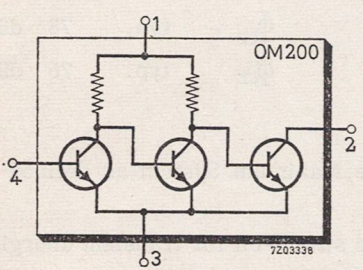
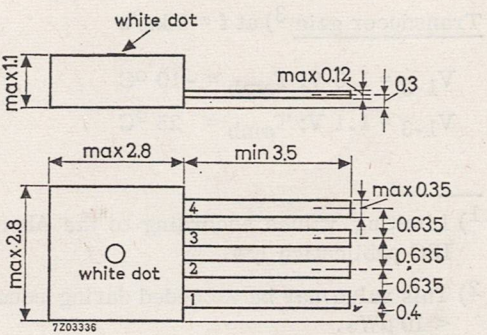
INTEGRATED CIRCUIT
AMPLIFIER FOR IN THE EAR HEARING AID

Monolithic semiconductor integrated-circuit amplifier in a plastic envelope, primarily intended for in the ear hearing aids.

QUICK REFERENCE DATA				
For meaning of symbols: see page 3 fig.1.				
Supply voltage	V_{1-3}	max.	5	V
Output current	I_2	max.	5	mA
In a practical circuit as given at page 3 fig.1:				
Total supply current	I_{tot}	typ.	1	mA
Transducer gain	Φ_{tr}	>	75	dB
		typ.	80	dB
Power output at d_{tot} = 10 %	P_o	>	0.2	mW
Frequency cut-off (–3 dB)	f_c	>	20	kc/s
Total device dissipation	P_{tot}	max.	25	mW

MECHANICAL DATA Dimensions in mm





The sealing of the plastic envelope withstands the accelerated damp heat test of IEC recommendation 68 (test D, severity IV, 6 cycles).

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RATINGS (Limiting values) [1]
(for meaning of symbols see page 3, fig.1)

Voltages				
Supply voltage	V_{1-3}	max.	5	V
Output voltage	V_{2-3}	max.	5	V [2]
Input voltage	$-V_{4-3}$	max.	5	V
Currents				
Output current	I_2	max.	5	mA
Input current	I_4	max.	5	mA
Dissipation				
Total device dissipation (See page A)	P_{tot}	max.	25	mW
Temperatures				
Storage temperature	T_{stg}	−20 to +80		°C
Ambient temperature	T_{amb}	max.	80	°C

CHARACTERISTIC RANGE VALUES FOR EQUIPMENT DESIGN
at V_{1-3} = 1.3 V and T_{amb} = 25 °C unless otherwise specified
I_2 see fig.1

Supply current (no signal)	I_{tot}	<	1.2	mA
	I_1	typ.	0.34	mA
Transducer gain [3] at f = 1 kc/s	Φ_{tr}	>	75	dB
		typ.	80	dB
V_{1-3} = 1.3 V; T_{amb} = −10 °C	Φ_{tr}	typ.	78	dB
V_{1-3} = 1.1 V; T_{amb} = 25 °C	Φ_{tr}	typ.	76	dB

1) Limiting values according to the Absolute Maximum System as defined in IEC publication 134.

2) This value may be exceeded during inductive switch-off for transient energies < 10 μWs.

3) The transducer gain is defined as the ratio of the output power in the load of Z = 1.5 kΩ and the available input power of the source with R_S = 5 kΩ

$$\Phi_{tr} = \frac{P_o}{V_i^2/4R_S}$$

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CHARACTERISTIC RANGE VALUES FOR EQUIPMENT DESIGN (continued)

at V_{1-3} = 1.3 V and T_{amb} = 25 °C unless otherwise specified
I_2 see figure 1

Total distortion at f = 1 kc/s				
P_o = 100 μW	d_{tot}	typ.	4	%
		<	6	%
P_o = 200 μW	d_{tot}	<	10	%
Noise figure at R_S = 5 kΩ				
bandwidth = 400 to 3200 c/s	F	<	6	dB
Frequency cut-off (−3 dB)	f_c	>	20	kc/s
Value of R_F to adjust I_2 at 0.7 mA	R_F	>	50	kΩ
		typ.	300	kΩ
		<	700	kΩ

I_2 = 0.7 mA,
adjusted by means of R_F.
V_{1-3} = 1.3 V; T_{amb} = 25 °C.

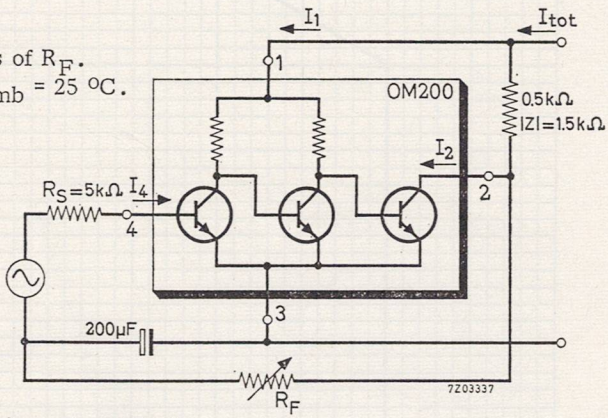

Fig.1

SOLDERING RECOMMENDATION

A: Iron soldering

At a maximum iron temperature of 300 °C the maximum permissible soldering time is 3 seconds, provided the soldering spot is at least 0.5 mm from the seal and the leads are not soldered at the same time. Soldering in immediate subsequence is allowed.

B: Dip soldering

At a maximum solder temperature of 250 °C the maximum permissible soldering time is 3 seconds, provided the soldering spot is at least 0.5 mm from the seal.

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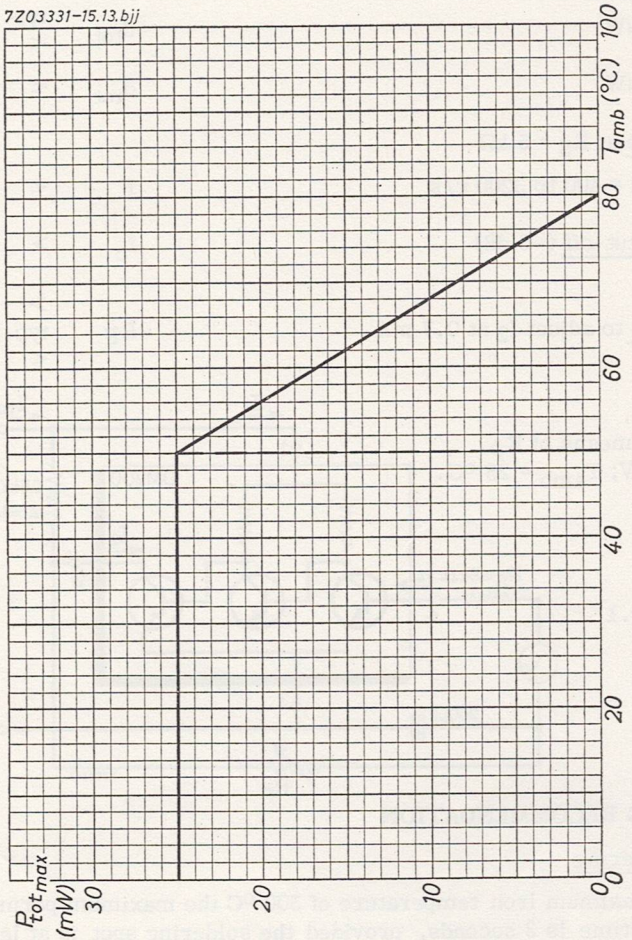
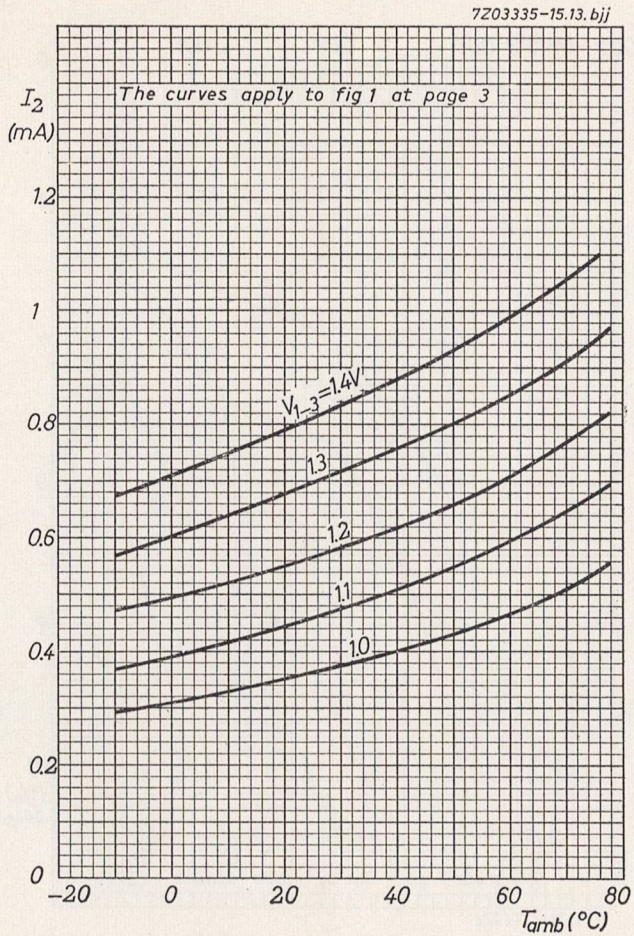
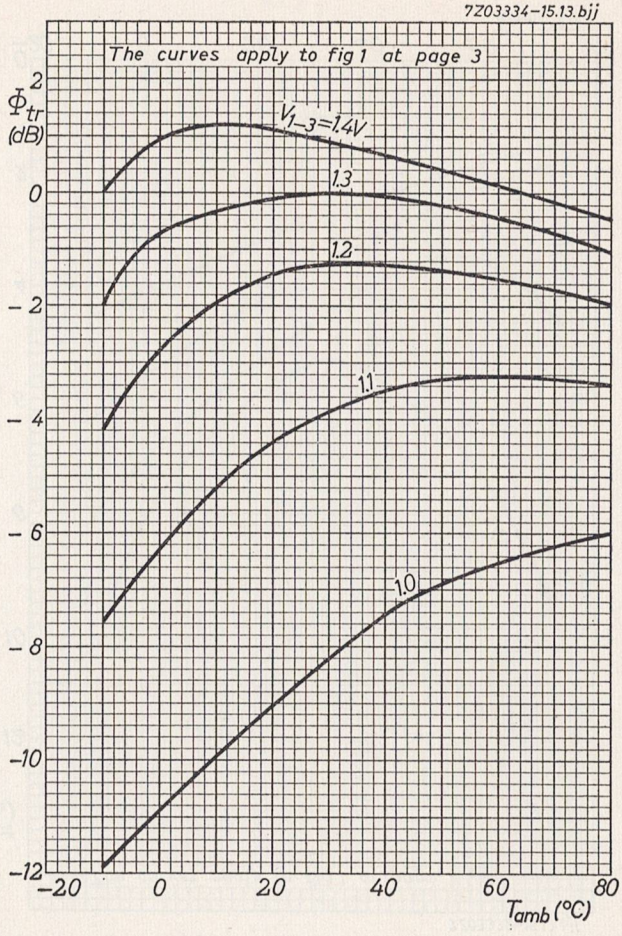
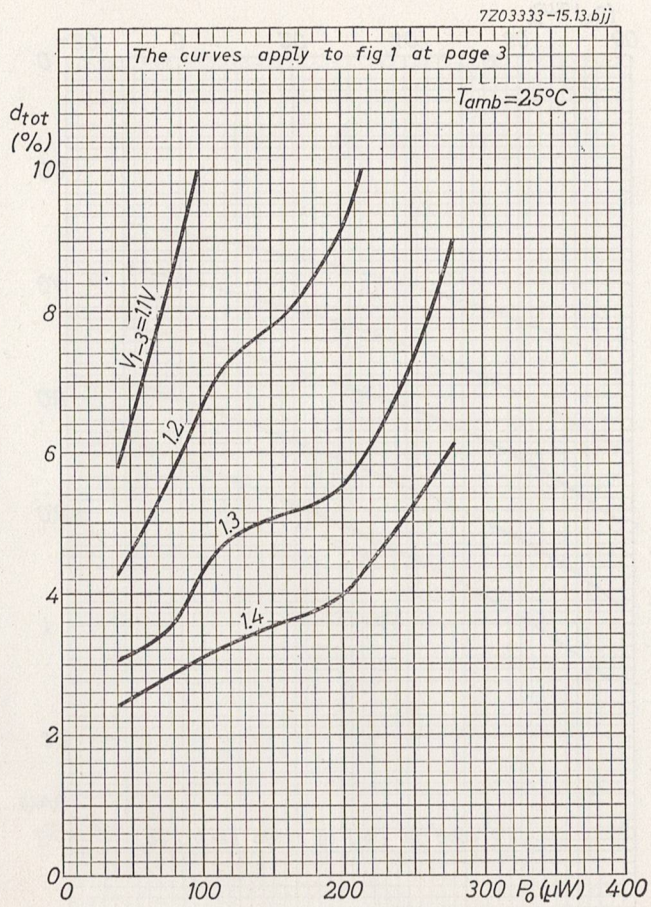
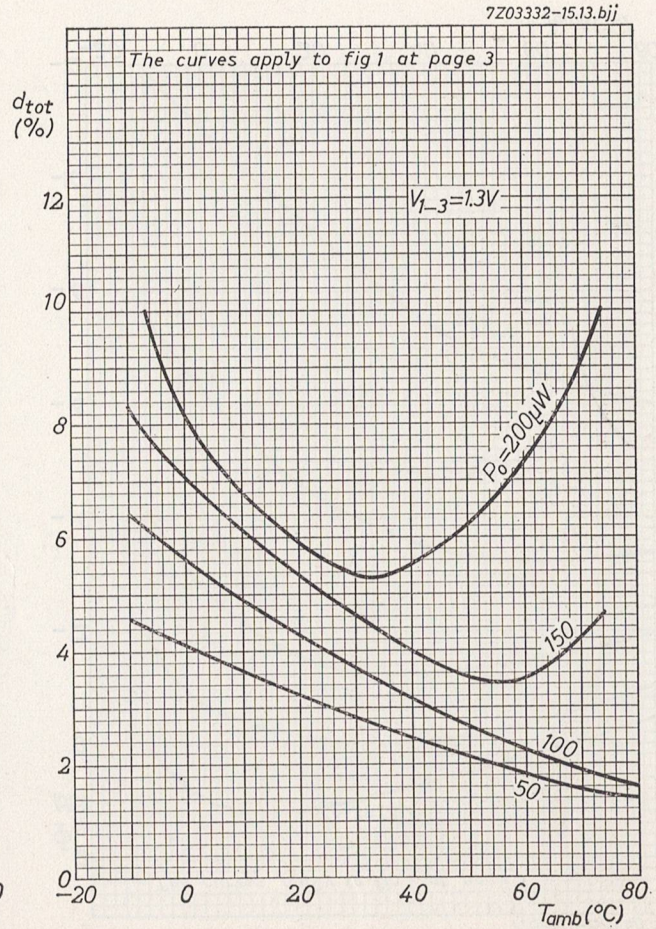

7Z03331-15.13.bjj
$P_{tot\,max}$ (mW)
30
20
10
0
0
20
40
60
80
100
T_{amb} (°C)


7Z03335-15.13.bjj
The curves apply to fig 1 at page 3
I_2 (mA)
1.2
1
0.8
0.6
0.4
0.2
0
V_{1-3}=1.4V
1.3
1.2
1.1
1.0
−20
0
20
40
60
80
T_{amb} (°C)


7Z03334-15.13.bjj
The curves apply to fig 1 at page 3
Φ_{tr} (dB)
2
0
− 2
− 4
− 6
− 8
−10
−12
V_{1-3}=1.4V
1.3
1.2
1.1
1.0
−20
0
20
40
60
80
T_{amb} (°C)


7Z03333-15.13.bjj
The curves apply to fig 1 at page 3
T_{amb}=25°C
d_{tot} (%)
V_{1-3}=1.1V
1.2
1.3
1.4
0
2
4
6
8
10
0
100
200
300
P_o (μW)
400


7Z03332-15.13.bjj
The curves apply to fig 1 at page 3
d_{tot} (%)
V_{1-3}=1.3V
P_o=200μW
150
100
50
0
2
4
6
8
10
12
−20
0
20
40
60
80
T_{amb} (°C)