



# Wireless charging solutions

Cost-effective and secure offerings of system solutions for consumer and industrial applications

# Content

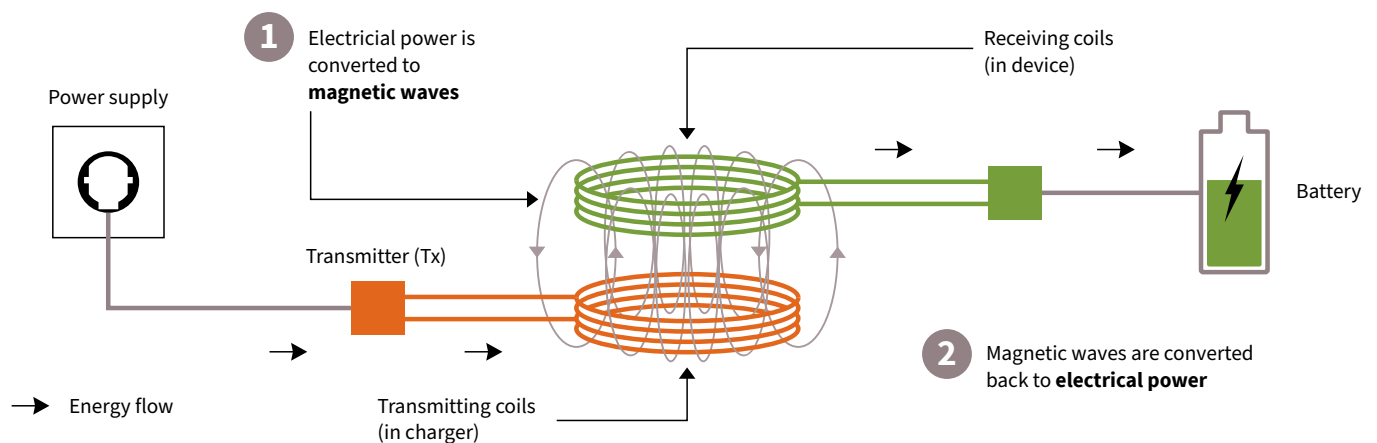
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# Wireless charging solutions

Over the last few years, wireless charging has been increasingly gaining traction in the market and is expected to continue to heavily influence our daily lives. Infineon offers a broad portfolio of efficient, high-quality products and solutions to serve the key requirements of the dominant market standards: inductive (Qi (WPC)) and resonant (AirFuel). Whether you charge a smartphone (e.g., at home or in the car), a handful of wearables, a power tool, a laptop, or a service robot, Infineon's components and solutions help you overcome a wide range of common wireless power transfer challenges for consumer, industrial and automotive wireless charging designs.


## What is wireless charging?

Wireless charging uses electromagnetic fields to transfer power from a transmitter to a receiver application to charge the battery. This erases the need for physical connectors and cables to transfer power – one of many benefits of this technology.



Wireless charging is a complex subject that requires in-depth system knowledge and expertise. Designers have to understand antennas and how they interact with surrounding structures. To successfully transfer power wirelessly, the power delivery has to be precisely controlled. By working closely with our experienced partners, we can help customers master all design challenges, including:

How does wireless charging work?



- Compatibility issues
- Safety issues
- Smart heat management
- Increasing efficiency and reducing charging times
- Preventing device and battery damage

## Different standards addressing wireless charging requirements

Currently, two wireless charging standards stand out on the market: inductive and resonant. Qi (WPC) is dominating the market in the smartphone segment as measured by volume. Their widespread use can be attributed to their cost-efficiency. For the resonant that operates at 6.78 MHz, the advantages include better user-friendliness because it allows the user to freely place the device in the vicinity of the transmitter (typically up to 30 mm of vertical freedom), and it charges multiple devices of different size and power in parallel. Find below some details about the standards.

	Tightly coupled		Loosely coupled
	Inductive single-coil	Inductive multi-coil	Magnetic resonance
Standard	Qi inductive 110-205 kHz		Resonant AirFuel 6.78 MHz
Positioning of receiver application	Exact positioning	Positioning more flexible (X and Y direction)	Free positioning (up to >30 mm vertical freedom)
Number of devices charged	Charges only one device	Charges one device but with better user experience	Charges multiple devices
Rx-Tx communication	In-band communication and optional out-of-band communication for high power applications		Bluetooth low energy or in-band communication

## Why use wireless charging

Imagine your smartphone's battery is dead. Until now, you first had to find the charging cable, then connect it to your phone and finally plug it into an outlet. The process works, but it can be a nuisance, especially if your cable is playing hide and seek or if you have incompatible connectors. Wireless charging removes the hassle of refueling your devices.

Greater user experience with wireless charging		
Easy charging without plugging in your device		Charging multiple devices in parallel
No tangled wires and damaged cables		Interoperability between chargers, no need to bring your own cable
Sealed devices: water and dust resistant		Appealing design: no need to have external openings

## Applications that benefit from wireless charging

Wearables



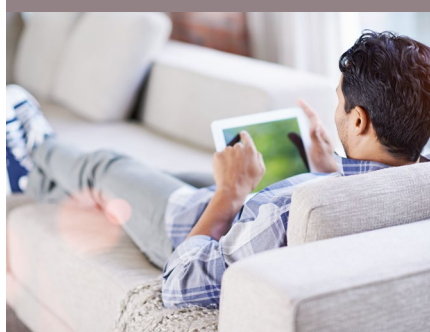
Mobile phone



Service and household robots



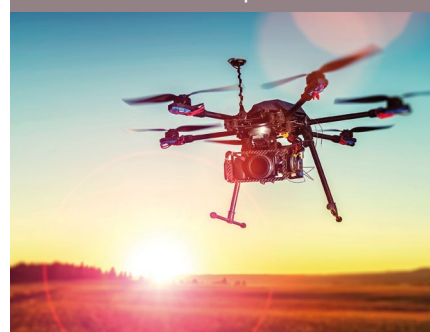
Tablets



Power tools



Multicopter



Notebooks



In-car charging



Public infrastructure



Internet of Things (IoT)



Medical

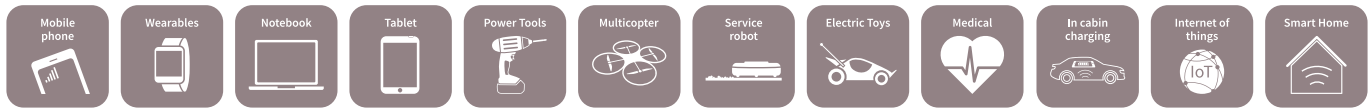


Smart home








## Choose Infineon to address your wireless charging requirements

Having a reliable partner by your side is the key to maximize the performance and consumer appeal of your wireless charging designs. At Infineon, we help you master every design challenge with our broad selection of semiconductors and reference designs.



## Key benefits when choosing Infineon

 Faster time-to-market	 Collaboration with partners	 In-depth system expertise	 Inductive and resonant	 Quality
Powerful and cost-effective system solutions that ensure smart, secure, high performance wireless charging for a range of applications	Ready-to-go system solutions including software supported by our partner	We draw on our in-depth knowledge and expertise to help to solve wireless power challenges	Addressing both standards (inductive and resonant) with components or system solutions	We help you master your design challenges with leading silicon technology and upcoming new technologies

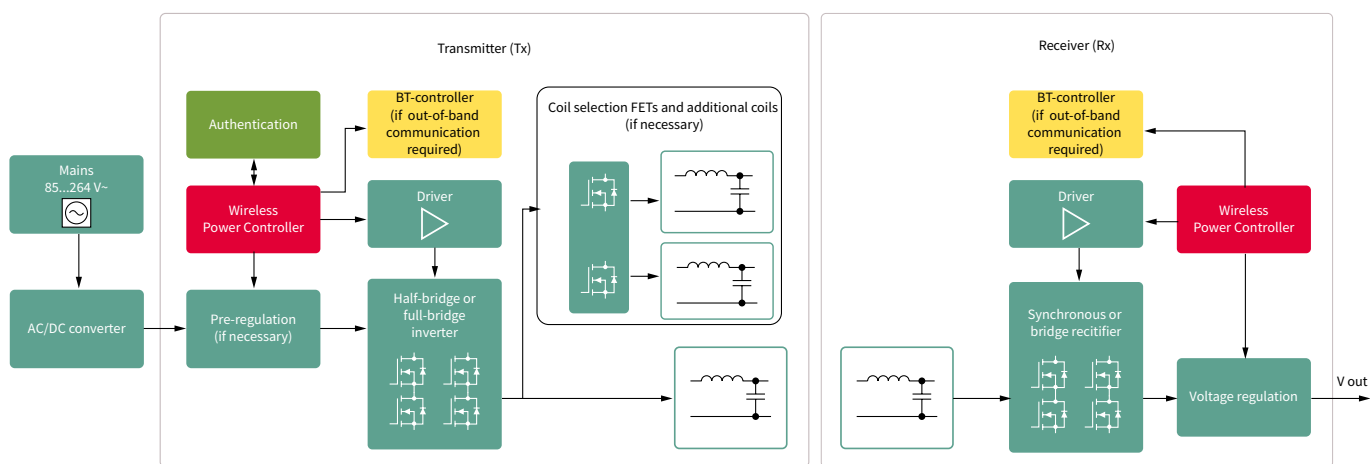
## Infineon's key enabling products for consumer and industrial solutions

- > Power MOSFETs – OptiMOS™, StrongIRFET™ and CoolMOS™
- > Gate driver ICs – EiceDRIVER™
- > P-channel and N-channel small signal power MOSFETs
- > 32-bit microcontrollers – XMC™, AURIX™, PSoC™
- > Wireless power controllers (including software IP) – XMC™-SC
- > USB Type-C Port Controller
- > Authentication - OPTIGA™ Trust Charge
- > AIROC™ Bluetooth® LE & Bluetooth
- > PWM/flyback controllers and integrated power stage ICs – CoolSET™
- > GaN HEMT – Gallium Nitride Transistor - CoolGaN™
- > Voltage and buck regulators for component and bridge supply
- > Reverse Conducting IGBTs R5/R6 - 650 V
- > PSoC™ 4 Bluetooth Low Energy (Bluetooth Smart)

# Inductive wireless charging for consumer applications

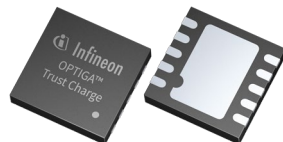
The Wireless Power Consortium's (WPC) Qi standard supports single-coil and multi-coil inductive topologies and uses frequencies of 110-205 kHz. In terms of sheer volume, it is the dominant standard on the market today. Inductive technology currently relies on in-band communication and enables wireless power to be transferred simply, efficiently and safely. For higher power designs, out-of-band communication using Bluetooth is an option to improve data transfer capacity while providing a reliable communication interface between Transmitter and Receiver. The inductive WPC Qi standard has become extremely popular, fueled by the success of wireless smartphone charging. In the future, wireless power transfer will also become a "must-have" feature in a wide range of other applications, including power tools, service robots and notebooks, as well as medical and smart home devices.

## System diagram example: >30 W inductive system solution



### MOSFETs & GaN

We offer a comprehensive portfolio of application-specific, discrete products. OptiMOS™, StrongIRFET™, CoolMOS™ and small-signal power MOSFETs, CoolGaN™ for high-speed switching.



### Authentication

The OPTIGA™ Trust Charge is an integrated turnkey solution for authentication and contributes to device and user safety by protecting against fake chargers.



### Driver ICs

Every switch needs a driver, and the right driver makes a big difference in the end application. Our half-bridge, level-shift EiceDRIVER™ gate-driver IC WCDSC006 ensures robust, efficient wireless charging.



### Microcontrollers

Our XMC™-SC Power Controllers provide a powerful yet cost-effective platform for smart, secure wireless charging applications that deliver outstanding performance levels.

# Key components for inductive designs for consumer and industrial

	Sub-application	Products
Wireless charging product portfolio for inductive	<b>MOSFETs</b>	30 V   BSC0996NS, BSC0993ND, BSZ0909NS, BSZ0909ND, BSZ0910ND, IRFHS8342 – check for more
		40 V   BSZ097N04LS, BSZ063N4LS6, BSC035N04LSG, BSC072N04LD
		60 V   BSZ099N06LS5, BSZ065N06LS5, BSZ040N06LS5
		80 V   IRL80HS120
		100 V   IRL100HS121, BSZ146N10LS5, BSZ096N10LS5
	<b>Driver IC</b>	EiceDRIVER™, WCDSC006, PX3519, IRS2301S, 1EDN7512B, 1ED44173N01B, 1EDI60N12AF, 2EDN7524G, IRS2007M, 2ED2182S06F
	<b>Microcontroller or wireless power controller</b>	XMC™, AURIX™ MCU and wireless power controller XMC™-SC (including software IP), PSoC™ 4
	<b>Voltage regulators</b>	TLE4296G V33, TLF50211EL, TLE8366EV
	<b>MCU + BLE Controller</b>	PSoC™ 4 Bluetooth Low Energy (Bluetooth Smart): CY8C4248LQI-BL573 (QFN)
	<b>AIROC™ Bluetooth® LE &amp; Bluetooth</b>	CYW20719B2 / CYW20721B2
	<b>USB Type-C port controller</b>	CYPD3120-40LQXIT, CYPD3171-24LQXQ, CYPM1011-24LQXI, CYPM1111-40LQXI, CYPM1211-40LQXI, CYPD3177-24LQXI
	<b>Small-signal MOSFETs</b>	Please check online <a href="#">small-signal MOSFETs</a>
	<b>Authentication</b>	SLS32AIA020Ux – OPTIGA™ Trust Charge (USON10 3 x 3 package)
<b>Reverse conducting IGBTs R5/R6 - 650 V</b>	Package PG-TO247-3 - IHW30N65RS (30 A), IHW40N65RS (40 A), IHW50N65RS (50 A)	
<b>Reference designs and kits</b>	<ul style="list-style-type: none"> <li>&gt; REF_10WTX_QI_4102 - 15 W Qi transmitter for charging smartphones</li> <li>&gt; CY4532 EZ-PD™ CCG3PA Evaluation Kit</li> <li>&gt; CY4533 EZ-PD™ BCR Evaluation Kit</li> <li>&gt; CY7110 EZ-PD™ PMG1-S0 Prototyping Kit</li> <li>&gt; CY7111 EZ-PD™ PMG1-S1 Prototyping Kit</li> <li>&gt; CY7112 EZ-PD™ PMG1-S2 Prototyping Kit</li> </ul>	

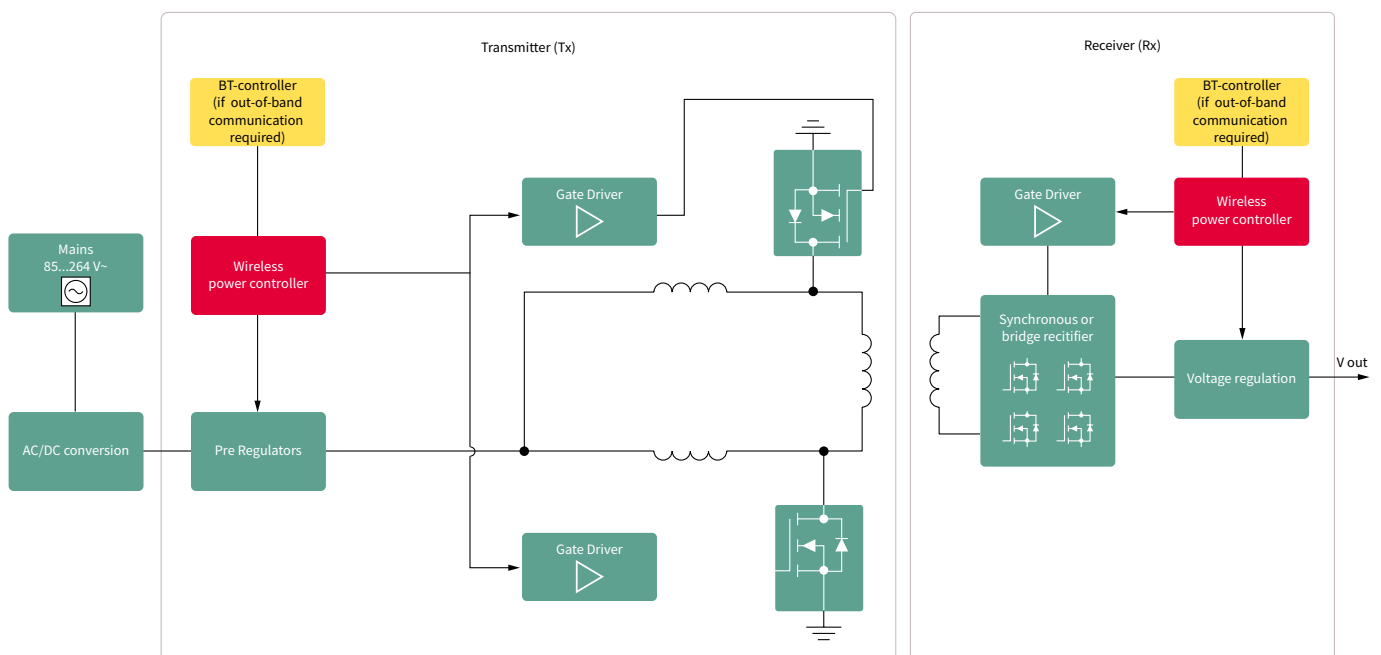


# Resonant wireless charging for consumer applications

Resonant wireless charging provides a range of benefits including enhanced user-friendliness – you can place a device anywhere in the vicinity of the transmitter (usually with up to 30 mm of vertical freedom) and the ability to charge multiple devices of varying sizes and power at the same time. It is operating at 6.78 MHz and the standard is driven by the AirFuel Alliance. Resonant wireless charging systems communicate using Bluetooth Low Energy, while proprietary resonant solutions utilize in-band communication. Two main topologies can be used to develop resonant solutions: Class-D (full-bridge or half-bridge) topology and class-E (single-ended or differential) topology.

Infineon offers a superior power MOSFET technology to address frequency switching implementations, especially in the 30 - 100 V areas for class D inverter designs and in the 150 - 250 V voltage class for class E inverter designs. We provide the leading products in the industry when it comes to fast switching and have the best figure-of-merit for gate charge times  $R_{DS(on)}$  and for  $C_{OSS}$ , thus enabling our customer to achieve 6.78 MHz inverter designs using robust silicon MOSFET technology. Infineon also offers GaN technology with a significant performance increase over silicon MOSFETs. CoolGaN™ is ideally suited to both topologies as it can maximize overall system performance (in class-D implementations) and also reduce overall system solution costs (in class-E implementations). Due to its significantly reduced parasitic capacitances, CoolGaN™ is the ideal choice when switching at frequencies in the MHz range (e.g., 6.78 MHz); it provides low, almost linear,  $C_{OSS}$  without a large increase at low VDS, enabling ZVS over a wide load impedance range. In addition, CoolGaN™ offers very low  $Q_G$  and  $Q_{OSS}$  compared with equivalent silicon MOSFETs, which, together with the Driver IC, helps switch power faster. Infineon offers the “coolest” driver ICs in the industry, already available as low side drivers for class E implementations and as level-shifted half-bridge driver for class D topologies. Here again, the XMC™ industrial microcontroller and the XMC™-SC wireless power controller, including software IP, are a great fit to charge “just about anything”.

## System diagram example: Resonant system solution



\*coming soon

\*\*  $V_{GS} = 8\text{ V}$

[www.infineon.com/wirelesscharging](http://www.infineon.com/wirelesscharging)

# Key components for resonant designs for consumer and industrial

	Sub-application	Products
Wireless charging product portfolio for resonant	<b>MOSFETs</b>	30 V   IRLHS6376PBF, BSZ0909ND, BSZ0910ND, IRLML0030PBF
		40 V   IRLML0040
		60 V   IRLML0060
		80 V   IRL80HS120
		100 V   IRL100HS121
		150 V   BSZ900N15NS3, BSZ520N15NS3
		200 V   BSZ900N20NS3, BSZ22DN20NS3, BSZ12DN20NS3
		250 V   BSZ42DN25NS3
	<b>Driver ICs</b>	EiceDRIVER™ 2EDL71*, 1EDN7512, 2EDN7524, 2ED2182S06F, 2ED24427N01F, 1EDI60N12AF, 1ED44173N01B
		EiceDRIVER™ ICs GaN 1EDS5663H, 1EDF5673F, 1EDF5673K
<b>GaN e-mode HEMTs</b>	CoolGaN™ 600 V e-mode GaN HEMT IGT60R190D1S (HDSOF-8-3)	
<b>Microcontroller</b>	XMC™, AURIX™ MCU and wireless power controller XMC™-SC (including software IP), PSoC™4	
<b>MCU + BLE Controller</b>	PSoC™ 4 Bluetooth Low Energy (Bluetooth Smart): CY8C4248LQI-BL573 (QFN)	
<b>AIROC™ Bluetooth® LE &amp; Bluetooth</b>	CYW20719B2 / CYW20721B2	
<b>USB Type-C port controller</b>	CYPD3120-40LQXIT, CYPD3171-24LQXQ, CYPM1011-24LQXI, CYPM1111-40LQXI, CYPM1211-40LQXI, CYPD3177-24LQXI	
<b>Voltage regulators</b>	TLE4296G V33, TLE4296G V50, TLE4296-2G V33, TLE4296-2G V50, TLF50211EL, TLE8366EV, TLE8366EV33, TLE8366EV50	
<b>Small signal MOSFETs</b>	Please check online <a href="#">small-signal MOSFETs</a>	
<b>Reference designs and kits</b>	<ul style="list-style-type: none"> <li>&gt; CY4532 EZ-PD™ CCG3PA Evaluation Kit</li> <li>&gt; CY4533 EZ-PD™ BCR Evaluation Kit</li> <li>&gt; CY7110 EZ-PD™ PMG1-S0 Prototyping Kit</li> <li>&gt; CY7111 EZ-PD™ PMG1-S1 Prototyping Kit</li> <li>&gt; CY7112 EZ-PD™ PMG1-S2 Prototyping Kit</li> </ul>	

\*coming soon

\*\* V<sub>GS</sub> = 8 VMOSFETs, Driver IC,  $\mu$ Cs are on the website: [www.infineon.com/wirelesscharging](http://www.infineon.com/wirelesscharging)[www.infineon.com/wirelesscharging](http://www.infineon.com/wirelesscharging)

# Trusted authentication for wireless charging

An increasing number of products and applications support wireless charging – driven by its obvious ease and convenience. However, an inaccurate power supply can be harmful to the device and, worst-case scenario, even to the user. Secured authentication with OPTIGA™ Trust Charge contributes to device and user safety by protecting against fake chargers.

## Enhanced security

The OPTIGA™ Trust Charge authentication device is certified to Common Criteria EAL6+ (high). Infineon is able to provide personalization and injection of the certificates and keys in a secured and certified environment, making it easy for customers to build in security capabilities.

## Fast and easy integration

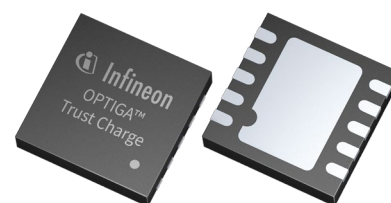
The turnkey setup – with full system integration support and all key and certificate material preprogrammed – minimizes customer effort for design, integration and deployment. OPTIGA™ Trust Charge comes with preprogrammed locked OS, locked application code, and host-side modules to integrate with host microcontroller software. Integration support includes a reference board and documentation for rapid design-in.

## Key features

- › Common Criteria EAL6+ (high) certified hardware
- › ECDSA P-256 authentication
- › NIST P-256, SHA-2 cryptography
- › Up to 10 kB user memory
- › PKI
- › I2C serial communication
- › USON10-2 package (3 x 3 mm)
- › Extended temperature range version available
- › Full turnkey solution incl. drivers, SW library, pre-implemented certificate(s) and key pair(s)

## Key benefits

- › Preloading of personalized keys and certificates at secured Infineon fabs to simplify key logistics and security integration
- › Easy integration thanks to full turnkey design and complete solution offering including embedded software, host software, a development board, a reference board and documentation
- › Optimized for small devices with the tiny package and extended temperature range, bringing added flexibility to a wide range of consumer and industrial applications



# USB Type-C controllers

Learn more about our available reference designs and products which are fitting into your wireless charging designs.

## EZ-PD™ CCG3 Type-C Port Controller with PD

- › CYPD3120 -40LQXIT

## EZ-PD™ CCG3PA USB Type-C and Power Delivery


- › CYPD3171-24LQXQ
- › Kit: CY4532

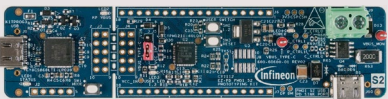
## EZ-PD™ PMG1: A Portfolio of High-voltage MCUs with USB-C Power Delivery

- › PMG1-S0 MPN: CYPM1011-24LQXI (bulk) and CYPM1011-24LQXI (T&R) - Kit: CY7110
- › PMG1-S1 MPN: CYPM1111-40LQXI (bulk) and CYPM1111-40LQXI (T&R) - Kit: CY7111
- › PMG1-S2 MPN: CYPM1211-40LQXI (bulk) and CYPM1211-40LQXI (T&R) - Kit: CY7112


## EZ-PD™ Barrel Connector Replacement (BCR)

- › CYPD3177-24LQXI
- › Kit: CY4533

For more details  
click on the product. 

Board	Description
	<p><b>CY4532 EZ-PD™ CCG3PA Evaluation Kit</b></p> <p>The CY4532 EZ-PD™ CCG3PA Evaluation Kit (EVK) is based on the CCG3PA product family of Cypress's USB Type-C microcontrollers. This EVK is intended to be an evaluation vehicle for USB Type-C Power Adapter (PA), USB Type-C mobile charger and USB Type-C Power Bank (PB) applications. The kit can be configured for the PA or PB application using a combination of firmware, jumper settings on the kit hardware, and external accessories.</p>
	<p><b>CY7111 EZ-PD™ PMG1-S1 Prototyping Kit</b></p> <p>The CY7111 EZ-PD™ PMG1-S1 Prototyping Kit is a development platform to design products which can be powered from a high-voltage USB PD port, and also need a microcontroller to implement different applications. This platform is compliant with the USB PD 3.0 protocol and can support up to 100 W (20 V, 5 A) of power consumption.</p>
	<p><b>CY7110 EZ-PD™ PMG1-S0 Prototyping Kit</b></p> <p>The CY7110 EZ-PD™ PMG1-S0 Prototyping Kit is a development platform to design products which can be powered from a high-voltage USB PD port, and also need a microcontroller to implement different applications. This platform is compliant with the USB PD 3.0 protocol and can support up to 100 W (20 V, 5 A) of power consumption.</p>
	<p><b>CY7112 EZ-PD™ PMG1-S2 Prototyping Kit</b></p> <p>The CY7112 EZ-PD™ PMG1-S2 Prototyping Kit is a development platform to design products which can be powered from a high-voltage USB PD port, and also need a microcontroller to implement different applications. This platform is compliant with the USB PD 3.0 protocol and can support up to 100 W (20 V, 5 A) of power consumption.</p>
	<p><b>CY4533 EZ-PD™ BCR Evaluation Kit</b></p> <p>The CY4533 EZ-PD™ Barrel Connector Replacement (BCR) Evaluation Kit (EVK) is intended to be an evaluation vehicle for applications that would want to consume power over a USB Type-C Connector. A device, such as a speaker, shaver, power tools, modem, etc. that use a barrel connector for power will benefit from using a universal power interface such as USB Type-C. To make the transition easier, the CY4533 EVK provides a USB Type-C receptacle to consume power from a charger and then supply it over a terminal block. A barrel connector can be attached to this block using wires to convert a barrel input to USB Type-C.</p>

USB Type-C and Power Delivery

For more details  
click on the product. 

# Wireless power controllers – XMC™-SC

Infinion's XMC™-SC wireless power controller, based on the ARM® Cortex®-M0 core, provides a powerful and a cost-effective turn-key platform for high-performance, smart and secure wireless charging applications.

The XMC™-SC wireless power controller helps the next-generation wireless charging systems meet strict safety, environmental, and regulatory requirements, while still enabling industry-leading charging performance and efficiency. This controller works seamlessly with Infineon's power devices in a scalable architecture to provide a complete wireless charging solution for various applications ranging from a fast charge smartphone, kitchen and home appliances and robots, drones, e-scooters and beyond.

## Key features

- › Supports inductive and resonant charging methods
- › Power levels up to 400 W
- › Multiple industry standard and custom charging profiles using the same hardware architecture
- › Single- and multi-coil transmitters
- › Half- and full-bridge support
- › Variable and fixed frequency transmitter types
- › Buck and boost topologies
- › Integrated flash for parameter storage
- › Voltage supply 1.8–5.5 V
- › Space-saving VQFN-40 package

## Key benefits

- › Supports 15 W charging and existing standards, including fast charge smartphones
- › Provides full power without complex thermal management
- › Achieves charging rates equivalent to wired charging
- › Supports custom charging profiles and industry standards on the same hardware
- › Foreign object detection (FOD) with improved accuracy quality-factor monitoring
- › FOD capability can be extended beyond existing standards to improve detection
- › Supports custom coils, and more than three coils
- › System, design and certification support through our partner Spark Connected



## XMC™-SC products available on request

Type	Package	Temperature range	Function	Technology
XMC6521SC-Q040X	VQFN40	-40 - +105°C	Transmitter	Qi 1-coil or 3-coil 15 W inductive MP-A11 transmitter
XMC6221SC-Q024X	VQFN24	-40 - +105°C	Receiver	Qi 15 W inductive receiver
XMC6522SC-Q040X	VQFN40	-40 - +105°C	Transmitter	Qi 1-coil 15 W inductive MP-A11 transmitter (USB-C)
XMC6523SC-Q040X	VQFN40	-40 - +105°C	Transmitter	Qi 3-coil 15 W inductive MP-A11 transmitter (USB-C)
XMC6511SC-Q040X	VQFN40	-40 - +105°C	Transmitter	Qi 1-coil 10 W sub-surface charger
XMC7531SC-Q040X	VQFN40	-40 - +105°C	Transmitter	30 W inductive transmitter
XMC7231SC-Q024X	VQFN24	-40 - +105°C	Receiver	30 W inductive receiver
XMC7541SC-Q040X	VQFN40	-40 - +105°C	Transmitter	80 W inductive transmitter
XMC7241SC-Q040X	VQFN40	-40 - +105°C	Receiver	80 W inductive receiver
XMC8501SC-Q040X	VQFN40	-40 - +105°C	Transmitter	2.5 W 6.78 MHz resonant transmitter
XMC8201SC-Q024X	VQFN40	-40 - +105°C	Receiver	2.5 W 6.78 MHz resonant receiver
XMC7501SC-Q040X	VQFN40	-40 - +105°C	Transmitter	2.5 W inductive transmitter
XMC7201SC-Q024X	VQFN24	-40 - +105°C	Receiver	2.5 W inductive receiver
XMC7551SC-Q040X	VQFN40	-40 - +105°C	Transmitter	200 W inductive transmitter
XMC7251SC-Q040X	VQFN40	-40 - +105°C	Receiver	200 W inductive receiver
XMC8531SC-Q040X	VQFN40	-40 - +105°C	Transmitter	30 W 6.78 MHz resonant transmitter
XMC8231SC-Q024X	VQFN24	-40 - +105°C	Receiver	30 W 6.78 MHz resonant receiver
XMC7532SC-Q040X	VQFN40	-40 - +105°C	Transmitter	30 W / 45 W inductive transmitter
XMC7232SC-Q040X	VQFN40	-40 - +105°C	Receiver	30 W / 45 W inductive receiver
XMC7332SC-Q040X	VQFN40	-40 - +105°C	RX + TX	30 W receiver with 15 W reverse charging (transmitter)

[www.infineon.com/wirelesscharging](http://www.infineon.com/wirelesscharging)

# System solutions for wireless charging

Wireless power becomes an important part of our connected lifestyles. Infineon puts an emphasis on the development of the next-generation technologies and standards that allow easy charging without the limitation of wires. What started out with phones will quickly evolve - applications such as tablets, laptops, robots, drones, power tools, handheld gaming devices, medical devices, infrastructure, and applications around Industry 4.0 will have wireless charging included.



Infineon collaborates with wireless charging experts to offer a variety of dedicated system solutions that provide complete “care-free” system solutions. These solutions include hardware, software, solution architecture, certification, testing, and consulting. Alongside our broad selection of leading semiconductor products, Infineon presents safe and efficient turnkey wireless charging solutions for inductive and resonant topologies in collaboration with Spark Connected.

Spark Connected is a global leading product development and engineering solutions company delivering high technology in wireless power systems and battery management solutions. Spark Connected provides full system-level wireless power solutions in both standards-based and proprietary Inductive as well as proprietary Resonant technologies. Spark Connected is a global leader specializing in multiple advanced and safe wireless power technologies that benefits a wide variety of applications in the automotive, industrial, medical, robotics, telecom, factory automation, IoT, smart home, consumer and telecom markets.



# Find the right system solution for your wireless charging design

Standard TX and RX mass market solutions

Customized TX and RX solutions up to 400 W on demand

Searching for a turnkey solution for your application?

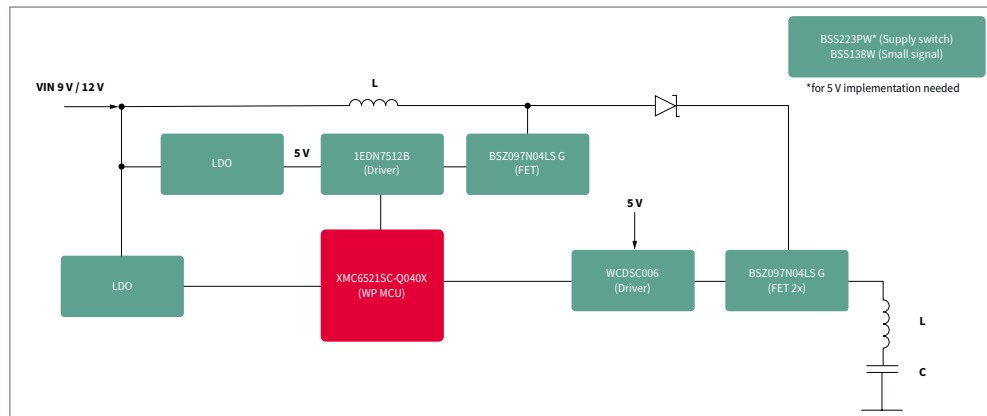
Infinion offers standard Qi or customized and proprietary turnkey wireless charging solutions, from 1 W up to 400 W, for inductive and resonant topologies in collaboration with our partner Spark Connected. For more information on the availability of our boards, visit [www.infineon.com/wirelesscharging](http://www.infineon.com/wirelesscharging) or get in contact with us via [www.infineon.com/support](http://www.infineon.com/support) to get your customized solution.

## System solutions – order now

### Standard TX and RX mass market solutions

#### 15 W Qi transmitter (Tx) for charging smartphones

The 15 W wireless power transmitter evaluation module is a high-performance, easy-to-use development kit designed for applications up to 15 W of power transfer. It supports input voltage range of 9 -12 V and compatible with QC 3.0 adaptors.



Solution max. power capability [W]	Frequency	Input power supply	Topology power	Regulation method	Rx-Tx communication	Supports	Charging rates Rx	FOD measurements calculated Tx power	DC-DC efficiency	Dimension	Coil type
7.5 W / 10 W	fixes 127.8 kHz (Apple iOS), variable (Android)	USB QC 3.0 (9 V / 12 V)	Boost topology (Half-bridge solution)	variable voltage Boost (added frequency control for Android)	In-band communication (bi-directional)	WPC 1.2.4 EPP	Up to 15 W	Direct AC measurements at coil	83%	L: 85 mm W: 50 mm H: 6.4 mm  Active Area: L: 45 mm W: 40 mm	MP-A11

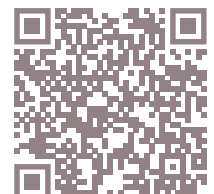


Spark Connected Inc. is our official partner for wireless charging. The software IP is provided by our partner.

For details visit:  
[www.sparkconnected.com](http://www.sparkconnected.com)

Explore more:  
REF\_10WTX\_QI\_4102 - Infineon Technologies  
[www.infineon.com/wirelesscharging](http://www.infineon.com/wirelesscharging)

Interactive 3D board model:



# System solutions – available on demand

## Customized TX and RX solutions up to 400 W on demand

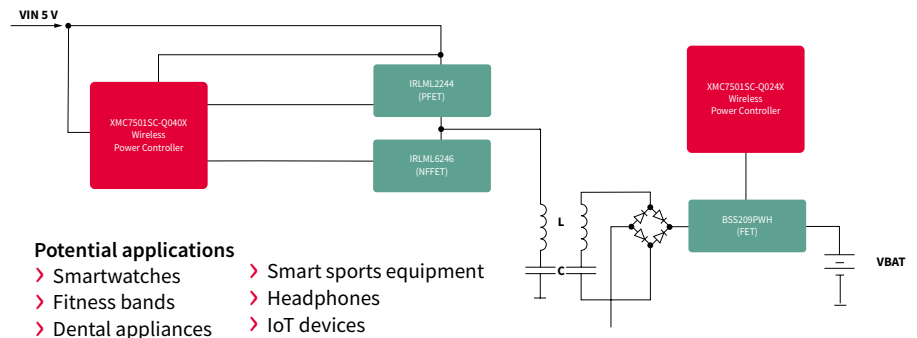
### System solutions – some examples

#### 2 W inductive transmitter and receiver solution

##### Features

- › Smallest and simplest low-power charging solution
- › Provides wireless charging for wearables and other connected IoT devices
- › Supports one-to-one charging up to 2 W
- › Receiver directly charges 1S Li-Ion / Li-Po battery
- › Low cost TX and RX architecture
- › Can use inexpensive PCB or FPC coils on the RX
- › Supports smaller coil dimensions than standard Qi solutions
- › Meets FCC/CE regulations

##### System diagram



##### Potential applications

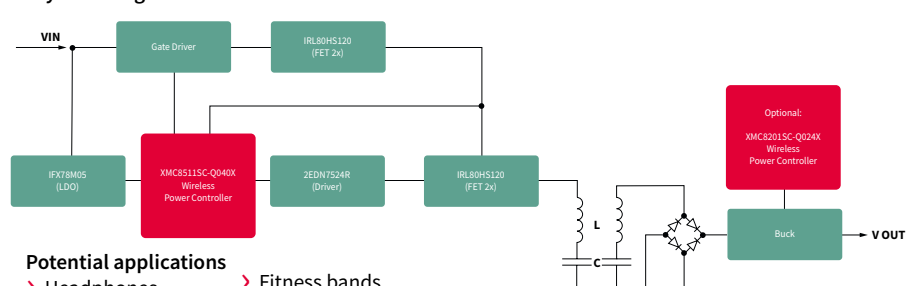
- › Smartwatches
- › Fitness bands
- › Dental appliances
- › Smart sports equipment
- › Headphones
- › IoT devices

#### 2.5 W resonant transmitter and receiver solution

##### Features

- › Smallest and simplest low-power charging solution
- › Unparalleled positioning flexibility
- › Supports one-to-one and multi-device charging
- › Higher frequency enables the smallest coil dimensions
- › Supports coil locations close to other metal objects
- › Uses inexpensive PCB or FPC antennas
- › Up to 2.5 W charging, depending on the RX antenna
- › Meets FCC/CE and Android Wear regulation

##### System diagram



##### Potential applications

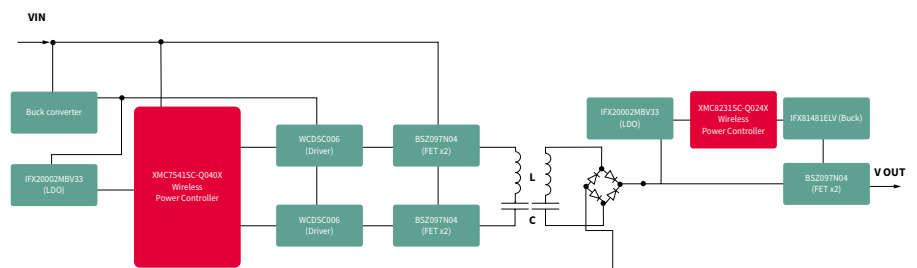
- › Headphones
- › Hearing aids
- › Smart glasses
- › Smartwatches
- › Fitness bands
- › Smart clothing
- › Smart sports equipment
- › Smart stylus pens, IoT devices

#### 30 W inductive transmitter and receiver solution

##### Features

- › Unique wireless charging and power delivery system
- › 30 W power delivery through up to 30 mm of non-metallic building material
- › Not affected by low-e glass coatings
- › Superior performance with >80% efficiency
- › Supports one-to-one charging and power delivery
- › Powered by commercially available 24 V supply
- › Foreign Object Detection (FOD) ensures safe power transfer
- › Firmware upgrades for future products and standards
- › Meets strict regulatory requirements

##### System diagram



##### Potential applications

- › 5G CPE
- › Security cameras
- › Telecom infrastructure
- › Factory automation



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