Why Your Next Winning Product Will Use NFC Wireless Charging

NFC FORUM

nfc-forum.org

Product managers, developers, and designers are tasked with creating products that solve user issues, are easy to use, and have a clean design esthetic. Plus they are asked to iterate on existing product designs with:

- Design efficiency improvements
- Improved user experience
- Increasingly small and lightweight designs
- All-in-one wireless charging and data transmission

Near Field Communication (NFC) technology helps to achieve these goals and boost profitability by reducing the complexity of the manufacturing cycle.

This document will define NFC Wireless Charging, the advantages for designing with NFC in mind, and the business advantages to NFC for organizations. It has been developed by the NFC Forum, the industry group that oversees standards that ensure the reliability and interoperability of connections.

What Is NFC Wireless Charging?

Near Field Communication (NFC) is unique in that it can transmit data as well as power.

It's a wireless technology that uses a radio frequency of 13.56 MHz and has a typical certified compliant range of 5 mm and a data rate of up to 424 Kbit/s. The wireless charging standard developed by the NFC Forum provides a new way to charge smaller mobile devices and accessories with up to 1 W of power using an extremely thin antenna with a surface area as small as 3X3 mm.

LEARN THE DETAILS

NFC Advantages for Product Design

NFC technology is everywhere. A quarter of the world's population already has access to it for contactless payments, door locks, location tags, and more. In an NFC Forum research study, ABI Research found that 85% of consumers use NFC technology.

NFC Wireless Charging adds an additional set of capabilities to the base functionality of NFC technology. It is being used in leading wearables and has received the endorsement of the Universal Stylus Initiative (USI). Now that Google Chromebooks are implementing the USI's stylus specification, widespread adoption of NFC Wireless Charging is imminent.

By providing designers with a convenient alternative to more cumbersome wireless solutions and traditional AC-powered wall sockets and dedicated chargers, NFC is transforming smartphones into portable charging stations. Future smartphone generations are expected to increasingly incorporate this transformative functionality. As a result, manufacturers will be urging product designers to develop a wide range of accessories such as wearables, fitness trackers, earbuds, enterprise tools, and even medical devices like hearing aids.

Design NFC Wireless Charging into a wide range of accessories and wearables, such as fitness trackers, earbuds, styluses, and even medical devices like hearing aids.

Here are the key ways NFC Forum wireless charging creates advantages for your product designs.

Small form factor

Version 2.0 of the NFC Forum Wireless Charging Specification is tested against an antenna size of 4X9 mm which allows for antennas designs which are even smaller. These sizes are at least an order of magnitude smaller in area needed for connection, compared to other wireless power standards. This makes NFC ideal for space-constrained products like styluses, earbuds, hearing aids, and more.

Great aesthetics

The hallmark of successful technology design is a clean, minimalist appearance. By embedding a charging connection inside a product, designers have more freedom to avoid having contacts and labeling exposed on the exterior of a product. Also, NFC's reduced size makes achieving this much easier, even in the smallest products.

Reduced manufacturing complexity

NFC's small transmitter allows designers to eliminate charging ports and reduce the number of parts to design, source, inventory, and manage. Manufacturing engineering is also simplified, since wireless power connections do not need the more precise alignment metal connectors require in various casings.

Seamless user experience

NFC connections are established with a simple tap, making it easy for users to get started without cumbersome setups or pairings. In the case of wireless charging, users will "tap and rest" their products to instantly start the charging process.

Negotiated power

Optimized charging and battery life with negotiated wattage up to 1 W over the NFC wireless power connection.

Cord-free convenience

Designers can create products without wires, plugs, or cords that can so easily be left behind when users are on the move.

Fast charging speed

NFC wireless charging often meets users' expectations for speed of charging and the contactless connection adds to ease of use.

Better security

NFC's data transmission capability means products can be designed to provide additional security features such as authentication and data encryption.

Battery-free power

An output of 1 W enables the charging of a wide range of low-power IoT devices. This reduces charging times for mobile accessories and means that low-power disposable batteries can be eliminated from designs.

Sustainability

By eliminating the need for disposable batteries, wires, and cables, NFC Wireless Charging can help designers to reduce raw material use and electronic waste in their products.

Fast data rate

The NFC Forum specification allows a data transfer rate of up to 424kbps. It takes less than one-tenth of a second to establish a connection between two devices, thanks to the absence of manual pairing and inductive coupling.

Increased compatibility

Because it's compatible with a wide range of existing devices, NFC is a flexible solution for product designers to use for wireless charging and a host of other connectivity benefits, like contactless provisioning and other tappable features.

Improved durability

By eliminating charging ports and cables, NFC Wireless Charging means less wear and tear, improving product lifespan. Also, by not exposing metal contacts to moisture and dirt, an embedded charging solution is more durable. It's ideal for smaller personal devices, like headphones.

Business Advantages of NFC Wireless Charging for Organizations

The advantages of NFC Wireless Charging extend beyond individual product cycles to the KPIs of the manufacturing division and the entire business.

1. Accelerate Time to Market

Without the need for charging ports, and related components, product development becomes faster and supply chains simpler and less risky. This reduction in manufacturing complexity also accelerates time to market and can create a first-mover advantage for innovative products.

Using the NFC Forum's wireless charging standards means a product is positioned to be interoperable across the NFC ecosystem, increases reliability, and has been built upon tested foundations. With NFC Forum Product Certification, companies can share their components and products have passed rigorous testing required to earn the NFC certified mark.

This vastly reduces the time needed for quality assurance processes – and the associated headaches that come with problem-solving.

An HVAC system can forgo the need for a screen with an NFC-enabled device that wirelessly powers and then retrieves the required data, reducing manufacturing complexity and cost.

2. Increase Profitability

Choosing NFC offers a couple of vectors for better profitability: cost reductions and increased manufacturer's suggested retail price (MSRP). By offering NFC Wireless Charging as a premium feature, you can charge more for your product.

NFC Wireless Charging eliminates the need for a charging port and cables, which means design teams enjoy reduced bill of materials (BOM) costs due to the need for fewer components. With reduced manufacturing complexity, you face fewer re-works, less waste, and an optimized manufacturing design. Furthermore, the NFC Forum's standards create market efficiencies that tend to drive down component costs. These add up to a significant reduction in manufacturing costs.

Accessories like earbuds can be effortlessly charged wirelessly by placing them on an NFC-enabled device's surface or case, enhancing user-friendliness and convenience.

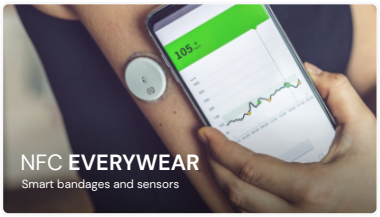
3. Enter New Markets

NFC Wireless Charging makes it much easier to enter new geographical markets because there is no need to accommodate the different AC standards in different regions. This can often simplify the process of introducing products into new markets.

The markets for mobile accessories are also undersaturated. For example, some users find it difficult to work with tiny ports and cables. Because NFC-enabled devices can be charged simply by resting them on a charging surface or case, they offer life-changing usability improvements to these markets. NFC can also be used to simplify user interfaces, allowing for more user-friendly products.

4. Gain Competitive Advantage

NFC has seen remarkable adoption in the marketplace, both in scope and penetration. By integrating NFC Wireless Charging into product designs, designers can differentiate their products from those of competitors.



With NFC Wireless Charging technology, you can broaden your range of product offerings, from consumer and industrial sectors to medical applications.

5. Create New Business Opportunities

Incorporating NFC and wireless charging technology can enable you to expand your product offerings.

For example, if your company specializes in consumer electronics, you can explore the development of NFC-enabled wireless charging docks, charging stations, or even smart home devices that integrate NFC capabilities. This expansion allows you to diversify your product portfolio, reach new customer segments, and capitalize on the increasing demand for wireless charging solutions.

6. Protect IP and Market Share

For many product types, the massive and growing counterfeit market not only represents a loss of revenue but can mean a loss of reputation. By utilizing the data channel of NFC tags, manufacturers can implement measures to validate genuine products.

Data transfer capabilities also unlock a suite of additional features. The data connection established during the NFC Wireless Charging process can serve as a means of communication between the charger and the device being charged. Manufacturers can embed unique identification codes or authentication protocols within their products to ensure that devices are authentic.

It's a great way for manufacturers to safeguard their products against unauthorized charging and prevent potential revenue loss from third-party products benefiting from their charging infrastructure. This helps maintain the integrity of the product ecosystem, protects against counterfeit or subpar charging experiences, and upholds the manufacturer's brand reputation for quality and reliability.

7. Become More Sustainable

By reducing the number of line items in your BOM, you improve your environmental, social, and governance (ESG) framework. This is not only a laudable end in itself, but it provides a way to connect with consumers who are looking for more sustainable options.

NFC Wireless Charging eliminates the need for chargers, cables, power adapters, and disposable batteries, helping manufacturers to claim these ESG benefits:

- **Reduced need for raw materials:** The elimination of disposable batteries and other components reduces the extraction of raw materials (some of which are conflict minerals when sourced from certain areas of the world). The mining and processing of many of these materials cause habitat loss and many forms of pollution.
- **Reduced electronic waste:** Batteries have limited charge cycles and degrade over time, eventually generating electronic waste. Using NFC Wireless Charging instead of disposable batteries solves this problem, minimizing the disposal of hazardous waste once the battery no longer works. Elimination of batteries also contributes to longer device lifespans, because this reduces the number of consumers who simply change devices because they get frustrated with exhausted rechargeable batteries.
- **Energy efficiency:** NFC Wireless Charging operates on inductive coupling. This means energy is transmitted directly from the charging pad to the receiving device, minimizing energy loss during the charging process. Compared to traditional wired charging methods, NFC Wireless Charging may reduce energy consumption and improve overall efficiency.

8. Earn Certification and Enhance Trust

Making sure millions of products work flawlessly with one another is the goal of the NFC Forum Certification Program. The program – Certification Release 13 (CR13) – allows manufacturers to confirm that their products comply with the NFC Wireless Charging (WLC) 2.0 specification. This minimizes risks for manufacturers in four key ways:

- **Interoperability:** NFC Forum testing extends to both analog and digital features of contactless connections, and ensures that products work seamlessly with the rest of the ecosystem.
- **Quality assurance:** Compliance reassures buyers that your product will work as defined in the technical specifications.
- **Product differentiation:** Stand out in your market by proving compliance with the NFC Forum specification. There is a fast-track option for products that embed already-compliant NFC technology.
- **Affordability:** NFC Forum Certification is offered at no cost for organizations that can provide a signed test case from an NFC Forum test lab.

NFC Wireless Charging eliminates the need for batteries in IoT offerings like NFC-enabled locks, enabling convenient unlocking and locking with an NFC-enabled device.

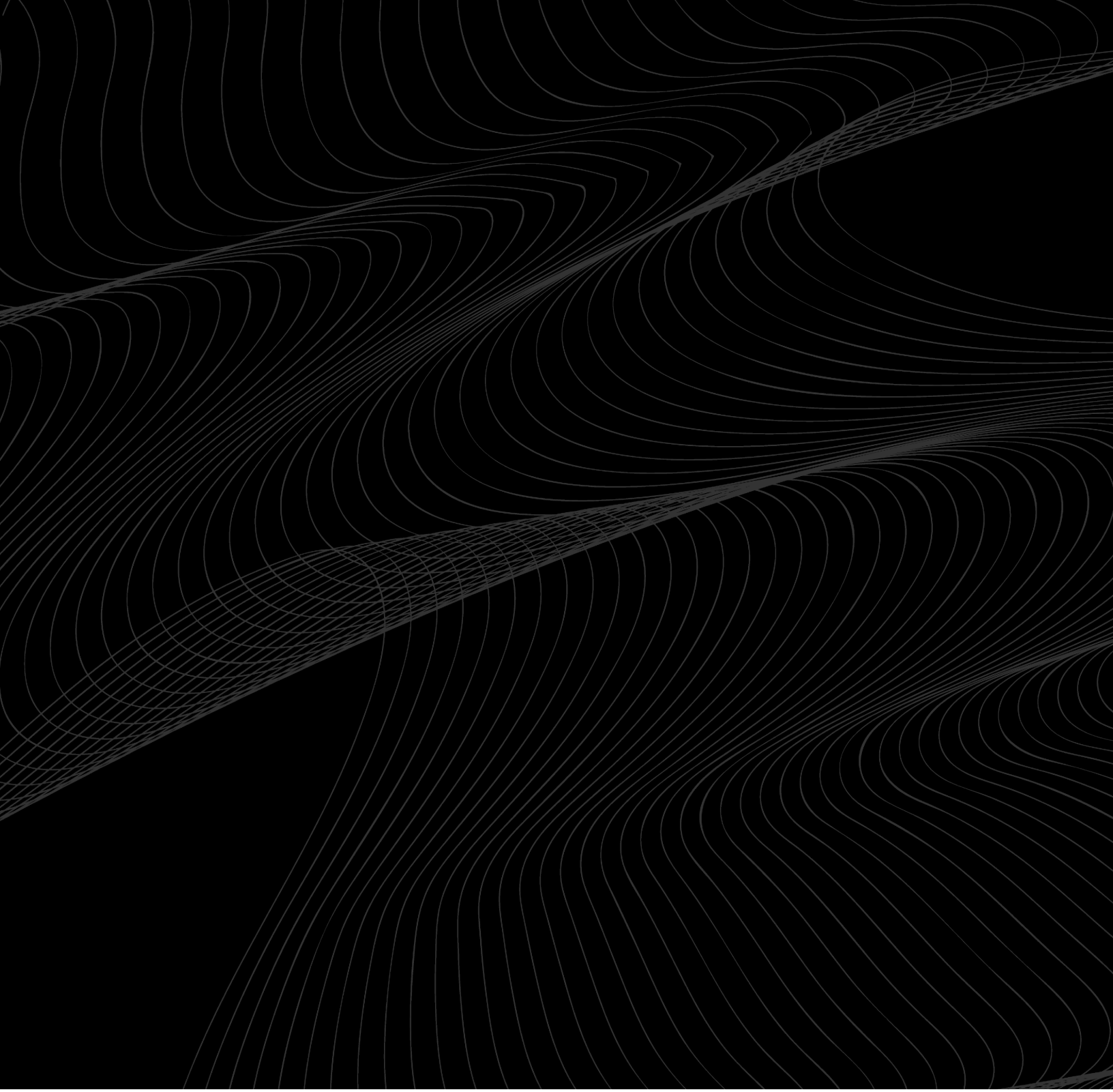
Unlike programs at many other standards development organizations, NFC Forum Certification is open to non-members.

More to Explore

If you'd like to learn more about the possibilities of NFC Wireless Charging for personal devices, you can visit our wireless charging with NFC use case page or watch the recording of our webinar on this topic.

The session provides insights from a panel of NFC Forum members and experts from Huawei, Infineon, NuCurrent, NXP, Panthronics, STMicroelectronics, Zebra Technologies, and Wired & Wireless Technologies Ltd. (WAWT).

VIEW THE WEBINAR



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