

Bipolar IC

Type	Ordering code	Package
TDA 5820	Q67000-A1776	DIP 22

The TDA 5820 contains a 4-stage broadband amplifier with controllable gain, a limiter, a synchronous demodulator for AM, a phase-switchable FM demodulator for generating the AFC voltage, and an AGC generator for the IF amplifier and tuner. The video amplifier is switchable for positive or negative modulation. Sync-pulse keyed AGC is used for negative modulation, black level keyed AGC with positive modulation.

Features

- Switchable to accommodate German and French standards
- Switchable AFC
- Fast control
- Positive and negative video outputs

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

Operating range

Supply voltage	V_S	10 to 15.8	V
Ambient temperature	T_A	0 to 70	°C

Characteristics $V_S = 13\text{ V}$; $T_A = 25^\circ\text{C}$

		min	typ	max	
Current consumption	I_{16}	38	60	90	mA
Stab. reference voltage	$V_{14/1}$	5.7	6.0	6.95	Vdc
Tuner control current	I_{17}	3.0	4.0	6.2	mA
$V_{17} = 0.5 V_{16}$					
Tuner AGC threshold	$V_{18/1}$	0		5.0	Vdc
Gating pulse voltage (see pulse diagram)	$V_{2\text{ pos}}$	4.0	3.0	$V_{16} - 1$	V
	$V_{2\text{ neg}}$	-10.0	-4.0	-3.0	V
	$V_{22/21}$			100	μV
Input voltage at G_{max}					
$V_{5\text{ pp}} = 3\text{ V}$					
AGC range	ΔG		60		dB
IF control voltage for max. gain	$V_{3/1}$	0			Vdc
IF control voltage for min. gain	$V_{3/1}$			5.0	Vdc
IF control voltage for video switch off	$V_{3/1}$	8.0		V_{16}	Vdc
AFC output current	I_9		± 1.0		mA
AFC switch OFF	$V_{11/1}$	0		4.0	Vdc
$V_{11} = V_{12}$; $R = 10\text{ k}\Omega$					
AFC switch ON	$V_{11/1}$		5.3		Vdc
$V_{11} = V_{12}$; $R = \infty$					
AFC characteristics	$V_{15/1}$	4.0		V_{16}	Vdc
$di/df > 0$					
AFC characteristics	$V_{15/1}$	0		1.0	Vdc
$di/df < 0$					
Standard switchover neg. modul. (G-standard)	$V_{7/1}$	4.0		V_{16}	Vdc
Standard switchover pos. modul. (L-standard)	$V_{7/1}$	0		1.0	Vdc
Video output voltage pos. ($R_L = \infty$)	$V_{q5\text{ pp}}$	2.3	3.0	3.5	V
Sync pulse level neg. modulation	$V_{5/1}$	1.25	2.0	2.5	Vdc
Black level for pos. modulation	$V_{5/1}$	2.15	2.9	3.65	Vdc
DC voltage					
$V_3 = 5\text{ V}$, $V_{22/21} = 0$ neg. modulation	$V_{5/1}$	4.0	5.3	6.6	Vdc
DC voltage					
$V_3 = 5\text{ V}$, $V_{22/21} = 0$ pos. modulation	$V_{5/1}$	1.5	2.0	2.8	Vdc
Output current					
to ground across R	I_{q5}		-5.0		mA
Output current					
to +, $V_S = 6\text{ V}$	I_{q5}	0.9	2.0	2.7	mA
Sync pulse level/max.					
White level					
residual carrier $\leq 6\%$ pos. modulation	V_5		6.0	9.0	%
Video output voltage neg. ($R_L = \infty$)	$V_{q6\text{ pp}}$	2.3	3.0	3.5	V
Sync pulse level neg. modulation	$V_{6/1}$	$V_{16} - 3.4$	$V_{16} - 2.0$	$V_{16} - 0.4$	Vdc
Black level for pos. modulation	$V_{6/1}$	$V_{16} - 4.5$	$V_{16} - 2.9$	$V_{16} - 1.5$	Vdc
DC voltage					
$V_3 = 5\text{ V}$, $V_{22/21} = 0$ neg. modulation	$V_{6/1}$	$V_{16} - 7.2$	$V_{16} - 5.3$	$V_{16} - 3.4$	Vdc
DC voltage					
$V_3 = 5\text{ V}$, $V_{22/21} = 0$ pos. modulation	$V_{6/1}$	$V_{16} - 3.6$	$V_{16} - 2.0$	$V_{16} - 0.6$	Vdc
Output current					
to ground across R	I_{q6}		-5.0		mA
Output current					
to +, $V_6 = 12.3\text{ V}$	I_{q6}	0.5	1.0	1.6	mA

Additional application data

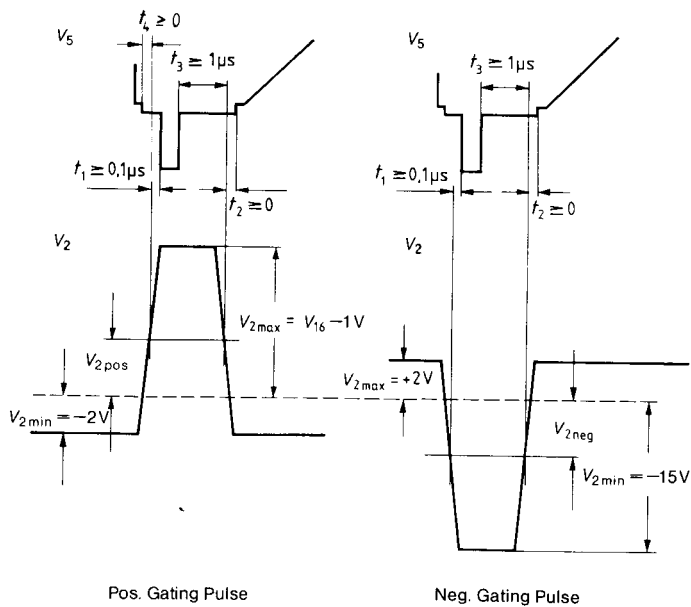
(not measured)

		min	typ	max	
Input impedance	$Z_{22/21}$		1.8/2		k Ω /pF
Output impedance	$Z_{10/13}$		6.6/2		k Ω /pF
AFC input impedance	$Z_{11/12}$		20		k Ω
Output resistance	R_{q5}		150		Ω
Output resistance	R_{q6}		150		Ω
IF frequency range	f_{IF}	15		75	MHz
Residual IF (basic frequency)	$V_5; V_6$		10		mV
Video bandwidth (–3 dB)	B_{video}		6.0		MHz
Intermodulation ratio referred to f_{CC} (sound color beat frequency)	a		45		dB

Pin description

Pin	Function
1	GND
2	Gating pulse
3	Time constant for control voltage; programming VTR recording/playback
4	White level adjustment
5	Video output, positive
6	Video output, negative
7	G/L standard switchover
8	GND
9	AFC output
10	Tank circuit
11	AFC tank circuit
12	AFC tank circuit
13	Tank circuit
14	Stab. reference voltage
15	Programmable AFC polarity
16	Supply voltage +
17	Delayed tuner control
18	Tuner AGC threshold
19	Operating point adjustment
20	Operating point adjustment
21	Video IF input
22	Video IF input

Pulse diagram



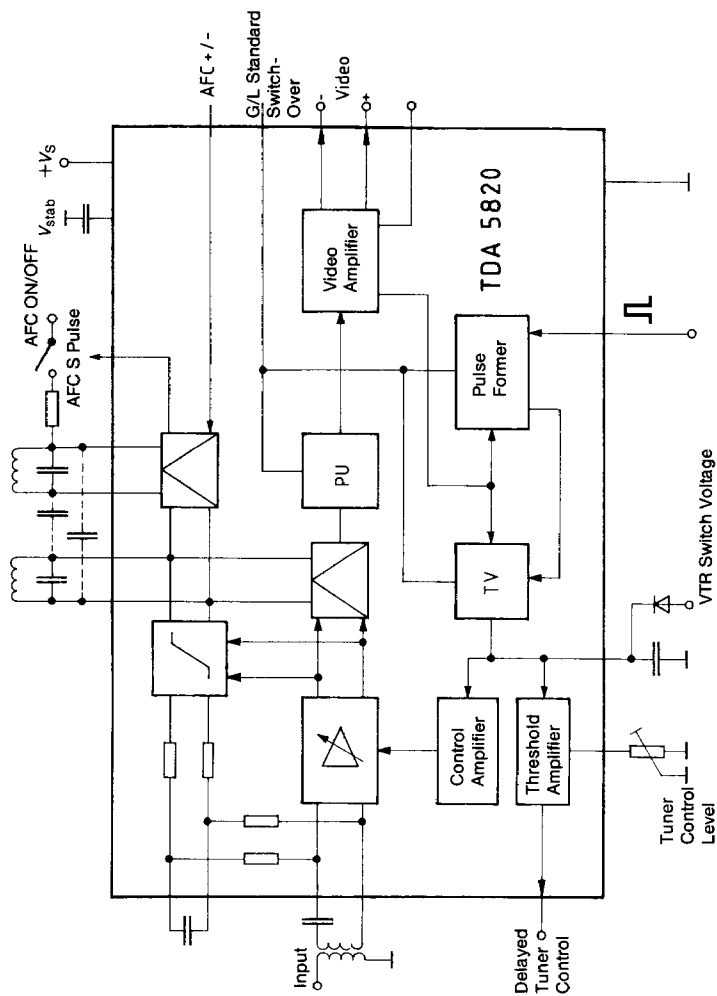
$$t_1 \geq 0.5 \mu s$$

$$t_2 \geq 0 \mu s$$

$$t_3 \geq 2.5 \mu s$$

$$t_4 \geq 0 \mu s$$

Block diagram and measurement circuit



Application circuit

