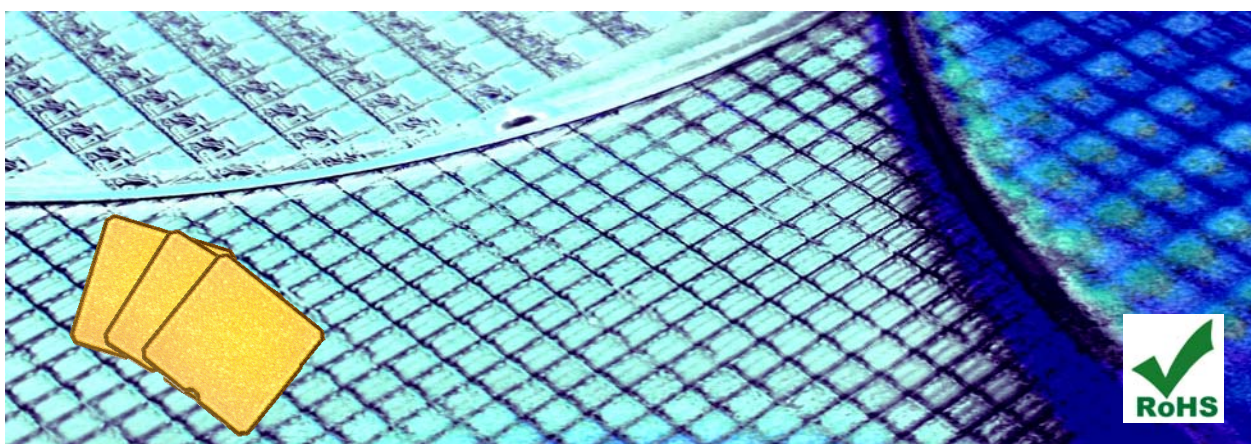




UWSC – Ultra large-band Wire bonding Silicon Capacitor – Wire Bondable Vertical

Rev 1.5



Key Features

- Ultra largeband performance up to 26 GHz
- Resonance free
- Phase stability
- Unique capacitance value of 1nF in 0101
- Ultra high stability of capacitance value
 - Temperature $< \pm 0.5\%$ (-55°C to +150°C)
 - Voltage $< 0.02\%$ /V
 - Negligible aging $< 0.001\%$ /1000 hours
- Ultra low ESR and ESL
- High reliability (FIT < 0.017 parts/billion hours)
- Compatible with standard wire bonding assembly (ball and wedge)*

* Please refer to our Assembly Application Note for more details

Key Applications

- Optoelectronics/high-speed data
- Trans-Impedance Amplifiers (TIA)
- Receive-and-Transmit Optical Sub-Assembly (ROSA/TOSA)
- Synchronous Optical Networking (SONET)
- High speed digital logic
- Broadband test equipment
- Broadband microwave/millimeter wave
- Replacement of X7R and NP0
- Low profile applications (250 μm , 100 μm on request)

UWSC Capacitors target **optical communication systems** (ROSA/TOSA, SONET and all optoelectronics) as well as **high speed data systems** or products. The UWSC are designed for DC decoupling and bypass applications. The unique technology of integrated passive devices in silicon developed by IPDiA, offers **high rejection up to 26GHz**. The UWSC capacitors are manufactured with both deep trench and MOS semiconductor processes to cover low and high capacitance requirements.

The UWSC capacitors provide **very high reliability** and capacitance stability over temperature ($\pm 0.5\%$) and voltage. They have an extended operating temperature range from -55 to 150°C. **Reliable and repeatable performances** are obtained thanks to a fully controlled production line with high temperature curing (above 900°C) generating a highly pure oxide. These capacitors are compatible with standard wire bonding assembly (ball and wedge). They are RoHS-compliant and are available with thick gold terminations.

Electrical Specifications

Part number	Product description	Case Size	Thickness
UWSC.xxx	Ultra largeband Wire bondable vertical Silicon Capacitor, from -55 to 150°C, 26GHz with Au termination		
935 153 622 410	Ultra largeband Wire bondable vertical Si Cap 1nF, BV>50V	0101	250µm
935 153 620 510	Ultra largeband Wire bondable vertical Si Cap 10nF, BV>50V	0303	250µm
935 153 624 522	Ultra largeband Wire bondable vertical Si Cap 22nF, BV>50V	0504	250µm
935 153 821 510	Ultra largeband Wire bondable vertical Si Cap 10nF, BV>30V	0202	250µm
935 154 622 410	Ultra largeband low profile Wire bondable vertical Si Cap 1 nF, BV>50V	0101	100µm
935 154 620 510	Ultra largeband low profile Wire bondable vertical Si Cap 10nF, BV>50V	0303	100µm
935 154 821 510	Ultra largeband low profile Wire bondable vertical Si Cap 10nF, BV>30V	0202	100µm

Parameters	Value
Capacitance range	10pF to 100 nF ⁽¹⁾
Capacitance tolerance	± 15 % ⁽²⁾
Operating temperature range	-55 °C to 150 °C
Storage temperature	- 70 °C to 165 °C
Temperature coefficient	<±0.5 %, from -55 °C to +150 °C
Breakdown voltage (BV)	11, 30, 50, 150, 450 V ⁽³⁾
Capacitance variation versus RVDC	0.02 %/V (from 0 V to RVDC)
Equivalent Serial Inductance (ESL)	typ 6 pH ⁽⁴⁾ @SRF
Equivalent Serial Resistance (ESR)	typ. 14 mΩ ⁽⁴⁾
Insulation resistance	100 GΩ min @ RVDC & +25°C
Aging	Negligible, < 0.001 % / 1000h
Reliability	FIT<0.017 parts / billion hours,
Capacitor height	Max 250 µm or 100 µm

(**) Other values on request

(***) e.g. 10nF/0303/BV 50V

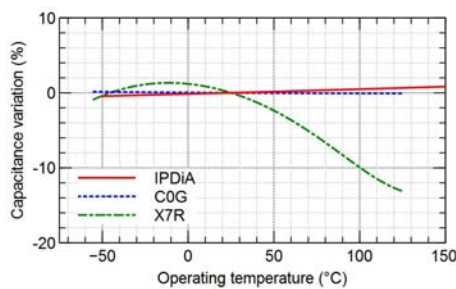


Fig.1: Capacitance variation vs temperature (for UWSC and MLCC technologies)

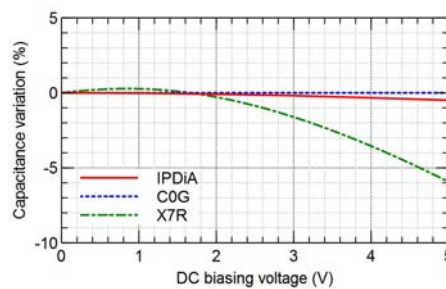


Fig.2: Capacitance variation vs DC biasing voltage (for UWSC and MLCC technologies)

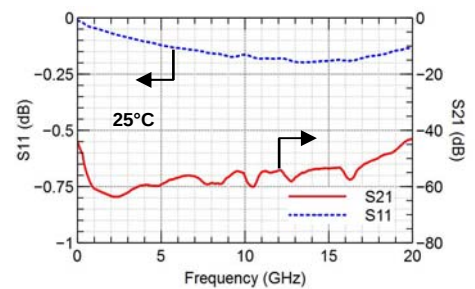
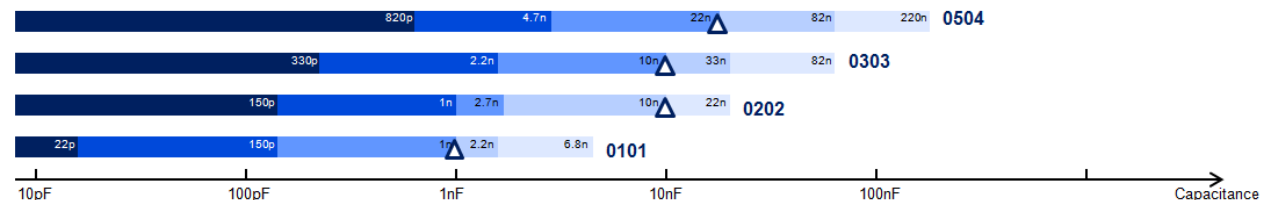


Fig.3: 10 nF/0303 UWSC measurement results (S-parameters in shunt mode)

UWSC Capacitance Range



Δ Available parts – see table above

For other values, contact your IPDiA sales representative

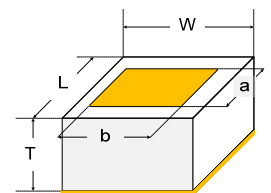
Termination and Outline

Termination

Can be directly mounted on the PCB using die bonding and wire bonding. Bottom electrode in Ti/Ni/Au and top electrode in Ti/Cu/Ni/Au. Other top finishings available on request (ex: 3µm Al/Si/Cu). Compatible with standard wire bonding assembly (ball and wedge).

Package Outline

(mm)	Pad dimension		Case size (typ. ±0.01mm)		
	a	b	L	W	T
0101	>0.15	>0.15	0.25 ⁽¹⁾	0.25 ⁽¹⁾	0.25 (standard profile) or 0.10 (low profile)
0201	>0.40	>0.15	0.50	0.25	
0202	>0.40	>0.40	0.50	0.50	
0303	>0.70	>0.70	0.80	0.80	
0404	>0.94	>0.94	1.04	1.04	
0503	>1.17	>0.72	1.27	0.82	
0504	>1.28	>0.92	1.38	1.02	



Packing

Tape and reel, wafer pack, film frame carrier or raw wafer delivery.

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- Подбор аналогов.
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- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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