IEEE P802.11  
Wireless LANs

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| LB 195 Comment Resolution: Annex B Comments | | | | |
| Date: 2013-05-05 | | | | |
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Abstract

This submission presented proposed resolution to CIDs; 3014, 3015, 3016, 3017, 3018, 3019, 3020, 3021, 3022, 3023, 3024, 3061, 3062, and 3063 of WG LB #195. The reference document is P802.11af Draft D4.0.

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| --- | --- | --- | --- | --- | --- |
| 3014 | 270.26 | B.4.27.1 | In "TVHT1.3", "CF29" is refered, but it shall be "CF30". | Replace ""CF29" by "CF30". | Accepted. See changes in <this documnet> |
| 3015 | 270.36 | B.4.27.1 | TVHT shall use TVHT\_W and TVHT\_2W instead of 20 MHz and 40 MHz respectively. | Replace "20 MHz" and "40 MHz" by "TVHT\_W" and "TVHT\_2W" respectively. | Accepted. Seechange in <this document> |
| 3016 | 270.40 | B.4.27.1 | TVHTM8.2 shall be removed. Channel widths wider than TVHT\_4W and more than 4 spatial streams are not permitted for STAs operating as TVHT STAs. | Remove "TVHTM8.2" row. | Accepted. See changes in <this document> |
| 3017 | 270.44 | B.4.27.1 | TVHT shall use TVHT\_W and TVHT\_2W instead of 20 MHz and 40 MHz respectively. | Replace "20 MHz" and "40 MHz" by "TVHT\_W" and "TVHT\_2W" respectively. | Accepted. See changes in <this document> |
| 3018 | 270.48 | B.4.27.1 | TVHTM8.4 shall be removed. Channel widths wider than TVHT\_4W and more than 4 spatial streams are not permitted for STAs operating as TVHT STAs. | Remove "TVHTM8.4" row. | Accepted. See changes in <this document> |
| 3019 | 271.15 | B.4.27.1 | TVHTM14 to TVHT14.3 shall be removed. Channel widths wider than TVHT\_4W and more than 4 spatial streams are not permitted for STAs operating as TVHT STAs. | Remove TVHTM14 to TVHT14.3 rows. | Rejected: Quiet element is used in TVHT. |
| 3020 | 272.04 | B.4.27 | A PICS table for TVHT PHY Features is missing. | Insert new subclause B.4.27.2 "TVHT PHY Features", which is based on B.4.23.2 of IEEE P802.11ac D5.0 with following modifications.  (1) Remove VHTP3.4, VHTP3.5, VHTP5.4, VHTP5.5, VHTP8.1.13 to VHTP VHTP8.1.24, VHTP8.2 to VHTP8.2.24 and VHTP8.3 to VHTP8.3.24.  (2) Replace "VHT" by "TVHT".  (3) Replace reference to clause 22 by reference to clause 23.  (4) Replace "CF29" by "CF30".  (5) Replace "20 MHz", "40 MHz" and "80MHz" by "TVHT\_W", "TVHT\_2W" and "TVHT\_4W" respectively.  (6) Replace "400ns GI" by "Short guard interval" | Revised. See TVHT PHY Feature section in <this document> |
| 3021 | 266.60 | B.2.2 | Abbreviation definitions of "TVHTM" and "TVHTP" are missing. | Insert the following entry in the appropriate place in B.2.2.    TVHTM Television very high throughput MAC  TVHTP Television very high throughput PHY | Revised. See changes in <this document> |
| 3022 | 267.17 | B.4.4.1 | The MAC protocol capabilities PICS table needs to be modified, because MAC protocol capabilities which are mandatory or optional for a VHT STA are also mandatory or optional for a TVHT STA. | Insert new subclause B.4.4.1 "MAC protocol capabilities", which is based on B.4.4.1 of IEEE P802.11ac D5.0 with following modifications.  (1) Add "CF30:M" to Status of PC9.1.  (2) Add "CF30:O" to Status of PC9.2. | Accepted. |
| 3023 | 267.18 | B.4.4.2 | The MAC frames PICS table needs to be modified, because MAC frames which are mandatory or optional for a VHT STA are also mandatory or optional for a TVHT STA. | Insert new subclause B.4.4.2 "MAC frames", which is based on B.4.4.2 of IEEE P802.11ac D5.0 with following modifications.  (1) Remove "FT29" row.  (2) Add "TVHTM4.1:M" to Status of FT27.  (3) Add "TVHTM4.1:O" and "TVHT4.3:M" to Status of FT29.  (4) Add "TVHTM4.2:M" to Status of FR27.  (5) Add "TVHTM4.2:O" and "TVHTM4.4:M" to Status of FR28.  (6) Add "CF30:M" to Status of FR29. | Accepted |
| 3024 | 267.19 | B.4.19.1 | The HT MAC features PICS table needs to be modified, because HT MAC features which are mandatory or optional for a VHT STA are also mandatory or optional for a TVHT STA. | Insert new subclause B.4.19.1 " HT MAC features", which is based on B.4.19.1 of IEEE P802.11ac D5.0 with following modifications.  (1) Add "CF30:M" to Status of HTM3.5.  (2) Add "CF30:M" to Status of HTM8. | Revised. See changes in <this document> |
| 3061 | 269.01 | B.4.27.1 | I think there is a need to add a PICS entry indicating that a TVHT STA is a QoS STA. | as in comment | Revised. See changes in <this document> |
| 3062 | 269.56 | B.4.27.1 | TVHTM 4.1 and TVHTM4.2 are two similar entries. | Delete TVHTM 4.2 | Rejected. VHTM4.1 is for a beamformer while VHTM4.2 is for a beamformee. |
| 3063 |  | B.4.27 | PICS table doesn't include TVHT PHY feature section | add TVHTP indicating mandatory and optional support of the PHY features, e.g. channel BW, MCS, etc. | Revised. See TVHT PHY Feature section in <this document> |

Protocol Implementation Conformance Statement (PICS) proforma

* Abbreviations and special symbols
* General abbreviations for Item and Support columns

***Insert the following entry in the appropriate place in B.2.2:***

WS white spaces

TVWS television white spaces

TVHTM Television Very High Throughput MAC

TVHTP Television Very High Throughput PHY

* PICS proforma—IEEE Std. 802.11-2012
* IUT configuration

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| \* CF10 | Spectrum management operation -supported(#179) | 8.4.1.4 (Capability Information field), 10.6 (Higher layer timer synchronization) | (CF6 OR CF16): O | Yes  No  |
| \*CF11 | Operating classes capability -implemented(#179) | 8.4.2.10 (Request element), 18.3.8.4.2 (Channel numbering), 18.3.8.6 (Slot time), 18.4.2 (OFDM PHY MIB), Annex D, Annex E | (CF6 OR CF16) &CF8& CF10:O | Yes  No  N/A  |
| \* CF12 | Quality of service (QoS) supported | 9.19 (HCF), 9.21 (Block Acknowledgment (Block Ack)), 4.3.10 (High-throughput (HT) STA), 4.3.15.3 (Mesh STA) | O  (CF16 OR CF21 OR CF22):(11ae) M  CF30:M | Yes  No  N/A  |

***Insert the following row in the appropriate place in B.4.3:***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| * IUT configuration | | | | |
| Item | IUT configuration | References | Status | Support |
| \*CF30 | TVWS Operation | Annex D, Annex E | O | Yes  No N/A  |

* MAC protocol

Change table in B.4.4.1 as follows (only changed rows shown):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| * MAC protocol capabilities | | | | |
| Item | Protocol capability | References | Status | Support |
| ... |  |  |  |  |
| PC9 | Multirate support | 9.7, Annex J | M | Yes  No  |
| PC9.1 | Rate selection using Rx Supported VHT-MCS and NSS Set / Tx Supported VHT-MCS and NSS Set | 9.7.11.1 (Rx Supported VHT-MCS and NSS Set), 9.7.11.2 (Tx Supported VHT-MCS and NSS Set) | CF29:M  CF30:M | Yes  No  N/A  |
| PC9.2 | Cropping of VHT Basic MCS Set | 9.7.11.3 (Additional rate selection constraints for VHT PPDUs) | CF29:O  CF30:O | Yes  No  N/A  |
| ... |  |  |  |  |

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| * MAC frames | | | | |
| Item | MAC frame | References | Status | Support |
|  | Is transmission of the following MAC frames supported? | Clause 8, Annex J |  |  |
| ... |  |  |  |  |
| FT27 | VHT NDP Announcement | Clause 8 | VHTM4.1:M  TVHTM4.1:M | Yes  No  N/A  |
| FT28 | Beamforming Report Poll | Clause 8 | VHTM4.1:O  VHTM4.3:M  TVHTM4.1:O  TVHTM4.3:M | Yes  No  N/A  |
|  | Is reception of the following MAC frames supported? | Clause 8, Annex J |  |  |
| ... |  |  |  |  |
| FR27 | VHT NDP Announcement | Clause 8 | VHTM4.2:M  TVHTM4.2:M | Yes  No  N/A  |
| FR28 | Beamforming Report Poll | Clause 8 | VHTM4.2:O  VHTM4.4:M  TVHTM4.2:O  TVHTM4.4:M | Yes  No  N/A  |
| FR29 | Reception of Operating Mode Notification frame and Operating Mode Notification element | 8.5.23.4 (Operating Mode Notification  frame format), 8.4.2.168 (Operating Mode Notification element), 10.41 (Notification of operating mode changes) | O  CF29:M  CF30:M | Yes  No  N/A  |

* High-throughput (HT) features
* HT MAC features

***Change table as follows (only modified rows are shown):***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| HTM3 | MPDU aggregation |  |  |  |
| HTM3.1 | Reception of A-MPDU | 8.4.2.55.3 (A-MPDU Parameters field), 11.4 (RSNA confidentiality and integrity protocols), 9.12.2 (A-MPDU length limit rules) | CF16:M  CF30:M | Yes  No  N/A  |
| HTM3.2 | A-MPDU format | 8.6.1 (A-MPDU format) | CF16:M  CF30:M | Yes  No  N/A  |
| HTM3.3 | A-MPDU contents | 8.6.3 (A-MPDU contents) | CF16:M  CF30:M | Yes  No  N/A  |
| HTM3.4 | A-MPDU frame exchange sequences | 9.19.2.4 (Multiple frame transmission in an EDCA TXOP) | CF16:M  CF30:M | Yes  No  N/A  |
| HTM3.5 | Transmission of A-MPDU | 8.4.2.55.3 (A-MPDU Parameters field), 11.4 (RSNA confidentiality and integrity protocols) | CF16:O  CF29:M  CF30:M | Yes  No  N/A  |
| HTM4 | MSDU aggregation |  |  |  |
| HTM4.1 | Reception of A-MSDUs | 8.2.4.5 (QoS Control field), 8.3.2.2 (A-MSDU format) | CF16:M  CF30:M | Yes  No  N/A  |
| HTM4.2 | A-MSDU format | 8.3.2.2 (A-MSDU format) | CF16:M  CF30:M | Yes  No  N/A  |
| HTM4.3 | A-MSDU content | 8.3.2.2 (A-MSDU format) | CF16:M  CF30:M | Yes  No  N/A  |
| HTM4.4 | Transmission of A-MSDUs | 8.3.2.2 (A-MSDU format), 8.2.4.5 (QoS Control field) | CF16:O  CF30:O | Yes  No  N/A  |

***Insert new B.4.27 table at the end of B.4 as follows:***

* TVWS functions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | | | |
| Item | Protocol capability | References | Status | Support |
| WS1 | Fixed STA TVWS operation | 10.43 (Operation under the control of a geolocation database), Annex D (Regulatory references), Annex E.2.5 (TVWS band in the United States and Canada (54 MHz to 698 MHz)) | CF30:O | Yes No N/A  |
| WS2 | Master STA TVWS operation | 10.43 (Operation under the control of a geolocation database), 10.43.2 (GDD enabling STA operation), Annex D (Regulatory references), Annex E.2.5 (TVWS band in the United States and Canada (54 MHz to 698 MHz)) | CF30:O | Yes No N/A  |
| \*WS3 | Client STA TVWS operation | 10.43.3 (GDD dependent STA operation), Annex D (Regulatory references), Annex E.2.5 (TVWS band in the United States and Canada (54 MHz to 698 MHz)) | CF30:O |  |
| WS3.1 | GDD Dependent STA TVWS behavior | 10.43.3 (GDD dependent STA operation), Annex D (Regulatory references), Annex E.2.5 (TVWS band in the United States and Canada (54 MHz to 698 MHz)) | WS3:M | Yes No N/A  |
| WS4 | Channel Availability Query | 8.4.5.2 (Channel Availability Query RLQP-element), 8.5.8.27 (Channel Availability Query frame format), 10.43.4 (Channel availability query (CAQ) procedure) | CF30:M | Yes No N/A  |
| WS5 | Channel Schedule Management | 8.4.1.53 (Channel Schedule Management element), 8.4.5.3 (Channel Schedule Management element RLQP-element), 8.5.8.28 (Channel Schedule Management frame format), 10.43.5 (Channel schedule management (CSM) procedures) | CF30:M | Yes No N/A  |
| WS6 | Contact Verification Signal | 8.5.8.29 (Contact Verification Signal frame format),  10.43.6 (Contact verification signal (CVS)) | CF30:M | Yes No N/A  |
| \*WS7 | Network Channel Control | 6.3.99 (Network channel control management), 8.4.5.4 (Network Channel Control RLQP-element), 8.5.8.32 (Network Channel Control frame format), 10.43.7 (Network channel control (NCC) procedures) | CF30:M |  |
| WS7.1 | NCC Requesting STA | 10.43.7.1 (NCC requesting STA) | CF30:M | Yes No N/A  |
| WS7.2 | NCC Responding STA | 10.43.7.2 (NCC responding STA) | CF30:O | Yes No N/A  |
| WS8 | White Space Map Announcement | 8.4.1.55 (White Space Map element), 8.5.8.33 (White Space Map Announcement frame format), 10.43.9 (White space map (WSM)) | CF30:M | Yes No N/A  |

* TVHT MAC features

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| --- | --- | --- | --- | --- |
| Item | Protocol capability | References | Status | Support |
|  | Are the following MAC protocol features supported? |  |  |  |
| TVHTM1 | TVHT capabilities signaling |  |  |  |
| TVHTM1.1 | VHT capabilities element | 8.4.2.160.1 | CF30:O | Yes  No  N/A  |
| TVHTM1.2 | Signaling of STA capabilities in Probe Request, (Re)Association Request frames | 8.4.2.160.1, 8.3.3.9 (Probe Request frame format), 8.3.3.5 (Association Request frame format), 8.3.3.7 (Reassociation Request frame format) | (CF30 AND CF2):O  (CF30 AND CF21):O(#6138) | Yes  No  N/A  |
| TVHTM1.3 | Signaling of STA and BSS capabilities in Beacon, Probe Response, (Re)Association Response frames | 8.4.2.160, 8.3.3.2 (Beacon frame format), 8.3.3.10 (Probe Response frame format), 8.3.3.6 (Association Response frame format), 8.3.3.8 (Reassociation Response frame format) | (CF30 AND CF1):O  (CF30 AND CF21):O(#6138) | Yes  No  N/A  |
| TVHTM2 | Signaling of VHT operation | 8.4.2.161 | (CF30 AND CF1):O  (CF30 AND CF21):O  (CF30 AND CF2.2):O(#6139) | Yes  No  N/A  |
| TVHTM3 | Link adaptation |  |  |  |
| TVHTM3.1 | Use of the VHT variant HT Control field for link adaptation in immediate response exchange. | 8.2.4.6, 8.3.3.14 (Action No Ack frame format), 9.28.3 | CF30:O | Yes  No  N/A  |
| TVHTM4 | Transmit beamforming |  |  |  |
| \*TVHTM4.1 | SU Beamformer Capable | 8.4.2.160 | CF30:O | Yes  No  N/A  |
| \*TVHTM4.2 | SU Beamformee Capable | 8.4.2.160 | CF30:O | Yes  No  N/A  |
| \*TVHTM4.3 | MU Beamformer Capable | 8.4.2.160 | CF1 AND TVHTM4.1:O | Yes  No  N/A  |
| \*TVHTM4.4 | MU Beamformee Capable | 8.4.2.160 | CF2 AND TVHTM4.2:O | Yes  No  N/A  |
| TVHTM4.5 | Transmission of Null Data packet | 9.31 | TVHTM4.1:M | Yes  No  N/A  |
| TVHTM4.6 | Reception of Null Data Packet | 9.31 | TVHTM4.2:M |  |
| TVHTM5 | VHT Sounding Protocol |  |  |  |
| TVHTM5.1 | VHT sounding protocol as SU beamformer | 9.31.5 | TVHTM4.1:M | Yes  No  N/A  |
| TVHTM5.2 | VHT sounding protocol as SU beamformee | 9.31.5 | TVHTM4.2:M | Yes  No  N/A  |
| TVHTM5.3 | VHT sounding protocol as MU beamformer | 9.31.5 | TVHTM4.3:M | Yes  No  N/A  |
| TVHTM5.4 | VHT sounding protocol as MU beamformee | 9.31.5 | TVHTM4.4:M | Yes  No  N/A  |
| TVHTM6 | TXOP Sharing |  |  |  |
| TVHTM6.1 | Sharing of EDCA TXOP | 9.19.2.3a | CF30:O | Yes  No  N/A  |
| TVHTM6.2 | Use of Primary and Secondary AC | 9.19.2.3a | TVHTM6.1: M | Yes  No  N/A  |
| TVHTM7 | TXOP Power Saving | 10.2.1.4a | CF30:O | Yes  No  N/A  |
| TVHTM8 | BSS Operation |  |  |  |
| TVHTM8.1 | Use of primary TVHT\_W, secondary TVHT\_W and secondary TVHT\_2W channels | 10.42 | CF30:M | Yes  No  N/A  |
| TVHTM8.2 | CCA on primary TVHT\_W, secondary TVHT\_W and secondary TVHT\_2W channels | 10.42 | CF30:M | Yes  No  N/A  |
| TVHTM9 | Group ID |  |  |  |
| TVHTM9.1 | Transmission of Group ID Management frame | 8.5.23.3 | TVHTM4.3:M | Yes  No  N/A  |
| TVHTM9.2 | Reception of Group ID Management frame | 8.5.23.3 | TVHTM4.4:M |  |
| TVHTM10 | Bandwidth signaling(#6142) |  |  |  |
| TVHTM10.1 | Support for non-HT bandwidth signaling and static operation(#6142) | 9.3.2.5a | CF30:M | Yes  No  N/A  |
| TVHTM10.2 | Support for non-HT bandwidth signaling and dynamic operation(#6142) | 9.3.2.5a | CF30:O | Yes  No  N/A  |
| TVHTM11 | VHT single MPDU format(#6411) | 9.12.7 | CF30:M | Yes  No  N/A  |
| TVHTM12 | Partial AID in VHT PPDU | 9.17a | CF30:M | Yes  No  N/A  |
| TVHTM13 | Extended BSS Load Element | 8.4.2.162 | CF30:O | Yes  No  N/A  |
| TVHTM13.1 | Transmission of the Extended BSS Load element | 8.4.2.162 | CF1 AND CF30:O | Yes  No  N/A  |
| TVHTM14 | Quiet Channel element |  |  |  |
| TVHTM14.1 | Transmission of Quiet Channel element by an AP or mesh station in Beacon and Probe Response frames | 8.3.3.2, 8.3.3.10, 8.4.2.167, 10.9.3 | (CF1 OR CF21) AND CF10 AND CF30 AND TTVHTP3.4:O | Yes  No  N/A  |
| TVHTM14.2 | Transmission of Quiet Channel element by an independent station or mesh station in Beacon and Probe Response frames | 8.3.3.2, 8.3.3.10, 8.4.2.167, 10.9.3 | (CF2 OR CF21) AND CF10 AND CF30 AND TTVHTP3.4:O | Yes  No  N/A  |
| TVHTM14.3 | Reception of Quiet Channel element by an independent station or mesh station in Beacon and Probe Response frames | 8.3.3.2, 8.3.3.10, 8.4.2.167, 10.9.3 | (CF2 OR CF21) AND CF10 AND CF30:O | Yes  No  N/A  |
| TVHTM15 | Space-time block coding (STBC) |  |  |  |
| TVHTM15.1 | STBC operation | 8.4.2.160, 9.15 | TTVHTP9:M | Yes  No  N/A  |
| TVHTM15.2 | Transmission of at least 2x1 STBC | 8.4.2.160.2 | TTVHTP9:O.1 | Yes  No  N/A  |
| TVHTM15.3 | Reception of 1 STBC spatial stream | 8.4.2.160.2 | TTVHTP9:O.1 | Yes  No  N/A  |
| TVHTM15.4 | Reception of 2 STBC spatial stream | 8.4.2.160.2 | TVHTM15.3:O | Yes  No  N/A  |
| TVHTM15.5 | Reception of 3 STBC spatial stream | 8.4.2.160.2 | TVHTM15.4:O | Yes  No  N/A  |
| TVHTM15.6 | Reception of 4 STBC spatial stream | 8.4.2.160.2 | TVHTM15.5:O | Yes  No  N/A  |
| TVHTM16 | Highest Supported Long GI Data Rate(#6430) |  |  |  |
| TVHTM16.1 | Tx Highest Supported Long GI Data Rate(#6430) | 8.4.2.160.3 | CF30:O | Yes  No  N/A  |
| TVHTM16.2 | Rx Highest Supported Long GI Data Rate(#6430) | 8.4.2.160.3 | CF30:O | Yes  No  N/A  |
| NOTE—Required support for MCS might be limited by the declaration of Tx and Rx Highest Supported Long GI Data Rates | | | | |

(#6430).

B.4.27.2 TVHT PHY Features

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item | Protocol capability | References | Status | Support |
|  | Are the following PHY protocol features supported? |  |  |  |
| TVHTP1 | PHY operating modes |  |  |  |
| TVHTP2 | VHT format | 22.3.2 (VHT PPDU format) | CF30:M | Yes  No  N/A  |
| TVHTP3 | BSS bandwidth |  |  |  |
| TVHTP3.1 | TVHT\_W operation | 10.42 (Basic TVHT BSS functionality) | CF30:M | Yes  No  N/A  |
| TVHTP3.2 | TVHT\_2W operation | 10.42 (Basic VHT BSS functionality) | CF30:O | Yes  No  N/A  |
| TVHTP3.3 | TVHT\_W+W operation | 10.42 (Basic TVHT BSS functionality) | CF30:O | Yes  No  N/A  |
| TVHTP3.4 | TVHT\_4W operation | 10.42 (Basic VHT BSS functionality) | CF30:O | Yes  No  N/A  |
| TVHTP3.5 | TVHT\_2W+2W operation | 10.42 (Basic VHT BSS functionality) | CF30:O | Yes  No  N/A  |
| TVHTP4 | Bandwidth indication | 18.3.5.5 (PLCP DATA scrambler and descrambler) | CF29:M | Yes  No  N/A  |
| TVHTP5 | PHY timing parameters |  |  |  |
| TVHTP5.1 | Values in 6 MHz channel | 23.3.6 (Timing-related parameters) | CF30:M | Yes  No  N/A  |
| TVHTP5.2 | Values in 7 MHz channel | 23.3.6 (Timing-related parameters) | CF30:M | Yes  No  N/A  |
| TVHTP5.3 | Values in 8 MHz channel | 23.3.6 (Timing-related parameters) | CF30:M | Yes  No  N/A  |
| TVHTP5.4 | Values in non-HT 6, 7, and 8 MHz channels | 23.2.4 (Support for non-HT and HT Formats) | CF30:M | Yes  No  N/A  |
| TVHTP6 | TVHT preamble | 23.3.8 (VHT preamble) | CF30:M | Yes  No  N/A  |
| TVHTP7 | Use of LDPC Code | 22.3.10.5.( coding) | CF30:O | Yes  No  N/A  |
| TVHTP8 | Modulation and coding schemes (MCS) |  |  |  |
| TVHTP8.1 | TVHT\_MODE\_1 | 23.5 (Parameters for TVHT-MCSs) |  |  |
| TVHTP8.1.1 | TVHT-MCS with Index 0-7 and *NSS* = 1 | 23.5 (Parameters for TVHT-MCSs) | CF30:M | Yes  No  N/A  |
| TVHTP8.1.2 | TVHT-MCS with Index 0-8 and *NSS* = 1 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.1.1:O | Yes  No  N/A  |
| TVHTP8.1.3 | TVHT-MCS with Index 0-9 and *NSS* = 1 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.1.2:O | Yes  No  N/A  |
| TVHTP8.1.4 | TVHT-MCS with Index 0-7 and *NSS* = 2 | 23.5 (Parameters for TVHT-MCSs) | CF30:O | Yes  No  N/A  |
| TVHTP8.1.5 | TVHT-MCS with Index 0-8 and *NSS* = 2 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.1.4:O | Yes  No  N/A  |
| TVHTP8.1.6 | TVHT-MCS with Index 0-9 and *NSS* = 2 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.1.5:O | Yes  No  N/A  |
| TVHTP8.1.7 | TVHT-MCS with Index 0-7 and *NSS* = 3 | 23.5 (Parameters for TVHT-MCSs) | CF30:O | Yes  No  N/A  |
| TVHTP8.1.8 | TVHT-MCS with Index 0-8 and *NSS* = 3 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.1.7:O | Yes  No  N/A  |
| TVHTP8.1.9 | TVHT-MCS with Index 0-9 and *NSS* = 3 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.1.7:O | Yes  No  N/A  |
| TVHTP8.1.10 | TVHT-MCS with Index 0-7 and *NSS* = 4 | 23.5 (Parameters for TVHT-MCSs) | CF30:O | Yes  No  N/A  |
| TVHTP8.1.11 | TVHT-MCS with Index 0-8 and *NSS* = 4 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.1.10:O | Yes  No  N/A  |
| TVHTP8.1.12 | TVHT-MCS with Index 0-9 and *NSS* = 4 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.1.11:O | Yes  No  N/A  |
| TVHTP8.2 | TVHT\_MODE\_2C and TVHT\_MODE\_2N | 23.5 (Parameters for TVHT-MCSs) |  |  |
| TVHTP8.2.1 | TVHT-MCS with Index 0-7 and *NSS* = 1 | 23.5 (Parameters for TVHT-MCSs) | (TVHTP3.2 AND  TVHTP3.3):M | Yes  No  N/A  |
| TVHTP8.2.2 | TVHT-MCS with Index 0-8 and *NSS* = 1 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.2.1:O | Yes  No  N/A  |
| TVHTP8.2.3 | TVHT-MCS with Index 0-9 and *NSS* = 1 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.2.2:O | Yes  No  N/A  |
| TVHTP8.2.4 | TVHT-MCS with Index 0-7 and *NSS* = 2 | 23.5 (Parameters for TVHT-MCSs) | TVHTP3.2 AND  TVHTP3.3):O | Yes  No  N/A  |
| TVHTP8.2.5 | TVHT-MCS with Index 0-8 and *NSS* = 2 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.2.4:O | Yes  No  N/A  |
| TVHTP8.2.6 | TVHT-MCS with Index 0-9 and *NSS* = 2 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.2.5:O | Yes  No  N/A  |
| TVHTP8.2.7 | TVHT-MCS with Index 0-7 and *NSS* = 3 | 23.5 (Parameters for TVHT-MCSs) | (TVHTP3.2 AND  TVHTP3.3):O | Yes  No  N/A  |
| TVHTP8.2.8 | TVHT-MCS with Index 0-8 and *NSS* = 3 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.2.7:O | Yes  No  N/A  |
| TVHTP8.2.9 | TVHT-MCS with Index 0-9 and *NSS* = 3 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.2.8:O | Yes  No  N/A  |
| TVHTP8.2.10 | TVHT-MCS with Index 0-7 and *NSS* = 4 | 23.5 (Parameters for TVHT-MCSs) | (TVHTP3.2 AND  TVHTP3.3):O | Yes  No  N/A  |
| TVHTP8.2.11 | TVHT-MCS with Index 0-8 and *NSS* = 4 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.2.10:O | Yes  No  N/A  |
| TVHTP8.2.12 | TVHT-MCS with Index 0-9 and *NSS* = 4 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.2.11:O | Yes  No  N/A  |
| TVHTP8.3 | TVHT\_MODE\_4C and TVHT\_MODE\_4N | 23.5 (Parameters for TVHT-MCSs) |  |  |
| TVHTP8.3.1 | TVHT-MCS with Index 0-7 and *NSS* = 1 | 23.5 (Parameters for TVHT-MCSs) | (TVHTP3.4 AND  TVHTP3.5):M | Yes  No  N/A  |
| TVHTP8.3.2 | TVHT-MCS with Index 0-8 and *NSS* = 1 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.3.1:O | Yes  No  N/A  |
| TVHTP8.3.3 | TVHT-MCS with Index 0-9 and *NSS* = 1 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.3.2:O | Yes  No  N/A  |
| TVHTP8.3.4 | TVHT-MCS with Index 0-7 and *NSS* = 2 | 23.5 (Parameters for TVHT-MCSs) | (TVHTP3.4 AND  TVHTP3.5):O | Yes  No  N/A  |
| TVHTP8.3.5 | TVHT-MCS with Index 0-8 and *NSS* = 2 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.3.4:O | Yes  No  N/A  |
| TVHTP8.3.6 | TVHT-MCS with Index 0-9 and *NSS* = 2 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.3.5:O | Yes  No  N/A  |
| TVHTP8.3.7 | TVHT-MCS with Index 0-7 and *NSS* = 3 | 23.5 (Parameters for TVHT-MCSs) | (TVHTP3.4 AND  TVHTP3.5):O | Yes  No  N/A  |
| TVHTP8.3.8 | TVHT-MCS with Index 0-8 and *NSS* = 3 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.3.7:O | Yes  No  N/A  |
| TVHTP8.3.9 | TVHT-MCS with Index 0-9 and *NSS* = 3 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.3.8:O | Yes  No  N/A  |
| TVHTP8.3.10 | TVHT-MCS with Index 0-7 and *NSS* = 4 | 23.5 (Parameters for TVHT-MCSs) | (TVHTP3.4 AND  TVHTP3.5):O | Yes  No  N/A  |
| TVHTP8.3.11 | TVHT-MCS with Index 0-8 and *NSS* = 4 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.3.10:O | Yes  No  N/A  |
| TVHTP8.3.12 | TVHT-MCS with Index 0-9 and *NSS* = 4 | 23.5 (Parameters for TVHT-MCSs) | TVHTP8.3.11:O | Yes  No  N/A  |
| TVHTP8.4 | Transmit and receive support for Short GI | 23.5 (Parameters for TVHT-MCSs) | CF30:O | Yes  No  N/A  |
| TVHTP9 | Space-time block coding (STBC) | 23.3.10.9.4 (Space-time block coding) | CF30:O | Yes  No  N/A  |

**References:**