ZigBit™ OEM Module 1.1

Application Note

ZigBit™ Power Consumption Testing

Doc. AN-481~01 v.1.5 January 2008

Summary

This Application note describes the method of measurement of power consumption of the ZigBit module in both active and sleep modes.

Related documents:

[1] ZigBit™ Development Kit 2.0 User's Guide. MeshNetics Doc. S-ZDK-451

[2] Range Measurement Tool User's Guide. MeshNetics Doc. P-ZBN-451

[3] ZigBeeNet™ Stack Documentation. MeshNetics Doc. P-ZBN-452~02

ZigBit™ Power Consumption Testing

The power consumption of the ZigBit module cannot be measured absolutely correctly when it is installed on the MeshBean2 board (see [1]), because of leakages through the peripherals connected to the ZigBit pins. This is the reason why precise measurements require ZigBit to be installed into a special circuitry (see Figure 1).

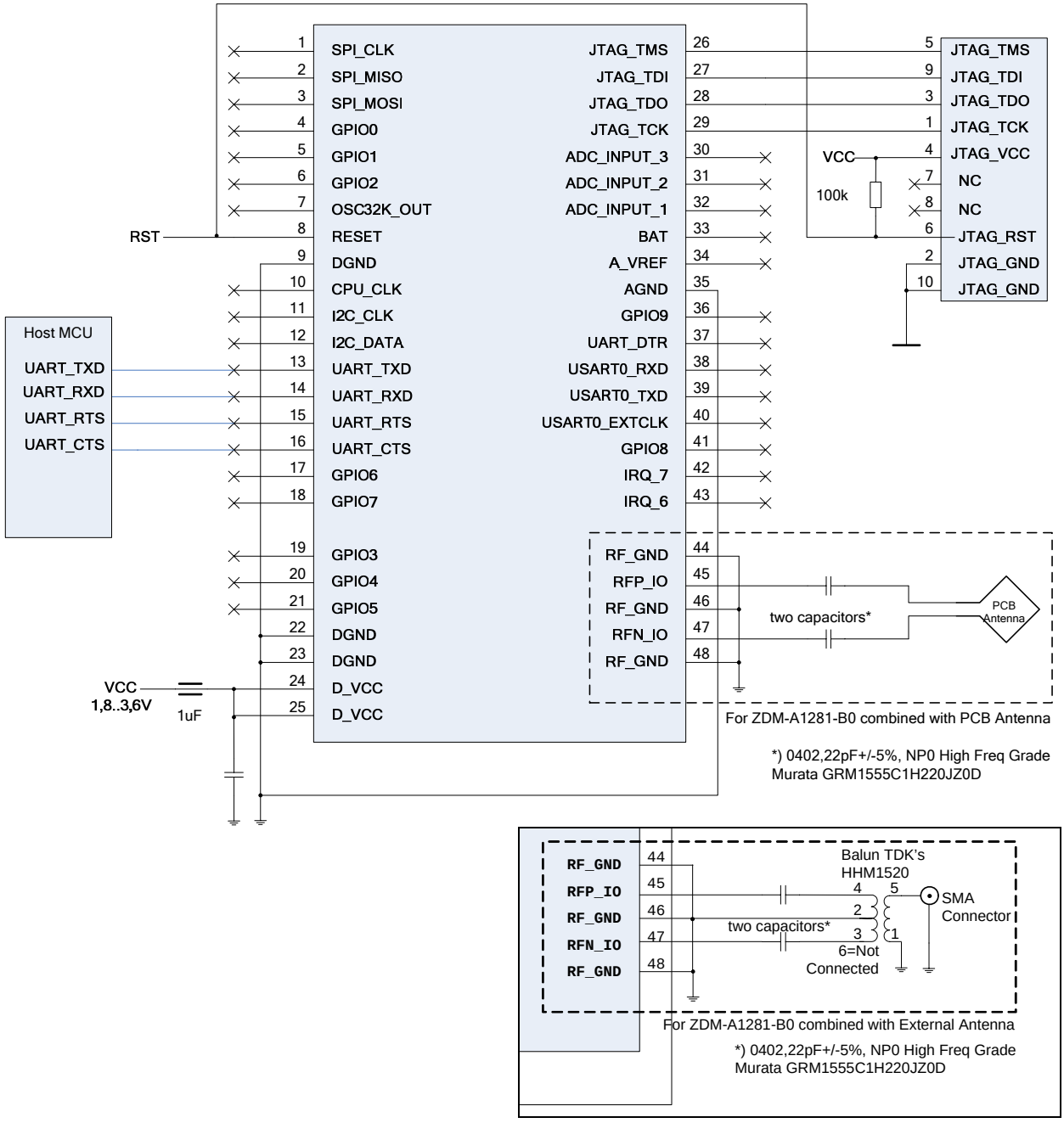

Figure 1. Power Measurement Circuitry

However, one may perform the measurements on MeshBean2 board using the following steps:

1. Program the node with the corresponding image and disconnect the JTAG emulator.
2. Remove the `J1` jumper (see [1]).
3. Power-on the board by batteries or via the DC connector (see [1]).
4. Connect ammeter to the `CM+` and `CM-` clamps (see Figure 2). Make sure that the ammeter is working in DC mode.

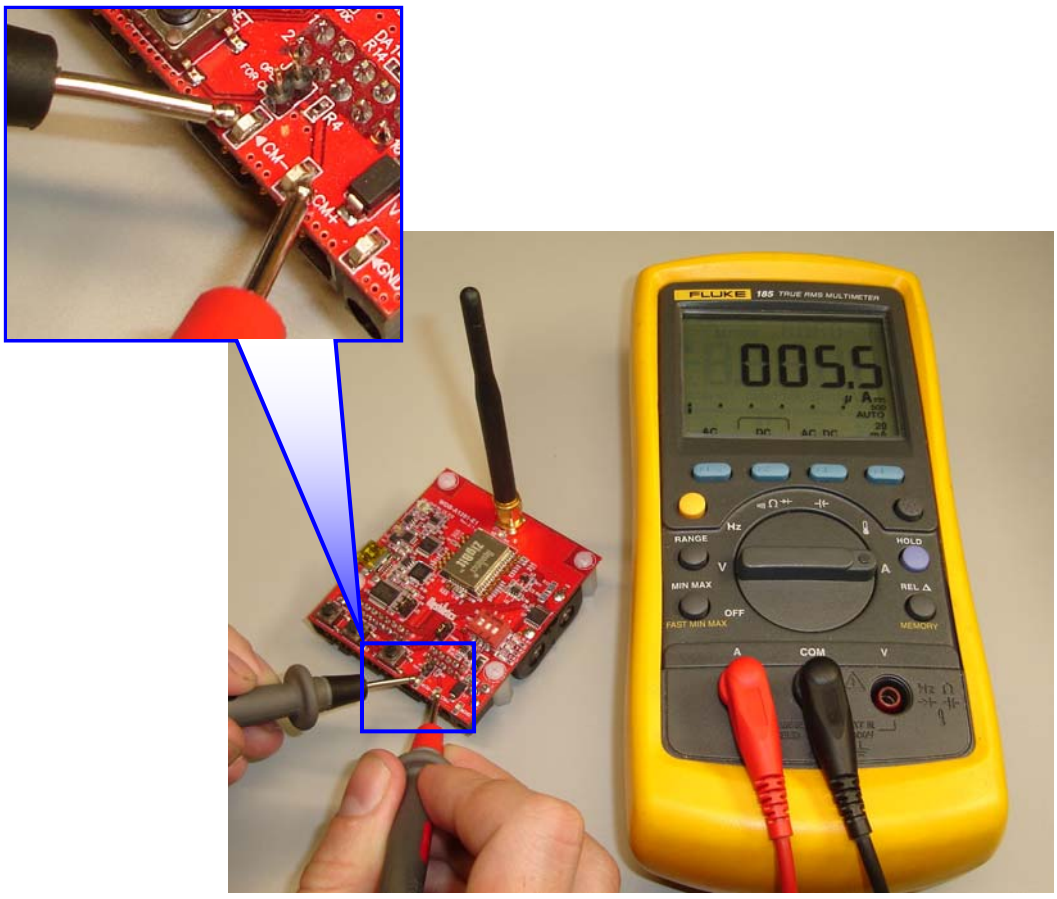

Figure 2. Power measurement on MeshBean2 board.

Three different firmware images of sample applications included in the ZigBit Development Kit (see [1]) may be used to perform static measurements in the following modes:

- RX mode, when the module's interfaces are initialized and the radio is turned on for listening to the channel persistently: use the `receiver` image from the Range Measurement application (see [2]).
- TX mode, when the module interfaces are initialized and the radio is turned on for a continuous transmission: use the `transmitter` image from the Range Measurement application (see [2]).
- Sleep mode: use the `enddevice` image from the Low-Power Networking application. Note that in this case you will have to set up another node as network coordinator (see [3]).

The latter image makes the device to wake up each 10 seconds, transmit data and fall asleep again. 10 seconds should be enough to measure currents in sleep mode using a general-purpose ammeter. Anyway, this value may be changed within the source code.