**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title | **Draft Oscillator Specification Text** | |
| Date Submitted | 30 April 2010 | |
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| Re: | Draft of 802.15.4f | |
| Abstract | Recommended text for crystal oscillator specification in UWB PHY | |
| Purpose | Contribution to draft text | |
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**6.?? UWB RFID PHY Transmitter Specification**

The transmission time of any individual pulse shall not drift more than 11 ns from its nominal transmission time during a 128 symbol period over the specified operating temperature range of the device.

This is an important issue for OOK modulation since no synchronization update can be made within the receiver unless a “1” is received. For this reason, a long sequence of zeros will cause a long period between frequency drift updates and necessitate a higher quality frequency reference in the transmitter, which is generally not desirable. For this reason section XXX specifies that the modulator must insert (and the demodulator ignore) a sequence of 4 pulses every 128th symbol for base mode, and 32nd symbol for extended mode, after the PHR. The result of this sync marker is that the 11 ns drift limit can be met using a very low cost, widely available AT-cut crystal oscillator. A wider temperature range may require a temperature compensated crystal to meet the drift requirement.

The requirement for adding additional timing markers is met in the long range mode by its utilization of Manchester encoding.