

MGSC

Medical Grade Silicon Capacitors



Rev 1.0

Key features

- High reliability.
- Extreme low profile.
- High stability of capacitor value over voltage, temperature and aging.
- Die to die stacking

Key applications

- Pacemakers and defibrillators
- Implantable neuro-stimulators
- Active prosthesis (artificial heart, electronic retina, mechanical limb prosthesis...)
- Life support equipment

The Murata* MGSC capacitors target **all critical implantable devices and life support solutions**. The deep trench MOS capacitors manufactured in **Murata ISO-13485 certified facility**, combined with a unique Mosaic design and distributed trench capacitors drive to an unprecedented level of electrical performances. Thanks to the purity of the oxide cured at a temperature of 900°C during the manufacturing process, Murata is now offering a range of capacitors tested as per the AEC-Q100 specifications. Moreover, due to the criticality of the applications, a specific 100% screening is done on all manufactured capacitors to avoid any « early life » defects. The very low leakage current enables to improve the performances of battery based applications and increase their lifetime.

The SiCap technology features **high reliability** - better than alternative ceramic capacitor technologies - coupled with **stability and low profile**. The MGSC capacitors offer enhanced decoupling performances compared with standard external SMD solutions, and can be integrated directly into the implantable devices.

*Murata Integrated Passive Solutions



Electrical specifications

MGSC.xxx	Medical Grade Si Capacitors from -55°C to 150°C			
Part number	Capacitance	BV	Case size	Thickness
935181730410-xxA	1 nF	30 V	0202	100 μm
935181732547-xxA	47 nF	30 V	0505	100 μm
935181733610-xxA	100 nF	30 V	0605	100 μm

Parameter	Value
Capacitance range	390 pF to 1 μF(*)
Capacitance tolerance	±15%(*)
Operating temperature range	-55 to 150 °C
Storage temperature range	- 70 to 175 °C(**)
Temperature coefficient	+60 ppm/K
RVDC	12 V
Breakdown voltage (BV)	30 VDC
Capacitance variation versus RVDC	0.1 %/V (from 0 V to RVDC)
Insulation resistance	50 GΩ @ 10 V, @ 25°C, t>120s, for 100 nF
Ageing	Negligible, < 0.001% / 1000 h
Reliability	FIT<0.017 parts / billions hours
Capacitor height	100 μm
(*) other values on request (**) w/o packing	

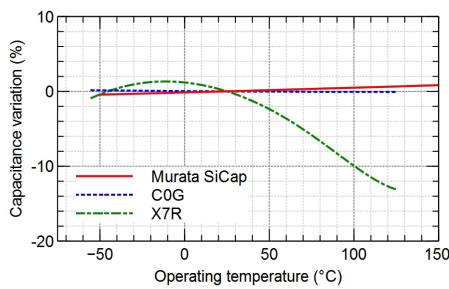


Fig. 1: Capacitance variation vs temperature (for MGSC and MLCC technologies)

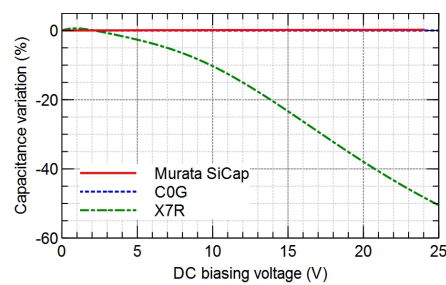
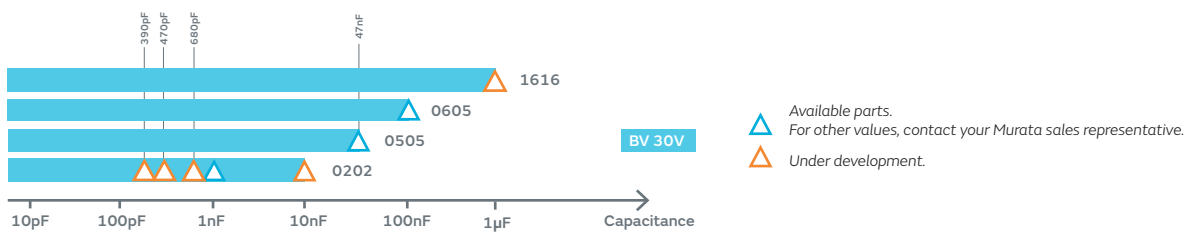


Fig.2: Capacitance variation vs DC biasing voltage @ BV 30 (for MGSC and MLCC technologies)

Capacitance range

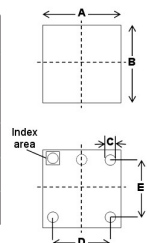


Termination

Aluminum pads suitable for wirebonding assembly. Copper finishing option for embedded technology.

Package outline

	Case size		Pad dimensions (±0.05) μm		
	A	B	C	D	E
0202	0.65	0.65	0.15	0.30	0.30
0505	1.32	1.32	0.15	0.96	0.96
0605	1.59	1.32	0.15	1.16	0.96
1616	4.07	4.07	0.15	3.44	3.44



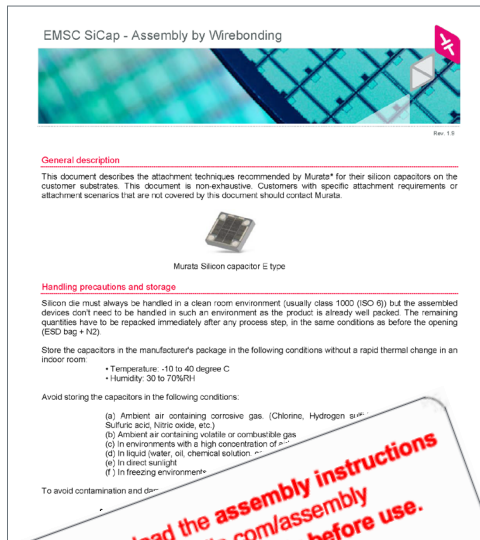
Packaging

Tape & reel. Other type of packagings on request (film frame carrier, raw wafer...).



Assembly by wirebonding

The attachment techniques recommended by Murata for the MGSC 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.ipdia.com/assembly and read them carefully.



For MGSC assembly instructions, please go to www.ipdia.com/assembly and download the pdf file called: 'EMSC Capacitors - Assembly by Wirebonding'

Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent or other industrial or intellectual property rights.



www.murata.com
mis@murata.com