



- 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

## 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

|                                    |         |
|------------------------------------|---------|
| TESTS PER MIL-STD-202.....         | ΔR MAX. |
| Short Time Overload .....          | ±0.25 % |
| Load Life.....                     | ±2.00 % |
| Moisture Resistance.....           | ±0.50 % |
| Resistance to Soldering Heat ..... | ±0.50 % |
| Terminal Strength .....            | ±0.25 % |
| Thermal Shock .....                | ±0.25 % |

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

## 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.

The graph illustrates the power dissipation capability of the 2N4610M transistor family across a range of ambient temperatures. The y-axis represents power in Watts, ranging from 0 to 3.5. The x-axis represents ambient temperature in degrees Celsius, ranging from 0 to 125. Six curves are shown, each corresponding to a specific power rating: 4614M (2.1W), 4612M (1.8W), 4610M (1.5W), 4608M (1.2W), 4606M (1.0W), and 4604M (0.5W). All curves show a constant power dissipation at low temperatures (up to 70°C) and then a linear decrease as the temperature rises towards 125°C.

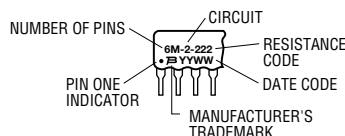
| Ambient Temperature (°C) | 4614M (W) | 4612M (W) | 4610M (W) | 4608M (W) | 4606M (W) | 4604M (W) |
|--------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| 0                        | 2.1       | 1.8       | 1.5       | 1.2       | 1.0       | 0.5       |
| 25                       | 2.1       | 1.8       | 1.5       | 1.2       | 1.0       | 0.5       |
| 50                       | 2.1       | 1.8       | 1.5       | 1.2       | 1.0       | 0.5       |
| 70                       | 2.1       | 1.8       | 1.5       | 1.2       | 1.0       | 0.5       |
| 100                      | 0.75      | 0.6       | 0.5       | 0.4       | 0.33      | 0.17      |
| 125                      | 0         | 0         | 0         | 0         | 0         | 0         |

| <b>Pkg.</b> | <b>Ambient<br/>Temp.<br/>70 °C</b> | <b>Pkg.</b> | <b>Ambient<br/>Temp.<br/>70 °C</b> |
|-------------|------------------------------------|-------------|------------------------------------|
| 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                               |             |                                    |

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.



Technical drawing of a 14-pin connector. The drawing shows a top view and a side view. The top view shows a rectangular body with 14 pins. The side view shows the profile of the connector. Dimensions are given in millimeters (mm) and inches (in). The maximum dimensions are given in parentheses.

Dimensions:

- Pin Count:** 14
- Pin #1 REF.**
- MAX. 1.24** (BOTH ENDS (.049))
- .508 ± .050** TYP. (.020 ± .002)
- 2.54 ± .07** TYP. (.100 ± .003\*) NON-ACCUM.
- 6.35 (.250) MAX.**
- 3.3 +0.5/-0.3** (.130 +.020/- .012)
- 2.49 (.098) MAX.**
- .254 ± .050** (.010 ± .002) TYP.

| Pin Count | A Maximum mm (Inch) |
|-----------|---------------------|
| 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.  
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

## 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.

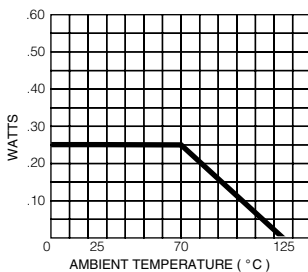
#### Resistance Tolerance

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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