

PRODUCT SPECIFICATION

C u s t o m e r : _____
P r o d u c t N a m e : Silicon Capacitor
P a r t N O : FSC0202V102R0300
I s s u e D a t e : _____

Prepared	Checked	Customer Check
ChenTT	Zelig	

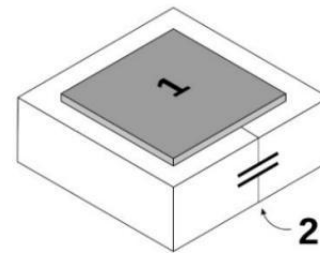
Silicon Capacitor – Vertical Cap0202 1nF BV300V

Features

- Ultra high stability (temperature, voltage).
- Low leakage current (high insulation resistance).
- Suitable with lead free reflow soldering

Typical Applications

- SONET
- High speed digital logic
- Microwave /millimeter system
- High volumetric efficiency
- Broadband test equipment



Pin configuration

Product Information

Product Name	Package Finishing	Description
FSC0202V102R0300	Top: Au 0.5um, Ni 2um, Cu 3um Bottom: Ti 0.1um, Ni 0.25um, Au 0.4um	1nF/0202/BV 300V – Vertical cap – 0.50 x 0.50 x 0.20 mm

Electrical Characteristics

Parameters	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Capacitance value	@25 ±3°C, 1.0MHz, Vbias= 0V, Vac= 0.2Vrms	C		1000		pF
Capacitance tolerance	@25 ±3°C	ΔCP	-20		20	%
Operating temperature		TOP	-55	25	125	°C
Capacitance temperature variation	@-55°C to 125 °C, 1.0MHz, Vbias= 0V, Vac= 0.2Vrms	ΔCT		65		ppm/°C
Rated voltage		RVDC			100	VDC
Break down voltage	@25 ±3°C, <50mA, 1~5s	BV	300			V
Capacitance voltage variation	From 0 V to RVDC, @25±3 °C, 1.0MHz	ΔCRVDC			0.01	%/VDC
Insulation resistor	@RVDC, 25±3°C, 60s, <50mA	IR	100			GΩ

Reliability Characteristics

Item	Technical Specifications		Test Conditions
Wire Bond Pull	Target	The bond should not be removed before the minimum force is applied	The capacitor shall be mounted onto the designated test substrate or fixture. After a 25 μm diameter Au wire has been bonded to the solder ball, a tensile load is applied vertically until separation, and the peak pull force is recorded as the bond strength value.
	Spec	≥3.0gf	
Wire Bond Shear	Target	The bond should not be removed before the minimum force is applied	The capacitor shall be mounted onto the designated test substrate or fixture. After a 25 μm diameter Au wire has been bonded to the solder ball, a tensile load is applied vertically until separation, and the peak pull force is recorded as the bond strength value.
	Spec	≥13.0gf	
Die Shear	Target	Within the range of the applied force, the sample shall not break at its mounting position	The capacitor is mounted onto the designated test substrate or fixture, and a lateral shear load is subsequently applied to its termination/ball.
	Spec	Depending on the size and specification of the product	
Solderability	Welding requirements		Prior to solder immersion, the DUT shall be flux-treated using a rosin/ethanol medium and then subjected to a preheat cycle ranging from 80°C to 120°C for 10 to 30 seconds. The final step involves a 2.0 ± 0.5 s dip into a solder pot at 245 ± 5°C..
	Good tinning, with a terminal wetting rate greater than 95%.		

Reliability Characteristics

Item	Technical Specifications		Test Conditions		
Rapid temperature changes	Appearance	No damage.	Steps	Temperature (°C)	Time (min)
	Capacitance variation	$C < 5\text{pF}$, $\pm 0.25\text{pF}$, $C \geq 5\text{pF}$, $\pm 5\%$	1 st	-55	30
			2 nd	25	2~5
			3 rd	125	30
	Q value	Within the initial specifications	4 th	25	2~5
	IR value	Within the initial specifications	Following the soldering of capacitors onto the test substrate, the assembly shall be subjected to temperature cycling as per Steps 1 through 4, repeated for 5 cycles. Upon completion, the samples are conditioned at ambient temperature ($25 \pm 5^\circ\text{C}$) for 24 hours. Thereafter, a visual inspection is performed, and electrical parameters including Q, C, and IR are evaluated		
Welding heat resistance	Appearance	No damage.	The capacitor specimen is subjected to a molten solder bath (tin-based alloy) maintained at $260 \pm 5^\circ\text{C}$ for a dwell time of 10 ± 1 seconds, with an immersion depth of 1 mm from the component surface. Following solder exposure, the DUT is allowed to recover under ambient conditions ($25 \pm 5^\circ\text{C}$) for 24 hours. Subsequently, a final inspection is conducted to assess external integrity and to measure the electrical parameters: Q, C, and IR		
	Capacitance variation	$C < 5\text{pF}$, $\pm 0.25\text{pF}$, $C \geq 5\text{pF}$, $\pm 5\%$			
	Q value	Within the initial specifications			
	IR value	Within the initial specifications			

Reliability Characteristics

Item	Technical Specifications		Test Conditions
Dampheat, steadystate	Appearance	No damage.	After the capacitors are soldered onto the test board, they are subjected to charge/discharge cycling with the current limited to a maximum of 50 mA. Upon completion of the stress application, the DUTs are conditioned at ambient temperature ($25 \pm 5^{\circ}\text{C}$) for 24 hours. A final visual inspection is then performed, followed by electrical characterization including Q, C, IR. Test temperature: $40 \pm 2^{\circ}\text{C}$ Test humidity: RH 90%~95% Test time: 500+/-12h Test voltage: Rated voltage
	Capacitance variation	$C < 5\text{pF}$, $\leq \pm 0.25\text{pF}$, $C \geq 5\text{pF}$, $\leq \pm 5\%$	
	Q value	Within the initial specifications	
	IR value	Within the initial specifications	
Endurance test	Appearance	No damage.	Weld capacitors on the test board. The charging and discharging current should not exceed 50mA. After leaving it at room temperature for 24 hours, observe the appearance and measure Q, C and IR. Test temperature: $125 \pm 3^{\circ}\text{C}$ Test time: 1000+/-12h Test voltage: 200% of the rated voltage
	Capacitance variation	$C < 5\text{pF}$, $\leq \pm 0.25\text{pF}$, $C \geq 5\text{pF}$, $\leq \pm 5\%$	
	Q value	Within the initial specifications	
	IR value	Within the initial specifications	

Pad Metallization

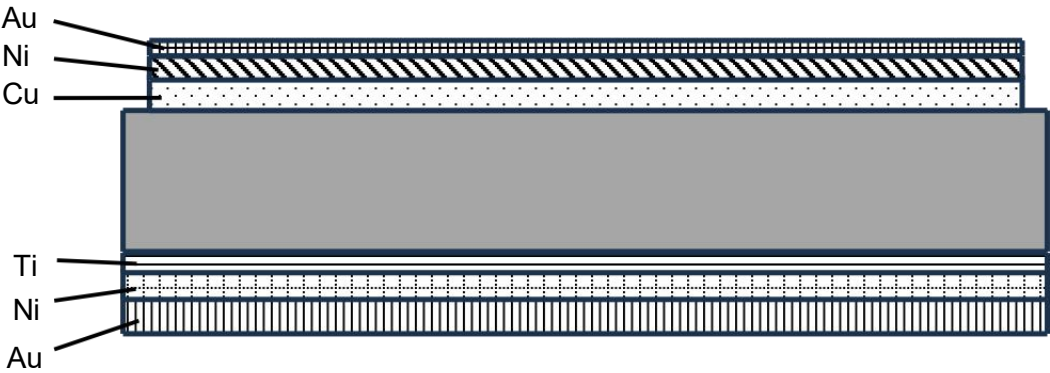
This surface-mounted silicon capacitor is available with bumping in a variety of metallization finishes. Optional plating materials include, but are not limited to, SAC305 (Type 6), copper, thick gold, and aluminum pads. Custom metallization specifications can be accommodated upon request.

Top Pad:

- Au: 0.5 ±0.3 um
- Ni: 2.0 ±1.0 um
- Cu: 3.0 ±1.0 um

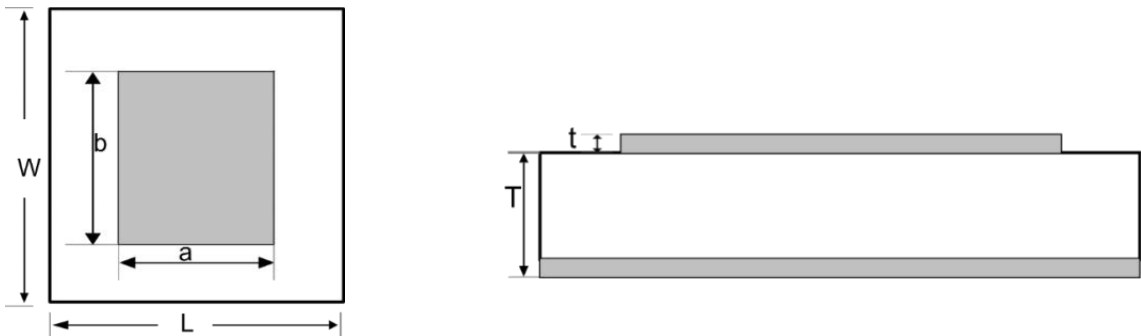
Bottom pad:

- Ti: 0.10 ±0.01 um
- Ni: 0.25 ±0.03 um
- Au: 0.40 ±0.04 um



Package outline

The product is delivered as a bare silicon die.



Dimensions and tolerances

	L (mm)	W (mm)	T (mm)	a (mm)	b(mm)	t(mm)
Component dimension	0.50 ±0.05	0.50 ±0.05	0.20±0.05	0.40	0.40	0.005