



RADIO TEST REPORT

Test Report No. : 11008648S-C

Applicant : **Panasonic Corporation**
Type of Equipment : **Car Audio System**
Model No. : **AT1603**
FCC ID : **ACJ932AT1603**
Test regulation : **FCC Part 15 Subpart C: 2015**
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: October 27 to November 26, 2015

Representative test engineer:

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

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13-EM-F0429

REVISION HISTORY

Original Test Report No.: 11008648S-C

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SECTION 1: Customer information

Company Name	:	Panasonic Corporation
Address	:	4261 Ikonobe-cho, Tsuzuki-ku, Yokohama-city, 224-8520, Japan
Telephone Number	:	+81-50-3689-6981
Contact Person	:	Hiroyuki Ishikawa

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

2.1 Identification of E.U.T.

Type of Equipment	:	Car Audio System
Model No.	:	AT1603
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 13.2 V
Receipt Date of Sample	:	October 27, 2015
Country of Mass-production	:	Japan, Czech, Mexico, Thailand
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: AT1603 (referred to as the EUT in this report) is a Car Audio System.

General Specification

Clock frequency(ies) in the system	:	37 MHz, 48 MHz, 54.9 MHz, 194 MHz, 795 MHz, 1.56 GHz
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Radio Specification

Radio Type	:	Transceiver
Frequency of Operation	:	2412 MHz - 2462 MHz
Modulation	:	DSSS
Power Supply (radio part input)	:	DC 3.3 V, DC 1.8 V
Antenna type	:	Dipole Antenna
Antenna gain with cable loss	:	-0.525 dBi

There are 2 types for AT1603; Display Combined Type (T2)) and Display Separated Type (L2)). The same radio module and antenna are installed in these models, however the substrate pattern and antenna arrangement are different.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2015, final revised on November 23, 2015
 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

*Some parts are effective on and after December 17, 2015 or December 23, 2015. The revision 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 C63.4-2009 7. AC powerline Conducted Emission measurements 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 v03r03 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 v03r03 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 v03r03 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 v03r03 IC: RSS-Gen 6.13	FCC: Section 15.247(d) IC: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10	Display Combined Type (T2) 5.7 dB 2483.500 MHz, AV, Vertical Tx 2452 MHz IEEE 802.11n-40 Display Separated Type(L2) 10.0 dB 9648.000 MHz, AV, Vertical Tx 2412 MHz IEEE 802.11b	Complied	Conducted (below 30 MHz)/ Radiated (above 30 MHz) *2)

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

*1) The test is not applicable since the EUT has no AC mains.

*2) Radiated test was selected over 30 MHz based on section 15.247(d) and KDB 558074 D01 DTS Meas Guidance v03r03 12.2.7.

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

However, there is one deviation from ANSI C 63.10:2013. (ANSI C63.10:2013 is Non-accreditation)

Measurement height is not 1.5 m, but 0.8 m.

FCC Part 15.31 (e)

The equipment provides the wireless transmitter with stable power supply (RF: DC 3.3 V, I/O: DC 1.8 V).

Instead of a new battery, DC power supply was used for the test. That does not affect the test result, therefore the EUT complies with the requirement.

FCC Part 15.203

The equipment and its antenna comply with the requirement since the antenna is built in the equipment and it cannot be replaced by end users.

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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

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k = 2$.
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Item	Frequency range	Uncertainty (+/-)		
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	3.6 dB	3.4 dB	3.4 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	3.7 dB	3.5 dB	3.5 dB
	30 MHz-300 MHz	4.9 dB	4.9 dB	4.7 dB
	300 MHz-1 GHz	5.0 dB	5.0 dB	4.8 dB
	1 GHz-13 GHz	4.9 dB	4.9 dB	4.9 dB
Radiated emission (Measurement distance: 1 m)	13 GHz-18 GHz	5.7 dB	5.7 dB	5.7 dB
	18 GHz-40 GHz	4.5 dB	4.3 dB	4.3 dB

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector)_SPM-06	0.76 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	0.79 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.74 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	1.08 dB
Spurious emission (Conducted) below 1GHz	1.5 dB
Spurious emission (Conducted) 1 GHz-3 GHz	1.7 dB
Spurious emission (Conducted) 3 GHz-18 GHz	2.4 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.5 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.5 dB
Bandwidth Measurement	0.66 %
Duty cycle and Time Measurement	0.012 %

Radiated emission test

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

3.5 Test Location

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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	Display Combined Type	Display Separated Type
IEEE 802.11b (11b)	11 Mbps, PN9	11Mbps, PN9
IEEE 802.11g (11g)	54 Mbps, PN9	36 Mbps, PN9
IEEE 802.11n HT20 (11n-20)	MCS 6 (800 ns GI), PN9	MCS 4 (800 ns GI), PN9
IEEE 802.11n HT40 (11n-40)	MCS 7 (800 ns GI), PN9	MCS 7 (800 ns GI), PN9
*The worst condition was determined based on the test result of Maximum Peak Output Power (Mid Channel)		
Power settings: Fixed		
Software (Firmware): D17517010700001V0, Ver. 1.0		

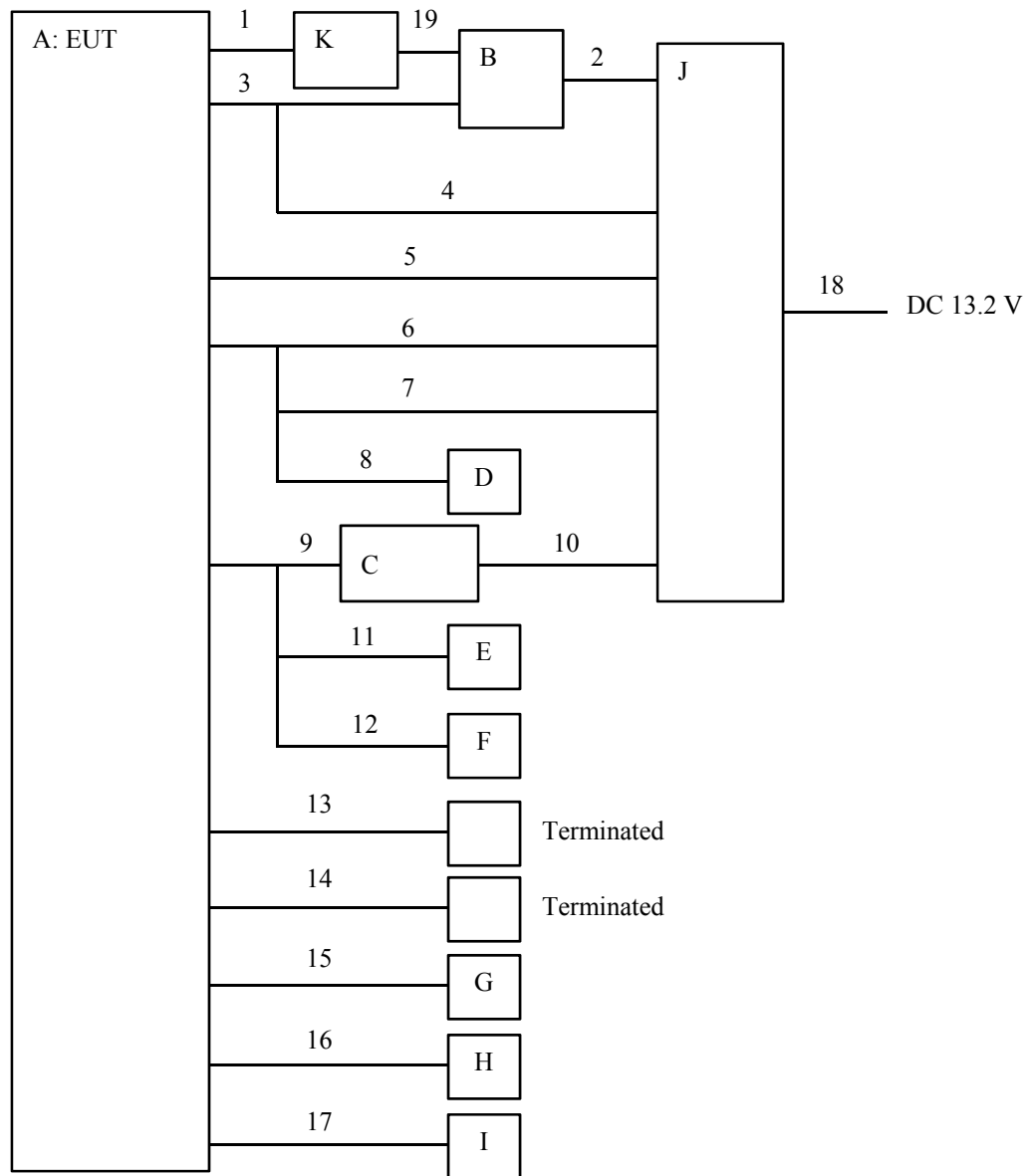
*The details of Operating mode(s)

Test Item	Operating Mode	Tested frequency
Spurious Emission (below 1 GHz)	11g Tx	2437 MHz
Spurious Emission (above 1 GHz)	11b Tx	2412 MHz
	11g Tx	2437 MHz
	11n-20 Tx	2462 MHz
	11n-40 Tx	2422 MHz
		2437 MHz 2452 MHz
Bandedge Compliance	11b Tx	2412 MHz 2462 MHz
	11g Tx 11n-20 Tx	2412 MHz 2417 MHz 2462 MHz
		2422 MHz
		2452 MHz
	11n-40 Tx	2422 MHz 2437 MHz 2452 MHz
6dB Bandwidth Maximum Peak Output Power Power Density 99% Occupied Bandwidth	11b Tx	2412 MHz
	11g Tx	2437 MHz
	11n-20 Tx	2462 MHz
	11n-40 Tx	2422 MHz
		2437 MHz 2452 MHz

Since the substrate pattern and antenna arrangement are different, the test has been performed with Display Combined Type (T2)) and Display Separated Type (L2)).

4.2 Configuration and peripherals

Display Combined Type (T2)



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

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Car Audio System	AT1603 (Display Combined Type (T2))	CV-CS87N08X No.180	Panasonic	EUT
B	MEU	-	-	-	-
C	AIR-con ECU	-	-	-	-
D	Steering Switch	ST-SW-IF	31	Panasonic	-
E	Microphone	-	86730-28040	-	-
F	Back Camera	-	86730-28040	-	-
G	USB Memory	USM4GU	-	Sony	-
H	XM Antenna	-	-	-	-
I	GPS Antenna	-	-	Panasonic	-
J	Vehicle Signal Simulator	-	-	Panasonic	-
K	DCM	-	86741-53054	DENSO	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Signal Cable	0.9	Unshielded	Unshielded	-
2	DC Cable	0.9	Unshielded	Unshielded	-
3	Signal Cable	2.3	Unshielded	Unshielded	-
4	DC Cable	0.9	Unshielded	Unshielded	-
5	DC Cable	0.9	Unshielded	Unshielded	-
6	DC Cable	1.5	Unshielded	Unshielded	-
7	DC Cable	2.5	Unshielded	Unshielded	-
8	Signal Cable	2.0	Unshielded	Unshielded	-
9	Signal Cable	1.5	Unshielded	Unshielded	-
10	DC Cable	0.9	Unshielded	Unshielded	-
11	Signal Cable	2.0	Shielded	Shielded	-
12	Signal Cable	2.5	Unshielded	Unshielded	-
13	Speaker Cable	1.1	Unshielded	Unshielded	-
14	Radio Cable	2.8	Shielded	Shielded	-
15	USB Cable	2.0	Shielded	Shielded	-
16	XM Antenna Cable	1.1	Unshielded	Unshielded	-
17	GPS Antenna Cable	2.0	Unshielded	Unshielded	-
18	DC Cable	1.5	Unshielded	Unshielded	-
19	Signal Cable	2.0	Shielded	Shielded	-

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Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remark
A	Car Audio System	AT1603 (Display Separated Type (T2))	CV-DL56N0AJ No.13	Panasonic	EUT
B	Steering SW	-	0009	-	-
C	IF-Box	-	3	-	-
D	USB memory	USM-4GU	-	SONY	-
E	USB memory	USM-4GU	-	SONY	-
F	Display	-	83290-48130	-	-
G	Microphone	-	-	-	-
H	AMP	86280-76050	521342	Panasonic	-
I	Short circuit	-	-	-	-
J	RSE	-	15 ECU-1S-053	-	-
K	DCM	OGTT86	8KYLK327398	DENSO	-
L	MEU	17CY MEU T2	3	-	-
M	Vehicle signal simulator	EPS-01	19	-	-

List of cables used

No.	Name				
1-A	General-purpus connector				
Pin No.	Terminal name	W/H type	W/H length (mm)	Load simulator	Remark
A-1	GND1	Single	2000	Battery -	-
A-2	GND2	Single	2000	IF-BOX	-
A-3	+B	Single	2000	IF-BOX	-
A-4	+B1	Single	2000	Battery +	-
A-5	TX1+	Twisted	2000	OPEN (DISPLAY)	-
A-6	TX1-	Twisted	2000	OPEN (DISPLAY)	-
A-7	VV+	Shielded	-	-	-
A-8	VV-	Shielded	-	-	-
A-9	SG	Shielded	-	-	-
A-10	AGND	Shielded	2000	IF-BOX	-
A-11	VAL+	Shielded	2000	IF-BOX	-
A-12	VAR+	Shielded	2000	IF-BOX	-
A-13	VA-	Shielded	2000	IF-BOX	-
A-14	ADPG	Shielded	2000	IF-BOX	-
A-15	ACC1	Single	2000	Battery +	-
A-16	ACC	Single	2000	IF-BOX	-
A-17	TX2+	Twisted	2000	OPEN	-
A-18	TX2-	Twisted	2000	OPEN	-
A-19	TX+	Twisted	2000	OPEN	-
A-20	TX-	Twisted	2000	OPEN	-
A-21	SW1	Single	2000	Steering SW	-
A-22	SW2	Single	2000	Steering SW	-
A-23	SW3	-	-	-	-
A-24	SWG	Single	2000	Steering SW	-
A-25	MUT1	-	-	-	-
A-26	-	-	-	-	-
A-27	SPD	Single	2000	Vehicle signal simulator	-
A-28	REV	Single	2000	Vehicle signal simulator	-

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No.		Name			
1-B		General-purpus connector			
Pin No.	Terminal name	W/H type	W/H length (mm)	Load simulator	Remark
B-1	VMTF	Single	2000	DISPLAY	-
B-2	SECH	Single	2000	OPEN	-
B-3	TMUT	-	-	-	-
B-4	ADIM	Single	2000	Battery +	-
B-5	CNH1	Twisted	2000	Terminated	-
B-6	CNL1	Twisted	2000	Terminated	-
B-7	PBEW	Single	2000	OPEN	-
B-8	AIR	Single	2000	OPEN	-
B-9	ARON	Single	2000	OPEN	-
B-10	HAZ	Single	2000	OPEN	-
B-11	LJB	Single	2000	OPEN	-
B-12	SEUC	Single	2000	OPEN	-
B-13	CANH	Twisted	2000	DCM	-
B-14	CANL	Twisted	2000	DCM	-
B-15	ILL+	Single	2000	Battery +	-
B-16	ILL-	Single	2000	OPEN	-
B-17	CNH2	Twisted	2000	OPEN	-
B-18	CNL2	Twisted	2000	OPEN	-
B-19	IG	Single	2000	Vehicle signal simulator	-
B -20	PKB	Single	2000	Vehicle signal simulator	-
B -21	MIN+	Shielded	2000	Microphone	-
B -22	MIN-	Shielded	2000	Microphone	-
B -23	MACC	Shielded	2000	Microphone	-
B -24	SGND	Shielded	2000	Microphone	-
B -25	SNS2	Single	2000	Microphone	-
B -26	HFL	Single	2000	OPEN	-
B -27	FLSW	Single	2000	OPEN	-
B -28	-	-	-	-	-
B -29	CNH3	Twisted	2000	OPEN	-
B -30	CNL3	Twisted	2000	OPEN	-

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No.		Name			
1-C		General-purpus connector			
Pin No.	Terminal name	W/H type	W/H length (mm)	Load simulator	Remark
C-1	TEST	Single	2000	OPEN	-
C-2	-	-	-	-	-
C-3	-	-	-	-	-
C-4	-	-	-	-	-
C-5	TX3+	Twisted	300	MEU	-
C-6	TX3-	Twisted	300	MEU	-
C-7	SUP	Single	300	MEU	-
C-8	UIND	Single	2000	OPEN (DISPLAY)	-
C-9	UPSW	Single	2000	OPEN (DISPLAY)	-
C-10	USBV	Single	2000	DCM	-
C-11	USBG	Single	2000	DCM	-
C-12	SGND	Shielded	2000	DCM	-
C-13	VOR+	Shielded	2000	DCM	-
C-14	VOR-	Shielded	2000	DCM	-
C-15	VOT+	Shielded	2000	DCM	-
C-16	VOT-	Shielded	2000	DCM	-
C-17	TX4+	Twisted	2000	OPEN	-
C-18	TX4-	Twisted	2000	OPEN	-
C-19	RST	Single	300	MEU	-
C-20	VMTR	Single	2000	OPEN (RSE)	-
C-21	SIGD	Shielded	300	MEU	-
C-22	SI+	Shielded	300	MEU	-
C-23	SI-	Shielded	300	MEU	-
C-24	SGND	Shielded	300	MEU	-
C-25	MCO+	Shielded	300	MEU	-
C-26	MCO-	Shielded	300	MEU	-
C-27	-	-	-		-
C-28	REV2	Single	300	MEU	-

No.		Name			
2		Radio/D-Radio antenna			
Pin No.	Terminal name	W/H type	W/H length (mm)	Load simulator	Remark
Radio-1	SUB	Shielded	2000	Radio antenna amp	-
Radio-2	GND	Shielded	2000	Radio antenna amp	-
Radio-3	MAIN	Shielded	2000	Radio antenna amp	-
Radio-4	GND	Shielded	2000	Radio antenna amp	-
Radio-5	ANT+	Single	2000	Radio antenna amp	-

No.		Name			
3		XM antenna connector			
Pin No.	Terminal name	W/H type	W/H length (mm)	Load simulator	Remark
XM-1	XM	Shielded	2000	XM antenna	-
XM-2	GND	Shielded	2000	XM antenna	-

No.		Name			
4		AVC-LAN Step3			
Pin No.	Terminal name	W/H type	W/H length (mm)	Load simulator	Remark
MOST-1	MI+	Shielded	2000	Short circuit	-
MOST-2	MI-	Shielded	2000	Short circuit	-
MOST-3	SLDI	Shielded	2000	Short circuit	-
MOST-4	WUO	Single	2000	Short circuit	-
MOST-5	NC	-	-	-	-
MOST-6	MO+	Shielded	2000	AMP	-
MOST-7	MO-	Shielded	2000	AMP	-
MOST-8	SLDO	Shielded	2000	AMP	-

No.		Name			
5		USB connector (IF-BOX)			
Pin No.	Terminal name	W/H type	W/H length (mm)	Load simulator	Remark
USB1-1	USV1	Shielded	2000	IF-BOX	-
USB1-2	US1-	Shielded	2000	IF-BOX	-
USB1-3	US1+	Shielded	2000	IF-BOX	-
USB1-4	UGD1	Shielded	2000	IF-BOX	-
USB1-5	USG1	Shielded	2000	IF-BOX	-

No.	Name				
6	GVIF connector				
Pin No.	Terminal name	W/H type	W/H length (mm)	Load simulator	Remark
GVIF1-1	GVI-	Shielded	2000	DISPLAY	-
GVIF1-2	GVI+	Shielded	2000	DISPLAY	-
GVIF1-3	GVG3	Shielded	2000	DISPLAY	-

No.	Name				
7	GVIF,USB from MEU				
Pin No.	Terminal name	W/H type	W/H length (mm)	Load simulator	Remark
GVIF2-1	GV2-	Shielded	300	MEU	-
GVIF2-2	GV2+	Shielded	300	MEU	-
GVIF2-3	GVG2	Shielded	300	MEU	-
USB4-4	US4+	Shielded	300	MEU	-
USB4-5	US4-	Shielded	300	MEU	-
USB4-6	UDG4	Shielded	300	MEU	-

No.	Name				
8	GVIF connector				
Pin No.	Terminal name	W/H type	W/H length (mm)	Load simulator	Remark
GVIF3-1	GVO-	Shielded	2000	RSE	-
GVIF3-2	GVO+	Shielded	2000	RSE	-
GVIF3-3	GVG2	Shielded	2000	RSE	-

No.	Name	Length (m)	Cable Shield	Connector Shield	Remark
9	Signal	0.7	Unshielded	Unshielded	-
10	DC Power	0.8	Unshielded	Unshielded	-
11	DC Power	1.0	Unshielded	Unshielded	-
12	Signal	1.0	Unshielded	Unshielded	-
13	Signal	0.6	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 v03r03".

EUT was placed on a platform of nominal size, 1.0 m by 2.0 m, raised 0.8 m above the conducting ground plane.

The table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity.

The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

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

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 300 MHz	300 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 *2)	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	3m	3 m (below 13 GHz), 1 m *1) (above 13 GHz)		3 m (below 13 GHz), 1 m *1) (above 13 GHz)

*1) Distance Factor: $20 \times \log(3.0 \text{ m} / 1.0 \text{ m}) = 9.5 \text{ dB}$

*2) Average Power Measurement was performed based on 6.0 & 12.2.5 of "KDB 558074 D01 DTS Meas Guidance v03r03"

The carrier level and noise levels were confirmed at angle of 0 to 30 deg. based on the product specification to see the position of maximum noise, and the test was made at the position (0 deg.) that has the maximum noise.

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

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

UL Japan, Inc.

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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 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 / Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak/ Average *2)	-	Power Meter (Sensor: 50 MHz BW)
Peak Power Density	1.5 times the 6dB Bandwidth	3 kHz	9.1 kHz	Auto	Peak	Max Hold	Spectrum Analyzer *3)
Conducted Spurious Emission *4)	9kHz to 150kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	10 kHz	30 kHz				

*1) Peak hold was applied as Worst-case measurement.

*2) Reference data

*3) Section 10.2 Method PKPSD (peak PSD) of "KDB 558074 D01 DTS Meas Guidance v03r03".

*4) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents.

① 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

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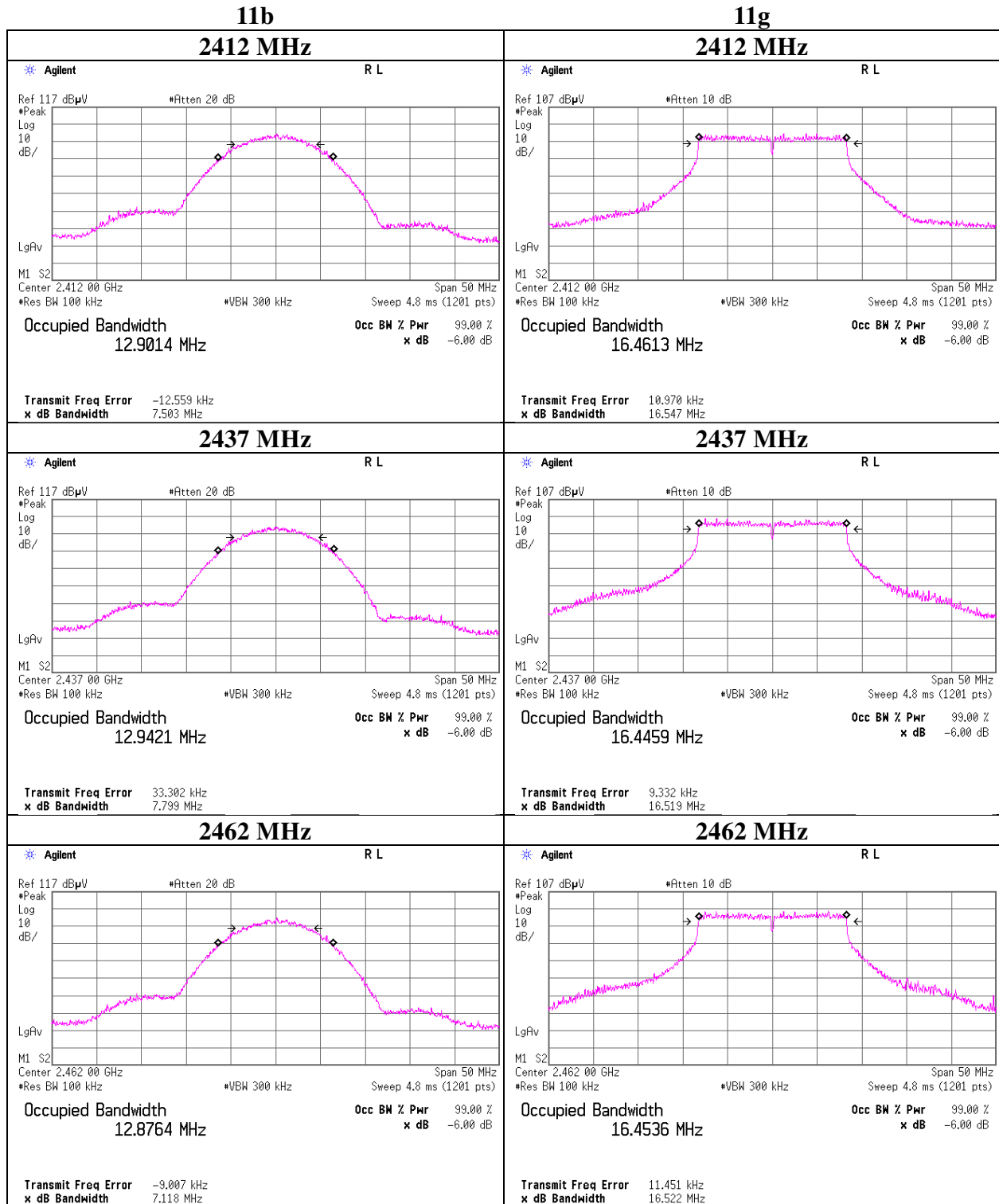
APPENDIX 1: Test data

6dB Bandwidth

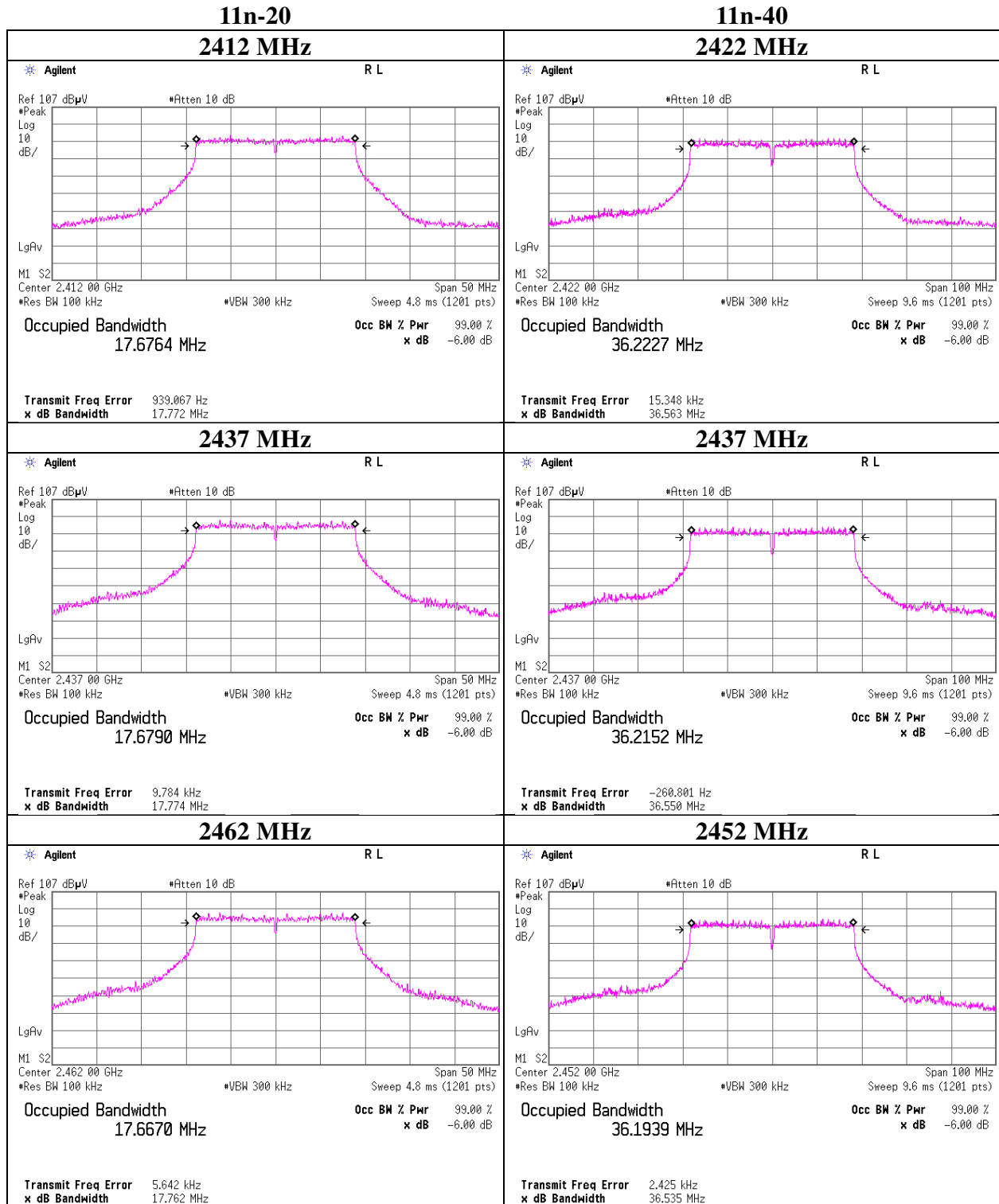
Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11008648S-C
Date	October 27, 2015
Temperature / Humidity	26 deg. C / 40 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx Display Combined Type(T2)

Mode	Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
11b	2412	7.503	> 500
	2437	7.799	> 500
	2462	7.118	> 500
11g	2412	16.547	> 500
	2437	16.519	> 500
	2462	16.522	> 500
11n-20	2412	17.772	> 500
	2437	17.774	> 500
	2462	17.762	> 500
11n-40	2422	36.563	> 500
	2437	36.550	> 500
	2452	36.535	> 500

6dB Bandwidth



6dB Bandwidth

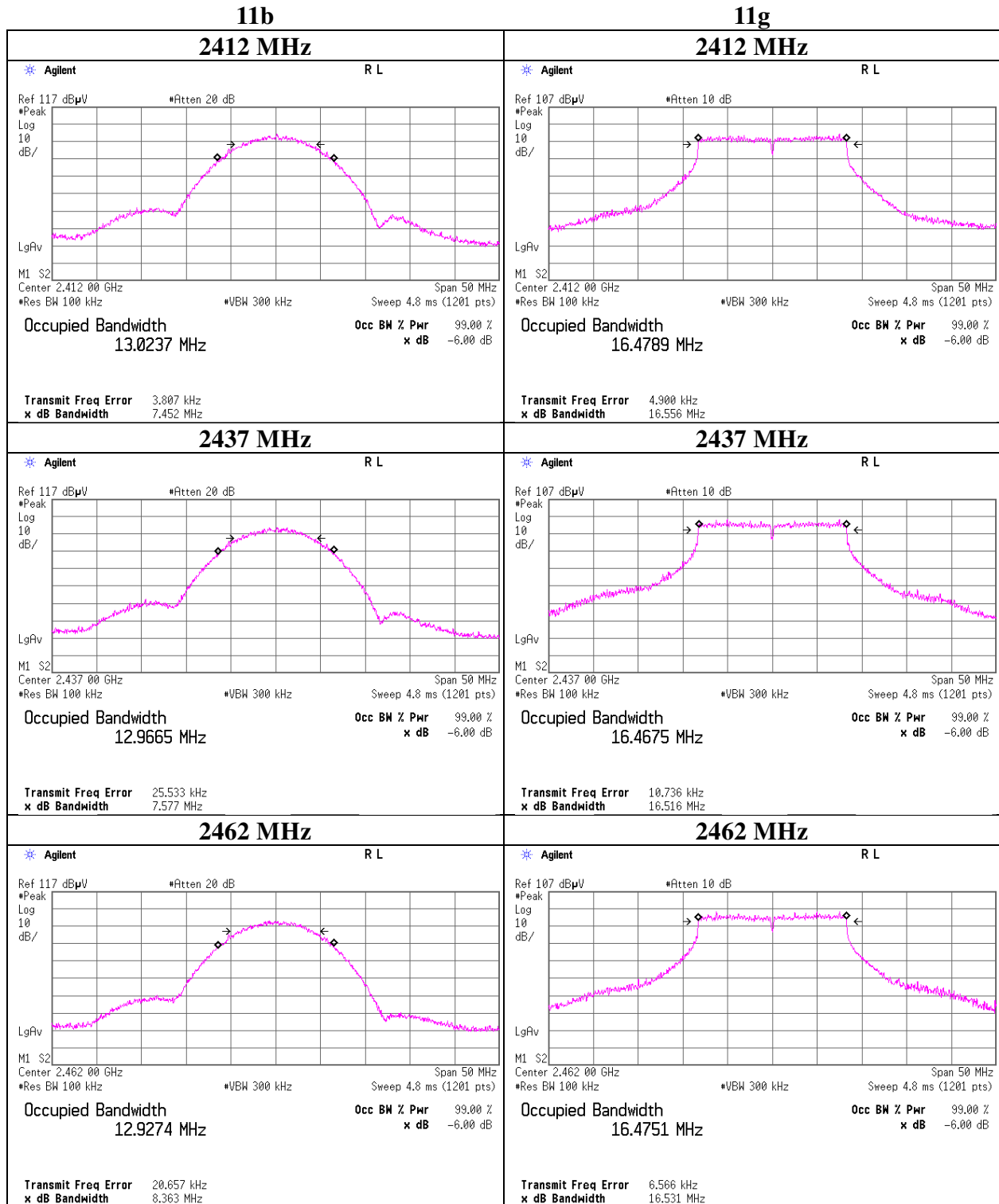


6dB Bandwidth

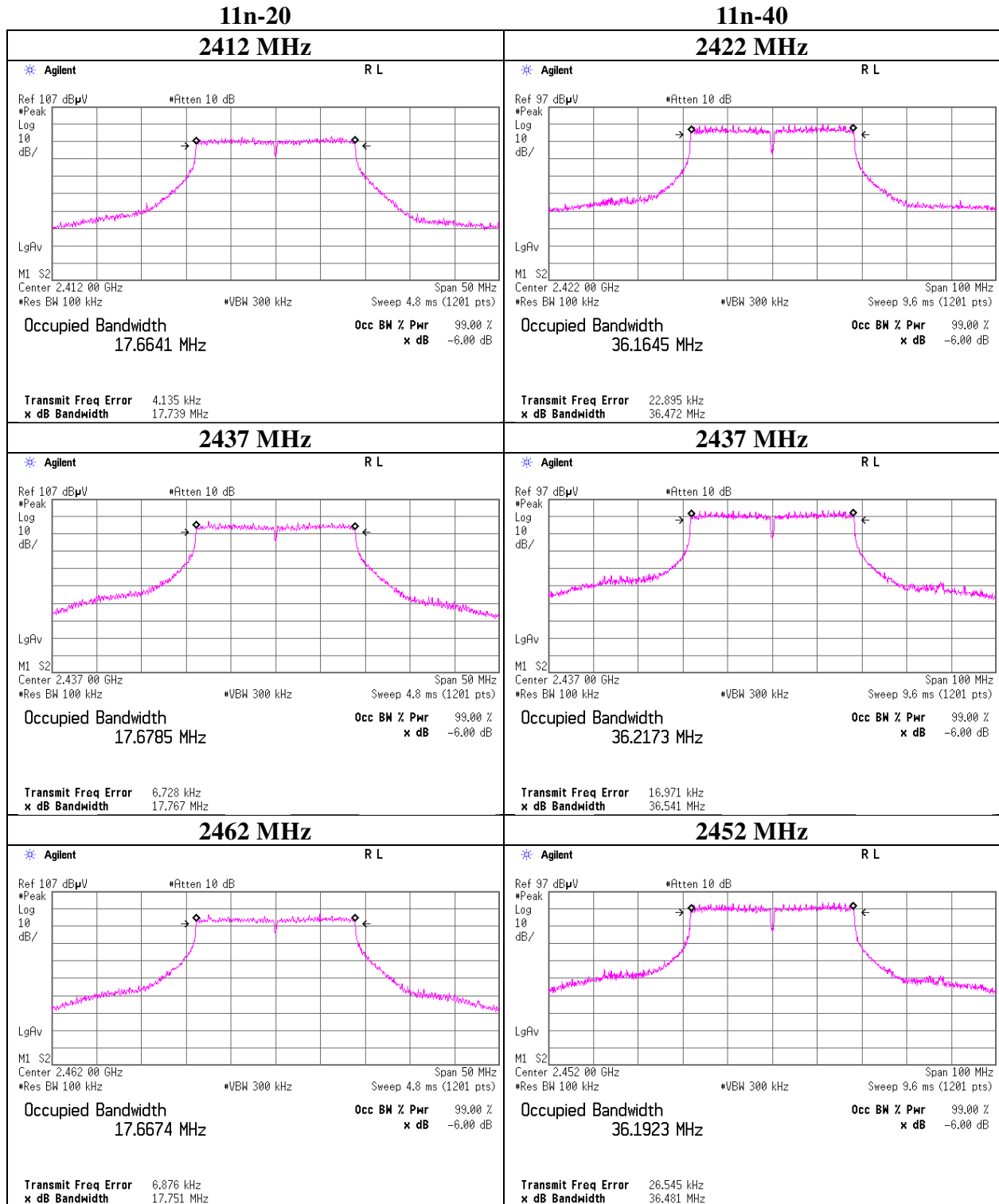
Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11008648S-C
Date	November 9, 2015
Temperature / Humidity	24 deg. C / 41 % RH
Engineer	Yosuke Ishikawa
Mode	Tx Display Separated Type(L2)

Mode	Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
11b	2412	7.452	> 500
	2437	7.577	> 500
	2462	8.363	> 500
11g	2412	16.556	> 500
	2437	16.516	> 500
	2462	16.531	> 500
11n-20	2412	17.739	> 500
	2437	17.767	> 500
	2462	17.751	> 500
11n-40	2422	36.472	> 500
	2437	36.541	> 500
	2452	36.481	> 500

6dB Bandwidth



6dB Bandwidth



Maximum Peak Output Power

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11008648S-C
Date October 27, 2015
Temperature / Humidity 26 deg. C / 40 % RH
Engineer Hiroyuki Morikawa
Mode Tx 11b Display Combined Type(T2)

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	4.91	2.03	9.63	16.57	45.39	30.00	1000	13.43
2437	4.94	2.04	9.63	16.61	45.81	30.00	1000	13.39
2462	4.84	2.05	9.63	16.52	44.87	30.00	1000	13.48

Sample Calculation:

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

2412MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
1	4.72	
2	4.90	
5.5	4.90	
11	4.91	*

*: 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.	11008648S-C
Date	October 27, 2015
Temperature / Humidity	26 deg. C / 40 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx 11g Display Combined Type(T2)

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	7.20	2.03	9.63	18.86	76.91	30.00	1000	11.14
2437	10.00	2.04	9.63	21.67	146.89	30.00	1000	8.33
2462	9.88	2.05	9.63	21.56	143.22	30.00	1000	8.44

Sample Calculation:

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

2412 MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
6	2.67	
9	2.65	
12	2.57	
18	2.78	
24	7.19	
36	7.19	
48	6.24	
54	7.20	*

*: Worst Rate

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

Maximum Peak Output Power

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11008648S-C
Date October 27, 2015
Temperature / Humidity 26 deg. C / 40 % RH
Engineer Hiroyuki Morikawa
Mode Tx 11n-20 Display Combined Type(T2)

800 ns GI

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	6.71	2.03	9.63	18.37	68.71	30.00	1000	11.63
2437	9.61	2.04	9.63	21.28	134.28	30.00	1000	8.72
2462	9.34	2.05	9.63	21.02	126.47	30.00	1000	8.98

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. 11008648S-C
Date October 27, 2015
Temperature / Humidity 26 deg. C / 40 % RH
Engineer Hiroyuki Morikawa
Mode Tx 11n-20 Display Combined Type(T2)

800 ns GI, 2412 MHz

MCS Number	Reading [dBm]	Remark
0	2.02	
1	1.76	
2	1.96	
3	6.68	
4	6.45	
5	6.10	
6	6.71	*
7	6.32	

* Worst MCS

400 ns GI, 2412 MHz

MCS Number	Reading [dBm]	Remark
16	2.01	
17	1.75	
18	1.95	
19	6.67	
20	6.45	
21	6.08	
22	6.69	
23	6.30	

Maximum Peak Output Power

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11008648S-C
Date October 27, 2015
Temperature / Humidity 26 deg. C / 40 % RH
Engineer Hiroyuki Morikawa
Mode Tx 11n-40 Display Combined Type(T2)

800 ns GI

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2422	6.45	2.03	9.63	18.11	64.71	30.00	1000	11.89
2437	9.35	2.04	9.63	21.02	126.47	30.00	1000	8.98
2452	9.28	2.04	9.63	20.95	124.45	30.00	1000	9.05

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. 11008648S-C
Date October 27, 2015
Temperature / Humidity 26 deg. C / 40 % RH
Engineer Hiroyuki Morikawa
Mode Tx 11n-40 Display Combined Type(T2)

800 ns GI, 2422 MHz

MCS Number	Reading [dBm]	Remark
0	1.36	
1	1.55	
2	1.37	
3	5.20	
4	5.80	
5	5.87	
6	5.38	
7	6.45	*

* Worst MCS

400 ns GI, 2422 MHz

MCS Number	Reading [dBm]	Remark
16	1.35	
17	1.54	
18	1.33	
19	5.18	
20	5.79	
21	5.86	
22	5.37	
23	6.42	

Maximum Peak Output Power

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11008648S-C
Date November 9, 2015
Temperature / Humidity 24 deg. C / 41 % RH
Engineer Yosuke Ishikawa
Mode Tx 11b Display Separated Type(L2)

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	4.49	2.03	10.01	16.53	44.98	30.00	1000	13.47
2437	4.44	2.04	10.01	16.49	44.57	30.00	1000	13.51
2462	4.21	2.05	10.01	16.27	42.36	30.00	1000	13.73

Sample Calculation:

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

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

2437MHz

Rate	Reading	Remark
[Mbps]	[dBm]	
1	4.13	
2	4.41	
5.5	4.39	
11	4.44	*

*: 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.	11008648S-C
Date	November 9, 2015
Temperature / Humidity	24 deg. C / 41 % RH
Engineer	Yosuke Ishikawa
Mode	Tx 11g Display Separated Type(L2)

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	7.01	2.03	10.01	19.05	80.35	30.00	1000	10.95
2437	9.58	2.04	10.01	21.63	145.55	30.00	1000	8.37
2462	9.28	2.05	10.01	21.34	136.14	30.00	1000	8.66

Sample Calculation:

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

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

2437 MHz

Rate [Mbps]	Reading [dBm]	Remark
6	5.74	
9	5.68	
12	5.71	
18	5.94	
24	9.43	
36	9.58	*
48	8.83	
54	9.42	

*: 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.	11008648S-C
Date	November 9, 2015
Temperature / Humidity	24 deg. C / 41 % RH
Engineer	Yosuke Ishikawa
Mode	Tx 11n-20 Display Separated Type(L2)

800 ns GI

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	6.41	2.03	10.01	18.45	69.98	30.00	1000	11.55
2437	9.20	2.04	10.01	21.25	133.35	30.00	1000	8.75
2462	8.86	2.05	10.01	20.92	123.59	30.00	1000	9.08

Sample Calculation:

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

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

800 ns GI, 2437 MHz

Mode [MCS]	Reading [dBm]	Remark
0	4.87	
1	4.75	
2	4.86	
3	9.02	
4	9.20	*
5	8.58	
6	9.18	
7	9.10	

400 ns GI, 2437 MHz

Mode [MCS]	Reading [dBm]	Remark
0	4.97	
1	4.53	
2	4.64	
3	8.96	
4	8.90	
5	8.51	
6	9.12	
7	8.62	

*: Worst Mode

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.	11008648S-C
Date	November 9, 2015
Temperature / Humidity	24 deg. C / 41 % RH
Engineer	Yosuke Ishikawa
Mode	Tx 11n-40 Display Separated Type(L2)

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2422	5.68	2.03	10.01	17.72	59.16	30.00	1000	12.28
2437	8.77	2.04	10.01	20.82	120.78	30.00	1000	9.18
2452	8.95	2.04	10.01	21.00	125.89	30.00	1000	9.00

Sample Calculation:

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

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

800 ns GI, 2437 MHz

Mode	Reading	Remark
[MCS]	[dBm]	
0	4.70	
1	4.53	
2	4.46	
3	8.24	
4	8.62	
5	8.67	
6	8.18	
7	8.77	*

400 ns GI, 2437 MHz

Mode	Reading	Remark
[MCS]	[dBm]	
0	4.56	
1	4.54	
2	4.58	
3	8.30	
4	8.40	
5	8.63	
6	8.37	
7	8.74	

*: Worst Mode

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

Average Output Power (Reference data)

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11008648S-C
Date : October 27, 2015
Temperature / Humidity : 26 deg. C / 40 % RH
Engineer : Hiroyuki Morikawa
Mode : Tx Display Combined Type(T2)

11b 5.5 Mbps

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Frame power)		Duty factor [dB]	Result (Burst power)	
				[dBm]	[mW]		[dBm]	[mW]
2412	2.44	2.03	9.63	14.10	25.70	0.01	14.11	25.76
2437	2.47	2.04	9.63	14.14	25.94	0.01	14.15	26.00
2462	2.24	2.05	9.63	13.92	24.66	0.01	13.93	24.72

11g 54 Mbps

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Frame power)		Duty factor [dB]	Result (Burst power)	
				[dBm]	[mW]		[dBm]	[mW]
2412	-3.75	2.03	9.63	7.91	6.18	0.15	8.06	6.40
2437	-0.14	2.04	9.63	11.53	14.22	0.15	11.68	14.72
2462	-0.18	2.05	9.63	11.50	14.13	0.15	11.65	14.62

11n-20 MCS 4 (800 ns GI)

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Frame power)		Duty factor [dB]	Result (Burst power)	
				[dBm]	[mW]		[dBm]	[mW]
2412	-4.63	2.03	9.63	7.03	5.05	0.11	7.14	5.18
2437	-1.09	2.04	9.63	10.58	11.43	0.11	10.69	11.72
2462	-1.19	2.05	9.63	10.49	11.19	0.11	10.60	11.48

11n-40 MCS 7 (800 ns GI)

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Frame power)		Duty factor [dB]	Result (Burst power)	
				[dBm]	[mW]		[dBm]	[mW]
2422	-6.07	2.03	9.63	5.59	3.62	0.66	6.25	4.22
2437	-2.53	2.04	9.63	9.14	8.20	0.66	9.80	9.55
2452	-2.67	2.04	9.63	9.00	7.94	0.66	9.66	9.25

Sample Calculation:

Result (Frame power) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuat

Result (Burst power) = Frame power + Duty factor

Average Output Power (Reference data)

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11008648S-C
Date	October 27, 2015
Temperature / Humidity	26 deg. C / 40 % RH
Engineer	Hiroyuki Morikawa
Mode	Tx Display Combined Type(T2)

2412 MHz

Mode	Rate Mbps	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11b	1	2.02	0.00	2.02	
	2	2.30	0.00	2.30	
	5.5	2.44	0.01	2.45	*
	11	2.32	0.03	2.35	
11g	6	-4.11	0.02	-4.09	
	9	-4.00	0.02	-3.98	
	12	-4.19	0.03	-4.16	
	18	-4.27	0.05	-4.22	
	24	-3.79	0.07	-3.72	
	36	-3.73	0.10	-3.63	
	48	-3.84	0.13	-3.71	
	54	-3.75	0.15	-3.60	*

* Worst rate

Sample Calculation:

Burst power = Reading (timed average) + Duty factor

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

11n-20, 2412 MHz

Mode	Rate MCS	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
800 ns	0	-5.10	0.02	-5.08	
	1	-5.21	0.03	-5.18	
	2	-5.16	0.06	-5.10	
	3	-4.71	0.07	-4.64	
	4	-4.63	0.11	-4.52	*
	5	-4.70	0.14	-4.56	
	6	-4.74	0.16	-4.58	
	7	-4.73	0.19	-4.54	
400 ns	0	-5.12	0.02	-5.10	
	1	-5.22	0.03	-5.19	
	2	-5.18	0.06	-5.12	
	3	-4.72	0.07	-4.65	
	4	-4.66	0.11	-4.55	
	5	-4.71	0.14	-4.57	
	6	-4.75	0.16	-4.59	
	7	-4.74	0.19	-4.55	

* Worst rate

Sample Calculation:

Burst power = Reading (timed average) + Duty factor

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

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Average Output Power
(Reference data)

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11008648S-C
Date October 27, 2015
Temperature / Humidity 26 deg. C / 40 % RH
Engineer Hiroyuki Morikawa
Mode Tx Display Combined Type(T2)

11n-40, 2422MHz

Mode	Rate	Reading	Duty factor	Burst power	Remarks
	MCS	[dBm]	[dB]	[dBm]	
800 ns	0	-5.82	0.08	-5.74	
	1	-5.86	0.15	-5.71	
	2	-5.94	0.23	-5.71	
	3	-5.71	0.29	-5.42	
	4	-5.93	0.42	-5.51	
	5	-6.12	0.54	-5.58	
	6	-6.16	0.63	-5.53	
	7	-6.07	0.66	-5.41	*
400 ns	0	-5.84	0.08	-5.76	
	1	-5.88	0.15	-5.73	
	2	-5.95	0.23	-5.72	
	3	-5.72	0.29	-5.43	
	4	-5.94	0.42	-5.52	
	5	-6.13	0.54	-5.59	
	6	-6.18	0.63	-5.55	
	7	-6.08	0.66	-5.42	

* 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)

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11008648S-C
Date	November 9, 2015
Temperature / Humidity	24 deg. C / 41 % RH
Engineer	Yosuke Ishikawa
Mode	Tx Display Separated Type(L2)

11b 11 Mbps

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Frame power)		Duty factor [dB]	Result (Burst power)	
				[dBm]	[mW]		[dBm]	[mW]
2412	1.94	2.03	10.01	13.98	25.00	0.03	14.01	25.18
2437	1.89	2.04	10.01	13.94	24.77	0.03	13.97	24.95
2462	1.51	2.05	10.01	13.57	22.75	0.03	13.60	22.91

11g 36 Mbps

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Frame power)		Duty factor [dB]	Result (Burst power)	
				[dBm]	[mW]		[dBm]	[mW]
2412	-4.28	2.03	10.01	7.76	5.97	0.11	7.87	6.12
2437	-0.55	2.04	10.01	11.50	14.13	0.11	11.61	14.49
2462	-0.73	2.05	10.01	11.33	13.58	0.11	11.44	13.93

11n-20 MCS 4 (800 ns GI)

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Frame power)		Duty factor [dB]	Result (Burst power)	
				[dBm]	[mW]		[dBm]	[mW]
2412	-5.12	2.03	10.01	6.92	4.92	0.11	7.03	5.05
2437	-1.60	2.04	10.01	10.45	11.09	0.11	10.56	11.38
2462	-1.80	2.05	10.01	10.26	10.62	0.11	10.37	10.89

11n-40 MCS 7 (800 ns GI)

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Frame power)		Duty factor [dB]	Result (Burst power)	
				[dBm]	[mW]		[dBm]	[mW]
2422	-6.05	2.03	10.01	5.99	3.97	0.67	6.66	4.63
2437	-3.01	2.04	10.01	9.04	8.02	0.67	9.71	9.35
2452	-3.14	2.04	10.01	8.91	7.78	0.67	9.58	9.08

Sample Calculation:

Result (Frame power) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuatc

Result (Burst power) = Frame power + Duty factor

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

Average Output Power (Reference data)

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11008648S-C
Date	November 9, 2015
Temperature / Humidity	24 deg. C / 41 % RH
Engineer	Yosuke Ishikawa
Mode	Tx Display Separated Type(L2)

2437 MHz

Mode	Rate Mbps	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
11b	1	1.52	0.00	1.52	
	2	1.78	0.00	1.78	
	5.5	1.87	0.01	1.88	
	11	1.89	0.03	1.92	*
11g	6	-0.90	0.02	-0.88	
	9	-0.94	0.03	-0.91	
	12	-0.93	0.04	-0.89	
	18	-0.97	0.05	-0.92	
	24	-0.55	0.07	-0.48	
	36	-0.55	0.11	-0.44	*
	48	-0.63	0.13	-0.50	
	54	-0.64	0.16	-0.48	

* Worst rate

Sample Calculation:

Burst power = Reading (timed average) + Duty factor

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

11n-20, 2437 MHz

GI	Mode MCS	Reading [dBm]	Duty factor [dB]	Burst power [dBm]	Remarks
800 ns	0	-2.08	0.02	-2.06	
	1	-2.08	0.04	-2.04	
	2	-2.14	0.06	-2.08	
	3	-1.58	0.08	-1.50	
	4	-1.60	0.11	-1.49	*
	5	-1.64	0.14	-1.50	
	6	-1.67	0.17	-1.50	
	7	-1.68	0.18	-1.50	
400 ns	0	-2.02	0.02	-2.00	
	1	-2.13	0.04	-2.09	
	2	-2.15	0.06	-2.09	
	3	-1.59	0.08	-1.51	
	4	-1.62	0.11	-1.51	
	5	-1.64	0.14	-1.50	
	6	-1.67	0.17	-1.50	
	7	-1.68	0.18	-1.50	

* Worst Mode

Sample Calculation:

Burst power = Reading (timed average) + Duty factor

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

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Average Output Power
(Reference data)

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11008648S-C
Date November 9, 2015
Temperature / Humidity 24 deg. C / 41 % RH
Engineer Yosuke Ishikawa
Mode Tx Display Separated Type(L2)

11n-40, 2437 MHz

GI	Mode	Reading	Duty factor	Burst power	Remarks
	MCS	[dBm]	[dB]	[dBm]	
800 ns	0	-2.61	0.07	-2.54	
	1	-2.68	0.16	-2.52	
	2	-2.76	0.22	-2.54	
	3	-2.69	0.30	-2.39	
	4	-2.78	0.41	-2.37	
	5	-2.94	0.54	-2.40	
	6	-2.99	0.63	-2.36	
	7	-3.01	0.67	-2.34	*
400 ns	0	-2.62	0.07	-2.55	
	1	-2.70	0.16	-2.54	
	2	-2.78	0.22	-2.56	
	3	-2.67	0.30	-2.37	
	4	-2.79	0.41	-2.38	
	5	-2.91	0.54	-2.37	
	6	-3.04	0.63	-2.41	
	7	-3.08	0.67	-2.41	

* Worst Mode

Sample Calculation:

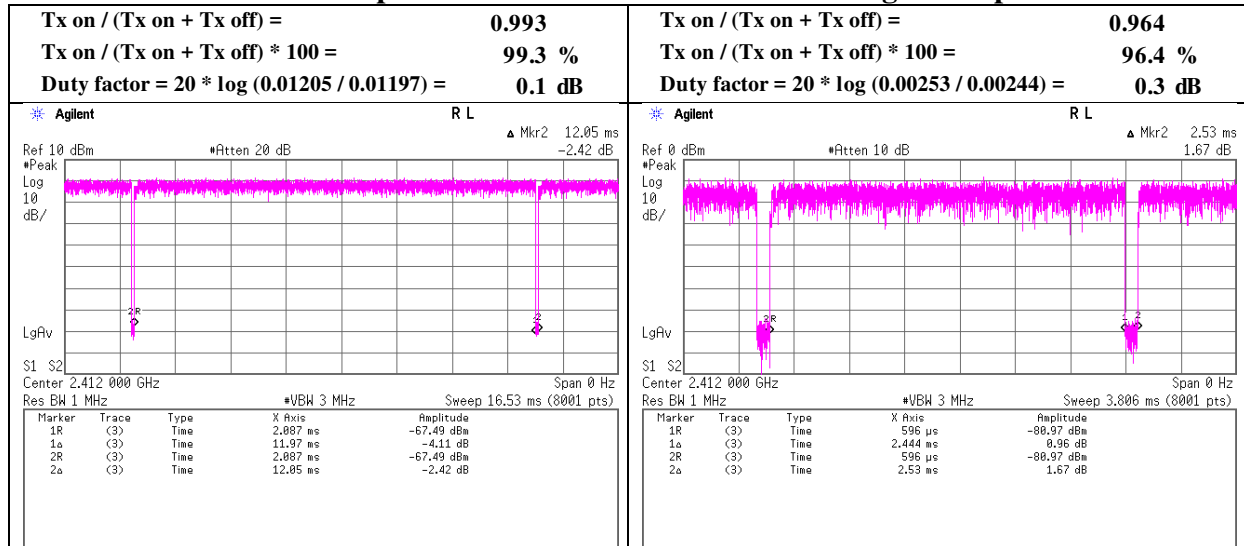
Burst power = Reading (timed average) + Duty factor

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

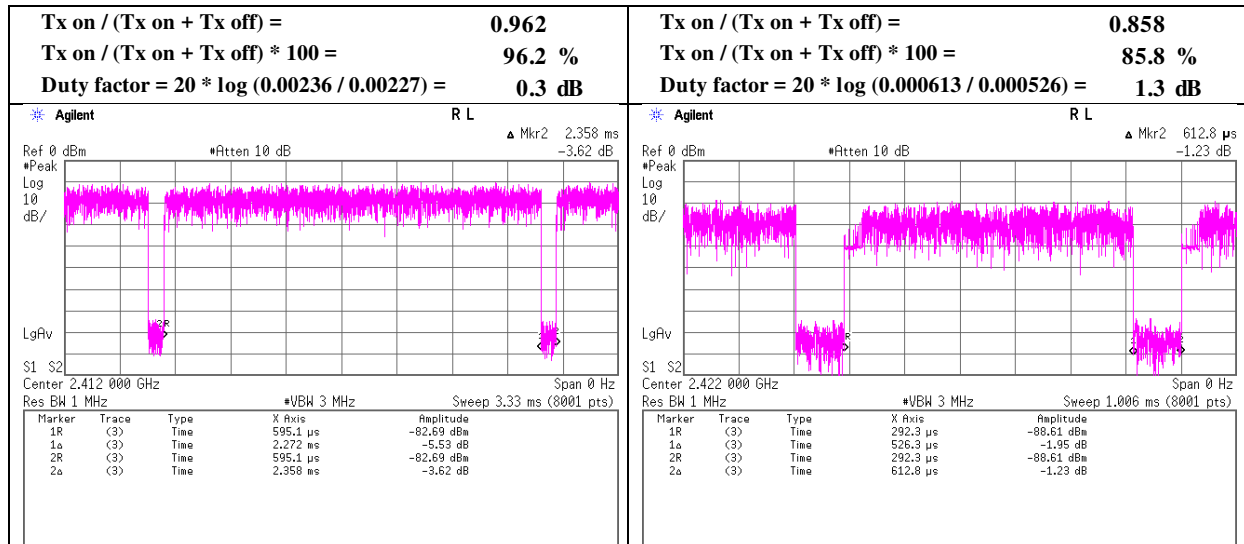
Burst rate confirmation

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11008648S-C
Date : October 27, 2015
Temperature / Humidity : 26 deg. C / 40 % RH
Engineer : Hiroyuki Morikawa
Mode : Tx Display Combined Type(T2)

11b 11 Mbps



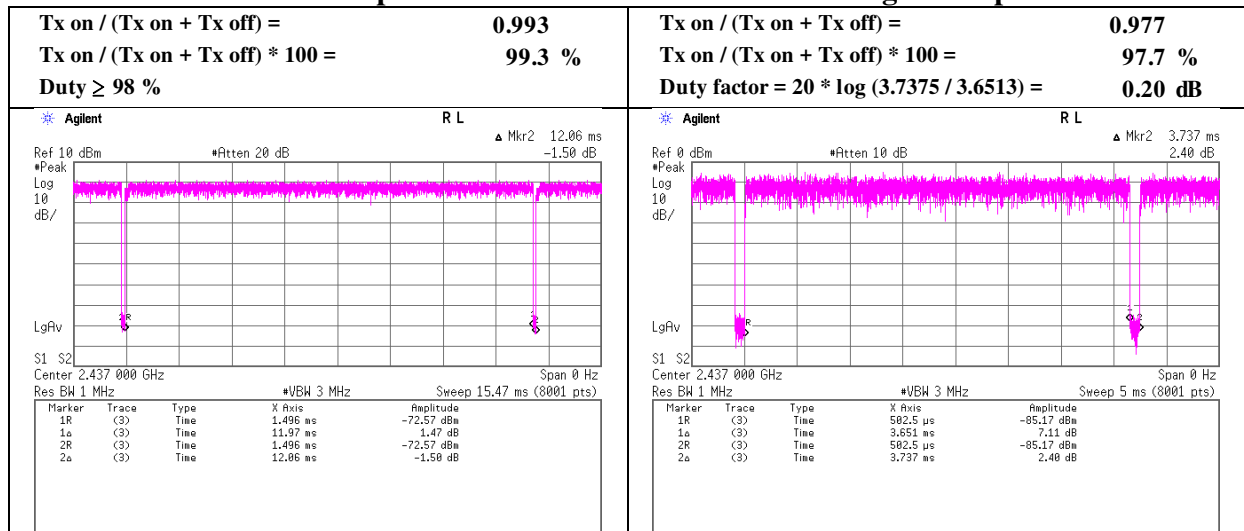
11n-20 MCS 6



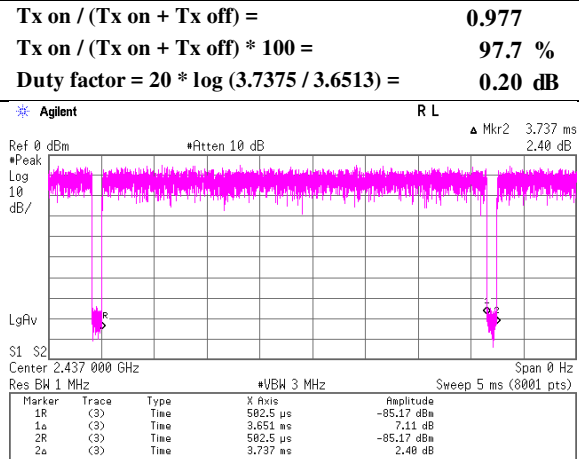
Burst rate confirmation

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11008648S-C
Date : November 9, 2015
Temperature / Humidity : 24 deg. C / 41 % RH
Engineer : Yosuke Ishikawa
Mode : Tx Display Separated Type(L2)

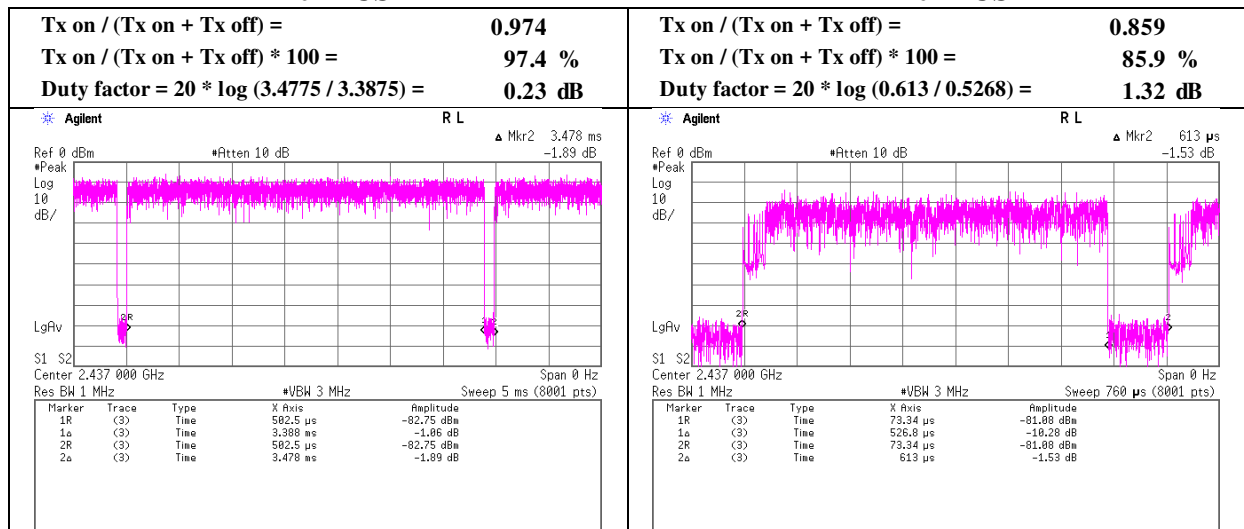
11b 11 Mbps



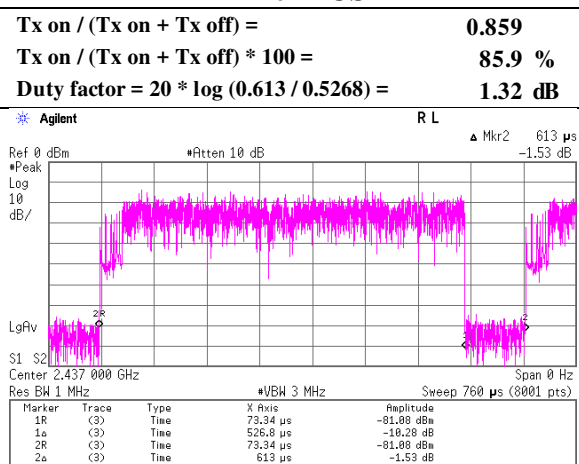
11g 36 Mbps



11n-20 MCS 4



11n-40 MCS 7



Radiated Spurious Emission

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11008648S-C	
Date	November 7, 2015	November 10, 2015
Temperature / Humidity	25 deg. C / 39 % RH	24 deg. C / 55 % RH
Engineer	Wataru Kojima	Hiroyuki Morikawa
	(1-13 GHz)	(13-26 GHz)
Mode	Tx 11b 2412 MHz Display Combined Type(T2)	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	47.2	27.8	13.7	41.0	1.8	49.5	73.9	24.4	208	41	
Hori.	4824.000	PK	44.5	31.5	5.7	39.5	1.8	44.0	73.9	29.9	134	205	
Hori.	7236.000	PK	44.9	36.9	7.1	40.1	1.8	50.6	73.9	23.3	100	0	
Hori.	9648.000	PK	43.8	38.5	8.2	39.6	1.8	52.7	73.9	21.2	100	0	
Hori.	2390.000	AV	40.2	27.8	13.7	41.0	1.8	42.5	53.9	11.4	208	41	
Hori.	4824.000	AV	37.1	31.5	5.7	39.5	1.8	36.6	53.9	17.3	134	205	
Hori.	7236.000	AV	35.9	36.9	7.1	40.1	1.8	41.6	53.9	12.3	100	0	
Hori.	9648.000	AV	35.5	38.5	8.2	39.6	1.8	44.4	53.9	9.5	100	0	
Vert.	2390.000	PK	47.0	27.8	13.7	41.0	1.8	49.3	73.9	24.6	100	305	
Vert.	4824.000	PK	45.5	31.5	5.7	39.5	1.8	45.0	73.9	28.9	123	65	
Vert.	7236.000	PK	44.5	36.9	7.1	40.1	1.8	50.2	73.9	23.7	100	0	
Vert.	9648.000	PK	43.8	38.5	8.2	39.6	1.8	52.7	73.9	21.2	100	0	
Vert.	2390.000	AV	38.6	27.8	13.7	41.0	1.8	40.9	53.9	13.0	100	305	
Vert.	4824.000	AV	38.1	31.5	5.7	39.5	1.8	37.6	53.9	16.3	123	65	
Vert.	7236.000	AV	36.0	36.9	7.1	40.1	1.8	41.7	53.9	12.2	100	0	
Vert.	9648.000	AV	35.3	38.5	8.2	39.6	1.8	44.2	53.9	9.7	100	0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65 \text{ m} / 3.0 \text{ m}) = 1.8 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	99.0	27.8	13.7	41.0	1.8	101.3	-	-	Carrier
Hori.	2400.000	PK	54.8	27.8	13.7	41.0	1.8	57.1	81.3	24.2	
Vert.	2412.000	PK	96.7	27.8	13.7	41.0	1.8	99.0	-	-	Carrier
Vert.	2400.000	PK	51.7	27.8	13.7	41.0	1.8	54.0	79.0	25.0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65 \text{ m} / 3.0 \text{ m}) = 1.8 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

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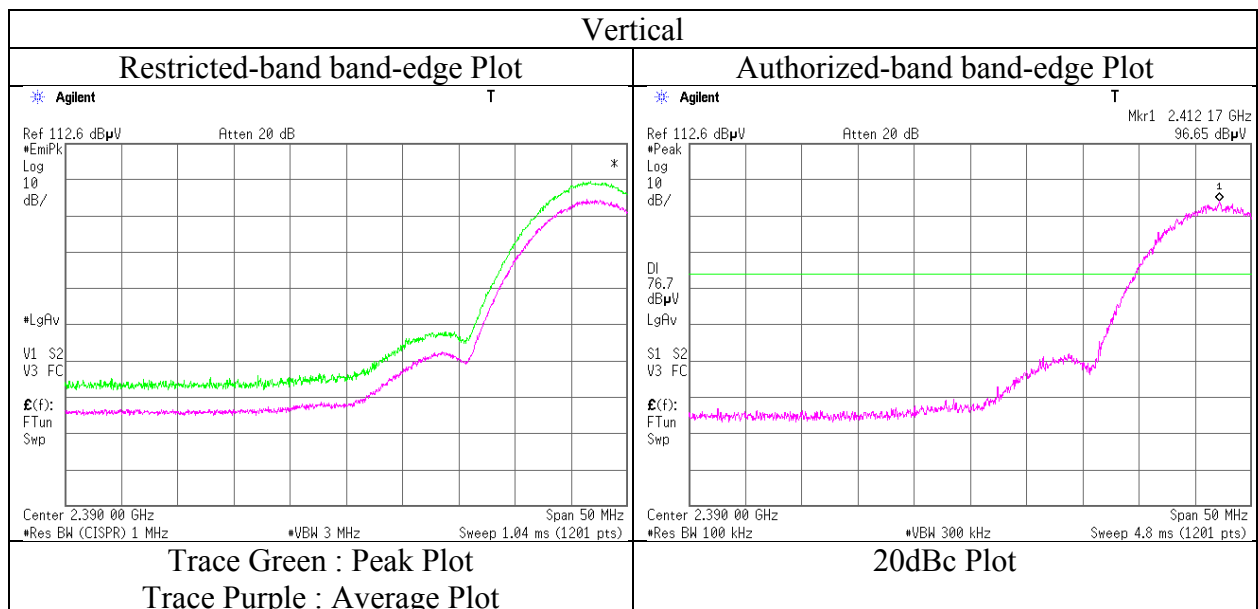
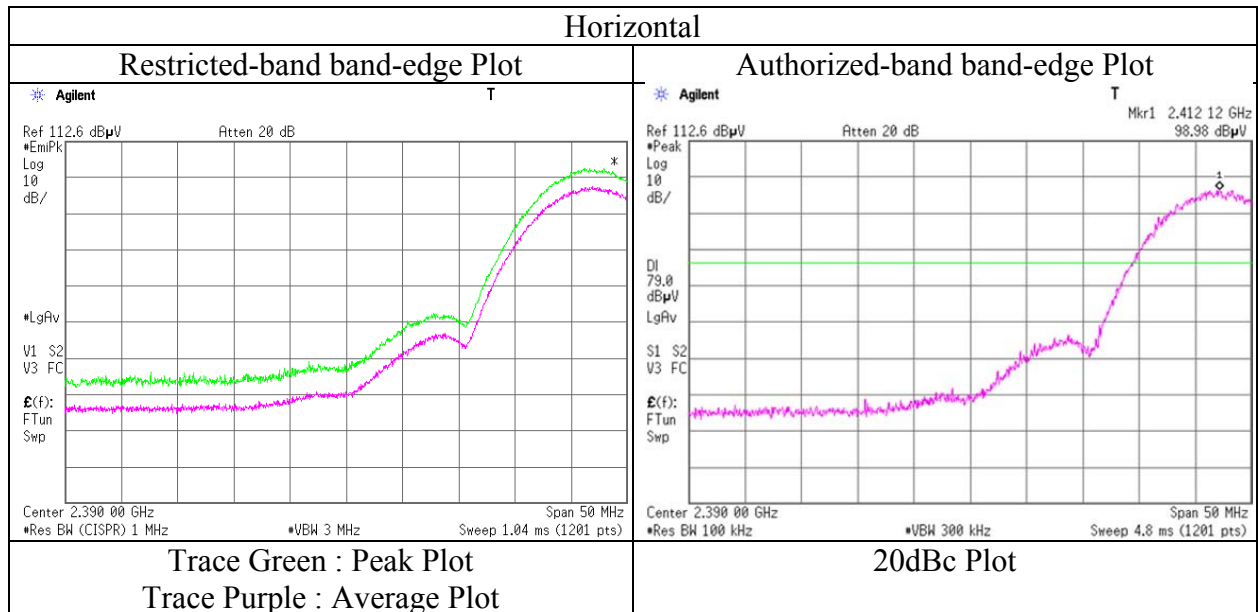
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Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11008648S-C
Date	November 7, 2015
Temperature / Humidity	25 deg. C / 39 % RH
Engineer	Wataru Kojima (1-13 GHz)
Mode	Tx 11b 2412 MHz Display Combined Type(T2)



* 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. : 11008648S-C
Date : November 7, 2015 November 10, 2015
Temperature / Humidity : 25 deg. C / 39 % RH 24 deg. C / 55 % RH
Engineer : Wataru Kojima Hiroyuki Morikawa
(1-13 GHz) (13-26 GHz)
Mode : Tx 11b 2437 MHz Display Combined Type(T2)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	44.5	31.7	5.8	39.5	1.8	44.3	73.9	29.6	100	205	
Hori.	7311.000	PK	44.8	36.9	7.2	40.2	1.8	50.5	73.9	23.4	100	0	
Hori.	9748.000	PK	45.1	38.5	8.2	39.5	1.8	54.1	73.9	19.8	100	211	
Hori.	4874.000	AV	36.7	31.7	5.8	39.5	1.8	36.5	53.9	17.4	100	205	
Hori.	7311.000	AV	36.4	36.9	7.2	40.2	1.8	42.1	53.9	11.8	100	0	
Hori.	9748.000	AV	37.5	38.5	8.2	39.5	1.8	46.5	53.9	7.4	100	211	
Vert.	4874.000	PK	45.9	31.7	5.8	39.5	1.8	45.7	73.9	28.2	134	33	
Vert.	7311.000	PK	45.6	36.9	7.2	40.2	1.8	51.3	73.9	22.6	100	0	
Vert.	9748.000	PK	45.2	38.5	8.2	39.5	1.8	54.2	73.9	19.7	153	221	
Vert.	4874.000	AV	38.4	31.7	5.8	39.5	1.8	38.2	53.9	15.7	134	33	
Vert.	7311.000	AV	36.4	36.9	7.2	40.2	1.8	42.1	53.9	11.8	100	0	
Vert.	9748.000	AV	37.6	38.5	8.2	39.5	1.8	46.6	53.9	7.3	153	221	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65\text{ m} / 3.0\text{ m}) = 1.8\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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Radiated Spurious Emission

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11008648S-C
Date : November 8, 2015 November 10, 2015
Temperature / Humidity : 25 deg. C / 49 % RH 24 deg. C / 55 % RH
Engineer : Wataru Kojima Hiroyuki Morikawa
(1-13 GHz) (13-26 GHz)
Mode : Tx 11b 2462 MHz Display Combined Type(T2)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	49.2	27.9	13.8	41.0	1.8	51.7	73.9	22.2	226	64	
Hori.	4924.000	PK	44.6	31.9	5.8	39.4	1.8	44.7	73.9	29.2	100	159	
Hori.	7386.000	PK	45.2	36.9	7.2	40.3	1.8	50.8	73.9	23.1	100	0	
Hori.	9848.000	PK	45.0	38.5	8.2	39.4	1.8	54.1	73.9	19.8	100	210	
Hori.	2483.500	AV	39.5	27.9	13.8	41.0	1.8	42.0	53.9	11.9	226	64	
Hori.	4924.000	AV	36.6	31.9	5.8	39.4	1.8	36.7	53.9	17.2	100	159	
Hori.	7386.000	AV	36.6	36.9	7.2	40.3	1.8	42.2	53.9	11.7	100	0	
Hori.	9848.000	AV	36.0	38.5	8.2	39.4	1.8	45.1	53.9	8.8	100	210	
Vert.	2483.500	PK	48.5	27.9	13.8	41.0	1.8	51.0	73.9	22.9	127	3	
Vert.	4924.000	PK	44.9	31.9	5.8	39.4	1.8	45.0	73.9	28.9	100	33	
Vert.	7386.000	PK	45.8	36.9	7.2	40.3	1.8	51.4	73.9	22.5	100	0	
Vert.	9848.000	PK	45.6	38.5	8.2	39.4	1.8	54.7	73.9	19.2	153	225	
Vert.	2483.500	AV	39.8	27.9	13.8	41.0	1.8	42.3	53.9	11.6	127	3	
Vert.	4924.000	AV	36.5	31.9	5.8	39.4	1.8	36.6	53.9	17.3	100	33	
Vert.	7386.000	AV	36.6	36.9	7.2	40.3	1.8	42.2	53.9	11.7	100	0	
Vert.	9848.000	AV	37.2	38.5	8.2	39.4	1.8	46.3	53.9	7.6	153	225	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65\text{ m} / 3.0\text{ m}) = 1.8\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

UL Japan, Inc.

Shonan EMC Lab.

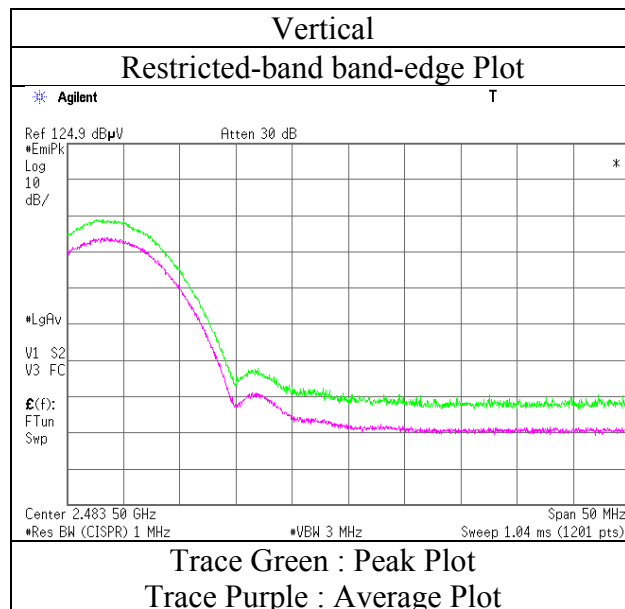
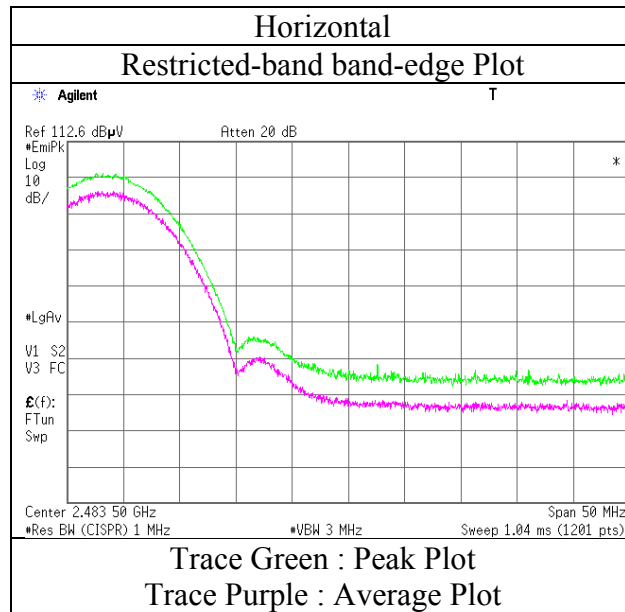
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Facsimile : +81 463 50 6401

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11008648S-C
Date	November 8, 2015
Temperature / Humidity	25 deg. C / 49 % RH
Engineer	Wataru Kojima (1-13 GHz)
Mode	Tx 11b 2462 MHz Display Combined Type(T2)



* 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. : 11008648S-C
Date : November 8, 2015 November 10, 2015
Temperature / Humidity : 25 deg. C / 49 % RH 24 deg. C / 55 % RH
Engineer : Wataru Kojima Hiroyuki Morikawa
(1-13 GHz) (13-26 GHz)
Mode : Tx 11g 2412 MHz Display Combined Type(T2)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	52.2	27.8	13.7	41.0	1.8	54.5	73.9	19.4	204	37	
Hori.	4824.000	PK	45.2	31.5	5.7	39.5	1.8	44.7	73.9	29.2	100	202	
Hori.	7236.000	PK	45.1	36.9	7.1	40.1	1.8	50.8	73.9	23.1	100	0	
Hori.	9648.000	PK	44.0	38.5	8.2	39.6	1.8	52.9	73.9	21.0	100	214	
Vert.	2390.000	PK	49.1	27.8	13.7	41.0	1.8	51.4	73.9	22.5	135	351	
Vert.	4824.000	PK	44.0	31.5	5.7	39.5	1.8	43.5	73.9	30.4	133	26	
Vert.	7236.000	PK	44.2	36.9	7.1	40.1	1.8	49.9	73.9	24.0	100	0	
Vert.	9648.000	PK	44.1	38.5	8.2	39.6	1.8	53.0	73.9	20.9	130	224	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65\text{ m} / 3.0\text{ m}) = 1.8\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	40.1	27.8	13.7	41.0	0.3	1.8	42.7	53.9	11.2	*1)
Hori.	4824.000	AV	35.2	31.5	5.7	39.5	0.3	1.8	35.0	53.9	18.9	
Hori.	7236.000	AV	35.7	36.9	7.1	40.1	0.3	1.8	41.7	53.9	12.2	
Hori.	9648.000	AV	35.0	38.5	8.2	39.6	0.3	1.8	44.2	53.9	9.7	
Vert.	2390.000	AV	38.3	27.8	13.7	41.0	0.3	1.8	40.9	53.9	13.0	*1)
Vert.	4824.000	AV	35.9	31.5	5.7	39.5	0.3	1.8	35.7	53.9	18.2	
Vert.	7236.000	AV	35.3	36.9	7.1	40.1	0.3	1.8	41.3	53.9	12.6	
Vert.	9648.000	AV	35.0	38.5	8.2	39.6	0.3	1.8	44.2	53.9	9.7	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65\text{ m} / 3.0\text{ m}) = 1.8\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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	90.2	27.8	13.7	41.0	1.8	92.5	-	-	Carrier
Hori.	2400.000	PK	55.8	27.8	13.7	41.0	1.8	58.1	72.5	14.4	
Vert.	2412.000	PK	86.0	27.8	13.7	41.0	1.8	88.3	-	-	Carrier
Vert.	2400.000	PK	50.4	27.8	13.7	41.0	1.8	52.7	68.3	15.6	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65\text{ m} / 3.0\text{ m}) = 1.8\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

UL Japan, Inc.

Shonan EMC Lab.

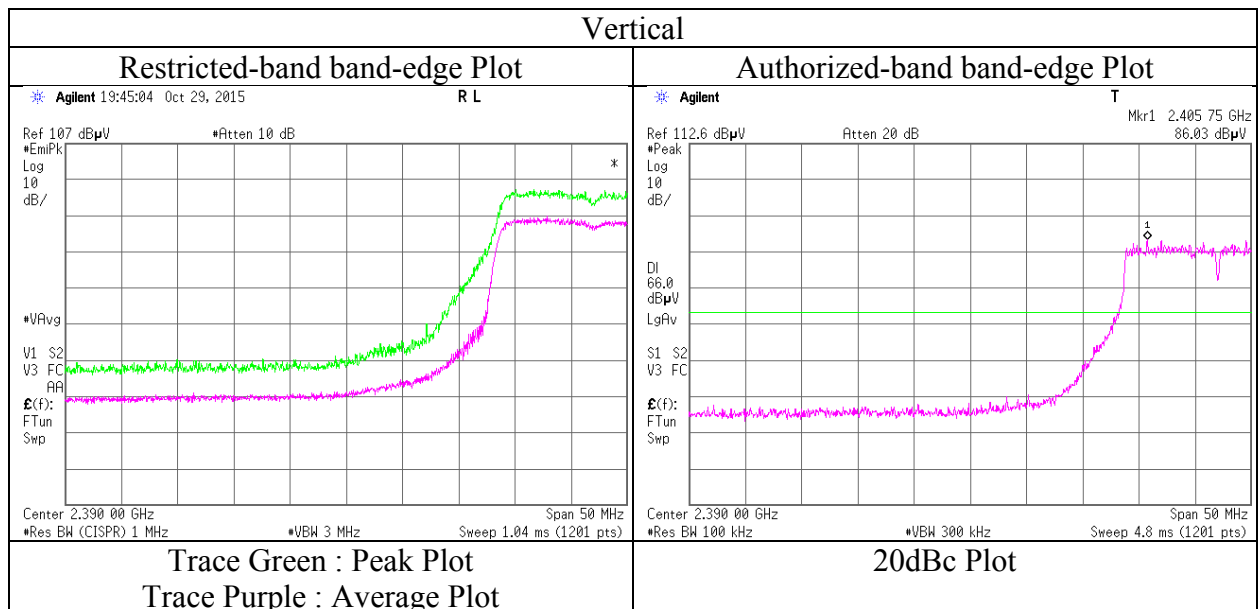
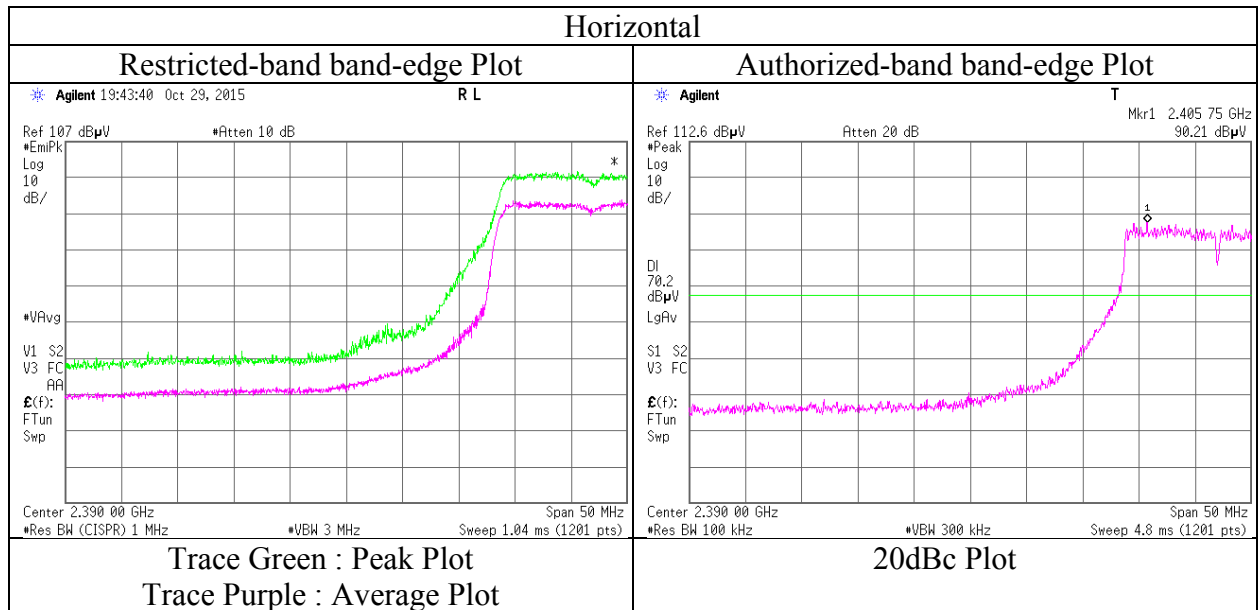
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

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Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11008648S-C
Date	November 8, 2015
Temperature / Humidity	25 deg. C / 49 % RH
Engineer	Wataru Kojima (1-13 GHz)
Mode	Tx 11g 2412 MHz Display Combined Type(T2)



* 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. : 11008648S-C
Date : November 16, 2015
Temperature / Humidity : 24 deg. C / 45 % RH
Engineer : Yosuke Ishikawa
(1-2.8 GHz)
Mode : Tx 11g 2417 MHz Display Combined Type(T2)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	53.6	27.8	13.7	41.0	1.8	55.9	73.9	18.0	100	34	
Vert.	2390.000	PK	51.8	27.8	13.7	41.0	1.8	54.1	73.9	19.8	100	304	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65 \text{ m} / 3.0 \text{ m}) = 1.8 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	40.8	27.8	13.7	41.0	0.3	1.8	43.4	53.9	10.5	*1)
Vert.	2390.000	AV	39.3	27.8	13.7	41.0	0.3	1.8	41.9	53.9	12.0	*1)

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65 \text{ m} / 3.0 \text{ m}) = 1.8 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

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.	2417.000	PK	92.6	27.8	13.7	41.0	1.8	94.9	-	-	Carrier
Hori.	2400.000	PK	52.4	27.8	13.7	41.0	1.8	54.7	74.9	20.2	
Vert.	2417.000	PK	90.1	27.8	13.7	41.0	1.8	92.4	-	-	Carrier
Vert.	2400.000	PK	49.4	27.8	13.7	41.0	1.8	51.7	72.4	20.7	

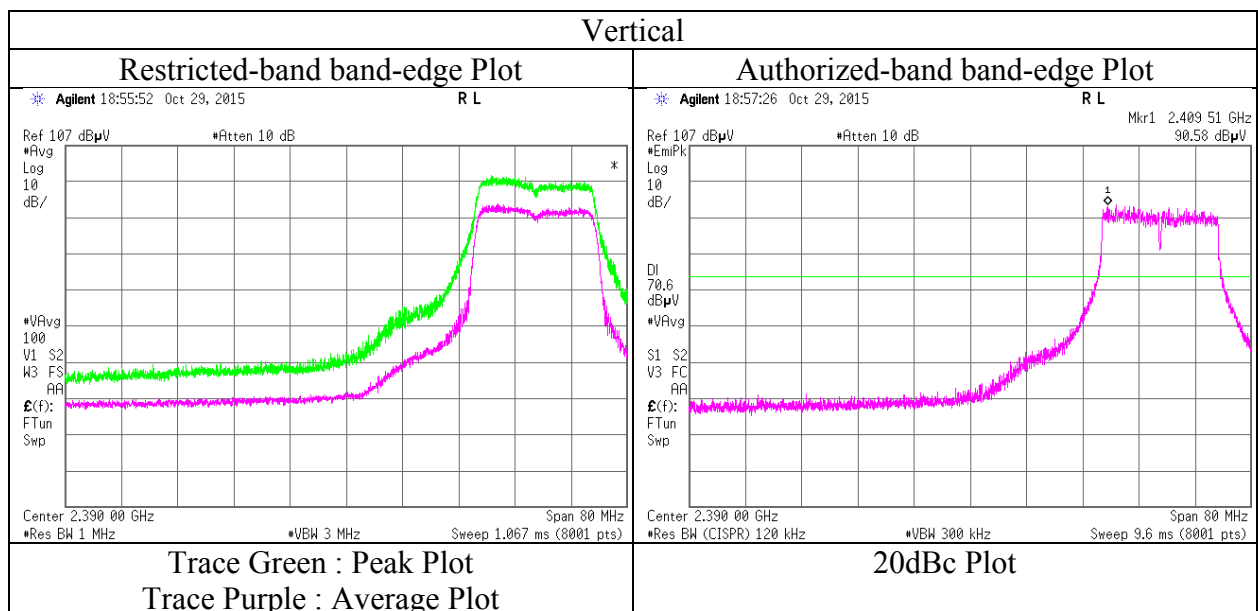
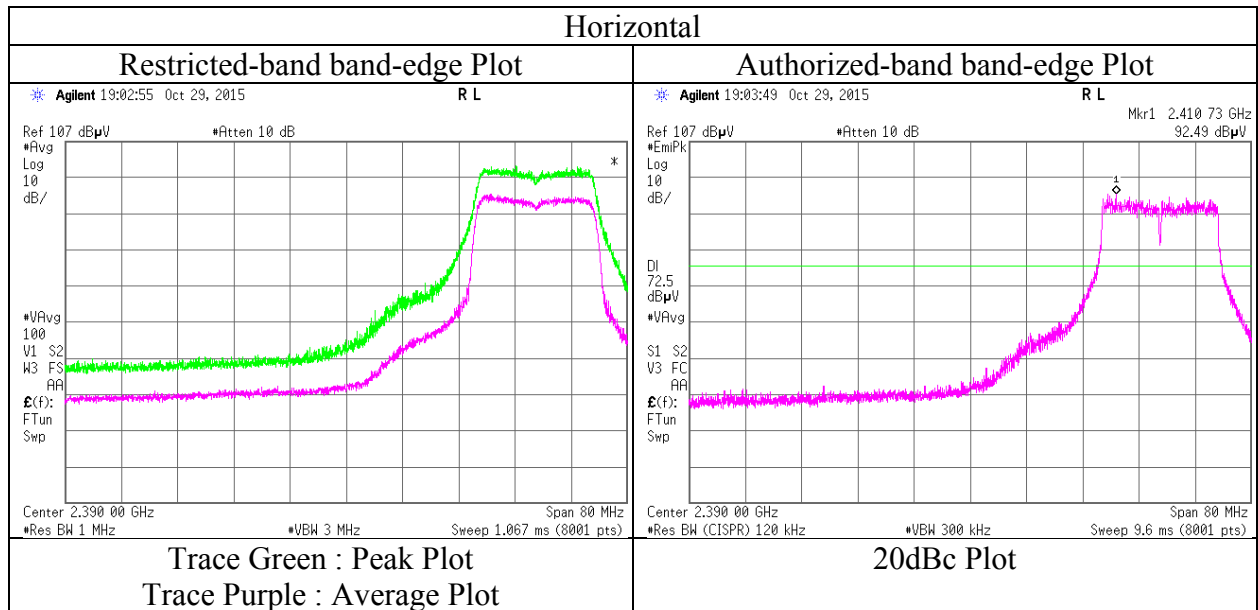
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.65 \text{ m} / 3.0 \text{ m}) = 1.8 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11008648S-C
Date	November 16, 2015
Temperature / Humidity	24 deg. C / 45 % RH
Engineer	Yosuke Ishikawa (1-2.8 GHz)
Mode	Tx 11g 2417 MHz Display Combined Type(T2)



* 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.	11008648S-C		
Date	November 8, 2015	November 10, 2015	November 15, 2015
Temperature / Humidity	25 deg. C / 49 % RH	24 deg. C / 55 % RH	24 deg. C / 49 % RH
Engineer	Wataru Kojima	Hiroyuki Morikawa	Kenichi Adachi
	(1-13 GHz)	(13-26 GHz)	(30-1000 MHz)
Mode	Tx 11g 2437 MHz Display Combined Type(T2)		

(* 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.	281.153	QP	34.7	18.4	8.6	32.0	0.0	29.7	46.0	16.3	126	307	
Hori.	380.006	QP	33.0	15.6	9.0	31.9	0.0	25.7	46.0	20.3	100	190	
Hori.	394.379	QP	31.7	15.9	9.1	31.9	0.0	24.8	46.0	21.2	100	65	
Hori.	791.232	QP	29.4	20.9	10.6	31.5	0.0	29.4	46.0	16.6	100	164	
Hori.	888.127	QP	29.4	22.2	10.9	31.0	0.0	31.5	46.0	14.5	100	45	
Hori.	4874.000	PK	43.5	31.7	5.8	39.5	1.8	43.3	73.9	30.6	100	50	
Hori.	7311.000	PK	44.0	36.9	7.2	40.2	1.8	49.7	73.9	24.2	100	0	
Hori.	9748.000	PK	43.7	38.5	8.2	39.5	1.8	52.7	73.9	21.2	100	211	
Vert.	194.637	QP	23.4	16.1	8.1	32.0	0.0	15.6	43.5	27.9	100	239	
Vert.	288.995	QP	29.6	18.8	8.6	32.0	0.0	25.0	46.0	21.0	100	317	
Vert.	4874.000	PK	43.4	31.7	5.8	39.5	1.8	43.2	73.9	30.7	124	60	
Vert.	7311.000	PK	43.9	36.9	7.2	40.2	1.8	49.6	73.9	24.3	100	0	
Vert.	9748.000	PK	43.8	38.5	8.2	39.5	1.8	52.8	73.9	21.1	105	220	

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

Distance factor : 1 GHz - 13 GHz : 20log (3.65 m / 3.0 m) = 1.8 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 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	35.5	31.7	5.8	39.5	0.3	1.8	35.6	53.9	18.3	
Hori.	7311.000	AV	36.0	36.9	7.2	40.2	0.3	1.8	42.0	53.9	11.9	
Hori.	9748.000	AV	35.5	38.5	8.2	39.5	0.3	1.8	44.8	53.9	9.1	
Vert.	4874.000	AV	35.8	31.7	5.8	39.5	0.3	1.8	35.9	53.9	18.0	
Vert.	7311.000	AV	35.9	36.9	7.2	40.2	0.3	1.8	41.9	53.9	12.0	
Vert.	9748.000	AV	35.8	38.5	8.2	39.5	0.3	1.8	45.1	53.9	8.8	

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

Distance factor : 1 GHz - 13 GHz : 20log (3.65 m / 3.0 m) = 1.8 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

Duty factor refer to "Duty factor Calculation chart" sheet.

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11008648S-C
Date : November 8, 2015 November 10, 2015
Temperature / Humidity : 25 deg. C / 49 % RH 24 deg. C / 55 % RH
Engineer : Wataru Kojima Hiroyuki Morikawa
(1-13 GHz) (13-26 GHz)
Mode : Tx 11g 2462 MHz Display Combined Type(T2)

(* 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	63.5	27.9	13.8	41.0	1.8	66.0	73.9	7.9	232	47	
Hori.	4924.000	PK	43.5	31.9	5.8	39.4	1.8	43.6	73.9	30.3	100	180	
Hori.	7386.000	PK	44.8	36.9	7.2	40.3	1.8	50.4	73.9	23.5	100	0	
Hori.	9848.000	PK	43.0	38.5	8.2	39.4	1.8	52.1	73.9	21.8	100	214	
Vert.	2483.500	PK	65.1	27.9	13.8	41.0	1.8	67.6	73.9	6.3	118	3	
Vert.	4924.000	PK	44.5	31.9	5.8	39.4	1.8	44.6	73.9	29.3	100	30	
Vert.	7386.000	PK	45.3	36.9	7.2	40.3	1.8	50.9	73.9	23.0	100	0	
Vert.	9848.000	PK	43.7	38.5	8.2	39.4	1.8	52.8	73.9	21.1	143	222	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65\text{ m} / 3.0\text{ m}) = 1.8\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	44.2	27.9	13.8	41.0	0.3	1.8	47.0	53.9	6.9	*1)
Hori.	4924.000	AV	35.7	31.9	5.8	39.4	0.3	1.8	36.1	53.9	17.8	
Hori.	7386.000	AV	36.3	36.9	7.2	40.3	0.3	1.8	42.2	53.9	11.7	
Hori.	9848.000	AV	35.7	38.5	8.2	39.4	0.3	1.8	45.1	53.9	8.8	
Vert.	2483.500	AV	44.8	27.9	13.8	41.0	0.3	1.8	47.6	53.9	6.3	*1)
Vert.	4924.000	AV	35.8	31.9	5.8	39.4	0.3	1.8	36.2	53.9	17.7	
Vert.	7386.000	AV	36.3	36.9	7.2	40.3	0.3	1.8	42.2	53.9	11.7	
Vert.	9848.000	AV	35.9	38.5	8.2	39.4	0.3	1.8	45.3	53.9	8.6	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65\text{ m} / 3.0\text{ m}) = 1.8\text{ dB}$

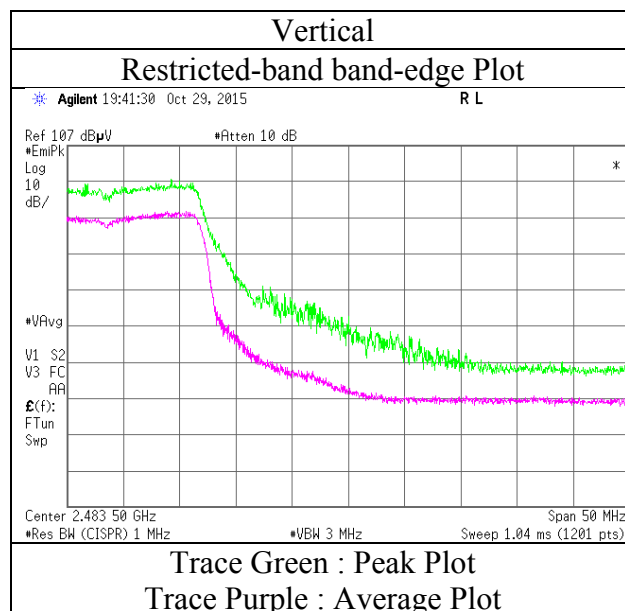
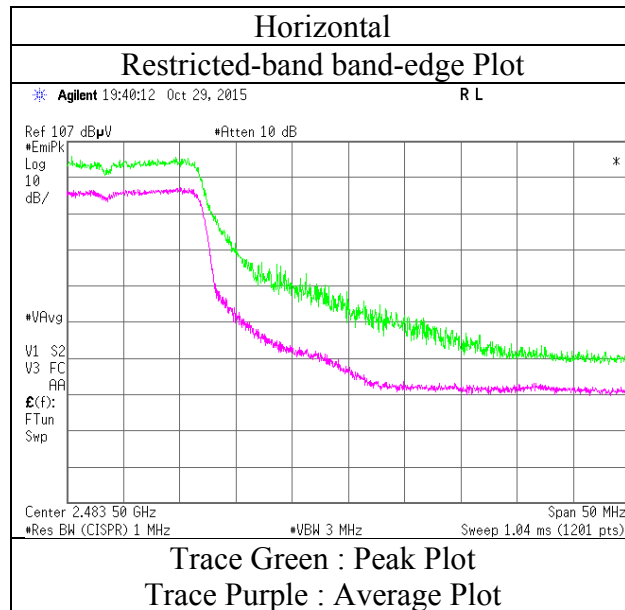
13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

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

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. 11008648S-C
Date November 8, 2015
Temperature / Humidity 25 deg. C / 49 % RH
Engineer Wataru Kojima
(1-13 GHz)
Mode Tx 11g 2462 MHz Display Combined Type(T2)



* 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. : 11008648S-C
Date : November 8, 2015 November 10, 2015
Temperature / Humidity : 25 deg. C / 49 % RH 24 deg. C / 55 % RH
Engineer : Wataru Kojima Hiroyuki Morikawa
(1-13 GHz) (13-26 GHz)
Mode : Tx 11n-20 2412 MHz Display Combined Type(T2)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	52.3	27.8	13.7	41.0	1.8	54.6	73.9	19.3	203	41	
Hori.	4824.000	PK	43.6	31.5	5.7	39.5	1.8	43.1	73.9	30.8	100	198	
Hori.	7236.000	PK	45.4	36.9	7.1	40.1	1.8	51.1	73.9	22.8	100	0	
Hori.	9648.000	PK	42.5	38.5	8.2	39.6	1.8	51.4	73.9	22.5	100	0	
Vert.	2390.000	PK	50.4	27.8	13.7	41.0	1.8	52.7	73.9	21.2	100	304	
Vert.	4824.000	PK	43.6	31.5	5.7	39.5	1.8	43.1	73.9	30.8	125	30	
Vert.	7236.000	PK	42.9	36.9	7.1	40.1	1.8	48.6	73.9	25.3	100	0	
Vert.	9648.000	PK	43.0	38.5	8.2	39.6	1.8	51.9	73.9	22.0	100	180	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65\text{ m} / 3.0\text{ m}) = 1.8\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	40.4	27.8	13.7	41.0	0.3	1.8	43.0	53.9	10.9	*1)
Hori.	4824.000	AV	35.5	31.5	5.7	39.5	0.3	1.8	35.3	53.9	18.6	
Hori.	7236.000	AV	35.5	36.9	7.1	40.1	0.3	1.8	41.5	53.9	12.4	
Hori.	9648.000	AV	35.0	38.5	8.2	39.6	0.3	1.8	44.2	53.9	9.7	
Vert.	2390.000	AV	38.1	27.8	13.7	41.0	0.3	1.8	40.7	53.9	13.2	*1)
Vert.	4824.000	AV	35.6	31.5	5.7	39.5	0.3	1.8	35.4	53.9	18.5	
Vert.	7236.000	AV	35.1	36.9	7.1	40.1	0.3	1.8	41.1	53.9	12.8	
Vert.	9648.000	AV	34.7	38.5	8.2	39.6	0.3	1.8	43.9	53.9	10.0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65\text{ m} / 3.0\text{ m}) = 1.8\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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	89.3	27.8	13.7	41.0	1.8	91.6	-	-	Carrier
Hori.	2400.000	PK	55.6	27.8	13.7	41.0	1.8	57.9	71.6	13.7	
Vert.	2412.000	PK	86.3	27.8	13.7	41.0	1.8	88.6	-	-	Carrier
Vert.	2400.000	PK	52.9	27.8	13.7	41.0	1.8	55.2	68.7	13.5	

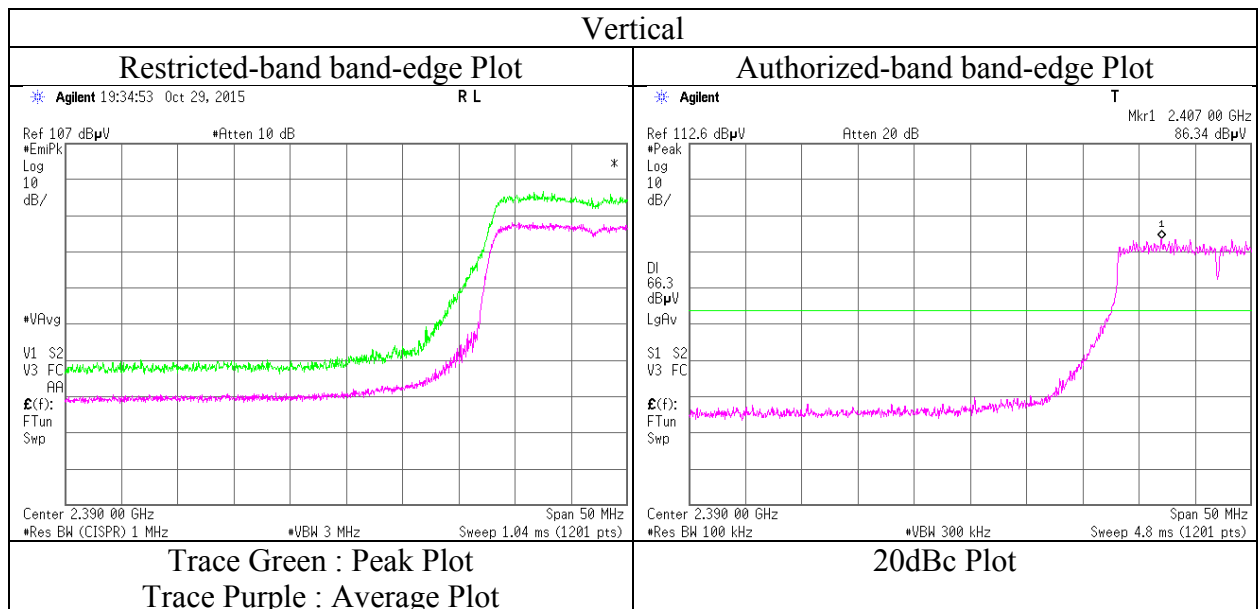
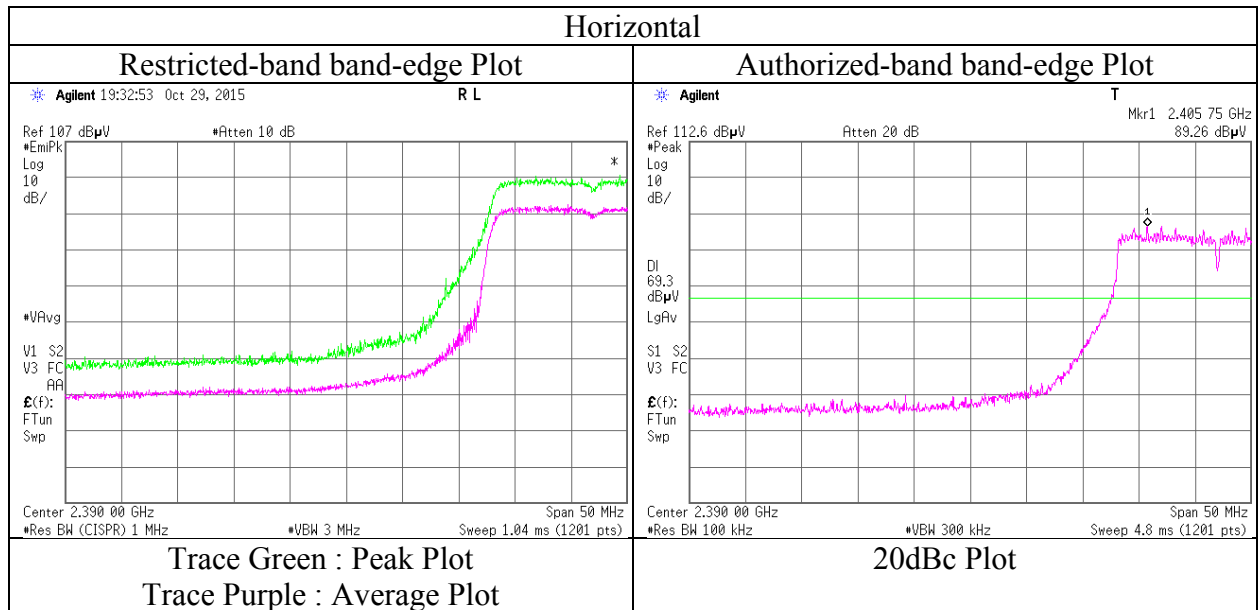
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.65\text{ m} / 3.0\text{ m}) = 1.8\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11008648S-C
Date	November 8, 2015
Temperature / Humidity	25 deg. C / 49 % RH
Engineer	Wataru Kojima (1-13 GHz)
Mode	Tx 11n-20 2412 MHz Display Combined Type(T2)



* 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. : 11008648S-C
Date : November 16, 2015
Temperature / Humidity : 24 deg. C / 45 % RH
Engineer : Yosuke Ishikawa
(1-2.8 GHz)
Mode : Tx 11n-20 2417 MHz Display Combined Type(T2)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	52.7	27.8	13.7	41.0	1.8	55.0	73.9	18.9	100	33	
Vert.	2390.000	PK	51.6	27.8	13.7	41.0	1.8	53.9	73.9	20.0	100	300	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65 \text{ m} / 3.0 \text{ m}) = 1.8 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	40.1	27.8	13.7	41.0	1.3	1.8	43.7	53.9	10.2	*1)
Vert.	2390.000	AV	39.2	27.8	13.7	41.0	1.3	1.8	42.8	53.9	11.1	*1)

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65 \text{ m} / 3.0 \text{ m}) = 1.8 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

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.	2417.000	PK	90.5	27.8	13.7	41.0	1.8	92.8	-	-	Carrier
Hori.	2400.000	PK	51.2	27.8	13.7	41.0	1.8	53.5	72.8	19.3	
Vert.	2417.000	PK	89.3	27.8	13.7	41.0	1.8	91.6	-	-	Carrier
Vert.	2400.000	PK	48.3	27.8	13.7	41.0	1.8	50.6	71.6	21.0	

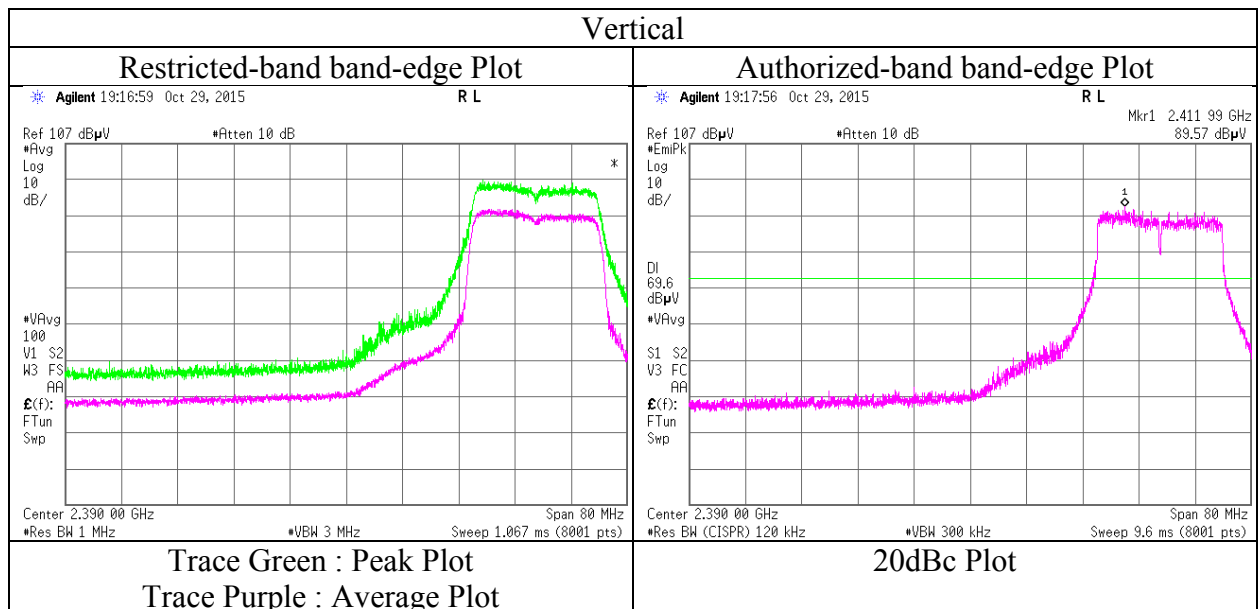
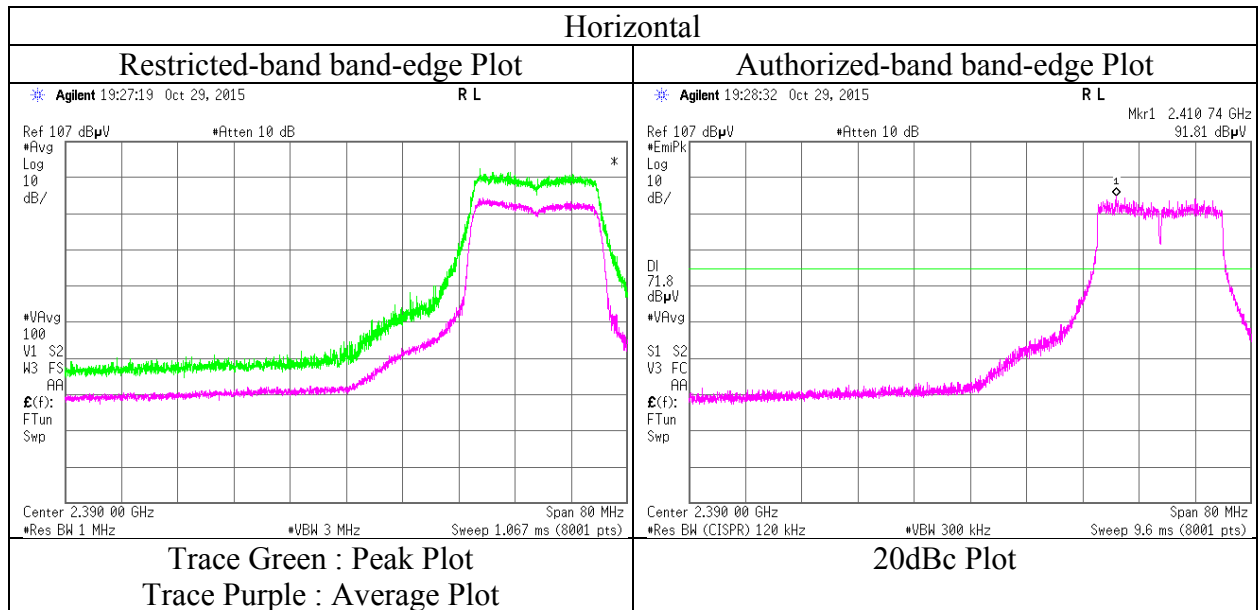
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.65 \text{ m} / 3.0 \text{ m}) = 1.8 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11008648S-C
Date	November 16, 2015
Temperature / Humidity	24 deg. C / 45 % RH
Engineer	Yosuke Ishikawa
	(1-2.8 GHz)
Mode	Tx 11n-20 2417 MHz Display Combined Type(T2)



* 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. : 11008648S-C
Date : November 8, 2015 November 10, 2015
Temperature / Humidity : 25 deg. C / 49 % RH 24 deg. C / 55 % RH
Engineer : Wataru Kojima Hiroyuki Morikawa
(1-13 GHz) (13-26 GHz)
Mode : Tx 11n-20 2437 MHz Display Combined Type(T2)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	44.1	31.7	5.8	39.5	1.8	43.9	73.9	30.0	100	0	
Hori.	7311.000	PK	45.0	36.9	7.2	40.2	1.8	50.7	73.9	23.2	100	0	
Hori.	9748.000	PK	43.4	38.5	8.2	39.5	1.8	52.4	73.9	21.5	100	210	
Vert.	4874.000	PK	44.1	31.7	5.8	39.5	1.8	43.9	73.9	30.0	128	62	
Vert.	7311.000	PK	43.8	36.9	7.2	40.2	1.8	49.5	73.9	24.4	100	0	
Vert.	9748.000	PK	42.5	38.5	8.2	39.5	1.8	51.5	73.9	22.4	126	223	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65\text{ m} / 3.0\text{ m}) = 1.8\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4874.000	AV	35.8	31.7	5.8	39.5	0.3	1.8	35.9	53.9	18.0	
Hori.	7311.000	AV	35.8	36.9	7.2	40.2	0.3	1.8	41.8	53.9	12.1	
Hori.	9748.000	AV	35.1	38.5	8.2	39.5	0.3	1.8	44.4	53.9	9.5	
Vert.	4874.000	AV	36.0	31.7	5.8	39.5	0.3	1.8	36.1	53.9	17.8	
Vert.	7311.000	AV	35.7	36.9	7.2	40.2	0.3	1.8	41.7	53.9	12.2	
Vert.	9748.000	AV	35.6	38.5	8.2	39.5	0.3	1.8	44.9	53.9	9.0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65\text{ m} / 3.0\text{ m}) = 1.8\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11008648S-C
Date : November 8, 2015 November 10, 2015
Temperature / Humidity : 25 deg. C / 49 % RH 24 deg. C / 55 % RH
Engineer : Wataru Kojima Hiroyuki Morikawa
(1-13 GHz) (13-26 GHz)
Mode : Tx 11n-20 2462 MHz Display Combined Type(T2)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	49.6	27.9	13.8	41.0	1.8	52.1	73.9	21.8	198	43	
Hori.	4924.000	PK	44.1	31.9	5.8	39.4	1.8	44.2	73.9	29.7	100	18	
Hori.	7386.000	PK	44.8	36.9	7.2	40.3	1.8	50.4	73.9	23.5	100	0	
Hori.	9848.000	PK	43.6	38.5	8.2	39.4	1.8	52.7	73.9	21.2	100	198	
Vert.	2483.500	PK	50.2	27.9	13.8	41.0	1.8	52.7	73.9	21.2	122	3	
Vert.	4924.000	PK	44.1	31.9	5.8	39.4	1.8	44.2	73.9	29.7	111	68	
Vert.	7386.000	PK	43.8	36.9	7.2	40.3	1.8	49.4	73.9	24.5	100	0	
Vert.	9848.000	PK	43.2	38.5	8.2	39.4	1.8	52.3	73.9	21.6	100	211	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65\text{ m} / 3.0\text{ m}) = 1.8\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	39.6	27.9	13.8	41.0	0.3	1.8	42.4	53.9	11.5	*1)
Hori.	4924.000	AV	36.1	31.9	5.8	39.4	0.3	1.8	36.5	53.9	17.4	
Hori.	7386.000	AV	36.5	36.9	7.2	40.3	0.3	1.8	42.4	53.9	11.5	
Hori.	9848.000	AV	36.0	38.5	8.2	39.4	0.3	1.8	45.4	53.9	8.5	
Vert.	2483.500	AV	40.6	27.9	13.8	41.0	0.3	1.8	43.4	53.9	10.5	*1)
Vert.	4924.000	AV	36.0	31.9	5.8	39.4	0.3	1.8	36.4	53.9	17.5	
Vert.	7386.000	AV	36.3	36.9	7.2	40.3	0.3	1.8	42.2	53.9	11.7	
Vert.	9848.000	AV	35.7	38.5	8.2	39.4	0.3	1.8	45.1	53.9	8.8	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65\text{ m} / 3.0\text{ m}) = 1.8\text{ dB}$

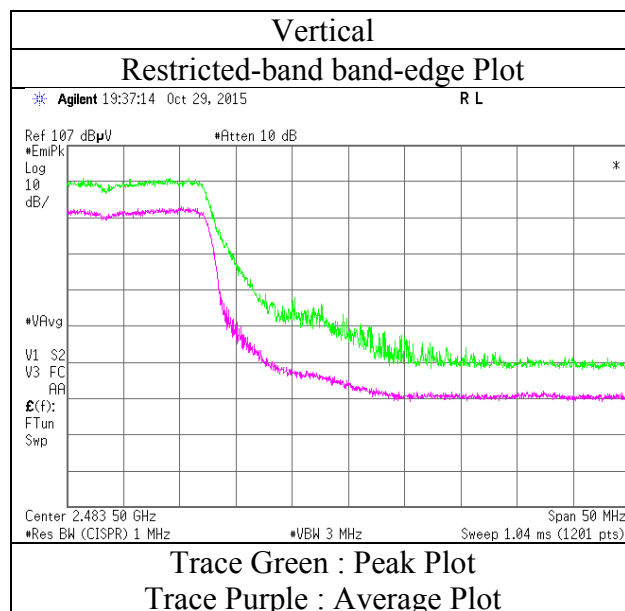
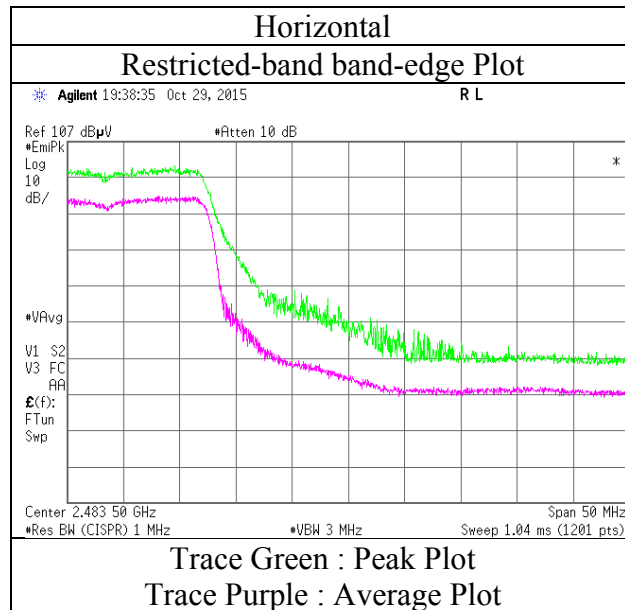
13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

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

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11008648S-C
Date : November 8, 2015
Temperature / Humidity : 25 deg. C / 49 % RH
Engineer : Wataru Kojima
(1-13 GHz)
Mode : Tx 11n-20 2462 MHz Display Combined Type(T2)



* 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. : 11008648S-C
Date : November 8, 2015 November 10, 2015
Temperature / Humidity : 25 deg. C / 49 % RH 24 deg. C / 55 % RH
Engineer : Wataru Kojima Hiroyuki Morikawa
(1-13 GHz) (13-26 GHz)
Mode : Tx 11n-40 2422 MHz Display Combined Type(T2)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	52.9	27.8	13.7	41.0	1.8	55.2	73.9	18.7	237	43	
Hori.	4844.000	PK	43.5	31.6	5.8	39.5	1.8	43.2	73.9	30.7	100	194	
Hori.	7266.000	PK	43.4	36.9	7.2	40.2	1.8	49.1	73.9	24.8	100	0	
Hori.	9688.000	PK	44.6	38.5	8.2	39.6	1.8	53.5	73.9	20.4	100	0	
Vert.	2390.000	PK	50.1	27.8	13.7	41.0	1.8	52.4	73.9	21.5	100	0	
Vert.	4844.000	PK	43.6	31.6	5.8	39.5	1.8	43.3	73.9	30.6	143	56	
Vert.	7266.000	PK	44.0	36.9	7.2	40.2	1.8	49.7	73.9	24.2	100	0	
Vert.	9688.000	PK	44.4	38.5	8.2	39.6	1.8	53.3	73.9	20.6	100	0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65\text{ m} / 3.0\text{ m}) = 1.8\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	41.8	27.8	13.7	41.0	1.3	1.8	45.4	53.9	8.5	*1)
Hori.	4844.000	AV	35.5	31.6	5.8	39.5	1.3	1.8	36.5	53.9	17.4	
Hori.	7266.000	AV	35.2	36.9	7.2	40.2	1.3	1.8	42.2	53.9	11.7	
Hori.	9688.000	AV	35.6	38.5	8.2	39.6	1.3	1.8	45.8	53.9	8.1	
Vert.	2390.000	AV	40.4	27.8	13.7	41.0	1.3	1.8	44.0	53.9	9.9	*1)
Vert.	4844.000	AV	35.6	31.6	5.8	39.5	1.3	1.8	36.6	53.9	17.3	
Vert.	7266.000	AV	35.1	36.9	7.2	40.2	1.3	1.8	42.1	53.9	11.8	
Vert.	9688.000	AV	35.6	38.5	8.2	39.6	1.3	1.8	45.8	53.9	8.1	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65\text{ m} / 3.0\text{ m}) = 1.8\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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.	2422.000	PK	85.7	27.8	13.7	41.0	1.8	88.0	-	-	Carrier
Hori.	2400.000	PK	54.2	27.8	13.7	41.0	1.8	56.5	68.0	11.5	
Vert.	2422.000	PK	84.1	27.8	13.7	41.0	1.8	86.4	-	-	Carrier
Vert.	2400.000	PK	53.3	27.8	13.7	41.0	1.8	55.6	66.4	10.8	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65\text{ m} / 3.0\text{ m}) = 1.8\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

UL Japan, Inc.

Shonan EMC Lab.

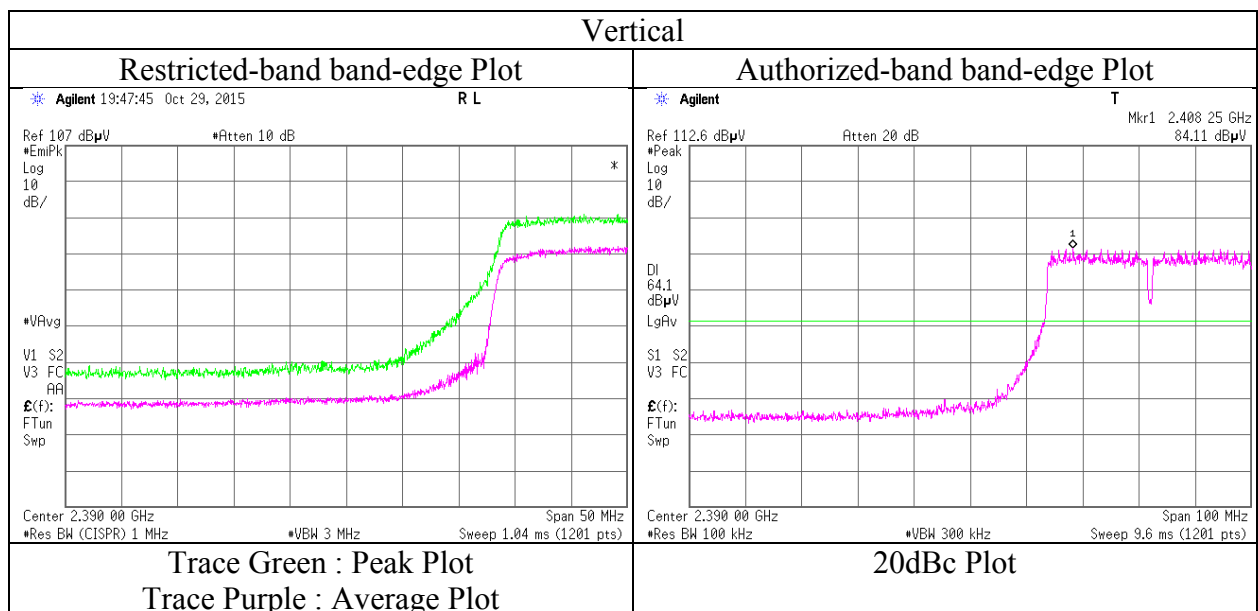
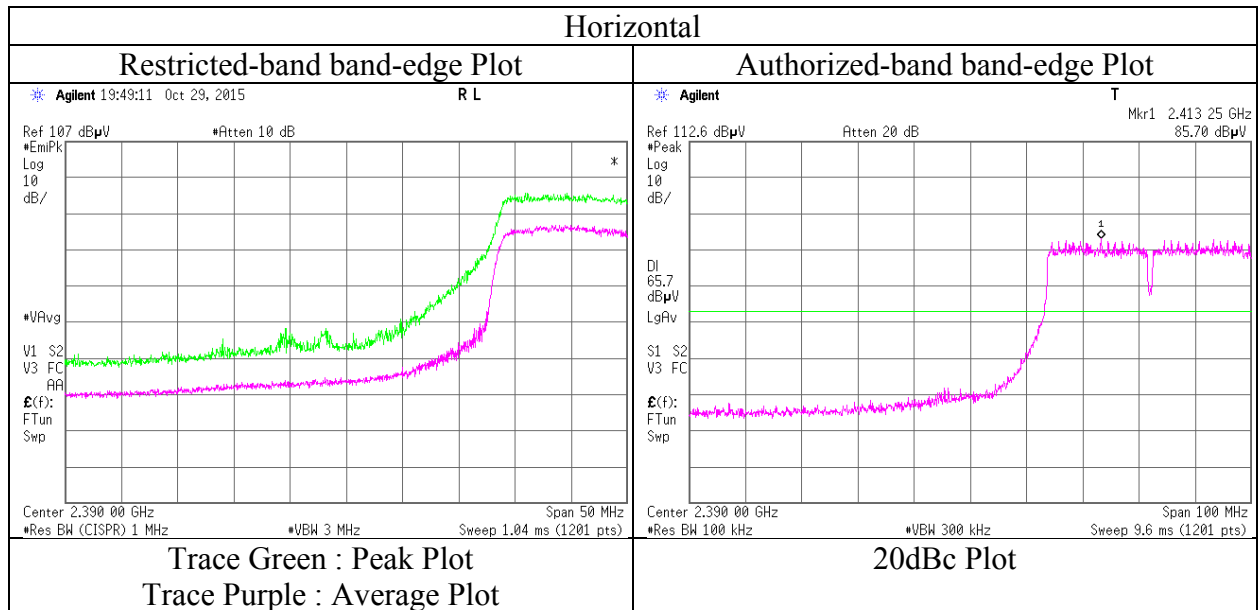
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11008648S-C
Date	November 8, 2015
Temperature / Humidity	25 deg. C / 49 % RH
Engineer	Wataru Kojima (1-13 GHz)
Mode	Tx 11n-40 2422 MHz Display Combined Type(T2)



* 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. : 11008648S-C
Date : November 8, 2015 November 10, 2015
Temperature / Humidity : 25 deg. C / 49 % RH 24 deg. C / 55 % RH
Engineer : Wataru Kojima Hiroyuki Morikawa
(1-13 GHz) (13-26 GHz)
Mode : Tx 11n-40 2437 MHz Display Combined Type(T2)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	44.5	31.7	5.8	39.5	1.8	44.3	73.9	29.6	100	204	
Hori.	7311.000	PK	44.4	36.9	7.2	40.2	1.8	50.1	73.9	23.8	100	0	
Hori.	9748.000	PK	43.6	38.5	8.2	39.5	1.8	52.6	73.9	21.3	100	210	
Vert.	4874.000	PK	44.6	31.7	5.8	39.5	1.8	44.4	73.9	29.5	143	92	
Vert.	7311.000	PK	44.5	36.9	7.2	40.2	1.8	50.2	73.9	23.7	100	0	
Vert.	9748.000	PK	43.4	38.5	8.2	39.5	1.8	52.4	73.9	21.5	100	217	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65\text{ m} / 3.0\text{ m}) = 1.8\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4874.000	AV	35.7	31.7	5.8	39.5	1.3	1.8	36.8	53.9	17.1	
Hori.	7311.000	AV	35.5	36.9	7.2	40.2	1.3	1.8	42.5	53.9	11.4	
Hori.	9748.000	AV	34.8	38.5	8.2	39.5	1.3	1.8	45.1	53.9	8.8	
Vert.	4874.000	AV	36.0	31.7	5.8	39.5	1.3	1.8	37.1	53.9	16.8	
Vert.	7311.000	AV	35.7	36.9	7.2	40.2	1.3	1.8	42.7	53.9	11.2	
Vert.	9748.000	AV	35.2	38.5	8.2	39.5	1.3	1.8	45.5	53.9	8.4	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65\text{ m} / 3.0\text{ m}) = 1.8\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11008648S-C
Date : November 8, 2015 November 10, 2015
Temperature / Humidity : 25 deg. C / 49 % RH 24 deg. C / 55 % RH
Engineer : Wataru Kojima Hiroyuki Morikawa
(1-13 GHz) (13-26 GHz)
Mode : Tx 11n-40 2452 MHz Display Combined Type(T2)

(* 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	58.5	27.9	13.8	41.0	1.8	61.0	73.9	12.9	201	43	
Hori.	4904.000	PK	44.3	31.8	5.8	39.4	1.8	44.3	73.9	29.6	100	147	
Hori.	7356.000	PK	43.7	36.9	7.2	40.3	1.8	49.3	73.9	24.6	100	0	
Hori.	9808.000	PK	43.9	38.5	8.2	39.5	1.8	52.9	73.9	21.0	100	199	
Vert.	2483.500	PK	59.9	27.9	13.8	41.0	1.8	62.4	73.9	11.5	129	4	
Vert.	4904.000	PK	44.6	31.8	5.8	39.4	1.8	44.6	73.9	29.3	143	122	
Vert.	7356.000	PK	43.7	36.9	7.2	40.3	1.8	49.3	73.9	24.6	100	0	
Vert.	9808.000	PK	42.9	38.5	8.2	39.5	1.8	51.9	73.9	22.0	135	55	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65\text{ m} / 3.0\text{ m}) = 1.8\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	43.6	27.9	13.8	41.0	1.3	1.8	47.4	53.9	6.5	*1)
Hori.	4904.000	AV	35.9	31.8	5.8	39.4	1.3	1.8	37.2	53.9	16.7	
Hori.	7356.000	AV	35.3	36.9	7.2	40.3	1.3	1.8	42.2	53.9	11.7	
Hori.	9808.000	AV	35.5	38.5	8.2	39.5	1.3	1.8	45.8	53.9	8.1	
Vert.	2483.500	AV	44.4	27.9	13.8	41.0	1.3	1.8	48.2	53.9	5.7	*1)
Vert.	4904.000	AV	36.0	31.8	5.8	39.4	1.3	1.8	37.3	53.9	16.6	
Vert.	7356.000	AV	35.7	36.9	7.2	40.3	1.3	1.8	42.6	53.9	11.3	
Vert.	9808.000	AV	35.4	38.5	8.2	39.5	1.3	1.8	45.7	53.9	8.2	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.65\text{ m} / 3.0\text{ m}) = 1.8\text{ dB}$

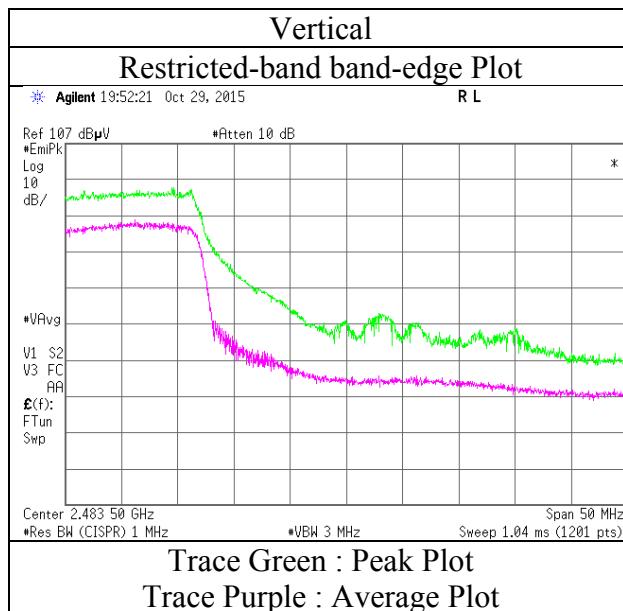
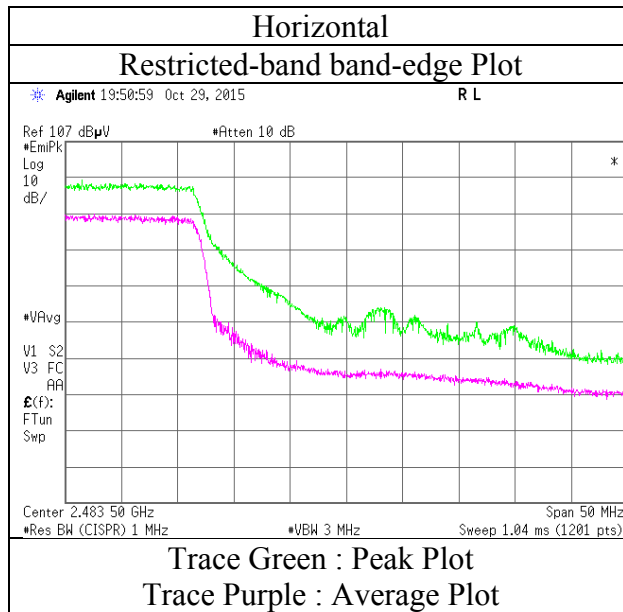
13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

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

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11008648S-C
Date	November 8, 2015
Temperature / Humidity	25 deg. C / 49 % RH
Engineer	Wataru Kojima (1-13 GHz)
Mode	Tx 11n-40 2452 MHz Display Combined Type(T2)



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No. : 11008648S-C
Date : November 26, 2015 November 24, 2015
Temperature / Humidity : 23 deg. C / 37 % RH 24 deg. C / 38 % RH
Engineer : Shinichi Takano Shinichi Takano
(1-13 GHz) (13-26 GHz)
Mode : Tx 11b 2412 MHz Display Separated Type(L2)

(* 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	51.5	27.8	13.7	41.0	1.1	53.1	73.9	20.8	260	1	
Hori.	4824.000	PK	46.6	31.5	5.7	39.5	1.1	45.4	73.9	28.5	100	194	
Hori.	7236.000	PK	47.4	36.9	7.1	40.1	1.1	52.4	73.9	21.5	100	351	
Hori.	9648.000	PK	46.6	38.5	8.2	39.6	1.1	54.8	73.9	19.1	100	172	
Hori.	2390.000	AV	39.8	27.8	13.7	41.0	1.1	41.4	53.9	12.5	260	1	
Hori.	4824.000	AV	34.7	31.5	5.7	39.5	1.1	33.5	53.9	20.4	100	194	
Hori.	7236.000	AV	35.2	36.9	7.1	40.1	1.1	40.2	53.9	13.7	100	351	
Hori.	9648.000	AV	35.5	38.5	8.2	39.6	1.1	43.7	53.9	10.2	100	172	
Vert.	2390.000	PK	37.7	27.8	13.7	41.0	1.1	39.3	73.9	34.6	100	296	
Vert.	4824.000	PK	46.9	31.5	5.7	39.5	1.1	45.7	73.9	28.2	100	348	
Vert.	7236.000	PK	47.8	36.9	7.1	40.1	1.1	52.8	73.9	21.1	100	8	
Vert.	9648.000	PK	47.3	38.5	8.2	39.6	1.1	55.5	73.9	18.4	100	188	
Vert.	2390.000	AV	35.5	27.8	13.7	41.0	1.1	37.1	53.9	16.8	100	296	
Vert.	4824.000	AV	35.1	31.5	5.7	39.5	1.1	33.9	53.9	20.0	100	348	
Vert.	7236.000	AV	35.2	36.9	7.1	40.1	1.1	40.2	53.9	13.7	100	8	
Vert.	9648.000	AV	35.7	38.5	8.2	39.6	1.1	43.9	53.9	10.0	100	188	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39 \text{ m} / 3.0 \text{ m}) = 1.1 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	98.9	27.8	13.7	41.0	1.1	100.5	-	-	Carrier
Hori.	2400.000	PK	52.7	27.8	13.7	41.0	1.1	54.3	80.5	26.2	
Vert.	2412.000	PK	88.0	27.8	13.7	41.0	1.1	89.6	-	-	Carrier
Vert.	2400.000	PK	43.1	27.8	13.7	41.0	1.1	44.7	69.6	24.9	

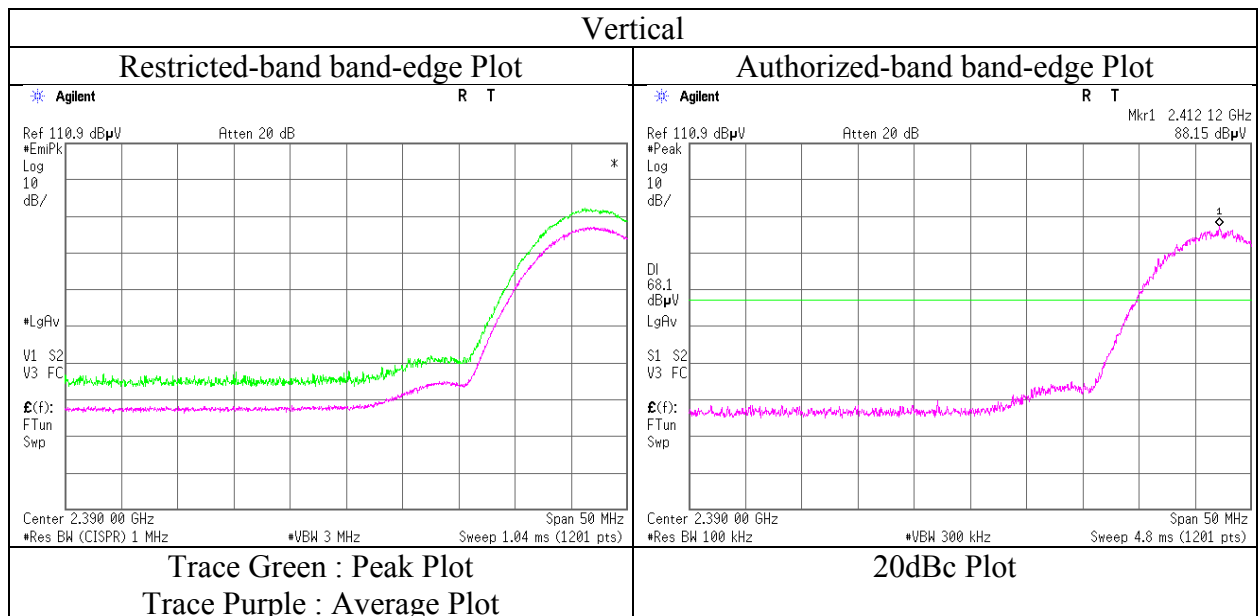
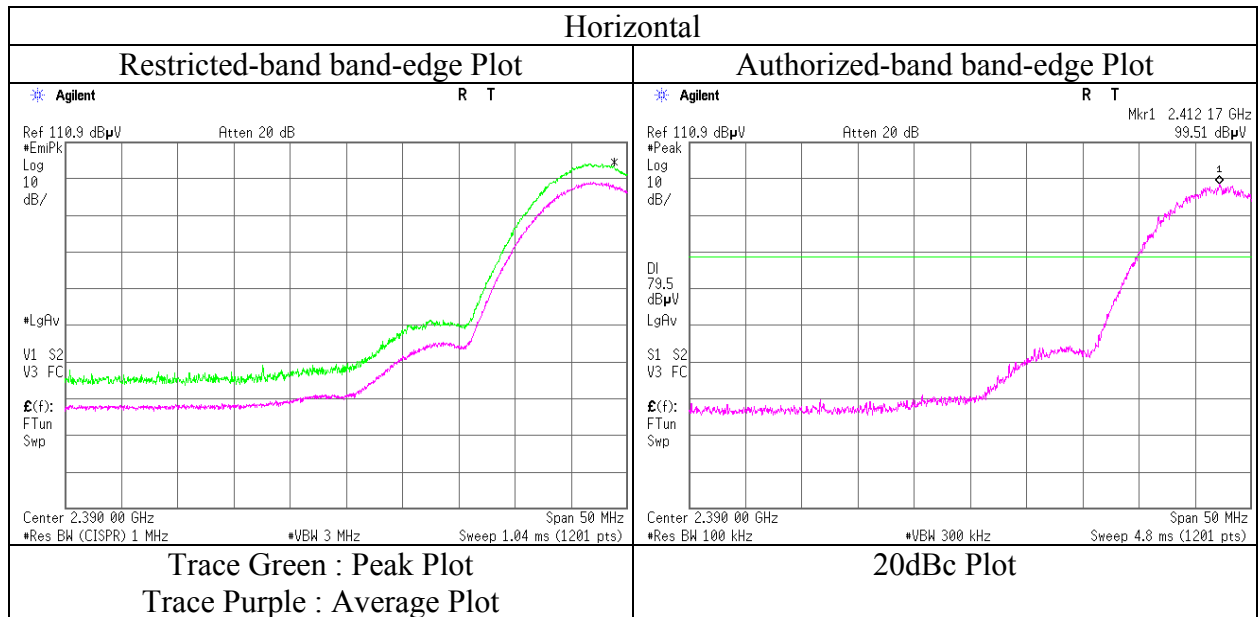
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.39 \text{ m} / 3.0 \text{ m}) = 1.1 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No.	11008648S-C
Date	November 26, 2015
Temperature / Humidity	23 deg. C / 37 % RH
Engineer	Shinichi Takano (1-13 GHz)
Mode	Tx 11b 2412 MHz Display Separated Type(L2)



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No. : 11008648S-C
Date : November 26, 2015 November 24, 2015
Temperature / Humidity : 23 deg. C / 37 % RH 24 deg. C / 38 % RH
Engineer : Shinichi Takano Shinichi Takano
(1-13 GHz) (13-26 GHz)
Mode : Tx 11b 2437 MHz Display Separated Type(L2)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	46.7	31.7	5.8	39.5	1.1	45.8	73.9	28.1	100	176	
Hori.	7311.000	PK	46.7	36.9	7.2	40.2	1.1	51.7	73.9	22.2	100	343	
Hori.	9748.000	PK	46.6	38.5	8.2	39.5	1.1	54.9	73.9	19.0	100	357	
Hori.	4874.000	AV	34.9	31.7	5.8	39.5	1.1	34.0	53.9	19.9	100	176	
Hori.	7311.000	AV	35.0	36.9	7.2	40.2	1.1	40.0	53.9	13.9	100	343	
Hori.	9748.000	AV	34.9	38.5	8.2	39.5	1.1	43.2	53.9	10.7	100	357	
Vert.	4874.000	PK	45.8	31.7	5.8	39.5	1.1	44.9	73.9	29.0	100	37	
Vert.	7311.000	PK	46.4	36.9	7.2	40.2	1.1	51.4	73.9	22.5	100	357	
Vert.	9748.000	PK	46.5	38.5	8.2	39.5	1.1	54.8	73.9	19.1	100	0	
Vert.	4874.000	AV	34.4	31.7	5.8	39.5	1.1	33.5	53.9	20.4	100	37	
Vert.	7311.000	AV	34.7	36.9	7.2	40.2	1.1	39.7	53.9	14.2	100	357	
Vert.	9748.000	AV	35.1	38.5	8.2	39.5	1.1	43.4	53.9	10.5	100	0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39\text{ m} / 3.0\text{ m}) = 1.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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Shonan EMC Lab.

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Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No. : 11008648S-C
Date : November 26, 2015 November 24, 2015
Temperature / Humidity : 23 deg. C / 37 % RH 24 deg. C / 38 % RH
Engineer : Shinichi Takano Shinichi Takano
(1-13 GHz) (13-26 GHz)
Mode : Tx 11b 2462 MHz Display Separated Type(L2)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	49.0	27.9	13.8	41.0	1.1	50.8	73.9	23.1	248	343	
Hori.	4924.000	PK	44.0	31.9	5.8	39.4	1.1	43.4	73.9	30.5	100	202	
Hori.	7386.000	PK	42.6	36.9	7.2	40.3	1.1	47.5	73.9	26.4	100	0	
Hori.	9848.000	PK	42.0	38.5	8.2	39.4	1.1	50.4	73.9	23.5	100	0	
Hori.	2483.500	AV	37.3	27.9	13.8	41.0	1.1	39.1	53.9	14.8	248	343	
Hori.	4924.000	AV	33.5	31.9	5.8	39.4	1.1	32.9	53.9	21.0	100	202	
Hori.	7386.000	AV	33.4	36.9	7.2	40.3	1.1	38.3	53.9	15.6	100	0	
Hori.	9848.000	AV	33.0	38.5	8.2	39.4	1.1	41.4	53.9	12.5	100	0	
Vert.	2483.500	PK	47.0	27.9	13.8	41.0	1.1	48.8	73.9	25.1	100	315	
Vert.	4924.000	PK	43.7	31.9	5.8	39.4	1.1	43.1	73.9	30.8	100	198	
Vert.	7386.000	PK	43.4	36.9	7.2	40.3	1.1	48.3	73.9	25.6	100	0	
Vert.	9848.000	PK	42.0	38.5	8.2	39.4	1.1	50.4	73.9	23.5	100	0	
Vert.	2483.500	AV	35.8	27.9	13.8	41.0	1.1	37.6	53.9	16.3	100	315	
Vert.	4924.000	AV	33.9	31.9	5.8	39.4	1.1	33.3	53.9	20.6	100	198	
Vert.	7386.000	AV	33.4	36.9	7.2	40.3	1.1	38.3	53.9	15.6	100	0	
Vert.	9848.000	AV	33.3	38.5	8.2	39.4	1.1	41.7	53.9	12.2	100	0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39\text{ m} / 3.0\text{ m}) = 1.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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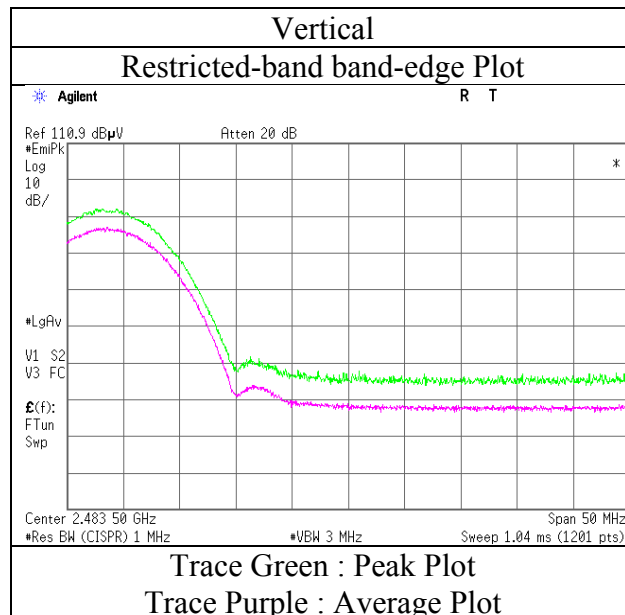
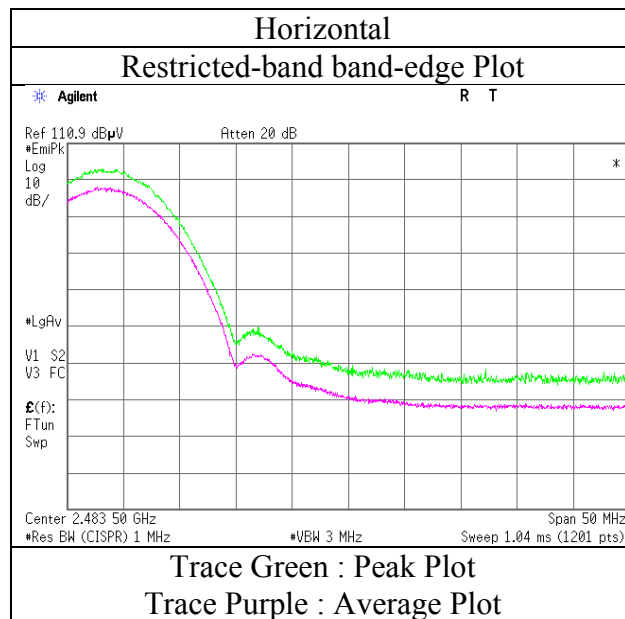
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Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No.	11008648S-C
Date	November 26, 2015
Temperature / Humidity	23 deg. C / 37 % RH
Engineer	Shinichi Takano (1-13 GHz)
Mode	Tx 11b 2462 MHz Display Separated Type(L2)



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No. : 11008648S-C
Date : November 26, 2015 November 24, 2015
Temperature / Humidity : 23 deg. C / 37 % RH 24 deg. C / 38 % RH
Engineer : Shinichi Takano Shinichi Takano
(1-13 GHz) (13-26 GHz)
Mode : Tx 11g 2412 MHz Display Separated Type(L2)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	47.2	27.8	13.7	41.0	1.1	48.8	73.9	25.1	263	6	
Hori.	4824.000	PK	44.0	31.5	5.7	39.5	1.1	42.8	73.9	31.1	100	119	
Hori.	7236.000	PK	43.1	36.9	7.1	40.1	1.1	48.1	73.9	25.8	100	0	
Hori.	9648.000	PK	43.3	38.5	8.2	39.6	1.1	51.5	73.9	22.4	100	0	
Vert.	2390.000	PK	45.4	27.8	13.7	41.0	1.1	47.0	73.9	26.9	100	294	
Vert.	4824.000	PK	44.4	31.5	5.7	39.5	1.1	43.2	73.9	30.7	100	0	
Vert.	7236.000	PK	42.6	36.9	7.1	40.1	1.1	47.6	73.9	26.3	100	0	
Vert.	9648.000	PK	44.7	38.5	8.2	39.6	1.1	52.9	73.9	21.0	100	0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39 \text{ m} / 3.0 \text{ m}) = 1.1 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	36.8	27.8	13.7	41.0	0.1	1.1	38.5	53.9	15.4	*1)
Hori.	4824.000	AV	33.2	31.5	5.7	39.5	0.1	1.1	32.1	53.9	21.8	
Hori.	7236.000	AV	33.7	36.9	7.1	40.1	0.1	1.1	38.8	53.9	15.1	
Hori.	9648.000	AV	33.9	38.5	8.2	39.6	0.1	1.1	42.2	53.9	11.7	
Vert.	2390.000	AV	33.4	27.8	13.7	41.0	0.1	1.1	35.1	53.9	18.8	*1)
Vert.	4824.000	AV	33.7	31.5	5.7	39.5	0.1	1.1	32.6	53.9	21.3	
Vert.	7236.000	AV	33.8	36.9	7.1	40.1	0.1	1.1	38.9	53.9	15.0	
Vert.	9648.000	AV	34.0	38.5	8.2	39.6	0.1	1.1	42.3	53.9	11.6	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39 \text{ m} / 3.0 \text{ m}) = 1.1 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

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	89.9	27.8	13.7	41.0	1.1	91.5	-	-	Carrier
Hori.	2400.000	PK	50.8	27.8	13.7	41.0	1.1	52.4	71.5	19.1	
Vert.	2412.000	PK	76.7	27.8	13.7	41.0	1.1	78.3	-	-	Carrier
Vert.	2400.000	PK	43.5	27.8	13.7	41.0	1.1	45.1	58.3	13.2	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39 \text{ m} / 3.0 \text{ m}) = 1.1 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

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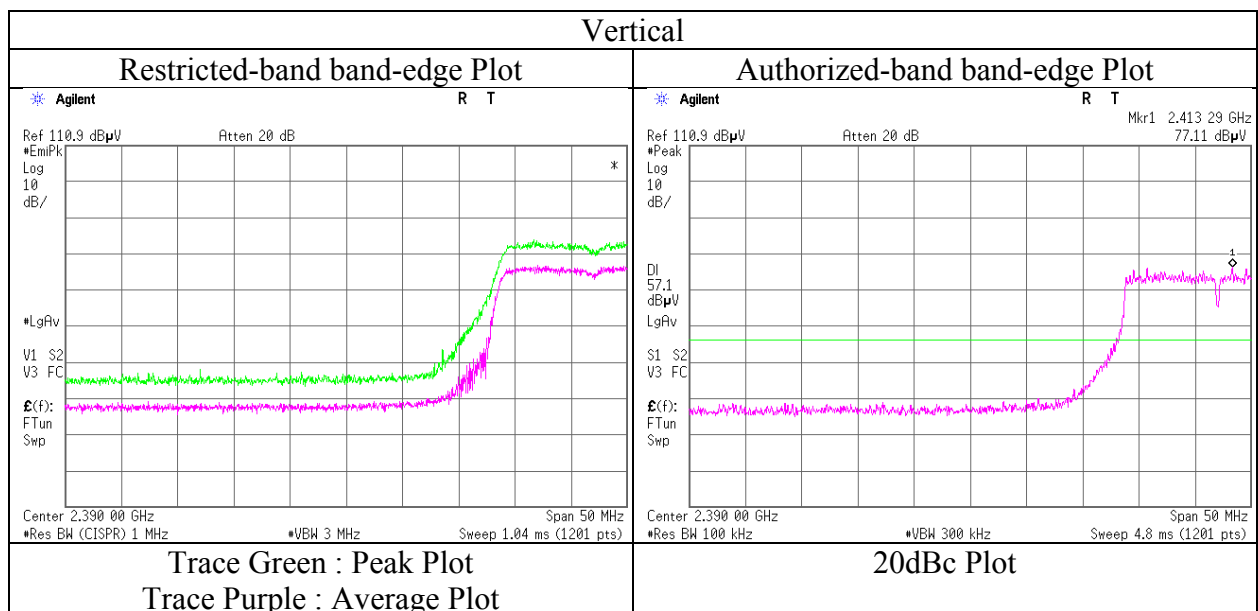
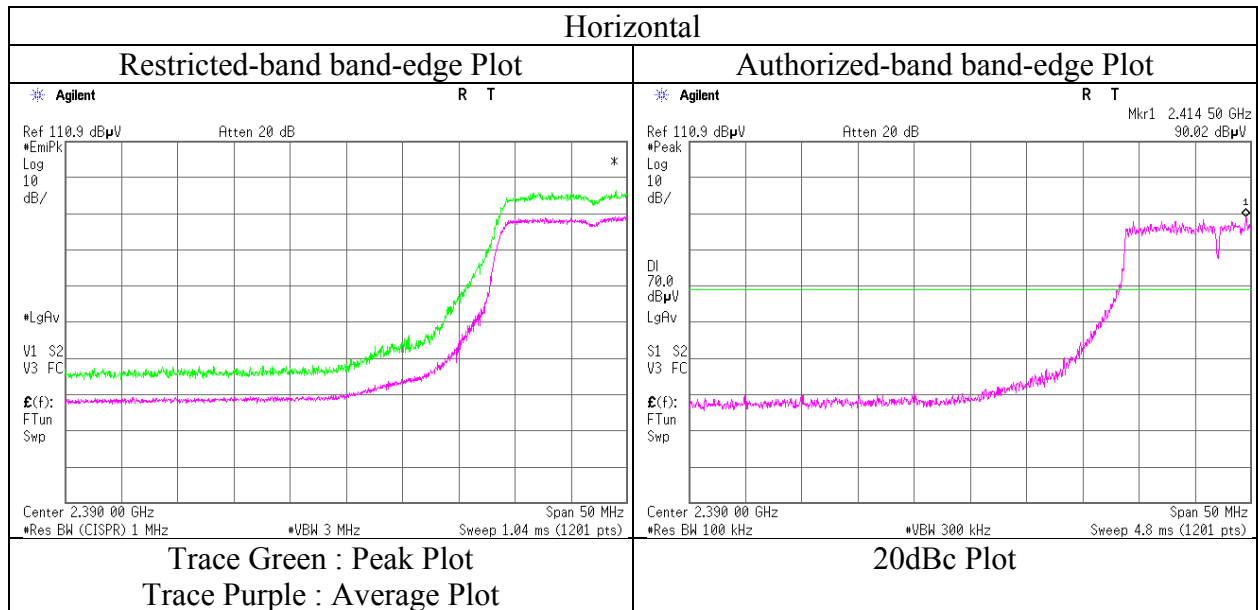
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Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber		
Report No.	11008648S-C		
Date	November 26, 2015	November 24, 2015	November 25, 2015
Temperature / Humidity	23 deg. C / 37 % RH	24 deg. C / 38 % RH	21 deg. C / 34 % RH
Engineer	Shinichi Takano	Shinichi Takano	Wataru Kojima
	(1-13 GHz)	(13-26 GHz)	(30-1000 MHz)
Mode	Tx 11g 2412 MHz Display Separated Type(L2)		



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No. : 11008648S-C
Date : November 26, 2015
Temperature / Humidity : 23 deg. C / 37 % RH
Engineer : Shinichi Takano
(1-2.8 GHz)
Mode : Tx 11g 2417 MHz Display Separated Type(L2)

(* 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	51.5	27.8	13.7	41.0	1.1	53.1	73.9	20.8	264	4	
Vert.	2390.000	PK	44.9	27.8	13.7	41.0	1.1	46.5	73.9	27.4	100	295	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39 \text{ m} / 3.0 \text{ m}) = 1.1 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	37.1	27.8	13.7	41.0	0.1	1.1	38.8	53.9	15.1	*1)
Vert.	2390.000	AV	34.1	27.8	13.7	41.0	0.1	1.1	35.8	53.9	18.1	*1)

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39 \text{ m} / 3.0 \text{ m}) = 1.1 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

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.	2417.000	PK	93.3	27.8	13.7	41.0	1.1	94.9	-	-	carrier
Hori.	2400.000	PK	50.4	27.8	13.7	41.0	1.1	52.0	74.9	22.9	
Vert.	2417.000	PK	82.3	27.8	13.7	41.0	1.1	83.9	-	-	carrier
Vert.	2400.000	PK	38.7	27.8	13.7	41.0	1.1	40.3	63.9	23.6	

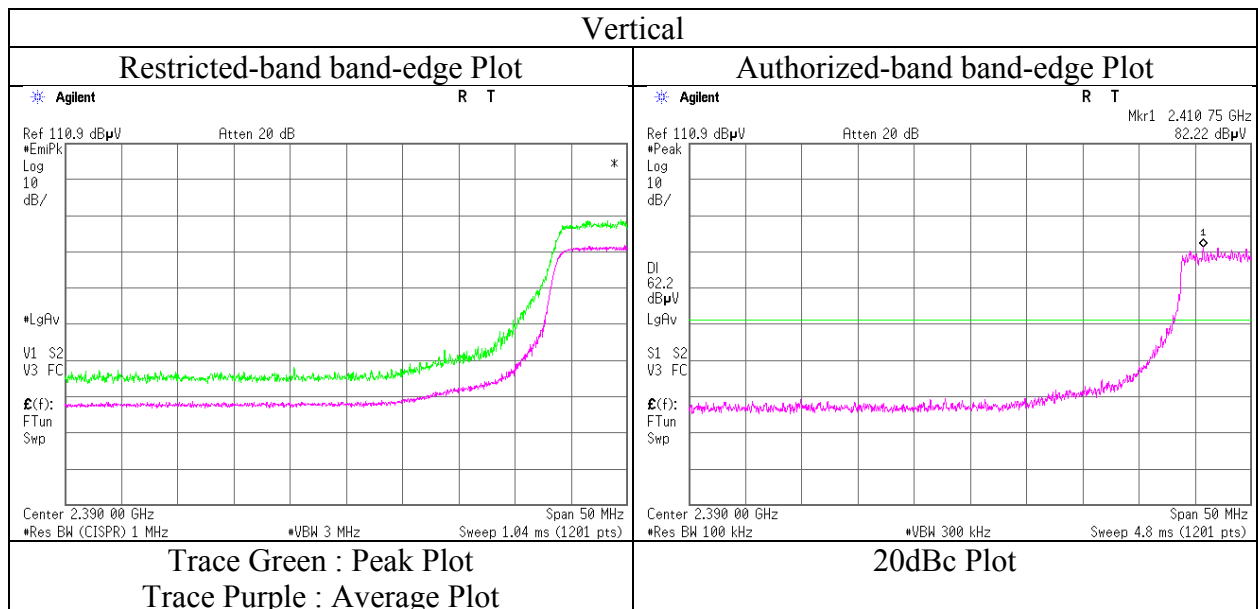
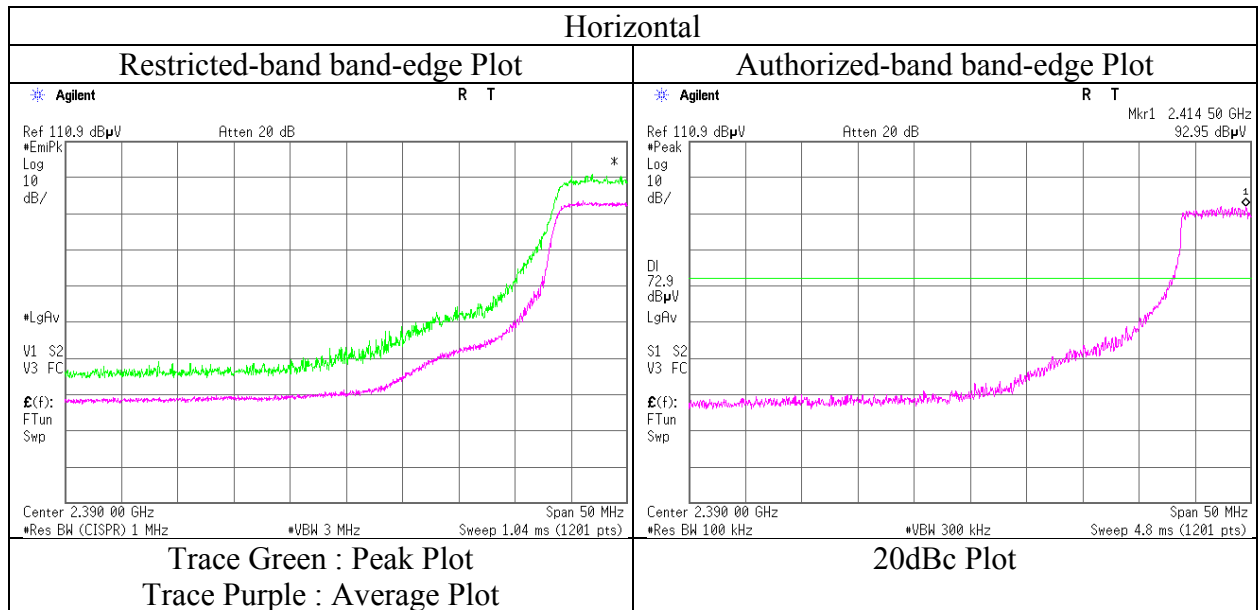
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.39 \text{ m} / 3.0 \text{ m}) = 1.1 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No.	11008648S-C
Date	November 26, 2015
Temperature / Humidity	23 deg. C / 37 % RH
Engineer	Shinichi Takano (1-2.8 GHz)
Mode	Tx 11g 2417 MHz Display Separated Type(L2)



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No. : 11008648S-C
Date : November 26, 2015 November 24, 2015 November 25, 2015
Temperature / Humidity : 23 deg. C / 37 % RH 24 deg. C / 38 % RH 21 deg. C / 34 % RH
Engineer : Shinichi Takano Shinichi Takano Wataru Kojima
(1-13 GHz) (13-26 GHz) (30-1000 MHz)
Mode : Tx 11g 2437 MHz Display Separated Type(L2)

(* 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.	202.510	QP	28.2	16.2	9.1	31.8	0.0	21.7	43.5	21.8	150	323	
Hori.	353.273	QP	37.7	15.0	6.8	31.8	0.0	27.7	46.0	18.3	100	254	
Hori.	358.780	QP	38.0	15.1	6.9	31.8	0.0	28.2	46.0	17.8	100	250	
Hori.	4874.000	PK	42.9	31.7	5.8	39.5	1.1	42.0	73.9	31.9	100	0	
Hori.	7311.000	PK	44.0	36.9	7.2	40.2	1.1	49.0	73.9	24.9	100	0	
Hori.	9748.000	PK	44.0	38.5	8.2	39.5	1.1	52.3	73.9	21.6	100	0	
Vert.	198.886	QP	28.7	16.2	9.0	31.8	0.0	22.1	43.5	21.4	100	213	
Vert.	552.690	QP	26.0	18.2	8.0	32.0	0.0	20.2	46.0	25.8	100	223	
Vert.	677.451	QP	26.6	20.0	8.6	32.0	0.0	23.2	46.0	22.8	100	163	
Vert.	903.576	QP	32.9	22.3	9.7	31.3	0.0	33.6	46.0	12.4	100	336	
Vert.	943.470	QP	26.6	22.6	9.8	31.0	0.0	28.0	46.0	18.0	100	346	
Vert.	4874.000	PK	43.9	31.7	5.8	39.5	1.1	43.0	73.9	30.9	100	0	
Vert.	7311.000	PK	44.4	36.9	7.2	40.2	1.1	49.4	73.9	24.5	100	0	
Vert.	9748.000	PK	41.8	38.5	8.2	39.5	1.1	50.1	73.9	23.8	100	0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39\text{ m} / 3.0\text{ m}) = 1.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4874.000	AV	32.6	31.7	5.8	39.5	0.1	1.1	31.8	53.9	22.1	
Hori.	7311.000	AV	33.5	36.9	7.2	40.2	0.1	1.1	38.6	53.9	15.3	
Hori.	9748.000	AV	33.2	38.5	8.2	39.5	0.1	1.1	41.6	53.9	12.3	
Vert.	4874.000	AV	32.8	31.7	5.8	39.5	0.1	1.1	32.0	53.9	21.9	
Vert.	7311.000	AV	33.5	36.9	7.2	40.2	0.1	1.1	38.6	53.9	15.3	
Vert.	9748.000	AV	33.6	38.5	8.2	39.5	0.1	1.1	42.0	53.9	11.9	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39\text{ m} / 3.0\text{ m}) = 1.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

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Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No. : 11008648S-C
Date : November 26, 2015 November 24, 2015
Temperature / Humidity : 23 deg. C / 37 % RH 24 deg. C / 38 % RH
Engineer : Shinichi Takano Shinichi Takano
(1-13 GHz) (13-26 GHz)
Mode : Tx 11g 2462 MHz Display Separated Type(L2)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	55.6	27.9	13.8	41.0	1.1	57.4	73.9	16.5	235	306	
Hori.	4924.000	PK	44.6	31.9	5.8	39.4	1.1	44.0	73.9	29.9	100	198	
Hori.	7386.000	PK	42.4	36.9	7.2	40.3	1.1	47.3	73.9	26.6	100	0	
Hori.	9848.000	PK	42.0	38.5	8.2	39.4	1.1	50.4	73.9	23.5	100	0	
Vert.	2483.500	PK	50.4	27.9	13.8	41.0	1.1	52.2	73.9	21.7	100	311	
Vert.	4924.000	PK	44.0	31.9	5.8	39.4	1.1	43.4	73.9	30.5	100	204	
Vert.	7386.000	PK	44.0	36.9	7.2	40.3	1.1	48.9	73.9	25.0	100	0	
Vert.	9848.000	PK	42.2	38.5	8.2	39.4	1.1	50.6	73.9	23.3	100	0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39\text{ m} / 3.0\text{ m}) = 1.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	34.7	27.9	13.8	41.0	0.1	1.1	36.6	53.9	17.3	*1)
Hori.	4924.000	AV	33.6	31.9	5.8	39.4	0.1	1.1	33.1	53.9	20.8	
Hori.	7386.000	AV	33.3	36.9	7.2	40.3	0.1	1.1	38.3	53.9	15.6	
Hori.	9848.000	AV	33.2	38.5	8.2	39.4	0.1	1.1	41.7	53.9	12.2	
Vert.	2483.500	AV	33.4	27.9	13.8	41.0	0.1	1.1	35.3	53.9	18.6	*1)
Vert.	4924.000	AV	33.6	31.9	5.8	39.4	0.1	1.1	33.1	53.9	20.8	
Vert.	7386.000	AV	33.3	36.9	7.2	40.3	0.1	1.1	38.3	53.9	15.6	
Vert.	9848.000	AV	33.2	38.5	8.2	39.4	0.1	1.1	41.7	53.9	12.2	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39\text{ m} / 3.0\text{ m}) = 1.1\text{ dB}$

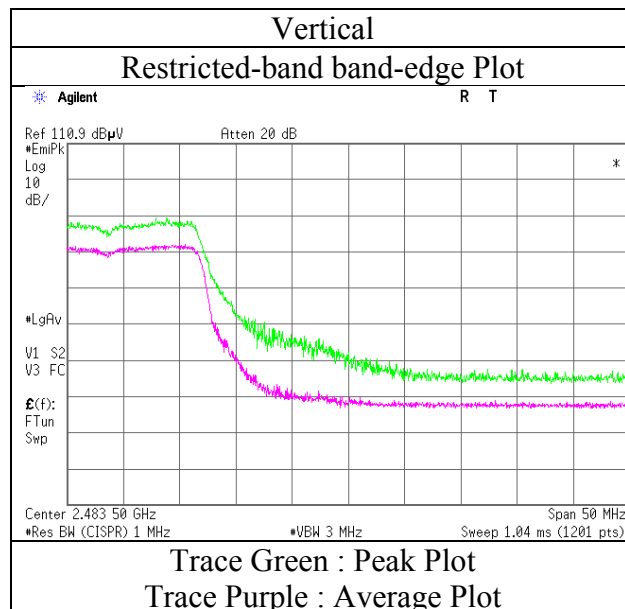
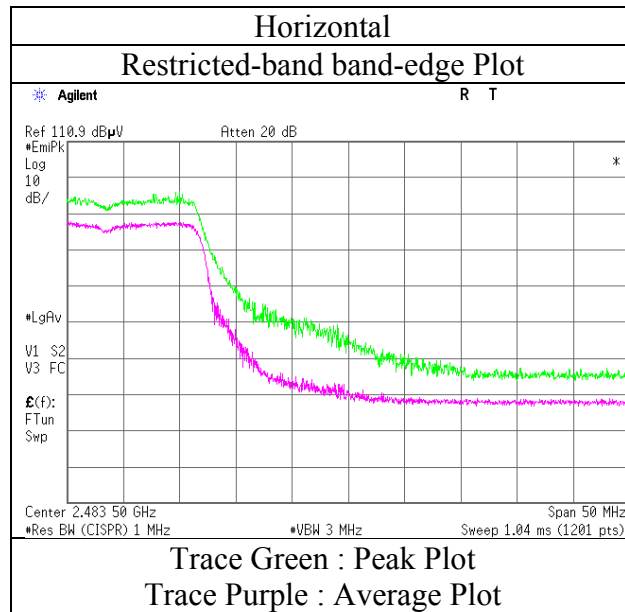
13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

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

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No.	11008648S-C
Date	November 26, 2015
Temperature / Humidity	23 deg. C / 37 % RH
Engineer	Shinichi Takano
	(1-13 GHz)
Mode	Tx 11g 2462 MHz Display Separated Type(L2)



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No. : 11008648S-C
Date : November 26, 2015 November 24, 2015
Temperature / Humidity : 23 deg. C / 37 % RH 24 deg. C / 38 % RH
Engineer : Shinichi Takano Shinichi Takano
(1-13 GHz) (13-26 GHz)
Mode : Tx 11n-20 2412 MHz Display Separated Type(L2)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	47.6	27.8	13.7	41.0	1.1	49.2	73.9	24.7	269	4	
Hori.	4824.000	PK	44.4	31.5	5.7	39.5	1.1	43.2	73.9	30.7	100	0	
Hori.	7236.000	PK	44.6	36.9	7.1	40.1	1.1	49.6	73.9	24.3	100	0	
Hori.	9648.000	PK	44.0	38.5	8.2	39.6	1.1	52.2	73.9	21.7	100	0	
Vert.	2390.000	PK	45.7	27.8	13.7	41.0	1.1	47.3	73.9	26.6	100	295	
Vert.	4824.000	PK	45.4	31.5	5.7	39.5	1.1	44.2	73.9	29.7	100	0	
Vert.	7236.000	PK	44.8	36.9	7.1	40.1	1.1	49.8	73.9	24.1	100	0	
Vert.	9648.000	PK	44.0	38.5	8.2	39.6	1.1	52.2	73.9	21.7	100	0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39 \text{ m} / 3.0 \text{ m}) = 1.1 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	35.3	27.8	13.7	41.0	0.1	1.1	37.0	53.9	16.9	*1)
Hori.	4824.000	AV	33.0	31.5	5.7	39.5	0.1	1.1	31.9	53.9	22.0	
Hori.	7236.000	AV	33.5	36.9	7.1	40.1	0.1	1.1	38.6	53.9	15.3	
Hori.	9648.000	AV	33.3	38.5	8.2	39.6	0.1	1.1	41.6	53.9	12.3	
Vert.	2390.000	AV	34.0	27.8	13.7	41.0	0.1	1.1	35.7	53.9	18.2	*1)
Vert.	4824.000	AV	33.1	31.5	5.7	39.5	0.1	1.1	32.0	53.9	21.9	
Vert.	7236.000	AV	33.5	36.9	7.1	40.1	0.1	1.1	38.6	53.9	15.3	
Vert.	9648.000	AV	33.6	38.5	8.2	39.6	0.1	1.1	41.9	53.9	12.0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39 \text{ m} / 3.0 \text{ m}) = 1.1 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

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	88.6	27.8	13.7	41.0	1.1	90.2	-	-	Carrier
Hori.	2400.000	PK	52.7	27.8	13.7	41.0	1.1	54.3	70.2	15.9	
Vert.	2412.000	PK	76.3	27.8	13.7	41.0	1.1	77.9	-	-	Carrier
Vert.	2400.000	PK	41.0	27.8	13.7	41.0	1.1	42.6	57.9	15.3	

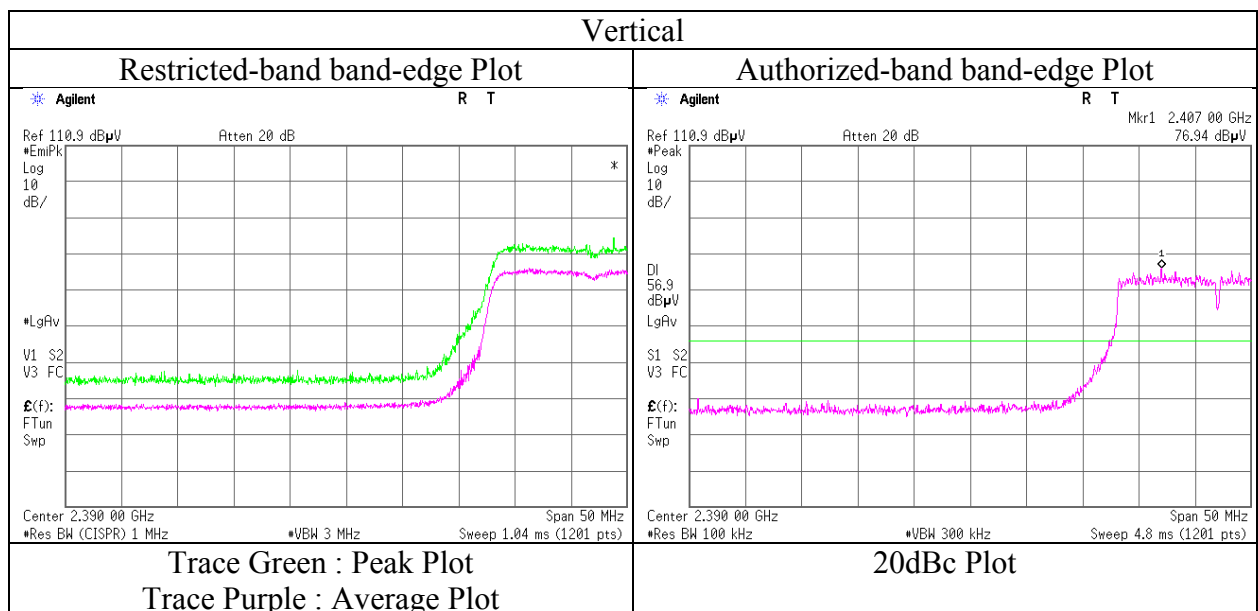
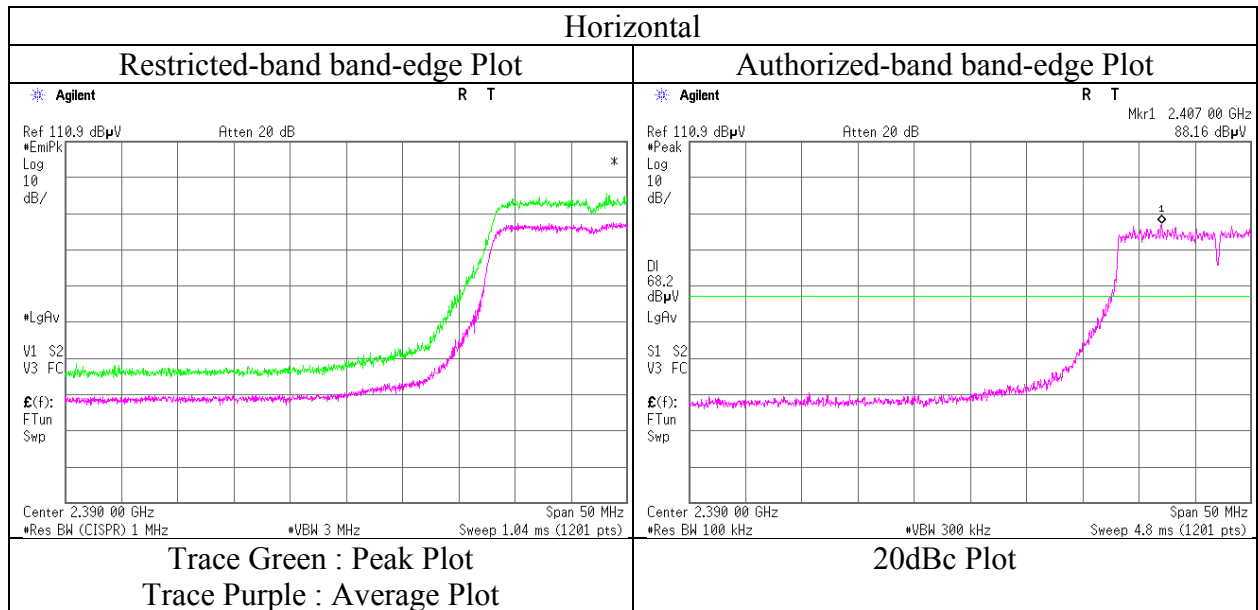
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.39 \text{ m} / 3.0 \text{ m}) = 1.1 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No.	11008648S-C
Date	November 26, 2015
Temperature / Humidity	23 deg. C / 37 % RH
Engineer	Shinichi Takano (1-13 GHz)
Mode	Tx 11n-20 2412 MHz Display Separated Type(L2)



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No. : 11008648S-C
Date : November 26, 2015
Temperature / Humidity : 23 deg. C / 37 % RH
Engineer : Shinichi Takano
(1-2.8 GHz)
Mode : Tx 11n-20 2417 MHz Display Separated Type(L2)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	49.0	27.8	13.7	41.0	1.1	50.6	73.9	23.3	266	3	
Vert.	2390.000	PK	42.6	27.8	13.7	41.0	1.1	44.2	73.9	29.7	100	292	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39\text{ m} / 3.0\text{ m}) = 1.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	36.6	27.8	13.7	41.0	0.1	1.1	38.3	53.9	15.6	*1)
Vert.	2390.000	AV	34.0	27.8	13.7	41.0	0.1	1.1	35.7	53.9	18.2	*1)

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39\text{ m} / 3.0\text{ m}) = 1.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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.	2417.000	PK	92.3	27.8	13.7	41.0	1.1	93.9	-	-	carrier
Hori.	2400.000	PK	51.0	27.8	13.7	41.0	1.1	52.6	74.0	21.4	
Vert.	2417.000	PK	80.5	27.8	13.7	41.0	1.1	82.1	-	-	carrier
Vert.	2400.000	PK	39.5	27.8	13.7	41.0	1.1	41.1	62.1	21.0	

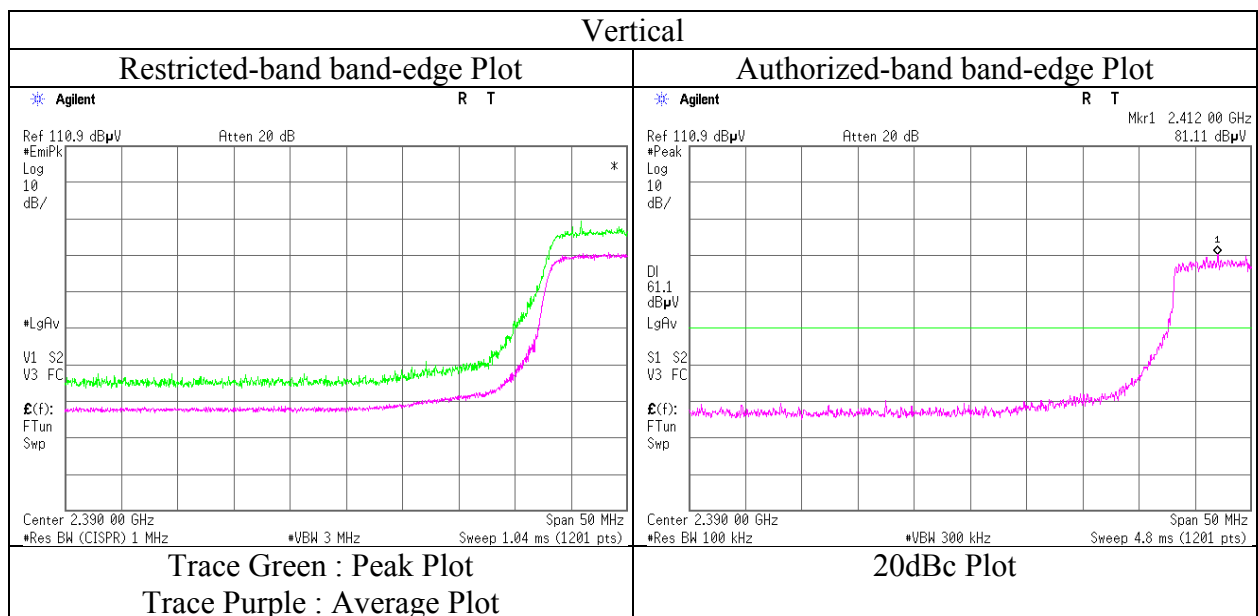
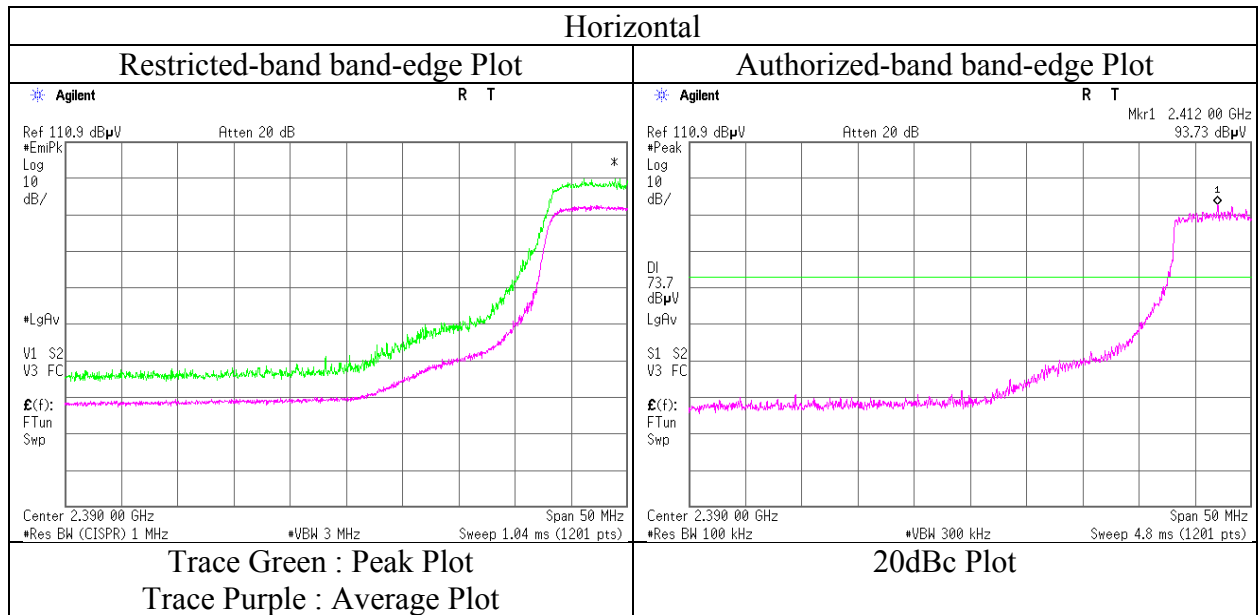
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.39\text{ m} / 3.0\text{ m}) = 1.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No.	11008648S-C
Date	November 26, 2015
Temperature / Humidity	23 deg. C / 37 % RH
Engineer	Shinichi Takano (1-13 GHz)
Mode	Tx 11n-20 2417 MHz Display Separated Type(L2)



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No. : 11008648S-C
Date : November 26, 2015 November 24, 2015
Temperature / Humidity : 23 deg. C / 37 % RH 24 deg. C / 38 % RH
Engineer : Shinichi Takano Shinichi Takano
(1-13 GHz) (13-26 GHz)
Mode : Tx 11n-20 2437 MHz Display Separated Type(L2)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	45.1	31.7	5.8	39.5	1.1	44.2	73.9	29.7	100	4	
Hori.	7311.000	PK	44.7	36.9	7.2	40.2	1.1	49.7	73.9	24.2	100	0	
Hori.	9748.000	PK	45.5	38.5	8.2	39.5	1.1	53.8	73.9	20.1	100	0	
Vert.	4874.000	PK	44.0	31.7	5.8	39.5	1.1	43.1	73.9	30.8	100	356	
Vert.	7311.000	PK	44.7	36.9	7.2	40.2	1.1	49.7	73.9	24.2	100	0	
Vert.	9748.000	PK	45.2	38.5	8.2	39.5	1.1	53.5	73.9	20.4	100	0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39 \text{ m} / 3.0 \text{ m}) = 1.1 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4874.000	AV	32.9	31.7	5.8	39.5	0.1	1.1	32.1	53.9	21.8	
Hori.	7311.000	AV	33.6	36.9	7.2	40.2	0.1	1.1	38.7	53.9	15.2	
Hori.	9748.000	AV	33.5	38.5	8.2	39.5	0.1	1.1	41.9	53.9	12.0	
Vert.	4874.000	AV	33.0	31.7	5.8	39.5	0.1	1.1	32.2	53.9	21.7	
Vert.	7311.000	AV	33.6	36.9	7.2	40.2	0.1	1.1	38.7	53.9	15.2	
Vert.	9748.000	AV	33.7	38.5	8.2	39.5	0.1	1.1	42.1	53.9	11.8	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39 \text{ m} / 3.0 \text{ m}) = 1.1 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No. : 11008648S-C
Date : November 26, 2015 November 24, 2015
Temperature / Humidity : 23 deg. C / 37 % RH 24 deg. C / 38 % RH
Engineer : Shinichi Takano Shinichi Takano
(1-13 GHz) (13-26 GHz)
Mode : Tx 11n-20 2462 MHz Display Separated Type(L2)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	54.7	27.9	13.8	41.0	1.1	56.5	73.9	17.4	262	3	
Hori.	4924.000	PK	44.6	31.9	5.8	39.4	1.1	44.0	73.9	29.9	100	0	
Hori.	7386.000	PK	44.8	36.9	7.2	40.3	1.1	49.7	73.9	24.2	100	0	
Hori.	9848.000	PK	43.4	38.5	8.2	39.4	1.1	51.8	73.9	22.1	100	0	
Vert.	2483.500	PK	49.5	27.9	13.8	41.0	1.1	51.3	73.9	22.6	100	292	
Vert.	4924.000	PK	45.0	31.9	5.8	39.4	1.1	44.4	73.9	29.5	100	0	
Vert.	7386.000	PK	44.9	36.9	7.2	40.3	1.1	49.8	73.9	24.1	100	0	
Vert.	9848.000	PK	45.0	38.5	8.2	39.4	1.1	53.4	73.9	20.5	100	0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39\text{ m} / 3.0\text{ m}) = 1.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	36.7	27.9	13.8	41.0	0.1	1.1	38.6	53.9	15.3	*1)
Hori.	4924.000	AV	32.9	31.9	5.8	39.4	0.1	1.1	32.4	53.9	21.5	
Hori.	7386.000	AV	33.3	36.9	7.2	40.3	0.1	1.1	38.3	53.9	15.6	
Hori.	9848.000	AV	32.9	38.5	8.2	39.4	0.1	1.1	41.4	53.9	12.5	
Vert.	2483.500	AV	33.0	27.9	13.8	41.0	0.1	1.1	34.9	53.9	19.0	*1)
Vert.	4924.000	AV	32.8	31.9	5.8	39.4	0.1	1.1	32.3	53.9	21.6	
Vert.	7386.000	AV	33.3	36.9	7.2	40.3	0.1	1.1	38.3	53.9	15.6	
Vert.	9848.000	AV	33.2	38.5	8.2	39.4	0.1	1.1	41.7	53.9	12.2	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39\text{ m} / 3.0\text{ m}) = 1.1\text{ dB}$

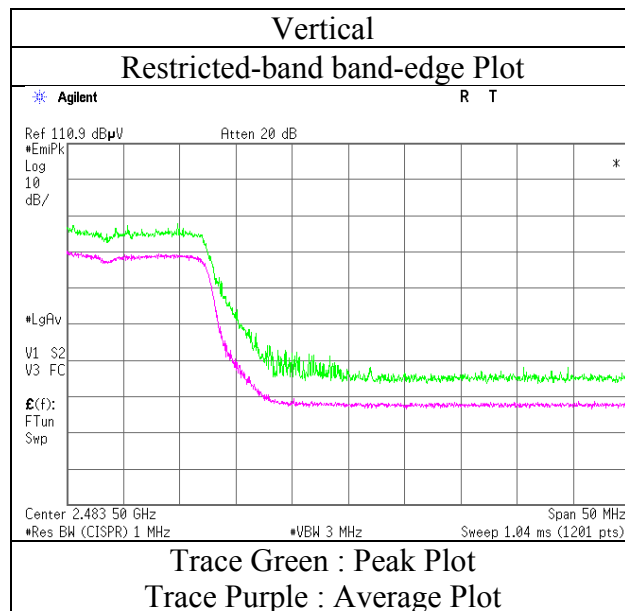
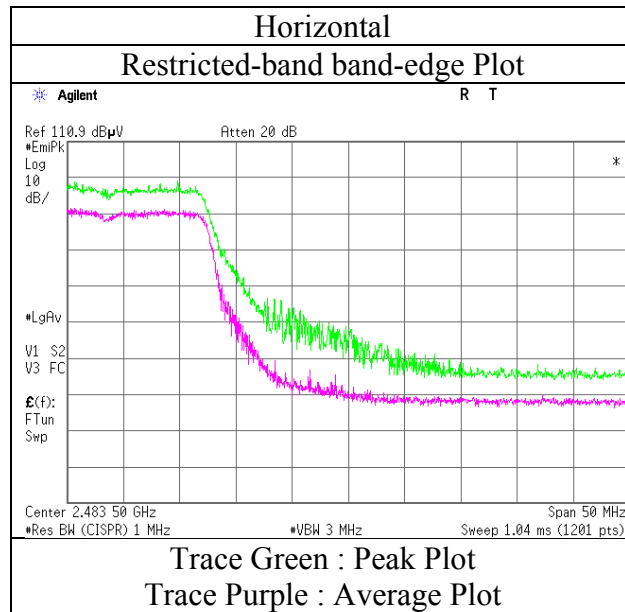
13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

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

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No.	11008648S-C
Date	November 26, 2015
Temperature / Humidity	23 deg. C / 37 % RH
Engineer	Shinichi Takano (1-13 GHz)
Mode	Tx 11n-20 2462 MHz Display Separated Type(L2)



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No. : 11008648S-C
Date : November 26, 2015 November 24, 2015
Temperature / Humidity : 23 deg. C / 37 % RH 24 deg. C / 38 % RH
Engineer : Shinichi Takano Shinichi Takano
(1-13 GHz) (13-26 GHz)
Mode : Tx 11n-40 2422 MHz Display Separated Type(L2)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	49.0	27.8	13.7	41.0	1.1	50.6	73.9	23.3	262	6	
Hori.	4844.000	PK	44.5	31.6	5.8	39.5	1.1	43.5	73.9	30.4	100	0	
Hori.	7266.000	PK	46.3	36.9	7.2	40.2	1.1	51.3	73.9	22.6	100	0	
Hori.	9688.000	PK	46.0	38.5	8.2	39.6	1.1	54.2	73.9	19.7	100	0	
Vert.	2390.000	PK	47.0	27.8	13.7	41.0	1.1	48.6	73.9	25.3	100	292	
Vert.	4844.000	PK	45.1	31.6	5.8	39.5	1.1	44.1	73.9	29.8	100	0	
Vert.	7266.000	PK	44.9	36.9	7.2	40.2	1.1	49.9	73.9	24.0	100	0	
Vert.	9688.000	PK	44.9	38.5	8.2	39.6	1.1	53.1	73.9	20.8	100	0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39 \text{ m} / 3.0 \text{ m}) = 1.1 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	37.8	27.8	13.7	41.0	0.7	1.1	40.1	53.9	13.8	*1)
Hori.	4844.000	AV	32.7	31.6	5.8	39.5	0.7	1.1	32.4	53.9	21.5	
Hori.	7266.000	AV	33.6	36.9	7.2	40.2	0.7	1.1	39.3	53.9	14.6	
Hori.	9688.000	AV	34.0	38.5	8.2	39.6	0.7	1.1	42.9	53.9	11.0	
Vert.	2390.000	AV	33.0	27.8	13.7	41.0	0.7	1.1	35.3	53.9	18.6	*1)
Vert.	4844.000	AV	33.0	31.6	5.8	39.5	0.7	1.1	32.7	53.9	21.2	
Vert.	7266.000	AV	33.6	36.9	7.2	40.2	0.7	1.1	39.3	53.9	14.6	
Vert.	9688.000	AV	34.2	38.5	8.2	39.6	0.7	1.1	43.1	53.9	10.8	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39 \text{ m} / 3.0 \text{ m}) = 1.1 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

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.	2422.000	PK	86.6	27.8	13.7	41.0	1.1	88.2	-	-	Carrier
Hori.	2400.000	PK	50.1	27.8	13.7	41.0	1.1	51.7	68.2	16.5	
Vert.	2422.000	PK	75.7	27.8	13.7	41.0	1.1	77.3	-	-	Carrier
Vert.	2400.000	PK	40.3	27.8	13.7	41.0	1.1	41.9	57.3	15.4	

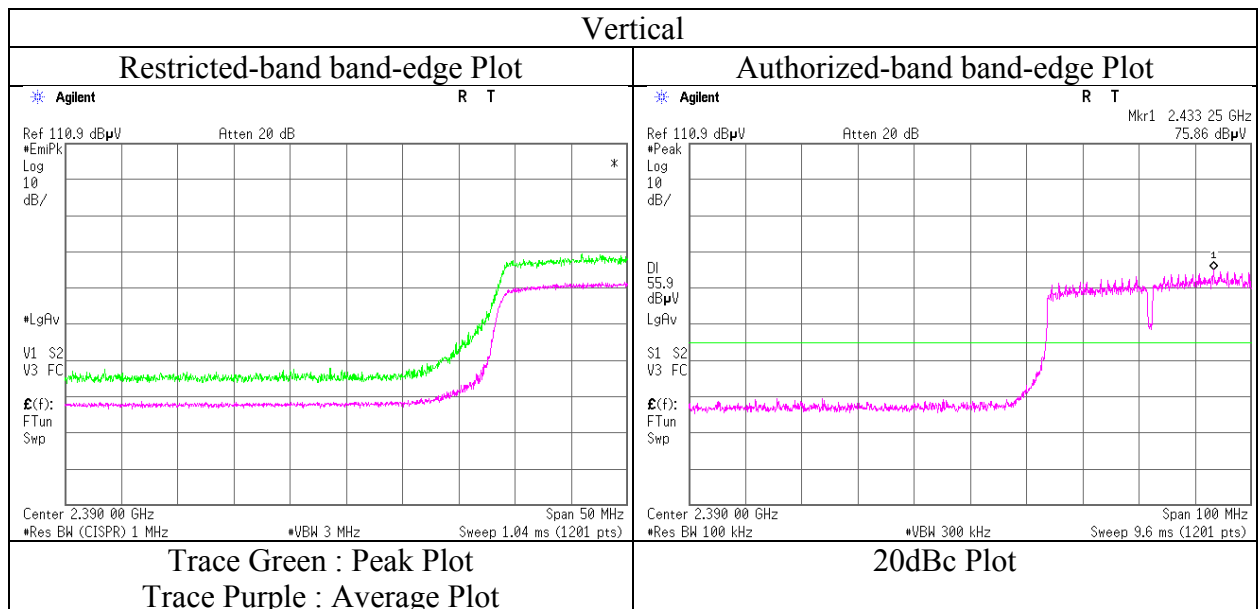
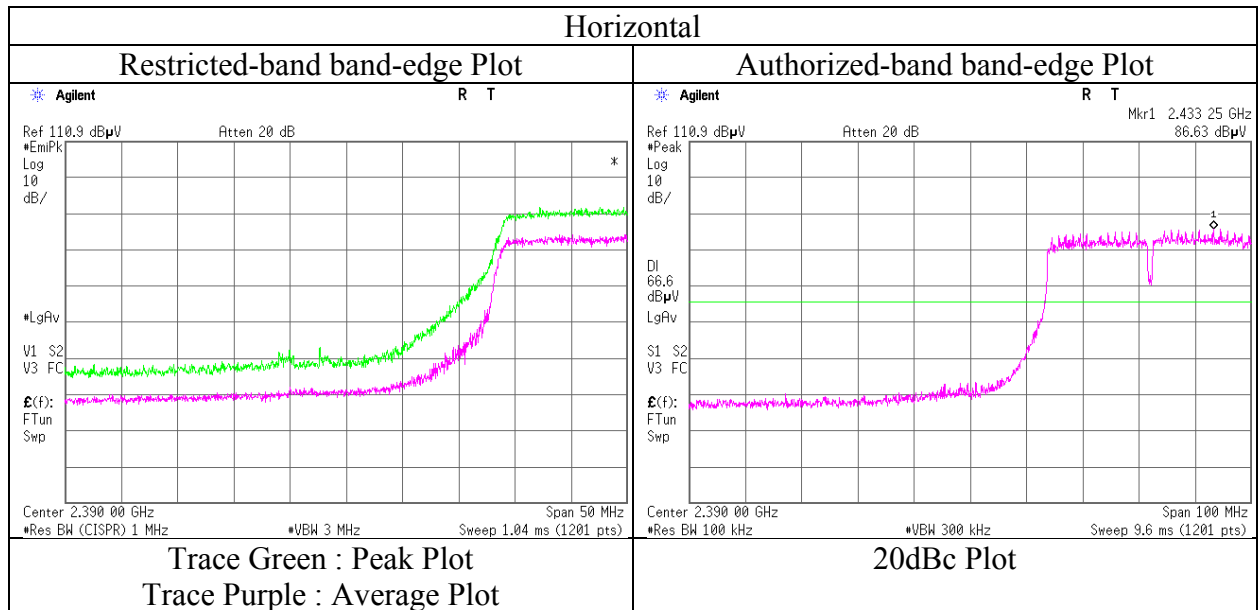
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.39 \text{ m} / 3.0 \text{ m}) = 1.1 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No.	11008648S-C
Date	November 26, 2015
Temperature / Humidity	23 deg. C / 37 % RH
Engineer	Shinichi Takano (1-13 GHz)
Mode	Tx 11n-40 2422 MHz Display Separated Type(L2)



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No. : 11008648S-C
Date : November 26, 2015 November 24, 2015
Temperature / Humidity : 23 deg. C / 37 % RH 24 deg. C / 38 % RH
Engineer : Shinichi Takano Shinichi Takano
(1-13 GHz) (13-26 GHz)
Mode : Tx 11n-40 2437 MHz Display Separated Type(L2)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	43.9	31.7	5.8	39.5	1.1	43.0	73.9	30.9	100	0	
Hori.	7311.000	PK	46.0	36.9	7.2	40.2	1.1	51.0	73.9	22.9	100	0	
Hori.	9748.000	PK	44.9	38.5	8.2	39.5	1.1	53.2	73.9	20.7	100	0	
Vert.	4874.000	PK	44.8	31.7	5.8	39.5	1.1	43.9	73.9	30.0	100	0	
Vert.	7311.000	PK	44.6	36.9	7.2	40.2	1.1	49.6	73.9	24.3	100	0	
Vert.	9748.000	PK	43.1	38.5	8.2	39.5	1.1	51.4	73.9	22.5	100	0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39 \text{ m} / 3.0 \text{ m}) = 1.1 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4874.000	AV	32.7	31.7	5.8	39.5	0.7	1.1	32.5	53.9	21.4	
Hori.	7311.000	AV	33.6	36.9	7.2	40.2	0.7	1.1	39.3	53.9	14.6	
Hori.	9748.000	AV	33.4	38.5	8.2	39.5	0.7	1.1	42.4	53.9	11.5	
Vert.	4874.000	AV	32.9	31.7	5.8	39.5	0.7	1.1	32.7	53.9	21.2	
Vert.	7311.000	AV	33.5	36.9	7.2	40.2	0.7	1.1	39.2	53.9	14.7	
Vert.	9748.000	AV	33.6	38.5	8.2	39.5	0.7	1.1	42.6	53.9	11.3	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39 \text{ m} / 3.0 \text{ m}) = 1.1 \text{ dB}$

13 GHz - 40 GHz : $20\log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No. : 11008648S-C
Date : November 26, 2015 November 24, 2015
Temperature / Humidity : 23 deg. C / 37 % RH 24 deg. C / 38 % RH
Engineer : Shinichi Takano Shinichi Takano
(1-13 GHz) (13-26 GHz)
Mode : Tx 11n-40 2452 MHz Display Separated Type(L2)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	53.2	27.9	13.8	41.0	1.1	55.0	73.9	18.9	100	4	
Hori.	4904.000	PK	44.0	31.8	5.8	39.4	1.1	43.3	73.9	30.6	100	0	
Hori.	7356.000	PK	44.5	36.9	7.2	40.3	1.1	49.4	73.9	24.5	100	0	
Hori.	9808.000	PK	42.8	38.5	8.2	39.5	1.1	51.1	73.9	22.8	100	0	
Vert.	2483.500	PK	48.0	27.9	13.8	41.0	1.1	49.8	73.9	24.1	100	294	
Vert.	4904.000	PK	44.6	31.8	5.8	39.4	1.1	43.9	73.9	30.0	100	0	
Vert.	7356.000	PK	45.1	36.9	7.2	40.3	1.1	50.0	73.9	23.9	100	0	
Vert.	9808.000	PK	45.0	38.5	8.2	39.5	1.1	53.3	73.9	20.6	100	0	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39\text{ m} / 3.0\text{ m}) = 1.1\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	35.3	27.9	13.8	41.0	0.7	1.1	37.8	53.9	16.1	*1)
Hori.	4904.000	AV	32.8	31.8	5.8	39.4	0.7	1.1	32.8	53.9	21.1	
Hori.	7356.000	AV	33.5	36.9	7.2	40.3	0.7	1.1	39.1	53.9	14.8	
Hori.	9808.000	AV	32.6	38.5	8.2	39.5	0.7	1.1	41.6	53.9	12.3	
Vert.	2483.500	AV	34.0	27.9	13.8	41.0	0.7	1.1	36.5	53.9	17.4	*1)
Vert.	4904.000	AV	32.9	31.8	5.8	39.4	0.7	1.1	32.9	53.9	21.0	
Vert.	7356.000	AV	33.5	36.9	7.2	40.3	0.7	1.1	39.1	53.9	14.8	
Vert.	9808.000	AV	32.8	38.5	8.2	39.5	0.7	1.1	41.8	53.9	12.1	

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

Distance factor : 1 GHz - 13 GHz : $20\log(3.39\text{ m} / 3.0\text{ m}) = 1.1\text{ dB}$

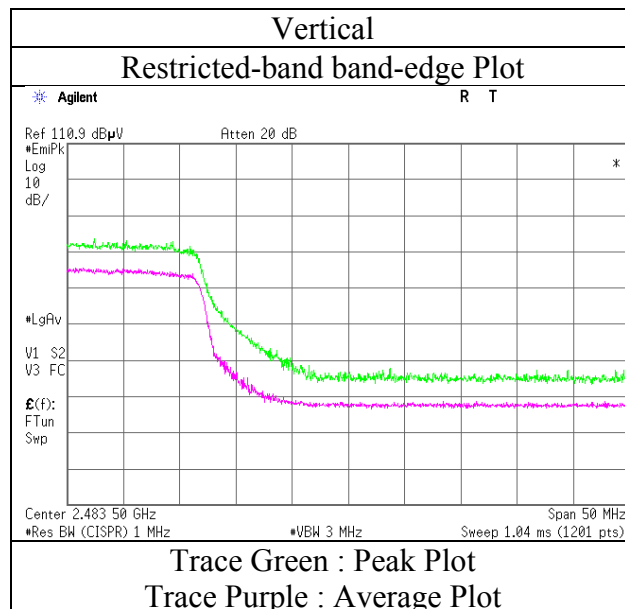
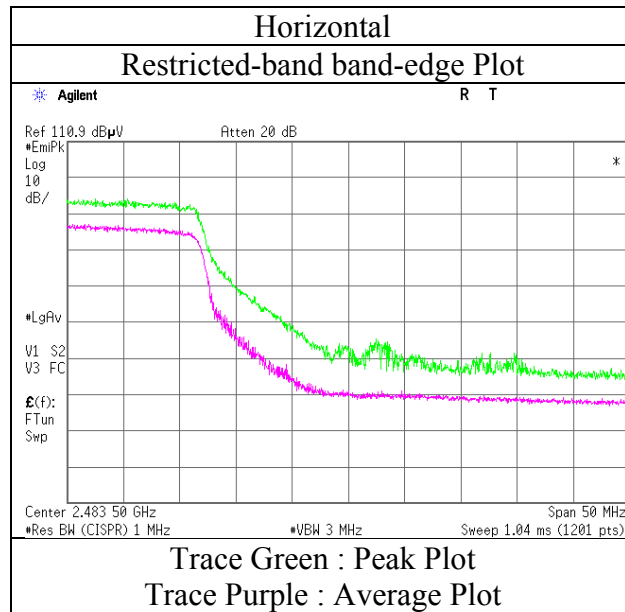
13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Duty factor refer to "Duty factor Calculation chart" sheet.

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

Radiated Spurious Emission (Reference Plot for band-edge)

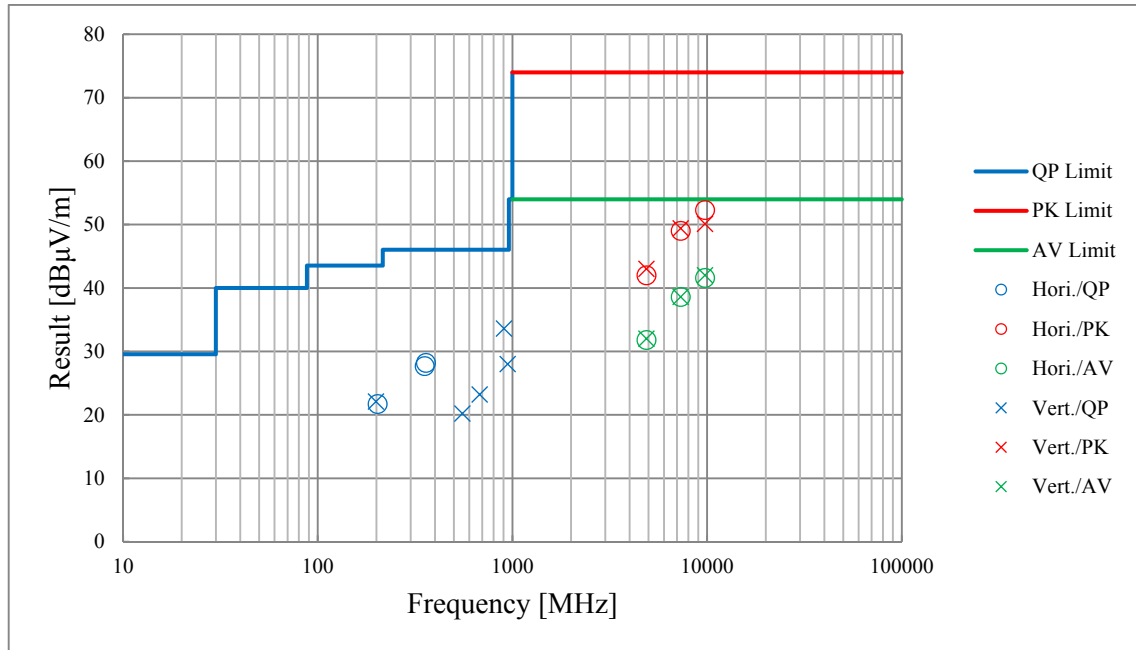
Test place	Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber
Report No.	11008648S-C
Date	November 26, 2015
Temperature / Humidity	23 deg. C / 37 % RH
Engineer	Shinichi Takano
	(1-13 GHz)
Mode	Tx 11n-40 2452 MHz Display Separated Type(L2)



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

Radiated Spurious Emission **(Plot data, Worst case)**

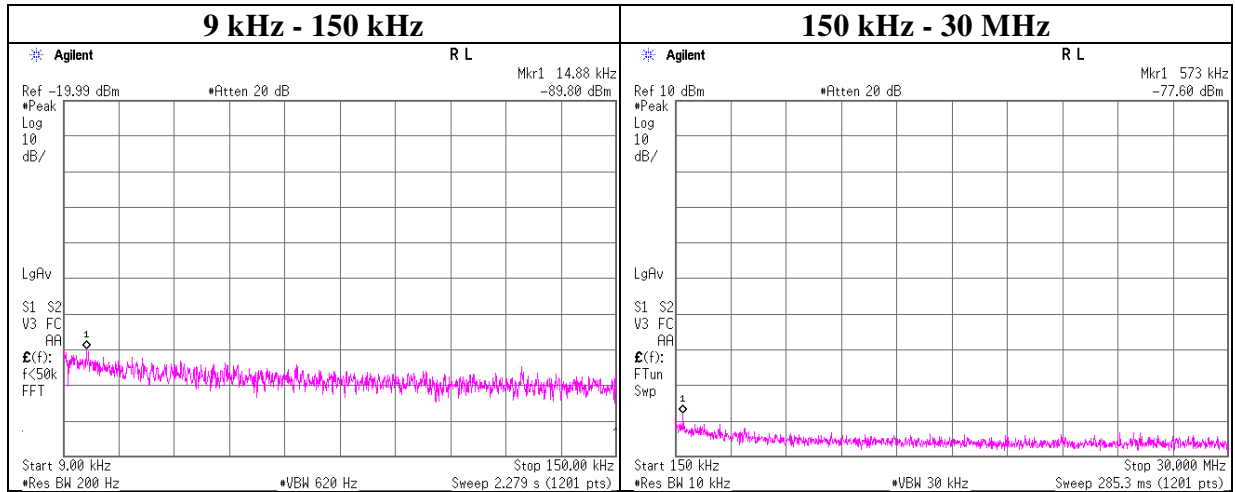
Test place	Shonan EMC Lab. No.1 and 3 Semi Anechoic Chamber		
Report No.	11008648S-C		
Date	November 26, 2015	November 24, 2015	November 25, 2015
Temperature / Humidity	23 deg. C / 37 % RH	24 deg. C / 38 % RH	21 deg. C / 34 % RH
Engineer	Shinichi Takano	Shinichi Takano	Wataru Kojima
	(1-13 GHz)	(13-26 GHz)	(30-1000 MHz)
Mode	Tx 11g 2437 MHz Display Separated Type(L2)		



*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. 11008648S-C
Date October 27, 2015
Temperature / Humidity 26 deg. C / 40 % RH
Engineer Hiroyuki Morikawa
Mode Tx 11g 2437 MHz Display Combined Type(T2)



UL Japan, Inc.

Shonan EMC Lab.

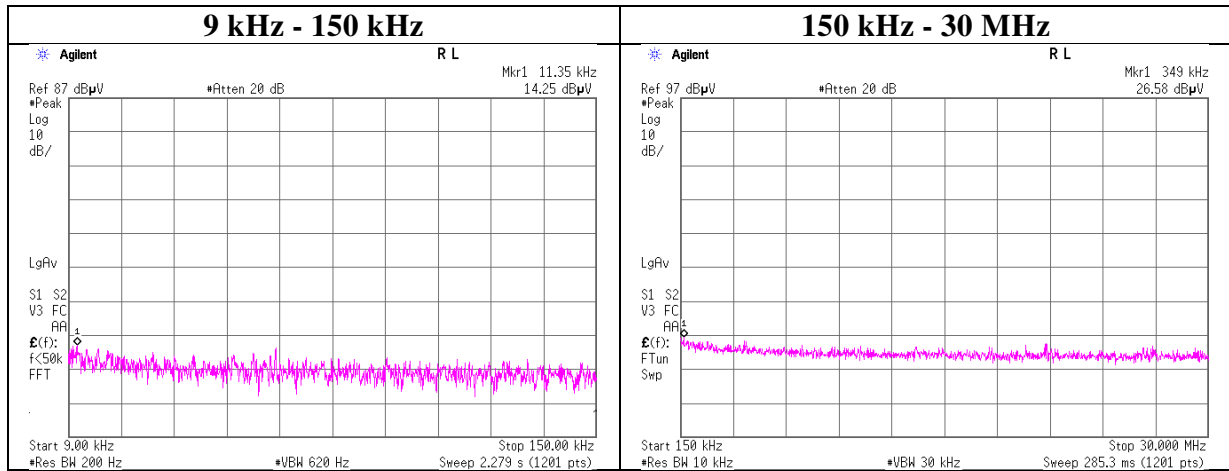
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Conducted Spurious Emission

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11008648S-C
Date : November 9, 2015
Temperature / Humidity : 24 deg. C / 41 % RH
Engineer : Yosuke Ishikawa
Mode : Tx 11g 2437 MHz Display Separated Type(L2)



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

Power Density

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11008648S-C
Date October 27, 2015
Temperature / Humidity 26 deg. C / 40 % RH
Engineer Hiroyuki Morikawa
Mode Tx Display Combined Type(T2)

11b

Freq.	Reading	Cable Loss	Atten. Loss	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2412.00	-15.99	2.03	9.63	-4.33	8.00	12.33
2437.00	-15.06	2.04	9.63	-3.39	8.00	11.39
2462.00	-13.54	2.05	9.63	-1.86	8.00	9.86

11g

Freq.	Reading	Cable Loss	Atten. Loss	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2412.00	-28.25	2.03	9.63	-16.59	8.00	24.59
2437.00	-24.54	2.04	9.63	-12.87	8.00	20.87
2462.00	-24.92	2.05	9.63	-13.24	8.00	21.24

Sample Calculation:

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

Power Density

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11008648S-C
Date : October 27, 2015
Temperature / Humidity : 26 deg. C / 40 % RH
Engineer : Hiroyuki Morikawa
Mode : Tx Display Combined Type(T2)

11n-20

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit [dBm]	Margin [dB]
				[dBm]	[mW]		
2412.00	-29.38	2.03	9.63	-17.72	0.02	8.00	25.72
2437.00	-26.19	2.04	9.63	-14.52	0.04	8.00	22.52
2462.00	-25.93	2.05	9.63	-14.25	0.04	8.00	22.25

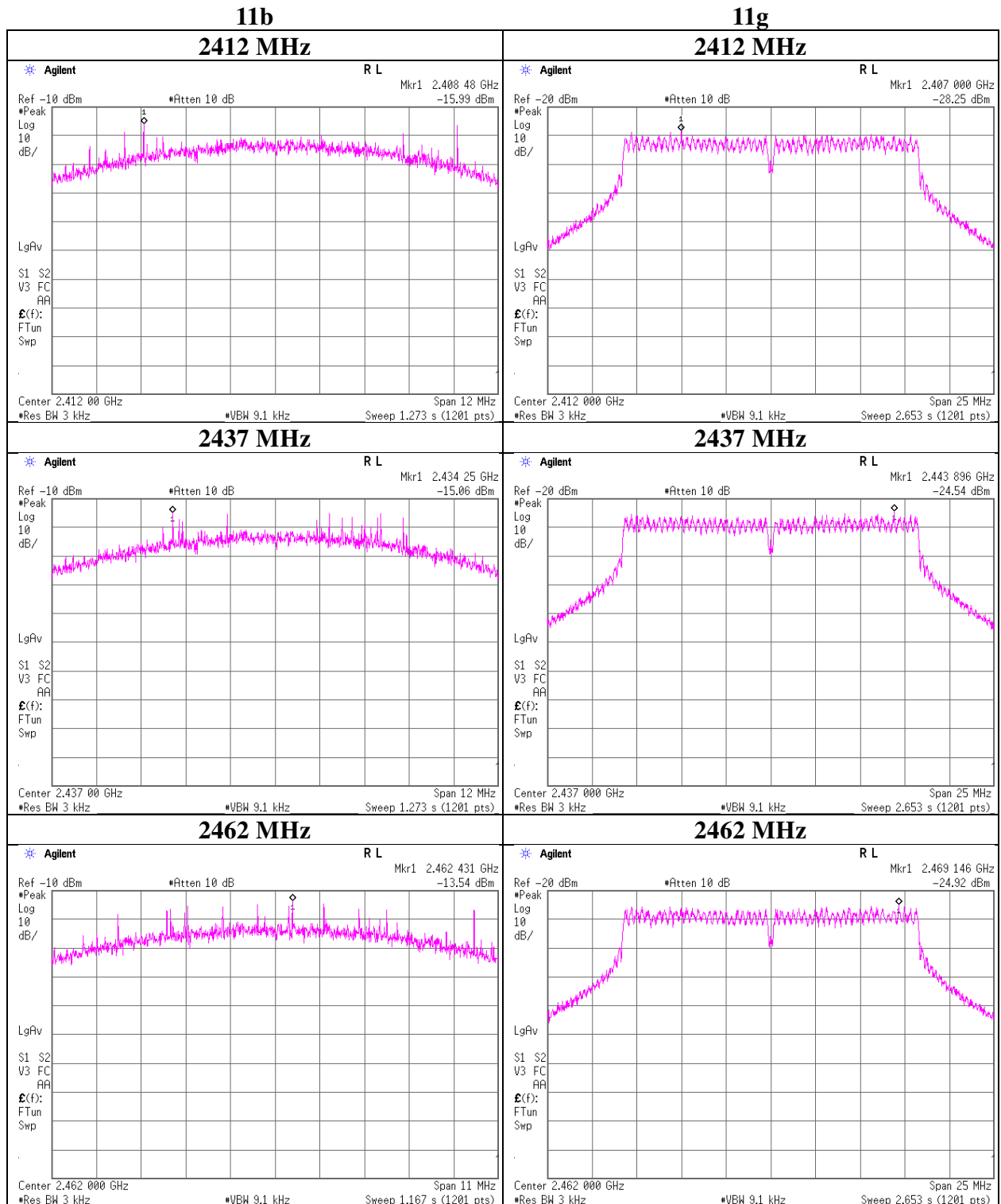
11n-40

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit [dBm]	Margin [dB]
				[dBm]	[mW]		
2422.00	-32.42	2.03	9.63	-20.76	0.01	8.00	28.76
2437.00	-30.41	2.04	9.63	-18.74	0.01	8.00	26.74
2452.00	-30.85	2.04	9.63	-19.18	0.01	8.00	27.18

Sample Calculation:

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

Power Density



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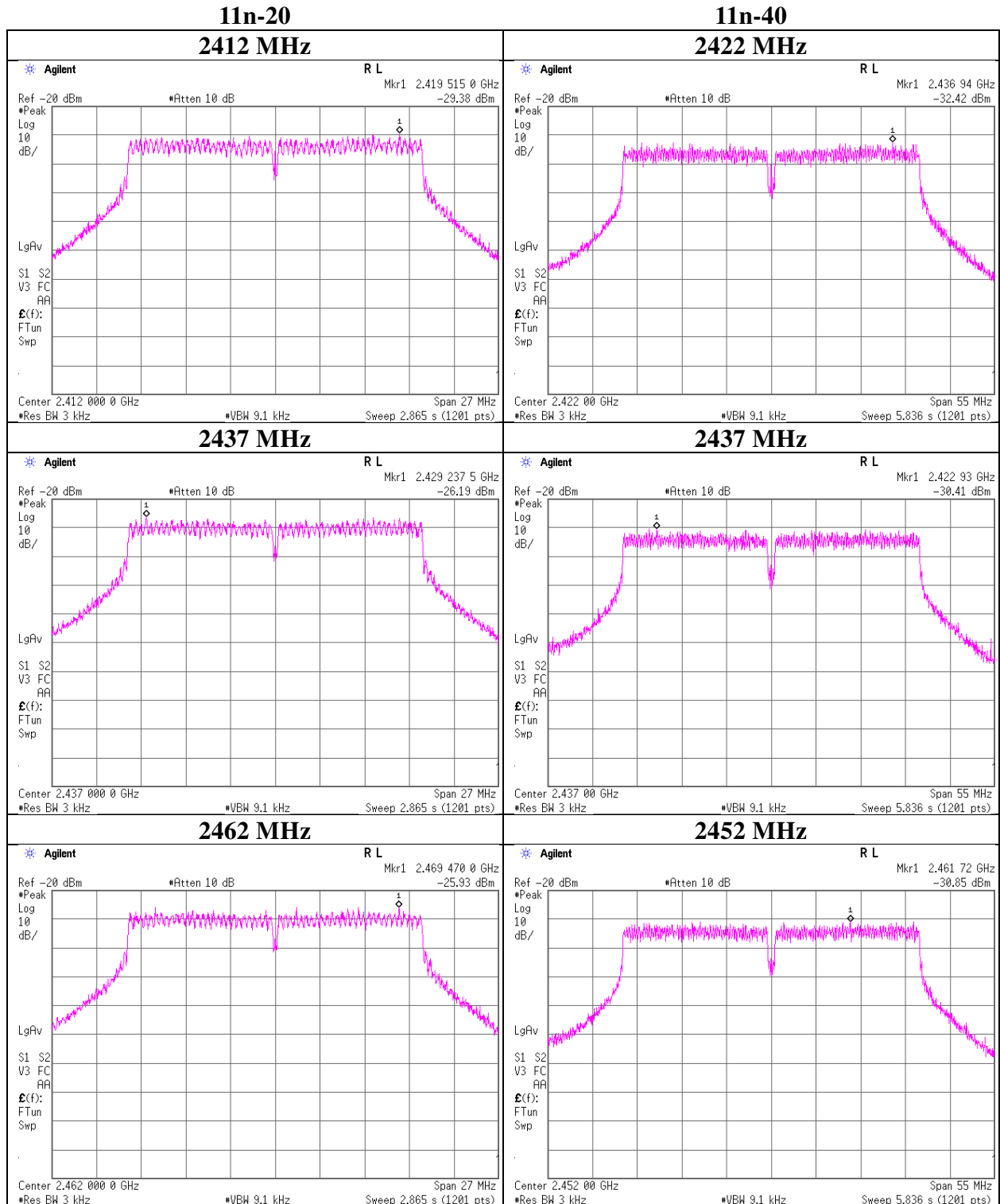
Shonan EMC Lab.

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Facsimile : +81 463 50 6401

Power Density



Power Density

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11008648S-C
Date	November 9, 2015
Temperature / Humidity	24 deg. C / 41 % RH
Engineer	Yosuke Ishikawa
Mode	Tx Display Separated Type(L2)

11b

Freq.	Reading	Cable Loss	Atten. Loss	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2412.00	-13.92	2.03	10.01	-1.88	8.00	9.88
2437.00	-10.36	2.04	10.01	1.69	8.00	6.31
2462.00	-10.63	2.05	10.01	1.43	8.00	6.57

11g

Freq.	Reading	Cable Loss	Atten. Loss	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2412.00	-29.05	2.03	10.01	-17.01	8.00	25.01
2437.00	-25.14	2.04	10.01	-13.09	8.00	21.09
2462.00	-25.33	2.05	10.01	-13.27	8.00	21.27

11n-20

Freq.	Reading	Cable Loss	Atten. Loss	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2412.00	-29.25	2.03	10.01	-17.21	8.00	25.21
2437.00	-26.26	2.04	10.01	-14.21	8.00	22.21
2462.00	-25.85	2.05	10.01	-13.79	8.00	21.79

11n-40

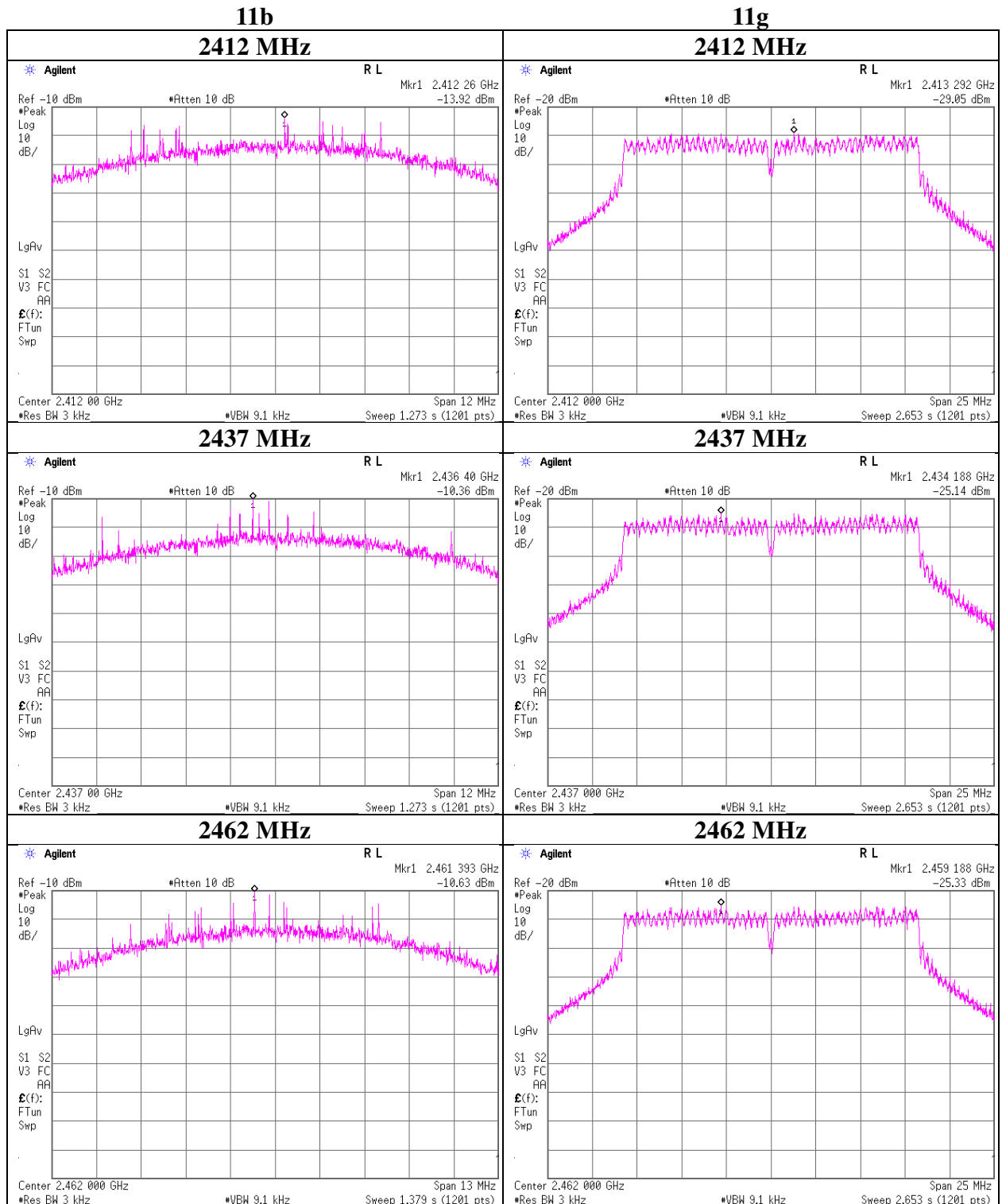
Freq.	Reading	Cable Loss	Atten. Loss	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2422.00	-35.10	2.03	10.01	-23.06	8.00	31.06
2437.00	-30.42	2.04	10.01	-18.37	8.00	26.37
2452.00	-31.42	2.04	10.01	-19.37	8.00	27.37

Sample Calculation:

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

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

Power Density



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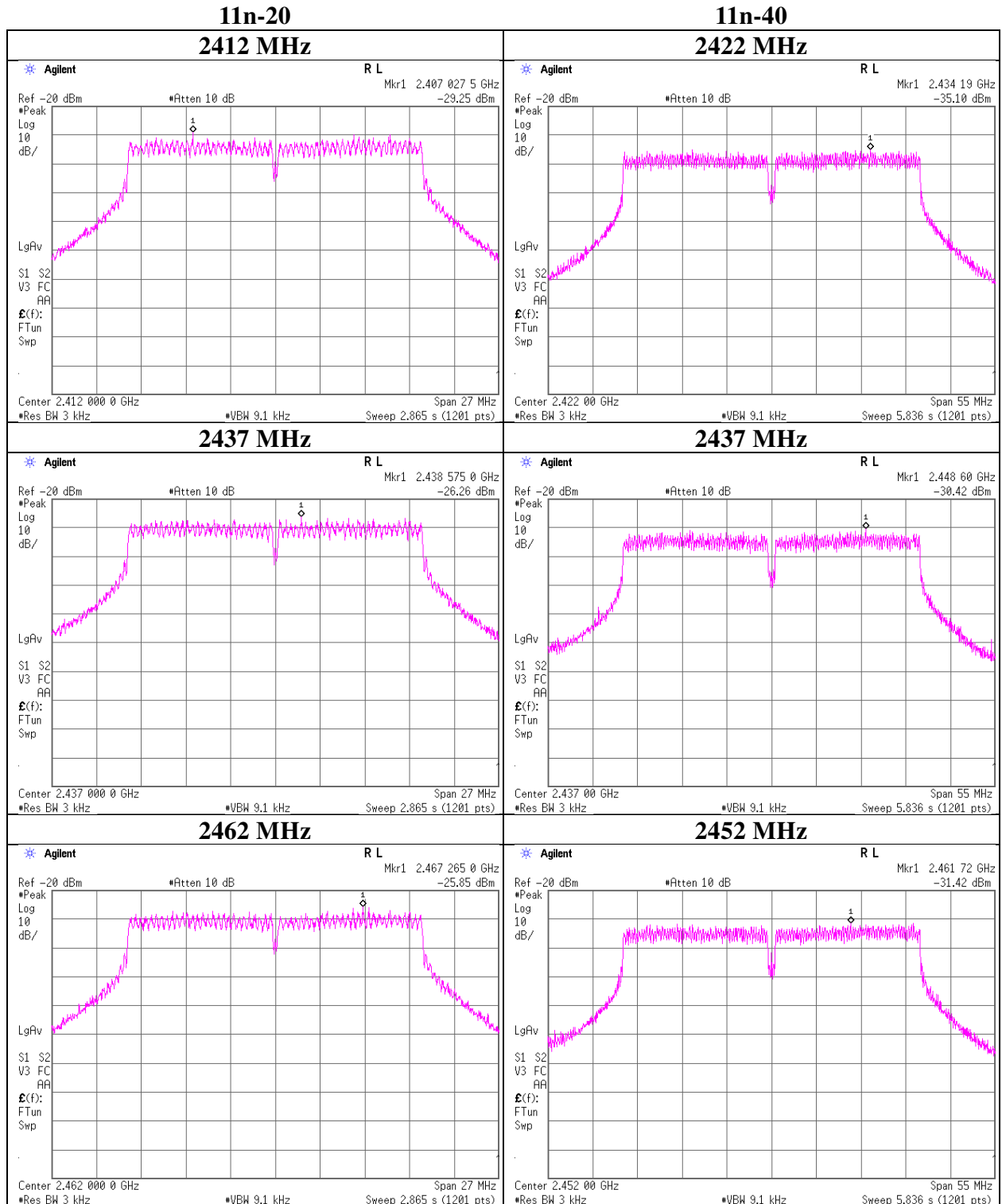
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Power Density



UL Japan, Inc.

Shonan EMC Lab.

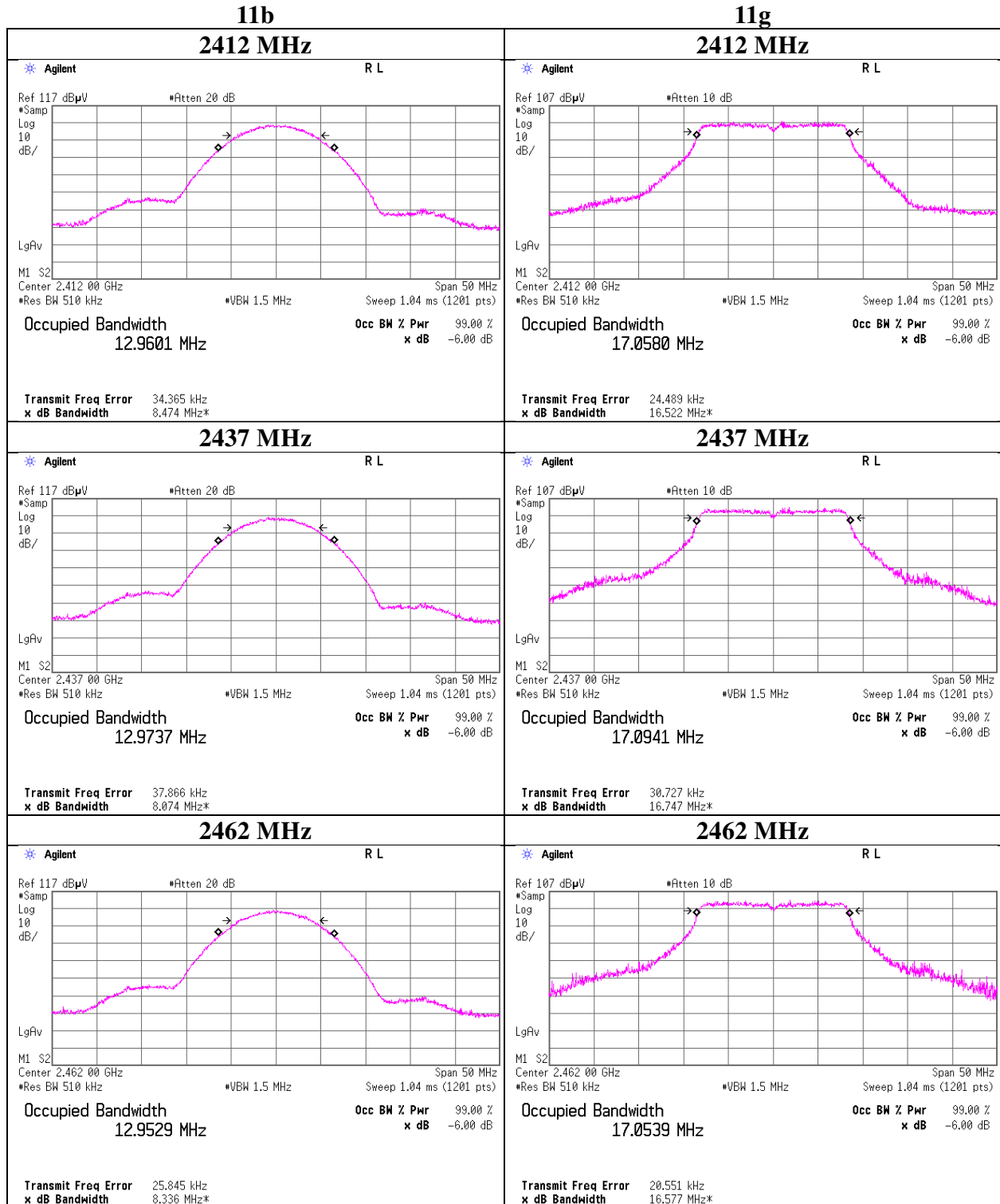
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

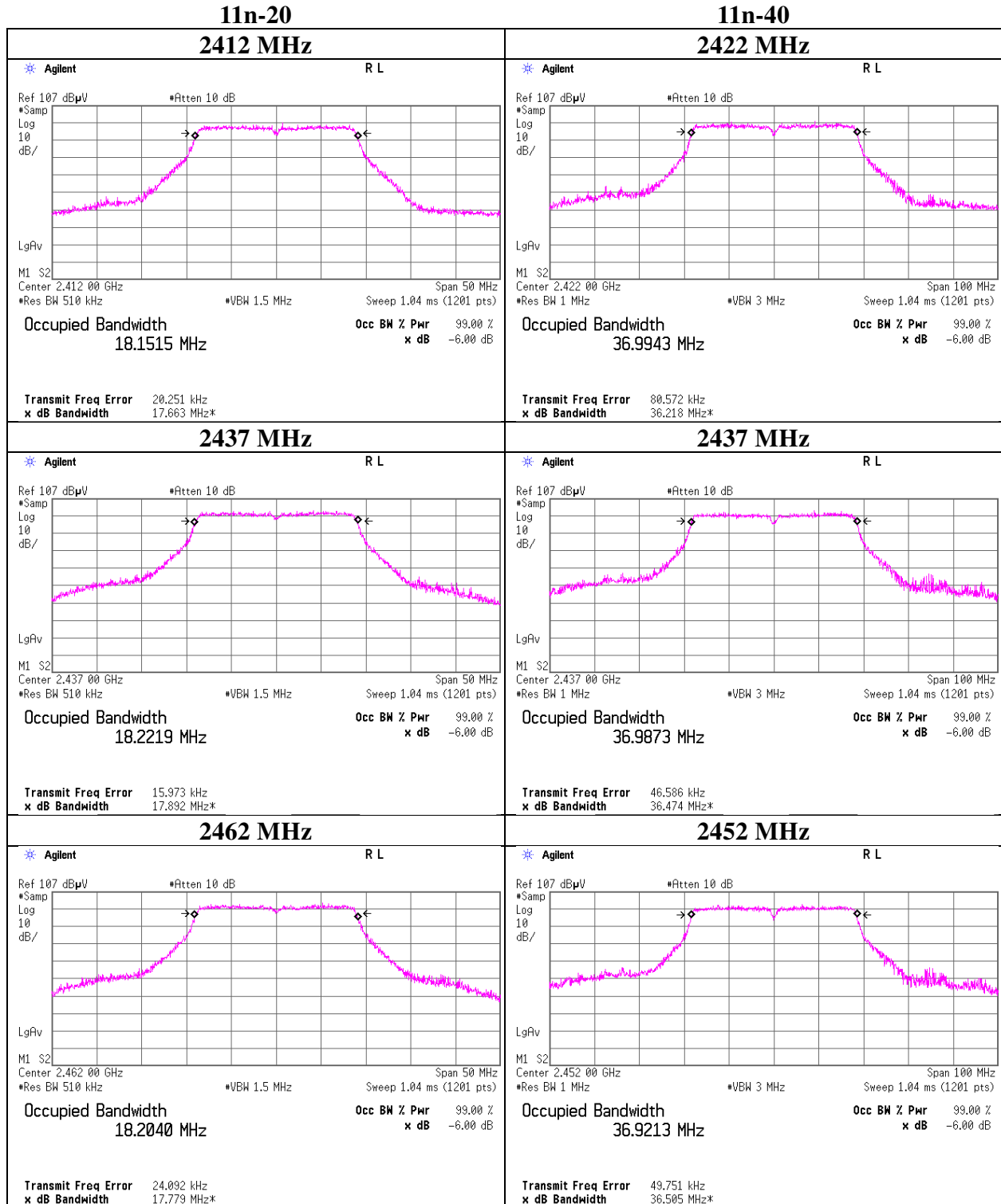
99% Occupied Bandwidth

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11008648S-C
Date : October 27, 2015
Temperature / Humidity : 26 deg. C / 40 % RH
Engineer : Hiroyuki Morikawa
Mode : Tx Display Combined Type(T2)



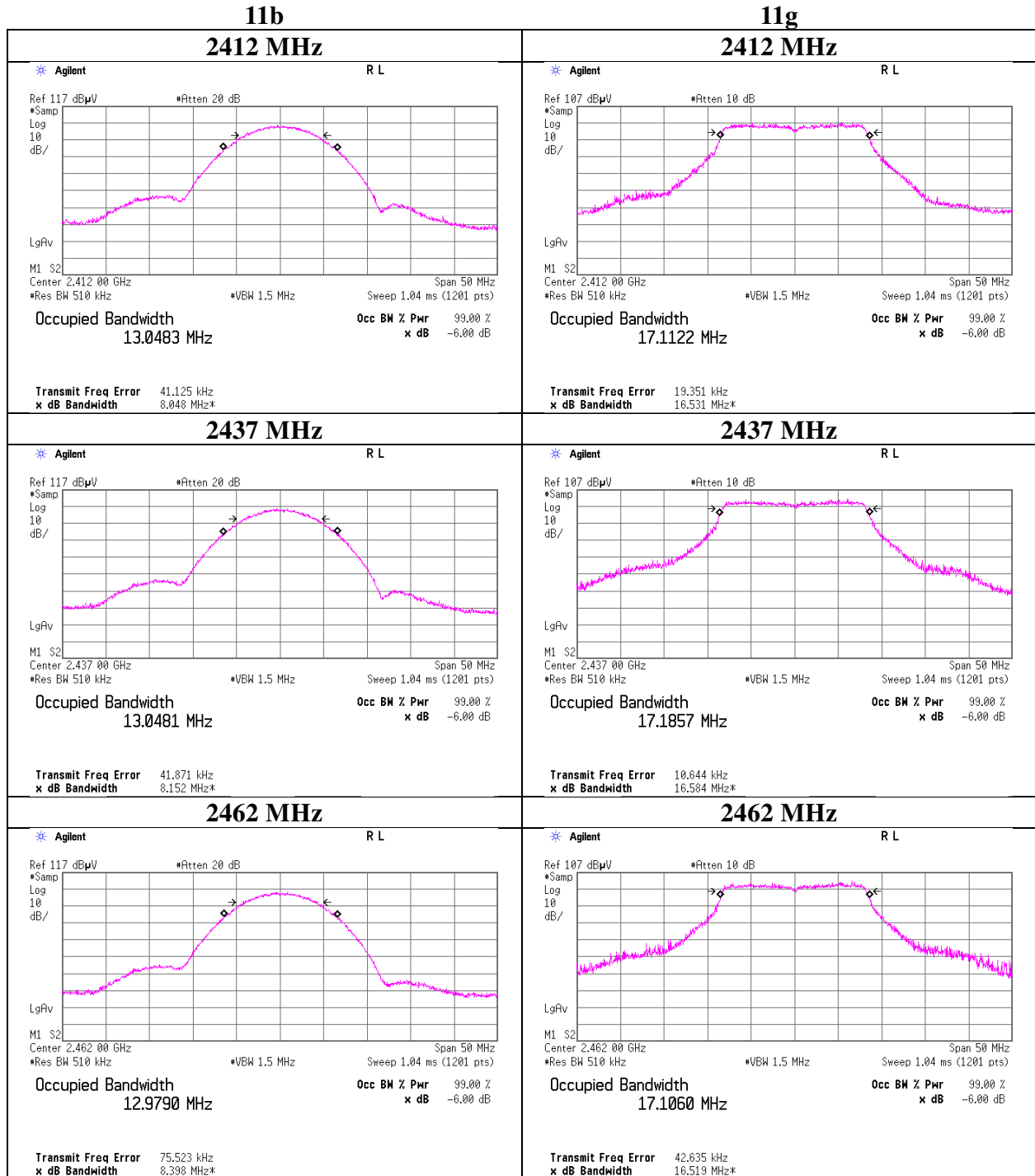
99% Occupied Bandwidth

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11008648S-C
Date : October 27, 2015
Temperature / Humidity : 26 deg. C / 40 % RH
Engineer : Hiroyuki Morikawa
Mode : Tx Display Combined Type(T2)



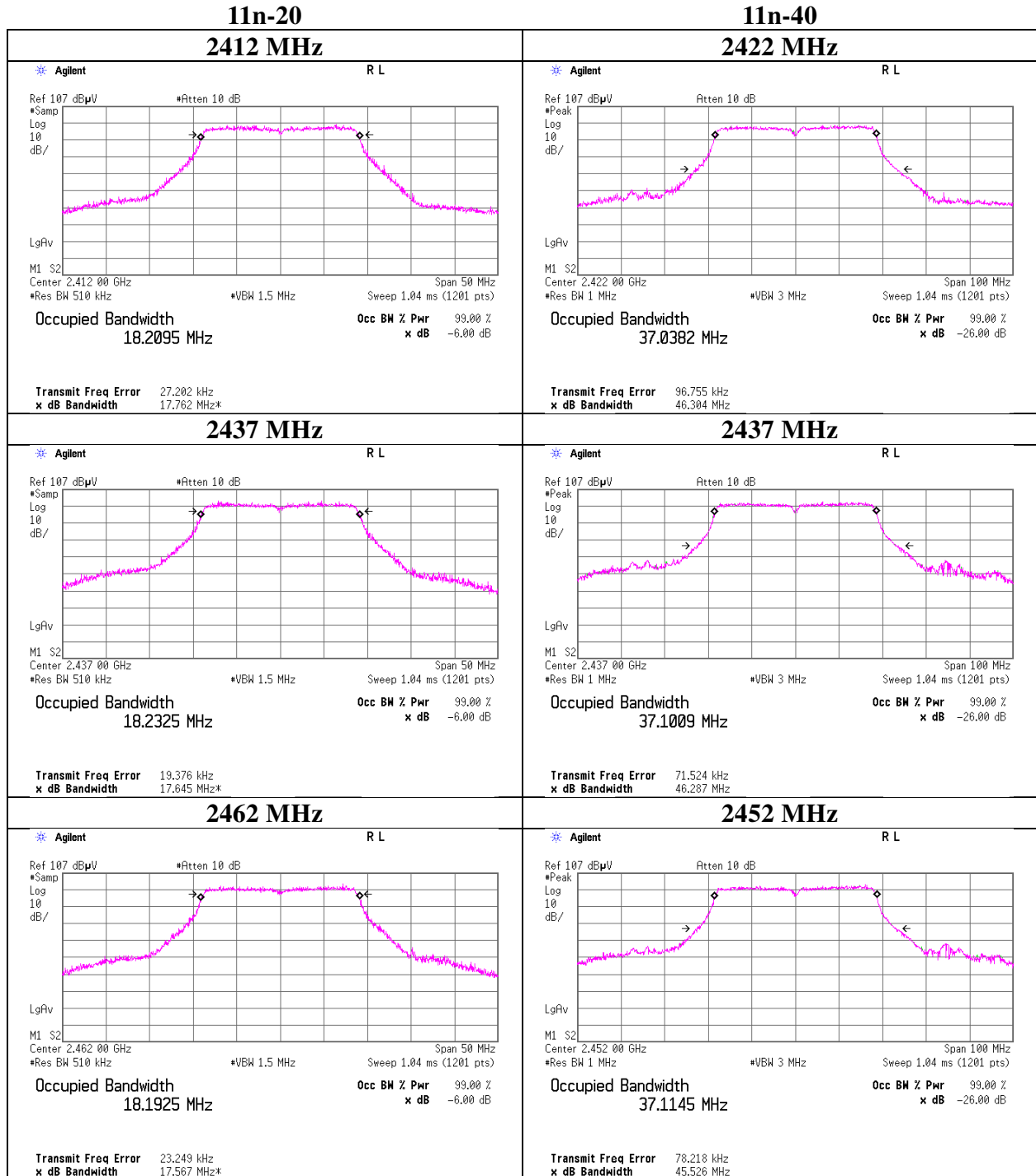
99% Occupied Bandwidth

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11008648S-C
Date : November 9, 2015
Temperature / Humidity : 24 deg. C / 41 % RH
Engineer : Yosuke Ishikawa
Mode : Tx Display Separated Type(L2)



99% Occupied Bandwidth

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11008648S-C
Date	November 9, 2015
Temperature / Humidity	24 deg. C / 41 % RH
Engineer	Yosuke Ishikawa
Mode	Tx Display Separated Type(L2)



APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2015/05/27 * 12
SCC-G04	Coaxial Cable	Junkosha	J12J102207-00	JUN-12-14-018	RE	2015/06/08 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2015/05/19 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2015/08/11 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2015/10/22 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE	2015/03/23 * 12
SJM-15	Measure	ASKUL	-	-	RE	-
SAEC-03(SVSWR)	Semi-Anechoic Chamber	TDK	SAEC-03(SVSWR)	3	RE	2015/08/28 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RF LMF)	-	RE	-
STS-03	Digital Hitester	Hioki	3805-50	080997823	RE	2015/11/18 * 12
SAT10-05	Attenuator(above1GHz)	Agilent	8493C-010	74864	RE	2015/11/04 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPMS0111	051	RE	2015/11/16 * 12
STR-07	Test Receiver	Rohde & Schwarz	ESU26	100484	RE	2015/09/04 * 12
SJM-14	Measure	ASKUL	-	-	RE	-
SAEC-02(NSA)	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	RE	2015/07/15 * 12
STS-02	Digital Hitester	Hioki	3805-50	080997819	RE	2015/03/10 * 12
SAF-05	Pre Amplifier	TOYO Corporation	TPA0118-36	1440490	RE	2015/09/08 * 12
SCC-G05	Coaxial Cable	Junkosha	J12J102207-00	APR-30-15-037	RE	2015/05/11 * 12
SCC-G22	Coaxial Cable	Suhner	SUCOFLEX 104	296199/4	RE	2015/05/19 * 12
SHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-726	RE	2015/08/10 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2015/03/17 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2015/03/23 * 12
SCC-G15	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	RE	2015/03/11 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2015/07/16 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2015/10/11 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2015/10/11 * 12
SAT6-08	Attenuator	HIROSE ELECTRIC CO.,LTD.	AT-406(40)	-	RE	2015/08/31 * 12
SCC-C1/C2/C3/C4/ C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suh ner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE /141PE/141PE/141PE/ NS4906	-/0901-271(RF Selector)	RE	2015/04/17 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2015/02/18 * 12
STR-06	Test Receiver	Rohde & Schwarz	ESCI	101259	RE	2015/03/24 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	AT	2015/09/16 * 12
SPM-07	Power Meter	Agilent	8990B	MY5100272	AT	2015/04/02 * 12
SPSS-04	Power sensor	Agilent	N1923A	MY5326009	AT	2015/04/02 * 12
SCC-G14	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	AT	2015/03/11 * 12
SAT10-09	Attenuator	Weinschel Corp.	54A-10	W5692	AT	2015/11/04 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2014/12/24 * 12
STS-05	Digital Hitester	Hioki	3805-50	080997828	AT	2015/11/18 * 12
SAF-01	Pre Amplifier	SONOMA	310N	290211	RE	2015/02/18 * 12
KAT6-04	Attenuator	INMET	18N-6dB	-	RE	2014/12/19 * 12
SAT3-09	Attenuator	JFW	50HF-003N	-	RE	2015/08/31 * 12
SBA-01	Biconical Antenna	Schwarzbeck	BBA9106	91032664	RE	2015/10/11 * 12
SCC-A1/A3/A5/A7/ A8/A13/SRSE-01	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suh ner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE /141PE/141PE/141PE/ NS4906	-/0901-269(RF Selector)	RE	2015/04/17 * 12
SCC-A2/A4/A6/A7/ A8/A13/SRSE-01	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suh ner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE /141PE/141PE/141PE/ NS4906	-/0901-269(RF Selector)	RE	2015/04/17 * 12
SLA-01	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0888	RE	2015/10/11 * 12
SOS-01	Humidity Indicator	A&D	AD-5681	4062555	RE	2015/10/22 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	RE	2015/11/06 * 12
SJM-02	Measure	KOMELON	KMC-36	-	RE	-
SAEC-01(NSA)	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	RE	2015/07/13 * 12
STS-01	Digital Hitester	Hioki	3805-50	080997812	RE	2015/11/18 * 12
SAT10-06	Attenuator	Agilent	8493C-010	74865	RE	2015/11/04 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2015/03/26 * 12

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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