

**OBSOLETE PRODUCT  
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# CA3088E

## AM Receiver Subsystem and General-Purpose Amplifier Array

May 1999

### Features

- Excellent Overload Characteristics
- AGC for IF Amplifier
- Buffered Output Signal for Tuning Meter
- Internal Zener Diode Provides Voltage Regulation
- Two IF Amplifier Stages
- Low-Noise Converter and First IF Amplifier
- Low Harmonic Distortion (THD)
- Delayed AGC for RF Amplifier
- Terminals for Optional Inclusion of Tone Control
- Operates from Wide Range of Power Supplies:  
V+ = 6V to 16V
- Optional AC and/or DC Feedback on Wide-Band Amplifier
- Array of Amplifiers for General-Purpose Applications
- Suitable for Use With Optional External RF Stage, Either MOS or Bipolar
- Related at:
  - Refer to AN6022 for Application Note Information

### Part Number Information

PART NUMBER	TEMP. RANGE (°C)	PACKAGE	PKG. NO.
CA3088E	-40 to 85	16 Ld PDIP	E16.3

### Description

The CA3088E, a monolithic integrated circuit, is an AM subsystem that provides the converter, IF amplifier, detector, and audio preamplifier stages for an AM receiver.

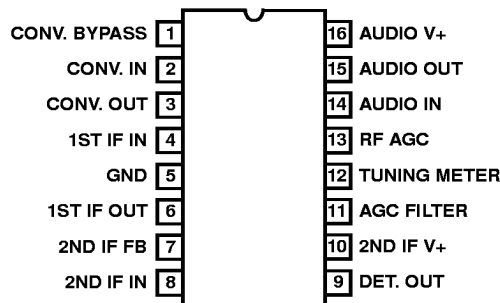
The CA3088E also provides internal AGC for the first IF amplifier stage, delayed AGC for an optional external RF amplifier, a buffer stage to drive a tuning meter, and terminals facilitating the optional use of a tone control.

Figure 2 is a functional diagram of the CA3088E. The signal from the low-noise converter is applied to the first IF amplifier and is then coupled to the second IF amplifier. This IF signal is then detected and externally filtered. The resultant audio signal is applied to an audio preamplifier. Optionally, a tone control circuit may be connected at the junction of the detector circuit and the audio preamplifier. The gain of the first IF amplifier stage is controlled by an internal AGC circuit. The CA3088E supplies a delayed AGC signal output for use with an external RF amplifier. A buffered output signal is also available for driving a tuning meter. A DC voltage, internally regulated by a Zener diode, supplies the second IF amplifier, the AGC and tuning meter circuits and may also be used with any other stage.

The CA3088E features four independent transistor amplifiers, each incorporating internal biasing for temperature tracking. These amplifiers are particularly useful in general-purpose amplifier, oscillator, and detector applications in a wide variety of equipment designs.

### Pinout

CA3088E  
(PDIP)  
TOP VIEW



# CA3088E

## Absolute Maximum Ratings $T_A = 25^\circ\text{C}$

Supply Voltage (Across Term. 5 and Terms. 3, 6, 13, 16, Respectively) . . . . .	16V
Output Current Terminals 3, 6, 13, 16, (Respectively). . . . .	10mA
Terminal 10 . . . . .	30mA

## Thermal Information

Thermal Resistance (Typical, Note 1)	$\theta_{JA}$ ( $^\circ\text{C}/\text{W}$ )
PDIP Package . . . . .	110
Maximum Junction Temperature (Plastic Package) . . . . .	150 $^\circ\text{C}$
Maximum Storage Temperature Range . . . . .	-65 $^\circ\text{C}$ to 150 $^\circ\text{C}$
Maximum Lead Temperature (Soldering 10s) . . . . .	300 $^\circ\text{C}$

## Operating Conditions

Temperature Range . . . . . -40 $^\circ\text{C}$  to 85 $^\circ\text{C}$

*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:

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

## Electrical Specifications $T_A = 25^\circ\text{C}$ , $V_+ = 12\text{V}$

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
<b>DC CHARACTERISTICS</b>						
Voltage (Figure 1)	$V_1, V_4, V_9, V_{11}$	Terminals 1, 4, 9, 11	-	0.7	-	V
	$V_2, V_7, V_8$	Terminals 2, 7, 8	-	1.4	-	V
	$V_{10}$	Terminal 10	-	5.6	-	V
	$V_{12}$	Terminal 12	-	0	-	V
	$V_{15}$	Terminal 15	-	3.5	-	V
Current (Figure 1)	$I_3$	Terminal 3	-	0.35	-	mA
	$I_6$	Terminal 6	-	1.0	-	mA
	$I_{10}$	Terminal 10	-	20	-	mA
	$I_{13}$	Terminal 13	-	0	-	mA
	$I_{16}$	Terminal 16	-	1.2	-	mA
<b>DYNAMIC CHARACTERISTICS</b>						
Detector Output (Figure 2)		30% Modulation	-	75	-	mV <sub>RMS</sub>
Audio Amplifier Gain (Figure 2)	$A_{AF}$	$f = 1\text{kHz}$	-	30	-	dB
Audio Distortion (Figure 2)		$V_{OUT} = 100\text{mV}$	-	0.2	-	%
Sensitivity ( $f_{IN} = 1\text{MHz}$ , Signal-to-Noise Ratio (S/N) = 20dB)		At Converter Stage Input (Figure 2)	-	200	-	$\mu\text{V}/\text{m}$
		At RF Stage Input (Figure 2)	-	100	-	$\mu\text{V}/\text{m}$
Total Harmonic Distortion (Figure 2)	THD	30% Modulation	-	1.0	-	%
Input Resistance (No AGC, $f_{IN} = 1\text{MHz}$ )	$R_{IN}$	At Transistor $Q_1$	-	3500	-	$\Omega$
		At Transistor $Q_5$	-	2000	-	$\Omega$
Input Capacitance (No AGC, $f_{IN} = 1\text{MHz}$ )	$C_{IN}$	At Transistor $Q_1$	-	17	-	pF
		At Transistor $Q_5$	-	12	-	pF
Feedback Capacitance (No AGC, $f_{IN} = 1\text{MHz}$ )	$C_{FB}$	At Transistor $Q_1$	-	1.5	-	pF
		At Transistor $Q_5$	-	1.5	-	pF

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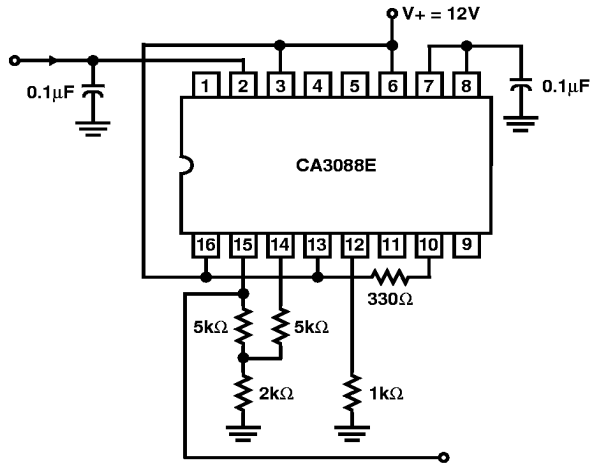
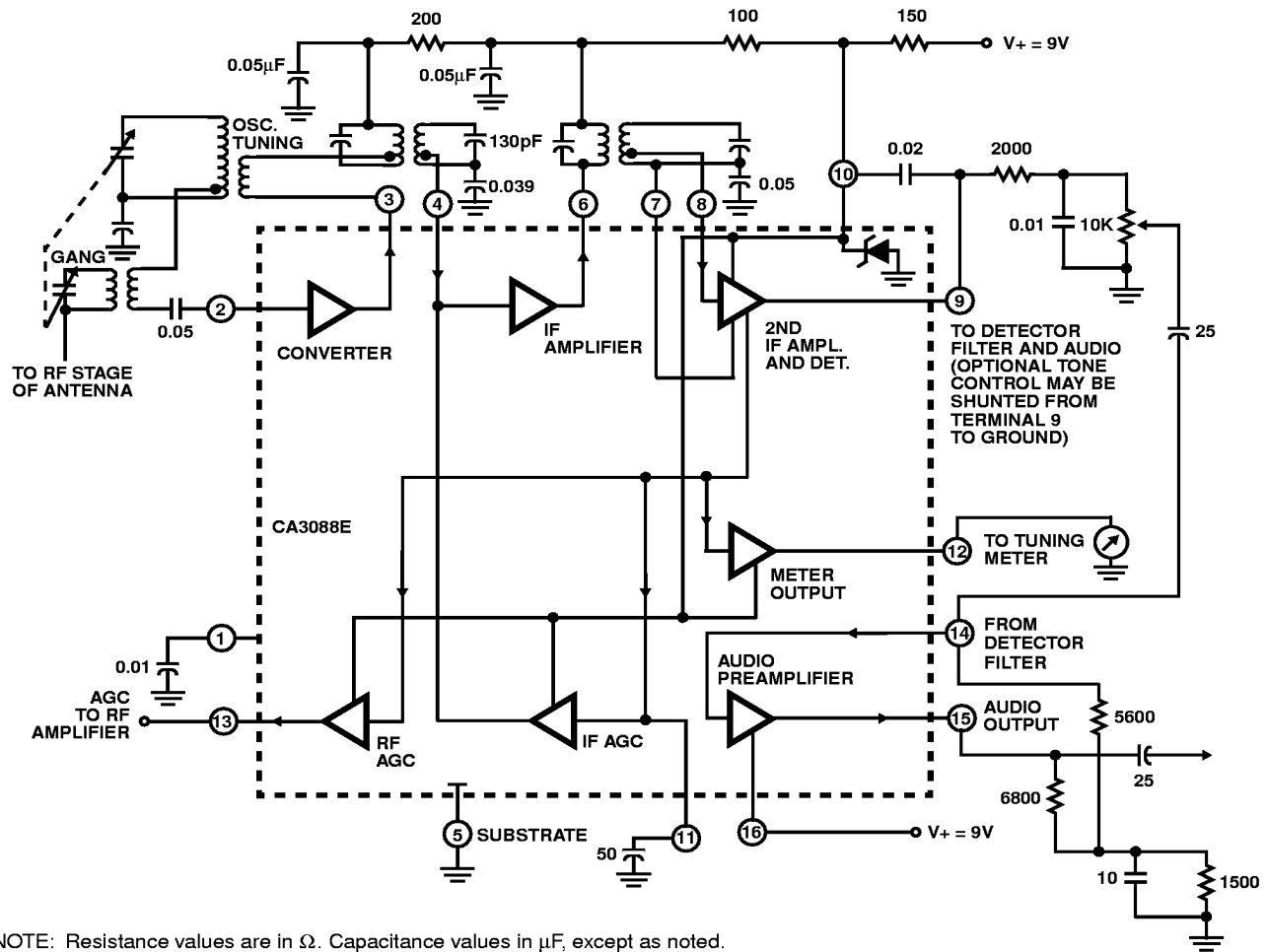


FIGURE 1. TEST CIRCUIT FOR DC CHARACTERISTICS



NOTE: Resistance values are in  $\Omega$ . Capacitance values in  $\mu\text{F}$ , except as noted.

FIGURE 2. FUNCTIONAL BLOCK DIAGRAM OF THE CA3088E

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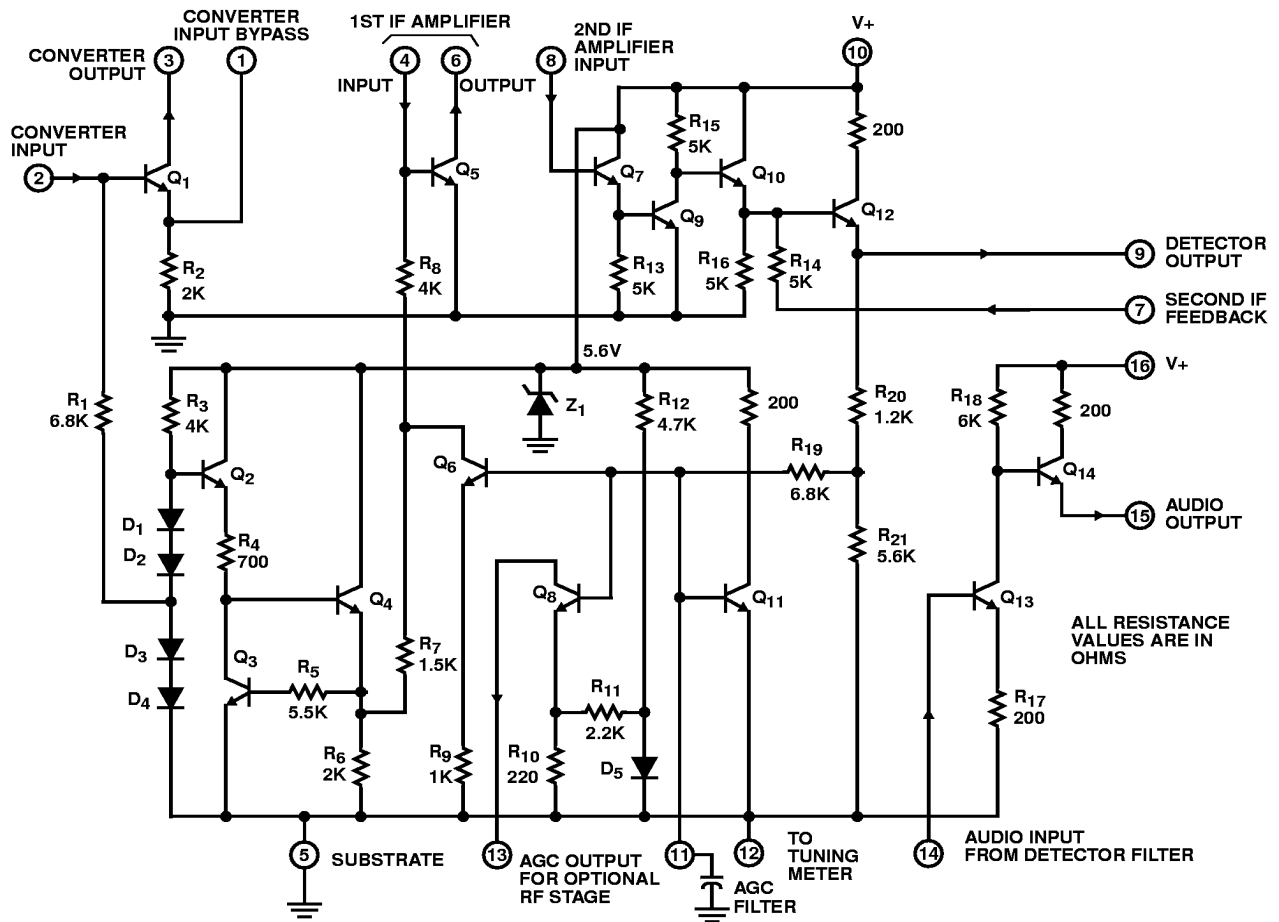


FIGURE 3. SCHEMATIC DIAGRAM OF THE CA3088E