

Quasi-Parallel Sound Processor for TV Sets

Technology: Bipolar

Features

- High signal sensitivity
 - Simple filter configuration and few external components
 - Processing of two carrier stereo signals
 - ESD protected
 - Low intercarrier distortions
 - Alignment-free intercarrier mixer
 - Optimum tuning characteristics
 - Improved linearity for NICAM applications
 - AF output level matched to SIMAVELEC condition
- Case:** DIP18

Block Diagram

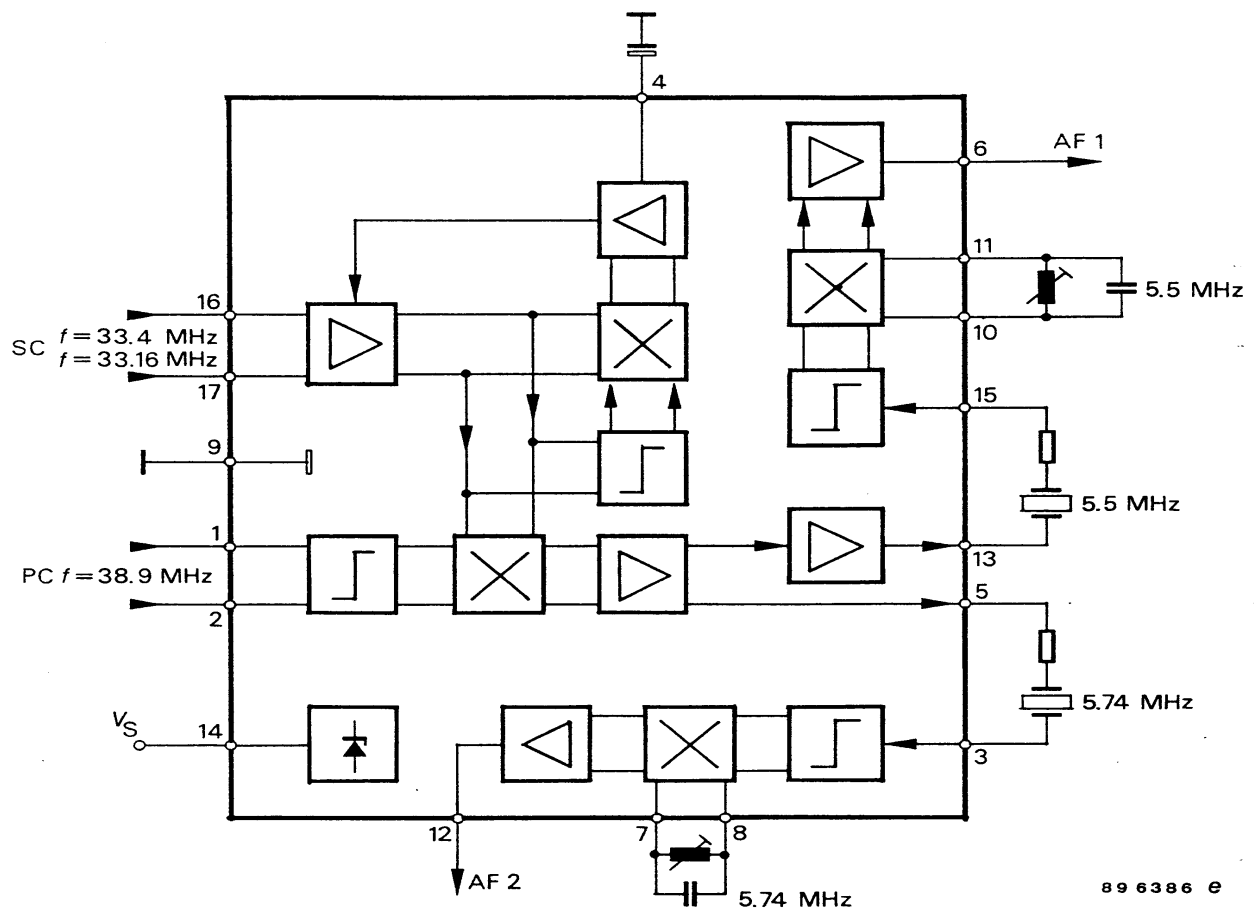


Figure 1.

Pin Configuration

| Pin | Function |
|-----|------------------------------|
| 1–2 | Vision-IF-carrier input |
| 3 | Intercarrier input 5.74 MHz |
| 4 | AGC storage capacitor |
| 5 | Intercarrier output 5.74 MHz |
| 6 | AF output 1 |
| 7–8 | FM demod circuit 5.74 MHz |
| 9 | Ground |

| Pin | Function |
|-------|-----------------------------|
| 10–11 | FM-demode circuit 5.5 MHz |
| 12 | AF output 2 |
| 13 | Intercarrier output 5.5 MHz |
| 14 | Supply voltage |
| 15 | Intercarrier input 5.5 MHz |
| 16–17 | Sound-IF-carrier input |
| 18 | Not connected |

Circuit Description

This circuit configuration permits high-quality processing of audio carriers for FM-sound standards, providing separate inputs for the video and audio carrier. The audio carrier signal is passed to two multiplying mixer arrangements via a 3-stage variable wideband amplifier with led level output signals. One mixer generates the gain-control signal. The second mixer operates as an intercarrier demodulator and supplies the intermediate AF carrier. The video carrier signal required from the intercarrier is decoupled in a prelimited and selected form from the demodulator tank of the intermediate video frequency circuit (TDA4453 or

TDA4439) and led to the intercarrier mixer via a limiting amplifier. Depending on the system, the Nyquist range of the IF input filter in the video channel affects the attainable AF signal-to-noise ratio.

The audio PM IF carrier reaches the quadrature demodulators via an inter-connected IF filter and subsequent limiting amplifier. The resulting AF signals are led via a low-pass amplifier with increased level to the buffered output stages. Switching can take place with TTL-equivalent levels.

Absolute Maximum Ratings

Reference point Pin 9, 18, unless otherwise specified

| Parameters | Symbol | Value | Unit |
|--|-----------|-------------|------|
| Supply voltage Pin 14 | V_S | 10 to 13.5 | V |
| Supply current Pin 14 | I_S | 80 | mA |
| External voltages Pins 1, 2, 3, 4, 5, 7, 8, 10, 11, 12, 13, 15, 16 and 17 | V_{ext} | 6 | V |
| Power dissipation (in soldered position) | P_{tot} | 1 | W |
| Junction temperature | T_j | 125 | °C |
| Ambient temperature range | T_{amb} | –25 to +70 | °C |
| Storage temperature range | T_{stg} | –25 to +125 | °C |

Thermal Resistance

| Parameters | Symbol | Maximum | Unit |
|------------------|------------|---------|------|
| Junction ambient | R_{thJA} | 60 | K/W |

Electrical Characteristics

$V_S = 12\text{ V}$, $T_{\text{amb}} = 25^\circ\text{C}$, reference point Pin 9, $f_{\text{PC}} = 38.9\text{ MHz}$, $f_{\text{SC1}} = 33.43\text{ MHz}$, $f_{\text{SC2}} = 33.1578\text{ MHz}$, $\text{SC1/SC2} = 7\text{ dB}$, unless otherwise specified

| Parameters | Test Conditions / Pin | Symbol | Min | Typ | Max | Unit |
|---|---|------------------------|-----|-------|------|---------------|
| Supply voltage range | Pin 14 | V_S | 10 | | 13.5 | V |
| Supply current | Pin 14 | I_S | 55 | 62 | 80 | mA |
| Output dc voltage | Pin 6, 12 | V_0 | | 3.6 | | V |
| Picture carrier input voltage | Pin 1–2 | v | 10 | 20 | 30 | mV |
| Min. sound carrier input voltage SC1 | (5.5 MHz-output signal –3 dB) Pin 16–17 | v | | 50 | | μV |
| AGC range | | | 60 | 65 | | dB |
| Audio output voltage | FM deviation = 27 kHz, Pin 6, 12 | v | | 500 | | mV |
| Audio-voltage difference between both outputs | Pin 6, 12 | Δv_{AF} | | | 1 | dB |
| Harmonic distortion ¹⁾ | $f_{\text{mod}} = 1\text{ kHz}$, FM deviation = 30 kHz Pin 6, 12 | THD | | 0.5 | | % |
| Limiting threshold | ($V_{\text{AF}} - 3\text{ dB}$) | | | 250 | | μV |
| AM rejection | $f_{\text{mod}} = 1\text{ kHz}$, $m = 30\%$ ³⁾ $V_{3(15)} = 10\text{ mV}$, $f = 5.5\text{ (5.74) MHz}$ | | | 55 | | dB |
| FM amplifier input resistance | | $R_{3,15}$ | | 560 | | Ω |
| Min. output load | Pin 6,12 | R | 3 | | | k Ω |
| Signal-to-noise ratio (standard B/G) according to CCIR 468-2 specifications v_{16-17} : SC1 = 10 mV, SC2 = 4.5 V PC: $v_{1-2} = 20\text{ mV}$, prelimited demodulator picture carrier signal from TDA4453 | | | | | | |
| Black burst | 1. channel/ 2. channel ^{2,3)} Pin 6,12 | (S+N)/N | | 62/60 | | dB |
| Grid test signal | 1. channel/ 2. channel ^{2,3)} Pin 6,12 | (S+N)/N | | 50/48 | | dB |

- 1) FM tank circuits: operation quality factor = 22
- 2) Standard B/G IF-modulated FBAS signal
- 3) Reference signal: $f_{\text{mod}} = 1\text{ kHz}$, FM deviation = 30 kHz

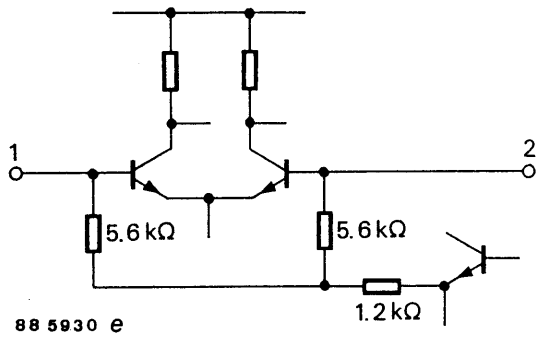


Figure 2. Pin 1, 2: IF input vision carrier

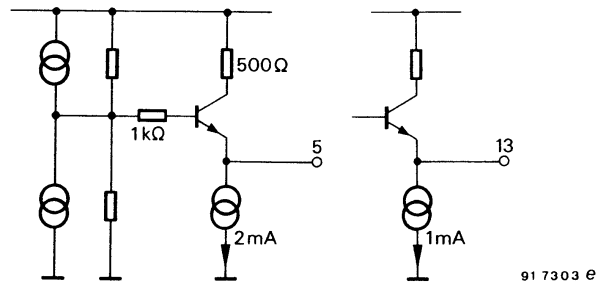


Figure 5. Pin 5 (13): Intercarrier output
Pin 5 = 5.74 MHz, Pin 13 = 5.5 MHz

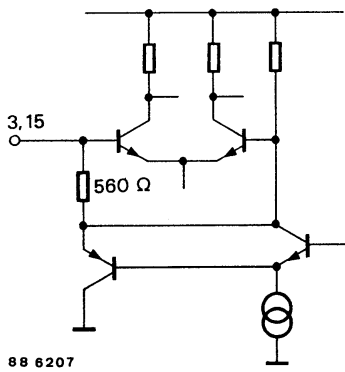


Figure 3. Pin 3 (15): Intercarrier input
Pin 3 = 5.74 MHz, Pin 15 = 5.5 MHz

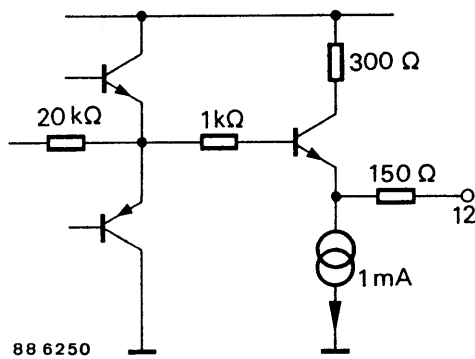


Figure 6. Pin 12: AF output 2

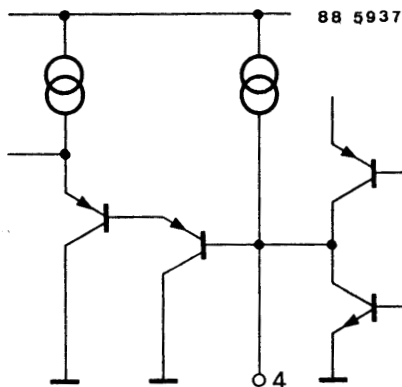


Figure 4. Pin 4: AGC storage capacitor

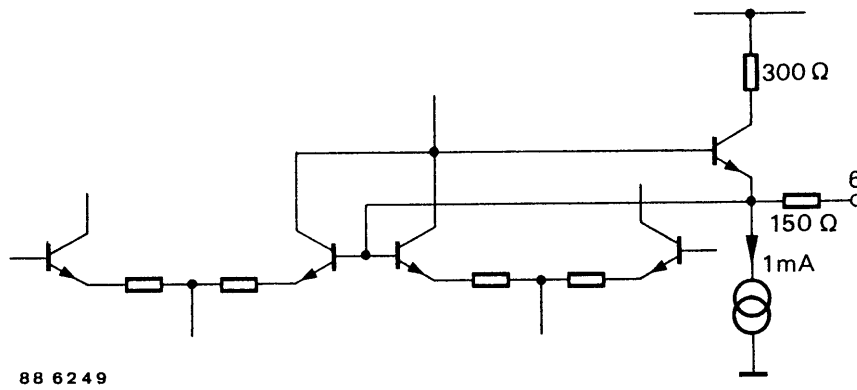


Figure 7. Pin 6: AF output 1

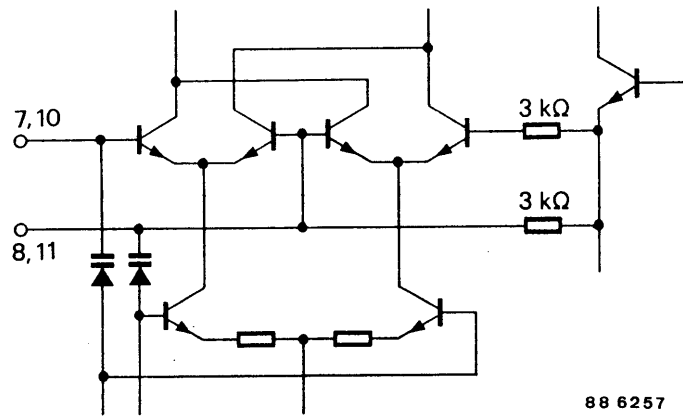


Figure 8. Pin 7, 8 (10, 11) FM demodulator circuit
Pin 7,8 = 5.74 MHz, Pin 10, 11 = 5.5 MHz

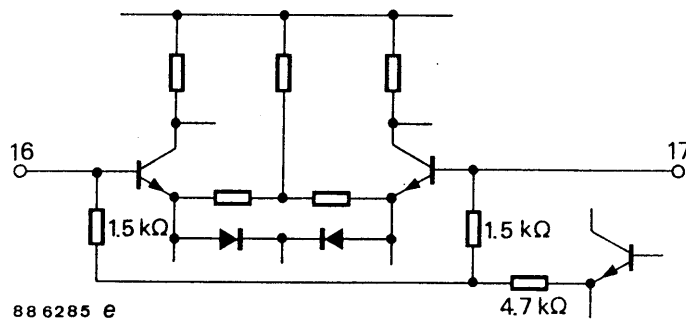
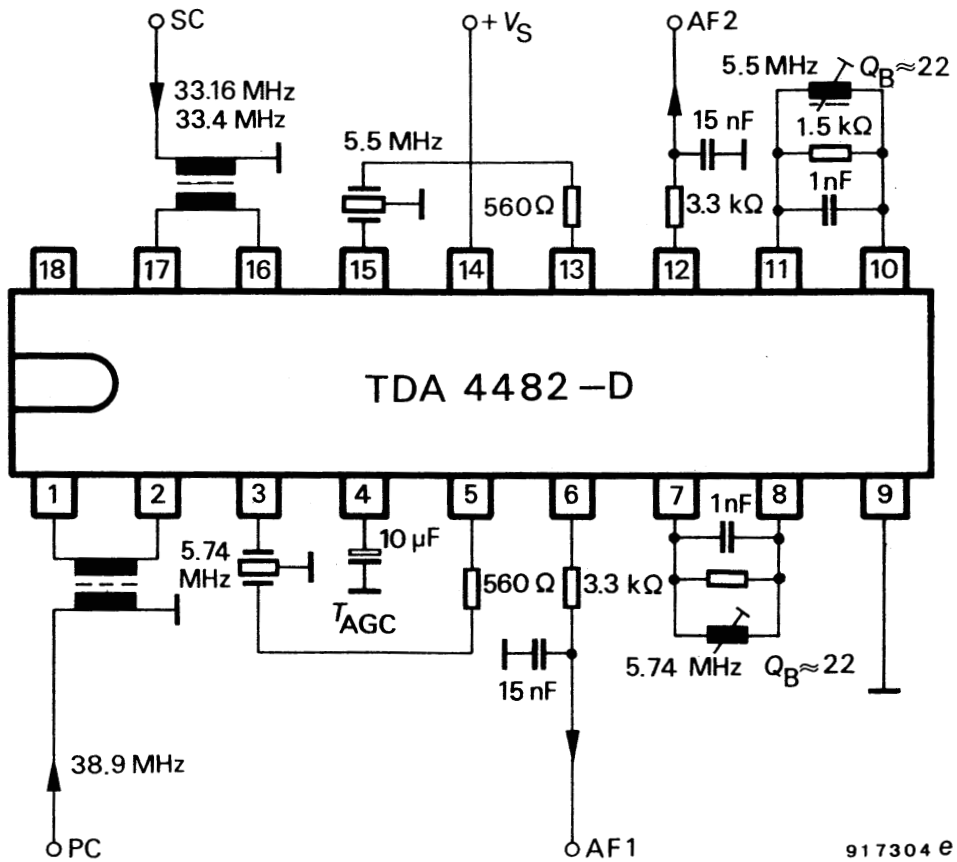


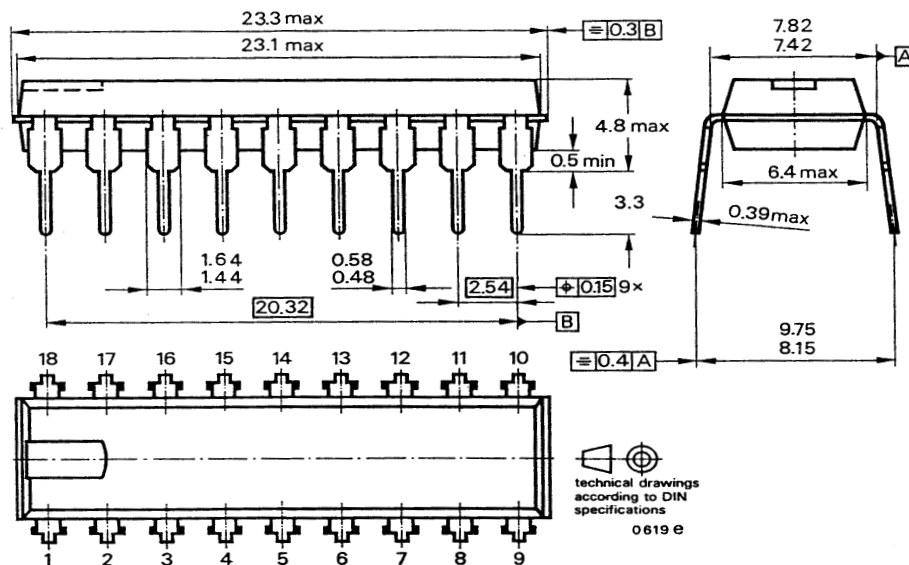
Figure 9. Pin 16, 17: IF input sound carrier

Test Circuit



Dimensions in mm

Case: 18-Pin dual inline plastic



Case:
DIP 18

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2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

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2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

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