

Features

- RoHS compliant*
- Low profile is compatible with DIPs
- Wide assortment of pin packages enhances design flexibility
- Ammo-pak packaging available
- Recommended for rosin flux and solvent clean or no clean flux processes

Marking on contrasting background for permanent identification

4600X Series - Thick Film Conformal SIPs

Product Characteristics

Resistance Range 10 ohms to 10 megohms Maximum Operating Voltage100 V Temperature Coefficient of Resistance 50 Ω to 2.2 megohms.....±100 ppm/°C below 50 Ω±250 ppm/°C above 2.2 megohms......±250 ppm/°C TCR Tracking......50 ppm/°C maximum; equal values Resistor Tolerance...... See circuits Insulation Resistance 10,000 megohms minimum Dielectric Withstanding Voltage200 VRMS Operating Temperature-55 °C to +125 °C

Environmental Characteristics

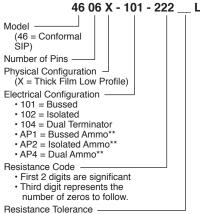
TESTS PER MIL-STD-202	ΔR MAX.
Short Time Overload	±0.25 %
Load Life	±1.00 %
Moisture Resistance	±0.50 %
Resistance to Soldering Heat	
	±0.50 %
Terminal Strength	
Thermal Shock	±0.25 %

Physical Characteristics

Flammability	. Conforms to UL94V-0
Body Material	Epoxy resin
Standard Packag	ing

..... Bulk, Ammo-pak available

How To Order



• Blank = ±2 % (see "Resistance Tolerance" on next page for resistance range)

 $F = \pm 1 \%$ (100 ohms - 5 megohms)

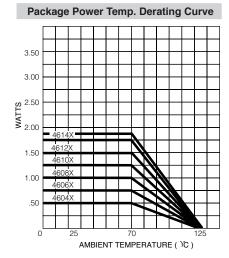
Terminations

 All electrical configurations EXCEPT 104 & AP4: LF = Sn/Ag/Cu-plated (RoHS compliant)

ONLY electrical configurations 104 & AP4: L = Sn/Ag/Cu-plated (RoHS compliant)

Consult factory for other available options.

**Available for packages with 10 pins or less.



Package Power Ratings (Watts)

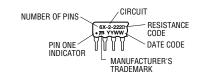
Pkg.	Ambient Temp. 70 °C	Pkg.	Ambient Temp. 70 °C
4604X	0.50	4610X	1.25
4605X	0.63	4611X	1.38
4606X	0.75	4612X	1.50
4607X	0.88	4613X	1.63
4608X 4609X	1.00 1.13	4614X	1.75

Typical Part Marking

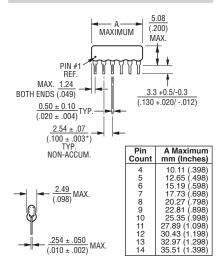
Represents total content. Layout may

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

RC = ohmic value, 3-digit resistance code.



Product Dimensions



Maximum package length is equal to 2.54mm (.100") times the number of pins, less .005mm (.002")

Governing dimensions are in metric. Dimensions in parentheses are inches and are approximate.

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

For Standard Values Used in Capacitors, Inductors, and Resistors, click here.



WARNING Cancer and Reproductive Harm - www.P65Warnings.ca.gov

*RoHS Directive 2015/863, Mar 31, 2015 and Annex. Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

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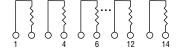
For information on specific applications, download Bourns' application notes:

- DRAM Applications
- **Dual Terminator Resistor Networks**
- R/2R Ladder Networks
- SCSI Applications

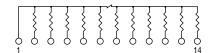
4600X Series - Thick Film Conformal SIPs

Isolated Resistors (102 Circuit)

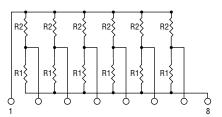
Model 4600X-102-RC 4, 6, 8, 10, 12, 14 Pin



Bussed Resistors (101 Circuit) Model 4600X-101-RC 4 through 14 Pin



Dual Terminator (104 Circuit) Model 4600X-104-R1/R2 4 through 14 Pin



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

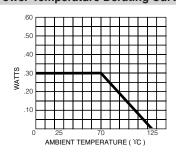
Resistance Tolerance

10 ohms to 49 ohms	±1 ohm
50 ohms to 5 megohms	±2 %*
Above 5 megohms	

Power Rating per Resistor

At 70 °C 0.30 watt

Power Temperature Derating Curve



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

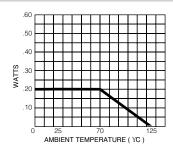
Resistance Tolerance

10 ohms to 49 ohms	±1 ohm
50 ohms to 5 megohms	±2 %*
Above 5 megohms	+5 %

Power Rating per Resistor

At 70 °C 0.20 watt

Power Temperature Derating Curve



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

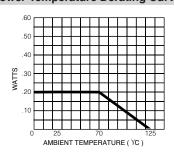
Resistance Tolerance

Below 100 ohms	±2 ohms
100 ohms to 5 megohms	±2 %'
Above 5 megohms	±5 %

Power Rating per Resistor

At 70 °C 0.20 watt

Power Temperature Derating Curve



Popular Resistance Values (101, 102 Circuits)**

Ohms	Code	Ohms	Code	Ohms	Code	Ohms	Code	Ohms	Code
10	100	180	181	1,800	182	15,000	153	120,000	124
22	220	220	221	2,000	202	18,000	183	150,000	154
27	270	270	271	2,200	222	20,000	203	180,000	184
33	330	330	331	2,700	272	22,000	223	220,000	224
39	390	390	391	3,300	332	27,000	273	270,000	274
47	470	470	471	3,900	392	33,000	333	330,000	334
56	560	560	561	4,700	472	39,000	393	390,000	394
68	680	680	681	5,600	562	47,000	473	470,000	474
82	820	820	821	6,800	682	56,000	563	560,000	564
100	101	1,000	102	8,200	822	68,000	683	680,000	684
120	121	1,200	122	10,000	103	82,000	823	820,000	824
150	151	1,500	152	12,000	123	100,000	104	1,000,000	105

^{* ±1 %} tolerance is available by adding suffix code "F" after the resistance code.

Popular Resistance Values (104 Circuit)**

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		

REV. 10/1/20

^{**}Non-standard values available, within resistance range.

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