Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: [Resolutions to MR-FSK Comments on Frequency Tolerance]
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Re: [MR-FSK Frequency Tolerance Proposal]

Abstract: [This document proposes a frequency tolerance for the MR-FSK that is consistent with other design parameters. It is appropriate for use with defined FSK modes as well as Generic PHY modes.]

Purpose: [802.15.4g Comment Resolution for LB51.]

Comments on Frequency tolerance

- CID 1315, 1316, 1318, 1319:
  - The frequency tolerance is unnecessarily tight and should be increased to +/- 50 ppm
- CID 1369:
  - Radio specifications are incomplete. The receiver sensitivity is not specified with regard to the data rate. Frequency tolerance of +/- 20 ppm is not appropriate for 12.5 kHz channel spacing at 450 - 470 MHz or 200 kHz channel spacing at 2400-2483.5 MHz.

Proposed Changes

- The specification on frequency tolerance for the MR-FSK PHY should be parameterized to account for design parameters appropriately.
- This would allow the specification of the clock frequency tolerance to be relaxed when possible, such as when larger data rates and frequency deviations are used.
- Conversely, it would allow the clock tolerance specification to be tightened for designs with narrow frequency deviations, low data rates, such as specified in the dedicated use bands.

Comment Resolutions

Accept in principle: CID 1315, 1316, 1318, 1319, 1369

Insert the following in the section on Radio Specifications for the MR-FSK PHY (6.12a.4):

The single sided clock frequency tolerance T, in ppm, shall be set according to the following equation:

$$T \leq \min(T_0 \times (R \times h) / (R_0 \times h_0) \times F_0 / F, 50\,ppm)$$

where R is the symbol rate in ksps, h is the modulation index and F is the carrier frequency in MHz. R0 is 50 ksps, h0 = 1 and F0 is 915 MHz. The value of T0 is set at 30 ppm to derive T for modes in all bands, except at 2450 MHz for which the value of T0 is set at 40ppm.

In addition, a SUN device shall also satisfy regulatory requirements applicable to frequency tolerance.