

4.2 AC Power Line Conducted Emissions

4.2.1 Measurement procedure

[FCC 15.207]

Test was applied by following conditions.

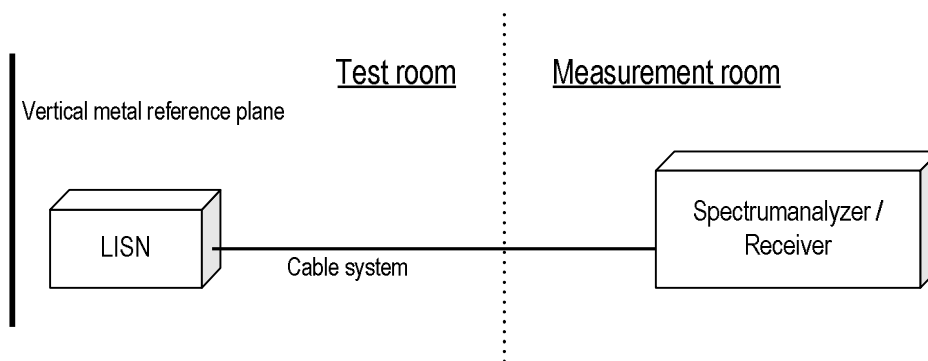
Test method	: ANSI C63.10
Frequency range	: 0.15 MHz to 30 MHz
Test place	: 3m Semi-anechoic chamber
EUT was placed on	: FRP table / (W) 2.0 × (D) 1.0 × (H) 0.8 m
Vertical Metal Reference Plane	: (W) 2.0 × (H) 2.0 m, 0.4 m away from EUT
Test receiver setting	
- Detector	: Quasi-peak, Average
- Bandwidth	: 9 kHz

EUT and peripherals are connected to 50Ω/50μH Line Impedance Stabilization Network (LISN) which are connected to reference ground plane, and are placed 80cm away from EUT. Excess of AC power cable is bundled in center.

LISN for peripheral is terminated in 50Ω.

EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Maximum emission configuration is determined by manipulating the EUT, peripherals, interconnecting cables. Then, emission measurements are performed with test receiver in above setting to each current-carrying conductor of the mains port. Sufficient time for EUT, peripherals and test equipment is provided in order for them to warm up to their normal operating condition. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits.

- Test configuration



4.2.2 Calculation method

Emission level = Reading + (LISN. factor + Cable system loss)

Margin = Limit – Emission level

4.2.3 Limit

Frequency [MHz]	Limit	
	QP [dBuV]	AV [dBuV]
0.15-0.5	66-56*	56-46*
0.5-5	56	46
5-30	60	50

*: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

4.2.4 Test data

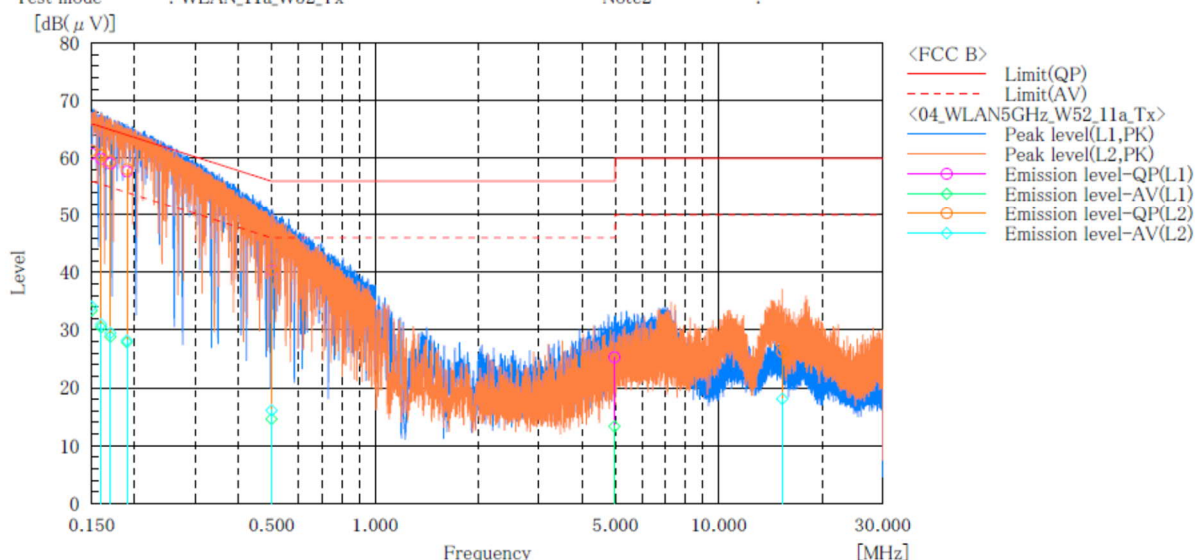
Date : 8~9-November-2021
 Temperature : 21.4 [°C]
 Humidity : 45.3 [%]
 Test place : 3m Semi-anechoic chamber

Test engineer : Chiaki Kanno

W52

Company Name : KYOCERA Corporation
 EUT : Mobile Phone
 Model No. : EB1084
 Serial No. : N/A
 Test mode : WLAN_11a_W52_Tx

Standard : FCC Part.15 Subpart C
 Operator : C.Kanno
 Temp,Hum,Atm : 21.4[°C] 45.3[%]
 Note1 :
 Note2 :



Final Result

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading CAV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result CAV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin CAV [dB]
1	0.150	50.3	22.9	10.5	60.8	33.4	66.0	56.0	5.2	22.6
2	0.160	49.4	20.0	10.5	59.9	30.5	65.5	55.5	5.6	25.0
3	0.170	48.7	18.5	10.4	59.1	28.9	65.0	55.0	5.9	26.1
4	0.190	47.3	17.5	10.4	57.7	27.9	64.0	54.0	6.3	26.1
5	0.500	30.2	4.3	10.3	40.5	14.6	56.0	46.0	15.5	31.4
6	4.968	14.8	2.8	10.5	25.3	13.3	56.0	46.0	30.7	32.7

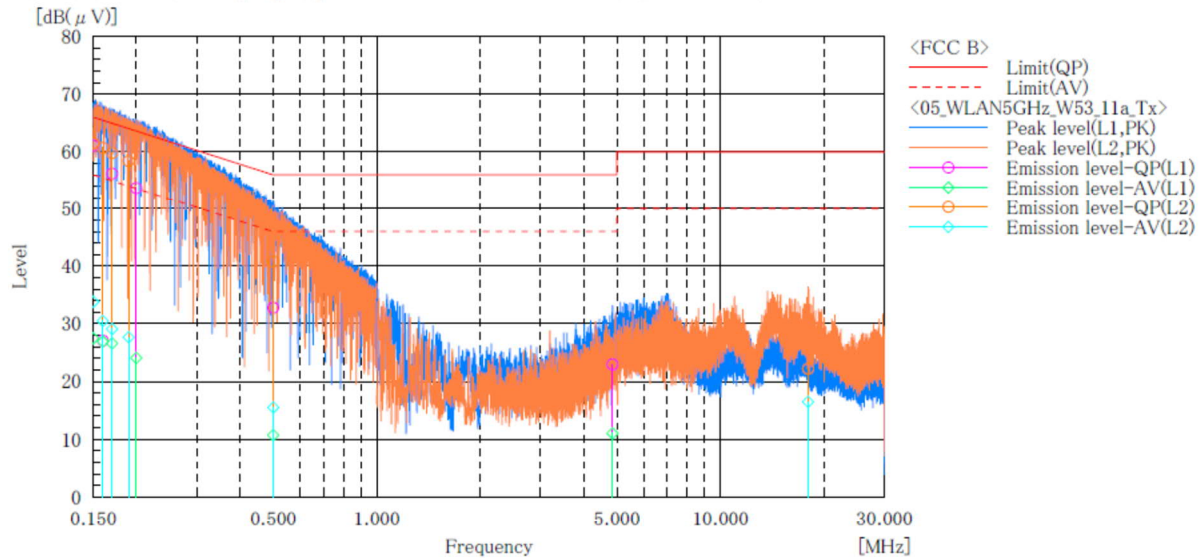
--- L2 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading CAV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result CAV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin CAV [dB]
1	0.150	50.9	23.7	10.4	61.3	34.1	66.0	56.0	4.7	21.9
2	0.160	50.2	20.6	10.4	60.6	31.0	65.5	55.5	4.9	24.5
3	0.170	49.1	19.1	10.4	59.5	29.5	65.0	55.0	5.5	25.5
4	0.190	47.7	17.8	10.4	58.1	28.2	64.0	54.0	5.9	25.8
5	0.500	30.3	5.8	10.3	40.6	16.1	56.0	46.0	15.4	29.9
6	15.290	15.4	7.2	10.9	26.3	18.1	60.0	50.0	33.7	31.9

W53

Company Name : KYOCERA Corporation
 EUT : Mobile Phone
 Model No. : EB1084
 Serial No. : N/A
 Test mode : WLAN_11a_W53_Tx

Standard : FCC Part.15 Subpart C
 Operator : C.Kanno
 Temp,Hum,Atm : 21.4[°C] 45.3[%]
 Note1 :
 Note2 :



Final Result

--- L1 Phase ---

No.	Frequency	Reading QP	Reading CAV	c. f	Result QP	Result CAV	Limit QP	Limit AV	Margin QP	Margin CAV
	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]
1	0.150	50.6	17.0	10.5	61.1	27.5	66.0	56.0	4.9	28.5
2	0.160	16.6	16.4	10.5	27.1	26.9	65.5	55.5	38.4	28.6
3	0.170	45.8	16.2	10.4	56.2	26.6	65.0	55.0	8.8	28.4
4	0.200	43.3	13.7	10.4	53.7	24.1	63.6	53.6	9.9	29.5
5	0.500	22.5	0.4	10.3	32.8	10.7	56.0	46.0	23.2	35.3
6	4.856	12.5	0.5	10.5	23.0	11.0	56.0	46.0	33.0	35.0

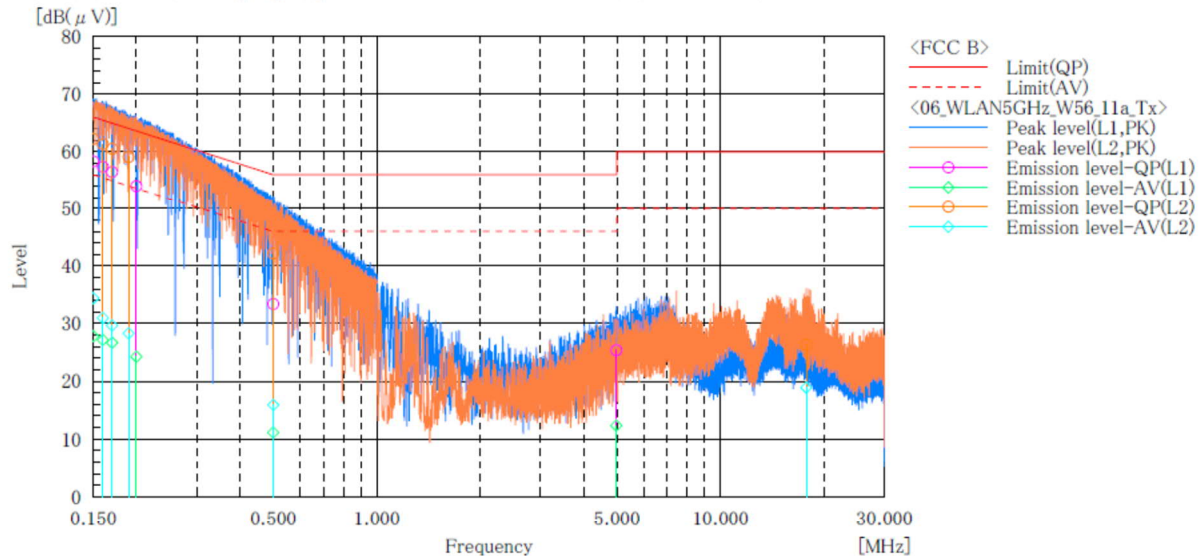
--- L2 Phase ---

No.	Frequency	Reading QP	Reading CAV	c. f	Result QP	Result CAV	Limit QP	Limit AV	Margin QP	Margin CAV
	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]
1	0.150	51.1	23.4	10.4	61.5	33.8	66.0	56.0	4.5	22.2
2	0.160	50.3	20.1	10.4	60.7	30.5	65.5	55.5	4.8	25.0
3	0.170	49.4	18.7	10.4	59.8	29.1	65.0	55.0	5.2	25.9
4	0.190	48.0	17.3	10.4	58.4	27.7	64.0	54.0	5.6	26.3
5	0.500	30.5	5.2	10.3	40.8	15.5	56.0	46.0	15.2	30.5
6	17.991	11.3	5.6	10.9	22.2	16.5	60.0	50.0	37.8	33.5

W56

Company Name : KYOCERA Corporation
 EUT : Mobile Phone
 Model No. : EB1084
 Serial No. : N/A
 Test mode : WLAN_11a_W56_Tx

Standard : FCC Part.15 Subpart C
 Operator : C.Kanno
 Temp,Hum,Atm : 21.4[°C] 45.3[%]
 Note1 :
 Note2 :



Final Result

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading CAV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result CAV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin CAV [dB]
1	0.150	47.8	17.3	10.5	58.3	27.8	66.0	56.0	7.7	28.2
2	0.160	46.9	16.7	10.5	57.4	27.2	65.5	55.5	8.1	28.3
3	0.170	46.1	16.3	10.4	56.5	26.7	65.0	55.0	8.5	28.3
4	0.200	43.6	13.9	10.4	54.0	24.3	63.6	53.6	9.6	29.3
5	0.500	23.1	0.8	10.3	33.4	11.1	56.0	46.0	22.6	34.9
6	4.979	14.9	1.8	10.5	25.4	12.3	56.0	46.0	30.6	33.7

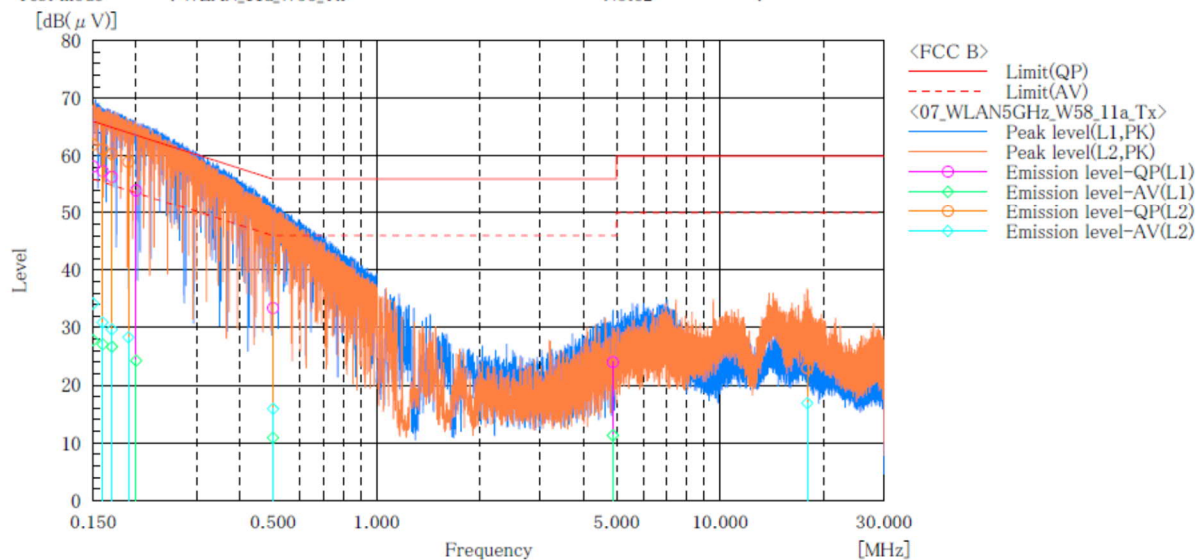
--- L2 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading CAV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result CAV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin CAV [dB]
1	0.150	51.8	24.0	10.4	62.2	34.4	66.0	56.0	3.8	21.6
2	0.160	50.9	20.6	10.4	61.3	31.0	65.5	55.5	4.2	24.5
3	0.170	50.1	19.3	10.4	60.5	29.7	65.0	55.0	4.5	25.3
4	0.190	48.7	17.9	10.4	59.1	28.3	64.0	54.0	4.9	25.7
5	0.500	31.9	5.6	10.3	42.2	15.9	56.0	46.0	13.8	30.1
6	17.766	15.5	8.0	10.9	26.4	18.9	60.0	50.0	33.6	31.1

W58

Company Name : KYOCERA Corporation
 EUT : Mobile Phone
 Model No. : EB1084
 Serial No. : N/A
 Test mode : WLAN_11a_W58_Tx

Standard : FCC Part.15 Subpart C
 Operator : C.Kanno
 Temp,Hum,Atm : 21.4[°C] 45.3[%]
 Note1 :
 Note2 :



Final Result

--- L1 Phase ---

No.	Frequency	Reading QP	Reading CAV	c. f	Result QP	Result CAV	Limit QP	Limit AV	Margin QP	Margin CAV
	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]
1	0.150	47.7	17.3	10.5	58.2	27.8	66.0	56.0	7.8	28.2
2	0.160	46.9	16.6	10.5	57.4	27.1	65.5	55.5	8.1	28.4
3	0.170	46.0	16.3	10.4	56.4	26.7	65.0	55.0	8.6	28.3
4	0.200	43.6	13.9	10.4	54.0	24.3	63.6	53.6	9.6	29.3
5	0.500	23.1	0.6	10.3	33.4	10.9	56.0	46.0	22.6	35.1
6	4.873	13.5	0.8	10.5	24.0	11.3	56.0	46.0	32.0	34.7

--- L2 Phase ---

No.	Frequency	Reading QP	Reading CAV	c. f	Result QP	Result CAV	Limit QP	Limit AV	Margin QP	Margin CAV
	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]
1	0.150	51.6	23.8	10.4	62.0	34.2	66.0	56.0	4.0	21.8
2	0.160	50.8	20.5	10.4	61.2	30.9	65.5	55.5	4.3	24.6
3	0.170	50.0	19.3	10.4	60.4	29.7	65.0	55.0	4.6	25.3
4	0.190	48.6	17.9	10.4	59.0	28.3	64.0	54.0	5.0	25.7
5	0.500	31.8	5.6	10.3	42.1	15.9	56.0	46.0	13.9	30.1
6	17.917	12.1	6.0	10.9	23.0	16.9	60.0	50.0	37.0	33.1



Japan

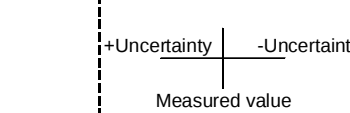
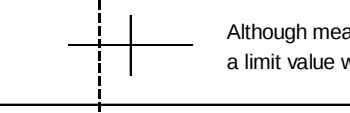
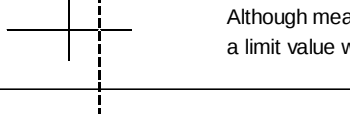
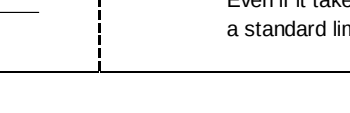
5 Antenna requirement

According to FCC section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The antenna is a special antenna mounted inside of the EUT. Therefore, the EUT complies with the antenna requirement of FCC section 15.203.

6 Measurement uncertainty

Expanded uncertainties stated are calculated with a coverage Factor $k=2$.
Please note that these results are not taken into account when measurement uncertainty considerations contained in ETSI TR 100 028 Parts 1 and 2 determining compliance or non-compliance with test result.

Test item	Measurement uncertainty
Conducted emission, AMN (9 kHz – 150 kHz)	± 3.7 dB
Conducted emission, AMN (150 kHz – 30 MHz)	± 3.3 dB
Radiated emission (9kHz – 30 MHz)	± 3.2 dB
Radiated emission (30 MHz – 1000 MHz)	± 5.3 dB
Radiated emission (1 GHz – 6 GHz)	± 4.8 dB
Radiated emission (6 GHz – 18 GHz)	± 4.5 dB
Radiated emission (18 GHz – 40 GHz)	± 6.4 dB
Radio Frequency	$\pm 1.4 \times 10^{-8}$
RF power, conducted	± 0.8 dB
Adjacent channel power	± 2.4 dB
Temperature	± 0.6 °C
Humidity	± 1.2 %
Voltage (DC)	± 0.4 %
Voltage (AC, <10kHz)	± 0.2 %

Judge	Measured value and standard limit value	
PASS	Standard limit value +Uncertainty -Uncertainty Measured value Case1  Even if it takes uncertainty into consideration, a standard limit value is fulfilled.	
	Standard limit value +Uncertainty -Uncertainty Measured value Case2  Although measured value is in a standard limit value, a limit value won't be fulfilled if uncertainty is taken into consideration.	
FAIL	Standard limit value +Uncertainty -Uncertainty Measured value Case3  Although measured value exceeds a standard limit value, a limit value will be fulfilled if uncertainty is taken into consideration.	
	Standard limit value +Uncertainty -Uncertainty Measured value Case4  Even if it takes uncertainty into consideration, a standard limit value isn't fulfilled.	



Japan

7 Laboratory Information

Testing was performed and the report was issued at:

TÜV SÜD Japan Ltd. Yonezawa Testing Center

Address: 5-4149-7 Hachimanpara, Yonezawa-shi, Yamagata, 992-1128 Japan

Phone: +81-238-28-2881

Accreditation and Registration

A2LA

Certificate #3686.03

VLAC

Accreditation No.: VLAC-013

BSMI

Laboratory Code: SL2-IN-E-6018, SL2-A1-E-6018

Innovation, Science and Economic Development Canada

ISED#: 4224A

VCCI Council

Registration number: A-0166

Appendix A. Test Equipment

Radiated emission

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	30-Sep-2022	15-Sep-2021
Spectrum analyzer	Agilent Technologies	E4447A	MY46180188	31-Mar-2022	11-Mar-2021
Spectrum analyzer	Agilent Technologies	E4440A	US40420937	31-Dec-2021	11-Dec-2020
Spectrum analyzer	ROHDE&SCHWARZ	FSV40	101731	30-Jun-2022	08-Jun-2021
Preamplifier	SONOMA	310	372170	30-Sep-2022	15-Sep-2021
Loop antenna	ROHDE&SCHWARZ	HFH2-Z2	100515	30-Apr-2022	27-Apr-2021
Attenuator	TOYO Connector	NA-PJ-6	N/A(S507)	28-Feb-2022	03-Feb-2021
Biconical antenna	Schwarzbeck	VHBB9124/BBA9106	1333	31-Dec-2021	15-Dec-2020
Log periodic antenna	Schwarzbeck	VUSLP9111B	345	31-Oct-2021	19-Oct-2020
Log periodic antenna	Schwarzbeck	VUSLP9111B	346	31-Oct-2022	19-Oct-2021
Attenuator	TOYO Connector	NA-PJ-6/dB	N/A(S541)	30-Sep-2022	16-Sep-2021
Attenuator	TAMAGAWA.ELEC	CFA-10/3dB	N/A(S503)	31-Jul-2022	20-Jul-2021
Preamplifier	TSJ	MLA-100M18-B02-40	1929118	31-Dec-2021	15-Dec-2020
Attenuator	AEROFLEX	26A-10	081217-08	31-Dec-2021	14-Dec-2020
Double ridged guide antenna	ETS LINDGREN	3117	00224193	31-Mar-2022	30-Mar-2021
Attenuator	HUBER+SUHNER	6803.17.B	N/A(2340)	31-Dec-2021	15-Dec-2020
Double ridged guide antenna	A.H.Systems Inc.	SAS-574	469	31-Aug-2022	02-Aug-2021
Preamplifier	TSJ	MLA-1840-B03-35	1240332	31-Aug-2022	02-Aug-2021
Microwave cable	HUBER+SUHNER	SUCOFLEX104/9m	MY30037/4	31-Dec-2021	15-Dec-2020
		SUCOFLEX104/1m	my24610/4	31-Dec-2021	15-Dec-2020
		SUCOFLEX104/8m	SN MY30033/4	31-Dec-2021	15-Dec-2020
		SUCOFLEX104/1m	MY32976/4	31-Dec-2021	15-Dec-2020
		SUCOFLEX104/2m	SN MY28404/4	31-Dec-2021	15-Dec-2020
		SUCOFLEX104/7m	41625/6	31-Dec-2021	15-Dec-2020
Notch Filter	Micro-Tronics	BRM50716	006	31-Jul-2022	20-Jul-2021
PC	DELL	DIMENSION E521	75465BX	N/A	N/A
Software	TOYO Corporation	EP5/RE-AJ	0611193/V6.0.140	N/A	N/A
Absorber	RIKEN	PFP30	N/A	N/A	N/A
3m Semi an-echoic Chamber	TOKIN	N/A	N/A(9002-NSA)	31-May-2022	20-May-2021
3m Semi an-echoic Chamber	TOKIN	N/A	N/A(9002-SVSWR)	31-May-2022	20-May-2021

Conducted emission at mains port

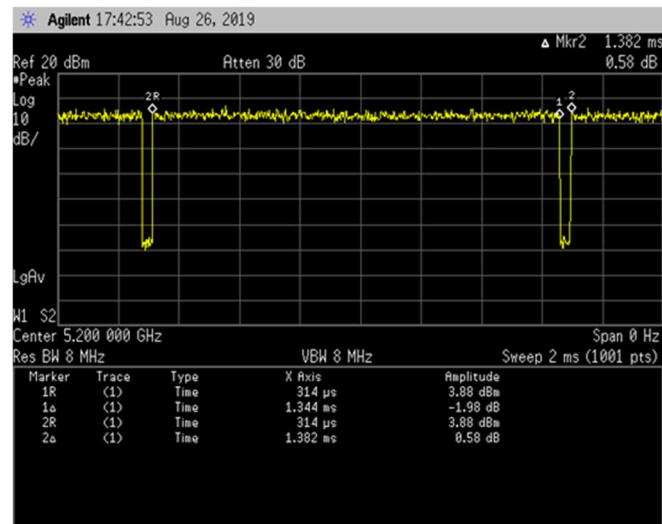
Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	30-Sep-2022	15-Sep-2021
Attenuator	HUBER+SUHNER	6810.01.A	N/A (S411)	31-Dec-2021	15-Dec-2020
Line impedance stabilization network	Kyoritsu Electrical Works, Ltd.	TNW-407F2	12-17-110-2	30-Jun-2022	17-Jun-2021
Coaxial cable	FUJIKURA	5D-2W/4m	N/A (S350)	31-Dec-2021	15-Dec-2020
Coaxial cable	FUJIKURA	5D-2W/1m	N/A (S193)	31-Dec-2021	15-Dec-2020
Coaxial cable	HUBER+SUHNER	RG214/U/10m	N/A (S194)	31-Dec-2021	15-Dec-2020
PC	DELL	DIMENSION	75465BX	N/A	N/A
Software	TOYO Corporation	EP5/CE-AJ	0611193/V5.4.11	N/A	N/A

*: The calibrations of the above equipment are traceable to NIST or equivalent standards of the reference organizations.

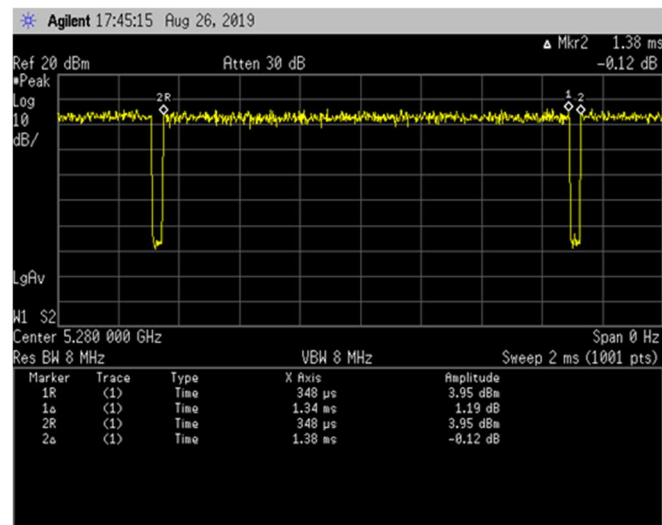
Appendix B. Duty Cycle

[IEEE802.11a]

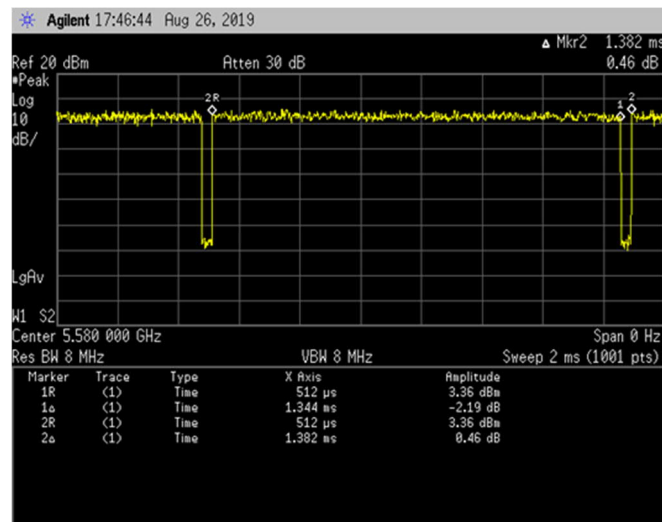
Channel: 40



Channel: 56

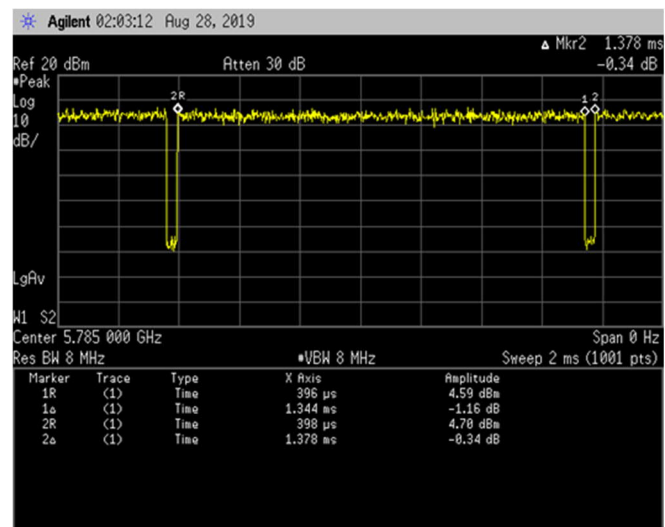


Channel: 116



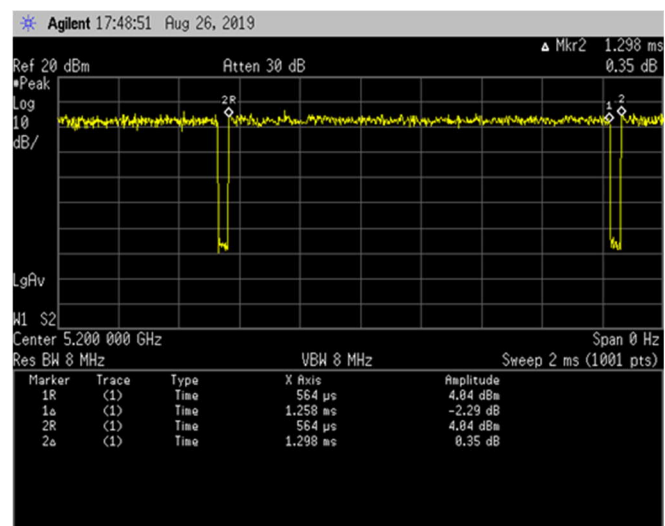
[IEEE802.11a]

Channel: 157

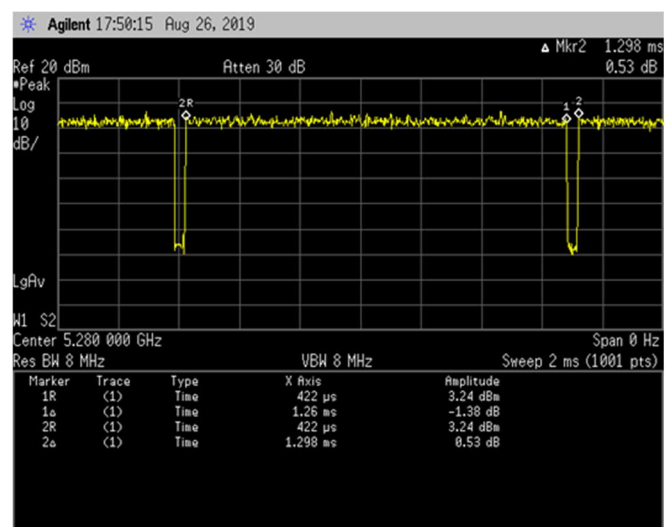


[IEEE802.11n (HT20)]

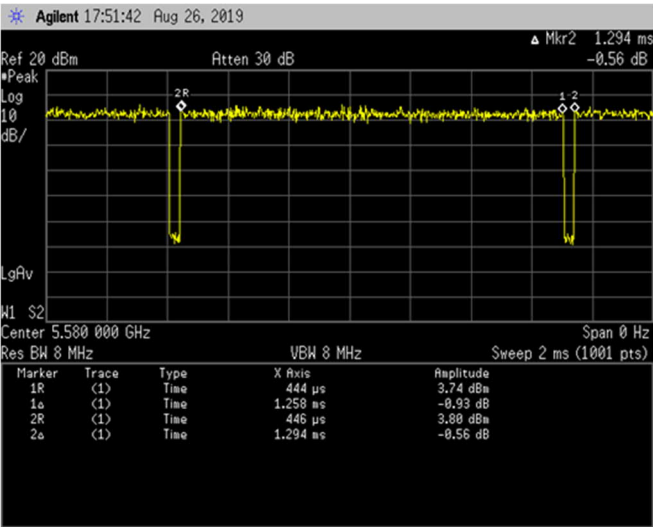
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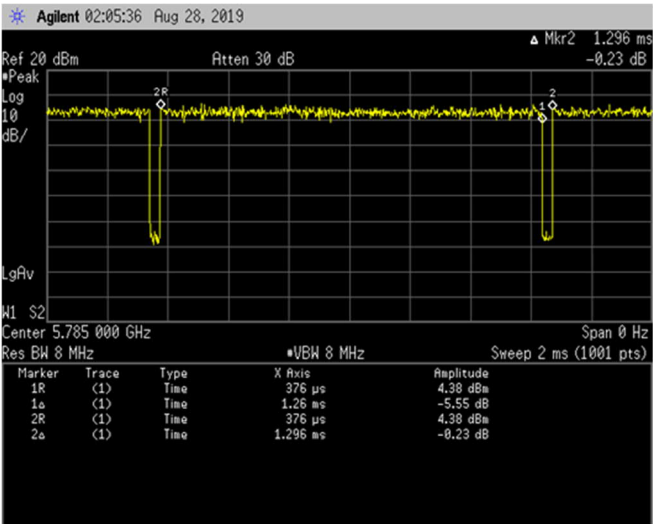
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[IEEE802.11n (HT20)]
Channel: 116



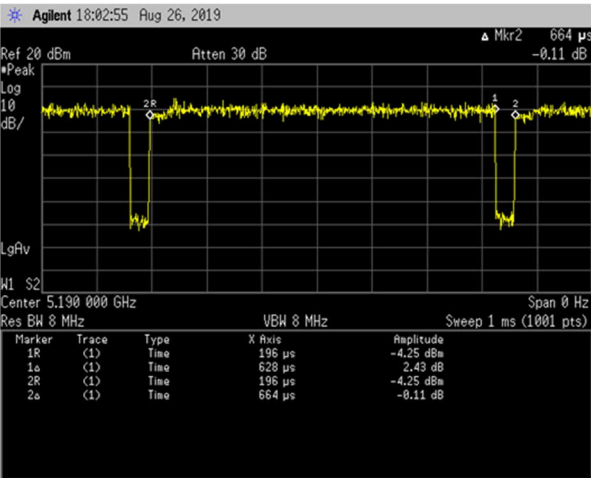
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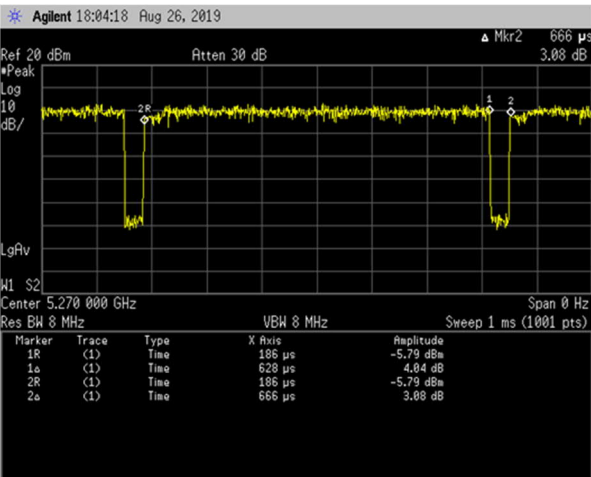


Japan

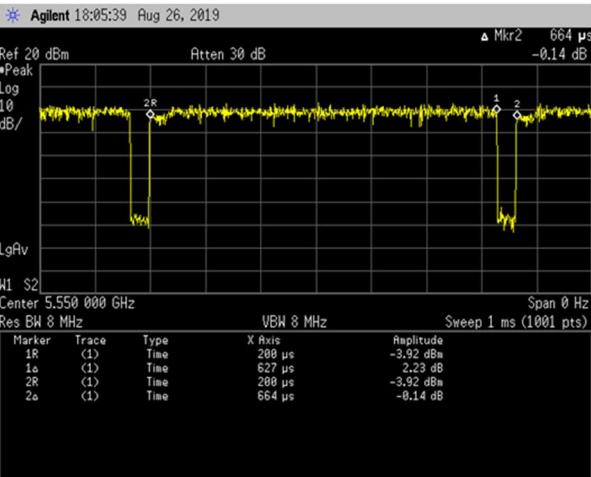
[IEEE802.11n (HT40)]
Channel: 38



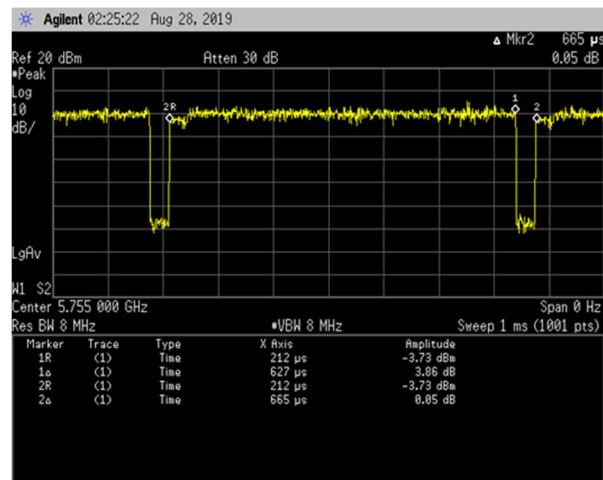
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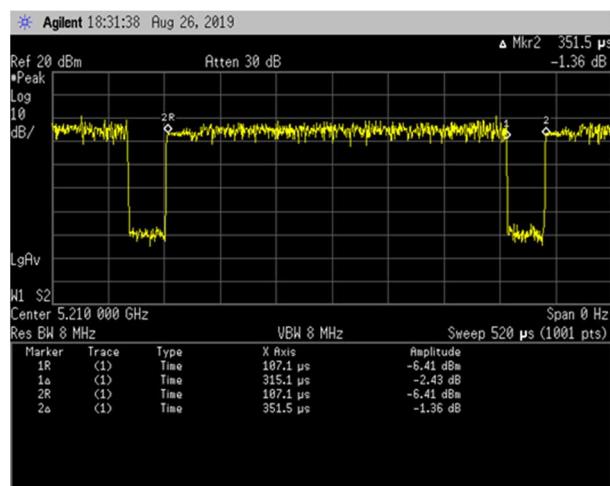
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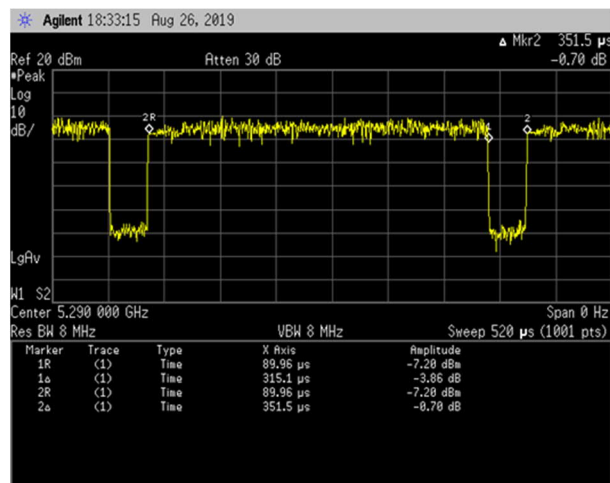
[IEEE802.11n (HT40)]
Channel: 151



[IEEE802.11ac (VHT80)]
Channel: 42



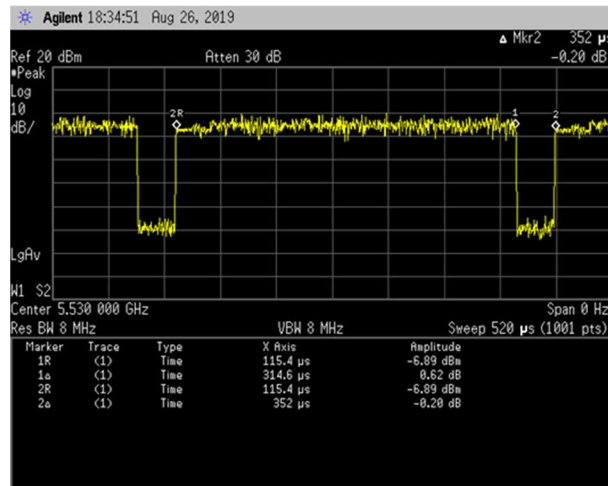
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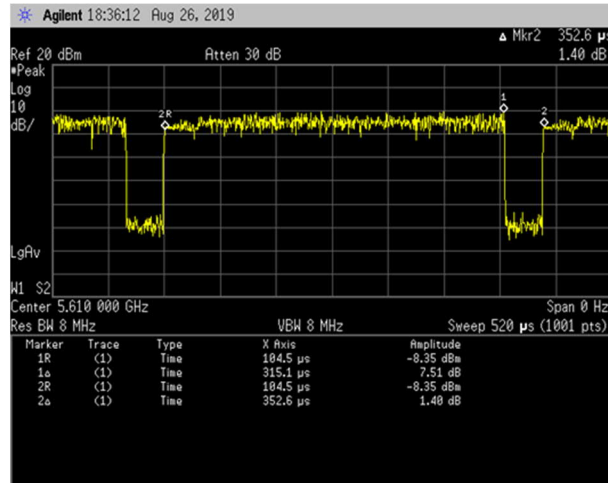


Japan

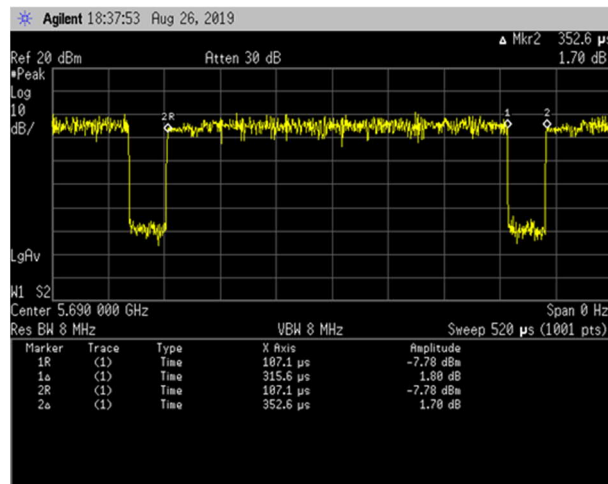
[IEEE802.11ac (VHT80)]
Channel: 106



Channel: 122



Channel: 138





Japan

[IEEE802.11ac (VHT80)]
Channel: 155

