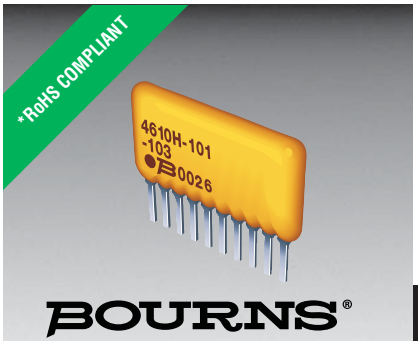



## Features

- RoHS compliant*
- High profile offers increased power handling
- 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

# 4600H Series - Thick Film Conformal SIPs

### Product Characteristics

Resistance Range
.....10 ohms to 10 megohms
Maximum Operating Voltage.....100 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 Voltage
.....200 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 ..... ±0.25 %
Thermal Shock ..... ±0.25 %

### Physical Characteristics

Flammability .....Conforms to UL94V-0
Body Material ..... Epoxy resin
Standard Packaging
.....Bulk, Ammo-pak available

### How To Order

**46 06 H - 101 - 222 __ LF**

Model
(46 = Conformal SIP)

Number of Pins

Physical Configuration
(H = Thick Film High Profile)

Electrical Configuration
- 101 = Bussed
- 102 = Isolated
- 104 = Dual Terminator
- AP1 = Bussed Ammo**
- AP2 = Isolated Ammo**
- AP4 = Dual Ammo**

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

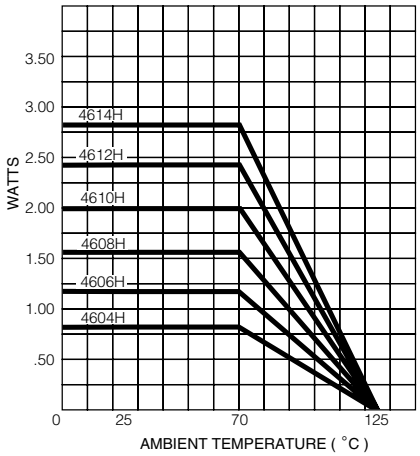
Resistance Tolerance
- Blank = ±2 % (see "Resistance Tolerance" on next page for resistance range)
- F = ±1 % (100 ohms - 5 megohms)

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 Temp. Derating Curve




### Package Power Ratings (Watts)

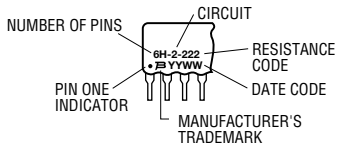
| Pkg. | Ambient Temp. 70 °C | Pkg. | Ambient Temp. 70 °C |
|---|---|---|---|
| 4604H | 0.80 | 4610H | 2.00 |
| 4605H | 1.00 | 4611H | 2.20 |
| 4606H | 1.20 | 4612H | 2.40 |
| 4607H | 1.40 | 4613H | 2.60 |
| 4608H | 1.60 | 4614H | 2.80 |
| 4609H | 1.80 | | |

### Typical Part Marking

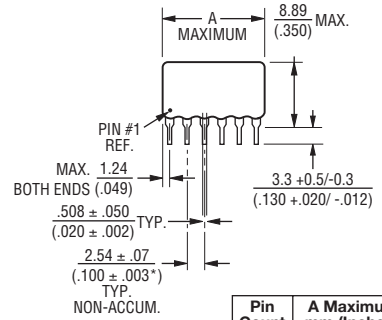
Represents total content. Layout may vary.

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

RC = ohmic value, 3-digit resistance code.




### Product Dimensions




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

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.

*RoHS Directive 2002/95/EC Jan 27 2003 including Annex.

Specifications are subject to change without notice.
Customers should verify actual device performance in their specific applications.

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

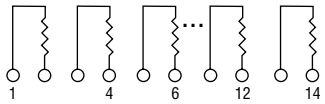
- DRAM Applications
- Dual Terminator Resistor Networks
- R/2R Ladder Networks
- SCSI Applications

# 4600H Series - Thick Film Conformal SIPs

BOURNS®

## Isolated Resistors (102 Circuit)

**Model 4600H-102**
**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.

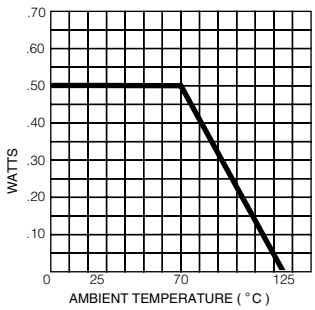
### Resistance Tolerance

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

### Power Rating per Resistor

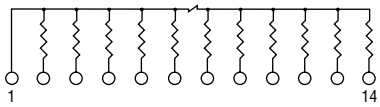
At 70 °C .....0.50 watt

### Power Temperature Derating Curve




## Bussed Resistors (101 Circuit)

**Model 4600H-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.

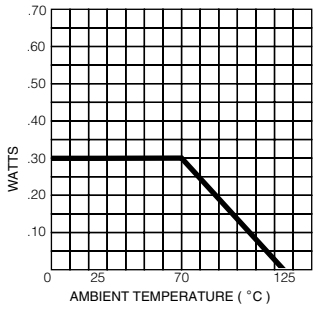
### Resistance Tolerance

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

### Power Rating per Resistor

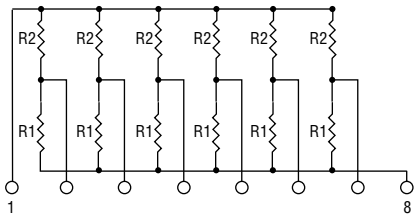
At 70 °C .....0.30 watt

### Power Temperature Derating Curve




## Dual Terminator (104 Circuit)

**Model 4600H-104-R1/R2**
**4 through 14 Pin**




The 4608H-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).

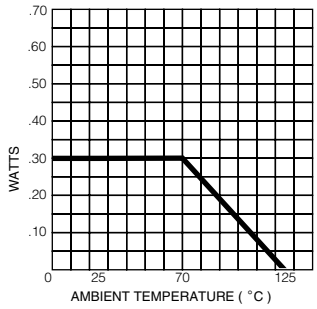
### Resistance Tolerance

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

### Power Rating per Resistor

At 70 °C .....0.30 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.
**Non-standard values available, within resistance range.

### 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 |



Specifications are subject to change without notice.
Customers should verify actual device performance in their specific applications.

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