

## Manual Handling recommendation



These capacitors are designed to be mounted with a standard pick and place machine, with reflow.

In case of manual handling, please follow below recommendations:

- Minimize mechanical pressure on the capacitors (use of a vacuum nozzle is recommended).
- Minimize temperature shocks (pre-heat the substrate).
- No wirebonding on 0402 47nF, 0402 100nF, 1206 1µF, 1812 3,3µF

Process steps:

- On substrate, form the solder meniscus on each land pattern targeting 100 meniscus height after reflow (screen printing, dispensing solder paste or by wire soldering).
- Pick the capacitor from the tape & reel or the Gel Pack keeping backside visible using a vacuum nozzle.
- Temporary place the capacitor on land pattern assuming remaining flux will stick the capacitor.
- Reflow the assembly with a dedicated profile ( see reflow recommendation profile )
- After soldering, no solder paste should touch the side of the capacitor dies.

If you have any questions prior to mounting the capacitors, please contact IPDiA (contact details below) and ask for our assembly specialist.

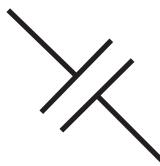
**IPDiA**

Tel : +33 2 535401

e-mail : [sales@ipdia.com](mailto:sales@ipdia.com)

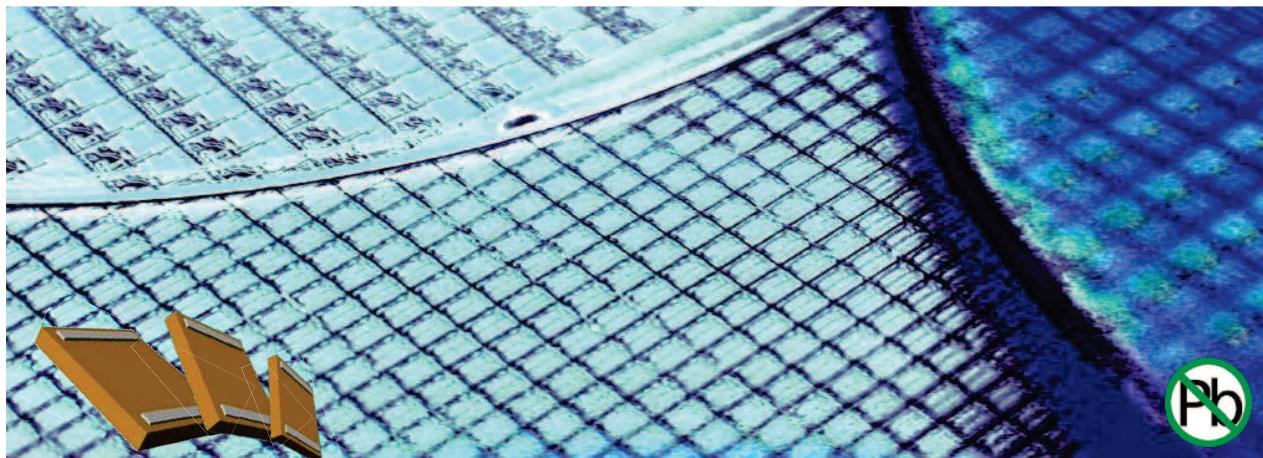
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The 3D Silicon Leader



# XTSC427.xxx - 1206 Extreme Temperature Silicon Capacitor

Rev 3.0



## Key features

- Ultra High temperature up to 250°C:
  - ♦ Temperature Coeff : <1.5% (-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  $\mu$ F
- High reliability (FIT <0.017 parts / billion hours)
- Low leakage current < 100 pA
- Low ESL and Low ESR
- Suitable for lead free reflow-soldering

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 allows to propose a **1.5 $\mu$ F in 1206** 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 COG 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 COG/NPO 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

Unit	Capacitance value					
	10	15	22	33	47	68
1 nF	Contact IPDIA Sales					
10 nF	100nF	Contact IPDIA Sales	Contact IPDIA Sales	470nF	Contact IPDIA Sales	
0,1 $\mu$ F	1 $\mu$ F	935.133.427.610		935.133.427.647		
1 $\mu$ F						

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

(\*\*) Other values on request.

Parameters	Value
Capacitance range	10 nF to 1 $\mu$ F <sup>(*)</sup>
Capacitance tolerances	$\pm 15\%$ <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 500m $\Omega$ <sup>(*)</sup>
Insulation resistance	100G $\Omega$ min @ RVDC, 25°C 50G $\Omega$ min @ RVDC, 250°C
Ageing	Negligible, < 0.001 % / 1000 h
Reliability	FIT<0.017 parts / billion hours,
Capacitor height	Max 400 $\mu$ m <sup>(*)</sup>

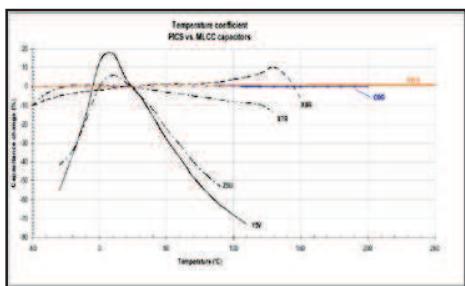


Fig.1 Capacitance change versus temperature variation compared with alternative dielectrics

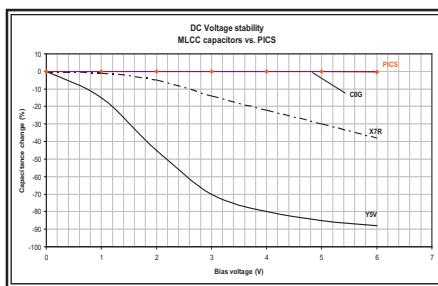


Fig.2 Capacitance change versus voltage variation compared with alternative dielectrics

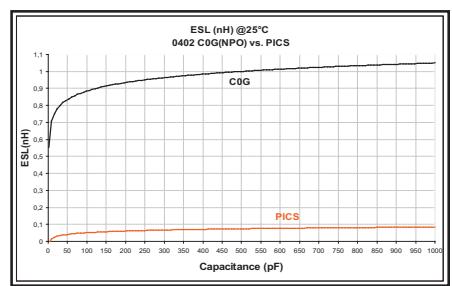


Fig.3 ESL versus capacitance value compared with alternative dielectrics

## How to order

935.133.

**BV** → **Breakdown Voltage**  
42 = 11V  
**S.** ↓ **Size**  
5 = 1206

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

i.e.: 1  $\mu$ F/1206 case (XTSC type)  
→ 935.133.427.710

## Termination and Outline

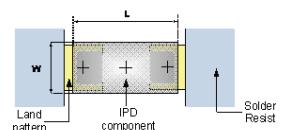
### Termination

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

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For more information, please visit: <http://www.ipdia.com>  
To contact us, email to: [sales@ipdia.com](mailto:sales@ipdia.com)

Date of release: 7<sup>th</sup> July 2011  
Document identifier: CL431 111 614 935

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935133427710-T3N