IEEE Std 802.11j™-2004
[Amendment to IEEE Std 802.11™, 1999 Edition (Reaff 2003)
as amended by
IEEE Stds 802.11a™-1999, 802.11b™-1999,
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IEEE Standards

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IEEE Standard for Information technology—Telecommunications and information exchange between systems—Local and metropolitan area networks—Specific requirements

Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications

Amendment 7: 4.9 GHz–5 GHz Operation in Japan

IEEE Computer Society

Sponsored by the
LAN/MAN Standards Committee

This amendment is an approved IEEE Standard. It will be incorporated into the base standard in a future edition.

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Specific requirements

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Sponsor
LAN/MAN Committee
of the
IEEE Computer Society

Approved 23 September 2004

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Abstract: This amendment specifies the extensions to IEEE Std 802.11 for wireless local area networks (WLANs) providing mechanisms for operation in the 4.9 GHz and 5 GHz bands in Japan.
Keywords: LAN, local area network, regulatory class

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Introduction

[This introduction is not part of IEEE Std 802.11j-2004, IEEE Standard for Information Technology—Telecommunications and Information Exchange Between Systems—Local and Metropolitan Area Networks—Specific Requirements—Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications—Amendment 7: 4.9 GHz–5 GHz Operation in Japan.]

IEEE Std 802.11j-2004 provides mechanisms for signalling compliance with regulatory domain requirements of the USA, Europe, and Japan; for extending 5 GHz orthogonal frequency division multiplexing (OFDM) physical layer (PHY) operation outdoors; and for 5 GHz OFDM PHY operation in nonoverlapping 10 MHz channel spacing.

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NOTE—The editing instructions contained in this amendment define how to merge the material contained herein into the existing base standard and its other amendments to form the comprehensive standard.

The editing instructions are shown in ***bold italic***. Four editing instructions are used: change, delete, insert, and replace. ***Change*** is used to make small corrections in existing text or tables. The editing instruction specifies the location of the change and describes what is being changed either by using ~~strikethrough~~ (to remove old material) or underscore (to add new material). ***Delete*** removes existing material. ***Insert*** adds new material without disturbing the existing material. Insertions may require renumbering. If so, renumbering instructions are given in the editing instructions. ***Replace*** is used to make large changes in existing text, subclauses, tables, or figures by removing existing material and replacing it with new material. Editorial notes will not be carried over into future editions.

3. Definitions

Insert the following definition in alphabetical order into Clause 3, renumbering as necessary:

3.122 channel spacing: Nonoverlapping, adjacent channel, center frequency spacing for radio transmitters.

End of changes to Clause 3.

7. Frame formats

7.3 Management frame body components

7.3.2 Information elements

7.3.2.12 Country information element

Replace Figure 42a with the following:

Element ID	Length
Country String (Octets 1, 2)	
Country String (Octet 3)	First Channel Number/ Regulatory Extension Identifier
Number of Channels/ Regulatory Class	Maximum Transmit Power Level/ Coverage Class
First Channel Number/ Regulatory Extension Identifier	Number of Channels/ Regulatory Class
Maximum Transmit Power Level/ Coverage Class	. . .
First Channel Number	Number of Channels
Maximum Transmit Power Level	Pad (if needed)

Figure 42a—Country information element

Change the second paragraph of 7.3.2.12 as shown:

The element identifier for this information element shall be 7. The length of the information element is variable, as the element may contain more than one triplet comprising the First Channel Number, Number of Channels, and Maximum Transmit Power Level fields and referred to as subband triplets. Alternatively, where dot11RegulatoryClassesRequired is true and the First Channel Number/Regulatory Extension Identifier octet has a positive integer value of 201 or greater, then that triplet comprises the Regulatory Extension Identifier, Regulatory Class, and Coverage Class fields. Together they are referred to as a regulatory triplet. The minimum length of the information element is 8 octets.

Change the fourth paragraph of 7.3.2.12 as shown:

The First Channel Number/Regulatory Extension Identifier field shall be 1 octet in length. If the field has a positive integer value less than 201, then it shall contain a positive integer value that indicates the lowest channel number in the subband described in this information element. The group of channels described by each pair of the First Channel Number and the Number of Channels fields shall not have overlapping channel identifiers. [For example, the pairs (2,4) and (5,2) overlap and shall not be used together.] The First Channel Number field shall be monotonically increasing where dot11RegulatoryClassesRequired is not true.

Where dot11RegulatoryClassesRequired is true, consecutive subband triplets following a regulatory triplet shall have monotonically increasing First Channel Number fields.

After the sixth paragraph in 7.3.2.12, insert the following text and renumber tables as necessary:

A regulatory class is an index into a set of values for radio equipment sets of rules. The Regulatory Class field shall be 1 octet in length.

A coverage class is an index into a set of values for aAirPropagationTime. The Coverage Class field shall be 1 octet in length.

The Coverage Class field of the regulatory triplet specifies the aAirPropagationTime characteristic used in basic service set (BSS) operation, as shown in Table 20.1a. The characteristic aAirPropagationTime describes variations in actual propagation time that are accounted for in a BSS and, together with maximum transmit power level, allow control of BSS diameter.

Table 20.1a—Coverage Class field parameters

Coverage class value	aAirPropagationTime (μs)
0	≤ 1
1	3
2	6
3	9
4	12
5	15
6	18
7	21
8	24
9	27
10	30
11	33
12	36
13	39
14	42
15	45
16	48
17	51
18	54
19	57
20	60
21	63
22	66

Table 20.1a—Coverage Class field parameters *(continued)*

Coverage class value	aAirPropagationTime (μs)
23	69
24	72
25	75
26	78
27	81
28	84
29	87
30	90
31	93
32–255	—

End of changes to Clause 7.

10. Layer management

10.3 Medium access control (MAC) sublayer management entity (MLME) service access point (SAP) interface

10.3.2 Scan

10.3.2.2 MLME-SCAN.confirm

10.3.2.2.2 Semantics of the service primitive

Change the following row in the untitled table defining the primitive parameters in 10.3.2.2.2:

Name	Type	Valid range	Description
ResultCode	Enumeration	SUCCESS, INVALID_ PARAMETERS, NOT_SUPPORTED	Indicates the result of the MLME-SCAN.request

10.3.10 Start

10.3.10.2 MLME-START.confirm

10.3.10.2.2 Semantics of the service primitive

Change the following row in the untitled table defining the primitive parameters in 10.3.10.2.2:

Name	Type	Valid range	Description
ResultCode	Enumeration	SUCCESS, INVALID_ PARAMETERS, BSS_ALREADY_ STARTED_OR_ JOINED, NOT_ SUPPORTED	Indicates the result of the MLME-START.request

End of changes to Clause 10.

11. MLME

11.1 Synchronization

11.1.3 Acquiring synchronization, scanning

Insert the following paragraph after the first paragraph in 11.1.3:

Active scanning is prohibited in some frequency bands and regulatory domains. The MAC of a station (STA) receiving an MLME-SCAN.request shall use the regulatory domain information it has to process the request and shall return a result code of NOT_SUPPORTED to a request for an active scan if regulatory domain information indicates an active scan is illegal.

Change the fifth paragraph in 11.1.3 as shown:

If a STA's scanning does not result in finding a BSS with the desired SSID and of the desired type, or does not result in finding any BSS, the STA may start an IBSS upon receipt of the MLME-START.request. The MAC of a STA receiving an MLME-START.request shall use the regulatory domain information it has to process the request and shall return a result code of NOT_SUPPORTED to the request if regulatory domain information indicates starting the BSS is illegal.

End of changes to Clause 11.

17. Orthogonal frequency division multiplexing (OFDM) physical layer (PHY) specification for the 5 GHz band

17.1 Introduction

Change the first paragraph of 17.1 as follows:

This clause specifies the PHY entity for an OFDM system and the additions that have to be made to the base standard to accommodate the OFDM PHY. ~~The radio frequency LAN system is initially aimed for the 5.15–5.25, 5.25–5.35 and 5.725–5.825 GHz unlicensed national information structure (U-NII) bands, as regulated in the United States by the Code of Federal Regulations, Title 47, Section 15.407.~~ The OFDM system provides a wireless local area network (WLAN) with data payload communication capabilities of 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s. The support of transmitting and receiving at data rates of 6, 12, and 24 Mbit/s is mandatory. The system uses 52 subcarriers that are modulated using binary or quadrature phase shift keying (BPSK or QPSK) or using 16- or 64-quadrature amplitude modulation (16-QAM or 64-QAM). Forward error correction coding (convolutional coding) is used with a coding rate of 1/2, 2/3, or 3/4.

Insert the following paragraph at the end of 17.1:

The OFDM system also provides a "half-clocked" operation using 10 MHz channel spacings with data communications capabilities of 3, 4.5, 6, 9, 12, 18, 24, and 27 Mbit/s. The support of transmitting and receiving at data rates of 3, 6, and 12 Mbit/s is mandatory when using 10 MHz channel spacing. The half-clocked operation doubles symbol times and clear channel assessment (CCA) times when using 10 MHz channel spacing. The regulatory requirements and information regarding use of this OFDM system in 4.9 GHz and 5 GHz bands is in Annex I and Annex J.

17.2 OFDM PHY specific service parameter list

17.2.2 TXVECTOR parameters

Change Table 76 as shown:

Table 76—TXVECTOR parameters

Parameter	Associate primitive	Value
LENGTH	PHY-TXSTART.request (TXVECTOR)	1–4095
DATATRATE	PHY-TXSTART.request (TXVECTOR)	6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s for 20 MHz channel spacing (Support of 6, 12, and 24 data rates is mandatory.) 3, 4.5, 6, 9, 12, 18, 24, and 27 Mbit/s for 10 MHz channel spacing (Support of 3, 6, and 12 data rates is mandatory.)
SERVICE	PHY-TXSTART.request (TXVECTOR)	Scrambler initialization; 7 null bits + 9 reserved null bits
TXPWR_LEVEL	PHY-TXSTART.request (TXVECTOR)	1–8

17.2.2.2 TXVECTOR DATARATE

Change the text in 17.2.2.2 as shown:

The DATARATE parameter describes the bit rate at which the PLCP shall transmit the PSDU. Its value can be any of the rates defined in Table 76. Data rates of 6, 12, and 24 Mbit/s shall be supported for 20 MHz channel spacing, and data rates of 3, 6, and 12 Mbit/s shall be supported for 10 MHz channel spacing; other rates may also be supported.

17.2.3 RXVECTOR parameters

Change Table 77 as shown:

Table 77—RXVECTOR parameters

Parameter	Associate primitive	Value
LENGTH	PHY-RXSTART.indicate	1–4095
RSSI	PHY-RXSTART.indicate (RXVECTOR)	0–RSSI maximum
DATARATE	PHY-RXSTART.request (RXVECTOR)	6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s for 20 MHz channel spacing (Support of 6, 12, and 24 data rates is mandatory.) 3, 4.5, 6, 9, 12, 18, 24, and 27 Mbit/s for 10 MHz channel spacing (Support of 3, 6, and 12 data rates is mandatory.)
SERVICE	PHY-RXSTART.request (RXVECTOR)	Null

17.2.3.3 DATARATE

Change the text in 17.2.3.3 as shown:

DATARATE shall represent the data rate at which the current PPDU was received. The allowed values of the DATARATE are 6, 9, 12, 18, 24, 36, 48, or 54 Mbit/s for 20 MHz channel spacing and 3, 4.5, 6, 9, 12, 18, 24, or 27 Mbit/s for 10 MHz channel spacing.

17.3 OFDM physical layer convergence procedure (PLCP) sublayer

17.3.2 PLCP frame format

17.3.2.1 Overview of the PLCP protocol data unit (PPDU) encoding process

Change item b) in 17.3.2.1 as shown:

b) Produce the PLCP header field from the RATE, LENGTH, and SERVICE fields of the TXVECTOR by filling the appropriate bit fields. The RATE and LENGTH fields of the PLCP header are encoded by a convolutional code at a rate of R = 1/2 and are subsequently mapped onto a single BPSK encoded OFDM symbol, denoted as the SIGNAL symbol. In order to facilitate a reliable and timely detection of the RATE and LENGTH fields, 6 zero tail bits are inserted into the PLCP header. The encoding of the SIGNAL field into an OFDM symbol follows the same steps for convolutional encoding, interleaving, BPSK modulation, pilot insertion, Fourier transform, and prepending a guard interval (GI) as described subsequently for data transmission <u>with BPSK-OFDM modulated</u> at ~~6 Mbit/s~~ <u>coding rate 1/2</u>. The contents of the SIGNAL field are not scrambled. Refer to 17.3.4 for details.

Change the title of 17.3.2.2 as shown:

17.3.2.2 <u>Modulation</u>~~Rate~~-dependent parameters

Change Table 78 as shown:

Table 78—<u>Modulation</u>~~Rate~~-dependent parameters

~~Data rate (Mbit/s)~~	Modulation	Coding rate (R)	Coded bits per subcarrier (N_{BPSC})	Coded bits per OFDM symbol (N_{CBPS})	Data bits per OFDM symbol (N_{DBPS})	<u>Data rate (Mbit/s) (20 MHz channel spacing)</u>	<u>Data rate (Mbit/s) (10 MHz channel spacing)</u>
~~6~~	BPSK	1/2	1	48	24	<u>6</u>	<u>3</u>
~~9~~	BPSK	3/4	1	48	36	<u>9</u>	<u>4.5</u>
~~12~~	QPSK	1/2	2	96	48	<u>12</u>	<u>6</u>
~~18~~	QPSK	3/4	2	96	72	<u>18</u>	<u>9</u>
~~24~~	16-QAM	1/2	4	192	96	<u>24</u>	<u>12</u>
~~36~~	16-QAM	3/4	4	192	144	<u>36</u>	<u>18</u>
~~48~~	64-QAM	2/3	6	288	192	<u>48</u>	<u>24</u>
~~54~~	64-QAM	3/4	6	288	216	<u>54</u>	<u>27</u>

17.3.2.3 Timing-related parameters

Change Table 79 as shown:

Table 79—Timing-related parameters

Parameter	Value (20 MHz channel spacing)	Value (10 MHz channel spacing)
N_{SD}: Number of data subcarriers	48	48
N_{SP}: Number of pilot subcarriers	4	4
N_{ST}: Number of subcarriers, total	52 ($N_{SD} + N_{SP}$)	52 ($N_{SD} + N_{SP}$)
Δ_F: Subcarrier frequency spacing	0.3125 MHz (= 20 MHz/64)	0.15625 MHz (= 10 MHz/64)
T_{FFT}: Inverse Fast Fourier Transform (IFFT)/ Fast Fourier Transform (FFT) period	3.2 μs ($1/\Delta_F$)	6.4 μs ($1/\Delta_F$)
$T_{PREAMBLE}$: PLCP preamble duration	16 μs ($T_{SHORT} + T_{LONG}$)	32 μs ($T_{SHORT} + T_{LONG}$)
T_{SIGNAL}: Duration of the SIGNAL BPSK-OFDM symbol	4.0 μs ($T_{GI} + T_{FFT}$)	8.0 μs ($T_{GI} + T_{FFT}$)
T_{GI}: GI duration	0.8 μs ($T_{FFT}/4$)	1.6 μs ($T_{FFT}/4$)
T_{GI2}: Training symbol GI duration	1.6 μs ($T_{FFT}/2$)	3.2 μs ($T_{FFT}/2$)
T_{SYM}: Symbol interval	4 μs ($T_{GI} + T_{FFT}$)	8 μs ($T_{GI} + T_{FFT}$)
T_{SHORT}: Short training sequence duration	8 μs ($10 \times T_{FFT}/4$)	16 μs ($10 \times T_{FFT}/4$)
T_{LONG}: Long training sequence duration	8 μs ($T_{GI2} + 2 \times T_{FFT}$)	16 μs ($T_{GI2} + 2 \times T_{FFT}$)

17.3.2.4 Mathematical conventions in the signal descriptions

Change the third paragraph of 17.3.2.4 as shown:

The subframes of which Equation (2) are composed are described in 17.3.3, 17.3.4, and 17.3.5.9. The time offsets $t_{SUBFRAME}$ determine the starting time of the corresponding subframe; t_{SIGNAL} is equal to 16 μs for 20 MHz channel spacing and 32 μs for 10 MHz channel spacing, and t_{DATA} is equal to 20 μs for 20 MHz channel spacing and 40 μs for 10 MHz channel spacing.

17.3.3 PLCP preamble (SYNC)

Change the first paragraph of 17.3.3 as shown:

The PLCP Preamble field is used for synchronization. It consists of 10 short symbols and two long symbols that are shown in Figure 110 and described in this subclause. The timings described in this subclause and shown in Figure 110 are for 20 MHz channel spacing and are doubled for half-clocked (i.e., 10 MHz) channel spacing.

17.3.4 Signal field (SIGNAL)

Change the first paragraph of 17.3.4 as shown:

The OFDM training symbols shall be followed by the SIGNAL field, which contains the RATE and the LENGTH fields of the TXVECTOR. The RATE field conveys information about the type of modulation and the coding rate as used in the rest of the packet. The encoding of the SIGNAL single OFDM symbol shall be performed with BPSK modulation of the subcarriers and using convolutional coding at R = 1/2. The encoding procedure, which includes convolutional encoding, interleaving, modulation mapping processes, pilot insertion, and OFDM modulation, follows the steps described in 17.3.5.5, 17.3.5.6, and 17.3.5.8, as used for transmission of data ~~at a 6 Mbit/s rate~~ with BPSK-OFDM modulated at coding rate 1/2. The contents of the SIGNAL field are not scrambled.

17.3.4.1 Data rate

Change Table 80 as shown:

Table 80—Contents of the SIGNAL field

~~Rate (Mbit/s)~~	R1–R4	Rate (Mbit/s) (20 MHz channel spacing)	Rate (Mbit/s) (10 MHz channel spacing)
~~6~~	1101	6	3
~~9~~	1111	9	4.5
~~12~~	0101	12	6
~~18~~	0111	18	9
~~24~~	1001	24	12
~~36~~	1011	36	18
~~48~~	0001	48	24
~~54~~	0011	54	27

17.3.7 PLCP data modulation and modulation rate change

Change the text of 17.3.7 as shown:

The PLCP preamble shall be transmitted using an OFDM modulated fixed waveform. The IEEE 802.11 SIGNAL field, BPSK-OFDM modulated ~~at 6 Mbit/s~~ with coding rate 1/2, shall indicate the modulation and coding rate that shall be used to transmit the MPDU. The transmitter (receiver) shall initiate the modulation (demodulation) constellation and the coding rate according to the RATE indicated in the SIGNAL field. The MPDU transmission rate shall be set by the DATARATE parameter in the TXVECTOR, issued with the PHY-TXSTART.request primitive described in 17.2.2.

17.3.8 Physical medium dependent (PMD) operating specifications (general)

17.3.8.1 Outline description

Change Table 86 as shown:

Table 86—Major parameters of the OFDM PHY

Information data rate	6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s (6, 12, and 24 Mbit/s are mandatory) (20 MHz channel spacing)	3, 4.5, 6, 9, 12, 18, 24, and 27 Mbit/s (3, 6, and 12 Mbit/s are mandatory) (10 MHz channel spacing)
Modulation	BPSK OFDM, QPSK OFDM, 16-QAM OFDM, 64-QAM OFDM	BPSK OFDM, QPSK OFDM, 16-QAM OFDM, 64-QAM OFDM
Error correcting code	K = 7 (64 states) convolutional code	K = 7 (64 states) convolutional code
Coding rate	1/2, 2/3, 3/4	1/2, 2/3, 3/4
Number of subcarriers	52	52
OFDM symbol duration	4.0 μs	8.0 μs
GI[a]	0.8 μs (T_{GI})	1.6 μs (T_{GI})
Occupied bandwidth	16.6 MHz	8.3 MHz

[a]Refer to 17.3.2.4.

17.3.8.2 Regulatory requirements

Change the text of 17.3.8.2 as shown, including the deletion of Table 87, and renumber tables as necessary:

WLANs implemented in accordance with this standard are subject to equipment certification and operating requirements established by regional and national regulatory administrations. The PMD specification establishes minimum technical requirements for interoperability, based upon established regulations at the time this standard was issued. These regulations are subject to revision or may be superseded. Requirements that are subject to local geographic regulations are annotated within the PMD specification. Regulatory requirements that do not affect interoperability are not addressed in this standard. Implementers are referred to the regulatory sources in ~~Table 87~~ Annex I for further information. Operation in countries within defined regulatory domains may be subject to additional or alternative national regulations.

~~The documents listed in Table 87 specify the current regulatory requirements for various geographic areas at the time this standard was developed. They are provided for information only, and are subject to change or revision at any time.~~

~~**Table 87—Regulatory requirement list**~~

~~Geographic area~~	~~Approval standards~~	~~Documents~~	~~Approval authority~~
~~United States~~	~~Federal Communications Commission (FCC)~~	~~CFR47 [B7], Part 15, Sections 15.205, 15.209, and 15.247; and Subpart E, Sections 15.401–15.407~~	~~FCC~~
~~Japan~~	~~Ministry of Public Management, Home Affairs, Post and Telecommunications (MPHPT)~~	~~MPHPT Ordinance for Regulating Radio Equipment, Article 49–20~~	~~MPHPT~~

17.3.8.3 Operating channel frequencies

17.3.8.3.1 Operating frequency range

Change the first paragraph of 17.3.8.3.1 as shown:

The OFDM PHY shall operate in the 5 GHz band, as allocated by a regulatory body in its operational region. Spectrum allocation in the 5 GHz band is subject to authorities responsible for geographic-specific regulatory domains (e.g., global, regional, and national). The particular channelization to be used for this standard is dependent on such allocation, as well as the associated regulations for use of the allocations. These regulations are subject to revision, or may be superseded. ~~In the United States, the FCC is the agency responsible for the allocation of the 5 GHz U-NII bands.~~

17.3.8.3.2 Channel numbering

Change the text of 17.3.8.3.2 as follows:

Channel center frequencies are defined at every integral multiple of 5 MHz above ~~5 GHz~~Channel starting frequency. The relationship between center frequency and channel number is given by Equation (27):

$$\text{Channel center frequency} = \text{~~5000~~ Channel starting frequency} + (n_{ch} \times 5)\ \text{(MHz)} \quad (27)$$

where

n_{ch} is 0,1,… 200,

Channel starting frequency is defined as dot11ChannelStartingFactor × 500 kHz or
is defined as 5 GHz for systems where dot11RegulatoryClassesRequired is false or not defined.

For example, dot11ChannelStartingFactor = 10 000 indicates that Channel zero center frequency is 5.000 GHz. The value NULL for n_{ch} shall be reserved, and a channel center frequency of 5.000 GHz shall be indicated by dot11ChannelStartingFactor = 8000 and n_{ch} = 200. An SME managing multiple channel sets can change the channel set being managed by changing the value of dot11ChannelStartingFactor.

This definition provides a unique numbering system for all channels with 5 MHz spacing ~~from 5 GHz to 6 GHz~~, as well as the flexibility to define channelization sets for all current and future regulatory domains.

17.3.8.3.3 Channelization

Change the text of 17.3.8.3.3 as shown, including the deletion of Table 88 and Figure 119, and renumber tables and figures as necessary:

The set of ~~valid~~ operating channel numbers by regulatory domain is defined in ~~Table 88~~ Annex J. As shown in Figure 117, no subcarrier is allocated on the channel center frequency.

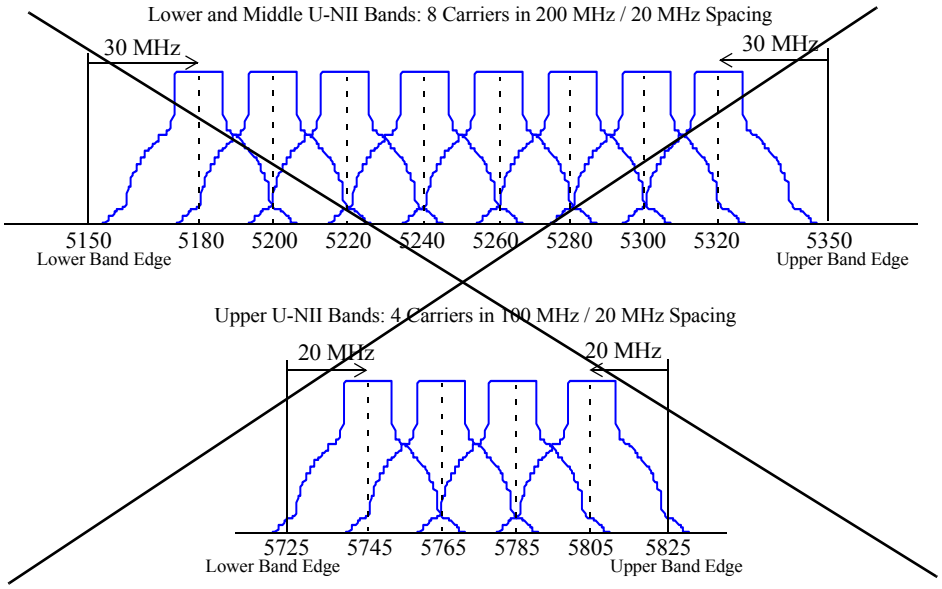
~~Table 88—Valid operating channel numbers by regulatory domain and band~~

~~Regulatory domain~~	~~Band (GHz)~~	~~Operating channel numbers~~	~~Channel center frequencies (MHz)~~
~~United States CEPT~~	~~U-NII lower band (5.15–5.25)~~	~~36 40 44 48~~	~~5180 5200 5220 5240~~
~~United States CEPT~~	~~U-NII middle band (5.25–5.35)~~	~~52 56 60 64~~	~~5260 5280 5300 5320~~
~~CEPT~~	~~(5.47–5.725)~~	~~100 104 108 112 116 120 124 128 132 136 140~~	~~5500 5520 5540 5560 5580 5600 5620 5640 5660 5680 5700~~
~~United States~~	~~U-NII upper band (5.725–5.825)~~	~~149 153 157 161~~	~~5745 5765 5785 5805~~

~~The OFDM PHY shall operate in the 5 GHz band, as allocated by a regulatory body in its operational region.~~

~~The center frequency is indicated in Figure 119 for the US frequency channel plan; however, no subcarrier is allocated on the center frequency as described in Figure 117.~~

~~In a multiple cell network topology, overlapping and/or adjacent cells using different channels can operate simultaneously.~~



~~Figure 43—OFDM PHY frequency channel plan for the United States~~

17.3.8.4 Transmit and receive in-band and out-of-band spurious emissions

Change the text of 17.3.8.4 as shown:

The OFDM PHY shall conform to in-band and out-of-band spurious emissions as set by regulatory bodies. ~~For the United States, refer to FCC 15.407.~~

17.3.8.6 Slot time

Change the text of 17.3.8.6 as follows:

The slot time for the OFDM PHY shall be 9 µs for 20 MHz channel spacing~~, which is the sum of the RX-to-TX turnaround time, MAC processing delay, and CCA detect time (< 4 µs)~~ and shall be 13 µs for 10 MHz channel spacing. ~~The propagation delay shall be regarded as being included in the CCA detect time.~~

Where dot11RegulatoryClassesRequired is true, the value of the slot time shall be increased by the value of 3 µs × coverage class. The default value of coverage class shall be zero.

NOTE—Distributed coordination function (DCF) operation over larger BSS diameters is facilitated by relaxing some PHY timing parameters, while maintaining compatibility with existing implementations in small BSS diameters.[1]

17.3.9 PMD transmit specifications

17.3.9.1 Transmit power levels

Change the text of 17.3.9.1 as shown, including the deletion of Table 89, and renumber tables as necessary:

The maximum allowable transmit ~~output~~ power by regulatory domain is ~~shown in Table 89~~ defined in Annex I.

[1]Notes in text, tables, and figures are given for information only and do not contain requirements needed to implement the standard.

~~**Table 89—Transmit power levels by regulatory domain**~~

~~**Frequency band (GHz)**~~	~~**United States (Maximum output power with up to 6 dBi antenna gain) (mW)**~~	~~**CERP (EIRP)**~~
~~5.15–5.25~~	~~40 (2.5 mW/MHz)~~	~~200 mW~~
~~5.25–5.35~~	~~200 (12.5 mW/MHz)~~	~~200 mW~~
~~5.470–5.725~~	~~—~~	~~1 W~~
~~5.725–5.825~~	~~800 (50 mW/MHz)~~	~~—~~

17.3.9.2 Transmit spectrum mask

Change the text of 17.3.9.2 as shown:

For operation using 20 MHz channel spacing, t~~T~~he transmitted spectrum shall have a 0 dBr (dB relative to the maximum spectral density of the signal) bandwidth not exceeding 18 MHz, –20 dBr at 11 MHz frequency offset, –28 dBr at 20 MHz frequency offset, and –40 dBr at 30 MHz frequency offset and above. The transmitted spectral density of the transmitted signal shall fall within the spectral mask, as shown in Figure 120. ~~The measurements shall be made using a 100 kHz resolution bandwidth and a 30 kHz video bandwidth.~~For operation using 10 MHz channel spacing, the transmitted spectrum shall have a 0 dBr bandwidth not exceeding 9 MHz, –20 dBr at 5.5 MHz frequency offset, –28 dBr at 10 MHz frequency offset, and –40 dBr at 15 MHz frequency offset and above. The transmit spectrum mask by regulatory domain is defined in Annex I and Annex J.

17.3.9.6 Modulation accuracy

17.3.9.6.3 Transmit constellation error

Change Table 90 as shown:

Table 90—Allowed relative constellation error versus data rate

~~**Data rate (Mbit/s)**~~	**Relative constellation error (dB)**	**Modulation**	**Coding rate (R)**
~~6~~	–5	BPSK	1/2
~~9~~	–8	BPSK	3/4
~~12~~	–10	QPSK	1/2
~~18~~	–13	QPSK	3/4
~~24~~	–16	16-QAM	1/2
~~36~~	–19	16-QAM	3/4
~~48~~	–22	64-QAM	2/3
~~54~~	–25	64-QAM	3/4

17.3.10 PMD receiver specifications

Change the title of 17.3.10.1 as shown:

17.3.10.1 Receiver minimum input ~~level~~ sensitivity

Change Table 91 as shown:

Table 91—Receiver performance requirements

Modulation	Coding rate (R)	~~Data rate (Mbit/s)~~	~~Minimum sensitivity (dBm)~~	Adjacent channel rejection (dB)	Alternate adjacent channel rejection (dB)	Minimum sensitivity (dBm) (20 MHz channel spacing)	Minimum sensitivity (dBm) (10 MHz channel spacing)
BPSK	1/2	~~6~~	~~–82~~	16	32	–82	–85
BPSK	3/4	~~9~~	~~–81~~	15	31	–81	–84
QPSK	1/2	~~12~~	~~–79~~	13	29	–79	–82
QPSK	3/4	~~18~~	~~–77~~	11	27	–77	–80
16-QAM	1/2	~~24~~	~~–74~~	8	24	–74	–77
16-QAM	3/4	~~36~~	~~–70~~	4	20	–70	–73
64-QAM	2/3	~~48~~	~~–66~~	0	16	–66	–69
64-QAM	3/4	~~54~~	~~–65~~	–1	15	–65	–68

17.3.10.5 CCA sensitivity

Change the text of 17.3.10.5 as shown:

The start of a valid OFDM transmission at a receive level equal to or greater than the minimum ~~6 Mbit/s~~ modulation and coding rate sensitivity (–82 dBm for 20 MHz channel spacing and –85 dBm for 10 MHz channel spacing) shall cause CCA to indicate busy with a probability > 90% within 4 μs for 20 MHz channel spacing and 8 μs for 10 MHz channel spacing. If the preamble portion was missed, the receiver shall hold the carrier sense (CS) signal busy for any signal 20 dB above the minimum ~~6 Mbit/s~~ modulation and coding rate sensitivity (–62 dBm for 20 MHz channel spacing and –65 dBm for 10 MHz channel spacing).

NOTE—CCA detect time is based on finding the short sequences in the preamble, so when T_{SYM} doubles, so does CCA detect time.

17.4 OFDM PLME

17.4.2 OFDM PHY MIB

Change Table 92 as shown (only affected rows are given here):

Table 92—MIB attribute default values/ranges

Managed object	Default value/range	Operational semantics
dot11 PHY Operation Table		
dot11 Current reg domain	Implementation dependent	~~Static~~Dynamic
dot11 Supported Data Rates Tx Table		
dot11 Supported ~~data~~ rates Tx value	6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s for 20 MHz channel spacing (Mandatory rates: 6, 12, and 24) 3, 4.5, 6, 9, 12, 18, 24, and 27 Mbit/s for 10 MHz channel spacing (Mandatory rates: 3, 6, and 12)	Static
dot11 Supported Data Rates Rx Table		
dot11 Supported ~~data~~ rates Rx value	6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s for 20 MHz channel spacing (Mandatory rates: 6, 12, and 24) 3, 4.5, 6, 9, 12, 18, 24, and 27 Mbit/s for 10 MHz channel spacing (Mandatory rates: 3, 6, and 12)	Static
dot11 PHY OFDM Table		
dot11 Channel starting factor	Implementation dependent	Dynamic

17.4.3 OFDM TXTIME calculation

Change the last paragraph in 17.4.3 as shown:

Equation (30) does not include the effect of rounding to the next OFDM symbol and may be in error by ± ~~2 µs~~T_{SYM}/2.

17.4.4 OFDM PHY characteristics

Change Table 93 as shown:

Table 93—OFDM PHY characteristics

Characteristics	Value (20 MHz channel spacing)	Value (10 MHz channel spacing)
aSlotTime	9 μs	13 μs
aSIFSTime	16 μs	32 μs
aCCATime	< 4 μs	< 8 μs
aRxTxTurnaroundTime	< 2 μs	< 2 μs
aTxPLCPDelay	Implementation dependent	Implementation dependent
aRxPLCPDelay	Implementation dependent	Implementation dependent
aRxTxSwitchTime	<< 1 μs	<< 1 μs
aTxRampOnTime	Implementation dependent	Implementation dependent
aTxRampOffTime	Implementation dependent	Implementation dependent
aTxRFDelay	Implementation dependent	Implementation dependent
aRxRFDelay	Implementation dependent	Implementation dependent
aAirPropagationTime	<< 1 μs	<< 1 μs
aMACProcessingDelay	< 2 μs	< 2 μs
aPreambleLength	20 μs	40 μs
aPLCPHeaderLength	4 μs	8 μs
aMPDUMaxLength	4095	4095
aCWmin	15	15
aCWmax	1023	1023

17.5 OFDM PMD sublayer

17.5.4 Basic service and options

17.5.4.3 PMD_SAP service primitive parameters

Change Table 96 as shown:

Table 96—List of parameters for the PMD primitives

Parameter	Associate primitive	Value (20 MHz channel spacing)	Value (10 MHz channel spacing)
TXD_UNIT	PMD_DATA.request	One(1), Zero(0): one OFDM symbol value	One(1),Zero(0): one OFDM symbol value
RXD_UNIT	PMD_DATA.indicate	One(1), Zero(0): one OFDM symbol value	One(1),Zero(0): one OFDM symbol value
TXPWR_LEVEL	PMD_TXPWRLVL.request	1–8 (max of 8 levels)	1–8 (max of 8 levels)

Table 96—List of parameters for the PMD primitives *(continued)*

Parameter	Associate primitive	Value (20 MHz channel spacing)	Value (10 MHz channel spacing)
RATE	PMD_RATE.request	12 Mbit/s (for BPSK) 24 Mbit/s (for QPSK) 48 Mbit/s (for 16-QAM) 72 Mbit/s (for 64-QAM)	6 Mbit/s (for BPSK) 12 Mbit/s (for QPSK) 24 Mbit/s (for 16-QAM) 36 Mbit/s (for 64-QAM)
RSSI	PMD_RSSI.indicate	0–8 bits of RSSI	0–8 bits of RSSI

End of changes to Clause 17.

Annex A

(normative)

Protocol Implementation Conformance Statements (PICS)

Change the title of A.4 as shown:

A.4 PICS proforma—IEEE Std 802.11, 1999 Edition (Reaff 2003)

Insert the following row at the end of the table in A.4.3:

A.4.3 Implementation under test (IUT) configuration

Item	IUT configuration	References	Status	Support
*CF11	Is regulatory classes capability implemented?	7.3.2.12, 17.3.8.3.2, 17.3.8.6, 17.4.2, Annex I, Annex J	CF6&CF8& CF10:O	Yes ❑ No ❑ N/A ❑

Insert the following rows in numerical order into the table in A.4.8 (the existing table section titles have been included here to clarify where to insert the new rows):

A.4.8 Orthogonal frequency division multiplex (OFDM) physical layer (PHY) functions

Item	Feature	References	Status	Support
OF1: OFDM PHY Specific Service Parameters				
*OF1.7	10 MHz Channel spacing	17.2.2, 17.2.3, 17.2.3.3	CF11:O	Yes ❑ No ❑ N/A ❑
OF1.7.1	DATARATE = 3 Mbit/s (10 MHz channel spacing)	17.2.2, 17.2.3, 17.2.3.3	CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF1.7.2	DATARATE = 4.5 Mbit/s (10 MHz channel spacing)	17.2.2, 17.2.3, 17.2.3.3	CF11& OF1.7:O	Yes ❑ No ❑ N/A ❑
OF1.7.3	DATARATE = 6 Mbit/s (10 MHz channel spacing)	17.2.2, 17.2.3, 17.2.3.3	CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF1.7.4	DATARATE = 9 Mbit/s (10 MHz channel spacing)	17.2.2, 17.2.3, 17.2.3.3	CF11& OF1.7:O	Yes ❑ No ❑ N/A ❑
OF1.7.5	DATARATE = 12 Mbit/s (10 MHz channel spacing)	17.2.2, 17.2.3, 17.2.3.3	CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑

A.4.8 Orthogonal frequency division multiplex (OFDM) physical layer (PHY) functions *(continued)*

Item	Feature	References	Status	Support
OF1.7.6	DATARATE = 18 Mbit/s (10 MHz channel spacing)	17.2.2, 17.2.3, 17.2.3.3	CF11& OF1.7:O	Yes ❑ No ❑ N/A ❑
OF1.7.7	DATARATE = 24 Mbit/s (10 MHz channel spacing)	17.2.2, 17.2.3, 17.2.3.3	CF11& OF1.7:O	Yes ❑ No ❑ N/A ❑
OF1.7.8	DATARATE = 27 Mbit/s (10 MHz channel spacing)	17.2.2, 17.2.3, 17.2.3.3	CF11& OF1.7:O	Yes ❑ No ❑ N/A ❑
OF2: OFDM PLCP Sublayer				
OF2.21	Modulation-dependent parameters (10 MHz channel spacing)	17.3.2.2	CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF2.22	Timing-related parameters (10 MHz channel spacing)	17.3.2.3	CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF2.23	PLCP header: RATE (10 MHz channel spacing)	17.3.4.1	CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF3: PDM Operating Specification General				
OF3.11	Occupied channel bandwidth (10 MHz channel spacing)	17.3.8.1	CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑
*OF3.12	Operating frequency range	17.3.8.2	CF11:M	Yes ❑ No ❑ N/A ❑
OF3.12.1	4.9 GHz band	Annex J	CF11:O	Yes ❑ No ❑ N/A ❑
OF3.12.2	5.0 GHz band	Annex J	CF11:M	Yes ❑ No ❑ N/A ❑
OF3.12.3	5.47–5.725 GHz band in Europe	Annex J	CF10& CF11:M	Yes ❑ No ❑ N/A ❑
OF3.13	Channelization	17.3.8.3.3, J.2.1	CF11:M	Yes ❑ No ❑ N/A ❑
OF3.13.1	4.9 GHz band (20 MHz channel spacing)	17.3.8.3.3	CF11& OF3.12.1: M	Yes ❑ No ❑ N/A ❑
OF3.13.2	4.9 GHz band (10 MHz channel spacing)	17.3.8.3.3	CF11& OF3.12.1& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF3.13.3	5.0 GHz band (20 MHz channel spacing)	17.3.8.3.3	CF11& OF3.12.2: M	Yes ❑ No ❑ N/A ❑
OF3.13.4	5.0 GHz band (10 MHz channel spacing)	17.3.8.3.3	CF11& OF3.12.2& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF3.13.5	5.15–5.25 GHz band in Japan	17.3.8.3.3	CF11:M	Yes ❑ No ❑ N/A ❑
OF3.13.6	5.47–5.725 GHz in Europe	17.3.8.3.3	CF11& OF3.12.3: M	Yes ❑ No ❑ N/A ❑
OF3.14	Number of operating channels	17.3.8.3.3	CF11:M	Yes ❑ No ❑ N/A ❑

A.4.8 Orthogonal frequency division multiplex (OFDM) physical layer (PHY) functions *(continued)*

Item	Feature	References	Status	Support
OF3.15	Operating channel frequencies	17.3.8.3.3	CF11:M	Yes ❑ No ❑ N/A ❑
OF3.16	Transmit and receive in-band and out-of-band spurious emissions (nomadic use)	17.3.8.4	CF11:M	Yes ❑ No ❑ N/A ❑
OF3.16.1	Interference-limited areas, 4.9 GHz band (20 MHz channel spacing)	17.3.8.4	CF11& OF3.12.1: M	Yes ❑ No ❑ N/A ❑
OF3.16.2	Interference-limited areas, 4.9 GHz band (10 MHz channel spacing)	17.3.8.4	CF11& OF3.12.1& OF1.7:O	Yes ❑ No ❑ N/A ❑
OF3.16.3	Interference-limited areas, 5.0 GHz band (20 MHz channel spacing)	17.3.8.4	CF11& OF3.12.2: M	Yes ❑ No ❑ N/A ❑
OF3.16.4	Interference-limited areas, 5.0 GHz band (10 MHz channel spacing)	17.3.8.4	CF11& OF3.12.2& OF1.7:O	Yes ❑ No ❑ N/A ❑
OF3.17	Slot time (20 MHz channel spacing and regulatory classes)	17.3.8.6	CF11& RC2:M	Yes ❑ No ❑ N/A ❑
OF3.18	Slot time (10 MHz channel spacing and regulatory classes)	17.3.8.6	CF11& RC3& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF4: PMD Transmit Specification				
OF4.7	Power level, 4.9 GHz band (20 MHz channel spacing)	17.3.9.1	CF11& OF3.12.1: M	Yes ❑ No ❑ N/A ❑
OF4.8	Power level, 5.0 GHz band (20 MHz channel spacing)	17.3.9.1	CF11& OF3.12.2: M	Yes ❑ No ❑ N/A ❑
OF4.9	Power level, 5.47–5.725 GHz band in Europe	17.3.9.1	CF11& OF3.12.3: M	Yes ❑ No ❑ N/A ❑
OF4.10	Power level, 4.9 GHz band (10 MHz channel spacing)	17.3.9.1	CF11& OF3.12.1& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF4.11	Power level, 5.0 GHz band (10 MHz channel spacing)	17.3.9.1	CF11& OF3.12.2& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF4.12	Spectrum mask (20 MHz channel spacing)	17.3.9.2	CF11:M	Yes ❑ No ❑ N/A ❑
OF4.13	Spectrum mask (10 MHz channel spacing)	17.3.9.2	CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF4.14	Transmitter constellation error (10 MHz channel spacing)			
OF4.14.1	Transmitter constellation error < –5 dB (10 MHz channel spacing)	17.3.9.6.3	CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF4.14.2	Transmitter constellation error < –8 dB (10 MHz channel spacing)	17.3.9.6.3	CF11& OF1.7.2:M	Yes ❑ No ❑ N/A ❑

A.4.8 Orthogonal frequency division multiplex (OFDM) physical layer (PHY) functions *(continued)*

Item	Feature	References	Status	Support
OF4.14.3	Transmitter constellation error < –10 dB (10 MHz channel spacing)	17.3.9.6.3	CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF4.14.4	Transmitter constellation error < –13 dB (10 MHz channel spacing)	17.3.9.6.3	CF11& OF1.7.4:M	Yes ❑ No ❑ N/A ❑
OF4.14.5	Transmitter constellation error < –16 dB (10 MHz channel spacing)	17.3.9.6.3	CF11& OF1.7.5:M	Yes ❑ No ❑ N/A ❑
OF4.14.6	Transmitter constellation error < –19 dB (10 MHz channel spacing)	17.3.9.6.3	CF11& OF1.7.6:M	Yes ❑ No ❑ N/A ❑
OF4.14.7	Transmitter constellation error < –22 dB (10 MHz channel spacing)	17.3.9.6.3	CF11& OF1.7.7:M	Yes ❑ No ❑ N/A ❑
OF4.14.8	Transmitter constellation error < –25 dB (10 MHz channel spacing)	17.3.9.6.3	CF11& OF1.7.8:M	Yes ❑ No ❑ N/A ❑
OF5: PMD Receiver Specifications				
OF5.6	Maximum input level sensitivity at packet error rate (PER) = 10% with 1000 octet frames (10 MHz channel spacing)			
OF5.6.1	–85 dBm for 3 Mbit/s (10 MHz channel spacing)	17.3.10.1	CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF5.6.2	–84 dBm for 4.5 Mbit/s (10 MHz channel spacing)	17.3.10.1	CF11& OF1.7.2:M	Yes ❑ No ❑ N/A ❑
OF5.6.3	–82 dBm for 6 Mbit/s (10 MHz channel spacing)	17.3.10.1	CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF5.6.4	–80 dBm for 9 Mbit/s (10 MHz channel spacing)	17.3.10.1	CF11& OF1.7.4:M	Yes ❑ No ❑ N/A ❑
OF5.6.5	–77 dBm for 12 Mbit/s (10 MHz channel spacing)	17.3.10.1	CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF5.6.6	–73 dBm for 18 Mbit/s (10 MHz channel spacing)	17.3.10.1	CF11& OF1.7.6:M	Yes ❑ No ❑ N/A ❑
OF5.6.7	–69 dBm for 24 Mbit/s (10 MHz channel spacing)	17.3.10.1	CF11& OF.17.7:M	Yes ❑ No ❑ N/A ❑
OF5.6.8	–68 dBm for 27 Mbit/s (10 MHz channel spacing)	17.3.10.1	CF11& OF1.7.8:M	Yes ❑ No ❑ N/A ❑
OF5.7	Adjacent channel rejection (10 MHz channel spacing)	17.3.10.2	CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF5.8	Nonadjacent channel rejection (10 MHz channel spacing)	17.3.10.3	CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF5.9	Maximum input level (10 MHz channel spacing)	17.3.10.4	CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF5.10	CCA sensitivity (10 MHz channel spacing)	17.3.10.5	CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF8: PLME				
OF8.4	PLME:support PHY characteristics (dot11ChannelStartingFactor)	17.4.2	CF11:M	Yes ❑ No ❑ N/A ❑

A.4.8 Orthogonal frequency division multiplex (OFDM) physical layer (PHY) functions *(continued)*

Item	Feature	References	Status	Support
OF9: OFDM PMD Sublayer				
OF9.4				
OF9.4.1	Parameter: RATE (6 Mbit/s for 10 MHz channel spacing)	17.5.4.3	CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF9.4.2	Parameter: RATE (12 Mbit/s for 10 MHz channel spacing)	17.5.4.3	CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF9.4.3	Parameter: RATE (24 Mbit/s for 10 MHz channel spacing)	17.5.4.3	CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF9.4.4	Parameter: RATE (36 Mbit/s for 10 MHz channel spacing)	17.5.4.3	CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑
OF10: Geographic Area Specific Requirements				
OF10.2	Regulatory domain extensions	17.3.8.3.3, 17.3.8.4, 17.3.9.1 17.3.9.2, Annex J	CF11:M	Yes ❑ No ❑ N/A ❑

Insert the following row at the end of the table in A.4.10:

A.4.10 Regulatory domain extensions

Item	Protocol capability	References	Status	Support
MD12	Regulatory and Coverage classes	7.3.2.12	RC1:M	Yes ❑ No ❑ N/A ❑

After A.4.12, insert A.4.13:

A.4.13 Regulatory classes extensions

Item	Protocol capability	References	Status	Support
RC1	Regulatory and Coverage classes	7.3.2.12	CF8&CF11:M	Yes ❑ No ❑ N/A ❑
RC2	Regulatory and Coverage classes (20 MHz channel spacing)	7.3.2.12, 17.3.8.6	CF8&CF11:M	Yes ❑ No ❑ N/A ❑
RC3	Regulatory and Coverage classes (10 MHz channel spacing)	7.3.2.12, 17.3.8.6	CF8&CF11& OF1.7:M	Yes ❑ No ❑ N/A ❑

Annex D

(normative)

ASN.1 encoding of the MAC and PHY MIB

In "Major sections" of Annex D, add the following text at the end of the Station Management attributes:

```
      -- dot11smt GROUPS
      -- dot11StationConfigTable                      ::= { dot11smt 1 }
      -- dot11AuthenticationAlgorithmsTable           ::= { dot11smt 2 }
      -- dot11WEPDefaultKeysTable                     ::= { dot11smt 3 }
      -- dot11WEPKeyMappingsTable                     ::= { dot11smt 4 }
      -- dot11PrivacyTable                            ::= { dot11smt 5 }
      -- dot11SMTnotification                         ::= { dot11smt 6 }
      -- dot11MultiDomainCapabilityTable              ::= { dot11smt 7 }
      -- dot11SpectrumManagementTable                 ::= { dot11smt 8 }
      -- dot11RSNAConfigTable                         ::= { dot11smt 9 }
      -- dot11RSNAConfigPairwiseCiphersTable          ::= { dot11smt 10 }
      -- dot11RSNAConfigAuthenticationSuitesTable     ::= { dot11smt 11 }
      -- dot11RSNAStatsTable                          ::= { dot11smt 12 }
      -- dot11RegulatoryClassesTable                  ::= { dot11smt 13 }
```

In "SMT Station Config Table" in Annex D, change Dot11StationConfigEntry as follows:

```
Dot11StationConfigEntry ::=
      SEQUENCE {
            dot11StationID                          MacAddress,
            dot11MediumOccupancyLimit               INTEGER,
            dot11CFPollable                         TruthValue,
            dot11CFPPeriod                          INTEGER,
            dot11CFPMaxDuration                     INTEGER,
            dot11AuthenticationResponseTimeOut      Unsigned32,
            dot11PrivacyOptionImplemented           TruthValue,
            dot11PowerManagementMode                INTEGER,
            dot11DesiredSSID                        OCTET STRING,
            dot11DesiredBSSType                     INTEGER,
            dot11OperationalRateSet                 OCTET STRING,
            dot11BeaconPeriod                       INTEGER,
            dot11DTIMPeriod                         INTEGER,
            dot11AssociationResponseTimeOut         Unsigned32,
            dot11DisassociateReason                 INTEGER,
            dot11DisassociateStation                MacAddress,
            dot11DeauthenticateReason               INTEGER,
            dot11DeauthenticateStation              MacAddress,
            dot11AuthenticateFailStatus             INTEGER,
            dot11AuthenticateFailStation            MacAddress,
            dot11MultiDomainCapabilityImplemented   TruthValue,
            dot11MultiDomainCapabilityEnabled       TruthValue,
            dot11CountryString                      OCTET STRING,
            dot11SpectrumManagementImplemented      TruthValue,
            dot11SpectrumManagementRequired         TruthValue,
            dot11RSNAOptionImplemented              TruthValue,
            dot11RSNAPreauthenticationImplemented   TruthValue,
            dot11RegulatoryClassesImplemented       TruthValue,
            dot11RegulatoryClassesRequired          TruthValue }
```

In "SMT Station Config Table" in Annex D, insert the following attributes after dot11RSNA-PreauthenticationImplemented { dot11StationConfigEntry 27 }:

```
dot11RegulatoryClassesImplemented OBJECT-TYPE
       SYNTAX TruthValue
       MAX-ACCESS read-write
       STATUS current
       DESCRIPTION
              "This attribute, when TRUE, indicates that the station implementa-
              tion is capable of supporting regulatory classes. The capability is
              disabled otherwise. The default value of this attribute is FALSE."
   ::= { dot11StationConfigEntry 28 }

dot11RegulatoryClassesRequired OBJECT-TYPE
       SYNTAX TruthValue
       MAX-ACCESS read-write
       STATUS current
       DESCRIPTION
              "A STA will use the defined regulatory classes procedures if and
              only if this attribute is TRUE. The default value of this attribute
              is FALSE."
   ::= { dot11StationConfigEntry 29 }
```

After the end of the "dot11SpectrumManagement TABLE" in Annex D, insert the following dot11RegulatoryClasses TABLE:

```
-- ************************************************************************
-- * dot11RegulatoryClasses TABLE
-- ************************************************************************

dot11RegulatoryClassesTable OBJECT-TYPE
       SYNTAX SEQUENCE OF Dot11RegulatoryClassesEntry
       MAX-ACCESS not-accessible
       STATUS current
       DESCRIPTION
              "(Conceptual) table of attributes for regulatory classes"
   ::= {dot11smt 13}

dot11RegulatoryClassesEntry OBJECT-TYPE
       SYNTAX Dot11RegulatoryClassesEntry
       MAX-ACCESS not-accessible
       STATUS current
       DESCRIPTION
              "An entry (conceptual row) in the Regulatory Classes Table.
              IfIndex - Each 802.11 interface is represented by an ifEntry.
              Interface tables in this MIB are indexed by ifIndex."
       INDEX {ifIndex, dot11RegulatoryClassesIndex}
   ::= { dot11RegulatoryClassesTable 1 }

Dot11RegulatoryClassesEntry ::=
       SEQUENCE {
              dot11RegulatoryClassesIndex             Integer32,
              dot11RegulatoryClass                    INTEGER,
              dot11CoverageClass                      INTEGER }

dot11RegulatoryClassesIndex OBJECT-TYPE
       SYNTAX Integer32
       MAX-ACCESS not-accessible
       STATUS current
       DESCRIPTION
              "The auxiliary variable used to identify instances of the columnar
              objects in the Regulatory Classes Table."
   ::= { dot11RegulatoryClassesEntry 1 }
```

```
dot11RegulatoryClass OBJECT-TYPE
       SYNTAX INTEGER
       MAX-ACCESS read-write
       STATUS current
       DESCRIPTION
              "This attribute shall indicate the regulatory class to be used. The
              default value of this attribute shall be zero."
   ::= { dot11RegulatoryClassesEntry 2 }

dot11CoverageClass OBJECT-TYPE
       SYNTAX INTEGER
       MAX-ACCESS read-write
       STATUS current
       DESCRIPTION
              "This attribute shall indicate the coverage class to be used. The
              default value of this attribute shall be zero."
   ::= { dot11RegulatoryClassesEntry 3 }

-- ****************************************************************
-- * End of dot11RegulatoryClasses TABLE
-- ****************************************************************
```

In "dot11RegDomainsSupported TABLE" in Annex D, change dot11RegDomainsSupportedTable object as shown:

```
dot11RegDomainsSupportedTable OBJECT-TYPE
       SYNTAX SEQUENCE OF Dot11RegDomainsSupportedEntry
       MAX-ACCESS not-accessible
       STATUS current
       DESCRIPTION
              "There are different operational requirements dependent on the
              regulatory domain. This attribute list describes the regulatory
              domains the PLCP and PMD support in this implementation. Currently
              defined values and their corresponding Regulatory Domains are as
              follows:

              FCC (USA) = X'10', DOC (Canada) = X'20', ETSI (most of
              Europe) = X'30', Spain = X'31', France = X'32', ~~MKK~~MPHPT
              (Japan) = X'40', Other = X'00' "
   ::= { dot11phy 7}
```

In "dot11RegDomainsSupported TABLE" in Annex D, change dot11RegDomainsSupportedValue object as shown:

```
dot11RegDomainsSupportedValue OBJECT-TYPE
       SYNTAX INTEGER { fcc(16), doc(32), etsi(48), spain (49), france(50),
                     ~~mkk~~mphpt (64) }
       MAX-ACCESS read-only
       STATUS current
       DESCRIPTION
              "There are different operational requirements dependent on the
              regulatory domain. This attribute list describes the regulatory
              domains the PLCP and PMD support in this implementation. Currently
              defined values and their corresponding Regulatory Domains are as
              follows:

              FCC (USA) = X'10', DOC (Canada) = X'20', ETSI (most of
              Europe) = X'30', Spain = X'31', France = X'32', ~~MKK~~MPHPT
              (Japan) = X'40' "
   ::= { dot11RegDomainsSupportedEntry 2 }
```

In "dot11PhyOFDM TABLE" in Annex D, change Dot11PhyOFDMEntry as shown:

```
Dot11PhyOFDMEntry ::=
        SEQUENCE { dot11CurrentFrequency             INTEGER,
                   dot11TIThreshold                  Integer32,
                   dot11FrequencyBandsSupported      INTEGER, }
                   dot11ChannelStartingFactor        Integer32 }
```

In "dot11PhyOFDM TABLE" in Annex D, change dot11FrequencyBandsSupported object as shown:

```
dot11FrequencyBandsSupported OBJECT-TYPE
       SYNTAX INTEGER (1..127)
       MAX-ACCESS read-only
       STATUS current
       DESCRIPTION
              "The capability of the OFDM PHY implementation to operate in the
              three U-NII bands, in the CEPT Band B, and in the Japanese 5 GHz
              bands. Coded as an integer value of a seven bit field as follows:
                 bit 0 .. capable of operating in the lower (5.15-5.25 GHz)
                    U-NII band
                 bit 1 .. capable of operating in the middle (5.25-5.35 GHz)
                    U-NII band
                 bit 2 .. capable of operating in the upper (5.725-5.825 GHz)
                    U-NII band
                 bit 3 .. capable of operating in CEPT Band B (5.47-5.725 GHz)
                 bit 4 .. capable of operating in the lower Japanese (5.15-
                    5.25 GHz) band
                 bit 5 .. capable of operating in the Japanese 5.0 (5.03-
                    5.091 GHz) band
                 bit 6 .. capable of operating in the Japanese 4.9 (4.9-5.0 GHz)
                    band
              For example, for an implementation capable of operating in the
              lower and mid bands, this attribute would take the value 3."
   ::= { dot11PhyOFDMEntry 3 }
```

In "dot11PhyOFDM TABLE" in Annex D, insert the following object after dot11FrequencyBandsSupported { dot11PhyOFDMEntry 3 }:

```
dot11ChannelStartingFactor OBJECT-TYPE
       SYNTAX Integer32 (8000..10000)
       MAX-ACCESS read-write
       STATUS current
       DESCRIPTION
              "The base factor from which channel center frequencies are
              calculated. This number is multiplied by 500 kHz to form the base
              frequency to be added to the channel number x 5 MHz. The default
              value of this attribute shall be 10 000."
   ::= { dot11PhyOFDMEntry 4 }
```

In "Compliance Statements" of Annex D, change OPTIONAL-GROUPS as follows:

```
-- OPTIONAL-GROUPS { dot11SMTprivacy, dot11MACStatistics,
--    dot11PhyAntennaComplianceGroup, dot11PhyTxPowerComplianceGroup,
--    dot11PhyRegDomainsSupportGroup,
--    dot11PhyAntennasListGroup, dot11PhyRateGroup,
--    dot11SMTbase3, dot11MultiDomainCapabilityGroup,
--    dot11PhyFHSSComplianceGroup2, dot11RSNAadditions,
--    dot11RegulatoryClassesGroup }
--

::= { dot11Compliances 1 }
```

In "Groups – units of conformance" of Annex D, change dot11PhyOFDMComplianceGroup object as shown:

```
dot11PhyOFDMComplianceGroup OBJECT-GROUP
        OBJECTS { dot11CurrentFrequency,
                  dot11TIThreshold,
                  dot11FrequencyBandsSupported, }
                  dot11ChannelStartingFactor }
       STATUS current
       DESCRIPTION
             "Attributes that configure the OFDM for IEEE 802.11."
   ::= { dot11Groups 17 }
```

In "Groups - units of conformance" of Annex D, change dot11SMTbase3 as follows:

```
dot11SMTbase3 OBJECT-GROUP
        OBJECTS { dot11MediumOccupancyLimit,
                  dot11CFPollable,
                  dot11CFPPeriod,
                  dot11CFPMaxDuration,
                  dot11AuthenticationResponseTimeOut,
                  dot11PrivacyOptionImplemented,
                  dot11PowerManagementMode,
                  dot11DesiredSSID, dot11DesiredBSSType,
                  dot11OperationalRateSet,
                  dot11BeaconPeriod, dot11DTIMPeriod,
                  dot11AssociationResponseTimeOut,
                  dot11DisassociateReason,
                  dot11DisassociateStation,
                  dot11DeauthenticateReason,
                  dot11DeauthenticateStation,
                  dot11AuthenticateFailStatus,
                  dot11AuthenticateFailStation,
                  dot11MultiDomainCapabilityImplemented,
                  dot11MultiDomainCapabilityEnabled,
                  dot11CountryString }
       STATUS currentdeprecated
       DESCRIPTION
             "The SMTbase3 object class provides the necessary support at the
             STA to manage the processes in the STA so that the STA may work
             cooperatively as a part of an IEEE 802.11 network, when the STA is
             capable of multidomain operation. This object group should be
             implemented when the multidomain capability option is implemented."
   ::= { dot11Groups 20 }
```

In "Groups - units of conformance" in Annex D, insert the following objects after dot11SMTbase4 { dot11Groups 26 }:

```
dot11RegulatoryClassesGroup OBJECT-GROUP
        OBJECTS { dot11RegulatoryClass,
                  dot11CoverageClass }
       STATUS current
       DESCRIPTION
             "Attributes that configure the OFDM for IEEE 802.11 in many
             regulatory domains."
   ::= { dot11Groups 29 }

dot11SMTbase5 OBJECT-GROUP
        OBJECTS { dot11MediumOccupancyLimit,
                  dot11CFPollable,
                  dot11CFPPeriod,
                  dot11CFPMaxDuration,
```

```
                dot11AuthenticationResponseTimeOut,
                dot11PrivacyOptionImplemented,
                dot11PowerManagementMode,
                dot11DesiredSSID, dot11DesiredBSSType,
                dot11OperationalRateSet,
                dot11BeaconPeriod, dot11DTIMPeriod,
                dot11AssociationResponseTimeOut,
                dot11DisassociateReason,
                dot11DisassociateStation,
                dot11DeauthenticateReason,
                dot11DeauthenticateStation,
                dot11AuthenticateFailStatus,
                dot11AuthenticateFailStation,
                dot11MultiDomainCapabilityImplemented,
                dot11MultiDomainCapabilityEnabled,
                dot11CountryString,
                dot11SpectrumManagementImplemented,
                dot11SpectrumManagementRequired,
                dot11RSNAOptionImplemented,
                dot11RegulatoryClassesImplemented,
                dot11RegulatoryClassesRequired }
    STATUS current
    DESCRIPTION
          "The SMTbase5 object class provides the necessary support at the
          STA to manage the processes in the STA so that the STA may work
          cooperatively as a part of an IEEE 802.11 network, when the STA is
          capable of multidomain operation. This object group should be
          implemented when the multidomain capability option is implemented."
::= { dot11Groups 30 }
```

After Annex H, insert Annex I and Annex J:

Annex I

(informative)

Regulatory classes

I.1 External regulatory references

This annex and Annex J provide information and requirements extending the OFDM PHY specification in Clause 17 for operation in the USA, Europe, and the 4.9 GHz and 5 GHz bands in Japan. The OFDM system provides a WLAN with data payload communication capabilities of 6, 9, 12, 18, 24, 36, 48, and 54 Mbit/s in 20 MHz channels and 3, 4.5, 6, 9, 12, 18, 24, and 27 Mbit/s in 10 MHz channels.

WLANs implemented in accordance with this standard and the specifications and definitions referenced in it are subject to equipment certification and operating requirements established by regional and national regulatory administrations. The specification establishes minimum technical requirements for interoperability, based upon established regulations at the time this standard was issued. These regional and national regulations are subject to revision or may be superseded. Regulatory requirements that do not affect interoperability are not addressed in this standard. Implementers are referred to the regulatory sources in Table I.1 for further information. Operation in countries within defined regulatory domains may be subject to additional or alternative national regulations.

The documents listed in Table I.1 specify the current regulatory requirements for various geographic areas at the time this standard was developed. They are provided for information only and are subject to change or revision at any time.

Table I.1—Regulatory requirement list

Geographic area	Approval standards	Documents	Approval authority
Japan	Ministry of Public Management, Home Affairs, Posts and Telecommunications (MPHPT)	MPHPT Equipment Ordinance (EO) for Regulating Radio Equipment Articles 7, 49.20, 49.21[a]	MPHPT
United States	Federal Communications Commission (FCC)	CFR47, Part 15, Sections 15.205, 15.209, and 15.247; and Subpart E, Sections 15.401–15.407	FCC
Europe	European Conference of Postal and Telecommunications (CEPT) Administrations and its Electronic Communications Committee (ECC). Also, European Radiocommunications Office, European Telecommunications Standards Institute	ECC DEC (04) 08, ETSI EN301 893	CEPT

[a]Frequency planning for licensed STAs in Japan is performed by the regulatory authority and the licensees, addressing the coexistence among STAs operating with a variety of air propagation times and the coexistence between STAs using 20 MHz channel spacing and STAs operating with 10 MHz channel spacing. Note also the CCA mechanism is preserved in licensed operation.

Emissions limits sets are listed in Table I.2, and behavior limits sets are specified in Table I.3. The external regulatory references in Table I.2 and Table I.3 are informative, as they do not specify technical parameters.

Table I.2—Emissions limits sets

Emissions limits set	USA	Europe	Japan
0	Not specified	Not specified	Not specified
1 nomadic use	FCC CFR47, Section 15.407	ETSI EN 301 389-1	MPHPT EO Articles 49.20, 49.21
2 interference-limited areas[a]	Reserved	Reserved	MPHPT EO Article 49.21
3 other interference areas[a]	Reserved	Reserved	MPHPT EO Article 49.21
4–255	Reserved	Reserved	Reserved

[a]The deployment in Japan of licensed radios in dense urban areas (i.e., interference-limited areas) and other areas (i.e., other interference areas) are specified to allow more radios to operate in dense urban areas, while permitting what can be less expensive radio designs to be used elsewhere.

Table I.3—Behavior limits sets

Behavior limits set	USA	Europe	Japan
0	Not specified	Not specified	Not specified
1 nomadic use	FCC CFR47, Section 15.407	ETSI EN 301 389-1	MPHPT EO Articles 49.20, 49.21
2 indoor only use	FCC CFR47, Section 15.407(e)	ETSI EN 301 389-1	MPHPT EO Article 49.20
3 transmit power control	Reserved	ETSI EN 301 389-1	Reserved
4 dynamic frequency selection	Reserved	ETSI EN 301 389-1	Reserved
5 Independent basic service set (IBSS) prohibited	Reserved	Reserved	MPHPT EO Article 49.21
6 4 ms CS[a]	Reserved	Reserved	MPHPT EO Articles 49.20, 49.21
7 licensed base station	Reserved	Reserved	MPHPT EO Article 49.21
8 mobile station	Reserved	Reserved	MPHPT EO Articles 49.20, 49.21
9–255	Reserved	Reserved	Reserved

[a]The Japanese 4 ms CS rule says no STA can transmit for more than 4 ms without carrier sensing, whether transmitting fragments or frames, unless it is controlled by another STA.

I.2 Radio performance specifications

I.2.1 Transmit and receive in-band and out-of-band spurious emissions

Spurious transmissions from compliant devices shall conform to national regulations. For operation in the USA, refer to FCC CFR47, Section 15.407. For operation in Europe, refer to ETSI EN 301 389-1. For operation in Japan, refer to MPHPT EO Article 49.20 and Article 49.21, Section 1.

NOTE—All out-of-band and in-band spurious emission requirements of MPHPT EO Article 49.20 and Article 49.21, Section 1, are included in Table I.4 and Table I.5. Figure I.1 and Figure I.2 are an informative summary of the requirements for operation in the Japanese 4.9 GHz and 5.0 GHz bands.

Table I.4—Japanese out-of-band emission limits

Regulatory domain	Band (GHz)	Out-of-band leakage power	Out-of-band frequencies
For 20 MHz channel spacing systems			
MPHPT EO Article 49.21	4.9	< 15 μW/MHz	$4880 \le f < 4900$ MHz, $5000 < f \le 5020$ MHz
MPHPT EO Article 49.21	5.0	< 15 μW/MHz	$5000 \le f < 5020$ MHz, $5100 < f \le 5120$ MHz
MPHPT EO Article 49.21	5.0	< 0.5 mW/MHz	$5020 \le f < 5030$ MHz, $5091 < f \le 5100$ MHz
MPHPT EO Article 49.21, Part 2 in limited interference areas, and unlicensed	4.9	< 0.2 μW/MHz	4840 MHz ± 10 MHz, 4860 MHz ± 10 MHz
MPHPT EO Article 49.21, Part 2 in limited interference areas, and unlicensed	5.0	< 0.2 μW/MHz	4960 MHz ± 10 MHz, 4980 MHz ± 10 MHz
MPHPT EO Article 49.20	5.15–5.25	≤ 2.5 μW/MHz	$5130 \le f \le 5142$ MHz
MPHPT EO Article 49.20	5.15–5.25	≤ 15 μW/MHz	$5142 < f \le 5150$ MHz, $5250 \le f < 5258$ MHz
MPHPT EO Article 49.20	5.15–5.25	≤ 0.2 μW/MHz	$5258 \le f \le 5270$ MHz
For 10 MHz channel spacing systems			
MPHPT EO Article 49.20	4.9	< 15 μW/MHz	$4895 \le f < 4905$ MHz, $4955 < f \le 4965$ MHz
MPHPT EO Article 49.20	5.0	< 15 μW/MHz	$5015 \le f < 5025$ MHz, $5065 < f \le 5075$ MHz
MPHPT EO Article 49.20	5.0	< 0.5 mW/MHz	$5025 \le f < 5030$ MHz

Table I.5—Japanese upper limit of spurious emissions

Regulatory domain	Band (GHz)	Spurious emissions power	Frequencies
For 20 MHz channel spacing systems			
MPHPT EO Article 7	4.9	≤ 2 μW/MHz	< 4870 MHz
MPHPT EO Article 7	4.9	≤ 2.5 μW/MHz	4870 ≤ f < 4880 MHz, 5020 < f ≤ 5270 MHz
MPHPT EO Article 7	4.9	≤ 0.2 μW/MHz	5270 < f ≤ 5342 MHz
MPHPT EO Article 7	4.9	≤ 1 μW/MHz	> 5342 MHz
MPHPT EO Article 7	5.0	≤ 2 μW/MHz	< 4990 MHz
MPHPT EO Article 7	5.0	≤ 2.5 μW/MHz	4990 ≤ f < 5000 MHz, 5120 < f ≤ 5270 MHz
MPHPT EO Article 7	5.0	≤ 0.2 μW/MHz	5270 < f ≤ 5342 MHz
MPHPT EO Article 7	5.0	≤ 1 μW/MHz	> 5342 MHz
MPHPT EO Article 7	5.15–5.25	≤ 2.5 μW/MHz	f < 5130 MHz, 5342 MHz < f
MPHPT EO Article 7	5.15–5.25	< 0.2 μW/MHz	5270 < f ≤ 5342 MHz
For 10 MHz channel spacing systems			
MPHPT EO Article 7	4.9	≤ 2 μW/MHz	< 4870 MHz
MPHPT EO Article 7	4.9	≤ 2.5 μW/MHz	4870 ≤ f < 4895 MHz, 4965 < f ≤ 5270 MHz
MPHPT EO Article 7	4.9	≤ 0.2 μW/MHz	5270 < f ≤ 5342 MHz
MPHPT EO Article 7	4.9	≤ 1 μW/MHz	> 5342 MHz
MPHPT EO Article 7	5.0	≤ 2 μW/MHz	< 4990 MHz
MPHPT EO Article 7	5.0	≤ 2.5 μW/MHz	4990 ≤ f < 5015 MHz, 5075 < f ≤ 5270 MHz
MPHPT EO Article 7	5.0	≤ 0.2 μW/MHz	5270 < f ≤ 5342 MHz
MPHPT EO Article 7	5.0	≤ 1 μW/MHz	> 5342 MHz

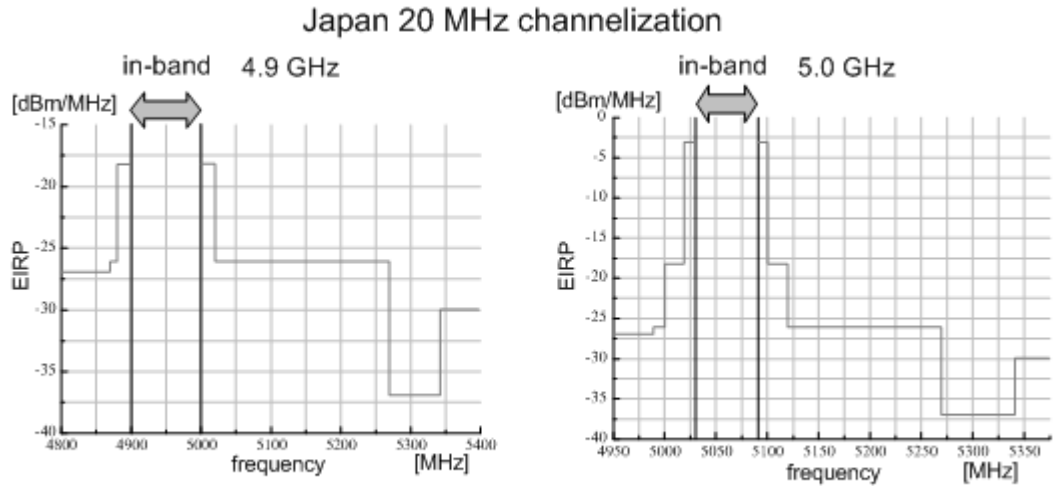


Figure I.1—Out-of-band and spurious emissions limits for 20 MHz channels in Japan

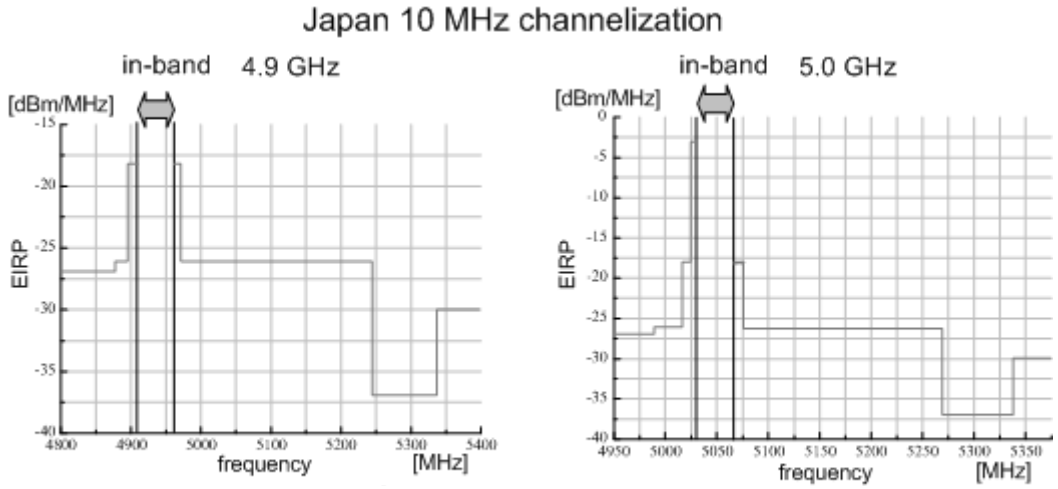


Figure I.2—Out-of-band and spurious emissions limits for 10 MHz channels in Japan

I.2.2 Transmit power levels

The maximum allowable output power by regulatory domain (except in Japan) is shown in Table I.6.

The maximum allowable output power by Japanese regulatory domain is shown in Table I.7. For the Japanese 4.9 GHz and 5.0 GHz bands, the maximum deviation of designated or rated equivalent isotropically radiated power (EIRP) shall be nominal +20% and nominal –80%.

Table I.6—Transmit power level by regulatory domain

Frequency band (GHz)	USA (Maximum output power with up to 6 dBi antenna gain) (mW)	Europe (EIRP)
5.15–5.25	40 (2.5 mW/MHz)	200 mW
5.25–5.35	200 (12.5 mW/MHz)	200 mW
5.470–5.725	—	1 W
5.725–5.825	800 (50 mW/MHz)	—

Table I.7—Japanese transmit power levels by regulatory domain

Frequency band (GHz)	Regulatory type	Japan
4.9–5.091	Fixed wireless access, licensed	< 250 mW EIRP, and < 50 mW/MHz EIRP for licensed access
4.9–5.091	Nomadic access, unlicensed	< 10 mW/MHz EIRP
5.15–5.25	Unlicensed	< 10 mW/MHz EIRP

I.2.3 Transmit spectrum mask

For operation using 20 MHz channel spacing in the USA, Europe, and Japan, the transmitted spectrum shall have a 0 dBr (dB relative to the maximum spectral density of the signal) bandwidth not exceeding 18 MHz, –20 dBr at 11 MHz frequency offset, –28 dBr at 20 MHz frequency offset, and –40 dBr at 30 MHz frequency offset and above. For operation using 10 MHz channel spacing, the transmitted spectrum shall have a 0 dBr bandwidth not exceeding 9 MHz, –20 dBr at 5.5 MHz frequency offset, –28 dBr at 10 MHz frequency offset, and –40 dBr at 15 MHz frequency offset and above. The measurements shall be made using a 100 kHz resolution bandwidth and a 30 kHz video bandwidth.

For operation in Japan, the average power emitted in adjacent and alternate adjacent channels of the same channel width shall be less than –3 dBr and –18 dBr, respectively, for both the 4.9 GHz and 5.0 GHz bands, measured relative to the EIRP in the 100 kHz at the channel edges and the band edges. For operation in Japan in the 5.15–5.25 GHz band, the average power emitted in adjacent and alternate adjacent channels shall be lower than average on-channel power by 25 dB and 40 dB, respectively.

NOTE—Figure I.3 shows the average power in adjacent channels for 20 MHz channel spacing, and Figure I.4 shows the average power in adjacent channels for 10 MHz channel spacing. There are no special spreading requirements for any particular channel. The alternate adjacent channel(s) are adjacent to the channels adjacent to a given channel.

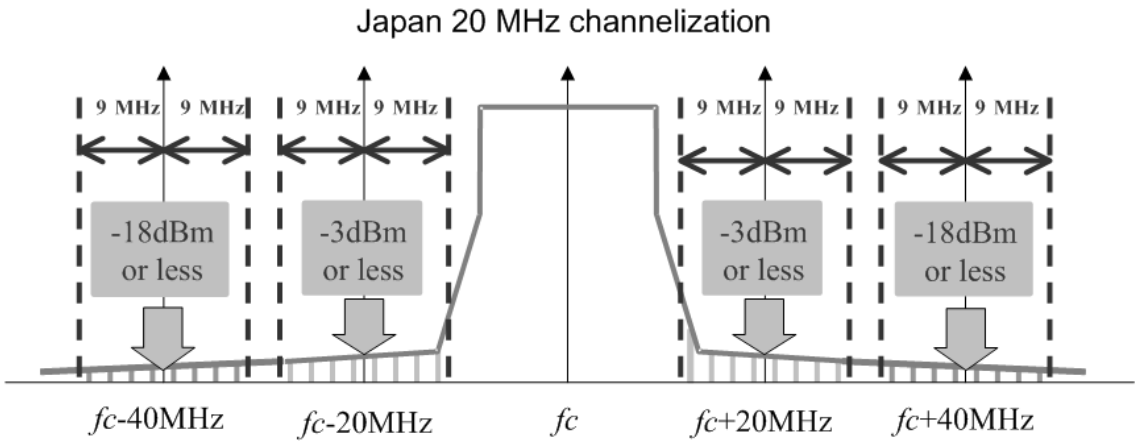


Figure I.3—Average power in adjacent channels for 20 MHz channel spacing in Japan

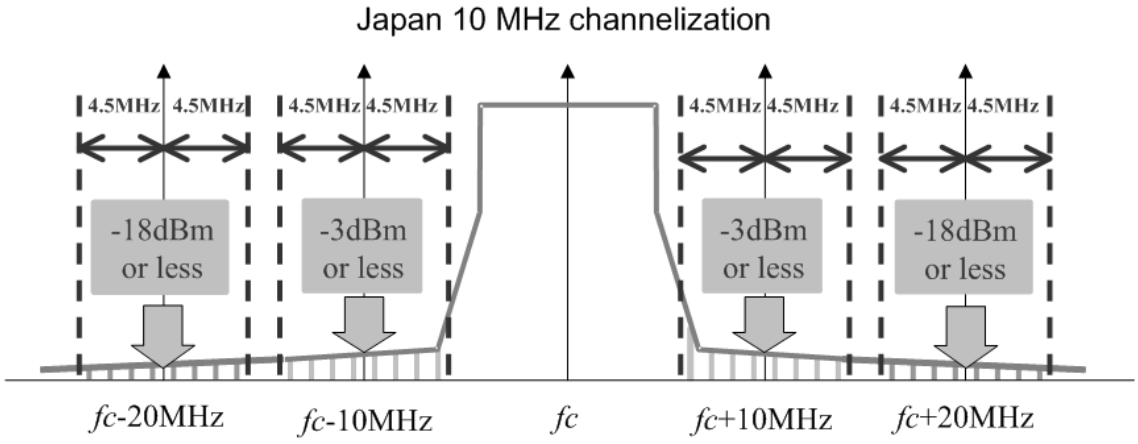


Figure I.4—Average power in adjacent channels for 10 MHz channel spacing in Japan

Annex J

(normative)

Country information element and regulatory classes

The Country information element (see 7.3.2.12) allows a STA to configure its PHY and MAC for operation when the regulatory triplet of Regulatory Extension Identifier, Regulatory Class, and Coverage Class fields is present. The regulatory triplet indicates both PHY and MAC configuration characteristics and operational characteristics. The First Channel Number field of subsequent subband triplet(s) is based on the dot11ChannelStartingFactor that is indicated by the Regulatory Class field.

The regulatory class for the OFDM PHY is an index into a set of values for radio equipment sets of rules.

The channel starting frequency variable is a frequency, used together with a channel number, to calculate a channel center frequency.

Channel spacing is the frequency difference between nonoverlapping adjacent channel center frequencies.

The channel set shall be the list of integer channel numbers that are legal for a regulatory domain and class.

The transmit power limit shall be the maximum transmit power that is legal for a regulatory domain and class.

An emissions limits set is an enumerated list of spectral masks and emissions limits that are legal for a regulatory domain and are listed in Table I.1.

Specific transmit restrictions and limits are listed in I.2.

A behavior limits set is an enumerated list of behaviors that are legal for a regulatory domain and are specified in Table I.3.

The regulatory classes specified for 5 GHz operation in the USA are enumerated in Table J.1.

Table J.1—Regulatory classes for 5 GHz bands in the USA

Regulatory class	Channel starting frequency (GHz)	Channel spacing (MHz)	Channel set	Transmit power limit (mW)	Emissions limits set	Behavior limits set
1	5	20	36, 40, 44, 48	40	1	1, 2
2	5	20	52, 56, 60, 64	200	1	1
3	5	20	149, 153, 157, 161	800	1	1
4–255	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

The regulatory classes specified for 5 GHz operation in Europe are enumerated in Table J.2.

Table J.2—Regulatory classes for 5 GHz bands in Europe

Regulatory class	Channel starting frequency (GHz)	Channel spacing (MHz)	Channel set	Transmit power limit (EIRP)	Emissions limits set	Behavior limits set
1	5	20	36, 40, 44, 48	200	1	2, 3
2	5	20	52, 56, 60, 64	200	1	1, 3, 4
3	5	20	100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140	1 W	1	1, 3, 4
4–255	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

The regulatory classes specified for 4.9 GHz and 5 GHz operation in Japan are enumerated in Table J.3.

Table J.3—Regulatory classes for 4.9 GHz and 5 GHz bands in Japan

Regulatory class	Channel starting frequency (GHz)	Channel spacing (MHz)	Channel set	Transmit power limit (dBm)	Emissions limits set	Behavior limits set
1	5	20	34, 38, 42, 46	22	1	1, 2, 6
2	5	20	8, 12, 16	24	2	5, 6, 7
3	5	20	8, 12, 16	24	2	5, 6, 8
4	5	20	8, 12, 16	24	3	5, 6, 7
5	5	20	8, 12, 16	24	3	5, 6, 8
6	5	20	8, 12, 16	22	1	5, 6, 8
7	4	20	184, 188, 192, 196	24	2	5, 6, 7
8	4	20	184, 188, 192, 196	24	2	5, 6, 8
9	4	20	184, 188, 192, 196	24	3	5, 6, 7
10	4	20	184, 188, 192, 196	24	3	5, 6, 8
11	4	20	184, 188, 192, 196	22	1	5, 6, 8
12	5	10	7, 8, 9, 11	24	2	5, 6, 7
13	5	10	7, 8, 9, 11	24	2	5, 6, 8
14	5	10	7, 8, 9, 11	24	3	5, 6, 7

Table J.3—Regulatory classes for 4.9 GHz and 5 GHz bands in Japan *(continued)*

Regulatory class	Channel starting frequency (GHz)	Channel spacing (MHz)	Channel set	Transmit power limit (dBm)	Emissions limits set	Behavior limits set
15	5	10	7, 8, 9, 11	24	3	5, 6, 8
16	4	10	183, 184, 185, 187, 188, 189	24	2	5, 6, 7
17	4	10	183, 184, 185, 187, 188, 189	24	2	5, 6, 8
18	4	10	183, 184, 185, 187, 188, 189	24	3	5, 6, 7
19	4	10	183, 184, 185, 187, 188, 189	24	3	5, 6, 8
20	4	10	183, 184, 185, 187, 188, 189	17	1	5, 6, 8
21–255	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved