# 100 & 200 Series

# **Bulk Ceramic Axial Lead Resistors**

100 & 200 Series Axial Leaded Non-Inductive Bulk Ceramic 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 noninductive 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. Three distinctly different ceramic materials are available in each size to afford the designer with unique components to meet the most demanding requirements.

As alternatives to hard to find carbon composition resistors, composition resistors can be used as drop-in replacements for 1 and 2 watt sizes. Much larger sizes, up to 70 watts in a single component, are available for new or re-designs where an array of smaller resistors may have been previously required.



# FEATURES

- · Non-inductive "bulk ceramic" resistor
- Uniform distribution of energy throughout resistor body
- Replacement of Carbon Composition Resistors
- Large peak energy in small size
- High power dissipation (Type SP)
- High voltage and energy absorption (Type AS)
- Through-hole or post mountable

### MATERIAL TYPES

# TYPE SP

Withstands high operating temperatures resulting in high power dissipation. Maximum continuous operating temperature is specified at 350°C. This type is suitable for use in oil without an oil-resistant coating.

### TYPE AS

Best suited for high energy and voltage pulse applications. Maximum continuous operating temperature is specified at 230°C. The standard dielectric coating is recommended for use in air, and the oil-resistant coating is recommended

## **Appplications**

- Soft Start/In-rush Limiters
- RC Snubber Circuits
- Spark-Gap Limiters
- Parasitic Suppression
- High Voltage Power Supplies

for use in oil.

- Pulse Waveform
- EMI/EFI Test Circuits
- RF Dummy Load Circuits
- Capacitor Dump Circuits

### TYPE BA

Best suited for high energy and voltage pulse 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. The standard dielectric coating is recommended for use in air, and the oil-resistant coating is recommended for use in oil.

### **Appplications**

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

(continued)

# 100 & 200 Series

# **Bulk Ceramic Axial Lead Resistors**

Series     Res. range (n)     Avg. power rating¹ (W)     Rated peak energy² (J)     Rated peak voltage²     Rated peak current³ (A)     Typ. body weight⁴ (g)       231 AS     25-6,350     1.5     75     1,500V     90     0.44       231 BA     6K-390K     1.2     35     1200V     350     0.44       233AS     6-1,800     2     170     1,100V     150     1.2       233BA     1.8K-150K     1.6     80     900V     90     1.2       233BA     1.8K-150K     1.6     80     900V     150     1.2       233BA     1.8K-150K     1.6     80     900V     150     1.9       234AS     12-5,000     3     275     2500V     150     1.9       234BA     4K-300K     2.4     140     2,000V     150     1.9       234BA     4K-300K     2.4     140     2,000V     190     1.9       250AS     4-1,200     2.5     260     1,500V     190     1.5       250AS <th></th> <th></th> <th></th> <th>S</th> <th>PECIFIC</th> <th>ATIONS</th> <th></th>				S	PECIFIC	ATIONS	
231SP     1-1,000     2.5     15     375V     350     0.44       231BA     6K-390K     1.2     35     1200V     12       233AS     6-1,800     2     170     1,100V     150     1.2       233SP     1-120     7     20     375V     550     1.2       233BA     1.8K-150K     1.6     80     900V     150     1.9       234SA     12-5,000     3     275     2500V     150     1.9       234SA     1-330     10     30     500V     550     1.9       234BA     4K-300K     2.4     140     2,000V     190     1.9       250SP     1-150     8.5     20     375V     700     1.5       250SP     1-150     8.5     20     375V     700     1.5       251AS     8-2,300     3.5     400     2,500V     190     3.0       251BA     2K-190K     3     200     2,000V     150     3.8	Series	•					
231SP     1-1,000     2.5     15     375V     350     0.44       231BA     6K-390K     1.2     35     1200V     12       233AS     6-1,800     2     170     1,100V     150     1.2       233SP     1-120     7     20     375V     550     1.2       233BA     1.8K-150K     1.6     80     900V     150     1.9       234SA     12-5,000     3     275     2500V     150     1.9       234SA     1-330     10     30     500V     550     1.9       234BA     4K-300K     2.4     140     2,000V     190     1.9       250SP     1-150     8.5     20     375V     700     1.5       250SP     1-150     8.5     20     375V     700     1.5       251AS     8-2,300     3.5     400     2,500V     190     3.0       251BA     2K-190K     3     200     2,000V     150     3.8	231AS	25-6,350	1.5		1,500V	90	0.44
233AS     6-1,800     2     170     1,100V     150     1.2       233BP     1-120     7     20     375V     550     1.2       233BA     1.8K-150K     1.6     80     900V     150     1.2       234AS     12-5,000     3     275     2500V     150     1.9       234BA     4K-300K     2.4     140     2,000V     190     1.9       250AS     4-1,200     2.5     260     1,500V     190     1.9       250SA     4-1,200     2.5     260     1,500V     190     1.9       250SA     14-130K     2     130     1,200V     150     1.5       250BA     1K-130K     2     130     1,200V     190     3.0       251AS     8-2,300     3.5     400     2,500V     190     3.0       251SP     1-330     12     30     500V     700     2.4       251BA     2K-190K     3     200     2,000V     150	231SP		2.5	15	375V	350	0.44
233SP     1-120     7     20     375V     550     1.2       234AS     1.25,000     3     275     2500V     150     1.9       234SP     1-330     10     30     500V     550     1.9       234BA     4K-300K     2.4     140     2,000V     190     1.9       250AS     4-1,200     2.5     260     1,500V     190     1.9       250SP     1-150     8.5     20     375V     700     1.5       250BA     1K-130K     2     130     1,200V     190     3.0       251SP     1-330     12     30     500V     700     2.4       251SP     1-330     12     30     500V     700     2.4       251BA     2K-190K     3     200     2,000V     150     3.8       102BA     9K-700K     4     300     2,400V     150     3.8       102BA     9K-700K     4     300     2,400V     190     6.0	231BA	6K-390K	1.2	35	1200V		
233BA     1.8K-150K     1.6     80     900V       234AS     12-5,000     3     275     2500V     150     1.9       234BP     1-330     10     30     500V     550     1.9       234BA     4K-300K     2.4     140     2,000V     190     1.9       250AS     4-1,200     2.5     260     1,500V     190     1.9       250SP     1-150     8.5     20     375V     700     1.5       250BA     1K-130K     2     130     1,200V     190     3.0       251AS     8-2,300     3.5     400     2,500V     190     3.0       251SP     1-330     12     30     500V     700     2.4       251BA     2K-190K     3     200     2,000V     150     3.8       102AS     30-9,000     5     600     3,000V     150     3.8       102SP     1-700     15     50     1,000V     50     3.8	233AS	6-1,800	2	170	1,100V	150	1.2
234AS     12-5,000     3     275     2500V     150     1.9       234SP     1-330     10     30     500V     550     1.9       234BA     4K-300K     2.4     140     2,000V     190     1.9       250AS     4-1,200     2.5     260     1,500V     190     1.9       250BA     1K-130K     2     130     1,200V     1.5     250BA     1K-130K     2     130     1,200V     1.5       251AS     8-2,300     3.5     400     2,500V     190     3.0       251SP     1-330     12     30     500V     700     2.4       251BA     2K-190K     3     200     2,000V     150     3.8       102AS     30-9,000     5     600     3,000V     150     3.8       102BA     9K-700K     4     300     2,400V     250     3.8       102BA     9K-700K     4     300     2,400V     4.8     252BA     5K-450K     5	233SP	1-120	7	20	375V	550	1.2
234SP     1-330     10     30     500V     550     1.9       234BA     4K-300K     2.4     140     2,000V     190     1.9       250AS     4-1,200     2.5     260     1,500V     190     1.9       250SP     1-150     8.5     20     375V     700     1.5       250BA     1K-130K     2     130     1,200V     190     3.0       251AS     8-2,300     3.5     400     2,500V     190     3.0       251SP     1-330     12     30     500V     700     2.4       251BA     2K-190K     3     200     2,000V     150     3.8       102AS     30-9,000     5     600     3,000V     150     3.8       102BA     9K-700K     4     300     2,400V     252     3.8       102SP     1-460     18     75     1,000V     700     4.8       252BA     5K-450K     5     450     2,400V     2. </td <td>233BA</td> <td>1.8K-150K</td> <td>1.6</td> <td>80</td> <td>900V</td> <td></td> <td></td>	233BA	1.8K-150K	1.6	80	900V		
234BA     4K-300K     2.4     140     2,000V       250AS     4-1,200     2.5     260     1,500V     190     1.9       250SP     1-150     8.5     20     375V     700     1.5       250BA     1K-130K     2     130     1,200V     190     3.0       251AS     8-2,300     3.5     400     2,500V     190     3.0       251BA     2K-190K     3     200     2,000V     190     3.0       251BA     2K-190K     3     200     2,000V     150     3.8       102AS     30-9,000     5     600     3,000V     150     3.8       102BA     9K-700K     4     300     2,400V     2.0     3.8       102BA     9K-700K     4     300     2,400V     2.0     3.8       102BA     9K-700K     4     300     2,400V     190     6.0       252BA     5K-450K     5     450     2,400V     150     7.6 <t< td=""><td>234AS</td><td>12-5,000</td><td>3</td><td>275</td><td>2500V</td><td>150</td><td>1.9</td></t<>	234AS	12-5,000	3	275	2500V	150	1.9
250AS     4-1,200     2.5     260     1,500V     190     1.9       250SP     1-150     8.5     20     375V     700     1.5       250BA     1K-130K     2     130     1,200V     190     3.0       251AS     8-2,300     3.5     400     2,500V     190     3.0       251BA     2K-190K     3     200     2,000V     190     3.0       251BA     2K-190K     3     200     2,000V     150     3.8       102BA     9,000     5     600     3,000V     150     3.8       102BA     9K-700K     4     300     2,400V     250     3.8       102BA     9K-700K     4     300     2,400V     190     6.0       252AS     20-5,800     6     900     3,000V     190     6.0       252BA     5K-450K     5     450     2,400V     150     7.6       104AS     55-18,000     9     1,200     9,000V     150<	234SP	1-330	10	30	500V	550	1.9
250SP     1-150     8.5     20     375V     700     1.5       250BA     1K-130K     2     130     1,200V     3.0       251AS     8-2,300     3.5     400     2,500V     190     3.0       251SP     1-330     12     30     500V     700     2.4       251BA     2K-190K     3     200     2,000V     150     3.8       102AS     30-9,000     5     600     3,000V     150     3.8       102BA     9K-700K     4     300     2,400V     550     3.8       102BA     9K-700K     4     300     2,400V     190     6.0       252AS     20-5,800     6     900     3,000V     190     6.0       252BA     5K-450K     5     450     2,400V     150     7.6       104AS     55-18,000     9     1,200     9,000V     150     7.6       104AS     75-18,000     9     1,200     9,000V     150     7.6	234BA	4K-300K	2.4	140	2,000V		
250BA     1K-130K     2     130     1,200V       251AS     8-2,300     3.5     400     2,500V     190     3.0       251SP     1-330     12     30     500V     700     2.4       251BA     2K-190K     3     200     2,000V     150     3.8       102BS     30-9,000     5     600     3,000V     150     3.8       102BA     9K-700K     4     300     2,400V     250     3.8       102BA     9K-700K     4     300     2,400V     250     3.8       102BA     9K-700K     4     300     2,400V     250     3.8       102BA     9K-700K     4     300     2,400V     190     6.0       252BA     5K-450K     5     450     2,400V     1048     251,500     9     1,200     9,000V     150     7.6       104SP     2-1,500     25     95     3,600V     550     7.6       104BA     18K-1M     7 </td <td>250AS</td> <td>4-1,200</td> <td>2.5</td> <td>260</td> <td>1,500V</td> <td>190</td> <td>1.9</td>	250AS	4-1,200	2.5	260	1,500V	190	1.9
251AS     8-2,300     3.5     400     2,500V     190     3.0       251SP     1-330     12     30     500V     700     2.4       251BA     2K-190K     3     200     2,000V     2.4       102AS     30-9,000     5     600     3,000V     150     3.8       102SP     1-700     15     50     1,000V     550     3.8       102BA     9K-700K     4     300     2,400V     2.000V     190     6.0       252BA     9K-700K     4     300     2,400V     700     4.8       252BA     5K-450K     5     450     2,400V     700     4.8       252BA     5K-450K     5     450     2,400V     104AS     55-18,000     9     1,200     9,000V     150     7.6       104SP     2-1,500     25     95     3,600V     550     7.6       104BA     18K-1M     7     600     7,000V     190     12.0       254S	250SP	1-150	8.5	20	375V	700	1.5
251SP     1-330     12     30     500V     700     2.4       251BA     2K-190K     3     200     2,000V     3.8       102AS     30-9,000     5     600     3,000V     150     3.8       102SP     1-700     15     50     1,000V     550     3.8       102BA     9K-700K     4     300     2,400V     190     6.0       252AS     20-5,800     6     900     3,000V     190     6.0       252SP     1-460     18     75     1,000V     700     4.8       252BA     5K-450K     5     450     2,400V     150     7.6       104AS     55-18,000     9     1,200     9,000V     150     7.6       104SP     2-1,500     25     95     3,600V     550     7.6       104BA     18K-1M     7     600     7,000V     190     12.0       254SP     2-1,000     31     150     3,600V     700     9.6	250BA	1K-130K	2	130	1,200V		
251BA     2K-190K     3     200     2,000V       102AS     30-9,000     5     600     3,000V     150     3.8       102SP     1-700     15     50     1,000V     550     3.8       102BA     9K-700K     4     300     2,400V     190     6.0       252AS     20-5,800     6     900     3,000V     190     6.0       252SP     1-460     18     75     1,000V     700     4.8       252BA     5K-450K     5     450     2,400V     150     7.6       104AS     55-18,000     9     1,200     9,000V     150     7.6       104SP     2-1,500     25     95     3,600V     550     7.6       104BA     18K-1M     7     600     7,000V     190     12.0       254AS     36-12,000     11     1,800     9,000V     700     9.6       254BA     12K-970K     9     900     7,000V     150     11.4	251AS	8-2,300	3.5	400	2,500V	190	3.0
102AS     30-9,000     5     600     3,000V     150     3.8       102SP     1-700     15     50     1,000V     550     3.8       102BA     9K-700K     4     300     2,400V     252AS     20-5,800     6     900     3,000V     190     6.0       252SP     1-460     18     75     1,000V     700     4.8       252BA     5K-450K     5     450     2,400V     2400V       104AS     55-18,000     9     1,200     9,000V     150     7.6       104SP     2-1,500     25     95     3,600V     550     7.6       104BA     18K-1M     7     600     7,000V     700     9.6       254AS     36-12,000     11     1,800     9,000V     190     12.0       254BA     12K-970K     9     900     7,000V     700     9.6       254BA     12K-970K     9     900     7,000V     150     11.4       106SP	251SP	1-330	12	30	500V	700	2.4
102SP     1-700     15     50     1,000V     550     3.8       102BA     9K-700K     4     300     2,400V     252AS     20-5,800     6     900     3,000V     190     6.0       252SP     1-460     18     75     1,000V     700     4.8       252BA     5K-450K     5     450     2,400V     2.0       104AS     55-18,000     9     1,200     9,000V     150     7.6       104SP     2-1,500     25     95     3,600V     550     7.6       104BA     18K-1M     7     600     7,000V     7.000V     190     12.0       254AS     36-12,000     11     1,800     9,000V     190     12.0       254SP     2-1,000     31     150     3,600V     700     9.6       254BA     12K-970K     9     900     7,000V     150     11.4       106SP     3-2,400     36     155     5,000V     550     11.4	251BA	2K-190K	3	200	2,000V		
102BA     9K-700K     4     300     2,400V       252AS     20-5,800     6     900     3,000V     190     6.0       252SP     1-460     18     75     1,000V     700     4.8       252BA     5K-450K     5     450     2,400V     104S     25-18,000     9     1,200     9,000V     150     7.6       104SP     2-1,500     25     95     3,600V     550     7.6       104BA     18K-1M     7     600     7,000V     7000V     12.0       254AS     36-12,000     11     1,800     9,000V     190     12.0       254SP     2-1,000     31     150     3,600V     700     9.6       254BA     12K-970K     9     900     7,000V     150     11.4       106SP     3-2,400     36     155     5,000V     550     11.4       106BA     30K-1M     10     1000     12,000V     190     18.0       256SP     2-1,600 </td <td>102AS</td> <td>30-9,000</td> <td>5</td> <td>600</td> <td>3,000V</td> <td>150</td> <td>3.8</td>	102AS	30-9,000	5	600	3,000V	150	3.8
252AS     20-5,800     6     900     3,000V     190     6.0       252SP     1-460     18     75     1,000V     700     4.8       252BA     5K-450K     5     450     2,400V       104AS     55-18,000     9     1,200     9,000V     150     7.6       104SP     2-1,500     25     95     3,600V     550     7.6       104BA     18K-1M     7     600     7,000V     7000V     12.0       254AS     36-12,000     11     1,800     9,000V     190     12.0       254SP     2-1,000     31     150     3,600V     700     9.6       254BA     12K-970K     9     900     7,000V     150     11.4       106AS     90-30,000     13     1,900     15,000V     150     11.4       106BA     30K-1M     10     1000     12,000V     190     18.0       256SP     2-1,600     45     240     5,000V     700     14.4	102SP	1-700	15	50	1,000V	550	3.8
252SP   1-460   18   75   1,000V   700   4.8     252BA   5K-450K   5   450   2,400V   1040V	102BA	9K-700K	4	300	2,400V		
252BA     5K-450K     5     450     2,400V       104AS     55-18,000     9     1,200     9,000V     150     7.6       104SP     2-1,500     25     95     3,600V     550     7.6       104BA     18K-1M     7     600     7,000V     700V     12.0       254AS     36-12,000     11     1,800     9,000V     190     12.0       254SP     2-1,000     31     150     3,600V     700     9.6       254BA     12K-970K     9     900     7,000V     150     11.4       106SP     3-2,400     36     155     5,000V     550     11.4       106BA     30K-1M     10     1000     12,000V     190     18.0       256AS     60-20,000     16     2,900     15,000V     700     14.4       256BA     20K-1M     13     1500     12,000V     100     14.4       256BA     20K-1M     13     1500     25,000V     150 <t< td=""><td>252AS</td><td>20-5,800</td><td>6</td><td>900</td><td>3,000V</td><td>190</td><td>6.0</td></t<>	252AS	20-5,800	6	900	3,000V	190	6.0
104AS   55-18,000   9   1,200   9,000V   150   7.6     104SP   2-1,500   25   95   3,600V   550   7.6     104BA   18K-1M   7   600   7,000V   7000V   7.6     254AS   36-12,000   11   1,800   9,000V   190   12.0     254SP   2-1,000   31   150   3,600V   700   9.6     254BA   12K-970K   9   900   7,000V   700   9.6     254BA   12K-970K   9   900   7,000V   150   11.4     106SP   3-2,400   36   155   5,000V   550   11.4     106BA   30K-1M   10   1000   12,000V   190   18.0     256AS   60-20,000   16   2,900   15,000V   190   18.0     256SP   2-1,600   45   240   5,000V   700   14.4     256BA   20K-1M   13   1500   12,000V     109AS   150-48,000   20   3,000   25,000V   150 </td <td>252SP</td> <td>1-460</td> <td>18</td> <td>75</td> <td>1,000V</td> <td>700</td> <td>4.8</td>	252SP	1-460	18	75	1,000V	700	4.8
104SP   2-1,500   25   95   3,600V   550   7.6     104BA   18K-1M   7   600   7,000V   190   12.0     254AS   36-12,000   11   1,800   9,000V   190   12.0     254SP   2-1,000   31   150   3,600V   700   9.6     254BA   12K-970K   9   900   7,000V   150   11.4     106AS   90-30,000   13   1,900   15,000V   150   11.4     106SP   3-2,400   36   155   5,000V   550   11.4     106BA   30K-1M   10   1000   12,000V     256AS   60-20,000   16   2,900   15,000V   190   18.0     256SP   2-1,600   45   240   5,000V   700   14.4     256BA   20K-1M   13   1500   12,000V     109AS   150-48,000   20   3,000   25,000V   150   17.1     109BA   48K-1M   16   1500   20,000V   190   27.0	252BA	5K-450K	5	450	2,400V		
104BA   18K-1M   7   600   7,000V     254AS   36-12,000   11   1,800   9,000V   190   12.0     254SP   2-1,000   31   150   3,600V   700   9.6     254BA   12K-970K   9   900   7,000V   7000V     106AS   90-30,000   13   1,900   15,000V   150   11.4     106SP   3-2,400   36   155   5,000V   550   11.4     106BA   30K-1M   10   1000   12,000V   190   18.0     256AS   60-20,000   16   2,900   15,000V   190   18.0     256SP   2-1,600   45   240   5,000V   700   14.4     256BA   20K-1M   13   1500   12,000V   150   17.1     109AS   150-48,000   20   3,000   25,000V   150   17.1     109BA   48K-1M   16   1500   20,000V   190   27.0     259AS   100-32,000   25   4,600   25,000V   190	104AS	55-18,000	9	1,200	9,000V	150	7.6
254AS   36-12,000   11   1,800   9,000V   190   12.0     254SP   2-1,000   31   150   3,600V   700   9.6     254BA   12K-970K   9   900   7,000V   150   11.4     106AS   90-30,000   13   1,900   15,000V   150   11.4     106SP   3-2,400   36   155   5,000V   550   11.4     106BA   30K-1M   10   1000   12,000V   190   18.0     256AS   60-20,000   16   2,900   15,000V   190   18.0     256SP   2-1,600   45   240   5,000V   700   14.4     256BA   20K-1M   13   1500   12,000V     109AS   150-48,000   20   3,000   25,000V   150   17.1     109SP   4-3,800   55   250   8,800V   550   17.1     109BA   48K-1M   16   1500   20,000V   190   27.0     259SP   3-2,500   70   380   8,800V   <	104SP	2-1,500	25	95	3,600V	550	7.6
254SP   2-1,000   31   150   3,600V   700   9.6     254BA   12K-970K   9   900   7,000V   150   11.4     106AS   90-30,000   13   1,900   15,000V   150   11.4     106SP   3-2,400   36   155   5,000V   550   11.4     106BA   30K-1M   10   1000   12,000V   190   18.0     256AS   60-20,000   16   2,900   15,000V   700   14.4     256BA   20K-1M   13   1500   12,000V   10   14.4     256BA   20K-1M   13   1500   12,000V   150   17.1     109AS   150-48,000   20   3,000   25,000V   150   17.1     109SP   4-3,800   55   250   8,800V   550   17.1     109BA   48K-1M   16   1500   20,000V   190   27.0     259SP   3-2,500   70   380   8,800V   700   21.6	104BA	18K-1M	7	600	7,000V		
254BA   12K-970K   9   900   7,000V     106AS   90-30,000   13   1,900   15,000V   150   11.4     106SP   3-2,400   36   155   5,000V   550   11.4     106BA   30K-1M   10   1000   12,000V     256AS   60-20,000   16   2,900   15,000V   190   18.0     256SP   2-1,600   45   240   5,000V   700   14.4     256BA   20K-1M   13   1500   12,000V     109AS   150-48,000   20   3,000   25,000V   150   17.1     109SP   4-3,800   55   250   8,800V   550   17.1     109BA   48K-1M   16   1500   20,000V     259AS   100-32,000   25   4,600   25,000V   190   27.0     259SP   3-2,500   70   380   8,800V   700   21.6	254AS	36-12,000	11	1,800	9,000V	190	12.0
106AS   90-30,000   13   1,900   15,000V   150   11.4     106SP   3-2,400   36   155   5,000V   550   11.4     106BA   30K-1M   10   1000   12,000V     256AS   60-20,000   16   2,900   15,000V   190   18.0     256SP   2-1,600   45   240   5,000V   700   14.4     256BA   20K-1M   13   1500   12,000V     109AS   150-48,000   20   3,000   25,000V   150   17.1     109SP   4-3,800   55   250   8,800V   550   17.1     109BA   48K-1M   16   1500   20,000V     259AS   100-32,000   25   4,600   25,000V   190   27.0     259SP   3-2,500   70   380   8,800V   700   21.6	254SP	2-1,000	31	150	3,600V	700	9.6
106SP   3-2,400   36   155   5,000V   550   11.4     106BA   30K-1M   10   1000   12,000V   1000   12,000V   1000   1000   12,000V   1000	254BA	12K-970K	9	900	7,000V		
106BA 30K-1M 10 1000 12,000V   256AS 60-20,000 16 2,900 15,000V 190 18.0   256SP 2-1,600 45 240 5,000V 700 14.4   256BA 20K-1M 13 1500 12,000V   109AS 150-48,000 20 3,000 25,000V 150 17.1   109SP 4-3,800 55 250 8,800V 550 17.1   109BA 48K-1M 16 1500 20,000V   259AS 100-32,000 25 4,600 25,000V 190 27.0   259SP 3-2,500 70 380 8,800V 700 21.6	106AS	90-30,000	13	1,900	15,000V	150	11.4
256AS   60-20,000   16   2,900   15,000V   190   18.0     256SP   2-1,600   45   240   5,000V   700   14.4     256BA   20K-1M   13   1500   12,000V     109AS   150-48,000   20   3,000   25,000V   150   17.1     109SP   4-3,800   55   250   8,800V   550   17.1     109BA   48K-1M   16   1500   20,000V     259AS   100-32,000   25   4,600   25,000V   190   27.0     259SP   3-2,500   70   380   8,800V   700   21.6	106SP	3-2,400	36	155	5,000V	550	11.4
256SP   2-1,600   45   240   5,000V   700   14.4     256BA   20K-1M   13   1500   12,000V     109AS   150-48,000   20   3,000   25,000V   150   17.1     109SP   4-3,800   55   250   8,800V   550   17.1     109BA   48K-1M   16   1500   20,000V     259AS   100-32,000   25   4,600   25,000V   190   27.0     259SP   3-2,500   70   380   8,800V   700   21.6	106BA	30K-1M	10	1000	12,000V		
256BA   20K-1M   13   1500   12,000V     109AS   150-48,000   20   3,000   25,000V   150   17.1     109SP   4-3,800   55   250   8,800V   550   17.1     109BA   48K-1M   16   1500   20,000V     259AS   100-32,000   25   4,600   25,000V   190   27.0     259SP   3-2,500   70   380   8,800V   700   21.6	256AS	60-20,000	16	2,900	15,000V	190	18.0
109AS 150-48,000 20 3,000 25,000V 150 17.1   109SP 4-3,800 55 250 8,800V 550 17.1   109BA 48K-1M 16 1500 20,000V   259AS 100-32,000 25 4,600 25,000V 190 27.0   259SP 3-2,500 70 380 8,800V 700 21.6	256SP	2-1,600	45	240	5,000V	700	14.4
109SP 4-3,800 55 250 8,800V 550 17.1   109BA 48K-1M 16 1500 20,000V   259AS 100-32,000 25 4,600 25,000V 190 27.0   259SP 3-2,500 70 380 8,800V 700 21.6	256BA	20K-1M	13	1500	12,000V		
109BA 48K-1M 16 1500 20,000V   259AS 100-32,000 25 4,600 25,000V 190 27.0   259SP 3-2,500 70 380 8,800V 700 21.6	109AS	150-48,000	20	3,000	25,000V	150	17.1
259AS 100-32,000 25 4,600 25,000V 190 27.0 259SP 3-2,500 70 380 8,800V 700 21.6	109SP	4-3,800	55	250	8,800V	550	17.1
259SP 3-2,500 70 380 8,800V 700 21.6	109BA	48K-1M	16	1500	20,000V		
259SP 3-2,500 70 380 8,800V 700 21.6	259AS	100-32,000	25	4,600	25,000V	190	27.0
	259SP	3-2,500			8,800V	700	21.6
	259BA	30K-1M	20	2300	20,000V		

- 1. @ 40°C Ambient. Derate linearly to 0 Watts at 230°C for Type AS and BA. Derate linearly to 0 Watts at 350 °C for Type SP.
- 2. Allowable peak energy/voltage will depend on the resistance value and pulse width. Energy ratings are based on pulse <10 milliseconds. Type SP rating can be substantially greater for longer pulses. Consult factory.
- 3. Peak Current Ratings presume energy approaching rated peak energy values. Allowable current can be higher for lower energy values. Consult factory.
- 4. Excludes caps/leads and coating.



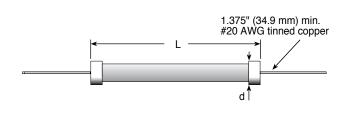
# 100 & 200 Series

# **Bulk Ceramic Axial Lead Resistors**

	CI	HARACTERIS1	rics	
Characteristic	Test	Type SP	Type AS	
Operating Temp.		-55°C to +350°C*	-55°C to +230°C	
Resistance Temp. Coefficient		+0.2 to -0.08 %/°C	+0.0 to -0.08 %/°C	
Voltage Coefficient	Max. % per kilovolt per inch active length	-1.0%	-1.0%	Derating
Short Time Overload		±5%	±2%	100 40°
Load Life	Max. % change after 1,000 hours at rated power	±5%	±5%	SP 40
Thermal Shock Max. % change after 10 cycles -55°C to +125°C		±3%	±3%	% 20 AS & BA 230° 350°
Moisture Resistance	Max. % change when tested per MIL-STD-202, Method 103	±5%	±5%	0 100 200 300 400 Ambient Temperature (°C)
Density		2.2-2.4 gm/cc	2.2-2.6 gm/cc	
Specific Heat		0.24-0.26 cal/gm -°C	0.23-0.25 cal/gm -°C	
Thermal Conductivity		0.14-0.16 cal/(cm-°C-sec)	0.003-0.006 cal/(cm-°	C-sec)

<sup>\*</sup>When required, Type SP material can withstand short periods of use at red-heat conditions, i.e. up to 550°C to 600°C

### DIMENSIONS



Size	Diam. d max. in. (mm)	Length L max. in. (mm)
231	0.2 (5.1)	0.75 (19.1)
233	0.31 (7.9)	0.75 (19.1)
234	0.31 (7.9)	1.125 (28.6)
250	0.44 (11.1)	0.75 (19.1)
251	0.44 (11.1)	1.125 (28.6)
102	0.31 (7.9)	2.125 (54.0)
252	0.44 (11.1)	2.125 (54.0)
104	0.31 (7.9)	4.125 (104.8)
254	0.44 (11.1)	4.125 (104.8)
106	0.31 (7.9)	6.125 (155.6)
256	0.44 (11.1)	6.125 (155.6)
109	0.31 (7.9)	9.125 (231.8)
259	0.44 (11.1)	9.125 (231.8)

#### **ORDERING INFORMATION**

# 102AS101KD

Coating/ Terminal option see chart

# Type Coating/Terminal option

No Suffix = Standard Includes aluminum metalization under caps/leads.

**AS, BA** D = Standard; includes dielectric coating and aluminum metalization under caps/leads.

DS = Dielectric coating and silver metalization under caps/leads.

O = Oil resistant coating and silver metalization under caps/leads

M = Ceramic based coating and aluminum metalization under caps/leads

Packaging: Bulk in poly bags is standard. Tape & reel is also available.

# **Mouser Electronics**

**Authorized Distributor** 

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

# Ohmite:

<u>251SP1R0L</u> <u>231AS101KO</u> <u>234SP100L</u> <u>231AS280JDS</u> <u>231SP012</u> <u>889AS502KDS</u> <u>104SP401J</u> <u>104SP601J</u> <u>104SP901J</u> <u>109SP601L</u> <u>233SP101J</u> <u>234SP101J</u> <u>250SP001</u> <u>234AS096</u> <u>250AS280JDS</u> <u>250AS4R0KDS</u> <u>250AS5R0JDS</u> 102AS102JDS 102AS101JDS 102SP101K 234SP500L 234SP007 102SP007 231AS101JW1