**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title | Text change for pulse shape and LEIP of the LRP UWB PHY | |
| Date Submitted | [March 3rd, 2020] | |
| Source | David Barras (3db Access AG) |  |
| Re: | Contribution to TG4z for IEEE 802.15.4z regarding pulse shape and LEIP | |
| Abstract | Contribution to TG4z amendment of IEEE Std 802.15.4 2015 | |
| Purpose | This submission proposes text to for the IEEE Std 802.15.4z draft amendment to IEEE Std 802.15.4. | |
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| This submission provides text intended to be ready to integrate directly into the 802.15.4z draft. |

**19.7.1 Pulse shape**

***Delete the following paragraph at line 1-6, pp. 173 in 19.7.1 of P802.15.4z-D6:***

For dual-frequency modes using the PBFSK modulation, the normalized power spectral density (PSD) of the unmodulated instantaneous frequency response (fdev = 0) as well as the normalized PSD of the modulated frequency response shall comply with the Transmit PSD Mask specified in 19.7.3 for the chosen operating band. Normalized PSD means PSD as being such that largest measured bin value is subtracted from all measured bins. Figure 90 is an example of LRP-ERDEV dual frequency mode spectrum fitting into the PSD mask for channel band 6 (as specified in Table 63) using a Gaussian pulse envelope.

***And replace with the following text:***

For dual-frequency modes using the PBFSK modulation, the normalized power spectral density (PSD) of the modulated frequency response shall comply with the Transmit PSD Mask specified in 19.7.3 for the chosen operating band. Normalized PSD means PSD as being such that largest measured bin value is subtracted from all measured bins. Figure 90 is an example of LRP-ERDEV dual frequency mode spectrum fitting into the PSD mask for channel band 6 (as specified in Table 63).

To help with interoperability in ranging scenarios, it is mandatory for the LRP-ERDEV to use transmitted pulse shapes with minimum precursor energy as depicted in the left-hand plot of Figure 16-13. The pulse shall monotonically rise to the main peak amplitude. For LRP-ERDEV in dual frequency mode, the 1%-99% rise time of the transmitted pulse envelope shall be 2.7ns ± 0.35ns.

**19.6 LRP UWB location enhancing information postamble**

***Add the following line (underlined in the text below) in the first enumeration of section 19.6 in IEEE Std 802.15.4-2015:***

The LEIP consists of a sequence of UWB pulses. The PRF of the LEIP pulse sequence is as follows:

- 1 MHz in the LRP UWB base and extended modes

- 2 MHz in the long-range mode

- various PRF for the LRP-ERDEV using the same format as described in 19.3.1.4 for the SHR, the number of pulses being defined in the DataRequestRangingDescriptor.