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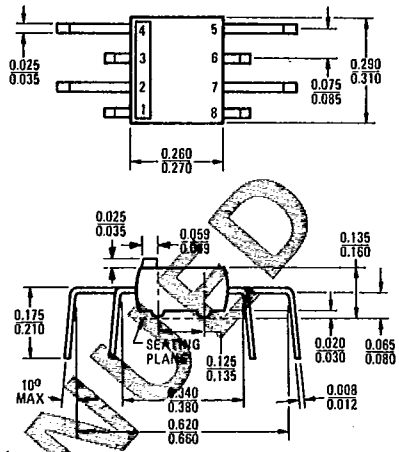
ECG796

CLASS B AUDIO DRIVER

semiconductors

. . . designed as preamplifiers and driver circuits for complementary output transistors.

- Driver for Auto Radios – and up to 20-Watt Amplifiers
- High Gain – 7.0 mV for 1.0 Watt, R_L = 3.2 Ohms
- High Input Impedance – 500-Kilohm Capability
- Output Biasing Diodes Included
- No Special h_{FE} Matching of Outputs Required



Maximum Ratings (T_A = +25°C unless otherwise noted)

Rating	Value ECG796	Unit
Power Supply Voltage	20	Vdc
Power Dissipation Derate above T_A = +25°C	1.0 10	Watt mW/°C
Peak Output Current (pins 5 & 8)	150	mA
Operating Temperature Range	-10 to +75	°C
Storage Temperature Range	-55 to +125	°C

Thermal Characteristics

Characteristic	Value	Unit
Thermal Resistance	100	°C/W
Junction Temperature	125	°C

Electrical Characteristics (T_A = +25°C unless otherwise noted) (See Figure 2)

Characteristic	Min	Typ	Max	Unit
Drain Current (e_{in} = 0) V_{CC} = 14 Vdc	–	7.0	30	mA
Sensitivity (P_O = 1.0 Watt, f = 1.0 kHz) e_o = 3.2 V(RMS), R_S = 65 Ω	–	32	40	mV
Total Harmonic Distortion (f = 1.0 kHz) V_{CC} = 14 V, e_o = 3.2 V(RMS), R_L = 65 Ω	–	1.0	5.0	%
Open-Loop Gain V_{CC} = 14 V, R_L = 65 Ω	–	87	–	dB
Ripple Rejection f = 60 Hz, A_V = 100, e_{in} = 0, Power Supply Ripple = 1.0 V(RMS)	–	27	–	dB
Equivalent Input Noise e_{in} = 0, R_S = 1.0 k Ω, BW = 100 Hz – 10 kHz	–	18	–	μV
Quiescent Output Voltage (e_{in} = 0) V_{CC} = 14 V	–	7.0	–	Vdc

Symbols conform to JEDEC Bulletin No. 1 where applicable.

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Figure 1 - Circuit Schematic

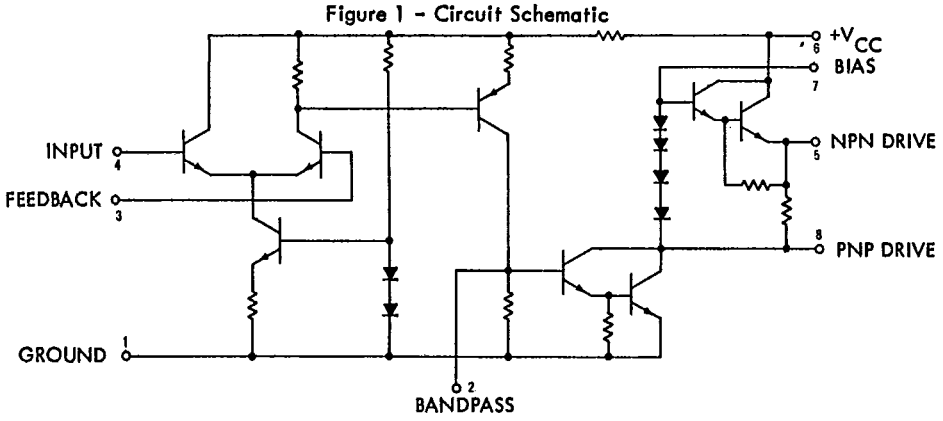
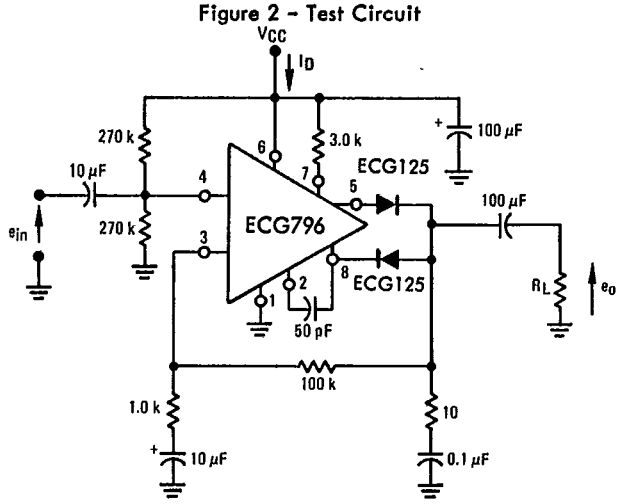


Figure 2 - Test Circuit



TYPICAL AUTO RADIO AUDIO APPLICATION and CHARACTERISTICS
(T_A = +25°C unless otherwise noted.)

Figure 3 - Application Circuit for ECG796

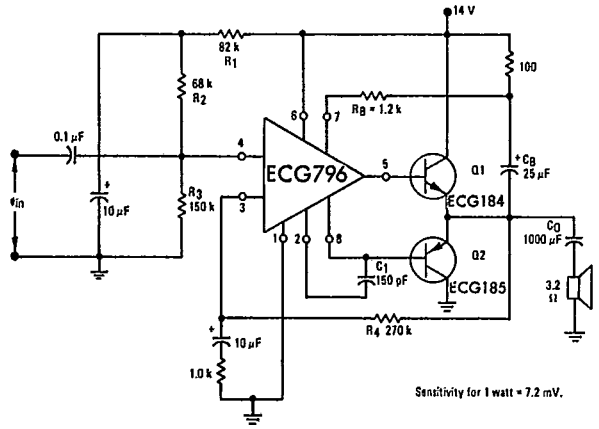


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Figure 4 - Total Harmonic Distortion versus Output Power

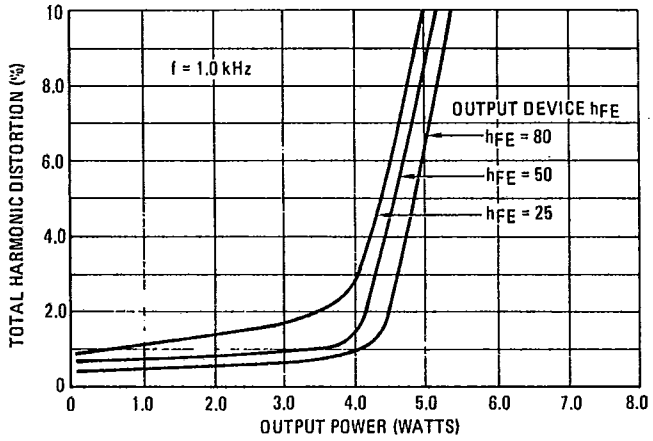

Figure 5 - Total Harmonic Distortion versus Frequency

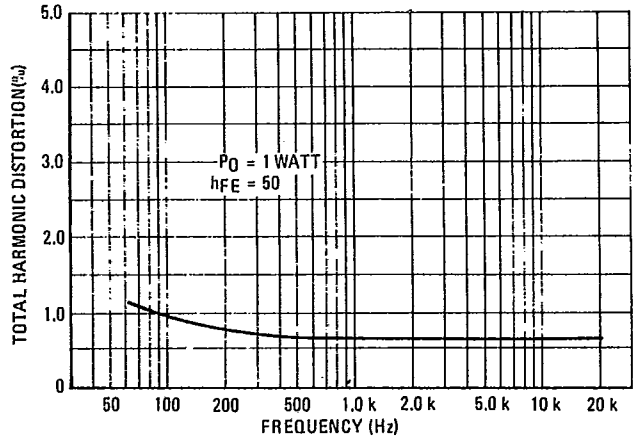

Figure 6 - Frequency Response

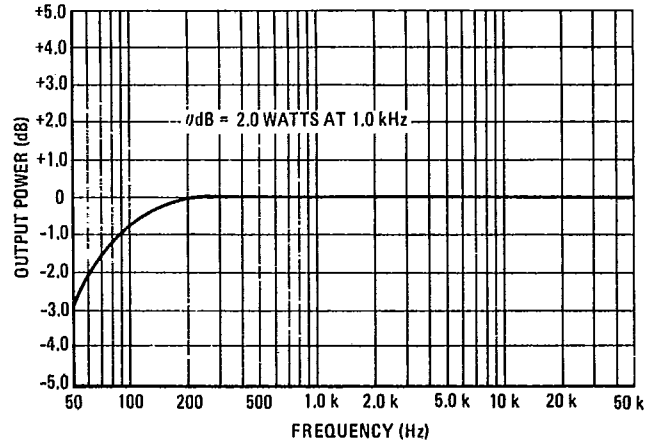

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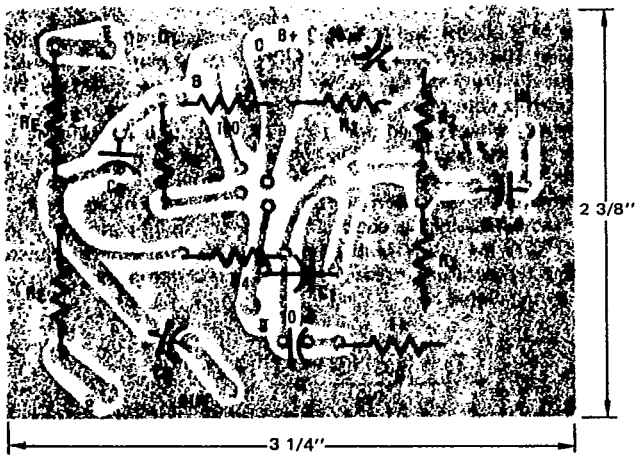
Figure 7 - Printed Circuit Board for Automotive Radio Audio 10-and-20 Watt Amplifiers (Copper Side)



Applications Information for ECG796 (Auto Radio Audio)

The ECG796 combines all the voltage gain required for an automotive radio audio amplifier into one package reducing the circuit-board area requirement. The circuit shown in Figure 3 has an input sensitivity of approximately 7.2 millivolts for a one-watt output. Sensitivity can be adjusted by changing the value of R_4. The circuit performance is a function of the output device h_{FE}, as shown in Figure 4. Figure 4 can be used to determine the minimum h_{FE} of the output transistors. The bandwidth of the amplifier is determined by the capacitor, C_1. If C_1 is increased to 390 pF the high frequency 3.0 dB point is typically 20 kHz.

An illustration of the copper side of the printed-circuit board layout is shown in Figure 7. The output transistors are mounted on the heatsink which for auto radio audio applications should have a maximum thermal resistance of $18^{o}C/W$ for each device or $9.0^{o}C/W$ when both output transistors are mounted on the same heatsink.