HYBRID V.H.F./U.H.F. WIDE-BAND AMPLIFIER

Three-stage wide-band amplifier in the hybrid technique, designed for use in MATV systems, and as general purpose amplifier for v.h.f. and u.h.f. applications requiring a high output level.
The OM337A needs an external collector-coil and blocking capacitor, whereas, the OM337 has these components built-in.

QUICK REFERENCE DATA

Frequency range	f	40 to 860	MHz
Source and load (characteristic) impedance	$R_s = R_\ell = Z_o$	= 75	Ω
Transducer gain	$G_{tr} = \lvert s_f \rvert^2$	typ. 26	dB
Flatness of frequency response	$\pm\Delta \lvert s_f \rvert^2$	typ. 1	dB
Output voltage at −60 dB intermodulation distortion (DIN45004, 3-tone); f = 470 MHz	$V_{o(rms)}$	typ. 112	dBμV
Noise figure	F	typ. 9,8	dB
D.C. supply voltage	V_B	= 24	V ± 10%
Operating mounting-base temperature	T_{mb}	−30 to +100	°C

ENCAPSULATION 9-pin, in-line, resin-coated body on a right-angled metal mounting tab, see MECHANICAL DATA

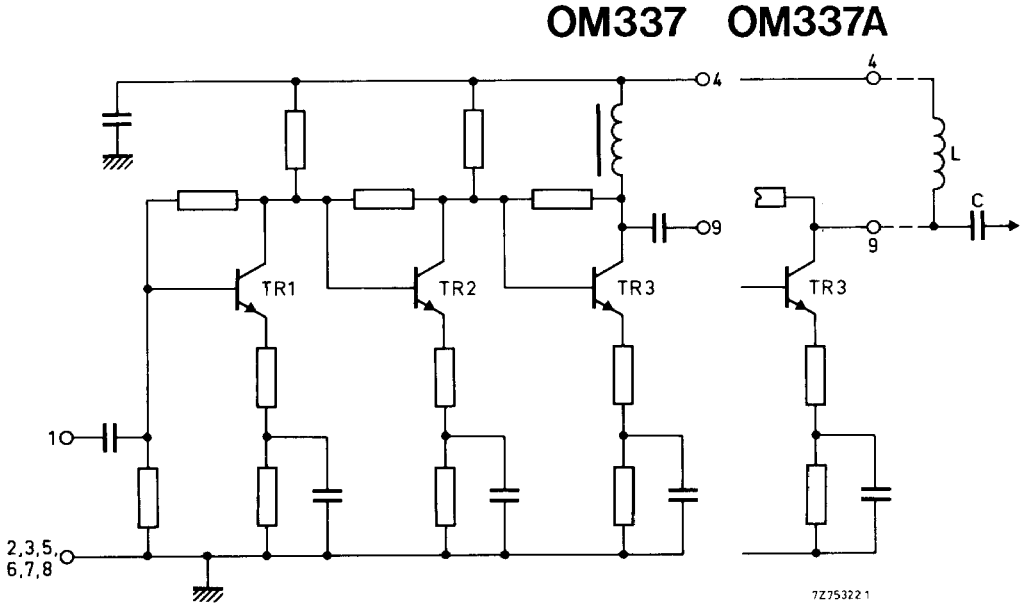


Fig. 1 Circuit diagram.

RATINGS Limiting values in accordance with the Absolute Maximum System (IEC134)

Operating mounting-base temperature	T_{mb}	−30 to +100		°C
Storage temperature	T_{stg}	−40 to +125		°C
D.C. supply voltage	V_B	max.	28	V
Peak voltages on pin 1	V_{1M}	max.	28	V
	$-V_{1M}$	max.	24	V
Peak voltages on pin 9	V_{9M}	max.	28	V
	$-V_{9M}$	max.	4	V
Peak incident powers on pins 1 and 9	P_{I1M}, P_{I9M}	max.	100	mW

CHARACTERISTICS

Measuring conditions

V.H.F.—U.H.F. test socket	catalogue no. 3504 110 01830*			
Mounting base temperature	T_{mb}	=	25	°C
D.C. supply voltage	V_B	=	24	V
Source impedance and load impedance	R_s, R_ℓ	=	75	Ω
Characteristic impedance of h.f. connections	Z_o	=	75	Ω
Frequency range	f	= 40 to 860		MHz

Performance

Supply current	I_B	110 to 120		mA
		typ.	115	mA
Transducer gain	$G_{tr} = \lvert s_f \rvert^2$	23 to 29		dB
		typ.	26	dB
Flatness of frequency response	$\pm\Delta \lvert s_f \rvert^2$	typ.	1	dB
Individual maximum v.s.w.r.				
input	$VSWR_{(i)}$	typ.	2,3	**
output	$VSWR_{(o)}$	typ.	1,8	**
Back attenuation				
f = 100 MHz	$\lvert s_r \rvert^2$	typ.	44	dB
f = 650 MHz	$\lvert s_r \rvert^2$	typ.	41	dB
f = 860 MHz	$\lvert s_r \rvert^2$	typ.	43	dB

* This socket can be made available for customer reference purposes.
** Highest value, for a sample, occurring in the frequency range.

Output voltage				
at −60 dB intermodulation distortion (DIN45004, par. 6.3: 3-tone)				
f = 40–230 MHz	$V_{o(rms)}$	>	113	dBμV
		typ.	114	dBμV
f = 470 MHz	$V_{o(rms)}$	typ.	112	dBμV
f = 860 MHz	$V_{o(rms)}$	typ.	110	dBμV
Noise figure				
channel 2	F	typ.	7	dB
channel 65	F	typ.	9,8	dB

s-parameters: $s_f = s_{21}$ $s_i = s_{11}$ $s_r = s_{12}$ $s_o = s_{22}$

OPERATING CONDITIONS

Mounting-base temperature range	T_{mb}		−30 to +100	°C
D.C. supply voltage	V_B	=	24	V ± 10%
Frequency range	f		40 to 860	MHz
Source impedance and load impedance	R_s, R_ℓ	=	75	Ω

THERMAL DATA

a. The maximum permissible temperature at the mounting base is 100 °C.

b. When the mounting tab is screwed to a double-sided printed-circuit board with dimensions 37 mm x 51 mm, its temperature will be 57 °C above the temperature of the surrounding free air.

c. When a heatsink is fixed to the mounting tab and the pins are soldered into a double-sided printed-circuit board with dimensions 37 mm x 51 mm, the tab will reach the temperatures stated in the following table.

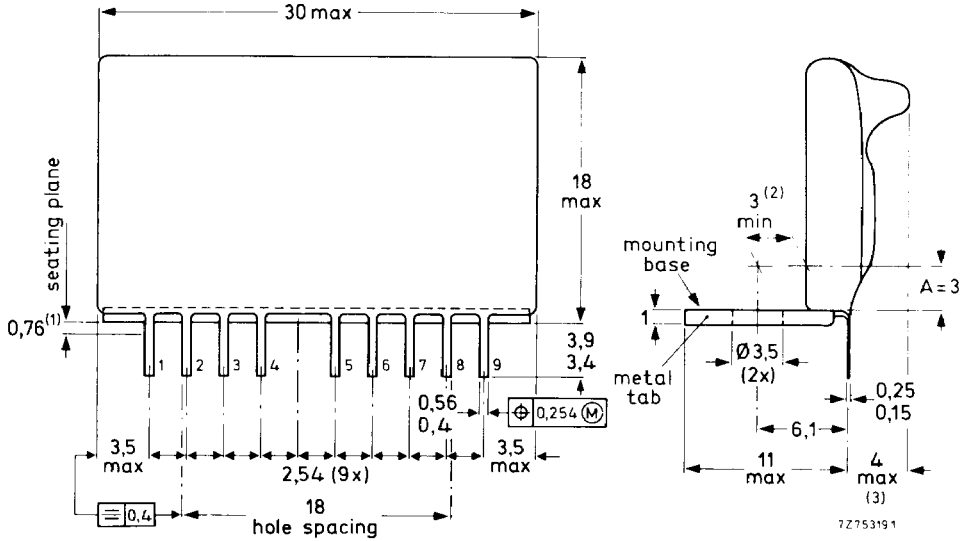
Notes:
1. When the device is fixed only to a heatsink, not to a printed-circuit board, the values of the second column of the table should be increased by 2 °C and those of the third column decreased by 2 °C.
2. The user is free to realize proper cooling by using differently shaped sinks, or, preferably, by fixing the tab to any convenient part of the equipment (e.g. a wall of the metal cabinet).

heatsink data thickness 1 mm	$T_{mb} - T_{amb}$ °C	$T_{amb\,max}$ °C
Bright aluminium heatsink L-shaped bar; length 100 mm, height 65 mm	27,5	72,5
Blackened aluminium heatsink L-shaped bar; length 50 mm, height 70 mm	26,5	73,5

MECHANICAL DATA

Dimensions in mm

The amplifier is resin coated and has a metal mounting tab at a right angle to the encapsulated part.



(1) Tolerance applies within this zone.
(2) Distance applies within zone A.
(3) For the OM337A: 3 mm maximum.

Fig. 2 Encapsulation.

Terminal connections

1 = Input
2, 3, 5, 6, 7, 8 = Common, connected to mounting tab
4 = Supply (+)
9 = Output

Soldering recommendations

Hand soldering

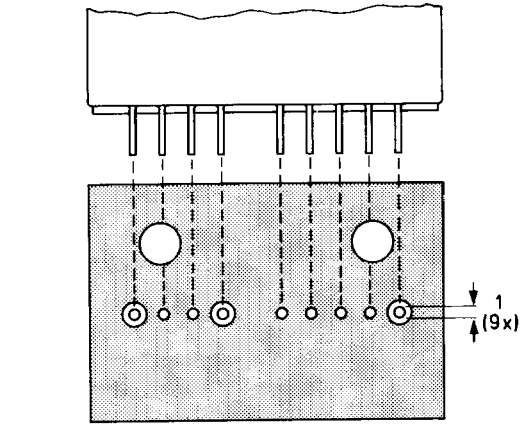
Maximum contact time for a soldering-iron temperature of 260 °C up to the seating plane is 5 s.

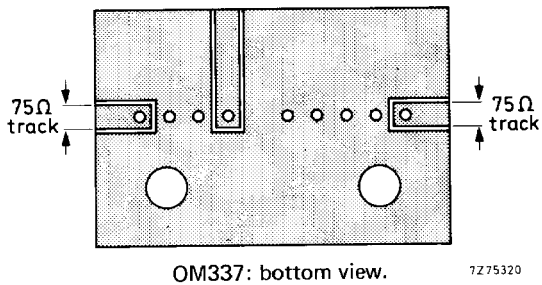
Dip or wave soldering

260 °C is the maximum permissible temperature of the solder; it must not be in contact with the joint for more than 5 seconds. The total contact time of successive solder waves must not exceed 5 seconds. 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 the following example. An example is also given of heatsink mounting.
Input and output should be connected to 75 Ω tracks.
The connections to the common pins should be as close to the seating plane as possible.





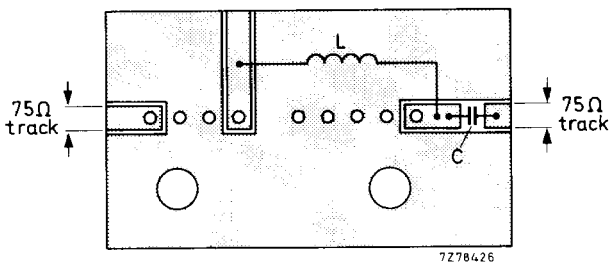


Fig. 3 Printed-circuit board holes and tracks for the OM337 and OM337A.

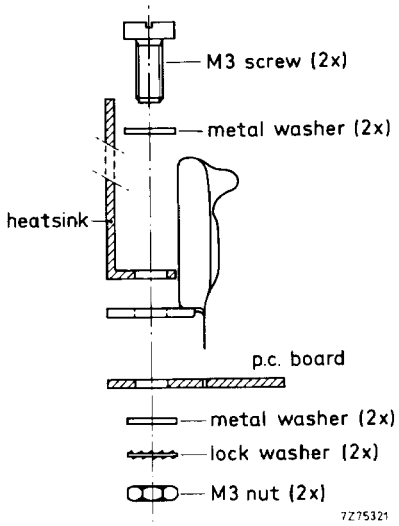


Fig. 4 Example of heatsink mounting.

L > 5 μH; e.g. catalogue no. 3122 108 20150 or 27 turns enamelled Cu wire (0,3 mm) wound on a ferrite core with a a diameter of 1,6 mm.
C > 220 pF ceramic capacitor.

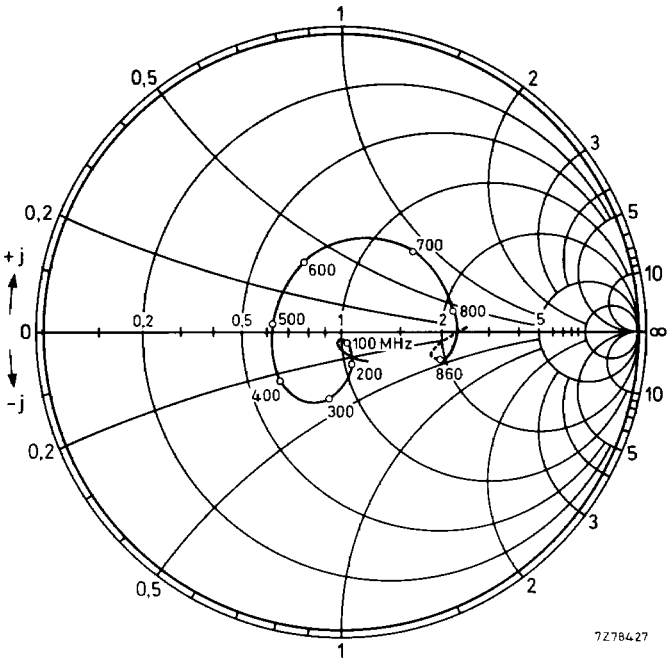


Fig. 5 Input impedance derived from input reflection coefficient s_i, co-ordinates in ohm x 75; typical values.

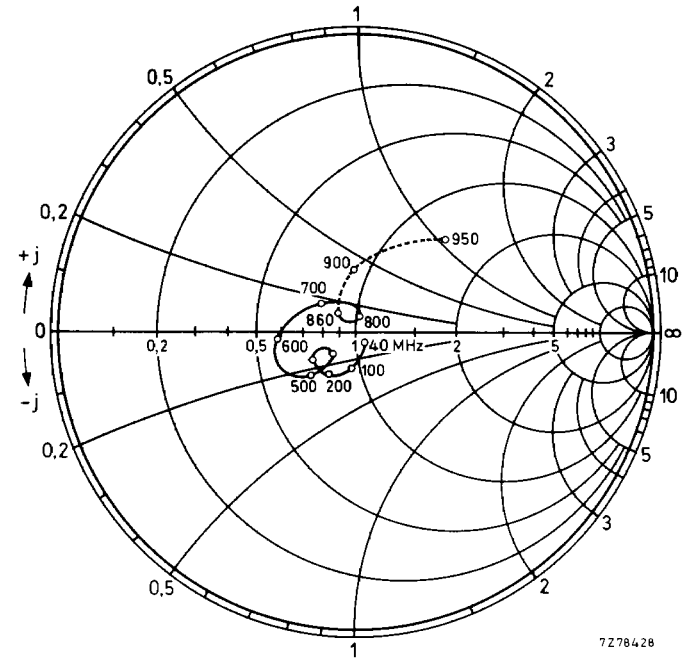


Fig. 6 Output impedance derived from output reflection coefficient s_o, co-ordinates in ohm x 75; typical values.

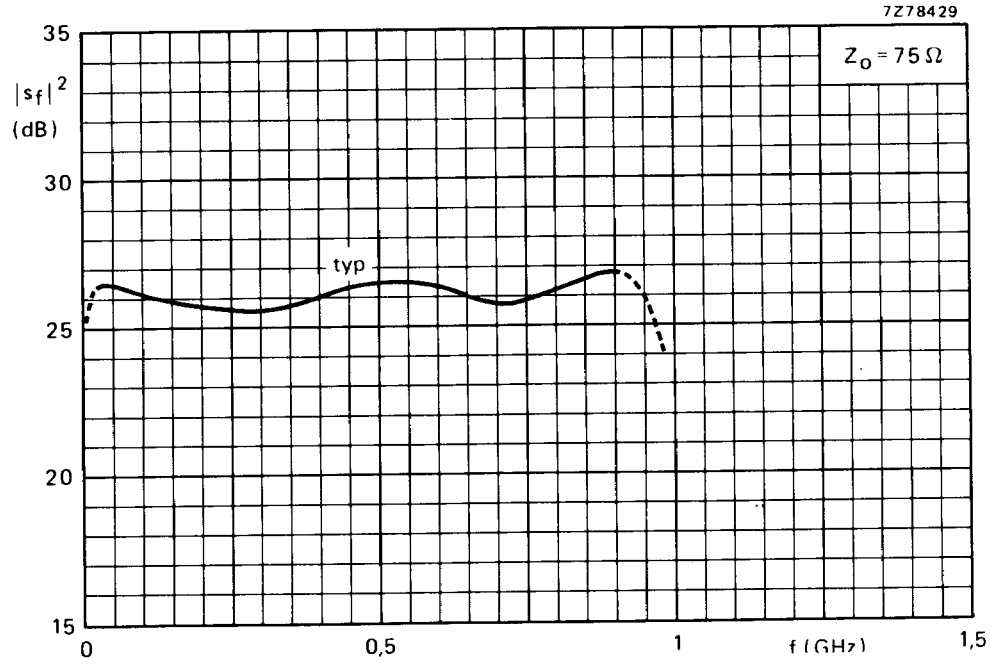


Fig. 7 Transducer gain as a function of frequency.