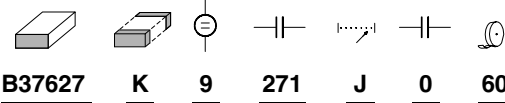


Ordering code system



**Packaging**  
 60  $\triangle$  cardboard tape, 180-mm reel  
 70  $\triangle$  cardboard tape, 330-mm reel

**Internal coding**

**Capacitance tolerance**  
**J  $\triangle$   $\pm$  5% (standard)**  
**K  $\triangle$   $\pm$  10%**

**Capacitance, coded**    102  $\triangle$   $10 \cdot 10^2$  pF = 1 nF  
 (example)                    103  $\triangle$   $10 \cdot 10^3$  pF = 10 nF  
                                       333  $\triangle$   $33 \cdot 10^3$  pF = 33 nF

<b>Rated voltage</b>	Rated voltage [VDC]	16
	Code	9

**Termination**      Standard:    K  $\triangle$  nickel barrier

<b>Type and size</b>	
Chip size (inch / mm)	Temperature characteristic HC1
<b>0402</b> / 1005 <b>0603</b> / 1608 <b>0805</b> / 2012	B37627 B37637 B37647

**HC1**
**Preliminary Data**
**Features**

- COG equivalent
- Class 1 characteristic with high capacitance values (up to 33 nF for case size 0805)
- No ageing effects
- No voltage dependence
- No piezoelectric effects
- Maximum relative capacitance change versus temperature within  $\pm 4\%$


**Applications**

- Loop filters
- Telecom (mobile phones, Bluetooth, ADSL/XDSL)
- Keyless entry systems
- Set top boxes

**Termination**

- For soldering: Nickel-barrier terminations (Ni)

**Options**

- Alternative capacitance tolerances available on request

**Delivery mode**

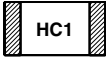
- Cardboard tape, 180-mm and 330-mm reel available

**Note: Production ramp up end of 2003, all capacitance values on request**

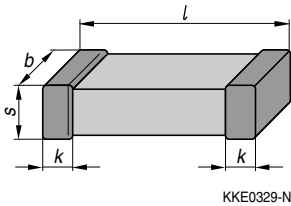
**Electrical data**

Temperature characteristic		HC1	
Climatic category (IEC 60068-1)		25/85/56	
Standard		EIA	
Dielectric		Class 1	
Rated voltage	$V_R$	16	VDC
Test voltage	$V_{test}$	$2,5 \cdot V_R/5$ s	VDC
Capacitance range / E series	$C_R$	270 pF ... 33 nF (E6)	
Max. relative capacitance change	$\Delta C/C$	$\pm 4$	%
Dissipation factor (limit value)	$\tan \delta$	$< 1,0 \cdot 10^{-3}$	
Insulation resistance <sup>1)</sup> at +25 °C	$R_{ins}$	$> 10^5$	M $\Omega$
Insulation resistance <sup>1)</sup> at +85 °C	$R_{ins}$	$> 10^4$	M $\Omega$
Time constant <sup>1)</sup> at +25 °C	$\tau$	$> 1000$	s
Time constant <sup>1)</sup> at +85 °C	$\tau$	$> 100$	s
Operating temperature range	$T_{op}$	-25 ... +85	°C
Ageing		none	

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


**Capacitance tolerances**

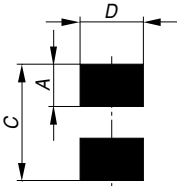
Code letter	J (standard)	K
Tolerance	$\pm 5\%$	$\pm 10\%$

**Dimensional drawing**

**Dimensions (mm)**

Case size (inch) (mm)	0402 1005	0603 1608	0805 2012
<i>l</i>	$1,0 \pm 0,10$	$1,6 \pm 0,15$	$2,0 \pm 0,20$
<i>b</i>	$0,5 \pm 0,05$	$0,8 \pm 0,10$	$1,25 \pm 0,15$
<i>s</i>	$0,5 \pm 0,05$	$0,8 \pm 0,10$	0,90 max.
<i>k</i>	0,1 – 0,4	0,1 – 0,4	0,13 – 0,75

Tolerances to CECC 32101-801

**Recommended solder pad**

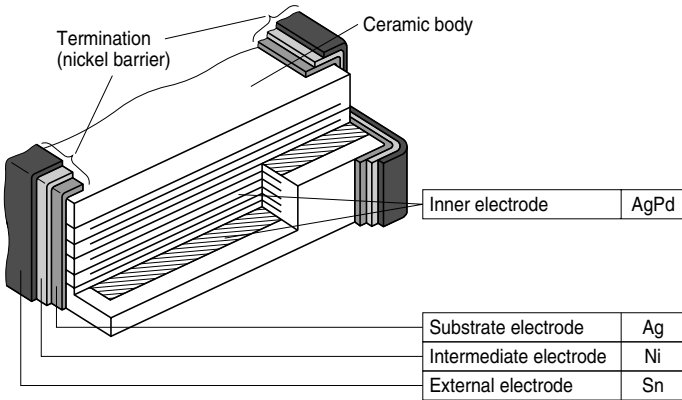


KKE0308-1

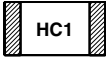
**Maximum dimensions (mm)**

Case size	(inch/mm)	Type	A	C	D
	0402/1005	single chip	0,6	1,7	0,6
	0603/1608	single chip	1,0	3,0	1,0
	0805/2012	single chip	1,2	3,4	1,3

**Termination**



KKE0484-W



**Product range chip capacitors**

		HC1					
Size <sup>1)</sup>		0402		0603		0805	
inch		1005		1608		2012	
mm							
Type		B37627		B37637		B37647	
$V_R$ (VDC)		16		16		16	
$C_R$							
270	pF						
330	pF						
470	pF						
680	pF						
1,0	nF						
1,5	nF						
2,2	nF						
2,7	nF						
3,3	nF						
4,7	nF						
6,8	nF						
10	nF						
15	nF						
22	nF						
33	nF						

**Production ramp up end of 2003, all capacitance values on request.**

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

**Multilayer Ceramic Capacitors**
**HC1; 0402, 0603, 0805 and 1206**
**HC1**
**Ordering codes and packing for HC1 capacitors, 16 VDC, nickel-barrier terminations**

$C_R$	Ordering code <sup>1)</sup>	Chip thickness mm	Cardboard tape, ∅ 180-mm reel	Cardboard tape, ∅ 330-mm reel
			** $\triangleq$ 60	** $\triangleq$ 70
			pcs/reel	pcs/reel

**Case size 0402, 16 VDC**

270 pF	B37627K9271J0**	0,5 ± 0,05	10000	50000
330 pF	B37627K9331J0**	0,5 ± 0,05	10000	50000
470 pF	B37627K9471J0**	0,5 ± 0,05	10000	50000
680 pF	B37627K9681J0**	0,5 ± 0,05	10000	50000
1,0 nF	B37627K9102J0**	0,5 ± 0,05	10000	50000

**Case size 0603, 16 VDC**

1,0 nF	B37637K9102J0**	0,8 ± 0,1	4000	16000
1,5 nF	B37637K9152J0**	0,8 ± 0,1	4000	16000
2,2 nF	B37637K9222J0**	0,8 ± 0,1	4000	16000
2,7 nF	B37637K9272J0**	0,8 ± 0,1	4000	16000
3,3 nF	B37637K9332J0**	0,8 ± 0,1	4000	16000
4,7 nF	B37637K9472J0**	0,8 ± 0,1	4000	16000
6,8 nF	B37637K9682J0**	0,8 ± 0,1	4000	16000
10 nF	B37637K9103J0**	0,8 ± 0,1	4000	16000

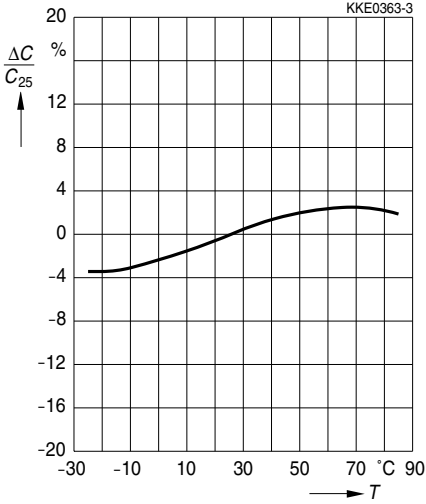
**Case size 0805, 16 VDC**

10 nF	B37647K9103J0**	0,8 ± 0,1	4000	16000
15 nF	B37647K9153J0**	0,8 ± 0,1	4000	16000
22 nF	B37647K9223J0**	0,8 ± 0,1	4000	16000
33 nF	B37647K9333J0**	0,8 ± 0,1	4000	16000

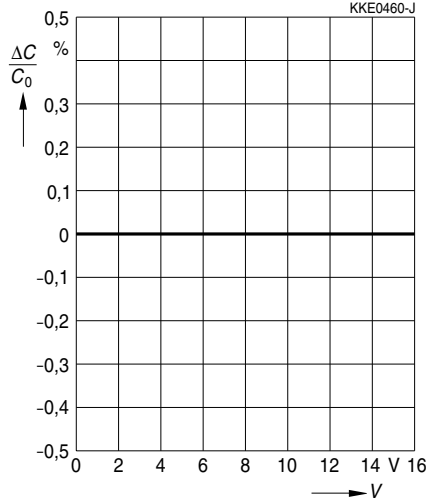
1) The table contains the ordering codes for the standard capacitance tolerance.  
For other available capacitance tolerances see page 144.

**Typical characteristics**

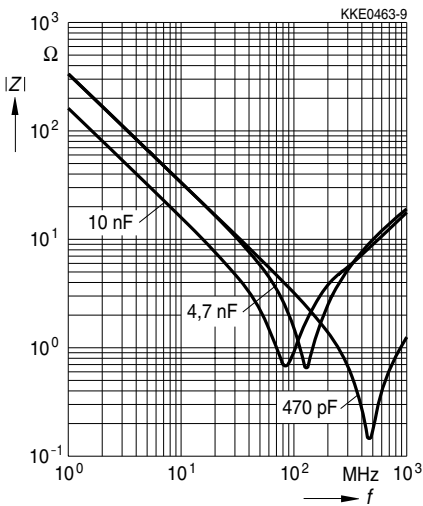
Capacitance change  $\Delta C/C_{25}$  versus temperature  $T$



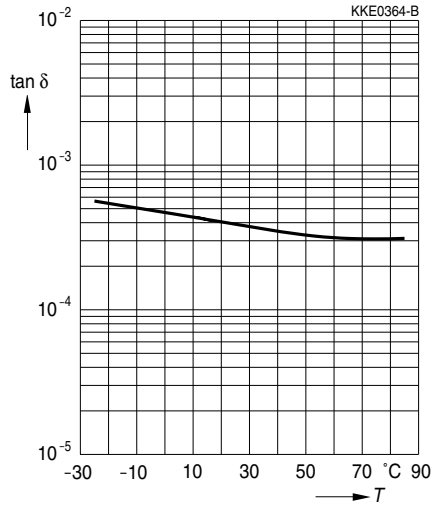
Capacitance change  $\Delta C/C_0$  versus superimposed DC voltage  $V$



Impedance  $|Z|$  versus frequency  $f$

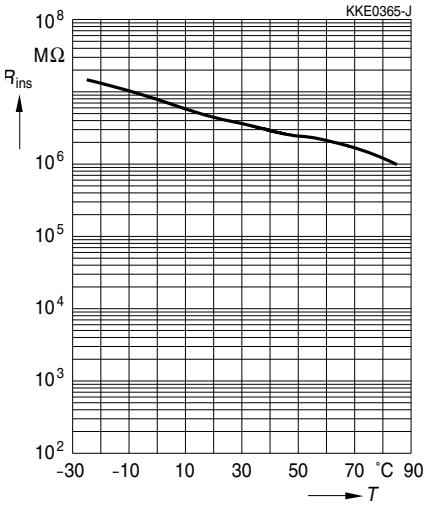


Dissipation factor  $\tan \delta$  versus temperature  $T$



**Typical characteristics**

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





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