



RADIO TEST REPORT

Test Report No. : 13456926S-A-R2

Applicant : Nintendo Co., Ltd.
Type of EUT : Game console
Model Number of EUT : HEG-001
FCC ID : BKEHEG001
Test regulation : FCC Part 15 Subpart C: 2021
*WLAN2.4 GHz band & Bluetooth Low Energy part
Test Result : Complied (Refer to SECTION 3)

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3. This sample tested is in compliance with the limits of the above regulation.
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6. This test report covers Radio technical requirements.
It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. The all test items in this test report are conducted by UL Japan, Inc. Shonan EMC Lab.
8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
9. The information provided from the customer for this report is identified in SECTION 1.
10. This report is a revised version of 13456926S-A-R1. 13456926S-A-R1 is replaced with this report.

Date of test: August 5, 2020 to June 8, 2021

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CERTIFICATE 1266.03

- The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
 There is no testing item of "Non-accreditation".

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REVISION HISTORY

Original Test Report No.: 13456926S-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	13456926S-A	June 9, 2021	-	-
1	13456926S-A-R1	June 24, 2021	5	Rating of Section 2.1 Identification of EUT: From DC 3.8 V (battery) To DC 3.7 V (battery) DC 5 V to DC 15 V (USB type C)
2	13456926S-A-R2	July 6, 2021	1	Addition of Test regulation “*WLAN2.4 GHz band & Bluetooth Low Energy part”

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Reference: Abbreviations (Including words undescribed in this report)

A2LA	The American Association for Laboratory Accreditation	MCS	Modulation and Coding Scheme
AC	Alternating Current	MRA	Mutual Recognition Arrangement
AFH	Adaptive Frequency Hopping	N/A	Not Applicable
AM	Amplitude Modulation	NIST	National Institute of Standards and Technology
Amp, AMP	Amplifier	NS	No signal detect.
ANSI	American National Standards Institute	NSA	Normalized Site Attenuation
Ant, ANT	Antenna	NVLAP	National Voluntary Laboratory Accreditation Program
AP	Access Point	OBW	Occupied Band Width
ASK	Amplitude Shift Keying	OFDM	Orthogonal Frequency Division Multiplexing
Atten., ATT	Attenuator	P/M	Power meter
AV	Average	PCB	Printed Circuit Board
BPSK	Binary Phase-Shift Keying	PER	Packet Error Rate
BR	Bluetooth Basic Rate	PHY	Physical Layer
BT	Bluetooth	PK	Peak
BT LE	Bluetooth Low Energy	PN	Pseudo random Noise
BW	BandWidth	PRBS	Pseudo-Random Bit Sequence
Cal Int	Calibration Interval	PSD	Power Spectral Density
CCK	Complementary Code Keying	QAM	Quadrature Amplitude Modulation
Ch., CH	Channel	QP	Quasi-Peak
CISPR	Comite International Special des Perturbations Radioelectriques	QPSK	Quadri-Phase Shift Keying
CW	Continuous Wave	RBW	Resolution Band Width
DBPSK	Differential BPSK	RDS	Radio Data System
DC	Direct Current	RE	Radio Equipment
D-factor	Distance factor	RF	Radio Frequency
DFS	Dynamic Frequency Selection	RMS	Root Mean Square
DQPSK	Differential QPSK	RSS	Radio Standards Specifications
DSSS	Direct Sequence Spread Spectrum	Rx	Receiving
EDR	Enhanced Data Rate	SA, S/A	Spectrum Analyzer
EIRP, e.i.r.p.	Equivalent Isotropically Radiated Power	SG	Signal Generator
EMC	ElectroMagnetic Compatibility	SVSWR	Site-Voltage Standing Wave Ratio
EMI	ElectroMagnetic Interference	TR	Test Receiver
EN	European Norm	Tx	Transmitting
ERP, e.r.p.	Effective Radiated Power	VBW	Video BandWidth
EU	European Union	Vert.	Vertical
EUT	Equipment Under Test	WLAN	Wireless LAN
Fac.	Factor		
FCC	Federal Communications Commission		
FHSS	Frequency Hopping Spread Spectrum		
FM	Frequency Modulation		
Freq.	Frequency		
FSK	Frequency Shift Keying		
GFSK	Gaussian Frequency-Shift Keying		
GNSS	Global Navigation Satellite System		
GPS	Global Positioning System		
Hori.	Horizontal		
ICES	Interference-Causing Equipment Standard		
IEC	International Electrotechnical Commission		
IEEE	Institute of Electrical and Electronics Engineers		
IF	Intermediate Frequency		
ILAC	International Laboratory Accreditation Conference		
ISED	Innovation, Science and Economic Development Canada		
ISO	International Organization for Standardization		
JAB	Japan Accreditation Board		
LAN	Local Area Network		
LIMS	Laboratory Information Management System		

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Radio Specification

Wireless LAN, Bluetooth (BR / EDR / Low Energy function) part:

Equipment Type	:	Transceiver
Frequency of Operation	:	Wireless LAN part: (2.4 GHz): 2412 MHz – 2472 MHz, (U-NII-1): 5180 MHz – 5240 MHz, (U-NII-2A): 5260 MHz – 5320 MHz, (U-NII-2C): 5500 MHz – 5700 MHz, (U-NII-3): 5745 MHz- 5825 MHz, Bluetooth (BR / EDR / Low Energy) part: 2402 MHz - 2480 MHz
Radio part clock frequency	:	37.4 MHz
Channel spacing	:	Wireless LAN part: (2.4 GHz): 5 MHz, (5 GHz): 20 MHz, Bluetooth part: (BR / EDR): 1 MHz, (Low Energy): 2 MHz
Type of modulation	:	Wireless LAN part: 2.4 GHz band: DBPSK, DQPSK, CCK, OFDM 5 GHz band: OFDM Bluetooth part: BR: GFSK EDR: $\pi/4$ DQPSK, 8DPSK Low Energy: GFSK
Antenna type	:	LDS antenna
Antenna connector type	:	(Ant: 0): MHF2, (Ant: 1): MHF2
Antenna Gain	:	2.4 GHz band: (Ant: 0): 0.30 dBi, (Ant: 1): 0.19 dBi 5GHz band: (Ant: 0): 4.04 dBi, (Ant: 1): 2.51 dBi
Power supply (radio part input)	:	DC 1.8 V, DC 3.3 V
Operating Temperature	:	+5 deg. C to +35 deg. C

Remarks: This wireless module consists of 1 chip each of 5 GHz band and 2.4 GHz band.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
FCC Part 15 final revised on May 3, 2021 and effective July 2, 2021
* The revision does not affect the test result conducted before its effective date.

Title : FCC 47 CFR Part 15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz,
and 5725-5850 MHz

* Also the EUT complies with FCC Part 15 Subpart B.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.10-2013 6. Standard test methods ----- ISED: RSS-Gen 8.8	FCC: Section 15.207 ----- ISED: RSS-Gen 8.8	17.7 dB 0.19214 MHz, AV, L1 Mode: Tx BT LE 2402 MHz	Complied a)	-
-6dB Bandwidth	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02 ----- ISED: -	FCC: Section 15.247(a)(2) ----- ISED: RSS-247 5.2(a)	See data.	Complied b)	Conducted
Maximum Peak Output Power	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02 ----- ISED: RSS-Gen 6.12	FCC: Section 15.247(b)(3) ----- ISED: RSS-247 5.4(d)		Complied c)	Conducted
Power Density	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02 ----- ISED: -	FCC: Section 15.247(e) ----- ISED: RSS-247 5.2(b)		Complied d)	Conducted
Spurious Emission Restricted Band Edges	FCC: KDB 558074 D01 15.247 Meas Guidance v05r02 ----- ISED: RSS-Gen 6.13	FCC: Section 15.247(d) ----- ISED: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10		0.9 dB 4804 MHz, Peak measurement value with DCCF, Hori. Mode: Tx BT LE 2402 MHz	Complied# e), f)

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.

*1) Radiated test was selected over 30 MHz based on section 15.247(d) and KDB 558074 D01 15.247 Meas Guidance v05r02 8.5 and 8.6.

- a) Refer to APPENDIX 1 (data of Conducted Emission)
b) Refer to APPENDIX 1 (data of 6 dB Bandwidth and 99 % Occupied Bandwidth)
c) Refer to APPENDIX 1 (data of Maximum Peak Output Power)
d) Refer to APPENDIX 1 (data of Power Density)
e) Refer to APPENDIX 1 (data of Conducted Spurious Emission)
f) Refer to APPENDIX 1 (data of Radiated Spurious Emission)

Symbols:

Complied The data of this test item has enough margin, more than the measurement uncertainty.

Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration.

* In case any questions arise about test procedure, ANSI C63.10: 2013 is also referred.

FCC Part 15.31 (e)

This EUT provides the stable voltage constantly to RF Part regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	ISED: RSS-Gen 6.7	ISED: -	N/A	- a)	Conducted

a) Refer to APPENDIX 1 (data of 6 dB Bandwidth and 99 % Occupied Bandwidth)

Other than above, no addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

There is no applicable rule of uncertainty in this applied standard. Therefore, the results are derived depending on whether or not laboratory uncertainty is applied.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k=2$.

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Item	Frequency range	Uncertainty (+/-)		
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.6 dB	2.6 dB	2.56dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	3.0 dB	2.7 dB	2.7 dB
	30 MHz-200 MHz	4.6 dB	4.6 dB	4.6 dB
	200 MHz-1 GHz	6.0 dB	6.0 dB	6.0 dB
	1 GHz-6 GHz	4.8 dB	4.8 dB	4.8 dB
	6 GHz-18 GHz	5.4 dB	5.4 dB	5.4 dB
	18 GHz-40 GHz	5.3 dB	5.3 dB	5.3 dB
Radiated emission (Measurement distance: 1 m)	1 GHz-18 GHz	5.7 dB	5.7 dB	5.7 dB
	18 GHz-40 GHz	5.6 dB	5.6 dB	5.6 dB

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector)_SPM-06	1.4 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	1.6 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.89 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	1.2 dB
Power Measurement above 1 GHz (Average Detector)_SPM-13	0.91 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-13	1.2 dB
Spurious emission (Conducted) below 1GHz	0.87 dB
Spurious emission (Conducted) 1 GHz-3 GHz	0.96 dB
Spurious emission (Conducted) 3 GHz-18 GHz	3.0 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.6 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.2 dB
Bandwidth Measurement	0.012 %
Duty cycle and Time Measurement	0.27 %
Temperature_SCH-01	0.95 deg.C.
Humidity_SCH-01	0.83 %
Temperature_SCH-02	2.0 deg.C.
Humidity_SCH-02	6.6 %
Voltage	0.86 %

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3.5 Test Location

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A2LA Certificate Number: 1266.03
(FCC test firm registration number: 626366, ISED lab company number: 2973D / CAB identifier: JP0001)

Test site	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
No.1 Semi-anechoic chamber	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.2 Semi-anechoic chamber	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.3 Semi-anechoic chamber	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5 m
No.4 Semi-anechoic chamber	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
No.1 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.2 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.3 Shielded room	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
No.4 Shielded room	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
No.5 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.6 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.8 Shielded room	-	3.45 x 5.5 x 2.4	3.45 x 5.5	-
No.1 Measurement room	-	2.55 x 4.1 x 2.5	-	-

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

SECTION 4: Operation of EUT during testing

4.1 Operating Mode(s)

Test operating mode was determined as follows according to “Section 1 of 6 802.11 a/b/g/n testing - Managing Complex Regulatory Approvals - ” of TCB Council Workshop October 2009 and also was judged the necessity of 802.11ac mode by the pre-test.

Mode	Remarks*
IEEE 802.11b (11b)	11 Mbps, PN9
IEEE 802.11g (11g)	48 Mbps, PN9
IEEE 802.11n SISO 20 MHz BW (11n-20 (SISO))	MCS 3, PN9
IEEE 802.OFDM SISO 20 MHz BW (OFDM VHT20 (SISO))	MCS 3, PN9 (2412 MHz – 2462 MHz) MCS 6, PN9 (2467 MHz – 2472 MHz)
IEEE 802.11n MIMO 20 MHz BW (11n-20 (MIMO))	MCS 11, PN9
IEEE 802.OFDM MIMO 20 MHz BW (OFDM VHT20 (MIMO))	MCS 3, PN9
IEEE 802.11n SISO 40 MHz BW (11n-40 (SISO))	MCS 3, PN9
IEEE 802.OFDM SISO 40 MHz BW (OFDM VHT40 (SISO))	MCS 9, PN9
IEEE 802.11n MIMO 40 MHz BW (11n-40 (MIMO))	MCS 11, PN9
IEEE 802.OFDM MIMO 40 MHz BW (OFDM VHT40 (MIMO))	MCS 4, PN9
Bluetooth Low Energy (BT LE)	1M PHY, PN9
*The worst condition was determined based on the test result of Maximum Peak Output Power (Mid Channel)	
*Power of the EUT was set by the software as follows; Power settings: Fixed (refer to power table setting (target power) table) Software: BlueTool.exe Version 1.9.6.5 (Date: 2020.10.22, Storage location: Driven by connected PC) cmd.exe ver.10.0.18362.657 (Date: 2019.3.19, Storage location: Driven by connected PC)	
*This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.	

Power setting (target power) table:

(Wireless LAN)

Bandwidth	Channel frequency	Mode	Rate / MCS mode [dBm]											
			1 M	2 M	5.5 M	11 M	-	-	-	-	-	-		
20 MHz	2412 MHz – 2462 MHz *1)	11b	1 M	2 M	5.5 M	11 M	-	-	-	-	-	-	-	-
			13.5	13.5	13.5	13.5	-	-	-	-	-	-	-	-
	1 M		2 M	5.5 M	11 M	-	-	-	-	-	-	-	-	
	8.5		8.5	8.5	8.5	-	-	-	-	-	-	-	-	
	2467 MHz	11g	1 M	2 M	5.5 M	11 M	-	-	-	-	-	-	-	-
			3.5	3.5	3.5	3.5	-	-	-	-	-	-	-	-
	6 M		9 M	12 M	18 M	24 M	36 M	48 M	54 M	-	-	-	-	
	13.5		13.5	13.5	13.5	13.5	13.5	13.5	13.5	-	-	-	-	
	2472 MHz	11n-20 (SISO)	6 M	9 M	12 M	18 M	24 M	36 M	48 M	54 M	-	-	-	-
			8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	-	-	-	-
	6 M		9 M	12 M	18 M	24 M	36 M	48 M	54 M	-	-	-	-	
	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	-	-	-	-	
	2412 MHz – 2462 MHz	11n-20 (MIMO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	-	-	-	-
			13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	-	-	-	-
	MCS 8		MCS 9	MCS 10	MCS 11	MCS 12	MCS 13	MCS 14	MCS 15	-	-	-	-	
	8.5		8.5	8.5	8.5	8.5	8.5	8.5	8.5	-	-	-	-	
	2467 MHz *2)	OFDM VHT20 (SISO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	-	-	-
			3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	-	-	-
	12.0		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	-	-	-
	8.5		8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	-	-	-
	2472 MHz	OFDM VHT20 (MIMO)	MCS 8	MCS 9	MCS 10	MCS 11	MCS 12	MCS 13	MCS 14	MCS 15	-	-	-	-
			3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	-	-	-
	MCS 0		MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	-	-	-	
	12.0		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	-	-	-
	2412 MHz – 2462 MHz	OFDM VHT40 (SISO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9	-	-
			8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	-	-
	MCS 0		MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9	-	-	
	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	-	-	
	2467 MHz *2)	OFDM VHT40 (MIMO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9	-	-
			8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	-	-
	MCS 0		MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9	-	-	
	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	-	-	
	40 MHz	2422 MHz – 2462 MHz	11n-40 (SISO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	-	-	-
			8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	-	-	-
		2422 MHz – 2462 MHz	11n-40 (MIMO)	MCS 8	MCS 9	MCS 10	MCS 11	MCS 12	MCS 13	MCS 14	MCS 15	-	-	-
			8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	-	-	-
2422 MHz – 2462 MHz	OFDM VHT40 (SISO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9	-	-	
	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	-	-	
2422 MHz – 2462 MHz	OFDM VHT40 (MIMO)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9	-	-	
	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	-	-	

*1) All test are carried out with 14.0 dBm setting regarding worst case although typical power setting is 13.5 dBm.

*2) All test are carried out with 9.0 dBm setting regarding worst case although typical power setting is 8.5 dBm.

(Bluetooth Low Energy)

Channel frequency	Mode	-
2402 MHz – 2480 MHz	BT LE	Fixed

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*The details of Operating mode(s)

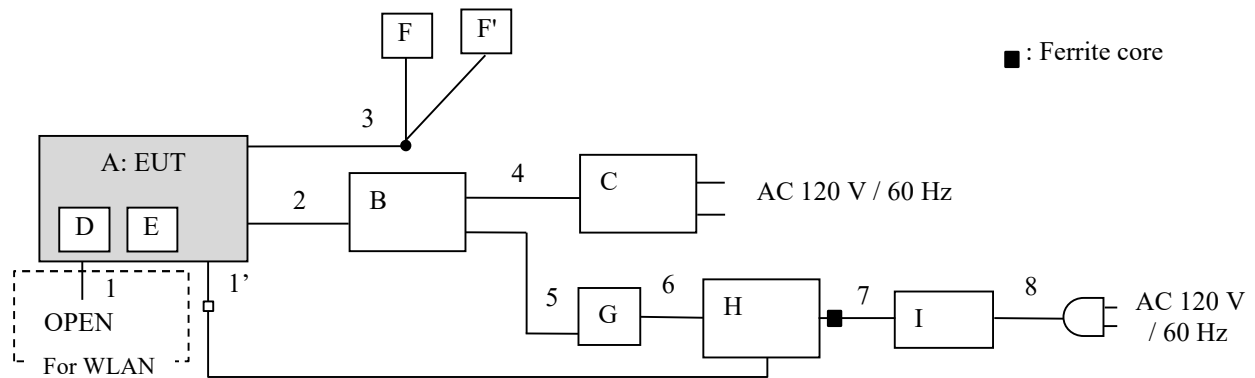
Test Item	Operating Mode	Tested Antenna *3)	Tested frequency
Conducted Emission	Tx BT LE	0	2402 MHz, 2440 MHz, 2480 MHz
	Tx OFDM VHT20 (MIMO)	0 & 1	2412 MHz
Spurious Emission *1)	Tx BT LE	0	2402 MHz, 2440 MHz, 2480 MHz
	Tx 11b	0	2437 MHz, 2462 MHz, 2467 MHz, 2472 MHz
		1	2412 MHz
	Tx OFDM VHT20 (SISO) *2)	0	2412 MHz, 2462 MHz
		1	2467 MHz, 2472 MHz
	Tx OFDM VHT20 (MIMO)	0 & 1	2412 MHz, 2437 MHz, 2462 MHz, 2467 MHz, 2472 MHz
	Tx OFDM VHT40 (SISO) *2)	1	2422 MHz, 2462 MHz
Tx 11n-40 (MIMO)	0 & 1	2422 MHz, 2442 MHz, 2462 MHz	
Maximum Peak Output Power, Power Density	Tx BT LE	0	2402 MHz, 2440 MHz, 2480 MHz
	Tx 11b, Tx 11g, Tx 11n-20 (SISO), Tx OFDM VHT20 (SISO), Tx 11n-20 (MIMO), Tx OFDM VHT20 (MIMO)	0 & 1	2412 MHz, 2437 MHz, 2462 MHz, 2467 MHz, 2472 MHz
		Tx 11n-40 (SISO), Tx OFDM VHT40 (SISO), Tx 11n-40 (MIMO), Tx OFDM VHT40 (MIMO)	0 & 1
-6 dB Bandwidth, 99 % Occupied Bandwidth	Tx BT LE	0	2402 MHz, 2440 MHz, 2480 MHz
	Tx 11b, Tx 11g, Tx 11n-20 (SISO), Tx OFDM VHT20 (SISO)	0	2412 MHz, 2437 MHz, 2462 MHz
		1	2467 MHz, 2472 MHz
	Tx 11n-20 (MIMO), Tx OFDM VHT20 (MIMO)	1	2412 MHz, 2437 MHz, 2462 MHz, 2467 MHz, 2472 MHz
		Tx 11n-40 (SISO), Tx OFDM VHT40 (SISO)	1
	Tx 11n-40 (MIMO), Tx OFDM VHT40 (MIMO)	1	2422 MHz, 2442 MHz, 2462 MHz

*1) Spurious Emission test was measured representative mode for highest EIRP power in 11g, 11n and OFDM.

*2) This mode wasn't worst, but only band edge of spurious emissions were measured for confirmation.

*3) The test was performed with the antenna that had higher EIRP power (for Spurious Emission test) or higher conducted power (-6 dB Bandwidth and 99 % Occupied Bandwidth test) as a representative.

4.2 Configuration and peripherals



* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

*As a result of comparing AC 120 V and AC 240 V at pre-check, conducted emission test was performed with AC 120 V of the worst voltage as representative.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Game console	HEG-001	XTW01000001073 *1) XTW01000011188 *2)	Nintendo Co., Ltd.	EUT
B	SDEV Cradle	HAT-003	XZL01000080825 *1) XZL01000079720 *2)	Nintendo Co., Ltd.	-
C	AC Adapter	HAC-002	-	Nintendo Co., Ltd.	-
D	Game Card	HAC-008	DFCAA22L000	Nintendo Co., Ltd.	-
E	Micro SD Card	-	-	Transcend	-
F, F'	Headphone	-	-	Nintendo Co., Ltd.	*2)
G	GIGA Ethernet Adapter	LAN-GTJU3	67L349603587A	Logitec	*1)
		LUA4-U3-AGT	20227871127320	Buffalo	*2)
H	Laptop PC	CF-S10AWNDS	1EKSA54822	Panasonic	*1)
		CF-SV8RDCVS	0BKSC77598	Panasonic	*2)
I	AC Adapter	CF-AA6402A M1	6402AM111143479A	Panasonic	*1)
		CF-AA6532A M1	6532AM119Y36338A	Panasonic	*2)

*1) Used for Antenna Terminal conducted test.

*2) Used for Conducted Emission test and Radiated Emission test.

List of cables used

No.	Cable Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Signal	0.05 *4)	Unshielded	Unshielded	*3)
1'		0.05 + 1.8			
2	USB	0.4	Shielded	Shielded	-
3	Headphone	0.9	Unshielded	Unshielded	-
4	USB	1.5	Shielded	Shielded	-
5	USB	0.1 *1) 0.15 *2)	Shielded	Shielded	-
6	LAN	1.0	Unshielded	Unshielded	-
7	DC	0.9	Unshielded	Unshielded	-
8	AC	0.8	Unshielded	Unshielded	-

*1) Used for Antenna Terminal conducted test.

*2) Used for Conducted Emission test and Radiated Emission test.

*3) Cable for test operation during the development, not used for the product.

*4) For WLAN test.

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane. The rear of tabletop was located 40 cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80 cm from a Line Impedance Stabilization Network (LISN) / Artificial mains Network (AMN) and excess AC cable was bundled in center.

I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. All unused 50ohm connectors of the LISN (AMN) were resistivity terminated in 50 ohm when not connected to the measuring equipment.

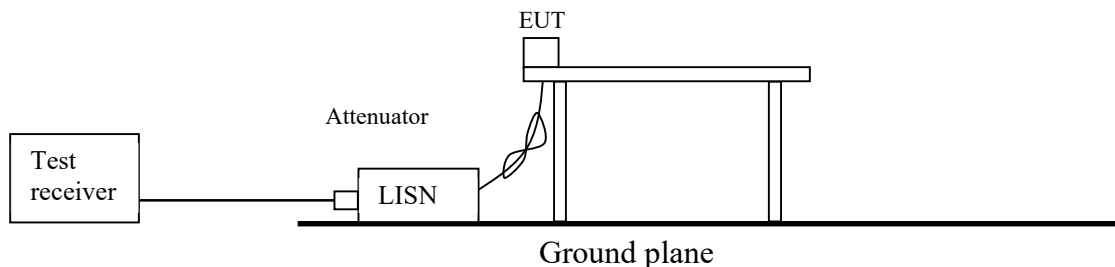
The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber. The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

The test results and limit are rounded off to one decimal place, so some differences might be observed.

Detector	: QP and CISPR AV
Measurement range	: 0.15 MHz - 30 MHz
Test data	: APPENDIX
Test result	: Pass

Figure 1: Test Setup



SECTION 6: Radiated Spurious Emission

Test Procedure

It was measured based on "8.5 and 8.6 of KDB 558074 D01 15.247 Meas Guidance v05r02".

[For below 1 GHz]

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[For above 1 GHz]

EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 1.5 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with absorbent materials lined on a ground plane.

The height of the measuring antenna varied between 1 m and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.

Test antenna was aimed at the EUT for receiving the maximum signal and always kept within the illumination area of the 3 dB beamwidth of the antenna.

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.

The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).

The test was made with the detector (RBW/VBW) in the following table.

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Test Antennas are used as below;

Frequency	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

In any 100 kHz bandwidth outside the restricted band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

20 dBc was applied to the frequency over the limit of FCC 15.209 / Table 4 of RSS-Gen 8.9(ISED) and outside the restricted band of FCC15.205 / Table 6 of RSS-Gen 8.10 (ISED).

Frequency	Below 1 GHz	Above 1 GHz		20 dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	[BT LE part] *1) - [WLAN part] *2) 11.12.2.5.2 RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (Linear voltage) Trace: 100 traces Duty factor was added to the results.	RBW: 100 kHz VBW: 300 kHz

*1) Measurement with Average detector was not performed. The limit for Average detector is applied to the measurement value with Peak detector used Duty cycle correction factor (DCCF).

*2) Average Power Measurement was performed based on ANSI C63.10-2013.

UL Japan, Inc.

Shonan EMC Lab.

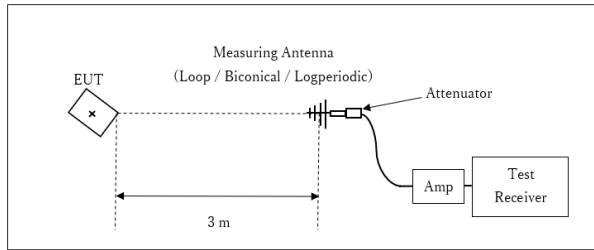
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Figure 2: Test Setup

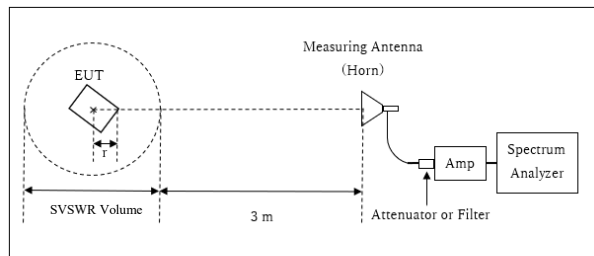
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz - 10 GHz



r : Radius of an outer periphery of EUT

× : Center of turn table

Distance Factor: $20 \times \log(3.9 \text{ m} / 3.0 \text{ m}) = 2.28 \text{ dB}$

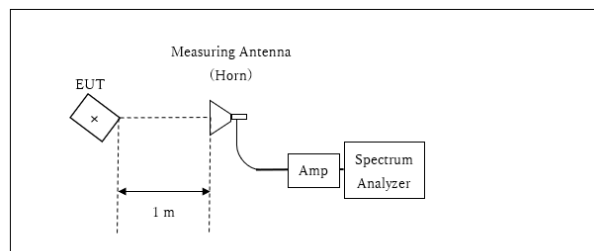
* Test Distance: $(3 + \text{SVSWR Volume} / 2) - r = 3.9 \text{ m}$

SVSWR Volume : 2.0 m

(SVSWR Volume has been calibrated based on CISPR 16-1-4.)

$r = 0.1 \text{ m}$

10 GHz – 26.5 GHz



× : Center of turn table

Distance Factor: $20 \times \log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$

*Test Distance: 1 m

The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

[BT LE]

Antenna polarization	Carrier	Spurious (30 MHz - 1 GHz)	Spurious (1 GHz - 2.8 GHz)	Spurious (2.8 GHz - 10 GHz)	Spurious (10 GHz - 18 GHz)	Spurious (18 GHz - 26.5 GHz)
Horizontal	Z	Y	Z	Z	X	X
Vertical	Z	Y	Z	Y	X	X

[WLAN (SISO) Ant 0]

Antenna polarization	Carrier	Spurious (1 GHz - 2.8 GHz)	Spurious (2.8 GHz - 10 GHz)	Spurious (10 GHz - 18 GHz)	Spurious (18 GHz - 26.5 GHz)
Horizontal	Y	Y	Z	X	X
Vertical	Z	Z	Y	X	X

[WLAN (SISO) Ant 1]

Antenna polarization	Carrier	Spurious (1 GHz - 2.8 GHz)	Spurious (2.8 GHz - 10 GHz)	Spurious (10 GHz - 18 GHz)	Spurious (18 GHz - 26.5 GHz)
Horizontal	Z	Z	Z	X	X
Vertical	Y	Y	Z	X	X

[WLAN (MIMO)]

Antenna polarization	Carrier	Spurious (30 MHz - 1 GHz)	Spurious (1 GHz - 2.8 GHz)	Spurious (2.8 GHz - 10 GHz)	Spurious (10 GHz - 18 GHz)	Spurious (18 GHz - 26.5 GHz)
Horizontal	Y	Y	Y	Z	X	X
Vertical	Z	Y	Z	Y	X	X

The test results and limit are rounded off to one decimal place, so some differences might be observed.

Measurement range : 30 MHz - 26.5 GHz
Test data : APPENDIX
Test result : Pass

SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

The tests were made with below setting connected to the antenna port.

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
-6dB Bandwidth	(BT LE) 10 MHz (WLAN) 50 MHz, 100 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth *1)	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak/ Average *2)	-	Power Meter (Sensor: 160 MHz BW)
Peak Power Density	1.5 times the 6dB Bandwidth	3 kHz	9.1 kHz	Auto	Peak	Max Hold	Spectrum Analyzer *3)
Conducted Spurious Emission *4) *5)	9kHz to 150kHz 150kHz to 30MHz	200 Hz 10 kHz	620 Hz 30 kHz	Auto	Peak	Max Hold	Spectrum Analyzer

*1) Peak hold was applied as Worst-case measurement.
*2) Reference data
*3) Section 11.10.2 Method PKPSD (peak PSD) of "ANSI C63.10-2013".
*4) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents.
Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart.
(9 kHz - 150 kHz: RBW = 200 Hz, 150 kHz - 30 MHz: RBW = 10 kHz)
*5) The limits in CFR 47, Part 15, Subpart C, paragraph 15.209(a), are identical to those in RSS-Gen section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377 Ohms. For example, the measurement at frequency 9 kHz resulted in a level of 45.5 dBuV/m, which is equivalent to $45.5 - 51.5 = -6.0$ dBuA/m, which has the same margin, 3 dB, to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limit.

The test results and limit are rounded off to two decimals place, so some differences might be observed.
The equipment and cables were not used for factor 0 dB of the data sheets.

Test data : APPENDIX
Test result : Pass

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room

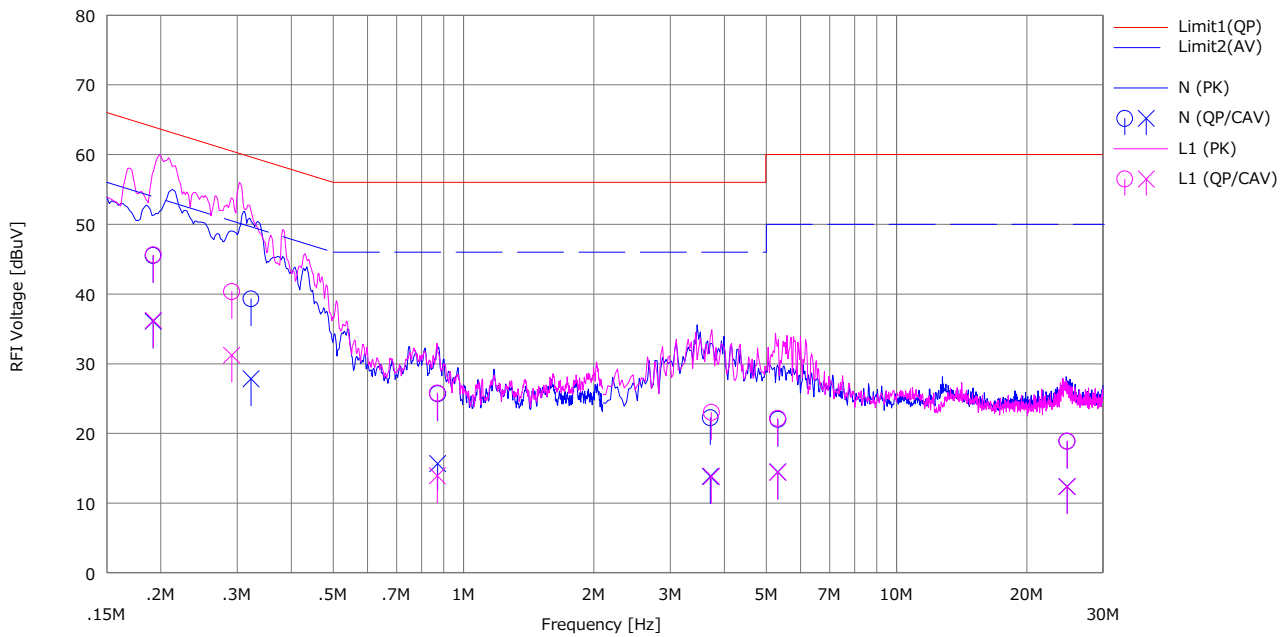
Date : 2021/02/14

Company : Nintendo Co., Ltd.
 Kind of EUT : Game console
 Model No. : HEG-001
 Serial No. : XTW01000011188
 Remarks : -

Mode : Tx BT LE 2402 MHz
 Order No. : 13456926S
 Power : AC 120 V / 60 Hz(AC adapter input)
 Temp./Humi. : 25 deg.C / 31 %RH

Limit : FCC_Part 15 Subpart C(15.207)

Engineer : Kenichi Adachi



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP>	<CAV>		<QP>	<CAV>	<QP>	<AV>	<QP>	<AV>		
		[dBuV]	[dBuV]		[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.19178	32.94	23.52	12.58	45.52	36.10	63.96	53.96	18.4	17.8	N	
2	0.32288	26.72	15.24	12.59	39.31	27.83	59.63	49.63	20.3	21.8	N	
3	0.87142	13.04	3.02	12.65	25.69	15.67	56.00	46.00	30.3	30.3	N	
4	3.71528	9.34	0.92	12.92	22.26	13.84	56.00	46.00	33.7	32.1	N	
5	5.31976	8.94	1.42	13.07	22.01	14.49	60.00	50.00	37.9	35.5	N	
6	24.75581	4.57	-1.92	14.31	18.88	12.39	60.00	50.00	41.1	37.6	N	
7	0.19214	33.04	23.64	12.58	45.62	36.22	63.94	53.94	18.3	17.7	L1	
8	0.29141	27.74	18.62	12.60	40.34	31.22	60.48	50.48	20.1	19.2	L1	
9	0.86990	13.12	1.28	12.66	25.78	13.94	56.00	46.00	30.2	32.0	L1	
10	3.73641	10.11	0.92	12.90	23.01	13.82	56.00	46.00	32.9	32.1	L1	
11	5.31384	9.12	1.42	13.02	22.14	14.44	60.00	50.00	37.8	35.5	L1	
12	24.75581	4.74	-1.81	14.16	18.90	12.35	60.00	50.00	41.1	37.6	L1	

Calculation: Result[dBuV]=Reading[dBuV]+C.Fac(LISN+Cable+ATT)[dB]
 LISN: SLS-02 with Extention cable

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room

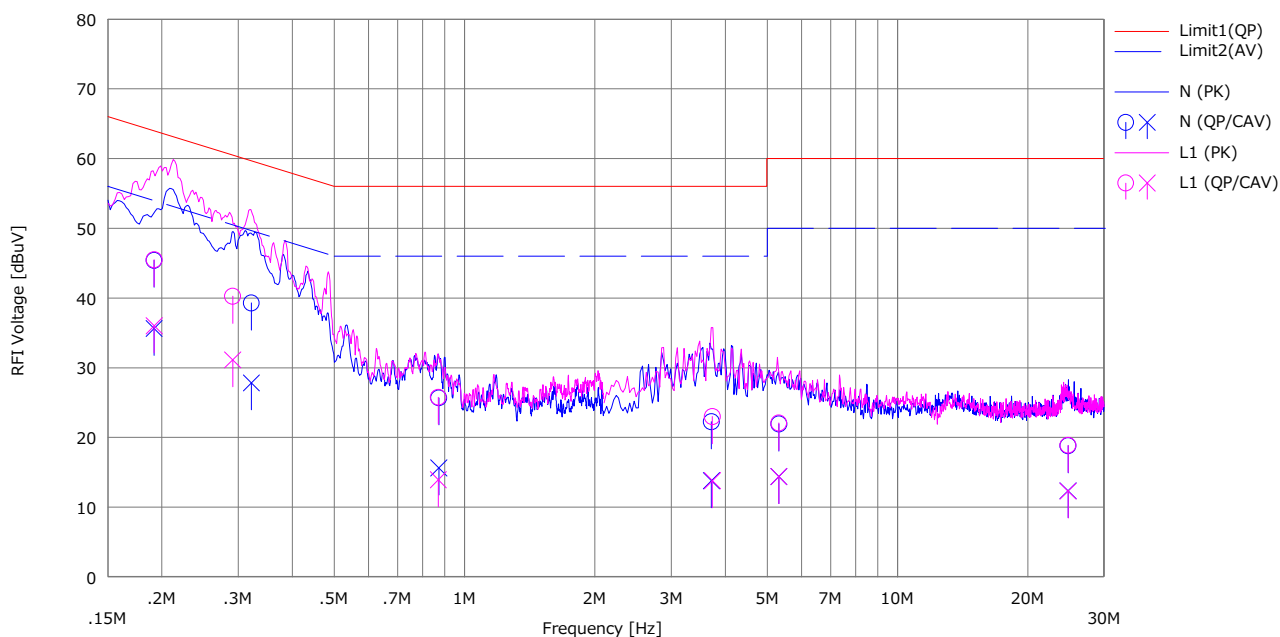
Date : 2021/02/14

Company : Nintendo Co., Ltd.
 Kind of EUT : Game console
 Model No. : HEG-001
 Serial No. : XTW01000011188
 Remarks : -

Mode : Tx BT LE 2440 MHz
 Order No. : 13456926S
 Power : AC 120 V / 60 Hz(AC adapter input)
 Temp./Humi. : 25 deg.C / 31 %RH

Limit : FCC_Part 15 Subpart C(15.207)

Engineer : Kenichi Adachi



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP>	<CAV>		<QP>	<CAV>	<QP>	<AV>	<QP>	<AV>		
		[dBuV]	[dBuV]		[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.19187	32.82	23.04	12.58	45.40	35.62	63.96	53.96	18.5	18.3	N	
2	0.32190	26.70	15.22	12.59	39.29	27.81	59.66	49.66	20.3	21.8	N	
3	0.87183	13.02	2.98	12.65	25.67	15.63	56.00	46.00	30.3	30.3	N	
4	3.71563	9.32	0.86	12.92	22.24	13.78	56.00	46.00	33.7	32.2	N	
5	5.31988	8.86	1.32	13.07	21.93	14.39	60.00	50.00	38.0	35.6	N	
6	24.75384	4.48	-1.96	14.31	18.79	12.35	60.00	50.00	41.2	37.6	N	
7	0.19211	32.92	23.44	12.58	45.50	36.02	63.94	53.94	18.4	17.9	L1	
8	0.29144	27.66	18.52	12.60	40.26	31.12	60.48	50.48	20.2	19.3	L1	
9	0.86987	13.10	1.26	12.66	25.76	13.92	56.00	46.00	30.2	32.0	L1	
10	3.73654	10.08	0.89	12.90	22.98	13.79	56.00	46.00	33.0	32.2	L1	
11	5.31823	9.04	1.36	13.03	22.07	14.39	60.00	50.00	37.9	35.6	L1	
12	24.75384	4.72	-1.86	14.16	18.88	12.30	60.00	50.00	41.1	37.7	L1	

Calculation: Result[dBuV]=Reading[dBuV]+C.Fac(LISN+Cable+ATT)[dB]
 LISN: SLS-02 with Extention cable

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room

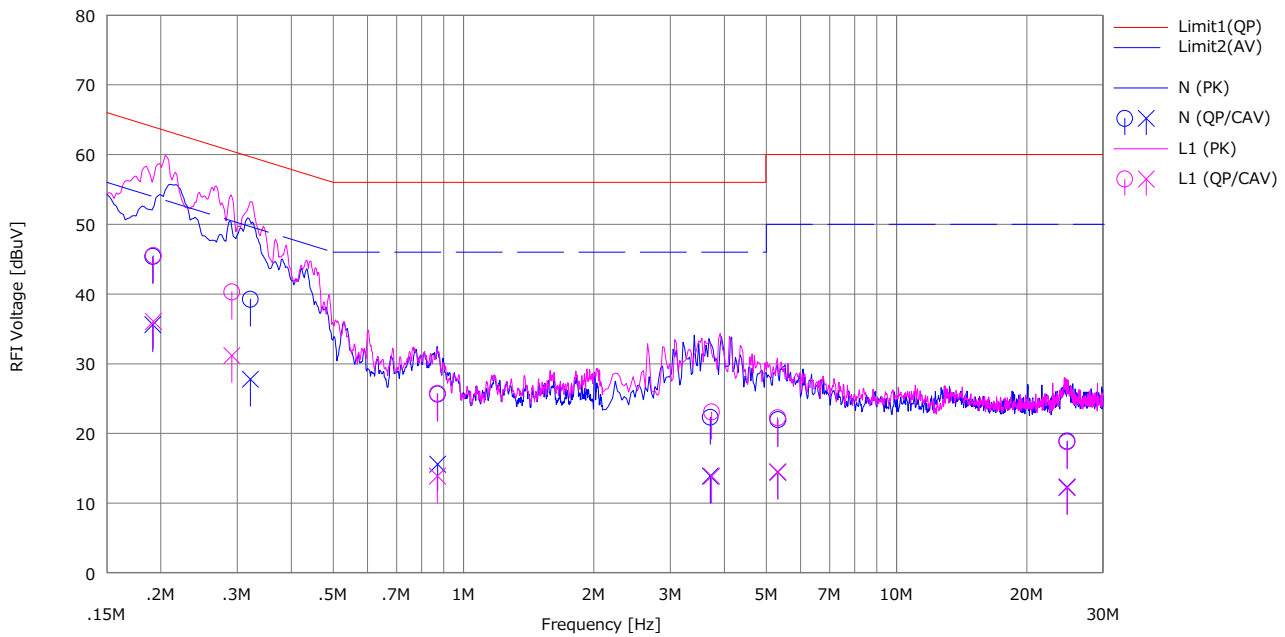
Date : 2021/02/14

Company : Nintendo Co., Ltd.
 Kind of EUT : Game console
 Model No. : HEG-001
 Serial No. : XTW01000011188
 Remarks : -

Mode : Tx BT LE 2480 MHz
 Order No. : 13456926S
 Power : AC 120 V / 60 Hz(AC adapter input)
 Temp./Humi. : 25 deg.C / 31 %RH

Limit : FCC_Part 15 Subpart C(15.207)

Engineer : Kenichi Adachi



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP>	<CAV>		<QP>	<CAV>	<QP>	<AV>	<QP>	<AV>		
		[dBuV]	[dBuV]		[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.19168	32.80	23.02	12.58	45.38	35.60	63.96	53.96	18.5	18.3	N	
2	0.32190	26.66	15.18	12.59	39.25	27.77	59.66	49.66	20.4	21.8	N	
3	0.87086	12.98	2.94	12.65	25.63	15.59	56.00	46.00	30.3	30.4	N	
4	3.71528	9.40	0.96	12.92	22.32	13.88	56.00	46.00	33.6	32.1	N	
5	5.31966	8.90	1.38	13.07	21.97	14.45	60.00	50.00	38.0	35.5	N	
6	24.75611	4.58	-1.99	14.31	18.89	12.32	60.00	50.00	41.1	37.6	N	
7	0.19225	32.94	23.48	12.58	45.52	36.06	63.94	53.94	18.4	17.8	L1	
8	0.29165	27.69	18.57	12.60	40.29	31.17	60.48	50.48	20.1	19.3	L1	
9	0.87025	13.08	1.22	12.66	25.74	13.88	56.00	46.00	30.2	32.1	L1	
10	3.73847	10.18	0.96	12.90	23.08	13.86	56.00	46.00	32.9	32.1	L1	
11	5.31392	9.22	1.48	13.02	22.24	14.50	60.00	50.00	37.7	35.5	L1	
12	24.75611	4.62	-1.96	14.16	18.78	12.20	60.00	50.00	41.2	37.8	L1	

Calculation: Result[dBuV]=Reading[dBuV]+C.Fac(LISN+Cable+ATT)[dB]
 LISN: SLS-02 with Extention cable

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room

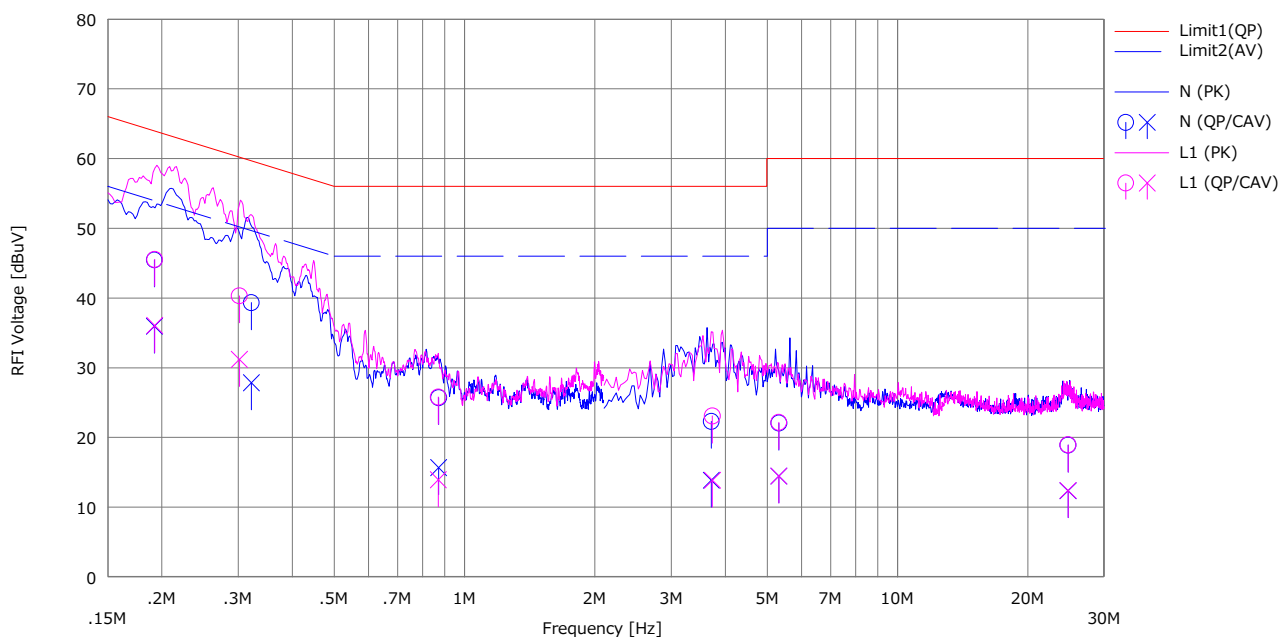
Date :2021/02/14

Company : Nintendo Co., Ltd.
 Kind of EUT : Game console
 Model No. : HEG-001
 Serial No. : XTW01000011188
 Remarks : -

Mode : Tx OFDM VHT20, MIMO, 2412 MHz
 Order No. : 13456926S
 Power : AC 120 V / 60 Hz(AC adapter input)
 Temp./Humi. : 25 deg.C / 31 %RH

Limit : FCC_Part 15 Subpart C(15.207)

Engineer : Kenichi Adachi



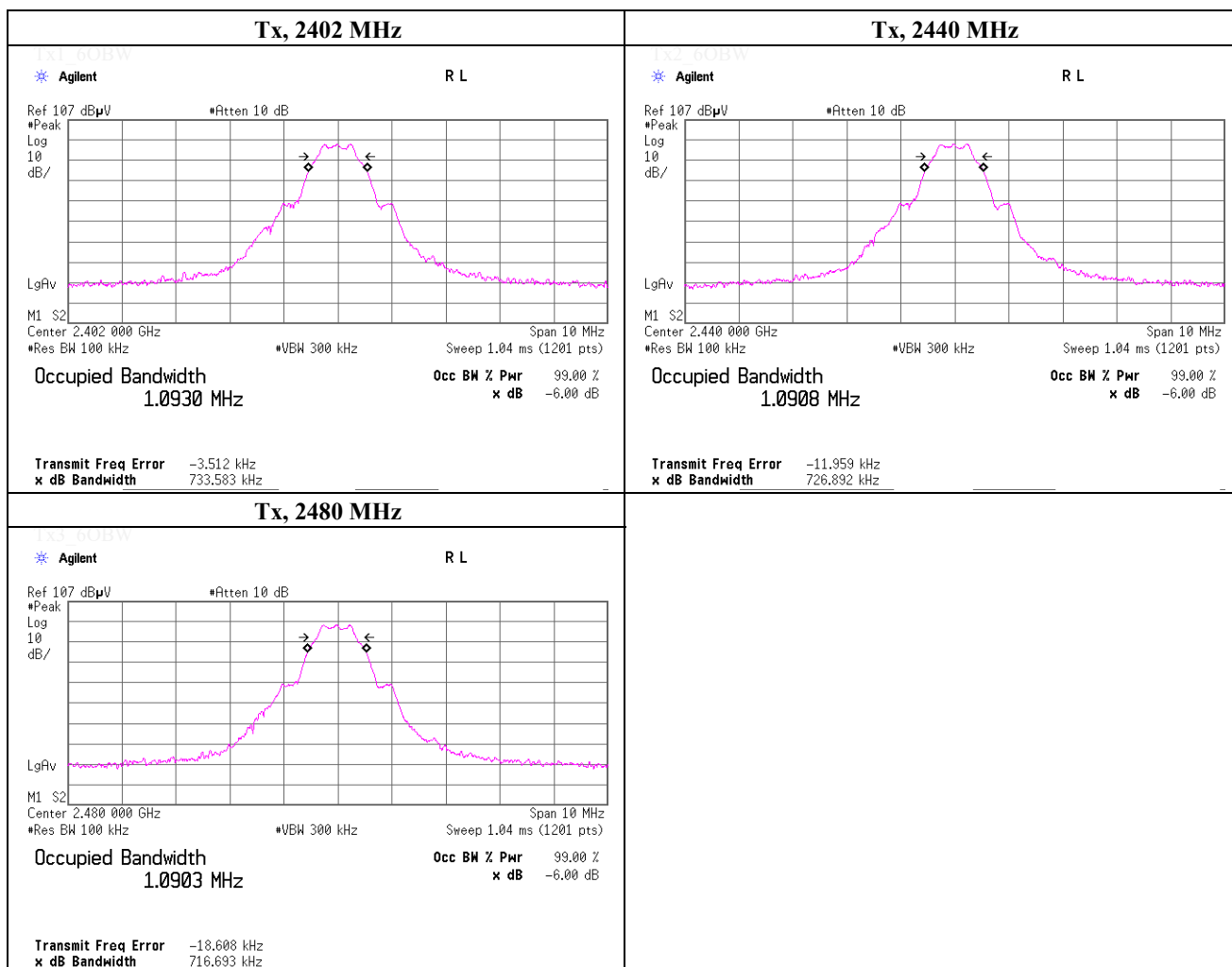
No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP>	<CAV>		<QP>	<CAV>	<QP>	<AV>	<QP>	<AV>		
		[dBuV]	[dBuV]		[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.19225	32.88	23.38	12.58	45.46	35.96	63.94	53.94	18.4	17.9	N	
2	0.32192	26.74	15.25	12.59	39.33	27.84	59.66	49.66	20.3	21.8	N	
3	0.87168	13.06	3.01	12.65	25.71	15.66	56.00	46.00	30.2	30.3	N	
4	3.71378	9.38	0.95	12.92	22.30	13.87	56.00	46.00	33.7	32.1	N	
5	5.31934	8.98	1.39	13.07	22.05	14.46	60.00	50.00	37.9	35.5	N	
6	24.75598	4.59	-1.97	14.31	18.90	12.34	60.00	50.00	41.1	37.6	N	
7	0.19248	32.95	23.49	12.58	45.53	36.07	63.93	53.93	18.4	17.8	L1	
8	0.30194	27.71	18.59	12.60	40.31	31.19	60.19	50.19	19.8	19.0	L1	
9	0.86989	13.12	1.28	12.66	25.78	13.94	56.00	46.00	30.2	32.0	L1	
10	3.73621	10.18	0.96	12.90	23.08	13.86	56.00	46.00	32.9	32.1	L1	
11	5.31692	9.14	1.44	13.03	22.17	14.47	60.00	50.00	37.8	35.5	L1	
12	24.75598	4.77	-1.77	14.16	18.93	12.39	60.00	50.00	41.0	37.6	L1	

Calculation: Result[dBuV]=Reading[dBuV]+C.Fac(LISN+Cable+ATT)[dB]
 LISN: SLS-02 with Extention cable

-6 dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	August 18, 2020	
Temperature / Humidity	24 deg.C , 48 %RH	
Engineer	Yusuke Tanikawara	
Mode	Tx, Bluetooth Low Energy, PRBS9	

Freq. [MHz]	-6 dB Bandwidth [MHz]	Limit [MHz]
2402.0000	0.734	> 0.500
2440.0000	0.727	> 0.500
2480.0000	0.717	> 0.500

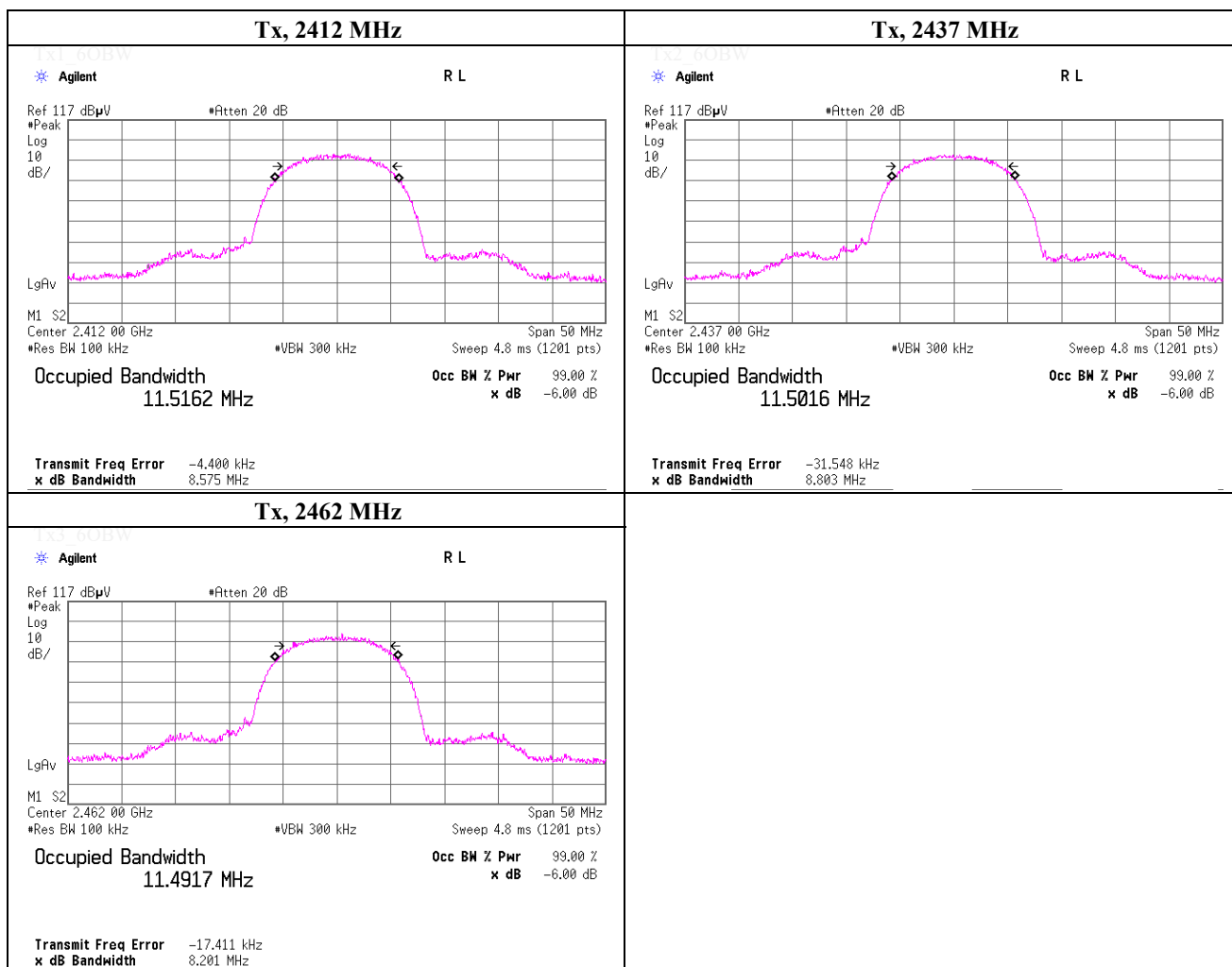


UL Japan, Inc.
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 Telephone : +81 463 50 6400
 Facsimile : +81 463 50 6401

-6 dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	January 8, 2021	
Temperature / Humidity	23 deg.C , 40 %RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11b, PN9, worst antenna port 0, worst data mode 11 Mbps	

Freq. [MHz]	-6 dB Bandwidth [MHz]	Limit [MHz]
2412.0000	8.575	> 0.500
2437.0000	8.803	> 0.500
2462.0000	8.201	> 0.500



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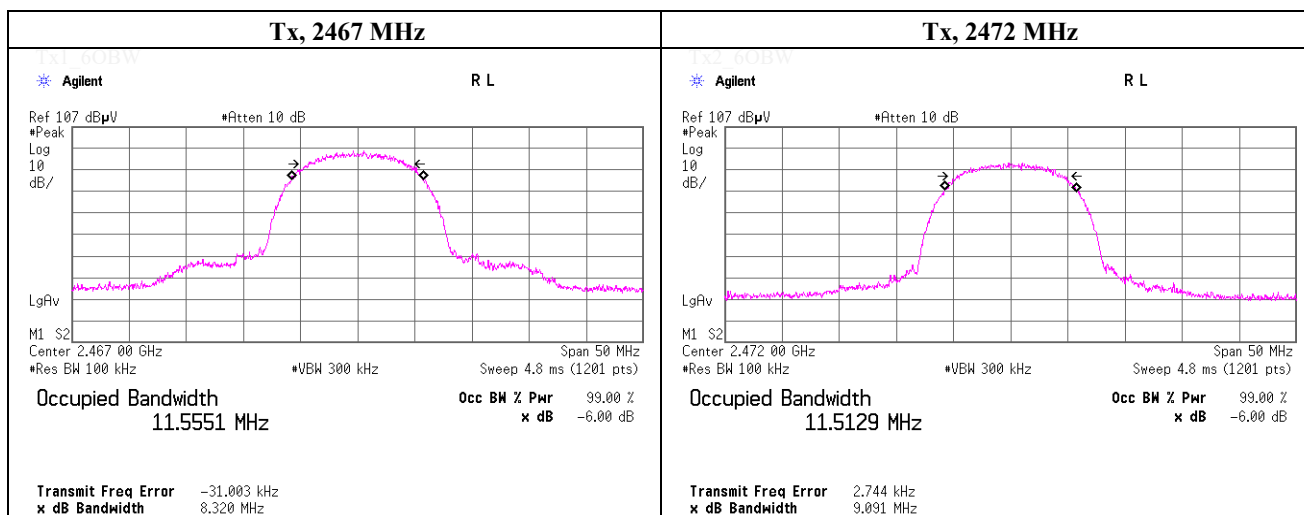
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

-6 dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	August 20, 2020	
Temperature / Humidity	25 deg.C , 40 %RH	
Engineer	Yusuke Tanikawara	
Mode	Tx, IEEE802.11b, PN9, worst antenna port 1, worst data mode 11 Mbps	

Freq. [MHz]	-6 dB Bandwidth [MHz]	Limit [MHz]
2467.0000	8.320	> 0.500
2472.0000	9.091	> 0.500
-	-	-



Tx3_60BW

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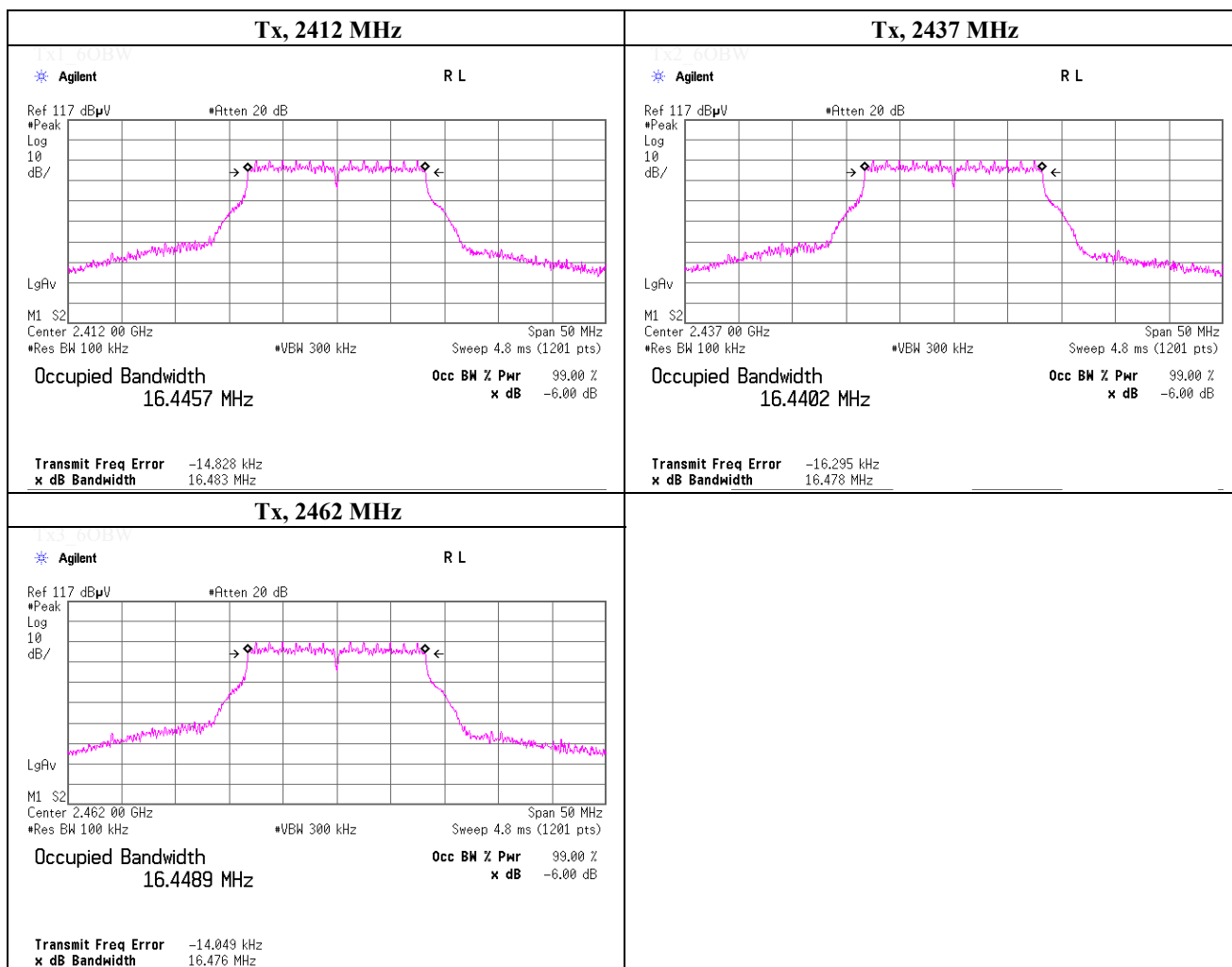
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

-6 dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	January 8, 2021	
Temperature / Humidity	23 deg.C , 40 %RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11g, PN9, worst antenna port 0, worst data mode 48 Mbps	

Freq. [MHz]	-6 dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.483	> 0.500
2437.0000	16.478	> 0.500
2462.0000	16.476	> 0.500



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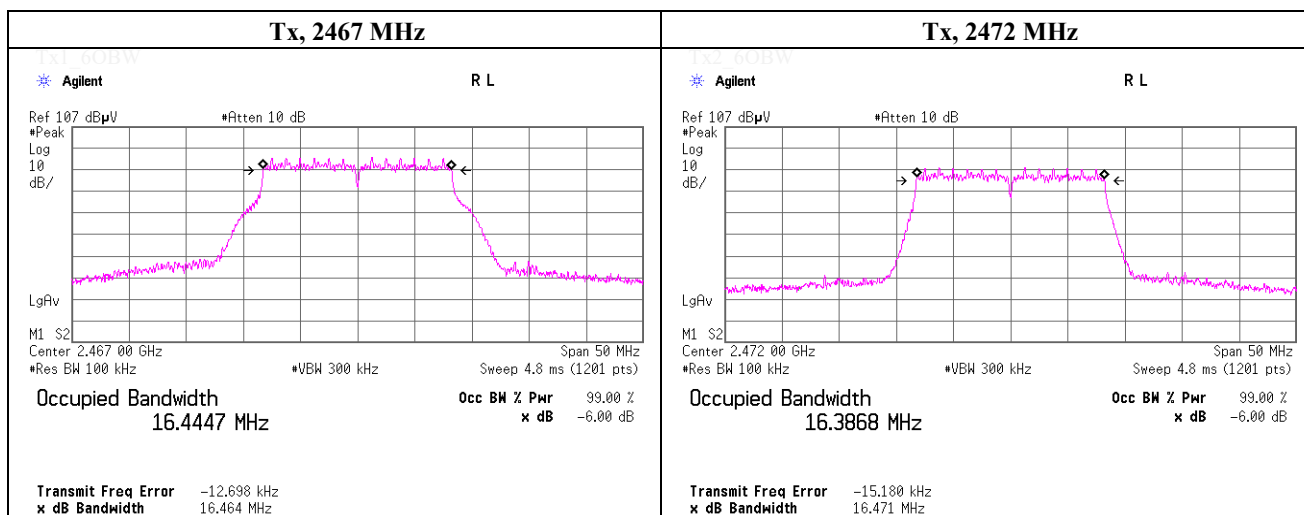
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

-6 dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	August 20, 2020	
Temperature / Humidity	25 deg.C , 40 %RH	
Engineer	Yusuke Tanikawara	
Mode	Tx, IEEE802.11g, PN9, worst antenna port 1, worst data mode 48 Mbps	

Freq. [MHz]	-6 dB Bandwidth [MHz]	Limit [MHz]
2467.0000	16.464	> 0.500
2472.0000	16.471	> 0.500
-	-	-



Tx3_60BW

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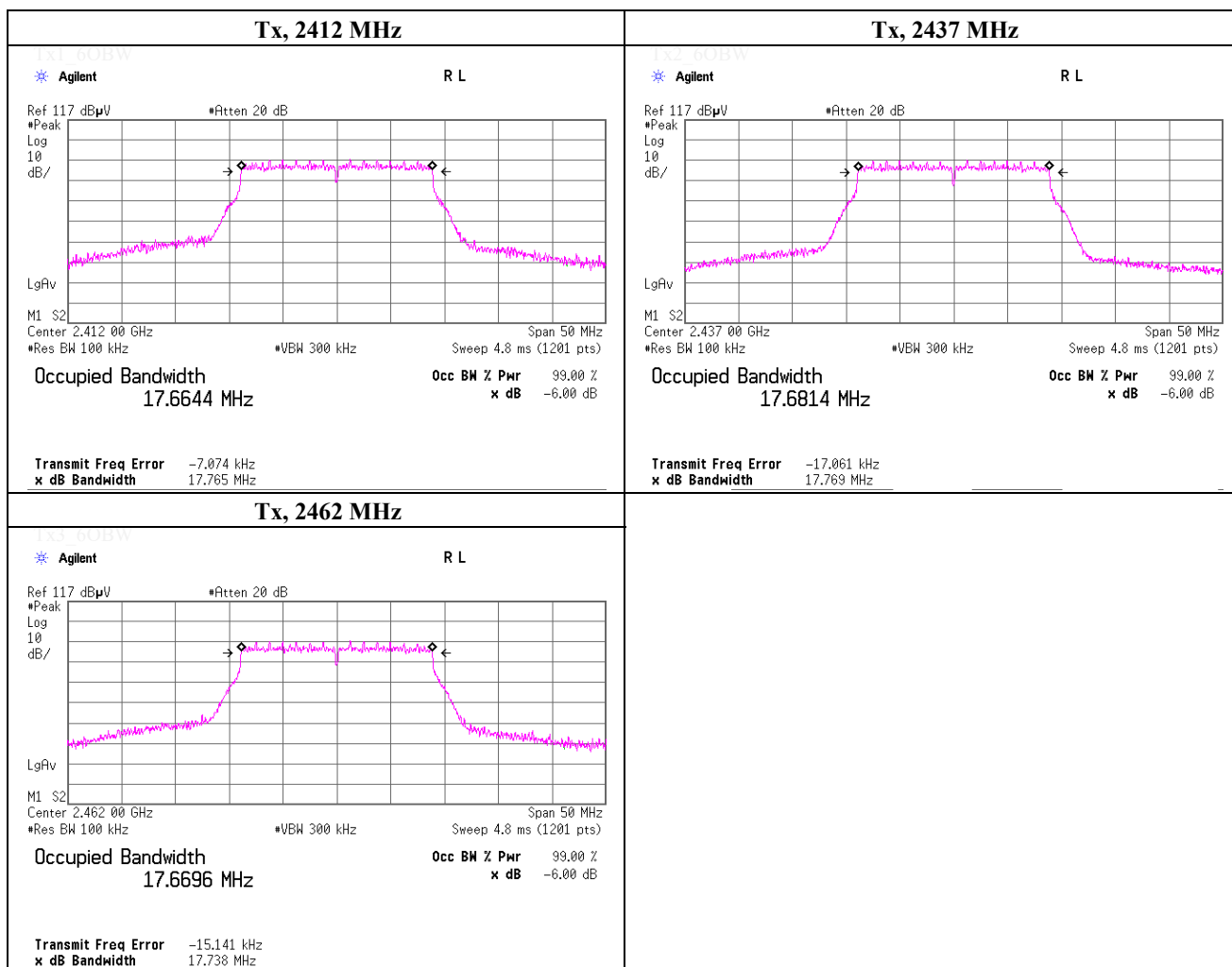
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Facsimile : +81 463 50 6401

-6 dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	January 8, 2021	
Temperature / Humidity	23 deg.C , 40 %RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11n-20 (SISO), PN9, worst antenna port 0, worst data mode 3 (MCS)	

Freq. [MHz]	-6 dB Bandwidth [MHz]	Limit [MHz]
2412.0000	17.765	> 0.500
2437.0000	17.769	> 0.500
2462.0000	17.738	> 0.500



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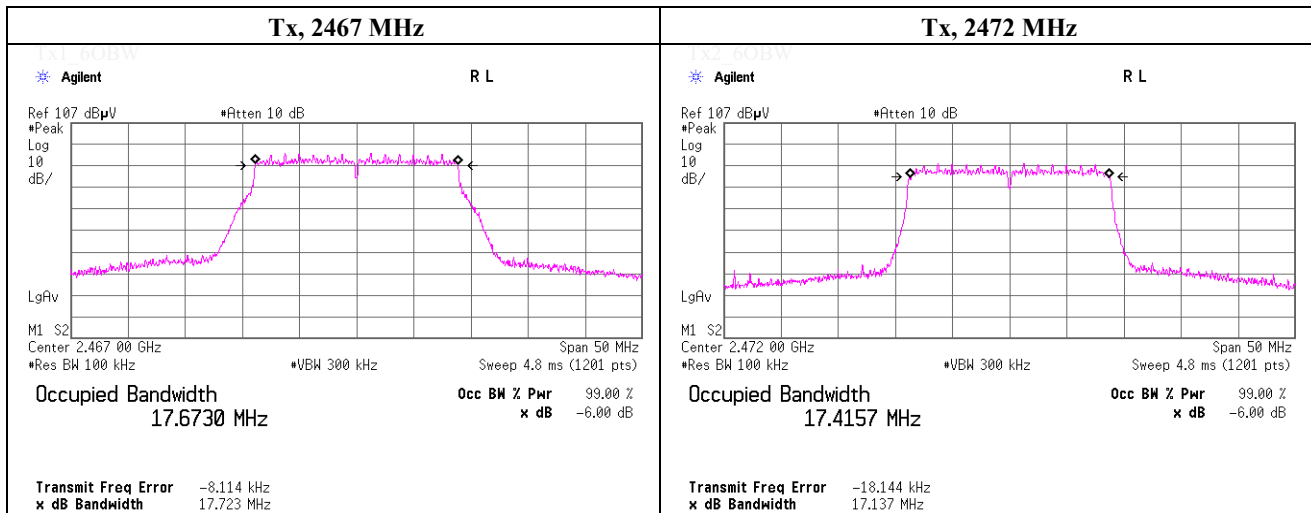
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

-6 dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	August 20, 2020	
Temperature / Humidity	25 deg.C , 40 %RH	
Engineer	Yusuke Tanikawara	
Mode	Tx, IEEE802.11n-20 (SISO), PN9, worst antenna port 1, worst data mode 3 (MCS)	

Freq. [MHz]	-6 dB Bandwidth [MHz]	Limit [MHz]
2467.0000	17.723	> 0.500
2472.0000	17.137	> 0.500
-	-	-



Tx3_60BW

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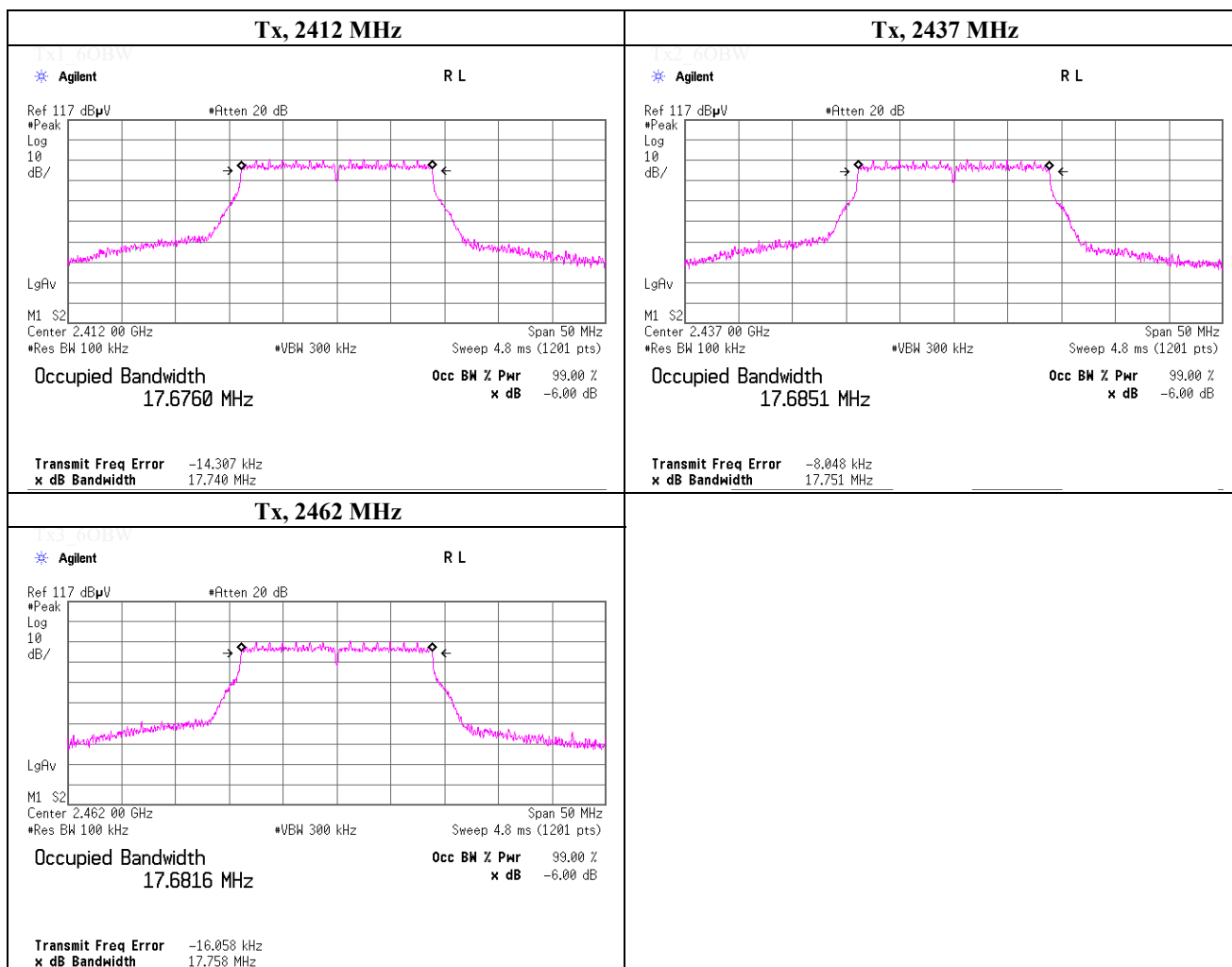
Telephone : +81 463 50 6400

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-6 dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	January 8, 2021	
Temperature / Humidity	23 deg.C , 40 %RH	
Engineer	Kenichi Adachi	
Mode	Tx, OFDM VHT20 (SISO), PN9, worst antenna port 0, worst data mode 3 (MCS)	

Freq. [MHz]	-6 dB Bandwidth [MHz]	Limit [MHz]
2412.0000	17.740	> 0.500
2437.0000	17.751	> 0.500
2462.0000	17.758	> 0.500



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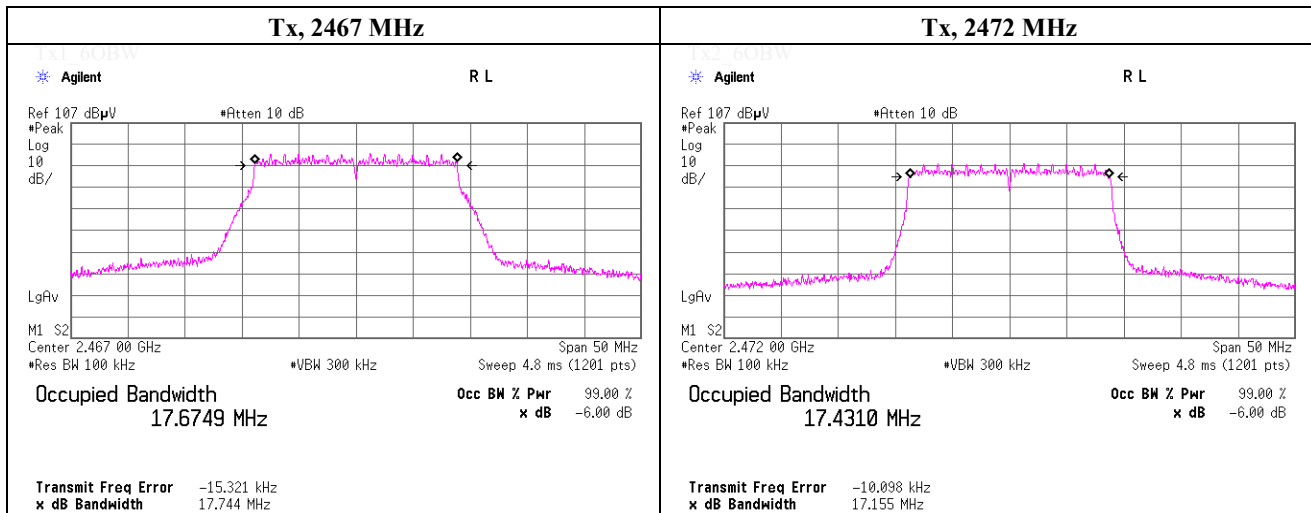
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

-6 dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	August 20, 2020	
Temperature / Humidity	25 deg.C , 40 %RH	
Engineer	Yusuke Tanikawara	
Mode	Tx, OFDM VHT20 (SISO), PN9, worst antenna port 1, worst data mode 6 (MCS)	

Freq. [MHz]	-6 dB Bandwidth [MHz]	Limit [MHz]
2467.0000	17.744	> 0.500
2472.0000	17.155	> 0.500
-	-	-



Tx3_60BW

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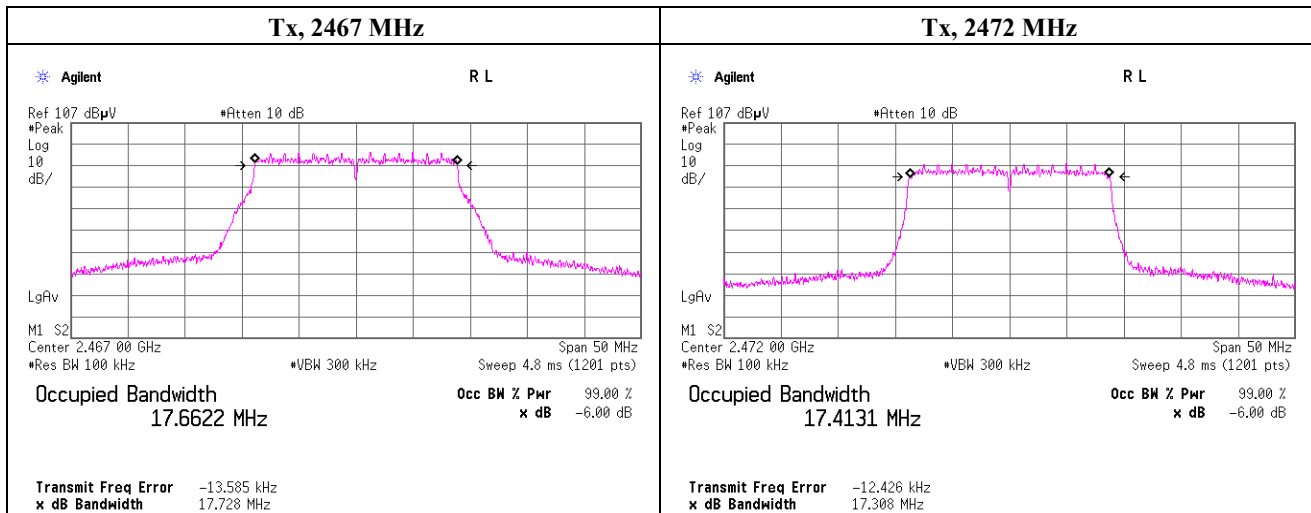
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

-6 dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	February 3, 2021	
Temperature / Humidity	24 deg.C , 55 %RH	
Engineer	Takahiro Kawakami	
Mode	Tx, IEEE802.11n-20 (MIMO), PN9, antenna port 1, worst data mode 11 (MCS)	

Freq. [MHz]	-6 dB Bandwidth [MHz]	Limit [MHz]
2467.0000	17.728	> 0.500
2472.0000	17.308	> 0.500
-	-	-

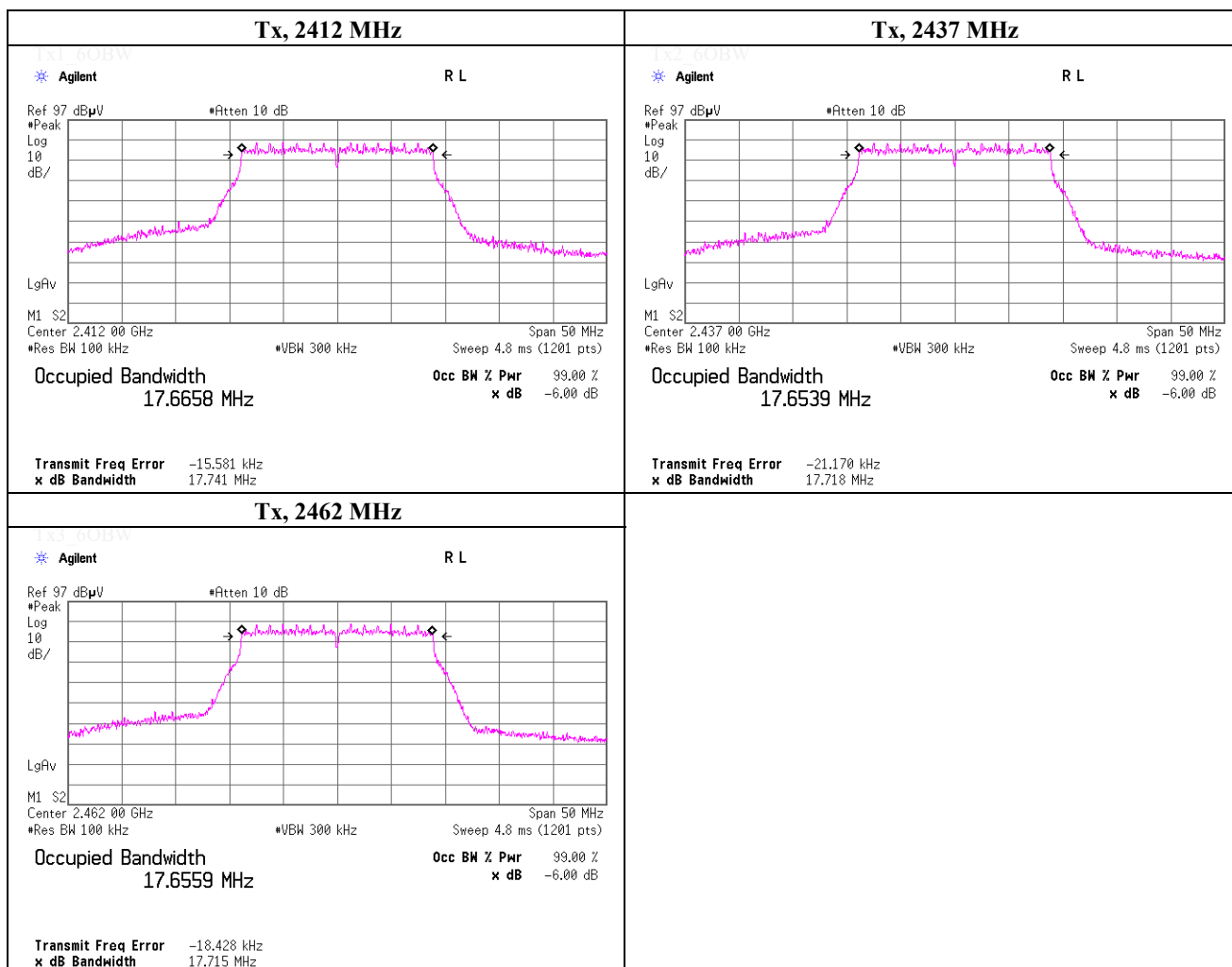


Tx3_60BW

-6 dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	August 21, 2020	
Temperature / Humidity	25 deg.C , 42 %RH	
Engineer	Yusuke Tanikawara	
Mode	Tx, OFDM VHT20 (MIMO), PN9, antenna port 1, worst data mode 3 (MCS)	

Freq. [MHz]	-6 dB Bandwidth [MHz]	Limit [MHz]
2412.0000	17.741	> 0.500
2437.0000	17.718	> 0.500
2462.0000	17.715	> 0.500



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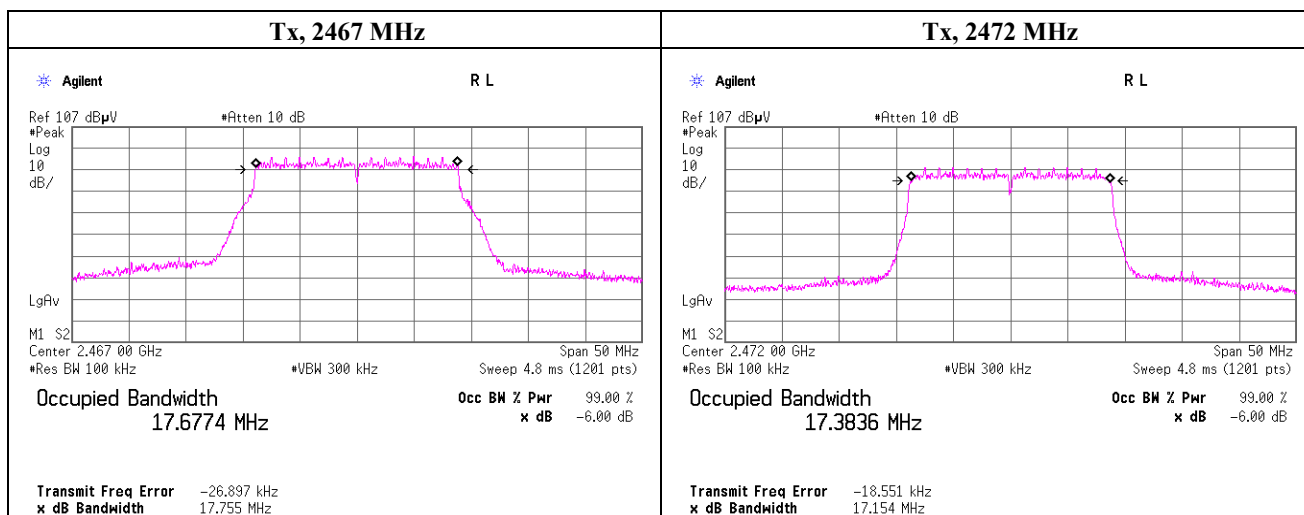
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

-6 dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	February 3, 2021	
Temperature / Humidity	24 deg.C , 55 %RH	
Engineer	Takahiro Kawakami	
Mode	Tx, OFDM VHT20 (MIMO), PN9, antenna port 1, worst data mode 3 (MCS)	

Freq. [MHz]	-6 dB Bandwidth [MHz]	Limit [MHz]
2467.0000	17.755	> 0.500
2472.0000	17.154	> 0.500
-	-	-



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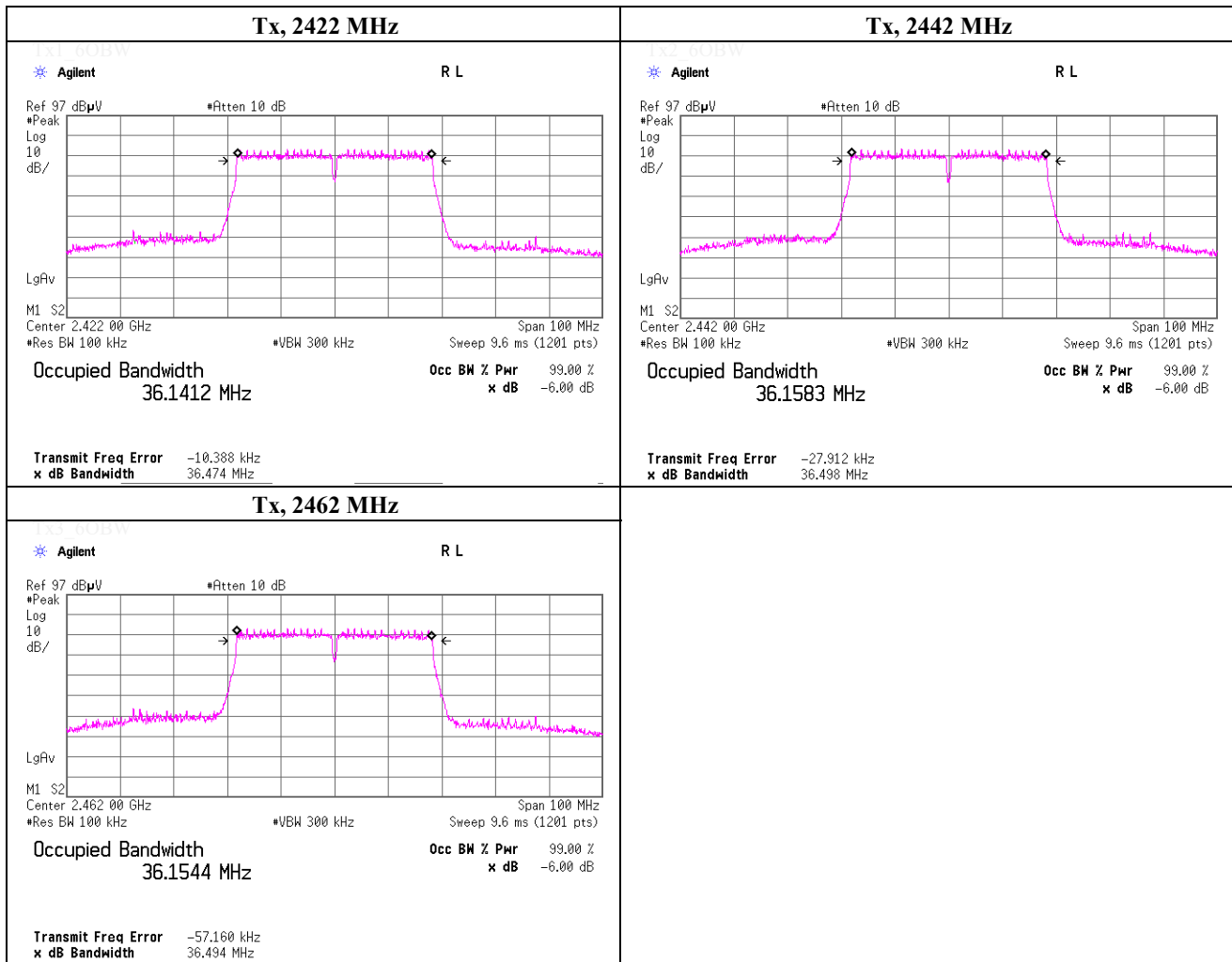
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Facsimile : +81 463 50 6401

-6 dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	August 20, 2020	
Temperature / Humidity	25 deg.C , 40 %RH	
Engineer	Yusuke Tanikawara	
Mode	Tx, IEEE802.11n-40 (SISO), PN9, worst antenna port 1, worst data mode 3 (MCS)	

Freq. [MHz]	-6 dB Bandwidth [MHz]	Limit [MHz]
2422.0000	36.474	> 0.500
2442.0000	36.498	> 0.500
2462.0000	36.494	> 0.500



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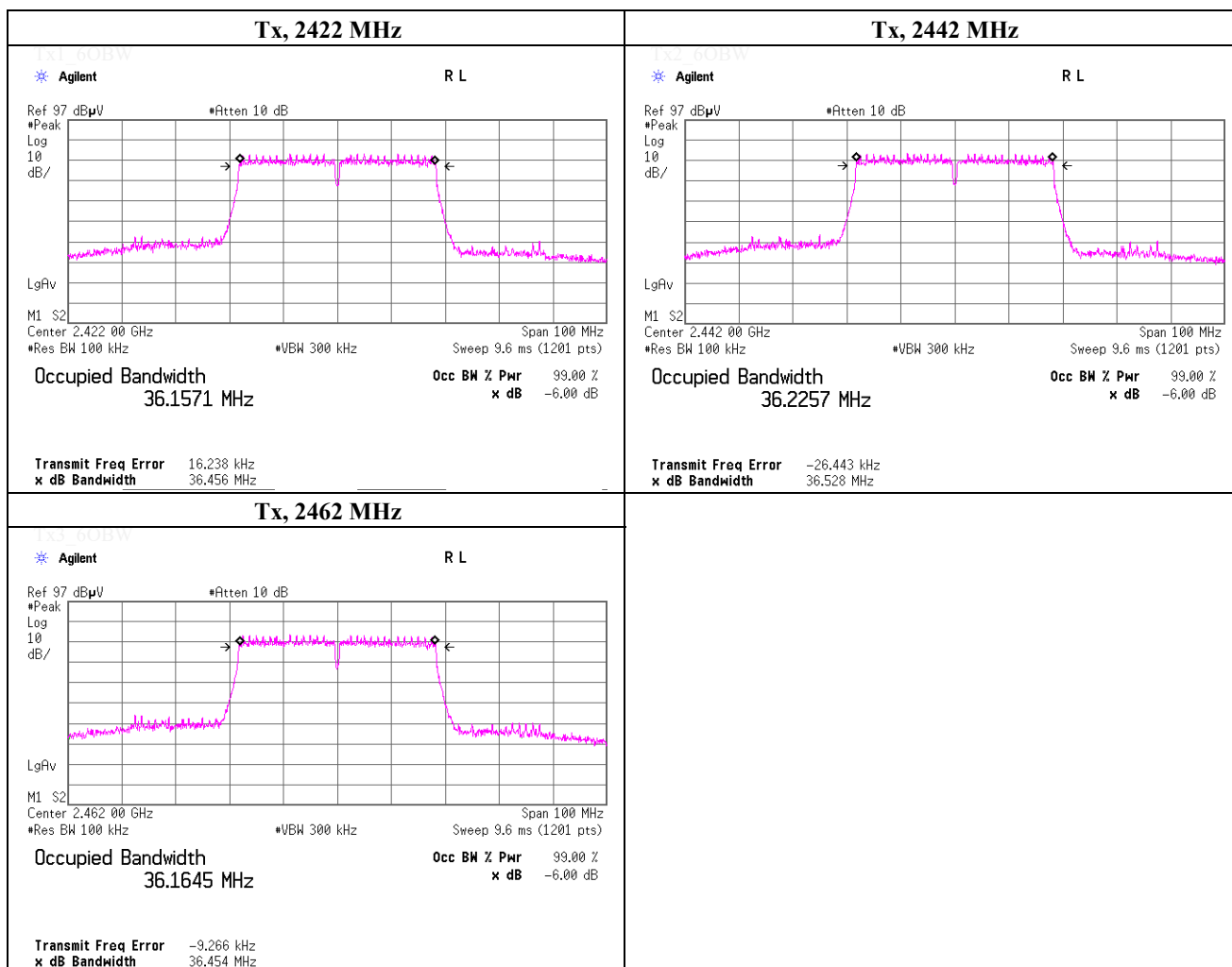
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

-6 dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	August 20, 2020	
Temperature / Humidity	25 deg.C , 40 %RH	
Engineer	Yusuke Tanikawara	
Mode	Tx, OFDM VHT40 (SISO), PN9, worst antenna port 1, worst data mode 9 (MCS)	

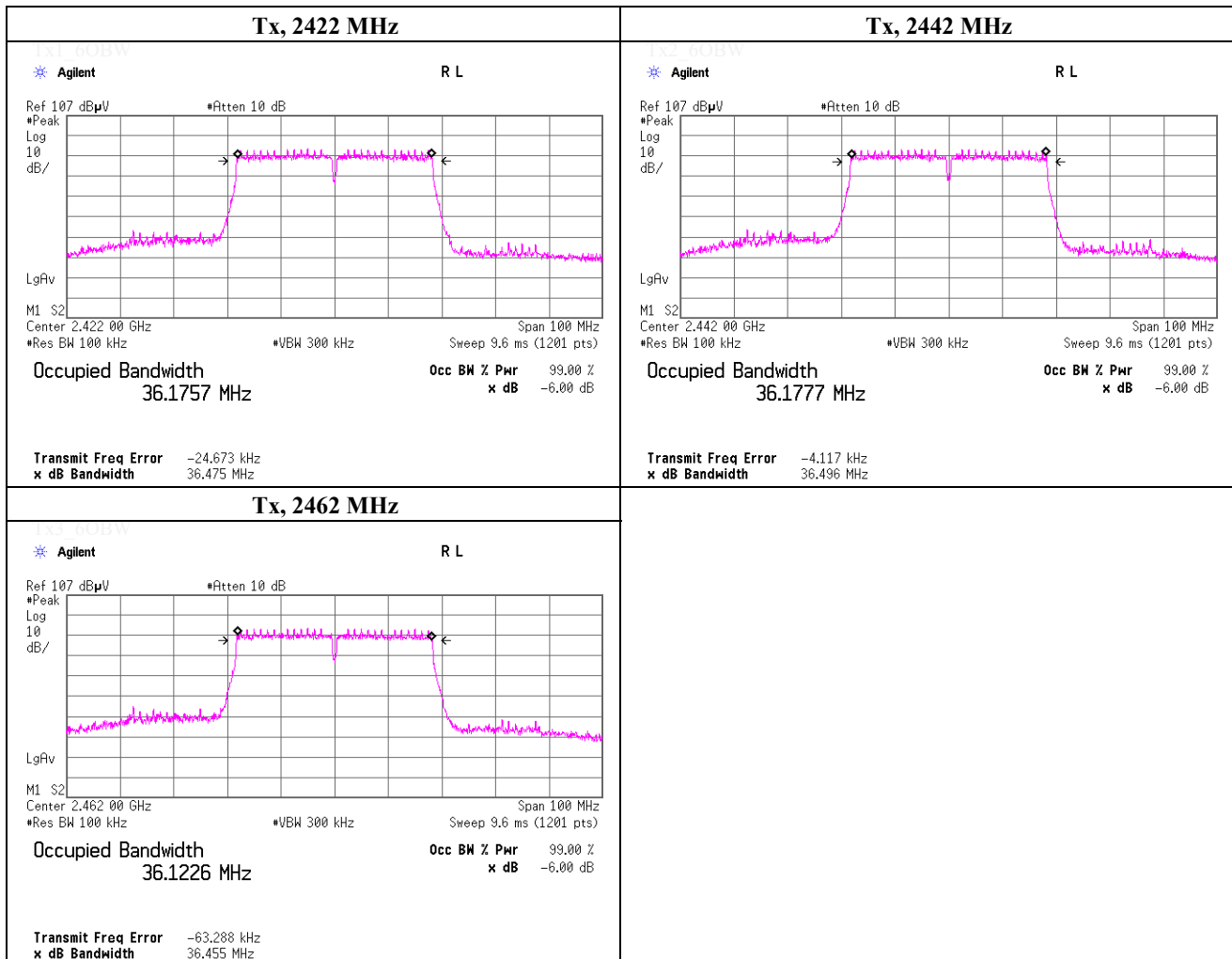
Freq. [MHz]	-6 dB Bandwidth [MHz]	Limit [MHz]
2422.0000	36.456	> 0.500
2442.0000	36.528	> 0.500
2462.0000	36.454	> 0.500



-6 dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	February 5, 2021	
Temperature / Humidity	24 deg.C , 30 %RH	
Engineer	Takahiro Kawakami	
Mode	Tx, IEEE802.11n-40 (MIMO), PN9, antenna port 1, worst data mode 11 (MCS)	

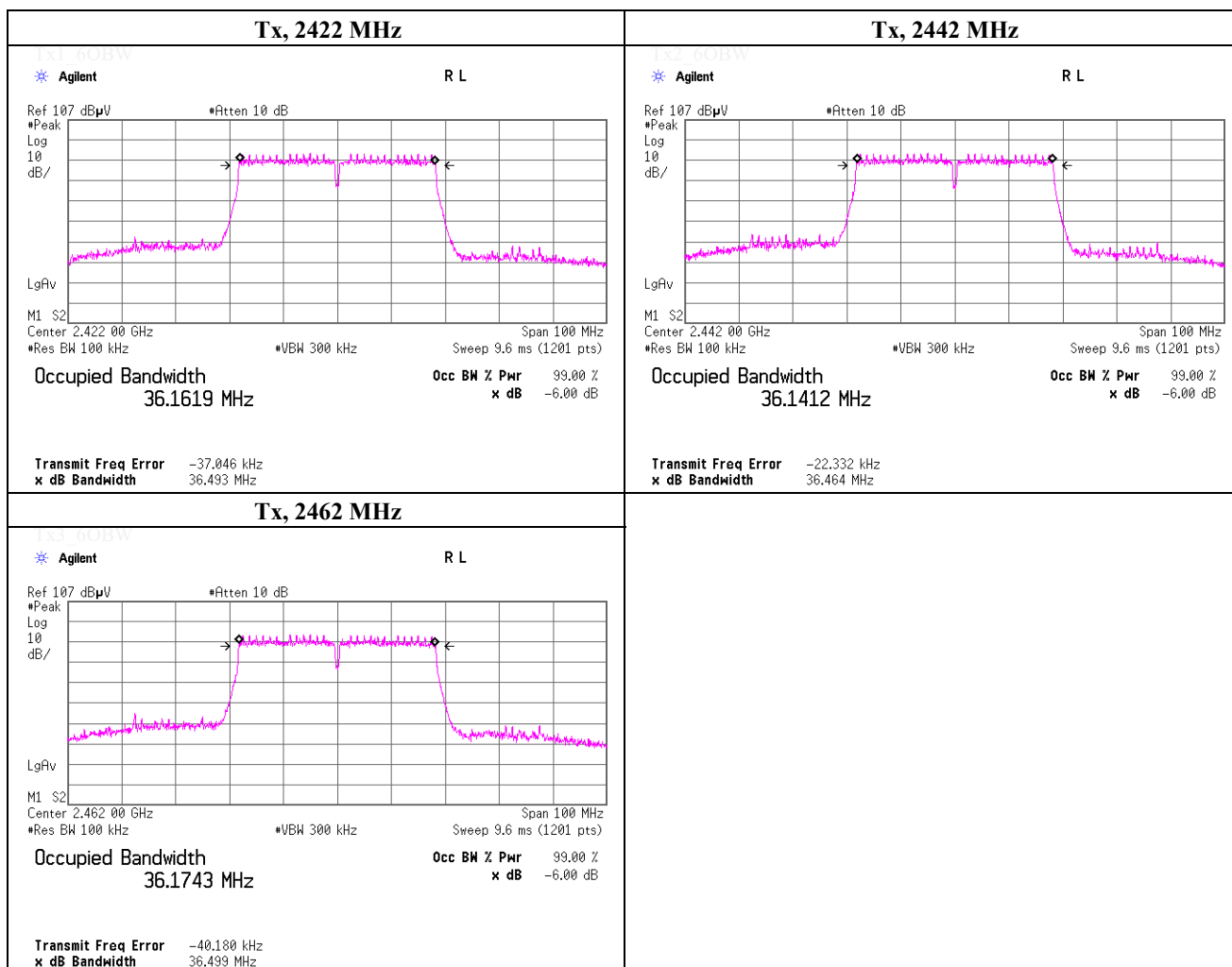
Freq. [MHz]	-6 dB Bandwidth [MHz]	Limit [MHz]
2422.0000	36.475	> 0.500
2442.0000	36.496	> 0.500
2462.0000	36.455	> 0.500



-6 dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	February 5, 2021	
Temperature / Humidity	24 deg.C , 30 %RH	
Engineer	Takahiro Kawakami	
Mode	Tx, OFDM VHT40 (MIMO), PN9, antenna port 1, worst data mode 4 (MCS)	

Freq. [MHz]	-6 dB Bandwidth [MHz]	Limit [MHz]
2422.0000	36.493	> 0.500
2442.0000	36.464	> 0.500
2462.0000	36.499	> 0.500



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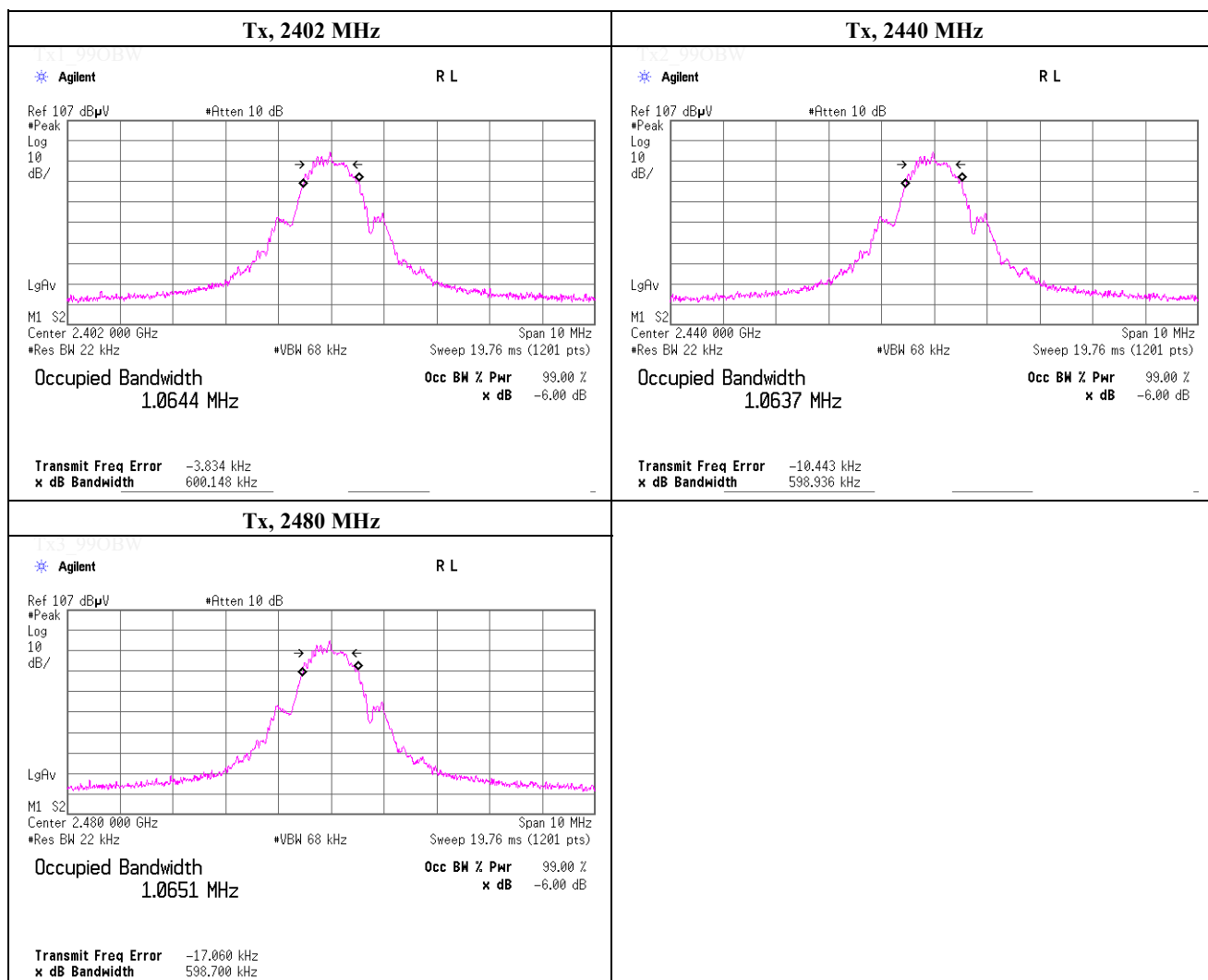
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

99 % Occupied Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	August 18, 2020	
Temperature / Humidity	24 deg.C , 48 %RH	
Engineer	Yusuke Tanikawara	
Mode	Tx, Bluetooth Low Energy, PRBS9	

Freq. [MHz]	99 % Occupied Bandwidth [kHz]
2402.0000	1064.4
2440.0000	1063.7
2480.0000	1065.1

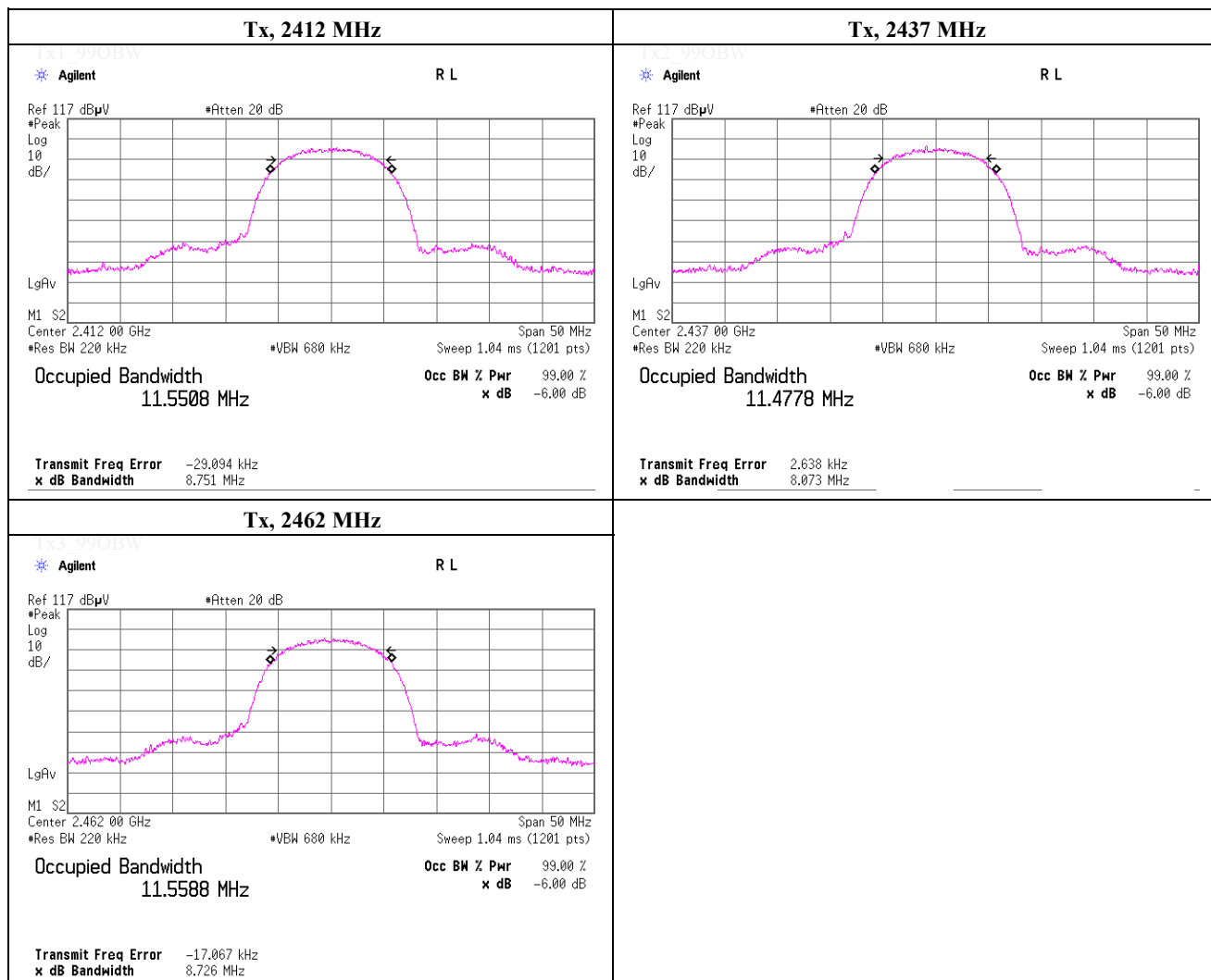


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 Telephone : +81 463 50 6400
 Facsimile : +81 463 50 6401

99 % Occupied Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	January 8, 2021	
Temperature / Humidity	23 deg.C , 40 %RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11b, PN9, worst antenna port 0, worst data mode 11 Mbps	

Freq. [MHz]	99 % Occupied Bandwidth [kHz]
2412.0000	11550.8
2437.0000	11477.8
2462.0000	11558.8

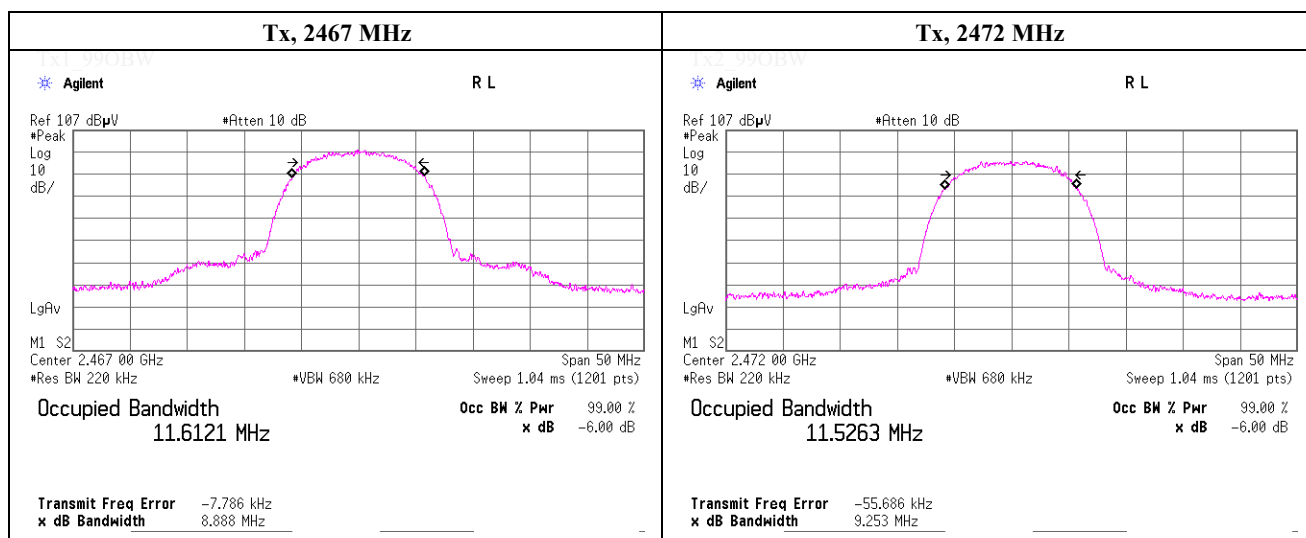


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 Facsimile : +81 463 50 6401

99 % Occupied Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	August 20, 2020	
Temperature / Humidity	25 deg.C , 40 %RH	
Engineer	Yusuke Tanikawara	
Mode	Tx, IEEE802.11b, PN9, worst antenna port 1, worst data mode 11 Mbps	

Freq. [MHz]	99 % Occupied Bandwidth [kHz]
2467.0000	11612.1
2472.0000	11526.3
-	-

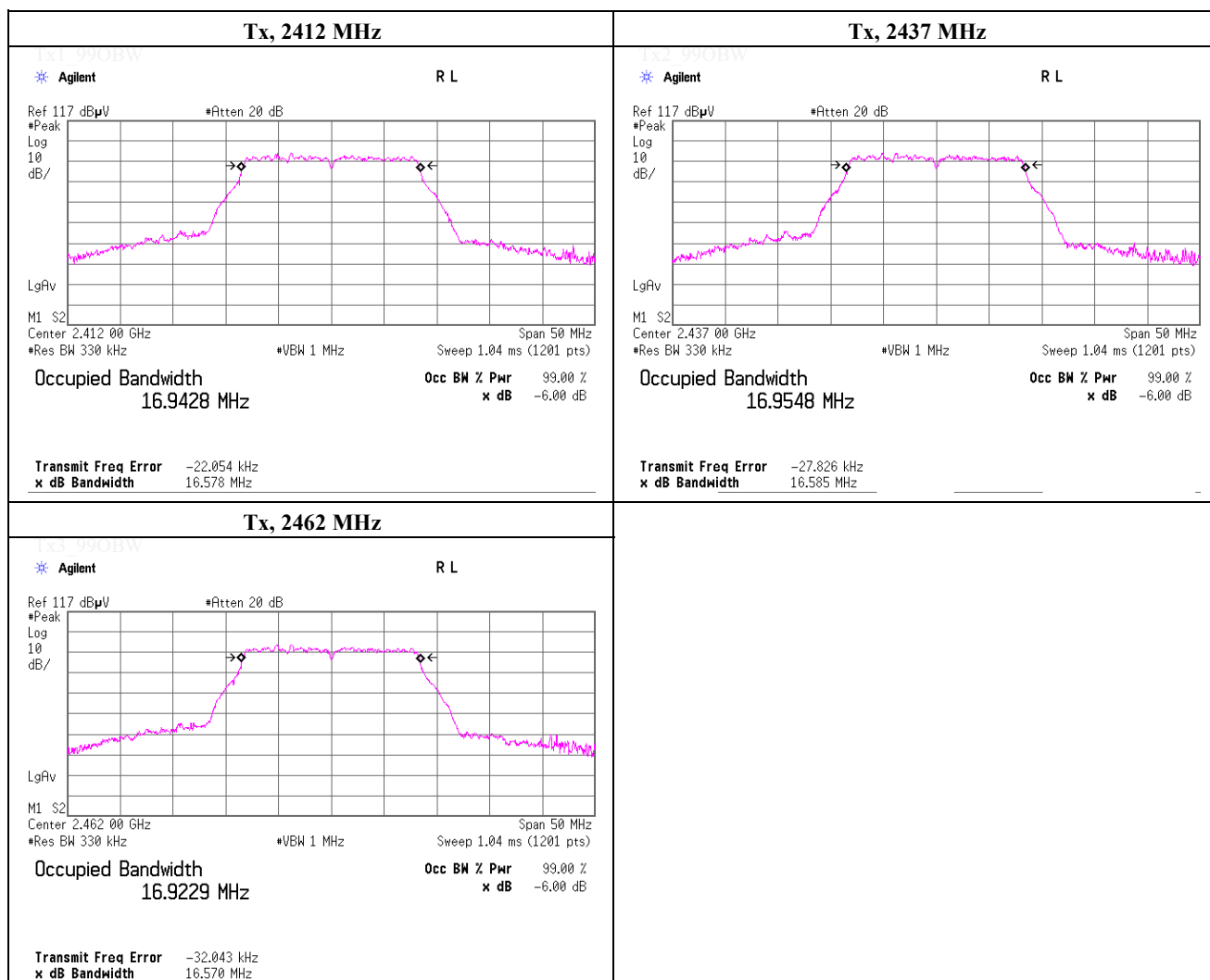


Tx3_99OBW

99 % Occupied Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	January 8, 2021	
Temperature / Humidity	23 deg.C , 40 %RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11g, PN9, worst antenna port 0, worst data mode 48 Mbps	

Freq. [MHz]	99 % Occupied Bandwidth [kHz]
2412.0000	16942.8
2437.0000	16954.8
2462.0000	16922.9



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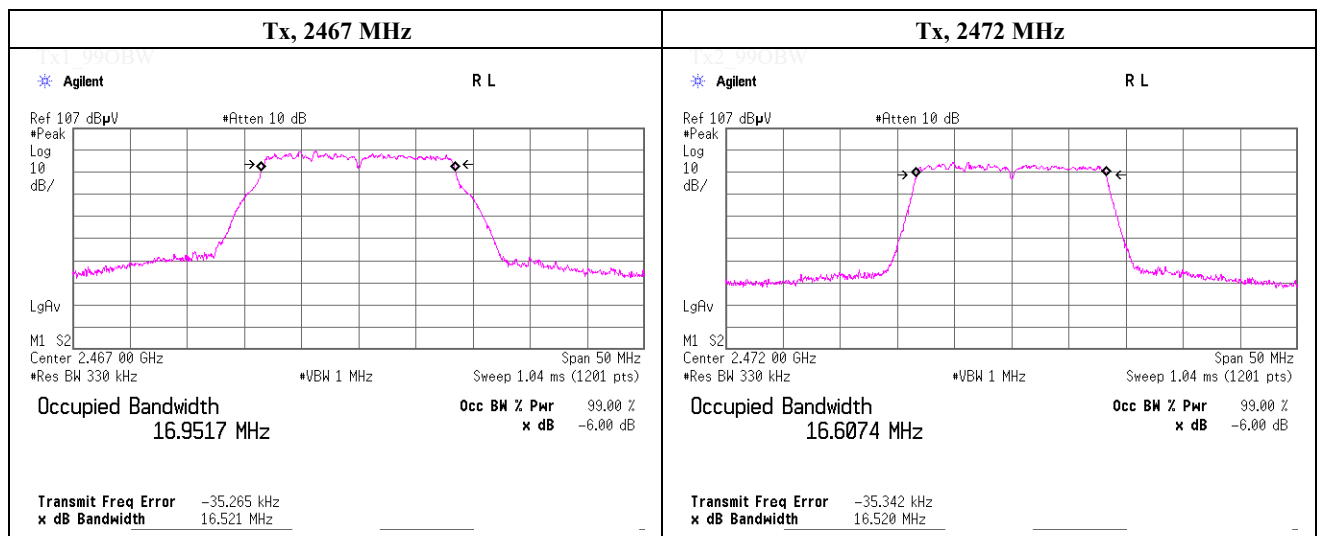
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

99 % Occupied Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	August 20, 2020	
Temperature / Humidity	25 deg.C , 40 %RH	
Engineer	Yusuke Tanikawara	
Mode	Tx, IEEE802.11g, PN9, worst antenna port 1, worst data mode 48 Mbps	

Freq. [MHz]	99 % Occupied Bandwidth [kHz]
2467.0000	16951.7
2472.0000	16607.4
-	-

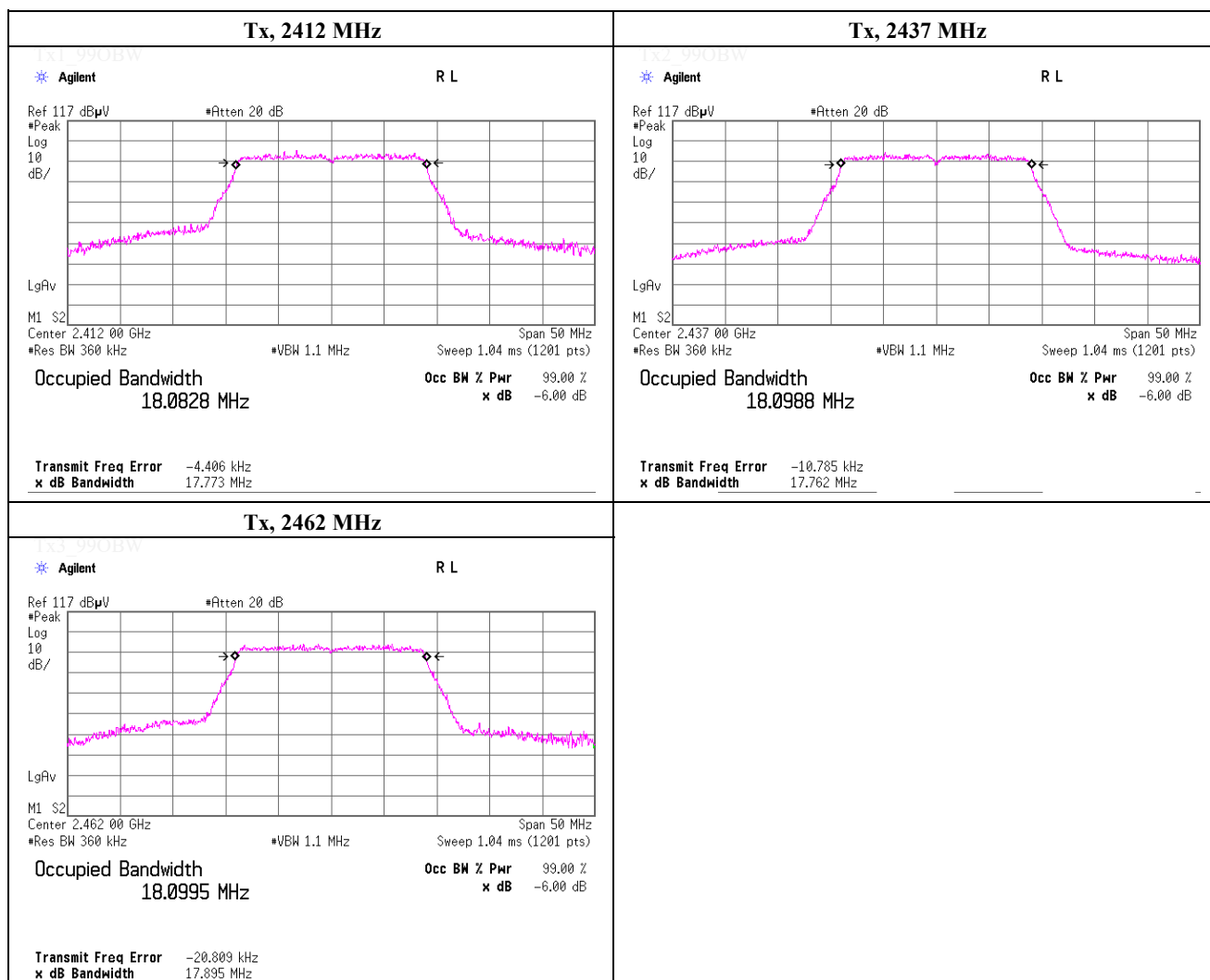


Tx3_99OBW

99 % Occupied Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	January 8, 2021	
Temperature / Humidity	23 deg.C , 40 %RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11n-20 (SISO), PN9, worst antenna port 0, worst data mode 3 (MCS)	

Freq. [MHz]	99 % Occupied Bandwidth [kHz]
2412.0000	18082.8
2437.0000	18098.8
2462.0000	18099.5

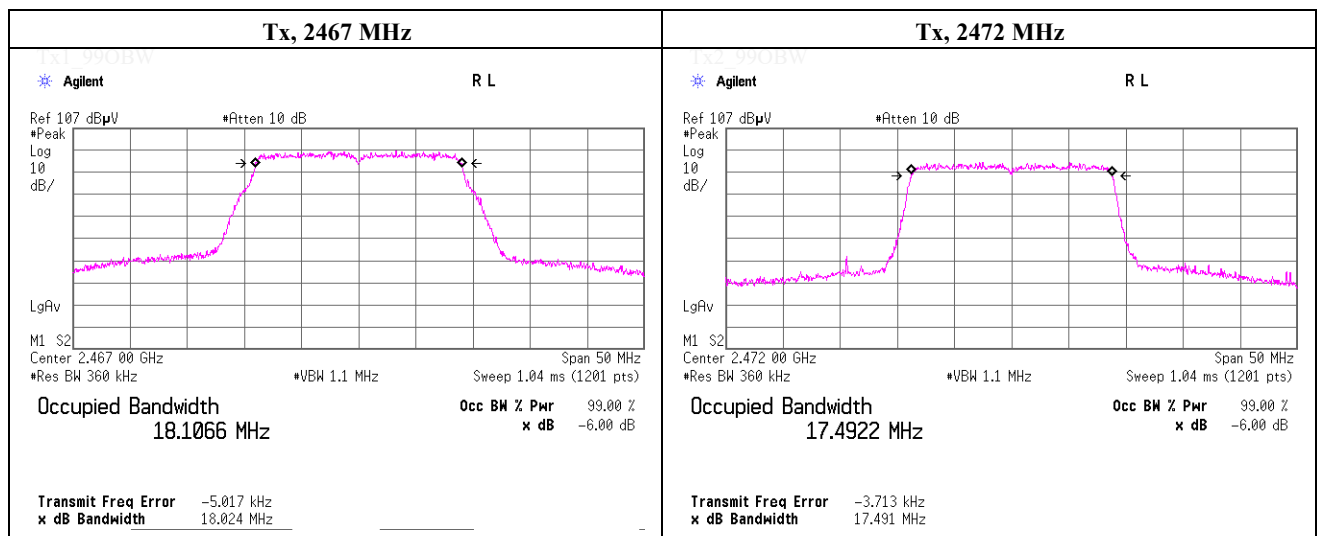


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 Facsimile : +81 463 50 6401

99 % Occupied Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	August 20, 2020	
Temperature / Humidity	25 deg.C , 40 %RH	
Engineer	Yusuke Tanikawara	
Mode	Tx, IEEE802.11n-20 (SISO), PN9, worst antenna port 1, worst data mode 3 (MCS)	

Freq. [MHz]	99 % Occupied Bandwidth [kHz]
2467.0000	18106.6
2472.0000	17492.2
-	-

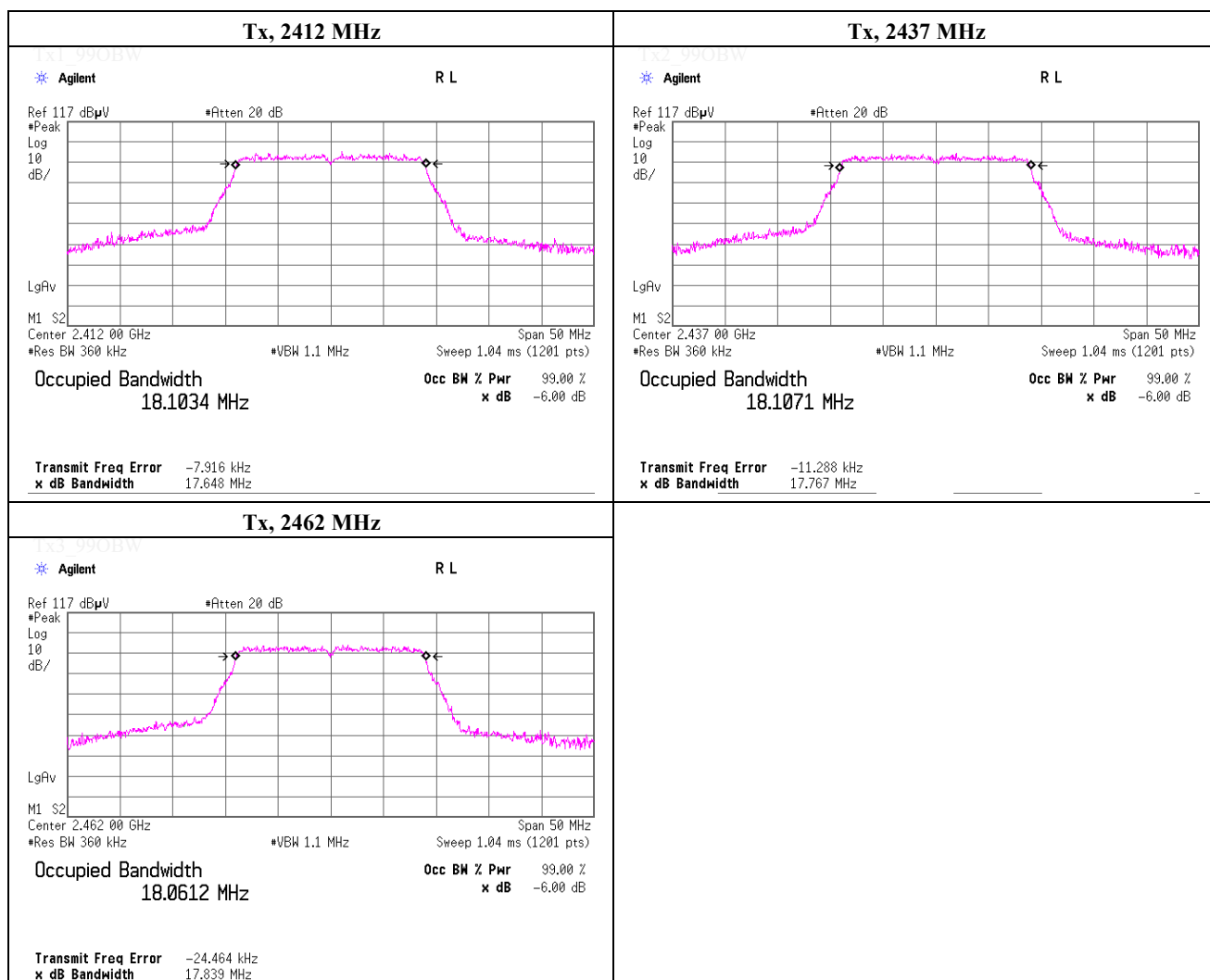


Tx3_99OBW

99 % Occupied Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	January 8, 2021	
Temperature / Humidity	23 deg.C , 40 %RH	
Engineer	Kenichi Adachi	
Mode	Tx, OFDM VHT20 (SISO), PN9, worst antenna port 0, worst data mode 3 (MCS)	

Freq. [MHz]	99 % Occupied Bandwidth [kHz]
2412.0000	18103.4
2437.0000	18107.1
2462.0000	18061.2



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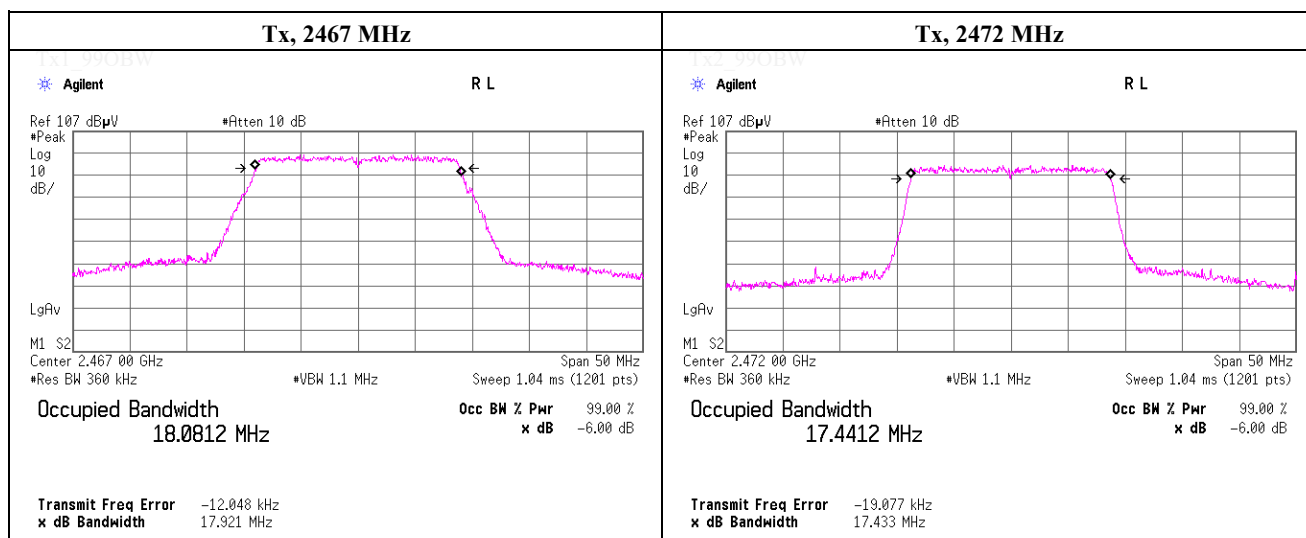
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

99 % Occupied Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	August 20, 2020	
Temperature / Humidity	25 deg.C , 40 %RH	
Engineer	Yusuke Tanikawara	
Mode	Tx, OFDM VHT20 (SISO), PN9, worst antenna port 1, worst data mode 6 (MCS)	

Freq. [MHz]	99 % Occupied Bandwidth [kHz]
2467.0000	18081.2
2472.0000	17441.2
-	-



Tx3_99OBW

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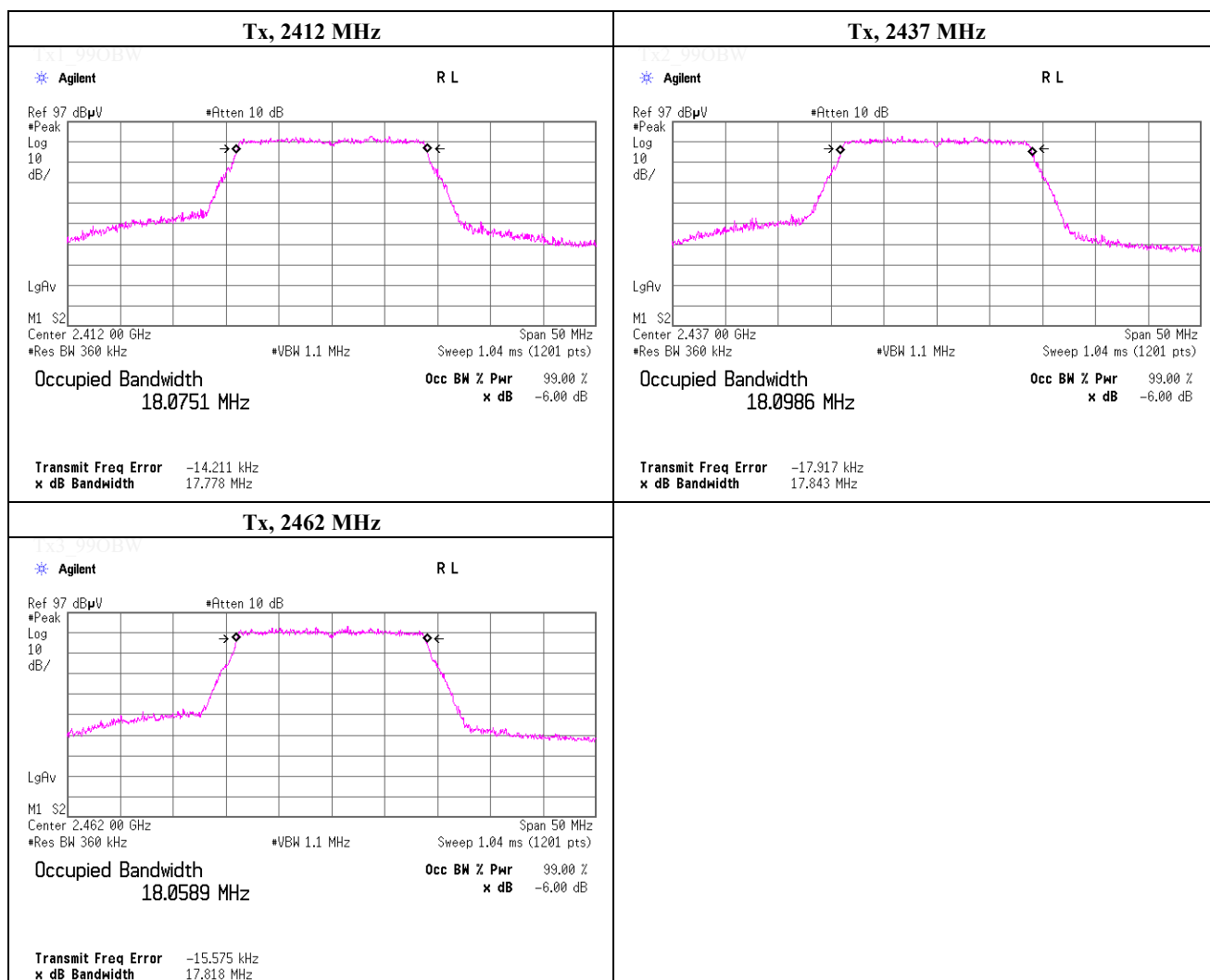
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

99 % Occupied Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	August 21, 2020	
Temperature / Humidity	25 deg.C , 42 %RH	
Engineer	Yusuke Tanikawara	
Mode	Tx, IEEE802.11n-20 (MIMO), PN9, antenna port 1, worst data mode 11 (MCS)	

Freq. [MHz]	99 % Occupied Bandwidth [kHz]
2412.0000	18075.1
2437.0000	18098.6
2462.0000	18058.9

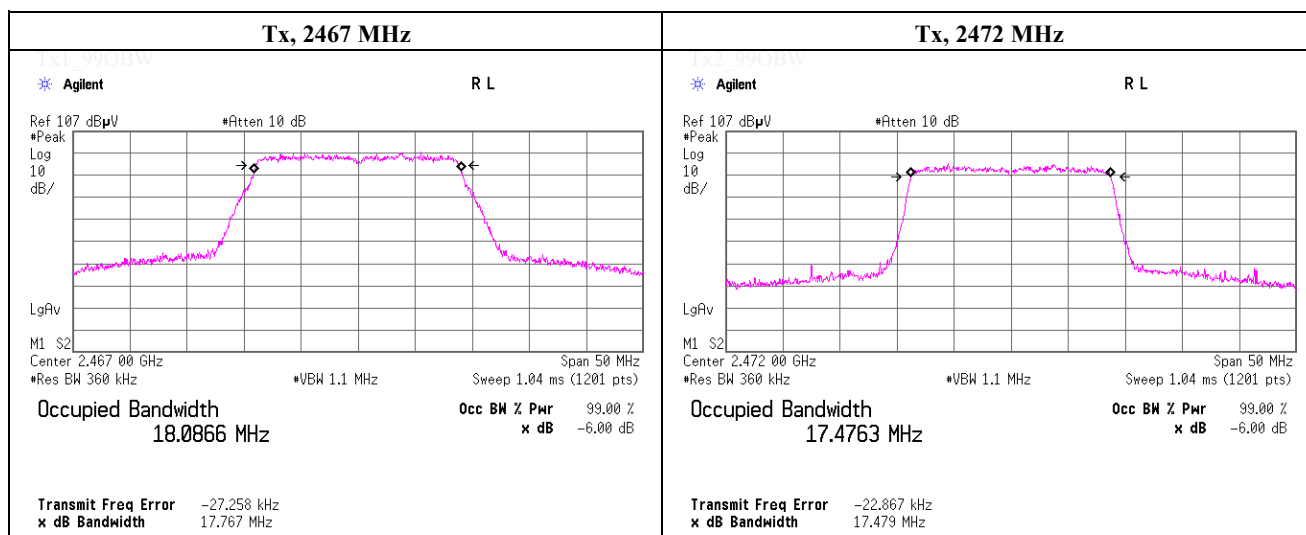


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99 % Occupied Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	February 3, 2021	
Temperature / Humidity	24 deg.C , 55 %RH	
Engineer	Takahiro Kawakami	
Mode	Tx, IEEE802.11n-20 (MIMO), PN9, antenna port 1, worst data mode 11 (MCS)	

Freq. [MHz]	99 % Occupied Bandwidth [kHz]
2467.0000	18086.6
2472.0000	17476.3
-	-

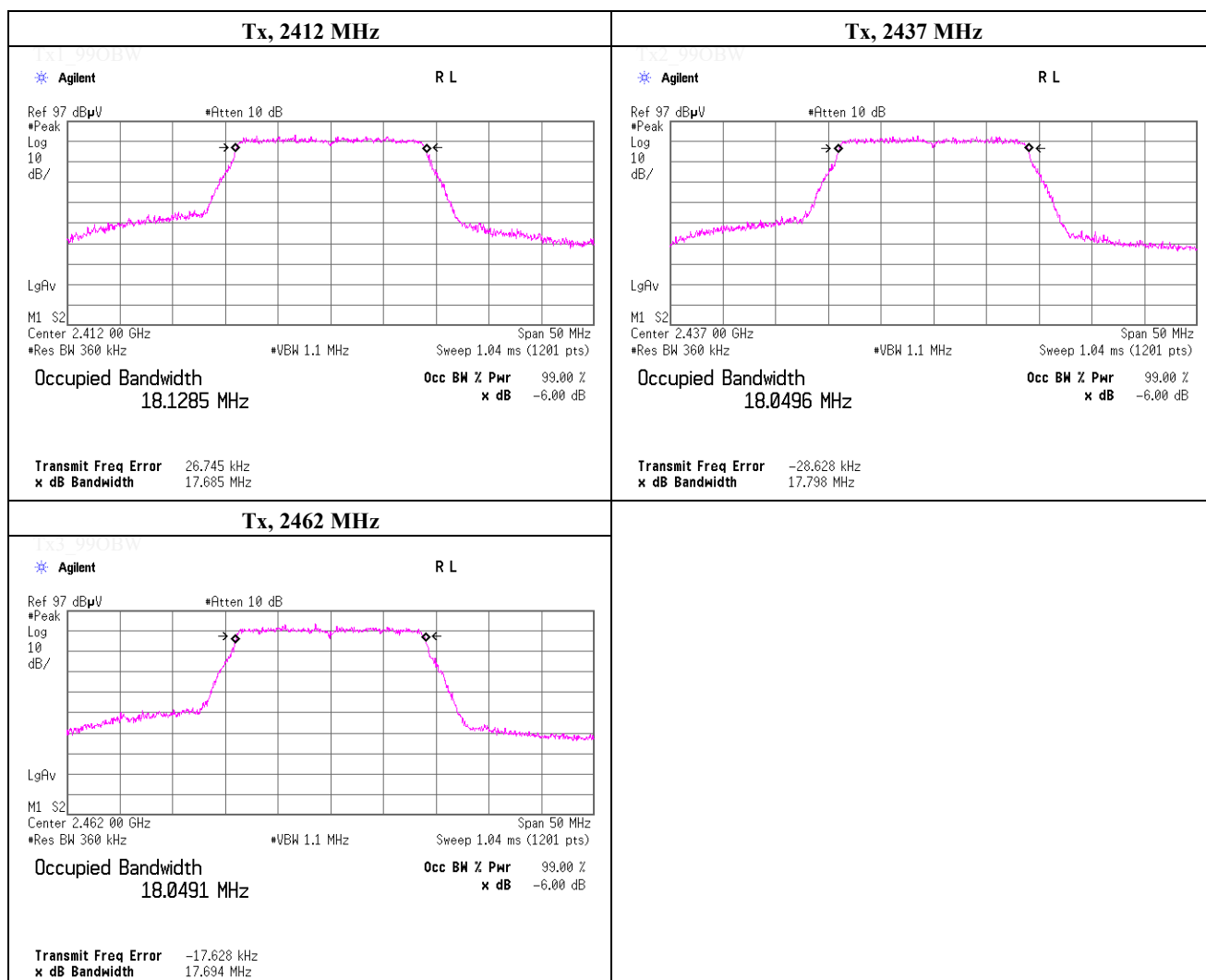


Tx3_99OBW

99 % Occupied Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	August 21, 2020	
Temperature / Humidity	25 deg.C , 42 %RH	
Engineer	Yusuke Tanikawara	
Mode	Tx, OFDM VHT20 (MIMO), PN9, antenna port 1, worst data mode 3 (MCS)	

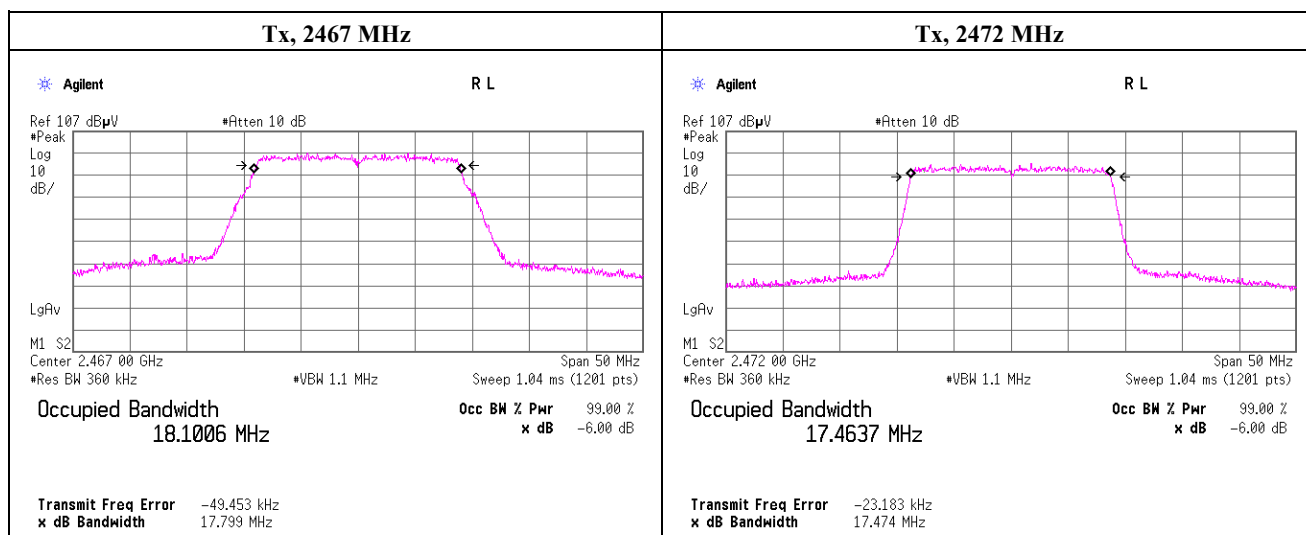
Freq. [MHz]	99 % Occupied Bandwidth [kHz]
2412.0000	18128.5
2437.0000	18049.6
2462.0000	18049.1



99 % Occupied Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	February 3, 2021	
Temperature / Humidity	24 deg.C , 55 %RH	
Engineer	Takahiro Kawakami	
Mode	Tx, OFDM VHT20 (MIMO), PN9, antenna port 1, worst data mode 3 (MCS)	

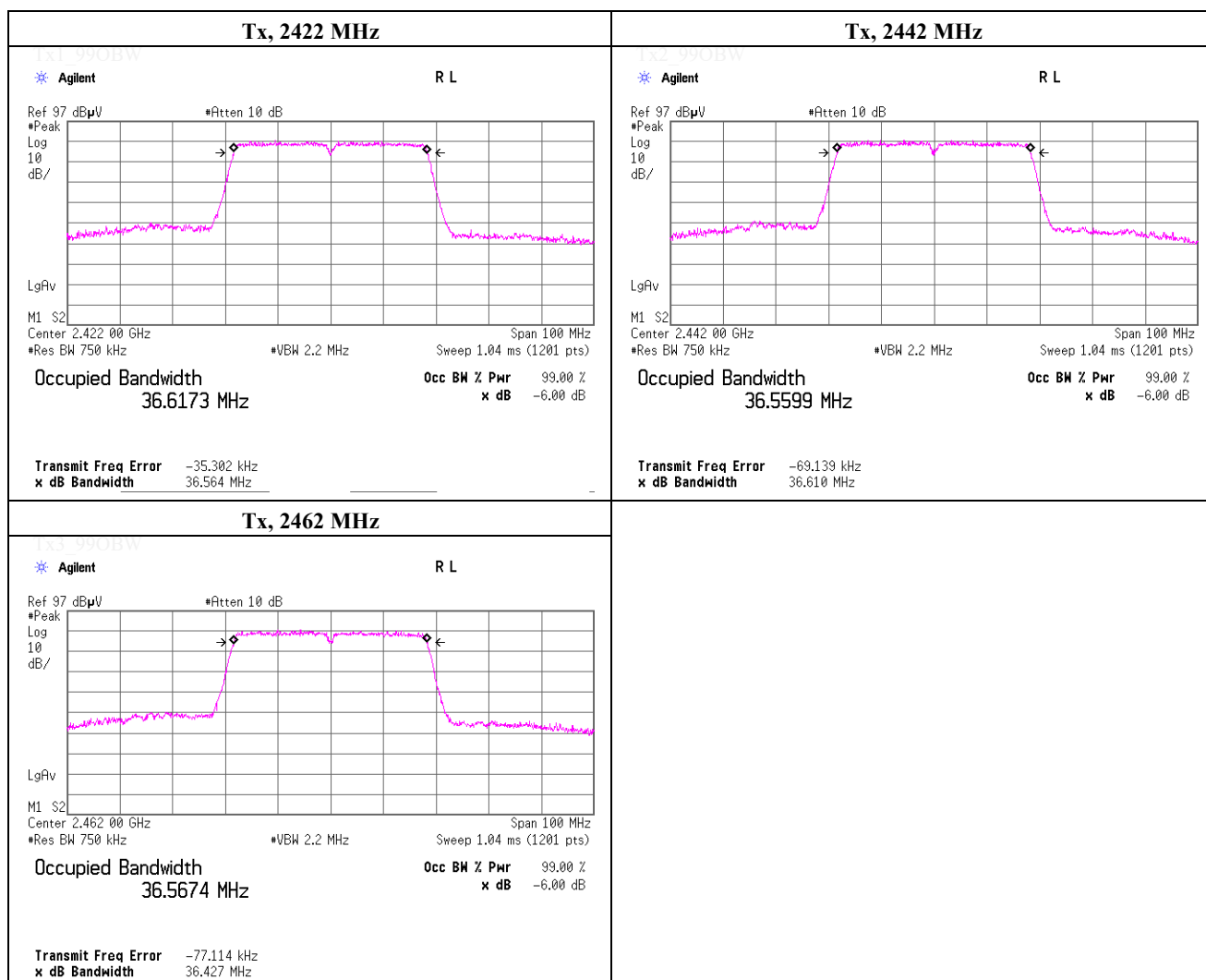
Freq. [MHz]	99 % Occupied Bandwidth [kHz]
2467.0000	18100.6
2472.0000	17463.7
-	-



99 % Occupied Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	August 20, 2020	
Temperature / Humidity	25 deg.C , 40 %RH	
Engineer	Yusuke Tanikawara	
Mode	Tx, IEEE802.11n-40 (SISO), PN9, worst antenna port 1, worst data mode 3 (MCS)	

Freq. [MHz]	99 % Occupied Bandwidth [kHz]
2422.0000	36617.3
2442.0000	36559.9
2462.0000	36567.4

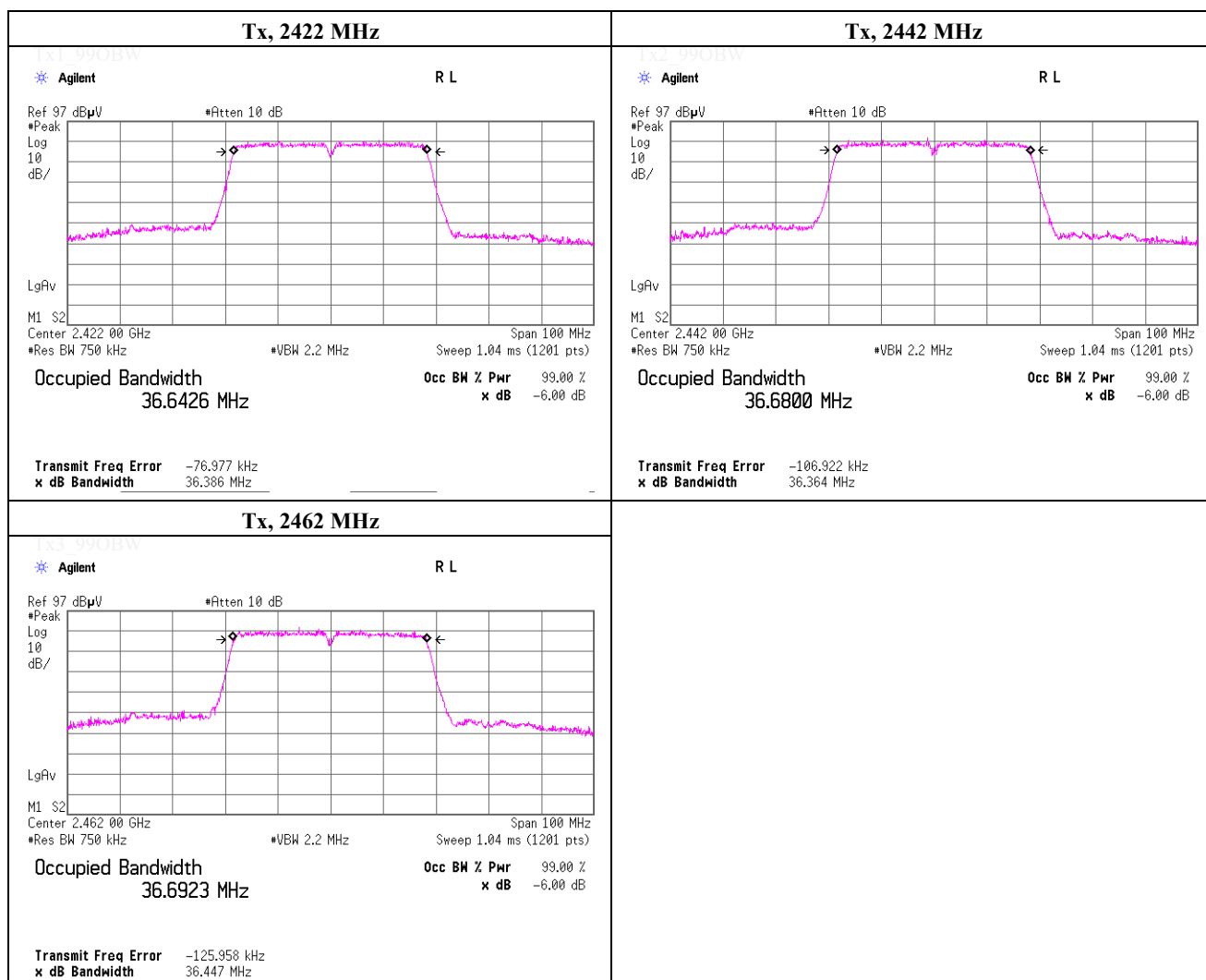


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99 % Occupied Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	August 20, 2020	
Temperature / Humidity	25 deg.C , 40 %RH	
Engineer	Yusuke Tanikawara	
Mode	Tx, OFDM VHT40 (SISO), PN9, worst antenna port 1, worst data mode 9 (MCS)	

Freq. [MHz]	99 % Occupied Bandwidth [kHz]
2422.0000	36642.6
2442.0000	36680.0
2462.0000	36692.3

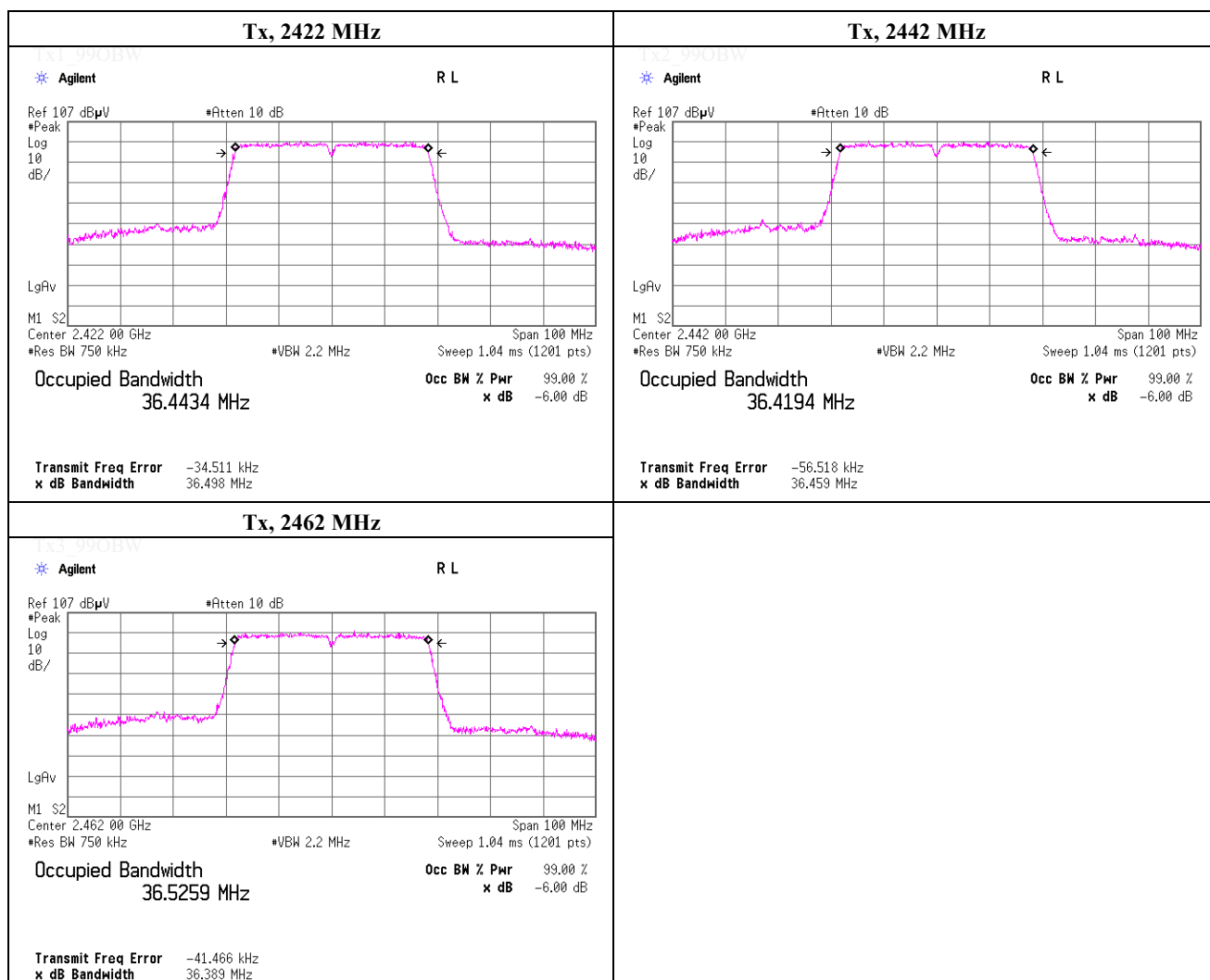


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99 % Occupied Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	February 5, 2021	
Temperature / Humidity	24 deg.C , 30 %RH	
Engineer	Takahiro Kawakami	
Mode	Tx, IEEE802.11n-40 (MIMO), PN9, antenna port 1, worst data mode 11 (MCS)	

Freq. [MHz]	99 % Occupied Bandwidth [kHz]
2422.0000	36443.4
2442.0000	36419.4
2462.0000	36525.9

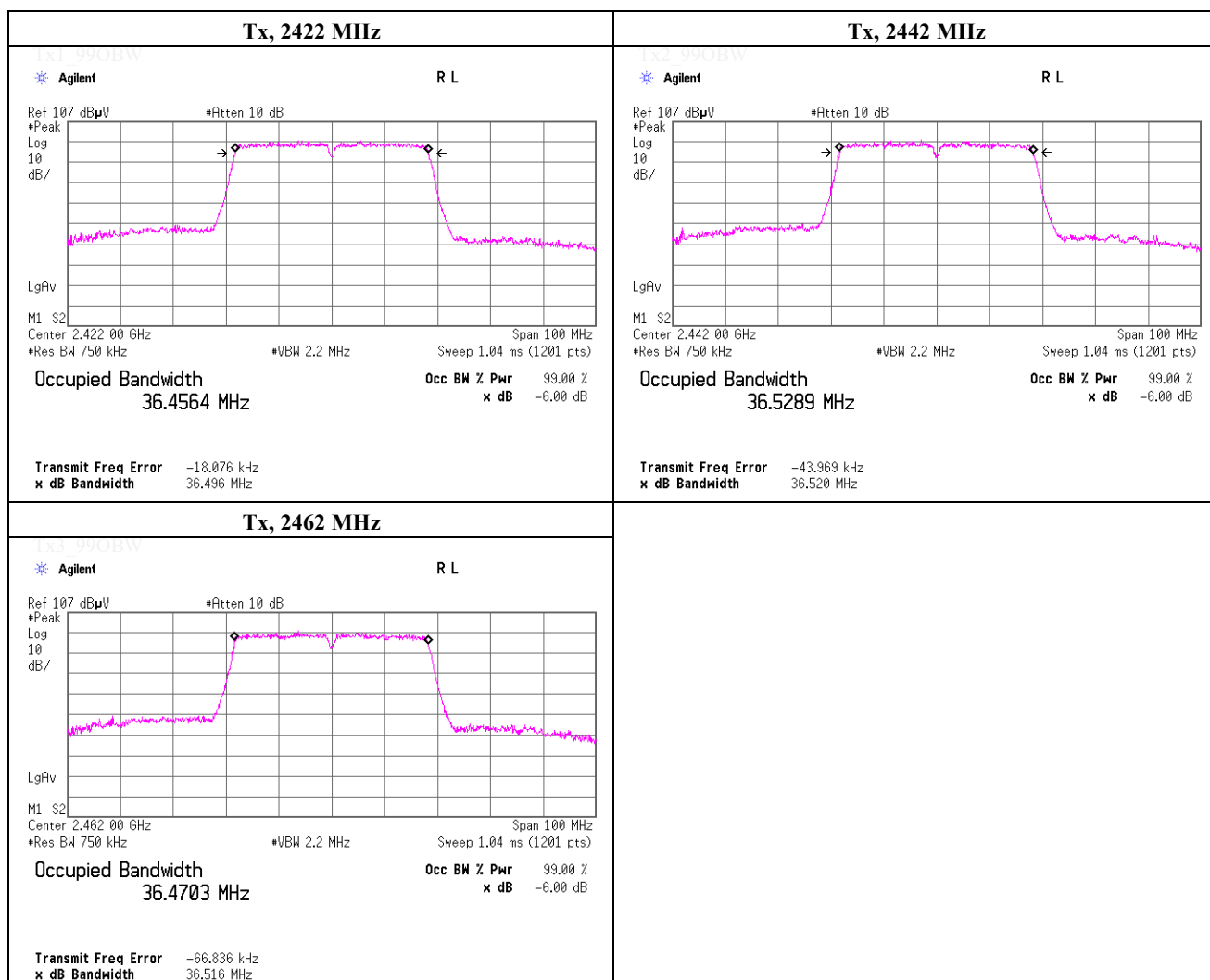


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99 % Occupied Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	February 5, 2021	
Temperature / Humidity	24 deg.C , 30 %RH	
Engineer	Takahiro Kawakami	
Mode	Tx, OFDM VHT40 (MIMO), PN9, antenna port 1, worst data mode 4 (MCS)	

Freq. [MHz]	99 % Occupied Bandwidth [kHz]
2422.0000	36456.4
2442.0000	36528.9
2462.0000	36470.3



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Maximum Peak Conducted Output Power

(PKPM1)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date August 6, 2020
 Temperature / Humidity 25 deg.C , 46 %RH
 Engineer Makoto Hosaka
 Mode Tx, Bluetooth Low Energy, PRBS9

Ch	Freq. [MHz]	(* P/M: Power Meter with power sensor)			Conducted Power					e.i.r.p.		
		P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result	
					[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]
Low	2402.0	-10.97	1.66	9.88	0.57	1.14	30.00	1000	29.43	0.30	0.87	1.22
Mid	2440.0	-10.79	1.66	9.88	0.75	1.19	30.00	1000	29.25	0.30	1.05	1.27
High1	2480.0	-10.45	1.67	9.89	1.11	1.29	30.00	1000	28.89	0.30	1.41	1.38

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

Result (e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Antenna Gain

UL Japan, Inc.

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Maximum Peak Conducted Output Power

(PKPM1)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
Date December 12, 2020
Temperature / Humidity 23 deg.C , 41 %RH
Engineer Takahiro Kawakami
Mode Tx, IEEE802.11b, PN9, worst data mode : 11 Mbps

Ant.	Ch	Freq. [MHz]	(* P/M: Power Meter with power sensor)			Conducted Power					e.i.r.p.		
			P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result	
						[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]
0	Low	2412.0	5.63	1.66	9.88	17.17	52.12	30.00	1000	12.83	0.30	17.47	55.85
0	Mid	2437.0	5.66	1.66	9.88	17.20	52.48	30.00	1000	12.80	0.30	17.50	56.23
0	High1	2462.0	5.61	1.67	9.89	17.17	52.12	30.00	1000	12.83	0.30	17.47	55.85
1	Low	2412.0	5.93	1.66	9.88	17.47	55.85	30.00	1000	12.53	0.19	17.66	58.34
1	Mid	2437.0	5.51	1.66	9.88	17.05	50.70	30.00	1000	12.95	0.19	17.24	52.97
1	High1	2462.0	5.61	1.67	9.89	17.17	52.12	30.00	1000	12.83	0.19	17.36	54.45

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

Result (e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Antenna Gain

[Pre check]

Antenna 0

	Data rate	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
	[Mbps]					[dBm]	[mW]	[dBm]	[mW]	
0	1	2437.0	5.26	1.66	9.88	16.80	47.86	30.00	1000	13.20
0	2	2437.0	5.35	1.66	9.88	16.89	48.87	30.00	1000	13.11
0	5.5	2437.0	5.40	1.66	9.88	16.94	49.43	30.00	1000	13.06
0	11	2437.0	5.66	1.66	9.88	17.20	52.48	30.00	1000	12.80

Worst

Antenna 1

	Data rate	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
	[Mbps]					[dBm]	[mW]	[dBm]	[mW]	
1	1	2437.0	5.49	1.66	9.88	17.03	50.47	30.00	1000	12.97
1	2	2437.0	5.41	1.66	9.88	16.95	49.55	30.00	1000	13.05
1	5.5	2437.0	5.36	1.66	9.88	16.90	48.98	30.00	1000	13.10
1	11	2437.0	5.51	1.66	9.88	17.05	50.70	30.00	1000	12.95

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

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Maximum Peak Conducted Output Power (PKPM1)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
Date August 5, 2020
Temperature / Humidity 26 deg.C , 50 %RH
Engineer Kenichi Adachi
Mode Tx, IEEE802.11b, PN9, worst data mode : 11 Mbps

Ant.	Ch	Freq. [MHz]	(* P/M: Power Meter with power sensor)			Conducted Power					e.i.r.p		
			P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result	
						[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]
0	High2	2467.0	-0.58	1.67	9.89	10.98	12.53	30.00	1000	19.02	0.30	11.28	13.43
0	High3	2472.0	-5.23	1.67	9.89	6.33	4.30	30.00	1000	23.67	0.30	6.63	4.60
1	High2	2467.0	0.78	1.67	9.89	12.34	17.14	30.00	1000	17.66	0.19	12.53	17.91
1	High3	2472.0	-4.03	1.67	9.89	7.53	5.66	30.00	1000	22.47	0.19	7.72	5.92

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

Result (e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Antenna Gain

[Pre check]

Antenna 0

	Data rate	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
	[Mbps]					[dBm]	[mW]	[dBm]	[mW]	
0	1	2467.0	-0.98	1.67	9.89	10.58	11.43	30.00	1000	19.42
0	2	2467.0	-0.59	1.67	9.89	10.97	12.50	30.00	1000	19.03
0	5.5	2467.0	-0.78	1.67	9.89	10.78	11.97	30.00	1000	19.22
0	11	2467.0	-0.58	1.67	9.89	10.98	12.53	30.00	1000	19.02

Antenna 1

	Data rate	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
	[Mbps]					[dBm]	[mW]	[dBm]	[mW]	
1	1	2467.0	0.48	1.67	9.89	12.04	16.00	30.00	1000	17.96
1	2	2467.0	0.56	1.67	9.89	12.12	16.29	30.00	1000	17.88
1	5.5	2467.0	0.53	1.67	9.89	12.09	16.18	30.00	1000	17.91
1	11	2467.0	0.78	1.67	9.89	12.34	17.14	30.00	1000	17.66

Worst

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

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Maximum Peak Conducted Output Power

(PKPM1)

Test place: UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date: December 12, 2020
 Temperature / Humidity: 23 deg.C , 41 %RH
 Engineer: Takahiro Kawakami
 Mode: Tx, IEEE802.11g, PN9, worst data mode : 48 Mbps

Ant.	Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Conducted Power					e.i.r.p.		
						Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result	
						[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]
0	Low	2412.0	11.28	1.66	9.88	22.82	191.43	30.00	1000	7.18	0.30	23.12	205.12
0	Mid	2437.0	11.30	1.66	9.88	22.84	192.31	30.00	1000	7.16	0.30	23.14	206.06
0	High1	2462.0	11.01	1.67	9.89	22.57	180.72	30.00	1000	7.43	0.30	22.87	193.64
1	Low	2412.0	11.29	1.66	9.88	22.83	191.87	30.00	1000	7.17	0.19	23.02	200.45
1	Mid	2437.0	11.22	1.66	9.88	22.76	188.80	30.00	1000	7.24	0.19	22.95	197.24
1	High1	2462.0	10.61	1.67	9.89	22.17	164.82	30.00	1000	7.83	0.19	22.36	172.19

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

Result (e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Antenna Gain

[Pre check]**Antenna 0**

	Data rate	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
	[Mbps]					[dBm]	[mW]	[dBm]	[mW]	
0	6	2437.0	9.10	1.66	9.88	20.64	115.88	30.00	1000	9.36
0	9	2437.0	9.16	1.66	9.88	20.70	117.49	30.00	1000	9.30
0	12	2437.0	8.65	1.66	9.88	20.19	104.47	30.00	1000	9.81
0	18	2437.0	8.80	1.66	9.88	20.34	108.14	30.00	1000	9.66
0	24	2437.0	10.85	1.66	9.88	22.39	173.38	30.00	1000	7.61
0	36	2437.0	10.89	1.66	9.88	22.43	174.98	30.00	1000	7.57
0	48	2437.0	11.30	1.66	9.88	22.84	192.31	30.00	1000	7.16
0	54	2437.0	10.77	1.66	9.88	22.31	170.22	30.00	1000	7.69

Worst**Antenna 1**

	Data rate	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
	[Mbps]					[dBm]	[mW]	[dBm]	[mW]	
1	6	2437.0	8.48	1.66	9.88	20.02	100.46	30.00	1000	9.98
1	9	2437.0	8.51	1.66	9.88	20.05	101.16	30.00	1000	9.95
1	12	2437.0	8.10	1.66	9.88	19.64	92.04	30.00	1000	10.36
1	18	2437.0	8.45	1.66	9.88	19.99	99.77	30.00	1000	10.01
1	24	2437.0	10.48	1.66	9.88	22.02	159.22	30.00	1000	7.98
1	36	2437.0	10.64	1.66	9.88	22.18	165.20	30.00	1000	7.82
1	48	2437.0	11.22	1.66	9.88	22.76	188.80	30.00	1000	7.24
1	54	2437.0	10.41	1.66	9.88	21.95	156.68	30.00	1000	8.05

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

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Maximum Peak Conducted Output Power

(PKPM1)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date August 5, 2020
 Temperature / Humidity 26 deg.C , 50 %RH
 Engineer Kenichi Adachi
 Mode Tx, IEEE802.11g, PN9, worst data mode : 48 Mbps

Ant.	Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Conducted Power					e.i.r.p.		
						Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result	
						[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]
0	High2	2467.0	5.39	1.67	9.89	16.95	49.55	30.00	1000	13.05	0.30	17.25	53.09
0	High3	2472.0	0.59	1.67	9.89	12.15	16.41	30.00	1000	17.85	0.30	12.45	17.58
1	High2	2467.0	6.34	1.67	9.89	17.90	61.66	30.00	1000	12.10	0.19	18.09	64.42
1	High3	2472.0	1.52	1.67	9.89	13.08	20.32	30.00	1000	16.92	0.19	13.27	21.23

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

Result (e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Antenna Gain

[Pre check]**Antenna 0**

	Data rate	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
	[Mbps]					[dBm]	[mW]	[dBm]	[mW]	
0	6	2467.0	3.23	1.67	9.89	14.79	30.13	30.00	1000	15.21
0	9	2467.0	3.02	1.67	9.89	14.58	28.71	30.00	1000	15.42
0	12	2467.0	2.88	1.67	9.89	14.44	27.80	30.00	1000	15.56
0	18	2467.0	3.25	1.67	9.89	14.81	30.27	30.00	1000	15.19
0	24	2467.0	5.26	1.67	9.89	16.82	48.08	30.00	1000	13.18
0	36	2467.0	5.33	1.67	9.89	16.89	48.87	30.00	1000	13.11
0	48	2467.0	5.39	1.67	9.89	16.95	49.55	30.00	1000	13.05
0	54	2467.0	4.83	1.67	9.89	16.39	43.55	30.00	1000	13.61

Antenna 1

	Data rate	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
	[Mbps]					[dBm]	[mW]	[dBm]	[mW]	
1	6	2467.0	4.09	1.67	9.89	15.65	36.73	30.00	1000	14.35
1	9	2467.0	3.93	1.67	9.89	15.49	35.40	30.00	1000	14.51
1	12	2467.0	3.78	1.67	9.89	15.34	34.20	30.00	1000	14.66
1	18	2467.0	3.86	1.67	9.89	15.42	34.83	30.00	1000	14.58
1	24	2467.0	5.86	1.67	9.89	17.42	55.21	30.00	1000	12.58
1	36	2467.0	6.22	1.67	9.89	17.78	59.98	30.00	1000	12.22
1	48	2467.0	6.34	1.67	9.89	17.90	61.66	30.00	1000	12.10
1	54	2467.0	5.52	1.67	9.89	17.08	51.05	30.00	1000	12.92

Worst

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

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Maximum Peak Conducted Output Power (PKPM1)

Test place: UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date: December 14, 2020
 Temperature / Humidity: 25 deg.C , 31 %RH
 Engineer: Kazuya Noda
 Mode: Tx, IEEE802.11n-20 (SISO), PN9, worst data mode : 3 (MCS)

Ant.	Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Conducted Power					e.i.r.p.		
						Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result	
						[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]
0	Low	2412.0	11.53	1.66	9.88	23.07	202.77	30.00	1000	6.93	0.30	23.37	217.27
0	Mid	2437.0	11.39	1.66	9.88	22.93	196.34	30.00	1000	7.07	0.30	23.23	210.38
0	High1	2462.0	11.25	1.67	9.89	22.81	190.99	30.00	1000	7.19	0.30	23.11	204.64
1	Low	2412.0	11.34	1.66	9.88	22.88	194.09	30.00	1000	7.12	0.19	23.07	202.77
1	Mid	2437.0	11.14	1.66	9.88	22.68	185.35	30.00	1000	7.32	0.19	22.87	193.64
1	High1	2462.0	11.01	1.67	9.89	22.57	180.72	30.00	1000	7.43	0.19	22.76	188.80

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

Result (e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Antenna Gain

[Pre check]

Antenna 0

	Mode (MCS)	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
						[dBm]	[mW]	[dBm]	[mW]	
0	0	2437.0	9.56	1.66	9.88	21.10	128.82	30.00	1000	8.90
0	1	2437.0	9.21	1.66	9.88	20.75	118.85	30.00	1000	9.25
0	2	2437.0	9.63	1.66	9.88	21.17	130.92	30.00	1000	8.83
0	3	2437.0	11.39	1.66	9.88	22.93	196.34	30.00	1000	7.07
0	4	2437.0	10.98	1.66	9.88	22.52	178.65	30.00	1000	7.48
0	5	2437.0	11.15	1.66	9.88	22.69	185.78	30.00	1000	7.31
0	6	2437.0	11.18	1.66	9.88	22.72	187.07	30.00	1000	7.28
0	7	2437.0	11.07	1.66	9.88	22.61	182.39	30.00	1000	7.39

Worst

Antenna 1

	Mode (MCS)	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
						[dBm]	[mW]	[dBm]	[mW]	
1	0	2437.0	9.17	1.66	9.88	20.71	117.76	30.00	1000	9.29
1	1	2437.0	9.71	1.66	9.88	21.25	133.35	30.00	1000	8.75
1	2	2437.0	9.36	1.66	9.88	20.90	123.03	30.00	1000	9.10
1	3	2437.0	11.14	1.66	9.88	22.68	185.35	30.00	1000	7.32
1	4	2437.0	10.82	1.66	9.88	22.36	172.19	30.00	1000	7.64
1	5	2437.0	11.12	1.66	9.88	22.66	184.50	30.00	1000	7.34
1	6	2437.0	11.13	1.66	9.88	22.67	184.93	30.00	1000	7.33
1	7	2437.0	10.91	1.66	9.88	22.45	175.79	30.00	1000	7.55

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

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Maximum Peak Conducted Output Power

(PKPM1)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date August 9, 2020
 Temperature / Humidity 25 deg.C , 57 %RH
 Engineer Takahiro Kawakami
 Mode Tx, IEEE802.11n-20 (MIMO), PN9, worst data mode : 11 (MCS)

Antenna 0 + Antenna 1				Conducted Power					e.i.r.p.	
Ch	Freq. [MHz]	Result Ant 0 [mW]	Result Ant 1 [mW]	Result Ant 0 + Ant 1		Limit		Margin [dB]	Result Ant 0 + Ant 1	
				[dBm]	[mW]	[dBm]	[mW]		[dBm]	[mW]
Low	2412.0	144.88	166.34	24.93	311.22	30.00	1000	5.07	25.17	329.02
Mid	2437.0	143.88	161.06	24.84	304.94	30.00	1000	5.16	25.08	322.44
High1	2462.0	139.96	160.32	24.78	300.28	30.00	1000	5.22	25.02	317.46

Antenna 0

(* P/M: Power Meter with power sensor)

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result (e.i.r.p.)	
					[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]
Low	2412.0	0.01	1.66	19.94	21.61	144.88	30.00	1000	8.39	0.30	21.91	155.24
Mid	2437.0	-0.02	1.66	19.94	21.58	143.88	30.00	1000	8.42	0.30	21.88	154.17
High1	2462.0	-0.15	1.67	19.94	21.46	139.96	30.00	1000	8.54	0.30	21.76	149.97

Antenna 1

(* P/M: Power Meter with power sensor)

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result (e.i.r.p.)	
					[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]
Low	2412.0	0.61	1.66	19.94	22.21	166.34	30.00	1000	7.79	0.19	22.40	173.78
Mid	2437.0	0.47	1.66	19.94	22.07	161.06	30.00	1000	7.93	0.19	22.26	168.27
High1	2462.0	0.44	1.67	19.94	22.05	160.32	30.00	1000	7.95	0.19	22.24	167.49

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

Result (e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Antenna Gain

[Pre check]

Mode (MCS)	Freq. [MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna 0			Antenna 1			Antenna 0 + 1 Total Result	
				Reading [dBm]	Result [dBm]	Result [mW]	Reading [dBm]	Result [dBm]	Result [mW]	[dBm]	[mW]
8	2437.0	1.66	19.94	-2.22	19.38	86.70	-1.81	19.79	95.28	22.60	181.98
9	2437.0	1.66	19.94	-2.52	19.08	80.91	-2.04	19.56	90.36	22.34	171.27
10	2437.0	1.66	19.94	-2.58	19.02	79.80	-2.30	19.30	85.11	22.17	164.91
11	2437.0	1.66	19.94	-0.02	21.58	143.88	0.47	22.07	161.06	24.84	304.94
12	2437.0	1.66	19.94	0.01	21.61	144.88	0.26	21.86	153.46	24.75	298.34
13	2437.0	1.66	19.94	0.09	21.69	147.57	0.31	21.91	155.24	24.81	302.81
14	2437.0	1.66	19.94	0.05	21.65	146.22	0.37	21.97	157.40	24.82	303.62
15	2437.0	1.66	19.94	-0.32	21.28	134.28	0.29	21.89	154.53	24.61	288.81

Worst

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

Total Result [mW] = 10 ^ (Antenna 0 Result / 10) + 10 ^ (Antenna 1 Result / 10)

Total Result [dBm] = 10 * log (Total Result [mW])

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Maximum Peak Conducted Output Power

(PKPM1)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date February 3, 2021
 Temperature / Humidity 24 deg.C , 55 %RH
 Engineer Takahiro Kawakami
 Mode Tx, IEEE802.11n-20 (MIMO), PN9, worst data mode : 11 (MCS)

Antenna 0 + Antenna 1				Conducted Power					e.i.r.p.	
Ch	Freq. [MHz]	Result Ant 0 [mW]	Result Ant 1 [mW]	Result Ant 0 + Ant 1		Limit		Margin [dB]	Result Ant 0 + Ant 1	
				[dBm]	[mW]	[dBm]	[mW]		[dBm]	[mW]
High2	2467.0	67.76	84.53	21.83	152.29	30.00	1000	8.17	22.07	160.92
High3	2472.0	19.77	26.67	16.67	46.44	30.00	1000	13.33	16.91	49.04

Antenna 0

(* P/M: Power Meter with power sensor)

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result (e.i.r.p.)	
					[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]
High2	2467.0	6.75	1.67	9.89	18.31	67.76	30.00	1000	11.69	0.30	18.61	72.61
High3	2472.0	1.40	1.67	9.89	12.96	19.77	30.00	1000	17.04	0.30	13.26	21.18

Antenna 1

(* P/M: Power Meter with power sensor)

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result (e.i.r.p.)	
					[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]
High2	2467.0	7.71	1.67	9.89	19.27	84.53	30.00	1000	10.73	0.19	19.46	88.31
High3	2472.0	2.70	1.67	9.89	14.26	26.67	30.00	1000	15.74	0.19	14.45	27.86

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

Result (e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Antenna Gain

[Pre check]

Mode (MCS)	Freq. [MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna 0			Antenna 1			Antenna 0 + 1 Total Result	
				Reading [dBm]	Result [dBm]	Result [mW]	Reading [dBm]	Result [dBm]	Result [mW]	[dBm]	[mW]
8	2467.0	1.67	9.89	4.65	16.21	41.78	5.05	16.61	45.81	19.42	87.59
9	2467.0	1.67	9.89	4.22	15.78	37.84	4.75	16.31	42.76	19.06	80.60
10	2467.0	1.67	9.89	4.36	15.92	39.08	4.65	16.21	41.78	19.08	80.86
11	2467.0	1.67	9.89	6.75	18.31	67.76	7.71	19.27	84.53	21.83	152.29
12	2467.0	1.67	9.89	6.71	18.27	67.14	7.11	18.67	73.62	21.48	140.76
13	2467.0	1.67	9.89	6.88	18.44	69.82	7.23	18.79	75.68	21.63	145.50
14	2467.0	1.67	9.89	6.85	18.41	69.34	7.11	18.67	73.62	21.55	142.96
15	2467.0	1.67	9.89	6.76	18.32	67.92	7.00	18.56	71.78	21.45	139.70

Worst

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

Total Result [mW] = 10 ^ (Antenna 0 Result / 10) + 10 ^ (Antenna 1 Result / 10)

Total Result [dBm] = 10 * log (Total Result [mW])

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Maximum Peak Conducted Output Power

(PKPM1)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date August 10, 2020 August 11, 2020
 Temperature / Humidity 24 deg.C , 42 %RH 26 deg.C , 47 %RH
 Engineer Takahiro Kawakami Kenichi Adachi
 Mode Tx, OFDM VHT20 (MIMO), PN9, worst data mode : 3 (MCS)

Antenna 0 + Antenna 1				Conducted Power					e.i.r.p.	
Ch	Freq. [MHz]	Result Ant 0 [mW]	Result Ant 1 [mW]	Result Ant 0 + Ant 1		Limit		Margin [dB]	Result Ant 0 + Ant 1	
				[dBm]	[mW]	[dBm]	[mW]		[dBm]	[mW]
Low	2412.0	148.59	184.08	25.22	332.67	30.00	1000	4.78	25.46	351.53
Mid	2437.0	141.25	174.98	25.00	316.23	30.00	1000	5.00	25.24	334.17
High1	2462.0	143.88	158.49	24.81	302.37	30.00	1000	5.19	25.05	319.75

Antenna 0

(* P/M: Power Meter with power sensor)

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result (e.i.r.p.)	
					[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]
Low	2412.0	0.12	1.66	19.94	21.72	148.59	30.00	1000	8.28	0.30	22.02	159.22
Mid	2437.0	-0.10	1.66	19.94	21.50	141.25	30.00	1000	8.50	0.30	21.80	151.36
High1	2462.0	-0.03	1.67	19.94	21.58	143.88	30.00	1000	8.42	0.30	21.88	154.17

Antenna 1

(* P/M: Power Meter with power sensor)

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result (e.i.r.p.)	
					[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]
Low	2412.0	1.05	1.66	19.94	22.65	184.08	30.00	1000	7.35	0.19	22.84	192.31
Mid	2437.0	0.83	1.66	19.94	22.43	174.98	30.00	1000	7.57	0.19	22.62	182.81
High1	2462.0	0.39	1.67	19.94	22.00	158.49	30.00	1000	8.00	0.19	22.19	165.58

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

Result (e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Antenna Gain

[Pre check]

Mode (MCS)	Freq. [MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna 0			Antenna 1			Antenna 0 + 1 Total Result	
				Reading [dBm]	Result [dBm]	Result [mW]	Reading [dBm]	Result [dBm]	Result [mW]	[dBm]	[mW]
0	2437.0	1.66	19.94	-2.35	19.25	84.14	-1.97	19.63	91.83	22.45	175.97
1	2437.0	1.66	19.94	-2.54	19.06	80.54	-2.44	19.16	82.41	22.12	162.95
2	2437.0	1.66	19.94	-2.48	19.12	81.66	-2.43	19.17	82.60	22.16	164.26
3	2437.0	1.66	19.94	-0.10	21.50	141.25	0.83	22.43	174.98	25.00	316.23
4	2437.0	1.66	19.94	-0.01	21.59	144.21	0.40	22.00	158.49	24.81	302.70
5	2437.0	1.66	19.94	-0.13	21.47	140.28	0.00	21.60	144.54	24.55	284.82
6	2437.0	1.66	19.94	-0.44	21.16	130.62	0.04	21.64	145.88	24.42	276.50
7	2437.0	1.66	19.94	-0.45	21.15	130.32	-0.19	21.41	138.36	24.29	268.68
8	2437.0	1.66	19.94	-0.04	21.56	143.22	0.41	22.01	158.85	24.80	302.07

Worst

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

Total Result [mW] = 10 ^ (Antenna 0 Result / 10) + 10 ^ (Antenna 1 Result / 10)

Total Result [dBm] = 10 * log (Total Result [mW])

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Maximum Peak Conducted Output Power

(PKPM1)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date February 3, 2021
 Temperature / Humidity 24 deg.C , 55 %RH
 Engineer Takahiro Kawakami
 Mode Tx, OFDM VHT20 (MIMO), PN9, worst data mode : 3 (MCS)

Antenna 0 + Antenna 1				Conducted Power					e.i.r.p.	
Ch	Freq. [MHz]	Result Ant 0 [mW]	Result Ant 1 [mW]	Result Ant 0 + Ant 1		Limit		Margin [dB]	Result Ant 0 + Ant 1	
				[dBm]	[mW]	[dBm]	[mW]		[dBm]	[mW]
High2	2467.0	72.44	88.10	22.06	160.54	30.00	1000	7.94	22.30	169.66
High3	2472.0	20.56	27.93	16.86	48.49	30.00	1000	13.14	17.09	51.20

Antenna 0

(* P/M: Power Meter with power sensor)

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result (e.i.r.p.)	
					[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]
High2	2467.0	7.04	1.67	9.89	18.60	72.44	30.00	1000	11.40	0.30	18.90	77.62
High3	2472.0	1.57	1.67	9.89	13.13	20.56	30.00	1000	16.87	0.30	13.43	22.03

Antenna 1

(* P/M: Power Meter with power sensor)

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result (e.i.r.p.)	
					[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]
High2	2467.0	7.89	1.67	9.89	19.45	88.10	30.00	1000	10.55	0.19	19.64	92.04
High3	2472.0	2.90	1.67	9.89	14.46	27.93	30.00	1000	15.54	0.19	14.65	29.17

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

Result (e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Antenna Gain

[Pre check]

Mode (MCS)	Freq. [MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna 0			Antenna 1			Antenna 0 + 1 Total Result	
				Reading [dBm]	Result [dBm]	Result [mW]	Reading [dBm]	Result [dBm]	Result [mW]	[dBm]	[mW]
0	2467.0	1.67	9.89	4.13	15.69	37.07	4.95	16.51	44.77	19.13	81.84
1	2467.0	1.67	9.89	3.94	15.50	35.48	4.83	16.39	43.55	18.98	79.03
2	2467.0	1.67	9.89	4.03	15.59	36.22	4.81	16.37	43.35	19.01	79.57
3	2467.0	1.67	9.89	7.04	18.60	72.44	7.89	19.45	88.10	22.06	160.54
4	2467.0	1.67	9.89	6.37	17.93	62.09	7.24	18.80	75.86	21.40	137.95
5	2467.0	1.67	9.89	6.47	18.03	63.53	6.77	18.33	68.08	21.19	131.61
6	2467.0	1.67	9.89	6.35	17.91	61.80	7.02	18.58	72.11	21.27	133.91
7	2467.0	1.67	9.89	6.45	18.01	63.24	7.23	18.79	75.68	21.43	138.92
8	2467.0	1.67	9.89	6.70	18.26	66.99	7.37	18.93	78.16	21.62	145.15

Worst

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

Total Result [mW] = 10 ^ (Antenna 0 Result / 10) + 10 ^ (Antenna 1 Result / 10)

Total Result [dBm] = 10 * log (Total Result [mW])

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Maximum Peak Conducted Output Power

(PKPM1)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date February 5, 2021
 Temperature / Humidity 24 deg.C , 30 %RH
 Engineer Takahiro Kawakami
 Mode Tx, IEEE802.11n-40 (MIMO), PN9, worst data mode : 11 (MCS)

Antenna 0 + Antenna 1				Conducted Power					e.i.r.p.	
Ch	Freq. [MHz]	Result Ant 0 [mW]	Result Ant 1 [mW]	Result Ant 0 + Ant 1		Limit		Margin [dB]	Result Ant 0 + Ant 1	
				[dBm]	[mW]	[dBm]	[mW]		[dBm]	[mW]
Low	2422.0	80.72	89.95	22.32	170.67	30.00	1000	7.68	22.56	180.47
Mid	2442.0	80.17	92.26	22.37	172.43	30.00	1000	7.63	22.61	182.28
High1	2462.0	77.80	81.85	22.03	159.65	30.00	1000	7.97	22.28	168.88

Antenna 0

(* P/M: Power Meter with power sensor)

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result (e.i.r.p.)	
					[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]
Low	2422.0	7.53	1.66	9.88	19.07	80.72	30.00	1000	10.93	0.30	19.37	86.50
Mid	2442.0	7.49	1.66	9.89	19.04	80.17	30.00	1000	10.96	0.30	19.34	85.90
High1	2462.0	7.35	1.67	9.89	18.91	77.80	30.00	1000	11.09	0.30	19.21	83.37

Antenna 1

(* P/M: Power Meter with power sensor)

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result (e.i.r.p.)	
					[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]
Low	2422.0	8.00	1.66	9.88	19.54	89.95	30.00	1000	10.46	0.19	19.73	93.97
Mid	2442.0	8.10	1.66	9.89	19.65	92.26	30.00	1000	10.35	0.19	19.84	96.38
High1	2462.0	7.57	1.67	9.89	19.13	81.85	30.00	1000	10.87	0.19	19.32	85.51

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

Result (e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Antenna Gain

[Pre check]

Mode (MCS)	Freq. [MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna 0			Antenna 1			Antenna 0 + 1 Total Result	
				Reading [dBm]	Result [dBm]	Result [mW]	Reading [dBm]	Result [dBm]	Result [mW]	[dBm]	[mW]
8	2442.0	1.66	9.89	5.42	16.97	49.77	5.61	17.16	52.00	20.08	101.77
9	2442.0	1.66	9.89	5.23	16.78	47.64	5.67	17.22	52.72	20.02	100.36
10	2442.0	1.66	9.89	5.13	16.68	46.56	5.70	17.25	53.09	19.98	99.65
11	2442.0	1.66	9.89	7.49	19.04	80.17	8.10	19.65	92.26	22.37	172.43
12	2442.0	1.66	9.89	7.30	18.85	76.74	7.87	19.42	87.50	22.15	164.24
13	2442.0	1.66	9.89	7.17	18.72	74.47	8.13	19.68	92.90	22.24	167.37
14	2442.0	1.66	9.89	7.31	18.86	76.91	7.64	19.19	82.99	22.04	159.90
15	2442.0	1.66	9.89	7.21	18.76	75.16	7.65	19.20	83.18	22.00	158.34

Worst

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

Total Result [mW] = 10 ^ (Antenna 0 Result / 10) + 10 ^ (Antenna 1 Result / 10)

Total Result [dBm] = 10 * log (Total Result [mW])

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Maximum Peak Conducted Output Power

(PKPM1)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room

Date February 5, 2021

Temperature / Humidity 24 deg.C , 30 %RH

Engineer Takahiro Kawakami

Mode Tx, OFDM VHT40 (MIMO), PN9,

worst data mode : 4 (MCS)

Antenna 0 + Antenna 1				Conducted Power					e.i.r.p.	
Ch	Freq. [MHz]	Result Ant 0 [mW]	Result Ant 1 [mW]	Result Ant 0 + Ant 1		Limit		Margin [dB]	Result Ant 0 + Ant 1	
				[dBm]	[mW]	[dBm]	[mW]		[dBm]	[mW]
Low	2422.0	80.91	84.53	22.19	165.44	30.00	1000	7.81	22.43	175.01
Mid	2442.0	78.70	81.85	22.06	160.55	30.00	1000	7.94	22.30	169.84
High1	2462.0	77.80	81.66	22.03	159.46	30.00	1000	7.97	22.27	168.68

Antenna 0

(* P/M: Power Meter with power sensor)

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result (e.i.r.p.)	
					[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]
Low	2422.0	7.54	1.66	9.88	19.08	80.91	30.00	1000	10.92	0.30	19.38	86.70
Mid	2442.0	7.41	1.66	9.89	18.96	78.70	30.00	1000	11.04	0.30	19.26	84.33
High1	2462.0	7.35	1.67	9.89	18.91	77.80	30.00	1000	11.09	0.30	19.21	83.37

Antenna 1

(* P/M: Power Meter with power sensor)

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]	Antenna Gain [dBi]	Result (e.i.r.p.)	
					[dBm]	[mW]	[dBm]	[mW]			[dBm]	[mW]
Low	2422.0	7.73	1.66	9.88	19.27	84.53	30.00	1000	10.73	0.19	19.46	88.31
Mid	2442.0	7.58	1.66	9.89	19.13	81.85	30.00	1000	10.87	0.19	19.32	85.51
High1	2462.0	7.56	1.67	9.89	19.12	81.66	30.00	1000	10.88	0.19	19.31	85.31

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

Result (e.i.r.p.) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Antenna Gain

[Pre check]

Mode (MCS)	Freq. [MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna 0			Antenna 1			Antenna 0 + 1	
				Reading [dBm]	Result [dBm]	Result [mW]	Reading [dBm]	Result [dBm]	Result [mW]	Total Result [dBm]	Total Result [mW]
0	2442.0	1.66	9.89	5.44	16.99	50.00	5.50	17.05	50.70	20.03	100.70
1	2442.0	1.66	9.89	5.18	16.73	47.10	5.54	17.09	51.17	19.92	98.27
2	2442.0	1.66	9.89	5.02	16.57	45.39	5.62	17.17	52.12	19.89	97.51
3	2442.0	1.66	9.89	7.26	18.81	76.03	7.35	18.90	77.62	21.87	153.65
4	2442.0	1.66	9.89	7.41	18.96	78.70	7.58	19.13	81.85	22.06	160.55
5	2442.0	1.66	9.89	7.46	19.01	79.62	7.46	19.01	79.62	22.02	159.24
6	2442.0	1.66	9.89	6.95	18.50	70.79	7.62	19.17	82.60	21.86	153.39
7	2442.0	1.66	9.89	7.38	18.93	78.16	7.58	19.13	81.85	22.04	160.01
8	2442.0	1.66	9.89	7.11	18.66	73.45	7.52	19.07	80.72	21.88	154.17
9	2442.0	1.66	9.89	7.15	18.70	74.13	7.29	18.84	76.56	21.78	150.69

Worst

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

Total Result [mW] = $10 \wedge (\text{Antenna 0 Result} / 10) + 10 \wedge (\text{Antenna 1 Result} / 10)$ Total Result [dBm] = $10 * \log (\text{Total Result [mW]})$ **UL Japan, Inc.****Shonan EMC Lab.**

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Maximum Conducted Output Power (Reference data)

(AVGPM)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
Date August 6, 2020
Temperature / Humidity 25 deg.C , 46 %RH
Engineer Makoto Hosaka
Mode Tx, Bluetooth Low Energy, PRBS9,

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
						[dBm]	[mW]
Low	2402.0	-13.62	1.66	9.88	1.79	-0.29	0.94
Mid	2440.0	-13.41	1.66	9.88	1.79	-0.08	0.98
High1	2480.0	-13.03	1.67	9.89	1.79	0.32	1.08

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

* This data shows output power is appropriate for maximum typical power at tested data mode.

Maximum Conducted Output Power (Reference data) (AVGPM)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
Date December 12, 2020
Temperature / Humidity 23 deg.C , 41 %RH
Engineer Takahiro Kawakami
Mode Tx, IEEE802.11b, PN9, worst antenna : 0 worst data mode : 11 Mbps

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
						[dBm]	[mW]
Low	2412.0	1.30	1.66	9.88	0.43	13.27	21.23
Mid	2437.0	1.39	1.66	9.88	0.43	13.36	21.68
High1	2462.0	1.30	1.67	9.89	0.43	13.29	21.33

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

* This data shows output power is appropriate for maximum typical power at tested data mode.

[Pre check]

Antenna 0

	Data rate [Mbps]	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
							[dBm]	[mW]
0	1	2437.0	1.58	1.66	9.88	0.04	13.16	20.70
0	2	2437.0	1.66	1.66	9.88	0.09	13.29	21.33
0	5.5	2437.0	1.50	1.66	9.88	0.23	13.27	21.23
0	11	2437.0	1.39	1.66	9.88	0.43	13.36	21.68

Antenna 1

	Data rate [Mbps]	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
							[dBm]	[mW]
1	1	2437.0	1.67	1.66	9.88	0.04	13.25	21.13
1	2	2437.0	1.58	1.66	9.88	0.09	13.21	20.94
1	5.5	2437.0	1.36	1.66	9.88	0.23	13.13	20.56
1	11	2437.0	1.17	1.66	9.88	0.43	13.14	20.61

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

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Maximum Conducted Output Power (Reference data)

(AVGPM)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
Date August 5, 2020
Temperature / Humidity 26 deg.C , 50 %RH
Engineer Kenichi Adachi
Mode Tx, IEEE802.11b, PN9, worst antenna : 1 worst data mode : 11 Mbps

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
						[dBm]	[mW]
High2	2467.0	-3.64	1.67	9.89	0.43	8.35	6.84
High3	2472.0	-7.98	1.67	9.89	0.43	4.01	2.52

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

* This data shows output power is appropriate for maximum typical power at tested data mode.

[Pre check]

Antenna 0

	Data rate [Mbps]	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
							[dBm]	[mW]
0	1	2467.0	-4.62	1.67	9.89	0.04	6.98	4.99
0	2	2467.0	-4.27	1.67	9.89	0.09	7.38	5.47
0	5.5	2467.0	-4.55	1.67	9.89	0.23	7.24	5.30
0	11	2467.0	-4.88	1.67	9.89	0.43	7.11	5.14

Antenna 1

	Data rate [Mbps]	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
							[dBm]	[mW]
1	1	2467.0	-3.35	1.67	9.89	0.04	8.25	6.68
1	2	2467.0	-3.33	1.67	9.89	0.09	8.32	6.79
1	5.5	2467.0	-3.45	1.67	9.89	0.23	8.34	6.82
1	11	2467.0	-3.64	1.67	9.89	0.43	8.35	6.84

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

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Maximum Conducted Output Power (Reference data)

(AVGPM)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
Date December 12, 2020
Temperature / Humidity 23 deg.C , 41 %RH
Engineer Takahiro Kawakami
Mode Tx, IEEE802.11g, PN9, worst antenna : 0 worst data mode : 48 Mbps

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
						[dBm]	[mW]
Low	2412.0	0.16	1.66	9.88	1.77	13.47	22.23
Mid	2437.0	-0.03	1.66	9.88	1.77	13.28	21.28
High1	2462.0	-0.32	1.67	9.89	1.77	13.01	20.00

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

* This data shows output power is appropriate for maximum typical power at tested data mode.

[Pre check]

Antenna 0

	Data rate [Mbps]	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
							[dBm]	[mW]
0	6	2437.0	1.08	1.66	9.88	0.29	12.91	19.54
0	9	2437.0	0.93	1.66	9.88	0.42	12.89	19.45
0	12	2437.0	0.84	1.66	9.88	0.55	12.93	19.63
0	18	2437.0	0.61	1.66	9.88	0.79	12.94	19.68
0	24	2437.0	0.49	1.66	9.88	1.02	13.05	20.18
0	36	2437.0	0.19	1.66	9.88	1.40	13.13	20.56
0	48	2437.0	-0.03	1.66	9.88	1.77	13.28	21.28
0	54	2437.0	-0.24	1.66	9.88	1.88	13.18	20.80

Antenna 1

	Data rate [Mbps]	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
							[dBm]	[mW]
1	6	2437.0	0.79	1.66	9.88	0.29	12.62	18.28
1	9	2437.0	0.62	1.66	9.88	0.42	12.58	18.11
1	12	2437.0	0.51	1.66	9.88	0.55	12.60	18.20
1	18	2437.0	0.31	1.66	9.88	0.79	12.64	18.37
1	24	2437.0	0.24	1.66	9.88	1.02	12.80	19.05
1	36	2437.0	-0.18	1.66	9.88	1.40	12.76	18.88
1	48	2437.0	-0.24	1.66	9.88	1.77	13.07	20.28
1	54	2437.0	-0.45	1.66	9.88	1.88	12.97	19.82

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

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Maximum Conducted Output Power (Reference data) (AVGPM)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
Date August 5, 2020
Temperature / Humidity 26 deg.C , 50 %RH
Engineer Kenichi Adachi
Mode Tx, IEEE802.11g, PN9, worst antenna : 1 worst data mode : 48 Mbps

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
						[dBm]	[mW]
High2	2467.0	-5.05	1.67	9.89	1.77	8.28	6.73
High3	2472.0	-9.46	1.67	9.89	1.77	3.87	2.44

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

* This data shows output power is appropriate for maximum typical power at tested data mode.

[Pre check]

Antenna 0

	Data rate [Mbps]	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
							[dBm]	[mW]
0	6	2467.0	-4.64	1.67	9.89	0.29	7.21	5.26
0	9	2467.0	-5.07	1.67	9.89	0.42	6.91	4.91
0	12	2467.0	-5.10	1.67	9.89	0.55	7.01	5.02
0	18	2467.0	-5.40	1.67	9.89	0.79	6.95	4.95
0	24	2467.0	-5.28	1.67	9.89	1.02	7.30	5.37
0	36	2467.0	-5.80	1.67	9.89	1.40	7.16	5.20
0	48	2467.0	-6.01	1.67	9.89	1.77	7.32	5.40
0	54	2467.0	-6.13	1.67	9.89	1.88	7.31	5.38

Antenna 1

	Data rate [Mbps]	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
							[dBm]	[mW]
1	6	2467.0	-3.64	1.67	9.89	0.29	8.21	6.62
1	9	2467.0	-4.03	1.67	9.89	0.42	7.95	6.24
1	12	2467.0	-4.04	1.67	9.89	0.55	8.07	6.41
1	18	2467.0	-4.42	1.67	9.89	0.79	7.93	6.21
1	24	2467.0	-4.38	1.67	9.89	1.02	8.20	6.61
1	36	2467.0	-4.84	1.67	9.89	1.40	8.12	6.49
1	48	2467.0	-5.05	1.67	9.89	1.77	8.28	6.73
1	54	2467.0	-5.23	1.67	9.89	1.88	8.21	6.62

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

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Maximum Conducted Output Power (Reference data)

(AVGPM)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date December 14, 2020
 Temperature / Humidity 25 deg.C , 31 %RH
 Engineer Kazuya Noda
 Mode Tx, IEEE802.11n-20 (SISO), PN9, worst antenna : 0 worst data mode : 3 (MCS)

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
						[dBm]	[mW]
Low	2412.0	0.86	1.66	9.88	1.03	13.43	22.03
Mid	2437.0	0.84	1.66	9.88	1.03	13.41	21.93
High1	2462.0	0.52	1.67	9.89	1.03	13.11	20.46

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

* This data shows output power is appropriate for maximum typical power at tested data mode.

[Pre check]

Antenna 0

	Mode (MCS)	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
							[dBm]	[mW]
0	0	2437.0	1.21	1.66	9.88	0.30	13.05	20.18
0	1	2437.0	0.84	1.66	9.88	0.58	12.96	19.77
0	2	2437.0	0.71	1.66	9.88	0.81	13.06	20.23
0	3	2437.0	0.84	1.66	9.88	1.03	13.41	21.93
0	4	2437.0	-0.21	1.66	9.88	1.39	12.72	18.71
0	5	2437.0	-0.47	1.66	9.88	1.72	12.79	19.01
0	6	2437.0	-0.65	1.66	9.88	1.84	12.73	18.75
0	7	2437.0	-0.79	1.66	9.88	1.99	12.74	18.79

Antenna 1

	Mode (MCS)	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
							[dBm]	[mW]
1	0	2437.0	0.78	1.66	9.88	0.30	12.62	18.28
1	1	2437.0	0.39	1.66	9.88	0.58	12.51	17.82
1	2	2437.0	0.18	1.66	9.88	0.81	12.53	17.91
1	3	2437.0	0.46	1.66	9.88	1.03	13.03	20.09
1	4	2437.0	0.07	1.66	9.88	1.39	13.00	19.95
1	5	2437.0	-0.21	1.66	9.88	1.72	13.05	20.18
1	6	2437.0	-0.56	1.66	9.88	1.84	12.82	19.14
1	7	2437.0	-0.52	1.66	9.88	1.99	13.01	20.00

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

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Maximum Conducted Output Power (Reference data) (AVGPM)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
Date August 6, 2020
Temperature / Humidity 25 deg.C , 46 %RH
Engineer Makoto Hosaka
Mode Tx, IEEE802.11n-20 (SISO), PN9, worst antenna : 1 worst data mode : 3 (MCS)

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
						[dBm]	[mW]
High2	2467.0	-4.04	1.67	9.89	1.03	8.55	7.16
High3	2472.0	-8.81	1.67	9.89	1.03	3.78	2.39

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

* This data shows output power is appropriate for maximum typical power at tested data mode.

[Pre check]

Antenna 0

	Mode (MCS)	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
							[dBm]	[mW]
0	0	2467.0	-4.80	1.67	9.89	0.30	7.06	5.08
0	1	2467.0	-5.08	1.67	9.89	0.58	7.06	5.08
0	2	2467.0	-5.23	1.67	9.89	0.81	7.14	5.18
0	3	2467.0	-5.12	1.67	9.89	1.03	7.47	5.58
0	4	2467.0	-5.67	1.67	9.89	1.39	7.28	5.35
0	5	2467.0	-5.96	1.67	9.89	1.72	7.32	5.40
0	6	2467.0	-6.03	1.67	9.89	1.84	7.37	5.46
0	7	2467.0	-6.16	1.67	9.89	1.99	7.39	5.48

Antenna 1

	Mode (MCS)	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
							[dBm]	[mW]
1	0	2467.0	-3.69	1.67	9.89	0.30	8.17	6.56
1	1	2467.0	-3.94	1.67	9.89	0.58	8.20	6.61
1	2	2467.0	-4.17	1.67	9.89	0.81	8.20	6.61
1	3	2467.0	-4.04	1.67	9.89	1.03	8.55	7.16
1	4	2467.0	-4.68	1.67	9.89	1.39	8.27	6.71
1	5	2467.0	-4.97	1.67	9.89	1.72	8.31	6.78
1	6	2467.0	-5.14	1.67	9.89	1.84	8.26	6.70
1	7	2467.0	-5.20	1.67	9.89	1.99	8.35	6.84

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

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Maximum Conducted Output Power (Reference data)

(AVGPM)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date December 14, 2020
 Temperature / Humidity 25 deg.C , 31 %RH
 Engineer Kazuya Noda
 Mode Tx, OFDM VHT20 (SISO), PN9, worst antenna : 0 worst data mode : 3 (MCS)

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
						[dBm]	[mW]
Low	2412.0	0.91	1.66	9.88	1.02	13.47	22.23
Mid	2437.0	0.81	1.66	9.88	1.02	13.37	21.73
High1	2462.0	0.45	1.67	9.89	1.02	13.03	20.09

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

* This data shows output power is appropriate for maximum typical power at tested data mode.

[Pre check]

Antenna 0

	Mode (MCS)	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
							[dBm]	[mW]
0	0	2437.0	1.03	1.66	9.88	0.30	12.87	19.36
0	1	2437.0	0.80	1.66	9.88	0.58	12.92	19.59
0	2	2437.0	0.57	1.66	9.88	0.81	12.92	19.59
0	3	2437.0	0.81	1.66	9.88	1.02	13.37	21.73
0	4	2437.0	0.45	1.66	9.88	1.37	13.36	21.68
0	5	2437.0	0.08	1.66	9.88	1.69	13.31	21.43
0	6	2437.0	-0.06	1.66	9.88	1.80	13.28	21.28
0	7	2437.0	-0.20	1.66	9.88	1.91	13.25	21.13
0	8	2437.0	-1.32	1.66	9.88	2.14	12.36	17.22

Antenna 1

	Mode (MCS)	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
							[dBm]	[mW]
1	0	2437.0	0.68	1.66	9.88	0.30	12.52	17.86
1	1	2437.0	0.42	1.66	9.88	0.58	12.54	17.95
1	2	2437.0	0.17	1.66	9.88	0.81	12.52	17.86
1	3	2437.0	0.44	1.66	9.88	1.02	13.00	19.95
1	4	2437.0	0.08	1.66	9.88	1.37	12.99	19.91
1	5	2437.0	-0.52	1.66	9.88	1.69	12.71	18.66
1	6	2437.0	-0.66	1.66	9.88	1.80	12.68	18.54
1	7	2437.0	-0.80	1.66	9.88	1.91	12.65	18.41
1	8	2437.0	-1.25	1.66	9.88	2.14	12.43	17.50

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

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Maximum Conducted Output Power (Reference data) (AVGPM)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
Date August 6, 2020
Temperature / Humidity 25 deg.C , 46 %RH
Engineer Makoto Hosaka
Mode Tx, OFDM VHT20 (SISO), PN9, worst antenna : 1 worst data mode : 8 (MCS)

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
						[dBm]	[mW]
High2	2467.0	-5.24	1.67	9.89	2.14	8.46	7.01
High3	2472.0	-9.82	1.67	9.89	2.14	3.88	2.44

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

* This data shows output power is appropriate for maximum typical power at tested data mode.

[Pre check]

Antenna 0

	Mode (MCS)	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
							[dBm]	[mW]
0	0	2467.0	-4.73	1.67	9.89	0.30	7.13	5.16
0	1	2467.0	-5.04	1.67	9.89	0.58	7.10	5.13
0	2	2467.0	-5.25	1.67	9.89	0.81	7.12	5.15
0	3	2467.0	-5.16	1.67	9.89	1.02	7.42	5.52
0	4	2467.0	-5.57	1.67	9.89	1.37	7.36	5.45
0	5	2467.0	-5.90	1.67	9.89	1.69	7.35	5.43
0	6	2467.0	-5.98	1.67	9.89	1.80	7.38	5.47
0	7	2467.0	-6.10	1.67	9.89	1.91	7.37	5.46
0	8	2467.0	-6.34	1.67	9.89	2.14	7.36	5.45

Antenna 1

	Mode (MCS)	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
							[dBm]	[mW]
1	0	2467.0	-3.61	1.67	9.89	0.30	8.25	6.68
1	1	2467.0	-3.87	1.67	9.89	0.58	8.27	6.71
1	2	2467.0	-4.07	1.67	9.89	0.81	8.30	6.76
1	3	2467.0	-4.24	1.67	9.89	1.02	8.34	6.82
1	4	2467.0	-4.58	1.67	9.89	1.37	8.35	6.84
1	5	2467.0	-4.92	1.67	9.89	1.69	8.33	6.81
1	6	2467.0	-5.00	1.67	9.89	1.80	8.36	6.85
1	7	2467.0	-5.09	1.67	9.89	1.91	8.38	6.89
1	8	2467.0	-5.24	1.67	9.89	2.14	8.46	7.01

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

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Maximum Conducted Output Power (Reference data) (AVGPM)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
Date August 9, 2020
Temperature / Humidity 25 deg.C , 57 %RH
Engineer Takahiro Kawakami
Mode Tx, IEEE802.11n-20 (MIMO), PN9, worst data mode : 12 (MCS)

Antenna 0 + Antenna 1

Ch	Freq. [MHz]	Ant 0	Ant 1	Result	
		Result [mW]	Result [mW]	[dBm]	[mW]
Low	2412.0	13.71	15.24	14.62	28.95
Mid	2437.0	14.03	17.10	14.93	31.13
High1	2462.0	12.91	14.72	14.41	27.63

Antenna 0

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Result	
						[dBm]	[mW]
Low	2412.0	-12.37	1.66	19.94	2.14	11.37	13.71
Mid	2437.0	-12.27	1.66	19.94	2.14	11.47	14.03
High1	2462.0	-12.64	1.67	19.94	2.14	11.11	12.91

Antenna 1

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Result	
						[dBm]	[mW]
Low	2412.0	-11.91	1.66	19.94	2.14	11.83	15.24
Mid	2437.0	-11.41	1.66	19.94	2.14	12.33	17.10
High1	2462.0	-12.07	1.67	19.94	2.14	11.68	14.72

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty factor

* This data shows output power is appropriate for maximum typical power at tested data mode.

[Pre check]

Mode (MCS)	Freq. [MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Antenna 0			Antenna 1			Antenna 0 + 1	
					Reading [dBm]	Result [dBm]	Result [mW]	Reading [dBm]	Result [dBm]	Result [mW]	Total Result [dBm]	Total Result [mW]
8	2437.0	1.66	19.94	0.57	-11.11	11.06	12.76	-10.83	11.34	13.61	14.21	26.37
9	2437.0	1.66	19.94	1.02	-11.71	10.91	12.33	-11.24	11.38	13.74	14.16	26.07
10	2437.0	1.66	19.94	1.38	-12.07	10.91	12.33	-11.40	11.58	14.39	14.27	26.72
11	2437.0	1.66	19.94	1.70	-11.93	11.37	13.71	-11.40	11.90	15.49	14.65	29.20
12	2437.0	1.66	19.94	2.14	-12.27	11.47	14.03	-11.41	12.33	17.10	14.93	31.13
13	2437.0	1.66	19.94	2.51	-12.59	11.52	14.19	-12.37	11.74	14.93	14.64	29.12
14	2437.0	1.66	19.94	2.64	-12.69	11.55	14.29	-12.45	11.79	15.10	14.68	29.39
15	2437.0	1.66	19.94	2.77	-13.18	11.19	13.15	-12.56	11.81	15.17	14.52	28.32

Worst

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty factor

Total Result [mW] = 10 ^ (Antenna 0 Result / 10) + 10 ^ (Antenna 1 Result / 10)

Total Result [dBm] = 10 * log (Total Result [mW])

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Maximum Conducted Output Power (Reference data)

(AVGPM)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date February 3, 2021
 Temperature / Humidity 24 deg.C , 55 %RH
 Engineer Takahiro Kawakami
 Mode Tx, IEEE802.11n-20 (MIMO), PN9, worst data mode : 11 (MCS)

Antenna 0 + Antenna 1

Ch	Freq. [MHz]	Ant 0		Ant 1		Result	
		Result [mW]	Result [mW]	Result [dBm]	Result [mW]		
High2	2467.0	6.15	7.76	11.43	13.91		
High3	2472.0	1.72	2.44	6.19	4.16		

Antenna 0

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Result	
						Result [dBm]	Result [mW]
High2	2467.0	-5.37	1.67	9.89	1.70	7.89	6.15
High3	2472.0	-10.91	1.67	9.89	1.70	2.35	1.72

Antenna 1

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Result	
						Result [dBm]	Result [mW]
High2	2467.0	-4.36	1.67	9.89	1.70	8.90	7.76
High3	2472.0	-9.39	1.67	9.89	1.70	3.87	2.44

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty factor

* This data shows output power is appropriate for maximum typical power at tested data mode.

[Pre check]

Mode (MCS)	Freq. [MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Antenna 0			Antenna 1			Antenna 0 + 1	
					Reading [dBm]	Result [dBm]	Result [mW]	Reading [dBm]	Result [dBm]	Result [mW]	Total Result [dBm]	Total Result [mW]
8	2467.0	1.67	9.89	0.57	-4.55	7.58	5.73	-3.68	8.45	7.00	11.05	12.73
9	2467.0	1.67	9.89	1.02	-5.13	7.45	5.56	-4.19	8.39	6.90	10.96	12.46
10	2467.0	1.67	9.89	1.38	-5.36	7.58	5.73	-4.35	8.59	7.23	11.13	12.96
11	2467.0	1.67	9.89	1.70	-5.37	7.89	6.15	-4.36	8.90	7.76	11.43	13.91
12	2467.0	1.67	9.89	2.14	-5.86	7.84	6.08	-4.98	8.72	7.45	11.31	13.53
13	2467.0	1.67	9.89	2.51	-6.09	7.98	6.28	-5.27	8.80	7.59	11.42	13.87
14	2467.0	1.67	9.89	2.64	-6.16	8.04	6.37	-5.56	8.64	7.31	11.36	13.68
15	2467.0	1.67	9.89	2.77	-6.38	7.95	6.24	-5.57	8.76	7.52	11.39	13.76

Worst

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty factor

Total Result [mW] = 10 ^ (Antenna 0 Result / 10) + 10 ^ (Antenna 1 Result / 10)

Total Result [dBm] = 10 * log (Total Result [mW])

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Maximum Conducted Output Power (Reference data) (AVGPM)

Test place: UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
Date: February 3, 2021
Temperature / Humidity: 24 deg.C , 55 %RH
Engineer: Takahiro Kawakami
Mode: Tx, OFDM VHT20 (MIMO), PN9, worst data mode : 3 (MCS)

Antenna 0 + Antenna 1

Ch	Freq. [MHz]	Ant 0	Ant 1	Result	
		Result [mW]	Result [mW]	[dBm]	[mW]
High2	2467.0	6.32	8.11	11.59	14.43
High3	2472.0	1.69	2.44	6.16	4.13

Antenna 0

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV)	Cable	Atten.	Duty	Result	
		Reading [dBm]	Loss [dB]	Loss [dB]	factor [dB]	[dBm]	[mW]
High2	2467.0	-5.21	1.67	9.89	1.66	8.01	6.32
High3	2472.0	-10.95	1.67	9.89	1.66	2.27	1.69

Antenna 1

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV)	Cable	Atten.	Duty	Result	
		Reading [dBm]	Loss [dB]	Loss [dB]	factor [dB]	[dBm]	[mW]
High2	2467.0	-4.13	1.67	9.89	1.66	9.09	8.11
High3	2472.0	-9.35	1.67	9.89	1.66	3.87	2.44

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty factor

* This data shows output power is appropriate for maximum typical power at tested data mode.

[Pre check]

Mode (MCS)	Freq. [MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Antenna 0			Antenna 1			Antenna 0 + 1	
					Reading [dBm]	Result [dBm]	Result [mW]	Reading [dBm]	Result [dBm]	Result [mW]	Total Result [dBm]	Total Result [mW]
0	2467.0	1.67	9.89	0.55	-4.52	7.59	5.74	-3.49	8.62	7.28	11.15	13.02
1	2467.0	1.67	9.89	1.01	-4.86	7.71	5.90	-3.93	8.64	7.31	11.21	13.21
2	2467.0	1.67	9.89	1.35	-5.22	7.69	5.87	-4.14	8.77	7.53	11.27	13.40
3	2467.0	1.67	9.89	1.66	-5.21	8.01	6.32	-4.13	9.09	8.11	11.59	14.43
4	2467.0	1.67	9.89	2.10	-5.61	8.05	6.38	-4.78	8.88	7.73	11.50	14.11
5	2467.0	1.67	9.89	2.44	-5.99	8.01	6.32	-5.11	8.89	7.74	11.48	14.06
6	2467.0	1.67	9.89	2.57	-6.04	8.09	6.44	-5.12	9.01	7.96	11.58	14.40
7	2467.0	1.67	9.89	2.68	-6.19	8.05	6.38	-5.28	8.96	7.87	11.54	14.25
8	2467.0	1.67	9.89	2.93	-6.34	8.15	6.53	-5.56	8.93	7.82	11.57	14.35

Worst

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty factor

Total Result [mW] = 10 ^ (Antenna 0 Result / 10) + 10 ^ (Antenna 1 Result / 10)

Total Result [dBm] = 10 * log (Total Result [mW])

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Maximum Conducted Output Power (Reference data) (AVGPM)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
Date August 7, 2020
Temperature / Humidity 25 deg.C , 54 %RH
Engineer Kenichi Adachi
Mode Tx, IEEE802.11n-40 (SISO), PN9, worst antenna : 1 worst data mode : 3 (MCS)

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
						[dBm]	[mW]
Low	2422.0	-14.12	1.66	19.94	1.74	9.22	8.36
Mid	2442.0	-14.09	1.66	19.94	1.74	9.25	8.41
High	2462.0	-14.29	1.67	19.94	1.74	9.06	8.05

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

* This data shows output power is appropriate for maximum typical power at tested data mode.

[Pre check]

Antenna 0

	Mode (MCS)	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
							[dBm]	[mW]
0	0	2442.0	-14.38	1.66	19.94	0.59	7.81	6.04
0	1	2442.0	-14.88	1.66	19.94	1.05	7.77	5.98
0	2	2442.0	-15.26	1.66	19.94	1.43	7.77	5.98
0	3	2442.0	-15.02	1.66	19.94	1.74	8.32	6.79
0	4	2442.0	-15.98	1.66	19.94	2.25	7.87	6.12
0	5	2442.0	-16.40	1.66	19.94	2.62	7.82	6.05
0	6	2442.0	-16.47	1.66	19.94	2.76	7.89	6.15
0	7	2442.0	-16.69	1.66	19.94	2.91	7.82	6.05

Antenna 1

	Mode (MCS)	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
							[dBm]	[mW]
1	0	2442.0	-13.33	1.66	19.94	0.59	8.86	7.69
1	1	2442.0	-13.79	1.66	19.94	1.05	8.86	7.69
1	2	2442.0	-14.11	1.66	19.94	1.43	8.92	7.80
1	3	2442.0	-14.09	1.66	19.94	1.74	9.25	8.41
1	4	2442.0	-14.84	1.66	19.94	2.25	9.01	7.96
1	5	2442.0	-14.99	1.66	19.94	2.62	9.23	8.38
1	6	2442.0	-15.12	1.66	19.94	2.76	9.24	8.39
1	7	2442.0	-15.54	1.66	19.94	2.91	8.97	7.89

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

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Maximum Conducted Output Power (Reference data)

(AVGPM)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date August 7, 2020
 Temperature / Humidity 25 deg.C , 54 %RH
 Engineer Kenichi Adachi
 Mode Tx, OFDM VHT40 (SISO), PN9, worst antenna : 1 worst data mode : 9 (MCS)

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
						[dBm]	[mW]
Low	2422.0	-15.75	1.66	19.94	3.23	9.08	8.09
Mid	2442.0	-15.68	1.66	19.94	3.23	9.15	8.22
High	2462.0	-15.66	1.67	19.94	3.23	9.18	8.28

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

* This data shows output power is appropriate for maximum typical power at tested data mode.

[Pre check]

Antenna 0

	Mode (MCS)	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
							[dBm]	[mW]
0	0	2442.0	-13.77	1.66	19.94	0.59	8.42	6.95
0	1	2442.0	-14.24	1.66	19.94	1.05	8.41	6.93
0	2	2442.0	-14.77	1.66	19.94	1.41	8.24	6.67
0	3	2442.0	-14.88	1.66	19.94	1.71	8.43	6.97
0	4	2442.0	-15.26	1.66	19.94	2.16	8.50	7.08
0	5	2442.0	-15.63	1.66	19.94	2.55	8.52	7.11
0	6	2442.0	-15.71	1.66	19.94	2.69	8.58	7.21
0	7	2442.0	-15.87	1.66	19.94	2.88	8.61	7.26
0	8	2442.0	-16.06	1.66	19.94	2.99	8.53	7.13
0	9	2442.0	-16.47	1.66	19.94	3.23	8.36	6.85

Antenna 1

	Mode (MCS)	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
							[dBm]	[mW]
1	0	2442.0	-13.22	1.66	19.94	0.59	8.97	7.89
1	1	2442.0	-13.77	1.66	19.94	1.05	8.88	7.73
1	2	2442.0	-14.06	1.66	19.94	1.41	8.95	7.85
1	3	2442.0	-14.22	1.66	19.94	1.71	9.09	8.11
1	4	2442.0	-14.72	1.66	19.94	2.16	9.04	8.02
1	5	2442.0	-15.04	1.66	19.94	2.55	9.11	8.15
1	6	2442.0	-15.16	1.66	19.94	2.69	9.13	8.18
1	7	2442.0	-15.36	1.66	19.94	2.88	9.12	8.17
1	8	2442.0	-15.50	1.66	19.94	2.99	9.09	8.11
1	9	2442.0	-15.68	1.66	19.94	3.23	9.15	8.22

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

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Maximum Conducted Output Power (Reference data)

(AVGPM)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date February 5, 2021
 Temperature / Humidity 24 deg.C , 30 %RH
 Engineer Takahiro Kawakami
 Mode Tx, IEEE802.11n-40 (MIMO), PN9, worst data mode : 11 (MCS)

Antenna 0 + Antenna 1

Ch	Freq. [MHz]	Ant 0	Ant 1	Result	
		Result [mW]	Result [mW]	[dBm]	[mW]
Low	2422.0	6.84	8.41	11.83	15.25
Mid	2442.0	7.08	8.32	11.88	15.40
High1	2462.0	6.75	7.98	11.68	14.73

Antenna 0

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Result	
						[dBm]	[mW]
Low	2422.0	-5.77	1.66	9.88	2.58	8.35	6.84
Mid	2442.0	-5.63	1.66	9.89	2.58	8.50	7.08
High1	2462.0	-5.85	1.67	9.89	2.58	8.29	6.75

Antenna 1

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Result	
						[dBm]	[mW]
Low	2422.0	-4.87	1.66	9.88	2.58	9.25	8.41
Mid	2442.0	-4.93	1.66	9.89	2.58	9.20	8.32
High1	2462.0	-5.12	1.67	9.89	2.58	9.02	7.98

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty factor

* This data shows output power is appropriate for maximum typical power at tested data mode.

[Pre check]

Mode (MCS)	Freq. [MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Antenna 0			Antenna 1			Antenna 0 + 1	
					Reading [dBm]	Result [dBm]	Result [mW]	Reading [dBm]	Result [dBm]	Result [mW]	Total Result [dBm]	Total Result [mW]
8	2442.0	1.66	9.89	1.05	-4.49	8.11	6.47	-3.76	8.84	7.66	11.50	14.13
9	2442.0	1.66	9.89	1.71	-5.24	8.02	6.34	-4.38	8.88	7.73	11.48	14.07
10	2442.0	1.66	9.89	2.18	-5.76	7.97	6.27	-4.67	9.06	8.05	11.56	14.32
11	2442.0	1.66	9.89	2.58	-5.63	8.50	7.08	-4.93	9.20	8.32	11.88	15.40
12	2442.0	1.66	9.89	3.00	-6.15	8.40	6.92	-5.40	9.15	8.22	11.80	15.14
13	2442.0	1.66	9.89	3.42	-6.67	8.30	6.76	-5.77	9.20	8.32	11.78	15.08
14	2442.0	1.66	9.89	3.52	-6.83	8.24	6.67	-5.82	9.25	8.41	11.78	15.08
15	2442.0	1.66	9.89	3.69	-7.02	8.22	6.64	-5.96	9.28	8.47	11.79	15.11

Worst

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty factor

Total Result [mW] = 10 ^ (Antenna 0 Result / 10) + 10 ^ (Antenna 1 Result / 10)

Total Result [dBm] = 10 * log (Total Result [mW])

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Maximum Conducted Output Power (Reference data)

(AVGPM)

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date February 5, 2021
 Temperature / Humidity 24 deg.C , 30 %RH
 Engineer Takahiro Kawakami
 Mode Tx, OFDM VHT40 (MIMO), PN9, worst data mode : 5 (MCS)

Antenna 0 + Antenna 1

Ch	Freq. [MHz]	Ant 0	Ant 1	Result	
		Result [mW]	Result [mW]	[dBm]	[mW]
Low	2422.0	7.21	8.13	11.86	15.34
Mid	2442.0	6.87	8.45	11.85	15.32
High1	2462.0	6.43	8.07	11.61	14.50

Antenna 0

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Result	
						[dBm]	[mW]
Low	2422.0	-6.29	1.66	9.88	3.33	8.58	7.21
Mid	2442.0	-6.51	1.66	9.89	3.33	8.37	6.87
High1	2462.0	-6.81	1.67	9.89	3.33	8.08	6.43

Antenna 1

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Result	
						[dBm]	[mW]
Low	2422.0	-5.77	1.66	9.88	3.33	9.10	8.13
Mid	2442.0	-5.61	1.66	9.89	3.33	9.27	8.45
High1	2462.0	-5.82	1.67	9.89	3.33	9.07	8.07

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty factor

* This data shows output power is appropriate for maximum typical power at tested data mode.

[Pre check]

Mode (MCS)	Freq. [MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Antenna 0			Antenna 1			Antenna 0 + 1	
					Reading [dBm]	Result [dBm]	Result [mW]	Reading [dBm]	Result [dBm]	Result [mW]	Total Result [dBm]	Total Result [mW]
0	2442.0	1.66	9.89	1.04	-4.28	8.31	6.78	-3.51	9.08	8.09	11.72	14.87
1	2442.0	1.66	9.89	1.68	-5.04	8.19	6.59	-4.23	9.00	7.94	11.62	14.53
2	2442.0	1.66	9.89	2.13	-5.66	8.02	6.34	-4.54	9.14	8.20	11.63	14.54
3	2442.0	1.66	9.89	2.51	-5.61	8.45	7.00	-4.89	9.17	8.26	11.84	15.26
4	2442.0	1.66	9.89	2.94	-6.20	8.29	6.75	-5.23	9.26	8.43	11.81	15.18
5	2442.0	1.66	9.89	3.33	-6.51	8.37	6.87	-5.61	9.27	8.45	11.85	15.32
6	2442.0	1.66	9.89	3.41	-6.79	8.17	6.56	-5.62	9.34	8.59	11.80	15.15
7	2442.0	1.66	9.89	3.57	-6.88	8.24	6.67	-5.79	9.33	8.57	11.83	15.24
8	2442.0	1.66	9.89	3.64	-6.97	8.22	6.64	-5.93	9.26	8.43	11.78	15.07
9	2442.0	1.66	9.89	3.82	-7.09	8.28	6.73	-6.25	9.12	8.17	11.73	14.90

Worst

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty factor

Total Result [mW] = 10 ^ (Antenna 0 Result / 10) + 10 ^ (Antenna 1 Result / 10)

Total Result [dBm] = 10 * log (Total Result [mW])

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Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date August 6, 2020
 Temperature / Humidity 25 deg.C , 46 %RH
 Engineer Makoto Hosaka

Burst rate confirmation

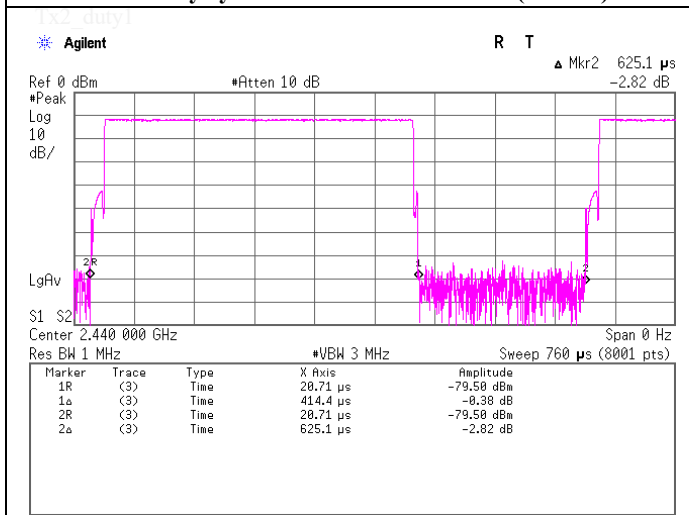
Tx, Bluetooth Low Energy, PRBS9

Duty Factor Calculation

Duty Factor: $20 \log (1/\text{duty cycle}) = 3.57 \text{ dB}$

Duty Factor: $10 \log (1/\text{duty cycle}) = 1.79 \text{ dB}$

duty cycle = $0.414 / 0.625 = 0.663 (66.3 \%)$



Tx2_duty2

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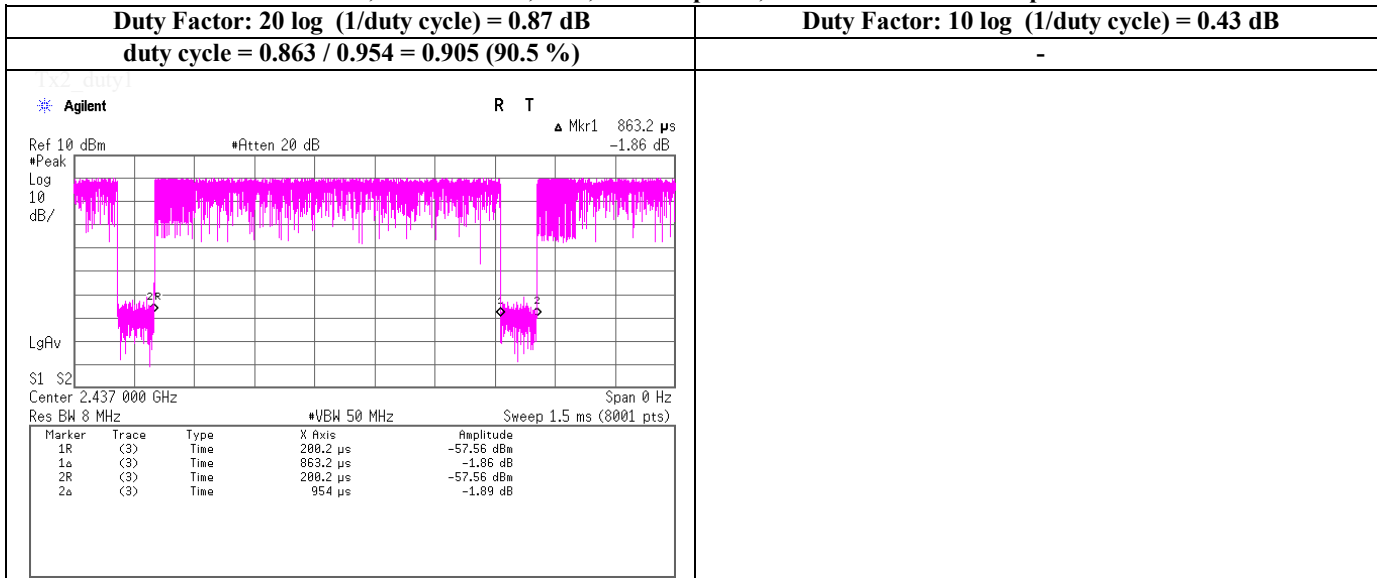
Facsimile : +81 463 50 6401

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date August 5, 2020
 Temperature / Humidity 26 deg.C , 50 %RH
 Engineer Kenichi Adachi

Burst rate confirmation

Duty Factor Calculation

Tx, IEEE802.11b, PN9, antenna port 0, worst data mode 11 Mbps



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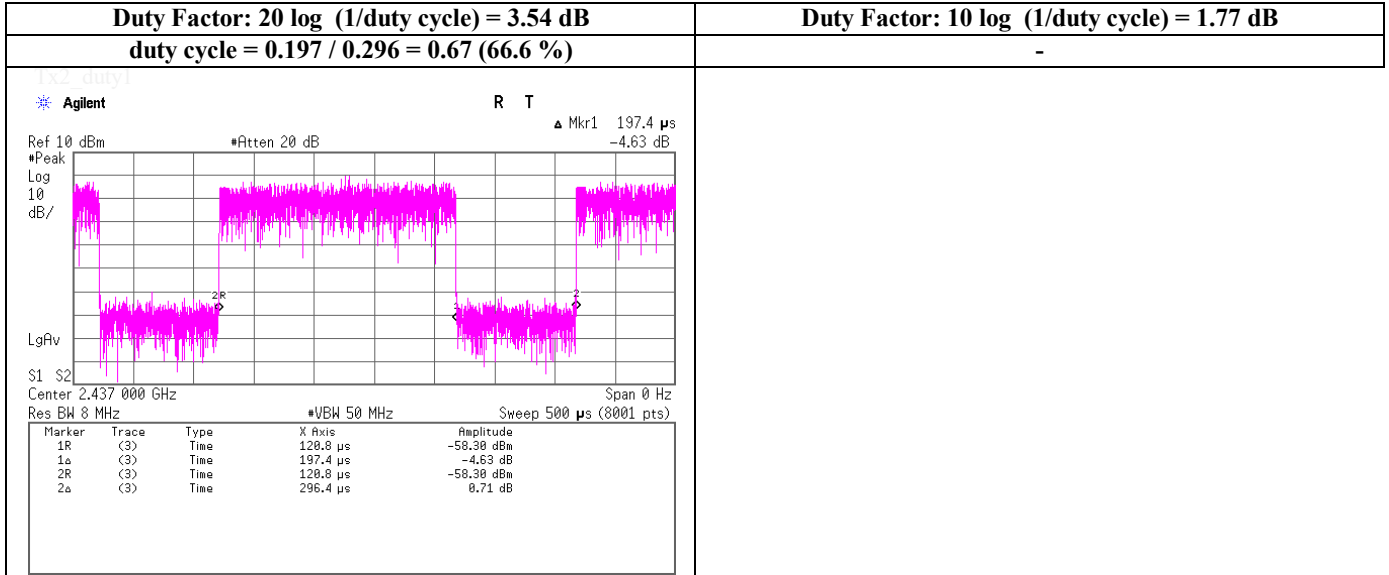
Facsimile : +81 463 50 6401

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date August 5, 2020
 Temperature / Humidity 26 deg.C , 50 %RH
 Engineer Kenichi Adachi

Burst rate confirmation

Duty Factor Calculation

Tx, IEEE802.11g, PN9, antenna port 0, worst data mode 48 Mbps



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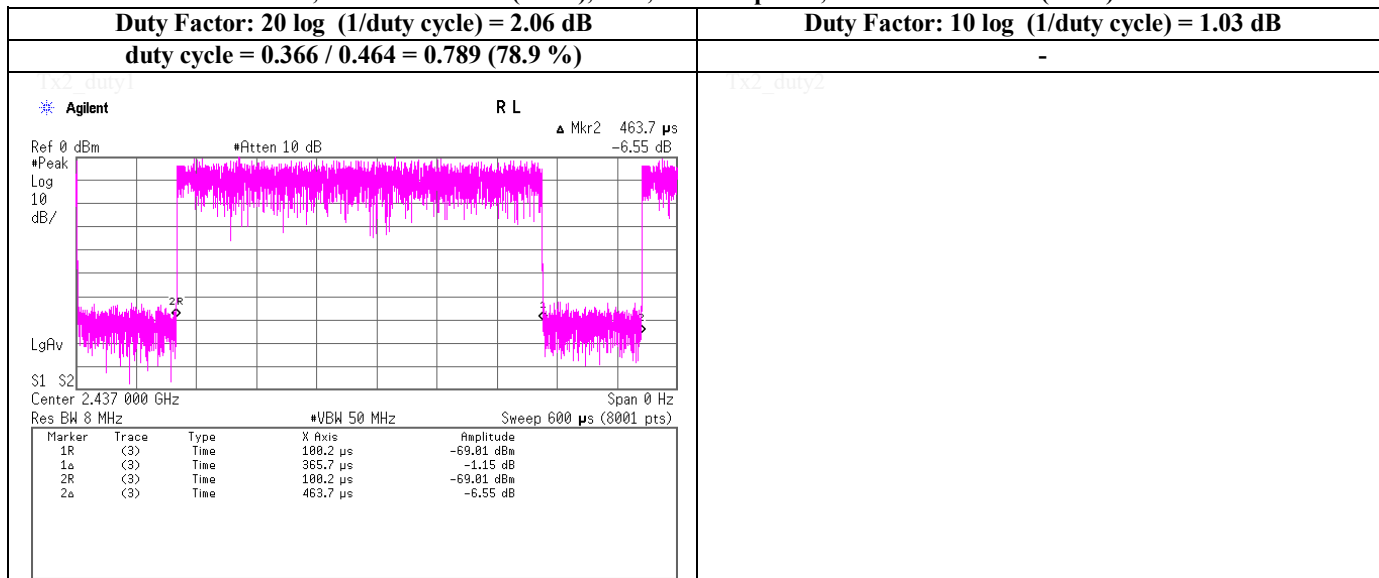
Facsimile : +81 463 50 6401

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date August 6, 2020
 Temperature / Humidity 25 deg.C , 46 %RH
 Engineer Makoto Hosaka

Burst rate confirmation

Duty Factor Calculation

Tx, IEEE802.11n-20 (SISO), PN9, antenna port 0, worst data mode 3 (MCS)



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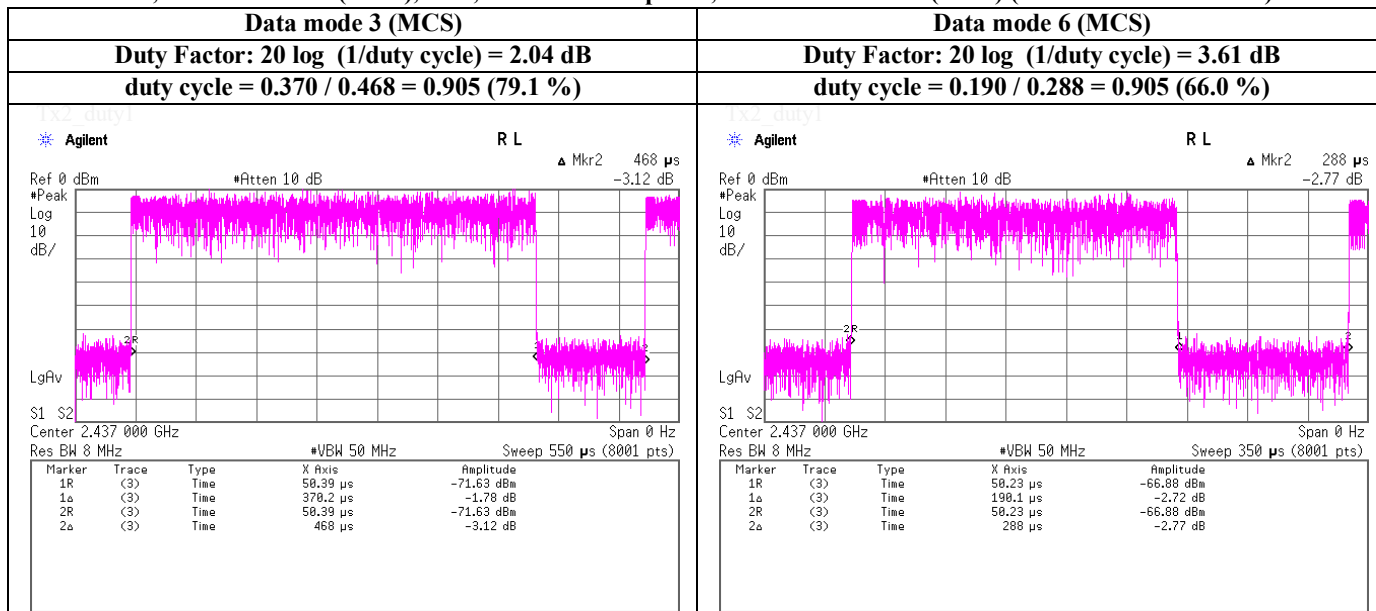
Facsimile : +81 463 50 6401

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date August 6, 2020
 Temperature / Humidity 25 deg.C , 46 %RH
 Engineer Makoto Hosaka

Burst rate confirmation

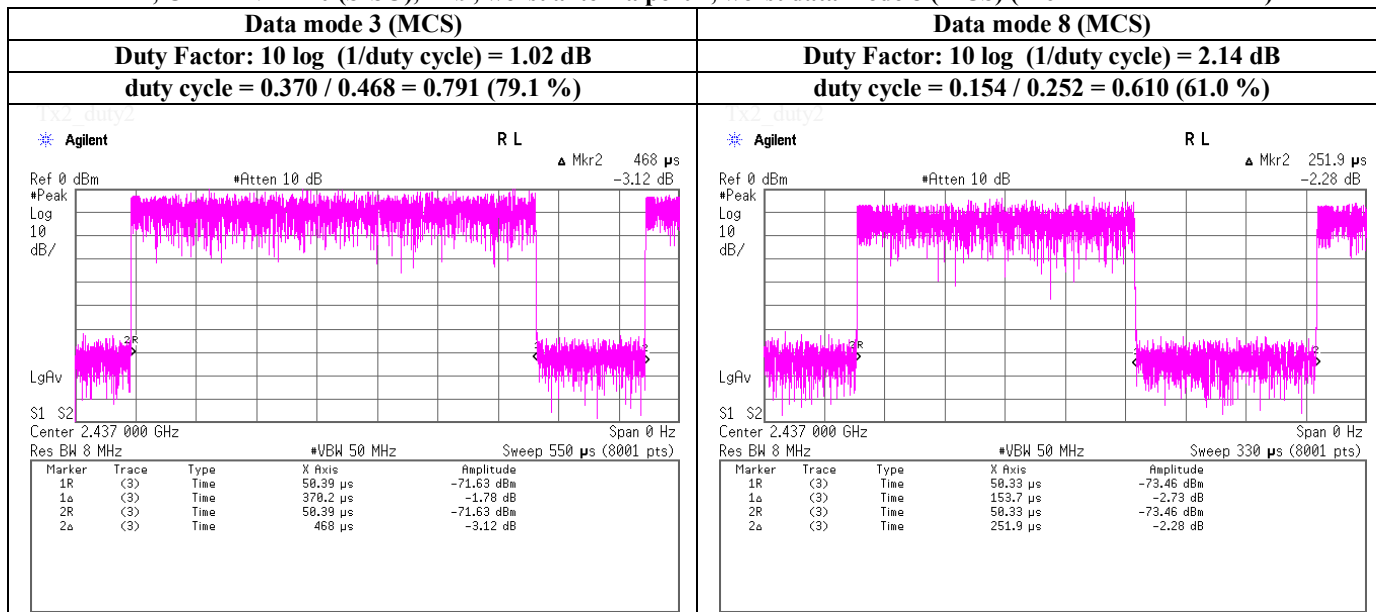
Duty Factor Calculation for Radiated Spurious Emission

Tx, OFDM VHT20 (SISO), PN9, worst antenna port 0, worst data mode 3 (MCS) (2412 MHz - 2462 MHz)
 Tx, OFDM VHT20 (SISO), PN9, worst antenna port 1, worst data mode 6 (MCS) (2467 MHz - 2472 MHz)



Duty Factor Calculation for Maximum Conducted power (Average)

Tx, OFDM VHT20 (SISO), PN9, worst antenna port 0, worst data mode 3 (MCS) (2412 MHz - 2462 MHz)
 Tx, OFDM VHT20 (SISO), PN9, worst antenna port 1, worst data mode 8 (MCS) (2467 MHz - 2472 MHz)



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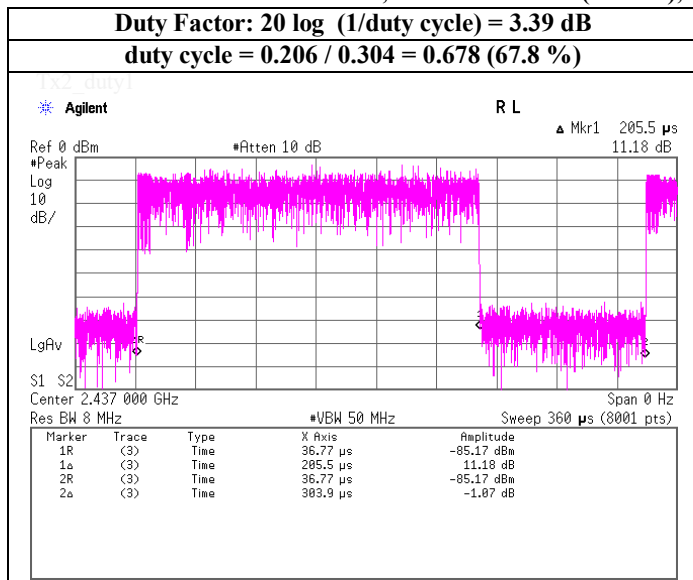
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date August 9, 2020
 Temperature / Humidity 25 deg.C , 57 %RH
 Engineer Takahiro Kawakami

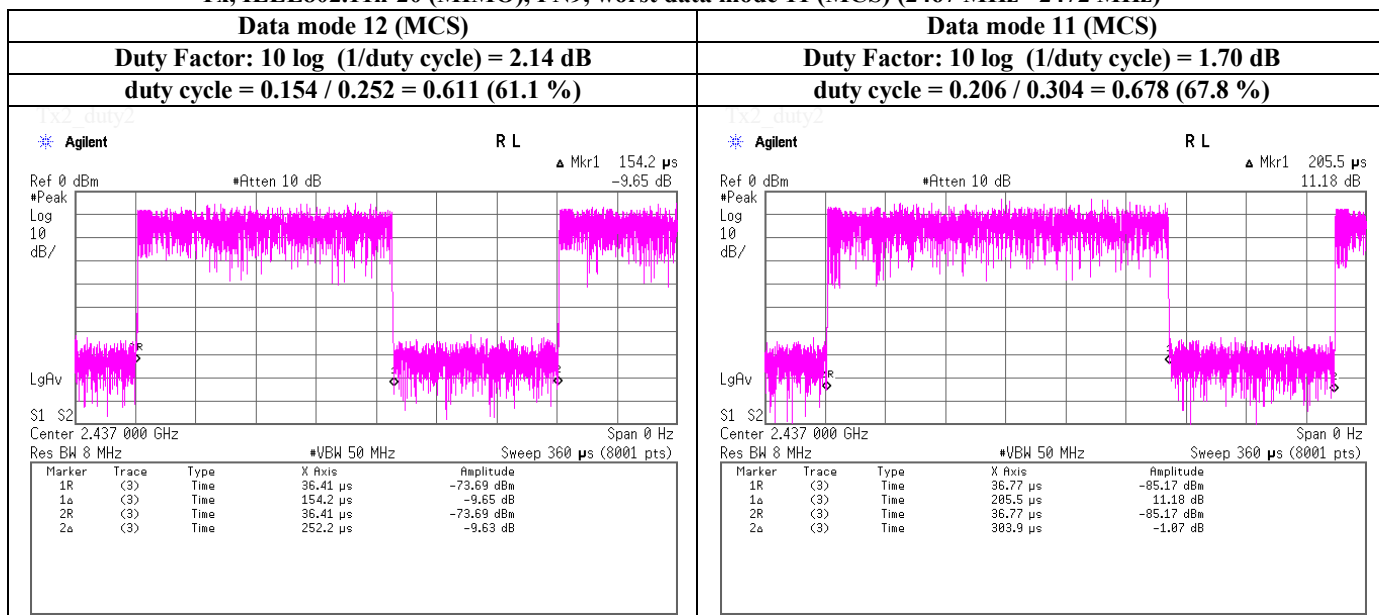
Burst rate confirmation

Duty Factor Calculation for Radiated Spurious Emission Tx, IEEE802.11n-20 (MIMO), PN9, worst data mode 11 (MCS)



Tx2_duty2

Duty Factor Calculation for Maximum Conducted power (Average) Tx, IEEE802.11n-20 (MIMO), PN9, worst data mode 12 (MCS) (2412 MHz - 2462 MHz) Tx, IEEE802.11n-20 (MIMO), PN9, worst data mode 11 (MCS) (2467 MHz - 2472 MHz)



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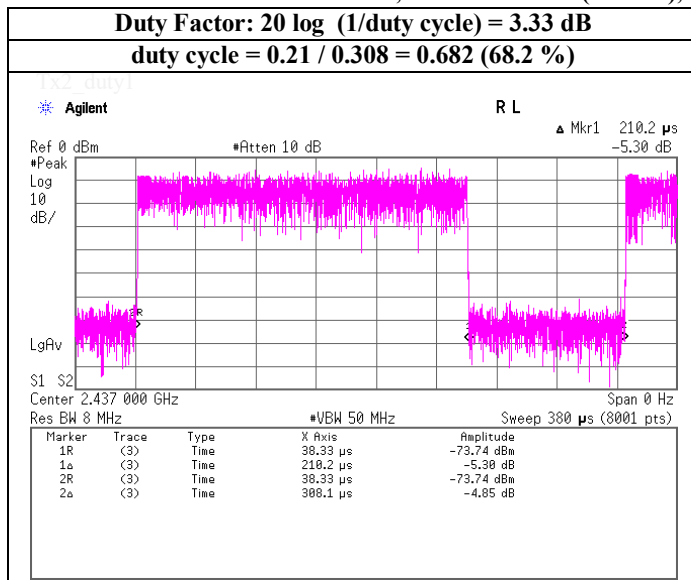
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date August 10, 2020
 Temperature / Humidity 24 deg.C , 42 %RH
 Engineer Takahiro Kawakami

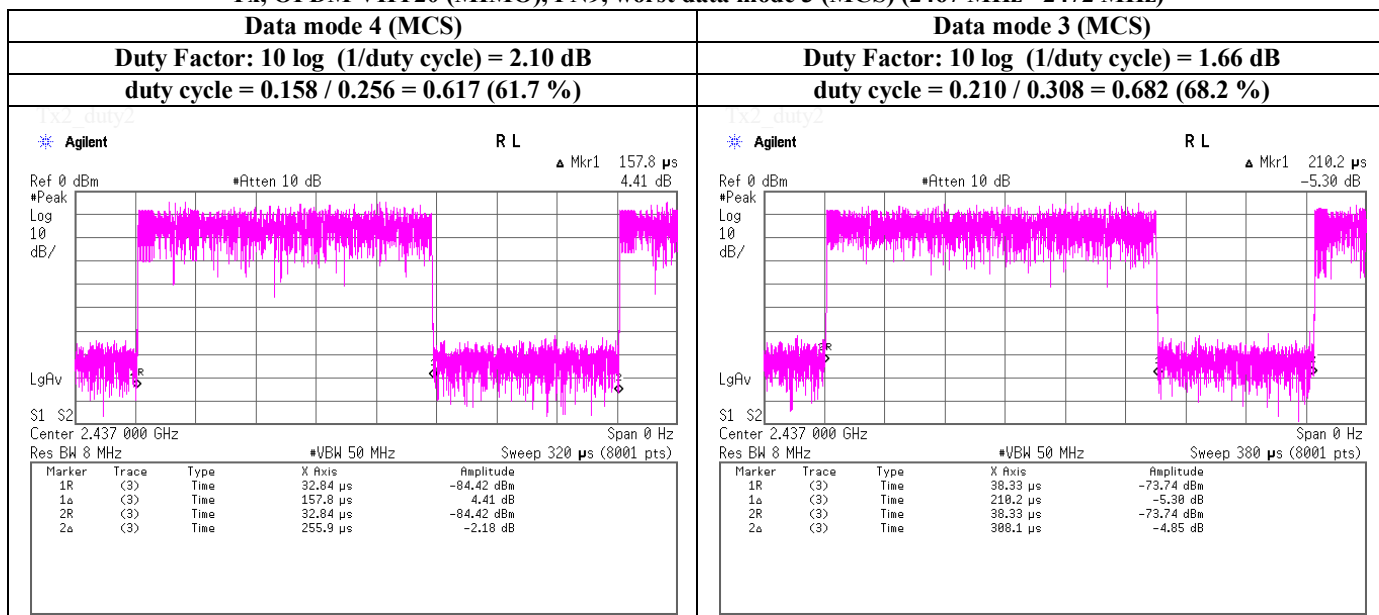
Burst rate confirmation

Duty Factor Calculation for Radiated Spurious Emission Tx, OFDM VHT20 (MIMO), PN9, worst data mode 3 (MCS)



Tx2_duty2

Duty Factor Calculation for Maximum Conducted power (Average) Tx, OFDM VHT20 (MIMO), PN9, worst data mode 4 (MCS) (2412 MHz - 2462 MHz) Tx, OFDM VHT20 (MIMO), PN9, worst data mode 3 (MCS) (2467 MHz - 2472 MHz)



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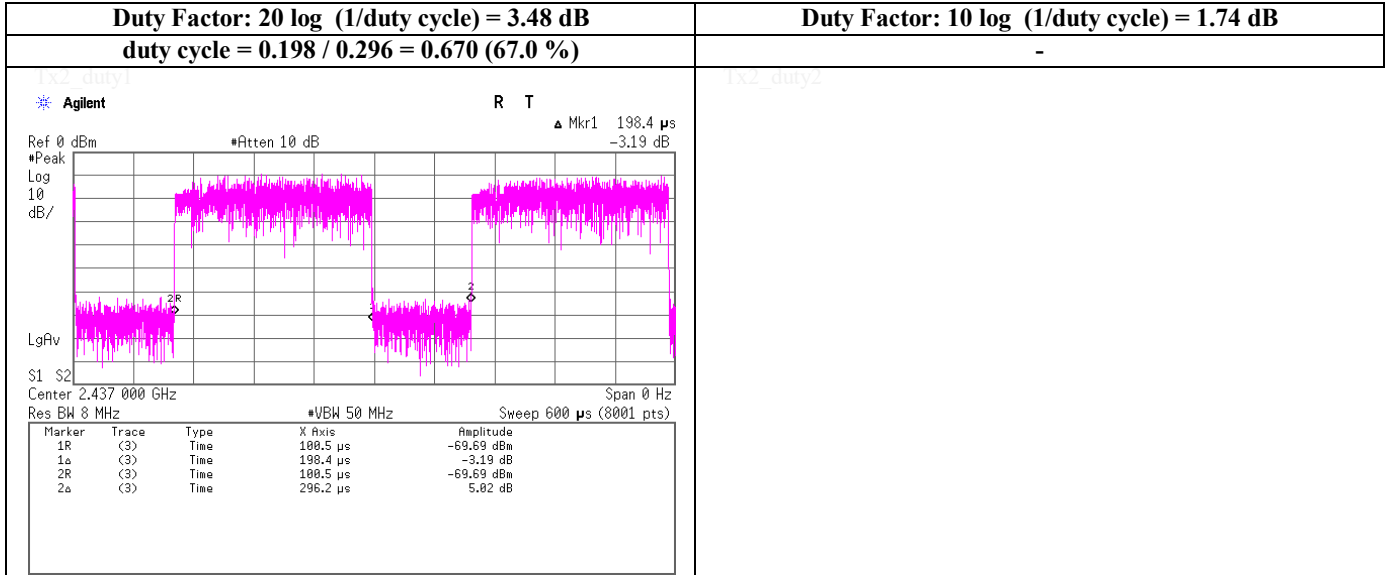
Facsimile : +81 463 50 6401

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date August 7, 2020
 Temperature / Humidity 25 deg.C , 54 %RH
 Engineer Kenichi Adachi

Burst rate confirmation

Duty Factor Calculation

Tx, IEEE802.11n-40 (SISO), PN9, worst antenna port 1, worst data mode 3 (MCS)



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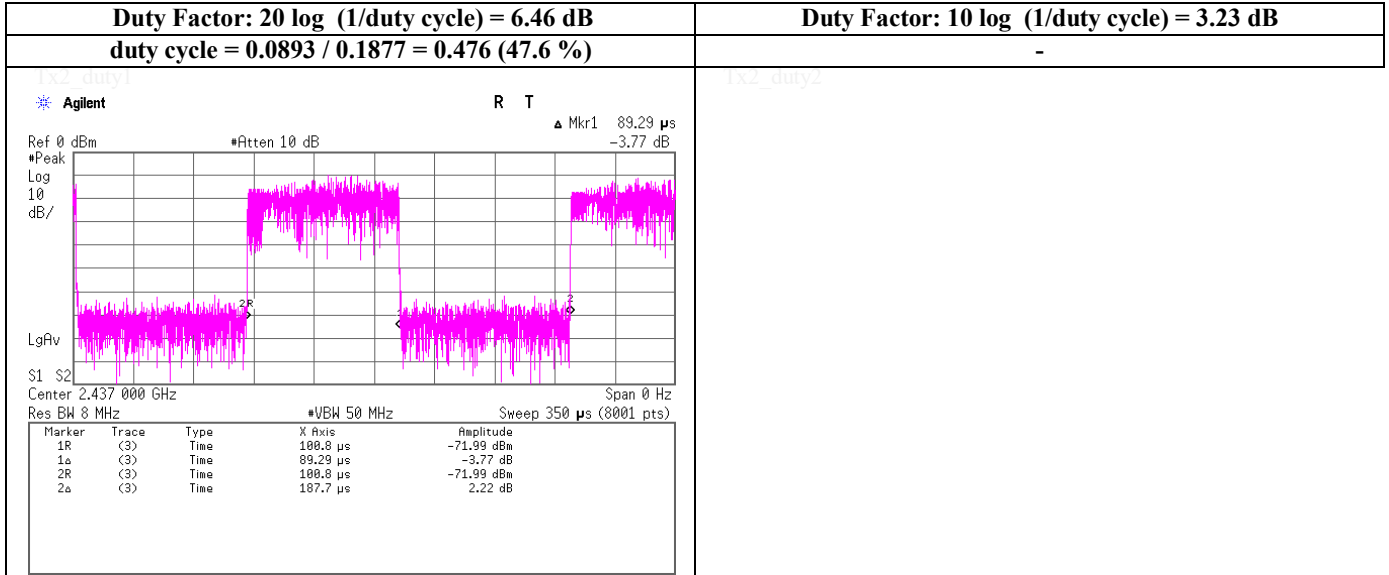
Facsimile : +81 463 50 6401

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
Date August 7, 2020
Temperature / Humidity 25 deg.C , 54 %RH
Engineer Kenichi Adachi

Burst rate confirmation

Duty Factor Calculation

Tx, OFDM VHT40 (SISO), PN9, worst antenna port 1, worst data mode 9 (MCS)



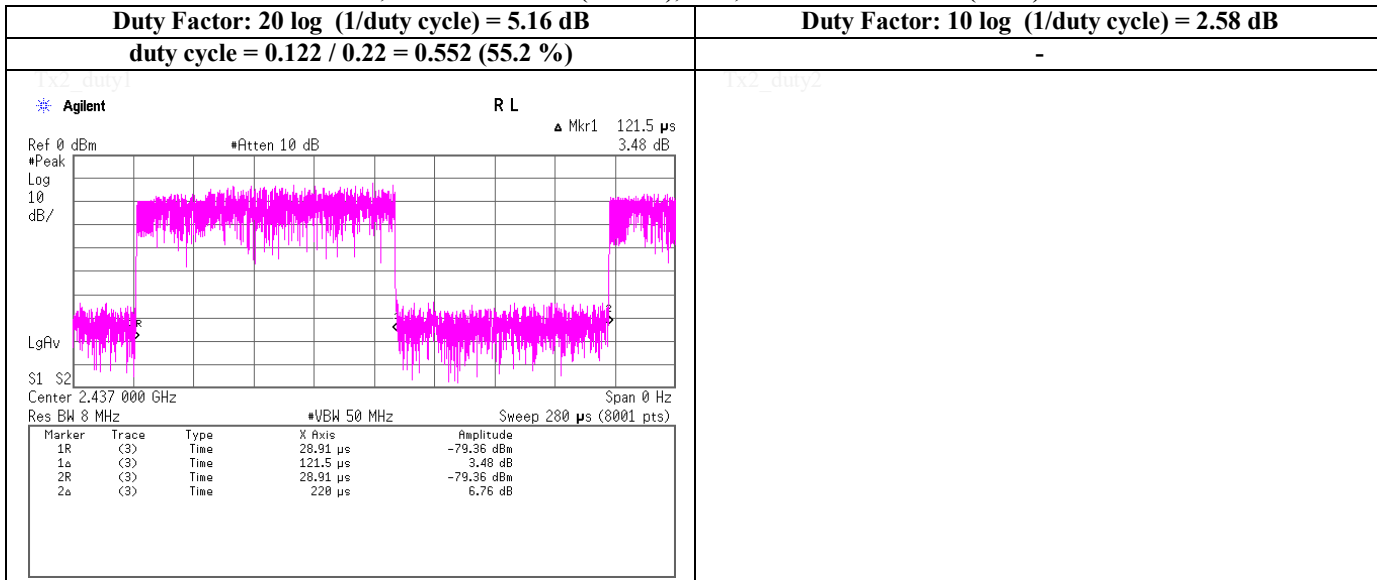
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Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date February 5, 2021
 Temperature / Humidity 24 deg.C , 30 %RH
 Engineer Takahiro Kawakami

Burst rate confirmation

Duty Factor Calculation

Tx, IEEE802.11n-40 (MIMO), PN9, worst data mode 11 (MCS)

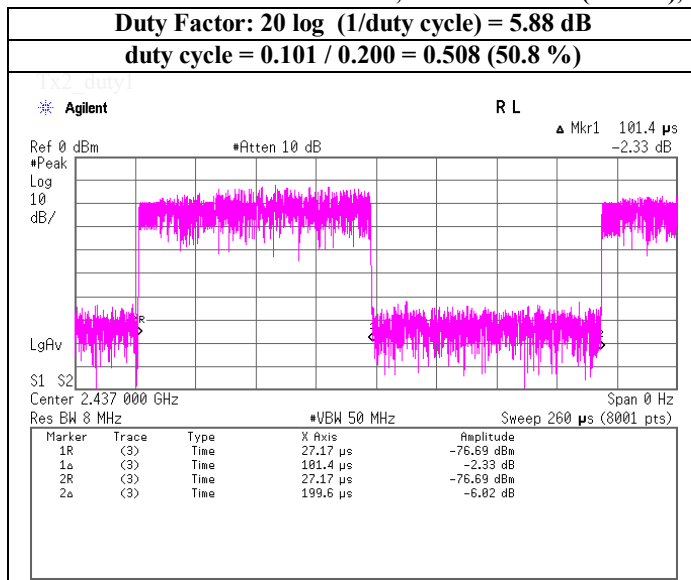


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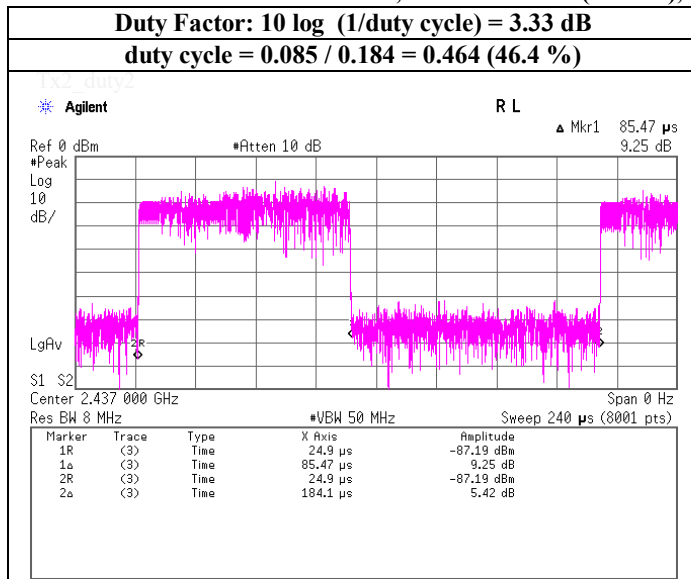
Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date February 5, 2021
 Temperature / Humidity 24 deg.C , 30 %RH
 Engineer Takahiro Kawakami

Burst rate confirmation

Duty Factor Calculation for Radiated Spurious Emission Tx, OFDM VHT40 (MIMO), PN9, worst data mode 4 (MCS)



Duty Factor Calculation for Maximum Conducted power (Average) Tx, OFDM VHT40 (MIMO), PN9, worst data mode 5 (MCS)



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Shonan EMC Lab.

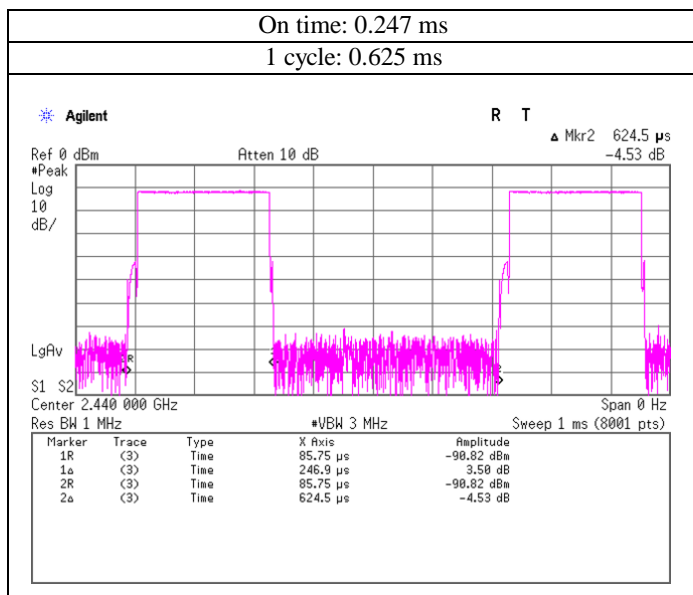
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Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date April 15, 2021
 Temperature / Humidity 25 deg.C , 50 %RH
 Engineer Takahiro Kawakami

Duty cycle correction factor



(for Duty cycle correction factor for Radiated Spurious Emission)
Worst 100 ms case

$$DCCF = 20 \log(0.247 \times (100/0.625) / 100) = -8.06 \text{ dB}$$

*Since the burst rate is not different between the channels, the data has been obtained on the representative channel.
 *Worst TX Duty cycle BLE is Advertising mode.
 The actual measurement value was applied as Duty Cycle Correction factor.

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Radiated Spurious Emission

Report No. 13456926S-A-R2
 Test place Shonan EMC Lab.
 Semi Anechoic Chamber 3 3 3 3 3
 Date February 14, 2021 December 23, 2020 December 24, 2020 December 25, 2020 January 5, 2021
 Temperature / Humidity 24 deg.C, 31 %RH 22 deg.C, 33 %RH 24 deg.C, 34 %RH 25 deg.C, 26 %RH 20 deg.C, 33 %RH
 Engineer Kenichi Adachi Yusuke Tanikawara Takahiro Kawakami Takahiro Kawakami Yusuke Tanikawara
 (30 MHz -1 GHz) (1 GHz -2.8 GHz) (2.8 GHz -10 GHz) (10 GHz -18 GHz) (18 GHz -26.5 GHz)
 Mode Tx BT LE 2402 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	72.006	QP	36.16	6.45	6.93	32.15	0.00	17.39	40.0	22.6	282	328	-
Hori.	96.004	QP	44.88	9.37	7.42	32.14	0.00	29.53	43.5	13.9	304	185	-
Hori.	124.999	QP	37.09	13.52	7.29	32.11	0.00	25.79	43.5	17.7	302	358	-
Hori.	192.029	QP	38.12	16.35	7.79	32.05	0.00	30.21	43.5	13.2	248	12	-
Hori.	249.999	QP	55.73	11.77	8.26	31.99	0.00	43.77	46.0	2.2	127	294	-
Hori.	833.525	QP	34.29	21.11	10.61	31.43	0.00	34.58	46.0	11.4	100	149	-
Hori.	874.996	QP	32.05	21.94	10.74	31.18	0.00	33.55	46.0	12.4	100	359	-
Hori.	2390.000	PK	47.35	28.41	14.22	41.66	2.28	50.60	73.9	23.3	341	231	-
Hori.	4804.000	PK	63.26	31.60	6.82	42.92	2.28	61.04	73.9	12.8	143	249	-
Hori.	7206.000	PK	49.11	37.60	8.40	43.39	2.28	54.00	73.9	19.9	150	0	-
Hori.	9608.000	PK	48.84	38.92	9.55	43.14	2.28	56.45	73.9	17.4	150	0	-
Vert.	47.996	QP	35.68	11.90	6.76	32.16	0.00	22.18	40.0	17.8	100	132	-
Vert.	72.007	QP	39.98	6.45	6.93	32.15	0.00	21.21	40.0	18.7	154	213	-
Vert.	96.006	QP	42.28	9.37	7.42	32.14	0.00	26.93	43.5	16.5	100	254	-
Vert.	124.999	QP	47.16	13.52	7.29	32.11	0.00	35.86	43.5	7.6	100	167	-
Vert.	192.029	QP	27.53	16.35	7.79	32.05	0.00	19.62	43.5	23.8	100	183	-
Vert.	249.999	QP	53.97	11.77	8.26	31.99	0.00	42.01	46.0	3.9	100	179	-
Vert.	837.537	QP	31.09	21.18	10.63	31.40	0.00	31.50	46.0	14.5	100	88	-
Vert.	874.996	QP	32.11	21.94	10.74	31.18	0.00	33.61	46.0	12.3	100	76	-
Vert.	2390.000	PK	47.23	28.41	14.22	41.66	2.28	50.48	73.9	23.4	216	198	-
Vert.	4804.000	PK	62.44	31.60	6.82	42.92	2.28	60.22	73.9	13.6	152	244	-
Vert.	7206.000	PK	48.46	37.60	8.40	43.39	2.28	53.35	73.9	20.5	150	0	-
Vert.	9608.000	PK	48.76	38.92	9.55	43.14	2.28	56.37	73.9	17.5	150	0	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log(3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

Peak measurement value with Duty cycle correction factor (DCCF)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	DCCF [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	PK	47.35	28.41	14.22	41.66	-8.06	2.28	42.54	53.9	11.3	*1)
Hori.	4804.000	PK	63.26	31.60	6.82	42.92	-8.06	2.28	52.98	53.9	0.9	-
Hori.	7206.000	PK	49.11	37.60	8.40	43.39	-8.06	2.28	45.94	53.9	7.9	-
Hori.	9608.000	PK	48.84	38.92	9.55	43.14	-8.06	2.28	48.39	53.9	5.5	-
Vert.	2390.000	PK	47.23	28.41	14.22	41.66	-8.06	2.28	42.42	53.9	11.4	*1)
Vert.	4804.000	PK	62.44	31.60	6.82	42.92	-8.06	2.28	52.16	53.9	1.7	-
Vert.	7206.000	PK	48.46	37.60	8.40	43.39	-8.06	2.28	45.29	53.9	8.6	-
Vert.	9608.000	PK	48.76	38.92	9.55	43.14	-8.06	2.28	48.31	53.9	5.5	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + DCCF + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log(3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

Duty cycle correction factor (DCCF) refer to "Duty cycle correction factor" sheet.

*1) Not out of band emission (Leakage Power)

20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	90.27	28.38	14.23	41.67	2.28	93.49	-	-	Carrier
Hori.	2400.000	PK	39.26	28.38	14.22	41.67	2.28	42.47	73.4	30.9	-
Vert.	2402.000	PK	92.02	28.38	14.23	41.67	2.28	95.24	-	-	Carrier
Vert.	2400.000	PK	39.60	28.38	14.22	41.67	2.28	42.81	75.2	32.3	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log(3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

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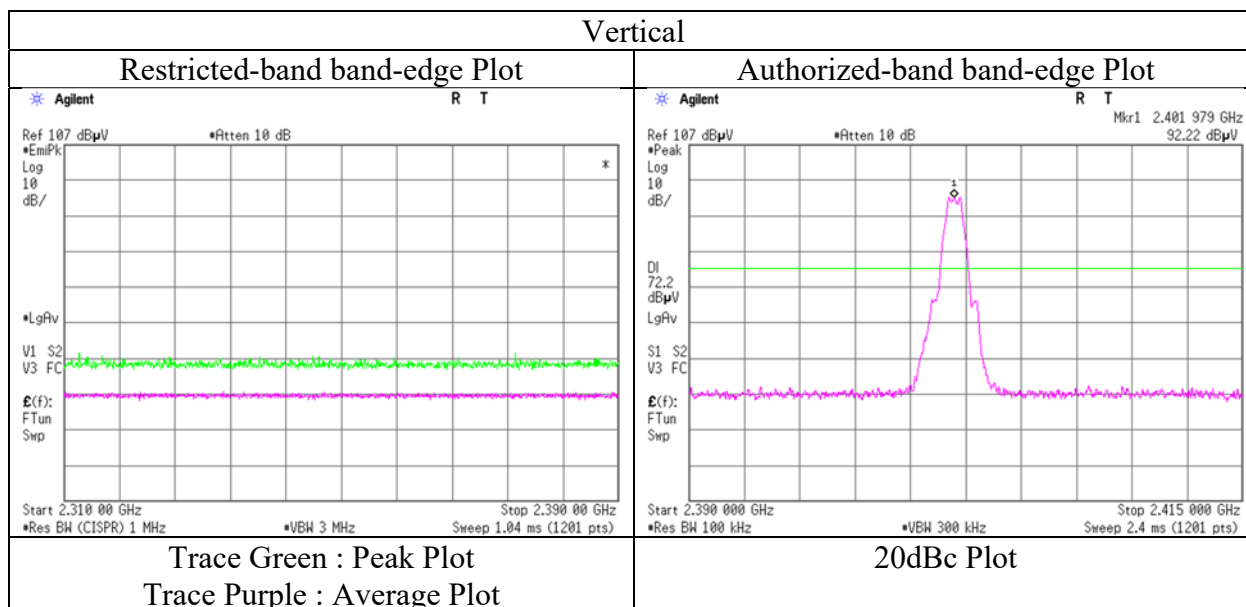
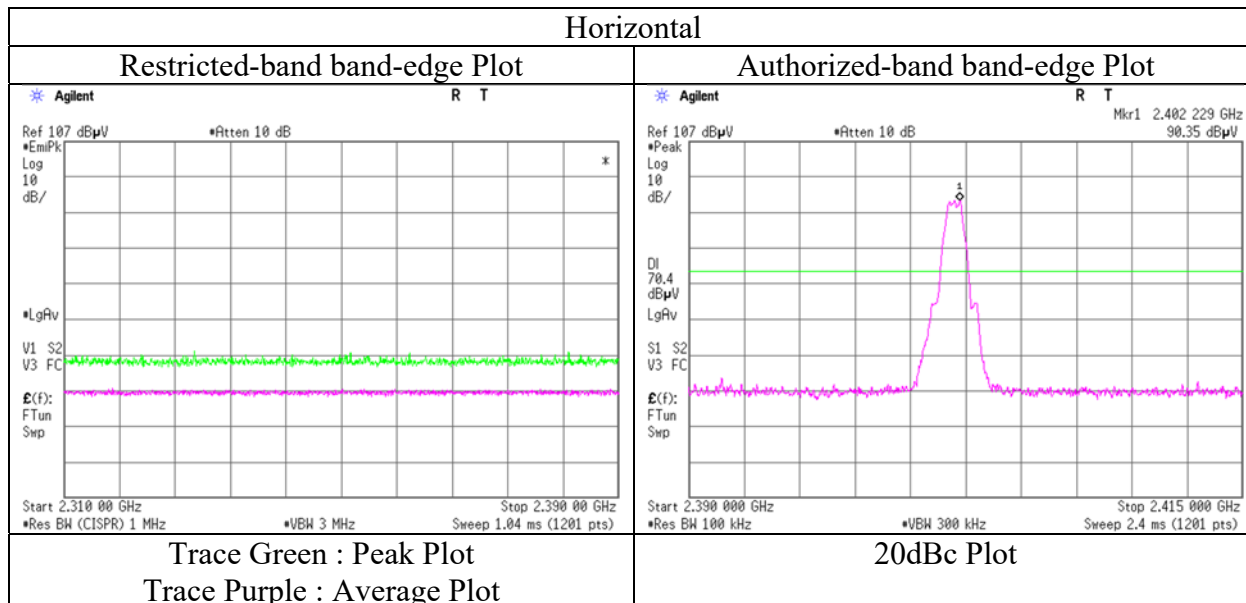
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Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	13456926S-A-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	December 23, 2020
Temperature / Humidity	22 deg.C, 33 %RH
Engineer	Yusuke Tanikawara (1 GHz -2.8 GHz)
Mode	Tx BT LE 2402 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

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Radiated Spurious Emission

Report No.	13456926S-A-R2				
Test place	Shonan EMC Lab.				
Semi Anechoic Chamber	3	3	3	3	3
Date	February 14, 2021	December 23, 2020	December 24, 2020	December 25, 2020	January 5, 2021
Temperature / Humidity	24 deg.C, 31 %RH	22 deg.C, 33 %RH	24 deg.C, 34 %RH	25 deg.C, 26 %RH	20 deg.C, 33 %RH
Engineer	Kenichi Adachi	Yusuke Tanikawara	Takahiro Kawakami	Takahiro Kawakami	Yusuke Tanikawara
Mode	(30 MHz -1 GHz)	(1 GHz -2.8 GHz)	(2.8 GHz -10 GHz)	(10 GHz -18 GHz)	(18 GHz -26.5 GHz)
	Tx BT LE 2440 MHz				

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	72.005	QP	36.02	6.45	6.93	32.15	0.00	17.25	40.0	22.7	279	324	-
Hori.	96.005	QP	44.67	9.37	7.42	32.14	0.00	29.32	43.5	14.1	302	184	-
Hori.	124.999	QP	37.16	13.52	7.29	32.11	0.00	25.86	43.5	17.6	301	359	-
Hori.	192.027	QP	38.08	16.35	7.79	32.05	0.00	30.17	43.5	13.3	251	11	-
Hori.	249.999	QP	56.23	11.77	8.26	31.99	0.00	44.27	46.0	1.7	128	297	-
Hori.	833.534	QP	34.08	21.11	10.61	31.43	0.00	34.37	46.0	11.6	100	147	-
Hori.	874.997	QP	32.12	21.94	10.74	31.18	0.00	33.62	46.0	12.3	100	359	-
Hori.	4880.000	PK	60.47	31.63	6.87	42.93	2.28	58.32	73.9	15.5	160	127	-
Hori.	7320.000	PK	48.94	37.71	8.47	43.49	2.28	53.91	73.9	19.9	150	0	-
Hori.	9760.000	PK	48.86	39.19	9.64	42.97	2.28	57.00	73.9	16.9	150	0	-
Vert.	47.997	QP	35.56	11.90	6.76	32.16	0.00	22.06	40.0	17.9	100	133	-
Vert.	72.006	QP	39.94	6.45	6.93	32.15	0.00	21.17	40.0	18.8	152	211	-
Vert.	96.006	QP	42.22	9.37	7.42	32.14	0.00	26.87	43.5	16.6	100	255	-
Vert.	124.999	QP	47.02	13.52	7.29	32.11	0.00	35.72	43.5	7.7	100	169	-
Vert.	192.028	QP	27.36	16.35	7.79	32.05	0.00	19.45	43.5	24.0	100	187	-
Vert.	249.999	QP	53.78	11.77	8.26	31.99	0.00	41.82	46.0	4.1	100	177	-
Vert.	833.542	QP	31.03	21.11	10.61	31.43	0.00	31.32	46.0	14.6	100	86	-
Vert.	874.997	QP	32.02	21.94	10.74	31.18	0.00	33.52	46.0	12.4	100	79	-
Vert.	4880.000	PK	59.94	31.63	6.87	42.93	2.28	57.79	73.9	16.1	119	250	-
Vert.	7320.000	PK	48.27	37.71	8.47	43.49	2.28	53.24	73.9	20.6	150	0	-
Vert.	9760.000	PK	48.21	39.19	9.64	42.97	2.28	56.35	73.9	17.5	150	0	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log(3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

Peak measurement value with Duty cycle correction factor (DCCF)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	DCCF [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4880.000	PK	60.47	31.63	6.87	42.93	-8.06	2.28	50.26	53.9	3.6	-
Hori.	7320.000	PK	48.94	37.71	8.47	43.49	-8.06	2.28	45.85	53.9	8.0	-
Hori.	9760.000	PK	48.86	39.19	9.64	42.97	-8.06	2.28	48.94	53.9	4.9	-
Vert.	4880.000	PK	59.94	31.63	6.87	42.93	-8.06	2.28	49.73	53.9	4.1	-
Vert.	7320.000	PK	48.27	37.71	8.47	43.49	-8.06	2.28	45.18	53.9	8.7	-
Vert.	9760.000	PK	48.21	39.19	9.64	42.97	-8.06	2.28	48.29	53.9	5.6	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + DCCF + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log(3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

Duty cycle correction factor (DCCF) refer to "Duty cycle correction factor" sheet.

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Radiated Spurious Emission

Report No.	13456926S-A-R2					
Test place	Shonan EMC Lab.					
Semi Anechoic Chamber	3	3	3	3	3	3
Date	February 14, 2021	December 23, 2020	December 24, 2020	December 25, 2020	January 5, 2021	
Temperature / Humidity	24 deg.C, 31 %RH	22 deg.C, 33 %RH	24 deg.C, 34 %RH	25 deg.C, 26 %RH	20 deg.C, 33 %RH	
Engineer	Kenichi Adachi	Yusuke Tanikawara	Takahiro Kawakami	Takahiro Kawakami	Yusuke Tanikawara	
Mode	(30 MHz -1 GHz)	(1 GHz -2.8 GHz)	(2.8 GHz -10 GHz)	(10 GHz -18 GHz)	(18 GHz -26.5 GHz)	
	Tx BT LE 2480 MHz					

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	72.006	QP	36.08	6.45	6.93	32.15	0.00	17.31	40.0	22.6	278	326	-
Hori.	96.006	QP	44.92	9.37	7.42	32.14	0.00	29.57	43.5	13.9	301	181	-
Hori.	124.999	QP	37.34	13.52	7.29	32.11	0.00	26.04	43.5	17.4	299	356	-
Hori.	192.031	QP	38.01	16.35	7.79	32.05	0.00	30.10	43.5	13.4	246	14	-
Hori.	249.999	QP	56.14	11.77	8.26	31.99	0.00	44.18	46.0	1.8	126	295	-
Hori.	833.532	QP	34.42	21.11	10.61	31.43	0.00	34.71	46.0	11.2	100	146	-
Hori.	874.995	QP	31.88	21.94	10.74	31.18	0.00	33.38	46.0	12.6	100	359	-
Hori.	2483.500	PK	47.57	28.28	14.31	41.69	2.28	50.75	73.9	23.1	319	231	-
Hori.	4960.000	PK	56.95	31.79	6.94	42.94	2.28	55.02	73.9	18.8	299	137	-
Hori.	7440.000	PK	48.78	37.88	8.54	43.60	2.28	53.88	73.9	20.0	150	0	-
Hori.	9920.000	PK	48.22	39.05	9.73	42.78	2.28	56.50	73.9	17.4	150	0	-
Vert.	47.998	QP	35.72	11.90	6.76	32.16	0.00	22.22	40.0	17.7	100	131	-
Vert.	72.006	QP	39.92	6.45	6.93	32.15	0.00	21.15	40.0	18.8	149	209	-
Vert.	96.006	QP	42.14	9.37	7.42	32.14	0.00	26.79	43.5	16.7	100	258	-
Vert.	124.999	QP	46.86	13.52	7.29	32.11	0.00	35.56	43.5	7.9	100	171	-
Vert.	192.031	QP	27.33	16.35	7.79	32.05	0.00	19.42	43.5	24.0	100	189	-
Vert.	249.999	QP	53.71	11.77	8.26	31.99	0.00	41.75	46.0	4.2	100	178	-
Vert.	833.544	QP	31.00	21.11	10.61	31.43	0.00	31.29	46.0	14.7	100	89	-
Vert.	874.995	QP	32.06	21.94	10.74	31.18	0.00	33.56	46.0	12.4	100	72	-
Vert.	2483.500	PK	47.67	28.28	14.31	41.69	2.28	50.85	73.9	23.0	357	159	-
Vert.	4960.000	PK	57.90	31.79	6.94	42.94	2.28	55.97	73.9	17.9	115	257	-
Vert.	7440.000	PK	48.36	37.88	8.54	43.60	2.28	53.46	73.9	20.4	150	0	-
Vert.	9920.000	PK	47.90	39.05	9.73	42.78	2.28	56.18	73.9	17.7	150	0	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Peak measurement value with Duty cycle correction factor (DCCF)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	DCCF [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	PK	47.57	28.28	14.31	41.69	-8.06	2.28	42.69	53.9	11.2	*1)
Hori.	4960.000	PK	56.95	31.79	6.94	42.94	-8.06	2.28	46.96	53.9	6.9	-
Hori.	7440.000	PK	48.78	37.88	8.54	43.60	-8.06	2.28	45.82	53.9	8.0	-
Hori.	9920.000	PK	48.22	39.05	9.73	42.78	-8.06	2.28	48.44	53.9	5.4	-
Vert.	2483.500	PK	47.67	28.28	14.31	41.69	-8.06	2.28	42.79	53.9	11.1	*1)
Vert.	4960.000	PK	57.90	31.79	6.94	42.94	-8.06	2.28	47.91	53.9	5.9	-
Vert.	7440.000	PK	48.36	37.88	8.54	43.60	-8.06	2.28	45.40	53.9	8.5	-
Vert.	9920.000	PK	47.90	39.05	9.73	42.78	-8.06	2.28	48.12	53.9	5.7	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + DCCF + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Duty cycle correction factor (DCCF) refer to "Duty cycle correction factor" sheet.

*1) Not out of band emission (Leakage Power)

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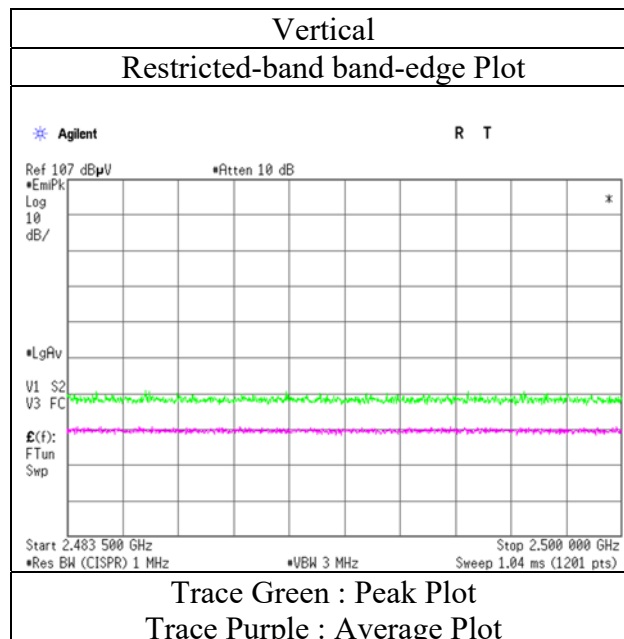
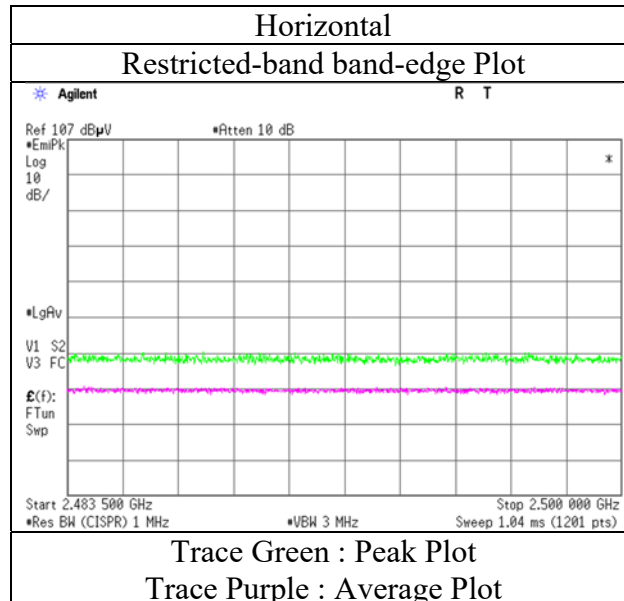
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Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	13456926S-A-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	December 23, 2020
Temperature / Humidity	22 deg.C, 33 %RH
Engineer	Yuske Taikawara (1 GHz -2.8 GHz)
Mode	Tx BT LE 2480 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No. 13456926S-A-R2
 Test place Shonan EMC Lab.
 Semi Anechoic Chamber 3 3
 Date February 5, 2021 June 8, 2021
 Temperature / Humidity 21 deg.C, 30 %RH 25 deg.C, 50 %RH
 Engineer Yusuke Tanikawara Yusuke Tanikawara
 (1 GHz -2.8 GHz) (2.8 GHz -26.5 GHz)
 Mode Tx 11b 2412 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	47.41	28.41	14.41	41.66	2.28	50.85	73.9	23.0	338	206	-
Hori.	4824.000	PK	50.47	31.47	6.99	42.89	2.28	48.32	73.9	25.5	128	240	-
Hori.	7236.000	PK	50.24	36.07	8.51	43.42	2.28	53.68	73.9	20.2	158	100	-
Hori.	9648.000	PK	48.74	38.77	9.74	43.12	2.28	56.41	73.9	17.4	150	0	-
Hori.	9648.000	AV	39.13	38.77	9.74	43.12	2.28	46.80	53.9	7.1	150	0	Floor
Vert.	2390.000	PK	47.80	28.41	14.41	41.66	2.28	51.24	73.9	22.6	165	273	-
Vert.	4824.000	PK	49.60	31.47	6.99	42.89	2.28	47.45	73.9	26.4	182	183	-
Vert.	7236.000	PK	50.08	36.07	8.51	43.42	2.28	53.52	73.9	20.3	127	93	-
Vert.	9648.000	PK	48.81	38.77	9.74	43.12	2.28	56.48	73.9	17.4	150	0	-
Vert.	9648.000	AV	39.07	38.77	9.74	43.12	2.28	46.74	53.9	7.1	150	0	Floor

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	37.83	28.41	14.41	41.66	0.87	2.28	42.14	53.9	11.7	*1)
Hori.	4824.000	AV	40.43	31.47	6.99	42.89	0.87	2.28	39.15	53.9	14.7	-
Hori.	7236.000	AV	40.87	36.07	8.51	43.42	0.87	2.28	45.18	53.9	8.7	-
Vert.	2390.000	AV	37.82	28.41	14.41	41.66	0.87	2.28	42.13	53.9	11.7	*1)
Vert.	4824.000	AV	39.94	31.47	6.99	42.89	0.87	2.28	38.66	53.9	15.2	-
Vert.	7236.000	AV	40.29	36.07	8.51	43.42	0.87	2.28	44.60	53.9	9.3	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Duty factor refer to "Burst rate confirmation" sheet.

*1) Not out of band emission (Leakage Power)

20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	91.19	28.37	14.43	41.67	2.28	94.60	-	-	Carrier
Hori.	2400.000	PK	42.72	28.38	14.42	41.67	2.28	46.13	74.6	28.4	-
Vert.	2412.000	PK	91.93	28.37	14.43	41.67	2.28	95.34	-	-	Carrier
Vert.	2400.000	PK	43.12	28.38	14.42	41.67	2.28	46.53	75.3	28.7	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

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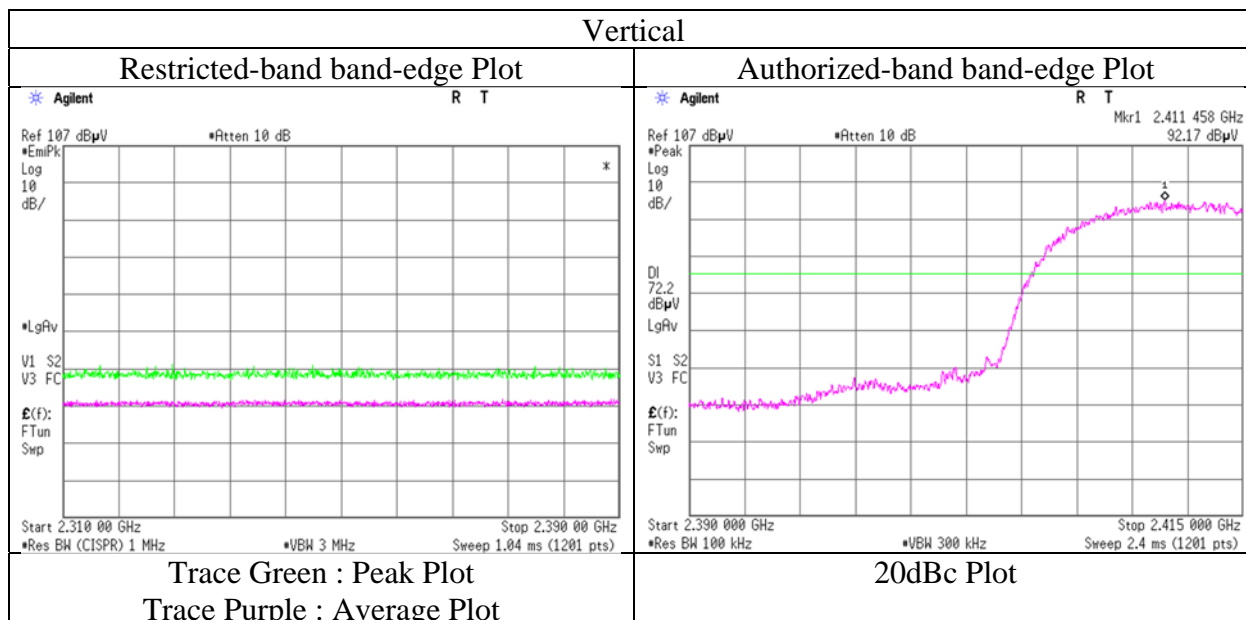
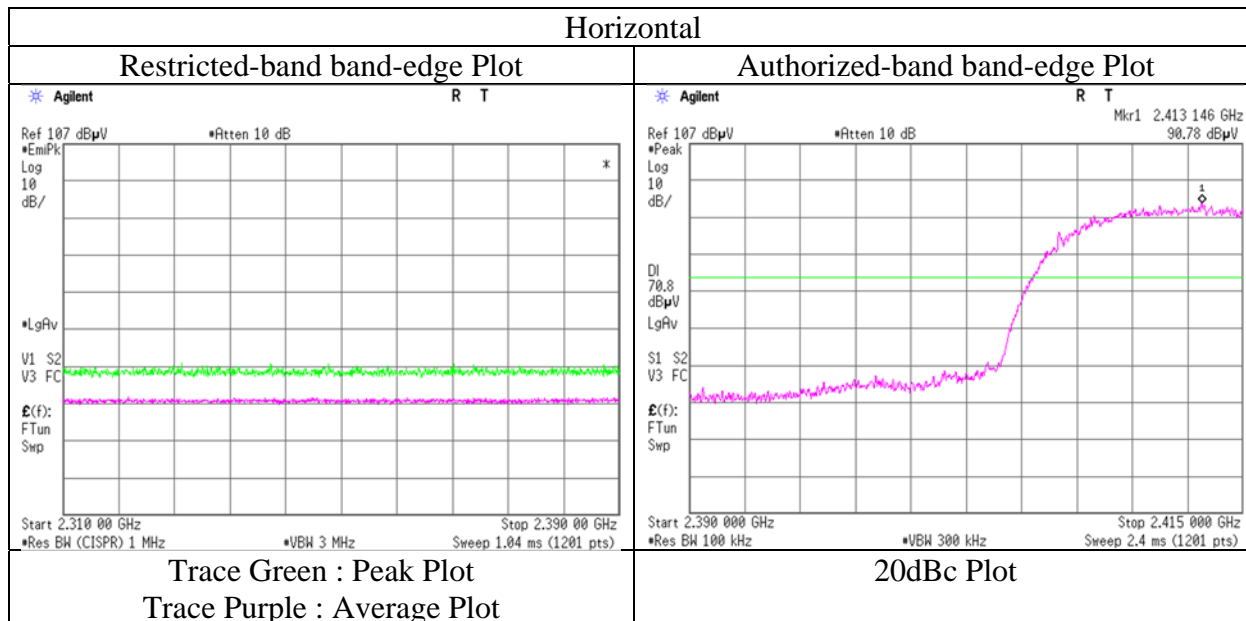
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Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	13456926S-A-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	February 5, 2021
Temperature / Humidity	21 deg.C, 30 %RH
Engineer	Yusuke Tanikawara (1 GHz -2.8 GHz)
Mode	Tx 11b 2412 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

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Radiated Spurious Emission

Report No.	13456926S-A-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	3		3
Date	February 5, 2021		June 8, 2021
Temperature / Humidity	21 deg.C, 30 %RH		25 deg.C, 50 %RH
Engineer	Yusuke Tanikawara		Yusuke Tanikawara
	(1 GHz -2.8 GHz)		(2.8 GHz -26.5 GHz)
Mode	Tx 11b 2437 MHz		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	55.41	31.50	7.02	42.89	2.28	53.32	73.9	20.5	164	172	-
Hori.	7311.000	PK	47.99	36.14	8.56	43.51	2.28	51.46	73.9	22.4	174	146	-
Hori.	9748.000	PK	48.11	38.97	9.78	42.99	2.28	56.15	73.9	17.7	150	0	-
Hori.	9748.000	AV	39.19	38.97	9.78	42.99	2.28	47.23	53.9	6.6	150	0	Floor
Vert.	4874.000	PK	55.45	31.50	7.02	42.89	2.28	53.36	73.9	20.5	165	76	-
Vert.	7311.000	PK	48.86	36.14	8.56	43.51	2.28	52.33	73.9	21.5	174	129	-
Vert.	9748.000	PK	47.88	38.97	9.78	42.99	2.28	55.92	73.9	17.9	150	0	-
Vert.	9748.000	AV	39.08	38.97	9.78	42.99	2.28	47.12	53.9	6.7	150	0	Floor

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4874.000	AV	45.29	31.50	7.02	42.89	0.87	2.28	44.07	53.9	9.8	-
Hori.	7311.000	AV	39.65	36.14	8.56	43.51	0.87	2.28	43.99	53.9	9.9	-
Vert.	4874.000	AV	45.46	31.50	7.02	42.89	0.87	2.28	44.24	53.9	9.6	-
Vert.	7311.000	AV	39.74	36.14	8.56	43.51	0.87	2.28	44.08	53.9	9.8	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Duty factor refer to "Burst rate confirmation" sheet.

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Radiated Spurious Emission

Report No.	13456926S-A-R2	
Test place	Shonan EMC Lab.	
Semi Anechoic Chamber	3	3
Date	February 5, 2021	June 8, 2021
Temperature / Humidity	21 deg.C, 30 %RH	25 deg.C, 50 %RH
Engineer	Yusuke Tanikawara	Yusuke Tanikawara
	(1 GHz -2.8 GHz)	(2.8 GHz -26.5 GHz)
Mode	Tx 11b 2462 MHz	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	49.22	28.28	14.51	41.69	2.28	52.60	73.9	21.3	234	293	-
Hori.	4924.000	PK	54.23	31.53	7.07	42.89	2.28	52.22	73.9	21.6	175	169	-
Hori.	7386.000	PK	48.22	36.29	8.61	43.59	2.28	51.81	73.9	22.0	156	149	-
Hori.	9848.000	PK	48.84	38.99	9.82	42.86	2.28	57.07	73.9	16.8	150	0	-
Hori.	9848.000	AV	38.97	38.99	9.82	42.86	2.28	47.20	53.9	6.7	150	0	Floor
Vert.	2483.500	PK	48.90	28.28	14.51	41.69	2.28	52.28	73.9	21.6	111	160	-
Vert.	4924.000	PK	55.00	31.53	7.07	42.89	2.28	52.99	73.9	20.9	135	75	-
Vert.	7386.000	PK	48.09	36.29	8.61	43.59	2.28	51.68	73.9	22.2	166	87	-
Vert.	9848.000	PK	48.24	38.99	9.82	42.86	2.28	56.47	73.9	17.4	150	0	-
Vert.	9848.000	AV	39.02	38.99	9.82	42.86	2.28	47.25	53.9	6.6	150	0	Floor

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	40.48	28.28	14.51	41.69	0.87	2.28	44.73	53.9	9.1	*1)
Hori.	4924.000	AV	44.11	31.53	7.07	42.89	0.87	2.28	42.97	53.9	10.9	-
Hori.	7386.000	AV	39.54	36.29	8.61	43.59	0.87	2.28	44.00	53.9	9.9	-
Vert.	2483.500	AV	39.83	28.28	14.51	41.69	0.87	2.28	44.08	53.9	9.8	*1)
Vert.	4924.000	AV	45.55	31.53	7.07	42.89	0.87	2.28	44.41	53.9	9.4	-
Vert.	7386.000	AV	39.49	36.29	8.61	43.59	0.87	2.28	43.95	53.9	9.9	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Duty factor refer to "Burst rate confirmation" sheet.

*1) Not out of band emission (Leakage Power)

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Shonan EMC Lab.

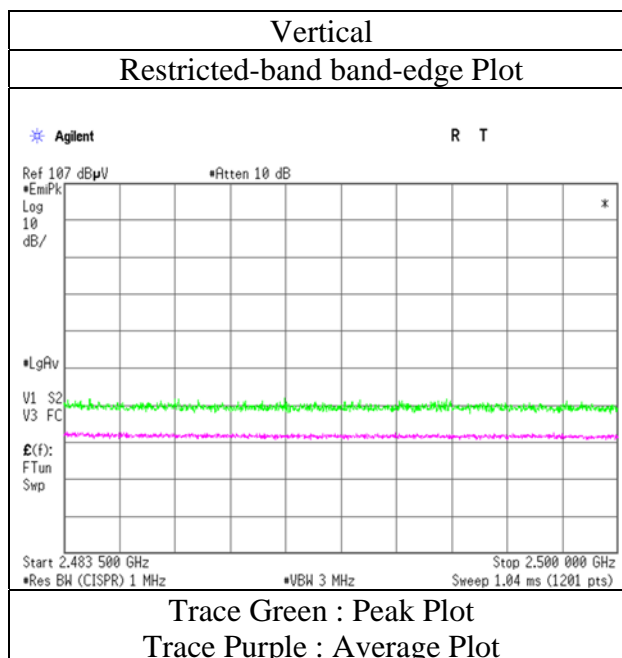
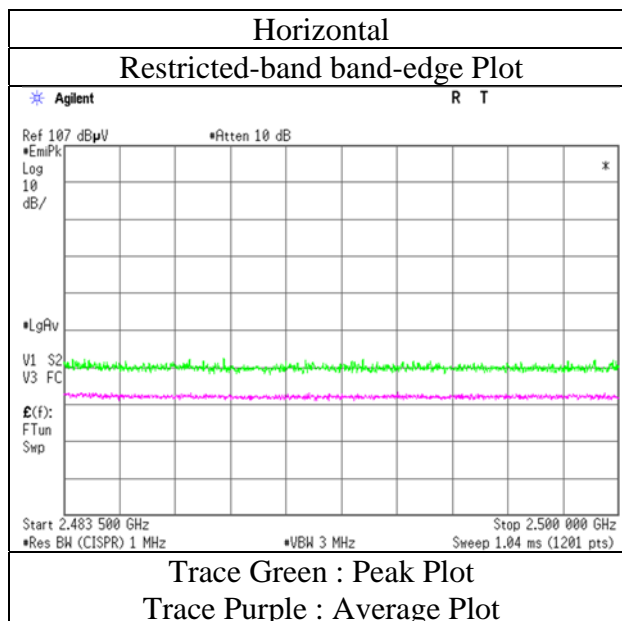
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	13456926S-A-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	February 5, 2021
Temperature / Humidity	21 deg.C, 30 %RH
Engineer	Yusuke Tanikawara (1 GHz -2.8 GHz)
Mode	Tx 11b 2462 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13456926S-R2	
Test place	Shonan EMC Lab.	
Semi Anechoic Chamber	3	3
Date	February 5, 2021	June 8, 2021
Temperature / Humidity	21 deg.C, 30 %RH	25 deg.C, 50 %RH
Engineer	Yusuke Tanikawara	Yusuke Tanikawara
	(1 GHz -2.8 GHz)	(2.8 GHz -26.5 GHz)
Mode	Tx 11b 2467 MHz	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	48.32	28.28	14.51	41.69	2.28	51.70	73.9	22.2	233	291	-
Hori.	4934.000	PK	49.89	31.55	7.07	42.89	2.28	47.90	73.9	26.0	202	173	-
Hori.	7401.000	PK	48.73	36.30	8.62	43.61	2.28	52.32	73.9	21.5	150	0	-
Hori.	9868.000	PK	48.05	38.96	9.83	42.83	2.28	56.29	73.9	17.6	150	0	-
Hori.	7401.000	AV	39.26	36.30	8.62	43.61	2.28	42.85	53.9	11.0	150	0	Floor
Hori.	9868.000	AV	38.92	38.96	9.83	42.83	2.28	47.16	53.9	6.7	150	0	Floor
Vert.	2483.500	PK	48.03	28.28	14.51	41.69	2.28	51.41	73.9	22.4	195	170	-
Vert.	4934.000	PK	50.19	31.55	7.07	42.89	2.28	48.20	73.9	25.7	139	73	-
Vert.	7401.000	PK	48.70	36.30	8.62	43.61	2.28	52.29	73.9	21.6	150	0	-
Vert.	9868.000	PK	48.24	38.96	9.83	42.83	2.28	56.48	73.9	17.4	150	0	-
Vert.	7401.000	AV	39.29	36.30	8.62	43.61	2.28	42.88	53.9	11.0	150	0	Floor
Vert.	9868.000	AV	38.83	38.96	9.83	42.83	2.28	47.07	53.9	6.8	150	0	Floor

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$ 10 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	38.46	28.28	14.51	41.69	0.87	2.28	42.71	53.9	11.1	*1)
Hori.	4934.000	AV	40.11	31.55	7.07	42.89	0.87	2.28	38.99	53.9	14.9	-
Vert.	2483.500	AV	38.04	28.28	14.51	41.69	0.87	2.28	42.29	53.9	11.6	*1)
Vert.	4934.000	AV	40.44	31.55	7.07	42.89	0.87	2.28	39.32	53.9	14.5	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor

Distance factor : 1 GHz - 10 GHz : $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$ 10 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Duty factor refer to "Burst rate confirmation" sheet.

*1) Not out of band emission (Leakage Power)

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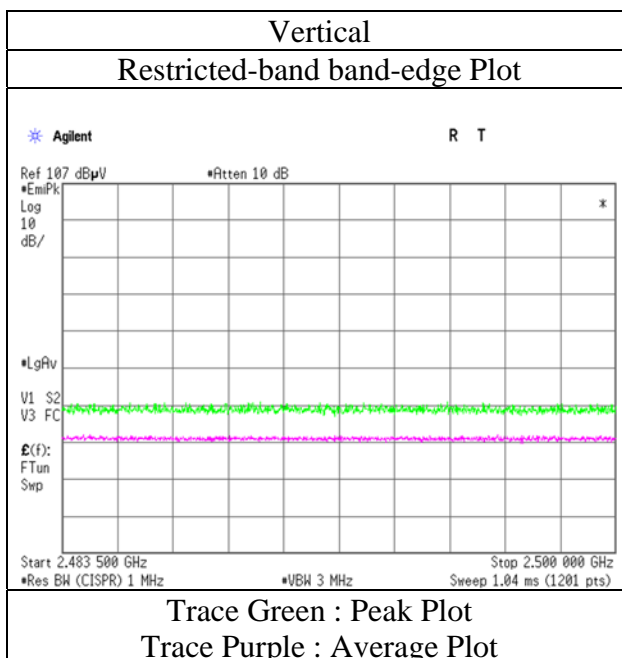
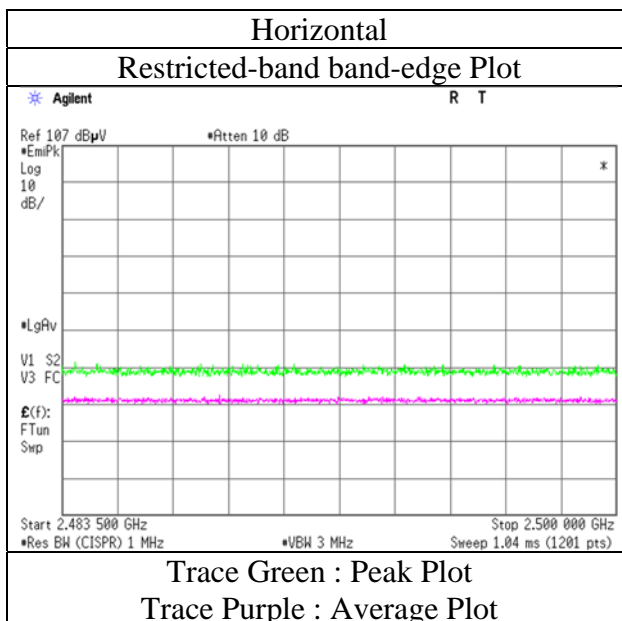
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Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	13456926S-A-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	February 5, 2021
Temperature / Humidity	21 deg.C, 30 %RH
Engineer	Yusuke Tanikawara (1 GHz -2.8 GHz)
Mode	Tx 11b 2467 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13456926S-A-R2	
Test place	Shonan EMC Lab.	
Semi Anechoic Chamber	3	3
Date	February 5, 2021	June 8, 2021
Temperature / Humidity	21 deg.C, 30 %RH	25 deg.C, 50 %RH
Engineer	Yusuke Tanikawara	Yusuke Tanikawara
	(1 GHz -2.8 GHz)	(2.8 GHz -26.5 GHz)
Mode	Tx 11b 2472 MHz	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	48.01	28.28	14.51	41.69	2.28	51.39	73.9	22.5	259	303	-
Hori.	4944.000	PK	48.54	31.57	7.08	42.89	2.28	46.58	73.9	27.3	167	168	-
Hori.	7416.000	PK	48.45	36.34	8.62	43.63	2.28	52.06	73.9	21.8	150	0	-
Hori.	9888.000	PK	47.88	38.92	9.86	42.81	2.28	56.13	73.9	17.7	150	0	-
Hori.	7416.000	AV	39.21	36.34	8.62	43.63	2.28	42.82	53.9	11.0	150	0	Floor
Hori.	9888.000	AV	38.94	38.92	9.86	42.81	2.28	47.19	53.9	6.7	150	0	Floor
Vert.	2483.500	PK	47.85	28.28	14.51	41.69	2.28	51.23	73.9	22.6	187	171	-
Vert.	4944.000	PK	49.00	31.57	7.08	42.89	2.28	47.04	73.9	26.8	151	69	-
Vert.	7416.000	PK	48.27	36.34	8.62	43.63	2.28	51.88	73.9	22.0	150	0	-
Vert.	9888.000	PK	47.94	38.92	9.86	42.81	2.28	56.19	73.9	17.7	150	0	-
Vert.	7416.000	AV	39.18	36.34	8.62	43.63	2.28	42.79	53.9	11.1	150	0	Floor
Vert.	9888.000	AV	38.92	38.92	9.86	42.81	2.28	47.17	53.9	6.7	150	0	Floor

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$ 10 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	38.38	28.28	14.51	41.69	0.87	2.28	42.63	53.9	11.2	*1)
Hori.	4944.000	AV	39.14	31.57	7.08	42.89	0.87	2.28	38.05	53.9	15.8	-
Vert.	2483.500	AV	37.84	28.28	14.51	41.69	0.87	2.28	42.09	53.9	11.8	*1)
Vert.	4944.000	AV	39.30	31.57	7.08	42.89	0.87	2.28	38.21	53.9	15.6	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor

Distance factor : 1 GHz - 10 GHz : $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$ 10 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Duty factor refer to "Burst rate confirmation" sheet.

*1) Not out of band emission (Leakage Power)

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Shonan EMC Lab.

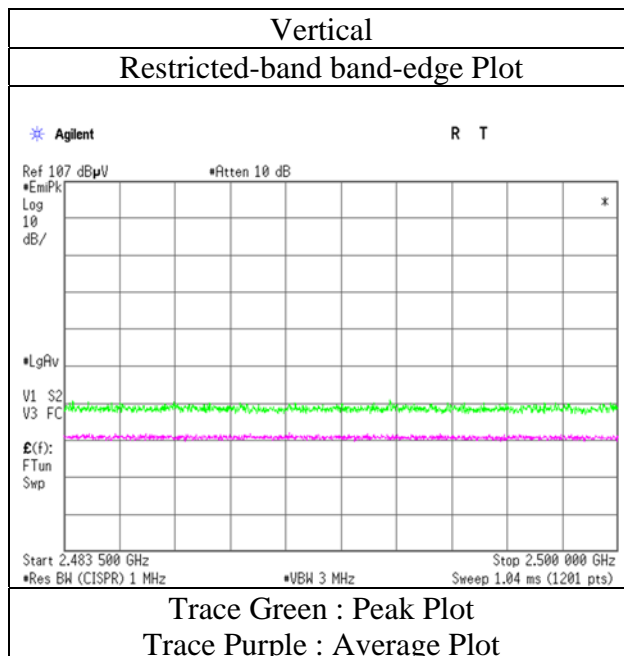
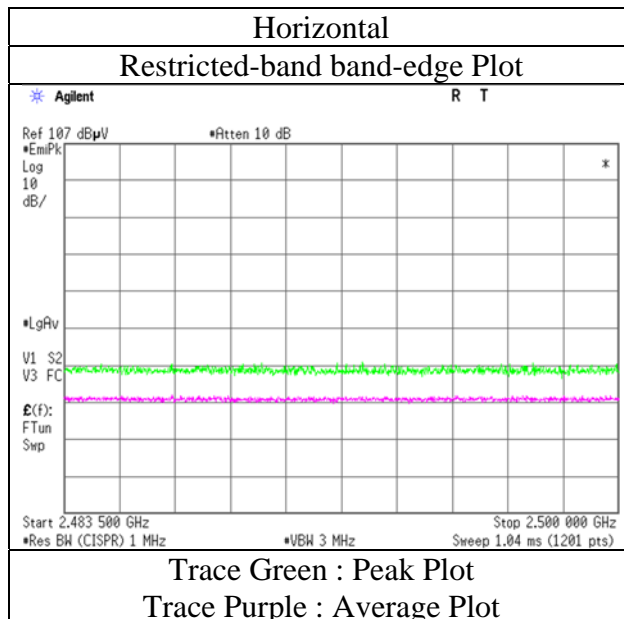
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**Radiated Spurious Emission
(Reference Plot for band-edge)**

Report No.	13456926S-A-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	February 5, 2021
Temperature / Humidity	21 deg.C, 30 %RH
Engineer	Yusuke Tanikawara (1 GHz -2.8 GHz)
Mode	Tx 11b 2472 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No. 13456926S-A-R2
 Test place Shonan EMC Lab.
 Semi Anechoic Chamber 3
 Date February 6, 2021
 Temperature / Humidity 24 deg.C, 34 %RH
 Engineer Takahiro Kawakami
 (1 GHz -2.8 GHz)
 Mode Tx OFDM VHT20 (SISO) 2412 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	59.05	28.41	14.41	41.66	2.28	62.49	73.9	11.4	345	304	-
Vert.	2390.000	PK	60.47	28.41	14.41	41.66	2.28	63.91	73.9	9.9	112	157	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

10 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	43.14	28.41	14.41	41.66	2.04	2.28	48.62	53.9	5.2	*1)
Vert.	2390.000	AV	45.47	28.41	14.41	41.66	2.04	2.28	50.95	53.9	2.9	*1)

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor

Distance factor : 1 GHz - 10 GHz : $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

10 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Duty factor refer to "Burst rate confirmation" sheet.

*1) Not out of band emission (Leakage Power)

20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	94.21	28.37	14.43	41.67	2.28	97.62	-	-	Carrier
Hori.	2400.000	PK	52.40	28.38	14.42	41.67	2.28	55.81	77.6	21.7	-
Vert.	2412.000	PK	93.56	28.37	14.43	41.67	2.28	96.97	-	-	Carrier
Vert.	2400.000	PK	55.12	28.38	14.42	41.67	2.28	58.53	76.9	18.3	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

10 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

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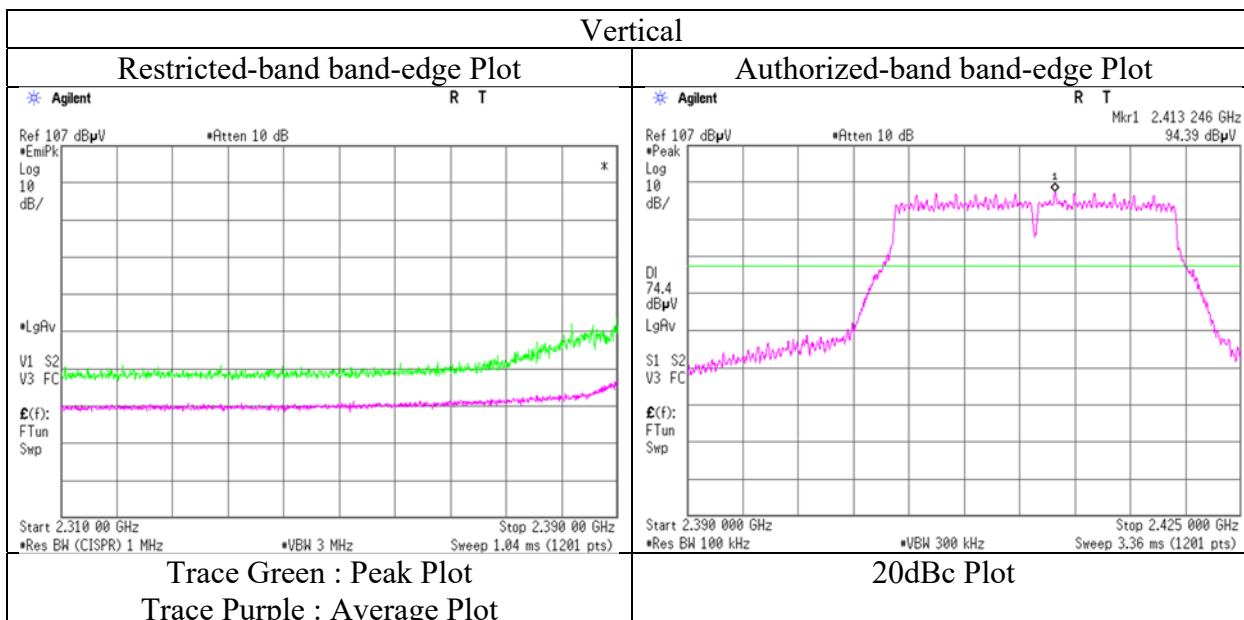
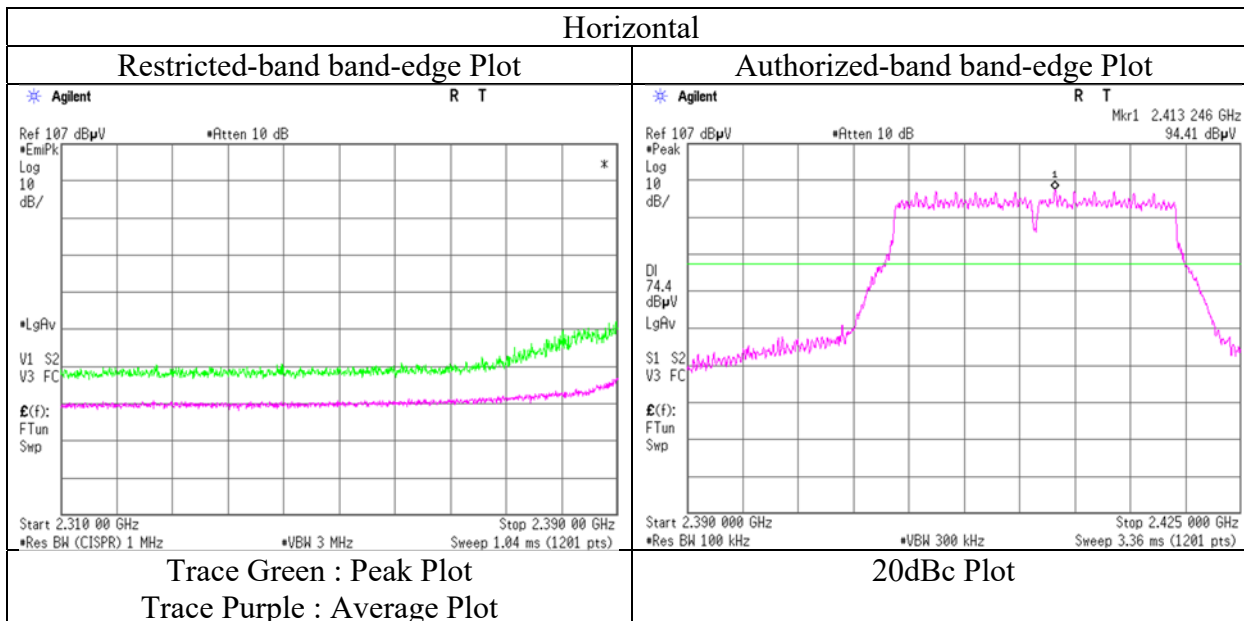
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Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	13456926S-A-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	February 6, 2021
Temperature / Humidity	24 deg.C, 34 %RH
Engineer	Takahiro Kawakami (1 GHz -2.8 GHz)
Mode	Tx OFDM VHT20 (SISO) 2412 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

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Radiated Spurious Emission

Report No. 13456926S-A-R2
 Test place Shonan EMC Lab.
 Semi Anechoic Chamber 3
 Date February 6, 2021
 Temperature / Humidity 24 deg.C, 34 %RH
 Engineer Takahiro Kawakami
 (1 GHz -2.8 GHz)
 Mode Tx OFDM VHT20 (SISO) 2462 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	60.87	28.28	14.51	41.69	2.28	64.25	73.9	9.6	367	321	-
Vert.	2483.500	PK	59.69	28.28	14.51	41.69	2.28	63.07	73.9	10.8	226	164	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

10 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	43.97	28.28	14.51	41.69	2.04	2.28	49.39	53.9	4.5	*1)
Vert.	2483.500	AV	42.98	28.28	14.51	41.69	2.04	2.28	48.40	53.9	5.5	*1)

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor

Distance factor : 1 GHz - 10 GHz : $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

10 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Duty factor refer to "Burst rate confirmation" sheet.

*1) Not out of band emission (Leakage Power)

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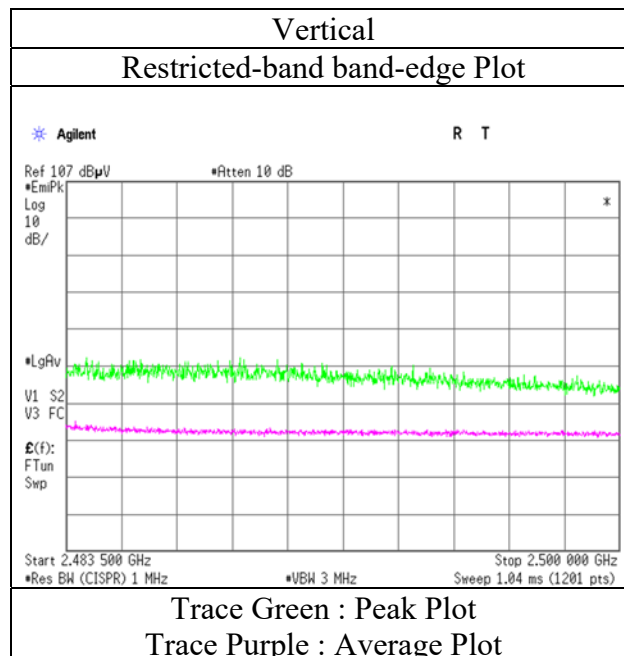
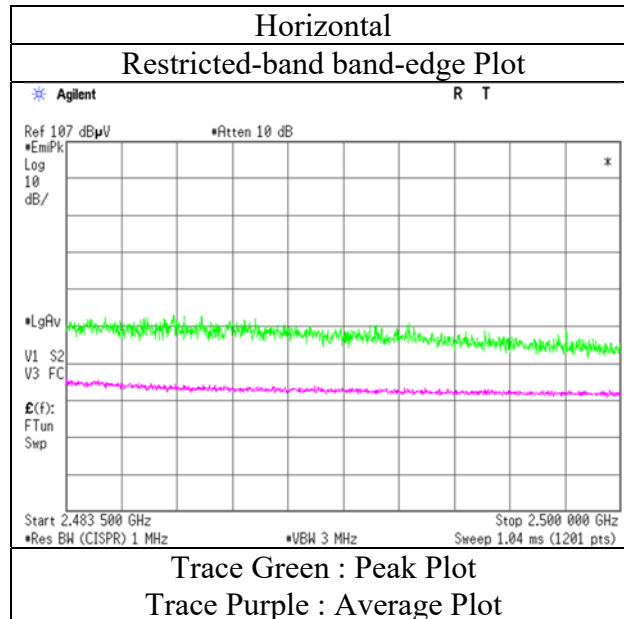
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Radiated Spurious Emission (Reference Plot for band-edge)

Report No. 13456926S-A-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date February 6, 2021
Temperature / Humidity 24 deg.C, 34 %RH
Engineer Takahiro Kawakami
(1 GHz -2.8 GHz)
Mode Tx OFDM VHT20 (SISO) 2462 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No. 13456926S-A-R2
 Test place Shonan EMC Lab.
 Semi Anechoic Chamber 3
 Date February 6, 2021
 Temperature / Humidity 24 deg.C, 34 %RH
 Engineer Takahiro Kawakami
 (1 GHz -2.8 GHz)
 Mode Tx OFDM VHT20 (SISO) 2467 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	50.96	28.28	14.51	41.69	2.28	54.34	73.9	19.5	147	197	-
Vert.	2483.500	PK	50.90	28.28	14.51	41.69	2.28	54.28	73.9	19.6	199	242	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

10 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	39.91	28.28	14.51	41.69	3.61	2.28	46.90	53.9	6.9	*1)
Vert.	2483.500	AV	39.87	28.28	14.51	41.69	3.61	2.28	46.86	53.9	7.0	*1)

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor

Distance factor : 1 GHz - 10 GHz : $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

10 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Duty factor refer to "Burst rate confirmation" sheet.

*1) Not out of band emission (Leakage Power)

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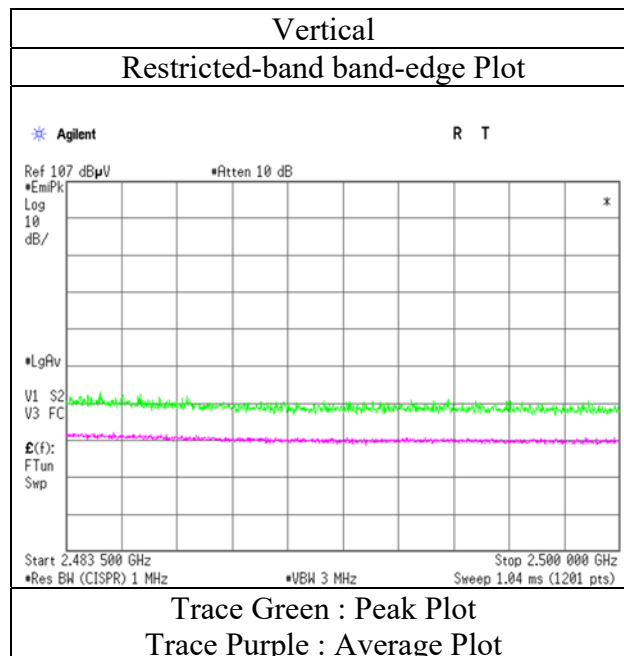
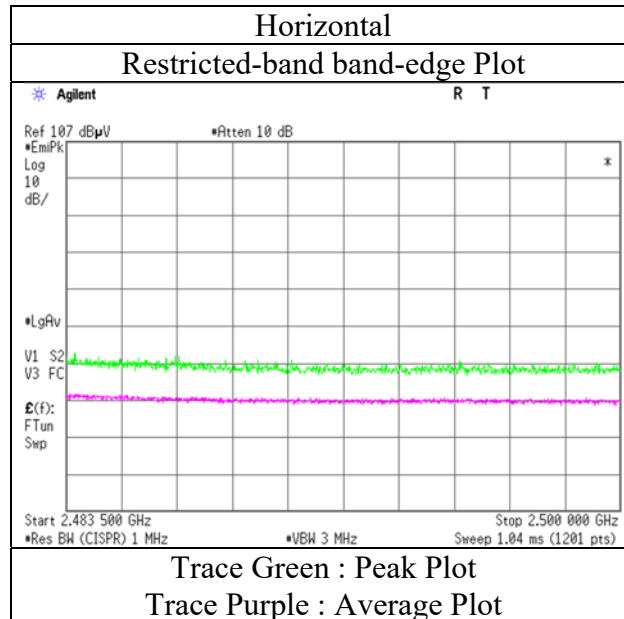
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Radiated Spurious Emission (Reference Plot for band-edge)

Report No. 13456926S-A-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date February 6, 2021
Temperature / Humidity 24 deg.C, 34 %RH
Engineer Takahiro Kawakami
(1 GHz -2.8 GHz)
Mode Tx OFDM VHT20 (SISO) 2467 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No. 13456926S-A-R2
 Test place Shonan EMC Lab.
 Semi Anechoic Chamber 3
 Date February 6, 2021
 Temperature / Humidity 24 deg.C, 34 %RH
 Engineer Takahiro Kawakami
 (1 GHz -2.8 GHz)
 Mode Tx OFDM VHT20 (SISO) 2472 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	48.31	28.28	14.51	41.69	2.28	51.69	73.9	22.2	148	199	-
Vert.	2483.500	PK	49.49	28.28	14.51	41.69	2.28	52.87	73.9	21.0	162	251	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

10 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	38.90	28.28	14.51	41.69	3.61	2.28	45.89	53.9	8.0	*1)
Vert.	2483.500	AV	39.12	28.28	14.51	41.69	3.61	2.28	46.11	53.9	7.7	*1)

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor

Distance factor : 1 GHz - 10 GHz : $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

10 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Duty factor refer to "Burst rate confirmation" sheet.

*1) Not out of band emission (Leakage Power)

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Shonan EMC Lab.

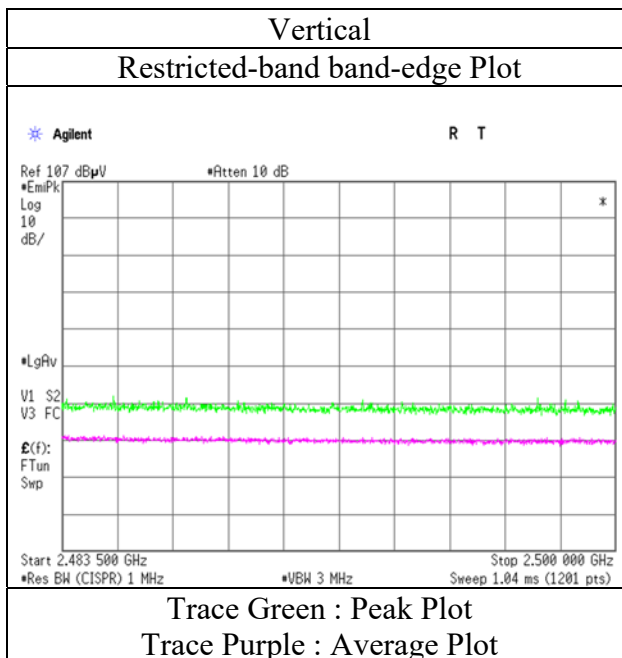
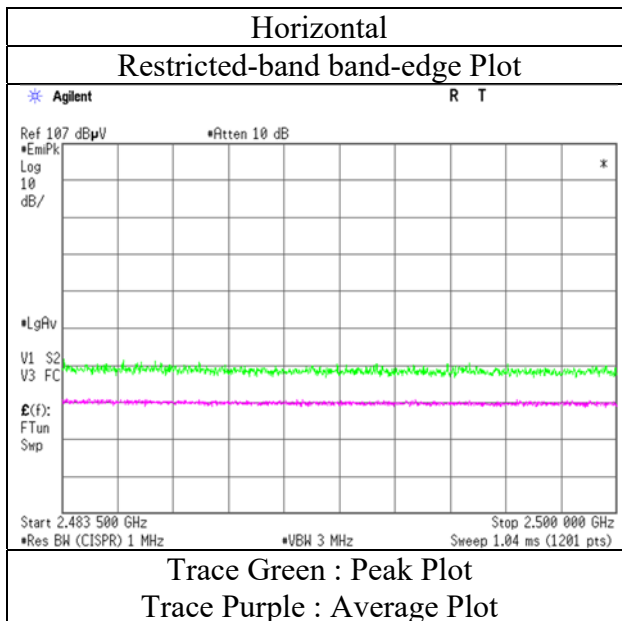
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Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	13456926S-A-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	February 6, 2021
Temperature / Humidity	24 deg.C, 34 %RH
Engineer	Takahiro Kawakami (1 GHz -2.8 GHz)
Mode	Tx OFDM VHT20 (SISO) 2472 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13456926S-A-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	3	3	3	3
Date	February 11, 2021	December 22, 2020	December 23, 2020	December 25, 2020
Temperature / Humidity	22 deg.C, 32 %RH	25 deg.C, 30 %RH	26 deg.C, 31 %RH	25 deg.C, 26 %RH
Engineer	Takahiro Kawakami	Takahiro Kawakami	Takahiro Kawakami	Takahiro Kawakami
	(Below 1 GHz)	(1 GHz -2.8 GHz)	(2.8 GHz -10 GHz)	(10 GHz -26.5 GHz)
Mode	Tx OFDM VHT20 (MIMO) 2412 MHz			

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	124.988	QP	42.69	13.52	7.29	32.11	0.00	31.39	43.5	12.1	352	346	-
Hori.	249.992	QP	52.40	11.77	8.26	31.99	0.00	40.44	46.0	5.5	163	252	-
Hori.	959.315	QP	29.55	22.15	11.01	30.55	0.00	32.16	46.0	13.8	100	125	-
Hori.	2390.000	PK	56.17	28.41	14.22	41.66	2.28	59.42	73.9	14.4	207	314	-
Hori.	4824.000	PK	51.27	31.61	6.83	42.93	2.28	49.06	73.9	24.8	100	243	-
Hori.	7236.000	PK	48.90	37.62	8.41	43.41	2.28	53.80	73.9	20.1	150	0	-
Hori.	9648.000	PK	48.98	39.01	9.59	43.10	2.28	56.76	73.9	17.1	150	0	-
Hori.	7236.000	AV	39.71	37.62	8.41	43.41	2.28	44.61	53.9	9.2	150	0	Floor
Hori.	9648.000	AV	39.73	39.01	9.59	43.10	2.28	47.51	53.9	6.3	150	0	Floor
Vert.	50.002	QP	36.50	11.18	6.78	32.16	0.00	22.30	40.0	17.7	100	152	-
Vert.	89.230	QP	39.53	8.03	7.54	32.14	0.00	22.96	43.5	20.5	100	259	-
Vert.	124.993	QP	42.90	13.52	7.29	32.11	0.00	31.60	43.5	11.9	336	359	-
Vert.	175.010	QP	34.26	15.73	7.81	32.06	0.00	25.74	43.5	17.7	100	157	-
Vert.	250.001	QP	49.30	11.77	8.26	31.99	0.00	37.34	46.0	8.6	100	208	-
Vert.	499.984	QP	35.53	17.77	9.41	31.92	0.00	30.79	46.0	15.2	100	304	-
Vert.	949.386	QP	26.80	22.06	10.98	30.65	0.00	29.19	46.0	16.8	100	35	-
Vert.	2390.000	PK	57.44	28.41	14.22	41.66	2.28	60.69	73.9	13.2	112	160	-
Vert.	4824.000	PK	51.53	31.61	6.83	42.93	2.28	49.32	73.9	24.5	209	265	-
Vert.	7236.000	PK	49.04	37.62	8.41	43.41	2.28	53.94	73.9	19.9	150	0	-
Vert.	9648.000	PK	50.29	39.01	9.59	43.10	2.28	58.07	73.9	15.8	150	0	-
Vert.	7236.000	AV	39.40	37.62	8.41	43.41	2.28	44.30	53.9	9.6	150	0	Floor
Vert.	9648.000	AV	39.96	39.01	9.59	43.10	2.28	47.74	53.9	6.1	150	0	Floor

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log(3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	43.02	28.41	14.22	41.66	3.33	2.28	49.60	53.9	4.2	*1)
Hori.	4824.000	AV	39.92	31.61	6.83	42.93	3.33	2.28	41.04	53.9	12.8	-
Vert.	2390.000	AV	41.80	28.41	14.22	41.66	3.33	2.28	48.38	53.9	5.5	*1)
Vert.	4824.000	AV	40.52	31.61	6.83	42.93	3.33	2.28	41.64	53.9	12.2	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log(3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

Duty factor refer to "Burst rate confirmation" sheet.

*1) Not out of band emission (Leakage Power)

20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	93.79	28.37	14.23	41.67	2.28	97.00	-	-	Carrier
Hori.	2400.000	PK	52.88	28.38	14.22	41.67	2.28	56.09	77.0	20.9	-
Vert.	2412.000	PK	94.79	28.37	14.23	41.67	2.28	98.00	-	-	Carrier
Vert.	2400.000	PK	50.83	28.38	14.22	41.67	2.28	54.04	78.0	23.9	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log(3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

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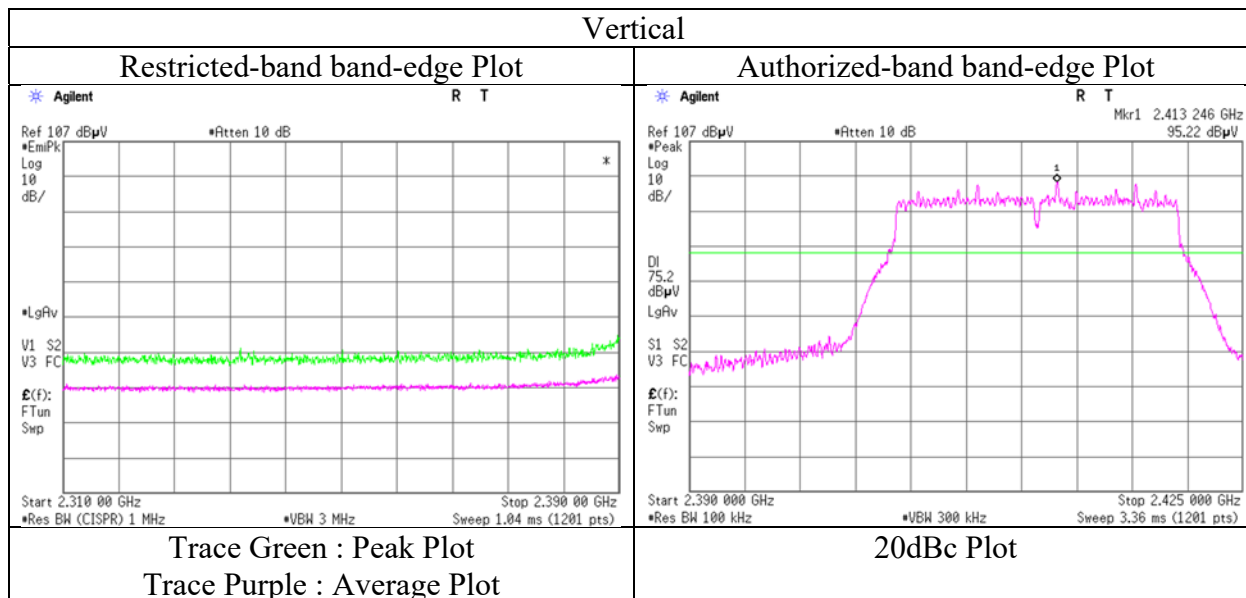
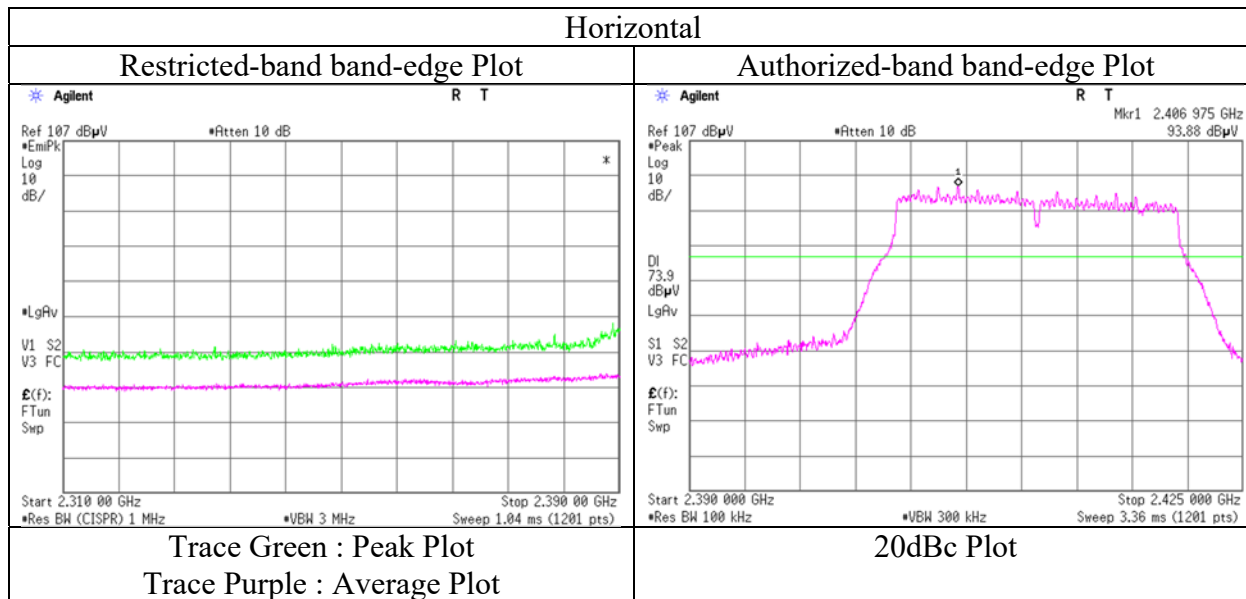
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Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	13456926S-A-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	December 22, 2020
Temperature / Humidity	25 deg.C, 30 %RH
Engineer	Takahiro Kawakami (1 GHz -2.8 GHz)
Mode	Tx OFDM VHT20 (MIMO) 2412 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

UL Japan, Inc.

Shonan EMC Lab.

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Radiated Spurious Emission

Report No.	13456926S-A-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	3	3	3
Date	December 22, 2020	December 23, 2020	December 25, 2020
Temperature / Humidity	25 deg.C, 30 %RH	26 deg.C, 31 %RH	25 deg.C, 26 %RH
Engineer	Takahiro Kawakami	Takahiro Kawakami	Takahiro Kawakami
	(1 GHz -2.8 GHz)	(2.8 GHz -10 GHz)	(10 GHz -26.5 GHz)
Mode	Tx OFDM VHT20 (MIMO) 2437 MHz		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	51.96	31.63	6.87	42.93	2.28	49.81	73.9	24.0	142	246	-
Hori.	7311.000	PK	49.69	37.69	8.45	43.48	2.28	54.63	73.9	19.2	150	0	-
Hori.	9748.000	PK	48.65	39.17	9.63	42.98	2.28	56.75	73.9	17.1	150	0	-
Hori.	7311.000	AV	38.99	37.69	8.45	43.48	2.28	43.93	53.9	9.9	150	0	Floor
Hori.	9748.000	AV	39.25	39.17	9.63	42.98	2.28	47.35	53.9	6.5	150	0	Floor
Vert.	4874.000	PK	51.11	31.63	6.87	42.93	2.28	48.96	73.9	24.9	177	269	-
Vert.	7311.000	PK	49.13	37.69	8.45	43.48	2.28	54.07	73.9	19.8	150	0	-
Vert.	9748.000	PK	48.49	39.17	9.63	42.98	2.28	56.59	73.9	17.3	150	0	-
Vert.	7311.000	AV	39.58	37.69	8.45	43.48	2.28	44.52	53.9	9.3	150	0	Floor
Vert.	9748.000	AV	39.36	39.17	9.63	42.98	2.28	47.46	53.9	6.4	150	0	Floor

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4874.000	AV	40.68	31.63	6.87	42.93	3.33	2.28	41.86	53.9	12.0	-
Vert.	4874.000	AV	40.40	31.63	6.87	42.93	3.33	2.28	41.58	53.9	12.3	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Duty factor refer to "Burst rate confirmation" sheet.

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Radiated Spurious Emission

Report No.	13456926S-A-R2		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	3	3	3
Date	December 22, 2020	December 23, 2020	December 25, 2020
Temperature / Humidity	25 deg.C, 30 %RH	26 deg.C, 31 %RH	25 deg.C, 26 %RH
Engineer	Takahiro Kawakami	Takahiro Kawakami	Takahiro Kawakami
	(1 GHz -2.8 GHz)	(2.8 GHz -10 GHz)	(10 GHz -26.5 GHz)
Mode	Tx OFDM VHT20 (MIMO) 2462 MHz		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	53.58	28.28	14.31	41.69	2.28	56.76	73.9	17.1	319	302	-
Hori.	4924.000	PK	51.78	31.68	6.91	42.94	2.28	49.71	73.9	24.1	201	196	-
Hori.	7386.000	PK	49.57	37.81	8.50	43.55	2.28	54.61	73.9	19.2	150	0	-
Hori.	9848.000	PK	48.37	39.16	9.68	42.87	2.28	56.62	73.9	17.2	150	0	-
Hori.	7386.000	AV	38.75	37.81	8.50	43.55	2.28	43.79	53.9	10.1	150	0	Floor
Hori.	9848.000	AV	38.09	39.16	9.68	42.87	2.28	46.34	53.9	7.5	150	0	Floor
Vert.	2483.500	PK	50.54	28.28	14.31	41.69	2.28	53.72	73.9	20.1	168	176	-
Vert.	4924.000	PK	50.61	31.68	6.91	42.94	2.28	48.54	73.9	25.3	127	279	-
Vert.	7386.000	PK	49.40	37.81	8.50	43.55	2.28	54.44	73.9	19.4	150	0	-
Vert.	9848.000	PK	48.30	39.16	9.68	42.87	2.28	56.55	73.9	17.3	150	0	-
Vert.	7386.000	AV	39.54	37.81	8.50	43.55	2.28	44.58	53.9	9.3	150	0	Floor
Vert.	9848.000	AV	38.72	39.16	9.68	42.87	2.28	46.97	53.9	6.9	150	0	Floor

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$ 10 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	40.83	28.28	14.31	41.69	3.33	2.28	47.34	53.9	6.5	*1)
Hori.	4924.000	AV	40.52	31.68	6.91	42.94	3.33	2.28	41.78	53.9	12.1	-
Vert.	2483.500	AV	40.36	28.28	14.31	41.69	3.33	2.28	46.87	53.9	7.0	*1)
Vert.	4924.000	AV	40.25	31.68	6.91	42.94	3.33	2.28	41.51	53.9	12.3	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor

Distance factor : 1 GHz - 10 GHz : $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$ 10 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Duty factor refer to "Burst rate confirmation" sheet.

*1) Not out of band emission (Leakage Power)

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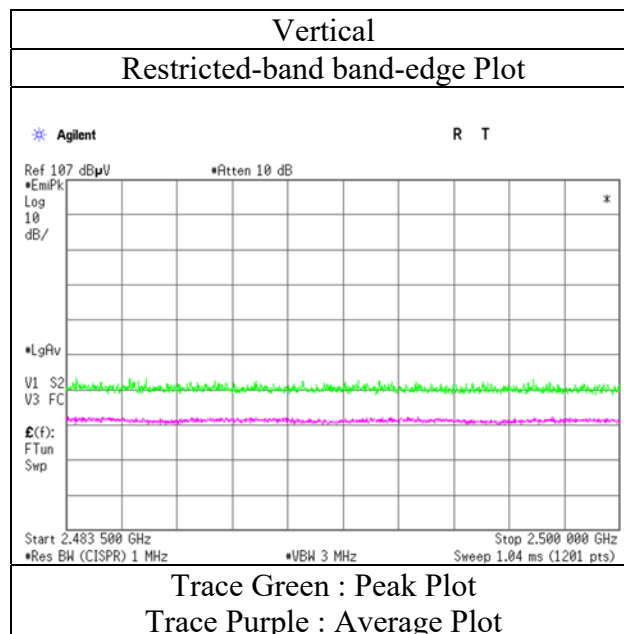
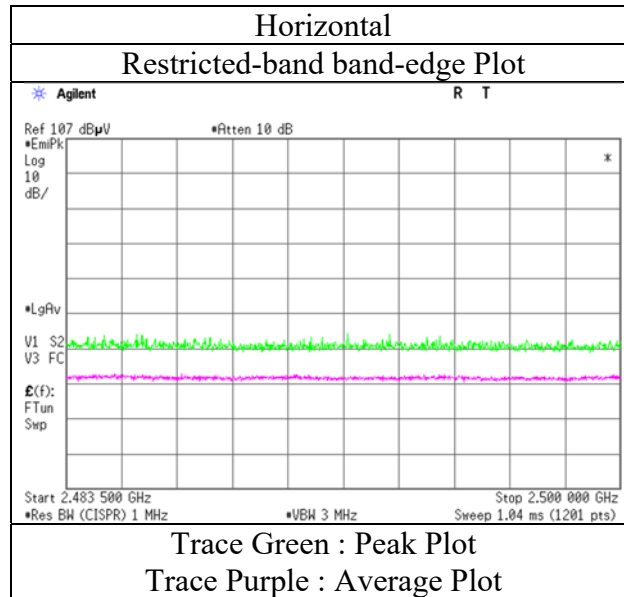
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

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Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	13456926S-A-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	December 22, 2020
Temperature / Humidity	25 deg.C, 30 %RH
Engineer	Takahiro Kawakami (1 GHz -2.8 GHz)
Mode	Tx OFDM VHT20 (MIMO) 2462 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No. 13456926S-A-R2
 Test place Shonan EMC Lab.
 Semi Anechoic Chamber 3 3
 Date February 6, 2021 February 11, 2021
 Temperature / Humidity 24 deg.C, 34 %RH 22 deg.C, 32 %RH
 Engineer Takahiro Kawakami Takahiro Kawakami
 (1 GHz -10 GHz) (10 GHz -26.5 GHz)
 Mode Tx OFDM VHT20 (MIMO) 2467 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	52.11	28.28	14.51	41.69	2.28	55.49	73.9	18.4	358	304	-
Hori.	4934.000	PK	48.49	31.71	7.15	42.94	2.28	46.69	73.9	27.2	150	0	-
Hori.	7401.000	PK	48.31	37.83	8.68	43.56	2.28	53.54	73.9	20.3	150	0	-
Hori.	9868.000	PK	48.41	39.13	9.84	42.84	2.28	56.82	73.9	17.0	150	0	-
Hori.	4934.000	AV	39.10	31.71	7.15	42.94	2.28	37.30	53.9	16.6	150	0	Floor
Hori.	7401.000	AV	38.89	37.83	8.68	43.56	2.28	44.12	53.9	9.7	150	0	Floor
Hori.	9868.000	AV	39.32	39.13	9.84	42.84	2.28	47.73	53.9	6.1	150	0	Floor
Vert.	2483.500	PK	51.73	28.28	14.51	41.69	2.28	55.11	73.9	18.7	226	166	-
Vert.	4934.000	PK	48.44	31.71	7.15	42.94	2.28	46.64	73.9	27.2	150	0	-
Vert.	7401.000	PK	48.55	37.83	8.68	43.56	2.28	53.78	73.9	20.1	150	0	-
Vert.	9868.000	PK	48.67	39.13	9.84	42.84	2.28	57.08	73.9	16.8	150	0	-
Vert.	4934.000	AV	39.21	31.71	7.15	42.94	2.28	37.41	53.9	16.4	150	0	Floor
Vert.	7401.000	AV	39.37	37.83	8.68	43.56	2.28	44.60	53.9	9.3	150	0	Floor
Vert.	9868.000	AV	39.03	39.13	9.84	42.84	2.28	47.44	53.9	6.4	150	0	Floor

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log(3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	40.52	28.28	14.51	41.69	3.33	2.28	47.23	53.9	6.6	*1)
Vert.	2483.500	AV	40.02	28.28	14.51	41.69	3.33	2.28	46.73	53.9	7.1	*1)

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log(3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

Duty factor refer to "Burst rate confirmation" sheet.

*1) Not out of band emission (Leakage Power)

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Shonan EMC Lab.

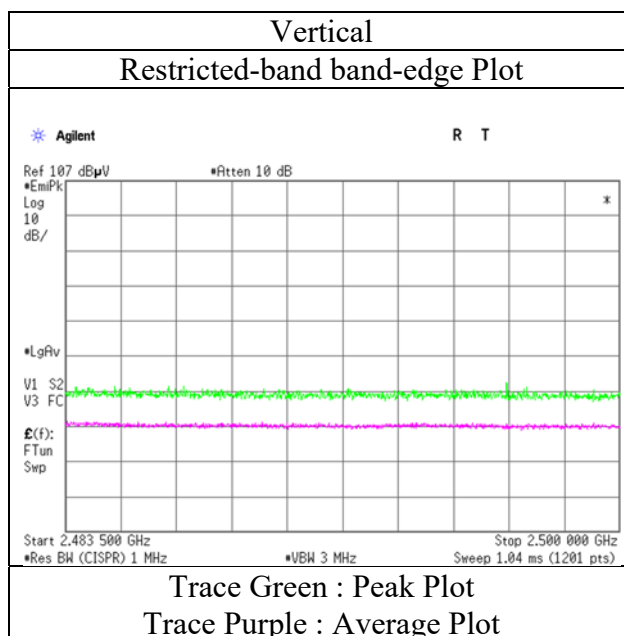
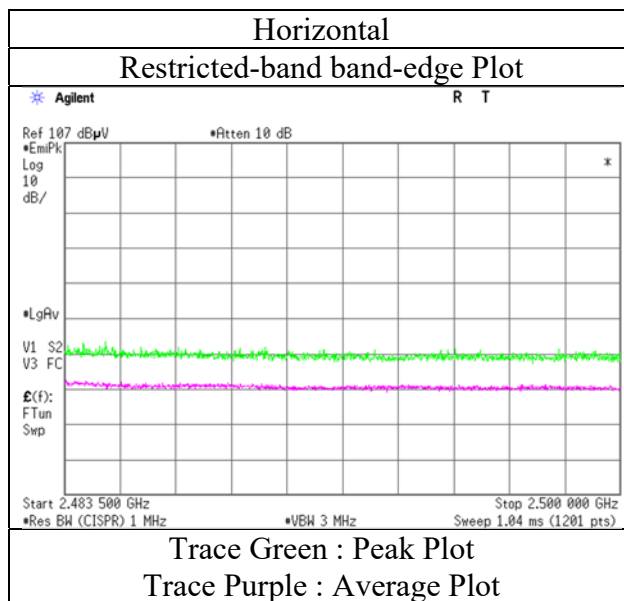
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	13456926S-A-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	December 22, 2020
Temperature / Humidity	25 deg.C, 30 %RH
Engineer	Takahiro Kawakami (1 GHz -2.8 GHz)
Mode	Tx OFDM VHT20 (MIMO) 2467 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No. 13456926S-A-R2
 Test place Shonan EMC Lab.
 Semi Anechoic Chamber 3 3
 Date February 6, 2021 February 11, 2021
 Temperature / Humidity 24 deg.C, 34 %RH 22 deg.C, 32 %RH
 Engineer Takahiro Kawakami Takahiro Kawakami
 (1 GHz -10 GHz) (10 GHz -26.5 GHz)
 Mode Tx OFDM VHT20 (MIMO) 2472 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	50.76	28.28	14.51	41.69	2.28	54.14	73.9	19.7	358	305	-
Hori.	4944.000	PK	49.01	31.74	7.16	42.94	2.28	47.25	73.9	26.6	150	0	-
Hori.	7416.000	PK	48.50	37.84	8.69	43.57	2.28	53.74	73.9	20.1	150	0	-
Hori.	9888.000	PK	48.01	39.10	9.86	42.82	2.28	56.43	73.9	17.4	150	0	-
Hori.	4944.000	AV	39.11	31.74	7.16	42.94	2.28	37.35	53.9	16.5	150	0	Floor
Hori.	7416.000	AV	38.89	37.84	8.69	43.57	2.28	44.13	53.9	9.7	150	0	Floor
Hori.	9888.000	AV	38.67	39.10	9.86	42.82	2.28	47.09	53.9	6.8	150	0	Floor
Vert.	2483.500	PK	49.90	28.28	14.51	41.69	2.28	53.28	73.9	20.6	228	166	-
Vert.	4944.000	PK	48.50	31.74	7.16	42.94	2.28	46.74	73.9	27.1	150	0	-
Vert.	7416.000	PK	48.02	37.84	8.69	43.57	2.28	53.26	73.9	20.6	150	0	-
Vert.	9888.000	PK	48.18	39.10	9.86	42.82	2.28	56.60	73.9	17.3	150	0	-
Vert.	4944.000	AV	39.34	31.74	7.16	42.94	2.28	37.58	53.9	16.3	150	0	Floor
Vert.	7416.000	AV	38.80	37.84	8.69	43.57	2.28	44.04	53.9	9.8	150	0	Floor
Vert.	9888.000	AV	38.88	39.10	9.86	42.82	2.28	47.30	53.9	6.6	150	0	Floor

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	40.24	28.28	14.51	41.69	3.33	2.28	46.95	53.9	6.9	*1)
Vert.	2483.500	AV	39.45	28.28	14.51	41.69	3.33	2.28	46.16	53.9	7.7	*1)

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Duty factor refer to "Burst rate confirmation" sheet.

*1) Not out of band emission (Leakage Power)

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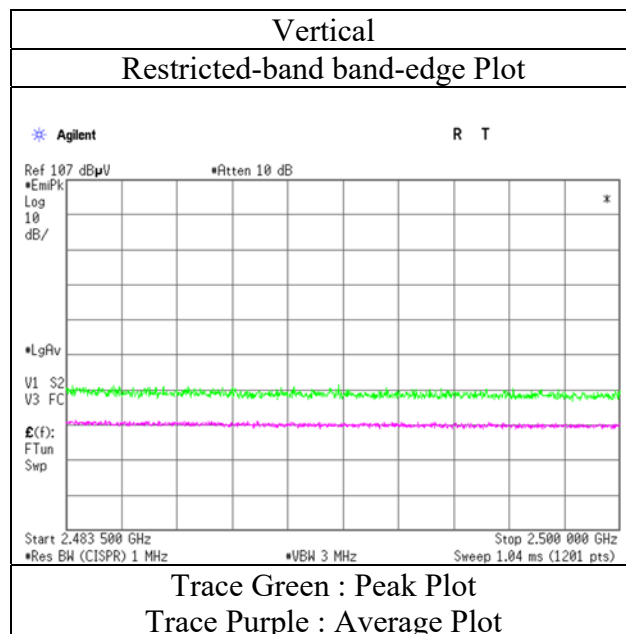
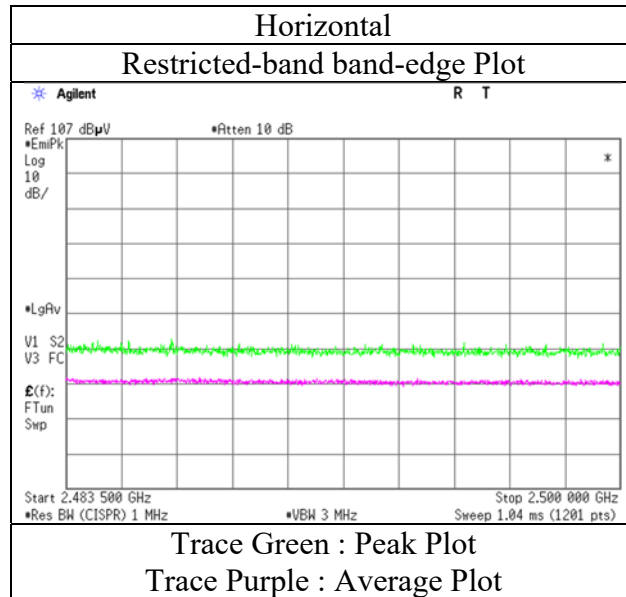
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Radiated Spurious Emission (Reference Plot for band-edge)

Report No. 13456926S-A-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date February 6, 2021
Temperature / Humidity 24 deg.C, 34 %RH
Engineer Takahiro Kawakami
(1 GHz -2.8 GHz)
Mode Tx OFDM VHT20 (MIMO) 2472 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No. 13456926S-A-R2
 Test place Shonan EMC Lab.
 Semi Anechoic Chamber 3
 Date February 6, 2021
 Temperature / Humidity 24 deg.C, 34 %RH
 Engineer Takahiro Kawakami
 (1 GHz -2.8 GHz)
 Mode Tx OFDM VHT40 (SISO) 2422 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	50.51	28.41	14.41	41.66	2.28	53.95	73.9	19.9	141	195	-
Vert.	2390.000	PK	51.48	28.41	14.41	41.66	2.28	54.92	73.9	18.9	230	263	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	38.63	28.41	14.41	41.66	6.46	2.28	48.53	53.9	5.3	*1)
Vert.	2390.000	AV	38.81	28.41	14.41	41.66	6.46	2.28	48.71	53.9	5.1	*1)

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Duty factor refer to "Burst rate confirmation" sheet.

*1) Not out of band emission (Leakage Power)

20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2422.000	PK	81.74	28.35	14.45	41.67	2.28	85.15	-	-	Carrier
Hori.	2400.000	PK	40.30	28.38	14.42	41.67	2.28	43.71	65.1	21.3	-
Vert.	2422.000	PK	81.55	28.35	14.45	41.67	2.28	84.96	-	-	Carrier
Vert.	2400.000	PK	39.72	28.38	14.42	41.67	2.28	43.13	64.9	21.7	-

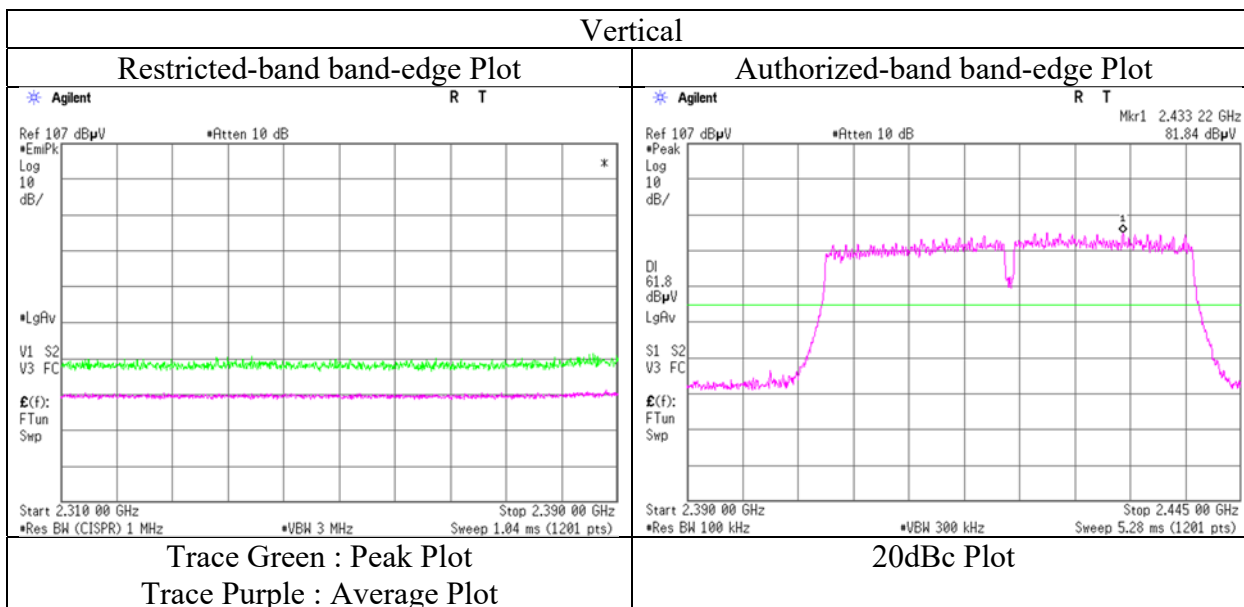
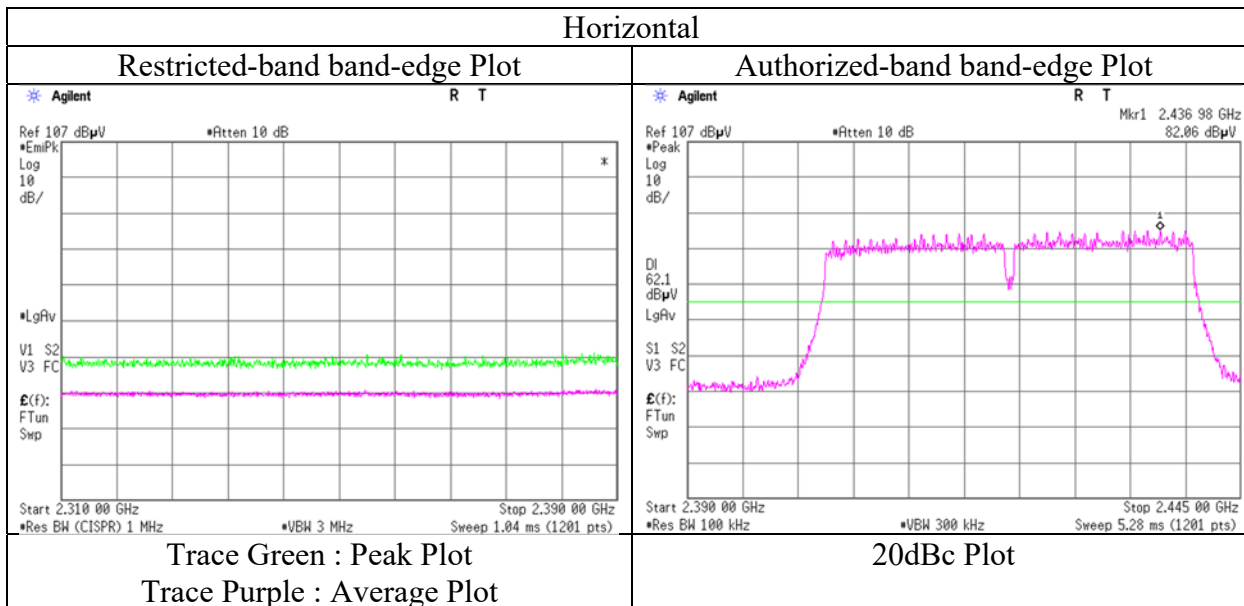
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	13456926S-A-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	February 6, 2021
Temperature / Humidity	24 deg.C, 34 %RH
Engineer	Takahiro Kawakami (1 GHz -2.8 GHz)
Mode	Tx OFDM VHT40 (SISO) 2422 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Radiated Spurious Emission

Report No. 13456926S-A-R2
 Test place Shonan EMC Lab.
 Semi Anechoic Chamber 3
 Date February 6, 2021
 Temperature / Humidity 24 deg.C, 34 %RH
 Engineer Takahiro Kawakami
 (1 GHz -2.8 GHz)
 Mode Tx OFDM VHT40 (SISO) 2462 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	54.56	28.28	14.51	41.69	2.28	57.94	73.9	15.9	134	192	-
Vert.	2483.500	PK	55.94	28.28	14.51	41.69	2.28	59.32	73.9	14.5	167	246	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

10 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	40.25	28.28	14.51	41.69	6.46	2.28	50.09	53.9	3.8	*1)
Vert.	2483.500	AV	40.77	28.28	14.51	41.69	6.46	2.28	50.61	53.9	3.2	*1)

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor

Distance factor : 1 GHz - 10 GHz : $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

10 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

Duty factor refer to "Burst rate confirmation" sheet.

*1) Not out of band emission (Leakage Power)

UL Japan, Inc.

Shonan EMC Lab.

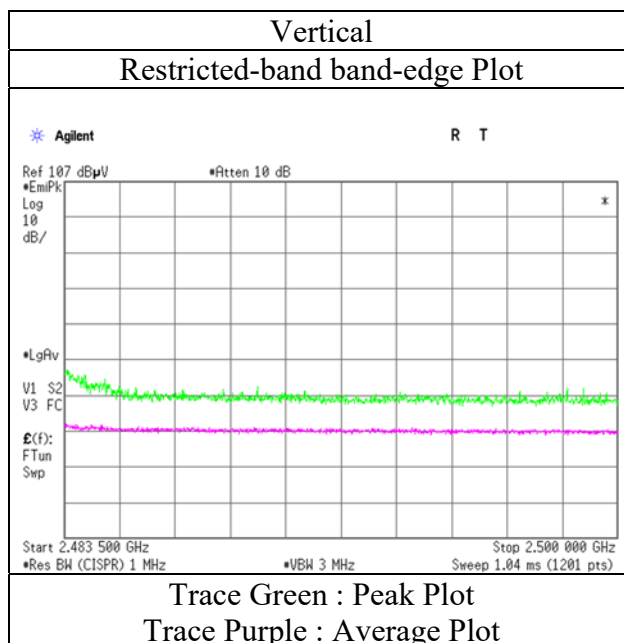
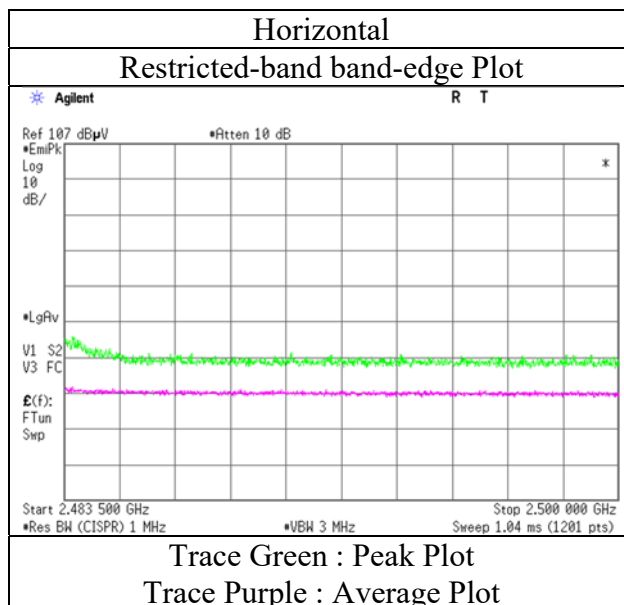
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Spurious Emission (Reference Plot for band-edge)

Report No. 13456926S-A-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date February 6, 2021
Temperature / Humidity 24 deg.C, 34 %RH
Engineer Takahiro Kawakami
(1 GHz -2.8 GHz)
Mode Tx OFDM VHT40 (SISO) 2462 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No. 13456926S-A-R2
 Test place Shonan EMC Lab.
 Semi Anechoic Chamber 3 3
 Date February 6, 2021 February 11, 2021
 Temperature / Humidity 24 deg.C, 34 %RH 22 deg.C, 32 %RH
 Engineer Takahiro Kawakami Takahiro Kawakami
 (1 GHz -10 GHz) (10 GHz -26.5 GHz)
 Mode Tx 11n-40 (MIMO) 2422 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	53.11	28.41	14.41	41.66	2.28	56.55	73.9	17.3	373	314	-
Hori.	4844.000	PK	49.55	31.61	7.08	42.93	2.28	47.59	73.9	26.3	150	0	-
Hori.	7266.000	PK	49.76	37.62	8.61	43.44	2.28	54.83	73.9	19.0	150	0	-
Hori.	9688.000	PK	50.17	39.09	9.76	43.05	2.28	58.25	73.9	15.6	150	0	-
Hori.	4844.000	AV	39.55	31.61	7.08	42.93	2.28	37.59	53.9	16.3	150	0	Floor
Hori.	7266.000	AV	39.36	37.62	8.61	43.44	2.28	44.43	53.9	9.4	150	0	Floor
Hori.	9688.000	AV	40.15	39.09	9.76	43.05	2.28	48.23	53.9	5.6	150	0	Floor
Vert.	2390.000	PK	54.46	28.41	14.41	41.66	2.28	57.90	73.9	16.0	106	161	-
Vert.	4844.000	PK	49.16	31.61	7.08	42.93	2.28	47.20	73.9	26.7	150	0	-
Vert.	7266.000	PK	48.70	37.62	8.61	43.44	2.28	53.77	73.9	20.1	150	0	-
Vert.	9688.000	PK	49.87	39.09	9.76	43.05	2.28	57.95	73.9	15.9	150	0	-
Vert.	4844.000	AV	39.80	31.61	7.08	42.93	2.28	37.84	53.9	16.0	150	0	Floor
Vert.	7266.000	AV	39.55	37.62	8.61	43.44	2.28	44.62	53.9	9.2	150	0	Floor
Vert.	9688.000	AV	40.19	39.09	9.76	43.05	2.28	48.27	53.9	5.6	150	0	Floor

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	40.99	28.41	14.41	41.66	5.16	2.28	49.59	53.9	4.3	*1)
Vert.	2390.000	AV	41.34	28.41	14.41	41.66	5.16	2.28	49.94	53.9	3.9	*1)

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Duty factor refer to "Burst rate confirmation" sheet.

*1) Not out of band emission (Leakage Power)

20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2422.000	PK	86.69	28.35	14.45	41.67	2.28	90.10	-	-	Carrier
Hori.	2400.000	PK	43.42	28.38	14.42	41.67	2.28	46.83	70.1	23.2	-
Vert.	2422.000	PK	87.47	28.35	14.45	41.67	2.28	90.88	-	-	Carrier
Vert.	2400.000	PK	43.49	28.38	14.42	41.67	2.28	46.90	70.8	23.9	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log (3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

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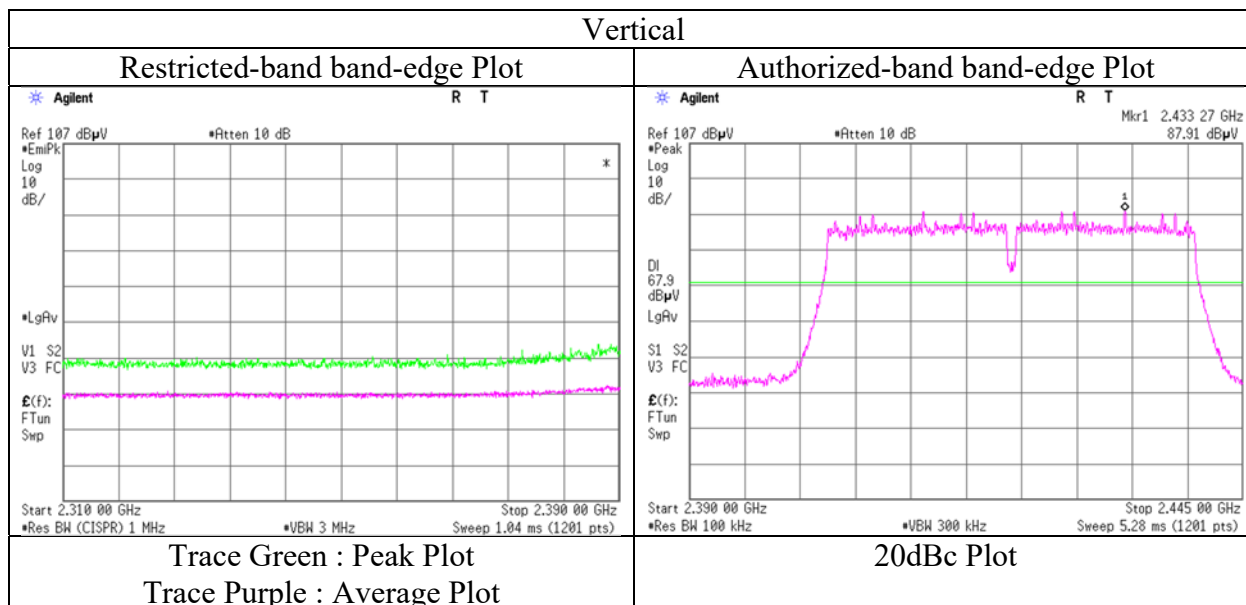
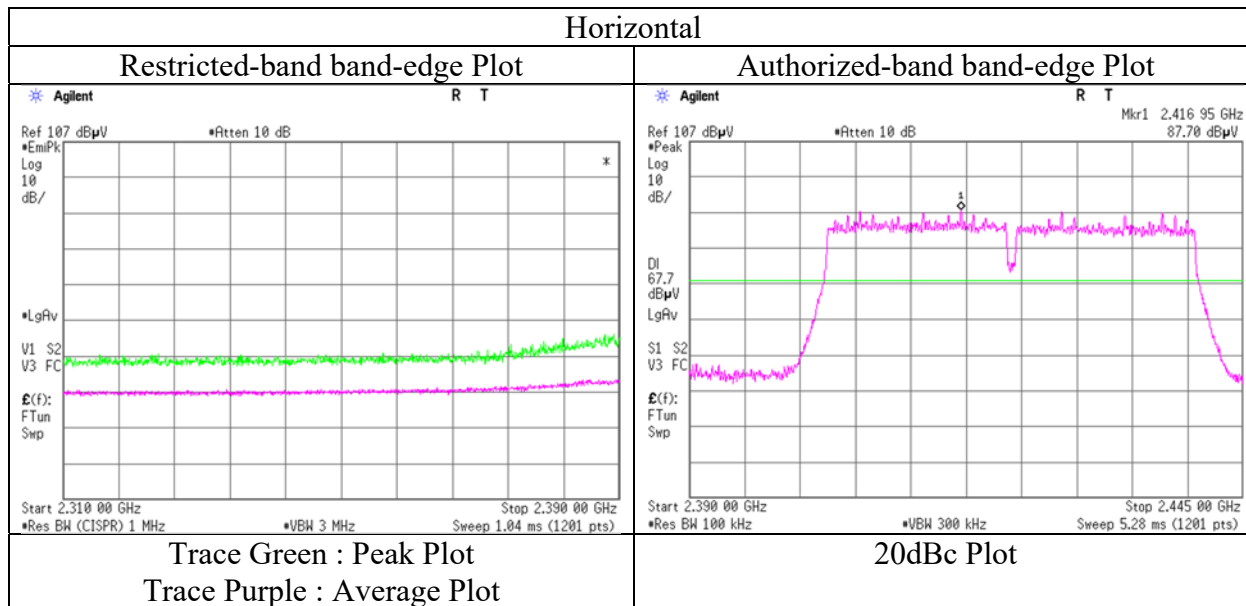
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Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	13456926S-A-R2
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	February 6, 2021
Temperature / Humidity	24 deg.C, 34 %RH
Engineer	Takahiro Kawakami (1 GHz -2.8 GHz)
Mode	Tx 11n-40 (MIMO) 2422 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

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Radiated Spurious Emission

Report No. 13456926S-A-R2
 Test place Shonan EMC Lab.
 Semi Anechoic Chamber 3 3
 Date February 6, 2021 February 11, 2021
 Temperature / Humidity 24 deg.C, 34 %RH 22 deg.C, 32 %RH
 Engineer Takahiro Kawakami Takahiro Kawakami
 (1 GHz -10 GHz) (10 GHz -26.5 GHz)
 Mode Tx 11n-40 (MIMO) 2442 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4884.000	PK	47.96	31.63	7.11	42.93	2.28	46.05	73.9	27.8	150	0	-
Hori.	7326.000	PK	48.01	37.72	8.65	43.49	2.28	53.17	73.9	20.7	150	0	-
Hori.	9768.000	PK	48.38	39.20	9.80	42.96	2.28	56.70	73.9	17.2	150	0	-
Hori.	4884.000	AV	39.10	31.63	7.11	42.93	2.28	37.19	53.9	16.7	150	0	Floor
Hori.	7326.000	AV	39.10	37.72	8.65	43.49	2.28	44.26	53.9	9.6	150	0	Floor
Hori.	9768.000	AV	39.65	39.20	9.80	42.96	2.28	47.97	53.9	5.9	150	0	Floor
Vert.	4884.000	PK	48.97	31.63	7.11	42.93	2.28	47.06	73.9	26.8	150	0	-
Vert.	7326.000	PK	48.37	37.72	8.65	43.49	2.28	53.53	73.9	20.3	150	0	-
Vert.	9768.000	PK	48.90	39.20	9.80	42.96	2.28	57.22	73.9	16.6	150	0	-
Vert.	4884.000	AV	39.25	31.63	7.11	42.93	2.28	37.34	53.9	16.5	150	0	Floor
Vert.	7326.000	AV	39.01	37.72	8.65	43.49	2.28	44.17	53.9	9.7	150	0	Floor
Vert.	9768.000	AV	39.52	39.20	9.80	42.96	2.28	47.84	53.9	6.0	150	0	Floor

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : $20\log(3.90\text{ m} / 3.0\text{ m}) = 2.28\text{ dB}$

10 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

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Radiated Spurious Emission

Report No. 13456926S-A-R2
 Test place Shonan EMC Lab.
 Semi Anechoic Chamber 3 3
 Date February 6, 2021 February 11, 2021
 Temperature / Humidity 24 deg.C, 34 %RH 22 deg.C, 32 %RH
 Engineer Takahiro Kawakami Takahiro Kawakami
 (1 GHz -10 GHz) (10 GHz -26.5 GHz)
 Mode Tx 11n-40 (MIMO) 2462 MHz

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	54.14	28.28	14.51	41.69	2.28	57.52	73.9	16.3	143	213	-
Hori.	4924.000	PK	49.01	31.68	7.15	42.94	2.28	47.18	73.9	26.7	150	0	-
Hori.	7386.000	PK	48.24	37.81	8.67	43.55	2.28	53.45	73.9	20.4	150	0	-
Hori.	9848.000	PK	48.22	39.16	9.83	42.87	2.28	56.62	73.9	17.2	150	0	-
Hori.	4924.000	AV	39.08	31.68	7.15	42.94	2.28	37.25	53.9	16.6	150	0	Floor
Hori.	7386.000	AV	39.15	37.81	8.67	43.55	2.28	44.36	53.9	9.5	150	0	Floor
Hori.	9848.000	AV	39.05	39.16	9.83	42.87	2.28	47.45	53.9	6.4	150	0	Floor
Vert.	2483.500	PK	56.98	28.28	14.51	41.69	2.28	60.36	73.9	13.5	227	166	-
Vert.	4924.000	PK	49.09	31.68	7.15	42.94	2.28	47.26	73.9	26.6	150	0	-
Vert.	7386.000	PK	48.59	37.81	8.67	43.55	2.28	53.80	73.9	20.1	150	0	-
Vert.	9848.000	PK	48.24	39.16	9.83	42.87	2.28	56.64	73.9	17.2	150	0	-
Vert.	4924.000	AV	38.87	31.68	7.15	42.94	2.28	37.04	53.9	16.8	150	0	Floor
Vert.	7386.000	AV	39.23	37.81	8.67	43.55	2.28	44.44	53.9	9.4	150	0	Floor
Vert.	9848.000	AV	39.11	39.16	9.83	42.87	2.28	47.51	53.9	6.3	150	0	Floor

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log(3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	40.75	28.28	14.51	41.69	5.16	2.28	49.26	53.9	4.6	*1)
Vert.	2483.500	AV	41.91	28.28	14.51	41.69	5.16	2.28	50.42	53.9	3.4	*1)

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Duty factor + Distance factor

Distance factor : 1 GHz - 10 GHz : 20log(3.90 m / 3.0 m) = 2.28 dB

10 GHz - 40 GHz : 20log(1.0 m / 3.0 m) = -9.54 dB

Duty factor refer to "Burst rate confirmation" sheet.

*1) Not out of band emission (Leakage Power)

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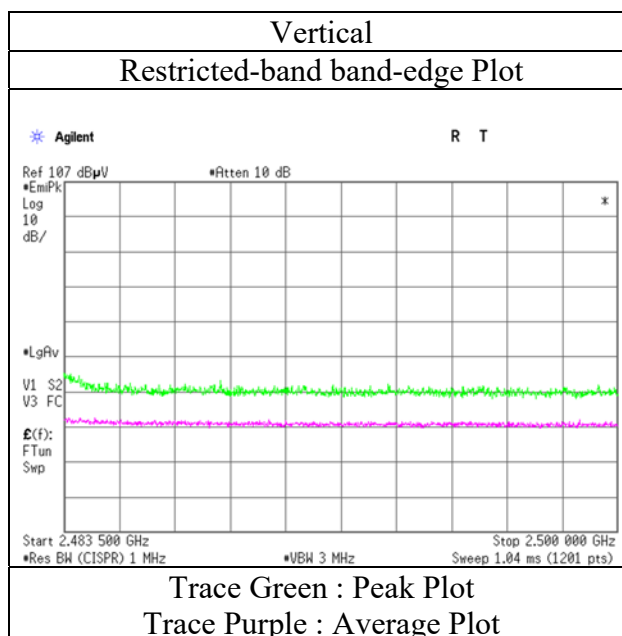
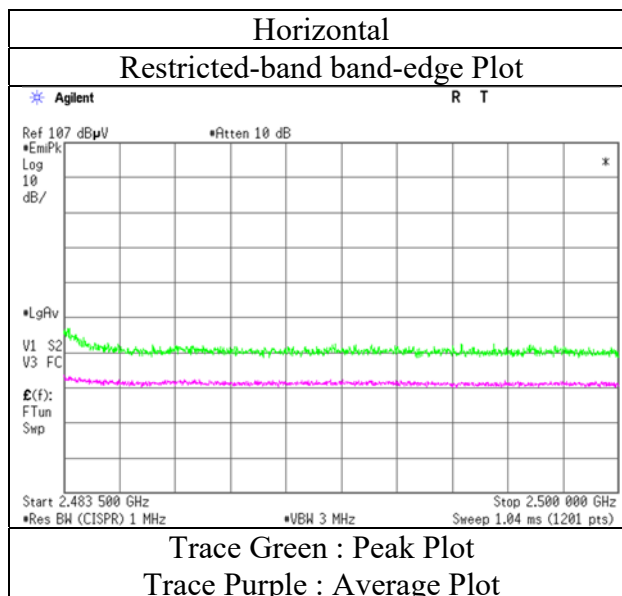
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Radiated Spurious Emission (Reference Plot for band-edge)

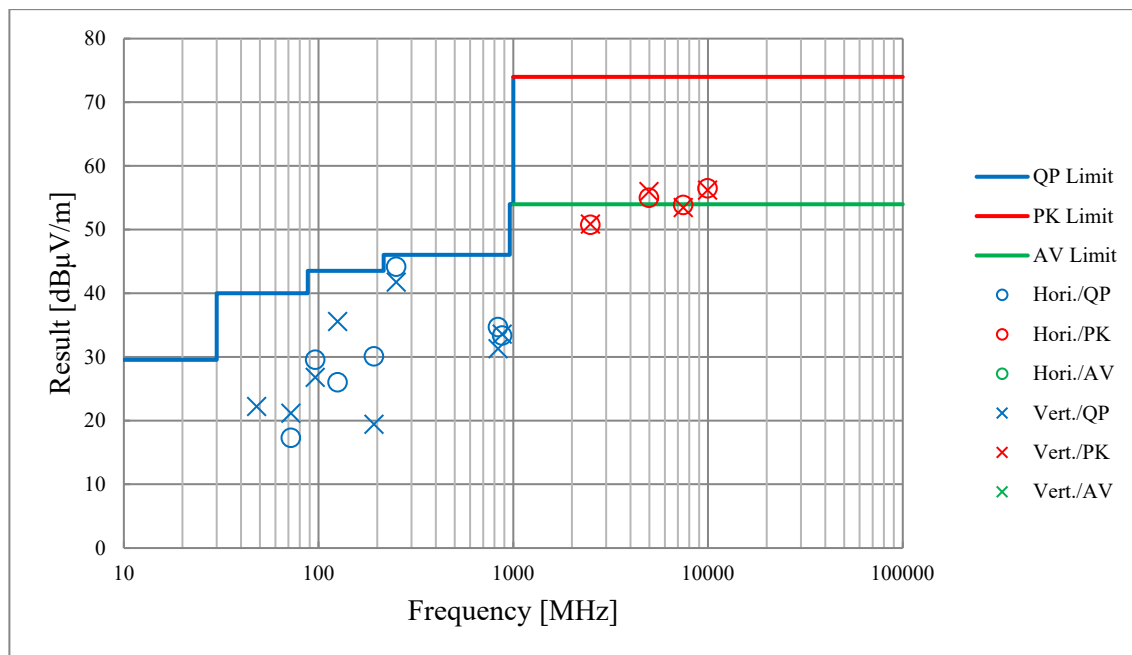
Report No. 13456926S-A-R2
Test place Shonan EMC Lab.
Semi Anechoic Chamber 3
Date February 6, 2021
Temperature / Humidity 24 deg.C, 34 %RH
Engineer Takahiro Kawakami
(1 GHz -2.8 GHz)
Mode Tx 11n-40 (MIMO) 2462 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission (Plot data, Worst case)

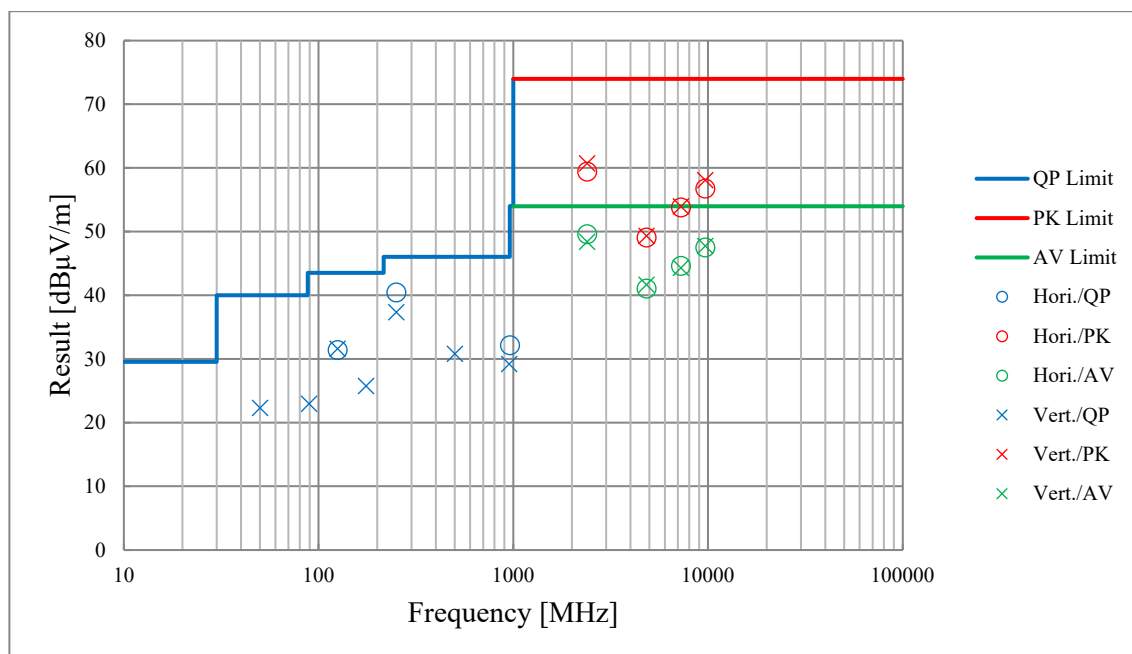
Report No.	13456926S-A-R2					
Test place	Shonan EMC Lab.					
Semi Anechoic Chamber	3	3	3	3	3	3
Date	February 14, 2021	December 23, 2020	December 24, 2020	December 25, 2020	January 5, 2021	
Temperature / Humidity	24 deg.C, 31 %RH	22 deg.C, 33 %RH	24 deg.C, 34 %RH	25 deg.C, 26 %RH	20 deg.C, 33 %RH	
Engineer	Kenichi Adachi	Yusuke Tanikawara	Takahiro Kawakami	Takahiro Kawakami	Yusuke Tanikawara	
	(30 MHz -1 GHz)	(1 GHz -2.8 GHz)	(2.8 GHz -10 GHz)	(10 GHz -18 GHz)	(18 GHz -26.5 GHz)	
Mode	Tx BT LE 2480 MHz					



*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Radiated Spurious Emission (Plot data, Worst case)

Report No.	13456926S-A-R2			
Test place	Shonan EMC Lab.			
Semi Anechoic Chamber	3	3	3	3
Date	February 11, 2021	December 22, 2020	December 23, 2020	December 25, 2020
Temperature / Humidity	22 deg.C, 32 %RH	25 deg.C, 30 %RH	26 deg.C, 31 %RH	25 deg.C, 26 %RH
Engineer	Takahiro Kawakami	Takahiro Kawakami	Takahiro Kawakami	Takahiro Kawakami
Mode	(Below 1 GHz)	(1 GHz -2.8 GHz)	(2.8 GHz -10 GHz)	(10 GHz -26.5 GHz)
	Tx OFDM VHT20 (MIMO) 2412 MHz			



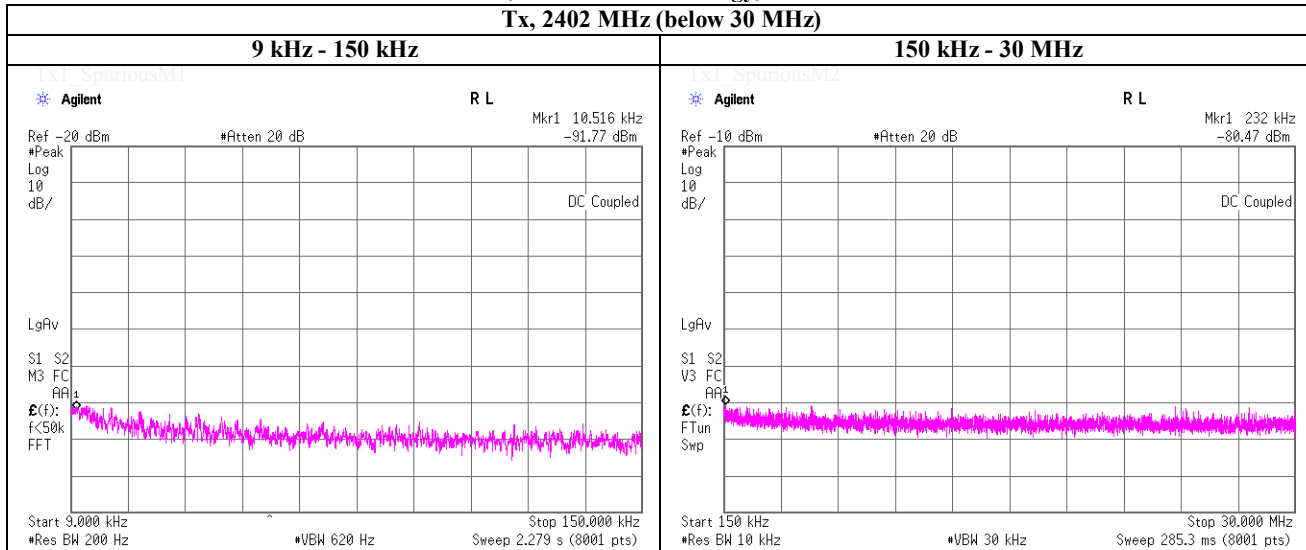
*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date August 18, 2020
 Temperature / Humidity 24 deg.C , 48 %RH
 Engineer Yusuke Tanikawara

Spurious emission (Conducted)

Tx, Bluetooth Low Energy, PRBS9

Tx, 2402 MHz (below 30 MHz)



TX1_SpuriousF

FREQ [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain * [dBi]	N (Number of output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field Strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]
10.516	-91.77	1.01	9.83	2.0	1	-78.94	300.0	6.0	-17.7	47.1	64.8
232.000	-80.47	1.01	9.83	2.0	1	-67.63	300.0	6.0	-6.4	20.2	26.6

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]
 EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)
 N: Number of output

*2.0 dBi was applied to the test result based on ANSI C63.10 since antenna gain was less than 2.0 dBi.

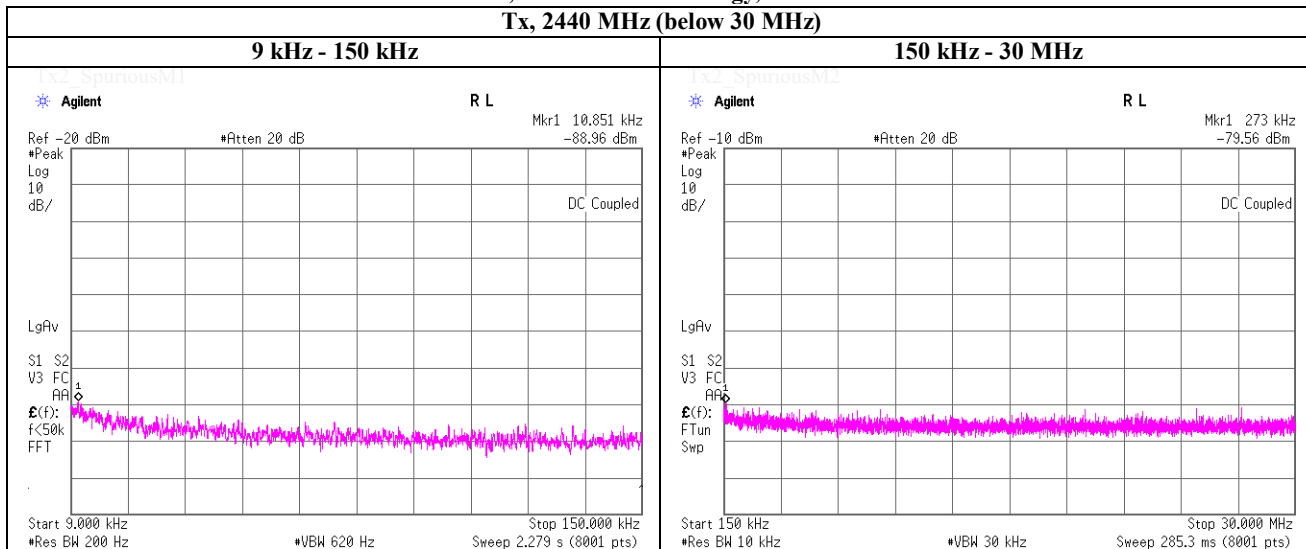
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 Facsimile : +81 463 50 6401

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date August 18, 2020
 Temperature / Humidity 24 deg.C , 48 %RH
 Engineer Yusuke Tanikawara

Spurious emission (Conducted)

Tx, Bluetooth Low Energy, PRBS9

Tx, 2440 MHz (below 30 MHz)



FREQ [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain * [dBi]	N (Number of output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field Strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]
10.851	-88.96	1.01	9.83	2.0	1	-76.13	300.0	6.0	-14.9	46.8	61.7
273.000	-79.56	1.01	9.83	2.0	1	-66.72	300.0	6.0	-5.5	18.8	24.3

$E [dBuV/m] = EIRP [dBm] - 20 \log (Distance [m]) + Ground\ bounce [dB] + 104.8 [dBuV/m]$

$EIRP [dBm] = Reading [dBm] + Cable\ loss [dB] + Attenuator\ Loss [dB] + Antenna\ gain [dBi] + 10 * \log (N)$

N: Number of output

*2.0 dBi was applied to the test result based on ANSI C63.10 since antenna gain was less than 2.0 dBi.

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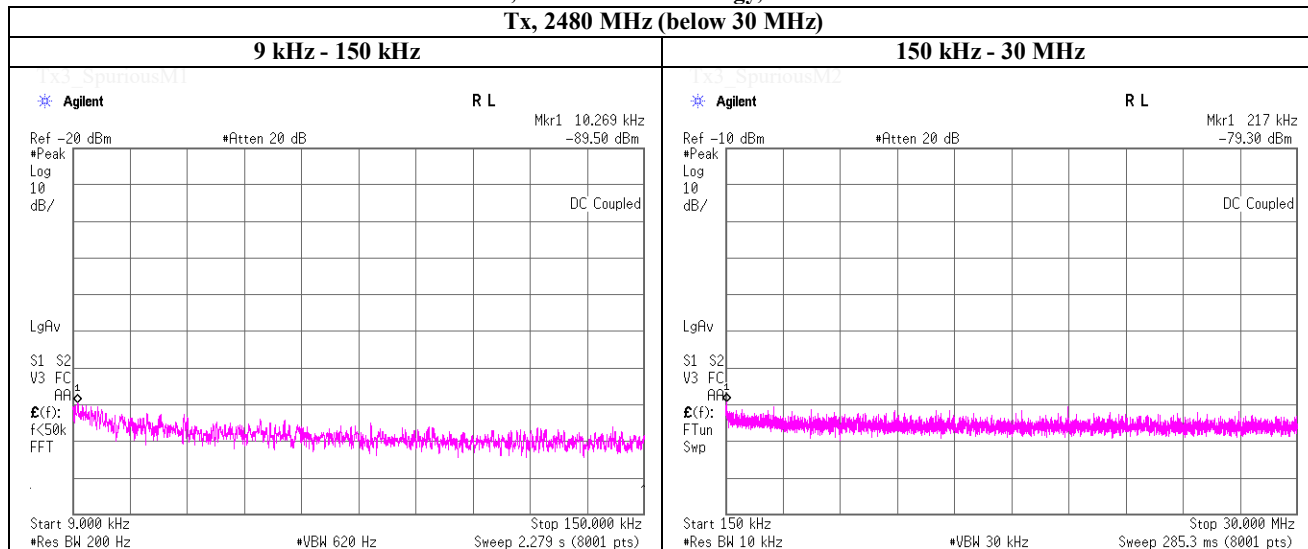
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Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date August 18, 2020
 Temperature / Humidity 24 deg.C , 48 %RH
 Engineer Yusuke Tanikawara

Spurious emission (Conducted)

Tx, Bluetooth Low Energy, PRBS9

Tx, 2480 MHz (below 30 MHz)



FREQ [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain * [dBi]	N (Number of output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field Strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]
10.269	-89.50	1.01	9.83	2.0	1	-76.67	300.0	6.0	-15.4	47.3	62.7
217.000	-79.30	1.01	9.83	2.0	1	-66.47	300.0	6.0	-5.2	20.8	26.0

$E [dBuV/m] = EIRP [dBm] - 20 \log (Distance [m]) + Ground\ bounce [dB] + 104.8 [dBuV/m]$

$EIRP [dBm] = Reading [dBm] + Cable\ loss [dB] + Attenuator\ Loss [dB] + Antenna\ gain [dBi] + 10 * \log (N)$

N: Number of output

*2.0 dBi was applied to the test result based on ANSI C63.10 since antenna gain was less than 2.0 dBi.

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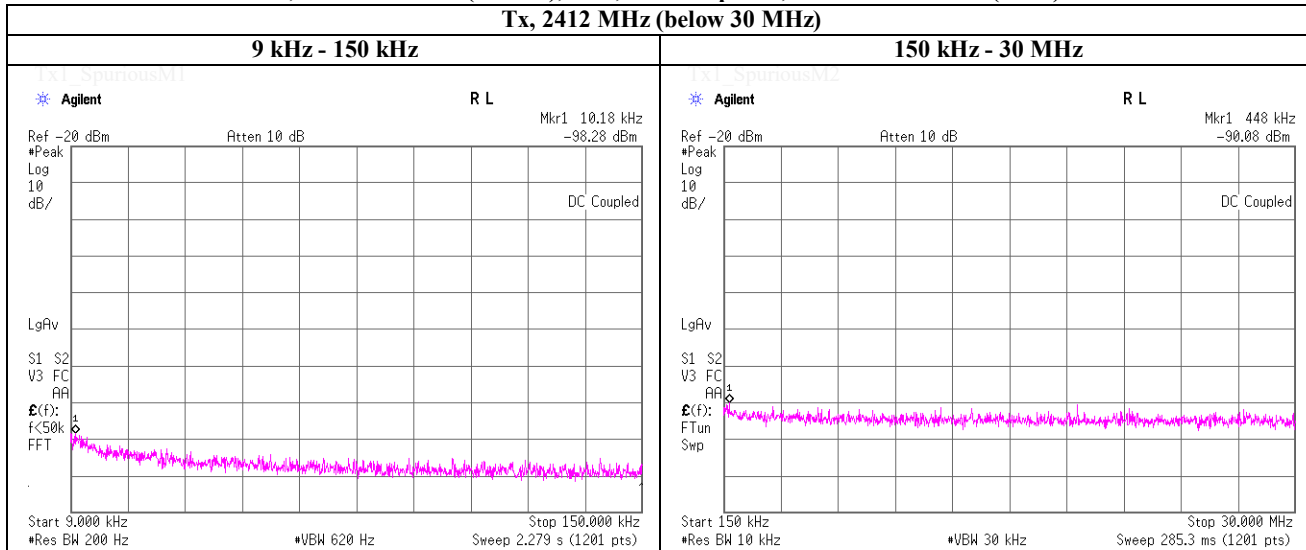
Facsimile : +81 463 50 6401

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
 Date August 20, 2020
 Temperature / Humidity 25 deg.C , 52 %RH
 Engineer Makoto Hosaka

Spurious emission (Conducted)

Tx, OFDM VHT20 (MIMO), PN9, antenna port 1, worst data mode 3 (MCS)

Tx, 2412 MHz (below 30 MHz)



FREQ [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain * [dB]	N (Number of output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field Strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]
10.180	-98.28	1.01	19.86	2.0	2	-72.40	300.0	6.0	-11.1	47.4	58.5
448.000	-90.08	1.01	19.86	2.0	2	-64.20	300.0	6.0	-2.9	14.5	17.4

$E \text{ [dBuV/m]} = \text{EIRP [dBm]} - 20 \times \log(\text{Distance [m]}) + \text{Ground bounce [dB]} + 104.8 \text{ [dBuV/m]}$

$\text{EIRP [dBm]} = \text{Reading [dBm]} + \text{Cable Loss [dB]} + \text{Attenuator Loss [dB]} + \text{Antenna Gain [dBi]} + 10 \times \log(N)$

N: Number of output port

*2.0 dBi was applied to the test result based on ANSI C63.10 since antenna gain was less than 2.0 dBi.

UL Japan, Inc.

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