IEEE P802.11
Wireless LANs

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| Comment resolution on CIDs on Clause 28.3 Part 2 |
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Abstract:

This document contains comment resolution on the following CIDs for 28.3 and the proposed specification changes are in draft 2.2:

11897, 12311, 12319, 12320, 12321, 12322, 12323, 12582, 12967, 13120, 13500, 13765, 14088, 14202, 14203, 14204, 14205, 14320.

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| **CID** | **Clause** | **Page** | **Line** | **Comment** | **Proposed Change** | **Resolution** |
|  11897 |

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| 28.3.18.4.4 |

 | 493 | 35 | In Step g), may want to mention that in the presence of midamble, the test equipment shall bypass midamble and only measure the data symbols, and maybe need to standardize one of the below two options: (1) the equipment should update channel estimation and Zero-Forcing computation per each midamble, or (2) the test equipment always use HE-LTFs in the preamble and ignore all the midambles. Maybe (1) is better because it unifies with regular cases without midamble. If we don't standardize how to use midamble, different equipment may create biased EVM results based on how they use the midamble. |

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| as in the comment |

 | Revised.11ax editor, please see the discussion for instructions of CID 11897 in doc IEEE 802.11-18/0475r0 |
| 12311 | 28.3.18.4.3 | 491 | 51 | It is important for the AP to know the Max Power for MCS7 or to derive the target RSSI for max power for MCS 7 as this is the threshold between 2 different EVM requirements. There should be an efficient way of collecting such information, or requiring STAs to operate at or below that power level. | Ensure that the spec defines efficient operation around Max power for MCS7 to allow the AP to force STAs to operate with good EVM | Rejected.Since it is for HE TB PPDU, the transmit power of each STA is controlled the AP.And different immplementations have different max power for MCS7. The requirement for EVM of other MCSs for HE TB PPDU is just to reduce the inter-user interferences. |
| 12319 | 3.2 | 29 | 42 | the definitions of 20MHz mask PPDU for i), j) and k) are unnecessary since they are covered by b), c), and d), respectively. | delete bulletins i), j) and k) | Revised.11ax editor, please see the discussion for instructions of CID 12319 in doc IEEE 802.11-18/0475r0. |
| 12320 | 3.2 | 30 | 44 | the definitions of 40MHz mask PPDU for k) and l) are unnecessary since they are covered by a) and f), respectively. | delete bulletins k) and l) | Rejected. In D2.2, item k) and l) specify the HE STA, they are different from a) and f). |
| 12321 | 3.2 | 31 | 21 | the definitions of 80MHz mask PPDU for f) and g) are unnecessary since they are covered by a) and b), respectively. | delete bulletins f) and g). | Revised.11ax editor, please see the discussion for instructions of CID 12321 in doc IEEE 802.11-18/0475r0. |
| 12322 | 3.2 | 31 | 64 | the definitions of 160MHz mask PPDU for g) and h) are unnecessary since they are covered by a) and b), respectively. | delete bulletins g) and h) | Revised.11ax editor, please see the discussion for instructions of CID 12322 in doc IEEE 802.11-18/0475r0. |
| 12323 | 3.2 | 32 | 31 | the definitions of 80+80MHz mask PPDU for d) and e) are unnecessary since they are covered by a) and b), respectively. | delete bulletins d) and e) | Revised.11ax editor, please see the discussion for instructions of CID 12323 in doc IEEE 802.11-18/0475r0. |
| 12582 | 28.3.14.3 | 481 | 61 | The first para of 17.3.9.10 Pre-correction accuracy requirements is inconsistent with the penultimate non-NOTE para of 28.3.14.3 Pre-correction accuracy requirements (2 kHz v. 350 Hz max CFO error) | Put these paras in the same subclause (suggest 28.3.14.3), state that one is for transmissions that solicit a non-HT or non-HT duplicate PPDU (e.g. MU-RTS) and the other for transmissions that solicit an HE PPDU (e.g. Basic Triggers) | Rejected. The Pre-correction accuracy requirements for non-HT or non-HT duplicate PPDU should be different from the requirements of HE TB PPDU. There is no mistake and confusion in the text. |
| 12967 | 3.2 | 29 | 35 | In h) to k), shouldn't the transmitted spectral mask for all these PPDUs be "the 20 MHz transmit spectral mask defined in Clause 28 (High Efficiency (HE) PHY specification)"?These bullet points for HE mirror the e) and f) for VHT, where the 20 MHz VHT mask is used. For example bullet i) is already covered by b) unless the spectrum mask is not the same.Same for 40 MHz, 80 MHz ... | In each bullet point from h) to k), refer to "the 20 MHz transmit spectral mask defined in Clause 28 (High Efficiency (HE) PHY specification)", e.g. replace "A Clause 17 PPDU transmitted by an HE STA using the transmit spectral mask defined in Clause 19 (High Throughput (HT) PHY specification)." with "A Clause 17 PPDU transmitted by an HE STA using the 20 MHz transmit spectral mask defined in Clause 28 (High Efficiency (HE) PHY specification)." and so onCheck consistency with 40 MHz, 80 MHz ... and apply the same change if needed. | Revised.  Please refer to the resolution of CID 12319, 12320, 12321, 12322, 12323. |
| 13120 | 3.2 | 29 | 39 | item (a) already covers item (h) | Remove item (h) | Revised.  Please refer to the resolution of CID 12319. |
| 13500 | 28.3.18.4.4 | 494 | 22 | "shall meet the relative constellation error staircase mask ". Provide reference. | See comment | Revised.11ax editor, please see the discussion for instructions of CID 13500 in doc IEEE 802.11-18/0475r0. |
| 13765 | 28.3.18.1 | 485 | 38 | "The bandwidth of the spectral mask applied to an HE SU PPDU, an HE TB PPDU and an HE MU PPDUwith the Bandwidth subfield of the HE-SIG-A field equal to 0, 1, 2 or 3 shall be determined by the bandwidth indicated in the Bandwidth subfield of the HE-SIG-A field."If 20MHz only STA is multiplex with 80MHz capable STAs via OFDMA in MU PPDU and TB PPDU, the mask of 20MHz only STA should still be 20MHz instead of the BW indicated in HE-SIG-A. | Add the following sentence before the last sentence of P.L. 485.46."The bandwidth of the spectral maskapplied to an 20MHz only STA shall be 20MHz regardless of the Bandwidth field indicated in HE-SIG-A in the MU PPDU or TB PPDU" | Revised.The commen is valid and need to be calrified. 11ax editor, please see the discussion for instructions of CIDs 13765, 14202, 14203, 14204 and 14205 in doc IEEE 802.11-18/0475r0. |
| 14088 | 28.3.18.3 | 491 | 11 | Transceivers for HE160/80+80 MHz PPDUs may use two RF LOs, one for each 80 MHz portions. | Add to the end of 28.3.18.3: "Transmit signals with TXVECTOR parameter CH\_BANDWIDTH set to CBW160 or CBW80+80 may be generated using two separate RF LOs, one for each of the lower and upper 80 MHz frequency portions.NOTE--The signal phase of the two 80 MHz frequency portions might not be correlated." | Already Resolved in D2.2, see comment resolution for CID 11890 (11-17/1730r1). |
| 14202 | 28.3.18.1 | 485 | 39 | HE-SIG-A field consists of many fields as shown in Table 28-18. Bandwidth subfield should be modified with Bandwidth field | as in comment | Revised.11ax editor, please see the discussion for instructions of CIDs 13765, 14202, 14203, 14204 and 14205 in doc IEEE 802.11-18/0475r0. |
| 14203 | 28.3.18.1 | 485 | 40 | HE-SIG-A field consists of many fields as shown in Table 28-18. Bandwidth subfield should be modified with Bandwidth field | as in comment | Revised.11ax editor, please see the discussion for instructions of CIDs 13765, 14202, 14203, 14204 and 14205 in doc IEEE 802.11-18/0475r0. |
| 14204 | 28.3.18.1 | 485 | 43 | HE-SIG-A field consists of many fields as shown in Table 28-18. Bandwidth subfield should be modified with Bandwidth field | as in comment | Revised.11ax editor, please see the discussion for instructions of CIDs 13765, 14202, 14203, 14204 and 14205 in doc IEEE 802.11-18/0475r0. |
| 14205 | 28.3.18.1 | 485 | 44 | HE-SIG-A field consists of many fields as shown in Table 28-18. Bandwidth subfield should be modified with Bandwidth field | as in comment | Revised.11ax editor, please see the discussion for instructions of CIDs 13765, 14202, 14203, 14204 and 14205 in doc IEEE 802.11-18/0475r0. |
| 14320 | 28.3.18.4.4 | 494 | 12 | In draft 2.0, 28.3.11.16 Midamble is added to support long packets in fast fading environment, i.e. insert midamble every 10 or 20 OFDM symbol. However the EVM measurement method is not updated accordingly in 28.3.18.4.4 Transmitter modulation accuracy (EVM) test. Specifically, EVM test only requests 16 OFDM symbol for user occupies more than 26 tones. Good long packet EVM performance is essential for good throughput. We need to increase the number of OFDM symbol for EVM test. | Please evaluate and suggested a reasonable long packets for EVM test, which eventually will guarantee a good throughput in real operation. Maybe we should use 32 OFDM for all cases, which will at least include one midamble. Or if chipset companies has a more practical number that will review system performance in long packets. | Rejected.Midamble is an optional feature and it is not essential to the EVM tests. In the 11ax spec, the following sentence is added to exclude the EVM tests with midamble.  |

**Discussions for CID 11897:**

To prevent biased EVM results from different test equipments with PPDU with midambles, the clarification on EVM tests for PPDU with midamble is added.

***TGax Editor: Please make the following text change (changed texts are in red) in the line 7, page 517 of D2.2***:

The transmit modulation accuracy test shall be performed by instrumentation capable of converting the transmitted signals into a stream of complex samples at sampling rate greater than or equal to the bandwidth of the signal being transmitted except that for a noncontiguous transmissions each frequency segment may be tested independently. The transmit modulation accuracy test shall be performed on HE PPDUs without midambles.

**Discussions for CID 12319:**

***TGax Editor: Please remove the following text (changed texts are in red) in the line 53-55, page 33 of D2.2***:

1. ~~A Clause 18 (Extended Rate PHY (ERP) specification) PPDU transmitted by an HE STA using the transmit spectral mask defined in Clause 18 (Extended Rate PHY (ERP) specification).(#13118, #13117)~~

**Discussions for CID 12320:**

***TGax Editor: Please remove the following text (changed texts are in red) in the line 48-52, page 34 of D2.2***:

~~k) A 40 MHz VHT PPDU (TXVECTOR parameter CH\_BANDWIDTH equal to CBW40) transmitted by an HE STA using the 40 MHz transmit spectral mask defined in Clause 21.~~

 ~~l) A 40 MHz non-HT duplicate PPDU (TXVECTOR parameter CH\_BANDWIDTH equal to CBW40) transmitted by an HE STA using the 40 MHz transmit spectral mask defined in Clause 19.~~

**Discussions for CID 12321:**

***TGax Editor: Please remove the following text (changed texts are in red) in the line 21-28, page 35 of D2.2***:

~~f) An 80 MHz VHT PPDU (TXVECTOR parameter CH\_BANDWIDTH equal to CBW80) transmit-ted by an HE STA using the 80 MHz transmit spectral mask defined in Clause 21 (Very High Throughput (VHT) PHY specification).~~

 ~~g) An 80 MHz non-HT duplicate PPDU (TXVECTOR parameter CH\_BANDWIDTH equal to CBW80) transmitted by an HE STA using the 80 MHz transmit spectral mask defined in Clause 21 (Very High Throughput (VHT) PHY specification).~~

**Discussions for CID 12322:**

***TGax Editor: Please remove the following text (changed texts are in red) in the line 1-7, page 36 of D2.2***:

~~g) A 160 MHz VHT PPDU (TXVECTOR parameter CH\_BANDWIDTH equal to CBW160) transmit-ted by an HE STA using the 160 MHz transmit spectral mask defined in Clause 21.~~

~~h) A 160 MHz non-HT duplicate PPDU (TXVECTOR parameter CH\_BANDWIDTH equal to CBW160) transmitted by an HE STA using the 160 MHz transmit spectral mask defined in Clause 21 (Very High Throughput (VHT) PHY Specification).~~

**Discussions for CID 12323:**

***TGax Editor: Please remove the following text (changed texts are in red) in the line 33-38, page 36 of D2.2***:

~~d) An 80+80 MHz VHT PPDU (TXVECTOR parameter CH\_BANDWIDTH equal to CBW80+80) transmitted by an HE STA using the 80+80 MHz transmit spectral mask defined in Clause 21.~~

~~e) An 80+80 MHz non-high throughput (non-HT) duplicate PPDU (TXVECTOR parameter CH\_BANDWIDTH equal to CBW80+80) transmitted by an HE STA using the 80+80 MHz trans-mit spectral mask defined in Clause 21.~~

**Discussions for CID 13500:**

***TGax Editor: Please make the following text change (changed texts are in red) in the line 46, page 518 of D2.2***:

The transmit modulation accuracy of unoccupied subcarriers of the PPDU shall meet the relative constellation error staircase mask specified in Equation (28-130) for each modulation and code rate using the unoccupied subcarriers within the corre-sponding segment.

**Discussions for CID 13765, 14202, 14203, 14204 and 14205:**

***TGax Editor: Please make the following text change (changed texts are in red) in the line 6-14, page 510 of D2.2***:

The bandwidth of the spectral mask applied to an HE SU PPDU, an HE TB PPDU and an HE MU PPDU with the Bandwidth ~~sub~~field of the HE-SIG-A ~~field~~ equal to 0, 1, 2 or 3 shall be determined by the band-width indicated in the Bandwidth ~~sub~~field of the HE-SIG-A ~~field.~~ The bandwidth of the spectral mask applied to an HE SU PPDU, an HE TB PPDU and an HE MU PPDU for a 20MHz only STA shall be 20MHz regardless of the Bandwidth field indicated in HE-SIG-A. The bandwidth of the spectral mask applied to an HE ER SU PPDU is 20 MHz. The bandwidth of the spectral mask applied to an HE MU PPDU with the Bandwidth ~~sub~~field of the HE-SIG-A ~~field~~ equal to 4 or 5 is 80 MHz. The bandwidth of the spectral mask applied to an HE MU PPDU with the Bandwidth ~~sub~~field of the HE-SIG-A ~~field~~ equal to 6 or 7 is 160 MHz. All HE PPDU formats shall be compliant with the transmit spectral mask described in this section.