IEEE P802.11
Wireless LANs

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| Draft Spec Text Update for Annex D.2 (Radio Performance Specifications) |
| Date: 2020-03-12 |
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Abstract

This submission contains modified spec text for Annex D.2 (Radio Performance Specifications) to be incorporated in P802.11bd D0.3. The text reflects the related passed motion (#66) recorded in 11-19/0514r14.

Revisions:

* Rev 0: Initial version of the document.

* Radio performance specifications
* Transmit and receive in-band and out-of-band spurious emissions

Spurious transmissions shall comply with national regulations.

* Transmit power levels

The maximum allowable output power is measured in accordance with practices specified by the appropriate regulatory bodies.

The maximum allowable STA transmit power classifications for ITS nonmobile operations in the U.S. 5.85–5.925 GHz band are shown in Table D-3 (Maximum STA transmit power classification for the 5.85–5.925 GHz band in the United States).

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| * Maximum STA transmit power classification for the 5.85–5.925 GHz band in the United States
 |
| STA transmit power classification | Maximum STA transmit power(mW) | Maximum permitted EIRP (dBm) |
| A | 1 | 23 |
| B | 10 | 23 |
| C | 100 | 33 |
| C2 | 100 | 33 |
| D | 760Note that for this class higher power is permitted as long as the power level is reduced to this level at the antenna connector(#140) and the emission mask specifications are met. | 33 for nongovernment44.8 for government |

(11ah)The maximum allowed transmit power and maximum bandwidth (BW) limits for an S1G STA are shown by country in Table D-4 (Maximum STA transmit power and maximum BW allowed(11ah)).

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| * Maximum STA transmit power and maximum BW allowed(11ah)
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| Geographic area | Frequency(MHz) | Maximum BW allowed(MHz) | Maximum STA transmit power (Max e.i.r.p (mW)) |
| Australia | 915–928 | 8 | (Ed)See NOTE 1 |
| China | 775–779 | 1 | 5 |
| 779–787 | Not defined | 10 |
| Europe | 863–868.6 | Not defined | 25.12 |
| Japan | 915.9–929.7 | 1 | (Ed)See NOTE 2 |
| 920.5–923.5 | (Ed)See NOTE 3 |
| New Zealand | 915–928 | 8 | (Ed)See NOTE 4 |
| United States | 902–928 | Not defined | 1000 |
| Singapore | 866–869, 920–925 | 8 | 500 |
| South Korea | 917–923.5 | Not defined | 3, 10 |
| NOTE 1—Max e.i.r.p. <= 30 dBm and PSD <= 25 mW/3 kHzNOTE 2—1 or 20 mW transmitter output power plus up to 3 dBi antenna gain (maximum power is 1 or 20 mW + 3 dBi)NOTE 3—250 mW transmitter output power plus up to 3 dBi antenna gain (maximum power is 250 mW + 3 dBi)NOTE 4—Max e.i.r.p. <= 5 dBm (915 MHz(Ed) to 928 MHz) for general sensor-type devices and Max e.i.r.p. <= 36 dBm (921.5 MHz to 928 MHz) for digital modulation transmitters |

* Transmit spectrum mask

Transmit spectrum masks defined in regulation are subject to change or revision at any time.

For operation in the 5.85**–**5.925 GHz band the transmitted spectrum shall be as follows:

* For any STA using 5 MHz channel spacing, the transmitted spectral density shall have a 0 dBr bandwidth not exceeding 4.5 MHz and shall not exceed the spectrum mask created using the permitted power spectral density levels listed in Table D-5 (Spectrum mask data for 5 MHz channel spacing) for the transmit power class of the STA.
* For any STA using 10 MHz channel spacing, the transmitted spectral density shall have a 0 dBr bandwidth not exceeding 9 MHz and shall not exceed the spectrum mask created using the permitted power spectral density levels listed in Table D-6 (Spectrum mask data for 10 MHz channel spacing) for the transmit power class of the STA.
* For any STA using 20 MHz channel spacing complying with transmit power class A, B, C and D, the transmitted spectral density shall have a 0 dBr bandwidth not exceeding 18 MHz and shall not exceed the spectrum mask created using the permitted power spectral density levels listed in Table D-7 (Spectrum mask data for 20 MHz channel spacing) for the transmit power class of the STA.

d)  For any STA using 20 MHz channel spacing complying with transmit power class C2, the transmitted spectral density shall have a 0 dBr bandwidth not exceeding 19 MHz and shall not exceed the spectrum mask created using the permitted power spectral density levels listed in Table D-8 (Spectrum mask data for the transmit power class C2) of the STA. Note that transmit power class C2 complies with the transmit power limitation as transmit power class C as listed in Table D-3.

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| * Spectrum mask data for 5 MHz channel spacing
 |
| STA transmit power class | Permitted power spectral density, dBr |
| ± 2.25 MHz offset(±f1) | ± 2.5 MHz offset(±f2) | ± 2.75 MHz offset(±f3) | ±5 MHz offset(±f4) | ± 7.5 MHz offset(±f5) |
| Class A | 0 | **–**10 | **–**20 | –28 | –40 |
| Class B | 0 | **–**16 | **–**20 | –28 | –40 |
| Class C | 0 | **–**26 | –32 | –40 | –50 |
| Class D | 0 | **–**35 | –45 | –55 | –65 |

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| * Spectrum mask data for 10 MHz channel spacing
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| STA transmit power class | Permitted power spectral density, dBr |
| ± 4.5 MHz offset(±f1) | ± 5.0 MHz offset(±f2) | ± 5.5 MHz offset(±f3) | ± 10 MHz offset(±f4) | ± 15 MHz offset(±f5) |
| Class A | 0 | –10 | –20 | –28 | –40 |
| Class B | 0 | –16 | –20 | –28 | –40 |
| Class C | 0 | –26 | –32 | –40 | –50 |
| Class D | 0 | –35 | –45 | –55 | –65 |

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| * Spectrum mask data for 20 MHz channel spacing
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| STA transmit power class | Permitted power spectral density, dBr |
| ± 9 MHz offset(±f1) | ± 10.0 MHz offset(±f2) | ± 11 MHz offset(±f3) | ± 20 MHz offset(±f4) | ± 30 MHz offset(±f5) |
| Class A | 0 | –10 | –20 | –28 | –40 |
| Class B | 0 | –16 | –20 | –28 | –40 |
| Class C | 0 | –26 | –32 | –40 | –50 |
| Class D | 0 | –35 | –45 | –55 | –65 |

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| Table D-8—Spectrum mask data for 20 MHz channel spacing with transmit power class C2 |
| STA transmit power class | Permitted power spectral density, dBr |
| ± 9.5 MHz offset(±f1) | ± 10.0 MHz offset(±f2) | ± 10.5 MHz offset(±f3) | ± 15 MHz offset(±f4) | ± 25 MHz offset(±f5) |
| Class C2 | 0 | –26 | –32 | –40 | –50 |

The transmit spectral mask is created and applied as shown in Figure D-1 (Transmit spectrum mask and application) about the channel center frequency (Fc) defined by the channel starting frequency and channel number from the operating class. The 0 dBr level is the maximum power spectral density measured in the channel. The measurements of transmit spectral density are made using a 100 kHz resolution bandwidth and a 30 kHz video bandwidth.

* Transmit Mask M

This subclause defines the characteristics of transmit mask M.

The power spectral density of the emissions shall be attenuated below the output power of the transmitter as follows:

* On any frequency removed from the center frequency between 0-45% of the channel bandwidth (BW): 0 dB.
* On any frequency removed from the center frequency between 45-50% of the channel bandwidth: 568 log (% of (BW)/45) dB.
* On any frequency removed from the center frequency between 50-55% of the channel bandwidth: 26 + 145 log (% of BW/50) dB.
* On any frequency removed from the center frequency between 55-100% of the channel bandwidth: 32 + 31 log (% of (BW)/55) dB.
* On any frequency removed from the center frequency between 100-150% of the channel bandwidth: 40 + 57 log (% of (BW)/100) dB.
* On any frequency removed from the center frequency between above 150% of the channel bandwidth: 50 dB or 55 + 10 log (P) dB, whichever is the lesser attenuation.
* The 0 dB reference is measured relative to the highest average power of the fundamental emission measured across the designated channel bandwidth using a resolution bandwidth of 100 kHz and a video bandwidth of 30 kHz. The power spectral density is the power measured within the resolution bandwidth of the measurement device divided by the resolution bandwidth of the measurement device. Emission levels are also based on the use of measurement instrumentation employing a resolution bandwidth of at least one percent of the occupied bandwidth.
* CCA-ED threshold

CCA-ED thresholds for operation in specific bands are given in E.2 (Band-specific operating requirements).