Freescale Wireless Charging ICs

MWCT1012 and MWCT1111

Maximum flexibility and uncompromising performance

Overview

The MWCT1012 device is Freescale's solutions for 15 watt single-coil wireless charging transmitter applications.

MWCT1012 is the standard offering, featuring a complete system solution to implement the controller functions in a wireless charging transmitter system. MWCT1012 supports any industry compliant 15W single-coil topology, providing a single solution with maximum flexibility.
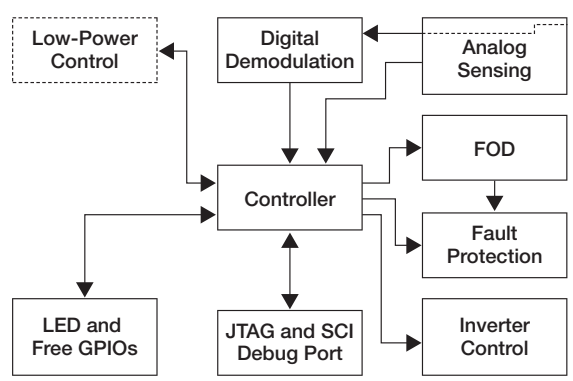
MWCT1012 uses a Freescale proprietary core architecture optimized for power conversion applications. Using the MWCT1012's DSP core engine and high performance peripheral blocks allows our solution to perform tasks such as digital demodulation and foreign object detection (FOD) with minimal CPU overhead. Additionally, the MWCT1012 provides unparalleled performance in performing the control loop function necessary for power supply regulation. This increased performance translates into higher efficiency—value which can be immediately realized at the end product level. Higher system efficiency translates into a lower thermal footprint and lower operating temperature.

The MWCT1111 is the premium version, offering additional programmability and customization options to provide maximum end product differentiation. Users are no longer confined to fixed-function solutions that provide little to no design freedom. With MWCT1111, engineers can differentiate their end product and provide value-added customizations and features. The MWCT1111 contains all of the features of the MWCT1012 but adds additional hardware resources, such as program memory and I/Os for application development.

Target Applications

- 15W 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

MWCT1012 and MWCT1111 Block Diagram

◌ Optional

State-of-the art software components delivered in the form of a firmware library are combined with the MWCT1012 hardware. All wireless charging solutions consist of both production hardware and software. The wireless charging software is optimized firmware, providing all of the necessary functions of a wireless charging transmit controller. The firmware consists of four main blocks necessary to implement wireless charging: the protocol state machine, the communications decoding block, timer functions, and the foreign object detection algorithm. Freescale provides access to these core software blocks via an API that provides maximum control to the application developer.

Development Tools

WCT-15W1COILTX

BOM-cost optimized single-coil 15W reference platform for any type of closely coupled inductive charging application.

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.

MWCT1012 and MWCT1111 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 15W single-coil type using a 12V 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
Support for current limited power sources	Operates from current limited power sources
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 15W 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