



NXP MiGLO NFMI radio portfolio NxH2280/81/61

MiGLO™ NFMI radios for truly wireless audio and data streaming

These ultra-low-power, single-chip solutions, optimized for high quality wireless audio and data communication use Near Field Magnetic Induction (NFMI) to provide 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
 - 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
- ▶ Packaged as bumped die < 11 mm²
- ▶ Typical battery voltage: 1.2V

SUPPORT

- ▶ Application boards
- ▶ LPCXpresso firmware environment
- ▶ Software development kit

APPLICATIONS

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

The MiGLO NxH22xx portfolio of fully integrated single-chip solutions enable wireless audio streaming and data communication using NFMI, a mature technology that has a proven track record in the hearing industry.

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



HUMAN BODY COMPATIBILITY

NFMI goes through human body tissue with very low absorption, unlike RF.

CUSTOMER PROGRAMMABLE

The MiGLO portfolio integrates a customer-programmable ARM Cortex M0 processor. The full set of peripherals, including control interfaces, timers, and EEPROM make it possible to create ultra-low-power audio and data streaming applications without the need for an external microcontroller. The NxH22XX also integrates a customer-programmable CoolFlux DSP for audio processing.

FLEXIBLE EMBEDDED NETWORK

MiGLO NFMI devices implement a very flexible embedded network, up to 15 devices and 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.

HIGHLY INTEGRATED

The NxH22XX is packaged as a bumped die (< 11 mm²). Only a few small external decoupling capacitors are needed.

PRODUCT OVERVIEW

The MiGLO NFMI NxH22XX series contains 3 products.

NxH2280 - uses G.722 audio codec on the wireless link

NxH2281 - also supports SBC audio codec and is pin compatible with NxH2280, both available as non-populated WLCSP with 130 µm bump diameter for extremely integrated applications such as hearing aids.

NxH2261 - variant of NxH2281, fully-populated WLCSP with 250 µm bump diameter for consumer products such as wireless earbuds.

Parameter	NxH2280	NxH2281	NxH2261
Audio			
High quality audio codec	G.722	SBC	SBC
Audio bandwidth	16 kHz	20 kHz	20 kHz
Power [mW]	2.5 mW	3.6 mW	3.6 mW
Free programming RAM	10 kB	15 kB	15 kB
Temperature range	0 – 60 °C	0 – 60 °C	-20 – 85 °C
Package			
Bump diameter	130 µm	130 µm	250 µm
Pitch	min. 400 µm	min. 400 µm	400 µm
Back side coating	No	No	Yes
Size	10.4 mm ²	10.4 mm ²	10.4 mm ²

Reported values are applicable at 48kHz sampling rate

STARTER KIT

To simplify development and reduce time-to-market, NXP offers a MiGLO starter kit which includes a hardware application board, the LPCXpresso firmware development environment, and a complete SDK for prototyping a wireless audio- and data-streaming application with one of the MiGLO NFMI radios.

The application board includes the following features:

- ▶ Breakout board with NxH22XX IC, which can be removed from the board to 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 LiPo battery
- ▶ Peripherals for user interface: display, buttons, switches
- ▶ Battery-powered operation

Starter Kit Contents

Item	Qty
NxH22xx application boards	3
LPC-Link2 debug probe	1
USB cable	1
Ferrite antenna coils	3
Software development kit	1

The SDK's demonstration use cases show uni-directional, bi-directional, and stereo audio streaming, as well as a Bit Error Rate application to evaluate 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).

Hardware Application board

