PT-MT Communication Module
MirX

User Guide

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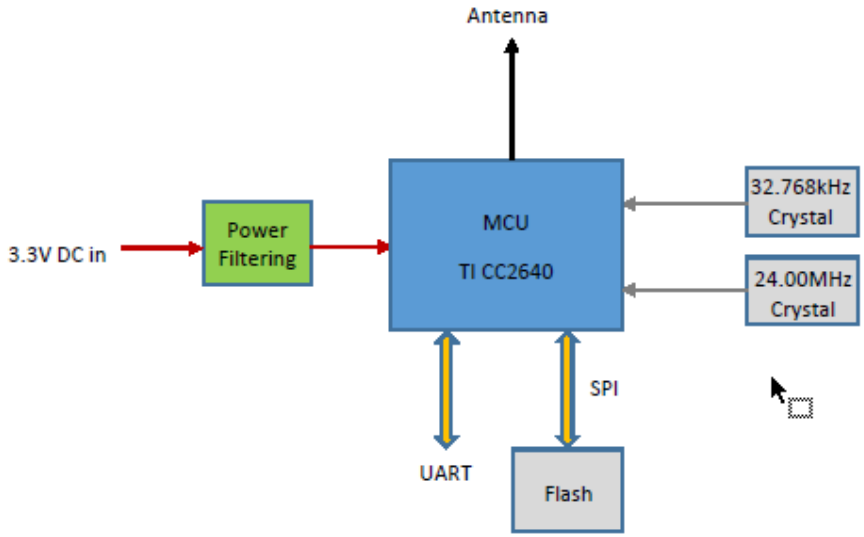
Contents

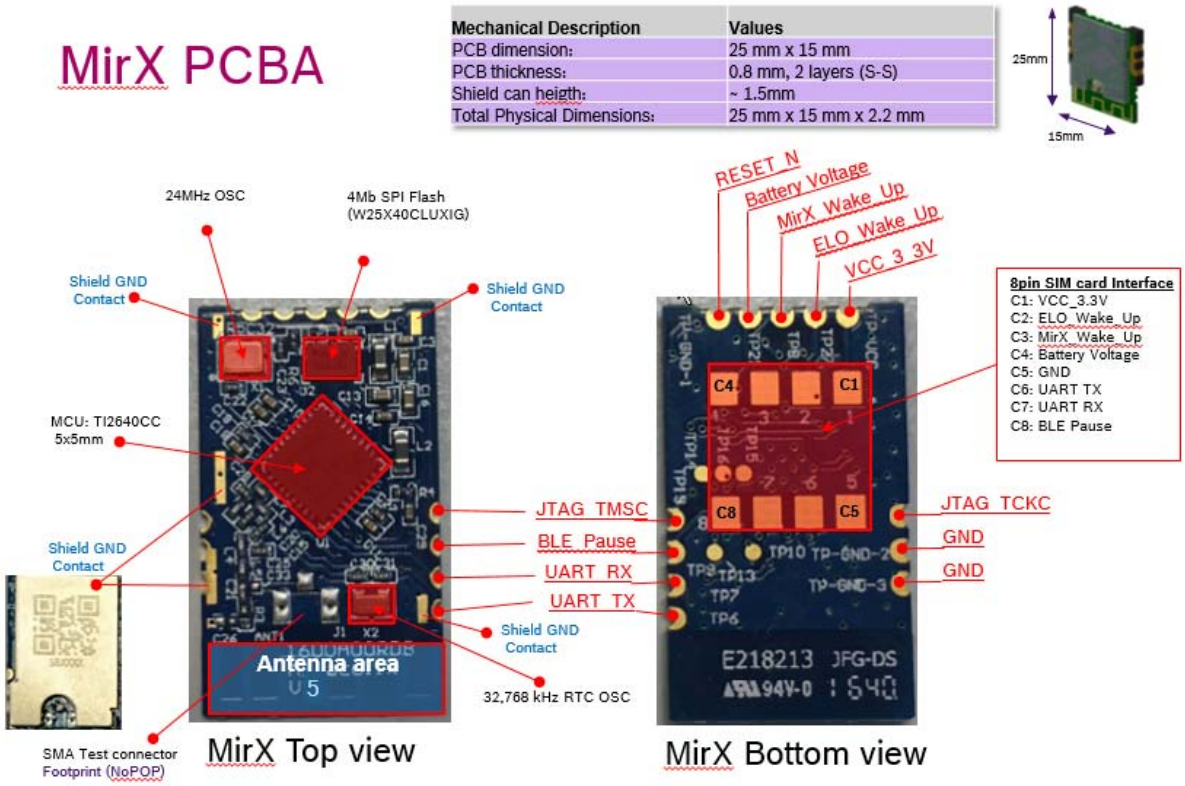
1 MirX Specifications

The nominal size of the Bluetooth module is 25.4mm x 15.0mm x 2.0 mm thk.

1.1 MirX Electronic Block Diagram

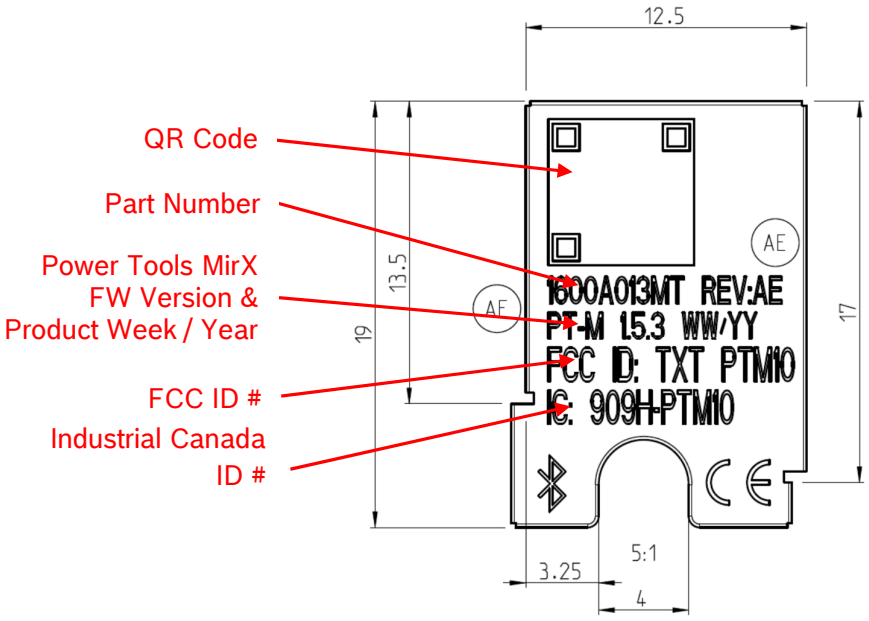


1.2 PCBA Electrical Interface

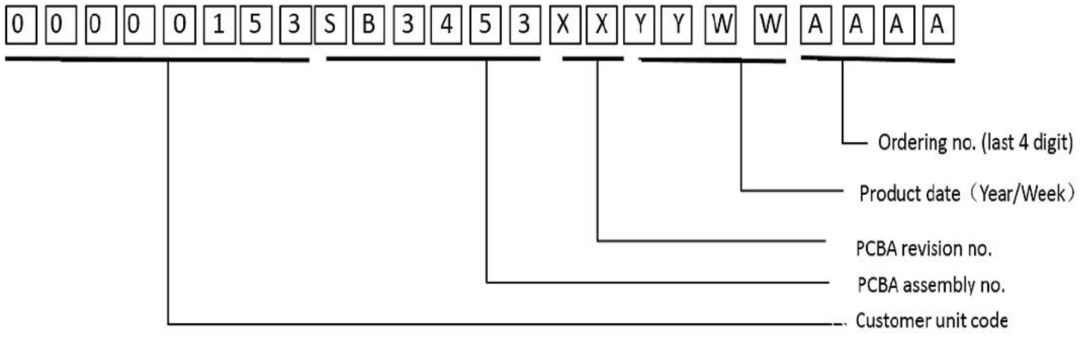


1.3 MirX RF Shield Marking

The RF shield will receive a laser marking with QR (MFG information), the RB HW part number and revision of the MirX hardware, production week and year, as well as the received certification ID and approval numbers of FCC and IC. The BT- and CE-symbol will be at the corners.



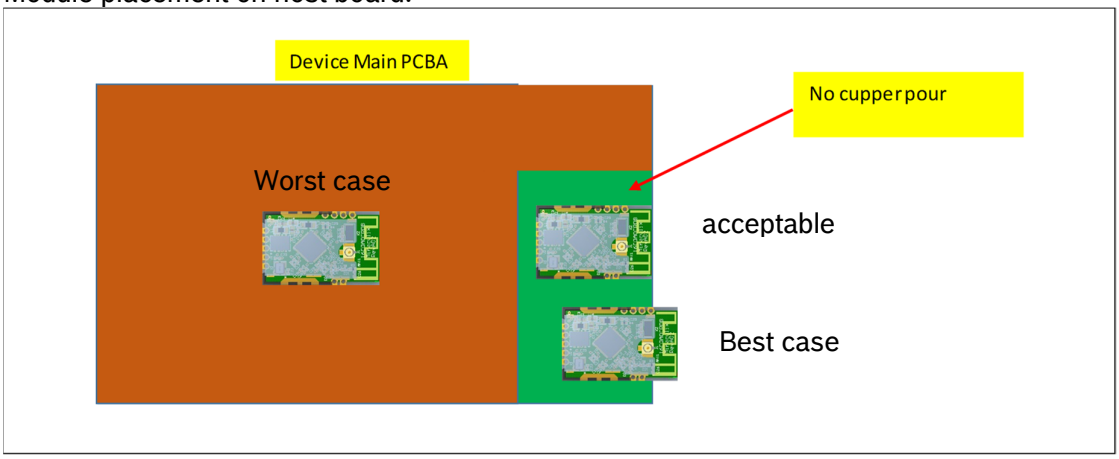
QR code unit（24 Digit）:



1.4 MirX Placement Requirement on the Host board (ELO)

The module will be soldered on the host board (ELO) and a clearance must be provided for the antenna where no routing or ground is allowed in any layer. Here is an example of a module placed in a host board. Placing the module at the edge is recommended as it gives the best RF performance and does not require any clearance surrounding the antenna.

Module placement on host board:



Guidelines for Enclosure and Ground Plane

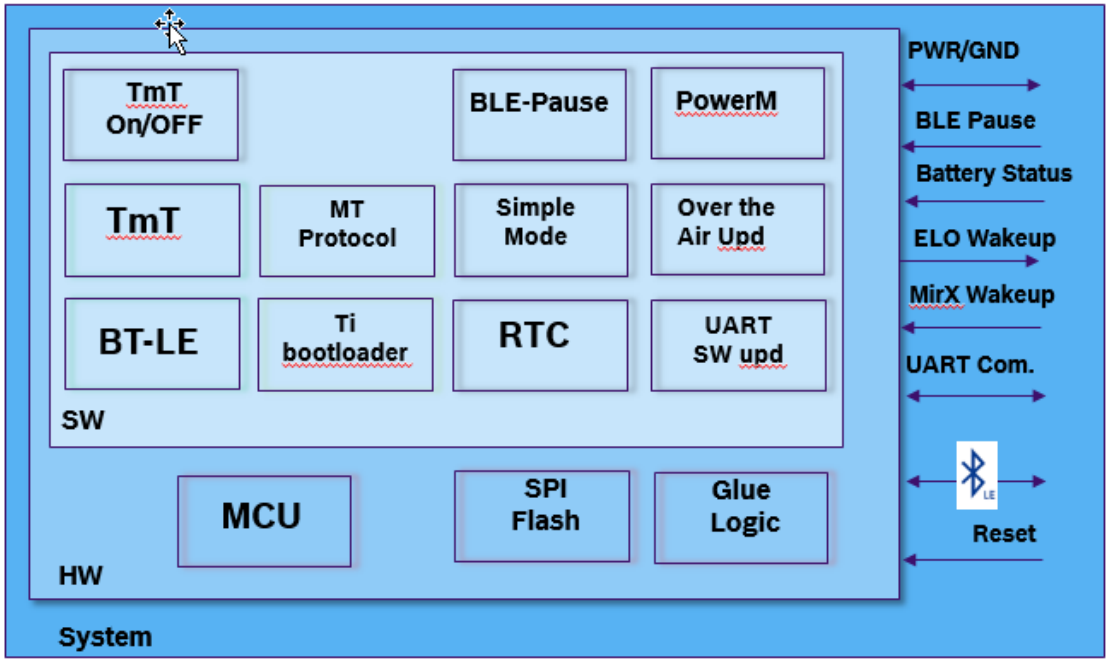
- There should not be any ground directly below the antenna
- Ensure that there is no component, mounting screw, or ground plane near the tip of the antenna or the length of antenna. No large components should be placed near the antenna.
- No battery cable, microphone cable, or any trace should cross the antenna trace on the PCB on the same side of the antenna.
- The antenna should not be covered by a metallic enclosure completely. If the product has a metallic casing or a shield, the casing should not cover the antenna. No metal is allowed in the antenna near field.
- Ensure the paint on the plastic enclosure is nonmetallic near the antenna for best performance.
- The orientation of the antenna should be in line with the final product orientation so that the radiation is maximized in the desired direction. The polarization of the receive antenna and the position of the receive antenna should be taken into account to orient the module in a way that maximum radiation occurs.
- Keep away from antenna, as far as possible, large metal objects to avoid electromagnetic field blocking
- Keep any components that may radiate noise or signals within the 2.4GHz – 2.5GHz frequency band far away from the antenna or better yet, shield the components that are generating the noise. Any noise radiated from the customer PCB in this frequency band will degrade the sensitivity of the module.

2 SW Details and Communication Protocols

2.1 MirX System Layout

The MirX system is a combination of hardware and software components.
The system is built on the HW foundation of the TI CC2640 chip including an attached SPI flash.
The SW components are basically the TI Bootloader, the Bluetooth lower energy stack and the Robert Bosch Application SW, described in some more details below.

MirX System Layout



2.2 MirX UART Communication Interface

The module needs to be initialized with some basic information to make BLE advertising. They are provided on UART interface using a proprietary protocol.

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