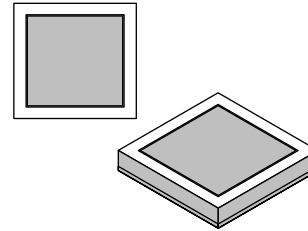


## Features

- Readily Available From Stock
- High Reliability Silicon Oxide–Nitride Dielectric
- Low Loss — Typically 0.04 dB in a 50 Ω System
- Operation through 26 GHz
- Wide Temperature Operation



## Description

Alpha's MIS Chip Capacitors are available in a wide range of sizes and capacitance values. They are frequently used in applications requiring DC blocking, and RF bypassing, or as a fixed capacitance tuning element in filters, oscillators, and matching networks. The devices have a dielectric composed of thermally grown silicon dioxide over which a layer of silicon nitride is deposited. This dielectric possesses a low temperature coefficient of capacitance, very high insulation resistance. The devices also exhibit excellent long term stability making them suitable for high reliability applications. The capacitors have a high dielectric breakdown which permits the use of thin dielectrics resulting in larger capacitance per unit area than our previous catalog offerings. The temperature coefficient is less than 50 ppm/°C, and operation is suitable from -65°C to 200°C. Compared to ceramic capacitors, Skyworks' MIS chip capacitors offer higher Q, and a lower insertion loss of 0.04 dB, in a 50 Ω system. Insulation resistance is greater than 10<sup>5</sup>M Ω. To accommodate high volume automated assembly methods, wafers can be supplied on expanded film frame. To reduce cost, chips can be supplied with only sample testing packaged in vials. Packaging in waffle packs with 100% electrical test and visual inspection is always available if required.

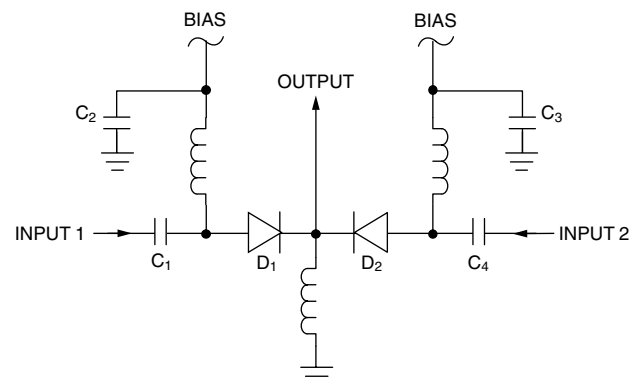
## Absolute Maximum Ratings

Characteristic	Value
Operating Temp Range (T <sub>OP</sub> )	-65 to +200°C
Storage Temp Range (T <sub>STG</sub> )	-65 to +200°C
Dielectric Withstanding Voltage	100 V

## Electrical Specifications

Capacitance Range<sup>1</sup>: 0.8 to 1000 pF  
 Temperature Coefficient: 50 ppm/°C Typical  
 Capacitance Tolerance<sup>2</sup>: ±20%  
 Operating Temperature: -65°C to 200°C  
 Dielectric Withstanding Voltage: 100 V  
 Insulation Resistance: 10<sup>5</sup> Megohms Typical  
 Leakage Current: Typ. < 1 nA

## Typical SPDT Switch



C<sub>2</sub>, C<sub>3</sub> — Chip MIS Capacitor  
 C<sub>1</sub>, C<sub>4</sub> — Chip or Beam — Lead MIS Capacitor  
 D<sub>1</sub>, D<sub>2</sub> DSG6474 Beam — Lead PIN Diode

### Electrical Specifications

Part Number	Capacitance (+ 20%)	Chip Dimensions (+ 1 mil)
SC00080710	0.8	7 mil Pad/10 mil Chip
SC00080912	0.8	9 mil Pad/12 mil Chip
SC00120710	1.2	7 mil Pad/10 mil Chip
SC00120912	1.2	9 mil Pad/12 mil Chip
SC00180710	1.8	7 mil Pad/10 mil Chip
SC00180912	1.8	9 mil Pad/12 mil Chip
SC00260710	2.6	7 mil Pad/10 mil Chip
SC00260912	2.6	9 mil Pad/12 mil Chip
SC00380710	3.8	7 mil Pad/10 mil Chip
◆ SC00380912	3.8	9 mil Pad/12 mil Chip
SC00560710	5.6	7 mil Pad/10 mil Chip
◆ SC00560912	5.6	9 mil Pad/12 mil Chip
SC00680710	6.8	7 mil Pad/10 mil Chip
SC00680912	6.8	9 mil Pad/12 mil Chip
SC00820710	8.2	7 mil Pad/10 mil Chip
◆ SC00820912	8.2	9 mil Pad/12 mil Chip
SC00821518	8.2	15 mil Pad/18 mil Chip
SC01000710	10	7 mil Pad/10 mil Chip
◆ SC01000912	10	9 mil Pad/12 mil Chip
SC01001518	10	15 mil Pad/18 mil Chip
SC01500710	15	7 mil Pad/10 mil Chip
SC01500912	15	9 mil Pad/12 mil Chip
SC01501518	15	15 mil Pad/18 mil Chip
◆ SC02200912	22	9 mil Pad/12 mil Chip
SC02201518	22	15 mil Pad/18 mil Chip
SC03301518	33	15 mil Pad/18 mil Chip
SC04701518	47	15 mil Pad/18 mil Chip
◆ SC06801518	68	15 mil Pad/18 mil Chip
SC10002430	100	24 mil Pad/30 mil Chip
◆ SC10003440	100	34 mil Pad/40 mil Chip
SC22203440	222	34 mil Pad/40 mil Chip
◆ SC33303440	333	34 mil Pad/40 mil Chip
SC50004450	500	44 mil Pad/50 mil Chip
◆ SC99906068	1000	60 mil Pad/68 mil Chip

◆ Available through distribution.

### Example

Part Number Structure — SCXXXXYYZZ

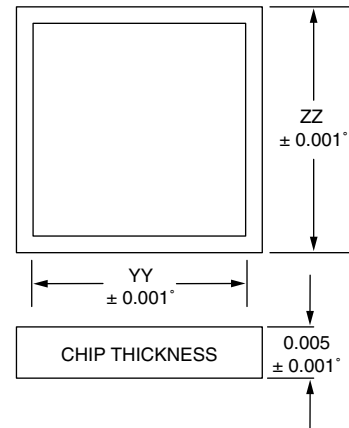
where:

SC = Silicon Capacitor

XXXX = Capacitance (pF)

YY = Square Contact Size (mils)

ZZ = Square Chip Size (mils)



### Performance Data

Tests on typical MIS capacitors at L and S band show insertion loss to be 1/2 to 1/3 that of equivalent ceramic type capacitors, without any of the associated resonance problems. Power tests indicate that the only limitation is the actual breakdown voltage of the device (see data section). A typical insertion loss versus frequency graph is shown in Figure 1. This data is taken from an actual tests circuit with series mounted beam-lead or chip capacitors on a 50 Ω microstrip transmission line. The apparent higher loss at lower frequencies on the lower capacitance units is strictly due to the capacitive reactance of the capacitor.

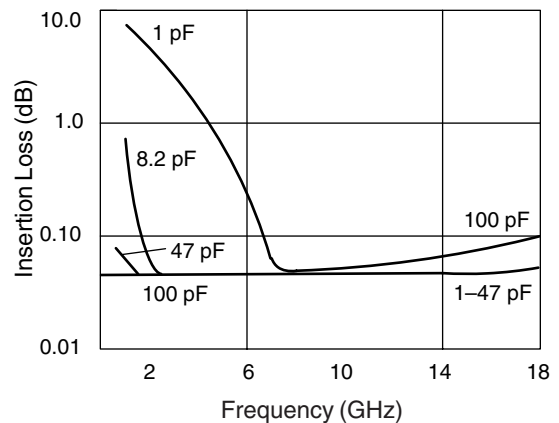


Figure 1. Typical Insertion Loss vs. Frequency (50 Ω System)