TDA4439

Video IF Amplifier for Multistandard TV and VTR

Technology: Bipolar

Features

- 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
- 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
- The direction of the AFC curve is selectable independently from the standard switch

Case: DIP18

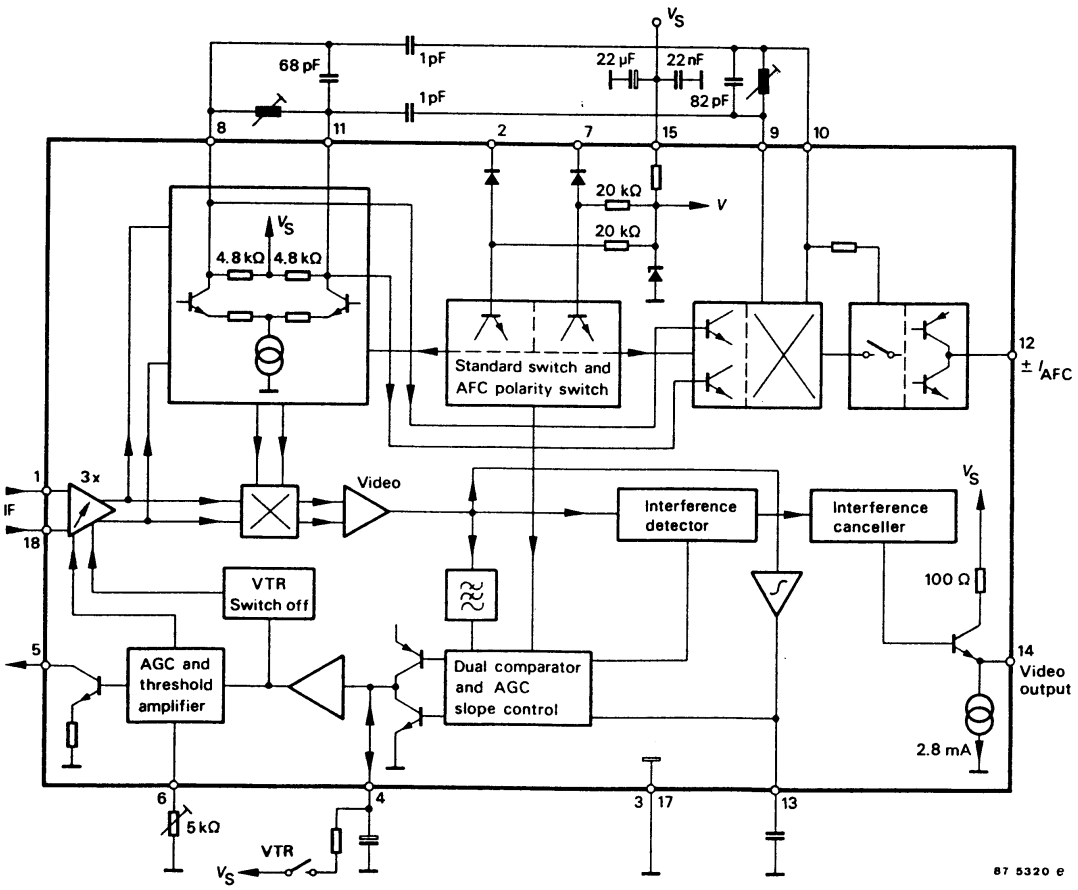
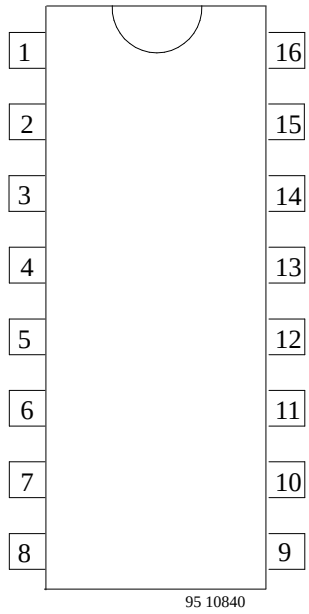


Figure 1. Block diagram

Pin Description



Pin	Function
1, 18	IF input
2	Standard switch: open B/G ground L
3, 17	Ground
4	IF-AGC storage capacitor
5	AGC (tuner control)
6	Tuner AGC take over
7	Polarity switch: open AFC “DOWN” ground AFC “UP”
8, 11	Demodulator circuit
9, 10	AFC circuit
12	AFC output
13	Average capacitor standard L
14	Video output
15	Supply voltage
16	n.c.

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 and AFC-signal

– Video output amplifier with low-pass characteristics, limiter for ultra black and inverter for ultra white interference

– Disconnectable AFC − generator with push pull current output

– 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 15	V_S	10 to 15	V
Supply current	Pin 15	I_S	75	mA
Open loop voltage	Pin 5	V_5	V_S	V
External voltage	Pin 4 Pin 14	V_4 V_{14}	10 8	V V
Breaking current for VTR operation	Pin 4	I_4	0.5	mA
Video output current max load short circuit max 1 s	 Pin 14 Pin 14	I_0	 5 50	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

V_S = 12 V, T_{amb} = 25°C, Reference point Pin 3, unless otherwise specified

Parameters	Test Conditions / Pins		Symbol	Min.	Typ.	Max.	Unit
Supply current		Pin 15	I_S		65		mA
Ultra white level at standard B/G [1]		Pin 14	v_0	4.8	5.2	5.6	V
Ultra black clamping level at standard B/G		Pin 14	v_0	1.75	1.9	2.05	V
Composite video output signal B/G [2]	Peak to peak	Pin 14	v_0	2.7	3.0	3.3	V
Video signal standard L (black/white) [3]	Peak to peak	Pin 14	v_0	1.85	2.1	2.35	V
Difference of the video signals standard L-B/G		Pin 14	Δ			10	%
Clamping level of black limiter		Pin 14	V_{14}	250 mV below Sync. (typ.)			
Threshold of the ultra white inverter		Pin 14	V_{14}	900 mV upper ultra white level (typ.)			
Grey level of the ultra white inverter		Pin 14	V_{14}		3.6		V
Supply voltage influence on the ultra black level in standard B/G		Pin 14	Δ		0.5		%/V
Supply voltage influence on the ultra white level in standard B/G		Pin 14	Δ		1.0		%/V
Video bandwidth	–3 dB	Pin 14	B_{video}		10		MHz
Video frequency response over the AGC control range		Pin 14	ΔV_{video}			2.0	dB
Output DC current	V_{14} = 8 V	Pin 14	I_{14}		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 (sym.) [6]	v_{14}=3.0 V_{pp}, V_4 = 0.8 V	Pin 1–18	v_i		120		µV
IF-AGC gain reduction			Δv_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 n.c.		Pin 5	AGC		61		dB

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 14 f = 77.8 MHz Pin 14	v		10 20		mV
Differential gain error	Pin 14	d		3	5	%
Differential phase error	Pin 14	φ		3	5	degree
Sound-chroma beat (1.07 MHz intermodulation) relating to demodulated auxiliary colour carrier	Video carrier = 0 dB Pin 14 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 1–18 Pin 1–18	R_i C_i		1.6 2		kΩ pF
Switch OFF voltage for VTR-operation	Pin 4	V_4	8		10	V
Switch OFF current for VTR-operation	Pin 4	I_4			150	µA
DC voltage at the AFC circuit	Pins 9 and 10	V		5.0		V
Scope of the AFC voltage	Pin 12	V	1.0		V_S–1.5	V
AFC current	Pin 12	i_{12}		0.8		mA
AFC transconductance	Pin 12	g		0.2		$\frac{mA}{100kHz}$
AFC residual current (AFC ”OFF”)	$V_{12} = V_S/2$ Pin 12	$\pm I_R$			10	µA
AFC current – OFF	Pins 9 and 10	I_{OFF}	100	150		µA
AFC polarity switching voltage [7]	“AFC-up” Pin 7 “AFC-down”	V_7	0 2		1.2 V_S	V

1) All measurements Pin 14 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
7) AFC polarity switch may be directly matched to TTL-output (i.e. processor output)

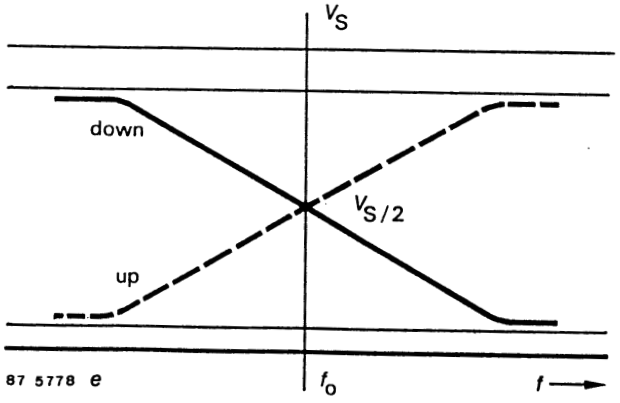
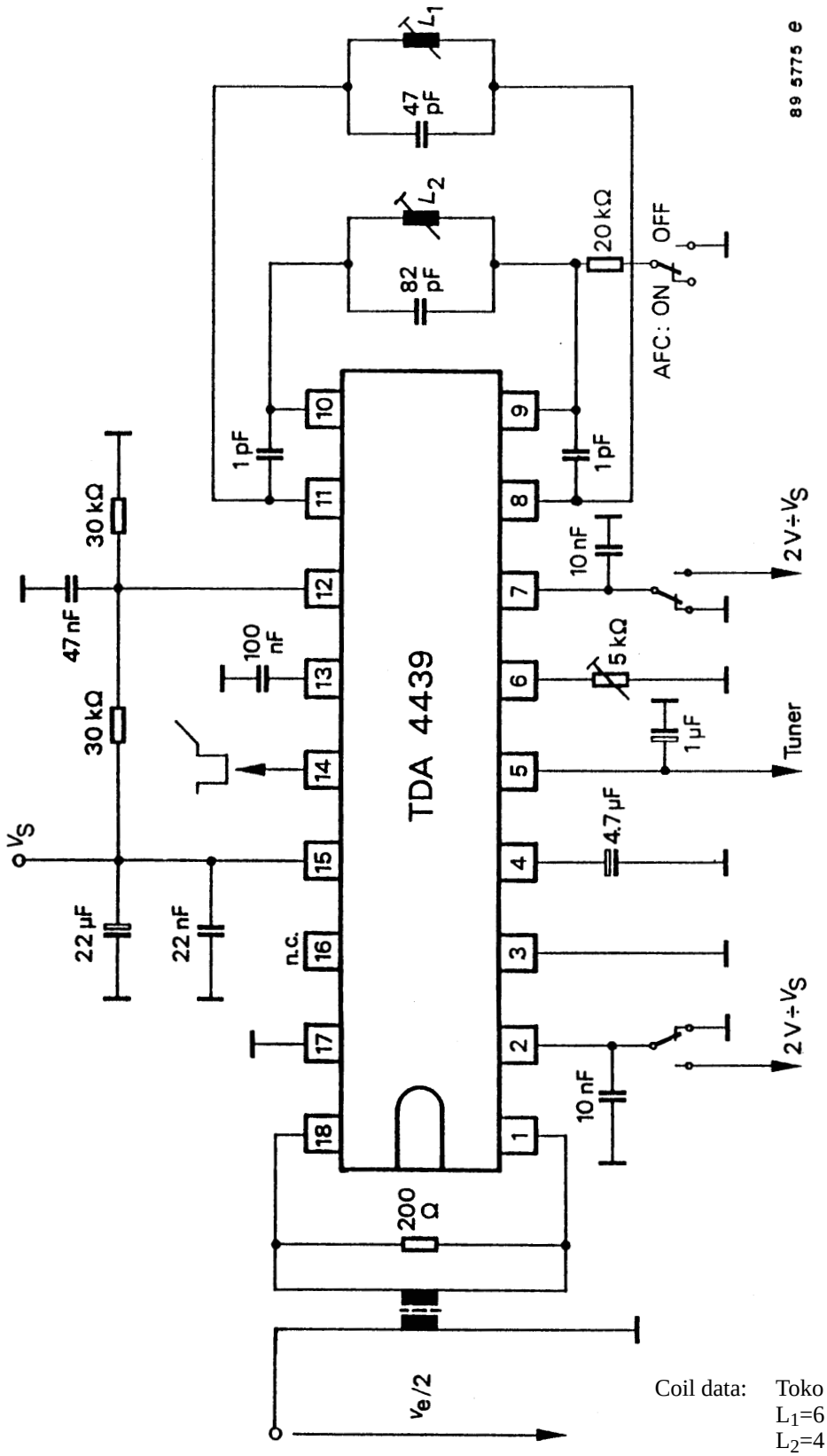


Figure 2. AFC characteristics/polarity

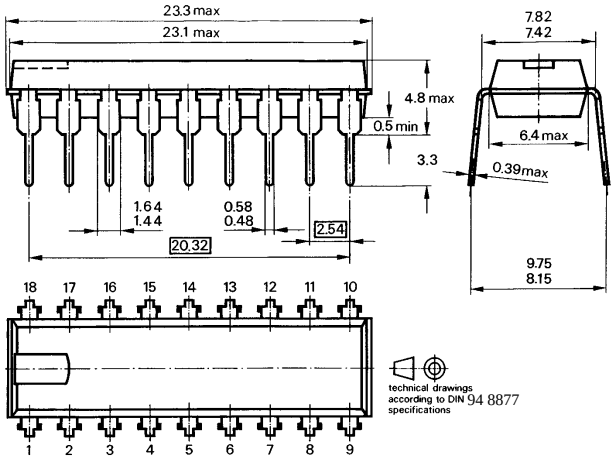


Coil data: Toko 7 KN
L_1=6 turns, 0.2 CuL
L_2=4 turns, 0.2 CuL

Figure 3. Test circuit

Dimensions in mm

Package: DIP 16



Ozone Depleting Substances Policy Statement

It is the policy of **TEMIC TELEFUNKEN microelectronic GmbH** to

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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