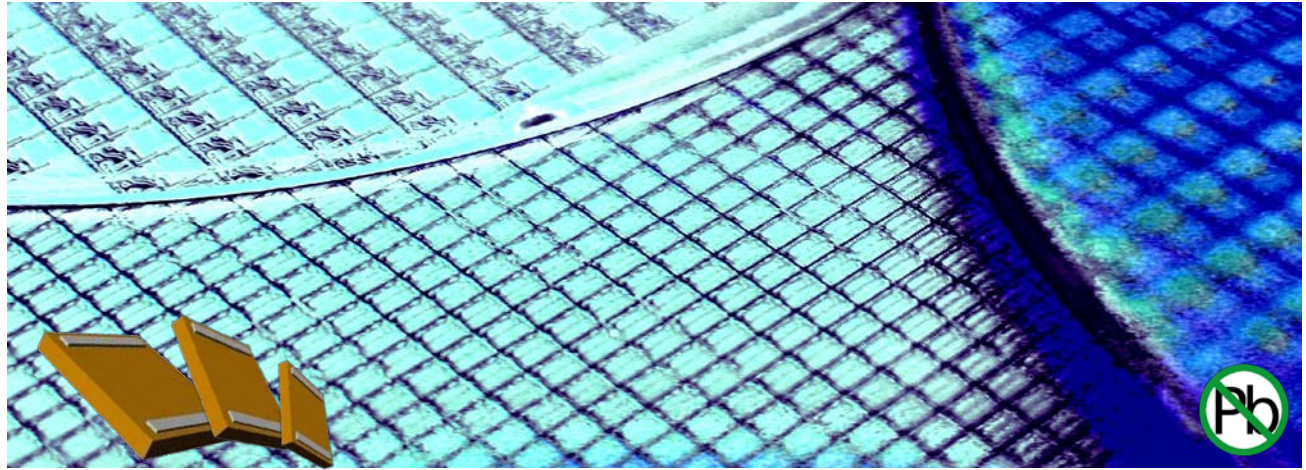


XTSC424.xxx - 0402 Extreme Temperature Silicon Capacitor

Rev 3.0



Key features

- Ultra High temperature up to 250°C:
 - ◆ Temperature Coeff : $<\pm 1.5\%$ (-55 °C to +250°C)
 - ◆ Voltage $<0.1\%$ /V
 - ◆ Negligible capacitance loss through aging
- Unique high capacitance in EIA/0402 package size, up to 47 nF
- 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 **47nF in 0402** with a **TC $\leq\pm 1.5\%$** 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/mm²) 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					
Unit		10	15	22	33	47	68
		Contact IPDIA Sales	Contact IPDIA Sales	Contact IPDIA Sales	Contact IPDIA Sales	Contact IPDIA Sales	Contact IPDIA Sales
1 pF	100 pF:						
10 pF	935.133.424.310	935.133.424.315	935.133.424.322	935.133.424.333	935.133.424.347	935.133.424.368	
0.1 nF	1 nF:						
1 nF	935.133.424.410	935.133.424.415	935.133.424.422	935.133.424.433	935.133.424.447	935.133.424.468	
10 nF	10 nF:						
10 nF	935.133.424.510	935.133.424.515	935.133.424.522	935.133.424.533	935.133.424.547		

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

(**) Other values on request.

Parameters	Value
Capacitance range	100pF to 47 nF ^(*)
Capacitance tolerances	±15 % ^(*)
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, 30VDC ^(**)
Capacitance variation versus RVDC	0.1 % / V (from 0 V to RVDC)
Equivalent Serial Inductor (ESL)	Max 100 pH
Equivalent Serial Resistor (ESR)	Max 400mΩ ^(**)
Insulation resistance	100GΩ min @ RVDC, 25°C 50GΩ min @ RVDC, 250°C
Ageing	Negligible, < 0.001 % / 1000 h
Reliability	FIT<0.017 parts / billion hours,
Capacitor height	Max 400 µm ^(*)

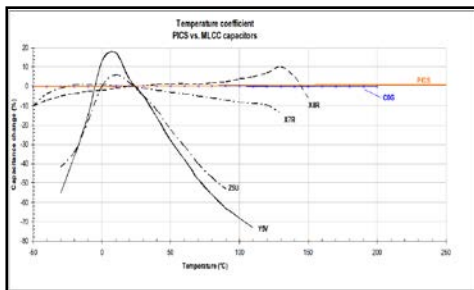


Fig.1 Capacitance change versus temperature variation compared with alternative dielectrics

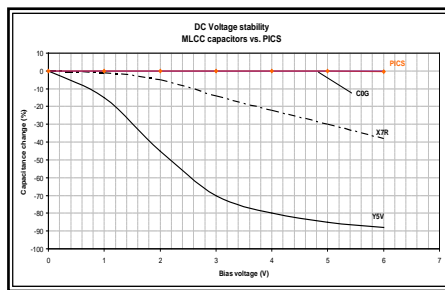


Fig.2 Capacitance change versus voltage variation compared with alternative dielectrics

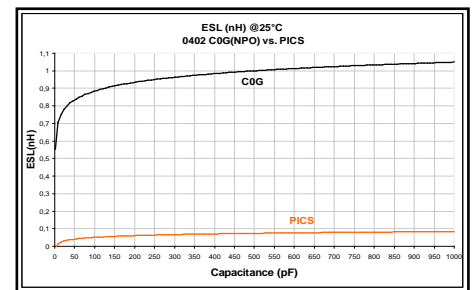


Fig.3 ESL versus capacitance value compared with alternative dielectrics

How to order

935.133. **BV** **S.** **U** **XX** **Value (E6)**

i.e.: 47 nF/0402 case (XTSC type)
→ 935.133.424.547

Breakdown Voltage
42 = 11V
12 = 30V

Size
4 = 0402

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

Termination and Outline

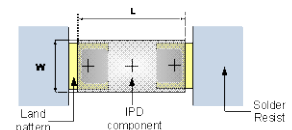
Termination

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

Typical dimensions, all dimensions in mm

Package outline

Typ.		0402
Comp. size	L	1.20±0.05
	W	0.70±0.05



(0402 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.