MICROPHONE AMPLIFIER

The TAA970 is a monolithic integrated microphone amplifier for use in telephone systems.
It is compatible with both piezo-electric and dynamic microphones of suitable impedance
and sensitivity.
Special features are:
- almost constant voltage gain and d.c. voltage drop with supply current variations of
  10 to 100 mA.
- output voltage before limiting: 1 V (r.m.s. value)
- operation is independent of supply voltage polarity
- gain can be set to either of two values
- only one external capacitor required
- output impedance determined by internal feed back
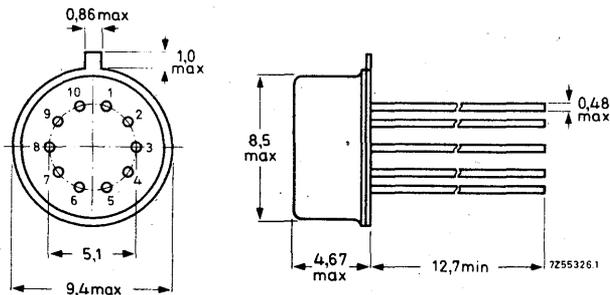
QUICK REFERENCE DATA				
Supply current	$\pm I_2$		10 to 100	mA
Supply voltage drop at $\pm I'_2 = 50$ mA	$\pm V_{2-4}$	typ.	4,8	V
Voltage gain				
pin 9 not connected	G_v	typ.	150	
pin 9 connected to pin 10	G_v	typ.	210	
Output impedance				
pin 9 not connected	R_o	typ.	60	Ω
pin 9 connected to pin 10	R_o	typ.	100	Ω

PACKAGE OUTLINE

TO-74 (reduced height)   Dimensions in mm

CIRCUIT DIAGRAM

R3 10kΩ R5 2kΩ

20pF 23 kΩ R17 R 23 4,5 Ω

R15 7kΩ D9 TR7

TR9

D11

R19 7,6kΩ TR11

R21 3,9kΩ

○ 4

○ 2

D1 D2 D5 D6

R1 7,5kΩ

D7

TR2 TR3

R4 10kΩ R7 2kΩ

R11 200kΩ

R10 2kΩ

TR6

20pF

23kΩ R18

R16 7kΩ D10 TR8

R 24 4,5 Ω

TR1

TR5

TR10

R20 7,6kΩ TR12

D12

D3

R6 800Ω

R9 200kΩ TR4

R12 400Ω

D4

R2 2kΩ

D8

R8 1,8kΩ

R13 85Ω R14 85Ω

R22 3,9kΩ

○ 10

6   8   9

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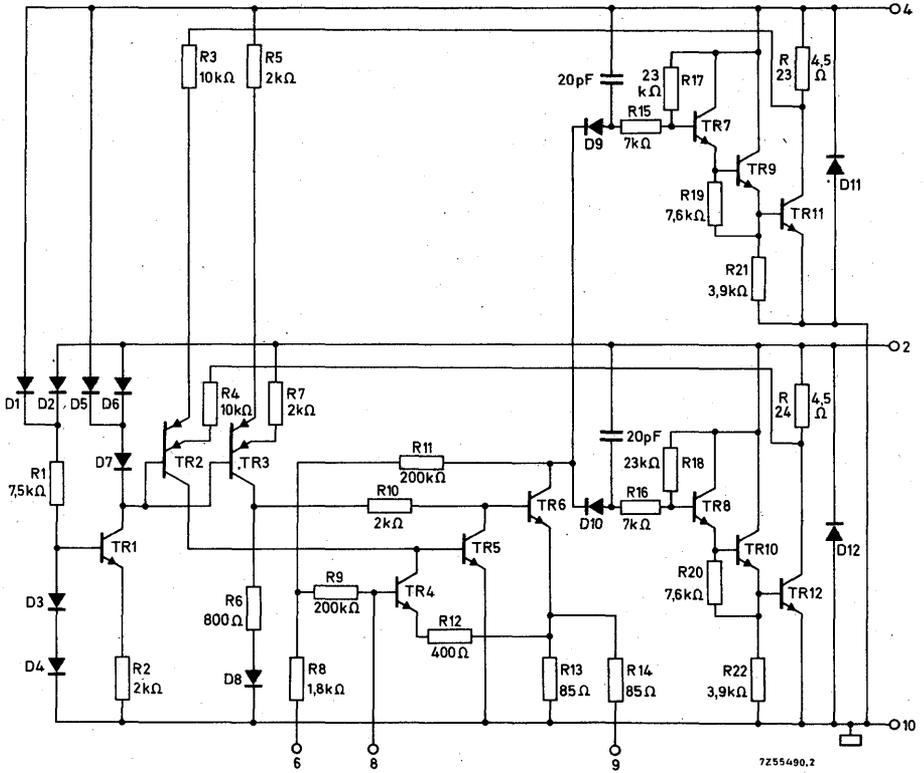
RATINGS Limiting values in accordance with the Absolute Maximum System (IEC 134)

Currents

Supply current (d.c.)	I_2		-100 to $+100$	mA
A.C. component of supply current (peak value)	I_{2m}	max.	100	mA
Pin No. 6 current	I_6	max.	100	μA
Pin No. 8 current	I_8	max.	100	μA

Power dissipation

Total power dissipation	P_{tot}	max.	700	mW
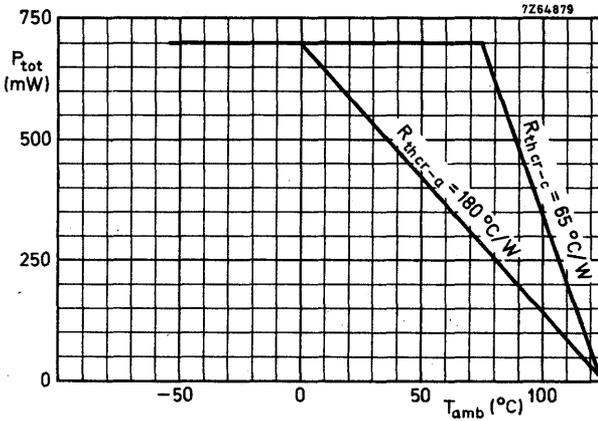
Temperatures

Storage temperature	T_{stg}		-55 to $+125$	^oC
Operating ambient temperature	T_{amb}		-35 to $+75$	^oC

THERMAL RESISTANCE

From crystal to case	$R_{th\ cr-c}$	$=$	65	$^oC/W$
From crystal to ambient	$R_{th\ cr-a}$	$=$	180	$^oC/W$

CHARACTERISTICS at $R_L = 200 \, \Omega$; $f = 2$ kHz; $T_{amb} = 25 \, ^oC$ unless otherwise specified.
(see test circuit below).

Supply voltage drop at $R_{th \, j-a} = 100 \, ^oC/W$

$\pm I_2 = 10$ mA	$\pm V_{2-4}$	3,4 to 5,4	V
$\pm I_2 = 50$ mA	$\pm V_{2-4}$	3,8 to·5,8	V
$\pm I_2 = 100$ mA	$\pm V_{2-4}$	4,3 to 6,0	V

Voltage gain

pin 9 not connected $\{$ $\pm I_2 = 10$ mA	G_v	typ. 140 / 105 to 165	
$\pm I_2 = 50$ mA	G_v	typ. 150 / 125 to 165	
pin 9 connected to pin 10 $\{$ $\pm I_2 = 10$ mA	G_v	typ. 200 / 150 to 230	
$\pm I_2 = 50$ mA	G_v	typ. 210 / 180 to 230	

Change of voltage gain

when changing T_{amb} from $-20 \, ^oC$ to $+55 \, ^oC$	ΔG_v	< 10	%

Gain reduction at $f = 300$ Hz

(with respect to $f = 2$ kHz)	ΔG_v	typ. 1	dB
		< 3	dB

Output impedance at $\pm I_2 = 50$ mA

pin 9 not connected	R_o	typ. 60	Ω
pin 9 connected to pin 10	R_o	typ. 100	Ω

Noise output voltage at $B = 0,3$ kHz to 4 kHz

pin 9 not connected	$V_{n(rms)}$	< 1	mV
pin 9 connected to pin 10	$V_{n(rms)}$	< 1,3	mV

Output voltage

$I_2 = 25$ mA; $d_{tot} = 5\%$	V_o	> 0,85	V
		typ. 1,0	V

Test circuit:

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