

Wideband amplifier module

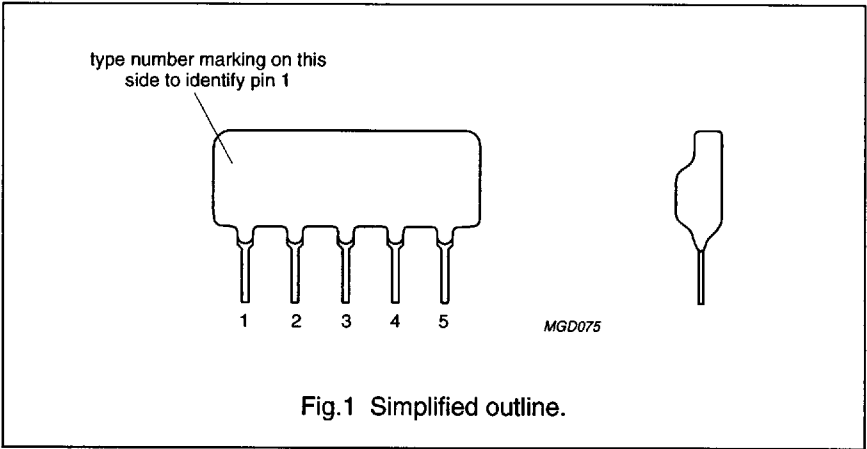
OM2045

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	–	dBμV
F	noise figure		–	3.6	–	dB
V _B	DC supply voltage		10.8	12	13.2	V
T _{amb}	ambient operating temperature		–20	–	+70	°C

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CIRCUIT DIAGRAM AND PRINTED-CIRCUIT BOARD

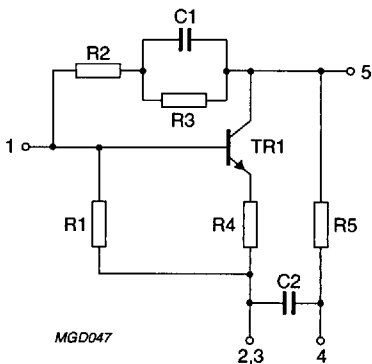
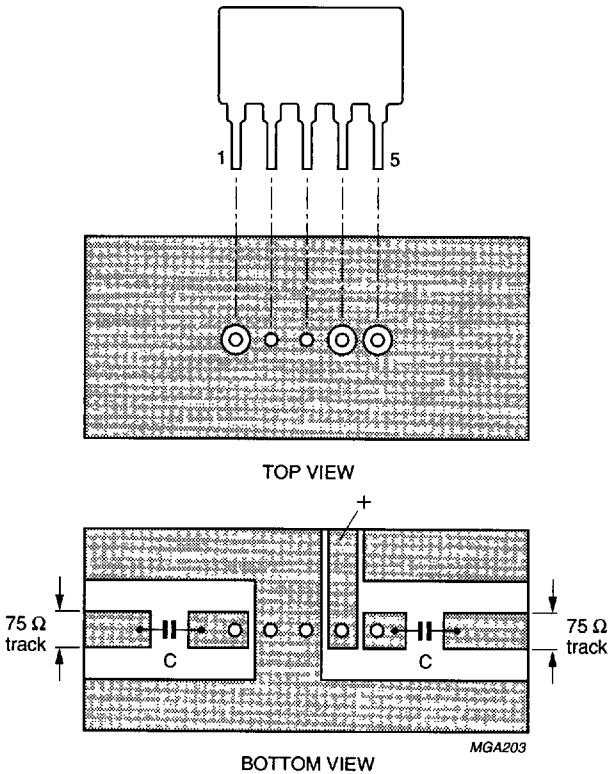


Fig.2 Circuit diagram.



C > 220 pF ceramic capacitor.

Fig.3 Printed-circuit board holes and tracks.

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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

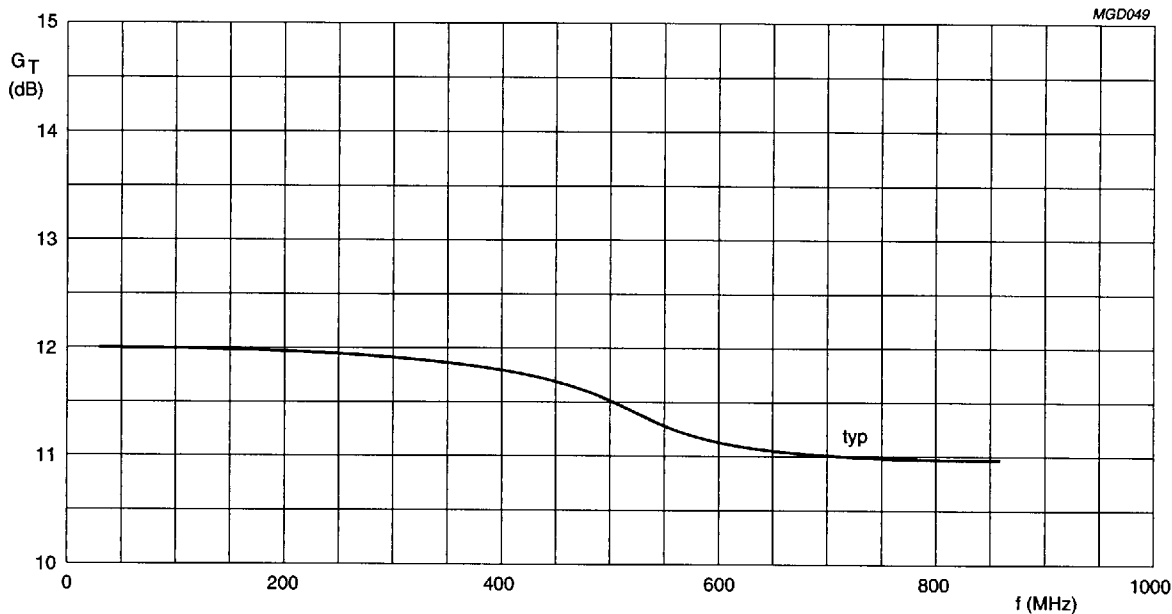
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Measuring conditions						
T_{amb}	ambient operating temperature		–	25	–	°C
V_B	DC supply voltage		–	12	–	V
Z_S	source impedance		–	75	–	Ω
Z_L	load impedance		–	75	–	Ω
Z_0	characteristic impedance of HF connections		–	75	–	Ω
f	frequency range		40	–	860	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	$f = 100 \text{ MHz}$	–	22	–	dB
		$f = 860 \text{ MHz}$	–	19	–	dB
$V_{o(rms)}$	output voltage (RMS value)	$d_{im} = -60 \text{ dB}$; 3rd order intermodulation (3-tone)	–	99	–	dB μ V
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.
Z₀ = 75 Ω.

Fig. 4 Transducer gain as a function of frequency.

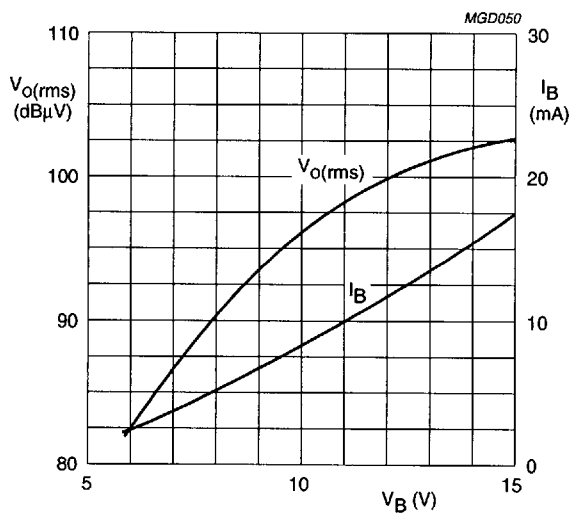
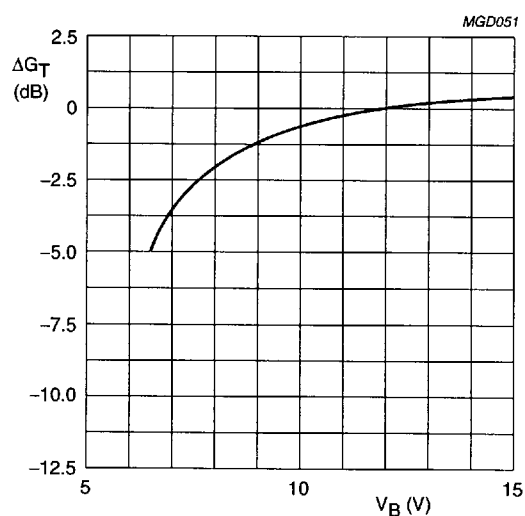


Fig. 5 Output voltage and supply current as a function of supply voltage; typical values.



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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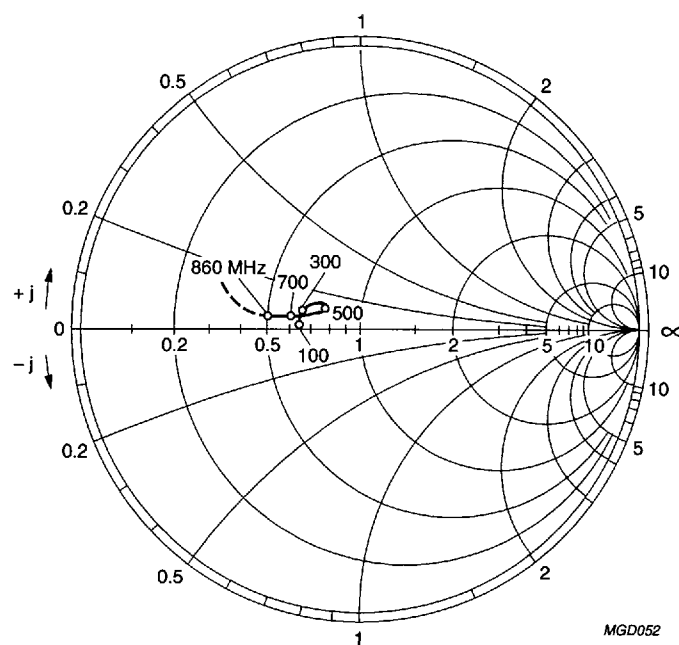


Fig.7 Input impedance derived from input reflection coefficient (S_{11}), co-ordinates in ohms $\times 75$; typical values.

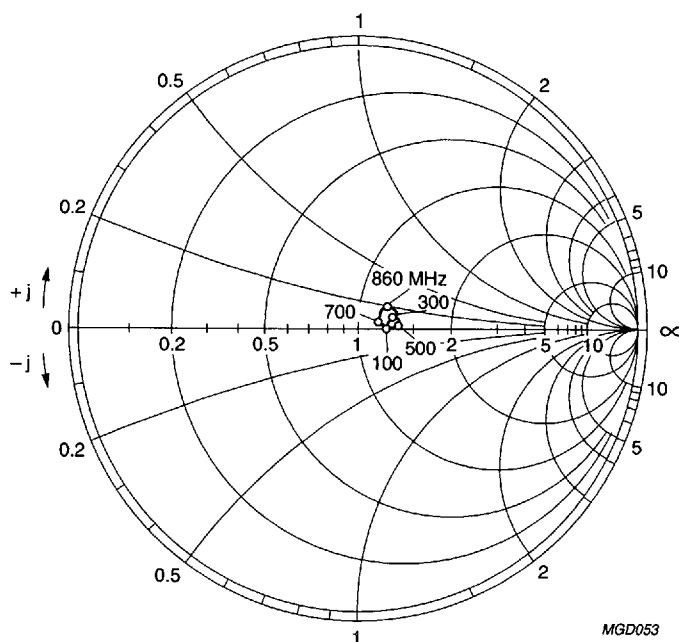


Fig.8 Output impedance derived from output reflection coefficient (S_{22}), co-ordinates in ohms $\times 75$; typical values.

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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.

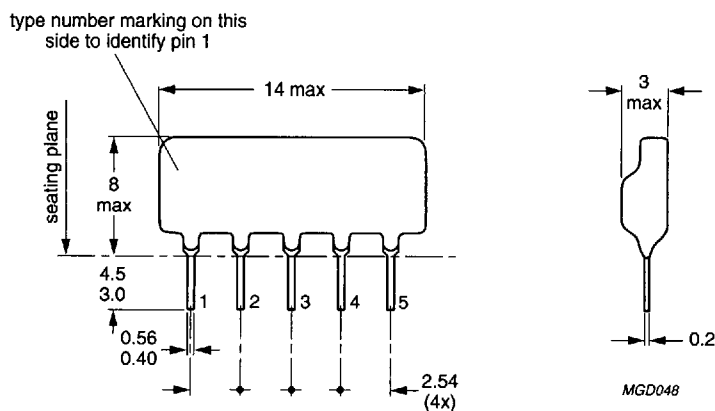
Dip or wave soldering

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

Dimensions in mm.

Fig.9 Resin coated encapsulation.