Hybrid wideband amplifier OM926

DESCRIPTION

A two-stage wideband amplifier in hybrid integrated circuit form on a thin-film substrate. The device is intended for use as an IF amplifier for satellite television and as a general purpose amplifier in the range 10 to 2000 MHz.

PINNING

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

PIN CONFIGURATION

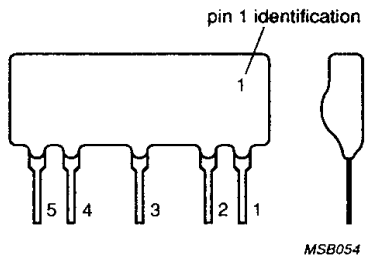


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency range		10	–	2000	MHz
G_{tr}	transducer gain	f = 1750 MHz; $G_{tr} = \lvert s_f \rvert^2$	–	18	–	dB
$V_{o(RMS)}$	output voltage	d_{im} = –60 dB (DIN 45004, paragraph 6.3: 3-tone)	101	–	–	dBμV
F	noise figure		–	6.5	–	dB
V_B	supply voltage	DC value	–	12	–	V
T_{amb}	ambient operating temperature range		–20	–	70	°C

MECHANICAL DATA

Encapsulation

The encapsulation comprises a 5-pin, in-line, resin-coated body, see Fig.8.

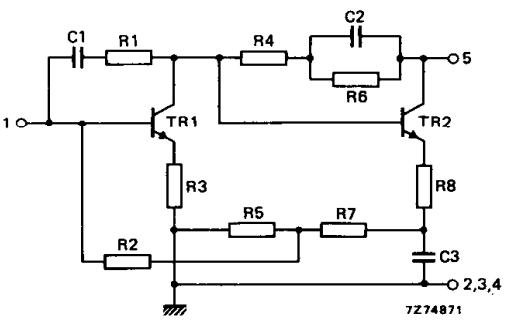


Fig.2 Circuit diagram.

Soldering recommendations

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 250 °C. It must not be in contact with the joint for more than 5 s.

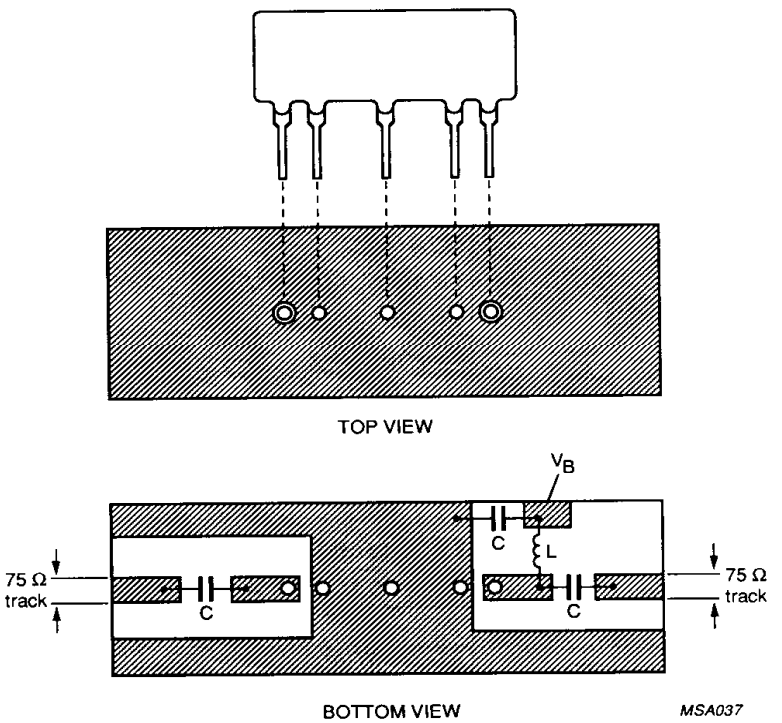
The total contact time of successive solder waves must not exceed 5 s.

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.

Mounting recommendations

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.



L > 5 µH; e.g. catalogue No. 3122 108 20150, or 27 turns enamelled 0.3 mm copper wire wound on a ferrite core with a diameter of 1.6 mm.

C > 1000 pF ceramic capacitor.

Fig.3 Printed-circuit board holes and tracks.

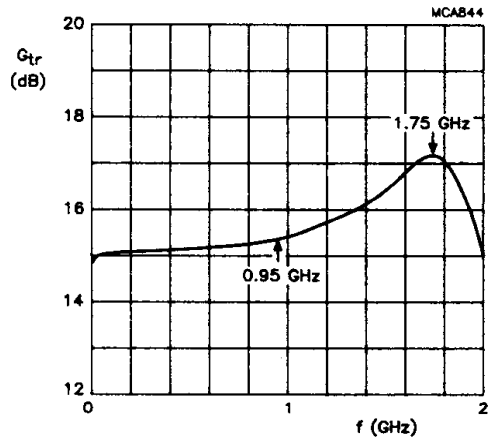
LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
T_{amb}	ambient operating temperature range	–20	70	°C
T_{stg}	storage temperature range	–40	125	°C
V_B	DC supply voltage	–	15	V
P_{I1M}, P_{I5M}	peak incident powers on pins 1 and 5	–	100	mW

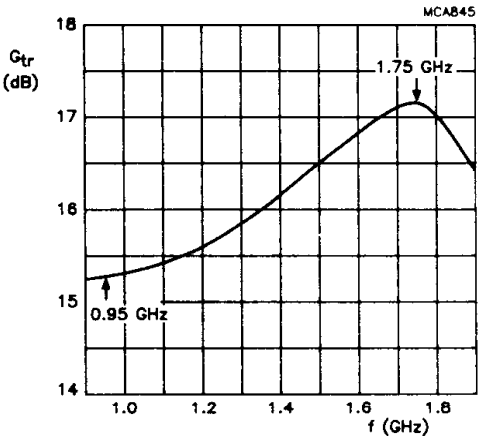
CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Measuring conditions						
T_{amb}	ambient operating temperature		–	25	–	°C
V_B	supply voltage	DC value	–	12	–	V
Z_S	source impedance		–	75	–	Ω
Z_L	load impedance		–	75	–	Ω
Performance						
I_B	supply current		–	28	–	mA
G_{tr}	transducer gain	$G_{tr} = \lvert s_{rl}\rvert^2$;				
		f = 10 to 1000 MHz	–	15	–	dB
		f = 1750 MHz	–	18	–	dB
		f = 2000 MHz	–	16	–	dB
S_{11}	input return loss					
		f = 10 to 1000 MHz	–	14	–	dB
		f = 1000 to 1750 MHz	–	12	–	dB
S_{22}	output return loss					
		f = 10 to 1000 MHz	–	14	–	dB
		f = 1000 to 1750 MHz	–	12	–	dB
$\lvert S_r\rvert^2$	feedback attenuation		–	25	–	dB
$V_{o(RMS)}$	output voltage	d_{im} = –60 dB (DIN 45004, paragraph 6.3, 3-tone)	101	103	–	dBμV
F	noise figure		–	6.5	–	dB
Operating conditions						
T_{amb}	ambient operating temperature range		–20	–	70	°C
V_B	supply voltage	DC value	10.8	–	13.2	V
f	frequency range		10	–	2000	MHz
Z_S	source impedance		–	75	–	Ω
Z_L	load impedance		–	75	–	Ω



Gain over the entire frequency range.
Z_o = 75 Ω.

Fig.4 Transducer gain as a function of frequency.



Expanded view of the satellite first IF frequency range.
Z_o = 75 Ω.

Fig.5 Transducer gain as a function of frequency.

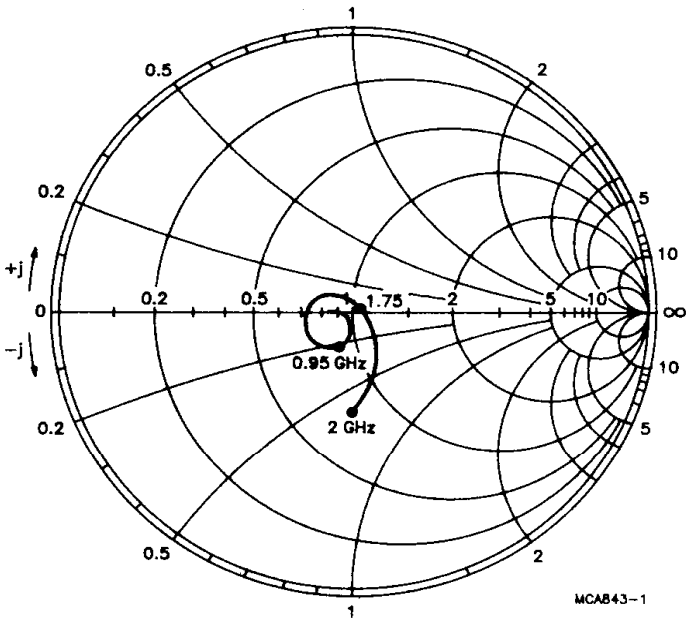


Fig.6 Input impedance derived from input reflection coefficient S_{ie}, co-ordinates in ohms x 75; typical values.

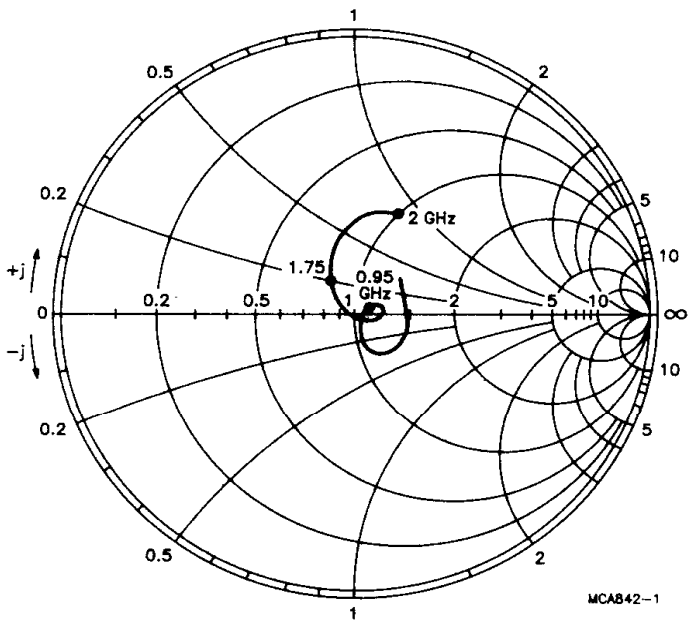
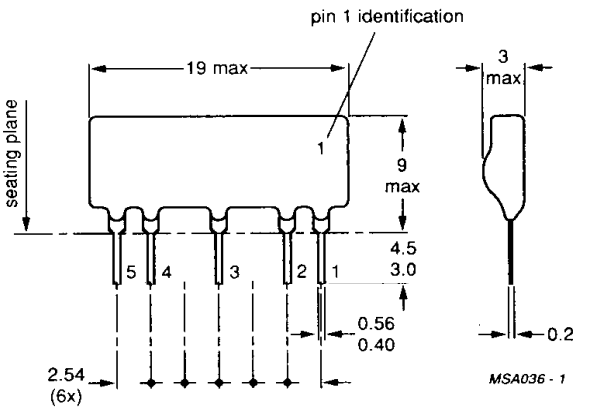


Fig.7 Output impedance derived from output reflection coefficient S_{oe}, co-ordinates in ohms x 75; typical values.

PACKAGE OUTLINE



Dimensions in mm.

Fig.8 Encapsulation.