

HSSC424.xxx - 0402 High Stability Silicon Capacitor

Rev 3.0.1



Key features

- **Ultra high stability :**
 - ◆ Temperature $\pm 0.5\%$ ($-55\text{ }^{\circ}\text{C}$ to $+150\text{ }^{\circ}\text{C}$)
 - ◆ Voltage $< 0.1\%$ /V
 - ◆ Negligible aging $< 0.001\%$ /10000hours
- **Unique high capacitance in EIA/0402 package size, up to 100 nF**
- **High reliability (FIT < 0.017 parts / billion hours)**
- **Low leakage current $< 100\text{ pA}$**
- **Low ESL and Low ESR**
- **Suitable with lead free reflow-soldering**

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

High Stability Silicon Capacitors are dedicated to applications where **stability** is the main parameter.

HSSC avoids the need to oversize the capacitor value for sensitive capacitive circuitry and offers a **higher DC voltage stability**.

This technology provides industry leading performances relative to the **capacitor stability** over the full **operating voltage & temperature range**.

The very high and stable insulation resistance of silicon capacitors can enhance up to 30 % the **battery lifetime** in mobile applications.

Key applications

- **All demanding applications, such as medical, aerospace, automotive industry**
- **High stability applications**
- **Decoupling / Filtering / Charge pump (i.e.: Pacemakers / defibrillators)**
- **Devices with battery operations**
- **Replacement of X7R and NP0 (COG)**
- **Downsizing**

The IPDiA technology features a capacitor integration capability (up to 250nF/mm^2) which allows a **smaller case size** than existing solutions to answer high volume constraints. 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 pF	10 pF: 935.131.424.210	15 pF: 935.131.424.215	22 pF: 935.131.424.222	33 pF: 935.131.424.233	47 pF: 935.131.424.247	68 pF: 935.131.424.268
	100 pF: 935.131.424.310	150 pF: 935.131.424.315	220 pF: 935.131.424.322	330 pF: 935.131.424.333	470 pF: 935.131.424.347	680 pF: 935.131.424.368
10 pF	1 nF: 935.131.424.410	1.5 nF: 935.131.424.415	2.2 nF: 935.131.424.422	3.3 nF: 935.131.424.433	4.7 nF: 935.131.424.447	6.8 nF: 935.131.424.468
	10 nF: 935.131.424.510	15 nF: 935.131.424.515	22 nF: 935.131.424.522	33 nF: 935.131.424.533	47 nF: 935.131.424.547	Contact IPDIA Sales
0.1 nF	100 nF: 935.131.424.610					

(*) 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 pF to 100 nF ^(***)
Capacitance tolerances	±15 % ^(***)
Operating temperature range	-55 °C to 150 °C ^(**)
Storage temperatures	-70 °C to 165 °C
Temperature coefficient	±0.5 %, from -55 °C to +150 °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, from -55°C to +150°C
Ageing	Negligible, < 0.001 % / 10000h
Reliability	FIT<0.017 parts / billion hours,
Capacitor height	Max 400 µm ^(*)

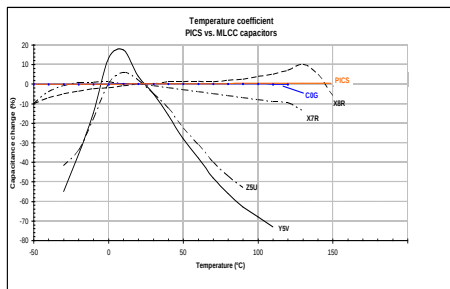


Fig.1 Capacitance change versus temperature variation compared with alternative dielectrics

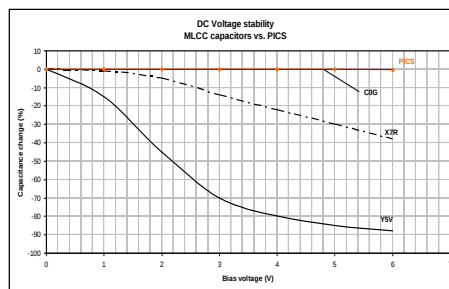


Fig.2 Capacitance change versus voltage variation compared with alternative dielectrics

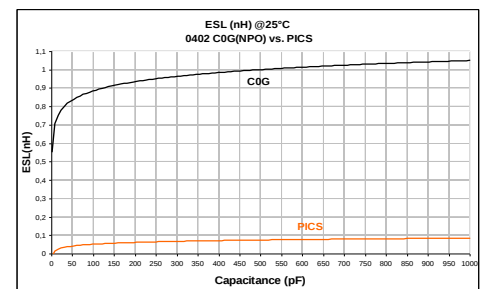


Fig.3 ESL versus capacitance value compared with alternative dielectrics

How to order

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

i.e.: 100 nF/0402 case (HSSC type)
→ 935.131.424.610

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

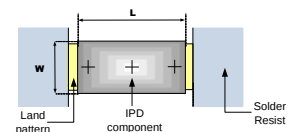
Termination

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.