ORDERING INFORMATION

Device	Temperature Range	Package
MC1349P	0°C to +70°C	Plastic DIP

MC1349P

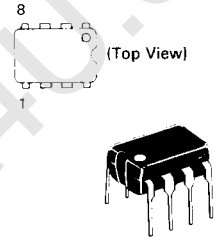
IF AMPLIFIER

SILICON MONOLITHIC INTEGRATED CIRCUIT

IF AMPLIFIER

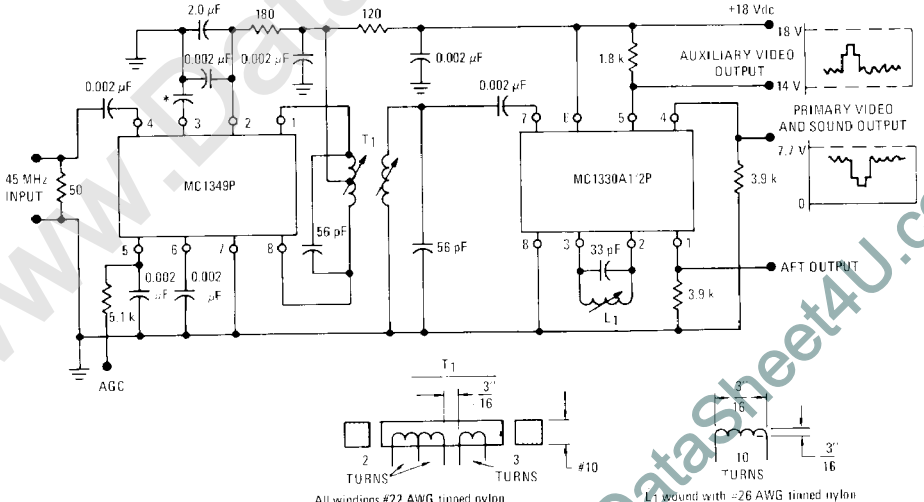
. . . an integrated circuit featuring wide range AGC for use as an IF amplifier in radio and television applications over the temperature range 0 to +70°C.

- Power Gain — 60 dB typ at 45 MHz (Pin 3 open)
  — 56 dB typ at 58 MHz (Pin 3 open)
  — 61 dB typ at 45 MHz (Pin 3 bypassed)
  — 59 dB typ at 58 MHz (Pin 3 bypassed)
- AGC Range — 80 dB typ, dc to 45 MHz
- High Output Impedance
- Low Reverse Transfer Admittance
- 15-Volt Operation, Single-Polarity Power Supply
- Improved Noise Figure versus AGC



PLASTIC PACKAGE
CASE 626-04

FIGURE 1 – TYPICAL APPLICATION OF MC1349P VIDEO IF AMPLIFIER and MC1330 LOW-LEVEL VIDEO DETECTOR CIRCUIT



All windings #22 AWG tinned nylon acetate wire tuned with Coilcraft #61 slugs, size 10-32, or equivalent.

L1 wound with #26 AWG tinned nylon acetate wire tuned by distorting winding.

*See Note 1 (page 3), and C4, Parts List (page 4) of this specification.

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MAXIMUM RATINGS (T_A = +25°C unless otherwise noted).

Rating	Value	Unit
Power Supply Voltage (V_{CC1})	+18	Vdc
Output Supply Voltage (V_{CC2})	+18	Vdc
AGC Supply Voltage	≤ V_{CC1} (Pin 2)	Vdc
Differential Input Voltage	5.0	Vdc
Power Dissipation (Package Limitation) Plastic Package Derate above T_A = +25°C	 625 5.0	 mW mW/°C
Operating Temperature Range	0 to +70	°C
Storage Temperature Range	−65 to +150	°C

ELECTRICAL CHARACTERISTICS (V_{CC1} = +12 Vdc [Pin 2], V_{CC2} = +15 Vdc [Pins 1 and 8], T_A = +25°C unless otherwise noted.)

Characteristic	Min	Typ	Max	Unit
AGC Range, 45 MHz (5.0 V to 7.5 V) (Figure 3)	70	80	—	dB
Power Gain (Pin 5 grounded via 5.1 kΩ resistor, input Pin 4) f = 45 MHz, BW (3 dB) = 4.5 MHz, Tuned Input, Pin 3 open Untuned Input, Pin 3 bypassed f = 58 MHz, BQ (3 dB) = 4.5 MHz, Tuned Input, Pin 3 open Untuned Input, Pin 3 bypassed	 52 — — —	 60 61 56 59	 — — — —	dB
Maximum Differential Output Voltage Swing	—	6.0	—	Vp-p
Output Stage Current (Pins 1 and 8)	—	9.0	—	mA
Amplifier Current (Pin 2)	—	15	20	mAdc
Power Dissipation	—	315	400	mW
Noise Figure f = 45 MHz, Tuned Input, Pin 3 open, Gain Reduction = 15 dB	—	8.5	—	dB

DESIGN PARAMETERS (V_{CC1} = +12 Vdc, [Pin 2], V_{CC2} = +15 Vdc, [Pins 1 and 8], T_A = +25°C unless otherwise noted.)

Parameter	Symbol	Frequency		Unit
		45 MHz	58 MHz	
Single-Ended Input Admittance, input Pin 4, AGC min Pin 3 open Pin 3 open Pin 3 bypassed Pin 3 bypassed	 g11 b11 g11 b11	 0.74 1.9 4.1 6.5	 0.95 2.4 5.4 6.9	mmhos
Differential Output Admittance, AGC max	g22 b22	5.5 270	8.3 360	μmhos
Reverse Transfer Admittance (magnitude)		1.5	2.0	μmhos
Forward Transfer Admittance Magnitude, Pin 3 open Angle (0 dB AGC), Pin 3 open Magnitude, Pin 3 bypassed Angle (0 dB AGC), Pin 3 bypassed		 520 100 1020 120	 400 130 800 400	 mmhos degrees mmhos degrees
Single-Ended Input Capacitance, AGC min Pin 3 open Pin 3 bypassed		 6.8 2.3	 6.7 20	pF
Differential Output Capacitance (AGC max)		1.0	1.0	pF

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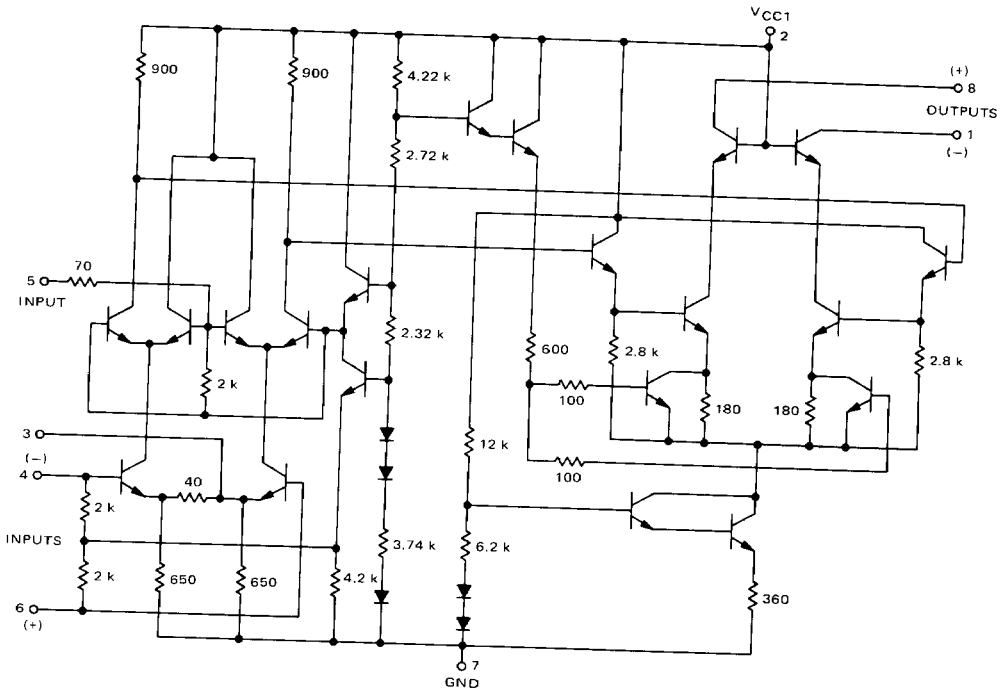
FIGURE 2 – CIRCUIT SCHEMATIC



GENERAL INFORMATION

The MC1349P is an improved version of the MC1350P. Featuring higher gain, a lower noise figure, and greater AGC range; in addition, an emitter of the input amplifier is available for bypassing. This provides a low input impedance with good gain, useful for untuned input configurations.

Both input and output IF amplifier sections are gain-controlled in the MC1349P, with the input amplifier also serving as an AGC amplifier for the output section. During the initial part of AGC gain reduction, the gain of the input amplifier decreases only a few dB while the output section decreases 15 dB; further AGC acts upon the input section. Although the gain reduction curve was taken with 5.1 kilohms at pin 5, higher series resistance can be used to reduce the voltage and temperature sensitivity of the AGC. Pin 5 currents are shown on the AGC curve, see Figure 10.

In use, it is important to bypass pin 2, both for IF frequencies and for low frequencies, (as shown in the test circuits). This is due to the dual function of the input amplifier. If replacing MC1350P take precaution not to ground pin 3, (not used in the MC1350P). Due to the significantly higher gain of the MC1349P, extra care in layout should be exercised.

NOTE 1: The references to bypasses at pin 3 do not give specific values (C4, see Figures 1 and 4). In all cases, measurements were taken with a bypass at a standard value as near as possible to series resonance. The values are dependent on test frequency and circuit layout. Fully bypassing pin 3 reduces the input signal handling capability before distortion from over 100 mV(RMS) to approximately 25 mV(RMS). C4 = 0.002 μF at f = 45 MHz is a typical value for printed circuit applications.

TEST CIRCUITS

FIGURE 3 – TUNED INPUT
(PIN 3 OPEN)

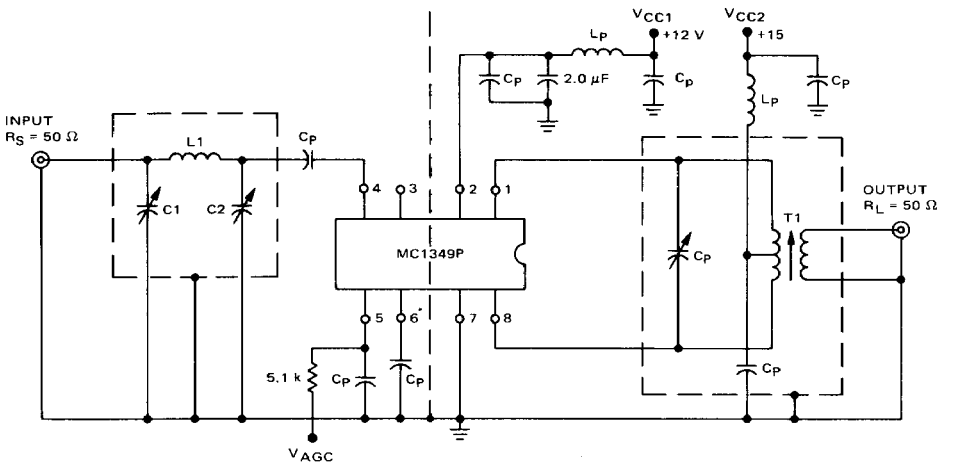
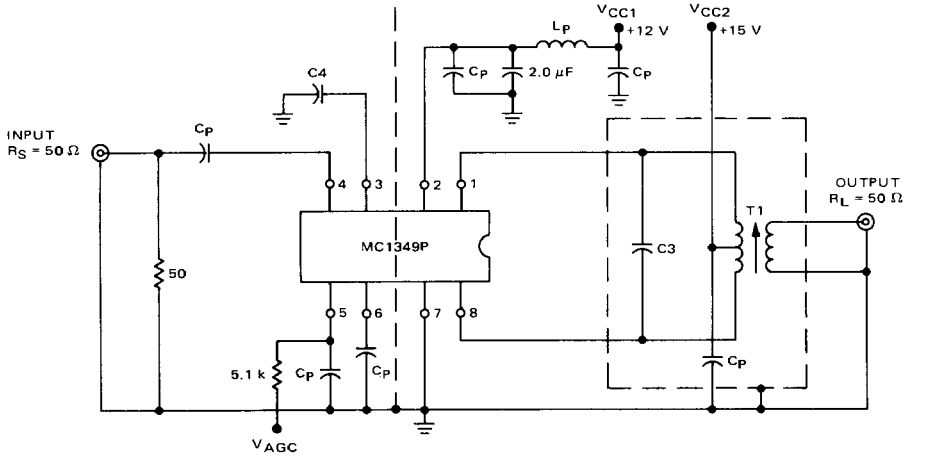


FIGURE 4 – UNTUNED INPUT
(PIN 3 BYPASSED TO GROUND)



PARTS LIST

COMPONENT	45 MHz	58 MHz
C1	8-60 pF	50-100 pF
C2	3-35 pF	3-35 pF
C3	1-7.0 pF	1-7.0 pF
C4	82-470 pF	82-470 pF
C_P	0.0015 μF	0.001 μF
L_1	0.84 μH	0.33 μH
L_P	10 μH	10 μH

T1 Primary 14 turns center-tapped
Secondary 2½ turns (45 MHz tuned input pin #3 open) 1½ turns (all other fixtures) wound over primary
Wire: #26 AWG tinned nylon acetate wound on 1/4" diameter coil form
Core: Arnold Type TH, 1/2" long or equivalent.

TYPICAL CHARACTERISTICS

FIGURE 5 – SINGLE-ENDED INPUT ADMITTANCE (PIN 3 OPEN)

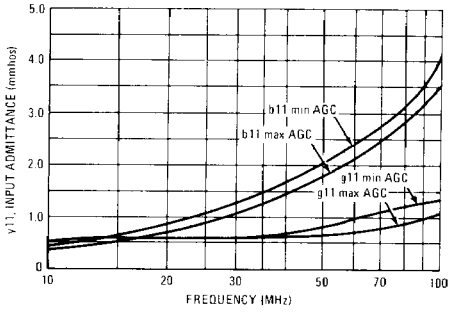


FIGURE 6 – SINGLE-ENDED INPUT ADMITTANCE (PIN 3 BYPASSED TO GROUND)

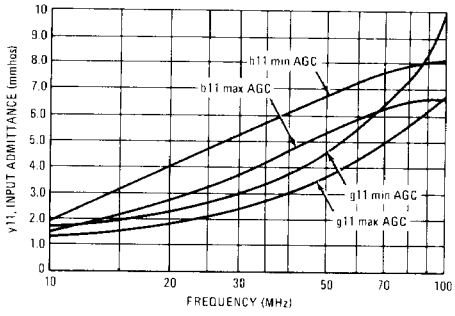


FIGURE 7 – SINGLE-ENDED FORWARD TRANSFER ADMITTANCE

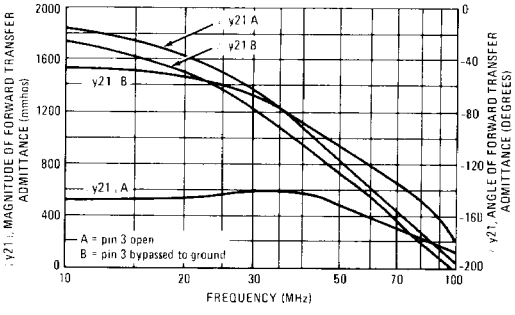


FIGURE 8 – DIFFERENTIAL OUTPUT ADMITTANCE (MAXIMUM AGC)

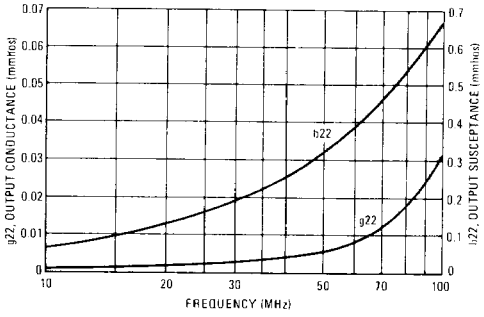


FIGURE 9 – NOISE FIGURE

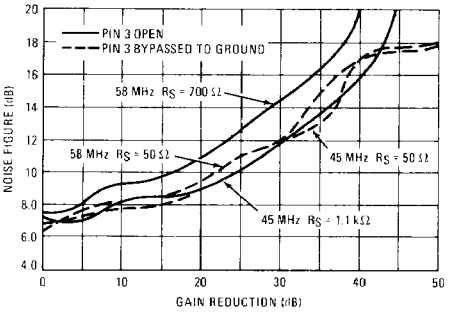


FIGURE 10 – GAIN REDUCTION