

WASC - Automotive Range

Wire bondable Automotive vertical Silicon Capacitors



Rev 0.1

Key features

- AECQ-100 Qualification
- Full compatible Monolithic ceramic capacitors for replacement
- Ultra-high stability of capacitance value:
 - Temperature 70ppm /K (-55 °C to +150 °C)
 - Voltage <0.02%/Volts
 - Negligible capacitance loss through ageing
- Low profile 0.25mm+/-0.010mm and 0.1mm +/-0.010mm. Other thickness possible on request.
- Small size from 0.26 x 0.26mm +/-0.02mm (0101 format) up to 0.5 x 2mm (0208 format)
- Break down voltage > 150V
- Low leakage current
- High reliability
- High operating temperature (up to 150 °C)
- Compatible with high temperature cycling during manufacturing operations (exceeding 300 °C)
- Applicable for standard wire bonding assembly (ball and wedge)

(please refer to our Assembly Application Note for more details)

Key applications

- Any demanding automotive applications, such as ADAS sensors (Lidars, Radars) as well as all Automotive SiP devices (Mems sensors, TPMS...)
- Supply decoupling / filtering of active device
- High reliability applications
- Devices with battery operations
- High temperature applications
- High volumetric efficiency (i.e. capacitance per unit volume)

The WAS Capacitor has been qualified according to AECQ-100 up to 68V, Grade 0 (-40°C/+150°C) 2000 cycles TMCL. Qualification report of the BV150 technology according to AECQ100 requirements is available on request. Target applications are decoupling and filtering of active devices when miniaturization and low ESL are required. The WASC offers capacitance range from 100pF up to 4,7nF. Other capacitance values and other package size can be available on request as a single die or capacitor array; please feel free to contact us.

The WAS Capacitor is based on PICS Integrated Passive technology.

They are RoHS-compliant at the time of publication.



Electrical specifications

Part number	Capacitance	BV	Case size	Thickness
935 148 522 310-W0T	100 pF	150 V	0101	100 μ m
935 148 529 315-W0T	150 pF	150 V	015015	100 μ m
935 148 521 410-T3T	1 nF	150 V	0202	100 μ m
935 147 521 410-T3T	1 nF	150 V	0202	250 μ m
935 248 520 427-T3T	2.7 nF	150 V	0205	100 μ m
935 247 520 427-T3T	2.7 nF	150 V	0205	250 μ m
935 248 521 437-T3T	3.7 nF	150 V	02065	100 μ m
935 247 521 437-T3T	3.7 nF	150 V	02065	250 μ m
935 248 522 447-T3T	4.7 nF	150 V	0208	100 μ m
935 247 522 447-T3T	4.7 nF	150 V	0208	250 μ m

Parameter	Value
Capacitance range	100 pF to 4.7 nF
Capacitance tolerance	$\pm 15\%$
Operating temperature range	-55 °C to 150 °C
Storage temperature	-70 °C to 165 °C
Temperature coefficient	+70 ppm/K
Breakdown voltage (BV)	150 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 m Ω
Insulation resistance	100G Ω @ RVDC @ 25°C, t>120s for 100nF
Ageing	Negligible, < 0.001% / 1000h
Capacitor height	250 μ m or 100 μ m

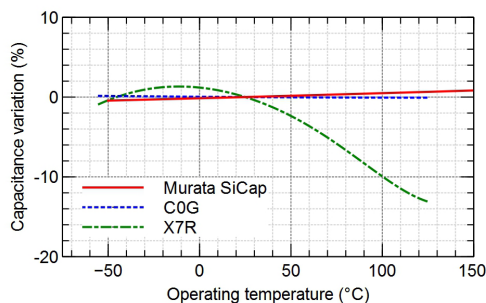


Fig. 1: Capacitance variation vs temperature
(for UWSC and MLCC technologies)

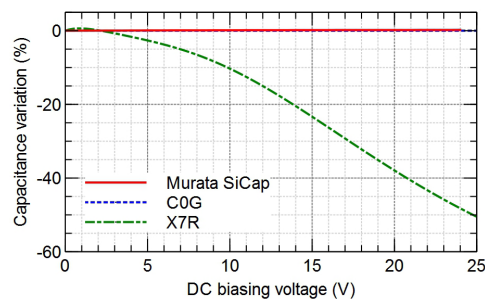
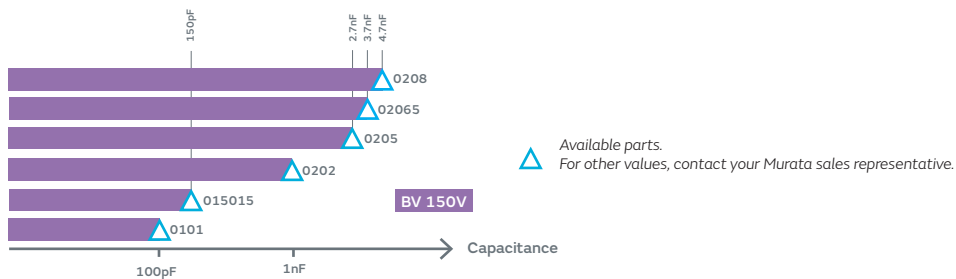


Fig.2: Capacitance variation vs DC biasing voltage @ BV30
(for UWSC and MLCC technologies)

Capacitance range

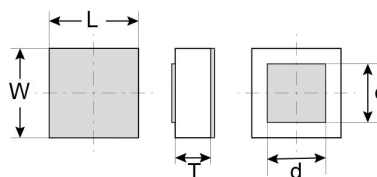


Termination

WASC Capacitors are directly mounted on the PCB using die bonding and wire bonding(s). Bottom electrode is in TiNiAu and top electrode in Gold (TiWAu). Other top finishings available on request (thick Gold or Aluminum). Compatible with standard wire bonding assembly (ball and wedge).

Package Outline

	Pad dimension mm		Case size mm (typ ± 0.02 mm)		
	d	e	L	W	T
0101	0.164	0.164	0.26	0.26	0.10
015015	0.295	0.295	0.39	0.39	
0202	0.4	0.4	0.51	0.51	0.25 or 0.10
0205	1.414	0.394	1.25	0.50	
02065	1.518	0.394	1.625	0.50	
0208	1.894	0.394	2	0.50	



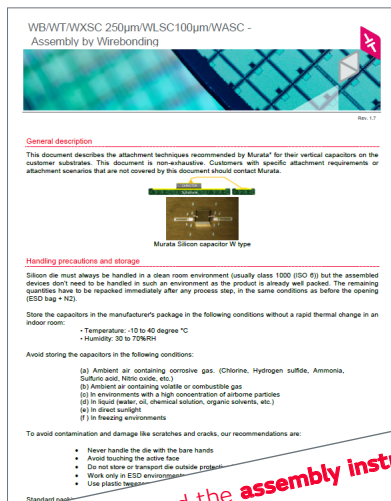


Packaging

Tape and reel (down to 0202 case size included), waffle pack, film frame carrier or raw wafer delivery.

Assembly by Wirebonding

The attachment techniques recommended by Murata for the WASC capacitors on the customers substrates are fully detailed in specific documents available on our website. To assure the correct use and proper functioning of Murata Silicon capacitors **please download the assembly instructions on www.murata.com and read them carefully.**



For the assembly instructions, please go to :

www.murata.com/ and follow the sections :

- Products
- Capacitor
- Silicon Capacitor
- WASC Series

Download the pdf file called :

'Assembly Note WBSC / WTSC / WXSC / WLSC / WASC '

Scan us, and visit our official Website
to get more details :



<https://www.murata.com/en-global/products/capacitor/siliconcapacitors/wasc>

Please download the **assembly instructions**
on www.murata.com
and **read them carefully before use.**
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