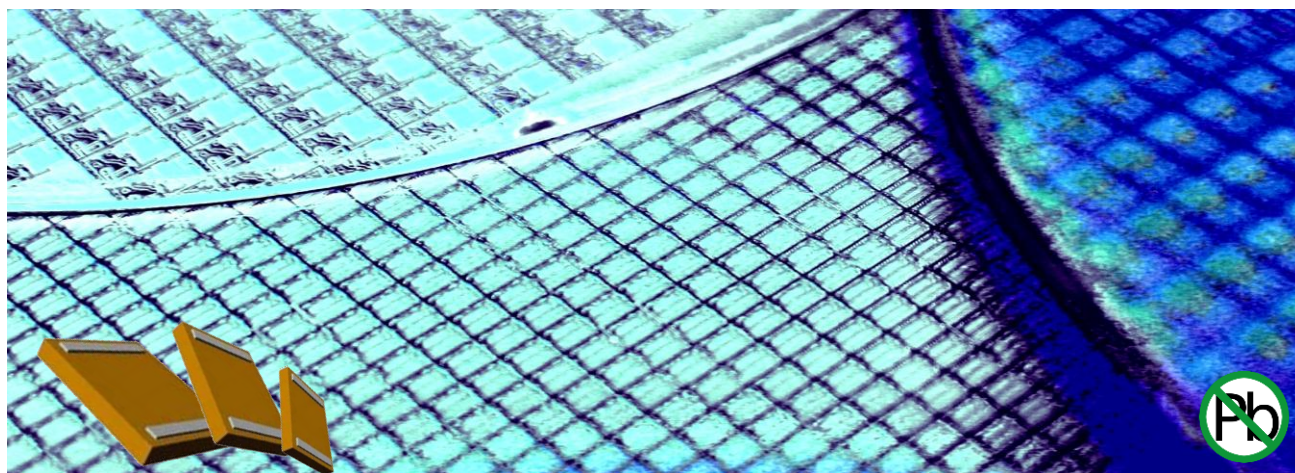


# HTSC423.xxx - 0201 High Temperature Silicon Capacitor

Rev 3.0



## Key features

- High stability up to 200°C:
  - ◆ Temperature  $\leq \pm 1\%$  (-55 °C to +200 °C)
  - ◆ Voltage  $< 0.1\%$ /V
  - ◆ Negligible capacitance loss through aging
- Unique high capacitance in EIA/0201 package size, up to 10nF
- 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

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

High Temperature Silicon Capacitors are dedicated to applications where **reliability** up to **200°C** is the main parameter.

This technology features a capacitor integration capability (up to 250nF/mm<sup>2</sup>) which offers capacitance value similar to X7R dielectric, but with better electrical performances than COG/NPO dielectrics, up to **200°C**

HTSC provides the highest capacitor **stability** over the full -55°C/+200°C temperature range in the market with a **Temperature coefficient Lower than  $\pm 1\%$** .

## Key applications

- All applications up to 200°C, such as military, aerospace and automotive industries
- High reliability applications
- Replacement of X7R and COG dielectrics
- Decoupling / Filtering / Charge pump (i.e.: motor management, temperature sensors)
- Downsizing

The IPDiA technology offers industry leading performances relative to **Failure rate** with a FIT $<0.017$ .

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 | 1 pF   | Contact<br>IPDIA Sales   | Contact<br>IPDIA Sales | Contact<br>IPDIA Sales | Contact<br>IPDIA Sales | Contact<br>IPDIA Sales | Contact<br>IPDIA Sales |
|      | 10 pF  | Contact<br>IPDIA Sales   | Contact<br>IPDIA Sales | Contact<br>IPDIA Sales | Contact<br>IPDIA Sales | Contact<br>IPDIA Sales | Contact<br>IPDIA Sales |
|      | 0.1 nF | Contact<br>IPDIA Sales   | Contact<br>IPDIA Sales | Contact<br>IPDIA Sales | Contact<br>IPDIA Sales | Contact<br>IPDIA Sales | Contact<br>IPDIA Sales |
|      | 1 nF   | 10nF:<br>935.132.423.510 |                        |                        |                        |                        |                        |
|      |        |                          |                        |                        |                        |                        |                        |

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

(\*\*) Extended temperature range (up to +250 °C) available, see Xtreme Temperature Silicon Capacitor product: XTSC

(\*\*\*) Other values on request.

| Parameters                        | Value                                       |
|-----------------------------------|---|
| Capacitance range                 | 10 nF <sup>(***)</sup>                      |
| Capacitance tolerances            | ±15 % <sup>(***)</sup>                      |
| Operating temperature range       | -55 °C to 200 °C <sup>(**)</sup>            |
| Storage temperatures              | -70 °C to 215 °C                            |
| Temperature coefficient           | ≤±1 %, from -55 °C to +200 °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 100 pH                                  |
| Equivalent Serial Resistor (ESR)  | Max 400mΩ <sup>(***)</sup>                  |
| Insulation resistance             | 50GΩ min @ 3V, 25°C<br>20GΩ min @ 3V, 200°C |
| Ageing                            | Negligible, < 0.001 % / 1000h               |
| Reliability                       | FIT<0.017 parts / billion hours,            |
| Capacitor height                  | Max 400 µm <sup>(*)</sup>                   |

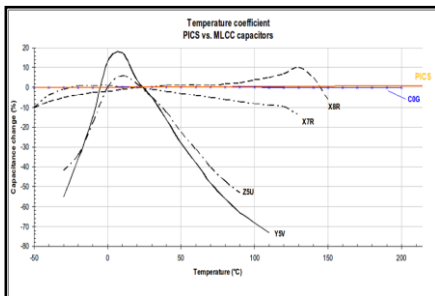


Fig.1 Capacitance change versus temperature variation compared with alternative dielectrics

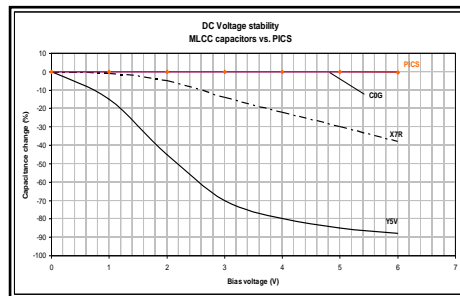


Fig.2 Capacitance change versus voltage variation compared with alternative dielectrics

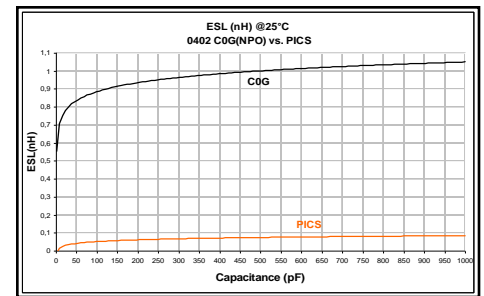


Fig.3 ESL versus capacitance value compared with alternative dielectrics

## Part Number

**935.132.**

**B.2**

**Breakdown  
Voltage**

4 = 11V

**S.**

**Size**

3 = 0201

**U**

**XX**

**Value (E6)**

i.e.: 10 nF/0201 case (HTSC type)  
→ 935.132.423.510

**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

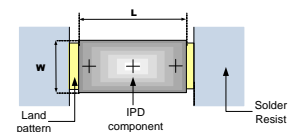
### Termination

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

Typical dimensions, all dimensions in mm

### Package outline

| Typ.       |   | 0201      |
|------------|---|-----------|
| Comp. size | L | 0.8±0.03  |
|            | W | 0.60±0.03 |



(0201 PCB footprint)

## Packaging

Tape and reel, tray, waffle pack or wafer delivery

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