

Ordering code system



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

Internal coding

Capacitance tolerance

J $\triangleq \pm 5\%$
K $\triangleq \pm 10\%$ (standard)
M $\triangleq \pm 20\%$

Capacitance, coded 102 $\triangleq$ 10 · 10² pF = 1 nF
(example) 103 $\triangleq$ 10 · 10³ pF = 10 nF

$$\frac{50}{5}$$

Termination

Standard: K $\triangleq$ nickel barrier for all case sizes

On request: J $\hat{=}$ silver-palladium for conductive adhesion for all case sizes

Type and size

Chip size
(**inch** / mm)

Temperature characteristic
X8R

0603 / 1608
0805 / 2012
1206 / 3216
1210 / 3225

B37531
B37541
B37472
B37550

Features

- Wide temperature range up to 150 °C
- High volumetric efficiency
- Non-linear capacitance change
- High insulation resistance
- High pulse strength



Applications

- Automotive
- Blocking
- Coupling
- Decoupling
- Interference suppression

Termination

- For soldering: Nickel-barrier terminations (Ni)

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

Electrical data

Temperature characteristic		X8R	
Climatic category (IEC 60068-1)		55/150/56	
Standard		EIA	
Dielectric		Class 2	
Rated voltage ¹⁾	V_R	50	VDC
Test voltage	V_{test}	$2,5 \cdot V_R/5$ s	VDC
Capacitance range / E series	C_R	100 pF ... 150 nF (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}	$> 10^5$	M Ω
Insulation resistance ²⁾ at +125 °C	R_{ins}	$> 10^4$	M Ω
Time constant ²⁾ at + 25 °C	τ	> 1000	s
Time constant ²⁾ at +125 °C	τ	> 100	s
Operating temperature range	T_{op}	-55 ... +150	°C
Ageing ³⁾		yes	

1) Note: No operation on AC line.

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

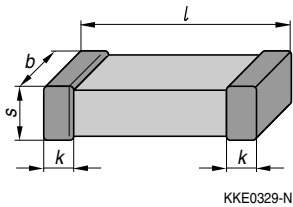
3) Refer to chapter "General Technical Information", page 197.



Capacitance tolerances

Code letter	J	K (standard)	M
Tolerance	$\pm 5\%$	$\pm 10\%$	$\pm 20\%$

Dimensional drawing



Dimensions (mm)

Case size	(inch) (mm)	0603 1608	0805 2012	1206 3216	1210 3225
<i>l</i>		$1,6 \pm 0,15$	$2,0 \pm 0,20$	$3,2 \pm 0,20$	$3,2 \pm 0,30$
<i>b</i>		$0,8 \pm 0,10$	$1,25 \pm 0,15$	$1,6 \pm 0,15$	$2,5 \pm 0,30$
<i>s</i>		$0,8 \pm 0,10$	1,30 max.	1,30 max.	1,30 max.
<i>k</i>		0,1 – 0,4	0,13 – 0,75	0,25 – 0,75	0,25 – 0,75

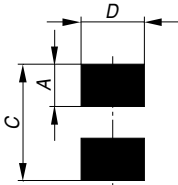
Tolerances to CECC 32101-801

Multilayer Ceramic Capacitors

X8R

X8R

Recommended solder pad

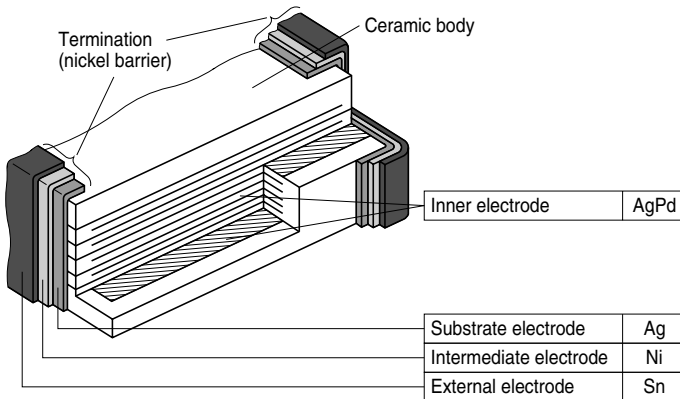


KKE0308-1

Maximum dimensions (mm)

Case size	(inch/mm)	Type	A	C	D
0603/1608		single chip	1,0	3,0	1,0
0805/2012		single chip	1,2	3,4	1,3
1206/3216		single chip	1,2	4,5	1,8
1210/3225		single chip	1,2	4,5	2,8

Termination



KKE0484-W



Product range chip capacitors

	X8R							
Size ¹⁾	0603		0805		1206		1210	
inch	1608		2012		3216		3225	
mm								
Type	B37531		B37541		B37472		B37550	
V_R (VDC)	50		50		50		50	
C_R								
100 pF								
150 pF								
220 pF								
330 pF								
470 pF								
680 pF								
1,0 nF								
1,5 nF								
2,2 nF								
3,3 nF								
4,7 nF								
6,8 nF								
10 nF								
15 nF								
22 nF								
33 nF								
47 nF								
68 nF								
100 nF								
150 nF								

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

Multilayer Ceramic Capacitors

X8R; 0603 and 0805

X8R

Ordering codes and packing for X8R, 50 VDC, nickel-barrier terminations

$C_R^{1)}$	Ordering code ²⁾	Chip thickness mm	Cardboard tape, Ø 180-mm reel	Cardboard tape, Ø 330-mm reel
			** $\triangleq$ 60	** $\triangleq$ 70
			pcs/reel	pcs/reel

Case size 0603, 50 VDC

100 pF	B37531K5101K0**	$0,8 \pm 0,1$	4000	16000
150 pF	B37531K5151K0**	$0,8 \pm 0,1$	4000	16000
220 pF	B37531K5221K0**	$0,8 \pm 0,1$	4000	16000
330 pF	B37531K5331K0**	$0,8 \pm 0,1$	4000	16000
470 pF	B37531K5471K0**	$0,8 \pm 0,1$	4000	16000
680 pF	B37531K5681K0**	$0,8 \pm 0,1$	4000	16000
1,0 nF	B37531K5102K0**	$0,8 \pm 0,1$	4000	16000
1,5 nF	B37531K5152K0**	$0,8 \pm 0,1$	4000	16000
2,2 nF	B37531K5222K0**	$0,8 \pm 0,1$	4000	16000
3,3 nF	B37531K5332K0**	$0,8 \pm 0,1$	4000	16000
4,7 nF	B37531K5472K0**	$0,8 \pm 0,1$	4000	16000

Case size 0805, 50 VDC

470 pF	B37541K5471K0**	$0,6 \pm 0,1$	5000	20000
680 pF	B37541K5681K0**	$0,6 \pm 0,1$	5000	20000
1,0 nF	B37541K5102K0**	$0,6 \pm 0,1$	5000	20000
1,5 nF	B37541K5152K0**	$0,6 \pm 0,1$	5000	20000
2,2 nF	B37541K5222K0**	$0,6 \pm 0,1$	5000	20000
3,3 nF	B37541K5332K0**	$0,6 \pm 0,1$	5000	20000
4,7 nF	B37541K5472K0**	$0,6 \pm 0,1$	5000	20000
6,8 nF	B37541K5682K0**	$0,6 \pm 0,1$	5000	20000
10 nF	B37541K5103K0**	$0,6 \pm 0,1$	5000	20000
15 nF	B37541K5153K0**	$0,6 \pm 0,1$	5000	20000
22 nF	B37541K5223K0**	$0,6 \pm 0,1$	5000	20000

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 72.


Ordering codes and packing for X8R, 50 VDC, nickel-barrier terminations

$C_R^{1)}$	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

Case size 1206, 50 VDC

1,0 nF	B37472K5102K0**	$0,8 \pm 0,1$	4000	16000
1,5 nF	B37472K5152K0**	$0,8 \pm 0,1$	4000	16000
2,2 nF	B37472K5222K0**	$0,8 \pm 0,1$	4000	16000
3,3 nF	B37472K5332K0**	$0,8 \pm 0,1$	4000	16000
4,7 nF	B37472K5472K0**	$0,8 \pm 0,1$	4000	16000
6,8 nF	B37472K5682K0**	$0,8 \pm 0,1$	4000	16000
10 nF	B37472K5103K0**	$0,8 \pm 0,1$	4000	16000
15 nF	B37472K5153K0**	$0,8 \pm 0,1$	4000	16000
22 nF	B37472K5223K0**	$0,8 \pm 0,1$	4000	16000
33 nF	B37472K5333K0**	$0,8 \pm 0,1$	4000	16000
47 nF	B37472K5473K0**	$0,8 \pm 0,1$	4000	16000
68 nF	B37472K5683K0**	$1,2 \pm 0,1$	3000 ³⁾	12000 ⁴⁾
100 nF	B37472K5104K0**	$1,2 \pm 0,1$	3000 ³⁾	12000 ⁴⁾
			Blister tape, Ø 180-mm reel	Blister tape, Ø 330-mm reel
			** $\triangle$ 62	** $\triangle$ 72
			pcs/reel	pcs/reel

Case size 1210, 50 VDC

10 nF	B37550K5103K0**	$0,8 \pm 0,1$	4000	16000
15 nF	B37550K5153K0**	$0,8 \pm 0,1$	4000	16000
22 nF	B37550K5223K0**	$0,8 \pm 0,1$	4000	16000
33 nF	B37550K5333K0**	$0,8 \pm 0,1$	4000	16000
47 nF	B37550K5473K0**	$0,8 \pm 0,1$	4000	16000
68 nF	B37550K5683K0**	$0,8 \pm 0,1$	4000	16000
100 nF	B37550K5104K0**	$0,8 \pm 0,1$	4000	16000
150 nF	B37550K5154K0**	$1,2 \pm 0,1$	3000	12000

1) Other capacitance values on request.

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

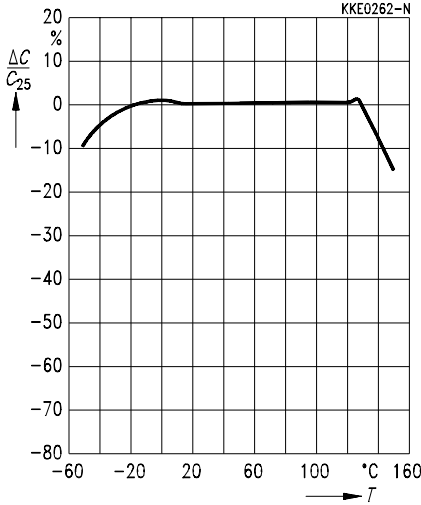
For other available capacitance tolerances see page 72.

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

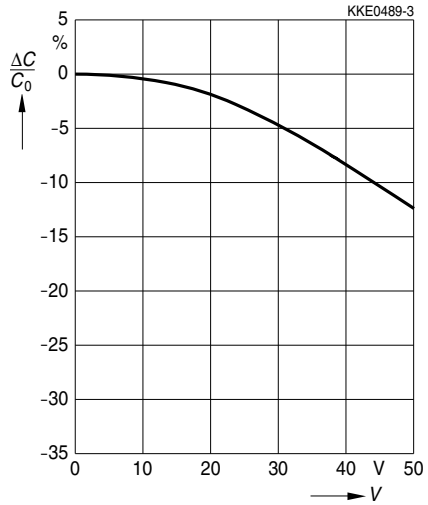
4) Blister tape, 330-mm reel, ordering code ** $\triangle$ 72

Typical characteristics

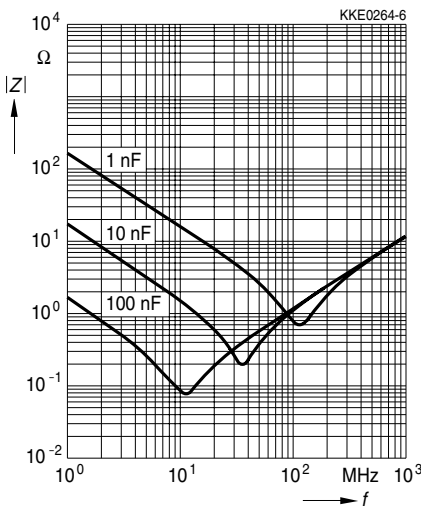
Capacitance change $\Delta C/C_{25}$ versus temperature T



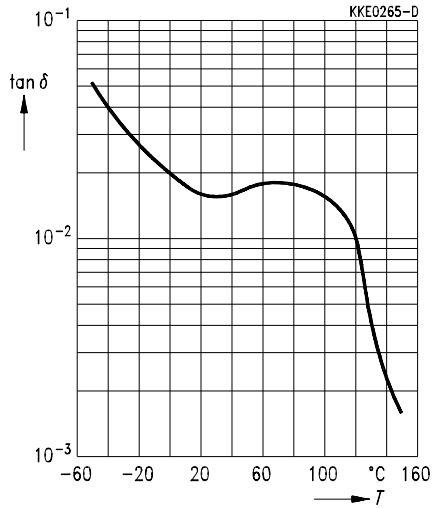
Capacitance change $\Delta C/C_0$ versus superimposed DC voltage V



Impedance $|Z|$ versus frequency f

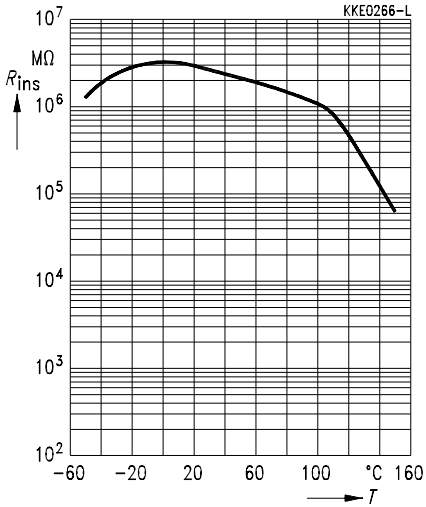


Dissipation factor $\tan \delta$ versus temperature T

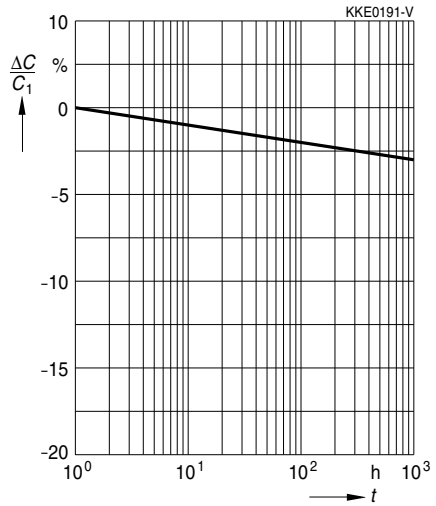


Typical characteristics

Insulation resistance R_{ins} versus temperature T



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



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