Declaration of maximum 2.4GHz transmitter duty cycle for Ubisensor30v1

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Overview

This document describes the maximum possible duty cycle of transmissions of the Ubisensor30v1 device via its 2.4GHz transceiver, which is to be certified under FCC Part 15.249.

Device operation

As part of its operation, the Ubisensor30v1 device utilises a 2.4GHz conventional radio link which is to be certified under FCC Part 15.249. The device transmits only infrequently on the 2.4GHz radio link.

Worst Case Example

Figure 1 shows a worst case example of 2.4GHz transmitter duty cycle of the Ubisensor30v1. The transmitter is 'on' for 4.288ms each cycle. The transmitter is cycled at 61.51059Hz. This leads to a maximum transmitter 'on' time of 4.288ms every 16.25736ms. In 100ms, the transmitter can complete six full cycles with 2.45582ms remaining (6 x 16.25736 = 97.54418ms. 100ms – 97.54418ms = 2.45582ms). 2.45582ms equates to 0.57272 of the transmitter 'on' time (2.45582/4.288 = 0.57272). The maximum transmitter 'on' time in any 100ms period is therefore 6.57272 x 4.288ms = 28.18382ms.

Conclusion

The maximum possible transmitter on time of the Ubisensor30v1 is 28.18382ms in any 100ms period.

Therefore the duty cycle correction factor which should be applied to measurements of a continuous signal during testing = 20log(28.18382/100) = -11 dB

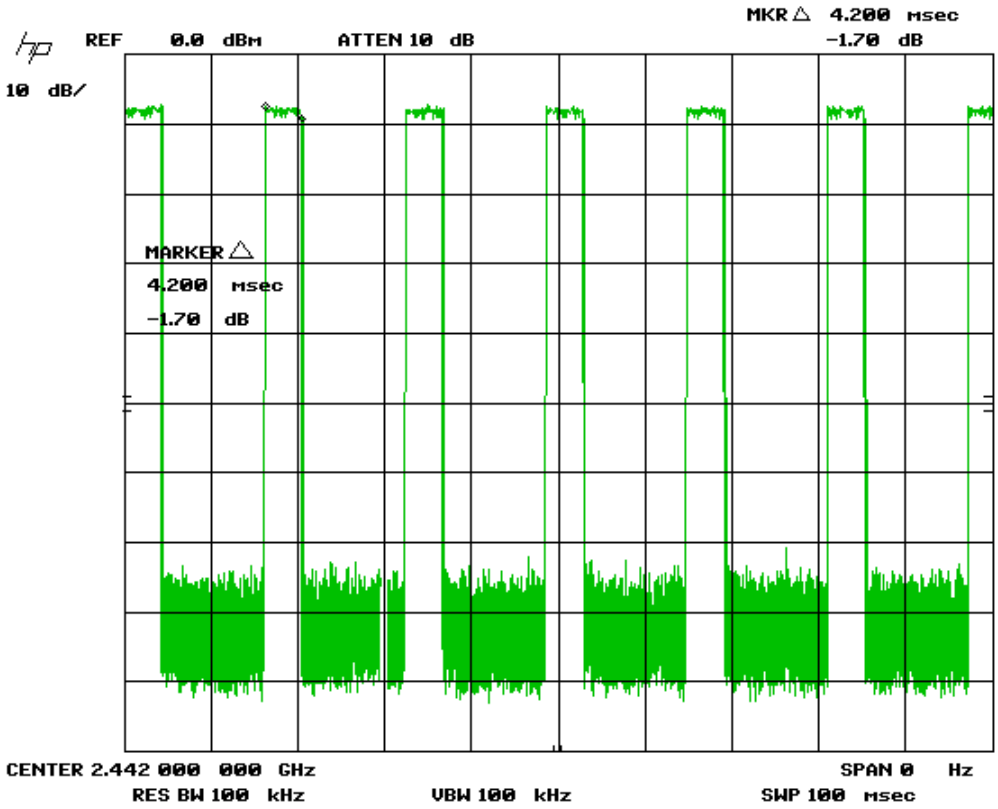

Figure 1 Spectrum analyser trace showing worst case example 2.4GHz transmitter on time of the Ubisensor30v1