

November 1996

## TV Sync/AGC/Horizontal Signal Processor

### Features

- Horizontal Oscillator with AFC
- Sync Separator with Noise Immunity
- Strobed AGC System
- IF AGC Output
- Delayed Outputs for Forward or Reverse AGC Tuners
- Internal Noise Threshold
- High-Impedance Video Input
- Choice of Dual External Time Constants for Sync Separator Noise Immunity
- RF AGC Delay Externally Controlled
- Output Short-Circuit Protection

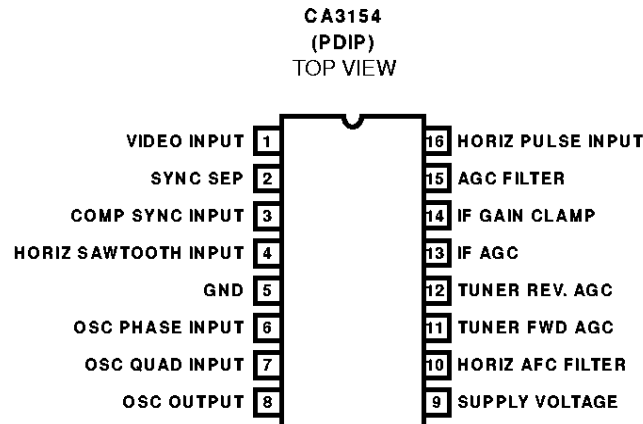
### Ordering Information

PART NUMBER	TEMP. RANGE (°C)	PACKAGE	PKG. NO.
CA3154E	-40 to 85	16 Ld PDIP	E16.3

### Description

The CA3154 is a monolithic integrated circuit TV signal processor designed for use in color or monochrome receivers. Circuit functions include a horizontal oscillator with AFC, a sync separator, and a keyed AGC system. The AGC system provides output signals for IF (reverse) and tuner (forward and/or reverse). The wide frequency-range horizontal oscillator has high stability at 503.5kHz. When the CA3154 is used in conjunction with horizontal/vertical countdown circuits, the need for horizontal and vertical hold controls is eliminated.

### Pinout



# CA3154

## Absolute Maximum Ratings

DC Supply Voltage (V+ to V-) ..... 15V

## Operating Conditions

Temperature Range ..... -40°C to 85°C

## Thermal Information

Thermal Resistance (Typical, Note 1)  $\theta_{JA}$  (°C/W)  
 PDIP Package ..... 80  
 Maximum Junction Temperature (Plastic Package) ..... 150°C  
 Maximum Storage Temperature Range ..... -65°C to 150°C  
 Maximum Lead Temperature (Soldering 10s) ..... 300°C

*CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.*

NOTE:

1.  $\theta_{JA}$  is measured with the component mounted on an evaluation PC board in free air.

## Electrical Specifications Terminal 5 to GND, and Terminal 9 to +12V, Unless Otherwise Specified

PARAMETER	SYMBOL	TEST CONDITIONS (TERMINALS CONNECTED AS SHOWN BELOW)	TEMP (°C)	MIN	TYP	MAX	UNITS
Power Supply Current	$I_9$	Measure (9)	25	10	-	22	mA
Video Inverter Voltage	$V_2$	(1) to +4V, (2) 12k $\Omega$ to GND, (3) 27k $\Omega$ to GND, Measure (2)	25	5.2	-	6.4	V
Sync Separator High Output Voltage	$V_{3H}$	(1) to +4V, (2) 12k $\Omega$ to GND, (3) 27k $\Omega$ to GND, Measure (2)	25	10.7	-	-	V
Sync Separator Low Output Voltage	$V_{3L}$	(1) to +4V, (3) 27k $\Omega$ to GND, Measure (3)	25	-	-	1.3	V
Video Noise Clamp Voltage	$V_3$ Clamp	(1) to +3.1V, (3) 27k $\Omega$ to GND, Measure (3)	25	10.7	-	-	V
AGC Discharge Current	$I_{15}$ Discharge	(1) to +4.4V, (2) 10k $\Omega$ to GND, (15) 470 $\Omega$ to +6V, (16) 27k $\Omega$ to 12V, Measure (15)	25	0.6	-	1.4	mA
AGC Charge Current	$I_{15}$ Charge	(1) to +3.45V, Otherwise, Same as Above	25	-2.1	-	-4.8	mA
AGC Comparator Leakage	$I_{15}$ Leakage	(1) to +3.45V, (2) 10k $\Omega$ to GND, (15) 4.7k $\Omega$ to +6V, Measure (15)	25	-20	-	20	$\mu$ A
AGC Threshold Voltage	$V_{1TH}$	Adj. (1) for $I_{15} = 0 \pm 0.1$ mA, (2) 10k $\Omega$ to GND, (15) 4.7k $\Omega$ to +6V, (16) 27k $\Omega$ to +12V, Measure (1)	25	3.8	4	4.3	V
Minimum IF AGC	$V_{13L}$	(11) 10k $\Omega$ to GND, (12) 10k $\Omega$ to +12V, (13) 22k $\Omega$ to +5V, (14) 1k $\Omega$ to +2.95V, (16) 1k $\Omega$ to +2.2V, Measure (13)	25	0.75	-	1.25	V
Forward Tuner AGC Leakage Current	$I_{11}$ Leakage	(11) 10k $\Omega$ to GND, (12) 10k $\Omega$ to 12V, (13) 2.2k $\Omega$ to +5V, (14) 1k $\Omega$ to +2.95V, (15) 1k $\Omega$ to +5.3V, Measure (11)	25	-20	-	20	$\mu$ A
Reverse Tuner AGC Leakage	$I_{12}$ Leakage	Same as Above, but Measure (12)	25	-10	-	10	$\mu$ A
IF AGC High Voltage	$V_{13H}$	Same as Above, but Measure (13)	25	3.65	-	4.15	V
Forward Tuner AGC Low Voltage	$V_{11L}$	(11) 3.6k $\Omega$ to GND, (12) 3.16k $\Omega$ to +12V, (13) 2.2k $\Omega$ to +5V, (14) 1k $\Omega$ to +2.95V, (15) 1k $\Omega$ to +7.9V, Measure (11)	25	0.8	-	3.2	V
Reverse Tuner AGC Low Voltage	$V_{12L}$	Same as Above, but Measure (12)	25	1.65	-	3.25	V
Maximum IF AGC Voltage	$V_{13H}$	(11) 10k $\Omega$ to GND, (12) 10k $\Omega$ to +12V, (13) 2.2k $\Omega$ to +5V, (14) 1k $\Omega$ to +2.95V, (15) 1k $\Omega$ to +7.9V, Measure (13)	25	4.85	-	5.2	V
Phase Detector Leakage Current	$I_{10L}$	(2) 10k $\Omega$ to GND, (3) to GND, (4) 5k $\Omega$ to +3.8V, (10) 10k $\Omega$ to +6V, Limit GND at (3) to 10s, Measure 10	25	-5	-	5	$\mu$ A

# CA3154

**Electrical Specifications** Terminal 5 to GND, and Terminal 9 to +12V, Unless Otherwise Specified (Continued)

PARAMETER	SYMBOL	TEST CONDITIONS (TERMINALS CONNECTED AS SHOWN BELOW)	TEMP (°C)	MIN	TYP	MAX	UNITS
Phase Detector Bias Voltage	$V_4$		25	2.65	-	3.1	V
Oscillator Output Voltage	$V_6$	Connect Oscillator Loop Shown in Test Circuit to (6), (7), (8); (3) to GND for 10s Max, Measure (6)	25	0.6	-	1.6	$V_{p-p}$
Oscillator Free-Running Frequency	$f_{6FR}$	Same as Above	25	475	-	535	kHz
Oscillator Frequency High	$f_{6H}$	Connect Oscillator Circuit Shown in Test Circuit to (10), (7), (8); (2) 10k $\Omega$ to GND, (4) 5k $\Omega$ to +18V, Measure (6)	25	520	-	-	kHz
Oscillator Frequency Low	$f_{6L}$	Same as Above, Except (4) 5k $\Omega$ to +3.8V	25	-	-	485	kHz
Sync Separator Short Circuit	$I_3$ Max	(3) 10 $\Omega$ to GND for 10s Max	25	-	-	40	mA
Oscillator Output Short Circuit	$I_8$ Max	(8) 10 $\Omega$ to GND for 10s Max (3) 10 $\Omega$ to GND for 10s Max	25	-	-	130	mA

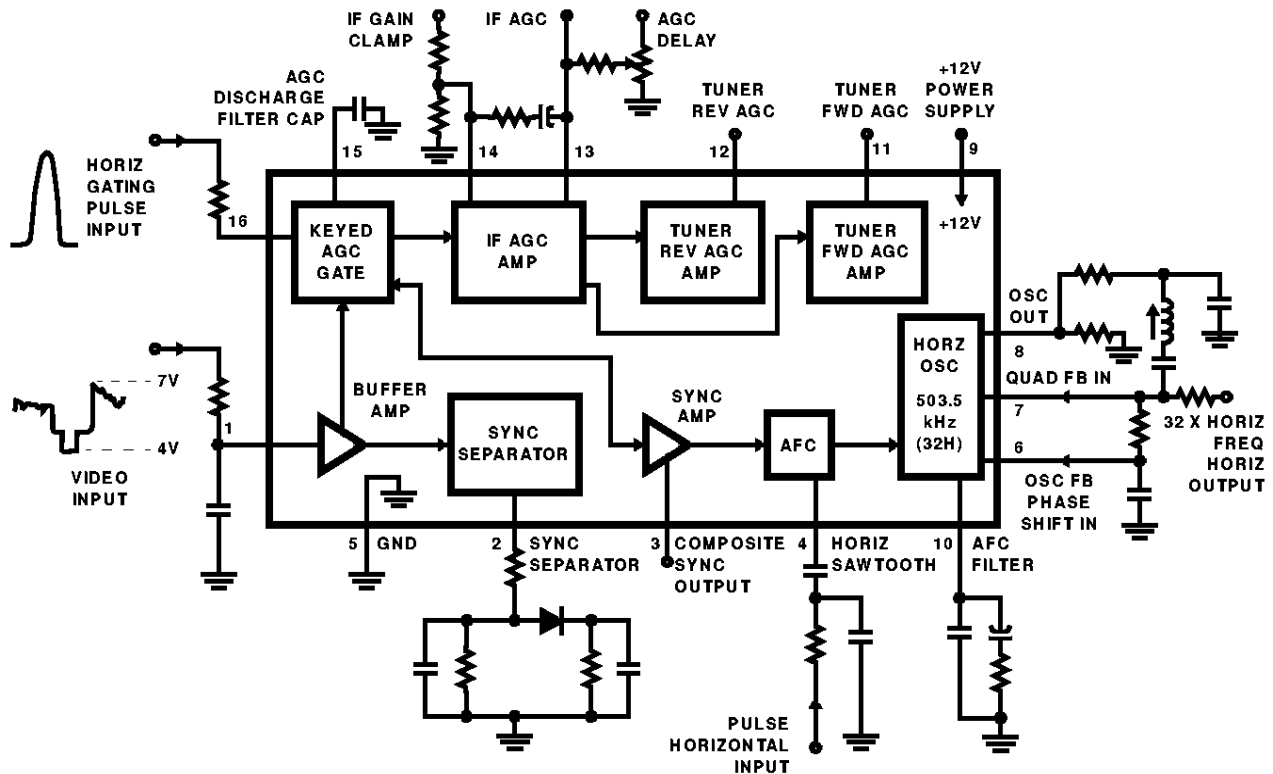
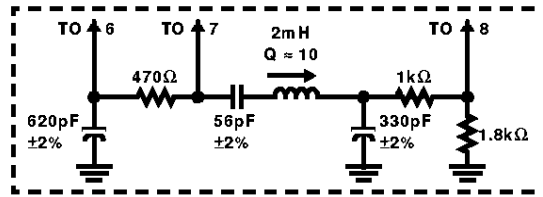


FIGURE 1. FUNCTIONAL BLOCK DIAGRAM OF CA3154



NOTE: Oscillator loop to be used as indicated in the electrical characteristics chart, with coil adjusted for typical unit to 503.5kHz for  $f_{6FR}$ .

FIGURE 2. ELECTRICAL CHARACTERISTICS TEST CIRCUIT

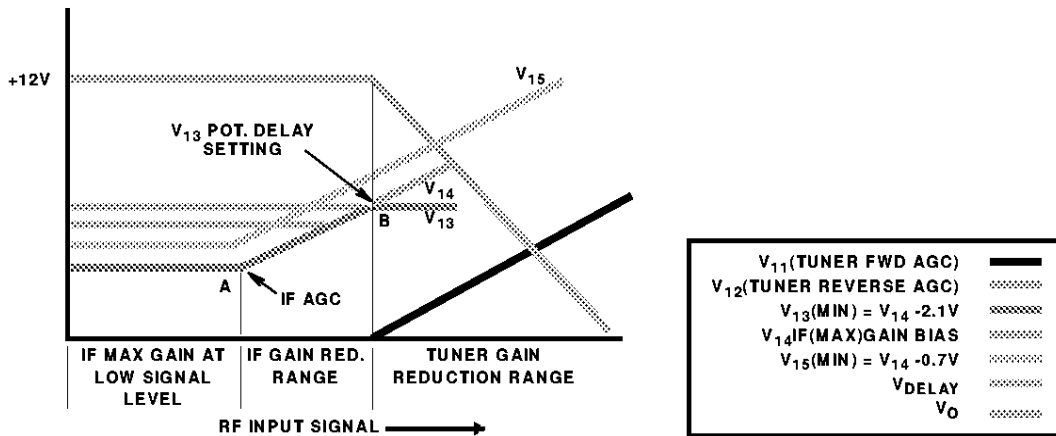


FIGURE 3. TYPICAL OPERATION OF AGC CIRCUITS USING THE CA3154

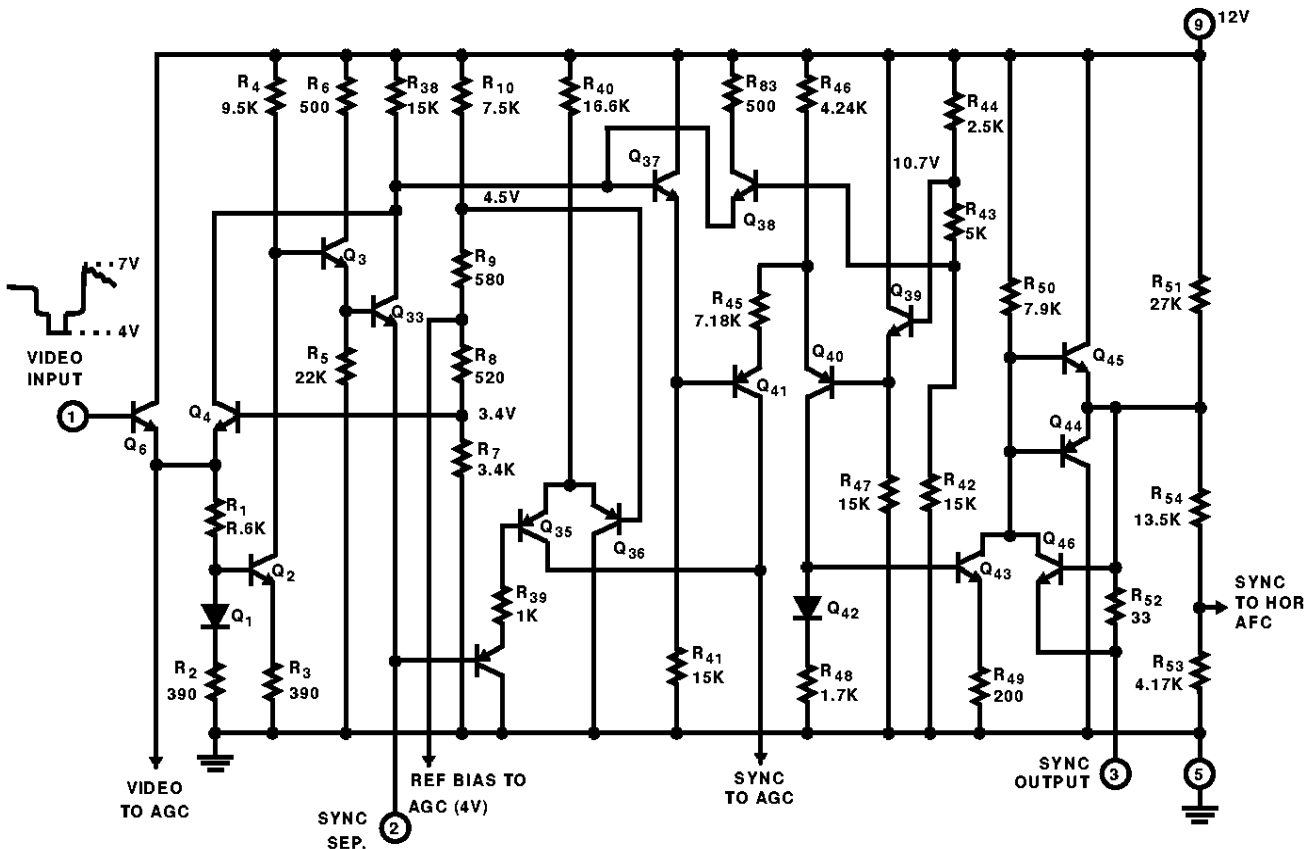


FIGURE 4. SCHEMATIC OF SYNC SEPARATOR SECTION OF THE CA3154

CA3154

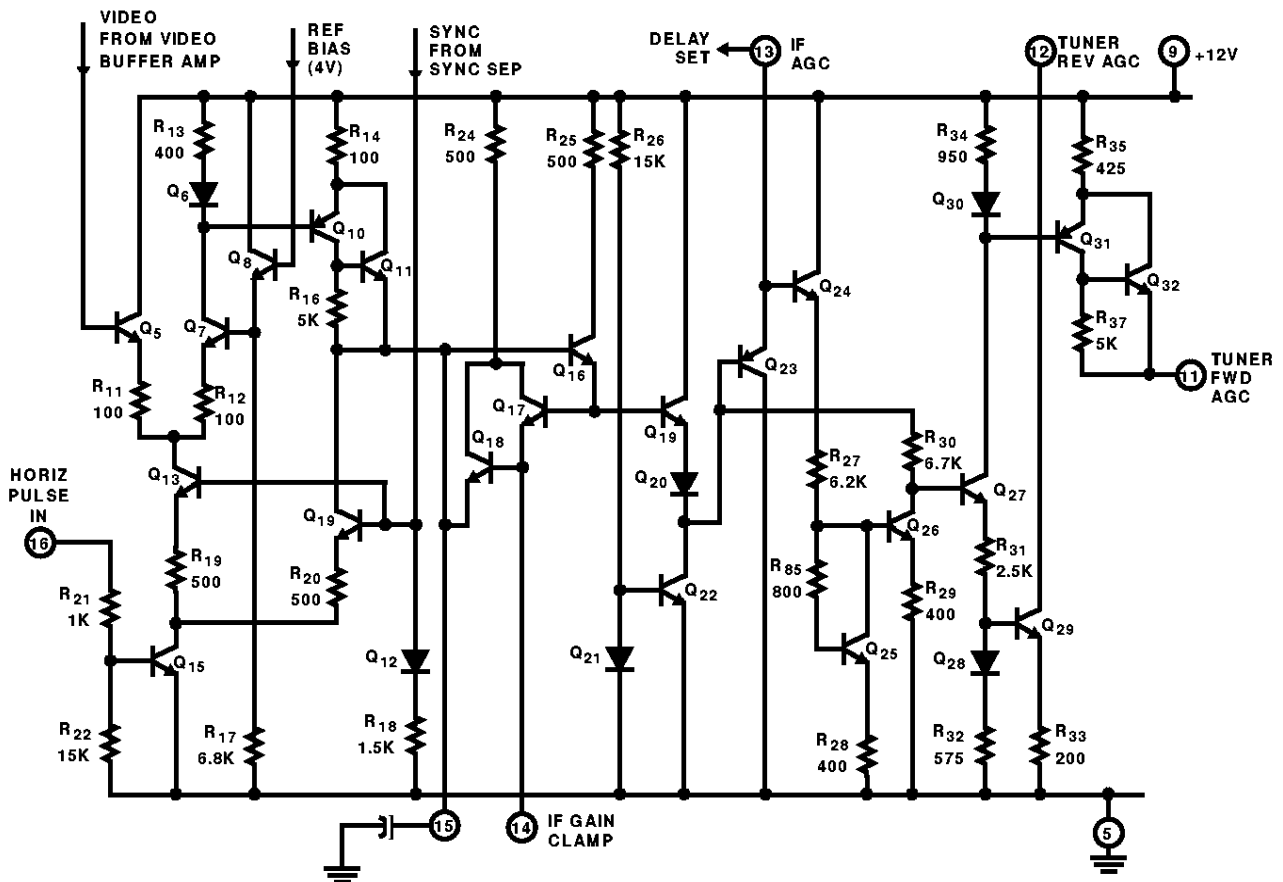


FIGURE 5. SCHEMATIC OF AGC SECTION OF THE CAA3154

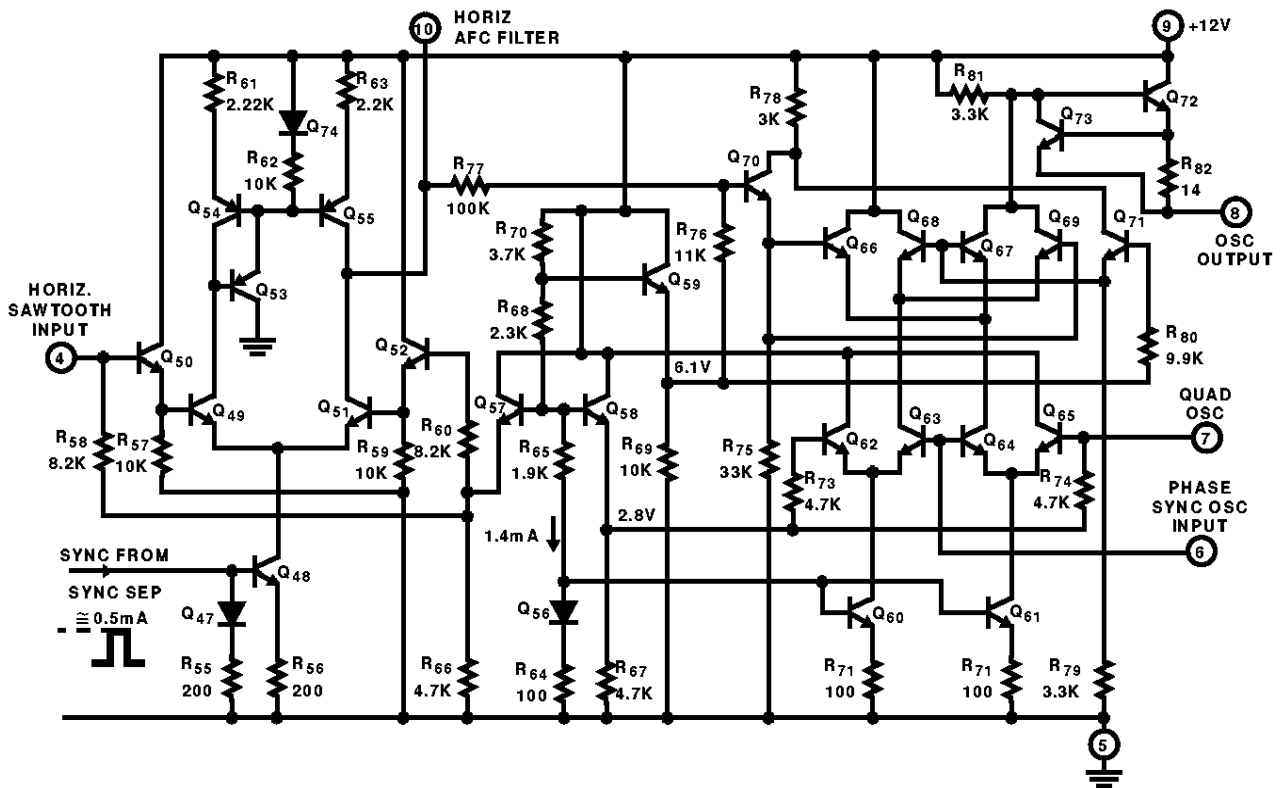


FIGURE 6. SCHEMATIC OF AFC-OSCILLATOR SECTION OF THE CA3154

# CA3154

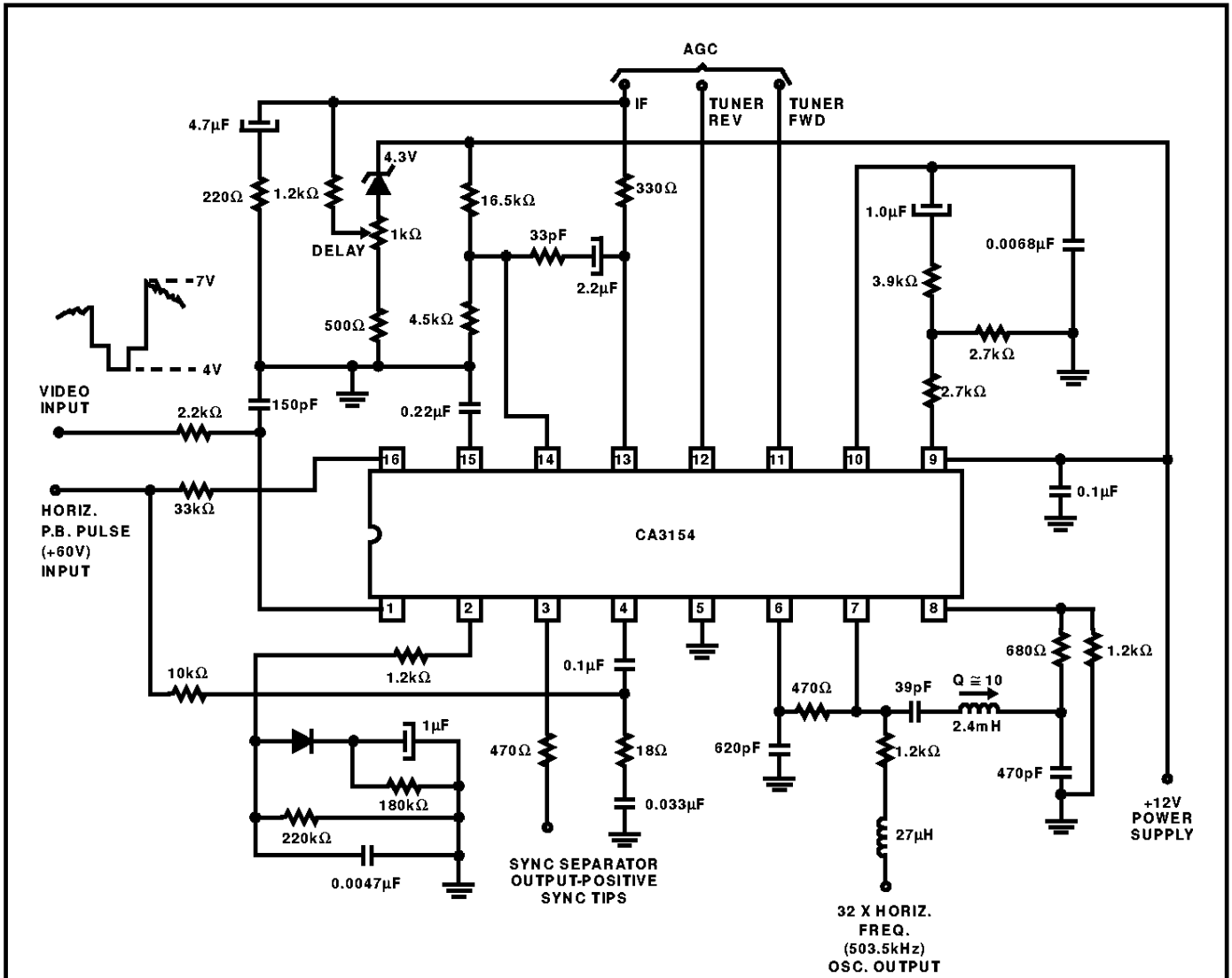


FIGURE 7. TYPICAL APPLICATION OF THE CA3154

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