NX1WP10

A4WP compliant high frequency wireless charging receiver front end

Rev. 1 — 1 October 2015 Objective short data sheet

1. General description

The NX1WP10 is an A4WP (Alliance for Wireless Power) compliant wireless power receiver front end. It contains a high-voltage, highly efficient active rectifier, integrated LDOs, a DC-to-DC converter, a multi-channel 12-bit ADC, four GPIOs and a Fast-Mode I^2C-bus interface. The integrated rectifier supports voltages of up to 20 V and is protected by an integrated automatic clamping function and an automatic detuning function. The DC-to-DC regulator delivers an adjustable output voltage between 4.2 V and 10 V with a maximum DC current of up to 1.1 A. It is used to charge portable devices through a PMU or a charging controller. The integrated LDOs are directly linked to the rectifier output. They are automatically enabled once a sufficient voltage level at the output of the rectifier is reached. These voltages are used to supply the corresponding wireless power receiver controller and BT-LE transceiver. The host microcontroller configures the on-chip controller for automatic interrupt-driven system control.

The microcontroller can measure the rectifier output voltage, current level information, junction temperature and external temperature sensor information with the ADC. It controls the DC-to-DC converter as well as the GPIOs. Key safety functions are implemented with low power analog comparators. For example, one of the selectable safety functions prevents the junction temperature from exceeding its limits by automatically detuning the antenna. The overall system efficiency from the antenna input to the DC-to-DC output reaches 86 %.

2. Features and benefits

- 25 V tolerant antenna input pins
- Automatic over-voltage protection of the antenna inputs
- 6.78 MHz compatible integrated rectifier
- High efficiency with an active rectifier and a DC-to-DC converter
- AC input to DC-to-DC output efficiency exceeding 86 % at 6 to 9 W output
- Integrated LDOs (1.8 V and 3.3 V up to 50 mA) with auto enable and discharge path
- Integrated DC-to-DC buck regulator with 4.2 V to 10 V, 1.1 A output
- Multi-channel 12-bit ADC subsystem
- Temperature sensor (NTC) analog interface
- USB bus power supply detection
- 400 kHz I^2C-bus slave interface
- Software and power-on reset of the on-chip digital controller
- Programmable rectifier modes: active, half-active and passive
- 2 digital General Purpose Input and Output ports (GPIOs) with open-drain outputs and up to 60 V tolerance for control and communication applications

- 2 digital General Purpose Input and Output ports (GPIOs) with open-drain outputs and 25 V tolerance for control and communication applications
- Protection circuitry
  - Automatic antenna detuning option
  - Automatic AC short to ground for OVP option
  - Automatic DC-to-DC over-voltage protection lock out option
  - Over-temperature protection
  - Over-voltage protection
  - Under-voltage protection
  - Under-voltage lockout (for LDOs and DC-to-DC controller)
- Specified from −40 °C to +85 °C ambient temperature
- 3.56 × 3.41 mm WLCSP with 0.5 mm pitch

3. Ordering information

Table 1. Ordering information

Type number	Topside marking	Package		
		Name	Description	Version
NX1WP10	NX1WP10			NX1WP10

3.1 Ordering options

Table 2. Ordering options

Type number	Orderable part number	Package	Packing method	Minimum order quantity	Temperature range
NX1WP10	NX1WP10Z		Reel 7” Q1/T1 *Standard mark chips DP	2000	−40 °C to +85 °C

4. Revision history

Table 3. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
NX1WP10 v1.0	20151001	Objective short data sheet	-	-

5. Legal information

5.1 Data sheet status

Document status[1][2]	Product status[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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