**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 for Frequency Stitching in UWB sensing (Based on UWB sensing TFD)** |
| Date Submitted |  July, 2023 |
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| Re: | Contribution to IEEE 802.15.4ab  |
| Abstract |  |
| Purpose | This submission proposes text to for the IEEE Std 802.15.4ab specification framework document. |
| Notice | This document does not represent the agreed views of the IEEE 802.15 Working Group or IEEE 802.15.4ab Task Group. It represents only the views of the participants listed in the “Source(s)” field above. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein. |

*The baseline for this TFD is 15-22-0538-04-04ab-proposal-of-sensing-framework.*

*Insert a new subclause 2.3.2 after 2.3.1 as follows*

1.
2.

## Operational modes for UWB sensing

1. * 1. Frequency Stitching

Frequency stitching combines multiple carrier frequencies, to improve sensing link budget and accuracy. Frequency stitching is an optional feature for mono-static and bi/multi-static modes. Frequency stitching can be performed with overlapping carrier frequencies or non-overlapping carrier frequencies. Carrier frequency grid configuration determines the percentage of overlap of transmissions in frequency stitching. A carrier frequency grid configuration of 124.8 MHz indicates an overlap of 75%, carrier frequency grid configuration of 249.6 MHz indicates an overlap of 50% and a carrier frequency grid configuration of 374.4 MHz indicates an overlap of 25%. Carrier frequency grid configuration of 499.2 MHz indicates no overlap of transmissions in frequency stitching. The sensing report can be shared per transmission or an aggregated report is sent after the last transmission.

*Changes to Table 6 in 2.6.2 are marked in RED color.*

*Insert the following description after Table 6 in 2.6.2 as follows*

2.6.2

Table 6: Frequency stitching parameters field

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0 | 1-4 | 5-6 | ~~7-8~~ 7-11 | ~~9-10~~ 12-13 | ~~11-15~~ 14-15 |
| Frequency stitching direction | Base channel number or channel number | Carrier frequency grid configuration ID | ~~Aggregated Bandwidth~~Number of transmissions | Feedback control | Reserved |

*Insert the following description after Table 6 in 2.6.2 as follows*

Frequency Stitching Direction – Indicates the direction of usage of channels, from base channel, for frequency stitching.

Base channel number or channel number – Indicates the starting channel for performing UWB sensing when frequency stitching is enabled

Carrier frequency grid configuration Identifier – Indicates the configuration of carrier frequency grid for frequency stitching. Table 7 defines the carrier frequency grid configuration identifiers.

**Table 7: Carrier Frequency Grid Configuration**

|  |  |
| --- | --- |
| Carrier Frequency Grid configuration Identifier | Definition |
| 0 | No Overlap of channels for frequency stitching |
| 1 | 124.8 MHz carrier frequency grid (75% overlap in consecutive channels) |
| 2 | 249.6 MHz carrier frequency grid (50% overlap in consecutive channels) |
| 3 | 374.4 MHz carrier frequency grid (25% overlap in consecutive channels) |

Number of transmissions – Indicates the total number of transmissions done with frequency stitching.

Feedback Control – Indicates if the report is shared per transmission or an aggregated report is shared after the last transmission. Table 9 indicates the values used for feedback control

**Table 9: Feedback Control**

|  |  |
| --- | --- |
| Feedback control | Definition |
| 0 | Feedback after each sensing transmission |
| 1 | Feedback for all transmissions at the end of last transmission |
| 2 | Feedback for the aggregated channel at the end of last transmission |