

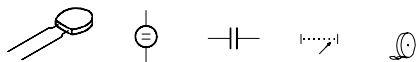


Multilayer Ceramic Capacitors

Leaded

C0G, X7R, Z5U (Y5U)

Ordering code system



B37979N 1 100 K 0 54

Packaging

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

Internal coding

Capacitance tolerance

J \triangleq \pm 5 %
 K \triangleq \pm 10 % (standard for C0G)
 M \triangleq \pm 20 % (standard for X7R and Z5U (Y5U))

Capacitance, coded 101 \triangleq $10 \cdot 10^1$ pF = 100 pF
 (example) 222 \triangleq $22 \cdot 10^2$ pF = 2,2 nF
 473 \triangleq $47 \cdot 10^3$ pF = 47 nF

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

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



Multilayer Ceramic Capacitors

Leaded

C0G

Features

- Good thermal stability
- High insulation resistance
- Low dissipation factor
- Low inductance



Applications

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

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		C0G	
Climatic category (IEC 60068-1)		55/125/56	
Standard		EIA	
Dielectric		Class 1	
Rated voltage	V_R	50, 100	VDC
Test voltage	V_{test}	$2,5 \cdot V_R/5$ s	VDC
Capacitance range / E series	C_R	10 pF ... 10 nF (E12)	
Temperature coefficient		$0 \pm 30 \cdot 10^{-6}/K$	
Dissipation factor (limit value)	$\tan \delta$	$< 1,0 \cdot 10^{-3}$	
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.



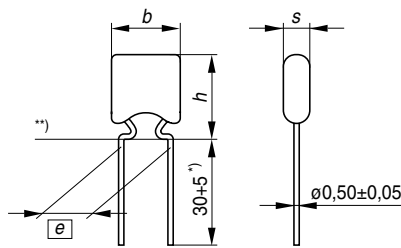
Multilayer Ceramic Capacitors

COG

Capacitance tolerances

Code letter	J	K (standard)
Tolerance	±5%	±10%

Dimensional drawing



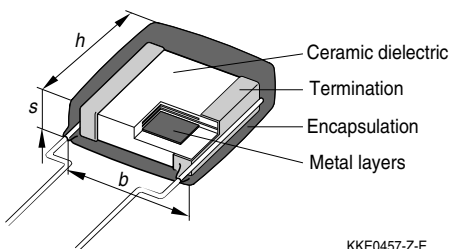
*) Lead length for bulk packaging KKE0456-R-E
 **) Seating plane in acc. with IEC 600717

Dimensions (mm)

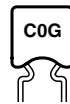
	Lead spacing [e] = 2,5 +0,6/-0,1 mm	
Type	B37979N	B37986N
h_{max}	5,5	6,5
b_{max}	5,0	5,0
s_{max}	2,5	2,5

	Lead spacing [e] = 5,0 +0,6/-0,1 mm	
Type	B37979G	B37986G
h_{max}	5,5	6,5
b_{max}	5,0	5,0
s_{max}	2,5	2,5

Termination



KKE0457-Z-E



Multilayer Ceramic Capacitors
COG

Product range leaded capacitors

		COG							
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	
Type		B37979N		B37986N		B37979G		B37986G	
V_R (VDC)		50		100		50		100	
C_R		50		100		50		100	
10 pF									
12 pF									
15 pF									
18 pF									
22 pF									
27 pF									
33 pF									
39 pF									
47 pF									
56 pF									
68 pF									
82 pF									
100 pF									
120 pF									
150 pF									
180 pF									
220 pF									
270 pF									
330 pF									
390 pF									
470 pF									
560 pF									
680 pF									
820 pF									

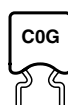


Multilayer Ceramic Capacitors

COG

Product range leaded capacitors

		COG							
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	
Type		B37979N		B37986N		B37979G		B37986G	
V_R (VDC)		50		100		50		100	
C_R		50		100		50		100	
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									



Multilayer Ceramic Capacitors

C0G

Ordering codes and packing for C0G, 50 VDC, lead spacing 2,5 mm

C _R	Ordering code ¹⁾	Ammo packing	Reel packing	Bulk
		** Δ 54	** Δ 51	** Δ 00
		pcs	pcs/reel	pcs

B37979, 50 VDC, 5,5 × 5,0 × 2,5 mm

100 pF	B37979N5101K0**	2500	2500	2000
120 pF	B37979N5121K0**	2500	2500	2000
150 pF	B37979N5151K0**	2500	2500	2000
180 pF	B37979N5181K0**	2500	2500	2000
220 pF	B37979N5221K0**	2500	2500	2000
270 pF	B37979N5271K0**	2500	2500	2000
330 pF	B37979N5331K0**	2500	2500	2000
390 pF	B37979N5391K0**	2500	2500	2000
470 pF	B37979N5471K0**	2500	2500	2000
560 pF	B37979N5561K0**	2500	2500	2000
680 pF	B37979N5681K0**	2500	2500	2000
820 pF	B37979N5821K0**	2500	2500	2000
1,0 nF	B37979N5102K0**	2500	2500	2000
1,2 nF	B37979N5122K0**	2500	2500	2000
1,5 nF	B37979N5152K0**	2500	2500	2000
1,8 nF	B37979N5182K0**	2500	2500	2000
2,2 nF	B37979N5222K0**	2500	2500	2000

B37986, 50 VDC, 6,5 × 5,0 × 2,5 mm

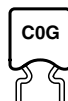
2,7 nF	B37986N5272K0**	2500	2500	2000
3,3 nF	B37986N5332K0**	2500	2500	2000
3,9 nF	B37986N5392K0**	2500	2500	2000
4,7 nF	B37986N5472K0**	2500	2500	2000
5,6 nF	B37986N5562K0**	2500	2500	2000
6,8 nF	B37986N5682K0**	2500	2500	2000
8,2 nF	B37986N5822K0**	2500	2500	2000
10 nF	B37986N5103K0**	2500	2500	2000

1) The table contains the ordering codes for the standard capacitance tolerance.
For other available capacitance tolerances see page 154.

**Multilayer Ceramic Capacitors****C0G****Ordering codes and packing for C0G, 50 VDC, lead spacing 5,0 mm**

C_R	Ordering code ¹⁾	Ammo packing	Reel packing	Bulk
		** Δ 54	** Δ 51	** Δ 00
		pcs	pcs/reel	pcs
B37979, 50 VDC, 5,5 × 5,0 × 2,5 mm				
100 pF	B37979G5101K0**	2500	2500	2000
120 pF	B37979G5121K0**	2500	2500	2000
150 pF	B37979G5151K0**	2500	2500	2000
180 pF	B37979G5181K0**	2500	2500	2000
220 pF	B37979G5221K0**	2500	2500	2000
270 pF	B37979G5271K0**	2500	2500	2000
330 pF	B37979G5331K0**	2500	2500	2000
390 pF	B37979G5391K0**	2500	2500	2000
470 pF	B37979G5471K0**	2500	2500	2000
560 pF	B37979G5561K0**	2500	2500	2000
680 pF	B37979G5681K0**	2500	2500	2000
820 pF	B37979G5821K0**	2500	2500	2000
1,0 nF	B37979G5102K0**	2500	2500	2000
1,2 nF	B37979G5122K0**	2500	2500	2000
1,5 nF	B37979G5152K0**	2500	2500	2000
1,8 nF	B37979G5182K0**	2500	2500	2000
2,2 nF	B37979G5222K0**	2500	2500	2000
B37986, 50 VDC, 6,5 × 5,0 × 2,5 mm				
2,7 nF	B37986G5272K0**	2500	2500	2000
3,3 nF	B37986G5332K0**	2500	2500	2000
3,9 nF	B37986G5392K0**	2500	2500	2000
4,7 nF	B37986G5472K0**	2500	2500	2000
5,6 nF	B37986G5562K0**	2500	2500	2000
6,8 nF	B37986G5682K0**	2500	2500	2000
8,2 nF	B37986G5822K0**	2500	2500	2000
10 nF	B37986G5103K0**	2500	2500	2000

1) The table contains the ordering codes for the standard capacitance tolerance.
For other available capacitance tolerances see page 154.



Multilayer Ceramic Capacitors

COG

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

C _R	Ordering code ¹⁾	Ammo packing	Reel packing	Bulk
		** Δ 54	** Δ 51	** Δ 00
		pcs	pcs/reel	pcs

B37979, 100 VDC, 5,5 × 5,0 × 2,5 mm

10 pF	B37979N1100K0**	2500	2500	2000
12 pF	B37979N1120K0**	2500	2500	2000
15 pF	B37979N1150K0**	2500	2500	2000
18 pF	B37979N1180K0**	2500	2500	2000
22 pF	B37979N1220K0**	2500	2500	2000
27 pF	B37979N1270K0**	2500	2500	2000
33 pF	B37979N1330K0**	2500	2500	2000
39 pF	B37979N1390K0**	2500	2500	2000
47 pF	B37979N1470K0**	2500	2500	2000
56 pF	B37979N1560K0**	2500	2500	2000
68 pF	B37979N1680K0**	2500	2500	2000
82 pF	B37979N1820K0**	2500	2500	2000
100 pF	B37979N1101K0**	2500	2500	2000
120 pF	B37979N1121K0**	2500	2500	2000
150 pF	B37979N1151K0**	2500	2500	2000
180 pF	B37979N1181K0**	2500	2500	2000
220 pF	B37979N1221K0**	2500	2500	2000
270 pF	B37979N1271K0**	2500	2500	2000
330 pF	B37979N1331K0**	2500	2500	2000
390 pF	B37979N1391K0**	2500	2500	2000
470 pF	B37979N1471K0**	2500	2500	2000
560 pF	B37979N1561K0**	2500	2500	2000
680 pF	B37979N1681K0**	2500	2500	2000
820 pF	B37979N1821K0**	2500	2500	2000
1,0 nF	B37979N1102K0**	2500	2500	2000

B37986, 100 VDC, 6,5 × 5,0 × 2,5 mm

1,2 nF	B37986N1122K0**	2500	2500	2000
1,5 nF	B37986N1152K0**	2500	2500	2000
1,8 nF	B37986N1182K0**	2500	2500	2000
2,2 nF	B37986N1222K0**	2500	2500	2000

1) The table contains the ordering codes for the standard capacitance tolerance.
For other available capacitance tolerances see page 154.

**Multilayer Ceramic Capacitors****C0G****Ordering codes and packing for C0G, 100 VDC, lead spacing 5,0 mm**

C_R	Ordering code ¹⁾	Ammo packing	Reel packing	Bulk
		** Δ 54	** Δ 51	** Δ 00
		pcs	pcs/reel	pcs

B37979, 100 VDC, 5,5 × 5,0 × 2,5 mm

10 pF	B37979G1100K0**	2500	2500	2000
12 pF	B37979G1120K0**	2500	2500	2000
15 pF	B37979G1150K0**	2500	2500	2000
18 pF	B37979G1180K0**	2500	2500	2000
22 pF	B37979G1220K0**	2500	2500	2000
27 pF	B37979G1270K0**	2500	2500	2000
33 pF	B37979G1330K0**	2500	2500	2000
39 pF	B37979G1390K0**	2500	2500	2000
47 pF	B37979G1470K0**	2500	2500	2000
56 pF	B37979G1560K0**	2500	2500	2000
68 pF	B37979G1680K0**	2500	2500	2000
82 pF	B37979G1820K0**	2500	2500	2000
100 pF	B37979G1101K0**	2500	2500	2000
120 pF	B37979G1121K0**	2500	2500	2000
150 pF	B37979G1151K0**	2500	2500	2000
180 pF	B37979G1181K0**	2500	2500	2000
220 pF	B37979G1221K0**	2500	2500	2000
270 pF	B37979G1271K0**	2500	2500	2000
330 pF	B37979G1331K0**	2500	2500	2000
390 pF	B37979G1391K0**	2500	2500	2000
470 pF	B37979G1471K0**	2500	2500	2000
560 pF	B37979G1561K0**	2500	2500	2000
680 pF	B37979G1681K0**	2500	2500	2000
820 pF	B37979G1821K0**	2500	2500	2000
1,0 nF	B37979G1102K0**	2500	2500	2000

B37986, 100 VDC, 6,5 × 5,0 × 2,5 mm

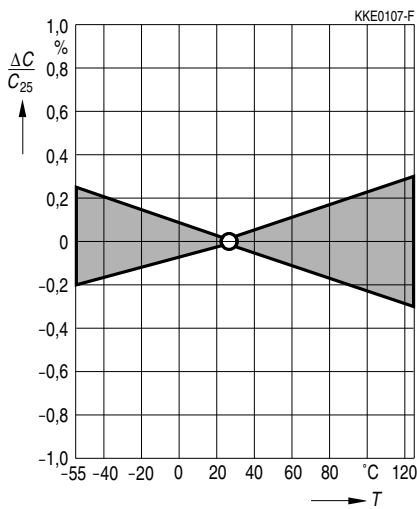
1,2 nF	B37986G1122K0**	2500	2500	2000
1,5 nF	B37986G1152K0**	2500	2500	2000
1,8 nF	B37986G1182K0**	2500	2500	2000
2,2 nF	B37986G1222K0**	2500	2500	2000

1) The table contains the ordering codes for the standard capacitance tolerance.
For other available capacitance tolerances see page 154.

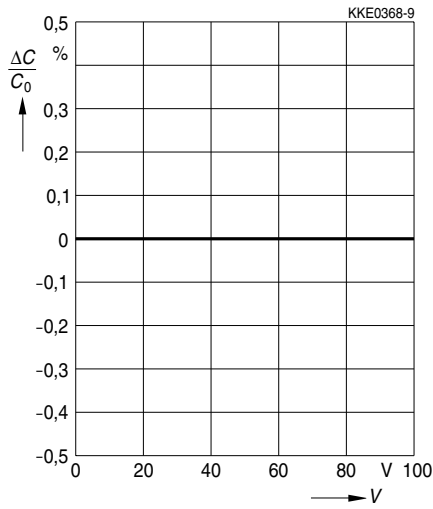
Multilayer Ceramic Capacitors
COG

Typical characteristics

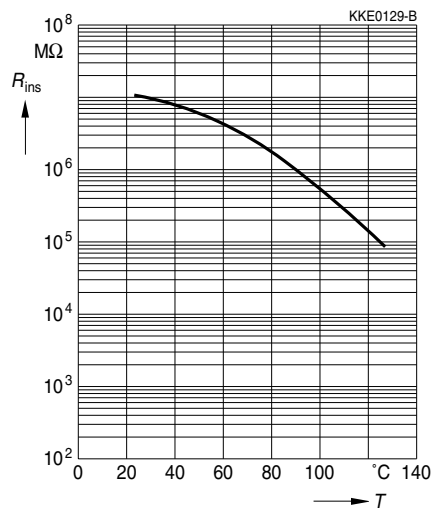
Capacitance change $\Delta C/C_{25}$ versus temperature T (tolerance range \square)



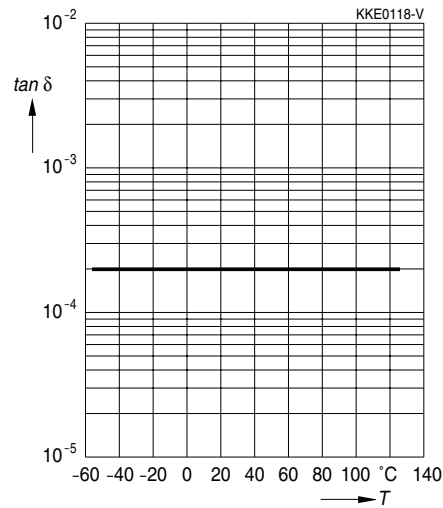
Capacitance change $\Delta C/C_0$ versus superimposed DC voltage V



Insulation resistance R_{ins} versus temperature T



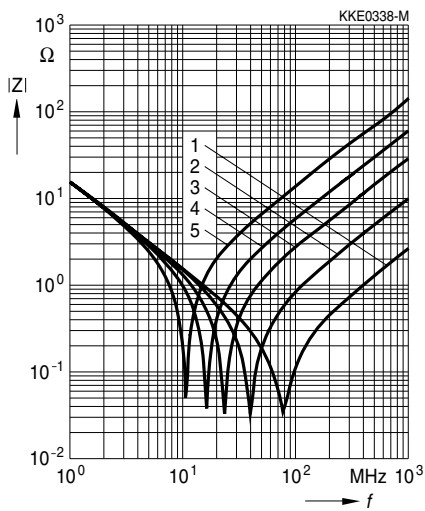
Dissipation factor $\tan \delta$ versus temperature T



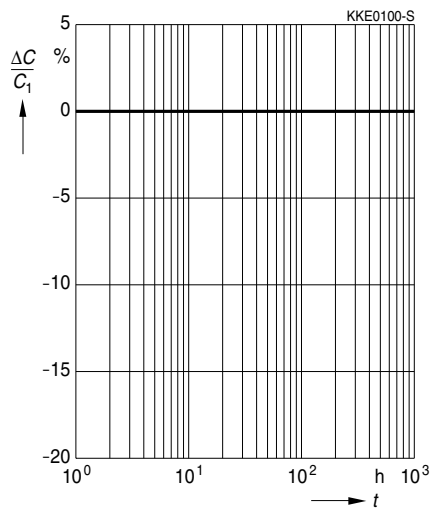


Typical characteristics

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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