**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | **LB225/D03 comment resolution -- Channel access related comments** |
| Date Submitted | Oct 7, 2025  |
| Sources | Alex Krebs (Apple)krebs @ apple.com |
| Re: |  |
| Abstract |  |
| Purpose | To propose resolution for MMS related comments for “P802.15.4ab™/D03 Draft Standard for Low-Rate Wireless Networks”. |
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**Table of contents**

[CID 180, 3, 13, 25, 15, 26, 177, 17 (Rejected) 3](#_Toc210733551)

[CID 204 (Accepted) 5](#_Toc210733552)

[CID 14, 22, 29, 31, 32 (Rejected) 6](#_Toc210733553)

[CID 23, 30 (Revised) 7](#_Toc210733554)

[CID 24 (Rejected) 8](#_Toc210733555)

[CID 32 (Rejected) 9](#_Toc210733556)

[CID 200, 201 (Accepted) 10](#_Toc210733557)

[CID 76, 77 (Revised) 11](#_Toc210733558)

# CID 180, 3, 13, 25, 15, 26, 177, 17 (Rejected)

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| **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| 180 | 87 | 10.39.8.3 | 17 | The details of LBT have been removed in D03, instead of being further clarified. NB coexistence with other technologies in UNII-3 and UNII-5 bands needs to be addressed by defining a mandatory channel access mechanism for NB operation in UNII-3/5, with clear and detailed guidance for the implementers. Adopt the proposed change in DCN 15-25-426/r0, which suggests to use CCA mode 1 for duty cycle greater that 2.5% | Change subclause 10.39.8.3 by replacing the existing text with the proposed text resolution in DCN 15-25-426/r0. The text is copied below for reference, see DCN15-25-426/r0 for thge detailed text proposal:" An NB device in section 10.39 (NBA UWB MMS) and 10.44 (UWB data offload to NB) operating in channels 0-249 in 5800 MHz and 6200 MHz bands, shall measure its NB transmission duty cycle, which is defined as the maximum ratio of the total NB transmission duration divided by any 100 ms observation window. Above 2.5% duty cycle an NB capable device shall perform CCA mode 1 before each O-QPSK PHY transmission. The ED threshold shall be set to the value required by local regulations; otherwise, it shall be set to -75 dBm/MHz. After completing the CCA, if the CCA is idle , the device shall start transmission no later than 16 μs after completing the CCA. If the CCA is busy and the number of consecutive CCAs is not equal to macMmsNbMaxConsecutiveCCAs, the device shall go the next channel (which might be the same channel) and perform a new CCA after at least 50 us when on another channel or after at least 100 us when on the same channel. Otherwise, the device shall skip transmission for the current ranging round. A receiving device shall check for the presence of an expected O-QPSK PHY transmission. If the expected transmission is not present and the number of consecutive absences is not equal to macMmsNbMaxConsecutive-CCAs, the device shall go to the next channel (which might be the same channel) and check for the presence of the expected transmission there. Otherwise, the device shall skip the expected reception." |
| 3 | 87 | 10.39.8.3 | 18 | The UNII-5 band is not license-free in China, which will result in increasing congestion in the UNII-3 band. To achieve better coexistence, a duty cycle–based LBT mechanism is necessary. We propose setting the duty cycle threshold at 5% within any 100ms interval: when the duty cycle is at or below 5%, LBT may be used; when the duty cycle exceeds 5%, LBT shall be used. | Change 10.39.8.3 to read as follows:"If the NB duty cycle within any 100ms observation window exceeds 5%, one of the channel access methods defined in 6.3.2 or 10.45 with CCA mode 1 or 3 shall be applied by initiator and responder independently in each transmission slot, even when the same channel is used in consecutive slots. If the the NB duty cycle within any 100ms observation window is 5% or lower, the same method may be used to improve coexistence with other spectrum users" |
| 13 | 87 | 10.39.8.3 | 18 | There is no mandatory coexistence scheme defined for NB operation.  | Change to LBT is mandatory required for NB operation if its transmission dutcy cycle is above certain threshold |
| 25 | 87 | 10.39.8.3 | 19 | Channel Access mechanism is ambiguous when LBT is not required. Change the sentence "If LBT is not required, the same methods may be used to improve coexistence with other spectrum users." to provide better guidance. | Change sentence to "If LBT is not required, the same methods shall be used to improve coexistence with other spectrum users." |
| 15 | 80 | 10.39.4.2 | 31 | Change "may use the listen-before-talk" to "shall use the listen-before-talk if the transmission duty cycle is above certain threshold".  | as in the comment. Threshold can set at 3% or the group compromised value |
| 26 | 80 | 10.39.4.2 | 32 | LBT has been shown to be the best channel access mechanism for NB device in the presence of other devices. Change "may" to a "shall" | as in comment and then remove the following sentence |
| 177 | 80 | 10.39.4.2 | 32 | Usage of the defined channel access (LBT) for NB should be mandatory to povide predictable and guaranteed coexistence with other spectrum users. | Change page 80, lines 32 and 33 to :"For the NBA MMS UWB, the O-QPSK PHY shall use the listen-before-talk (LBT) functionality defined in 32 10.39.8.3." |
| 17 | 80 | 10.39.4.2 | 32 | NB coexistence with other technologies in UNII-3 and UNII-5 bands needs to be addressed by defining a mandatory coexistence mechanism for NB operation in UNII-3/5, with clear guidance for the implementers. | Adopt a mandatory coexistence mechanism for NB operation in UNII-3 and UNII-5 bands. Adopt the proposed resolution text in DCN 15-25-426/r0 (duty cycle based CCA mode 1), or the proposed resolution text in DCN 15-25-429/r1 (Single CCA mode 1 based on transmit power).  |

Discussion: Topic has been discussed before, see 15-24-0207-06-04ab and 15-25-0427-04-04ab.

Proposed resolution: Rejected

Disposition detail: The group could not find consensus on that LBT is a good mandatory coexistence mechanism for 802.15.

# CID 204 (Accepted)

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| **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| 204 | 87 | 10.39.8.3 Listen-before-talk (LBT) | 18 | The conditional statement "If LBT is required [...] for regulatory reasons or as a coexistence mechanism, then [...] shall be applied" is unclear because:1. "regulatory reasons" imply the existence of a legal requirement. Mandating the use of a specific IEEE 802.15.4 method may not meet this requirement. In that case, implementers would have to make a choice between violating regulatory requirements or violating 802.15.4ab requirements.2. "coexistence reasons" would be for the device/implementer to determine subjectively since no objective (normative) criteria for coexistence exist in the 802.15.4-2024 standard.The proposed text change clarifies the sentence adequately by suggesting options to meet the requirements if either of the stated conditions carries. | Change paragraph to "If LBT is required before a transmission for regulatory reasons then one of the channel access methods defined in 6.3.2 or 10.45 with CCA mode 1 or 3a may be applied by initiator and responder independently in each transmission slot, even if the same channel is used in consecutive slots. If LBT is not required, the same methods may be used to improve coexistence with other spectrum users." |

Discussion: Has been discussed before in 15-25-0427-04-04ab.

Proposed resolution: Accepted

Disposition detail: n/a

# CID 14, 22, 29, 31, 32 (Rejected)

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| **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| 14 | 87 | 10.39.8.3 | 19 | "channel access methods defined in 6.3.2 or 10.45 with CCA mode 1 or 3 shall be applied". Many details like the ED threshold need to be defined for NB LBT | Add a setence on the LBT parameters like ED threshold (e.g. -75dBm/MHz)  |
| 22 | 87 | 10.39.8.3 | 19 | Energy Detect Threshold is sometimes not defined and could be set arbitrarily large. Guidance should be provided when it is not defined. | Define EDT to be min(-69 dBm/MHz, -67 dBm/MHz – Ptx) in channels 0 to 49 and to max(-83 dBm/MHz, min(-63 dBm/MHz,-70 dBm/MHz – Ptx)) in channels 50 to 249, where Ptx is the equipment’s instantaneous transmit power for the upcoming transmission in dBm  |
| 29 | 87 | 10.39.8.3 | 19 | The required ED threshold is sometimes specified by local regulations for a given band, and varies region to region and band to band. In the case that it is not specified, we should specify it. | Add a statement that says "phyCcaEdThreshold shall be set to shall be set to the value required by local regulations; otherwise, it shall be set to min(-69 dBm/MHz, -67 dBm/MHz – Ptx) in channels 0 to 49 and to max(-83 dBm/MHz, min(-63 dBm/MHz,-70 dBm/MHz – Ptx)) in channels 50 to 249, where Ptx is the equipment’s instantaneous transmit power for the upcoming transmission in dBm  |
| 31 | 87 | 10.39.8.3 | 19 | How long is CCA duration? Too short of a duration can lead to not being able to access the channel when in fact the device can. Please specify | An 802.11 device has typical CCA measurement duration (aCCATime for those familiar with 802.11 spec) of 4us and uses 20 MHz bandwidth, resulting in 80 CCA samples. In order to keep the same accuracy and false detection probability, we should use 4\*20/2.5 = 32us. Note that in order to reduce the CCA duration and keep the same performance, the CCA BW can be increased. Therefore, add a sentence that says "The CCA duration should be at least 32us\*2.5/CCA\_BW\_MHz, where CCA\_BW\_MHz denotes the CCA bandwidth in MHz." |
| 32 | 87 | 10.39.8.3 | 19 | When doing LBT, if the channel is deemed free, the transmission should occur immediately. This reduces the probability of a collision. | Please add the following: "When the channel is sensed free, the transmission shall occur immediately." |

Discussion: n/a

Proposed resolution: Rejected.

Disposition detail: CCA/EDT and timing requirement vary globally over different bands and regulatory domains and application needs therefore choice of CCA should be left to the implementer.

# CID 23, 30 (Revised)

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| **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| 23 | 87 | 10.39.8.3 | 19-Jan | CCA Mode 3 is not defined | change it to CCA mode 3a |
| 30 | 87 | 10.39.8.3 | 19 | CCA mode 3 does not exist anymore | specify whether 3a or 3b |

Discussion: n/a

Proposed resolution: Revised.

Disposition detail: Replace "3" by "3a".

# CID 24 (Rejected)

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| **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| 24 | 87 | 10.39.8.3 | 19 | CCA Mode 4 is not an adequate mechanism | Add "CCA Mode 4 shall not be used as a channel access mechanism" |

Discussion: n/a

Proposed resolution: Rejected.

Disposition detail: CCA mode 4 is successfully used by a large number of devices.

# CID 32 (Rejected)

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| **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| 32 | 87 | 10.39.8.3 | 19 | When doing LBT, if the channel is deemed free, the transmission should occur immediately. This reduces the probability of a collision. | Please add the following: "When the channel is sensed free, the transmission shall occur immediately." |

Discussion: n/a

Proposed resolution: Rejected.

Disposition detail: The CSMA/CA and SSBD protocols are to be used as referenced without additional requirements added in this section.

# CID 200, 201 (Accepted)

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| **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| 200 | 80 | 10.39.4.2 Channel access | 32 | "For the NBA MMS UWB, the O-QPSK PHY may use the listen-before-talk (LBT) functionality defined in 10.39.8.3. Note that some regulatory domains require channel access using some form of LBT." is inaccurate. The channel access described in 10.39.8.3 is called CSMA and SSBD. Also no regulatory domain currently requires LBT in any of the channels used by the PHY. | Change to "For the NBA MMS UWB, the O-QPSK PHY may use the channel access functionality defined in 10.39.8.3." |
| 201 | 80 | 10.39.4.2 Channel access | 34 | "When channel access fails, transmission shall be deferred for the remainder of the ranging round." is defined more clearly by the respective channel access mechanism that is chosen. The higher layer behavior is more adequately described in the remained of the subclause. | Remove this line. |

Discussion: As in comment.

Proposed resolution: Accepted

Disposition detail: n/a

# CID 76, 77 (Revised)

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| **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| 76 | 80 | 10.39.4.2 | 35 | An initiator shall discontinue the MMS UWB ranging round if ..., or the initiator fails to receive the response Compact frame at the expected time. There is an exception for one-way ranging | add "except for one-way ranging" |
| 77 | 81 | 10.39.4.2 | 1 | To be compatible with non interleaved mode and one to may scheme, a responder shall not discontinue the MMS UWB ranging round if the responder fails to receive the poll Compact frame at the beginning of the expected ranging round but a the expected time. | remove "at the beginning of the expected ranging round" and add "at the expected time" |

Discussion: For one-way-ranging no response frame is expected. More generally, this section is outdated. The newly added features for e.g. updating or requesting to update the short-term or long-term parameters via response or report frames require that the ranging round is continued even if the poll frame cannot be transmitted. Also as mentioned in CID 77 the stated behavior does not fit anymore to the newly added one-to-many modes. Hence, whether or not the transmission of packets is to be discontinued depends on the application and should be left to the implementer.

Proposed resolution: Revised.

Disposition detail: Remove the entire sentence on page 80 line 35-37 and page 81 line 1-5.