TV SOUND CIRCUIT

SOUND IF AMPLIFIER

MC1351

WIDE-BAND FM-AMPLIFIER; LIMITER, DETECTOR, AND AUDIO AMPLIFIER INTEGRATED CIRCUIT

. . . designed for IF limiting, detection, audio preamplifier and driver for the sound portion of a TV receiver.

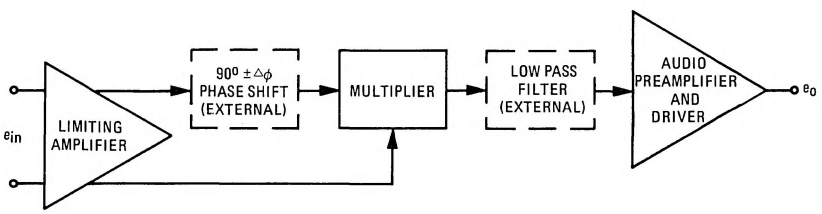
- Excellent Limiting with 80 μV(rms) Input Signal typ
- Large Output-Voltage Swing – to 3.5 V(rms) typ
- High IF Voltage Gain – 65 dB typ
- Zener Power-Supply Regulation Built-In
- Short-Circuit Protection
- A Coincidence Discriminator that Requires Only One RLC Phase Shift Network
- Preamplifier to Drive a Single External-Transistor Class-A Audio-Output Stage

TV SOUND CIRCUIT
MONOLITHIC SILICON EPITAXIAL PASSIVATED

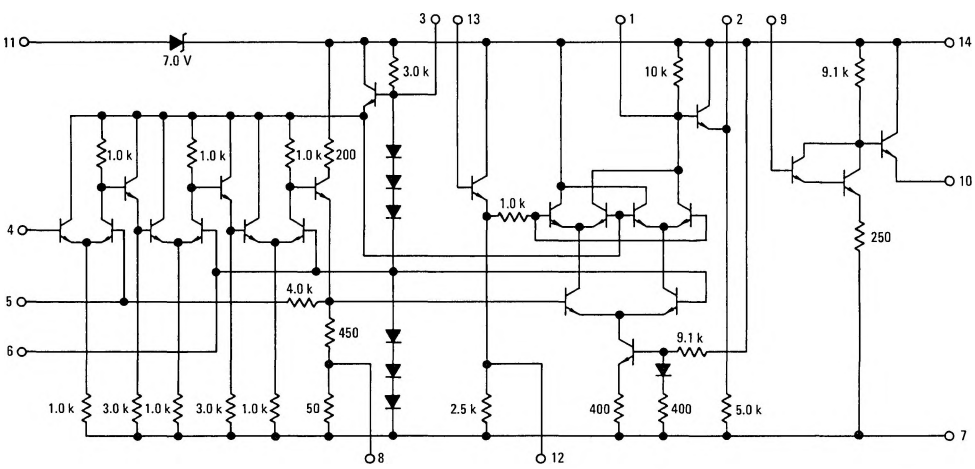
P SUFFIX
PLASTIC PACKAGE
CASE 605
TO-116

PQ SUFFIX
PLASTIC PACKAGE
CASE 647

BLOCK DIAGRAM



CIRCUIT SCHEMATIC



See Packaging Information Section for outline dimensions.

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

Rating	Symbol	Value	Unit
Power Supply Voltage	V+	+16	Vdc
Input Voltage	V_{in}	0.7	$V_{(rms)}$
Power Dissipation (Package Limitation) Plastic Packages Derate above +25°C	 P_D $1/\theta_{JA}$	 625 5.0	 mW mW/°C
Operating Temperature Range	T_A	0 to +75	°C
Storage Temperature Range	T_{stg}	-65 to +150	°C

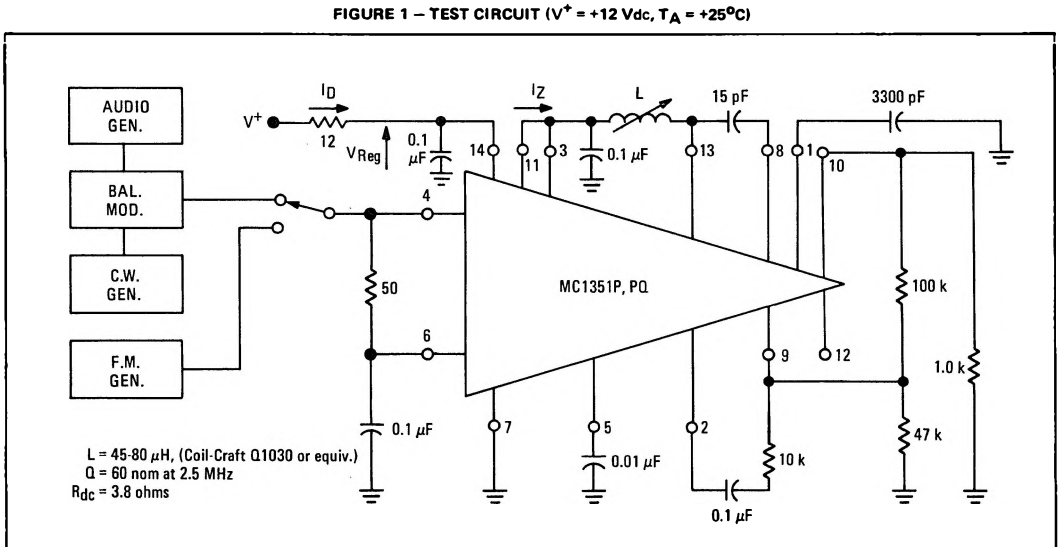
Maximum Ratings as defined in MIL-S-19500, Appendix A.

ELECTRICAL CHARACTERISTICS (V^+ = 12 Vdc, T_A = +25°C, f = 4.5 MHz, Deviation = ±25 kHz unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Input Voltage (−3.0 dB Limiting)	V_L	–	80	160	μV(rms)
AM Rejection (V_{in} = 20 mV(rms), AM = 30%) (See Note 1) $AMR = 20 \log \frac{V_{OFM}}{V_{OAM}}$ { f = 4.5 MHz, Deviation = ±25 kHz, Q_L = 24 { f = 5.5 MHz, Deviation = ±50 kHz, Q_L = 30	AMR	 – –	 45 45	 – –	dB
Total Harmonic Distortion (Q_L = 24) (See Note 1) (7.5 kHz Deviation)	THD	–	1.0	–	%
Maximum Undistorted Audio Output Voltage (Pin 10) (See Note 1) (Audio Gain Adjusted Externally) (Q = 24)	$V_{o(max)}$	–	3.5	–	V(rms)
Recovered Audio (Pin 2) (See Note 1) (f = 4.5 MHz, Deviation = ±25 kHz, Q_L = 24) (f = 5.5 MHz, Deviation = ±50 kHz, Q_L = 30)	V_A	 0.35 –	 0.50 0.80	 – –	V(rms)
Audio Preamplifier Open Loop Gain	A_{VP}	–	25	–	dB
IF Voltage Gain	A_{VIF}	–	65	–	dB
Parallel Input Resistance	R_{in}	–	9.0	–	kΩ
Parallel Input Capacitance	C_{in}	–	6.0	–	pF
Nominal Zener Voltage (I_Z = 5.0 mAdc)	V_{Reg}	–	11.6	–	Vdc
Power Supply Current (I_Z = 5.0 mAdc)	I_D	–	31	–	mAdc
Power Dissipation (I_Z = 5.0 mAdc)	P_D	–	300	375	mW

Note 1: Q_L is loaded circuit Q.

FIGURE 1 – TEST CIRCUIT (V^+ = +12 Vdc, T_A = +25°C)



TYPICAL CHARACTERISTICS

FIGURE 2 – DETECTED AUDIO OUTPUT versus INPUT LEVEL @ f =4.5 MHz, ±25 kHz DEVIATION

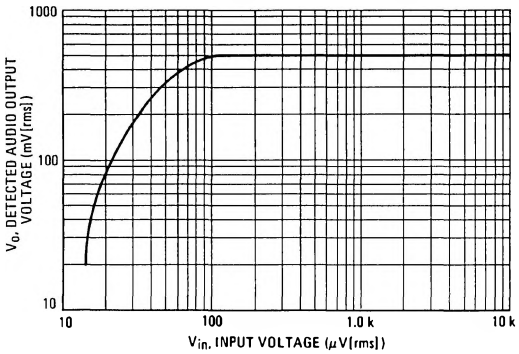


FIGURE 3 – DETECTED AUDIO OUTPUT versus INPUT LEVEL @ f = 5.5 MHz, ±50 kHz DEVIATION

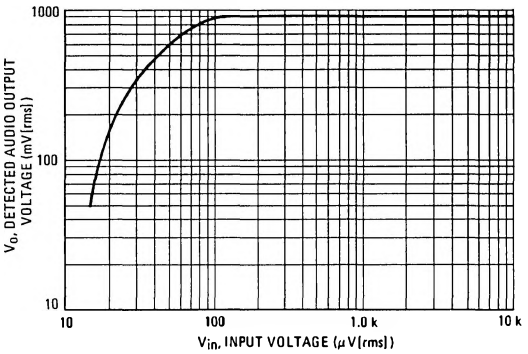


FIGURE 4 – DETECTOR "S" CURVE @ f = 4.5 MHz, BW = 200 kHz, Q = 24

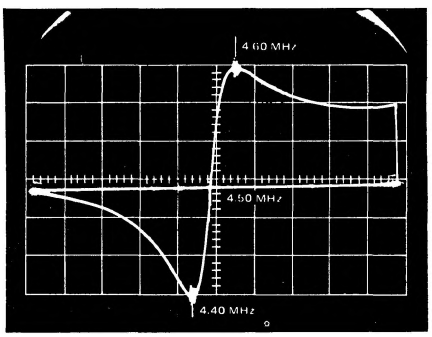


FIGURE 5 – DETECTOR "S" CURVE @ f = 5.5 MHz, BW = 220 kHz, Q = 30

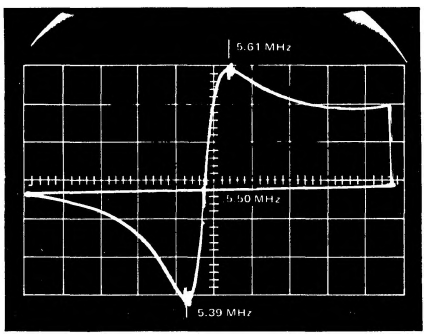


FIGURE 6 – IF VOLTAGE GAIN versus FREQUENCY

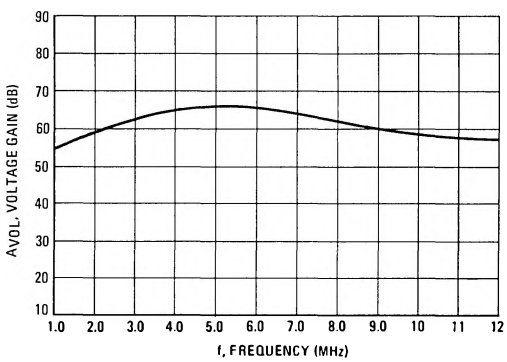


FIGURE 7 – AM REJECTION

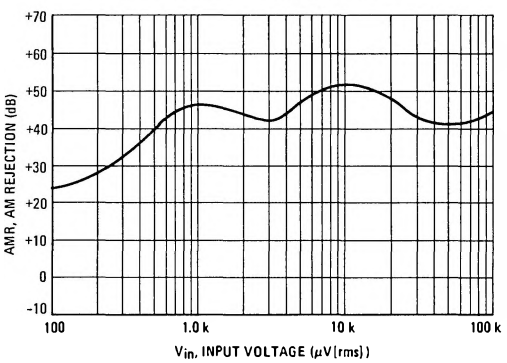


FIGURE 8 – 4.5 MHz TYPICAL APPLICATION