IEEE P802.11
Wireless LANs

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| LB188 (TGac D3.0) Comment Resolution –Clause 22.3.8 |
| Date: September 17th 2012 |
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Abstract

This document provides resolutions for CID 6348, 6352, 6477, 6488, 6499, 6592, 6593, 6594, 6595, 6596, 6597, 6600, 6601, 6653, 6656, 6657, 6658 and 6784.

All of these 18 CIDS are PHY CIDs.

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed change** | **Resolution** |
| 6348 | 219.44 | 22.3.8.1.1 | It is not clear whether the word "between" includes the boundary values or not. | Clarify it. | REJECT“Between -200 and 0 inclusive” includes -200 and 0 as well. So, there is no ambiguity. See 12/1087r0. |
| <Discussion>“Between -200 and 0 inclusive” includes -200 and 0 as well. So, there is no ambiguity.  **TGac editor: No change** |
| 6352 | 235.19 | 22.3.8.2.6 | As stated in P238L1, transmission signal of VHT-SIG-B field for 80+80 MHz PPDU is defied as two 80 MHz VHT formats; therefore, the definition of VHT-SIG-B bits in 80+80 MHz transmission is not needed in Figure 22-20. | Delete the caption of "80+80 MHz" from Figure 22-20.Change the caption of "80 MHz" to "80 MHz / each segment of 80+80 MHz."Delete "and 80+80 MHz" in P235L2.Change "For an 80 MHz transmission" in P235L1 to "For 80 MHz transmission and each segment of 80+80 MHz transmission" | ACCEPT See 12/1087r0. |
| <Discussion>Because it may give some ambiguity if we repeat the pattern consecutively in the frequency domain for non-contiguous 80+80 MHz transmission, I modifiy according to what the commnter pointed out.**TGac editor: modify the 3.0 text from P235L01, as follows**For a 40 MHz transmission, the VHT-SIG-B bits are repeated twice. For an 80 MHz transmission and each segment of 80+80 MHz transmission, the VHT-SIG-B bits are repeated four times and a pad bit appended that is set to 0. For a 160 MHz transmission, the VHT-SIG-B bits are first repeated four times and a pad bit appended that is set to 0 as in the 80 MHz transmission. Then, the resulting 117 bits are repeated again to fill the 234 available bits. The repetition of the VHT-SIG-B bits for various channel width PPDUs is shown in Figure 22-20. **TGac editor: modify the 3.0 text from P235L08, as follows**Delete the caption of "80+80 MHz" from Figure 22-20.Change the caption of "80 MHz" to "80 MHz / each segment of 80+80 MHz." |
| 6477 | 234.00 | 22.3.8.2.6 | Since the maximum useful pre-EOF pad PSDU size is 2\*\*20-1 octets, you can't need more than 19 bits to represent this.The rejection to CID 4703 refers to 11/609r5 as the justification for the extra two bits. However, the only justification given there is "Bigger PHY layer maximal PSDU length makes future extention easier." This is not a valid justification as (a) there is no problem extending the field in the future if there are reserved bits after it and (b) none of the other lengths have "future extension" padding | In the penultimate column of Table 22-14, change the Length field to read "B0-B18 (19)" and the Reserved field to read "B19-B22 (4)" | REJECTThe commenters suggested reduce the bit size of VHT-SIG-B length representation for SU 80/80+80/160. But, when a similar comment was submitted in D0.1 & D2.0 comments resolution stage, TGac has already agreed that the current text is still valid even if it might be excessive a little for a case, because bigger PHY layer maximal PSDU length makes future extention easier. See 11/0609r5 (Liwen’s) and 12/0337r0. Therefore, VHT-SIG-B length 21 bit is still necessary from the above reasonings.See 12/1087r0. |
| <Discussion>The commenters suggested reduce the bit size of VHT-SIG-B length representation for SU 80/80+80/160. But, when a similar comment was submitted in D0.1 & D2.0 comments resolution stage, TGac has already agreed that the current text is still valid even if it might be excessive a little for a case, because bigger PHY layer maximal PSDU length makes future extention easier. See 11/0609r5 (Liwen’s) and 12/0337r0. Therefore, VHT-SIG-B length 21 bit is still necessary from the above reasonings. **TGac editor: No change** |
| 6488 | 221.44 | 22.3.8.1.4 | The resolution to CID 5311 makes no sense. There can be no "slight error" in TXTIME as this is defined by a mathematical equation with exact inputs, not a measurement. The ceiling function in equation 22-20 is indeed quite superfluous | Replace the ceiling brackets with parenthese | REJECTAs described in 22.4.3 (TXTIME and PSDU\_LENGTH calculation), TXTIME can be calculated in unit of 4us symbol irrespective of the guard interval type applied. If a VHT data packet is transmitted with the short GI, that value is then coverted into unit of 4 us for calculation of TXTIME.TXTIME seems to have an important role of parent parameter to others such as N\_SYM, LENGTH (in L-SIG) and PSDU\_LENGTH. So, even though TXTIME can be calculated as multiples of 4us in normal cases, it may not do any harm to introduce the ceiling operator in Eq. (22-20) of clause 22.3.8.1.4.See 12/1087r0. |
| <Discussion>As described in 22.4.3 (TXTIME and PSDU\_LENGTH calculation), TXTIME can be calculated in unit of 4us symbol irrespective of the guard interval type applied. If a VHT data packet is transmitted with the short GI, that value is then coverted into unit of 4 us for calculation of TXTIME.TXTIME seems to have an important role of parent parameter to others such as N\_SYM, LENGTH (in L-SIG) and PSDU\_LENGTH. So, even though TXTIME can be calculated as multiples of 4us in normal cases, it may not do any harm to introduce the ceiling operator in Eq. (22-20) of clause 22.3.8.1.4. **TGac editor: No change** |
| 6499 | 234.32 | 22.3.8.2.6 | The 40 MHz MU VHT-SIG-B Length field size does not allow a PPDU duration of 5.46 ms | Add ", or slightly less for 40 MHz MU format," after the closing parenthesis in "NOTE--Varying the VHT-SIG-B Length field size ensures that a consistent maximum PPDU duration of approximately 5.46 ms (the maximum PPDU duration from the L-SIG field) is maintained across all channel widths with both SU and MU formats." | REJECTIn general, the maximum PPDU duration is typically limited within 3ms (from L-SIG value of 2340) without RTS/CTS protection. Even if we try to extend the maximum PPDU duration upto 5.46ms using kind of RTS/CTS protection, there may be only 1 exceptional case among 311 modulation cases in total, that is, in MU-MIMO, all the 4 spatial streams are transmitted to one user with 256QAM, 5/6 code rate and short GI as well, and only in 40MHz BW. Even in that exceptional case among 311 cases, it is short by just 3% of the total PPDU duration. The current text already describes “NOTE—Varying the VHT-SIG-B Length field size ensures that a consistent maximum PPDU duration of approximately 5.46 ms (the maximum PPDU duration from the L-SIG field) is maintained across all channel widths with both SU and MU format”. So, there seems no meaningfulness to additionally insert an explanatory description only to explicitely mention one case. See also 12/0337r0.See 12/1087r0. |
| <Discussion>In general, the maximum PPDU duration is typically limited within 3ms (from L-SIG value of 2340) without RTS/CTS protection. Even if we try to extend the maximum PPDU duration upto 5.46ms using kind of RTS/CTS protection, there may be only 1 exceptional case among 311 modulation cases in total, that is, in MU-MIMO, all the 4 spatial streams are transmitted to one user with 256QAM, 5/6 code rate and short GI as well, and only in 40MHz BW. Even in that exceptional case among 311 cases, it is short by just 3% of the total PPDU duration. The current text already describes “NOTE—Varying the VHT-SIG-B Length field size ensures that a consistent maximum PPDU duration of approximately 5.46 ms (the maximum PPDU duration from the L-SIG field) is maintained across all channel widths with both SU and MU format”. So, there seems no meaningfulness to additionally insert an explanatory description only to explicitely mention one case. See also 12/0337r0. **TGac editor: No change** |
| 6592 | 221.33 | 22.3.8.1.4 | To say that "L-SIG is used to communicate data rate and length information" is not accurate for VHT. | Delete this sentence | ACCEPTSee 12/1087r0. |
| <Discussion> **TGac editor: modify the 3.0 text from P221L32, as follows**. The structure of the L-SIG field is defined in Figure 18-5 (SIGNAL field bit assignment). |
| 6593 | 222.42 | 22.3.8.1.4 | p\_0 is defined as the "first pilot value". It should be the "first pilot polarity value". | Change "first pilot value" to "first pilot polarity value". | REJECTIt can be easily seen that “pilot value” is widely used term in the 802.11 specification as follows:-Table 20-19, Table 20-20, Table 20-6, Equation (20-15), Table 20-29 and so on (in HT)-All the related expressions in VHTSo, there seems no need to switch to other term such as “pilot polarity value”.See 12/1087r0. |
| <Discussion>It can be easily seen that “pilot value” is widely used term in the 802.11 specification as follows:* Table 20-19, Table 20-20, Table 20-6, Equation (20-15), Table 20-29 and so on (in HT)
* All the related expressions in VHT

So, there seems no need to switch to other term such as “pilot polarity value”. **TGac editor: No change** |
| 6594 | 224.07 | 22.3.8.2.3 | The uncoded bits of VHT-SIG-A1 and VHT-SIG-A2 don't exactly corresponds to "symbols" | Change "The structure of VHT-SIG-A for the first symbol" to "The first 24 bits of VHT-SIG-A".Change "for the second symbol" to "The second 24 bits of VHT-SIG-A". | REVISESee 12/1087r0. |
| <Discussion>As the comment poined out, the uncoded bits of VHT-SIG-A and VHT-SIG-A2 don’t exactly corresponds to symbols because splitting into two symbols is done after the BCC encoding and interleaving. There has also been the similar text change on the overview encoding process, that is, clause 22.3.4. See 12/1074r1 as well. **TGac editor: modify the 3.0 text from P224L06, as follows**The VHT-SIG-A field carries information required to interpret VHT PPDUs. The first 24 uncoded bits of VHT-SIG-A (VHT-SIG-A1) is shown in Figure 22-16 and the second 24 uncoded bits of VHT-SIG-A (VHT-SIGA2) is shown in Figure 22-17. |
| 6595 | 226.64 | 22.3.8.2.3 | The uncoded bits of VHT-SIG-A1 and VHT-SIG-A2 don't exactly corresponds to "symbols" | Change "symbols" to "blocks of bits" | ACCEPTSee 12/1087r0. |
| 6596 | 227.01 | 22.3.8.2.3 | Bits are encoded, not symbols | Change "The VHT-SIG-A symbols shall be BCC encoded ..." to "The bits of the VHT-SIG-A field shall be BCC encoded ..." | ACCEPTSee 12/1087r0. |
| <Discussion>With the same reasoning as to the above CID (CID#6595), we need to change the expression correspondingly. **TGac editor: modify the 3.0 text from P226L63, as follows**The VHT-SIG-A field is composed of two blocks of bits, VHT-SIG-A1 and VHT-SIG-A2, each containing 24 data bits, as shown in Table 22-12 (Fields in the VHT-SIG-A field). VHT-SIG-A1 is transmitted before VHT-SIG-A2. The bits of the VHT-SIG-A field shall be BCC encoded at rate, R = 1/2, interleaved, mapped to a BPSK constellation, and have pilots inserted following the steps described in 18.3.5.6 (Convolutional encoder), 18.3.5.7 (Data interleaving), 18.3.5.8 (Subcarrier modulation mapping), and 18.3.5.9 (Pilot subcarriers), respectively. |
| 6597 | 227.08 | 22.3.8.2.3 | The constellation rortation in VHT-SIG-A is needed to distinguish non-HT frames that are coded as 6Mb/s. Others will already have been recognized during L-SIG processing. | Change "non-HT" to "non-HT sent at 6 Mb/s" | REJECTEven in a HT PPDU, RATE in L-SIG (that is, L\_DATARATE) shall be set to the value 6Mbps, not different from the case of a VHT PPDU. So, what the commenter pointed out is not correct. See the following paragraph in the 11mb for a reference. See 12/1087r0. |
| <Discussion>Even in a HT PPDU, RATE in L-SIG (that is, L\_DATARATE) shall be set to the value 6Mbps, not different from the case of a VHT PPDU. So, what the commenter pointed out is not correct. See the following paragraph in the 11mb for a reference. **9.23.4 L\_LENGTH and L\_DATARATE parameter values for HT-mixed format PPDUs**L\_LENGTH and L\_DATARATE determine the duration that non-HT STAs do not transmit, equal to theremaining duration of the HT PPDU or the L-SIG duration when L-SIG TXOP protection is used as defined in9.23.5, following the non-HT portion of the preamble of the HT-mixed format PPDU.The L\_DATARATE parameter of the TXVECTOR shall be set to the value 6 Mb/s. **TGac editor: No change** |
| 6600 | 234.38 | 22.3.8.2.6 | VHT-SIG-B length is per user | Change APEP\_LENGTH/4 to APEP\_LENGTH\_u/4 | REVISESee 12/1087r0. |
| <Discussion>APEP\_LENGTH is defined as a vector with a size of number of users in clause 22.2.2 TXVECTOR and RXVECTOR parameters. So, its exact expression for user *u* is APEP\_LENGTH[*u*] as seen in the following.TGac D3.0 from P119L55 (clause 9.12.6 A-MPDU padding for VHT PPDU)The A-MPDU\_Length[*n*] for user *n* is used as the APEP\_LENGTH[*n*] parameter value for the PLME-TXTIME.request (see 6.5.7 (PLME-TXTIME.request)) primitive, which is then invoked once for each VHT PPDU.The PLME-TXTIME.confirm (see 6.5.8 (PLME-TXTIME.confirm)) primitive provides the TXTIMEparameter and PSDU\_LENGTH[] parameters for all the users for the transmission. **TGac editor: modify the 3.0 text from P234L35, as follows**The VHT-SIG-B Length field for user *u* shall be set using Equation (22-42).Change in Equation (22-42)1. “VHT-SIG-B Length field” => “VHT-SIG-B Length field for user *u*”
2. “APEP\_LENGTH” => “APEP\_LENGTH [*u*]”

 (22-42)whereAPEP\_LENGTH [*u*] is the TXVECTOR parameter APEP\_LENGTH for user *u* (in octets) |
| 6601 | 235.40 | 22.3.8.2.6 | When refering to short GI, use reference to value of GI\_TYPE in TXVECTOR, rather than to field in VHT-SIG-A. | Change "value of the short GI field in VHT-SIG-A" to "value of the GI\_TYPE field in TXVECTOR" | ACCEPTSee 12/1087r0. |
| <Discussion>EVEN the VHT-SIG-A originally refers to value of the GI\_TYPE field in the TXVECTOR when specifies its Short\_GI field. **TGac editor: modify the 3.0 text from P235L40, as follows**The duration of the VHT-SIG-B field is *TVHT-SIG-B*(#5441), regardless of the value of the GI\_TYPE field in the TXVECTOR. The time domain waveform for the VHT-SIG-B field in a VHT PPDU(#4734) is specified by(#4204) Equation (22-43). |
| 6653 | 225.18 | 22.3.8.2.3 | This Note does not seem to be right:"NOTE--For some but not all users to have space time block coding is not allowed as defined in 22.3.10.9.4 (Space-time block coding)." | Please correct | REVISESee 12/1087r0. |
| <Discussion>What the current text tries to say is that there are only two cases in terms of number of users to which STBC applies, that is, 0 user or all users. I modified the text a little for better understanding. **TGac editor: modify the 3.0 text from P225L15, as follows**Set to 1 if all spatial streams of all users have space time block coding and set to 0 if no spatial streams of any user has space time block codingNOTE—In an MU transmission, if STBC is applied to any user, STBC shall be applied to all users as defined in 22.3.10.9.4 (Space-time block coding)(#4086). |
| 6656 | 227.59 | 22.3.8.2.3 | Mention that 90 deg rotation is ccw. | As in comment | ACCEPTSee 12/1087r0. |
| 6657 | 227.61 | 22.3.8.2.3 | Delete, not clear: "This is done to accommodate the estimation of channel parameters needed to robustly demodulate and decode the information contained in VHT-SIG-A." | As in comment | ACCEPTSee 12/1087r0. |
| <Discussion>Modified accepting the comments. **TGac editor: modify the 3.0 text from P227L58, as follows**NOTE—This definition results in a QBPSK modulation on the second symbol of VHT-SIG-A where the constellation of the data tones is rotated by 90º counter-clockwise relative to the first symbol of VHT-SIG-A and relative to the non-HT signal field in VHT PPDUs (Figure 22-18). In VHT PPDUs, the VHT-SIG-A is transmitted with the same number of subcarriers and the same cyclic shifts as the preceding non-HT portion of the preamble.  |
| 6658 | 229.60 | 22.3.8.2.3 | "a single section" is not clear | Clarify | See 12/1087r0. |
| <Discussion> **TGac editor: modify the 3.0 text from PXXXLYY, as follows** |
| 6784 | 224.40 | 22.3.8.2.3 | What does "NSTS sets to 0 where x is" mean? | Replace "NSTS sets to 0 where x is" with "NSTS is 0 when x is". | ACCEPTSee 12/1087r0. |
| <Discussion>Bit positions of array values of N\_STS may not be mapped in the exactly increasing order of *u*, because user index *u* may not match to USER\_POSITION array value *p*, whose relation between each other is already described in Table 22-11, that is, *p*=USER\_POSITION[*u*]. For your more information, see 12/0336r2 (resolution to CID 4244) as well.  **TGac editor: modify the 3.0 text from P224L39, as follows**NOTE—in MU[*x*] for values listed in USER\_POSITION, *x* represents USER\_POSITION[*u*] where *u* is the user index described in Table 22-12 (Fields in the VHT-SIG-A field). Otherwise MU[*x*] NSTS is 0 where*x* is not listed in USER\_POSITION. |