Bipolar circuit

Highly amplifying controlled video IF amplifier including demodulator, low-ohmic video outputs for positive- and negative-going signal, gated control, AFC output, and delayed tuner control.
Both types — TDA 5600 and TDA 5610 — only differ by the direction of their AFC voltage and are provided for pnp tuners. If npn tuners are used, the TDA 5611 is suitable.
TDA 5600: AFC zero crossing after positive direction
TDA 5610: AFC zero crossing after negative direction
TDA 5611: like TDA 5610; however, for npn tuners

- High integration
- Large control range
- High input sensitivity
- PC board layout TDA 5600/5610 or 5611, respectively, also intended for TBA 1440 G or 1441, respectively.

Type	Ordering code	Package outline
TDA 5600	Q67000-A1519	DIP 18
TDA 5610	Q67000-A1526	
TDA 5611	Q67000-A1625	

Maximum ratings

Supply voltage	V_S	15 [1]	V
Voltages	V_4	5	V
	V_5	20	V
	V_{16}	5	V
Ohmic resistance between			
pin 9 and 10	$R_{9\text{-}10}$	20	Ω
pin 8 and 11	$R_{8\text{-}11}$	20	Ω
Thermal resistance (system-air)	$R_{\text{th SA}}$	70	K/W
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	−40 to 125	°C

Range of operation

Supply voltage range	V_S	10.5 to 15	V
Ambient temperature range	T_{amb}	−25 to 70	°C

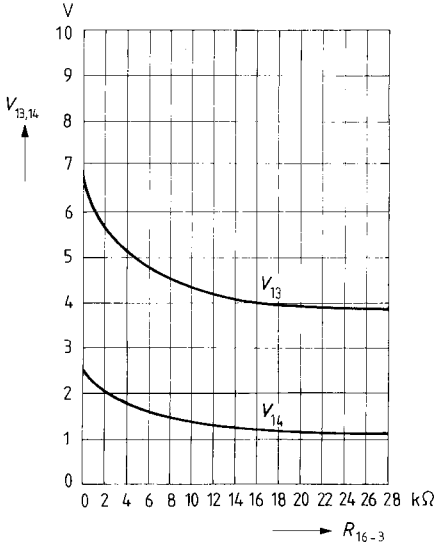
1) maximal 16.5 V for 1 minute

Characteristics (V_S = 13 V, $f_{i\,IF}$ = 38.9 MHz, T_{amb} = 25 °C)

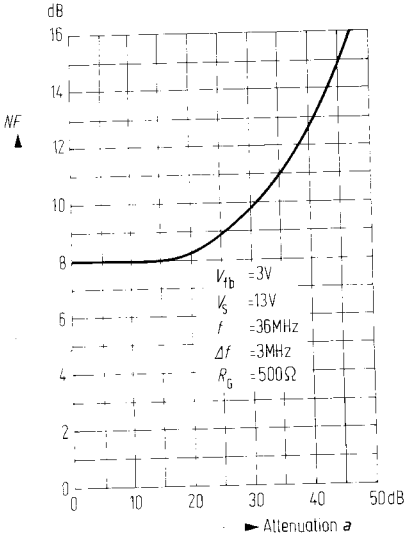
		min	typ	max	
Current consumption	I_{15}		60		mA
DC voltage at output 13 (V_{15} = 15 V, V_i = 0)					
$R_{16\text{-}3} = \infty$	V_{13}		3.5		V
$R_{16\text{-}3} = 0$	V_{13}		7		V
DC voltage at output 14 (V_{15} = 15 V, V_i = 0)					
$R_{16\text{-}3} = \infty$	V_{14}		1.1		V
$R_{16\text{-}3} = 0$	V_{14}		2.5		V
White level deviation	$\Delta V_{13}/\Delta V_{15}$		100		mV/V
	$\Delta V_{14}/\Delta V_{15}$		20		mV/V
Resistance for ΔV_{13} = 1 V	$R_{16\text{-}3}$		8.5		kΩ
Sync pulse level	V_{13}		1.9		V
Sync pulse level with async or without gating pulses (peak level control)	$V_{13\ sync.}$		0.5		V
Control current for tuner prestage ($V_5 > 2$ V)	I_5	10	15		mA
IF control voltage for max. gain	V_4	0		0.9	V
for min. gain	V_4	2.8		5	V
Gating pulse voltage	$-V_7$	2		7	V
Residual IF (basic frequency)	V_{13}, V_{14}		10		mV
Output current to ground	I_{13}, I_{14}			6	mA
to plus	I_{13}, I_{14}			−1	mA
Input impedance at max. gain	$Z_{1\text{-}18}$		1.8/2		kΩ/pF
at min. gain	$Z_{1\text{-}18}$		1.9/0		kΩ/pF
Input voltage for V_{13} = 3 V_{pp}[1])	$V_{i\,1\text{-}18}$		160	300	μV
Video bandwidth (−3 dB)	B_{video}	6	7		MHz
AGC range	ΔG		55		dB
Intermodulation ratio (1.07 MHz) with reference to color carrier[2])	a		45		dB
Output impedance	$Z_{q\,8\text{-}11}$		2/2.5		kΩ/pF
AFC input impedance	$Z_{i\,9\text{-}10}$		20		kΩ
AFC output current	$\pm I_{12}$		2.5		mA

[1]) According to test circuit: V_i = rms sync pulse level at 60 Ω
[2]) Test level a_{cc} = − 3 dB, referred to picture carrier
a_{sc} = −20 dB, referred to picture carrier

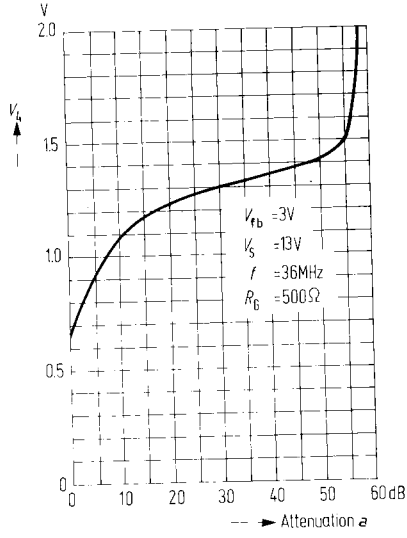
DC output voltage
versus white level resistance
V_S = 13 V; $R_{12\text{-}13}$ = ∞



Noise figure versus attenuation
(measured at video frequency)
V_S = 13 V, f = 36 MHz, Δf = 3 MHz,
R_G = 500 Ω, $-V_{fb}$ = 3 V

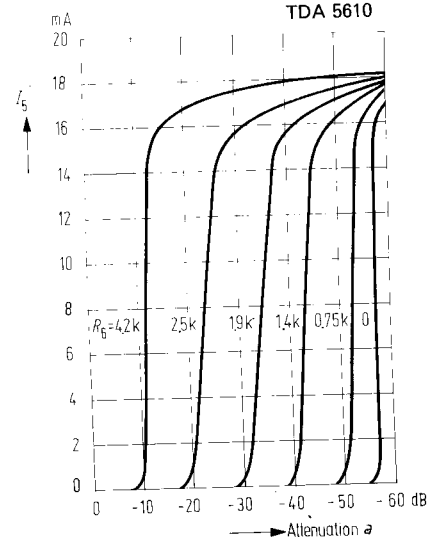


Control voltage versus attenuation
$-V_{fb}$ = 3 V, V_S = 13 V, f = 36 MHz,
R_G = 500 Ω



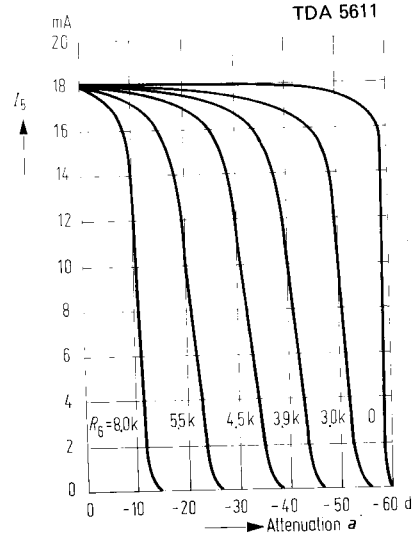
Tuner control current versus attenuation
R_6 = parameter

TDA 5600
TDA 5610

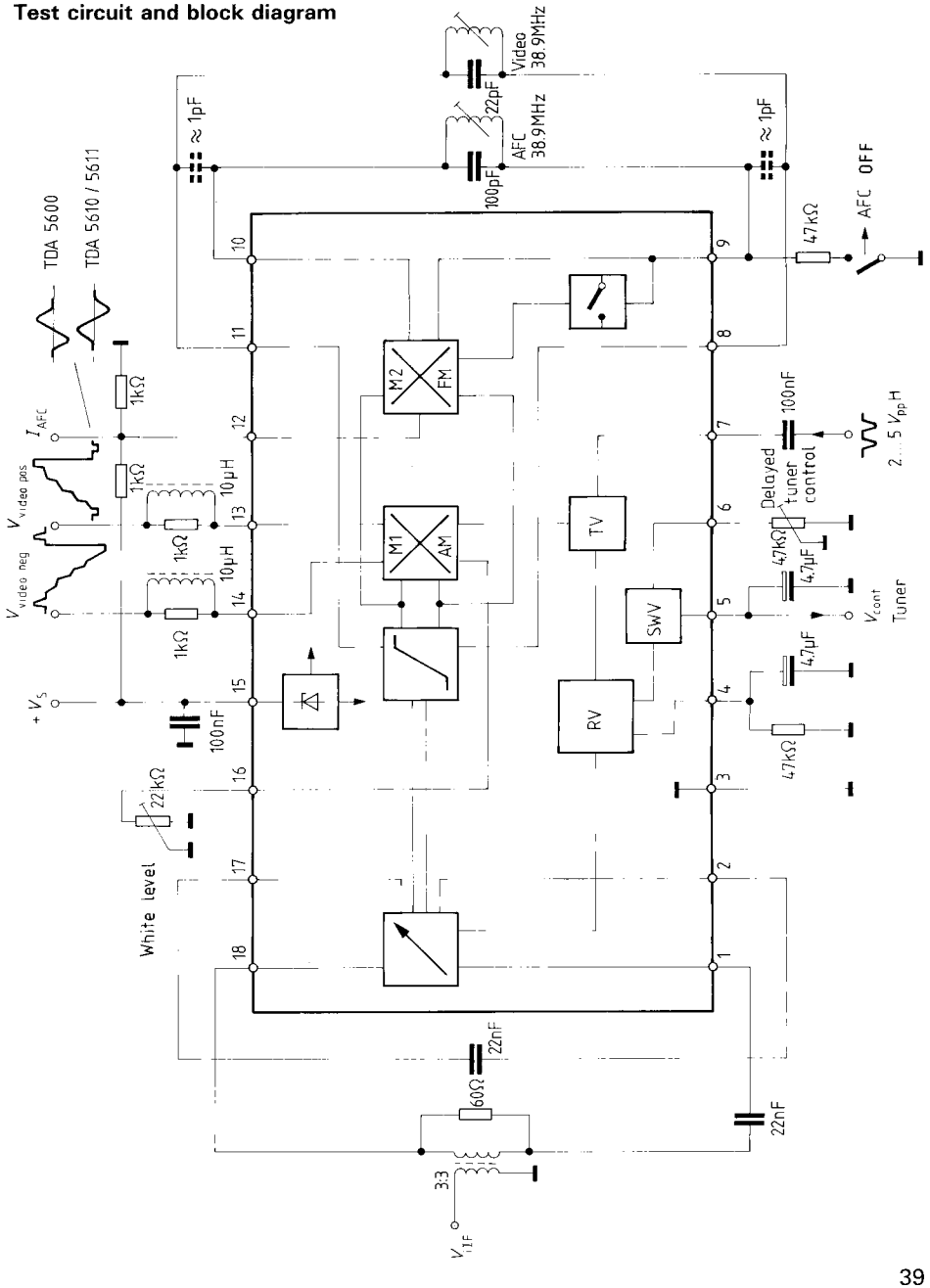
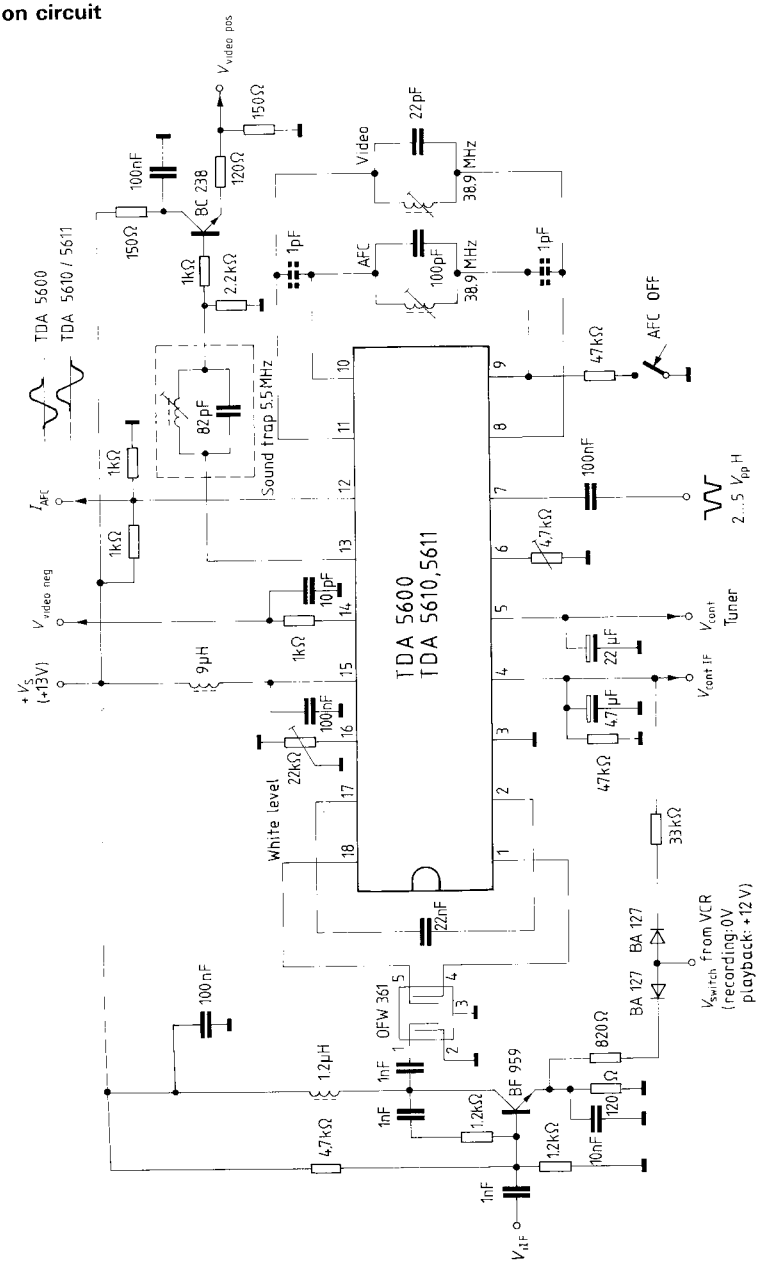


Tuner control current versus attenuation
R_6 = parameter

TDA 5611



Test circuit and block diagram



Application circuit