

XTSC

Xtreme Temperature Si Capacitors up to 250°C



Rev 2.0

Key features

- Extended operating temperature range (up to 250°C) with low capacitance variation
- High stability
- High reliability
- Low leakage current
- Suitable for lead-free reflow or wire bonding soldering

(please refer to our Assembly Application Note for more details)

Key applications

- 250°C requirements, High temperature applications, such as 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

Thanks to the unique Murata* Silicon capacitor technology, most of the problems encountered in demanding applications can be solved. The Extreme Temperature Silicon Capacitors are appropriate for applications used in extreme operating temperature range (up to **250°C**). The XTSC industry leading performances offer a **100 nF in 0402** with a **temperature coefficient of +60 ppm/K**. This technology also offers a **negligible aging** and a stable insulation resistance, even at very high temperature, as well as a stable capacitor value over the full operating range.

Murata Silicon technology features a capacitor integration capability (up to 250 nF/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.

*Murata Integrated Passive Solutions



Electrical specifications

XTSC.xxx	Extreme Temperature Si Capacitors 400µm from -55°C to 250°C			
Part number	Capacitance	BV	Case size	Thickness
935133424247-T1N	47 pF	11 V	0402	400 µm
935133424310-T1N	100 pF	11 V	0402	400 µm
935133424347-T1N	470 pF	11 V	0402	400 µm
935133424410-T1N	1 nF	11 V	0402	400 µm
935133424510-T1N	10 nF	11 V	0402	400 µm
935133424522-T1N	22 nF	11 V	0402	400 µm
935133424533-T1N	33 nF	11 V	0402	400 µm
935133424547-T1N	47 nF	11 V	0402	400 µm
935133424610-T1N	100 nF	11 V	0402	400 µm
935133425610-T1N	100 nF	11 V	0603	400 µm
935133427710-T1N	1 µF	11 V	1206	400 µm

Parameter	Value
Capacitance range	47 pF to 1 µF(*)
Capacitance tolerances	±15 %(*)
Operating temperature range	-55°C to 250°C
Storage temperature range	-70°C to 265°C(**)
Temperature coefficient	+60 ppm/K
Breakdown Voltage (BV)	11 VDC or 30 VDC
Capacitance variation versus RVDC	0.1 %/V (from 0 to RVDC)
Insulation resistance	100 GΩ @ 3 V, @ 25°C, t>120s, for 100nF
Aging	Negligible, < 0.001% / 1000 h
Reliability	FIT<0.017 parts / billions hours
Capacitor thickness	400 µm (*)

(*) Other values on request (**) w/o packing

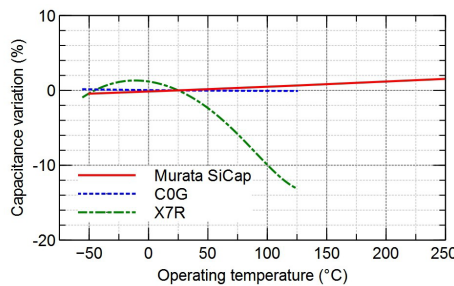


Fig. 1: Capacitance variation vs temperature (for XTSC and MLCC technologies)

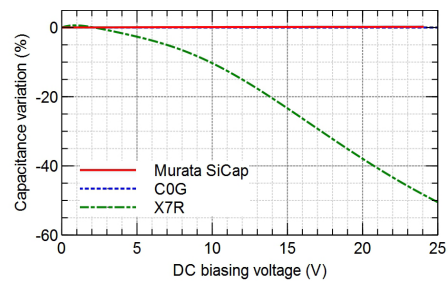
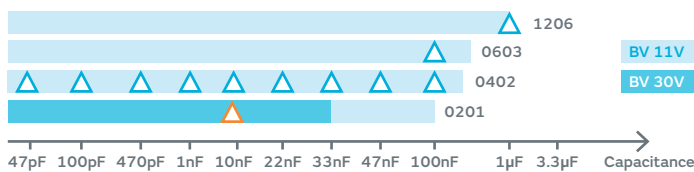


Fig. 2: Capacitance variation vs DC biasing voltage @ BV 30 (for XTSC and MLCC technologies)

Capacitance range



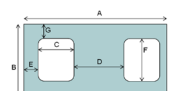
△ Available parts.
For other values, contact your Murata sales representative.
△ Under development.

Termination

Lead-free NiAu finishing compatible with wirebonding or leadframe soldering. Aluminum pads on request.

Package Outline

	Case size		Pad dimensions (±0.05 µm)				
	A	B	C	D	E	F	G
0201	0.80	0.60	0.15	0.3	0.1	0.4	0.1
0402	1.20	0.70	0.3	0.4	0.1	0.5	0.1
0603	1.80	1.10	0.4	0.8	0.1	0.9	0.1
0805	2.20	1.40	0.5	1	0.1	1.2	0.1
1206	3.40	1.80	0.6	2	0.1	1.6	0.1



Packaging


Tape & reel, waffle pack or wafer delivery.



Assembly by Soldering

The attachment techniques recommended by Murata for the XTSC capacitors on the customers substrates are fully detailed in specific documents available on our website. To assure the correct use and proper functioning of Murata Silicon capacitors **please download the assembly instructions on www.ipdia.com/assembly and read them carefully.**


XTSC SiCap 400µm - NiAu finishing - Assembly by soldering



Rev. 1.0

General description

This document describes the attachment techniques recommended by Murata* for their XTSC silicon capacitors on the customer's substrates. This document is non-exhaustive. Customers with specific attachment requirements or attachment scenarios that are not covered by this document should contact Murata. The solder printing is described in this document but other processes like solder jetting, pre-cumped capacitors... can also be used with the same recommendations.



Murata Silicon capacitor (1206) The silicon capacitor mounted on substrate

Handling precautions and storage

Silicon die must always be handled in a clean room environment (usually class 1000 (ISO 6)) but the assembled devices don't need to be handled in such an environment as the product is already well packed. The remaining quantities have to be repacked immediately after any process step, in the same conditions as before the opening (ESD bag + AZ).

Store the capacitors in the manufacturer's package in the following conditions without a rapid thermal change in an indoor room:

- Temperature: -10 to 40 degree C
- Humidity: 30 to 70%RH

Avoid storing the capacitors in the following conditions:

- (1) Ambient air containing corrosive gas (Chlorine, Hydrogen sulfide, Ammonia, Sulfuric acid, Nitric oxide, etc.)
- (2) Ambient air containing volatile or combustible gas
- (3) In environments with a high concentration of airborne particles
- (4) In liquid (water, oil, chemical solution, organic solvents, etc.)
- (5) In direct sunlight
- (6) In freezing environments

Please download the **assembly instructions** on www.ipdia.com/assembly and **read them carefully before use.**

在使用IPDIA电容之前请从 www.ipdia.com/assembly 网站上下载电容安装说明并仔细阅读。

For XTSC assembly instructions, please go to : www.ipdia.com/assembly and download the pdf file called **“XTSC Capacitors 400 µm - Assembly by Soldering”**

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