

The Outline of Proposed Amendment to Ministerial Ordinance

1 Item

Partial revision of Regulations for Radio Equipment etc.

2 Amendment to ministerial ordinance

Regulations for Radio Equipment

3 Reasons for amendment

Considering the situation that the traffic of the mobile communications is increasing every year, it is necessary to make connection of Wireless LAN (WLAN) more efficient in Japan. To meet these demands, we make the technical standards of the WLAN System for the expansion of use the WLAN system extends to the 5.925GHz to 6.425GHz Band.

The 2019 ITU World Radiocommunication Conference (WRC-19) made a decision to make 5.2GHz band wireless LAN available in automobiles. To meet these demands, we arrange the technical standards of the WLAN System.

4 Outline of the amendment

Technical requirements of radio equipment

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

Item	
Name	Wireless LAN System (2.4/5.2/5.3/5.6/6GHz band)
Frequency band	2400MHz to 2483.5MHz 5150MHz to 5350MHz 5470MHz to 5730MHz 5925MHz to 6425MHz
Communication Systems	Unidirectional, Simplex, Half-Duplex and Duplex
Modulation	DS-SS, Amplitude Modulation, Phase Modulation, Frequency Modulation, Pulse Modulation or these combination, and OFDM
Max Bit-rate	(5150MHz to 5350MHz, 5470MHz to 5730MHz and 5925MHz to 6425MHz) <ul style="list-style-type: none"> ▪ 20MHz system : more than 20 Mbps ▪ 40MHz system : more than 40 Mbps

	<ul style="list-style-type: none"> ▪ 80MHz system : more than 80 Mbps ▪ 160MHz system : more than 160 Mbps 																																																											
OBW	<p>(2400MHz to 2483.5MHz)</p> <ul style="list-style-type: none"> ▪ 20MHz system : 26 MHz ▪ 40MHz system : 40 MHz <p>(5150MHz to 5350MHz and 5470MHz to 5730MHz)</p> <ul style="list-style-type: none"> ▪ 20MHz system : 20 MHz (OFDM), 18 MHz (other modulations) ▪ 40MHz system : 40 MHz ▪ 80MHz system : 80 MHz ▪ 160MHz system : 160 MHz <p>(5925MHz to 6425MHz)</p> <ul style="list-style-type: none"> ▪ 20MHz system : 20 MHz (OFDM) ▪ 40MHz system : 40 MHz(OFDM) ▪ 80MHz system : 80 MHz(OFDM) ▪ 160MHz system : 160 MHz(OFDM) 																																																											
Allowable deviation of frequency	<ul style="list-style-type: none"> ▪ 2400MHz to 2483.5MHz : $\pm 50 \times 10^{-6}$ ▪ 5150MHz to 5350MHz, 5470MHz to 5730MHz and 5925MHz to 6425MHz : $\pm 20 \times 10^{-6}$ 																																																											
Antenna Power	<table border="1"> <thead> <tr> <th>Frequency band</th> <th>Modulations</th> <th>Antenna Power</th> </tr> </thead> <tbody> <tr> <td rowspan="5">2400MHz to 2483.5MHz</td> <td>FH</td> <td>3 mW/MHz</td> </tr> <tr> <td colspan="2">DS-SS (excepting FH-DS)</td> <td>10 mW/MHz</td> </tr> <tr> <td rowspan="2">OFDM (excepting FH-OFDM)</td> <td>20MHz system</td> <td>10 mW/MHz</td> </tr> <tr> <td>40MHz system</td> <td>5 mW/MHz</td> </tr> <tr> <td colspan="2">other modulations</td> <td>10 mW</td> </tr> <tr> <td rowspan="5">5150MHz - 5350MHz</td> <td colspan="2">DS-SS</td> <td>10 mW/MHz</td> </tr> <tr> <td rowspan="4">OFDM</td> <td>20MHz system</td> <td>10 mW/MHz (without connecting)</td> </tr> <tr> <td>40MHz system</td> <td>5 mW/MHz (without)</td> </tr> <tr> <td>80MHz system</td> <td>2.5 mW/MHz (without)</td> </tr> <tr> <td>160MHz system</td> <td>1.25 mW/MHz</td> </tr> <tr> <td colspan="2">other modulations</td> <td>10 mW</td> </tr> <tr> <td rowspan="5">5470MHz - 5730MHz</td> <td colspan="2">DS-SS</td> <td>10 mW/MHz</td> </tr> <tr> <td rowspan="4">OFDM</td> <td>20MHz system</td> <td>10 mW/MHz</td> </tr> <tr> <td>40MHz system</td> <td>5 mW/MHz</td> </tr> <tr> <td>80MHz system</td> <td>2.5 mW/MHz</td> </tr> <tr> <td>160MHz system</td> <td>1.25 mW/MHz</td> </tr> <tr> <td colspan="2">other modulations</td> <td>10 mW/MHz</td> </tr> <tr> <td rowspan="4">5925MHz - 6425MHz</td> <td rowspan="4">OFDM</td> <td>20MHz system</td> <td>10 mW/MHz</td> </tr> <tr> <td>40MHz system</td> <td>5 mW/MHz</td> </tr> <tr> <td>80MHz system</td> <td>2.5 mW/MHz</td> </tr> <tr> <td>160MHz system</td> <td>1.25 mW/MHz</td> </tr> </tbody> </table>	Frequency band	Modulations	Antenna Power	2400MHz to 2483.5MHz	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	DS-SS		10 mW/MHz	OFDM	20MHz system	10 mW/MHz (without connecting)	40MHz system	5 mW/MHz (without)	80MHz system	2.5 mW/MHz (without)	160MHz system	1.25 mW/MHz	other modulations		10 mW	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/MHz	5925MHz - 6425MHz	OFDM	20MHz system	10 mW/MHz	40MHz system	5 mW/MHz	80MHz system	2.5 mW/MHz	160MHz system	1.25 mW/MHz
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EIRP

(unlicensed 5.2/5.3/5.6/6GHz WLAN system)

Frequency band		EIRP
5150MHz to 5250MHz	20MHz system	10 mW/MHz (use in cars; 2mW/MHz)
	40MHz system	5 mW/MHz (use in cars; 1mW/MHz)
	80MHz system	2.5 mW/MHz (use in cars; 0.5mW/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)
5925MHz to 6425MHz	20MHz system	Low Power Indoor (LPI); 10mW/MHz Very Low Power (VLP); 1.25mW/MHz
	40MHz system	LPI; 5mW/MHz VLP; 0.625mW/MHz
	80MHz system	LPI ; 2.5mW/MHz VLP; 0.3125mW/MHz
	160MHz system	LPI; 1.25mW/MHz VLP; 0.15625mW/MHz

(registered 5.2GHz High-power WLAN system)

	elevation angle θ (degree)	Max 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(θ - 8)
	40 to 45	-41.9 - 1.22(θ - 40)
	45 <	-48

<p>Allowable deviation of Antenna Power</p>	<p>(5470MHz to 5730MHz, 5925MHz to 6425MHz) -80 to +20% (others) -50 to +50%</p>
<p>Spectrum Mask (1)</p>	<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>

Spectrum Mask (2)	(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	
	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)

(unlicensed 5.6GHz WLAN system)

OBW	applied frequency region	Allowable unwanted emission level(EIRP)
≤ 20MHz (OFDM)	< 5460MHz	2.5 μW/MHz
	5460MHz - 5470MHz	12.5 μW/MHz
	5730MHz - 5765MHz	12.5 μW/MHz
	5765MHz <	2.5 μW/MHz
≤ 20MHz (others)	≤ 5470MHz	12.5 μW/MHz
	5730MHz ≤	12.5 μW/MHz
20MHz to 40MHz	≤ 5460MHz	12.5 μW/MHz
	5460MHz - 5470MHz	50 μW/MHz
	5770MHz ≤	12.5 μW/MHz
40MHz to 80MHz	≤ 5460MHz	12.5 μW/MHz
	5460MHz - 5469.5MHz	50 μW/MHz
	5469.5MHz - 5470MHz	51.2 μW/MHz
	5770MHz ≤	12.5 μW/MHz
80MHz to 160MHz	≤ 5419.6MHz	12.5 μW/MHz
	5419.6MHz - 5470MHz	50 μW/MHz
	5725MHz ≤	12.5 μW/MHz

(unlicensed 5.2GHz WLAN system use in cars)

OBW	reference channel	applied frequency region	Allowable unwanted emission level (EIRP)
< 20MHz	5180MHz	≤ 5142MHz	0.5μW/MHz
		5142MHz - 5150MHz	3μW/MHz
	5240MHz	5250MHz - 5250.2MHz	$0.2 \times 10^{-(8/3)(f-9.75)}$ mW
		5250.2MHz - 5251MHz	$0.2 \times 10^{1-(f-9)}$ mW/MHz
		5251MHz - 5260MHz	$0.2 \times 10^{-1-(8/90)(f-11)}$ mW/MHz
		5260MHz - 5266.7MHz	$0.2 \times 10^{-1.8-(6/50)(f-20)}$ mW/MHz
	5266.7MHz ≤	0.5μW/MHz	
20MHz to 40MHz	5190MHz	≤ 5141.6MHz	0.5μW/MHz
		5141.6MHz - 5150MHz	3μW/MHz
	5230MHz	5250MHz - 5251MHz	$0.2 \times 10^{-(f-20)+\log(1/2)}$ mW/MHz
		5251MHz - 5270MHz	$0.2 \times 10^{-(8/190)(f-21)-1+\log(1/2)}$ mW/MHz
		5270MHz - 5278.4MHz	$0.2 \times 10^{-(3/50)(f-40)-1.8+\log(1/2)}$ mW/MHz
	5278.4MHz ≤	0.5μW/MHz	
40MHz to 80MHz	5210MHz	≤ 5123.2MHz	0.5μW/MHz
		5123.2MHz - 5150MHz	3μW/MHz
		5250MHz - 5251MHz	$0.2 \times 10^{-(f-40)+\log(1/4)}$ mW/MHz
		5251MHz - 5290MHz	$0.2 \times 10^{-(8/390)(f-41)-1+\log(1/4)}$ mW/MHz
		5290MHz - 5296.7MHz	$0.2 \times 10^{-(3/100)(f-80)-1.8+\log(1/4)}$ mW/MHz
	5296.7MHz ≤	0.5μW/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	≤ 5142MHz	12.5μW/MHz
		5142MHz - 5150MHz	75μW/MHz

		5250MHz - 5251MHz	$10^{1+\log(5)-(F-9)}$ mW/MHz
		5251MHz - 5260MHz	$10^{-1+\log(5)-(8/90)(F-11)}$ mW/MHz
		5260MHz - 5266.7MHz	$10^{-1.8+\log(5)-(6/50)(F-20)}$ mW/MHz
		5266.7MHz \leq	12.5 μ W/MHz
18MHz to 20MHz	5180MHz	\leq 5142MHz	12.5 μ W/MHz
		5142MHz - 5150MHz	75 μ W/MHz
	5240MHz	5250MHz - 5250.2MHz	$10^{1+\log(5)-(8/3)(F-9.75)}$ mW
		5250.2MHz - 5251MHz	$10^{1+\log(5)-(F-9)}$ mW/MHz
		5251MHz - 5260MHz	$10^{-1+\log(5)-(8/90)(F-11)}$ mW/MHz
		5260MHz - 5266.7MHz	$10^{-1.8+\log(5)-(6/50)(F-20)}$ mW/MHz
	5266.7MHz \leq	12.5 μ W/MHz	
20MHz to 40MHz	5190MHz	\leq 5141.6MHz	12.5 μ W/MHz
		5141.6MHz - 5150MHz	75 μ W/MHz
	5230MHz	5250MHz - 5251MHz	$10^{\log(5)-(F-20)+\log(1/2)}$ mW/MHz
		5251MHz - 5270MHz	$10^{\log(5)-(8/190)(F-21)-1+\log(1/2)}$ mW/MHz
		5270MHz - 5278.4MHz	$10^{\log(5)-(3/50)(F-40)-1.8+\log(1/2)}$ mW/MHz
		5278.4MHz \leq	12.5 μ W/MHz
40MHz to 80MHz	5210MHz	\leq 5123.2MHz	12.5 μ W/MHz
		5123.2MHz - 5150MHz	75 μ W/MHz
		5250MHz - 5251MHz	$10^{\log(5)-(F-40)+\log(1/4)}$ mW/MHz
		5251MHz - 5290MHz	$10^{\log(5)-(8/390)(F-41)-1+\log(1/4)}$ mW/MHz
		5290MHz - 5296.7MHz	$10^{\log(5)-(3/100)(F-80)-1.8+\log(1/4)}$ mW/MHz
		5296.7MHz \leq	12.5 μ W/MHz

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

(unlicensed 6GHz WLAN system (LPI))

OBW	reference channel	applied frequency region	Allowable unwanted emission level (EIRP)
\leq 20MHz	5955MHz	\leq 5925MHz	2 μ W/MHz
	6415MHz	6425MHz - 6435.9MHz	10 μ W/MHz
		6435.9MHz \leq	2.5 μ W/MHz
20MHz to 40MHz	5965MHz	\leq 5925MHz	2 μ W/MHz
	6405MHz	6425MHz - 6440.1MHz	50 μ W/MHz
		6440.1MHz \leq	12.5 μ W/MHz
40MHz to 80MHz	5925MHz	\leq 5925MHz	2 μ W/MHz
	6385MHz	6425MHz - 6440.4MHz	50 μ W/MHz
		6440.4MHz \leq	12.5 μ W/MHz
80MHz to 160MHz	6025MHz	\leq 5925MHz	2 μ W/MHz
	6345MHz	6425MHz - 6425.5MHz	50 μ W/MHz
		6425.5MHz \leq	12.5 μ W/MHz

(unlicensed 6GHz WLAN system (VLP))

OBW	reference channel	applied frequency region	Allowable unwanted emission level (EIRP)
\leq 20MHz	5955MHz	\leq 5925MHz	0.2 μ W/MHz
	6415MHz	6425MHz - 6425.5MHz	50 μ W/MHz
		6425.5MHz \leq	12.5 μ W/MHz
20MHz to 40MHz	5965MHz	\leq 5925MHz	0.2 μ W/MHz
	6405MHz	6425MHz - 6425.4MHz	50 μ W/MHz

		6425.4MHz \leq	12.5 μ W/MHz
40MHz to 80MHz	5925MHz	\leq 5925MHz	0.2 μ W/MHz
	6385MHz	6425MHz – 6425.2MHz	50 μ W/MHz
		6425.2MHz \leq	12.5 μ W/MHz
80MHz to 160MHz	6025MHz	\leq 5925MHz	0.2 μ W/MHz
	6345MHz	6425MHz – 6425.1MHz	50 μ W/MHz
			6425.1MHz \leq

Leak radiation from receiver circuit	At the frequency region less than 1GHz : 4nW more 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 ▪ 6GHz WLAN system (LPI) : indoor use only(*) ▪ 6GHz WLAN system (VLP) : do not use in the sky <p>(*) Indoor includes trains, boats, and aircraft exceptionally includes cars in the 5.15 – 5.25 GHz band.</p>
License	<ul style="list-style-type: none"> ▪ 2.4/5.2/5.3/5.6/6GHz WLAN system : unlicensed system ▪ 5.2GHz High-power WLAN system : registered system

5 Proposed date of entry into force

August, 2022