NXP NFMI radio NxH2280

NFMI radio for wireless audio and data streaming

This ultra-low-power, single-chip solution, optimized for wireless audio and data communication using a Near Field Magnetic Induction (NFMI) radio, provides a robust and tightly-contained body-area network around the user.

KEY FEATURES

‣ Single-chip solution for wireless audio and data streaming
‣ Second-generation NFMI technology
   - Low power, robust, and private
   - 596 kbit/s transmission rate
   - Worldwide applicable
   - Low absorption by human body tissue
‣ Integrated ARM Cortex-M0 processor
   - Extensive set of peripherals
   - Fully customer programmable
‣ CoolFlux DSP for audio processing
‣ Works standalone or with external MCU
‣ Flexible embedded network
   - Up to 15 devices
   - Optimized protocol for low-latency ear-to-ear communication
   - Up to 2 audio Tx, 2 audio Rx, and multiple data streams in parallel
‣ Ultra-low-power operation
   - Bidirectional audio streaming: 1.2 mA @ 16 kHz sampling rate
   - Unidirectional audio streaming: 1.9 mA @ 48 kHz sampling rate
‣ Packaged as bumped die < 11 mm²
‣ Operates off a single ZnAir battery

‣ Supported by a complete starter kit
   - Application boards
   - LPCXpresso firmware environment
   - Software development kit

APPLICATIONS

‣ Truly wireless earbuds/headphones
‣ Hearing aid instruments
‣ Mission-critical communication

The NXP NxH2280 is a fully integrated single-chip solution that enables wireless audio streaming and data communication using NFMI, a mature technology that has a proven track record in the hearing industry.

POWER EFFICIENT, ROBUST, AND PRIVATE

NFMI is more power-efficient than RF on short distances. The steep degradation of NMFI signal strength as a function of distance increases privacy and reduces issues with interference compared to RF. Less issues with interference means increased robustness.

HUMAN BODY COMPATIBILITY

NFMI goes through human body tissue with very low absorption, whereas RF doesn't.

CUSTOMER PROGRAMMABLE

The NxH2280 integrates a customer-programmable ARM Cortex M0 processor. The full set of peripherals, including control interfaces, timers, and EEPROM, makes it possible to create ultra-low-power audio and data streaming applications without the need for an external microcontroller.

The NxH2280 also integrates a customer-programmable CoolFlux DSP for audio processing.

FLEXIBLE EMBEDDED NETWORK

The NxH2280 implements a very flexible embedded network, up to 15 devices and having two transmit audio streams, two receive audio streams, and multiple data streams at the same time. Audio sample rates between 16 and 48 kHz are supported.
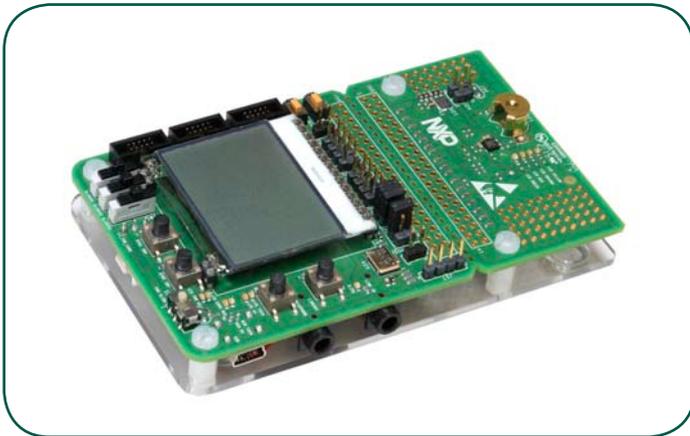
ALLOWS HIGH INTEGRATION FACTOR

The NxH2280 is packaged as a bumped die (< 11 mm²). Only a few small external decoupling capacitors are needed.

ULTRA-LOW-POWER OPERATION

The NxH2280 operates off a single ZnAir battery.

Hardware application board

STARTER KIT

To simplify development and reduce time-to-market, NXP offers an NxH2280 starter kit. The kit includes a hardware application board, the LPCXpresso firmware development environment, and a complete software development kit (SDK) for prototyping a wireless audio-and data-streaming application with the NxH2280 NFMI radio.

The application board includes the following features:

▸ Breakout board with NxH2280 IC, which can be removed from the application board and run in standalone mode
▸ LPC1115 host microcontroller
▸ Audio codec supporting A-to-D and D-to-A conversion
▸ Connectors for the ARM Serial Wire Debug Interface
▸ Mini USB connector for serial interface and recharging LiPolymer battery
▸ Peripherals for user interface: display, buttons, switches
▸ Battery-powered operation

The SDK's demonstration use cases show unidirectional, bidirectional, and stereo audio streaming, as well as a Bit Error Rate application, for evaluation of link distance versus transmit power, and a data-streaming (file-transfer) application. The SDK is accompanied by the free LPCXpresso development environment (www.lpcware.com).

Contents of starter kit

Item	Qty
NxH2280 application boards	3
LPC-Link2 debug probe	1
USB cable	1
Ferrite antenna coils	3
Software development kit	1