



# THIN FILM CHIP RESISTORS

## 68 Series 0.020"x0.020"

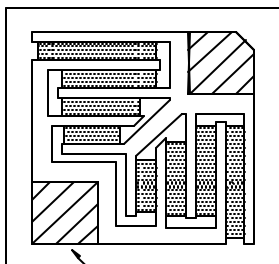
Spectrum Microwave 68 Series 0.020" x 0.020" Thin-film Chip Resistors are available in both top-contact and back-contact versions in several resistances and tolerances. Values are available from 1 ohm to 500 Kohms. Both passivated nichrome and tantalum-nitride resistor versions are available. Nichrome provides excellent stability and temperature coefficient in hermetic applications while tantalum-nitride provides superior moisture-resistance for non-hermetic applications.

### Electrical Specifications

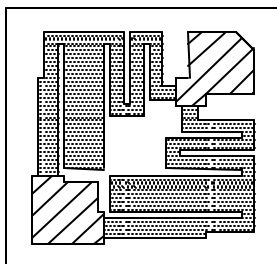
Parameter	Limit	Test conditions
Power Rating	100 mW	(derated at 70° to 0 mW @ 150°)
Life	±0.2% max	1000 hours @ 125° C
Noise	-35 dB typ	MIL-STD-202 method 308
High Temp Exposure	±0.2% max	100 hours at 150° C
TCR (68AL, 68BCN)	±50 ppm/°C	-55° to 125° C
TCR (68ALT, 68BCR)	-50 to -120 ppm/°C	-55° to 125° C
Operating voltage	100 VDC max	
Moisture resistance	±0.5% max	MIL-STD-202 method 106
Thermal shock	±0.5% max	MIL-STD-202 method 107

### Typical Configurations

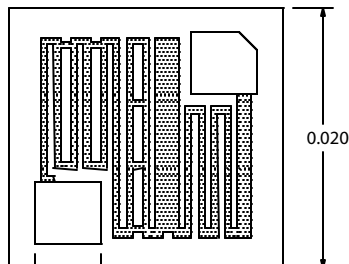
Values below 20 ohms



Values from 20 to 200 ohms



Values above 200 ohms



On back--Contact versions, pad without bevel is connected to back side.

### Mechanical Specifications

Substrate	Silicon with 1 micron thermal oxide
Bond pad metalization	Gold, 100 microinches
Size	0.021 x .021 ±0.002 (0.53 x 0.53 mm ±0.05 mm)
Thickness	0.013 ±0.003 (0.33 ±0.07 mm)
Bond pad dimensions	0.004 x .004 minimum (0.1 x 0.1 mm)
Protective overcoat (passivation)	0.6 microns SiO <sub>2</sub> (68AL & 68BCN versions only)
Back side	Lapped silicon (68AL, 68ALT), Gold (68BCN, 68BCR)

### Spectrum Microwave

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All parts are 100% electrically tested, sample tested per MIL-STD-38534 section 3.4, and visually inspected to MIL-STD-883 requirements. Chips are supplied in standard 2"x 2" matrix tray packaging.

### Ordering Information

<u>Base Part Code</u>	<u>Value (3 digits plus exponent)</u>	<u>Tolerance Letter</u>
<b>68xxx-</b>	<b>NNNE</b>	<b>X</b>
68AL (Nichrome top-contact)	(Under 100 ohms, an R indicates the decimal point location)	B = 0.1%
68ALT (Tantalum-nitride top-contact)		C = 0.25%
		D = 0.5%
		F = 1%
		G = 2%
68BCN (Nichrome back-contact)		J = 5%
		K = 10%
68BCR (Tantalum-nitride back-contact)		M = 20%

#### Ordering Examples:

68AL-5002F is a 50 kilohm 1% resistor with nichrome metalization.

68ALT-75R0J is a 75 ohm 5% resistor with tantalum-nitride metalization.

68BCR-5R10K is a 5.1 ohm 10% back contact resistor with tantalum-nitride metalization.

#### Availability and Limitations:

68AL & 68BCN series are available from 2 ohms to 500 kohms.

68ALT & 68BCR series are available from 1 ohm to 250 kohms.

B tolerance is available above 250 ohms.

C tolerance is available above 100 ohms.

D tolerance is available above 50 ohms.

F tolerance is available above 25 ohms.

G tolerance is available above 12 ohms.

J tolerance is available above 5 ohms.

(Specifications subject to change without notice.)

**Spectrum Microwave** also manufactures Custom Substrates on a variety of materials, a wide range of Microwave, PIN Diode Drivers, and Custom Hybrid Circuits. Please contact the factory or your local representative for more information.

