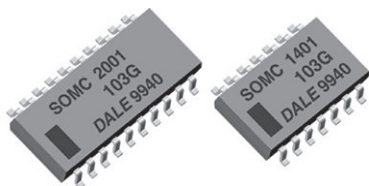


# Thick Film Resistor Networks, Dual-In-Line, Medium Body, Small Outline, Molded DIP, Surface Mount



## FEATURES

- Isolated, bussed and dual terminator schematics available
- 14, 16, or 20 terminal package
- Molded case construction
- Thick film resistive elements
- Reflow solderable
- Compatible with automatic surface mounting equipment
- Reduces total assembly costs
- For wave flow soldering contact factory
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS\***  
Available

### Note

\* This datasheet provides information about parts that are RoHS-compliant and/or parts that are non-RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information/tables in this datasheet for details.

## STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL | CIRCUIT | POWER RATING ELEMENT $P_{70^{\circ}\text{C}}$ W | POWER RATING PACKAGE $P_{70^{\circ}\text{C}}$ W | TOLERANCE $\pm \%$ (3) | RESISTANCE RANGE $\Omega$ | MAXIMUM WORKING VOLTAGE (2) $V_{DC}$ | TEMPERATURE COEFFICIENT (1) $\pm \text{ppm}/^{\circ}\text{C}$ |
|--------------|---------|-------------------------------------------------|-------------------------------------------------|------------------------|---------------------------|--------------------------------------|---------------------------------------------------------------|
| SOMC14       | 01      | 0.08                                            | 1.05                                            | 1, 2, 5                | 10 to 1M                  | 50                                   | 100                                                           |
|              | 03      | 0.16                                            | 1.125                                           | 1, 2, 5                | 10 to 1M                  | 50                                   | 100                                                           |
|              | 05      | 0.08                                            | 1.05                                            | 1, 2, 5                | 10 to 1M                  | 50                                   | 100                                                           |
| SOMC16       | 01      | 0.08                                            | 1.20                                            | 1, 2, 5                | 10 to 1M                  | 50                                   | 100                                                           |
|              | 03      | 0.16                                            | 1.28                                            | 1, 2, 5                | 10 to 1M                  | 50                                   | 100                                                           |
|              | 05      | 0.08                                            | 1.20                                            | 1, 2, 5                | 10 to 1M                  | 50                                   | 100                                                           |
| SOMC20       | 01      | 0.08                                            | 1.52                                            | 1, 2, 5                | 10 to 1M                  | 50                                   | 100                                                           |
|              | 03      | 0.16                                            | 1.60                                            | 1, 2, 5                | 10 to 1M                  | 50                                   | 100                                                           |
|              | 05      | 0.08                                            | 1.52                                            | 1, 2, 5                | 10 to 1M                  | 50                                   | 100                                                           |

### Notes

- DSCC has created series of drawings to support the need for a surface mount gull wing resistor network product. Vishay Dale is listed as a resource on this drawing as follows:

| DSCC DRAWING NUMBER | VISHAY DALE MODEL | CIRCUIT | POWER RATING ELEMENT $P_{70^{\circ}\text{C}}$ W | POWER RATING PACKAGE $P_{70^{\circ}\text{C}}$ W | RESISTANCE RANGE $\Omega$ | TOLERANCE $\pm \%$ | TEMPERATURE COEFFICIENT (0 $^{\circ}\text{C}$ to 70 $^{\circ}\text{C}$ ) $\pm \text{ppm}/^{\circ}\text{C}$ | MAXIMUM WORKING VOLTAGE (2) $V_{DC}$ |
|---------------------|-------------------|---------|-------------------------------------------------|-------------------------------------------------|---------------------------|--------------------|------------------------------------------------------------------------------------------------------------|--------------------------------------|
| 87012               | SOMC1601..16      | 01 (B)  | 0.08                                            | 1.20                                            | 10 to 2.2M                | 1, 2, 5            | 100, 300                                                                                                   | 50                                   |
|                     | SOMC1603..17      | 03 (A)  | 0.16                                            |                                                 |                           |                    |                                                                                                            |                                      |
|                     | SOMC1605..48      | 05 (J)  | 0.08                                            |                                                 |                           |                    |                                                                                                            |                                      |
| 87013               | SOMC1401..6       | 01 (B)  | 0.08                                            | 1.00                                            | 10 to 2.2M                | 1, 2, 5            | 100, 300                                                                                                   | 50                                   |
|                     | SOMC1403..13      | 03 (A)  | 0.16                                            |                                                 |                           |                    |                                                                                                            |                                      |
|                     | SOMC1405..22      | 05 (J)  | 0.08                                            |                                                 |                           |                    |                                                                                                            |                                      |

These drawings can be viewed at: [www.landandmaritime.dla.mil/Programs/MilSpec/ListDwgs.aspx?DocType=DSCCdmg](http://www.landandmaritime.dla.mil/Programs/MilSpec/ListDwgs.aspx?DocType=DSCCdmg).

- Power rating depends on the max. temperature at the solder point, the component placement density and the substrate material.
- Jumper: 0  $\Omega$ -resistor on request (100 m $\Omega$ ).
- Packaging: According to EIA; see appropriate catalog or web page.

(1) Temperature range: -55  $^{\circ}\text{C}$  to +125  $^{\circ}\text{C}$ .

(2) Continuous working voltage shall be  $\sqrt{P \times R}$  or maximum working voltage, whichever is less.

(3)  $\pm 2 \%$  standard,  $\pm 1 \%$  and  $\pm 5 \%$  available.

## TECHNICAL SPECIFICATIONS

| PARAMETER                                                        | UNIT                    | 01 CIRCUIT  | 03 CIRCUIT | 05 CIRCUIT |
|------------------------------------------------------------------|-------------------------|-------------|------------|------------|
| Rated dissipation at 70 $^{\circ}\text{C}$ per element           | W                       | 0.08        | 0.16       | 0.08       |
| Limiting element voltage (4)                                     | $V_{DC}$                | 50          |            |            |
| Voltage coefficient                                              | ppm/V                   | < 50        |            |            |
| Insulation voltage (1 min)                                       | $V_{DC/AC}$ peak        | 200         |            |            |
| Category temperature range                                       | $^{\circ}\text{C}$      | -55/+150    |            |            |
| Insulation resistance                                            | $\Omega$                | > $10^{10}$ |            |            |
| TC tracking (-55 $^{\circ}\text{C}$ to +125 $^{\circ}\text{C}$ ) | ppm/ $^{\circ}\text{C}$ | 50          |            |            |

### Note

(4) Rated voltage:  $\sqrt{P \times R}$ .

**GLOBAL PART NUMBER INFORMATION**New Global Part Numbering: **SOMC16011K00GDC** (preferred part numbering format)

|                 |                |                                              |                                                                                                                                                     |                                                                                            |                                                                                                                            |   |                                                                                         |   |   |   |   |   |   |   |  |  |  |
|-----------------|----------------|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---|-----------------------------------------------------------------------------------------|---|---|---|---|---|---|---|--|--|--|
| S               | O              | M                                            | C                                                                                                                                                   | 1                                                                                          | 6                                                                                                                          | 0 | 1                                                                                       | 1 | K | 0 | 0 | G | D | C |  |  |  |
| GLOBAL<br>MODEL | PIN COUNT      | SCHEMATIC                                    | RESISTANCE<br>VALUE                                                                                                                                 | TOLERANCE<br>CODE                                                                          | PACKAGING                                                                                                                  |   | SPECIAL                                                                                 |   |   |   |   |   |   |   |  |  |  |
| SOMC            | 14<br>16<br>20 | 01 = Bussed<br>03 = Isolated<br>00 = Special | R = $\Omega$<br>K = $k\Omega$<br>M = $M\Omega$<br>10R0 = 10 $\Omega$<br>680K = 680 $k\Omega$<br>1M00 = 1.0 $M\Omega$<br>0000 = 0 $\Omega$<br>Jumper | F = $\pm 1\%$<br>G = $\pm 2\%$<br>J = $\pm 5\%$<br>S = Special<br>Z = 0 $\Omega$<br>Jumper | EJ = Lead (Pb)-free, tube<br>EA = Lead (Pb)-free, tape and reel<br><br>DC = Tin/lead, tube<br>RZ = Tin/lead, tape and reel |   | Blank = Standard<br>(Dash number)<br>(Up to 3 digits)<br>From 1 to 999 as<br>applicable |   |   |   |   |   |   |   |  |  |  |

Historical Part Number Example: **SOMC1601102G** (will continue to be accepted)

|                     |           |           |                     |                   |           |
|---------------------|-----------|-----------|---------------------|-------------------|-----------|
| SOMC                | 16        | 01        | 102                 | G                 | D02       |
| HISTORICAL<br>MODEL | PIN COUNT | SCHEMATIC | RESISTANCE<br>VALUE | TOLERANCE<br>CODE | PACKAGING |

New Global Part Numbering: **SOMC2005500BGRZ** (preferred part numbering format)

|                 |                |                         |                                                                                      |                                                 |                                                                                                                            |   |                                                                                       |   |   |   |   |   |   |   |  |  |  |
|-----------------|----------------|-------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---|---------------------------------------------------------------------------------------|---|---|---|---|---|---|---|--|--|--|
| S               | O              | M                       | C                                                                                    | 2                                               | 0                                                                                                                          | 0 | 5                                                                                     | 5 | 0 | 0 | B | G | R | Z |  |  |  |
| GLOBAL<br>MODEL | PIN COUNT      | SCHEMATIC               | RESISTANCE<br>VALUE                                                                  | TOLERANCE<br>CODE                               | PACKAGING                                                                                                                  |   | SPECIAL                                                                               |   |   |   |   |   |   |   |  |  |  |
| SOMC            | 14<br>16<br>20 | 05 =<br>Dual terminator | 3 digit impedance<br>code, followed by<br>alpha modifier<br>(see Impedance<br>table) | F = $\pm 1\%$<br>G = $\pm 2\%$<br>J = $\pm 5\%$ | EJ = Lead (Pb)-free, tube<br>EA = Lead (Pb)-free, tape and reel<br><br>DC = Tin/lead, tube<br>RZ = Tin/lead, tape and reel |   | Blank = Standard<br>(Dash number)<br>Up to 3 digits<br>From 1 to 999 as<br>applicable |   |   |   |   |   |   |   |  |  |  |

Historical Part Number Example: **SOMC2005820131G** (will continue to be accepted)

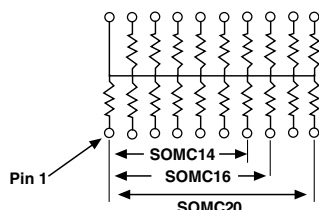
|                     |           |           |                       |                       |                   |           |
|---------------------|-----------|-----------|-----------------------|-----------------------|-------------------|-----------|
| SOMC                | 20        | 05        | 820                   | 131                   | G                 | R61       |
| HISTORICAL<br>MODEL | PIN COUNT | SCHEMATIC | RESISTANCE<br>VALUE 1 | RESISTANCE<br>VALUE 2 | TOLERANCE<br>CODE | PACKAGING |

**Note**

- For additional information on packaging, refer to the Surface Mount Network Packaging document ([www.vishay.com/doc?31540](http://www.vishay.com/doc?31540)).

## CIRCUIT APPLICATIONS

### 01 Schematic

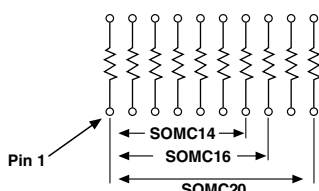


13, 15, or 19 resistors with one pin common

The SOMCxx01 circuit provides a choice of 13, 15, or 19 nominally equal resistors, each connected between a common lead (14, 16, or 20) and a discrete PC board pin. Commonly used in the following applications:

- MOS/ROM pull-up/pull-down
- Open collector pull-up
- "Wired OR" pull-up
- Power driven pull-up
- TTL input pull-down
- Digital pulse squaring
- TTL unused gate pull-up
- High speed parallels pull-up

### 03 Schematic

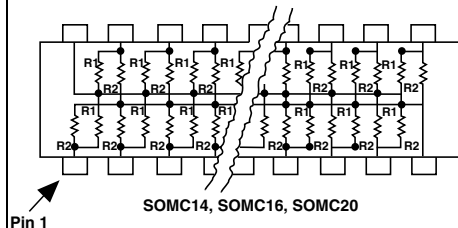


7, 8, or 10 isolated resistors

The SOMCxx03 circuit provides a choice of 7, 8, or 10 nominally equal resistors with each resistor isolated from all others and wired directly across. Commonly used in the following applications:

- "Wired OR" pull-up
- Power driven pull-up
- Powergate pull-up
- Line termination
- Long-line Impedance balancing
- LED current limiting
- ECL output pull-down
- TTL input pull-down

### 05 Schematic



TTL dual-line terminator; pulse squaring, 12, 14, or 18 pairs of resistors

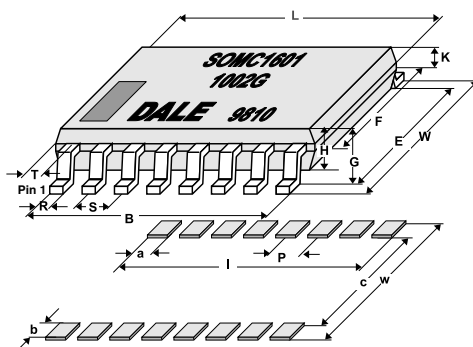
(R<sub>1</sub> resistors are common to leads 14, 16, or 20)

(R<sub>2</sub> resistors are common to leads 7, 8, or 10)

The SOMCxx05 circuit contains 12, 14, or 18 pairs of resistors. Each pair is connected between ground and a common line. The junctions of these resistor pairs are connected to the input leads.

The 05 circuits are designed for TTL dual-line termination and pulse squaring.

## DIMENSIONS



### SOLDER PAD DIMENSIONS in millimeters

|        | a    | b    | c    | l    | p    | w    |
|--------|------|------|------|------|------|------|
| WAVE   | 0.64 | 1.91 | 5.34 | 9.53 | 1.27 | 9.15 |
| REFLOW | 0.64 | 1.91 | 5.34 | 9.53 | 1.27 | 9.15 |

#### Notes

- The dimension shown are for a 16 pin part. For parts with different pin numbers use the same pitch and add or subtract pads as required.
- Maximum solder reflow temperature +255 °C.

### DIMENSIONS in millimeters

| PIN NO# | L       | W       | B       | E       | F       | G       | H       | K     | R     | S       | T    |
|---------|---------|---------|---------|---------|---------|---------|---------|-------|-------|---------|------|
| 14      | 9.91    | 7.62    | 7.62    | 6.20    | 5.59    | 2.16    | 2.03    | 0.914 | 0.457 | 1.27    | 1.14 |
| 16      | 11.18   | 7.62    | 8.89    | 6.20    | 5.59    | 2.16    | 2.03    | 0.914 | 0.457 | 1.27    | 1.14 |
| 20      | 13.72   | 7.62    | 11.43   | 6.20    | 5.59    | 2.16    | 2.03    | 0.914 | 0.457 | 1.27    | 1.14 |
| Tol.    | ± 0.254 | ± 0.381 | ± 0.254 | ± 0.381 | ± 0.127 | ± 0.127 | ± 0.127 |       |       | ± 0.254 |      |

**IMPEDANCE CODES**

| CODE | R <sub>1</sub> (Ω) | R <sub>2</sub> (Ω) | CODE | R <sub>1</sub> (Ω) | R <sub>2</sub> (Ω) |
|------|--------------------|--------------------|------|--------------------|--------------------|
| 500B | 82                 | 130                | 141A | 270                | 270                |
| 750B | 120                | 200                | 181A | 330                | 390                |
| 800C | 130                | 210                | 191A | 330                | 470                |
| 990A | 160                | 260                | 221B | 330                | 680                |
| 101C | 180                | 240                | 281B | 560                | 560                |
| 111C | 180                | 270                | 381B | 560                | 1.2K               |
| 121B | 180                | 390                | 501C | 620                | 2.7K               |
| 121C | 220                | 270                | 102A | 1.5K               | 3.3K               |
| 131A | 220                | 330                | 202B | 3K                 | 6.2K               |

**Note**

- For additional impedance codes, refer to the Dual Terminator Impedance Code Table document ([www.vishay.com/doc?31530](http://www.vishay.com/doc?31530)).

**PERFORMANCE**

| TEST                         | CONDITIONS OF TEST | TEST RESULTS<br>(TYPICAL TEST LOTS) |
|------------------------------|--------------------|-------------------------------------|
| Power conditioning           | MIL-STD-202        | ± 0.5 %                             |
| Load life at 70 °C           | MIL-STD-202        | ± 0.5 %                             |
| Short time overload          | MIL-STD-202        | ± 0.25 %                            |
| Thermal shock                | MIL-STD-202        | ± 0.5 %                             |
| Moisure resistance           | MIL-STD-202        | ± 0.5 %                             |
| Resistance to soldering heat | MIL-STD-202        | ± 0.25 %                            |
| Low temperature operation    | MIL-STD-202        | ± 0.25 %                            |
| Vibration                    | MIL-STD-202        | ± 0.25 %                            |
| Shock                        | MIL-STD-202        | ± 0.25 %                            |
| Terminal strength            | MIL-STD-202        | ± 0.25 %                            |

**MECHANICAL SPECIFICATIONS**

|                                   |                                                                             |
|-----------------------------------|-----------------------------------------------------------------------------|
| Marking                           | Model number, schematic number, value tolerance, pin 1 indicator, date code |
| Marking resistance to solvents    | Permanency testing per MIL-STD-202, method 215                              |
| Maximum solder reflow temperature | +255 °C                                                                     |
| Solderability                     | Per MIL-STD-202, method 208E                                                |
| Terminals                         | Copper alloy. Solder dipped terminal                                        |
| Body                              | Molded epoxy                                                                |



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