



## Features

- RoHS compliant\*
- Medium 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

## 4600M Series - Thick Film Conformal SIPs

### Product Characteristics

Resistance Range ..... 10 ohms to 10 megohms  
 Maximum Operating Voltage..... 100 V  
 Temperature Coefficient of Resistance  
   50  $\Omega$  to 2.2 megohms ...  $\pm 100$  ppm/ $^{\circ}$ C  
   below 50  $\Omega$  .....  $\pm 250$  ppm/ $^{\circ}$ C  
   above 2.2 megohms .....  $\pm 250$  ppm/ $^{\circ}$ C  
 TCR Tracking ..... 50 ppm/ $^{\circ}$ C  
   maximum; equal values  
 Resistor Tolerance..... See circuits  
 Insulation Resistance  
   ..... 10,000 megohms minimum  
 Dielectric Withstanding Voltage  
   ..... 200 VRMS  
 Operating Temperature  
   ..... -55  $^{\circ}$ C to +125  $^{\circ}$ C

### Environmental Characteristics

TESTS PER MIL-STD-202..... $\Delta$ R MAX.  
 Short Time Overload .....  $\pm 0.25$  %  
 Load Life.....  $\pm 2.00$  %  
 Moisture Resistance.....  $\pm 0.50$  %  
 Resistance to Soldering Heat  
   .....  $\pm 0.50$  %  
 Terminal Strength .....  $\pm 0.25$  %  
 Thermal Shock .....  $\pm 0.25$  %

### Physical Characteristics

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

### How To Order

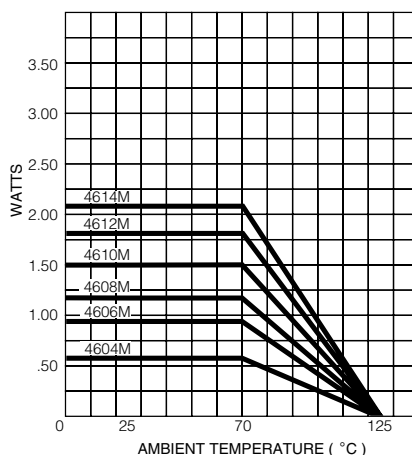
**46 06 M - 101 - 222 LF**

Model \_\_\_\_\_  
 (46 = Conformal SIP)  
 Number of Pins \_\_\_\_\_  
 Physical Configuration \_\_\_\_\_  
 (M = Thick Film Medium 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 =  $\pm 2$  % (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 Temp. Derating Curve



### Package Power Ratings (Watts)

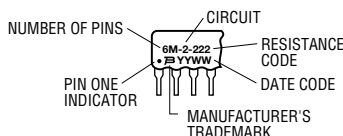
| Pkg.  | Ambient Temp. 70 $^{\circ}$ C | Pkg.  | Ambient Temp. 70 $^{\circ}$ C |
|-------|-------------------------------|-------|-------------------------------|
| 4604M | 0.60                          | 4610M | 1.50                          |
| 4605M | 0.75                          | 4611M | 1.65                          |
| 4606M | 0.90                          | 4612M | 1.80                          |
| 4607M | 1.05                          | 4613M | 1.95                          |
| 4608M | 1.20                          | 4614M | 2.10                          |
| 4609M | 1.35                          |       |                               |

### Typical Part Marking

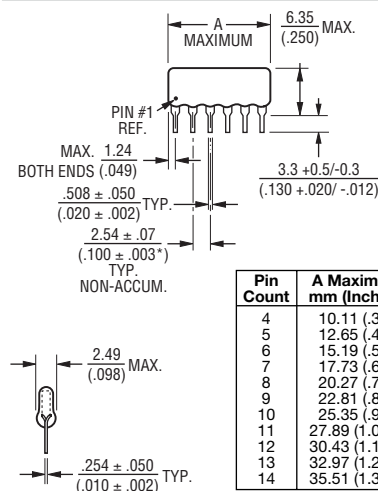
Represents total content. Layout may vary.

| Part Number     | Part Number |
|-----------------|-------------|
| 4606M-101-RC    | 6M-1-RC     |
| 4608M-102-RC    | 8M-2-RC     |
| 4610M-104-RC/RC | 10M-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](#).

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

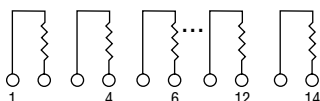
- DRAM Applications
- Dual Terminator Resistor Networks
- R/2R Ladder Networks
- SCSI Applications

## 4600M Series - Thick Film Conformal SIPs

**BOURNS®**

### Isolated Resistors (102 Circuit)

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



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

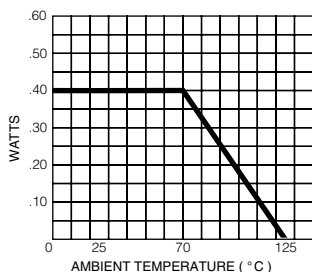
#### Resistance Tolerance

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

#### Power Rating per Resistor

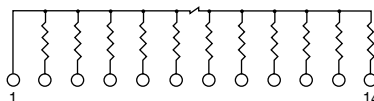
At 70 °C ..... 0.40 watt

#### 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.

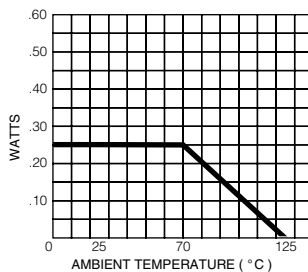
#### Resistance Tolerance

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

#### Power Rating per Resistor

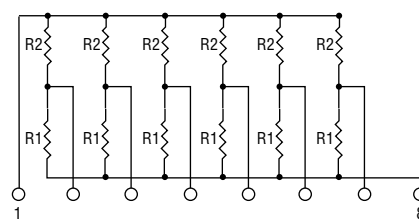
At 70 °C ..... 0.25 watt

#### Power Temperature Derating Curve



### Dual Terminator (104 Circuit)

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



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).

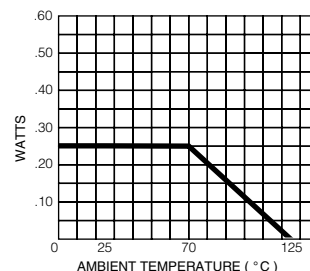
#### Resistance Tolerance

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

#### Power Rating per Resistor

At 70 °C ..... 0.25 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 <sub>1</sub> | R <sub>2</sub> | R <sub>1</sub> | R <sub>2</sub> |
| 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. 07/10

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

## Данный компонент на территории Российской Федерации

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<http://moschip.ru/get-element>

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### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9