

Thin Film MNOS Wire-bondable Chip Capacitor

OnChip Devices' SiC0101 thin film top to bottom contact MNOS capacitors provide an extremely stable and precise component for a variety of hybrid microelectronic and multichip module applications. Other applications include voltage-controlled oscillators, filter networks, matching networks in modules for wireless communications including mobile phones, cordless phones, and global positioning systems.

The SiC0101 device is built on silicon with a single wire-bondable pad on the top and metallization on the backside of the chip suitable for epoxy die attach. A layer of Silicon Nitride dielectric film is sandwiched between these two metal plates to form the capacitor. OnChip's high quality dielectric is deposited using proprietary processes to achieve capacitance values of 4.7pF to 30pF. This dielectric material offers high stability and Q values while exhibiting low temperature and voltage coefficients. These Thin Film devices have extremely stable capacitances over a wide range of frequencies from 1MHz to several GHz. Additionally, their semiconductor construction provides an ultra-high Self-Resonant Frequency (SRF) and exceptionally low Equivalent Series Resistance (ESR).

ELECTRICAL SPECIFICATIONS	
Parameter	Test Conditions
Operating Temperature Range	-55°C + 125°C
D.C. Working Voltage @ 25°C	As specified in C/V table
Peak Voltage @ 25°C	1.2 x Working Voltage
Dissipation Factor @ 1 khz, 1V, 25°C	0.1% max
Q @ 1 Mhz, 50 mV, 25°C	1,000 min
Temperature Coefficient of Capacitance (TCC), -55°C + 150°C	±150ppm/°C

CV TABLE	
Capacitance (pF)	Break Down Voltage (V)
4.7	75
5.6	75
6.8	75
10	50
12	50
15	50
18	30
22	30
30	25

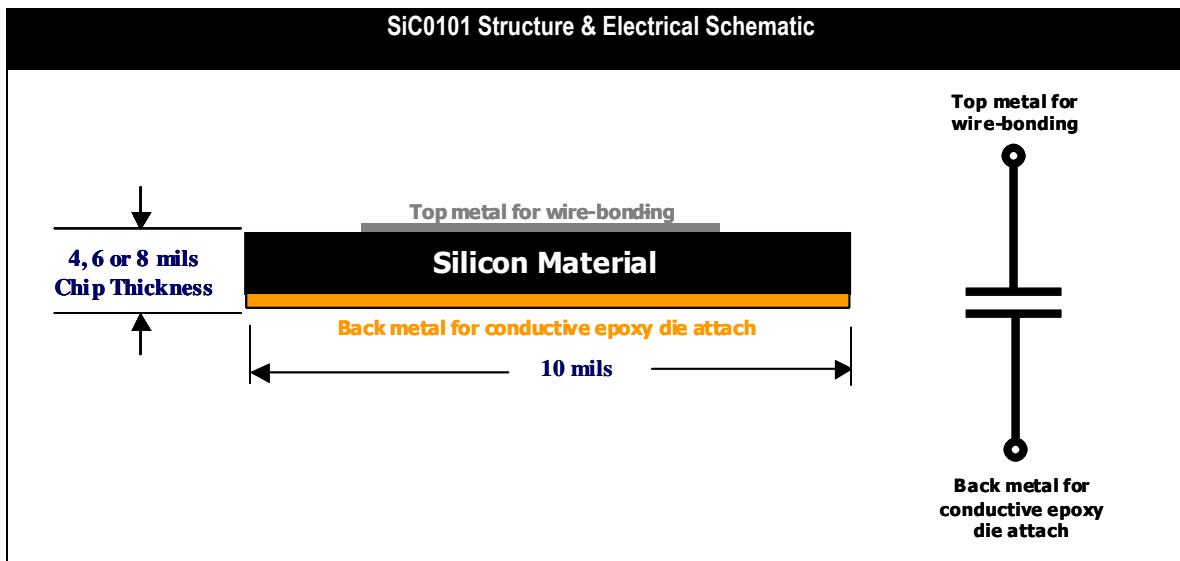
PRELIMINARY DATA SHEET

OnChip

SiC0101

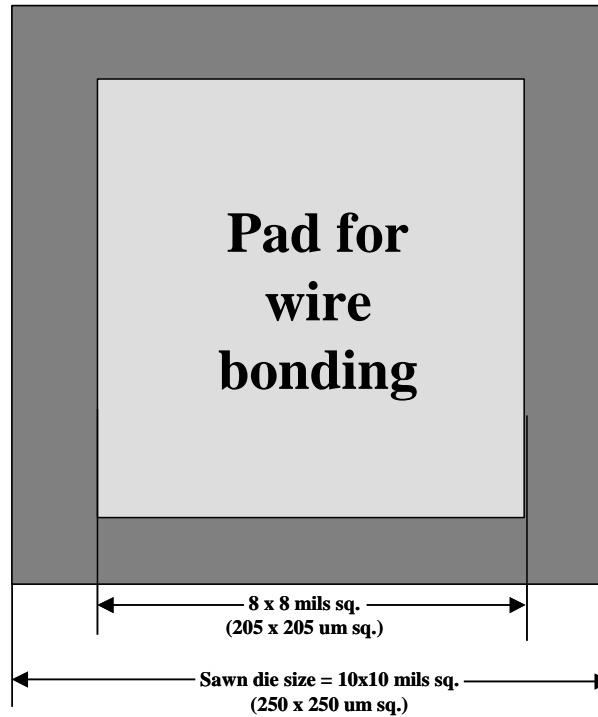
Ordering Part No.						
Part Family	Chip Thickness	Capacitance Value	Tolerance	Package Type	Front Metal Pad for Wire Bonding	Back Metal for Die Attach (Typical thickness)
SiC0101	x4 = 4 mils	-4.7 = 4.7pF	K = $\pm 10\%$	W = Unsawn full 5" wafer	A = Aluminum	1= Ti/Ni/Au (550A/4,000A/2,500A)
	x6 = 6 mils	-7 = 7pF	M = $\pm 20\%$	B = Diced and shipped on mylar/tape	G = Gold	2 = Ti/Ag (550A/5,000A)
	x8 = 8 mils	-22 = 22pF		P = Diced and shipped in Gelpak		

Part Number Example: SiC0101x4-12KWA1 is a 10 x 10 mils sq silicon chip with 12pF $\pm 10\%$ capacitance; shipped as 4 mils thick unsawn 5" wafers with Aluminum top pads and Ti/Ni/Au back metal.



Mechanical specifications		Unit
Die composition	Silicon wafer	
Die shape	Square	
Chip Length	250 (after saw)	μm
Chip Width	250 (after saw)	μm
Chip Thickness	4, 6 & 8 ± 0.5	mils
Saw street widths (space between each capacitor chip on the wafer)	80 (X-direction) 80 (Y-direction)	μm
Top pad length	205	μm
Top pad width	205	μm
Top pad composition	Aluminum or Gold	
Back metal (underside of die)	Gold or Silver (for conductive epoxy die attach)	

Device Dimensions



Wafer Array: Saw Step Size = 330 μm x 330 μm

