IEEE P802.11  
Wireless LANs

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| TGac PICs | | | | |
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Abstract

This document includes resolution to CID 1321 on TGac PICS

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| **CommentID** | **Subclause** | **Page** | **Line** | **CommentType** | **Comment** | **SuggestedRemedy** |
| 1321 | General |  |  | TR | There are no PICS entries | Add PICS entries. |

**B.2.2 General abbreviations for Item and Support columns**

* **VHTM: Very Hight Throughput MAC**
* **VHTP: Very High Throughput PHY**

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| * IUT configuration | | | | |
| Item | IUT configuration | References | Status | Support |
|  | What is the configuration of the IUT? |  |  |  |
| \* CF1 | Access point (AP) | 4.3 (Components of the IEEE 802.11 architecture) | O.1 | Yes  No  |
| \* CF2 | Independent station (*not* an AP) | 4.3 (Components of the IEEE 802.11 architecture) | O.1 | Yes  No  |
| \*CF2.1 | Operation in an infrastructure BSS(#1558) | 4.3 (Components of the IEEE 802.11 architecture) | CF2:M | Yes  No  N/A  |
| \*CF2.2 | Operation in an IBSS(#1558) | 4.3 (Components of the IEEE 802.11 architecture) | CF2:O | Yes  No  N/A  |
| \*CF2.3 (11p) | Independent station operating outside the context of a BSS (dot11OCBActivated(#10538) is true) | 10.20 (STAs communicating data frames outside the context of a BSS(11p)) | (not CF17):O, CF17:M | Yes  No  |
| \* CF3 | Frequency-hopping spread spectrum (FHSS) PHY for the 2.4 GHz band | — | O.2 | Yes  No  |
| \* CF4 | Direct sequence spread spectrum (DSSS) PHY for the 2.4 GHz band | — | O.2 | Yes  No  |
| CF5 (#4031) | Infrared (IR) PHY | — | O.2 | Yes  No  |
| \* CF6 | Orthogonal frequency division multiplexing (OFDM) PHY(11y) | — | O.2 | Yes  No  |
| \* CF7 | High-speed PHY | — | O.2 | Yes  No  |
| \* CF8 | Is multidomain operation capability -implemented? | 8.4.2.11 (Hopping Pattern Parameters (#1684)element), 8.4.2.12 (Hopping Pattern Table (#1684)element), 9.18 (Operation across regulatory domains), 10.1.4.5 (Synchronizing with a BSS) | O.3 | Yes  No  |
| \* CF9 | Extended Rate PHY (ERP) | Clause 18 (Extended Rate PHY (ERP) specification(#1468)(#1729)) | O.2 | Yes  No  |
| \* CF10 | Is spectrum management operation -supported? | 8.4.1.4 (Capability Information field), 10.6 (Higher layer timer synchronization) | (CF6 OR CF16:(11n) O  CFac: O | Yes  No  |
| \*CF11 | Is operating classes(#2113) capability -implemented? | 8.4.2.13 (Request (#1684)element), 17.3.8.4.2 (Channel numbering), 17.3.8.7 (Slot time), 17.4.2 (OFDM PHY MIB), Annex D, Annex E | (CF6 OR CF16)(11n) &CF8& CF10:O | Yes  No  N/A  |
| \* CF12 | Quality of service (QoS) supported | 9.19 (HCF), 9.20 (Block Acknowledgment (Block Ack)), 4.3.10 (High-throughput (HT) station (STA)(11n))(11n) | O  CF16:M  CFac :M(11n) | Yes  No  N/A  (11n) |
| \* CF13(11k) | Is Radio Measurement supported? (#1704) | 8.4.1.4 (Capability Information field), 10.11 (Radio measurement procedures(11k)) | (CF6 AND CF11):O | Yes  No  N/A  |
| \*CF14(11r) | Is infrastructure mode implemented? | 4.3.3 (STA membership in a BSS is dynamic) | O | Yes  No  |
| \*CF15(11y) | 3.65–3.70 GHz band in United States | 8.4.2.54 (DSE Registered Location element(11y)), 10.12 (DSE procedures(11y)), 17.3.6 (CCA), 17.3.10.6 (CCA requirements(11y)), Annex D, Annex E | CF6&CF8&CF10&CF11:O | Yes  No  N/A  |
| \*CF16(11n)  (#4000) | High-throughput (HT) features | 8.4.2.58 (HT Capabilities element (11n)) | O | Yes  No  |
| \*CF17(11p) | 5.9 GHz band | Annex E | CF6:O | Yes  No  |
| \*CF18(11z) | Is tunneled direct-link setup supported? | 10.22 (Tunneled direct-link setup(11z)) | O | Yes  No  N/A  |
| CFac | Very High Throughput (VHT) Features | 8.4.2.94 (VHT Capabilities element) | O | Yes  No  N/A  |

QoS base functionality

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| Item | Protocol capability | References | Status | Support |
| QB1 | QoS frame format | 8.3.1.2 (RTS frame format)–8.3.1.4 (ACK frame format), 8.3.2.1 (Data frame format(11n)),(11n) 8.3.3.2 (Beacon frame format), 8.3.3.5 (Association Request frame format)–8.3.3.8 (Reassociation Response frame format), 8.3.3.10 (Probe Response frame format), 8.3.3.13 (Action frame format) | CF12:M | Yes  No  N/A  |
| QB2 | Per traffic identifier (TID) -duplicate detection | 8.2.4.4 (Sequence Control field), 8.2.4.5 (QoS Control field), 9.3.2.11 (Duplicate detection and recovery(#1606)) | CF12:M | Yes  No  N/A  |
| QB3 | Decode of no-acknowledgment policy in QoS data frames | 8.2.4.5.4 (Ack Policy subfield), 9.19.2.4 (Multiple frame transmission in an EDCA TXOP), 9.19.2.5 (EDCA backoff procedure), 9.19.4.2 (Contention-based admission control procedures), 9.19.4.3 (Controlled-access admission control) | CF12:M | Yes  No  N/A  |
| QB4 | Block Acknowledgments (Block Acks) | (11n) |  |  |
| QB4.1 (11n) | Immediate Block Ack | 8.3.1.8.1 (Overview(11n)), 8.3.1.8.2 (Basic BlockAckReq variant(11n)), 8.3.1.9.1 (Overview(11n)), 8.3.1.9.2 (Basic BlockAck variant(11n)),  8.5.5 (Block Ack Action frame details), 9.20 (Block Acknowledgment (Block Ack)) (except 9.20.7 (HT-immediate Block Ack extensions) and 9.20.8 (HT-delayed Block Ack extensions)), 10.5 (Block Ack operation) | CF12:O  CF16:M  CFac:M | Yes  No  N/A  |
| \*QB4.2 (11n) | Delayed Block Ack | 8.3.1.8.1 (Overview(11n)), 8.3.1.8.2 (Basic BlockAckReq variant(11n)), 8.3.1.9.1 (Overview(11n)), 8.3.1.9.2 (Basic BlockAck variant(11n)),  8.5.5 (Block Ack Action frame details), 9.20 (Block Acknowledgment (Block Ack)) (except 9.20.7 (HT-immediate Block Ack extensions) and 9.20.8 (HT-delayed Block Ack extensions)), 10.5 (Block Ack operation) | CF12:O | Yes  No  N/A  |
| QB4.3 (11n) | Compressed Block Ack | 8.3.1.8.3 (Compressed BlockAckReq variant(11n)) | CF12:O CF16:M  CFac:M | Yes  No  N/A  |
| QB4.4 (11n) | MultiTID Block Ack | 8.3.1.8.4 (Multi-TID BlockAckReq variant(11n)) | CF12:O  CF16:M  CFac:M | Yes  No  N/A  |
| QB5 | Automatic power-save delivery (APSD) | 8.5.3 (QoS Action frame details), 10.2.1 (Power management in an infrastructure network) | CF12:O | Yes  No  N/A  |
| QB6 | Direct-link setup (DLS) | 8.4.2.21 (Channel Switch Announcement element), 8.5.4 (DLS Action frame details), 6.3.14 (Measurement request), 10.7 (DLS operation) | (CF1 AND CF12):M  (CF2.1 AND CF12):O (#1558) | Yes  No  N/A  |

High-throughput (HT) features(11n)

HT MAC features

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| Item | Protocol capability | References | Status | Support |
|  | Are the following MAC protocol features supported? |  |  |  |
| HTM1 | HT capabilities signaling |  |  |  |
| HTM1.1 | HT Capabilities(#11223) element | 8.4.2.58.1 (HT Capabilities element structure(11n)) | CF16:M | Yes  No  N/A  |
| HTM1.2 | Signaling of STA capabilities in Probe Request, (Re)Association Request frames | 8.4.2.58 (HT Capabilities element (11n)), 8.3.3.9 (Probe Request frame format), 8.3.3.5 (Association Request frame format), 8.3.3.7 (Reassociation Request frame format) | (CF16 and CF2):M | Yes  No  N/A  |
| HTM1.3 | Signaling of STA and BSS capabilities in Beacon, Probe Response, (Re)Association Response frames | 8.4.2.58 (HT Capabilities element (11n)), 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) | (CF16 and CF1):M | Yes  No  N/A  |
| HTM2 | Signaling of HT operation | 8.4.2.59 (HT Operation element) | (CF16 and CF1):M | Yes  No  N/A  |
| HTM3 | MPDU aggregation |  |  |  |
| HTM3.1 | Reception of A-MPDU | 8.4.2.58.3 (A-MPDU Parameters field), 11.3 (RSNA confidentiality and integrity(11w) protocols), 9.12.2 (A-MPDU length limit rules(11n)) | CF16:M  CFac:M | Yes  No  N/A  |
| HTM3.2 | A-MPDU format | 8.6.1 (A-MPDU format(11n)) | CF16:M  CFac:M | Yes  No  N/A  |
| HTM3.3 | A-MPDU contents | 8.6.3 (A-MPDU contents (11n)) | CF16:M  CFac: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  CFac:M | Yes  No  N/A  |
| HTM3.5 | Transmission of A-MPDU | 8.4.2.58.3 (A-MPDU Parameters field), 11.3 (RSNA confidentiality and integrity(11w) protocols) | CF16:O  CFac: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(11n)) | CF16:M  CFac:M | Yes  No  N/A  |
| HTM4.2 | A-MSDU format | 8.3.2.2 (A-MSDU format(11n)) | CF16:M  CFac :M | Yes  No  N/A  |
| HTM4.3 | A-MSDU content | 8.3.2.2 (A-MSDU format(11n)) | CF16:M  CFac:M | Yes  No  N/A  |
| HTM4.4 | Transmission of A-MSDUs | 8.3.2.2 (A-MSDU format(11n)), 8.2.4.5 (QoS Control field) | CF16:O  CFac:O | Yes  No  N/A  |
| HTM5 | Block Ack |  |  |  |
| HTM5.1 | Block Ack mechanism | 8.3.1.8 (BlockAckReq(11n) frame format), 8.3.1.9 (BlockAck(11n) frame format), 8.4.1.14 (Block Ack Parameter Set field), 9.20 (Block Acknowledgment (Block Ack)), 10.15 (20/40 MHz BSS operation(11n)) | CF16:M  CFac:M | Yes  No  N/A  |
| HTM5.2 | Use of compressed bitmap between HT STAs | 8.3.1.9.3 (Compressed BlockAck variant(11n)), 9.20.6 (Selection of BlockAck and BlockAckReq variants(11n)), | CF16:M  CFac:M | Yes  No  N/A  |
| HTM5.3 | HT-immediate Block Ack extensions | 9.20.7 (HT-immediate Block Ack extensions) | CF16:M  CFac:M | Yes  No  N/A  |
| HTM5.4 | HT-delayed Block Ack extensions | 9.20.8 (HT-delayed Block Ack extensions) | CF16 and QB4.2:M  CFac and QB4.2:M | Yes  No  N/A  |
| HTM5.5 | Multiple TID Block Ack | 8.3.1.8.4 (Multi-TID BlockAckReq variant(11n)), 8.3.1.9.4 (Multi-TID BlockAck variant(11n)), 9.25.1.7 (PSMP acknowledgment rules(11n)) | HTM12:M  CFac:M | Yes  No  N/A  |
| HTM6 | Protection mechanisms for different HT PHY options |  |  |  |
| HTM6.1 | Protection of RIFS PPDUs in the presence of non-HT STAs | 9.22.3.3 (RIFS protection(11n)) | CF16:M | Yes  No  N/A  |
| HTM6.1a | Protection of RIFS PPDUs in an IBSS | 9.22.3.3 (RIFS protection(11n)) | CF16:M | Yes  No  N/A  |
| HTM6.2 | Protection of HT-greenfield PPDUs in the presence of non-HT STAs | 9.22.3.1 (General(11n)) | HTP1.3:M | Yes  No  N/A  |
| HTM6.2a | Protection of HT-greenfield PPDUs in an IBSS | 9.22.3.1 (General(11n)) | CF16:M | Yes  No  N/A  |
| \*HTM7 | L-SIG TXOP protection mechanism | 9.22.5 (L-SIG TXOP protection) | CF16:O | Yes  No  N/A  |
| HTM7.1 | Update NAV according to L-SIG | 9.22.5.4 (L-SIG TXOP protection NAV update rule(11n)) | HTM7:M | Yes  No  N/A  |
| HTM8 | Duration/ID rules for A-MPDU and TXOP | 8.2.4.2 (Duration/ID field) | CF16:O  CFac:M | Yes  No  N/A  |
| HTM9 | Truncation of TXOP as TXOP holder | 9.19.2.7 (Truncation of TXOP(11n)) | CF16:O  CFac:O | Yes  No  N/A  |
| HTM10 | Reception of +HTC frames | 8.2.4.1.10 (Order field), 8.4.2.58.5 (HT Extended Capabilities field), 9.9 (HT Control field operation(11n)) | CF16:O | Yes  No  N/A  |
| \*HTM11 | Reverse direction (RD) aggregation exchanges | 9.24 (Reverse Direction Protocol(11n)) | CF16:O  CFac:O | Yes  No  N/A  |
| HTM11.1 | Constraints regarding responses | 9.24.4 (Rules for RD responder(11n)) | HTM11:M | Yes  No  N/A  |
| HTM12 | Link adaptation |  |  |  |
| HTM12.1 | Use of the HT Control field for link adaptation in immediate response exchange. | 8.2.4.6 (HT Control field(11n)), 8.3.3.14 (Action No Ack frame format(11n)), 9.27.2 (Link adaptation using the HT Control field(11n)) | CF16:O | Yes  No  N/A  |
| HTM12.2 | Link adaptation using explicit feedback mechanism | 8.3.3.14 (Action No Ack frame format(11n)), 9.28.3 (Explicit feedback beamforming(11n)) | CF16:O | Yes  No  N/A  |
| HTM13 | Transmit beamforming |  |  |  |
| \*HTM13.1 | Transmission of beamformed PPDUs | 9.28 (Transmit beamforming(11n)) | CF16:O | Yes  No  N/A  |
| \*HTM13.2 | Reception of beamformed PPDUs | 9.28 (Transmit beamforming(11n)) | CF16:O | Yes  No  N/A  |
| \*HTM13.3 | Initiate transmit beamforming frame exchange with implicit feedback | 9.28.2 (Transmit beamforming with implicit feedback(11n)) | HTM13.1:O | Yes  No  N/A  |
| HTM13.3.1 | Reception of sounding PPDUs | 9.28.2 (Transmit beamforming with implicit feedback(11n)) | HTM13.3:M | Yes  No  N/A  |
| \*HTM13.4 | Response to transmit beamforming frame exchange with implicit feedback | 9.28.2 (Transmit beamforming with implicit feedback(11n)) | HTM13.2:O | Yes  No  N/A  |
| HTM13.4.1 | Transmission of sounding PPDUs | 9.28.2 (Transmit beamforming with implicit feedback(11n)) | HTM13.4:M | Yes  No  N/A  |
| \*HTM13.5 | Initiate transmit beamforming frame exchange with explicit feedback | 8.5.12.6 (CSI frame format(11n)), 9.28.3 (Explicit feedback beamforming(11n)) | HTM13.1:O | Yes  No  N/A  |
| HTM13.5.1 | Transmission of sounding PPDUs | 9.28.3 (Explicit feedback beamforming(11n)) | HTM13.5:M | Yes  No  N/A  |
| \*HTM13.6 | Respond to transmit beamforming frame exchange with explicit feedback | 9.28.3 (Explicit feedback beamforming(11n)) | HTM13.2:O | Yes  No  N/A  |
| HTM13.6.1 | Transmission of Action No Ack +HTC frame including Action payload of type CSI | 9.28.3 (Explicit feedback beamforming(11n)), 8.5.12.6 (CSI frame format(11n)) | HTM13.6:O.1 | Yes  No  N/A  |
| HTM13.6.2 | Transmission of Action No Ack +HTC frame including Action payload of type “noncompressed beamforming” | 9.28.3 (Explicit feedback beamforming(11n)), 8.5.12.7 (Noncompressed Beamforming frame format(11n)) | HTM13.6:O.1 | Yes  No  N/A  |
| HTM13.6.3 | Transmission of Action No Ack +HTC frame including Action payload of type “Compressed beamforming” | 9.28.3 (Explicit feedback beamforming(11n)), 8.5.12.8 (Compressed Beamforming frame format(11n)) | HTM13.6:O.1 | Yes  No  N/A  |
| \*HTM13.7 | Calibration procedure | 8.3.3.14 (Action No Ack frame format(11n)), 9.28.2.4 (Calibration(11n)) | HTM13:O | Yes  No  N/A  |
| HTM14 | Antenna selection (ASEL) | 8.2.4.6 (HT Control field(11n)), 8.4.2.58.7 (ASEL Capability field), 8.5.12.9 (Antenna Selection Indices Feedback frame format(11n)), 9.29 (Antenna selection (ASEL)(11n)) | CF16:O | Yes  No  N/A  |
| \*HTM15 | Null data packet (NDP) | 9.30 (Null data packet (NDP) sounding(11n)) | CF16:O | Yes  No  N/A  |
| HTM16 | Space-time block coding (STBC) support |  |  |  |
| HTM16.1 | STBC beacon transmission | 10.1.3.2 (Beacon generation in infrastructure networks) | HTP2.11:O | Yes  No  N/A  |
| HTM16.2 | Dual CTS protection | 9.3.2.8 (Dual CTS protection) | HTP2.11:O | Yes  No  N/A  |
| HTM17 | SM power save support |  |  |  |
| \*HTM17.1 | AP support for dynamic and static SM power save mode | 10.2.3 (SM power save(11n)) | (CF16 and CF1):M | Yes  No  N/A  |
| \*HTM17.2 | STA support for dynamic and static SM power save mode | 10.2.3 (SM power save(11n)) | (CF16 and CF2):O | Yes  No  N/A  |
| HTM17.3 | Transmit SM Power Save state information using HT capabilities, or SM Power Save Action frame | 8.5.12.3 (SM Power Save frame format(11n)), 10.2.3 (SM power save(11n)) | (HTM17.1 OR HTM17.2):M | Yes  No  N/A  |
| HTM17.4 | Receive SM Power Save state information and support frame exchanges with SM Power Save STAs | 10.2.3 (SM power save(11n)) | CF16:M | Yes  No  N/A  |
| HTM18 | Mechanisms for coexistence of 20 MHz and 40 MHz channels | 10.15 (20/40 MHz BSS operation(11n)) | CF16:M | Yes  No  N/A  |
| HTM19 | Channel selection methods for  20/40 MHz operation | 10.15.3 (Channel selection methods for 20/40 MHz operation(11n)) | (HTP2.3.4 and CF1):M | Yes  No  N/A  |
| HTM20 | 20/40 MHz operation | 10.15 (20/40 MHz BSS operation(11n)) | HTP2.3.4:M | Yes  No  N/A  |
| HTM21 | Phased coexistence operation (PCO) |  |  |  |
| \*HTM21.1 | PCO capability at AP | 10.16 (Phased coexistence operation (PCO)(11n)) | (CF16 and CF1):O | Yes  No  N/A  |
| HTM21.1.1 | Rules for operation at a PCO active AP | 8.5.12.5 (Set PCO Phase frame format(11n)), 10.16.2 (Operation at a PCO active AP(11n)) | HTM21.1:M | Yes  No  N/A  |
| \*HTM21.2 | STA support for PCO mode | 10.16 (Phased coexistence operation (PCO)(11n)) | (CF16 and CF2):O | Yes  No  N/A  |
| HTM21.2.1 | Rules for operation at PCO active STA | 8.5.12.5 (Set PCO Phase frame format(11n)), 10.16.3 (Operation at a PCO active non-AP STA(11n)) | HTM21.2:M | Yes  No  N/A  |
| HTM22 | Management information base (MIB) |  |  |  |
| HTM22.1 | dot11PhyHTComplianceGroup | Annex C | CF16:M | Yes  No  N/A  |
| HTM22.2 | dot11PhyMCSGroup | Annex C | CF16:M | Yes  No  N/A  |

(11n)

HT PHY features

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| Item | Protocol capability | References | Status | Support |
|  | Are the following PHY protocol features supported? |  |  |  |
| HTP1 | PHY operating modes |  |  |  |
| HTP1.1 | Operation according to 17 (Orthogonal frequency division multiplexing (OFDM) PHY specification (11y)) and/or Clause 18 (Extended Rate PHY (ERP) specification(#1468)(#1729)) | 19.1.4 (PPDU formats) | CF16:M | Yes  No  N/A  |
| HTP1.2 | HT-mixed format | 19.1.4 (PPDU formats) | CF16:M | Yes  No  N/A  |
| \*HTP1.3 | HT-greenfield format | 19.1.4 (PPDU formats) | CF16:O | Yes  No  N/A  |
| HTP2 | PLCP frame format |  |  |  |
| HTP2.1 | HT-mixed format PLCP format | 19.3.2 (PPDU format) | CF16:M | Yes  No  N/A  |
| HTP2.2 | HT-greenfield PLCP format | 19.3.2 (PPDU format) | HTP1.3:M | Yes  No  N/A  |
| HTP2.3 | Modulation and coding schemes (MCS) |  |  |  |
| HTP2.3.1 | MCS 0 through MCS 7 in 20 MHz with 800 ns guard interval (GI) |  |  |  |
| HTP2.3.1.1 | Support for 20 MHz with 800 ns GI MCS index 0 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:M | Yes  No  N/A  |
| HTP2.3.1.2 | Support for 20 MHz with 800 ns GI MCS index 1 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:M | Yes  No  N/A  |
| HTP2.3.1.3 | Support for 20 MHz with 800 ns GI MCS index 2 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:M | Yes  No  N/A  |
| HTP2.3.1.4 | Support for 20 MHz with 800 ns GI MCS index 3 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:M | Yes  No  N/A  |
| HTP2.3.1.5 | Support for 20 MHz with 800 ns GI MCS index 4 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:M | Yes  No  N/A  |
| HTP2.3.1.6 | Support for 20 MHz with 800 ns GI MCS index 5 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:M | Yes  No  N/A  |
| HTP2.3.1.7 | Support for 20 MHz with 800 ns GI MCS index 6 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:M | Yes  No  N/A  |
| HTP2.3.1.8 | Support for 20 MHz with 800 ns GI MCS index 7 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:M | Yes  No  N/A  |
| HTP2.3.2 | MCS 8 through MCS 15 in 20 MHz with 800 ns GI |  |  |  |
| HTP2.3.2.1 | Support for 20 MHz with 800 ns GI MCS index 8 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | (CF16 and CF1):M | Yes  No  N/A  |
| HTP2.3.2.2 | Support for 20 MHz with 800 ns GI MCS index 9 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | (CF16 and CF1):M | Yes  No  N/A  |
| HTP2.3.2.3 | Support for 20 MHz with 800 ns GI MCS index 10 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | (CF16 and CF1):M | Yes  No  N/A  |
| HTP2.3.2.4 | Support for 20 MHz with 800 ns GI MCS index 11 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | (CF16 and CF1):M | Yes  No  N/A  |
| HTP2.3.2.5 | Support for 20 MHz with 800 ns GI MCS index 12 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | (CF16 and CF1):M | Yes  No  N/A  |
| HTP2.3.2.6 | Support for 20 MHz with 800 ns GI MCS index 13 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | (CF16 and CF1):M | Yes  No  N/A  |
| HTP2.3.2.7 | Support for 20 MHz with 800 ns GI MCS index 14 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | (CF16 and CF1):M | Yes  No  N/A  |
| HTP2.3.2.8 | Support for 20 MHz with 800 ns GI MCS index 15 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | (CF16 and CF1):M | Yes  No  N/A  |
| HTP2.3.3 | Transmit and receive support for 400 ns GI | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| \*HTP2.3.4 | Operation at 40 MHz | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5 | Support for MCS with indices 16 through 76 |  |  |  |
| HTP2.3.5.1 | Support for MCS with index 16 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.2 | Support for MCS with index 17 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.3 | Support for MCS with index 18 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.4 | Support for MCS with index 19 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.5 | Support for MCS with index 20 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.6 | Support for MCS with index 21 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.7 | Support for MCS with index 22 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.8 | Support for MCS with index 23 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.9 | Support for MCS with index 24 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.10 | Support for MCS with index 25 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.11 | Support for MCS with index 26 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.12 | Support for MCS with index 27 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.13 | Support for MCS with index 28 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.14 | Support for MCS with index 29 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.15 | Support for MCS with index 30 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.16 | Support for MCS with index 31 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.17 | Support for MCS with index 32 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.18 | Support for MCS with index 33 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.19 | Support for MCS with index 34 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.20 | Support for MCS with index 35 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.21 | Support for MCS with index 36 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.22 | Support for MCS with index 37 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.23 | Support for MCS with index 38 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.24 | Support for MCS with index 39 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.25 | Support for MCS with index 40 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.26 | Support for MCS with index 41 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.27 | Support for MCS with index 42 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.28 | Support for MCS with index 43 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.29 | Support for MCS with index 44 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.30 | Support for MCS with index 45 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.31 | Support for MCS with index 46 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.32 | Support for MCS with index 47 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.33 | Support for MCS with index 48 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.34 | Support for MCS with index 49 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.35 | Support for MCS with index 50 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.36 | Support for MCS with index 51 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.37 | Support for MCS with index 52 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.38 | Support for MCS with index 53 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.39 | Support for MCS with index 54 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.40 | Support for MCS with index 55 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.41 | Support for MCS with index 56 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.42 | Support for MCS with index 57 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.43 | Support for MCS with index 58 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.44 | Support for MCS with index 59 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.45 | Support for MCS with index 60 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.46 | Support for MCS with index 61 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.47 | Support for MCS with index 62 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.48 | Support for MCS with index 63 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.49 | Support for MCS with index 64 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.50 | Support for MCS with index 65 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.51 | Support for MCS with index 66 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.52 | Support for MCS with index 67 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.53 | Support for MCS with index 68 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.54 | Support for MCS with index 69 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.55 | Support for MCS with index 70 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.56 | Support for MCS with index 71 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.57 | Support for MCS with index 72 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.58 | Support for MCS with index 73 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.59 | Support for MCS with index 74 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.60 | Support for MCS with index 75 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.3.5.61 | Support for MCS with index 76 | 19.3.5 (Modulation and coding scheme (MCS)), 19.6 (Parameters for HT MCSs) | CF16:O | Yes  No  N/A  |
| HTP2.4 | PHY timing parameters |  |  |  |
| HTP2.4.1 | Values in non-HT 20 MHz channel | 19.3.6 (Timing-related parameters) | CF16:M | Yes  No  N/A  |
| HTP2.4.2 | Values in 20 MHz HT channel | 19.3.6 (Timing-related parameters) | CF16:M | Yes  No  N/A  |
| HTP2.4.3 | Values in 40 MHz channel | 19.3.6 (Timing-related parameters) | HTP2.3.4:M | Yes  No  N/A  |
| HTP2.5 | HT Preamble field definition and coding |  |  |  |
| HTP2.5.1 | HT-mixed format preamble | 19.3.9.2 (HT-mixed format preamble) | CF16:M | Yes  No  N/A  |
| HTP2.5.2 | HT-greenfield preamble | 19.3.9.5 (HT-greenfield format preamble) | HTP1.3:M | Yes  No  N/A  |
| HTP2.5.3 | Extension HT Long Training fields (HT-ELTFs) | 19.3.9.4.6 (HT-LTF definition) | CF16:O | Yes  No  N/A  |
| HTP2.6 | HT Data field definition and coding | 19.3.11 (Data field) | CF16:M | Yes  No  N/A  |
| HTP2.6.1 | Use of LDPC codes | 19.3.11.7 (LDPC codes) | CF16:O | Yes  No  N/A  |
| HTP2.7 | Beamforming | 19.3.12 (Beamforming) | CF16:O | Yes  No  N/A  |
| HTP2.8 | Sounding PPDUs |  |  |  |
| HTP2.8.1 | HT preamble format for sounding PPDUs | 19.3.13 (HT Preamble format for sounding PPDUs) | CF16:O | Yes  No  N/A  |
| HTP2.8.2 | Sounding with an NDP | 19.3.13.2 (Sounding with a NDP) | HTM15:O | Yes  No  N/A  |
| HTP2.8.3 | Sounding PPDU for calibration | 19.3.13.3 (Sounding PPDU for calibration) | HTM14.7:M | Yes  No  N/A  |
| HTP2.9 | Channel numbering and channelization |  |  |  |
| HTP2.9.1 | Channel allocation for 20 MHz channels at 5 GHz | 17.3.8.4 (Operating channel frequencies) | CF16:M | Yes  No  N/A  |
| HTP2.9.2 | Channel allocation for 20 MHz channels at 2.4 GHz | 18.4.3 (Operating channel frequencies) | CF16:M | Yes  No  N/A  |
| HTP2.9.3 | Channel allocation for 40 MHz channels at 5 GHz | 19.3.15.3 (Channel allocation in the 5 GHz band) | HTP2.3.4:M | Yes  No  N/A  |
| HTP2.9.4 | Channel allocation for 40 MHz channels at 2.4 GHz | 19.3.15.2 (Channel allocation in the 2.4 GHz Band) | HTP2.3.4:M | Yes  No  N/A  |
| HTP2.10 | PMD transmit specification |  |  |  |
| HTP2.10.1 | PMD transmit specification for 20 MHz channel | 19.3.20 (PMD transmit specification) | CF16:M | Yes  No  N/A  |
| HTP2.10.2 | PMD transmit specification for 40 MHz channel | 19.3.20 (PMD transmit specification) | HTP2.3.4:M | Yes  No  N/A  |
| \*HTP2.11 | Space-time block coding (STBC) | 19.3.11.9.2 (Space-time block coding (STBC)) | CF16 and CFac:O | Yes  No  N/A  |
| HTP2.12 | PMD receive specification |  |  |  |
| HTP2.12.1 | PMD receive specification for 20 MHz channel | 19.3.21 (HT PMD receiver specification) | CF16:M | Yes  No  N/A  |
| HTP2.12.2 | PMD receive specification for 40 MHz channel | 19.3.21 (HT PMD receiver specification) | HTP2.3.4:M | Yes  No  N/A  |
| HTP2.13 | PPDU reception with RIFS | 19.3.21.7 (Reduced interframe space (RIFS)) | CF16:M | Yes  No  N/A  |

Very High Throughput (VHT) Features

VHT MAC Features

|  |  |  |  |  |
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|  | Are the following MAC protocol features supported? |  |  |  |
| VHTM1 | VHT capabilities signaling |  |  |  |
| VHTM1.1 | VHT Capabilities(#11223) element | 8.4.2.94.1 (VHT Capabilities element structure(11ac)) | CFac:M | Yes  No  N/A  |
| VHTM1.2 | Signaling of STA capabilities in Probe Request, (Re)Association Request frames | 8.4.2.94 (VHT Capabilities element (11ac)), 8.3.3.9 (Probe Request frame format), 8.3.3.5 (Association Request frame format), 8.3.3.7 (Reassociation Request frame format) | CFac and CF2:M | Yes  No  N/A  |
| VHTM1.3 | Signaling of STA and BSS capabilities in Beacon, Probe Response, (Re)Association Response frames | 8.4.2.94 (VHT Capabilities element (11ac)), 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) | CFac and CF1:M | Yes  No  N/A  |
| VHTM2 | Signaling of VHT operation | 8.4.2.95 (VHT Operation element) | (CFac and CF1):M | Yes  No  N/A  |
| VHTM3 | Link adaptation |  |  |  |
| VHTM3.1 | Use of the VHT Control field for link adaptation in immediate response exchange. | 8.2.4.6 (HT Control field(11ac)), 8.3.3.14 (Action No Ack frame format(11n)), 9.27.3 (Link adaptation using the VHT Control field(11ac)) | CFac:O | Yes  No  N/A  |
| VHTM4 | Transmit beamforming |  |  |  |
| VHTM4.1 | SU Beamformer/Beamformee Capable | 8.4.2.94.2 (VHT Capabilities (11ac)) | CFac:O | Yes  No  N/A  |
| VHTM4.2 | MU Beamformer/Beamformee Capable | 8.4.2.94.2 (VHT Capabilities (11ac)) | CFac:O | Yes  No  N/A  |
| VHTM4.3 | Null Data packet | 9.30 (Null Data Packet (NDP) Sounding) | VHTM4.1 and VHTM4.2: M | Yes  No  N/A  |
| VHTM5 | VHT Sounding Protocol | 9.30.5 (VHT Sounding Protocol) | VHTM4.1 and VHTM4.2: M | Yes  No  N/A  |
| VHTM6 | TXOP Sharing |  |  |  |
| VHTM6.1 | Sharing of EDCA TXOP | 9:19.2.2a (Sharing of EDCA TXOP) | CFac: O | Yes  No  N/A  |
| VHTM6.2 | Use of Primary and Secondary ACs | 9:19.2.2a (Sharing of EDCA TXOP) | VHTM6.1: M | Yes  No  N/A  |
| VHTM7 | TXOP Power Saving | 10.2.1.4a(Power Management During VHT Transmission) | CFac:O | Yes  No  N/A  |
| VHTM8 | BSS Operation |  |  |  |
| VHTM8.1 | Use of Primary and Secondary channels | 10.24.1(Basic VHT Functionality) | CFac:M | Yes  No  N/A  |
| VHTM8.2 | CCA on Primary and Secondary Channels | 10.24.2(CCA Sensing in a VHT BSS) | CFac:M | Yes  No  N/A  |
| VHTM9 | Group ID | 22.3.12.3(Group ID) |  | Yes  No  N/A  |
| VHTM9.1 | Group ID Management | 8.15.6.3 (Group ID Management Frame Format) | CFac:O | Yes  No  N/A  |
| VHTM10 | Dynamic/Static Bandwidth Operation | 10.24.2(CCA Sensing in a VHT BSS) | CFac:O | Yes  No  N/A  |
| VHTM11 | VHT Single MPDU Format | 9.12.7(Transport of VHT Single MPDUs) | CFac:M | Yes  No  N/A  |
| VHTM12 | VHT Operation Notification | 8.4.2.95(VHT Operation Element) | CFac:M | Yes  No  N/A  |
| VHTM13 | Partial AID in VHT PPDU | 9.17a(Partial AID in VHT PPDU) | CFac:M | Yes  No  N/A  |
| VHTM14 | BSS Load Element | 8.4.2.96(Extended BSS Load Element) | CFac: O | Yes  No  N/A  |

VHT PHY Features

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item | Protocol capability | References | Status | Support |
|  | Are the following PHY protocol features supported? |  |  |  |
| VHTP1 | PHY operating modes |  |  |  |
| VHTP1.1 | Operation according to 17 (Orthogonal frequency division multiplexing (OFDM) PHY specification) and/or Clause 19 (High Throughput) | 22.1.4 (PPDU formats) | CFac:M | Yes  No  N/A  |
| VHTP2 | VHT format | 22.3.2 (VHT PPDU format) | CFac:M | Yes  No  N/A  |
| VHTP3 | BSS Bandwidth |  |  |  |
| VHTP3.1 | 20 MHz Operation | 10.24.1(Basic VHT BSS Functionality) | CFac:M | Yes  No  N/A  |
| VHTP3.2 | 40 MHz Operation | 10.24.1(Basic VHT BSS Functionality) | CFac:M | Yes  No  N/A  |
| VHTP3.3 | 80 MHz Operation | 10.24.1(Basic VHT BSS Functionality) | CFac:M | Yes  No  N/A  |
| VHTP3.4 | 160 MHz Operation | 10.24.1(Basic VHT BSS Functionality) | CFac: O | Yes  No  N/A  |
| VHTP3.5 | 80+80 MHz Operation | 10.24.1(Basic VHT BSS Functionality) | CFac: O | Yes  No  N/A  |
| VHTP4 | Bandwidth Indication | 17.3.5.5 (PLCP Data Scrambler and Descrambler) | CFac: M | Yes  No  N/A  |
| VHTP5 | PHY Timing Parameters |  |  |  |
| VHTP5.1 | Values in VHT\_CBW 20 MHz channel | 22.3.6 (Timing-related parameters) | CFac:M | Yes  No  N/A  |
| VHTP5.2 | Values in VHT\_CBW 40 MHz channel | 22.3.6 (Timing-related parameters) | CFac:M | Yes  No  N/A  |
| VHTP5.3 | Values in VHT\_CBW 80 MHz channel | 22.3.6 (Timing-related parameters) | CFac:M | Yes  No  N/A  |
| VHTP5.5 | Values in VHT\_CBW 160 MHz channel | 22.3.6 (Timing-related parameters) | CFac:O | Yes  No  N/A  |
| VHTP5.4 | Values in VHT\_CBW 80+80 MHz channel | 22.3.6 (Timing-related parameters) | CFac:O | Yes  No  N/A  |
| VHTP6 | VHT Preamble | 22.3.9(VHT Preamble) | CFac:M | Yes  No  N/A  |
| VHTP7 | Use of LDPC Code | 22.3.11.4.2 | CFac: O | Yes  No  N/A  |
| VHTP8 | Beamforming |  |  |  |
| VHTP8.1 | SU Beamforming | 22.3.12(SU-MIMO and MU-MIMO Beamforming) | VHTM4.1: M | Yes  No  N/A  |
| VHTP8.2 | MU Beamforming | 22.3.12(SU-MIMO and MU-MIMO Beamforming) | VHTM4.2:M | Yes  No  N/A  |
| VHTP8.3 | Group ID | 22.3.12.3(Group ID) | GFac:M | Yes  No  N/A  |
| VHT8.4 | VHT Preamble for Sounding PPDU | 22.3.13 (VHT Preamble format for sounding PPDU) | VHTM4.1: M OR  VHTM4.2:M | Yes  No  N/A  |
| VHTP 9 | Modulation and coding schemes (MCS) |  |  |  |
| VHTP 9.1 | MCS 0 through MCS 7 in 20, 40, and 80 MHz with Long\_GI, Nss=1 | 22.5 (Parameters for VHT MCSs) | CFac:M | Yes  No  N/A  |
| VHTP 9.2 | MCS 0 through MCS 7 in 160 and 80+80 MHz with Long\_GI, Nss=1 | 22.5 (Parameters for VHT MCSs) | VHTP3.4 and VHTP3.5:M | Yes  No  N/A  |
| VHTP 9.3 | MCS 8 in 20, 40, 80, 160, and 80+80 MHz with Long\_GI , Nss=1 | 22.5 (Parameters for VHT MCSs) | CFac:O | Yes  No  N/A  |
| VHTP 9.4 | MCS 8 in 20, 40, 80, 160, and 80+80 MHz with Long\_GI , Nss=2 | 22.5 (Parameters for VHT MCSs) | CFac:O | Yes  No  N/A  |
| VHTP 9.5 | MCS 8 in 20, 40, 80, 160 and 80+80 MHz with Long\_GI , Nss=3 | 22.5 (Parameters for VHT MCSs) | CFac:O | Yes  No  N/A  |
| VHTP 9.6 | MCS 8 in 20, 40, 80, 160, and 80+80 MHz with Long\_GI , Nss=4 | 22.5 (Parameters for VHT MCSs) | CFac:O | Yes  No  N/A  |
| VHTP 9.7 | MCS 8 in 20, 40, 80, 160, and 80+80 MHz with Long\_GI , Nss=5 | 22.5 (Parameters for VHT MCSs) | CFac:O | Yes  No  N/A  |
| VHTP 9.8 | MCS 8 in 20, 40, 80, 160, and 80+80 MHz with Long\_GI , Nss=6 | 22.5 (Parameters for VHT MCSs) | CFac:O | Yes  No  N/A  |
| VHTP 9.9 | MCS 8 in 20, 40, 80, 160, and 80+80 MHz with Long\_GI , Nss=7 | 22.5 (Parameters for VHT MCSs) | CFac:O | Yes  No  N/A  |
| VHTP 9.10 | MCS 8 in 20, 40, 80, 160, and 80+80 MHz with Long\_GI , Nss=8 | 22.5 (Parameters for VHT MCSs) | CFac:O | Yes  No  N/A  |
| VHTP 9.11 | MCS 9 in 20, 40, 80, 160, and 80+80 MHz with Long\_GI , Nss=1 | 22.5 (Parameters for VHT MCSs) | CFac:O | Yes  No  N/A  |
| VHTP 9.12 | MCS 9 in 20, 40, 80, 160, and 80+80 MHz with Long\_GI , Nss=2 | 22.5 (Parameters for VHT MCSs) | CFac:O | Yes  No  N/A  |
| VHTP 9.13 | MCS 9 in 20, 40, 80, 160, and 80+80 MHz with Long\_GI , Nss=3 | 22.5 (Parameters for VHT MCSs) | CFac:O | Yes  No  N/A  |
| VHTP 9.14 | MCS 9 in 20, 40, 80, 160, and 80+80 MHz with Long\_GI , Nss=4 | 22.5 (Parameters for VHT MCSs) | CFac:O | Yes  No  N/A  |
| VHTP 9.15 | MCS 9 in 20, 40, 80, 160, and 80+80 MHz with Long\_GI , Nss=5 | 22.5 (Parameters for VHT MCSs) | CFac:O | Yes  No  N/A  |
| VHTP 9.16 | MCS 9 in 20, 40, 80, 160, and 80+80 MHz with Long\_GI , Nss=6 | 22.5 (Parameters for VHT MCSs) | CFac:O | Yes  No  N/A  |
| VHTP 9.17 | MCS 9 in 20, 40, 80, 160, and 80+80 MHz with Long\_GI , Nss=7 | 22.5 (Parameters for VHT MCSs) | CFac:O | Yes  No  N/A  |
| VHTP 9.18 | MCS 9 in 20, 40, 80, 160, and 80+80 MHz with Long\_GI , Nss=8 | 22.5 (Parameters for VHT MCSs) | CFac:O | Yes  No  N/A  |

**References:**