IEEE P802.11  
Wireless LANs

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| CC50 CR for subclauses 38.3.9 and 38.3.8 | | | | |
| Date: 2025-05-14 | | | | |
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**Abstract**

This submission proposes amending the draft text of transmitter block diagram in P802.11bn D0.2 to resolve CC50's fifty-five comments below.

2270, 125, 1335, 1128, 1336, 5761129, 1337, 2762, 126, 2271, 1130, 1930, 1081, 2440, 127, 1082, 1131, 1338, 1759, 2763, 1339, 1132, 929, 1340, 577, 578, 1083, 2272, 2764, 308, 2725, 1622, 1133, 3238, 930, 1134, 1135, 579, 2273, 580, 1084, 2726, 1623, 946, 3239, 3240, 1136, 1931, 2441, 1085, 26, 1137, 1932, and 2442.

(Note: Because CID 2270 was originally tagged as the subclause 38.3.9, it was assigned to the author. but that was for the subclause 38.3.8.)

**Revision History**

|  |  |
| --- | --- |
| Revision | Changes |
| 0 | Initial version of the document. |
| 1 | The document title and the DCN were fixed. |
| 2 | Some changes to the propoed resolutions were applied (marked green) according to the discussion on the Wednesday AM1 PHY ad-hoc session in May 2025 IEEE meeting. |
| 3 | Some additional changes were applied based on the discussion on the Wednesday PM2 PHY ad-hoc session in May 2025 meeting. |
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**CC50 Comments**

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| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 2270 | Yan Zhang | 38.3.8 | 116.24 | "LDPC coding with codeword block length up to 1944 bits" should be "LDPC coding with nominal codeword length up to 1944 bits". If repetition code bits are added to the codeword, the block length can be greater than 1944 bits. | As in comment | **ACCEPTED.** |
| 125 | Jialing Li | 38.3.9 | 116.55 | The whole sentence of "The generation of each field in a UHR PPDU uses" "Frequency domain duplication over 52-tone regular RUs (RRU52s) if a UHR ELR PPDU is transmitted." doesn't sound right. Change "if a UHR ELR PPDU is transmitted" to "if the UHR PPDU is a UHR ELR PPDU". | Refer to the comment. | **REVISED.**  Change "if a UHR ELR PPDU is transmitted" to "if the ~~UHR~~ PPDU is a UHR ELR PPDU".  TGbn editor: please implement changes as shown in this document tagged (#125) |
| 1335 | Juan Fang | 38.3.9 | 117.17 | remove space between "L-" and "LTF" in the end | see comment | **ACCEPTED.** |
| 1128 | Dong Guk Lim | 38.3.9 | 117.51 | Add the Transmitter block diagram for the L-SIG, RL-SIG, and U-SIG fields for a UHR ELR PPDU. | As the comment. | **REVISED.**  Agree with the comment.  TGbn editor: please implement changes as shown in this document tagged (#1128). |
| 1336 | Juan Fang | 38.3.9 | 118.01 | missing " subchannels" after "20 MHz" | Add " subchannels" after "20 MHz" | **ACCEPTED.** |
| 576 | Eunsung Park | 38.3.9 | 118.26 | Add a description of the transmitter block diagram for the L-SIG, RL-SIG, and U-SIG fields of an ELR PPDU | See the comment. | **REVISED.**  Agree with the com-ment. The comment addresses similar topic to the CID 1128.  TGbn editor: please implement changes as shown in this document tagged (#1128). |
| 1129 | Dong Guk Lim | 38.3.9 | 118.30 | Delete the last sentence ie., "for PPDU bandwidth greater than 80 MHz." | As the comment. | **ACCEPTED.** |
| 1337 | Juan Fang | 38.3.9 | 118.30 | "for PPDU bandwdith greater than 80 MHz" seems paste in error | delete"for PPDU bandwdith greater than 80 MHz" | **ACCEPTED.** |
| 2762 | Rong Zhang | 38.3.9 | 118.30 | Remove "for PPDU bandwidth ..." | see comments | **ACCEPTED.** |
| 126 | Jialing Li | 38.3.9 | 119.08 | In Figure 38-10, correct the typo in "Onstellation Mapper" and change it to "Constellation Mapper. Same comment to P125L15 (Figure 38-18), P125L46 (Figure 38-19). | Refer to the comment. | **ACCEPTED.** |
| 2271 | Yan Zhang | 38.3.9 | 119.08 | In Figure 38-10, Scrambler block should not be included for generating UHR ELR-SIG field. Please remove the block. | As in comment | **REVISED.**  In addition to “Scrambler” block, “Pre-FEC PHY padding” block should also be deleted.  TGbn editor: please implement changes as shown in this document tagged (#2271). |
| 1130 | Dong Guk Lim | 38.3.9 | 119.12 | Figure 38-10 has a typo. | Change "Onstellation Mapper" with "Constellation Mapper" | **ACCEPTED.** |
| 1930 | Yingqiao Quan | 38.3.9 | 119.12 | Typo in Figure 38-10--Transmitter block diagram for the UHR ELR-SIG field of a UHR ELR PPDU, "Onstellation Mapper" should be "Constellation Mapper". | As in comment. | **ACCEPTED.** |
| 1081 | Kanke Wu | 38.3.9 | 119.14 | "Onstellation Mapper (BPSK)", typo, "Constellation Mapper" | change to "Constellation" | **ACCEPTED.** |
| 2440 | Thomas Handte | 38.3.9 | 119.14 | Typo "Onstellation Mapper" in Fig. 38-10 | "Constellation Mapper" | **ACCEPTED.** |
| 127 | Jialing Li | 38.3.9 | 119.24 | Suggest to combine Figure 38-10 (for ELR-SIG) and Figure 38-18 (for BCC encoding Data in ELR PPDU) into one figure and remove "BSPK" (in Figure 38-10) and "BPSK or QPSK" (in Figure 38-18) in the "Onstellation Mapper" block. They're essentially the same and the only difference is the constellation. However, the exact constellation (e.g., BSPK in legacy SIG fields) are not mentioned in other figures (e.g., Figure 38-7, Figure 38-8). This detail could be stated in text. | Refer to the comment. | **REVISED.**  Partially agree with the comment.  The typo should be fixed. As pointed out in the CID 2271, ELR-SIG does not use the scrambler function but Data in ELR PPDU use it.  Therefore, the TGbn draft should have the fugures for ELR-SIG and Data in ELR PPDU individually .  TGbn editor: please implement changes as shown in this document tagged (#127). |
| 1082 | Kanke Wu | 38.3.9 | 119.27 | "Figure 38-12 ....." should be "Figure 38-11". The paragraph should be describing Figure 38-11 instead of 38-12 | See comment | **ACCPETED.** |
| 1131 | Dong Guk Lim | 38.3.9 | 119.27 | Figure 38-12 should be changed with figure 38-11. | As the comment. | **ACCPETED.** |
| 1338 | Juan Fang | 38.3.9 | 119.27 | no space between "MU-" and "MIMO" | remove the space between "MU-" and "MIMO" | **ACCEPTED.** |
| 1759 | Yapu Li | 38.3.9 | 119.27 | Figure 38-12 should be Figure 38-11. Also in P119L32 | Change "Figure 38-12" to "Figure 38-11" | **ACCEPTED.** |
| 2763 | Rong Zhang | 38.3.9 | 119.27 | Figure 38-12 should be changed to Figure 38-11 in line 27 and line 32 | see comments | **ACCEPTED.** |
| 1339 | Juan Fang | 38.3.9 | 119.30 | add space after "applies)" | see comment | **ACCEPTED.** |
| 1132 | Dong Guk Lim | 38.3.9 | 119.32 | Figure 38-12 should be changed with figure 38-11. | As the comment. | **ACCEPTED.** |
| 929 | Wookbong Lee | 38.3.9 | 119.42 | EQM and UEQM Stream Parser are not defined. Define it or remove EQM/UEQM in front of stream parser in figures in 38.3.9 | As in comment | **REVISED.**  In this subclause, there is no definition about EQM/UEQM stream parser.  In addition, as the CID 308 points out, in the "Construction of Data field (38.3.10.12)" no distinction is made for EQM/UEQM. So, the Constellation mapper is a block that handles both of them.  TGbn editor: please implement changes as shown in this document tagged (#929). |
| 1340 | Juan Fang | 38.3.9 | 120.34 | no space between "MU-" and "MIMO" | remove the space between "MU-" and "MIMO" | **ACCEPTED.** |
| 577 | Eunsung Park | 38.3.9 | 120.39 | UEQM is not always allowed in a UL transmission. For UL, it is only allowed in a UL SU transmission using UHR MU PPDU. Correct it. | See the comment. | **REVISED.**  The resolution to CID 578 addresses the comment.  TGbn editor: please implement changes as shown in this document tagged (#578). |
| 578 | Eunsung Park | 38.3.9 | 120.42 | DL non-MU MIMO includes DL SU. Also, for UL, UEQM is only allowed in a UL SU transmission using UHR MU PPDU. Change "a DL transmission" to "a UL SU transmission using UHR MU PPDU". | See the comment. | **ACCEPTED.** |
| 1083 | Kanke Wu | 38.3.9 | 120.42 | "generate the Data field of a DL transmission or DL non-MUMIMO".. Should be "generate the Data field of a UL transmission or DL non-MU-MIMO transmission" | See comment | **REVISED.**  The resolution to CID 308 merges Figures 38-12 and 38-13, which resolves this CID.  TGbn editor: please implement changes as shown in this document tagged (#308). |
| 2272 | Yan Zhang | 38.3.9 | 120.42 | "Figure 38-13 (Transmitter block diagram for the UL transmission or DL non-MU-MIMO transmission of a Data field with LDPC encoding on an RU or MRU equal to or smaller than a 996-tone RU when UEQM applies) shows the transmitter blocks used to generate the Data field of a DL transmission or DL non-MU-MIMO transmission with LDPC encoding on an RU or MRU whose size is the same as or smaller than a 996-tone RU when UEQM is applied to the spatial streams of the user." Please clarify that UL transmission is not a UL TB PPDU transmission which UEQM does not apply to. "DL transmission or DL non-MUMIMO transmission" is wrong, the DL transmission should be corrected to "UL transmission which is not a response to a triggering frame". | As in comment | **REVISED.**  The resolution to CID 308 merges Figures 38-12 and 38-13, which resolves this CID.  TGbn editor: please implement changes as shown in this document tagged (#308). |
| 2764 | Rong Zhang | 38.3.9 | 120.42 | Change from "DL" to "DL SU" | see comments | **REVISED.**  The resolution to CID 308 merges Figures 38-12 and 38-13, which resolves this CID.  TGbn editor: please implement changes as shown in this document tagged (#308). |
| 308 | Sigurd Schelstraete | 38.3.9 | 121.21 | "Transmitter block diagram (...) when UEQM applies". This figure can apply to both EQM and UEQM. No need to duplicate. Note that for instance in the "Construction of Data field (38.3.10.12)" no distinction is made for EQM/UEQM. The Constellation mapper is a block that handles both of these. | Delete Figure 38-13 and have only one figure to show multi-stream transmission (i.e. consolidtae Figure 38-13 and 38-14) | **REVISED.**  It is correct that no distinction is made for EQM/UEQM and the block diagrams should be revised. A part of this point is implemented as the resolution to the CID 929.  In addition, there is no need to distinguish EQM/UEQM in this subclause.  As a result, Figures 12 and 13 become almost identical and should be merged. .  TGbn editor: please implement changes as shown in this document tagged (#308). |
| 2725 | Rong Zhang | 38.3.9 | 121.21 | Figure 38-13 should exclude "UL transmission" since UEQM is for DL | see comments | **REVISED.**  As the resolution to the CID 308, The figure does not limit to EQM.  TGbn editor: please implement changes as shown in this document tagged (#308). |
| 1622 | Jian Yu | 38.3.9 | 121.27 | Remove editor's note | as in comment | **REVISED.**  In addition to this part, the editor’s note at the earlier part should also be removed.  TGbn editor: please implement changes as shown in this document tagged (#1622). |
| 1133 | Dong Guk Lim | 38.3.9 | 121.35 | OFDMA + MU-MIMO does not apply to 242 tone RU. So, the title of figure 38-14 should be modified. | Change with " Transmitter block diagram for the DL non-OFDMA MU-MIMO transmission of a Data field with BCC encoding on a 242-tone RU when EQM applies" | **REVISED.**  As the resolution to the CID 930, Figure 38-14 should be deleted.  TGbn editor: please implement changes as shown in this document tagged (#930). |
| 3238 | Yusuke Asai | 38.3.9 | 122.03 | The Figure 38-14 should be revised for editorial corretion. Ditto Figure 38-15 | The commentor will provide the revised Visio figure. | **REVISED.**  Some editorial corrections in terms of figure overlapping are made.  TGbn editor: please implement changes as shown in this document tagged (#3238). |
| 930 | Wookbong Lee | 38.3.9 | 122.35 | Several features which aim for high throughput defined in UHR uses only LDPC. It would be good to apply only LDPC in DL MU-MIMO as well. If group decided to remove BCC for MU-MIMO, then remove figure 38-14 and add statement only LDPC is applicable for MU-MIMO. | As in comment | **REVISED.**  TGbn decided that “LDPC is the only FEC coding scheme for DL/UL MU-MIMO in 11bn” by the Motion 325. As a result, Figure 38-14, that includes BCC encoding, is not allowed and should be deleted.  TGbn editor: please implement changes as shown in this document tagged (#930). |
| 1134 | Dong Guk Lim | 38.3.9 | 122.35 | OFDMA + MU-MIMO does not apply to 242 tone RU. So, the title of figure 38-14 should be modified. | Change with " Transmitter block diagram for the DL non-OFDMA MU-MIMO transmission of a Data field with BCC encoding on a 242-tone RU when EQM applies" | **REVISED.**  As the proposed resolution in the CID 930, Figure 38-14 is deleted.  TGbn editor: please implement changes as shown in this document tagged (#930). |
| 1135 | Dong Guk Lim | 38.3.9 | 122.39 | OFDMA + MU-MIMO does not apply to 242 tone RU and 484 tone RU. So, the title of figure 38-15 and description should be modified. | By considering the RUs for OFDMA+MU-MIMO, revise the title of figure 38-15 and description. | **REVISED.**  As a contrast to Figure 38-13 (…on an RU or MRU equal to or smaller than a 996-tone RU) and figure 38-16 (…on RU or MRU size larger than a 996-tone RU), the title of Figure 15 should be (…on RU or MRU size equal to or smaller than a 996-tone RU).  TGbn editor: please implement changes as shown in this document tagged (#1135). |
| 579 | Eunsung Park | 38.3.9 | 124.33 | UEQM is not always allowed in a UL transmission. For UL, it is only allowed in a UL SU transmission using UHR MU PPDU. Correct it. | See the comment. | **REVISED.**  As the proposed resolution in the CID 308, this figure does not limit UEQM cases.  TGbn editor: please implement changes as shown in this document tagged (#308). |
| 2273 | Yan Zhang | 38.3.9 | 124.34 | "Figure 38-17 (Transmitter block diagram for the UL transmission or DL non-MU-MIMO transmission of a Data field with LDPC encoding on an RU or MRU larger than a 996-tone RU when UEQM applies)shows the transmitter blocks used to generate the Data field of a DL SU transmission or DL non-MU-MIMO transmission with LDPC encoding in an RU or MRU whose size is larger than a 996-tone RU when UEQM is applied to the spatial streams of the user." Please clarify that UL transmission is not UL TB PPDU which UEQM is not apply to. "DL SU transmission" should be "UL transmission which is not a response to a triggering frame". | As in comment | **REVISED.**  Change "a DL SU transmission" to "a UL SU transmission using UHR MU PPDU".  TGbn editor: please implement changes as shown in this document tagged (#580). |
| 580 | Eunsung Park | 38.3.9 | 124.36 | DL non-MU MIMO includes DL SU. Also, for UL, UEQM is only allowed in a UL SU transmission using UHR MU PPDU. Change "a DL SU transmission" to "a UL SU transmission using UHR MU PPDU". | See the comment. | **ACCEPTED.** |
| 1084 | Kanke Wu | 38.3.9 | 124.36 | "Data field of a DL SU transmission" should be "Data field of a UL transmission" | See comment | **REVISED.**  Change "a DL SU transmission" to "a UL SU transmission using UHR MU PPDU".  TGbn editor: please implement changes as shown in this document tagged (#580). |
| 2726 | Rong Zhang | 38.3.9 | 124.54 | Figure 38-17 should exclude "UL transmission" since UEQM is for DL | see comments | **REVISED.**  As the proposed resolution in the CID 930, Figure 38-14 is deleted.  TGbn editor: please implement changes as shown in this document tagged (#930). |
| 1623 | Jian Yu | 38.3.9 | 124.6 | Remove editor's note | as in comment | **ACCEPTED.** |
| 946 | Wookbong Lee | 38.3.9 | 125.07 | Typo | Update figures with "Onstellation" to "Constellation" in figures 38-18 and 38-19. | **ACCEPTED.** |
| 3239 | Yusuke Asai | 38.3.9 | 125.1 | In the Figure 38-18, It is seemed that the CSD blocks are needed to convert when single spatial stream is duplicated to to N\_TX transmit chains as well as the legacy portions. Ditto the Figure 38-19. | Remove spatial mapping, duplicate the single spatial stream to the N\_TX transmit chain, and add CSD for the 2nd or more transmit chain. | **REJECTED.**  The commentor needs further clarification about the comment. If there needs to revise these diagrams, the commenter should investigate the next version of the draft and submit appropriate comments. |
| 3240 | Yusuke Asai | 38.3.9 | 125.1 | In Figure 38-18, "Onstellation Mapper" should be the typo of "Constellation Mapper". Ditto Figure 38-19. | The commentor will provide the revised Visio figures. | **ACCEPTED.** |
| 1136 | Dong Guk Lim | 38.3.9 | 125.18 | Fix typo in figure 38-18, change 'Onstellation Mapper" with "Constellation Mapper" | As the comment. | **ACCEPTED.** |
| 1931 | Yingqiao Quan | 38.3.9 | 125.19 | Typo in Figure 38-18--Transmitter block diagram for the Data field of a UHR ELR PPDU transmission with BCC encoding, "Onstellation Mapper" should be "Constellation Mapper". | As in comment. | **ACCEPTED.** |
| 2441 | Thomas Handte | 38.3.9 | 125.21 | Typo "Onstellation Mapper" in Fig. 38-18 | "Constellation Mapper" | **ACCEPTED.** |
| 1085 | Kanke Wu | 38.3.9 | 125.22 | "Onstellation Mapper (BPSK)", typo, "Constellation Mapper" Same on line 52 | Change to "Constellation" | **ACCEPTED.** |
| 26 | Zheng Guo | 38.3.9 | 125.31 | A typo in the Figure 38-18 and Figure 38-19, it should be "Constellation" | it should be "Constellation" | **ACCEPTED.** |
| 1137 | Dong Guk Lim | 38.3.9 | 125.5 | Fix typo in figure 38-19, change 'Onstellation Mapper" with "Constellation Mapper" | As the comment. | **ACCEPTED.** |
| 1932 | Yingqiao Quan | 38.3.9 | 125.5 | Typo in Figure 38-19--Transmitter block diagram for the Data field of a UHR ELR PPDU transmission with LDPC encoding, "Onstellation Mapper" should be "Constellation Mapper". | As in comment. | **ACCEPTED.** |
| 2442 | Thomas Handte | 38.3.9 | 125.52 | Typo "Onstellation Mapper" in Fig. 38-19 | "Constellation Mapper" | **ACCEPTED.** |

**Proposed Changes to P802.11bn D0.2:**

* **Enhanced long range PPDU**

A UHR Enhanced Long Range (ELR) PPDU can be used to overcome the link budget imbalance between downlink and uplink or can be used to achieve higher data rate when compared to a DSSS PPDU defined in Clause 15 (DSSS PHY specification for the 2.4 GHz band designated for ISM applications).

A UHR ELR PPDU is applicable for 2.4 GHz, 5 GHz, and 6 GHz bands in uplink, and only for 2.4 GHz in downlink. A UHR ELR PPDU is defined only for 20 MHz PPDU bandwidth, a single spatial stream and UHR-MCSs 0 and 1 with four times frequency domain duplication over 52-tone regular RUs (RRU52s or 52-tone RRUs) in primary 20 MHz channel. UHR ELR PPDU supports using BCC and LDPC coding with nominal (#2270) codeword block length up to 1944 bits. A UHR ELR PPDU sets the PPDU Type And Compression Mode subfield in the U-SIG field (Table 38-22 (U-SIG field of a UHR ELR PPDU))to 3, and includes the ELR-MARK field right after the U-SIG field.

* **Transmitter block diagram**

The generation of each field in a UHR PPDU uses many of the following blocks:

* Pre-FEC PHY padding
* Scrambler
* FEC (BCC or LDPC) encoders
* Post-FEC PHY padding
* Stream parser
* Segment parser (for RU or MRU size larger than 996 tones)
* BCC interleaver
* Constellation mapper
* DCM tone mapper
* Pilot insertion
* Replication over multiple 20 MHz (for bandwidth greater than 20 MHz)
* LDPC tone mapper
* Segment deparser
* Frequency domain duplication over 52-tone regular RUs (RRU52s) if the PPDU is a UHR ELR PPDU(#125)
* CSD per spatial stream insertion
* Spatial mapper
* Frequency mapping
* IDFT
* CSD per chain insertion
* GI insertion
* Windowing

(#1622)Figure 38-7 (Transmitter block diagram for the L-SIG, RL-SIG, and U-SIG fields for a UHR MU PPDU) to

Figure 38-19 (Transmitter block diagram for the Data field of a UHR ELR PPDU transmission with LDPC encoding) show example transmitter block diagrams. The actual structure of the transmitter is implementation dependent.

In particular, Figure 38-7 (Transmitter block diagram for the L-SIG, RL-SIG, and U-SIG fields for a UHR MU PPDU) shows the transmit process for the L-SIG, RL-SIG, and U-SIG fields of a UHR MU PPDU using one 80 MHz frequency subblock. These transmit blocks are also used to generate the L-STF and L-LTF(#1335) fields of the UHR MU PPDU with the following exceptions:

— The BCC encoder and interleaver as well as constellation mapper are not used when generating the L-STF and L-LTF fields.

NOTE—For a UHR MU PPDU, the duplication on 20 MHz channels is subject to the availability of 20 MHz channels in the case of preamble puncturing. The U-SIG field contents may be different in different 80 MHz frequency subblocks.



**Figure 38-7—Transmitter block diagram for the L-SIG, RL-SIG, and U-SIG fields for a UHR MU PPDU**

Figure 38-8 (Transmitter block diagram for the L-SIG, RL-SIG, and U-SIG fields of a UHR TB PPDU) shows the transmit process for the L-SIG, RL-SIG, and U-SIG fields of a UHR TB PPDU. These transmit blocks are also used to generate the L-STF and L-LTF fields of the UHR TB PPDU with the following exception:

— The BCC encoder, interleaver, and constellation mapper are not used when generating the L-STF and L-LTF fields.

The L-SIG, RL-SIG, and U-SIG fields are duplicated over multiple 20 MHz subchannels (#1336) if the UHR modulated fields are allocated in an RU or MRU > 242 tones.



**Figure38-8—Transmitter block diagram for the L-SIG, RL-SIG, and U-SIG fields of an UHR TB PPDU**

(#1128) Figure 38-8.1 (Transmitter block diagram for the L-SIG, RL-SIG, and U-SIG fields of a UHR ELR PPDU) shows the transmit process for the L-SIG, RL-SIG, and U-SIG fields of a UHR ELR PPDU. These transmit blocks are also used to generate the L-STF and L-LTF fields of the UHR ELR PPDU with the following exceptions:

— The BCC encoder and interleaver as well as constellation mapper are not used when generating the L-STF and L-LTF fields.

NOTE—For a UHR ELR PPDU, the channel bandwidth is fixed to 20 MHz.



**Figure 38-8-1—Transmitter block diagram for the L-SIG, RL-SIG, and U-SIG fields for a UHR ELR PPDU**

Figure 38-9 (Transmitter block diagram for the UHR-SIG fields of a UHR MU PPDU) shows the transmit process for the UHR-SIG field of a UHR MU PPDU. This block diagram is for transmitting UHR-SIG in one 20 MHz subchannel. Refer to 38.3.15.9.2 (UHR-SIG content channels) for the methods of transmitting UHR-SIG in 40 MHz, 80 MHz, 160 MHz, and 320 MHz.(#1129) (#1337) (#2762)



**Figure 38-9—Transmitter block diagram for the UHR-SIG field for an UHR MU PPDU**

Figure 38-10 (Transmitter block diagram for the UHR ELR-SIG field of a UHR ELR PPDU) shows the transmit process for the UHR ELR-SIG field of a UHR ELR PPDU.



(#126) (#2271) (#1130) (#1930) (#1081) (#2440) (#127) **Figure 38-10— Transmitter block diagram for the UHR ELR-SIG field of a UHR ELR PPDU**

Figure 38-11 (#1082) (#1131) (#1759) (#2763) (Transmitter block diagram for the UL transmission or DL non-MU-(#1338)MIMO transmission of aData field with LDPC encoding on an RU or MRU size equal to or smaller than a 996-tone RU(#308)) (#1339) shows the transmitter blocks for the UL transmission or DL non-MU-MIMO transmission of a Data field with BCC encoding on an RU or MRU smaller than or equal to 242 tone if the number of spatial streams is less than or equal to 4. Figure 38-11 (#1759) (#2763) (#1132) (Transmitter block diagram for the UL transmission or DL non-MU- MIMO transmission of a Data field with LDPC encoding on an RU or MRU size equal to or smaller than a 996-tone RU(#308)) applies to the Data field of a UHR MU PPDU that is transmitted on an RU or MRU allocated to a single user and the Data field of a UHR TB PPDU (whether or not it is spatially multiplexed with other users).

A subset of these transmitter blocks consisting of the CSD blocks, as well as the blocks to the right of, and including, the spatial mapping block, are also used to generate the UHR-LTF and UHR-STF fields.



(#929)

**Figure 38-11—Transmitter block diagram for the UL transmission or DL non-MU-MIMO transmission of a Data field with BCC encoding on an RU or MRU size equal to or smaller than a 242-tone RU(#308)**

Figure 38-12 (Transmitter block diagram for the UL transmission or DL non-MU- MIMO transmission of a Data field with LDPC encoding on an RU or MRU size equal to or smaller than a 996-tone RU(#308)) shows the transmitter blocks for the UL transmission or DL non-MU-MIMO transmission of a Data field with LDPC encoding on an RU or MRU that is the same size or smaller than a 996-tone RU(#308). Figure 38-12 (Transmitter block diagram for the UL transmission or DL non-MU- MIMO transmission of a Data field with LDPC encoding on an RU or MRU size equal to or smaller than a 996-tone RU(#308)) applies to the Data field of a UHR MU PPDU that is transmitted on an RU or MRU allocated to a single user and the Data field of a UHR TB PPDU (whether or not it is spatially multiplexed with other users).

Note – In UEQM modulation, the maximum number of spatial streams is less than or equal to four..(#308)



(#929)

**Figure 38-12—Transmitter block diagram for the UL transmission or DL non-MU-(#1340)MIMO transmission of a Data field with LDPC encoding on an RU or MRU size equal to or smaller than a 996-tone RU (#308)**

(#308)

(#1622)

(#930)

Figure 38-15 (Transmitter block diagram for the DL MU-MIMO transmission of a Data field with LDPC encoding on an RU or MRU equal to or smaller than a 996-tone RU (#1135) (#308)) shows the transmitter blocks for the transmission, in a UHR MU PPDU, of the Data field with LDPC encoding on a 242-, 484-, 484+242-, or 996-tone RU or MRU allocated to more than one user(#308).



(#929) (#3238)

**Figure 38-15—Transmitter block diagram for the DL MU-MIMO transmission of a Data field with LDPC encoding on an RU or MRU equal to or smaller than a 996-tone RU (#1135) (#308)**

Figure 38-16 (Transmitter block diagram for the Data field of a UHR SU transmission with LDPC encoding on RU or MRU size larger than a 996-tone RU(#308)) shows the transmitter blocks used to generate the Data field of a single-user UHR transmission with LDPC encoding on RU or MRU size larger than 996 tone.



(#929)

**Figure 38-16—Transmitter block diagram for the Data field of an UHR SU transmission with LDPC encoding on RU or MRU size larger than a 996-tone RU (#308)**

Figure 38-17 (Transmitter block diagram for the UL transmission or DL non-MU-MIMO transmission of a Data field with LDPC encoding on an RU or MRU larger than a 996-tone RU(#308)) shows the transmitter blocks used to generate the Data field of UL SU transmission using UHR MU PPDU (#580) or DL non-MU-MIMO transmission with LDPC encoding in an RU or MRU whose size is larger than a 996-tone RU(#308).



(#929)

**Figure 38-17— Transmitter block diagram for the UL SU transmission using UHR MU PPDU (#580) or DL non-MU-MIMO transmission of a Data field with LDPC encoding on an RU or MRU larger than a 996-tone RU (#308)**

(#1623)

Figure 38-18 (Transmitter block diagram for the Data field of a UHR ELR PPDU transmission with BCC encoding) shows the transmit blocks used to generate the Data field of a UHR ELR PPDU with BCC encoding.



(#126) (#946) (#3240) (#1136) (#1931) (#2441) (1085) (#26)

**Figure 38-18— Transmitter block diagram for the Data field of a UHR ELR PPDU transmission with BCC encoding**

Figure 38-19 (Transmitter block diagram for the Data field of a UHR ELR PPDU transmission with LDPC encoding)shows the transmit blocks used to generate the Data field of a UHR ELR PPDU with LDPC encoding.

(#946) (#3240) (#1136) (#26) (#1137) (#1932) (#2442)

**Figure 38-19— Transmitter block diagram for the Data field of a UHR ELR PPDU transmission with LDPC encoding**

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**Appendix: Visio files for the figures:**

