IEEE P802.11  
Wireless LANs

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| LB 203 Comment Resolution for Section 24.3.17.5 and Annex E | | | | |
| Date: 2014-09-15 | | | | |
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Abstract

This submission proposes resolutions for comments in subclause 24.3.17.5.4 of TGah Draft 2.1 with the following CIDs:

* 3073, 3521, 3568, 3569, 3570, 3571, 3572, 3887, 4003, 4005, 4135, 4146, 4204, 3673, 3674, 3675

This submission proposes resolutions for comments in subclause 24.3.17.5.2 of TGah Draft 2.1 with the following CIDs:

* 4173

This submission proposes resolutions for comments in Annex E of TGah Draft 2.1 with the following CIDs:

* 3078, 4172

Revisions:

* Rev 0: Initial version of the document

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGah Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGah Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGah Editor: Editing instructions preceded by “TGah Editor” are instructions to the TGah editor to modify existing material in the TGah draft. As a result of adopting the changes, the TGah editor will execute the instructions rather than copy them to the TGah Draft.***

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 3073 | 456.10 | 24.3.17.5.4 | "The PHY shall hold the CCA indication as BUSY for the duration of the PPDU"  This is written as though the CCA were a continuous signal, when it is, in fact, a discrete event. | Change language to "shall not generate a PHY-CCA.indication(BUSY) primitive until the end of the PPDU, as determined from its duration" or some such. See .11ac for examples.  Likewise at 456.54, 458.07, and 458.30. | Revise.  Accept in pricinple. See detailed text resolution in 11-14-1126/r0 |
| 3521 | 455.41 | 24.3.17.5.4 | Use of "must" is discouraged | Change from "must obey" to "shall use" | Revise.  Accept in pricinple. See detailed text resolution in 11-14-1126/r0 |
| 3568 | 455.45 | 24.3.17.5.4 | This paragraph describes how to set primary 1MHz CCA busy in Type 1 channel, including start of packet detection and mid-packet detection. However the 3rd sub-bullet talks about >=2MHz. All we care here at the receiver is what we see in primary 1MHz channel, regardless of packet format (S1G\_1M, S1G\_SHORT, S1G\_LONG). In third bullet, it is also very unclear what "-89dBm/2MHz" mean. | Merge sub-bullets 2 and 3 into one bullet, and change the text two "An ongoing S1G PPDU that occupies the Primary 1MHz channel...-89dBm..." make similar correction for the next paragraph on Type 2 Channel, and also for the next sub-clause on Type 2 intended 8/16MHz transmissions. | Revise.  Change -89dBm/2MHz to “-89dBm within the Primary 2MHz channel”.  Add provisions for duplicated PPDUs  Reject proposed change to merge bullet points because this would mean S1G\_1M PPDUs in non-Primary 1MHz of Primary 2MHz that exceed threshold for aCCAMidTime can trigger a busy condition for Primary 1MHz, which is not desired behavior.  Although text is longer, current approach differentiates midpacket detection behavior while monitoring Primary 1MHz and while monitoring Primary 2MHz. |
| 3569 | 456.22 | 24.3.17.5.4 | This sub-bullet defines the mid-packet detection CCA level for secondary 1MHz channel when operated in Type-1 bands, if a device is operated in >=2MHz BW. This unnecessarily increases the implementation complexity without much benefit even to the 1MHz OBSSs, because it yields only to the 1MHz OBSS located at secondary 1MHz channel, while its secondary 2MHz, secondary 4MHz and secondary 8MHz has much less CCA sensivity over a much wider BW, for all 1MHz OBSSs located at those channels the protection is much weaker anyways. If we just define mid-packet detection level of Primary 2MHz as -86dBm, it still covers a standalone secondary 1MHz signal of -86dBm, or -89dBm if it is part of an 1MHz dup packet. The same issue applies for Type-2 bands in next paragraph, as well as Type-2 bands for 8/16MHz intended transmissions in the next sub-clause | Revise this sub-bullet as "An ongoing S1G PPDU detected in the Primary 2 MHz channel at or above -86dBm with >90% probability within a period of aCCAMidTime (see 24.4.4 (PHY characteristics))." Apply the same for the next paragraph for Type-2 bands with sensitivity changed to -83dBm, and also for the next sub-clause on Type 2 intended 8/16MHz transmissions with sensitivity -83dBm. | Reject.  For Primary 2MHz CCA: disagree that specifying current Midpacket level for 1MHz PPDUs in non-Primary 1MHz within Primary 2MHz adds implementation complexity because this level can be achieved through single Midpacket detection check on full Primary 2MHz. Note that doing this check is already a requirement as part of Primary 1MHz CCA.  1MHz OBSSs in Secondary 2MHz, Secondary 4MHz, and Secondary 8MHz currently get -86dBm level of protection (using Type 1 channels as example). The Midpacket level of -89dBm for 1MHz PPDUs in the Secondary 1MHz is slightly more sensitive but it was done this way to keep this level the same as the Midpacket sensitivity to >=2MHz PPDUs (in the Primary 2MHz) and 1MHz PPDUs in the Primary 1MHz. Therefore it can be all be realized with a single 2MHz-wide Midpacket detection scheme. |
| 3570 | 456.60 | 24.3.17.5.4 | "Additionally, when a STA detects a PPDU with a value of the PAID field matching its Partial AID or matchning the BSSID of the BSS with which the STA is associated,..." There is no PAID field defined in SIG/SIG-A field (they use ID field), also there is even no ID field for S1G\_1M format. | Match the statement with the actual SIG field defintion, also mention "excep S1G\_1M PPDU" | Revise.  Accept in principle. See detailed text resolution in 11-14-1126/r0 |
| 3571 | 456.30 | 24.3.17.5.4 | Table 24-34 is for Type 2 channel, why mention here for Type-1 channel? | Quote the right table(s). | Revise.  Accept in principle. Remove reference to the Type 2 table.  See detailed text resolution in 11-14-1126/r0 |
| 3572 | 456.48 | 24.3.17.5.4 | Table 24-33 is for Type 1 channel, why mention here for Type-2 channel? | Quote the right table(s). | Revise.  Accept in principle. Remove reference to the Type 1 table.  See detailed text resolution in 11-14-1126/r0 |
| 3887 | 456.63 | 24.3.17.5.4 | what is the meaning of "protected duration"? there is no definition anywhere in the specification. Note also that this term is used back in the sectorized beam operation subclause and probably meaning something different than what is meant here - so one of the two uses needs to come up with a different term to avoid confusion and both need to define the term that they adopt | come up with a unique term to avoid conflict with the sectorized beam operation use of the same term "protected duration" and whatever is used here, please define it | Revise.  Accept in principle. Instead of using “protected duration”, use the term duration of the remainder of the PPDU as indicated in its preamble”  See detailed text resolution in 11-14-1126/r0 |
| 4003 | 456 | 24.3.17.5.4 | current CCA rule over protects 1MHz secondary channels | just define mid-packet detection level of Primary 2MHz as -86dBm | Reject.  1MHz OBSSs in Secondary 2MHz, Secondary 4MHz, and Secondary 8MHz currently get -86dBm level of protection (using Type 1 channels as example). The Midpacket level of -89dBm for 1MHz PPDUs in the Secondary 1MHz is slightly more sensitive but it was done this way to keep this level the same as the Midpacket sensitivity to >=2MHz PPDUs (in the Primary 2MHz) and 1MHz PPDUs in the Primary 1MHz. Therefore it can be all be realized with a single 2MHz-wide Midpacket detection scheme.  See resolution of CID 3569 for additional rationale. |
| 4005 | 456.63 | 24.3.17.5.4 | What is the meaning of "protected duration"? there is no definition anywhere in the specification. Note also that this term is used back in the sectorized beam operation subclause and probably meaning something different than what is meant here - so one of the two uses needs to come up with a different term to avoid confusion and both need to define the term that they adopt | Please come up with a unique term to avoid conflict with the sectorized beam operation use of the same term "protected duration" and whatever is used here, please define it. | Revise.  Accept in principle Instead of using “protected duration”, use the term duration of the remainder of the PPDU as indicated in its preamble”  See detailed text resolution in 11-14-1126/r0 |
| 4135 | 456.22 | 24.3.17.5.4 | For devices operating in Type 1 channels, the PHY shall issue a PHY-CCA.indication(BUSY, {primary2}) if the conditions for issuing PHY-CCA.indication(BUSY, {primary1}) are not present and one of the following conditions is met in an otherwise idle 2 MHz, 4 MHz, 8 MHz, or 16 MHz operating channel width: "An S1G\_1M PPDU detected in the non-Primary 1 MHz portion of the Primary 2 MHz channel at or above -89dBm with >90% probability within a period of aCCAMidTime (see 24.4.4 (PHY characteristics))."  This rule seems to selectively benefit 1MHz OBSSs in the secondary 1MHz, while those 1MHz OBSSs in the secondary 2/4/8MHz channels are not protected (or less protected).  Same issue with Type2 channels in the following paragraph. | Change this to "A S1G PPDU detected in the primary 2 MHz channel at or above -86dBm with >90% probability within a period of aCCAMidTime (see 24.4.4 (PHY characteristics))." Similar changes for following Type-2 paragraph. | Reject.  1MHz OBSSs in Secondary 2MHz, Secondary 4MHz, and Secondary 8MHz currently get -86dBm level of protection (using Type 1 channels as example). The Midpacket level of -89dBm for 1MHz PPDUs in the Secondary 1MHz is slightly more sensitive but it was done this way to keep this level the same as the Midpacket sensitivity to >=2MHz PPDUs (in the Primary 2MHz) and 1MHz PPDUs in the Primary 1MHz. Therefore it can be all be realized with a single 2MHz-wide Midpacket detection scheme.  See resolution of CID 3569 for additional rationale. |
| 4146 | 456.22 | 24.3.17.5.4 | Defining mid-packet detection CCA level for secondary 1MHz channel when operated in Type-1 bands is unnecessary if a device is operated in wider than 2MHz bandwith. This feature significantly increases the implementation complexity without much benefit, even for the 1MHz OBSSs. It only benefits for the 1MHz OBSS located at secondary 1MHz channel. The protection is much weaker for all 1MHz OBSSs located at its secondary 2MHz, secondary 4MHz and secondary 8MHz channels since they have much less CCA sensitivity over a much wider bandwidth. Defining mid-packet CCA detection level of primary 2MHz as -86dBm is sufficent as it still covers a stand-alone secondary 1MHz signal of -86dBm, or -89dBm if it is part of a 1MHz duple packet. This also applies for Type-2 bands in next paragraph, and Type-2 bands for 8/16MHz intended transmissions in the next sub-clause. | "An ongoing S1G PPDU detected in the Primary 2 MHz channel at or above -86dBm with >90% probability within a period of aCCAMidTime (see 24.4.4 (PHY characteristics))." Apply the same for the next paragraph for Type-2 bands with CCA level changed to -83dBm, and also for the next sub-clause on Type 2 intended 8/16MHz transmissions with CCA level changed to -83dBm. | Reject.  For Primary 2MHz CCA: disagree that specifying current Midpacket level for 1MHz PPDUs in non-Primary 1MHz within Primary 2MHz adds implementation complexity because this level can be achieved through single Midpacket detection check on full Primary 2MHz. Note that doing this check is already a requirement as part of Primary 1MHz CCA.  1MHz OBSSs in Secondary 2MHz, Secondary 4MHz, and Secondary 8MHz currently get -86dBm level of protection (using Type 1 channels as example). The Midpacket level of -89dBm for 1MHz PPDUs in the Secondary 1MHz is slightly more sensitive but it was done this way to keep this level the same as the Midpacket sensitivity to >=2MHz PPDUs (in the Primary 2MHz) and 1MHz PPDUs in the Primary 1MHz. Therefore it can be all be realized with a single 2MHz-wide Midpacket detection scheme. |
| 4204 | 456.22 | 24.3.17.5.4 | what is the meaning of "protected duration"? there is no definition anywhere in the specification. Note also that this term is used back in the sectorized beam operation subclause and probably meaning something different than what is meant here - so one of the two uses needs to come up with a different term to avoid confusion and both need to define the term that they adopt | come up with a unique term to avoid conflict with the sectorized beam operation use of the same term "protected duration" and whatever is used here, please define it | Revise.  Accept in principle. Instead of using “protected duration”, use the term duration of the remainder of the PPDU as indicated in its preamble”  See detailed text resolution in 11-14-1126/r0 |
| 3673 | 456.31 | 24.3.17.5.4 | Phrase "or Table 24-34 (Conditions for CCA BUSY on the Primary 2 MHz in Type 2 Channelization)" is not necessary because explanation of line 26 - 33 is for S1G devices operating in Type 1 channel. | Remove "or Table 24-34 (Conditions for CCA BUSY on the Primary 2 MHz in Type 2 Channelization)" from line 31. | Revise.  Accept in principle. See detailed text resolution in 11-14-1126/r0 |
| 3674 | 456.48 | 24.3.17.5.4 | Phrase "Table 24-33 (Additional Conditions for CCA BUSY on the Primary 2 MHz in Type 1 Channelization) or" is not necessary because explanation of line 45 - 52 is for S1G devices operating in Type 2 channel. | Remove "Table 24-33 (Additional Conditions for CCA BUSY on the Primary 2 MHz in Type 1 Channelization) or" from line 48. | Revise.  Accept in principle. See detailed text resolution in 11-14-1126/r0 |
| 3675 | 456.55 | 24.3.17.5.4 | "Additionally, for both Type 1 and Type 2 channels, the CCA indication will be BUSY if any received signal in the Primary 2 MHz channel exceeds the CCA-ED threshold of -72dBm within a period aCCATime." is redundant because section 24.3.17.5.3 mentions CCA ED conditions clearly. | Remove the sentence. | Reject.  Although CCA-ED threshold values are covered in 24.3.17.5.3, it is stated again in this section to describe clearly how these are mapped to the CCA primitives (i.e. PHY-CCA.indication(BUSY, {channel-list}) |
| 4173 | 454.53 | 24.3.17.5.2 | The referred Table E-1 has been removed in "Draft P802.11\_ah\_D2.0.pdf" | Change "Table E-1 through Table E-4" to "Table E-4 through Table E-4a" | Revise.  Accept in principle. See detailed text resolution in 11-14-1126/r0 |
| 4172 | 544.14 | E.1 | The referred sections 24.3.18.5.4 and 24.3.18.5.5 have been removed in "Draft P802.11\_ah\_D2.0.pdf" | Change the corresponding sections to 24.3.17.5.4 and 24.3.17.5.5 | Revise.  Accept in principle. See detailed text resolution in 11-14-1126/r0 |
| 3078 | 544.38 | E.1 | I object to adding an S1G-specific tale of operating classes, because other tables are organized by regulatory domain, not type of STA. | Split this into tables per regulatory domain. Append those rows to matching tables where they exist. The new CCA classification column could be handled by a table note or table footnote. | Reject  Table E-4 creates entries for the new ANAs related to S1G, and marks parameters as reserved. Table E-4a for S1G Operating classes defines the reserved parameters and additionally lists parameters specific to S1G, and not relevant to other ANAs (e.g. S1G operating class, CCA Level classification). |

**TGah Editor: Please modify the following text to the section below to resolve CID 3072**

* CCA sensitivity for signals occupying the Primary 2 MHz and/or Primary 1 MHz channel

In S1G operation, the CCA sensitivity levels a device shall use when detecting the start of S1G PPDUs are based on whether the occupied Primary channel in question is classified as Type 1 or Type 2.

For devices operating in Type 1 channels, the PHY shall issue a PHY-CCA.indication(BUSY, {primary1}) if one of the following conditions is present in an otherwise idle Primary 1 MHz channel:

* The start of an S1G\_1M PPDU or duplicated S1G\_1M PPDU detected in the Primary 1 MHz channel at or above - 98 dBm within the Primary 1MHz channel with >90% probability within a period aCCATime (see 24.4.4 (PHY characteristics)).
* An S1G\_1M PPDU or duplicated S1G\_1M PPDU detected in the Primary 1 MHz channel at or above -89dBm within the Primary 1MHz channel with >90% probability within a period of aCCAMidTime (see 24.4.4 (PHY characteristics)).
* A >= 2 MHz S1G\_SHORT or S1G\_LONG PPDU or a duplicated S1G\_SHORT or S1G\_LONG PPDU overlapping the Primary 2 MHz channel (in which the Primary 1 MHz is contained) detected at or above -89dBm within the Primary 2MHz channel (in regions where such PPDUs are permitted) with >90% probability within a period of aCCAMidTime (see 24.4.4 (PHY characteristics)).

For devices operating in Type 2 channels, the PHY shall issue a PHY-CCA.indication(BUSY, {primary1}) if one of the following conditions is present in an otherwise idle Primary 1 MHz channel:

* The start of an S1G\_1M PPDU or duplicated S1G\_1M PPDU detected in the Primary 1 MHz channel at or above - 89 dBm within the Primary 1MHz channel with >90% probability within a period aCCATime (see 24.4.4 (PHY characteristics)).
* An S1G\_1M PPDU or duplicated S1G\_1M PPDU detected in the Primary 1 MHz channel at or above -86dBm within the Primary 1MHz channel with >90% probability within a period of aCCAMidTime (see 24.4.4 (PHY characteristics)).
* A >= 2 MHz S1G\_SHORT or S1G\_LONG PPDU or a duplicated S1G\_SHORT or S1G\_LONG PPDU overlapping the Primary 2 MHz channel (in which the Primary 1 MHz is contained) detected at or above -86dBm within the Primary 2MHz channel (in regions where such PPDUs are permitted) with >90% probability within a period of aCCAMidTime (see 24.4.4 (PHY characteristics)).

The device shall not issue a PHY-CCA.indication(BUSY, {primary2}), PHY-CCA.indication(BUSY, {secondary2}), PHY-CCA.indication(BUSY, {secondary4}), or PHY-CCA.indication(BUSY, {secondary8}) until the end of the duration indicated by the packet or until all conditions above are no longer satisfied. Additionally, for both Type 1 and Type 2 channels, the device shall issue a PHY-CCA.indication(BUSY, {primary1}) if any received signal in the Primary 1 MHz channel exceeds the CCA-ED threshold of -75dBm within a period aCCATime.

For devices operating in Type 1 channels, the PHY shall issue a PHY-CCA.indication(BUSY, {primary2}) if the conditions for issuing PHY-CCA.indication(BUSY, {primary1}) are not present and one of the following conditions is met in an otherwise idle 2 MHz, 4 MHz, 8 MHz, or 16 MHz operating channel width:

* An S1G PPDU in the Primary 2MHz channel at or above -89dBm within the non-Primary 1MHz with >90% probability within a period of aCCAMidTime (see 24.4.4 (PHY characteristics)).
* Any of the applicable conditions listed in Table 24-33 (Additional Conditions for CCA BUSY on the Primary 2 MHz in Type 1 Channelization). An applicable condition shall be met (i.e., triggered) if the PHY detects the start of the described PPDU(s) in Table 24-33 (Additional Conditions for CCA BUSY on the Primary 2 MHz in Type 1 Channelization) with >90% probability within a period of aCCATime (see 24.4.4 (PHY characteristics)).

For devices operating in Type 2 channels, the PHY shall issue a PHY-CCA.indication(BUSY, {primary2}) if the conditions for issuing PHY-CCA.indication(BUSY, {primary1}) are not present and one of the following conditions is met in an otherwise idle 2 MHz, 4 MHz, 8 MHz, or 16 MHz operating channel width:

* An S1G PPDU in the Primary 2MHz channel at or above -86dBm within the non-Primary 1MHz with >90% probability within a period of aCCAMidTime (see 24.4.4 (PHY characteristics)).
* Any of the applicable conditions listed in Table 24-34 (Conditions for CCA BUSY on the Primary 2 MHz in Type 2 Channelization). An applicable condition shall be met (i.e., triggered) if the PHY detects the start of the described PPDU(s) in Table 24-34 (Additional Conditions for CCA BUSY on the Primary 2 MHz in Type 2 Channelization) with >90% probability within a period of aCCATime (see 24.4.4 (PHY characteristics)).

The device shall not issue a PHY-CCA.indication(BUSY, {secondary2}), PHY-CCA.indication(BUSY, {secondary4}), or PHY-CCA.indication(BUSY, {secondary8}) until the end of the duration indicated by the packet or until all conditions above are no longer satisfied. Additionally, for both Type 1 and Type 2 channels, the device shall issue a PHY-CCA.indication(BUSY, {primary2}) if any received signal in the Primary 2 MHz channel exceeds the CCA-ED threshold of -72dBm within a period aCCATime.

Additionally, when a STA detects an S1G\_SHORT or S1G\_LONG PPDU with an ID field of its SIG field indicating a Partial AID or COLOR value that matches its own Partial AID or BSSID, the PHY shall issue a PHY-CCA.indication(BUSY, {primary2}) for the remaining duration of the PPDU as indicated in its preamble.

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| * Additional Conditions for CCA BUSY on the Primary 2 MHz in Type 1 Channelization | |
| Operating Channel Width | Conditions |
| 2 MHz, 4 MHz, 8 MHz, 16 MHz | The start of a 2MHz S1G\_SHORT or S1G\_LONG PPDU, or of a duplicated S1G\_SHORT or S1G\_LONG PPDU at or above -92dBm in the primary 2MHz channel. |
| 4 MHz, 8 MHz, 16 MHz | The start of a 4MHz S1G\_SHORT or S1G\_LONG PPDU, or of a duplicated S1G\_SHORT or S1G\_LONG PPDU at or above -89dBm in the primary 4MHz channel. |
| 8 MHz, 16 MHz | The start of an 8MHz S1G\_SHORT or S1G\_LONG PPDU, or of a duplicated S1G\_SHORT or S1G\_LONG PPDU at or above -86dBm in the primary 8MHz channel. |
| 16 MHz | The start of a 16 MHz S1G PPDU at or above –83 dBm.  The start of a 16MHz S1G\_SHORT or S1G\_LONG PPDU, or of a duplicated S1G\_SHORT or S1G\_LONG PPDU at or above -83dBm. |

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| * Additional Conditions for CCA BUSY on the Primary 2 MHz in Type 2 Channelization | |
| Operating Channel Width | Conditions |
| 2 MHz, 4 MHz, 8 MHz, 16 MHz | The start of a 2MHz S1G\_SHORT or S1G\_LONG PPDU, or of a duplicated S1G\_SHORT or S1G\_LONG PPDU at or above -89dBm in the primary 2MHz channel. |
| 4 MHz, 8 MHz, 16 MHz | The start of a 4MHz S1G\_SHORT or S1G\_LONG PPDU, or of a duplicated S1G\_SHORT or S1G\_LONG PPDU at or above -86dBm in the primary 4MHz channel. |
| 8 MHz, 16 MHz | The start of an 8MHz S1G\_SHORT or S1G\_LONG PPDU, or of a duplicated S1G\_SHORT or S1G\_LONG PPDU at or above -83dBm in the primary 8MHz channel. |
| 16 MHz | The start of a 16MHz S1G\_SHORT or S1G\_LONG PPDU, or of a duplicated S1G\_SHORT or S1G\_LONG PPDU at or above -80dBm. |

* CCA sensitivity for devices in Type 2 channels implementing intended 8 or 16 MHz transmit channel width channel access procedure

For devices operating in Type 2 channels, if the device intends to transmit an 8 or 16 MHz channel width PPDU and the device implements the procedure and rules for high intended BW transmission channel access described in 9.22.2.5a (EDCA channel access in an S1G BSS(#3130)), the PHY shall issue a PHY-CCA.indication(BUSY, {primary1}) if one of the following conditions is present in an otherwise idle Primary 1 MHz channel:

* The start of an S1G\_1M PPDU or duplicated S1G\_1M PPDU detected in the Primary 1 MHz channel at or above - 86 dBm within the Primary 1MHz channel with >90% probability within a period aCCATime (see 24.4.4 (PHY characteristics)).
* An S1G\_1M PPDU or duplicated S1G\_1M PPDU detected in the Primary 1 MHz channel at or above -86dBm within the Primary 1MHz channel with >90% probability within a period of aCCAMidTime (see 24.4.4 (PHY characteristics)).
* A >= 2 MHz S1G\_SHORT or S1G\_LONG PPDU or a duplicated S1G\_SHORT or S1G\_LONG PPDU overlapping the Primary 2 MHz channel (in which the Primary 1 MHz is contained) detected at or above -86dBm within the Primary 2MHz channel with >90% probability within a period of aCCAMidTime (see 24.4.4 (PHY characteristics)).

The device shall not issue a PHY-CCA.indication(BUSY, {primary2}), PHY-CCA.indication(BUSY, {secondary2}), PHY-CCA.indication(BUSY, {secondary4}), or PHY-CCA.indication(BUSY, {secondary8}) until the end of the duration indicated by the packet or until all conditions above are no longer satisfied. Additionally, the device shall issue a PHY-CCA.indication(BUSY, {primary1}) if any received signal in the Primary 1 MHz channel exceeds the CCA-ED threshold of -75dBm within a period aCCATime.

The PHY shall issue a PHY-CCA.indication(BUSY, {primary2}) if the conditions for issuing PHY-CCA.indication(BUSY, {primary1}) are not present and one of the following conditions is met in an otherwise idle 8 MHz or 16 MHz operating channel width:

* An S1G PPDU in the Primary 2MHz channel at or above -86dBm within the non-Primary 1MHz with >90% probability within a period of aCCAMidTime (see 24.4.4 (PHY characteristics)).
* Any of the applicable conditions listed in Table 24-35 (Additional Conditions for CCA BUSY on the Primary 2 MHz in Type 2 Channelization for 8/16 MHz intended channel width). An applicable condition shall be met (i.e., triggered) if the PHY detects the start of the described PPDU(s) in Table 24-35 (Additional Conditions for CCA BUSY on the Primary 2 MHz in Type 2 Channelization for 8/16 MHz intended channel width) with >90% probability within a period of aCCATime (see 24.4.4 (PHY characteristics)).

The device shall not issue a PHY-CCA.indication(BUSY, {secondary2}), PHY-CCA.indication(BUSY, {secondary4}), or PHY-CCA.indication(BUSY, {secondary8}) until the end of the duration indicated by the packet or until all conditions above are no longer satisfied. Additionally, for both Type 1 and Type 2 channels, the device shall issue a PHY-CCA.indication(BUSY, {primary2}) if any received signal in the Primary 2 MHz channel exceeds the CCA-ED threshold of -72dBm within a period aCCATime.

Additionally, when a STA detects an S1G\_SHORT or S1G\_LONG PPDU with an ID field of its SIG field indicating a Partial AID or COLOR value that matches its own Partial AID or BSSID, the PHY shall issue a PHY-CCA.indication(BUSY, {primary2}) for the remaining duration of the PPDU as indicated in its preamble.

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| * Additional Conditions for CCA BUSY on the Primary 2 MHz in Type 2 Channelization for 8/16 MHz intended channel width | |
| Operating Channel Width | Conditions |
| 8 MHz, 16 MHz | The start of a 2MHz S1G\_SHORT or S1G\_LONG PPDU, or of a duplicated S1G\_SHORT or S1G\_LONG PPDU at or above -86dBm in the primary 2MHz channel. |
| 8 MHz, 16 MHz | The start of a 4MHz S1G\_SHORT or S1G\_LONG PPDU, or of a duplicated S1G\_SHORT or S1G\_LONG PPDU at or above -83dBm in the primary 4MHz channel. |
| 8 MHz, 16 MHz | The start of an 8MHz S1G\_SHORT or S1G\_LONG PPDU, or of a duplicated S1G\_SHORT or S1G\_LONG PPDU at or above -80dBm in the primary 8MHz channel. |
| 16 MHz | The start of a 16MHz S1G\_SHORT or S1G\_LONG PPDU, or of a duplicated S1G\_SHORT or S1G\_LONG PPDU at or above -77dBm. |

**TGah Editor: Please modify the following text to the section below to resolve CID 4173**

* Type 1 and Type 2 channelization for CCA levels

In S1G operation, the CCA sensitivity levels are defined such that they are dependent and specific to country channelization and channel location within the frequency band. For S1G channelizations in all regions of the world, there are to be two available classifications for channels and CCA levels, defined as Type 1 and Type 2.

For BSSs set up on channels classified as using Type 1, the AP and non-AP STA devices are required to use what are referred to in this subclause as Type 1 CCA levels when performing their CCA procedures. Likewise, if the BSS is set up on channels classified as Type 2, the AP and non-AP STA devices are required to use Type 2 specific CCA levels. The Type 1 and Type 2 channel classification for different operating classes in different regions of the world are denoted by "CCA Level Classification" in Table E-1 through Table E-4 in Annex E.

Instruction to TGah Editor: Please change hyperlink of highlighted text to reflect new numbering in D2.1, Table E-4a and Table E-4a

**TGah Editor: Please modify the following text to the section in Annex E below to resolve CID 4172**

* Country information and operating classes

NOTE - Definition of Type 1 and Type 2 channels for CCA Level Classification and required behavior is described in 24.3.18.5.4 (CCA sensitivity for signals occupying the Primary 2 MHz and/or Primary 1 MHz channel) and 24.3.18.5.5 (CCA sensitivity for signals not occupying the primary 2 MHz channel).

Instruction to TGah Editor: Please change hyperlink of highlighted text to reflect new numbering in D2.1, 24.3.17.5.4 and 24.3.17.5.5.