Hardware Comparison Between MP5/MP5T SRR and MP2/X2 SRR

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Summary

This document compares the Short Range Radio (SRR) module implementations in the IntelliVue MP5/MP5T vs. in the IntelliVue MP2/X2.

Components

Microcontroller and Firmware

The microcontroller and the contained firmware are identical. Associated with the microcontrollers are debug LEDs, which are identical, and debug connectors, which are depopulated in the MP2/X2. The debug connectors are not associated with the transmitter portion of the circuit.

RF Processor Chip

The RF Processor Chips are identical.

Clock Oscillator / Multiplicator

The used clock crystal and load capacitors are identical; the clock oscillator and frequency multiplier is contained in the RF processor which is identical.

Modulation Method and Circuit

Modulator and demodulator are contained in the RF processor which is identical; likewise, the used modulation method remains identical.

Maximum Output Power

The maximum output power is determined by the RF processor in combination with the antenna. The RF processor is identical; for antenna differences see below.

Antennas

The MP5/MP5T radio uses a "WE-MCA" chip antenna (part no. 7488920245) from Würth Elektronik for both radio modules on that board.
The MP2/X2 radio uses two different chip antennas:
-    "Micro Reach Xtend" chip antenna (part no. FR05-S1-N-0-110) from Fractus for radio 1
-    "Comata" chip antenna (part no. 3030A6111) from Antenova for radio 2
Likewise the antenna matching circuit has been adapted for the different antennas.
As a reference, the specified antenna gains for the used antennas are:
-    Würth "WE-MCA": 1.3 dBi peak, 0.0 dBi average
-    Fractus "Micro Reach Xtend": - 0.5 dBi peak
-    Antenova "Comata": 0.0 dBi peak, -3.5 dBi average
The data sheet values together with measurements demonstrate that the antenna gains for the MP2/X2 are lower than on the MP5/MP5T.

Non-Radio Circuitry

Push buttons and LEDs for the user interface are contained on the IntelliVue MP2/X2 PCB; these are located on a separate PCB in the IntelliVue MP5/MP5T. However, these components hove nothing to do with the RF portion of the circuit.

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Detailed Schematics

Details of the schematics can be seen in drawings D-M8100-96471-1 rev. 0818 (MP5/MP5T) and
D-M3002-96471-1 rev. 0850 (MP2/X2). Identical portions have been marked green; changed
portions, as detailed above, have been marked orange and non-radio circuitry only present on the
MP2/X2 has been marked gray.

Placement

Placement and PCB shape have been adjusted to accommodate the different space restrictions
inside the IntelliVue MP2/X2. This includes integration of the SRR module on an existing PCB,
which also contains other non-radio circuitry, as the push buttons and LEDs.

Details of the placement can be seen in the attached photographs; identical portions have been
marked green, changed portions have been marked orange and non-radio circuitry only present on
the MP2/X2 has been marked gray.

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