

# 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  $< 0.1\text{ } \%/V$
  - ◆ 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  $250\text{nF/mm}^2$ ) 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

		Capacitance value					
		10	15	22	33	47	68
Unit	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
	10 pF	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
	0.1 nF	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
	1 nF	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
	10 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 <sup>(***)</sup>
Capacitance tolerances	±15 % <sup>(***)</sup>
Operating temperature range	-55 °C to 150 °C <sup>(**)</sup>
Storage temperatures	-70 °C to 165 °C
Temperature coefficient	±0.5 %, from -55 °C to +150 °C
Breakdown voltage (BV)	11 VDC, 30VDC <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
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 <sup>(*)</sup>

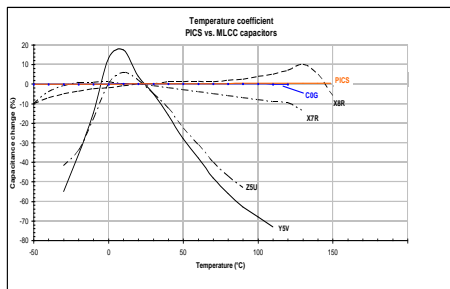


Fig.1 Capacitance change versus temperature variation compared with alternative dielectrics

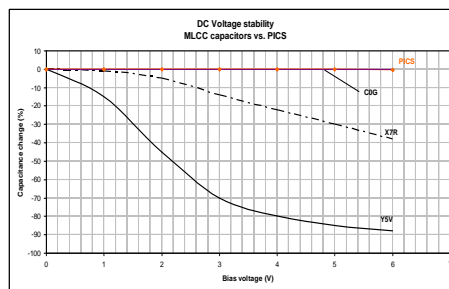


Fig.2 Capacitance change versus voltage variation compared with alternative dielectrics

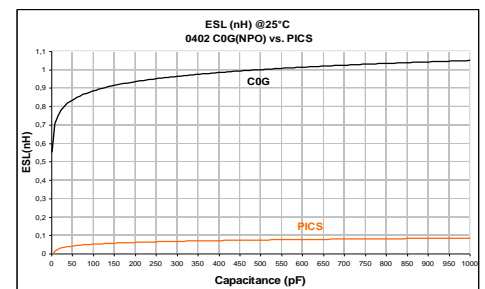


Fig.3 ESL versus capacitance value compared with alternative dielectrics

## 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

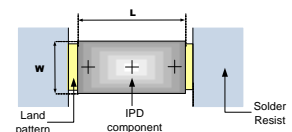
### Termination

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

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