

# MC1350

## Monolithic IF Amplifier

The MC1350 is an integrated circuit featuring wide range AGC for use as an IF amplifier in radio and TV over an operating temperature range of 0° to +75°C.

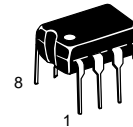
- Power Gain: 50 dB Typ at 45 MHz  
50 dB Typ at 58 MHz
- AGC Range: 60 dB Min, DC to 45 MHz
- Nearly Constant Input & Output Admittance over the Entire AGC Range
- $\gamma_{21}$  Constant (-3.0 dB) to 90 MHz
- Low Reverse Transfer Admittance:  $<< 1.0 \mu\text{mho Typ}$
- 12 V Operation, Single-Polarity Power Supply

### MAXIMUM RATINGS ( $T_A = +25^\circ\text{C}$ , unless otherwise noted.)

Rating	Symbol	Value	Unit
Power Supply Voltage	$V^+$	+18	Vdc
Output Supply Voltage	$V_1, V_8$	+18	Vdc
AGC Supply Voltage	$V_{AGC}$	$V^+$	Vdc
Differential Input Voltage	$V_{in}$	5.0	Vdc
Power Dissipation (Package Limitation)	$P_D$	625	mW
Plastic Package		5.0	$\text{mW}/^\circ\text{C}$
Derate above 25°C			
Operating Temperature Range	$T_A$	0 to +75	°C

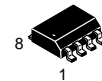
## IF AMPLIFIER

### SEMICONDUCTOR TECHNICAL DATA



**P SUFFIX**  
PLASTIC PACKAGE  
CASE 626

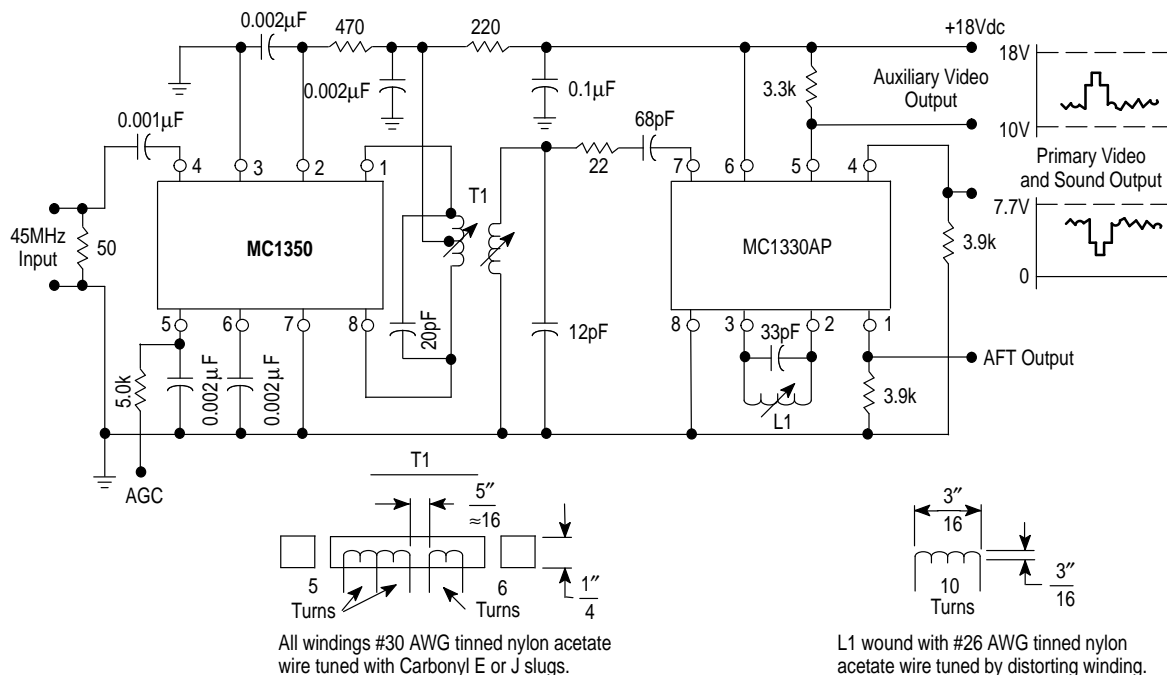
**D SUFFIX**  
PLASTIC PACKAGE  
CASE 751  
(SO-8)



### ORDERING INFORMATION

Device	Operating Temperature Range	Package
MC1350P	$T_A = 0^\circ \text{ to } +75^\circ\text{C}$	Plastic DIP
MC1350D		SO-8

**Figure 1. Typical MC1350 Video IF Amplifier and MC1330 Low-Level Video Detector Circuit**



# MC1350

## ELECTRICAL CHARACTERISTICS ( $V^+ = +12$ Vdc, $T_A = +25^\circ\text{C}$ , unless otherwise noted.)

Characteristics	Symbol	Min	Typ	Max	Unit
AGC Range, 45 MHz (5.0 V to 7.0 V) (Figure 1)		60	68	–	dB
Power Gain (Pin 5 grounded via a 5.1 k $\Omega$ resistor) f = 58 MHz, BW = 4.5 MHz See Figure 6(a) f = 45 MHz, BW = 4.5 MHz See Figure 6(a), (b) f = 10.7 MHz, BW = 350 kHz See Figure 7 f = 455 kHz, BW = 20 kHz	$A_p$	– 46 – –	48 50 58 62	– – – –	dB
Maximum Differential Voltage Swing 0 dB AGC –30 dB AGC	$V_O$	– –	20 8.0	– –	$V_{pp}$
Output Stage Current (Pins 1 and 8)	$I_1 + I_8$	–	5.6	–	mA
Total Supply Current (Pins 1, 2 and 8)	$I_S$	–	14	17	mAdc
Power Dissipation	$P_D$	–	168	204	mW

## DESIGN PARAMETERS, Typical Values ( $V^+ = +12$ Vdc, $T_A = +25^\circ\text{C}$ , unless otherwise noted.)

Parameter	Symbol	Frequency				Unit
		455 kHz	10.7 MHz	45 MHz	58 MHz	
Single-Ended Input Admittance	$g_{11}$ $b_{11}$	0.31 0.022	0.36 0.50	0.39 2.30	0.5 2.75	mmho
Input Admittance Variations with AGC (0 dB to 60 dB)	$\Delta g_{11}$ $\Delta b_{11}$	– –	– –	60 0	– –	$\mu\text{mho}$
Differential Output Admittance	$g_{22}$ $b_{22}$	4.0 3.0	4.4 110	30 390	60 510	$\mu\text{mho}$
Output Admittance Variations with AGC (0 dB to 60 dB)	$\Delta g_{22}$ $\Delta b_{22}$	– –	– –	4.0 90	– –	$\mu\text{mho}$
Reverse Transfer Admittance (Magnitude)	$ y_{12} $	$\ll 1.0$	$\ll 1.0$	$\ll 1.0$	$\ll 1.0$	$\mu\text{mho}$
Forward Transfer Admittance Magnitude Angle (0 dB AGC) Angle (–30 dB AGC)	$ y_{21} $ $\angle y_{21}$ $\angle y_{21}$	160 –5.0 –3.0	160 –20 –18	200 –80 –69	180 –105 –90	mmho Degrees Degrees
Single-Ended Input Capacitance	$C_{in}$	7.2	7.2	7.4	7.6	pF
Differential Output Capacitance	$C_O$	1.2	1.2	1.3	1.6	pF

Figure 2. Typical Gain Reduction

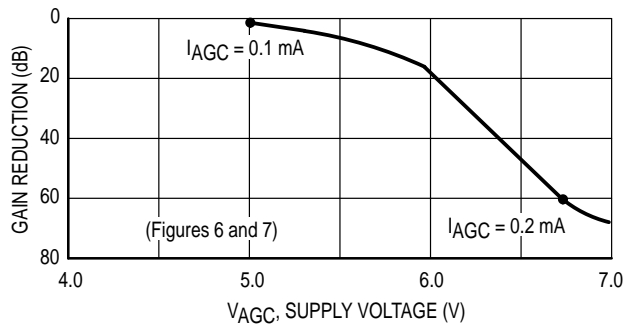
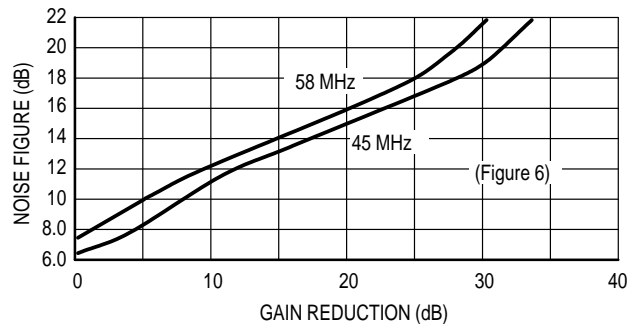


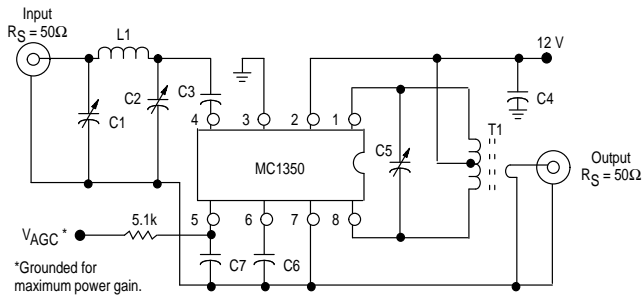
Figure 3. Noise Figure versus Gain Reduction





# MC1350

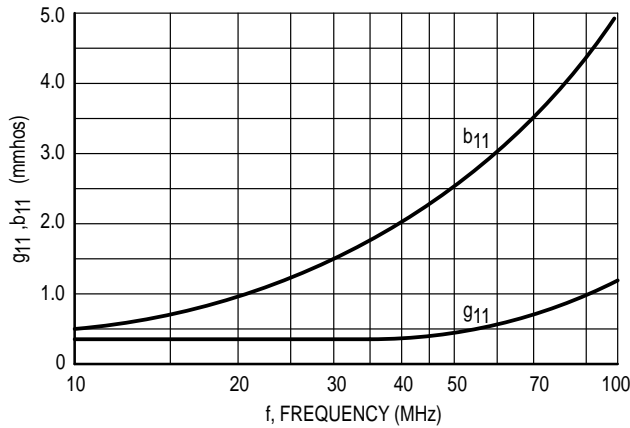
**Figure 7. Power Gain and AGC Test Circuit (455 kHz and 10.7 MHz)**



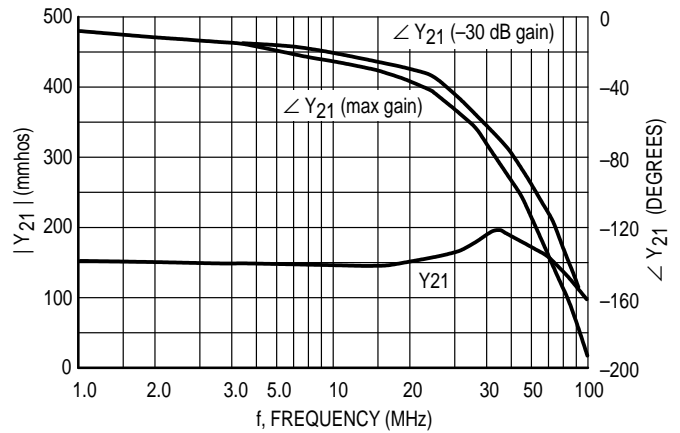
Component	Frequency	
	455 kHz	10.7 MHz
C1	—	80–450 pF
C2	—	5.0–80 pF
C3	0.05 μF	0.001 μF
C4	0.05 μF	0.05 μF
C5	0.001 μF	36 pF
C8	0.05 μF	0.05 μF
C7	0.05 μF	0.05 μF
L1	—	4.6 μF
T1	Note 1	Note 2

**NOTES:** 1. Primary: 120 μH (center-tapped)  
 $Q_U = 140$  at 455 kHz  
 Primary: Secondary turns ratio  $\approx 13$   
 2. Primary: 6.0 μH  
 Primary winding = 24 turns #36 AWG  
 (close-wound on 1/4" dia. form)  
 Core = Carbonyl E or J  
 Secondary winding = 1–1/2 turns #36 AWG, 1/4" dia.  
 (wound over center-tap)

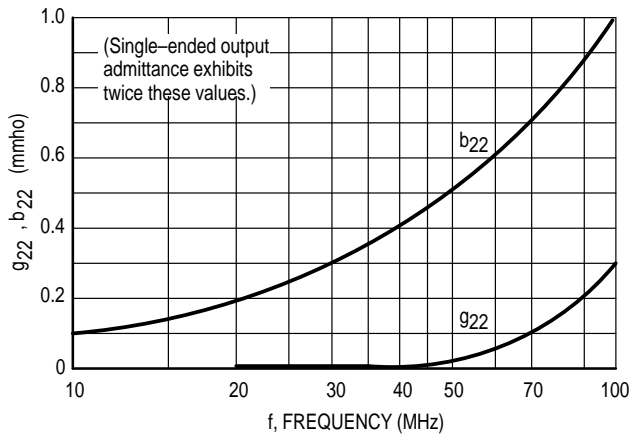
**Figure 8. Single-Ended Input Admittance**



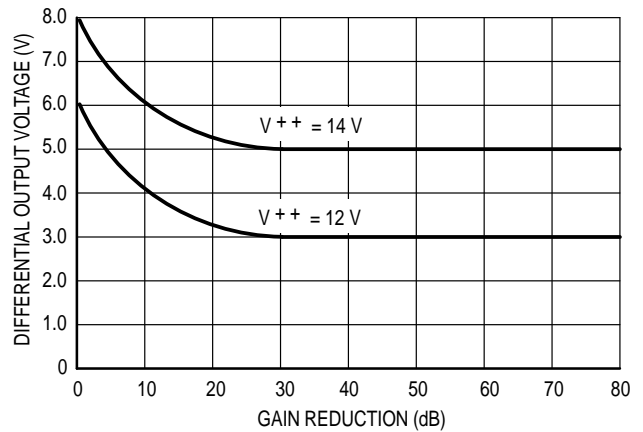
**Figure 9. Forward Transfer Admittance**



**Figure 10. Differential Output Admittance**



**Figure 11. Differential Output Voltage**



# MC1350

## OUTLINE DIMENSIONS

**P SUFFIX**  
PLASTIC PACKAGE  
CASE 626-05  
ISSUE K

NOTE 2

SEATING PLANE

$\oplus \text{ } \varnothing 0.13 (0.005) \text{ } \textcircled{M} \text{ } T \text{ } A \text{ } \textcircled{M} \text{ } B \text{ } \textcircled{M}$

NOTES:

1. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL.
2. PACKAGE CONTOUR OPTIONAL (ROUND OR SQUARE CORNERS).
3. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.40	10.16	0.370	0.400
B	6.10	6.60	0.240	0.260
C	3.94	4.45	0.155	0.175
D	0.38	0.51	0.015	0.020
F	1.02	1.78	0.040	0.070
G	2.54 BSC		0.100 BSC	
H	0.76	1.27	0.030	0.050
J	0.20	0.30	0.008	0.012
K	2.92	3.43	0.115	0.135
L	7.62 BSC		0.300 BSC	
M	— 10°		— 10°	
N	0.76	1.01	0.030	0.040

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**D SUFFIX**  
PLASTIC PACKAGE  
CASE 751-05  
(SO-8)  
ISSUE N

SEATING PLANE

$\oplus 0.25 (0.010) \text{ } \textcircled{M} \text{ } B \text{ } \textcircled{M}$


$\oplus 0.25 (0.010) \text{ } \textcircled{M} \text{ } T \text{ } B \text{ } \textcircled{S} \text{ } A \text{ } \textcircled{S}$

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	4.80	5.00	0.189	0.196
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	0.18	0.25	0.007	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

# MC1350

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MC1350/D

