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MOTOROLA

MC44306

Advance Information

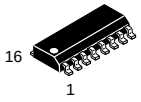
Demodulator

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

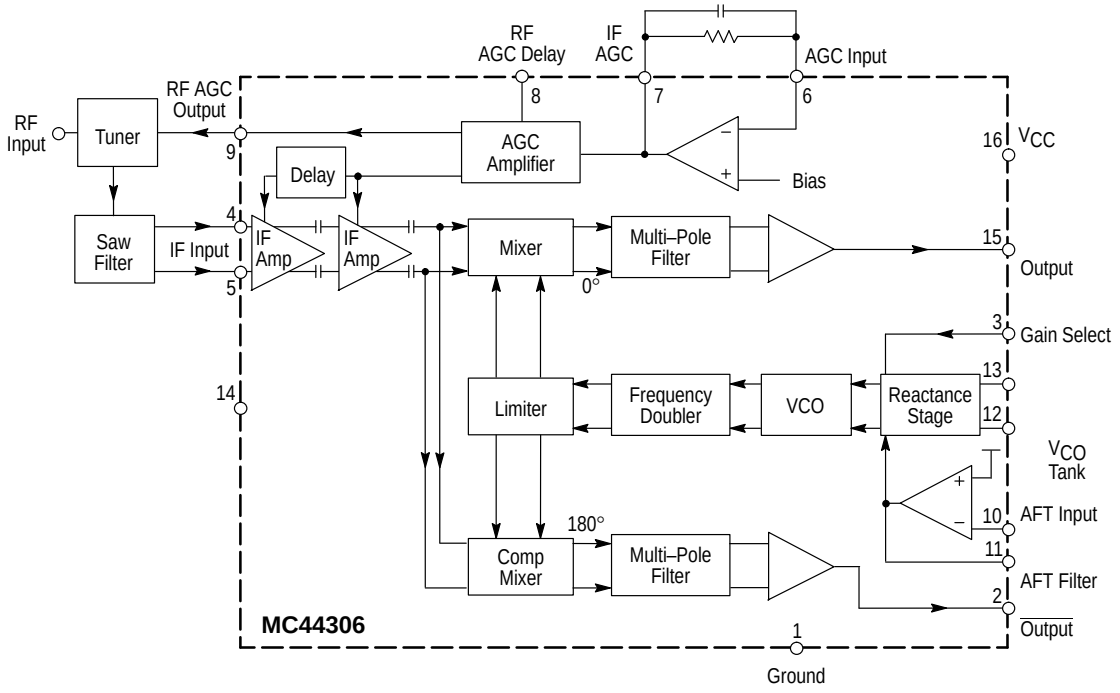


D SUFFIX
PLASTIC PACKAGE
CASE 751B
(SO–16)

ORDERING INFORMATION

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

Application Block Diagram



MAXIMUM RATINGS

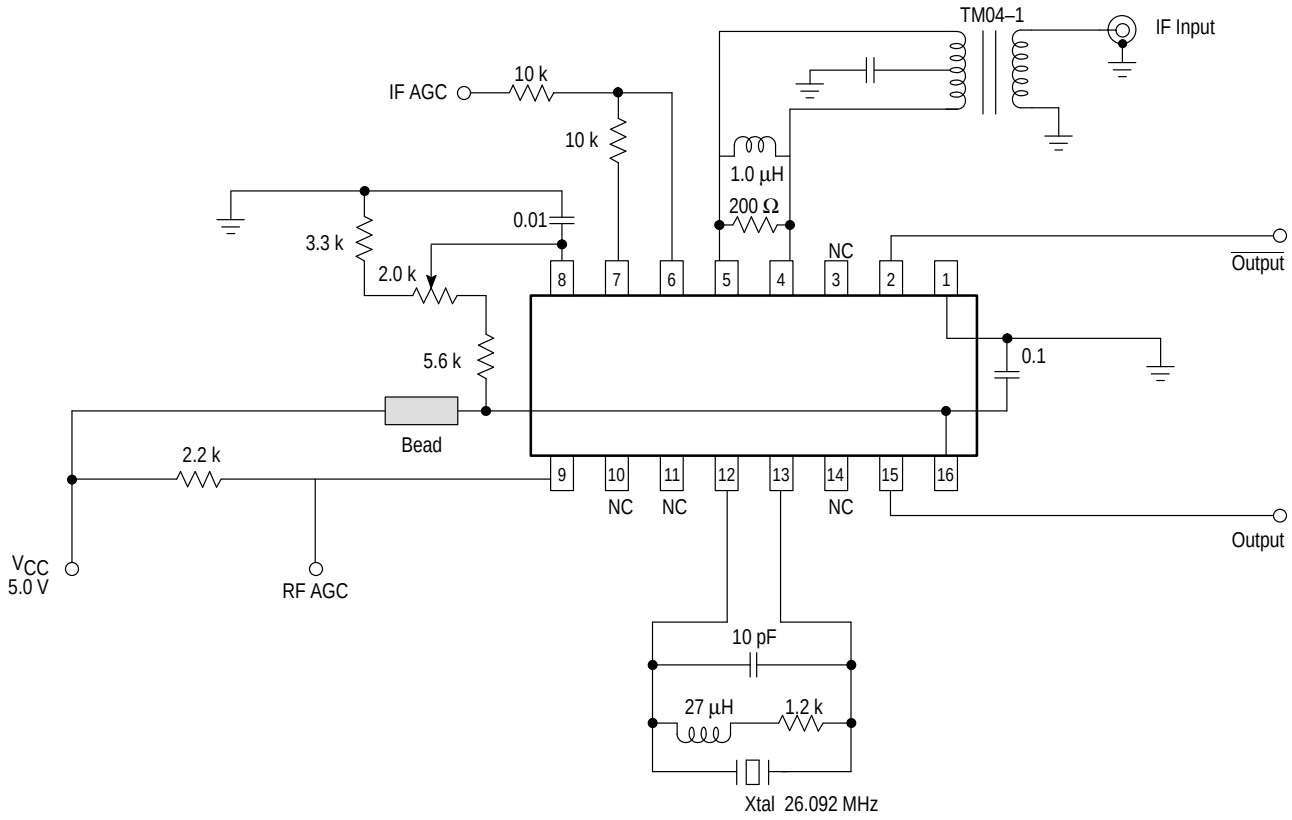
Rating	Symbol	Value	Unit
Power Supply Voltage	V_{CC}	7.0	V
Input Voltage Range IF Input, AGC Input, AFT Input, Gain Select, RF AGC Delay, Quadrature Adjust	V_{in}	–0.5 to V_{CC}	V
VCO Coil Voltage	VCO	V_{CC}	V
Output Current Outputs RF AGC, Internally Limited	–	 15 2.0	mA
Power Dissipation at T_A = 70°C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

NOTE: ESD data available upon request.

ELECTRICAL CHARACTERISTICS (V_{CC} = 5.0 V, T_A = 25°C, f_{IF} = 44 MHz, f_{VCO} = 22 MHz, unless otherwise noted.)

Characteristic	Symbol	Typ	Unit
IF AMPLIFIER			
Differential Input Impedance	R_{in} C_{in}	2.0 3.0	kΩ 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 Ω 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 kΩ	–	2.0	Vpp
Distortion (CW Input 5.0 mVrms, VCO Unlocked, Adjust AGC for 2.0 Vpp Output Beat Note), all Harmonies	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
VCO			
Tuning Range Gain Select Pulled–Up with 2.0 kΩR 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

Figure 1. MC44306 Test Circuit



PIN CONNECTIONS

(Top View)

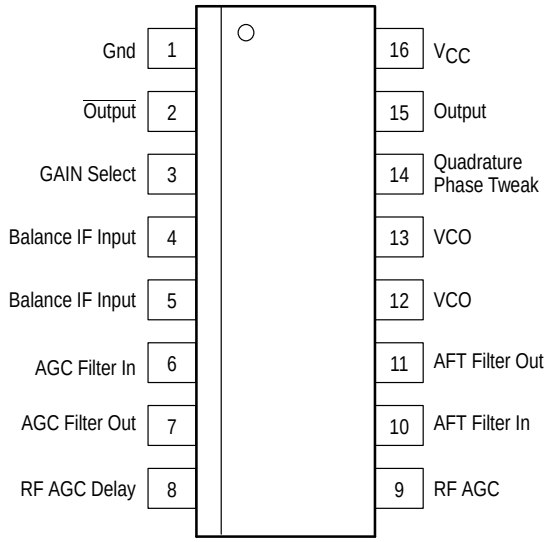
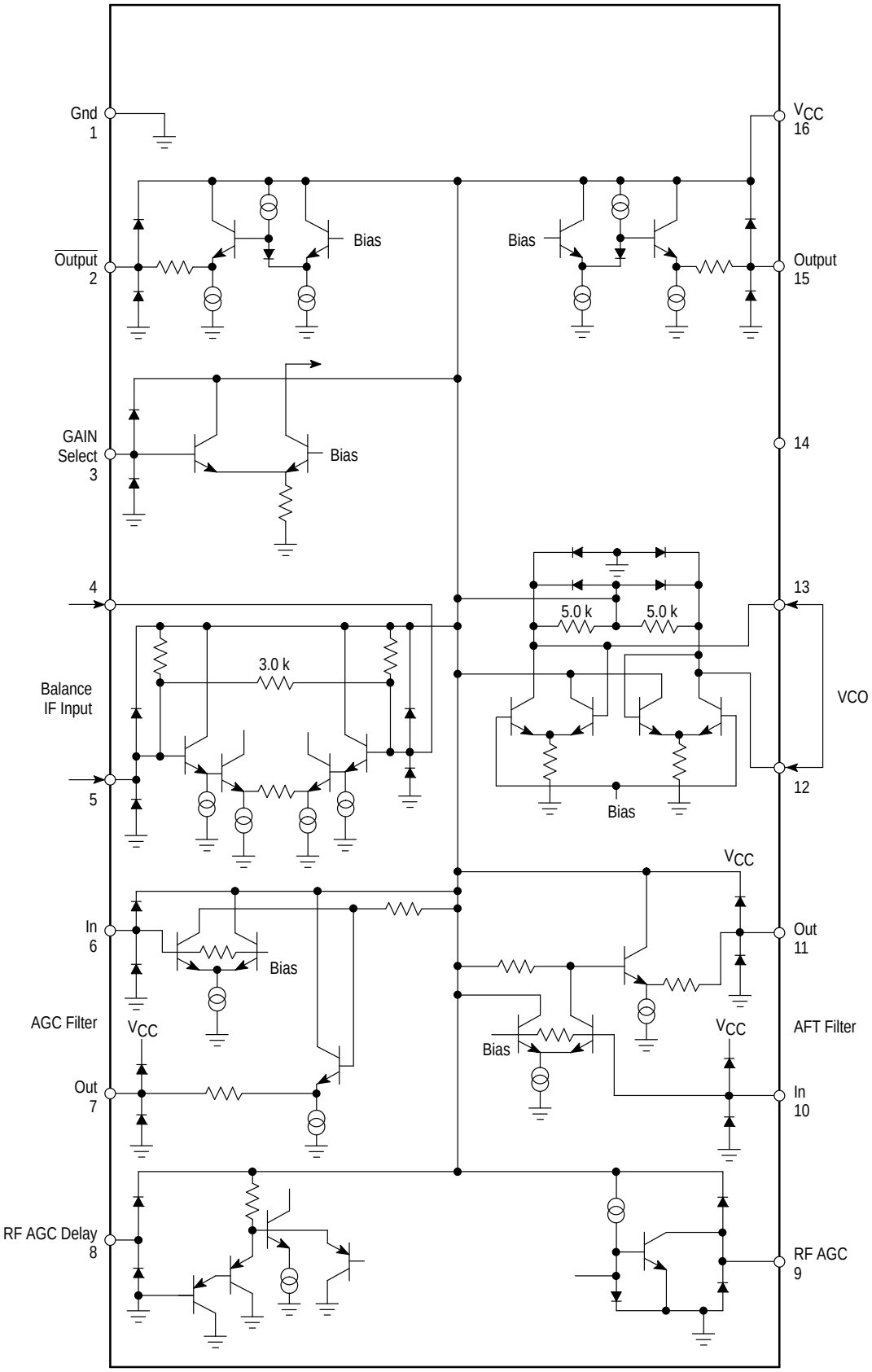
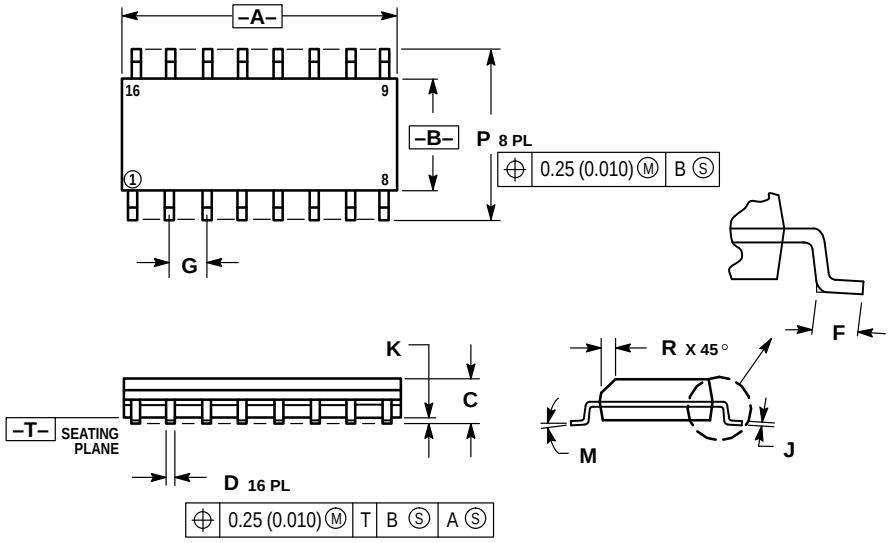


Figure 2. MC44306 Pin Schematic



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.

	MILLIMETERS		INCHES	
DIM	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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