

# MC13060

## Mini-Watt Audio Output

This device is a rugged and versatile power amplifier in a remarkable plastic power package.

- Supply Voltages from 6.0 Vdc to 35 Vdc
- 2.0 W Output @ 70°C Ambient on PC Board with Good Copper Ground Plane
- Self Protecting Thermal Shutdown
- Easy to Apply, Few Components
- Gain Externally Determined
- Output is Independent of Supply Voltage Over a Wide Range

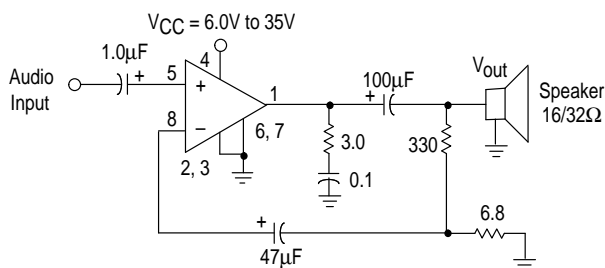
### MINI-WATT AUDIO OUTPUT

#### SEMICONDUCTOR TECHNICAL DATA

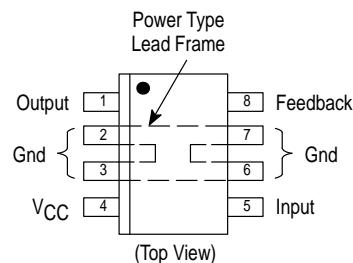


**D SUFFIX**  
PLASTIC PACKAGE  
CASE 751  
(SOP-8)

**Figure 1. Simplified Application**



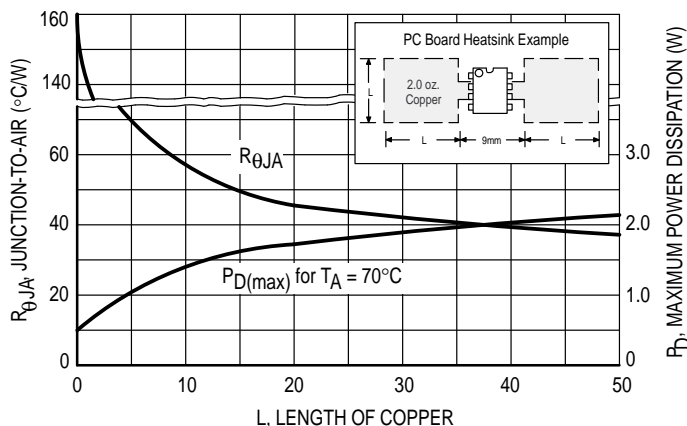
#### PIN CONNECTIONS



#### ORDERING INFORMATION

Device	Operating Temperature Range	Package
MC13060D	$T_A = -40$ to $+85^\circ\text{C}$	SOP-8

**Figure 2. Thermal Resistance & Maximum Power Dissipation versus PC Board Copper**



# MC13060

## MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Power Supply Voltage	$V_{CC}$	35	V
Audio Input, Pin 5		1.0	$V_{pp}$
Thermal Resistance, Junction to Air	$R_{\theta JA}$	160	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	25	$^{\circ}\text{C}/\text{W}$
Junction Temperature	$T_J$	150	$^{\circ}\text{C}$
Operating Ambient Temperature Range	$T_A$	-40 to +85	$^{\circ}\text{C}$
Storage Temperature Range	$T_{stg}$	-65 to +150	$^{\circ}\text{C}$

## ELECTRICAL CHARACTERISTICS ( $T_A = 25^{\circ}\text{C}$ , circuit of Figure 3, unless otherwise noted.)

Characteristics	Symbol	Min	Typ	Max	Unit
<b>AUDIO SECTION</b>					
Power Supply Current, No Signal	$I_{CC}$	—	13	—	mAdc
Gain	$A_o$	—	50	—	V/V
Distortion at 62.5 mW Output, 1.0 kHz	THD	—	0.2	1.0	%
Distortion at 900 mW Output, 1.0 kHz	THD	—	0.5	3.0	%
Quiescent Output Voltage, No Signal	$V_{Pin\ 1}$	—	8.4	—	Vdc
Input Bias	$V_{Pin\ 5}, V_{Pin\ 8}$	—	0.7	—	Vdc
Input Resistance	$R_{in}, Pin\ 5$	—	28	—	$k\Omega$
Output Noise (50 Hz to 15 kHz) Input 50 $\Omega$	$V_{out}$	—	0.5	4.0	mVrms

## GENERAL DESCRIPTION

The MC13060 is a quasi-complementary audio power amplifier, mounted in the SOP 8 (power SOIC package). It is well suited to a variety of 1.0 W and 2.0 W applications in radio, TV, intercom, and other speaker driving tasks. It requires the usual external components for high frequency stability and for gain adjustment.

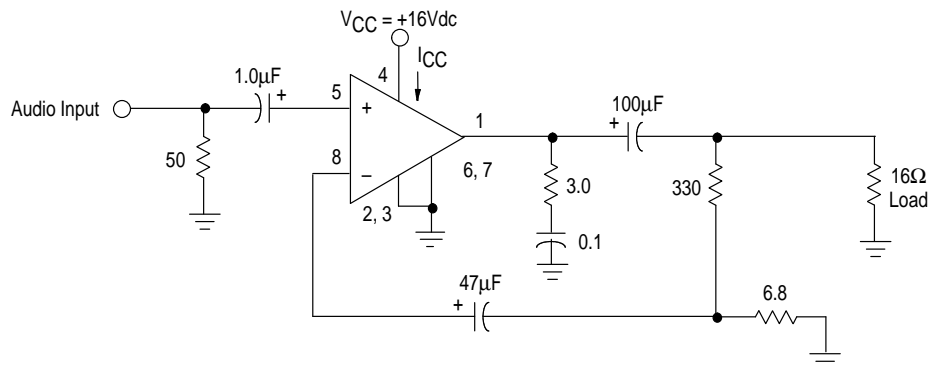
The output signal voltage and the power supply drain current are very linearly related, as shown in Figure 5. Both are quite constant over wide variation of the power supply voltage (above minimum  $V_{CC}$  for clipping, of course). The

amplifier can best be described as a voltage source with about 1.0  $A_{pp}$  capability. On a good heatsink, it can deliver over 2.0 W at  $70^{\circ}\text{C}$  ambient.

The MC13060 will automatically go into shutdown at a die temperature of about  $150^{\circ}\text{C}$ , effectively protecting itself, even on fairly stiff power supplies. This eliminates the need for decoupling the power supply, which degrades performance and requires extra components.

Input Pins 5 and 8 are internally biased at 0.7 Vdc and should not be driven below ground.

Figure 3. Test Circuit



All Curves Taken in the Test Circuit of Figure 3, Unless Otherwise Noted.

Figure 4. Quiescent Supply Current and Output Voltage versus Supply Voltage

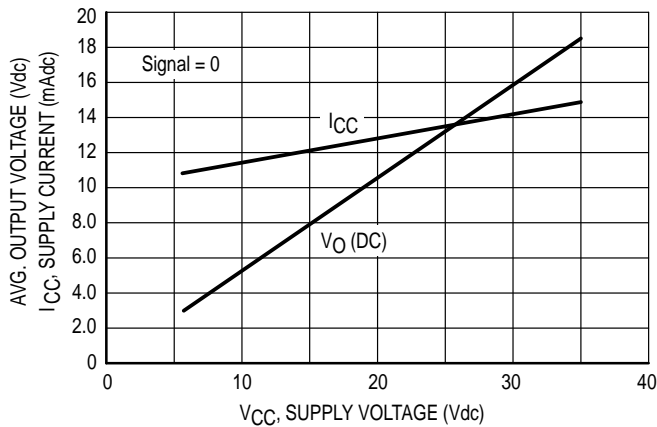


Figure 5. Supply Current versus Output

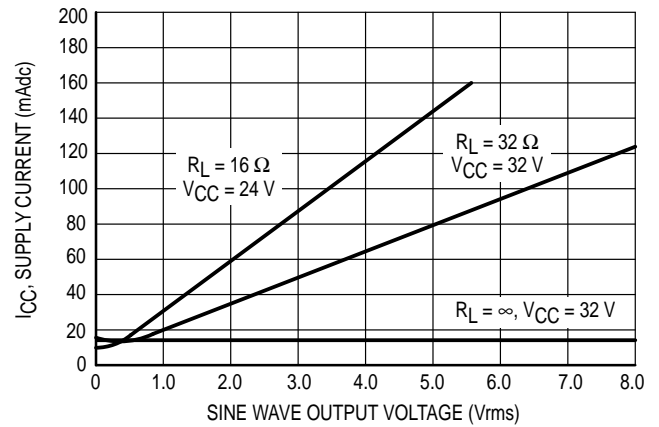


Figure 6. Distortion and Gain versus Frequency

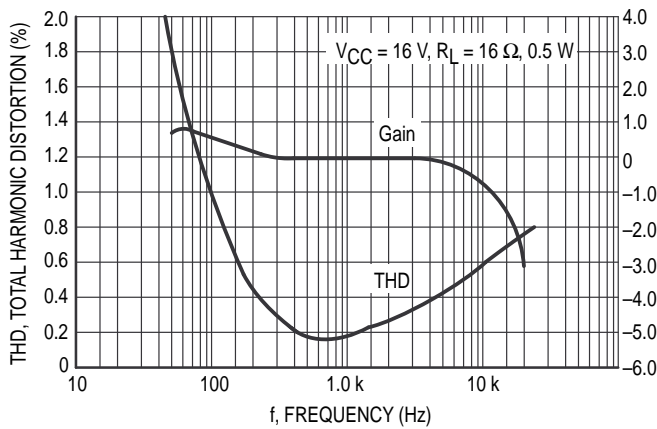


Figure 7. Distortion versus Power Output

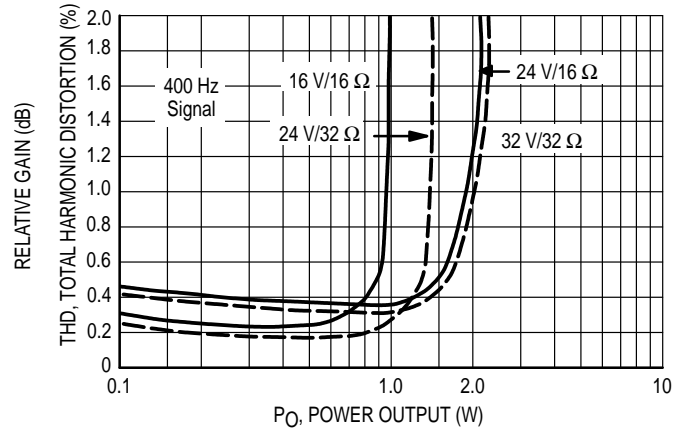


Figure 8. Dissipation versus Output Power

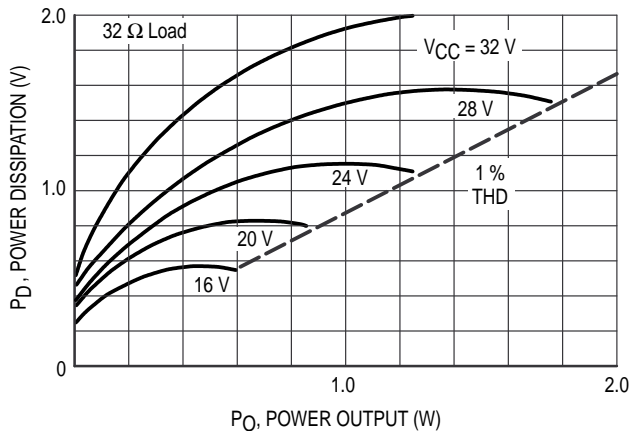
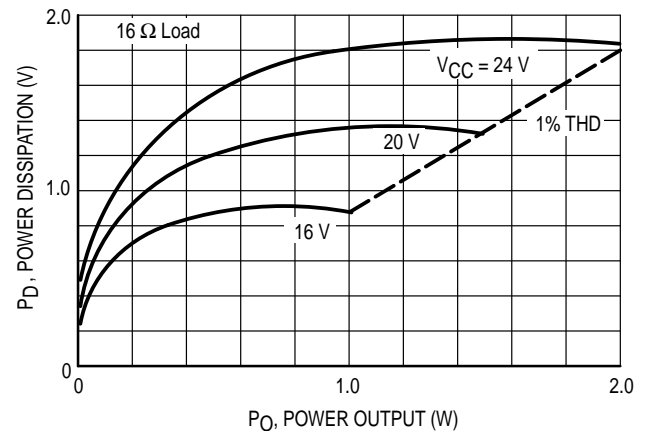
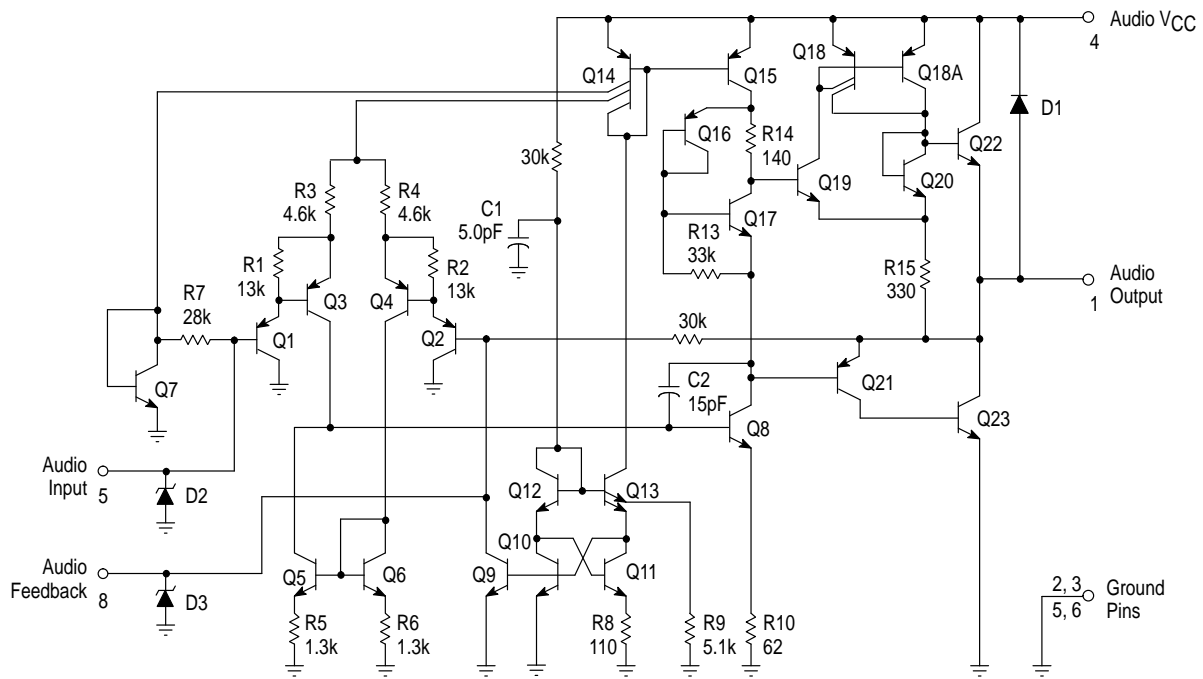


Figure 9. Dissipation versus Output Power



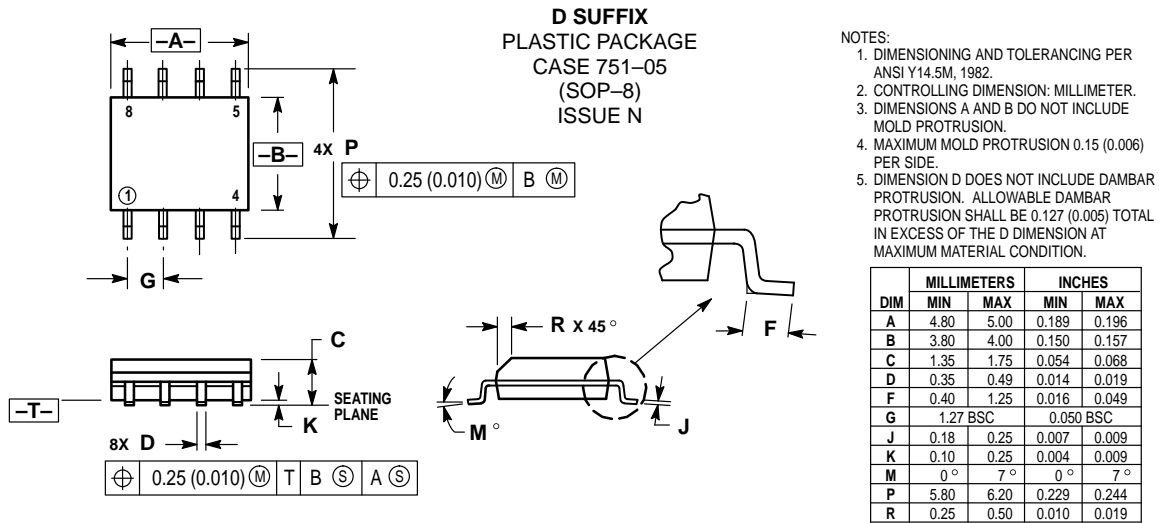
# MC13060

Figure 10. Representative Schematic Diagram




MC13060

OUTLINE DIMENSIONS



# MC13060

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MC13060/D

