SIEMENS

TDA 5400-2
Video IF IC with AFC

The high gain, controlled video IF amplifier with controlled demodulator includes low-impedance outputs for the positive and negative video signal, gated control as well as delayed tuner control and an AFC output.

TDA 5400-2: for PNP tuners

Features

- High degree of integration
- Extensive control range
- High input sensitivity

Maximum ratings

Supply voltage	V_S	16.5	V
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	−40 to 125	°C
Thermal resistance (system-air)	$R_{th\ SA}$	70	K/W

Operational range

Supply voltage	V_S	10 to 15.8	V
IF frequency	f_{IF}	15 to 75	MHz
Ambient temperature	T_A	0 to 70	°C

Characteristics

$V_S = 13$ V; $T_A = 25$ °C

Current consumption	I_{13}	60	mA
Stabilized reference voltage	$V_{14/12}$	6.0	Vdc
Control current for tuner	I_{16}	4.0	mA
$V_{16} = 0.5\ V_{13}$			
Tuner AGC threshold	$V_{15/12}$	0 to 4	Vdc
Gating pulse voltage			
pos. gating pulse	V_1	+3.0	V
neg. gating pulse	V_1	−3.0	V
Input voltage at G_{max}	$V_{i17/18}$	max 100	µV
$V_3 = 3\ V_{pp}$			
AGC range	ΔG	60	dB
IF control voltage			
V_{max}	$V_{2/12}$	min 0	Vdc
V_{min}	$V_{2/12}$	max 4.0	Vdc
AFC output current	I_{q6}	±1.0	mA
AFC switching			
$V_8 = V_9; R = 10$ kΩ OFF	$V_{8/12}$	max 4.0	Vdc
$V_8 = V_9; R = \infty$ ON	$V_{8/12}$	6.0	Vdc
AFC direction			
$di/df > 0$	$V_{5/12}$	4.0 to V_{13}	Vdc
$di/df < 0$	$V_{5/12}$	0 to 1.0	Vdc
Video output voltage (pos.)	V_{q3pp}	3.0	V
$R_L = \infty$			
Sync pulse level	$V_{3/12}$	2.0	Vdc
DC voltage $V_2 = 4$ V; $V_{17/18} = 0$	$V_{3/12}$	5.3	Vdc
Output current			
to ground through R	I_{q3}	−5.0	mA
to plus $V_3 = 7$ V	I_{q3}	+2.0	mA
Video output voltage (neg.) ($R_L = \infty$)	V_{q4pp}	3.0	V
Sync pulse level	$V_{4/12}$	V_{13} −2.0	Vdc
DC voltage ($V_2 = 4$ V; $V_{17/18} = 0$)	$V_{4/12}$	V_{13} −5.3	Vdc
Output current			
to ground through R	I_{q4}	−5.0	mA
to plus $V_4 = V_{13}$	I_{q4}	+1.0	mA

Additional application data[1]

Input impedance	$Z_{i17/18}$	1.8/2	kΩ/pF
Output impedance	$Z_{q10/11}$	6.6/2	kΩ/pF
AFC input impedance	$Z_{i8/9}$	20	kΩ
Output resistance	R_{q3}	150	Ω
Output resistance	R_{q4}	150	Ω
Residual IF (basic frequency)	$V_3; V_4$	10	mV
Video bandwidth (−3 dB)	B_{video}	6.0	MHz
Intermodulation ratio with reference to f_{CC} (sound-color-beat frequency)	a	45	dB

1) not measured

7

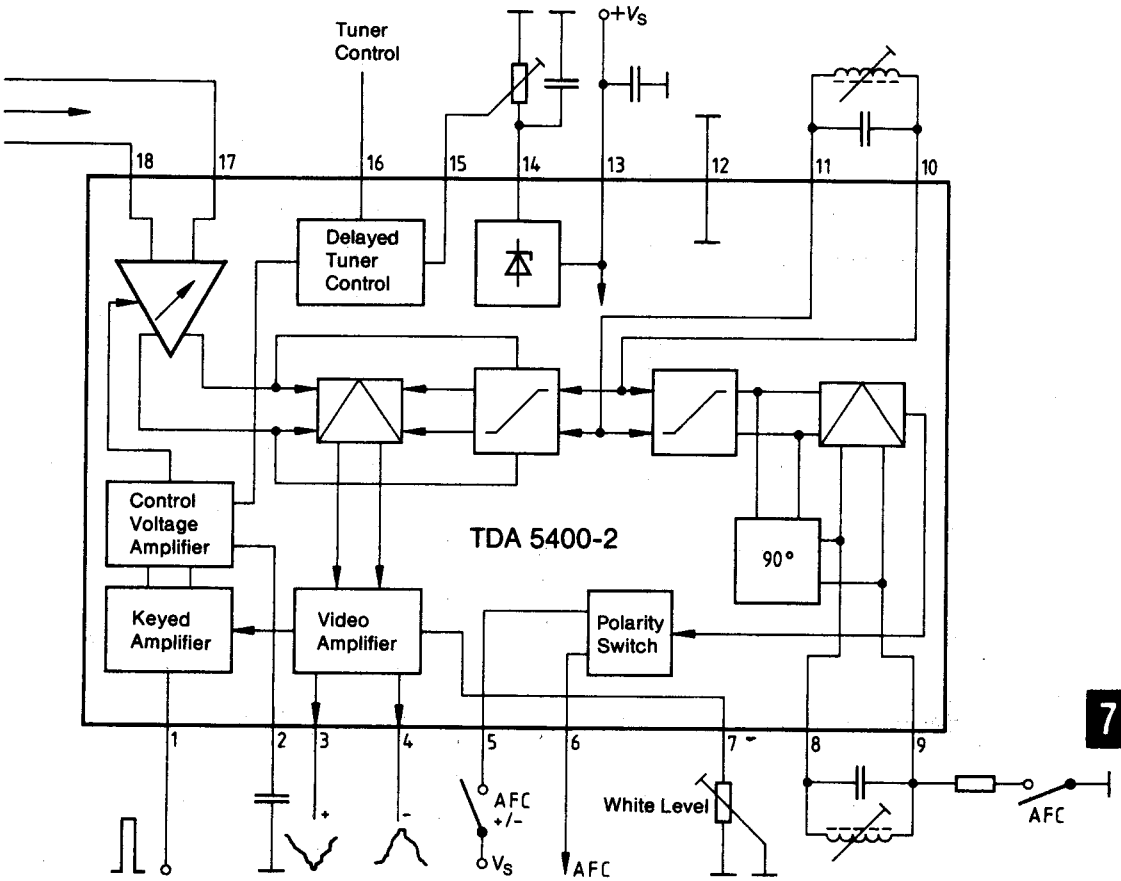
Circuit description

The integrated circuit is comprised of a 4-stage controlled AM amplifier, a limiter and mixer for synchronous demodulation of the video signals as well as an FM demodulator to generate positive or negative AFC voltages. In addition, an amplifier for both the positive and negative video output signal is included. The positive video signal together with the positive flyback pulse are used for gated control.

Pin description

Pin	Function
1	Gating pulse
2	Time constant AGC
3	Positive video output
4	Negative video output
5	AFC polarity switch
6	AFC output
7	White level adjustment
8	AFC circuit
9	AFC circuit
10	Tank circuit
11	Tank circuit
12	GND
13	Supply voltage
14	Reference voltage
15	Tuner AGC
16	Delayed AGC output
17	Video IF input
18	Video IF input

Block diagram



7

Measurement circuit