

FEATURES

Electro-Films Inc. offers a broad line of precision thin-film DIP (Dual In-Line Package) resistor networks for military or commercial applications. Electro-Films, Inc.'s unique fabrication process provides for the production of a wide range of resistor network configurations, without costly artwork charges, while achieving a fast turnaround time.

- Available in molded, hermetic, and coated package configurations.
- Excellent resistor matching, temperature tracking, and long-term stability.
- Low cost and fast production for custom networks.
- Any combination of values from 10Ω to $1M\Omega$.
- Hermetically sealed packages available with 8, 14, 16, 18, and 24 leads.
- Molded versions available in 8, 14, 16, 18, and 24 lead packages.
- Conformally coated versions containing any even number of leads from 4 to 64.
- Screened to MIL-STD-883, method 5008, class B or S; or MIL-R-83401.
- Semi-standard; no artwork required.

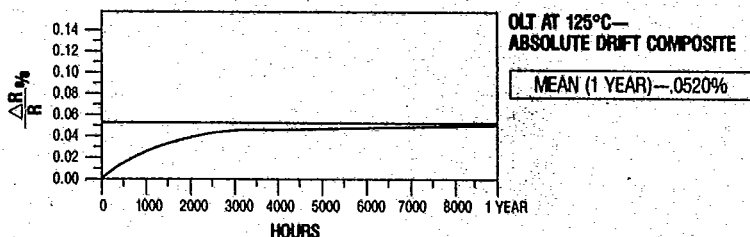
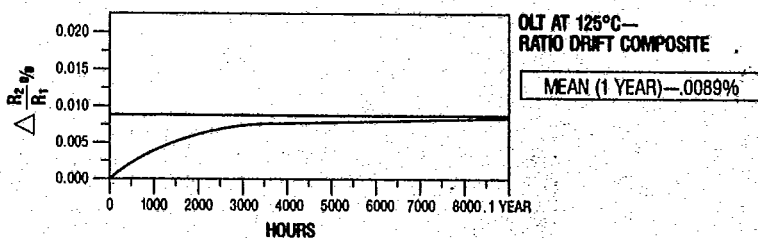
ELECTRICAL SPECIFICATIONS

EFI's selection of DIP networks provides excellent long-term stability, a large range of resistance values and high performance over a wide range of environmental conditions.

- Absolute accuracy: $\pm 20\%$ to $\pm 0.05\%$.
- Ratio match: $\pm 1.0\%$ to $\pm 0.005\%$.
- Operating temperature range: Commercial 0°C to 70°C , Military -55°C to 125°C .
- Absolute TCR: ± 50 ppm/ $^\circ\text{C}$ to ± 10 ppm/ $^\circ\text{C}$.
- Ratio TCR tracking: ± 5 ppm/ $^\circ\text{C}$ to ± 0.5 ppm/ $^\circ\text{C}$.
- Resistance values: Any combination of values from 10Ω to $1M\Omega$.

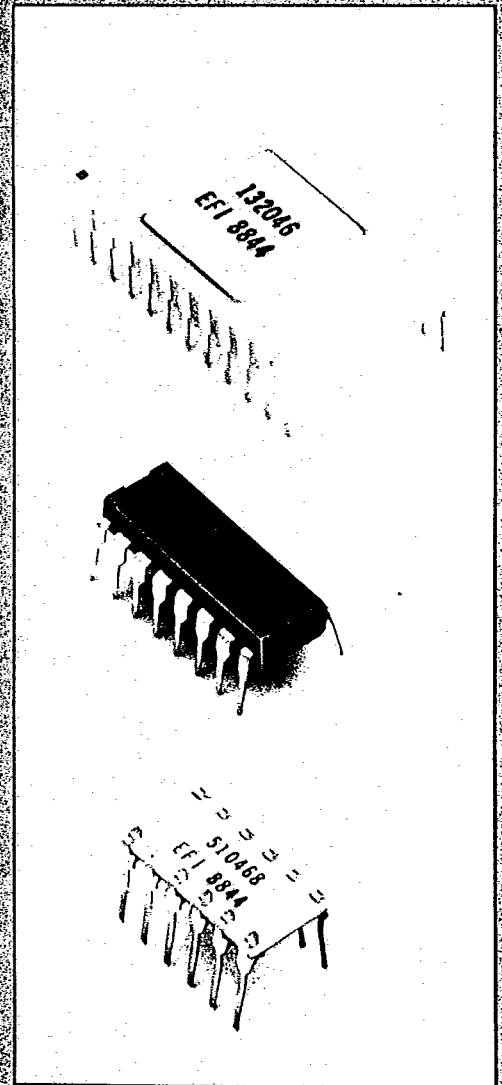
LONG-TERM STABILITY

EFI's new enhanced metalization ensures excellent stability and low drift. The results of extensive 125°C operating life tests are illustrated below. EFI's unique process yields typical absolute drifts of 0.03% @ 1000 hrs. and 0.052% @ 1 year; and typical mean ratio drifts of 0.003% @ 1000 hrs. and 0.0089% @ 1 year.



DIP PRECISION THIN-FILM RESISTOR NETWORKS

T-62-05



Electro-Films Inc.

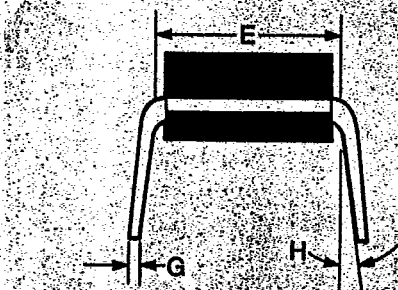
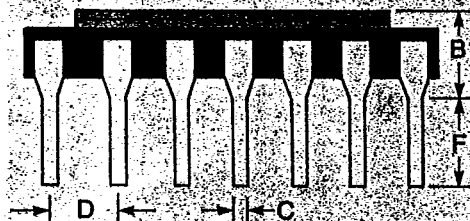
111 Gilbane Street
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TWX 710-482-0405
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MECHANICAL SPECIFICATIONS



MOLDED

NO LEADS	A	B	C	D	E	F	G	H
8-LEAD	0.400	0.160	0.018	0.100	0.300	0.125	0.012	10°
14-LEAD	0.750	0.160	0.018	0.100	0.300	0.125	0.012	10°
16-LEAD	0.750	0.160	0.018	0.100	0.300	0.125	0.012	10°
18-LEAD	0.900	0.160	0.018	0.100	0.300	0.125	0.012	10°
24-LEAD	1.250	0.160	0.018	0.100	0.300	0.125	0.012	10°



HERMETIC

NO LEADS	A	B	C	D	E	F	G	H
8-LEAD	0.400	0.160	0.018	0.100	0.300	0.170	0.012	10°
14-LEAD	0.700	0.160	0.018	0.100	0.300	0.150	0.012	10°
16-LEAD	0.800	0.160	0.018	0.100	0.300	0.150	0.012	10°
18-LEAD	0.900	0.160	0.018	0.100	0.300	0.150	0.012	10°
24-LEAD	1.200	0.160	0.018	0.100	0.600	0.150	0.012	10°

*NOTE: All package dimensions are nominal values. ALL DIMENSIONS IN INCHES

APPLICATIONS

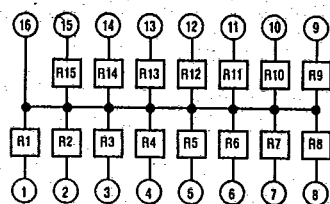
EFI's custom precision thin-film DIP networks provide system designers with a convenient answer to circuits whose performance depends critically on the relationships between two or more resistors. Their initial moderate cost, plus savings in areas such as: purchasing, inventory control, assembly, test, and board space, make these networks suitable for a multitude of applications. The following is only a small sample of applications where EFI precision thin-film networks can be employed:

- Programmable gain amplifiers.
- Comparators.
- Voltage dividers.
- Matched pairs or quads.
- Operational amplifier feedback networks which require a stable gain over a wide temperature range.

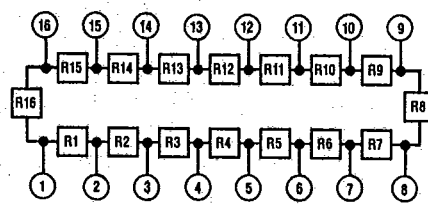
ORDERING INFORMATION

The following information must be furnished with each order: Network Type, Package Type, Resistance Value for each position, Absolute Tolerance, Reference Resistor, and Ratio Tolerance. Please use the diagrams below to define resistor location (eliminate resistors where not required) and furnish a table as illustrated in the examples. Network types D1, D2 and D4 are shown for 16-pin packages. For packages with different numbers of pins use similar numbering.

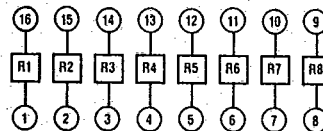
STANDARD CONFIGURATIONS



D1 - COMMON CONNECTION



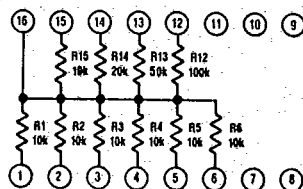
D2 - SERIES CONNECTION



D4 - ISOLATED CONNECTION

EXAMPLE #1

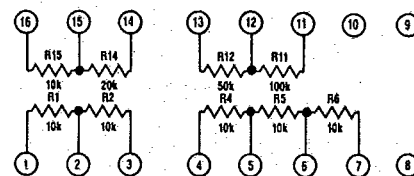
NET. TYPE	PKG. TYPE	NO. OF LEADS			
D1	M	16			
Resistor	Value (OHMS)	Absolute Tolerance (%)	Reference Resistor	Ratio Tolerance (%)	
R1	10kΩ	1.0	—	—	
R2-R6, R15	10kΩ	1.0	R1	0.01	
R14	20kΩ	1.0	R1	0.01	
R13	50kΩ	1.0	R1	0.01	
R12	100kΩ	1.0	R1	0.01	



RESULTING NETWORK

EXAMPLE #2

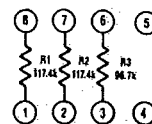
NET. TYPE	PKG. TYPE	NO. OF LEADS			
D2	C	16			
Resistor	Value (OHMS)	Absolute Tolerance (%)	Reference Resistor	Ratio Tolerance (%)	
R1	10kΩ	0.1	—	—	
R2-R6, R15	10kΩ	0.1	R1	0.02	
R13	20kΩ	0.1	R1	0.02	
R11	50kΩ	0.1	R1	0.02	
R10	100kΩ	0.1	R1	0.02	



RESULTING NETWORK

EXAMPLE #3

NET. TYPE	PKG. TYPE	NO. OF LEADS			
D4	C	8			
Resistor	Value (OHMS)	Absolute Tolerance (%)	Reference Resistor	Ratio Tolerance (%)	
R1	117.4kΩ	0.1	—	—	
R2	117.4kΩ	0.1	R1	0.1	
R3	58.7kΩ	0.1	R1	0.1	



RESULTING NETWORK

KEY
 Package Type:
 H = Hermetic
 C = Coated
 M = Molded