

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

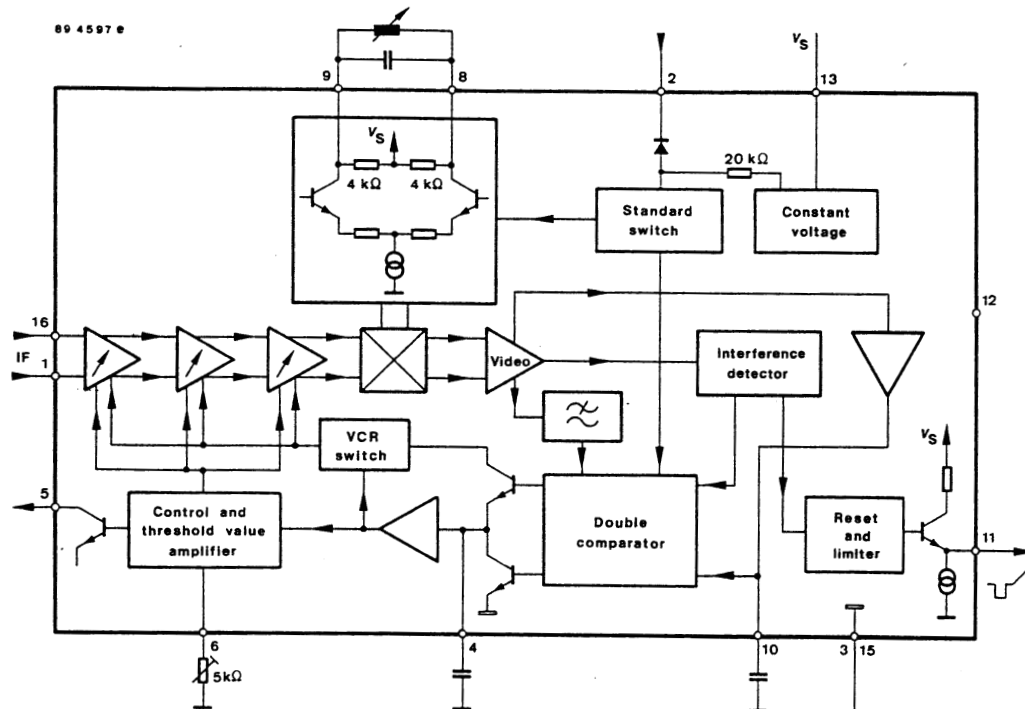


Figure 1. Block diagram

Pin Description

Pin	Function
1,16	IF-input
2	Standard switch: open B/G 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	V_4	10	V
	Pin 11	V_{11}	8	
Breaking current for VTR operation	Pin 4	I_4	0.3	mA
Video output current				
Max. load	Pin 11	I_O	5	mA
Short circuit max 1 s	Pin 11		30	
Power dissipation	$T_{amb} \leq 60^\circ\text{C}$	P_{tot}	1.0	W
Junction temperature		T_j	125	$^\circ\text{C}$
Ambient temperature range		T_{amb}	-25 to +70	$^\circ\text{C}$
Storage temperature range		T_{stg}	-25 to +125	$^\circ\text{C}$

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 ²⁾ signal B/G	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	ΔV_{black}		0.5		%/V
Supply voltage influence on the ultra white level in standard B/G	Pin 11	ΔV_{white}		1.0		%/V
Video bandwidth (-3 dB)	Pin 11	B_{Video}		10		MHz
Video frequency response over the AGC control range	Pin 11	ΔV_{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 ⁵⁾ B/G	Pin 2	V_2	2		V_S	V
Voltage level standard L ⁵⁾	Pin 2	V_2	0		1.2	V
Input sensitivity ⁶⁾ (symmetrical)	$v_{14(pp)} = 3.0 V$ 1-16 $V_4 = 0.8 V$ Pin	v_i		100		μV
IF-AGC gain reduction		ΔP	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%

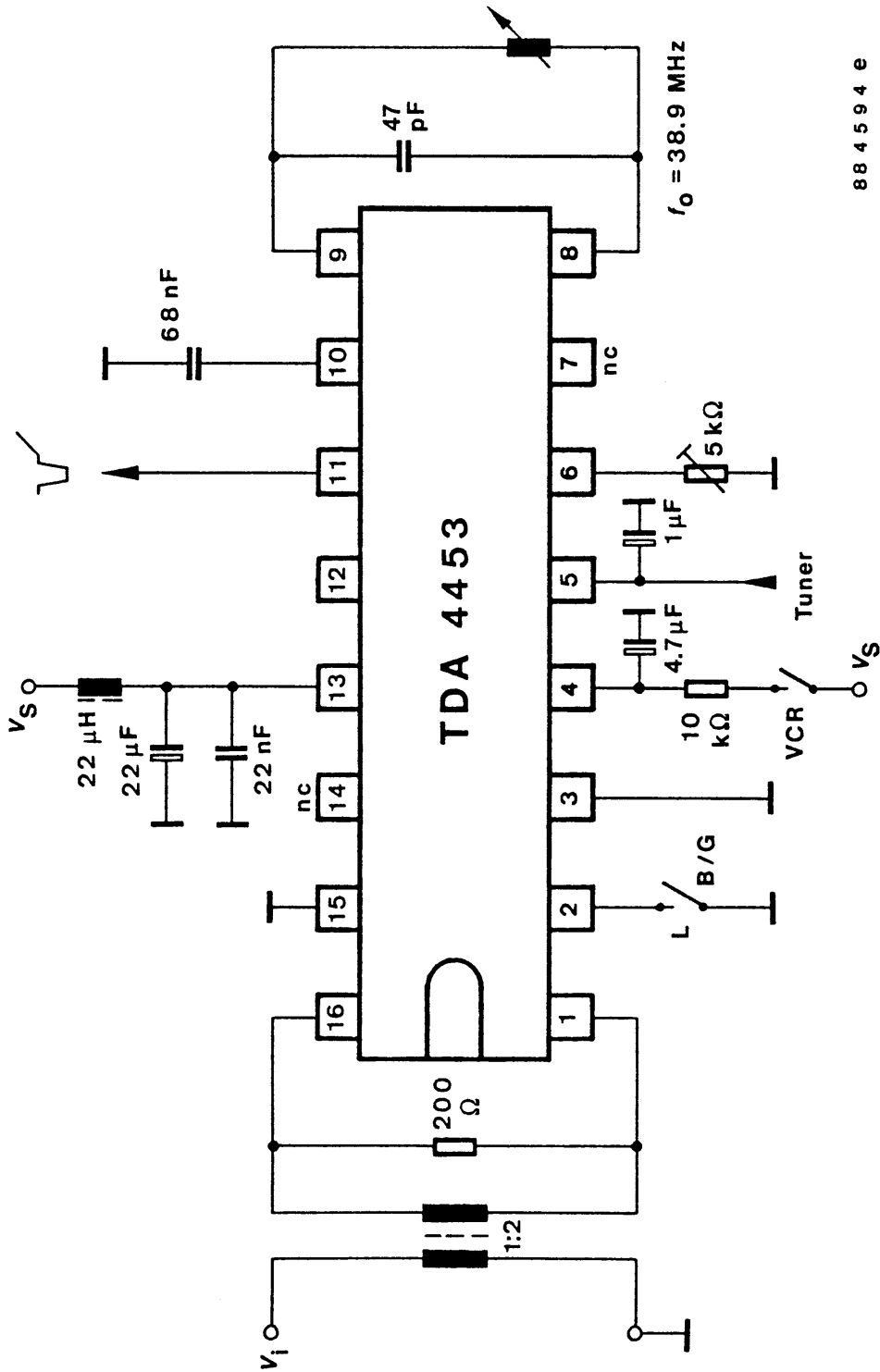
3) Blanking level 30% carrier amplitude

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 f = 77.8 MHz	v		10 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 Video carrier = 0 dB Colour carrier = -6 dB Sound carrier = -24 dB		α_{IM}		50		dB
Upsetting factor sync. pulse		$\frac{\Delta V_{Sync}}{V_{Sync}}$		3		%
Input impedance	Pin 1-16	R_i C_i		1.6 2		k Ω pF
Video switch						
Control voltage	RF operation VTR operation	V4 I4	8		10 150	V μ A



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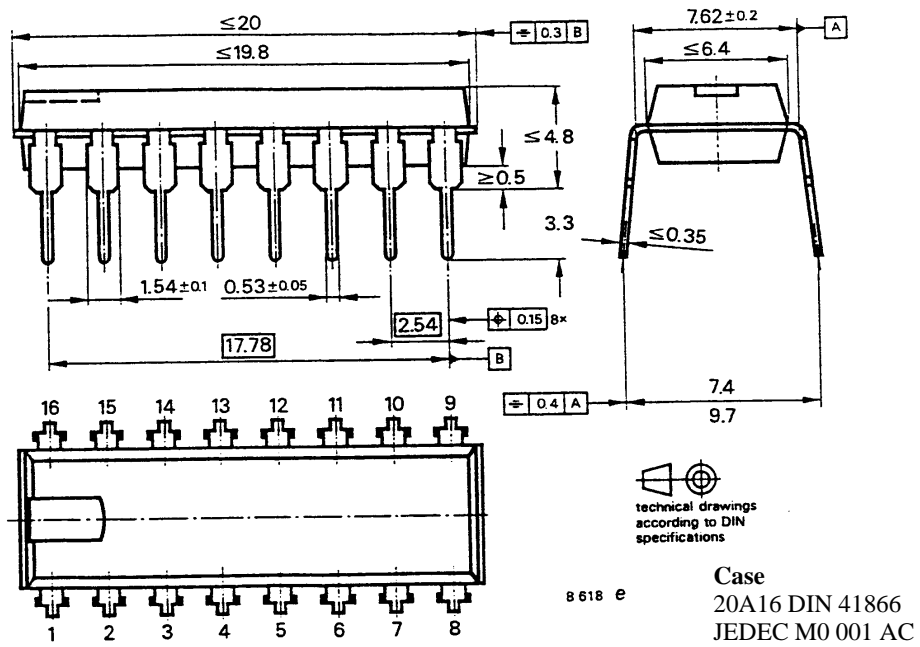
Coil data: Toko 7 KN
6 turns 0.2 CuL

Figure 2. Test circuit

TDA4453

Dimensions in mm

Package: 16-pin dual inline plastic



Ozone Depleting Substances Policy Statement

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1. Meet all present and future national and international statutory requirements.
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.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

TEMIC TELEFUNKEN microelectronic GmbH semiconductor division has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
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.

TEMIC can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

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