Hybrid integrated circuit hi-fi audio power amplifiers

OM961/OM991

DESCRIPTION

The OM961 and OM991 are thin film hybrid integrated circuit hi-fi audio amplifiers for sinusoidal output power up to 60 W and 120 W respectively. The modules offer maximum design possibilities regarding amplification, ripple rejection, stability for complex loads etc. The amplifiers have built in short-circuit protection (SOAR protected) and are specially designed for low transient and harmonic distortion. All built in resistors are dynamically adjusted for optimum performance over a wide temperature range.

PIN CONFIGURATION

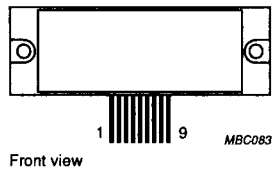


Fig.1 Simplified outline.

PINNING

PIN	DESCRIPTION
1	supply (–)
2	ground
3	output
4	output
5	driver supply (–)
6	non inverting input
7	inverting input
8	boot strap
9	supply (+)

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	UNIT
P_o	sinusoidal output power OM961	d_{tot} < 0.2%; f = 20 Hz to 20 kHz; R_L = 4 Ω; V_S = ±31 V	60	–	W
		d_{tot} < 0.2%; f = 20 Hz to 20 kHz; R_L = 8 Ω; V_S = ±35 V	60	–	W
	sinusoidal output power OM991	d_{tot} < 0.2%; f = 20 Hz to 20 kHz; R_L = 4 Ω; V_S = ±45 V	60	–	W
		d_{tot} < 0.2%; f = 20 Hz to 20 kHz; R_L = 8 Ω; V_S = ±50 V	60	–	W
d_{tot}	total harmonic distortion	P_o = 1 W; f = 1 kHz	–	0.02	%

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_S	symmetrical supply voltage			
	OM961	–	±45	V
	OM991	–	±50	V
T_{stg}	storage temperature range	–30	100	°C
T_{mb}	mounting base operating temperature range	–	95	°C

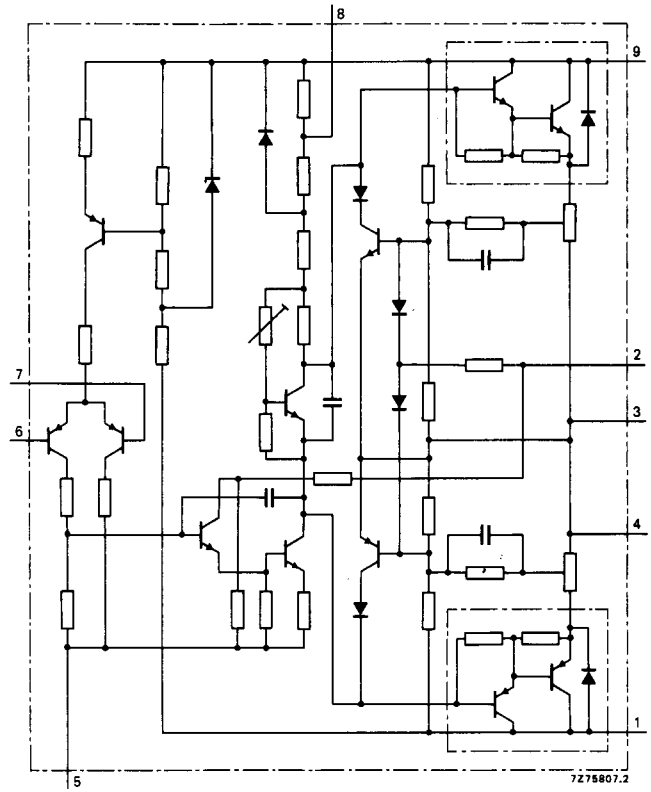


Fig.2 Circuit diagram.

CHARACTERISTICS

Measured in circuit shown in Fig.3; T_{mb} = 25 °C.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_S	symmetrical supply voltage					
	OM961		±31	–	±35	V
	OM991		±40	–	±45	V
I_{tot}	total supply current	zero signal	–	100	–	mA
P_o	sinusoidal output power OM961	d_{tot} < 0.2%; f = 20 Hz to 20 kHz; R_L = 4 Ω; note 1 note 2	60	–	–	W
		d_{tot} < 0.2%; f = 20 Hz to 20 kHz; R_L = 8 Ω note 2	–	–	60	W
	sinusoidal output power OM991	d_{tot} < 0.2%; f = 20 Hz to 20 kHz; R_L = 4 Ω	120	–	–	W
		d_{tot} < 0.2%; f = 20 Hz to 20 kHz; R_L = 8 Ω	–	–	90	W
	clipping level	d_{tot} = 0.7%; f = 1 kHz; R_L = 4 Ω				
	OM961		–	75	–	W
	OM991		100	–	135	W
d_{tot}	total harmonic distortion	P_o = 1 W; f = 1 kHz	–	0.02	–	%
d_{im}	intermodulation distortion	f_1 = 250 Hz; f_2 = 8 kHz amplitude ratio V_{f1}/V_{f2} = 4/1				
		P_o = 1 W	–	0.05	–	%
		P_o = rated value	–	0.1	–	%
V_i	input sensitivity	P_o = rated value				
	OM961		1	–	1.4	V
	OM991		1.4	–	1.7	V
R_i	input impedance	determined by input circuitry	–	10	–	kΩ
G_o	open loop gain		–	80	–	dB

Notes

1. Federal trade commission U.S.A.
2. P_o is stated as rated value.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_c	closed loop gain		–	24	–	dB
f	frequency response	P_o = rated value –10 dB (–1 dB)	30	–	40000	Hz
f_p	power bandwidth	–3 dB	20	–	40000	Hz
S/N	signal to noise ratio	wide band; P_o = 50 mW; unweighted	–	75	–	dB
		A-curve; P_o = 50 mW; weighted	–	87	–	dB
V_{off}	DC output offset voltage		–	±20	–	mV
RR	ripple rejection		65	–	–	dB
Z_o	output impedance		–	0.05	–	Ω

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	NOM.	UNIT
$R_{th\ h\text{-}a}$	from heatsink to ambient	heatsink length a = 50 mm (note 1)	1.0	K/W
$R_{th\ h\text{-}a}$	from heatsink to ambient	heatsink length a = 75 mm (note 1)	0.7	K/W
$R_{th\ h\text{-}a}$	from heatsink to ambient	heatsink length a = 100 mm (note 1)	0.6	K/W
$R_{th\ h\text{-}a}$	from heatsink to ambient	heatsink length a = 150 mm (note 1)	0.4	K/W
$R_{th\ mb\text{-}h}$	from mounting base to heatsink	using heatsink compound	0.2	K/W

Note

1. See Fig.5

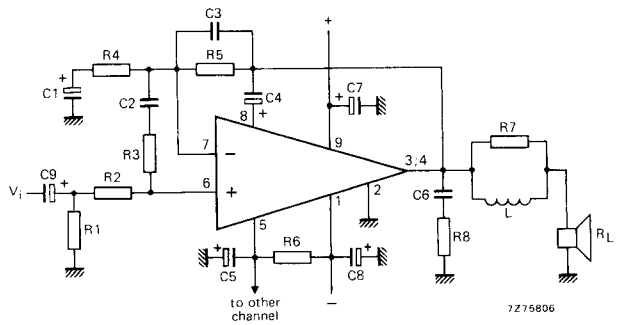


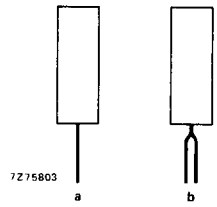
Fig.3 Example of an amplifier with external components.

List of components

COMPONENT	DESCRIPTION	VALUE
R1	0.25 W resistor	10 kΩ
R2	0.25 W resistor	4.7 kΩ
R3	0.25 W resistor	300 Ω
R4	0.25 W resistor	680 Ω
R5	0.25 W resistor	10 kΩ
R6	0.5 W resistor	22 Ω
R7	0.25 W resistor	2.2 Ω
R8	0.5 W resistor	10 Ω
C1	10 V capacitor	47 µF
C2	capacitor (10%)	270 pF
C3	capacitor (10%)	120 pF
C4	100 V capacitor	100 µF
C5	63 V capacitor	470 µF
C6	100 V capacitor	100 nF
C7	63 V capacitor	10 µF
C8	63 V capacitor	10 µF
C9	63 V capacitor	1 µF
L	inductor	4 µH
R_L	load resistance	4 or 8 Ω

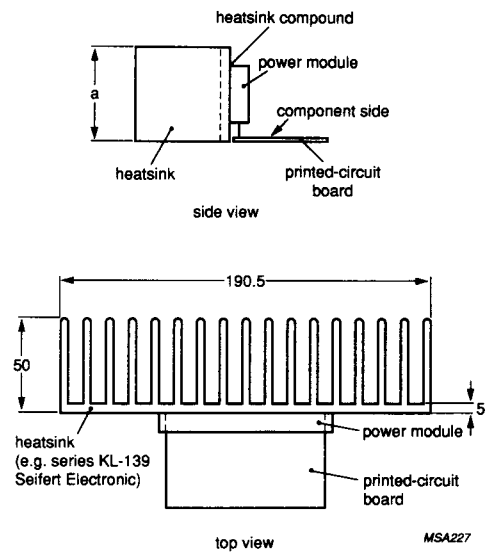
MOUNTING RECOMMENDATIONS

The modules are delivered with SIL (single in-line) leads but may also be bent to ZIL (zig-zag in-line) configuration.



A. Single in-line (SIL) leads.
B. Zig-zag in-line (ZIL) leads.

Fig.4 Lead configuration.



Dimensions in mm

Fig.5 Example of a heatsink to be used for the module.

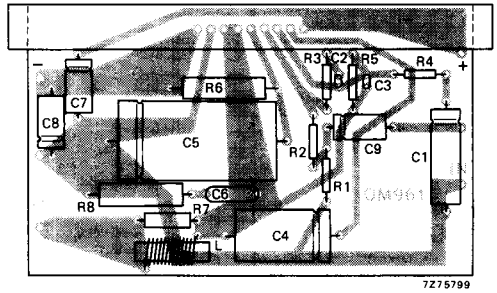


Fig.6 Component side of SIL version showing component layout.

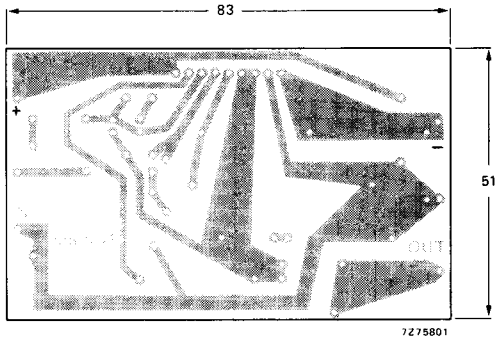
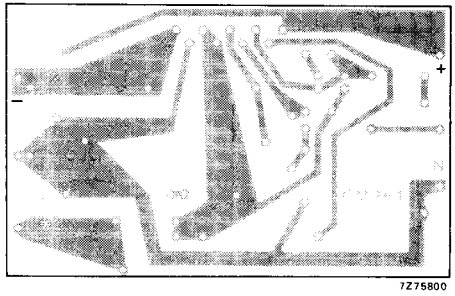


Fig.7 Track side of SIL version.



For component layout see Fig.6.

Fig.8 Component side of ZIL version.

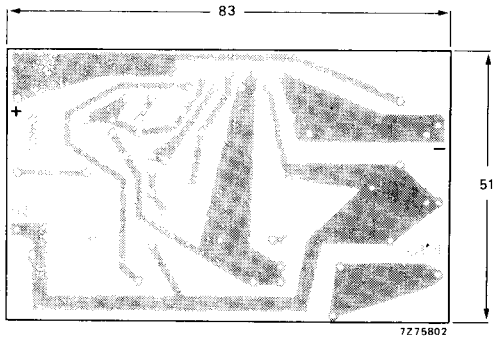
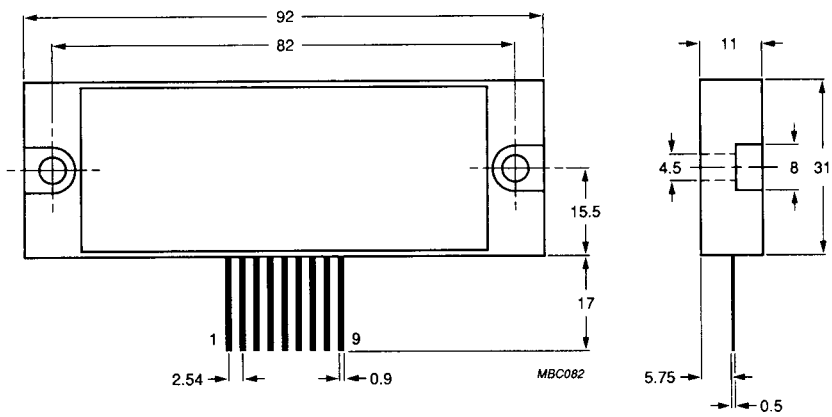


Fig.9 Track side of ZIL version.

PACKAGE OUTLINE



Dimensions in mm.

Fig.10 Encapsulation.