

Single-Chip FM Transmitter Extends Home-Entertainment Systems

This application note presents the design of a broadcast band, low-power FM transmitter. The output is between 88MHz and 108MHz, and allows transmitting audio signals to FM radios for remote listening. A schematic is provided with all component values to complete the project. Output power is ~ -21dBm, and the IC operates on 3V.

A simple FM transmitter (Figure 1) links your home-entertainment system to a portable radio that can be carried around the house and into the back yard. For example, you can play music on the CD changer in your living room, and listen to it on a portable radio by the back-yard barbeque.

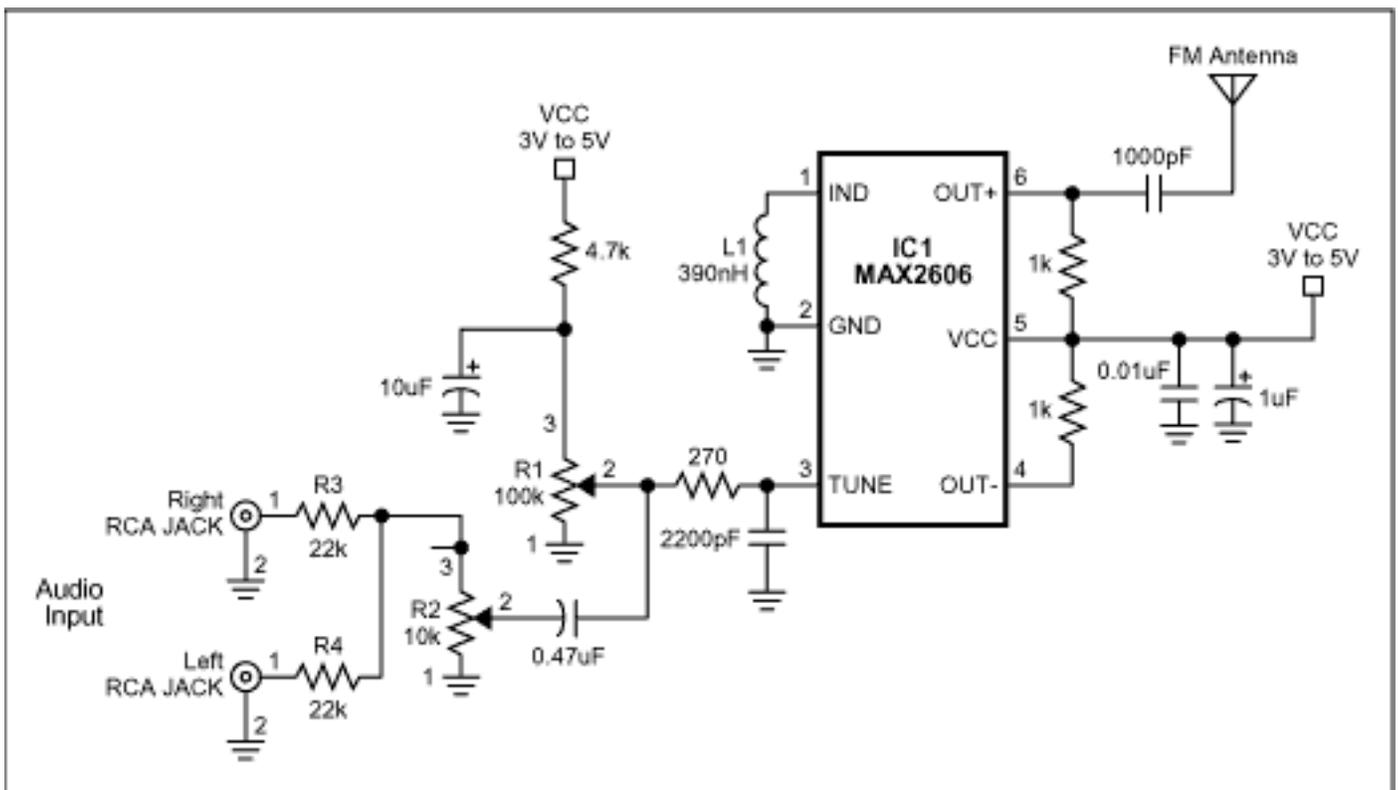


Figure 1. This simple, short-range FM radio transmitter has only one IC.

IC1 is a voltage-controlled oscillator with integrated varactor. Its nominal frequency of oscillation is set by inductor L1, and a 390nH value places that frequency at 100MHz. Potentiometer R1

then lets you select a channel by tuning over the FM band of 88MHz to 108MHz. Output power is about -21dBm into 50 Ω (most countries accept emissions below 10dBm in the FM band).

The home system's left and right audio signals are summed by R3 and R4, and attenuated by the (optional) potentiometer R2. R2's wiper signal serves as a volume control by modulating the RF frequency. Signals above 60mV introduce distortion, so the pot attenuates down from that level.

In the absence of a standard FM radio antenna, 75cm (30 inches) of wire will suffice as a transmitting antenna. For best reception, it should be mounted parallel with the transmitting antenna. The IC operates on a single supply voltage in the range 3V to 5V, but you should regulate the applied voltage to minimize frequency drift and noise.

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More Information

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