RADIO TEST REPORT

Test Report No. : 11504641S-B

Applicant	:	**JVC KENWOOD Corporation**
Type of Equipment	:	**GPS Navigation System**
Model No.	:	**ECI1-MC100K**
FCC ID	:	**IOMKC014**
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)

Date of test: November 3 to December 15, 2016

Representative test engineer:
Hiroyuki Morikawa
Engineer
Consumer Technology Division

Approved by:
Toyokazu Imamura
Leader
Consumer Technology Division

RTL02610

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

REVISION HISTORY

Original Test Report No.: 11504641S-B

Revision	Test report No.	Date	Page revised	Contents
- (Original)	11504641S-B	January 6, 2017	-	-

UL Japan, Inc.
Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
Telephone : +81 463 50 6400
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SECTION 1: Customer information

Company Name	:	JVC KENWOOD Corporation
Address	:	2967-3, Ishikawa-mach, Hachioji-shi, Tokyo 192-8525 Japan
Telephone Number	:	+81-42-646-5525
Facsimile Number	:	+81-42-646-7801
Contact Person	:	Hitoshi Aiso

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

2.1 Identification of E.U.T.

Type of Equipment	:	GPS Navigation System
Model No.	:	ECI1-MC100K
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 12 V
Receipt Date of Sample	:	October 28, 2016
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: ECI1-MC100K (referred to as the EUT in this report) is a GPS Navigation System.

Radio Specification

[WLAN]

Radio Type	:	Transceiver
Frequency of Operation	:	2412 MHz - 2462 MHz
Modulation	:	DSSS
Power Supply (radio part input)	:	DC 3.3 V/ 1.8 V
Antenna type	:	Inverted F Pattern Antenna
Antenna Gain	:	Antenna 1 : -2.2 dBi Antenna 2 : 1.5 dBi
Clock frequency (Maximum)	:	6.3 GHz

[Bluetooth]

Radio Type	:	Transceiver
Frequency of Operation	:	2402 MHz - 2480 MHz
Modulation	:	FHSS
Power Supply (radio part input)	:	DC 3.3 V/ 1.8 V
Antenna type	:	Inverted F Pattern Antenna
Antenna Gain	:	1.5 dBi (Antenna 2)
Clock frequency (Maximum)	:	6.3 GHz

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part 15 Subpart C FCC Part 15 final revised on November 14, 2016 and effective December 14, 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

* The revision on November 14, 2016, does not affect the test specification applied to the EUT.

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	-	N/A	*1)
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	5.2 dB 2483.500 MHz, AV, Vert. Tx 11n-20 MIMO 2462 MHz	Complied	Conducted (below 30 MHz)/ Radiated (above 30 MHz) *2)

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420.
*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 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 equipment provides the wireless transmitter with stable power supply (DC 3.3 V / 1.8 V). Instead of a new battery, DC power supply was used for the test. That does not affect the test result. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

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

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	No. 5,6,8 SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.6 dB	2.5 dB	2.6 dB	2.5 dB	2.5 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	3.1 dB	3.1 dB	3.1 dB	-	-
	30 MHz-200 MHz	4.6 dB	4.4 dB	4.6 dB	-	-
	200 MHz-1 GHz	5.8 dB	5.7 dB	5.8 dB	-	-
	1 GHz-13 GHz	4.9 dB	4.9 dB	4.9 dB	-	-
Radiated emission (Measurement distance: 1 m)	13 GHz-18 GHz	4.6 dB	4.6 dB	4.6 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	0.72 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	0.85 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.74 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	0.91 dB
Spurious emission (Conducted) below 1GHz	1.6 dB
Spurious emission (Conducted) 1 GHz-3 GHz	1.3 dB
Spurious emission (Conducted) 3 GHz-18 GHz	2.2 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.3 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.4 dB
Bandwidth Measurement	1.01 %
Duty cycle and Time Measurement	0.012 %

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	10 m
No.2 Semi-anechoic chamber	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.3 Semi-anechoic chamber	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5 m
No.4 Semi-anechoic chamber	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
No.1 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.2 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.3 Shielded room	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
No.4 Shielded room	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
No.5 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.6 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.8 shielded room	-	3.45 x 5.5 x 2.4	3.45 x 5.5	-
No.1 Measurement room	-	2.55 x 4.1 x 2.5	-	-

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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

4.1 Operating Mode(s)

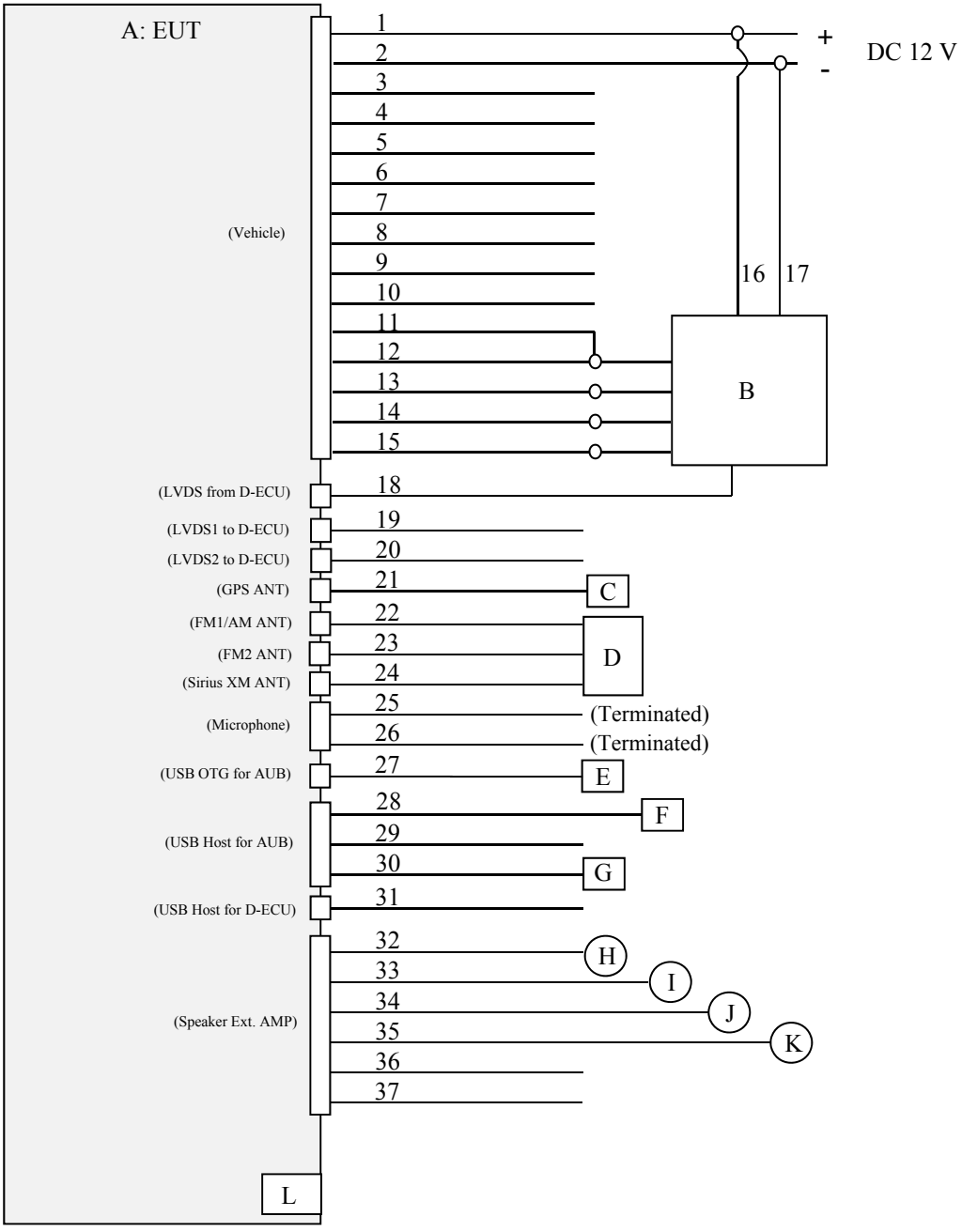
Test operating mode was determined as follows according to "Section 1 of 6 802.11 a/b/g/n testing - Managing Complex Regulatory Approvals - " of TCB Council Workshop October 2009.

Mode	Remarks*
IEEE 802.11b (11b)	11 Mbps, PN9
IEEE 802.11g (11g)	18 Mbps, PN9
IEEE 802.11n SISO 20 MHz BW (11n-20)	MCS 7
IEEE 802.11n MIMO 20 MHz BW (11n-20)	MCS 11
*The worst condition was determined based on the test result of Maximum Peak Output Power (Mid Channel)	
*Power of the EUT was set by the software as follows; Power settings: Fixed Software: JVCKENWOOD BT WiFi Certification Test iMX_MC_2016 Version: V0.991 *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 Antenna	Tested frequency
Spurious Emission	11b Tx 11g Tx 11n-20 SISO Tx	1	2412 MHz 2437 MHz 2462 MHz
	11n-20 MIMO Tx	1-2	2412 MHz 2437 MHz 2462 MHz
6dB Bandwidth Maximum Peak Output Power Power Density 99% Occupied Bandwidth	11b Tx 11g Tx 11n-20 SISO Tx	1-2	2412 MHz 2437 MHz 2462 MHz
	11n-20 MIMO Tx	1-2	2412 MHz 2437 MHz 2462 MHz

4.2 Configuration and peripherals



Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	GPS Navigation System	ECI1-MC100K	67900011	JVC KENWOOD Corporation	EUT
B	Display	DDR2-MC100W	67900046	JVC KENWOOD Corporation	-
C	Jig	-	-	JVC KENWOOD Corporation	-
D	Jig	-	-	JVC KENWOOD Corporation	-
E	USB Memory	SDK-USM1GL	08N18HDDB	Sony	-
F	USB Memory	AH312	-	Apacer	-
G	iPod	A1320	YM005VWJ71Y	Apple	-
H	Speaker	KFC-RS160	-	JVC KENWOOD Corporation	-
I	Speaker	KFC-RS160	-	JVC KENWOOD Corporation	-
J	Speaker	KFC-RS160	-	JVC KENWOOD Corporation	-
K	Speaker	KFC-RS160	-	JVC KENWOOD Corporation	-
L	micro SDHC Card	4GB	-	TDK	-

List of cable used

No.	Item	Length (m)	Shield (Cable)	Shield (Connector)	Remarks
1	KL30 BATT	2.0 + 1.9	Unshielded	Unshielded	-
2	KL30 GND	2.0 + 1.9	Unshielded	Unshielded	-
3	LIN	2.0	Unshielded	Unshielded	-
4	LIN +12V	2.0	Unshielded	Unshielded	-
5	LIN GND	2.0	Unshielded	Unshielded	-
6	C-SW +12V	2.0	Unshielded	Unshielded	-
7	C-SW GND	2.0	Unshielded	Unshielded	-
8	KL15 Ignition	2.0	Unshielded	Unshielded	-
9	Priv Vehicle L	2.0	Unshielded	Unshielded	-
10	Priv Vehicle H	2.0	Unshielded	Unshielded	-
11	BU 5U	2.0	Unshielded	Unshielded	-
12	ECU ON	2.0 + 0.5	Unshielded	Unshielded	-
13	Priv Control L	2.0 + 0.5	Unshielded	Unshielded	-
14	Priv Control H	2.0 + 0.5	Unshielded	Unshielded	-
15	Safe Shutdown	2.0 + 0.5	Unshielded	Unshielded	-
16	KL30 BATT	0.5	Unshielded	Unshielded	-
17	KL30 GND	0.5	Unshielded	Unshielded	-
18	LVDS from D-ECU	1.0	Shielded	Shielded	-
19	LVDS1 to D-ECU	2.8	Shielded	Shielded	-
20	LVDS2 to D-ECU	2.8	Shielded	Shielded	-
21	GPS ANT	3.2	Shielded	Shielded	-
22	FM1/AM ANT	2.8	Shielded	Shielded	-
23	FM2 ANT	2.8	Shielded	Shielded	-
24	Sirius XM ANT	2.8	Shielded	Shielded	-
25	MIC 1	2.8	Shielded	Unshielded	-
26	MIC 2	2.8	Shielded	Unshielded	-
27	USB (USB OTG for AUB)	2.8	Shielded	Shielded	-
28	USB (USB Host for AUB)	2.8	Unshielded	Shielded	-
29	USB Host GND	2.8	Unshielded	Unshielded	-
30	Audio	2.8 + 3.0	Unshielded	Shielded	-
31	USB Host for D-ECU	2.8	Shielded	Shielded	-
32	Speaker Front L	2.8 + 1.9	Unshielded	Unshielded	-
33	Speaker Front R	2.8 + 1.9	Unshielded	Unshielded	-
34	Speaker Rear L	2.8 + 1.9	Unshielded	Unshielded	-
35	Speaker Rear R	2.8 + 1.9	Unshielded	Unshielded	-
36	Info CAN L	2.8	Unshielded	Unshielded	-
37	Info CAN H	2.8	Unshielded	Unshielded	-

SECTION 5: 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, 1.0 m by 2.0 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[For above 1 GHz]
EUT was placed on a urethane platform of nominal size, 0.5 m by 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	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(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: 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
Test Distance	3 m	3 m *1) (1 GHz – 13 GHz), 1 m *2) (13 GHz – 31.5 GHz)		3 m *1) (1 GHz – 13 GHz), 1 m *2) (13 GHz – 31.5 GHz)

*1) Distance Factor: 20 x log (3.88 m / 3.0 m) = 2.24 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 test was made on EUT at the normal use position.

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

Measurement range : 30 MHz – 31.5 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	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 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 10.2 Method PKPSD (peak PSD) of "KDB 558074 D01 DTS Meas Guidance v03r05".
*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.

Test data : APPENDIX
Test result : Pass

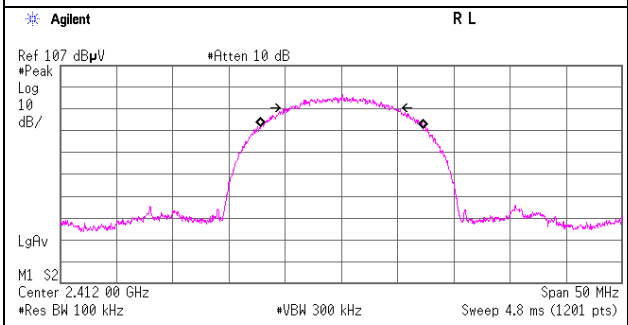
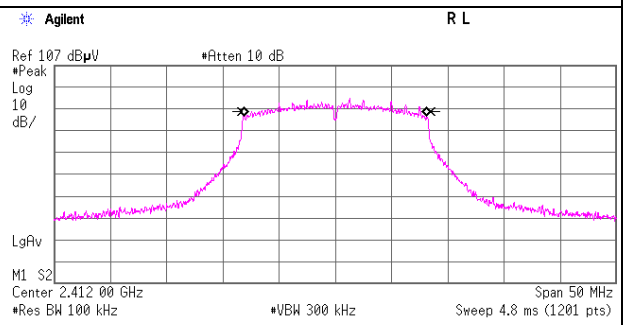
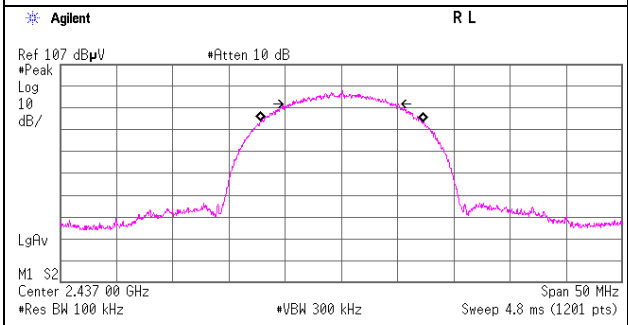
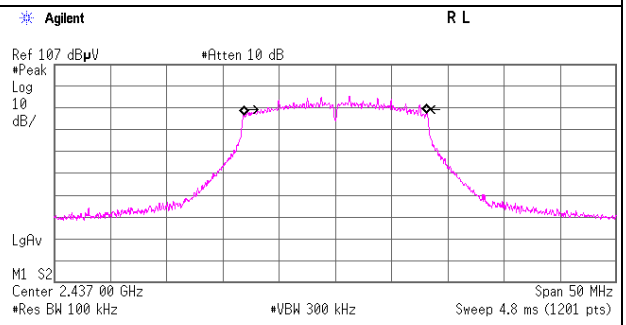
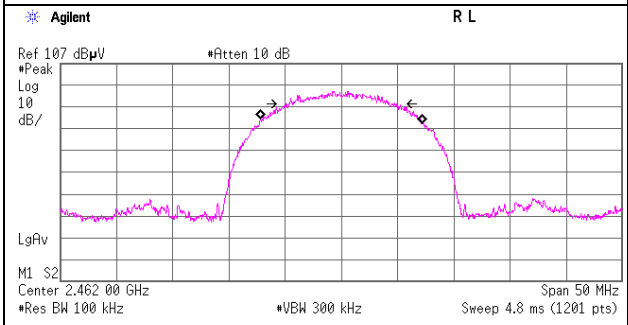
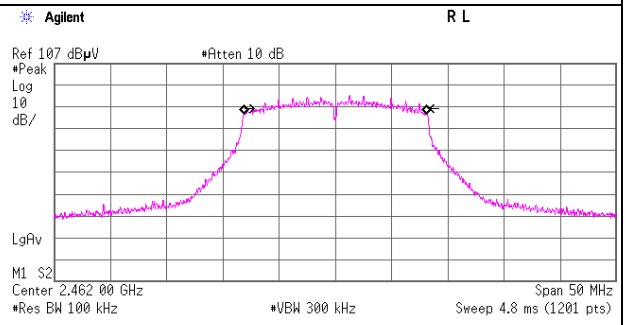
APPENDIX 1: Test data

6dB Bandwidth

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11504641S-B
Date December 15, 2016
Temperature / Humidity 24 deg. C / 35 % RH
Engineer Hiroyuki Morikawa
Mode Tx

Mode	Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
11b	2412	9.151	> 500
Antenna 1	2437	8.787	> 500
	2462	9.884	> 500
11g	2412	15.000	> 500
Antenna 1	2437	13.587	> 500
	2462	13.877	> 500
11n-20	2412	15.138	> 500
(SISO)	2437	15.132	> 500
Antenna 1	2462	15.150	> 500
11n-20	2412	15.121	> 500
(MIMO)	2437	15.107	> 500
Antenna 1	2462	15.098	> 500

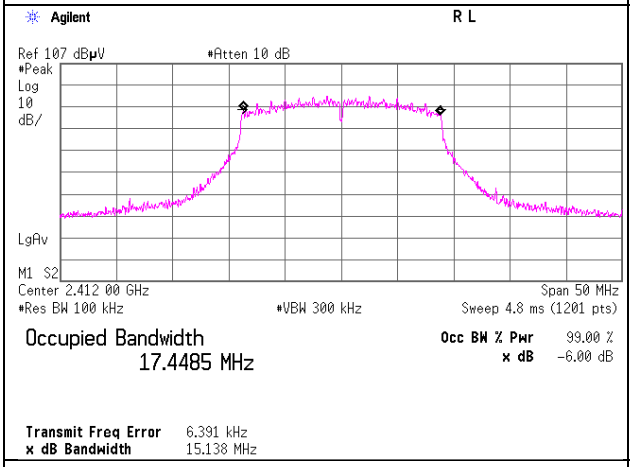
6dB Bandwidth

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

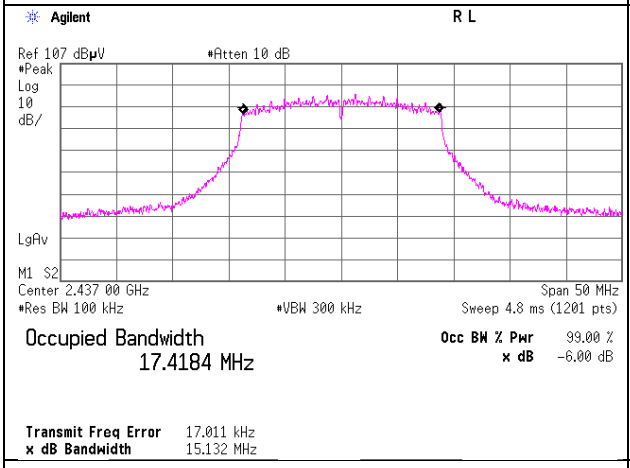
6dB Bandwidth

11n-20 (SISO)

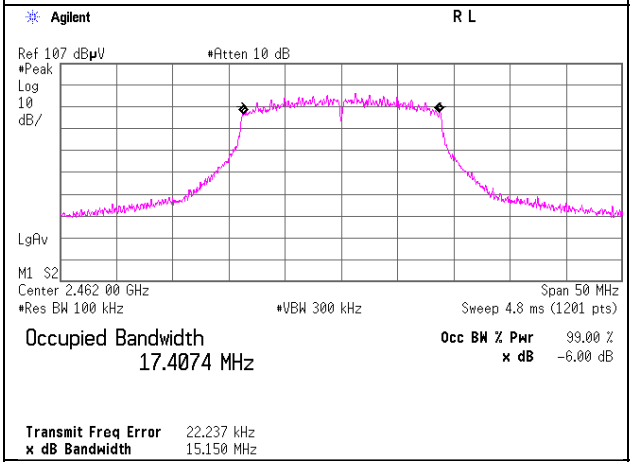
2412 MHz



2437 MHz

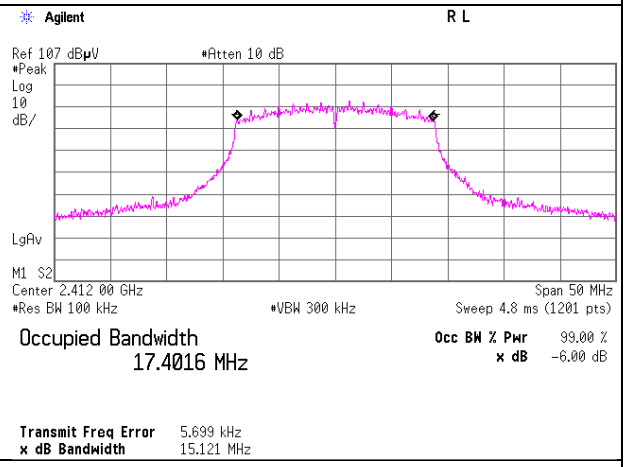


2462 MHz

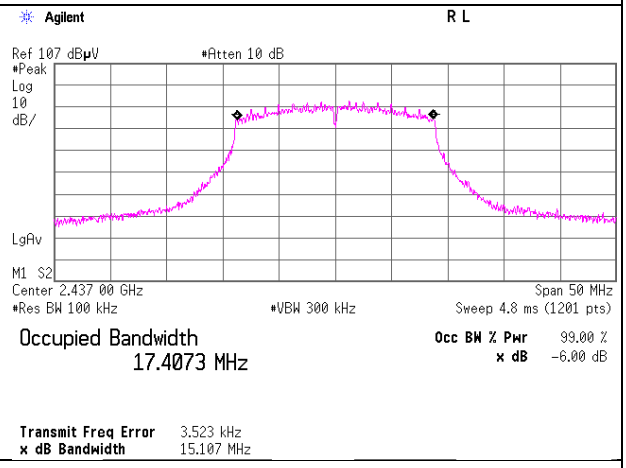


11n-20 (MIMO)

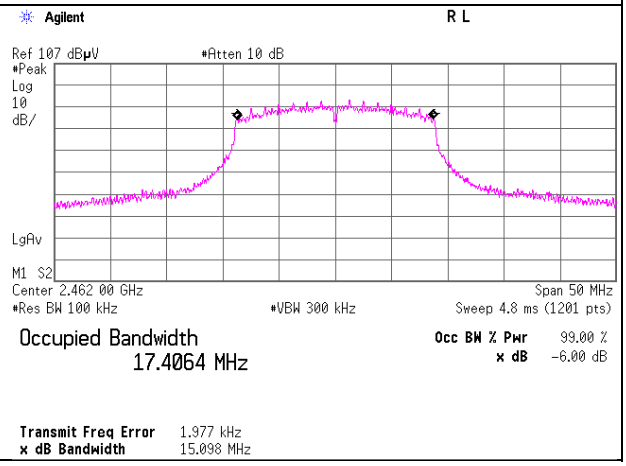
2412 MHz



2437 MHz



2462 MHz



Maximum Peak Output Power

Test place	Shonan EMC Lab. No.5 Shielded Room	
Report No.	11504641S-B	
Date	November 3, 2016	December 15, 2016
Temperature / Humidity	24 deg. C / 47 % RH	24 deg. C / 35 % RH
Engineer	Hiroyuki Morikawa	Hiroyuki Morikawa
Mode	Tx 11b	

Antenna 1

Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	-2.11	2.32	9.67	9.88	9.73	30.00	1000	20.12
2437	-1.77	2.32	9.67	10.22	10.52	30.00	1000	19.78
2462	-1.63	2.33	9.67	10.37	10.89	30.00	1000	19.63

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

Antenna 1, 2412MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
1	-2.61	
2	-2.47	
5.5	-2.24	
11	-2.11	*

Antenna 2, 2412MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
1	-2.65	
2	-2.63	
5.5	-2.47	
11	-2.35	

*: 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.	11504641S-B	
Date	November 3, 2016	December 15, 2016
Temperature / Humidity	24 deg. C / 47 % RH	24 deg. C / 35 % RH
Engineer	Hiroyuki Morikawa	Hiroyuki Morikawa
Mode	Tx 11g	

Antenna 1

Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	5.98	2.32	9.67	17.97	62.66	30.00	1000	12.03
2437	6.09	2.32	9.67	18.08	64.27	30.00	1000	11.92
2462	6.21	2.33	9.67	18.21	66.22	30.00	1000	11.79

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

Antenna 1, 2412 MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
6	5.86	
9	5.87	
12	5.77	
18	5.98	*
24	5.88	
36	5.74	
48	5.86	
54	5.95	

Antenna 2, 2412 MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
6	5.38	
9	5.49	
12	5.56	
18	5.60	
24	5.55	
36	5.41	
48	5.50	
54	5.62	

*: 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.	11504641S-B	
Date	November 3, 2016	December 15, 2016
Temperature / Humidity	24 deg. C / 47 % RH	24 deg. C / 35 % RH
Engineer	Hiroyuki Morikawa	Hiroyuki Morikawa
Mode	Tx 11n-20 (SISO)	

Antenna 1

Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	6.32	2.32	9.67	18.31	67.76	30.00	1000	11.69
2437	6.58	2.32	9.67	18.57	71.94	30.00	1000	11.43
2462	6.41	2.33	9.67	18.41	69.34	30.00	1000	11.59

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

Antenna 1, 2412 MHz

Rate	Reading	Remark
MCS	[dBm]	
0	6.01	
1	5.46	
2	4.78	
3	5.96	
4	5.24	
5	6.02	
6	5.74	
7	6.32	*

Antenna 2, 2412 MHz

Rate	Reading	Remark
MCS	[dBm]	
0	6.24	
1	5.97	
2	4.94	
3	6.01	
4	5.65	
5	5.93	
6	5.85	
7	6.25	

*: 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.	11504641S-B	
Date	November 3, 2016	December 15, 2016
Temperature / Humidity	24 deg. C / 47 % RH	24 deg. C / 35 % RH
Engineer	Hiroyuki Morikawa	Hiroyuki Morikawa
Mode	Tx 11n-20 (MIMO)	

Antenna 1 + 2

Freq.	Antenna 1 Result	Antenna 2 Result	Result		Limit		Margin
[MHz]	[mW]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	35.16	34.20	18.41	69.35	30.00	1000	11.59
2437	36.31	35.73	18.58	72.04	30.00	1000	11.42
2462	35.65	35.48	18.52	71.13	30.00	1000	11.48

Sample Calculation:
Result = Antenna 1 + 2

Antenna 1

Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	3.47	2.32	9.67	15.46	35.16	30.00	1000	14.54
2437	3.61	2.32	9.67	15.60	36.31	30.00	1000	14.40
2462	3.52	2.33	9.67	15.52	35.65	30.00	1000	14.48

Antenna 2

Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	3.35	2.32	9.67	15.34	34.20	30.00	1000	14.66
2437	3.54	2.32	9.67	15.53	35.73	30.00	1000	14.47
2462	3.50	2.33	9.67	15.50	35.48	30.00	1000	14.50

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

Maximum Peak Output Power

Test place	Shonan EMC Lab. No.5 Shielded Room	
Report No.	11504641S-B	
Date	November 3, 2016	December 15, 2016
Temperature / Humidity	24 deg. C / 47 % RH	24 deg. C / 35 % RH
Engineer	Hiroyuki Morikawa	Hiroyuki Morikawa
Mode	Tx 11n-20 (MIMO)	

2412 MHz

MCS Number	Reading Antenna 1		Reading Antenna 2		Reading Antenna 1 + Antenna 2		Remark
	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
8	3.29	2.13	3.32	2.15	6.31	4.28	
9	3.58	2.28	3.13	2.06	6.37	4.34	
10	3.42	2.20	2.92	1.96	6.19	4.16	
11	3.47	2.22	3.35	2.16	6.41	4.38	*
12	3.19	2.08	3.13	2.06	6.17	4.14	
13	3.46	2.22	3.31	2.14	6.39	4.36	
14	2.91	1.95	2.55	1.80	5.74	3.75	
15	2.58	1.81	2.81	1.91	5.71	3.72	

*worst rate

Average Output Power
(Reference data for RF Exposure)

Test place	Shonan EMC Lab. No.5 Shielded Room	
Report No.	11504641S-B	
Date	November 3, 2016	December 15, 2016
Temperature / Humidity	24 deg. C / 47 % RH	24 deg. C / 35 % RH
Engineer	Hiroyuki Morikawa	Hiroyuki Morikawa
Mode	Tx	

11b **11 Mbps** Antenna 1

Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	-6.55	2.32	9.67	5.44	3.50	2.66	8.10	6.46
2437	-6.21	2.32	9.67	5.78	3.78	2.66	8.44	6.98
2462	-6.10	2.33	9.67	5.90	3.89	2.66	8.56	7.18

11g **18 Mbps** Antenna 1

Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	-5.48	2.32	9.67	6.51	4.48	0.86	7.37	5.46
2437	-5.09	2.32	9.67	6.90	4.90	0.86	7.76	5.97
2462	-4.85	2.33	9.67	7.15	5.19	0.86	8.01	6.32

11n-20 (SISO) **MCS 7** Antenna 1

Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	-7.19	2.32	9.67	4.80	3.02	2.92	7.72	5.92
2437	-6.84	2.32	9.67	5.15	3.27	2.92	8.07	6.41
2462	-6.69	2.33	9.67	5.31	3.40	2.92	8.23	6.65

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

Average Output Power
(Reference data for RF Exposure)

Test place	Shonan EMC Lab. No.5 Shielded Room	
Report No.	11504641S-B	
Date	November 3, 2016	December 15, 2016
Temperature / Humidity	24 deg. C / 47 % RH	24 deg. C / 35 % RH
Engineer	Hiroyuki Morikawa	Hiroyuki Morikawa
Mode	Tx	

Antenna 1 + Antenna 2

Freq.	Antenna 1 Result	Antenna 2 Result	Result		Limit		Margin
[MHz]	[mW]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	3.05	3.02	7.83	6.07	30.00	1000	22.17
2437	3.20	2.82	7.80	6.02	30.00	1000	22.20
2462	3.23	3.30	8.15	6.53	30.00	1000	21.85

Sample Calculation:
Result = Main antenna + Sub antenna

11n-20 (MIMO) **MCS11** Antenna 1

Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	-9.64	2.32	9.67	2.35	1.72	2.50	4.85	3.05
2437	-9.44	2.32	9.67	2.55	1.80	2.50	5.05	3.20
2462	-9.41	2.33	9.67	2.59	1.82	2.50	5.09	3.23

11n-20 (MIMO) **MCS 11** Antenna 2

Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
2412	-9.69	2.32	9.67	2.30	1.70	2.50	4.80	3.02
2437	-9.98	2.32	9.67	2.01	1.59	2.50	4.51	2.82
2462	-9.31	2.33	9.67	2.69	1.86	2.50	5.19	3.30

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

Average Output Power
(Reference data for RF Exposure)

Test place	Shonan EMC Lab. No.5 Shielded Room	
Report No.	11504641S-B	
Date	November 3, 2016	December 15, 2016
Temperature / Humidity	24 deg. C / 47 % RH	24 deg. C / 35 % RH
Engineer	Hiroyuki Morikawa	Hiroyuki Morikawa
Mode	Tx	

2412 MHz

Mode	Rate Mbps	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11b Antenna 1	1	-4.94	0.45	-4.49	
	2	-5.41	0.84	-4.57	
	5.5	-5.99	1.79	-4.20	
	11	-6.46	2.66	-3.80	*
11b Antenna 2	1	-5.21	0.45	-4.76	
	2	-5.61	0.84	-4.77	
	5.5	-6.27	1.79	-4.48	
	11	-6.89	2.66	-4.23	
11g Antenna 1	6	-5.18	0.30	-4.88	
	9	-5.18	0.45	-4.73	
	12	-5.40	0.59	-4.81	
	18	-5.48	0.86	-4.62	*
	24	-6.02	1.10	-4.92	
	36	-6.49	1.53	-4.96	
	48	-6.59	1.96	-4.63	
	54	-7.08	2.15	-4.93	
11g Antenna 2	6	-5.34	0.30	-5.04	
	9	-5.44	0.45	-4.99	
	12	-5.58	0.59	-4.99	
	18	-5.82	0.86	-4.96	
	24	-6.25	1.10	-5.15	
	36	-6.57	1.53	-5.04	
	48	-6.89	1.96	-4.93	
	54	-7.16	2.15	-5.01	

* Worst rate

Sample Calculation:

Burst power = Reading (timed average) + Duty factor

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.	11504641S-B	
Date	November 3, 2016	December 15, 2016
Temperature / Humidity	24 deg. C / 47 % RH	24 deg. C / 35 % RH
Engineer	Hiroyuki Morikawa	Hiroyuki Morikawa
Mode	Tx	

2412 MHz

Mode	Rate MCS	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11n-20 (SISO) Antenna 1	0	-5.10	0.43	-4.67	
	1	-5.51	0.82	-4.69	
	2	-5.75	1.14	-4.61	
	3	-5.86	1.46	-4.40	
	4	-6.57	2.04	-4.53	
	5	-6.81	2.51	-4.30	
	6	-7.09	2.67	-4.42	
	7	-7.19	2.92	-4.27	*
11n-20 (SISO) Antenna 2	0	-5.18	0.43	-4.75	
	1	-5.32	0.82	-4.50	
	2	-5.60	1.14	-4.46	
	3	-5.95	1.46	-4.49	
	4	-6.55	2.04	-4.51	
	5	-7.18	2.51	-4.67	
	6	-7.14	2.67	-4.47	
	7	-7.32	2.92	-4.40	

* Worst rate

Sample Calculation:

Burst power = Reading (timed average) + Duty factor

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.	11504641S-B	
Date	November 3, 2016	December 15, 2016
Temperature / Humidity	24 deg. C / 47 % RH	24 deg. C / 35 % RH
Engineer	Hiroyuki Morikawa	Hiroyuki Morikawa
Mode	Tx	

Mode	Mode	Duty factor	Cable Loss	Atten. Loss	Antenna 1		
					Reading	Result	
	(MCS)	[dB]	[dB]	[dB]	[dBm]	[dBm]	[mW]
11n-20 (MIMO) Antenna 1	8	0.80	2.32	9.67	-8.58	4.21	2.64
	9	1.46	2.32	9.67	-8.73	4.72	2.96
	10	1.99	2.32	9.67	-9.23	4.75	2.99
	11	2.50	2.32	9.67	-9.64	4.85	3.05
	12	3.26	2.32	9.67	-10.35	4.90	3.09
	13	3.79	2.32	9.67	-10.97	4.81	3.03
	14	4.06	2.32	9.67	-12.74	3.31	2.14
	15	4.28	2.32	9.67	-13.83	2.44	1.75

Mode	Mode	Duty factor	Cable Loss	Atten. Loss	Antenna 2		
					Reading	Result	
(MCS)	(MCS)	[dB]	[dB]	[dB]	[dBm]	[dBm]	[mW]
11n-20 (MIMO) Antenna 2	8	0.80	2.32	9.67	-8.55	4.24	2.65
	9	1.46	2.32	9.67	-8.88	4.57	2.86
	10	1.99	2.32	9.67	-9.35	4.63	2.90
	11	2.50	2.32	9.67	-9.69	4.80	3.02
	12	3.26	2.32	9.67	-10.53	4.72	2.96
	13	3.79	2.32	9.67	-11.09	4.69	2.94
	14	4.06	2.32	9.67	-12.82	3.23	2.10
	15	4.28	2.32	9.67	-13.97	2.30	1.70

Mode	Mode	Antenna 1 + 2 Result		Remarks
(MCS)	(MCS)	[dBm]	[mW]	
11n-20 (MIMO)	8	7.23	5.29	
	9	7.65	5.82	
	10	7.70	5.89	
	11	7.83	6.07	*
	12	7.82	6.05	
	13	7.76	5.97	
	14	6.27	4.24	
	15	5.38	3.45	

* Worst rate

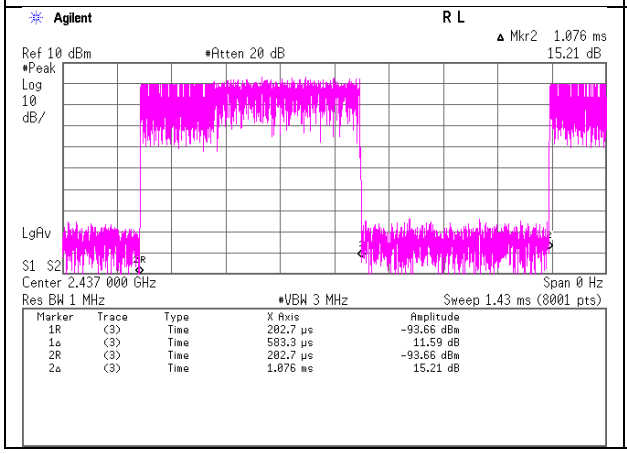
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

Burst rate confirmation

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11504641S-B
Date	November 3, 2016
Temperature / Humidity	24 deg. C / 47 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx

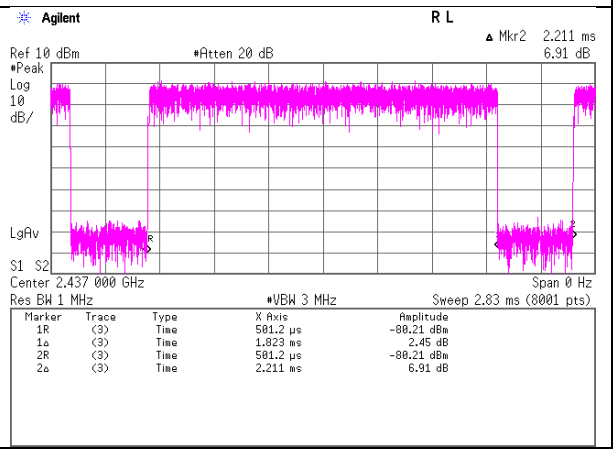
11b 11 Mbps

Tx on / (Tx on + Tx off) = 0.542
Tx on / (Tx on + Tx off) * 100 = 54.2 %
Duty factor = 20 * log (1.076 / 0.5833) = 5.32 dB



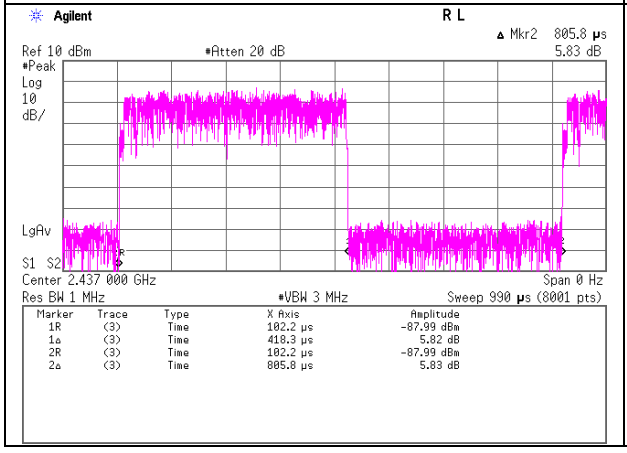
11g 18 Mbps

Tx on / (Tx on + Tx off) = 0.825
Tx on / (Tx on + Tx off) * 100 = 82.5 %
Duty factor = 20 * log (2.211 / 1.823) = 1.68 dB



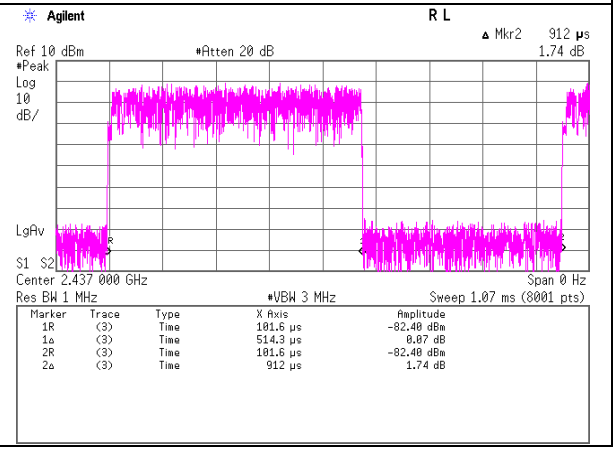
11n-20 (SISO) MCS7

Tx on / (Tx on + Tx off) = 0.519
Tx on / (Tx on + Tx off) * 100 = 51.9 %
Duty factor = 20 * log (0.806 / 0.418) = 5.70 dB



11n-20 (MIMO) MCS11

Tx on / (Tx on + Tx off) = 0.564
Tx on / (Tx on + Tx off) * 100 = 56.4 %
Duty factor = 20 * log (0.912 / 0.51434) = 4.97 dB



Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11504641S-B		
Date	December 10, 2016	November 4, 2016	November 18, 2016
Temperature / Humidity	23 deg. C / 34 % RH	25 deg. C / 41 % RH	23 deg. C / 46 % RH
Engineer	Shinichi Takano	Shinichi Takano	Kenichi Adachi
	(1 GHz -13 GHz)	(13 GHz -26.5 GHz)	(26.5 GHz -31.5 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	43.84	27.41	13.77	37.06	2.24	50.20	73.90	23.7	188	123	
Hori.	3833.608	PK	47.73	29.36	5.65	36.85	2.24	48.13	73.90	25.7	113	111	
Hori.	4824.000	PK	43.96	31.17	5.95	37.13	2.24	46.19	73.90	27.7	150	0	
Hori.	7236.000	PK	44.50	36.52	7.38	37.86	2.24	52.78	73.90	21.1	150	0	Floor Noise
Hori.	3833.608	AV	42.83	29.36	5.65	36.85	2.24	43.23	53.90	10.6	113	111	
Hori.	7236.000	AV	34.80	36.52	7.38	37.86	2.24	43.08	53.90	10.8	150	0	Floor Noise
Vert.	2390.000	PK	43.38	27.41	13.77	37.06	2.24	49.74	73.90	24.1	224	132	
Vert.	3833.320	PK	45.11	29.36	5.65	36.85	2.24	45.51	73.90	28.3	226	334	
Vert.	4824.000	PK	44.32	31.17	5.95	37.13	2.24	46.55	73.90	27.3	154	315	
Vert.	7236.000	PK	44.14	36.52	7.38	37.86	2.24	52.42	73.90	21.4	150	0	Floor Noise
Vert.	3833.320	AV	41.47	29.36	5.65	36.85	2.24	41.87	53.90	12.0	226	334	
Vert.	7236.000	AV	35.09	36.52	7.38	37.86	2.24	43.37	53.90	**10.5**	150	0	Floor Noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 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	34.51	27.41	13.77	37.06	5.32	2.24	46.19	53.90	**7.7**	*1)
Hori.	4824.000	AV	34.15	31.17	5.95	37.13	5.32	2.24	41.70	53.90	12.2	
Vert.	2390.000	AV	34.29	27.41	13.77	37.06	5.32	2.24	45.97	53.90	7.9	*1)
Vert.	4824.000	AV	34.75	31.17	5.95	37.13	5.32	2.24	42.30	53.90	11.6	

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 (3.88 m / 3.0 m) = 2.24 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)

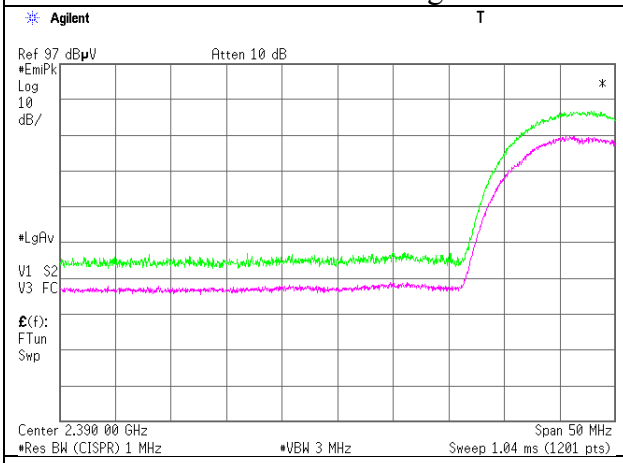
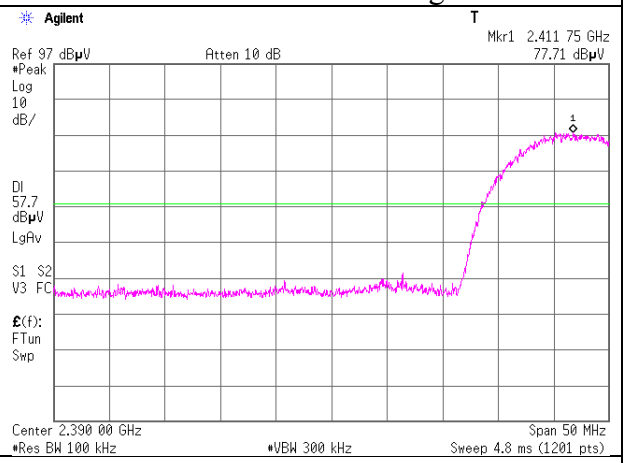
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	77.54	27.50	13.79	37.04	2.24	84.03	-	-	Carrier
Hori.	2396.112	PK	37.78	27.43	13.78	37.05	2.24	44.18	64.03	19.9	
Hori.	2400.000	PK	34.91	27.45	13.78	37.05	2.24	41.33	64.03	22.7	
Hori.	9648.000	PK	39.41	38.66	8.33	39.15	2.24	49.49	64.03	14.5	
Vert.	2412.000	PK	80.51	27.50	13.79	37.04	2.24	87.00	-	-	Carrier
Vert.	2397.475	PK	36.56	27.44	13.78	37.05	2.24	42.97	67.00	24.0	
Vert.	2400.000	PK	36.35	27.45	13.78	37.05	2.24	42.77	67.00	24.2	
Vert.	9648.000	PK	42.18	38.66	8.33	39.15	2.24	52.26	67.00	14.7	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

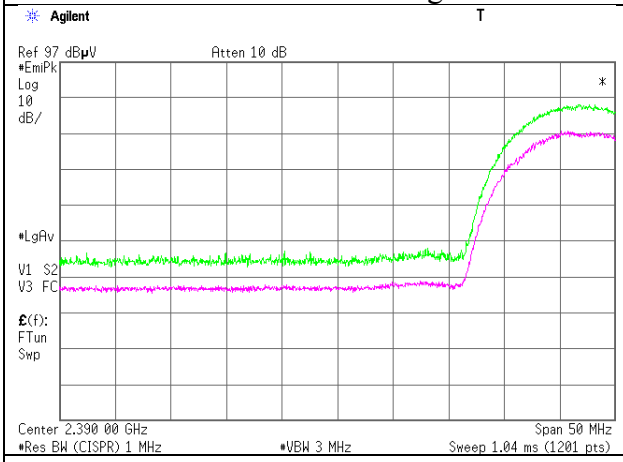
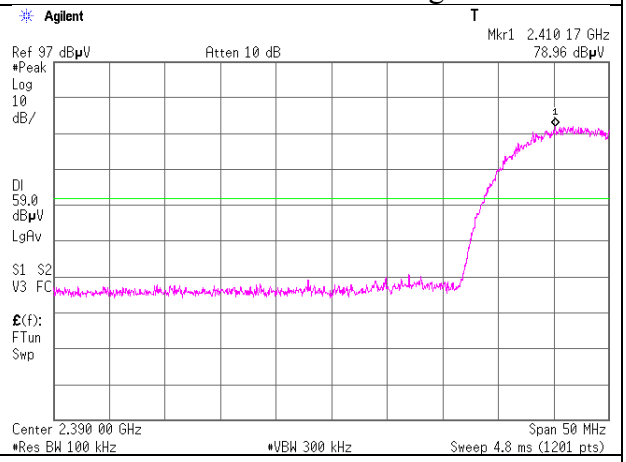
Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11504641S-B
Date	December 10, 2016
Temperature / Humidity	23 deg. C / 34 % RH
Engineer	Shinichi Takano
	(1 GHz -13 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

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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11504641S-B		
Date	December 10, 2016	November 4, 2016	November 18, 2016
Temperature / Humidity	23 deg. C / 34 % RH	25 deg. C / 41 % RH	23 deg. C / 46 % RH
Engineer	Shinichi Takano	Shinichi Takano	Kenichi Adachi
	(1 GHz -13 GHz)	(13 GHz -26.5 GHz)	(26.5 GHz -31.5 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.	3833.531	PK	48.09	29.36	5.65	36.85	2.24	48.49	73.90	25.4	110	110	
Hori.	4874.000	PK	43.20	31.28	5.96	37.15	2.24	45.53	73.90	28.3	150	0	
Hori.	7311.000	PK	43.87	36.74	7.36	37.91	2.24	52.30	73.90	21.6	150	0	Floor Noise
Hori.	3833.531	AV	42.93	29.36	5.65	36.85	2.24	43.33	53.90	**10.5**	110	110	
Hori.	7311.000	AV	34.90	36.74	7.36	37.91	2.24	43.33	53.90	**10.5**	150	0	Floor Noise
Vert.	3833.319	PK	47.15	29.36	5.65	36.85	2.24	47.55	73.90	26.3	265	332	
Vert.	4874.000	PK	44.31	31.28	5.96	37.15	2.24	46.64	73.90	27.2	100	318	
Vert.	7311.000	PK	44.74	36.74	7.36	37.91	2.24	53.17	73.90	20.7	150	0	Floor Noise
Vert.	3833.319	AV	41.44	29.36	5.65	36.85	2.24	41.84	53.90	12.0	265	332	
Vert.	7311.000	AV	34.78	36.74	7.36	37.91	2.24	43.21	53.90	10.6	150	0	Floor Noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 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	33.85	31.28	5.96	37.15	5.32	2.24	41.50	53.90	12.4	
Vert.	4874.000	AV	34.33	31.28	5.96	37.15	5.32	2.24	41.98	53.90	**11.9**	

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 (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
Duty factor refer to "Duty factor Calculation chart" sheet.

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.	2437.000	PK	78.88	27.60	13.81	37.03	2.24	85.50	-	-	Carrier
Hori.	9748.000	PK	39.22	38.74	8.35	39.19	2.24	49.36	65.50	16.1	
Vert.	2437.000	PK	82.32	27.60	13.81	37.03	2.24	88.94	-	-	Carrier
Vert.	9748.000	PK	42.28	38.74	8.35	39.19	2.24	52.42	68.94	16.5	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11504641S-B		
Date	December 10, 2016	November 4, 2016	November 18, 2016
Temperature / Humidity	23 deg. C / 34 % RH	25 deg. C / 41 % RH	23 deg. C / 46 % RH
Engineer	Shinichi Takano	Shinichi Takano	Kenichi Adachi
	(1 GHz -13 GHz)	(13 GHz -26.5 GHz)	(26.5 GHz -31.5 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	44.69	27.79	13.86	37.01	2.24	51.57	73.90	22.3	166	44	
Hori.	3833.612	PK	47.94	29.36	5.65	36.85	2.24	48.34	73.90	25.5	110	112	
Hori.	4924.000	PK	42.97	31.38	5.97	37.18	2.24	45.38	73.90	28.5	150	0	
Hori.	7386.000	PK	43.98	36.95	7.34	37.96	2.24	52.55	73.90	21.3	150	0	Floor Noise
Hori.	3833.612	AV	42.91	29.36	5.65	36.85	2.24	43.31	53.90	10.5	110	112	
Hori.	7386.000	AV	34.85	36.95	7.34	37.96	2.24	43.42	53.90	**10.4**	150	0	Floor Noise
Vert.	2483.500	PK	43.46	27.79	13.86	37.01	2.24	50.34	73.90	23.5	167	142	
Vert.	3833.196	PK	47.67	29.36	5.65	36.85	2.24	48.07	73.90	25.8	263	334	
Vert.	4924.000	PK	44.32	31.38	5.97	37.18	2.24	46.73	73.90	27.1	156	208	
Vert.	7386.000	PK	43.91	36.95	7.34	37.96	2.24	52.48	73.90	21.4	150	0	Floor Noise
Vert.	3833.196	AV	41.50	29.36	5.65	36.85	2.24	41.90	53.90	12.0	263	334	
Vert.	7386.000	AV	34.81	36.95	7.34	37.96	2.24	43.38	53.90	10.5	150	0	Floor Noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 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	35.47	27.79	13.86	37.01	5.32	2.24	47.67	53.90	**6.2**	*1)
Hori.	4924.000	AV	33.97	31.38	5.97	37.18	5.32	2.24	41.70	53.90	12.2	
Vert.	2483.500	AV	34.51	27.79	13.86	37.01	5.32	2.24	46.71	53.90	7.2	*1)
Vert.	4924.000	AV	34.63	31.38	5.97	37.18	5.32	2.24	42.36	53.90	11.5	

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 (3.88 m / 3.0 m) = 2.24 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.	2462.000	PK	77.06	27.70	13.84	37.02	2.24	83.82	-	-	Carrier
Hori.	9848.000	PK	39.33	38.81	8.37	39.23	2.24	49.52	63.82	14.3	
Vert.	2462.000	PK	82.25	27.70	13.84	37.02	2.24	89.01	-	-	Carrier
Vert.	9848.000	PK	43.58	38.81	8.37	39.23	2.24	53.77	69.01	15.2	

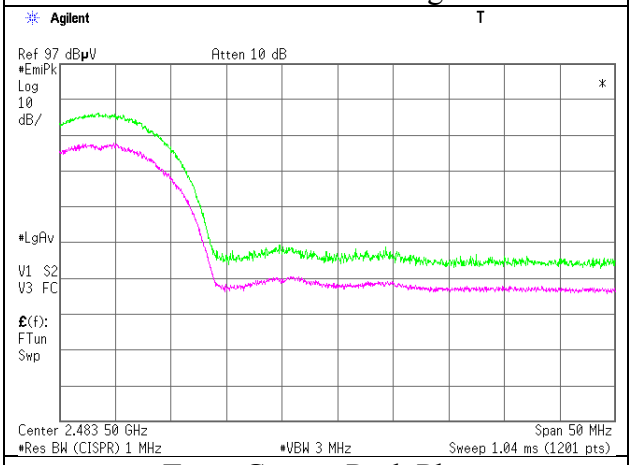
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11504641S-B
Date	December 10, 2016
Temperature / Humidity	23 deg. C / 34 % RH
Engineer	Shinichi Takano
	(1 GHz -13 GHz)
Mode	Tx 11b 2462 MHz

Horizontal

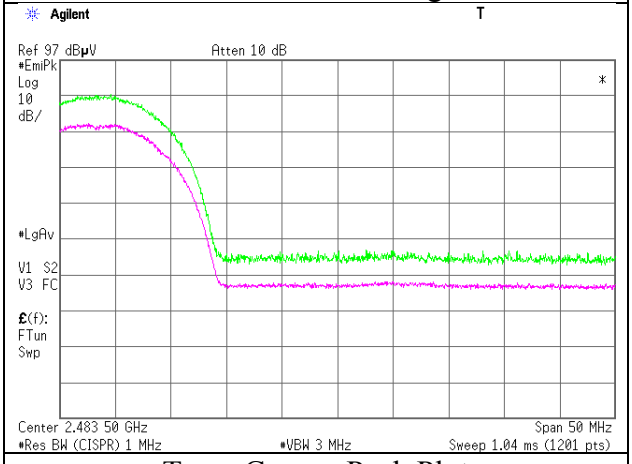
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11504641S-B		
Date	December 10, 2016	November 4, 2016	November 18, 2016
Temperature / Humidity	23 deg. C / 34 % RH	25 deg. C / 41 % RH	23 deg. C / 46 % RH
Engineer	Shinichi Takano	Shinichi Takano	Kenichi Adachi
	(1 GHz -13 GHz)	(13 GHz -26.5 GHz)	(26.5 GHz -31.5 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	44.51	27.41	13.77	37.06	2.24	50.87	73.90	23.0	197	122	
Hori.	3833.614	PK	47.92	29.36	5.65	36.85	2.24	48.32	73.90	25.5	115	110	
Hori.	4824.000	PK	44.16	31.17	5.95	37.13	2.24	46.39	73.90	27.5	150	0	
Hori.	7236.000	PK	44.58	36.52	7.38	37.86	2.24	52.86	73.90	21.0	150	0	Floor Noise
Hori.	3833.614	AV	42.81	29.36	5.65	36.85	2.24	43.21	53.90	**10.6**	115	110	
Hori.	4824.000	AV	33.99	31.17	5.95	37.13	2.24	36.22	53.90	17.6	150	0	*1)
Hori.	7236.000	AV	34.81	36.52	7.38	37.86	2.24	43.09	53.90	10.8	150	0	Floor Noise
Vert.	2390.000	PK	44.33	27.41	13.77	37.06	2.24	50.69	73.90	23.2	247	137	
Vert.	3833.175	PK	47.43	29.36	5.65	36.85	2.24	47.83	73.90	26.0	266	327	
Vert.	4824.000	PK	44.47	31.17	5.95	37.13	2.24	46.70	73.90	27.2	104	315	
Vert.	7236.000	PK	44.12	36.52	7.38	37.86	2.24	52.40	73.90	21.5	150	0	Floor Noise
Vert.	3833.175	AV	41.54	29.36	5.65	36.85	2.24	41.94	53.90	11.9	266	327	
Vert.	4824.000	AV	34.65	31.17	5.95	37.13	2.24	36.88	53.90	17.0	104	315	*1)
Vert.	7236.000	AV	34.73	36.52	7.38	37.86	2.24	43.01	53.90	10.8	150	0	Floor Noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
*1) Not apply duty factor, because duty cycle of this noise was above 98 %.

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	34.51	27.41	13.77	37.06	1.68	2.24	42.55	53.90	11.3	*1)
Vert.	2390.000	AV	34.89	27.41	13.77	37.06	1.68	2.24	42.93	53.90	**11.0**	*1)

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 (3.88 m / 3.0 m) = 2.24 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)**

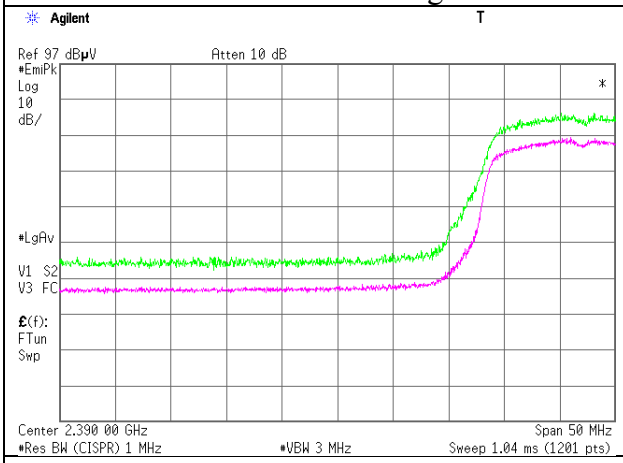
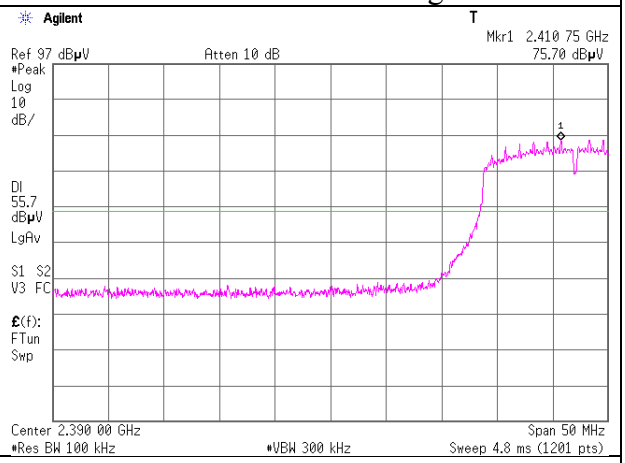
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	76.13	27.50	13.79	37.04	2.24	82.62	-	-	Carrier
Hori.	2400.000	PK	39.19	27.45	13.78	37.05	2.24	45.61	62.62	17.0	
Hori.	9648.000	PK	39.91	38.66	8.33	39.15	2.24	49.99	62.62	12.6	
Vert.	2412.000	PK	77.10	27.50	13.79	37.04	2.24	83.59	-	-	Carrier
Vert.	2400.000	PK	40.73	27.45	13.78	37.05	2.24	47.15	63.59	16.4	
Vert.	9648.000	PK	41.82	38.66	8.33	39.15	2.24	51.90	63.59	11.7	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

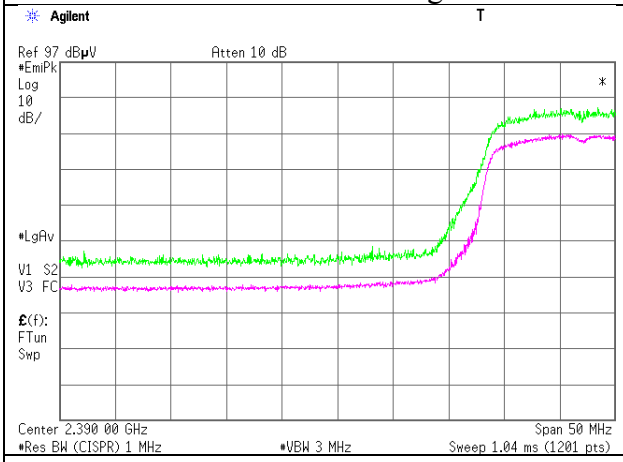
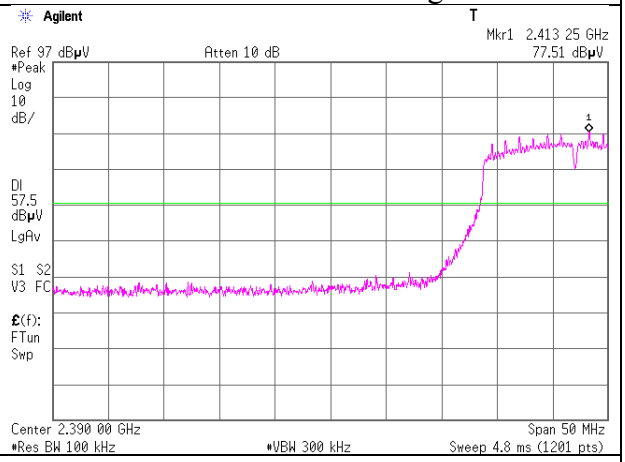
Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11504641S-B
Date	December 10, 2016
Temperature / Humidity	23 deg. C / 34 % RH
Engineer	Shinichi Takano
	(1 GHz -13 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

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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11504641S-B		
Date	December 10, 2016	November 4, 2016	November 18, 2016
Temperature / Humidity	23 deg. C / 34 % RH	25 deg. C / 41 % RH	23 deg. C / 46 % RH
Engineer	Shinichi Takano	Shinichi Takano	Kenichi Adachi
	(1 GHz -13 GHz)	(13 GHz -26.5 GHz)	(26.5 GHz -31.5 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.	3833.623	PK	48.04	29.36	5.65	36.85	2.24	48.44	73.90	25.4	114	117	
Hori.	4874.000	PK	43.66	31.28	5.96	37.15	2.24	45.99	73.90	27.9	150	0	
Hori.	7311.000	PK	44.13	36.74	7.36	37.91	2.24	52.56	73.90	21.3	150	0	Floor Noise
Hori.	3833.623	AV	42.43	29.36	5.65	36.85	2.24	42.83	53.90	11.0	114	117	
Hori.	4874.000	AV	34.00	31.28	5.96	37.15	2.24	36.33	53.90	17.5	150	0	*1)
Hori.	7311.000	AV	34.66	36.74	7.36	37.91	2.24	43.09	53.90	10.8	150	0	Floor Noise
Vert.	3833.096	PK	47.66	29.36	5.65	36.85	2.24	48.06	73.90	25.8	266	334	
Vert.	4874.000	PK	44.11	31.28	5.96	37.15	2.24	46.44	73.90	27.4	121	314	
Vert.	7311.000	PK	45.49	36.74	7.36	37.91	2.24	53.92	73.90	19.9	150	0	Floor Noise
Vert.	3833.096	AV	41.78	29.36	5.65	36.85	2.24	42.18	53.90	11.7	266	334	
Vert.	4874.000	AV	34.66	31.28	5.96	37.15	2.24	36.99	53.90	16.9	121	314	*1)
Vert.	7311.000	AV	35.31	36.74	7.36	37.91	2.24	43.74	53.90	**10.1**	150	0	Floor Noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
*1) Not apply duty factor, because duty cycle of this noise was above 98 %.

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.	2437.000	PK	77.54	27.60	13.81	37.03	2.24	84.16	-	-	Carrier
Hori.	9748.000	PK	38.23	38.74	8.35	39.19	2.24	48.37	64.16	15.8	
Vert.	2437.000	PK	80.27	27.60	13.81	37.03	2.24	86.89	-	-	Carrier
Vert.	9748.000	PK	41.68	38.74	8.35	39.19	2.24	51.82	66.89	15.1	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11504641S-B		
Date	December 10, 2016	November 4, 2016	November 18, 2016
Temperature / Humidity	23 deg. C / 34 % RH	25 deg. C / 41 % RH	23 deg. C / 46 % RH
Engineer	Shinichi Takano	Shinichi Takano	Kenichi Adachi
	(1 GHz -13 GHz)	(13 GHz -26.5 GHz)	(26.5 GHz -31.5 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.	2483.500	PK	45.60	27.79	13.86	37.01	2.24	52.48	73.90	21.4	232	125	
Hori.	3833.298	PK	47.85	29.36	5.65	36.85	2.24	48.25	73.90	25.6	110	112	
Hori.	4924.000	PK	43.53	31.38	5.97	37.18	2.24	45.94	73.90	27.9	150	0	
Hori.	7386.000	PK	44.18	36.95	7.34	37.96	2.24	52.75	73.90	21.1	150	0	Floor Noise
Hori.	3833.298	AV	42.71	29.36	5.65	36.85	2.24	43.11	53.90	10.7	110	112	
Hori.	4924.000	AV	34.03	31.38	5.97	37.18	2.24	36.44	53.90	17.4	150	0	*1)
Hori.	7386.000	AV	34.78	36.95	7.34	37.96	2.24	43.35	53.90	**10.5**	150	0	Floor Noise
Vert.	2483.500	PK	47.85	27.79	13.86	37.01	2.24	54.73	73.90	19.1	166	144	
Vert.	3833.197	PK	47.82	29.36	5.65	36.85	2.24	48.22	73.90	25.6	265	326	
Vert.	4924.000	PK	44.87	31.38	5.97	37.18	2.24	47.28	73.90	26.6	206	204	
Vert.	7386.000	PK	43.80	36.95	7.34	37.96	2.24	52.37	73.90	21.5	100	0	Floor Noise
Vert.	3833.197	AV	41.67	29.36	5.65	36.85	2.24	42.07	53.90	11.8	265	326	
Vert.	4924.000	AV	34.89	31.38	5.97	37.18	2.24	37.30	53.90	16.6	206	204	*1)
Vert.	7386.000	AV	34.78	36.95	7.34	37.96	2.24	43.35	53.90	**10.5**	100	0	Floor Noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
*1) Not apply duty factor, because duty cycle of this noise was above 98 %.

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	35.32	27.79	13.86	37.01	1.68	2.24	43.88	53.90	10.0	*1)
Vert.	2483.500	AV	36.67	27.79	13.86	37.01	1.68	2.24	45.23	53.90	**8.7**	*1)

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 (3.88 m / 3.0 m) = 2.24 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.	2462.000	PK	75.81	27.70	13.84	37.02	2.24	82.57	-	-	Carrier
Hori.	9848.000	PK	38.88	38.81	8.37	39.23	2.24	49.07	62.57	13.5	
Vert.	2462.000	PK	79.47	27.70	13.84	37.02	2.24	86.23	-	-	Carrier
Vert.	9848.000	PK	42.89	38.81	8.37	39.23	2.24	53.08	66.23	13.2	

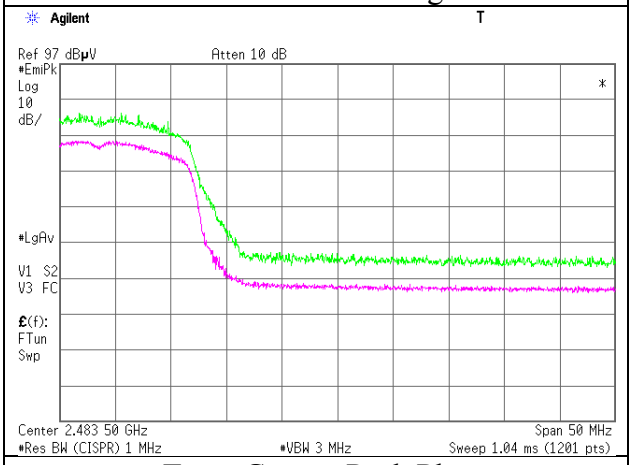
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11504641S-B
Date	December 10, 2016
Temperature / Humidity	23 deg. C / 34 % RH
Engineer	Shinichi Takano
	(1 GHz -13 GHz)
Mode	Tx 11g 2462 MHz

Horizontal

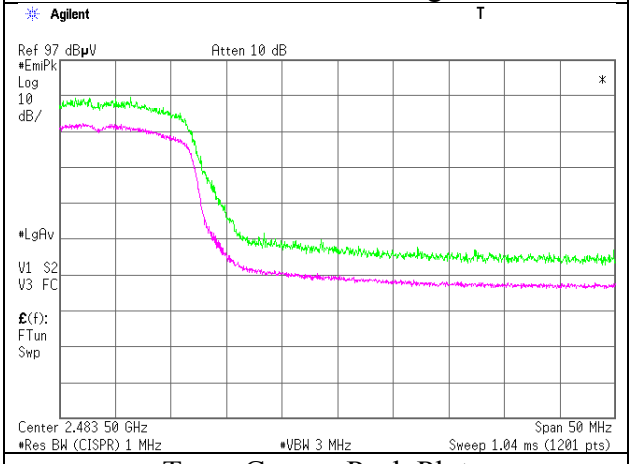
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

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

Radiated Spurious Emission

Test place	Shonan EMC Lab.			
Report No.	11504641S-B			
Semi Anechoic Chamber	No.3	No.2	No.3	No.3
Date	December 10, 2016	December 11, 2016	November 4, 2016	November 18, 2016
Temperature / Humidity	23 deg. C / 34 % RH	20 deg. C / 56 % RH	25 deg. C / 41 % RH	23 deg. C / 46 % RH
Engineer	Shinichi Takano	Shinichi Takano	Shinichi Takano	Kenichi Adachi
	(1 GHz -2.8 GHz)	(2.8 GHz -13 GHz)	(13 GHz -26.5 GHz)	(26.5 GHz -31.5 GHz)
Mode	Tx 11n-20 SISO 2412 MHz			

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	44.30	27.41	13.77	37.06	2.24	50.66	73.90	23.2	195	121	
Hori.	3833.617	PK	48.67	29.34	7.96	36.85	2.24	51.36	73.90	22.5	292	91	
Hori.	4824.000	PK	44.41	31.17	8.46	37.13	2.24	49.15	73.90	24.8	208	226	
Hori.	7236.000	PK	45.58	36.49	9.50	37.86	2.24	55.95	73.90	18.0	150	0	Floor Noise
Hori.	3833.617	AV	43.04	29.34	7.96	36.85	2.24	45.73	53.90	**8.2**	292	91	
Hori.	4824.000	AV	34.15	31.17	8.46	37.13	2.24	38.89	53.90	15.0	208	226	*1)
Hori.	7236.000	AV	35.27	36.49	9.50	37.86	2.24	45.64	53.90	8.3	150	0	Floor Noise
Vert.	2390.000	PK	44.34	27.41	13.77	37.06	2.24	50.70	73.90	23.2	249	137	
Vert.	3833.452	PK	46.21	29.34	7.96	36.85	2.24	48.90	73.90	25.0	304	333	
Vert.	4824.000	PK	44.28	31.17	8.46	37.13	2.24	49.02	73.90	24.9	276	197	
Vert.	7236.000	PK	44.34	36.49	9.50	37.86	2.24	54.71	73.90	19.2	150	0	Floor Noise
Vert.	3833.452	AV	39.87	29.34	7.96	36.85	2.24	42.56	53.90	11.3	304	333	
Vert.	4824.000	AV	34.13	31.17	8.46	37.13	2.24	38.87	53.90	15.0	276	197	*1)
Vert.	7236.000	AV	34.90	36.49	9.50	37.86	2.24	45.27	53.90	8.6	150	0	Floor Noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
*1) Not apply duty factor, because duty cycle of this noise was above 98 %.

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	34.73	27.41	13.77	37.06	5.70	2.24	46.79	53.90	**7.1**	*1)
Vert.	2390.000	AV	34.75	27.41	13.77	37.06	5.70	2.24	46.81	53.90	**7.1**	*1)

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 (3.88 m / 3.0 m) = 2.24 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)**

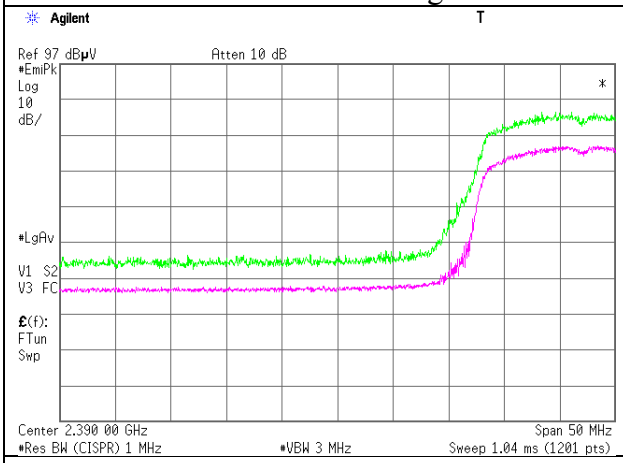
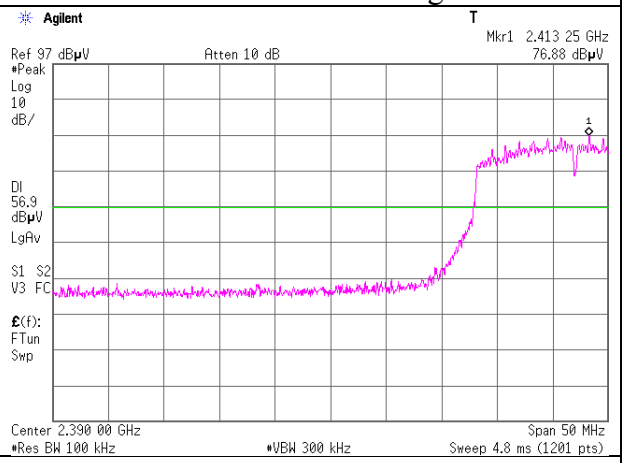
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	76.43	27.50	13.79	37.04	2.24	82.92	-	-	Carrier
Hori.	2400.000	PK	40.90	27.45	13.78	37.05	2.24	47.32	62.92	15.6	
Hori.	9648.000	PK	38.89	38.34	10.14	39.15	2.24	50.46	65.16	14.7	
Vert.	2412.000	PK	77.43	27.50	13.79	37.04	2.24	83.92	-	-	Carrier
Vert.	2400.000	PK	42.53	27.45	13.78	37.05	2.24	48.95	63.92	15.0	
Vert.	9648.000	PK	40.74	38.34	10.14	39.15	2.24	52.31	66.16	13.9	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

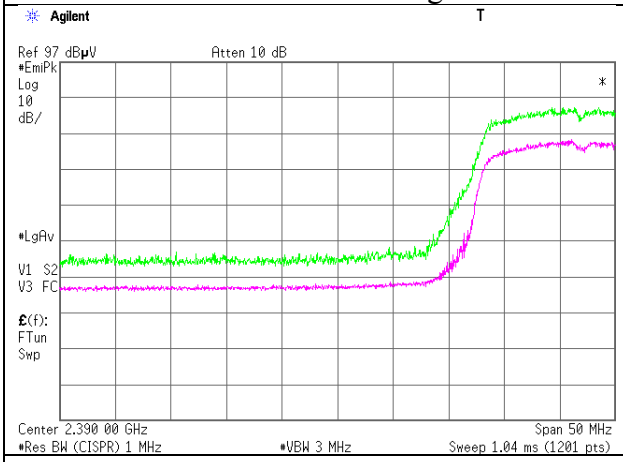
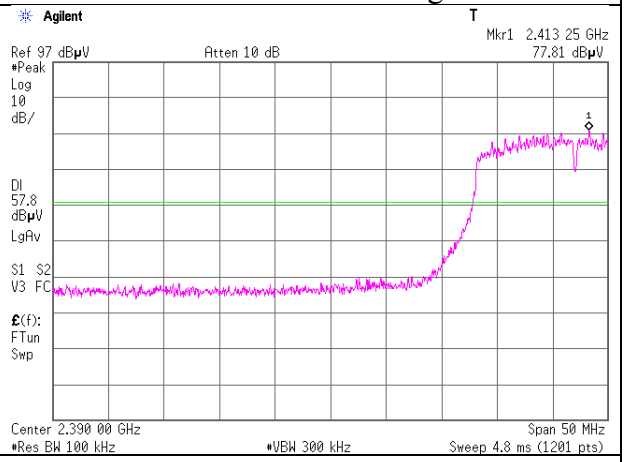
Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11504641S-B
Date	December 10, 2016
Temperature / Humidity	23 deg. C / 34 % RH
Engineer	Shinichi Takano
	(1 GHz -2.8 GHz)
Mode	Tx 11n-20 SISO 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

Test place	Shonan EMC Lab.			
Report No.	11504641S-B			
Semi Anechoic Chamber	No.3	No.2	No.3	No.3
Date	December 10, 2016	December 11, 2016	November 4, 2016	November 18, 2016
Temperature / Humidity	23 deg. C / 34 % RH	20 deg. C / 56 % RH	25 deg. C / 41 % RH	23 deg. C / 46 % RH
Engineer	Shinichi Takano	Shinichi Takano	Shinichi Takano	Kenichi Adachi
	(1 GHz -2.8 GHz)	(2.8 GHz -13 GHz)	(13 GHz -26.5 GHz)	(26.5 GHz -31.5 GHz)
Mode	Tx 11n-20 SISO 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.	3833.774	PK	47.40	29.34	7.96	36.85	2.24	50.09	73.90	23.8	292	89	
Hori.	4874.000	PK	43.00	31.28	8.48	37.15	2.24	47.85	73.90	26.1	204	210	
Hori.	7311.000	PK	44.21	36.62	9.51	37.91	2.24	54.67	73.90	19.2	150	0	Floor Noise
Hori.	3833.774	AV	41.42	29.34	7.96	36.85	2.24	44.11	53.90	9.8	292	89	
Hori.	4874.000	AV	33.95	31.28	8.48	37.15	2.24	38.80	53.90	15.1	204	210	*1)
Hori.	7311.000	AV	34.81	36.62	9.51	37.91	2.24	45.27	53.90	**8.6**	150	0	Floor Noise
Vert.	3834.288	PK	46.07	29.34	7.96	36.85	2.24	48.76	73.90	25.1	299	344	
Vert.	4874.000	PK	43.73	31.28	8.48	37.15	2.24	48.58	73.90	25.3	217	203	
Vert.	7311.000	PK	43.92	36.62	9.51	37.91	2.24	54.38	73.90	19.5	150	0	Floor Noise
Vert.	3834.288	AV	38.17	29.34	7.96	36.85	2.24	40.86	53.90	13.0	299	344	
Vert.	4874.000	AV	34.67	31.28	8.48	37.15	2.24	39.52	53.90	14.4	217	203	*1)
Vert.	7311.000	AV	34.34	36.62	9.51	37.91	2.24	44.80	53.90	9.1	150	0	Floor Noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
*1) Not apply duty factor, because duty cycle of this noise was above 98 %.

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.	2437.000	PK	77.99	27.60	13.81	37.03	2.24	84.61	-	-	Carrier
Hori.	9748.000	PK	37.57	38.50	10.19	39.19	2.24	49.31	66.85	17.5	
Vert.	2437.000	PK	79.95	27.60	13.81	37.03	2.24	86.57	-	-	Carrier
Vert.	9748.000	PK	40.14	38.50	10.19	39.19	2.24	51.88	68.81	16.9	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab.			
Report No.	11504641S-B			
Semi Anechoic Chamber	No.3	No.2	No.3	No.3
Date	December 10, 2016	December 11, 2016	November 4, 2016	November 18, 2016
Temperature / Humidity	23 deg. C / 34 % RH	20 deg. C / 56 % RH	25 deg. C / 41 % RH	23 deg. C / 46 % RH
Engineer	Shinichi Takano	Shinichi Takano	Shinichi Takano	Kenichi Adachi
	(1 GHz -2.8 GHz)	(2.8 GHz -13 GHz)	(13 GHz -26.5 GHz)	(26.5 GHz -31.5 GHz)
Mode	Tx 11n-20 SISO 2462 MHz			

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	44.32	27.79	13.86	37.01	2.24	51.20	73.90	22.7	134	40	
Hori.	3834.492	PK	49.47	29.34	7.96	36.85	2.24	52.16	73.90	21.7	326	95	
Hori.	4924.000	PK	43.04	31.38	8.51	37.18	2.24	47.99	73.90	25.9	217	199	
Hori.	7386.000	PK	43.21	36.75	9.52	37.96	2.24	53.76	73.90	20.1	150	0	Floor Noise
Hori.	3834.492	AV	44.51	29.34	7.96	36.85	2.24	47.20	53.90	**6.7**	326	95	
Hori.	4924.000	AV	33.98	31.38	8.51	37.18	2.24	38.93	53.90	15.0	217	199	*1)
Hori.	7386.000	AV	34.94	36.75	9.52	37.96	2.24	45.49	53.90	8.4	150	0	Floor Noise
Vert.	2483.500	PK	45.21	27.79	13.86	37.01	2.24	52.09	73.90	21.8	156	172	
Vert.	3834.492	PK	45.88	29.34	7.96	36.85	2.24	48.57	73.90	25.3	302	343	
Vert.	4924.000	PK	43.99	31.38	8.51	37.18	2.24	48.94	73.90	25.0	261	305	
Vert.	7386.000	PK	43.92	36.75	9.52	37.96	2.24	54.47	73.90	19.4	150	0	Floor Noise
Vert.	3834.492	AV	38.99	29.34	7.96	36.85	2.24	41.68	53.90	12.2	302	343	
Vert.	4924.000	AV	34.48	31.38	8.51	37.18	2.24	39.43	53.90	14.5	261	305	*1)
Vert.	7386.000	AV	34.64	36.75	9.52	37.96	2.24	45.19	53.90	8.7	150	0	Floor Noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
*1) Not apply duty factor, because duty cycle of this noise was above 98 %.

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	34.90	27.79	13.86	37.01	5.70	2.24	47.48	53.90	6.4	*1)
Vert.	2483.500	AV	35.01	27.79	13.86	37.01	5.70	2.24	47.59	53.90	**6.3**	*1)

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 (3.88 m / 3.0 m) = 2.24 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.	2462.000	PK	75.71	27.70	13.84	37.02	2.24	82.47	-	-	Carrier
Hori.	9848.000	PK	37.41	38.65	10.24	39.23	2.24	49.31	64.71	15.4	
Vert.	2462.000	PK	79.57	27.70	13.84	37.02	2.24	86.33	-	-	Carrier
Vert.	9848.000	PK	46.99	38.65	10.24	39.23	2.24	58.89	68.57	9.7	

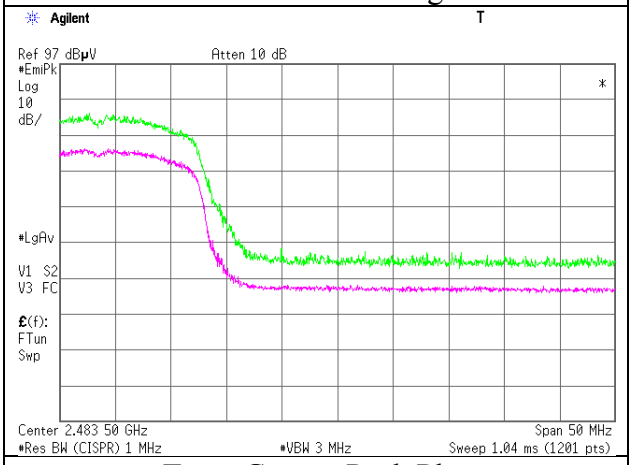
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11504641S-B
Date	November 5, 2016
Temperature / Humidity	23 deg. C / 44 % RH
Engineer	Yosuke Ishikawa (1 GHz -2.8 GHz)
Mode	Tx 11n-20 SISO 2462 MHz

Horizontal

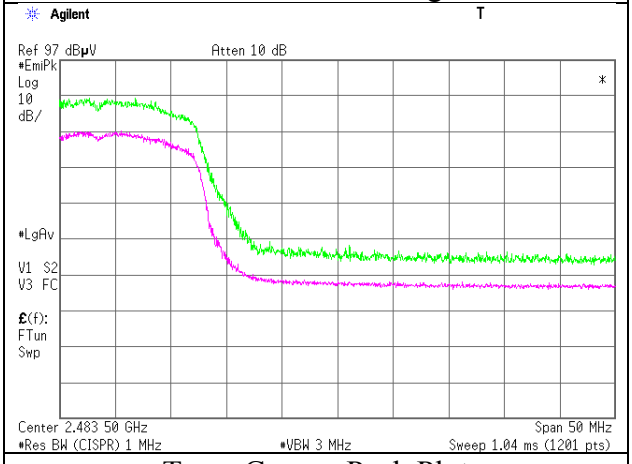
Restricted-band band-edge Plot



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

Test place	Shonan EMC Lab.			
Report No.	11504641S-B			
Semi Anechoic Chamber	No.3	No.2	No.3	No.3
Date	December 10, 2016	December 11, 2016	November 4, 2016	November 18, 2016
Temperature / Humidity	23 deg. C / 34 % RH	20 deg. C / 56 % RH	25 deg. C / 41 % RH	23 deg. C / 46 % RH
Engineer	Shinichi Takano	Shinichi Takano	Shinichi Takano	Kenichi Adachi
	(1 GHz -2.8 GHz)	(2.8 GHz -13 GHz)	(13 GHz -26.5 GHz)	(26.5 GHz -31.5 GHz)
Mode	Tx 11n-20 MIMO 2412 MHz			

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	43.24	27.41	13.77	37.06	2.24	49.60	73.90	24.3	182	255	
Hori.	3834.683	PK	46.41	29.34	7.96	36.85	2.24	49.10	73.90	24.8	288	101	
Hori.	4824.000	PK	43.59	31.17	8.46	37.13	2.24	48.33	73.90	25.6	207	305	
Hori.	7236.000	PK	43.88	36.49	9.50	37.86	2.24	54.25	73.90	19.7	150	0	Floor Noise
Hori.	3834.683	AV	39.16	29.34	7.96	36.85	2.24	41.85	53.90	12.1	288	101	
Hori.	4824.000	AV	34.73	31.17	8.46	37.13	2.24	39.47	53.90	14.4	207	305	*1)
Hori.	7236.000	AV	35.41	36.49	9.50	37.86	2.24	45.78	53.90	**8.1**	150	0	Floor Noise
Vert.	2390.000	PK	43.55	27.41	13.77	37.06	2.24	49.91	73.90	23.9	243	249	
Vert.	3834.706	PK	46.45	29.34	7.96	36.85	2.24	49.14	73.90	24.8	331	358	
Vert.	4824.000	PK	44.30	31.17	8.46	37.13	2.24	49.04	73.90	24.9	307	186	
Vert.	7236.000	PK	43.68	36.49	9.50	37.86	2.24	54.05	73.90	19.9	150	0	Floor Noise
Vert.	3834.706	AV	40.15	29.34	7.96	36.85	2.24	42.84	53.90	11.1	331	358	
Vert.	4824.000	AV	35.62	31.17	8.46	37.13	2.24	40.36	53.90	13.5	307	186	*1)
Vert.	7236.000	AV	34.74	36.49	9.50	37.86	2.24	45.11	53.90	8.8	150	0	Floor Noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
*1) Not apply duty factor, because duty cycle of this noise was above 98 %.

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	34.52	27.41	13.77	37.06	4.97	2.24	45.85	53.90	**8.0**	*1)
Vert.	2390.000	AV	34.47	27.41	13.77	37.06	4.97	2.24	45.80	53.90	8.1	*1)

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 (3.88 m / 3.0 m) = 2.24 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)**

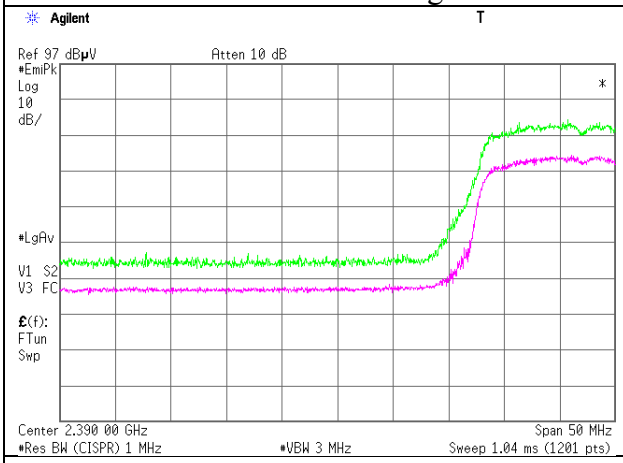
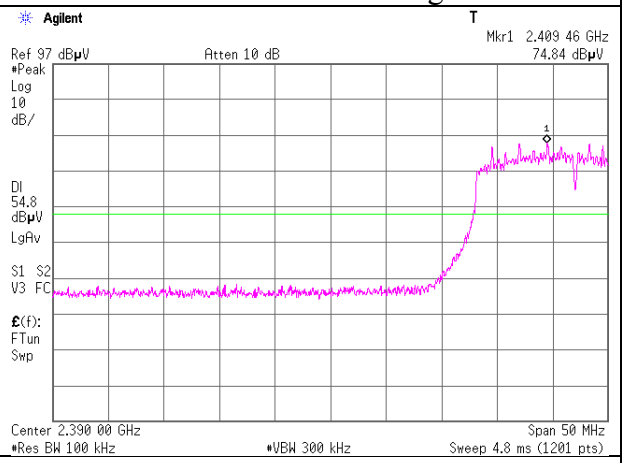
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	75.27	27.50	13.79	37.04	2.24	81.76	-	-	
Hori.	2400.000	PK	39.78	27.45	13.78	37.05	2.24	46.20	61.76	15.6	
Hori.	9648.000	PK	38.71	38.34	10.14	39.15	2.24	50.28	64.00	13.7	
Vert.	2412.000	PK	81.05	27.50	13.79	37.04	2.24	87.54	-	-	
Vert.	2400.000	PK	41.52	27.45	13.78	37.05	2.24	47.94	67.54	19.6	
Vert.	9648.000	PK	43.02	38.34	10.14	39.15	2.24	54.59	69.78	15.2	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

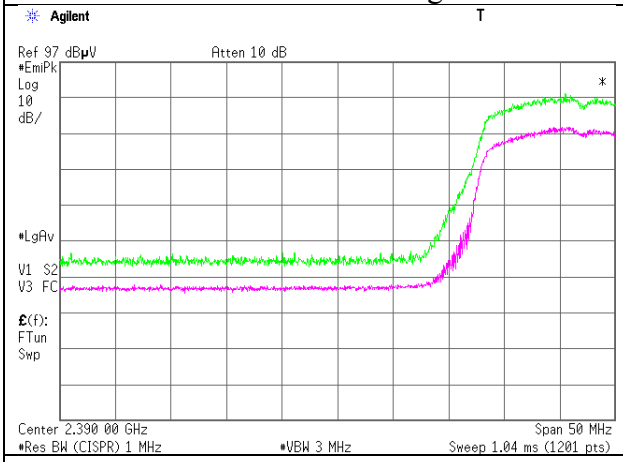
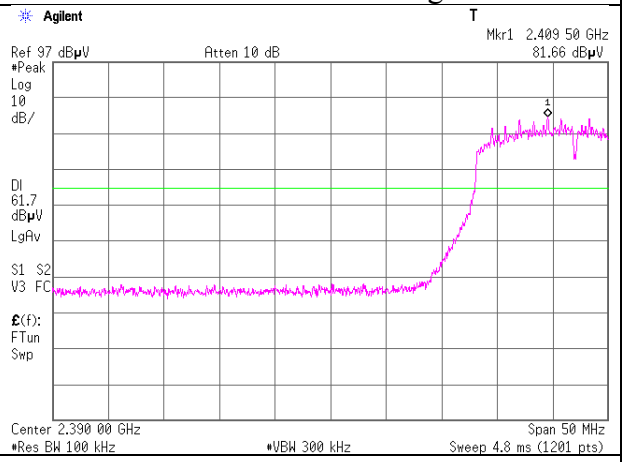
Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11504641S-B
Date	December 10, 2016
Temperature / Humidity	23 deg. C / 34 % RH
Engineer	Shinichi Takano
	(1 GHz -2.8 GHz)
Mode	Tx 11n-20 MIMO 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

Test place	Shonan EMC Lab.				
Report No.	11504641S-B				
Semi Anechoic Chamber	No.2	No.3	No.2	No.3	No.3
Date	November 8, 2016	December 10, 2016	December 11, 2016	November 4, 2016	November 18, 2016
Temperature / Humidity	23 deg. C / 38 % RH	23 deg. C / 34 % RH	20 deg. C / 56 % RH	25 deg. C / 41 % RH	23 deg. C / 46 % RH
Engineer	Takahiro Suzuki (30 MHz -1 GHz)	Shinichi Takano (1 GHz -2.8 GHz)	Shinichi Takano (2.8 GHz -13 GHz)	Shinichi Takano (13 GHz -26.5 GHz)	Kenichi Adachi (26.5 GHz -31.5 GHz)
Mode	Tx 11n-20 MIMO 2437 MHz				

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	145.000	QP	37.30	14.51	8.49	31.81	0.00	28.49	43.50	15.0	224	28	
Hori.	152.407	QP	39.00	14.76	8.62	31.81	0.00	30.57	43.50	12.9	226	255	
Hori.	155.000	QP	35.60	14.85	8.66	31.81	0.00	27.30	43.50	16.2	190	105	
Hori.	316.103	QP	41.70	13.73	6.67	31.66	0.00	30.44	46.00	15.5	152	263	
Hori.	735.107	QP	29.60	20.09	9.04	31.47	0.00	27.26	46.00	18.7	153	160	
Hori.	960.278	QP	37.00	22.14	10.10	30.42	0.00	38.82	53.90	15.0	100	170	
Hori.	3834.896	PK	46.52	29.34	7.96	36.85	2.24	49.21	73.90	24.7	283	106	
Hori.	4874.000	PK	43.94	31.28	8.48	37.15	2.24	48.79	73.90	25.1	239	306	
Hori.	7311.000	PK	43.96	36.62	9.51	37.91	2.24	54.42	73.90	19.5	150	0	Floor Noise
Hori.	3834.896	AV	40.38	29.34	7.96	36.85	2.24	43.07	53.90	10.8	283	106	
Hori.	4874.000	AV	34.65	31.28	8.48	37.15	2.24	39.50	53.90	14.4	239	306	*1)
Hori.	7311.000	AV	34.82	36.62	9.51	37.91	2.24	45.28	53.90	**8.6**	150	0	Floor Noise
Vert.	67.739	QP	49.10	6.57	7.14	31.88	0.00	30.93	40.00	9.0	100	95	
Vert.	107.260	QP	40.50	11.20	7.92	31.84	0.00	27.78	43.50	15.7	100	181	
Vert.	112.903	QP	45.00	12.05	7.91	31.84	0.00	33.12	43.50	10.3	100	72	
Vert.	114.032	QP	40.50	12.22	7.90	31.84	0.00	28.78	43.50	14.7	100	122	
Vert.	3835.050	PK	45.67	29.34	7.97	36.85	2.24	48.37	73.90	25.5	334	356	
Vert.	4874.000	PK	43.76	31.28	8.48	37.15	2.24	48.61	73.90	25.3	305	196	
Vert.	7311.000	PK	44.17	36.62	9.51	37.91	2.24	54.63	73.90	19.3	150	0	Floor Noise
Vert.	3835.050	AV	40.01	29.34	7.97	36.85	2.24	42.71	53.90	11.2	334	356	
Vert.	4874.000	AV	34.97	31.28	8.48	37.15	2.24	39.82	53.90	14.1	305	196	*1)
Vert.	7311.000	AV	34.58	36.62	9.51	37.91	2.24	45.04	53.90	8.9	150	0	Floor Noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
*1) Not apply duty factor, because duty cycle of this noise was above 98 %.

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.	2437.000	PK	78.21	27.60	13.81	37.03	2.24	84.83	-	-	Carrier
Hori.	9748.000	PK	37.60	38.50	10.19	39.19	2.24	49.34	67.07	17.7	
Vert.	2437.000	PK	83.75	27.60	13.81	37.03	2.24	90.37	-	-	Carrier
Vert.	9748.000	PK	42.09	38.50	10.19	39.19	2.24	53.83	72.61	18.8	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission

Test place	Shonan EMC Lab.			
Report No.	11504641S-B			
Semi Anechoic Chamber	No.3	No.2	No.3	No.3
Date	December 10, 2016	December 11, 2016	November 4, 2016	November 18, 2016
Temperature / Humidity	23 deg. C / 34 % RH	20 deg. C / 56 % RH	25 deg. C / 41 % RH	23 deg. C / 46 % RH
Engineer	Shinichi Takano	Shinichi Takano	Shinichi Takano	Kenichi Adachi
	(1 GHz -2.8 GHz)	(2.8 GHz -13 GHz)	(13 GHz -26.5 GHz)	(26.5 GHz -31.5 GHz)
Mode	Tx 11n-20 MIMO 2462 MHz			

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	43.59	27.79	13.86	37.01	2.24	50.47	73.90	23.4	161	329	
Hori.	3835.083	PK	45.57	29.34	7.97	36.85	2.24	48.27	73.90	25.6	264	100	
Hori.	4924.000	PK	43.73	31.38	8.51	37.18	2.24	48.68	73.90	25.2	300	224	
Hori.	7386.000	PK	44.01	36.75	9.52	37.96	2.24	54.56	73.90	19.3	150	0	Floor Noise
Hori.	3835.083	AV	39.45	29.34	7.97	36.85	2.24	42.15	53.90	11.8	264	100	
Hori.	4924.000	AV	35.38	31.38	8.51	37.18	2.24	40.33	53.90	13.6	300	224	*1)
Hori.	7386.000	AV	35.60	36.75	9.52	37.96	2.24	46.15	53.90	**7.8**	150	0	Floor Noise
Vert.	2483.500	PK	47.94	27.79	13.86	37.01	2.24	54.82	73.90	19.0	161	142	
Vert.	3835.398	PK	47.80	29.34	7.97	36.85	2.24	50.50	73.90	23.4	342	347	
Vert.	4924.000	PK	45.16	31.38	8.51	37.18	2.24	50.11	73.90	23.8	284	196	
Vert.	7386.000	PK	43.89	36.75	9.52	37.96	2.24	54.44	73.90	19.5	150	0	Floor Noise
Vert.	3835.398	AV	41.43	29.34	7.97	36.85	2.24	44.13	53.90	9.8	342	347	
Vert.	4924.000	AV	35.36	31.38	8.51	37.18	2.24	40.31	53.90	13.6	284	196	*1)
Vert.	7386.000	AV	34.88	36.75	9.52	37.96	2.24	45.43	53.90	8.5	150	0	Floor Noise

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB
*1) Not apply duty factor, because duty cycle of this noise was above 98 %.

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	34.33	27.79	13.86	37.01	4.97	2.24	46.18	53.90	7.7	*1)
Vert.	2483.500	AV	36.87	27.79	13.86	37.01	4.97	2.24	48.72	53.90	**5.2**	*1)

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 (3.88 m / 3.0 m) = 2.24 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.	2462.000	PK	77.06	27.70	13.84	37.02	2.24	83.82	-	-	
Hori.	9848.000	PK	38.26	38.65	10.24	39.23	2.24	50.16	66.06	15.9	
Vert.	2462.000	PK	77.87	27.70	13.84	37.02	2.24	84.63	-	-	
Vert.	9848.000	PK	42.73	38.65	10.24	39.23	2.24	54.63	66.87	12.2	

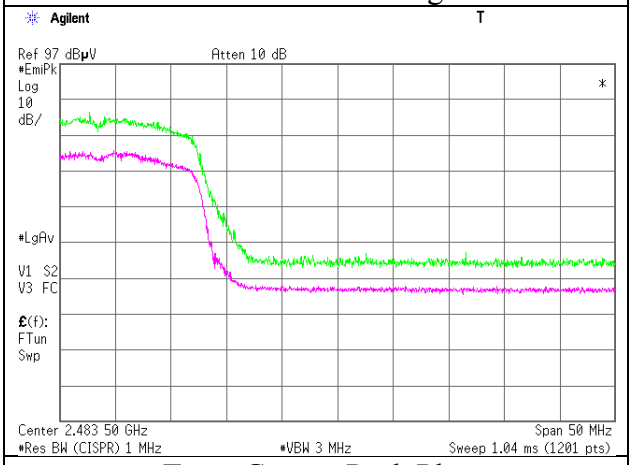
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amprifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.88 m / 3.0 m) = 2.24 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11504641S-B
Date	December 10, 2016
Temperature / Humidity	23 deg. C / 34 % RH
Engineer	Shinichi Takano
	(1 GHz -2.8 GHz)
Mode	Tx 11n-20 MIMO 2462 MHz

Horizontal

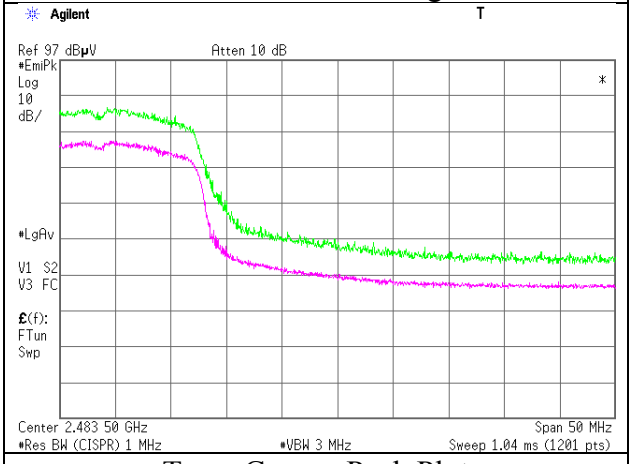
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot

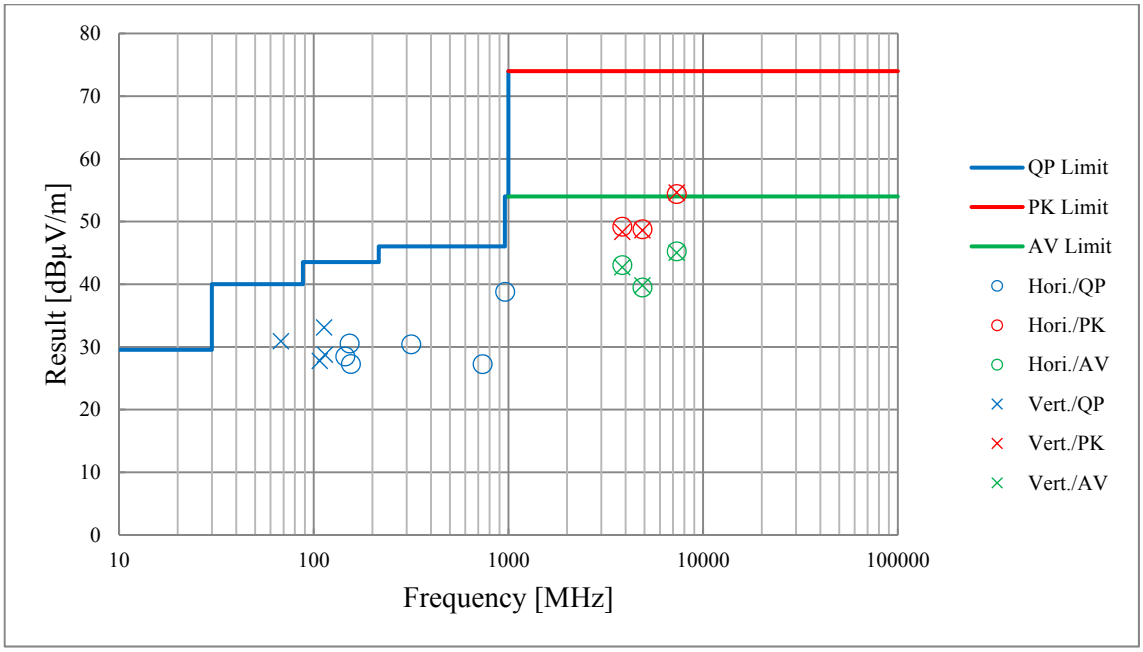


Trace Green : Peak Plot
Trace Purple : Average Plot

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

Radiated Spurious Emission
(Plot data, Worst case)

Test place	Shonan EMC Lab.				
Report No.	11504641S-B				
Semi Anechoic Chamber	No.2	No.3	No.2	No.3	No.3
Date	November 8, 2016	December 10, 2016	December 11, 2016	November 4, 2016	November 18, 2016
Temperature / Humidity	23 deg. C / 38 % RH	23 deg. C / 34 % RH	20 deg. C / 56 % RH	25 deg. C / 41 % RH	23 deg. C / 46 % RH
Engineer	Takahiro Suzuki (30 MHz -1 GHz)	Shinichi Takano (1 GHz -2.8 GHz)	Shinichi Takano (2.8 GHz -13 GHz)	Shinichi Takano (13 GHz -26.5 GHz)	Kenichi Adachi (26.5 GHz -31.5 GHz)
Mode	Tx 11n-20 MIMO 2437 MHz				

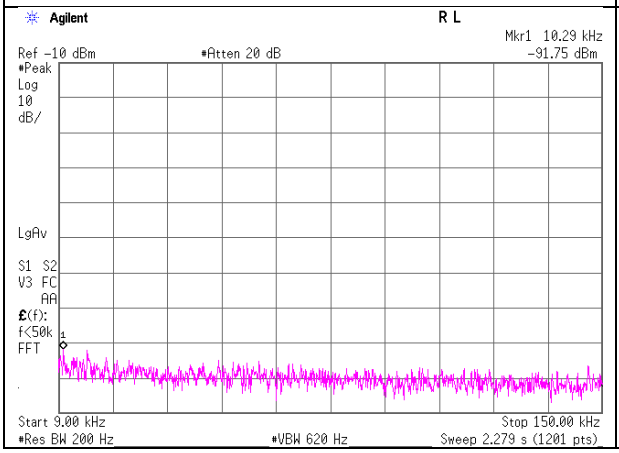


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

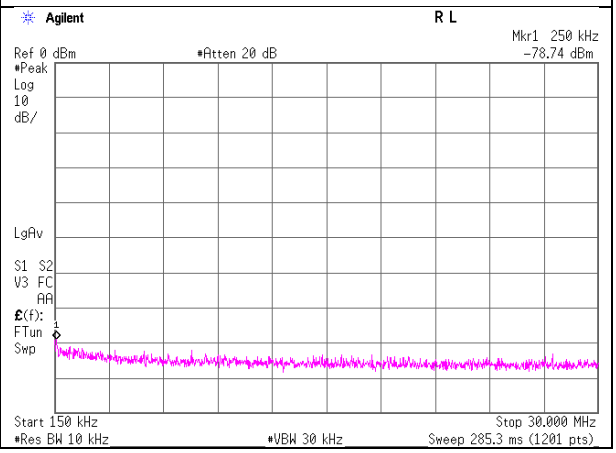
Conducted Spurious Emission

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11504641S-B
Date	November 17, 2016
Temperature / Humidity	25 deg. C / 48 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx 11n-20 (MIMO) 2437 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenator 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
10.29	-91.8	0.01	9.8	2.0	1	-79.9	300	6.0	-18.6	47.3	65.9	
250.00	-78.7	0.02	9.8	2.0	1	-66.9	300	6.0	-5.6	19.6	25.2	

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

EIRP = Reading + Cable Loss + Attenator Loss + Antenna Gain + 10 * log (N)

Power Density

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11504641S-B
Date	December 15, 2016
Temperature / Humidity	24 deg. C / 35 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx 11b

11b Antenna 1

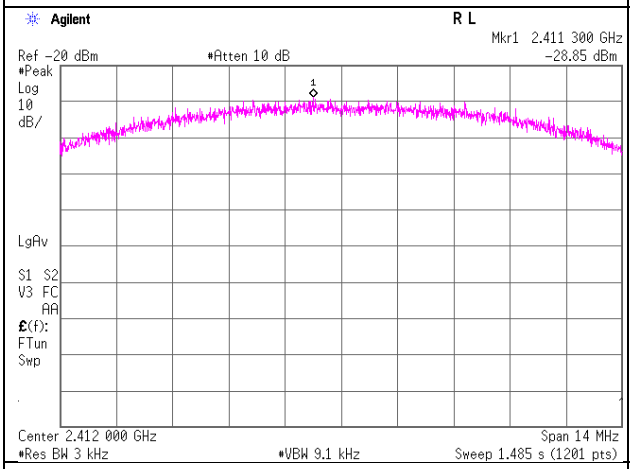
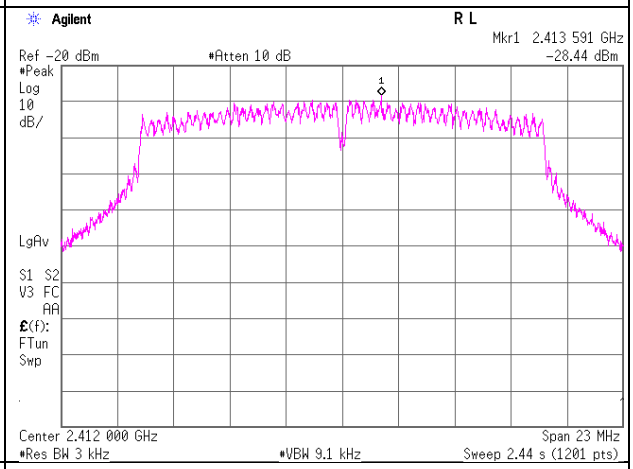
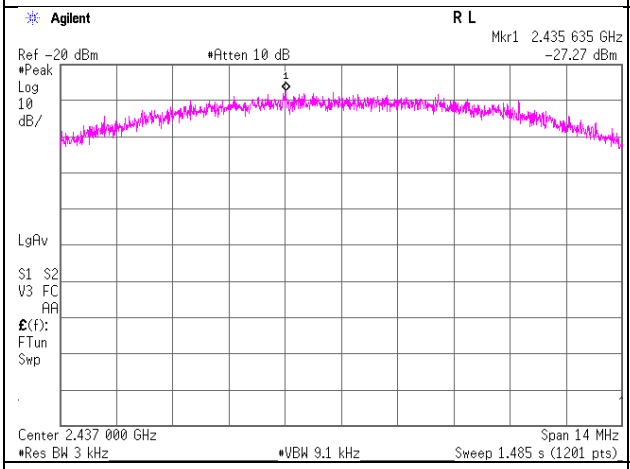
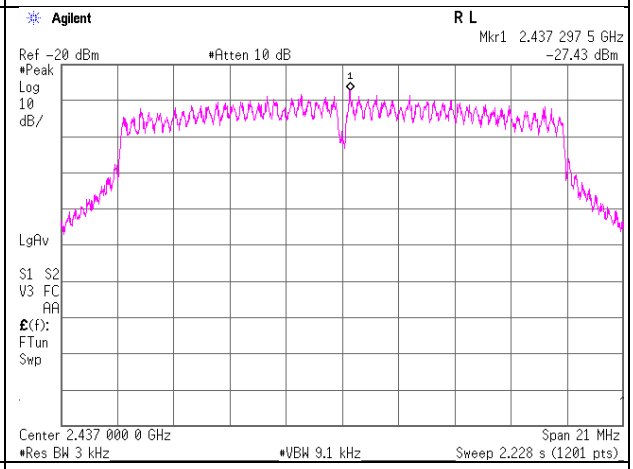
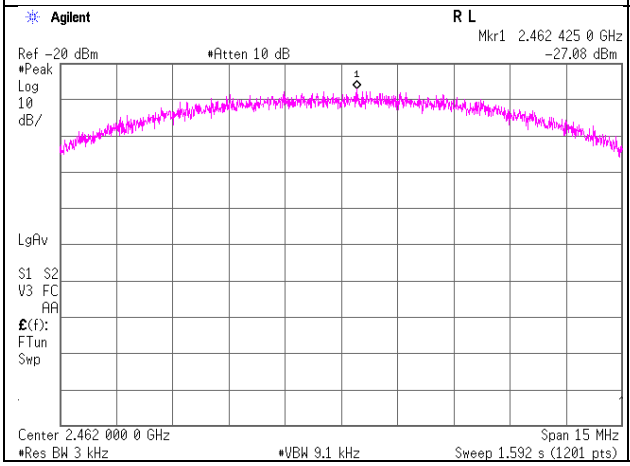
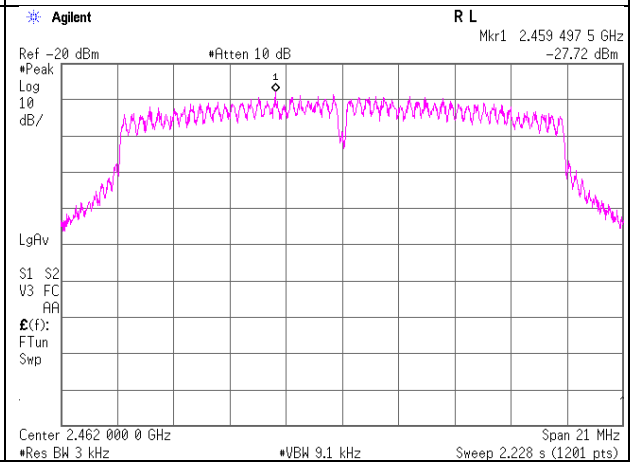
Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.00	-28.85	2.32	9.67	-16.86	8.00	24.86
2437.00	-27.27	2.32	9.67	-15.28	8.00	23.28
2462.00	-27.08	2.33	9.67	-15.08	8.00	23.08

11g Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.00	-28.44	2.32	9.67	-16.45	8.00	24.45
2437.00	-27.43	2.32	9.67	-15.44	8.00	23.44
2462.00	-27.72	2.33	9.67	-15.72	8.00	23.72

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

Power Density

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

Power Density

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11504641S-B
Date	December 15, 2016
Temperature / Humidity	24 deg. C / 35 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx 11n-20 (SISO)

11n-20(SISO) Antenna 1

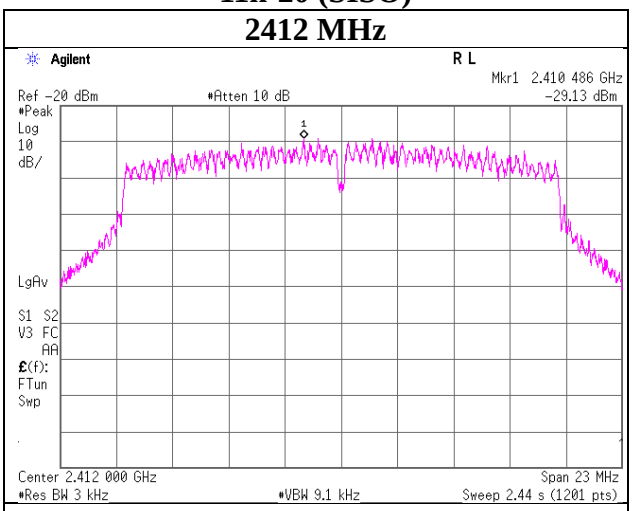
Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.00	-29.13	2.32	9.67	-17.14	8.00	25.14
2437.00	-27.77	2.32	9.67	-15.78	8.00	23.78
2462.00	-28.92	2.33	9.67	-16.92	8.00	24.92

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

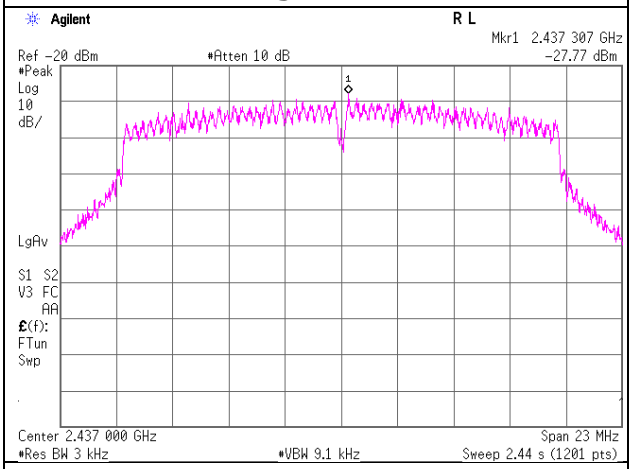
Power Density

11n-20 (SISO)

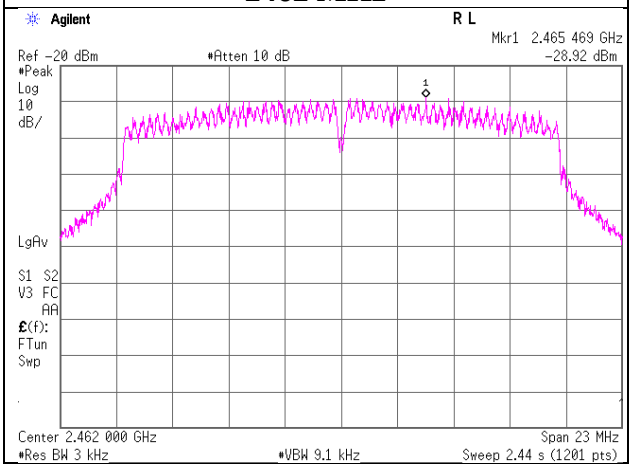
2412 MHz



2437 MHz



2462 MHz



Power Density

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11504641S-B
Date	December 15, 2016
Temperature / Humidity	24 deg. C / 35 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx 11n-20 (MIMO)

Antenna 1 + 2

Freq.	Antenna 1 Result	Antenna 2 Result	Result		Limit	Margin
[MHz]	[mW]	[mW]	[dBm]	[mW]	[dBm]	[dB]
2412.00	0.01	0.01	-16.44	0.02	8.00	24.44
2437.00	0.02	0.01	-16.13	0.02	8.00	24.13
2462.00	0.01	0.01	-16.00	0.03	8.00	24.00

Sample Calculation:
Result = Antenna 1 + 2

Antenna 1

Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[dB]
2412.00	-32.17	2.32	9.67	-20.18	0.01	8.00	28.18
2437.00	-30.13	2.32	9.67	-18.14	0.02	8.00	26.14
2462.00	-30.61	2.33	9.67	-18.61	0.01	8.00	26.61

Antenna 2

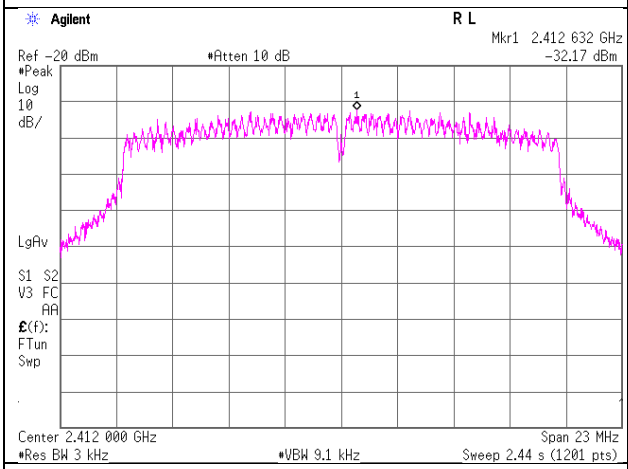
Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[dB]
2412.00	-30.81	2.32	9.67	-18.82	0.01	8.00	26.82
2437.00	-32.43	2.32	9.67	-20.44	0.01	8.00	28.44
2462.00	-31.47	2.33	9.67	-19.47	0.01	8.00	27.47

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

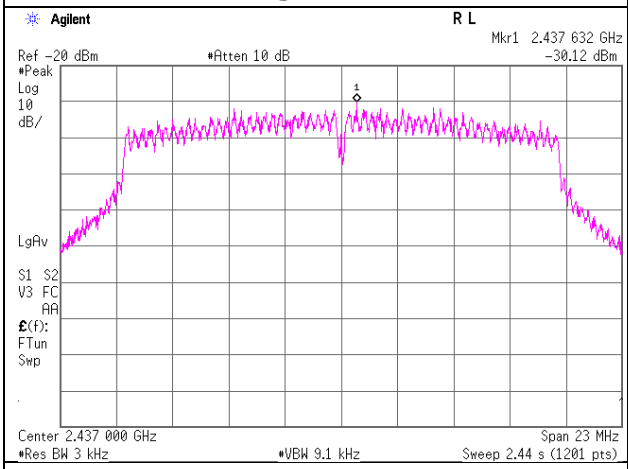
Power Density

11n-20 (MIMO) Antenna 1

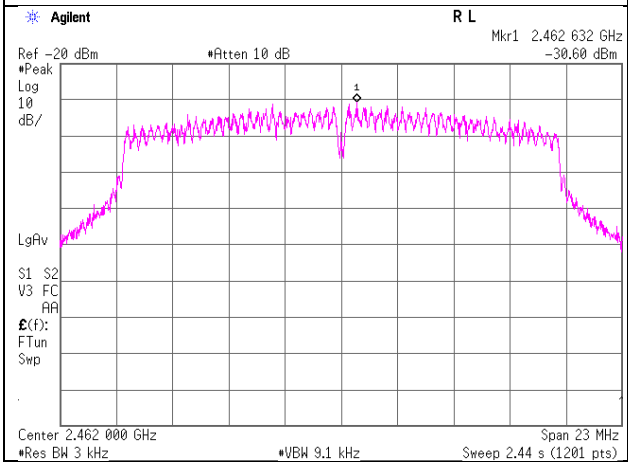
2412 MHz



2437 MHz

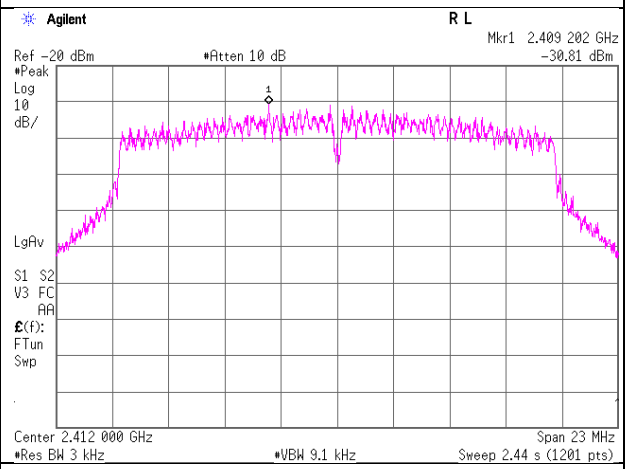


2462 MHz

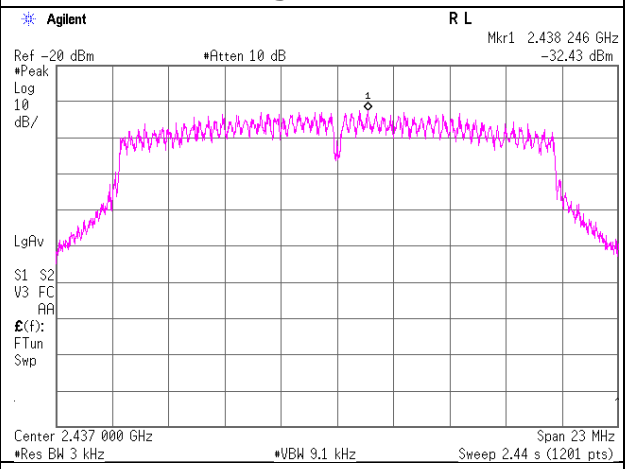


11n-20 (MIMO) Antenna 2

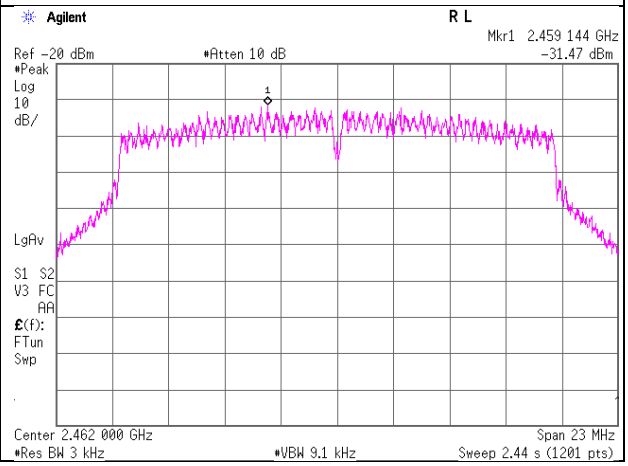
2412 MHz



2437 MHz



2462 MHz

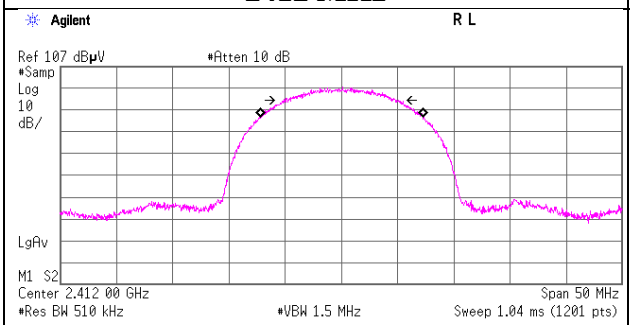


99%Occupied Bandwidth

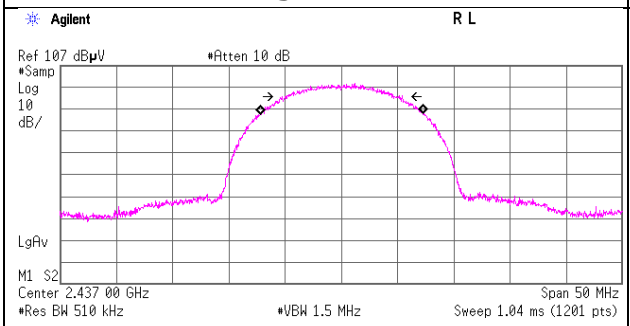
Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11504641S-B
Date	December 15, 2016
Temperature / Humidity	24 deg. C / 35 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx

11b Antenna 1

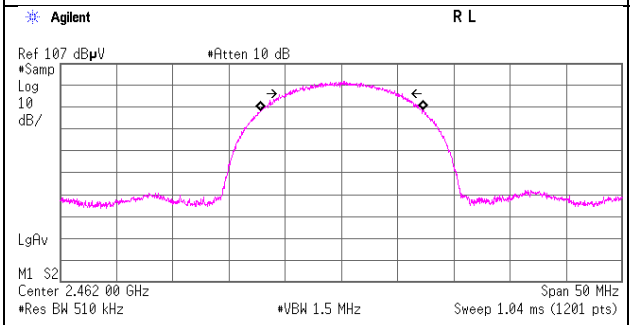
2412 MHz



2437 MHz

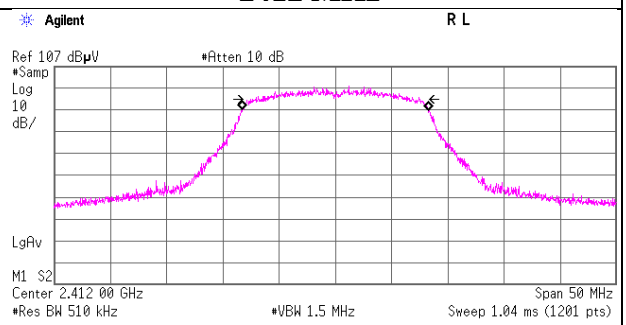


2462 MHz

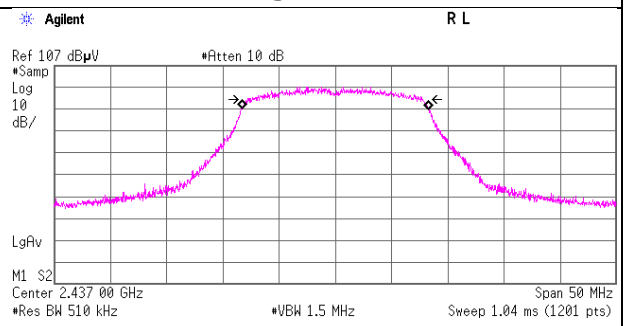


11g Antenna 1

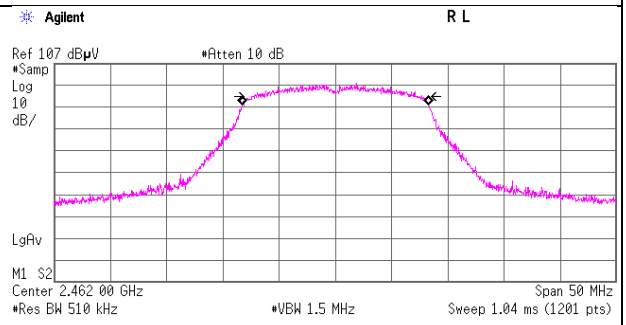
2412 MHz



2437 MHz



2462 MHz

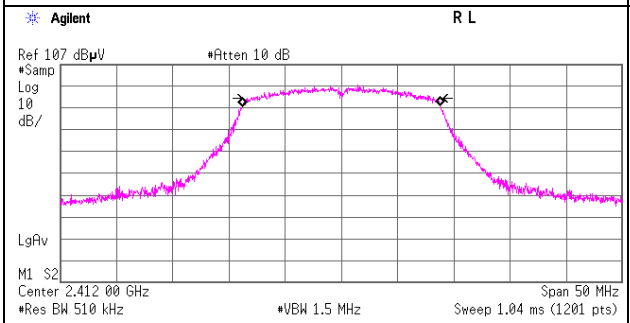


99% Occupied Bandwidth

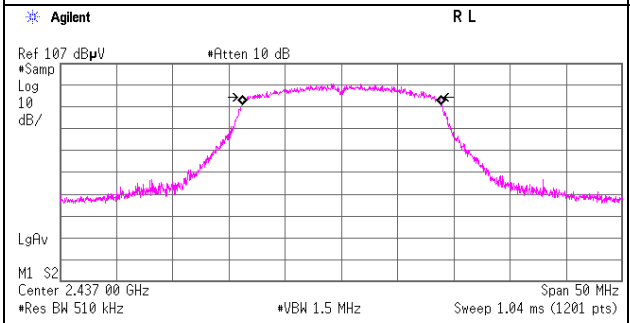
Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11504641S-B
Date	December 15, 2016
Temperature / Humidity	24 deg. C / 35 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx

11n-20 (SISO) Antenna 1

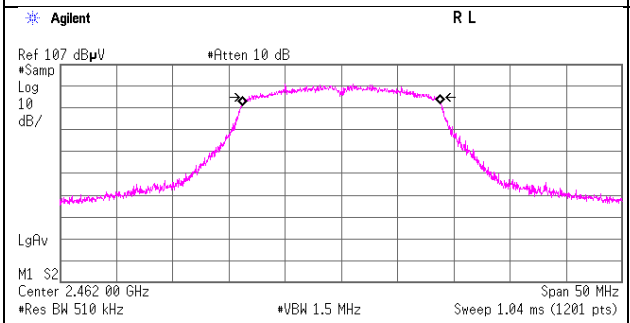
2412 MHz



2437 MHz

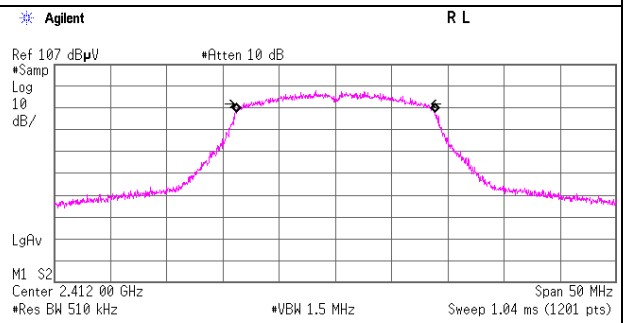


2462 MHz

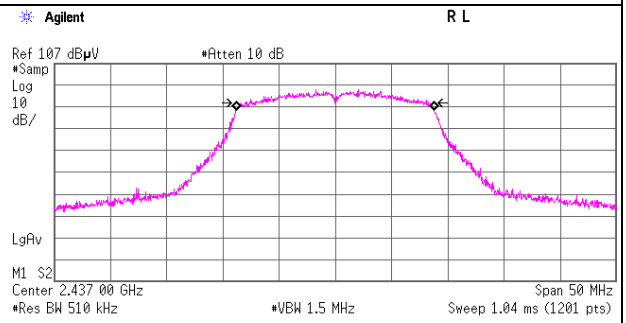


11n-20 (MIMO) Antenna 1

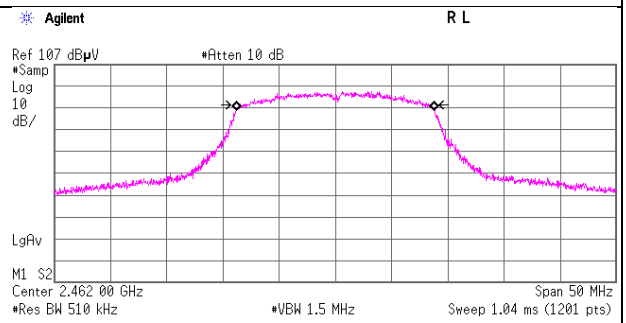
2412 MHz



2437 MHz



2462 MHz



APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MSA-16	Spectrum Analyzer	Agilent	E4440A	MY46186390	AT	2016/02/08 * 12
SRENT-10	Spectrum Analyzer	Agilent	E4440A	US41421511	AT	2016/12/05 * 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
SCC-G13	Coaxial Cable	Suhner	SUCOFLEX 102	31599/2	AT	2016/03/23 * 12
SCC-G14	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	AT	2016/03/23 * 12
SAT10-10	Attenuator	Weinschel Corp.	54A-10	37584	AT	2016/04/18 * 12
SAT10-09	Attenuator	Weinschel Corp.	54A-10	W5692	AT	2016/11/07 * 12
STM-G3	Terminator	Weinschel	M1459A	U6569	AT	2016/07/27 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT *1)	2015/12/07 * 12
SOS-10	Humidity Indicator	A&D	AD-5681	4064561	AT	2016/10/12 * 12
KTS-07	Digital Tester	SANWA	PC500	7019232	AT	2016/10/17 * 12
SAF-04	Pre Amplifier	TOYO Corporation	TPA0118-36	1440489	RE	2016/03/22 * 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	2016/08/22 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2016/10/12 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	RE *1)	2015/11/06 * 12
SJM-02	Measure	KOMELON	KMC-36	-	RE	-
SAEC-03(SVSWR)	Semi-Anechoic Chamber	TDK	SAEC-03(SVSWR)	3	RE	2016/07/25 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI,MF)	-	RE	-
STS-03	Digital Hitester	Hioki	3805-50	080997823	RE	2016/10/17 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE, AT	2016/03/23 * 12
SCC-G15	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	RE	2016/03/08 * 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
SAT10-05	Attenuator(above1GHz)	Agilent	8493C-010	74864	RE	2016/11/07 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE *1)	2015/11/16 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	RE	2016/09/26 * 12
SAF-02	Pre Amplifier	SONOMA	310N	290212	RE	2016/02/19 * 12
SAT6-02	Attenuator	JFW	50HF-006N	-	RE	2016/02/25 * 12
KAT3-10	Attenuator	JFW IND. INC.	50HF-003N	-	RE	2016/07/26 * 12
SBA-02	Biconical Antenna	Schwarzbeck	BBA9106	91032665	RE *1)	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-06	Logperiodic Antenna	Schwarzbeck	VUSLP9111B	195	RE	2016/01/30 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2016/10/12 * 12
TR-09	Test Receiver	Rohde & Schwarz	ESCI	100769	RE	2016/10/07 * 12
SJM-09	Measure	PROMART	SEN1935	-	RE	-
SAEC-02(NSA)	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	RE	2016/07/13 * 12
STS-02	Digital Hitester	Hioki	3805-50	080997819	RE	2016/03/22 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE	2016/10/11 * 12
SHA-06	Horn Antenna	ETS LINDGREN	3160-10	LM3459	RE	2016/03/24 * 12
SAF-10	Pre Amplifier	TOYO Corporation	HAP26-40W	00000010	RE	2016/03/23 * 12
SCC-G19	Coaxial Cable	Suhner	SUCOFLEX 102A	1188/2A	RE	2016/03/08 * 12
SCC-G33	Coaxial Cable	Junkosha	MWX241-01000KMSKMS	-	RE	2016/04/18 * 12
SAT10-06	Attenuator	Agilent	8493C-010	74865	RE	2016/11/07 * 12
SFL-18	Highpass Filter	MICRO-TRONICS	HPM50111	119	RE	2016/04/18 * 12

***1) This test equipment was used for the tests before the expiration date of the calibration.**
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