

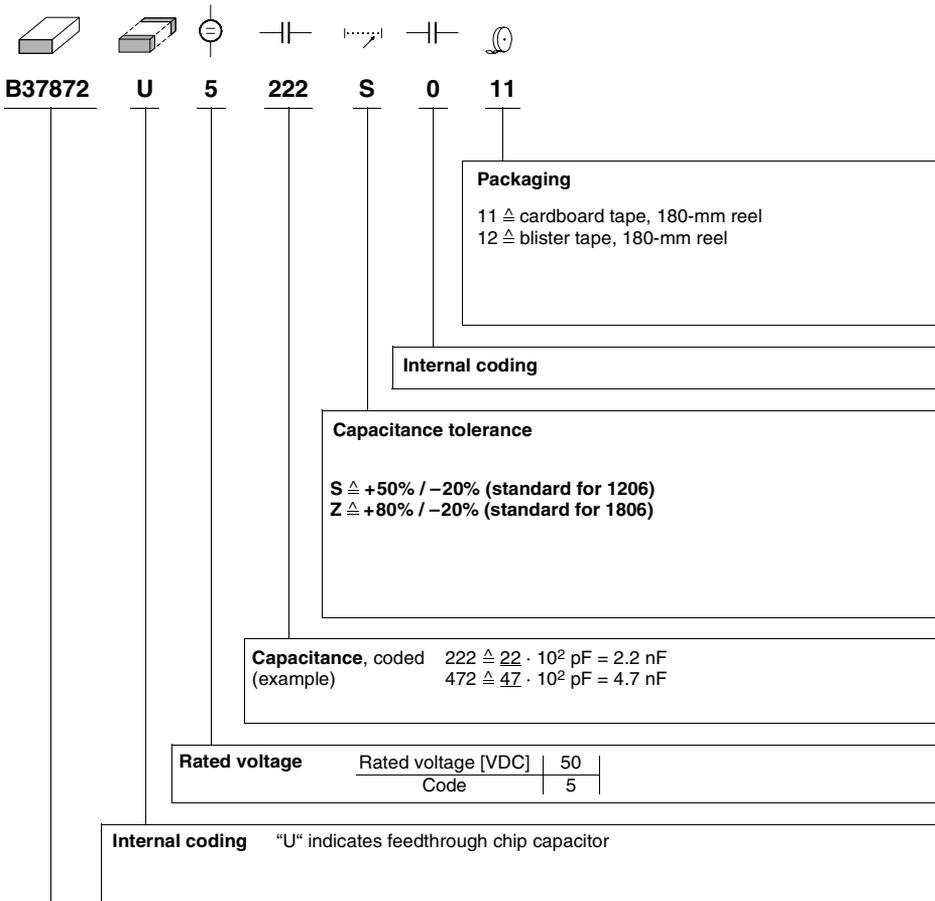
The design of EPCOS feedthrough capacitors provides excellent performance for EMI suppression and signal filtering. A typical application is the protection of signal sensor lines, e.g. for Hall sensors in the automotive industry.



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Ordering code system



Type and size	
Chip size (inch / mm)	Temperature characteristic X7R
1206 / 3216 1806 / 4616	B37872 B37971


Features

- Excellent EMI suppression
- Low parasitic inductance and low electrical losses
- High attenuation at higher natural resonant frequency
- Space saving on the PCB
- To AEC-Q200

Applications

- EMI suppression / Decoupling and filtering
- Noise suppression and broadband I/O filtering
- Automotive brake systems (e.g. ABS)
- Hall sensors

Termination

- For soldering: 4 terminations, nickel barrier terminations (Ni)

Options

- Alternative capacitance values, capacitance tolerances, COG characteristic and feedthrough arrays available on request

Delivery mode

- Cardboard tape, 180-mm reel

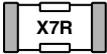
Electrical data

Temperature characteristic		X7R	
Max. relative capacitance change within $-55\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$	$\Delta C/C$	± 15	%
Climatic category (IEC 60068-1)		55/125/56	
Standard		EIA	
Dielectric		Class 2	
Rated voltage ¹⁾	V_R	50	VDC
Test voltage	V_{test}	$2.5 \cdot V_R/5\text{ s}$	VDC
Capacitance range / E series	C_R	2.2 nF ... 10 nF (E3); 220 nF	
Dissipation factor (limit value)	$\tan \delta$	$< 25 \cdot 10^{-3}$	
DC resistance	R_{DC}	< 600	m Ω
Insulation resistance ²⁾ at $+ 25\text{ }^{\circ}\text{C}$	R_{ins}	$> 10^5$	M Ω
Insulation resistance ²⁾ at $+125\text{ }^{\circ}\text{C}$	R_{ins}	$> 10^4$	M Ω
Time constant ²⁾ at $+ 25\text{ }^{\circ}\text{C}$	τ	> 1000	s
Time constant ²⁾ at $+125\text{ }^{\circ}\text{C}$	τ	> 100	s
Operating temperature range	T_{op}	$-55 \dots +125$	$^{\circ}\text{C}$
Ageing ³⁾		yes	

1) Note: No operation on AC line.

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

3) Refer to chapter "General technical information", "Ageing", page 219.



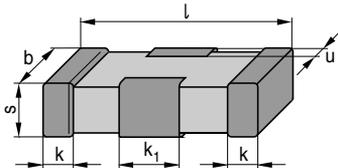
Multilayer ceramic capacitors

X7R

Capacitance tolerances

Code letter	S (standard for 1206)	Z (standard for 1806)
Tolerance	+50/-20%	+80/-20%

Dimensional drawing



KKE0328-F

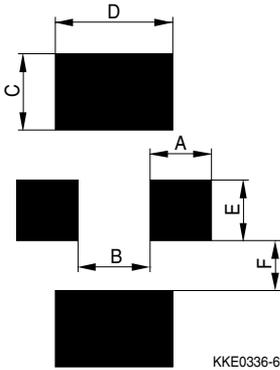
Dimensions (mm)

Case size	(inch) (mm)	1206 3216	1806 4616
l		3.2 ±0.20	4.6 ±0.20
b		1.6 ±0.15	1.6 ±0.30
s		0.9 max.	1.2 max.
k		0.4 ±0.2	0.4 ±0.3
k ₁		1.0 ±0.35	1.5 ±0.3
u		0.2 +0.2/-0.1	0.3 +0.3/-0.2

Tolerances to CECC 32101-801



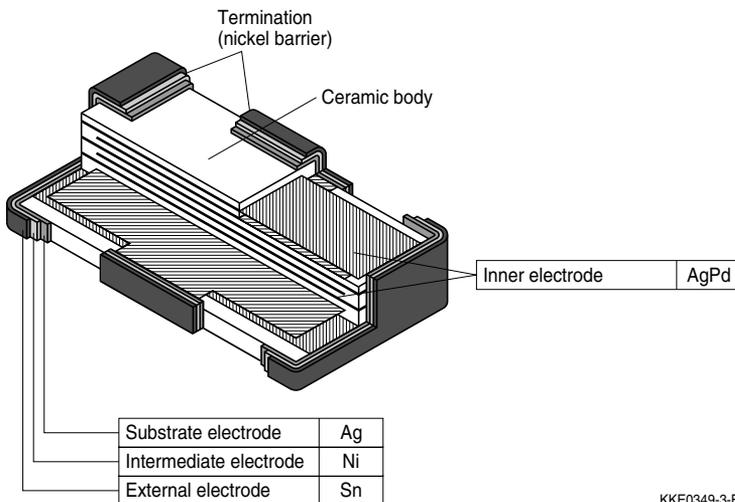
Recommended solder pad



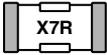
Recommended dimensions (mm) for reflow soldering

Case size (inch/mm)	Type	A	B	C	D	E	F
1206/3216	feedthrough chip	0.73 ...	0.93 ...	0.80 ...	1.00 ...	0.73 ...	0.74 ...
		0.83	1.20	0.90	1.40	0.83	0.85
1806/4616	feedthrough chip	1.00	0.60	1.00	2.00	1.50	1.00

Termination



KKE0349-3-E


Multilayer ceramic capacitors
X7R; 1206 and 1806
Product range feedthrough capacitors, X7R

Size ¹⁾	1206	1806
inch	0.492	0.708
mm	12.5	18.0
Type	B37872	B37971
V_R (VDC)	50	50
C_R		
2.2 nF		
4.7 nF		
10 nF		
220 nF		

Ordering codes and packing for X7R feedthrough capacitors, 50 VDC, nickel barrier terminations

C_R ²⁾	Ordering code	Chip thickness mm	Cardboard tape, Ø 180-mm reel	Blister tape, Ø 180-mm reel
			** \triangle 11 pcs/reel	** \triangle 12 pcs/reel

Case size 1206, 50 VDC

2.2 nF	B37872U5222S0**	0.8 ± 0.1	4000	—
4.7 nF	B37872U5472S0**	0.8 ± 0.1	4000	—
10 nF	B37872U5103S0**	0.8 ± 0.1	4000	—

Case size 1806, 50 VDC

220 nF	B37971U5224Z0**	1.0 ± 0.2	—	3000
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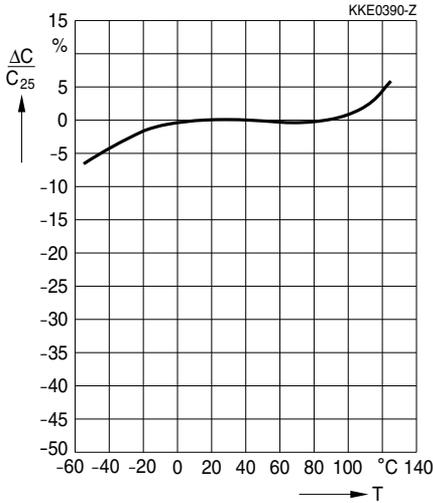
1) $l \times b$ (inch) / $l \times b$ (mm)

2) Other capacitance values on request.

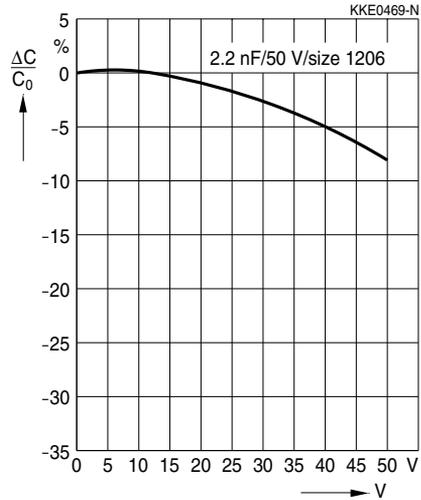


Typical characteristics¹⁾

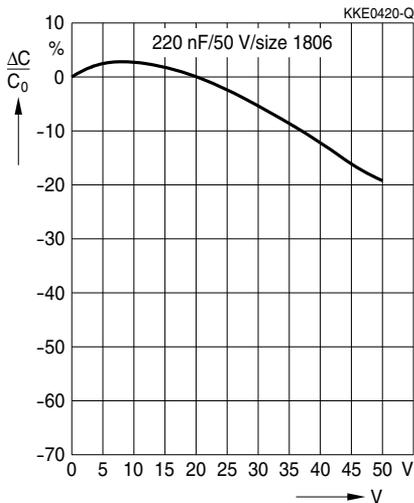
Capacitance change $\Delta C/C_{25}$ versus temperature T



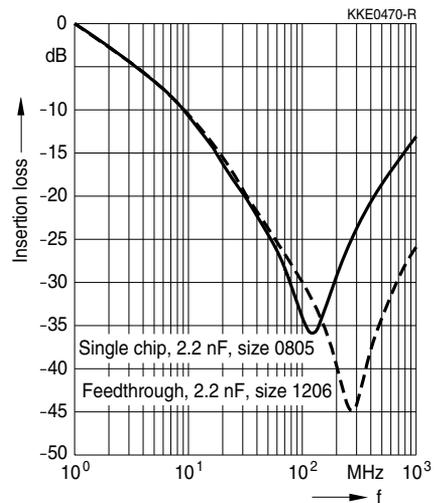
Capacitance change $\Delta C/C_0$ versus superimposed DC voltage V



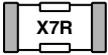
Capacitance change $\Delta C/C_0$ versus superimposed DC voltage V



Insertion loss dB versus frequency f

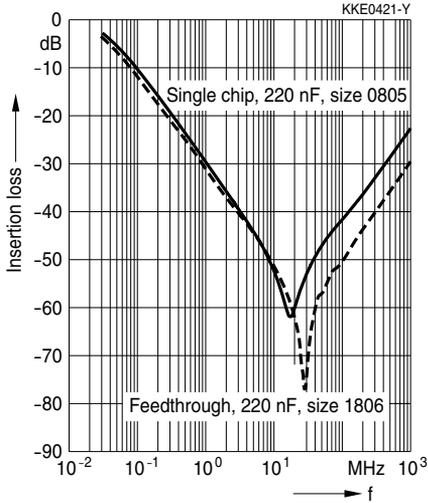


1) For more detailed information on frequency behavior and characteristics see www.epcos.com/mlcc_impedance.

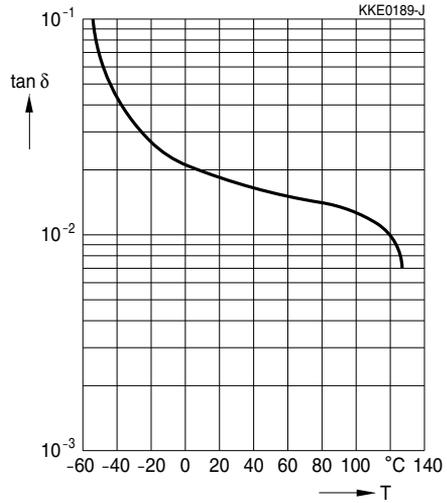


Typical characteristics¹⁾

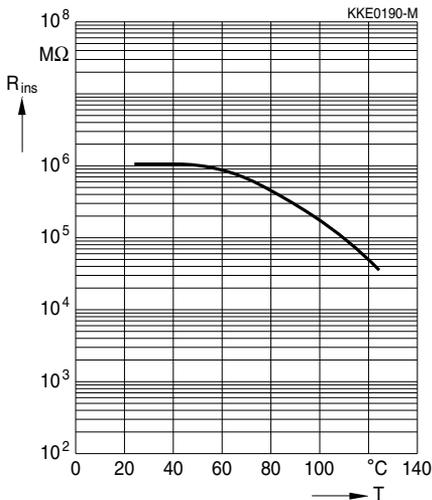
Insertion loss dB versus frequency f



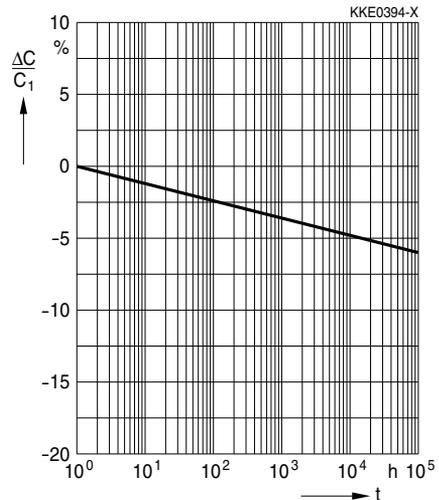
Dissipation factor $\tan \delta$ versus temperature T



Insulation resistance R_{ins} versus temperature T



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



1) For more detailed information on frequency behavior and characteristics see www.epcos.com/mlcc_impedance.