

List of WLAN channels

Wireless LAN (WLAN) channels are frequently accessed using IEEE 802.11 protocols, and equipment that does so is sold mostly under the trademark Wi-Fi. Other equipment also accesses the same channels, such as Bluetooth. The radio frequency (RF) spectrum is vital for wireless communications infrastructure.

The 802.11 standard provides several distinct radio frequency bands for use in Wi-Fi communications: 900 MHz, 2.4 GHz, 3.6 GHz, 4.9 GHz, 5 GHz, 5.9 GHz, 6 GHz and 60 GHz. Each range is divided into a multitude of channels. In the standards, channels are numbered at 5 MHz spacing within a band (except in the 60 GHz band, where they are 2.16 GHz apart), and the number linearly relates to the centre frequency of the channel. Although channels are numbered at 5 MHz spacing, transmitters generally occupy at least 20 MHz, and standards allow for channels to be bonded together to form wider channels for higher throughput.

Countries apply their own regulations to the allowable channels, allowed users and maximum power levels within these frequency ranges. The ISM band ranges are also often used.

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900 MHz (802.11ah)

2.4 GHz (802.11b/g/n/ax)

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5 GHz (802.11a/h/j/n/ac/ax)

United States

United Kingdom

Germany

Austria

Japan

Brazil

Australia

New Zealand

Singapore

South Korea

China

Indonesia

India

5.9 GHz (802.11p)

6 GHz (802.11ax)

United States

Standard power

Low-power indoor (LPI) operation

Very-low-power devices

Canada

Standard power

Low-power indoor (LPI)

Very low power (VLP)

Europe

United Kingdom

Australia

60 GHz (802.11ad/ay)

See also

Notes

References

Further reading

900 MHz (802.11ah)

802.11ah operates in sub-gigahertz unlicensed bands. Each world region supports different sub-bands, and the channels number depends on the starting frequency of the sub-band it belongs to. Thus, there is no global channels numbering plan, and the channels numbers are incompatible between world regions (and even between sub-bands of a same world region).

The following sub-bands are defined in the 802.11ah specifications:

Region	Subband (MHz)	Bandwidths (MHz)
Australia	915–920	1, 2, 4
	920–928	1, 2, 4, 8
China	755–779	1
	779–787	1, 2, 4, 8
Europe	863–868	1, 2
Japan	916.5–927.5	1
Korea	917.5–923.5	1, 2, 4
New Zealand	915–924	1, 2, 4, 8
	924–928	1, 2, 4
Singapore	866–869	1, 2
	920–925	1, 2, 4
Taiwan	839–848.5	1, 2, 4
United States ^[1]	902–904	1, 2
	904–920	1, 2, 4, 8, 16
	920–928	1, 2, 4, 8

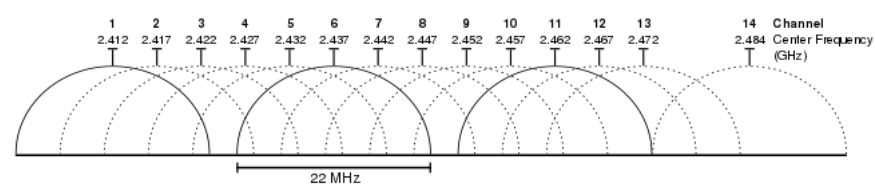
2.4 GHz (802.11b/g/n/ax)

Fourteen channels are designated in the 2.4 GHz range, spaced 5 MHz apart from each other except for a 12 MHz space before channel 14.^[2]

Channel	F ₀ (MHz)	Frequency range (MHz)	Most of world ^{[3][4][5][6][7][8][9][10]}	North America ^[3]	Japan ^[3]
1	2412	2401–2423	Yes	Yes	Yes
2	2417	2406–2428	Yes	Yes	Yes
3	2422	2411–2433	Yes	Yes	Yes
4	2427	2416–2438	Yes	Yes	Yes
5	2432	2421–2443	Yes	Yes	Yes
6	2437	2426–2448	Yes	Yes	Yes
7	2442	2431–2453	Yes	Yes	Yes
8	2447	2436–2458	Yes	Yes	Yes
9	2452	2441–2463	Yes	Yes	Yes
10	2457	2446–2468	Yes	Yes	Yes
11	2462	2451–2473	Yes	Yes	Yes
12	2467	2456–2478	Yes	No ^B	Yes
13	2472	2461–2483	Yes	No ^B	Yes
14	2484	2473–2495	No	No	11b only ^C

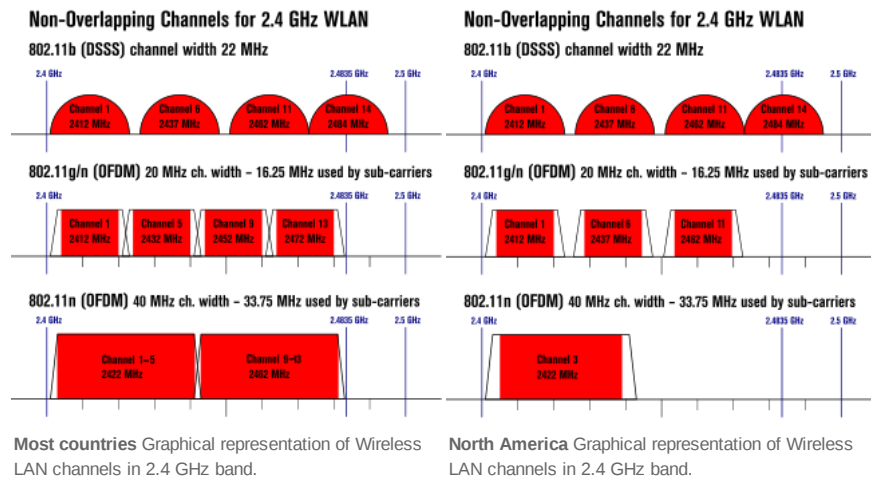
Nations apply their own RF emission regulations to the allowable channels, allowed users and maximum power levels within these frequency ranges. Network operators should consult their local authorities as these regulations may be out of date as they are subject to change at any time. Most of the world will allow the first thirteen channels in the spectrum.

To guarantee no interference in any circumstances the Wi-Fi protocol requires 16.25 to 22 MHz of channel separation (as shown below). The remaining 2 MHz gap is used as a guard band to allow sufficient attenuation along the edge of the band. This guardband is mainly used to accommodate older routers with modem chipsets prone to full channel occupancy, as most modern Wi-Fi modems are not prone to excessive channel occupancy. In 22 MHz channel width situations, there is 3 MHz free/unused spectrum between NON-overlapping channels, this is not called guard band but channel spacing.



Graphical representation of overlapping 20 MHz channels within the 2.4 GHz band

While overlapping frequencies can be configured at a location and will usually work, it can cause interference resulting in slowdowns, sometimes severe, particularly in heavy use. Certain subsets of frequencies can be used simultaneously at any one location without interference (see diagrams for typical allocations):



However, the exact spacing required when the transmitters are not colocated depends on the protocol, the data rate selected, the distances and the electromagnetic environment where the equipment is used.^[11]

The overall effect is that if there is considerable overlap between adjacent channels transmitters they will often interfere with each other. However, using every fourth or fifth channel by leaving three or four channels clear between used channels can cause less interference than sharing channels, and narrower spacing still can be used at further distances.^{[12][11]}

As shown in the diagram, bonding two 20 MHz channels to form a 40 MHz channel is permitted in the 2.4 GHz bands. These are generally referred to by the centres of the primary 20 MHz channel and the adjacent secondary 20 MHz channel (e.g. 1+5, 9+13, 13-9, 5-1). The primary 20 MHz channel is used for signalling and backwards compatibility, the secondary is only used when sending data at full speed.

3.65 GHz (802.11y)

Except where noted, all information taken from Annex J of IEEE 802.11y-2008

This range is documented as only being allowed as a licensed band in the United States. However, not in the original specification, under newer frequency allocations from the FCC, it falls under the 3.55-3.7GHz Citizens Broadband Radio Service band. This allows for unlicensed use, under Tier 3 GAA rules, provided that the user doesn't cause harmful interference to Incumbent Access users or Priority Access Licensees and accepts all interference from these users,^[13] and also follows of all the technical requirements in CFR 47 Part 96 Subpart E (<https://www.ecfr.gov/current/title-47/part-96/subpart-E>)

A 40 MHz band is available from 3655 to 3695 MHz. It may be divided into eight 5 MHz channels, four 10 MHz channels, or two 20 MHz channels, as follows:

Channel	Center frequency (MHz)	Span		
		5 MHz	10 MHz	20 MHz
131	3657.5	3655–3660	3655–3665	3655–3675
	3660			
132	3662.5	3660–3665		
	3665			
133	3667.5	3665–3670	3665–3675	3675–3685
	3670			
134	3672.5	3670–3675		
135	3677.5	3675–3680	3675–3685	
	3680			
136	3682.5	3680–3685		
	3685			
137	3687.5	3685–3690	3685–3695	
	3690			
138	3692.5	3690–3695		

4.9-5.0 GHz (802.11j) WLAN

In Japan starting in 2002, 100 MHz of spectrum from 4900 to 5000 MHz can be used for both indoor and outdoor connection once registered. Originally, another spectrum of 5030-5091 MHz was also available for use, however, it has been re-purposed and cannot be used after 2017.^[14]

50 MHz of spectrum from 4940 to 4990 MHz (WLAN channels 20-26) are in use by public safety entities in the United States. Within this spectrum there are two non-overlapping channels allocated, each 20 MHz wide. The most commonly used channels are 22 and 26.

5 GHz (802.11a/h/j/n/ac/ax)

Channel	Center frequency (MHz)	Frequency range (MHz)	10 MHz	20 MHz	40 MHz	80 MHz	160 MHz	United States FCC U-NII band(s)	United States [15]	Canada [16][17]	United Kingdom [18]	Europe [19][20][21][22][23][24]	Russia [25]	Japa [26][27]		
7	5035	5030–5040	10	20	✗	✗	✗	—	No	No	No	No	No	No		
8	5040	5030–5050			✗	✗	✗	—	No	No	No	No	No	No		
9	5045	5040–5050	10		✗	✗	✗	—	No	No	No	No	No	No		
11	5055	5050–5060	10	20	✗	✗	✗	—	No	No	No	No	No	No		
12	5060	5050–5070			✗	✗	✗	—	No	No	No	No	No	No		
16	5080	5070–5090			20	✗	✗	✗	—	No	No	No	No	No	No	
32	5160	5150–5170		20	40	80	160	✗	✗	U-NII-1	Yes	Indoors	Indoors/TPC or [note 1] [note 2]	Indoors/TPC or [note 1] [note 2]	Indoors/TPC or [note 3]	Indoo
34	5170	5150–5190		✗				✗	U-NII-1	Yes	Indoors	Indoors/TPC or [note 1] [note 2]	Indoors/TPC or [note 1] [note 2]	Indoors/TPC or [note 3]	Indoo	
36	5180	5170–5190	20	U-NII-1				Yes	Indoors	Indoors/TPC or [note 1] [note 2]	Indoors/TPC or [note 1] [note 2]	Indoors/TPC or [note 3]	Indoo			
38	5190	5170–5210		40				U-NII-1	Yes	Indoors	Indoors/TPC or [note 1] [note 2]	Indoors/TPC or [note 1] [note 2]	Indoors/TPC or [note 3]	Indoo		
40	5200	5190–5210	20	U-NII-1				Yes	Indoors	Indoors/TPC or [note 1] [note 2]	Indoors/TPC or [note 1] [note 2]	Indoors/TPC or [note 3]	Indoo			
42	5210	5170–5250		80				U-NII-1	Yes	Indoors	Indoors/TPC or [note 1] [note 2]	Indoors/TPC or [note 1] [note 2]	Indoors/TPC or [note 3]	Indoo		
44	5220	5210–5230	20	U-NII-1				Yes	Indoors	Indoors/TPC or [note 1] [note 2]	Indoors/TPC or [note 1] [note 2]	Indoors/TPC or [note 3]	Indoo			
46	5230	5210–5250		40				U-NII-1	Yes	Indoors	Indoors/TPC or [note 1] [note 2]	Indoors/TPC or [note 1] [note 2]	Indoors/TPC or [note 3]	Indoo		
48	5240	5230–5250	20	U-NII-1				Yes	Indoors	Indoors/TPC or [note 1] [note 2]	Indoors/TPC or [note 1] [note 2]	Indoors/TPC or [note 3]	Indoo			
50	5250	5170–5330		40	80	160	U-NII-1 and U-NII-2A	DFS/TPC or [note 5]	DFS/TPC or [note 5]	Indoors/DFS /TPC or [note 1] [note 2]	Indoors/DFS /TPC or [note 1] [note 2]	Indoors/DFS or [note 3]	Indoo			
52	5260	5250–5270	20				U-NII-2A	DFS/TPC or [note 5]	DFS/TPC or [note 5]	Indoors/DFS /TPC or [note 1] [note 2]	Indoors/DFS /TPC or [note 1] [note 2]	Indoors/TPC or [note 3]	Indoo			
54	5270	5250–5290					40	U-NII-2A	DFS/TPC or [note 5]	DFS/TPC or [note 5]	Indoors/DFS /TPC or [note 1] [note 2]	Indoors/DFS /TPC or [note 1] [note 2]	Indoors/TPC or [note 3]	Indoo		
56	5280	5270–5290	20				U-NII-2A	DFS/TPC or [note 5]	DFS/TPC or [note 5]	Indoors/DFS /TPC or [note 1] [note 2]	Indoors/DFS /TPC or [note 1] [note 2]	Indoors/TPC or [note 3]	Indoo			
58	5290	5250–5330					80	U-NII-2A	DFS/TPC or [note 5]	DFS/TPC or [note 5]	Indoors/DFS /TPC or [note 1] [note 2]	Indoors/DFS /TPC or [note 1] [note 2]	Indoors/TPC or [note 3]	Indoo		
60	5300	5290–5310	20				U-NII-2A	DFS/TPC or [note 5]	DFS/TPC or [note 5]	Indoors/DFS /TPC or [note 1] [note 2]	Indoors/DFS /TPC or [note 1] [note 2]	Indoors/TPC or [note 3]	Indoo			
62	5310	5290–5330		40	80	160	U-NII-2A	DFS/TPC or [note 5]	DFS/TPC or [note 5]	Indoors/DFS /TPC or [note 1] [note 2]	Indoors/DFS /TPC or [note 1] [note 2]	Indoors/TPC or [note 3]	Indoo			
64	5320	5310–5330	20				U-NII-2A	DFS/TPC or [note 5]	DFS/TPC or [note 5]	Indoors/DFS /TPC or [note 1] [note 2]	Indoors/DFS /TPC or [note 1] [note 2]	Indoors/TPC or [note 3]	Indoo			
68	5340	5330–5350		20	✗	✗	✗	U-NII-2A	DFS/TPC or [note 5]	DFS/TPC or [note 5]	Indoors/DFS /TPC or [note 1] [note 2]	Indoors/DFS /TPC or [note 1] [note 2]	Indoors/TPC or [note 3]	Indoo		
96	5480	5470–5490		20	✗	✗	✗	U-NII-2C	DFS/TPC or [note 5]	DFS/TPC or [note 5]	Indoors/DFS /TPC or [note 1] [note 2]	DFS/TPC or [note 7] [note 8]	No	DFS/T		

										[note 7] [note 8]				
100	5500	5490–5510	20	40	80	160	U-NII-2C	DFS/TPC or [note 5]	DFS/TPC or [note 5]	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8]	No	DFS/T	
102	5510	5490–5530					U-NII-2C	DFS/TPC or [note 5]	DFS/TPC or [note 5]	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8]	No	DFS/T	
104	5520	5510–5530	20				U-NII-2C	DFS/TPC or [note 5]	DFS/TPC or [note 5]	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8]	No	DFS/T	
106	5530	5490–5570					U-NII-2C	DFS/TPC or [note 5]	DFS/TPC or [note 5]	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8]	No	DFS/T	
108	5540	5530–5550	20				U-NII-2C	DFS/TPC or [note 5]	DFS/TPC or [note 5]	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8]	No	DFS/T	
110	5550	5530–5570					U-NII-2C	DFS/TPC or [note 5]	DFS/TPC or [note 5]	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8]	No	DFS/T	
112	5560	5550–5570	20				U-NII-2C	DFS/TPC or [note 5]	DFS/TPC or [note 5]	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8]	No	DFS/T	
114	5570	5490–5650		40	80	160	U-NII-2C	DFS/TPC or [note 5]	No	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8]	No	DFS/T	
116	5580	5570–5590	20				U-NII-2C	DFS/TPC or [note 5]	DFS/TPC or [note 5]	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8]	No	DFS/T	
118	5590	5570–5610					U-NII-2C	DFS/TPC or [note 5]	No	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8]	No	DFS/T	
120	5600	5590–5610	20				U-NII-2C	DFS/TPC or [note 5]	No	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8]	No	DFS/T	
122	5610	5570–5650					U-NII-2C	DFS/TPC or [note 5]	No	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8]	No	DFS/T	
124	5620	5610–5630	20				U-NII-2C	DFS/TPC or [note 5]	No	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8]	No	DFS/T	
126	5630	5610–5650					U-NII-2C	DFS/TPC or [note 5]	No	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8]	No	DFS/T	
128	5640	5630–5650	20				U-NII-2C	DFS/TPC or [note 5]	No	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8]	No	DFS/T	
132	5660	5650–5670	20	40	80	160	✗	U-NII-2C	DFS/TPC or [note 5]	DFS/TPC or [note 5]	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8]	Indoors/TPC [note 10]	DFS/T
134	5670	5650–5690					✗	U-NII-2C	DFS/TPC or [note 5]	DFS/TPC or [note 5]	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8]	Indoors/TPC [note 10]	DFS/T
136	5680	5670–5690	20				✗	U-NII-2C	DFS/TPC or [note 5]	DFS/TPC or [note 5]	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8]	Indoors/TPC [note 10]	DFS/T
138	5690	5650–5730					✗	U-NII-2C and U-NII-3	DFS/TPC or [note 5]	DFS/TPC or [note 5]	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8] + SRD (25 mW)	Indoors/TPC [note 10]	DFS/T
140	5700	5690–5710	20				✗	U-NII-2C	DFS/TPC or [note 5]	DFS/TPC or [note 5]	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8]	Indoors/TPC [note 10]	DFS/T
142	5710	5690–5730					✗	U-NII-2C and U-NII-3	DFS/TPC or [note 5]	DFS/TPC or [note 5]	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8] + SRD (25 mW)	Indoors/TPC [note 10]	DFS/T
144	5720	5710–5730	20				✗	U-NII-2C and U-NII-3	DFS/TPC or [note 5]	DFS/TPC or [note 5]	DFS/TPC or [note 7] [note 8]	DFS/TPC or [note 7] [note 8] + SRD (25 mW)	Indoors/TPC [note 10]	DFS/T
149	5745	5735–5755	20	40	80	160	U-NII-3	Yes	Yes	SRD (200 mW)	SRD (25 mW) ^[45]	Indoors/TPC [note 10]	No	
151	5755	5735–5775					U-NII-3	Yes	Yes	SRD (200 mW)	SRD (25 mW) ^[45]	Indoors/TPC [note 10]	No	
153	5765	5755–5775	20				U-NII-3	Yes	Yes	SRD (200 mW)	SRD (25 mW) ^[45]	Indoors/TPC [note 10]	No	

155	5775	5735–5815	80					160	U-NII-3	Yes	Yes	SRD (200 mW)	SRD (25 mW) ^[45]	Indoors/TPC ^[note 10]	No				
157	5785	5775–5795	20	40			U-NII-3		Yes	Yes	SRD (200 mW)	SRD (25 mW) ^[45]	Indoors/TPC ^[note 10]	No					
159	5795	5775–5815	U-NII-3				Yes		Yes	SRD (200 mW)	SRD (25 mW) ^[45]	Indoors/TPC ^[note 10]	No						
161	5805	5795–5815	20	U-NII-3			Yes		Yes	SRD (200 mW)	SRD (25 mW) ^[45]	Indoors/TPC ^[note 10]	No						
163	5815	5735–5895	80						U-NII-3 and U-NII-4	Indoors ^[46]	No	No	No	Indoors/TPC ^[note 10]	No				
165	5825	5815–5835							20	40			U-NII-3	Yes	Yes	SRD (200 mW)	SRD (25 mW) ^[45]	Indoors/TPC ^[note 10]	No
167	5835	5815–5855							U-NII-3 and U-NII-4				Indoors ^[46]	No	SRD (25 mW) ^[45]	SRD (25 mW) ^[45]	Indoors/TPC ^[note 10]	No	
169	5845	5835–5855							20	U-NII-4			Indoors ^[46]	No	SRD (25 mW) ^[45]	SRD (25 mW) ^[45]	Indoors/TPC ^[note 10]	No	
171	5855	5815–5895	80						U-NII-3 and U-NII-4	Indoors ^[46]	No	SRD (25 mW) ^[45]	SRD (25 mW) ^[45]	Registration required	No				
173	5865	5855–5875							20	40			U-NII-4	Indoors ^[46]	No	SRD (25 mW) ^[45]	SRD (25 mW) ^[45]	Registration required	No
175	5875	5855–5895							U-NII-4				Indoors ^[46]	No	No	No	Registration required	No	
177	5885	5875–5895							20	U-NII-4			Indoors ^[46]	No	No	No	Registration required	No	
182	5910	5905–5915	10	20	✗	✗	✗		—	No	No	No	No	Registration required	Registrat				
183 (proposed)	5915	5905–5925			✗	✗	✗		—	No	No	No	No	Registration required	Registrat				
184	5920	5915–5925	10		✗	✗	✗		—	No	No	Indoors/SRD (250 mW)	No	Registration required	Registrat				
187	5935	5930–5940	10	20	✗	✗	✗		—	No	No	Indoors/SRD (250 mW)	No	Registration required	Registrat				
188	5940	5930–5950			✗	✗	✗	—	No	No	Indoors/SRD (250 mW)	No	Registration required	Registrat					
189	5945	5940–5950	10		✗	✗	✗	—	No	No	Indoors/SRD (250 mW)	No	Registration required	Registrat					
192	5960	5950–5970	20		✗	✗	✗	—	No	No	Indoors/SRD (250 mW)	No	Registration required	Registrat					
196	5980	5970–5990	20		✗	✗	✗	—	No	No	Indoors/SRD (250 mW)	No	Registration required	Registrat					
Channel	Center frequency (MHz)	Frequency range (MHz)	10 MHz	20 MHz	40 MHz	80 MHz	160 MHz	United States FCC U-NII band(s)	United States	Canada	United Kingdom	Europe	Russia	Japa					

Notes:

- Transmit power / Power density: Max. 200 mW e.i.r.p. Max. 10 mW/MHz e.i.r.p. density in any 1 MHz band. WAS/RLANs operating in the band 5250–5350 MHz shall either employ transmitter power control (TPC), which provides, on average, a mitigation factor of at least 3 dB on the maximum permitted output power of the systems; or if transmitter power control is not in use, the maximum permitted e.i.r.p. and the corresponding e.i.r.p. density limits shall be reduced by 3 dB. Type of Antenna: integral or dedicated. Max. 25 mW e.i.r.p. (5150–5250 MHz) inside cars for RLAN use. RLAN use inside cars (passenger cars, lorries, buses) in the band 5150–5250 MHz is allowed at a maximum e.i.r.p. of 25 mW. EN 301 893 / ECC/DEC/(04)08 / ERC/REC 70-03, Annex A.
- Channel access and occupation rules: WAS/RLANs operating in the band 5250 - 5350 MHz shall use mitigation techniques that give at least the same protection as the detection, operational and response requirements described in EN 301 893 to ensure compatible operation with radiodetermination systems (radars). Such mitigation techniques shall equalise the probability of selecting a specific channel for all available channels so as to ensure, on average, a near-uniform spread of spectrum loading. The equipment shall implement an adequate spectrum sharing mechanism in order to facilitate sharing between the various technologies and applications. The adequate spectrum sharing mechanism can be e.g. LBT (Listen Before Talk), DAA (Detect And Avoid) or any other mechanism providing a similar level of mitigation. EN 301 893 / ECC/DEC/(04)08 / ERC/REC 70-03, Annex A.
- limited to 100 mW instead of 200 mW without TPC
- limited to power density
- limited to 500 mW instead
- Transmit power control with an e.i.r.p. of less than 1048(E). dt 18 October 2018
- Transmit power / Power e.i.r.p. density in any 1 MHz band 5470–5725 MHz shall be limited to 10 mW e.i.r.p. (TPC), which provides, on average, a mitigation factor of at least 3 dB on the maximum permitted e.i.r.p. and the corresponding e.i.r.p. density limits shall be reduced by 3 dB. Type of Antenna: integral or dedicated. Max. 25 mW e.i.r.p. (5150–5250 MHz) inside cars for RLAN use. RLAN use inside cars (passenger cars, lorries, buses) in the band 5150–5250 MHz is allowed at a maximum e.i.r.p. of 25 mW. EN 301 893 / ECC/DEC/(04)08 / ERC/REC 70-03, Annex A.

Caption

Text	Meaning
Yes	MAY be used without restrictions.
No	SHOULD NOT be used.
Indoors	MUST be used indoor only.
DFS	MUST be used with <u>DFS</u> regardless indoor or outdoor.
SRD	MUST comply with <u>SRD</u> requirements regardless indoor or outdoor.
Indoors/DFS	MUST be used with <u>DFS</u> and indoor only.
Indoors/TPC	MUST be used with <u>TPC</u> and indoor only.
DFS/TPC	MUST be used with <u>DFS</u> and <u>TPC</u> .
DFS/TPC + SRD	MUST be used with <u>DFS</u> , <u>TPC</u> and comply with <u>SRD</u> requirements.
Indoors/DFS/TPC	MUST be used with <u>DFS</u> , <u>TPC</u> and indoor only.
Registration required	MUST be registered before using.
Unknown	Information not available or defined.
Notes: <i>RFC 2119</i> , <i>RFC 854</i> (https://tools.ietf.org/html/rfc854)	

United States

Source:^[47]

In 2007, the FCC (United States) began requiring that devices operating in the bands of 5.250–5.350 GHz and 5.470–5.725 GHz must employ dynamic frequency selection (DFS) and transmit power control (TPC) capabilities. This is to avoid interference with weather-radar and military applications.^[48] In 2010, the FCC further clarified the use of channels in the 5.470–5.725 GHz band to avoid interference with TDWR, a type of weather radar system.^[49] In FCC parlance, these restrictions are now referred to collectively as the "Old Rules". On 10 June 2015, the FCC approved a "new" ruleset for 5 GHz device operation (called the "New Rules"), which adds 160 and 80 MHz channel identifiers, and re-enables previously prohibited DFS channels, in Publication Number 905462.^[50] This FCC publication eliminates the ability for manufacturers to have devices approved or modified under the Old Rules in phases; the New Rules apply in all circumstances as of 2 June 2016.^[50]

Source:^[51] "To help meet the increasing demand for Wi-Fi and other unlicensed services, the FCC's new rules will make 45 megahertz of the 5.9 GHz band available for unlicensed use. This spectrum's impact will be further amplified by the fact that it is adjacent to an existing Wi-Fi band which, when combined with the 45 megahertz made available today, will support cutting edge broadband applications. These high-throughput channels—up to 160 megahertz wide—will enable gigabit Wi-Fi connectivity for schools, hospitals, small businesses, and other consumers. The Report and Order adopts technical rules to enable full-power indoor unlicensed operations in the lower 45 megahertz portion of the band immediately, as well as opportunities for outdoor unlicensed use on a coordinated basis under certain circumstances. Under the new rules, ITS services will be required to vacate the lower 45 megahertz of the band within one year."

United Kingdom

The UK's Ofcom regulations for unlicensed use of the 5 GHz band is similar to Europe, except that DFS is not required for the frequency range 5.725–5.850 GHz and the SRD maximum mean e.i.r.p is 200 mW instead of 25 mW.^[52]

Additionally, 5.925–6.425 GHz is also available for unlicensed use, as long as it is used indoors with an SRD of 250 mW.

Germany

Germany requires DFS and TPC capabilities on 5.250–5.350 GHz and 5.470–5.725 GHz as well; in addition, the frequency range 5.150–5.350 GHz is allowed only for indoor use, leaving only 5.470–5.725 GHz for outdoor and indoor use.^[53]

Since this is the German implementation of EU Rule 2005/513/EC, similar regulations must be expected throughout the European Union.^{[54][55]}

European standard EN 301 893 covers 5.15–5.725 GHz operation, and as of 23 May 2017 v2.1.1 has been adopted.^[56] 6 GHz can now be used.^[57]

Austria

Austria adopted Decision 2005/513/EC directly into national law.^[58] The same restrictions as in Germany apply, only 5.470–5.725 GHz is allowed to be used outdoor and indoor.

Japan

Japan's use of 10 and 20 MHz-wide 5 GHz wireless channels is codified by Association of Radio Industries and Businesses (ARIB) document STD-T71, *Broadband Mobile Access Communication System (CSMA)*.^[59] Additional rule specifications relating to 40, 80, and 160 MHz channel allocation has been taken on by Japan's Ministry of Internal Affairs and Communications (MIC).^[60]

Brazil

In Brazil, the use of TPC is required in the 5.150-5.350 GHz and 5.470-5.725 GHz bands is required, but devices without TPC are allowed with a reduction of 3 dB.^[61] DFS is required in the 5.250-5.350 GHz and 5.470-5.725 GHz bands, and optional in the 5.150-5.250 GHz band.^[62]

Australia

As of 2015, some of the Australian channels require DFS to be utilised (a significant change from the 2000 regulations, which allowed lower power operation without DFS).^[8] As per AS/NZS 4268 B1 and B2, transmitters designed to operate in any part of 5250–5350 MHz and 5470–5725 MHz bands shall implement DFS in accordance with sections 4.7 and 5.3.8 and Annex D of ETSI EN 301 893 or alternatively in accordance with FCC paragraph 15.407(h)(2). Also as per AS/NZS 4268 B3 and B4, transmitters designed to operate in any part of 5250–5350 MHz and 5470–5725 MHz bands shall implement TPC in accordance with sections 4.4 and 5.3.4 of ETSI EN 301 893 or alternatively in accordance with FCC paragraph 15.407(h)(1).

New Zealand

New Zealand regulation differs from Australian.^[63]

Singapore

Singapore regulation requires DFS and TPC to be used in the 5.250–5.350 GHz band to transmit more than 100 mW effective radiated power (EIRP), but no more than 200 mW, and requires DFS capability on 5.250–5.350 GHz below or equal to 100 mW EIRP, and requires DFS and TPC capabilities on 5.470–5.725 below or equal to 1000 mW EIRP. Operating 5.725–5.850 GHz above 1000 mW and below or equal to 4000 mW EIRP shall be approved on exceptional basis.^[33]

South Korea

In South Korea, the Ministry of Science and ICT has public notices. *신고하지 아니하고 개설할 수 있는 무선국용 무선설비의 기술기준*, Technical standard for radio equipment for radio stations that can be opened without reporting. They allowed 160 MHz channel bandwidth from 2018 to 2016–27.^[64]

China

China MIIT expanded allowed channels as of 31 December 2012 to add UNII-1, 5150–5250 GHz, UNII-2, 5250–5350 GHz (DFS/TPC), similar to European standards EN 301.893 V1.7.1.^[65] China MIIT expanded allowed channels as of 3 July 2017 to add UNII-3, 5725—5850 MHz. ^[66]

Indonesia

Indonesia allows use of frequency of 5.150–5.250 GHz and 5.250–5.350 GHz for indoors use with maximum EIRP of 200 mW and frequency of 5.725–5.825 GHz with maximum EIRP of 4000 mW for outdoors and 200 mW for indoors.^[44]

India

In exercise of the powers conferred by sections 4 and 7 of the Indian Telegraph Act, 1885 (13 of 1885) and sections 4 and 10 of the Indian Wireless Telegraphy Act, 1933 (17 of 1933) and in supersession of notification under G.S.R. 46(E), dated 28 January 2005 and notification under G.S.R. 36(E), dated 10 January 2007 and notification under G.S.R. 38(E), dated 19 January 2007, the Central Government made the rules, called the Use of Wireless Access System including Radio Local Area Network in 5 GHz band (Exemption from Licensing Requirement) Rules, 2018. The rules include criteria's like 26 dB bandwidth of the modulated signal measured relative to the maximum level of the modulated carrier; the maximum power within the specified measurement bandwidth, within the device operating band; measurements in the 5725-5875 MHz band are made over a bandwidth of 500 kHz; measurements in the 5150-5250 MHz, 5250-5350 MHz, and 5470-5725 MHz bands are made over a bandwidth of 1 MHz or 26 dB emission bandwidth of the device. No licence shall be required under indoor and outdoor environment to establish, maintain, work, possess or deal in any wireless equipment for the purpose of low power wireless access systems. Transmitters operating in 5725-5875 MHz, all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emission shall not exceed an EIRP of -27 dBm/MHz.^[67] ^[68]

5.9 GHz (802.11p)

The 802.11p amendment published on 15 July 2010, specifies WLAN in the licensed band of 5.9 GHz (5.850–5.925 GHz).

6 GHz (802.11ax)

The Wi-Fi Alliance has introduced the term "Wi-Fi 6E" to identify and certify Wi-Fi devices that support this new band. Channel numbers will be defined by the IEEE's 802.11ax task group.

Channel	Center frequency (MHz)	Frequency range (MHz)	20 MHz	40 MHz	80 MHz	160 MHz	United States FCC U-NII band(s)	United States	Canada	Europe	Australia, Greenland, United Arab Emirates, United Kingdom, Japan	Brazil, ^[69] Chile, Costa Rica, Guatemala, Honduras, Peru, Saudi Arabia, South Korea	Colombia, Jordan, Mexico, Qatar	
1	5955	5945-5965	20	40	80	160	U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed	
5	5975	5965–5985	20				U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed	
9	5995	5985-6005	20	40			U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed	
13	6015	6005-6025	20				U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed	
17	6035	6025-6045	20	40	80		160	U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed
21	6055	6045-6065	20					U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed
25	6075	6065-6085	20	40				U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed
29	6095	6085-6105	20					U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed
33	6115	6105-6125	20	40	80	160		U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed
37	6135	6125-6145	20					U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed
41	6155	6145-6165	20	40				U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed
45	6175	6165-6185	20					U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed
49	6195	6185-6205	20	40	80		160	U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed
53	6215	6205-6225	20					U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed
57	6235	6225-6245	20	40				U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed
61	6255	6245-6265	20					U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed
65	6275	6265-6285	20	40	80	160		U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed
69	6295	6285-6305	20					U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed
73	6315	6305-6325	20	40				U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed
77	6335	6325-6345	20					U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed
81	6355	6345-6365	20	40	80		160	U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed
85	6375	6365-6385	20					U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed
89	6395	6385-6405	20	40				U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed
93	6415	6405-6425	20					U-NII-5	Standard/LPI	Standard/LPI/VLP	LPI/VLP	Yes	Yes	Proposed
97	6435	6425-6445	20	40	80	160		U-NII-6	LPI	Standard/LPI/VLP	No	No	Yes	Proposed
101	6455	6445-6465	20					U-NII-6	LPI	Standard/LPI/VLP	No	No	Yes	Proposed
105	6475	6465-6485	20	40				U-NII-6	LPI	Standard/LPI/VLP	No	No	Yes	Proposed
109	6495	6485-6505	20					U-NII-6	LPI	Standard/LPI/VLP	No	No	Yes	Proposed
113	6515	6505-6525	20	40	80		160	U-NII-6	LPI	Standard/LPI/VLP	No	No	Yes	Proposed
117	6535	6525-6545	20					U-NII-7	Standard/LPI	Standard/LPI/VLP	No	No	Yes	Proposed
121	6555	6545-6565	20	40				U-NII-7	Standard/LPI	Standard/LPI/VLP	No	No	Yes	Proposed
125	6575	6565-6585	20					U-NII-7	Standard/LPI	Standard/LPI/VLP	No	No	Yes	Proposed
129	6595	6585-6605	20	40	80	160		U-NII-7	Standard/LPI	Standard/LPI/VLP	No	No	Yes	Proposed
133	6615	6605-6625	20					U-NII-7	Standard/LPI	Standard/LPI/VLP	No	No	Yes	Proposed
137	6635	6625-6645	20	40				U-NII-7	Standard/LPI	Standard/LPI/VLP	No	No	Yes	Proposed
141	6655	6645-6665	20					U-NII-7	Standard/LPI	Standard/LPI/VLP	No	No	Yes	Proposed
145	6675	6665-6685	20	40	80		160	U-NII-7	Standard/LPI	Standard/LPI/VLP	No	No	Yes	Proposed
149	6695	6685-6705	20					U-NII-7	Standard/LPI	Standard/LPI/VLP	No	No	Yes	Proposed
153	6715	6705-6725	20	40				U-NII-7	Standard/LPI	Standard/LPI/VLP	No	No	Yes	Proposed
157	6735	6725-6745	20					U-NII-7	Standard/LPI	Standard/LPI/VLP	No	No	Yes	Proposed
161	6755	6745-6765	20	40	80	160		U-NII-7	Standard/LPI	Standard/LPI/VLP	No	No	Yes	Proposed
165	6775	6765-6785	20					U-NII-7	Standard/LPI	Standard/LPI/VLP	No	No	Yes	Proposed
169	6795	6785-6805	20	40				U-NII-7	Standard/LPI	Standard/LPI/VLP	No	No	Yes	Proposed
173	6815	6805-6825	20					U-NII-7	Standard/LPI	Standard/LPI/VLP	No	No	Yes	Proposed
177	6835	6825-6845	20	40	80		160	U-NII-7	Standard/LPI	Standard/LPI/VLP	No	No	Yes	Proposed
181	6855	6845-6865	20					U-NII-7	Standard/LPI	Standard/LPI/VLP	No	No	Yes	Proposed
185	6875	6865-6885	20	40				U-NII-7/U-NII-8	LPI	LPI/VLP	No	No	Yes	Proposed
189	6895	6885-6905	20					U-NII-8	LPI	LPI/VLP	No	No	Yes	Proposed
193	6915	6905-6925	20	40	80	160		U-NII-8	LPI	LPI/VLP	No	No	Yes	Proposed
197	6935	6925-6945	20					U-NII-8	LPI	LPI/VLP	No	No	Yes	Proposed
201	6955	6945-6965	20	40				U-NII-8	LPI	LPI/VLP	No	No	Yes	Proposed

205	6975	6965-6985	20	40	80		U-NII-8	LPI	LPI/VLP	No	No	Yes	Proposed
209	6995	6985-7005	20				U-NII-8	LPI	LPI/VLP	No	No	Yes	Proposed
213	7015	7005-7025	20	40	80		U-NII-8	LPI	LPI/VLP	No	No	Yes	Proposed
217	7035	7025-7045	20				U-NII-8	LPI	LPI/VLP	No	No	Yes	Proposed
221	7055	7045-7065	20	40	80		U-NII-8	LPI	LPI/VLP	No	No	Yes	Proposed
225	7075	7065-7085	20				U-NII-8	LPI	LPI/VLP	No	No	Yes	Proposed
229	7095	7085-7105	20	40	80	✗	U-NII-8	LPI	LPI/VLP	No	No	Yes	Proposed
233	7115	7105-7125	20				U-NII-8	LPI	LPI/VLP	No	No	Yes	Proposed
Channel	Center frequency (MHz)	Frequency range (MHz)	20 MHz	40 MHz	80 MHz	160 MHz	United States FCC U-NII band(s)	United States	Canada	Europe	Australia, Greenland, United Arab Emirates, United Kingdom	Brazil, Chile, Costa Rica, Guatemala, Honduras, Peru, Saudi Arabia, South Korea	Colombia, Japan, Jordan, Mexico, Qatar

United States

On 23 April 2020, the FCC voted on and ratified a Report and Order^{[70][71]} to allocate 1.2 GHz of unlicensed spectrum in the 6 GHz band (5.925–7.125 GHz) for Wi-Fi use.

Standard power

USA 6 GHz standard-power channels

Band	20 MHz	40 MHz	80 MHz	160 MHz
U-NII-5	24	12	6	3
U-NII-6	Not allowed			
U-NII-7	17	8	3	1
U-NII-8	Not Allowed			
TOTAL	41	20	9	4

Standard power access points are permitted indoors and outdoors at a maximum EIRP of 36 dBm in the U-NII-5 and U-NII-7 sub-bands with automatic frequency coordination (AFC).

Low-power indoor (LPI) operation

USA 6 GHz low-power indoor channels

Band	20 MHz	40 MHz	80 MHz	160 MHz
U-NII-5	24	12	6	3
U-NII-6	5	2.5	1.25	0.5
U-NII-7	17.5	8.75	4.25	2.25
U-NII-8	12.5	5.75	2.5	1.25
TOTAL	59	29	14	7

Note: Partial channels indicate channels that span UNII boundaries, which is permitted in 6 GHz LPI operation. Under the proposed channel numbers, the U-NII-7/U-NII-8 boundary is spanned by channels 185 (20 MHz), 187 (40 MHz), 183 (80 MHz), and 175 (160 MHz). The U-NII-6/U-NII-7 boundary is spanned by channels 115 (40 MHz), 119 (80 MHz), and channel 111 (160 MHz).

For use in indoor environments, access points are limited to a maximum EIRP of 30 dBm and a maximum power spectral density of 5 dBm/MHz. They can operate in this mode on all four U-NII bands (5,6,7,8) without the use of automatic frequency coordination. To help ensure they are used only indoors, these types of access points are not permitted to be connectorized for external antennas, weather-resistant, or run on battery power.^{[71]:41}

Very-low-power devices

The FCC will issue a ruling in the future on a third class of very low power devices such as hotspots and short-range applications.

Canada

In November 2020, the Innovation, Science and Economic Development (ISED) of Canada published "Consultation on the Technical and Policy Framework for Licence-Exempt Use in the 6 GHz Band".^[72] They proposed to allow licence-exempt operations in the 6 GHz spectrum for three classes of radio local area networks (RLANs):

Standard power

For indoor and outdoor use. Maximum EIRP of 36 dBm and maximum power spectral density (PSD) of 23 dBm/MHz. Should employ Automated Frequency Coordination (AFC) control.

Low-power indoor (LPI)

For indoor use only. Maximum EIRP of 30 dBm and maximum PSD of 5 dBm/MHz.

Very low power (VLP)

For indoor and outdoor use. Maximum EIRP of 14 dBm and maximum PSD of -8 dBm/MHz.

Europe

ECC Decision (20)01 from 20 November 2020^[73] allocated the frequency band from 5925 to 6425 MHz (corresponding to the US U-NII-5 band) for use by low-power indoor and very-low-power devices for Wireless Access Systems/Radio Local Area Networks (WAS/RLAN), with a portion specifically reserved for rail networks and intelligent transport systems.^[74]

EU 6 GHz Channels				
Band	20 MHz	40 MHz	80 MHz	160 MHz
5925–6425 MHz	24	12	6	3

United Kingdom

Since July 2020, the UK's Ofcom permitted unlicensed use of the lower 6 GHz band (5925 to 6425 MHz, corresponding to the US U-NII-5 band) by Low Power indoor and Very Low Power indoor and mobile Outdoor devices.^{[75][76]}

Australia

In April 2021, Australia's ACMA opened consultations for the 6 GHz band. The lower 6 GHz band (5925 to 6425 MHz, corresponding to the US U-NII-5 band) was approved for 250 mW EIRP indoors and 25 mW outdoors on March 4, 2022.^[77] Further consideration is also being given to releasing the upper 6 GHz band (6425 to 7125 MHz) for WLAN use as well, although nothing has been officially proposed at this time.

60 GHz (802.11ad/ay)

The 802.11ad/ay, also known as WiGig. This operates in the 60 GHz V band ISM band.

Channel	Center (GHz)	Min. (GHz)	Max. (GHz)	<u>BW</u> (GHz)
1	58.32	57.24	59.40	2.16
2	60.48	59.40	61.56	
3	62.64	61.56	63.72	
4	64.80	63.72	65.88	
5	66.96	65.88	68.04	
6	69.12	68.04	70.20	
9	59.40	57.24	61.56	4.32
10	61.56	59.40	63.72	
11	63.72	61.56	65.88	
12	65.88	63.72	68.04	
13	68.04	65.88	70.20	
17	60.48	57.24	63.72	6.48
18	62.64	59.40	65.88	
19	64.80	61.56	68.04	
20	66.96	63.72	70.20	
25	61.56	57.24	65.88	8.64
26	63.72	59.40	68.04	
27	65.88	61.56	70.20	

Most original 802.11ad based chipset products only use channels 1–12.

There are some exceptions to this channel scheme. For example, IgniteNet (manufacturer of 60 GHz PtP and PtMP products) incorporate an option for eight 1.08 GHz wide "half channels" (channels 1, 1.5, 2, 2.5, 3, 3.5, 4, and 4.5).

See also

- 2.4 GHz radio use
- High-speed multimedia radio

Notes

A In the 2.4 GHz bands bonded 40 MHz channels are uniquely named by the primary and secondary 20 MHz channels, e.g. 9+13. In the 5 GHz bands they are denoted by the center of the wider band and the primary 20 MHz channel e.g. 42[40]

B In the US, 802.11 operation on channels 12 and 13 is allowed under low power conditions. The 2.4 GHz Part 15 band in the US allows spread-spectrum operation as long as the 50 dB bandwidth of the signal is within the range of 2,400–2,483.5 MHz^[78] which fully encompasses both channels 12 and 13. A Federal Communications Commission (FCC) document clarifies that only channel 14 is forbidden and that low-power transmitters with low-gain antennas may operate legally in channels 12 and 13.^[79] Channels 12 and 13, however, are not normally used in order to avoid any potential interference in the adjacent restricted frequency band, 2,483.5–2,500 MHz,^[80] which is subject to strict emission limits set out in 47 CFR § 15.205.^[81] Per recent FCC Order 16–181, "an authorized access point device can only operate in the 2483.5–2495 MHz band when it is operating under the control of a Globalstar Network Operating Center and that a client device can only operate in the 2483.5–2495 MHz band when it is operating under the control of an authorized access point"^[82]

C Channel 14 is valid only for DSSS and CCK modes (Clause 18 a.k.a. 802.11b) in Japan. OFDM (i.e., 802.11g) may not be used. (IEEE 802.11-2007 §19.4.2)

References

1. "Advantages and Disadvantages of ISM Band Frequencies" (<http://www.l-com.com/content/Article.aspx?Type=N&ID=10421>). *L-com Global Connectivity*. Retrieved 2018-08-18.
2. *IEEE 802.11-2016: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications* (<https://ieeexplore.ieee.org/servletopac?punumber=7786993>). IEEE. 14 December 2016. Table 15-6—DSSS PHY Frequency Channel Plan. doi:10.1109/IEEESTD.2016.7786995 (<https://doi.org/10.1109/2FIIEEESTD.2016.7786995>). ISBN 978-1-5044-3645-8.
3. IEEE 802.11-2007 — Table 18-9
4. *Article 10, Act No. 14448 of 4 December 2017* (<https://informacoes.anatel.gov.br/legislacao/atos-de-certificacao-de-produtos/2017/1139-ato-14448>) (in Brazilian Portuguese). Anatel. Retrieved 2022-08-20.
5. "WLAN Regulatory Update" (<https://en.arcep.fr/news/press-release/s/view/n/wlan-regulatory-update.html>). 3 February 2003.
6. "Cuadro Nacional de Atribución de Frecuencias (CNAF)" (<https://web.archive.org/web/20080206082504/http://www.mityc.es/Telecomunicaciones/Secciones/Espectro/cnaf/>) [National Table of Attribution of Frequencies (CNAF)] (in Spanish). 6 February 2008. Archived from the original (<https://www.mityc.es/Telecomunicaciones/Secciones/Espectro/cnaf/>) on 6 February 2008. Retrieved 2 August 2017.
7. Israel: האלוטו: צו הטלגרף האלוטו (https://web.archive.org/web/20210204070008/https://www.nevo.co.il/law_html/law01/164_008.htm) [Wireless Telegraph Order] (in Hebrew). Archived from the original (https://www.nevo.co.il/law_html/law01/164_008.htm) on 4 February 2021.
8. "Radiocommunications (Low Interference Potential Devices) Class Licence 2015" (<https://www.legislation.gov.au/Details/F2022C00281>). *www.legislation.gov.au*. Retrieved 16 March 2022.
9. "WLAN / RLAN" (<https://www.bakom.admin.ch/bakom/en/homepage/equipments-and-installations/particular-equipment/wlan-rlan.html>). *Bakom.Admin.ch*. Retrieved 24 June 2017.
10. "Gazette Notification No. G.S.R. 45 (E), dated 28.1.2005" (<https://asi.aactual.com/wp-content/uploads/2020/09/Gazette-Notification-No.-G.S.R.45E-Frequency-Band-2.4-GHz-To-2.4835-GHz-Exemption-From-Licensing-Requirement-Rules-2005.pdf>) (PDF). >
11. Garcia Villegas, E.; et al. (2007). *Effect of adjacent-channel interference in IEEE 802.11 WLANs* (https://upcommons.upc.edu/e-prints/bitstream/2117/1234/1/CrownCom07_CReady.pdf) (PDF). CrownCom 2007. ICST & IEEE. Archived (https://web.archive.org/web/20110720102658/https://upcommons.upc.edu/e-prints/bitstream/2117/1234/1/CrownCom07_CReady.pdf) (PDF) from the original on 2011-07-20.
12. "Choosing the right Wi-Fi channel can minimize wireless interference" (<https://compnetworking.about.com/od/wifihomenetworking/qt/wifichannel.htm>). *compnetworking.about.com*. Retrieved 5 June 2016.
13. "3.5 GHz Band Overview" (<https://www.fcc.gov/35-ghz-band-overview>). *Federal Communications Commission*. 2015-12-16. Retrieved 2022-06-15.
14. "5GHz帯無線アクセシシステム" (<https://www.tele.soumu.go.jp/jadm/system/trunk/wimax/5ghz/>) [5GHz Band Wireless Access System]. 総務省 電波利用ホームページ | 免許関係 [Ministry of Internal Affairs and Communications Radio Usage] (in Japanese).
15. "Code of Federal Regulations" (https://www.ecfr.gov/cgi-bin/text-id.x?SID=28b05f5394b36aa075de02a8dcd3578a&mc=true&node=se47.1.15_1407&rgn=div8). *ecfr.gov*. Retrieved 25 March 2020.
16. "RSS-247 — Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices" (<https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10971.html>). *Industry Canada*. Retrieved 10 August 2015.
17. "5GHz Regulations in Canada (2018 Update)" (<https://www.semfonetworks.com/blog/5ghz-regulations-in-canada-2018-update>). Retrieved 26 July 2020.
18. "IR 2030 - Licence Exempt Short Range Devices (April 2021)" (https://www.ofcom.org.uk/_data/assets/pdf_file/0028/84970/ir-2030.pdf) (PDF). Retrieved 8 December 2021.
19. "COMMISSION DECISION of 11 July 2005 on the harmonised use of radio spectrum in the 5 GHz frequency band for the implementation of wireless access systems including radio local area networks (WAS/RLANs)" (<https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2005:187:0022:0024:EN:PDF>). *eur-lex.europa.eu*. Retrieved 27 January 2016.
20. "Commission Decision of 12 February 2007 amending Decision 2005/513/EC on the harmonised use of radio spectrum in the 5 GHz frequency band for the implementation of Wireless Access Systems including Radio Local Area Networks (WAS/RLANs)" (<https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:041:0010:0010:EN:PDF>). *eur-lex.europa.eu*. Retrieved 27 January 2016.
21. "ERC Recommendation 70-03 Relating to the use of Short Range Devices (SRD)" (https://efis.cept.org/sitecontent.jsp?sitecontent=srd_regulations). *www.efis.dk*. Retrieved 31 May 2018.
22. "Electronic Communications Committee ECC Decision of 9 July 2004 on the harmonised use of the 5 GHz frequency bands for the implementation of Wireless Access Systems including Radio Local Area Networks (WAS/RLANs)" (<https://web.archive.org/web/20160202043618/http://www.erodocdb.dk/docs/doc98/official/pdf/ECCDec0408.pdf>) (PDF). *www.erodocdb.dk*. Archived from the original (<https://www.erodocdb.dk/docs/doc98/official/pdf/ECCDec0408.pdf>) (PDF) on 2016-02-02. Retrieved 27 January 2016.
23. "ETSI EN 301 893 V2.1.1 (2017–05) 5 GHz RLAN; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU" (https://www.etsi.org/deliver/etsi_en/301800_301899/301893/02.01.01_60/en_301893v020101p.pdf) (PDF). *www.etsi.org*. Retrieved 24 December 2018.
24. "UK 5GHz WLAN Spectrum (Aug 2017)" (<http://bowdennetworks.co.uk/downloads/5GHz%20Spectrum%20Usage%20UK%20-%202017%20-%20v1.pdf>) (PDF). *Bowden Networks*.
25. "Приложение к решению ГКРЧ от 16 июня 2021 г. No. 21-58-05 (стр.10-11)" (<https://digital.gov.ru/uploaded/files/prilozhenie-k-reshe-niyu-gkrch-ot-16-iyunya-2021-g-21-58-05.pdf>) [Appendix to decision of State RF Commission No. 21-58-05 (page 10-11)] (PDF) (in Russian). 16 June 2021.
26. "無線LAN | 基礎知識" (<https://www.allied-tesis.co.jp/products/list/wireless/knowl.html>) [Wireless LAN | Basic Knowledge] (in Japanese). Retrieved 29 April 2018.
27. "Restudy of 5GHz band radar detection requirement and points to the market growth" (<https://www.tele.soumu.go.jp/resource/j/equ/mra/pdf/26/e12-2.pdf>) (PDF). Retrieved 28 March 2020.

28. "Top 10 Printers Compatible with 5GHz Wifi (Top Pick) - Tech Doa" (<https://techdoa.com/printers-compatible-with-5ghz-wifi/>). 2022-03-19. Retrieved 2022-06-09.
29. "India's National Frequency allocation plan 2018" (<https://dot.gov.in/sites/default/files/NFAP%202018.pdf>) (PDF).
30. "index : kernel/git/linville/wireless-regdb.git" (<https://git.kernel.org/pub/scm/linux/kernel/git/linville/wireless-regdb.git/tree/db.txt>).
31. "Gazette Notification for license exemption for usage of 5GHz frequency band for Wireless LAN" (https://dot.gov.in/sites/default/files/License%20Exemption%20in%205%20GHz%20G_S_R_1048%28E%29%20dated%2022nd%20October%2C%202018_0.pdf?download=1) (PDF).
32. "IDA Singapore: Spectrum Management Handbook" (<https://web.archive.org/web/20160310065020/https://www.ida.gov.sg/~media/Files/PCDG/Licensees/SpectrumMgmt/SpectrumNumMgmt/SpectrumMgmtHB.pdf>) (PDF). May 2011. p. 30. Archived from the original (<https://www.ida.gov.sg/~media/Files/PCDG/Licensees/SpectrumMgmt/SpectrumNumMgmt/SpectrumMgmtHB.pdf>) (PDF) on 10 March 2016. Retrieved 2 August 2017.
33. "IMDA Technical Specification Short Range Devices – Issue 1 Rev 1, April 2018 / See Page 13 & 14" (<https://web.archive.org/web/20150224202955/https://www.ida.gov.sg/~media/Files/PCDG/Licensees/StandardsQoS/RadiocomEquipStd/TSSRD.pdf>) (PDF). Archived from the original (<https://www.imda.gov.sg/~media/imda/files/regulation-licensing-and-consultations/ict-standards/telecommunication-standards/radio-comms/imdatssrd.pdf?la=en>) (PDF) on 24 February 2015. Retrieved 7 September 2018.
34. Hou, Chun "Johnson" (1 April 2013). "Wi-Fi Amateur: China Opened More Channels in 5 GHz & Embraced IEEE Std 802.11ac VHT80" (<https://wifiamateur.blogspot.com/2013/04/china-opened-more-channels-in-5-ghz.html>). *wifiamateur.blogspot.com*. Retrieved 5 June 2016.
35. "대한민국 주파수 분배표, 과학기술정보통신부 고시 제2019-87호, 2019. 10. 18" ([http://www.law.go.kr/행정규칙/대한민국주파수분배표/\(2019-87,20191018\)](http://www.law.go.kr/행정규칙/대한민국주파수분배표/(2019-87,20191018))) [Korea Frequency Distribution Table (Ministry of Science and ICT Commission No. 2019-87, 2019.10.18)] (in Korean). Retrieved 2017-08-02.
36. "신고하지 아니하고 개설할 수 있는 무선국용 무선설비의 기술기준" ([http://www.law.go.kr/행정규칙/신고하지아니하고개설할수있는무선국용무선설비의기술기준/\(2019-105,20191223\)](http://www.law.go.kr/행정규칙/신고하지아니하고개설할수있는무선국용무선설비의기술기준/(2019-105,20191223))) [Technical standard for radio equipment for radio stations that can be opened without reporting]. NATIONAL LAW INFORMATION CENTER. Korea Ministry of Government Legislation. Retrieved 12 April 2020.
37. "Bilgi Teknolojileri ve İletişim Kurulu Kararı" (<https://www.btk.gov.tr/uploads/boarddecisions/gorus-alinmasi-frekans-tahsisinden-muaf-tel-siz-cihaz-ve-sistemlerine-iliskin-teknik-olcutler/68-2021-web.pdf>) [Decision of Information Technology and Communication Board] (PDF). *www.btk.gov.tr* (in Turkish). 10 March 2021. Retrieved 2 November 2021.
38. "The Radio Frequency Spectrum Regulations 2015" (<https://www.icasa.org.za/uploads/files/Radio-Frequency-Spectrum-Regulations-2015.pdf>) (PDF). *icasa.org.za*. pp. 74–76. Retrieved 10 September 2018.
39. *Article 11, Act No. 14448 of 4 December 2017* (<https://informacoes.anatel.gov.br/legislacao/atos-de-certificacao-de-produtos/2017/1139-ato-14448>) (in Brazilian Portuguese). Anatel. Retrieved 2022-08-20.
40. "頻率供應計畫" (https://www.motc.gov.tw/ch/home.jsp?id=14&parentpath=0,2&mcustomize=news_view.jsp&dataserno=201805280001&toolsflag=Y) [Frequency supply plan] (in Chinese). Ministry Of Transportation and Communication R.O.C. Archived (https://web.archive.org/web/20161228033449/https://www.motc.gov.tw/post/home.jsp?id=268&parentpath=0&mcustomize=multimessages_view.jsp&dataserno=201505040001&aplistdn=ou=data,ou=bulletin,ou=chinese,ou=ap_root,o=motc,c=tw&toolsflag=Y&imgfolder=img) from the original on 28 December 2016. Retrieved 22 October 2020.
41. "Radiocommunications Regulations (General User Radio Licence for Short Range Devices) Notice 2019" (<https://gazette.govt.nz/notice/id/2019-go1588>). *gazette.govt.nz*. Retrieved 28 March 2020.
42. "FORM OF INDIVIDUAL LICENSE FOR THE USE OF 2.4 and 5 GHz Spectrum" (https://web.archive.org/web/20160810222919/https://www.tra.org.bh/media/document/FORM_OF_INDIVIDUAL_LICENSE_FOR_THE_USE_OF%2023.pdf) (PDF). Archived from the original (http://www.tra.org.bh/media/document/FORM_OF_INDIVIDUAL_LICENSE_FOR_THE_USE_OF%2023.pdf) (PDF) on 10 August 2016. Retrieved 28 March 2020.
43. "Quy định danh mục thiết bị vô tuyến điện được miễn giấy phép sử dụng tần số vô tuyến điện, điều kiện kỹ thuật và khai thác kèm theo" (<http://mic.gov.vn/Upload/VanBan/Thong-tu-46-2016-bttttt.sign.ed.pdf>) (PDF). *mic.gov.vn*. Retrieved 14 March 2020.
44. "Peraturan Menteri Komunikasi dan Informatika Nomor 1 Tahun 2019 tanggal 24 April 2019" (https://jdih.kominfo.go.id/produk_hukum/unduh/id/676/t/peraturan+menteri+komunikasi+dan+informatika+nomor+1+tahun+2019+tanggal+24+april+2019). *jdih.kominfo.go.id* (in Indonesian). Retrieved 2020-12-05.
45. "Relating to the use of Short Range Devices (SRD)" (https://efis.cep.t.org/sitecontent.jsp?sitecontent=srd_regulations). *ECC*. 13 October 2017. Retrieved 31 May 2018.
46. "Use of the 5.850-5.925 GHz Band" (<https://www.fcc.gov/document/fcc-modernizes-59-ghz-band-improve-wi-fi-and-automotive-safety-0>). *FCC*. 20 November 2020. Retrieved 27 January 2021.
47. IEEE 802.11-2007 Annex J modified by amendments k, y and n.
48. "15.407 – General technical requirements" (<https://web.archive.org/web/20120323122829/https://louis.hallikainen.org/FCC/FccRules/2011/15/407/>). *louis.hallikainen.org*. Archived from the original (<https://louis.hallikainen.org/FCC/FccRules/2011/15/407/>) on 23 March 2012. Retrieved 2 August 2017.
49. "Publication Number: 443999 Rule Parts: 15E" (<https://apps.fcc.gov/oetcf/kdb/forms/FTSSearchResultPage.cfm?id=41732&switch=P>). *Federal Communications Commission*. 14 August 2014. "Devices must be professionally installed when operating in the 5470 – 5725 GHz band"
50. FCC Office of Engineering and Technology. "905462 15.401 UNII, U-NII, DFS Test Procedures" (<https://apps.fcc.gov/oetcf/kdb/forms/FTSSearchResultPage.cfm?switch=P&id=27155>). *apps.fcc.gov*. Retrieved 8 August 2015.
51. FCC Modernizes 5.9 GHz Band for Wi-Fi and AUTO SAFETY New Plan Makes Additional Spectrum Available Immediately for Improved Indoor Wi-Fi Connectivity While Authorizing Market-Driven Transportation Safety Services (<https://docs.fcc.gov/public/attachments/DOC-368228A1.pdf>)
52. "IR 2030 Licence Exempt Short Range Devices (April 2021)" (http://www.ofcom.gov.uk/data/assets/pdf_file/0028/84970/ir-2030.pdf) (PDF). Retrieved 8 December 2021.
53. "Bundesnetzagentur Vfg 7/2010 / See footnote 4 and 5 (German only)" (https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Telekommunikation/Unternehmen_Institutionen/Frequenzen/Allgemeinzuteilungen/2010_07_WLAN_5GHz_pdf.pdf?__blob=publicationFile) (PDF). Retrieved 2 August 2017.
54. "EUR-Lex – 32005D0513 – EN – EUR-Lex" (<https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32005D0513:EN:NOT>). *eur-lex.europa.eu*. Retrieved 5 June 2016.
55. "EUR-Lex – 32007D0090 – EN – EUR-Lex" (<https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32007D0090:EN:NOT>). *eur-lex.europa.eu*. Retrieved 5 June 2016.
56. "Details of 'REN/BRAN-60015' Work Item Schedule" (https://portal.etsi.org/webapp/workProgram/Report_Schedule.asp?WKI_ID=46061). Retrieved 24 December 2018.
57. "WLAN-Nutzungen nun auch im 6 GHz-Bereich 02. July 2021" (http://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Allgemeines/Presse/Pressemitteilungen/2021/20210714_WLAN6GHz.pdf) (PDF). Retrieved 29 December 2021.
58. "Information of the Austrian Telecommunications Authority – Wireless Local Area Networks (WAS, WLAN, RLAN)" (<https://web.archive.org/web/20190714115450/https://www.bmvit.gv.at/ofb/publikationen/infoblaetter/downloads/201005en.pdf>) (PDF). Archived from the original (<https://www.bmvit.gv.at/ofb/publikationen/infoblaetter/downloads/201005en.pdf>) (PDF) on July 14, 2019. Retrieved August 2, 2017.
59. "List of ARIB Standards for Radio" (https://www.arib.or.jp/english/html/overview/st_ej.html). *www.arib.or.jp*. Retrieved 19 January 2016.
60. Hou, Chun "Johnson" (3 April 2013). "Wi-Fi Amateur: IEEE Std 802.11ac Deployment in Japan" (<https://wifiamateur.blogspot.com/2013/04/80211ac-device-deployment-in-japan.html>). *wifiamateur.blogspot.com*. Retrieved 19 January 2016.
61. *Article 11.5, Act No. 14448 of 4 December 2017* (<https://informacoes.anatel.gov.br/legislacao/atos-de-certificacao-de-produtos/2017/1139-ato-14448>) (in Brazilian Portuguese). Anatel. Retrieved 2022-08-20.

62. *Article 11.6, Act No. 14448 of 4 December 2017* (<https://informacoes.anatel.gov.br/legislacao/atos-de-certificacao-de-produtos/2017/1139-ato-14448>) (in Brazilian Portuguese). Anatel. Retrieved 2022-08-20.
63. "Short Range Devices GURL" (<https://www.rsm.govt.nz/licensing/frequencies-for-anyone/short-range-devices-gurl/>). *Radio Spectrum Management New Zealand*.
64. "신고하지 아니하고 개설할 수 있는 무선국용 무선설비의 기술기준" (<http://www.law.go.kr/행정규칙/신고하지아니하고개설할수있는무선국용무선설비의기술기준/2019-105,20191223>) [Technical Standard for Radio Equipment for Radio Stations That Can Be Opened without Reporting]. *National Law Information Center* (in Korean). Korea Ministry of Government Legislation. Retrieved 12 April 2020.
65. "工业和信息化部发布5150-5350兆赫兹频段无线接入系统频率使用相关事宜的通知" (<https://web.archive.org/web/20130530151754/http://www.miit.gov.cn/n11293472/n11293832/n12843926/n1391707/2/15140529.html>) [Ministry of Industry and Information Technology Issues Notice on Frequency Use of Wireless Access System in the 5150-5350 MHz Band]. *Ministry of Industry and Information Technology* (Press release) (in Chinese). Archived from the original (<https://www.miit.gov.cn/n11293472/n11293832/n12843926/n1391707/2/15140529.html>) on 30 May 2013. Retrieved 2 August 2017.
66. "关于使用5.8GHz频段频率事宜的通知" (https://www.miit.gov.cn/jgsj/wgj/wjfb/art/2020/art_bfd0fd64e0a1427aaf8aff18a01c0fd0.html) [Notice on Frequency Use of Wireless Access System around 5.8GHz]. *Ministry of Industry and Information Technology* (Press release) (in Chinese). Retrieved 19 August 2021.
67. "India's National Frequency allocation plan 2018" (PDF) (<https://dot.gov.in/sites/default/files/NFAP%202018.pdf>) (PDF).
68. "Gazette Notification for license exemption for usage of 5GHz frequency band for Wireless LAN" (PDF) (https://dot.gov.in/sites/default/files/License%20Exemption%20in%205%20GHz%20G_S_R_1048%28E%29%20dated%2022nd%20October%2C%202018_0.pdf?download=1) (PDF).
69. *Article 11.7, Act No. 14448 of 4 December 2017* (<https://informacoes.anatel.gov.br/legislacao/atos-de-certificacao-de-produtos/2017/1139-ato-14448>) (in Brazilian Portuguese). Anatel. Retrieved 2022-08-20.
70. "FCC Opens 6 GHz Band to Wi-Fi and Other Unlicensed Uses" (<https://www.fcc.gov/document/fcc-opens-6-ghz-band-wi-fi-and-other-unlicensed-uses/>). *fcc.gov*. 23 April 2020.
71. "Unlicensed Use of the 6 GHz Band Report and Order and Further Notice of Proposed Rulemaking; ET Docket No. 18-295; GN Docket No. 17-183" (<https://docs.fcc.gov/public/attachments/DOC-363490A1.pdf>) (PDF). *FCC*. 2 April 2020. Retrieved 24 April 2020.
72. "Consultation on the Technical and Policy Framework for Licence-Exempt Use in the 6 GHz Band" (<https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11643.html>). *ECC Newsletter*. November 2020. Retrieved 4 January 2022.
73. "ECO Documentation" (<https://docdb.cept.org/document/16737>).
74. "Spectrum assists drive towards better road and rail safety" (http://apps.cept.org/eccnews/dec-2020/spectrum_assists_drive_towards_better_road_and_rail_safety.html). *ECC Newsletter*. December 2020. Retrieved 1 January 2022.
75. "Statement: Improving Spectrum Access for WiFi – spectrum use in the 5 and 6 GHz bands" (<https://www.ofcom.org.uk/consultations-and-statements/category-2/improving-spectrum-access-for-wi-fi>). *Ofcom*. 2020-07-24. Retrieved 2021-12-08.
76. "IR 2030 Licence Exempt Short Range Devices (April 2021)" (https://www.ofcom.org.uk/data/assets/pdf_file/0028/84970/ir-2030.pdf) (PDF). *OFCOM*. Retrieved 2021-12-08.
77. "Radiocommunications (Low Interference Potential Devices) Class Licence Variation 2022 (No. 1)" (<https://www.legislation.gov.au/Datasets/F2022L00249>). *The Federal Register of Legislation*. 2022-03-04. Retrieved 2022-03-13.
78. "dead link" (<https://archive.today/20121212090129/http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr;sid=9eab2402bb1cccc8f85bb3fa9e6c2daa;rgn=div5;view=text;node=47:1.0.1.1.16;idno=47;cc=ecfr%2347:1.0.1.1.16.3.234.31>). Archived from the original (<https://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr;sid=9eab2402bb1cccc8f85bb3fa9e6c2daa;rgn=div5;view=text;node=47:1.0.1.1.16;idno=47;cc=ecfr%2347:1.0.1.1.16.3.234.31>) on 2012-12-12. Retrieved 18 February 2014.
79. "TCB workshop on unlicensed devices" (https://web.archive.org/web/20081105163502/http://www.fcc.gov/oet/ea/presentations/files/oct05/Unlicensed_Devices_JD.pdf) (PDF). October 2005. p. 58. Archived from the original (https://www.fcc.gov/oet/ea/presentations/files/oct05/Unlicensed_Devices_JD.pdf) (PDF) on 5 November 2008.
80. "NTIA Comments ET Docket No 03-108 02-15-2005" (https://www.ntia.doc.gov/ntiahome/fccfilings/2005/cogradio/ETDocket03-108_02152005.htm#_ftn88). *www.ntia.doc.gov*. Retrieved 5 June 2016.
81. "47 CFR Ch. I (10–1–04 Edition)" (https://edocket.access.gpo.gov/cfr_2004/octqtr/pdf/47cfr15.205.pdf) (PDF). *Edocket.access.gpo.gov*. Retrieved 2 August 2017.
82. "FCC 16-181" (https://apps.fcc.gov/edocs_public/attachmatch/FCC-16-181A1.pdf) (PDF). *apps.fcc.gov*. 23 December 2016. Retrieved 22 February 2017.

Further reading

- "Regulatory Database" (<https://wireless.wiki.kernel.org/en/developers/regulatory>). *Linux Wireless — An online database of allowed frequencies used by Linux 802.11 subsystem*.
- "FCC Regulations Update" (https://www.cisco.com/c/en/us/products/collateral/wireless/aironet-1300-series/prod_white_paper0900aecd801c4a88.html). *www.cisco.com — Dynamic Frequency Selection for 5 GHz WLAN in the U.S. and Canada*.

Retrieved from "https://en.wikipedia.org/w/index.php?title=List_of_WLAN_channels&oldid=1105564679"

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