

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



## FEATURES

- Isolated, bussed, and dual terminator schematics available
- 0.110" (2.79 mm) maximum seated height
- Rugged, molded case construction
- 0.050" (1.27 mm) lead spacing
- Reduces total assembly costs
- Compatible with automatic surface mounting equipment
- Uniform performance characteristics
- Meets EIA PDP 100, SOGN-0003 outline dimensions
- Available in tube pack or tape and reel pack
- 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 | SCHEMATIC | POWER RATING ELEMENT $P_{70^{\circ}\text{C}}$ W | POWER RATING PACKAGE $P_{70^{\circ}\text{C}}$ W | TOLERANCE <sup>(1)</sup> $\pm$ % | RESISTANCE RANGE $\Omega$ | MAXIMUM WORKING VOLTAGE <sup>(2)</sup> V <sub>DC</sub> | TEMPERATURE COEFFICIENT $\pm$ ppm/ $^{\circ}\text{C}$ |
|--------------|-----------|-------------------------------------------------|-------------------------------------------------|----------------------------------|---------------------------|--------------------------------------------------------|-------------------------------------------------------|
| SOGC16       | 01        | 0.1                                             | 1.6                                             | 1, 2, 5                          | 10 to 1M                  | 50                                                     | 100                                                   |
|              | 03        | 0.19                                            | 1.6                                             | 1, 2, 5                          | 10 to 1M                  | 50                                                     | 100                                                   |
|              | 05        | 0.1                                             | 1.6                                             | 1, 2, 5                          | 10 to 1M                  | 50                                                     | 100                                                   |
| SOGC20       | 01        | 0.1                                             | 2.0                                             | 1, 2, 5                          | 10 to 1M                  | 50                                                     | 100                                                   |
|              | 03        | 0.19                                            | 2.0                                             | 1, 2, 5                          | 10 to 1M                  | 50                                                     | 100                                                   |
|              | 05        | 0.1                                             | 2.0                                             | 1, 2, 5                          | 10 to 1M                  | 50                                                     | 100                                                   |

## Notes

- 100 m $\Omega$  maximum on 0  $\Omega$ -jumper

<sup>(1)</sup>  $\pm$  2 % standard,  $\pm$  1 % and  $\pm$  5 % available

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

## GLOBAL PART NUMBER INFORMATION

New Global Part Numbering: SOGC200310K0GDC (preferred part numbering format)

|                 |           |                                              |                                                                                                 |                                                                      |   |   |   |                                                                                                                                      |   |   |   |                                                                                         |   |   |  |  |  |
|-----------------|-----------|----------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|---|---|---|--------------------------------------------------------------------------------------------------------------------------------------|---|---|---|-----------------------------------------------------------------------------------------|---|---|--|--|--|
| S               | O         | G                                            | C                                                                                               | 2                                                                    | 0 | 0 | 3 | 1                                                                                                                                    | 0 | K | 0 | G                                                                                       | D | C |  |  |  |
| GLOBAL<br>MODEL | PIN COUNT | SCHEMATIC                                    | RESISTANCE<br>VALUE                                                                             | TOLERANCE<br>CODE                                                    |   |   |   | PACKAGING                                                                                                                            |   |   |   | SPECIAL                                                                                 |   |   |  |  |  |
| SOGC            | 16<br>20  | 01 = bussed<br>03 = isolated<br>00 = special | R = Ω<br>K = kΩ<br>M = MΩ<br>10R0 = 10 Ω<br>680K = 680 kΩ<br>1M00 = 1.0 MΩ<br>0000 = 0 Ω jumper | F = ± 1 %<br>G = ± 2 %<br>J = ± 5 %<br>S = special<br>Z = 0 Ω jumper |   |   |   | EJ = lead (Pb)-free, tube<br>EA = lead (Pb)-free,<br>tape and reel<br><br>DC = tin / lead, tube<br>RZ = tin / lead,<br>tape and reel |   |   |   | Blank = standard<br>(dash-number)<br>(up to 3 digits)<br>From 1 to 999<br>as applicable |   |   |  |  |  |

Historical Part Number Example: SOGC2002103G (will continue to be accepted)

|                |           |           |                  |                |           |  |  |
|----------------|-----------|-----------|------------------|----------------|-----------|--|--|
| SOGC           | 20        | 03        | 103              | G              | D02       |  |  |
| HISTORIC MODEL | PIN COUNT | SCHEMATIC | RESISTANCE VALUE | TOLERANCE CODE | PACKAGING |  |  |

New Global Part Numbering: SOGC1605131AGRZ (preferred part numbering format)

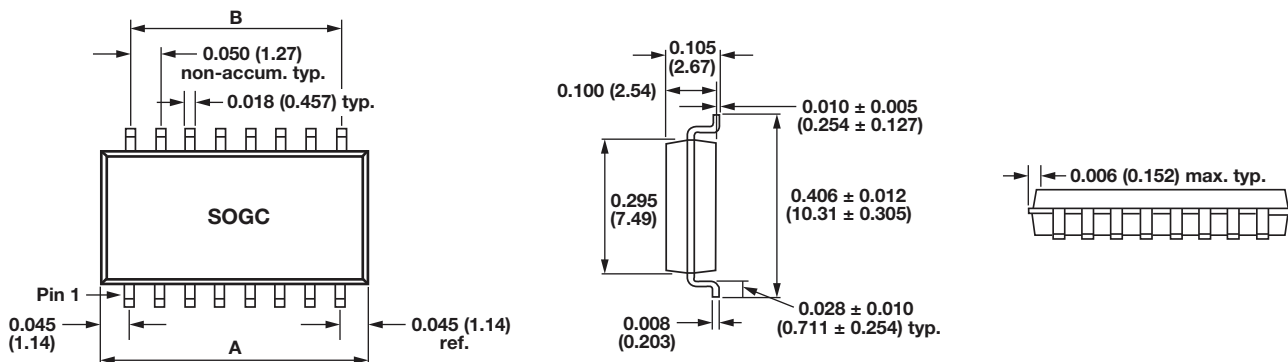
|              |           |                      |                                                                                |                                     |                                                                                                                                |   |   |   |                                                                             |   |   |   |   |   |  |  |  |
|--------------|-----------|----------------------|--------------------------------------------------------------------------------|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|---|---|---|-----------------------------------------------------------------------------|---|---|---|---|---|--|--|--|
| S            | O         | G                    | C                                                                              | 1                                   | 6                                                                                                                              | 0 | 5 | 1 | 3                                                                           | 1 | A | G | R | Z |  |  |  |
| GLOBAL MODEL | PIN COUNT | SCHEMATIC            | RESISTANCE VALUE                                                               | TOLERANCE CODE                      | PACKAGING                                                                                                                      |   |   |   | SPECIAL                                                                     |   |   |   |   |   |  |  |  |
| SOGC         | 16<br>20  | 05 = dual terminator | 3 digit impedance code, followed by alpha modifier (see Impedance Codes table) | F = ± 1 %<br>G = ± 2 %<br>J = ± 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 (dash number) (up to 3 digits) From 1 to 999 as applicable |   |   |   |   |   |  |  |  |

Historical Part Number Example: SOGC1605221331G (will continue to be accepted)

|              |           |           |                    |                    |                |           |  |  |
|--------------|-----------|-----------|--------------------|--------------------|----------------|-----------|--|--|
| SOGC         | 16        | 05        | 221                | 331                | G              | R61       |  |  |
| GLOBAL MODEL | PIN COUNT | SCHEMATIC | RESISTANCE VALUE 1 | RESISTANCE VALUE 2 | TOLERANCE 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))

**DIMENSIONS** in inches (millimeters)


| GLOBAL MODEL | A             | B             |
|--------------|---------------|---------------|
| SOGC16       | 0.440 (11.18) | 0.350 (8.89)  |
| SOGC20       | 0.540 (13.72) | 0.450 (11.43) |

**TECHNICAL SPECIFICATIONS**

| PARAMETER                             | UNIT            | SOGC16       | SOGC20 |
|---------------------------------------|-----------------|--------------|--------|
| Package power rating (max. at +70 °C) | W               | 1.6          | 2.0    |
| TCR tracking (-55 °C to +125 °C)      | ppm/°C          | ± 50         |        |
| Voltage coefficient of resistance     | ppm/V           | < 50 typical |        |
| Maximum operating voltage             | V <sub>DC</sub> | 50           |        |
| Operating temperature range           | °C              | -55 to +125  |        |
| Storage temperature range             | °C              | -55 to +150  |        |

**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                                                                |

**IMPEDANCE CODES**

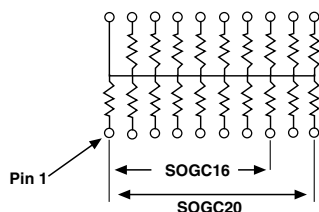
| CODE | R <sub>1</sub> (Ω) | R <sub>2</sub> (Ω) | CODE | R <sub>1</sub> (Ω) | R <sub>2</sub> (Ω) |
|------|--------------------|--------------------|------|--------------------|--------------------|
| 500B | 82                 | 130                | 141A | 270                | 270                |
| 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))

## CIRCUIT APPLICATIONS

### 01 Schematic

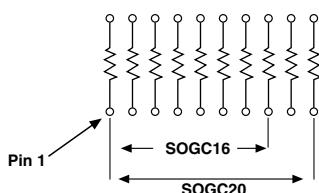


15 or 19 resistors with one pin common

The SOGCxx01 circuit provides a choice of 15 or 19 nominally equal resistors, each connected between a common lead (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

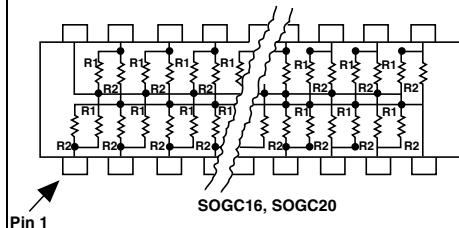


8 or 10 isolated resistors

The SOGCxx03 circuit provides a choice of 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, 14 or 18 pairs of resistors

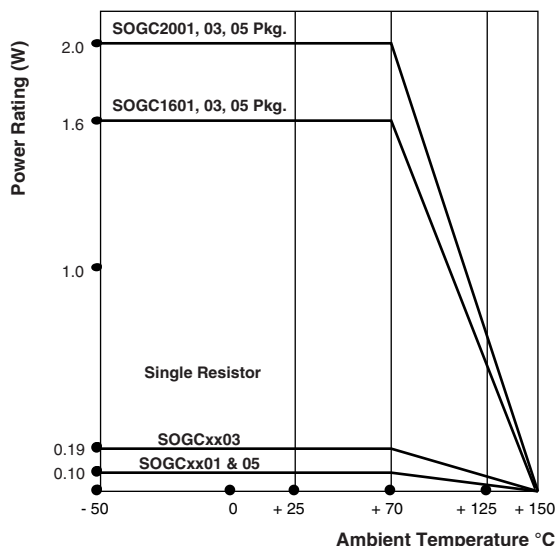
(R<sub>1</sub> resistors are common to leads 16 or 20)

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

The SOGCxx05 circuit contains 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.

## DERATING





| PERFORMANCE                     |                                                                     |
|---------------------------------|---------------------------------------------------------------------|
| TEST                            | MAX. $\Delta R$<br>(TYPICAL TEST LOTS)                              |
| Power conditioning              | $\pm 0.50 \% \Delta R$                                              |
| Thermal shock                   | $\pm 0.50 \% \Delta R$                                              |
| Short time overload             | $\pm 0.25 \% \Delta R$                                              |
| Low temperature operation       | $\pm 0.25 \% \Delta R$                                              |
| Moisture resistance             | $\pm 0.50 \% \Delta R$                                              |
| Resistance to soldering heat    | $\pm 0.25 \% \Delta R$                                              |
| Shock                           | $\pm 0.25 \% \Delta R$                                              |
| Vibration                       | $\pm 0.25 \% \Delta R$                                              |
| Load life                       | $\pm 0.50 \% \Delta R$                                              |
| Terminal strength               | $\pm 0.25 \% \Delta R$                                              |
| Insulation resistance           | 10 000 M $\Omega$ (minimum)                                         |
| Dielectric withstanding voltage | No evidence of arcing or damage<br>(200 V <sub>RMS</sub> for 1 min) |



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