

Hybrid integrated VHF/UHF wideband amplifier

OM2064

DESCRIPTION

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

PINNING

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

PIN CONFIGURATION

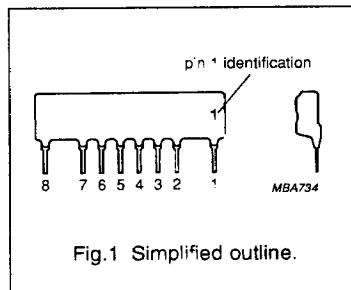


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency range		40	–	860	MHz
$R_s = R_L = Z_0$	source and load (characteristic) impedance		–	75	–	Ω
$G_{tr} = S_{21} ^2$	transducer gain		–	28	–	dB
$\pm \Delta S_{21} ^2$	flatness of frequency response		–	1	–	dB
$V_{o(RMS)}$	output voltage	at –60 dB intermodulation distortion (DIN 45004, 3-tone)	105	107	–	dB μ V
F	noise figure		–	4.4	–	dB
V_B	DC supply voltage		10.8	12	13.4	V
T_{amb}	ambient operating temperature range		–20	–	70	$^{\circ}$ C

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MECHANICAL DATA

Encapsulation

The encapsulation comprises an 8-pin, in-line, resin-coated body, see Fig.7.

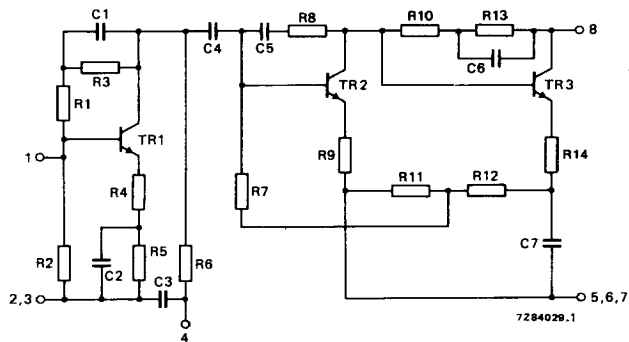


Fig.2 Circuit diagram.

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 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.

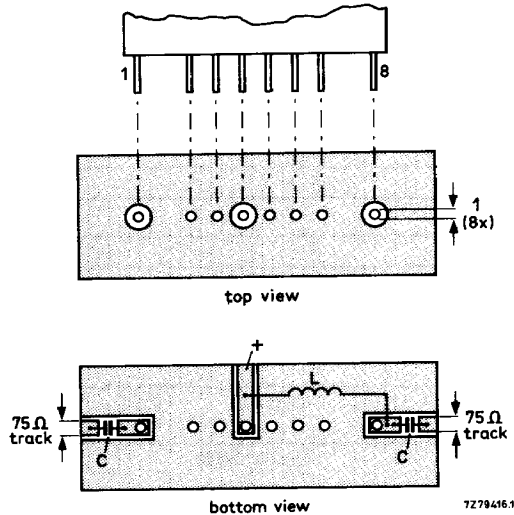
If the printed-circuit board has been pre-heated, forced cooling may be necessary immediately after soldering to keep the temperature below the allowable limit.

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.

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$L > 5 \mu\text{H}$; 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.
 $C > 220 \text{ pF}$ 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_{11M}, P_{18M}	peak incident powers on pins 1 and 8	-	100	mW

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CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Measuring conditions						
T_{amb}	ambient temperature		–	25	–	°C
V_B	DC supply voltage		–	12	–	V
R_S, R_L	source impedance and load impedance		–	75	–	Ω
Z_0	characteristic impedance of HF connections		–	75	–	Ω
f	frequency range		40	–	860	MHz
Performance						
I_B	supply current		48	51	54	mA
$G_{tr} = S_{21} ^2$	transducer gain		26	28	31	dB
$\pm \Delta S_{21} ^2$	flatness of frequency response		–	1	1.5	dB
$VSWR_{(i)}$	individual maximum VSWR	input	–	1.3 (note 1)	1.5	
$VSWR_{(o)}$	individual maximum VSWR	output	–	1.5 (note 1)	1.6	
$ S_{12} ^2$	back attenuation	f = 100 MHz f = 860 MHz	42 37	44 39	–	dB dB
$V_{\alpha(RMS)}$	output voltage	at –60 dB intermodulation distortion (DIN 45004, par. 6.3, 3-tone)	105	107	–	$dB_{\mu V}$
F	noise figure		–	4.4	–	dB

Notes

Scattering parameters: $S_i = S_{21}$; $S_r = S_{12}$.

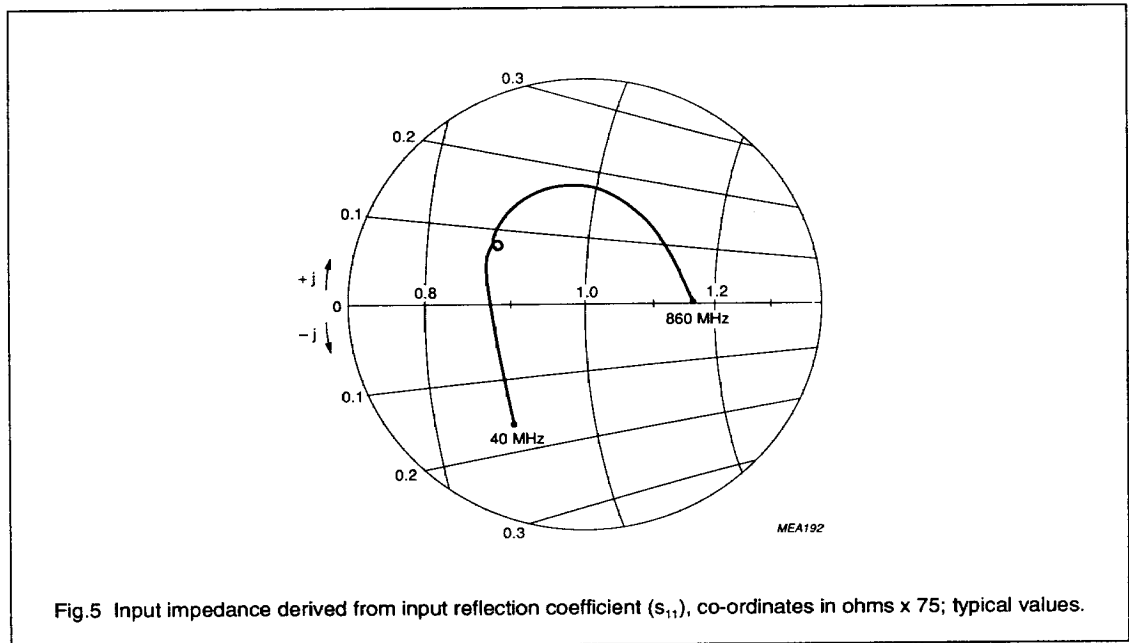
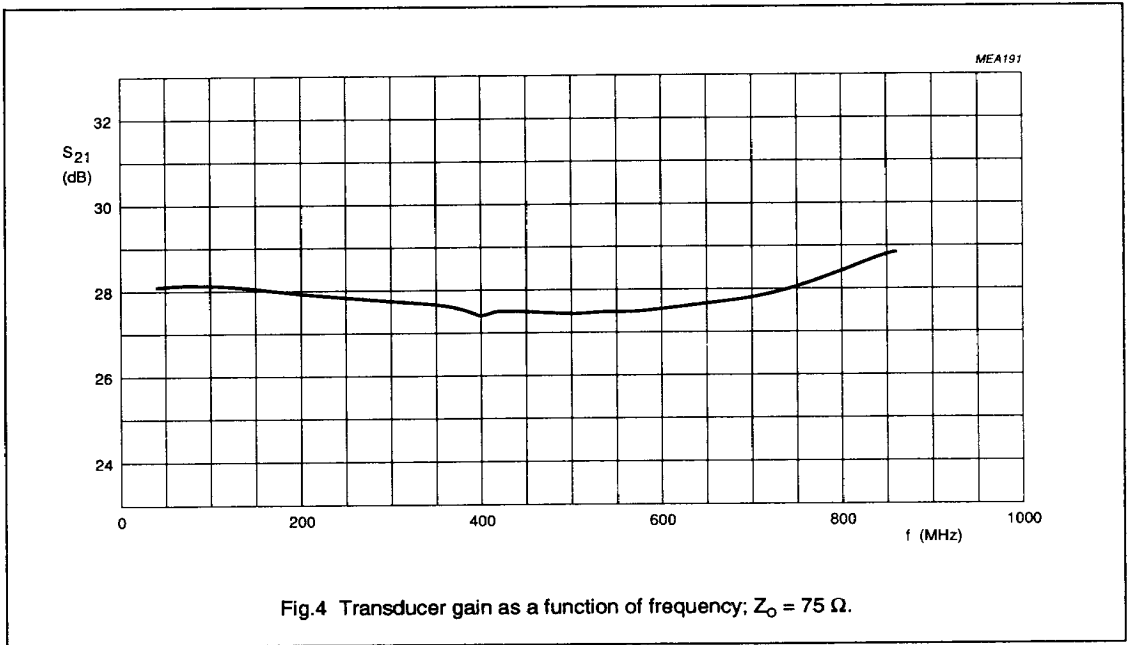
1. Highest value (for a sample) occurring in the frequency range.

OPERATING CONDITIONS

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
T_{amb}	ambient temperature range	–20	–	70	°C
V_B	DC supply voltage	10.8	12	13.4	V
f	frequency range	40	–	860	MHz
R_S, R_L	source impedance and load impedance	–	75	–	Ω

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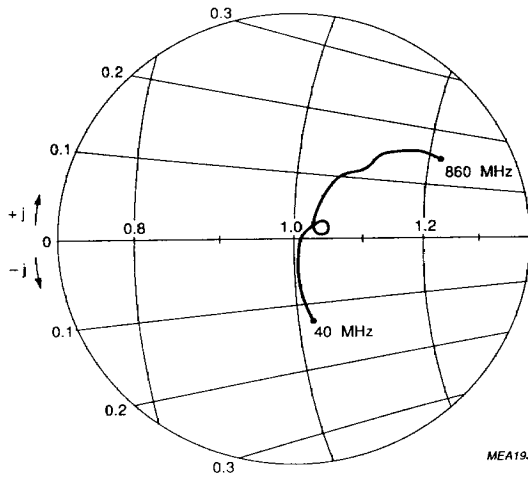
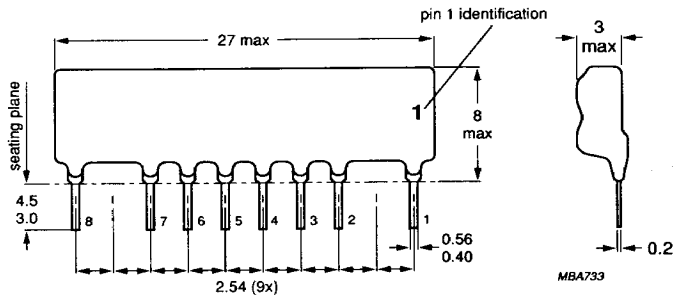


Fig.6 Output impedance derived from output reflection coefficient (s_{22}), co-ordinates in ohms x 75; typical values.

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Dimensions in mm.

Fig.7 Encapsulation.