

# MC44306

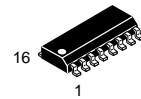
## Advance Information Demodulator

The MC44306 is an IF amplifier and mixer circuit intended for demodulation of QAM, VSB or GPSK digitally modulated signals. Great care was applied to this design to provide the best possible linearity, bandwidth.

- 60 dB Voltage Gain IF Amplifier
- 10 MHz Detectors for QAM, VSB or Analog Signals
- Complementary Buffered Mixer Outputs
- Continuous AGC with Adjustable Delay for RF Stage
- Oscillator at "Half IF" to Minimize Spurious Feedback
- VCO Frequency Range 35 to 55 MHz

### IF AMPLIFIER AND DEMODULATOR

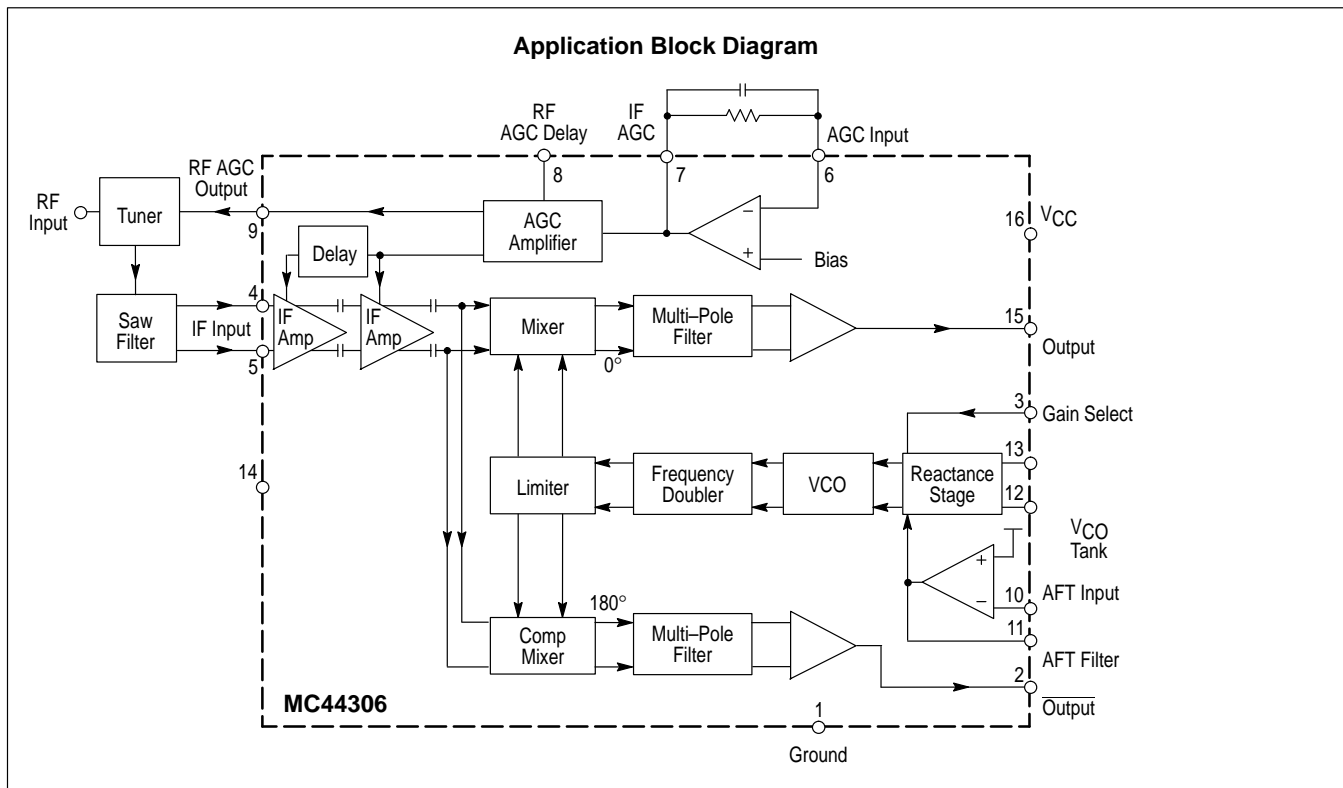
#### SEMICONDUCTOR TECHNICAL DATA



**D SUFFIX**  
PLASTIC PACKAGE  
CASE 751B  
(SO-16)

#### ORDERING INFORMATION

Device	Temperature Range	Package
MC44306D	0° to +70°C	SO-16



# MC44306

## MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Power Supply Voltage	$V_{CC}$	7.0	V
Input Voltage Range IF Input, AGC Input, AFT Input, Gain Select, RF AGC Delay, Quadrature Adjust	$V_{in}$	-0.5 to $V_{CC}$	V
VCO Coil Voltage	VCO	$V_{CC}$	V
Output Current Outputs RF AGC, Internally Limited	-	15 2.0	mA
Power Dissipation at $T_A = 70^\circ\text{C}$	$P_D$ $R_{\theta JA}$	800 100	mW $^\circ\text{C/W}$
Operating Junction Temperature	$T_J$	+150	$^\circ\text{C}$
Operating Ambient Temperature	$T_A$	0 to +70	$^\circ\text{C}$

NOTE: ESD data available upon request.

## ELECTRICAL CHARACTERISTICS ( $V_{CC} = 5.0\text{ V}$ , $T_A = 25^\circ\text{C}$ , $f_{IF} = 44\text{ MHz}$ , $f_{VCO} = 22\text{ MHz}$ , unless otherwise noted.)

Characteristic	Symbol	Typ	Unit
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### IF AMPLIFIER

Differential Input Impedance	$R_{in}$ $C_{in}$	2.0 3.0	$k\Omega$ pF
Differential Input for Full Output – 1.0 Vpp	$V_{in}$	0.6	mVrms
Automatic Gain Control Range	AGC	60	dB
Noise Figure (IF Input, Sourced by 900 $\Omega$ in Parallel with 5.0 pF)	NF	5.0	dB
Bandwidth (Lower and Upper Limits) IF Amplifier	BW	35 to 120	MHz

### DETECTORS

Output Voltage $R_L \geq 1.0\text{ k}\Omega$	-	2.0	Vpp
Distortion (CW Input 5.0 mVrms, VCO Unlocked, Adjust AGC for 2.0 Vpp Output Beat Note), all Harmonics	THD	2.0 -34	% dB
Flatness ( $f_{MOD} = 0$ to 2.5 MHz)	-	0.5	dB
Relative Group Delay	-	5.0	ns
Output 3.0 dB Bandwidth	BW	10	MHz
Spurious and IF Harmonics (Ref. to 2.0 Vpp Output)	-	-40	dB

### AGC

RF AGC Output (Sink)	-	2.0	mA
RF AGC Delay Voltage Range	-	1.7 to 2.4	V

### AFT (Pulse Width Modulator AFT Input 0.5 V or Open)

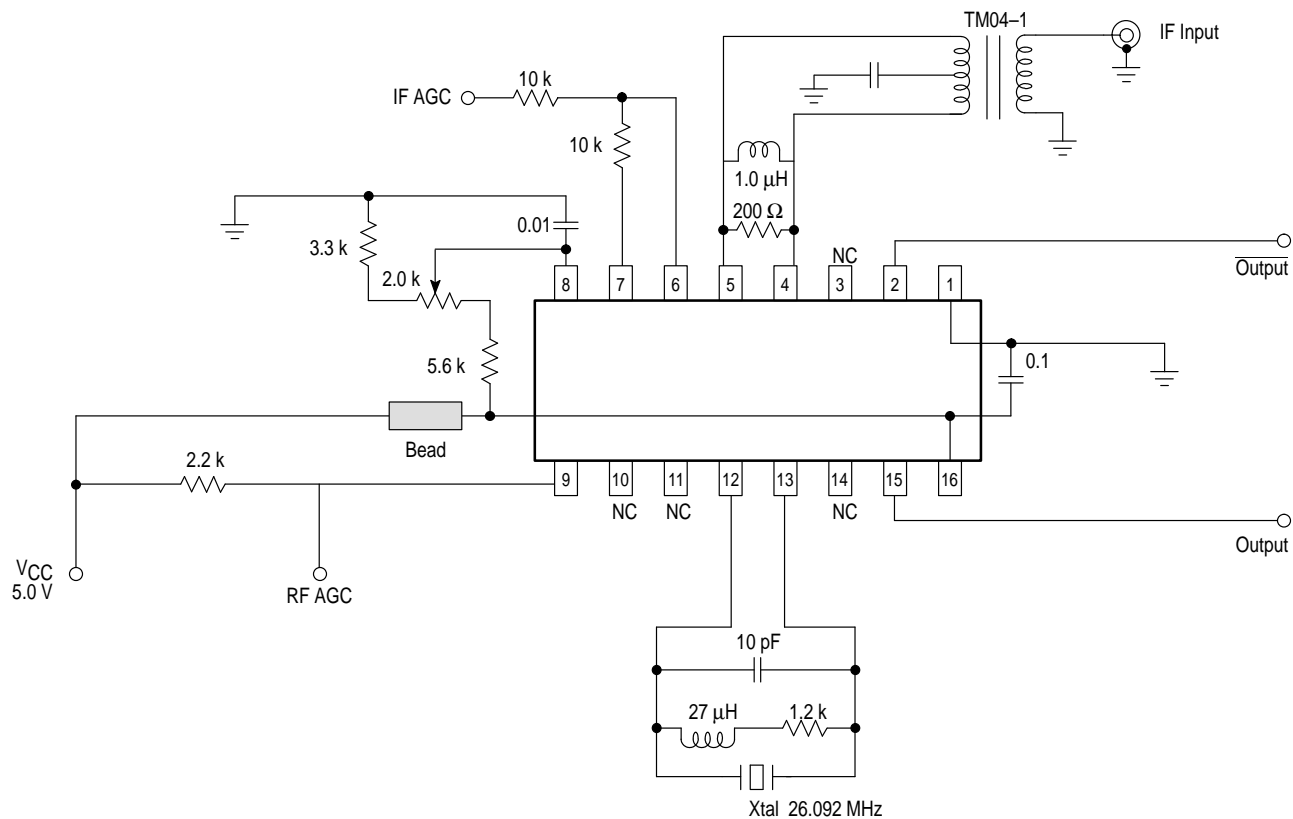
PWM Frequency	-	5.0	MHz
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### VCO

Tuning Range Gain Select Pulled-Up with 2.0 $k\Omega$ R Gain Select Open	-	1.0 100	MHz kHz
Tuning Voltage	-	0.5 to 4.5	V
Phase Noise 10 kHz 1.0 kHz	-	-95 -80	dB

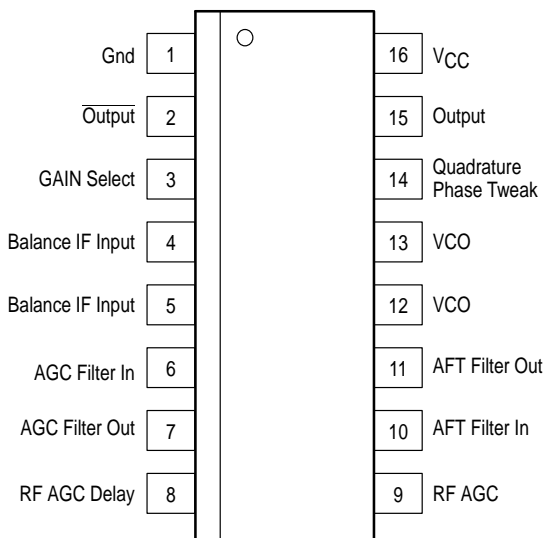
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Figure 1. MC44306 Test Circuit



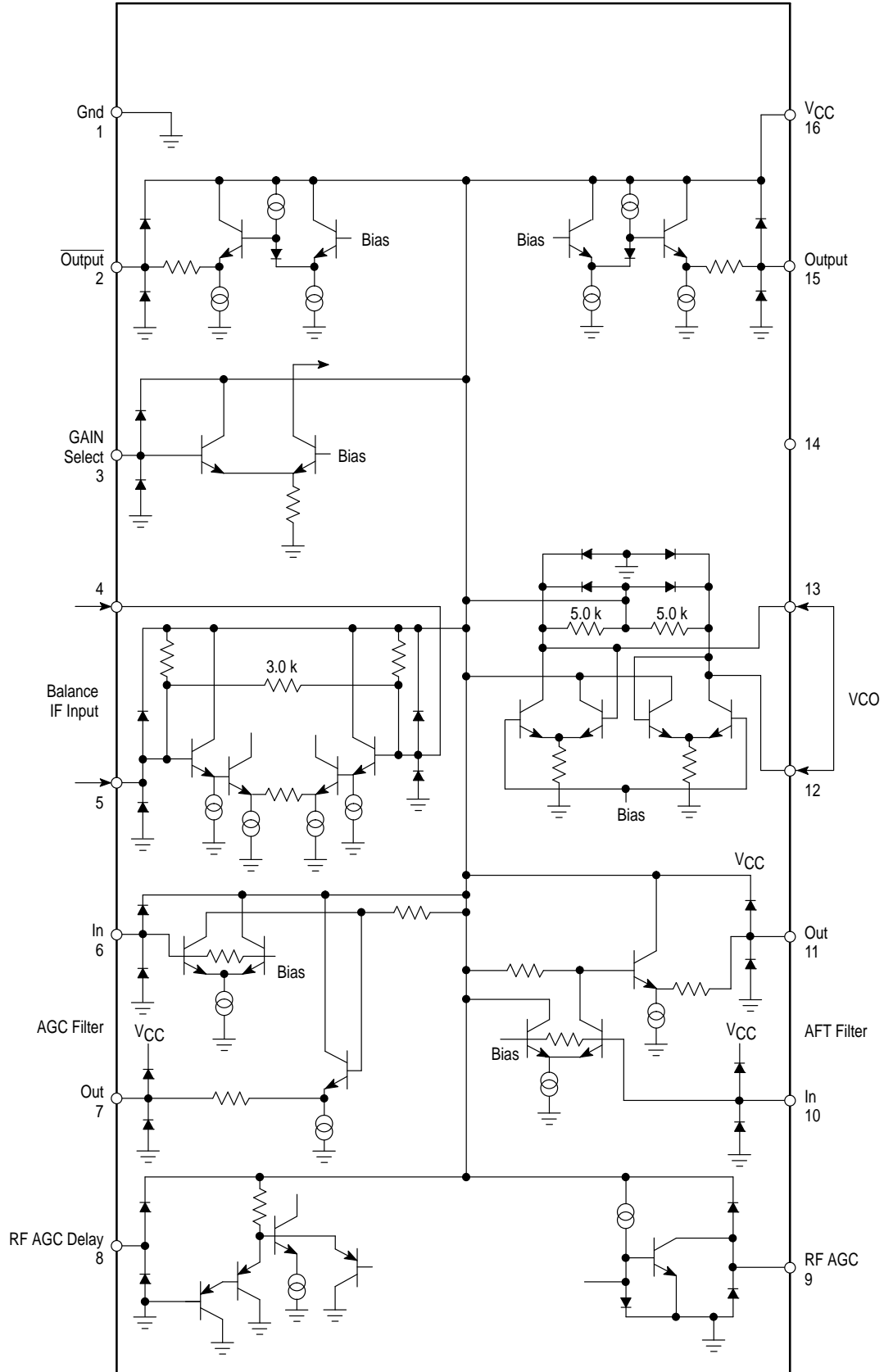
## PIN CONNECTIONS

(Top View)



# MC44306

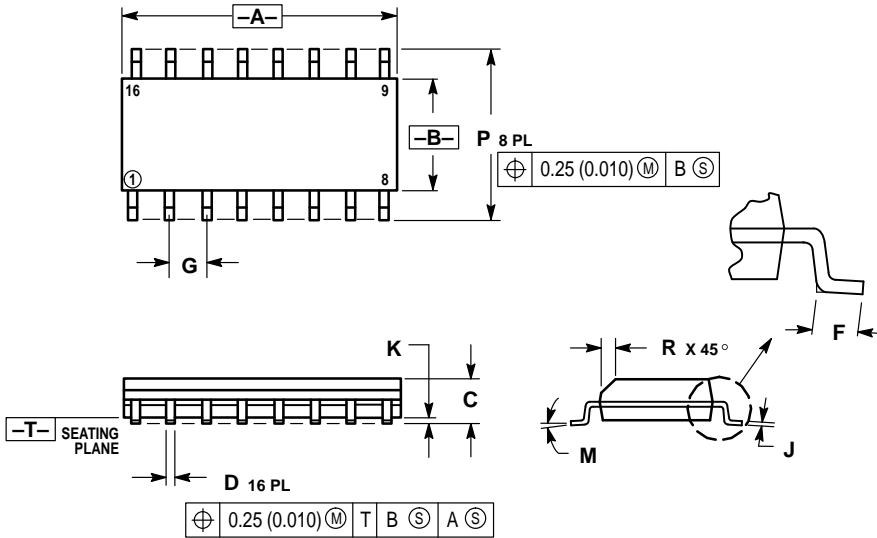
Figure 2. MC44306 Pin Schematic



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## OUTLINE DIMENSIONS

**D SUFFIX**  
**PLASTIC PACKAGE**  
**CASE 751B-05**  
**(SO-16)**  
**ISSUE J**



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: MILLIMETER.
  3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
  4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
  5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.80	10.00	0.386	0.393
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 BSC		0.050 BSC	
J	0.19	0.25	0.008	0.009
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

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