MC1304
MC1305

STEREO DEMODULATOR

MONOLITHIC FM MULTIPLEX STEREO DEMODULATORS

. . . derive the left and right audio information from the detected composite signal. The MC1304 eliminates the need for an external stereo-channel separation control. The MC1305 is similar to the MC1304 but permits the use of an external stereo-channel separation control for maximum separation.

- Operation Practicable Over Wide Power-Supply Range, 8-14 Vdc
- Built-in Stereo-Indicator Lamp Driver
- Total Audio Muting Capability
- Automatic Switching – Stereo-Monaural
- Monaural Squelch Capability

FM MULTIPLEX STEREO DEMODULATOR

SILICON MONOLITHIC INTEGRATED CIRCUIT

P SUFFIX
PLASTIC PACKAGE
CASE 605
TO-116

PQ SUFFIX
PLASTIC PACKAGE
CASE 647

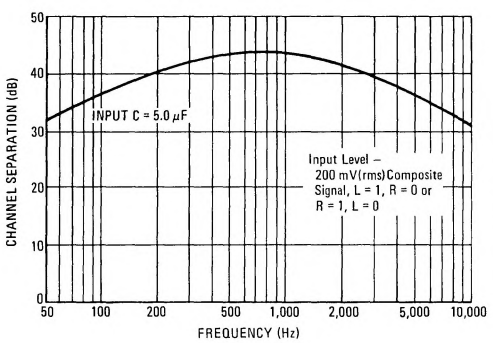
MAXIMUM RATINGS (T_A = +25°C unless otherwise noted)

Rating	Value	Unit
Power Supply Voltage (Pins 1, 6, 9,* 11, 12) (Pin 7 is grounded)	+22	Vdc
Lamp Driver Current	40	mAdc
Power Dissipation (Package Limitation) (Both Packages)	625	mW
Derate above T_A = 25°C	5.0	mW/°C
Operating Temperature Range (Ambient)	0 to +75	°C
Storage Temperature Range	-65 to +150	°C

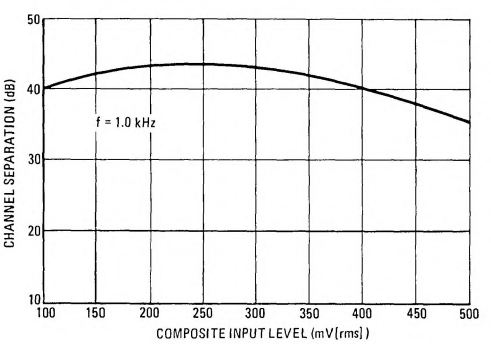
*Pin 8 for MC1305

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

CHANNEL SEPARATION versus FREQUENCY



CHANNEL SEPARATION versus COMPOSITE INPUT LEVEL



See Packaging Information Section for outline dimensions.

ELECTRICAL CHARACTERISTICS [V+ = 12 Vdc, T_A = +25°C unless otherwise noted. Test made with 75 μs de-emphasis network (3.9 kΩ, 0.02 μF) unless otherwise noted].

Characteristics	Min	Typ	Max	Unit
Input Impedance (f = 20 Hz)	12	20	–	kΩ
Stereo Channel Separation (See Notes 1 and 2)				dB
(f = 100 Hz)	–	35	–	
(f = 1.0 kHz)	–	45	–	
(f = 10 kHz)	–	30	–	
Channel Balance (Monaural Input = 200 mV[rms]), (Monaural, Left and Right Outputs)	–	0.5	–	dB
Total Harmonic Distortion (See Notes 1 and 3) (Modulation frequency - 1.0 kHz)	–	0.5	1.0	%
Ultrasonic Frequency Rejection (See Note 4)				dB
(19 kHz)	–	25	–	
(38 kHz)	–	20	–	
Inherent SCA Rejection (without filter) @ 60 kHz, 67 kHz and 74 kHz	–	50	–	dB
Lamp Indicator (R_A = 120Ω)				mV(rms)
Minimum 19 kHz Input Level for lamp on	–	16	25	
Maximum 19 kHz Input Level for lamp off	5.0	14	–	
Audio Muting				
Mute on (Voltage required at pin 5)	0.6	–	1.0	Vdc
Mute off (Voltage required at pin 5)	1.3	–	2.0	Vdc
Attentuation in Mute Mode (Note 5)	–	55	–	dB
Stereo-Monaural Switching				Vdc
Stereo (Voltage required at pin 4)	1.3	–	2.0	
Monaural (Voltage required at pin 4)	–	–	1.0	
Power Dissipation (V+ = 10 V)				mW
(Without lamp)	–	150	300	
(With lamp)	–	180	300	

Note 1 – Measurement made with 200 mV(rms) Standard Multiplex Composite Signal and L = 1, R = 0 or R = 1, L = 0. Standard Multiplex Composite signal is here defined as a signal containing left and/or right audio information with a 10% (19 kHz) pilot signal in accordance with FCC regulations.

Note 2 – Stereo channel separation is adjustable for the MC1305 with a resistor from pin 9 to ground.

Note 3 – Distortion specification also applies to Monaural Signal.

Note 4 – Referenced to 1 kHz output signal with Standard Multiplex Composite Input Signal.

Note 5 – This is referenced to 1.0 kHz output signal with either Standard Multiplex Composite Signal or Monaural Input Signal.

FIGURE 1 – DISTORTION COMPONENTS IN AUDIO SIGNAL

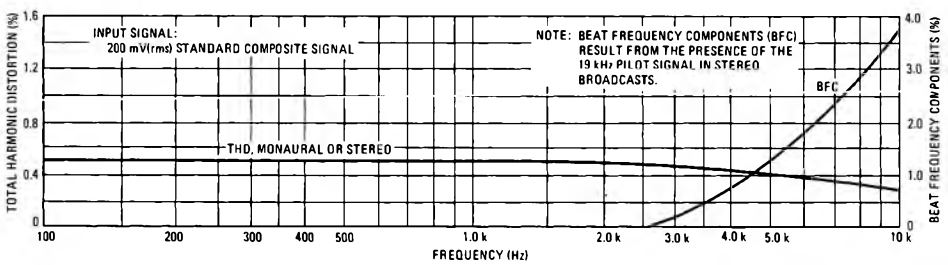


FIGURE 2 – TOTAL HARMONIC DISTORTION

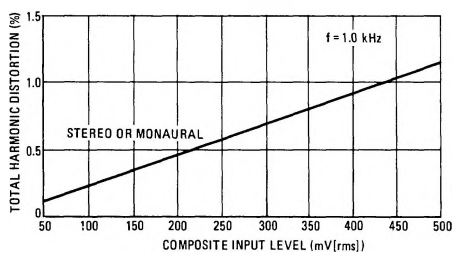


FIGURE 3 – MULTIPLEX SENSITIVITY

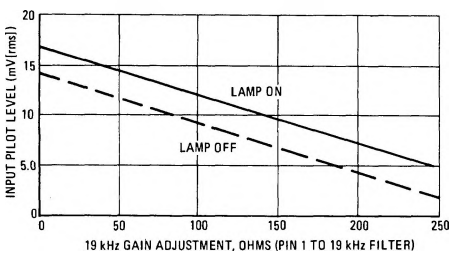


FIGURE 4 – MC1304 CIRCUIT SCHEMATIC

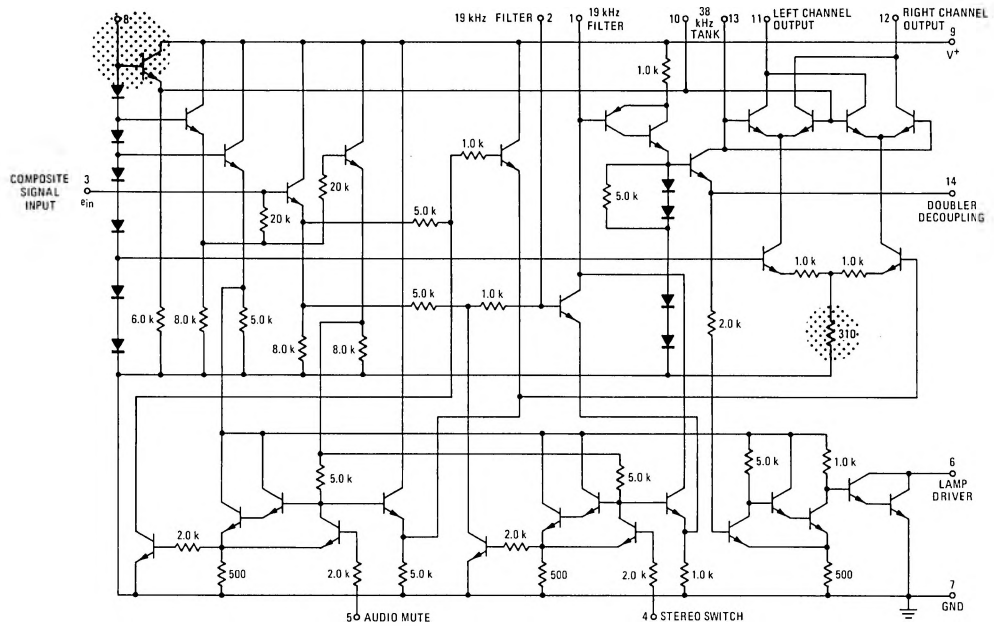
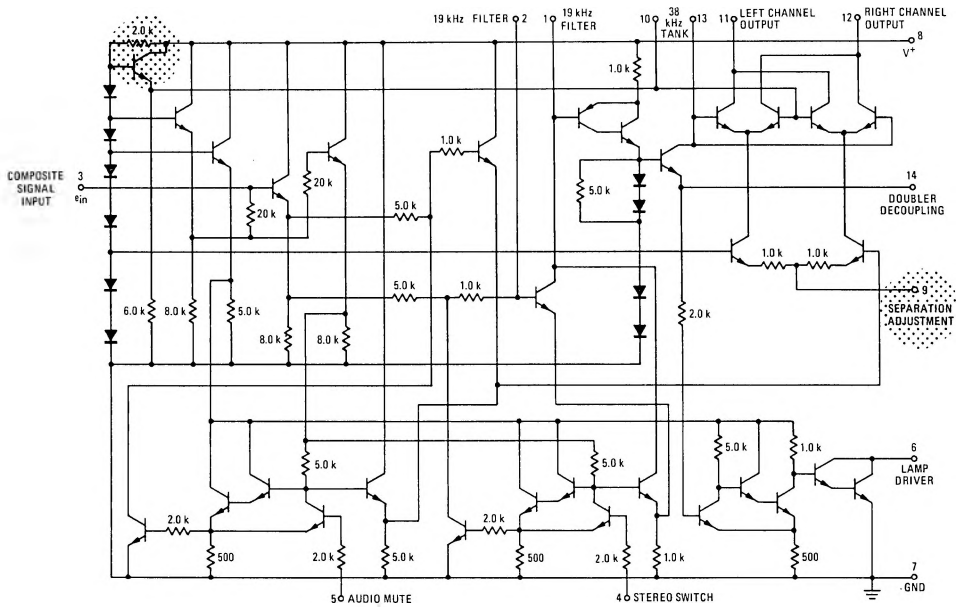
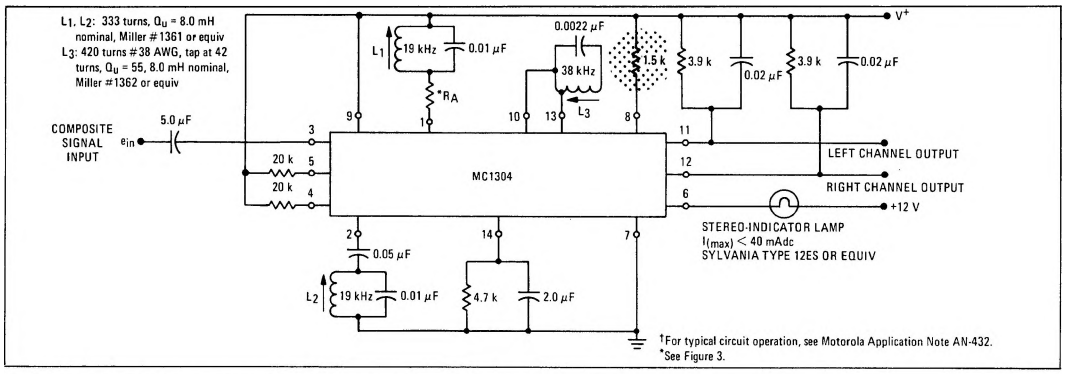


FIGURE 5 – MC1305 CIRCUIT SCHEMATIC



Portions of the circuits shown within the dotted areas pertain to the MC1304 or MC1305 as indicated by the titles of the circuits.

FIGURE 6 – MC1304 TYPICAL CIRCUIT CONFIGURATION†

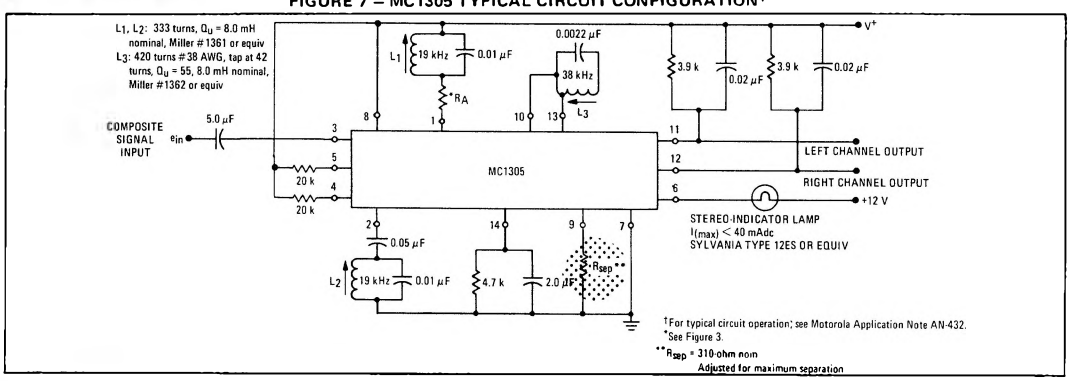


Typical dc voltages (All voltages measured with respect to ground, Pin 7, R_A = 0)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
V_{CC} = 8.5 Vdc	8.5	2.0	2.8	1.6	1.6	0.8	0	4.6*	8.5	3.9	6.3	6.3	3.9	1.9
V_{CC} = 12 Vdc	12	2.0	2.8	1.9	1.9	0.8	0	4.6**	12	3.9	9.7	9.7	3.9	1.9

*1.5 kΩ in series with pin 8
**2.7 kΩ in series with pin 8

FIGURE 7 – MC1305 TYPICAL CIRCUIT CONFIGURATION†



Typical dc voltages (All voltages measured with respect to ground Pin 7)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
V_{CC} = 8.5 Vdc	8.5	2.0	2.8	1.6	1.6	0.8	0	8.5	0.32	3.9	6.3	6.3	3.9	1.9
V_{CC} = 12 Vdc	12	2.0	2.8	1.9	1.9	0.8	0	12	0.36	3.9	9.7	9.7	3.9	1.9

Portions of the circuits shown within the dotted areas pertain to the MC1304 or MC1305 as indicated by the titles of the circuits.