IEEE P802.11
Wireless LANs

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| Proposed Draft Text (PDT-PHY): Receive specification: General and receiver minimum input sensitivity and channel rejection |
| Date: 2020-11-05 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Wook Bong Lee | Samsung |  |  | wookbong.lee@samsung.com |

Abstract

This submission proposed modifications on modulation accuracy of TGbe D0.1 to resolve TBDs.

This document is based on TGbe D0.1 and following motions.

802.11be defines only PPDU with contiguous signal bandwidth, including 20 MHz, 40 MHz, 80 MHz, 160 MHz, and 320 MHz.

* NOTE – Noncontiguous 80+80 MHz and 160+160 MHz are not defined.

[Motion 137, #SP288, [3] and [4]]

802.11be shall not support STBC.

[Motion 135, #SP218, [21] and [39]]

802.11be agrees that:

* MCS numbering for BSPK – 1024QAM is the same as 802.11ax
* 4096 QAM is defined with R=3/4 and R=5/6
* MCS numbering for 4096 QAM is 12 and 13.

[20/1290r1 (PDT-PHY-Parameters-for-EHT-MCSs, Yujin Noh, Newracom), SP#1, Y/N/A: 42/1/3]

[Motion 131, #SP209, [19] and [45]]

The following MCSs are defined:

* MCS14: BPSK + ½ rate coding + DCM + Dup
* MCS15: BPSK + ½ rate coding + DCM

NOTE – These MCSs are only applicable to Nss = 1.

[Motion 137, #SP250, [47] and [48]]

Proposed Changes:

*TGbe Editor: Modify text in 36.3.19 (Receiver specification):*

* 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 antenna (output) ports and also equal to the number of utilized Device Under Test input ports. Each output port of the transmitting STA shall be connected through a cable to one input port of the Device Under Test.

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

The requirements on receiver minimum input sensitivity in 36.3.19.2 (Receiver minimum input sensitivity), adjacent channel rejection in 36.3.19.3 (Adjacent channel rejection) and nonadjacent channel rejection in 36.3.19.4 (Nonadjacent channel rejection) apply to PPDUs that meet all the following conditions:

*N* RU Allocation subfields are present in an EHT-SIG content channel, where:

* 0.8 µs GI is used.
* If the PPDU bandwidth is 20 MHz and the EHT-MCS is less than 10 or equals to 15, then BCC is used. Otherwise, LDPC is used.
* The PPDU is an EHT MU PPDU, compressed mode (non-OFDMA), transmitted to a single user, and without puncturing.
* Receiver minimum input sensitivity

The packet error rate (PER) shall be less than 10% for a PSDU with the rate-dependent input levels listed in Table 36-46 (Receiver minimum input level sensitivity). The PSDU length shall be 2 048 octets for BPSK modulation with DCM or 4 096 octets for all other modulations.

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| * Receiver minimum input level sensitivity
 |
| 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 | 3/4 | –77 | –74 | –71 | –68 | –65 |
| 16-QAM | 1/2 | –74 | –71 | –68 | –65 | –62 |
| 16-QAM | 3/4 | –70 | –67 | –64 | –61 | –58 |
| 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 | 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 (TBD) | –46 (TBD) | –43 (TBD) | –40 (TBD) | –37 (TBD) |
| 4096-QAM | 5/6 | –46 (TBD) | –43 (TBD) | –40 (TBD) | –37 (TBD) | –34 (TBD) |
| BPQK-DCM | 1/2 | –82 | –79 | –76 | –73 | –70 |

* 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 Table 36-46 (Receiver minimum input level sensitivity) and raising the power of the interfering signal of *W* MHz bandwidth until 10% PER is caused for a PSDU length of 2 048 octets for BPSK modulation with DCM or 4 096 octets for all other modulations. 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 EHT 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 Table 36-47 (Minimum required adjacent and nonadjacent channel rejection levels).

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| * Minimum required adjacent and nonadjacent channel rejection levels
 |
| 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 | 3/4 | 11 |  | 27 |  |
| 16-QAM | 1/2 | 8 |  | 24 |  |
| 16-QAM | 3/4 | 4 |  | 20 |  |
| 64-QAM | 2/3 | 0 |  | 16 |  |
| 64-QAM | 3/4 | –1 |  | 15 |  |
| 64-QAM | 5/6 | –2 |  | 14 |  |
| 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 | 1/2 | 16 |  | 32 |  |

* Per the authors of 20/1254r6, all the entries highlighted in red are TBD.

The measurement of adjacent channel rejection for 160 MHz and 320 MHz (TBD) 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 Table 36-46 (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 2 048 octets for BPSK modulation with DCM or 4 096 octets for all other modulations. 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 EHT 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 Table 36-47 (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 2 048 octets for BPSK modulation with DCM or 4 096 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 antenna for any baseband EHT modulation.

***End of proposed changes.***