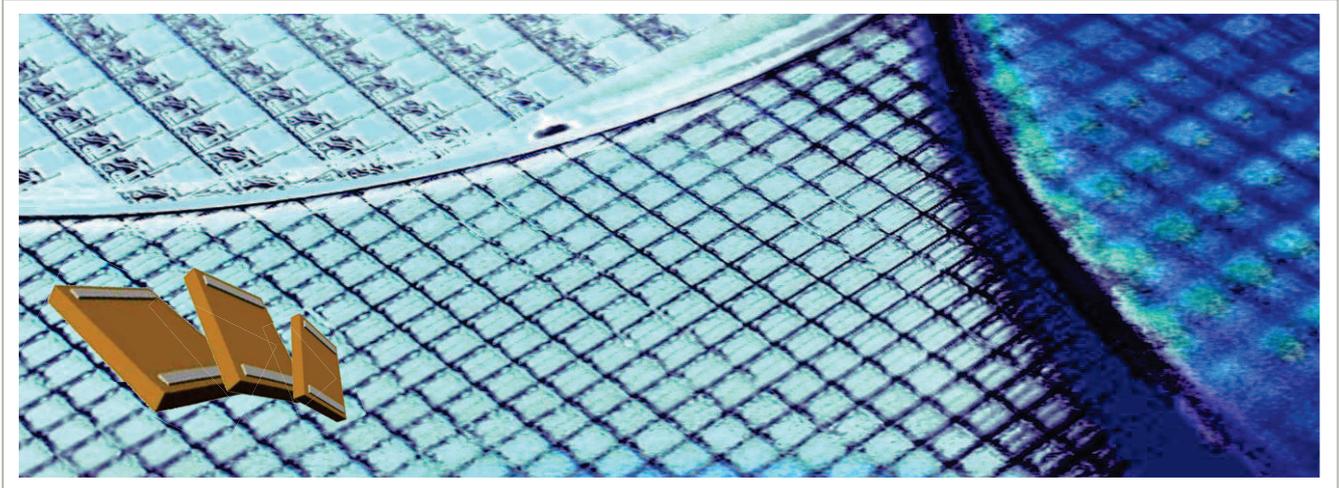


## Manual Handling recommendation



These capacitors are designed to be mounted with a standard pick and place machine, with reflow.

In case of manual handling, please follow below recommendations:

- Minimize mechanical pressure on the capacitors (use of a vacuum nozzle is recommended).
- Minimize temperature shocks (pre-heat the substrate).
- No wirebonding on 0402 47nF, 0402 100nF, 1206 1 $\mu$ F, 1812 3,3 $\mu$ F

Process steps:

- On substrate, form the solder meniscus on each land pattern targeting 100 meniscus height after reflow (screen printing, dispensing solder paste or by wire soldering).
- Pick the capacitor from the tape & reel or the Gel Pack keeping backside visible using a vacuum nozzle.
- Temporary place the capacitor on land pattern assuming remaining flux will stick the capacitor.
- Reflow the assembly with a dedicated profile ( see reflow recommendation profile )
- After soldering, no solder paste should touch the side of the capacitor dies.

If you have any questions prior to mounting the capacitors, please contact IPDiA (contact details below) and ask for our assembly specialist.

### IPDiA

Tel : +33 2 535401

e-mail : [sales@ipdia.com](mailto:sales@ipdia.com)

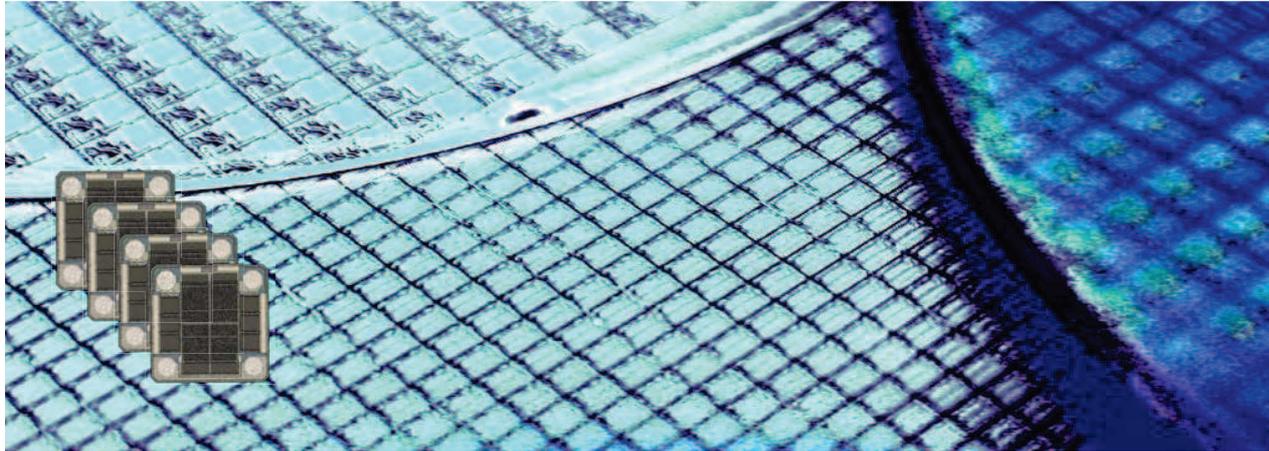
[www.ipdia.com](http://www.ipdia.com)





# EXSC – Embedded & Wirebond Extreme Temperature Silicon Capacitor

Rev 3.2



## Key features

- Ultra High Operating temperature up to 250°C
- Low profile (250µm)
- High stability of capacitance value:
  - ◆ Temperature <1,5% (-55°C to +250°C)
  - ◆ Voltage <0.1%/Volts
  - ◆ Negligible capacitance loss through ageing
- Low leakage current down to 100pA
- High reliability
- Different Pad finishing available (Al, Au, Ni/Au)

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

Embedded EXtreme Temperature Silicon Capacitors are dedicated to applications where **reliability** up to **250°C** is the main parameter.

EXSC are the most appropriate solution for Chip On Board, Chip On Foil, Chip On Glass, Chip On Ceramic, flip chip and embedded applications.

This technology features a capacitor integration capability (up to 250nF/mm<sup>2</sup>) which offers capacitance value similar to X8R dielectric, but with better electrical performances than COG/NP0 dielectrics, up to **250°C**.

## Key applications

- All applications up to 250°C, such as downhole and defense industries
- High reliability applications
- Replacement of X8R and C0G dielectrics
- Decoupling / Filtering / Charge pump (i.e.: motor management, temperature sensors)
- Downsizing

EXSC provide the highest capacitor **stability** over the full -55°C/+250°C temperature range in the market with a **TC<1.5%**.

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					
		10	15	22	33	47	68
Unit	0.1nF	Contact IPDiA Sales	Contact IPDiA Sales	Contact IPDiA Sales	Contact IPDiA Sales	Contact IPDiA Sales	Contact IPDiA Sales
	1nF	10nF/0202 935 125 72C 510	Contact IPDiA Sales	22nF/0203 935 125 72I 522	Contact IPDiA Sales	Contact IPDiA Sales	Contact IPDiA Sales
	10nF	100nF/0404 935 125 42F 610	Contact IPDiA Sales	220nF/0505 935 125 42H 622	Contact IPDiA Sales	Contact IPDiA Sales	Contact IPDiA Sales
	0.1µF	1µF/1208 935 125 42S 710	Contact IPDiA Sales	2.2µF/1612 935 125 42V 722	3.3µF/1616 935 125 42Y 733	4.7µF/2016 935 125 42X 747	

(\*) Other values on request

Parameters	Value
Capacitance range	10nF to 4.7µF <sup>(*)</sup>
Capacitance tolerances	±15% <sup>(*)</sup>
Operating temperature range	-55 to 250 °C
Storage temperatures	-70 to 265 °C
Temperature coefficient	±1,5%, from -55 to +250°C
Breakdown Voltage (BV)	90, 50, 30, 20, 11V
Capacitance variation versus RVDC	0.1 % /V (from 0 V to RVDC)
Equivalent Serial Inductor (ESL)	Max 100 pH
Equivalent Serial Resistor (ESR)	Max 0.1Ω
Insulation resistance	50GΩ min @3V,25°C 10GΩ min @3V,250°C
Aging	Negligible, < 0.001% / 10000h
Reliability	FIT<0.017 parts / billions hours
Capacitor height	Max 250µm <sup>(*)</sup>

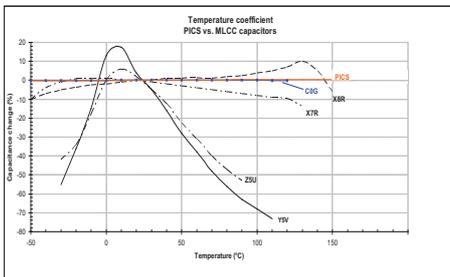


Fig.1: Capacitance change versus temperature variation compared to alternative technologies

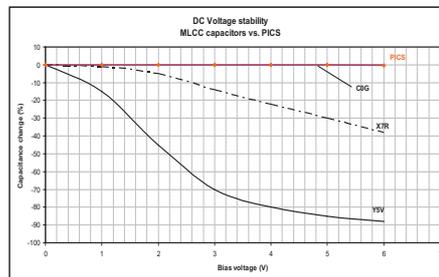


Fig.2: Capacitance change versus voltage variation compared to alternative

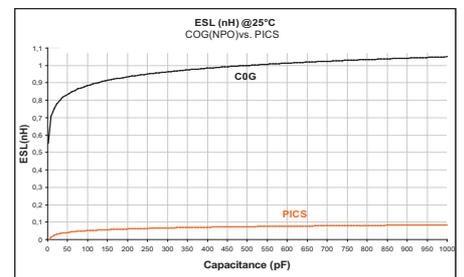
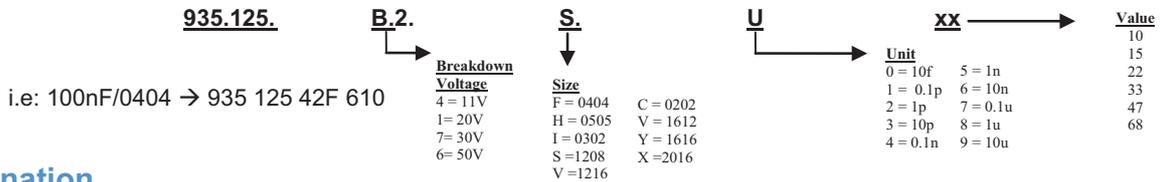


Fig.3: ESL versus capacitance value compared to alternative technologies

## Part Number



## Termination

Pad finishing in Aluminum (3µm thickness +/-10%), other finishing available such as copper, nickel or gold. Applicable for almost all embedded applications. Parts should be glued with non conductive paste. If conductive glue is used on the backside of the silicon cap, it is strongly recommended to connect the backside and pads 3 & 4 to the same level (GND preferred).

## Pinning definition & Outline

pin #	Symbol	Description
1, 2	Signal	Signal
3, 4	GND	Ground

Typ.	0202	0203	0303	0404	0505	1208	1612	1616	2016	
Comp. size	A	0.64 ±0.05	0.64 ±0.05	0.80 ±0.05	1.00 ±0.05	1.25 ±0.05	3.00 ±0.05	4.00 ±0.05	5.00 ±0.05	
	B	0.64 ±0.05	0.80 ±0.05	0.80 ±0.05	1.00 ±0.05	1.25 ±0.05	2.00 ±0.05	3.00 ±0.05	4.00 ±0.05	
	C	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	
	d				0.72		2.72	3.72	3.72	4.72
	e				0.72		1.72	2.72	3.72	3.72

## Packaging

Tape and reel, tray, waffle pack or wafer delivery.

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