

802.11 Wi-Fi Physical Layer and Transmitter Measurements

		802.11b (HR/DSSSS)	802.11a and 802.11g (ERP)	802.11n (HT)	802.11ac (VHT)	Channel # / Center Frequency																																																																																																																																																																																																																																																																																																														
Channel Allocation	2.4 GHz				<table border="1"> <thead> <tr> <th colspan="10">2.4 GHz</th> </tr> <tr> <th>Primary Channel</th> <th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th> </tr> <tr> <th>2nd Channel</th> <td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td> </tr> <tr> <th>Center Channel</th> <td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td> </tr> <tr> <th>Center Frequency</th> <td>2422</td><td>2427</td><td>2432</td><td>2437</td><td>2442</td><td>2447</td><td>2452</td><td>2457</td><td>2462</td> </tr> </thead> </table>	2.4 GHz										Primary Channel	1	2	3	4	5	6	7	8	9	2nd Channel	5	6	7	8	9	10	11	12	13	Center Channel	3	4	5	6	7	8	9	10	11	Center Frequency	2422	2427	2432	2437	2442	2447	2452	2457	2462	<table border="1"> <thead> <tr> <th colspan="10">802.11</th> </tr> <tr> <th>Bandwidth</th> <th>a</th> <th>n</th> <th>ac</th> <th>IEEE Channel Number</th> <th>36</th><th>40</th><th>44</th><th>48</th><th>52</th><th>56</th><th>60</th><th>64</th> <th>100</th><th>104</th><th>108</th><th>112</th><th>116</th><th>120</th><th>124</th><th>128</th><th>132</th><th>136</th><th>140</th> <th>149</th><th>153</th><th>157</th><th>161</th><th>165</th> </tr> </thead> <tbody> <tr> <td>20 MHz</td> <td>Yes</td> <td>Yes</td> <td>Yes</td> <td></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>40 MHz</td> <td></td> <td></td> <td>Yes</td> <td></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>80 MHz</td> <td></td> <td></td> <td></td> <td>Yes</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>160 MHz</td> <td></td> <td></td> <td></td> <td>Yes</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td><td></td> </tr> </tbody> </table>	802.11										Bandwidth	a	n	ac	IEEE Channel Number	36	40	44	48	52	56	60	64	100	104	108	112	116	120	124	128	132	136	140	149	153	157	161	165	20 MHz	Yes	Yes	Yes																										40 MHz			Yes																										80 MHz				Yes																									160 MHz				Yes																									<table border="1"> <thead> <tr> <th colspan="6">2.4 GHz</th> </tr> <tr> <th>Channel Number</th> <th>Center Frequency</th> <th>North America (FCC)</th> <th>Europe (ETSI)</th> <th>Japan</th> <th>ROW</th> </tr> </thead> <tbody> <tr><td>1</td><td>2412</td><td>Yes</td><td>Yes</td><td>Yes</td><td>Yes</td></tr> <tr><td>2</td><td>2417</td><td>Yes</td><td>Yes</td><td>Yes</td><td>Yes</td></tr> <tr><td>3</td><td>2422</td><td>Yes</td><td>Yes</td><td>Yes</td><td>Yes</td></tr> <tr><td>4</td><td>2427</td><td>Yes</td><td>Yes</td><td>Yes</td><td>Yes</td></tr> <tr><td>5</td><td>2432</td><td>Yes</td><td>Yes</td><td>Yes</td><td>Yes</td></tr> <tr><td>6</td><td>2437</td><td>Yes</td><td>Yes</td><td>Yes</td><td>Yes</td></tr> <tr><td>7</td><td>2442</td><td>Yes</td><td>Yes</td><td>Yes</td><td>Yes</td></tr> <tr><td>8</td><td>2447</td><td>Yes</td><td>Yes</td><td>Yes</td><td>Yes</td></tr> <tr><td>9</td><td>2452</td><td>Yes</td><td>Yes</td><td>Yes</td><td>Yes</td></tr> <tr><td>10</td><td>2457</td><td>Yes</td><td>Yes</td><td>Yes</td><td>Yes</td></tr> <tr><td>11</td><td>2462</td><td>Yes</td><td>Yes</td><td>Yes</td><td>Yes</td></tr> <tr><td>12</td><td>2467</td><td>No</td><td>Yes</td><td>Yes</td><td>Yes</td></tr> <tr><td>13</td><td>2472</td><td>No</td><td>Yes</td><td>Yes</td><td>Yes</td></tr> <tr><td>14</td><td>2484</td><td>No</td><td>No</td><td>802.11b only</td><td>No</td></tr> </tbody> </table>	2.4 GHz						Channel Number	Center Frequency	North America (FCC)	Europe (ETSI)	Japan	ROW	1	2412	Yes	Yes	Yes	Yes	2	2417	Yes	Yes	Yes	Yes	3	2422	Yes	Yes	Yes	Yes	4	2427	Yes	Yes	Yes	Yes	5	2432	Yes	Yes	Yes	Yes	6	2437	Yes	Yes	Yes	Yes	7	2442	Yes	Yes	Yes	Yes	8	2447	Yes	Yes	Yes	Yes	9	2452	Yes	Yes	Yes	Yes	10	2457	Yes	Yes	Yes	Yes	11	2462	Yes	Yes	Yes	Yes	12	2467	No	Yes	Yes	Yes	13	2472	No	Yes	Yes	Yes	14	2484	No	No	802.11b only	No
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Spectral Shape and Emission Mask	5 GHz				<table border="1"> <thead> <tr> <th colspan="5">Spectral Mask for 20, 40, 80, and 160 MHz Channels</th> </tr> <tr> <th>Channel Size</th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> </tr> </thead> <tbody> <tr> <td>20 MHz</td> <td>9 MHz</td> <td>11 MHz</td> <td>20 MHz</td> <td>30 MHz</td> </tr> <tr> <td>40 MHz</td> <td>19 MHz</td> <td>21 MHz</td> <td>40 MHz</td> <td>60 MHz</td> </tr> <tr> <td>80 MHz</td> <td>39 MHz</td> <td>41 MHz</td> <td>80 MHz</td> <td>120 MHz</td> </tr> <tr> <td>160 MHz</td> <td>79 MHz</td> <td>61 MHz</td> <td>160 MHz</td> <td>240 MHz</td> </tr> </tbody> </table>	Spectral Mask for 20, 40, 80, and 160 MHz Channels					Channel Size	A	B	C	D	20 MHz	9 MHz	11 MHz	20 MHz	30 MHz	40 MHz	19 MHz	21 MHz	40 MHz	60 MHz	80 MHz	39 MHz	41 MHz	80 MHz	120 MHz	160 MHz	79 MHz	61 MHz	160 MHz	240 MHz		<table border="1"> <thead> <tr> <th colspan="6">5 GHz</th> </tr> <tr> <th>Channel Number</th> <th>Center Frequency</th> <th>U.S.</th> <th>Europe</th> <th>Japan</th> <th>China</th> </tr> </thead> <tbody> <tr><td>36</td><td>5180</td><td>Yes</td><td>Indoors</td><td>Yes</td><td>Yes</td></tr> <tr><td>38</td><td>5190</td><td>No</td><td>No</td><td>Client Only</td><td>No</td></tr> <tr><td>40</td><td>5200</td><td>Yes</td><td>Indoors</td><td>Yes</td><td>Yes</td></tr> <tr><td>42</td><td>5210</td><td>No</td><td>No</td><td>Client Only</td><td>No</td></tr> <tr><td>44</td><td>5220</td><td>Yes</td><td>Indoors</td><td>Yes</td><td>Yes</td></tr> <tr><td>46</td><td>5230</td><td>No</td><td>No</td><td>Client Only</td><td>No</td></tr> <tr><td>48</td><td>5240</td><td>Yes</td><td>Indoors</td><td>Yes</td><td>Yes</td></tr> <tr><td>52</td><td>5260</td><td>DFS</td><td>Indoors/DFS/TPC</td><td>DFS/TPC</td><td>Yes</td></tr> <tr><td>56</td><td>5280</td><td>DFS</td><td>Indoors/DFS/TPC</td><td>DFS/TPC</td><td>Yes</td></tr> <tr><td>60</td><td>5300</td><td>DFS</td><td>Indoors/DFS/TPC</td><td>DFS/TPC</td><td>Yes</td></tr> <tr><td>64</td><td>5320</td><td>DFS</td><td>DFS/TPC</td><td>DFS/TPC</td><td>Yes</td></tr> <tr><td>100</td><td>5500</td><td>DFS</td><td>DFS/TPC</td><td>DFS/TPC</td><td>Yes</td></tr> <tr><td>104</td><td>5520</td><td>DFS</td><td>DFS/TPC</td><td>DFS/TPC</td><td>Yes</td></tr> <tr><td>108</td><td>5540</td><td>DFS</td><td>DFS/TPC</td><td>DFS/TPC</td><td>No</td></tr> <tr><td>112</td><td>5560</td><td>DFS</td><td>DFS/TPC</td><td>DFS/TPC</td><td>No</td></tr> <tr><td>116</td><td>5580</td><td>DFS</td><td>DFS/TPC</td><td>DFS/TPC</td><td>No</td></tr> <tr><td>120</td><td>5600</td><td>No</td><td>DFS/TPC</td><td>DFS/TPC</td><td>No</td></tr> <tr><td>124</td><td>5620</td><td>No</td><td>DFS/TPC</td><td>DFS/TPC</td><td>No</td></tr> <tr><td>128</td><td>5640</td><td>No</td><td>DFS/TPC</td><td>DFS/TPC</td><td>No</td></tr> <tr><td>132</td><td>5660</td><td>DFS</td><td>DFS/TPC</td><td>DFS/TPC</td><td>No</td></tr> <tr><td>136</td><td>5680</td><td>DFS</td><td>DFS/TPC</td><td>DFS/TPC</td><td>No</td></tr> <tr><td>140</td><td>5700</td><td>DFS</td><td>DFS/TPC</td><td>DFS/TPC</td><td>No</td></tr> <tr><td>149</td><td>5745</td><td>Yes</td><td>SRD</td><td>No</td><td>Yes</td></tr> <tr><td>153</td><td>5765</td><td>Yes</td><td>SRD</td><td>No</td><td>Yes</td></tr> <tr><td>157</td><td>5785</td><td>Yes</td><td>SRD</td><td>No</td><td>Yes</td></tr> <tr><td>161</td><td>5805</td><td>Yes</td><td>SRD</td><td>No</td><td>Yes</td></tr> <tr><td>165</td><td>5825</td><td>Yes</td><td>SRD</td><td>No</td><td>Yes</td></tr> </tbody> </table>	5 GHz						Channel Number	Center Frequency	U.S.	Europe	Japan	China	36	5180	Yes	Indoors	Yes	Yes	38	5190	No	No	Client Only	No	40	5200	Yes	Indoors	Yes	Yes	42	5210	No	No	Client Only	No	44	5220	Yes	Indoors	Yes	Yes	46	5230	No	No	Client Only	No	48	5240	Yes	Indoors	Yes	Yes	52	5260	DFS	Indoors/DFS/TPC	DFS/TPC	Yes	56	5280	DFS	Indoors/DFS/TPC	DFS/TPC	Yes	60	5300	DFS	Indoors/DFS/TPC	DFS/TPC	Yes	64	5320	DFS	DFS/TPC	DFS/TPC	Yes	100	5500	DFS	DFS/TPC	DFS/TPC	Yes	104	5520	DFS	DFS/TPC	DFS/TPC	Yes	108	5540	DFS	DFS/TPC	DFS/TPC	No	112	5560	DFS	DFS/TPC	DFS/TPC	No	116	5580	DFS	DFS/TPC	DFS/TPC	No	120	5600	No	DFS/TPC	DFS/TPC	No	124	5620	No	DFS/TPC	DFS/TPC	No	128	5640	No	DFS/TPC	DFS/TPC	No	132	5660	DFS	DFS/TPC	DFS/TPC	No	136	5680	DFS	DFS/TPC	DFS/TPC	No	140	5700	DFS	DFS/TPC	DFS/TPC	No	149	5745	Yes	SRD	No	Yes	153	5765	Yes	SRD	No	Yes	157	5785	Yes	SRD	No	Yes	161	5805	Yes	SRD	No	Yes	165	5825	Yes	SRD	No	Yes																																																																																																	
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256-QAM	5/6					-32																																																																																																																																																																																																																																																																																																														

Based on IEEE802.11-2012 standard.