

BOURNS

Model 4600M

® Resistor Networks

CONFORMAL SIPs, MEDIUM PROFILE 4 THROUGH 14 PIN

- Medium profile offers increased power handling
- Wide assortment of pin packages enhances design flexibility
- High temperature design ensures compatibility with all popular board soldering techniques
- Copper leads for superior heat dissipation

Electrical Characteristics

Standard Resistance Values

..... 10 ohms to 10 megohms

Maximum Operating Voltage... 100V

Temperature Coefficient of Resistance (TCR)..... $\pm 100\text{ppm}/^\circ\text{C}$

$\pm 250\text{ppm}/^\circ\text{C}$ for values

less than 50 ohms and
greater than 2.2 megohms

Voltage Coefficient..... $\pm 100\text{ppm}/\text{V}$

typical by decade values

TCR Tracking..... $50\text{ppm}/^\circ\text{C}$

maximum; equal values

Resistor Tolerance..... See circuits

Operating Temperature

..... -55°C to $+125^\circ\text{C}$

Power Rating..... Derate to zero

power from $+70^\circ\text{C}$ to $+125^\circ\text{C}$

Environmental Characteristics

Tests per MIL-R-83401. ΔR maximum

Short Time Overload..... $\pm 0.25\%$

Load Life..... $\pm 1.00\%$

Mechanical Shock..... $\pm 0.25\%$

Moisture Resistance..... $\pm 0.50\%$

Resistance to Soldering Heat

..... $\pm 0.25\%$

Terminal Strength..... $\pm 0.25\%$

Thermal Shock..... $\pm 0.25\%$

Vibration..... $\pm 0.25\%$

Insulation Resistance

..... 10,000 megohms minimum

Dielectric Withstanding Voltage

..... 200 VRMS

Lead Solderability & Solvent Resistance

. Meet requirements of MIL-R-83401

Physical Characteristics

Flammability... Conforms to UL94V-0

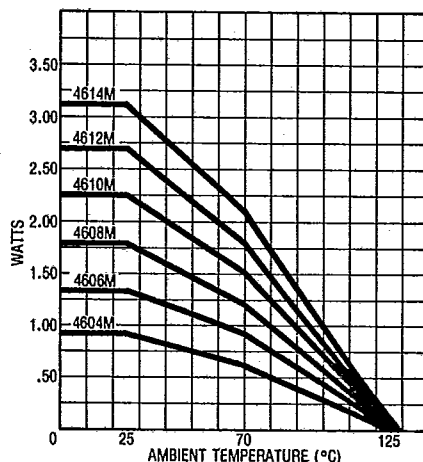
Lead Frame Material

Copper (OLIN 194) 60/40 solder dip

Body Material

. Epoxy resin/anhydride diphenol A

PACKAGE POWER TEMPERATURE DERATING CURVE



PACKAGE POWER RATINGS (Watts)

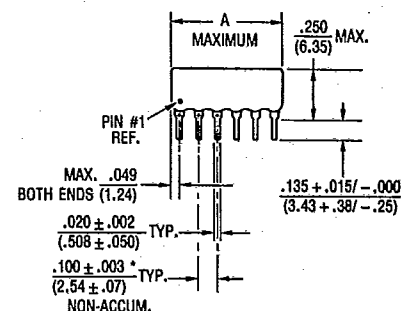
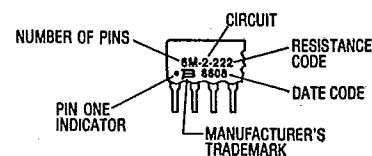
Pkg.	Ambient Temperature		Pkg.	Ambient Temperature	
	70°C	25°C		70°C	25°C
4604M	0.60	0.90	4610M	1.50	2.25
4605M	0.75	1.13	4611M	1.65	2.47
4606M	0.90	1.35	4612M	1.80	2.70
4607M	1.05	1.58	4613M	1.95	2.92
4608M	1.20	1.80	4614M	2.10	3.15
4609M	1.35	2.03			

TYPICAL PART MARKING

Represents total content. Layout may vary.
RC = ohmic value, 3-digit resistance code.

Part Number	Part Marking
4606M-101-RC	6M-1-RC
4608M-102-RC	8M-2-RC
4610-104-RC/RC	10M-4-RC/RC

RC = ohmic value, 3-digit resistance code.



Maximum package length is equal to .100" (2.54mm) times the number of pins, less .002" (.05mm).

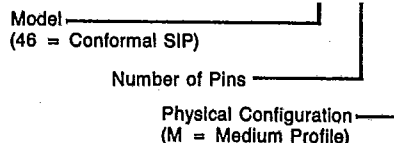
Governing dimensions are in inches. Dimensions in parentheses are metric (mm) and are approximate.

*Terminal centerline to centerline measurements made at point of emergence of the lead from the body.

Pin Count	A Maximum Inches (mm)
4	.398 (10.11)
5	.498 (12.65)
6	.598 (15.19)
7	.698 (17.73)
8	.798 (20.27)
9	.898 (22.81)
10	.998 (25.35)
11	1.098 (27.89)
12	1.198 (30.43)
13	1.298 (32.97)
14	1.398 (35.51)

HOW TO ORDER CONFORMAL SIP NETWORKS

46 06 M -101 - 222



Resistance Code

- First 2 digits are significant
- Third digit represents the number of zeros to follow.

Electrical Configuration

- 101 = Bussed
- 102 = Isolated
- 104 = Dual Terminator

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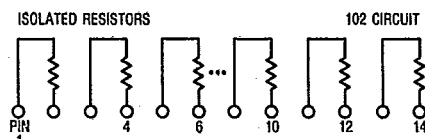
- Trifurcated Krimp-Joint™ lead attachment for product reliability and strength
- Gold epoxy provides excellent marking contrast
- Laser marking for permanent identification

Model 4600M

® Resistor Networks

ISOLATED RESISTORS (102 CIRCUIT)

Model 4600M-102-RC
4, 6, 8, 10, 12 or 14 Pin



These models incorporate 2 to 7 isolated thick-film resistors of equal value, each connected between two pins.

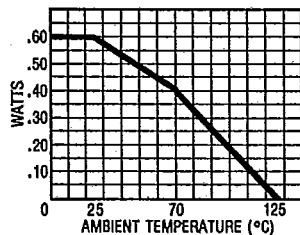
Resistance Tolerance

10 ohms to 49 ohms..... ± 1 ohm
50 ohms to 5 megohms..... $\pm 2\%$ *
Above 5 megohms..... $\pm 5\%$

Power Rating per Resistor

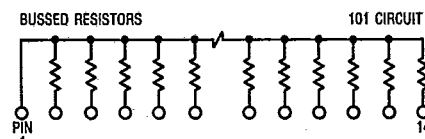
At 70°C.....0.40 watt
At 25°C.....0.60 watt

POWER TEMPERATURE DERATING CURVE



BUSSED RESISTORS (101 CIRCUIT)

Model 4600M-101-RC
4 through 14 Pin



These models incorporate 3 to 13 thick-film resistors of equal value, each connected between a common bus (pin 1) and a separate pin.

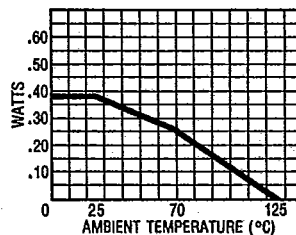
Resistance Tolerance

10 ohms to 49 ohms..... ± 1 ohm
50 ohms to 5 megohms..... $\pm 2\%$ *
Above 5 megohms..... $\pm 5\%$

Power Rating per Resistor

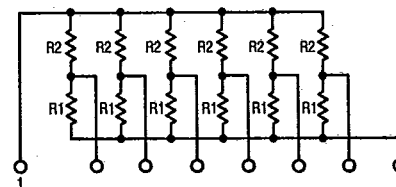
At 70°C.....0.25 watt
At 25°C.....0.38 watt

POWER TEMPERATURE DERATING CURVE



DUAL TERMINATORS (104 CIRCUIT)

Model 4600M-104-R1/R2
4 through 14 Pin



For example, the 4608M-104 (shown above) is an 8-pin configuration and terminates 6 lines. Pins 1 and 8 are common for ground and power, respectively. Twelve thick-film resistors are paired in series between the common lines (pins 1 and 8).

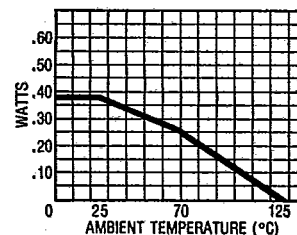
Resistance Tolerance

Below 100 ohms..... ± 2 ohms
100 ohms to 5 megohms..... $\pm 2\%$ *
Above 5 megohms..... $\pm 5\%$

Power Rating per Resistor

At 70°C.....0.25 watt
At 25°C.....0.38 watt

POWER TEMPERATURE DERATING CURVE



STANDARD RESISTANCE VALUES (101, 102 CIRCUITS)

Resistance (Ohms)	Resistance Code	Resistance (Ohms)	Resistance Code
10	100	330	331
22	220	390	391
27	270	470	471
33	330	560	561
39	390	680	681
47	470	820	821
56	560	1,000	102
68	680	1,200	122
82	820	1,500	152
100	101	1,800	182
120	121	2,000	202
150	151	2,200	222
180	181	2,700	272
220	221	3,300	332
270	271	3,900	392

Resistance (Ohms)	Resistance Code	Resistance (Ohms)	Resistance Code
4,700	472	68,000	683
5,600	562	82,000	823
6,800	682	100,000	104
8,200	822	120,000	124
10,000	103	150,000	154
12,000	123	180,000	184
15,000	153	220,000	224
18,000	183	270,000	274
20,000	203	330,000	334
22,000	223	390,000	394
27,000	273	470,000	474
33,000	333	560,000	564
39,000	393	680,000	684
47,000	473	820,000	824
56,000	563	1,000,000	105

STANDARD RESISTANCE VALUES (104 CIRCUITS)

Resistance			
(Ohms)		Code	
R ₁	R ₂	R ₁	R ₂
160	240	161	241
180	390	181	391
220	270	221	271
220	330	221	331
330	390	331	391
330	470	331	471
3,000	6,200	302	622

Specifications are subject to change without notice.

* $\pm 1\%$ tolerance is available by adding suffix code "F" after the resistance code.

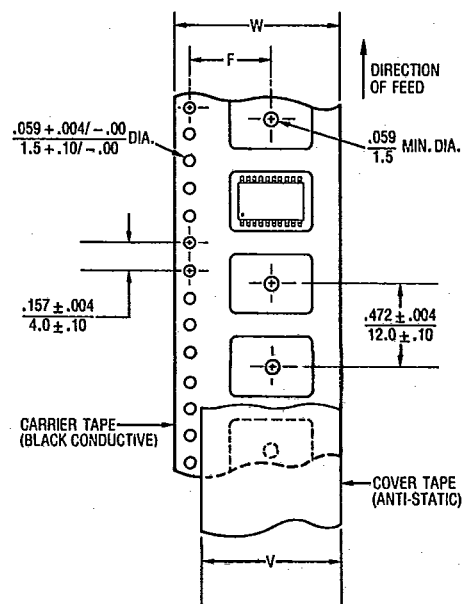
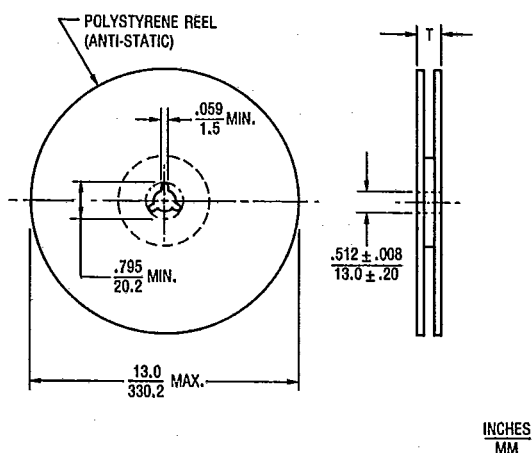
BOURNS

T-90-20

RESISTOR NETWORKS SURFACE MOUNT TAPE AND REEL SPECIFICATIONS

Model	Standard Quantity Per Reel	Carrier Tape Width (W)	Cover Tape Width (V)	Reel Width (T)	Pocket Center (F)
4210P 4220P	1,000	$\frac{.630 \pm .012}{16.0 \pm .30}$	$\frac{.524}{13.3}$ NOM.	$\frac{.882}{22.4}$ MAX.	$\frac{.295 \pm .004}{7.5 \pm .10}$
4416P 4416J	1,500				
4814P	2,000				
4420P 4420J	1,500	$\frac{.945 \pm .012}{24.0 \pm .30}$	$\frac{.827}{21.0}$ NOM.	$\frac{1.43}{36.4}$ MAX.	$\frac{.453 \pm .004}{11.5 \pm .10}$
4816P	2,000				

Leader Length = 530 ± 30 mm } Empty Component Pockets
 Trailer Length = 500mm Min. } Sealed With Cover Tape



NOTE: Dimensions not specified are per EIA RS-481.
 Governing dimensions are in millimeters.