RADIO TEST REPORT

Test Report No. : 11259492S-A-R3

Applicant	:	**Canon Inc.**
Type of Equipment	:	**Wireless LAN Module**
Model No.	:	**K30374**
FCC ID	:	**AZDK30374**
Test regulation	:	**FCC Part 15 Subpart C: 2016**
Test Result	:	**Complied**

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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 above regulation.
4. The test results in this report are traceable to the national or international standards.
5. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
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. This report is a revised version of 11259492S-A-R2. 11259492S-A-R2 is replaced with this report.

Date of test: August 1 to 24, 2016

Representative test engineer:
S. Takano
Shinichi Takano
Engineer
Consumer Technology Division

Approved by:
A. Hayashi
Akio Hayashi
Leader
Consumer Technology Division

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

RTL02610

UL Japan, Inc.
Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
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REVISION HISTORY

Original Test Report No.: 11259492S-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	11259492S-A	October 19, 2016	-	-
1	11259492S-A-R1	November 4, 2016	6	Correction of Section 3.2
2	11259492S-A-R2	November 8, 2016	10	Update of Section 4.2
3	11259492S-A-R3	November 10, 2016	14	Update of KDB version

CONTENTS **PAGE**

SECTION 1: Customer information

Company Name	:	Canon Inc.
Address	:	3-451 Tsukakoshi, Saiwai-ku, Kawasaki, kanagawa 212-8530 Japan
Telephone Number	:	+81-3-3758-2111
Contact Person	:	Haruyuki Yanagi

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment	:	Wireless LAN Module
Model No.	:	K30374
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 3.3 V
Receipt Date of Sample	:	July 30, 2016
Country of Mass-production	:	Thailand
Condition of EUT	:	Engineering 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: K30374 (referred to as the EUT in this report) is a Wireless LAN Module.

Radio Specification

Radio Type	:	Transceiver
Frequency of Operation	:	2412-2462 MHz (IEEE 802.11b, 11g, 11n-20) 2422-2452 MHz (IEEE 802.11n-40)
Modulation	:	DSSS, OFDM
Power Supply (radio part input)	:	DC 3.3 V
Antenna type	:	Inverted-L antenna
Antenna Gain	:	-1.69 dBi
Clock frequency (Maximum)	:	40 MHz

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part 15 Subpart C FCC part 15 final revised on April 6, 2016.
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators Section 15.207 Conducted limits Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	**FCC:** ANSI C63.10-2013 6. Standard test methods **IC:** RSS-Gen 8.8	**FCC:** Section 15.207 **IC:** RSS-Gen 8.8	**QP** 29.8 dB, 0.22938 MHz, N 0.36038 MHz, L1 **AV** 25.2 dB, 19.66582 MHz, N	Complied	-
6dB Bandwidth	**FCC:** KDB 558074 D01 DTS Meas Guidance v03r05 **IC:** -	**FCC:** Section 15.247(a)(2) **IC:** RSS-247 5.2(1)	See data.	Complied	Conducted
Maximum Peak Output Power	**FCC:** KDB 558074 D01 DTS Meas Guidance v03r05 **IC:** RSS-Gen 6.12	**FCC:** Section 15.247(b)(3) **IC:** RSS-247 5.4(4)		Complied	Conducted
Power Density	**FCC:** KDB 558074 D01 DTS Meas Guidance v03r05 **IC:** -	**FCC:** Section 15.247(e) **IC:** RSS-247 5.2(2)		Complied	Conducted
Spurious Emission Restricted Band Edges	**FCC:** KDB 558074 D01 DTS Meas Guidance v03r05 **IC:** RSS-Gen 6.13	**FCC:** Section15.247(d) **IC:** RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10	3.3 dB 2483.500 MHz, AV, Vert. Tx 11n-20 2462 MHz	Complied	Conducted (below 30 MHz)/ Radiated (above 30 MHz) *1)

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 DTS Meas Guidance v03r05 12.2.7.

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

FCC Part 15.31 (e)

The host device provides stable voltage (DC 3.3 V) constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203/212 Antenna requirement

The antenna is not removable from the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	**IC:** RSS-Gen 6.6	**IC:** -	N/A	-	Conducted

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

3.4 Uncertainty

EMI

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 SAC / SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.1 dB	2.1 dB	2.6 dB	2.2 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	2.7 dB	2.7 dB	3.1 dB	-
	30 MHz-300 MHz	4.4 dB	4.4 dB	4.6 dB	-
	300 MHz-1 GHz	5.6 dB	5.5 dB	5.3 dB	-
	1 GHz-13 GHz	5.2 dB	5.2 dB	5.2 dB	-
Radiated emission (Measurement distance: 1 m)	13 GHz-18 GHz	4.9 dB	4.9 dB	4.9 dB	-
	18 GHz-40 GHz	4.9 dB	4.9 dB	4.9 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	0.76 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	0.79 dB
Bandwidth Measurement	0.66 %
Duty cycle and Time Measurement	0.012 %

Conducted Emission test

The data listed in this test report has enough margin, more than the site margin.

Radiated emission test

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

3.5 Test Location

UL Japan, Inc. Shonan EMC Lab.
1-22-3, Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 JAPAN
Telephone: +81 463 50 6400, Facsimile: +81 463 50 6401
JAB Accreditation No. RTL02610

Test site	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
No.1 Semi-anechoic chamber	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
No.2 Semi-anechoic chamber	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
No.3 Semi-anechoic chamber	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5m
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.

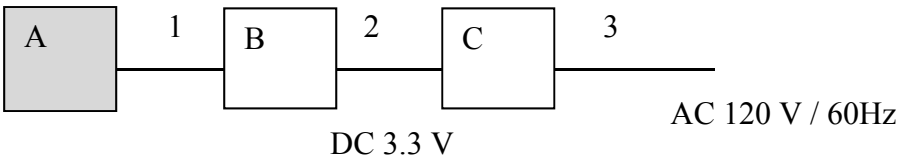
Mode	Remarks*
IEEE 802.11b (11b)	1 Mbps, PN9
IEEE 802.11g (11g)	24 Mbps, PN9
IEEE 802.11n 20 MHz BW (11n-20)	MCS 4, PN9
IEEE 802.11n 40 MHz BW (11n-40)	MCS 4, PN9
*Transmitting duty was 100 % on all tests. *The worst condition was determined based on the test result of Maximum Peak Output Power (Low Channel)	
*Power of the EUT was set by the software as follows; Power settings: 11b : 12 dBm, 11g/11n-20 : 10 dBm, 11n-40 : 7 dBm Software: DutApiBRIDGEETH8782.exe, Ver.1.0.7.32 *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.	

*The details of Operating mode(s)

Test Item	Operating Mode	Tested frequency
Conducted Emission Spurious Emission (below 1 GHz)	Tx, 11g	2412 MHz
Spurious Emission (above 1 GHz)	Tx, 11b Tx, 11 g	2412 MHz 2437 MHz 2462 MHz
	Tx, 11 n-20 *1)	2412 MHz 2462 MHz
	Tx, 11n-40	2422 MHz 2437 MHz 2452 MHz
6 dB Bandwidth Maximum Peak Output Power Power Density 99 % Occupied Bandwidth	Tx, 11b, Tx, 11g, Tx, 11n-20	2412 MHz 2437 MHz 2462 MHz
	Tx, 11n-40	2422 MHz 2437 MHz 2452 MHz

*1) These were carried out only in Band edge.

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

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless LAN Module	K30374	A135 *1), A138 *2)	Canon	EUT
B	WLAN JOINT PCB	-	-	Canon	-
C	DC Power supply	PAN35-10A	DE001677	Kikusui	Conducted Emission only

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

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Flat	0.1	Unshielded	Unshielded	-
2	DC	2.0	Unshielded	Unshielded	-
3	AC	1.8	Unshielded	Unshielded	-

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane.
The rear of tabletop was located 40 cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80 cm 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.

Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN / (AMN) to the input power source.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Shielded Room.
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**

SECTION 6: Radiated Spurious Emission

Test Procedure

It was measured based on "11.0 Emissions in non-restricted frequency bands" of "558074 D01 DTS Meas Guidance v03r05".

[For below 1 GHz]
EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

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

The height of the measuring antenna varied between 1 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.
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	Below 30 MHz	30 MHz to 300 MHz	300 MHz to 1 GHz	Above 1 GHz
Antenna Type	Loop	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(IC) and outside the restricted band of FCC15.205 / Table 6 of RSS-Gen 8.10 (IC).

Frequency	Below 1 GHz	Above 1 GHz		20 dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV *3)	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	Average Power Method: RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (RMS) Trace: 100 traces If duty cycle was less than 98 %, a duty factor was added to the results.	RBW: 100 kHz VBW: 300 kHz
Test Distance	3 m	3.99 m *1) (1 GHz – 13 GHz), 1 m *2) (13 GHz – 26.5 GHz)		3.99 m *1) (1 GHz – 13 GHz), 1 m *2) (13 GHz – 26.5 GHz)

*1) Distance Factor: 20 x log (3.99 m / 3.0 m) = 2.48 dB
*2) Distance Factor: 20 x log (1.0 m / 3.0 m) = -9.54 dB
*3) Average Power Measurement was performed based on 6. 0 & 12.2.5 of "KDB 558074 D01 DTS Meas Guidance v03r05"

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

Worst case:

Antenna polarization	Carrier (Band edge)	Spurious			
		Below 1 GHz	Above 1 GHz		
			1 GHz- 2.8 GHz	2.8 GHz -13 GHz	13 GHz - 26.5 GHz
Horizontal	Y	X	Y	Y	X
Vertical	Z	X	Z	Y	X

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

Measurement range : 9 kHz - 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	50 MHz or 100MHz	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	Sample	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	9.1 kHz	Auto	Peak	Max Hold	Spectrum Analyzer *3)

*1) Peak hold was applied as Worst-case measurement.
*2) Reference data
*3) Section 10.2 Method PKPSD (peak PSD) of "KDB 558074 D01 DTS Meas Guidance v03r05".

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

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Test data

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

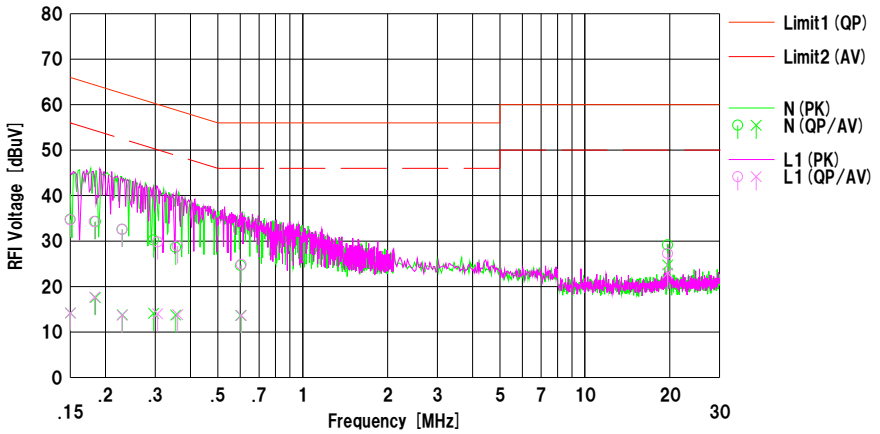
UL Japan,Inc. Shonan EMC Lab. No.2 Shielded Room
Date : 2016/08/24

Mode : 11g Tx 2412MHz

Power : AC 120V / 60Hz (DC 3.3 V)
Temp./Humi. : 24 deg.C / 56 %RH

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Hikaru Shirasawa



No.	Freq.	Reading <QP>	Reading <AV>	C.Fac	Results <QP>	Results <AV>	Limit <QP>	Limit <AV>	Margin <QP>	Margin <AV>	Phase	Comment
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15000	22.20	1.60	12.58	34.78	14.18	66.00	56.00	31.2	41.8	N	
2	0.18423	21.70	5.00	12.58	34.28	17.58	64.29	54.29	30.0	36.7	N	
3	0.22938	20.00	1.20	12.58	32.58	13.78	62.47	52.47	29.8	38.6	N	
4	0.29610	17.60	1.50	12.61	30.21	14.11	60.35	50.35	30.1	36.2	N	
5	0.35455	16.00	1.10	12.62	28.62	13.72	58.86	48.86	30.2	35.1	N	
6	0.60263	12.00	1.00	12.64	24.64	13.64	56.00	46.00	31.3	32.3	N	
7	19.66582	15.50	11.10	13.65	29.15	24.75	60.00	50.00	30.8	25.2	N	
8	0.15000	22.10	1.60	12.58	34.68	14.18	66.00	56.00	31.3	41.8	L1	
9	0.18288	21.70	5.10	12.58	34.28	17.68	64.35	54.35	30.0	36.6	L1	
10	0.22888	20.00	1.10	12.58	32.58	13.68	62.49	52.49	29.9	38.8	L1	
11	0.30586	17.20	1.40	12.61	29.81	14.01	60.08	50.08	30.2	36.0	L1	
12	0.36038	16.30	1.20	12.62	28.92	13.82	58.72	48.72	29.8	34.9	L1	
13	0.60637	12.20	1.00	12.64	24.84	13.64	56.00	46.00	31.1	32.3	L1	
14	19.66570	13.60	9.30	13.65	27.25	22.95	60.00	50.00	32.7	27.0	L1	

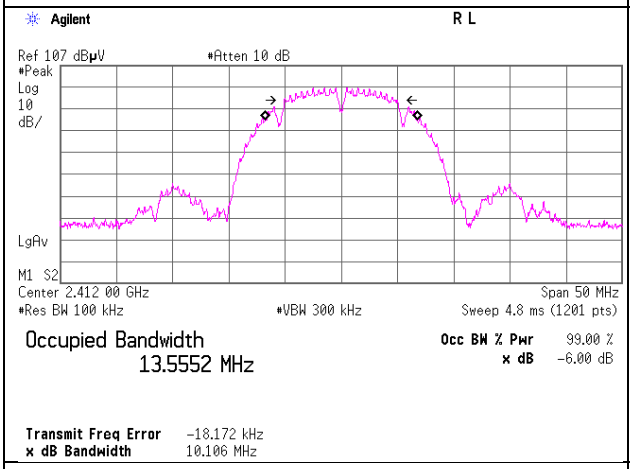
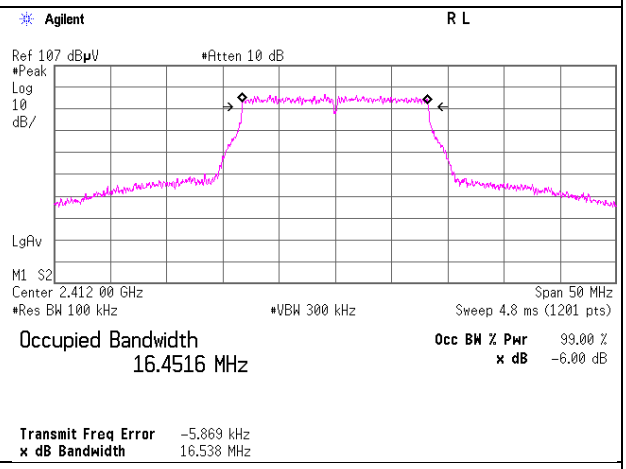
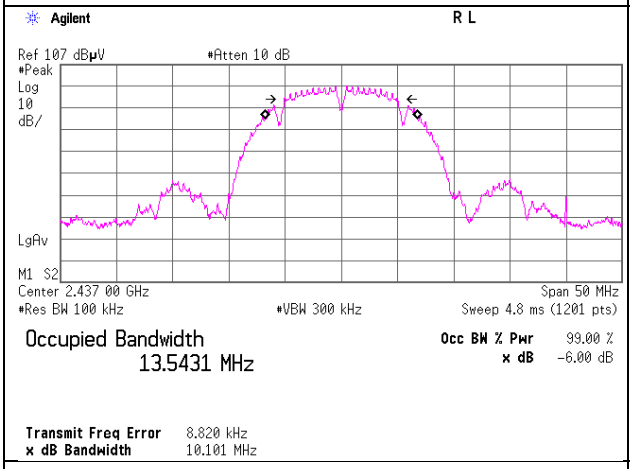
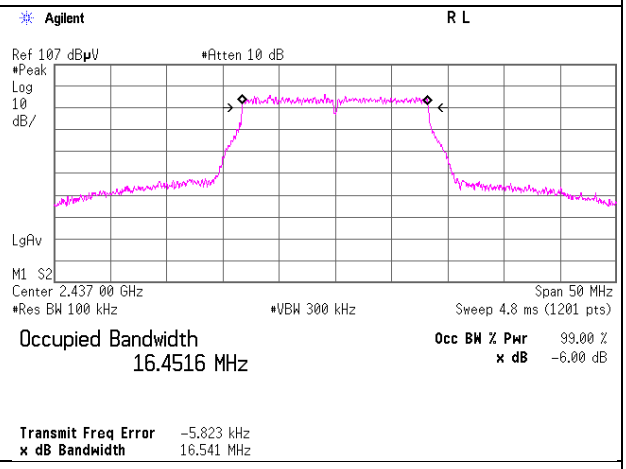
Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
LISN: SLS-03

6dB Bandwidth

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11259492S-A-R3
Date	August 4, 2016
Temperature / Humidity	25 deg. C / 38 % RH
Engineer	Kazutaka Takeyma
Mode	Tx

Mode	Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
11b	2412	10.106	> 500
	2437	10.101	> 500
	2462	10.113	> 500
11g	2412	16.538	> 500
	2437	16.541	> 500
	2462	16.565	> 500
11n-20	2412	17.854	> 500
	2437	17.850	> 500
	2462	17.849	> 500
11n-40	2422	36.604	> 500
	2437	36.609	> 500
	2452	36.618	> 500

6dB Bandwidth

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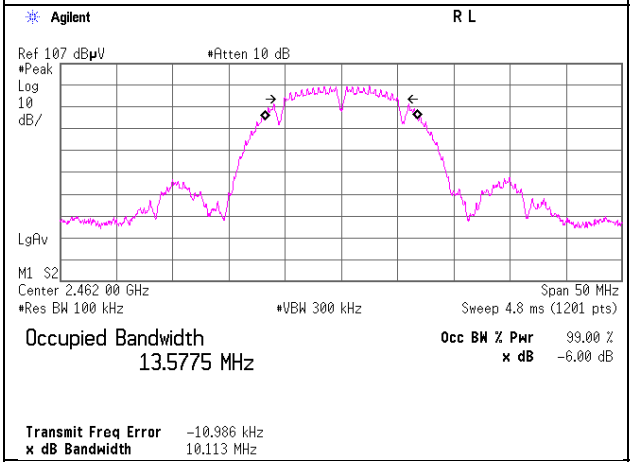
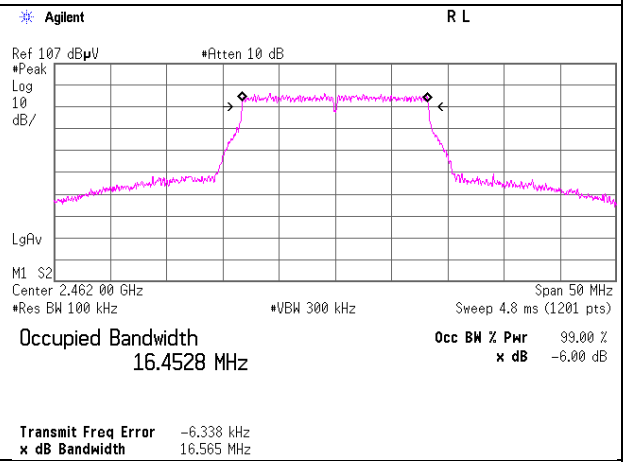
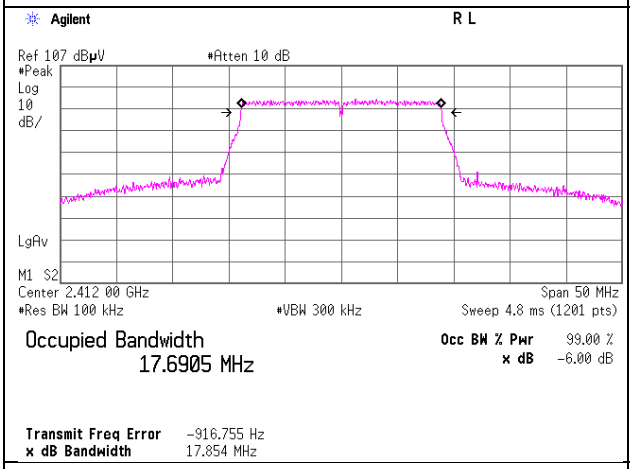
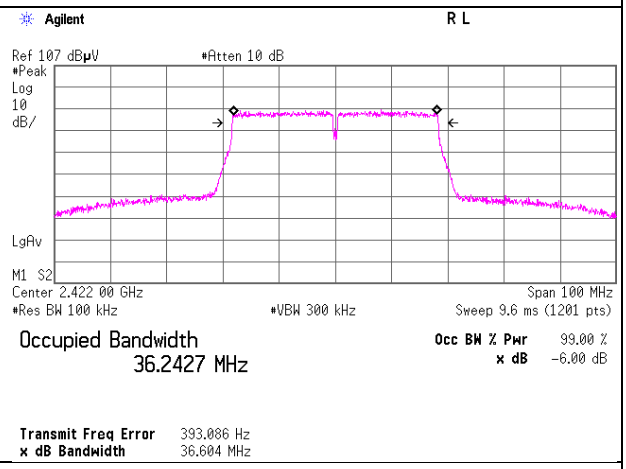
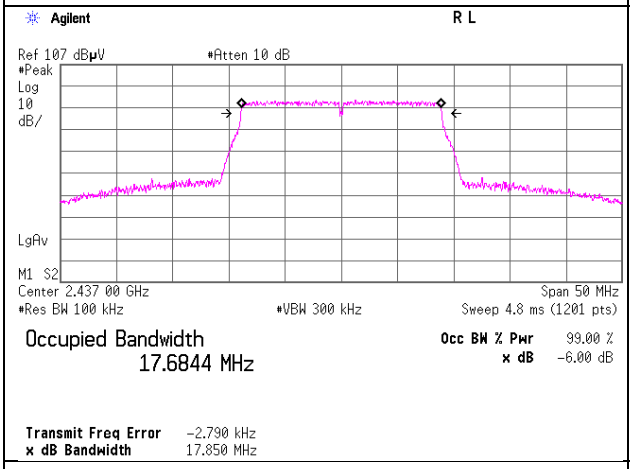
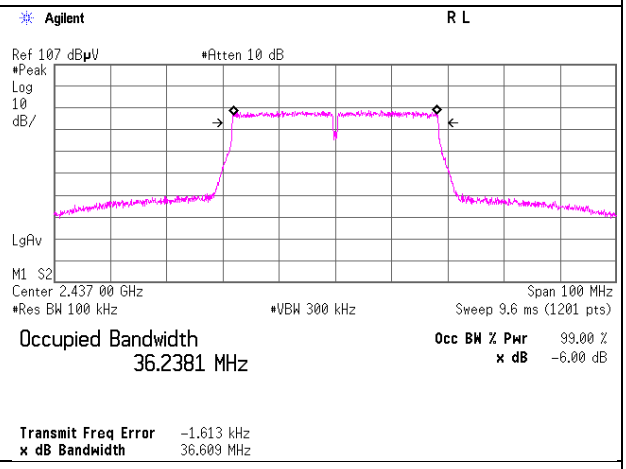
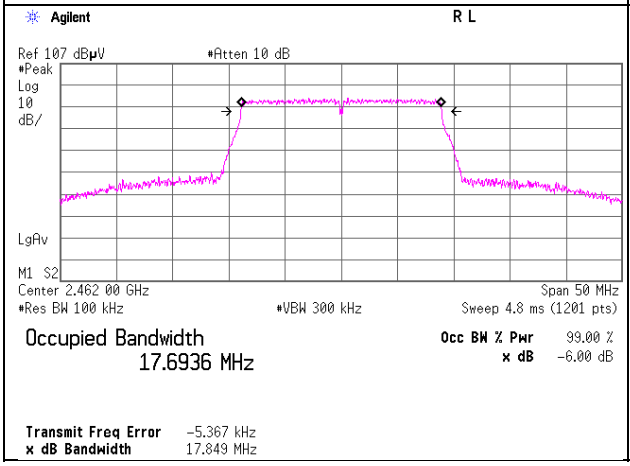
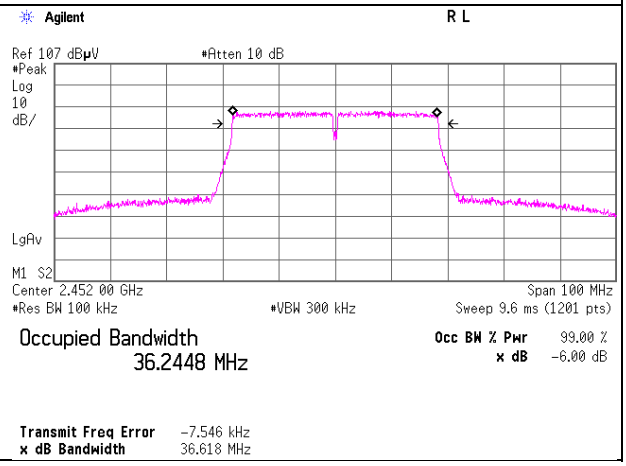
	

6dB Bandwidth

11n-20	11n-40
2412 MHz	**2422 MHz**
	
2437 MHz	**2437 MHz**
	
2462 MHz	**2452 MHz**
	

Maximum Peak Output Power

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11259492S-A-R3
Date	August 1, 2016
Temperature / Humidity	25 deg. C / 54 % RH
Engineer	Shinichi Takano
Mode	Tx 11b

Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	2.23	2.47	9.92	14.62	28.97	30.00	1000	15.38
2437	2.20	2.47	9.92	14.59	28.77	30.00	1000	15.41
2462	2.13	2.48	9.92	14.53	28.38	30.00	1000	15.47

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.

2412 MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
1	2.23	*
2	2.18	
5.5	2.09	
11	2.20	

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

Maximum Peak Output Power

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11259492S-A-R3
Date	August 1, 2016
Temperature / Humidity	25 deg. C / 54 % RH
Engineer	Shinichi Takano
Mode	Tx 11g

Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	8.85	2.47	9.92	21.24	133.05	30.00	1000	8.76
2437	8.33	2.47	9.92	20.72	118.03	30.00	1000	9.28
2462	8.76	2.48	9.92	21.16	130.62	30.00	1000	8.84

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.

2412 MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
6	7.62	
9	7.80	
12	8.27	
18	8.52	
24	8.85	*
36	8.46	
48	7.94	
54	8.79	

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

Maximum Peak Output Power

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11259492S-A-R3
Date	August 1, 2016
Temperature / Humidity	25 deg. C / 54 % RH
Engineer	Shinichi Takano
Mode	Tx 11n-20

Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	8.32	2.47	9.92	20.71	117.76	30.00	1000	9.29
2437	7.65	2.47	9.92	20.04	100.93	30.00	1000	9.96
2462	8.24	2.48	9.92	20.64	115.88	30.00	1000	9.36

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.

2412 MHz

MCS Number [Mbps]	Reading [dBm]	Remark
0	8.05	
1	8.07	
2	8.16	
3	8.26	
4	8.32	*
5	8.12	
6	8.11	
7	8.02	

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

Maximum Peak Output Power

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11259492S-A-R3
Date	August 1, 2016
Temperature / Humidity	25 deg. C / 54 % RH
Engineer	Shinichi Takano
Mode	Tx 11n-40

Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2422	5.45	2.47	9.92	17.84	60.81	30.00	1000	12.16
2437	5.17	2.47	9.92	17.56	57.02	30.00	1000	12.44
2452	4.42	2.48	9.92	16.82	48.08	30.00	1000	13.18

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.

2422 MHz

MCS Number [Mbps]	Reading [dBm]	Remark
0	5.32	
1	5.31	
2	4.93	
3	4.90	
4	5.45	*
5	4.83	
6	5.05	
7	4.77	

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

Average Output Power
(Reference data for RF Exposure)

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11259492S-A-R3
Date	August 1, 2016
Temperature / Humidity	25 deg. C / 54 % RH
Engineer	Shinichi Takano
Mode	Tx

11b **1 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	-0.30	2.47	9.92	12.09	16.18	0.00	12.09	16.18
2437	-0.31	2.47	9.92	12.08	16.14	0.00	12.08	16.14
2462	-0.37	2.48	9.92	12.03	15.96	0.00	12.03	15.96

11g **24 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	-1.28	2.47	9.92	11.11	12.91	0.00	11.11	12.91
2437	-2.10	2.47	9.92	10.29	10.69	0.00	10.29	10.69
2462	-1.53	2.48	9.92	10.87	12.22	0.00	10.87	12.22

11n-20 **MCS 4**

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	-1.26	2.47	9.92	11.13	12.97	0.00	11.13	12.97
2437	-1.95	2.47	9.92	10.44	11.07	0.00	10.44	11.07
2462	-1.43	2.48	9.92	10.97	12.50	0.00	10.97	12.50

11n-40 **MCS 4**

Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2422	-4.92	2.47	9.92	7.47	5.58	0.00	7.47	5.58
2437	-5.37	2.47	9.92	7.02	5.04	0.00	7.02	5.04
2452	-5.87	2.48	9.92	6.53	4.50	0.00	6.53	4.50

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

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

Average Output Power
(Reference data for RF Exposure)

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11259492S-A-R3
Date	August 1, 2016
Temperature / Humidity	25 deg. C / 54 % RH
Engineer	Shinichi Takano
Mode	Tx

2412 MHz

Mode	Rate Mbps	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11b	1	-0.30	0.00	-0.30	*
	2	-0.32	0.00	-0.32	
	5.5	-0.32	0.00	-0.32	
	11	-0.34	0.00	-0.34	

* Worst rate

2412 MHz

Mode	Rate Mbps	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11g	6	-1.35	0.00	-1.35	
	9	-1.34	0.00	-1.34	
	12	-1.40	0.00	-1.40	
	18	-1.30	0.00	-1.30	
	24	-1.28	0.00	-1.28	*
	36	-1.34	0.00	-1.34	
	48	-1.33	0.00	-1.33	
	54	-1.34	0.00	-1.34	

* Worst rate

2412 MHz

Mode	Rate Mbps	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11n-20	0	-1.34	0.00	-1.34	
	1	-1.29	0.00	-1.29	
	2	-1.28	0.00	-1.28	
	3	-1.33	0.00	-1.33	
	4	-1.26	0.00	-1.26	*
	5	-1.29	0.00	-1.29	
	6	-1.33	0.00	-1.33	
	7	-1.34	0.00	-1.34	

* Worst rate

2422 MHz

Mode	Rate Mbps	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11n-40	0	-5.10	0.00	-5.10	
	1	-5.12	0.00	-5.12	
	2	-4.97	0.00	-4.97	
	3	-4.95	0.00	-4.95	
	4	-4.92	0.00	-4.92	*
	5	-5.03	0.00	-5.03	
	6	-5.05	0.00	-5.05	
	7	-5.12	0.00	-5.12	

* Worst rate

Sample Calculation:

Burst power = Reading (timed average) + Duty factor

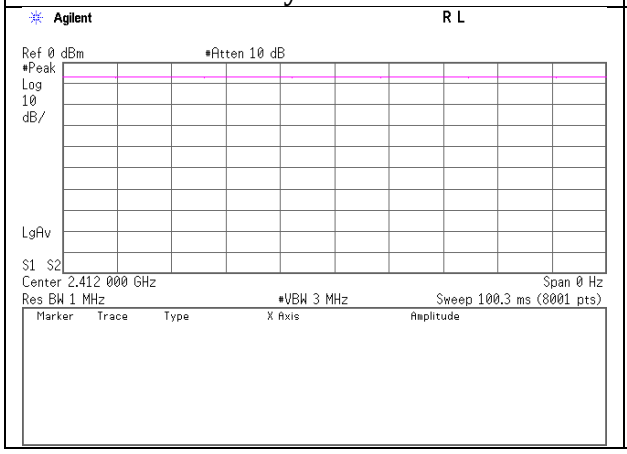
All comparison were carried out on same frequency and measurement factors.

Burst rate confirmation

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11259492S-A-R3
Date	August 1, 2016
Temperature / Humidity	25 deg. C / 54 % RH
Engineer	Shinichi Takano
Mode	Tx

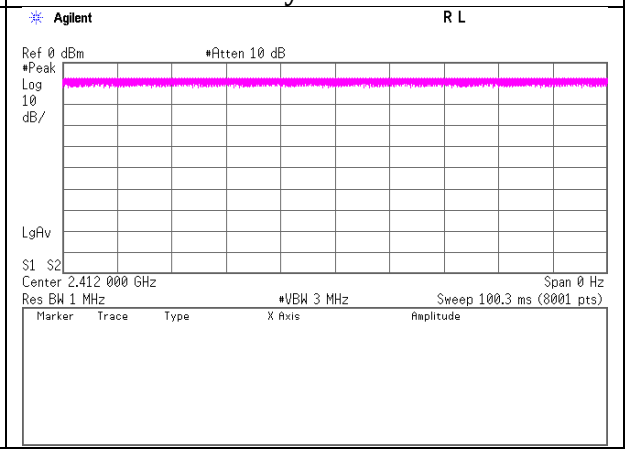
11b 1 Mbps

Duty 100 %



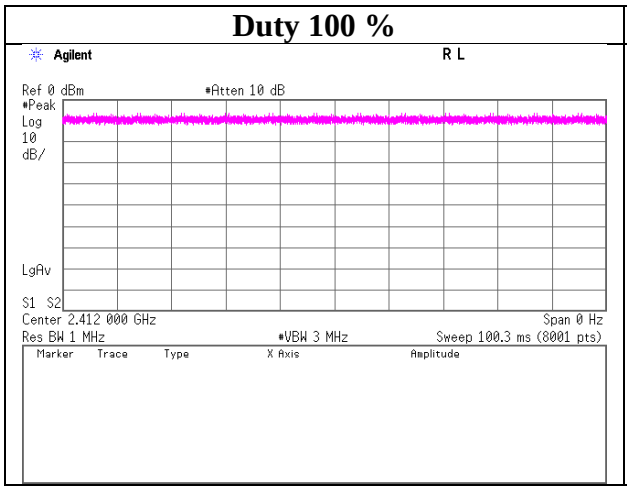
11g 24 Mbps

Duty 100 %



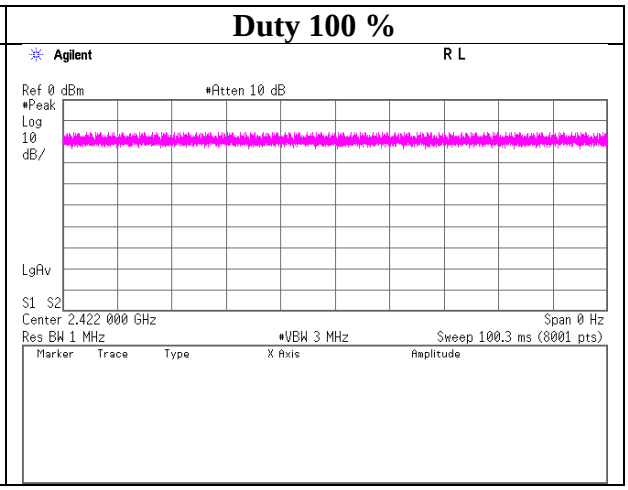
11n-20 MCS 4

Duty 100 %



11n-40 MCS 4

Duty 100 %



Radiated Spurious Emission

Report No.	11259492S-A-R3			
Test place(AC No.)	3	3	2	3
Date	August 4, 2016	August 13, 2016	August 18, 2016	August 20, 2016
Temperature / Humidity	23 deg. C / 60 % RH	25 deg. C / 52 % RH	25 deg. C / 55 % RH	23 deg. C / 54 % RH
Engineer	Shinichi Takano	Shinichi Takano	Yosuke Ishikawa	Hikaru Shirasawa
Test frequency band	1 GHz – 2.8 GHz	2.8 GHz – 13 GHz	13 GHz – 18 GHz	18 GHz – 26 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	44.85	27.75	13.82	37.06	2.48	51.84	73.90	22.0	203	253	
Hori.	4824.000	PK	50.50	31.48	6.01	41.50	2.48	48.97	73.90	24.9	128	109	
Hori.	7236.000	PK	46.78	36.90	7.56	41.16	2.48	52.56	73.90	21.3	150	0	
Hori.	9648.000	PK	46.21	38.45	8.43	40.47	2.48	55.10	73.90	18.8	150	0	
Hori.	2390.000	AV	35.36	27.75	13.82	37.06	2.48	42.35	53.90	11.5	203	253	
Hori.	4824.000	AV	42.91	31.48	6.01	41.50	2.48	41.38	53.90	12.5	128	109	
Hori.	7236.000	AV	37.10	36.90	7.56	41.16	2.48	42.88	53.90	11.0	150	0	
Hori.	9648.000	AV	36.13	38.45	8.43	40.47	2.48	45.02	53.90	**8.8**	150	0	
Vert.	2390.000	PK	44.90	27.75	13.82	37.06	2.48	51.89	73.90	22.0	170	91	
Vert.	4824.000	PK	50.53	31.48	6.01	41.50	2.48	49.00	73.90	24.9	100	105	
Vert.	7236.000	PK	47.12	36.90	7.56	41.16	2.48	52.90	73.90	21.0	150	0	
Vert.	9648.000	PK	46.05	38.45	8.43	40.47	2.48	54.94	73.90	18.9	150	0	
Vert.	2390.000	AV	35.73	27.75	13.82	37.06	2.48	42.72	53.90	11.1	170	91	
Vert.	4824.000	AV	42.48	31.48	6.01	41.50	2.48	40.95	53.90	12.9	100	105	
Vert.	7236.000	AV	37.00	36.90	7.56	41.16	2.48	42.78	53.90	11.1	150	0	
Vert.	9648.000	AV	36.02	38.45	8.43	40.47	2.48	44.91	53.90	8.9	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 (3.99 m / 3.0 m) = 2.48 dB

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

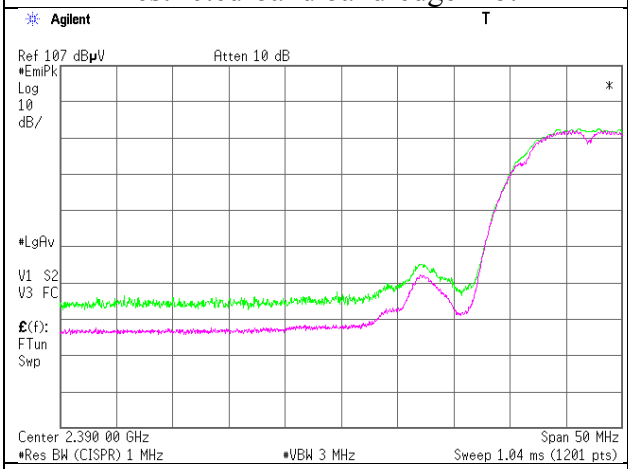
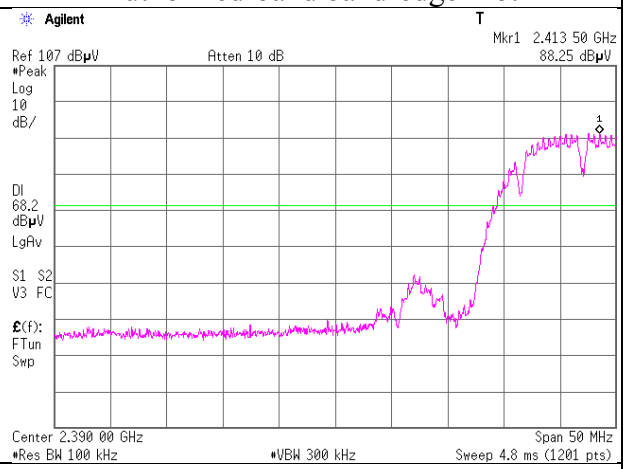
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	88.25	27.79	13.84	37.04	2.48	95.32	-	-	Carrier
Hori.	2396.999	PK	49.07	27.76	13.83	37.05	2.48	56.09	75.32	19.2	
Hori.	2400.000	PK	39.35	27.76	13.83	37.05	2.48	46.37	75.32	29.0	
Vert.	2412.000	PK	90.53	27.79	13.84	37.04	2.48	97.60	-	-	Carrier
Vert.	2396.993	PK	50.21	27.76	13.83	37.05	2.48	57.23	77.60	20.4	
Vert.	2400.000	PK	40.75	27.76	13.83	37.05	2.48	47.77	77.60	29.8	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.99 m / 3.0 m) = 2.48 dB

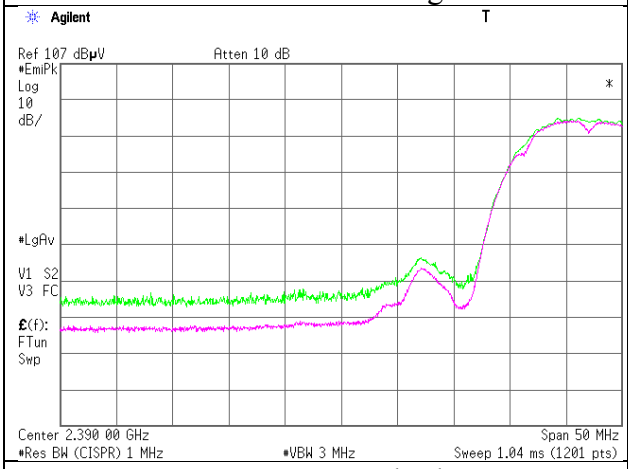
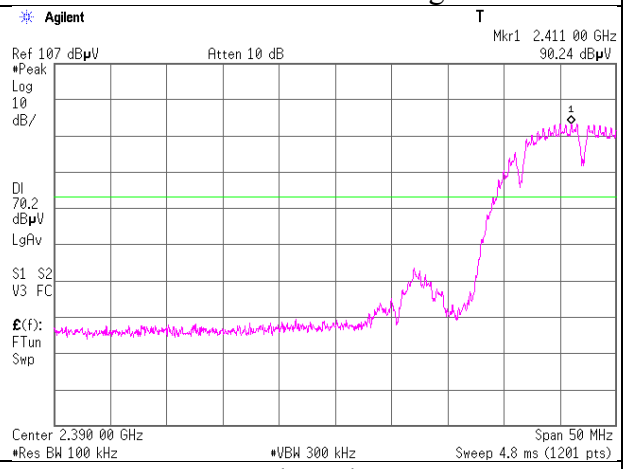
Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	11259492S-A-R3
Test place(AC No.)	3
Date	August 4, 2016
Temperature / Humidity	23 deg. C / 60 % RH
Engineer	Shinichi Takano
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

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	11259492S-A-R3			
Test place(AC No.)	3	3	2	3
Date	August 4, 2016	August 13, 2016	August 18, 2016	August 20, 2016
Temperature / Humidity	23 deg. C / 60 % RH	25 deg. C / 52 % RH	25 deg. C / 55 % RH	23 deg. C / 54 % RH
Engineer	Shinichi Takano	Shinichi Takano	Yosuke Ishikawa	Hikaru Shirasawa
Test frequency band	1 GHz – 2.8 GHz	2.8 GHz – 13 GHz	13 GHz – 18 GHz	18 GHz – 26 GHz
Mode	Tx 11b 2437 MHz			

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	49.64	31.67	6.02	41.40	2.48	48.41	73.90	25.4	166	113	
Hori.	7311.000	PK	46.27	36.92	7.59	41.23	2.48	52.03	73.90	21.8	150	0	
Hori.	9748.000	PK	45.09	38.45	8.48	40.42	2.48	54.08	73.90	19.8	150	0	
Hori.	4874.000	AV	41.56	31.67	6.02	41.40	2.48	40.33	53.90	13.5	166	113	
Hori.	7311.000	AV	37.13	36.92	7.59	41.23	2.48	42.89	53.90	11.0	150	0	
Hori.	9748.000	AV	35.56	38.45	8.48	40.42	2.48	44.55	53.90	9.3	150	0	
Vert.	4874.000	PK	49.40	31.67	6.02	41.40	2.48	48.17	73.90	25.7	156	287	
Vert.	7311.000	PK	46.09	36.92	7.59	41.23	2.48	51.85	73.90	22.0	150	0	
Vert.	9748.000	PK	45.84	38.45	8.48	40.42	2.48	54.83	73.90	19.0	150	0	
Vert.	4874.000	AV	41.98	31.67	6.02	41.40	2.48	40.75	53.90	13.1	156	287	
Vert.	7311.000	AV	37.21	36.92	7.59	41.23	2.48	42.97	53.90	10.9	150	0	
Vert.	9748.000	AV	35.87	38.45	8.48	40.42	2.48	44.86	53.90	**9.0**	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 (3.99 m / 3.0 m) = 2.48 dB

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Telephone : +81 463 50 6400
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Radiated Spurious Emission

Report No.	11259492S-A-R3			
Test place(AC No.)	3	3	2	3
Date	August 4, 2016	August 13, 2016	August 18, 2016	August 20, 2016
Temperature / Humidity	23 deg. C / 60 % RH	25 deg. C / 52 % RH	25 deg. C / 55 % RH	23 deg. C / 54 % RH
Engineer	Shinichi Takano	Shinichi Takano	Yosuke Ishikawa	Hikaru Shirasawa
Test frequency band	1 GHz – 2.8 GHz	2.8 GHz – 13 GHz	13 GHz – 18 GHz	18 GHz – 26 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	46.68	27.91	13.91	37.01	2.48	53.97	73.90	19.9	283	249	
Hori.	4924.000	PK	52.08	31.86	6.04	41.30	2.48	51.16	73.90	22.7	255	113	
Hori.	7386.000	PK	45.88	36.94	7.60	41.31	2.48	51.59	73.90	22.3	150	0	
Hori.	9848.000	PK	45.39	38.45	8.54	40.36	2.48	54.50	73.90	19.4	150	0	
Hori.	2483.500	AV	37.63	27.91	13.91	37.01	2.48	44.92	53.90	8.9	283	249	
Hori.	4924.000	AV	46.51	31.86	6.04	41.30	2.48	45.59	53.90	8.3	255	113	
Hori.	7386.000	AV	36.61	36.94	7.60	41.31	2.48	42.32	53.90	11.5	150	0	
Hori.	9848.000	AV	35.44	38.45	8.54	40.36	2.48	44.55	53.90	9.3	150	0	
Vert.	2483.500	PK	47.07	27.91	13.91	37.01	2.48	54.36	73.90	19.5	153	88	
Vert.	4924.000	PK	52.72	31.86	6.04	41.30	2.48	51.80	73.90	22.1	113	105	
Vert.	7386.000	PK	45.78	36.94	7.60	41.31	2.48	51.49	73.90	22.4	150	0	
Vert.	9848.000	PK	44.86	38.45	8.54	40.36	2.48	53.97	73.90	19.9	150	0	
Vert.	2483.500	AV	38.51	27.91	13.91	37.01	2.48	45.80	53.90	8.1	153	88	
Vert.	4924.000	AV	47.49	31.86	6.04	41.30	2.48	46.57	53.90	**7.3**	113	105	
Vert.	7386.000	AV	36.76	36.94	7.60	41.31	2.48	42.47	53.90	11.4	150	0	
Vert.	9848.000	AV	35.43	38.45	8.54	40.36	2.48	44.54	53.90	9.3	150	0	

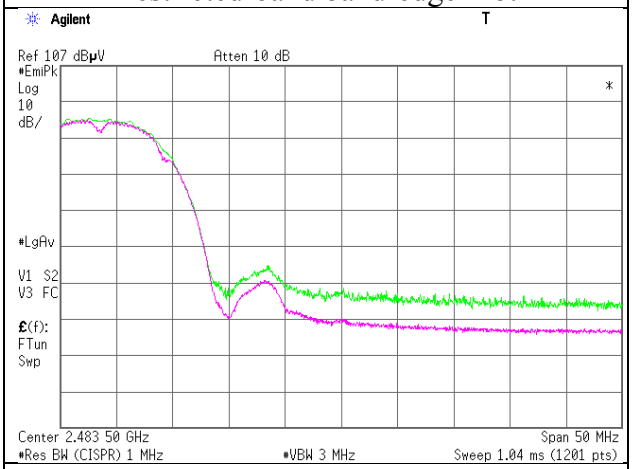
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.99 m / 3.0 m) = 2.48 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	11259492S-A-R3
Test place(AC No.)	3
Date	August 4, 2016
Temperature / Humidity	23 deg. C / 60 % RH
Engineer	Shinichi Takano
Mode	Tx 11b 2462 MHz

Horizontal

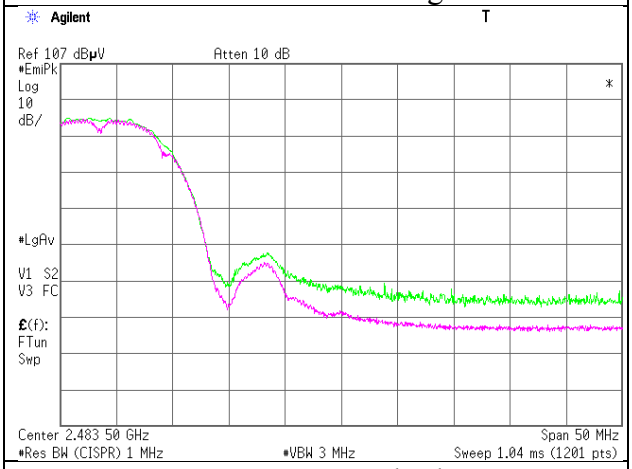
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	11259492S-A-R3					
Test place(AC No.)	3	3	2	3	1	2
Date	August 4, 2016	August 13, 2016	August 18, 2016	August 20, 2016	August 23, 2016	August 24, 2016
Temperature / Humidity	23 deg. C / 60 % RH	25 deg. C / 52 % RH	25 deg. C / 55 % RH	23 deg. C / 54 % RH	23 deg. C / 65 % RH	23 deg. C / 65 % RH
Engineer	Shinichi Takano	Shinichi Takano	Yosuke Ishikawa	Hikaru Shirasawa	Hikaru Shirasawa	Hikaru Shirasawa
Test frequency band	1 GHz – 2.8 GHz	2.8 GHz – 13 GHz	13 GHz – 18 GHz	18 GHz – 26 GHz	9 kHz – 30 MHz	30 MHz – 1 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.	32.176	QP	24.80	16.69	6.96	31.91	0.00	16.54	40.00	23.4	200	241	
Hori.	204.717	QP	25.00	16.52	9.00	31.75	0.00	18.77	43.50	24.7	200	140	
Hori.	823.021	QP	23.70	21.20	9.45	31.24	0.00	23.11	46.00	22.8	100	257	
Hori.	934.278	QP	23.30	22.30	9.98	30.62	0.00	24.96	46.00	21.0	150	323	
Hori.	2390.000	PK	52.58	27.75	13.82	37.06	2.48	59.57	73.90	14.3	162	64	
Hori.	4824.000	PK	48.63	31.48	6.01	41.50	2.48	47.10	73.90	26.8	262	112	
Hori.	7236.000	PK	46.83	36.90	7.56	41.16	2.48	52.61	73.90	21.2	150	0	
Hori.	9648.000	PK	46.31	38.45	8.43	40.47	2.48	55.20	73.90	18.7	150	0	
Hori.	2390.000	AV	40.91	27.75	13.82	37.06	2.48	47.90	53.90	6.0	162	64	
Hori.	4824.000	AV	39.54	31.48	6.01	41.50	2.48	38.01	53.90	15.8	262	112	
Hori.	7236.000	AV	37.49	36.90	7.56	41.16	2.48	43.27	53.90	10.6	150	0	
Hori.	9648.000	AV	36.83	38.45	8.43	40.47	2.48	45.72	53.90	8.1	150	0	
Vert.	31.327	QP	24.30	16.88	6.94	31.91	0.00	16.21	40.00	23.7	100	338	
Vert.	200.159	QP	24.70	16.39	8.97	31.76	0.00	18.30	43.50	25.2	100	179	
Vert.	836.188	QP	23.60	21.35	9.51	31.16	0.00	23.30	46.00	22.7	100	295	
Vert.	928.493	QP	23.30	22.26	9.96	30.66	0.00	24.86	46.00	21.1	100	55	
Vert.	2390.000	PK	54.62	27.75	13.82	37.06	2.48	61.61	73.90	12.2	141	87	
Vert.	4824.000	PK	48.84	31.48	6.01	41.50	2.48	47.31	73.90	26.5	127	292	
Vert.	7236.000	PK	46.76	36.90	7.56	41.16	2.48	52.54	73.90	21.3	150	0	
Vert.	9648.000	PK	45.49	38.45	8.43	40.47	2.48	54.38	73.90	19.5	150	0	
Vert.	2390.000	AV	42.71	27.75	13.82	37.06	2.48	49.70	53.90	**4.2**	141	87	
Vert.	4824.000	AV	39.33	31.48	6.01	41.50	2.48	37.80	53.90	16.1	127	292	
Vert.	7236.000	AV	37.66	36.90	7.56	41.16	2.48	43.44	53.90	10.4	150	0	
Vert.	9648.000	AV	36.49	38.45	8.43	40.47	2.48	45.38	53.90	8.5	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 (3.99 m / 3.0 m) = 2.48 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	83.85	27.79	13.84	37.04	2.48	90.92	-	-	Carrier
Hori.	2400.000	PK	46.19	27.76	13.83	37.05	2.48	53.21	70.92	17.7	
Vert.	2412.000	PK	86.89	27.79	13.84	37.04	2.48	93.96	-	-	Carrier
Vert.	2400.000	PK	47.31	27.76	13.83	37.05	2.48	54.33	73.96	19.6	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.99 m / 3.0 m) = 2.48 dB

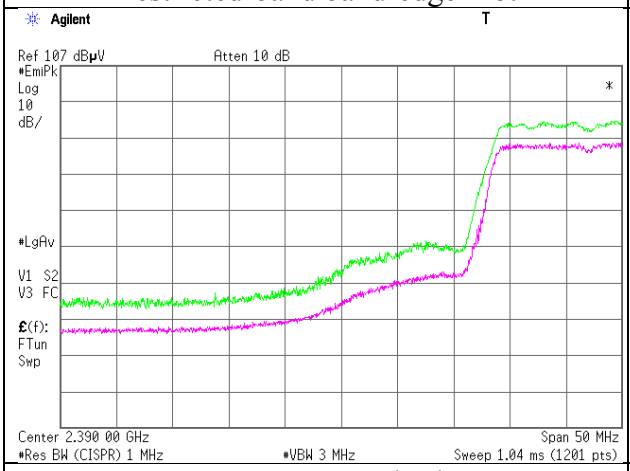
No noise was detected below 30 MHz.

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	11259492S-A-R3
Test place(AC No.)	3
Date	August 4, 2016
Temperature / Humidity	23 deg. C / 60 % RH
Engineer	Shinichi Takano
Mode	Tx 11g 2412 MHz

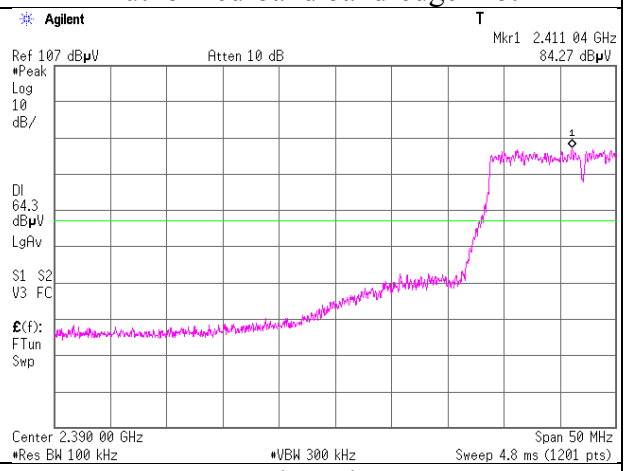
Horizontal

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

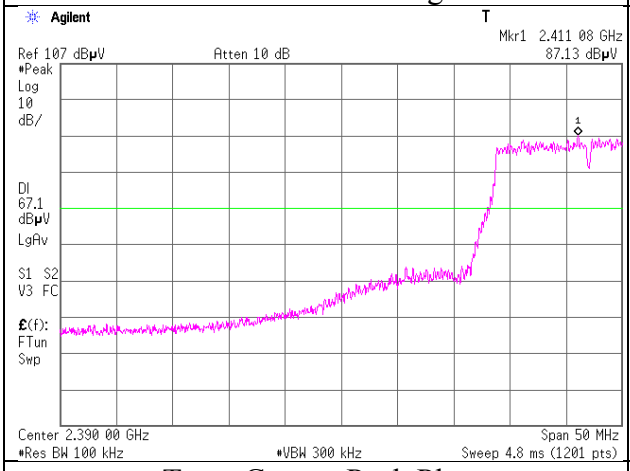
Authorized-band band-edge Plot



20dBc Plot

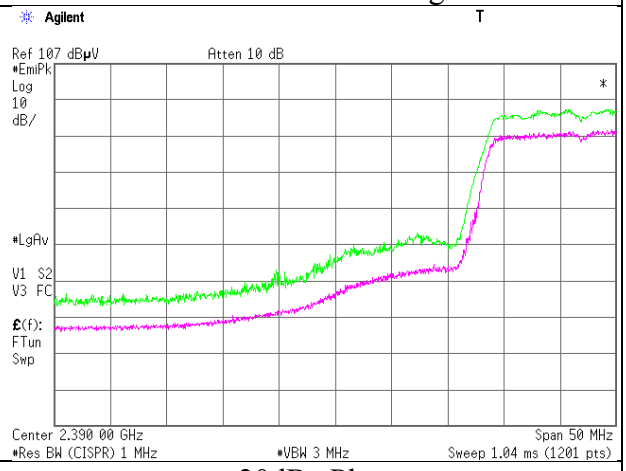
Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Authorized-band band-edge Plot



20dBc Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	11259492S-A-R3			
Test place(AC No.)	3	3	2	3
Date	August 4, 2016	August 13, 2016	August 18, 2016	August 20, 2016
Temperature / Humidity	23 deg. C / 60 % RH	25 deg. C / 52 % RH	25 deg. C / 55 % RH	23 deg. C / 54 % RH
Engineer	Shinichi Takano	Shinichi Takano	Yosuke Ishikawa	Hikaru Shirasawa
Test frequency band	1 GHz – 2.8 GHz	2.8 GHz – 13 GHz	13 GHz – 18 GHz	18 GHz – 26 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.	4874.000	PK	48.50	31.67	6.02	41.40	2.48	47.27	73.90	26.6	280	112	
Hori.	7311.000	PK	46.56	36.92	7.59	41.23	2.48	52.32	73.90	21.5	150	0	
Hori.	9748.000	PK	45.22	38.45	8.48	40.42	2.48	54.21	73.90	19.6	150	0	
Hori.	4874.000	AV	39.36	31.67	6.02	41.40	2.48	38.13	53.90	15.7	280	112	
Hori.	7311.000	AV	37.42	36.92	7.59	41.23	2.48	43.18	53.90	10.7	150	0	
Hori.	9748.000	AV	36.14	38.45	8.48	40.42	2.48	45.13	53.90	**8.7**	150	0	
Vert.	4874.000	PK	48.07	31.67	6.02	41.40	2.48	46.84	73.90	27.0	154	273	
Vert.	7311.000	PK	46.08	36.92	7.59	41.23	2.48	51.84	73.90	22.0	150	0	
Vert.	9748.000	PK	44.74	38.45	8.48	40.42	2.48	53.73	73.90	20.1	150	0	
Vert.	4874.000	AV	39.06	31.67	6.02	41.40	2.48	37.83	53.90	16.0	154	273	
Vert.	7311.000	AV	37.33	36.92	7.59	41.23	2.48	43.09	53.90	10.8	150	0	
Vert.	9748.000	AV	36.05	38.45	8.48	40.42	2.48	45.04	53.90	8.8	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 (3.99 m / 3.0 m) = 2.48 dB

Radiated Spurious Emission

Report No.	11259492S-A-R3			
Test place(AC No.)	3	3	2	3
Date	August 4, 2016	August 13, 2016	August 18, 2016	August 20, 2016
Temperature / Humidity	23 deg. C / 60 % RH	25 deg. C / 52 % RH	25 deg. C / 55 % RH	23 deg. C / 54 % RH
Engineer	Shinichi Takano	Shinichi Takano	Yosuke Ishikawa	Hikaru Shirasawa
Test frequency band	1 GHz – 2.8 GHz	2.8 GHz – 13 GHz	13 GHz – 18 GHz	18 GHz – 26 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.	2483.500	PK	52.00	27.91	13.91	37.01	2.48	59.29	73.90	14.6	196	57	
Hori.	4924.000	PK	48.45	31.86	6.04	41.30	2.48	47.53	73.90	26.3	258	115	
Hori.	7386.000	PK	45.37	36.94	7.60	41.31	2.48	51.08	73.90	22.8	150	0	
Hori.	9848.000	PK	44.50	38.45	8.54	40.36	2.48	53.61	73.90	20.2	150	0	
Hori.	2483.500	AV	41.71	27.91	13.91	37.01	2.48	49.00	53.90	4.9	196	57	
Hori.	4924.000	AV	39.00	31.86	6.04	41.30	2.48	38.08	53.90	15.8	258	115	
Hori.	7386.000	AV	36.73	36.94	7.60	41.31	2.48	42.44	53.90	11.4	150	0	
Hori.	9848.000	AV	35.65	38.45	8.54	40.36	2.48	44.76	53.90	9.1	150	0	
Vert.	2483.500	PK	53.18	27.91	13.91	37.01	2.48	60.47	73.90	13.4	140	93	
Vert.	4924.000	PK	48.76	31.86	6.04	41.30	2.48	47.84	73.90	26.0	106	105	
Vert.	7386.000	PK	46.10	36.94	7.60	41.31	2.48	51.81	73.90	22.0	150	0	
Vert.	9848.000	PK	44.96	38.45	8.54	40.36	2.48	54.07	73.90	19.8	150	0	
Vert.	2483.500	AV	42.53	27.91	13.91	37.01	2.48	49.82	53.90	**4.0**	140	93	
Vert.	4924.000	AV	39.96	31.86	6.04	41.30	2.48	39.04	53.90	14.8	106	105	
Vert.	7386.000	AV	36.72	36.94	7.60	41.31	2.48	42.43	53.90	11.4	150	0	
Vert.	9848.000	AV	36.02	38.45	8.54	40.36	2.48	45.13	53.90	8.7	150	0	

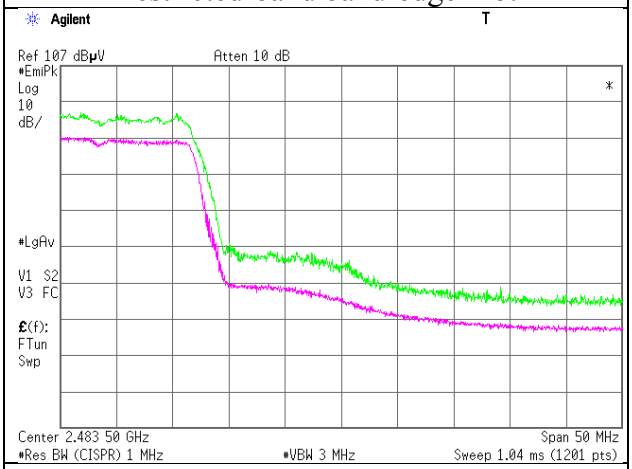
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.99 m / 3.0 m) = 2.48 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	11259492S-A-R3
Test place(AC No.)	3
Date	August 4, 2016
Temperature / Humidity	23 deg. C / 60 % RH
Engineer	Shinichi Takano
Mode	Tx 11g 2462 MHz

Horizontal

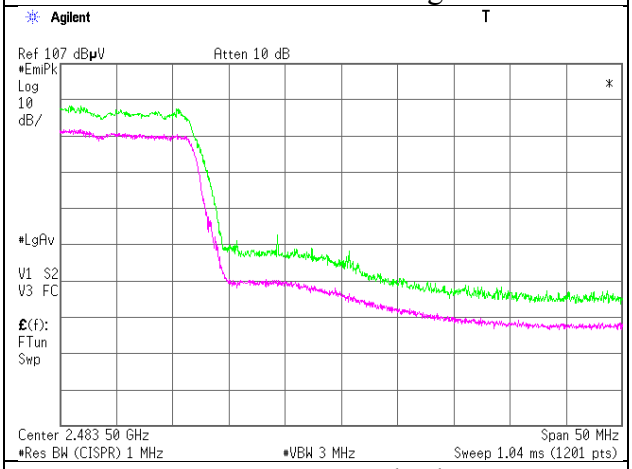
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	11259492S-A-R3
Test place(AC No.)	3
Date	August 4, 2016
Temperature / Humidity	23 deg. C / 60 % RH
Engineer	Shinichi Takano
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	56.41	27.75	13.82	37.06	2.48	63.40	73.90	10.5	266	58	
Hori.	2390.000	AV	42.02	27.75	13.82	37.06	2.48	49.01	53.90	4.8	266	58	
Vert.	2390.000	PK	57.99	27.75	13.82	37.06	2.48	64.98	73.90	8.9	142	92	
Vert.	2390.000	AV	43.10	27.75	13.82	37.06	2.48	50.09	53.90	**3.8**	142	92	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.99 m / 3.0 m) = 2.48 dB

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

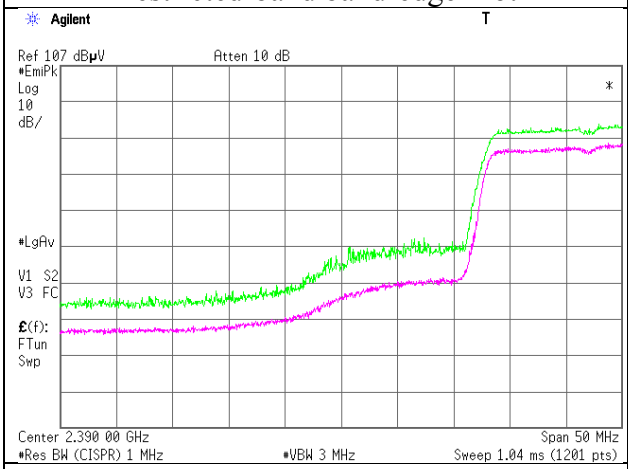
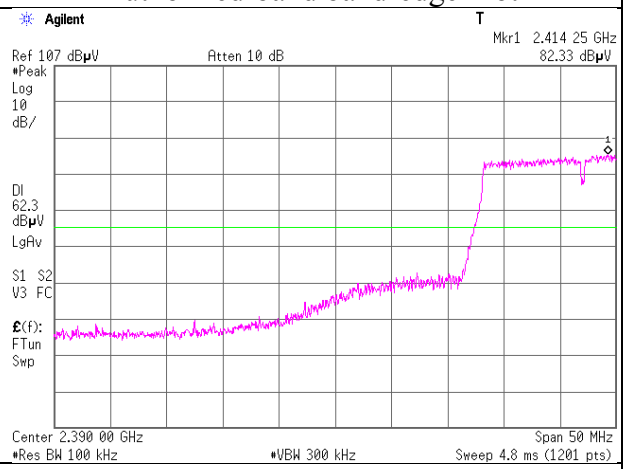
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	82.63	27.79	13.84	37.04	2.48	89.70	-	-	Carrier
Hori.	2400.000	PK	48.21	27.76	13.83	37.05	2.48	55.23	69.70	14.5	
Vert.	2412.000	PK	84.27	27.79	13.84	37.04	2.48	91.34	-	-	Carrier
Vert.	2400.000	PK	49.28	27.76	13.83	37.05	2.48	56.30	71.34	15.0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.99 m / 3.0 m) = 2.48 dB

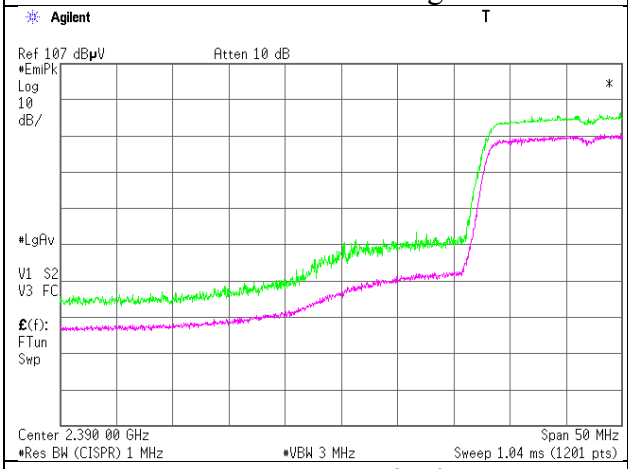
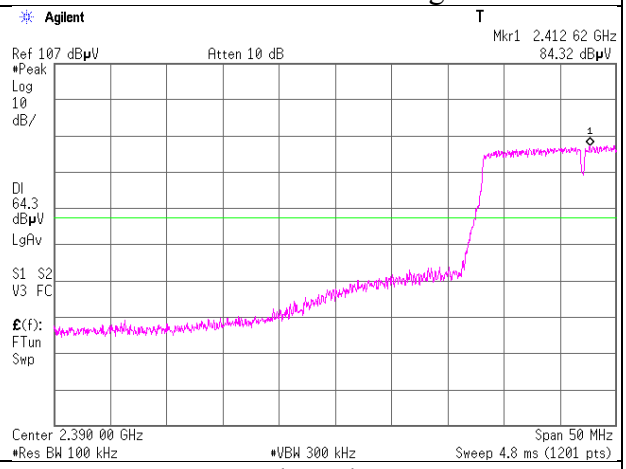
Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	11259492S-A-R3
Test place(AC No.)	3
Date	August 4, 2016
Temperature / Humidity	23 deg. C / 60 % RH
Engineer	Shinichi Takano
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

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	11259492S-A-R3
Test place(AC No.)	3
Date	August 4, 2016
Temperature / Humidity	23 deg. C / 60 % RH
Engineer	Shinichi Takano
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	56.32	27.91	13.91	37.01	2.48	63.61	73.90	10.2	210	63	
Hori.	2483.500	AV	42.92	27.91	13.91	37.01	2.48	50.21	53.90	3.6	210	63	
Vert.	2483.500	PK	55.74	27.91	13.91	37.01	2.48	63.03	73.90	10.8	154	89	
Vert.	2483.500	AV	43.29	27.91	13.91	37.01	2.48	50.58	53.90	**3.3**	154	89	

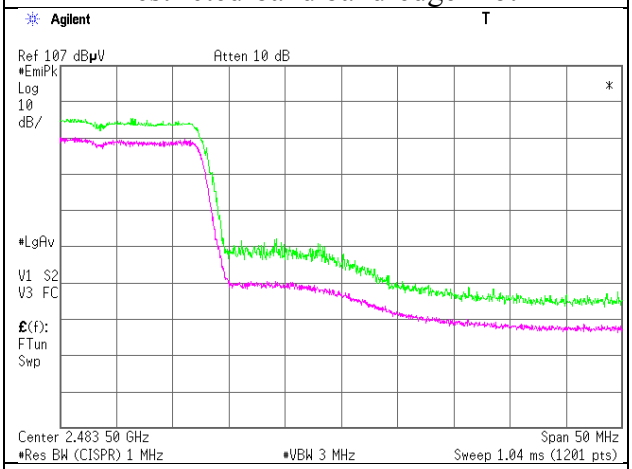
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.99 m / 3.0 m) = 2.48 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	11259492S-A-R3
Test place(AC No.)	3
Date	August 4, 2016
Temperature / Humidity	23 deg. C / 60 % RH
Engineer	Shinichi Takano
Mode	Tx 11n-20 2462 MHz

Horizontal

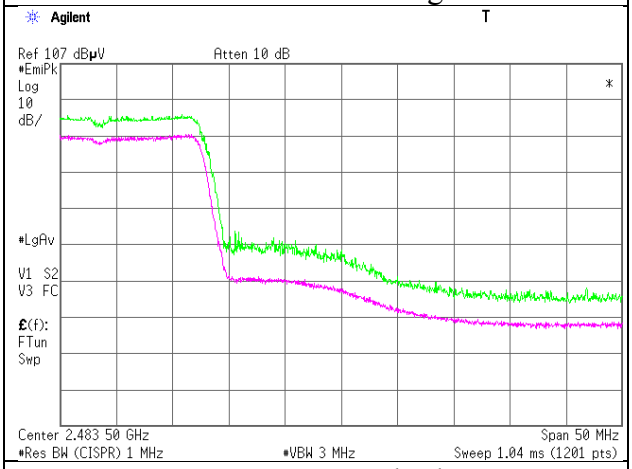
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	11259492S-A-R3			
Test place(AC No.)	3	3	2	3
Date	August 4, 2016	August 13, 2016	August 18, 2016	August 20, 2016
Temperature / Humidity	23 deg. C / 60 % RH	25 deg. C / 52 % RH	25 deg. C / 55 % RH	23 deg. C / 54 % RH
Engineer	Shinichi Takano	Shinichi Takano	Yosuke Ishikawa	Hikaru Shirasawa
Test frequency band	1 GHz – 2.8 GHz	2.8 GHz – 13 GHz	13 GHz – 18 GHz	18 GHz – 26 GHz
Mode	Tx 11n-40 2422 MHz			

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	48.40	27.75	13.82	37.06	2.48	55.39	73.90	18.5	268	57	
Hori.	4844.000	PK	47.19	31.56	6.02	41.46	2.48	45.79	73.90	28.1	150	122	
Hori.	7266.000	PK	45.89	36.90	7.57	41.19	2.48	51.65	73.90	22.2	150	0	
Hori.	9688.000	PK	45.37	38.45	8.45	40.45	2.48	54.30	73.90	19.6	150	0	
Hori.	2390.000	AV	39.41	27.75	13.82	37.06	2.48	46.40	53.90	7.5	268	57	
Hori.	4844.000	AV	38.09	31.56	6.02	41.46	2.48	36.69	53.90	17.2	150	122	
Hori.	7266.000	AV	37.52	36.90	7.57	41.19	2.48	43.28	53.90	10.6	150	0	
Hori.	9688.000	AV	36.51	38.45	8.45	40.45	2.48	45.44	53.90	8.4	150	0	
Vert.	2390.000	PK	51.26	27.75	13.82	37.06	2.48	58.25	73.90	15.6	143	86	
Vert.	4844.000	PK	47.70	31.56	6.02	41.46	2.48	46.30	73.90	27.6	140	246	
Vert.	7266.000	PK	45.88	36.90	7.57	41.19	2.48	51.64	73.90	22.2	150	0	
Vert.	9688.000	PK	45.94	38.45	8.45	40.45	2.48	54.87	73.90	19.0	150	0	
Vert.	2390.000	AV	40.91	27.75	13.82	37.06	2.48	47.90	53.90	**6.0**	143	86	
Vert.	4844.000	AV	38.06	31.56	6.02	41.46	2.48	36.66	53.90	17.2	140	246	
Vert.	7266.000	AV	37.54	36.90	7.57	41.19	2.48	43.30	53.90	10.6	150	0	
Vert.	9688.000	AV	36.31	38.45	8.45	40.45	2.48	45.24	53.90	8.6	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 (3.99 m / 3.0 m) = 2.48 dB

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

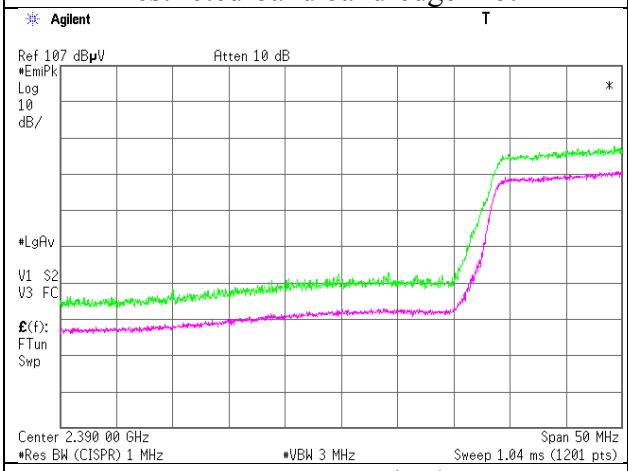
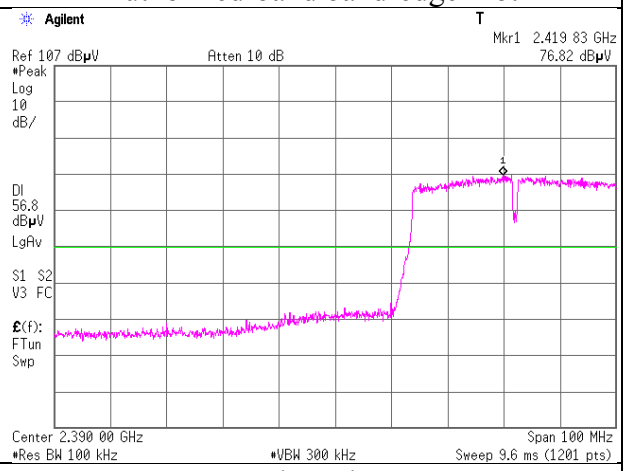
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2422.000	PK	76.82	27.80	13.85	37.04	2.48	83.91	-	-	Carrier
Hori.	2400.000	PK	39.87	27.76	13.83	37.05	2.48	46.89	63.91	17.0	
Vert.	2422.000	PK	78.76	27.80	13.85	37.04	2.48	85.85	-	-	Carrier
Vert.	2400.000	PK	40.79	27.76	13.83	37.05	2.48	47.81	65.85	18.0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.99 m / 3.0 m) = 2.48 dB

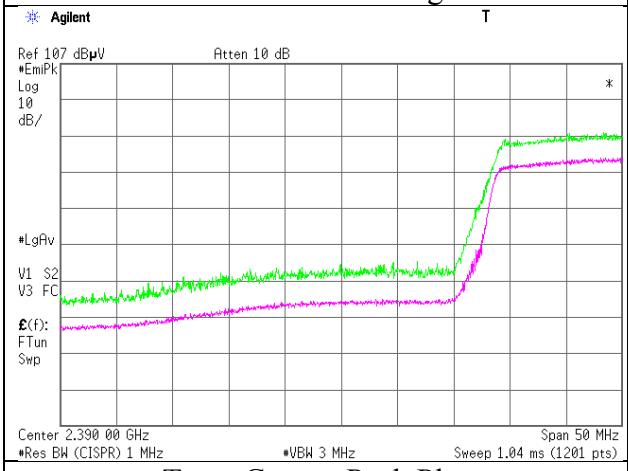
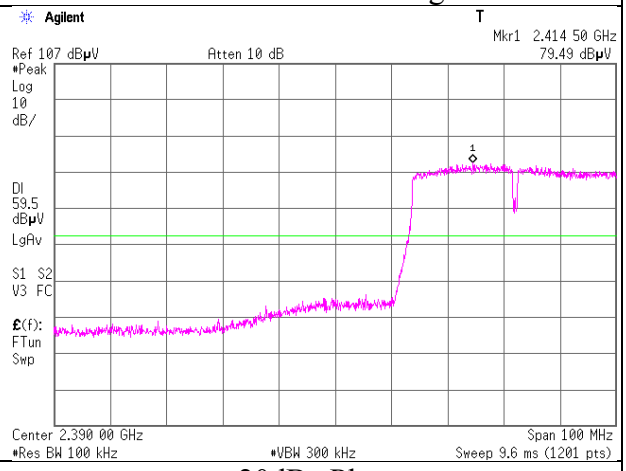
Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	11259492S-A-R3
Test place(AC No.)	3
Date	August 4, 2016
Temperature / Humidity	23 deg. C / 60 % RH
Engineer	Shinichi Takano
Mode	Tx 11n-40 2422 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

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	11259492S-A-R3			
Test place(AC No.)	3	3	2	3
Date	August 4, 2016	August 13, 2016	August 18, 2016	August 20, 2016
Temperature / Humidity	23 deg. C / 60 % RH	25 deg. C / 52 % RH	25 deg. C / 55 % RH	23 deg. C / 54 % RH
Engineer	Shinichi Takano	Shinichi Takano	Yosuke Ishikawa	Hikaru Shirasawa
Test frequency band	1 GHz – 2.8 GHz	2.8 GHz – 13 GHz	13 GHz – 18 GHz	18 GHz – 26 GHz
Mode	Tx 11n-40 2437 MHz			

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	46.76	31.67	6.02	41.40	2.48	45.53	73.90	28.3	270	336	
Hori.	7311.000	PK	46.78	36.92	7.59	41.23	2.48	52.54	73.90	21.3	150	0	
Hori.	9748.000	PK	44.87	38.45	8.48	40.42	2.48	53.86	73.90	20.0	150	0	
Hori.	4874.000	AV	38.33	31.67	6.02	41.40	2.48	37.10	53.90	16.8	270	336	
Hori.	7311.000	AV	37.10	36.92	7.59	41.23	2.48	42.86	53.90	11.0	150	0	
Hori.	9748.000	AV	35.96	38.45	8.48	40.42	2.48	44.95	53.90	**8.9**	150	0	
Vert.	4874.000	PK	47.29	31.67	6.02	41.40	2.48	46.06	73.90	27.8	134	248	
Vert.	7311.000	PK	46.16	36.92	7.59	41.23	2.48	51.92	73.90	21.9	150	0	
Vert.	9748.000	PK	44.51	38.45	8.48	40.42	2.48	53.50	73.90	20.4	150	0	
Vert.	4874.000	AV	38.20	31.67	6.02	41.40	2.48	36.97	53.90	16.9	134	248	
Vert.	7311.000	AV	37.11	36.92	7.59	41.23	2.48	42.87	53.90	11.0	150	0	
Vert.	9748.000	AV	35.90	38.45	8.48	40.42	2.48	44.89	53.90	9.0	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 (3.99 m / 3.0 m) = 2.48 dB

Radiated Spurious Emission

Report No.	11259492S-A-R3			
Test place(AC No.)	3	3	2	3
Date	August 4, 2016	August 13, 2016	August 18, 2016	August 20, 2016
Temperature / Humidity	23 deg. C / 60 % RH	25 deg. C / 52 % RH	25 deg. C / 55 % RH	23 deg. C / 54 % RH
Engineer	Shinichi Takano	Shinichi Takano	Yosuke Ishikawa	Hikaru Shirasawa
Test frequency band	1 GHz – 2.8 GHz	2.8 GHz – 13 GHz	13 GHz – 18 GHz	18 GHz – 26 GHz
Mode	Tx 11n-40 2452 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	49.86	27.91	13.91	37.01	2.48	57.15	73.90	16.7	212	251	
Hori.	4904.000	PK	47.26	31.79	6.04	41.34	2.21	45.96	73.90	27.9	151	327	
Hori.	7356.000	PK	45.84	36.93	7.59	41.28	2.21	51.29	73.90	22.6	150	0	
Hori.	9808.000	PK	43.62	38.45	8.52	40.38	2.21	52.42	73.90	21.4	150	0	
Hori.	2483.500	AV	39.28	27.91	13.91	37.01	2.48	46.57	53.90	7.3	212	251	
Hori.	4904.000	AV	38.27	31.79	6.04	41.34	2.21	36.97	53.90	16.9	151	327	
Hori.	7356.000	AV	36.94	36.93	7.59	41.28	2.21	42.39	53.90	11.5	150	0	
Hori.	9808.000	AV	35.08	38.45	8.52	40.38	2.21	43.88	53.90	10.0	150	0	
Vert.	2483.500	PK	50.57	27.91	13.91	37.01	2.48	57.86	73.90	16.0	140	91	
Vert.	4904.000	PK	46.87	31.79	6.04	41.34	2.21	45.57	73.90	28.3	150	269	
Vert.	7356.000	PK	45.89	36.93	7.59	41.28	2.21	51.34	73.90	22.5	150	0	
Vert.	9808.000	PK	44.38	38.45	8.52	40.38	2.21	53.18	73.90	20.7	150	0	
Vert.	2483.500	AV	40.73	27.91	13.91	37.01	2.48	48.02	53.90	**5.8**	140	91	
Vert.	4904.000	AV	38.42	31.79	6.04	41.34	2.21	37.12	53.90	16.7	150	269	
Vert.	7356.000	AV	37.16	36.93	7.59	41.28	2.21	42.61	53.90	11.2	150	0	
Vert.	9808.000	AV	35.43	38.45	8.52	40.38	2.21	44.23	53.90	9.6	150	0	

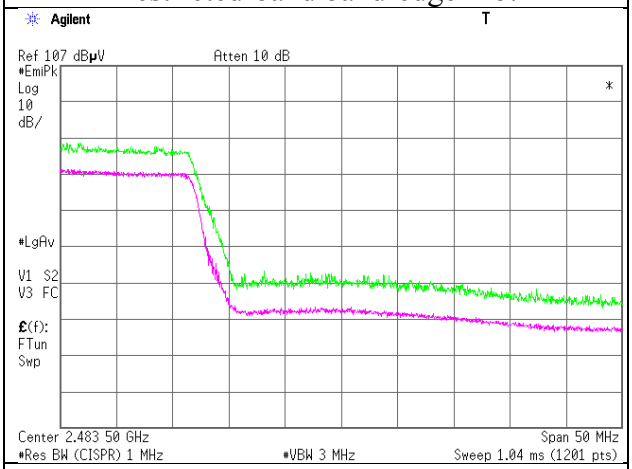
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.99 m / 3.0 m) = 2.48 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	11259492S-A-R3
Test place(AC No.)	3
Date	August 4, 2016
Temperature / Humidity	23 deg. C / 60 % RH
Engineer	Shinichi Takano
Mode	Tx 11n-40 2452 MHz

Horizontal

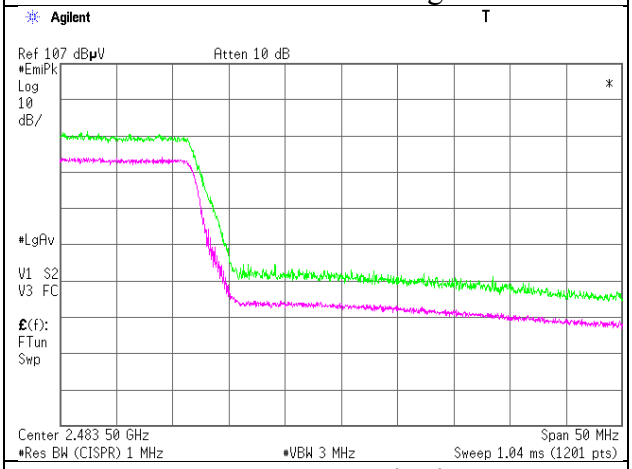
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot

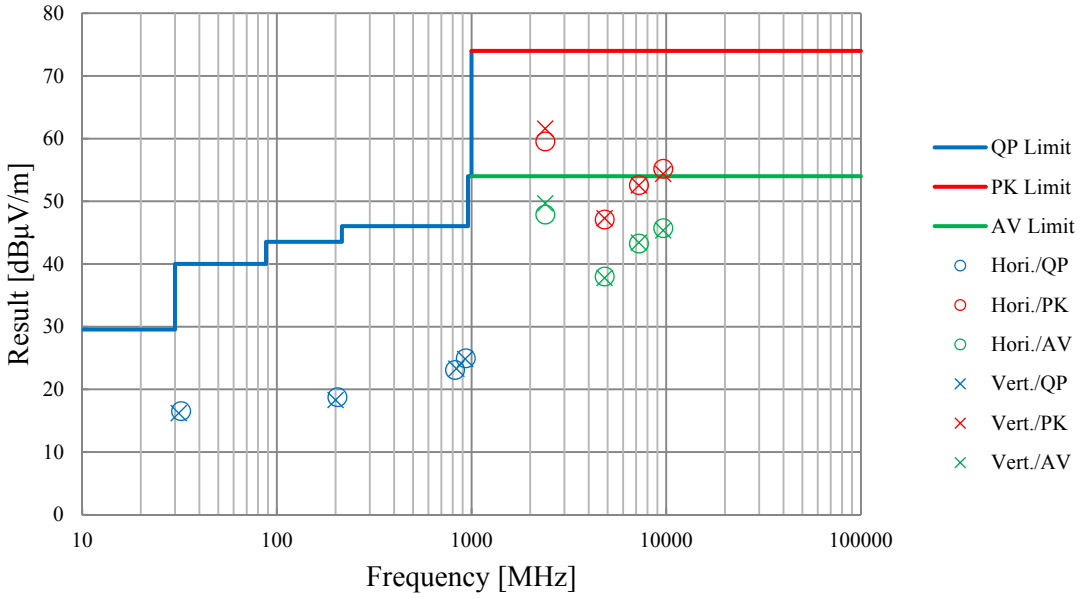


Trace Green : Peak Plot
Trace Purple : Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(Plot data, Worst case)

Report No.	11259492S-A-R3					
Test place(AC No.)	3	3	2	3	1	2
Date	August 4, 2016	August 13, 2016	August 18, 2016	August 20, 2016	August 23, 2016	August 24, 2016
Temperature / Humidity	23 deg. C / 60 % RH	25 deg. C / 52 % RH	25 deg. C / 55 % RH	23 deg. C / 54 % RH	23 deg. C / 65 % RH	23 deg. C / 65 % RH
Engineer	Shinichi Takano	Shinichi Takano	Yosuke Ishikawa	Hikaru Shirasawa	Hikaru Shirasawa	Hikaru Shirasawa
Test frequency band	1 GHz – 2.8 GHz	2.8 GHz – 13 GHz	13 GHz – 18 GHz	18 GHz – 26 GHz	9 kHz – 30 MHz	30 MHz – 1 GHz
Mode	Tx 11g 2412 MHz					



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

Power Density

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11259492S-A-R3
Date	August 4, 2016
Temperature / Humidity	25 deg. C / 38 % RH
Engineer	Kazutaka Takeyma
Mode	Tx

11b

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.00	-24.04	2.47	9.92	-11.65	8.00	19.65
2437.00	-24.37	2.47	9.92	-11.98	8.00	19.98
2462.00	-24.26	2.48	9.92	-11.86	8.00	19.86

11g

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.00	-26.78	2.47	9.92	-14.39	8.00	22.39
2437.00	-27.64	2.47	9.92	-15.25	8.00	23.25
2462.00	-27.07	2.48	9.92	-14.67	8.00	22.67

11n-20

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.00	-27.29	2.47	9.92	-14.90	8.00	22.90
2437.00	-27.55	2.47	9.92	-15.16	8.00	23.16
2462.00	-27.45	2.48	9.92	-15.05	8.00	23.05

11n-40

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2422.00	-32.97	2.47	9.92	-20.58	8.00	28.58
2437.00	-33.91	2.47	9.92	-21.52	8.00	29.52
2452.00	-33.92	2.48	9.92	-21.52	8.00	29.52

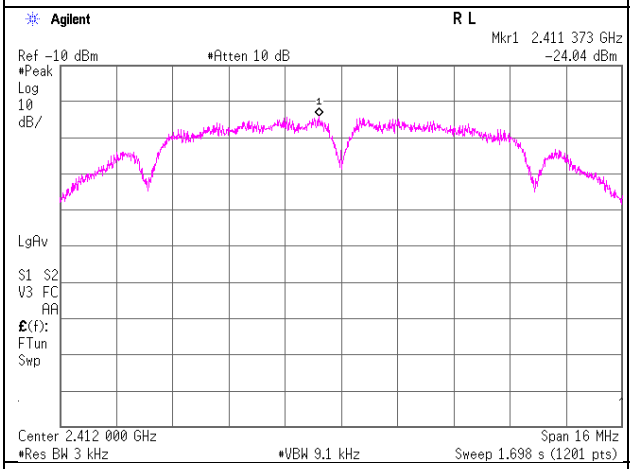
Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

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

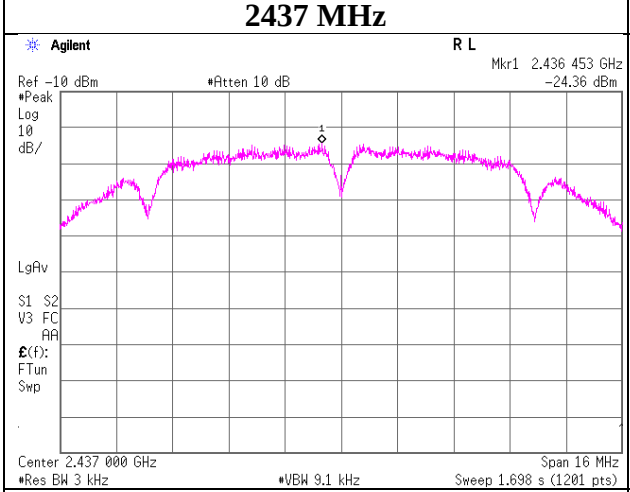
Power Density

11b

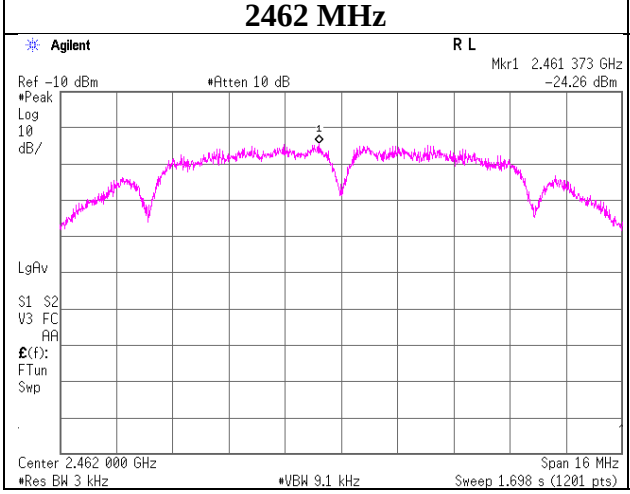
2412 MHz



2437 MHz

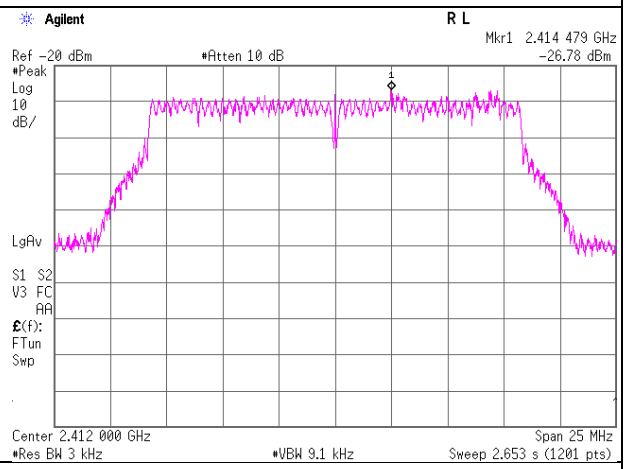


2462 MHz

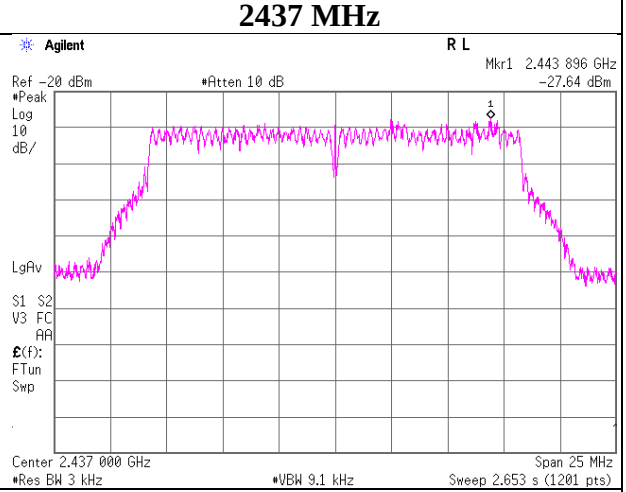


11g

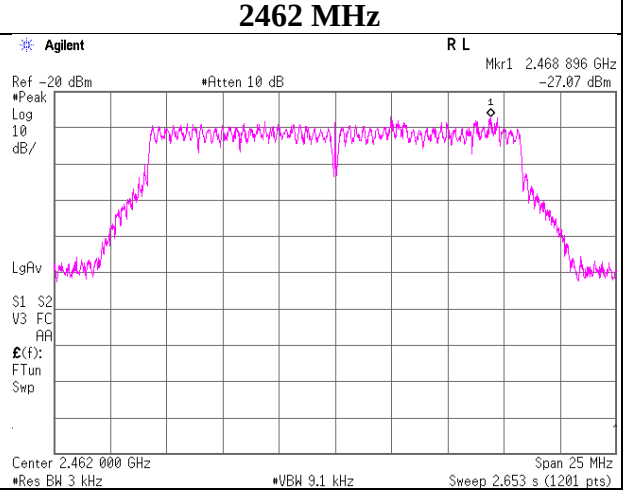
2412 MHz



2437 MHz



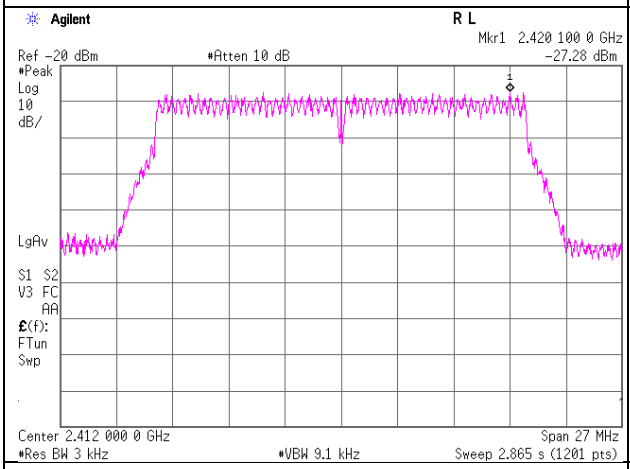
2462 MHz



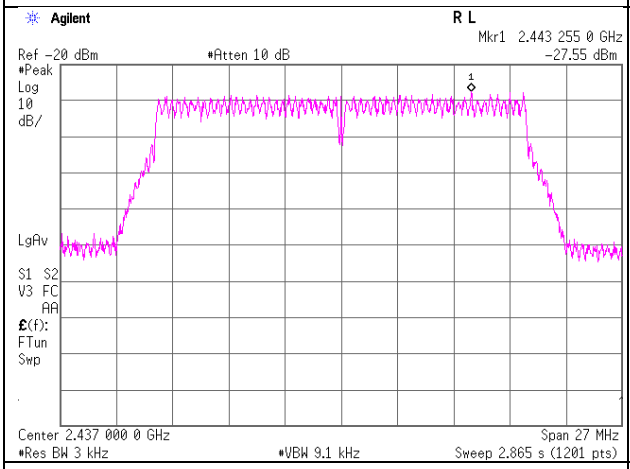
Power Density

11n-20

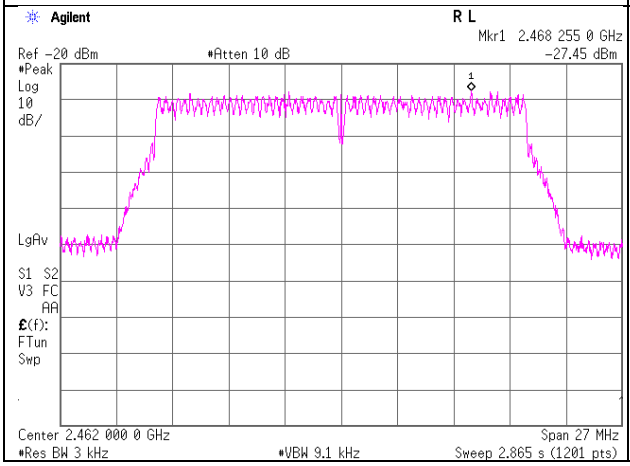
2412 MHz



2437 MHz

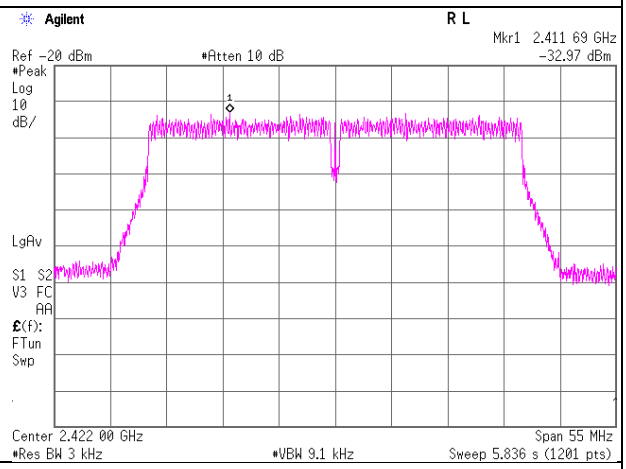


2462 MHz

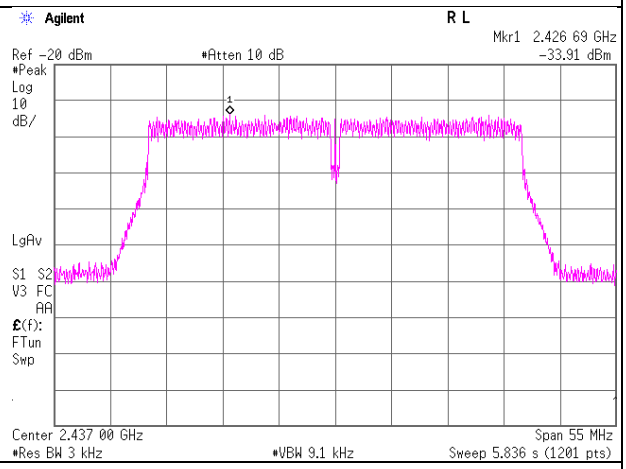


11n-40

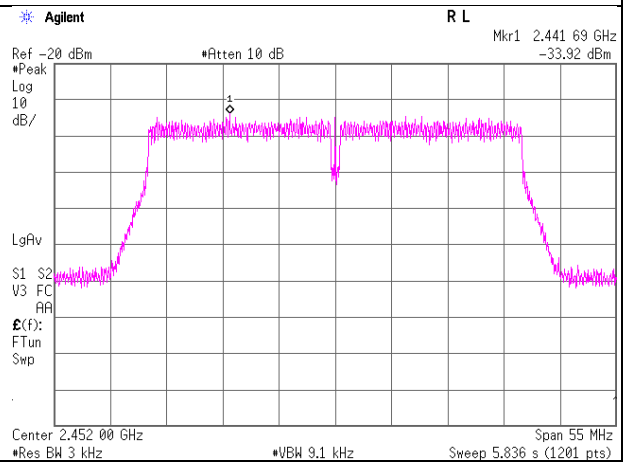
2422 MHz



2437 MHz

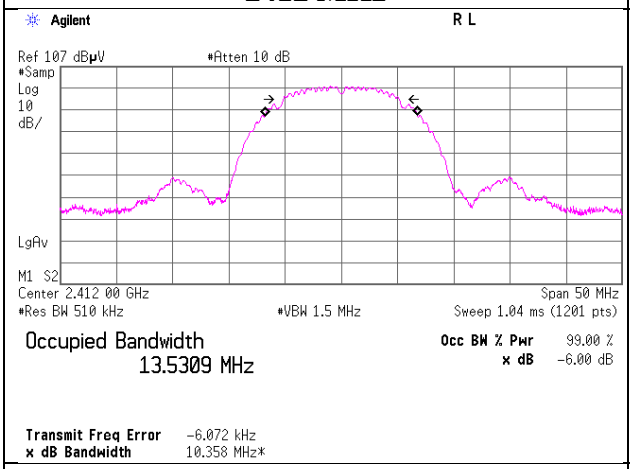
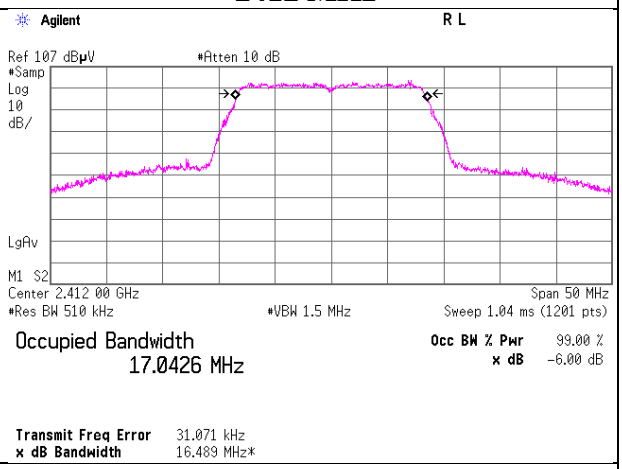
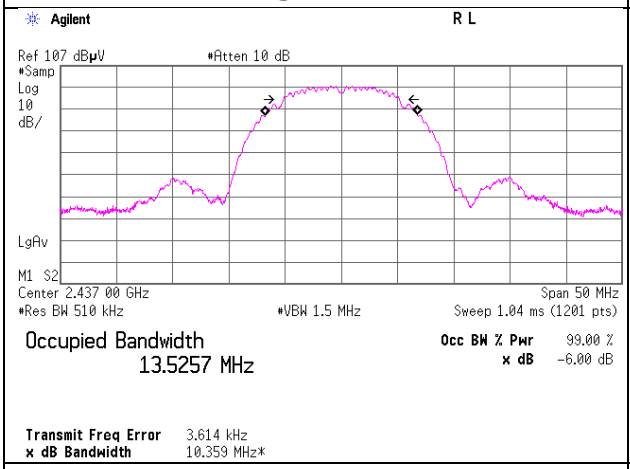
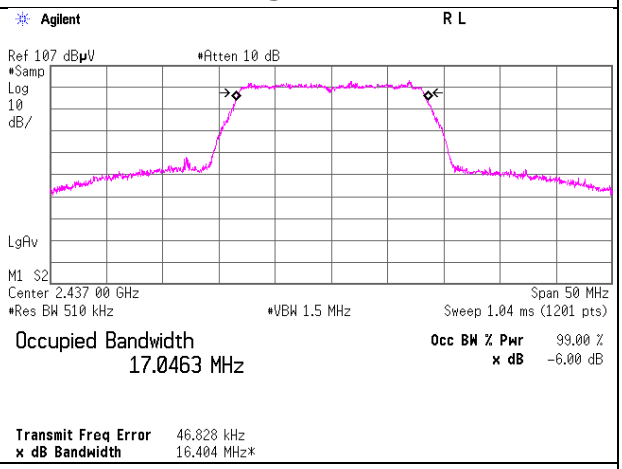
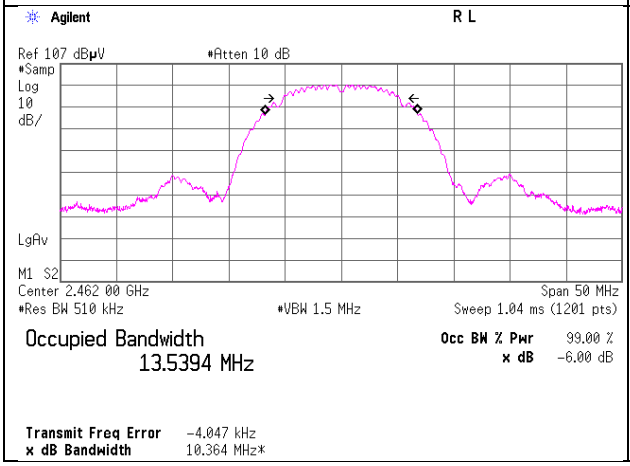
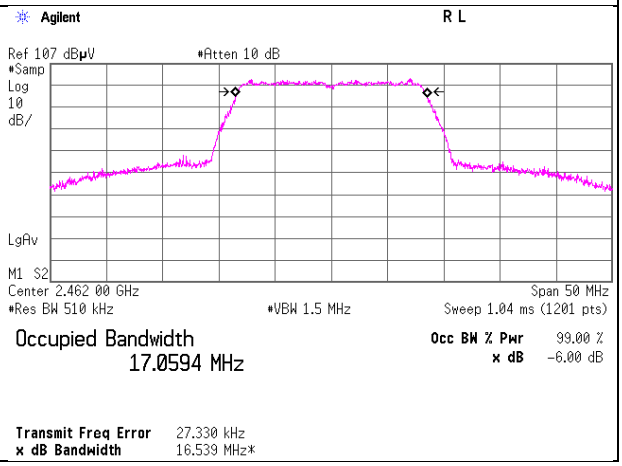


2452 MHz



99%Occupied Bandwidth

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11259492S-A-R3
Date	August 4, 2016
Temperature / Humidity	25 deg. C / 38 % RH
Engineer	Kazutaka Takeyma
Mode	Tx

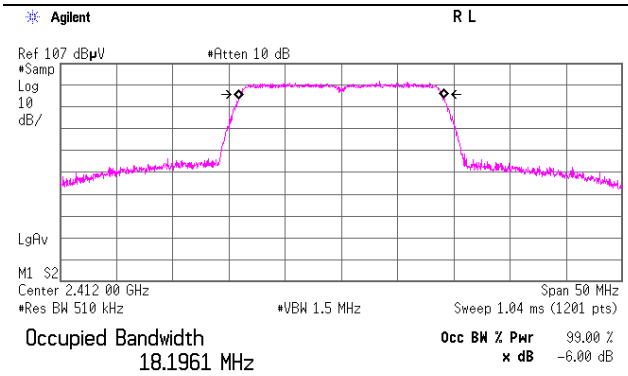
11b	11g
2412 MHz	**2412 MHz**
	
2437 MHz	**2437 MHz**
	
2462 MHz	**2462 MHz**
	

99% Occupied Bandwidth

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11259492S-A-R3
Date	August 4, 2016
Temperature / Humidity	25 deg. C / 38 % RH
Engineer	Kazutaka Takeyma
Mode	Tx

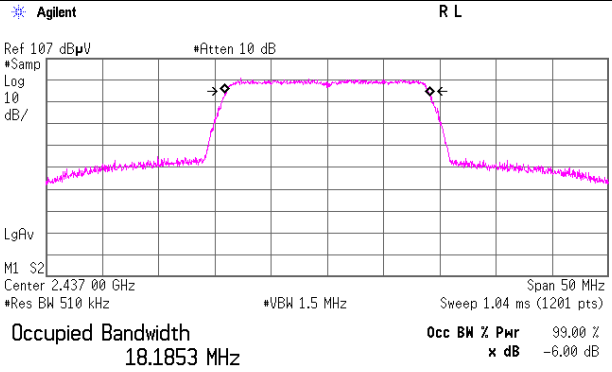
11n-20

2412 MHz



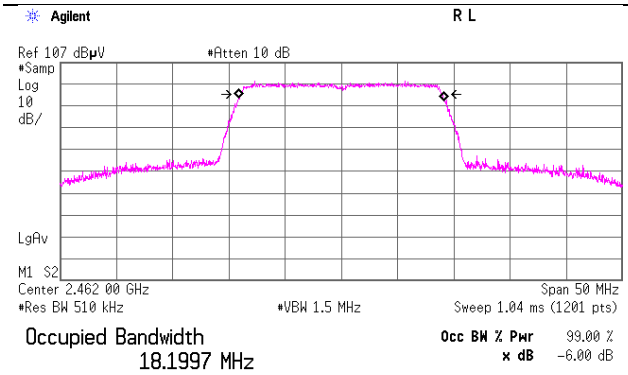
Transmit Freq Error	8.253 kHz
x dB Bandwidth	17.866 MHz*

2437 MHz



Transmit Freq Error	716.555 Hz
x dB Bandwidth	17.898 MHz*

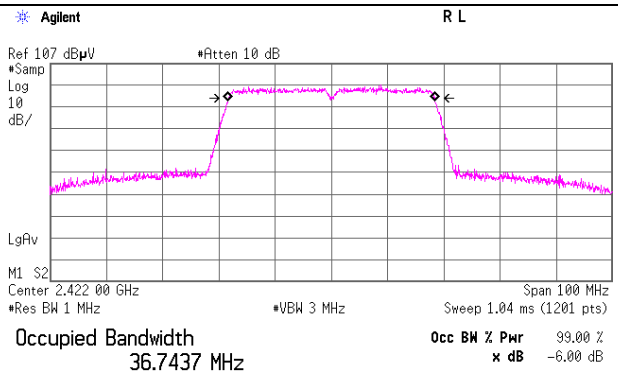
2462 MHz



Transmit Freq Error	-326.025 Hz
x dB Bandwidth	17.869 MHz*

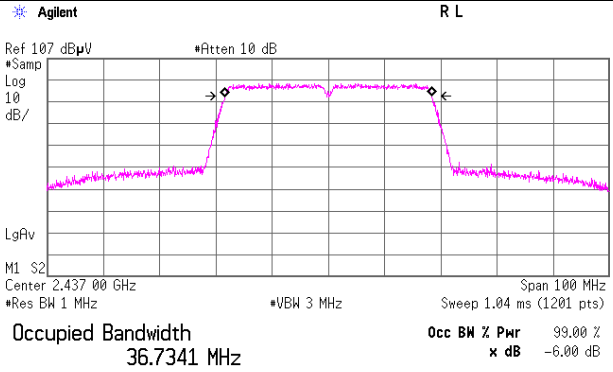
11n-40

2422 MHz



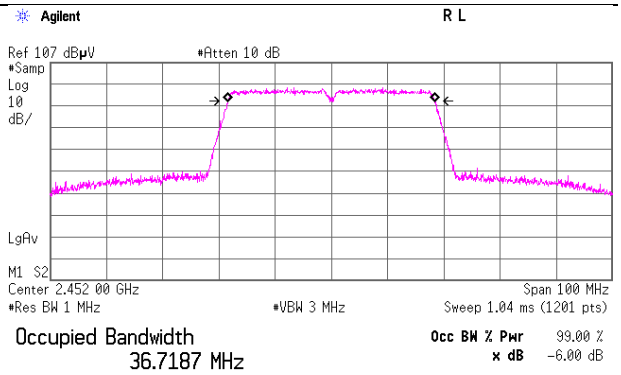
Transmit Freq Error	28.575 kHz
x dB Bandwidth	36.535 MHz*

2437 MHz



Transmit Freq Error	-8.200 kHz
x dB Bandwidth	36.684 MHz*

2452 MHz



Transmit Freq Error	21.482 kHz
x dB Bandwidth	36.501 MHz*

APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	AT, RE	2016/03/28 * 12
SCC-G13	Coaxial Cable	Suhner	SUCOFLEX 102	31599/2	AT	2016/03/23 * 12
SAT10-10	Attenuator	Weinschel Corp.	54A-10	37584	AT	2016/04/18 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2016/04/01 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2016/04/01 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2015/12/07 * 12
KTS-07	Digital Tester	SANWA	PC500	7019232	AT	2015/11/18 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	AT	2015/09/16 * 12
SAF-05	Pre Amplifier	TOYO Corporation	TPA0118-36	1440490	RE	2016/02/10 * 12
SCC-G04	Coaxial Cable	Junkosha	J12J102207-00	JUN-12-14-018	RE	2016/06/23 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2016/05/11 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2015/08/11 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2015/10/22 * 12
SJM-15	Measure	ASKUL	-	-	RE	-
SAEC-03(SVSWR)	Semi-Anechoic Chamber	TDK	SAEC-03(SVSWR)	3	RE	2015/08/28 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI,MF)	-	RE,CE	-
STS-03	Digital Hitester	Hioki	3805-50	080997823	RE	2015/11/18 * 12
SAT10-05	Attenuator(above1GHz)	Agilent	8493C-010	74864	RE	2015/11/04 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2015/11/16 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2016/03/23 * 12
SAF-04	Pre Amplifier	TOYO Corporation	TPA0118-36	1440489	RE	2016/03/22 * 12
SCC-G05	Coaxial Cable	Junkosha	J12J102207-00	APR-30-15-037	RE	2016/05/24 * 12
SCC-G22	Coaxial Cable	Suhner	SUCOFLEX 104	296199/4	RE	2016/05/11 * 12
SHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-726	RE	2015/08/10 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2015/10/22 * 12
SJM-09	Measure	PROMART	SEN1935	-	RE,CE	-
SAEC-02(SVSWR)	Semi-Anechoic Chamber	TDK	SAEC-02(SVSWR)	2	RE	2016/07/22 * 12
STS-02	Digital Hitester	Hioki	3805-50	080997819	RE,CE	2016/03/22 * 12
SFL-18	Highpass Filter	MICRO-TRONICS	HPM50111	119	RE	2016/04/18 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2016/03/15 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2016/03/23 * 12
SCC-G15	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	RE	2016/03/08 * 12
SCC-G33	Coaxial Cable	Junkosha	MWX241-01000KMSKMS	-	RE	2016/04/18 * 12

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SLP-02	Loop Antenna	Rohde & Schwarz	HFH2-Z2	100218	ME	2015/11/14 * 12
SAF-01	Pre Amplifier	SONOMA	310N	290211	RE	2016/02/19 * 12
SAT6-12	Attenuator	HIROSE ELECTRIC CO.,LTD.	AT-406(40)	-	RE	2016/08/04 * 12
SCC-A2/A4/A6/A7/A8/A13/SRSE-01	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-269(RF Selector)	RE	2016/04/22 * 12
SOS-01	Humidity Indicator	A&D	AD-5681	4062555	RE	2015/10/22 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	RE	2015/11/06 * 12
KJM-09	Measure	KOMELON	KMC-36	-	RE	-
SAEC-01(NSA)	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	RE	2016/07/14 * 12
STS-01	Digital Hitester	Hioki	3805-50	080997812	RE	2015/11/18 * 12
SAF-02	Pre Amplifier	SONOMA	310N	290212	RE	2016/02/19 * 12
SAT6-02	Attenuator	JFW	50HF-006N	-	RE	2016/02/25 * 12
KAT3-11	Attenuator	JFW IND. INC.	50HF-003N	-	RE	2015/08/31 * 12
SBA-02	Biconical Antenna	Schwarzbeck	BBA9106	91032665	RE	2015/11/02 * 12
SCC-B1/B3/B5/B7/B8/B13/SRSE-02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	RE	2016/04/22 * 12
SCC-B2/B4/B6/B7/B8/B13/SRSE-02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	RE	2016/04/22 * 12
SLA-02	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0893	RE	2015/11/03 * 12
STR-07	Test Receiver	Rohde & Schwarz	ESU26	100484	RE,CE	2015/09/04 * 12
SAEC-02(NSA)	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	RE	2016/07/13 * 12
SCC-B12/B13/SRSE-02	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/NS4906	-/0901-270(RF Selector)	CE	2016/04/22 * 12
SLS-03	LISN	Rohde & Schwarz	ENV216	100513	CE	2016/02/08 * 12
SAT3-06	Attenuator	JFW	50HF-003N	-	CE	2016/02/25 * 12
SOS-04	Humidity Indicator	A&D	AD-5681	4061512	CE	2015/12/07 * 12

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: **CE: Conducted Emission test**
RE: Radiated Emission test
AT: Antenna Terminal Conducted test