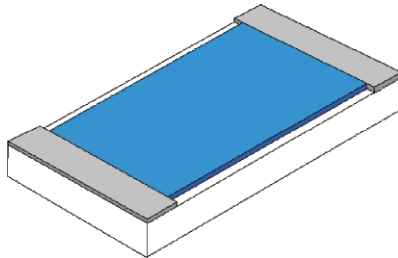




## S0402AF High Frequency Thin Film Chip Resistor

Standard Grade, Surface Mount, Top Surface Terminations



### PRODUCT FEATURES

- Frequency Range to 20GHz with excellent VSWR characteristics
- High stability thin film resistor element, 99.5% alumina substrate
- Produced with the same stringent quality and reliability standards as our QPL S level Mil-PRF-55342 and space level products
- Tight tolerance and low TCR availability

### MECHANICAL

	INCHES	MILIMETERS
Length	.042 (.040 - .048)	1.07 (1.02 - 1.22)
Width	.022 (.020 - .024)	0.56 (0.51 - 0.61)
Thickness	.015 (.013 - .023)	0.38 (0.33 - 0.58)
Top Term	.009 (.004 - .014)	0.23 (0.10 - 0.35)
Gap	.022 (.018 - .026)	0.57 (0.47 - 0.67)
Approx. Weight	.0009 grams	

### FREQUENCY PERFORMANCE

State of the Art thin film high frequency chip resistors are produced with a tantalum-nitride based resistor element that is extremely stable with time, temperature, and frequency. The chips perform well over a wide frequency range, exhibiting low VSWR response from DC to 20 GHz and higher. Solderable terminations allow the chips to be reflowed or hand soldered into microwave circuits easily while maintaining excellent return loss characteristics. Parasitic reactance is very low for these chips with capacitance being typically less than 0.1 pF.

### CHARACTERISTICS

Resistance (others available)	50, 75, 100, 200 ohms
Tolerance (others available)	0.1, 1, 2, 5 %
Maximum Power	50 milliwatts
Frequency Range	DC to 20 GHz
TCR (-55° / + 125°C)	25, 50, 100 ppm/°C

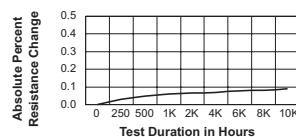
#### ENVIRONMENTAL PERFORMANCE\*

Thermal Shock	±0.03 %
Low Temperature Operation	±0.03 %
Short Time Overload	±0.03 %
Resistance to Bonding Exposure	±0.03 %
Moisture Resistance	±0.05 %
High Temperature Exposure	±0.05 %

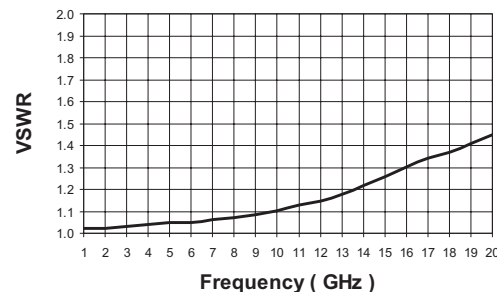
\* Typical percent resistance change - test methods and actual specification limits are in accordance with Mil-PRF-55342.

#### TYPICAL LIFE PERFORMANCE

Parts are solder mounted on Fr4 board and tested at 70°C. Power is applied for 90 minutes on and 30 minutes off at a rate that achieves a film temperature 30°C above ambient.



The frequency response data plotted below shows an example of VSWR obtained for 50 ohm resistors tested (resistor element down) in pressure contact fixtures. Data for chips which are solder attached to matched circuit traces may exhibit even better performance.



VSWR	Return Loss
1.1	26.4 dB
1.2	20.8 dB
1.3	17.7 dB
1.4	15.6 dB
1.5	14.0 dB

Thin film 0402 high frequency chip resistors are also available in other terminations styles and material finishes for attachment to circuit boards by soldering, bonding, or epoxy mounting. High power chip designs on BeO can be provided for increased heat dissipation. Custom chip designs are available to provide optimum solutions for specific high frequency applications.

ADS and Characterization files are available upon request.

Consult our engineering department for specific performance needs.

### PART NUMBERING

**S0402AF 50R0 F H B**

#### RESISTANCE VALUE

Three digits (>1% tolerance) or four digits (1% and lower) are used with all leading digits significant. The last digit specifies the number of zeros to add. The letter "R" is used to represent the decimal for fractional ohmic values.

B: Solderable W: Wire Bondable  
K: SN 62 bump M: 80/20 Au/Sn bump

#### TEMPERATURE COEFFICIENT

E: 25 ppm H: 50 ppm K: 100 ppm

#### TOLERANCES

B: 0.1% F: 1% G: 2% J: 5%

### PACKAGING

Two packaging options are available:  
Waffle Pack - 360 per tray maximum  
Tape & Reel - 5000 per 7 inch reel maximum

### OPTIONS

- Optional high reliability screening or custom testing or other special requirements can also be furnished. Consult our factory with your special needs.
- Also available on fused silica, product code: T