



NXP MiGLO NFMI radio portfolio NxH2281/61/65/66

MiGLO™ NFMI radios for wireless, ultra-low power 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 communication
 - Up to 2 audio Tx, 2 audio Rx, and multiple data streams in parallel
- ▶ Ultra-low-power operation
- ▶ Packaged as bumped die
- ▶ Typical supply voltage: 1.3V

SUPPORT

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

APPLICATIONS

- ▶ Truly wireless earbuds/headphones
- ▶ Hearing aid instruments
- ▶ Mission-critical communication
- ▶ Smart pills and implants

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 and in truly wireless earbud consumer products.

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. Reduced interference in turn increases link robustness.



HUMAN BODY CAPABILITY

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, with up to 15 devices and up to two transmit and two receive audio streams and multiple data streams at the same time. Audio sample rates between 16 and 48 kHz are supported.

HIGHLY INTEGRATED

All NxH22XX products are packaged as chip scale package. Only a few small external decoupling capacitors are needed.

PRODUCT OVERVIEW

The MiGLO NFMI NxH22XX series contains 4 products.

- ▶ **NxH2281** – supports both G.722 and SBC audio codec on the wireless link. Available as non-fully populated WLCSP with 130 µm bump diameter for extremely integrated applications such as hearing aids.
- ▶ **NxH2261** – a package variant of the NxH2281 in a fully-populated WLCSP with 250 µm bump diameter for consumer products such as wireless earbuds.
- ▶ **NxH2265** – a derivative of NxH2261 with reduced functionality in order to optimize cost and implementation size. Its functionality is tuned towards truly wireless earbud products.
- ▶ **NxH2266** – a new derivative of NxH2265 with support for increased audio quality and up to 3 audio streams, hence supporting 2+2 mic beamforming for Hearables.

HARDWARE DEVELOPMENT BOARD



STARTER KIT

To simplify development and reduce time-to-market, NXP offers a MiGLO starter kit which includes a hardware development 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 development 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	2/3*
LPC-Link2 debug probe	1
USB cable	1
Ferrite antenna coils	2/3*
Software development kit	1

* NxH2265/66 starter kit contains 2 application boards. Other starter kits contain 3 boards

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 MCUXpresso development environment (mcuxpresso.nxp.com).

Parameter	NxH2281	NxH2261	NxH2265	NxH2266
Audio				
Audio codecs	G722 / SBC HQ	G722 / SBC HQ	G722 / SBC HQ	G722 / SBC HQ & SHQ
Audio bandwidth	20 kHz	20 kHz	20 kHz	20 kHz
# Audio streams	Up to 4	Up to 4	Up to 2	Up to 3
THD+N	-65 dB	-65 dB	-65 dB	-65 dB
SNR	-93 dBFS	-93 dBFS	-93 dBFS	-93 dBFS
Power	3.4 mW	3.4 mW	3.0 mW	3.0 mW
Non-volatile memory	512 kbit	512 kbit	0 kbit	0 kbit
Supply voltage	1.00–1.45V	1.00–1.45V	1.15–1.40V	1.15–1.40V
Free programming RAM	15 kB	15 kB	5 kB	5 kB
Temperature range	-20–85 °C	-20–85 °C	-20–85 °C	-20–85 °C
Package				
Bump diameter	130 µm	250 µm	250 µm	250 µm
Pitch	Min. 400 µm	Min. 400 µm	400 µm	400 µm
Back side coating	No	Yes	Yes	Yes
Size	10.4 mm2	10.4 mm2	7.8mm2	7.8 mm2