Multilayer Chip Capacitors

X7R

SMD

Features

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

Applications

- Blocking
- Coupling
- Decoupling
- Interference suppression

Terminations

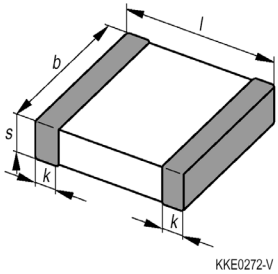
- For soldering:
  Sizes 0402 through 1210:
  Ni barrier terminations
  Sizes 1812, 2220:
  silver palladium
- For conductive adhesion:
  All sizes:
  silver palladium

Packing

- Blister and cardboard tape,
  for details refer to chapter
  “Taping and Packing”, page 19.
- Bulk case for sizes 0402, 0603,
  for details see page 22.

Maximum ratings

Climatic category
in accordance with IEC 60068-1: 55/125/56



Dimensions (mm)

Size **inch**/ mm	*l*	*b*	*s*	*k*
0402/ 1005	1,0 ± 0,10	0,50 ± 0,05	0,5 ± 0,05	0,1 - 0,3
0603/ 1608	1,6 ± 0,15*)	0,80 ± 0,10	0,8 ± 0,10	0,1 - 0,4
0805/ 2012	2,0 ± 0,20	1,25 ± 0,15	1,3 max.	0,13 - 0,75
1206/ 3216	3,2 ± 0,20	1,60 ± 0,15	1,3 max.	0,25 - 0,75
1210/ 3225	3,2 ± 0,30	2,50 ± 0,30	1,7 max.	0,25 - 0,75
1812/ 4532	4,5 ± 0,30	3,20 ± 0,30	1,3 max.	0,25 - 1,00
2220/ 5750	5,7 ± 0,40	5,00 ± 0,40	1,3 max	0,25 - 1,00

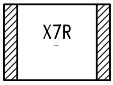
Tolerances in acc. with CECC 32101-801
*) For bulk cases: 1,6 ± 0,1

Available capacitance tolerances

Tolerance	Symbol
$\Delta C_R/C_R = \pm$ 5 %	J
$\Delta C_R/C_R = \pm$ 10 %	**K**
$\Delta C_R/C_R = \pm$ 20 %	M

Standard tolerance in bold print
J tolerance not available for 16 V, 200 V and 500 V

Rated voltage values



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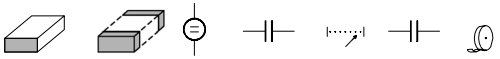


B37941 K 5 102 K 0 60

Packaging

62 = blister tape, reel dia. 180 mm
72 = blister tape, reel dia. 330 mm
60 = cardboard tape, reel dia. 180 mm
70 = cardboard tape, reel dia. 330 mm
01 = bulk case

Internal Code

Capacitance tolerance
(tolerance code in acc. with IEC 62, standard values bold)

X7R

J = ± 5 %
K = ± 10 %
M = ± 20 %

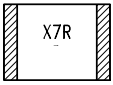
Capacitance, coded 010 = 1 pF 101 = 100 pF 103 = 10 nF 105 = 1 µF
100 = 10 pF 102 = 1 nF 104 = 100 nF 474 = 470 nF

Rated voltage

Rated voltage [Vdc]	16	25	50	100	200	500
Code	9	0	5	1	2	3

Terminations Standard: K = silver/nickel/tin
J = silver palladium

Type and size	
Chip size (**inch** / mm)	Temperature characteristics X7R
0402 / 1005	B37921
0603 / 1608	B37931
0805 / 2012	B37941
1206 / 3216	B37872
1210 / 3225	B37950
1812 / 4532	B37953
2220 / 5750	B37956



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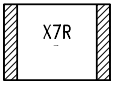
Electrical characteristics

Temperature characteristic Standard	X7R EIA
Dielectric	Class 2
Rated voltage V_R Vdc	16/25/50/100/ 200/500
Climatic category (IEC 68-1)	55/125/56
Temperature range	– 55 ... + 125 °C
Available capacitance values C_R E series	100 pF … 1 µF E12
Capacitance tolerance (standard in bold print)	± 5 % 1) ± **10 %** ± 20 %
Max. rel. capacitance change $\Delta C/C$ at V_{meas}	 ± 15 %
Voltage test	2,5 · V_R/5 s
Dissipation factor tan δ (limit value)	< 25 · 10^{-3} < 35 · 10^{-3} (16 V)
Insulation resistance 2) at 25 °C 125 °C	 > 10^5 MΩ > 10^4 MΩ
Time constant τ 2) at 25 °C 125 °C	 > 1000 s > 100 s

1) 5% tolerance not available for 16 V, 200 V and 500 V
2) For capacitance values exceeding 10 nF the time constant $\tau = C \cdot R_{ins}$ is given.



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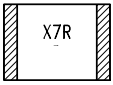
Product range

	X7R												
Size[1)] **inch** mm	**0402** 1005		**0603** 1608				**0805** 2012				**1206** 3216		
Type	B37921		B37931				B37941				B37872		
V_R (Vdc)	16	25	16	25	50	100	16	25	50	100	16	25	50
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													

Chip thickness (*s*): 0,5 ± 0,1 mm | 0,6 ± 0,1 mm | 0,8 ± 0,1 mm | 1,2 ± 0,1 mm

1) l × b (inch) / l × b (mm)



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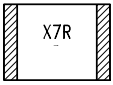
Product range

	X7R												
Size[1)] **inch** mm	**0402** 1005		**0603** 1608				**0805** 2012				**1206** 3216		
Type	B37921		B37931				B37941				B37872		
V_R (Vdc)	16	25	16	25	50	100	16	25	50	100	16	25	50
10 nF													
12 nF													
15 nF													
18 nF													
22 nF													
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													

Chip thickness (s): 0,5 ± 0,1 mm | 0,6 ± 0,1 mm | 0,8 ± 0,1 mm | 1,2 ± 0,1 mm

1) l × b (inch) / l × b (mm)



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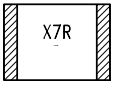
Product range

	X7R										
Size[1] **inch** mm	**1206** 3216			**1210** 3225				**1812** 4532		**2220** 5750	
Type	B37872			B37950				B37953		B37956	
V_R (Vdc)	100	200	500	50	100	200	500	50		50	
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											

Chip thickness (*s*): 0,8 ± 0,1 mm | 1,2 ± 0,1 mm | 1,6 ± 0,1 mm

1) l × b (inch) / l × b (mm)



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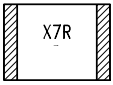
Product range

	X7R										
Size[1] **inch** mm	**1206** 3216			**1210** 3225				**1812** 4532		**2220** 5750	
Type	B37872			B37950				B37953		B37956	
V_R (Vdc)	100	200	500	50	100	200	500	50		50	
10 nF											
12 nF											
15 nF											
18 nF											
22 nF											
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											

Chip thickness (s): 0,8 ± 0,1 mm | 1,2 ± 0,1 mm | 1,6 ± 0,1 mm

1) l × b (inch) / l × b (mm)



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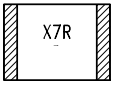
Ordering codes for X7R, 16 Vdc, Ni barrier terminations

Size	0402/1005	0603/1608	0805/2012	1206/3216
C_R	Ordering code [1]			
	B37921	B37931	B37941	B37872
470 pF	K9471K060 ▲			
560 pF	K9561K060 ▲			
680 pF	K9681K060 ▲			
820 pF	K9821K060 ▲			
1,0 nF	K9102K060 ▲			
1,2 nF	K9122K060 ▲			
1,5 nF	K9152K060 ▲			
1,8 nF	K9182K060 ▲			
2,2 nF	K9222K060 ▲			
2,7 nF	K9272K060 ▲			
3,3 nF	K9332K060 ▲			
3,9 nF	K9392K060 ▲			
4,7 nF	K9472K060 ▲			
5,6 nF	K9562K060 ▲			
6,8 nF	K9682K060 ▲			
8,2 nF	K9822K060 ▲			
10 nF	K9103K060 ▲			
12 nF	K9123K060 ▲			
15 nF	K9153K060 ▲			
18 nF				
22 nF				
27 nF		K9273K060 ❍		
33 nF		K9333K060 ❍		
39 nF		K9393K060 ❍		
47 nF		K9473K060 ❍		
56 nF		K9563K060 ❍		
68 nF		K9683K060 ❍		
82 nF				
100 nF				
120 nF			K9124K060 ❍	
150 nF			K9154K062 ◆	
180 nF			K9184K062 ◆	
220 nF			K9224K062 ◆	
270 nF				K9274K060 ❍
330 nF				K9334K060 ❍
390 nF				K9394K062 ◆
470 nF				K9474K062 ◆

Chip thickness: ▲: 0,5 ± 0,1 mm ❍: 0,8 ± 0,1 mm ◆: 1,2 ± 0,1 mm

1) The tables contain the ordering codes for the standard capacitance tolerance:
K = ± 10 %. Example: B37921K9471**K**060. For other available capacitance tolerances see page 1.



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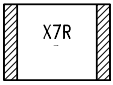
Ordering codes for X7R, 25 Vdc, Ni barrier terminations

Size	0402/1005	0603/1608	0805/2012	1206/3216	
C_R	Ordering code[1]				
	B37921	B37931	B37941	B37872	
100 pF	K0101K060 ▲				
120 pF	K0121K060 ▲				
150 pF	K0151K060 ▲				
180 pF	K0181K060 ▲				
220 pF	K0221K060 ▲				
270 pF	K0271K060 ▲				
330 pF	K0331K060 ▲				
390 pF	K0391K060 ▲				
470 pF	K0471K060 ▲				
560 pF	K0561K060 ▲				
680 pF	K0681K060 ▲				
820 pF	K0821K060 ▲				
1,0 nF	K0102K060 ▲				
1,2 nF	K0122K060 ▲				
1,5 nF	K0152K060 ▲				
1,8 nF	K0182K060 ▲				
2,2 nF	K0222K060 ▲				
2,7 nF	K0272K060 ▲				
3,3 nF	K0332K060 ▲				
3,9 nF	K0392K060 ▲				
4,7 nF	K0472K060 ▲				
5,6 nF					
6,8 nF					
8,2 nF					
10 nF					
12 nF		K0123K060 ❍			
15 nF		K0153K060 ❍			
18 nF		K0183K060 ❍			
22 nF		K0223K060 ❍			
27 nF					
33 nF					
39 nF					
47 nF					
56 nF					
68 nF					

Chip thickness: ▲: 0,5 ± 0,1 mm ❍: 0,8 ± 0,1 mm

1) The tables contain the ordering codes for the standard capacitance tolerance:
K = ± 10 %. Example: B37921K0101**K**060. For other available capacitance tolerances see page 1.



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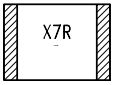
Ordering codes for X7R, 25 Vdc, Ni barrier terminations (cont´d)

Size	0402/1005	0603/1608	0805/2012	1206/3216	
C_R	Ordering code [1]				
	B37921	B37931	B37941	B37872	
82 nF					
100 nF					
120 nF				K0124K062	❍
150 nF				K0154K062	❍
180 nF				K0184K062	◆
220 nF				K0224K062	◆

Chip thickness: ❍: 0,8 ± 0,1 mm ◆: 1,2 ± 0,1 mm

1) The tables contain the ordering codes for the standard capacitance tolerance:
K = ± 10 %. Example: B37941K0823**K**062. For other available capacitance tolerances see page 1.



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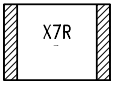
Ordering codes for X7R, 50 Vdc, Ni barrier terminations

Size	0603/1608	0805/2012	1206/3216	1210/3225
C_R	Ordering code [1]			
	B37931	B37941	B37872	B37950
220 pF	K5221K060 ❍			
270 pF	K5271K060 ❍			
330 pF	K5331K060 ❍			
390 pF	K5391K060 ❍			
470 pF	K5471K060 ❍	K5471K060 ❑		
560 pF	K5561K060 ❍	K5561K060 ❑		
680 pF	K5681K060 ❍	K5681K060 ❑		
820 pF	K5821K060 ❍	K5821K060 ❑		
1,0 nF	K5102K060 ❍	K5102K060 ❑	K5102K060 ❍	
1,2 nF	K5122K060 ❍	K5122K060 ❑	K5122K060 ❍	
1,5 nF	K5152K060 ❍	K5152K060 ❑	K5152K060 ❍	
1,8 nF	K5182K060 ❍	K5182K060 ❑	K5182K060 ❍	
2,2 nF	K5222K060 ❍	K5222K060 ❑	K5222K060 ❍	
2,7 nF	K5272K060 ❍	K5272K060 ❑	K5272K060 ❍	
3,3 nF	K5332K060 ❍	K5332K060 ❑	K5332K060 ❍	
3,9 nF	K5392K060 ❍	K5392K060 ❑	K5392K060 ❍	
4,7 nF	K5472K060 ❍	K5472K060 ❑	K5472K060 ❍	
5,6 nF	K5562K060 ❍	K5562K060 ❑	K5562K060 ❍	
6,8 nF	K5682K060 ❍	K5682K060 ❑	K5682K060 ❍	
8,2 nF	K5822K060 ❍	K5822K060 ❑	K5822K060 ❍	
10 nF	K5103K060 ❍	K5103K060 ❑	K5103K060 ❍	K5103K062 ❍
12 nF		K5123K060 ❑	K5123K060 ❍	K5123K062 ❍
15 nF		K5153K060 ❑	K5153K060 ❍	K5153K062 ❍
18 nF		K5183K060 ❑	K5183K060 ❍	K5183K062 ❍
22 nF		K5223K060 ❑	K5223K060 ❍	K5223K062 ❍
27 nF		K5273K060 ❑	K5273K060 ❍	K5273K062 ❍
33 nF		K5333K060 ❑	K5333K060 ❍	K5333K062 ❍
39 nF		K5393K060 ❑	K5393K060 ❍	K5393K062 ❍
47 nF		K5473K060 ❑	K5473K060 ❍	K5473K062 ❍
56 nF		K5563K062 ◆	K5563K060 ❍	K5563K062 ❍
68 nF		K5683K062 ◆	K5683K060 ❍	K5683K062 ❍
82 nF		K5823K062 ◆	K5823K060 ❍	K5823K062 ❍
100 nF		K5104K062 ◆	K5104K060 ❍	K5104K062 ❍
120 nF				K5124K062 ❍
150 nF				K5154K062 ❍
180 nF				K5184K062 ◆
220 nF				K5224K062 ◆

Chip thickness: ❑: 0,6 ± 0,1 mm ❍: 0,8 ± 0,1 mm ◆: 1,2 ± 0,1 mm

1) The tables contain the ordering codes for the standard capacitance tolerance:
K = ± 10 %. Example: B37931K5221**K**060. For other available capacitance tolerances see page 1.



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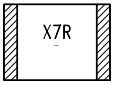
Ordering codes for X7R, 50 Vdc, AgPd terminations

Size	1812/4532	2220/5750		
C_R	Ordering code[1)]			
	B37953	B37956		
100 nF	J5104K062 ◆			
120 nF	J5124K062 ◆			
150 nF	J5154K062 ◆			
180 nF	J5184K062 ◆			
220 nF	J5224K062 ◆			
270 nF	J5274K062 ◆			
330 nF	J5334K062 ◆			
390 nF	J5394K062 ◆			
470 nF	J5474K062 ◆	J5474K062 ◆		
560 nF		J5564K062 ◆		
680 nF		J5684K062 ◆		
820 nF		J5824K062 ◆		
1,0 µF		J5105K062 ◆		

Chip thickness: ◆: 1,2 ± 0,1 mm

1) The tables contain the ordering codes for the standard capacitance tolerance:
K = ± 10 %. Example: B37953J5104**K**062. For other available capacitance tolerances see page 1.



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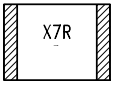
Ordering codes for X7R, 100 Vdc, Ni barrier terminations

Size	0603/1608	0805/2012	1206/3216	1210/3225
C_R	Ordering code [1]			
	B37931	B37941	B37872	B37950
100 pF	K1101K060 ❍			
120 pF	K1121K060 ❍			
150 pF	K1151K060 ❍			
180 pF	K1181K060 ❍			
220 pF	K1221K060 ❍			
270 pF	K1271K060 ❍			
330 pF	K1331K060 ❍			
390 pF	K1391K060 ❍			
470 pF	K1471K060 ❍	K1471K060 ❑		
560 pF	K1561K060 ❍	K1561K060 ❑		
680 pF	K1681K060 ❍	K1681K060 ❑		
820 pF	K1821K060 ❍	K1821K060 ❑		
1,0 nF	K1102K060 ❍	K1102K060 ❑	K1102K060 ❍	
1,2 nF	K1122K060 ❍	K1122K060 ❑	K1122K060 ❍	
1,5 nF	K1152K060 ❍	K1152K060 ❑	K1152K060 ❍	
1,8 nF	K1182K060 ❍	K1182K060 ❑	K1182K060 ❍	
2,2 nF	K1222K060 ❍	K1222K060 ❑	K1222K060 ❍	
2,7 nF	K1272K060 ❍	K1272K060 ❑	K1272K060 ❍	
3,3 nF	K1332K060 ❍	K1332K060 ❑	K1332K060 ❍	
3,9 nF	K1392K060 ❍	K1392K060 ❑	K1392K060 ❍	
4,7 nF	K1472K060 ❍	K1472K060 ❑	K1472K060 ❍	
5,6 nF		K1562K060 ❑	K1562K060 ❍	
6,8 nF		K1682K060 ❑	K1682K060 ❍	
8,2 nF		K1822K060 ❑	K1822K060 ❍	
10 nF		K1103K060 ❑	K1103K060 ❍	K1103K062 ❍
12 nF		K1123K060 ❑	K1123K060 ❍	K1123K062 ❍
15 nF		K1153K060 ❑	K1153K060 ❍	K1153K062 ❍
18 nF			K1183K060 ❍	K1183K062 ❍
22 nF			K1223K060 ❍	K1223K062 ❍
27 nF			K1273K060 ❍	K1273K062 ❍
33 nF			K1333K060 ❍	K1333K062 ❍
39 nF			K1393K060 ❍	K1393K062 ❍
47 nF			K1473K060 ❍	K1473K062 ❍

Chip thickness: ❑: 0,6 ± 0,1 mm ❍: 0,8 ± 0,1 mm

1) The tables contain the ordering codes for the standard capacitance tolerance:
K = ± 10 %. Example: B37931K1101**K**060. For other available capacitance tolerances see page 1.



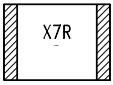
SMD

Ordering codes for X7R, 100 Vdc, Ni barrier terminations (cont´d)

Size	0603/1608	0805/2012	1206/3216	1210/3225
C_R	Ordering code [1]			
	B37931	B37941	B37872	B37950
56 nF			K1563K062 ◆	K1563K062 ❍
68 nF			K1683K062 ◆	K1683K062 ❍
82 nF			K1823K062 ◆	K1823K062 ❍
100 nF			K1104K062 ◆	K1104K062 ❍
120 nF				K1124K062 ◆
150 nF				K1154K062 ◆

Chip thickness: ❍: 0,8 ± 0,1 mm ◆: 1,2 ± 0,1 mm

1) The tables contain the ordering codes for the standard capacitance tolerance:
K = ± 10 %. Example: B37872K1563**K**062. For other available capacitance tolerances see page 1.



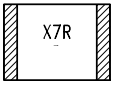
SMD

Ordering codes for X7R, 200/500 Vdc, Ni barrier terminations

Size	1206/3216	1206/3216	1210/3225	1210/3225
V_R	200	500	200	500
C_R	Ordering code[1]			
	B37872	B37872	B37950	B37950
470 pF		K3471K060 ❍		
560 pF		K3561K060 ❍		
680 pF		K3681K060 ❍		
820 pF	K2821K060 ❍	K3821K060 ❍		
1,0 nF	K2102K060 ❍	K3102K060 ❍		K3102K062 ❍
1,2 nF	K2122K060 ❍	K3122K060 ❍		K3122K062 ❍
1,5 nF	K2152K060 ❍	K3152K060 ❍		K3152K062 ❍
1,8 nF	K2182K060 ❍	K3182K060 ❍		K3182K062 ❍
2,2 nF	K2222K060 ❍	K3222K060 ❍		K3222K062 ❍
2,7 nF	K2272K060 ❍	K3272K062 ◆		K3272K062 ❍
3,3 nF	K2332K060 ❍	K3332K062 ◆		K3332K062 ❍
3,9 nF	K2392K060 ❍	K3392K062 ◆	K2392K062 ❍	K3392K062 ◆
4,7 nF	K2472K060 ❍	K3472K062 ◆	K2472K062 ❍	K3472K062 ◆
5,6 nF	K2562K060 ❍		K2562K062 ❍	K3562K062 ◆
6,8 nF	K2682K060 ❍		K2682K062 ❍	K3682K062 ◆
8,2 nF	K2822K060 ❍		K2822K062 ❍	K3822K062 ●
10 nF	K2103K060 ❍		K2103K062 ❍	K3103K062 ●
12 nF	K2123K062 ◆		K2123K062 ❍	
15 nF	K2153K062 ◆		K2153K062 ❍	
18 nF	K2183K062 ◆		K2183K062 ❍	
22 nF	K2223K062 ◆		K2223K062 ◆	
27 nF			K2273K062 ◆	
33 nF			K2333K062 ◆	
39 nF			K2393K062 ●	
47 nF			K2473K062 ●	

Chip thickness: ❍: 0,8 ± 0,1 mm ◆: 1,2 ± 0,1 mm ●: 1,6 ± 0,1 mm

1) The tables contain the ordering codes for the standard capacitance tolerance:
K = ± 10 %. Example: B37872K2471**K**060. For other available capacitance tolerances see page 1.



SMD

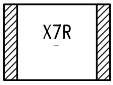
Ordering codes for X7R, 25 V/50 Vdc, Ni barrier terminations, bulk case packing

Size	0402/1005	
V_R	25 V	
C_R	Ordering code [1] B37921	
100 pF	K0101K001 ▲	
120 pF	K0121K001 ▲	
150 pF	K0151K001 ▲	
180 pF	K0181K001 ▲	
220 pF	K0221K001 ▲	
270 pF	K0271K001 ▲	
330 pF	K0331K001 ▲	
390 pF	K0391K001 ▲	
470 pF	K0471K001 ▲	
560 pF	K0561K001 ▲	
680 pF	K0681K001 ▲	
820 pF	K0821K001 ▲	
1,0 nF	K0102K001 ▲	
1,2 nF	K0122K001 ▲	
1,5 nF	K0152K001 ▲	
1,8 nF	K0182K001 ▲	
2,2 nF	K0222K001 ▲	
2,7 nF	K0272K001 ▲	
3,3 nF	K0332K001 ▲	
3,9 nF	K0392K001 ▲	
4,7 nF	K0472K001 ▲	
5,6 nF		
6,8 nF		
8,2 nF		
10 nF		
12 nF		
15 nF		
18 nF		
22 nF		

Size	0603	0603
V_R	25 V	50 V
C_R	Ordering code [1] B37931	B37931
220 pF		K5221K001 ❍
270 pF		K5271K001 ❍
330 pF		K5331K001 ❍
390 pF		K5391K001 ❍
470 pF		K5471K001 ❍
560 pF		K5561K001 ❍
680 pF		K5681K001 ❍
820 pF		K5821K001 ❍
1,0 nF		K5102K001 ❍
1,2 nF		K5122K001 ❍
1,5 nF		K5152K001 ❍
1,8 nF		K5182K001 ❍
2,2 nF		K5222K001 ❍
2,7 nF		K5272K001 ❍
3,3 nF		K5332K001 ❍
3,9 nF		K5392K001 ❍
4,7 nF		K5472K001 ❍
5,6 nF		K5562K001 ❍
6,8 nF		K5682K001 ❍
8,2 nF		K5822K001 ❍
10 nF		K5103K001 ❍
12 nF	K0123K001 ❍	
15 nF	K0153K001 ❍	
18 nF	K0183K001 ❍	
22 nF	K0223K001 ❍	
27 nF		
33 nF		
39 nF		
47 nF		

Chip thickness: ▲: 0,5 ± 0,1 mm ❍: 0,8 ± 0,1 mm

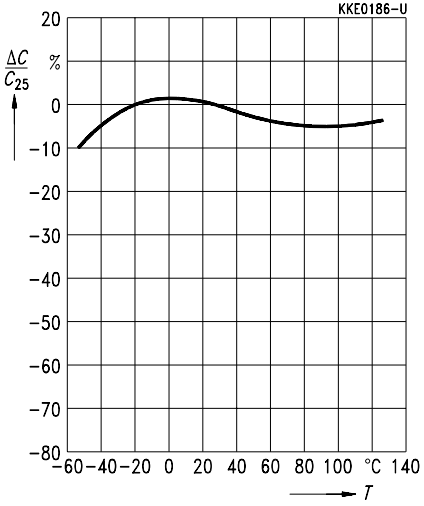
1) The tables contain the ordering codes for the standard capacitance tolerance:
K = ± 10 %. Example: B37931K0472**K**001. For other available capacitance tolerances see page 1.



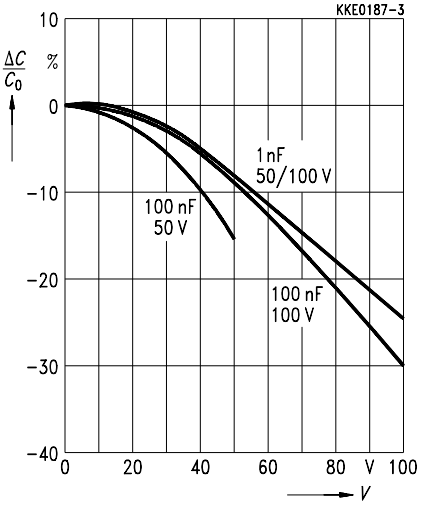
SMD

Characteristics (typical)

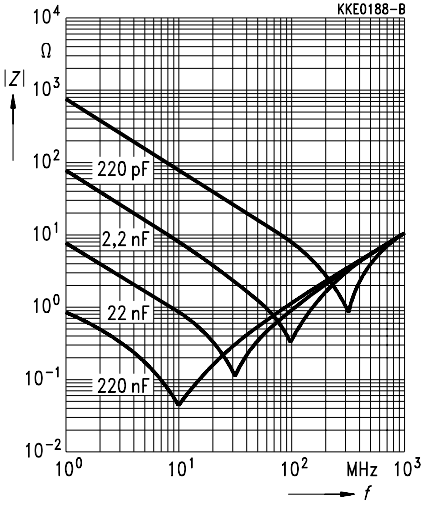
Capacitance change $\Delta C/C_{25}$ versus temperature T



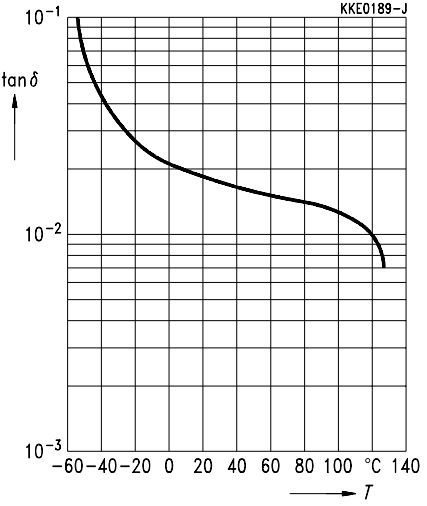
Capacitance change $\Delta C/C_0$ versus superimposed dc voltage V

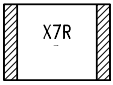


Impedance $|Z|$ versus frequency f



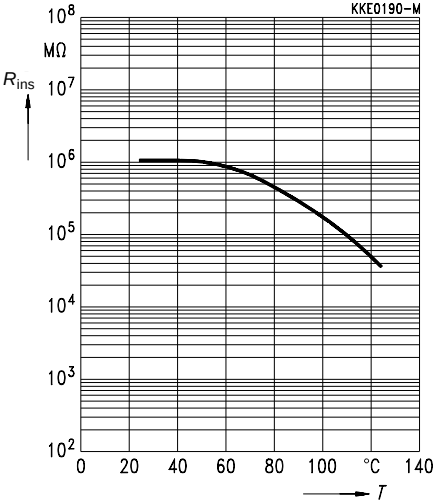
Dissipation factor tan δ versus temperature T



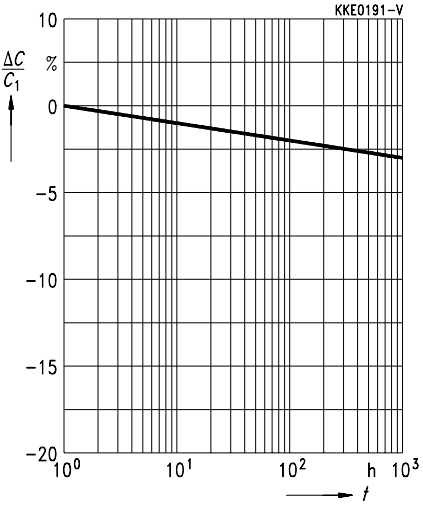


SMD

Insulation resistance R_{ins} versus temperature T

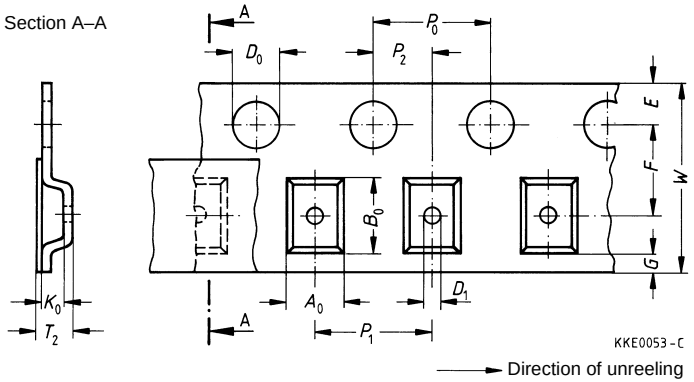


Capacitance change $\Delta C/C_1$ versus time t



1 Taping of chip capacitors

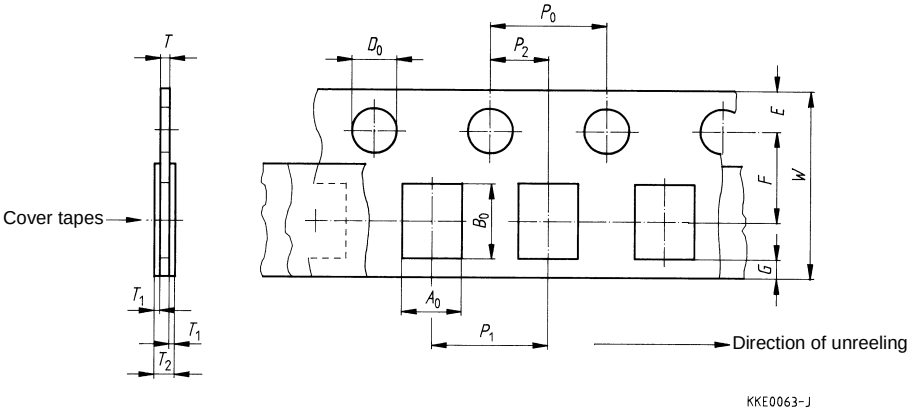
1.1 **Blister tape** (taping in accordance with IEC 60286-3)



Dimensions (mm)	Size (8-mm tape)			Size (12-mm tape)		Tolerance
	0805/2012	1206/3216	1210/3225	1812/4532	2220/5150	
$A_0 \times B_0$	1,6 × 2,4	1,9 × 3,5	2,8 × 3,5	3,5 × 4,8	5,1 × 6,0	± 0,2
K_0	0,7 ; 0,9; 1,3 (standard)			1,3		max.
T_2	2,5			4,5		max.
D_0	1,5			1,5		+ 0,1/ – 0
D_1	1,0			1,5		min.
P_0	4,0			4,0		± 0,1[1)]
P_2	2,0			2,0		± 0,05
P_1	4,0			8,0		± 0,1
W	8,0			12,0		± 0,3
E	1,75			1,75		± 0,1
F	3,5			5,5		± 0,05
G	0,75			0,75		min.

1) ≤ 0,2 mm over 10 hole spaces

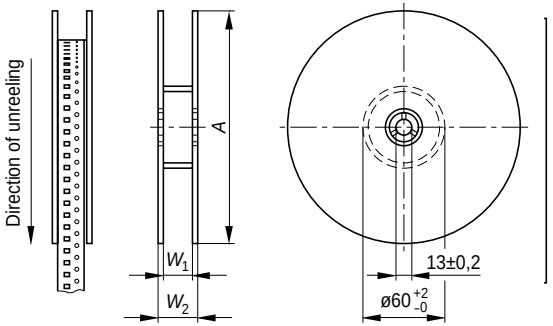
1.2 **Cardboard tape** (taping in accordance with IEC 60286-3)



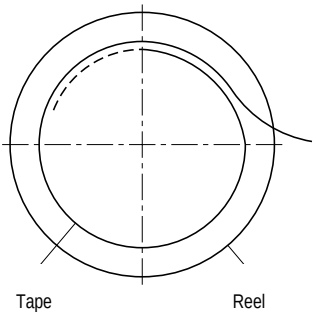
Dimensions (mm)	Size (8-mm tape)				Tolerance
	0402/1005	0603/1608	0805/2012	1206/3216	
$A_0 \times B_0$	0,6 × 1,15	0,95 × 1,8	1,50 × 2,30	2,0 × 3,6	± 0,2
T	0,6	0,7; 0,9 (standard)			max.
T_2	0,7	0,9	1,1		max.
D_0	1,5	1,5			± 0,1
P_0	4,0	4,0			± 0,1[1)]
P_2	2,0	2,0			± 0,05
P_1	2,0	4,0			± 0,1
W	8,0	8,0			± 0,3
E	1,75	1,75			± 0,1
F	3,5	3,5			± 0,05
G	0,75	0,75			min.

1) ≤ 0,2 mm over 10 hole spaces

1.3 Reel packaging



KKE0058-I



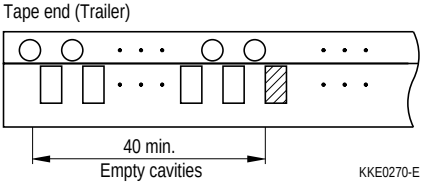
KKE0057-A

8-mm tape

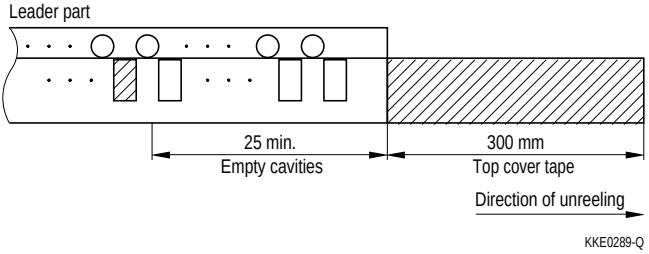
Dimensions	180-mm tape reel	330-mm tape reel
A	180 – 3/+ 0	330 ± 2,0
W_1	8,4 + 1,5/– 0	8,4 + 1,5/– 0
W_2	14,4 max.	14,4 max.

12-mm tape

Dimensions	180-mm tape reel	330-mm tape reel
A	180 – 3/+ 0	330 ± 2,0
W_1	12,4 + 1,5/– 0	12,4 + 1,5/– 0
W_2	18,4 max.	18,4 max.



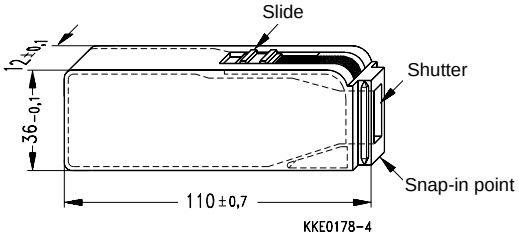
KKE0270-E



KKE0289-Q

1.4 Bulk case packing

Part of our standard chip range is also available in bulk cases.



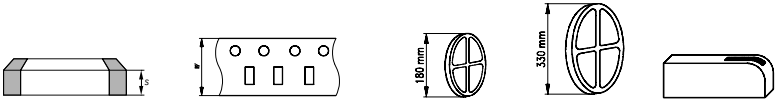
Packing units:

Chip size	pcs
0402	70000
0603	15000

Advantages of bulk case packaging:

- Environmentally compatible material; considerably less packaging material (1/30 of blister packing)
- Small package sizes (110 × 36 × 12) mm with appropriately low storage requirements
- Can be used several times (less waste)
- No standstill-times during production, since packages can be refilled or replaced while component mounting is in progress
- High component placement reliability if the bulk feeder is used

1.5 Packing units for chip capacitors



Size inch/mm	Thickness *s*	Tape		Packing units (in 1000 pcs)		
		Cardboard Width *W*	Blister Width *W*	Reel 180 mm dia.	Reel 330 mm dia.	Bulk case
0402/1005	0,5	8 mm	–	10,0	–	70,0
0603/1608	0,8	8 mm	–	4,0	16,0	15,0
0805/2012	0,6	8 mm	–	5,0	20,0	–
	0,8	8 mm	–	4,0	16,0	–
	1,2	–	8 mm	3,0	12,0	–
1206/3216	0,6	8 mm	–	4,0	16,0	–
	0,8	8 mm	–	4,0	16,0	–
	1,2	–	8 mm	3,0	12,0	–
1210/3225	0,6	–	8 mm	4,0	16,0	–
	0,8	–	8 mm	4,0	16,0	–
	1,2	–	8 mm	3,0	12,0	–
	1,6	–	8 mm	2,0	8,0	–
1812/4532	1,2	–	12 mm	1,5	5,0	–
2220/5750	1,2	–	12 mm	1,5	5,0	–