Freescale Wireless Charging ICs

WCT-15W1COILTX

Exceptional performance at the lowest cost

Overview

The 15W1COILTX reference design is a 15 watt single-coil transmitter reference design based on the Freescale MWCT1012 wireless charging IC. The Freescale 15 W single-coil transmitter focuses on what the market needs most–highest performance at the lowest cost. The reference design provides the highest efficiency and active charging area available, while maintaining the most competitive electronic bill of materials (BOM) cost.

The 15W1COILTX reference design is a unique Freescale design, comprising a 12 V DC input source, full-bridge inverter topology, and frequency control methodology and fully compliant with the latest Wireless Power Consortium (WPC) 15 W specification. Freescale extends support to any coil topology which uses a 12 V input source. This reduces the need for different hardware to support multiple (and future) coil types with similar characteristics.

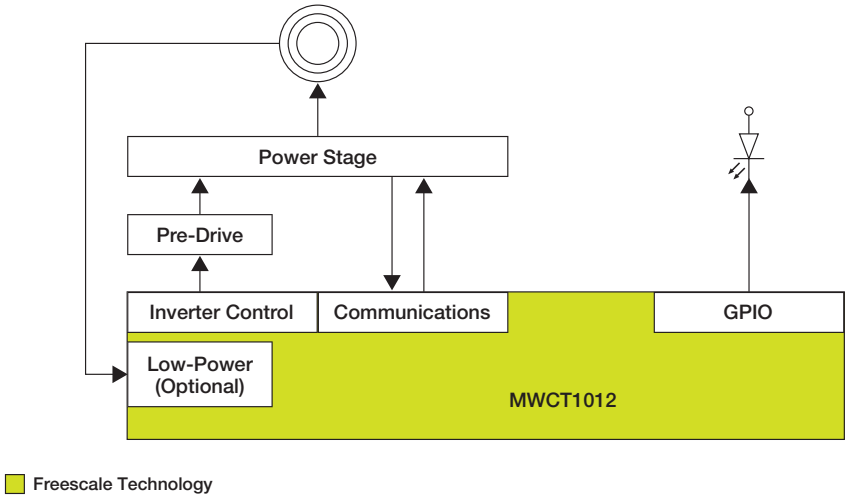
The reference design uses Freescale's innovative wireless charging transmit controller IC to perform digital demodulation on incoming signals from the receiver. This unique feature provides a major reduction in BOM costs and reduces the PCB footprint.

An additional feature of the solution is a robust foreign object detection (FOD) algorithm. This feature detects metallic objects, such as aluminum or steel objects which may be present in the charging environment. Freescale foreign object detection algorithms meet and exceed the latest standards within industry.

Target Applications

- 15 W single-coil wireless charging applications
- Mobile phone chargers
- Tablet PCs
- Point-of-sale terminals
- Hand-held medical devices
- Mobile phone accessories such as battery banks and active phone sleeves

WCT-15W1COILTX Single-Coil Wireless Charger Block Diagram



The WCT-15W1COILTX reference design is a complete system solution, containing all of the hardware and software components necessary to quickly implement a single-coil charger solution. Special attention has been placed on BOM costs in order to deliver a production-ready design. Freescale provides all of the necessary hardware documentation: including schematics, layout and assembly files, as well as a complete BOM. A firmware library is provided which contains all of the necessary wireless charging control blocks. Access to the library is provided via an API which lets users interact with parameters and settings contained in the firmware, providing maximum control to the engineer. Customers can choose to use a ready-to-use binary file provided by Freescale or to take a more developmental approach and build an application around the firmware library.

Development Tools

Eclipse™ based CodeWarrior Development Studio for Microcontrollers

A complete integrated development environment (IDE) that provides a highly-visual and automated framework to accelerate the development of the most complex embedded applications.

WCTGUI

Graphical User Interface tool allows for quick configuring and optimizing wireless charging transmitter solutions.

WCT-15W1COILTX Features and Benefits

Features	Benefits
Compliant with latest Wireless Power Consortium (WPC) Qi specification	Ensures end solution meets latest industry specification
Transfer efficiency greater than 75%	Maximum energy transfer and lower thermal footprint
Meets latest FOD requirements	Ensures foreign objects are detected and provides safety function
Supports any 15 W single-coil type using a 12 V power source	Provides a broad range of magnetics support with a single solution
Low active RUN power	Increases overall operating efficiency
Low standby power	Low power operating modes translate into lower power consumption during periods of inactivity
SPI, UART, I²C communication interfaces	Communicate to and from wireless charging IC to transfer charging information (MWCT1111 only)
On-chip digital demodulation	Lower system bill-of-materials (BOM) and greater performance
Run-time calibration	Fast and accurate system calibration, saving time and effort to optimize system performance

Package Options

Part Number	Package	Available Flash Size	Key Features
MWCT1012	32-pin QFN	NA	Complete controller solution, supports most Qi 15 W single coil systems
MWCT1111	64-pin LQFP	40 KB*	Premium controller, I²C, UART, SPI, flash memory for application programming

* Available memory is an estimate only

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For more information visit freescale.com/wirelesscharging

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