IEEE P802.11
Wireless LANs

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| LB188 (TGac D3.0) Comment Resolution –Clause 22.3.8 |
| Date: September 18th 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.

R1: CID 6352, 6594, 6595, 6596, 6658 and 6784 deferred. The others strawpoll passed.

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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 12/1087r1. |
| <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" | DEFERP238L1of D3.0 is for the waveform, while figure 22-20 is for the uncoded bits SIG-B transmit flow generally follows that data field and thus current figure 22-20 is appropriate. See 12/1087r1. |
| <Discussion>P238L1 is for the waveform, while figure 22-20 is for the uncoded bits SIG-B transmit flow generally follows that data field and thus current figure 22-20 is appropriate. **TGac editor: No change** |
| 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 12/1087r1. |
| <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 12/1087r1. |
| <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 12/1087r1. |
| <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 | REVISESee 12/1087r1. |
| <Discussion>L-SIG field gives rate information which is set to 6Mbps (HT or VHT) or other values as well as length information. **TGac editor: modify the 3.0 text from P221L32, as follows**The L-SIG field is used to communicate rate and length information. 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.So, there seems no need to switch to other term such as “pilot polarity value”.See 12/1087r1. |
| <Discussion>It can be easily seen that “pilot value” is widely used term in the 802.11 specification. 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". | DEFERIn order to match to the paragraph used for HT SIG transmission in 11mb. See 12/1087r1. |
| <Discussion> **TGac editor: No change** |
| 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" | DEFERSee 12/1087r1. |
| 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 ..." | DEFERSee 12/1087r1. |
| <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" | REVISESee 12/1087r1. |
| <Discussion>What the commenter pointed out is correct. Non-HT PPDU whose rate field is set to 6Mbps is BPSK modulated Non-HT PPDU. FYI, Non-HT PPDU whose rate field is set to 9Mbps is QPSK modulated. In HT-PPDU, see the following reference in the TGmb draft. **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: modify the 3.0 text from P227L07, as follows**The BPSK constellation for VHT-SIG-A2 subfield is rotated by 90° counter-clockwise relative toVHT-SIG-A1 subfield in order to accommodate differentiation of the VHT PPDU from a BPSK modulated non-HT and HT PPDU. |
| 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 12/1087r1. |
| <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 12/1087r1. |
| <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 12/1087r1. |
| <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 otherwise, see 22.3.10.9.4 (Space time block coding). |
| 6656 | 227.59 | 22.3.8.2.3 | Mention that 90 deg rotation is ccw. | As in comment | ACCEPTSee 12/1087r1. |
| 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 12/1087r1. |
| <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 | DEFERSee 12/1087r1. |
| <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". | DEFERSee 12/1087r1. |
| <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.It needs to refer to the previous resolution to CID#6390 done in Doc. 12/1007 (by Adrian)  **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. |