IEEE P802.11
Wireless LANs

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| Resolution for comments received for CC on D0.1 for subclause 38.3.25 - receiver specification - part 2 |
| Date: 2025-03-09 |
| Author(s): |
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Abstract

This submission contains proposed comment resolutions to comments on P802.11bn D0.1. The changes are based on P802.11bn D0.2.

The submission provides resolutions to the following 7CIDs in the receiver\_specification subclause 38.3.25

271, 956, 959, 1657, 1658, 3246, 3249

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: minor edit on the document format
* Rev 2: remove UHR MCS 14 from the document according to DCN #855

# [CID #956, 1657]

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| **CID** | **Commenter** | **Clause Number(C)** | **Page** | **Comment** | **Proposed Change** | **Resolution**  |
| 956 | Wookbong Lee | 38.3.24.2 | 211.16 | Define minimum Rx sensitivity for new MCS levels | As in comment | RevisedInstruction to editor:Apply the proposed change @Table38-47 in D0.2 marked as [#956, 1657]in 11-25/0777r3 |
| 1657 | Jian Yu | 38.3.24.2 | 211.29 | Define TBDs | as in comment | RevisedDuplicate of CID 956 and resolved through the proposed change in that resolusion.  |

# [CID #959]

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| **CID** | **Commenter** | **Clause Number(C)** | **Page** | **Comment** | **Proposed Change** | **Resolution**  |
| 959 | Wookbong Lee | 38.3.24.3 | 212.52 | Define adjacent channel rejection and non-adjacent channel rejection requirement for new MCS levels | As in comment | RevisedInstruction to editor:Apply the proposed change @Table38-49 in D0.2 marked as [#959] in 11-25/0777r3 |

# [CID #3246]

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| **CID** | **Commenter** | **Clause Number(C)** | **Page** | **Comment** | **Proposed Change** | **Resolution**  |
| 3246 | Yusuke Asai | 38.3.24 | 210.45 | The conditions for PSDU length for the measurement are not consistent in this subclause. | Please update and unify the conditions for subclauses 38.3.24.2 (Receiver minimum input sensitivity), 38.3.24.3 (Adjacent channel rejection), and 38.3.24.4 (Nonadjacent channel rejection) | Revised Agreed with the commenter and updated the writing to be consistent. Also changed the PSDU length requirement for ELR-MCS0 and ELR MCS-1as 512 octets according to DCN #721 and deleted UHR MCS 14 in the sentence according to DCN #855Instruction to editor:Apply the proposed change in subclauses 38.3.24.2 (Receiver minimum input sensitivity), 38.3.24.3 (Adjacent channel rejection), and 38.3.24.4 (Nonadjacent channel rejection) in D0.2 marked as [#3246] in 11-25/0777r3Please also delete UHR MCS 14 row in Table 38-47 and Table 38-49 according to DCN #855  |

# [CID #271, 1658]

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| **CID** | **Commenter** | **Clause Number(C)** | **Page** | **Comment** | **Proposed Change** | **Resolution**  |
| 271 | Qinghua Li | 38.3.24.6.4 | 214.55 | There is a 3 dB power boost on the L-STF and L-LTF of UHR ELR PPDU, which is the same as HE ER PPDU. The CCA calculation needs to take the 3 dB powerboost into account. Similar to HE ER PPDU, the 3 dB should be subtracted from the received signal strength measured from the L-STF or L-LTF fields of thePPDU, prior to using it to determine PHY-CCA.indication and to comparing it to OBSS PD level for determining the transmit power in spatial reuse. | The whole subclause is missing currently. When adding the subclause draft in, text about the 3 dB subtraction should be included as suggested in the comment text. | Revised Instruction to editor:Apply the proposed change marked as [#271] in 11-25/0777r3 |
| 1658 | Jian Yu | 38.3.24.6 | 214.36 | Define CCA sensitivity | as in comment | Revised Same as CCA sensitivity defined in 36.3.21.6 except that subclause 38.3.21.6.5: **Received channel power indicator (RCPI) measurement is added.** Insruction to editor:Apply the proposed change marked as #1658 in 11-25/0777r3 |

# [CID #3249]

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| **CID** | **Commenter** | **Clause Number(C)** | **Page** | **Comment** | **Proposed Change** | **Resolution**  |
| 3249 | Yusuke Asai | 38.3.24.3 | 214.01 | It is true that the condition for the measurement of adjacent channel rejection depends on the regulatory rules, but that is not limited to 160 MHz and 320 MHz operation. (20/40/80MHz operation may be limited by the reguratory rules.) | Delete "for 160 MHz and 320 MHz operation in regulatory domain" in this sentence. Ditto P214L24 (38.3.24.4 Nonadjacent channel rejection). | RejectedIt was defined in 802.11ax (P4426L57, P4427L37 in P802.11REVme\_D7.0) for 160MHz and in 802.11be (P936L13, P936L36 in P802.11be\_D7.0) for 160MHz and 320MHz. It’s better to keep this for cosistance.  |

* Receiver specification
* General

For receiver minimum input sensitivity, adjacent channel rejection, nonadjacent channel rejection, receiver maximum input level, and CCA sensitivity requirements described in this subclause, the input levels are measured at the antenna connector and are referenced as the average power per receive antenna. The number of spatial streams under test shall be equal to the number of utilized transmitting STA physical antenna (output) ports and also equal to the number of utilized receiving STA antenna (input) ports. Each output port of the transmitting STA shall be connected through a cable to one input port of the receiving STA.

NOTE—Additional test requirements and/or test methods might be needed to meet regulatory requirements.

The requirements on receiver minimum input sensitivity in 38.3.25.2 (Receiver minimum input sensitivity), adjacent channel rejection in 38.3.25.3 (Adjacent channel rejection) and nonadjacent channel rejection in 38.3.25.4 (Nonadjacent channel rejection) apply to PPDUs that meet all the following conditions:

* 0.8 µs GI is used.
* If the PPDU bandwidth is 20 MHz and the UHR-MCS is less than 10 or equal to 15, 17, 19, 20 or 23, then BCC is used. Otherwise, LDPC is used.
* The PPDU is a UHR MU PPDU without puncturing and a PPDU Type And Compression Mode field in U-SIG field is equal to 1.
* Receiver minimum input sensitivity

The PER shall be less than 10% for a PSDU with the rate-dependent input levels listed in Table38-47 (Receiver minimum input level sensitivity) and Table38-48 (Receiver minimum input level sensitivityfor ELR). The PSDU length shall be 512 octets for ELR-MCS0 and ELR-MCS1, 2048 octets for UHR-MCS 15, 4096 octets for all other modulations[#3246].

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| * Receiver minimum input level sensitivity [#956, 1657]
 |
| Modulation | Rate (*R*) | Minimum sensitivity (20 MHz PPDU) (dBm) | Minimum sensitivity (40 MHz PPDU) (dBm) | Minimum sensitivity (80 MHz PPDU) (dBm) | Minimum sensitivity (160 MHz PPDU) (dBm) | Minimum sensitivity (320 MHz PPDU) (dBm) |
|
| BPSK | 1/2 | –82 | –79 | –76 | –73 | –70 |
| QPSK | 1/2 | –79 | –76 | –73 | –70 | –67 |
| QPSK(UHR-MCS 17) | 2/3 | -78 | -75 | -72 | -69 | -66 |
| QPSK | 3/4 | –77 | –74 | –71 | –68 | –65 |
| 16-QAM | 1/2 | –74 | –71 | –68 | –65 | –62 |
| 16-QAM(UHR-MCS 19) | 2/3 | -71 | -68 | -65 | -62 | -59 |
| 16-QAM | 3/4 | –70 | –67 | –64 | –61 | –58 |
| 16-QAM(UHR-MCS 20) | 5/6 | -69 | -66 | -63 | -60 | -57 |
| 64-QAM | 2/3 | –66 | –63 | –60 | –57 | –54 |
| 64-QAM | 3/4 | –65 | –62 | –59 | –56 | –53 |
| 64-QAM | 5/6 | –64 | –61 | –58 | –55 | –52 |
| 256-QAM(UHR-MCS 23) | 2/3 | -60 | -57 | -54 | -51 | -48 |
| 256-QAM | 3/4 | –59 | –56 | –53 | –50 | –47 |
| 256-QAM | 5/6 | –57 | –54 | –51 | –48 | –45 |
| 1024-QAM | 3/4 | –54 | –51 | –48 | –45 | –42 |
| 1024-QAM | 5/6 | –52 | –49 | –46 | –43 | –40 |
| 4096-QAM | 3/4 | –49 | –46 | –43 | –40 | –37 |
| 4096-QAM | 5/6 | –46 | –43 | –40 | –37  | –34 |
| BPSK-DCM (UHR-MCS 15) | 1/2 | –82 | –79 | –76 | –73 | –70 |
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| NOTE—N/A = not supported by the PPDU format. |
| * Receiver minimum input level sensitivity for ELR
 |
| Modulation | Rate (*R*) | RU tone and DUP | Minimum sensitivity (20 MHz PPDU) (dBm) |
|
| BPSK | 1/2 | 52-tone RRU with four times duplication | -82 |
| QPSK | 1/2 | 52-tone RRU with four times duplication | -82 |

* Adjacent channel rejection

Adjacent channel rejection for *W* MHz (where *W* is 20, 40, 80, 160, or 320) shall be measured by setting the desired signal’s strength 3 dB above the rate-dependent sensitivity specified in Table38-49 (Minimum required adjacent and nonadjacent channel rejection levels) and raising the power of the interfering signal of *W* MHz bandwidth until 10% PER is caused for a PSDU length of 512 octets for ELR-MCS0 and ELR-MCS1, 2048 octets for UHR-MCS 15, 4096 octets for all other modulations[#3246]. The difference in power between the signals in the interfering channel and the desired channel is the corresponding adjacent channel rejection. The center frequency of the adjacent channel shall be placed *W* MHz away from the center frequency of the desired signal.

The interfering signal in the adjacent channel shall be a signal compliant with the UHR PHY, unsynchronized with the signal in the channel under test, and shall have a minimum duty cycle of 50%. The corresponding rejection shall be no less than specified in Table38-49 (Minimum required adjacent and nonadjacent channel rejection levels).

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| * Minimum required adjacent and nonadjacent channel rejection levels (#959)
 |
| Modulation | Rate (*R*) | Adjacent channel rejection (dB) | Nonadjacent channel rejection (dB) |
| 20/40/80/160/320 MHz channel | 20/40/80/160/320 MHz channel |
| BPSK | 1/2 | 16 | 32 |
| QPSK | 1/2 | 13 | 29 |
| QPSK(UHR-MCS 17) | 2/3 | 12 | 28 |
| QPSK | 3/4 | 11 | 27 |
| 16-QAM | 1/2 | 8 | 24 |
| 16-QAM(UHR-MCS 19) | 2/3 | 5 | 21 |
| 16-QAM | 3/4 | 4 | 20 |
| 16-QAM(UHR-MCS 20) | 5/6 | 3 | 19 |
| 64-QAM | 2/3 | 0 | 16 |
| 64-QAM | 3/4 | –1 | 15 |
| 64-QAM | 5/6 | –2 | 14 |
| 256-QAM(UHR-MCS 23) | 2/3 | -6 | 10 |
| 256-QAM | 3/4 | –7 | 9 |
| 256-QAM | 5/6 | –9 | 7 |
| 1024-QAM | 3/4 | –12 | 4 |
| 1024-QAM | 5/6 | –14 | 2 |
| 4096-QAM | 3/4 | –17 | –1 |
| 4096-QAM | 5/6 | –20 | –4 |
| BPSK-DCM (UHR-MCS 15) | 1/2 | 16 | 32 |
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| * Minimum required adjacent and nonadjacent channel rejection levels for ELR MCS
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| Modulation | Rate (*R*) | RU tone and DUP | Adjacent channel rejection (dB) | Nonadjacent channel rejection (dB) |
| 20 MHz channel | 20 MHz channel |
| BPSK | 1/2 | 52-tone RRU with four times duplication | 16 | 32 |
| QPSK | 1/2 | 52-tone RRU with four times duplication | 16 | 32 |

The measurement of adjacent channel rejection for 160 MHz and 320 MHz operation in regulatory domain is required only if such a frequency band plan is permitted in the regulatory domain.

* Nonadjacent channel rejection

Nonadjacent channel rejection for *W* MHz channels (where *W* is 20, 40, 80, 160, or 320) shall be measured by setting the desired signal’s strength 3 dB above the rate-dependent sensitivity specified in Table38-47 (Receiver minimum input level sensitivity), and raising the power of the interfering signal of *W* MHz bandwidth until a 10% PER occurs for a PSDU length of 512 octets for ELR-MCS0 and ELR-MCS1, 2048 octets for UHR-MCS 15, 4096 octets for all other modulations[#3246].The difference in power between the signals in the interfering channel and the desired channel is the corresponding nonadjacent channel rejection. The nonadjacent channel rejection shall be met with any nonadjacent channels located at least 2´*W* MHz away from the center frequency of the desired signal.

The interfering signal in the nonadjacent channel shall be a signal compliant with the UHR PHY, unsynchronized with the signal in the channel under test, and shall have a minimum duty cycle of 50%. The corresponding rejection shall be no less than specified in Table38-49 (Minimum required adjacent and nonadjacent channel rejection levels).

The measurement of nonadjacent channel rejection for 160 MHz and 320 MHz operation in regulatory domain is required only if such a frequency band plan is permitted in the regulatory domain.

* Receiver maximum input level

The receiver shall provide a maximum PER of 10% at a PSDU length of 2048 octets for BPSK modulation with DCM or 4096 octets for all other modulations, for a maximum input level of –30 dBm in the 5 GHz and 6 GHz bands and –20 dBm in the 2.4 GHz band, measured at each physical antenna port for any baseband UHR modulation.

* CCA sensitivity [#1658]
* General

The thresholds in this subclause are compared with the signal level at each receiving antenna.

* CCA sensitivity for operating classes requiring CCA-ED

A UHR STA follows the rules defined in 36.3.21.6.2 (**CCA sensitivity for operating classes requiring CCA-ED**).

* CCA sensitivity for the primary 20 MHz channel

A UHR STA follows the rules defined in 36.3.21.6.3 (CCA sensitivity for primary 20 MHz channel).

* Per 20 MHz CCA sensitivity

A UHR STA follows the rules defined in 36.3.21.6.4 (Per 20 MHz CCA sensitivity).

**38.3.25.6.5 Received channel power indicator (RCPI) measurement (#271)**

The RCPI is a measure of the received RF power in the selected channel for a received PPDU. This parameter shall be a measurement by the PHY of the received RF power in the channel measured over the UHR-STF or UHR-LTF field of the received PPDU. If the RCPI is measured for a UHR ELR PPDU, then the reported RCPI value is 3 dB less than the measured power over the UHR-STF or UHR-LTF field. The received power shall be the average of the power in all active receive chains.

NOTE—The UHR-STF and UHR-LTF fields in a UHR ELR PPDU have 3 dB higher power than the Data field, hence the reported RCPI value is subtracting 3 dB from the measured power.

RCPI shall equal the received RF power in dBm within an accuracy of ± 5 dB (95% confidence interval)

within the specified dynamic range of the receiver.