



The LM386 was primarily designed for a 4 Ω speaker load, but is rated for 8 Ω and 32 Ω loads as well.

Audio Amplifiers

Before integrated circuits came along you had to build an audio amplifier using valves or transistors and a number of other discrete components. If you needed any real power then the transistors would be quite large and probably mounted on heatsinks.

All of that changed when the audio amplifier chip was introduced. Now it was possible to have a complete amplifier circuit capable of easily driving a small loudspeaker all in one chip.

There are many types of audio amplifier ICs, such as the LM series from Texas Instruments.

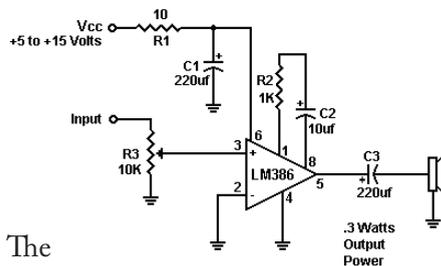
Part number	Description
LM380	2.5W audio power amplifier (fixed 34dB gain)
LM384	5W audio power amplifier (fixed 34dB gain)
LM386	Low voltage audio power amplifier
LM833	Dual high speed audio amplifiers

LM386

This device has been around since 1983 and can still be found in low-power, battery-driven applications all around the world. It is perfect for building your first chip-based audio amplifier, as it runs from a single power supply, is efficient, and needs no heatsink. The configuration below has a gain of 20.

Circuit diagram

Only eight components are needed to make the amplifier, and that includes the IC and loudspeaker. The output is 0.3 W, and is perfectly adequate for most purposes. The LM386N is very cheap so this project can be built for hardly any cost.



Output capacitor coupling is mandatory in just about all IC audio amplifier designs (Capacitor C3 here).

Parts list

- Resistors – R1 (10 Ω), R2 (1 k Ω), R3 (100 k Ω).
- Capacitors – C1 (220 μ F), C2 (10 μ F), C3 (220 μ F).
- Integrated circuit – LM386 (LM386N-1 = 300 milliwatts); (LM386N-3 = 700 milliwatts); (LM386N-4 = 1000 milliwatts).
- Sundries – Loudspeaker (4 Ω or 8 Ω), 9 V battery; Breadboard or stripboard, connecting wire.

