

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

Two-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 OM323A needs an external collector-coil and blocking capacitor, whereas, the OM323 has these components built-in.

QUICK REFERENCE DATA

Frequency range	f	40 to 860 MHz
Source and load (characteristic) impedance	$R_s = R_l = Z_o =$	75 Ω
Transducer gain	$G_{tr} = s_f ^2$	typ 15 dB
Flatness of frequency response	$\pm \Delta s_f ^2$	typ 0,5 dB
Output voltage at -60 dB intermodulation distortion (DIN45004, 3-tone); $f = 470$ MHz	$V_{O(rms)}$	typ 113 dB μ V
Noise figure	F	typ 9 dB
D.C. supply voltage	V_B	= 24 V $\pm$ 10%
Operating mounting-base temperature	T_{mb}	-30 to +100 $^{\circ}$ C

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

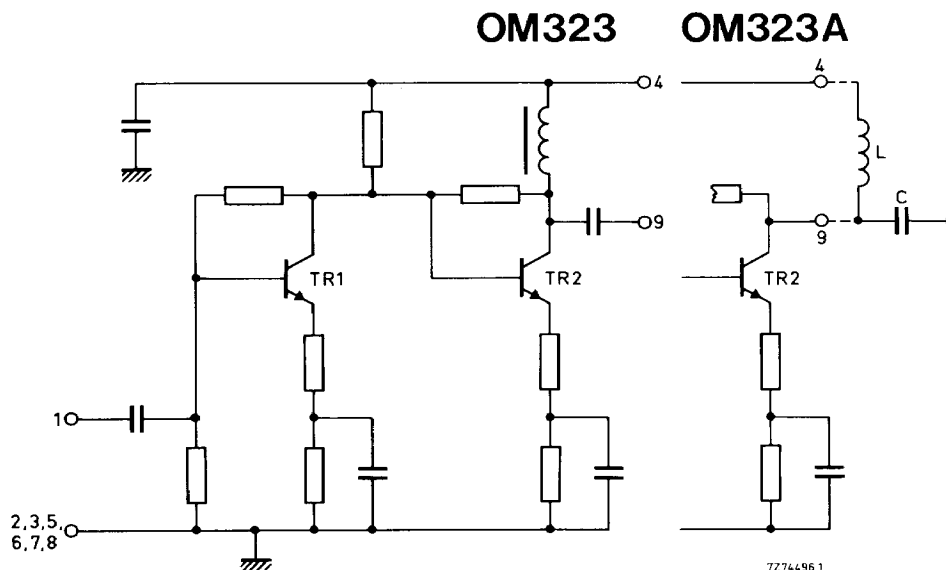


Fig. 1 Circuit diagram.

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_{11M}, P_{19M}	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_0 = 75 Ω
Frequency range	f = 40 to 860 MHz

Performance

Supply current	I_B	95 to 105 mA typ 100 mA
Transducer gain	$G_{tr} = s_f ^2$	14 to 17 dB typ 15 dB
Flatness of frequency response	$\pm \Delta s_f ^2$	typ 0,5 dB
Individual maximum v.s.w.r.		
input	$VSWR_{(i)}$	typ 1,9 **
output	$VSWR_{(o)}$	typ 2,3 **
Back attenuation		
$f = 100$ MHz	$ s_r ^2$	typ 29 dB
$f = 650$ MHz	$ s_r ^2$	typ 25,5 dB
$f = 860$ MHz	$ s_r ^2$	typ 24 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

$V_{o(rms)}$	>	112 dB μ V
	typ	114 dB μ V
$V_{o(rms)}$	typ	113 dB μ V
$V_{o(rms)}$	typ	112 dB μ V

f = 470 MHz

f = 860 MHz

Noise figure

channel 2

channel 65

F	typ	8 dB
F	typ	9 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 $\pm$ 10%

Frequency range

f 40 to 860 MHz

Source impedance and load impedance

 R_s, R_L = 75 Ω

THERMAL DATA

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

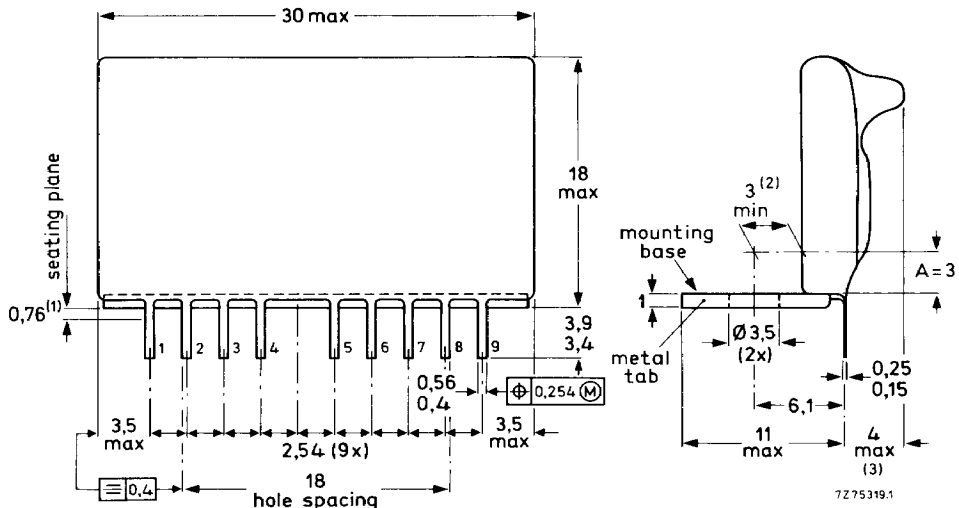
- When the device is fixed only to a heatsink, not to a printed-circuit board, the values of the second column of the table should be increased by 2 °C and those of the third column decreased by 2 °C.
- The user is free to realize proper cooling by using differently shaped sinks, or, preferably, by fixing 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 165 mm	24	76
Blackened aluminium heatsink		
L-shaped bar, length 50 mm, height 70 mm	23	77

MECHANICAL DATA

Dimensions in mm

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



- (1) Tolerance applies within this zone.
- (2) Distance applies within zone A.
- (3) For the OM323A: 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 $75\ \Omega$ tracks.

The connections to the common pins should be as close to the seating plane as possible.

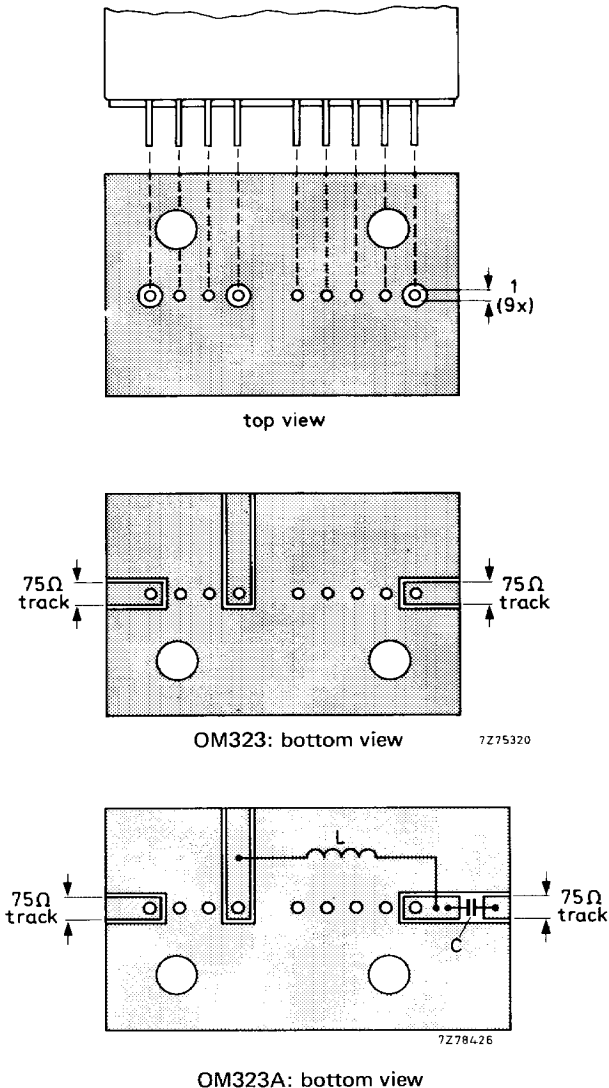


Fig. 3 Printed-circuit board holes and tracks for the OM323 and OM323A.

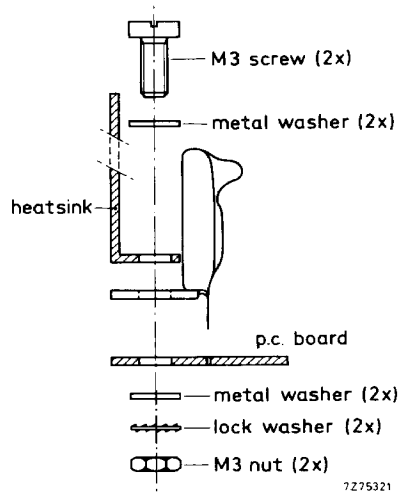


Fig. 4 Example of heatsink mounting.

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