

Theory of Operation (TT2301 Wireless USB Hub)

The TT2301 Wireless USB Reference Design Kit from Focus Enhancements is a turnkey solution that enables customers to start volume production of high performance Certified Wireless USB Hubs. The Reference Design Kit is based on the single System-in-a-Package UWB solution (TT1013) which embeds most of the critical components needed for a high-performance wireless USB platform.

The TT1013 includes a WiMedia-based ultra wideband media access controller (MAC), WiMedia physical layer (PHY) baseband processor, an RF Transceiver, and a USB 2.0 compliant interface. It requires 1.2 V, 1.8 V, and 3.3 V regulated supplies.

The TT2301 is an external 4 port hub which includes a separate 5.0 Volt offline power source to supply the TT1013 plus additional port power. Using the USB-A-plug-to-USB-miniB-plug cable provided, it can plug into any USB 2.0 PC port to accomplish the Cable Based Association Function (CBAF) to configure the system. To ease use, the DWA driver runs on the host PC, and no changes are required to existing class drivers or applications. The design includes a high-performance UWB antenna, serial flash memory, LEDs, a 4 port USB hub chip, and the necessary power supplies.

The TT2301 operates in the frequency band defined by the FCC for UWB. The TT2301 Reference Design Kit supports all data rates as defined by WiMedia (53, 80, 106, 160, 200, 320, 400 and 480Mbps,) and supports operation in band group 1 frequency bands as defined by WiMedia. This band group covers the 3168 to 4752 MHz range with three sub bands with center frequencies of 3432, 3960, 4488 MHz.

The UWB antenna is fully integrated into the TT2301, there is no facility for an external antenna. The antenna is a Fujitsu N880-9701-T011 printed antenna which is connected to the printed wiring board using a cable and is permanently attached to the hub with an adhesive. A band pass filter limits the radio's reception and transmission bandwidth to 3.1 to 4.8 GHz.

References:

WiMedia Multi-Band OFDM Physical Layer Specification 1.1

WiMedia MAC-PHY Interface Specification 1.01

USB Specification 2.0