

Ixana XA-NFE2001 | Wi-R NFE

Lowest Power Near-Field Transceiver Chip

XA-NFE2001 is designed to solve the challenges of existing short-range technologies.

XA-NFE2001 leverages Near Field Electric (NFE) communication, which uses a contained electric field to create a private, un-sniffable data link between devices. This approach makes physical closeness the ultimate security key.

This enables contact-range data exchange, where an intuitive physical tap or close distance between devices can trigger an automatic and physically secure 5 Mbps data transfer. This eliminates the need for complex software pairing procedures and is orders of magnitude more energy-efficient than radiating signals into the air.

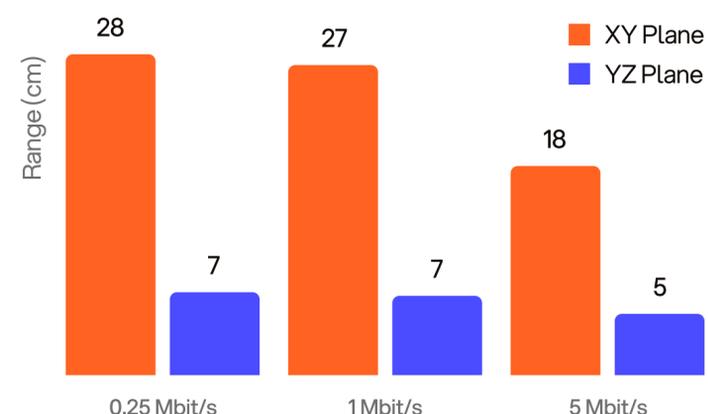
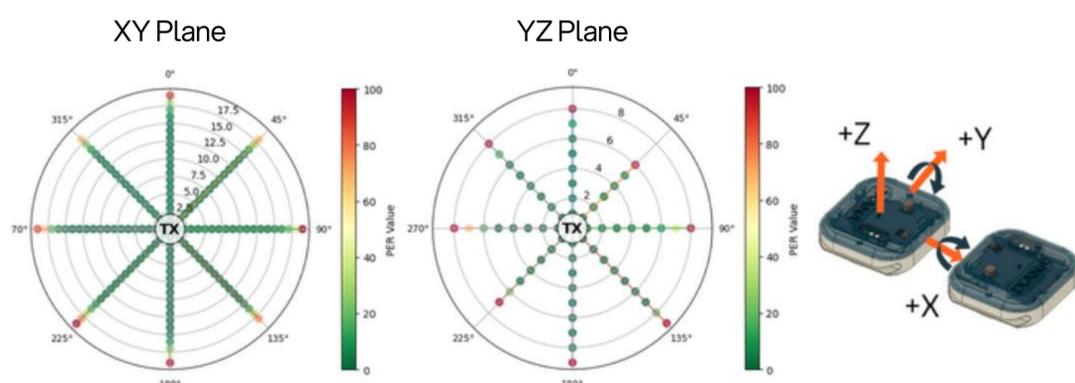
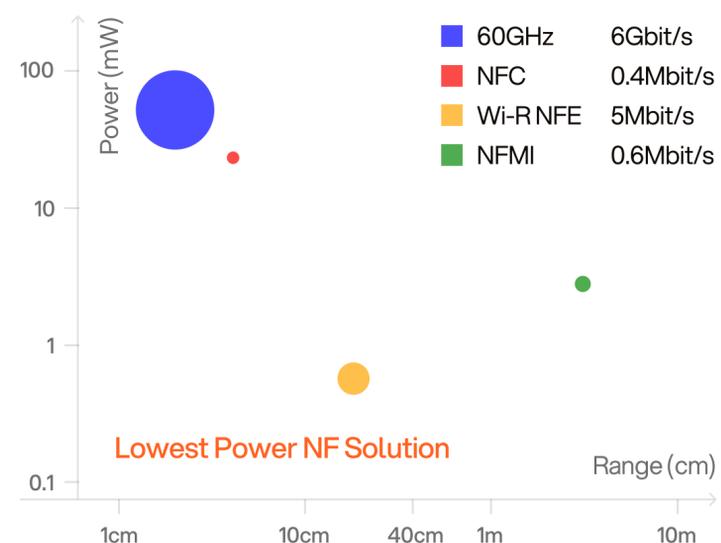
Wi-R NFE E-field Transceiver (XA-NFE2001)

Voltage	1.7V–2.7V (1.8V/2.5V compliant)
Interface	SPI up to 24MHz; 40MHz external crystal
Performance	Adjustable carrier/data rate up to 5Mbps
Power Efficiency	<1mW @5Mbps, Sleep modes for long-battery
Scalability	Supports up to 16 devices simultaneously
Integration	Built-in power management, clocking, 8Kbit Tx/Rx FIFO
Temperature	–40°C to 85°C
Packages	6×6×0.8mm QFN-48, 4×4×0.5mm QFN-28 (coming soon), CSP (coming soon)

Comparison of Near Field Technology: Power, Range, Data Rate

	NFE	NFC	NFMI	60GHz
Power	Rx: 0.6mW Tx: 0.4mW	24mW ¹	3mW ²	3mW ²
Range	Typical: 18cm 5-30cm possible	4cm	100-300cm	1cm
Data Rate	5Mbit/s	0.4Mbit/s	0.6Mbit/s	6250Mbit/s ³

1 - ST25R3918 for single RX channel and VDD= 2.4V 3 - ST60A2 Chip power at 3.125Gbit/s
2 - MiGLO NFMI NxH2281



NFE supports 18cm range in XY plane and 5cm in the YZ plane. The supported range for interaction with other directions fall within this range. The range also varies with data rate; the range is higher at lower data rates.

NFE range as a function of speed

Wi-R NFE Target Applications (XA-NFE2001)

The XA-NFE2001 enables a new class of smart, secure, and intuitive interactions across consumer, industrial, and wearable devices:

Secure Access & Authentication	Replace passwords and key cards by tapping a phone, smartwatch, or fob to a reader. E-field confinement ensures the communication is physically un-interceptable.
Instant Device Pairing & Configuration	Pair headphones, smart home devices, or configure industrial equipment with a touch — no setup, no pairing menu.
Private Peer-to-Peer Data Exchange	Share contacts, business cards, or files locally without cloud access or vulnerable RF protocols (e.g. Airdrop for Android alternative).
Smart Industrial and IoT Tools	Enable tools to securely authenticate with machinery or log usage data upon physical contact.
Next-Gen Payment & Ticketing	Supports low-power, contact-based transactions with faster response and enhanced security over traditional NFC.

Key Features & Benefits of Wi-R NFE

High-Speed Data Transfer

A 5 Mbps data rate supports rich data exchange, from instant transfer of contact information and photos to authentication credentials and configuration files.

Unmatched Energy Efficiency

With sub-milliwatt power consumption, the XA-NFE2001 is ideal for battery-powered devices where every joule of energy counts.

Scalable Multi-Device Networks

The XA-NFE2001 SDK supports communication with up to 16 devices simultaneously — suitable for group authentication, smart classrooms, or medical setups.

Contact-Range Security

The signal is capacitively coupled and confined to the immediate vicinity of the devices, making it physically impossible to intercept from a distance.

Simplified, Instant Connectivity

Devices automatically discover, authenticate, and connect upon contact or close distance, creating a seamless and intuitive user experience.

Configurable Range

XA-NFE2001 offers multiple ways of configuring range (defined as the distance between the two devices) of communication.

Three of these methods:

Orientation

As depicted in Fig 2, at 5Mbit/s, in typical cases, the range in YZ direction is 6cm, while XY direction is 18cm.

Chip Parameters

Parameters such as chip transmit voltage can control the range.

Data Rate

As in the figure above, the range in the XY direction increases from 18cm to 28cm if data rate is reduced from 5Mbit/s to 0.25Mbit/s continuous communication.

Presence of a Conductor or Body

In wearable situations (the figure below), the range in XY direction @5Mbit/s increases from 18cm off-body to 40cm on-body. This feature opens up a myriad of applications by combining Wi-R BAN with Wi-R NFE technology

Beyond Near-Field: Wi-R BAN + Wi-R NFE

The XA-NFE2001 is pin-compatible with Ixana's Wi-R BAN (Body Area Network) transceivers such as YR23, enabling seamless integration between near-field and wearable communication. While Wi-R NFE excels at secure, low-power, near-field exchange, combining it with Wi-R BAN unlocks entirely new application categories such as:

Smart Wearable Ecosystems

Wi-R NFE handles secure device pairing and configuration transfer between wearables and smartphones when the devices are close by, while Wi-R BAN maintains the always-on, ultra-low-power data links between on-body devices (smartwatch to earbuds, fitness tracker to smart clothing)

Medical Device Networks

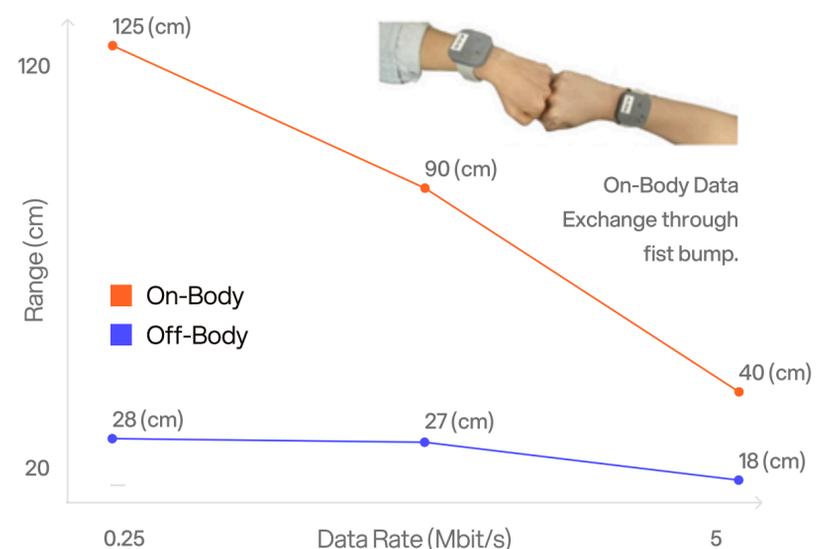
Hospital environments can use Wi-R NFE for secure patient ID verification and device provisioning when they are close, while Wi-R BAN enables continuous monitoring

Touch-driven Data Exchange

Touch activated data transfer is now possible i.e. if two people with a Wi-R watch fistbump or handshake, they can transfer data with authentication.

Industrial IoT with Human Interface

Factory workers can use Wi-R NFE to securely configure and retrieve data



In wearable scenarios, body conductivity boosts range significantly — from 18cm (off-body) to 40cm (on-body) at 5Mbps — expanding the reach of secure, low-power communication.

Request XA-NFE2001 Wi-R NFE development kit:

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