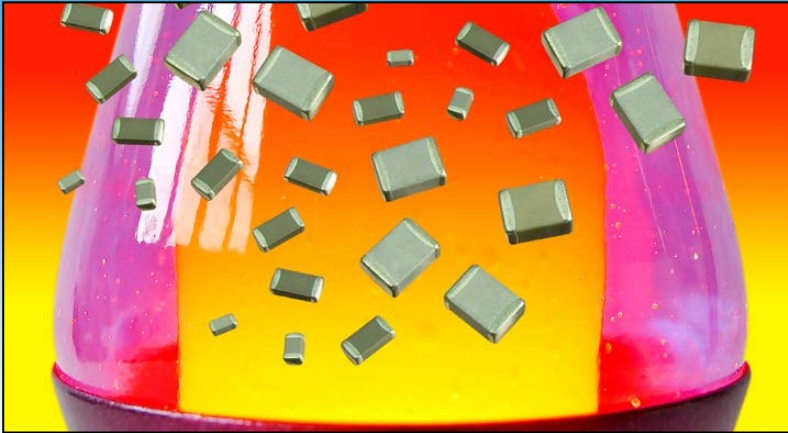


HiT range

200°C MLC capacitors

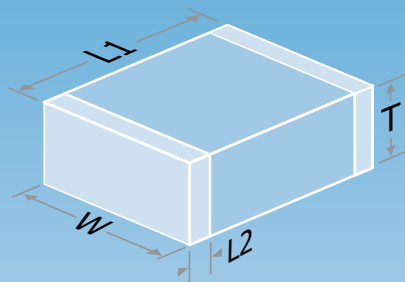


HiT range features

**RoHS
Compliant
Pb Free
Sn Finish**

- 200°C operating temperature
- 0603 to 2220 chip sizes
- COG/NP0 (1B) and X7R (2R1) dielectric options
- Capacitance range COG/NP0 (1B) from 3.9pF up to 47nF
- Capacitance range X7R (2R1) from 100pF up to 4.7μF
- Voltage ratings from 10V to 630V
- RoHS compliant / Pb Free
- Sn over Ni termination
- Sample kits available

Dimensions



Size	Length (L1) mm ~ inches	Width (W) mm ~ inches	Thickness (T) max mm ~ inches	Termination Band (L2)	
				min mm ~ inches	max mm ~ inches
0603	1.6 ± 0.15 0.063 ± 0.006	0.8 ± 0.15 0.032 ± 0.006	0.80 ~ 0.032	0.20 ~ 0.004	0.40 ~ 0.016
0805	2.0 ± 0.20 0.079 ± 0.008	1.25 ± 0.20 0.049 ± 0.008	1.37 ~ 0.054	0.25 ~ 0.010	0.75 ~ 0.030
1206	3.2 ± 0.20 0.126 ± 0.008	1.6 ± 0.20 0.063 ± 0.008	1.70 ~ 0.068	0.25 ~ 0.010	0.75 ~ 0.030
1210	3.2 ± 0.20 0.126 ± 0.008	2.5 ± 0.20 0.098 ± 0.008	2.0 ~ 0.080	0.25 ~ 0.010	0.75 ~ 0.030
1808	4.5 ± 0.35 0.180 ± 0.014	2.0 ± 0.30 0.08 ± 0.012	2.0 ~ 0.080	0.25 ~ 0.010	1.0 ~ 0.040
1812	4.5 ± 0.30 0.180 ± 0.012	3.2 ± 0.20 0.126 ± 0.008	2.5 ~ 0.100	0.25 ~ 0.010	1.143 ~ 0.045
2220	5.7 ± 0.40 0.225 ± 0.016	5.0 ± 0.40 0.197 ± 0.016	2.5 ~ 0.100	0.25 ~ 0.010	1.0 ~ 0.040

Description

The HiT range of multilayer ceramic capacitors is suitable for a variety of high temperature applications including: oil exploration, geothermal, military, automotive under-hood and avionics.

This range is manufactured to exacting standards using our unique screen printing process. This provides a high quality component suitable for demanding applications.

Specification

Capacitance Values See table for full list of values

COG/NP0 (1B)	X7R (2R1)
3.9pF - 47nF	100pF - 4.7μF

Operating Temperature

-55°C to +200°C

Temperature Coefficient of Capacitance (Typical)

COG/NP0 (1B)	X7R (2R1)
30ppm/°C to +125°C	±15% to +125°C

Dielectric Withstand Voltage

≤200V	2.5 times
>200V to <500V	Rated voltage +250V
500V to ≤1kV	1.5 times

Insulation Resistance

Time constant (Ri x Cr) (whichever is the least)

25°C	>100GΩ or 1000s
200°C	>1GΩ or 10s

Ageing Rate

COG/NP0 (1B)	X7R (2R1)
Zero	X7R (2R1) typically less than 2% per time decade

Termination Material

Standard finish is Sn plate over Ni undercoat.
See ordering information.

Solderability

IEC 60068-2-5 8 / MIL-STD-202 METHOD 208.
Passed 3 times reflow profile defined in J-STD-020. Compatible with lead free and high melting point solders. Standard finish is Sn plate over Ni undercoat.

Lead Free Soldering

Pb Free. This range is fully compliant with the RoHS, REACH and WEEE directives and parts are compatible with lead free and high melting point solders. Standard finish is Sn plate over Ni undercoat.

Climatic Category

55/200/56



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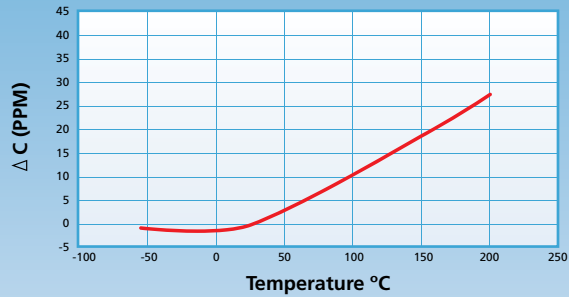
HiT range

200°C MLC capacitors

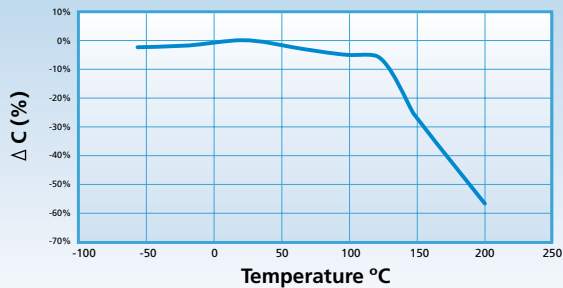
Typical Performance Data

TCC

Ultra Stable COG/NP0 (1B) dielectric

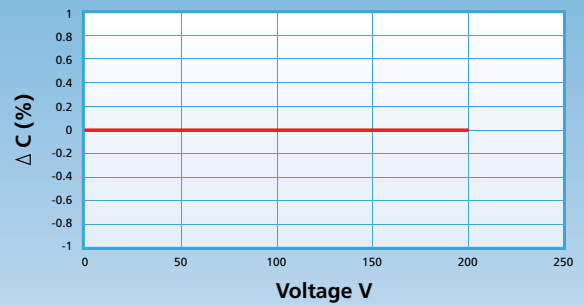


Stable X7R (2R1) dielectric



VCC

Ultra Stable COG/NP0 (1B) dielectric

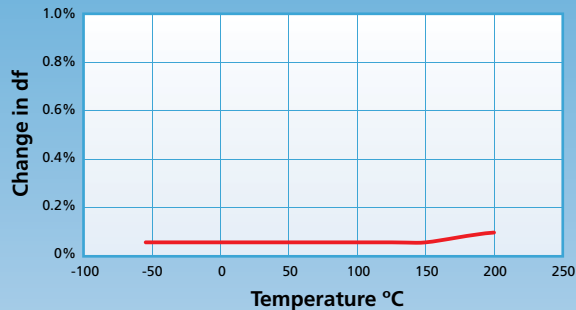


VCC performance of X7R (1B) parts is design specific. Consult factory for more information.

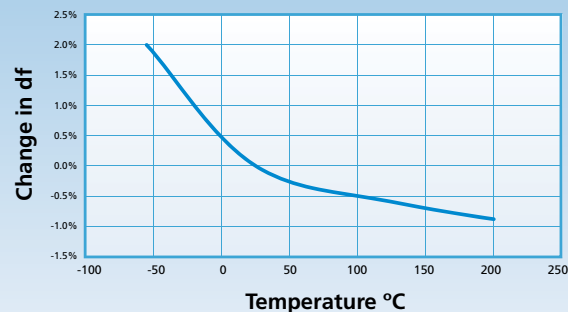
COG/NP0 (1B) parts life tested at maximum rated voltage and temperature for 4000Hr duration.

df vs Temp.

Ultra Stable COG/NP0 (1B) dielectric

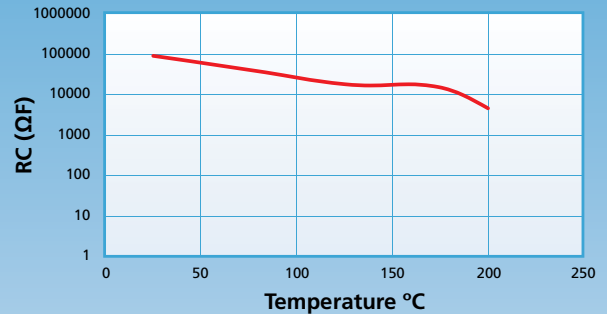


Stable X7R (2R1) dielectric

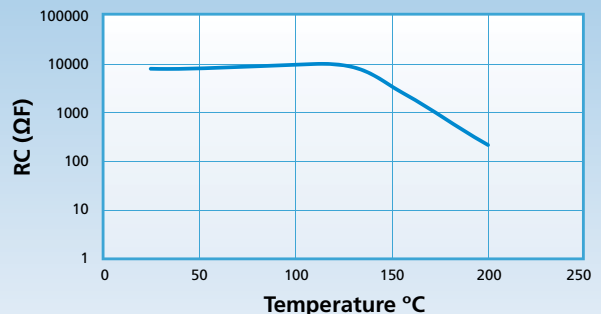


Hot IR result

Ultra Stable COG/NP0 (1B) dielectric



Stable X7R (2R1) dielectric

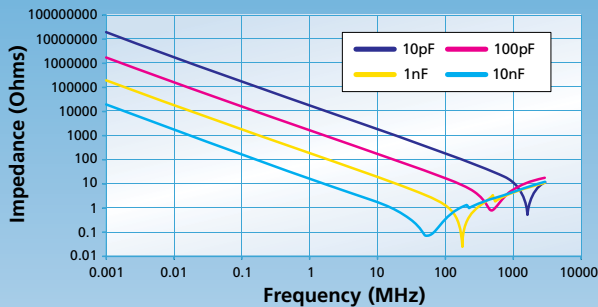


Note: Data is typical only and does not constitute a specification. Knowles Precision Devices reserves the right to modify or substitute with equivalent parts that meet or exceed the specification.

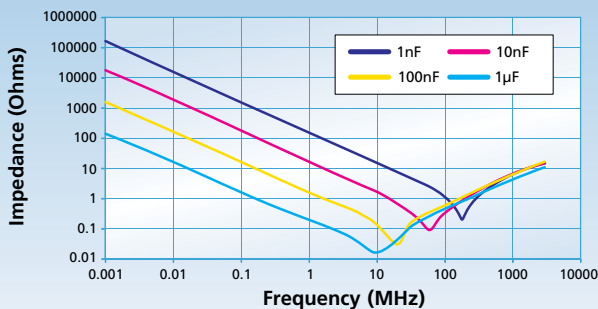
HiT range 200°C MLC capacitors

Impedance vs Frequency

Ultra Stable COG/NP0 (1B) dielectric

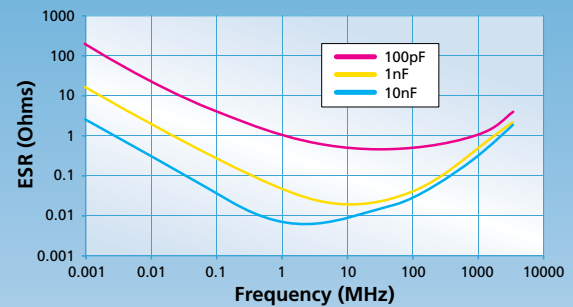


Stable X7R (2R1) dielectric

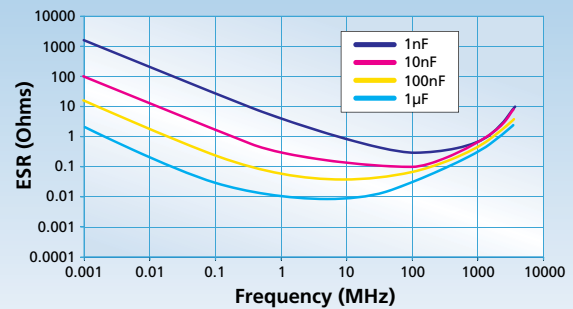


ESR vs Frequency

Ultra Stable COG/NP0 (1B) dielectric



Stable X7R (2R1) dielectric



Note: Data is typical only and does not constitute a specification. Knowles Precision Devices reserves the right to modify or substitute with equivalent parts that meet or exceed the specification.

Maximum capacitance values - HiT range - 200°C capacitors

Rated Voltage	Chip Size													
	0603		0805		1206		1210		1808		1812		2220	
	COG/NP0 (1B)	X7R (2R1)	COG/NP0 (1B)	X7R (2R1)	COG/NP0 (1B)	X7R (2R1)	COG/NP0 (1B)	X7R (2R1)	COG/NP0 (1B)	X7R (2R1)	COG/NP0 (1B)	X7R (2R1)	COG/NP0 (1B)	X7R (2R1)
Min Cap	3.9pF	100pF	4.7pF	100pF	10pF	100pF	22pF	100pF	22pF	100pF	47pF	150pF	68pF	220pF
10V	470pF	100nF	1.8nF	220nF	3.9nF	820nF	8.2nF	1.2μF	8.2nF	1.2μF	15nF	2.2uF	47nF	4.7μF
16V	470pF	100nF	1.8nF	220nF	3.9nF	820nF	8.2nF	1.2μF	8.2nF	1.2μF	15nF	2.2uF	47nF	4.7μF
25V	470pF	47nF	1.8nF	220nF	3.9nF	820nF	8.2nF	1.2μF	8.2nF	1.2μF	15nF	2.2uF	47nF	4.7μF
50V	470pF	15nF	1.8nF	100nF	3.9nF	270nF	8.2nF	680nF	8.2nF	560nF	15nF	1.5uF	47nF	2.2μF
100V	390pF	8.2nF	1.5nF	33nF	3.3nF	100nF	5.6nF	270nF	6.8nF	180nF	12nF	560nF	39nF	1.0μF
200V	180pF	1.2nF	820pF	6.8nF	1.8nF	27nF	3.9nF	68nF	3.9nF	47nF	10nF	82nF	39nF	120nF
250V	120pF	820pF	470pF	3.9nF	1.0nF	15nF	2.2nF	47nF	2.2nF	27nF	5.6nF	56nF	12nF	82nF
500V	100pF	270pF	220pF	1.5nF	820pF	3.9nF	1.5nF	12nF	1.8nF	12nF	4.7nF	18nF	10nF	68nF
630V	-	-	68pF	-	330pF	-	820pF	-	820pF	-	2.7nF	-	6.8nF	-

Note: Other capacitance values may become available, please contact the Sales Office if you need values other than those shown in the above table. For dimensions and soldering information, please go to our website www.knowlescapacitors.com

Taped quantities - HiT range - 200°C capacitors

Chip Size	0603	0805	1206	1210	1808	1812	2220
7" Reel	4,000	3,000	2,500	2,000	1,500	500	500
13" Reel	16,000	12,000	10,000	8,000	6,000	2,000	2,000

HiT range

200°C MLC capacitors

Ordering information (Syfer Brand) - HiT range - 200°C capacitors

1206	J	100	0103	M		X	T	H20
Chip size	Termination	Voltage	Capacitance in picofarads (pF)	Capacitance tolerance		Dielectric	Packaging	Suffix Code
0603 0805 1206 1210 1808 1812 2220	J = Nickel barrier with 100% matte tin plating. RoHS compliant. Lead free.	010 = 10V 016 = 16V 025 = 25V 050 = 50V 100 = 100V 200 = 200V 250 = 250V 500 = 500V 630 = 630V	≥1.0pF & <10pF Insert a P for the decimal point as the second character. e.g., 8P20 = 8.2pF ≥10pF First digit is 0. Second and third digits are significant figures of capacitance code. The fourth digit is the number of zeros following. e.g., 0101 = 100pF	C0G/NP0 (1B) B = ±0.10pF C = ±0.25pF D = ±0.50pF F = ±1% G = ±2% J = ±5% K = ±10% M = ±20%	X7R (2R1) J = ±5% K = ±10% M = ±20%	G = C0G/NP0 (1B) (BME) X = X7R (2R1)	T = 178mm (7") reel R = 330mm (13") reel B = Bulk pack - tubs	H20 HiT range

Ordering information (Novacap Brand) - HiT range - 200°C capacitors

1206	RE	331	J		501	N	H	T
Case size	Dielectric	Capacitance in picofarads (pF)	Capacitance tolerance		Voltage	Termination	Screening	Packaging
0603 0805 1206 1210 1808 1812 2220	RD = C0G/NP0 (1B) (200°C) RE = X7R (2R1) (200°C)	First and Second digits are significant figures of capacitance code. The fourth digit is number of 0's following. Example: 103 = 10000pF R = decimal	C0G/NP0 (1B) B = ±0.10pF C = ±0.25pF D = ±0.50pF F = ±1% G = ±2% J = ±5% K = ±10% M = ±20%	X7R (2R1) J = ±5% K = ±10% M = ±20%	100 = 10V 160 = 16V 250 = 25V 500 = 50V 101 = 100V 201 = 200V 251 = 250V 501 = 500V 631 = 630V	N = Nickel barrier with 100% matte tin plating. RoHS compliant. Lead free.	H = High Temp Screening - if required	T = 178mm (7") reel 330mm (13") reel None = Bulk pack - tubs