MFC9020

AUDIO AMPLIFIER

Advance Information

2-WATT AUDIO AMPLIFIER

. . . designed to provide the complete audio system in television, radio and phonograph equipment.

- 2-Watts Continuous Sine Wave Power
- Minimal Heat-Sinking Required for Operation @ T_A = 55°C
- Short Circuit Proof (Short-Term)
- High Gain – 200 mV for 2-Watts Output Power
- High Input Impedance – 500 k Ohms

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

Rating	Symbol	Value	Unit
Power Supply Voltage	V^+	24	Vdc
Output Peak Current	I_P	1.05	Amperes
Maximum Power Output T_A = 55°C (Free Air Mounting)	P_O	2.0	Watts

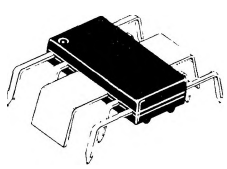
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance (Junction to Tab) Derate above 25°C	θ_{JC}	10 100	°C/W mW/°C
Thermal Resistance (Junction to Ambient) (1) Derate above 25°C	θ_{JA}	60 8.0	°C/W mW/°C

(1) Thermal resistance is measured in still air with fine wires connected to the leads, representing the "worst case" situation.
For a larger power requirement, the tab (pin 9) must be soldered to at least one square inch (effective area) of copper foil on the printed circuit board. The θ_{JA} will be no greater than +45°C/W. Thus, 2.0 Watts of audio power is allowable under "worst case" conditions at an ambient temperature of +65°C, which must be linearly derated at 22.2 mW/°C from +65°C to +150°C.

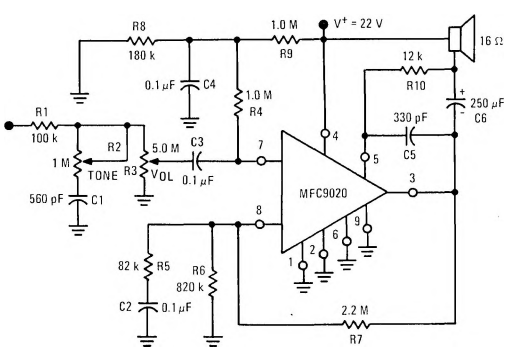
2-WATT
AUDIO AMPLIFIER

Silicon Monolithic Functional Circuit



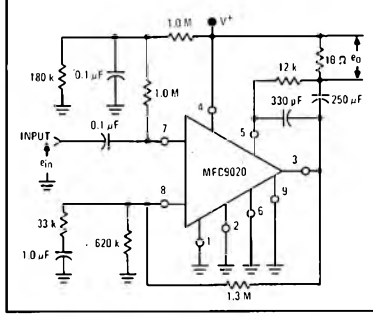
CASE 641
PLASTIC PACKAGE

FIGURE 1 – TYPICAL CIRCUIT APPLICATION



This is advance information and specifications are subject to change without notice.
See Packaging Information Section for outline dimensions.

ELECTRICAL CHARACTERISTICS (V^+ = 22 Vdc, T_A = 25°C unless otherwise specified)

Circuit	Characteristic	Symbol	Min	Typ	Max	Unit
	Quiescent Output Voltage	V_o	–	10	–	Vdc
	Quiescent Drain Current (e_{in} = 0)	i_D	–	12	20	mA
	Sensitivity Input Voltage (e_o = 4.0 V(rms) @ 1.0 kHz, P_o = 2.0 W)	e_{in}	–	–	200	mV
	Total Harmonic Distortion (P_o = 2.0 W, 1.0 kHz)	THD	–	1.0	10	%
	(P_o = 100 mW, 1.0 kHz)		–	1.0	3.0	
	Hum and Noise *		–	-40	–	dB

*IHF STANDARD IHF-A-201 1966

Performance Curves for Circuit Shown Above.

FIGURE 2 – TOTAL HARMONIC DISTORTION

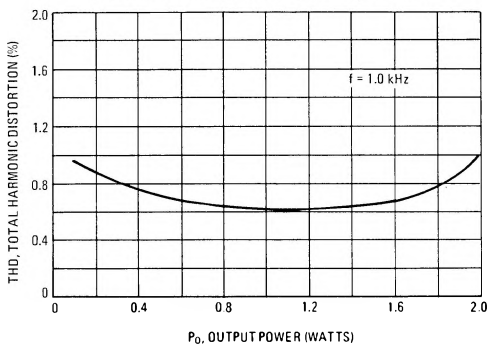


FIGURE 3 – POWER DISSIPATION

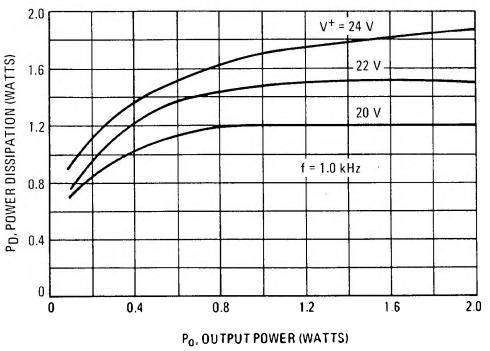


FIGURE 4 – TOTAL HARMONIC DISTORTION

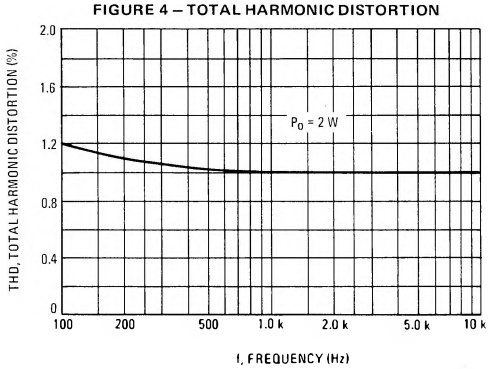
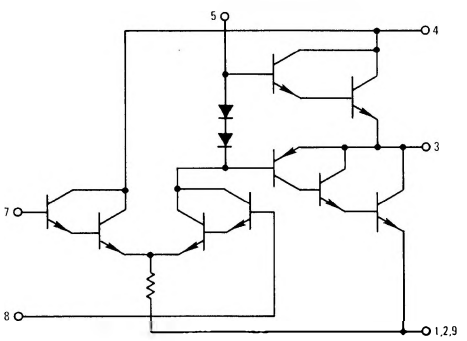


FIGURE 5 – CIRCUIT SCHEMATIC



Applications Information for Circuit Shown in Figure 1.

Figures 7 thru 11 pertain to the 2-watt amplifier with a 16-ohm load connected to V^+ as shown in Figure 1. The sensitivity of this amplifier is approximately 250 mV and the input impedance at 100 Hz is approximately 800 k ohms. R7/R5 determines the approximate gain that can be best altered by changing the value of R5 and holding R7 to a large value. This allows the use of a smaller and less expensive capacitor for C2.

The speaker can also be connected to ground as shown in Figure 6, and the printed circuit board art work (1:1 pattern) is shown in Figure 13.

The maximum operation voltage for the amplifier should reflect a consideration of at least a 10% high-line condition. Under high-line conditions, the power supply voltage should be less than the maximum rating of the device.

FIGURE 6 – ALTERNATE SPEAKER CONNECTION FOR SPEAKER TO GROUND

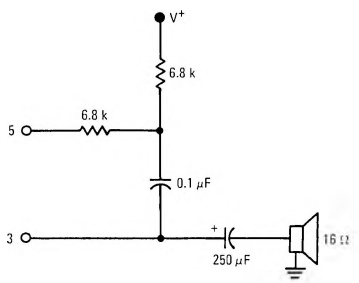


FIGURE 7 – TOTAL HARMONIC DISTORTION

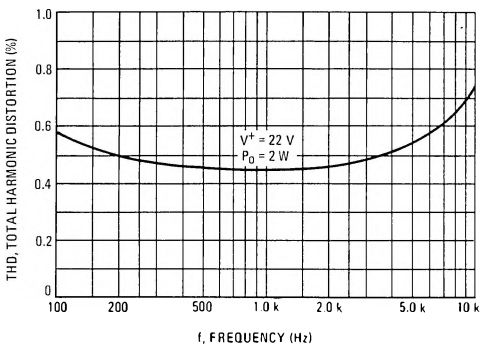


FIGURE 8 – POWER DISSIPATION

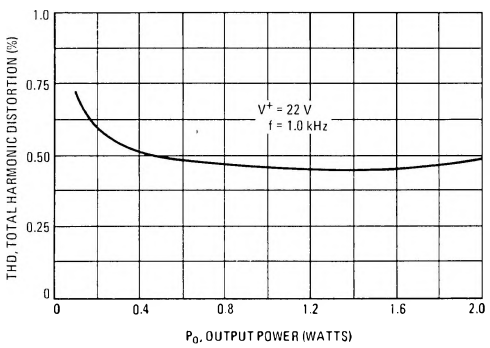


FIGURE 9 – FREQUENCY RESPONSE

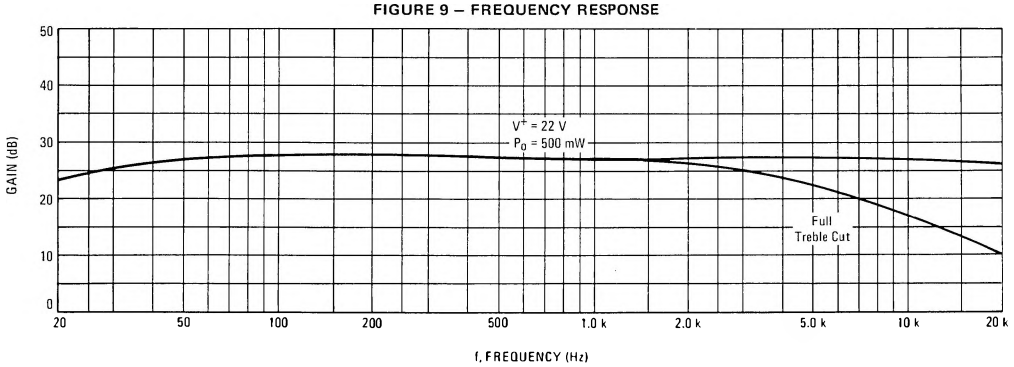


FIGURE 10 – PRINTED CIRCUIT BOARD
(Speaker to V^+)

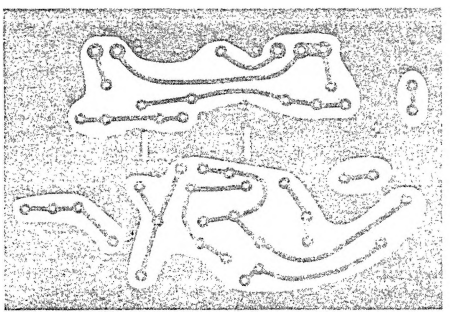


FIGURE 11 – COMPONENT DIAGRAM FOR FIGURE 10

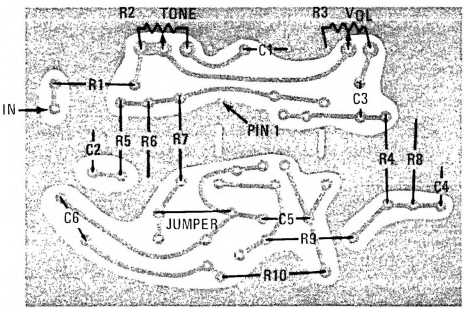


FIGURE 12 – COMPLETED BOARD
(Speaker to V^+)

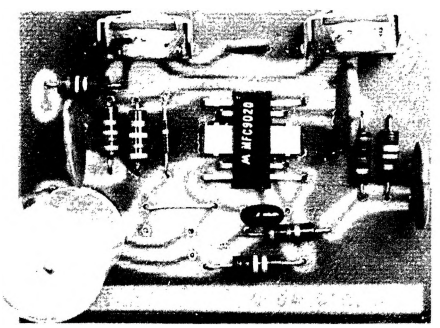


FIGURE 13 – PRINTED CIRCUIT BOARD
(Speaker to Ground)