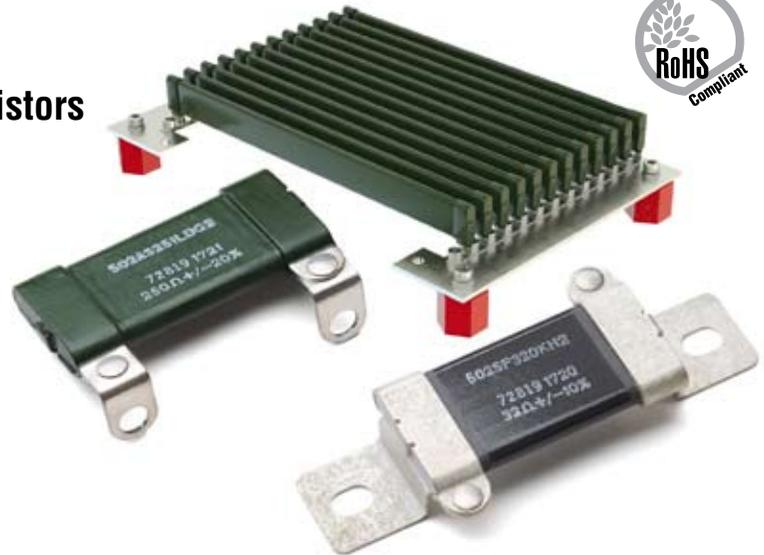


# 500 Series

## Non-inductive Bulk Ceramic Slab Resistors



500 Series Non-Inductive Bulk Ceramic Slab Resistors provide high power and energy dissipation in a compact size. The 500 Series design enables the designer to minimize resistor package size and cost while providing unequaled performance and reliability. The slim, compact resistors offer a number of termination options allowing easy configuration for specific requirements. Ohmite 500 Series non-inductive bulk ceramic slab resistors provide excellent performance where high peak power or high-energy pulses must be handled in a small size. The advantage of the bulk construction is that it produces an inherently non-inductive resistor; and it allows energy and power to be uniformly distributed through the entire ceramic resistor body – there is no film or wire to fail. We offer a full line of rugged, reliable ceramic resistors – including custom designs. Standard terminal mounting tabs are tin plated steel which are soldered to the resistor body. Consult factory for other materials.



### FEATURES

- Inherently non-inductive, high reliability due to bulk ceramic construction
- 15 watts per inch of length power dissipation (type SP)
- Excellent pulse/overload capability
- Slim profile for excellent volumetric power efficiency
- Resistance range from 0.2 to 870K (resistance range dependent on material type)
- Resistance tolerances 5, 10, 20% standard on individual components, available to  $\pm 2\%$  on assemblies

### MATERIAL TYPES

#### TYPE SP

Material composition type SP is formulated to provide lower resistance values and higher derating temperatures. The higher derating temperatures translates to a higher wattage per inch than other material types.

##### Applications

- Motor Drive Controls
- Power Supplies
- Power Conditioning Equipment
- Soft Start/Current Limit Circuits
- Dynamic Braking
- Snubber Circuits
- RF Dummy Load Circuits
- Capacitor Dump Circuits

#### TYPE AS

Material composition type AS is formulated to provide high voltage and high energy absorption in a singular package.

##### Applications

- High voltage power supplies
- Capacitor charge/discharge
- Pulse test equipment
- Radar/broadcast transmitters
- Laser/imaging equipment

#### TYPE BA

Material composition type BA is formulated to withstand high energy and high voltage applications where the required resistance value is above the resistance values available in Type SP and Type AS resistors. Maximum continuous operating temperature is specified at 230°C.

##### Applications

- DC Coupling and Filter Cap Discharge
- Voltage Balancing
- Pre-charge / Inrush Limit
- Voltage Divider
- Filter
- Snubber
- Crowbar
- Measuring
- EMI / EFI Test Circuits
- Test Loads

# 500 Series

## Non-inductive Bulk Ceramic Slab Resistors

### SPECIFICATIONS

Type	Resistance Range ( $\Omega$ )	Avg. Power @ 40°C Amb. (W)	Peak* Energy @ 40°C Amb. (J)	Peak* Voltage	Weight (Grams)
502SP	0.2-110	30	150	900	15
503SP	0.3-190	45	290	1900	22.5
504SP	0.4-280	60	480	2800	30
506SP	0.8-450	90	800	4700	45
508SP	1.0-630	120	1100	6700	60
510SP	1.3-800	150	1400	8500	75
502AS	5-1,200	12	1,500	8,500	16
503AS	9-2,200	18	2,700	16,000	24
504AS	13-3,200	24	4,000	23,000	32
505AS	17-4,200	30	5,200	30,000	40
506AS	21-5,200	36	6,400	36,000	48
507AS	25-6,200	42	7,700	43,000	56
508AS	29-7,200	48	8,900	50,000	64
509AS	33-8,200	54	10,100	57,000	72
510AS	37-9,200	60	11,400	65,000	80
502BA	1.2K-110K	10	700	3,000	
503BA	2.2K-210K	14	1,200	5,400	
504BA	3.2K-300K	20	1,800	8,000	
506BA	5.2K-490K	30	2,900	13,000	
508BA	7.2K-680K	38	4,100	18,000	
510BA	9.2K-870K	48	5,200	22,000	

### Packaged assemblies

Individual standard components can be packaged in series, parallel, or series/parallel arrays to optimize energy and power dissipation in available space. Custom assembly packages are available.

\*Based on energy absorption in less than 10 milliseconds. Energy rating can be substantially greater for longer pulses. Allowable peak energy/voltage will depend on the resistance value.

### CHARACTERISTICS

<b>Operating Temperature</b>	SP: -55°C to +350°C When required, Type SP material can withstand short periods of use at red-heat conditions, i.e. up to 550 to 600°C AS & BA: -55°C to +230°C
<b>Temperature Coefficient</b>	SP & AS: +0.0 to -0.08%/°C BA: +0.0 to -0.2%/°C
<b>Density</b>	SP & AS: 2.2 – 2.4 gm/cc BA: 2.2 – 2.6 gm / cc
<b>Specific Heat</b>	SP: 0.24 – 0.26 cal/gm°C AS: 0.22 – 0.24 cal/gm°C BA: 0.22 – 0.28 cal / (gm -°C)
<b>Thermal Conductivity</b>	SP: 0.14 - 0.16 cal/(cm-°C - sec) AS: 0.003 – 0.006 cal/cm-°C-sec BA: 0.14 – 0.16 cal / (c m -°C - sec )
<b>Size</b>	Standard units are 1" wide by 1/4" thick in variable lengths of 2, 3, 4, 6, 8 and 10 inches. Other lengths to 10" maximum are available.
<b>Rated Average Power</b>	SP: 15 watts per inch of length based on 350°C maximum operating temperature with 40°C ambient. BA: based on 230°C maximum operating temperature with 40°C ambient. Derate linearly to 0 Watts at 230°C
<b>Peak Impulse Current</b>	SP: Max 1000 Amps AS: Max 200 Amps For applications requiring higher current ratings contact factory.

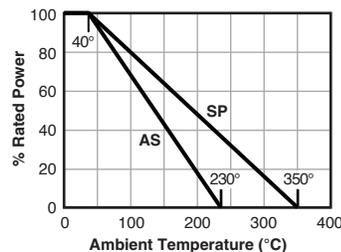
**Short Time Overload** Max. % change after 5 cycles – 10 times rated power, 5 seconds on, 90 seconds off +2%

**Load Life** Max. % change after 1000 hrs. rated power 1½ hours on; ½ hour off +5%

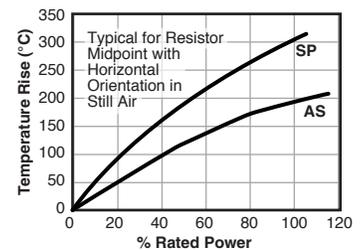
**Thermal Shock** Max. % change after 10 cycles -55°C to +125°C +3%

**Moisture Resistance** Max. % change when tested per MIL-STD-202, Method 103 +5%

### Derating



### Surface Temperature Rise

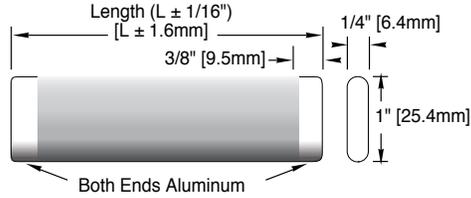


# 500 Series

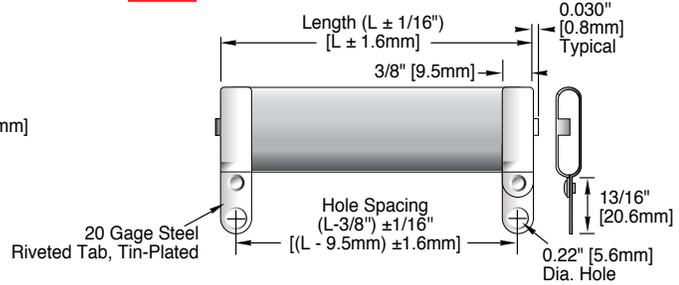
## Non-inductive Bulk Ceramic Slab Resistors

### DIMENSIONS

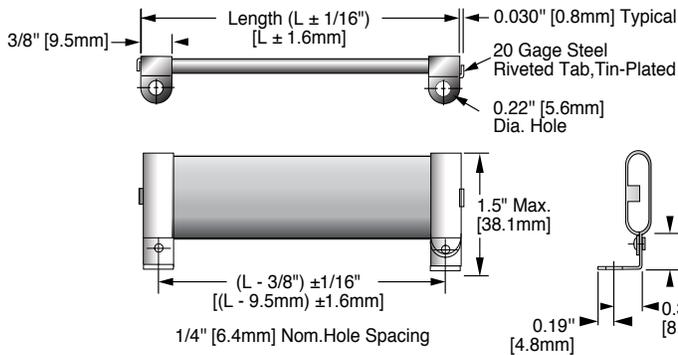
**Fig. 1 Without Tabs**



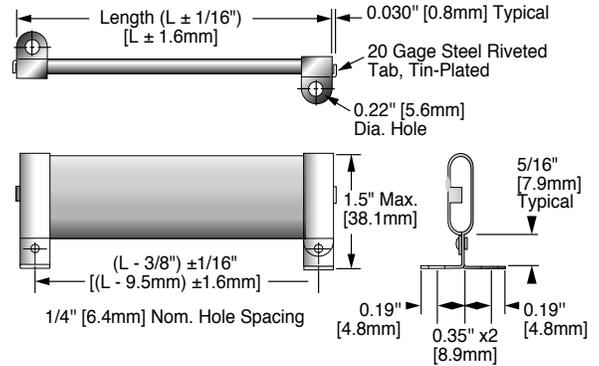
**Fig. 2 With Straight Radial Tabs (G1)**



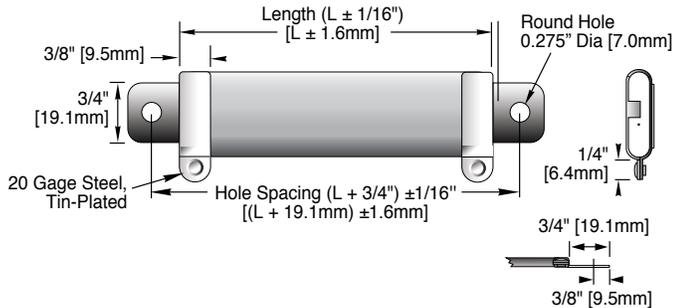
**Fig. 3 With Right Angle Radial Tabs – same direction – (G2)**



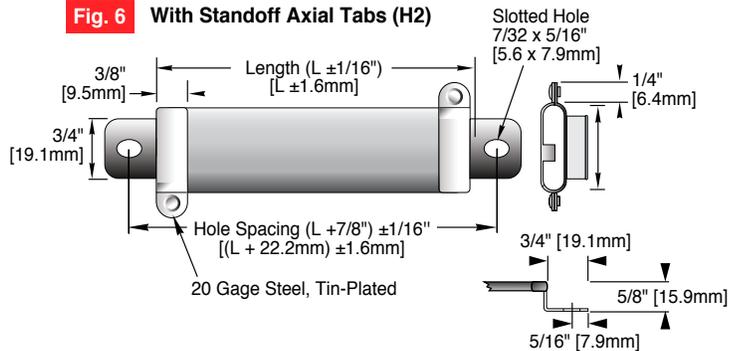
**Fig. 4 With Right Angle Radial Tabs – opposite direction – (G3)**



**Fig. 5 With Low Profile Axial Tabs (H1)**



**Fig. 6 With Standoff Axial Tabs (H2)**



### HOW TO ORDER

**Material Type**  
AS, BA, or SP

**Coating Options**  
D = Dielectric (AS and BA only)  
O = Oil resistant

**504SP101KDG1**

<b>Size/Length</b> 502 = 2" 503 = 3" 504 = 4" 506 = 6" 508 = 8" 510 = 10" (etc.)	<b>Resistance (Ω)</b> For ≥10Ω: First 2 digits are significant, third is number of zeros to follow, e.g. 101 = 100Ω For <10Ω: R replaces decimal point, e.g. R50 = 0.50Ω, 7R5 = 7.5Ω	<b>Tolerance</b> J = ±5% K = ±10% L = ±20%	<b>Terminal Options</b> blank = Standard aluminum metalized ends, no tabs, per Fig. 1 G1 = Straight radial tabs per Fig. 2 G2 = Right angle radial tabs, same direction per Fig. 3 G3 = Right angle radial tab, opposite direction, per Fig. 4 H1 = Low profile axial tabs, per Fig. 5 H2 = Elevated axial tabs, per Fig. 6 Tin plated steel radial tabs are standard. Consult factory for other tab materials.
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