

DATA SHEET

OM2045

Wideband amplifier module

Product specification
File under Discrete Semiconductors, SC16

1995 Nov 10

Wideband amplifier module

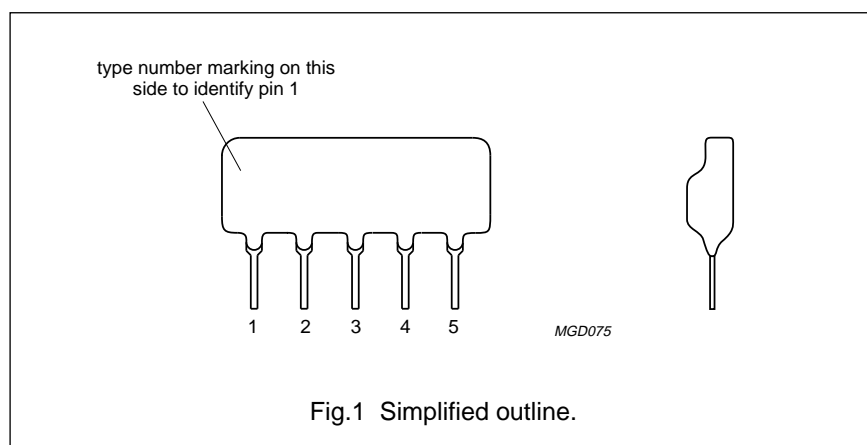
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DESCRIPTION

A one-stage wideband amplifier in hybrid integrated circuit form on a thin-film substrate. The device is intended as an aerial amplifier in car radios, caravans or RATV and MATV systems.

PINNING

| PIN | DESCRIPTION |
|-----|-------------|
| 1 | input |
| 2 | common |
| 3 | common |
| 4 | supply (+) |
| 5 | output |



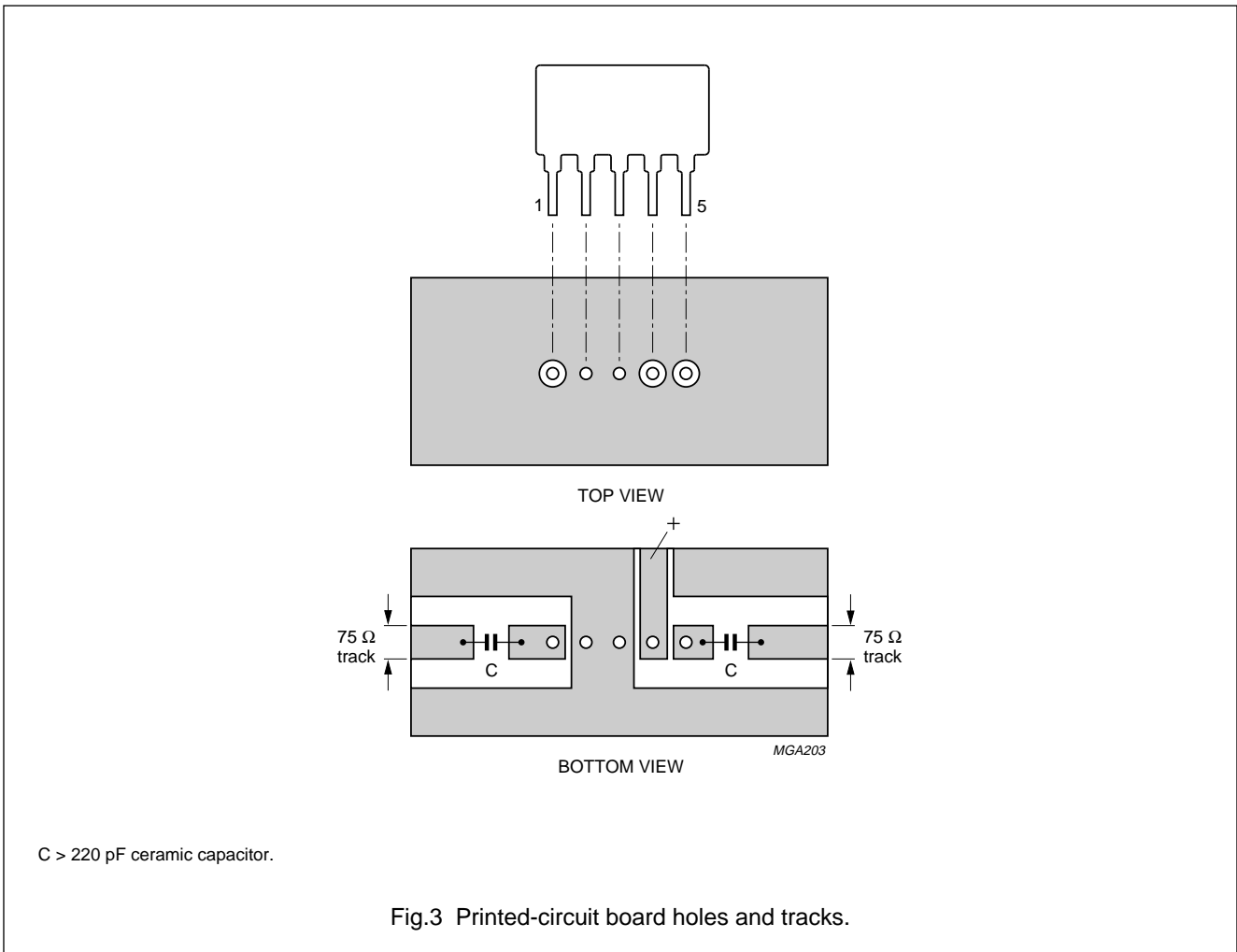
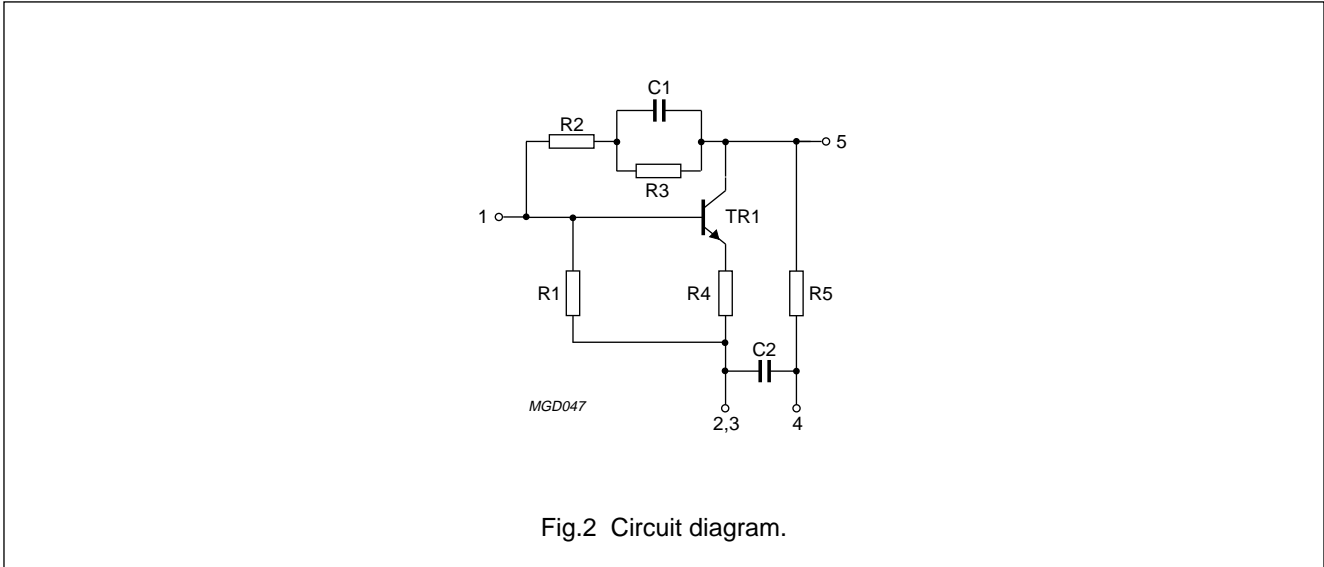
QUICK REFERENCE DATA

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|--------------|--------------------------------|--|------|------|------|------------------------|
| f | frequency range | | 40 | – | 860 | MHz |
| Z_S, Z_L | source and load impedance | | – | 75 | – | Ω |
| G_T | transducer gain = $ S_{21} ^2$ | | – | 12 | – | dB |
| ΔG_T | flatness of frequency response | | – | 1 | – | dB |
| $V_{o(rms)}$ | output voltage (RMS value) | $d_{im} = -60$ dB; 3rd order intermodulation (3-tone) | – | 99 | – | $\text{dB}\mu\text{V}$ |
| F | noise figure | | – | 3.6 | – | dB |
| V_B | DC supply voltage | | 10.8 | 12 | 13.2 | V |
| T_{amb} | ambient operating temperature | | -20 | – | +70 | $^{\circ}\text{C}$ |

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CIRCUIT DIAGRAM AND PRINTED-CIRCUIT BOARD



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LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

| SYMBOL | PARAMETER | MIN. | MAX. | UNIT |
|------------------|--------------------------------------|------|------|------|
| T _{amb} | ambient operating temperature | -20 | +70 | °C |
| T _{stg} | storage temperature | -40 | +125 | °C |
| V _B | DC supply voltage | - | 15 | V |
| P _{IM} | peak incident powers on pins 1 and 5 | - | 100 | mW |

CHARACTERISTICS

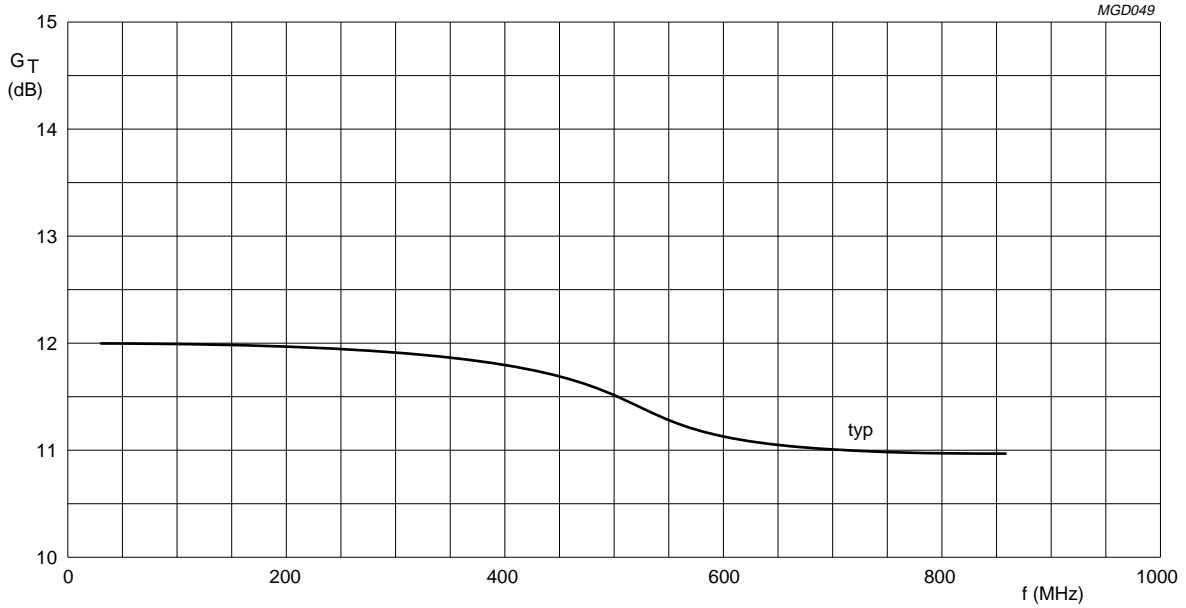
| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|--------------------------------|---|---|------|------|------|------|
| Measuring conditions | | | | | | |
| T _{amb} | ambient operating temperature | | - | 25 | - | °C |
| V _B | DC supply voltage | | - | 12 | - | V |
| Z _S | source impedance | | - | 75 | - | Ω |
| Z _L | load impedance | | - | 75 | - | Ω |
| Z ₀ | characteristic impedance of HF connections | | - | 75 | - | Ω |
| f | frequency range | | 40 | - | 860 | MHz |
| Performance | | | | | | |
| I _B | supply current | | - | 11.5 | - | mA |
| G _T | transducer gain = S ₂₁ ² | | - | 12 | - | dB |
| ΔG _T | flatness of frequency response | | - | 1 | - | dB |
| VSWR _{in} | individual maximum VSWR | input; note 1 | - | 2.0 | - | |
| VSWR _{out} | individual maximum VSWR | output; note 1 | - | 1.4 | - | |
| S ₁₂ ² | back attenuation | f = 100 MHz | - | 22 | - | dB |
| | | f = 860 MHz | - | 19 | - | dB |
| V _{o(rms)} | output voltage (RMS value) | d _{im} = -60 dB; 3rd order intermodulation (3-tone) | - | 99 | - | dBμV |
| F | noise figure | | - | 3.6 | - | dB |
| Operating conditions | | | | | | |
| T _{amb} | ambient operating temperature | | -20 | - | +70 | °C |
| V _B | DC supply voltage | | 10.8 | 12 | 13.2 | V |
| f | frequency range | | 40 | - | 860 | MHz |
| Z _S | source impedance | | - | 75 | - | Ω |
| Z _L | load impedance | | - | 75 | - | Ω |

Note

1. Highest value (for sample) occurring in the frequency range.

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Gain over entire frequency range.
 $Z_0 = 75 \Omega$.

Fig.4 Transducer gain as a function of frequency.

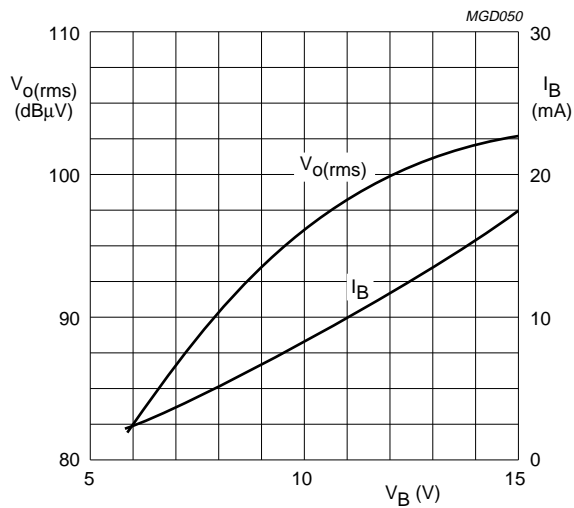
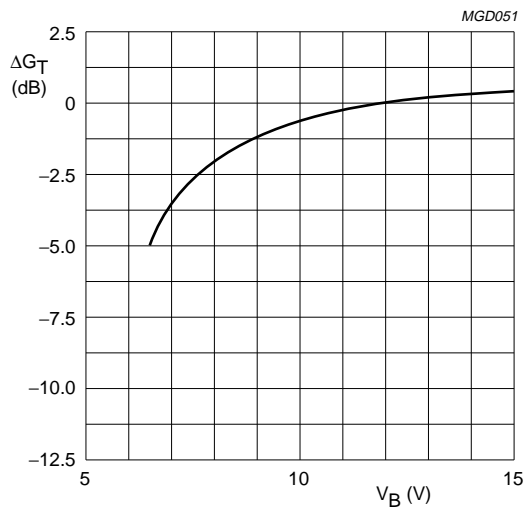


Fig.5 Output voltage and supply current as a function of supply voltage; typical values.



Reference 0 dB at 12 V; $f = 100$ to 860 MHz.

Fig.6 Variation of transducer gain as a function of supply voltage; typical values.

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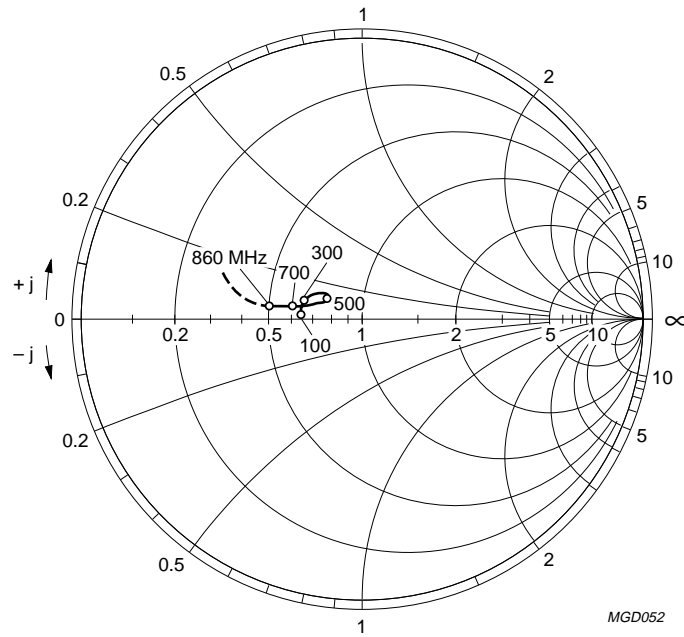


Fig.7 Input impedance derived from input reflection coefficient (S_{11}), co-ordinates in ohms \times 75; typical values.

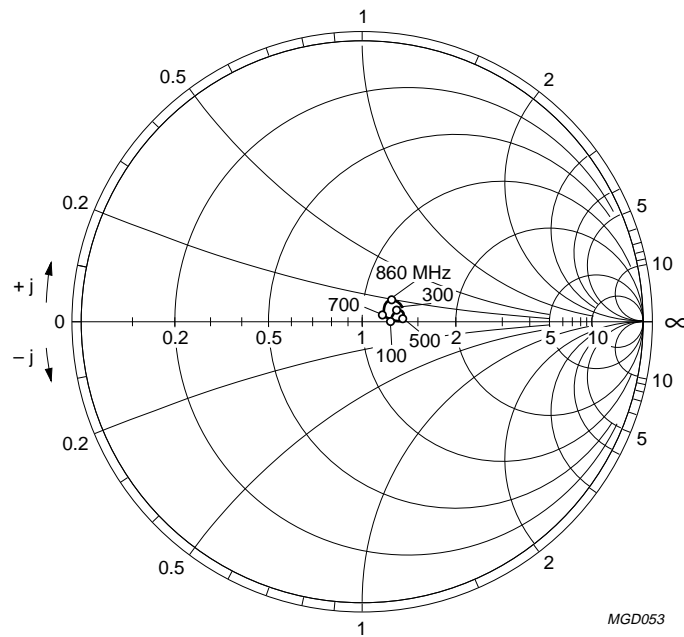


Fig.8 Output impedance derived from output reflection coefficient (S_{22}), co-ordinates in ohms \times 75; typical values.

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MOUNTING

The module should preferably be mounted on a double-sided printed-circuit board, see Fig.3. Input and output should be connected to 75 Ω tracks. The connection to the common pins should be as close to the seating plane as possible.

SOLDERING**Hand soldering**

The maximum contact time for a soldering iron temperature of 260 °C up to the seating plane is 5 s.

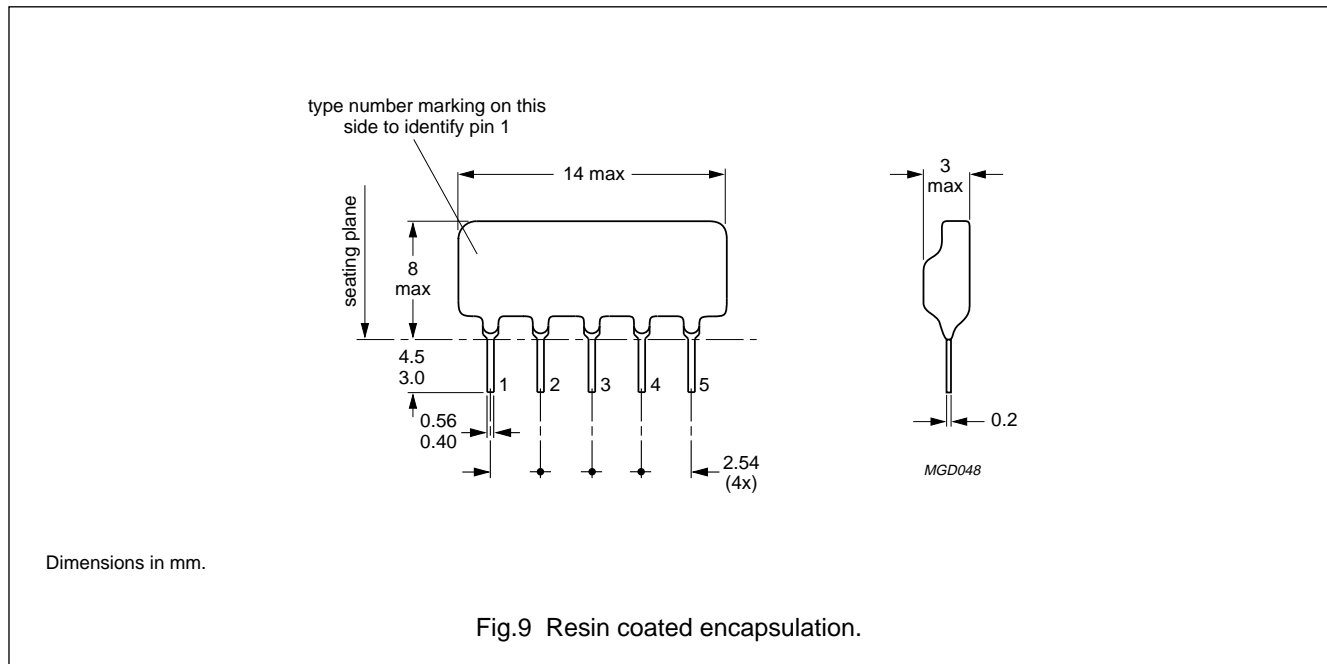
Dip or wave soldering

The maximum permissible temperature for the solder is 260 °C. It must not be in contact with the joint for more than 5 s.

The total contact time of successive solder waves must not exceed 5 s.

The device may be mounted against the printed-circuit board, but the temperature of the device must not exceed 125 °C.

If the printed-circuit board has been pre-heated, forced cooling may be necessary immediately after soldering to keep the temperature below the allowable limit.

PACKAGE OUTLINE

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DEFINITIONS

| Data sheet status | |
|---|---|
| Objective specification | This data sheet contains target or goal specifications for product development. |
| Preliminary specification | This data sheet contains preliminary data; supplementary data may be published later. |
| Product specification | This data sheet contains final product specifications. |
| Limiting values | |
| Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability. | |
| Application information | |
| Where application information is given, it is advisory and does not form part of the specification. | |

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