

BOURNS

Model 4600X

Resistor Networks

CONFORMAL SIPs, LOW PROFILE 4 THROUGH 14 PIN

- Low profile is compatible with DIPs
- Wide assortment of pin packages enhances design flexibility
- High temperature ensures compatibility with all popular board soldering techniques
- Copper leads for superior heat dissipation and resistance to corrosion

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.....50ppm/ $^\circ\text{C}$ 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 $+125^\circ\text{C}$

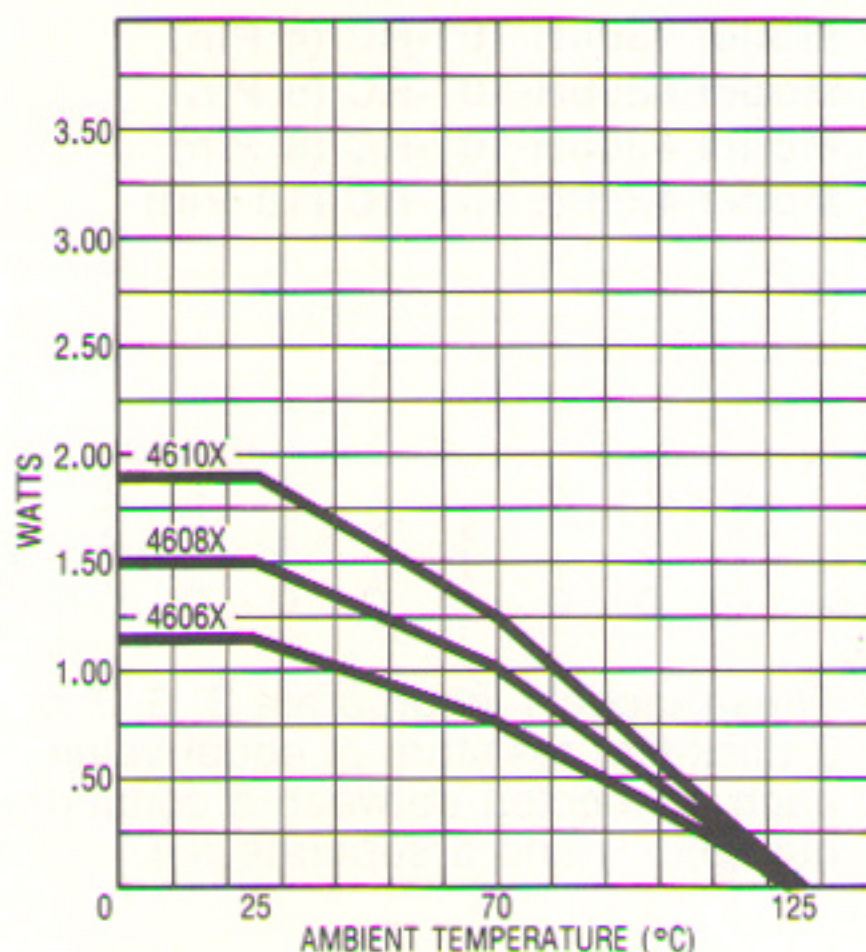
Environmental Characteristics

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 disphenol A

PACKAGE POWER TEMPERATURE DERATING CURVE



PACKAGE POWER RATING AT 70°C

4610X.....1.25 watts
4608X.....1.00 watt
4606X.....0.75 watt

PACKAGE POWER RATING AT 25°C

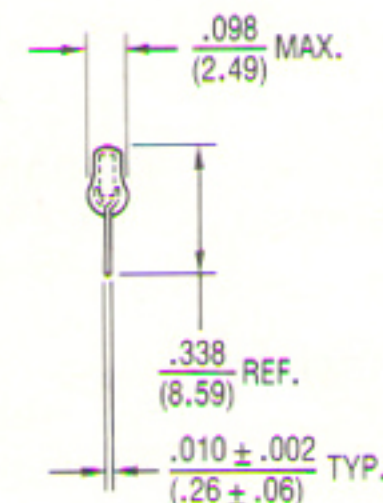
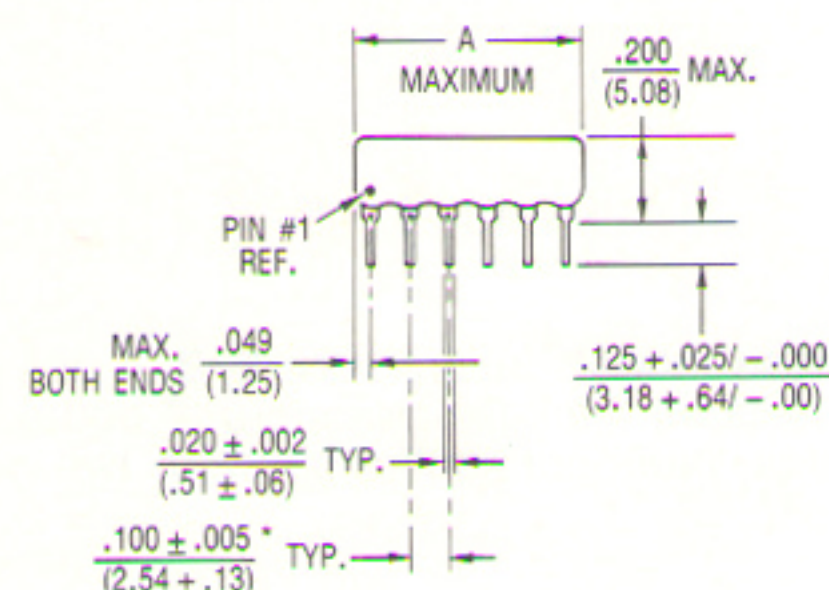
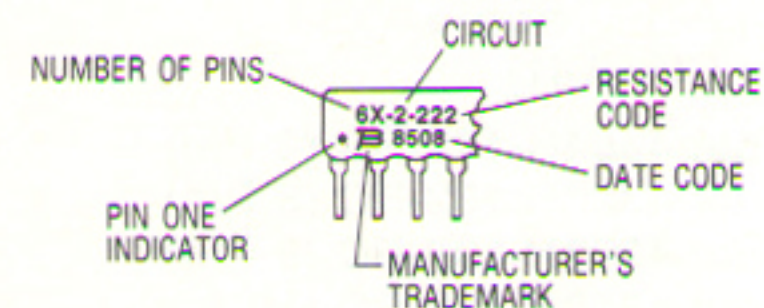
4610X.....1.88 watts
4608X.....1.50 watts
4606X.....1.13 watts

TYPICAL PART MARKING

Represents total content. Layout may vary.

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

RC = ohmic value, 3-digit resistance code.



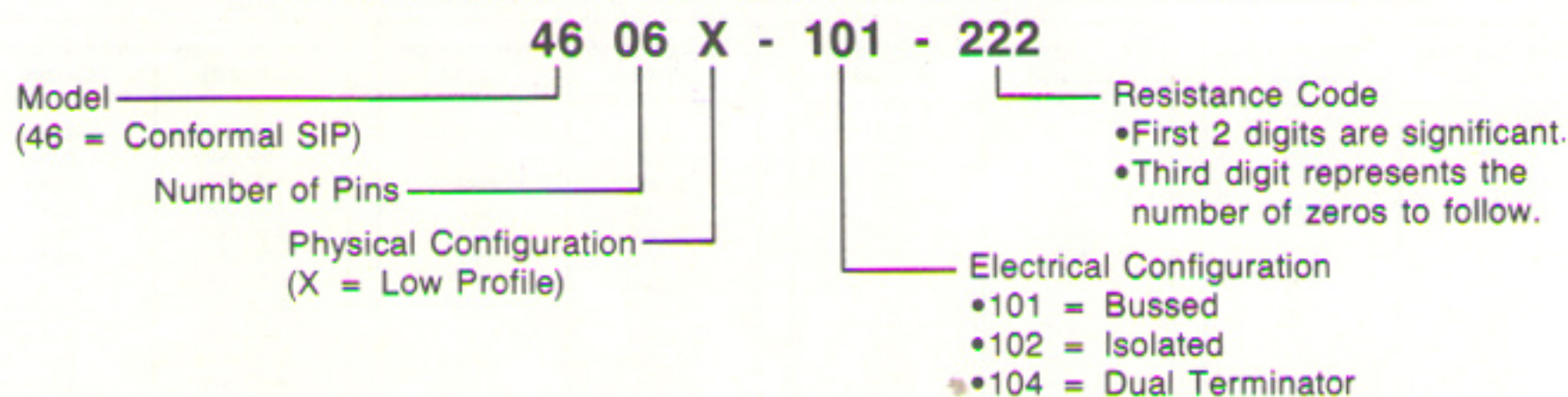
Pin Count	A Maximum Inches (mm)
4	.398 (10.11)
5	.498 (12.65)
6	.598 (15.19)
7	.698 (17.73)
8	.798 (20.27)
9	.898 (22.81)
10	.998 (25.35)
11	1.098 (27.89)
12	1.198 (30.43)
13	1.298 (32.97)
14	1.398 (35.51)

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), rounded to the next highest hundredth.

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

HOW TO ORDER CONFORMAL SIP NETWORKS



Specifications are subject to change without notice.

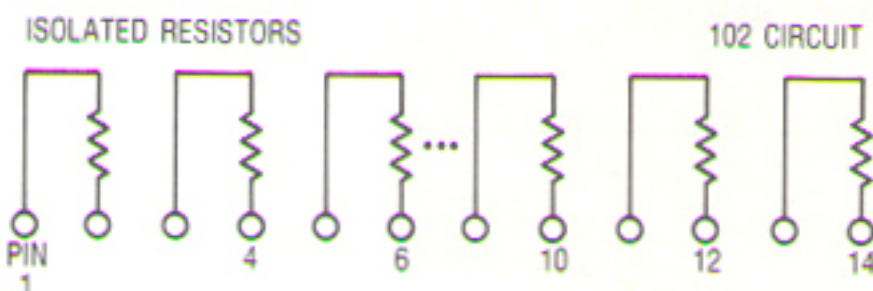
- Trifurcated Krimp-Joint™ lead attachment for product reliability and strength
- Gold epoxy provides excellent marking contrast
- Laser marking for permanent identification
- Temperature coefficient of resistance is under $\pm 100\text{ppm}/^\circ\text{C}$
Resistor tracking (equal values) is under $50\text{ppm}/^\circ\text{C}$

Model 4600X

Resistor Networks

ISOLATED RESISTORS (102 CIRCUIT)

Model 4600X-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.

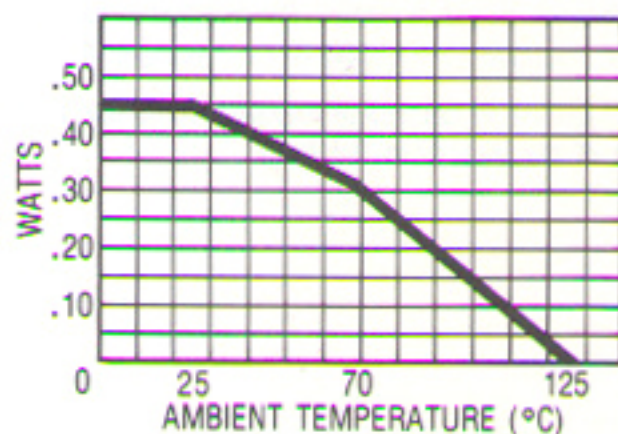
Resistance Tolerance

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

Power Rating per Resistor

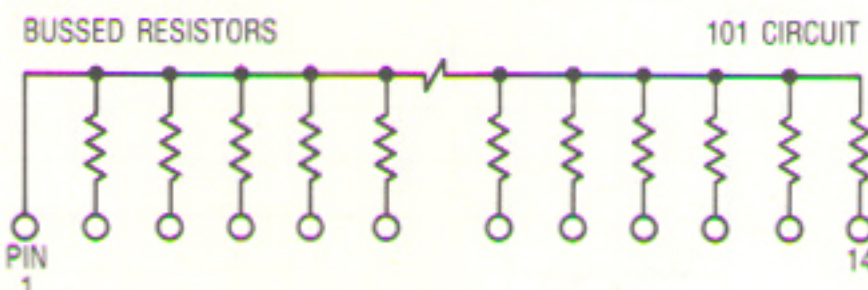
At 70°C 0.30 watt
At 25°C 0.45 watt

POWER TEMPERATURE DERATING CURVE



BUSSED RESISTORS (101 CIRCUIT)

Model 4600X-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.

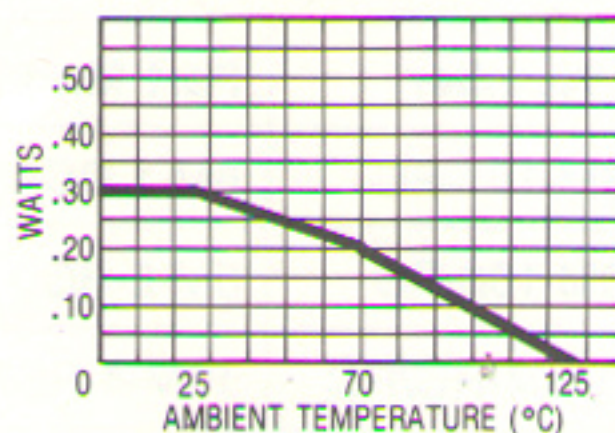
Resistance Tolerance

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

Power Rating per Resistor

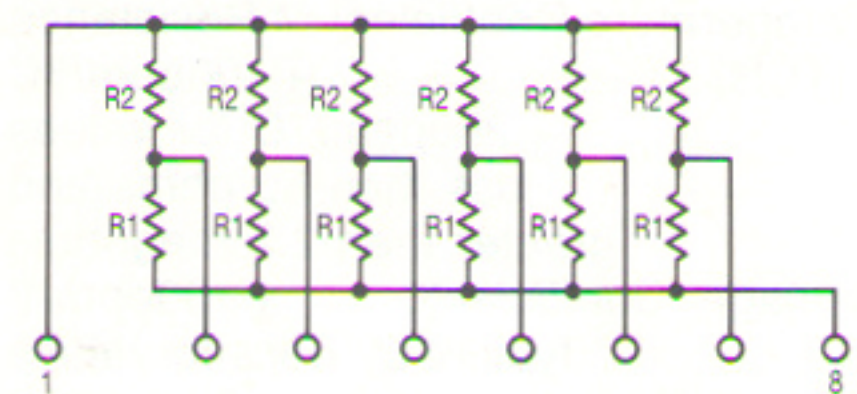
At 70°C 0.20 watt
At 25°C 0.30 watt

POWER TEMPERATURE DERATING CURVE



DUAL TERMINATORS (104 CIRCUIT)

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



The 4608X-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).

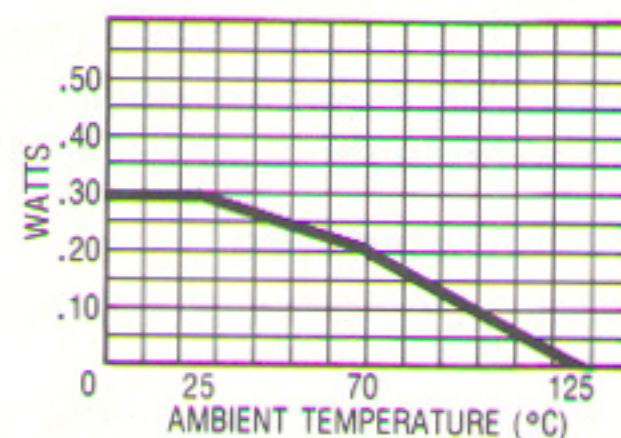
Resistance Tolerance

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

Power Rating per Resistor

At 70°C 0.20 watt
At 25°C 0.30 watt

POWER TEMPERATURE DERATING CURVE



STANDARD RESISTANCE VALUES (101, 102 CIRCUITS)

Resistance (Ohms)	Resistance Code	Resistance (Ohms)	Resistance Code	Resistance (Ohms)	Resistance Code	Resistance (Ohms)	Resistance Code
10	100	330	331	4.700	472	68.000	683
22	220	390	391	5.600	562	82.000	823
27	270	470	471	6.800	682	100.000	104
33	330	560	561	8.200	822	120.000	124
39	390	680	681	10.000	103	150.000	154
47	470	820	821	12.000	123	180.000	184
56	560	1.000	102	15.000	153	220.000	224
68	680	1.200	122	18.000	183	270.000	274
82	820	1.500	152	20.000	203	330.000	334
100	101	1.800	182	22.000	223	390.000	394
120	121	2.000	202	27.000	273	470.000	474
150	151	2.200	222	33.000	333	560.000	564
180	181	2.700	272	39.000	393	680.000	684
220	221	3.300	332	47.000	473	820.000	824
270	271	3.900	392	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

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