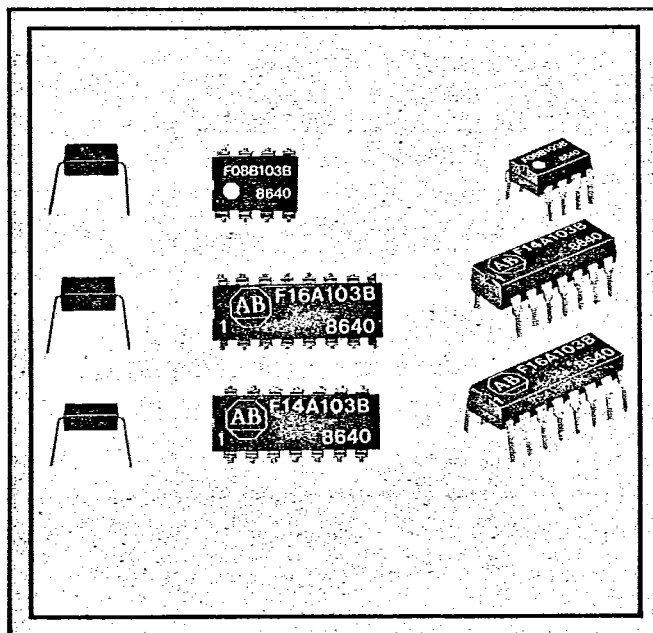




Series F08, F14, F16

Thin Film Resistor Networks



DIP

Dual In-Line Package

FEATURES

- 99.5% Alumina Substrate
- Molded Epoxy DIP Package
- 0.100 Inch (2,54mm) Lead Spacing
- Low Profile
- 8, 14 and 16 Pin Construction
- Automatically Insertable
- Meets Specifications of Characteristic V of MIL-R-83401

SPECIFICATIONS

Standard Network Applications

NETWORK	
F14A F16A	F08B F14B F16B
APPLICATIONS	
Pull-Up Resistor Arrays for Open TTL Gates Parallel High Speed Circuitry Wired OR Configurations Pull-Down Applications TTL-MOS Interfacing Digital Pulse Squaring	Matched Pairs Current Limiting Transmission Line Termination Power Gate Pull-Up Logic Level Translation

Applications Information

For application information refer to the following Allen-Bradley Application Notes:

- R2R Ladder Networks: EC5510-4.2
- Voltage Divider Networks: EC5515-4.2

For handling and soldering procedures refer to Allen-Bradley Product Data EC5570-5.1.

Custom Resistor Networks

When a standard Allen-Bradley network does not meet your requirements, a custom network can be designed to your specifications. Consult Allen-Bradley Co., Greensboro, North Carolina with your specifications.

Applications

Series F14A and F16A

Pull-Up resistor arrays for open TTL gates.
Parallel high speed circuitry.
Wired OR configurations.
Pull-Down applications.
TTL-MOS interfacing.
Digital pulse squaring.

Series F08B, F14B and F16B

Matched pairs.
Current limiting.
Transmission line termination.
Power gate pull-up.
Logic level translation.

Standard Network Specifications

Resistor tolerance — $\pm 0.1\%$, $\pm 0.5\%$ and $\pm 1\%$ absolute.

Temperature coefficient of resistance — $\pm 50 \text{ ppm}/^\circ\text{C}$.

TCR tracking — Between resistors in the same network is $\pm 5 \text{ ppm}/^\circ\text{C}$ standard.

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

Storage temperature — -65°C to $+150^\circ\text{C}$.

Power dissipation rating — Up to 70°C ambient **1**

Series	Individual Resistor Rating	Total Package Rating
F08B	150 mw	.5 watts
F14A	50 mw 2	.7 watts
F14B	100 mw 3	.7 watts
F16A	50 mw 2	.7 watts
F16B	100 mw 3	.7 watts

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

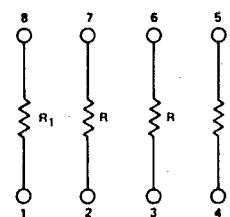
2 Rated continuous working voltage (RCWV), based on nominal resistance (R) in ohms, is $\sqrt{0.050 \times R}$ or 100 volts, whichever is less.

3 Rated continuous working voltage (RCWV), based on nominal resistance (R) in ohms, is $\sqrt{0.100 \times R}$ or 100 volts, whichever is less.

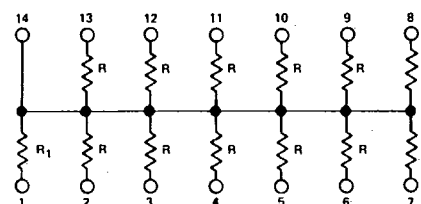
Network Accuracy Code	A	B	D	F
Tolerance (absolute)	.1%	.1%	.5%	1%
Resistance matching	.05%	.1%	.1%	.5%

Note: R_1 is reference resistor for resistance ratio matching.

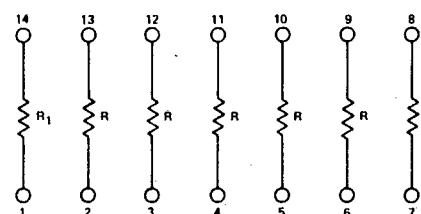
Standard Network Schematic Diagrams



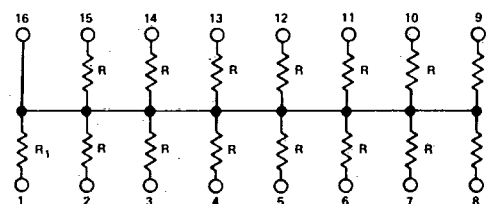
Series F08B



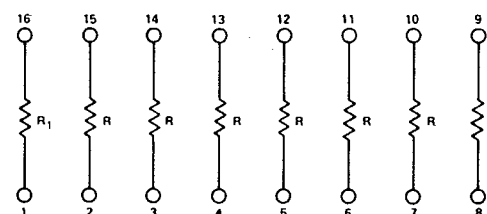
Series F14A



Series F14B



Series F16A



Series F16B

Standard Resistance Values

Resistance Value (Ohms)	Part Numbers					
	8 Pin DIP	(Tol.)	14 Pin DIP	(Tol.)	16 Pin DIP	(Tol.)
100	F08B101	B,D,F	F14B101	B,D,F	F16B101	B,D,F
500	F08B501	B,D,F	F14B501	B,D,F	F16B501	B,D,F
1K	F08B102	A,B,D,F	F14B102	A,B,D,F	F16B102	A,B,D,F
2K	—		—		F16B202	A,B,D,F
4.7K	F08B472	A,B,D,F	F14B472	A,B,D,F	F16B472	A,B,D,F
5.0K	—		F14B502	A,B,D,F	F16B502	A,B,D,F
10.0K	F08B103	A,B,D,F	F14B103	A,B,D,F	F16B103	A,B,D,F
—	—		—		F16A103	B,D,F
50.0K	—		—		F16B503	A,B,D,F
100.0K	F08B104	A,B,D,F	F14B104	A,B,D,F	F16B104	A,B,D,F
150.0K	—		—		F16B154	A,B,D,F
300.0K	—		—		F16B304	A,B,D,F
390.0K	—		—		F16B394	A,B,D,F
500.0K	F08B504	A,B,D,F	—		—	
700.0K	—		—		F16B704	A,B,D,F
1.0 Meg	—		—		F16B105	A,B,D,F

Nonstandard Resistance Values

(Consult factory on build, minimum order, and residual inventory.)

Pin Count	Resistance Range with Masks Available (No NRE Required)	
	"B" Circuit Resistance Range (Ohms)	"A" Circuit resistance Range (Ohms)
8	100 Ohms thru 20.0K, 47.0K thru 500.0K	—
14	100 Ohms thru 1.0 Meg	1.0K thru 22.0K, 33.0K thru 100.0K
16	100 Ohms thru 1.0 Meg	1.0K thru 22.0K, 33.0K thru 100.0K

Consult factory for resistance range need outside of available mask range.

Custom parts: 8, 14, 16 pin DIP; 4, 7, 8 pin SIP, SOIC and PLCC available.

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 dual in-line resistor network capabilities:

Resistance range — 1K ohm to 1 megohm; special to 100 ohms. Requests for custom resistor networks can best be met when total number of different resistor values is limited to a small number. Maximum total resistance per package is 2.5 megohms.

Tolerance (absolute) — Standard $\pm 1\%$.

Resistance matching or ratio — Low as $\pm .05\%$.

Temperature coefficient of resistance (TCR) — ± 50 ppm/ $^{\circ}\text{C}$ and ± 25 ppm/ $^{\circ}\text{C}$ available.

TCR Tracking — Depends on resistance range and number of resistors. Typical tracking is 5 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.

Power dissipation rating —

8 pin DIP — .5 watts up to 70°C ; derated linearly to 0 watts at 150°C .

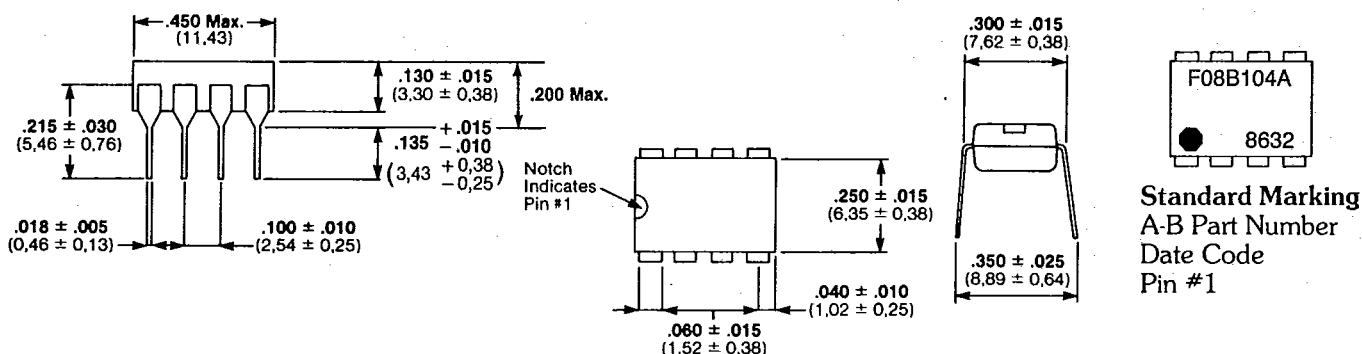
14 pin DIP — .7 watts up to 70°C ; derated linearly to 0 watts at 150°C .

16 pin DIP — .7 watts up to 70°C ; derated linearly to 0 watts at 150°C .

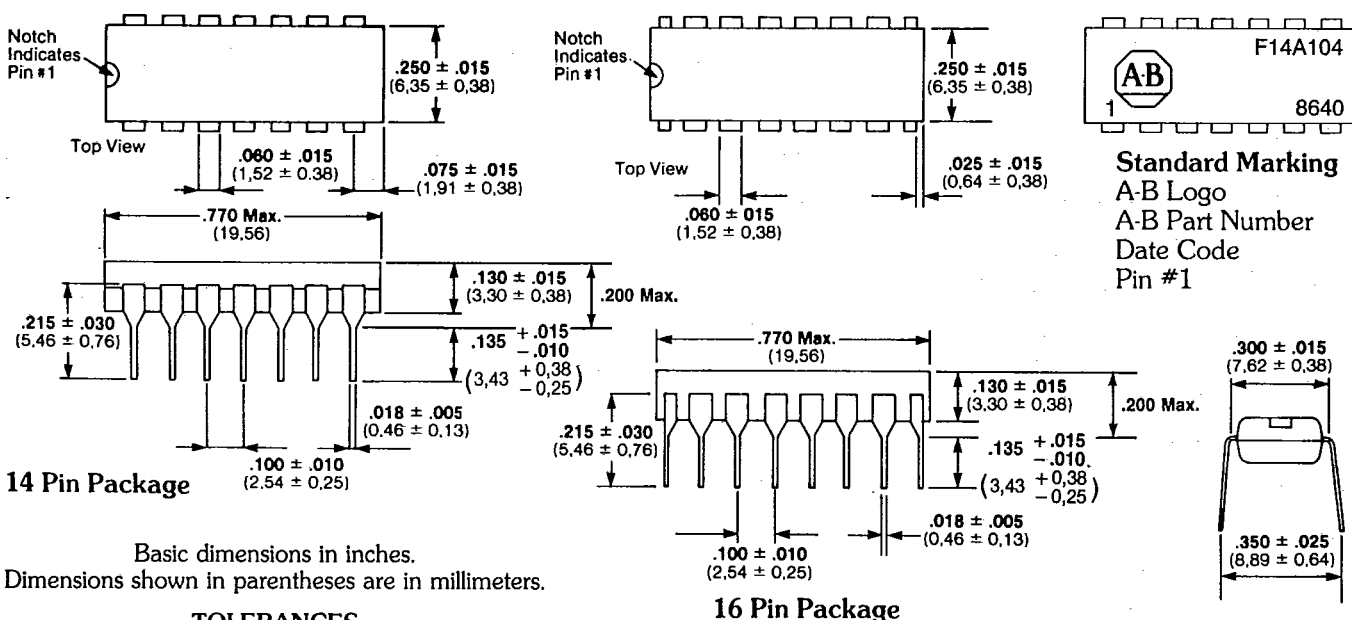
Additional Capabilities — Group A and B testing available. R/2R ladders to 10 bits at $\pm 1/2$ LSB Full Scale Accuracy, -55°C to $+125^{\circ}\text{C}$.

DIMENSIONS

Series F08B



Series F14A, F14B, F16A, and F16B



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

TOLERANCES

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

NOT TO SCALE

Typical Performance Test Capabilities

Test Group	Order Of Test	Examination or Test	Test Method Per MIL-R-83401 (Paragraph) I	Post Test Requirements I
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, Δ Ratio $\pm .03\%$.
	3	Power Conditioning	4.6.4	Resistance change ± 0.1 percent maximum, Δ Ratio $\pm .03\%$.
	4	DC Resistance	4.6.5	In accordance with applicable requirements.
II	1	Solderability	4.6.6	In accordance with applicable requirements.
	2	Resistance to Solvents	4.6.7	Marking shall remain legible.
III	1	Resistance Temperature Characteristic	4.6.8	Within specified limits. ± 50 ppm/ $^{\circ}$ C TCR Tracking, ± 5 ppm/ $^{\circ}$ C.
	2	Low Temperature Operation	4.6.9	Resistance change ± 0.1 percent maximum, Δ Ratio $\pm .02\%$.
	3	Short Time Overload	4.6.10	Resistance change ± 0.1 percent maximum, Δ Ratio $\pm .02\%$.
	4	Terminal Strength	4.6.11	Resistance change ± 0.1 percent maximum, Δ Ratio $\pm .03\%$.
IV	1	Dielectric Withstanding Voltage	4.6.12	Resistance change ± 0.1 percent maximum, Δ Ratio $\pm .03\%$. 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 ± 0.1 percent maximum, Δ Ratio $\pm .02\%$.
	4	Moisture Resistance	4.6.15	Resistance change ± 0.2 percent maximum, Δ Ratio $\pm .02\%$.
V	1	Shock (Specified Pulse)	4.6.16	Resistance change ± 0.25 percent maximum, Δ Ratio $\pm .03\%$.
	2	Vibration, High Frequency	4.6.17	Resistance change ± 0.25 percent maximum, Δ Ratio $\pm .03\%$.
VI	1	Life	4.6.18	Resistance change ± 0.1 percent maximum, Δ Ratio $\pm .03\%$.
VII	1	High Temperature Exposure	4.6.19	Resistance change ± 0.1 percent maximum, Δ Ratio $\pm .03\%$.
	2	Low Temperature Storage	4.6.20	Resistance change ± 0.1 percent maximum, Δ Ratio $\pm .02\%$.

I Post test requirements meet Characteristic V.

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 V inclusive, and subjected to the tests and inspections of the particular group.

Explanation of Part Numbers

F08B103F

