



# WIRELESS VOICE TRANSCEIVER REFERENCE DESIGN KIT USER'S GUIDE

## 1. Kit Contents

The Wireless Voice Transceiver Reference Design Kit contains the following items:

- Wireless Voice Transceiver Boards (2)
- Antennas (2)
- Headsets (2)
- Universal Power Supplies (2)
- Wireless Voice Transceiver Reference Design Kit User's Guide (this document)
- Wireless Voice Transceiver Reference Design Kit CD-ROM. CD content includes the following:
  - Reference Design Documentation (AN147)
  - Wireless Voice Transceiver Reference Design Source Code
  - C8051F33x Device Data Sheet

## 2. Kit Overview

Wireless voice applications require a microcontroller to quickly compress and decompress audio, efficiently control an RF transceiver, and accurately sample and output an audio stream. With its small, 4x4 mm size and high level of integration combining an on-chip ADC, DAC, and a 25 MIPS peak CPU, the Silicon Laboratories C8051F330 small form factor, mixed-signal microcontroller is an ideal choice for wireless audio designs. This reference design demonstrates how an 'F330 can be utilized for such applications.

**Note:** This design operates the RF transceiver at **908 MHz**. This frequency can be modified in firmware. Silicon Labs' USB debug adapter and software tools are required to recompile the code and reprogram the boards.



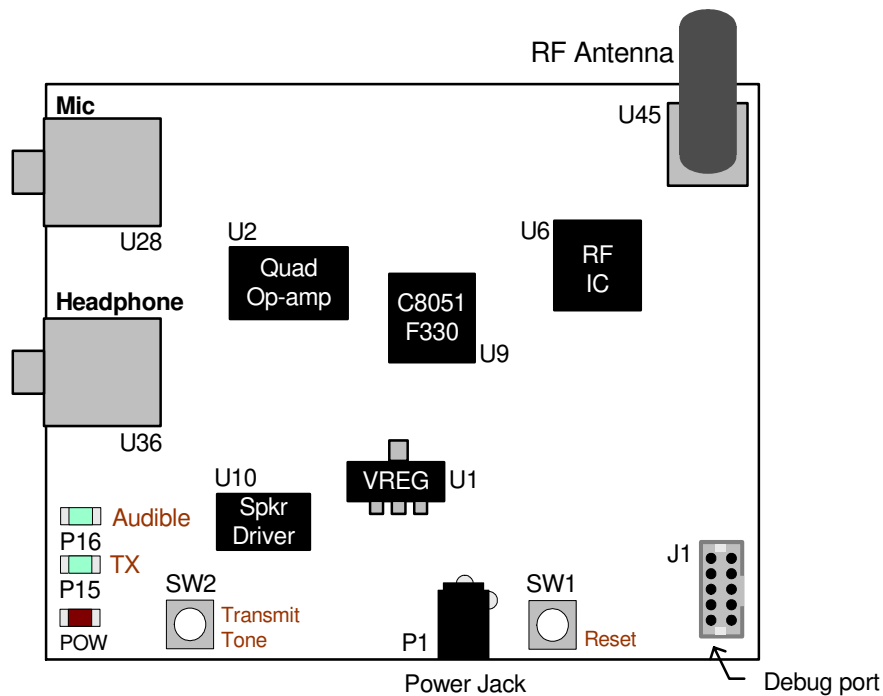
Figure 1. Wireless Voice Transceiver Board

# WL-TRANSCVR-RD

## 3. Wireless Voice Transceiver Reference Design Demonstration

The following steps are necessary to assemble and demonstrate the operation of this reference design:

1. Screw-in the provided antennas to the wireless voice transceiver boards. Do not over-tighten.
2. Plug in the headset microphone connector (pink color) to the board socket labeled "Mic". Plug in the headset headphone connector (green color) to the board socket labeled "Headphone." Make sure that both connectors are plugged in all the way into the sockets. The sockets might be tighter than normal on the first use. Repeat the same for the second board.
3. Choose appropriate plugs for the universal power supplies depending on your location and snap them in place. Connect each power supply to wall power with the other end connected to the boards' power socket. Power is indicated by the LED labeled "POW."
4. After the above steps, you should be able to talk via one board and listen with the other. Press the SW1 switch to transmit a low frequency tone that can be heard on the other end. The LED labeled P15 will light up whenever the local audio level is above the configured audible threshold. The LED labeled P16 will light up during transmission.



Note: Debug adapter required to reprogram or debug (not included in this kit).

**Figure 2. Wireless Voice Transceiver Board Part Locations**

## 4. Reference Design Documentation and Source Code

The architecture of the Wireless Voice Transceiver Reference Design is described in detail in the application note AN147 that is included in the CD-ROM. AN147 includes the transceiver board schematic and bill of materials (BOM). The C language source code is also included.

The software system's constants and configuration values are declared with the "#define" preprocessor directives so that the system can be easily customizable. Buffer sizes, bytes sent per data packet, and tolerance values can be adjusted by changing the appropriate values listed in the "#define" section of code. The Keil C51 tool chain should be used to compile the code. To reprogram the transceiver boards and to debug, a Silicon Labs USB Debug Adapter (Part number: DEBUGADPTR1-USB) is required (not included with this reference design kit). This debug adapter can be obtained by buying the C8051F330DK Development Kit, which also includes an evaluation version of the Keil C51 tool chain. It can be purchased separately. To purchase, please visit the following link and choose "Development Tools", or contact your nearest Silicon Laboratories distributor.

- <http://www.silabs.com/mcu>

The USB debug adapter can be used with the Silicon Laboratories Integrated Development Environment (IDE) to program and debug the transceiver boards. The Silicon Labs IDE and other software tools can be downloaded from the following link:

- <http://www.silabs.com/products/microcontroller/downloads.asp>

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