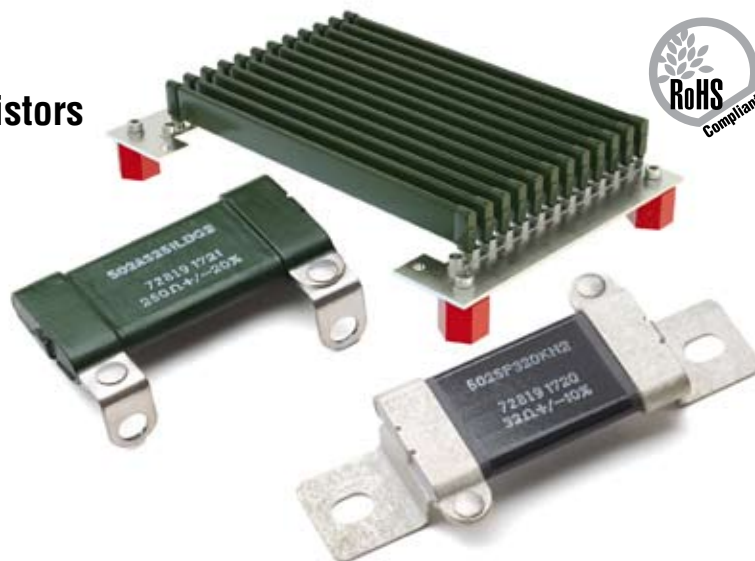




500 Series

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

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SPECIFICATIONS

| Type | Resistance Range (Ω) | 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.

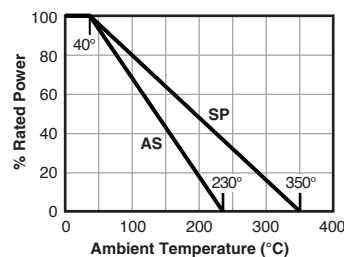
*Based on energy absorption in less than 10 milliseconds. Energy rating can be substantially greater for longer pulses. Allowable peak energy/voltage will depend on the resistance value.

CHARACTERISTICS

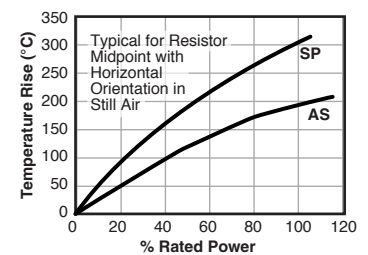
| | |
|--------------------------------|--|
| Operating Temperature | SP: -55°C to +350°C When required, Type SP material can withstand short periods of use at red-heat conditions, i.e. up to 550 to 600°C AS & BA: -55°C to +230°C |
| Temperature Coefficient | SP & AS: +0.0 to -0.08%/°C BA: +0.0 to -0.2%/°C |
| Density | SP & AS: 2.2 – 2.4 gm/cc BA: 2.2 – 2.6 gm / cc |
| Specific Heat | SP: 0.24 – 0.26 cal/gm°C AS: 0.22 – 0.24 cal/gm°C BA: 0.22 – 0.28 cal / (gm -°C) |
| Thermal Conductivity | 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) |
| Size | 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. |
| Rated Average Power | 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 |
| Peak Impulse Current | 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



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DIMENSIONS

Fig. 1 Without Tabs

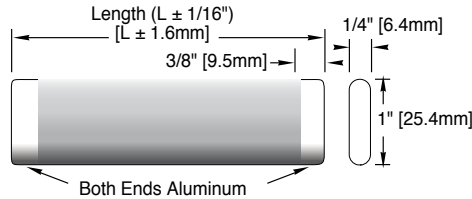


Fig. 2 With Straight Radial Tabs (G1)

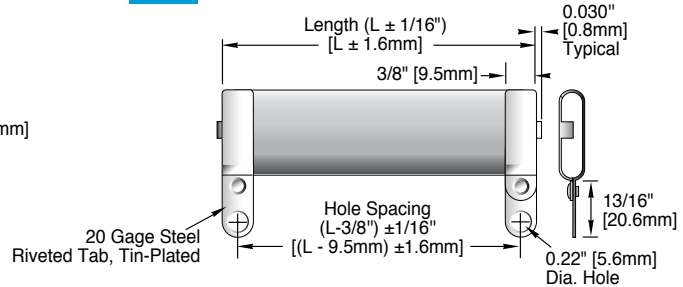


Fig. 3 With Right Angle Radial Tabs – same direction – (G2)

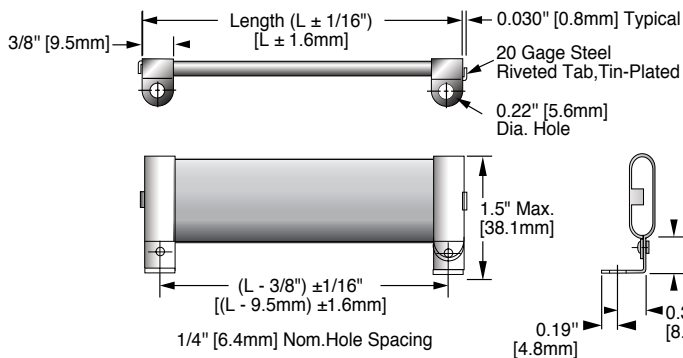


Fig. 4 With Right Angle Radial Tabs – opposite direction – (G3)

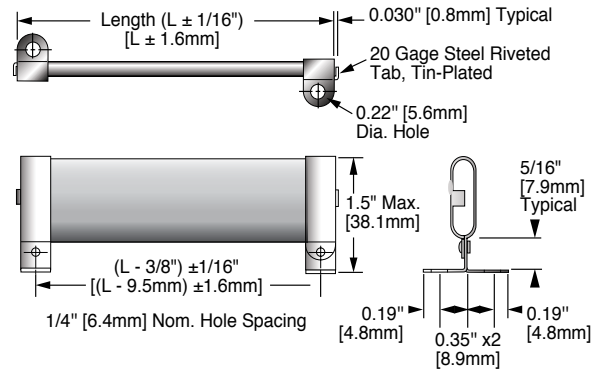


Fig. 5 With Low Profile Axial Tabs (H1)

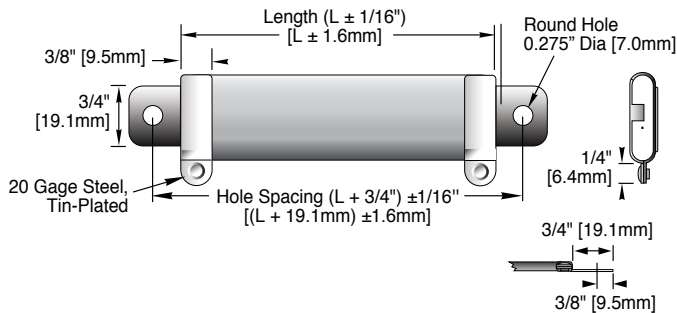
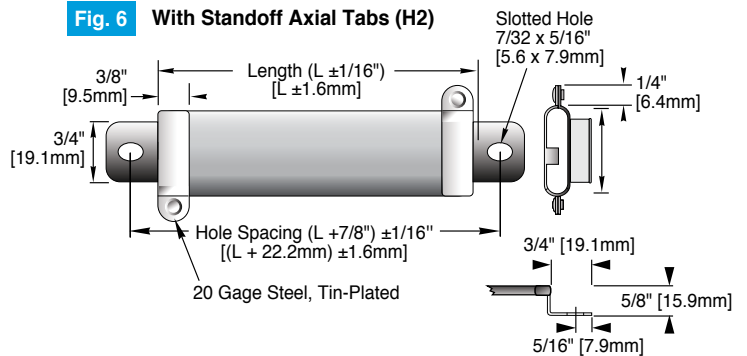


Fig. 6 With Standoff Axial Tabs (H2)



HOW TO ORDER

Coating Options
D = Dielectric
O = Oil resistant

504SP101KDG1

| | | | |
|--------------------------|--|---|---|
| Construction Type | Resistance (Ω) 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 | Tolerance J = ±5% K = ±10% L = ±20% | Terminal Options 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. |
|--------------------------|--|---|---|