# Video IF Amplifier for Multistandard TV Receiver and VTR Appliances

## Technology: Bipolar

## Features

- Interference suppression
- Standard B/G-L suitable, processes negatively and positively modulated IF-signals with equal polarity of the output signal
- Ultra white inverter and ultra black limiter for reducing transmission interference
- Internally noise protected gain control, no flyback pulses required
- Expanded video frequency response allows the demodulation of amplitude modulated MAC signals
- High input sensitivity
- Minimal intermodulation interference
- Fast AGC by controlled discharge of the AGC capacitor
  Standard L mode: AGC acting on peak white level, capacitor discharge control by averaged video signal

  Standard B/G: AGC acting on the sync. pulse peak
- Small differential error
- Constant input impedance
- Video output voltage with narrow tolerance
- Adapted output for insertion of ceramic transducers as intrinsic sound trap
- Connecting and basic circuitry compatible to the TEMIC video IF type programme - permits building block system for video IF module

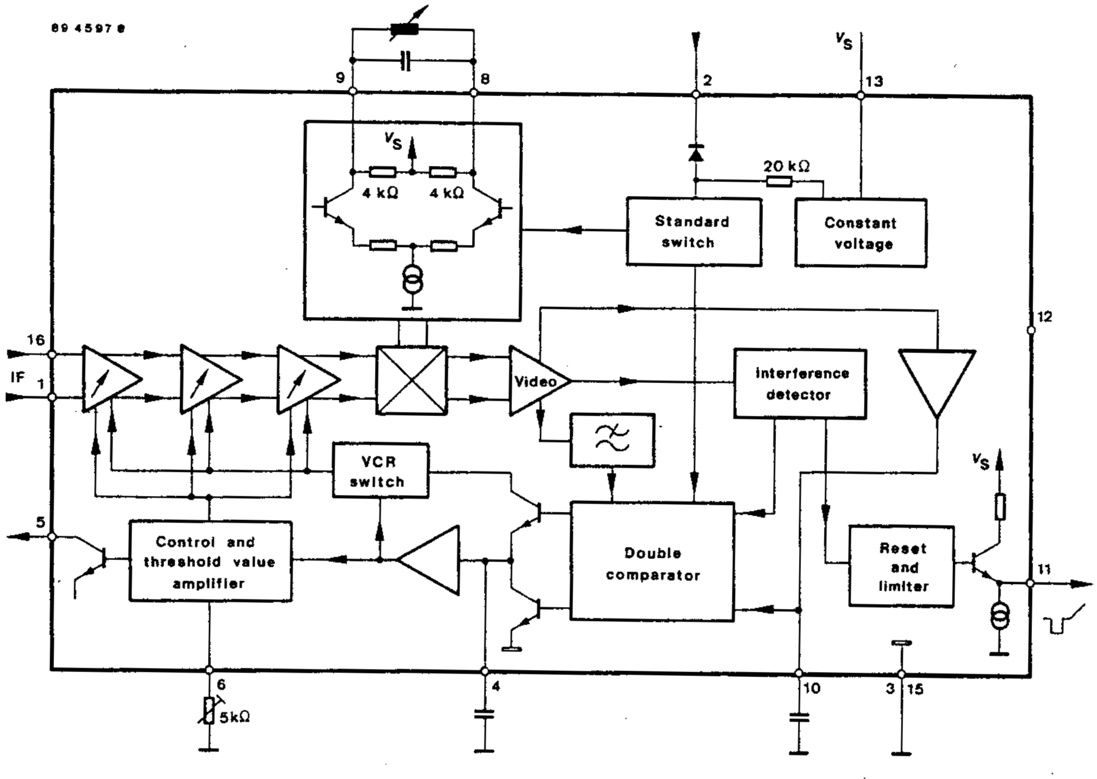



Figure 1. Block diagram

## Pin Description

| Pin | Function |
|---|---|
| 1,16 | IF-input |
| 2 | Standard switch: open B/G<br>ground L |
| 3,15 | Ground |
| 4 | IF-AGC storage capacitor |
| 5 | AGC (tuner control) |
| 6 | Tuner AGC take over |

| Pin | Function |
|---|---|
| 7 | Not connected |
| 8,9 | Demodulator circuit |
| 10 | Average capacitor standard L |
| 11 | Video output |
| 12 | Not connected |
| 13 | Supply voltage |
| 14 | Not connected |

## Circuit Description

The following function units are integrated in this circuit combination for video-IF processing:

- Three symmetric, highly stable, gain controlled wide-band amplifier, quasi galvanic coupling eliminates feed back
- Video carrier controlled demodulator of high linearity
- Polarity switch over for video
- Video output amplifier with low-pass characteristics, limiter for ultra black and inverter for ultra white interference
- High impedance, interference free controlled voltage facilities, best possible AGC time constant with small storage capacitor
- Controlled discharge circuit for fast gain control
- With VTR - operation the video output level is according to the ultra white level in B/G, ultra black level in L

## Absolute Maximum Ratings

Reference point Pin 3, unless otherwise specified

| Parameters | | Symbol | Value | Unit |
|---|---|---|---|---|
| Supply voltage | Pin 13 | $V_S$ | 10 to 13.5 | V |
| Supply current | Pin 13 | $I_S$ | 65 | mA |
| Open loop voltage | Pin 5 | $V_5$ | $V_S$ | V |
| External voltage | Pin 4<br>Pin 11 | $V_4$<br>$V_{11}$ | 10<br>8 | V |
| Breaking current for VTR operation | Pin 4 | $I_4$ | 0.3 | mA |
| Video output current<br>Max. load<br>Short circuit max 1 s | <br>Pin 11<br>Pin 11 | $I_O$ | <br>5<br>30 | mA |
| Power dissipation | $T_{amb} \leq 60°C$ | $P_{tot}$ | 1.0 | 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

| Parameters | Test Conditions / Pins | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Supply current | Pin 13 | $I_S$ | | 65 | | mA |
| Ultra white level at standard B/G [1] | Pin 11 | $V_o$ | 4.8 | 5.2 | 5.6 | V |
| Ultra black clamping level at standard B?G | Pin 11 | $V_o$ | 1.75 | 1.9 | 2.05 | V |
| Composite video output signal B/G [2] | Pin 11 | $v_{o(pp)}$ | 2.7 | 3.0 | 3.3 | V |
| Video signal standard L [3] | (black/white) Pin 11 | $v_{o(pp)}$ | 1.85 | 2.1 | 2.35 | V |
| Difference of the video signals standard L-B/G | Pin 11 | | | | 10 | % |
| Clamping level of black limiter | Pin 11 | $V_{11}$ | 250 mV below sync. (typ.) | | | |
| Threshold of the ultra white inverter | Pin 11 | $V_{11}$ | 900 mV upper ultra white level (typ.) | | | |
| Grey level of the ultra white inverter | Pin 11 | $V_{11}$ | | 3.6 | | V |
| Supply voltage influence on the ultra black level in standard B/G | Pin 11 | $\Delta V_{black}$ | | 0.5 | | %/V |
| Supply voltage influence on the ultra white level in standard B/G | Pin 11 | $\Delta V_{white}$ | | 1.0 | | %/V |
| Video bandwidth (–3 dB) | Pin 11 | $B_{Video}$ | | 10 | | MHz |
| Video frequency response over the AGC control range | Pin 11 | $\Delta V_{Video}$ | | | 2.0 | dB |
| Output DC current | $V_{11}$= 8 V Pin 11 | $I_{11}$ | | 2.8 | | mA |
| Response time of the peak white control in standard L [4] | Pin 4 | $t_r$ | | | 10 | µs |
| Voltage level standard B/G [5] | Pin 2 | $V_2$ | 2 | | $V_S$ | V |
| Voltage level standard L [5] | Pin 2 | $V_2$ | 0 | | 1.2 | V |
| Input sensitivity (symmetrical) [6] | $v_{14(pp)}$ =3.0 V Pin 1–16<br>$V_4$ = 0.8 V | $v_i$ | | 100 | | µV |
| IF-AGC gain reduction | | $\Delta P$ | 60 | | | dB |
| Available tuner AGC | 10 dB via AGC use Pin 5 | $I_5$ | 3 | 4 | | mA |
| Automatic tuner AGC with IF-control | Pin 6 not connected Pin 5 | AGC | | 61 | | dB |

1) All measurements Pin 11 without load
2) Residual carrier 10%
3) Blanking level 30% carrier amplitude
4) A peak white value for at least 10 µs must be transmitted for each complete frame
5) Direct control of standard reversing switch with TTL level
6) Sync. peak value standard B/G

| Parameters | Test Conditions / Pins | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| IF-residual voltage at the video output in the AGC area | f = 38.9 MHz Pin 11<br>f = 77.8 MHz | v | | 10<br>20 | | mV |
| Differential gain error | | d | | 3 | 5 | % |
| Differential phase error | | φ | | 3 | 5 | degree |
| Sound-chroma beat (1.07 MHz intermodulation) relating to demodulated auxiliary colour carrier<br>Video carrier = 0 dB<br>Colour carrier = –6 dB<br>Sound carrier = –24 dB | | $\alpha_{IM}$ | | 50 | | dB |
| Upsetting factor sync. pulse | | $\frac{\Delta V_{Sync}}{V_{Sync}}$ | | 3 | | % |
| Input impedance | Pin 1–16 | $R_i$<br>$C_i$ | | 1.6<br>2 | | kΩ<br>pF |
| **Video switch** | | | | | | |
| Control voltage | RF operation<br>VTR operation | V4<br>$I_4$ | 8 | | 10<br>150 | V<br>µA |

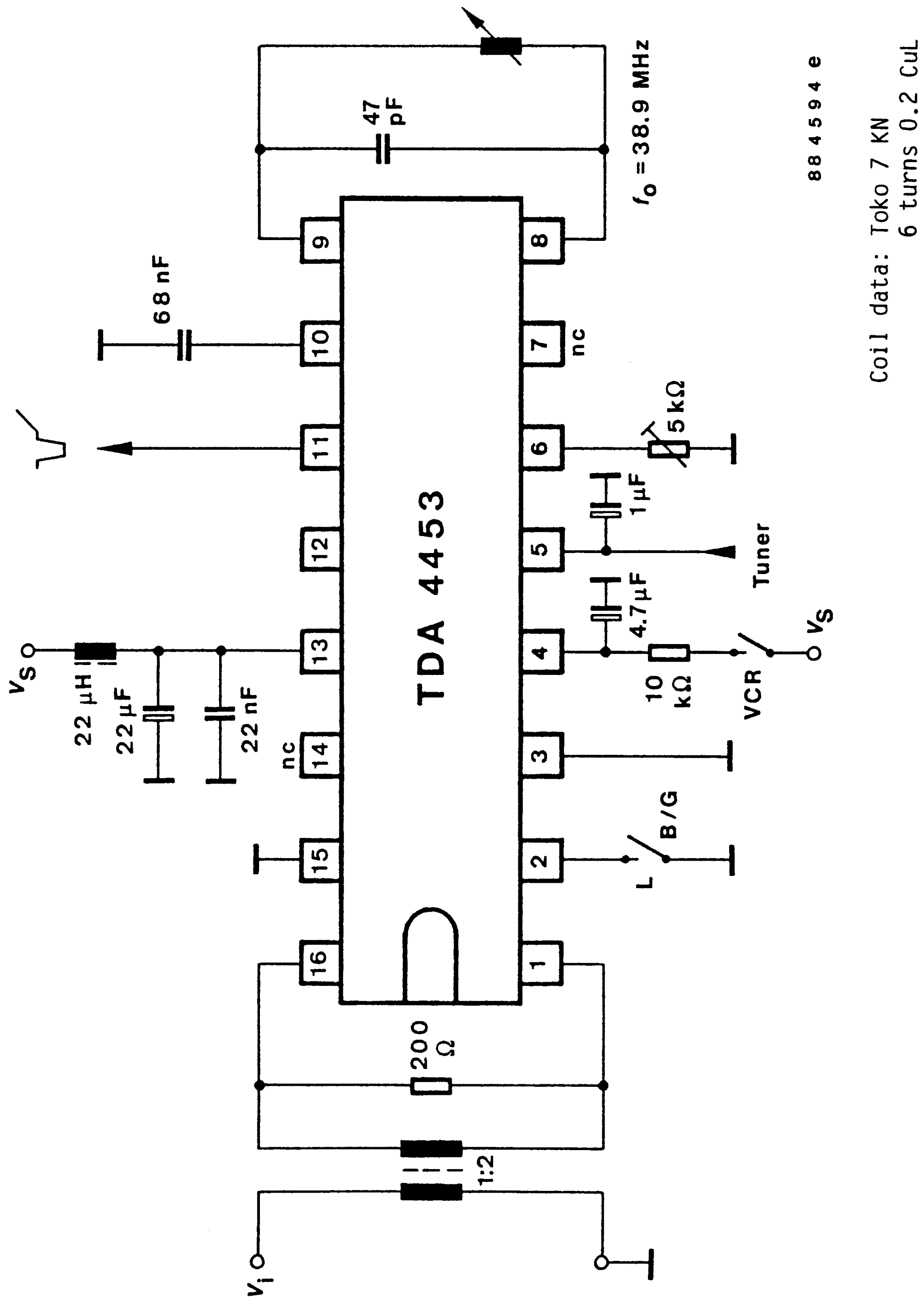
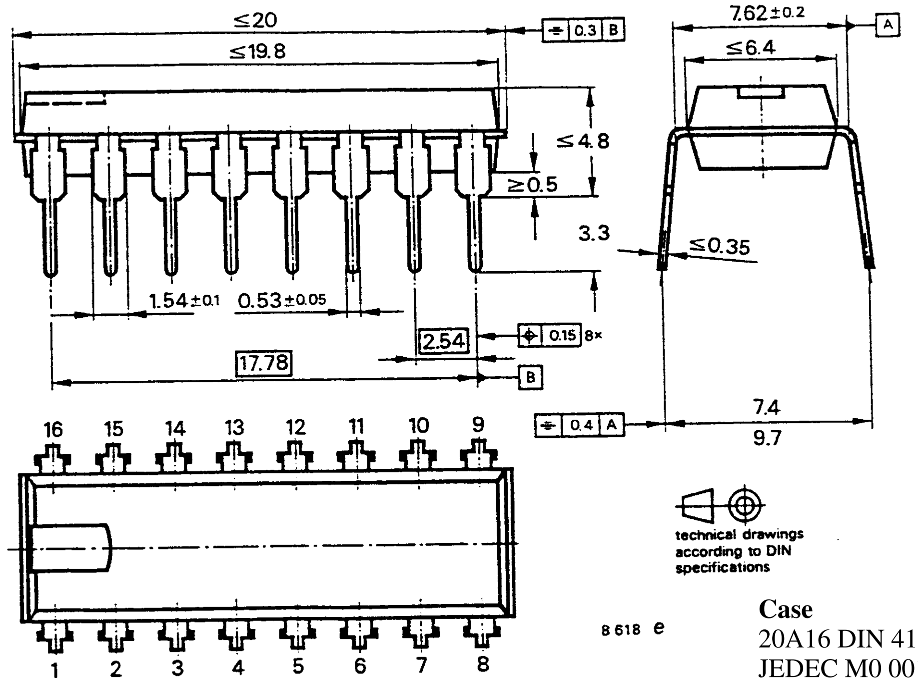



Figure 2. Test circuit

## Dimensions in mm

**Package:** 16-pin dual inline plastic




**Case**
20A16 DIN 41866
JEDEC M0 001 AC

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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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