Declaration of maximum 2.4GHz link duty cycle for Ubitag V2.x devices

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Overview

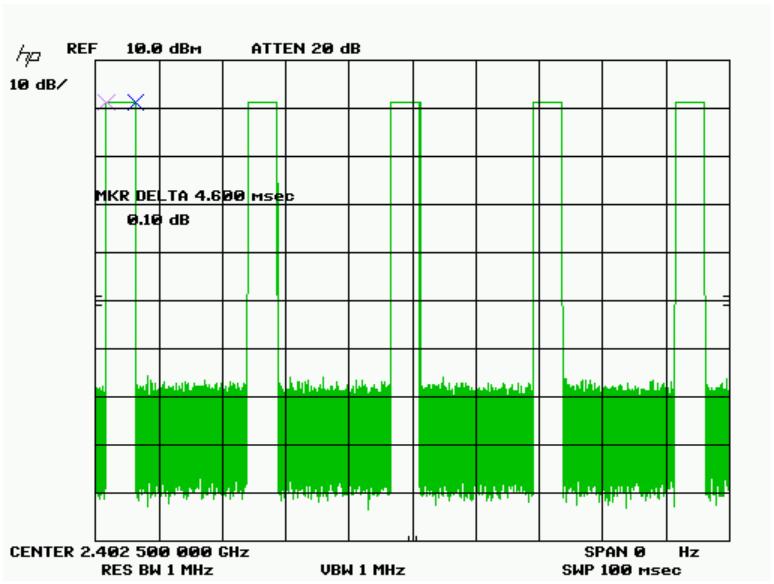
This document describes the maximum possible duty cycle of transmissions of the Ubitag V2.0, V2.1, V2.2, V2.3, V2.4 and V2.5 devices via their 2.4GHz transceivers, which are to be certified under FCC Part 15.249.

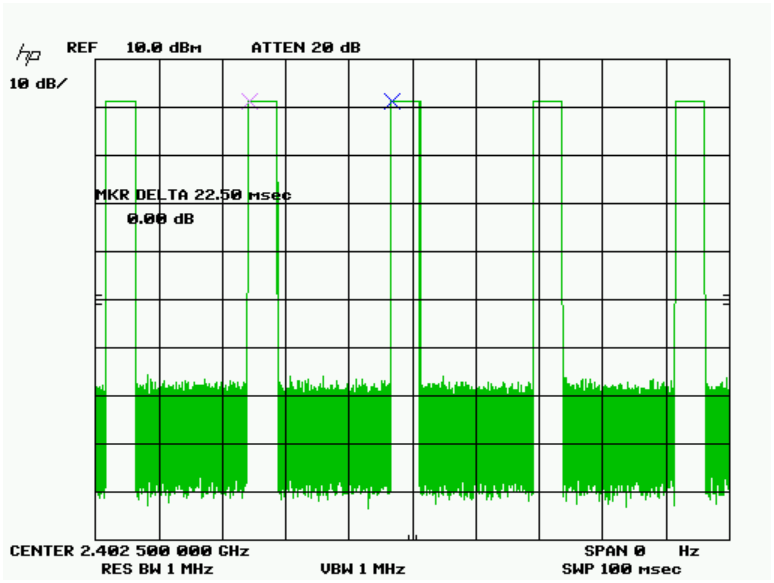
Device operation

As part of their operation, the Ubitag V2.0, V2.1, V2.2, V2.3, V2.4 and V2.5 devices utilise a 2.4GHz conventional radio link which is to be certified under FCC Part 15.249. To maximise battery lifetime, these devices transmit only infrequently on the 2.4GHz radio link.

The maximum time for which the 2.4GHz transmitter of the Ubitag devices may be active in a cycle is 4.6ms, and the maximum rate at which the device may be cycled is 44.5Hz, leading to a maximum transmitter on time of 4.6ms every 22.5ms. The maximum transmitter on time in any 100ms period is therefore 5 x 4.6ms = 23ms, because in the worst-case the 100ms window can happen to capture five complete 4.6ms transmission periods, each with a (22.5ms – 4.6ms) = 17.9ms gap between them.

The plot below shows the conducted output from a Ubitag V2.0 device when it is transmitting at maximum duty cycle, across a worst-case 100ms span, and validates the numbers given above. The operating code and 2.4GHz transceivers on the V2.1, V2.2, V2.3, V2.4 and V2.5 Ubitags are identical, and therefore will generate identical results.





Conclusion

The maximum possible transmitter on time of a Ubitag V2.0, V2.1, V2.2, V2.3, V2.4 or V2.5 device is 23ms in any 100ms period.