

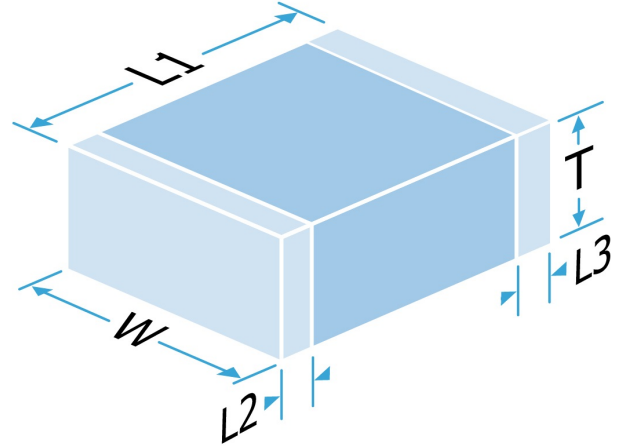
# Multilayer Ceramic Chip Capacitor

**Part Number:** 2211Y3K00392KST

**Description:** 2211 3000Vdc 3.9nF ±10% X7R (2R1) to AEC-Q200

A range of X7R MLC capacitors fully tested and approved to automotive specification AEC-Q200. Available in a wide selection of chip sizes, working voltages and termination options, including FlexiCap™, the world's first commercially available flexible termination.

WS2 and WS3 parts use StackiCap™ patented construction technology.



## Mechanical Specification

Size Code	2211
Length (L1) in mm (")	5.7 +0.50/-0.40 (0.225 +0.02/-0.016)
Width (W) in mm (")	2.79 ± 0.30 (0.11 ± 0.012)
Thickness (T) in mm (")	2.54 Max (0.1 Max)
Minimum Termination Band (L2,L3) in mm (")	0.25 (0.010)
Maximum Termination Band (L2,L3) in mm (")	0.80 (0.030)
Termination Material	FlexiCap™ Polymer termination, Nickel barrier, Sn Plated Solder (RoHS compliant)
Solderability	IEC-60068-2-58
Packaging	7" Reel Horizontal Orientation, 750 per reel
Conformal Coating	Considered essential and was used for internal qualification testing

## General Electrical Specification

Rated Voltage	3000Vdc
Nominal Capacitance Value	3.9nF
Capacitance Tolerance	±10%
Tangent of Loss Angle (Tan δ)	≤0.025
Capacitance and Tan δ Test Conditions	1.0Vrms @ 1kHz
Voltage Proof	3600Vdc
(Voltage applied for 5 secs max. @ 50mA max. charge current)	
Min Insulation Resistance (IR)	100.00GOhm @ 100Vdc
Dielectric Classification	X7R (2R1) to AEC-Q200
Rated Temperature Range	-55°C / +125°C
Maximum Capacitance Change over Temperature Range	No DC Voltage ±15%
Climatic Category (IEC)	Rated DC Voltage -
Ageing Characteristic	55/125/56
	<2% per decade (nominal capacitance is 1000 hour value)

### Knowles Precision Devices - Sales

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This datasheet is for a standard item and is confirmed valid on the date generated, the latest published data for this part may differ and is available at <http://www.knowlescapacitors.com> or by contacting us.

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Date: Tuesday, April 25, 2023

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## Environmental

RoHS Compliant to 2011/65/EC as amended by 2015/863/EU	Compliant
REACH Compliant	233 compliant
California Proposition 65	No exposure risk

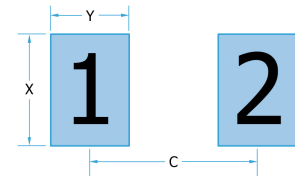
## Board Layout

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. Refer to application note AN0043 for further information.

### IPC-7351 pad design

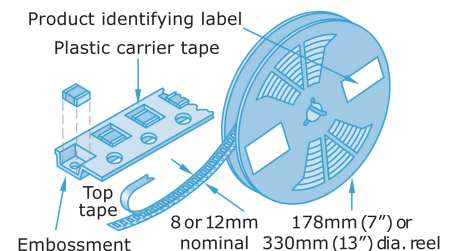
	2211	
C	5.40mm	0.213"
Y	1.35mm	0.053"
X	3.10mm	0.122"



## 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

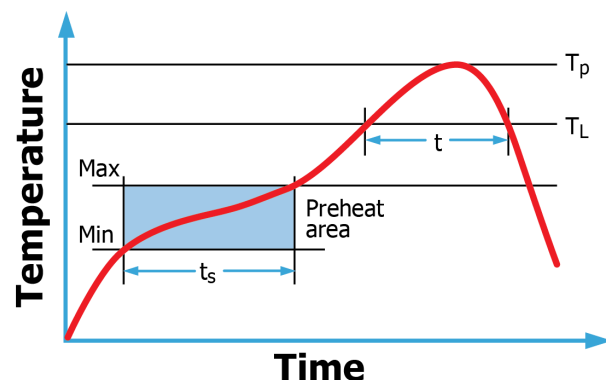
Reflow solder in accordance with IPC-A-610. Recommended reflow profile as laid down in IPC/JEDEC J-STD-020.

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.



Compex      DLI      Johanson MFG      Novacap      Syfer      Voltronics

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