UWSC - 26 GHz+

Ultra large-band Wire bondable vertical Silicon Capacitors

Rev 1.3

Key features

- Ultra large band performance higher than 26 GHz
- Resonance free and phase stability
- Unique capacitance value of 1 nF in 0101
- High stability of capacitance value over temperature, voltage and aging
- Ultra low ESR and ESL and high reliability
- 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 capacitors
- 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 Murata Integrated Passive Solutions, offers **high rejection at frequencies higher than 26 GHz.** 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 (+60ppm/K) and voltage. They have and 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 large-band Wire bondable vertical Si Capacitor from -55 to 150°C, 26 GHz+ with Gold termination		
935154528247-xxT	Low profile UWSC, 47 pF BV150	0201	100 µm
935154522310-xxT	Low profile UWSC, 100 pF BV150	0101	100 µm
935154521310-xxT	Low profile UWSC, 100 pF BV150	0202	100 µm
935153521310-xxT	UWSC, 100 pF BV150	0202	250 µm
935154529315-xxT	Low profile UWSC, 150 pF BV150	015015	100 µm
935154832410-xxT	Low profile UWSC, 1 nF BV30	0101	100 µm
935154632410-xxT	Low profile UWSC, 1 nF BV50	0101+	100µm
935154521410-xxT	Low profile UWSC, 1 nF BV150	0202	100 µm
935153521410-xxT	UWSC, 1 nF BV150	0202	250 µm
935154831510-xxT	Low profile UWSC, 10 nF BV30	0202	100 µm
935154630510-xxT	Low profile UWSC, 10nF BV 50	0303	100 µm
935153831510-xxT	UWSC, 10 nF BV30	0202	250 µm
935153630510-xxT	Low profile UWSC, 10 nF BV 50	0303	250 µm
935154634522-xxT	Low profile UWSC, 22nF BV 50	0504	100 µm

Parameter	Value
Capacitance range	47 pF to 22 nF(*)
Capacitance tolerance	± 15 %(*)
Operating temperature range	-55 °C to 150 °C
Storage temperature	- 70 °C to 165 °C(**)
Temperature coefficient	+60 ppm/K
Breakdown voltage (BV)	11 V, 30 V, 50 V, 100 V, 150 V, 450 V(*)
Capacitance variation versus RVDC	0.02 %/V (from 0 V to RVDC)
Equivalent Series Inductance (ESL)	Typ 6 pH (****) @ SRF
Equivalent Series Resistance (ESR)	Typ 14 mΩ(****)
Insulation resistance	100GΩ @ RVDC @ 25°C, t>120s for 100nF
Ageing	Negligible, < 0.001% / 1000h
Reliability	FIT<0.017 parts / billions hours
Capacitor height	250 µm or 100 µm (*)
(*) Other values on request (**) w/o packing (****) e.g. 10 nF/0303/BV 50V	

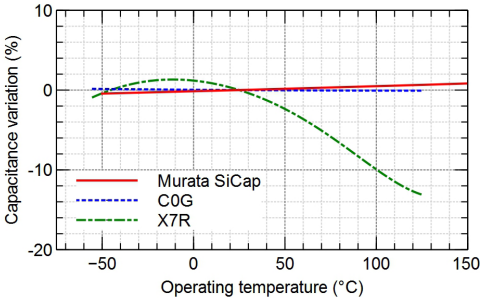


Fig. 1: Capacitance variation vs temperature (for UWSC and MLCC technologies)

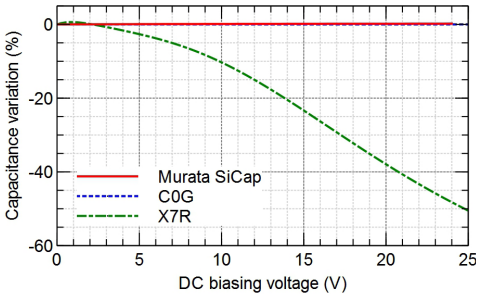


Fig.2: Capacitance variation vs DC biasing voltage @ BV30 (for UWSC and MLCC technologies)

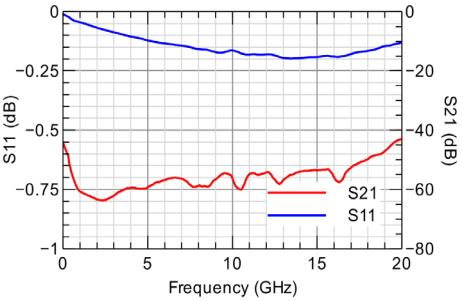
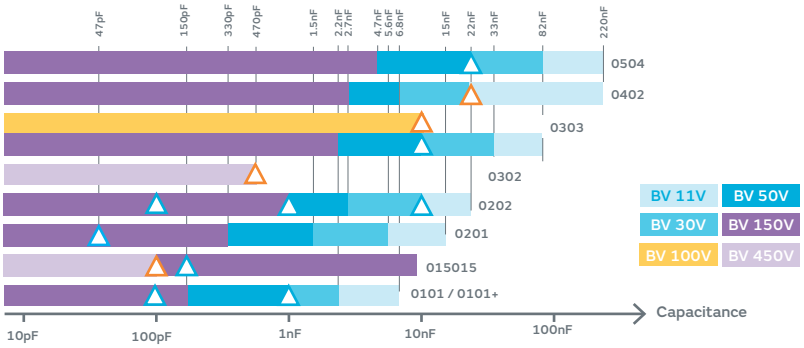


Fig.3: 10 nF / 0303 UWSC @ BV50 measurement results (S-parameters in shunt mode)

Capacitance range



Available parts.
For other values, contact your Murata sales representative.
Under development.

0101+ available as 1 nF-BV50 only.

Termination

Can be directly mounted on the PCB using die bonding and wire bonding(s). Bottom electrode is in Ti/Ni/Au and top electrode in Gold (TiWAu). Other top finishings available on request (ex: Aluminum). Compatible with standard wire bonding assembly (ball and wedge).