IEEE P802.11
Wireless LANs

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| IEEE 802.11ax Annex B (PICs) |
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Abstract

This document includes proposed resolutions to CIDs 1700 and 2504 related to Annex B

R0: Initial draft

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| **CID** | **Page** | **Clause** | **Duplicate of CID** | **Comment** | **Proposed Change** | **Resolution** |
| 1700 |  |  |  | Annex B (PICS) is missing | Add PICS | Revised: Proposed PICS table is in <this document> |
| 2504 | 201.01 | Annex B |  | Make Annex B for 802.11ax MAC/PHY features. | As per comment | Revised: Proposed PICS table is in <this document> |

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Protocol Implementation Conformance Statement (PICS) -proforma

* Introduction
* General abbreviations for Item and Support columns

N/A not applicable

AD address function(#2425)

AVT audio video transport(11aa)

CF implementation under test (IUT) configuration

DMG-M directional multi-gigabit (DMG) medium access control (MAC) features(#2425)

DMG-P directional multi-gigabit (DMG) physical layer (PHY) features(#2425)

DS direct sequence

DSE dynamic station enablement

ERP extended rate physical layer (PHY)(#63)

FR frame reception(#2425)

FS frame exchange(#6299) sequence(#2425)

FT frame transmission

HRDS high rate direct sequence

HTM (#2425)high throughput(#1533) (HT) medium access control (MAC) features

HTP (#2425)high throughput(#1533) (HT) physical layer (PHY) features

HWM hybrid wireless mesh protocol (HWMP)(#2425) path selection protocol capability(#64)

IW interworking with external networks

MD multidomain

MP mesh protocol(#2425)

OC operating classes(#2425)

OF orthogonal frequency division multiplexing (OFDM)

PC protocol capability

RM radio management

QB quality-of-service (QoS) base functionality

QD quality-of-service (QoS) enhanced distributed channel access (EDCA)

QMF quality-of-service (Ed)Management frame(11ae)

QP quality-of-service (QoS) hybrid coordination function (HCF) controlled channel access (HCCA)

SM spectrum management

TDLS tunneled direct-link setup

TVHTM television very high throughput medium access control (MAC) features(11af)

TVHTP television very high throughput physical layer (PHY) features(11af)

TVWS television white spaces(11af)

VHTM Very High Throughput MAC(11ac)

VHTP Very High Throughput PHY(11ac)

WNM wireless network management

WS white spaces(11af)

HEWM High Efficiency WLAN physical layer (PHY) features

HEWP High Efficiency WLAN medium access control (MAC) features

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| * IUT configuration
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| Item | IUT configuration | References | Status | Support |
|  | What is the configuration of the IUT? |  |  |  |
| \*CF2.3  | *Reserved (#2425)* |  |  |  |
| NOTE—See CFMBSS(#6573) for mesh STA and CFOCB(#6573) for OCB operation. (#2425)(#241) |
| CF3 | *Reserved*(#63) |  |  |  |
| CF5 | *Reserved*(#64) |  |  |  |
| \* CFOFDM(#6573) | Orthogonal frequency division multiplexing (OFDM) PHY | — | O.2CFHT5G:M(11ad)CFTVHT(#6573):M(#3136) | Yes  No  |
| \* CFQoS(#6573) | Quality of service (QoS) (#2425) | 10.22 (HCF), 10.24 (Block acknowledgment (block ack)), 4.3.13 (High throughput (HT) STA), 4.3.20.3 (Mesh STA)(Ed) | OCFHT OR CFMBSS OR CFQMF OR CFAVT:MCFDMG:M(11ad)CFTVHT(#6573):MCFHEW20: M(11af) | Yes  No  N/A  |
| \*CFHT(#6573) | High throughput(#1533) (HT) PHY (#2425) | 9.4.2.56 (HT Capabilities element)(Ed) | O.2(#2425)CFVHT(#6573):MCFHEW:M(#3051) | Yes  No  |
| \* CFHT2G4(#6573)(11ad) | HT operation in 2.4 GHz band | 19 (High Throughput (HT) PHY specification)(Ed) | CFHT(#6573):O.6 | Yes  No  N/A  |
| \* CFHT5G(#6573)(11ad) | HT operation in 5 GHz band | 19 (High Throughput (HT) PHY specification)(Ed) | CFHT:O.6CFVHT(#6573):M (11ac) | Yes  No  N/A  |
| \*CF5G9(#6573) | 5.9 GHz band  | Annex E(Ed) | CFOFDM(#6573):O | Yes  No  N/A  |
| CF24 | *Reserved* |  |  |  |
| \*CFMBO(#6573)(11ad) | Multi-band operation  | 9.6.21 (FST Action frame details), 11.32 (Spatial sharing and interference mitigation for DMG STAs)(Ed) | At least two of CFDSSS, CFOFDM, CF3G6, CF5G9, CFDMG(#6573):O | Yes  No  N/A (#7556) |
| \*CFVHT(#6573)(11ac) | Very High Throughput (VHT) Features | 9.4.2.158 (VHT Capabilities element)(Ed) | O.2CFHEW5G:M(#3051) | Yes  No  |
| \*CFESM(#6573) (#3479) | Extended spectrum management(#3479) | 10.21.3 (Operation with operating classes)(Ed) | OCFVHT OR CFTVHT(#6573):M(#3479) | Yes  No (#3479) |
| \*CFHEW | High Efficiency WLAN (HEW) Operation | 9.4.2.213 (HE Capabilities element) | O | Yes  No  |
| CFHEW2G4 | HEW Operation in 2.4 GHz band | 26 (High Efficiency (HE) PHY specification | CFHEW: M | Yes  No  N/A  |
| CFHEW5G | HEW Operation in 5 GHz band | 26 (High Efficiency (HE) PHY specification | CFHEW: M | Yes  No  N/A  |
| CFHEW20 | HEW Operation in 20 MHz channel only | 26 (High Efficiency (HE) PHY specification | CFIndSTA and CFHEW:O | Yes  No  N/A  |

* MAC protocol

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| * MAC protocol capabilities
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| PC6 | Fragmentation | 10.3 (DCF), 10.5 (Fragmentation) (#5059) |  |  |
| PC6.1 | Static Fragmentation | 10.3 (DCF), 10.5 (Fragmentation) | M | Yes  No  |
| PC6.2 | Dynamic Fragmentation | 10.3 (DCF), 10.5 (Fragmentation) |  |  |
| PC6.2.1 | Dynamic Fragmentation-Level 0 | 25.3.3.1 | CFHEW: M | Yes  No  N/A  |
| PC6.2.2 | Dynamic Fragmentation Level 1 | 25.3.3.2 | CFHEW: O | Yes  No  N/A  |
| PC6.2.3 | Dynamic Fragmentation – Level 2 | 25.3.3.3 | CFHEW: O | Yes  No  N/A  |
| PC6.2.4 | Dynamic Fragmentation – Level 3 | 25.3.3.4 | CFHEW: O | Yes  No  N/A  |
| PC7 | Defragmentation | 10.3 (DCF), 10.6 (Defragmentation)(#5059) | M | Yes  No  |

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| * MAC frames
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| FT40(11ac) | VHT NDP Announcement | 9 (Frame formats) (Ed) | VHTM4.1:MTVHTM4.1:M(11af) | Yes  No  N/A  |
| FT41(11ac) | Beamforming Report Poll | 9 (Frame formats) (Ed) | VHTM4.1:OVHTM4.3:MTVHTM4.1:O(11af)TVHTM4.3:M(11af) | Yes  No  N/A  |
| FT42(11ac) | Transmission of Operating Mode Notification frame and Operating Mode Notification element | 9.6.23.4 (Operating Mode Notification frame format(11ac)), 9.4.2.166 (Operating Mode Notification element(11ac)), 11.42 (Notification of operating mode changes(11ac))(Ed) | O | Yes  No  N/A  |
| FRxx | Trigger Frame | 9. (Frame formats) | CFHEW: MCFHEW20: M | Yes  No  N/A  |

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| FR41(11ac) | VHT NDP Announcement | 9 (Frame formats) (Ed) | VHTM4.2:MTVHTM4.2:M(11af) | Yes  No  N/A  |
| FR42(11ac) | Beamforming Report Poll | 9 (Frame formats) (Ed) | VHTM4.2:OVHTM4.4:MTVHTM4.2:O(11af)TVHTM4.4:M(11af) | Yes  No  N/A  |
| FR43(11ac) | Reception of Operating Mode Notification frame and Operating Mode Notification element | 9.6.23.4 (Operating Mode Notification frame format(11ac)), 9.4.2.166 (Operating Mode Notification element(11ac)), 11.42 (Notification of operating mode changes(11ac))(Ed) | CFVHT:MCFTVHT(#6573):M (11af)(#5955) | Yes  No  N/A  |
| FRxx | Trigger Frame | 9.3.2.13  | CFHEW: MCFHEW20: M | Yes  No  N/A  |

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| * QoS base functionality
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| QB4 | Block acknowledgments (block ack)(#2069) |  |  |  |
| QB4.1 | Immediate block ack(#2069)Non-HT block ack is obsolete. Support for this mechanism might be removed in a later revision of the standard.(#6488) | 9.3.1.8.1 (Overview), 9.3.1.8.2 (Basic BlockAckReq variant), 9.3.1.9.1 (Overview), 9.3.1.9.2 (Basic BlockAck variant), 9.6.5 (Block Ack Action frame details), 10.24 (Block acknowledgment (block ack)(#2069)) (except 10.24.7 (HT-immediate block ack(#2069) extensions) and 10.24.8 (HT-delayed block ack(#2069) extensions)), 11.5 (Block ack(#2069) operation)(Ed) | CFQoS:OCFHT OR CFDMG(11ad) OR CFTVHT(#6573)(11af):M | Yes  No  N/A  |
| \*QB4.2(#346) | Delayed block ack(#2069)Non-HT block ack is obsolete. Support for this mechanism might be removed in a later revision of the standard.(#6488) | 9.3.1.8.1 (Overview), 9.3.1.8.2 (Basic BlockAckReq variant), 9.3.1.9.1 (Overview), 9.3.1.9.2 (Basic BlockAck variant), 9.6.5 (Block Ack Action frame details), 10.24 (Block acknowledgment (block ack)(#2069)) (except 10.24.7 (HT-immediate block ack(#2069) extensions) and 10.24.8 (HT-delayed block ack(#2069) extensions)), 11.5 (Block ack(#2069) operation)(Ed) | CFQoS(#6573):O | Yes  No  N/A  |
| QB4.3 | Compressed Block Ack |  |  |  |
| QB4.3.1(11ad) | Compressed Block Ack | 9.3.1.8.3 (Compressed BlockAckReq variant)(Ed) | CFQoS:OCFHT OR CFDMG OR CFTVHT(#6573)(11af):M | Yes  No  N/A  |
| QB4.3.2(11ad) | Extended Compressed Block Ack | 9.3.1.8.4 (Extended Compressed BlockAckReq variant(11ad))(Ed) | CFDMG(#6573):O | Yes  No  N/A  |
| QB4.4 | Multi-TID(#6748) Block Ack | 9.3.1.9.4 (Multi-TID BlockAck variant)(Ed) | CFQoS:OCFHT OR CFTVHT(#6573)(11af):M | Yes  No  N/A  |
| QB4.5 | Multi-User Block Ack (M-BA) | 9.3.1.9.7 (Multi-STA BlockAck variant) |  |  |
| QB4.5.1 | Transmission of M-BA | 9.3.1.9.7 (Multi-STA BlockAck variant) | CFAP and CFHEW:M | Yes  No  N/A  |
| QB4.5.2 | Reception of M-BA | 9.3.1.9.7 (Multi-STA BlockAck variant) | CFSTAofAP and CFHEW:MCFSTAofAP and CFHEW20:M | Yes  No  N/A  |

* Very high throughput (VHT) features
* (11ac)

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| * VHT PHY features
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| Item | Protocol capability | References | Status | Support |
|  | Are the following PHY protocol features supported? |  |  |  |
| VHTP1 | PHY operating modes |  |  |  |
| VHTP1.1 | Operation according to Clause 18 (Orthogonal frequency division multiplexing (OFDM) PHY specification) (Orthogonal frequency division multiplexing (OFDM) PHY specification) and/or Clause 20 (High Throughput (HT) PHY specification) (High Throughput) | 21.1.4 (PPDU formats)(Ed) | CFVHT(#6573):M | Yes  No  N/A  |
| VHTP2 | VHT format | 21.3.2 (VHT PPDU format)(Ed) | CFVHT(#6573):M | Yes  No  N/A  |
| VHTP3 | BSS bandwidth |  |  |  |
| VHTP3.1 | 20 MHz operation | 11.40.1 (Basic VHT BSS functionality(11ac))(Ed) | CFVHT(#6573):MCFHEW2G4:MCFHEW20:M | Yes  No  N/A  |
| VHTP3.2 | 40 MHz operation | 11.40.1 (Basic VHT BSS functionality(11ac))(Ed) | CFVHT(#6573):MCFHEW2G4:M | Yes  No  N/A  |
| VHTP3.3 | 80 MHz operation | 11.40.1 (Basic VHT BSS functionality(11ac))(Ed) | CFVHT(#6573):M | Yes  No  N/A  |
| VHTP3.4 | 160 MHz operation | 11.40.1 (Basic VHT BSS functionality(11ac))(Ed) | CFVHT(#6573):OVHTP3.5:M | Yes  No  N/A  |
| VHTP3.5 | 80+80 MHz operation | 11.40.1 (Basic VHT BSS functionality(11ac))(Ed) | CFVHT(#6573):O | Yes  No  N/A  |
| VHTP4 | Bandwidth indication | 17.3.5.5 (PHY(#61) DATA scrambler and descrambler)(Ed) | CFVHT(#6573):M | Yes  No  N/A  |
| VHTP5 | PHY timing parameters |  |  |  |
| VHTP5.1 | Values in 20 MHz channel | 21.3.6 (Timing-related parameters)(Ed) | CFVHT(#6573):M | Yes  No  N/A  |
| VHTP5.2 | Values in 40 MHz channel | 21.3.6 (Timing-related parameters)(Ed) | CFVHT(#6573):M | Yes  No  N/A  |
| VHTP5.3 | Values in 80 MHz channel | 21.3.6 (Timing-related parameters)(Ed) | CFVHT(#6573):M | Yes  No  N/A  |
| VHTP5.4 | Values in 160 MHz channel | 21.3.6 (Timing-related parameters)(Ed) | VHTP3.4:M | Yes  No  N/A  |
| VHTP5.5 | Values in 80+80 MHz channel | 21.3.6 (Timing-related parameters)(Ed) | VHTP3.5:M | Yes  No  N/A  |
| VHTP6 | VHT preamble | 21.3.8 (VHT preamble)(Ed) | CFVHT(#6573):M | Yes  No  N/A  |
| VHTP7 | Use of LDPC Code | 21.3.10.5.4 (LDPC coding)(Ed) | CFVHT(#6573):O | Yes  No  N/A  |
| VHTP8 | Modulation and coding schemes (MCS) |  |  |  |
| VHTP8.1 | CBW20, CBW40 and CBW80 | 21.5 (Parameters for VHT-MCSs)26.5 (Parameters for HE-MCSs)(Ed) |  |  |
| VHTP8.1.1 | VHT-MCS with Index 0-7 and *NSS* = 1 | 21.5 (Parameters for VHT-MCSs)26.5 (Parameters for HE-MCSs) (Ed) | CFVHT(#6573):MHEWP6.1:MHEWP6.2:MHEWP6.3:MHEWP6.4:MHEWP6.5:MHEWP6.6:M | Yes  No  N/A  |
| VHTP8.1.2 | VHT-MCS with Index 0-8 and *NSS* = 1 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.1.1:O | Yes  No  N/A  |
| VHTP8.1.3 | VHT-MCS with Index 0-9 and *NSS* = 1 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.1.2:O | Yes  No  N/A  |
| VHTP8.1.4 | VHT-MCS with Index 0-7 and *NSS* = 2 | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573):OHEWP6.1:OHEWP6.2:OHEWP6.3:OHEWP6.4:OHEWP6.5:OHEWP6.6:O | Yes  No  N/A  |
| VHTP8.1.5 | VHT-MCS with Index 0-8 and *NSS* = 2 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.1.4:O | Yes  No  N/A  |
| VHTP8.1.6 | VHT-MCS with Index 0-9 and *NSS* = 2 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.1.5:O | Yes  No  N/A  |
| VHTP8.1.7 | VHT-MCS with Index 0-7 and *NSS* = 3 | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573):OHEWP6.1:OHEWP6.2:OHEWP6.3:OHEWP6.4:OHEWP6.5:OHEWP6.6:O | Yes  No  N/A  |
| VHTP8.1.8 | VHT-MCS with Index 0-8 and *NSS* = 3 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.1.7:O | Yes  No  N/A  |
| VHTP8.1.9 | VHT-MCS with Index 0-9 and *NSS* = 3 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.1.7:O | Yes  No  N/A  |
| VHTP8.1.10 | VHT-MCS with Index 0-7 and *NSS* = 4 | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573):OHEWP6.1:OHEWP6.2:OHEWP6.3:OHEWP6.4:OHEWP6.5:OHEWP6.6:O | Yes  No  N/A  |
| VHTP8.1.11 | VHT-MCS with Index 0-8 and *NSS* = 4 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.1.10:O | Yes  No  N/A  |
| VHTP8.1.12 | VHT-MCS with Index 0-9 and *NSS* = 4 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.1.11:O | Yes  No  N/A  |
| VHTP8.1.13 | VHT-MCS with Index 0-7 and *NSS* = 5 | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573):OHEWP6.1:OHEWP6.2:OHEWP6.3:OHEWP6.4:OHEWP6.5:OHEWP6.6:O | Yes  No  N/A  |
| VHTP8.1.14 | VHT-MCS with Index 0-8 and *NSS* = 5 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.1.13:O | Yes  No  N/A  |
| VHTP8.1.15 | VHT-MCS with Index 0-9 and *NSS* = 5 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.1.14:O | Yes  No  N/A  |
| VHTP8.1.16 | VHT-MCS with Index 0-7 and *NSS* = 6 | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573):OHEWP6.1:OHEWP6.2:OHEWP6.3:OHEWP6.4:OHEWP6.5:OHEWP6.6:O | Yes  No  N/A  |
| VHTP8.1.17 | VHT-MCS with Index 0-8 and *NSS* = 6 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.1.16:O | Yes  No  N/A  |
| VHTP8.1.18 | VHT-MCS with Index 0-9 and *NSS* = 6 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.1.17:O | Yes  No  N/A  |
| VHTP8.1.19 | VHT-MCS with Index 0-7 and *NSS* = 7 | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573):OHEWP6.1:OHEWP6.2:OHEWP6.3:OHEWP6.4:OHEWP6.5:OHEWP6.6:O | Yes  No  N/A  |
| VHTP8.1.20 | VHT-MCS with Index 0-8 and *NSS* = 7 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.1.19:O | Yes  No  N/A  |
| VHTP8.1.21 | VHT-MCS with Index 0-9 and *NSS* = 7 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.1.20:O | Yes  No  N/A  |
| VHTP8.1.22 | VHT-MCS with Index 0-7 and *NSS* = 8 | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573):OHEWP6.1:OHEWP6.2:OHEWP6.3:OHEWP6.4:OHEWP6.5:OHEWP6.6:O | Yes  No  N/A  |
| VHTP8.1.23 | VHT-MCS with Index 0-8 and *NSS* = 8 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.1.22:O | Yes  No  N/A  |
| VHTP8.1.24 | VHT-MCS with Index 0-9 and *NSS* = 8 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.1.23:O | Yes  No  N/A  |
| VHTP8.2 | CBW160 | 21.5 (Parameters for VHT-MCSs)(Ed) |  |  |
| VHTP8.2.1 | VHT-MCS with Index 0-7 and *NSS* = 1 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP3.4:M(VHTP3.4 and HEWP6.1):M(VHTP3.4 and HEWP6.2):M(VHTP3.4 and HEWP6.3):M(VHTP3.4 and HEWP6.4):M(VHTP3.4 and HEWP6.5):M(VHTP3.4 and HEWP6.6):M(VHTP3.4 and HEWP6.7):M | Yes  No  N/A  |
| VHTP8.2.2 | VHT-MCS with Index 0-8 and *NSS* = 1 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.2.1:O | Yes  No  N/A  |
| VHTP8.2.3 | VHT-MCS with Index 0-9 and *NSS* = 1 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.2.2:O | Yes  No  N/A  |
| VHTP8.2.4 | VHT-MCS with Index 0-7 and *NSS* = 2 | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573):O | Yes  No  N/A  |
| VHTP8.2.5 | VHT-MCS with Index 0-8 and *NSS* = 2 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.2.4:O | Yes  No  N/A  |
| VHTP8.2.6 | VHT-MCS with Index 0-9 and *NSS* = 2 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.2.5:O | Yes  No  N/A  |
| VHTP8.2.7 | VHT-MCS with Index 0-7 and *NSS* = 3 | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573):O | Yes  No  N/A  |
| VHTP8.2.8 | VHT-MCS with Index 0-8 and *NSS* = 3 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.2.7:O | Yes  No  N/A  |
| VHTP8.2.9 | VHT-MCS with Index 0-9 and *NSS* = 3 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.2.8:O | Yes  No  N/A  |
| VHTP8.2.10 | VHT-MCS with Index 0-7 and *NSS* = 4 | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573):O | Yes  No  N/A  |
| VHTP8.2.11 | VHT-MCS with Index 0-8 and *NSS* = 4 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.2.10:O | Yes  No  N/A  |
| VHTP8.2.12 | VHT-MCS with Index 0-9 and *NSS* = 4 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.2.11:O | Yes  No  N/A  |
| VHTP8.2.13 | VHT-MCS with Index 0-7 and *NSS* = 5 | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573)9:O | Yes  No  N/A  |
| VHTP8.2.14 | VHT-MCS with Index 0-8 and *NSS* = 5 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.2.13:O | Yes  No  N/A  |
| VHTP8.2.15 | VHT-MCS with Index 0-9 and *NSS* = 5 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.2.14:O | Yes  No  N/A  |
| VHTP8.2.16 | VHT-MCS with Index 0-7 and *NSS* = 6 | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573):O | Yes  No  N/A  |
| VHTP8.2.17 | VHT-MCS with Index 0-8 and *NSS* = 6 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.2.16:O | Yes  No  N/A  |
| VHTP8.2.18 | VHT-MCS with Index 0-9 and *NSS* = 6 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.2.17:O | Yes  No  N/A  |
| VHTP8.2.19 | VHT-MCS with Index 0-7 and *NSS* = 7 | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573):O | Yes  No  N/A  |
| VHTP8.2.20 | VHT-MCS with Index 0-8 and *NSS* = 7 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.2.19:O | Yes  No  N/A  |
| VHTP8.2.21 | VHT-MCS with Index 0-9 and *NSS* = 7 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.2.20:O | Yes  No  N/A  |
| VHTP8.2.22 | VHT-MCS with Index 0-7 and *NSS* = 8 | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573):O | Yes  No  N/A  |
| VHTP8.2.23 | VHT-MCS with Index 0-8 and *NSS* = 8 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.2.22:O | Yes  No  N/A  |
| VHTP8.2.24 | VHT-MCS with Index 0-9 and *NSS* = 8 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.2.23:O | Yes  No  N/A  |
| VHTP8.3 | CBW80+80 | 21.5 (Parameters for VHT-MCSs)(Ed) |  |  |
| VHTP8.3.1 | VHT-MCS with Index 0-7 and *NSS* = 1 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP3.5:M | Yes  No  N/A  |
| VHTP8.3.2 | VHT-MCS with Index 0-8 and *NSS* = 1 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.3.1:O | Yes  No  N/A  |
| VHTP8.3.3 | VHT-MCS with Index 0-9 and *NSS* = 1 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.3.2:O | Yes  No  N/A  |
| VHTP8.3.4 | VHT-MCS with Index 0-7 and *NSS* = 2 | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573):O | Yes  No  N/A  |
| VHTP8.3.5 | VHT-MCS with Index 0-8 and *NSS* = 2 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.3.4:O | Yes  No  N/A  |
| VHTP8.3.6 | VHT-MCS with Index 0-9 and *NSS* = 2 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.3.5:O | Yes  No  N/A  |
| VHTP8.3.7 | VHT-MCS with Index 0-7 and *NSS* = 3 | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573):O | Yes  No  N/A  |
| VHTP8.3.8 | VHT-MCS with Index 0-8 and *NSS* = 3 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.3.7:O | Yes  No  N/A  |
| VHTP8.3.9 | VHT-MCS with Index 0-9 and *NSS* = 3 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.3.8:O | Yes  No  N/A  |
| VHTP8.3.10 | VHT-MCS with Index 0-7 and *NSS* = 4 | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573):O | Yes  No  N/A  |
| VHTP8.3.11 | VHT-MCS with Index 0-8 and *NSS* = 4 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.3.10:O | Yes  No  N/A  |
| VHTP8.3.12 | VHT-MCS with Index 0-9 and *NSS* = 4 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.3.11:O | Yes  No  N/A  |
| VHTP8.3.13 | VHT-MCS with Index 0-7 and *NSS* = 5 | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573):O | Yes  No  N/A  |
| VHTP8.3.14 | VHT-MCS with Index 0-8 and *NSS* = 5 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.3.13:O | Yes  No  N/A  |
| VHTP8.3.15 | VHT-MCS with Index 0-9 and *NSS* = 5 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.3.14:O | Yes  No  N/A  |
| VHTP8.3.16 | VHT-MCS with Index 0-7 and *NSS* = 6 | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573):O | Yes  No  N/A  |
| VHTP8.3.17 | VHT-MCS with Index 0-8 and *NSS* = 6 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.3.16:O | Yes  No  N/A  |
| VHTP8.3.18 | VHT-MCS with Index 0-9 and *NSS* = 6 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.3.17:O | Yes  No  N/A  |
| VHTP8.3.19 | VHT-MCS with Index 0-7 and *NSS* = 7 | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573):O | Yes  No  N/A  |
| VHTP8.3.20 | VHT-MCS with Index 0-8 and *NSS* = 7 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.3.19:O | Yes  No  N/A  |
| VHTP8.3.21 | VHT-MCS with Index 0-9 and *NSS* = 7 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.3.20:O | Yes  No  N/A  |
| VHTP8.3.22 | VHT-MCS with Index 0-7 and *NSS* = 8 | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573):O | Yes  No  N/A  |
| VHTP8.3.23 | VHT-MCS with Index 0-8 and *NSS* = 8 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.3.22:O | Yes  No  N/A  |
| VHTP8.3.24 | VHT-MCS with Index 0-9 and *NSS* = 8 | 21.5 (Parameters for VHT-MCSs)(Ed) | VHTP8.3.23:O | Yes  No  N/A  |
| VHTP8.4 | Transmit and receive support for 400 ns GI | 21.5 (Parameters for VHT-MCSs)(Ed) | CFVHT(#6573):O | Yes  No  N/A  |
| VHTP9 | Space-time block coding (STBC) | 21.3.10.9.4 (Space-time block coding)(Ed) | CFVHT(#6573):O | Yes  No  N/A  |
| VHTP10 | Non-HT duplicate format | 21.3.10.12 (Non-HT duplicate transmission)(Ed) | CFVHT(#6573):M | Yes  No  N/A  |

* B.4.xx High Efficiency WLAN (HEW) features

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| B.4.xx.1HEW MAC features  |
| Item | Protocol capability | References | Status | Support |
|  | Are the following MAC protocol features supported? |  |  |  |
| HEWM1 | HE capabilities signaling |  |  |  |
| HEWM1.1 | HE Capabilities element | 9.4.2.213(HE Capabilities element)(Ed) | CFHEW:MCFHEW20(#6573):M(11af) | Yes  No  N/A  |
| HEWM1.2 | Signaling of STA capabilities in Probe Request, (Re)Association Request frames | 9.3.3.6 (Association Request frame format), 9.3.3.8 (Reassociation Request frame format), 9.3.3.10 (Probe Request frame format), 9.4.2.213 (HE Capabilities element)(Ed) | (CFHEW AND CFSTAof AP):M(CFHEW20 AND CFSTAofAP(#6573)):M(11af) | Yes  No  N/A  |
| HEWM1.3 | Signaling of STA and BSS capabilities in Beacon, Probe Response, (Re)Association Response frames | 9.3.3.3 (Beacon frame format), 9.3.3.7 (Association Response frame format), 9.3.3.9 (Reassociation Response frame format), 9.3.3.11 (Probe Response frame format), 9.4.2.213 (HE Capabilities element)(Ed) | (CFHEW AND CFAP):M(CFHEW20 AND CFAP(#6573)):M(11af) | Yes  No  N/A  |
| HEWM2 | Signaling of HT operation | 9.4.2.214 (HE Operation element)(Ed) | (CFHEW AND CFAP):M(CFHEW20 AND CFAP(#6573)):M(11af) | Yes  No  N/A  |
| HEWM3 | A-MPDU with multiple TIDs | 25.10.4(A-MPDU with multiple TIDs) | CFHEW:O | Yes  No  N/A  |
| HEWM4 | HE Variant HT Control  |  |  |  |
| HEWM4.1 | UL MU Response Scheduling | 9.2.4.6.4.2 (UL MU response scheduling) | CFHEW: OCFHEW20: O | Yes  No  N/A  |
| HEWM4.2 | Operating Mode | 9.2.4.6.4.3 (Operating mode) | CFAP and CFHEW: MCFIndepStA and CFHEW:OCFHEW: O | Yes  No  N/A  |
| HEWM4.3 | HE Link Adaptation | 9.2.4.6.4 (HE link adaptation) | CFHEW: OCFHEW20: O |  |
| HEWM4.4 | Buffer Status Report | 9.2.4.6.5(Buufer Status Report) | CFHEW: OCFHEW20: O |  |
| HEWM4.5 | UL Power Headroom | 9.2.4.6.5.1(UL power headroom) | CFHEW: MCFHEW20: M |  |
| HEWM6 | Trigger |  |  |  |
| HEWM6.1 | Basic Trigger | 9.3.1.23.1(Basic Trigger variant) | CFHEW:M | Yes  No  N/A  |
| HEWM6.2 | Beamforming Report Poll | 9.3.1.23.2(Beamforing Report Poll variant) | CFHEW:M | Yes  No  N/A  |
| HEWM6.3 | MU-BAR | 9.3.1.23.3(MU BAR variant) | CFHEW:O | Yes  No  N/A  |
| HEWM6.4 | MU-RTS | 9.3.1.23.4(MU-RTS variant) | CFHEW:O | Yes  No  N/A  |
| HEWM6.5 | BSRP | 9.3.1.23.5(BSRP variant) | CFHEW:O | Yes  No  N/A  |
| HEWM7 | Transmit beamforming |  |  |  |
| HEWM7.1 | SU Beamformer Capable | 9.4.2.218 (HE Capability Element) | CFHEW:OCFHEW20:O | Yes  No  N/A  |
| HEWM7.2 | SU Beamformee Capable | 9.4.2.218 (HE Capability Element) | CFHEW:OCFHEW20:O | Yes  No  N/A  |
| HEWM7.3 | MU Beamformer Capable | 9.4.2.218 (HE Capability Element) | CFAP and HEWM7.1:O+ | Yes  No  N/A  |
| HEWM7.4 | MU Beamformee Capable | 9.4.2.218 (HE Capability Element) | VFIndepSTA and VHTM7.2:O | Yes  No  N/A  |
| HEWM7.5 | Trasnmission of HE null data packet | 26.6 (HE Sounding Protocol) | HEWM7.1:M | Yes  No  N/A  |
| HEWM7.6 | Reception of HE null data packet | 25.6 (HE Sounding Protocol) | HEWM7.2:M | Yes  No  N/A  |
| HEW7.7 | Transmission of Trigger frame | 25.6 (HE Sounding Protocol) | HEWM7.1:O | Yes  No  N/A  |
| HEW7.7 | Reception of trigger frame | 25.6 (HE Sounding Protocol) | HEWM7.7:M | Yes  No  N/A  |
| HEWM8 | Sounding Protocol |  |  |  |
| HEWM8.1 | HE Sounding Protocol as SU beamformer | 25.6 (HE sounding protocol) | HEWM7.1:M | Yes  No  N/A  |
| HEWM8.2 | HE Sounding Protocol as SU beamformee | 25.6 (HE sounding protocol) | HEW7.2:M | Yes  No  N/A  |
| HEWM8.3 | HE Sounding Protocol as MU beamformer | 25.6 (HE sounding protocol) | HEW7.4:M | Yes  No  N/A  |
| HWEM8.4 | HE Sounding Protocol as MU beamformee | 25.6 (HE sounding protocol) | HEW7.5:M | Yes  No  N/A  |
| HEWM9 | NAV Update | 25.2.2 (Updating two NAVs) |  |  |
| HEWM9.1 | Update regular NAV | 25.2.2 (Updating two NAVs) | CFHEW:MCFHEW20:M | Yes  No  N/A  |
| HEWM9.2 | Update IntraqBSS NAV | 25.2.2(updating two NAVs) | CFAP and CFHEW:OCFIndSTA and CFHEW:MCFHEW20:M | Yes  No  N/A  |
| HEWM10 | OFDMA Radom Access | 25.5.2.6(UL OFDMA-based randon access) | CFHEW:O | Yes  No  N/A  |
| HEWM11 | TWT Operation | 25.7(TWT operation) | CFHEW:O | Yes  No  N/A  |

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| B.4.xx.2 HEW PHY features  |

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| Item | Protocol capability | References | Status | Support |
|  | Are the following PHY protocol features supported? |  |  |  |
| HEWP1 | PHY operating modes |  |  |  |
| HEWP1.1 | Operation according to Clause 17 (Orthogonal frequency division multiplexing (OFDM) PHY specification) and/or Clause 19 (High Throughput (HT) PHY specification) (High Throughput) and/or Clause 21 (Very High Throughput (VHT) PHY specigcation)  | 26.1.1 (Introduction to the HE PHY)(Ed) | CFHEE5G(#6573) and (HEWP3.3 or HEWP3.4): M | Yes  No  N/A  |
| HEWP1.2 | Operation according Clause 19 (High Throughput (HT) PHY specification) (High Throughput) | 26.1.1 (Introduction to the HE PHY) | CFHEW5G and CFHEW20: M | Yes  No  N/A  |
| HEWP1.3 | Operation according Clause 19 (High Throughput (HT) PHY specification) (High Throughput) | 26.1.1 (Introduction to the HE PHY) | CFHEW2G4:M | Yes  No  N/A  |
| HEWP2 | HE PPDU format | 26.1.4 (PPDU format)(Ed) |  |  |
| HEWP2.1 | HE SU PPDU (HE\_SU) | 26.1.4 (PPDU format) |  | Yes  No  N/A  |
| HEWP2.2 | HE extended range SU PPDU (HE\_EXT\_SU) | 26.1.4 (PPDU format) |  | Yes  No  N/A  |
| HEWP2.3 | HE MU PPDU (HE\_MU) | 26.1.4 (PPDU format) |  | Yes  No  N/A  |
| HEWP2.4 | HE trigger-based PPDU (HE\_TRIG) | 26.1.4 (PPDU format) |  | Yes  No  N/A  |
| HEWP3 | PHY timing parameters |  |  |  |
| HEWP3.1 | Values in 20 MHz channel | 26.3.8 (Timing-related parameters)(Ed) | CFHEW2G4(#6573):MCFHEW5G:MCFHEW20:M | Yes  No  N/A  |
| HEWP3.2 | Values in 40 MHz channel | 26.3.8 (Timing-related parameters)(Ed) | CFHEW2G4(#6573):MCFHEW5G:M (#6573) | Yes  No  N/A  |
| HEWP3.3 | Values in 80 MHz channel | 26.3.8 (Timing-related parameters) (Ed) | CFHEW5G:M | Yes  No  N/A  |
| HEWP3.4 | Values in 160 MHz channel | 26.3.8 (Timing-related parameters) (Ed) | CFHEW5G:M | Yes  No  N/A  |
| HEWP3.5 | Values in 80+80 MHz channel | 26.3.8 (Timing-related parameters) (Ed) | CFHEW5G:M | Yes  No  N/A  |
| HEWP4 | HE preamble | 21.3.10 (VHT preamble)(Ed) |  (#6573) |  |
| HEWP4.1 | HE SU Preamble | 21.3.10 (VHT preamble) | CFHEW5G:M | Yes  No  N/A  |
| HEWP4.2 | HE MU Preamble | 21.3.10 (VHT preamble) | CFHEW5G:M | Yes  No  N/A  |
| HEWP4.3 | HE\_EXT\_SU Preamble | 21.3.10 (VHT preamble) | CFHEW5G:M | Yes  No  N/A  |
| HEWP4.4 | HE\_TRIG Preamble | 21.3.10 (VHT preamble) | CFHEW5G:M | Yes  No  N/A  |
| HEWP5 | STBC | 26.3.10.9 | CFHEW:O | Yes  No  N/A  |
| HEWP6 | Tone Allocation |  |  |  |
| HEWP6.1 | 26 RU tone mapping |  | VHTP3.1:MVHTP3.2:MVHTP3.3:MVHTP3.4:MVHTP3.5:MCFHEW20:M |  |
| HEWP6.2 | 52 RU tone mapping |  | VHTP3.1:MVHTP3.2:MVHTP3.3:MVHTP3.4:MVHTP3.5:MCFHEW20:M |  |
| HEWP6.3 | 106 RU tone mapping |  | VHTP3.1:MVHTP3.2:MVHTP3.3:MVHTP3.4:MVHTP3.5:MCFHEW20:M |  |
| HEWP6.4 | 242 RU tone mapping |  | VHTP3.1 and HEWP2.1:MVHTP3.2:MVHTP3.3:MVHTP3.4:MVHTP3.5:MCFHEW20:M |  |
| HEWP6.5 | 484 RU Tone mapping |  | VHTP3.2:MVHTP3.3:MVHTP3.4:MVHTP3.5:M |  |
| HEWP6.6 | 996 RU Tone Mapping |  | VHTP3.3:MVHTP3.4:MVHTP3.5:M |  |
| HEWP6.7 | 2x996 RU tone mapping |  | VHTP3.4:MVHTP3.5:M |  |
| HEWP10 | Coding  |  |  |  |
| HEWP10.1 | BCC with less than 4 spatial streams |  | (HEWP6.1 or HEWP6.2 or HEWP6.3 or HEWP6.4):M(VHTP3.1 and HEWP2.1):M |  |
|  | LDPC with more than 4 spatial streams |  | CFHEW:MCFHEW20:O |  |
|  | LDPC with less or equal to 4 spatial streams  |  | (HEWP6.5 or HEWP6.6 or HEWP6.7):M((VHTP3.2 or VHTP3.3 or VHTP3.4 or VHTP3.5) and HEWP2.1):M(HEWP6.1 or HEWP6.2 or HEWP6.3 or HEWP6.4):O(VHTP3.1 and HEWP2.1):OCFHEW20:O |  |
| HEWP11 | STBC |  | CFHEW:OCFHEW20:O |  |
| HEWP12 | Coding and Modulation Schemes |  |  |  |
| HEWP12.1 | HEW-MCS with Index 0-10 and *NSS* = 1 | 26.5 (Parameters for HE-MCSs)(Ed) | (HEWP6.4 and VHTP8.1.2):O(HEWP6.5 and VHTP8.1.2):O (HEWP6.6 and VHTP8.1.2):O (HEWP6.7 and VHTP8.1.2):O (#6573) | Yes  No  N/A  |
| HEWP12.2 | HEW-MCS with Index 0-11 and *NSS* = 1 | 26.5 (Parameters for HE-MCSs)(Ed) | HEWP12.2:O | Yes  No  N/A  |
| HEWP12.3 | HEW-MCS with Index 0-10 and *NSS* = 2 | 26.5 (Parameters for VHT-MCSs)(Ed) | (HEWP6.4 and VHTP8.1.2):O(HEWP6.5 and VHTP8.1.2):O (HEWP6.6 and VHTP8.1.2):O (HEWP6.7 and VHTP8.1.2):O | Yes  No  N/A  |
| HEWP12.4 | HEW-MCS with Index 0-11 and *NSS* = 2 | 26.5 (Parameters for VHT-MCSs)(Ed) | HEWP12.3:O | Yes  No  N/A  |
| HEWP12.5 | HEW-MCS with Index 0-10 and *NSS* = 3 | 26.5 (Parameters for VHT-MCSs)(Ed) | (HEWP6.4 and VHTP8.1.2):O(HEWP6.5 and VHTP8.1.2):O (HEWP6.6 and VHTP8.1.2):O (HEWP6.7 and VHTP8.1.2):O | Yes  No  N/A  |
| HEWP12.6 | HEW-MCS with Index 0-11 and *NSS* = 3 | 26.5 (Parameters for VHT-MCSs)(Ed) | HEWP12.4:O | Yes  No  N/A  |
| HEWP12.7 | HEW-MCS with Index 0-10 and *NSS* = 4 | 26.5 (Parameters for VHT-MCSs)(Ed) | (HEWP6.4 and VHTP8.1.2):O(HEWP6.5 and VHTP8.1.2):O (HEWP6.6 and VHTP8.1.2):O (HEWP6.7 and VHTP8.1.2):O | Yes  No  N/A  |
| HEWP12.8 | HEW-MCS with Index 0-11 and *NSS* = 4 | 26.5 (Parameters for VHT-MCSs)(Ed) | HEWP12.6:O | Yes  No  N/A  |
| HEWP12.9 | HEW-MCS with Index 0-10 and *NSS* = 5 | 26.5 (Parameters for VHT-MCSs)(Ed) | (HEWP6.4 and VHTP8.1.2):O(HEWP6.5 and VHTP8.1.2):O (HEWP6.6 and VHTP8.1.2):O (HEWP6.7 and VHTP8.1.2):O | Yes  No  N/A  |
| HEWP12.10 | HEW-MCS with Index 0-11 and *NSS* = 5 | 26.5 (Parameters for VHT-MCSs)(Ed) | HEWP12.3:O | Yes  No  N/A  |
| HEWP12.11 | HEW-MCS with Index 0-10 and *NSS* = 6 | 26.5 (Parameters for VHT-MCSs)(Ed) | (HEWP6.4 and VHTP8.1.2):O(HEWP6.5 and VHTP8.1.2):O (HEWP6.6 and VHTP8.1.2):O (HEWP6.7 and VHTP8.1.2):O | Yes  No  N/A  |
| HEWP12.12 | HEW-MCS with Index 0-11 and *NSS* = 6 | 26.5 (Parameters for VHT-MCSs)(Ed) | HEWP12.3:O | Yes  No  N/A  |
| HEWP12.13 | HEW-MCS with Index 0-10 and *NSS* = 7 | 26.5 (Parameters for VHT-MCSs)(Ed) | (HEWP6.4 and VHTP8.1.2):O(HEWP6.5 and VHTP8.1.2):O (HEWP6.6 and VHTP8.1.2):O (HEWP6.7 and VHTP8.1.2):O | Yes  No  N/A  |
| HEWP12.14 | HEW-MCS with Index 0-11 and *NSS* = 7 | 26.5 (Parameters for VHT-MCSs)(Ed) | HEWP12.3:O | Yes  No  N/A  |
| HEWP12.15 | HEW-MCS with Index 0-10 and *NSS* = 8 | 26.5 (Parameters for VHT-MCSs)(Ed) | (HEWP6.4 and VHTP8.1.2):O(HEWP6.5 and VHTP8.1.2):O (HEWP6.6 and VHTP8.1.2):O (HEWP6.7 and VHTP8.1.2):O | Yes  No  N/A  |
| HEWP12.16 | HEW-MCS with Index 0-11 and *NSS* = 8 | 26.5 (Parameters for VHT-MCSs)(Ed) | HEWP12.3:O | Yes  No  N/A  |
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**References:**