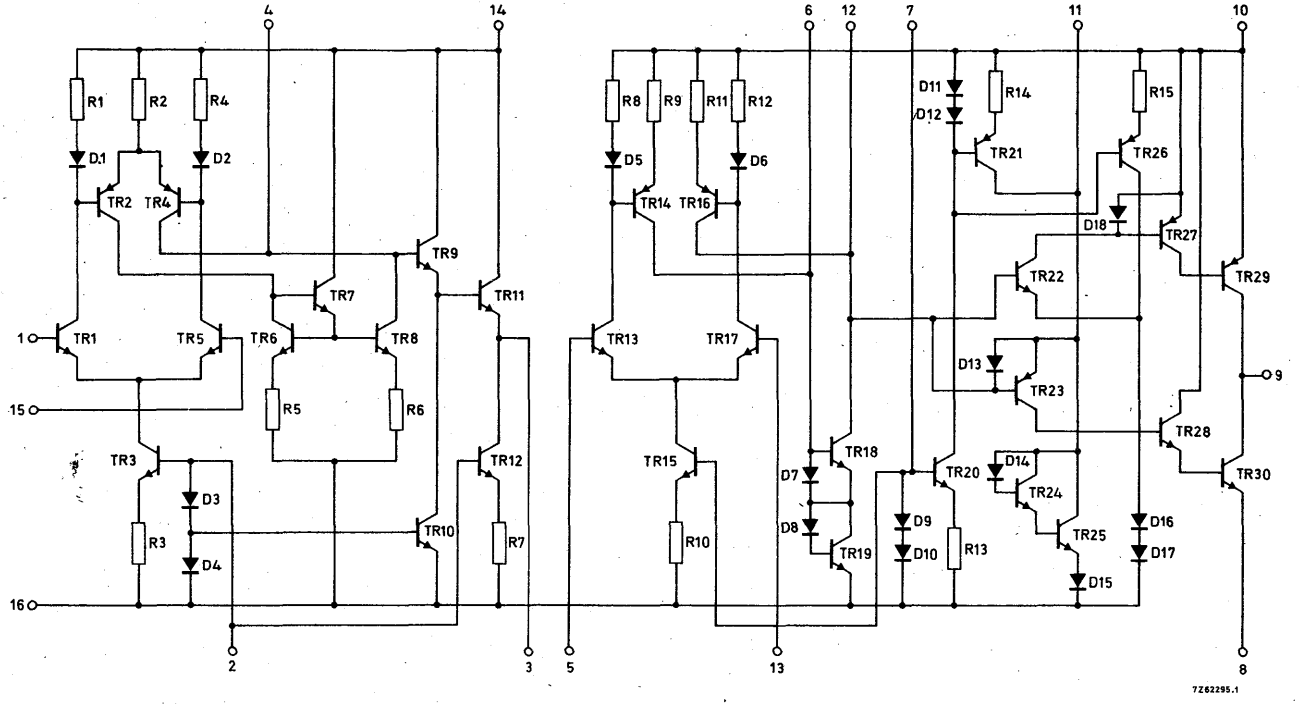
AUDIO AMPLIFIER AND PRE-AMPLIFIER

The TCA210 is a monolithic integrated circuit comprising two amplifiers for use in intercoms and other audio systems. The first is a high-gain pre-amplifier with differential input and a class-A output stage which can deliver 2,5 mW into an 800 Ω load. The second is a power amplifier with a class-B output stage capable of delivering 500 mW into a 25 Ω load.
Speech rating: up to 800 mW can be delivered into a 15 Ω load for short periods.
When there is no signal, the current consumption is 8 mA (typ.). Squelch provision incorporated in both amplifiers can be used to ensure maximum battery life.

QUICK REFERENCE DATA				
Supply voltage	V_P	nom.	12	V
Total current drain	I_{tot}	typ.	8	mA
Pre-amplifier				
Open loop voltage gain	G_v	typ.	10 000	
Output power at R_L = 800 Ω	P_o	typ.	2,5	mW
Noise figure (B = 300 to 4000 Hz) R_S = 500 Ω	F	<	6	dB
Unity-gain bandwidth (compensated)	B	>	10	MHz
Output amplifier				
Open loop voltage gain	G_v	typ.	500	
Output power at R_L = 25 Ω; d_{tot} = 5%	P_o	typ.	500	mW
at R_L = 15 Ω; d_{tot} = 5%	P_o	typ.	800	mW

PACKAGE OUTLINE plastic 16-lead dual in-line (see general section).

CIRCUIT DIAGRAM



RATINGS Limiting values in accordance with the Absolute Maximum System (IEC 134)

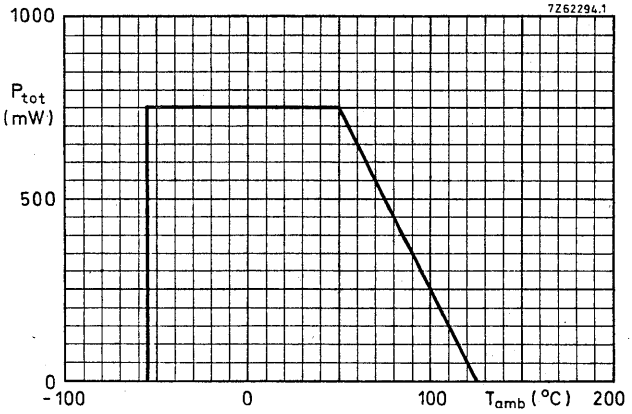
Voltages; pin 8 must be externally connected to pin 16

Pins 3, 9, 10, 14 with respect to pin 16	max.	17	V
Pins 1, 15, 5, 13 with respect to pin 16	max.	17	V [1]
Pin 1 with respect to pin 15	max.	±5	V
Pin 5 with respect to pin 13	max.	±5	V

Currents

Pin 10	max.	550	mA
Pin 9	max.	±550	mA
Pin 8	max.	550	mA
Pin 14	max.	20	mA
Pin 3	max.	±20	mA
Pins 2, 4, 6, 7, 11, 12	max.	5	mA
Pins 1, 15, 5, 13	max.	0,5	mA

Total power dissipation



Temperatures

Storage temperature	T_{stg}	−55 to +125	°C
Operating ambient temperature (see also graph)	T_{amb}	−55 to +125	°C

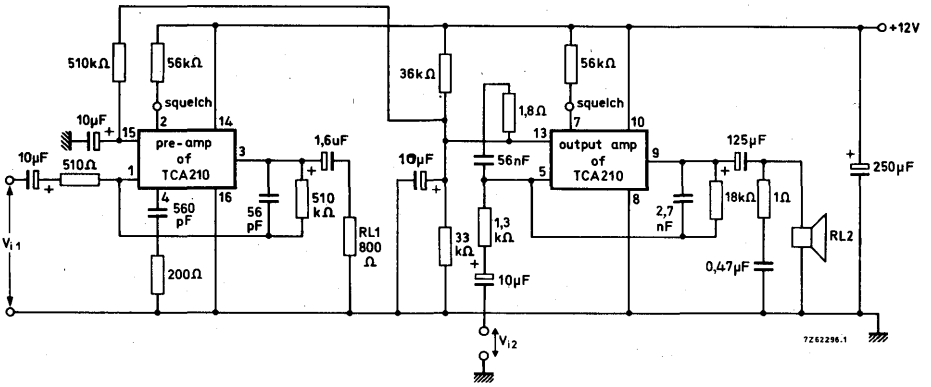
[1]) For a supply voltage less than 14 V, the maximum input voltage is equal to the supply voltage.

CHARACTERISTICS at T_{amb} = 25 °C; V_P = 12 V

Input bias current; pins 1 and 15	$\frac{1}{2}(I_1+I_{15})$	typ.	2,5	μA
Total current; pin 14	I_{14}	typ.	4	mA
Bias current; pin 2	I_2	typ.	200	μA
Input current; pins 5 and 13	$\frac{1}{2}(I_5+I_{13})$	typ.	2	μA
Total current; d.c.; no signal; pin 10	I_{10}	typ.	4	mA
Bias current; pin 7	I_7	typ.	150	μA
Pre-amplifier				
Open-loop voltage gain	G_v	>	65	dB
		typ.	80	dB
Noise figure at R_S = 5 kΩ; B = 300 to 4000 Hz	F	typ.	4	dB
Current in the output transistor	I_C	>	2,5	mA
Unity gain bandwidth with 6 dB/oct compensation	B	typ.	10	MHz
Output amplifier				
Open loop voltage gain	G_v	typ.	54	dB
Total distortion at f = 1 kHz; P_o = 50 mW; R_L = 25Ω	d_{tot}	typ.	1,5	%
Maximum output power at d_{tot} = 5%; R_L = 25Ω	P_o	typ.	450	mW

APPLICATION INFORMATION

Pre-amplifier and output amplifier for intercom systems



Performance T_{amb} = 25 °C; V_P = 12 V

Pre-amplifier

Output power at R_{L1} = 800 Ω	P_o	typ.	2,5	mW
Bandwidth (−3 dB)	B	typ.	4	kHz
Total current	I_{14}	typ.	4,0	mA
Input signal	V_{il}	typ.	1,5	mV
Input impedance	$\|Z_i\|$	typ.	500	Ω

Output amplifier

Output power at R_{L2} = 25 Ω; d_{tot} = 5%	P_o	typ.	500	mW
at R_{L2} = 15 Ω; d_{tot} = 5%	P_o	typ.	800	mW
Bandwidth (−3 dB)	B	typ.	4	kHz
Total distortion at P_o = 50 mW	d_{tot}	typ.	1,5	%
Input signal	V_{i2}	typ.	260	mV
Input impedance	$\|Z_i\|$	typ.	1,3	kΩ
Total current (d.c.; no signal; pin 10)	I_{10}	typ.	4	mA