



Series **100,**  
**200,**  
**400**

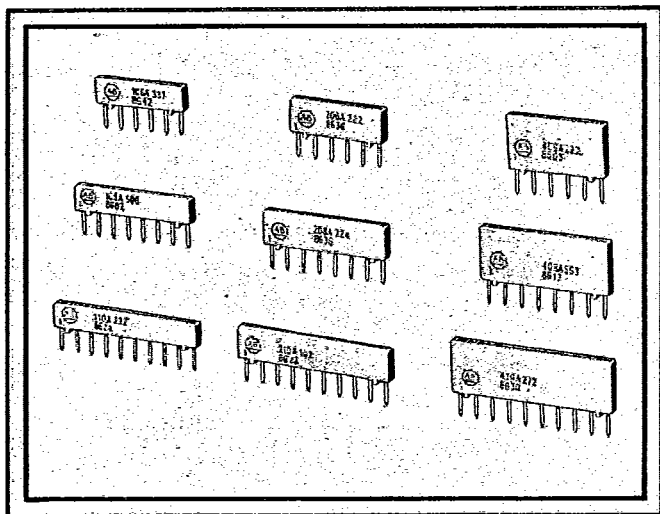
## Cermet Resistor Networks

I-SIP

Single In-Line Package

### FEATURES

- Solid Ceramic Body, with V-Groove
- Triple-Strength Leads
- 0.100 Inch (2,54mm) Lead Spacing
- Three Package Heights (0.190 in., .250 in., 0.350 in.)
- 6, 8 and 10 Pins
- Automatically Insertable
- Permanent Laser Marking
- Part Markings – Side and Top
- Exclusive Allen-Bradley Cermet Ink Performance



## SPECIFICATIONS

### General Capabilities

I-SIP — Single In-Line Package:

- A unique packaging concept for single in-line resistor networks.
- Provides standard cermet resistor networks and custom network designs.
- Standard circuits available in 6, 8 and 10 pin packages and in three package profiles.

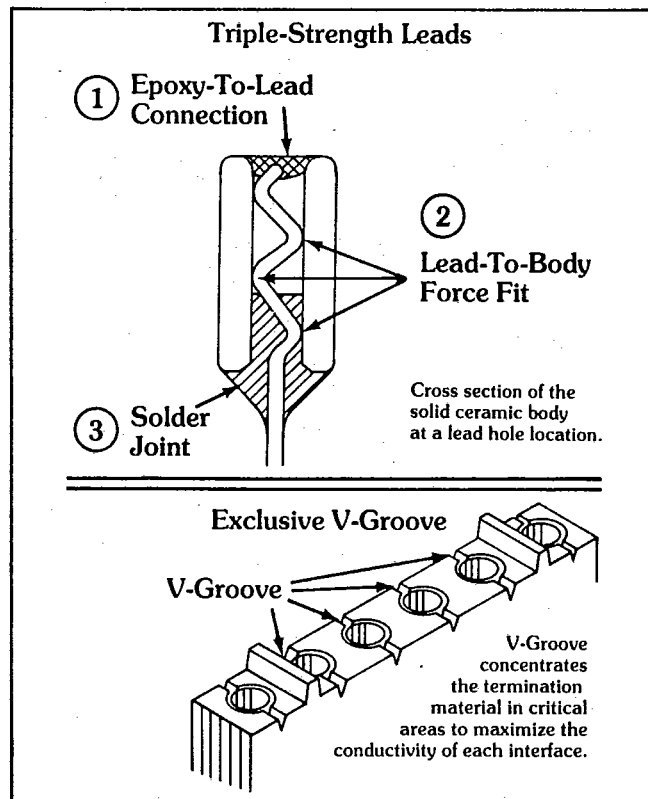
### Applications

- Pull-up and pull-down arrays
- Transmission line terminators
- Current limiting resistors
- ECL termination networks
- A wide array of custom designs

For Applications Information refer to the following Allen-Bradley Application Notes:

- Digital System Resistor Arrays: EC5410-4.1
- ECL Terminator Networks: EC5410-4.2
- Resistive Attenuator Pads: EC5410-4.3

### Rugged New Package



### Standard Resistance Values

Series 106A, 108A, 110A, 106B, 108B, 110B, 206A, 208A, 210A, 206B, 208B, 210B, 406A, 408A, 410A, 406B, 408B and 410B Resistor Networks

Series 106E, 108E, 110E, 206E, 208E, 210E, 406E, 408E and 410E Resistor Networks

| R (Ohms) |     |      |      |      |
|----------|-----|------|------|------|
| 22       | 180 | 1.2K | 6.8K | 47K  |
| 33       | 220 | 1.5K | 8.2K | 56K  |
| 39       | 270 | 1.8K | 10K  | 68K  |
| 47       | 330 | 2K   | 12K  | 100K |
| 56       | 390 | 2.2K | 15K  | 120K |
| 68       | 470 | 2.7K | 18K  | 150K |
| 82       | 560 | 3.3K | 22K  | 180K |
| 100      | 680 | 3.9K | 27K  | 220K |
| 120      | 820 | 4.7K | 33K  | 470K |
| 150      | 1K  | 5.6K | 39K  | 1M   |

| R1/R2   | Zo (Characteristic Impedance) |
|---------|-------------------------------|
| 81/130  | 50                            |
| 120/200 | 75                            |
| 160/260 | 100                           |
| 180/390 | 123                           |
| 220/330 | 132                           |
| 330/390 | 179                           |
| 330/470 | 194                           |
| 330/680 | 222                           |
| 3K/6.2K | 2.02K                         |

For intermediate values between 22 ohms and 1 megohm not listed above, consult Allen-Bradley Co., Greensboro, NC.

### Standard Network Specifications

Resistor tolerance -  $\pm 2\%$  or  $\pm 1$  ohm whichever is greater,  $\pm 1\%$  available.

Temperature coefficient of resistance -  $\pm 100$  ppm/ $^{\circ}$  C.

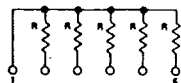
Operating temperature range -  $-55^{\circ}$  C to  $+125^{\circ}$  C.

■ At  $+70^{\circ}$  C power derates linearly from full rated power to 0 wattage at  $+150^{\circ}$  C.

■ Rated continuous working voltage (RCWV), based on nominal resistance (R) in ohms, is  $\sqrt{\text{Individual Resistor Power Rating (see Table)} \times R}$  or 100 volts, whichever is less.

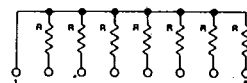
| Network Series Designation                               | Power Dissipation Rating (up to $70^{\circ}$ C Ambient)                 |
|--|---|
| 106A, 108A, 110A<br>206A, 208A, 210A<br>406A, 408A, 410A | ■ 125 mw/per resistor<br>■ 200 mw/per resistor<br>■ 250 mw/per resistor |
| 106B, 108B, 110B<br>206B, 208B, 210B<br>406B, 408B, 410B | ■ 250 mw/per resistor<br>■ 400 mw/per resistor<br>■ 500 mw/per resistor |
| 106E, 108E, 110E<br>206E, 208E, 210E<br>406E, 408E, 410E | ■ 125 mw/per resistor<br>■ 200 mw/per resistor<br>■ 250 mw/per resistor |

### Standard Network Schematic Diagrams

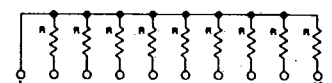


Low Profile  
Medium Profile  
High Profile

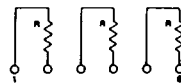
106A  
206A  
406A



108A  
208A  
408A

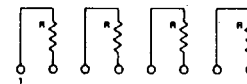


110A  
210A  
410A

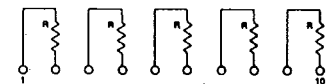


Low Profile  
Medium Profile  
High Profile

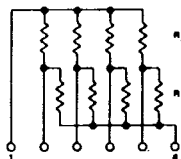
106B  
206B  
406B



108B  
208B  
408B

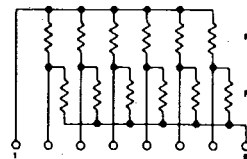


110B  
210B  
410B

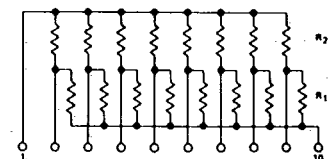


Low Profile  
Medium Profile  
High Profile

106E  
206E  
406E



108E  
208E  
408E



110E  
210E  
410E

## Custom Resistor Networks

When an Allen-Bradley standard resistor network does not fit your exact application, consider our custom resistor networks. The following is a summary of Allen-Bradley custom single-in-line resistor network capabilities:

**Resistance range** – 8 ohms to 20 megohms. Requests for custom resistor networks can best be met when the total number of different resistor values is limited to a small number.

**Tolerance (absolute)** – Standard  $\pm 2\%$ . Special to  $\pm 0.5\%$ .

**Resistance matching or ratio** – Low as  $\pm .25\%$ .

**Temperature coefficient of resistance (TCR)** –  $\pm 100 \text{ ppm}/^\circ \text{C}$ .

**TCR tracking** – Depends on resistance range and number of resistors. Typical tracking is  $\pm 50 \text{ ppm}/^\circ \text{C}$  or  $\pm 100 \text{ ppm}/^\circ \text{C}$ .

**Temperature range of operation** – Industrial ( $0^\circ \text{C}$  to  $+70^\circ \text{C}$ ), Military ( $-55^\circ \text{C}$  to  $+125^\circ \text{C}$ ) and other ranges available.

**User-trimmable option** – Resistor networks can be designed to permit the user to actively calibrate the networks in a system. Resistors can be trimmed under actual circuit operating conditions, providing in-circuit settability. Trimming methods include lasers, sand abrasion, and mechanical.

### PACKAGE POWER RATINGS (WATTS) (up to $70^\circ \text{C}$ ambient) ■

| Package Height (Profile) | Number of Pins |     |     |     |
|--------------------------|----------------|-----|-----|-----|
|                          | 4              | 6   | 8   | 10  |
| Low Profile (.190")      | —              | .6  | .9  | 1.1 |
| Medium Profile (.250")   | —              | .6  | .8  | 1.0 |
| High Profile (.350")     | .7             | 1.0 | 1.3 | 1.8 |

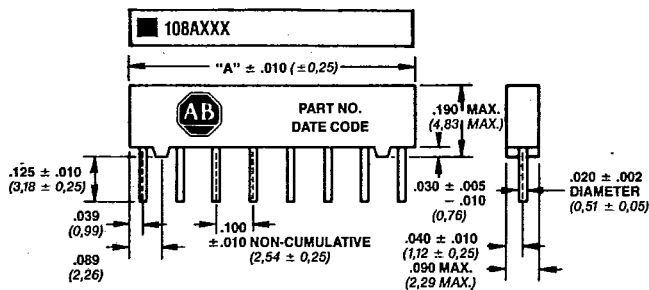
■ At  $70^\circ \text{C}$  power derates linearly from full rated power to 0 wattage at  $+150^\circ \text{C}$ .

CONSULT FACTORY.

## DIMENSIONS

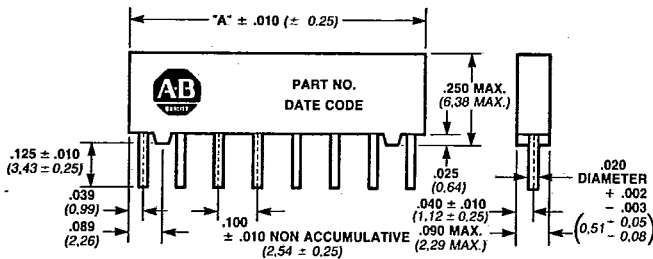
NOT TO SCALE

### Low Profile 100 Series



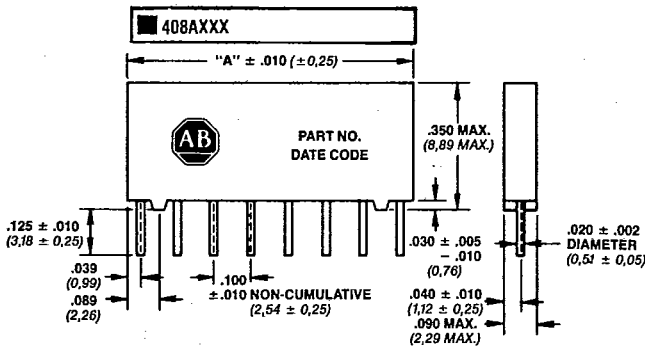
| Pkg. Style | No. of Pins | "A" Dimension |
|------------|-------------|---------------|
| 106        | 6           | .578 (14,68)  |
| 108        | 8           | .778 (19,76)  |
| 110        | 10          | .978 (24,84)  |

### Medium Profile 200 Series



| Pkg. Style | No. of Pins | "A" Dimension |
|------------|-------------|---------------|
| 206        | 6           | .578 (14,68)  |
| 208        | 8           | .778 (19,76)  |
| 210        | 10          | .978 (24,84)  |

### High Profile 400 Series



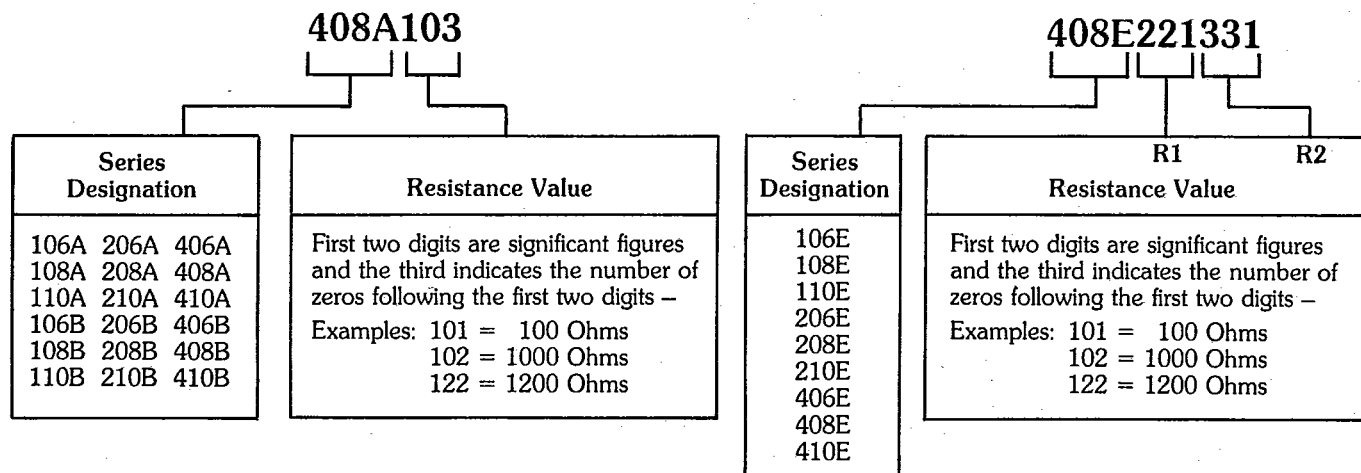
| Pkg. Style | No. of Pins | "A" Dimension |
|------------|-------------|---------------|
| 404        | 4           | .378 (9,60)   |
| 406        | 6           | .578 (14,68)  |
| 408        | 8           | .778 (19,76)  |
| 410        | 10          | .978 (24,84)  |

### TOLERANCES

Dimensional Tolerance  $\pm .005$  (0,13)  
Angular Tolerance  $\pm 5^\circ$  Except as Specified.

Basic dimensions in inches.  
Dimensions shown in parentheses are in millimeters

## Explanation of Part Numbers



## Typical Performance Test Capabilities

| Test Group | Order Of Test | Examination or Test                   | Test Method Per MIL-R-83401 (Paragraph) | Post Test Requirements   |
|------------|---------------|---------------------------------------|---|--|
| I          | 1             | Visual and Mechanical Examination     | 4.6.2                                   | In accordance with applicable requirements.  |
|            | 2             | Thermal Shock                         | 4.6.3                                   | Resistance change $\pm 0.25$ percent maximum.  |
|            | 3             | DC Resistance                         | 4.6.5                                   | In accordance with applicable requirements.  |
| II         | 1             | Solderability                         | 4.6.6                                   | Resistance change $\pm 0.25$ percent maximum.  |
|            | 2             | Resistance to Solvents                | 4.6.7                                   | Resistance change $\pm 0.25$ percent maximum. Marking shall remain legible.                    |
| III        | 1             | Resistance Temperature Characteristic | 4.6.8                                   | Within specified limits (normally $\pm 100$ ppm/ $^{\circ}$ C or $\pm 250$ ppm/ $^{\circ}$ C). |
|            | 2             | Low Temperature Operation             | 4.6.9                                   | Resistance change $\pm 0.25$ percent maximum.  |
|            | 3             | Short Time Overload                   | 4.6.10                                  | Resistance change $\pm 0.25$ percent maximum.  |
|            | 4             | Terminal Strength                     | 4.6.11                                  | Resistance change $\pm 0.25$ percent maximum.  |
| IV         | 1             | Dielectric Withstanding Voltage       | 4.6.12                                  | Resistance change $\pm 0.25$ percent maximum. No mechanical damage, arcing or breakdown.       |
|            | 2             | Insulation Resistance                 | 4.6.13                                  | $10^{11}$ Ohms minimum.  |
|            | 3             | Resistance to Soldering Heat          | 4.6.14                                  | Resistance change $\pm 0.25$ percent maximum.  |
|            | 4             | Moisture Resistance                   | 4.6.15                                  | Resistance change $\pm 0.5$ percent maximum.   |
| V          | 1             | Shock (Specified Pulse)               | 4.6.16                                  | Resistance change $\pm 0.25$ percent maximum.  |
|            | 2             | Vibration, High Frequency             | 4.6.17                                  | Resistance change $\pm 0.25$ percent maximum.  |
| VI         | 1             | Life                                  | 4.6.18                                  | Resistance change $\pm 0.5$ percent maximum.   |
| VII        | 1             | High Temperature Exposure             | 4.6.19                                  | Resistance change $\pm 0.5$ percent maximum.   |
|            | 2             | Low Temperature Storage               | 4.6.20                                  | Resistance change $\pm 0.25$ percent maximum.  |

**INSPECTION CONDITIONS:** Unless otherwise specified, all measurements are understood to be made at the following initial inspection conditions:

- Normal atmospheric pressure.
- Relative humidity of  $40 \pm 10$  percent.
- Ambient temperature of  $24^{\circ} \pm 2^{\circ}$  C.

**NOTE:** During an inspection or qualification, all the networks shall be subjected to the inspections of Test Group I. The total samples are then divided into Groups II to VII inclusive, and subjected to the tests and inspections of the particular group.