

Metal Frame J-Lead Terminal Multilayer Ceramic Chip Capacitor

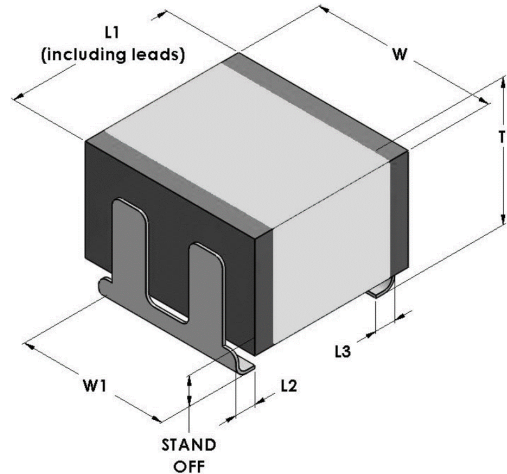
Part Number: 2220B5000684KSTUW031

Description: 2220 500Vdc 680nF ±10% X7R (2R1) to AEC-Q200

A range of X7R MLC capacitors to suit a variety of applications. In a wide selection of rated voltages and chip sizes 2220 / 2225 and with stand-off leads to raise the ceramic body off the board.

The stand-off tab style 'J' lead offers enhanced performance under thermal shock and mechanical vibration test conditions. Capable of 3000 thermal cycles with no degradation of interconnect when solder mounted to FR4 board.

Suitable for both industrial and automotive markets, including 3kV and 4kV parts to satisfy the demands of 800V battery system DWV testing.



Mechanical Specification

Size Code	2220
Length, incl. leads (L1) in mm (")	6.0 ± 0.40 (0.23 ± 0.016)
Width (W) in mm (")	5.0 ± 0.40 (0.197 ± 0.016)
Thickness, incl. leads (T) in mm (")	5.5 Max (0.217 Max)
Lead Length (L2 and L3) in mm (")	0.7 Typ (0.028 Typ)
Lead Width (W1) in mm (")	5.10 ± 0.20 (0.200 ± 0.008)
Standoff in mm (")	1.0 Typ (0.039 Typ)
Solderability	IEC-60068-2-58
Packaging	7" Reel Horizontal Orientation, 330 per reel
Lead Material / Finish	Silver plated copper
Solder Attachment Type	SnSb
Conformal Coating	Not normally required

General Electrical Specification

Rated Voltage	500Vdc
Nominal Capacitance Value	680nF
Capacitance Tolerance	±10%
Tangent of Loss Angle (Tan δ)	≤0.025
Capacitance and Tan δ Test Conditions	1.0Vrms @ 1kHz
Voltage Proof	750Vdc
(Voltage applied for 5 secs max. @ 50mA max. charge current. 50% Max, RH)	
Min Insulation Resistance (IR)	1.47GOhm @ 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)

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Data is correct to the best of our knowledge, errors and omissions excepted.

Date: Tuesday, February 18, 2025

20250218 054031779UTC



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Description: 2220 500Vdc 680nF ±10% X7R (2R1) to AEC-Q200

Environmental

RoHS Compliant to 2011/65/EC as amended by 2015/863/EU

Compliant with exemption 7(a)

REACH Compliant

241 compliant

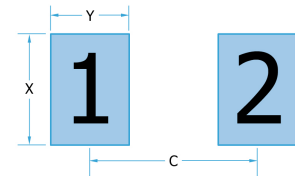
California Proposition 65

No exposure risk

Board Layout

IPC-7351 pad design

	2220	
C	5.30mm	0.209"
Y	1.50mm	0.059"
X	5.40mm	0.213"



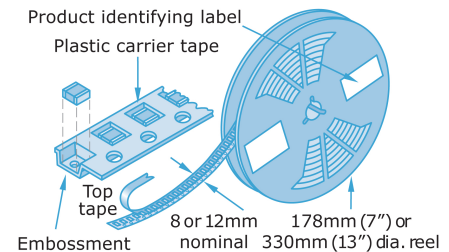
Knowles' conventional 2-terminal chip capacitors can generally be mounted using pad designs in accordance with international specification IPC-7351, Generic Requirements for Surface Mount Design and Land Pattern Standards, but there are some other factors that have been shown to reduce mechanical stress, 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.

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

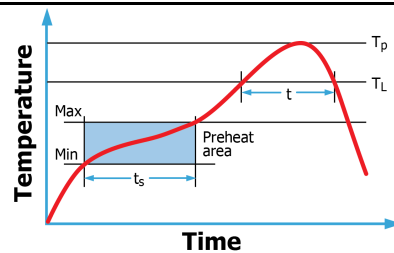
Reflow solder in accordance with IPC-A-610. Recommended reflow profile as laid down in IPC/JEDEC J-STD-020.

Wave soldering not possible for Tab leaded stand-off parts.

Peak re-flow temperature (T_p) 250°C. Solder volume should be calculated such that the meniscus between tab and board remains under the 'cut-out' guidance edge on the tab (see diagram). Excessive solder or heat may reflow the solder between the lead and MLCC, impacting the integrity of the joint

Hand soldering of Tab leaded parts is not recommended.

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



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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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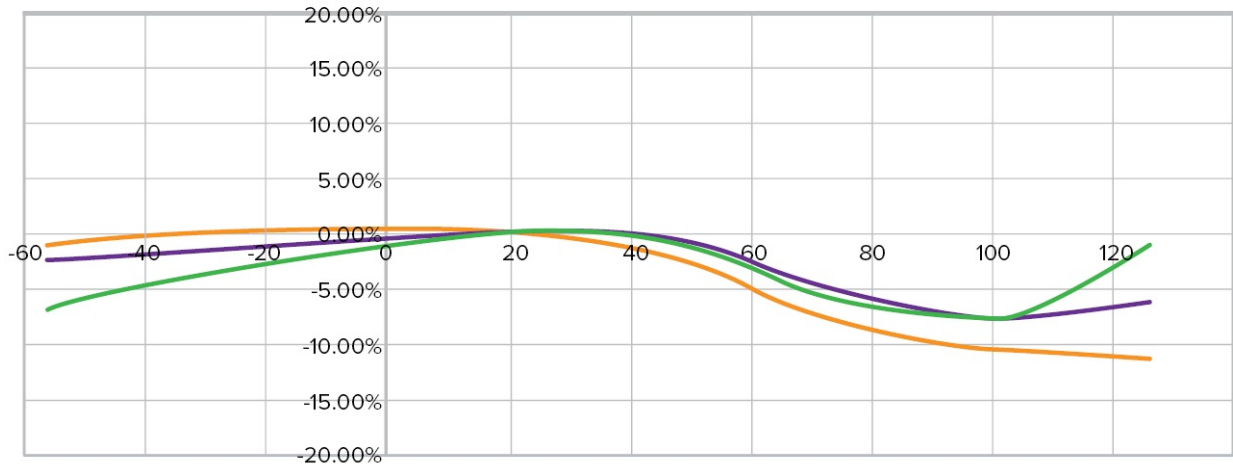
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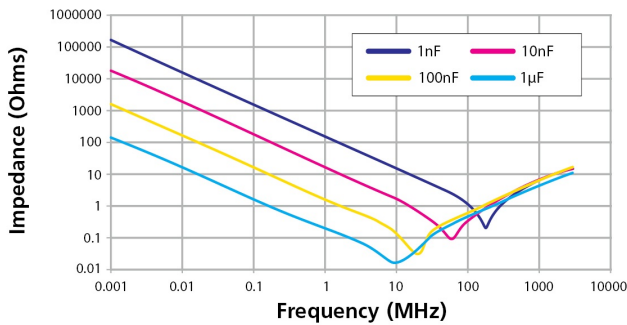
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Typical Capacitance Change vs Temperature

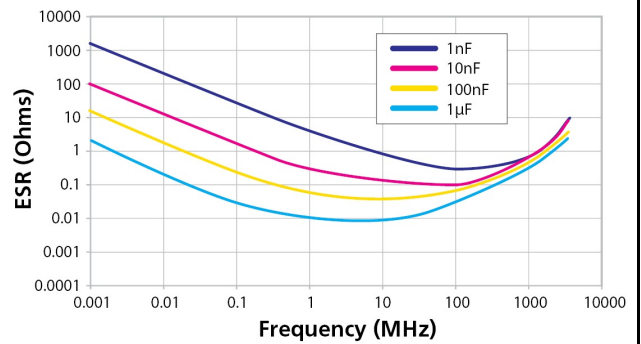


Typical TC Curves for X7R capacitors showing different dielectric types

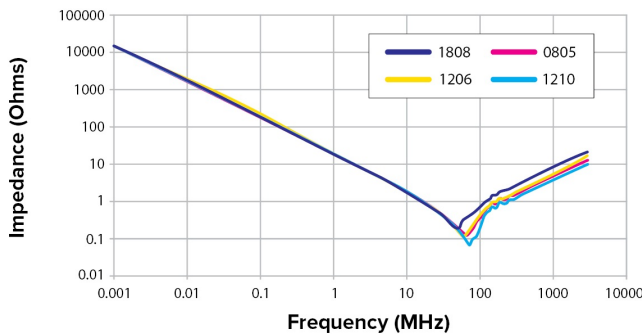
Stable X7R Dielectric



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.

Complex

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