

DATA SHEET

OM2070

Wideband amplifier module

Product specification
File under Discrete Semiconductors, SC16

1995 Nov 14

Wideband amplifier module

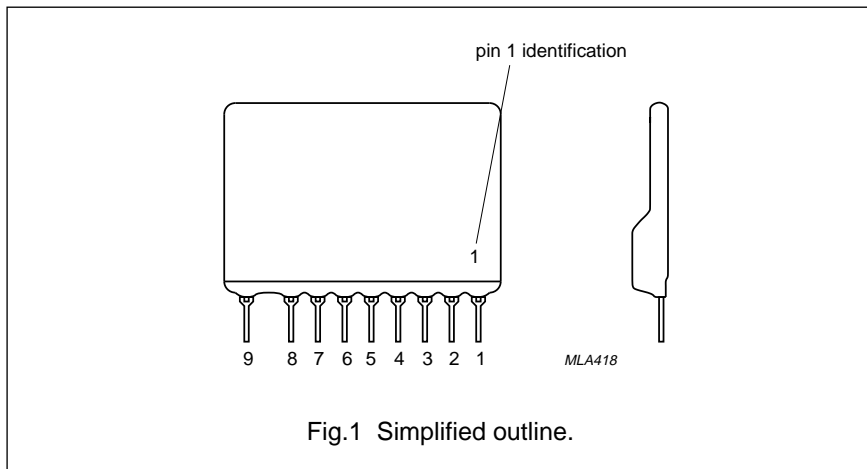
OM2070

DESCRIPTION

A three-stage wideband amplifier in hybrid integrated circuit form on a thin-film substrate. The device is intended for use in mast-head booster amplifiers, as an amplifier in MATV and CATV systems and as a general purpose amplifier for VHF and UHF applications.

PINNING

PIN	DESCRIPTION
1	input
2	common
3	common
4	common
5	common
6	supply (+)
7	common
8	common
9	output/supply (+)



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		–	28	–	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)				
		VHF	–	113	–	dBμV
		UHF	–	112	–	dBμV
F	noise figure		–	4.8	–	dB
V _B	DC supply voltage		10.8	12	13.2	V
T _{amb}	ambient operating temperature		-20	–	+70	°C

Wideband amplifier module

OM2070

CIRCUIT DIAGRAM AND PRINTED-CIRCUIT BOARD

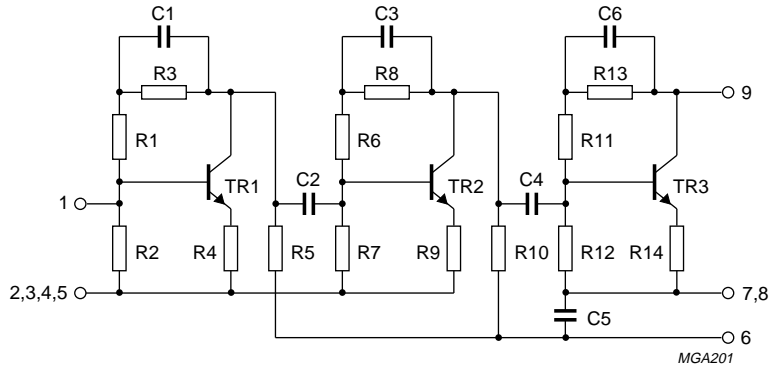
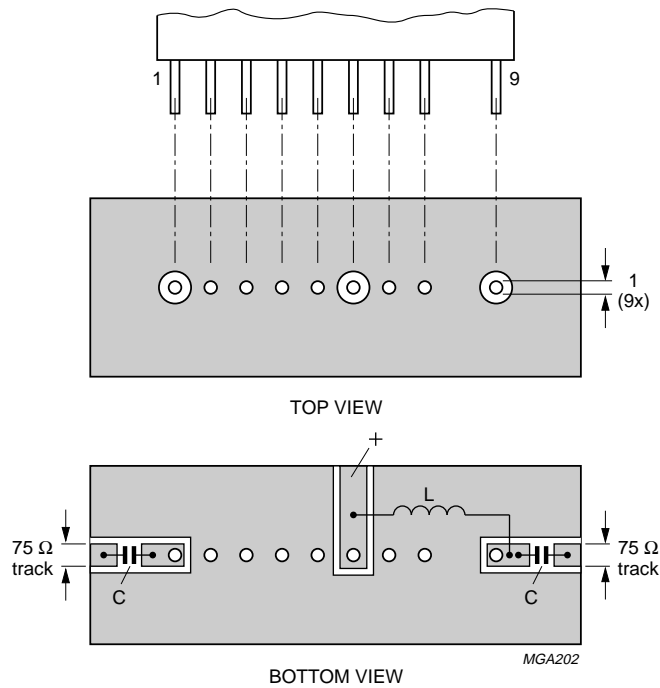


Fig.2 Circuit diagram.



L > 5 μ H; e.g. catalogue No. 3122 108 20150, or 27 turns enamelled 0.3 mm copper wire wound on a ferrite core (material 4B1; catalogue No. 3122 104 91110) with a diameter of 1.6 mm.
 C > 220 pF ceramic capacitor.

Fig.3 Printed-circuit board holes and tracks.

Wideband amplifier module

OM2070

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 8	-	100	mW

CHARACTERISTICS

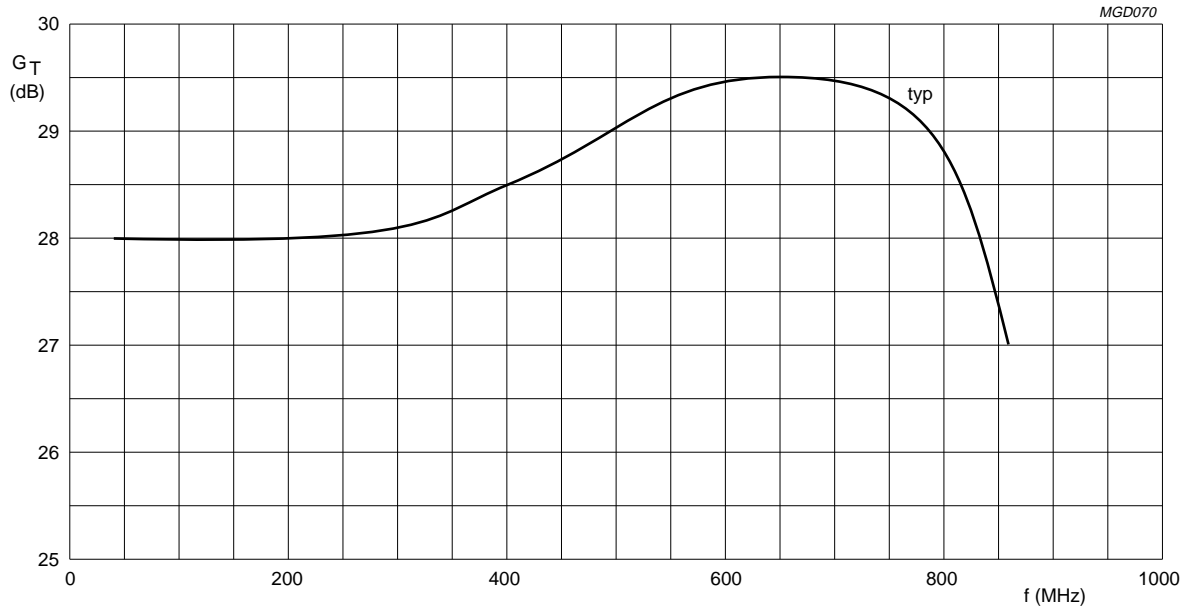
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Measuring conditions						
T _{amb}	ambient operating temperature		-	25	-	°C
V _B	DC supply voltage		-	12	-	V
Z _S	source impedance		-	75	-	Ω
Z _L	load impedance		-	75	-	Ω
Z ₀	characteristic impedance of HF connections		-	75	-	Ω
f	frequency range		40	-	860	MHz
Performance						
I _B	supply current		-	100	-	mA
G _T	transducer gain = S ₂₁ ²		26	28	31	dB
ΔG _T	flatness of frequency response		-	1	-	dB
VSWR _{in}	individual maximum VSWR	input; note 1	-	2.3	-	
VSWR _{out}	individual maximum VSWR	output; note 1	-	1.9	-	
S ₁₂ ²	back attenuation	f = 100 MHz	-	45	-	dB
		f = 860 MHz	-	35	-	dB
V _{o(rms)}	output voltage (RMS value)	d _{im} = -60 dB; 3rd order intermodulation (3-tone)				
		VHF	111	113	-	dBμV
		UHF	110	112	-	dBμV
F	noise figure		-	4.8	-	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.

Wideband amplifier module

OM2070



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

Fig.4 Transducer gain as a function of frequency.

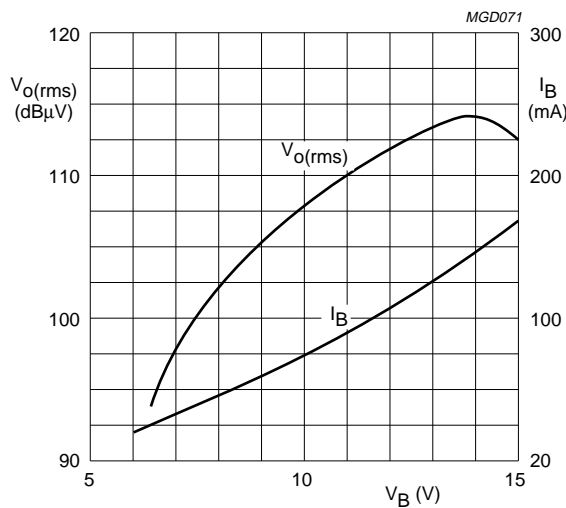
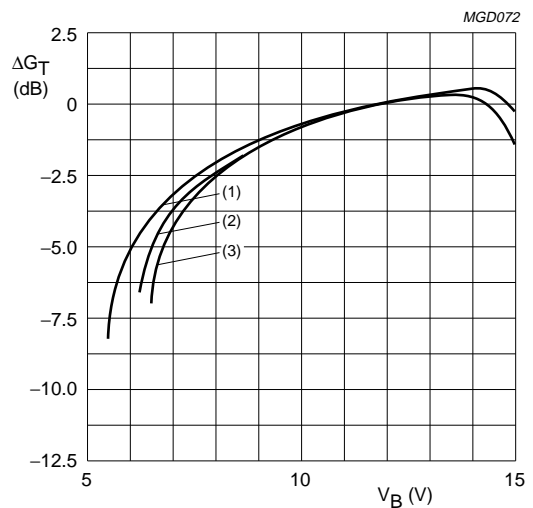


Fig.5 Output voltage and supply current as a function of supply voltage; typical values.



Reference 0 dB at 12 V.

- (1) $f = 100 \text{ MHz}$.
- (2) $f = 860 \text{ MHz}$.
- (3) $f = 500 \text{ MHz}$.

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

Wideband amplifier module

OM2070

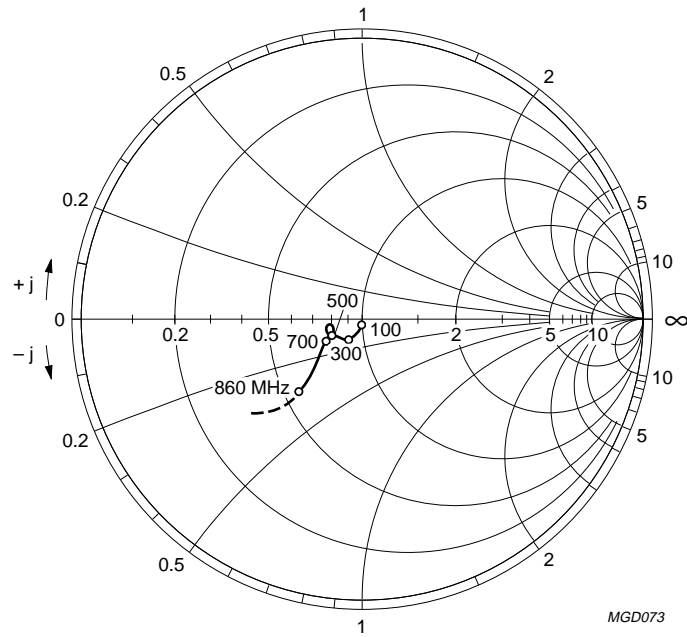


Fig.7 Input impedance derived from input reflection coefficient (S_{11}), co-ordinates in ohms \times 75; typical values.

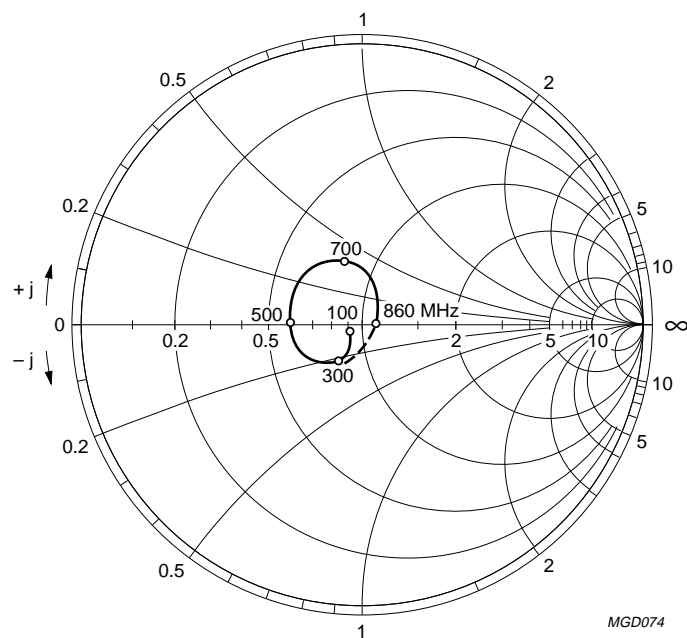


Fig.8 Output impedance derived from output reflection coefficient (S_{22}), co-ordinates in ohms \times 75; typical values.

Wideband amplifier module

OM2070

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

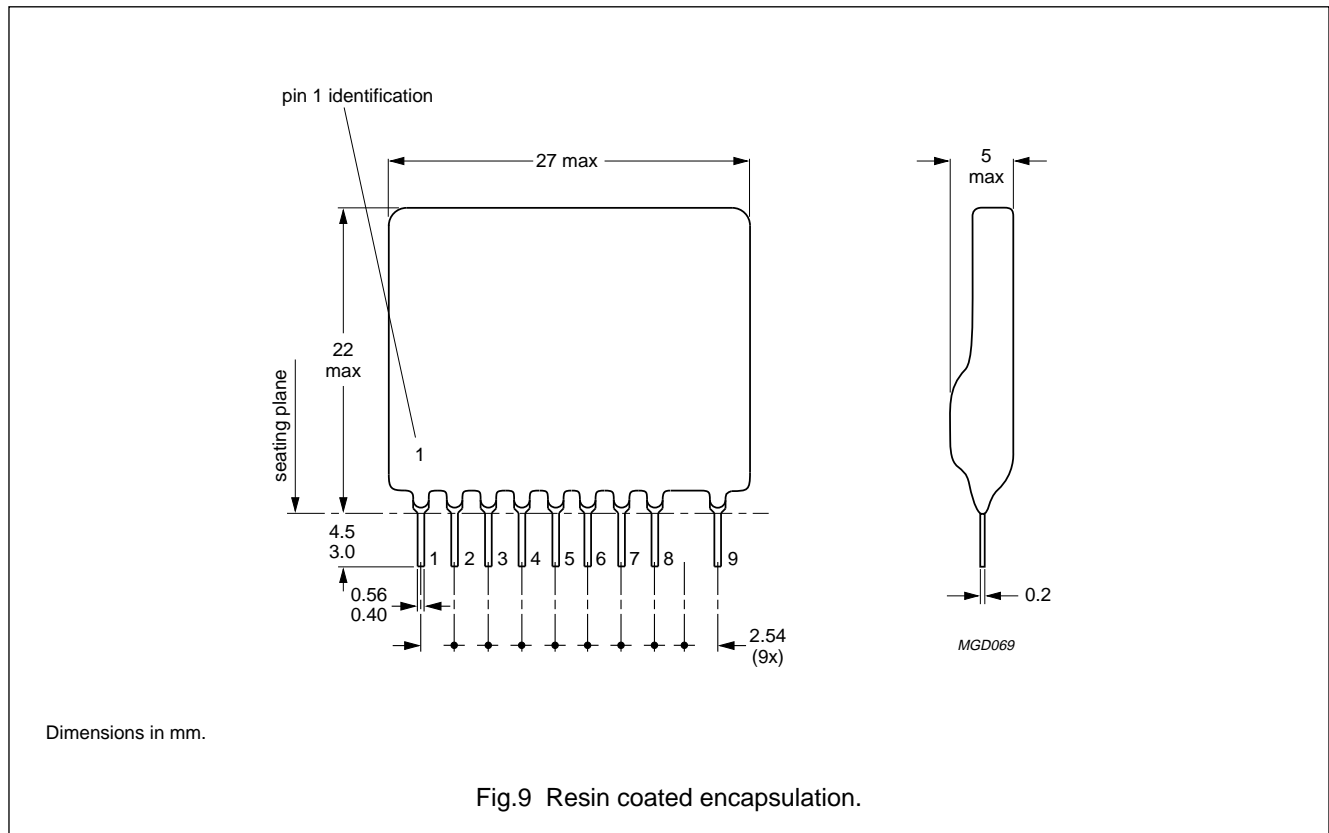
The maximum permissible temperature for the solder is 260 °C. It must not be in contact with the joint for more than 5 s.

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



Wideband amplifier module

OM2070

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.	

LIFE SUPPORT APPLICATIONS

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