List of WLAN channels

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The **List of WLAN channels** is the legally allowed IEEE 802.11 or more commonly Wi-Fi Wireless LAN channels.

The 802.11 workgroup currently documents use in three distinct frequency ranges, 2.4 GHz, 3.6 GHz and 4.9/5.0 GHz bands.[1] Each range is divided into multitude of channels. Countries apply their own regulations to both the allowable channels, allowed users and maximum power levels within these frequency ranges. In some countries, such as the United States, licensed Amateur Radio operators may use some of the channels at much higher power for long distance wireless access.

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[edit] 2.4 GHz (802.11b/g/n)

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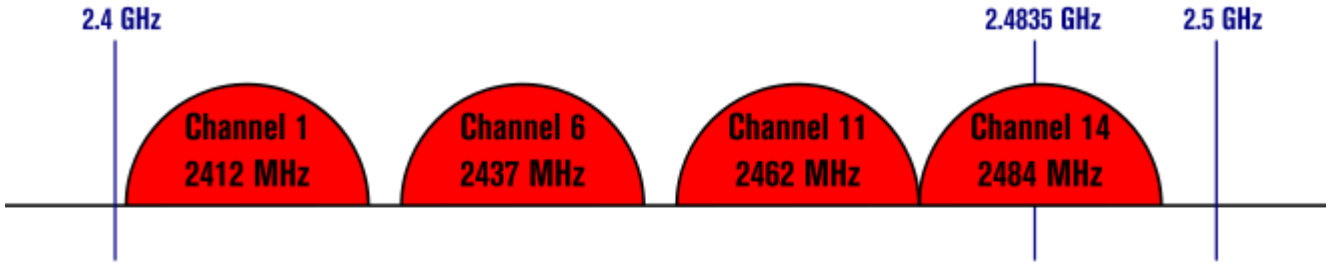
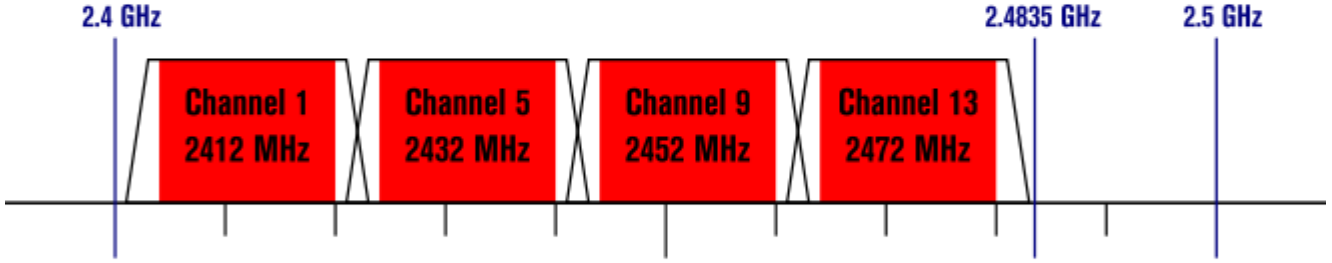
Telecommunications & Broadcast

Non-Overlapping Channels for 2.4 GHz WLAN

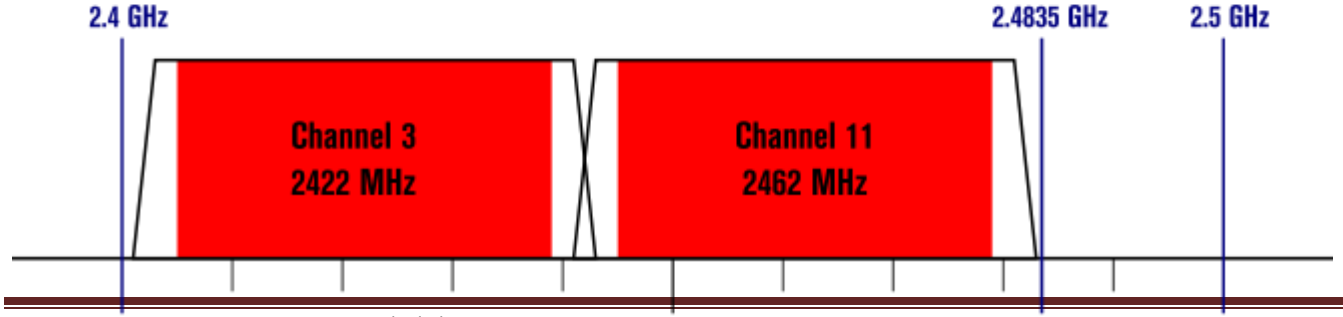
802.11b (DSSS) channel width 22 MHz



802.11g/n (OFDM) 20 MHz ch. width – 16.25 MHz used by sub-carriers



802.11n (OFDM) 40 MHz ch. width – 33.75 MHz used by sub-carriers



Graphical representation of Wi-Fi channels in 2.4 GHz band

There are 14 channels designated in the 2.4 GHz range spaced 5 MHz apart (with the exception of a 12 MHz spacing before Channel 14). As the protocol requires 25 MHz of channel separation, adjacent channels overlap and will interfere with each other. Consequently, using only channels 1, 6, 11, and 14 is recommended to avoid interference.[2]

Potential Wireless LAN uses of this range are documented by IEEE 802.11 clauses 18 (802.11b), 19 (802.11g) and 20 (802.11n). IEEE 802.11 clauses 14 and 15 also specify potential uses of this range, but did not see widespread implementation.

Countries apply their own regulations to both the allowable channels, allowed users and maximum power levels within these frequency ranges. Consult your 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.

Canal	frequence (MHz)	North America [3]	Japan[3]	Most of world[A] [3][4][5][6][7]
1*	2412	Yes	Yes	Yes[D]
2	2417	Yes	Yes	Yes[D]
3	2422	Yes	Yes	Yes[D]
4	2427	Yes	Yes	Yes[D]
5*	2432	Yes	Yes	Yes
6	2437	Yes	Yes	Yes
7	2442	Yes	Yes	Yes
8	2447	Yes	Yes	Yes

9*	2452	Yes	Yes	Yes
10	2457	Yes	Yes	Yes
11	2462	Yes	Yes	Yes
12	2467	No[B]	Yes	Yes
13*	2472	No[B]	Yes	Yes
14	2484	No	11b only[C]	No

*With 802.11g and newer only the channels 1, 5, 9, and 13 shall be used in order to obey the non-overlapping 20 MHz OFDM channel scheme borrowed from 802.11a.

^A Earlier, in Spain the only allowable channels were 10–11, and in France 10–13. These restrictions have been removed since, and these countries are currently following the common European policy (channels 1–13).

^B In the USA, 802.11 operation in the channels 12 and 13 is actually allowed under low powered 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 2400–2483.5 MHz[8] which wholly encompasses both channels 12 and 13. A Federal Communications Commission (FCC) document clarifies that only channel 14 is forbidden and furthermore low-power transmitters with low-gain antennas may legally operate in channels 12 and 13.[9] However, channels 12 and 13 are not normally used in order to avoid any potential interference in the adjacent restricted frequency band, 2483.5–2500 MHz,[10] which is subject to strict emission limits set out in 47 CFR §15.205.[11]

In Canada, 12 channels are available for use, 11 of which at full power and channel 12's transmit power limited. However, few devices have a method to enable a lower powered channel 12.

^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)

^D Outdoor use of channels 1-4 is not allowed in Israel, although indoor use is permitted.[12]

[edit] 3.6 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. Please see IEEE 802.11y for details.

Countries apply their own regulations to both the allowable channels, allowed users and maximum power levels within these frequency ranges.

channel	frequency (MHz)	United States		
		5 MHz	10 MHz	20 MHz
131	3657.5	Yes	No	No
132	3662.5	Yes	No	No
132	3660.0	No	Yes	No
133	3667.5	Yes	No	No
133	3665.0	No	No	Yes
134	3672.5	Yes	No	No
134	3670.0	No	Yes	No
135	3677.5	Yes	No	No
136	3682.5	Yes	No	No
136	3680.0	No	Yes	No
137	3687.5	Yes	No	No
137	3685.0	No	No	Yes

138	3689.5	Yes	No	No
138	3690.0	No	Yes	No

[edit] 5 GHz (802.11a/h/j/n)

Except where noted, all information taken from Annex J of IEEE 802.11-2007 modified by amendments k, y and n.

Countries apply their own regulations to both the allowable channels, allowed users and maximum power levels within these frequency ranges. Consult your local authorities as these regulations may be out of date as they are subject to change at any time.

In 2007 the FCC (United States) began requiring that devices in operating on 5.250 - 5.350 GHz and 5.47 - 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.[13]

Germany requires dynamic frequency selection (DFS) and transmit power control (TPC) capabilities on 5.250 - 5.350 GHz and 5.47 - 5.725 GHz as well, in addition the frequency range 5.150 - 5.250 GHz is only allowed for indoor use.[14] Since this is the german implementation of EU-Rule 2005/513/EC, similar regulations must be expected throughout the European Union.[15][16]

Austria adopted Decision 2005/513/EC directly into national law.[17]

South Africa simply copied the european regulations.[18]

Japan allows 34,38,42 and 46 channels for connecting J52 supported old APs.

channel	frequency (MHz)	United States	Europe	Japan		Singapore	China	Israel	Korea	Turkey	Australia	South Africa	Brazil
		40/20 MHz [21]	40/20 MHz	40/20 MHz [22]	10 MHz	40/20 MHz [23]	20 MHz	20 MHz [6]	20 MHz [24]	40/20 MHz [25]	40/20 MHz [7]	40/20 MHz [19]	40/20 MHz [20]
183	4915	No	No	No	Yes	No	No	No	No	No	No	No	No
184	4920	No	No	Yes	Yes	No	No	No	No	No	No	No	No
185	4925	No	No	No	Yes	No	No	No	No	No	No	No	No
187	4935	No	No	No	Yes	No	No	No	No	No	No	No	No
188	4940	No	No	Yes	Yes	No	No	No	No	No	No	No	No
189	4945	No	No	No	Yes	No	No	No	No	No	No	No	No
192	4960	No	No	Yes	No	No	No	No	No	No	No	No	No
196	4980	No	No	Yes	No	No	No	No	No	No	No	No	No
7	5035	No	No	No	Yes	No	No	No	No	No	No	No	No
8	5040	No	No	No	Yes	No	No	No	No	No	No	No	No
9	5045	No	No	No	Yes	No	No	No	No	No	No	No	No
11	5055	No	No	No	Yes	No	No	No	No	No	No	No	No

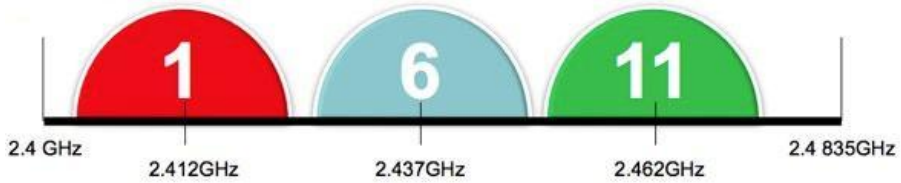
12	5060	No	No	No	No	No	No	No	No	No	No	No	No
16	5080	No	No	No	No	No	No	No	No	No	No	No	No
34	5170	No	No	Yes-clientonly	No	Yes	No	Yes	Yes	Yes-indoors	No	Yes-indoors	Yes-indoors
36	5180	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes-indoors	Yes	Yes-indoors	Yes-indoors
38	5190	No	No	Yes-clientonly	No	Yes	No	Yes	Yes	Yes-indoors	No	Yes-indoors	Yes-indoors
40	5200	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes-indoors	Yes	Yes-indoors	Yes-indoors
42	5210	No	No	Yes-clientonly	No	Yes	No	Yes	Yes	Yes-indoors	No	Yes-indoors	Yes-indoors
44	5220	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes-indoors	Yes	Yes-indoors	Yes-indoors
46	5230	No	No	Yes-clientonly	No	Yes	No	Yes	Yes	Yes-indoors	No	Yes-indoors	Yes-indoors
48	5240	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes-indoors	Yes	Yes-indoors	Yes-indoors
52	5260	Yes-w/DFS	Yes-DFS/TPC	Yes-DFS/TPC	No	Yes	No	Yes	Yes	Yes-indoors	Yes-DFS/TPC	Yes-indoors	Yes-indoors
56	5280	Yes-w/DFS	Yes-DFS/TPC	Yes-DFS/TPC	No	Yes	No	Yes	Yes	Yes-indoors	Yes-DFS/TPC	Yes-indoors	Yes-indoors
60	5300	Yes-w/DFS	Yes-	Yes-	No	Yes	No	Yes	Yes	Yes-indoors	Yes-	Yes-indoors	Yes-indoors

			DFS/TPC	DFS/TPC							DFS/TPC		
64	5320	Yes-w/DFS	Yes-DFS/TPC	Yes-DFS/TPC	No	Yes	No	Yes	Yes	Yes-indoors	Yes-DFS/TPC	Yes-indoors	Yes-indoors
100	5500	Yes-w/DFS[14]	Yes-DFS/TPC	Yes-DFS/TPC	No	No	No	No	Yes	Yes-DFS/TPC	Yes-DFS/TPC	Yes	Yes-w/DFS
104	5520	Yes-w/DFS[14]	Yes-DFS/TPC	Yes-DFS/TPC	No	No	No	No	Yes	Yes-DFS/TPC	Yes-DFS/TPC	Yes	Yes-w/DFS
108	5540	Yes-w/DFS[14]	Yes-DFS/TPC	Yes-DFS/TPC	No	No	No	No	Yes	Yes-DFS/TPC	Yes-DFS/TPC	Yes	Yes-w/DFS
112	5560	Yes-w/DFS[14]	Yes-DFS/TPC	Yes-DFS/TPC	No	No	No	No	Yes	Yes-DFS/TPC	Yes-DFS/TPC	Yes	Yes-w/DFS
116	5580	Yes-w/DFS[14]	Yes-DFS/TPC	Yes-DFS/TPC	No	No	No	No	Yes	Yes-DFS/TPC	Yes-DFS/TPC	Yes	Yes-w/DFS
120	5600	No[14]	Yes-DFS/TPC	Yes-DFS/TPC	No	No	No	No	Yes	Yes-DFS/TPC	No	Yes	Yes-w/DFS
124	5620	No[14]	Yes-DFS/TPC	Yes-DFS/TPC	No	No	No	No	Yes	Yes-DFS/TPC	No	Yes	Yes-w/DFS
128	5640	No[14]	Yes-DFS/TPC	Yes-DFS/TPC	No	No	No	No	Yes	Yes-DFS/TPC	No	Yes	Yes-w/DFS
132	5660	Yes-w/DFS[14]	Yes-DFS/TPC	Yes-DFS/TPC	No	No	No	No	No	Yes-DFS/TPC	Yes-DFS/TPC	Yes	Yes-w/DFS

136	5680	Yes-w/DFS[14]	Yes-DFS/TPC	Yes-DFS/TPC	No	No	No	No	No	Yes-DFS/TPC	Yes-DFS/TPC	Yes	Yes-w/DFS
140	5700	Yes-w/DFS[14]	Yes-DFS/TPC	Yes-DFS/TPC	No	No	No	No	No	Yes-DFS/TPC	Yes-DFS/TPC	Yes	Yes-w/DFS
149	5745	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes
153	5765	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes
157	5785	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes
161	5805	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes
165	5825	Yes	No	No	No	Yes	Yes	No	Yes	No	Yes	No	Yes

I) La bande de fréquence des 2,4GHz (2400 – 2483,5 MHz)

Cette bande de fréquence est entre autre utilisée par des technologies WiFi comme le 802.11b, 802.11g, 802.11n.
Elle offre 3 canaux de 20 MHz ou bien un seul canal 40MHz

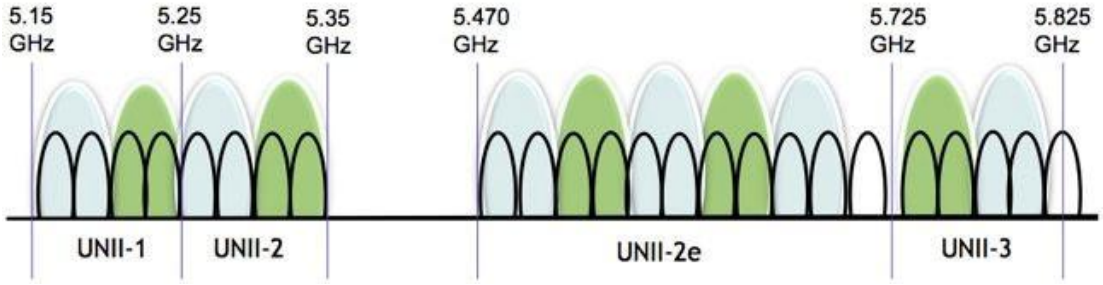


La seule contrainte imposée dans cette fréquence par l'ARCEP*, c'est la puissance d'émission (PIRE*) des équipements.
Elle est **limitée à 100mW (20dB)** en intérieur.
En extérieur, nous retrouvons les mêmes limitations, à un point prêt pour la France métropolitaine : entre 2454 MHz et 2483,5 MHz, la PIRE est réduite à 10mW (10 dB). Cette plage de fréquence correspond aux canaux 8 à 13.

II) La bande de fréquence des 5 GHz

Cette bande de fréquence est utilisée par des technologies WiFi comme le 802.11a, 802.11n et les technologies dites “HiperLan”.
Cette bande de fréquence est en fait divisée en 4 parties :

- UNI-1 : 5,15 – 5,25 GHz : 4 canaux de 20Mhz, 2 de 40MHz
- UNI-2 : 5,25 – 5,35 GHz : 4 canaux de 20Mhz, 2 de 40MHz
- UNI-2e : 5,470 – 5,725 GHz : 11 canaux de 20Mhz, 5 de 40MHz
- UNI-3 : 5,725 – 5,825 GHz : 4 canaux de 20Mhz, 2 de 40MHz



La bande UNI-1 et UNI-2 est interdite pour les usages extérieurs.
La bande UNI2-e est aussi bien utilisable en intérieur qu’en extérieur. La bande UNI-3 est interdite, aussi bien pour un usage intérieur qu’extérieur. D’un point de vue puissance d’émission, UNI-1 et UNI-2 sont limitées à 200mW (23dB). UNI-2e est limitée à 1W (30dB).

Cependant, UNI-2 et UNI-2e ont deux contraintes supplémentaires pour les équipements qui les utilisent :

- ils doivent intégrer une notion de DFS*, un système capable de repérer les radars dans les zones environnantes afin de changer la fréquence du lien radio pour ne pas déranger le radar. Ces radars appartiennent en général au ministère de la Défense (l’Armée) ou à Météo France.
- ils doivent aussi être capable de diminuer la puissance d’émission par 2 à travers un mécanisme logiciel (TPC). Si les équipements ne peuvent pas le faire, leur puissance d’émission légale est d’office divisée par 2.