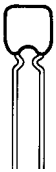
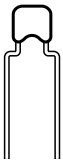
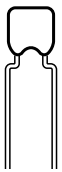
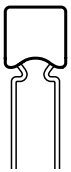

KKE0457-Z-E

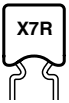



**Product range leaded capacitors**

| | X7R | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Lead spacing | 2,5 mm | | | | 5,0 mm | | | | | |
| |  | |  | |  | |  | |  | |
| $h \times b \times s$ (mm) | 5,5 × 5,0 × 2,5 | | 6,5 × 5,0 × 2,5 | | 5,5 × 5,0 × 2,5 | | 6,5 × 5,0 × 2,5 | | 9,0 × 7,5 × 2,5 | |
| Type | B37981M | | B37987M | | B37981F | | B37987F | | B37984M | |
| $C_R$ \ $V_R$ (VDC) | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | |
| 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 | ■ | ■ | | | ■ | ■ | | | | |
| 12 nF | ■ | ■ | | | ■ | ■ | | | | |
| 15 nF | ■ | ■ | | | ■ | ■ | | | | |
| 18 nF | ■ | | | ■ | ■ | | | ■ | | |
| 22 nF | ■ | | | ■ | ■ | | | ■ | | |

**Product range leaded capacitors**

| | X7R | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Lead spacing | 2,5 mm | | | | 5,0 mm | | | | | |
| |  | |  | |  | |  | |  | |
| $h \times b \times s$ (mm) | 5,5 × 5,0 × 2,5 | | 6,5 × 5,0 × 2,5 | | 5,5 × 5,0 × 2,5 | | 6,5 × 5,0 × 2,5 | | 9,0 × 7,5 × 2,5 | |
| Type | B37981M | | B37987M | | B37981F | | B37987F | | B37984M | |
| $C_R$ \ $V_R$ (VDC) | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | |
| 27 nF | | | | ■ | ■ | | | ■ | | |
| 33 nF | ■ | | | ■ | ■ | | | ■ | | |
| 39 nF | | | | ■ | ■ | | | ■ | | |
| 47 nF | ■ | | | ■ | ■ | | | ■ | | |
| 56 nF | | | | ■ | | | ■ | ■ | | |
| 68 nF | | | ■ | ■ | | | ■ | ■ | | |
| 82 nF | | | ■ | ■ | | | ■ | ■ | | |
| 100 nF | | | ■ | ■ | | | ■ | ■ | | |
| 120 nF | | | | ■ | | | ■ | ■ | | |
| 150 nF | | | ■ | ■ | | | ■ | ■ | | |
| 180 nF | | | ■ | | | | ■ | | | |
| 220 nF | | | ■ | | | | ■ | | | |
| 270 nF | | | | | | | | | ■ | |
| 330 nF | | | | | | | | | ■ | |
| 390 nF | | | | | | | | | ■ | |
| 470 nF | | | | | | | | | ■ | |
| 560 nF | | | | | | | | | ■ | |
| 680 nF | | | | | | | | | ■ | |
| 820 nF | | | | | | | | | ■ | |
| 1,0 µF | | | | | | | | | ■ | |




**Ordering codes and packing for X7R, 50 VDC, lead spacing 2,5 mm**

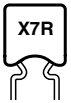
| $C_R$ | Ordering code[1)] | Ammo packing<br>** ≙ 54<br>pcs | Reel packing<br>** ≙ 51<br>pcs/reel | Bulk<br>** ≙ 00<br>pcs |
|---|---|---|---|---|
| **B37981, 50 VDC, 5,5 × 5,0 × 2,5 mm** | | | | |
| 3,3 nF | B37981M5332M0** | 2500 | 2500 | 2000 |
| 4,7 nF | B37981M5472M0** | 2500 | 2500 | 2000 |
| 5,6 nF | B37981M5562M0** | 2500 | 2500 | 2000 |
| 6,8 nF | B37981M5682M0** | 2500 | 2500 | 2000 |
| 10 nF | B37981M5103M0** | 2500 | 2500 | 2000 |
| 12 nF | B37981M5123M0** | 2500 | 2500 | 2000 |
| 15 nF | B37981M5153M0** | 2500 | 2500 | 2000 |
| 18 nF | B37981M5183M0** | 2500 | 2500 | 2000 |
| 22 nF | B37981M5223M0** | 2500 | 2500 | 2000 |
| 33 nF | B37981M5333M0** | 2500 | 2500 | 2000 |
| 47 nF | B37981M5473M0** | 2500 | 2500 | 2000 |
| **B37987, 50 VDC, 6,5 × 5,0 × 2,5 mm** | | | | |
| 68 nF | B37987M5683M0** | 2500 | 2500 | 2000 |
| 82 nF | B37987M5823M0** | 2500 | 2500 | 2000 |
| 100 nF | B37987M5104M0** | 2500 | 2500 | 2000 |
| 150 nF | B37987M5154M0** | 2500 | 2500 | 2000 |
| 180 nF | B37987M5184M0** | 2500 | 2500 | 2000 |
| 220 nF | B37987M5224M0** | 2500 | 2500 | 2000 |

1) The table contains the ordering codes for the standard capacitance tolerance.
For other available capacitance tolerances see page 164.

**Ordering codes and packing for X7R, 50 VDC, lead spacing 5,0 mm**

| | | Ammo packing | Reel packing | Bulk |
|---|---|---|---|---|
| | | ** ≙ 54 | ** ≙ 51 | ** ≙ 00 |
| $C_R$ | Ordering code[1)] | pcs | pcs/reel | pcs |
| **B37981, 50 VDC, 5,5 × 5,0 × 2,5 mm** | | | | |
| 3,3 nF | B37981F5332M0** | 2500 | 2500 | 2000 |
| 3,9 nF | B37981F5392M0** | 2500 | 2500 | 2000 |
| 4,7 nF | B37981F5472M0** | 2500 | 2500 | 2000 |
| 5,6 nF | B37981F5562M0** | 2500 | 2500 | 2000 |
| 6,8 nF | B37981F5682M0** | 2500 | 2500 | 2000 |
| 8,2 nF | B37981F5822M0** | 2500 | 2500 | 2000 |
| 10 nF | B37981F5103M0** | 2500 | 2500 | 2000 |
| 12 nF | B37981F5123M0** | 2500 | 2500 | 2000 |
| 15 nF | B37981F5153M0** | 2500 | 2500 | 2000 |
| 18 nF | B37981F5183M0** | 2500 | 2500 | 2000 |
| 22 nF | B37981F5223M0** | 2500 | 2500 | 2000 |
| 27 nF | B37981F5273M0** | 2500 | 2500 | 2000 |
| 33 nF | B37981F5333M0** | 2500 | 2500 | 2000 |
| 39 nF | B37981F5393M0** | 2500 | 2500 | 2000 |
| 47 nF | B37981F5473M0** | 2500 | 2500 | 2000 |
| **B37987, 50 VDC, 6,5 × 5,0 × 2,5 mm** | | | | |
| 56 nF | B37987F5563M0** | 2500 | 2500 | 2000 |
| 68 nF | B37987F5683M0** | 2500 | 2500 | 2000 |
| 82 nF | B37987F5823M0** | 2500 | 2500 | 2000 |
| 100 nF | B37987F5104M0** | 2500 | 2500 | 2000 |
| 120 nF | B37987F5124M0** | 2500 | 2500 | 2000 |
| 150 nF | B37987F5154M0** | 2500 | 2500 | 2000 |
| 180 nF | B37987F5184M0** | 2500 | 2500 | 2000 |
| 220 nF | B37987F5224M0** | 2500 | 2500 | 2000 |
| **B37984, 50 VDC, 9,0 × 7,5 × 2,5 mm** | | | | |
| 270 nF | B37984M5274M0** | 2000 | 2000 | 2000 |
| 330 nF | B37984M5334M0** | 2000 | 2000 | 2000 |
| 390 nF | B37984M5394M0** | 2000 | 2000 | 2000 |
| 470 nF | B37984M5474M0** | 2000 | 2000 | 2000 |
| 560 nF | B37984M5564M0** | 2000 | 2000 | 2000 |
| 680 nF | B37984M5684M0** | 2000 | 2000 | 2000 |
| 820 nF | B37984M5824M0** | 2000 | 2000 | 2000 |
| 1,0 µF | B37984M5105M0** | 2000 | 2000 | 2000 |

1) The table contains the ordering codes for the standard capacitance tolerance.
For other available capacitance tolerances see page 164.




**Ordering codes and packing for X7R, 100 VDC, lead spacing 2,5 mm**

| $C_R$ | Ordering code[1)] | Ammo packing<br>** ≙ 54<br>pcs | Reel packing<br>** ≙ 51<br>pcs/reel | Bulk<br>** ≙ 00<br>pcs |
|---|---|---|---|---|
| **B37981, 100 VDC, 5,5 × 5,0 × 2,5 mm** | | | | |
| 470 pF | B37981M1471M0** | 2500 | 2500 | 2000 |
| 680 pF | B37981M1681M0** | 2500 | 2500 | 2000 |
| 820 pF | B37981M1821M0** | 2500 | 2500 | 2000 |
| 1,0 nF | B37981M1102M0** | 2500 | 2500 | 2000 |
| 1,2 nF | B37981M1122M0** | 2500 | 2500 | 2000 |
| 1,5 nF | B37981M1152M0** | 2500 | 2500 | 2000 |
| 1,8 nF | B37981M1182M0** | 2500 | 2500 | 2000 |
| 2,2 nF | B37981M1222M0** | 2500 | 2500 | 2000 |
| 2,7 nF | B37981M1272M0** | 2500 | 2500 | 2000 |
| 3,3 nF | B37981M1332M0** | 2500 | 2500 | 2000 |
| 3,9 nF | B37981M1392M0** | 2500 | 2500 | 2000 |
| 4,7 nF | B37981M1472M0** | 2500 | 2500 | 2000 |
| 5,6 nF | B37981M1562M0** | 2500 | 2500 | 2000 |
| 6,8 nF | B37981M1682M0** | 2500 | 2500 | 2000 |
| 8,2 nF | B37981M1822M0** | 2500 | 2500 | 2000 |
| 10 nF | B37981M1103M0** | 2500 | 2500 | 2000 |
| 12 nF | B37981M1123M0** | 2500 | 2500 | 2000 |
| 15 nF | B37981M1153M0** | 2500 | 2500 | 2000 |
| **B37987, 100 VDC, 6,5 × 5,0 × 2,5 mm** | | | | |
| 18 nF | B37987M1183M0** | 2500 | 2500 | 2000 |
| 22 nF | B37987M1223M0** | 2500 | 2500 | 2000 |
| 27 nF | B37987M1273M0** | 2500 | 2500 | 2000 |
| 33 nF | B37987M1333M0** | 2500 | 2500 | 2000 |
| 39 nF | B37987M1393M0** | 2500 | 2500 | 2000 |
| 47 nF | B37987M1473M0** | 2500 | 2500 | 2000 |
| 56 nF | B37987M1563M0** | 2500 | 2500 | 2000 |
| 68 nF | B37987M1683M0** | 2500 | 2500 | 2000 |
| 82 nF | B37987M1823M0** | 2500 | 2500 | 2000 |
| 100 nF | B37987M1104M0** | 2500 | 2500 | 2000 |
| 120 nF | B37987M1124M0** | 2500 | 2500 | 2000 |
| 150 nF | B37987M1154M0** | 2500 | 2500 | 2000 |

1) The table contains the ordering codes for the standard capacitance tolerance.
For other available capacitance tolerances see page 164.

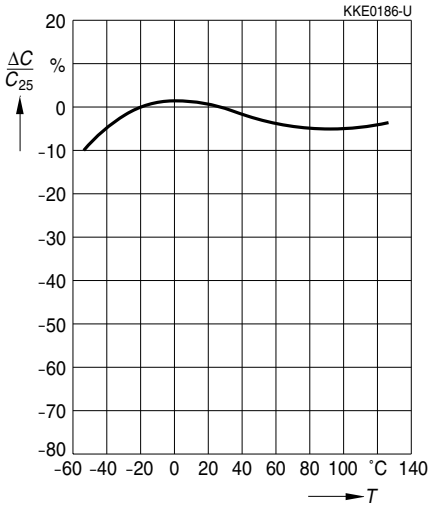
**Ordering codes and packing for X7R, 100 VDC, lead spacing 5,0 mm**

| $C_R$ | Ordering code[1)] | Ammo packing ** ≙ 54 pcs/reel | Reel packing ** ≙ 51 pcs | Bulk ** ≙ 00 pcs |
|---|---|---|---|---|
| **B37981, 100 VDC, 5,5 × 5,0 × 2,5 mm** | | | | |
| 470 pF | B37981F1471M0** | 2500 | 2500 | 2000 |
| 560 pF | B37981F1561M0** | 2500 | 2500 | 2000 |
| 680 pF | B37981F1681M0** | 2500 | 2500 | 2000 |
| 820 pF | B37981F1821M0** | 2500 | 2500 | 2000 |
| 1,0 nF | B37981F1102M0** | 2500 | 2500 | 2000 |
| 1,2 nF | B37981F1122M0** | 2500 | 2500 | 2000 |
| 1,5 nF | B37981F1152M0** | 2500 | 2500 | 2000 |
| 1,8 nF | B37981F1182M0** | 2500 | 2500 | 2000 |
| 2,2 nF | B37981F1222M0** | 2500 | 2500 | 2000 |
| 2,7 nF | B37981F1272M0** | 2500 | 2500 | 2000 |
| 3,3 nF | B37981F1332M0** | 2500 | 2500 | 2000 |
| 3,9 nF | B37981F1392M0** | 2500 | 2500 | 2000 |
| 4,7 nF | B37981F1472M0** | 2500 | 2500 | 2000 |
| 5,6 nF | B37981F1562M0** | 2500 | 2500 | 2000 |
| 6,8 nF | B37981F1682M0** | 2500 | 2500 | 2000 |
| 8,2 nF | B37981F1822M0** | 2500 | 2500 | 2000 |
| 10 nF | B37981F1103M0** | 2500 | 2500 | 2000 |
| 12 nF | B37981F1123M0** | 2500 | 2500 | 2000 |
| 15 nF | B37981F1153M0** | 2500 | 2500 | 2000 |
| **B37987, 100 VDC, 6,5 × 5,0 × 2,5 mm** | | | | |
| 18 nF | B37987F1183M0** | 2500 | 2500 | 2000 |
| 22 nF | B37987F1223M0** | 2500 | 2500 | 2000 |
| 27 nF | B37987F1273M0** | 2500 | 2500 | 2000 |
| 33 nF | B37987F1333M0** | 2500 | 2500 | 2000 |
| 39 nF | B37987F1393M0** | 2500 | 2500 | 2000 |
| 47 nF | B37987F1473M0** | 2500 | 2500 | 2000 |
| 56 nF | B37987F1563M0** | 2500 | 2500 | 2000 |
| 68 nF | B37987F1683M0** | 2500 | 2500 | 2000 |
| 82 nF | B37987F1823M0** | 2500 | 2500 | 2000 |
| 100 nF | B37987F1104M0** | 2500 | 2500 | 2000 |
| 120 nF | B37987F1124M0** | 2500 | 2500 | 2000 |
| 150 nF | B37987F1154M0** | 2500 | 2500 | 2000 |

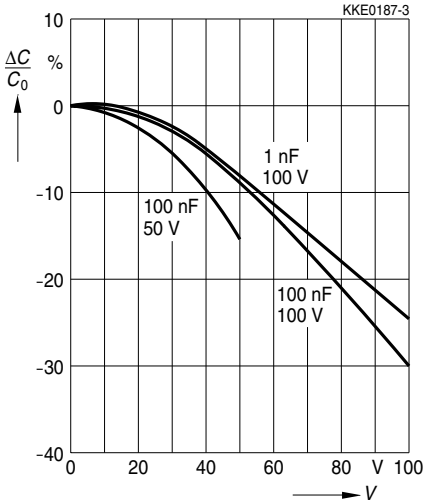
1) The table contains the ordering codes for the standard capacitance tolerance.
For other available capacitance tolerances see page 164.

### Typical characteristics

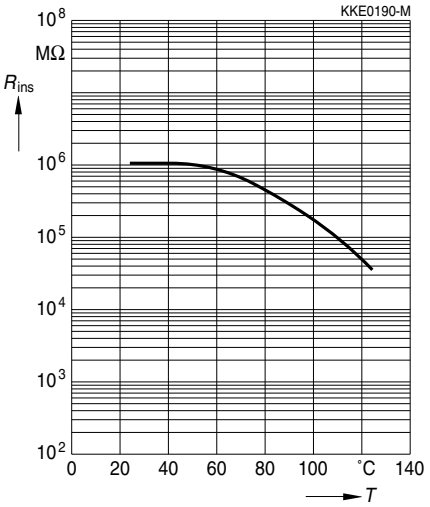
Capacitance change $\Delta C/C_{25}$ versus temperature $T$



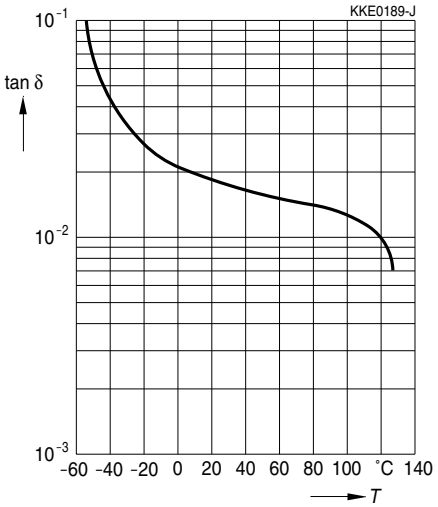

Capacitance change $\Delta C/C_0$ versus superimposed DC voltage $V$




Insulation resistance $R_{ins}$ versus temperature $T$

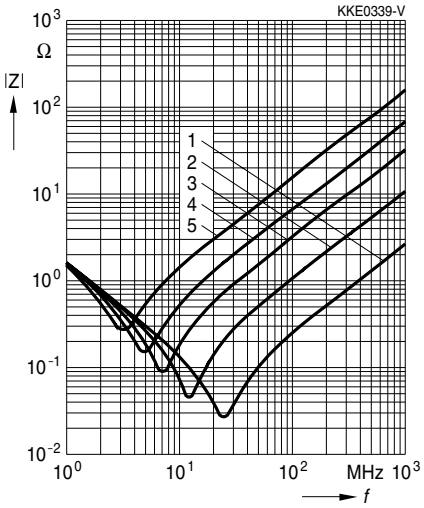



Dissipation factor tan $\delta$ versus temperature $T$

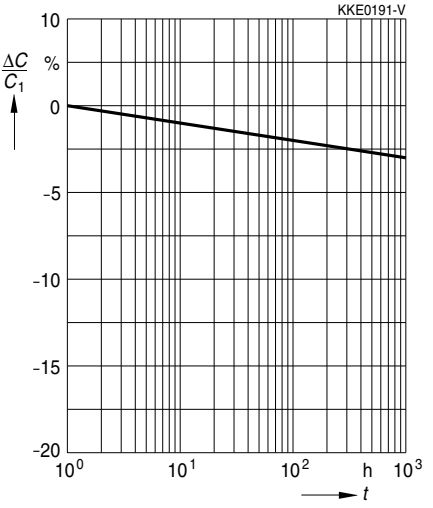


**Typical characteristics**

Impedance $|Z|$ versus frequency $f$




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




1: Chip
2: 1,5 mm lead length
3: 5,0 mm lead length
4: 10,0 mm lead length
5: 20,0 mm lead length

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