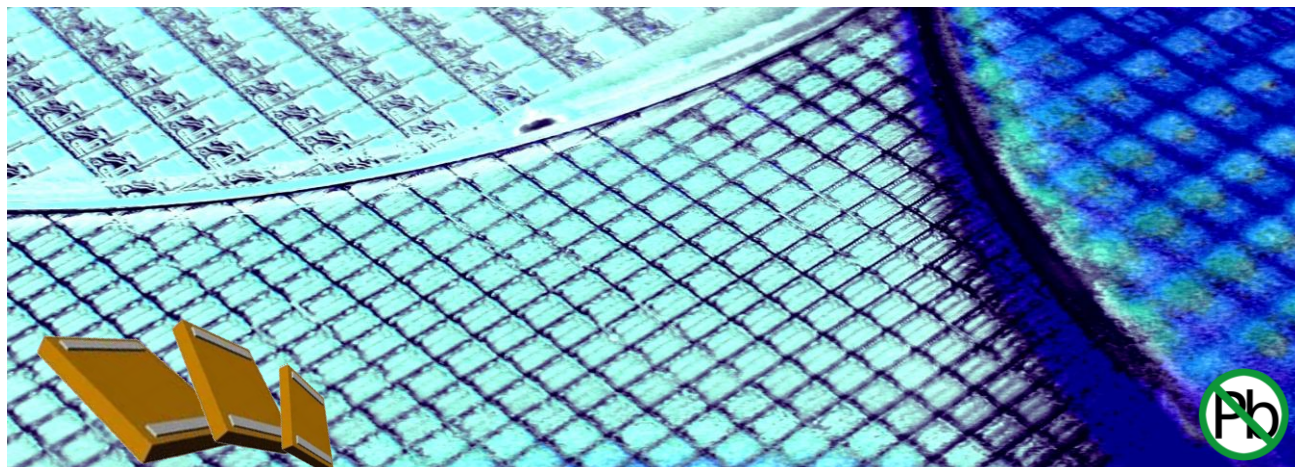


# XTSC429.xxx - 1812 Extreme Temperature Silicon Capacitor

Rev 3.1



## 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/1812 package size, up to 3.3  $\mu$ F
- High reliability (FIT <0.017 parts / billion hours)
- Low leakage current technology down to 3nA
- Low ESL and Low ESR
- Suitable for lead free reflow-soldering \*Please refer to our assembly Application Note for further recommendations

## Key applications

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

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 **3.3 $\mu$ F in 1812** 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.

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

		Capacitance value					
		10	22	27	33	47	68
Unit	1 nF	Contact	Contact	Contact	Contact		
	10 nF	IPDIA Sales	IPDIA Sales	IPDIA Sales	IPDIA Sales		
	0,1 µF	1µF	2.2µF	2.7µF	3.3µF		
		935.xxx.xxx.xxx	935.xxx.xxx.xxx	935.xxx.xxx.xxx	935.133.429.733		
	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	1µF to 3.3µF <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 800mΩ <sup>(**)</sup>
Insulation resistance	1GΩ min @ 3V, 25°C 100MΩ min @ 3V, 250°C
Ageing	Negligible, < 0.001 % / 1000 h
Reliability	FIT < 0.017 parts / billion hours,
Capacitor height	Max 400 µm <sup>(*)</sup>

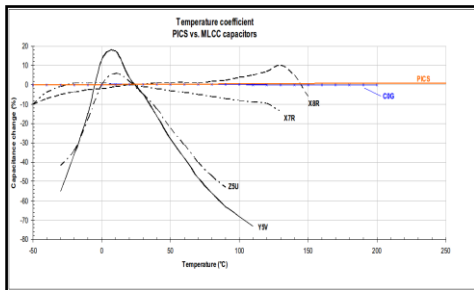


Fig.1 Capacitance change versus temperature variation compared with alternative dielectrics

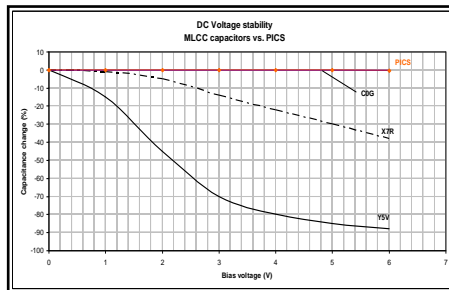


Fig.2 Capacitance change versus voltage variation compared with alternative dielectrics

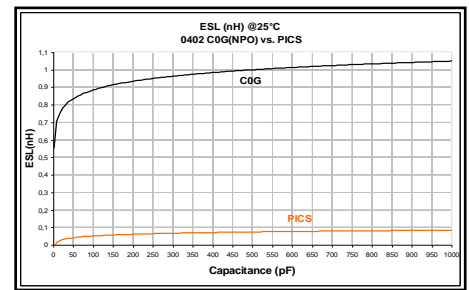


Fig.3 ESL versus capacitance value compared with alternative dielectrics

## Part Number

**935.133.**

**B.2**  
Breakdown  
Voltage  
4 = 11V

**S.**  
Size  
9 = 1812

**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  
22  
27  
33  
47  
68

i.e.: 3.3 µF/1812 case (XTSC type)  
→ 935.133.429.733

## Termination and Outline

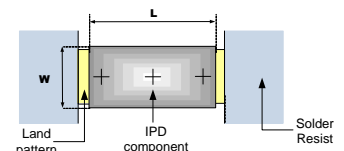
## Termination

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

Typical dimensions, all dimensions in mm

## Package outline

Typ.		1812
Comp. size	L	4.66 ± 0.05
	W	3.56 ± 0.05
IPD Land patterns size	X	0.9
	Y	3.4



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