RADIO TEST REPORT

Test Report No. : 13170804H-A-R1

Applicant	:	**Sony Interactive Entertainment Inc.**
Type of EUT	:	**Wireless communication module**
Model Number of EUT	:	**J20H100**
FCC ID	:	**AK8M19DFR1**
Test regulation	:	**FCC Part 15 Subpart C: 2020** ***WLAN and Bluetooth Low Energy parts**
Test Result	:	**Complied (Refer to SECTION 3.2)**

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above standard.
4. The test results in this test report are traceable to the national or international standards.
5. This test report covers Radio technical requirements.
   It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
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8. The information provided from the customer for this report is identified in SECTION 1.
9. This report is a revised version of 13170804H-A. 13170804H-A is replaced with this report.

Date of test: December 16, 2019 to April 10, 2020

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☒ There is no testing item of "Non-accreditation".

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REVISION HISTORY

Original Test Report No.: 13170804H-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	13170804H-A	June 3, 2020	-	-
1	13170804H-A-R1	June 10, 2020	P17	Corrected the Test setup; Test Distance of No.2 Semi Anechoic Chamber of frequency range 1 GHz - 10 GHz * Test Distance: (3 + Test Volume /2) - r = **3.75** m ↓ * Test Distance: (3 + Test Volume /2) - r = **3.7** m
1	13170804H-A-R1	June 10, 2020	P60 - 64	Corrected the Result of table for "Antenna 1 + Antenna 2"
1	13170804H-A-R1	June 10, 2020	P227 - 228	Added Item H: DC Power supply and Cable No.7: AC Cable

Reference: Abbreviations (Including words undescribed in this report)

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

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SECTION 1: Customer information

Company Name	Sony Interactive Entertainment Inc.
Brand Name	SONY
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Telephone Number	+81-50-3807-5639
Facsimile Number	+81-50-3807-9594
Contact Person	Miho Nakamura

*Remarks:
Sony Interactive Entertainment Inc. designates Foxconn Industrial Internet Co Ltd as manufacturer of the product (Wireless communication module).

The information provided from the customer is as follows;
- Applicant, Type of EUT, Model Number of EUT, FCC ID on the cover and other relevant pages
- Operating/Test Mode(s) (Mode(s)) on all the relevant pages
- SECTION 1: Customer information
- SECTION 2: Equipment under test (EUT) other than the Receipt Date
- SECTION 4: Operation of EUT during testing

* The laboratory is exempted from liability of any test results affected from the above information in SECTION 2 and 4.

SECTION 2: Equipment under test (EUT)

2.1 Identification of EUT

Type	Wireless communication module
Model Number	J20H100
Serial Number	Refer to SECTION 4.2
Country of Manufacture	China
Receipt Date	December 16, 2019
Condition	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	No modification by the test lab.

2.2 Product Description

Model: J20H100 (referred to as the EUT in this report) is a Wireless communication module.

Product Specification

Operating Temperature	-5 deg. C to 85 deg. C
Power Supply	DC 3.3 V, DC 1.8 V

Radio Specification

WLAN (IEEE802.11b/11g/11n-20/11ax-20)

Equipment Type	Transceiver		
Frequency of Operation	2412 MHz to 2462 MHz		
Type of Modulation	DSSS, OFDM		
	OFDMA (IEEE802.11ax only)	20 MHz: 26/52/106/242-tone RU	
Bandwidth & Channel spacing	Less than 20 MHz & 5 MHz		
Method of frequency generation	Synthesizer		
Antenna Type *1)	PIFA	IFA	
Antenna Gain: G_{ANT}	Antenna 1: 6.0 dBi Antenna 2: 6.0 dBi	Antenna 1: 4.0 dBi Antenna 2: 3.5 dBi	
Directional Gain *2)	9.01 dBi	6.76 dBi	
Maximum clock frequency	320 MHz		

WLAN (IEEE802.11a/11n-20/11ac-20/11ax-20/11n-40/11ac-40/11ax-40/11ac-80/11ax-80)

Equipment Type	Transceiver		
Frequency of Operation	20 M Band: 5180 MHz to 5240 MHz 5260 MHz to 5320 MHz 5500 MHz to 5720 MHz 5745 MHz to 5825 MHz		
	40 M Band: 5190 MHz to 5230 MHz 5270 MHz to 5310 MHz 5510 MHz to 5710 MHz 5755 MHz to 5795 MHz		
	80 M Band: 5210 MHz 5290 MHz 5530 MHz to 5690 MHz 5775 MHz		
Type of Modulation	OFDM		
	OFDMA (IEEE802.11ax only)	20 MHz: 26/52/106/242-tone RU	
		40 MHz: 26/52/106/242/484-tone RU	
		80 MHz: 26/52/106/242/484/996-tone RU	
Bandwidth & Channel spacing	Less than 20 MHz / 40 MHz / 80 MHz & 20 MHz / 40 MHz / 80 MHz		
Method of frequency generation	Synthesizer		
Antenna Type *1)	PIFA	IFA	
Antenna Gain: G_{ANT}	Antenna 1: 5.0 dBi Antenna 3: 3.5 dBi	Antenna 1: 5.0 dBi Antenna 3: 2.0 dBi	
Directional Gain *2)	7.29 dBi	6.64 dBi	
Maximum clock frequency	512 MHz		

BT1: Bluetooth (BR / EDR / Low Energy)

Equipment Type	Transceiver	
Frequency of Operation	2402 MHz to 2480 MHz	
Type of Modulation	BT: FHSS (GFSK, π/4DQPSK, 8DPSK) BT LE: GFSK	
Bandwidth / Channel spacing	BT:79 MHz / 1 MHz BT LE: 1 MHz & 2 MHz / 2 MHz	
Method of frequency generation	Synthesizer	
Antenna Type *1)	PIFA	IFA
Antenna Gain	Antenna 3: 5.8 dBi	Antenna 3: 3.0 dBi
Maximum clock frequency	128 MHz	

BT2: Bluetooth (BR / EDR / Low Energy)

Equipment Type	Transceiver	
Frequency of Operation	2402 MHz to 2480 MHz	
Type of Modulation	BT: FHSS (GFSK, π/4DQPSK, 8DPSK) BT LE: GFSK	
Bandwidth / Channel spacing	BT:79 MHz / 1 MHz BT LE: 1 MHz & 2 MHz / 2 MHz	
Method of frequency generation	Synthesizer	
Antenna Type *1)	PIFA	IFA
Antenna Gain	Antenna 4: 5.8 dBi	Antenna 4: 4.0 dBi
Maximum clock frequency	128 MHz	

*1) Details for the antenna combinations are as follows.

	WLAN	BT1	BT2
Combination 1	PIFA	PIFA	PIFA
Combination 2	IFA	IFA	IFA

*2) Directional antenna gain = $10\log\left(\left(10^{\frac{G_{ANT1}}{20}}+10^{\frac{G_{ANT2}}{20}}\right)^2/2\right)$

*This test report applies to WLAN (2.4 GHz band) and Bluetooth Low Energy parts.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
FCC Part 15 final revised on May 26, 2020 and effective July 27, 2020 except 15.258

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

* The revision does not affect the test result conducted before its effective date.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	**FCC:** ANSI C63.10-2013 6. Standard test methods	**FCC:** Section 15.207	26.65 dB, 0.98694 MHz, Phase: N	Complied a)	-
	ISED: RSS-Gen 8.8	**ISED:** RSS-Gen 8.8			
6dB Bandwidth	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02	**FCC:** Section 15.247(a)(2)	See data.	Complied b)	Conducted
	ISED: -	**ISED:** RSS-247 5.2(a)			
Maximum Peak Output Power	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02	**FCC:** Section 15.247(b)(3)		Complied c)	Conducted
	ISED: RSS-Gen 6.12	**ISED:** RSS-247 5.4(d)			
Power Density	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02	**FCC:** Section 15.247(e)		Complied d)	Conducted
	ISED: -	**ISED:** RSS-247 5.2(b)			
Spurious Emission Restricted Band Edges	**FCC:** KDB 558074 D01 15.247 Meas Guidance v05r02	**FCC:** Section15.247(d)	3.8 dB 2483.500 MHz, Horizontal, AV (PIFA Antenna4 (BT2))	Complied# e), f)	Conducted (below 30 MHz)/ Radiated (above 30 MHz) *1)
	ISED: RSS-Gen 6.13	**ISED:** RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10			

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)
The stable voltage will be supplied by the end product, which will be required to have a power supply regulator. Therefore, the EUT complies with the requirement.

FCC Part 15.203/212 Antenna requirement
The EUT has a unique coupling/antenna connector (U.FL). Therefore the equipment complies with the requirement of 15.203.

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	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.
Ise EMC Lab.

Antenna Terminal test

Test Item	Uncertainty (+/-)
20 dB Bandwidth / 99 % Occupied Bandwidth	0.96 %
Maximum Peak Output Power / Average Output Power	1.4 dB
Carrier Frequency Separation	0.42 %
Dwell time / Burst rate	0.10 %
Conducted Spurious Emission	2.6 dB

Conducted emission

using Item	Frequency range	Uncertainty (+/-)
AMN (LISN)	0.009 MHz to 0.15 MHz	3.4 dB
	0.15 MHz to 30 MHz	2.9 dB

Radiated emission

Measurement distance	Frequency range	Uncertainty (+/-)
3 m	9 kHz to 30 MHz	3.3 dB
10 m		3.2 dB
3 m	30 MHz to 200 MHz (Horizontal)	4.8 dB
	(Vertical)	5.0 dB
	200 MHz to 1000 MHz (Horizontal)	5.2 dB
	(Vertical)	6.3 dB
10 m	30 MHz to 200 MHz (Horizontal)	4.8 dB
	(Vertical)	4.8 dB
	200 MHz to 1000 MHz (Horizontal)	5.0 dB
	(Vertical)	5.0 dB
3 m	1 GHz to 6 GHz	4.9 dB
	6 GHz to 18 GHz	5.2 dB
1 m	10 GHz to 26.5 GHz	5.5 dB
	26.5 GHz to 40 GHz	5.5 dB
10 m	1 GHz to 18 GHz	5.2 dB

3.5 Test Location

UL Japan, Inc. Ise EMC Lab.
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Test site	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms	Maximum measurement distance
No.1 semi-anechoic chamber	19.2 x 11.2 x 7.7	7.0 x 6.0	No.1 Power source room	10 m
No.2 semi-anechoic chamber	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.3 Preparation room	3 m
No.3 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.4 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.4 Preparation room	3 m
No.4 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.5 semi-anechoic chamber	6.0 x 6.0 x 3.9	6.0 x 6.0	-	-
No.5 measurement room	6.4 x 6.4 x 3.0	6.4 x 6.4	-	-
No.6 shielded room	4.0 x 4.5 x 2.7	4.0 x 4.5	-	-
No.6 measurement room	4.75 x 5.4 x 3.0	4.75 x 4.15	-	-
No.7 shielded room	4.7 x 7.5 x 2.7	4.7 x 7.5	-	-
No.8 measurement room	3.1 x 5.0 x 2.7	3.1 x 5.0	-	-
No.9 measurement room	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-
No.11 measurement room	6.2 x 4.7 x 3.0	4.8 x 4.6	-	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0 m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

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)

[WLAN]
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.

Mode	Remarks*
IEEE 802.11b (11b)	1 Mbps, PN9
IEEE 802.11g (11g)	24 Mbps, PN9
IEEE 802.11n MIMO 20 MHz BW (11n-20)	MCS 14, PN9
IEEE 802.11ax MIMO 20 MHz BW (11ax-20)	MCS 6 (1TX), 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: OFDM: 8.0 dBm OFDMA: -1.5 dBm (26-tone RU), 1.5 dBm (52-tone RU), 4.5 dBm (106-tone RU), 8.0 dBm(242-tone RU) Software: Dut Labtool Version: 1.0.0.101 (Date: December 16, 2019, 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.	

*Details of Operating mode for WLAN

Test Item	Operating Mode	Tested Antenna		Tested frequency
		Antenna type	Antenna No.	
Conducted Emission *1) Radiated Spurious Emission (Below 1 GHz)	11ax-20 OFDM Tx *2)	PIFA	Antenna 1 + 2	2462 MHz
Radiated Spurious Emission (Above 1 GHz)	11b Tx 11ax-20 OFDMA Tx *3) 11ax-20 OFDM Tx *4)	PIFA IFA	Antenna 1 + 2	2412 MHz 2437 MHz 2462 MHz
Conducted Spurious Emission	11ax-20 OFDM Tx *2)	-	Antenna 1 + 2	2462 MHz
Maximum Peak Output Power Power Density	11b Tx 11g Tx 11n-20 Tx 11ax-20 OFDMA Tx 11ax-20 OFDM Tx	-	Antenna 1 Antenna 2 Antenna 1 + 2	2412 MHz 2437 MHz 2462 MHz
6dB Bandwidth 99% Occupied Bandwidth	11b Tx 11g Tx 11n-20 Tx 11ax-20 OFDMA Tx 11ax-20 OFDM Tx	-	Antenna 2 *5)	2412 MHz 2437 MHz 2462 MHz

*1) The test was conducted with PIFA Antenna which had higher antenna gain.
*2) The mode was tested as a representative, because it had the highest power at antenna terminal test.
*3) OFDMA configuration tests were conducted only at the band edge since they had lower power and density than OFDM.
*4) Since 11g and 11n-20, 11ax-20 have the same modulation method and no differences in transmitting specification, test was performed on the representative mode that had the highest output power.
*5) After the comparison between Antenna 1 and Antenna 2, the test was performed with the antenna that had higher power as a representative.

[BT LE]

Mode	Remarks*
Bluetooth Low Energy (BT LE) 1M-PHY Uncoded PHY (1M-PHY)	Maximum Packet Size, PRBS9
Bluetooth Low Energy (BT LE) 2M-PHY Uncoded PHY (2M-PHY)	Maximum Packet Size, PRBS9

*Power of the EUT was set by the software as follows;
Power settings: 2 dBm
Software: Dut Labtool
Version: 1.0.0.101
(Date: December 16, 2019, 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.

*Details of Operating mode for BT LE

Test Item	Operating Mode	Tested Antenna		Tested frequency
		Antenna type	Antenna No.	
Conducted Emission *1)	BT LE, 1M-PHY BT LE, 2M-PHY	PIFA	Antenna 3 (BT1) Antenna 4 (BT2)	2402 MHz 2440 MHz 2480 MHz
Radiated Spurious Emission	BT LE, 1M-PHY BT LE, 2M-PHY	PIFA IFA	Antenna 3 (BT1) Antenna 4 (BT2)	2402 MHz 2440 MHz 2480 MHz
Maximum Peak Output Power Power Density	BT LE, 1M-PHY BT LE, 2M-PHY	-	Antenna 3 (BT1) Antenna 4 (BT2)	2402 MHz 2440 MHz 2480 MHz
6dB Bandwidth 99% Occupied Bandwidth Conducted Spurious Emission	BT LE, 1M-PHY BT LE, 2M-PHY	-	Antenna 3 (BT1) Antenna 4 (BT2)	2402 MHz 2440 MHz 2480 MHz
*1) The test was conducted with PIFA Antenna which had higher antenna gain.				

Simultaneous transmission (Only Antenna 3 simultaneously transmits BT1 and WLAN 5 GHz on a single antenna.)

Test Item	Mode *1)	Antenna type
Radiated Spurious Emission	Tx BT LE 2M-PHY 2402 MHz + Tx 11ax-40 5755MHz Tx BT LE 2M-PHY 2440 MHz + Tx 11ax-40 5755MHz Tx BT LE 2M-PHY 2480 MHz + Tx 11ax-40 5755MHz	PIFA IFA
*1) The test was performed on the mode as a representative, because it had the highest power of 5GHz band at antenna terminal test.		

4.2 Configuration and peripherals

This page has been submitted for a separate exhibit.

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 0.5 m by 1.0 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.

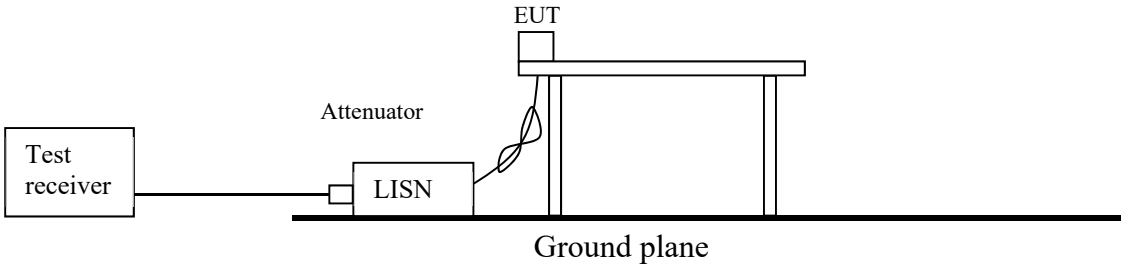
For the tests on EUT with other peripherals (as a whole system)
I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. All unused 50ohm connectors of the LISN (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, 0.5 m by 1.0 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 1.0 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.

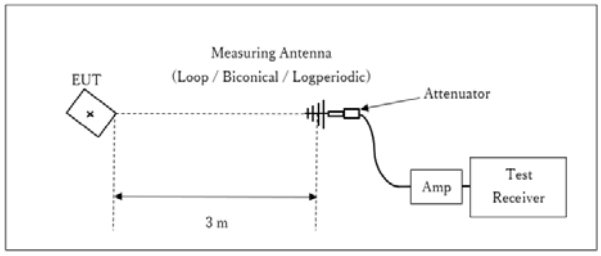
20 dBc was applied to the frequency over the limit of FCC 15.209 / Table 4 of RSS-Gen 8.9(ISED) and outside the restricted band of FCC15.205 / Table 6 of RSS-Gen 8.10 (ISED).

Frequency	Below 1 GHz	Above 1 GHz		20 dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV *1)	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	11.12.2.5.1 RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (RMS) Trace: 100 traces 11.12.2.5.2 The duty cycle was less than 98% for detected noise, a duty factor was added to the 11.12.2.5.1 results.	RBW: 100 kHz VBW: 300 kHz

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

Figure 2: Test Setup

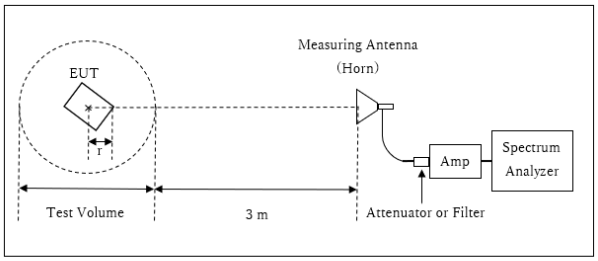
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz - 10 GHz



r : Radius of an outer periphery of EUT
× : Center of turn table

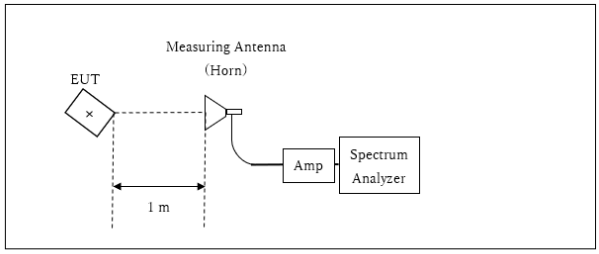
[Other than IFA Antenna (WLAN)]
(No.3 Semi Anechoic Chamber)
Distance Factor: 20 x log (3.95 m / 3.0 m) = 2.39 dB
* Test Distance: (3 + Test Volume /2) - r = 3.95 m
Test Volume : 2.0 m
(No.2 Semi Anechoic Chamber)
Distance Factor: 20 x log (3.7 m / 3.0 m) = 1.83 dB
* Test Distance: (3 + Test Volume /2) - r = 3.7 m
Test Volume : 1.5 m

(Test Volume has been calibrated based on CISPR 16-1-4.)
r = 0.05 m

[IFA Antenna (WLAN)]
(No.3 Semi Anechoic Chamber)
Distance Factor: 20 x log (3.9 m / 3.0 m) = 2.28 dB
* Test Distance: (3 + Test Volume /2) - r = 3.9 m
Test Volume : 2.0 m

(Test Volume has been calibrated based on CISPR 16-1-4.)
r = 0.1 m

10 GHz – 26.5 GHz



× : Center of turn table

Distance Factor: 20 x log (1.0 m / 3.0 m) = -9.5 dB
*Test Distance: 1 m

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

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
6 dB Bandwidth	3 MHz/5 MHz/6 MHz/ 12 MHz/20 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: 50 MHz BW)
Peak Power Density	1.5 times the 6 dB Bandwidth	3 kHz	10 kHz	Auto	Peak	Max Hold	Spectrum Analyzer *3)
Conducted Spurious Emission *4) *5)	9 kHz to 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz to 30 MHz	9.1 kHz	27 kHz				

*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 30 MHz, 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 = 9.1 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 Ohmes. 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.

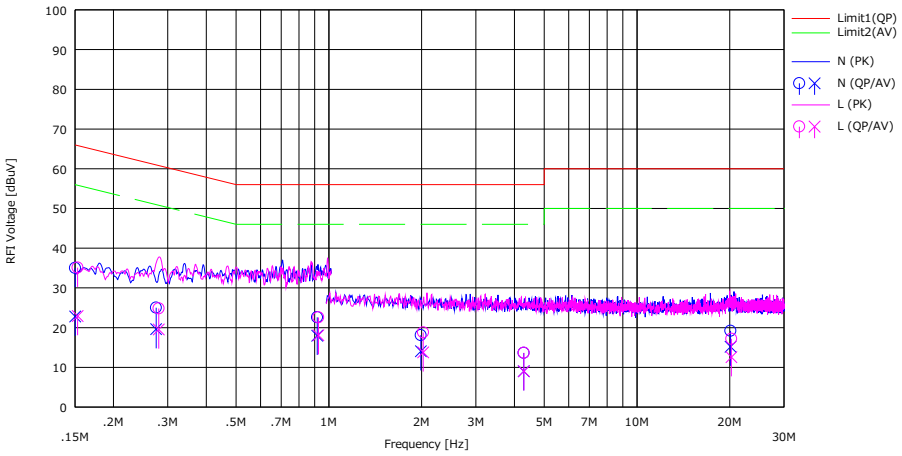
Test data : APPENDIX
Test result : Pass

APPENDIX 1: Test data

Conducted Emission

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Date	January 15, 2020
Temperature / Humidity	20 deg. C / 33 % RH
Engineer	Junki Nagatomi
Mode	Tx 11ax-20 (OFDM) 2462 MHz

Limit : FCC_Part 15 Subpart C(15.207)



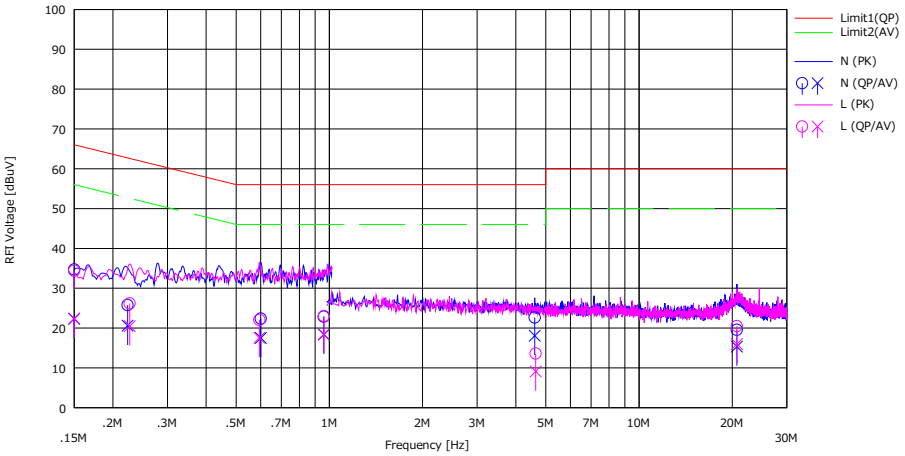
No.	Freq.	Reading		LISN	LOSS	Results		Limit		Margin		Phase	Comment
		〈QP〉	〈AV〉			〈QP〉	〈AV〉	〈QP〉	〈AV〉	〈QP〉	〈AV〉		
	[MHz]	[dBuV]	[dBuV]	[dB]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15032	21.80	9.60	0.07	13.14	35.01	22.81	66.00	56.00	30.99	33.19	N	
2	0.27504	11.80	6.40	0.07	13.16	25.03	19.63	61.00	51.00	35.97	31.37	N	
3	0.91664	9.30	4.70	0.08	13.21	22.59	17.99	56.00	46.00	33.41	28.01	N	
4	1.98923	4.70	0.70	0.09	13.28	18.07	14.07	56.00	46.00	37.93	31.93	N	
5	4.28971	0.10	-4.50	0.13	13.40	13.63	9.03	56.00	46.00	42.37	36.97	N	
6	20.11613	5.00	1.00	0.37	13.83	19.20	15.20	60.00	50.00	40.80	34.80	N	
7	0.15310	21.90	9.70	0.07	13.14	35.11	22.91	65.80	55.80	30.69	32.89	L	
8	0.28068	11.60	6.30	0.06	13.16	24.82	19.52	60.80	50.80	35.98	31.28	L	
9	0.92510	9.30	4.80	0.06	13.21	22.57	18.07	56.00	46.00	33.43	27.93	L	
10	2.02520	5.40	0.40	0.10	13.28	18.78	13.78	56.00	46.00	37.22	32.22	L	
11	4.29532	0.10	-4.50	0.14	13.40	13.64	9.04	56.00	46.00	42.36	36.96	L	
12	20.23843	2.90	-1.70	0.46	13.83	17.19	12.59	60.00	50.00	42.81	37.41	L	

CHART: WITH FACTOR Peak hold data. CALCULATION : RESULT = READING + LISN + LOSS (CABLE + ATT)
Except for the above table: adequate margin data below the limits.

Conducted Emission

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Date	February 22, 2020
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Yuta Moriya
Mode	Tx BT LE 1M-PHY 2440MHz

Limit : FCC_Part 15 Subpart C(15.207)



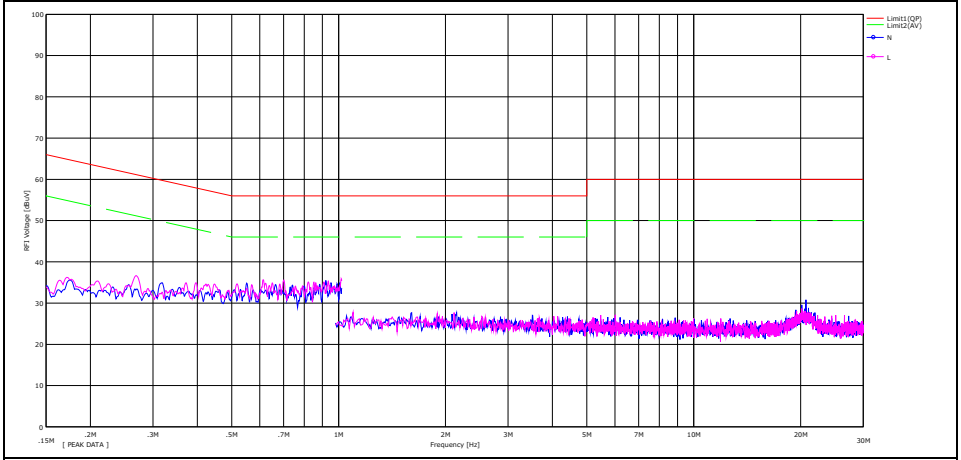
No.	Freq.	Reading ⟨QP⟩	Reading ⟨AV⟩	LISN	LOSS	Results ⟨QP⟩	Results ⟨AV⟩	Limit ⟨QP⟩	Limit ⟨AV⟩	Margin ⟨QP⟩	Margin ⟨AV⟩	Phase	Comment
	[MHz]	[dBuV]	[dBuV]	[dB]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15000	21.50	9.11	0.07	13.14	34.71	22.32	66.00	56.00	31.29	33.68	N	
2	0.22308	12.56	7.38	0.07	13.14	25.77	20.59	62.70	52.70	36.93	32.11	N	
3	0.60066	9.09	4.26	0.08	13.18	22.35	17.52	56.00	46.00	33.65	28.48	N	
4	0.95910	9.55	5.10	0.08	13.22	22.85	18.40	56.00	46.00	33.15	27.60	N	
5	4.60800	9.09	4.52	0.14	13.41	22.64	18.07	56.00	46.00	33.36	27.93	N	
6	20.69680	5.32	1.11	0.39	13.84	19.55	15.34	60.00	50.00	40.45	34.66	N	
7	0.15000	21.20	9.21	0.07	13.14	34.41	22.42	66.00	56.00	31.59	33.58	L	
8	0.22656	12.95	7.26	0.07	13.15	26.17	20.48	62.60	52.60	36.43	32.12	L	
9	0.59457	8.83	4.32	0.05	13.18	22.06	17.55	56.00	46.00	33.94	28.45	L	
10	0.96084	9.74	5.10	0.06	13.22	23.02	18.38	56.00	46.00	32.98	27.62	L	
11	4.63521	0.05	-4.45	0.15	13.41	13.61	9.11	56.00	46.00	42.39	36.89	L	
12	20.69680	6.16	1.66	0.48	13.84	20.48	15.98	60.00	50.00	39.52	34.02	L	

CHART: WITH FACTOR Peak hold data. CALCULATION : RESULT = READING + LISN + LOSS (CABLE + ATT)
Except for the above table: adequate margin data below the limits.

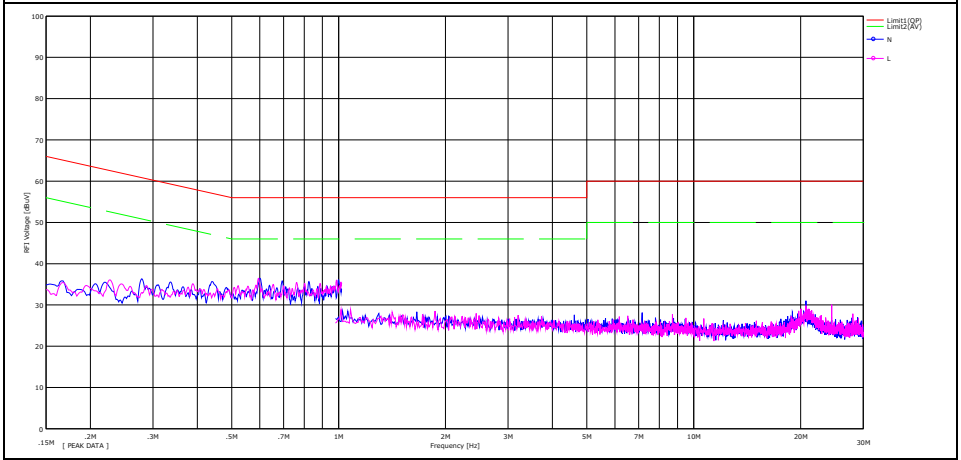
Conducted Emission

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Date	February 22, 2020
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Yuta Moriya
Mode	Tx BT LE 1M-PHY

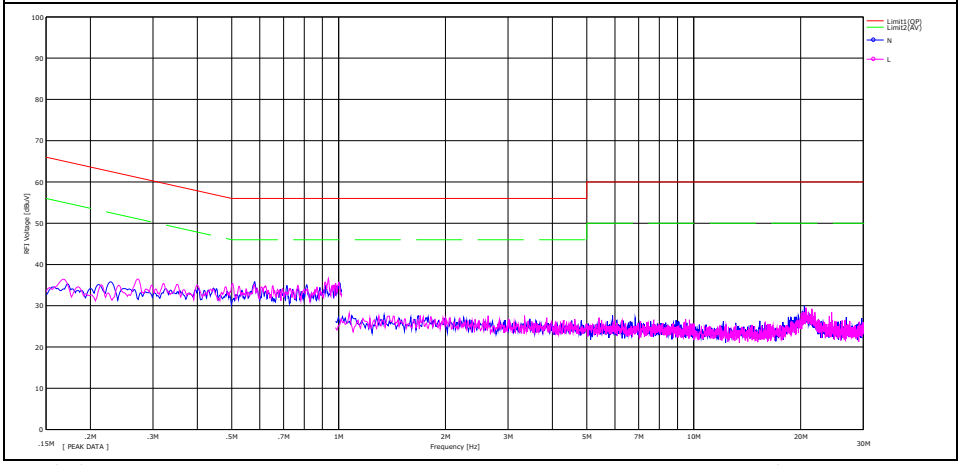
2402 MHz



2440 MHz



2480 MHz

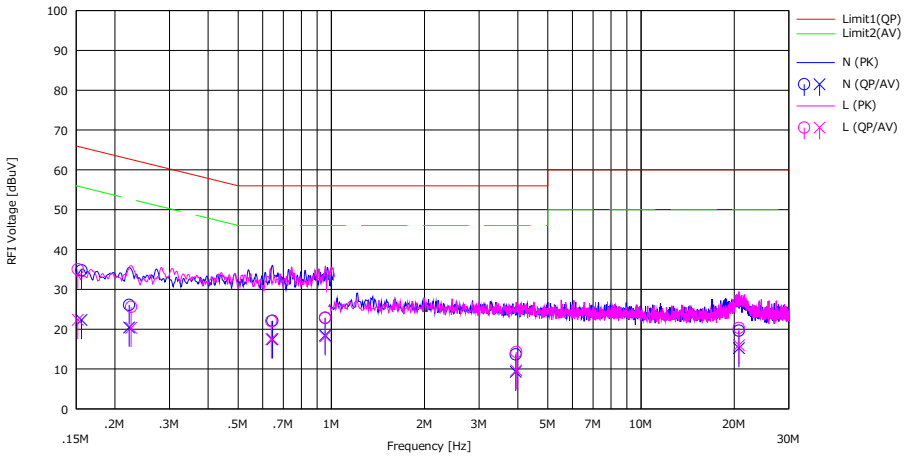


Y scale [dBuV] Chart N L

Conducted Emission

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Date	February 22, 2020
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Yuta Moriya
Mode	Tx BT LE 2M-PHY 2440MHz

Limit : FCC_Part 15 Subpart C(15.207)



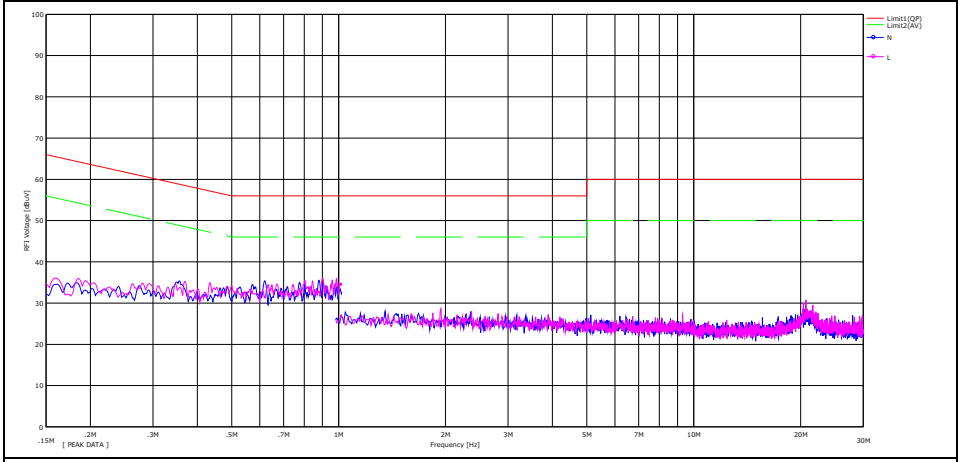
No.	Freq.	Reading		LISN	LOSS	Results		Limit		Margin		Phase	Comment
		〈QP〉	〈AV〉			〈QP〉	〈AV〉	〈QP〉	〈AV〉	〈QP〉	〈AV〉		
	[MHz]	[dBuV]	[dBuV]	[dB]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15609	21.56	9.11	0.07	13.14	34.77	22.32	65.70	55.70	30.93	33.38	N	
2	0.22221	12.87	7.21	0.07	13.14	26.08	20.42	62.70	52.70	36.62	32.28	N	
3	0.64503	8.83	4.22	0.08	13.18	22.09	17.48	56.00	46.00	33.91	28.52	N	
4	0.95475	9.55	5.16	0.08	13.22	22.85	18.46	56.00	46.00	33.15	27.54	N	
5	3.93682	0.17	-4.21	0.12	13.38	13.67	9.29	56.00	46.00	42.33	36.71	N	
6	20.69680	5.40	1.01	0.39	13.84	19.63	15.24	60.00	50.00	40.37	34.76	N	
7	0.15174	21.81	9.14	0.07	13.14	35.02	22.35	65.90	55.90	30.88	33.55	L	
8	0.22569	12.38	7.10	0.07	13.15	25.60	20.32	62.60	52.60	37.00	32.28	L	
9	0.63981	8.80	4.24	0.05	13.18	22.03	17.47	56.00	46.00	33.97	28.53	L	
10	0.95562	9.62	4.89	0.06	13.22	22.90	18.17	56.00	46.00	33.10	27.83	L	
11	3.95496	0.74	-3.85	0.14	13.38	14.26	9.67	56.00	46.00	41.74	36.33	L	
12	20.69680	5.98	1.66	0.48	13.84	20.30	15.98	60.00	50.00	39.70	34.02	L	

CHART: WITH FACTOR Peak hold data. CALCULATION : RESULT = READING + LISN + LOSS (CABLE + ATT)
Except for the above table: adequate margin data below the limits.

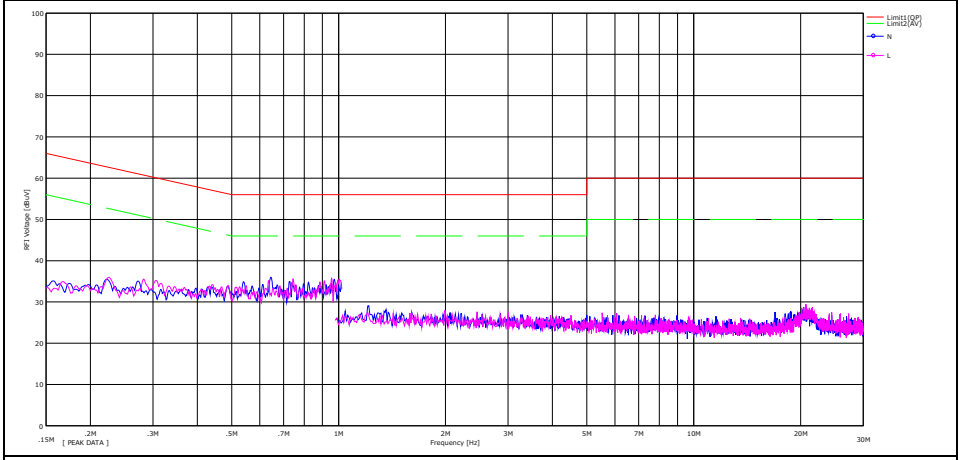
Conducted Emission

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Date	February 22, 2020
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Yuta Moriya
Mode	Tx BT LE 2M-PHY

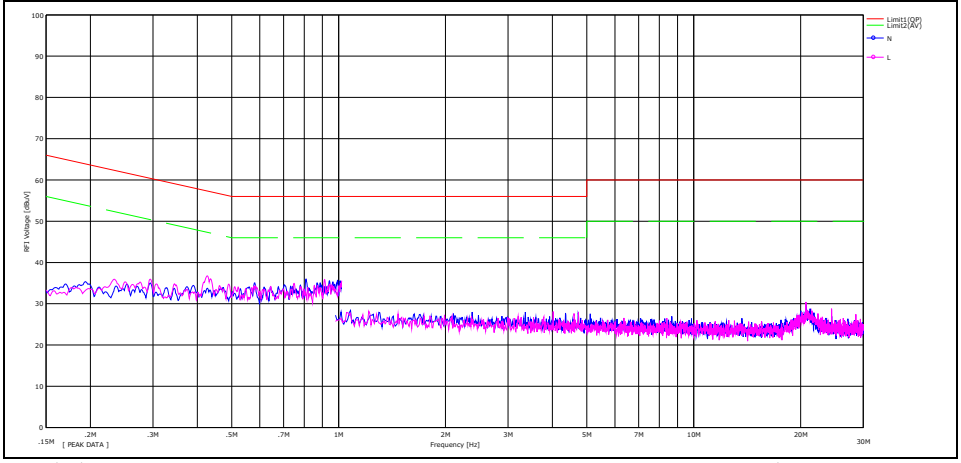
2402 MHz



2440 MHz



2480 MHz

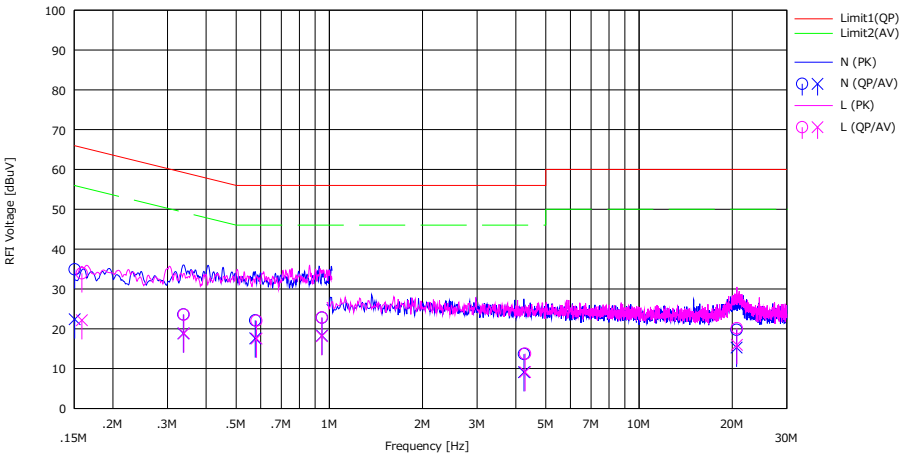


Y scale [dBuV] Chart N L

Conducted Emission

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Date	February 22, 2020
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Yuta Moriya
Mode	Tx BT LE 1M-PHY 2402 MHz

Limit : FCC_Part 15 Subpart C(15.207)



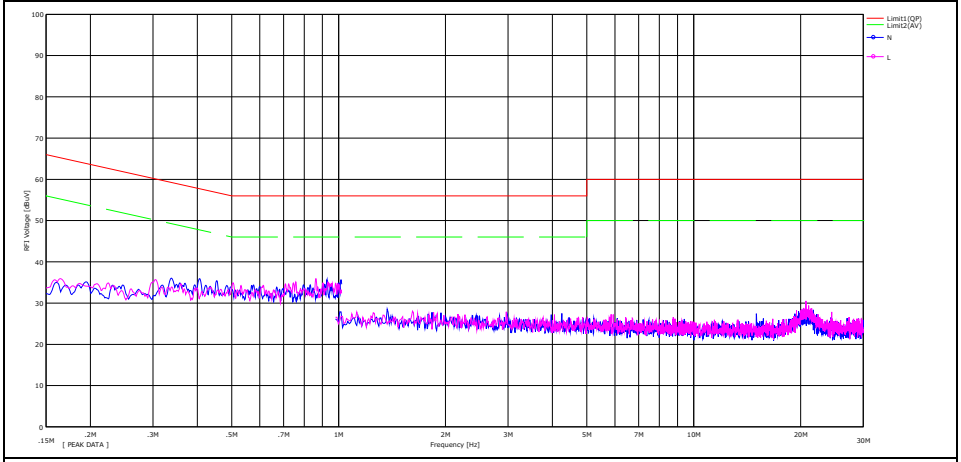
No.	Freq.	Reading ⟨QP⟩	Reading ⟨AV⟩	LISN	LOSS	Results ⟨QP⟩	Results ⟨AV⟩	Limit ⟨QP⟩	Limit ⟨AV⟩	Margin ⟨QP⟩	Margin ⟨AV⟩	Phase	Comment
	[MHz]	[dBuV]	[dBuV]	[dB]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15044	21.70	9.17	0.07	13.14	34.91	22.38	66.00	56.00	31.09	33.62	N	
2	0.33792	10.36	5.60	0.07	13.16	23.59	18.83	59.30	49.30	35.71	30.47	N	
3	0.57630	8.83	4.33	0.08	13.18	22.09	17.59	56.00	46.00	33.91	28.41	N	
4	0.94692	9.50	4.99	0.08	13.21	22.79	18.28	56.00	46.00	33.21	27.72	N	
5	4.25427	0.12	-4.43	0.13	13.40	13.65	9.10	56.00	46.00	42.35	36.90	N	
6	20.65670	5.50	1.03	0.39	13.84	19.73	15.26	60.00	50.00	40.27	34.74	N	
7	0.15870	20.72	8.96	0.07	13.14	33.93	22.17	65.50	55.50	31.57	33.33	L	
8	0.33879	10.34	5.63	0.06	13.16	23.56	18.85	59.20	49.20	35.64	30.35	L	
9	0.58152	8.80	4.32	0.05	13.18	22.03	17.55	56.00	46.00	33.97	28.45	L	
10	0.94518	9.55	4.87	0.06	13.21	22.82	18.14	56.00	46.00	33.18	27.86	L	
11	4.29055	0.21	-4.41	0.14	13.40	13.75	9.13	56.00	46.00	42.25	36.87	L	
12	20.69680	5.84	1.64	0.48	13.84	20.16	15.96	60.00	50.00	39.84	34.04	L	

CHART: WITH FACTOR Peak hold data. CALCULATION : RESULT = READING + LISN + LOSS (CABLE + ATT)
Except for the above table: adequate margin data below the limits.

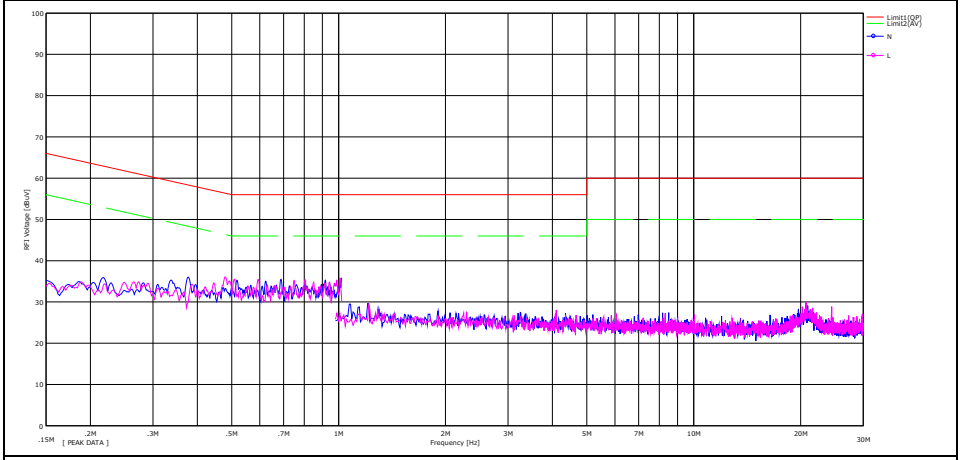
Conducted Emission

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Date	February 22, 2020
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Yuta Moriya
Mode	Tx BT LE 1M-PHY

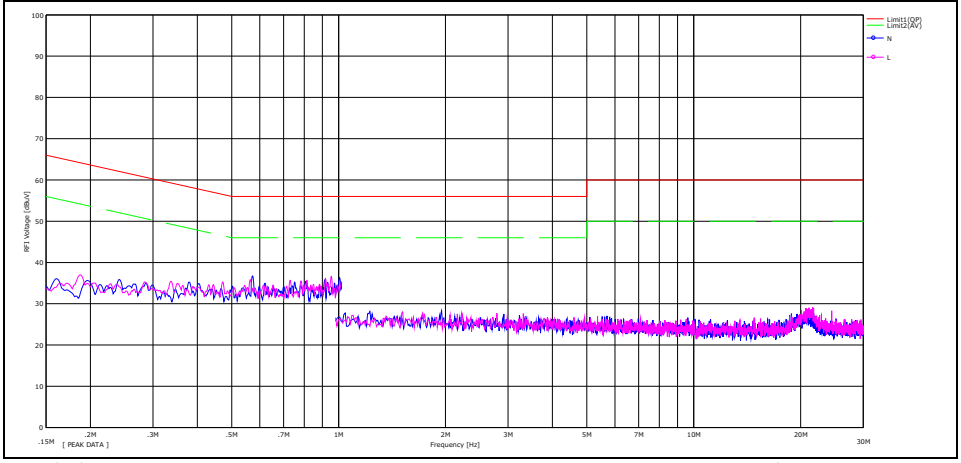
2402 MHz



2440 MHz



2480 MHz

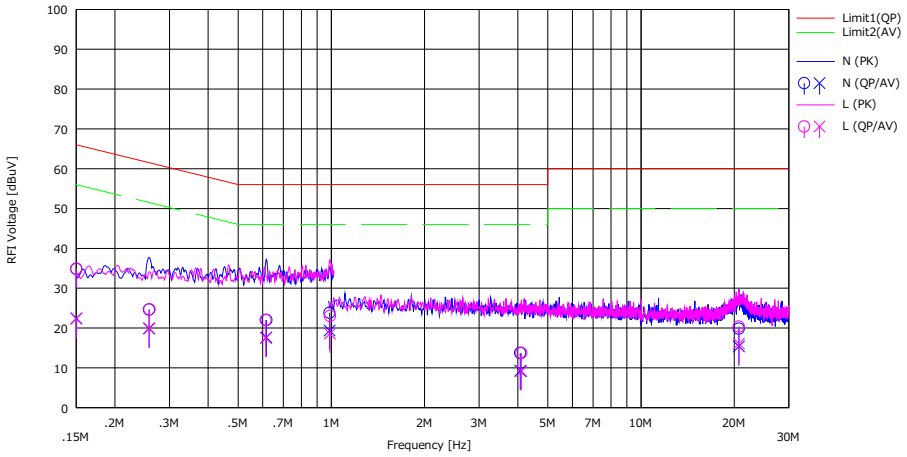


Y scale [dBuV] Chart N L

Conducted Emission

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Date	February 22, 2020
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Yuta Moriya
Mode	Tx BT LE 2M-PHY 2402 MHz

Limit : FCC_Part 15 Subpart C(15.207)



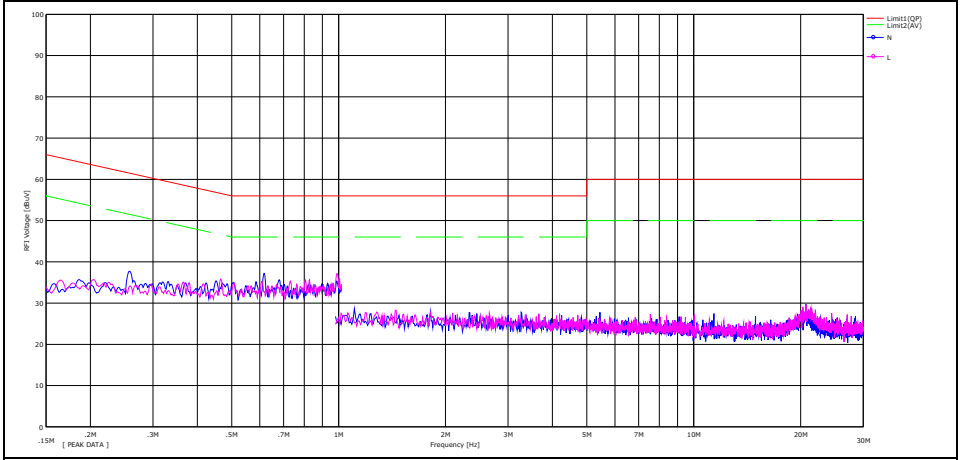
No.	Freq.	Reading ⟨QP⟩	Reading ⟨AV⟩	LISN	LOSS	Results ⟨QP⟩	Results ⟨AV⟩	Limit ⟨QP⟩	Limit ⟨AV⟩	Margin ⟨QP⟩	Margin ⟨AV⟩	Phase	Comment
	[MHz]	[dBuV]	[dBuV]	[dB]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15032	21.60	9.20	0.07	13.14	34.81	22.41	66.00	56.00	31.19	33.59	N	
2	0.25788	11.41	6.64	0.07	13.15	24.63	19.86	61.50	51.50	36.87	31.64	N	
3	0.61719	8.75	4.35	0.08	13.18	22.01	17.61	56.00	46.00	33.99	28.39	N	
4	0.98694	10.52	6.05	0.08	13.22	23.82	19.35	56.00	46.00	32.18	26.65	N	
5	4.07287	0.23	-4.28	0.13	13.39	13.75	9.24	56.00	46.00	42.25	36.76	N	
6	20.69680	5.59	1.15	0.39	13.84	19.82	15.38	60.00	50.00	40.18	34.62	N	
7	0.15000	21.66	9.16	0.07	13.14	34.87	22.37	66.00	56.00	31.13	33.63	L	
8	0.25875	11.49	6.68	0.06	13.15	24.70	19.89	61.50	51.50	36.80	31.61	L	
9	0.61371	8.80	4.28	0.05	13.18	22.03	17.51	56.00	46.00	33.97	28.49	L	
10	0.98955	9.72	5.33	0.06	13.22	23.00	18.61	56.00	46.00	33.00	27.39	L	
11	4.10915	0.19	-4.33	0.14	13.39	13.72	9.20	56.00	46.00	42.28	36.80	L	
12	20.69680	6.06	1.75	0.48	13.84	20.38	16.07	60.00	50.00	39.62	33.93	L	

CHART: WITH FACTOR Peak hold data. CALCULATION : RESULT = READING + LISN + LOSS (CABLE + ATT)
Except for the above table: adequate margin data below the limits.

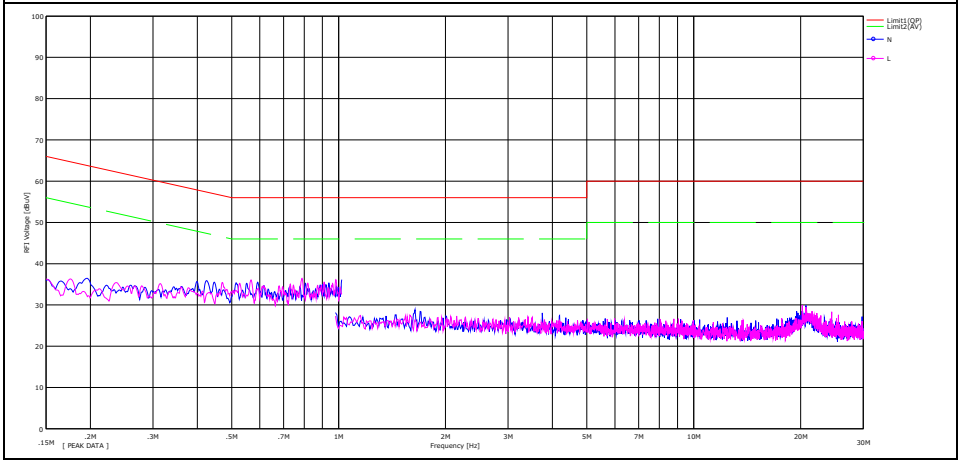
Conducted Emission

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Date	February 22, 2020
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Yuta Moriya
Mode	Tx BT LE 2M-PHY

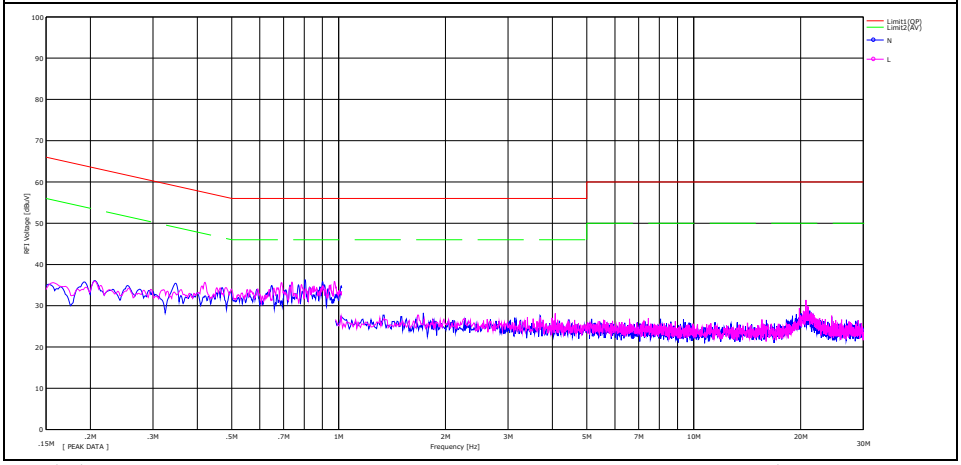
2402 MHz



2440 MHz



2480 MHz



Y scale [dBuV] Chart N L

6 dB Bandwidth and 99 % Occupied Bandwidth

Report No.	13170804H	
Test place	Ise EMC Lab. No.3 Measurement Room	
Date	December 17, 2019	February 17, 2020
Temperature / Humidity	23 deg. C / 39 % RH	24 deg. C / 41 % RH
Engineer	Takafumi Noguchi	Yuta Moriya
Mode	Tx	

Mode	Frequency [MHz]	99% Occupied Bandwidth [kHz]	6dB Bandwidth [MHz]	Limit for 6dB Bandwidth [MHz]
11b	2412	13332.4	10.066	> 0.5000
	2437	13358.5	10.061	> 0.5000
	2462	13363.7	10.064	> 0.5000
11g	2412	16983.8	16.481	> 0.5000
	2437	16990.4	16.486	> 0.5000
	2462	17012.6	16.484	> 0.5000
11n-20	2412	17992.2	17.690	> 0.5000
	2437	18011.5	17.689	> 0.5000
	2462	18008.6	17.686	> 0.5000
11ax-20 (OFDM)	2412	18901.4	18.643	> 0.5000
	2437	18901.8	18.797	> 0.5000
	2462	18869.7	18.671	> 0.5000

6 dB Bandwidth and 99 % Occupied Bandwidth

Report No.	13170804H	
Test place	Ise EMC Lab. No.3 Measurement Room	
Date	February 17, 2020	March 28, 2020
Temperature / Humidity	24 deg. C / 41 % RH	24 deg. C / 51 % RH
Engineer	Yuta Moriya	Takafumi Noguchi
Mode	Tx	

Mode	Frequency [MHz]	RU Type	RU Index	99% Occupied Bandwidth [kHz]	6dB Bandwidth [MHz]	Limit for 6dB Bandwidth [MHz]
11ax-20	2412	26-tone RU	0	18173.7	2.027	> 0.5000
			4	16918.6	2.647	> 0.5000
			8	18383.6	2.000	> 0.5000
	2437		0	18316.5	2.032	> 0.5000
			4	17035.3	2.662	> 0.5000
			8	18297.2	1.988	> 0.5000
	2462		0	17971.5	2.055	> 0.5000
			4	16909.5	2.650	> 0.5000
			8	18354.4	2.013	> 0.5000
	2412	52-tone RU	37	17957.1	4.020	> 0.5000
			38	16924.8	4.062	> 0.5000
			40	18216.1	4.101	> 0.5000
	2437		37	18180.9	3.973	> 0.5000
			38	16890.2	4.076	> 0.5000
			40	18232.0	4.042	> 0.5000
	2462		37	17848.7	4.028	> 0.5000
			38	16727.2	4.060	> 0.5000
			40	18261.0	4.001	> 0.5000
	2412	106-tone RU	53	18049.0	8.321	> 0.5000
			54	18223.7	8.302	> 0.5000
	2437		53	18179.1	8.175	> 0.5000
			54	18071.7	8.157	> 0.5000
	2462		53	17963.6	8.244	> 0.5000
			54	18137.5	8.150	> 0.5000
	2412	242-tone RU	61	18881.9	18.445	> 0.5000
	2437			18896.8	18.774	> 0.5000
	2462			18863.4	18.643	> 0.5000

6 dB Bandwidth and 99 % Occupied Bandwidth

Report No.	13170804H	
Test place	Ise EMC Lab. No.3 Measurement Room	
Date	December 19, 2019	December 26, 2019
Temperature / Humidity	24 deg. C / 32 % RH	23 deg. C / 38 % RH
Engineer	Takafumi Noguchi	Koji Yamamoto
Mode	Tx BT LE	

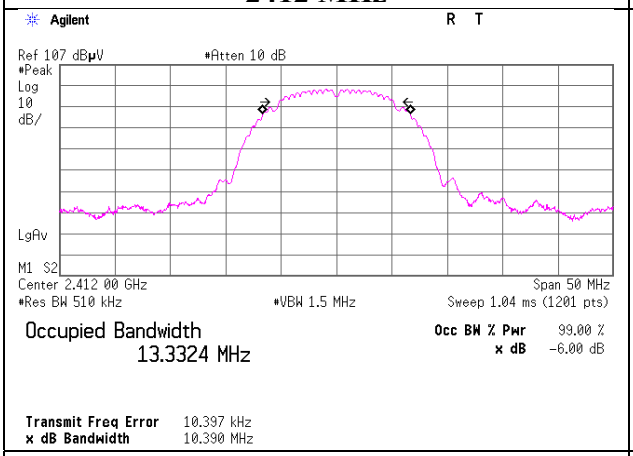
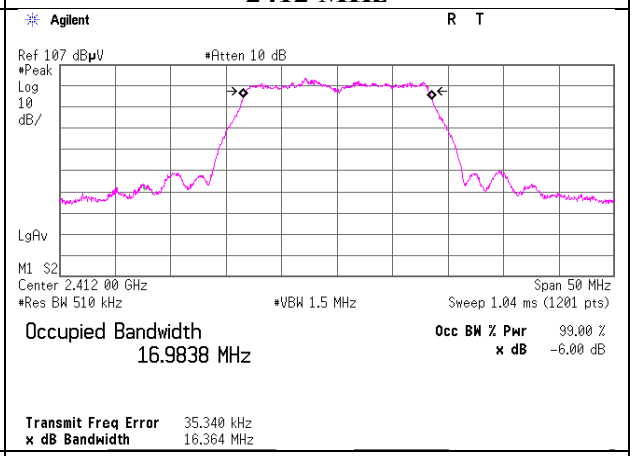
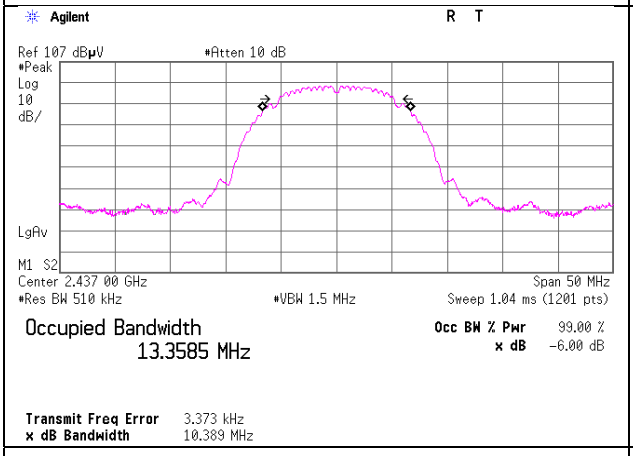
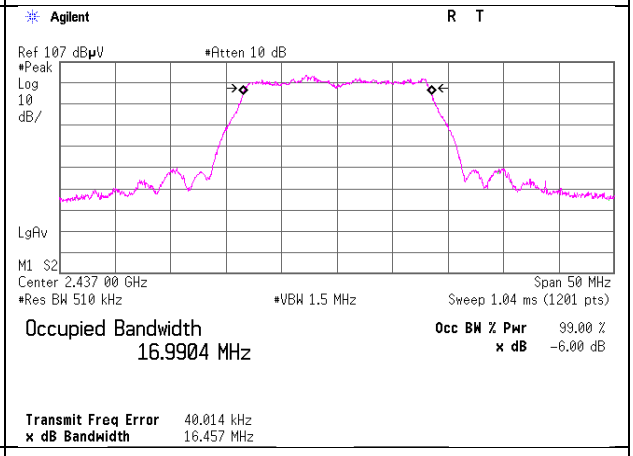
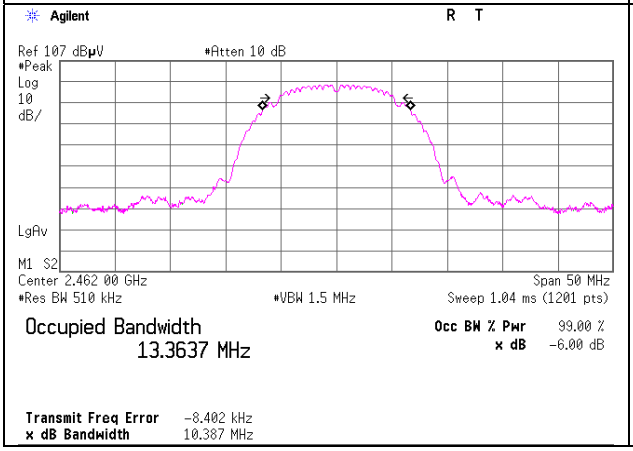
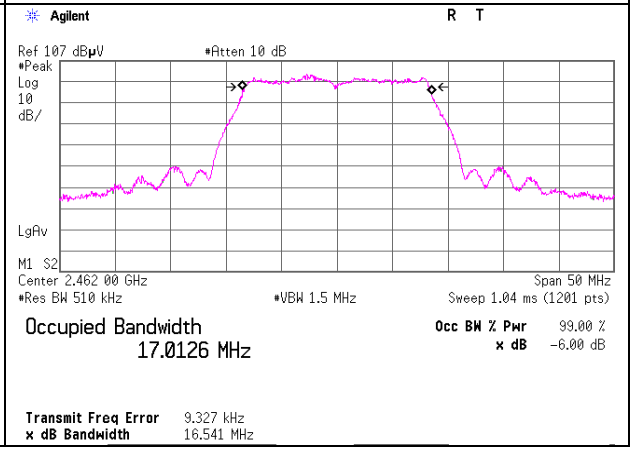
BT1

Mode	Frequency [MHz]	99% Occupied Bandwidth [kHz]	6dB Bandwidth [MHz]	Limit for 6dB Bandwidth [MHz]
1M-PHY	2402	1045.5	0.714	> 0.5000
	2440	1046.2	0.715	> 0.5000
	2480	1044.6	0.724	> 0.5000
2M-PHY	2402	2058.6	1.170	> 0.5000
	2440	2061.1	1.172	> 0.5000
	2480	2059.8	1.172	> 0.5000

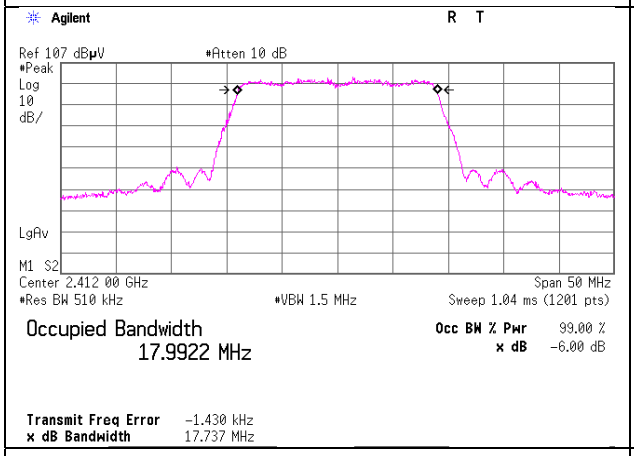
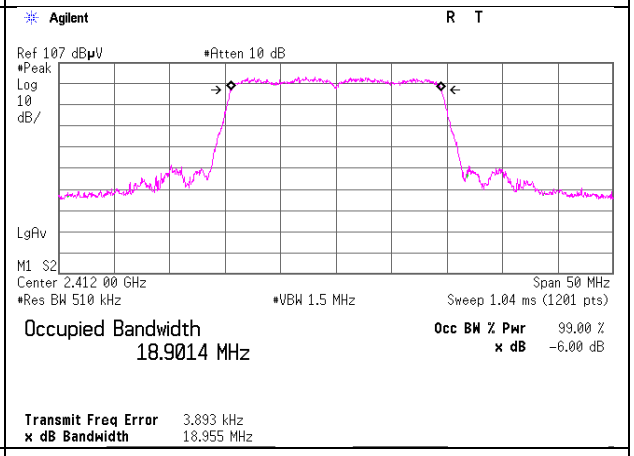
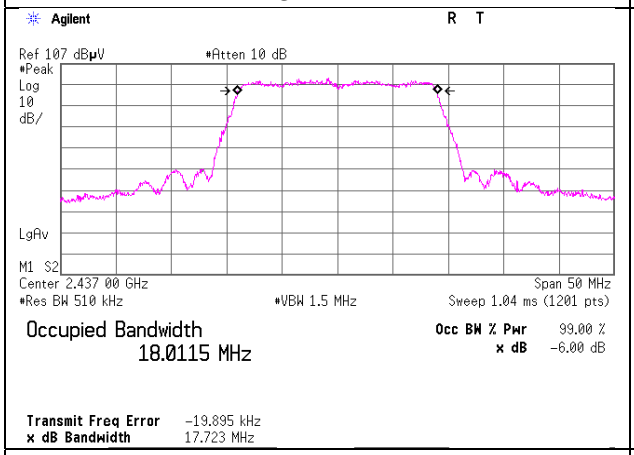
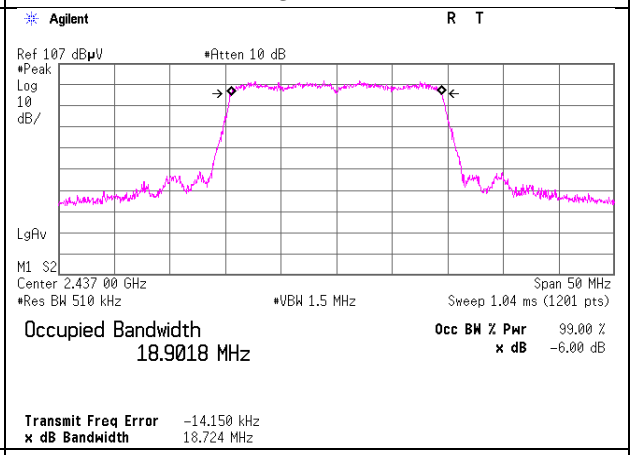
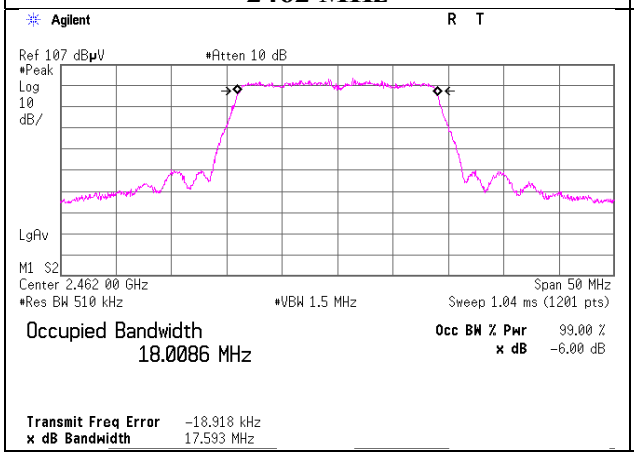
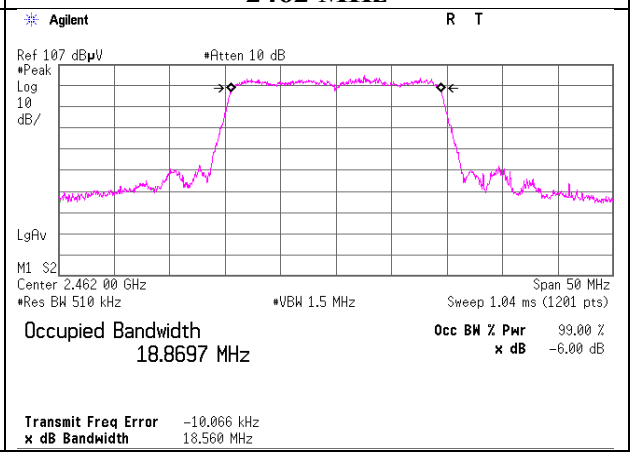
BT2

Mode	Frequency [MHz]	99% Occupied Bandwidth [kHz]	6dB Bandwidth [MHz]	Limit for 6dB Bandwidth [MHz]
1M-PHY	2402	1039.0	0.687	> 0.5000
	2440	1039.3	0.693	> 0.5000
	2480	1038.6	0.688	> 0.5000
2M-PHY	2402	2058.3	1.161	> 0.5000
	2440	2057.6	1.166	> 0.5000
	2480	2060.1	1.171	> 0.5000

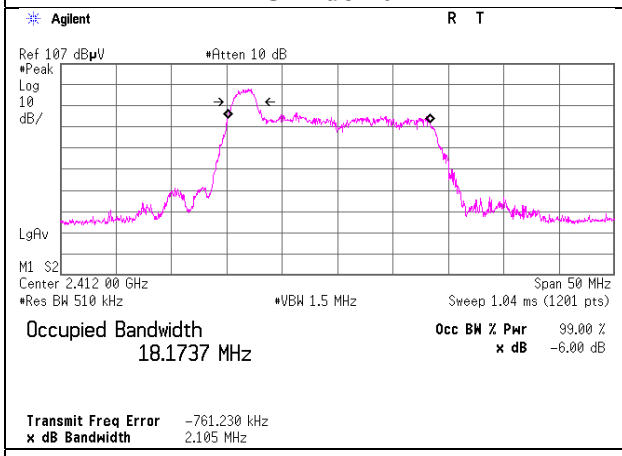
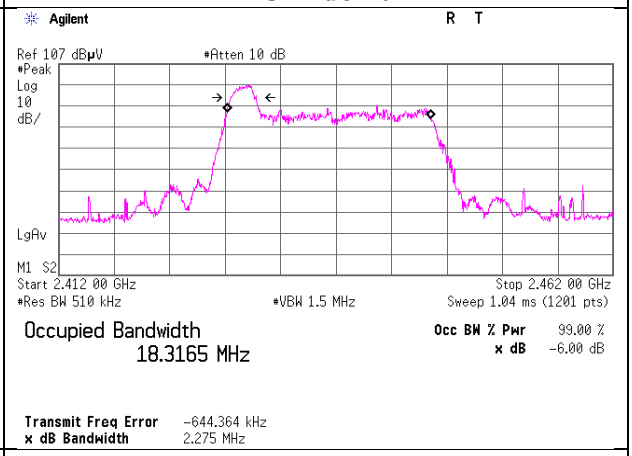
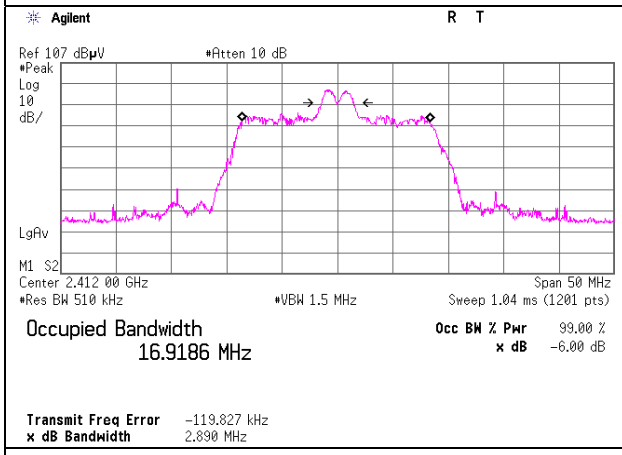
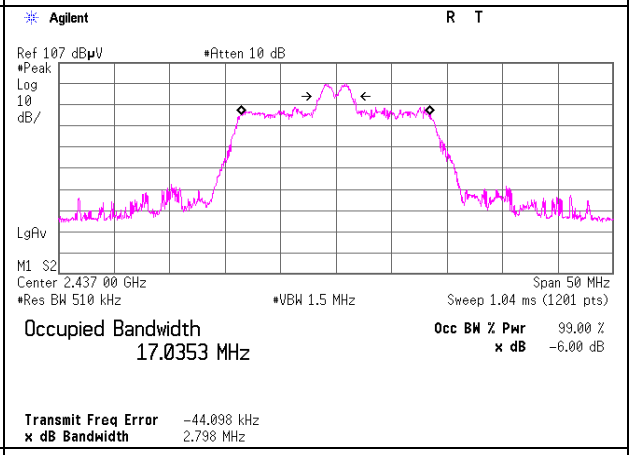
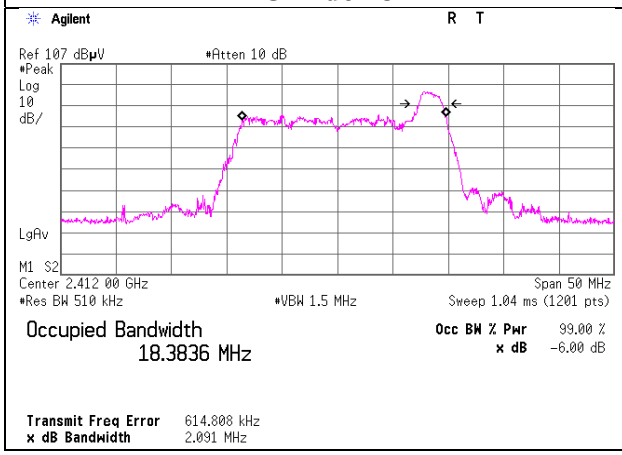
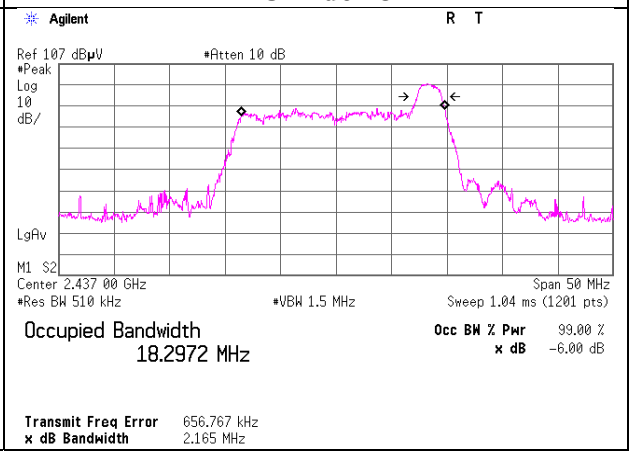
99%Occupied Bandwidth

11b	11g
2412 MHz	**2412 MHz**
	
2437 MHz	**2437 MHz**
	
2462 MHz	**2462 MHz**
	

99% Occupied Bandwidth

11n-20	11ax-20 OFDM
2412 MHz	**2412 MHz**
	
2437 MHz	**2437 MHz**
	
2462 MHz	**2462 MHz**
	

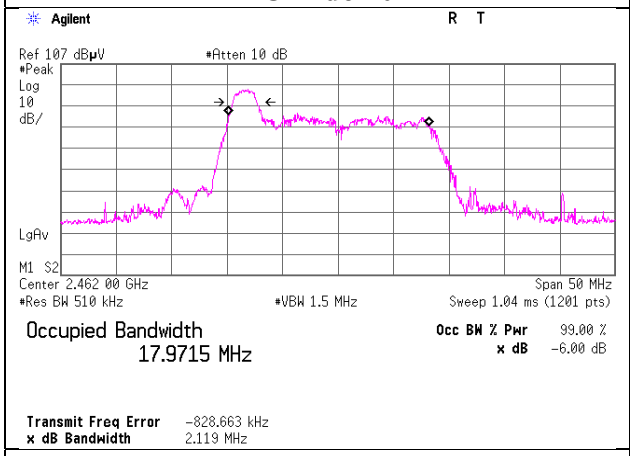
99% Occupied Bandwidth

11ax-20 26-tone RU 2412 MHz	11ax-20 26-tone RU 2437 MHz
RU Index 0	**RU Index 0**
	
RU Index 4	**RU Index 4**
	
RU Index 8	**RU Index 8**
	

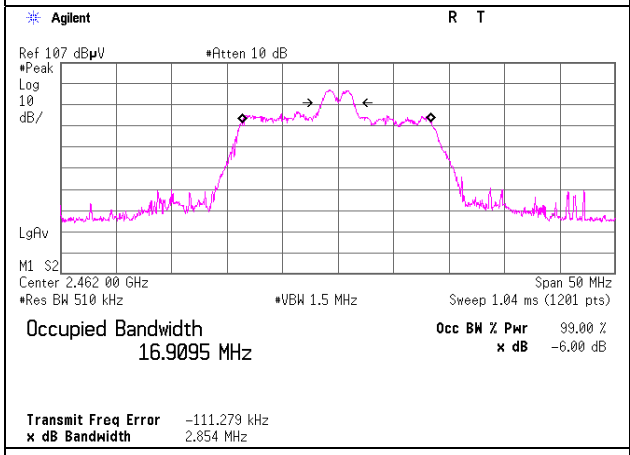
99% Occupied Bandwidth

11ax-20 26-tone RU 2462 MHz

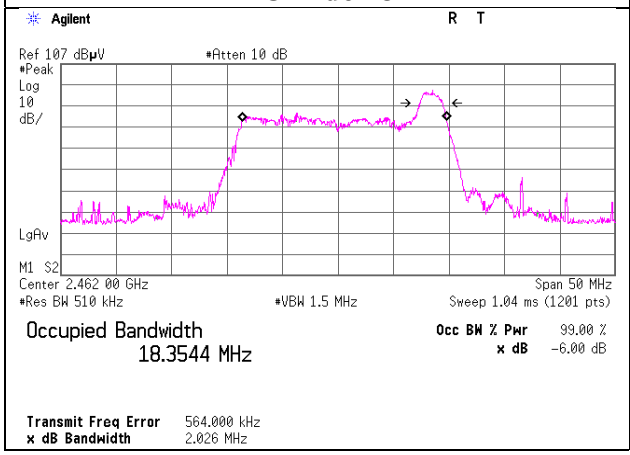
RU Index 0



RU Index 4

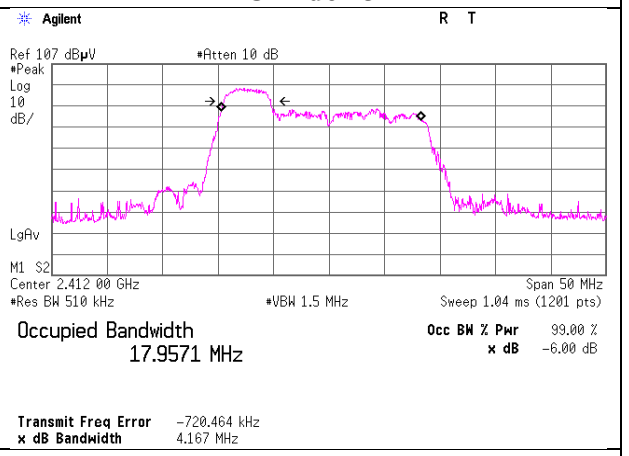


RU Index 8

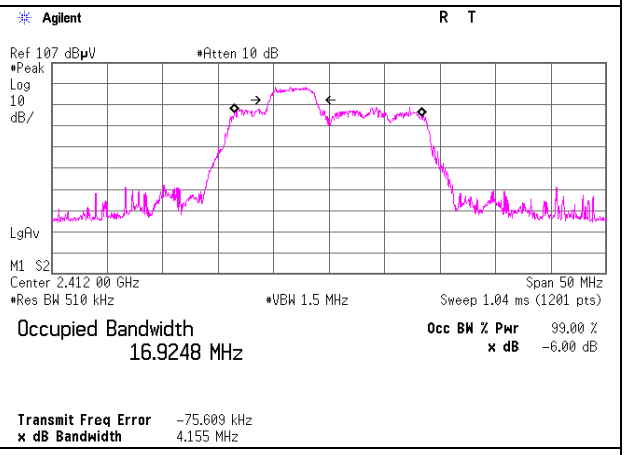


11ax-20 52-tone RU 2412 MHz

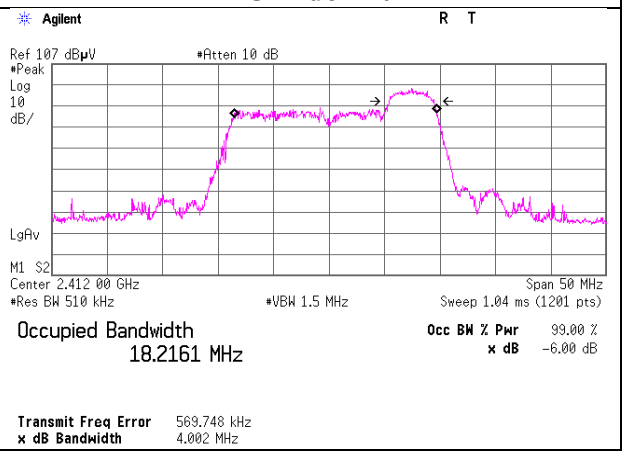
RU Index 37



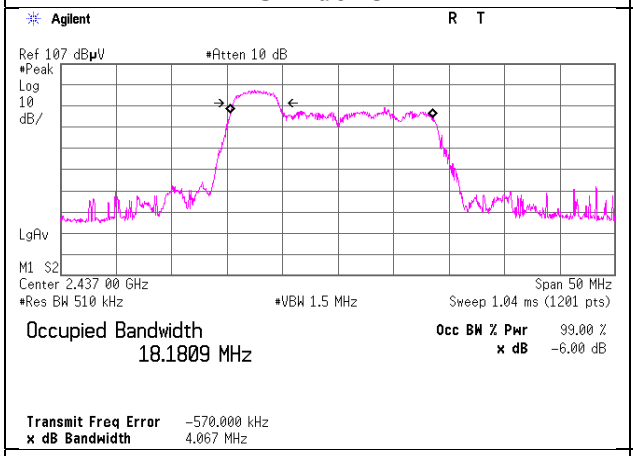
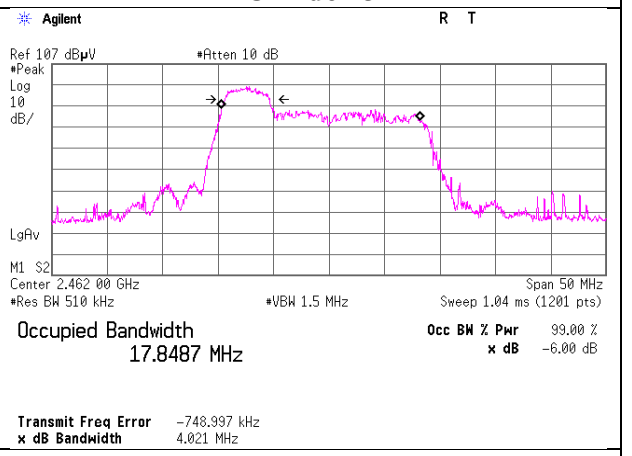
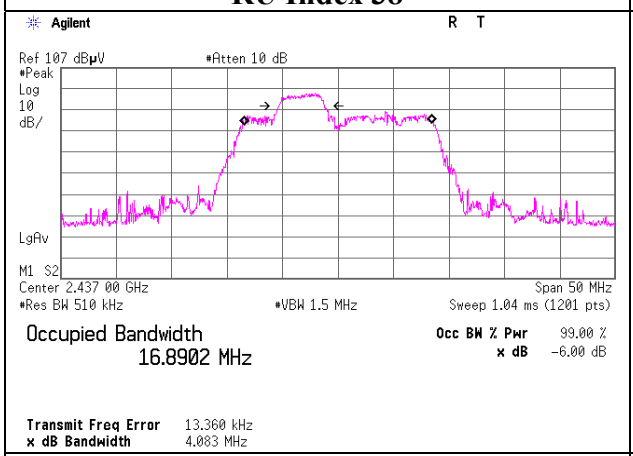
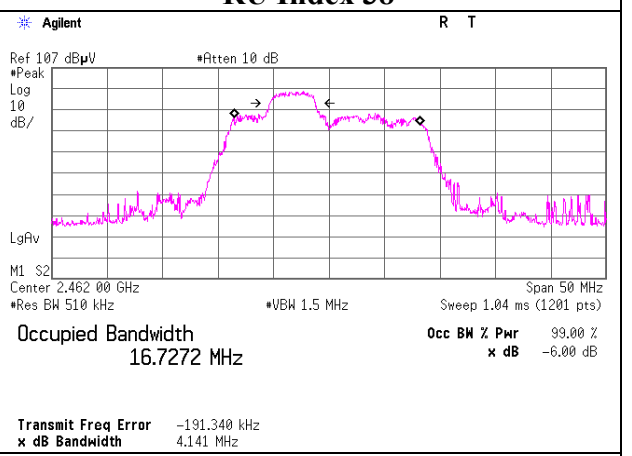
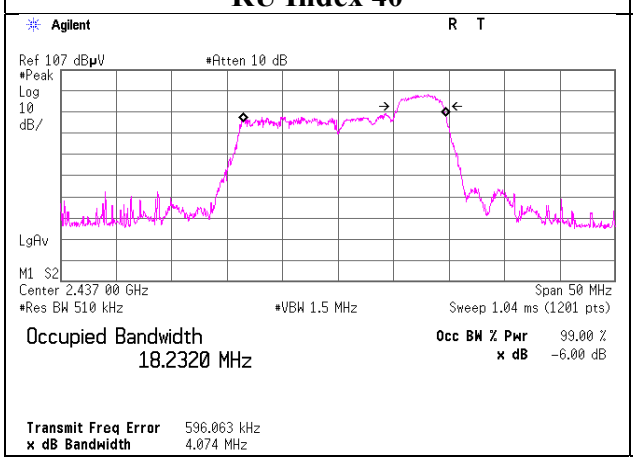
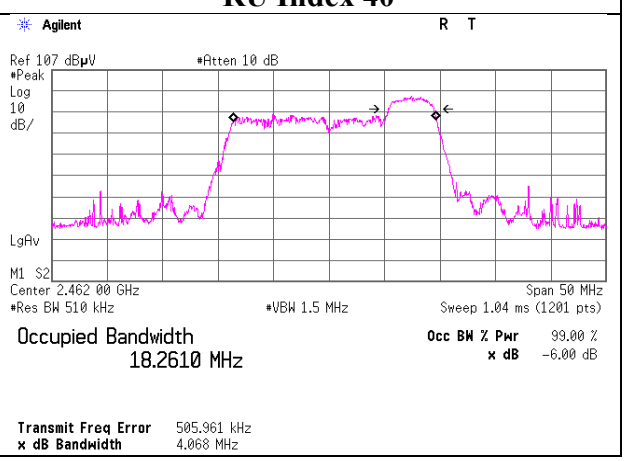
RU Index 38



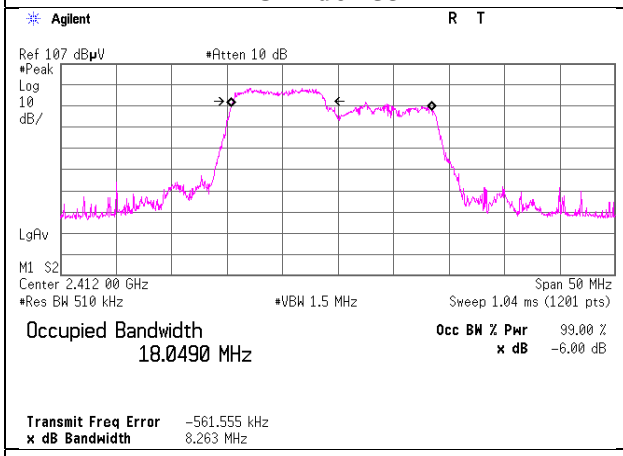
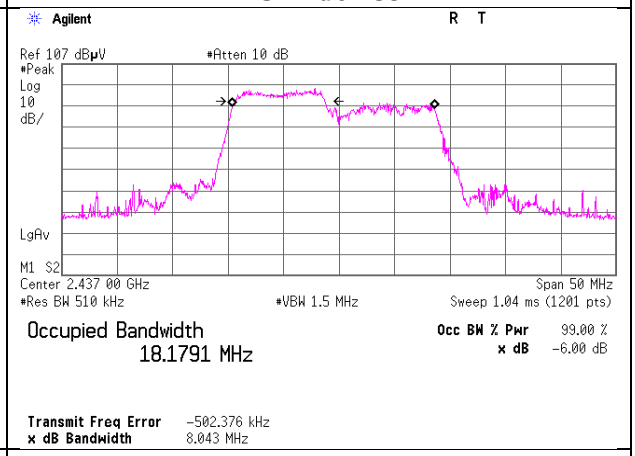
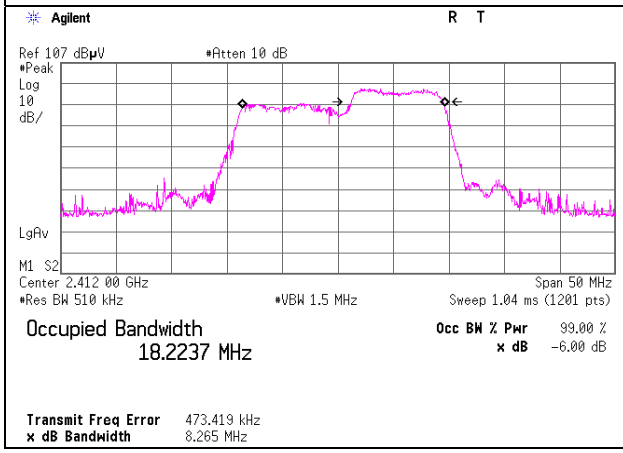
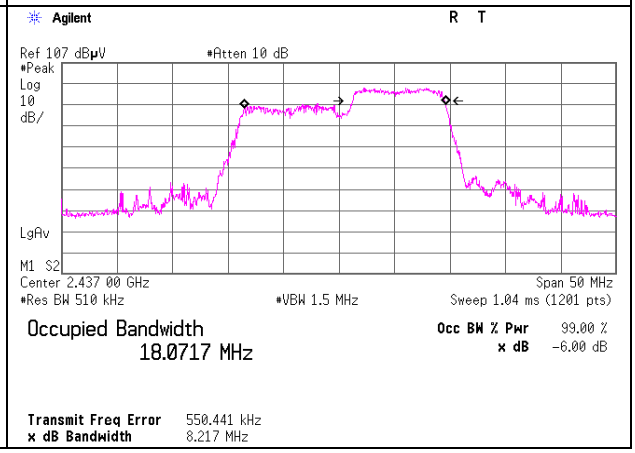
RU Index 40



99% Occupied Bandwidth

11ax-20 52-tone RU 2437 MHz	11ax-20 52-tone RU 2462 MHz
RU Index 37	**RU Index 37**
	
RU Index 38	**RU Index 38**
	
RU Index 40	**RU Index 40**
	

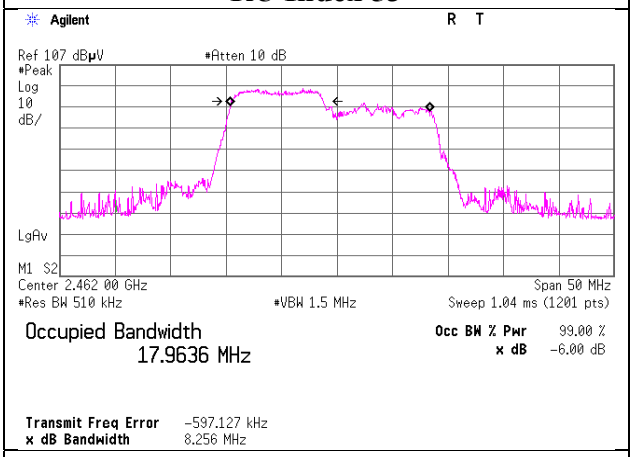
99% Occupied Bandwidth

11ax-20 106-tone RU 2412 MHz	11ax-20 106-tone RU 2437 MHz
RU Index 53	**RU Index 53**
	
RU Index 54	**RU Index 54**
	

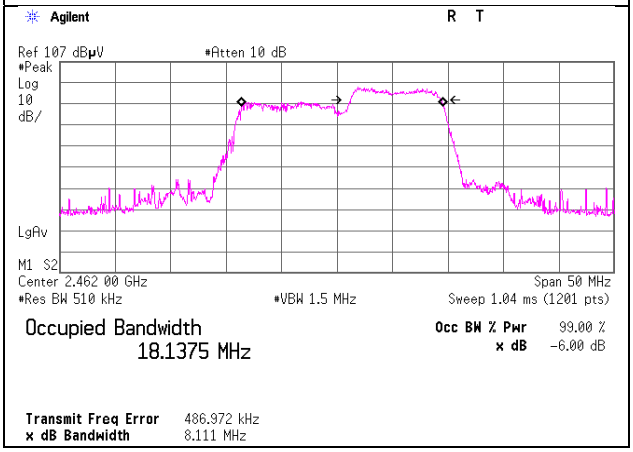
99% Occupied Bandwidth

11ax-20
106-tone RU
2462 MHz

RU Index 53



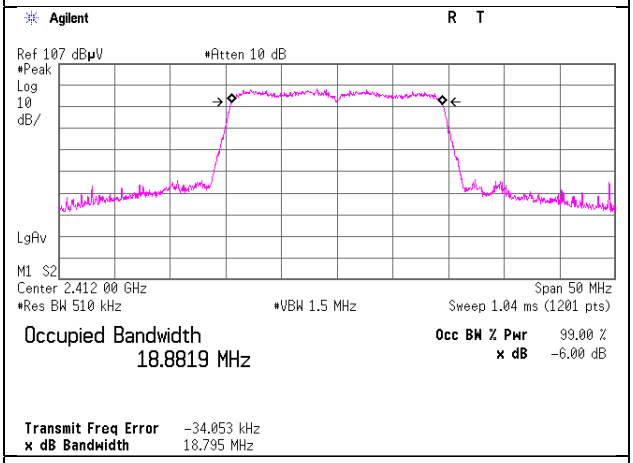
RU Index 54



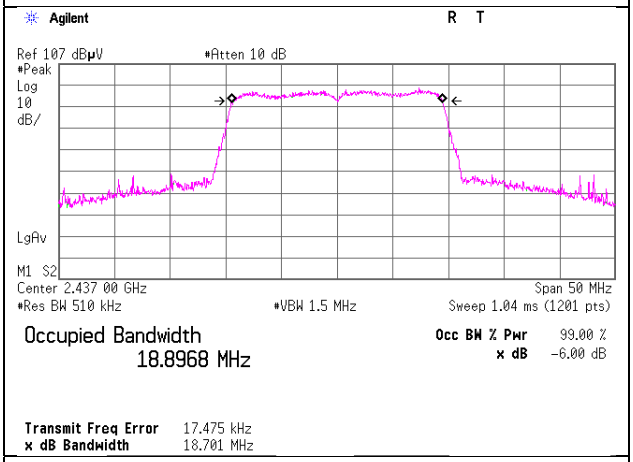
99% Occupied Bandwidth

11ax-20
242-tone RU

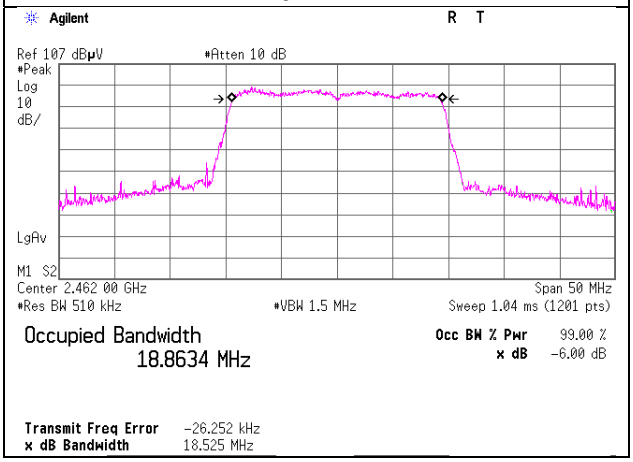
2412 MHz



2437 MHz



2462 MHz

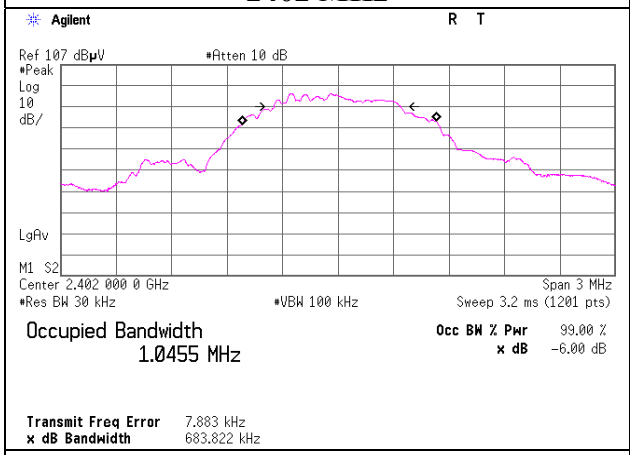


99%Occupied Bandwidth

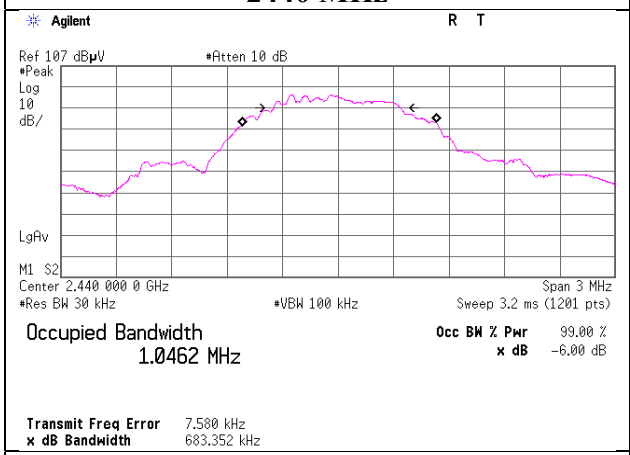
BT1

BT LE 1M-PHY

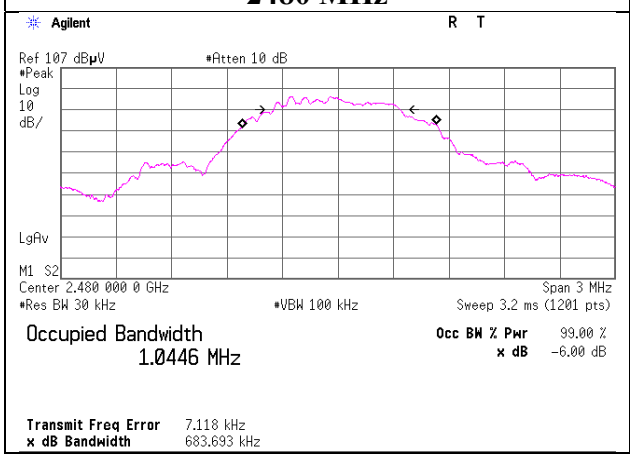
2402 MHz



2440 MHz

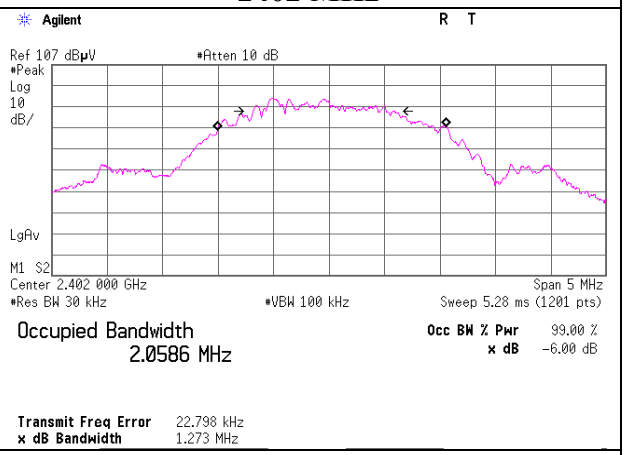


2480 MHz

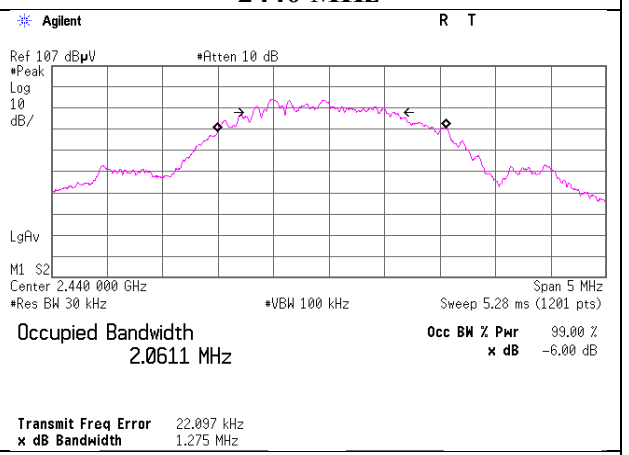


BT LE 2M-PHY

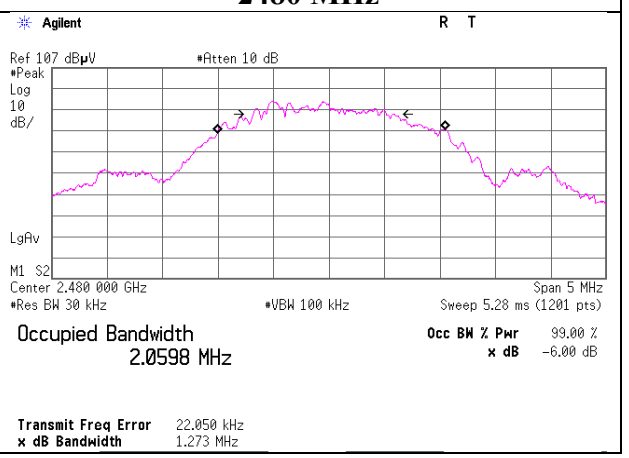
2402 MHz



2440 MHz



2480 MHz

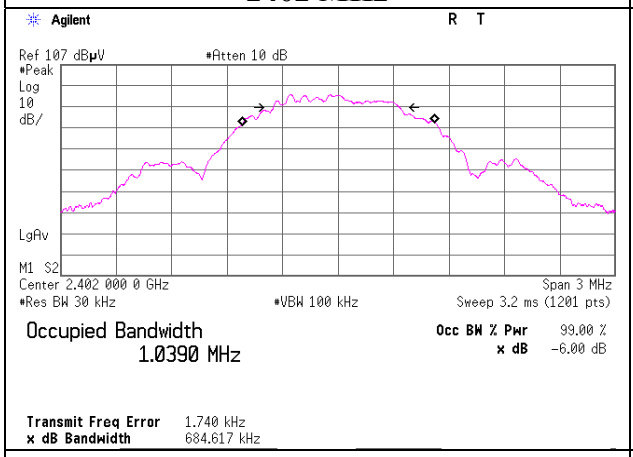


99%Occupied Bandwidth

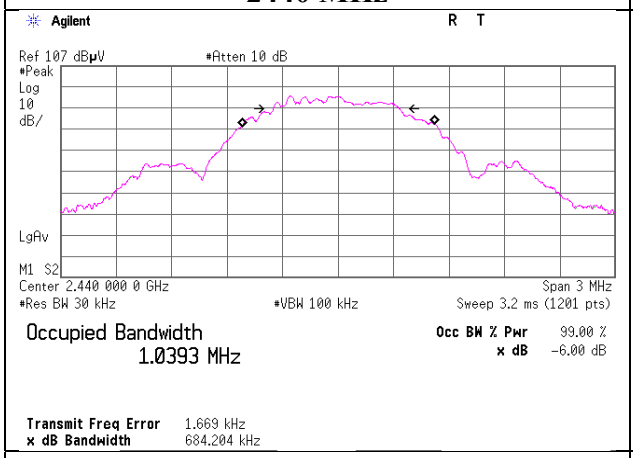
BT2

BT LE 1M-PHY

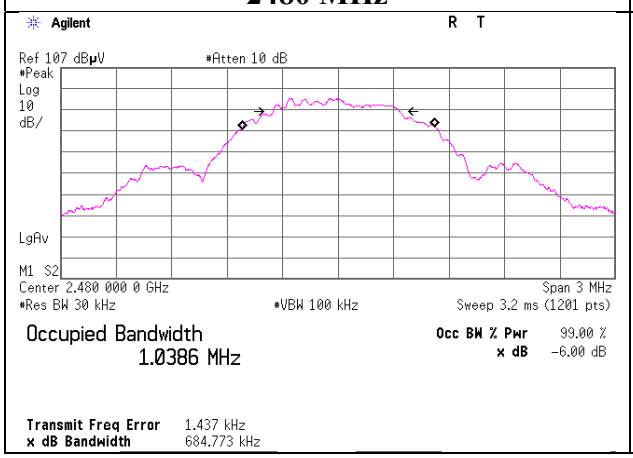
2402 MHz



2440 MHz

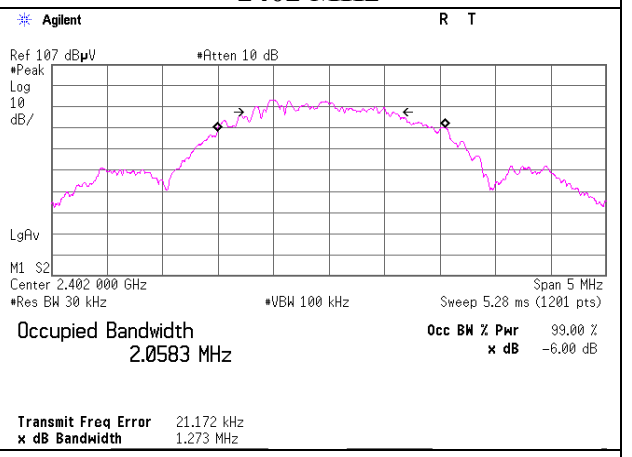


2480 MHz

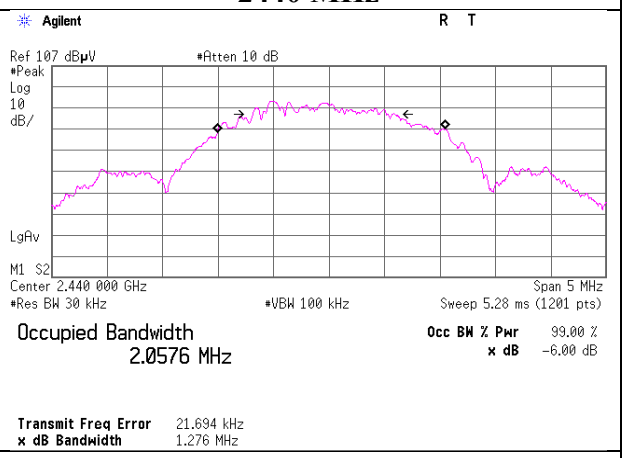


BT LE 2M-PHY

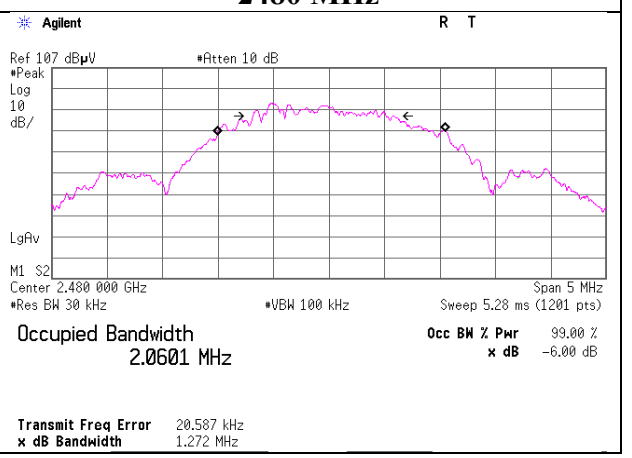
2402 MHz



2440 MHz



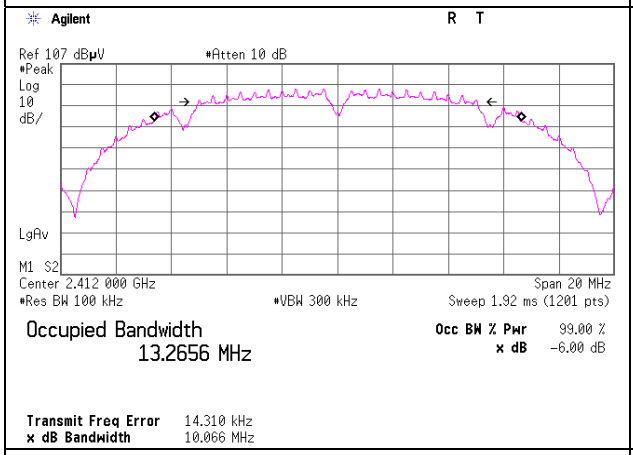
2480 MHz



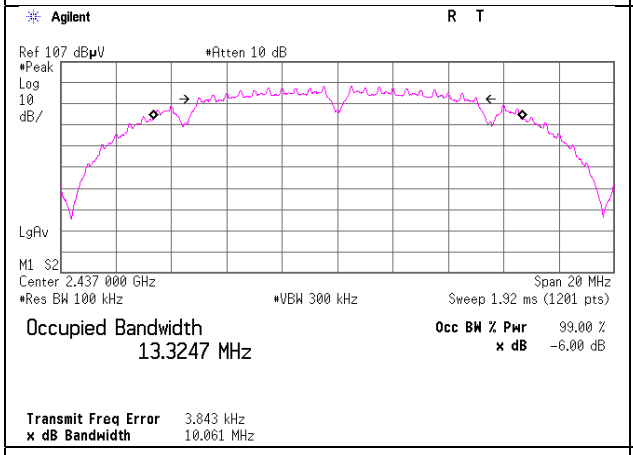
6dB Bandwidth

11b

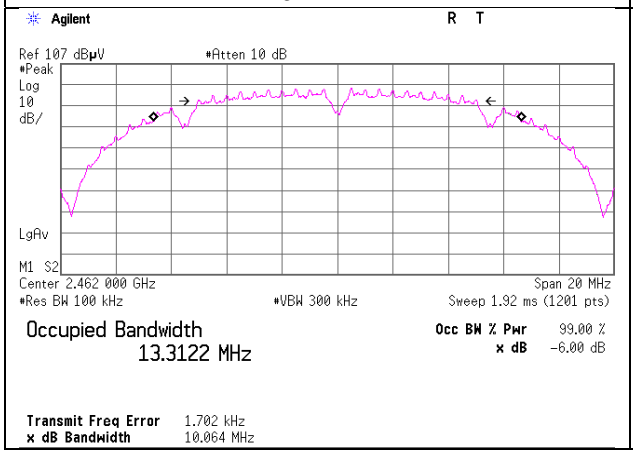
2412 MHz



2437 MHz

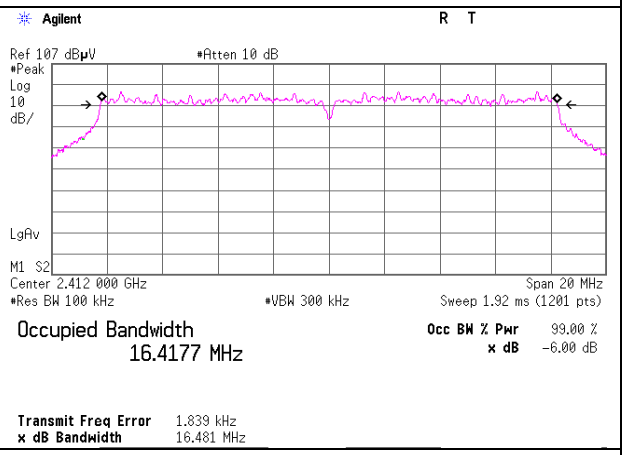


2462 MHz

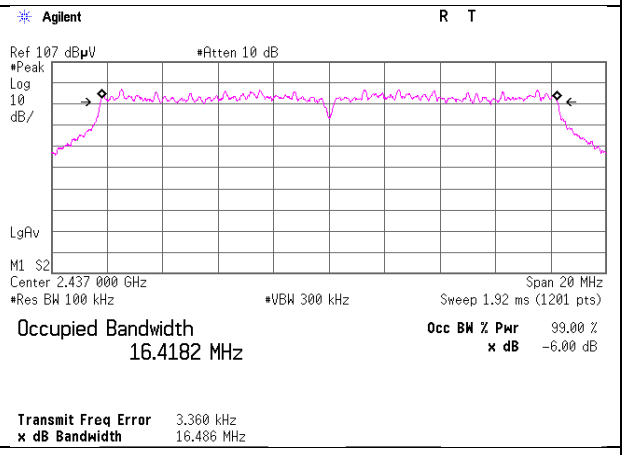


11g

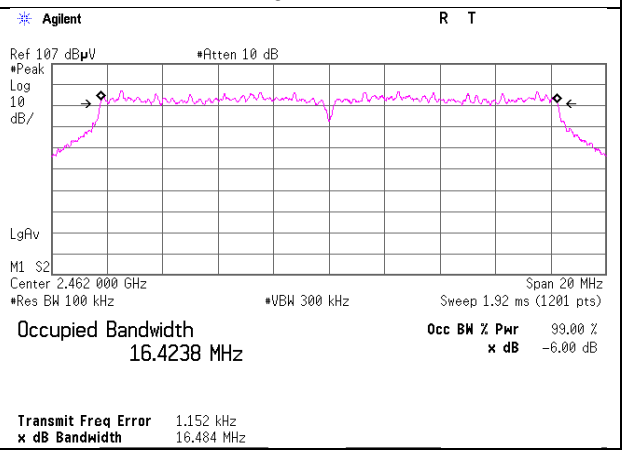
2412 MHz



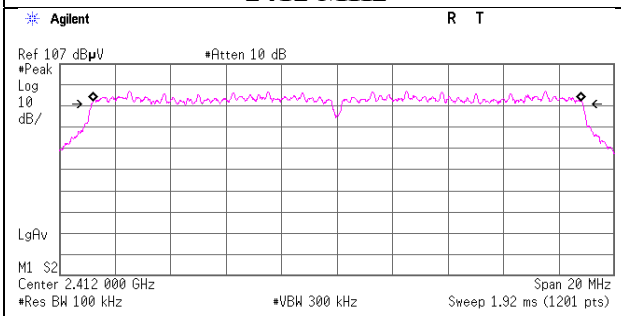
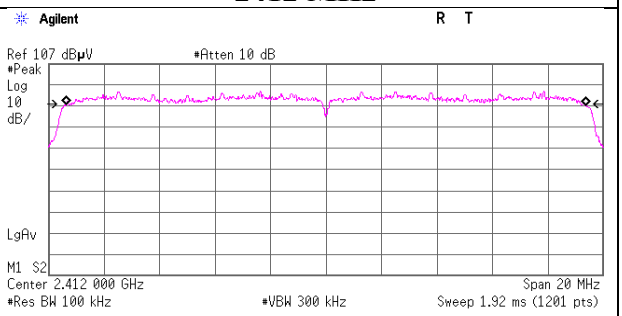
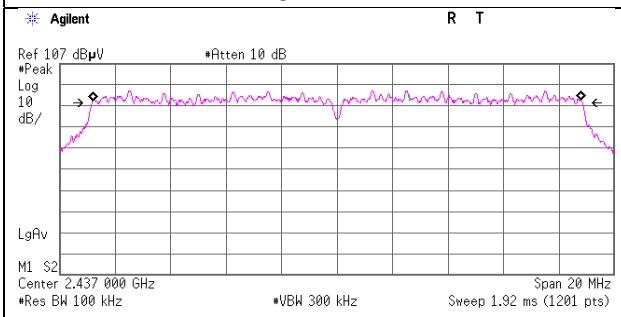
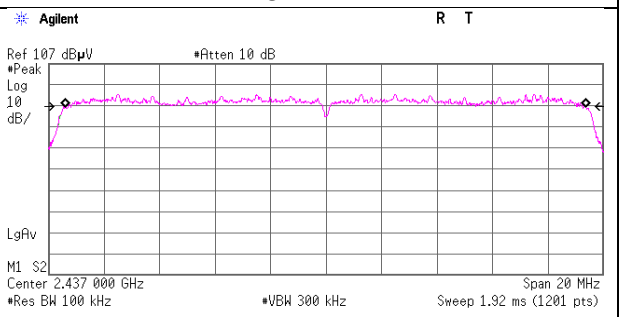
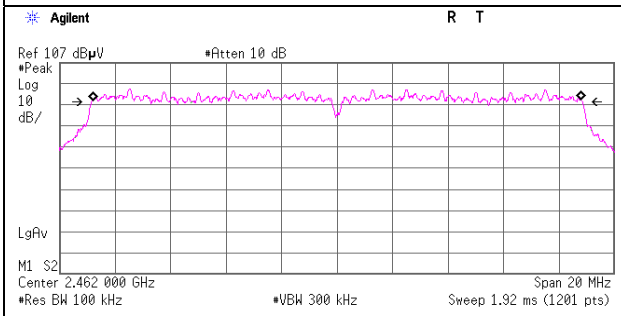
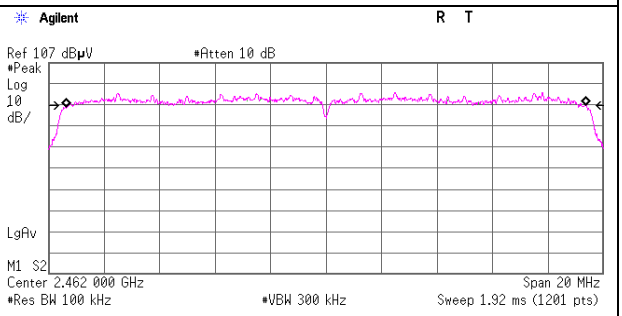
2437 MHz



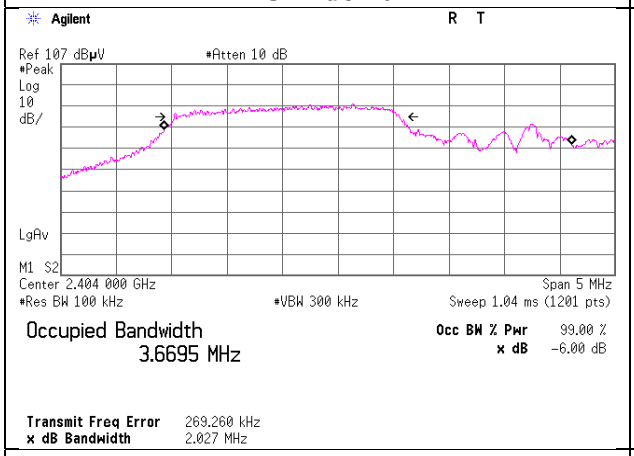
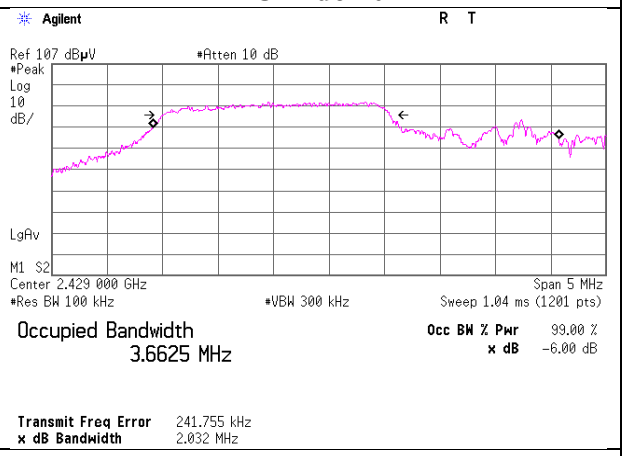
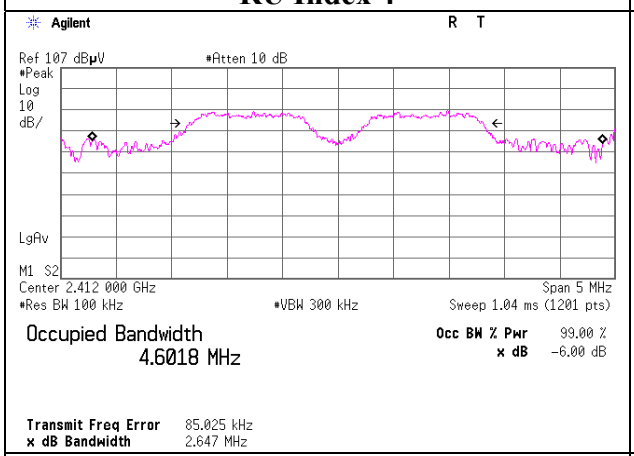
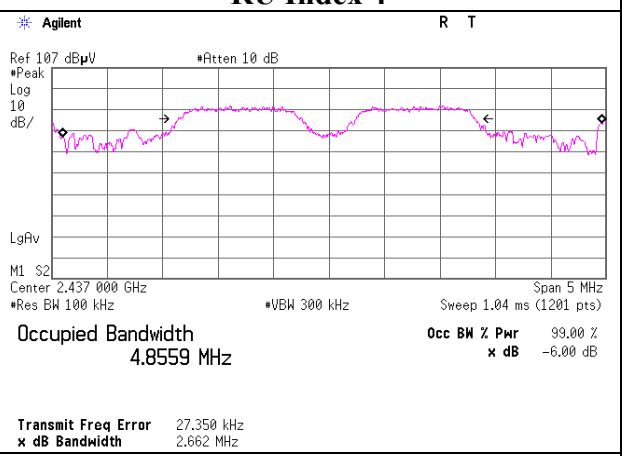
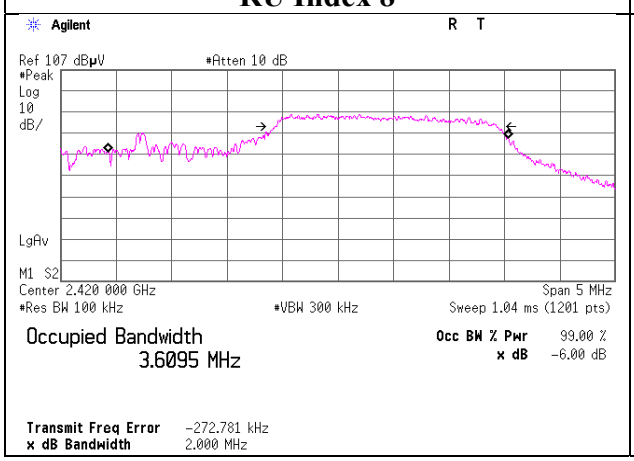
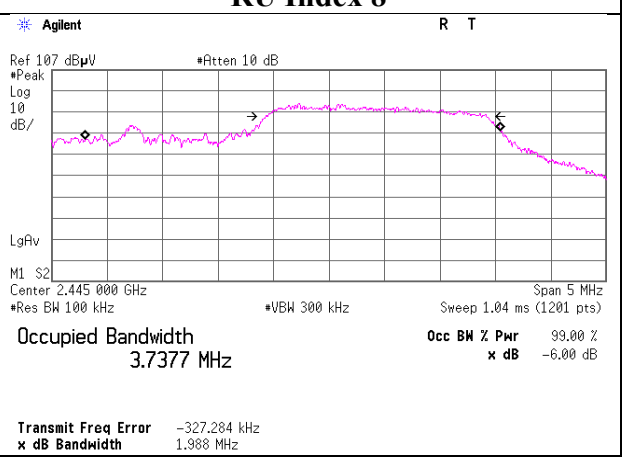
2462 MHz



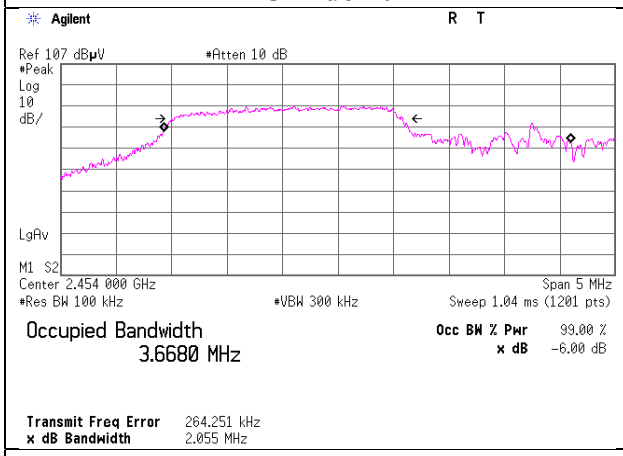
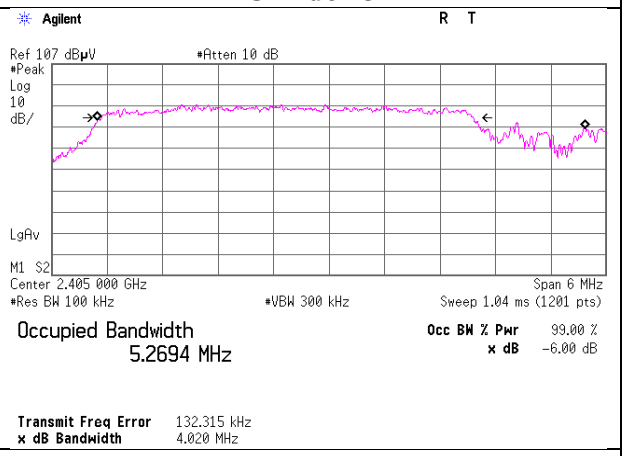
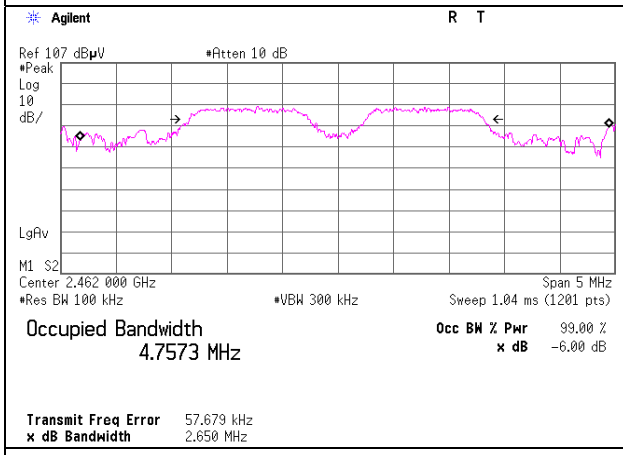
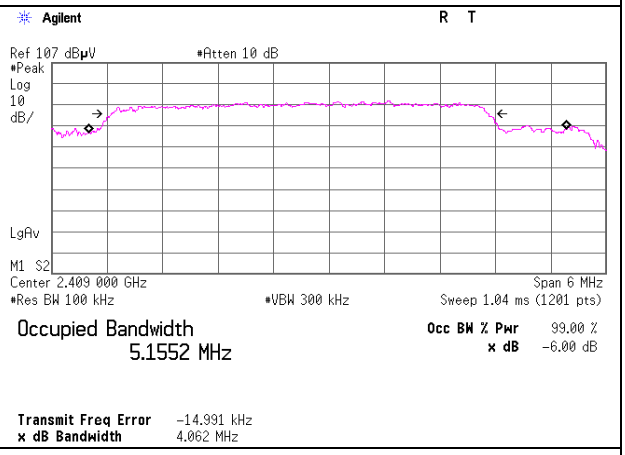
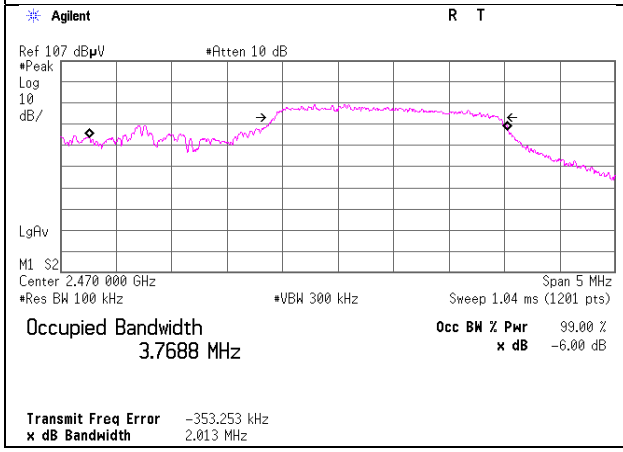
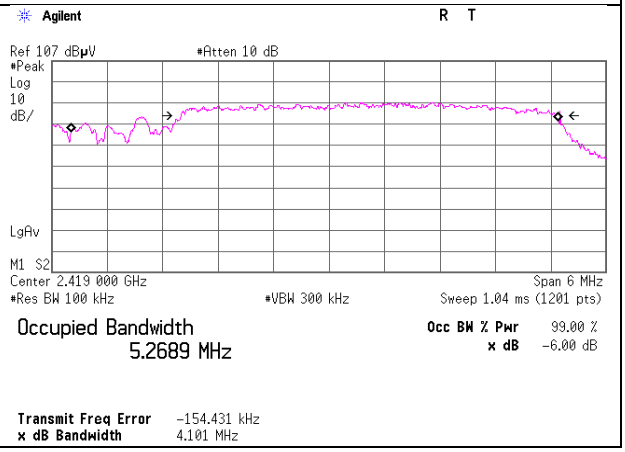
6dB Bandwidth

11n-20	11ax-20 OFDM
2412 MHz	**2412 MHz**
	
2437 MHz	**2437 MHz**
	
2462 MHz	**2462 MHz**
	

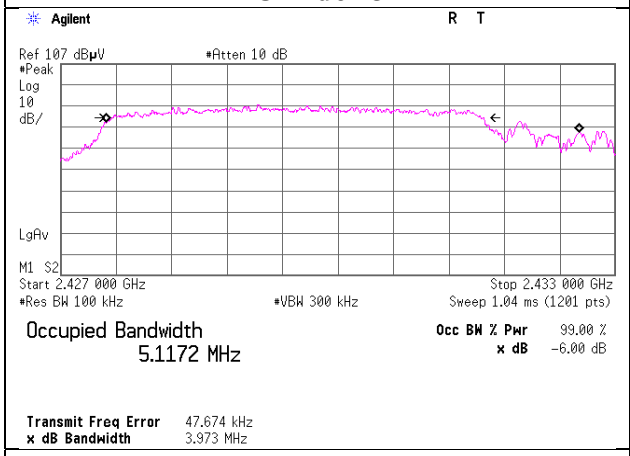
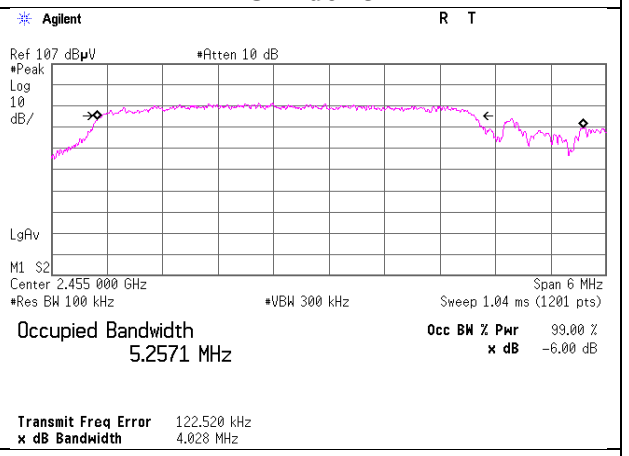
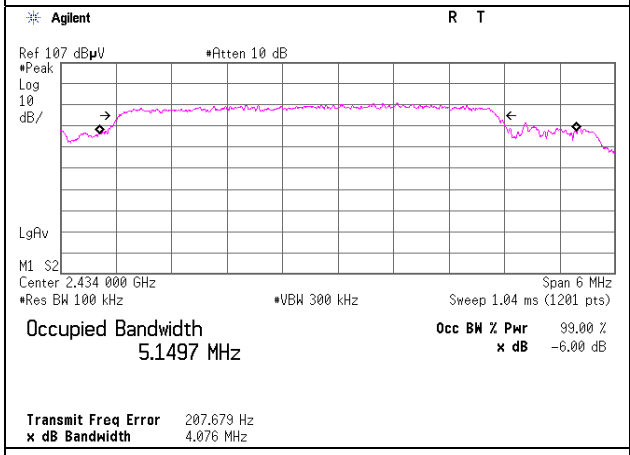
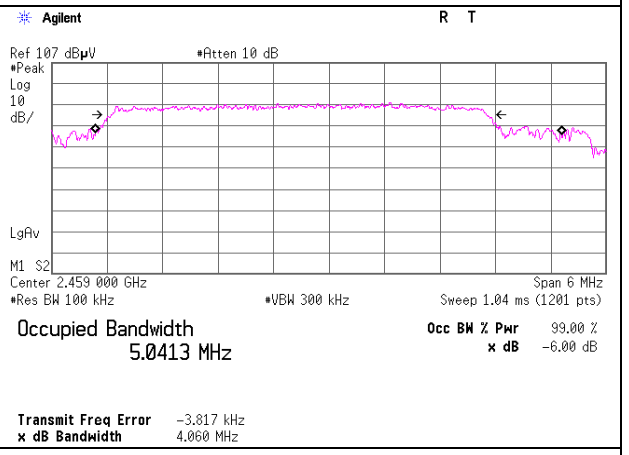
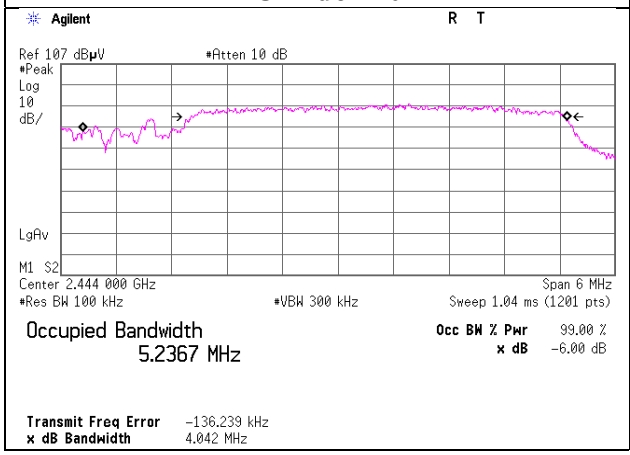
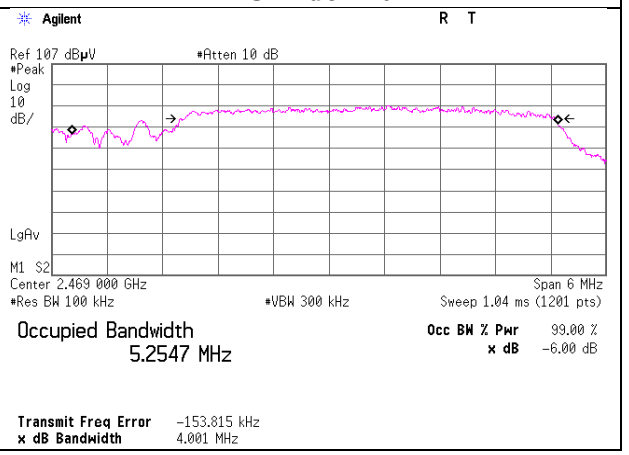
6dB Bandwidth

11ax-20 26-tone RU 2412 MHz	11ax-20 26-tone RU 2437 MHz
RU Index 0	**RU Index 0**
	
RU Index 4	**RU Index 4**
	
RU Index 8	**RU Index 8**
	

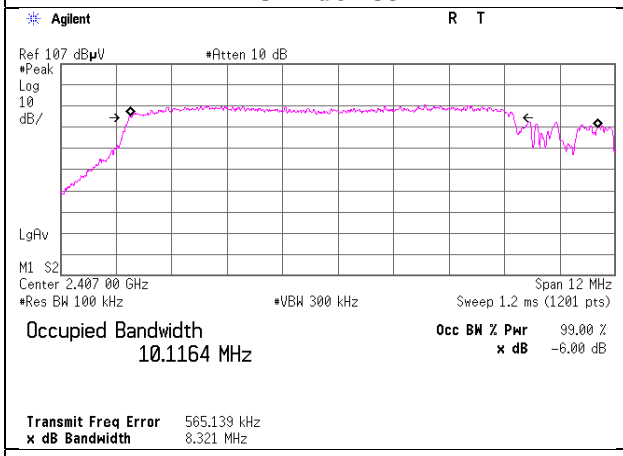
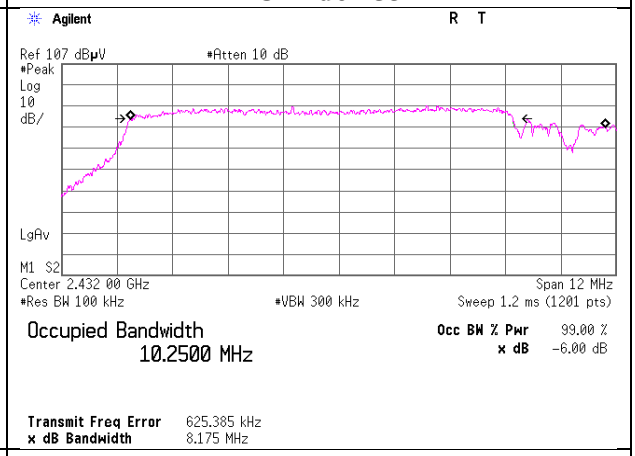
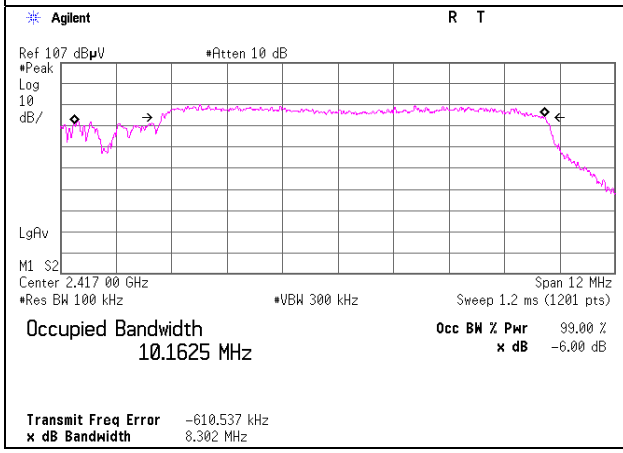
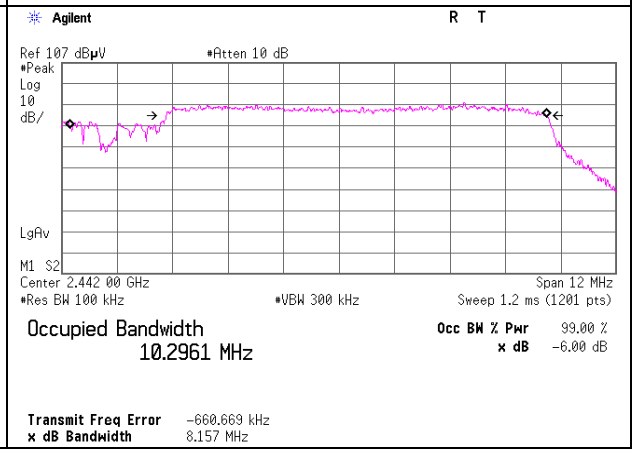
6dB Bandwidth

11ax-20 26-tone RU 2462 MHz	11ax-20 52-tone RU 2412 MHz
RU Index 0	**RU Index 37**
	
RU Index 4	**RU Index 38**
	
RU Index 8	**RU Index 40**
	

6dB Bandwidth

11ax-20 52-tone RU 2437 MHz	11ax-20 52-tone RU 2462 MHz
RU Index 37	**RU Index 37**
	
RU Index 38	**RU Index 38**
	
RU Index 40	**RU Index 40**
	

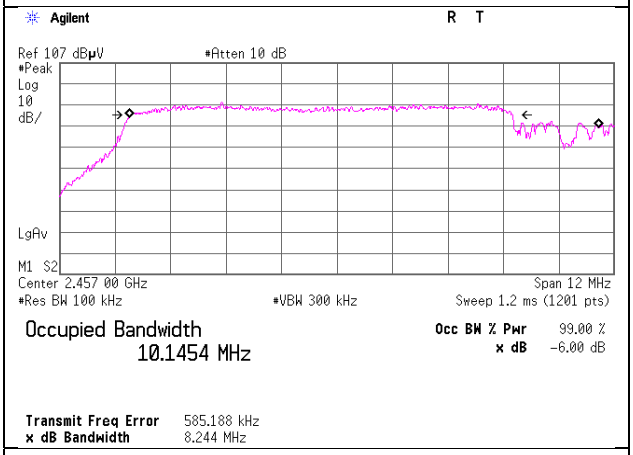
6dB Bandwidth

11ax-20 106-tone RU 2412 MHz	11ax-20 106-tone RU 2437 MHz
RU Index 53	**RU Index 53**
	
RU Index 54	**RU Index 54**
	

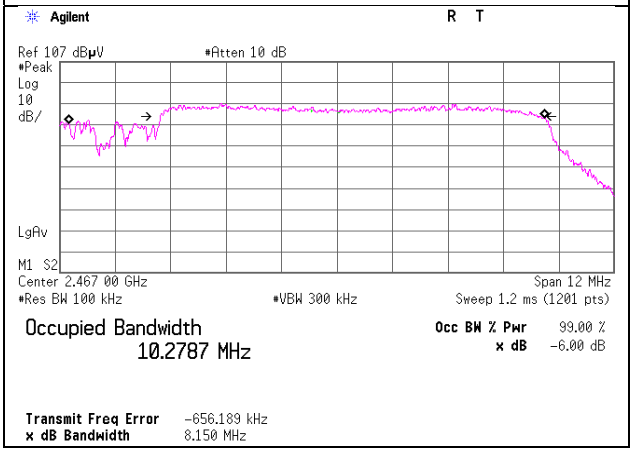
6dB Bandwidth

11ax-20
106-tone RU
2462 MHz

RU Index 53



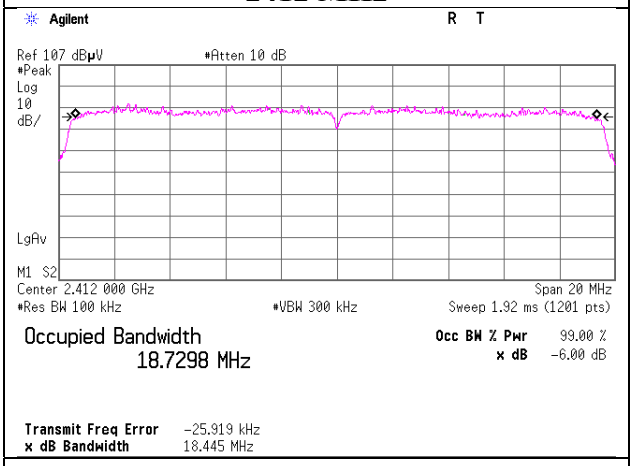
RU Index 54



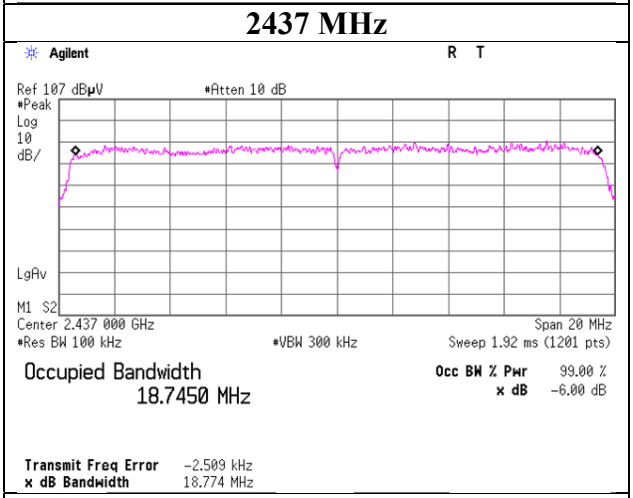
6dB Bandwidth

11ax-20
242-tone RU

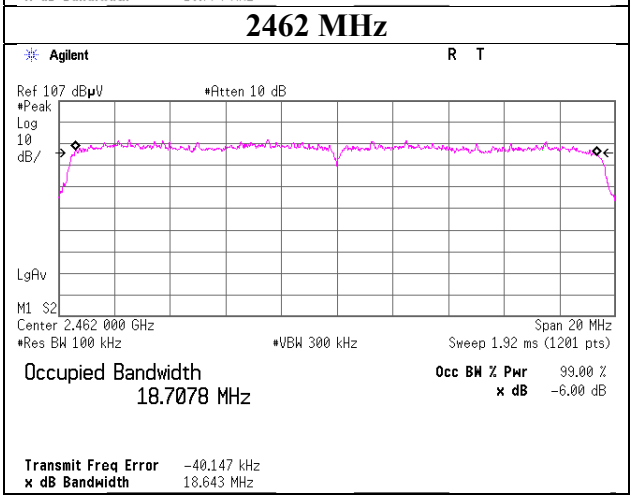
2412 MHz



2437 MHz



2462 MHz

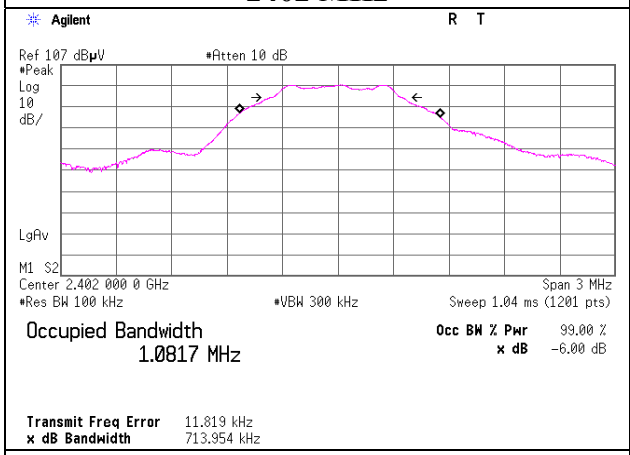


6dB Bandwidth

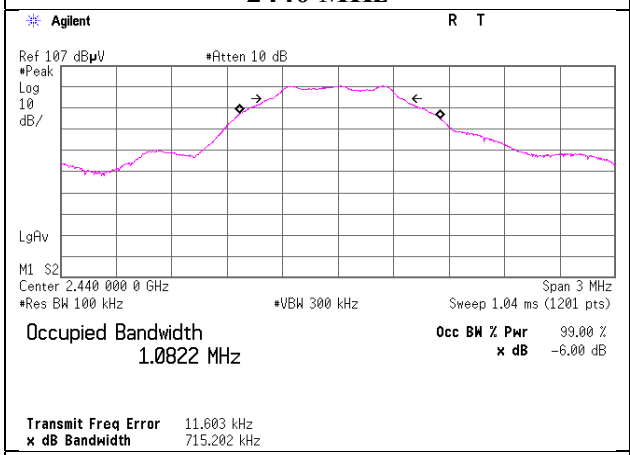
BT1

BT LE 1M-PHY

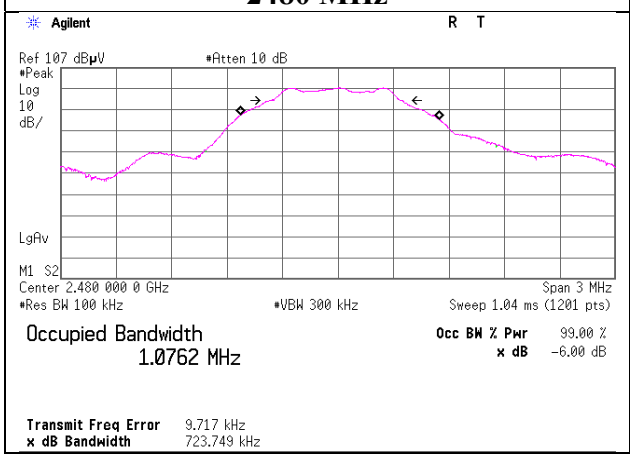
2402 MHz



2440 MHz

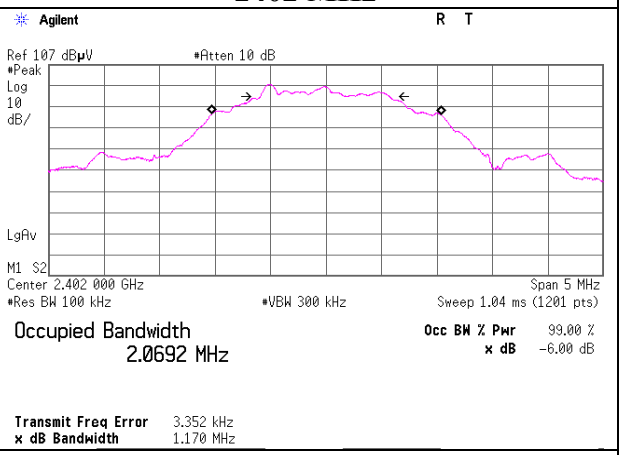


2480 MHz

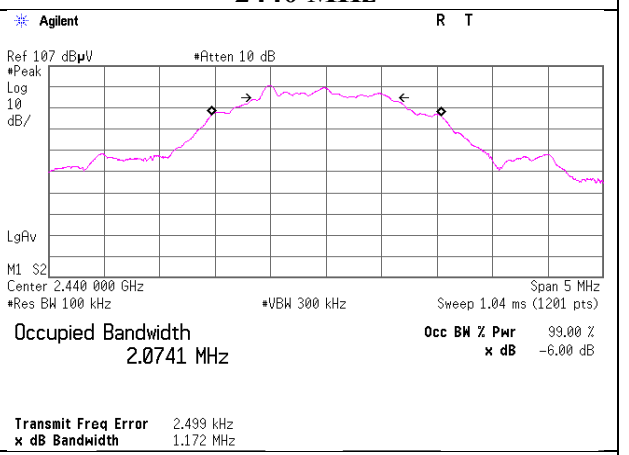


BT LE 2M-PHY

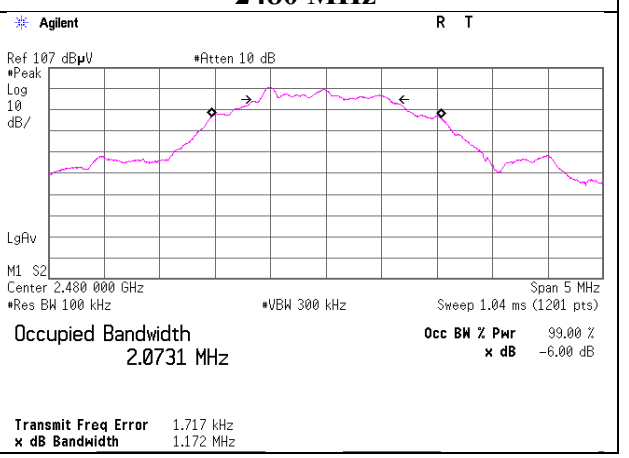
2402 MHz



2440 MHz



2480 MHz

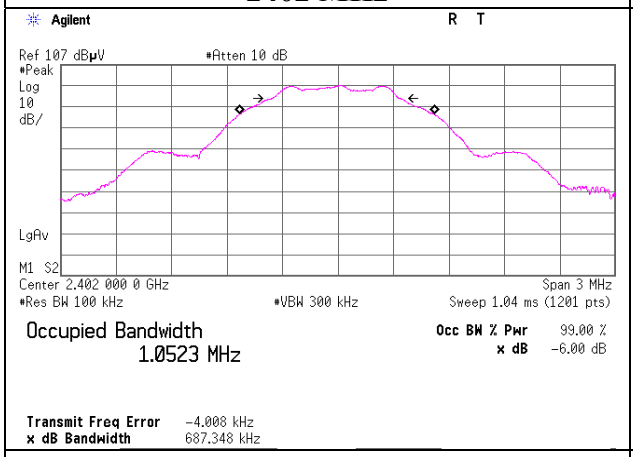


6dB Bandwidth

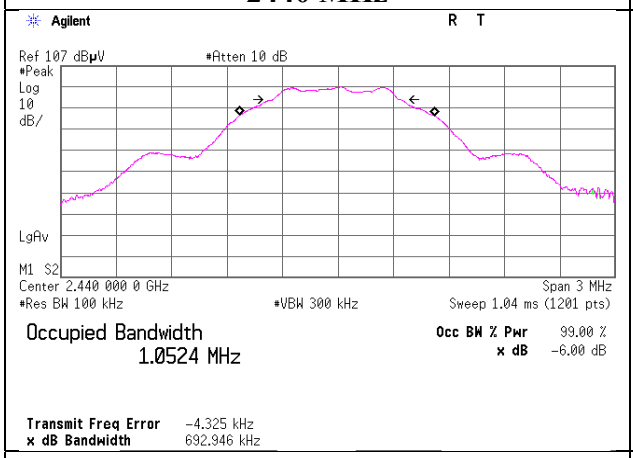
BT2

BT LE 1M-PHY

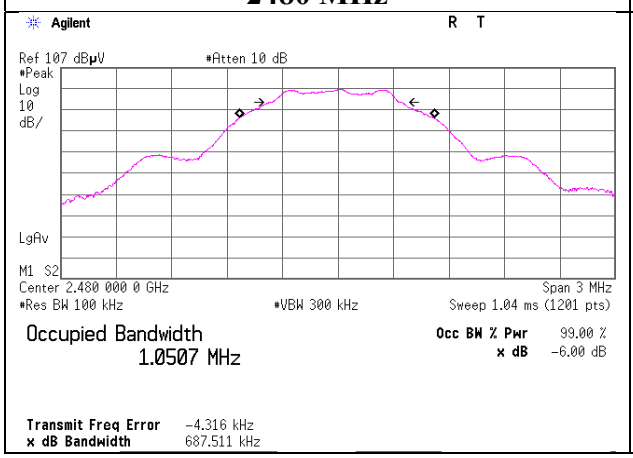
2402 MHz



2440 MHz

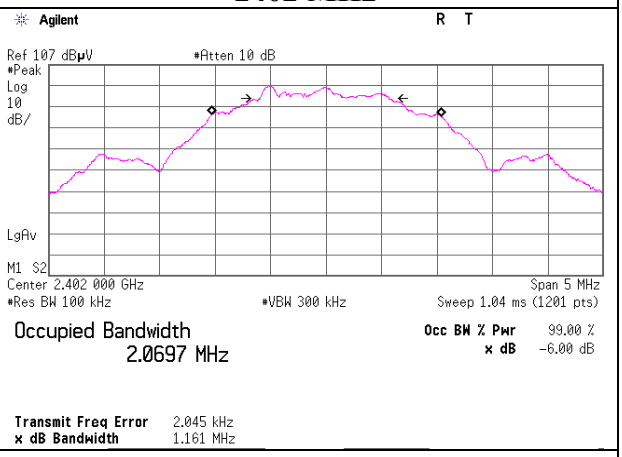


2480 MHz

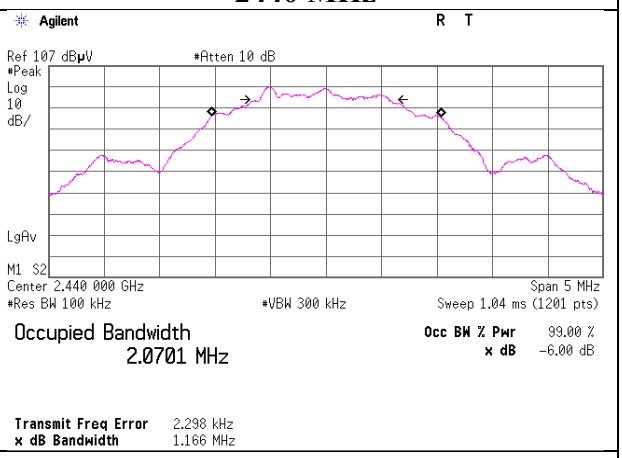


BT LE 2M-PHY

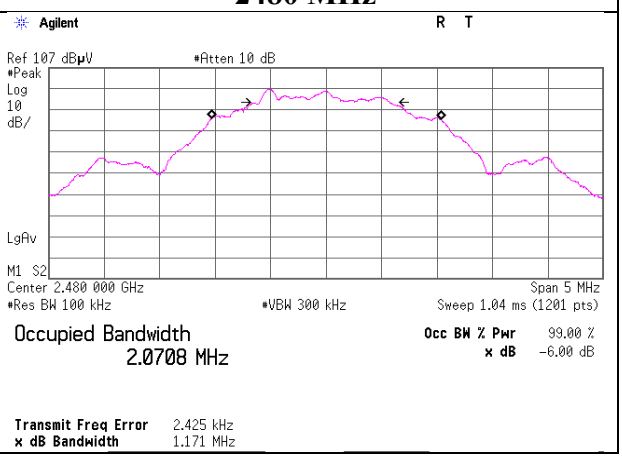
2402 MHz



2440 MHz



2480 MHz



Maximum Peak Output Power

Report No.	13170804H	
Test place	Ise EMC Lab. No.3 Measurement Room	
Date	December 16, 2019	December 17, 2019
Temperature / Humidity	24 deg. C / 30 % RH	23 deg. C / 39 % RH
Engineer	Takafumi Noguchi	Takafumi Noguchi
Mode	Tx 11b	

Antenna 1 + Antenna 2			Conducted Power					e.i.r.p.					
Freq.	Antenna 1 Result	Antenna 2 Result	Result		Limit		Margin	Antenna Gain	Result		Limit		Margin
[MHz]	[mW]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	8.39	10.09	12.67	18.49	26.99	500	14.32	9.01	21.68	147.19	36.02	4000.00	14.34
2437	8.79	10.69	12.90	19.48	26.99	500	14.09	9.01	21.91	155.10	36.02	4000.00	14.11
2462	8.99	10.72	12.95	19.71	26.99	500	14.04	9.01	21.96	156.92	36.02	4000.00	14.06

Sample Calculation:
Result = Antenna 1 + Antenna 2
e.i.r.p. Result = Conducted Power Result + Antenna Gain
*This Limit was reduced by the amount in dB (3.01 dB)
that the directional gain of the antenna/antenna array exceeding 6 dBi.

Antenna 1

Freq.	Reading	Cable Loss	Atten. Loss	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	-1.25	0.50	9.99	9.24	8.39
2437	-1.05	0.50	9.99	9.44	8.79
2462	-0.95	0.50	9.99	9.54	8.99

Antenna 2

Freq.	Reading	Cable Loss	Atten. Loss	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	-0.19	0.50	9.73	10.04	10.09
2437	0.06	0.50	9.73	10.29	10.69
2462	0.07	0.50	9.73	10.30	10.72

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

2412MHz

Rate	Antenna 1 Reading Peak		Antenna 2 Reading Peak		Total Reading Power		Remark
[Mbps]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
1	-0.60	0.87	-0.18	0.96	2.63	1.83	*
2	-0.63	0.86	-0.19	0.96	2.61	1.82	
5.5	-0.69	0.85	-0.20	0.95	2.57	1.81	
11	-0.69	0.85	-0.20	0.95	2.57	1.81	

*Worst Rate

The worst antenna gain was applied for e.i.r.p.

Maximum Peak Output Power

Report No.	13170804H	
Test place	Ise EMC Lab. No.3 Measurement Room	
Date	December 16, 2019	December 17, 2019
Temperature / Humidity	24 deg. C / 30 % RH	23 deg. C / 39 % RH
Engineer	Takafumi Noguchi	Takafumi Noguchi
Mode	Tx 11g	

Antenna 1 + Antenna 2

			Conducted Power					e.i.r.p.					
Freq.	Antenna 1 Result	Antenna 2 Result	Result		Limit		Margin	Antenna Gain	Result		Limit		Margin
[MHz]	[mW]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	59.70	70.96	21.16	130.66	26.99	500	5.83	9.01	30.17	1040.27	36.02	4000.00	5.85
2437	59.02	71.61	21.16	130.63	26.99	500	5.83	9.01	30.17	1040.06	36.02	4000.00	5.85
2462	60.39	73.79	21.28	134.19	26.99	500	5.71	9.01	30.29	1068.33	36.02	4000.00	5.73

Sample Calculation:
Result = Antenna 1 + Antenna 2
e.i.r.p. Result = Conducted Power Result + Antenna Gain
*This Limit was reduced by the amount in dB (3.01 dB)
that the directional gain of the antenna/antenna array exceeding 6 dBi.

Antenna 1

Freq.	Reading	Cable Loss	Atten. Loss	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	7.27	0.50	9.99	17.76	59.70
2437	7.22	0.50	9.99	17.71	59.02
2462	7.32	0.50	9.99	17.81	60.39

Antenna 2

Freq.	Reading	Cable Loss	Atten. Loss	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	8.28	0.50	9.73	18.51	70.96
2437	8.32	0.50	9.73	18.55	71.61
2462	8.45	0.50	9.73	18.68	73.79

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

2412MHz

Rate	Antenna 1 Reading Peak		Antenna 2 Reading Peak		Total Reading Power		Remark
[Mbps]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
6	7.63	5.79	8.27	6.71	10.97	12.51	
9	7.66	5.83	8.24	6.67	10.97	12.50	
12	7.42	5.52	7.95	6.24	10.70	11.76	
18	7.33	5.41	8.22	6.64	10.81	12.04	
24	7.67	5.85	8.27	6.71	10.99	12.56	*
36	7.00	5.01	7.63	5.79	10.34	10.81	
48	7.53	5.66	8.19	6.59	10.88	12.25	
54	7.50	5.62	8.22	6.64	10.89	12.26	

*Worst Rate

The worst antenna gain was applied for e.i.r.p.

Maximum Peak Output Power

Report No.	13170804H	
Test place	Ise EMC Lab. No.3 Measurement Room	
Date	December 16, 2019	December 17, 2019
Temperature / Humidity	24 deg. C / 30 % RH	23 deg. C / 39 % RH
Engineer	Takafumi Noguchi	Takafumi Noguchi
Mode	Tx 11n-20	

Antenna 1 + Antenna 2

Freq.	Antenna 1 Result	Antenna 2 Result	Conducted Power Result		Conducted Power Limit		Conducted Power Margin	e.i.r.p. Antenna Gain	e.i.r.p. Result		e.i.r.p. Limit		e.i.r.p. Margin
[MHz]	[mW]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	63.97	84.14	21.71	148.11	26.99	500	5.28	9.01	30.72	1179.22	36.02	4000.00	5.30
2437	66.07	90.99	21.96	157.06	26.99	500	5.03	9.01	30.97	1250.45	36.02	4000.00	5.05
2462	68.87	91.41	22.05	160.28	26.99	500	4.94	9.01	31.06	1276.06	36.02	4000.00	4.96

Sample Calculation:
Result = Antenna 1 + Antenna 2
e.i.r.p. Result = Conducted Power Result + Antenna Gain
*This Limit was reduced by the amount in dB (3.01 dB)
that the directional gain of the antenna/antenna array exceeding 6 dBi.

Antenna 1

Freq.	Reading	Cable Loss	Atten. Loss	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	7.57	0.50	9.99	18.06	63.97
2437	7.71	0.50	9.99	18.20	66.07
2462	7.89	0.50	9.99	18.38	68.87

Antenna 2

Freq.	Reading	Cable Loss	Atten. Loss	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	9.02	0.50	9.73	19.25	84.14
2437	9.36	0.50	9.73	19.59	90.99
2462	9.38	0.50	9.73	19.61	91.41

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

2412MHz

MCS Number	Antenna 1 Reading Peak		Antenna 2 Reading Peak		Total Reading Power		Remark
	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
0	7.98	6.28	8.54	7.14	11.28	13.43	
1	7.97	6.27	8.54	7.14	11.27	13.41	
2	7.82	6.05	8.55	7.16	11.21	13.21	
3	7.87	6.12	8.54	7.14	11.23	13.27	
4	7.83	6.07	8.65	7.33	11.27	13.40	
5	7.92	6.19	8.67	7.36	11.32	13.56	
6	7.92	6.19	8.35	6.84	11.15	13.03	
7	7.82	6.05	8.38	6.89	11.12	12.94	
8	7.73	5.93	8.45	7.00	11.12	12.93	
9	7.08	5.11	8.54	7.14	10.88	12.25	
10	7.59	5.74	8.37	6.87	11.01	12.61	
11	7.93	6.21	8.62	7.28	11.30	13.49	
12	7.97	6.27	8.55	7.16	11.28	13.43	
13	7.52	5.65	7.98	6.28	10.77	11.93	
14	8.06	6.40	9.00	7.94	11.57	14.34	*
15	7.45	5.56	8.84	7.66	11.21	13.22	

*Worst MCS
All comparison were carried out on same frequency and measurement factors.

The worst antenna gain was applied for e.i.r.p.

Maximum Peak Output Power

Report No.	13170804H	
Test place	Ise EMC Lab. No.3 Measurement Room	
Date	December 16, 2019	December 17, 2019
Temperature / Humidity	24 deg. C / 30 % RH	23 deg. C / 39 % RH
Engineer	Takafumi Noguchi	Takafumi Noguchi
Mode	Tx 11ax-20 (OFDM)	

Antenna 1 + Antenna 2

			Conducted Power					e.i.r.p.					
Freq.	Antenna 1 Result	Antenna 2 Result	Result		Limit		Margin	Antenna Gain	Result		Limit		Margin
[MHz]	[mW]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	73.45	89.95	22.13	163.40	26.99	500	4.86	9.01	31.14	1300.93	36.02	4000.00	4.88
2437	78.16	96.38	22.42	174.55	26.99	500	4.57	9.01	31.43	1389.66	36.02	4000.00	4.59
2462	79.80	100.23	22.55	180.03	26.99	500	4.44	9.01	31.56	1433.33	36.02	4000.00	4.46

Sample Calculation:
Result = Antenna 1 + Antenna 2
e.i.r.p. Result = Conducted Power Result + Antenna Gain
*This Limit was reduced by the amount in dB (3.01 dB)
that the directional gain of the antenna/antenna array exceeding 6 dBi.

Antenna 1

Freq.	Reading	Cable Loss	Atten. Loss	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	8.17	0.50	9.99	18.66	73.45
2437	8.44	0.50	9.99	18.93	78.16
2462	8.53	0.50	9.99	19.02	79.80

Antenna 2

Freq.	Reading	Cable Loss	Atten. Loss	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	9.31	0.50	9.73	19.54	89.95
2437	9.61	0.50	9.73	19.84	96.38
2462	9.78	0.50	9.73	20.01	100.23

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

2412MHz

Mode	MCS Number	Antenna 1 Reading Peak		Antenna 2 Reading Peak		Total Reading Power		Remark
		[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
1TX	0	7.90	6.17	8.60	7.24	11.27	13.41	
	1	8.66	7.35	8.93	7.82	11.81	15.16	
	2	8.37	6.87	8.89	7.74	11.65	14.62	
	3	8.14	6.52	8.80	7.59	11.49	14.10	
	4	8.05	6.38	8.95	7.85	11.53	14.23	
	5	8.30	6.76	8.94	7.83	11.64	14.60	
	6	8.76	7.52	9.38	8.67	12.09	16.19	*
	7	8.32	6.79	9.14	8.20	11.76	15.00	
	8	8.32	6.79	8.90	7.76	11.63	14.55	
	9	7.93	6.21	8.90	7.76	11.45	13.97	
	10	8.00	6.31	8.82	7.62	11.44	13.93	
	11	8.17	6.56	8.96	7.87	11.59	14.43	
2TX	0	7.90	6.17	9.19	8.30	11.60	14.46	
	1	9.44	8.79	8.59	7.23	12.05	16.02	
	2	7.60	5.75	8.88	7.73	11.30	13.48	
	3	7.98	6.28	9.20	8.32	11.64	14.60	
	4	7.64	5.81	8.65	7.33	11.18	13.14	
	5	7.74	5.94	8.68	7.38	11.25	13.32	
	6	8.19	6.59	9.01	7.96	11.63	14.55	
	7	8.08	6.43	8.86	7.69	11.50	14.12	
	8	7.98	6.28	8.71	7.43	11.37	13.71	
	9	8.20	6.61	8.77	7.53	11.50	14.14	
	10	8.31	6.78	8.90	7.76	11.63	14.54	
	11	8.97	7.89	9.04	8.02	12.02	15.91	

*Worst MCS

The worst antenna gain was applied for e.i.r.p.

Maximum Peak Output Power

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	February 7, 2020
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Takafumi Noguchi
Mode	Tx 11ax-20 (26-tone RU)

Antenna 1 + Antenna 2

Freq.	RU Type	RU Index	Antenna 1 Result	Antenna 2 Result	Conducted Power Result		Conducted Power Limit		Margin	e.i.r.p. Antenna Gain	e.i.r.p. Result		e.i.r.p. Limit		Margin
[MHz]			[mW]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	26-tone RU	0	7.53	8.11	11.94	15.64	26.99	500	15.05	9.01	20.95	124.54	36.02	4000.00	15.07
		4	7.94	7.98	12.02	15.92	26.99	500	14.97	9.01	21.03	126.77	36.02	4001.00	14.99
		8	7.48	7.53	11.77	15.02	26.99	500	15.22	9.01	20.78	119.55	36.02	4002.00	15.25
2437		0	7.28	7.33	11.65	14.61	26.99	500	15.34	9.01	20.66	116.29	36.02	4000.00	15.37
		4	6.10	7.05	11.19	13.14	26.99	500	15.80	9.01	20.20	104.63	36.02	4001.00	15.82
		8	6.15	7.98	11.50	14.13	26.99	500	15.49	9.01	20.51	112.51	36.02	4002.00	15.51
2462		0	7.62	8.63	12.11	16.25	26.99	500	14.88	9.01	21.12	129.38	36.02	4000.00	14.90
		4	8.34	8.39	12.24	16.73	26.99	500	14.75	9.01	21.25	133.21	36.02	4001.00	14.78
		8	7.91	7.93	12.00	15.83	26.99	500	14.99	9.01	21.01	126.05	36.02	4002.00	15.02

Sample Calculation:
Result = Antenna 1 + Antenna 2
e.i.r.p. Result = Conducted Power Result + Antenna Gain
*This Limit was reduced by the amount in dB (3.01 dB)
that the directional gain of the antenna/antenna array exceeding 6 dBi.

Antenna 1

Freq.	RU Type	RU Index	Reading	Cable Loss	Atten. Loss	Result	
[MHz]			[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	26-tone RU	0	-5.78	4.82	9.73	8.77	7.53
		4	-5.55	4.82	9.73	9.00	7.94
		8	-5.81	4.82	9.73	8.74	7.48
2437		0	-5.93	4.82	9.73	8.62	7.28
		4	-6.70	4.82	9.73	7.85	6.10
		8	-6.66	4.82	9.73	7.89	6.15
2462		0	-5.72	4.81	9.73	8.82	7.62
		4	-5.33	4.81	9.73	9.21	8.34
		8	-5.56	4.81	9.73	8.98	7.91

Antenna 2

Freq.	RU Type	RU Index	Reading	Cable Loss	Atten. Loss	Result	
[MHz]			[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	26-tone RU	0	-5.46	4.82	9.73	9.09	8.11
		4	-5.53	4.82	9.73	9.02	7.98
		8	-5.78	4.82	9.73	8.77	7.53
2437		0	-5.90	4.82	9.73	8.65	7.33
		4	-6.07	4.82	9.73	8.48	7.05
		8	-5.53	4.82	9.73	9.02	7.98
2462		0	-5.18	4.81	9.73	9.36	8.63
		4	-5.30	4.81	9.73	9.24	8.39
		8	-5.55	4.81	9.73	8.99	7.93

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

The worst antenna gain was applied for e.i.r.p.

Maximum Peak Output Power

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	February 7, 2020
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Takafumi Noguchi
Mode	Tx 11ax-20 (52-tone RU)

Antenna 1 + Antenna 2

Freq.	RU Type	RU Index	Antenna 1 Result	Antenna 2 Result	Conducted Power Result		Conducted Power Limit		Margin	Antenna Gain	e.i.r.p. Result		e.i.r.p. Limit		Margin
[MHz]			[mW]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	52-tone RU	37	16.11	17.26	15.23	33.36	26.99	500	11.76	9.01	24.24	265.64	36.02	4000.00	11.78
		38	19.91	20.42	16.06	40.32	26.99	500	10.93	9.01	25.07	321.04	36.02	4001.00	10.96
		40	16.41	16.44	15.17	32.85	26.99	500	11.82	9.01	24.18	261.54	36.02	4002.00	11.85
2437		37	14.06	15.21	14.66	29.27	26.99	500	12.33	9.01	23.67	233.00	36.02	4000.00	12.35
		38	15.17	15.52	14.87	30.69	26.99	500	12.12	9.01	23.88	244.38	36.02	4001.00	12.14
		40	13.06	17.06	14.79	30.12	26.99	500	12.20	9.01	23.80	239.82	36.02	4002.00	12.22
2462		37	16.94	18.28	15.47	35.22	26.99	500	11.52	9.01	24.48	280.44	36.02	4000.00	11.54
		38	19.86	19.91	16.00	39.77	26.99	500	10.99	9.01	25.01	316.61	36.02	4001.00	11.02
		40	16.29	16.37	15.14	32.66	26.99	500	11.85	9.01	24.15	260.03	36.02	4002.00	11.87

Sample Calculation:
Result = Antenna 1 + Antenna 2
e.i.r.p. Result = Conducted Power Result + Antenna Gain
*This Limit was reduced by the amount in dB (3.01 dB)
that the directional gain of the antenna/antenna array exceeding 6 dBi.

Antenna 1

Freq.	RU Type	RU Index	Reading	Cable Loss	Atten. Loss	Result	
[MHz]			[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	52-tone RU	37	-2.48	4.82	9.73	12.07	16.11
		38	-1.56	4.82	9.73	12.99	19.91
		40	-2.40	4.82	9.73	12.15	16.41
2437		37	-3.07	4.82	9.73	11.48	14.06
		38	-2.74	4.82	9.73	11.81	15.17
		40	-3.39	4.82	9.73	11.16	13.06
2462		37	-2.25	4.81	9.73	12.29	16.94
		38	-1.56	4.81	9.73	12.98	19.86
		40	-2.42	4.81	9.73	12.12	16.29

Antenna 2

Freq.	RU Type	RU Index	Reading	Cable Loss	Atten. Loss	Result	
[MHz]			[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	52-tone RU	37	-2.18	4.82	9.73	12.37	17.26
		38	-1.45	4.82	9.73	13.10	20.42
		40	-2.39	4.82	9.73	12.16	16.44
2437		37	-2.73	4.82	9.73	11.82	15.21
		38	-2.64	4.82	9.73	11.91	15.52
		40	-2.23	4.82	9.73	12.32	17.06
2462		37	-1.92	4.81	9.73	12.62	18.28
		38	-1.55	4.81	9.73	12.99	19.91
		40	-2.40	4.81	9.73	12.14	16.37

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

The worst antenna gain was applied for e.i.r.p.

Maximum Peak Output Power

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	February 7, 2020
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Takafumi Noguchi
Mode	Tx 11ax-20 (106-tone RU)

Antenna 1 + Antenna 2

					Conducted Power					e.i.r.p.					
Freq.	RU Type	RU Index	Antenna 1 Result	Antenna 2 Result	Result		Limit		Margin	Antenna Gain	Result		Limit		Margin
[MHz]			[mW]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	106-tone RU	53	33.88	35.08	18.39	68.96	26.99	500	8.60	9.01	27.40	549.03	36.02	4000.00	8.62
		54	31.99	31.99	18.06	63.98	26.99	500	8.93	9.01	27.07	509.37	36.02	4002.00	8.95
2437		53	32.73	33.27	18.20	66.00	26.99	500	8.79	9.01	27.21	525.47	36.02	4000.00	8.82
		54	28.64	32.89	17.89	61.53	26.99	500	9.10	9.01	26.90	489.85	36.02	4002.00	9.12
2462		53	34.83	35.32	18.46	70.15	26.99	500	8.53	9.01	27.47	558.52	36.02	4000.00	8.55
		54	33.42	34.59	18.33	68.01	26.99	500	8.66	9.01	27.34	541.50	36.02	4002.00	8.69

Sample Calculation:
Result = Antenna 1 + Antenna 2
e.i.r.p. Result = Conducted Power Result + Antenna Gain
*This Limit was reduced by the amount in dB (3.01 dB)
that the directional gain of the antenna/antenna array exceeding 6 dBi.

Antenna 1

Freq.	RU Type	RU Index	Reading	Cable Loss	Atten. Loss	Result	
[MHz]			[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	106-tone RU	53	0.75	4.82	9.73	15.30	33.88
		54	0.50	4.82	9.73	15.05	31.99
2437		53	0.60	4.82	9.73	15.15	32.73
		54	0.02	4.82	9.73	14.57	28.64
2462		53	0.88	4.81	9.73	15.42	34.83
		54	0.70	4.81	9.73	15.24	33.42

Antenna 2

Freq.	RU Type	RU Index	Reading	Cable Loss	Atten. Loss	Result	
[MHz]			[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	106-tone RU	53	0.90	4.82	9.73	15.45	35.08
		54	0.50	4.82	9.73	15.05	31.99
2437		53	0.67	4.82	9.73	15.22	33.27
		54	0.62	4.82	9.73	15.17	32.89
2462		53	0.94	4.81	9.73	15.48	35.32
		54	0.85	4.81	9.73	15.39	34.59

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

The worst antenna gain was applied for e.i.r.p.

Maximum Peak Output Power

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	March 28, 2020
Temperature / Humidity	24 deg. C / 51 % RH
Engineer	Takafumi Noguchi
Mode	Tx 11ax-20 (242-tone RU)

Antenna 1 + Antenna 2

			Conducted Power					e.i.r.p.					
Freq.	Antenna 1 Result	Antenna 2 Result	Result		Limit		Margin	Antenna Gain	Result		Limit		Margin
[MHz]	[mW]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	73.45	73.79	21.68	147.24	26.99	500	5.31	9.01	30.69	1172.28	36.02	4000.00	5.33
2437	65.16	75.16	21.47	140.33	26.99	500	5.52	9.01	30.48	1117.21	36.02	4000.00	5.54
2462	74.82	76.91	21.81	151.73	26.99	500	5.18	9.01	30.82	1208.01	36.02	4000.00	5.20

Sample Calculation:
Result = Antenna 1 + Antenna 2
e.i.r.p. Result = Conducted Power Result + Antenna Gain
*This Limit was reduced by the amount in dB (3.01 dB)
that the directional gain of the antenna/antenna array exceeding 6 dBi.

Antenna 1

Freq.	Reading	Cable Loss	Atten. Loss	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	4.11	4.82	9.73	18.66	73.45
2437	3.59	4.82	9.73	18.14	65.16
2462	4.20	4.81	9.73	18.74	74.82

Antenna 2

Freq.	Reading	Cable Loss	Atten. Loss	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	4.13	4.82	9.73	18.68	73.79
2437	4.21	4.82	9.73	18.76	75.16
2462	4.32	4.81	9.73	18.86	76.91

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

The worst antenna gain was applied for e.i.r.p.

Maximum Peak Output Power

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	December 19, 2019
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Takafumi Noguchi
Mode	Tx BT LE

BT1

Mode	Freq.	Reading	Cable Loss	Atten. Loss	Conducted Power Result		Limit		Margin	Antenna Gain	e.i.r.p. for RSS-247 Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]	[dB]
1M-PHY	2402.0	-8.73	0.50	9.73	1.50	1.41	20.96	125	19.46	5.80	7.30	5.37	36.02	4000	28.72
	2440.0	-8.72	0.50	9.73	1.51	1.42	20.96	125	19.45	5.80	7.31	5.38	36.02	4000	28.71
	2480.0	-8.74	0.50	9.73	1.49	1.41	20.96	125	19.47	5.80	7.29	5.36	36.02	4000	28.73
2M-PHY	2402.0	-8.70	0.50	9.73	1.53	1.42	20.96	125	19.43	5.80	7.33	5.41	36.02	4000	28.69
	2440.0	-8.69	0.50	9.73	1.54	1.43	20.96	125	19.42	5.80	7.34	5.42	36.02	4000	28.68
	2480.0	-8.71	0.50	9.73	1.52	1.42	20.96	125	19.44	5.80	7.32	5.40	36.02	4000	28.70

BT2

Mode	Freq.	Reading	Cable Loss	Atten. Loss	Conducted Power Result		Limit		Margin	Antenna Gain	e.i.r.p. for RSS-247 Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]	[dB]
1M-PHY	2402.0	-8.38	0.50	9.99	2.11	1.63	20.96	125	18.85	5.80	7.91	6.18	36.02	4000	28.11
	2440.0	-8.44	0.50	9.99	2.05	1.60	20.96	125	18.91	5.80	7.85	6.10	36.02	4000	28.17
	2480.0	-8.57	0.50	9.99	1.92	1.56	20.96	125	19.04	5.80	7.72	5.92	36.02	4000	28.30
2M-PHY	2402.0	-8.35	0.50	9.99	2.14	1.64	20.96	125	18.82	5.80	7.94	6.22	36.02	4000	28.08
	2440.0	-8.42	0.50	9.99	2.07	1.61	20.96	125	18.89	5.80	7.87	6.12	36.02	4000	28.15
	2480.0	-8.55	0.50	9.99	1.94	1.56	20.96	125	19.02	5.80	7.74	5.94	36.02	4000	28.28

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

*The equipment and cables were not used for factor 0 dB of the data sheets.

The worst antenna gain was applied for e.i.r.p.

Average Output Power
(Reference data for RF Exposure)

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	December 17, 2019
Temperature / Humidity	23 deg. C / 39 % RH
Engineer	Takafumi Noguchi
Mode	Tx 11b

Antenna 1 + Antenna 2

Freq.	Antenna 1 Result	Antenna 2 Result	Result (Burst average)	
[MHz]	[mW]	[mW]	[dBm]	[mW]
2412	4.38	5.27	9.84	9.65
2437	4.55	5.61	10.07	10.16
2462	4.67	5.65	10.14	10.32

Sample Calculation:
Result = Antenna 1 + Antenna 2

11b **1 Mbps** Antenna 1

Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	-4.08	0.50	9.99	6.41	4.38	0.00	6.41	4.38
2437	-3.91	0.50	9.99	6.58	4.55	0.00	6.58	4.55
2462	-3.80	0.50	9.99	6.69	4.67	0.00	6.69	4.67

11b **1 Mbps** Antenna 2

Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	-3.01	0.50	9.73	7.22	5.27	0.00	7.22	5.27
2437	-2.74	0.50	9.73	7.49	5.61	0.00	7.49	5.61
2462	-2.71	0.50	9.73	7.52	5.65	0.00	7.52	5.65

Sample Calculation:
Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss
Result (Burst power average) = Time average + Duty factor

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Average Output Power
(Reference data for RF Exposure)

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	December 17, 2019
Temperature / Humidity	23 deg. C / 39 % RH
Engineer	Takafumi Noguchi
Mode	Tx 11g

Antenna 1 + Antenna 2

Freq.	Antenna 1 Result	Antenna 2 Result	Result (Burst average)	
[MHz]	[mW]	[mW]	[dBm]	[mW]
2412	4.66	6.03	10.29	10.68
2437	4.93	6.37	10.53	11.30
2462	5.01	6.38	10.57	11.39

Sample Calculation:
Result = Antenna 1 + Antenna 2

11g **6 Mbps** Antenna 1

Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	-3.83	0.50	9.99	6.66	4.63	0.02	6.68	4.66
2437	-3.58	0.50	9.99	6.91	4.91	0.02	6.93	4.93
2462	-3.51	0.50	9.99	6.98	4.99	0.02	7.00	5.01

11g **6 Mbps** Antenna 2

Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	-2.45	0.50	9.73	7.78	6.00	0.02	7.80	6.03
2437	-2.21	0.50	9.73	8.02	6.34	0.02	8.04	6.37
2462	-2.20	0.50	9.73	8.03	6.35	0.02	8.05	6.38

Sample Calculation:
Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss
Result (Burst power average) = Time average + Duty factor

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Average Output Power
(Reference data for RF Exposure)

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	December 17, 2019
Temperature / Humidity	23 deg. C / 39 % RH
Engineer	Takafumi Noguchi
Mode	Tx 11n-20

Antenna 1 + Antenna 2

Freq.	Antenna 1 Result	Antenna 2 Result	Result (Burst average)	
[MHz]	[mW]	[mW]	[dBm]	[mW]
2412	4.67	6.04	10.30	10.71
2437	4.95	6.37	10.54	11.32
2462	5.02	6.43	10.59	11.45

Sample Calculation:
Result = Antenna 1 + Antenna 2

11n-20 **MCS 0** Antenna 1

Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	-3.83	0.50	9.99	6.66	4.63	0.03	6.69	4.67
2437	-3.57	0.50	9.99	6.92	4.92	0.03	6.95	4.95
2462	-3.51	0.50	9.99	6.98	4.99	0.03	7.01	5.02

11n-20 **MCS 0** Antenna 2

Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	-2.45	0.50	9.73	7.78	6.00	0.03	7.81	6.04
2437	-2.22	0.50	9.73	8.01	6.32	0.03	8.04	6.37
2462	-2.18	0.50	9.73	8.05	6.38	0.03	8.08	6.43

Sample Calculation:
Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss
Result (Burst power average) = Time average + Duty factor

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Average Output Power
(Reference data for RF Exposure)

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	December 17, 2019
Temperature / Humidity	23 deg. C / 39 % RH
Engineer	Takafumi Noguchi
Mode	Tx 11ax-20 (OFDM)

Antenna 1 + Antenna 2

Mode	Freq.	Antenna 1 Result	Antenna 2 Result	Result (Burst average)	
	[MHz]	[mW]	[mW]	[dBm]	[mW]
1TX	2412	4.95	6.41	10.56	11.37
	2437	5.14	6.70	10.73	11.84
	2462	5.24	6.71	10.77	11.95

Sample Calculation:
Result = Antenna 1 + Antenna 2

11ax-20 **MCS 0** Antenna 1

Mode	Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
1TX	2412	-3.57	0.50	9.99	6.92	4.92	0.03	6.95	4.95
	2437	-3.41	0.50	9.99	7.08	5.11	0.03	7.11	5.14
	2462	-3.33	0.50	9.99	7.16	5.20	0.03	7.19	5.24

11ax-20 **MCS 0** Antenna 2

Mode	Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
1TX	2412	-2.19	0.50	9.73	8.04	6.37	0.03	8.07	6.41
	2437	-2.00	0.50	9.73	8.23	6.65	0.03	8.26	6.70
	2462	-1.99	0.50	9.73	8.24	6.67	0.03	8.27	6.71

Sample Calculation:
Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss
Result (Burst power average) = Time average + Duty factor
*) The test on 11ax-20 was performed on OFDM / OFDMA(242-tone RU) was the worst condition.

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Average Output Power
(Reference data for RF Exposure)

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	March 28, 2020
Temperature / Humidity	24 deg. C / 51 % RH
Engineer	Takafumi Noguchi
Mode	Tx 11ax-20 (242-tone RU)

Antenna 1 + Antenna 2

Mode	Freq.	Antenna 1 Result	Antenna 2 Result	Result (Burst average)	
	[MHz]	[mW]	[mW]	[dBm]	[mW]
1TX	2412	5.36	5.40	10.32	10.75
	2437	4.48	5.32	9.91	9.80
	2462	5.52	5.52	10.43	11.04

Sample Calculation:
Result = Antenna 1 + Antenna 2

11ax-20 **MCS 0** Antenna 1

Mode	Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
1TX	2412	-7.77	4.82	9.73	6.78	4.76	0.51	7.29	5.36
	2437	-8.55	4.82	9.73	6.00	3.98	0.51	6.51	4.48
	2462	-7.63	4.81	9.73	6.91	4.91	0.51	7.42	5.52

11ax-20 **MCS 0** Antenna 2

Mode	Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
1TX	2412	-7.74	4.82	9.73	6.81	4.80	0.51	7.32	5.40
	2437	-7.80	4.82	9.73	6.75	4.73	0.51	7.26	5.32
	2462	-7.63	4.81	9.73	6.91	4.91	0.51	7.42	5.52

Sample Calculation:
Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss
Result (Burst power average) = Time average + Duty factor
*) The test on 11ax-20 was performed on OFDM / OFDMA(242-tone RU) was the worst condition.

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Average Output Power
(Reference data for RF Exposure)

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	December 19, 2019
Temperature / Humidity	24 deg. C / 32 % RH
Engineer	Takafumi Noguchi
Mode	Tx BT LE

BT1

Mode	Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)	
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
1M-PHY	2402.0	-11.14	0.50	9.73	-0.91	0.81
	2440.0	-11.13	0.50	9.73	-0.90	0.81
	2480.0	-11.15	0.50	9.73	-0.92	0.81
2M-PHY	2402.0	-13.93	0.50	9.73	-3.70	0.43
	2440.0	-13.92	0.50	9.73	-3.69	0.43
	2480.0	-13.94	0.50	9.73	-3.71	0.43

BT2

Mode	Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)	
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
1M-PHY	2402.0	-10.71	0.50	9.99	-0.22	0.95
	2440.0	-10.79	0.50	9.99	-0.30	0.93
	2480.0	-10.92	0.50	9.99	-0.43	0.91
2M-PHY	2402.0	-13.49	0.50	9.99	-3.00	0.50
	2440.0	-13.58	0.50	9.99	-3.09	0.49
	2480.0	-13.71	0.50	9.99	-3.22	0.48

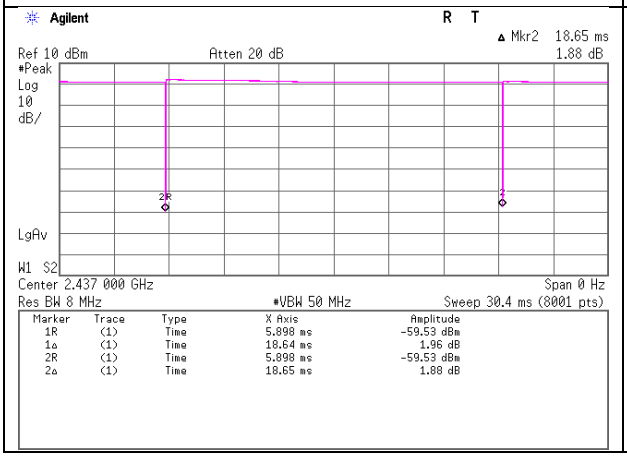
Sample Calculation:
Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

Burst rate confirmation

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	December 17, 2019
Temperature / Humidity	23 deg. C / 39 % RH
Engineer	Takafumi Noguchi
Mode	Tx

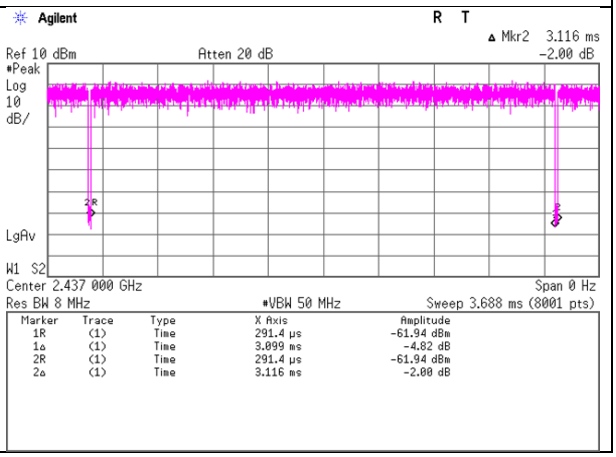
11b 1 Mbps

Tx on / (Tx on + Tx off) = 0.999
Tx on / (Tx on + Tx off) * 100 = 99.9 %
Duty factor = 10 * log (18.65 / 18.64) = 0.00 dB



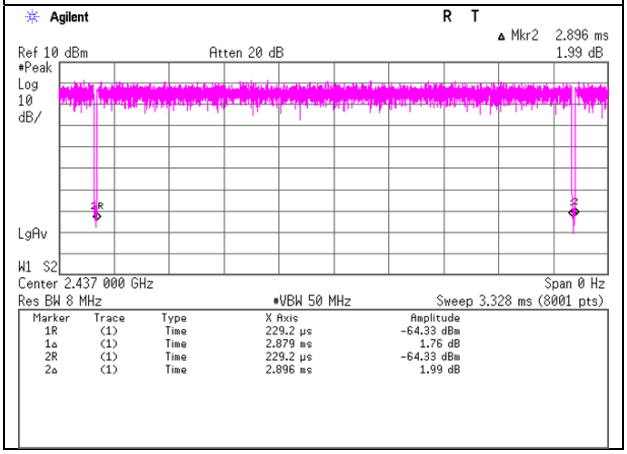
11g 6 Mbps

Tx on / (Tx on + Tx off) = 0.995
Tx on / (Tx on + Tx off) * 100 = 99.5 %
Duty factor = 10 * log (3.116 / 3.099) = 0.02 dB



11n-20 MCS 0

Tx on / (Tx on + Tx off) = 0.994
Tx on / (Tx on + Tx off) * 100 = 99.4 %
Duty factor = 10 * log (2.896 / 2.879) = 0.03 dB



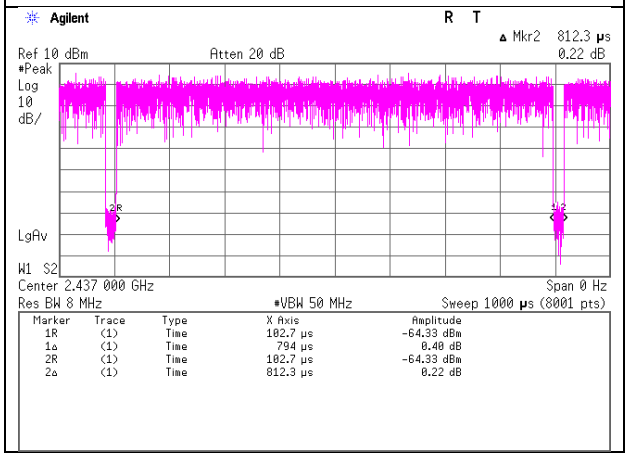
* Since the burst rate is not different between the channels, the data has been obtained on the representative channel.

Burst rate confirmation

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	December 17, 2019
Temperature / Humidity	23 deg. C / 39 % RH
Engineer	Takafumi Noguchi
Mode	Tx

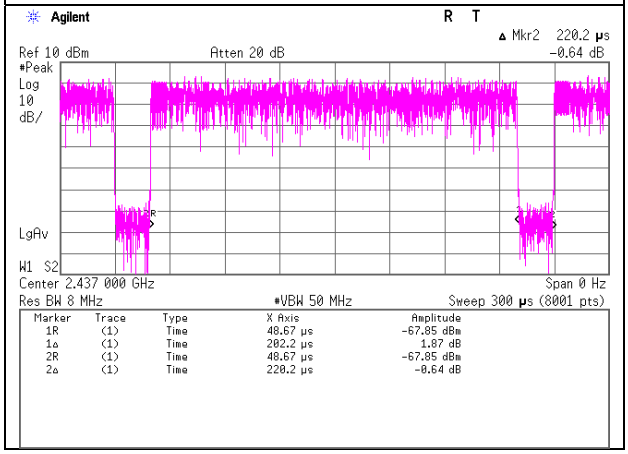
11g 24 Mbps

Tx on / (Tx on + Tx off) =	**0.977**
Tx on / (Tx on + Tx off) * 100 =	**97.7 %**
Duty factor = 10 * log (812.3 / 794) =	**0.10 dB**



11n-20 MCS 14

Tx on / (Tx on + Tx off) =	**0.918**
Tx on / (Tx on + Tx off) * 100 =	**91.8 %**
Duty factor = 10 * log (220.2 / 202.2) =	**0.37 dB**



* Since the burst rate is not different between the channels, the data has been obtained on the representative channel.

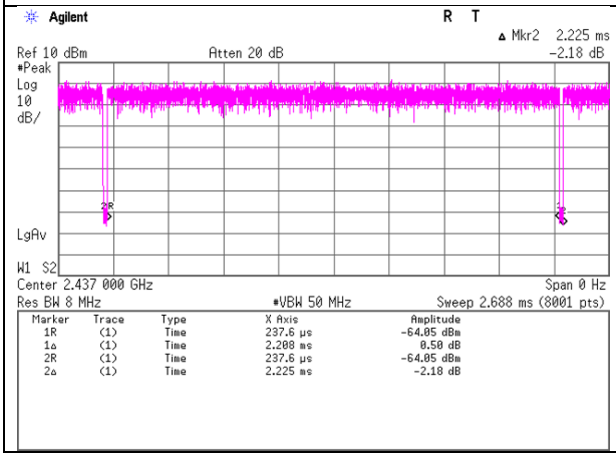
Burst rate confirmation

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	December 17, 2019
Temperature / Humidity	23 deg. C / 39 % RH
Engineer	Takafumi Noguchi
Mode	Tx

11ax-20 MCS 0

OFDM

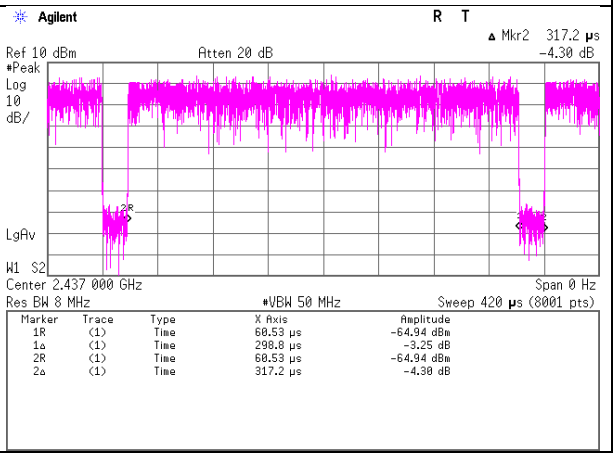
Tx on / (Tx on + Tx off) =	0.992
Tx on / (Tx on + Tx off) * 100 =	99.2 %
Duty factor = 10 * log (2.225 / 2.208) =	0.03 dB



11ax-20 MCS 6

OFDM

Tx on / (Tx on + Tx off) =	0.942
Tx on / (Tx on + Tx off) * 100 =	94.2 %
Duty factor = 10 * log (317.2 / 298.8) =	0.26 dB



* Since the burst rate is not different between the channels, the data has been obtained on the representative channel.

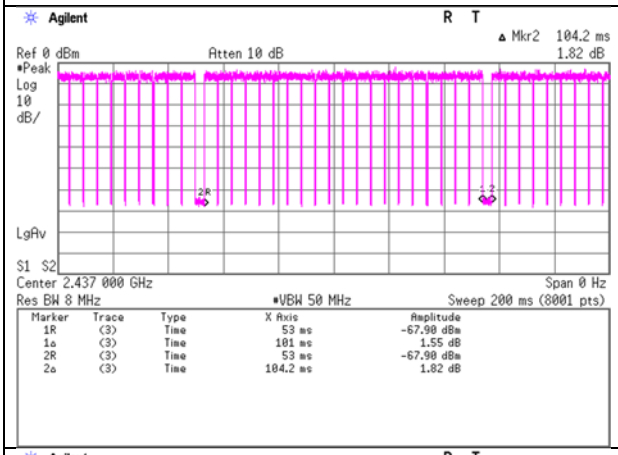
Burst rate confirmation

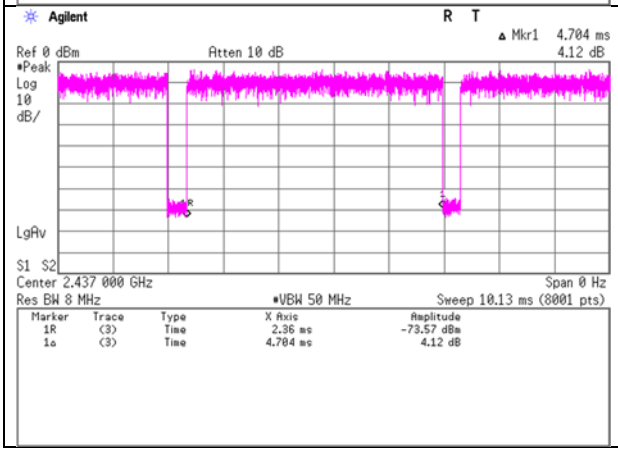
Report No.	13170804H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	February 27, 2020
Temperature / Humidity	20 deg. C / 30 % RH
Engineer	Takafumi Noguchi
Mode	Tx

11ax-20 MCS 6

26-tone RU

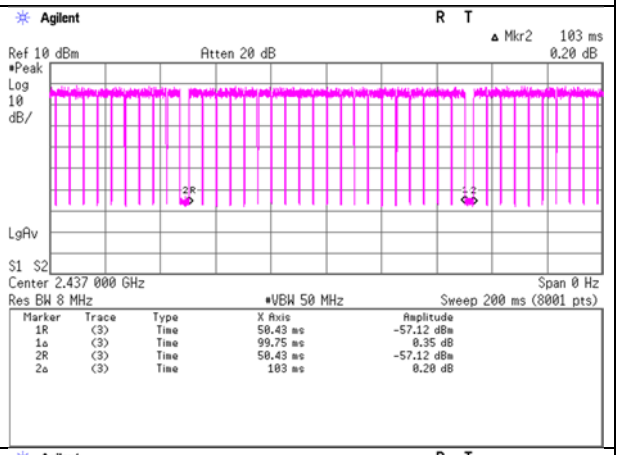
Tx on / (Tx on + Tx off) = 0.903
Tx on / (Tx on + Tx off) * 100 = 90.3 %
Duty factor = 10 * log (104.2 / (20 * 4.704)) = 0.44 dB

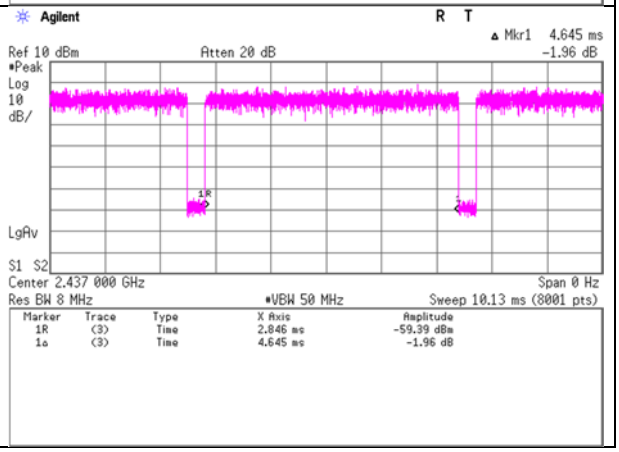




52-tone RU

Tx on / (Tx on + Tx off) = 0.902
Tx on / (Tx on + Tx off) * 100 = 90.2 %
Duty factor = 10 * log (103 / (20 * 4.645)) = 0.45 dB





* Since the burst rate is not different between the channels, the data has been obtained on the representative channel.

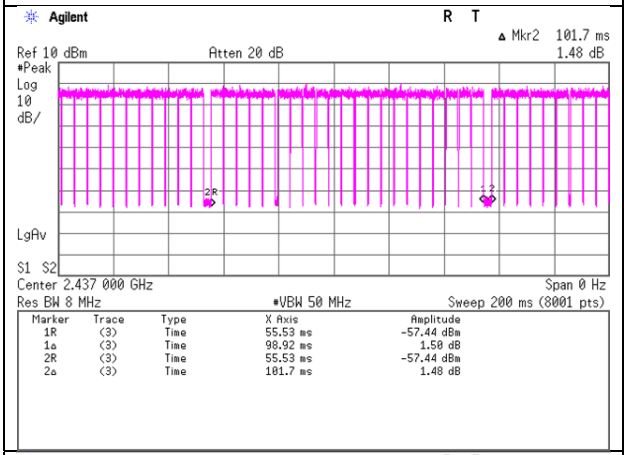
Burst rate confirmation

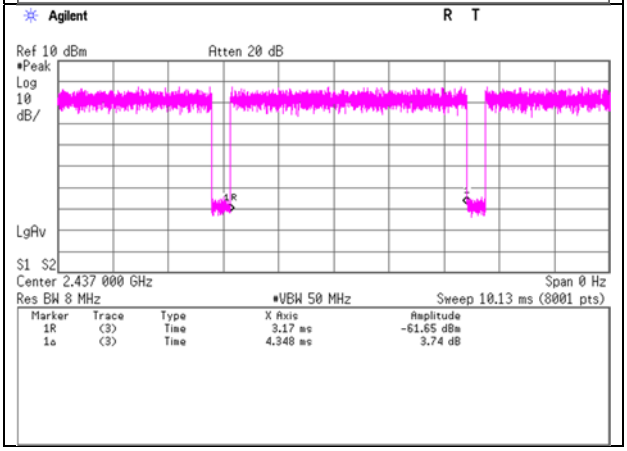
Report No.	13170804H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	February 27, 2020
Temperature / Humidity	20 deg. C / 30 % RH
Engineer	Takafumi Noguchi
Mode	Tx

11ax-20 MCS 6

106-tone RU

Tx on / (Tx on + Tx off) =	**0.898**
Tx on / (Tx on + Tx off) * 100 =	**89.8 %**
Duty factor = 10 * log (101.7 / (20 * 4.704)) =	**0.47 dB**

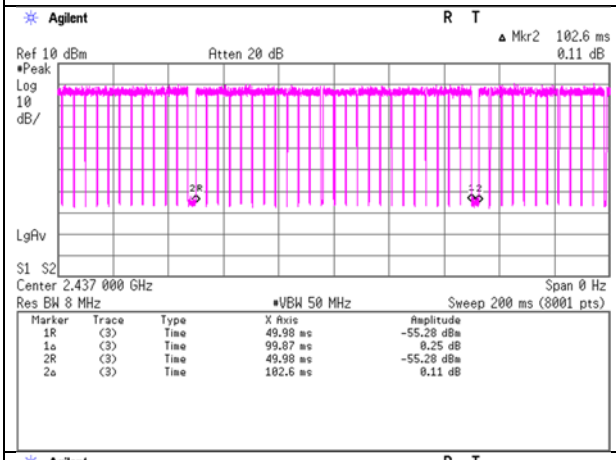
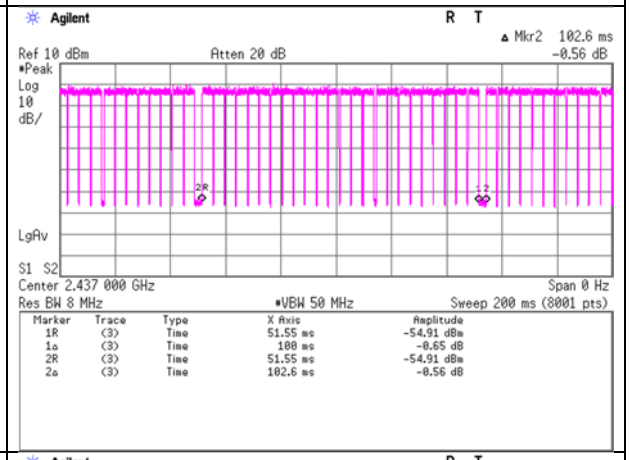
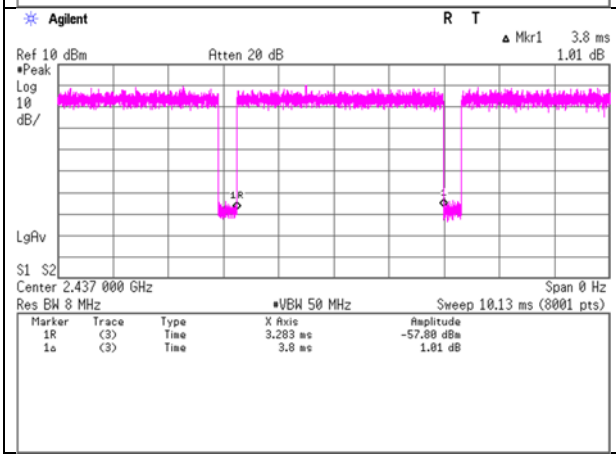
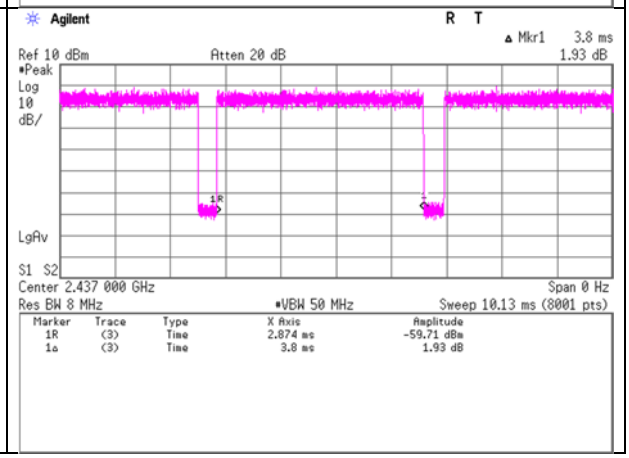




* Since the burst rate is not different between the channels, the data has been obtained on the representative channel.

Burst rate confirmation

Report No.	13170804H
Test place	Ise EMC Lab. No.3 Measurement Room
Date	March 28, 2020
Temperature / Humidity	24 deg. C / 51 % RH
Engineer	Takafumi Noguchi
Mode	Tx

11ax-20 MCS 0	11ax-20 MCS 6
242-tone RU	**242-tone RU**
Tx on / (Tx on + Tx off) = 0.889	**Tx on / (Tx on + Tx off) = 0.889**
Tx on / (Tx on + Tx off) * 100 = 88.9 %	**Tx on / (Tx on + Tx off) * 100 = 88.9 %**
Duty factor = 10 * log (102.6 / (24 * 3.8)) = 0.51 dB	**Duty factor = 10 * log (102.6 / (24 * 3.8)) = 0.51 dB**
	
	

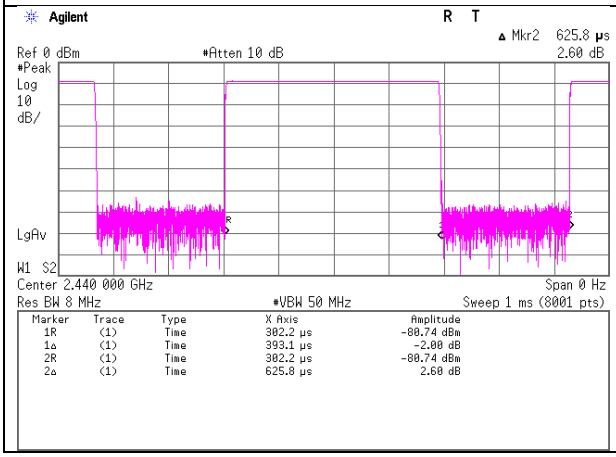
* Since the burst rate is not different between the channels, the data has been obtained on the representative channel.

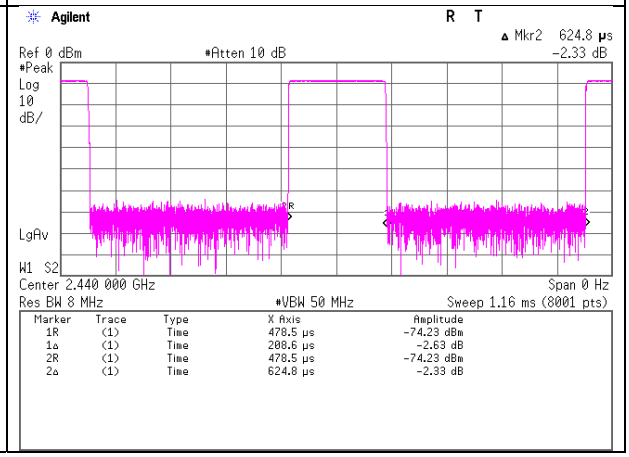
Burst rate confirmation

Report No.	13170804H	
Test place	Ise EMC Lab. No.3 Measurement Room	
Date	December 19, 2019	December 24, 2019
Temperature / Humidity	24 deg. C / 32 % RH	21 deg. C / 41 % RH
Engineer	Takafumi Noguchi	Yuta Moriya
Mode	Tx BT LE	

BT1

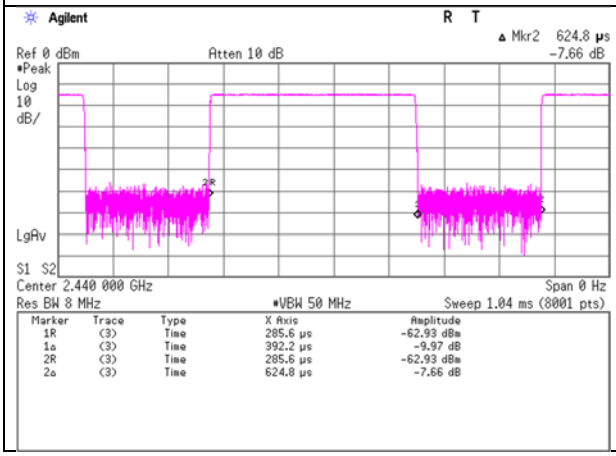
BT LE 1M-PHY		BT LE 2M-PHY	
Tx on / (Tx on + Tx off) =	**0.628**	**Tx on / (Tx on + Tx off) =**	**0.334**
Tx on / (Tx on + Tx off) * 100 =	**62.8 %**	**Tx on / (Tx on + Tx off) * 100 =**	**33.4 %**
Duty factor = 10 * log (625.8 / 393.1) =	**2.02 dB**	**Duty factor = 10 * log (624.8 / 208.6) =**	**4.76 dB**

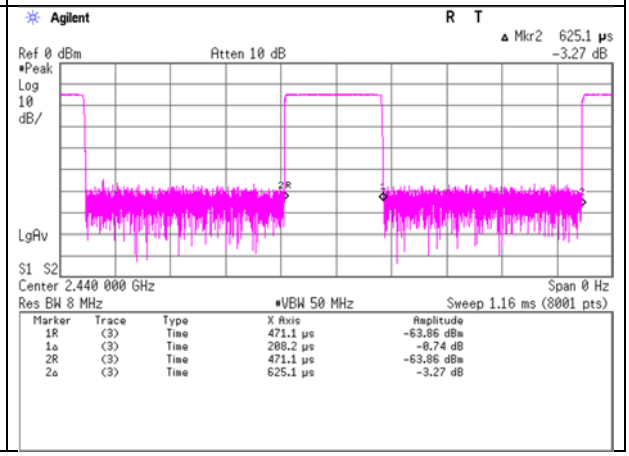




BT2

BT LE 1M-PHY		BT LE 2M-PHY	
Tx on / (Tx on + Tx off) =	**0.628**	**Tx on / (Tx on + Tx off) =**	**0.333**
Tx on / (Tx on + Tx off) * 100 =	**62.8 %**	**Tx on / (Tx on + Tx off) * 100 =**	**33.3 %**
Duty factor = 10 * log (624.8 / 392.2) =	**2.02 dB**	**Duty factor = 10 * log (625.1 / 208.2) =**	**4.77 dB**





* Since the burst rate is not different between the channels, the data has been obtained on the representative channel.

Radiated Spurious Emission
(PIFA Antenna)

Report No.	13170804H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	December 19, 2019	January 9, 2020	January 9, 2020
Temperature / Humidity	23 deg. C / 40 % RH	23 deg. C / 35 % RH	22 deg. C / 34 % RH
Engineer	Yuta Moriya	Tomohisa Nakagawa	Junki Nagatomi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11b 2412 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	PK	43.9	27.7	5.4	32.8	-	44.2	73.9	29.7	
Hori.	4824.000	PK	39.7	31.6	7.5	31.8	-	46.9	73.9	27.0	Floor noise
Hori.	7236.000	PK	41.2	36.0	8.9	32.7	-	53.5	73.9	20.5	Floor noise
Hori.	9648.000	PK	40.6	38.6	9.4	33.3	-	55.3	73.9	18.6	Floor noise
Hori.	2390.000	AV	34.5	27.7	5.4	32.8	-	34.8	53.9	19.1	
Hori.	4824.000	AV	32.2	31.6	7.5	31.8	-	39.5	53.9	14.4	Floor noise
Hori.	7236.000	AV	31.8	36.0	8.9	32.7	-	44.1	53.9	9.8	Floor noise
Hori.	9648.000	AV	32.9	38.6	9.4	33.3	-	47.5	53.9	6.4	Floor noise
Vert.	2390.000	PK	46.7	27.7	5.4	32.8	-	47.1	73.9	26.8	
Vert.	4824.000	PK	39.9	31.6	7.5	31.8	-	47.1	73.9	26.8	Floor noise
Vert.	7236.000	PK	41.3	36.0	8.9	32.7	-	53.5	73.9	20.4	Floor noise
Vert.	9648.000	PK	40.8	38.6	9.4	33.3	-	55.4	73.9	18.5	Floor noise
Vert.	2390.000	AV	34.7	27.7	5.4	32.8	-	35.0	53.9	18.9	
Vert.	4824.000	AV	32.1	31.6	7.5	31.8	-	39.4	53.9	14.5	Floor noise
Vert.	7236.000	AV	31.9	36.0	8.9	32.7	-	44.1	53.9	9.8	Floor noise
Vert.	9648.000	AV	32.9	38.6	9.4	33.3	-	47.5	53.9	6.4	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	94.3	27.6	5.4	32.7	94.6	-	-	Carrier
Hori.	2400.000	PK	37.4	27.7	5.4	32.7	37.8	74.6	36.9	
Vert.	2412.000	PK	95.4	27.6	5.4	32.7	95.7	-	-	Carrier
Vert.	2400.000	PK	37.4	27.7	5.4	32.7	37.7	75.7	38.0	

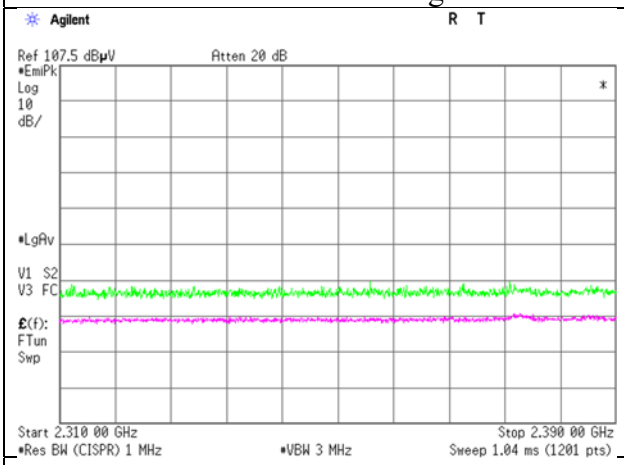
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	December 19, 2019
Temperature / Humidity	23 deg. C / 40 % RH
Engineer	Yuta Moriya
	(1 GHz - 10 GHz)
Mode	Tx 11b 2412 MHz

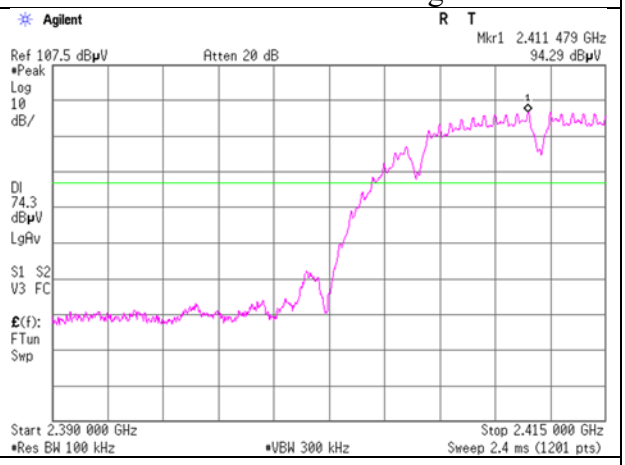
Horizontal

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

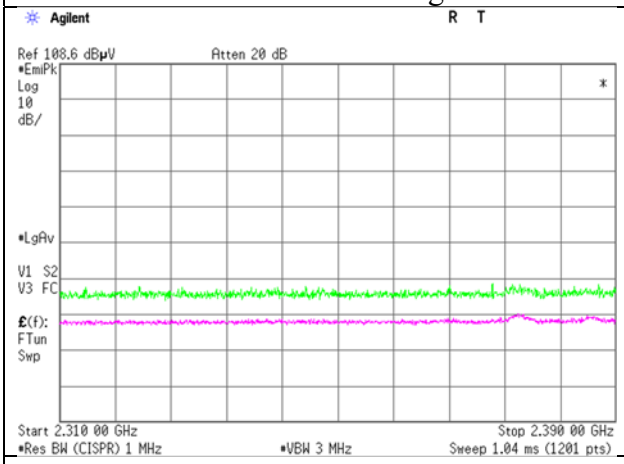
Authorized-band band-edge Plot



20dBc Plot

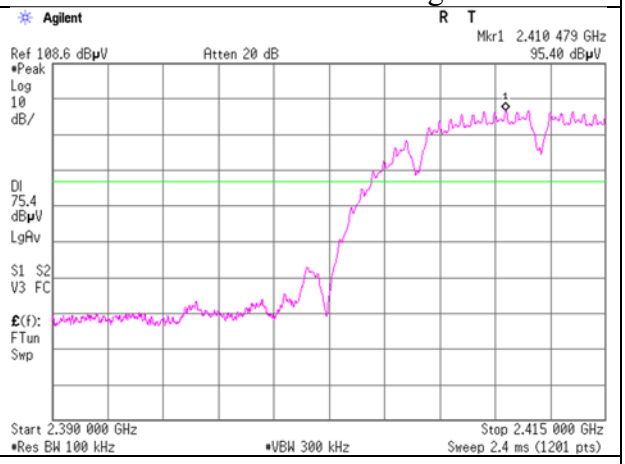
Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Authorized-band band-edge Plot



20dBc Plot

* 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
(PIFA Antenna)

Report No.	13170804H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	December 19, 2019	January 9, 2020	January 9, 2020
Temperature / Humidity	23 deg. C / 40 % RH	23 deg. C / 35 % RH	22 deg. C / 34 % RH
Engineer	Yuta Moriya	Tomohisa Nakagawa	Junki Nagatomi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11b 2437 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4874.000	PK	40.6	31.6	7.5	31.8	-	47.8	73.9	26.1	Floor noise
Hori.	7311.000	PK	41.4	36.2	8.9	32.7	-	53.8	73.9	20.1	Floor noise
Hori.	9748.000	PK	41.5	38.8	9.4	33.4	-	56.3	73.9	17.6	Floor noise
Hori.	4874.000	AV	32.1	31.6	7.5	31.8	-	39.3	53.9	14.6	Floor noise
Hori.	7311.000	AV	31.9	36.2	8.9	32.7	-	44.3	53.9	9.6	Floor noise
Hori.	9748.000	AV	32.7	38.8	9.4	33.4	-	47.5	53.9	6.4	Floor noise
Vert.	4874.000	PK	40.5	31.6	7.5	31.8	-	47.7	73.9	26.2	Floor noise
Vert.	7311.000	PK	41.5	36.2	8.9	32.7	-	53.9	73.9	20.0	Floor noise
Vert.	9748.000	PK	41.6	38.8	9.4	33.4	-	56.4	73.9	17.5	Floor noise
Vert.	4874.000	AV	32.1	31.6	7.5	31.8	-	39.4	53.9	14.5	Floor noise
Vert.	7311.000	AV	32.0	36.2	8.9	32.7	-	44.4	53.9	9.5	Floor noise
Vert.	9748.000	AV	32.6	38.8	9.4	33.4	-	47.4	53.9	6.5	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(PIFA Antenna)

Report No.	13170804H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	December 19, 2019	January 9, 2020	January 9, 2020
Temperature / Humidity	23 deg. C / 40 % RH	23 deg. C / 35 % RH	22 deg. C / 34 % RH
Engineer	Yuta Moriya (1 GHz - 10 GHz)	Tomohisa Nakagawa (10 GHz - 18 GHz)	Junki Nagatomi (18 GHz - 26.5 GHz)
Mode	Tx 11b 2462 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	PK	43.5	27.5	5.5	32.7	-	43.7	73.9	30.2	
Hori.	4924.000	PK	39.8	31.5	7.5	31.8	-	47.0	73.9	26.9	Floor noise
Hori.	7386.000	PK	41.3	36.3	8.9	32.7	-	53.8	73.9	20.1	Floor noise
Hori.	9848.000	PK	40.7	39.0	9.4	33.4	-	55.7	73.9	18.2	Floor noise
Hori.	2483.500	AV	35.0	27.5	5.5	32.7	-	35.2	53.9	18.7	
Hori.	4924.000	AV	32.1	31.5	7.5	31.8	-	39.4	53.9	14.5	Floor noise
Hori.	7386.000	AV	32.6	36.3	8.9	32.7	-	45.1	53.9	8.8	Floor noise
Hori.	9848.000	AV	32.6	39.0	9.4	33.4	-	47.5	53.9	6.4	Floor noise
Vert.	2483.500	PK	43.1	27.5	5.5	32.7	-	43.3	73.9	30.6	
Vert.	4924.000	PK	40.0	31.5	7.5	31.8	-	47.3	73.9	26.6	Floor noise
Vert.	7386.000	PK	41.2	36.3	8.9	32.7	-	53.7	73.9	20.2	Floor noise
Vert.	9848.000	PK	40.8	39.0	9.4	33.4	-	55.8	73.9	18.1	Floor noise
Vert.	2483.500	AV	35.5	27.5	5.5	32.7	-	35.7	53.9	18.2	
Vert.	4924.000	AV	32.1	31.5	7.5	31.8	-	39.3	53.9	14.6	Floor noise
Vert.	7386.000	AV	32.4	36.3	8.9	32.7	-	44.9	53.9	9.0	Floor noise
Vert.	9848.000	AV	32.4	39.0	9.4	33.4	-	47.4	53.9	6.5	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

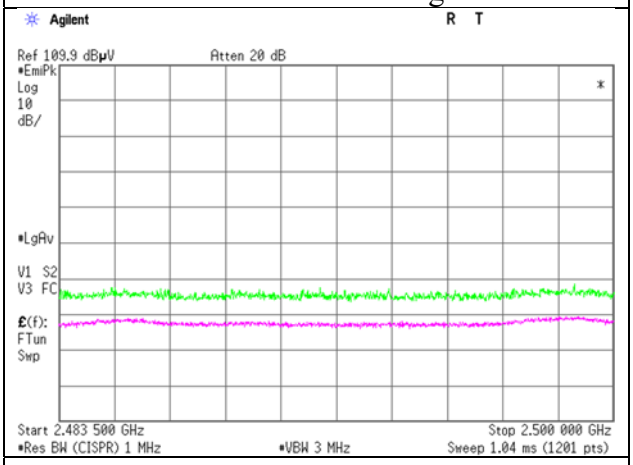
Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	December 19, 2019
Temperature / Humidity	23 deg. C / 40 % RH
Engineer	Yuta Moriya
	(1 GHz - 10 GHz)
Mode	Tx 11b 2462 MHz

Horizontal

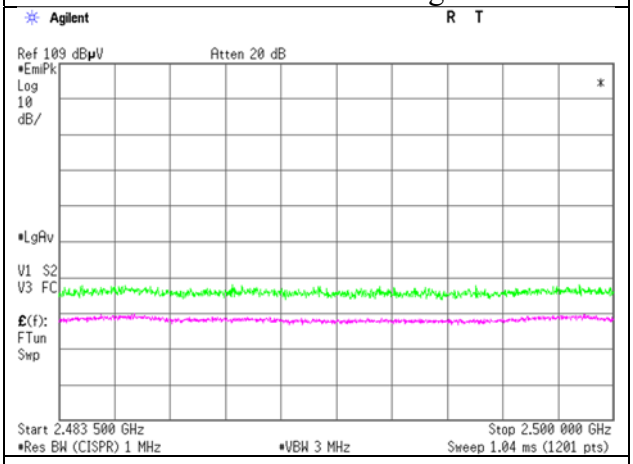
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* 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
(PIFA Antenna)

Report No.	13170804H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	December 19, 2019	January 9, 2020	January 9, 2020
Temperature / Humidity	23 deg. C / 40 % RH	23 deg. C / 35 % RH	22 deg. C / 34 % RH
Engineer	Yuta Moriya	Tomohisa Nakagawa	Junki Nagatomi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11ax-20 2412MHz (OFDM)		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	PK	49.9	27.7	5.4	32.8	-	50.2	73.9	23.7	
Hori.	4824.000	PK	39.9	31.6	7.5	31.8	-	47.2	73.9	26.7	Floor noise
Hori.	7236.000	PK	40.8	36.0	8.9	32.7	-	53.0	73.9	20.9	Floor noise
Hori.	9648.000	PK	40.4	38.6	9.4	33.3	-	55.1	73.9	18.8	Floor noise
Hori.	2390.000	AV	38.8	27.7	5.4	32.8	0.3	39.4	53.9	14.5	*1)
Hori.	4824.000	AV	31.8	31.6	7.5	31.8	-	39.1	53.9	14.8	Floor noise
Hori.	7236.000	AV	31.9	36.0	8.9	32.7	-	44.1	53.9	9.8	Floor noise
Hori.	9648.000	AV	32.9	38.6	9.4	33.3	-	47.5	53.9	6.4	Floor noise
Vert.	2390.000	PK	49.8	27.7	5.4	32.8	-	50.1	73.9	23.8	
Vert.	4824.000	PK	38.9	31.6	7.5	31.8	-	46.1	73.9	27.8	Floor noise
Vert.	7236.000	PK	40.7	36.0	8.9	32.7	-	53.0	73.9	20.9	Floor noise
Vert.	9648.000	PK	40.6	38.6	9.4	33.3	-	55.2	73.9	18.7	Floor noise
Vert.	2390.000	AV	39.3	27.7	5.4	32.8	0.3	39.9	53.9	14.0	*1)
Vert.	4824.000	AV	31.6	31.6	7.5	31.8	-	38.9	53.9	15.0	Floor noise
Vert.	7236.000	AV	31.8	36.0	8.9	32.7	-	44.0	53.9	9.9	Floor noise
Vert.	9648.000	AV	32.6	38.6	9.4	33.3	-	47.3	53.9	6.6	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

*1) Not Out of Band emission(Leakage Power)

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	95.4	27.6	5.4	32.7	95.7	-	-	Carrier
Hori.	2400.000	PK	45.8	27.7	5.4	32.7	46.1	75.7	29.6	
Vert.	2412.000	PK	95.5	27.6	5.4	32.7	95.8	-	-	Carrier
Vert.	2400.000	PK	46.0	27.7	5.4	32.7	46.3	75.8	29.5	

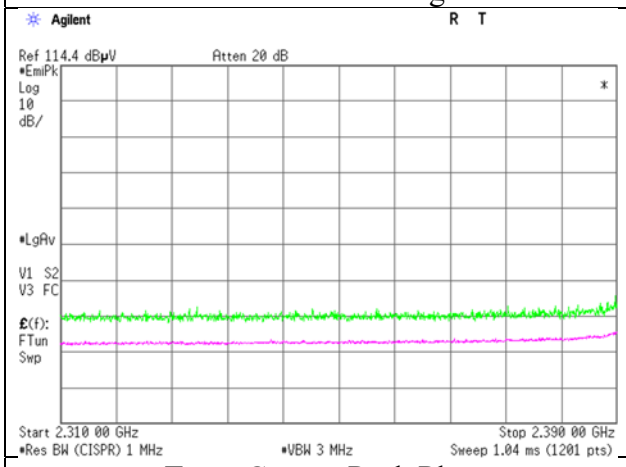
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	December 19, 2019
Temperature / Humidity	23 deg. C / 40 % RH
Engineer	Yuta Moriya
	(1 GHz - 10 GHz)
Mode	Tx 11ax-20 2412MHz (OFDM)

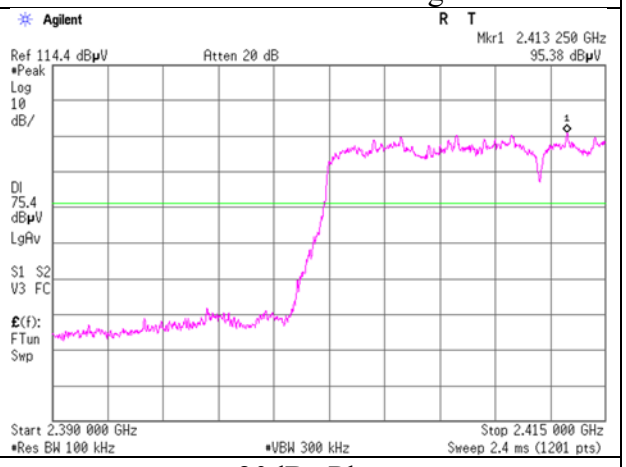
Horizontal

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

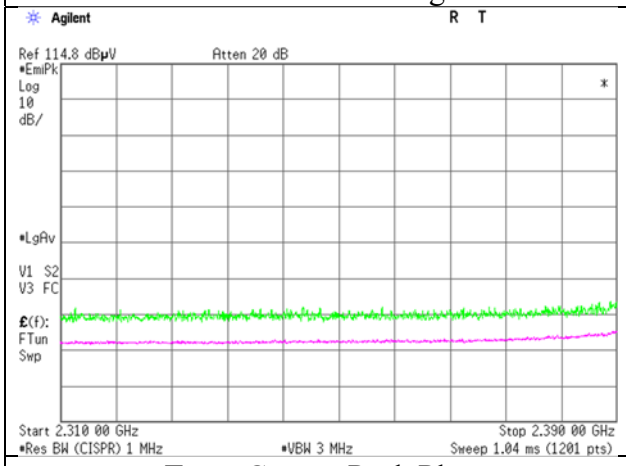
Authorized-band band-edge Plot



20dBc Plot

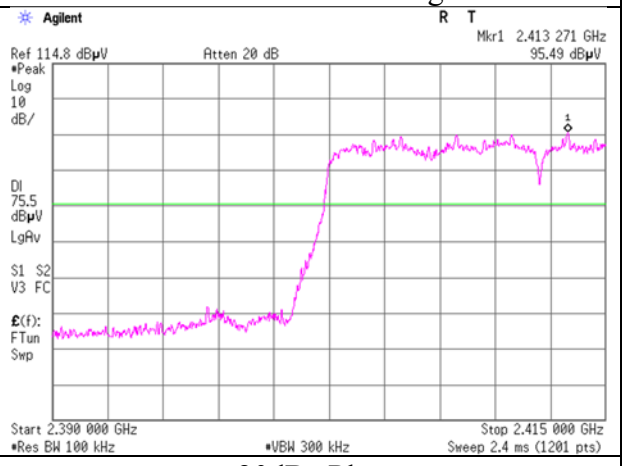
Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Authorized-band band-edge Plot



20dBc Plot

* 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
(PIFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 9, 2020
Temperature / Humidity	23 deg. C / 43 % RH
Engineer	Junki Nagatomi
	Band edge
Mode	Tx 11ax-20 2412 MHz (26-tone RU)

RU Index 0

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	PK	42.3	27.7	4.9	32.8	-	42.1	73.9	31.8	
Hori.	2390.000	AV	33.8	27.7	4.9	32.8	0.4	34.1	53.9	19.8	*1)
Vert.	2390.000	PK	45.5	27.7	4.9	32.8	-	45.3	73.9	28.6	
Vert.	2390.000	AV	33.8	27.7	4.9	32.8	0.4	34.1	53.9	19.8	*1)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB

*1) Not Out of Band emission(Leakage Power)

20dBc Data Sheet

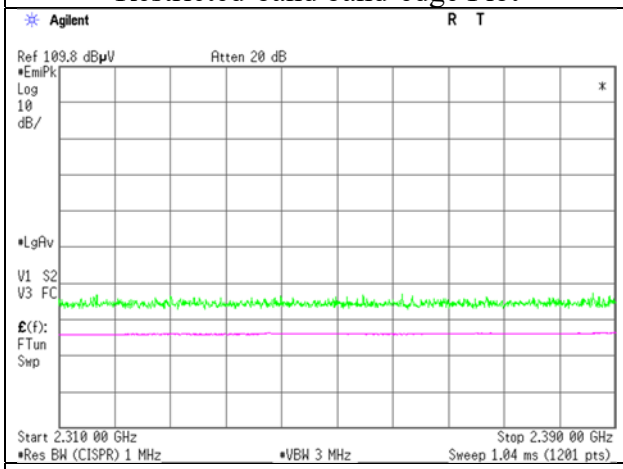
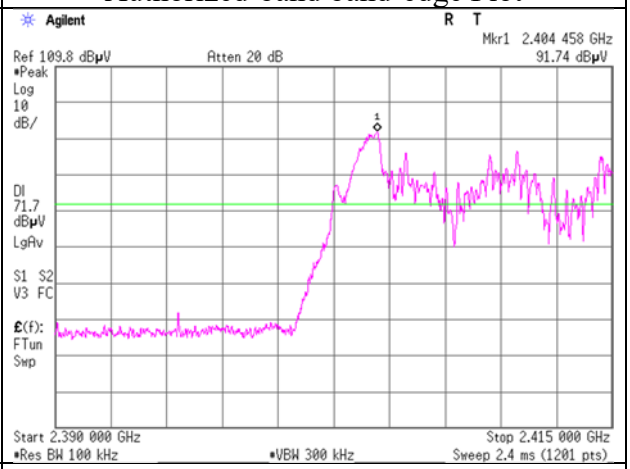
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	91.7	27.6	4.9	32.7	91.6	-	-	Carrier
Hori.	2400.000	PK	40.8	27.7	4.9	32.7	40.7	71.6	30.9	
Vert.	2412.000	PK	91.7	27.6	4.9	32.7	91.5	-	-	Carrier
Vert.	2400.000	PK	52.4	27.7	4.9	32.7	52.2	71.5	19.3	

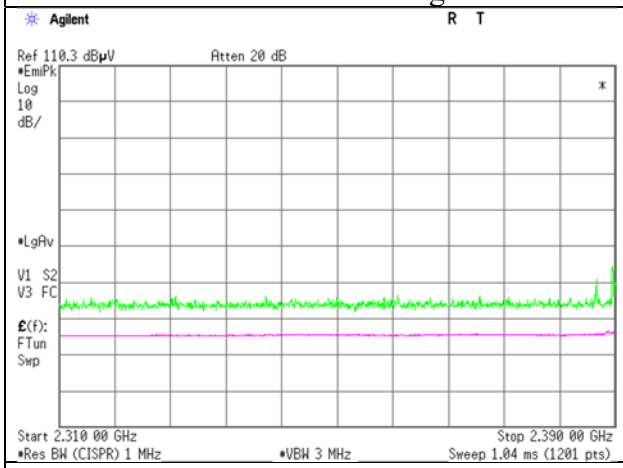
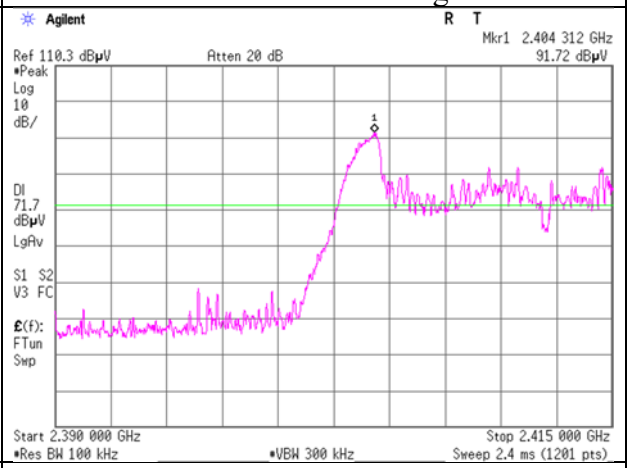
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB

Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 9, 2020
Temperature / Humidity	23 deg. C / 43 % RH
Engineer	Junki Nagatomi
	Band edge
Mode	Tx 11ax-20 2412 MHz (26-tone RU)

RU Index 0	
Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

RU Index 0	
Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* 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
(PIFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 9, 2020
Temperature / Humidity	23 deg. C / 43 % RH
Engineer	Junki Nagatomi
	Band edge
Mode	Tx 11ax-20 2412 MHz (52-tone RU)

RU Index 37

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	PK	49.0	27.7	4.9	32.8	-	48.8	73.9	25.1	
Hori.	2390.000	AV	34.1	27.7	4.9	32.8	0.5	34.4	53.9	19.5	*1)
Vert.	2390.000	PK	47.3	27.7	4.9	32.8	-	47.1	73.9	26.8	
Vert.	2390.000	AV	34.3	27.7	4.9	32.8	0.5	34.6	53.9	19.3	*1)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
*1) Not Out of Band emission(Leakage Power)

20dBc Data Sheet

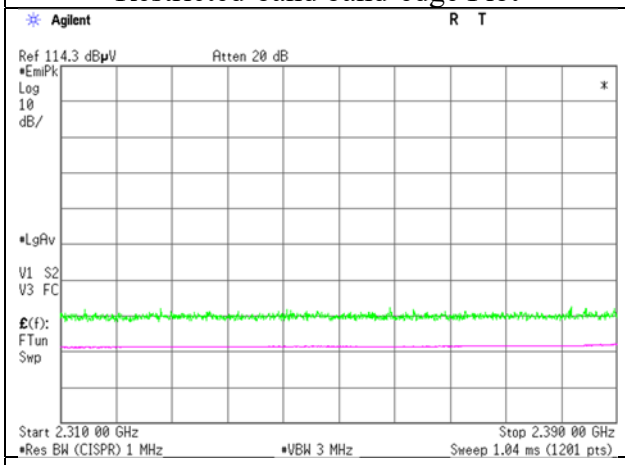
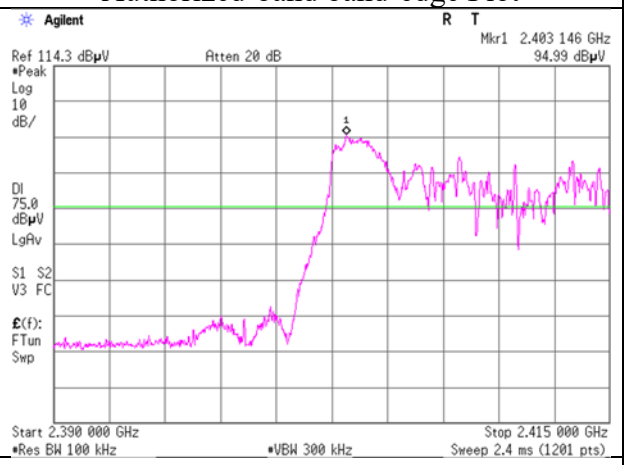
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	95.0	27.6	4.9	32.7	94.8	-	-	Carrier
Hori.	2400.000	PK	45.3	27.7	4.9	32.7	45.2	74.8	29.6	
Vert.	2412.000	PK	93.7	27.6	4.9	32.7	93.5	-	-	Carrier
Vert.	2400.000	PK	44.9	27.7	4.9	32.7	44.8	73.5	28.8	

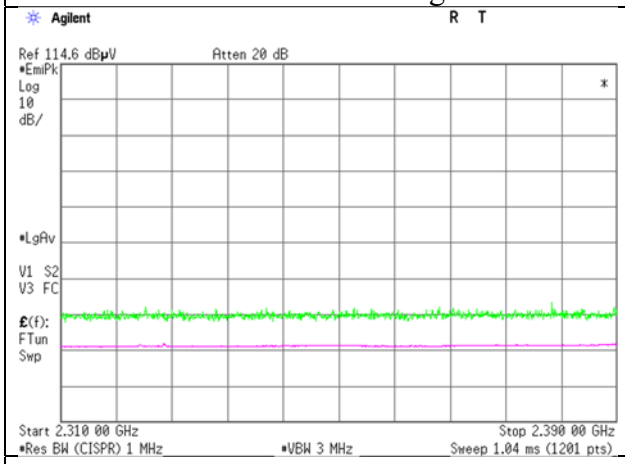
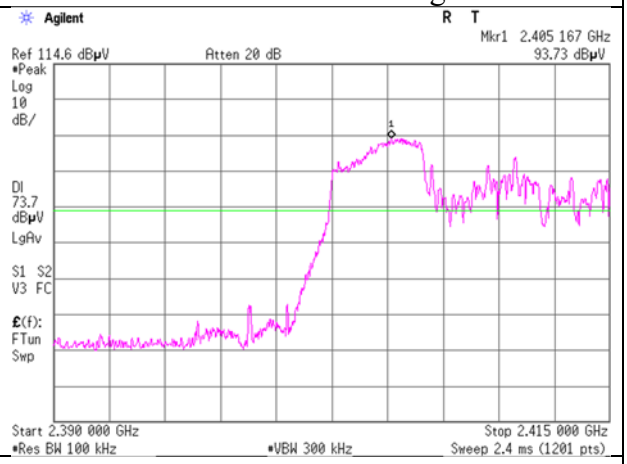
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

Distance factor: 1 GHz - 10 GHz 20log (4.45 m / 3.0 m) = 3.43 dB

Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 9, 2020
Temperature / Humidity	23 deg. C / 43 % RH
Engineer	Junki Nagatomi
	Band edge
Mode	Tx 11ax-20 2412 MHz (52-tone RU)

RU Index 37	
Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

RU Index 37	
Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* 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
(PIFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 9, 2020
Temperature / Humidity	23 deg. C / 43 % RH
Engineer	Junki Nagatomi
	Band edge
Mode	Tx 11ax-20 2412 MHz (106-tone RU)

RU Index 53

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	PK	49.8	27.7	4.9	32.8	-	49.6	73.9	24.3	
Hori.	2390.000	AV	34.6	27.7	4.9	32.8	0.5	34.9	53.9	19.0	*1)
Vert.	2390.000	PK	51.9	27.7	4.9	32.8	-	51.7	73.9	22.2	
Vert.	2390.000	AV	35.7	27.7	4.9	32.8	0.5	36.0	53.9	17.9	*1)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
*1) Not Out of Band emission(Leakage Power)

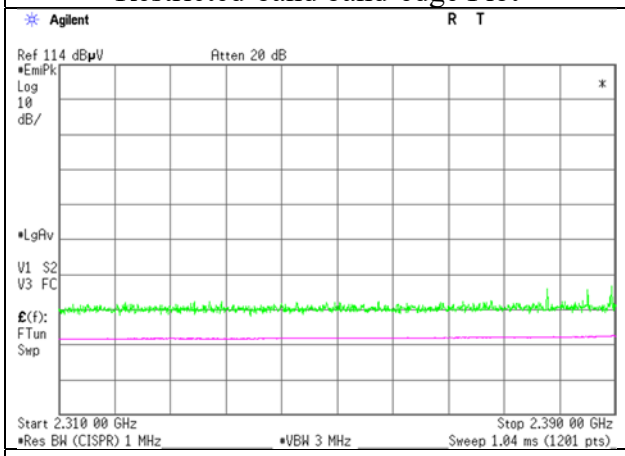
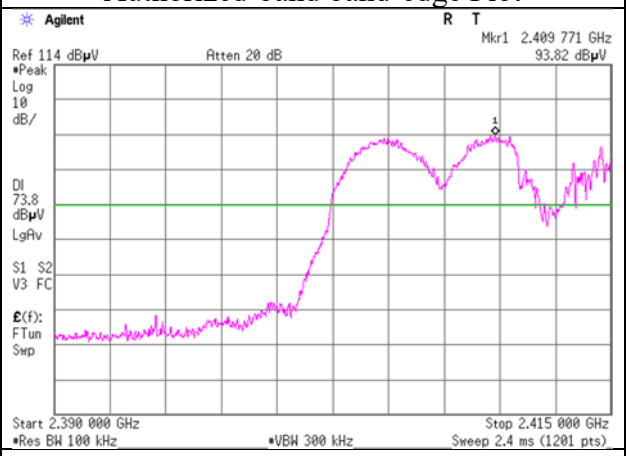
20dBc Data Sheet

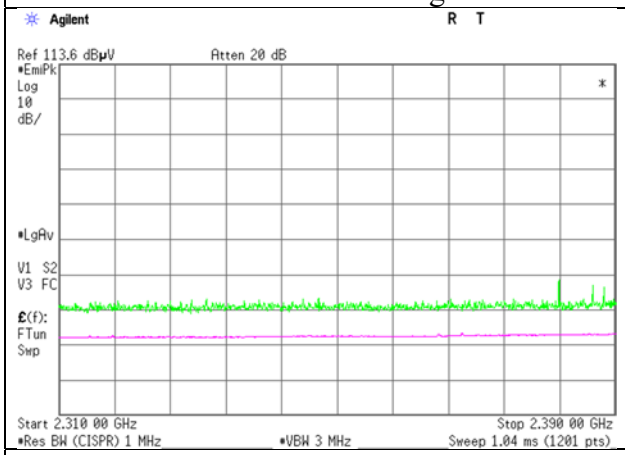
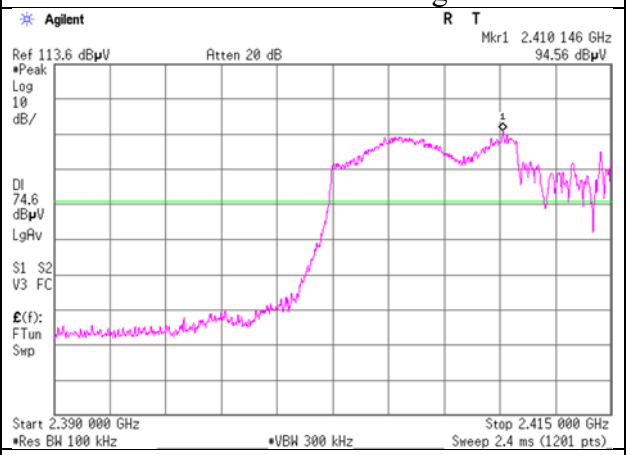
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	93.8	27.6	4.9	32.7	93.6	-	-	Carrier
Hori.	2400.000	PK	46.1	27.7	4.9	32.7	46.0	73.6	27.7	
Vert.	2412.000	PK	94.6	27.6	4.9	32.7	94.4	-	-	Carrier
Vert.	2400.000	PK	47.2	27.7	4.9	32.7	47.0	74.4	27.4	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)
Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB

Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 9, 2020
Temperature / Humidity	23 deg. C / 43 % RH
Engineer	Junki Nagatomi
	Band edge
Mode	Tx 11ax-20 2412 MHz (106-tone RU)

RU Index 53	
Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

RU Index 53	
Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* 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
(PIFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	April 4, 2020
Temperature / Humidity	22 deg. C / 40 % RH
Engineer	Takafumi Noguchi
	Band edge
Mode	Tx 11ax-20 2412 MHz (242-tone RU)

RU Index 61

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2389.033	PK	63.8	27.7	4.9	32.7	-	63.6	73.9	10.3	
Hori.	2390.000	PK	59.3	27.7	4.9	32.7	-	59.1	73.9	14.8	
Hori.	2389.033	AV	44.4	27.7	4.9	32.7	0.5	44.7	53.9	9.2	
Hori.	2390.000	AV	42.4	27.7	4.9	32.7	0.5	42.7	53.9	11.2	*1)
Vert.	2389.033	PK	64.4	27.7	4.9	32.7	-	64.3	73.9	9.6	
Vert.	2390.000	PK	59.4	27.7	4.9	32.7	-	59.2	73.9	14.7	
Vert.	2389.033	AV	44.9	27.7	4.9	32.7	0.5	45.3	53.9	8.6	
Vert.	2390.000	AV	43.3	27.7	4.9	32.7	0.5	43.6	53.9	10.3	*1)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
*1) Not Out of Band emission(Leakage Power)

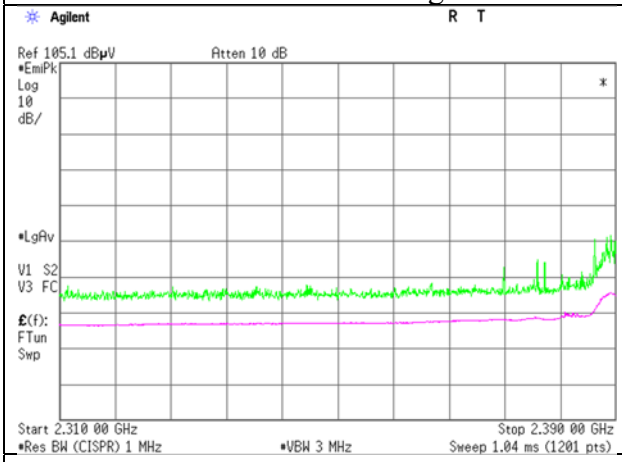
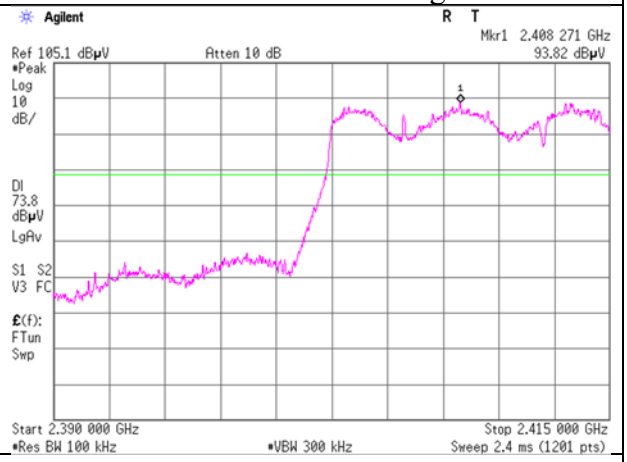
20dBc Data Sheet

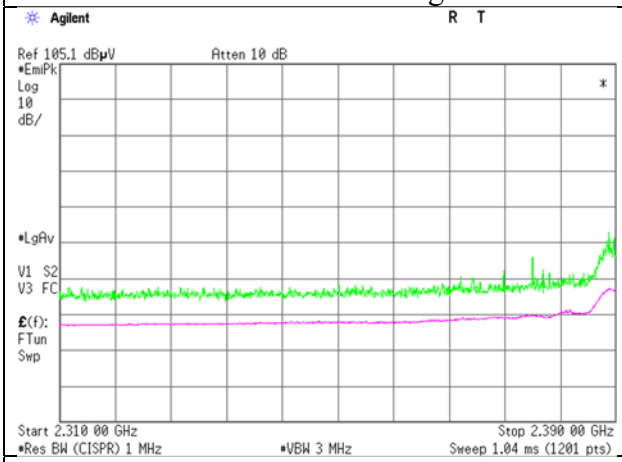
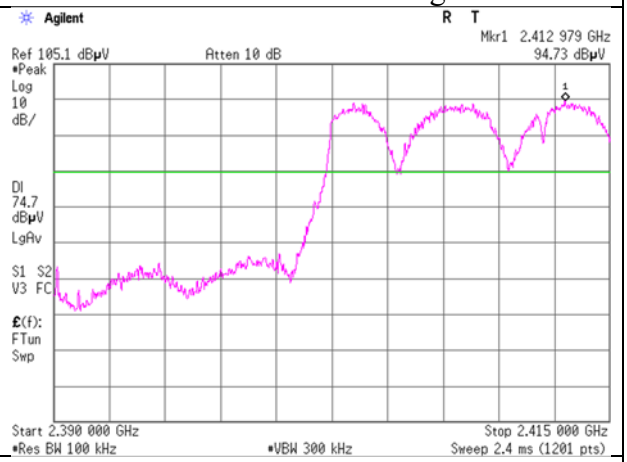
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	93.8	27.6	4.9	32.7	93.6	-	-	Carrier
Hori.	2398.575	PK	52.7	27.7	4.9	32.7	52.6	73.6	21.0	
Hori.	2400.000	PK	50.8	27.7	4.9	32.7	50.7	73.6	23.0	
Vert.	2412.000	PK	94.7	27.6	4.9	32.7	94.5	-	-	Carrier
Vert.	2398.575	PK	54.0	27.7	4.9	32.7	53.8	74.5	20.7	
Vert.	2400.000	PK	52.0	27.7	4.9	32.7	51.8	74.5	22.7	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	April 4, 2020
Temperature / Humidity	22 deg. C / 40 % RH
Engineer	Takafumi Noguchi
	Band edge
Mode	Tx 11ax-20 2412 MHz (242-tone RU)

RU Index 61	
Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

RU Index 61	
Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* 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
(PIFA Antenna)

Report No.	13170804H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	December 19, 2019	January 9, 2020	January 9, 2020
Temperature / Humidity	23 deg. C / 40 % RH	23 deg. C / 35 % RH	22 deg. C / 34 % RH
Engineer	Yuta Moriya	Tomohisa Nakagawa	Junki Nagatomi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11ax-20 2437 MHz (OFDM)		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4874.000	PK	40.3	31.6	7.5	31.8	-	47.5	73.9	26.4	Floor noise
Hori.	7311.000	PK	41.4	36.2	8.9	32.7	-	53.7	73.9	20.2	Floor noise
Hori.	9748.000	PK	40.3	38.8	9.4	33.4	-	55.1	73.9	18.8	Floor noise
Hori.	4874.000	AV	31.6	31.6	7.5	31.8	-	38.8	53.9	15.1	Floor noise
Hori.	7311.000	AV	32.1	36.2	8.9	32.7	-	44.5	53.9	9.4	Floor noise
Hori.	9748.000	AV	32.2	38.8	9.4	33.4	-	46.9	53.9	7.0	Floor noise
Vert.	4874.000	PK	40.3	31.6	7.5	31.8	-	47.6	73.9	26.3	Floor noise
Vert.	7311.000	PK	41.2	36.2	8.9	32.7	-	53.6	73.9	20.3	Floor noise
Vert.	9748.000	PK	40.3	38.8	9.4	33.4	-	55.1	73.9	18.8	Floor noise
Vert.	4874.000	AV	31.7	31.6	7.5	31.8	-	38.9	53.9	15.0	Floor noise
Vert.	7311.000	AV	32.0	36.2	8.9	32.7	-	44.4	53.9	9.6	Floor noise
Vert.	9748.000	AV	32.3	38.8	9.4	33.4	-	47.1	53.9	6.8	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(PIFA Antenna)

Report No.	13170804H			
Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	December 19, 2019	January 9, 2020	January 9, 2020	January 10, 2020
Temperature / Humidity	23 deg. C / 40 % RH	23 deg. C / 35 % RH	22 deg. C / 34 % RH	23 deg. C / 35 % RH
Engineer	Yuta Moriya	Tomohisa Nakagawa	Junki Nagatomi	Tomohisa Nakagawa
	(1 GHz – 10 GHz)	(10 GHz – 18 GHz)	(18 GHz – 26.5 GHz)	(Below 1GHz)
Mode	Tx 11ax-20 2462 MHz (OFDM)			

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	62.258	QP	25.0	7.4	7.6	32.2	-	7.7	40.0	32.3	
Hori.	104.991	QP	22.6	11.0	8.1	32.1	-	9.6	43.5	33.9	
Hori.	162.303	QP	22.6	15.5	8.8	32.1	-	14.8	43.5	28.7	
Hori.	341.300	QP	22.2	14.9	10.3	31.9	-	15.4	46.0	30.6	
Hori.	576.300	QP	22.3	18.6	11.8	32.0	-	20.7	46.0	25.3	
Hori.	879.600	QP	22.1	22.0	13.4	31.1	-	26.4	46.0	19.6	
Hori.	2483.500	PK	51.2	27.5	5.5	32.7	-	51.5	73.9	22.4	
Hori.	4924.000	PK	39.8	31.5	7.5	31.8	-	47.0	73.9	26.9	Floor noise
Hori.	7386.000	PK	40.5	36.3	8.9	32.7	-	53.0	73.9	20.9	Floor noise
Hori.	9848.000	PK	41.1	39.0	9.4	33.4	-	56.0	73.9	17.9	Floor noise
Hori.	2483.500	AV	39.5	27.5	5.5	32.7	0.3	40.0	53.9	13.9	*1)
Hori.	4924.000	AV	30.9	31.5	7.5	31.8	-	38.1	53.9	15.8	Floor noise
Hori.	7386.000	AV	32.5	36.3	8.9	32.7	-	44.9	53.9	9.0	Floor noise
Hori.	9848.000	AV	32.8	39.0	9.4	33.4	-	47.8	53.9	6.1	Floor noise
Vert.	62.215	QP	33.4	7.4	7.6	32.2	-	16.1	40.0	23.9	
Vert.	95.634	QP	26.6	9.5	8.0	32.2	-	11.9	43.5	31.6	
Vert.	162.345	QP	22.6	15.5	8.8	32.1	-	14.8	43.5	28.7	
Vert.	341.300	QP	22.3	14.9	10.3	31.9	-	15.5	46.0	30.5	
Vert.	576.200	QP	22.1	18.6	11.8	32.0	-	20.5	46.0	25.5	
Vert.	879.200	QP	22.4	22.0	13.4	31.1	-	26.7	46.0	19.3	
Vert.	2483.500	PK	48.8	27.5	5.5	32.7	-	49.0	73.9	24.9	
Vert.	4924.000	PK	39.7	31.5	7.5	31.8	-	46.9	73.9	27.0	Floor noise
Vert.	7386.000	PK	40.8	36.3	8.9	32.7	-	53.3	73.9	20.7	Floor noise
Vert.	9848.000	PK	41.2	39.0	9.4	33.4	-	56.2	73.9	17.7	Floor noise
Vert.	2483.500	AV	37.7	27.5	5.5	32.7	0.3	38.2	53.9	15.7	*1)
Vert.	4924.000	AV	31.2	31.5	7.5	31.8	-	38.5	53.9	15.4	Floor noise
Vert.	7386.000	AV	32.4	36.3	8.9	32.7	-	44.9	53.9	9.0	Floor noise
Vert.	9848.000	AV	32.8	39.0	9.4	33.4	-	47.7	53.9	6.2	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

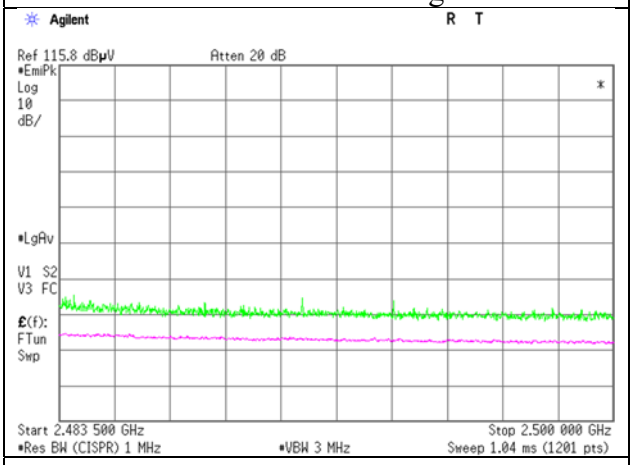
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	December 19, 2019
Temperature / Humidity	23 deg. C / 40 % RH
Engineer	Yuta Moriya
	(1 GHz – 10 GHz)
Mode	Tx 11ax-20 2462 MHz (OFDM)

Horizontal

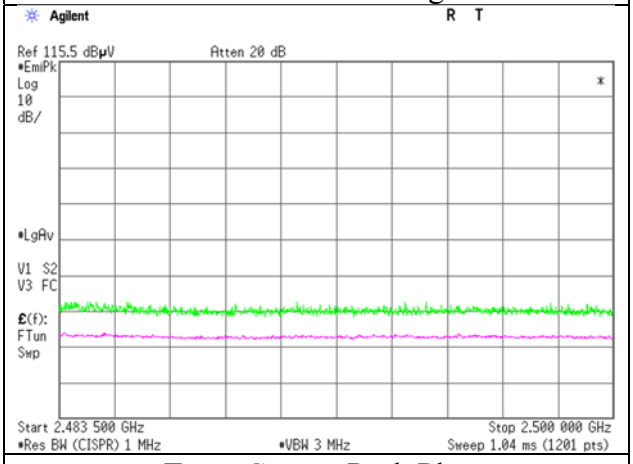
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* 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
(PIFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 9, 2020
Temperature / Humidity	23 deg. C / 43 % RH
Engineer	Junki Nagatomi
	Band edge
Mode	Tx 11ax-20 2462 MHz (26-tone RU)

RU Index 8

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	PK	43.0	27.5	5.0	32.7	-	42.7	73.9	31.2	
Hori.	2483.500	AV	34.7	27.5	5.0	32.7	0.4	34.8	53.9	19.1	*1)
Vert.	2483.500	PK	48.5	27.5	5.0	32.7	-	48.2	73.9	25.7	
Vert.	2483.500	AV	34.4	27.5	5.0	32.7	0.4	34.6	53.9	19.4	*1)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
*1) Not Out of Band emission(Leakage Power)

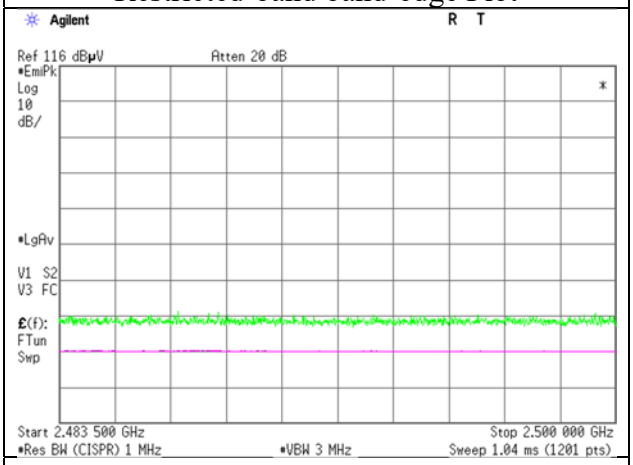
Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 9, 2020
Temperature / Humidity	23 deg. C / 43 % RH
Engineer	Junki Nagatomi
	Band edge
Mode	Tx 11ax-20 2462 MHz (26-tone RU)

RU Index 8

Horizontal

Restricted-band band-edge Plot

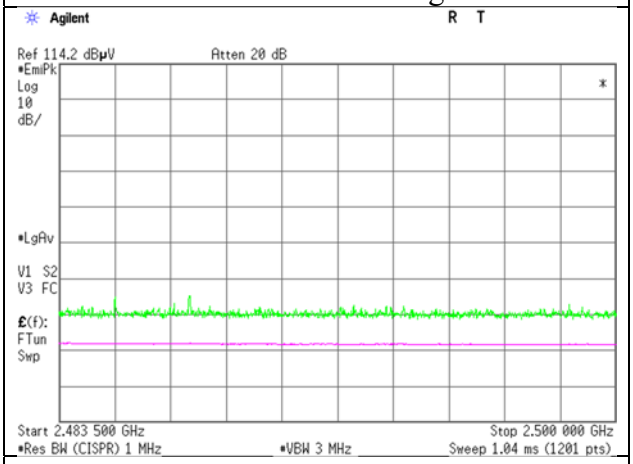


Trace Green : Peak Plot
Trace Purple : Average Plot

RU Index 8

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* 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
(PIFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 9, 2020
Temperature / Humidity	23 deg. C / 43 % RH
Engineer	Junki Nagatomi
	Band edge
Mode	Tx 11ax-20 2462 MHz (52-tone RU)

RU Index 40

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	PK	45.3	27.5	5.0	32.7	-	45.0	73.9	28.9	
Hori.	2483.500	AV	36.1	27.5	5.0	32.7	0.5	36.2	53.9	17.7	*1)
Vert.	2483.500	PK	48.1	27.5	5.0	32.7	-	47.8	73.9	26.1	
Vert.	2483.500	AV	35.0	27.5	5.0	32.7	0.5	35.1	53.9	18.8	*1)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
*1) Not Out of Band emission(Leakage Power)

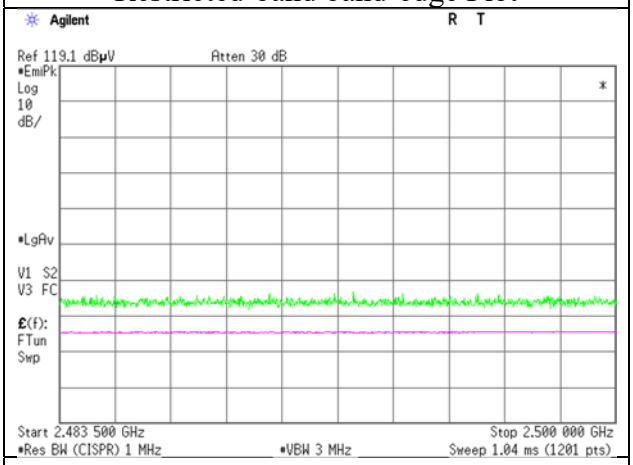
Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 9, 2020
Temperature / Humidity	23 deg. C / 43 % RH
Engineer	Junki Nagatomi
	Band edge
Mode	Tx 11ax-20 2462 MHz(52-tone RU)

RU Index 40

Horizontal

Restricted-band band-edge Plot

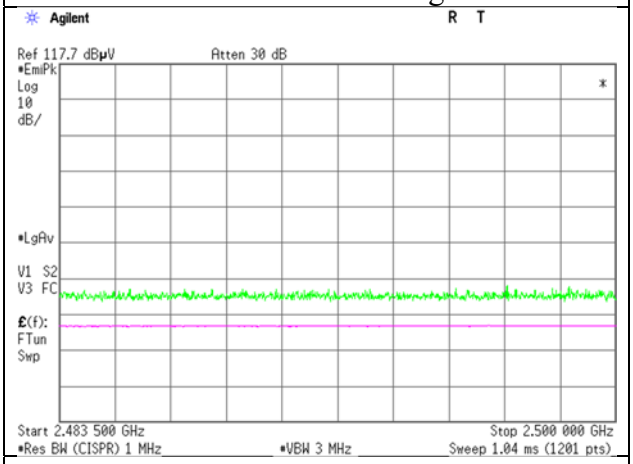


Trace Green : Peak Plot
Trace Purple : Average Plot

RU Index 40

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* 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
(PIFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 9, 2020
Temperature / Humidity	23 deg. C / 43 % RH
Engineer	Junki Nagatomi
	Band edge
Mode	Tx 11ax-20 2462 MHz (106-tone RU)

RU Index 54

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	PK	45.3	27.5	5.0	32.7	-	45.0	73.9	28.9	
Hori.	2483.500	AV	36.1	27.5	5.0	32.7	0.5	36.2	53.9	17.7	*1)
Vert.	2483.500	PK	46.2	27.5	5.0	32.7	-	45.9	73.9	28.0	
Vert.	2483.500	AV	36.7	27.5	5.0	32.7	0.5	36.9	53.9	17.0	*1)

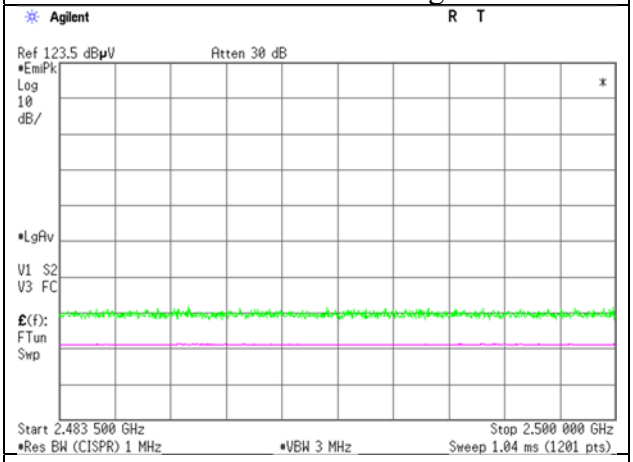
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna)

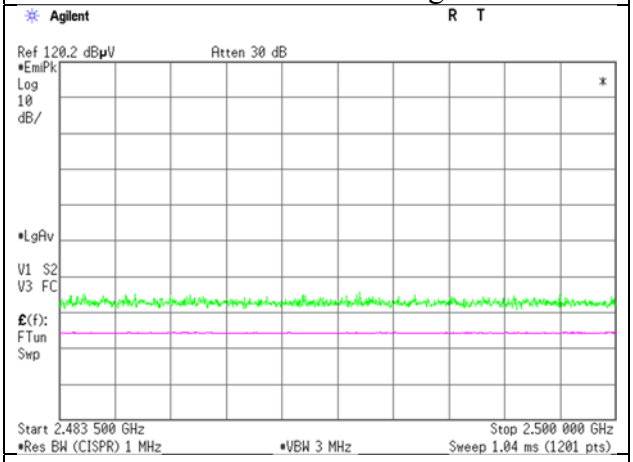
Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 9, 2020
Temperature / Humidity	23 deg. C / 43 % RH
Engineer	Junki Nagatomi
	Band edge
Mode	Tx 11ax-20 2462 MHz (106-tone RU)

RU Index 54
Horizontal
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

RU Index 54
Vertical
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* 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
(PIFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	April 4, 2020
Temperature / Humidity	22 deg. C / 40 % RH
Engineer	Takafumi Noguchi
	Band edge
Mode	Tx 11ax-20 2462 MHz (242-tone RU)

RU Index 61

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	PK	67.8	27.5	4.9	32.7	-	67.5	73.9	6.4	
Hori.	2483.500	AV	48.2	27.5	4.9	32.7	0.5	48.4	53.9	5.5	*1)
Vert.	2483.500	PK	68.3	27.5	4.9	32.7	-	68.0	73.9	5.9	
Vert.	2483.500	AV	48.3	27.5	4.9	32.7	0.5	48.5	53.9	5.4	*1)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
*1) Not Out of Band emission(Leakage Power)

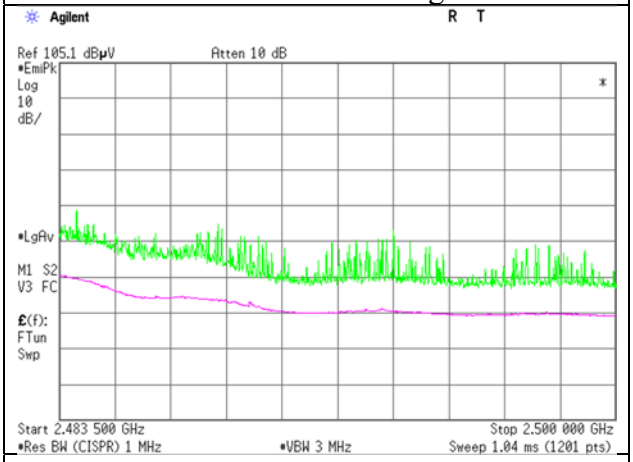
Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	April 4, 2020
Temperature / Humidity	22 deg. C / 40 % RH
Engineer	Takafumi Noguchi
	Band edge
Mode	Tx 11ax-20 2462 MHz (242-tone RU)

RU Index 61

Horizontal

Restricted-band band-edge Plot

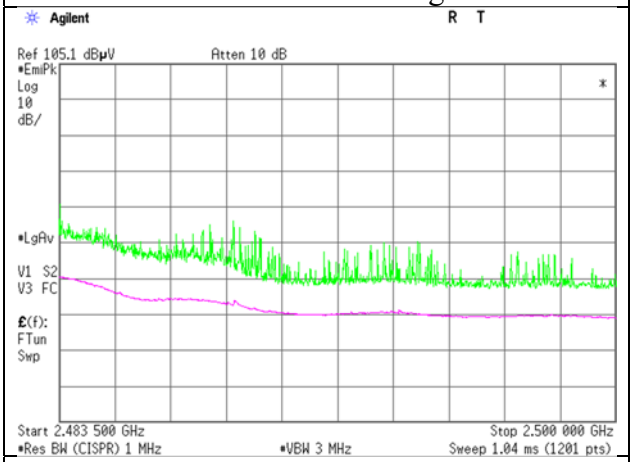


Trace Green : Peak Plot
Trace Purple : Average Plot

RU Index 61

Vertical

Restricted-band band-edge Plot

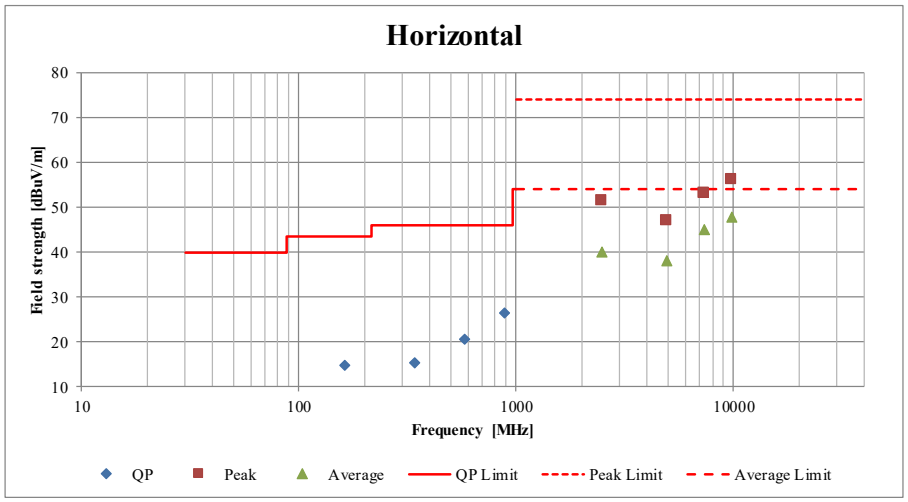


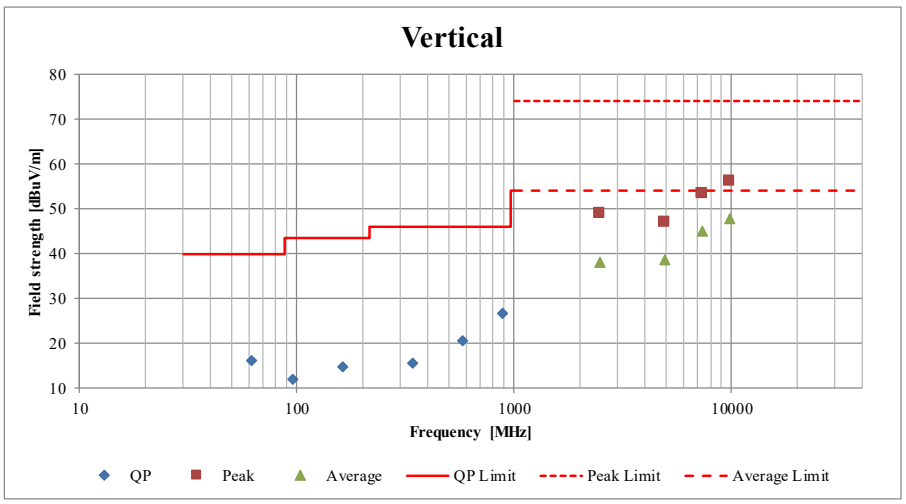
Trace Green : Peak Plot
Trace Purple : Average Plot

* 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)
(PIFA Antenna WLAN)

Report No.	13170804H			
Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	December 19, 2019	January 9, 2020	January 9, 2020	January 10, 2020
Temperature / Humidity	23 deg. C / 40 % RH	23 deg. C / 35 % RH	22 deg. C / 34 % RH	23 deg. C / 35 % RH
Engineer	Yuta Moriya	Tomohisa Nakagawa	Junki Nagatomi	Tomohisa Nakagawa
	(1 GHz – 10 GHz)	(10 GHz – 18 GHz)	(18 GHz – 26.5 GHz)	(Below 1GHz)
Mode	Tx 11ax-20 2462 MHz (OFDM)			





Radiated Spurious Emission
(PIFA Antenna BT1)

Report No.	13170804H			
Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	December 22, 2019	January 9, 2020	January 9, 2020	January 11, 2020
Temperature / Humidity	23 deg. C / 43 % RH	23 deg. C / 35 % RH	22 deg. C / 34 % RH	22 deg. C / 37 % RH
Engineer	Akihiko Maeda	Tomohisa Nakagawa	Junki Nagatomi	Koji Yamamoto
	(1 GHz -10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)	(Below 1 GHz)
Mode	Tx BT LE 1M-PHY 2402 MHz			

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	59.288	QP	24.3	8.1	7.5	32.2	-	7.7	40.0	32.3	
Hori.	62.277	QP	23.0	7.3	7.6	32.2	-	5.7	40.0	34.3	
Hori.	128.949	QP	22.8	13.8	8.4	32.1	-	12.9	43.5	30.6	
Hori.	352.995	QP	22.3	15.0	10.4	31.9	-	15.8	46.0	30.3	
Hori.	590.593	QP	22.2	19.1	11.9	32.0	-	21.1	46.0	24.9	
Hori.	879.126	QP	21.7	22.0	13.4	31.1	-	26.0	46.0	20.0	
Hori.	2339.989	PK	47.6	27.8	5.4	32.8	-	48.0	73.9	25.9	
Hori.	2390.000	PK	57.5	27.7	5.4	32.8	-	57.9	73.9	16.0	
Hori.	4804.000	PK	41.3	31.6	7.5	31.8	-	48.6	73.9	25.3	Floor noise
Hori.	7206.000	PK	42.3	36.0	8.9	32.7	-	54.5	73.9	19.4	Floor noise
Hori.	9608.000	PK	42.3	38.5	9.4	33.3	-	56.9	73.9	17.0	Floor noise
Hori.	2339.989	AV	39.1	27.8	5.4	32.8	2.0	41.5	53.9	12.4	*2)
Hori.	2390.000	AV	43.2	27.7	5.4	32.8	2.0	45.5	53.9	8.4	*1)
Hori.	4804.000	AV	32.5	31.6	7.5	31.8	-	39.8	53.9	14.1	Floor noise
Hori.	7206.000	AV	33.7	36.0	8.9	32.7	-	46.0	53.9	8.0	Floor noise
Hori.	9608.000	AV	32.3	38.5	9.4	33.3	-	46.8	53.9	7.1	Floor noise
Vert.	59.288	QP	29.1	8.1	7.5	32.2	-	12.5	40.0	27.5	
Vert.	62.277	QP	25.8	7.3	7.6	32.2	-	8.5	40.0	31.5	
Vert.	128.949	QP	22.7	13.8	8.4	32.1	-	12.8	43.5	30.7	
Vert.	352.995	QP	22.3	15.0	10.4	31.9	-	15.8	46.0	30.3	
Vert.	590.593	QP	22.1	19.1	11.9	32.0	-	21.0	46.0	25.0	
Vert.	879.126	QP	21.8	22.0	13.4	31.1	-	26.1	46.0	19.9	
Vert.	2339.989	PK	47.5	27.8	5.4	32.8	-	47.9	73.9	26.1	
Vert.	2390.000	PK	55.6	27.7	5.4	32.8	-	55.9	73.9	18.0	
Vert.	4804.000	PK	41.0	31.6	7.5	31.8	-	48.3	73.9	25.6	Floor noise
Vert.	7206.000	PK	42.7	36.0	8.9	32.7	-	54.9	73.9	19.0	Floor noise
Vert.	9608.000	PK	42.1	38.5	9.4	33.3	-	56.7	73.9	17.2	Floor noise
Vert.	2339.989	AV	38.0	27.8	5.4	32.8	2.0	40.4	53.9	13.5	*2)
Vert.	2390.000	AV	41.2	27.7	5.4	32.8	2.0	43.5	53.9	10.4	*1)
Vert.	4804.000	AV	32.5	31.6	7.5	31.8	-	39.8	53.9	14.1	Floor noise
Vert.	7206.000	AV	34.0	36.0	8.9	32.7	-	46.2	53.9	7.7	Floor noise
Vert.	9608.000	AV	32.1	38.5	9.4	33.3	-	46.7	53.9	7.2	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

*1) Not Out of Band emission(Leakage Power)
*2) Noise synchronized with duty of carrier frequency.

20dBc Data Sheet

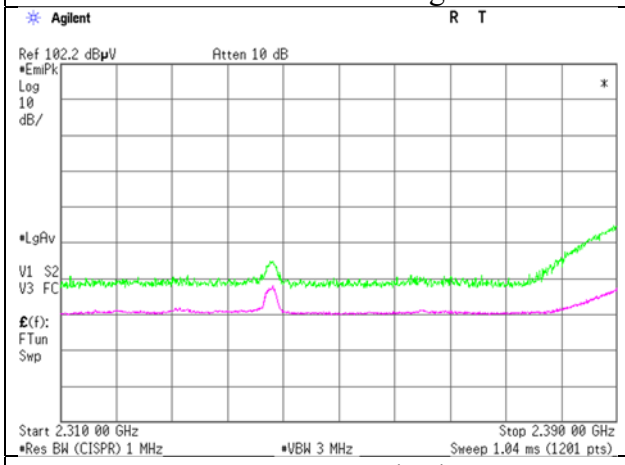
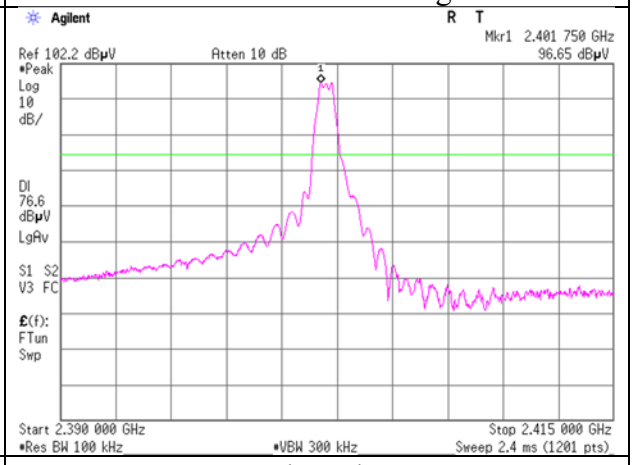
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	96.7	27.7	5.4	32.7	97.0	-	-	Carrier
Hori	2400.000	PK	53.6	27.7	5.4	32.7	54.0	77.0	23.0	
Vert	2402.000	PK	94.0	27.7	5.4	32.7	94.3	-	-	Carrier
Vert	2400.000	PK	51.0	27.7	5.4	32.7	51.4	74.3	22.9	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

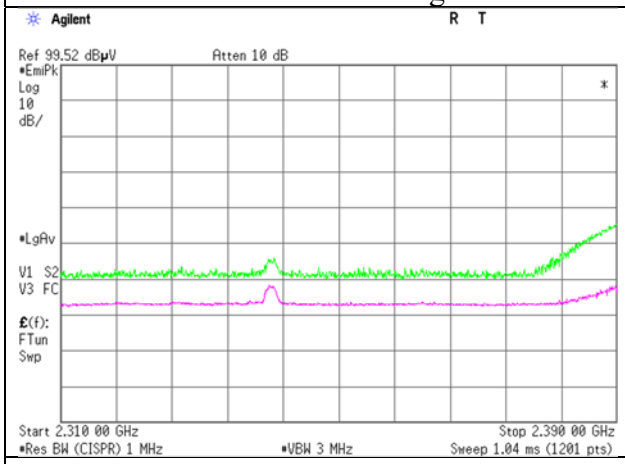
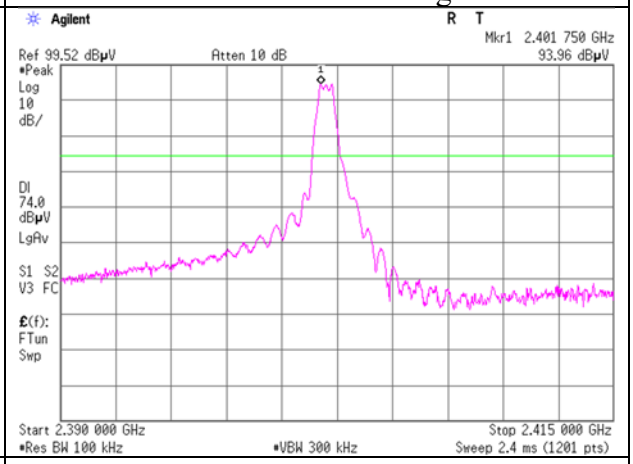
Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna BT1)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	December 22, 2019
Temperature / Humidity	23 deg. C / 43 % RH
Engineer	Akihiko Maeda
	(1 GHz -10 GHz)
Mode	Tx BT LE 1M-PHY 2402 MHz

Horizontal

Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical

Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* 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
(PIFA Antenna BT1)

Report No.	13170804H			
Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	December 22, 2019	January 9, 2020	January 9, 2020	January 11, 2020
Temperature / Humidity	23 deg. C / 43 % RH	23 deg. C / 35 % RH	22 deg. C / 34 % RH	22 deg. C / 37 % RH
Engineer	Akihiko Maeda	Tomohisa Nakagawa	Junki Nagatomi	Koji Yamamoto
	(1 GHz -10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)	(Below 1 GHz)
Mode	Tx BT LE 1M-PHY 2440 MHz			

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	59.281	QP	24.1	8.1	7.5	32.2	-	7.5	40.0	32.5	
Hori.	62.268	QP	22.9	7.4	7.6	32.2	-	5.6	40.0	34.4	
Hori.	181.979	QP	22.1	16.4	9.0	32.1	-	15.4	43.5	28.1	
Hori.	337.644	QP	22.3	14.8	10.2	31.9	-	15.4	46.0	30.6	
Hori.	491.358	QP	22.2	17.6	11.3	32.0	-	19.1	46.0	26.9	
Hori.	959.676	QP	23.9	22.2	13.8	30.6	-	29.2	46.0	16.8	
Hori.	2373.968	PK	47.9	27.7	5.4	32.8	-	48.3	73.9	25.6	
Hori.	4880.000	PK	42.0	31.5	7.5	31.8	-	49.3	73.9	24.6	Floor noise
Hori.	7320.000	PK	41.7	36.2	8.9	32.7	-	54.1	73.9	19.8	Floor noise
Hori.	9760.000	PK	41.9	38.8	9.4	33.4	-	56.7	73.9	17.2	Floor noise
Hori.	2373.968	AV	39.3	27.7	5.4	32.8	2.0	41.7	53.9	12.2	*1)
Hori.	4880.000	AV	32.2	31.5	7.5	31.8	-	39.4	53.9	14.5	Floor noise
Hori.	7320.000	AV	33.6	36.2	8.9	32.7	-	46.0	53.9	7.9	Floor noise
Hori.	9760.000	AV	32.3	38.8	9.4	33.4	-	47.1	53.9	6.8	Floor noise
Vert.	59.281	QP	29.2	8.1	7.5	32.2	-	12.6	40.0	27.4	
Vert.	62.268	QP	25.7	7.4	7.6	32.2	-	8.4	40.0	31.6	
Vert.	181.979	QP	22.2	16.4	9.0	32.1	-	15.5	43.5	28.0	
Vert.	337.644	QP	22.4	14.8	10.2	31.9	-	15.5	46.0	30.5	
Vert.	491.358	QP	22.3	17.6	11.3	32.0	-	19.2	46.0	26.8	
Vert.	959.676	QP	23.3	22.2	13.8	30.6	-	28.6	46.0	17.4	
Vert.	2373.968	PK	46.9	27.7	5.4	32.8	-	47.2	73.9	26.7	
Vert.	4880.000	PK	41.2	31.5	7.5	31.8	-	48.4	73.9	25.5	Floor noise
Vert.	7320.000	PK	43.2	36.2	8.9	32.7	-	55.5	73.9	18.4	Floor noise
Vert.	9760.000	PK	41.6	38.8	9.4	33.4	-	56.4	73.9	17.5	Floor noise
Vert.	2373.968	AV	38.8	27.7	5.4	32.8	2.0	41.2	53.9	12.8	*1)
Vert.	4880.000	AV	32.4	31.5	7.5	31.8	-	39.7	53.9	14.2	Floor noise
Vert.	7320.000	AV	33.6	36.2	8.9	32.7	-	46.0	53.9	7.9	Floor noise
Vert.	9760.000	AV	32.2	38.8	9.4	33.4	-	47.0	53.9	6.9	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

*1) Noise synchronized with duty of carrier frequency.

Radiated Spurious Emission
(PIFA Antenna BT1)

Report No.	13170804H			
Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	December 22, 2019	January 9, 2020	January 9, 2020	January 11, 2020
Temperature / Humidity	23 deg. C / 43 % RH	23 deg. C / 35 % RH	22 deg. C / 34 % RH	22 deg. C / 37 % RH
Engineer	Akihiko Maeda	Tomohisa Nakagawa	Junki Nagatomi	Koji Yamamoto
	(1 GHz -10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)	(Below 1 GHz)
Mode	Tx BT LE 1M-PHY 2480 MHz			

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	59.407	QP	24.3	8.0	7.5	32.2	-	7.7	40.0	32.3	
Hori.	62.780	QP	22.9	7.3	7.6	32.2	-	5.6	40.0	34.4	
Hori.	145.199	QP	22.6	14.8	8.6	32.1	-	13.9	43.5	29.6	
Hori.	354.545	QP	22.2	15.0	10.4	31.9	-	15.7	46.0	30.3	
Hori.	500.950	QP	22.1	17.7	11.3	32.0	-	19.2	46.0	26.8	
Hori.	959.794	QP	24.0	22.2	13.8	30.6	-	29.3	46.0	16.7	
Hori.	2483.500	PK	59.4	27.5	5.5	32.7	-	59.6	73.9	14.3	
Hori.	4960.000	PK	41.2	31.6	7.5	31.8	-	48.5	73.9	25.4	Floor noise
Hori.	7440.000	PK	43.0	36.3	8.9	32.7	-	55.5	73.9	18.4	Floor noise
Hori.	9920.000	PK	42.1	38.9	9.4	33.4	-	57.0	73.9	16.9	Floor noise
Hori.	2483.500	AV	44.7	27.5	5.5	32.7	2.0	46.9	53.9	7.0	*1)
Hori.	4960.000	AV	32.2	31.6	7.5	31.8	-	39.5	53.9	14.4	Floor noise
Hori.	7440.000	AV	34.5	36.3	8.9	32.7	-	46.9	53.9	7.0	Floor noise
Hori.	9920.000	AV	32.4	38.9	9.4	33.4	-	47.2	53.9	6.7	Floor noise
Vert.	59.407	QP	29.2	8.0	7.5	32.2	-	12.6	40.0	27.4	
Vert.	62.780	QP	25.9	7.3	7.6	32.2	-	8.6	40.0	31.4	
Vert.	145.199	QP	22.7	14.8	8.6	32.1	-	14.0	43.5	29.5	
Vert.	354.545	QP	22.3	15.0	10.4	31.9	-	15.8	46.0	30.2	
Vert.	500.950	QP	22.3	17.7	11.3	32.0	-	19.4	46.0	26.6	
Vert.	959.794	QP	23.3	22.2	13.8	30.6	-	28.6	46.0	17.4	
Vert.	2483.500	PK	54.8	27.5	5.5	32.7	-	55.0	73.9	18.9	
Vert.	4960.000	PK	41.2	31.6	7.5	31.8	-	48.5	73.9	25.4	Floor noise
Vert.	7440.000	PK	42.5	36.3	8.9	32.7	-	54.9	73.9	19.0	Floor noise
Vert.	9920.000	PK	42.8	38.9	9.4	33.4	-	57.7	73.9	16.2	Floor noise
Vert.	2483.500	AV	41.5	27.5	5.5	32.7	2.0	43.8	53.9	10.1	*1)
Vert.	4960.000	AV	32.5	31.6	7.5	31.8	-	39.8	53.9	14.1	Floor noise
Vert.	7440.000	AV	34.4	36.3	8.9	32.7	-	46.9	53.9	7.0	Floor noise
Vert.	9920.000	AV	32.3	38.9	9.4	33.4	-	47.2	53.9	6.7	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

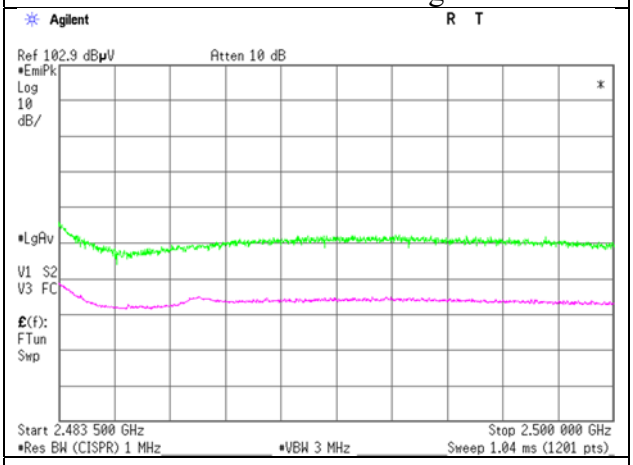
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna BT1)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	December 22, 2019
Temperature / Humidity	23 deg. C / 43 % RH
Engineer	Akihiko Maeda
	(1 GHz -10 GHz)
Mode	Tx BT LE 1M-PHY 2480 MHz

Horizontal

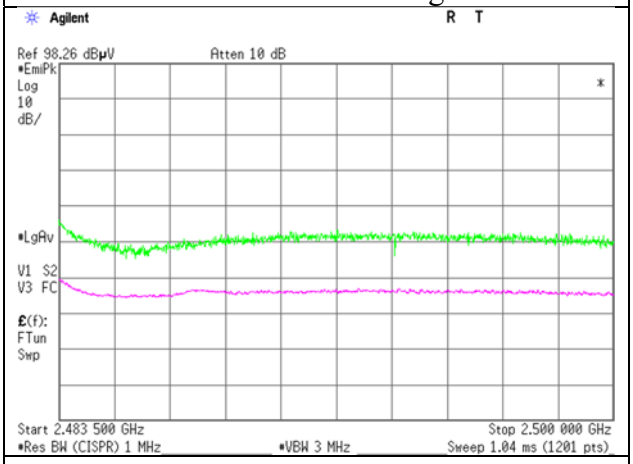
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* 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
(PIFA Antenna BT1)

Report No.	13170804H			
Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	December 22, 2019	January 9, 2020	January 9, 2020	January 11, 2020
Temperature / Humidity	23 deg. C / 43 % RH	23 deg. C / 35 % RH	22 deg. C / 34 % RH	22 deg. C / 37 % RH
Engineer	Akihiko Maeda	Tomohisa Nakagawa	Junki Nagatomi	Koji Yamamoto
	(1 GHz -10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)	(Below 1 GHz)
Mode	Tx BT LE 2M-PHY 2402 MHz			

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	59.235	QP	24.1	8.1	7.5	32.2	-	7.5	40.0	32.5	
Hori.	62.991	QP	22.8	7.3	7.6	32.2	-	5.4	40.0	34.6	
Hori.	175.140	QP	22.9	16.1	8.9	32.1	-	15.9	43.5	27.7	
Hori.	341.535	QP	22.3	14.9	10.3	31.9	-	15.5	46.0	30.5	
Hori.	544.779	QP	22.1	17.8	11.6	32.0	-	19.5	46.0	26.5	
Hori.	959.777	QP	24.1	22.2	13.8	30.6	-	29.4	46.0	16.6	
Hori.	2339.989	PK	48.9	27.8	5.4	32.8	-	49.3	73.9	24.6	
Hori.	2390.000	PK	57.4	27.7	5.4	32.8	-	57.7	73.9	16.2	
Hori.	4804.000	PK	41.2	31.6	7.5	31.8	-	48.5	73.9	25.4	Floor noise
Hori.	7206.000	PK	42.2	36.0	8.9	32.7	-	54.4	73.9	19.5	Floor noise
Hori.	9608.000	PK	42.0	38.5	9.4	33.3	-	56.6	73.9	17.3	Floor noise
Hori.	2339.989	AV	40.2	27.8	5.4	32.8	4.8	45.4	53.9	8.5	*2)
Hori.	2390.000	AV	43.4	27.7	5.4	32.8	4.8	48.5	53.9	5.4	*1)
Hori.	4804.000	AV	32.6	31.6	7.5	31.8	-	39.9	53.9	14.0	Floor noise
Hori.	7206.000	AV	33.5	36.0	8.9	32.7	-	45.8	53.9	8.2	Floor noise
Hori.	9608.000	AV	32.2	38.5	9.4	33.3	-	46.8	53.9	7.1	Floor noise
Vert.	59.235	QP	29.0	8.1	7.5	32.2	-	12.4	40.0	27.6	
Vert.	62.991	QP	25.8	7.3	7.6	32.2	-	8.4	40.0	31.6	
Vert.	175.140	QP	22.7	16.1	8.9	32.1	-	15.7	43.5	27.9	
Vert.	341.535	QP	22.1	14.9	10.3	31.9	-	15.3	46.0	30.7	
Vert.	544.779	QP	22.2	17.8	11.6	32.0	-	19.6	46.0	26.4	
Vert.	959.777	QP	23.2	22.2	13.8	30.6	-	28.5	46.0	17.5	
Vert.	2339.989	PK	46.8	27.8	5.4	32.8	-	47.2	73.9	26.7	
Vert.	2390.000	PK	55.1	27.7	5.4	32.8	-	55.4	73.9	18.5	
Vert.	4804.000	PK	41.0	31.6	7.5	31.8	-	48.3	73.9	25.7	Floor noise
Vert.	7206.000	PK	42.3	36.0	8.9	32.7	-	54.5	73.9	19.4	Floor noise
Vert.	9608.000	PK	42.0	38.5	9.4	33.3	-	56.6	73.9	17.3	Floor noise
Vert.	2339.989	AV	36.8	27.8	5.4	32.8	4.8	42.0	53.9	11.9	*2)
Vert.	2390.000	AV	40.3	27.7	5.4	32.8	4.8	45.4	53.9	8.5	*1)
Vert.	4804.000	AV	32.3	31.6	7.5	31.8	-	39.6	53.9	14.4	Floor noise
Vert.	7206.000	AV	34.1	36.0	8.9	32.7	-	46.3	53.9	7.6	Floor noise
Vert.	9608.000	AV	32.1	38.5	9.4	33.3	-	46.7	53.9	7.2	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

*1) Not Out of Band emission(Leakage Power)
*2) Noise synchronized with duty of carrier frequency.

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	96.3	27.7	5.4	32.7	96.6	-	-	Carrier
Hori.	2400.000	PK	53.2	27.7	5.4	32.7	53.6	76.6	23.1	
Vert.	2402.000	PK	94.3	27.7	5.4	32.7	94.6	-	-	Carrier
Vert.	2400.000	PK	51.2	27.7	5.4	32.7	51.5	74.6	23.1	

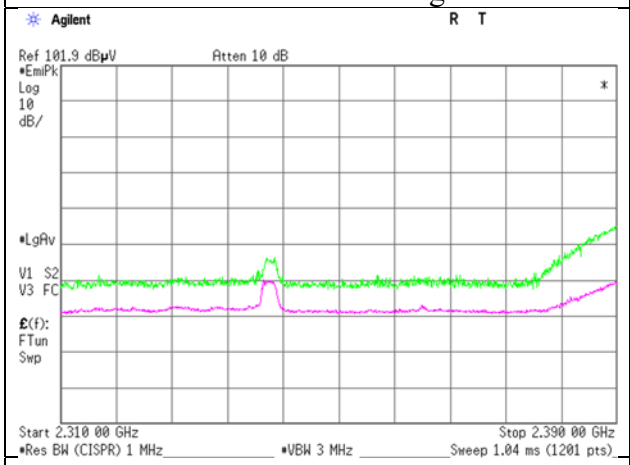
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna BT1)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	December 22, 2019
Temperature / Humidity	23 deg. C / 43 % RH
Engineer	Akihiko Maeda
	(1 GHz -10 GHz)
Mode	Tx BT LE 2M-PHY 2402 MHz

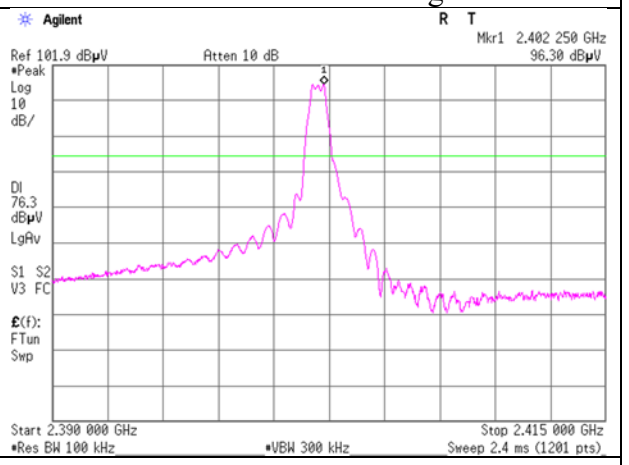
Horizontal

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

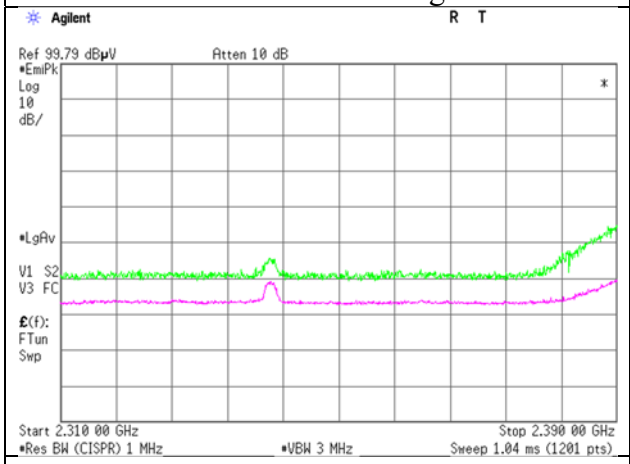
Authorized-band band-edge Plot



20dBc Plot

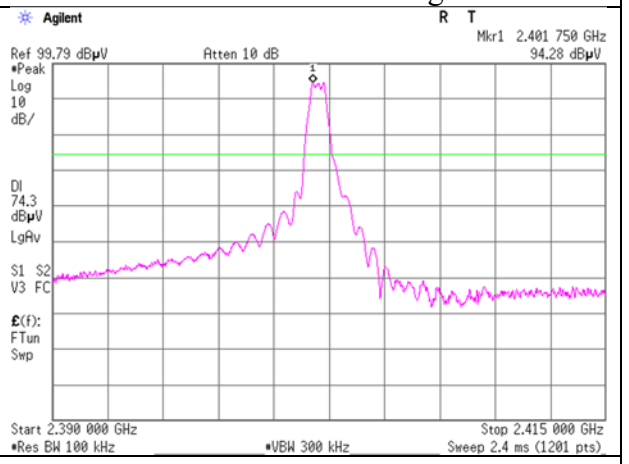
Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Authorized-band band-edge Plot



20dBc Plot

* 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
(PIFA Antenna BT1)

Report No.	13170804H			
Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	December 22, 2019	January 9, 2020	January 9, 2020	January 11, 2020
Temperature / Humidity	23 deg. C / 43 % RH	23 deg. C / 35 % RH	22 deg. C / 34 % RH	22 deg. C / 37 % RH
Engineer	Akihiko Maeda	Tomohisa Nakagawa	Junki Nagatomi	Koji Yamamoto
	(1 GHz -10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)	(Below 1 GHz)
Mode	Tx BT LE 2M-PHY 2440 MHz			

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	59.259	QP	24.2	8.1	7.5	32.2	-	7.6	40.0	32.4	
Hori.	62.516	QP	22.9	7.3	7.6	32.2	-	5.6	40.0	34.4	
Hori.	130.109	QP	22.1	13.8	8.4	32.1	-	12.2	43.5	31.3	
Hori.	345.690	QP	22.2	15.0	10.3	31.9	-	15.5	46.0	30.5	
Hori.	502.203	QP	22.1	17.7	11.3	32.0	-	19.2	46.0	26.8	
Hori.	959.846	QP	24.5	22.2	13.8	30.6	-	29.8	46.0	16.2	
Hori.	2373.968	PK	47.9	27.7	5.4	32.8	-	48.2	73.9	25.7	
Hori.	4880.000	PK	42.1	31.5	7.5	31.8	-	49.4	73.9	24.6	Floor noise
Hori.	7320.000	PK	41.6	36.2	8.9	32.7	-	54.0	73.9	20.0	Floor noise
Hori.	9760.000	PK	42.0	38.8	9.4	33.4	-	56.8	73.9	17.1	Floor noise
Hori.	2373.968	AV	38.9	27.7	5.4	32.8	4.8	44.0	53.9	9.9	*1)
Hori.	4880.000	AV	32.4	31.5	7.5	31.8	-	39.6	53.9	14.3	Floor noise
Hori.	7320.000	AV	33.4	36.2	8.9	32.7	-	45.8	53.9	8.1	Floor noise
Hori.	9760.000	AV	32.2	38.8	9.4	33.4	-	47.0	53.9	6.9	Floor noise
Vert.	59.259	QP	29.2	8.1	7.5	32.2	-	12.6	40.0	27.4	
Vert.	62.516	QP	25.7	7.3	7.6	32.2	-	8.4	40.0	31.6	
Vert.	130.109	QP	22.4	13.8	8.4	32.1	-	12.5	43.5	31.0	
Vert.	345.690	QP	22.3	15.0	10.3	31.9	-	15.6	46.0	30.4	
Vert.	502.203	QP	22.3	17.7	11.3	32.0	-	19.4	46.0	26.6	
Vert.	959.846	QP	23.3	22.2	13.8	30.6	-	28.6	46.0	17.4	
Vert.	2373.968	PK	48.0	27.7	5.4	32.8	-	48.3	73.9	25.6	
Vert.	4880.000	PK	41.0	31.5	7.5	31.8	-	48.2	73.9	25.7	Floor noise
Vert.	7320.000	PK	43.3	36.2	8.9	32.7	-	55.7	73.9	18.3	Floor noise
Vert.	9760.000	PK	41.3	38.8	9.4	33.4	-	56.1	73.9	17.8	Floor noise
Vert.	2373.968	AV	39.0	27.7	5.4	32.8	4.8	44.1	53.9	9.8	*1)
Vert.	4880.000	AV	32.5	31.5	7.5	31.8	-	39.8	53.9	14.1	Floor noise
Vert.	7320.000	AV	33.5	36.2	8.9	32.7	-	45.9	53.9	8.0	Floor noise
Vert.	9760.000	AV	32.1	38.8	9.4	33.4	-	46.9	53.9	7.0	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

*1) Noise synchronized with duty of carrier frequency.

Radiated Spurious Emission
(PIFA Antenna BT1)

Report No.	13170804H			
Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	December 22, 2019	January 9, 2020	January 9, 2020	January 11, 2020
Temperature / Humidity	23 deg. C / 43 % RH	23 deg. C / 35 % RH	22 deg. C / 34 % RH	22 deg. C / 37 % RH
Engineer	Akihiko Maeda	Tomohisa Nakagawa	Junki Nagatomi	Koji Yamamoto
	(1 GHz -10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)	(Below 1 GHz)
Mode	Tx BT LE 2M-PHY 2480 MHz			

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	59.075	QP	24.5	8.1	7.5	32.2	-	8.0	40.0	32.0	
Hori.	62.278	QP	23.2	7.3	7.6	32.2	-	5.9	40.0	34.1	
Hori.	171.909	QP	22.7	16.0	8.9	32.1	-	15.4	43.5	28.1	
Hori.	356.774	QP	22.1	15.0	10.4	31.9	-	15.6	46.0	30.4	
Hori.	627.392	QP	22.1	19.5	12.1	32.0	-	21.6	46.0	24.4	
Hori.	959.934	QP	27.9	22.2	13.8	30.6	-	33.2	46.0	12.8	
Hori.	2483.500	PK	58.3	27.5	5.5	32.7	-	58.6	73.9	15.4	
Hori.	4960.000	PK	41.3	31.6	7.5	31.8	-	48.6	73.9	25.3	Floor noise
Hori.	7440.000	PK	43.1	36.3	8.9	32.7	-	55.5	73.9	18.4	Floor noise
Hori.	9920.000	PK	42.8	38.9	9.4	33.4	-	57.6	73.9	16.3	Floor noise
Hori.	2483.500	AV	45.0	27.5	5.5	32.7	4.8	50.0	53.9	3.9	*1)
Hori.	4960.000	AV	32.4	31.6	7.5	31.8	-	39.7	53.9	14.2	Floor noise
Hori.	7440.000	AV	34.3	36.3	8.9	32.7	-	46.7	53.9	7.2	Floor noise
Hori.	9920.000	AV	32.2	38.9	9.4	33.4	-	47.1	53.9	6.8	Floor noise
Vert.	59.075	QP	29.5	8.1	7.5	32.2	-	13.0	40.0	27.0	
Vert.	62.278	QP	27.3	7.3	7.6	32.2	-	10.0	40.0	30.0	
Vert.	171.909	QP	22.6	16.0	8.9	32.1	-	15.3	43.5	28.2	
Vert.	356.774	QP	22.3	15.0	10.4	31.9	-	15.8	46.0	30.2	
Vert.	627.392	QP	22.0	19.5	12.1	32.0	-	21.5	46.0	24.5	
Vert.	959.934	QP	23.5	22.2	13.8	30.6	-	28.8	46.0	17.2	
Vert.	2483.500	PK	56.5	27.5	5.5	32.7	-	56.7	73.9	17.2	
Vert.	4960.000	PK	41.5	31.6	7.5	31.8	-	48.8	73.9	25.2	Floor noise
Vert.	7440.000	PK	42.3	36.3	8.9	32.7	-	54.8	73.9	19.1	Floor noise
Vert.	9920.000	PK	42.4	38.9	9.4	33.4	-	57.3	73.9	16.6	Floor noise
Vert.	2483.500	AV	42.1	27.5	5.5	32.7	4.8	47.1	53.9	6.8	*1)
Vert.	4960.000	AV	32.5	31.6	7.5	31.8	-	39.8	53.9	14.1	Floor noise
Vert.	7440.000	AV	34.5	36.3	8.9	32.7	-	47.0	53.9	6.9	Floor noise
Vert.	9920.000	AV	32.5	38.9	9.4	33.4	-	47.3	53.9	6.6	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

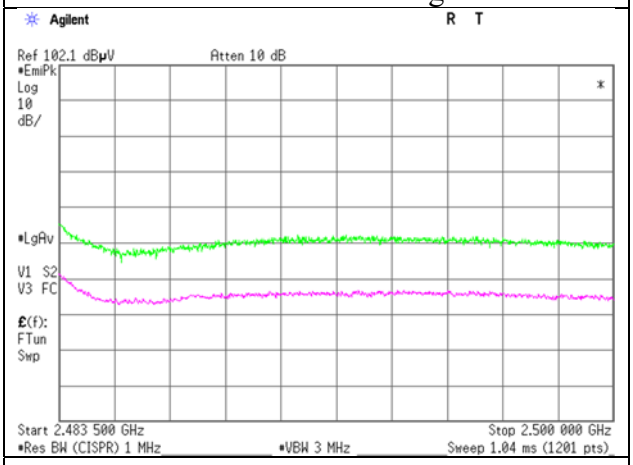
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna BT1)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	December 22, 2019
Temperature / Humidity	23 deg. C / 43 % RH
Engineer	Akihiko Maeda
	(1 GHz -10 GHz)
Mode	Tx BT LE 2M-PHY 2480 MHz

Horizontal

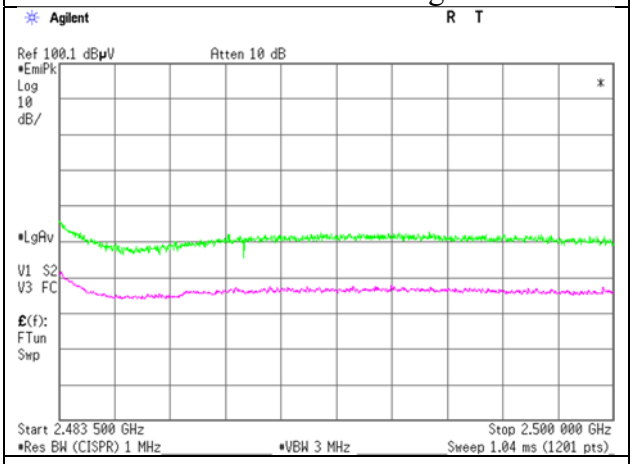
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* 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
(PIFA Antenna BT2)

Report No.	13170804H			
Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	December 24, 2019	January 9, 2020	January 9, 2020	January 11, 2020
Temperature / Humidity	21 deg. C / 41 % RH	23 deg. C / 35 % RH	22 deg. C / 34 % RH	22 deg. C / 37 % RH
Engineer	Yuta Moriya	Tomohisa Nakagawa	Junki Nagatomi	Koji Yamamoto
	(1 GHz -10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)	(Below 1 GHz)
Mode	Tx BT LE 1M-PHY 2402 MHz			

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	59.189	QP	24.5	8.1	7.5	32.2	-	7.9	40.0	32.1	
Hori.	62.882	QP	23.1	7.3	7.6	32.2	-	5.8	40.0	34.2	
Hori.	191.870	QP	22.3	16.5	9.0	32.1	-	15.8	43.5	27.7	
Hori.	344.717	QP	22.2	15.0	10.3	31.9	-	15.5	46.0	30.5	
Hori.	543.895	QP	22.3	17.8	11.6	32.0	-	19.7	46.0	26.4	
Hori.	959.485	QP	26.7	22.1	13.8	30.6	-	32.0	46.0	14.0	
Hori.	2339.989	PK	46.5	27.8	5.4	32.8	-	46.9	73.9	27.0	
Hori.	2390.000	PK	55.7	27.7	5.4	32.8	-	56.1	73.9	17.8	
Hori.	4804.000	PK	40.5	31.6	7.5	31.8	-	47.7	73.9	26.2	Floor noise
Hori.	7206.000	PK	40.7	36.0	8.9	32.7	-	52.9	73.9	21.0	Floor noise
Hori.	9608.000	PK	40.8	38.5	9.4	33.3	-	55.4	73.9	18.5	Floor noise
Hori.	2339.989	AV	38.0	27.8	5.4	32.8	2.0	40.4	53.9	13.5	*2)
Hori.	2390.000	AV	40.7	27.7	5.4	32.8	2.0	43.1	53.9	10.8	*1)
Hori.	4804.000	AV	32.4	31.6	7.5	31.8	-	39.7	53.9	14.2	Floor noise
Hori.	7206.000	AV	32.4	36.0	8.9	32.7	-	44.7	53.9	9.3	Floor noise
Hori.	9608.000	AV	32.1	38.5	9.4	33.3	-	46.7	53.9	7.2	Floor noise
Vert.	59.189	QP	29.5	8.1	7.5	32.2	-	12.9	40.0	27.1	
Vert.	62.882	QP	25.8	7.3	7.6	32.2	-	8.5	40.0	31.5	
Vert.	191.870	QP	22.5	16.5	9.0	32.1	-	16.0	43.5	27.5	
Vert.	344.717	QP	22.4	15.0	10.3	31.9	-	15.7	46.0	30.3	
Vert.	543.895	QP	22.1	17.8	11.6	32.0	-	19.5	46.0	26.6	
Vert.	959.485	QP	23.5	22.1	13.8	30.6	-	28.8	46.0	17.2	
Vert.	2339.989	PK	45.4	27.8	5.4	32.8	-	45.8	73.9	28.1	
Vert.	2390.000	PK	54.6	27.7	5.4	32.8	-	55.0	73.9	18.9	
Vert.	4804.000	PK	41.5	31.6	7.5	31.8	-	48.7	73.9	25.2	Floor noise
Vert.	7206.000	PK	42.0	36.0	8.9	32.7	-	54.2	73.9	19.7	Floor noise
Vert.	9608.000	PK	40.5	38.5	9.4	33.3	-	55.1	73.9	18.8	Floor noise
Vert.	2339.989	AV	37.2	27.8	5.4	32.8	2.0	39.6	53.9	14.3	*2)
Vert.	2390.000	AV	39.7	27.7	5.4	32.8	2.0	42.0	53.9	11.9	*1)
Vert.	4804.000	AV	32.5	31.6	7.5	31.8	-	39.7	53.9	14.2	Floor noise
Vert.	7206.000	AV	31.8	36.0	8.9	32.7	-	44.0	53.9	9.9	Floor noise
Vert.	9608.000	AV	32.2	38.5	9.4	33.3	-	46.8	53.9	7.1	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

*1) Not Out of Band emission(Leakage Power)
*2) Noise synchronized with duty of carrier frequency.

20dBc Data Sheet

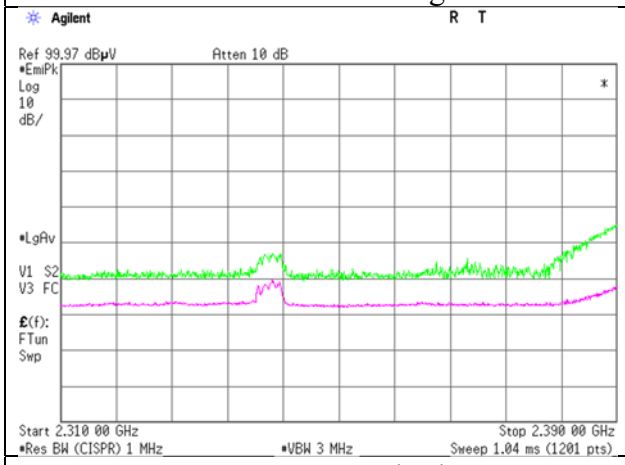
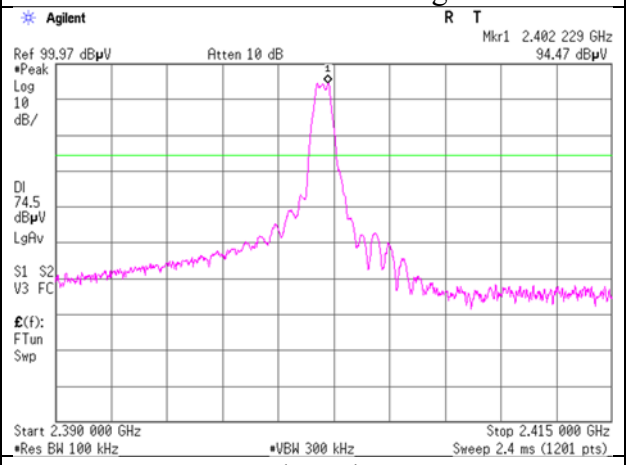
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	94.5	27.7	5.4	32.7	94.8	-	-	Carrier
Hori.	2400.000	PK	54.0	27.7	5.4	32.7	54.4	74.8	20.4	
Vert.	2402.000	PK	94.0	27.7	5.4	32.7	94.4	-	-	Carrier
Vert.	2400.000	PK	53.5	27.7	5.4	32.7	53.9	74.4	20.5	

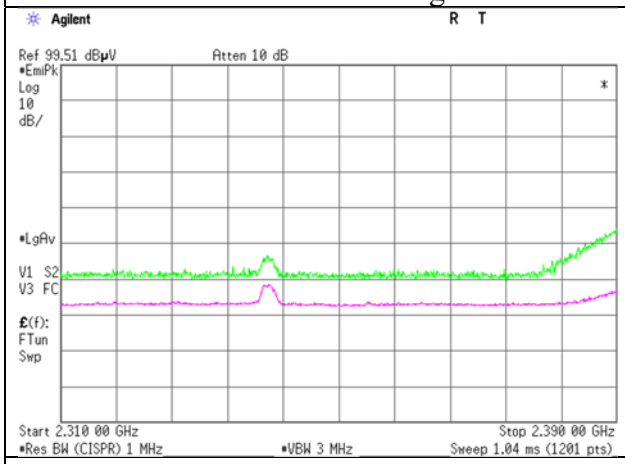
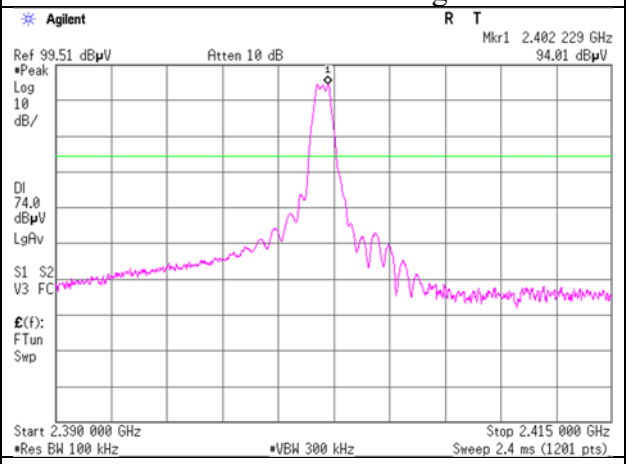
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB

Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna BT2)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	December 24, 2019
Temperature / Humidity	21 deg. C / 41 % RH
Engineer	Yuta Moriya
	(1 GHz -10 GHz)
Mode	Tx BT LE 1M-PHY 2402 MHz

Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* 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
(PIFA Antenna BT2)

Report No.	13170804H			
Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	December 24, 2019	January 9, 2020	January 9, 2020	January 11, 2020
Temperature / Humidity	21 deg. C / 41 % RH	23 deg. C / 35 % RH	22 deg. C / 34 % RH	22 deg. C / 37 % RH
Engineer	Yuta Moriya	Tomohisa Nakagawa	Junki Nagatomi	Koji Yamamoto
	(1 GHz -10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)	(Below 1 GHz)
Mode	Tx BT LE 1M-PHY 2440 MHz			

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	59.171	QP	24.1	8.1	7.5	32.2	-	7.5	40.0	32.5	
Hori.	62.432	QP	22.8	7.3	7.6	32.2	-	5.5	40.0	34.5	
Hori.	167.730	QP	22.3	15.7	8.8	32.1	-	14.8	43.5	28.7	
Hori.	348.436	QP	22.2	15.0	10.3	31.9	-	15.6	46.0	30.4	
Hori.	581.713	QP	21.9	18.7	11.8	32.0	-	20.4	46.0	25.6	
Hori.	959.915	QP	26.5	22.2	13.8	30.6	-	31.8	46.0	14.2	
Hori.	2373.968	PK	47.2	27.7	5.4	32.8	-	47.6	73.9	26.3	
Hori.	4880.000	PK	40.4	31.5	7.5	31.8	-	47.7	73.9	26.2	Floor noise
Hori.	7320.000	PK	41.5	36.2	8.9	32.7	-	53.9	73.9	20.0	Floor noise
Hori.	9760.000	PK	40.5	38.8	9.4	33.4	-	55.3	73.9	18.7	Floor noise
Hori.	2373.968	AV	37.0	27.7	5.4	32.8	2.0	39.4	53.9	14.5	*1)
Hori.	4880.000	AV	32.3	31.5	7.5	31.8	-	39.6	53.9	14.4	Floor noise
Hori.	7320.000	AV	32.1	36.2	8.9	32.7	-	44.5	53.9	9.4	Floor noise
Hori.	9760.000	AV	32.2	38.8	9.4	33.4	-	47.0	53.9	6.9	Floor noise
Vert.	59.171	QP	29.2	8.1	7.5	32.2	-	12.6	40.0	27.4	
Vert.	62.432	QP	26.0	7.3	7.6	32.2	-	8.7	40.0	31.3	
Vert.	167.730	QP	22.3	15.7	8.8	32.1	-	14.8	43.5	28.7	
Vert.	348.436	QP	22.4	15.0	10.3	31.9	-	15.8	46.0	30.2	
Vert.	581.713	QP	22.2	18.7	11.8	32.0	-	20.7	46.0	25.3	
Vert.	959.915	QP	23.6	22.2	13.8	30.6	-	28.9	46.0	17.1	
Vert.	2373.968	PK	46.1	27.7	5.4	32.8	-	46.5	73.9	27.4	
Vert.	4880.000	PK	40.6	31.5	7.5	31.8	-	47.9	73.9	26.0	Floor noise
Vert.	7320.000	PK	41.6	36.2	8.9	32.7	-	54.0	73.9	19.9	Floor noise
Vert.	9760.000	PK	40.6	38.8	9.4	33.4	-	55.4	73.9	18.5	Floor noise
Vert.	2373.968	AV	36.4	27.7	5.4	32.8	2.0	38.7	53.9	15.2	*1)
Vert.	4880.000	AV	32.4	31.5	7.5	31.8	-	39.7	53.9	14.2	Floor noise
Vert.	7320.000	AV	32.1	36.2	8.9	32.7	-	44.5	53.9	9.4	Floor noise
Vert.	9760.000	AV	32.2	38.8	9.4	33.4	-	47.0	53.9	6.9	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

*1) Noise synchronized with duty of carrier frequency.

Radiated Spurious Emission
(PIFA Antenna BT2)

Report No.	13170804H			
Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	December 24, 2019	January 9, 2020	January 9, 2020	January 11, 2020
Temperature / Humidity	21 deg. C / 41 % RH	23 deg. C / 35 % RH	22 deg. C / 34 % RH	22 deg. C / 37 % RH
Engineer	Yuta Moriya	Tomohisa Nakagawa	Junki Nagatomi	Koji Yamamoto
	(1 GHz -10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)	(Below 1 GHz)
Mode	Tx BT LE 1M-PHY 2480 MHz			

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	59.226	QP	24.3	8.1	7.5	32.2	-	7.7	40.0	32.3	
Hori.	62.527	QP	22.9	7.3	7.6	32.2	-	5.6	40.0	34.4	
Hori.	172.313	QP	22.3	16.0	8.9	32.1	-	15.0	43.5	28.5	
Hori.	375.315	QP	22.3	15.1	10.5	31.9	-	16.0	46.0	30.0	
Hori.	592.826	QP	22.0	19.1	11.9	32.0	-	21.0	46.0	25.0	
Hori.	959.616	QP	26.1	22.1	13.8	30.6	-	31.4	46.0	14.6	
Hori.	2483.500	PK	60.1	27.5	5.5	32.7	-	60.3	73.9	13.6	
Hori.	4960.000	PK	39.9	31.6	7.5	31.8	-	47.2	73.9	26.7	Floor noise
Hori.	7440.000	PK	41.3	36.3	8.9	32.7	-	53.8	73.9	20.1	Floor noise
Hori.	9920.000	PK	40.7	38.9	9.4	33.4	-	55.6	73.9	18.3	Floor noise
Hori.	2483.500	AV	46.9	27.5	5.5	32.7	2.0	49.1	53.9	4.8	*1)
Hori.	4960.000	AV	32.1	31.6	7.5	31.8	-	39.4	53.9	14.5	Floor noise
Hori.	7440.000	AV	32.8	36.3	8.9	32.7	-	45.3	53.9	8.6	Floor noise
Hori.	9920.000	AV	32.2	38.9	9.4	33.4	-	47.1	53.9	6.8	Floor noise
Vert.	59.226	QP	29.1	8.1	7.5	32.2	-	12.5	40.0	27.5	
Vert.	62.527	QP	26.1	7.3	7.6	32.2	-	8.8	40.0	31.2	
Vert.	172.313	QP	22.3	16.0	8.9	32.1	-	15.0	43.5	28.5	
Vert.	375.315	QP	22.3	15.1	10.5	31.9	-	16.0	46.0	30.0	
Vert.	592.826	QP	22.1	19.1	11.9	32.0	-	21.1	46.0	24.9	
Vert.	959.616	QP	23.3	22.1	13.8	30.6	-	28.6	46.0	17.4	
Vert.	2483.500	PK	57.9	27.5	5.5	32.7	-	58.1	73.9	15.8	
Vert.	4960.000	PK	40.1	31.6	7.5	31.8	-	47.4	73.9	26.5	Floor noise
Vert.	7440.000	PK	41.2	36.3	8.9	32.7	-	53.7	73.9	20.2	Floor noise
Vert.	9920.000	PK	40.9	38.9	9.4	33.4	-	55.8	73.9	18.2	Floor noise
Vert.	2483.500	AV	45.1	27.5	5.5	32.7	2.0	47.3	53.9	6.6	*1)
Vert.	4960.000	AV	32.0	31.6	7.5	31.8	-	39.3	53.9	14.6	Floor noise
Vert.	7440.000	AV	32.2	36.3	8.9	32.7	-	44.7	53.9	9.2	Floor noise
Vert.	9920.000	AV	32.1	38.9	9.4	33.4	-	47.0	53.9	6.9	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

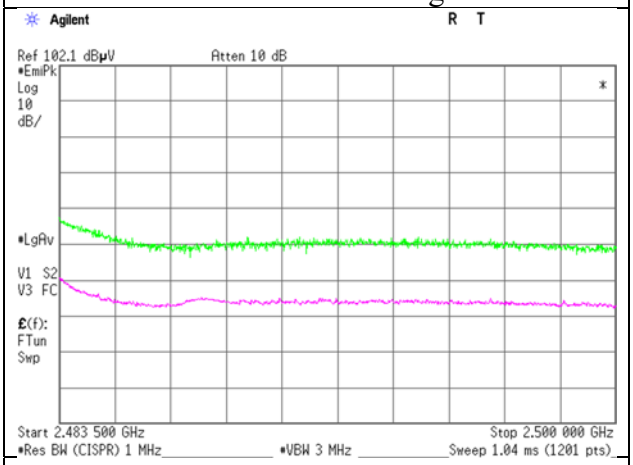
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna BT2)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	December 24, 2019
Temperature / Humidity	21 deg. C / 41 % RH
Engineer	Yuta Moriya
	(1 GHz -10 GHz)
Mode	Tx BT LE 1M-PHY 2480 MHz

Horizontal

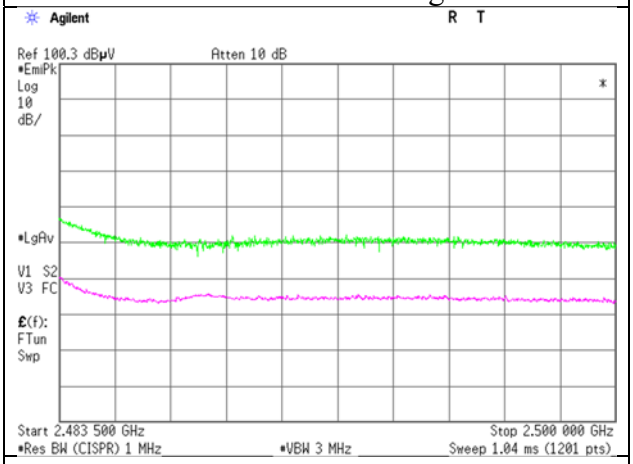
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* 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
(PIFA Antenna BT2)

Report No.	13170804H			
Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	December 24, 2019	January 9, 2020	January 9, 2020	January 11, 2020
Temperature / Humidity	21 deg. C / 41 % RH	23 deg. C / 35 % RH	22 deg. C / 34 % RH	22 deg. C / 37 % RH
Engineer	Yuta Moriya	Tomohisa Nakagawa	Junki Nagatomi	Koji Yamamoto
	(1 GHz -10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)	(Below 1 GHz)
Mode	Tx BT LE 2M-PHY 2402 MHz			

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	59.383	QP	24.3	8.0	7.5	32.2	-	7.7	40.0	32.3	
Hori.	62.531	QP	23.0	7.3	7.6	32.2	-	5.7	40.0	34.3	
Hori.	177.338	QP	22.5	16.2	8.9	32.1	-	15.6	43.5	28.0	
Hori.	352.644	QP	22.2	15.0	10.4	31.9	-	15.7	46.0	30.4	
Hori.	631.873	QP	22.1	19.4	12.1	32.0	-	21.6	46.0	24.4	
Hori.	959.640	QP	26.3	22.1	13.8	30.6	-	31.6	46.0	14.4	
Hori.	2337.277	PK	51.4	27.8	5.4	32.8	-	51.8	73.9	22.1	
Hori.	2390.000	PK	56.6	27.7	5.4	32.8	-	57.0	73.9	17.0	
Hori.	4804.000	PK	40.1	31.6	7.5	31.8	-	47.4	73.9	26.5	Floor noise
Hori.	7206.000	PK	41.0	36.0	8.9	32.7	-	53.2	73.9	20.7	Floor noise
Hori.	9608.000	PK	40.7	38.5	9.4	33.3	-	55.3	73.9	18.6	Floor noise
Hori.	2337.277	AV	40.8	27.8	5.4	32.8	4.8	45.9	53.9	8.0	*2)
Hori.	2390.000	AV	42.0	27.7	5.4	32.8	4.8	47.1	53.9	6.8	*1)
Hori.	4804.000	AV	32.4	31.6	7.5	31.8	-	39.7	53.9	14.3	Floor noise
Hori.	7206.000	AV	32.0	36.0	8.9	32.7	-	44.3	53.9	9.7	Floor noise
Hori.	9608.000	AV	31.8	38.5	9.4	33.3	-	46.4	53.9	7.5	Floor noise
Vert.	59.383	QP	29.3	8.0	7.5	32.2	-	12.7	40.0	27.3	
Vert.	62.531	QP	26.1	7.3	7.6	32.2	-	8.8	40.0	31.2	
Vert.	177.338	QP	22.3	16.2	8.9	32.1	-	15.4	43.5	28.2	
Vert.	352.644	QP	22.4	15.0	10.4	31.9	-	15.9	46.0	30.2	
Vert.	631.873	QP	22.2	19.4	12.1	32.0	-	21.7	46.0	24.3	
Vert.	959.640	QP	23.4	22.1	13.8	30.6	-	28.7	46.0	17.3	
Vert.	2337.277	PK	49.7	27.8	5.4	32.8	-	50.1	73.9	23.8	
Vert.	2390.000	PK	56.3	27.7	5.4	32.8	-	56.7	73.9	17.3	
Vert.	4804.000	PK	40.4	31.6	7.5	31.8	-	47.7	73.9	26.2	Floor noise
Vert.	7206.000	PK	40.9	36.0	8.9	32.7	-	53.1	73.9	20.8	Floor noise
Vert.	9608.000	PK	40.7	38.5	9.4	33.3	-	55.3	73.9	18.6	Floor noise
Vert.	2337.277	AV	40.0	27.8	5.4	32.8	4.8	45.2	53.9	8.7	*2)
Vert.	2390.000	AV	43.1	27.7	5.4	32.8	4.8	48.2	53.9	5.7	*1)
Vert.	4804.000	AV	32.3	31.6	7.5	31.8	-	39.6	53.9	14.3	Floor noise
Vert.	7206.000	AV	32.1	36.0	8.9	32.7	-	44.3	53.9	9.6	Floor noise
Vert.	9608.000	AV	31.6	38.5	9.4	33.3	-	46.2	53.9	7.7	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

*1) Not Out of Band emission(Leakage Power)
*2) Noise synchronized with duty of carrier frequency.

20dBc Data Sheet

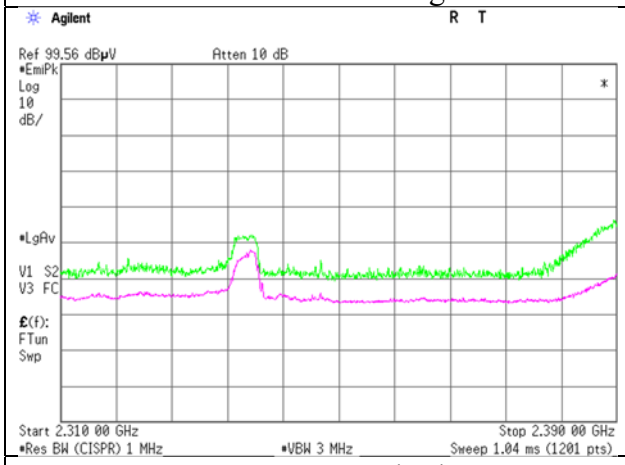
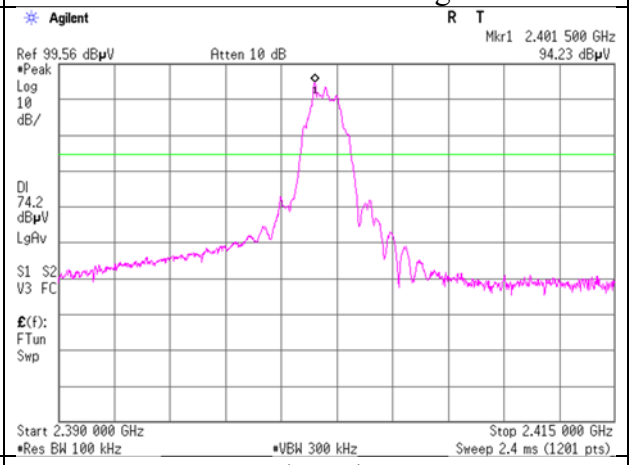
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	94.2	27.7	5.4	32.7	94.6	-	-	Carrier
Hori.	2400.000	PK	62.4	27.7	5.4	32.7	62.8	74.6	11.8	
Vert.	2402.000	PK	93.5	27.7	5.4	32.7	93.8	-	-	Carrier
Vert.	2400.000	PK	61.4	27.7	5.4	32.7	61.8	73.8	12.0	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

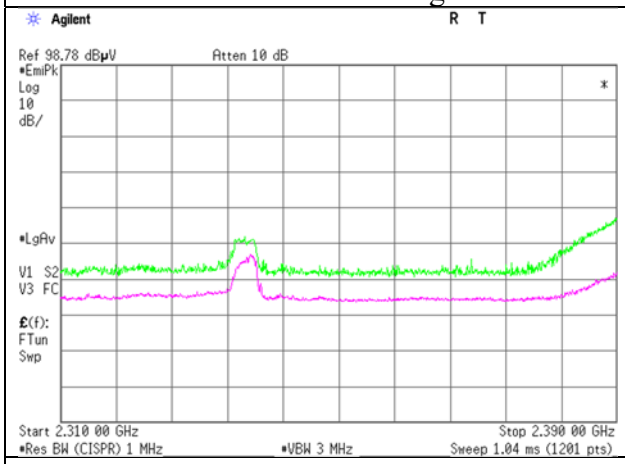
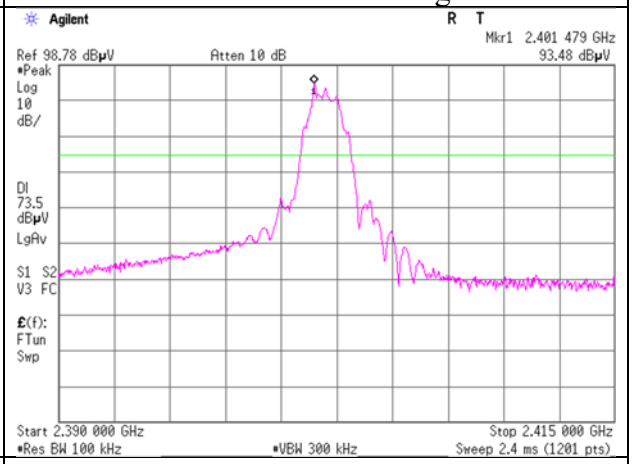
Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna BT2)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	December 24, 2019
Temperature / Humidity	21 deg. C / 41 % RH
Engineer	Yuta Moriya
	(1 GHz -10 GHz)
Mode	Tx BT LE 2M-PHY 2402 MHz

Horizontal

Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical

Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* 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
(PIFA Antenna BT2)

Report No.	13170804H			
Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	December 24, 2019	January 9, 2020	January 9, 2020	January 11, 2020
Temperature / Humidity	21 deg. C / 41 % RH	23 deg. C / 35 % RH	22 deg. C / 34 % RH	22 deg. C / 37 % RH
Engineer	Yuta Moriya	Tomohisa Nakagawa	Junki Nagatomi	Koji Yamamoto
	(1 GHz -10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)	(Below 1 GHz)
Mode	Tx BT LE 2M-PHY 2440 MHz			

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	59.484	QP	24.1	8.0	7.5	32.2	-	7.5	40.0	32.6	
Hori.	62.617	QP	23.1	7.3	7.6	32.2	-	5.8	40.0	34.2	
Hori.	167.532	QP	22.3	15.7	8.8	32.1	-	14.8	43.5	28.8	
Hori.	345.537	QP	22.5	15.0	10.3	31.9	-	15.8	46.0	30.2	
Hori.	570.883	QP	22.2	18.4	11.8	32.0	-	20.4	46.0	25.6	
Hori.	959.929	QP	27.6	22.2	13.8	30.6	-	32.9	46.0	13.1	
Hori.	2371.427	PK	51.9	27.7	5.4	32.8	-	52.3	73.9	21.6	
Hori.	4880.000	PK	39.7	31.5	7.5	31.8	-	47.0	73.9	26.9	Floor noise
Hori.	7320.000	PK	40.2	36.2	8.9	32.7	-	52.6	73.9	21.3	Floor noise
Hori.	9760.000	PK	40.4	38.8	9.4	33.4	-	55.2	73.9	18.7	Floor noise
Hori.	2371.427	AV	40.1	27.7	5.4	32.8	4.8	45.2	53.9	8.7	*1)
Hori.	4880.000	AV	32.0	31.5	7.5	31.8	-	39.2	53.9	14.7	Floor noise
Hori.	7320.000	AV	31.8	36.2	8.9	32.7	-	44.2	53.9	9.7	Floor noise
Hori.	9760.000	AV	32.3	38.8	9.4	33.4	-	47.1	53.9	6.8	Floor noise
Vert.	59.484	QP	29.4	8.0	7.5	32.2	-	12.8	40.0	27.3	
Vert.	62.617	QP	26.2	7.3	7.6	32.2	-	8.9	40.0	31.1	
Vert.	167.532	QP	22.4	15.7	8.8	32.1	-	14.9	43.5	28.7	
Vert.	345.537	QP	22.4	15.0	10.3	31.9	-	15.7	46.0	30.3	
Vert.	570.883	QP	22.1	18.4	11.8	32.0	-	20.3	46.0	25.7	
Vert.	959.929	QP	23.5	22.2	13.8	30.6	-	28.8	46.0	17.2	
Vert.	2371.427	PK	49.5	27.7	5.4	32.8	-	49.8	73.9	24.1	
Vert.	4880.000	PK	39.7	31.5	7.5	31.8	-	47.0	73.9	26.9	Floor noise
Vert.	7320.000	PK	40.2	36.2	8.9	32.7	-	52.6	73.9	21.3	Floor noise
Vert.	9760.000	PK	40.4	38.8	9.4	33.4	-	55.2	73.9	18.7	Floor noise
Vert.	2371.427	AV	38.2	27.7	5.4	32.8	4.8	43.4	53.9	10.6	*1)
Vert.	4880.000	AV	31.8	31.5	7.5	31.8	-	39.1	53.9	14.9	Floor noise
Vert.	7320.000	AV	31.8	36.2	8.9	32.7	-	44.2	53.9	9.7	Floor noise
Vert.	9760.000	AV	32.1	38.8	9.4	33.4	-	46.9	53.9	7.0	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

*1) Noise synchronized with duty of carrier frequency.

Radiated Spurious Emission
(PIFA Antenna BT2)

Report No.	13170804H			
Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	December 24, 2019	January 9, 2020	January 9, 2020	January 11, 2020
Temperature / Humidity	21 deg. C / 41 % RH	23 deg. C / 35 % RH	22 deg. C / 34 % RH	22 deg. C / 37 % RH
Engineer	Yuta Moriya	Tomohisa Nakagawa	Junki Nagatomi	Koji Yamamoto
	(1 GHz -10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)	(Below 1 GHz)
Mode	Tx BT LE 2M-PHY 2480 MHz			

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	59.237	QP	24.3	8.1	7.5	32.2	-	7.7	40.0	32.3	
Hori.	62.466	QP	23.1	7.3	7.6	32.2	-	5.8	40.0	34.2	
Hori.	162.921	QP	22.2	15.5	8.8	32.1	-	14.4	43.5	29.1	
Hori.	365.505	QP	22.3	15.0	10.4	31.9	-	15.8	46.0	30.2	
Hori.	498.459	QP	22.2	17.7	11.3	32.0	-	19.3	46.0	26.7	
Hori.	959.919	QP	27.4	22.2	13.8	30.6	-	32.7	46.0	13.3	
Hori.	2483.500	PK	61.8	27.5	5.5	32.7	-	62.0	73.9	11.9	
Hori.	4960.000	PK	40.2	31.6	7.5	31.8	-	47.5	73.9	26.4	Floor noise
Hori.	7440.000	PK	41.6	36.3	8.9	32.7	-	54.1	73.9	19.8	Floor noise
Hori.	9920.000	PK	41.9	38.9	9.4	33.4	-	56.8	73.9	17.1	Floor noise
Hori.	2483.500	AV	45.1	27.5	5.5	32.7	4.8	50.1	53.9	3.8	*1)
Hori.	4960.000	AV	32.1	31.6	7.5	31.8	-	39.4	53.9	14.5	Floor noise
Hori.	7440.000	AV	32.9	36.3	8.9	32.7	-	45.4	53.9	8.6	Floor noise
Hori.	9920.000	AV	32.8	38.9	9.4	33.4	-	47.7	53.9	6.2	Floor noise
Vert.	59.237	QP	29.3	8.1	7.5	32.2	-	12.7	40.0	27.3	
Vert.	62.466	QP	26.1	7.3	7.6	32.2	-	8.8	40.0	31.2	
Vert.	162.921	QP	22.3	15.5	8.8	32.1	-	14.5	43.5	29.0	
Vert.	365.505	QP	22.3	15.0	10.4	31.9	-	15.8	46.0	30.2	
Vert.	498.459	QP	22.1	17.7	11.3	32.0	-	19.2	46.0	26.8	
Vert.	959.919	QP	23.3	22.2	13.8	30.6	-	28.6	46.0	17.4	
Vert.	2483.500	PK	61.6	27.5	5.5	32.7	-	61.8	73.9	12.1	
Vert.	4960.000	PK	40.3	31.6	7.5	31.8	-	47.6	73.9	26.3	Floor noise
Vert.	7440.000	PK	41.7	36.3	8.9	32.7	-	54.2	73.9	19.7	Floor noise
Vert.	9920.000	PK	41.5	38.9	9.4	33.4	-	56.4	73.9	17.5	Floor noise
Vert.	2483.500	AV	43.7	27.5	5.5	32.7	4.8	48.7	53.9	5.2	*1)
Vert.	4960.000	AV	32.2	31.6	7.5	31.8	-	39.5	53.9	14.4	Floor noise
Vert.	7440.000	AV	32.8	36.3	8.9	32.7	-	45.3	53.9	8.6	Floor noise
Vert.	9920.000	AV	32.8	38.9	9.4	33.4	-	47.7	53.9	6.2	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

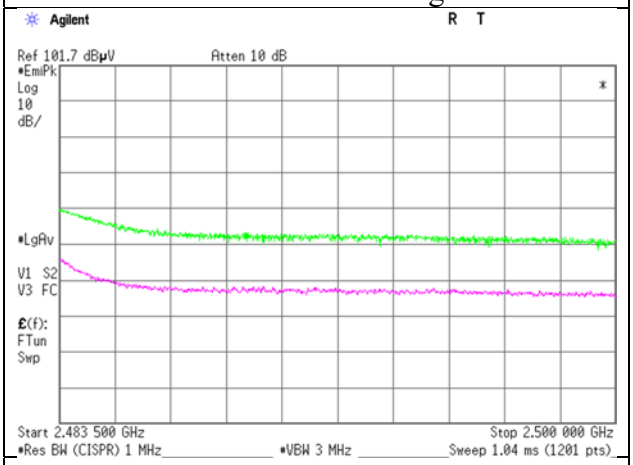
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna BT2)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	December 24, 2019
Temperature / Humidity	21 deg. C / 41 % RH
Engineer	Yuta Moriya
	(1 GHz -10 GHz)
Mode	Tx BT LE 2M-PHY 2480 MHz

Horizontal

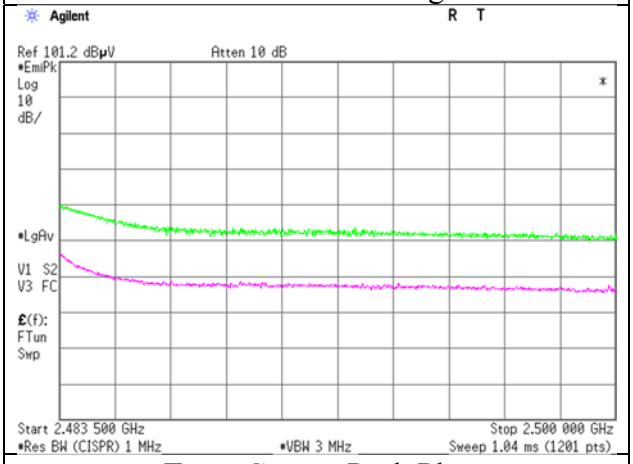
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* 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
(PIFA Antenna BT1)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	January 20, 2020
Temperature / Humidity	22 deg. C / 30 % RH
Engineer	Koji Yamamoto
	(1 GHz -10 GHz)
Mode	Tx BT LE 2M-PHY 2402 MHz + Tx 11ax-40 5755MHz (OFDM)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2336.881	PK	55.6	27.8	5.1	35.3	-	53.2	73.9	20.7	
Hori.	2390.000	PK	50.7	27.6	5.2	35.2	-	48.3	73.9	25.6	
Hori.	2336.881	AV	44.9	27.8	5.1	35.3	4.8	47.3	53.9	6.7	*2)
Hori.	2390.000	AV	38.7	27.6	5.2	35.2	4.8	41.0	53.9	12.9	*1)
Vert.	2336.881	PK	55.5	27.8	5.1	35.3	-	53.1	73.9	20.8	
Vert.	2390.000	PK	50.0	27.6	5.2	35.2	-	47.6	73.9	26.3	
Vert.	2336.881	AV	42.5	27.8	5.1	35.3	4.8	44.8	53.9	9.1	*2)
Vert.	2390.000	AV	38.8	27.6	5.2	35.2	4.8	41.1	53.9	12.8	*1)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.7 m / 3.0 m) = 1.83 dB
*1) Not Out of Band emission(Leakage Power)
*2) Noise synchronized with duty of carrier frequency.

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	98.2	27.6	5.2	35.2	95.7	-	-	Carrier
Hori	2400.000	PK	66.2	27.6	5.2	35.2	63.7	75.7	12.0	
Vert	2402.000	PK	97.3	27.6	5.2	35.2	94.8	-	-	Carrier
Vert	2400.000	PK	65.5	27.6	5.2	35.2	63.0	74.8	11.8	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

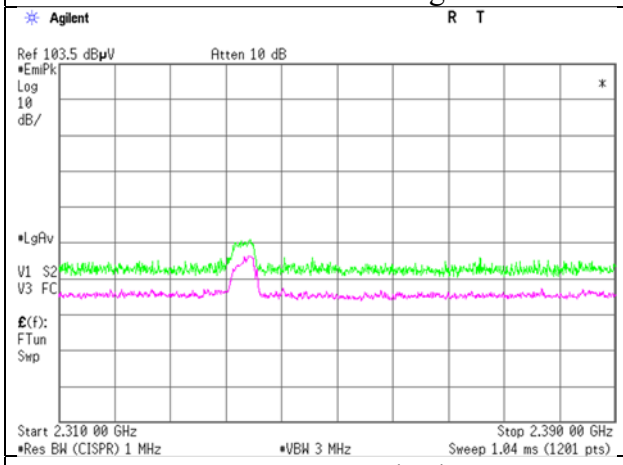
Distance factor: 1 GHz - 10 GHz 20log (3.7 m / 3.0 m) = 2.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna BT1)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	January 20, 2020
Temperature / Humidity	22 deg. C / 30 % RH
Engineer	Koji Yamamoto (1 GHz -10 GHz)
Mode	Tx BT LE 2M-PHY 2402 MHz + Tx 11ax-40 5755MHz (OFDM)

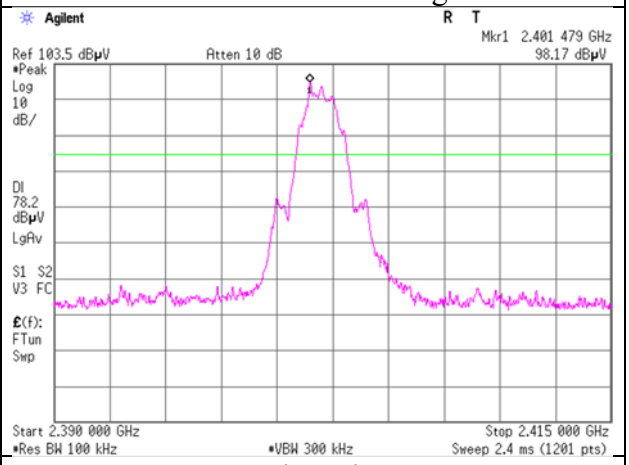
Horizontal

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

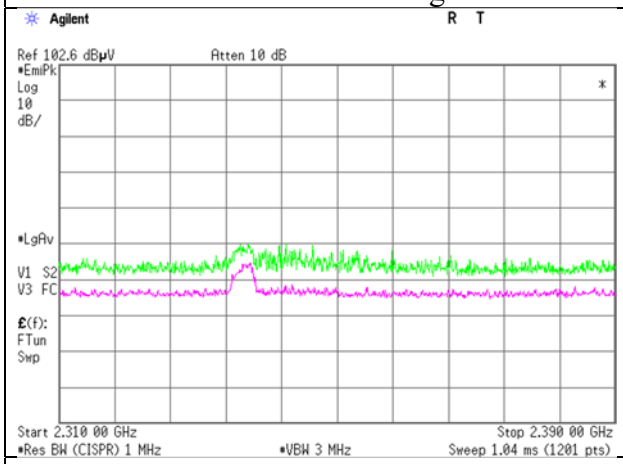
Authorized-band band-edge Plot



20dBc Plot

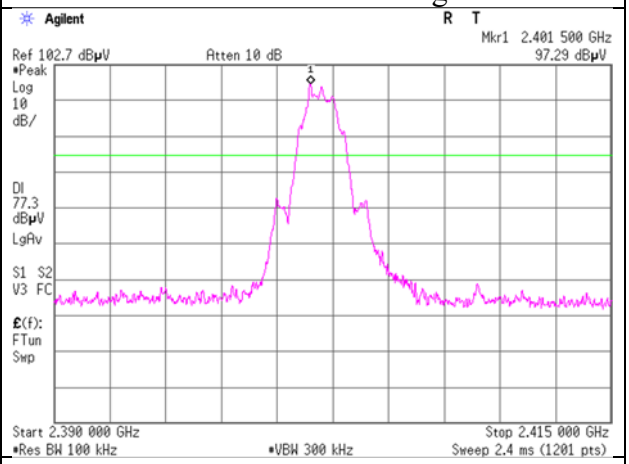
Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Authorized-band band-edge Plot



20dBc Plot

* 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

(PIFA Antenna BT1)

Report No.	13170804H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.2
Date	January 20, 2020	January 21, 2020	January 22, 2020
Temperature / Humidity	22 deg. C / 30 % RH	22 deg. C / 30 % RH	21 deg. C / 41 % RH
Engineer	Koji Yamamoto	Koji Yamamoto	Takumi Shimada
	(1 GHz -10 GHz)	(10 GHz -26.5 GHz)	(Below 1 GHz)
Mode	Tx BT LE 2M-PHY 2440 MHz + Tx 11ax-40 5755MHz (OFDM)		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	31.854	QP	27.1	17.7	7.0	30.5	-	21.4	40.0	18.6	
Hori.	54.472	QP	25.0	9.7	7.4	30.4	-	11.7	40.0	28.3	
Hori.	91.656	QP	25.8	8.8	7.9	30.2	-	12.3	43.5	31.2	
Hori.	343.829	QP	25.2	14.9	10.1	29.4	-	20.8	46.0	25.2	
Hori.	503.935	QP	23.8	17.5	11.1	30.0	-	22.3	46.0	23.7	
Hori.	985.547	QP	22.1	22.3	13.3	27.8	-	29.9	54.0	24.1	
Hori.	2371.475	PK	55.7	27.6	5.2	35.2	-	53.3	73.9	20.6	
Hori.	4880.000	PK	46.4	31.6	7.5	34.4	-	51.0	73.9	22.9	Floor noise
Hori.	7320.000	PK	46.3	36.1	8.4	34.4	-	56.4	73.9	17.6	Floor noise
Hori.	9760.000	PK	46.2	39.2	9.6	34.9	-	60.1	73.9	13.8	Floor noise
Hori.	2371.475	AV	45.1	27.6	5.2	35.2	4.8	47.5	53.9	6.4	*1)
Hori.	4880.000	AV	34.1	31.6	7.5	34.4	-	38.7	53.9	15.2	Floor noise
Hori.	7320.000	AV	33.3	36.1	8.4	34.4	-	43.4	53.9	10.5	Floor noise
Hori.	9760.000	AV	33.4	39.2	9.6	34.9	-	47.3	53.9	6.6	Floor noise
Vert.	31.854	QP	28.9	17.7	7.0	30.5	-	23.2	40.0	16.8	
Vert.	54.472	QP	30.3	9.7	7.4	30.4	-	17.0	40.0	23.0	
Vert.	91.656	QP	32.2	8.8	7.9	30.2	-	18.7	43.5	24.8	
Vert.	343.829	QP	24.0	14.9	10.1	29.4	-	19.6	46.0	26.4	
Vert.	503.935	QP	23.8	17.5	11.1	30.0	-	22.3	46.0	23.7	
Vert.	985.547	QP	22.0	22.3	13.3	27.8	-	29.8	54.0	24.2	
Vert.	2371.475	PK	54.6	27.6	5.2	35.2	-	52.2	73.9	21.7	
Vert.	4880.000	PK	48.3	31.6	7.5	34.4	-	52.9	73.9	21.0	Floor noise
Vert.	7320.000	PK	47.1	36.1	8.4	34.4	-	57.2	73.9	16.7	Floor noise
Vert.	9760.000	PK	46.3	39.2	9.6	34.9	-	60.2	73.9	13.8	Floor noise
Vert.	2371.475	AV	43.4	27.6	5.2	35.2	4.8	45.7	53.9	8.2	*1)
Vert.	4880.000	AV	36.4	31.6	7.5	34.4	-	41.0	53.9	12.9	Floor noise
Vert.	7320.000	AV	34.2	36.1	8.4	34.4	-	44.3	53.9	9.6	Floor noise
Vert.	9760.000	AV	33.2	39.2	9.6	34.9	-	47.1	53.9	6.8	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.7 m / 3.0 m) = 1.83 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

*1) Noise synchronized with duty of carrier frequency.

Radiated Spurious Emission

(PIFA Antenna BT1)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	January 20, 2020
Temperature / Humidity	22 deg. C / 30 % RH
Engineer	Koji Yamamoto
	(1 GHz -10 GHz)
Mode	Tx BT LE 2M-PHY 2480 MHz + Tx 11ax-40 5755MHz (OFDM)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	PK	62.3	27.5	5.2	35.2	-	59.9	73.9	14.1	
Hori.	2483.500	AV	45.6	27.5	5.2	35.2	4.8	47.8	53.9	6.1	*1)
Vert.	2483.500	PK	63.7	27.5	5.2	35.2	-	61.3	73.9	12.7	
Vert.	2483.500	AV	47.6	27.5	5.2	35.2	4.8	49.8	53.9	4.1	*1)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.7 m / 3.0 m) = 1.83 dB

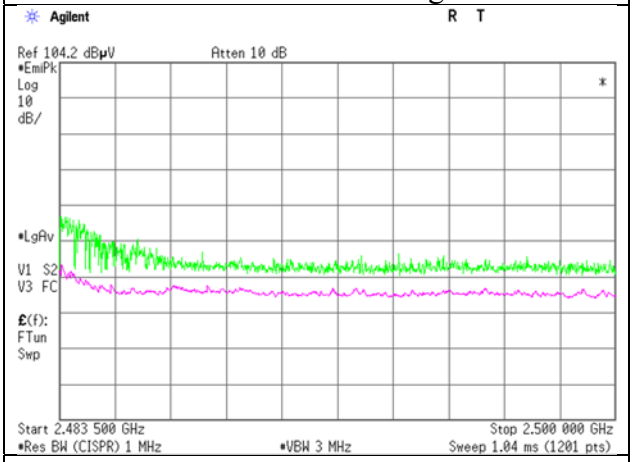
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)
(PIFA Antenna BT1)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	January 20, 2020
Temperature / Humidity	22 deg. C / 30 % RH
Engineer	Koji Yamamoto (1 GHz -10 GHz)
Mode	Tx BT LE 2M-PHY 2480 MHz + Tx 11ax-40 5755MHz (OFDM)

Horizontal

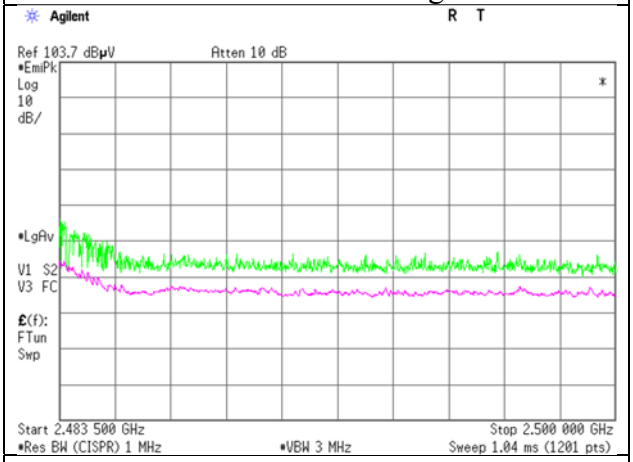
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot

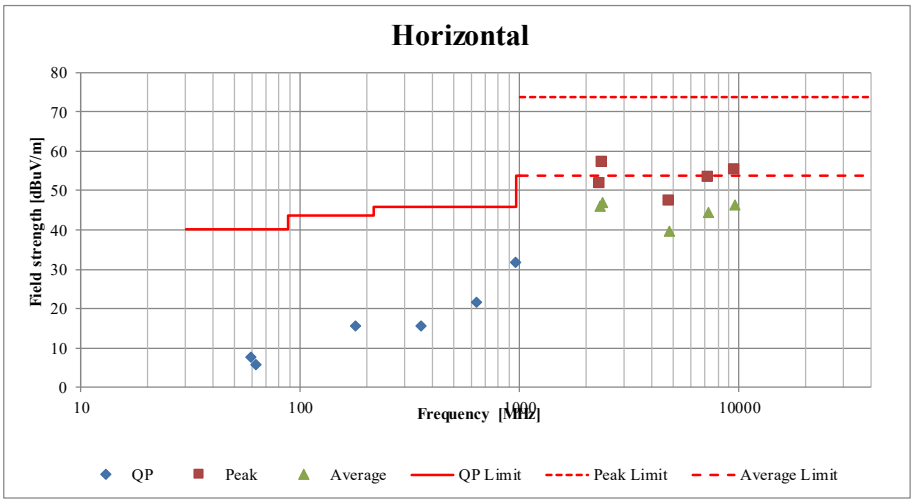


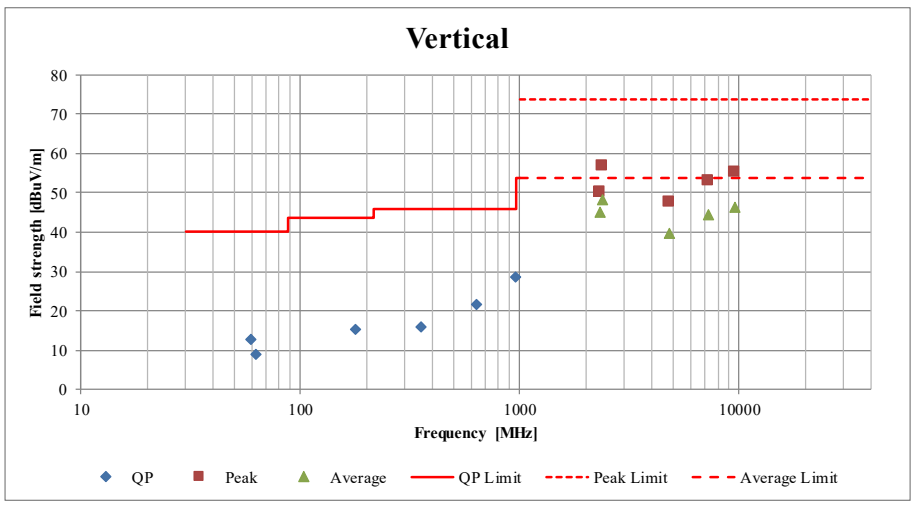
Trace Green : Peak Plot
Trace Purple : Average Plot

* 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)
(PIFA Antenna BT2)

Report No.	13170804H			
Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	December 24, 2019	January 9, 2020	January 9, 2020	January 11, 2020
Temperature / Humidity	21 deg. C / 41 % RH	23 deg. C / 35 % RH	22 deg. C / 34 % RH	22 deg. C / 37 % RH
Engineer	Yuta Moriya (1 GHz -10 GHz)	Tomohisa Nakagawa (10 GHz - 18 GHz)	Junki Nagatomi (18 GHz - 26.5 GHz)	Koji Yamamoto (Below 1 GHz)
Mode	Tx BT LE 2M-PHY 2402 MHz			





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

Radiated Spurious Emission
(IFA Antenna)

Report No.	13170804H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	December 25, 2019	January 8, 2020	January 8, 2020
Temperature / Humidity	21 deg. C / 41 % RH	22 deg. C / 39 % RH	23 deg. C / 35 % RH
Engineer	Yuta Moriya	Junki Nagatomi	Tomohisa Nakagawa
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11b 2412 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	PK	46.1	27.7	5.4	32.8	-	46.4	73.9	27.5	
Hori.	4824.000	PK	40.2	31.6	7.5	31.8	-	47.5	73.9	26.4	Floor noise
Hori.	7236.000	PK	41.2	36.0	8.9	32.7	-	53.5	73.9	20.4	Floor noise
Hori.	9648.000	PK	41.3	38.6	9.4	33.3	-	56.0	73.9	17.9	Floor noise
Hori.	2390.000	AV	34.8	27.7	5.4	32.8	-	35.2	53.9	18.7	
Hori.	4824.000	AV	32.2	31.6	7.5	31.8	-	39.5	53.9	14.4	Floor noise
Hori.	7236.000	AV	32.0	36.0	8.9	32.7	-	44.3	53.9	9.6	Floor noise
Hori.	9648.000	AV	32.3	38.6	9.4	33.3	-	46.9	53.9	7.0	Floor noise
Vert.	2390.000	PK	53.2	27.7	5.4	32.8	-	53.5	73.9	20.4	
Vert.	4824.000	PK	40.3	31.6	7.5	31.8	-	47.6	73.9	26.4	Floor noise
Vert.	7236.000	PK	41.3	36.0	8.9	32.7	-	53.6	73.9	20.3	Floor noise
Vert.	9648.000	PK	41.4	38.6	9.4	33.3	-	56.1	73.9	17.8	Floor noise
Vert.	2390.000	AV	38.2	27.7	5.4	32.8	-	38.5	53.9	15.4	
Vert.	4824.000	AV	32.3	31.6	7.5	31.8	-	39.6	53.9	14.3	Floor noise
Vert.	7236.000	AV	32.0	36.0	8.9	32.7	-	44.3	53.9	9.6	Floor noise
Vert.	9648.000	AV	32.3	38.6	9.4	33.3	-	47.0	53.9	6.9	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

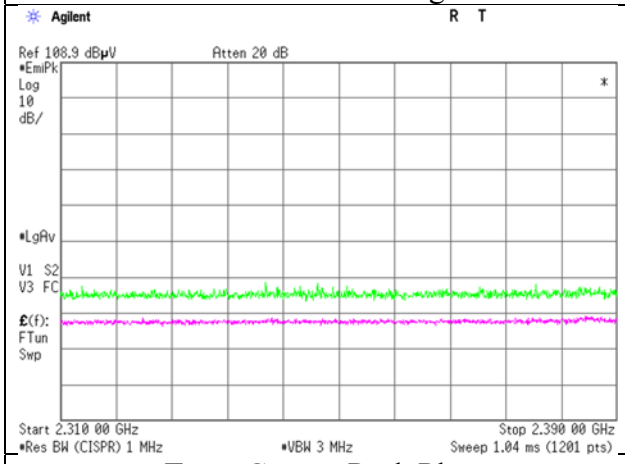
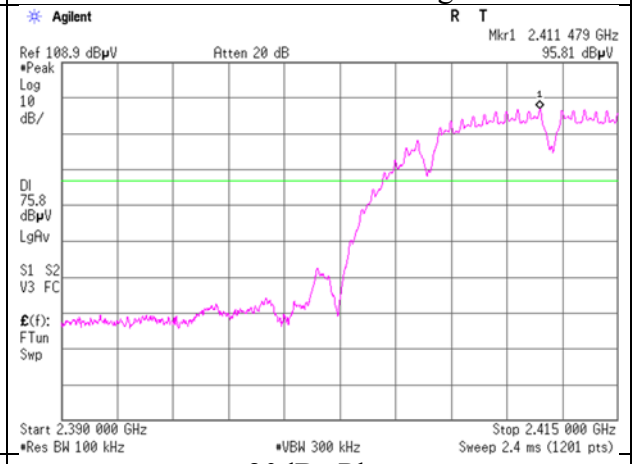
20dBc Data Sheet

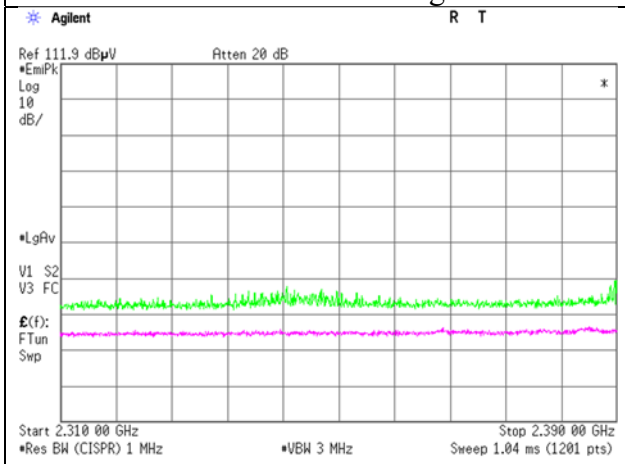
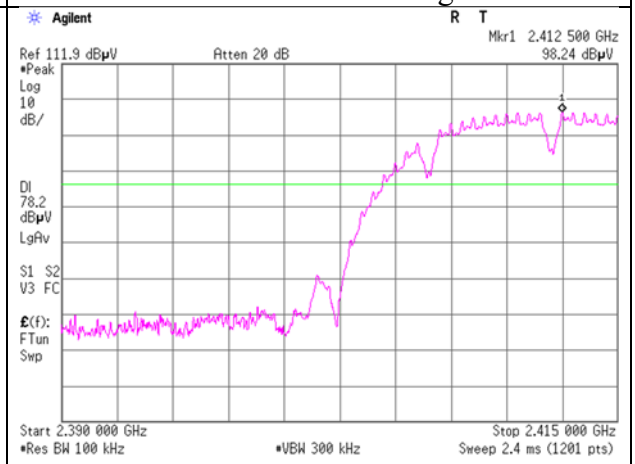
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	95.8	27.6	5.4	32.7	96.1	-	-	Carrier
Hori.	2400.000	PK	38.4	27.7	5.4	32.7	38.8	76.1	37.4	
Vert.	2412.000	PK	98.2	27.6	5.4	32.7	98.6	-	-	Carrier
Vert.	2400.000	PK	38.6	27.7	5.4	32.7	39.0	78.6	39.6	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

Radiated Spurious Emission
(Reference Plot for band-edge)
(IFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	December 25, 2019
Temperature / Humidity	21 deg. C / 41 % RH
Engineer	Yuta Moriya
	(1 GHz - 10 GHz)
Mode	Tx 11b 2412 MHz

Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* 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
(IFA Antenna)

Report No.	13170804H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	December 25, 2019	January 8, 2020	January 8, 2020
Temperature / Humidity	21 deg. C / 41 % RH	22 deg. C / 39 % RH	23 deg. C / 35 % RH
Engineer	Yuta Moriya	Junki Nagatomi	Tomohisa Nakagawa
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11b 2437 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4874.000	PK	41.3	31.6	7.5	31.8	-	48.6	73.9	25.3	Floor noise
Hori.	7311.000	PK	41.5	36.2	8.9	32.7	-	53.9	73.9	20.0	Floor noise
Hori.	9748.000	PK	41.3	38.8	9.4	33.4	-	56.1	73.9	17.8	Floor noise
Hori.	4874.000	AV	32.3	31.6	7.5	31.8	-	39.6	53.9	14.3	Floor noise
Hori.	7311.000	AV	32.0	36.2	8.9	32.7	-	44.4	53.9	9.5	Floor noise
Hori.	9748.000	AV	32.7	38.8	9.4	33.4	-	47.5	53.9	6.4	Floor noise
Vert.	4874.000	PK	41.3	31.6	7.5	31.8	-	48.5	73.9	25.4	Floor noise
Vert.	7311.000	PK	41.5	36.2	8.9	32.7	-	53.8	73.9	20.1	Floor noise
Vert.	9748.000	PK	41.3	38.8	9.4	33.4	-	56.1	73.9	17.8	Floor noise
Vert.	4874.000	AV	32.5	31.6	7.5	31.8	-	39.7	53.9	14.2	Floor noise
Vert.	7311.000	AV	31.9	36.2	8.9	32.7	-	44.3	53.9	9.6	Floor noise
Vert.	9748.000	AV	32.7	38.8	9.4	33.4	-	47.5	53.9	6.4	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(IFA Antenna)

Report No.	13170804H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	December 25, 2019	January 8, 2020	January 8, 2020
Temperature / Humidity	21 deg. C / 41 % RH	22 deg. C / 39 % RH	23 deg. C / 35 % RH
Engineer	Yuta Moriya	Junki Nagatomi	Tomohisa Nakagawa
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11b 2462 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	PK	43.5	27.5	5.5	32.7	-	43.8	73.9	30.1	
Hori.	4924.000	PK	39.9	31.5	7.5	31.8	-	47.1	73.9	26.8	Floor noise
Hori.	7386.000	PK	41.3	36.3	8.9	32.7	-	53.8	73.9	20.2	Floor noise
Hori.	9848.000	PK	40.7	39.0	9.4	33.4	-	55.7	73.9	18.2	Floor noise
Hori.	2483.500	AV	36.5	27.5	5.5	32.7	-	36.7	53.9	17.2	*1)
Hori.	4924.000	AV	32.0	31.5	7.5	31.8	-	39.2	53.9	14.7	Floor noise
Hori.	7386.000	AV	32.8	36.3	8.9	32.7	-	45.3	53.9	8.6	Floor noise
Hori.	9848.000	AV	32.8	39.0	9.4	33.4	-	47.7	53.9	6.2	Floor noise
Vert.	2483.500	PK	45.5	27.5	5.5	32.7	-	45.7	73.9	28.2	
Vert.	4924.000	PK	39.8	31.5	7.5	31.8	-	47.0	73.9	26.9	Floor noise
Vert.	7386.000	PK	41.6	36.3	8.9	32.7	-	54.0	73.9	19.9	Floor noise
Vert.	9848.000	PK	40.6	39.0	9.4	33.4	-	55.6	73.9	18.3	Floor noise
Vert.	2483.500	AV	38.5	27.5	5.5	32.7	-	38.7	53.9	15.2	*1)
Vert.	4924.000	AV	32.0	31.5	7.5	31.8	-	39.2	53.9	14.7	Floor noise
Vert.	7386.000	AV	32.8	36.3	8.9	32.7	-	45.3	53.9	8.6	Floor noise
Vert.	9848.000	AV	32.9	39.0	9.4	33.4	-	47.8	53.9	6.1	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

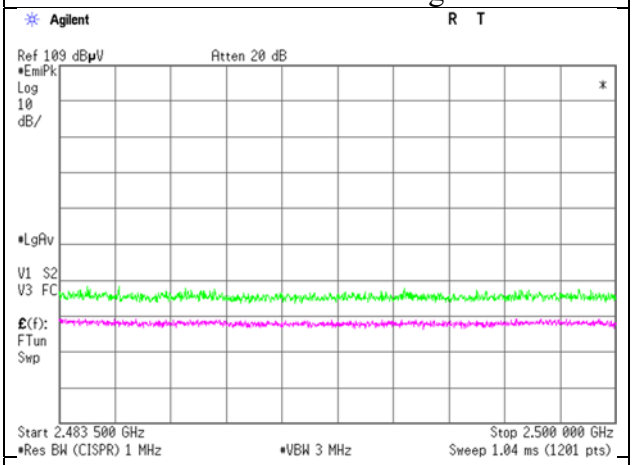
*1) Noise synchronized with duty of carrier frequency.

Radiated Spurious Emission
(Reference Plot for band-edge)
(IFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	December 25, 2019
Temperature / Humidity	21 deg. C / 41 % RH
Engineer	Yuta Moriya
	(1 GHz - 10 GHz)
Mode	Tx 11b 2462 MHz

Horizontal

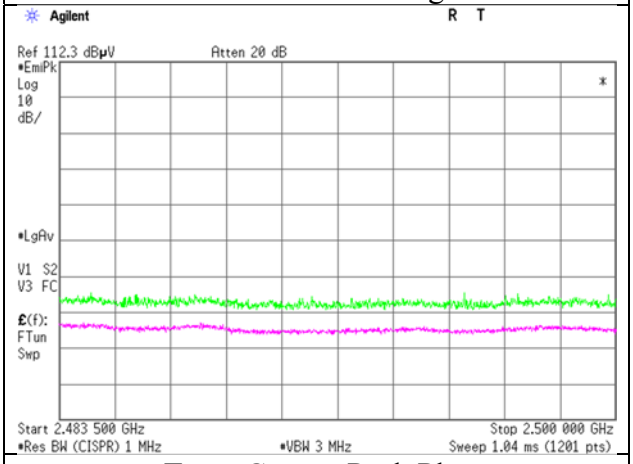
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* 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
(IFA Antenna)

Report No.	13170804H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	December 25, 2019	January 8, 2020	January 8, 2020
Temperature / Humidity	21 deg. C / 41 % RH	22 deg. C / 39 % RH	23 deg. C / 35 % RH
Engineer	Yuta Moriya	Junki Nagatomi	Tomohisa Nakagawa
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx 11ax-20 2412 MHz (OFDM)		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	PK	52.8	27.7	5.4	32.8	-	53.2	73.9	20.7	
Hori.	4824.000	PK	40.1	31.6	7.5	31.8	-	47.3	73.9	26.6	Floor noise
Hori.	7236.000	PK	42.1	36.0	8.9	32.7	-	54.4	73.9	19.5	Floor noise
Hori.	9648.000	PK	41.4	38.6	9.4	33.3	-	56.0	73.9	17.9	Floor noise
Hori.	2390.000	AV	42.2	27.7	5.4	32.8	-	42.5	53.9	11.4	
Hori.	4824.000	AV	32.2	31.6	7.5	31.8	-	39.5	53.9	14.5	Floor noise
Hori.	7236.000	AV	32.2	36.0	8.9	32.7	-	44.4	53.9	9.5	Floor noise
Hori.	9648.000	AV	32.5	38.6	9.4	33.3	-	47.1	53.9	6.8	Floor noise
Vert.	2390.000	PK	53.3	27.7	5.4	32.8	-	53.6	73.9	20.3	
Vert.	4824.000	PK	40.0	31.6	7.5	31.8	-	47.3	73.9	26.6	Floor noise
Vert.	7236.000	PK	42.1	36.0	8.9	32.7	-	54.4	73.9	19.6	Floor noise
Vert.	9648.000	PK	41.5	38.6	9.4	33.3	-	56.2	73.9	17.7	Floor noise
Vert.	2390.000	AV	40.8	27.7	5.4	32.8	-	41.2	53.9	12.8	
Vert.	4824.000	AV	32.2	31.6	7.5	31.8	-	39.5	53.9	14.5	Floor noise
Vert.	7236.000	AV	32.2	36.0	8.9	32.7	-	44.4	53.9	9.5	Floor noise
Vert.	9648.000	AV	32.5	38.6	9.4	33.3	-	47.1	53.9	6.8	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	96.5	27.6	5.4	32.7	96.8	-	-	Carrier
Hori.	2400.000	PK	50.9	27.7	5.4	32.7	51.3	76.8	25.6	
Vert.	2412.000	PK	95.6	27.6	5.4	32.7	95.9	-	-	Carrier
Vert.	2400.000	PK	48.2	27.7	5.4	32.7	48.6	75.9	27.3	

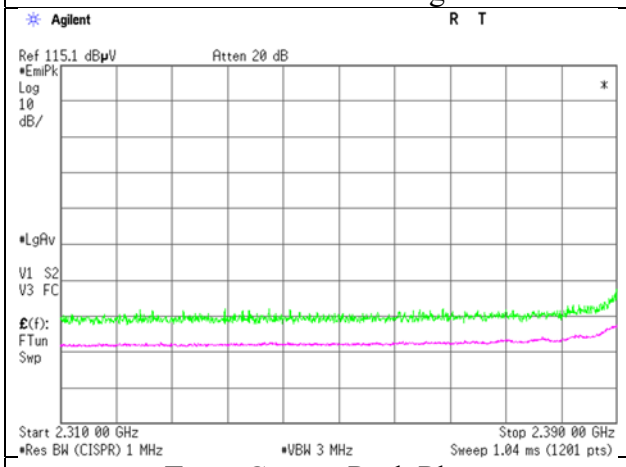
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

Radiated Spurious Emission
(Reference Plot for band-edge)
(IFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	December 25, 2019
Temperature / Humidity	21 deg. C / 41 % RH
Engineer	Yuta Moriya
	(1 GHz - 10 GHz)
Mode	Tx 11ax-20 2412 MHz (OFDM)

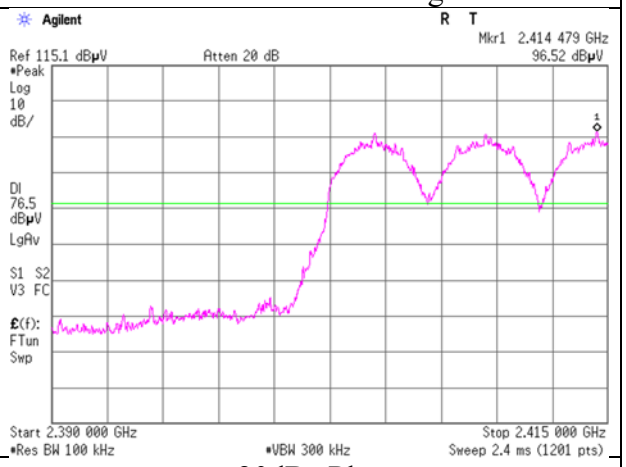
Horizontal

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

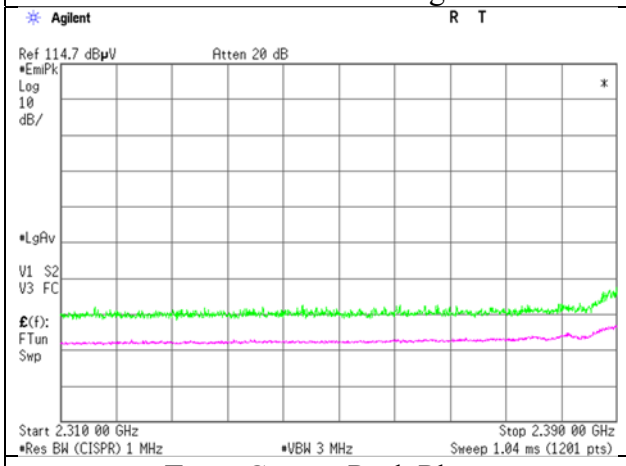
Authorized-band band-edge Plot



20dBc Plot

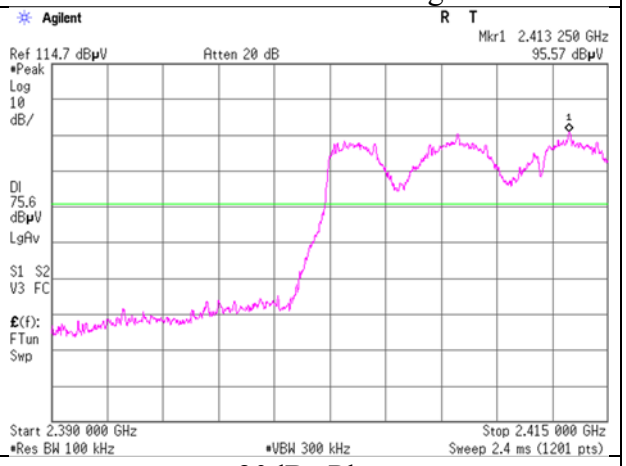
Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Authorized-band band-edge Plot



20dBc Plot

* 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
(IFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 2, 2020
Temperature / Humidity	21 deg. C / 34 % RH
Engineer	Tomohisa Nakagawa
	Band edge
Mode	Tx 11ax-20 2412 MHz (26-tone RU)

RU Index 0

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	PK	45.8	27.7	4.7	32.8	-	45.4	73.9	28.5	
Hori.	2390.000	AV	34.8	27.7	4.7	32.8	0.4	34.9	53.9	19.0	*1)
Vert.	2390.000	PK	43.2	27.7	4.7	32.8	-	42.8	73.9	31.1	
Vert.	2390.000	AV	32.5	27.7	4.7	32.8	0.4	32.6	53.9	21.4	*1)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB
*1) Not Out of Band emission(Leakage Power)

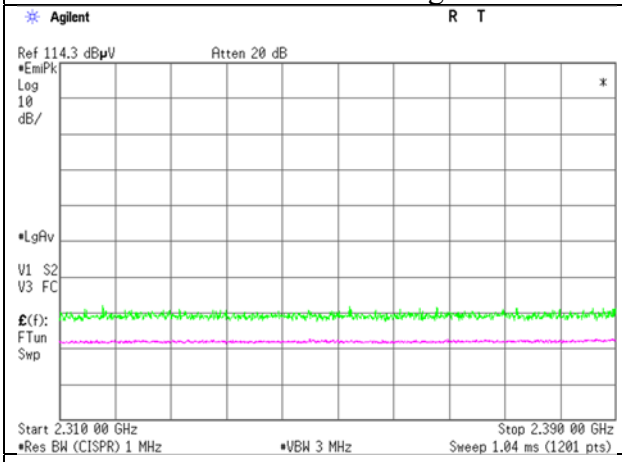
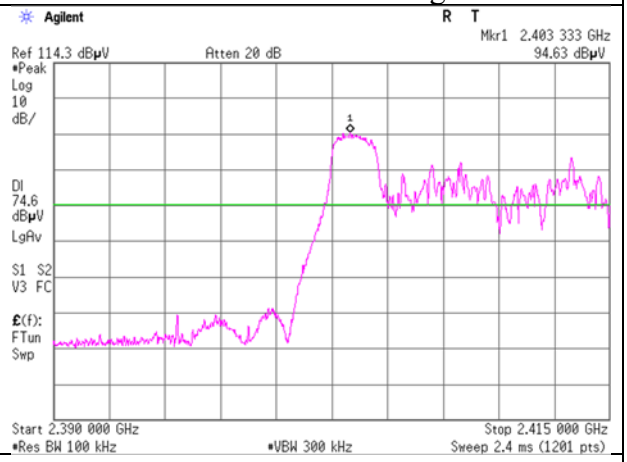
20dBc Data Sheet

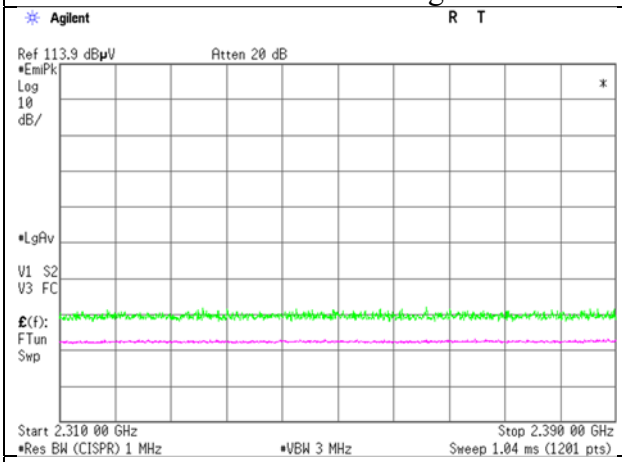
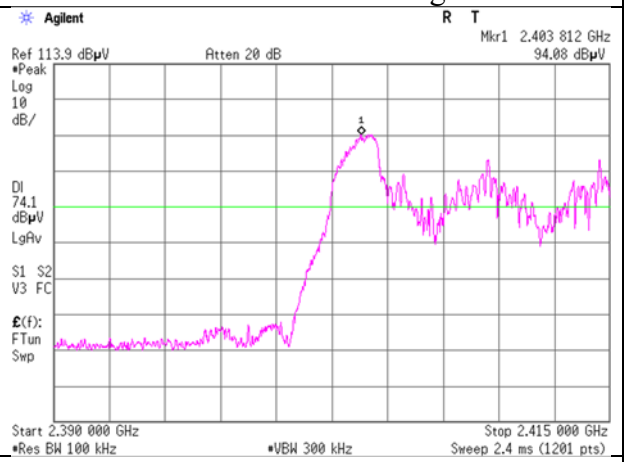
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	94.6	27.6	4.7	32.7	94.2	-	-	Carrier
Hori.	2400.000	PK	45.0	27.7	4.7	32.7	44.6	74.2	29.6	
Vert.	2412.000	PK	94.1	27.6	4.7	32.7	93.7	-	-	Carrier
Vert.	2390.000	AV	32.5	27.7	4.7	32.8	32.1	73.7	41.6	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

Radiated Spurious Emission
(Reference Plot for band-edge)
(IFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 2, 2020
Temperature / Humidity	23 deg. C / 34 % RH
Engineer	Tomohisa Nakagawa
	Band edge
Mode	Tx 11ax-20 2412 MHz (26-tone RU)

RU Index 0	
Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

RU Index 0	
Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* 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
(IFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 2, 2020
Temperature / Humidity	21 deg. C / 34 % RH
Engineer	Tomohisa Nakagawa
	Band edge
Mode	Tx 11ax-20 2412 MHz (52-tone RU)

RU Index 37

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	PK	47.1	27.7	4.7	32.8	-	46.7	73.9	27.2	
Hori.	2390.000	AV	32.7	27.7	4.7	32.8	0.5	32.8	53.9	21.1	*1)
Vert.	2390.000	PK	47.2	27.7	4.7	32.8	-	46.8	73.9	27.1	
Vert.	2390.000	AV	33.5	27.7	4.7	32.8	0.5	33.6	53.9	20.3	*1)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB
*1) Not Out of Band emission(Leakage Power)

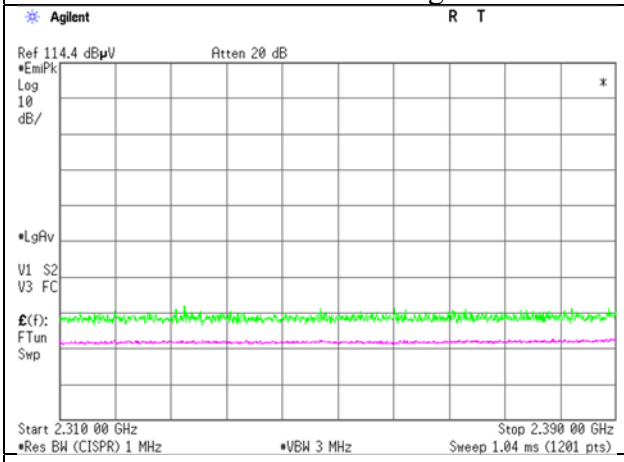
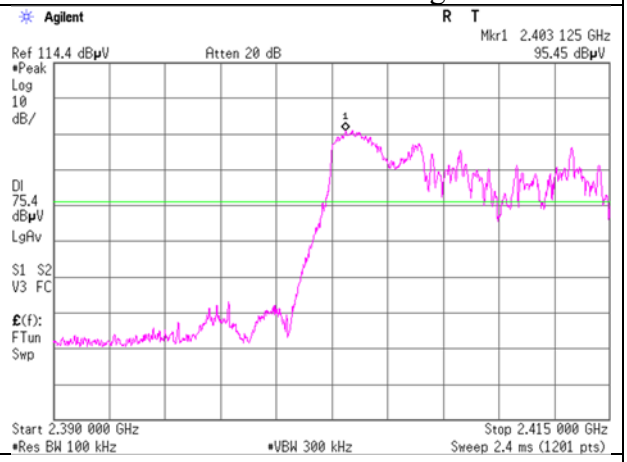
20dBc Data Sheet

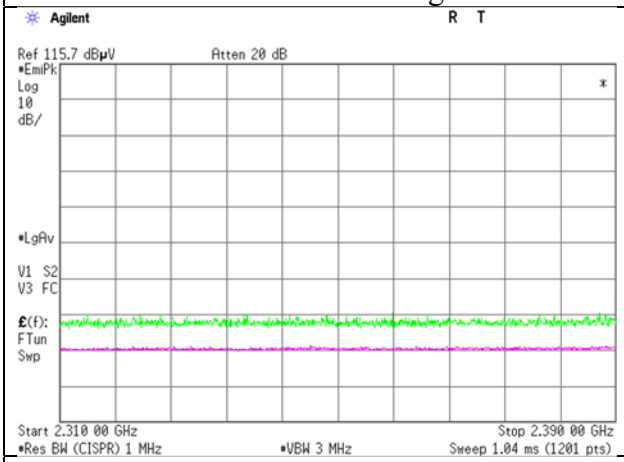
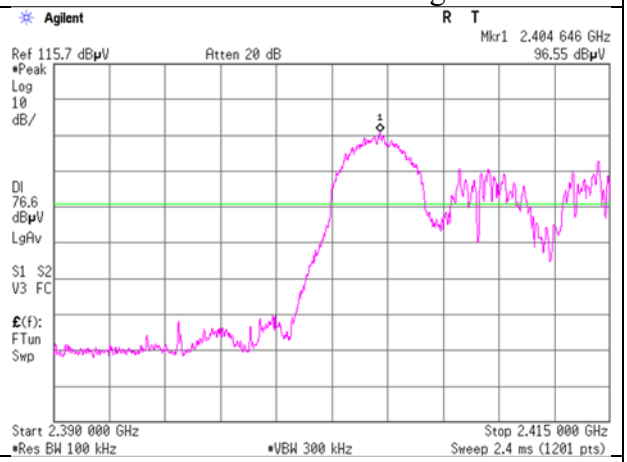
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	95.5	27.6	4.7	32.7	95.0	-	-	Carrier
Hori.	2400.000	PK	45.9	27.7	4.7	32.7	45.5	75.0	29.5	
Vert.	2412.000	PK	96.6	27.6	4.7	32.7	96.1	-	-	Carrier
Vert.	2400.000	PK	45.8	27.7	4.7	32.7	45.4	76.1	30.7	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

Radiated Spurious Emission
(Reference Plot for band-edge)
(IFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 2, 2020
Temperature / Humidity	23 deg. C / 34 % RH
Engineer	Tomohisa Nakagawa
	Band edge
Mode	Tx 11ax-20 2412 MHz (52-tone RU)

RU Index 37	
Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

RU Index 37	
Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* 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
(IFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 2, 2020
Temperature / Humidity	21 deg. C / 34 % RH
Engineer	Tomohisa Nakagawa
	Band edge
Mode	Tx 11ax-20 2412 MHz (106-tone RU)

RU index 53

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	PK	50.4	27.7	4.7	32.8	-	50.0	73.9	23.9	
Hori.	2390.000	AV	34.3	27.7	4.7	32.8	0.5	34.4	53.9	19.5	*1)
Vert.	2390.000	PK	53.0	27.7	4.7	32.8	-	52.6	73.9	21.3	
Vert.	2390.000	AV	33.7	27.7	4.7	32.8	0.5	33.8	53.9	20.1	*1)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.9 m / 3.0 m) = 2.28 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

*1) Not Out of Band emission(Leakage Power)

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	95.2	27.6	4.7	32.7	94.7	-	-	Carrier
Hori.	2400.000	PK	49.8	27.7	4.7	32.7	49.4	74.7	25.3	
Vert.	2412.000	PK	94.9	27.6	4.7	32.7	94.5	-	-	Carrier
Vert.	2400.000	PK	46.9	27.7	4.7	32.7	46.5	74.5	28.0	

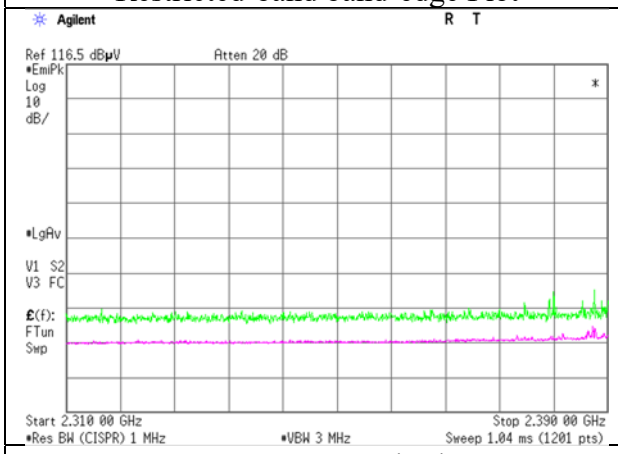
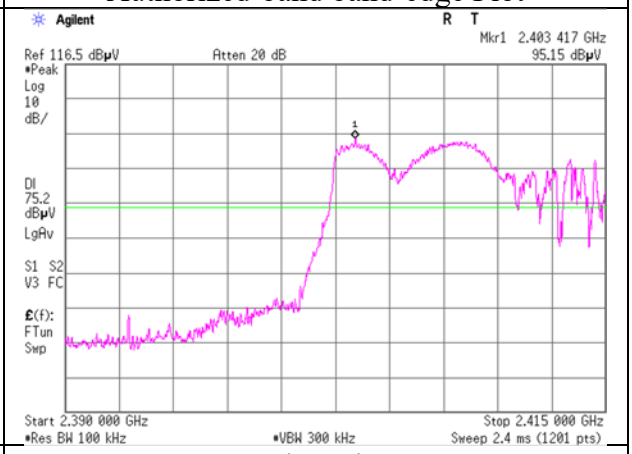
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

Radiated Spurious Emission
(Reference Plot for band-edge)
(IFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 2, 2020
Temperature / Humidity	23 deg. C / 34 % RH
Engineer	Tomohisa Nakagawa
	Band edge
Mode	Tx 11ax-20 2412 MHz (106-tone RU)

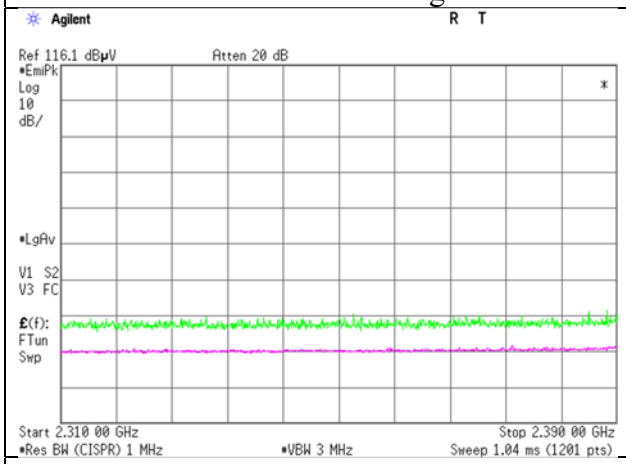
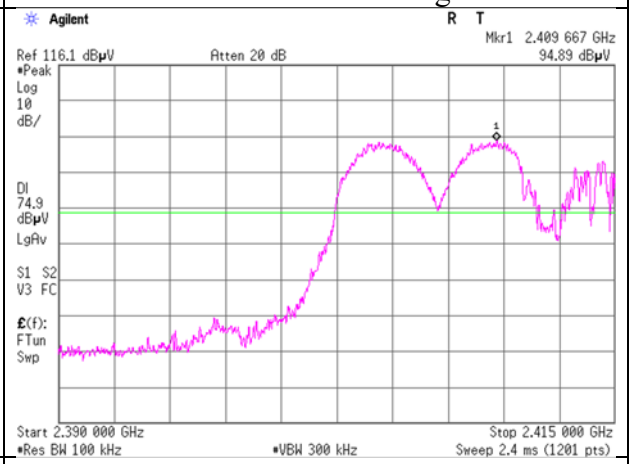
RU Index 53

Horizontal

Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

RU Index 53

Vertical

Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* 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
(IFA Antenna)

Report No.	13170804H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.4
Date	April 10, 2020
Temperature / Humidity	20 deg. C / 28 % RH
Engineer	Yuta Moriya
	Band edge
Mode	Tx 11ax-20 2412 MHz (242-tone RU)

RU Index 61

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	PK	59.6	27.9	5.0	31.9	-	60.6	73.9	13.3	
Hori.	2390.000	AV	45.3	27.9	5.0	31.9	0.5	46.8	53.9	7.1	*1)
Vert.	2390.000	PK	59.0	27.9	5.0	31.9	-	60.0	73.9	13.9	
Vert.	2390.000	AV	45.2	27.9	5.0	31.9	0.5	46.7	53.9	7.2	*1)

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.9 m / 3.0 m) = 2.28 dB
*1) Not Out of Band emission(Leakage Power)

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	94.8	27.9	5.0	31.9	95.8	-	-	Carrier
Hori.	2400.000	PK	52.8	27.9	5.0	31.9	53.8	75.8	22.0	
Vert.	2412.000	PK	95.8	27.9	5.0	31.9	96.8	-	-	Carrier
Vert.	2400.000	PK	53.0	27.9	5.0	31.9	54.0	76.8	22.8	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)