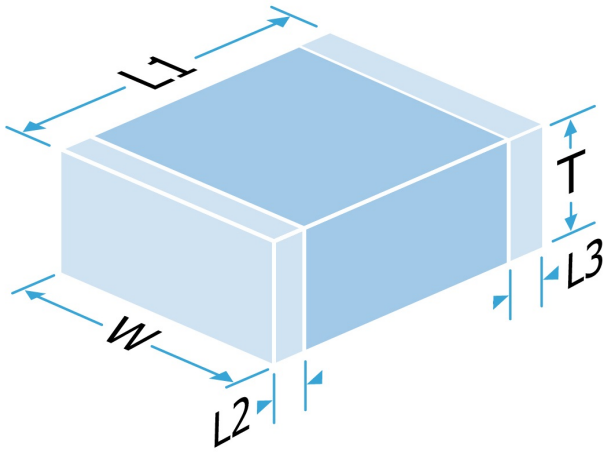
Multilayer Ceramic Chip Capacitor

Part Number: 0402205005O471KXTFM2

Description: 0402 50Vdc 470pF ±10% X7R - Non Mag (CTI ≥ 600)

A range of X7R MLC capacitors with a guaranteed non-magnetic / relative permeability of 1.000 and having a customised design to achieve a lower ESR and improved Q factor than normal X7R MLCC's. Ideal for critical applications such as NMR / MRI and where PIM could potentially be an issue if nickel was present. These MLCC's can be used where an improved performance is required, such as blocking caps.



Mechanical Specification

Size Code	0402
Length (L1) in mm (")	1.0 ± 0.10 (0.04 ± 0.004)
Width (W) in mm (")	0.52 ± 0.12 (0.02 ± 0.005)
Thickness (T) in mm (")	0.64 Max (0.025 Max)
Minimum Termination Band (L2,L3) in mm (")	0.10 (0.004)
Maximum Termination Band (L2,L3) in mm (")	0.40 (0.016)
Termination Material	Copper Barrier, Sn Plated Solder (Non-Mag., RoHS compliant)
Solderability	IEC-60068-2-58
Packaging	7" Reel Horizontal Orientation, 10000 per reel

General Electrical Specification

Rated Voltage	50Vdc
Nominal Capacitance Value	470pF
Capacitance Tolerance	±10%
Tangent of Loss Angle (Tan δ)	≤0.025
Capacitance and Tan δ Test Conditions	1.0Vrms @ 1kHz
Voltage Proof (Voltage applied for 5 secs max. @ 50mA max. charge current. 50% Max, RH)	125Vdc
Min Insulation Resistance (IR)	100.00GOhm @ 50Vdc
Dielectric Classification	X7R - Non Mag (CTI ≥ 600)
Rated Temperature Range	-55°C / +125°C
Maximum Capacitance Change over Temperature Range	No DC Voltage ±15% Rated DC Voltage -
Climatic Category (IEC)	55/125/56
Ageing Characteristic	<2% per decade (nominal capacitance is 1000 hour value)

Knowles Precision Devices - Sales

Europe: KPD-Europe-sales@knowles.com

Asia: KPD-Asia-sales@knowles.com

USA: KPD-NA-sales@knowles.com

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Date: Wednesday, July 02, 2025

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Multilayer Ceramic Chip Capacitor

Part Number: 0402205004 71KXTFM2

Description: 0402 50Vdc 470pF ±10% X7R - Non Mag (CTI ≥ 600)

Environmental

RoHS Compliant to 2011/65/EC as amended by 2015/863/EU	Compliant
REACH Compliant	247 compliant
California Proposition 65	No exposure risk

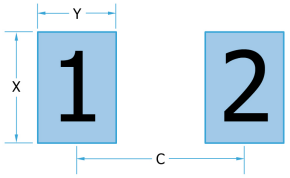
Board Layout

Knowles' conventional 2-terminal chip capacitors can generally be mounted using pad designs in accordance with international specification IPC-7351, Generic Requirements for Surface Mount Design and Land Pattern Standards, but there are some other factors that have been shown to reduce mechanical stress, such as reducing the pad width to less than the chip width. In addition, the position of the chip on the board should be considered.

Some high voltage parts may require modifications to the board layout and/or the addition of a conformal coating to prevent flashover, especially under high humidity conditions. Board cleanliness and environmental conditions can also impact this. Refer to application note AN0043 for further information.

IPC-7351 pad design

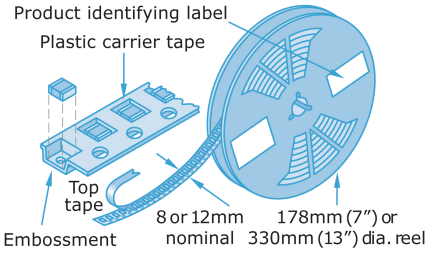
	0402	
C	0.90mm	0.035"
Y	0.65mm	0.026"
X	0.64mm	0.025"



Packaging

Tape packaging information for tape-and-reel parts:

Tape and reel packing of surface mounting chip capacitors for automatic placement are in accordance with IEC60286-3.



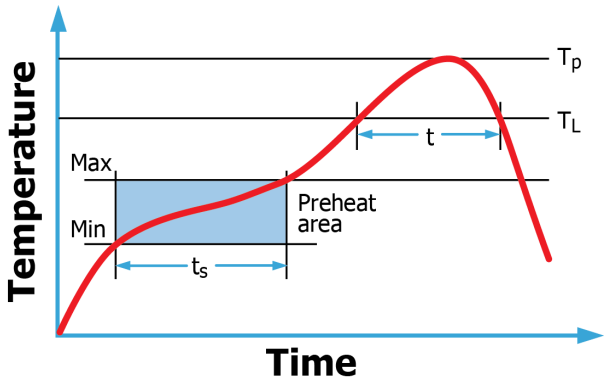
Soldering

Reflow solder in accordance with IPC-A-610. Recommended reflow profile as laid down in IPC/JEDEC J-STD-020.

Wave soldering is also possible, but care must be taken for case sizes 1210 and larger and component thickness >1.0mm. Trials are encouraged.

Hand soldering is not recommended and can lead to component damage through thermal shock.

PdAg terminations are primarily intended for conductive epoxy attachment - they may be suitable for soldering but trials are recommended.



Application notes with mounting and handling guidance are available on request.

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Multilayer Ceramic Chip Capacitor

Part Number: 0402205005471KXTFM2	**Description:** 0402 50Vdc 470pF ±10% X7R - Non Mag (CTI ≥ 600)

DC Bias Characteristics

Insufficient data exists to automatically calculate dc bias data for this specific part number.

Please contact your local sales office and our engineering teams will be happy to look at requests for part specific data.

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Multilayer Ceramic Chip Capacitor

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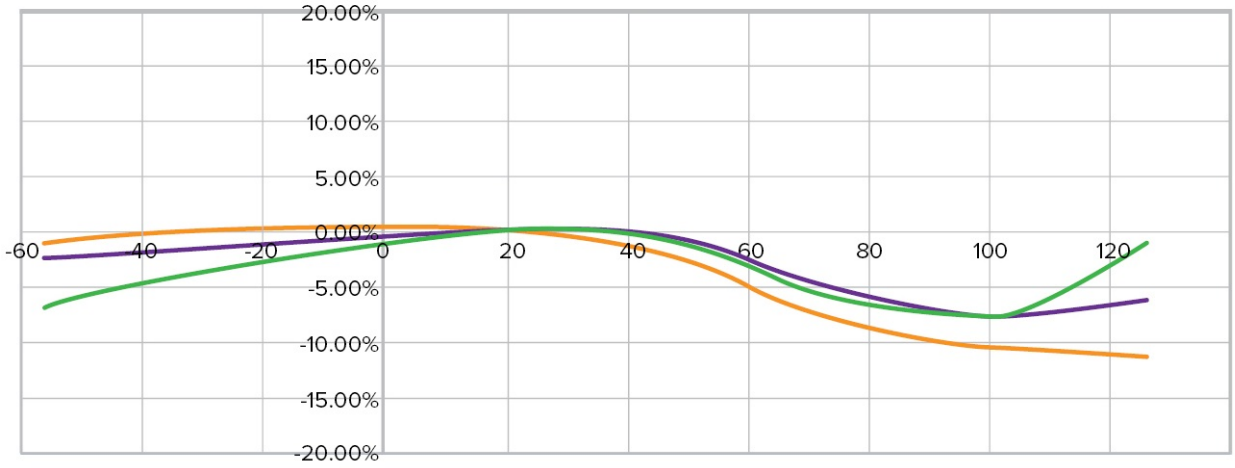
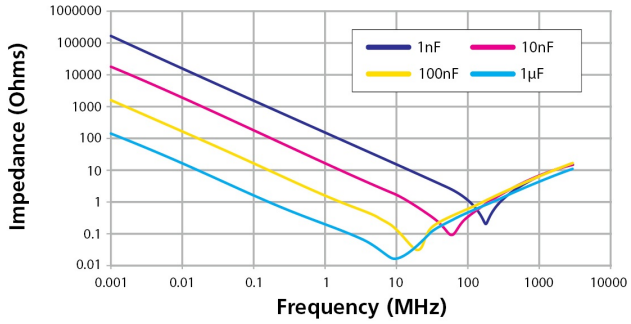
Description: 0402 50Vdc 470pF ±10% X7R - Non Mag (CTI ≥ 600)

Typical Capacitance Change vs Temperature

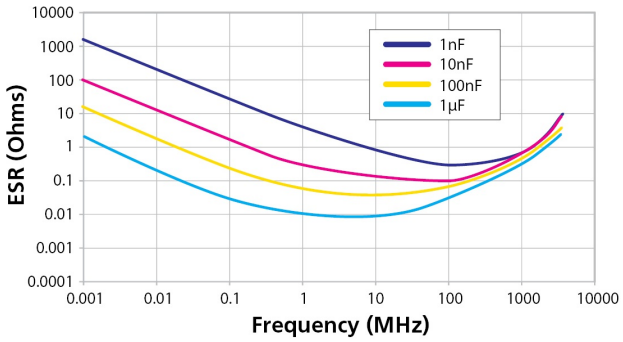


Typical TC Curves for X7R capacitors showing different dielectric types

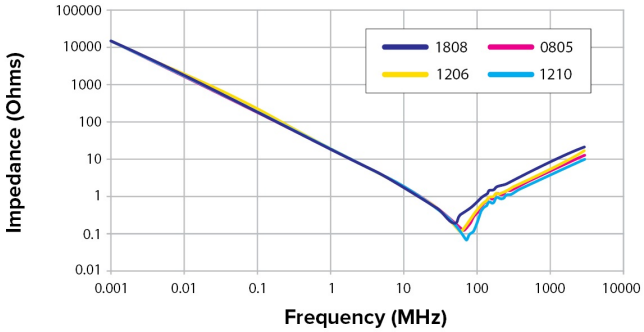
Stable X7R Dielectric



Stable X7R Dielectric



Stable X7R Dielectric — 10nF



Typical Performance Data - X7R

For part specific data, please contact your local sales office

This data is for reference only and does not constitute a specification.

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