RADIO TEST REPORT

Test Report No. : 12979151S-A-R1

Applicant	:	**Panasonic Corporation**
Type of Equipment	:	**Car Display**
Model No.	:	**AT1806**
FCC ID	:	**ACJ932AT1806**
Test regulation	:	**FCC Part 15 Subpart C: 2019**
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 regulation.
4. The test results in this test report are traceable to the national or international standards.
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6. This test report covers Radio technical requirements.
   It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. The all test items in this test report are conducted by UL Japan, Inc. Shonan EMC Lab.
8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
9. The information provided from the customer for this report is identified in SECTION 1.
10. This report is a revised version of 12979151S-A. 12979151S-A is replaced with this report.

Date of test: October 28 to November 1, 2019

Representative test engineer:
H. Sato
Hiromasa Sato
Engineer
Consumer Technology Division

Approved by:
S. Takano
Shinichi Takano
Engineer
Consumer Technology Division

CERTIFICATE 1266.03

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

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REVISION HISTORY

Original Test Report No.: 12979151S-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	12979151S-A	November 25, 2019	-	-
1	12979151S-A-R1	December 12, 2019	9	Correction: "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." to "The test was conducted with the settings of each sample to be as close as possible to the target power according to the customer requirements. End users cannot change the settings of the output power of the product."
			24	Correction of Duty factor of 11n-20 MCS 3: "0.15 dB" to ">98 %"
			35,37,39,40,42	Deletion the table of "Average measurement value with duty factor", Addition the data to the upper table

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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

CONTENTS **PAGE**

SECTION 1: Customer information

Company Name	:	Panasonic Corporation
Address	:	4261, Ikonobe-cho, Tsuzuki-ku, Yokohama-shi, Kanagawa-ken, 224-8520, Japan
Telephone Number	:	+81-50-3689-6795
Facsimile Number	:	+81-45-931-0806
Contact Person	:	Yuta Mouri

The information provided from the customer is as follows;
- Applicant, Type of Equipment, Model No., 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 (E.U.T.)
- SECTION 4: Operation of E.U.T. 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 (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment	:	Car Display
Model No.	:	AT1806
Serial No.	:	Refer to SECTION 4.2
Rating	:	DC 10.5 V - 16.0 V (Typ: 13.2 V)
Receipt Date of Sample (Information from test lab.)	:	October 28, 2019
Country of Mass-production	:	Japan
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab.

2.2 Product Description

Model: AT1806 (referred to as the EUT in this report) is a Car Display.

Radio Specification

Radio Type	:	Transceiver
Frequency of Operation	:	2412 MHz - 2462 MHz
Modulation	:	DSSS, OFDM
Antenna type	:	Dipole
Antenna Gain	:	2.15 dBi
Clock frequency (Maximum)	:	48 MHz

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
FCC Part 15 final revised on July 19, 2019 and effective August 19, 2019 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

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	-	N/A	*1)
	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 a)	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 b)	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 c)	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)	3.2 dB 291.753 MHz, QP, Horizontal Tx 11g 2462 MHz	Complied# d), e)	Conducted (below 30 MHz)/ Radiated (above 30 MHz) *2)
	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) The test is not applicable since the EUT has no AC mains.
*2) 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 6 dB Bandwidth and 99 % Occupied Bandwidth)
b) Refer to APPENDIX 1 (data of Maximum Peak Output Power)
c) Refer to APPENDIX 1 (data of Power Density)
d) Refer to APPENDIX 1 (data of Conducted Spurious Emission)
e) 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 equipment provides the wireless transmitter with stable power supply.
Instead of a new battery, DC power supply was used for the test. That does not affect the test result, therefore the EUT complies with the requirement.

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

3.3 Addition to standard

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

Shonan EMC Lab.

Item	Frequency range	Uncertainty (+/-)			
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR	No. 4,5,6,8 SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.6 dB	2.6 dB	2.5 dB	2.6 dB
Radiated emission	9 kHz-30 MHz	3.0 dB	3.0 dB	3.0 dB	-
(Measurement distance: 3 m)	30 MHz-200 MHz	4.6 dB	4.6 dB	4.6 dB	-
	200 MHz-1 GHz	6.0 dB	6.0 dB	6.0 dB	-
	1 GHz-6 GHz	4.9 dB	4.9 dB	4.9 dB	-
	6 GHz-18 GHz	5.5 dB	5.5 dB	5.5 dB	-
	18 GHz-40 GHz	5.4 dB	5.4 dB	5.4 dB	-
Radiated emission	1 GHz-18 GHz	5.8 dB	5.8 dB	5.8 dB	-
(Measurement distance: 1 m)	18 GHz-40 GHz	5.7 dB	5.7 dB	5.7 dB	-

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector)_SPM-06	0.98 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	1.75 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.89 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	1.12 dB
Power Measurement above 1 GHz (Average Detector)_SPM-13	1.06 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-13	1.24 dB
Spurious emission (Conducted) below 1GHz	0.9 dB
Spurious emission (Conducted) 1 GHz-3 GHz	0.9 dB
Spurious emission (Conducted) 3 GHz-18 GHz	2.9 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.6 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.0 dB
Bandwidth Measurement	0.07 %
Duty cycle and Time Measurement	0.262 %
Temperature	0.95 deg.C.
Voltage	0.83 %

3.5 Test Location

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A2LA Certificate Number: 1266.03 (FCC Test Firm Registration Number: 626366, ISED Lab Company Number: 2973D)

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

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

SECTION 4: Operation of E.U.T. during testing

4.1 Operating Mode(s)

Test operating mode was determined as follows according to "Section 1 of 6 802.11 a/b/g/n testing - Managing Complex Regulatory Approvals - " of TCB Council Workshop October 2009

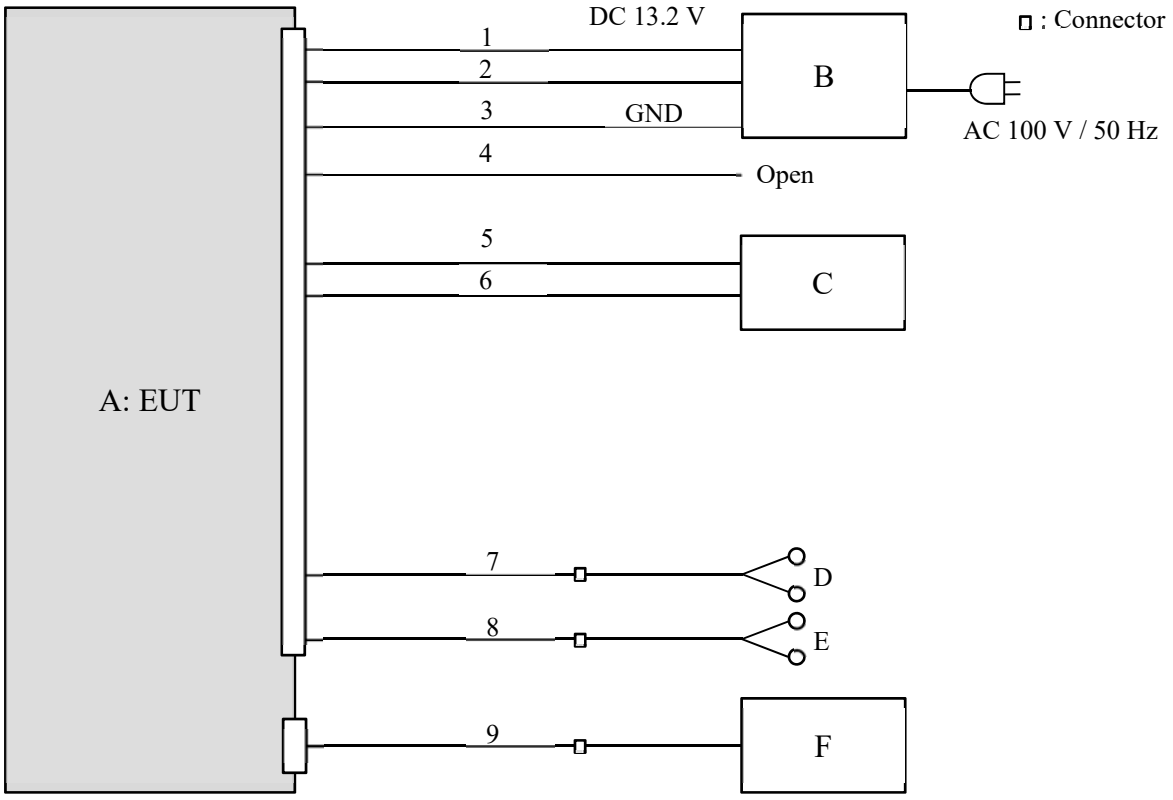
Mode	Remarks*
IEEE 802.11b (11b)	2 Mbps, PN9
IEEE 802.11g (11g)	36 Mbps, PN9
IEEE 802.11n 20 MHz BW (11n-20)	MCS 3, PN9
*The worst condition was determined based on the test result of Maximum Peak Output Power (Mid Channel)	
*Power of the EUT was set by the software as follows; Power settings for Antenna Terminal conducted test: 11b: 12 dBm 11g: 12 dBm 11n-20: 11 dBm (1 and 11 channel), 12 dBm (other channels) Power settings for Radiated Emission test: 11b: 11 dBm 11g: 11 dBm 11n-20: 10 dBm (1 and 11 channel), 11 dBm (other channels) Software: WIFI Diag ver.9.76 * The test was conducted with the settings of each sample to be as close as possible to the target power according to the customer requirements. End users cannot change the settings of the output power of the product.	

*The details of Operating mode(s)

Test Item	Operating Mode	Tested frequency
Spurious Emission (below 1 GHz)	11g Tx	2462 MHz
6dB Bandwidth Maximum Peak Output Power Power Density 99% Occupied Bandwidth	11b Tx 11g Tx 11n-20 Tx	2412 MHz 2437 MHz 2462 MHz
Spurious Emission (above 1 GHz)	11b Tx 11g Tx 11n-20 Tx	2412 MHz 2417 MHz *) 2437 MHz 2457 MHz *) 2462 MHz

*) Bandedge measurement of 11n-20 only.

4.2 Configuration and peripherals



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

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Car Display	AT1806	500B-2S-050*1) 500B-2S-057*2)	Panasonic	EUT
B	Power Supply(DC)	PAN35-10A	NA000955	Kikusui	-
C	DCU	AT1603	102020	Panasonic	-
D	Earphone	-	-	-	-
E	Earphone	-	-	-	-
F	Tablet Computer	ME571-16G	07924744	ASUS	-

*1) Used for Antenna Terminal conducted test
*2) Used for Radiated Emission test

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	ACC	2.0	Unshielded	Unshielded	-
2	+B	2.0	Unshielded	Unshielded	-
3	GND	2.0	Unshielded	Unshielded	-
4	ILL+	2.0	Unshielded	Unshielded	-
5	Signal	2.0	Unshielded	Unshielded	-
6	Signal	2.0	Unshielded	Unshielded	-
7	HP1	2.0 + 1.0	Unshielded	Unshielded	-
8	HP2	2.0 + 1.0	Unshielded	Unshielded	-
9	HDMI	2.0 + 1.0	Shielded	Shielded	-

SECTION 5: 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 platform of nominal size, 1.0 m by 2.0 m, raised 0.8 m above the conducting ground plane.
The table is made of expanded polystyrol and expanded polypropylene and the table top is covered with polycarbonate. That has very low permittivity.
The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[For above 1 GHz]
EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 1.5 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with absorbent materials lined on a ground plane.

The height of the measuring antenna varied between 1 m and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.
Test antenna was aimed at the EUT for receiving the maximum signal and always kept within the illumination area of the 3 dB beamwidth of the antenna.
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.
The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).
The test was made with the detector (RBW/VBW) in the following table.
When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Test Antennas are used as below;

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

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

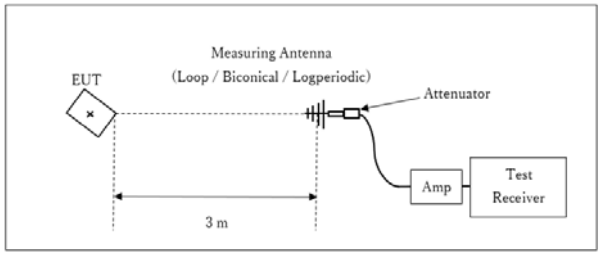
20 dBc was applied to the frequency over the limit of FCC 15.209 / Table 4 of RSS-Gen 8.9(ISED) and outside the restricted band of FCC15.205 / Table 6 of RSS-Gen 8.10 (ISED).

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

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

Figure 1: Test Setup

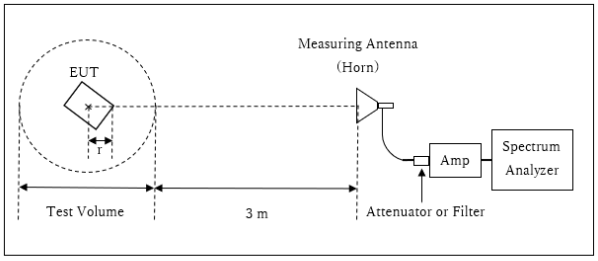
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz - 13 GHz

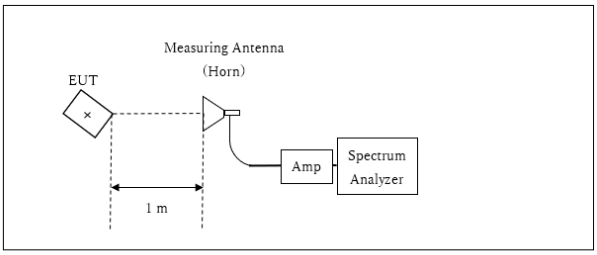


r : Radius of an outer periphery of EUT
× : Center of turn table

Distance Factor: 20 x log (3.69 m / 3.0 m) = 1.80 dB
* Test Distance: (3 + Test Volume /2) - r = 3.69 m

Test Volume : 2.0 m
(Test Volume has been calibrated based on CISPR 16-1-4.)
r = 0.31 m

13 GHz - 26.5 GHz



× : Center of turn table

Distance Factor: 20 x log (1.0 m / 3.0 m) = -9.54 dB
*Test Distance: 1 m

-The carrier level and noise levels were confirmed at Display angle of 0 deg., 90 deg. and 130 deg. based on the product specification to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Antenna polarization	Carrier	Spurious (Below 1 GHz)	Spurious (1 GHz – 2.8 GHz)	Spurious (2.8 GHz – 13 GHz)	Spurious (13 GHz – 26.5 GHz)
Horizontal	90 deg.	130 deg.	90 deg.	90 deg.	0 deg.
Vertical	90 deg.	130 deg.	90 deg.	90 deg.	0 deg.

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 6: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
6dB Bandwidth	50 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 6dB Bandwidth	3 kHz	9.1 kHz	Auto	Peak	Max Hold	Spectrum Analyzer *3)
Conducted Spurious Emission *4)	9kHz to 150kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	10 kHz	30 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 30MHz, RBW was narrowed to separate the noise contents.
Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart.
(9 kHz - 150 kHz: RBW = 200 Hz, 150 kHz - 30 MHz: RBW = 10 kHz)

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

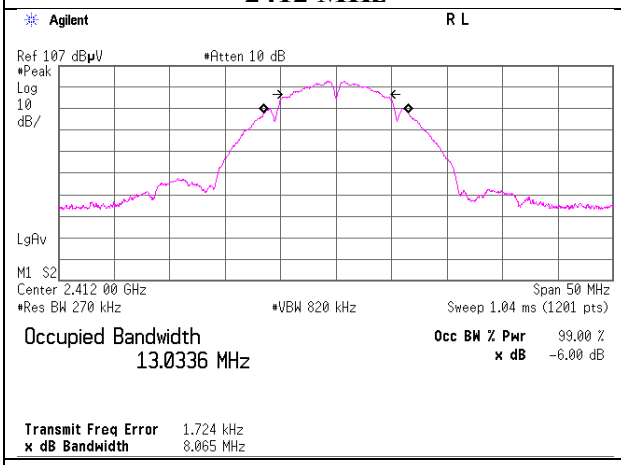
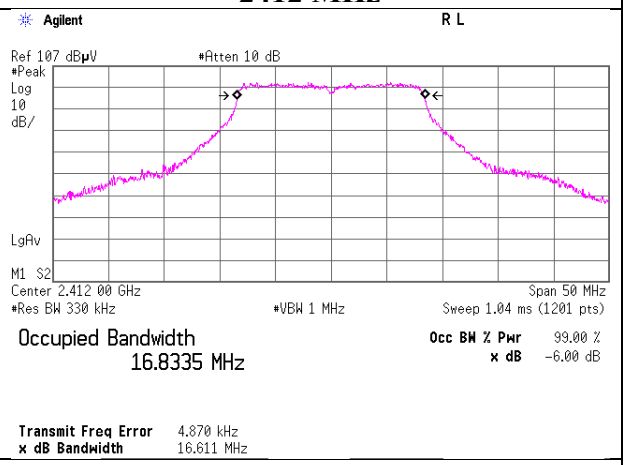
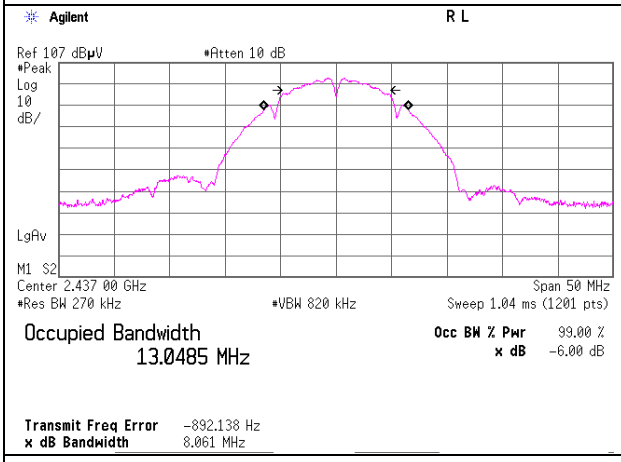
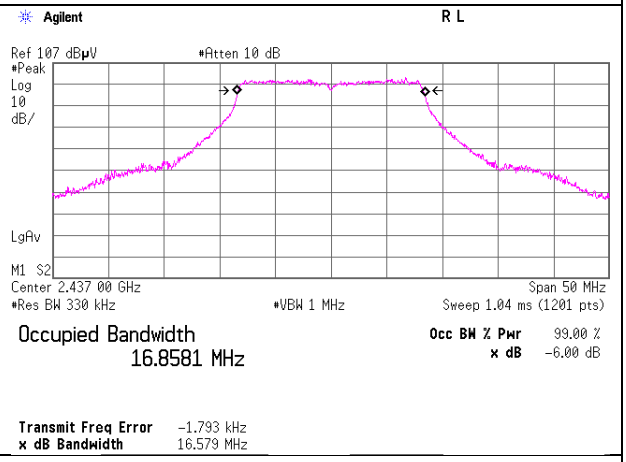
APPENDIX 1: Test data

6 dB Bandwidth and 99 % Occupied Bandwidth

Report No.	12979151S-A	
Test place	Shonan EMC Lab.	
	No.6 Shielded Room	No.5 Shielded Room
Date	October 28, 2019	October 29, 2019
Temperature / Humidity	24 deg. C / 43 % RH	26 deg. C / 53 % RH
Engineer	Makoto Hosaka	
Mode	Tx	

Mode	Frequency [MHz]	99% Occupied Bandwidth [kHz]	6dB Bandwidth [MHz]	Limit for 6dB Bandwidth [MHz]
11b	2412	13033.6	7.835	> 0.5000
	2437	13048.5	7.892	> 0.5000
	2462	13044.5	7.890	> 0.5000
11g	2412	16833.5	16.555	> 0.5000
	2437	16858.1	16.544	> 0.5000
	2462	16853.1	16.539	> 0.5000
11n-20	2412	18043.4	17.761	> 0.5000
	2437	18046.6	17.754	> 0.5000
	2462	18049.6	17.762	> 0.5000

99%Occupied Bandwidth

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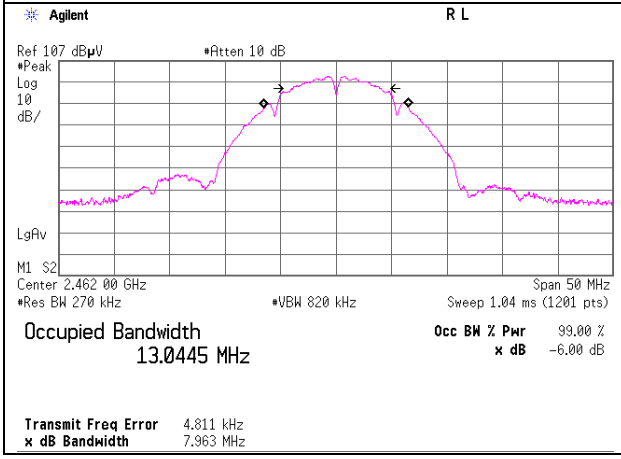
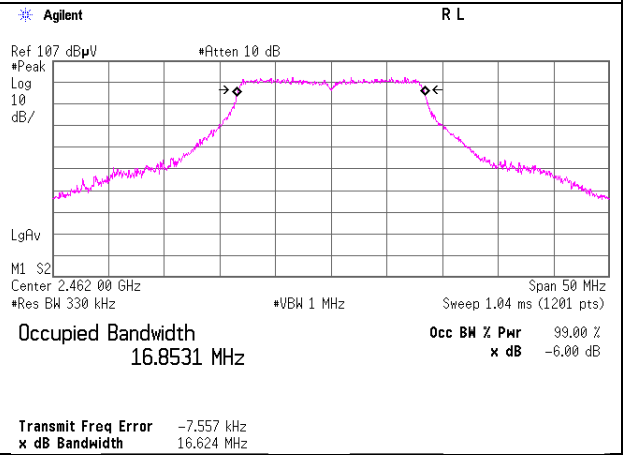
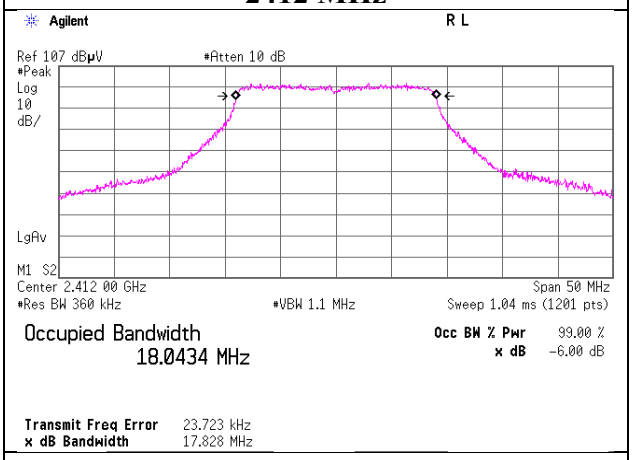
	

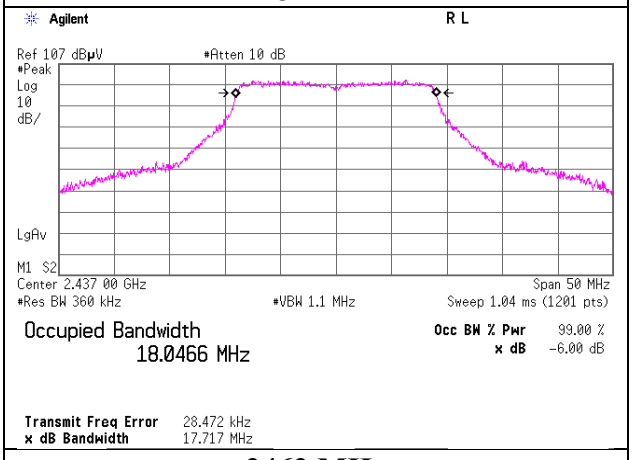
99% Occupied Bandwidth

11n-20

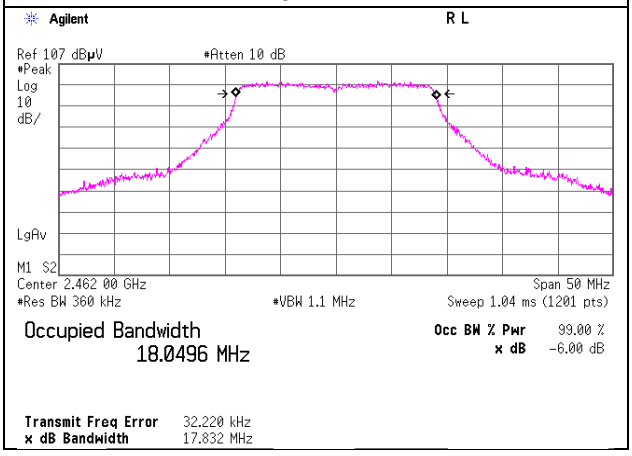
2412 MHz



2437 MHz



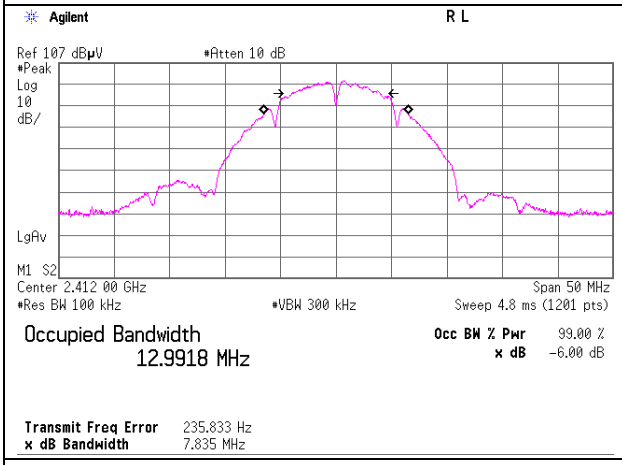
2462 MHz



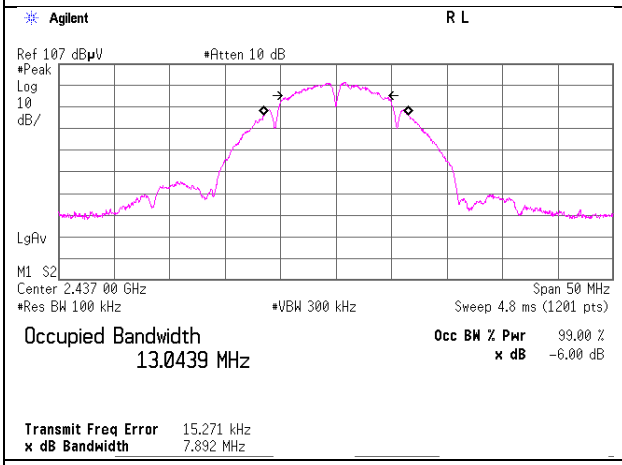
6dB Bandwidth

11b

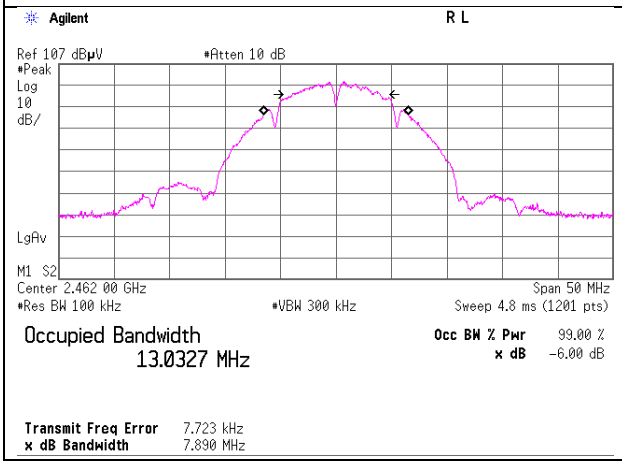
2412 MHz



2437 MHz

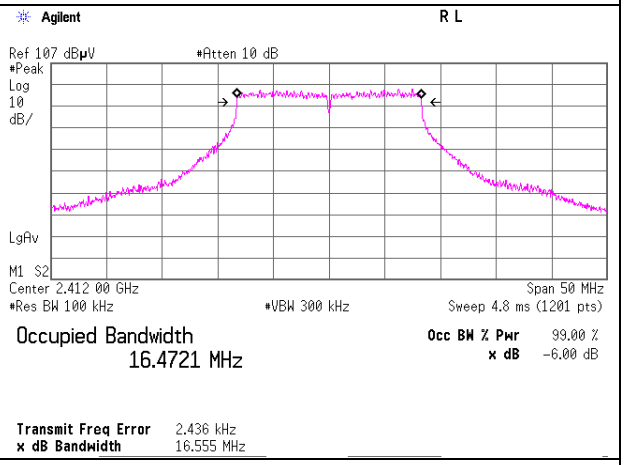


2462 MHz

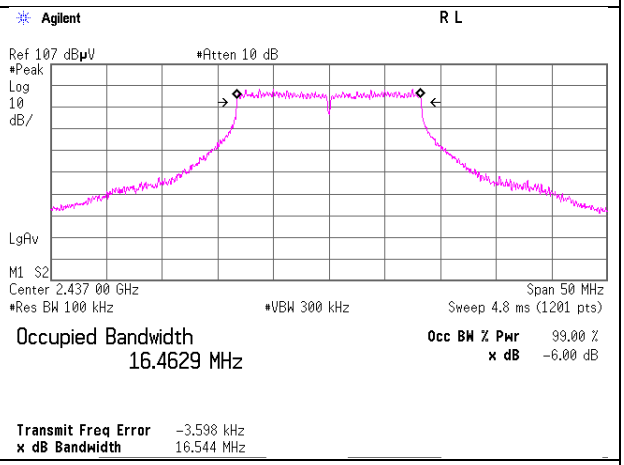


11g

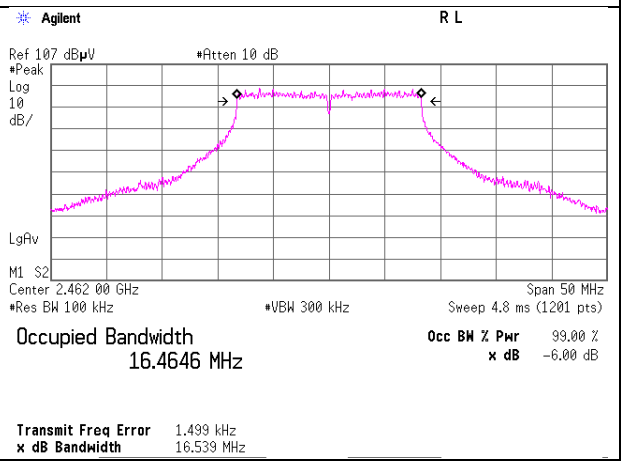
2412 MHz



2437 MHz



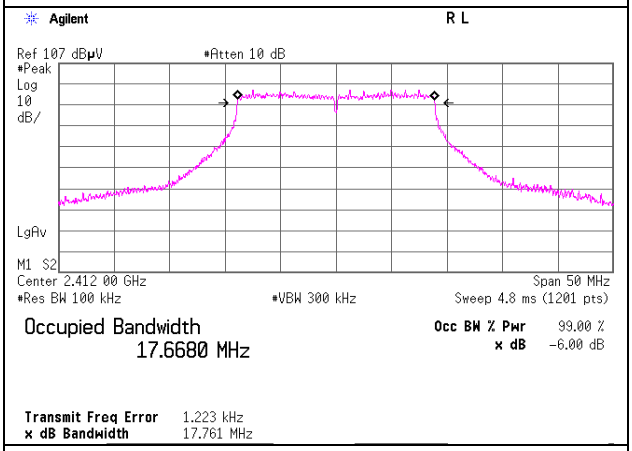
2462 MHz



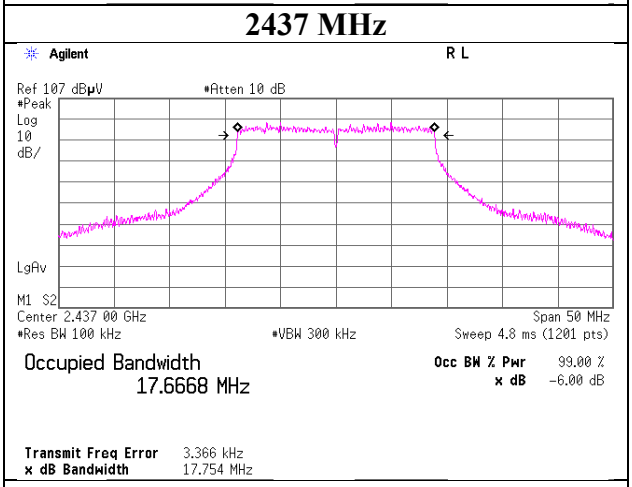
6dB Bandwidth

11n-20

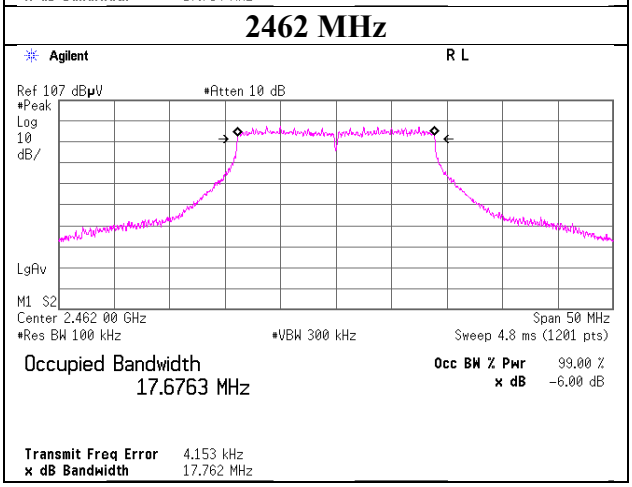
2412 MHz



2437 MHz



2462 MHz



Maximum Peak Output Power

Report No.	12979151S-A
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 29, 2019
Temperature / Humidity	26 deg. C / 53 % RH
Engineer	Makoto Hosaka
Mode	Tx 11b

				Conducted Power					e.i.r.p. for RSS-247					
Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin	Antenna Gain	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	2.50	1.82	9.89	14.21	26.36	30.00	1000	15.79	2.15	16.36	43.25	36.02	4000	19.66
2437	2.62	1.83	9.89	14.34	27.16	30.00	1000	15.66	2.15	16.49	44.57	36.02	4000	19.53
2462	2.61	1.84	9.89	14.34	27.16	30.00	1000	15.66	2.15	16.49	44.57	36.02	4000	19.53

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss
e.i.r.p. Result = Conducted Power Result + Antenna Gain
*The equipment and cables were not used for factor 0 dB of the data sheets.

2437MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
1	2.30	-
2	2.62	*
5.5	2.60	-
11	2.56	-

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

Maximum Peak Output Power

Report No.	12979151S-A
Test place	Shonan EMC Lab. No.6 Shielded Room
Date	October 28, 2019
Temperature / Humidity	24 deg. C / 43 % RH
Engineer	Makoto Hosaka
Mode	Tx 11g

				Conducted Power					e.i.r.p. for RSS-247					
Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin	Antenna Gain	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	9.91	1.82	9.89	21.62	145.21	30.00	1000	8.38	2.15	23.77	238.23	36.02	4000	12.25
2437	10.00	1.83	9.89	21.72	148.59	30.00	1000	8.28	2.15	23.87	243.78	36.02	4000	12.15
2462	10.13	1.84	9.89	21.86	153.46	30.00	1000	8.14	2.15	24.01	251.77	36.02	4000	12.01

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss
e.i.r.p. Result = Conducted Power Result + Antenna Gain
*The equipment and cables were not used for factor 0 dB of the data sheets.

2437 MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
6	5.79	-
9	5.95	-
12	5.83	-
18	6.05	-
24	9.77	-
36	10.00	*
48	9.16	-
54	9.79	-

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

Maximum Peak Output Power

Report No.	12979151S-A
Test place	Shonan EMC Lab. No.6 Shielded Room
Date	October 28, 2019
Temperature / Humidity	24 deg. C / 43 % RH
Engineer	Makoto Hosaka
Mode	Tx 11n-20

				Conducted Power					e.i.r.p. for RSS-247					
Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin	Antenna Gain	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	9.40	1.82	9.89	21.11	129.12	30.00	1000	8.89	2.15	23.26	211.84	36.02	4000	12.76
2437	9.98	1.83	9.89	21.70	147.91	30.00	1000	8.30	2.15	23.85	242.66	36.02	4000	12.17
2462	9.49	1.84	9.89	21.22	132.43	30.00	1000	8.78	2.15	23.37	217.27	36.02	4000	12.65

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss
e.i.r.p. Result = Conducted Power Result + Antenna Gain
*The equipment and cables were not used for factor 0 dB of the data sheets.

2437 MHz

Rate [MCS]	Reading [dBm]	Remark
0	5.98	-
1	5.87	-
2	6.06	-
3	9.98	*
4	9.90	-
5	9.60	-
6	9.88	-
7	9.81	-

*: Worst Rate

Average Output Power
(Reference data for RF Exposure)

Report No.	12979151S-A	
Test place	Shonan EMC Lab.	
	No.6 Shielded Room	No.5 Shielded Room
Date	October 28, 2019	October 29, 2019
Temperature / Humidity	24 deg. C / 43 % RH	26 deg. C / 53 % RH
Engineer	Makoto Hosaka	
Mode	Tx	

11b **2 Mbps**

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	-0.21	1.82	9.89	11.50	14.13	0.01	11.51	14.16
2437	-0.11	1.83	9.89	11.61	14.49	0.01	11.62	14.52
2462	-0.11	1.84	9.89	11.62	14.52	0.01	11.63	14.55

11g **36 Mbps**

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	-0.50	1.82	9.89	11.21	13.21	0.11	11.32	13.55
2437	-0.39	1.83	9.89	11.33	13.58	0.11	11.44	13.93
2462	-0.35	1.84	9.89	11.38	13.74	0.11	11.49	14.09

11n-20 **MCS 3**

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	-1.46	1.82	9.89	10.25	10.59	0.07	10.32	10.76
2437	-0.38	1.83	9.89	11.34	13.61	0.07	11.41	13.84
2462	-1.32	1.84	9.89	10.41	10.99	0.07	10.48	11.17

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

Average Output Power
(Reference data for RF Exposure)

Report No.	12979151S-A	
Test place	Shonan EMC Lab.	
	No.6 Shielded Room	No.5 Shielded Room
Date	October 28, 2019	October 29, 2019
Temperature / Humidity	24 deg. C / 43 % RH	26 deg. C / 53 % RH
Engineer	Makoto Hosaka	
Mode	Tx	

2437 MHz

Mode	Rate Mbps	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11b	1	-0.38	0.01	-0.37	-
	2	-0.11	0.01	-0.10	*
	5.5	-0.13	0.01	-0.12	-
	11	-0.15	0.03	-0.12	-
11g	6	-0.75	0.02	-0.73	-
	9	-0.75	0.02	-0.73	-
	12	-0.70	0.04	-0.66	-
	18	-0.76	0.05	-0.71	-
	24	-0.41	0.07	-0.34	-
	36	-0.39	0.11	-0.28	*
	48	-0.44	0.14	-0.30	-
	54	-0.49	0.16	-0.33	-
11n-20	0	-0.93	0.02	-0.91	-
	1	-0.95	0.04	-0.91	-
	2	-0.95	0.05	-0.90	-
	3	-0.38	0.07	-0.31	*
	4	-0.45	0.11	-0.34	-
	5	-0.48	0.15	-0.33	-
	6	-0.50	0.17	-0.33	-
	7	-0.52	0.19	-0.33	-

* Worst rate

Sample Calculation:

Burst power = Reading (timed average) + Duty factor

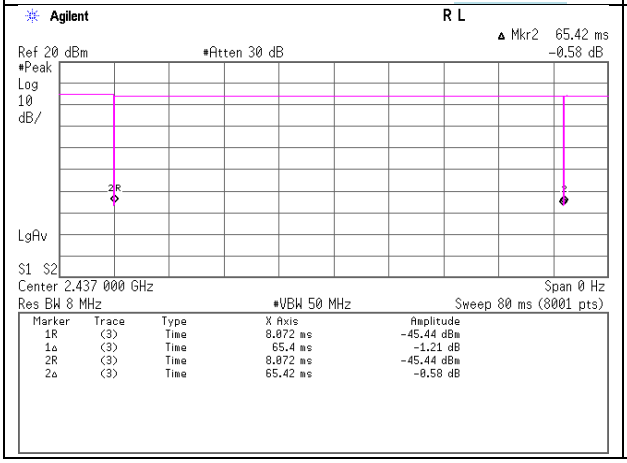
All comparison were carried out on same frequency and measurement factors.

Burst rate confirmation

Report No.	12979151S-A	
Test place	Shonan EMC Lab.	
	No.6 Shielded Room	No.5 Shielded Room
Date	October 28, 2019	October 29, 2019
Temperature / Humidity	24 deg. C / 43 % RH	26 deg. C / 53 % RH
Engineer	Makoto Hosaka	
Mode	Tx	

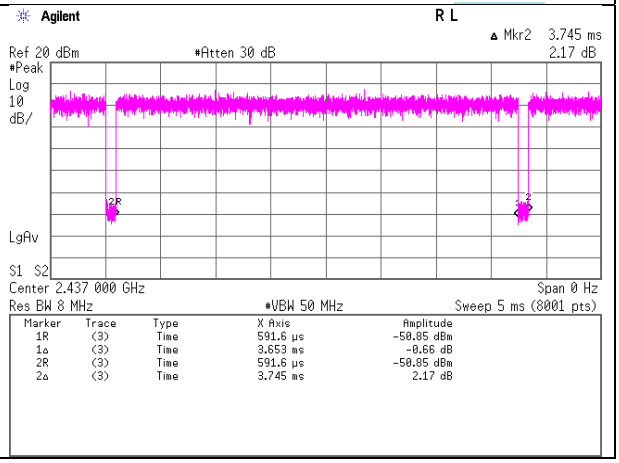
11b 2 Mbps

Tx on / (Tx on + Tx off) =	**0.999**
Tx on / (Tx on + Tx off) * 100 =	**99.9 %**
for Average output power	
Duty factor = 10 * log (65.42 / 65.4) =	**0.01 dB**
for Radiated spurious emission	
Duty factor = 20 * log (65.42 / 65.4)	**>98 %**



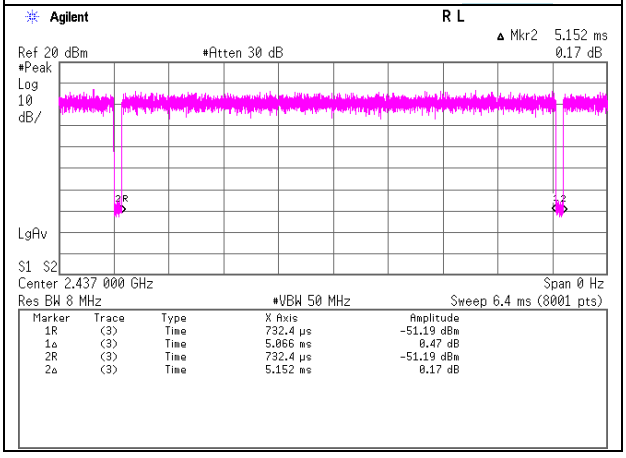
11g 36 Mbps

Tx on / (Tx on + Tx off) =	**0.975**
Tx on / (Tx on + Tx off) * 100 =	**97.5 %**
for Average output power	
Duty factor = 10 * log (3.745 / 3.653) =	**0.11 dB**
for Radiated spurious emission	
Duty factor = 20 * log (3.745 / 3.653) =	**0.22 dB**



11n-20 MCS 3

Tx on / (Tx on + Tx off) =	**0.983**
Tx on / (Tx on + Tx off) * 100 =	**98.3 %**
for Average output power	
Duty factor = 10 * log (5.152 / 5.066) =	**0.07 dB**
for Radiated spurious emission	
Duty factor = 20 * log (5.152 / 5.066)	**>98 %**



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

Radiated Spurious Emission

Report No.	12979151S-A	
Test place	Shonan EMC Lab.	
Semi Anechoic Chamber	3	3
Date	October 30, 2019	October 31, 2019
Temperature / Humidity	25 deg. C / 51 % RH	24 deg. C / 54 % RH
Engineer	Hiromasa Sato	Hiromasa Sato
	(1 GHz – 2.8 GHz)	(2.8 GHz – 26.5 GHz)
Mode	Tx 11b 2412 MHz	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	49.95	28.33	14.16	41.59	1.80	52.65	73.9	21.2	106	356	-
Hori.	2877.402	PK	59.26	28.86	6.19	41.77	1.80	54.34	73.9	19.5	125	45	-
Hori.	3330.016	PK	52.73	28.73	5.69	42.01	1.80	46.94	73.9	26.9	131	316	-
Hori.	4824.000	PK	51.18	31.64	6.46	42.88	1.80	48.20	73.9	25.7	117	353	-
Hori.	7236.000	PK	48.16	37.25	7.89	42.98	1.80	52.12	73.9	21.7	150	0	-
Hori.	9648.000	PK	47.83	38.97	9.18	43.13	1.80	54.65	73.9	19.2	150	0	-
Hori.	2390.000	AV	40.86	28.33	14.16	41.59	1.80	43.56	53.9	10.3	106	356	-
Hori.	2877.402	AV	45.42	28.86	6.19	41.77	1.80	40.50	53.9	13.4	125	45	-
Hori.	3330.016	AV	40.83	28.73	5.69	42.01	1.80	35.04	53.9	18.8	131	316	-
Hori.	4824.000	AV	40.62	31.64	6.46	42.88	1.80	37.64	53.9	16.2	117	353	-
Hori.	7236.000	AV	39.54	37.25	7.89	42.98	1.80	43.50	53.9	10.4	150	0	-
Hori.	9648.000	AV	39.44	38.97	9.18	43.13	1.80	46.26	53.9	7.6	150	0	-
Vert.	2390.000	PK	48.67	28.33	14.16	41.59	1.80	51.37	73.9	22.5	119	144	-
Vert.	2877.401	PK	64.48	28.86	6.19	41.77	1.80	59.56	73.9	14.3	148	183	-
Vert.	3330.134	PK	59.33	28.73	5.69	42.01	1.80	53.54	73.9	20.3	140	265	-
Vert.	3493.783	PK	56.12	29.11	5.73	42.12	1.80	50.64	73.9	23.2	108	356	-
Vert.	3904.789	PK	58.62	30.01	5.80	42.13	1.80	54.10	73.9	19.8	150	335	-
Vert.	4824.000	PK	50.36	31.64	6.46	42.88	1.80	47.38	73.9	26.5	124	30	-
Vert.	7236.000	PK	48.12	37.25	7.89	42.98	1.80	52.08	73.9	21.8	150	0	-
Vert.	9648.000	PK	48.82	38.97	9.18	43.13	1.80	55.64	73.9	18.2	150	0	-
Vert.	2390.000	AV	39.50	28.33	14.16	41.59	1.80	42.20	53.9	11.7	119	144	-
Vert.	2877.401	AV	50.57	28.86	6.19	41.77	1.80	45.65	53.9	8.2	148	183	-
Vert.	3330.134	AV	49.94	28.73	5.69	42.01	1.80	44.15	53.9	9.7	140	265	-
Vert.	3493.783	AV	40.78	29.11	5.73	42.12	1.80	35.30	53.9	18.6	108	356	-
Vert.	3904.789	AV	45.51	30.01	5.80	42.13	1.80	40.99	53.9	12.9	150	335	-
Vert.	4824.000	AV	39.83	31.64	6.46	42.88	1.80	36.85	53.9	17.0	124	30	-
Vert.	7236.000	AV	39.34	37.25	7.89	42.98	1.80	43.30	53.9	10.6	150	0	-
Vert.	9648.000	AV	39.59	38.97	9.18	43.13	1.80	46.41	53.9	**7.4**	150	0	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.69 m / 3.0 m) = 1.80 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

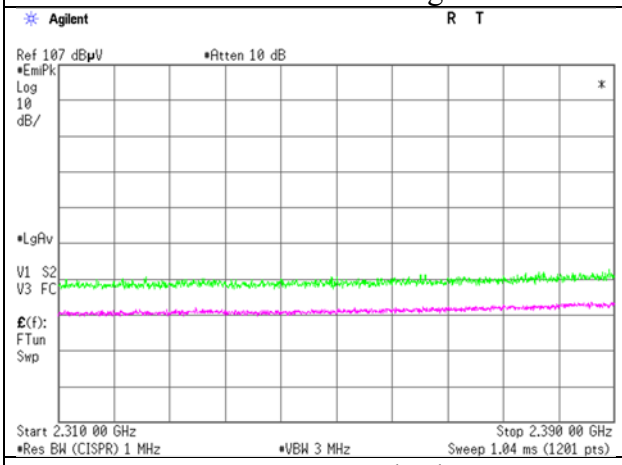
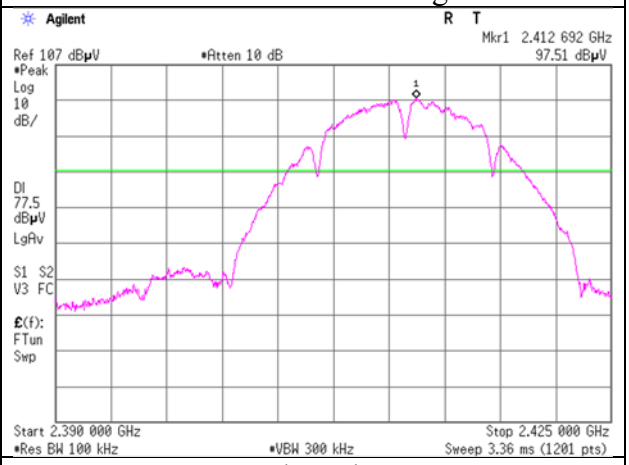
20 dBc Data Sheet **(RBW 100 kHz, VBW 300 kHz)**

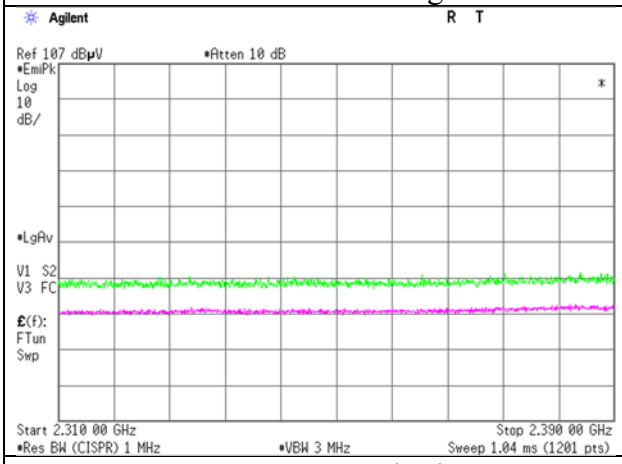
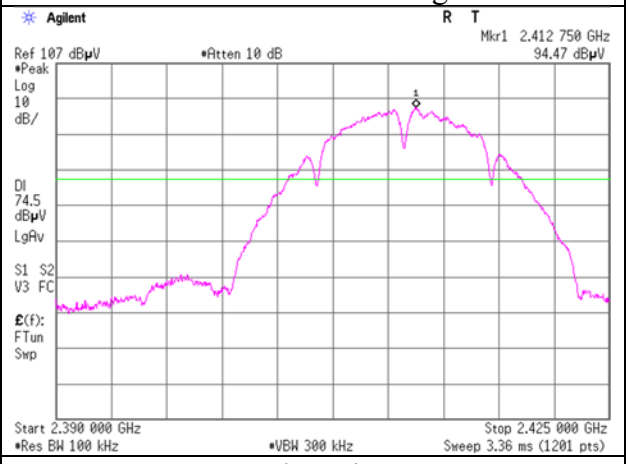
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	96.88	28.29	14.17	41.60	1.80	99.54	-	-	Carrier
Hori.	2400.000	PK	46.22	28.31	14.16	41.60	1.80	48.89	79.54	30.6	-
Vert.	2412.000	PK	94.65	28.29	14.17	41.60	1.80	97.31	-	-	Carrier
Vert.	2400.000	PK	43.29	28.31	14.16	41.60	1.80	45.96	77.31	31.3	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.69 m / 3.0 m) = 1.80 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12979151S-A
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	October 30, 2019
Temperature / Humidity	25 deg. C / 51 % RH
Engineer	Hiromasa Sato
	(1 GHz – 2.8 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

Report No.	12979151S-A	
Test place	Shonan EMC Lab.	
Semi Anechoic Chamber	3	3
Date	October 30, 2019	October 31, 2019
Temperature / Humidity	25 deg. C / 51 % RH	24 deg. C / 54 % RH
Engineer	Hiromasa Sato	Hiromasa Sato
	(1 GHz – 2.8 GHz)	(2.8 GHz – 26.5 GHz)
Mode	Tx 11b 2437 MHz	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2877.396	PK	53.29	28.86	6.19	41.77	1.80	48.37	73.9	25.5	121	233	-
Hori.	3329.824	PK	53.28	28.73	5.69	42.01	1.80	47.49	73.9	26.4	124	308	-
Hori.	4874.000	PK	51.40	31.70	6.49	42.89	1.80	48.50	73.9	25.4	116	348	-
Hori.	7311.000	PK	47.42	37.36	7.95	43.13	1.80	51.40	73.9	22.5	150	0	-
Hori.	9748.000	PK	48.74	39.31	9.21	43.02	1.80	56.04	73.9	17.8	150	0	-
Hori.	2877.396	AV	40.86	28.86	6.19	41.77	1.80	35.94	53.9	17.9	121	233	-
Hori.	3329.824	AV	43.35	28.73	5.69	42.01	1.80	37.56	53.9	16.3	124	308	-
Hori.	4874.000	AV	42.60	31.70	6.49	42.89	1.80	39.70	53.9	14.2	116	348	-
Hori.	7311.000	AV	39.21	37.36	7.95	43.13	1.80	43.19	53.9	10.7	150	0	-
Hori.	9748.000	AV	39.13	39.31	9.21	43.02	1.80	46.43	53.9	7.4	150	0	-
Vert.	2877.332	PK	65.12	28.86	6.19	41.77	1.80	60.20	73.9	13.7	100	9	-
Vert.	3330.021	PK	55.62	28.73	5.69	42.01	1.80	49.83	73.9	24.0	100	289	-
Vert.	3493.799	PK	53.58	29.11	5.73	42.12	1.80	48.10	73.9	25.8	146	358	-
Vert.	3904.531	PK	53.71	30.01	5.80	42.13	1.80	49.19	73.9	24.7	117	321	-
Vert.	4874.000	PK	50.70	31.70	6.49	42.89	1.80	47.80	73.9	26.1	115	27	-
Vert.	7311.000	PK	47.49	37.36	7.95	43.13	1.80	51.47	73.9	22.4	150	0	-
Vert.	9748.000	PK	48.45	39.31	9.21	43.02	1.80	55.75	73.9	18.1	150	0	-
Vert.	2877.332	AV	51.28	28.86	6.19	41.77	1.80	46.36	53.9	7.5	100	9	-
Vert.	3330.021	AV	45.16	28.73	5.69	42.01	1.80	39.37	53.9	14.5	100	289	-
Vert.	3493.799	AV	41.95	29.11	5.73	42.12	1.80	36.47	53.9	17.4	146	358	-
Vert.	3904.531	AV	41.18	30.01	5.80	42.13	1.80	36.66	53.9	17.2	117	321	-
Vert.	4874.000	AV	41.13	31.70	6.49	42.89	1.80	38.23	53.9	15.6	115	27	-
Vert.	7311.000	AV	39.28	37.36	7.95	43.13	1.80	43.26	53.9	10.6	150	0	-
Vert.	9748.000	AV	39.41	39.31	9.21	43.02	1.80	46.71	53.9	**7.1**	150	0	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.69 m / 3.0 m) = 1.80 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission

Report No.	12979151S-A	
Test place	Shonan EMC Lab.	
Semi Anechoic Chamber	3	3
Date	October 30, 2019	October 31, 2019
Temperature / Humidity	25 deg. C / 51 % RH	24 deg. C / 54 % RH
Engineer	Hiromasa Sato	Hiromasa Sato
	(1 GHz – 2.8 GHz)	(2.8 GHz – 26.5 GHz)
Mode	Tx 11b 2462 MHz	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	49.10	28.24	14.24	41.62	1.80	51.76	73.9	22.1	108	354	-
Hori.	2877.371	PK	58.15	28.86	6.19	41.77	1.80	53.23	73.9	20.6	122	48	-
Hori.	3328.794	PK	54.62	28.73	5.69	42.01	1.80	48.83	73.9	25.0	129	326	-
Hori.	4924.000	PK	50.91	31.82	6.52	42.90	1.80	48.15	73.9	25.7	112	351	-
Hori.	7386.000	PK	47.48	37.49	8.00	43.28	1.80	51.49	73.9	22.4	150	0	-
Hori.	9848.000	PK	48.02	39.33	9.24	42.92	1.80	55.47	73.9	18.4	150	0	-
Hori.	2483.500	AV	39.82	28.24	14.24	41.62	1.80	42.48	53.9	11.4	108	354	-
Hori.	2877.371	AV	44.96	28.86	6.19	41.77	1.80	40.04	53.9	13.8	122	48	-
Hori.	3328.794	AV	44.47	28.73	5.69	42.01	1.80	38.68	53.9	15.2	129	326	-
Hori.	4924.000	AV	42.82	31.82	6.52	42.90	1.80	40.06	53.9	13.8	112	351	-
Hori.	7386.000	AV	38.83	37.49	8.00	43.28	1.80	42.84	53.9	11.0	150	0	-
Hori.	9848.000	AV	39.27	39.33	9.24	42.92	1.80	46.72	53.9	**7.1**	150	0	-
Vert.	2483.500	PK	47.92	28.24	14.24	41.62	1.80	50.58	73.9	23.3	115	143	-
Vert.	2877.117	PK	64.32	28.86	6.19	41.77	1.80	59.40	73.9	14.5	104	3	-
Vert.	3329.886	PK	57.79	28.73	5.69	42.01	1.80	52.00	73.9	21.9	130	270	-
Vert.	3493.803	PK	54.94	29.11	5.73	42.12	1.80	49.46	73.9	24.4	112	328	-
Vert.	3904.889	PK	57.45	30.01	5.80	42.13	1.80	52.93	73.9	20.9	152	337	-
Vert.	4924.000	PK	49.79	31.82	6.52	42.90	1.80	47.03	73.9	26.8	125	3	-
Vert.	7386.000	PK	48.49	37.49	8.00	43.28	1.80	52.50	73.9	21.4	150	0	-
Vert.	9848.000	PK	48.44	39.33	9.24	42.92	1.80	55.89	73.9	18.0	150	0	-
Vert.	2483.500	AV	39.55	28.24	14.24	41.62	1.80	42.21	53.9	11.7	115	143	-
Vert.	2877.117	AV	51.36	28.86	6.19	41.77	1.80	46.44	53.9	7.4	104	3	-
Vert.	3329.886	AV	49.89	28.73	5.69	42.01	1.80	44.10	53.9	9.8	130	270	-
Vert.	3493.803	AV	42.43	29.11	5.73	42.12	1.80	36.95	53.9	16.9	112	328	-
Vert.	3904.889	AV	43.51	30.01	5.80	42.13	1.80	38.99	53.9	14.9	152	337	-
Vert.	4924.000	AV	41.72	31.82	6.52	42.90	1.80	38.96	53.9	14.9	125	3	-
Vert.	7386.000	AV	38.76	37.49	8.00	43.28	1.80	42.77	53.9	11.1	150	0	-
Vert.	9848.000	AV	38.87	39.33	9.24	42.92	1.80	46.32	53.9	7.5	150	0	-

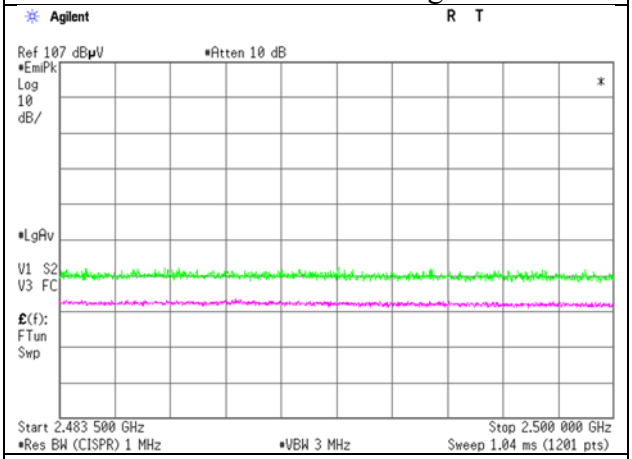
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.69 m / 3.0 m) = 1.80 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12979151S-A
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	October 30, 2019
Temperature / Humidity	25 deg. C / 51 % RH
Engineer	Hiromasa Sato
	(1 GHz – 2.8 GHz)
Mode	Tx 11b 2462 MHz

Horizontal

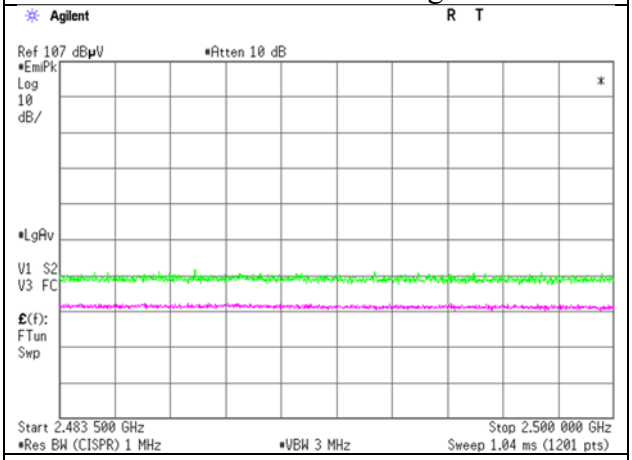
Restricted-band band-edge Plot



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

Report No.	12979151S-A	
Test place	Shonan EMC Lab.	
Semi Anechoic Chamber	3	3
Date	October 30, 2019	October 31, 2019
Temperature / Humidity	25 deg. C / 51 % RH	24 deg. C / 54 % RH
Engineer	Hiromasa Sato	Hiromasa Sato
	(1 GHz – 2.8 GHz)	(2.8 GHz – 26.5 GHz)
Mode	Tx 11g 2412 MHz	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	53.80	28.33	14.16	41.59	1.80	56.50	73.9	17.4	109	358	-
Hori.	2877.299	PK	58.88	28.86	6.19	41.77	1.80	53.96	73.9	19.9	125	49	-
Hori.	3331.163	PK	54.61	28.73	5.70	42.02	1.80	48.82	73.9	25.0	154	324	-
Hori.	4824.000	PK	48.50	31.64	6.46	42.88	1.80	45.52	73.9	28.3	150	0	-
Hori.	7236.000	PK	48.42	37.25	7.89	42.98	1.80	52.38	73.9	21.5	150	0	-
Hori.	9648.000	PK	48.59	38.97	9.18	43.13	1.80	55.41	73.9	18.4	150	0	-
Hori.	2877.299	AV	45.13	28.86	6.19	41.77	1.80	40.21	53.9	13.6	125	49	-
Hori.	3331.163	AV	44.96	28.73	5.70	42.02	1.80	39.17	53.9	14.7	154	324	-
Vert.	2390.000	PK	50.91	28.33	14.16	41.59	1.80	53.61	73.9	20.2	115	145	-
Vert.	2877.157	PK	65.26	28.86	6.19	41.77	1.80	60.34	73.9	13.5	100	11	-
Vert.	3329.994	PK	58.46	28.73	5.69	42.01	1.80	52.67	73.9	21.2	139	272	-
Vert.	3493.846	PK	54.71	29.11	5.73	42.12	1.80	49.23	73.9	24.6	113	357	-
Vert.	3904.910	PK	55.82	30.01	5.80	42.13	1.80	51.30	73.9	22.6	146	333	-
Vert.	4824.000	PK	48.19	31.64	6.46	42.88	1.80	45.21	73.9	28.6	150	0	-
Vert.	7236.000	PK	48.61	37.25	7.89	42.98	1.80	52.57	73.9	21.3	150	0	-
Vert.	9648.000	PK	48.80	38.97	9.18	43.13	1.80	55.62	73.9	18.2	150	0	-
Vert.	2877.157	AV	50.67	28.86	6.19	41.77	1.80	45.75	53.9	**8.1**	100	11	-
Vert.	3329.994	AV	49.52	28.73	5.69	42.01	1.80	43.73	53.9	10.1	139	272	-
Vert.	3493.846	AV	42.39	29.11	5.73	42.12	1.80	36.91	53.9	16.9	113	357	-
Vert.	3904.910	AV	42.22	30.01	5.80	42.13	1.80	37.70	53.9	16.2	146	333	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.69 m / 3.0 m) = 1.80 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	42.84	28.33	14.16	41.59	0.22	1.80	45.76	53.9	8.1	*1)
Hori.	4824.000	AV	39.44	31.64	6.46	42.88	0.22	1.80	36.68	53.9	17.2	-
Hori.	7236.000	AV	39.43	37.25	7.89	42.98	0.22	1.80	43.61	53.9	10.2	-
Hori.	9648.000	AV	39.53	38.97	9.18	43.13	0.22	1.80	46.57	53.9	7.3	-
Vert.	2390.000	AV	40.97	28.33	14.16	41.59	0.22	1.80	43.89	53.9	10.0	*1)
Vert.	4824.000	AV	39.11	31.64	6.46	42.88	0.22	1.80	36.35	53.9	17.5	-
Vert.	7236.000	AV	39.45	37.25	7.89	42.98	0.22	1.80	43.63	53.9	10.2	-
Vert.	9648.000	AV	39.64	38.97	9.18	43.13	0.22	1.80	46.68	53.9	**7.2**	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.69 m / 3.0 m) = 1.80 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
Duty factor refer to "Duty factor Calculation chart" sheet.
*1) Not out of band emission (Leakage Power)

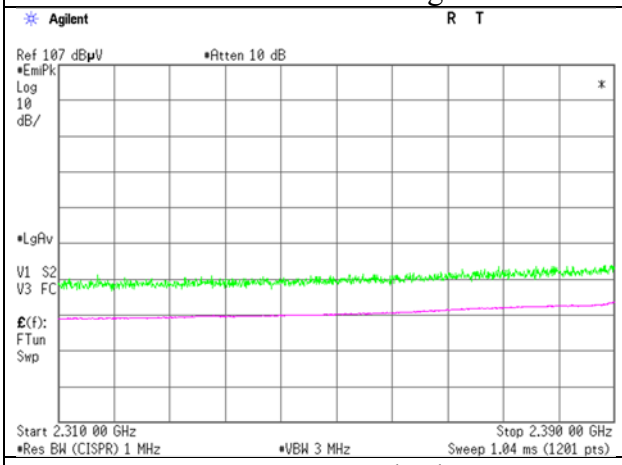
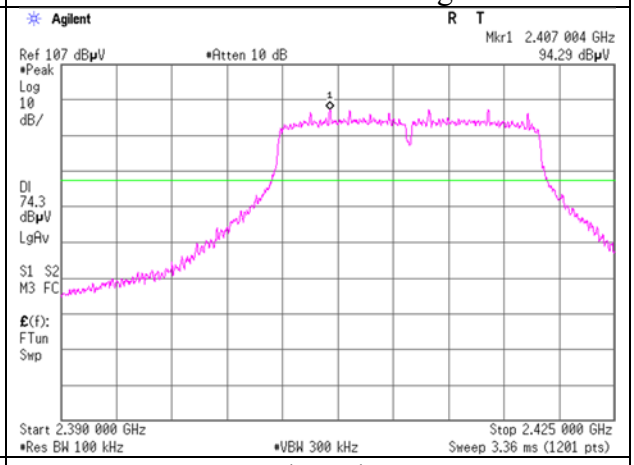
20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

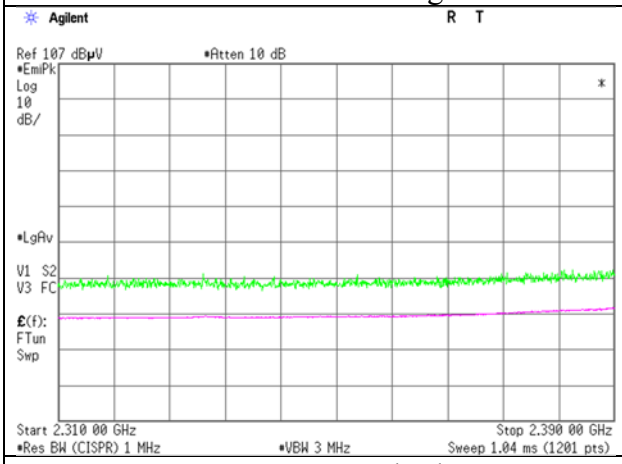
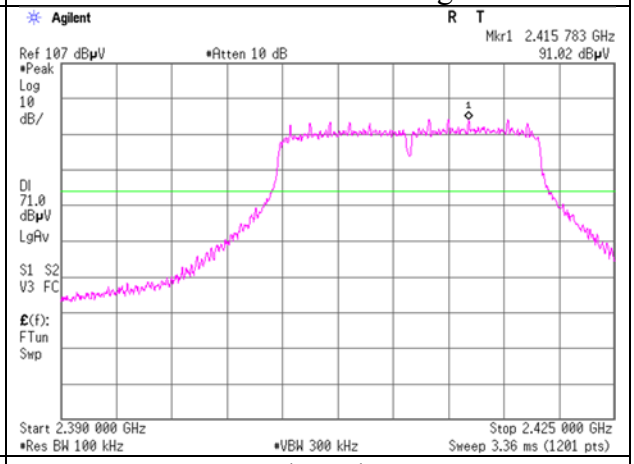
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	93.27	28.29	14.17	41.60	1.80	95.93	-	-	Carrier
Hori.	2400.000	PK	58.92	28.31	14.16	41.60	1.80	61.59	75.93	14.3	-
Vert.	2412.000	PK	90.72	28.29	14.17	41.60	1.80	93.38	-	-	Carrier
Vert.	2400.000	PK	54.83	28.31	14.16	41.60	1.80	57.50	73.38	15.8	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.69 m / 3.0 m) = 1.80 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12979151S-A
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	October 30, 2019
Temperature / Humidity	25 deg. C / 51 % RH
Engineer	Hiromasa Sato
	(1 GHz – 2.8 GHz)
Mode	Tx 11g 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

Report No.	12979151S-A	
Test place	Shonan EMC Lab.	
Semi Anechoic Chamber	3	3
Date	October 30, 2019	October 31, 2019
Temperature / Humidity	25 deg. C / 51 % RH	24 deg. C / 54 % RH
Engineer	Hiromasa Sato	Hiromasa Sato
	(1 GHz – 2.8 GHz)	(2.8 GHz – 26.5 GHz)
Mode	Tx 11g 2437 MHz	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2877.125	PK	58.63	28.86	6.19	41.77	1.80	53.71	73.9	20.1	131	26	-
Hori.	3331.102	PK	53.95	28.73	5.70	42.02	1.80	48.16	73.9	25.7	133	321	-
Hori.	4874.000	PK	48.11	31.70	6.49	42.89	1.80	45.21	73.9	28.6	150	0	-
Hori.	7311.000	PK	48.64	37.36	7.95	43.13	1.80	52.62	73.9	21.2	150	0	-
Hori.	9748.000	PK	48.39	39.31	9.21	43.02	1.80	55.69	73.9	18.2	150	0	-
Hori.	2877.125	AV	44.88	28.86	6.19	41.77	1.80	39.96	53.9	13.9	131	26	-
Hori.	3331.102	AV	44.20	28.73	5.70	42.02	1.80	38.41	53.9	15.4	133	321	-
Vert.	2877.326	PK	64.88	28.86	6.19	41.77	1.80	59.96	73.9	13.9	100	21	-
Vert.	3331.214	PK	57.31	28.73	5.70	42.02	1.80	51.52	73.9	22.3	138	270	-
Vert.	3493.554	PK	53.22	29.11	5.73	42.12	1.80	47.74	73.9	26.1	124	358	-
Vert.	3905.196	PK	56.83	30.01	5.81	42.13	1.80	52.32	73.9	21.5	148	336	-
Vert.	4874.000	PK	48.03	31.70	6.49	42.89	1.80	45.13	73.9	28.7	150	0	-
Vert.	7311.000	PK	48.81	37.36	7.95	43.13	1.80	52.79	73.9	21.1	150	0	-
Vert.	9748.000	PK	48.79	39.31	9.21	43.02	1.80	56.09	73.9	17.8	150	0	-
Vert.	2877.326	AV	51.05	28.86	6.19	41.77	1.80	46.13	53.9	**7.7**	100	21	-
Vert.	3331.214	AV	49.73	28.73	5.70	42.02	1.80	43.94	53.9	9.9	138	270	-
Vert.	3493.554	AV	43.18	29.11	5.73	42.12	1.80	37.70	53.9	16.2	124	358	-
Vert.	3905.196	AV	43.21	30.01	5.81	42.13	1.80	38.70	53.9	15.2	148	336	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.69 m / 3.0 m) = 1.80 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4874.000	AV	39.44	31.70	6.49	42.89	0.22	1.80	36.76	53.9	17.1	-
Hori.	7311.000	AV	39.78	37.36	7.95	43.13	0.22	1.80	43.98	53.9	9.9	-
Hori.	9748.000	AV	39.77	39.31	9.21	43.02	0.22	1.80	47.29	53.9	**6.6**	-
Vert.	4874.000	AV	39.53	31.70	6.49	42.89	0.22	1.80	36.85	53.9	17.0	-
Vert.	7311.000	AV	39.71	37.36	7.95	43.13	0.22	1.80	43.91	53.9	9.9	-
Vert.	9748.000	AV	39.44	39.31	9.21	43.02	0.22	1.80	46.96	53.9	6.9	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.69 m / 3.0 m) = 1.80 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
Duty factor refer to "Duty factor Calculation chart" sheet.

Radiated Spurious Emission

Report No.	12979151S-A		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	3	3	3
Date	November 1, 2019	October 30, 2019	October 31, 2019
Temperature / Humidity	26 deg. C / 53 % RH	25 deg. C / 51 % RH	24 deg. C / 54 % RH
Engineer	Hiromasa Sato	Hiromasa Sato	Hiromasa Sato
	(30 MHz – 1000 MHz)	(1 GHz – 2.8 GHz)	(2.8 GHz – 26.5 GHz)
Mode	Tx 11g 2462 MHz		

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	74.233	QP	45.57	6.16	7.16	32.17	0.00	26.72	40.0	13.2	131	117	-
Hori.	148.499	QP	36.74	14.63	7.80	32.12	0.00	27.05	43.5	16.4	100	357	-
Hori.	291.753	QP	52.70	13.40	8.72	32.02	0.00	42.80	46.0	**3.2**	123	107	-
Hori.	338.462	QP	44.66	14.48	9.00	31.96	0.00	36.18	46.0	9.8	100	282	-
Hori.	542.866	QP	36.19	17.57	9.80	31.98	0.00	31.58	46.0	14.4	150	170	-
Hori.	896.802	QP	32.83	21.53	11.00	31.11	0.00	34.25	46.0	11.7	120	56	-
Hori.	2483.500	PK	51.43	28.24	14.24	41.62	1.80	54.09	73.9	19.8	108	353	-
Hori.	2877.406	PK	56.43	28.86	6.19	41.77	1.80	51.51	73.9	22.3	113	22	-
Hori.	3330.168	PK	51.78	28.73	5.69	42.01	1.80	45.99	73.9	27.9	148	350	-
Hori.	4924.000	PK	48.62	31.82	6.52	42.90	1.80	45.86	73.9	28.0	150	0	-
Hori.	7386.000	PK	48.70	37.49	8.00	43.28	1.80	52.71	73.9	21.1	150	0	-
Hori.	9848.000	PK	48.71	39.33	9.24	42.92	1.80	56.16	73.9	17.7	150	0	-
Hori.	2877.406	AV	43.22	28.86	6.19	41.77	1.80	38.30	53.9	15.6	113	22	-
Hori.	3330.168	AV	42.13	28.73	5.69	42.01	1.80	36.34	53.9	17.5	148	350	-
Vert.	74.186	QP	41.83	6.16	7.16	32.17	0.00	22.98	40.0	17.0	137	122	-
Vert.	148.501	QP	37.11	14.63	7.81	32.12	0.00	27.43	43.5	16.0	103	4	-
Vert.	291.755	QP	49.23	13.40	8.72	32.02	0.00	39.33	46.0	6.6	100	96	-
Vert.	445.401	QP	35.68	16.13	9.45	31.97	0.00	29.29	46.0	16.7	100	140	-
Vert.	482.628	QP	36.91	17.11	9.57	31.95	0.00	31.64	46.0	14.3	153	189	-
Vert.	896.783	QP	35.58	21.53	11.00	31.11	0.00	37.00	46.0	9.0	100	58	-
Vert.	924.641	QP	33.66	21.69	11.09	30.87	0.00	35.57	46.0	10.4	100	358	-
Vert.	2483.500	PK	49.47	28.24	14.24	41.62	1.80	52.13	73.9	21.7	150	141	-
Vert.	2877.158	PK	64.66	28.86	6.19	41.77	1.80	59.74	73.9	14.1	100	2	-
Vert.	3331.183	PK	58.21	28.73	5.70	42.02	1.80	52.42	73.9	21.4	148	263	-
Vert.	3493.912	PK	55.89	29.11	5.73	42.12	1.80	50.41	73.9	23.4	110	359	-
Vert.	3904.705	PK	55.40	30.01	5.80	42.13	1.80	50.88	73.9	23.0	139	320	-
Vert.	4924.000	PK	48.24	31.82	6.52	42.90	1.80	45.48	73.9	28.4	150	0	-
Vert.	7386.000	PK	48.74	37.49	8.00	43.28	1.80	52.75	73.9	21.1	150	0	-
Vert.	9848.000	PK	48.65	39.33	9.24	42.92	1.80	56.10	73.9	17.8	150	0	-
Vert.	2877.158	AV	50.53	28.86	6.19	41.77	1.80	45.61	53.9	8.2	100	2	-
Vert.	3331.183	AV	49.88	28.73	5.70	42.02	1.80	44.09	53.9	9.8	148	263	-
Vert.	3493.912	AV	40.71	29.11	5.73	42.12	1.80	35.23	53.9	18.6	110	359	-
Vert.	3904.705	AV	44.36	30.01	5.80	42.13	1.80	39.84	53.9	14.0	139	320	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.69 m / 3.0 m) = 1.80 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Average measurement value with duty factor

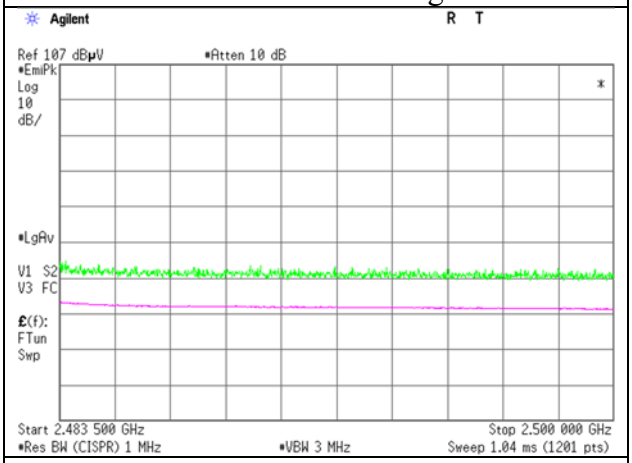
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	42.39	28.24	14.24	41.62	0.22	1.80	45.27	53.9	8.6	*1)
Hori.	4924.000	AV	39.40	31.82	6.52	42.90	0.22	1.80	36.86	53.9	17.0	-
Hori.	7386.000	AV	39.79	37.49	8.00	43.28	0.22	1.80	44.02	53.9	9.8	-
Hori.	9848.000	AV	39.68	39.33	9.24	42.92	0.22	1.80	47.35	53.9	6.5	-
Vert.	2483.500	AV	40.42	28.24	14.24	41.62	0.22	1.80	43.30	53.9	10.6	*1)
Vert.	4924.000	AV	39.23	31.82	6.52	42.90	0.22	1.80	36.69	53.9	17.2	-
Vert.	7386.000	AV	39.39	37.49	8.00	43.28	0.22	1.80	43.62	53.9	10.2	-
Vert.	9848.000	AV	39.83	39.33	9.24	42.92	0.22	1.80	47.50	53.9	6.4	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Duty factor + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.69 m / 3.0 m) = 1.80 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
Duty factor refer to "Duty factor Calculation chart" sheet.
*1) Not out of band emission (Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

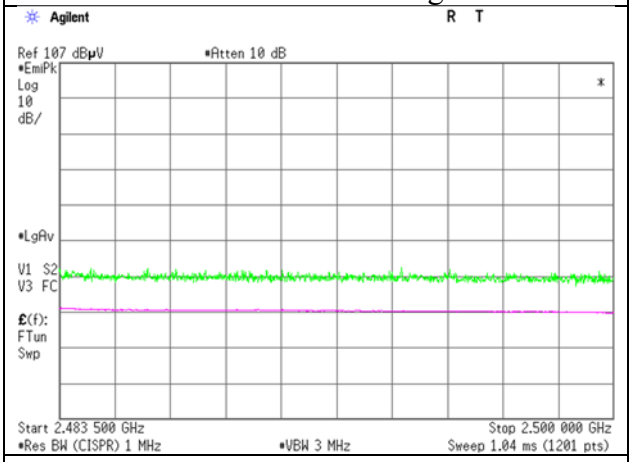
Report No.	12979151S-A
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	October 30, 2019
Temperature / Humidity	25 deg. C / 51 % RH
Engineer	Hiromasa Sato
	(1 GHz – 2.8 GHz)
Mode	Tx 11g 2462 MHz

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

Report No.	12979151S-A	
Test place	Shonan EMC Lab.	
Semi Anechoic Chamber	3	3
Date	October 30, 2019	October 31, 2019
Temperature / Humidity	25 deg. C / 51 % RH	24 deg. C / 54 % RH
Engineer	Hiromasa Sato	Hiromasa Sato
	(1 GHz – 2.8 GHz)	(2.8 GHz – 26.5 GHz)
Mode	Tx 11n-20 2412 MHz	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	55.16	28.33	14.16	41.59	1.80	57.86	73.9	16.0	111	356	-
Hori.	2877.249	PK	56.81	28.86	6.19	41.77	1.80	51.89	73.9	22.0	145	31	-
Hori.	3330.365	PK	51.20	28.73	5.69	42.01	1.80	45.41	73.9	28.4	150	332	-
Hori.	4824.000	PK	48.66	31.64	6.46	42.88	1.80	45.68	73.9	28.2	150	0	-
Hori.	7236.000	PK	48.35	37.25	7.89	42.98	1.80	52.31	73.9	21.5	150	0	-
Hori.	9648.000	PK	48.31	38.97	9.18	43.13	1.80	55.13	73.9	18.7	150	0	-
Hori.	2390.000	AV	44.04	28.33	14.16	41.59	1.80	46.74	53.9	**7.1**	111	356	-
Hori.	2877.249	AV	44.33	28.86	6.19	41.77	1.80	39.41	53.9	14.4	145	31	-
Hori.	3330.365	AV	41.86	28.73	5.69	42.01	1.80	36.07	53.9	17.8	150	332	-
Hori.	4824.000	AV	39.33	31.64	6.46	42.88	1.80	36.35	53.9	17.5	150	0	-
Hori.	7236.000	AV	39.70	37.25	7.89	42.98	1.80	43.66	53.9	10.2	150	0	-
Hori.	9648.000	AV	39.57	38.97	9.18	43.13	1.80	46.39	53.9	7.5	150	0	-
Vert.	2390.000	PK	52.43	28.33	14.16	41.59	1.80	55.13	73.9	18.7	116	139	-
Vert.	2877.400	PK	64.83	28.86	6.19	41.77	1.80	59.91	73.9	13.9	102	31	-
Vert.	3332.663	PK	59.16	28.72	5.70	42.02	1.80	53.36	73.9	20.5	146	271	-
Vert.	3494.023	PK	56.01	29.11	5.73	42.12	1.80	50.53	73.9	23.3	109	349	-
Vert.	3904.965	PK	55.73	30.01	5.80	42.13	1.80	51.21	73.9	22.6	154	330	-
Vert.	4824.000	PK	48.33	31.64	6.46	42.88	1.80	45.35	73.9	28.5	150	0	-
Vert.	7236.000	PK	48.97	37.25	7.89	42.98	1.80	52.93	73.9	20.9	150	0	-
Vert.	9648.000	PK	48.73	38.97	9.18	43.13	1.80	55.55	73.9	18.3	150	0	-
Vert.	2390.000	AV	41.18	28.33	14.16	41.59	1.80	43.88	53.9	10.0	116	139	-
Vert.	2877.400	AV	50.24	28.86	6.19	41.77	1.80	45.32	53.9	8.5	102	31	-
Vert.	3332.663	AV	49.31	28.72	5.70	42.02	1.80	43.51	53.9	10.3	146	271	-
Vert.	3494.023	AV	40.81	29.11	5.73	42.12	1.80	35.33	53.9	18.5	109	349	-
Vert.	3904.965	AV	44.51	30.01	5.80	42.13	1.80	39.99	53.9	13.9	154	330	-
Vert.	4824.000	AV	39.28	31.64	6.46	42.88	1.80	36.30	53.9	17.6	150	0	-
Vert.	7236.000	AV	39.61	37.25	7.89	42.98	1.80	43.57	53.9	10.3	150	0	-
Vert.	9648.000	AV	39.66	38.97	9.18	43.13	1.80	46.48	53.9	7.4	150	0	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.69 m / 3.0 m) = 1.80 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

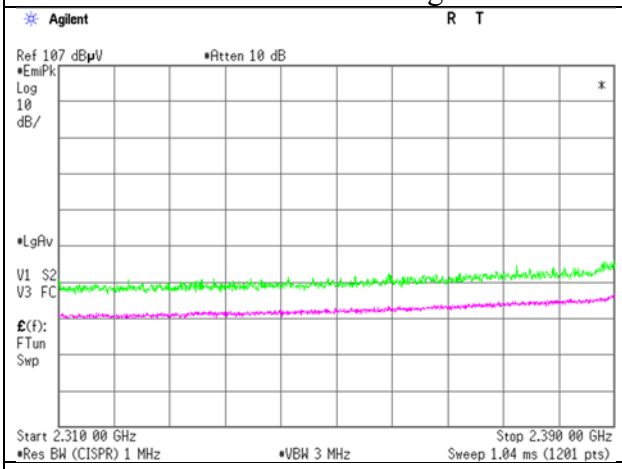
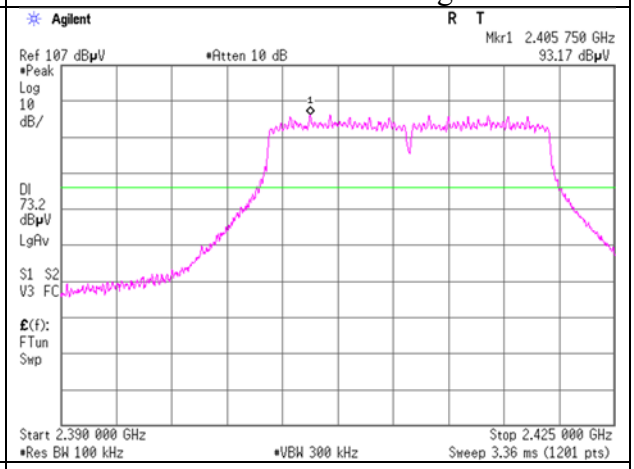
20 dBc Data Sheet **(RBW 100 kHz, VBW 300 kHz)**

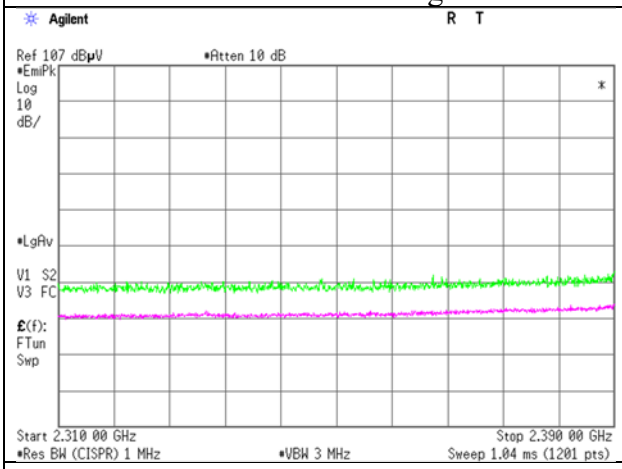
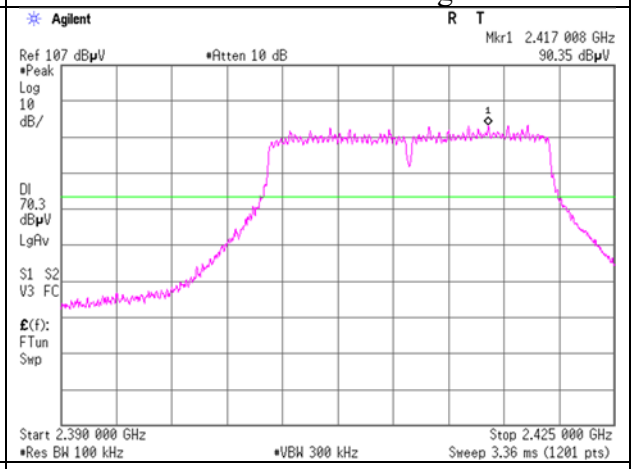
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	92.47	28.29	14.17	41.60	1.80	95.13	-	-	Carrier
Hori.	2400.000	PK	58.61	28.31	14.16	41.60	1.80	61.28	75.13	13.8	-
Vert.	2412.000	PK	89.91	28.29	14.17	41.60	1.80	92.57	-	-	Carrier
Vert.	2400.000	PK	55.22	28.31	14.16	41.60	1.80	57.89	72.57	14.6	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.69 m / 3.0 m) = 1.80 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12979151S-A
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	October 30, 2019
Temperature / Humidity	25 deg. C / 51 % RH
Engineer	Hiromasa Sato
	(1 GHz – 2.8 GHz)
Mode	Tx 11n-20 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

Report No.	12979151S-A	
Test place	Shonan EMC Lab.	
Semi Anechoic Chamber	3	3
Date	October 30, 2019	October 31, 2019
Temperature / Humidity	25 deg. C / 51 % RH	24 deg. C / 54 % RH
Engineer	Hiromasa Sato	Hiromasa Sato
	(1 GHz – 2.8 GHz)	(2.8 GHz – 26.5 GHz)
Mode	Tx 11n-20 2417 MHz	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	52.00	28.33	14.16	41.59	1.80	54.70	73.9	19.2	115	358	-
Hori.	2390.000	AV	41.93	28.33	14.16	41.59	1.80	44.63	53.9	**9.2**	115	358	-
Vert.	2390.000	PK	51.33	28.33	14.16	41.59	1.80	54.03	73.9	19.8	113	143	-
Vert.	2390.000	AV	40.67	28.33	14.16	41.59	1.80	43.37	53.9	10.5	113	143	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.69 m / 3.0 m) = 1.80 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

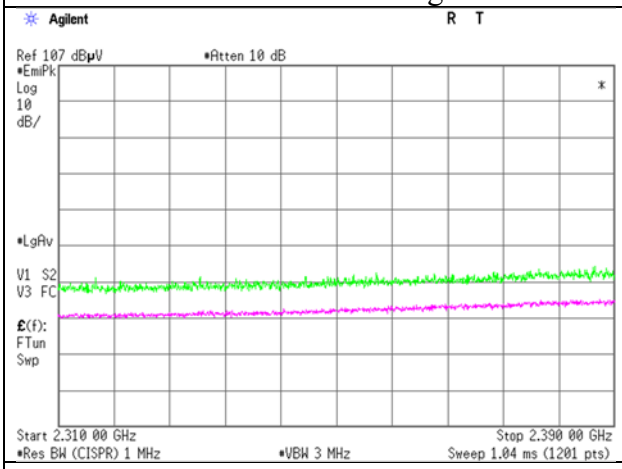
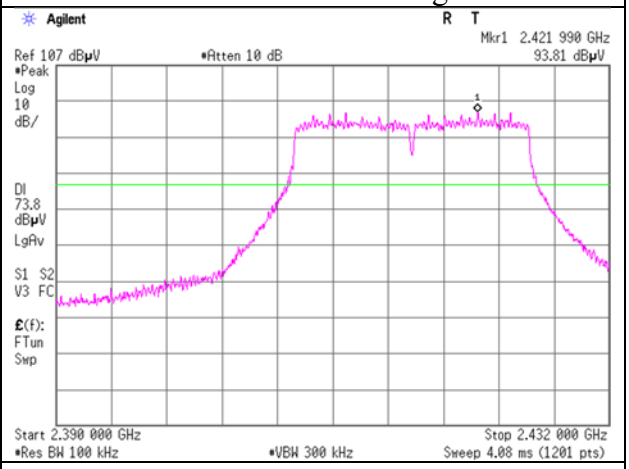
20 dBc Data Sheet **(RBW 100 kHz, VBW 300 kHz)**

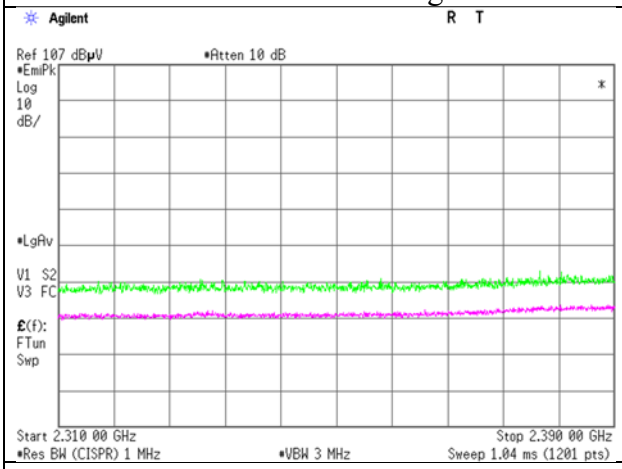
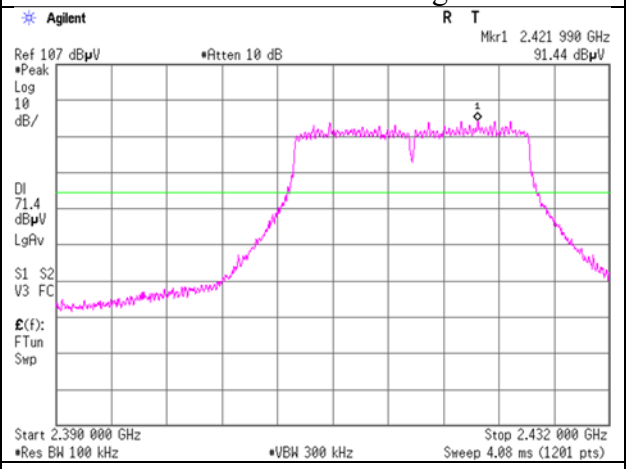
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2417.000	PK	93.08	28.28	14.19	41.60	1.80	95.75	-	-	Carrier
Hori.	2400.000	PK	46.39	28.31	14.16	41.60	1.80	49.06	75.75	26.6	-
Vert.	2417.000	PK	90.75	28.28	14.19	41.60	1.80	93.42	-	-	Carrier
Vert.	2400.000	PK	44.19	28.31	14.16	41.60	1.80	46.86	73.42	26.5	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.69 m / 3.0 m) = 1.80 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12979151S-A
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	October 30, 2019
Temperature / Humidity	25 deg. C / 51 % RH
Engineer	Hiromasa Sato
	(1 GHz – 2.8 GHz)
Mode	Tx 11n-20 2417 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

Report No.	12979151S-A	
Test place	Shonan EMC Lab.	
Semi Anechoic Chamber	3	3
Date	October 30, 2019	October 31, 2019
Temperature / Humidity	25 deg. C / 51 % RH	24 deg. C / 54 % RH
Engineer	Hiromasa Sato	Hiromasa Sato
	(1 GHz – 2.8 GHz)	(2.8 GHz – 26.5 GHz)
Mode	Tx 11n-20 2437 MHz	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2877.386	PK	58.77	28.86	6.19	41.77	1.80	53.85	73.9	20.0	142	41	-
Hori.	3332.335	PK	51.61	28.73	5.70	42.02	1.80	45.82	73.9	28.0	135	342	-
Hori.	4874.000	PK	48.77	31.70	6.49	42.89	1.80	45.87	73.9	28.0	150	0	-
Hori.	7311.000	PK	47.93	37.36	7.95	43.13	1.80	51.91	73.9	21.9	150	0	-
Hori.	9748.000	PK	48.37	39.31	9.21	43.02	1.80	55.67	73.9	18.2	150	0	-
Hori.	2877.386	AV	44.87	28.86	6.19	41.77	1.80	39.95	53.9	13.9	142	41	-
Hori.	3332.335	AV	42.74	28.73	5.70	42.02	1.80	36.95	53.9	16.9	135	342	-
Hori.	4874.000	AV	39.73	31.70	6.49	42.89	1.80	36.83	53.9	17.0	150	0	-
Hori.	7311.000	AV	39.34	37.36	7.95	43.13	1.80	43.32	53.9	10.5	150	0	-
Hori.	9748.000	AV	39.04	39.31	9.21	43.02	1.80	46.34	53.9	7.5	150	0	-
Vert.	2877.161	PK	64.41	28.86	6.19	41.77	1.80	59.49	73.9	14.4	103	10	-
Vert.	3328.974	PK	59.33	28.73	5.69	42.01	1.80	53.54	73.9	20.3	144	275	-
Vert.	3531.510	PK	55.89	29.28	5.73	42.12	1.80	50.58	73.9	23.3	103	357	-
Vert.	3904.816	PK	58.34	30.01	5.80	42.13	1.80	53.82	73.9	20.0	146	313	-
Vert.	4874.000	PK	48.43	31.70	6.49	42.89	1.80	45.53	73.9	28.3	150	0	-
Vert.	7311.000	PK	48.44	37.36	7.95	43.13	1.80	52.42	73.9	21.4	150	0	-
Vert.	9748.000	PK	48.53	39.31	9.21	43.02	1.80	55.83	73.9	18.0	150	0	-
Vert.	2877.161	AV	50.40	28.86	6.19	41.77	1.80	45.48	53.9	8.4	103	10	-
Vert.	3328.974	AV	49.23	28.73	5.69	42.01	1.80	43.44	53.9	10.4	144	275	-
Vert.	3531.510	AV	40.55	29.28	5.73	42.12	1.80	35.24	53.9	18.6	103	357	-
Vert.	3904.816	AV	42.87	30.01	5.80	42.13	1.80	38.35	53.9	15.5	146	313	-
Vert.	4874.000	AV	39.31	31.70	6.49	42.89	1.80	36.41	53.9	17.4	150	0	-
Vert.	7311.000	AV	39.67	37.36	7.95	43.13	1.80	43.65	53.9	10.2	150	0	-
Vert.	9748.000	AV	39.12	39.31	9.21	43.02	1.80	46.42	53.9	**7.4**	150	0	-

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.69 m / 3.0 m) = 1.80 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission

Report No.	12979151S-A	
Test place	Shonan EMC Lab.	
Semi Anechoic Chamber	3	3
Date	October 30, 2019	October 31, 2019
Temperature / Humidity	25 deg. C / 51 % RH	24 deg. C / 54 % RH
Engineer	Hiromasa Sato	Hiromasa Sato
	(1 GHz – 2.8 GHz)	(2.8 GHz – 26.5 GHz)
Mode	Tx 11n-20 2457 MHz	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	49.77	28.24	14.24	41.62	1.80	52.43	73.9	21.4	137	356	-
Hori.	2483.500	AV	40.58	28.24	14.24	41.62	1.80	43.24	53.9	**10.6**	137	356	-
Vert.	2483.500	PK	49.27	28.24	14.24	41.62	1.80	51.93	73.9	21.9	114	145	-
Vert.	2483.500	AV	40.58	28.24	14.24	41.62	1.80	43.24	53.9	**10.6**	114	145	-

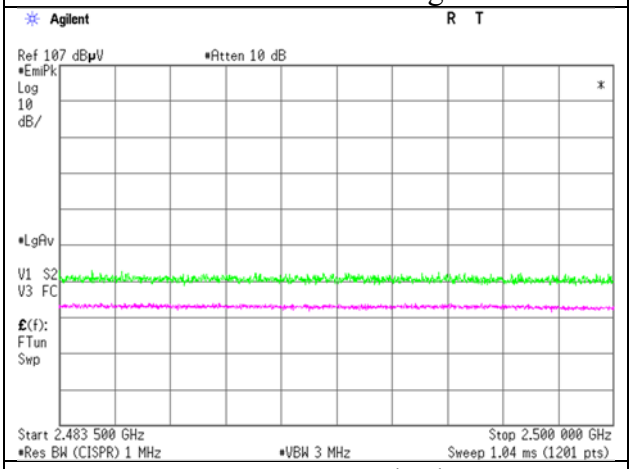
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.69 m / 3.0 m) = 1.80 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12979151S-A
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	October 30, 2019
Temperature / Humidity	25 deg. C / 51 % RH
Engineer	Hiromasa Sato
	(1 GHz – 2.8 GHz)
Mode	Tx 11n-20 2457 MHz

Horizontal

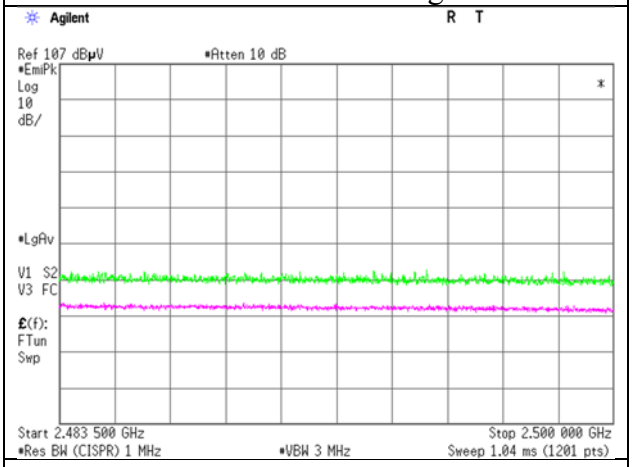
Restricted-band band-edge Plot



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

Report No.	12979151S-A	
Test place	Shonan EMC Lab.	
Semi Anechoic Chamber	3	3
Date	October 30, 2019	October 31, 2019
Temperature / Humidity	25 deg. C / 51 % RH	24 deg. C / 54 % RH
Engineer	Hiromasa Sato	Hiromasa Sato
	(1 GHz – 2.8 GHz)	(2.8 GHz – 26.5 GHz)
Mode	Tx 11n-20 2462 MHz	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	55.52	28.24	14.24	41.62	1.80	58.18	73.9	15.7	104	355	-
Hori.	2877.201	PK	58.73	28.86	6.19	41.77	1.80	53.81	73.9	20.0	135	64	-
Hori.	3327.570	PK	52.81	28.74	5.69	42.01	1.80	47.03	73.9	26.8	121	330	-
Hori.	4924.000	PK	47.93	31.82	6.52	42.90	1.80	45.17	73.9	28.7	150	0	-
Hori.	7386.000	PK	48.36	37.49	8.00	43.28	1.80	52.37	73.9	21.5	150	0	-
Hori.	9848.000	PK	48.27	39.33	9.24	42.92	1.80	55.72	73.9	18.1	150	0	-
Hori.	2483.500	AV	43.40	28.24	14.24	41.62	1.80	46.06	53.9	7.8	104	355	-
Hori.	2877.201	AV	44.99	28.86	6.19	41.77	1.80	40.07	53.9	13.8	135	64	-
Hori.	3327.570	AV	40.78	28.74	5.69	42.01	1.80	35.00	53.9	18.9	121	330	-
Hori.	4924.000	AV	39.24	31.82	6.52	42.90	1.80	36.48	53.9	17.4	150	0	-
Hori.	7386.000	AV	39.84	37.49	8.00	43.28	1.80	43.85	53.9	10.0	150	0	-
Hori.	9848.000	AV	39.60	39.33	9.24	42.92	1.80	47.05	53.9	**6.8**	150	0	-
Vert.	2483.500	PK	51.90	28.24	14.24	41.62	1.80	54.56	73.9	19.3	150	142	-
Vert.	2877.282	PK	65.42	28.86	6.19	41.77	1.80	60.50	73.9	13.4	111	23	-
Vert.	3331.083	PK	59.22	28.73	5.70	42.02	1.80	53.43	73.9	20.4	130	273	-
Vert.	3493.942	PK	55.73	29.11	5.73	42.12	1.80	50.25	73.9	23.6	107	357	-
Vert.	3907.241	PK	57.98	30.01	5.81	42.13	1.80	53.47	73.9	20.4	149	329	-
Vert.	4924.000	PK	48.52	31.82	6.52	42.90	1.80	45.76	73.9	28.1	150	0	-
Vert.	7386.000	PK	48.55	37.49	8.00	43.28	1.80	52.56	73.9	21.3	150	0	-
Vert.	9848.000	PK	48.71	39.33	9.24	42.92	1.80	56.16	73.9	17.7	150	0	-
Vert.	2483.500	AV	41.42	28.24	14.24	41.62	1.80	44.08	53.9	9.8	150	142	-
Vert.	2877.282	AV	50.04	28.86	6.19	41.77	1.80	45.12	53.9	8.7	111	23	-
Vert.	3331.083	AV	49.83	28.73	5.70	42.02	1.80	44.04	53.9	9.8	130	273	-
Vert.	3493.942	AV	40.55	29.11	5.73	42.12	1.80	35.07	53.9	18.8	107	357	-
Vert.	3907.241	AV	45.33	30.01	5.81	42.13	1.80	40.82	53.9	13.0	149	329	-
Vert.	4924.000	AV	39.47	31.82	6.52	42.90	1.80	36.71	53.9	17.1	150	0	-
Vert.	7386.000	AV	39.11	37.49	8.00	43.28	1.80	43.12	53.9	10.7	150	0	-
Vert.	9848.000	AV	39.23	39.33	9.24	42.92	1.80	46.68	53.9	7.2	150	0	-

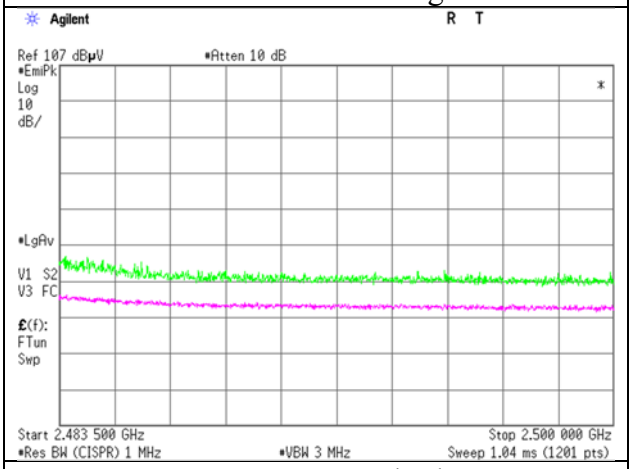
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.69 m / 3.0 m) = 1.80 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	12979151S-A
Test place	Shonan EMC Lab.
Semi Anechoic Chamber	3
Date	October 30, 2019
Temperature / Humidity	25 deg. C / 51 % RH
Engineer	Hiromasa Sato
	(1 GHz – 2.8 GHz)
Mode	Tx 11g 2462 MHz

Horizontal

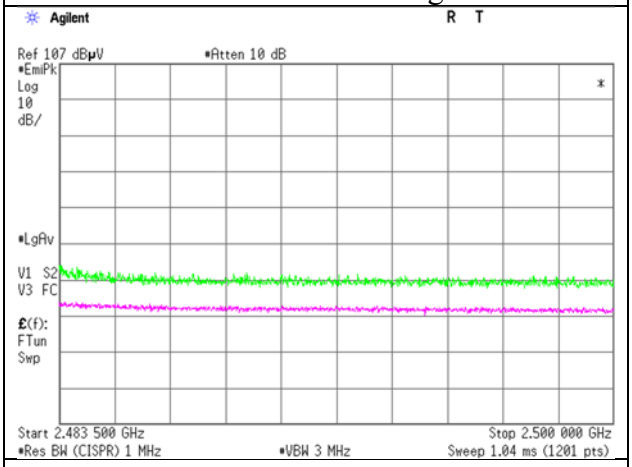
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot

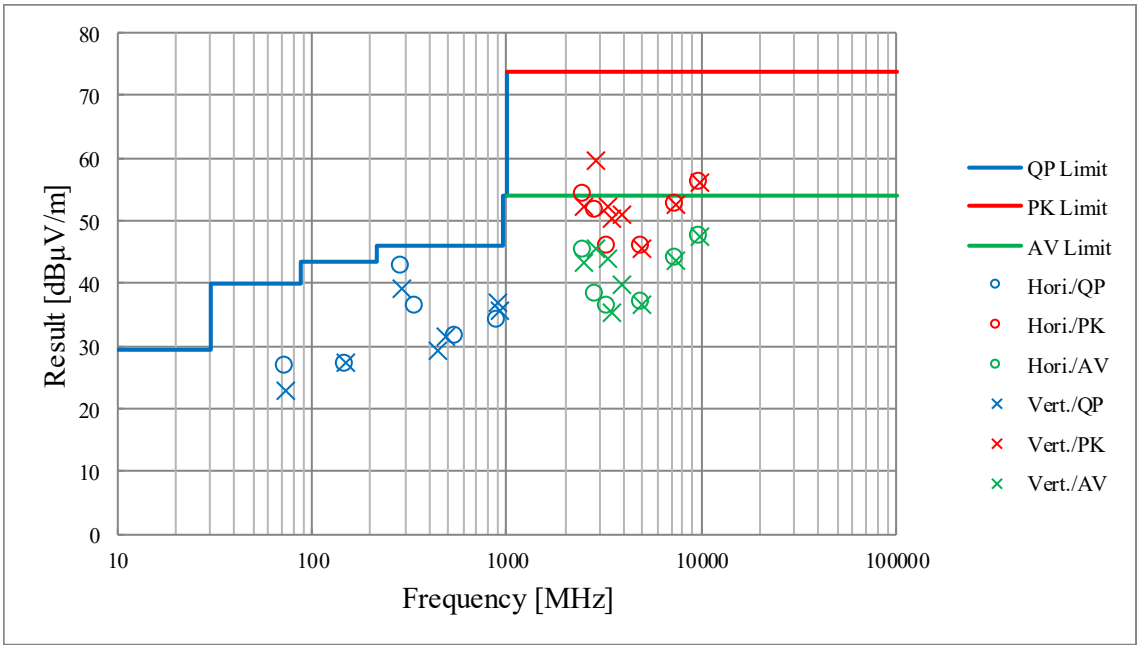


Trace Green : Peak Plot
Trace Purple : Average Plot

* 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
(Plot data, Worst case)

Report No.	12979151S-A		
Test place	Shonan EMC Lab.		
Semi Anechoic Chamber	3	3	3
Date	November 1, 2019	October 30, 2019	October 31, 2019
Temperature / Humidity	26 deg. C / 53 % RH	25 deg. C / 51 % RH	24 deg. C / 54 % RH
Engineer	Hiromasa Sato	Hiromasa Sato	Hiromasa Sato
	(30 MHz – 1000 MHz)	(1 GHz – 2.8 GHz)	(2.8 GHz – 26.5 GHz)
Mode	Tx 11g 2462 MHz		

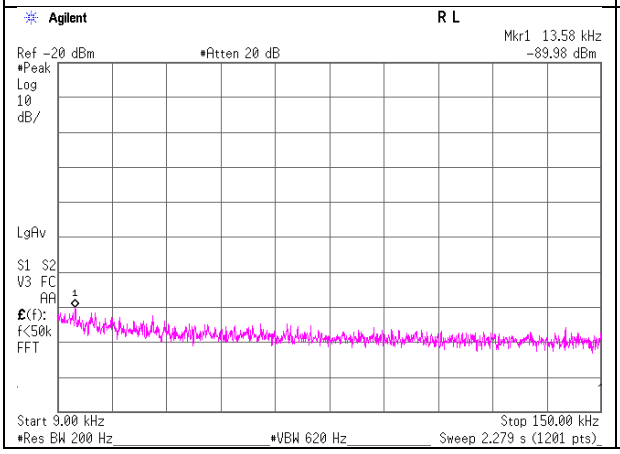


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

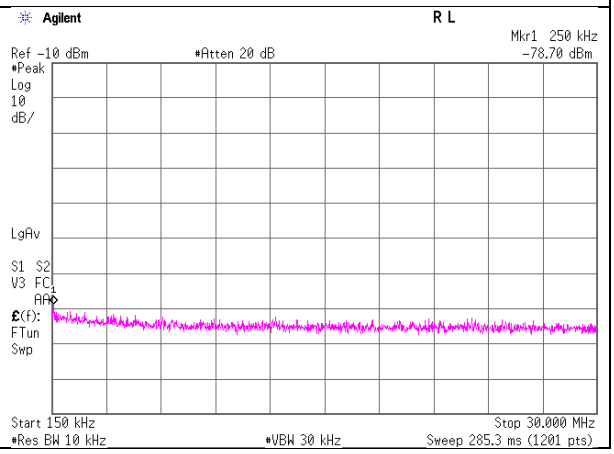
Conducted Spurious Emission

Report No.	12979151S-A
Test place	Shonan EMC Lab. No.6 Shielded Room
Date	October 28, 2019
Temperature / Humidity	24 deg. C / 43 % RH
Engineer	Makoto Hosaka
Mode	Tx 11g 2462 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
13.58	-89.98	0.02	9.80	2.15	1	-78.0	300	6.0	-16.8	44.9	61.7	-
250.00	-78.70	0.02	9.80	2.15	1	-66.7	300	6.0	-5.5	19.6	25.1	-

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

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

N: Number of output

Power Density

Report No.	12979151S-A	
Test place	Shonan EMC Lab.	
	No.6 Shielded Room	No.5 Shielded Room
Date	October 28, 2019	October 29, 2019
Temperature / Humidity	24 deg. C / 43 % RH	26 deg. C / 53 % RH
Engineer	Makoto Hosaka	
Mode	Tx	

11b

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412	-18.45	1.82	9.89	-6.74	8.00	14.74
2437	-18.49	1.83	9.89	-6.77	8.00	14.77
2462	-19.83	1.84	9.89	-8.10	8.00	16.10

11g

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412	-25.30	1.82	9.89	-13.59	8.00	21.59
2437	-25.33	1.83	9.89	-13.61	8.00	21.61
2462	-25.18	1.84	9.89	-13.45	8.00	21.45

11n-20

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412	-26.34	1.82	9.89	-14.63	8.00	22.63
2437	-25.56	1.83	9.89	-13.84	8.00	21.84
2462	-26.36	1.84	9.89	-14.63	8.00	22.63

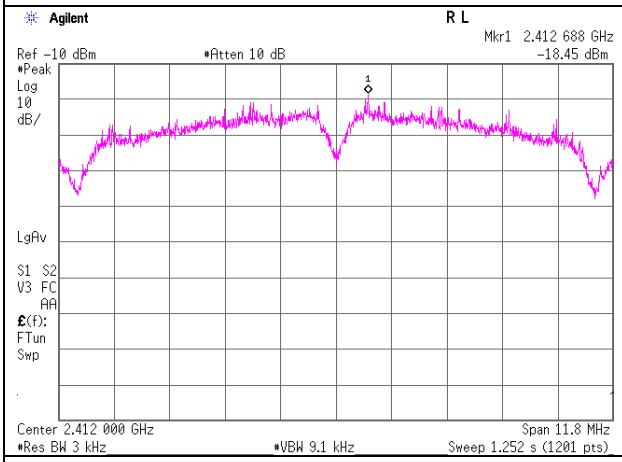
Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

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

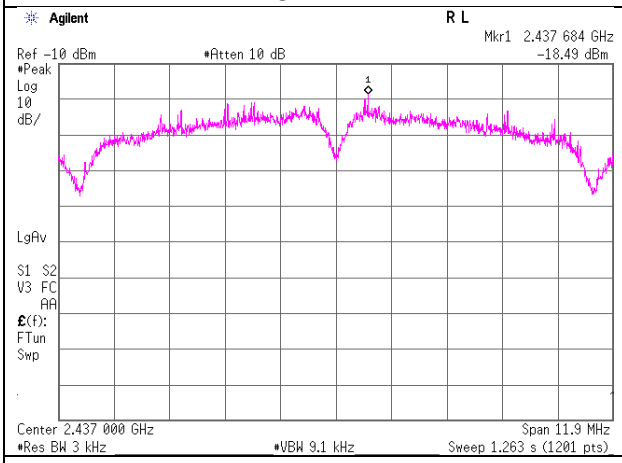
Power Density

11b

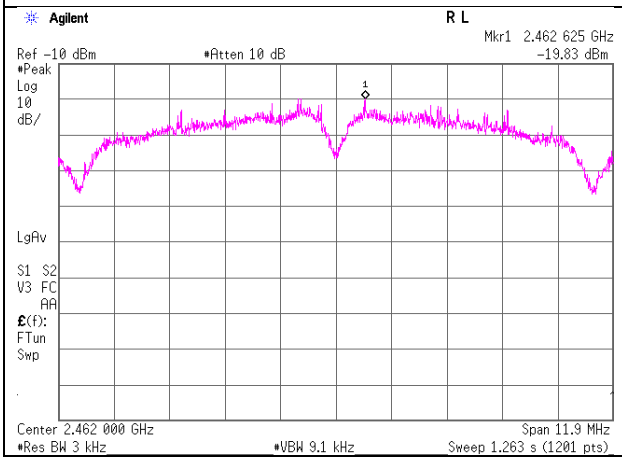
2412 MHz



2437 MHz

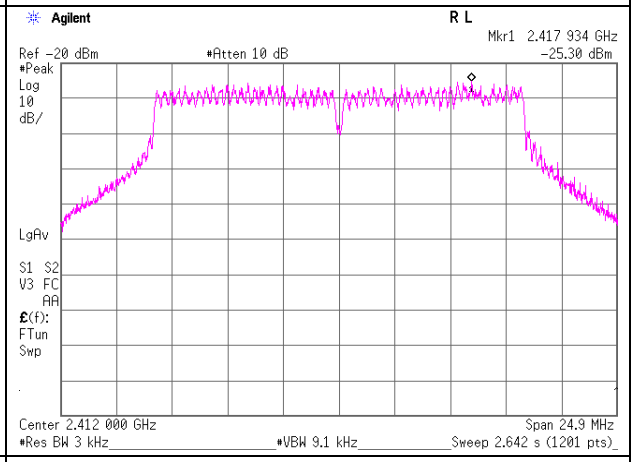


2462 MHz

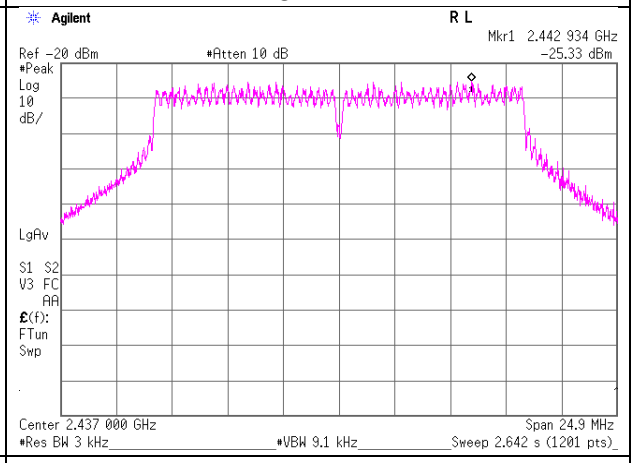


11g

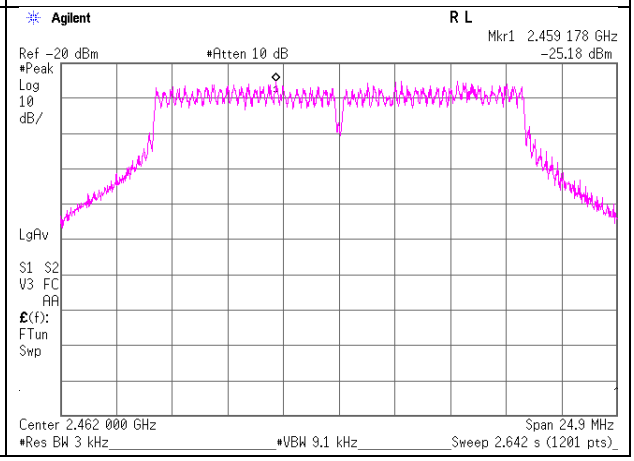
2412 MHz



2437 MHz



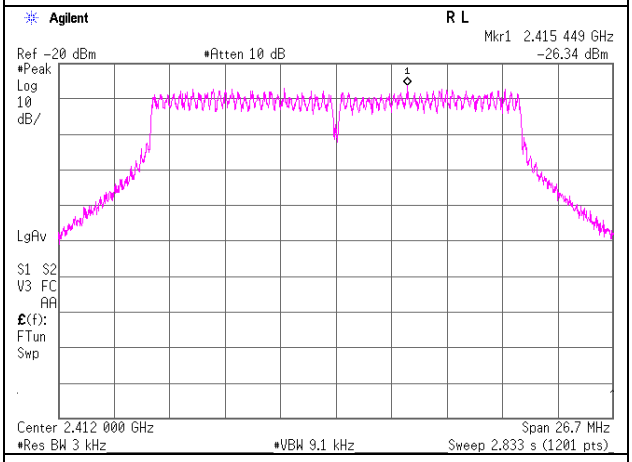
2462 MHz



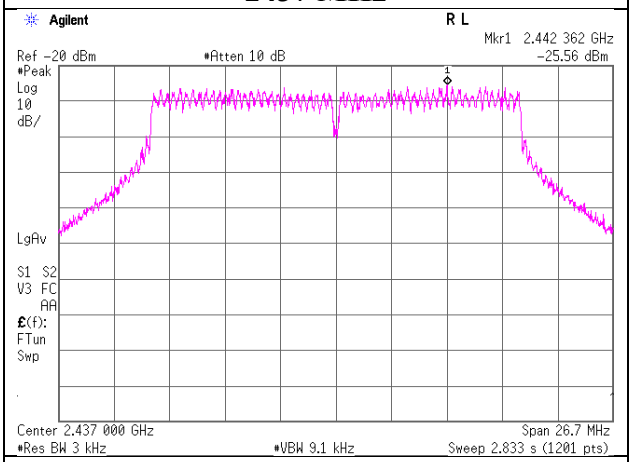
Power Density

11n-20

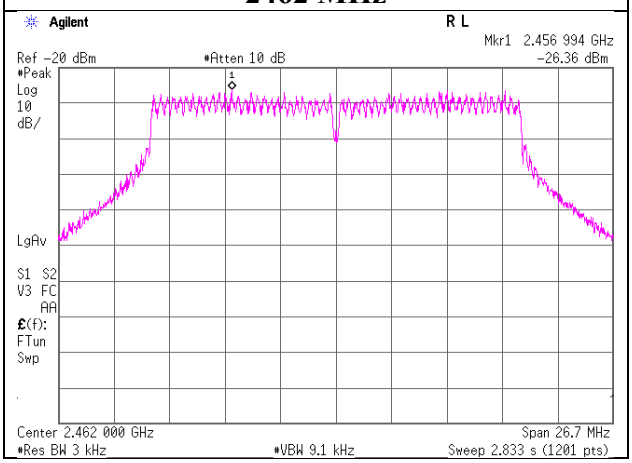
2412 MHz



2437 MHz



2462 MHz



APPENDIX 2: Test instruments

Test Instruments (1 / 2)

Local ID	Test Name	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Calibration Interval (Month)
KSA-08	AT	145089	Spectrum Analyzer	AGILENT	E4446A	MY46180525	2018/10/7	2019/10/31	12*1)
KTS-06	AT	145110	Digital Tester	SANWA	PC500	7019240	2019/4/2	2020/4/30	12
SAT10-16	AT	160494	Attenuator	Weinschel Corp.	54A-10	83406	2018/12/6	2019/12/30	12
SCC-G32	AT	145183	Coaxial Cable	Junkosha	MWX241-02000KMSKMS	OCT-09-13-005	2018/11/25	2019/11/30	12
SOS-09	AT	146318	Humidity Indicator	A&D	AD-5681	4061484	2018/12/5	2019/12/31	12
SOS-18	AT	175822	Humidity Indicator	CUSTOM	CTH-201	-	2018/12/5	2019/12/31	12
SPM-13	AT	169910	Power Meter	EMC Instruments Corporation	8990B	MY51000448	2019/3/6	2020/3/31	12
SPSS-06	AT	169911	Power sensor	EMC Instruments Corporation	N1923A	MY57270004	2019/3/6	2020/3/31	12
STS-05	AT	146212	Digital Hitester	HIOKI	3805-50	80997828	2019/10/1	2020/10/31	12
SSA-02	AT,RE	145800	Spectrum Analyzer	AGILENT	E4448A	MY48250106	2019/4/4	2020/4/30	12
COTS-SEMI-5	RE	170932	EMI Software	TSJ	TEPTO-DV3(RE,CE,ME,PE)	-	-	-	-
KJM-02	RE	146432	Measure	TAJIMA	GL19-55	-	-	-	-
SAEC-03(NSA)	RE	145565	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	2019/4/8	2020/4/30	12
SAEC-03(SVSWR)	RE	145566	Semi-Anechoic Chamber	TDK	SAEC-03(SVSWR)	3	2019/5/3	2020/5/31	12

Test Instruments (2 / 2)

Local ID	Test Name	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Calibration Interval (Month)
SAF-03	RE	145126	Pre Amplifier	SONOMA	310N	290213	2019/2/5	2020/2/29	12
SAF-06	RE	145005	Pre Amplifier	Toyo Corporation	TPA0118-36	1440491	2019/2/8	2020/2/29	12
SAF-08	RE	145007	Pre Amplifier	Toyo Corporation	HAP18-26W	19	2019/3/5	2020/3/31	12
SAT10-05	RE	145136	Attenuator(above1GHz)	AGILENT	8493C-010	74864	2018/11/25	2019/11/30	12
SAT6-13	RE	167094	Attenuator	JFW	50HF-006N	-	2019/2/5	2020/2/29	12
SBA-03	RE	145023	Biconical Antenna	Schwarzbeck	BBA9106	91032666	2019/5/7	2020/5/31	12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	RE	145171	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141P	-/0901-271(RF Selector)	2019/4/19	2020/4/30	12
SCC-G15	RE	145176	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	2019/3/27	2020/3/31	12
SCC-G40	RE	166491	Coaxial Cable	Junkosha	MWX221-01000NFSNMS/B	1612S005	2019/1/25	2020/1/31	12
SCC-G43	RE	156380	Coaxial Cable	HUBER+SUNER	SUCOFLEX_104_E	SN MY 13406/4E	2019/7/3	2020/7/31	12
SCC-G57	RE	179540	Coaxial Cable	Huber+Suhner	SUCOFLEX 102	802815/2	2019/5/16	2020/5/31	12
SCC-G58	RE	183047	Coaxial Cable	HUBER+SUNER	SUCOFLEX 104	800287/4A	2019/7/23	2020/7/31	12
SFL-18	RE	145305	Highpass Filter	MICRO-TRONICS	HPM50111	119	2019/4/16	2020/4/30	12
SHA-03	RE	145501	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	2019/6/26	2020/6/30	12
SHA-04	RE	145512	Horn Antenna	ETS LINDGREN	3160-09	94868	2019/6/26	2020/6/30	12
SLA-07	RE	145529	Logperiodic Antenna	Schwarzbeck	VUSLP9111B	196	2019/5/7	2020/5/31	12
SOS-05	RE	146293	Humidity Indicator	A&D	AD-5681	4062518	2019/10/8	2020/10/31	12
STR-08	RE	150463	Test Receiver	Rohde & Schwarz	ESW44	101581	2018/11/28	2019/11/30	12
STS-03	RE	146210	Digital Hitester	HIOKI	3805-50	80997823	2019/10/1	2020/10/31	12

***1) This test equipment was used for the tests before the expiration date of the calibration.**
***Hyphens for Last Calibration Date, Calibration Due Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.**

The expiration date of the calibration is the end of the expired month.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

Test item: **RE: Radiated Emission test**
AT: Antenna Terminal Conducted test