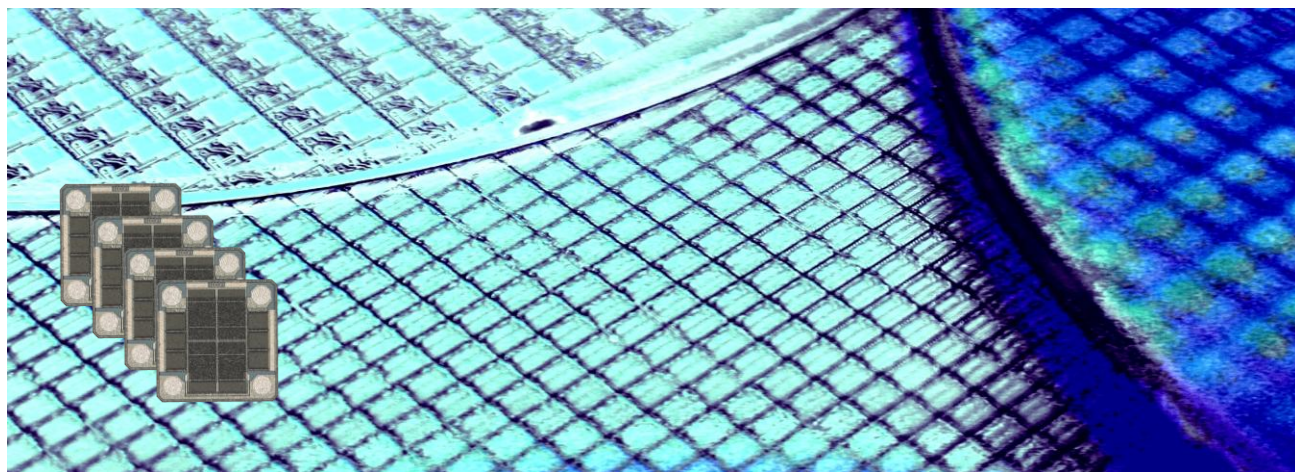


EXSC – Embedded & Wirebond Extreme Temperature Silicon Capacitor

Rev 3.6



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
- Aluminum Pad finishing

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/mm²) which offers capacitance value similar to X8R dielectric, but with better electrical performances than C0G/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						Parameters	Value
		10	15	22	33	39	47	68	
Unit	10pF	Contact IPDIA Sales	Contact IPDIA Sales	Contact IPDIA Sales	Contact IPDIA Sales	390pF/0202/30V 935 125 72C 339	470pF/0202/30V 935 125 72C 347	680pF/0202/30V 935 125 72C 368	Capacitance range 390pF to 4.7μF ^(*)
	0.1nF	1nF/0202/30V 935 125 72C 410	Contact IPDIA Sales	Contact IPDIA Sales	Contact IPDIA Sales	Contact IPDIA Sales	Contact IPDIA Sales	Contact IPDIA Sales	Capacitance tolerances ±15% ^(*)
	1nF	10nF/0202/30V 935 125 72C 510	Contact IPDIA Sales	Contact IPDIA Sales	33nF/0404/30V 935 125 72F 533	Contact IPDIA Sales	Contact IPDIA Sales	Contact IPDIA Sales	Operating temperature range -55 to 250 °C
	10nF	100nF/0404/11V 935 125 42F 610 100nF/0605/30V 935 125 72G 610	Contact IPDIA Sales	220nF/0505/11V 935 125 42H 622	Contact IPDIA Sales	Contact IPDIA Sales	Contact IPDIA Sales	Contact IPDIA Sales	Storage temperatures - 70 to 265 °C
	0.1μF	1μF/1208/11V 935 125 42S 710 1μF/1616/30V 935 125 72Y 710	Contact IPDIA Sales	2.2μF/1612/11V 935 125 42V 722	3.3μF/1616/11V 935 125 42Y 733	Contact IPDIA Sales	4.7μF/2016/11V 935 125 42X 747	Contact IPDIA Sales	Temperature coefficient ±1,5%, from -55 to +250°C
									Breakdown Voltage (BV) 30V, 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 ^(*)

(*) Other values on request

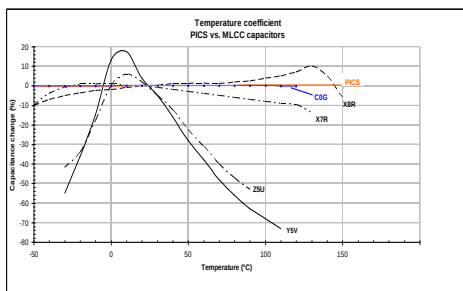


Fig.1: Capacitance change versus temperature variation compared to alternative technologies

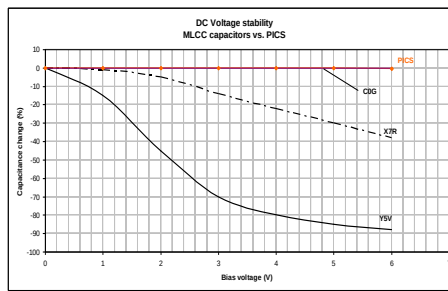


Fig.2 Capacitance change versus voltage variation compared to alternative

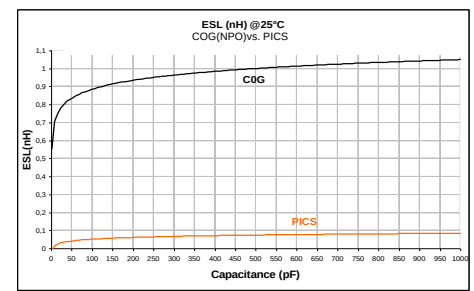


Fig.3 ESL versus capacitance value compared to alternative technologies

Part Number

<u>935.125.</u>	<u>B.2.</u>	<u>S.</u>	<u>U</u>	<u>XX</u>	<u>Value</u>
	<u>Breakdown Voltage</u>	<u>Size</u>	<u>Unit</u>		
i.e: 100nF/0404 → 935 125 42F 610	4 = 11V 7 = 30V	F = 0404 H = 0505 I = 0302 S = 1208 V = 1216	G = 0605 C = 0202 V = 1612 Y = 1616 X = 2016	0 = 10 f 1 = 0.1 p 2 = 1 p 3 = 10 p 4 = 0.1 n	5 = 1 n 6 = 10 n 7 = 0.1 μ 8 = 1 μ 9 = 10 μ

Termination

Pad finishing in Aluminum (3μm thickness +/-10%).

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	0302	0303	0404	0505	0605	1208	1612	1616	2016
Comp. size	A	0.58 ±0.05	0.80 ±0.05	0.80 ±0.05	1.00 ±0.05	1.25 ±0.05	1.50 ±0.05	3.00 ±0.05	4.00 ±0.05	4.00 ±0.05	5.00 ±0.05
	B	0.58 ±0.05	0.64 ±0.05	0.80 ±0.05	1.00 ±0.05	1.25 ±0.05	1.25 ±0.05	2.00 ±0.05	3.00 ±0.05	4.00 ±0.05	4.00 ±0.05
	C	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
	d	0.3	0.52	0.52	0.72	0.97	1.22	2.72	3.72	3.72	4.72
	e	0.3	0.36	0.58	0.72	0.97	1.22	1.72	2.72	3.72	3.72

Packaging

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

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