



Realtek DWA User's Guide

Revision A

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1. Introduction

This document describes the operations, interfaces, schematic and layout of Rev. 2.1 of the NEC DWA Demo Board. The DWA is the hub function device to connect wired USB device with wireless USB host controller. If the upstream port is connected to host PC with USB cable, DWA worked as wired USB Hub device. If DWA upstream port isn't connected to host PC, DWA can worked as wireless USB Hub device.



2. System Description

The DWA supports the following functions:

- Compliant with USB2.0(max. data rate=480 Mbps)
- Supports for 4 downstream facing ports.
- Support full speed and low speed transaction on downstream facing.
- Supports switches to select associated hosts and LEDs to indicate connecting host.
- Support 53.3M, 80M, 106.7M, 160M, 200M, 320M, 400M, 480Mbps.

The DWA system mainly consists of two main chips – (i) UWB PHY(**RTU7010**), (ii) NEC MAC(**UPD720180**). Up to two antennas can be supported by the UWB PHY for performance improvement. A serial EEPROM(256K) is required to store proper data/commands for the PHY chip and MAC chip. To make the system work properly, the EEPROM should be loaded with proper content by using the EEPROM utility provided by NEC.

The RF performance can also be tested using the test utility provided by NEC. Two basic clock frequencies are used in the system – 30MHz for MAC and 66MHz for PHY. Some more details of the components are shown in the following sections. The system block diagram is shown below.

BLOCK DIAGRAM

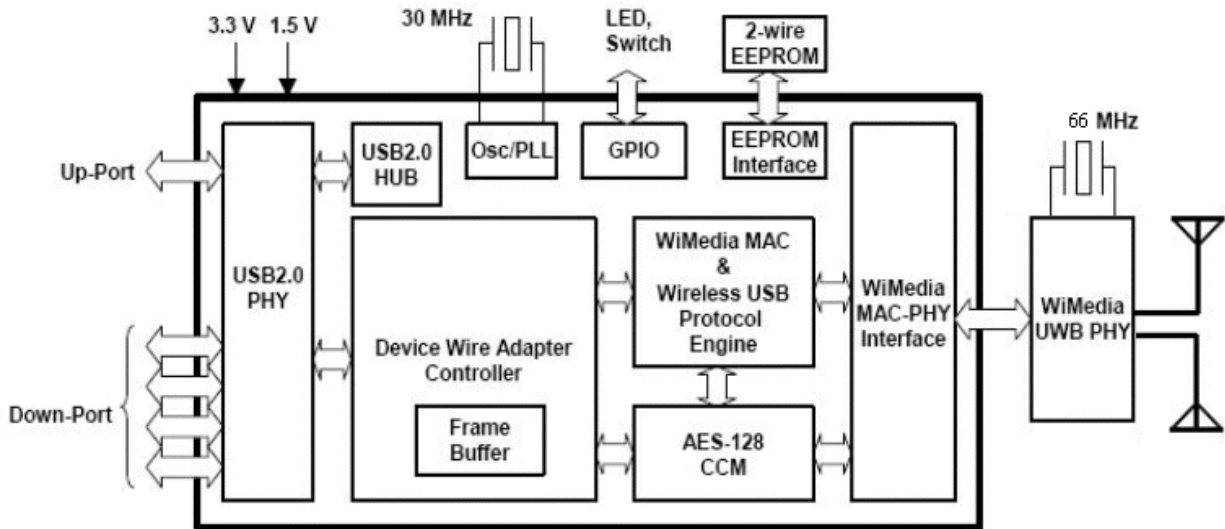


Figure 1 System Block Diagram

2.1.UWB PHY

This chip integrates the RF and baseband functions of a UWB PHY defined by the standard. This version of PHY chip is packaged in 48-pin QFN form factor. The analog/RF section requires 1.8V and 3.3V to operate. The digital core operates with 1.5V and the I/O voltage can support a range of 1.8V~3.3V.

2.2. NEC MAC

This MAC chip is from NEC which has a standard MPI interface to communicate with a standard UWB PHY, as well as a high speed USB interface(the upstream port) to connect directly to a PC. This chip requires voltages of 1.5V and 3.3V.

2.3. EEPROM

This chip is a serial EEPROM from Atmel with a capacity of 256Kb. It is used by the MAC to store the initialization data and command sequence required by the MAC and PHY on start up. This chip requires 3.3V only.

3. Hardware Interfaces

3.1. USB Interface

Table 1 USB series “Mini-B” connector termination assignment

Pin#	Pin Name	Description
1	VBUS	See USB specification
2	D-	See USB specification
3	D+	See USB specification
4	NC	See USB specification
5	GND	See USB specification
6	SHELL	See USB specification

4. Document History

Date	Revision	Description	Author
06/03/07	A	Initial Release	Robert Teng

5. Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device may only be operated indoors. Operation outdoors is in violation of 47 U.S.C. 301 and could subject the operator to serious legal penalties.

6. Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION: Any changes of modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

7. Coordination Requirements

For real application, the transmitter will only be active when communicating with the specific receiver through handshaking, acknowledgement and other mechanisms over the wireless channel.