Designed with automotive in mind

MWCT1001A/MWCT1003A Wireless Charging ICs

MWCT1001A and MWCT1003A multi-coil wireless charging transmitter ICs provide complete controller functionality to implement a baseline power profile wireless charging transmitter solution in an automotive environment.

OVERVIEW

The MWCT1001A and MWCT1003A devices are NXP's newest solutions for baseline power profile automotive wireless charging applications.

MWCT1001A is the standard offering, featuring a complete system solution to enable the controller functions in a wireless charging transmitter system. The MWCT1001A supports all baseline power profile coil topologies, providing a single solution with maximum flexibility.

MWCT1001A uses an NXP proprietary core architecture optimized for power conversion applications. Using the MWCT1001A's DSP core engine and high-performance peripheral blocks allows our solution to perform tasks such as digital demodulation and foreign object detection with minimal CPU overhead. Additionally, the MWCT1001A provides unparalleled performance in performing the control loop function necessary for power delivery regulation. This increased performance translates into higher efficiency—a value that can be immediately realized at the end product level. Higher system efficiency translates into lower thermal footprint and lower operating temperature which are important considerations in the complex automotive operating environment.

TARGET APPLICATIONS

- Baseline power profile wireless charging for automotive applications

State-of-the-art software components delivered in the form of a firmware library are combined with the MWCT1001A device. All wireless charging solutions consist of both production-level 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 six main blocks necessary to implement wireless charging: the state machine, the communications decoding block, power control, coil selection, error handling and the foreign object detection algorithm. NXP provides access to these core software blocks via APIs that give maximum control to the application developer.

The MWCT1003A 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 offer little to no design freedom. With the MWCT1003A device, users can differentiate their end product and provide value-added customizations and features. It contains all of the features of the MWCT1001A but adds additional hardware resources, such as EEPROM and I/Os for application development.

DEVELOPMENT TOOLS

WCT-5WTXAUTO

Automotive-optimized multi-coil baseline power profile reference design.

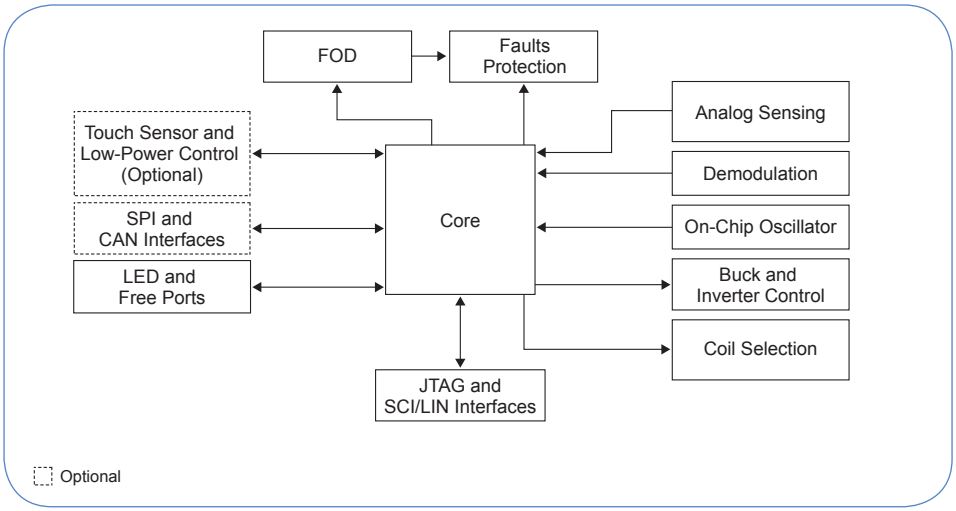
Eclipse™-based CodeWarrior® Development Studio for Microcontrollers

The CodeWarrior Development Studio is a complete integrated development environment (IDE) that provides a highly visual and automated framework to accelerate the development of the most complex embedded applications.

WCT GUI

The WCT GUI quickly configures and optimizes wireless charging transmitter solutions.

MWCT1001A AND MWCT1003A BLOCK DIAGRAM



FEATURES

Features	Benefits
Compliant to latest WPC Qi specification	Ensure end solution meets latest industry specification
Transfer efficiency greater than 60%	Maximum energy transfer and lower thermal footprint
Meets latest FOD requirements	Ensures foreign objects are detected and provides safety function
Supports all Qi baseline profile power transmitter coil types	Provides maximum design freedom and product differentiation
Low active RUN power	Increase overall operating efficiency
Low standby power	Low-power operating modes translate into lower power consumption during periods of inactivity
Rail voltage power control	Reduce EMC to meet industry requirements
SPI, UART, I²C communication interfaces	Communicate to and from wireless charging IC to transfer charging information
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
Integrated CAN/LIN support	Connect to the vehicle network for control and management
Meets AEC-Q100 (Grade 2) guidelines	Meets latest automotive requirements

PACKAGE OPTIONS

Part Number	Package	Available Flash Size	Key Features
MWCT1001A	64 LQFP	26 KB*	Complete automotive controller solution
MWCT1003A	64 LQFP	246 KB*	Premium solution for additional feature integration

*Available memory is an estimate only

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