Video IF IC with AFC and VTR Connection

TDA 5800

Bipolar IC

Type	Ordering code	Package
TDA 5800	Q67000-A1777	DIP 22

The TDA 5800 contains a 4-stage broadband amplifier with controllable gain, a limiter, a synchronous demodulator for AM, an FM demodulator for generating the AFC voltage, and an AGC generator for the IF amplifier and tuner.

An external PNP transistor is required for a VTR connection according to the IEC standard.

Features

- Suitable for standard VTR connection
- Switchable AFC
- Fast control
- Positive and negative video output

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
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

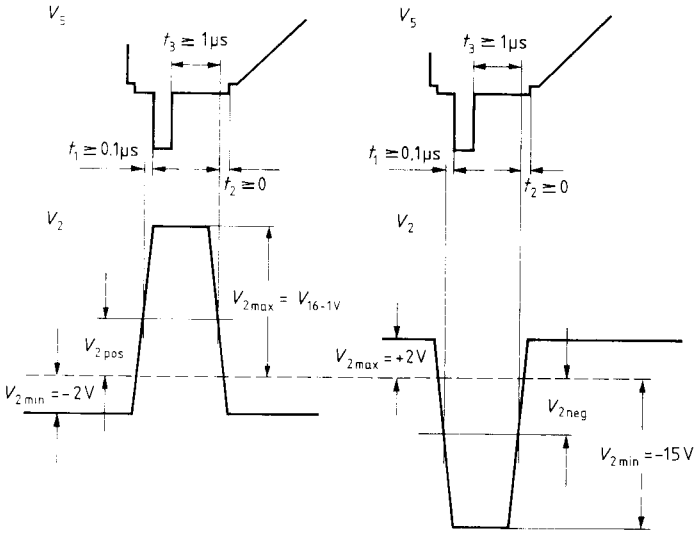
		min	typ	max	
Current consumption	I_{16}		60		mA
Stab. reference voltage	$V_{14/1}$		6.0		Vdc
Tuner control current	I_{17}	3.0	4.0		mA
Tuner AGC threshold	$V_{18/1}$	0		5.0	Vdc
Gating pulse voltage	$V_{2\,pos}$	−2.0	3.0	$V_{16}-1$	V
	$V_{2\,neg}$	−15.0	−3.0	2.0	V
Input voltage at G_{max} ($V_{5\,pp} = 3$ V)	$V_{22/21}$			100	µV
AGC range	ΔG		60		dB
IF control voltage for G_{max}	$V_{3/1}$	0			Vdc
IF control voltage for G_{min}	$V_{3/1}$			5.0	Vdc
IF control voltage for VTR switchover	$V_{3/1}$	8.0		V_{16}	Vdc
AFC output current	I_9		± 1.0		mA
AFC switch OFF ($V_{11} = V_{12}$; $R = 10$ kΩ)	$V_{11/1}$	0		4.0	Vdc
AFC switch ON ($V_{11} = V_{12}$; $R = \infty$)	$V_{11/1}$		5.3		Vdc
AFC characteristics (di/d$f > 0$)	$V_{15/1}$	3.0		V_{16}	Vdc
AFC characteristics (di/d$f < 0$)	$V_{15/1}$	0		1.0	Vdc
Video output voltage pos. ($R_L = \infty$)	$V_{q\,5}$		3.0		Vdc
Sync pulse level	$V_{5/1}$		2.0		Vdc
DC voltage ($V_3 = 5$ V; $V_{22/21} = 0$)	$V_{5/1}$		5.3		Vdc
Output current to ground across R	$I_{q\,5}$		−5.0		mA
Output current (to +)	$I_{q\,5}$		2.0		mA
Output resistance	$R_{q\,5}$		150		Ω
Video output voltage neg. ($R_L = \infty$)	$V_{q\,6\,pp}$		3.0		V
Sync pulse level	$V_{6/1\,pp}$		$V_{16}-2$		V
DC voltage ($V_3 = 5$ V; $V_{22/21} = 0$)	$V_{6/1\,pp}$		$V_{16}-5.3$		V
Output current to ground across R	$I_{q\,6}$		−5.0		mA
Output current (to +)	$I_{q\,6}$		1.0		mA
VTR output voltage neg.	$V_{q\,7\,pp}$		1.0		V
$R_L = \infty$; VTR recording					
Sync pulse level	$V_{7/1}$		$V_{16}-1.2$		Vdc
$R_L = \infty$; VTR recording					
DC voltage	$V_{7/1}$		$V_{16}-2.3$		Vdc
$V_3 = 5$ V; $V_{22/21} = 0$					
DC voltage	$V_{7/1}$		$V_{16}-0.9$		Vdc
$V_3 \geq 8$ V; VTR playback					
Output current	$I_{q\,7}$		−5.0		mA
to ground across R					
Output current (to +)	$I_{q\,7}$		1.0		mA
Video amplifier VTR playback	V		3.0		
$V = V_5/V_8$; $V_8 = 1$ V_{pp}					

Additional application data

(not measured)

		min	typ	max	
Input impedance	$Z_{i\,22/21}$		1.8/2		kΩ/pF
Output impedance	$Z_{q\,10/13}$		6.6/2		kΩ/pF
AFC input impedance	$Z_{i\,11/12}$		20		kΩ
Output resistance	$R_{q\,6}$		150		Ω
Output resistance	$R_{q\,7}$		150		Ω
Residual IF (basic frequency)	V_5; V_6		10		mV
Video bandwidth (−3 dB) VTR recording	B_{video}		6.0		MHz
Video bandwidth (VTR recording $V_{8\,pp} = 1$ V)	B_{video}		10.0		MHz
Intermodulation ratio with reference to f_{CC} (sound-color-beat frequency)	a		45		dB

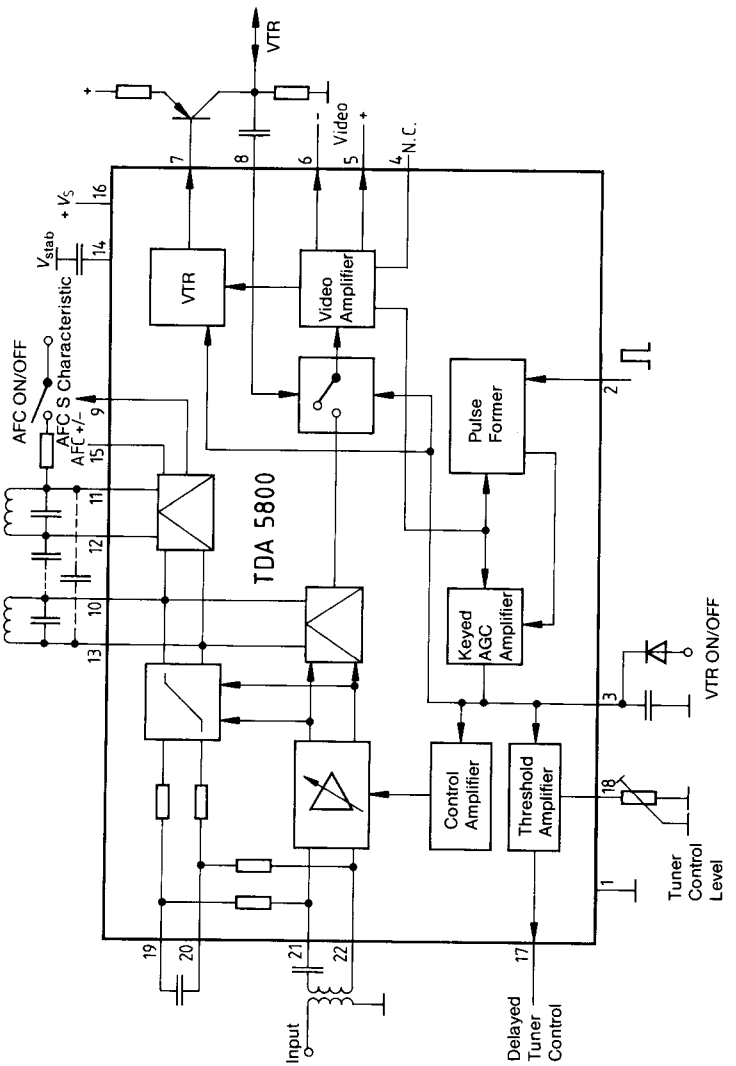
Pulse diagram



Pos. Gating Pulse

Neg. Gating Pulse

Block diagram and measurement circuit



Application circuit