

Cermet Resistor Networks

EXPLANATION OF PART NUMBERS

408A103		408E221331		
Series Designation	Resistance Value	Series Designation	R1	R2
106A 406A 108A 408A 110A 410A 106B 406B 108B 408B 110B 410B	First two digits are significant figures and the third indicates the number of zeros following the first two digits — Examples: 101 = 100 Ohms 102 = 1000 Ohms 122 = 1200 Ohms	106E 108E 110E 406E 408E 410E		First two digits are significant figures and the third indicates the number of zeros following the first two digits — Examples: 101 = 100 Ohms 102 = 1000 Ohms 122 = 1200 Ohms

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 ± 0.25 percent maximum.
	3	DC Resistance	4.6.5	In accordance with applicable requirements.
II	1	Solderability	4.6.6	Resistance change ± 0.25 percent maximum.
	2	Resistance to Solvents	4.6.7	Resistance change ± 0.25 percent maximum. Marking shall remain legible.
III	1	Resistance Temperature Characteristic	4.6.8	Within specified limits (normally ± 100 ppm/ $^{\circ}$ C or ± 250 ppm/ $^{\circ}$ C).
	2	Low Temperature Operation	4.6.9	Resistance change ± 0.25 percent maximum.
	3	Short Time Overload	4.6.10	Resistance change ± 0.25 percent maximum.
	4	Terminal Strength	4.6.11	Resistance change ± 0.25 percent maximum.
IV	1	Dielectric Withstanding Voltage	4.6.12	Resistance change ± 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 ± 0.25 percent maximum.
	4	Moisture Resistance	4.6.15	Resistance change ± 0.5 percent maximum.
V	1	Shock (Specified Pulse)	4.6.16	Resistance change ± 0.25 percent maximum.
	2	Vibration, High Frequency	4.6.17	Resistance change ± 0.25 percent maximum.
VI	1	Life	4.6.18	Resistance change ± 0.5 percent maximum.
VII	1	High Temperature Exposure	4.6.19	Resistance change ± 0.5 percent maximum.
	2	Low Temperature Storage	4.6.20	Resistance change ± 0.25 percent maximum.

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

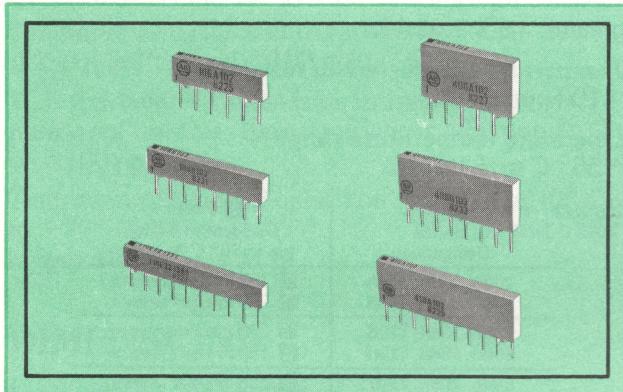
Normal atmospheric pressure.
Relative humidity of 40 ± 10 percent.
Ambient temperature of $24^{\circ} \pm 2^{\circ}$ C.

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.



Series 100 400

Cermet Resistor Networks



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 two package profiles.

Applications

- Pull-up and pull-down arrays
- Transmission line terminators
- Current limiting resistors
- ECL terminating 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

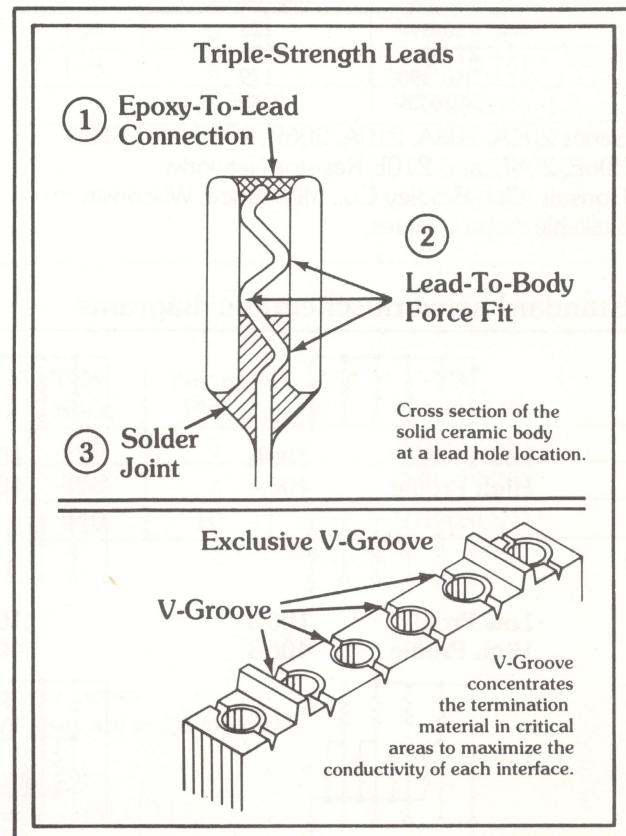
I-SIP

Single In-Line Package

FEATURES

- Solid Ceramic Body, with V-Groove
- Triple-Strength Leads
- 0.100 Inch (2,54mm) Lead Spacing
- Two Package Heights:
 - 0.190 Inch (4,83mm), 0.350 Inch (8,89mm)
- 6, 8 and 10 Pins
- Automatically Insertable
- Permanent Laser Marking
- Part Markings — Side and Top

Tough new package





Cermet Resistor Networks

Standard resistance values

Series 106A, 108A, 110A, 106B, 108B, 110B, 406A, 408A, 410A, 406B, 408B and 410B 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

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

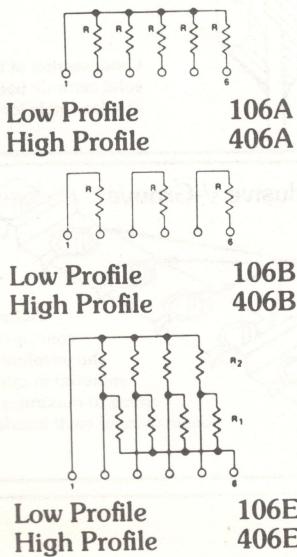
Series 106E, 108E, 110E, 406E, 408E and 410E Resistor Networks

R1/R2	Zo (Characteristic Impedance)
180/390	123
220/330	132
330/390	179
3K/6.2K	2.02K

Series 206A, 208A, 210A, 206B, 208B, and 210B 206E, 208E, and 210E Resistor Networks.

Consult Allen-Bradley Co., Milwaukee, Wisconsin for available resistor values.

Standard network schematic diagrams



Standard network specifications

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

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

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

Power —	Network Series Designation	1 Power Dissipation Rating (up to 70° C Ambient)
	106A, 108A, 110A	1 125 mw/per resistor
	406A, 408A, 410A	2 250 mw/per resistor
	106B, 108B, 110B	2 250 mw/per resistor
	406B, 408B, 410B	2 500 mw/per resistor
	106E, 108E, 110E	2 125 mw/per resistor
	406E, 408E, 410E	2 250 mw/per resistor

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

2 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.

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 — 10 ohms to 10 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 $\pm 1.0\%$.

Resistance matching or ratio — Low as $\pm 1\%$.

Temperature coefficient of resistance (TCR) — $\pm 250 \text{ ppm}/^\circ\text{C}$ and $\pm 100 \text{ ppm}/^\circ\text{C}$.

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°C to $+70^\circ\text{C}$), Military (-55°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 setability. Trimming methods include lasers, sand abrasion, and mechanical.

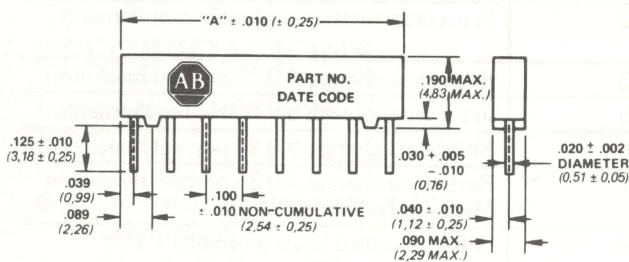
PACKAGE POWER RATINGS (WATTS) (up to 70°C ambient) ■

Package Height (Profile)	Number of Pins		
	6	8	10
Low Profile (.190")	.6	.9	1.1
High Profile (.350")	1.0	1.3	1.8

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

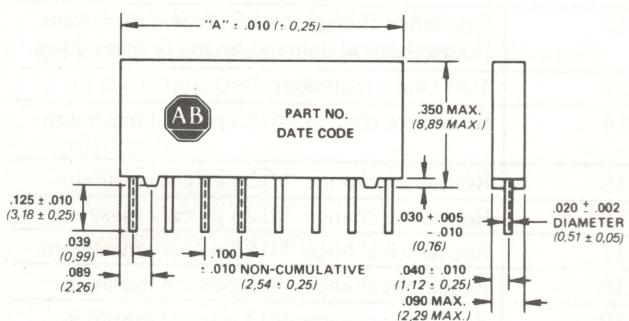
DIMENSIONS

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)

High profile 400 series



Pkg. Style	No. of Pins	"A" Dimension
406	6	.578 (14,68)
408	8	.778 (19,76)
410	10	.978 (24,84)

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

TOLERANCES

Dimensional Tolerance $\pm .005$ (0.13)
Angular Tolerance $\pm 5^\circ$ Except as Specified.

NOT TO SCALE