With more than 10,000 certified products, it enables safe and interoperable charging across smartphones, wearables, and accessories worldwide.

For manufacturers, achieving WPC certification and regulatory compliance involves WPC interoperability testing, EMC and health assessments, and region-specific requirements across North America, Europe, APAC, and Latin America.

> **Working on Qi certification for your product?**
> Connect with our testing lab for WPC interoperability testing, EMC/health assessments, and multi-region approvals.
> → Qi Testing and Certification Services

Key Takeaways

Technology

- Qi uses inductive power transfer with optimal energy transfer at 5–10 mm distance, achieving 70–80 % system efficiency.
- The charging process ensures interoperability through standardized coil designs, communication protocols, and magnetic alignment for consistent cross-device performance.

Certification & Safety

- WPC certification and testing verify power-transfer efficiency, Foreign Object Detection (FOD), and protocol compliance in accredited laboratories.
- EMC and health compliance includes EMC emissions and immunity evaluations, RF exposure analysis, and SAR evaluation where applicable.

Regulatory Outlook

- Global deployment depends on the regulatory framework by region, with requirements from CE (EU), FCC (USA), ISED (Canada), MIC (Japan), ANATEL (Brazil), and others.

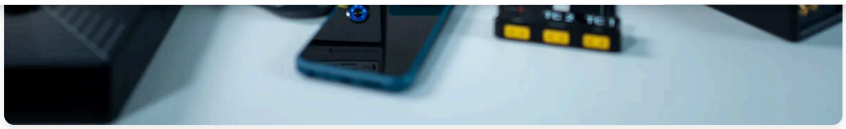
> The following section outlines the functional principle of Qi wireless charging and its main system components.

Technology Overview

Operating through magnetic induction, Qi wireless charging works like an air-core transformer: a transmitting coil generates an alternating magnetic field that induces voltage in the receiving coil. The induced energy is rectified and managed by the receiver to safely charge the battery.

A complete Qi system is composed of three key elements:

- **Power Transmitter (pad):** Coil and ferrite structure operating at 110–205 kHz in Qi v1.x or at 360 kHz in Qi 2.
- **Power Receiver (device):** Integrated coil and rectifier circuit inside the smartphone, wearable, or accessory. It converts the induced AC into DC and manages charging parameters, including thermal protection and overcurrent/overvoltage management.
- **Control and communication loop:** Bidirectional signaling via load modulation enables power control, device identification, charging status updates, and foreign object detection (FOD) to prevent unwanted heating of metallic objects.



Qi test setup using nok9 CATS II system for transmitter and receiver compliance evaluation.

Qi Power Profiles

Qi defines four primary power profiles that specify power transfer behavior between transmitters and receivers:

- **BPP (Baseline Power Profile)** – up to 5 W, standard inductive charging
- **EPP (Extended Power Profile)** – up to 15 W, higher efficiency for faster charging
- **MPP (Magnetic Power Profile)** – up to 25 W, fixed magnetic alignment
- **APP (Active Alignment Power Profile)** – up to 25 W, dynamic coil positioning

Some receivers additionally support **MCPE** (Mobile Communication Protocol for Energy) or **MCPM** (Multiple Coil Power Management) to handle magnetic accessories or multi-coil designs.

Power profile classification directly impacts regulatory testing requirements: higher power levels (15 W and above) typically require more extensive RF exposure assessment and may trigger additional evaluation thresholds depending on jurisdiction.

Qi 2 Evolution

Qi 2 introduced magnetic alignment and higher power levels while maintaining backward compatibility.

- **Qi 2.0 (2023)**: Introduced the Magnetic Power Profile (MPP) for improved coupling efficiency.
- **Qi 2.2 (2025)**: Increased MPP to 25 W, added Active Alignment (APP), enhanced USB-C integration, and improved Foreign Object Detection (FOD).

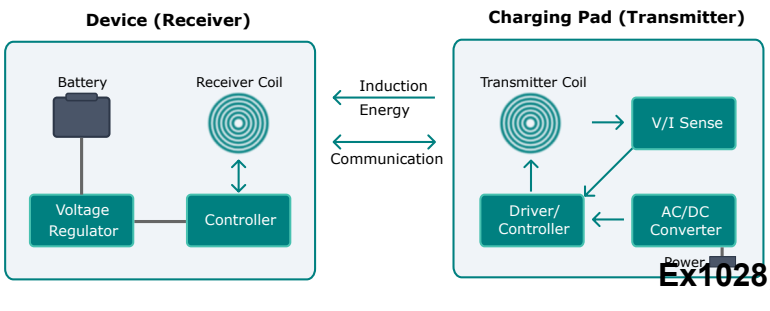
All Qi 2 profiles remain fully backward-compatible with earlier Qi v1.x devices, ensuring seamless interoperability across generations.

> → For detailed **Power Transmitter (PTx)** and **Power Receiver (PRx)** configurations defined in Qi v2.0 – v2.2, see Qi Wireless Power Profiles.

Charging Process & Interoperability

A Qi charging session follows a defined sequence:

1. **Detection & Initialization** - When a device is placed on the pad, the transmitter detects its presence
2. **Power Negotiation** - Transmitter and receiver perform a handshake to determine the supported power level (BPP, EPP, or MPP)
3. **Power Delivery** - The transmitter ramps up power gradually until the battery is charged or specified limits are reached



WPC Certification & Testing Requirements

Before a product can carry the Qi logo, it must undergo Wireless Power Consortium (WPC) certification. This certification ensures compliance with Qi specifications for safety, interoperability, and performance. Tests are conducted by authorized laboratories according to official WPC test plans.

Qi logo – only products that have successfully passed WPC certification may display the official Qi mark, ensuring recognized interoperability and safety.

WPC Certification Process

Qi certification follows a five-step process managed by the Wireless Power Consortium (WPC):

WPC Membership
Join WPC and submit self-declaration form

↓

Internal Testing
Compliance testing at Authorized Test Lab (ATL)

↓

External Interoperability Testing
WPC interoperability testing with certified reference devices

↓

Product Registration
Product registration and Qi logo authorization

↓

Market Launch
Qi certified and ready for market deployment

Key Test Categories

Power Transfer & Efficiency

- Verifies reliable delivery of specified power levels (5 W, 15 W, 25 W)
- Confirms minimum efficiency thresholds and thermal stability under load

Interoperability

- Ensures universal compatibility across Qi-certified devices
- Products are validated against WPC reference transmitters and receivers (golden units)

Foreign Object Detection (FOD)

- Detects metallic objects (e.g., coins, rings) and prevents hazardous heating
- Evaluated with standardized WPC FOD test kits

Communication Protocol

- **Magnetic Flux Density in the Gap**: Ensures field strengths between coils remain within safety limits to prevent excessive electromagnetic exposure. Measurements verify compliance with international EMF safety standards.
- **Coil Quality Factor (Q)**: Represents the ratio of energy stored to energy lost per cycle. Higher Q values indicate lower resistive losses and better efficiency. WPC testing verifies that Q factors meet specification requirements while maintaining sufficient bandwidth for reliable operation.
- **Modulation Index**: Determines accuracy and stability of load modulation for communication between transmitter and receiver. Testing verifies that modulation parameters remain within tolerance across various operating conditions, ensuring reliable power negotiation and safety functions.

These advanced parameters form the technical foundation of Qi compliance and are also relevant in regulatory evaluations of EMC and safety performance. See: Regulatory Requirements by Region.

Test Systems & Equipment

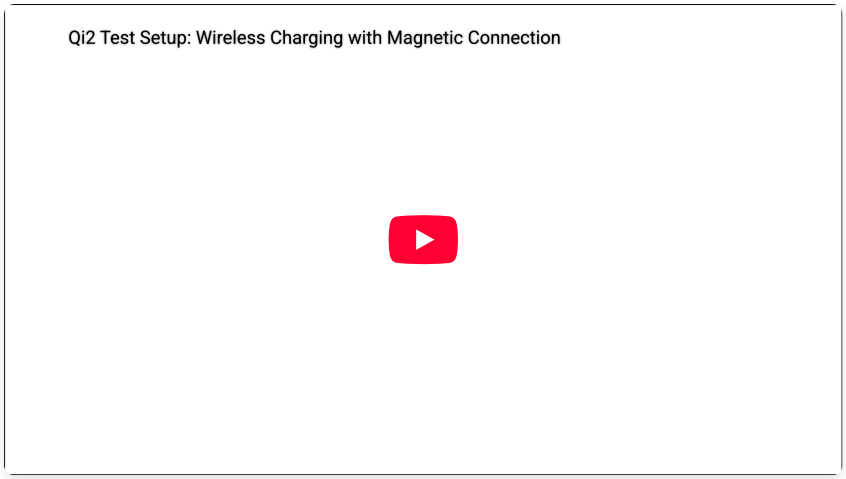
For Qi certification, authorized laboratories employ automated platforms such as the nok9 CATSII, the only fully WPC-authorized system. These systems include standardized transmitters and receivers, electronic loads, and measurement devices covering all required test cases.

Many laboratories also offer EMC pre-screening to identify potential regulatory compliance issues early in the development process. For details on EMC and EMF testing requirements, see: EMC & Health Compliance.

> Important: WPC Qi certification ensures interoperability and safety but does not replace regulatory approvals (e.g., CE marking, FCC authorization), which must be addressed separately.

Qi2 Magnetic Alignment & FOD Testing

Real-time demonstration of Qi2 magnetic placement verification, communication protocol monitoring, and foreign object detection in our authorized test laboratory.



EMC & Health Compliance

Qi wireless charging systems operate in the low-frequency range (110–360 kHz) and generate magnetic fields necessary for power transfer. Devices must comply with regulatory limits for electromagnetic compatibility (EMC) and electromagnetic field (EMF) exposure to prevent interference and protect users.

EMC Testing

Emissions Testing

- **Conducted Emissions (150 kHz – 30 MHz):** Power-line disturbances are measured to ensure the device does not inject noise back into the mains supply. The device under test operates at maximum load while a line impedance stabilization network (LISN) captures conducted emissions. Applicable standards include EN 300 330 (Qi operating frequencies at 128 kHz and 360 kHz), CISPR 11/32 (multimedia and ISM devices), and ETSI EN 303 417 (narrowband WPT around 128 kHz).
- **Radiated Emissions (>30 MHz):** Spurious emissions from harmonics and switching noise are measured in an EMC test chamber using broadband antennas and spectrum analyzers. Measurements typically cover 9 kHz to 1 GHz or higher, depending on regional requirements.

Immunity Testing

Immunity testing verifies correct operation under external electromagnetic interference. Tests are performed with the device actively charging at full load to simulate worst-case operational scenarios:

- Electrostatic Discharge (ESD): Contact and air discharge events
- Electrical Fast Transient (Burst): Voltage spikes on power lines
- Surge: Lightning-induced transients
- Radiated Immunity: External RF field exposure

During interference exposure, the device is monitored for charging interruptions, communication errors, or safety malfunctions. Standards: EN 301 489-1 (generic EMC for radio devices) and EN 301 489-3 (short-range devices and WPT in LF band).

Regulatory Context

EMC and EMF compliance requirements vary by region. The European Union requires EN 300 330, EN 301 489, and EN 62311 under the Radio Equipment Directive (RED). The United States enforces FCC Part 15/18 with EMF guidelines. Canada mandates ISED RSS-102, including strict nerve stimulation requirements per SPR-002.

→ See Regulatory Requirements by Region for complete certification pathways and market-specific requirements.

Regulatory Requirements by Region

Wireless charging devices require regulatory approval before market entry. Certification requirements, testing procedures, and technical standards vary significantly by region.

The following overview covers the primary regulatory authorities, standards, and key requirements for each major market, including critical compliance considerations.

Region / Market	Authority / Standard	Key Conditions	Details
USA	FCC Part 18 (ISM), FCC 15.209, KDB 680106	RF exposure testing mandatory (MPE/SAR)	See Americas
Canada	ISED (RSS-216, RSS-102)	Nerve stimulation testing mandatory (PNS)	See Americas
Brazil	ANATEL (restricted radiation)	Homologation mandatory; LF frequency restrictions apply	See Americas
EU	RED (EN 300 330, EN 62311)	EMF assessment mandatory; spurious emission limits	See Europe

Americas

United States – FCC

Authority / Standard: FCC Part 18 (ISM), FCC 15.209, KDB 680106 (RF exposure), KDB 648474 (handset SAR evaluation)

Key Requirements:

- WPT operation under Part 18 (ISM equipment); Part 15 applies only to additional radio functions (e.g., NFC, BLE)
- RF exposure evaluation: MPE or SAR depending on form factor, power, and spacing
- Emission limits per Part 18; spurious emissions assessed under Part 15

▶ **Critical Notes**

▶ **Certification Path**

Canada – ISED

Authority / Standard: ISED RSS-216, RSS-102

Key Requirements:

- **NS/PNS verification required:** Below 10 MHz per RSS-102; full SPR-002 testing if approaching thresholds
- SAR consideration for handhelds above 100 kHz
- Emission compliance per RSS-216 Issue 3 (Sept 2024)

▶ **Critical Notes**

▶ **Certification Path**

Brazil – ANATEL

Authority / Standard: ANATEL requirements (restricted radiation equipment)

Key Requirements:

- Homologation mandatory via OCD
- LF frequency restrictions apply (including constraints around 90–100 kHz range)
- EMC testing per CISPR 11 and applicable ABNT NBR standards

▶ **Critical Notes**

▶ **Certification Path**

FAQs on Qi Wireless Charging and Regulatory Requirements

Do Qi transmitters and receivers require separate certifications?

Yes, in most jurisdictions. The wireless charging transmitter (pad/base) and receiver (typically integrated into the device) are evaluated separately. The transmitter undergoes EMC testing, RF exposure assessment, and emissions testing as a standalone product. The receiver is assessed as part of the host device (e.g., smartphone), often requiring additional SAR evaluation per FCC KDB 648474 or equivalent.

Each component needs its own certification unless explicitly covered under modular approval policies. In practice, receiver modules are usually certified together with the host device under a single FCC ID or CE approval, but planning for separate test campaigns and certification timelines is recommended.

Can I reuse FCC or CE test reports for other markets?

Devices operating outside these bands—such as certain fast-charging implementations above 148.5 kHz—are considered noncompliant and may be prohibited from import or sale in China. Manufacturers should address this early in development, as post-design adjustments are complex and costly.

Is EU Declaration of Conformity (DoC) sufficient, or do I need a Notified Body?

For standard Qi wireless chargers using harmonized standards EN 300 330, EN 301 489-1/-3, EN 62311), self-assessment via DoC without Notified Body involvement is typically sufficient. This assumes full compliance with harmonized standards covering all essential requirements of the Radio Equipment Directive (RED).

However, if your device uses non-harmonized standards (e.g., EN 303 417 for narrowband WPT), incorporates novel technologies, or cannot fully demonstrate conformity via harmonized standards, Module B+C assessment by a Notified Body may be required. In practice, Notified Body involvement for mainstream Qi chargers is rare but can be triggered by gaps in standards coverage. Consult with your test lab or regulatory body early to determine the appropriate conformity route and avoid delays.

Looking for Support?

> Our accredited labs provide full compliance testing for inductive wireless power transfer devices, from Qi v1.x to Qi 2.2, including interoperability validation, EMC testing, RF exposure assessment, and multi-country conformity evaluation.
> → Qi Wireless Charging Testing Services

Further Reading & Official Resources

Selected Qi Wireless Charging Regulations by Key Market

- Wireless Power Consortium – Qi Standard & Certification
  Official Qi standard and certification program: WPC
- ETSI EN 300 330 (SRD)
  Standard for Short Range Devices under RED: ETSI (PDF)
- ETSI – EN 303 417 (WPT systems)
  Technical standard for wireless power transfer systems under the Radio Equipment Directive (RED), currently not harmonized: ETSI (PDF)
- ETSI – EN 301 489-1 (EMC for radio equipment)
  Base EMC standard for radio devices: ETSI (PDF)
- ETSI – EN 301 489-3 (EMC for SRD including WPT)
  Specific EMC requirements for short-range devices: ETSI (PDF)
- IEC / VDE – EN 62311 (Assessment of devices for human exposure)
  Evaluation of RF exposure for electronic devices: VDE Verlag
- FCC – Part 18 (Industrial, Scientific, and Medical Equipment)
  Regulation covering ISM devices, including wireless power transfer systems: eCFR
- FCC – 47 CFR 15.209
  Radiated emission limits; general requirements: eCFR
- ISED Canada – RSS-216 (Wireless Power Transfer Devices)
  Standard for wireless power transfer devices: ISED
- ISED Canada – RSS-102 (RF Exposure Compliance)

Worldwide Product Certifications

Take advantage of our extensive experience in the field of Global Market Access and our worldwide network

Global Product Certification

- International Market Type Approval — Approvals for over 200 countries worldwide
- CE Marking (Europe) — Ready for the European Market
- FCC (USA) — Complete the US Type Approval Process
- MIC (Japan) — MIC Certification for Japan
- ISED (Canada) — Canada Market Approval
- KC (South Korea) — South Korea Type Approval
- Anatel (Brazil) — Brazilian Market Approval
- IoT Cybersecurity — Certification & Compliance Solutions for IoT Devices
- Certification Bodies — Certification Services Directly In-house
- UKCA (United Kingdom) — United Kingdom Market Approval
- Bluetooth SIG Certification — Bluetooth Certification for your Devices

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