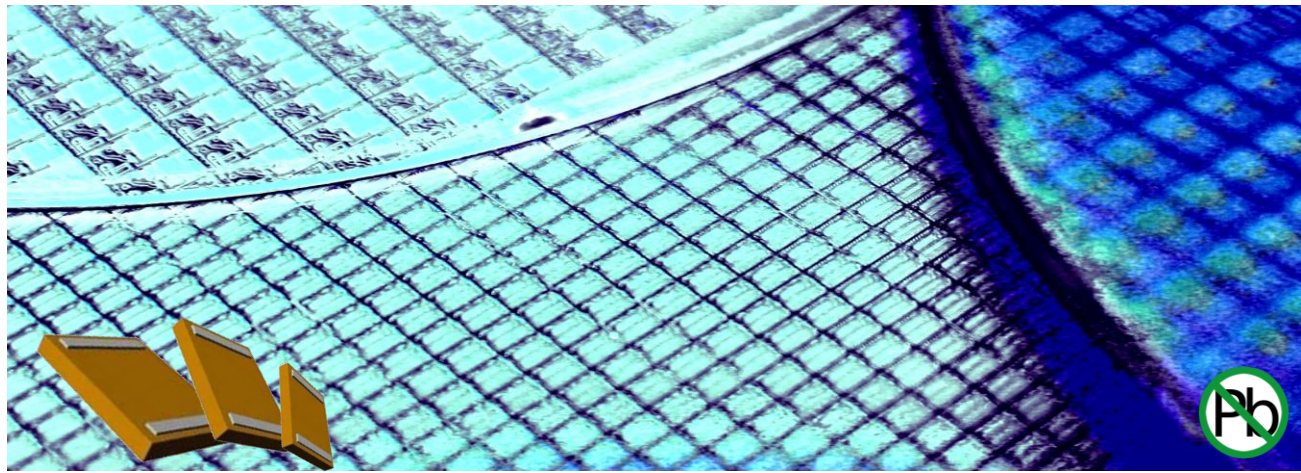


# XTSC427.xxx - 1206 Extreme Temperature Silicon Capacitor

Rev 3.1



## Key features

- Ultra High temperature up to 250°C:
  - ◆ Temperature Coeff: <2% (-55 °C to +250 °C)
  - ◆ Voltage <0.1 %/V
  - ◆ Negligible capacitance loss through aging
- Unique high capacitance in EIA/1206 package size, up to 1  $\mu\text{F}$
- High reliability (FIT <0.017 parts / billion hours)
- Low leakage current down to 100 pA
- Low ESL and Low ESR
- Suitable for lead free reflow-soldering \*Please refer to our assembly Application Note for further recommendations

Thanks to the unique IPDiA Silicon capacitor technology, most of the problems encountered in demanding applications can be solved.

**EXtreme Temperature Silicon Capacitors** are appropriate for applications used in extreme operating temperature range (up to **250°C**).

XTSC industry leading performances offer a **1 $\mu\text{F}$**  in **1206** package with a **TC<1,5%** over the full -55°C/+250°C temperature range.

This technology also offers a **negligible ageing** and a stable insulation resistance, even at very high temperature, as well as a stable capacitor value over the full operating.

## Key applications

- 250°C requirements, high temperature applications, such as military, aerospace, automotive and downhole industries
- High reliability applications
- Replacement of X8R and C0G dielectrics
- Decoupling / Filtering / Charge pump (i.e.: pressure sensor, motor management)
- Downsizing

The IPDiA technology features a capacitor integration capability (up to 250nF/mm<sup>2</sup>) which allows a capacitance value similar to X8R dielectric, but with better electrical performances than C0G/NP0 dielectrics.

This technology also offers **high reliability**, up to 10 times better than alternative capacitor technologies, such as Tantalum or MLCC, and eliminates cracking phenomena.

This Silicon based technology is RoHS compliant and compatible with lead free reflow soldering process.

Electrical specification

		Capacitance value					
		10	15	22	33	47	68
Unit	1 nF	10nF 935.133.427.510	Contact IPDIA Sales	Contact IPDIA Sales	Contact IPDIA Sales	Contact IPDIA Sales	Contact IPDIA Sales
	10 nF	100nF 935.133.427.610	Contact IPDIA Sales	Contact IPDIA Sales	Contact IPDIA Sales	Contact IPDIA Sales	Contact IPDIA Sales
	0,1 µF	1µF 935.133.427.710					
	1 µF						

(\*) Thinner thickness (as low as 100 µm thick) available, see Low Profile Silicon Capacitor product: LPSC

(\*\*) Other values on request.

Parameters	Value
Capacitance range	10 nF to 1µF <sup>(*)</sup>
Capacitance tolerances	±15 % <sup>(**)</sup>
Operating temperature range	-55 °C to 250 °C
Storage temperatures	- 70 °C to 265 °C
Temperature coefficient	<±1.5 %, from -55 °C to +250 °C
Breakdown voltage (BV)	11 VDC <sup>(**)</sup>
Capacitance variation versus RVDC	0.1 % /V (from 0 V to RVDC)
Equivalent Serial Inductor (ESL)	Max 1nH
Equivalent Serial Resistor (ESR)	Max 500mΩ <sup>(**)</sup>
Insulation resistance	50GΩ min @ 3V,25°C 10GΩ min @ 3V,250°C
Ageing	Negligible, < 0.001 % / 1000 h
Reliability	FIT<0.017 parts / billion hours,
Capacitor height	Max 400 µm <sup>(*)</sup>

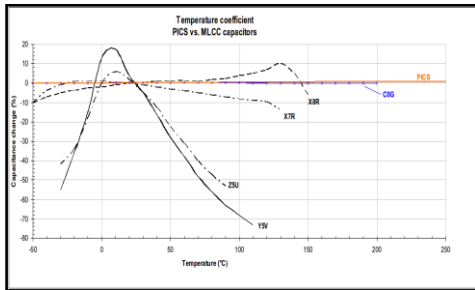


Fig.1 Capacitance change versus temperature variation compared with alternative dielectrics

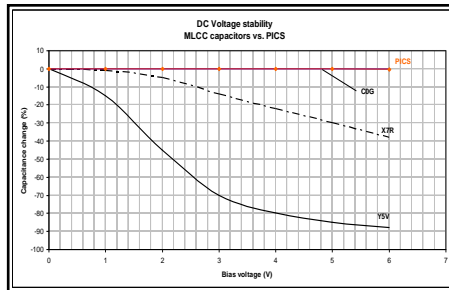


Fig.2 Capacitance change versus voltage variation compared with alternative dielectrics

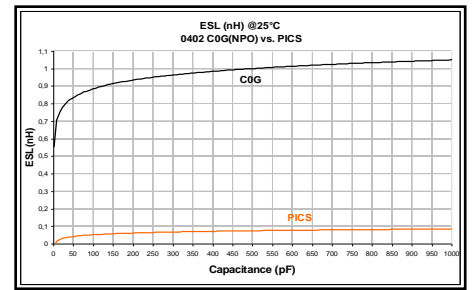


Fig.3 ESL versus capacitance value compared with alternative dielectrics

Part Number

**935.133.**

i.e.: 1 µF/1206 case (XTSC type)  
→ 935.133.427.710

**B.2** → Breakdown Voltage  
4 = 11V

**S.** → Size  
7 = 1206

**U** → Unit  
0 = 10 f      5 = 1 n  
1 = 0.1 p     6 = 10 n  
2 = 1 p        7 = 0.1 µ  
3 = 10 p       8 = 1 µ  
4 = 0.1 n      9 = 10 µ

**XX** → Value (E6)  
10  
15  
22  
33  
47  
68

Termination and Outline

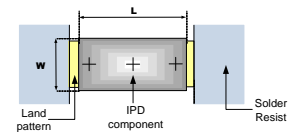
Termination

Lead-free nickel/solder coating compatible with automatic soldering technologies: reflow and manual.

Typical dimensions, all dimensions in mm.

Package outline

Typ.		1206
Comp. size	L	3.40±0.05
	W	1.80±0.05



(1206 PCB footprint)

Packaging

Tape and reel, tray, waffle pack or wafer delivery.

Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights.