

## ORDERING INFORMATION

Device	Temperature Range	Package
MC1358P	-20°C to +75°C	Plastic DIP

# MC1358

## TV SOUND IF AMPLIFIER

... a versatile monolithic device incorporating IF limiting, detection, electronic attenuation, audio amplifier, and audio driver capabilities.

- Direct Replacement for the CA3065
- Differential Peak Detector Requiring a Single Tuned Circuit
- Electronic Attenuator Replaces Conventional ac Volume Control - Range > 60 dB
- Excellent AM Rejection @ 4.5 and 5.5 MHz
- High Stability
- Low Harmonic Distortion
- Audio Drive Capability - 6.0 mA<sub>p-p</sub>
- Minimum Undesirable Output Signal @ Maximum Attenuation

**IF AMPLIFIER, LIMITER,  
FM DETECTOR, AUDIO DRIVER,  
ELECTRONIC ATTENUATOR**

**SILICON MONOLITHIC  
INTEGRATED CIRCUIT**

**P SUFFIX  
PLASTIC PACKAGE  
CASE 646-05**

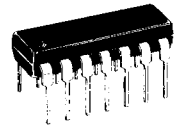
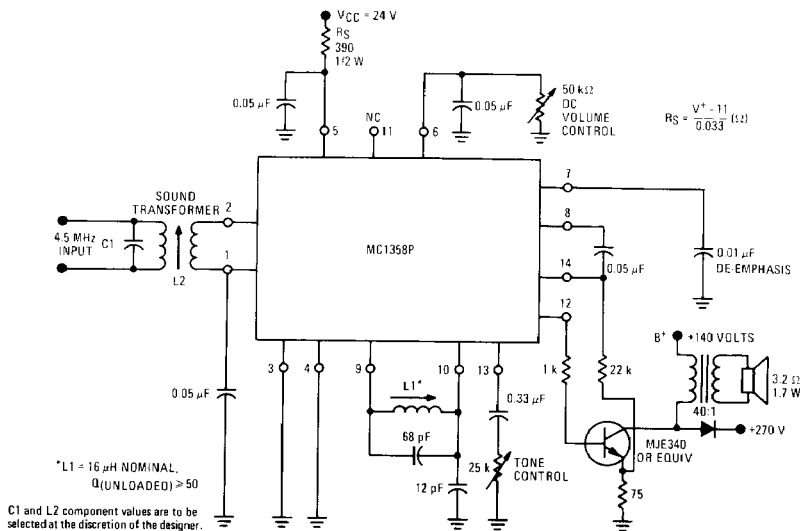


FIGURE 1 -- TYPICAL TV APPLICATION CIRCUIT



MAXIMUM RATINGS (T<sub>A</sub> = +25°C unless otherwise noted)

Rating	Value	Unit
Input Signal Voltage (Pins 1 and 2)	±3.0	Vdc
Power Supply Current	50	mA
Power Dissipation (Package Limitation)		
Plastic Packages	625	mW
Derate above T <sub>A</sub> = +25°C	5.0	mW/°C
Operating Temperature Range (Ambient)	-20 to +75	°C
Storage Temperature Range	-65 to +150	°C

ELECTRICAL CHARACTERISTICS (V<sub>CC</sub> = 24 Vdc, T<sub>A</sub> = +25°C unless otherwise noted).

Characteristic	Pin	Min	Typ	Max	Unit
Regulated Voltage	5	10.3	11	12.2	Vdc
DC Supply Current (V <sup>+</sup> = 9 Vdc, R <sub>S</sub> = 0)	5	10	16	24	mA
Quiescent Output Voltage	12	—	5.1	—	Vdc

DYNAMIC CHARACTERISTICS (V<sub>CC</sub> = 24 Vdc, T<sub>A</sub> = +25°C unless otherwise noted).

Characteristic	Min	Typ	Max	Unit
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IF AMPLIFIER AND DETECTOR

f<sub>o</sub> = 4.5 MHz, Δf = ±25 kHz

AM Rejection* (V <sub>in</sub> = 10 mV [rms])	40	51	—	dB
Input Limiting Threshold Voltage	—	200	400	μV(rms)
Recovered Audio Output Voltage (V <sub>in</sub> = 10 mV [rms])	0.5	0.70	—	V(rms)
Output Distortion (V <sub>in</sub> = 10 mV [rms])	—	0.4	2.0	%

f<sub>o</sub> = 5.5 MHz, Δf = ±50 kHz

AM Rejection* (V <sub>in</sub> = 10 mV [rms])	40	53	—	dB
Input Limiting Threshold Voltage	—	200	400	μV(rms)
Recovered Audio Output Voltage (V <sub>in</sub> = 10 mV [rms])	0.5	0.91	—	V(rms)
Output Distortion (V <sub>in</sub> = 10 mV [rms])	—	0.9	—	%
Input Impedance Components (f = 4.5 MHz, measurement between Pins 1 and 2)				
Parallel Input Resistance	—	17	—	kΩ
Parallel Input Capacitance	—	4.0	—	pF
Output Impedance Components (f = 4.5 MHz, measurement between Pin 9 and Gnd)				
Parallel Output Resistance	—	3.25	—	kΩ
Parallel Output Capacitance	—	3.6	—	pF
Output Resistance, Detector				
Pin 7	—	7.5	—	kΩ
Pin 8	—	250	—	Ω

ATTENUATOR

Volume Reduction Range (See Figure 8) (dc Volume Control = ∞)	60	—	—	dB
Maximum Undesirable Signal (See Note 1) (dc Volume Control = ∞)	—	0.07	1.0	mV

AUDIO AMPLIFIER

Voltage Gain (V <sub>in</sub> = 0.1 V(rms), f = 400 Hz)	17.5	20	—	dB
Total Harmonic Distortion (V <sub>o</sub> = 2.0 V(rms), f = 400 Hz)	—	2.0	—	%
Output Voltage (THD = 5%, f = 400 Hz)	2.0	3.0	—	V(rms)
Input Resistance (f = 400 Hz)	—	70	—	kΩ
Output Resistance (f = 400 Hz)	—	270	—	Ω

\* 100% FM, 30% AM Modulation.

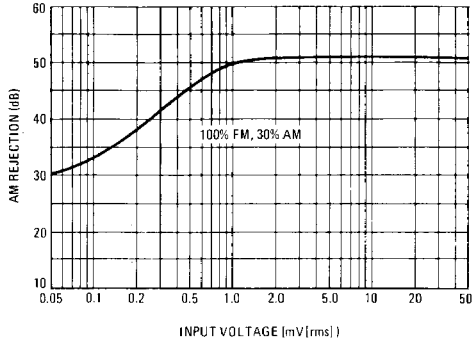
Note 1. Undesirable signal is measured at pin 8 when volume control is set for minimum output.

TYPICAL CHARACTERISTICS

( $V_{CC} = 24 \text{ Vdc}$ ,  $T_A = +25^\circ\text{C}$  unless otherwise noted)

( $f_o = 4.5 \text{ MHz}$ )

FIGURE 2 – AM REJECTION



( $f_o = 5.5 \text{ MHz}$ )

FIGURE 3 – AM REJECTION

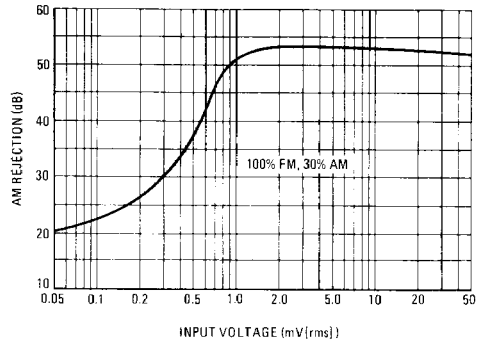


FIGURE 4 – DETECTED AUDIO OUTPUT

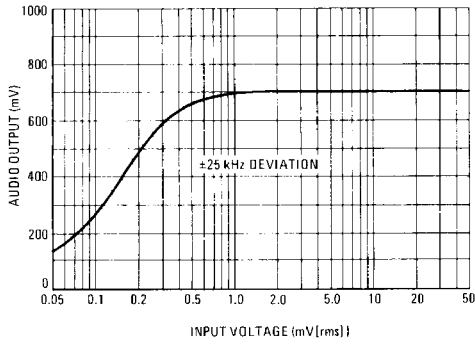


FIGURE 5 – DETECTED AUDIO OUTPUT

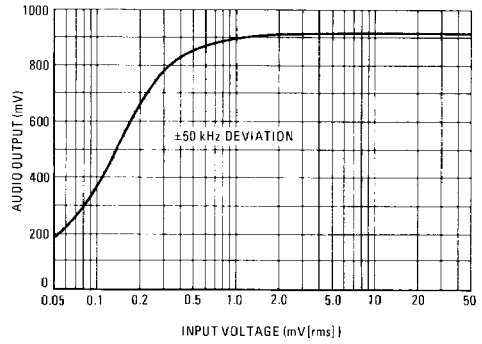


FIGURE 6 – IF AMPLIFIER AND DETECTOR THD

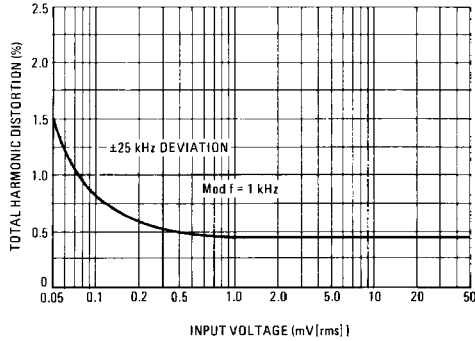
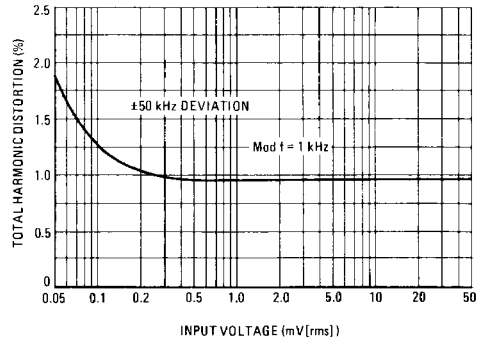


FIGURE 7 – IF AMPLIFIER AND DETECTOR THD



TYPICAL CHARACTERISTICS (continued)

FIGURE 8 – GAIN REDUCTION OF ATTENUATOR

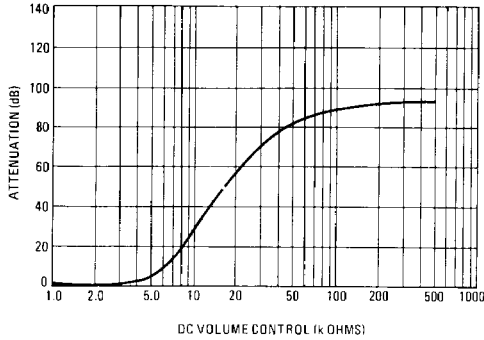


FIGURE 9 – AUDIO AMPLIFIER THD

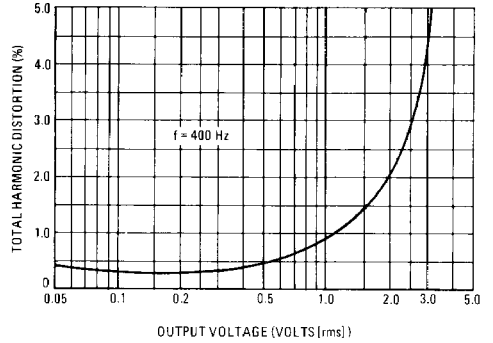


FIGURE 10 – IF FREQUENCY RESPONSE

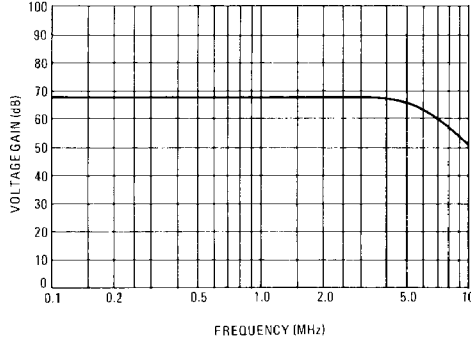
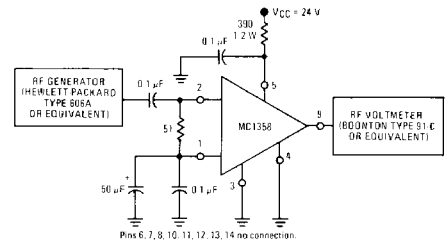


FIGURE 11 – IF FREQUENCY RESPONSE TEST CIRCUIT



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FIGURE 12 – AM REJECTION, DETECTED AUDIO, THD, ATTENUATION TEST CIRCUIT

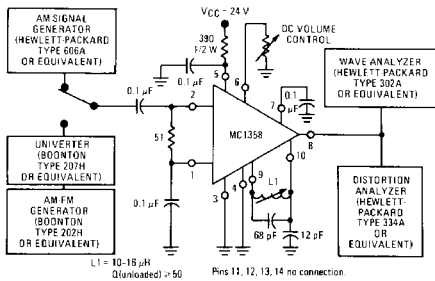


FIGURE 13 – AUDIO VOLTAGE GAIN, AUDIO THD TEST CIRCUIT

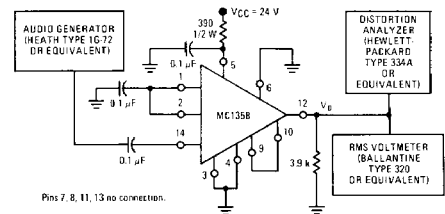


FIGURE 14 - CIRCUIT SCHEMATIC

