

The Outline of Proposed Amendment to Ministerial Ordinance

1 Item

Partial revision of Regulations for Radio Equipment

2 Amendment to ministerial ordinance

Regulations for Radio Equipment

3 Reasons for amendment

Japan needs to improve efficiency of Wireless LAN (WLAN) connections, considering the current increased traffic of the mobile communications in Japan. To meet these demands, Japan will arrange the technical regulations of the WLAN System for the expansion of use the WLAN system with IEEE 802.11ax support.

4 Outline of the amendment

Technical requirements of radio equipment

(The following items written in red indicate are points to change.)

Item	Description
Name	Wireless LAN (WLAN) System (2.4/5.2/5.3/5.6GHz bands)
Frequency band	2400MHz to 2483.5MHz 5150MHz to 5250MHz 5250MHz to 5350MHz 5470MHz to 5730MHz
Communication Systems	Unidirectional, Simplex, Half-Duplex and Duplex
Modulation	Frequency-Hopping (FH), Direct Sequence Spread Spectrum (DS-SS), Amplitude Modulation, Phase Modulation, Frequency Modulation, Pulse Modulation or these combination, and Orthogonal Frequency Division Multiplexing (OFDM)
Maximum bitrate	(5150MHz to 5350MHz and 5470MHz to 5730MHz) <ul style="list-style-type: none">▪ 20MHz system : more than 20Mbps▪ 40MHz system : more than 40Mbps▪ 80MHz system : more than 80Mbps▪ 160MHz system : more than 160Mbps

Occupied Band Width (OBW)	(2400MHz to 2483.5MHz) <ul style="list-style-type: none"> ▪ 20MHz system : 26MHz ▪ 40MHz system : 40MHz (5150MHz to 5350MHz and 5470MHz to 5730MHz) <ul style="list-style-type: none"> ▪ 20MHz system : 20MHz (OFDM), 18 MHz (other modulations) ▪ 40MHz system : 40MHz ▪ 80MHz system : 80MHz ▪ 160MHz system : 160MHz 			
Allowable deviation of frequency	<ul style="list-style-type: none"> ▪ 2400MHz to 2483.5MHz : $\pm 50 \times 10^{-6}$ ▪ 5150MHz to 5350MHz and 5470MHz to 5730MHz : $\pm 20 \times 10^{-6}$ 			
Antenna Power	Frequency band	Modulations	Antenna Power	
	2400MHz to 2483.5MHz	Frequency-Hopping (FH)	3 mW/MHz	
		DS-SS (excepting FH-DS)	10 mW/MHz	
		OFDM (excepting FH-OFDM)	20MHz system	10 mW/MHz
			40MHz system	5 mW/MHz
	other modulations		10 mW	
	5150MHz - 5350MHz or 5470MHz - 5730MHz	DS-SS		10 mW/MHz
		OFDM	20MHz system	10 mW/MHz
			40MHz system	5 mW/MHz
			80MHz system	2.5 mW/MHz
160MHz system			1.25 mW/MHz	
other modulations		10 mW		
Equivalent Isotropically Radiated Power (EIRP)	(unlicensed 5.2/5.3/5.6GHz WLAN system)			
	Frequency band	OBW	EIRP	
	5150MHz to 5250MHz	20MHz system	10 mW/MHz	
		40MHz system	5 mW/MHz	
		80MHz system	2.5 mW/MHz	
	5250MHz to 5350MHz	20MHz system	10 mW/MHz (without TPC support; 5 mW/MHz)	
		40MHz system	5 mW/MHz (without TPC support; 2.5 mW/MHz)	
		80MHz system	2.5 mW/MHz (without TPC support; 1.25 mW/MHz)	
	5470MHz to 5730MHz	20MHz system	50 mW/MHz (without TPC support; 25 mW/MHz)	
		40MHz system	25 mW/MHz (without TPC support; 12.5 mW/MHz)	
		80MHz system	12.5 mW/MHz (without TPC support; 6.25 mW/MHz)	
		160MHz system	6.25 mW/MHz (without TPC support; 3.125 mW/MHz)	
	(registered 5.2GHz High-power WLAN system)			
		OBW	elevation angle θ (degree)	Maximum EIRP (dBW/MHz)
	20MHz system		< 8	-13
			8 to 40	-13 - 0.716(θ - 8)
		40 to 45	-35.9 - 1.22(θ - 40)	
		45 <	-42	
40MHz system		< 8	-16	
		8 to 40	-16 - 0.716(θ - 8)	
		40 to 45	-38.9 - 1.22(θ - 40)	
		45 <	-45	
80MHz system		< 8	-19	

		8 to 40	$-19 - 0.716(\theta - 8)$
		40 to 45	$-41.9 - 1.22(\theta - 40)$
		45 <	-48
Allowable deviation of Antenna Power	(5470MHz to 5730MHz)	-80% to +20%	
	(others)	-50% to +50%	
Spectrum Mask	<p>OBW is less than 18MHz : Average powers within the ± 9MHz regions of 20MHz and 40MHz separations from the carrier frequency are respectively 25dB and 40dB less than the average power of the carrier frequency.</p> <p>OBW is 18MHz to 20MHz : Average powers within the ± 10MHz regions of 20MHz and 40MHz separations from the carrier frequency are respectively 25dB and 40dB less than the average power of the carrier frequency.</p> <p>OBW is 20MHz to 40MHz : Average powers within the ± 20MHz regions of 40MHz and 80MHz separations from the carrier frequency are respectively 25dB and 40dB less than the average power of the carrier frequency.</p> <p>OBW is 40MHz to 80MHz : Average power within the ± 40MHz region of 80MHz separation from the carrier frequency are 25dB less than the average power of the carrier frequency.</p>		

Unwanted Emission Levels	(unlicensed 5.2/5.3GHz WLAN system)				
	OBW	reference channel	applied frequency region	Allowable unwanted emission level(EIRP)	
	≤ 18MHz	5240MHz	≤ 5142MHz	2.5 μW/MHz	
			5142MHz - 5150MHz	15 μW/MHz	
			5250MHz - 5251MHz	$10^{1-(f-9)}$ mW/MHz	
			5251MHz - 5260MHz	$10^{1-(8/90)(f-11)}$ mW/MHz	
			5260MHz - 5266.7MHz	$10^{1.8-(6/50)(f-20)}$ mW/MHz	
			5266.7MHz ≤	2.5 μW/MHz	
		5260MHz	≤ 5233.3MHz	2.5μW/MHz	
			5233.3MHz -5240MHz	$10^{1.8-(6/50)(f-20)}$ mW/MHz	
			5240MHz - 5249MHz	$10^{1-(8/90)(f-11)}$ mW/MHz	
			5249MHz - 5250MHz	$10^{1-(f-9)}$ mW/MHz	
			5350MHz ≤	2.5 μW/MHz	
		18MHz to 20MHz	5180MHz	≤ 5142MHz	2.5 μW/MHz
				5142MHz - 5150MHz	15 μW/MHz
	5240MHz		5250MHz - 5250.2MHz	$10^{1-(8/3)(f-9.75)}$ mW/MHz	
			5250.2MHz - 5251MHz	$10^{1-(f-9)}$ mW/MHz	
			5251MHz - 5260MHz	$10^{1-(8/90)(f-11)}$ mW/MHz	
			5260MHz - 5266.7MHz	$10^{1.8-(6/50)(f-20)}$ mW/MHz	
			5266.7MHz ≤	2.5μW/MHz	
	5260MHz		≤ 5233.3MHz	2.5 μW/MHz	
			5233.3MHz - 5240MHz	$10^{1.8-(6/50)(f-20)}$ mW/MHz	
			5240MHz - 5249MHz	$10^{1-(8/90)(f-11)}$ mW/MHz	
			5249MHz - 5249.8MHz	$10^{1-(f-9)}$ mW/MHz	
			5249.8MHz - 5250MHz	$10^{1-(8/3)(f-9.75)}$ mW/MHz	
	5320MHz	5350MHz ≤	2.5 μW/MHz		
	20MHz to 40MHz	5190MHz	≤ 5141.6MHz	2.5μW/MHz	
			5141.6MHz - 5150MHz	15μW/MHz	
		5230MHz	5250MHz - 5251MHz	$10^{-(f-20)+\log(1/2)}$ mW/MHz	
			5251MHz - 5270MHz	$10^{-(8/190)(f-21)-1+\log(1/2)}$ mW/MHz	
			5270MHz - 5278.4MHz	$10^{-(3/50)(f-40)-1.8+\log(1/2)}$ mW/MHz	
			5278.4MHz ≤	2.5 μW/MHz	
		5270MHz	≤ 5200MHz	2.5 μW/MHz	
			5200MHz - 5221.6MHz	2.5 μW/MHz	
			5221.6MHz - 5230MHz	$10^{-(3/50)(f-40)-1.8+\log(1/2)}$ mW/MHz	
			5230MHz - 5249MHz	$10^{-(8/190)(f-21)-1+\log(1/2)}$ mW/MHz	
			5249MHz - 5250MHz	$10^{-(f-20)+\log(1/2)}$ mW/MHz	
		5310MHz	5350MHz - 5358.4MHz	15μW/MHz	
			5358.4MHz ≤	2.5 μW/MHz	
	40MHz to 80MHz	5210MHz	≤ 5123.2MHz	2.5 μW/MHz	
			5123.2MHz - 5150MHz	15 μW/MHz	
			5250MHz - 5251MHz	$10^{-(f-40)+\log(1/4)}$ mW/MHz	
			5251MHz - 5290MHz	$10^{-(8/390)(f-41)-1+\log(1/4)}$ mW/MHz	
			5290MHz - 5296.7MHz	$10^{-(3/100)(f-80)-1.8+\log(1/4)}$ mW/MHz	
			5296.7MHz - 5480MHz	2.5 μW/MHz	
5290MHz		≤ 5203.3MHz	2.5 μW/MHz		
		5203.3MHz - 5210MHz	$10^{-(3/100)(f-80)-1.8+\log(1/4)}$ mW/MHz		
		5210MHz - 5249MHz	$10^{-(8/390)(f-41)-1+\log(1/4)}$ mW/MHz		
		5249MHz - 5250MHz	$10^{-(f-40)+\log(1/4)}$ mW/MHz		
		5350MHz - 5376.8MHz	15 μW/MHz		
		5376.8MHz ≤	2.5 μW/MHz		
80MHz to 160MHz	5250MHz	≤ 5099.6MHz	2.5 μW/MHz		
		5099.6MHz - 5150MHz	15 μW/MHz		
		5350MHz - 5400.4MHz	15 μW/MHz		
		5400.4MHz ≤	2.5 μW/MHz		

' f ' is the separation from the carrier frequency. (unit : MHz)

(registered 5.2GHz High-power WLAN system)			
OBW	reference channel	applied frequency region	Allowable unwanted emission level (EIRP)
< 18MHz	5240MHz	$\leq 5142\text{MHz}$	12.5 $\mu\text{W/MHz}$
		5142MHz - 5150MHz	75 $\mu\text{W/MHz}$
		5250MHz - 5251MHz	$10^{1+\log(5)-(F-9)}\text{mW/MHz}$
		5251MHz - 5260MHz	$10^{-1+\log(5)-(8/90)(F-11)}\text{mW/MHz}$
		5260MHz - 5266.7MHz	$10^{-1.8+\log(5)-(6/50)(F-20)}\text{mW/MHz}$
		5266.7MHz \leq	12.5 $\mu\text{W/MHz}$
18MHz to 20MHz	5180MHz	$\leq 5142\text{MHz}$	12.5 $\mu\text{W/MHz}$
		5142MHz - 5150MHz	75 $\mu\text{W/MHz}$
	5240MHz	5250MHz - 5250.2MHz	$10^{1+\log(5)-(8/3)(F-9.75)}\text{mW}$
		5250.2MHz - 5251MHz	$10^{1+\log(5)-(F-9)}\text{mW/MHz}$
		5251MHz - 5260MHz	$10^{-1+\log(5)-(8/90)(F-11)}\text{mW/MHz}$
		5260MHz - 5266.7MHz	$10^{-1.8+\log(5)-(6/50)(F-20)}\text{mW/MHz}$
		5266.7MHz \leq	12.5 $\mu\text{W/MHz}$
20MHz to 40MHz	5190MHz	$\leq 5141.6\text{MHz}$	12.5 $\mu\text{W/MHz}$
		5141.6MHz - 5150MHz	75 $\mu\text{W/MHz}$
	5230MHz	5250MHz - 5251MHz	$10^{\log(5)-(F-20)+\log(1/2)}\text{mW/MHz}$
		5251MHz - 5270MHz	$10^{\log(5)-(8/190)(F-21)-1+\log(1/2)}\text{mW/MHz}$
		5270MHz - 5278.4MHz	$10^{\log(5)-(3/50)(F-40)-1.8+\log(1/2)}\text{mW/MHz}$
		5278.4MHz \leq	12.5 $\mu\text{W/MHz}$
40MHz to 80MHz	5210MHz	$\leq 5123.2\text{MHz}$	12.5 $\mu\text{W/MHz}$
		5123.2MHz - 5150MHz	75 $\mu\text{W/MHz}$
		5250MHz - 5251MHz	$10^{\log(5)-(F-40)+\log(1/4)}\text{mW/MHz}$
		5251MHz - 5290MHz	$10^{\log(5)-(8/390)(F-41)-1+\log(1/4)}\text{mW/MHz}$
		5290MHz - 5296.7MHz	$10^{\log(5)-(3/100)(F-80)-1.8+\log(1/4)}\text{mW/MHz}$
		5296.7MHz \leq	12.5 $\mu\text{W/MHz}$
' f ' is the separation from the carrier frequency. (unit : MHz)			
Leak radiation from receiver circuit	At the frequency region less than 1GHz : 4nW no less than 1GHz : 20nW		
Usage condition	<ul style="list-style-type: none"> ▪ 2.4GHz WLAN system : none ▪ 5.2GHz WLAN system : indoor use only, except connecting to 5.2GHz High-power WLAN system (Fixed-AP) ▪ 5.3GHz WLAN system : indoor use only ▪ 5.6GHz WLAN system : do not use in the sky (except using in an airplane) ▪ 5.2GHz High-power WLAN system : Fixed-AP 		
License	<ul style="list-style-type: none"> ▪ 2.4/5.2/5.3/5.6GHz WLAN system : unlicensed system ▪ 5.2GHz High-power WLAN system : registered system 		

- 5 Proposed date of entry into force
Around June or July, 2019