

CA7607, CA7611

Video IF Amplifier System for Color and Black and White TV Receivers

Especially Suitable for SAW Filter Applications

Features:

- High-gain wideband IF output
- Excellent S/N ratio
- Excellent DG/DP characteristics
- Black and white noise inverters
- Peak AGC
- Fast uniform AGC action
- Wide-gain reduction range
- Synchronous AFT detector
- High gain AFT
- Synchronous video detector
- Negative video output
- VTR switch

RCA CA7607 and CA7611* perform video IF amplification, video detection and amplification, AFT detection and amplification and AGC control of video IF and tuner stages. The CA7607 is suitable for FET applications; the CA7611 is

used for NPN tuner stages and has a higher value of RF AGC control current.

*The CA7607 was formerly RCA Dev. No. TA10770; the CA7611 was formerly RCA Dev. No. TA11025.

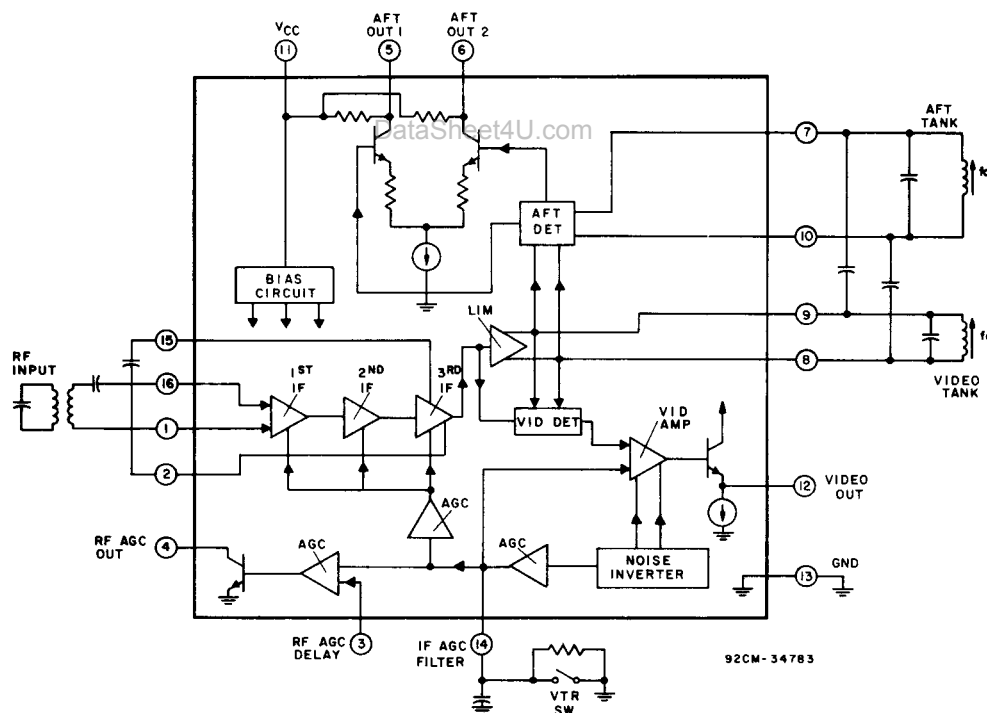


Fig. 1 - Block diagram of the CA7607 and CA7611.

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A three-stage, wideband IF amplifier employs an advanced gain reduction circuit for a wide range of AGC gain control with excellent stability at all gain conditions.

A synchronous video demodulator having a low distortion reference amplifier provides a negative-polarity video output signal containing negligible intermodulation products.

Noise inverters prevent ultra white and black spots in the picture.

A separate synchronous demodulator is used for AFT detection giving an accurate and sensitive AFT (12 kHz/V typ.).

A VTR switch permits removing internal video when using a VTR.

The CA7607 and CA7611 are supplied in 16-lead dual-in-line plastic packages (E suffix).

MAXIMUM RATINGS, Absolute-Maximum Values:**DC SUPPLY VOLTAGE:**

Between Terminals 11-13 15 V

Between Terminals 4-13 15 V

VIDEO OUTPUT CURRENT, I_{I2} 6 mA

DEVICE DISSIPATION:

Up to T_A = 70°C 890 mW

Above T_A = 70°C Derate linearly 11.2 mW/°C

AMBIENT TEMPERATURE RANGE:

Operating -40 to +70°C

Storage -65 to +150°C

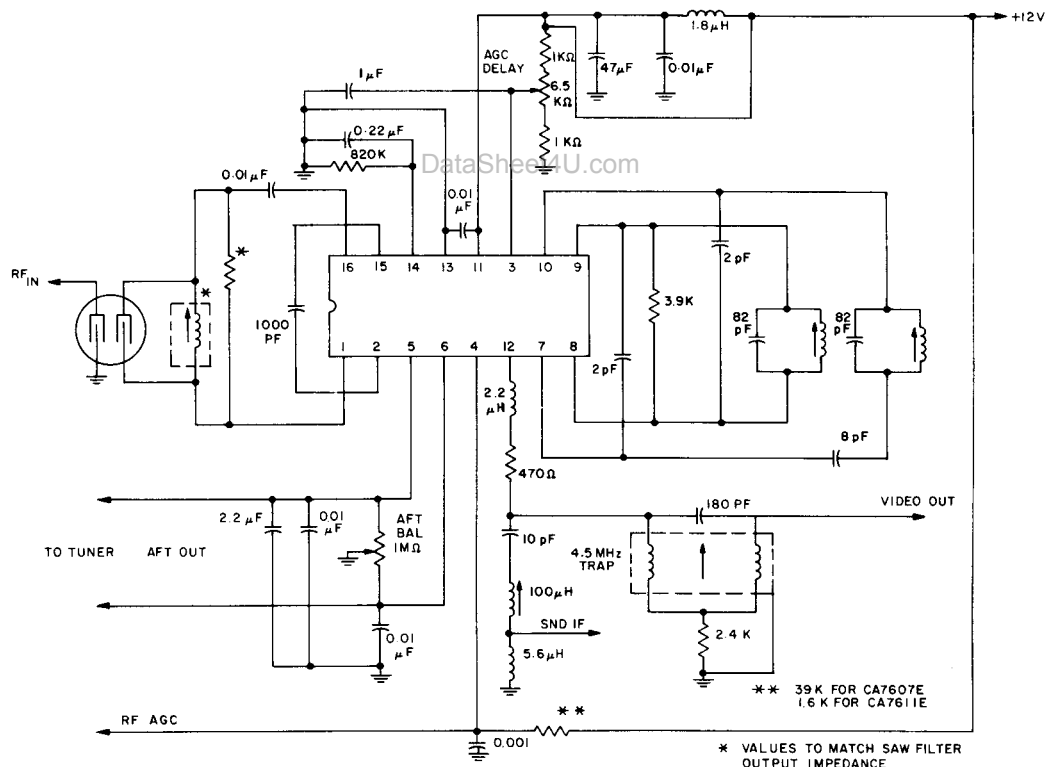
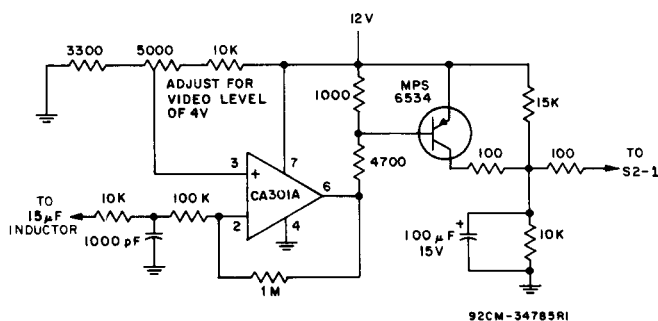


Fig. 2 - Typical application circuit for the CA7607 and CA7611.

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ELECTRICAL CHARACTERISTICS at $T_A = 25^\circ\text{C}$, $V_+ = 12\text{ V}$, V_{IN} at TP8 (Fig. 3)

CHARACTERISTIC	TEST CONDITIONS	S2	S3	LIMITS			UNITS
				Min.	Typ.	Max.	
Recommended Supply Voltage				10.8	12	13.2	V dc
Supply Current, I_{11}	$V_{IN} = 0$	4	1	42	51	63	mA
Video DC Output Voltage, V12	$V_{IN} = 0$	4	1	5.2	5.5	5.8	V dc
AFT DC Output Voltage, V5	$V_{IN} = 0$	4	1	5.3	7.3	8.3	V dc
AFT DC Output Voltage, V6	$V_{IN} = 0$	4	1	5.3	7.3	8.3	V dc
AFT Output Offset Voltage, V5-V6	$V_{IN} = 0$	4	1	-1.5	0	1.5	V dc
RF AGC Residual Output Voltage, V_{4sat}	CA7607	4	1	0	0.2	0.5	V dc
	CA7611	4	2				
RF AGC Voltage Drop, V11-V4	CA7607	2	2	-0.1	0	0.1	V dc
	CA7611	4	1				
Maximum Video Sensitivity, V12	$V_{IN} = 25\text{ }\mu\text{V rms CW}$	2	2	-0.25	0.25	1	V dc
Minimum Video Sensitivity, V12	$V_{IN} = 110\text{ }\mu\text{V rms CW}$	2	2	1	2	3.8	V dc
Synch Tip Level Voltage, V12	$V_{IN} = 15\text{ mV rms}$	2	2	2.3	2.5	2.7	V dc
Black Noise Threshold Level Voltage, V12	$V_{IN} = 50\text{ mV rms at }45.75\text{ MHz}$ @ 30% AM Mod 1 kHz	3	2	1.4	1.6	1.8	V dc
Black Noise Clamp Level, V12		3	2	2.9	3.3	3.7	V dc
Video Freq. Response at 3.58 MHz, V12		1	2	-2	0	+1	dB
Video Freq. Response at 4.5 MHz, V12		1	2	-3	-2	+2	dB
920-kHz Beat, V12	$V_{IN1} = 33\text{ mV rms CW}$	1	2	31	38	—	dB
	$V_{IN2} = 11\text{ mV rms CW}$						
	$V_{IN3} = 11\text{ mV rms CW}$						
Video Amplifier Bandwidth, V12 +BW		1	2	4.5	5.5	10	MHz
Suppression of Carrier, V12	$V_{IN} = 25\text{ mV at }45.75\text{ MHz}$ @ 80% AM Mod 1 kHz	3	2	40	50	—	dB
Suppression of 2nd Harmonic, V12		3	2	35	50	—	dB
Differential Phase, V12		2	2	—	3.5	6	degree
Differential Gain, V12		2	2	—	7	10	%
Picture-to-Noise Ratio, PIN 12	$V_{IN} = 25\text{ mV at }45.75\text{ MHz CW}$	1	2	53	58	—	dB
Picture-to-Noise Ratio, PIN 12	$V_{IN} = 7.5\text{ mV at }45.75\text{ MHz CW}$	1	2	50	54	—	dB
AFT Sensitivity $\frac{\Delta f}{V5-V6}$	$V_{IN} = 15\text{ mV rms CW}$	2	2	6	12	16	kHz/V
AFT Output at 44.75 MHz, V5	$V_{IN} = 15\text{ mV rms CW}$	2	2	11.4	11.9	12.1	V dc
AFT Output at 44.75 MHz, V6	$V_{IN} = 15\text{ mV rms CW}$	2	2	1.6	2.1	2.8	V dc
AFT Output at 46.75 MHz, V5	$V_{IN} = 15\text{ mV rms CW}$	2	2	1.6	2.1	2.8	V dc
AFT Output at 46.75 MHz, V6	$V_{IN} = 15\text{ mV rms CW}$	2	2	11.4	11.9	12.1	V dc
RF Delay 1, V4	$V_{IN} = 15\text{ mV rms at }45.75\text{ MHz CW}$	2	1	0	1	10.4	V dc
	CA7607						
RF Delay 2, V4	$V_{IN} = 100\text{ mV rms at }45.75\text{ MHz CW}$	2	2	10.6	12	12.1	V dc
	CA7607						
	CA7611						
RF AGC Leakage Current, I_{4L}				—	—	1	μA
Maximum Available Current, I_{4max}	CA7607			0.3	—	—	mA
	CA7611			7	—	—	
RF Delay Low, V4	CA7607	2	1	0.2	5	15	mV
	CA7611	2	2				
RF Delay High, V4	CA7607	2	2	100	200	1000	mV
	CA7611	2	1				
Input Impedance, PIN 1-16		4		—	3	—	k Ω
				—	3	—	pF



Detail of AGC circuit.

Fig. 3 - Test circuit for the CA7607 and CA7611.