



RADIO TEST REPORT

Test Report No. : 11182619H-A-R1

Applicant : silex technology, Inc.
Type of Equipment : SDIO Wireless Module
Model No. : SX-SDMAC
FCC ID : N6C-SDMAC
Test regulation : FCC Part 15 Subpart C: 2016
(WLAN, BT LE parts)
Test Result : Complied

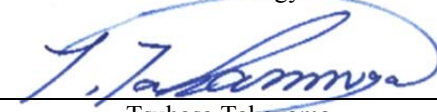
1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. This report is a revised version of 11182619H-A. 11182619H-A is replaced with this report.

Date of test: March 30 to August 25, 2016

Representative test engineer:


Yutaka Yoshida
Engineer
Consumer Technology Division

Approved by:


Tsubasa Takayama
Engineer
Consumer Technology Division



NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.

*As for the range of Accreditation in NVLAP, you may refer to the WEB address,
http://japan.ul.com/resources/emc_accredited/

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

13-EM-F0429

REVISION HISTORY

Original Test Report No.: 11182619H-A

[illegible]

CONTENTS	PAGE
SECTION 1: Customer information.....	4
SECTION 2: Equipment under test (E.U.T.).....	4
SECTION 3: Test specification, procedures & results.....	6
SECTION 4: Operation of E.U.T. during testing.....	10
SECTION 5: Conducted Emission.....	14
SECTION 6: Radiated Spurious Emission	15
SECTION 7: Antenna Terminal Conducted Tests.....	17
APPENDIX 1: Test data	18
Conducted Emission	18
6dB Bandwidth	24
Maximum Peak Output Power	28
Average Output Power	33
Burst rate confirmation	36
Radiated Spurious Emission	38
Conducted Spurious Emission	90
Power Density	94
99%Occupied Bandwidth	98
APPENDIX 2: Test instruments	101
APPENDIX 3: Photographs of test setup	103
Conducted Emission	103
Radiated Spurious Emission	105

SECTION 1: Customer information

Company Name	:	silex technology, Inc.
Address	:	2-3-1 Hikaridai, Seika-cho, Kyoto 619-0237, Japan
Telephone Number	:	+81-774-98-3878
Facsimile Number	:	+81-774-98-3758
Contact Person	:	Toshiro Kometani

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

2.1 Identification of E.U.T.

Type of Equipment	:	SDIO Wireless Module
Model No.	:	SX-SDMAC
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 3.3 V
Receipt Date of Sample	:	March 7, 2016
Country of Mass-production	:	Japan
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

Model: SX-SDMAC (referred to as the EUT in this report) is a SDIO Wireless Module.

General Specification

Clock frequency(ies) in the system : 48 MHz
Operating Temperature : -40 deg. C - +85 deg. C

Radio Specification

Radio Type : Transceiver
Method of Frequency Generation : Synthesizer
Power Supply (inner) : DC 1.1 V

	IEEE802.11b	IEEE802.11g/n (20 M band)	IEEE802.11a/n/ac (20 M band)	IEEE802.11n/ac (40 M band)	IEEE802.11ac (80 M band)	Bluetooth Ver.4.0 with EDR/ LE function
Frequency of operation	2412 MHz - 2462 MHz *1)	2412 MHz - 2462 MHz *1)	2412 MHz - 2462 MHz *1) 5180 MHz - 5240 MHz 5260 MHz - 5320 MHz 5500 MHz - 5700 MHz 5745 MHz - 5825 MHz	2422 MHz - 2452 MHz *1) 5190 MHz - 5230 MHz 5270 MHz - 5310 MHz 5510 MHz - 5670 MHz 5755 MHz - 5795 MHz	5210 MHz 5290 MHz 5530 MHz - 5610 MHz 5775 MHz	2402 MHz - 2480 MHz *1)
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	11a/n: OFDM (64QAM, 16QAM, QPSK, BPSK) 11ac: OFDM (64QAM, 16QAM, QPSK, BPSK, 256QAM)			BT: FHSS (GFSK, $\pi/4$ -DQPSK, 8-DPSK) LE: GFSK
Channel spacing	5 MHz		20 MHz	40 MHz	80 MHz	BT: 1 MHz LE: 2 MHz
Antenna type	[Antenna 1] Model Name: 146153 PCB antenna (Dipole antenna) [Antenna 2] Model Name: H2U84W1H1S Chip Antenna					
Antenna Connector type	Antenna 1: U.FL Alternative connectorUFL Antenna 2: -none					
Antenna Gain	Antenna 1: 3.25 dBi (2.4 GHz Band), 5.0 dBi (5 GHz Band) Antenna 2: 1.40 dBi (2.4 GHz Band), 2.3 dBi (5 GHz Band)					

*1) This test report applies to IEEE802.11b/g/n-20 (2412 MHz - 2462 MHz), IEEE802.11n-40 (2422 MHz - 2452 MHz) and Bluetooth Low Energy function (2402 MHz - 2480 MHz).

* Spurious emission test was performed with two antenna type (PCB antenna (Dipole antenna) and chip antenna).

** WLAN and Bluetooth do not transmit simultaneously.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
FCC part 15 final revised on April 6, 2016.

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.247 Operation within the bands 902-928MHz,
2400-2483.5MHz, and 5725-5850MHz

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.10-2013 6. Standard test methods IC: RSS-Gen 8.8	FCC: Section 15.207 IC: RSS-Gen 8.8	[WLAN] QP 15.7 dB, 0.45680 MHz, N AV 16.7 dB, 0.45236 MHz, L [BT LE] QP 14.0 dB, 0.45865 MHz, N AV 7.0 dB, 0.45865 MHz, N	Complied	-
6dB Bandwidth	FCC: KDB 558074 D01 DTS Meas Guidance v03r04 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 v03r04 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 v03r04 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 v03r04 IC: RSS-Gen 6.13	FCC: Section 15.247(d) IC: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10	[WLAN] 2.0 dB 2483.500 MHz, AV, Hori. / 2483.5 MHz, AV, Hori. [BT LE] 3.4 dB 20879.980 MHz, AV, Vert.	Complied	Conducted (below 30 MHz)/ Radiated (above 30 MHz) *1)
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422. *1) Radiated test was selected over 30 MHz based on section 15.247(d) and KDB 558074 D01 DTS Meas Guidance v03r05 12.2.7.					

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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

FCC Part 15.31 (e)

The stable voltage (DC1.1V) was provided to the EUT during the tests.
Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

[PCB antenna (Dipole antenna)]

The EUT has a unique coupling/antenna connector (UFL). Therefore the equipment complies with the requirement of 15.203.

[Chip Antenna]

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

3.3 Addition to standard

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

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

3.4 Uncertainty

EMI

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k = 2$.
Ise EMC Lab.

Antenna terminal test Uncertainty (+/-)							
Power meter		Conducted emission and Power density			Conducted emission		Channel power
Below 1 GHz	Above 1 GHz	Below 1 GHz	1 GHz - 3 GHz	3 GHz - 18 GHz	18 GHz - 26.5 GHz	26.5 GHz - 40 GHz	
0.9 dB	1.0 dB	1.4 dB	1.7 dB	2.8 dB	2.8 dB	2.9 dB	

Frequency range	Conducted emission using AMN(LISN) (+dB)
0.009 – 0.15MHz	3.5 dB
0.15 – 30MHz	2.9 dB

Test distance	Radiated emission (+dB) 9 kHz - 30 MHz
3m	3.8 dB
10m	3.7 dB

Polarity	Radiated emission (Below 1GHz)			
	(3 m*)(+dB)		(10 m*)(+dB)	
	30 – 300 MHz	300 – 1000MHz	30 – 300 MHz	300 – 1000MHz
Horizontal	4.8 dB	5.2 dB	4.8 dB	5.0 dB
Vertical	4.5 dB	5.9 dB	4.8 dB	5.1 dB

Radiated emission				
(3 m*)(+dB)		(1 m*)(+dB)	(0.5 m*)(+dB)	(10 m*)(+dB)
1 – 6GHz	6 – 18GHz	10 – 26.5 GHz	26.5 – 40GHz	1 -18 GHz
5.1 dB	5.3 dB	5.1 dB	5.1 dB	5.3 dB

*Measurement distance

Conducted Emission test

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

Radiated emission test

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

3.5 Test Location

UL Japan, Inc. Ise EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone: +81 596 24 8999, Facsimile: +81 596 24 8124

Test site	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms	Maximum measurement distance
No.1 semi-anechoic chamber	2973C-1	19.2 x 11.2 x 7.7	7.0 x 6.0	No.1 Power source room	10 m
No.2 semi-anechoic chamber	2973C-2	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	2973C-3	12.0 x 8.5 x 5.9	6.8 x 5.75	No.3 Preparation room	3 m
No.3 shielded room	-	4.0 x 6.0 x 2.7	N/A	-	-
No.4 semi-anechoic chamber	2973C-4	12.0 x 8.5 x 5.9	6.8 x 5.75	No.4 Preparation room	3 m
No.4 shielded room	-	4.0 x 6.0 x 2.7	N/A	-	-
No.5 semi-anechoic chamber	-	6.0 x 6.0 x 3.9	6.0 x 6.0	-	-
No.6 shielded room	-	4.0 x 4.5 x 2.7	4.0 x 4.5	-	-
No.6 measurement room	-	4.75 x 5.4 x 3.0	4.75 x 4.15	-	-
No.7 shielded room	-	4.7 x 7.5 x 2.7	4.7 x 7.5	-	-
No.8 measurement room	-	3.1 x 5.0 x 2.7	N/A	-	-
No.9 measurement room	-	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-
No.11 measurement room	-	6.2 x 4.7 x 3.0	4.8 x 4.6	-	-

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

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

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

4.1 Operating Mode(s)

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

Mode	Remarks*
IEEE 802.11b (11b)	2 Mbps, PN9
IEEE 802.11g (11g)	24 Mbps, PN9
IEEE 802.11n 20 MHz BW (11n-20)	MCS 4 (Long GI, 3 Streams), PN9
IEEE 802.11n 40 MHz BW (11n-40)	MCS 3 (Short GI, 3 Streams), PN9
Bluetooth(BT) LE(Low Energy)	Maximum Packet Size, PN9
*The worst condition was determined based on the test result of Maximum Peak Output Power (Mid Channel)	
*Power of the EUT was set by the software as follows (power setting value might be different from product specification value); Power settings: Refer to the following table Software: QRCT Version 3.0.197.0 *This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.	

[Power setting: WLAN]

	Rate		Power Setting
11b	2 Mbps (Short GI)	2412 MHz	17.5
		2417 MHz	18
		2437 MHz	18
		2457 MHz	18
		2462 MHz	17.5
11g	24Mbps	2412 MHz	13
		2417 MHz	15
		2437 MHz	15
		2457 MHz	15
		2462 MHz	12
11n20	MCS4	2412 MHz	12
		2417 MHz	15
		2437 MHz	15
		2457 MHz	15
		2462 MHz	11.5
11n40	MCS3	2422 MHz	9
		2427 MHz	9.5
		2437 MHz	10.5
		2447 MHz	10.5
		2452 MHz	9.5

[Power setting: BT LE]

BT LE: MAX (default)

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

*The details of Operating mode(s)

Test Item	Operating Mode	Tested frequency
Conducted Emission *1)	11g Tx	2437 MHz
	BT LE Tx	2402 MHz 2440 MHz 2480 MHz
Spurious Emission above 1GHz (Radiated) *2)	11b Tx	2412 MHz
	11g Tx	2437 MHz 2462 MHz
	11n-20 Tx *3)	2412 MHz 2462 MHz
	11n-40 Tx	2422 MHz 2437 MHz 2452 MHz
	BT LE Tx	2402 MHz 2440 MHz 2480 MHz
Spurious Emission below 1GHz(Radiated) *1)	11g Tx	2437 MHz
	BT LE Tx	2402 MHz 2440 MHz 2480 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
	BT LE Tx	2402 MHz 2440 MHz 2480 MHz
Spurious Emission(Conducted) *1)	11g Tx	2437 MHz
	BT LE Tx	2402 MHz 2440 MHz 2480 MHz

*In normal use, the external antenna might not be connected when the internal antenna is used. Therefore, the test was performed under the worst condition based on the result of pre-testing.

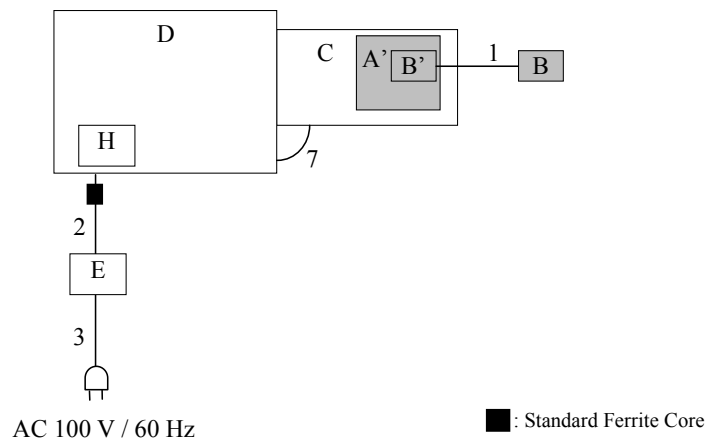
*1) The operating mode and tested frequency were tested as a representative, because it had the highest power at antenna terminal test.

*2) Since 11g and 11n-20 have the same modulation method and no differences in transmitting specification, test was performed on the representative mode that had the highest peak output power.

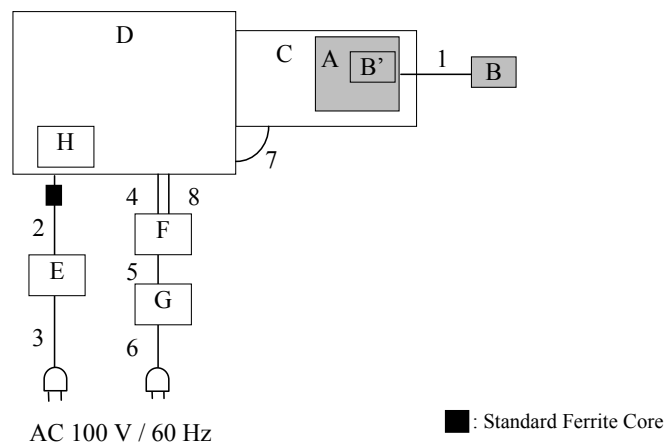
*3) The test was performed only band-edge.

4.2 Configuration and peripherals

[Conducted emission test]



[Radiated emission / Antenna Terminal Conducted test]



* 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	SDIO Wireless Module	SX-SDMAC	84253F-011034	silex technology, Inc.	EUT
A'	SDIO Wireless Module	SX-SDMAC	84253F-011035	silex technology, Inc.	EUT
B	PCB Antenna	146153	-	MOLEX	EUT
B'	Chip Antenna	H2U84W1H1S	-	Unictron	EUT
C	Jig	PW102660	-	silex technology, Inc.	*1)
D	Jig	MCIMX6Q-SDB	-	silex technology, Inc.	-
E	AC Adapter	ATS030-A050	-	SCEPTER POWER	-
F	Laptop PC	E5540	HK42N12	DELL	-
G	AC Adapter	HA65NM130	CN-06TFFF-74661-4BO-06R0-A00	DELL	-
H	SD Card	SDHC Class4	-	San Disk	-

*1) The test was performed with the module that as normal assumed implementation conditions (without a solid ground)

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Antenna Cable	0.05	Unshielded	Unshielded	-
2	DC Cable	1.00	Unshielded	Unshielded	-
3	AC Cable	1.90	Unshielded	Unshielded	-
4	USB Cable	2.80	Shielded	Shielded	-
5	DC Cable	1.80	Unshielded	Unshielded	-
6	AC Cable	0.90	Unshielded	Unshielded	-
7	Flat Cable	0.15	Unshielded	Unshielded	-
8	LAN Cable	2.00	Shielded	Shielded	-

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane.

The rear of tabletop was located 40 cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80 cm from a Line Impedance Stabilization Network (LISN) / Artificial mains Network (AMN) and excess AC cable was bundled in center.

For the tests on EUT with other peripherals (as a whole system)

I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. All unused 50ohm connectors of the LISN (AMN) were resistivity terminated in 50 ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber.

The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

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

Detector	: QP and CISPR AV
Measurement range	: 0.15 MHz - 30 MHz
Test data	: APPENDIX
Test result	: Pass

SECTION 6: Radiated Spurious Emission

Test Procedure

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

[For below 1GHz]

EUT was placed on a urethane platform of nominal size, 1.0 m by 0.5 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[For above 1GHz]

EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 1.5 m above the conducting ground plane.

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

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

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.

The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).

The test was made with the detector (RBW/VBW) in the following table.

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Test Antennas are used as below;

Frequency	Below 30 MHz	30 MHz to 300 MHz	300 MHz to 1 GHz	Above 1 GHz
Antenna Type	Loop	Biconical	Logperiodic	Horn

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

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

Frequency	Below 1 GHz	Above 1 GHz		20 dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV *3)	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	Average Power Method: RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (RMS) Trace: 100 traces If duty cycle was less than 98%, a duty factor was added to the results.	RBW: 100 kHz VBW: 300 kHz
Test Distance	3 m	4.5 m *1) (1 GHz - 10 GHz), 1 m *2) (10 GHz - 26.5 GHz)		4.5 m *1) (1 GHz - 10 GHz), 1 m *2) (10 GHz - 26.5 GHz)

*1) Distance Factor: $20 \times \log(4.5 \text{ m} / 3.0 \text{ m}) = 3.53 \text{ dB}$

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

*3) Average Power Measurement was performed based on 6. 0 & 12.2.5 of "KDB 558074 D01 DTS Meas Guidance v03r05"

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

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

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

SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
6dB Bandwidth	20 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth *1)	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak/Average *2)	-	Power Meter (Sensor: 50 MHz BW)
Peak Power Density	1.5 times the 6dB Bandwidth	3 kHz	10 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	9.1 kHz	27 kHz				

*1) Peak hold was applied as Worst-case measurement.
 *2) Reference data
 *3) Section 10.2 Method PKPSD (peak PSD) of "KDB 558074 D01 DTS Meas Guidance v03r05".
 *4) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents.
 Then, wide-band noise near the limit was checked separately, however the noise was low enough as shown in the chart.
 (9 kHz - 150 kHz: RBW = 200 Hz, 150 kHz - 30 MHz: RBW = 9.1 kHz).

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

*Antenna terminal conducted tests were performed on U.FL port because the structures of the route to both antennas are the same.

Test data : **APPENDIX**

Test result : **Pass**

APPENDIX 1: Test data

Conducted Emission (Antenna : M/N 146153)

DATA OF CONDUCTED EMISSION TEST

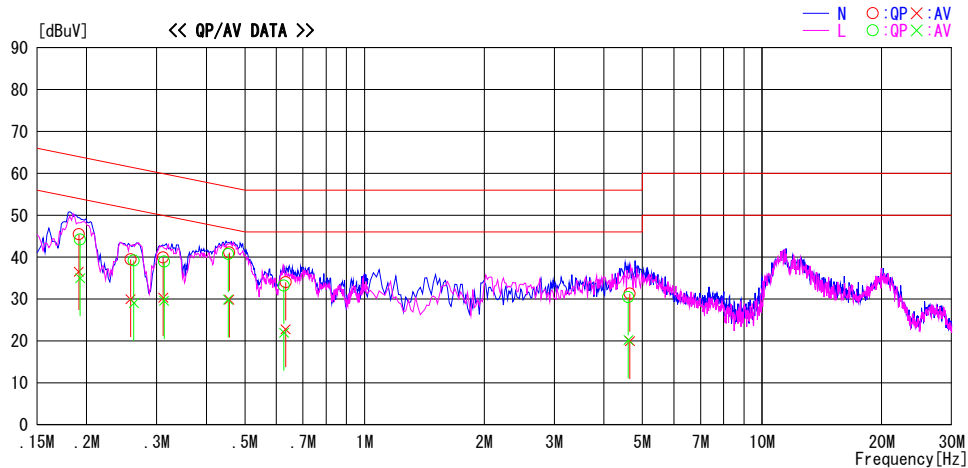
UL Japan, Inc. Ise EMC Lab. No.3 Semi Anechoic Chamber
Date : 2016/08/20

Report No. : 11182619H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Kazuya Yoshioka

Mode / Remarks : 11g 2437MHz

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.19104	32.3	23.3	13.2	45.5	36.5	64.0	54.0	18.5	17.5	N	
0.25803	26.2	16.7	13.3	39.5	30.0	61.5	51.5	22.0	21.5	N	
0.31136	26.6	17.0	13.3	39.9	30.3	59.9	49.9	20.0	19.6	N	
0.45680	27.8	16.6	13.3	41.1	29.9	56.8	46.8	15.7	16.9	N	
0.63290	20.7	9.5	13.3	34.0	22.8	56.0	46.0	22.0	23.2	N	
4.65120	17.4	6.1	13.9	31.3	20.0	56.0	46.0	24.7	26.0	N	
0.19248	31.0	21.8	13.2	44.2	35.0	63.9	53.9	19.7	18.9	L	
0.26293	25.9	15.8	13.3	39.2	29.1	61.3	51.3	22.1	22.2	L	
0.31304	25.6	16.3	13.3	38.9	29.6	59.9	49.9	21.0	20.3	L	
0.45390	27.4	16.6	13.3	40.7	29.9	56.8	46.8	16.1	16.9	L	
0.62720	19.9	8.7	13.3	33.2	22.0	56.0	46.0	22.8	24.0	L	
4.60880	16.6	6.3	13.9	30.5	20.2	56.0	46.0	25.5	25.8	L	

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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Emission
(Antenna : M/N 146153)

DATA OF CONDUCTED EMISSION TEST

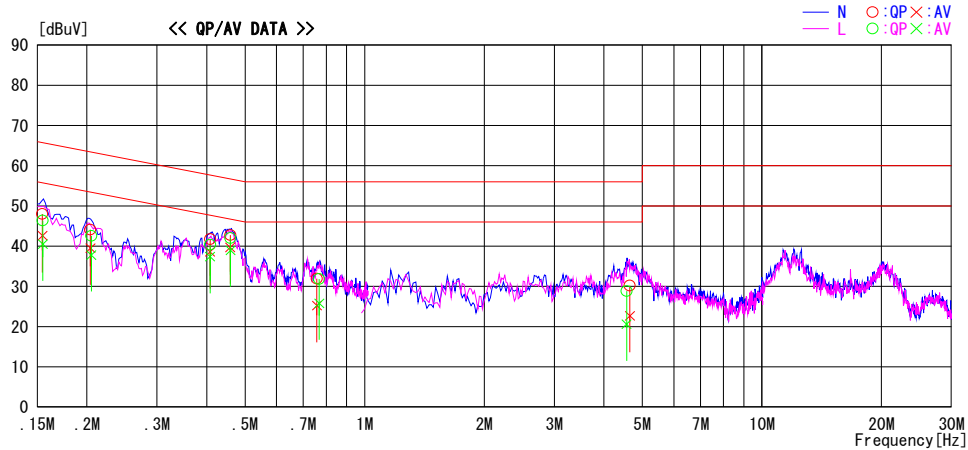
UL Japan, Inc. Ise EMC Lab. No.3 Semi Anechoic Chamber
Date : 2016/08/20

Report No. : 11182619H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Kazuya Yoshioka

Mode / Remarks : BLE 2480MHz

LIMIT : FCC15. 207 QP
FCC15. 207 AV



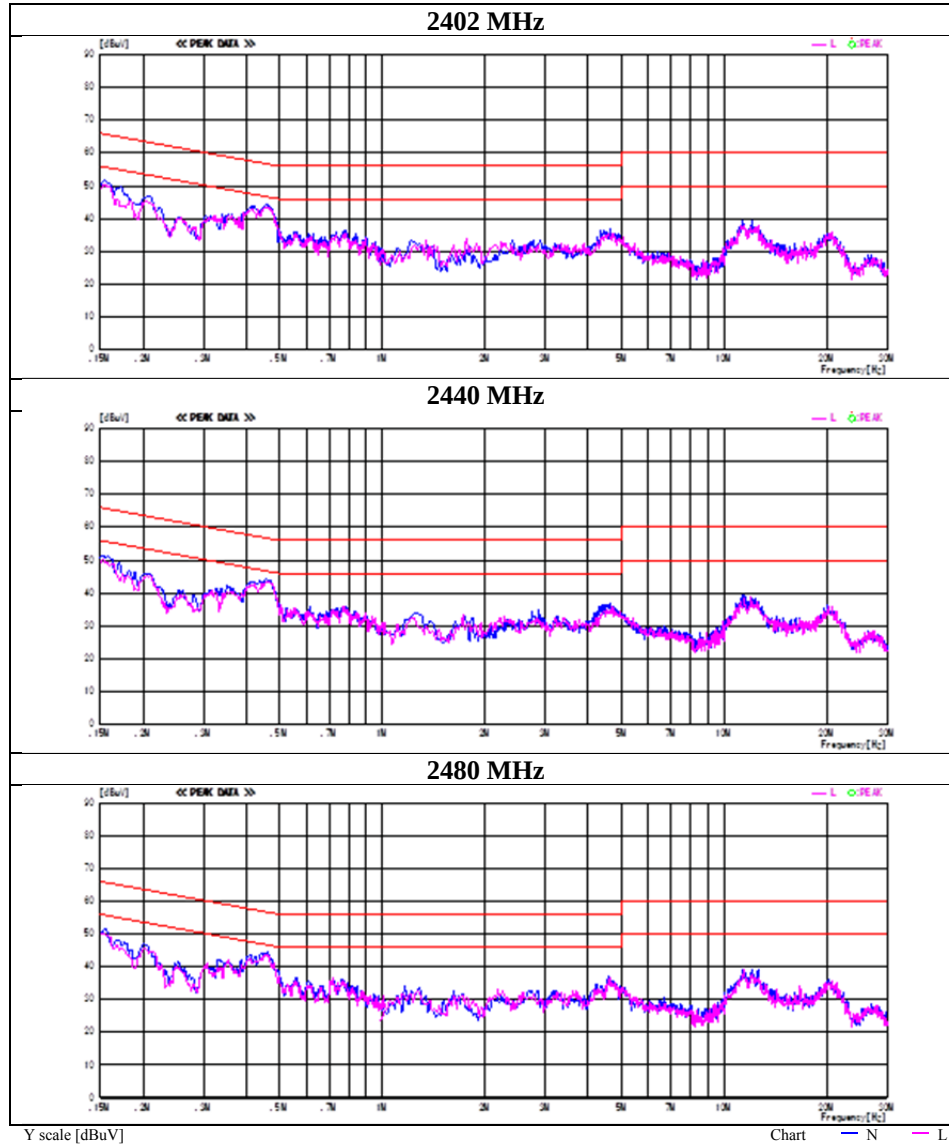
Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15434	34.8	29.4	13.2	48.0	42.6	65.8	55.8	17.8	13.2	N	
0.20390	30.9	26.3	13.2	44.1	39.5	63.5	53.5	19.4	14.0	N	
0.40838	28.4	25.3	13.3	41.7	38.6	57.7	47.7	16.0	9.1	N	
0.45865	29.4	26.4	13.3	42.7	39.7	56.7	46.7	14.0	7.0	N	
0.75810	18.5	11.8	13.4	31.9	25.2	56.0	46.0	24.1	20.8	N	
4.65080	16.3	8.8	13.9	30.2	22.7	56.0	46.0	25.8	23.3	N	
0.15482	33.2	27.3	13.2	46.4	40.5	65.7	55.7	19.3	15.2	L	
0.20500	29.4	24.6	13.2	42.6	37.8	63.4	53.4	20.8	15.6	L	
0.40825	27.1	24.1	13.3	40.4	37.4	57.7	47.7	17.3	10.3	L	
0.45954	28.7	25.7	13.3	42.0	39.0	56.7	46.7	14.7	7.7	L	
0.76780	18.4	12.4	13.4	31.8	25.8	56.0	46.0	24.2	20.2	L	
4.56412	14.9	6.7	13.9	28.8	20.6	56.0	46.0	27.2	25.4	L	

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

Conducted Emission

(Antenna : M/N 146153)

Test place	Ise EMC Lab. No.1 Semi Anechoic Chamber
Report No.	11182619H
Date	August 20, 2016
Temperature / Humidity	21 deg. C / 63 % RH
Engineer	Kazuya Yoshioka
Mode	Tx BT LE



UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Emission
(Antenna : M/N H2U84W1H1S)

DATA OF CONDUCTED EMISSION TEST

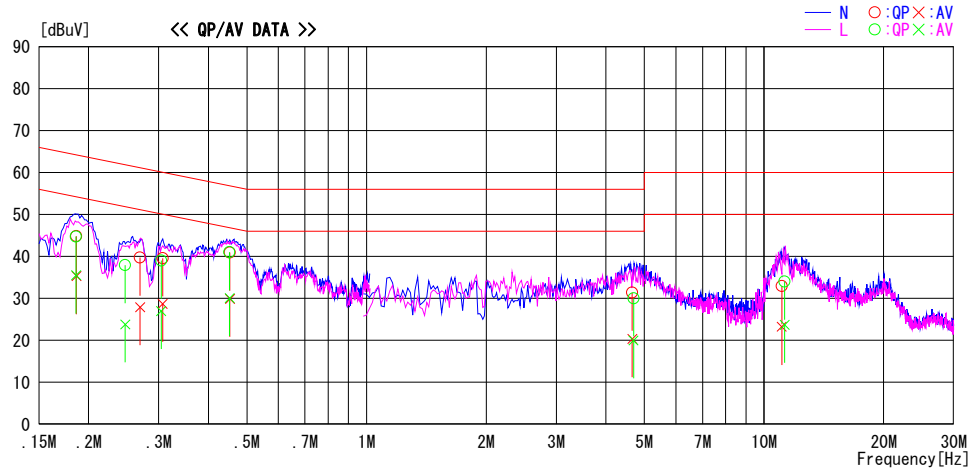
UL Japan, Inc. Ise EMC Lab. No.3 Semi Anechoic Chamber
Date : 2016/08/20

Report No. : 11182619H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Kazuya Yoshioka

Mode / Remarks : 11g 2437MHz

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.18624	31.6	22.1	13.2	44.8	35.3	64.2	54.2	19.4	18.9	N	
0.26936	26.4	14.6	13.3	39.7	27.9	61.1	51.1	21.4	23.2	N	
0.30696	26.3	15.4	13.3	39.6	28.7	60.1	50.1	20.5	21.4	N	
0.45321	27.6	16.6	13.3	40.9	29.9	56.8	46.8	15.9	16.9	N	
4.65960	17.5	6.4	13.9	31.4	20.3	56.0	46.0	24.6	25.7	N	
11.08080	18.5	8.8	14.4	32.9	23.2	60.0	50.0	27.1	26.8	N	
0.18590	31.5	22.3	13.2	44.7	35.5	64.2	54.2	19.5	18.7	L	
0.24700	24.6	10.5	13.3	37.9	23.8	61.9	51.9	24.0	28.1	L	
0.30451	25.7	13.7	13.3	39.0	27.0	60.1	50.1	21.1	23.1	L	
0.45236	27.7	16.8	13.3	41.0	30.1	56.8	46.8	15.8	16.7	L	
4.69800	16.1	6.1	13.9	30.0	20.0	56.0	46.0	26.0	26.0	L	
11.26240	19.6	9.3	14.4	34.0	23.7	60.0	50.0	26.0	26.3	L	

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

Conducted Emission
(Antenna : M/N H2U84W1H1S)

DATA OF CONDUCTED EMISSION TEST

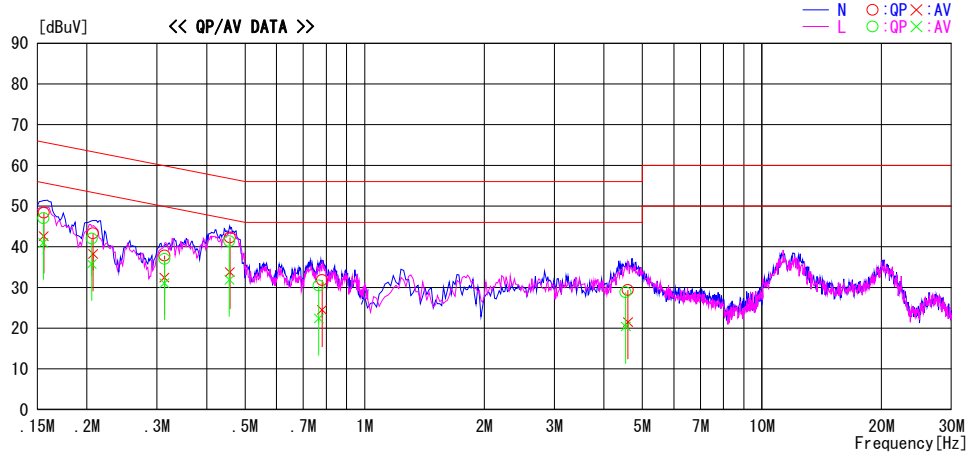
UL Japan, Inc. Ise EMC Lab. No.3 Semi Anechoic Chamber
Date : 2016/08/20

Report No. : 11182619H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Kazuya Yoshioka

Mode / Remarks : BLE 2480MHz

LIMIT : FCC15. 207 QP
FCC15. 207 AV

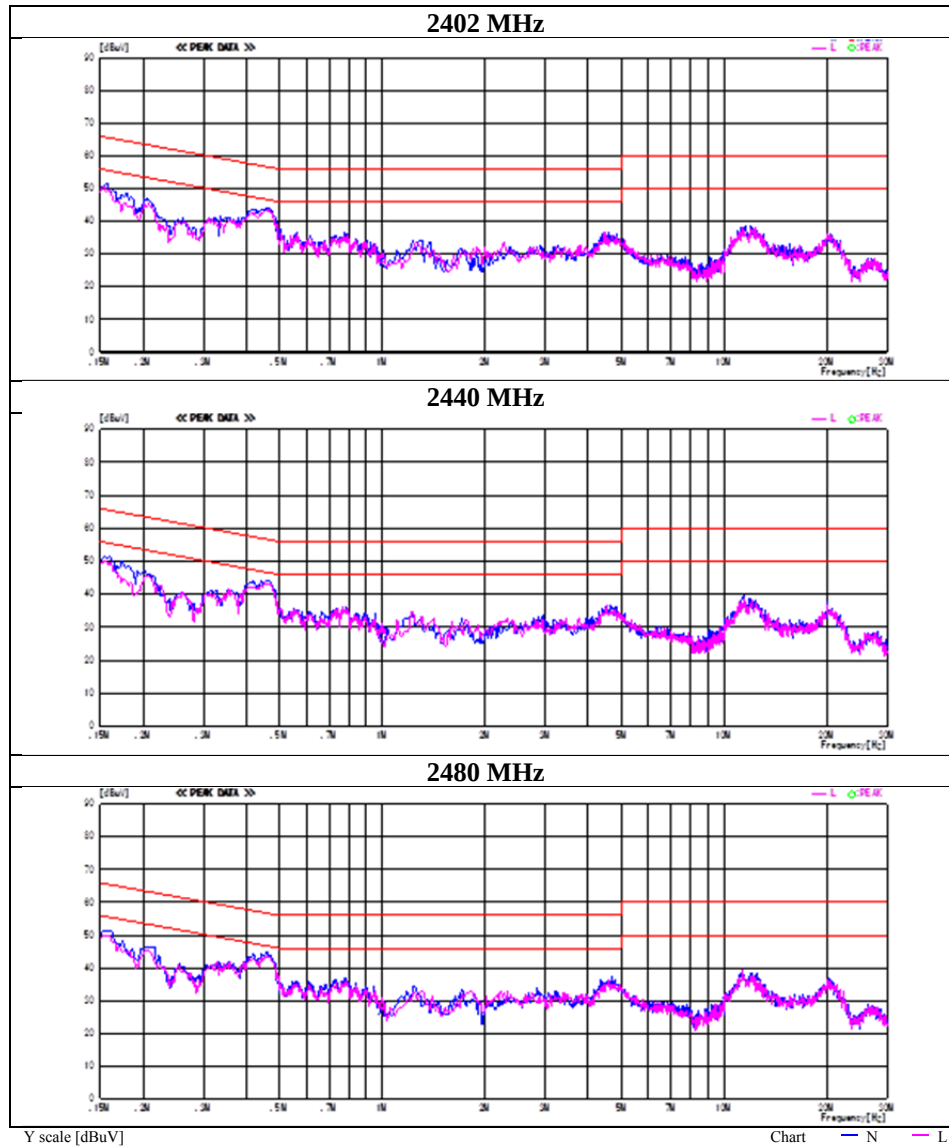


Frequency [MHz]	Reading		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15556	35.2	29.4	13.2	48.4	42.6	65.7	55.7	17.3	13.1	N	
0.20712	30.1	25.0	13.2	43.3	38.2	63.3	53.3	20.0	15.1	N	
0.31332	24.5	19.1	13.3	37.8	32.4	59.9	49.9	22.1	17.5	N	
0.45768	29.0	20.5	13.3	42.3	33.8	56.7	46.7	14.4	12.9	N	
0.78124	18.4	11.1	13.4	31.8	24.5	56.0	46.0	24.2	21.5	N	
4.59840	15.5	7.6	13.9	29.4	21.5	56.0	46.0	26.6	24.5	N	
0.15520	33.8	27.8	13.2	47.0	41.0	65.7	55.7	18.7	14.7	L	
0.20546	28.8	22.6	13.2	42.0	35.8	63.4	53.4	21.4	17.6	L	
0.31321	23.7	17.8	13.3	37.0	31.1	59.9	49.9	22.9	18.8	L	
0.45604	28.1	18.6	13.3	41.4	31.9	56.8	46.8	15.4	14.9	L	
0.76612	17.1	9.0	13.4	30.5	22.4	56.0	46.0	25.5	23.6	L	
4.53760	14.9	6.5	13.9	28.8	20.4	56.0	46.0	27.2	25.6	L	

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

Conducted Emission
(Antenna : M/N H2U84W1H1S)

Test place : Ise EMC Lab. No.1 Semi Anechoic Chamber
Report No. : 11182619H
Date : August 20, 2016
Temperature / Humidity : 21 deg. C / 63 % RH
Engineer : Kazuya Yoshioka
Mode : Tx BT LE



UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

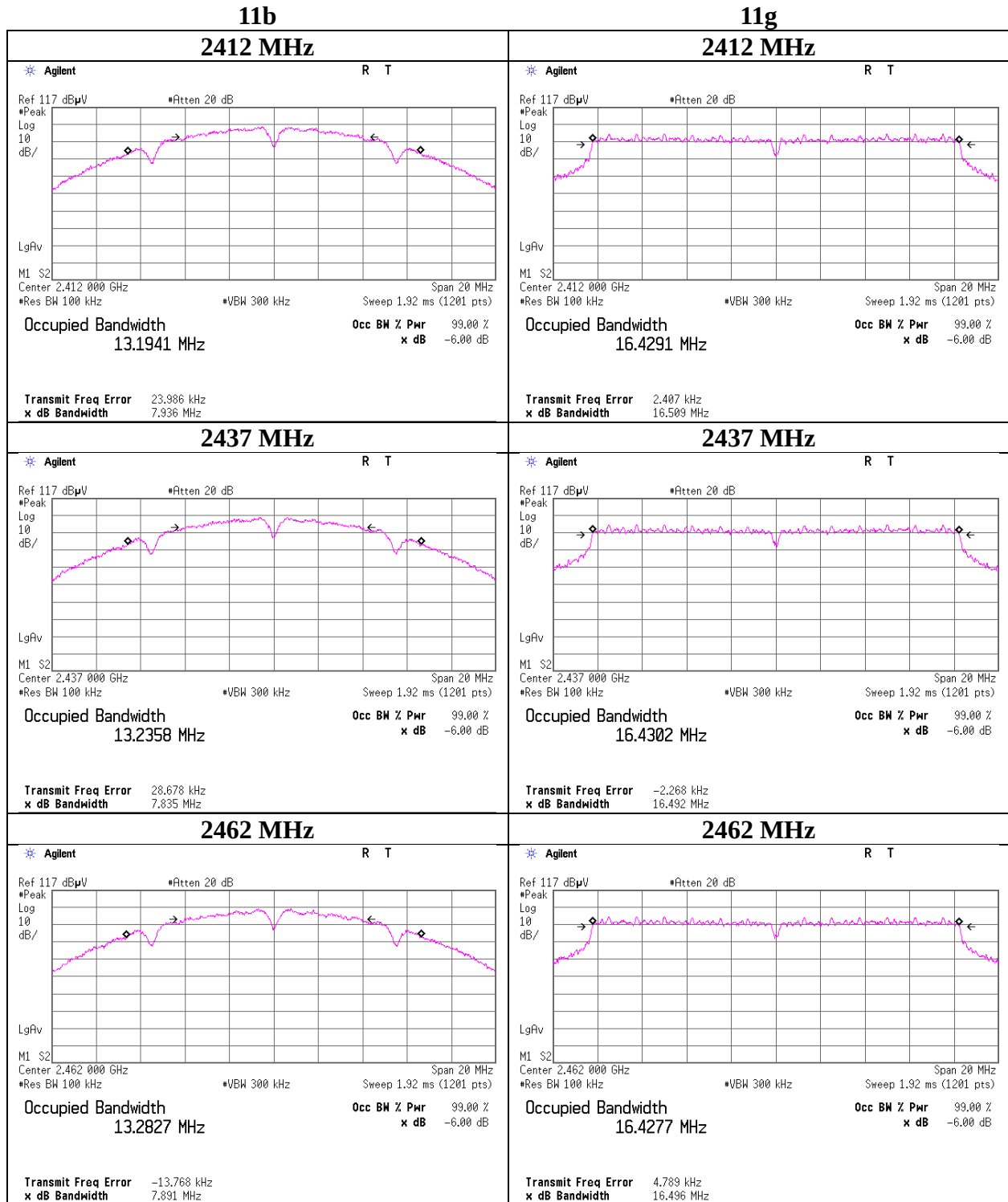
Facsimile : +81 596 24 8124

6dB Bandwidth

Test place	Ise EMC Lab. No.11 Measurement Room	
Report No.	11182619H	
Date	March 30, 2016	March 31, 2016
Temperature / Humidity	22 deg. C / 27 % RH	23 deg. C / 33 % RH
Engineer	Yutaka Yoshida	Yutaka Yoshida
Mode	Tx	

Mode	Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
11b	2412	7.936	> 500
	2437	7.835	> 500
	2462	7.891	> 500
11g	2412	16.509	> 500
	2437	16.492	> 500
	2462	16.496	> 500
11n-20	2412	17.711	> 500
	2437	17.687	> 500
	2462	17.719	> 500
11n-40	2422	36.486	> 500
	2437	36.489	> 500
	2452	36.489	> 500
BT LE	2402	0.666	> 500
	2440	0.671	> 500
	2480	0.675	> 500

6dB Bandwidth



UL Japan, Inc.

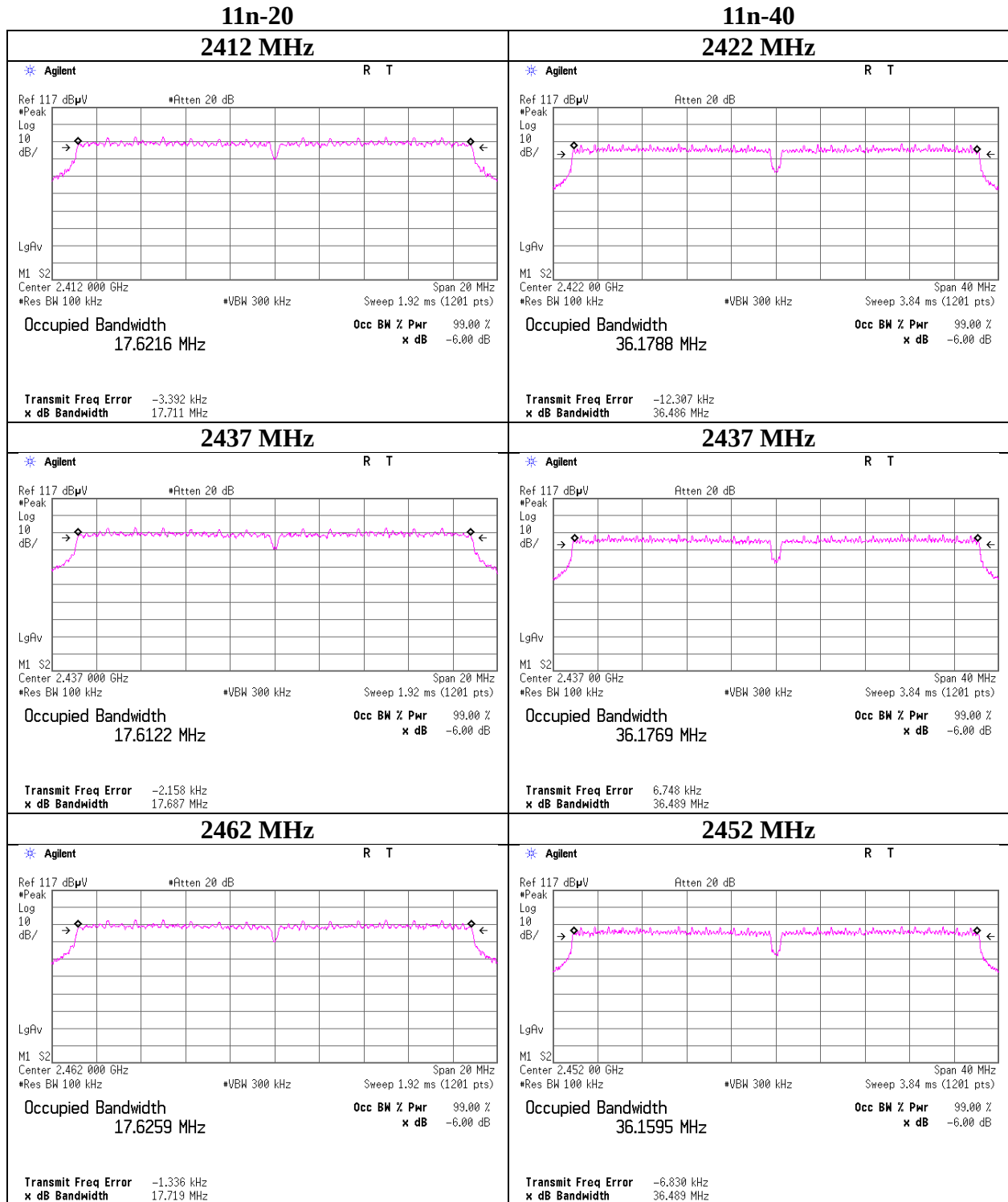
Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

6dB Bandwidth



UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

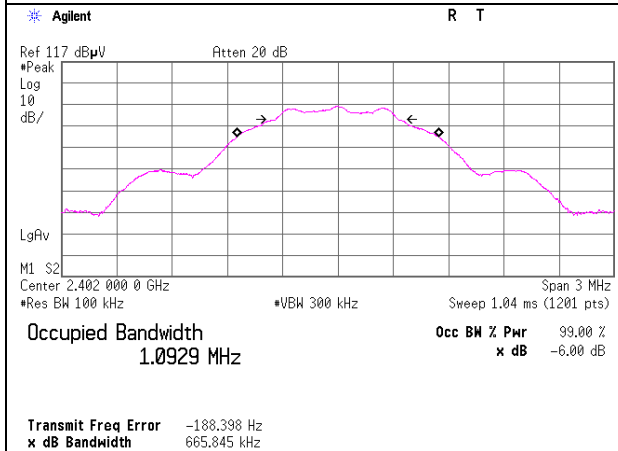
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

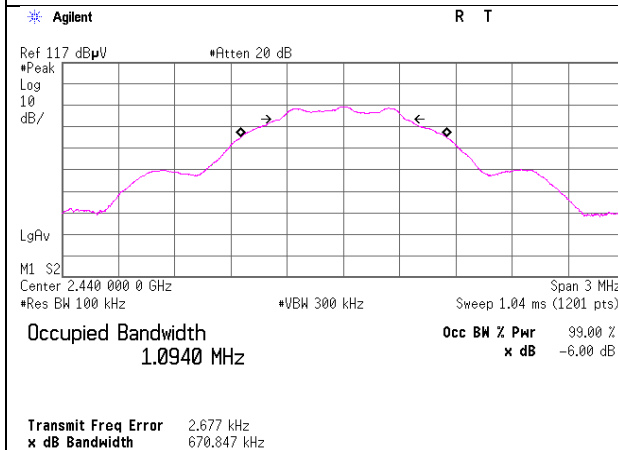
6dB Bandwidth

BT LE

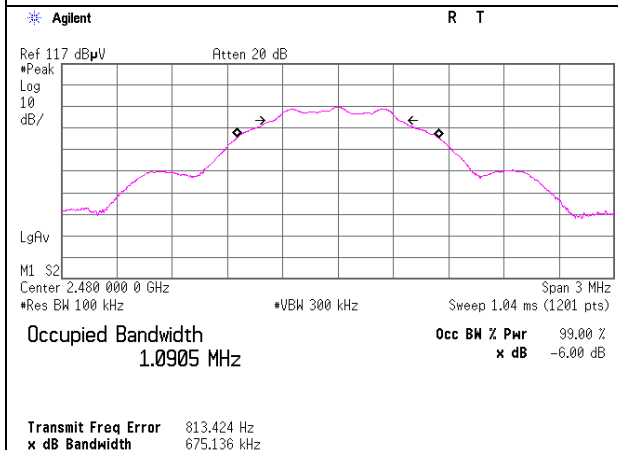
2402 MHz



2440 MHz



2480 MHz



UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Maximum Peak Output Power

Test place : Ise EMC Lab.
Report No. : 11182619H
Measurement Room : No.11
Date : March 30, 2016
Temperature / Humidity : 22 deg. C / 27 % RH
Engineer : Yutaka Yoshida
Mode : Tx 11b

No.6
August 25, 2016
28 deg. C / 39 % RH
Tomoki Matsui

2Mbps(Short)

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	9.20	1.64	10.03	20.87	122.18	30.00	1000	9.13
2437	9.66	1.66	10.03	21.35	136.46	30.00	1000	8.65
2462	9.35	1.67	10.03	21.05	127.35	30.00	1000	8.95

Sample Calculation:

Result = Reading + Cable Loss + Attenuator Loss

2437MHz

Rate [Mbps]	GI	Reading PK [dBm]	Remark
1	Long	9.22	
2	Long	9.25	
2	Short	9.49	*
5.5	Long	9.27	
5.5	Short	8.61	
11	Long	8.41	
11	Short	8.65	

*: Worst Rate

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

Maximum Peak Output Power

Test place : Ise EMC Lab.
Report No. : 11182619H
Measurement Room : No.11
Date : March 30, 2016
Temperature / Humidity : 22 deg. C / 27 % RH
Engineer : Yutaka Yoshida
Mode : Tx 11g

No.6
August 25, 2016
28 deg. C / 39 % RH
Tomoki Matsui

24Mbps

Freq. [MHz]	Reading PK [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	12.38	1.64	10.03	24.05	254.10	30.00	1000	5.95
2437	13.08	1.66	10.03	24.77	299.92	30.00	1000	5.23
2462	12.06	1.67	10.03	23.76	237.68	30.00	1000	6.24

Sample Calculation:

Result = Reading + Cable Loss + Attenuator Loss

2437MHz

Rate [Mbps]	Reading PK [dBm]	Remark
6	10.83	
9	10.90	
12	11.05	
18	11.17	
24	13.13	*
36	13.03	
48	12.27	
54	11.74	

*: Worst Rate

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

Maximum Peak Output Power

Test place : Ise EMC Lab.
Report No. : 11182619H
Measurement Room : No.11
Date : March 30, 2016
Temperature / Humidity : 22 deg. C / 27 % RH
Engineer : Yutaka Yoshida
Mode : Tx 11n-20

No.6
August 25, 2016
28 deg. C / 39 % RH
Tomoki Matsui

MCS4

Freq. [MHz]	Reading PK [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	12.10	1.64	10.03	23.77	238.23	30.00	1000	6.23
2437	13.05	1.66	10.03	24.74	297.85	30.00	1000	5.26
2462	12.04	1.67	10.03	23.74	236.59	30.00	1000	6.26

Sample Calculation:

Result = Reading + Cable Loss + Attenuator Loss

2437MHz

MCS Index	Reading PK [dBm]	Remark
0	11.87	
1	11.43	
2	11.32	
3	13.02	
4	13.15	*
5	12.79	
6	11.39	
7	11.51	

*: Worst Rate

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

Maximum Peak Output Power

Test place	Ise EMC Lab.	
Report No.	11182619H	
Measurement Room	No.11	No.6
Date	March 30, 2016	August 25, 2016
Temperature / Humidity	22 deg. C / 27 % RH	28 deg. C / 39 % RH
Engineer	Yutaka Yoshida	Tomoki Matsui
Mode	Tx 11n-40	

MCS3

Freq. [MHz]	Reading PK [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2422	8.23	1.65	10.03	19.91	97.95	30.00	1000	10.09
2437	10.13	1.66	10.03	21.82	152.05	30.00	1000	8.18
2452	9.02	1.66	10.03	20.71	117.76	30.00	1000	9.29

Sample Calculation:

Result = Reading + Cable Loss + Attenuator Loss

2437MHz

MCS Index	Reading PK [dBm]	Remark
0	11.74	
1	11.09	
2	11.08	
3	12.83	*
4	12.61	
5	12.44	
6	12.12	
7	11.79	

*: Worst Rate

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

Maximum Peak Output Power

Test place Ise EMC Lab. No.11 Measurement Room
Report No. 11182619H
Date March 30, 2016
Temperature / Humidity 22 deg. C / 27 % RH
Engineer Yutaka Yoshida
Mode Tx BT LE

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2402	-10.74	1.94	10.03	1.23	1.33	30.00	1000	28.77
2440	-10.25	1.96	10.03	1.74	1.49	30.00	1000	28.26
2480	-10.06	1.97	10.03	1.94	1.56	30.00	1000	28.06

Sample Calculation:

Result = Reading + Cable Loss + Attenuator Loss

Average Output Power (Reference data for RF Exposure)

Test place	Ise EMC Lab.	
Report No.	11182619H	
Measurement Room	No.11	No.6
Date	March 30, 2016	August 25, 2016
Temperature / Humidity	22 deg. C / 27 % RH	28 deg. C / 39 % RH
Engineer	Yutaka Yoshida	Tomoki Matsui
Mode	Tx 11b/11g	

11b 2Mbps(Short)

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
2412	6.54	1.64	10.03	18.21	66.22	0.06	18.27	67.14
2437	7.06	1.66	10.03	18.75	74.99	0.06	18.81	76.03
2462	6.72	1.67	10.03	18.42	69.50	0.06	18.48	70.47

11b 2437MHz

Rate [Mbps]	GI	Reading AV [dBm]	Remark
1	Long	6.62	
2	Long	6.60	
2	Short	6.87	*
5.5	Long	6.63	
5.5	Short	5.97	
11	Long	5.55	
11	Short	5.80	

11g 24Mbps

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
2412	0.80	1.64	10.03	12.47	17.66	0.68	13.15	20.65
2437	3.17	1.66	10.03	14.86	30.62	0.68	15.54	35.81
2462	0.17	1.67	10.03	11.87	15.38	0.68	12.55	17.99

11g 2437MHz

Rate [Mbps]	Reading AV [dBm]	Remark
6	4.66	
9	4.49	
12	4.38	
18	4.42	
24	4.67	*
36	2.57	
48	1.34	
54	0.24	

Sample Calculation:

Result (Time average) = Reading + Cable Loss + Attenuator

Result (Burst power average) = Frame power + Duty factor

The test was performed with condition that obtained the maximum frame power in pre-check.

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Average Output Power (Reference data for RF Exposure)

Test place	Ise EMC Lab.	
Report No.	11182619H	
Measurement Room	No.11	No.6
Date	March 30, 2016	August 25, 2016
Temperature / Humidity	22 deg. C / 27 % RH	28 deg. C / 39 % RH
Engineer	Yutaka Yoshida	Tomoki Matsui
Mode	Tx 11n-20/11n-40	

11n-20 MCS 0

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
2412	0.24	1.64	10.03	11.91	15.52	0.21	12.12	16.29
2437	3.22	1.66	10.03	14.91	30.97	0.21	15.12	32.51
2462	0.06	1.67	10.03	11.76	15.00	0.21	11.97	15.74

11n-20 2437MHz

MCS Index	Reading AV [dBm]	Remark
0	5.75	*
1	4.55	
2	4.57	
3	2.89	
4	2.65	
5	1.86	
6	-0.17	
7	-0.26	

11n-40 MCS 0

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
2422	-2.96	1.65	10.03	8.72	7.45	0.43	9.15	8.22
2437	-1.40	1.66	10.03	10.29	10.69	0.43	10.72	11.80
2452	-2.31	1.66	10.03	9.38	8.67	0.43	9.81	9.57

11n-40 2437MHz

MCS Index	Reading AV [dBm]	Remark
0	5.11	*
1	3.85	
2	3.54	
3	1.45	
4	1.08	
5	-0.30	
6	-0.45	
7	-0.45	

Sample Calculation:

Result (Time average) = Reading + Cable Loss + Attenuator

Result (Burst power average) = Frame power + Duty factor

The test was performed with condition that obtained the maximum frame power in pre-check.

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Average Output Power
(Reference data for RF Exposure)

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11182619H
Date	March 30, 2016
Temperature / Humidity	22 deg. C / 27 % RH
Engineer	Yutaka Yoshida
Mode	Tx BT LE

BT LE

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
2402	-13.09	1.94	10.03	-1.12	0.77	1.67	0.55	1.14
2440	-12.56	1.96	10.03	-0.57	0.88	1.67	1.10	1.29
2480	-12.37	1.97	10.03	-0.37	0.92	1.67	1.30	1.35

Sample Calculation:

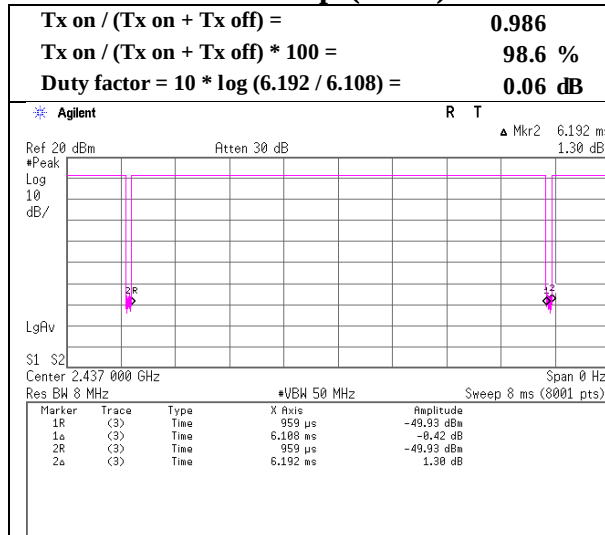
Result (Time average) = Reading + Cable Loss + Attenuator

Result (Burst power average) = Frame power + Duty factor

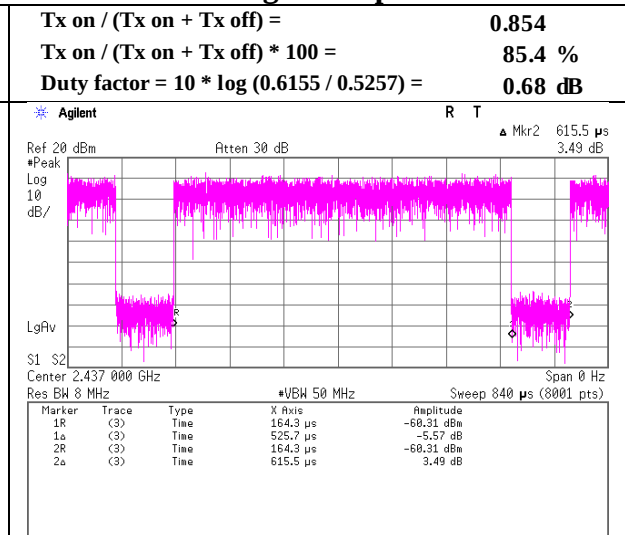
Burst rate confirmation

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 11182619H
Date : March 30, 2016
Temperature / Humidity : 23 deg. C / 27 % RH
Engineer : Yutaka Yoshida
Mode : Tx 11b, 11g, 11n-20

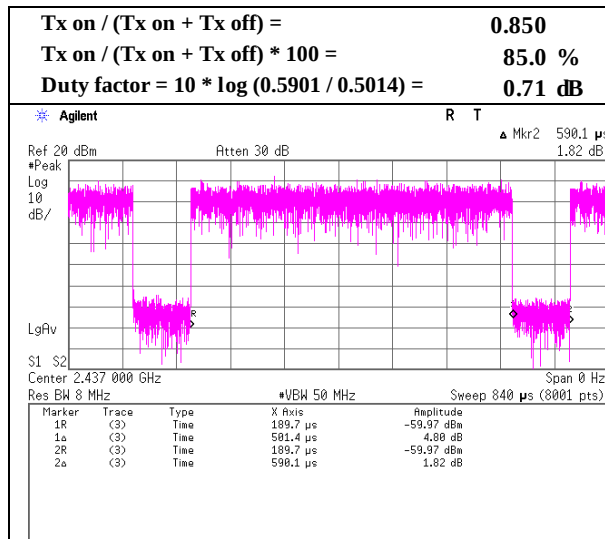
11b 2 Mbps(Short)



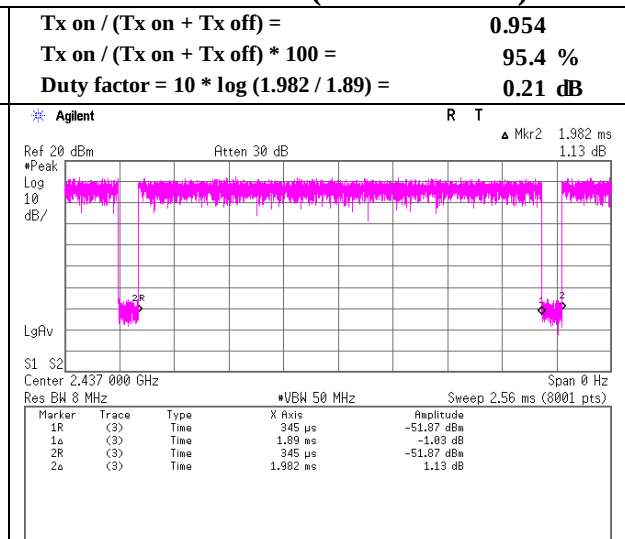
11g 24 Mbps



11n-20 MCS 4



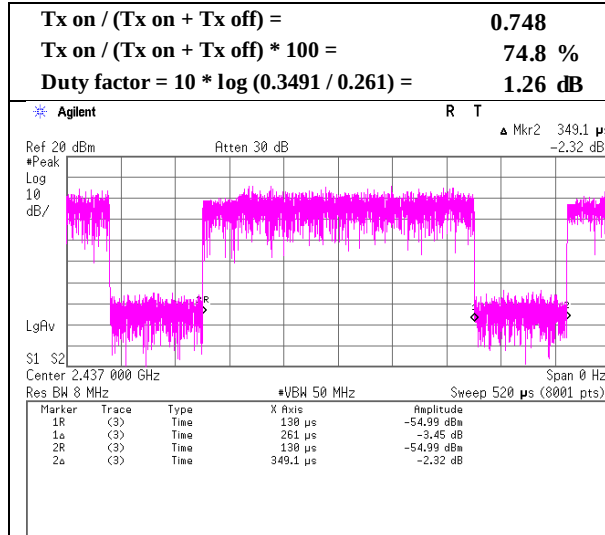
11n-20 MCS 0 (reference data)



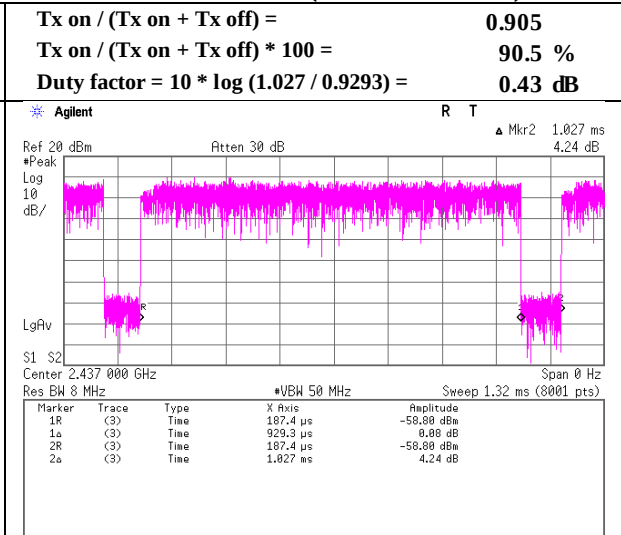
Burst rate confirmation

Test place Ise EMC Lab. No.1 Measurement Room / Shielded Room / Semi Anechoic Chamber
Report No. 11182619H
Date March 31, 2016
Temperature / Humidity 23 deg. C / 33 % RH
Engineer Yutaka Yoshida
Mode Tx 11n-40 / BT LE

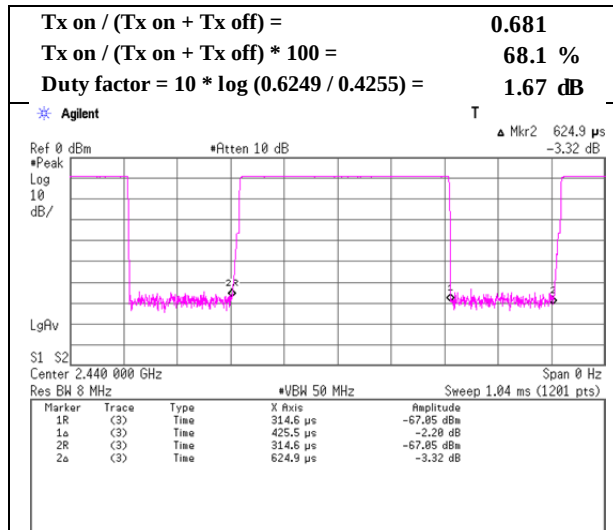
11n-40 MCS 3



11n-40 MCS 0 (reference data)



BT LE



UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

(Antenna : M/N 146153)

Report No.	11182619H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.4
Date	May 23, 2016	May 31, 2016	August 8, 2016
Temperature / Humidity	22 deg. C / 47 % RH	21 deg. C / 60 % RH	24 deg. C / 51 % RH
Engineer	Hiroyuki Furutaka	Keisuke Kawamura	Tomoki Matsui
	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)	(1 GHz - 10 GHz)
Mode	Tx 11b 2412 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	54.8	27.9	6.7	32.1	-	57.3	73.9	16.6	
Hori	4824.000	PK	45.4	32.9	9.0	31.3	-	56.0	73.9	17.9	
Hori	7236.000	PK	42.0	36.8	10.1	32.6	-	56.3	73.9	17.6	Floor noise
Hori	9648.000	PK	41.2	38.1	11.0	32.6	-	57.7	73.9	16.2	Floor noise
Hori	2390.000	AV	45.8	27.9	6.7	32.1	-	48.3	53.9	5.6	
Hori	4824.000	AV	39.6	32.9	9.0	31.3	-	50.2	53.9	3.7	
Hori	7236.000	AV	33.4	36.8	10.1	32.6	-	47.7	53.9	6.2	Floor noise
Hori	9648.000	AV	31.4	38.1	11.0	32.6	-	47.9	53.9	6.0	Floor noise
Vert	2390.000	PK	54.0	27.9	6.7	32.1	-	56.5	73.9	17.4	
Vert	4824.000	PK	46.3	32.9	9.0	31.3	-	56.9	73.9	17.0	
Vert	7236.000	PK	42.0	36.8	10.1	32.6	-	56.3	73.9	17.6	Floor noise
Vert	9648.000	PK	41.2	38.1	11.0	32.6	-	57.7	73.9	16.2	Floor noise
Vert	2390.000	AV	44.8	27.9	6.7	32.1	-	47.3	53.9	6.6	
Vert	4824.000	AV	40.6	32.9	9.0	31.3	-	51.2	53.9	2.7	
Vert	7236.000	AV	33.4	36.8	10.1	32.6	-	47.7	53.9	6.2	Floor noise
Vert	9648.000	AV	31.4	38.1	11.0	32.6	-	47.9	53.9	6.0	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	107.2	28.0	6.7	32.1	109.8	-	-	Carrier
Hori	2397.742	PK	58.9	28.0	6.7	32.1	61.5	89.8	28.3	
Hori	2400.000	PK	49.7	28.0	6.7	32.1	52.3	89.8	37.5	
Vert	2412.000	PK	106.3	28.0	6.7	32.1	108.9	-	-	Carrier
Vert	2398.467	PK	55.9	28.0	6.7	32.1	58.5	88.9	30.4	
Vert	2400.000	PK	48.7	28.0	6.7	32.1	51.3	88.9	37.6	

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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

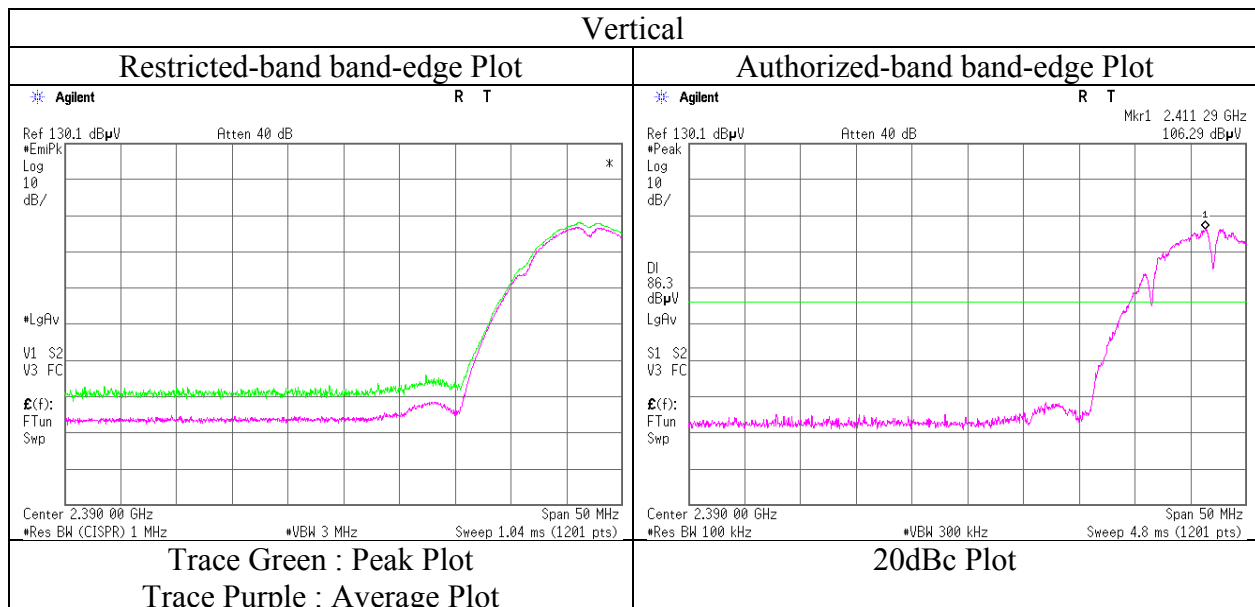
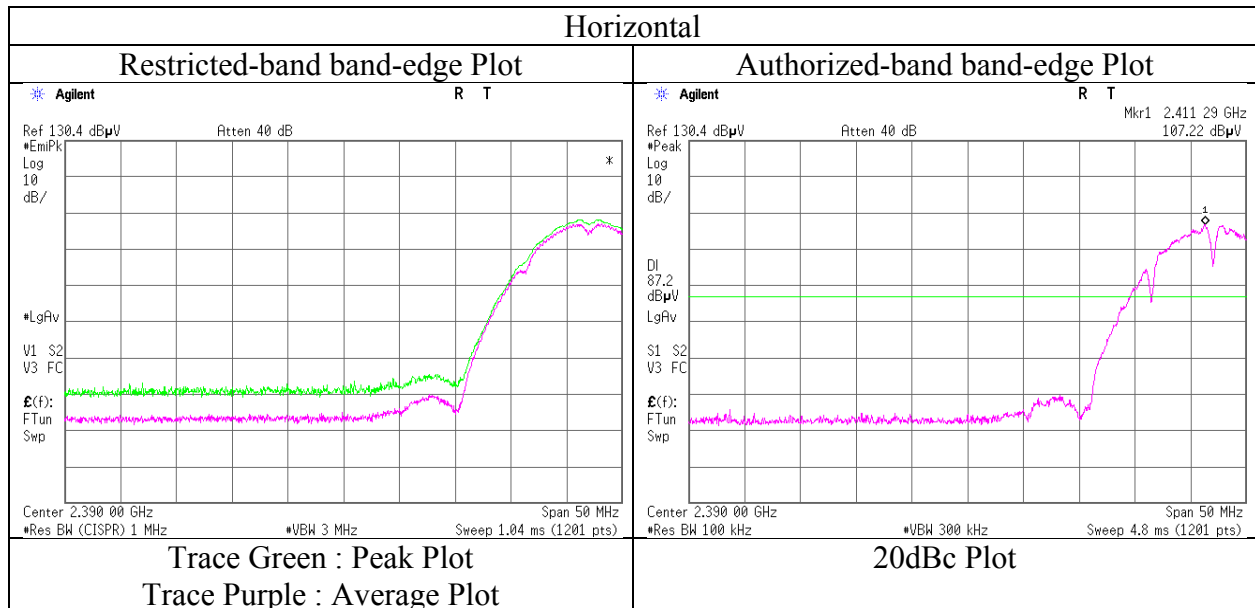
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Reference Plot for band-edge (Antenna : M/N 146153)

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11182619H
Date	August 8, 2016
Temperature / Humidity	24 deg. C / 51 % RH
Engineer	Tomoki Matsui
	(1 GHz - 10 GHz)
Mode	Tx 11b 2412 MHz



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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission
(Antenna : M/N 146153)

Report No.	11182619H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.4
Date	May 23, 2016	May 31, 2016	August 8, 2016
Temperature / Humidity	22 deg. C / 47 % RH	21 deg. C / 60 % RH	24 deg. C / 51 % RH
Engineer	Hiroyuki Furutaka (10 GHz - 18 GHz)	Keisuke Kawamura (18 GHz - 26.5 GHz)	Tomoki Matsui (1 GHz - 10 GHz)
Mode	Tx 11b 2437 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	4874.000	PK	44.9	33.1	9.0	31.3	-	55.7	73.9	18.2	
Hori	7311.000	PK	42.6	36.8	10.1	32.6	-	56.9	73.9	17.0	Floor noise
Hori	9748.000	PK	40.3	38.2	11.0	32.7	-	56.8	73.9	17.1	Floor noise
Hori	4874.000	AV	39.1	33.1	9.0	31.3	-	49.9	53.9	4.0	
Hori	7311.000	AV	33.3	36.8	10.1	32.6	-	47.6	53.9	6.3	Floor noise
Hori	9748.000	AV	31.3	38.2	11.0	32.7	-	47.8	53.9	6.1	Floor noise
Vert	4874.000	PK	45.6	33.1	9.0	31.3	-	56.4	73.9	17.5	
Vert	7311.000	PK	42.4	36.8	10.1	32.6	-	56.7	73.9	17.2	Floor noise
Vert	9748.000	PK	40.1	38.2	11.0	32.7	-	56.6	73.9	17.3	Floor noise
Vert	4874.000	AV	40.1	33.1	9.0	31.3	-	50.9	53.9	3.0	
Vert	7311.000	AV	33.2	36.8	10.1	32.6	-	47.5	53.9	6.4	Floor noise
Vert	9748.000	AV	31.2	38.2	11.0	32.7	-	47.7	53.9	6.2	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
 10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission
(Antenna : M/N 146153)

Report No.	11182619H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.4
Date	May 23, 2016	May 31, 2016	August 8, 2016
Temperature / Humidity	22 deg. C / 47 % RH	21 deg. C / 60 % RH	24 deg. C / 51 % RH
Engineer	Hiroyuki Furutaka (10 GHz - 18 GHz)	Keisuke Kawamura (18 GHz - 26.5 GHz)	Tomoki Matsui (1 GHz - 10 GHz)
Mode	Tx 11b 2462 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2483.500	PK	54.8	28.1	6.8	32.1	-	57.6	73.9	16.3	
Hori	4924.000	PK	43.1	33.3	9.1	31.3	-	54.2	73.9	19.7	
Hori	7386.000	PK	42.0	36.8	10.1	32.6	-	56.3	73.9	17.6	Floor noise
Hori	9848.000	PK	42.1	38.2	11.0	32.7	-	58.6	73.9	15.3	Floor noise
Hori	2483.500	AV	45.8	28.1	6.8	32.1	-	48.6	53.9	5.3	
Hori	4924.000	AV	37.0	33.3	9.1	31.3	-	48.1	53.9	5.8	
Hori	7386.000	AV	33.2	36.8	10.1	32.6	-	47.5	53.9	6.4	Floor noise
Hori	9848.000	AV	31.2	38.2	11.0	32.7	-	47.7	53.9	6.2	Floor noise
Vert	2483.500	PK	55.2	28.1	6.8	32.1	-	58.0	73.9	15.9	
Vert	4924.000	PK	45.5	33.3	9.1	31.3	-	56.6	73.9	17.3	
Vert	7386.000	PK	42.1	36.8	10.1	32.6	-	56.4	73.9	17.5	Floor noise
Vert	9848.000	PK	42.4	38.2	11.0	32.7	-	58.9	73.9	15.0	Floor noise
Vert	2483.500	AV	46.2	28.1	6.8	32.1	-	49.0	53.9	4.9	
Vert	4924.000	AV	40.5	33.3	9.1	31.3	-	51.6	53.9	2.3	
Vert	7386.000	AV	33.5	36.8	10.1	32.6	-	47.8	53.9	6.1	Floor noise
Vert	9848.000	AV	31.2	38.2	11.0	32.7	-	47.7	53.9	6.2	Floor noise

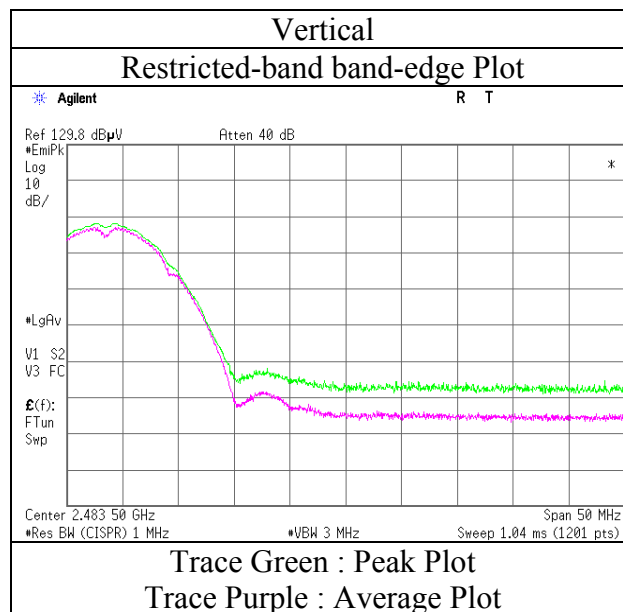
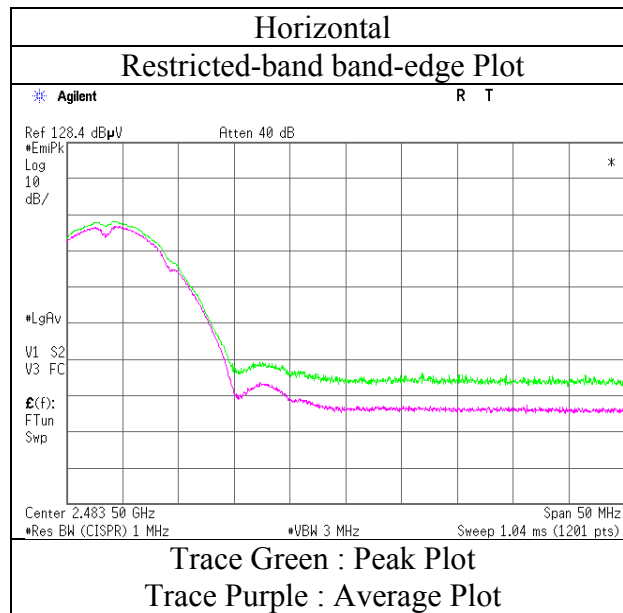
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

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

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
Reference Plot for band-edge (Antenna : M/N 146153)

Test place : Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 11182619H
Date : August 8, 2016
Temperature / Humidity : 24 deg. C / 51 % RH
Engineer : Tomoki Matsui
(1 GHz - 10 GHz)
Mode : Tx 11b 2462 MHz



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

Radiated Spurious Emission

(Antenna : M/N 146153)

Report No.	11182619H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.4
Date	May 23, 2016	May 31, 2016	August 8, 2016
Temperature / Humidity	22 deg. C / 47 % RH	21 deg. C / 60 % RH	24 deg. C / 51 % RH
Engineer	Hiroyuki Furutaka (10 GHz - 18 GHz)	Keisuke Kawamura (18 GHz - 26.5 GHz)	Tomoki Matsui (1 GHz - 10 GHz)
Mode	Tx 11g 2412 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	61.3	27.9	6.7	32.1	-	63.8	73.9	10.1	
Hori	4824.000	PK	41.4	32.9	9.0	31.3	-	52.0	73.9	21.9	Floor noise
Hori	7236.000	PK	42.6	36.8	10.1	32.6	-	56.9	73.9	17.0	Floor noise
Hori	9648.000	PK	40.0	38.1	11.0	32.6	-	56.5	73.9	17.4	Floor noise
Hori	2390.000	AV	48.6	27.9	6.7	32.1	0.7	51.8	53.9	2.1	*1)
Hori	4824.000	AV	32.0	32.9	9.0	31.3	-	42.6	53.9	11.3	Floor noise
Hori	7236.000	AV	32.0	36.8	10.1	32.6	-	46.3	53.9	7.6	Floor noise
Hori	9648.000	AV	31.1	38.1	11.0	32.6	-	47.6	53.9	6.3	Floor noise
Vert	2390.000	PK	59.4	27.9	6.7	32.1	-	61.9	73.9	12.0	
Vert	4824.000	PK	41.4	32.9	9.0	31.3	-	52.0	73.9	21.9	Floor noise
Vert	7236.000	PK	42.8	36.8	10.1	32.6	-	57.1	73.9	16.8	Floor noise
Vert	9648.000	PK	39.9	38.1	11.0	32.6	-	56.4	73.9	17.5	Floor noise
Vert	2390.000	AV	48.1	27.9	6.7	32.1	0.7	51.3	53.9	2.6	*1)
Vert	4824.000	AV	32.1	32.9	9.0	31.3	-	42.7	53.9	11.2	Floor noise
Vert	7236.000	AV	33.4	36.8	10.1	32.6	-	47.7	53.9	6.2	Floor noise
Vert	9648.000	AV	31.2	38.1	11.0	32.6	-	47.7	53.9	6.2	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

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

20dBc Data Sheet

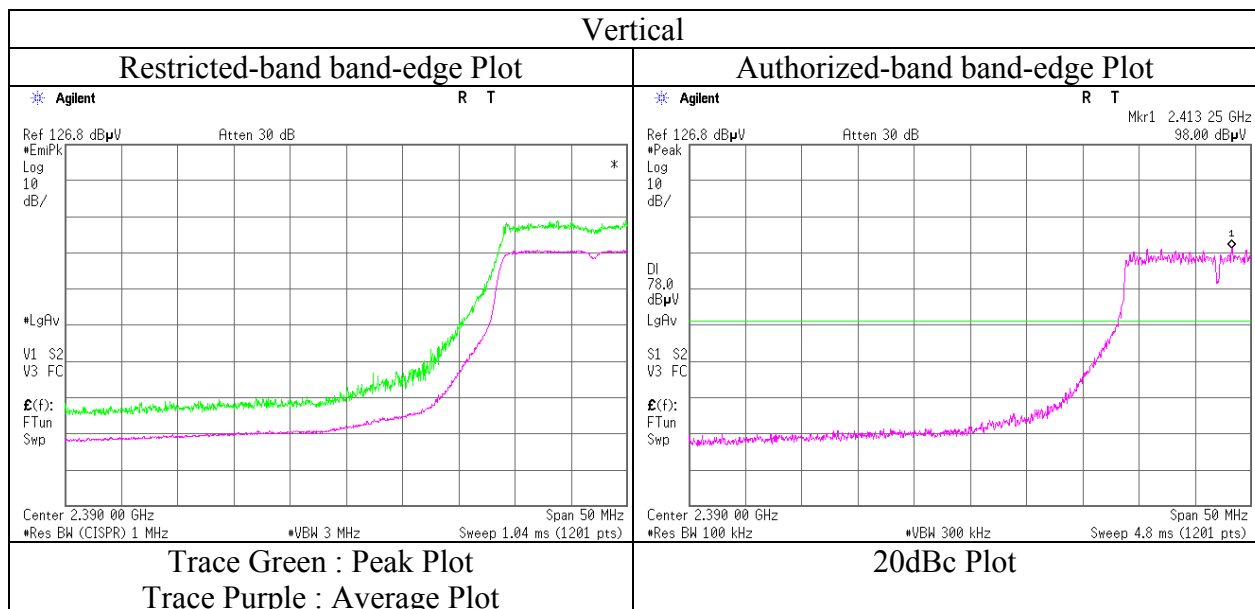
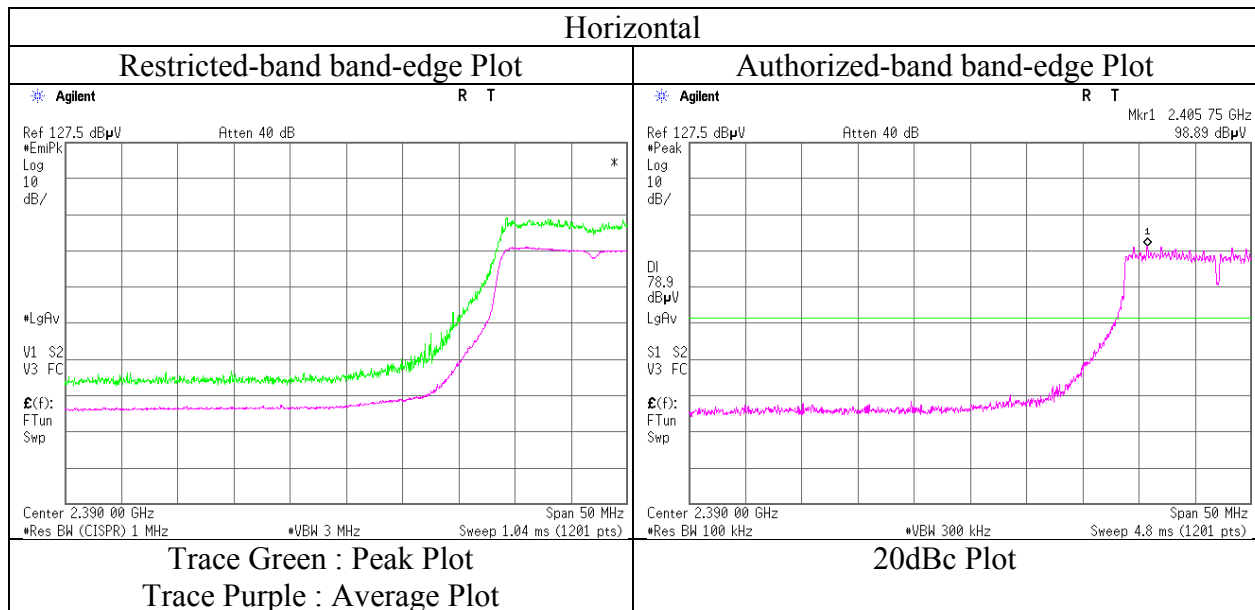
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	98.9	28.0	6.7	32.1	101.5	-	-	Carrier
Hori	2400.000	PK	64.0	28.0	6.7	32.1	66.6	81.5	14.9	
Vert	2412.000	PK	98.0	28.0	6.7	32.1	100.6	-	-	Carrier
Vert	2400.000	PK	63.2	28.0	6.7	32.1	65.8	80.6	14.8	

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

Radiated Spurious Emission

Reference Plot for band-edge (Antenna : M/N 146153)

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11182619H
Date	August 8, 2016
Temperature / Humidity	24 deg. C / 51 % RH
Engineer	Tomoki Matsui
	(1 GHz - 10 GHz)
Mode	Tx 11g 2412 MHz



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

Radiated Spurious Emission

(Antenna : M/N 146153)

Report No.	11182619H			
Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.2	No.2	No.4	No.3
Date	May 23, 2016	May 31, 2016	August 8, 2016	August 18, 2016
Temperature / Humidity	22 deg. C / 47 % RH	21 deg. C / 60 % RH	24 deg. C / 51 % RH	23 deg. C / 58 % RH
Engineer	Hiroyuki Furutaka (10 GHz - 18 GHz)	Keisuke Kawamura (18 GHz - 26.5 GHz)	Tomoki Matsui (1 GHz - 10 GHz)	Takafumi Noguchi (Below 1 GHz)
Mode	Tx 11g 2437 MHz			

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	98.996	QP	46.5	9.6	8.0	32.2	-	31.9	43.5	11.6	
Hori	111.699	QP	31.2	11.3	8.2	32.2	-	18.5	43.5	25.0	
Hori	692.968	QP	41.8	19.7	12.4	32.1	-	41.8	46.0	4.2	
Hori	721.508	QP	30.3	20.0	12.5	32.0	-	30.8	46.0	15.2	
Hori	989.954	QP	31.7	22.4	13.8	30.5	-	37.4	53.9	16.5	
Hori	1000.000	QP	28.5	22.5	13.9	30.4	-	34.5	53.9	19.4	
Hori	4874.000	PK	41.0	33.1	8.1	31.3	-	50.9	73.9	23.0	Floor noise
Hori	7311.000	PK	42.6	36.8	10.1	32.6	-	56.9	73.9	17.0	Floor noise
Hori	9748.000	PK	40.3	38.2	11.0	32.7	-	56.8	73.9	17.1	Floor noise
Hori	4874.000	AV	32.3	33.1	8.1	31.3	-	42.2	53.9	11.7	Floor noise
Hori	7311.000	AV	33.3	36.8	10.1	32.6	-	47.6	53.9	6.3	Floor noise
Hori	9748.000	AV	31.3	38.2	11.0	32.7	-	47.8	53.9	6.1	Floor noise
Vert	98.996	QP	55.3	9.6	8.0	32.2	-	40.7	43.5	2.8	
Vert	111.699	QP	34.1	11.3	8.2	32.2	-	21.4	43.5	22.1	
Vert	692.968	QP	40.4	19.7	12.4	32.1	-	40.4	46.0	5.6	
Vert	721.508	QP	29.4	20.0	12.5	32.0	-	29.9	46.0	16.1	
Vert	989.954	QP	26.5	22.4	13.8	30.5	-	32.2	53.9	21.7	
Vert	1000.000	QP	26.7	22.5	13.9	30.4	-	32.7	53.9	21.2	
Vert	4874.000	PK	41.2	33.1	8.1	31.3	-	51.1	73.9	22.8	Floor noise
Vert	7311.000	PK	42.4	36.8	10.1	32.6	-	56.7	73.9	17.2	Floor noise
Vert	9748.000	PK	40.1	38.2	11.0	32.7	-	56.6	73.9	17.3	Floor noise
Vert	4874.000	AV	32.3	33.1	8.1	31.3	-	42.2	53.9	11.7	Floor noise
Vert	7311.000	AV	33.2	36.8	10.1	32.6	-	47.5	53.9	6.4	Floor noise
Vert	9748.000	AV	31.2	38.2	11.0	32.7	-	47.7	53.9	6.2	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

(Antenna : M/N 146153)

Report No.	11182619H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.4
Date	May 23, 2016	May 31, 2016	August 8, 2016
Temperature / Humidity	22 deg. C / 47 % RH	21 deg. C / 60 % RH	24 deg. C / 51 % RH
Engineer	Hiroyuki Furutaka (10 GHz - 18 GHz)	Keisuke Kawamura (18 GHz - 26.5 GHz)	Tomoki Matsui (1 GHz - 10 GHz)
Mode	Tx 11g 2462 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2483.500	PK	59.7	28.1	6.8	32.1	-	62.5	73.9	11.4	
Hori	4924.000	PK	40.8	33.3	9.1	31.3	-	51.9	73.9	22.0	Floor noise
Hori	7386.000	PK	42.0	36.8	10.1	32.6	-	56.3	73.9	17.6	Floor noise
Hori	9848.000	PK	42.1	38.2	11.0	32.7	-	58.6	73.9	15.3	Floor noise
Hori	2483.500	AV	47.2	28.1	6.8	32.1	0.7	50.7	53.9	3.2	*1),*2)
Hori	4924.000	AV	32.0	33.3	9.1	31.3	-	43.1	53.9	10.8	Floor noise
Hori	7386.000	AV	33.2	36.8	10.1	32.6	-	47.5	53.9	6.4	Floor noise
Hori	9848.000	AV	31.2	38.2	11.0	32.7	-	47.7	53.9	6.2	Floor noise
Vert	2483.500	PK	60.3	28.1	6.8	32.1	-	63.1	73.9	10.8	
Vert	4924.000	PK	40.6	33.3	9.1	31.3	-	51.7	73.9	22.2	Floor noise
Vert	7386.000	PK	42.1	36.8	10.1	32.6	-	56.4	73.9	17.5	Floor noise
Vert	9848.000	PK	42.4	38.2	11.0	32.7	-	58.9	73.9	15.0	Floor noise
Vert	2483.500	AV	48.2	28.1	6.8	32.1	0.7	51.7	53.9	2.2	*1),*2)
Vert	4924.000	AV	32.1	33.3	9.1	31.3	-	43.2	53.9	10.7	Floor noise
Vert	7386.000	AV	33.5	36.8	10.1	32.6	-	47.8	53.9	6.1	Floor noise
Vert	9848.000	AV	31.2	38.2	11.0	32.7	-	47.7	53.9	6.2	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

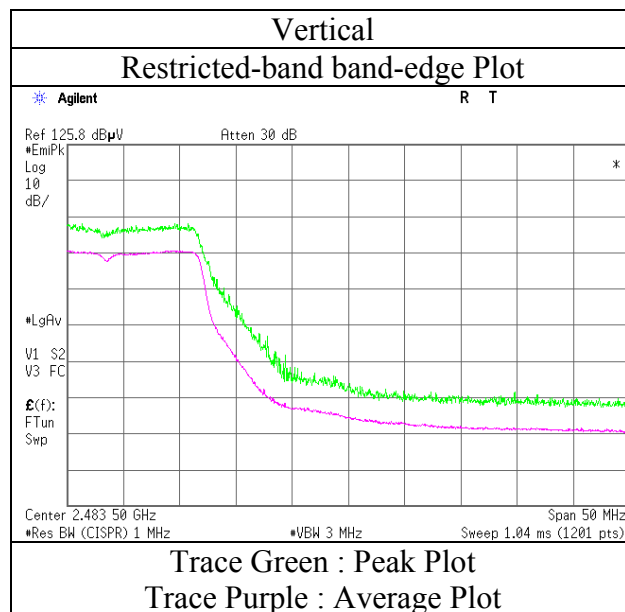
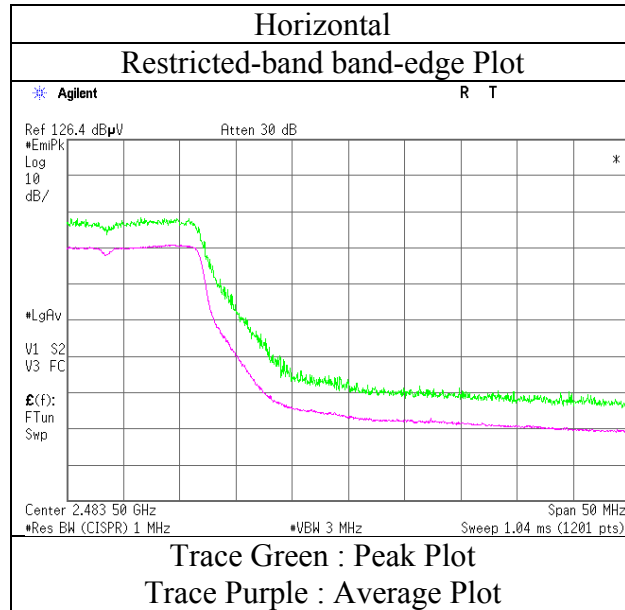
*1) Not Out of Band emission(Leakage Power)

*2) Integration method

Radiated Spurious Emission

Reference Plot for band-edge (Antenna : M/N 146153)

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11182619H
Date	August 8, 2016
Temperature / Humidity	24 deg. C / 51 % RH
Engineer	Tomoki Matsui
	(1 GHz - 10 GHz)
Mode	Tx 11g 2462 MHz



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

Radiated Spurious Emission

(Antenna : M/N 146153)

Test place : Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 11182619H
Date : August 8, 2016
Temperature / Humidity : 24 deg. C / 51 % RH
Engineer : Tomoki Matsui
(Band Edge)
Mode : Tx 11n-20 2412 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	59.4	27.9	6.7	32.1	-	61.9	73.9	12.0	
Hori	2390.000	AV	47.7	27.9	6.7	32.1	0.7	50.9	53.9	3.0	*1)
Vert	2390.000	PK	60.2	27.9	6.7	32.1	-	62.7	73.9	11.2	
Vert	2390.000	AV	47.2	27.9	6.7	32.1	0.7	50.4	53.9	3.5	*1)

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

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

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

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

20dBc Data Sheet

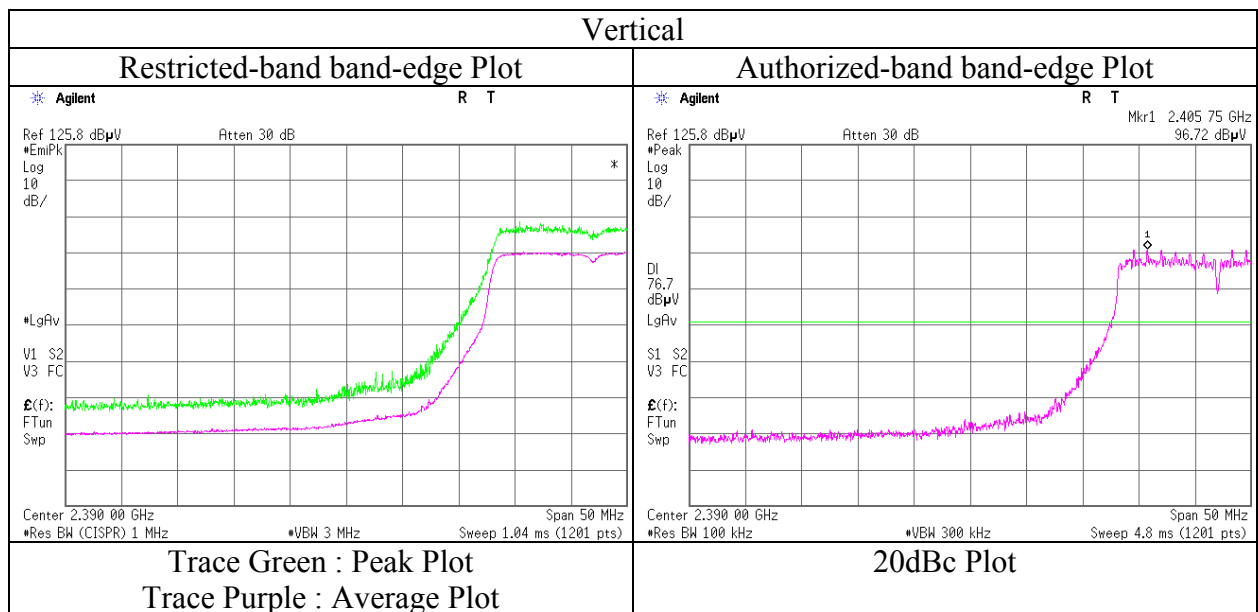
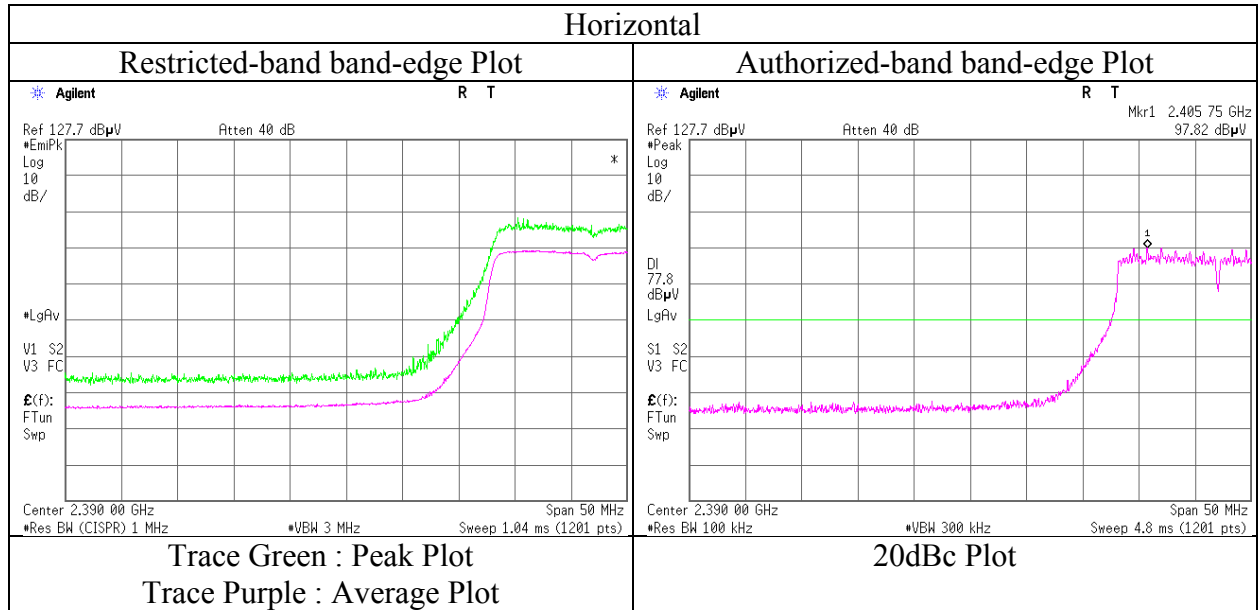
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	97.8	28.0	6.7	32.1	100.4	-	-	Carrier
Hori	2400.000	PK	63.8	28.0	6.7	32.1	66.4	80.4	14.0	
Vert	2412.000	PK	96.7	28.0	6.7	32.1	99.3	-	-	Carrier
Vert	2400.000	PK	62.7	28.0	6.7	32.1	65.3	79.3	14.0	

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

Radiated Spurious Emission

Reference Plot for band-edge (Antenna : M/N 146153)

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11182619H
Date	August 8, 2016
Temperature / Humidity	24 deg. C / 51 % RH
Engineer	Tomoki Matsui (Band Edge)
Mode	Tx 11n-20 2412 MHz



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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

(Antenna : M/N 146153)

Test place : Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 11182619H
Date : August 8, 2016
Temperature / Humidity : 24 deg. C / 51 % RH
Engineer : Tomoki Matsui
(Band Edge)
Mode : Tx 11n-20 2462 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2483.500	PK	61.0	28.1	6.8	32.1	-	63.8	73.9	10.1	
Hori	2483.500	AV	48.3	28.1	6.8	32.1	0.7	51.8	53.9	2.1	*1),*2)
Vert	2483.500	PK	60.5	28.1	6.8	32.1	-	63.3	73.9	10.6	
Vert	2483.500	AV	48.0	28.1	6.8	32.1	0.7	51.5	53.9	2.4	*1),*2)

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

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

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

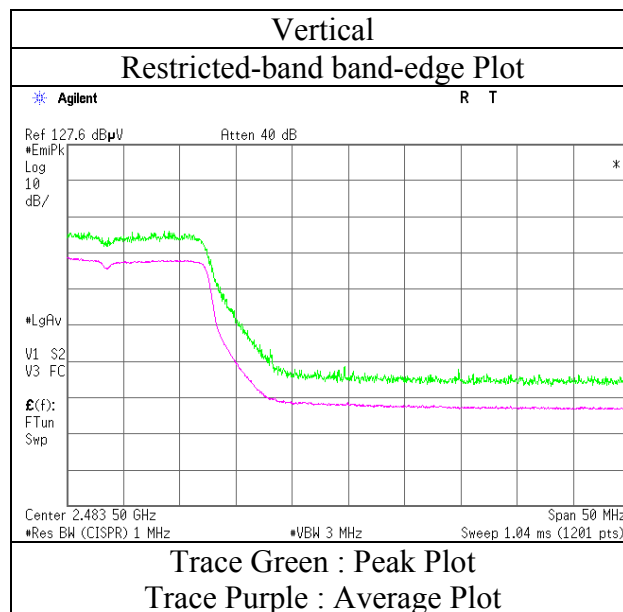
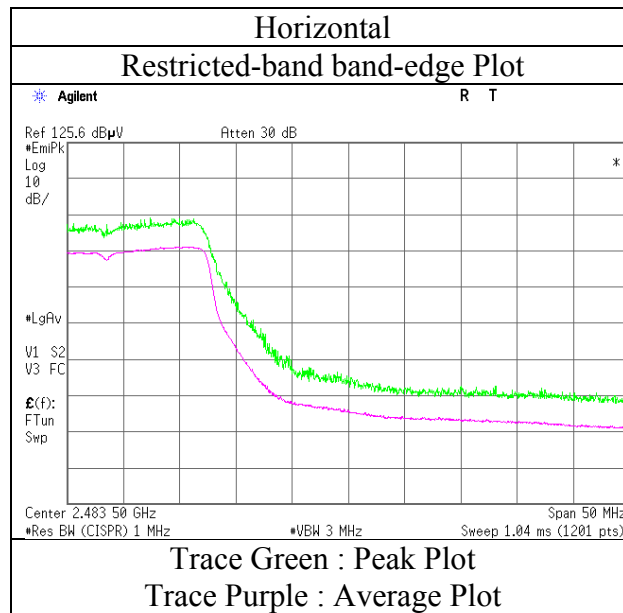
*1) Not Out of Band emission (Leakage Power)

*2) Integration method

Radiated Spurious Emission

Reference Plot for band-edge (Antenna : M/N 146153)

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11182619H
Date	August 8, 2016
Temperature / Humidity	24 deg. C / 51 % RH
Engineer	Tomoki Matsui (Band Edge)
Mode	Tx 11n-20 2462 MHz



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

Radiated Spurious Emission

(Antenna : M/N 146153)

Report No.	11182619H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.4
Date	May 23, 2016	May 31, 2016	August 8, 2016
Temperature / Humidity	22 deg. C / 47 % RH	21 deg. C / 60 % RH	24 deg. C / 51 % RH
Engineer	Hiroyuki Furutaka	Keisuke Kawamura	Tomoki Matsui
	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)	(1 GHz - 10 GHz)
Mode	Tx 11n-40 2422 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	57.7	27.9	6.7	32.1	-	60.2	73.9	13.7	
Hori	4844.000	PK	40.6	33.0	9.0	31.3	-	51.3	73.9	22.6	Floor noise
Hori	7266.000	PK	42.0	36.8	10.1	32.6	-	56.3	73.9	17.6	Floor noise
Hori	9688.000	PK	41.2	38.1	11.0	32.7	-	57.6	73.9	16.3	Floor noise
Hori	2390.000	AV	45.5	27.9	6.7	32.1	1.3	49.3	53.9	4.6	*1)
Hori	4844.000	AV	32.0	33.0	9.0	31.3	-	42.7	53.9	11.2	Floor noise
Hori	7266.000	AV	32.9	36.8	10.1	32.6	-	47.2	53.9	6.7	Floor noise
Hori	9688.000	AV	31.3	38.1	11.0	32.7	-	47.7	53.9	6.2	Floor noise
Vert	2390.000	PK	59.8	27.9	6.7	32.1	-	62.3	73.9	11.6	
Vert	4844.000	PK	40.8	33.0	9.0	31.3	-	51.5	73.9	22.4	Floor noise
Vert	7266.000	PK	42.3	36.8	10.1	32.6	-	56.6	73.9	17.3	Floor noise
Vert	9688.000	PK	41.4	38.1	11.0	32.7	-	57.8	73.9	16.1	Floor noise
Vert	2390.000	AV	47.3	27.9	6.7	32.1	1.3	51.1	53.9	2.8	*1)
Vert	4844.000	AV	31.8	33.0	9.0	31.3	-	42.5	53.9	11.4	Floor noise
Vert	7266.000	AV	33.0	36.8	10.1	32.6	-	47.3	53.9	6.6	Floor noise
Vert	9688.000	AV	31.2	38.1	11.0	32.7	-	47.6	53.9	6.3	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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

20dBc Data Sheet

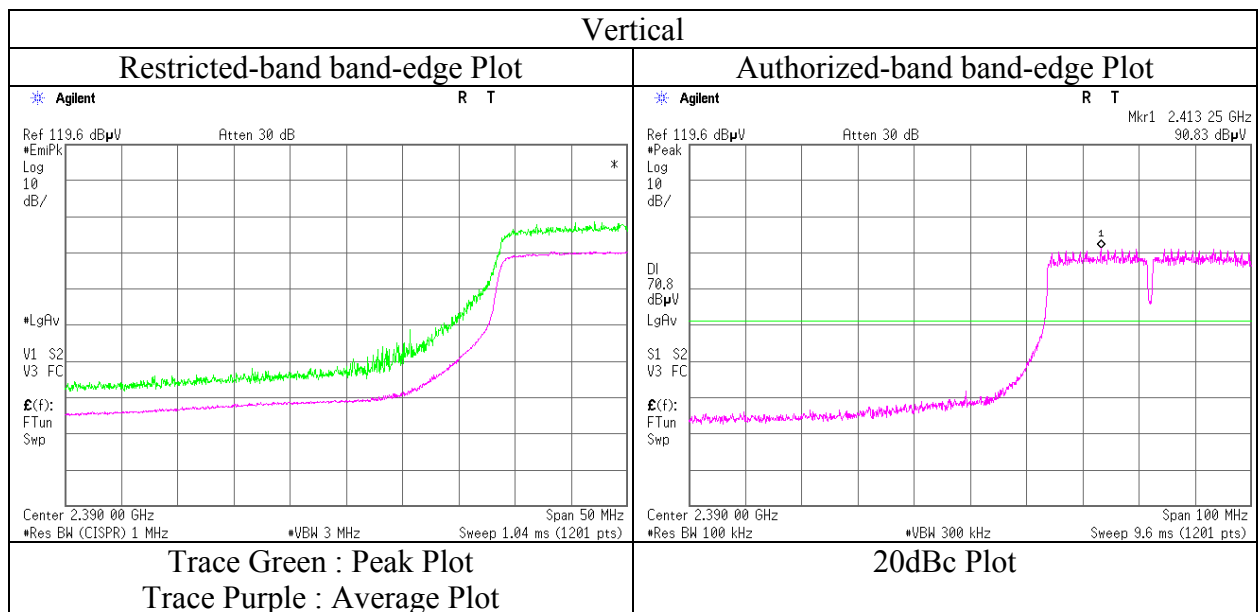
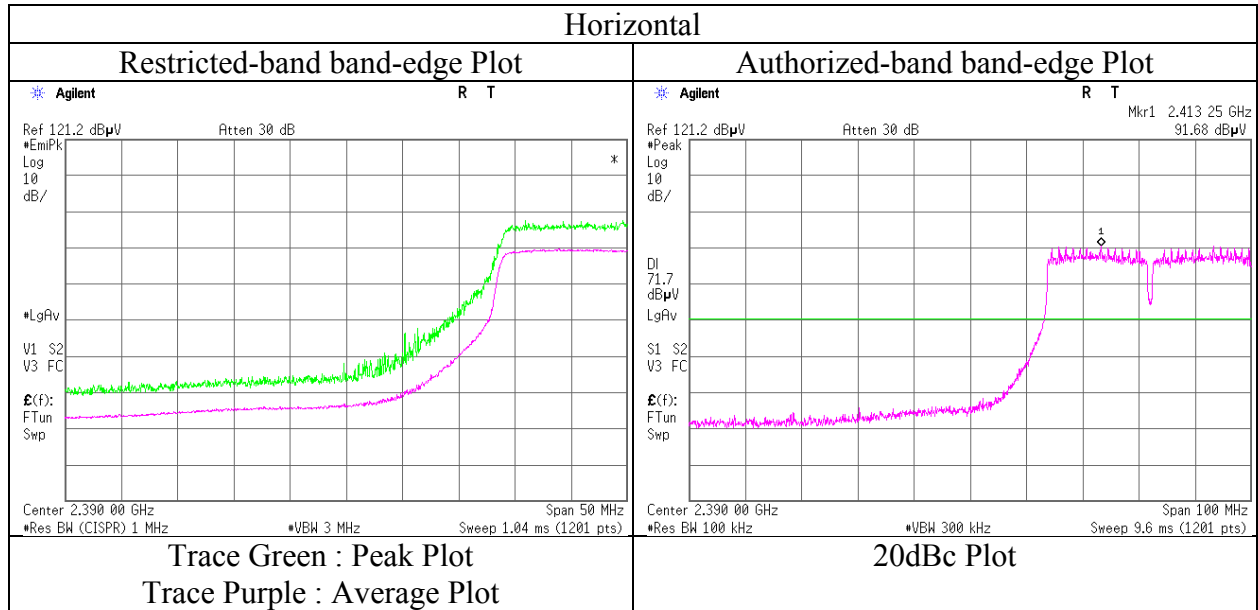
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2422.000	PK	91.7	28.0	6.7	32.1	94.3	-	-	Carrier
Hori	2400.000	PK	60.2	28.0	6.7	32.1	62.8	74.3	11.5	
Vert	2422.000	PK	90.8	28.0	6.7	32.1	93.4	-	-	Carrier
Vert	2400.000	PK	58.9	28.0	6.7	32.1	61.5	73.4	11.9	

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

Radiated Spurious Emission

Reference Plot for band-edge (Antenna : M/N 146153)

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11182619H
Date	August 8, 2016
Temperature / Humidity	24 deg. C / 51 % RH
Engineer	Tomoki Matsui
	(1 GHz - 10 GHz)
Mode	Tx 11n-40 2422 MHz



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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

(Antenna : M/N 146153)

Report No.	11182619H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.4
Date	May 23, 2016	May 31, 2016	August 8, 2016
Temperature / Humidity	22 deg. C / 47 % RH	21 deg. C / 60 % RH	24 deg. C / 51 % RH
Engineer	Hiroyuki Furutaka	Keisuke Kawamura	Tomoki Matsui
	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)	(1 GHz - 10 GHz)
Mode	Tx 11n-40 2437 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	60.8	27.9	6.7	32.1	-	63.3	73.9	10.6	
Hori	2483.500	PK	60.7	28.1	6.8	32.1	-	63.5	73.9	10.4	
Hori	4874.000	PK	41.0	33.1	9.0	31.3	-	51.8	73.9	22.1	Floor noise
Hori	7311.000	PK	42.5	36.8	10.1	32.6	-	56.8	73.9	17.1	Floor noise
Hori	9748.000	PK	40.2	38.2	11.0	32.7	-	56.7	73.9	17.2	Floor noise
Hori	2390.000	AV	47.7	27.9	6.7	32.1	1.3	51.5	53.9	2.4	*1)
Hori	2483.500	AV	47.8	28.1	6.8	32.1	1.3	51.9	53.9	2.0	*1)
Hori	4874.000	AV	32.3	33.1	9.0	31.3	-	43.1	53.9	10.8	Floor noise
Hori	7311.000	AV	33.3	36.8	10.1	32.6	-	47.6	53.9	6.3	Floor noise
Hori	9748.000	AV	31.1	38.2	11.0	32.7	-	47.6	53.9	6.3	Floor noise
Vert	2390.000	PK	60.1	27.9	6.7	32.1	-	62.6	73.9	11.3	
Vert	2483.500	PK	61.1	28.1	6.8	32.1	-	63.9	73.9	10.0	
Vert	4874.000	PK	41.0	33.1	9.0	31.3	-	51.8	73.9	22.1	Floor noise
Vert	7311.000	PK	42.5	36.8	10.1	32.6	-	56.8	73.9	17.1	Floor noise
Vert	9748.000	PK	40.2	38.2	11.0	32.7	-	56.7	73.9	17.2	Floor noise
Vert	2390.000	AV	47.6	27.9	6.7	32.1	1.3	51.4	53.9	2.5	*1)
Vert	2483.500	AV	46.9	28.1	6.8	32.1	1.3	51.0	53.9	2.9	*1),*2)
Vert	4874.000	AV	32.3	33.1	9.0	31.3	-	43.1	53.9	10.8	Floor noise
Vert	7311.000	AV	33.3	36.8	10.1	32.6	-	47.6	53.9	6.3	Floor noise
Vert	9748.000	AV	31.2	38.2	11.0	32.7	-	47.7	53.9	6.2	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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

*2) Integration method

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2437.000	PK	93.2	28.0	6.7	32.1	95.8	-	-	Carrier
Hori	2400.000	PK	51.9	28.0	6.7	32.1	54.5	75.8	21.3	
Vert	2437.000	PK	93.6	28.0	6.7	32.1	96.2	-	-	Carrier
Vert	2400.000	PK	51.1	28.0	6.7	32.1	53.7	76.2	22.5	

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

Radiated Spurious Emission
(Antenna : M/N 146153)

Report No.	11182619H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.4
Date	May 23, 2016	May 31, 2016	August 8, 2016
Temperature / Humidity	22 deg. C / 47 % RH	21 deg. C / 60 % RH	24 deg. C / 51 % RH
Engineer	Hiroyuki Furutaka	Keisuke Kawamura	Tomoki Matsui
	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)	(1 GHz - 10 GHz)
Mode	Tx 11n-40 2452 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2483.500	PK	64.4	28.1	6.8	32.1	-	67.2	73.9	6.7	
Hori	4904.000	PK	40.7	33.2	9.1	31.3	-	51.7	73.9	22.2	Floor noise
Hori	7356.000	PK	41.9	36.8	10.1	32.6	-	56.2	73.9	17.7	Floor noise
Hori	9808.000	PK	41.8	38.2	11.0	32.7	-	58.3	73.9	15.6	Floor noise
Hori	2483.500	AV	47.6	28.1	6.8	32.1	1.3	51.7	53.9	2.2	*1),*2)
Hori	4904.000	AV	32.1	33.2	9.1	31.3	-	43.1	53.9	10.8	Floor noise
Hori	7356.000	AV	33.2	36.8	10.1	32.6	-	47.5	53.9	6.4	Floor noise
Hori	9808.000	AV	31.2	38.2	11.0	32.7	-	47.7	53.9	6.2	Floor noise
Vert	2483.500	PK	65.4	28.1	6.8	32.1	-	68.2	73.9	5.7	
Vert	4904.000	PK	40.5	33.2	9.1	31.3	-	51.5	73.9	22.4	Floor noise
Vert	7356.000	PK	41.9	36.8	10.1	32.6	-	56.2	73.9	17.7	Floor noise
Vert	9808.000	PK	41.8	38.2	11.0	32.7	-	58.3	73.9	15.6	Floor noise
Vert	2483.500	AV	47.7	28.1	6.8	32.1	1.3	51.8	53.9	2.1	*1),*2)
Vert	4904.000	AV	32.0	33.2	9.1	31.3	-	43.0	53.9	10.9	Floor noise
Vert	7356.000	AV	33.2	36.8	10.1	32.6	-	47.5	53.9	6.4	Floor noise
Vert	9808.000	AV	31.1	38.2	11.0	32.7	-	47.6	53.9	6.3	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB

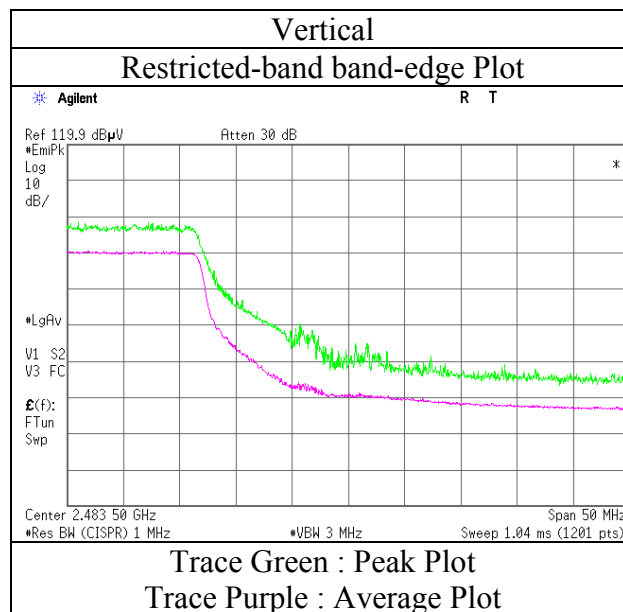
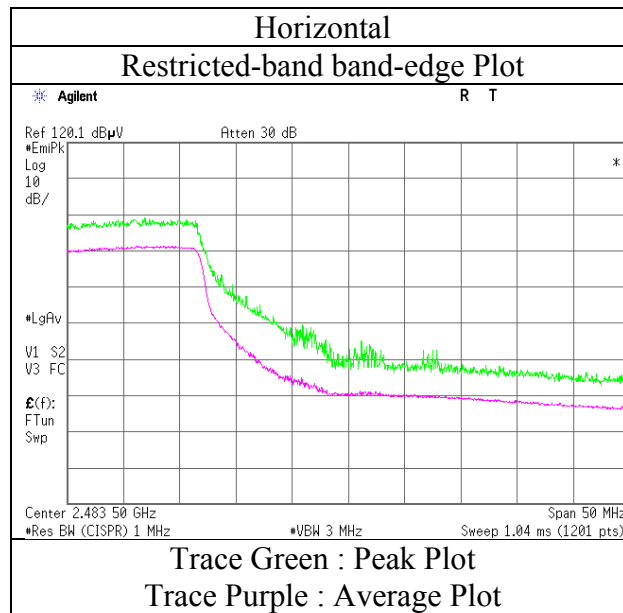
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

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

*2) Integration method

Radiated Spurious Emission
Reference Plot for band-edge (Antenna : M/N 146153)

Test place : Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 11182619H
Date : August 8, 2016
Temperature / Humidity : 24 deg. C / 51 % RH
Engineer : Tomoki Matsui
Mode : (1 GHz - 10 GHz)
Tx 11n-40 2452 MHz



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

Radiated Spurious Emission

(Antenna : M/N 146153)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11182619H	
Date	June 15, 2016	August 19, 2016
Temperature / Humidity	22 deg. C / 64 % RH	23 deg. C / 62 % RH
Engineer	Tomoki Matsui	Satofumi Matsuyama
	(Above 1 GHz)	(Below 1 GHz)
Mode	Tx BT LE 2402 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	272.228	QP	39.9	13.0	9.7	32.0	-	30.6	46.0	15.4	
Hori	296.989	QP	50.5	13.5	9.9	31.9	-	42.0	46.0	4.0	
Hori	321.736	QP	35.9	14.0	10.1	31.9	-	28.1	46.0	17.9	
Hori	325.526	QP	32.9	14.1	10.1	31.9	-	25.2	46.0	20.8	
Hori	742.453	QP	36.5	20.2	12.6	31.8	-	37.5	46.0	8.5	
Hori	874.959	QP	35.8	21.8	13.3	31.1	-	39.8	46.0	6.2	
Hori	1875.144	PK	47.0	26.0	6.5	33.1	-	46.4	73.9	27.5	
Hori	2390.000	PK	44.9	26.7	6.8	32.7	-	45.7	73.9	28.2	
Hori	4804.000	PK	42.6	31.0	9.1	31.8	-	50.9	73.9	23.0	
Hori	7206.000	PK	41.2	35.7	10.3	32.6	-	54.6	73.9	19.3	Floor noise
Hori	9608.000	PK	43.3	37.2	9.6	33.2	-	56.9	73.9	17.0	Floor noise
Hori	20879.980	PK	48.5	38.2	-1.0	33.0	-	52.7	73.9	21.2	
Hori	1875.144	AV	41.7	26.0	6.5	33.1	-	41.1	53.9	12.8	
Hori	2390.000	AV	34.6	26.7	6.8	32.7	1.7	37.1	53.9	16.8	*1)
Hori	4804.000	AV	31.8	31.0	9.1	31.8	1.7	41.8	53.9	12.1	
Hori	7206.000	AV	32.9	35.7	10.3	32.6	-	46.3	53.9	7.6	Floor noise
Hori	9608.000	AV	34.0	37.2	9.6	33.2	-	47.6	53.9	6.3	Floor noise
Hori	20879.980	AV	43.9	38.2	-1.0	33.0	-	48.1	53.9	5.8	
Vert	272.228	QP	35.5	13.0	9.7	32.0	-	26.2	46.0	19.8	
Vert	296.989	QP	44.5	13.5	9.9	31.9	-	36.0	46.0	10.0	
Vert	321.736	QP	31.0	14.0	10.1	31.9	-	23.2	46.0	22.8	
Vert	325.526	QP	30.3	14.1	10.1	31.9	-	22.6	46.0	23.4	
Vert	742.453	QP	29.6	20.2	12.6	31.8	-	30.6	46.0	15.4	
Vert	874.959	QP	33.1	21.8	13.3	31.1	-	37.1	46.0	8.9	
Vert	1875.144	PK	47.5	26.0	6.5	33.1	-	46.9	73.9	27.0	
Vert	2390.000	PK	44.0	26.7	6.8	32.7	-	44.8	73.9	29.1	
Vert	4804.000	PK	42.6	31.0	9.1	31.8	-	50.9	73.9	23.0	
Vert	7206.000	PK	41.8	35.7	10.3	32.6	-	55.2	73.9	18.7	Floor noise
Vert	9608.000	PK	43.4	37.2	9.6	33.2	-	57.0	73.9	16.9	Floor noise
Vert	20879.980	PK	49.9	38.2	-1.0	33.0	-	54.1	73.9	19.8	
Vert	1875.144	AV	41.5	26.0	6.5	33.1	-	40.9	53.9	13.0	
Vert	2390.000	AV	34.0	26.7	6.8	32.7	1.7	36.5	53.9	17.4	*1)
Vert	4804.000	AV	34.8	31.0	9.1	31.8	1.7	44.8	53.9	9.1	
Vert	7206.000	AV	32.7	35.7	10.3	32.6	-	46.1	53.9	7.8	Floor noise
Vert	9608.000	AV	34.0	37.2	9.6	33.2	-	47.6	53.9	6.3	Floor noise
Vert	20879.980	AV	46.3	38.2	-1.0	33.0	-	50.5	53.9	3.4	

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

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

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB

10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

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

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	100.3	26.7	6.8	32.7	101.1	-	-	Carrier
Hori	2400.000	PK	43.7	26.7	6.8	32.7	44.5	81.1	36.6	
Vert	2402.000	PK	98.7	26.7	6.8	32.7	99.5	-	-	Carrier
Vert	2400.000	PK	42.4	26.7	6.8	32.7	43.2	79.5	36.3	

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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

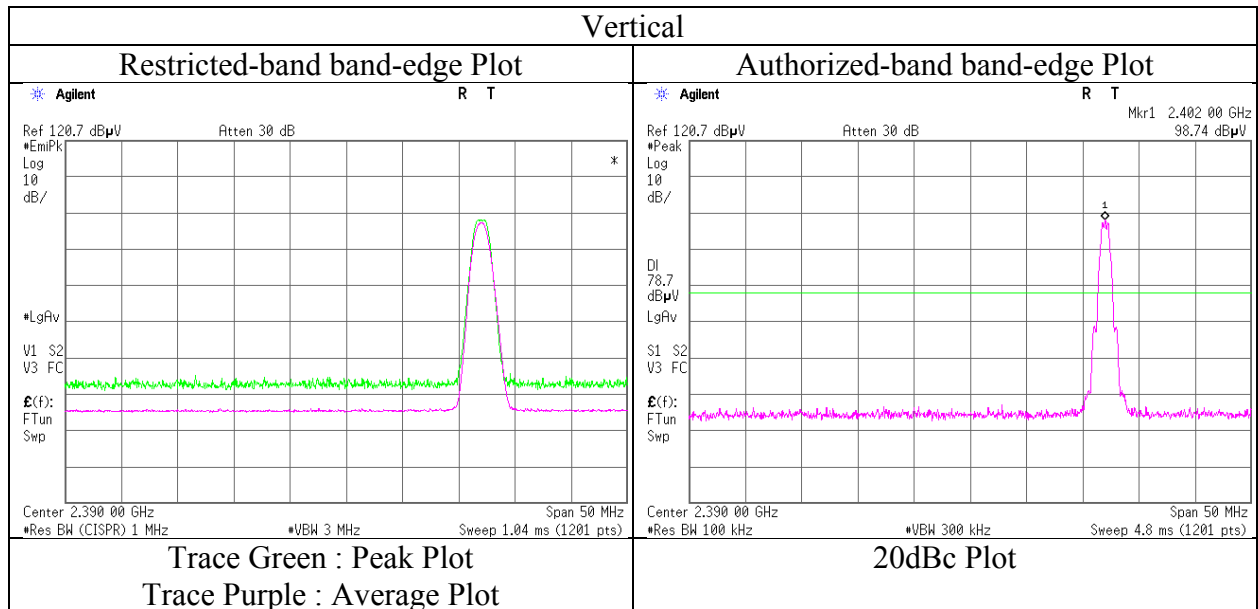
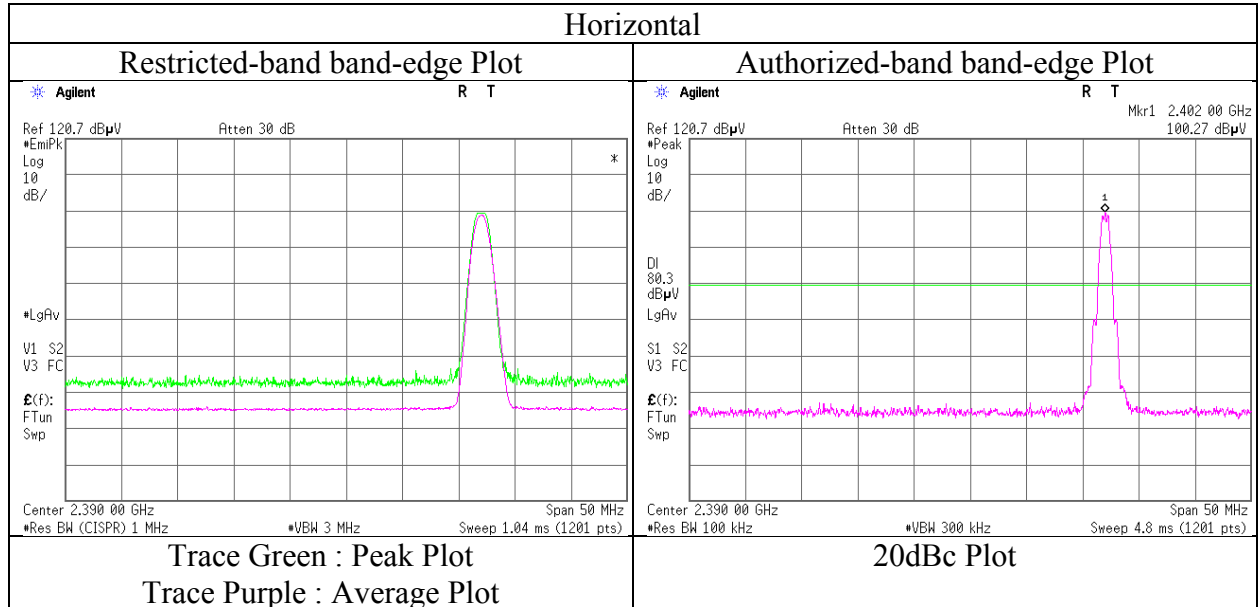
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Reference Plot for band-edge (Antenna : M/N 146153)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11182619H
Date	June 15, 2016
Temperature / Humidity	22 deg. C / 64 % RH
Engineer	Tomoki Matsui
Mode	Tx BT LE 2402 MHz



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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

(Antenna : M/N 146153)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11182619H	
Date	June 15, 2016	August 19, 2016
Temperature / Humidity	22 deg. C / 64 % RH	23 deg. C / 62 % RH
Engineer	Tomoki Matsui	Satofumi Matsuyama
	(Above 1 GHz)	(Below 1 GHz)
Mode	Tx BT LE 2440 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	272.228	QP	39.3	13.0	9.7	32.0	-	30.0	46.0	16.0	
Hori	296.989	QP	45.3	13.5	9.9	31.9	-	36.8	46.0	9.2	
Hori	321.736	QP	35.8	14.0	10.1	31.9	-	28.0	46.0	18.0	
Hori	325.526	QP	32.4	14.1	10.1	31.9	-	24.7	46.0	21.3	
Hori	742.453	QP	36.7	20.2	12.6	31.8	-	37.7	46.0	8.3	
Hori	874.959	QP	36.9	21.8	13.3	31.1	-	40.9	46.0	5.1	
Hori	1875.123	PK	47.5	26.0	6.5	33.1	-	46.9	73.9	27.0	
Hori	4880.000	PK	41.3	31.3	9.1	31.7	-	50.0	73.9	23.9	
Hori	7320.000	PK	40.6	35.6	10.3	32.6	-	53.9	73.9	20.0	Floor noise
Hori	9760.000	PK	43.3	37.2	11.0	33.3	-	58.2	73.9	15.7	Floor noise
Hori	20879.980	PK	49.0	38.2	-1.0	33.0	-	53.2	73.9	20.7	
Hori	1875.123	AV	41.5	26.0	6.5	33.1	-	40.9	53.9	13.0	
Hori	4880.000	AV	32.7	31.3	9.1	31.7	1.7	43.1	53.9	10.8	
Hori	7320.000	AV	31.9	35.6	10.3	32.6	-	45.2	53.9	8.7	Floor noise
Hori	9760.000	AV	34.0	37.2	11.0	33.3	-	48.9	53.9	5.0	Floor noise
Hori	20879.980	AV	44.0	38.2	-1.0	33.0	-	48.2	53.9	5.7	
Vert	272.228	QP	35.2	13.0	9.7	32.0	-	25.9	46.0	20.1	
Vert	296.989	QP	44.0	13.5	9.9	31.9	-	35.5	46.0	10.5	
Vert	321.736	QP	31.4	14.0	10.1	31.9	-	23.6	46.0	22.4	
Vert	325.526	QP	30.4	14.1	10.1	31.9	-	22.7	46.0	23.3	
Vert	742.453	QP	29.3	20.2	12.6	31.8	-	30.3	46.0	15.7	
Vert	874.959	QP	33.9	21.8	13.3	31.1	-	37.9	46.0	8.1	
Vert	1875.123	PK	47.8	26.0	6.5	33.1	-	47.2	73.9	26.7	
Vert	4880.000	PK	41.0	31.3	9.1	31.7	-	49.7	73.9	24.2	
Vert	7320.000	PK	40.3	35.6	10.3	32.6	-	53.6	73.9	20.3	Floor noise
Vert	9760.000	PK	43.2	37.2	9.6	33.3	-	56.7	73.9	17.2	Floor noise
Vert	20879.980	PK	49.5	38.2	-1.0	33.0	-	53.7	73.9	20.2	
Vert	1875.123	AV	41.6	26.0	6.5	33.1	-	41.0	53.9	12.9	
Vert	4880.000	AV	33.0	31.3	9.1	31.7	1.7	43.4	53.9	10.5	
Vert	7320.000	AV	32.1	35.6	10.3	32.6	-	45.4	53.9	8.5	Floor noise
Vert	9760.000	AV	34.2	37.2	9.6	33.3	-	47.7	53.9	6.2	Floor noise
Vert	20879.980	AV	45.4	38.2	-1.0	33.0	-	49.6	53.9	4.3	

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

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

Distance factor: 1 GHz - 10 GHz 20log (4.0 m / 3.0 m) = 2.5 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

(Antenna : M/N 146153)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11182619H	
Date	June 15, 2016	August 19, 2016
Temperature / Humidity	22 deg. C / 64 % RH	23 deg. C / 62 % RH
Engineer	Tomoki Matsui	Satofumi Matsuyama
	(Above 1 GHz)	(Below 1 GHz)
Mode	Tx BT LE 2480 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	272.228	QP	39.5	13.0	9.7	32.0	-	30.2	46.0	15.8	
Hori	296.989	QP	50.4	13.5	9.9	31.9	-	41.9	46.0	4.1	
Hori	321.736	QP	35.9	14.0	10.1	31.9	-	28.1	46.0	17.9	
Hori	325.526	QP	32.1	14.1	10.1	31.9	-	24.4	46.0	21.6	
Hori	742.453	QP	36.2	20.2	12.6	31.8	-	37.2	46.0	8.8	
Hori	874.959	QP	36.3	21.8	13.3	31.1	-	40.3	46.0	5.7	
Hori	1875.123	PK	46.6	26.0	6.5	33.1	-	46.0	73.9	27.9	
Hori	2483.500	PK	54.4	26.8	6.9	32.6	-	55.5	73.9	18.4	
Hori	4960.000	PK	41.2	31.5	9.0	31.7	-	50.0	73.9	23.9	
Hori	7440.000	PK	41.5	35.5	10.3	32.7	-	54.6	73.9	19.3	Floor noise
Hori	9920.000	PK	42.8	37.2	9.6	33.4	-	56.2	73.9	17.7	Floor noise
Hori	20879.980	PK	48.1	38.2	-1.0	33.0	-	52.3	73.9	21.6	
Hori	1875.123	AV	41.3	26.0	6.5	33.1	-	40.7	53.9	13.2	
Hori	2483.500	AV	42.0	26.8	6.9	32.6	1.7	44.8	53.9	9.1	*1)
Hori	4960.000	AV	31.9	31.5	9.0	31.7	1.7	42.4	53.9	11.5	
Hori	7440.000	AV	32.2	35.5	10.3	32.7	-	45.3	53.9	8.6	Floor noise
Hori	9920.000	AV	34.3	37.2	9.6	33.4	-	47.7	53.9	6.2	Floor noise
Hori	20879.980	AV	43.8	38.2	-1.0	33.0	-	48.0	53.9	5.9	
Vert	272.228	QP	35.3	13.0	9.7	32.0	-	26.0	46.0	20.0	
Vert	296.989	QP	44.1	13.5	9.9	31.9	-	35.6	46.0	10.4	
Vert	321.736	QP	31.4	14.0	10.1	31.9	-	23.6	46.0	22.4	
Vert	325.526	QP	30.2	14.1	10.1	31.9	-	22.5	46.0	23.5	
Vert	742.453	QP	29.4	20.2	12.6	31.8	-	30.4	46.0	15.6	
Vert	874.959	QP	33.4	21.8	13.3	31.1	-	37.4	46.0	8.6	
Vert	1875.123	PK	48.2	26.0	6.5	33.1	-	47.6	73.9	26.3	
Vert	2483.500	PK	53.0	26.8	6.9	32.6	-	54.1	73.9	19.8	
Vert	4960.000	PK	41.6	31.5	9.0	31.7	-	50.4	73.9	23.5	
Vert	7440.000	PK	41.2	35.5	10.3	32.7	-	54.3	73.9	19.6	Floor noise
Vert	9920.000	PK	43.6	37.2	9.6	33.4	-	57.0	73.9	16.9	Floor noise
Vert	20879.980	PK	50.0	38.2	-1.0	33.0	-	54.2	73.9	19.7	
Vert	1875.123	AV	43.7	26.0	6.5	33.1	-	43.1	53.9	10.8	
Vert	2483.500	AV	39.1	26.8	6.9	32.6	1.7	41.9	53.9	12.0	*1)
Vert	4960.000	AV	33.0	31.5	9.0	31.7	1.7	43.5	53.9	10.4	
Vert	7440.000	AV	32.1	35.5	10.3	32.7	-	45.2	53.9	8.7	Floor noise
Vert	9920.000	AV	34.3	37.2	9.6	33.4	-	47.7	53.9	6.2	Floor noise
Vert	20879.980	AV	45.4	38.2	-1.0	33.0	-	49.6	53.9	4.3	

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

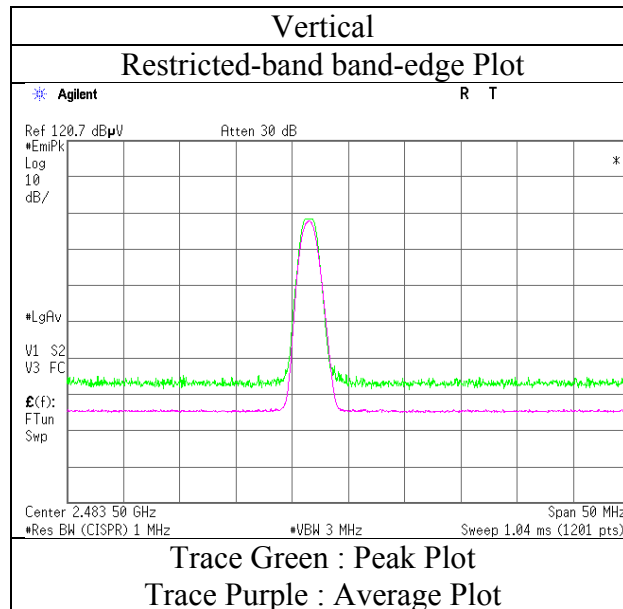
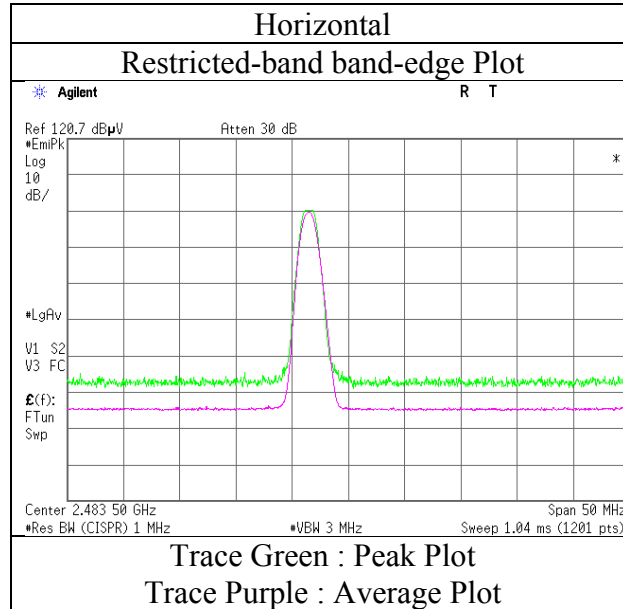
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (4.0 m / 3.0 m) = 2.5 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

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

Radiated Spurious Emission
Reference Plot for band-edge (Antenna : M/N 146153)

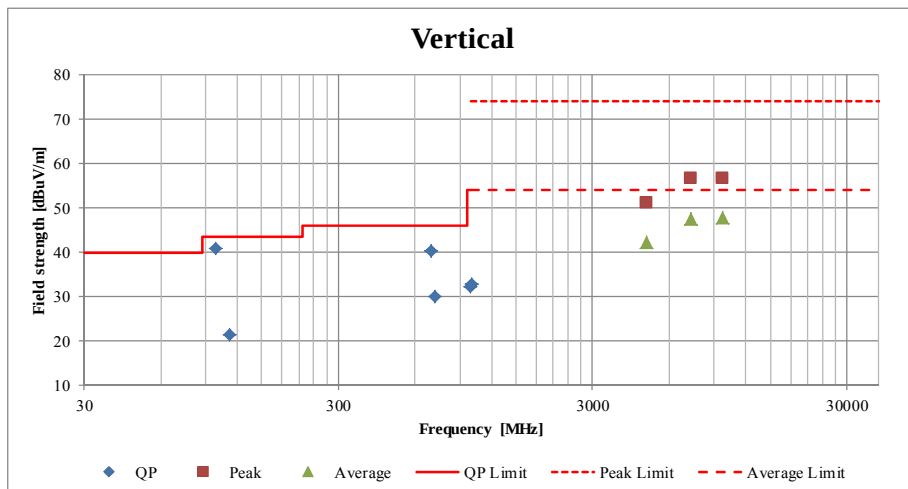
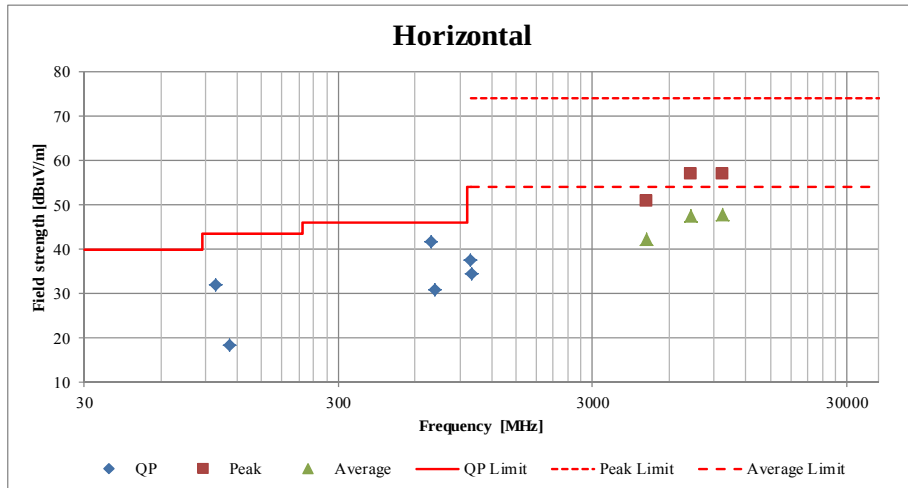
Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11182619H
Date	June 15, 2016
Temperature / Humidity	22 deg. C / 64 % RH
Engineer	Tomoki Matsui
Mode	Tx BT LE 2480 MHz



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

Radiated Spurious Emission
Plot data, Worst case (Antenna : M/N 146153)

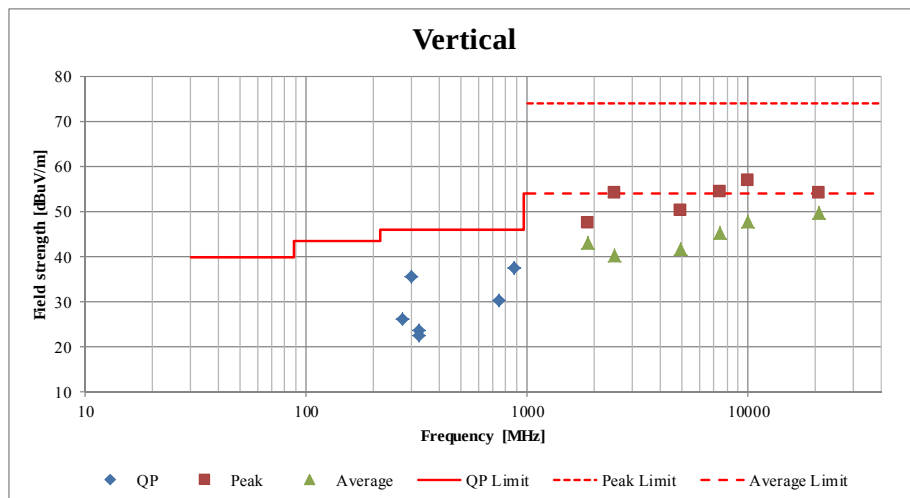
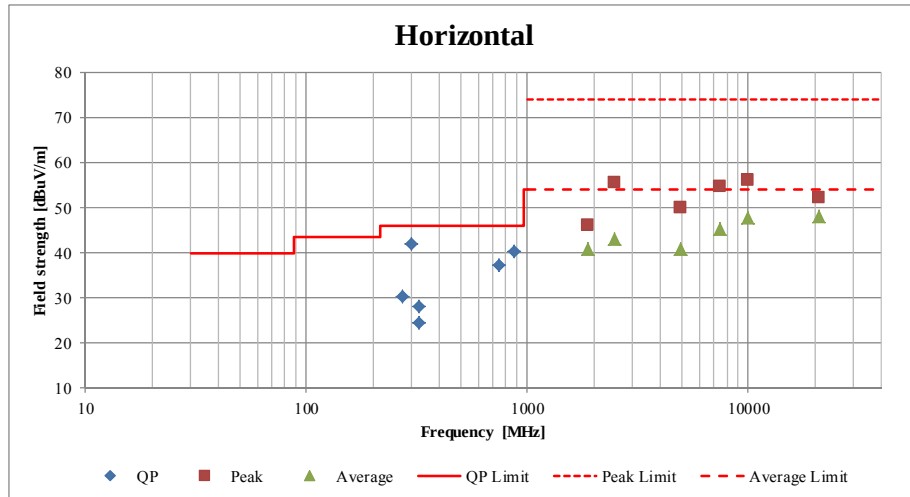
Report No.	11182619H			
Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.2	No.2	No.4	No.3
Date	May 23, 2016	May 31, 2016	August 8, 2016	August 18, 2016
Temperature / Humidity	22 deg. C / 47 % RH	21 deg. C / 60 % RH	24 deg. C / 51 % RH	23 deg. C / 58 % RH
Engineer	Hiroyuki Furutaka (10 GHz - 18 GHz)	Keisuke Kawamura (18 GHz - 26.5 GHz)	Tomoki Matsui (1 GHz - 10 GHz)	Takafumi Noguchi (Below 1 GHz)
Mode	Tx 11g 2437 MHz			



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

Radiated Spurious Emission
Plot data, Worst case (Antenna : M/N 146153)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11182619H	
Date	June 15, 2016	August 19, 2016
Temperature / Humidity	22 deg. C / 64 % RH	23 deg. C / 62 % RH
Engineer	Tomoki Matsui (Above 1 GHz)	Satofumi Matsuyama (Below 1 GHz)
Mode	Tx BT LE 2480 MHz	



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

Radiated Spurious Emission

(Antenna : M/N H2U84W1H1S)

Report No.	11182619H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.4
Date	June 21, 2016	August 9, 2016
Temperature / Humidity	21 deg. C / 54 % RH	27 deg. C / 48 % RH
Engineer	Keisuke Kawamura	Tomoki Matsui
	(Above 10 GHz)	(1 GHz - 10 GHz)
Mode	Tx 11b 2412 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	51.7	27.9	6.7	32.1	-	54.2	73.9	19.7	
Hori	4824.000	PK	45.4	32.9	9.0	31.3	-	56.0	73.9	17.9	
Hori	7236.000	PK	42.0	36.8	10.1	32.6	-	56.3	73.9	17.6	Floor noise
Hori	9648.000	PK	41.2	38.1	11.0	32.6	-	57.7	73.9	16.2	Floor noise
Hori	2390.000	AV	43.1	27.9	6.7	32.1	-	45.6	53.9	8.3	
Hori	4824.000	AV	39.0	32.9	9.0	31.3	-	49.6	53.9	4.3	
Hori	7236.000	AV	33.4	36.8	10.1	32.6	-	47.7	53.9	6.2	Floor noise
Hori	9648.000	AV	31.4	38.1	11.0	32.6	-	47.9	53.9	6.0	Floor noise
Vert	2390.000	PK	51.3	27.9	6.7	32.1	-	53.8	73.9	20.1	
Vert	4824.000	PK	45.0	32.9	9.0	31.3	-	55.6	73.9	18.3	
Vert	7236.000	PK	42.0	36.8	10.1	32.6	-	56.3	73.9	17.6	Floor noise
Vert	9648.000	PK	41.2	38.1	11.0	32.6	-	57.7	73.9	16.2	Floor noise
Vert	2390.000	AV	42.7	27.9	6.7	32.1	-	45.2	53.9	8.7	
Vert	4824.000	AV	38.8	32.9	9.0	31.3	-	49.4	53.9	4.5	
Vert	7236.000	AV	33.4	36.8	10.1	32.6	-	47.7	53.9	6.2	Floor noise
Vert	9648.000	AV	31.4	38.1	11.0	32.6	-	47.9	53.9	6.0	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	102.9	28.0	6.7	32.1	105.5	-	-	Carrier
Hori	2398.375	PK	62.9	28.0	6.7	32.1	65.5	85.5	20.0	
Hori	2400.000	PK	57.1	28.0	6.7	32.1	59.7	85.5	25.8	
Vert	2412.000	PK	103.5	28.0	6.7	32.1	106.1	-	-	Carrier
Vert	2398.117	PK	60.5	28.0	6.7	32.1	63.1	86.1	23.0	
Vert	2400.000	PK	54.5	28.0	6.7	32.1	57.1	86.1	29.0	

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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

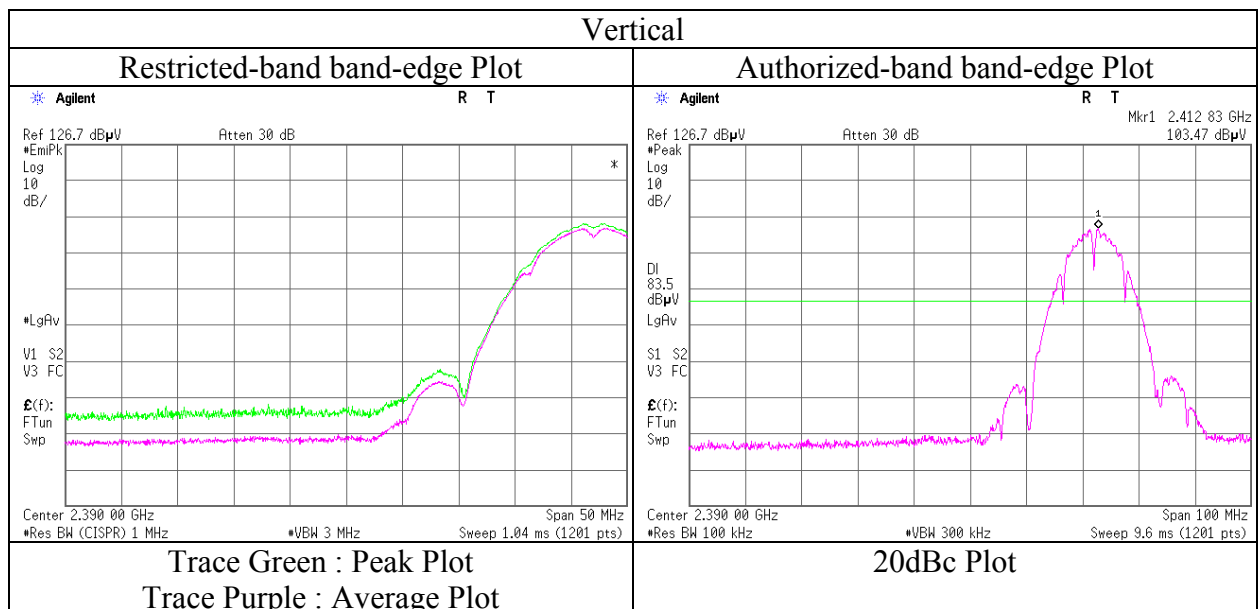
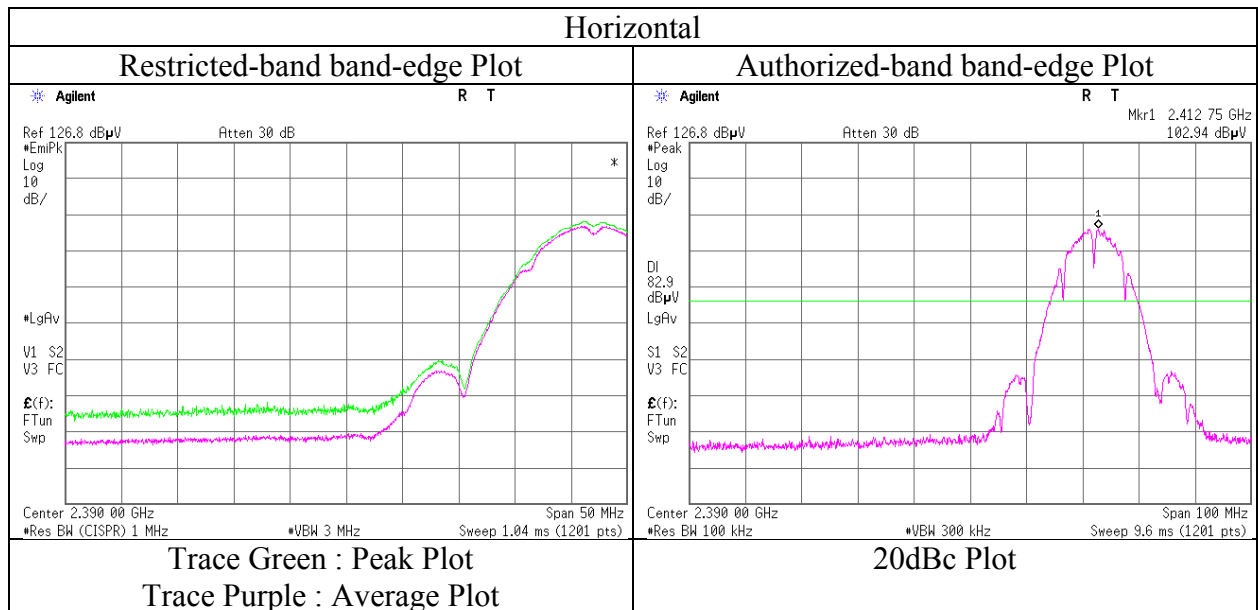
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Reference Plot for band-edge (Antenna : M/N H2U84W1H1S)

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11182619H
Date	August 9, 2016
Temperature / Humidity	27 deg. C / 48 % RH
Engineer	Tomoki Matsui
	(1 GHz - 10 GHz)
Mode	Tx 11b 2412 MHz



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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission
(Antenna : M/N H2U84W1H1S)

Report No. 11182619H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.2 No.4
Date June 21, 2016 August 9, 2016
Temperature / Humidity 21 deg. C / 54 % RH 27 deg. C / 48 % RH
Engineer Keisuke Kawamura Tomoki Matsui
(Above 10 GHz) (1 GHz - 10 GHz)
Mode Tx 11b 2437 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	4874.000	PK	43.5	33.1	9.0	31.3	-	54.3	73.9	19.6	
Hori	7311.000	PK	42.6	36.8	10.1	32.6	-	56.9	73.9	17.0	Floor noise
Hori	9748.000	PK	40.3	38.2	11.0	32.7	-	56.8	73.9	17.1	Floor noise
Hori	4874.000	AV	37.2	33.1	9.0	31.3	-	48.0	53.9	5.9	
Hori	7311.000	AV	33.3	36.8	10.1	32.6	-	47.6	53.9	6.3	Floor noise
Hori	9748.000	AV	31.3	38.2	11.0	32.7	-	47.8	53.9	6.1	Floor noise
Vert	4874.000	PK	44.6	33.1	9.0	31.3	-	55.4	73.9	18.5	
Vert	7311.000	PK	42.4	36.8	10.1	32.6	-	56.7	73.9	17.2	Floor noise
Vert	9748.000	PK	40.1	38.2	11.0	32.7	-	56.6	73.9	17.3	Floor noise
Vert	4874.000	AV	37.9	33.1	9.0	31.3	-	48.7	53.9	5.2	
Vert	7311.000	AV	33.2	36.8	10.1	32.6	-	47.5	53.9	6.4	Floor noise
Vert	9748.000	AV	31.2	38.2	11.0	32.7	-	47.7	53.9	6.2	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission
(Antenna : M/N H2U84W1H1S)

Report No. 11182619H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.2 No.4
Date June 21, 2016 August 9, 2016
Temperature / Humidity 21 deg. C / 54 % RH 27 deg. C / 48 % RH
Engineer Keisuke Kawamura Tomoki Matsui
(Above 10 GHz) (1 GHz - 10 GHz)
Mode Tx 11b 2462 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2483.500	PK	51.0	28.1	6.8	32.1	-	53.8	73.9	20.1	
Hori	4924.000	PK	43.3	33.3	9.1	31.3	-	54.4	73.9	19.5	
Hori	7386.000	PK	42.0	36.8	10.1	32.6	-	56.3	73.9	17.6	Floor noise
Hori	9848.000	PK	42.1	38.2	11.0	32.7	-	58.6	73.9	15.3	Floor noise
Hori	2483.500	AV	42.5	28.1	6.8	32.1	-	45.3	53.9	8.6	
Hori	4924.000	AV	37.0	33.3	9.1	31.3	-	48.1	53.9	5.8	
Hori	7386.000	AV	33.2	36.8	10.1	32.6	-	47.5	53.9	6.4	Floor noise
Hori	9848.000	AV	31.2	38.2	11.0	32.7	-	47.7	53.9	6.2	Floor noise
Vert	2483.500	PK	50.0	28.1	6.8	32.1	-	52.8	73.9	21.1	
Vert	4924.000	PK	45.2	33.3	8.2	31.3	-	55.4	73.9	18.5	
Vert	7386.000	PK	42.1	36.8	10.1	32.6	-	56.4	73.9	17.5	Floor noise
Vert	9848.000	PK	42.4	38.2	11.0	32.7	-	58.9	73.9	15.0	Floor noise
Vert	2483.500	AV	41.6	28.1	6.8	32.1	-	44.4	53.9	9.5	
Vert	4924.000	AV	38.6	33.3	8.2	31.3	-	48.8	53.9	5.1	
Vert	7386.000	AV	33.5	36.8	10.1	32.6	-	47.8	53.9	6.1	Floor noise
Vert	9848.000	AV	31.2	38.2	11.0	32.7	-	47.7	53.9	6.2	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

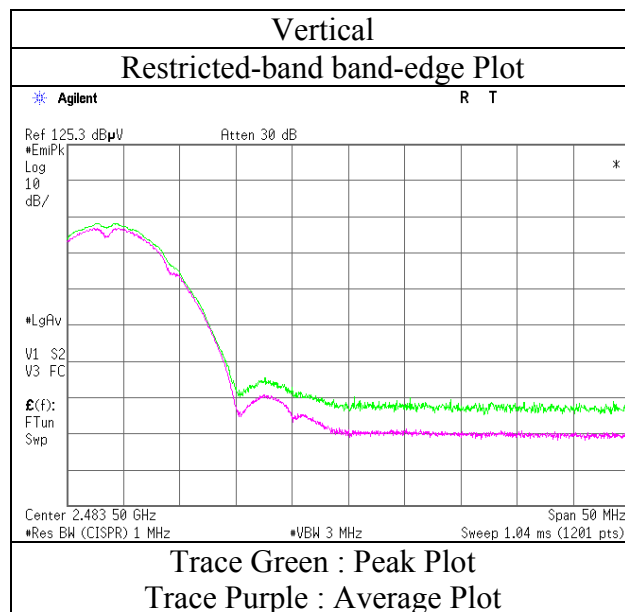
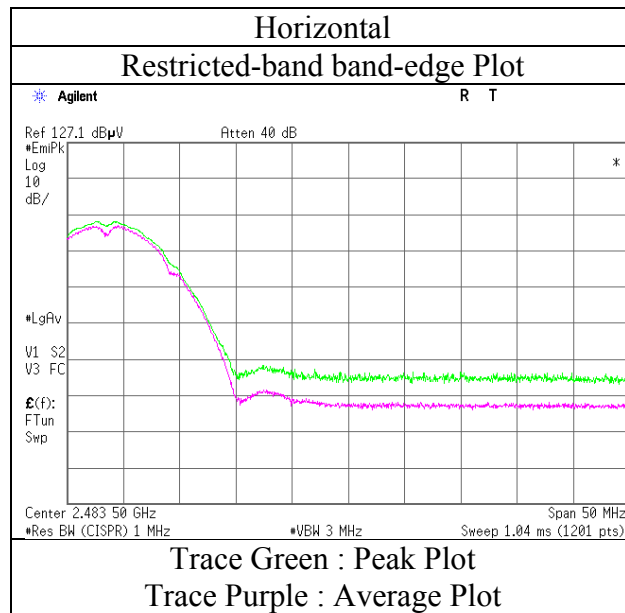
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Reference Plot for band-edge (Antenna : M/N H2U84W1H1S)

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11182619H
Date	August 9, 2016
Temperature / Humidity	27 deg. C / 48 % RH
Engineer	Tomoki Matsui
	(1 GHz - 10 GHz)
Mode	Tx 11b 2462 MHz



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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

(Antenna : M/N H2U84W1H1S)

Report No.	11182619H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.4
Date	June 21, 2016	August 9, 2016
Temperature / Humidity	21 deg. C / 54 % RH	27 deg. C / 48 % RH
Engineer	Keisuke Kawamura (Above 10 GHz)	Tomoki Matsui (1 GHz - 10 GHz)
Mode	Tx 11g 2412 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	66.5	27.9	6.7	32.1	-	69.0	73.9	4.9	
Hori	4824.000	PK	41.4	32.9	9.0	31.3	-	52.0	73.9	21.9	Floor noise
Hori	7236.000	PK	42.6	36.8	10.1	32.6	-	56.9	73.9	17.0	Floor noise
Hori	9648.000	PK	40.0	38.1	11.0	32.6	-	56.5	73.9	17.4	Floor noise
Hori	2390.000	AV	48.7	27.9	6.7	32.1	0.7	51.9	53.9	2.0	*1)
Hori	4824.000	AV	32.0	32.9	9.0	31.3	-	42.6	53.9	11.3	Floor noise
Hori	7236.000	AV	32.0	36.8	10.1	32.6	-	46.3	53.9	7.6	Floor noise
Hori	9648.000	AV	31.1	38.1	11.0	32.6	-	47.6	53.9	6.3	Floor noise
Vert	2390.000	PK	64.9	27.9	6.7	32.1	-	67.4	73.9	6.5	
Vert	4824.000	PK	41.4	32.9	9.0	31.3	-	52.0	73.9	21.9	Floor noise
Vert	7236.000	PK	42.8	36.8	10.1	32.6	-	57.1	73.9	16.8	Floor noise
Vert	9648.000	PK	39.9	38.1	11.0	32.6	-	56.4	73.9	17.5	Floor noise
Vert	2390.000	AV	48.0	27.9	6.7	32.1	0.7	51.2	53.9	2.7	*1)
Vert	4824.000	AV	32.1	32.9	9.0	31.3	-	42.7	53.9	11.2	Floor noise
Vert	7236.000	AV	33.4	36.8	10.1	32.6	-	47.7	53.9	6.2	Floor noise
Vert	9648.000	AV	31.2	38.1	11.0	32.6	-	47.7	53.9	6.2	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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

20dBc Data Sheet

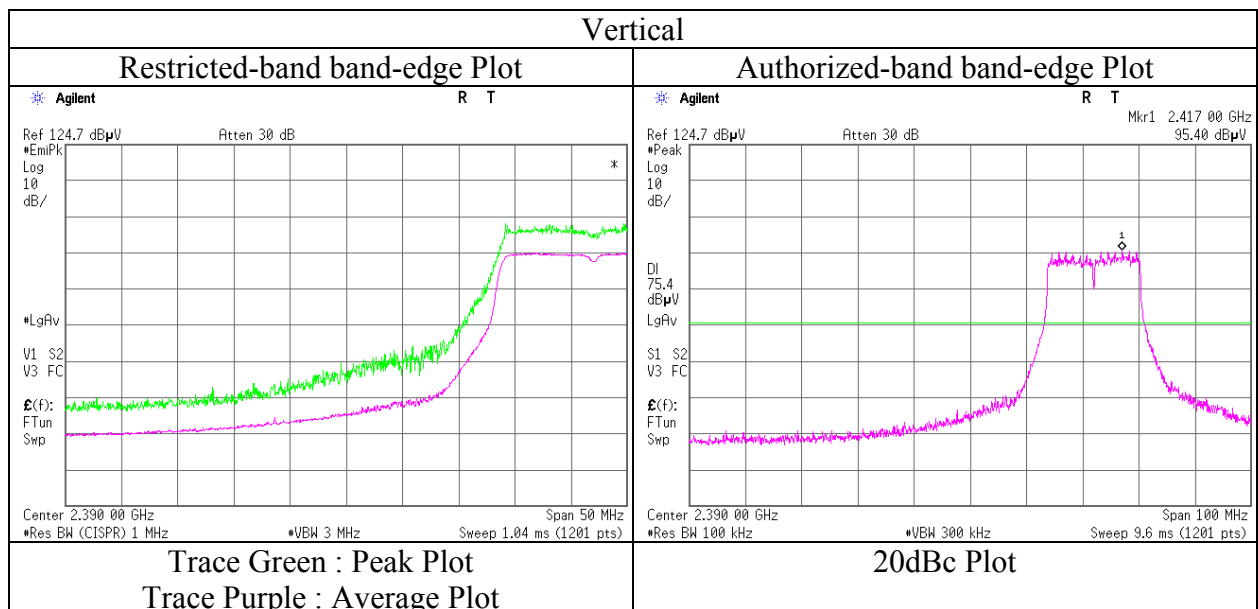
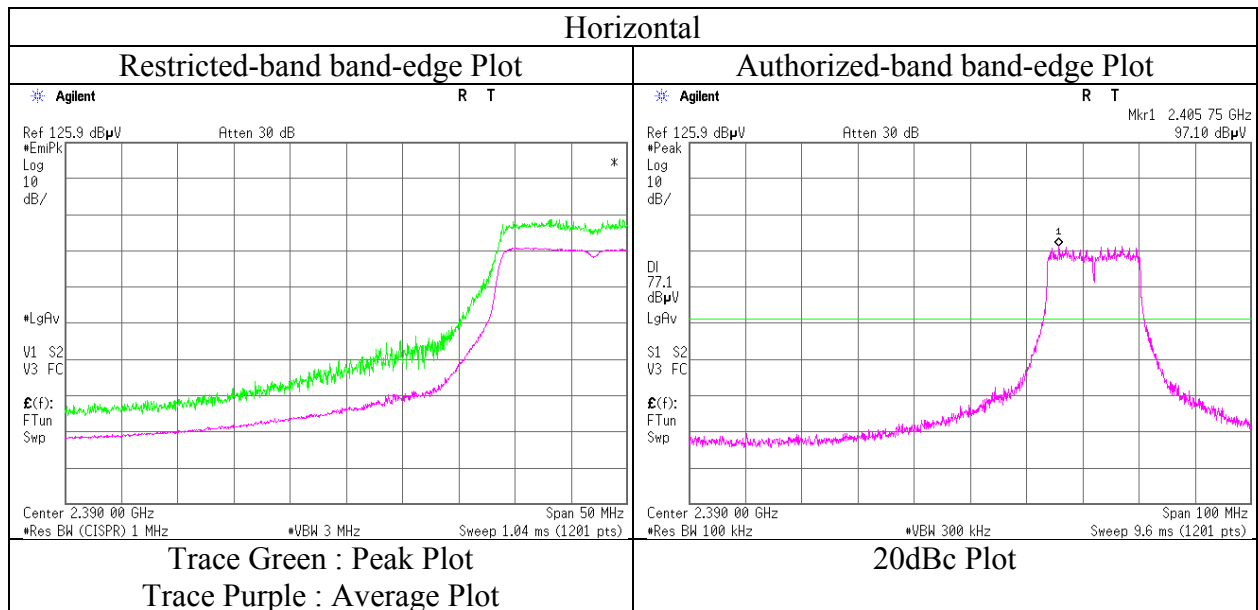
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	97.1	28.0	6.7	32.1	99.7	-	-	Carrier
Hori	2400.000	PK	63.5	28.0	6.7	32.1	66.1	79.7	13.6	
Vert	2412.000	PK	95.4	28.0	6.7	32.1	98.0	-	-	Carrier
Vert	2400.000	PK	61.0	28.0	6.7	32.1	63.6	78.0	14.4	

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

Radiated Spurious Emission

Reference Plot for band-edge (Antenna : M/N H2U84W1H1S)

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11182619H
Date	August 9, 2016
Temperature / Humidity	27 deg. C / 48 % RH
Engineer	Tomoki Matsui
	(1 GHz - 10 GHz)
Mode	Tx 11g 2412 MHz



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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission
(Antenna : M/N H2U84W1H1S)

Report No. 11182619H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.2 No.4 No.3
Date June 21, 2016 August 9, 2016 August 18, 2016
Temperature / Humidity 21 deg. C / 54 % RH 27 deg. C / 48 % RH 22 deg. C / 48 % RH
Engineer Keisuke Kawamura Tomoki Matsui Takafumi Noguchi
(Above 10 GHz) (1 GHz - 10 GHz) (Below 1 GHz)
Mode Tx 11g 2437 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	98.996	QP	47.5	9.6	8.0	32.2	-	32.9	43.5	10.6	
Hori	111.699	QP	24.0	11.3	8.2	32.2	-	11.3	43.5	32.2	
Hori	692.968	QP	42.4	19.7	12.4	32.1	-	42.4	46.0	3.6	
Hori	721.508	QP	30.7	20.0	12.5	32.0	-	31.2	46.0	14.8	
Hori	989.954	QP	30.1	22.4	13.8	30.5	-	35.8	53.9	18.1	
Hori	1000.000	QP	30.5	22.5	13.9	30.4	-	36.5	53.9	17.4	
Hori	4874.000	PK	41.0	33.1	8.1	31.3	-	50.9	73.9	23.0	Floor noise
Hori	7311.000	PK	42.6	36.8	10.1	32.6	-	56.9	73.9	17.0	Floor noise
Hori	9748.000	PK	40.3	38.2	11.0	32.7	-	56.8	73.9	17.1	Floor noise
Hori	4874.000	AV	32.3	33.1	8.1	31.3	-	42.2	53.9	11.7	Floor noise
Hori	7311.000	AV	33.3	36.8	10.1	32.6	-	47.6	53.9	6.3	Floor noise
Hori	9748.000	AV	31.3	38.2	11.0	32.7	-	47.8	53.9	6.1	Floor noise
Vert	98.996	QP	56.0	9.6	8.0	32.2	-	41.4	43.5	2.1	
Vert	111.699	QP	26.4	11.3	8.2	32.2	-	13.7	43.5	29.8	
Vert	692.968	QP	39.5	19.7	12.4	32.1	-	39.5	46.0	6.5	
Vert	721.508	QP	28.6	20.0	12.5	32.0	-	29.1	46.0	16.9	
Vert	989.954	QP	26.8	22.4	13.8	30.5	-	32.5	53.9	21.4	
Vert	1000.000	QP	25.9	22.5	13.9	30.4	-	31.9	53.9	22.0	
Vert	4874.000	PK	41.2	33.1	8.1	31.3	-	51.1	73.9	22.8	Floor noise
Vert	7311.000	PK	42.4	36.8	10.1	32.6	-	56.7	73.9	17.2	Floor noise
Vert	9748.000	PK	40.1	38.2	11.0	32.7	-	56.6	73.9	17.3	Floor noise
Vert	4874.000	AV	32.3	33.1	8.1	31.3	-	42.2	53.9	11.7	Floor noise
Vert	7311.000	AV	33.2	36.8	10.1	32.6	-	47.5	53.9	6.4	Floor noise
Vert	9748.000	AV	31.2	38.2	11.0	32.7	-	47.7	53.9	6.2	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission
(Antenna : M/N H2U84W1H1S)

Report No. 11182619H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.2 No.4
Date June 21, 2016 August 9, 2016
Temperature / Humidity 21 deg. C / 54 % RH 27 deg. C / 48 % RH
Engineer Keisuke Kawamura Tomoki Matsui
(Above 10 GHz) (1 GHz - 10 GHz)
Mode Tx 11g 2462MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2483.500	PK	57.7	28.1	6.8	32.1	-	60.5	73.9	13.4	
Hori	4924.000	PK	40.8	33.3	9.1	31.3	-	51.9	73.9	22.0	Floor noise
Hori	7386.000	PK	42.0	36.8	10.1	32.6	-	56.3	73.9	17.6	Floor noise
Hori	9848.000	PK	42.1	38.2	11.0	32.7	-	58.6	73.9	15.3	Floor noise
Hori	2483.500	AV	44.8	28.1	6.8	32.1	0.7	48.3	53.9	5.6	*1)
Hori	4924.000	AV	32.0	33.3	9.1	31.3	-	43.1	53.9	10.8	Floor noise
Hori	7386.000	AV	33.2	36.8	10.1	32.6	-	47.5	53.9	6.4	Floor noise
Hori	9848.000	AV	31.2	38.2	11.0	32.7	-	47.7	53.9	6.2	Floor noise
Vert	2483.500	PK	55.7	28.1	6.8	32.1	-	58.5	73.9	15.4	
Vert	4924.000	PK	40.6	33.3	9.1	31.3	-	51.7	73.9	22.2	Floor noise
Vert	7386.000	PK	42.1	36.8	10.1	32.6	-	56.4	73.9	17.5	Floor noise
Vert	9848.000	PK	42.4	38.2	11.0	32.7	-	58.9	73.9	15.0	Floor noise
Vert	2483.500	AV	44.1	28.1	6.8	32.1	0.7	47.6	53.9	6.3	*1)
Vert	4924.000	AV	32.1	33.3	9.1	31.3	-	43.2	53.9	10.7	Floor noise
Vert	7386.000	AV	33.5	36.8	10.1	32.6	-	47.8	53.9	6.1	Floor noise
Vert	9848.000	AV	31.2	38.2	11.0	32.7	-	47.7	53.9	6.2	Floor noise

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

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

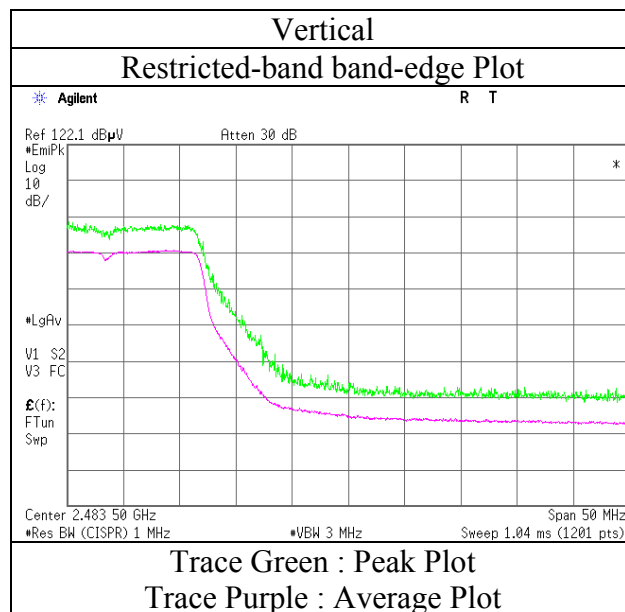
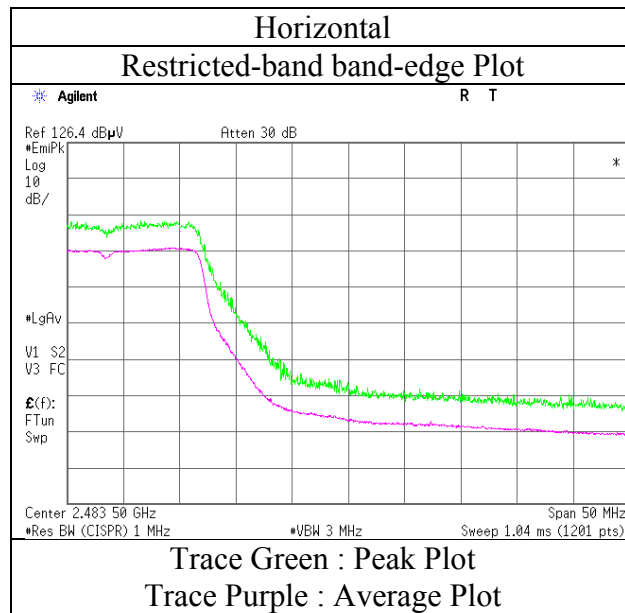
Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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

Radiated Spurious Emission

Reference Plot for band-edge (Antenna : M/N H2U84W1H1S)

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11182619H
Date	August 9, 2016
Temperature / Humidity	27 deg. C / 48 % RH
Engineer	Tomoki Matsui
	(1 GHz - 10 GHz)
Mode	Tx 11g 2462 MHz



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

Radiated Spurious Emission

(Antenna : M/N H2U84W1H1S)

Test place : Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 11182619H
Date : August 9, 2016
Temperature / Humidity : 27 deg. C / 48 % RH
Engineer : Tomoki Matsui
(Band Edge)
Mode : Tx 11n-20 2412 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	61.1	27.9	6.7	32.1	-	63.6	73.9	10.3	
Hori	2390.000	AV	47.1	27.9	6.7	32.1	0.7	50.3	53.9	3.6	*1)
Vert	2390.000	PK	61.1	27.9	6.7	32.1	-	63.6	73.9	10.3	
Vert	2390.000	AV	46.3	27.9	6.7	32.1	0.7	49.5	53.9	4.4	*1)

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

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

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

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

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	95.4	28.0	6.7	32.1	98.0	-	-	Carrier
Hori	2400.000	PK	61.0	28.0	6.7	32.1	63.6	78.0	14.4	
Vert	2412.000	PK	94.0	28.0	6.7	32.1	96.6	-	-	Carrier
Vert	2400.000	PK	59.4	28.0	6.7	32.1	62.0	76.6	14.6	

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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

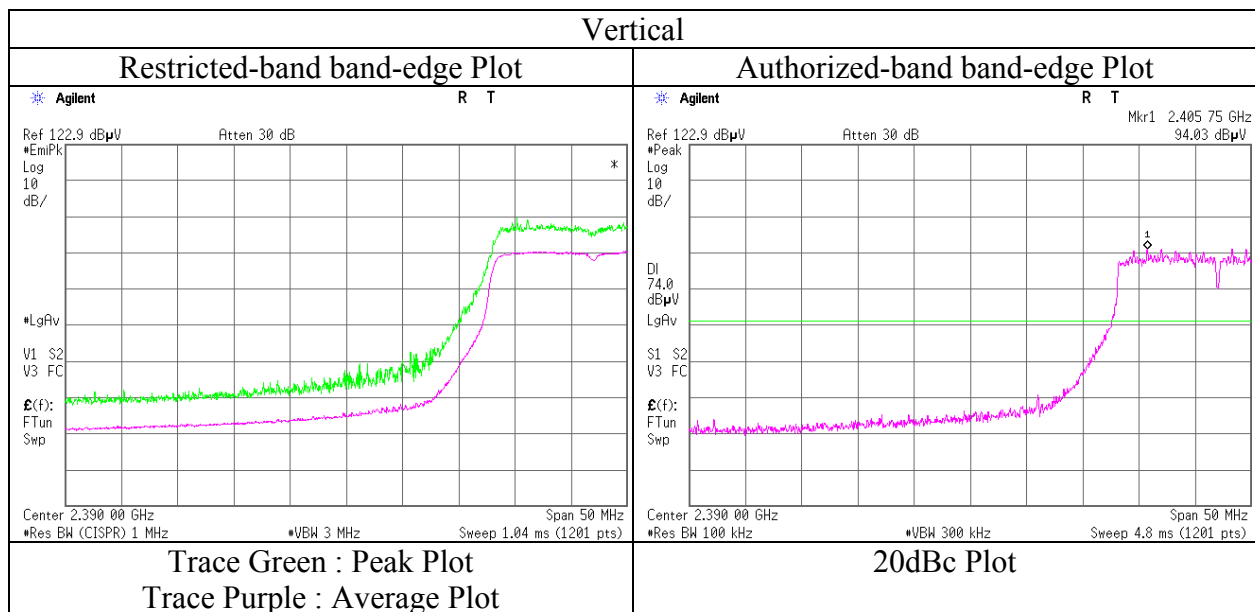
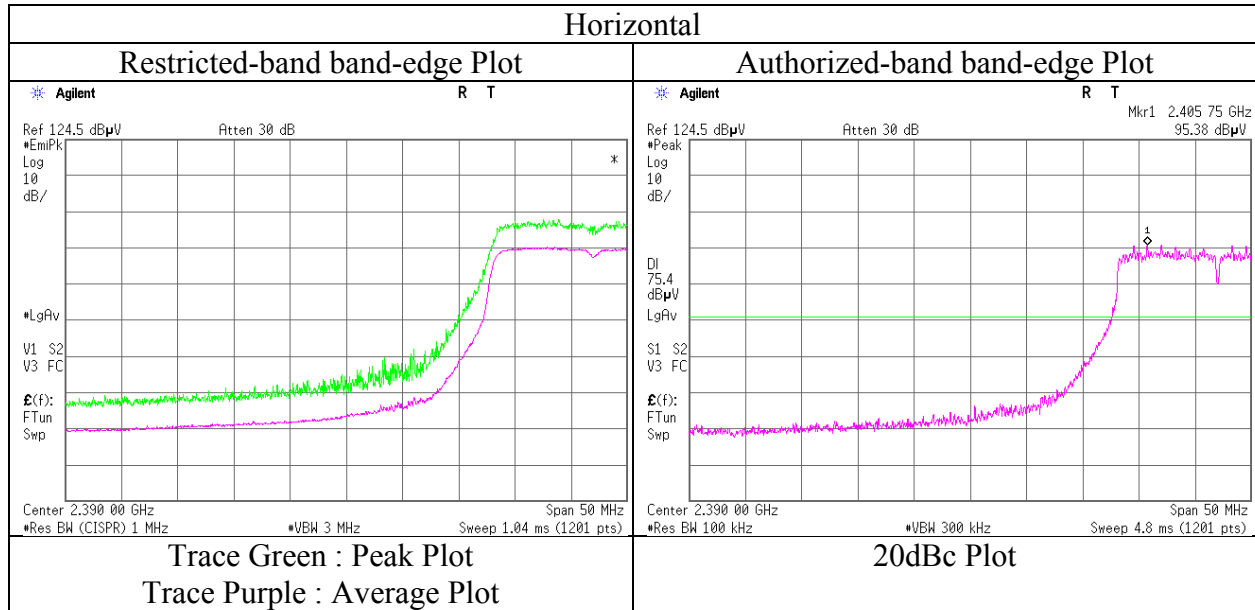
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Reference Plot for band-edge (Antenna : M/N H2U84W1H1S)

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11182619H
Date	August 9, 2016
Temperature / Humidity	27 deg. C / 48 % RH
Engineer	Tomoki Matsui (Band Edge)
Mode	Tx 11n-20 2412 MHz



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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission
(Antenna : M/N H2U84W1H1S)

Test place : Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 11182619H
Date : August 9, 2016
Temperature / Humidity : 27 deg. C / 48 % RH
Engineer : Tomoki Matsui
(Band Edge)
Mode : Tx 11n-20 2462 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2483.500	PK	57.7	28.1	6.8	32.1	-	60.5	73.9	13.4	
Hori	2483.500	AV	46.2	28.1	6.8	32.1	0.7	49.7	53.9	4.2	*1)
Vert	2483.500	PK	55.2	28.1	6.8	32.1	-	58.0	73.9	15.9	
Vert	2483.500	AV	43.3	28.1	6.8	32.1	0.7	46.8	53.9	7.1	*1)

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

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

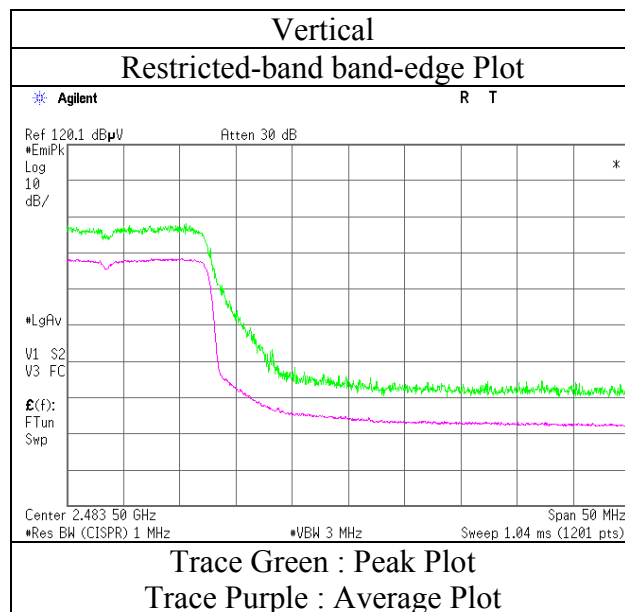
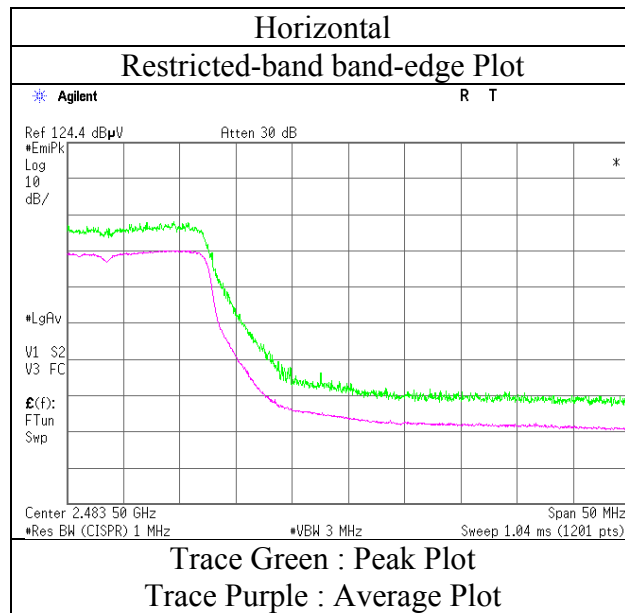
Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

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

Radiated Spurious Emission

Reference Plot for band-edge (Antenna : M/N H2U84W1H1S)

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11182619H
Date	August 9, 2016
Temperature / Humidity	27 deg. C / 48 % RH
Engineer	Tomoki Matsui (Band Edge)
Mode	Tx 11n-20 2462 MHz



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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission
(Antenna : M/N H2U84W1H1S)

Report No. 11182619H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.2 No.4
Date June 21, 2016 August 9, 2016
Temperature / Humidity 21 deg. C / 54 % RH 27 deg. C / 48 % RH
Engineer Keisuke Kawamura Tomoki Matsui
(Above 10 GHz) (1 GHz - 10 GHz)
Mode Tx 11n-40 2422 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	57.1	27.9	6.7	32.1	-	59.6	73.9	14.3	
Hori	4844.000	PK	40.6	33.0	9.0	31.3	-	51.3	73.9	22.6	Floor noise
Hori	7266.000	PK	42.0	36.8	10.1	32.6	-	56.3	73.9	17.6	Floor noise
Hori	9688.000	PK	41.2	38.1	11.0	32.7	-	57.6	73.9	16.3	Floor noise
Hori	2390.000	AV	45.0	27.9	6.7	32.1	1.3	48.8	53.9	5.1	*1)
Hori	4844.000	AV	32.0	33.0	9.0	31.3	-	42.7	53.9	11.2	Floor noise
Hori	7266.000	AV	32.9	36.8	10.1	32.6	-	47.2	53.9	6.7	Floor noise
Hori	9688.000	AV	31.3	38.1	11.0	32.7	-	47.7	53.9	6.2	Floor noise
Vert	2390.000	PK	56.7	27.9	6.7	32.1	-	59.2	73.9	14.7	
Vert	4844.000	PK	40.8	33.0	9.0	31.3	-	51.5	73.9	22.4	Floor noise
Vert	7266.000	PK	42.3	36.8	10.1	32.6	-	56.6	73.9	17.3	Floor noise
Vert	9688.000	PK	41.4	38.1	11.0	32.7	-	57.8	73.9	16.1	Floor noise
Vert	2390.000	AV	42.9	27.9	6.7	32.1	1.3	46.7	53.9	7.2	*1)
Vert	4844.000	AV	31.8	33.0	9.0	31.3	-	42.5	53.9	11.4	Floor noise
Vert	7266.000	AV	33.0	36.8	10.1	32.6	-	47.3	53.9	6.6	Floor noise
Vert	9688.000	AV	31.2	38.1	11.0	32.7	-	47.6	53.9	6.3	Floor noise

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

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB
*1) Not Out of Band emission(Leakage Power)

20dBc Data Sheet

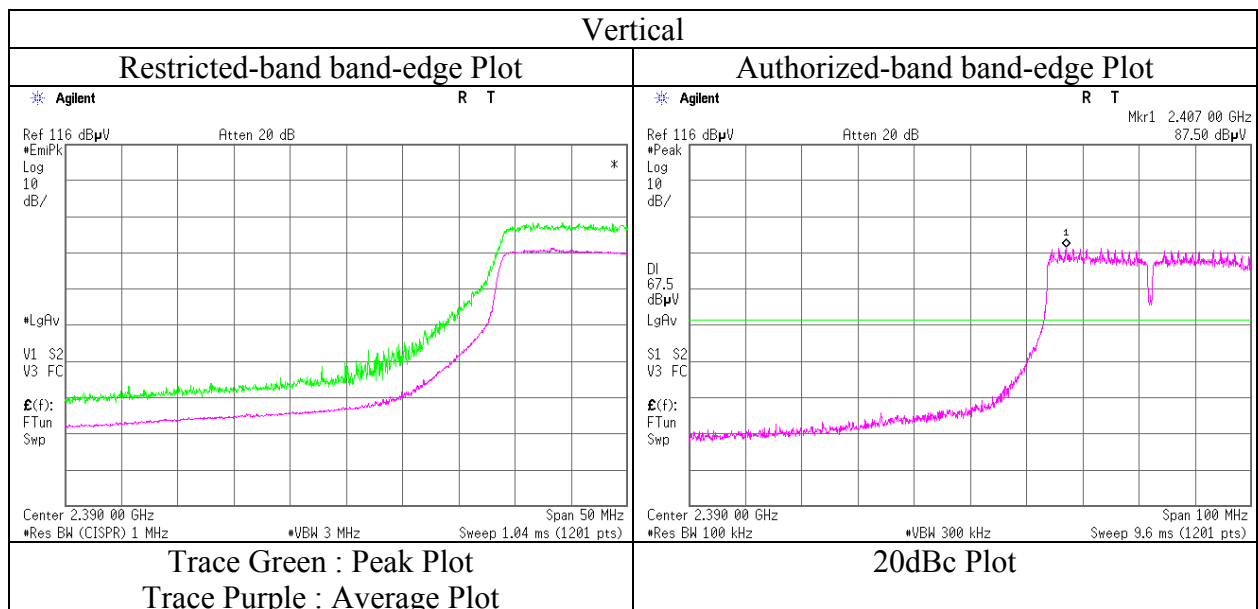
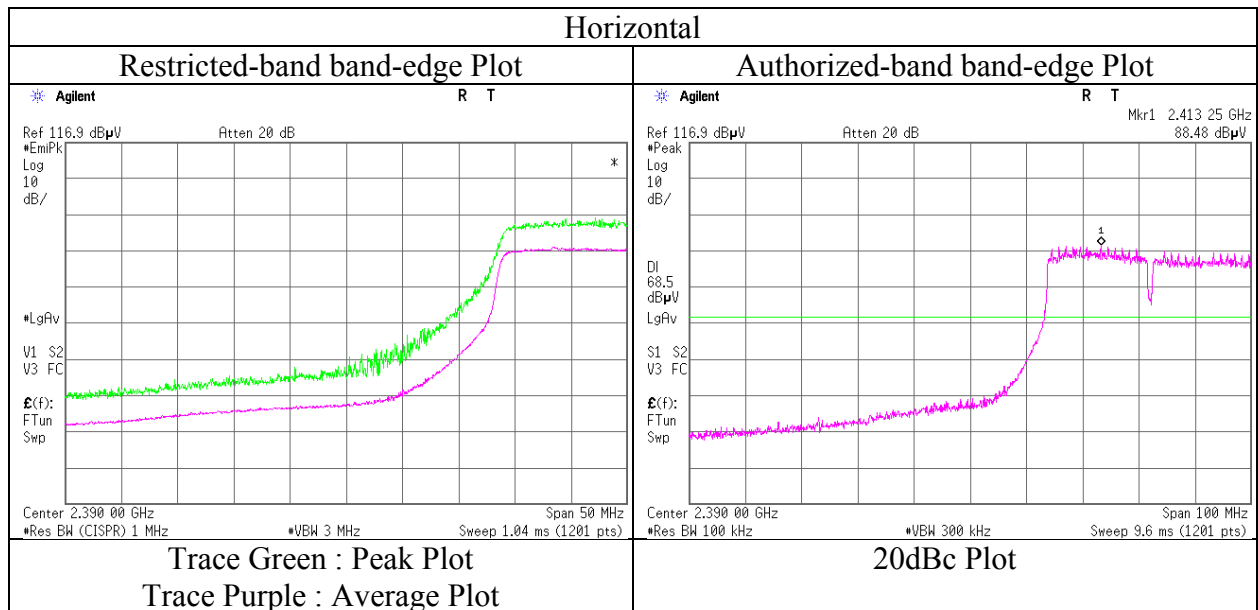
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2422.000	PK	88.5	28.0	6.7	32.1	91.1	-	-	Carrier
Hori	2400.000	PK	57.4	28.0	6.7	32.1	60.0	71.1	11.1	
Vert	2422.000	PK	87.5	28.0	6.7	32.1	90.1	-	-	Carrier
Vert	2400.000	PK	56.5	28.0	6.7	32.1	59.1	70.1	11.0	

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

Radiated Spurious Emission

Reference Plot for band-edge (Antenna : M/N H2U84W1H1S)

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11182619H
Date	August 9, 2016
Temperature / Humidity	27 deg. C / 48 % RH
Engineer	Tomoki Matsui
	(1 GHz - 10 GHz)
Mode	Tx 11n-40 2422 MHz



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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

(Antenna : M/N H2U84W1H1S)

Report No.	11182619H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.4
Date	June 21, 2016	August 9, 2016
Temperature / Humidity	21 deg. C / 54 % RH	27 deg. C / 48 % RH
Engineer	Keisuke Kawamura	Tomoki Matsui
	(Above 10 GHz)	(1 GHz - 10 GHz)
Mode	Tx 11n-40 2437 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	57.6	27.9	6.7	32.1	-	60.1	73.9	13.8	
Hori	2483.500	PK	58.8	28.1	6.8	32.1	-	61.6	73.9	12.3	
Hori	4874.000	PK	41.0	33.1	9.0	31.3	-	51.8	73.9	22.1	Floor noise
Hori	7311.000	PK	42.5	36.8	10.1	32.6	-	56.8	73.9	17.1	Floor noise
Hori	9748.000	PK	40.2	38.2	11.0	32.7	-	56.7	73.9	17.2	Floor noise
Hori	2390.000	AV	44.7	27.9	6.7	32.1	1.3	48.5	53.9	5.4	*1)
Hori	2483.500	AV	46.8	28.1	6.8	32.1	1.3	50.9	53.9	3.0	*1)
Hori	4874.000	AV	32.3	33.1	9.0	31.3	-	43.1	53.9	10.8	Floor noise
Hori	7311.000	AV	33.3	36.8	10.1	32.6	-	47.6	53.9	6.3	Floor noise
Hori	9748.000	AV	31.1	38.2	11.0	32.7	-	47.6	53.9	6.3	Floor noise
Vert	2390.000	PK	57.9	27.9	6.7	32.1	-	60.4	73.9	13.5	
Vert	2483.500	PK	56.8	28.1	6.8	32.1	-	59.6	73.9	14.3	
Vert	4874.000	PK	41.0	33.1	9.0	31.3	-	51.8	73.9	22.1	Floor noise
Vert	7311.000	PK	42.5	36.8	10.1	32.6	-	56.8	73.9	17.1	Floor noise
Vert	9748.000	PK	40.2	38.2	11.0	32.7	-	56.7	73.9	17.2	Floor noise
Vert	2390.000	AV	43.2	27.9	6.7	32.1	1.3	47.0	53.9	6.9	*1)
Vert	2483.500	AV	44.7	28.1	6.8	32.1	1.3	48.8	53.9	5.1	*1)
Vert	4874.000	AV	32.3	33.1	9.0	31.3	-	43.1	53.9	10.8	Floor noise
Vert	7311.000	AV	33.3	36.8	10.1	32.6	-	47.6	53.9	6.3	Floor noise
Vert	9748.000	AV	31.2	38.2	11.0	32.7	-	47.7	53.9	6.2	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2437.000	PK	91.0	28.0	6.7	32.1	93.6	-	-	Carrier
Hori	2400.000	PK	48.9	28.0	6.7	32.1	51.5	73.6	22.1	
Vert	2437.000	PK	91.5	28.0	6.7	32.1	94.1	-	-	Carrier
Vert	2400.000	PK	47.2	28.0	6.7	32.1	49.8	74.1	24.3	

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

Radiated Spurious Emission
(Antenna : M/N H2U84W1H1S)

Report No. 11182619H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.2 No.4
Date June 21, 2016 August 9, 2016
Temperature / Humidity 21 deg. C / 54 % RH 27 deg. C / 48 % RH
Engineer Keisuke Kawamura Tomoki Matsui
(Above 10 GHz) (1 GHz - 10 GHz)
Mode Tx 11n-40 2452 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2483.500	PK	60.0	28.1	6.8	32.1	-	62.8	73.9	11.1	
Hori	4904.000	PK	40.7	33.2	9.1	31.3	-	51.7	73.9	22.2	Floor noise
Hori	7356.000	PK	41.9	36.8	10.1	32.6	-	56.2	73.9	17.7	Floor noise
Hori	9808.000	PK	41.8	38.2	11.0	32.7	-	58.3	73.9	15.6	Floor noise
Hori	2483.500	AV	46.5	28.1	6.8	32.1	1.3	50.6	53.9	3.3	*1)
Hori	4904.000	AV	32.1	33.2	9.1	31.3	-	43.1	53.9	10.8	Floor noise
Hori	7356.000	AV	33.2	36.8	10.1	32.6	-	47.5	53.9	6.4	Floor noise
Hori	9808.000	AV	31.2	38.2	11.0	32.7	-	47.7	53.9	6.2	Floor noise
Vert	2483.500	PK	58.1	28.1	6.8	32.1	-	60.9	73.9	13.0	
Vert	4904.000	PK	40.5	33.2	9.1	31.3	-	51.5	73.9	22.4	Floor noise
Vert	7356.000	PK	41.9	36.8	10.1	32.6	-	56.2	73.9	17.7	Floor noise
Vert	9808.000	PK	41.8	38.2	11.0	32.7	-	58.3	73.9	15.6	Floor noise
Vert	2483.500	AV	44.5	28.1	6.8	32.1	1.3	48.6	53.9	5.3	*1)
Vert	4904.000	AV	32.0	33.2	9.1	31.3	-	43.0	53.9	10.9	Floor noise
Vert	7356.000	AV	33.2	36.8	10.1	32.6	-	47.5	53.9	6.4	Floor noise
Vert	9808.000	AV	31.1	38.2	11.0	32.7	-	47.6	53.9	6.3	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB

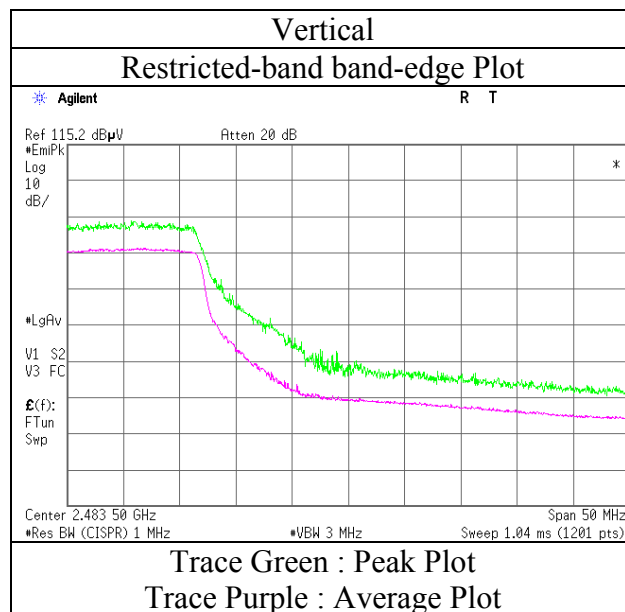
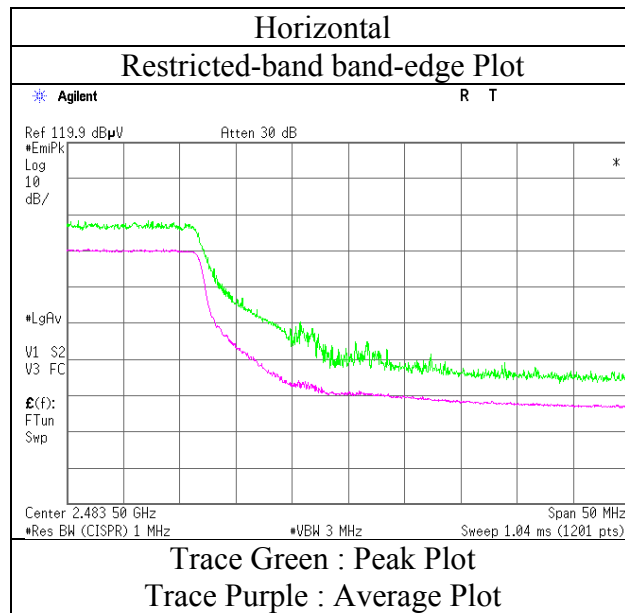
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

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

Radiated Spurious Emission

Reference Plot for band-edge (Antenna : M/N H2U84W1H1S)

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	11182619H
Date	August 9, 2016
Temperature / Humidity	27 deg. C / 48 % RH
Engineer	Tomoki Matsui
	(1 GHz - 10 GHz)
Mode	Tx 11n-40 2452 MHz



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

Radiated Spurious Emission

(Antenna : M/N H2U84W1H1S)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11182619H		
Date	June 20, 2016	June 21, 2016	August 19, 2016
Temperature / Humidity	22 deg. C / 62 % RH	21 deg. C / 54 % RH	23 deg. C / 62 % RH
Engineer	Keisuke Kawamura (1 GHz - 10 GHz)	Keisuke Kawamura (Above 10 GHz)	Satofumi Matsuyama (Below 1 GHz)
Mode	Tx BT LE 2402 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	272.228	QP	31.5	13.0	9.7	32.0	-	22.2	46.0	23.8	
Hori	296.989	QP	46.6	13.5	9.9	31.9	-	38.1	46.0	7.9	
Hori	321.736	QP	29.0	14.0	10.1	31.9	-	21.2	46.0	24.8	
Hori	325.526	QP	32.0	14.1	10.1	31.9	-	24.3	46.0	21.7	
Hori	742.453	QP	32.3	20.2	12.6	31.8	-	33.3	46.0	12.7	
Hori	874.959	QP	34.0	21.8	13.3	31.1	-	38.0	46.0	8.0	
Hori	2390.000	PK	42.2	26.7	6.8	32.7	-	43.0	73.9	30.9	
Hori	4804.000	PK	42.0	31.0	9.1	31.8	-	50.3	73.9	23.6	Floor noise
Hori	7206.000	PK	42.3	35.7	10.3	32.6	-	55.7	73.9	18.2	Floor noise
Hori	9608.000	PK	44.4	37.2	11.0	33.2	-	59.4	73.9	14.5	Floor noise
Hori	20880.060	PK	45.3	38.2	-1.0	33.0	-	49.5	73.9	24.4	
Hori	2390.000	AV	33.8	26.7	6.8	32.7	1.7	36.3	53.9	17.6	*1)
Hori	4804.000	AV	33.3	31.0	9.1	31.8	-	41.6	53.9	12.3	Floor noise
Hori	7206.000	AV	31.0	35.7	10.3	32.6	-	44.4	53.9	9.5	Floor noise
Hori	9608.000	AV	32.1	37.2	11.0	33.2	-	47.1	53.9	6.8	Floor noise
Hori	20880.060	AV	39.1	38.2	-1.0	33.0	-	43.3	53.9	10.6	
Vert	272.228	QP	30.7	13.0	9.7	32.0	-	21.4	46.0	24.6	
Vert	296.989	QP	44.1	13.5	9.9	31.9	-	35.6	46.0	10.4	
Vert	321.736	QP	29.9	14.0	10.1	31.9	-	22.1	46.0	23.9	
Vert	325.526	QP	30.1	14.1	10.1	31.9	-	22.4	46.0	23.6	
Vert	742.453	QP	29.2	20.2	12.6	31.8	-	30.2	46.0	15.8	
Vert	874.959	QP	33.2	21.8	13.3	31.1	-	37.2	46.0	8.8	
Vert	2390.000	PK	42.0	26.7	6.8	32.7	-	42.8	73.9	31.1	
Vert	4804.000	PK	41.8	31.0	9.1	31.8	-	50.1	73.9	23.8	Floor noise
Vert	7206.000	PK	42.3	35.7	10.3	32.6	-	55.7	73.9	18.2	Floor noise
Vert	9608.000	PK	44.4	37.2	11.0	33.2	-	59.4	73.9	14.5	Floor noise
Vert	20880.060	PK	50.0	38.2	-1.0	33.0	-	54.2	73.9	19.7	
Vert	2390.000	AV	33.6	26.7	6.8	32.7	1.7	36.1	53.9	17.8	*1)
Vert	4804.000	AV	33.3	31.0	9.1	31.8	-	41.6	53.9	12.3	Floor noise
Vert	7206.000	AV	30.8	35.7	10.3	32.6	-	44.2	53.9	9.7	Floor noise
Vert	9608.000	AV	32.1	37.2	11.0	33.2	-	47.1	53.9	6.8	Floor noise
Vert	20880.060	AV	46.1	38.2	-1.0	33.0	-	50.3	53.9	3.6	

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

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

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

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

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	91.4	26.7	6.8	32.7	92.2	-	-	Carrier
Hori	2400.000	PK	37.2	26.7	6.8	32.7	38.0	72.2	34.2	
Vert	2402.000	PK	91.0	26.7	6.8	32.7	91.8	-	-	Carrier
Vert	2400.000	PK	37.0	26.7	6.8	32.7	37.8	71.8	34.0	

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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

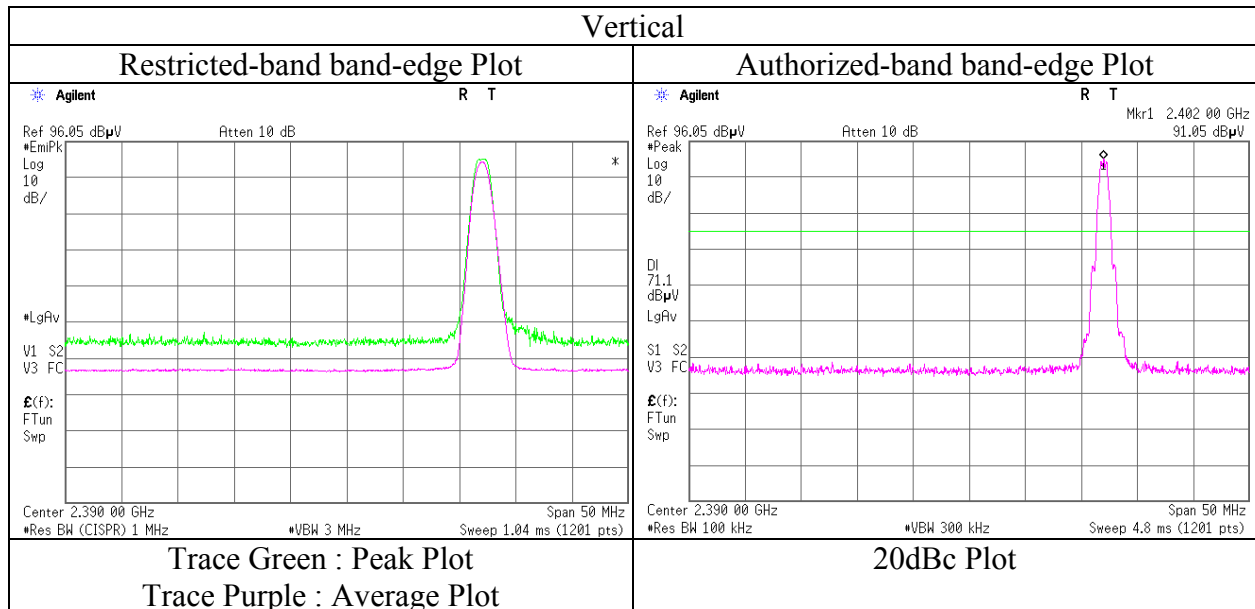
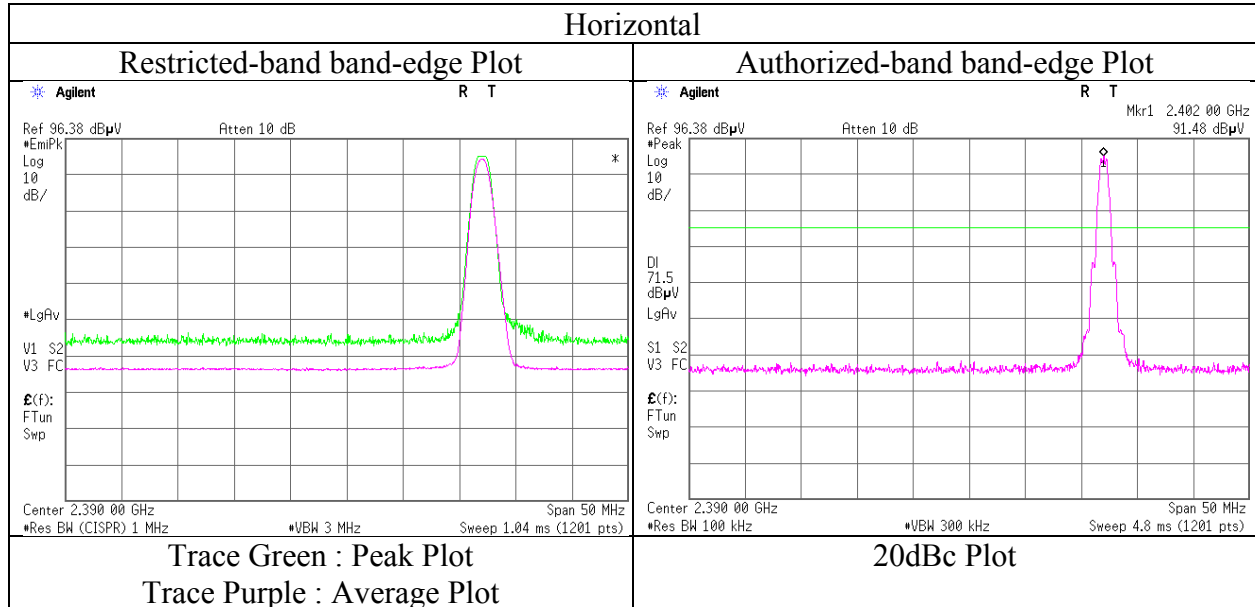
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Reference Plot for band-edge (Antenna : M/N H2U84W1H1S)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11182619H
Date	June 20, 2016
Temperature / Humidity	22 deg. C / 62 % RH
Engineer	Keisuke Kawamura
Mode	Tx BT LE 2402 MHz



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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

(Antenna : M/N H2U84W1H1S)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11182619H		
Date	June 20, 2016	June 21, 2016	August 19, 2016
Temperature / Humidity	22 deg. C / 62 % RH	21 deg. C / 54 % RH	22 deg. C / 54 % RH
Engineer	Keisuke Kawamura (1 GHz - 10 GHz)	Keisuke Kawamura (Above 10 GHz)	Takafumi Noguchi (Below 1 GHz)
Mode	Tx BT LE 2440 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	272.228	QP	35.4	13.0	9.7	32.0	-	26.1	46.0	19.9	
Hori	296.989	QP	48.1	13.5	9.9	31.9	-	39.6	46.0	6.4	
Hori	321.736	QP	35.1	14.0	10.1	31.9	-	27.3	46.0	18.7	
Hori	325.526	QP	32.3	14.1	10.1	31.9	-	24.6	46.0	21.4	
Hori	742.453	QP	33.7	20.2	12.6	31.8	-	34.7	46.0	11.3	
Hori	874.959	QP	35.3	21.8	13.3	31.1	-	39.3	46.0	6.7	
Hori	4880.000	PK	42.0	31.3	9.1	31.7	-	50.7	73.9	23.2	Floor noise
Hori	7320.000	PK	42.3	35.6	10.3	32.6	-	55.6	73.9	18.3	Floor noise
Hori	9760.000	PK	44.4	37.2	11.0	33.3	-	59.3	73.9	14.6	Floor noise
Hori	20880.060	PK	45.2	38.2	-1.0	33.0	-	49.4	73.9	24.5	
Hori	4880.000	AV	33.3	31.3	9.1	31.7	-	42.0	53.9	11.9	Floor noise
Hori	7320.000	AV	31.0	35.6	10.3	32.6	-	44.3	53.9	9.6	Floor noise
Hori	9760.000	AV	32.1	37.2	11.0	33.3	-	47.0	53.9	6.9	Floor noise
Hori	20880.060	AV	37.9	38.2	-1.0	33.0	-	42.1	53.9	11.8	
Vert	272.228	QP	30.9	13.0	9.7	32.0	-	21.6	46.0	24.4	
Vert	296.989	QP	41.6	13.5	9.9	31.9	-	33.1	46.0	12.9	
Vert	321.736	QP	29.4	14.0	10.1	31.9	-	21.6	46.0	24.4	
Vert	325.526	QP	27.1	14.1	10.1	31.9	-	19.4	46.0	26.6	
Vert	742.453	QP	30.1	20.2	12.6	31.8	-	31.1	46.0	14.9	
Vert	874.959	QP	34.2	21.8	13.3	31.1	-	38.2	46.0	7.8	
Vert	4880.000	PK	41.8	31.3	9.1	31.7	-	50.5	73.9	23.4	Floor noise
Vert	7320.000	PK	42.3	35.6	10.3	32.6	-	55.6	73.9	18.3	Floor noise
Vert	9760.000	PK	44.4	37.2	11.0	33.3	-	59.3	73.9	14.6	Floor noise
Vert	20880.060	PK	49.5	38.2	-1.0	33.0	-	53.7	73.9	20.2	
Vert	4880.000	AV	33.3	31.3	9.1	31.7	-	42.0	53.9	11.9	Floor noise
Vert	7320.000	AV	30.8	35.6	10.3	32.6	-	44.1	53.9	9.8	Floor noise
Vert	9760.000	AV	32.1	37.2	11.0	33.3	-	47.0	53.9	6.9	Floor noise
Vert	20880.060	AV	46.2	38.2	-1.0	33.0	-	50.4	53.9	3.5	

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

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB
 10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

(Antenna : M/N H2U84W1H1S)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11182619H		
Date	June 20, 2016	June 21, 2016	August 19, 2016
Temperature / Humidity	22 deg. C / 62 % RH	21 deg. C / 54 % RH	22 deg. C / 548 % RH
Engineer	Keisuke Kawamura (1 GHz - 10 GHz)	Keisuke Kawamura (Above 10 GHz)	Takafumi Noguchi (Below 1 GHz)
Mode	Tx BT LE 2480 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	272.228	QP	35.4	13.0	9.7	32.0	-	26.1	46.0	19.9	
Hori	296.989	QP	47.2	13.5	9.9	31.9	-	38.7	46.0	7.3	
Hori	321.736	QP	34.4	14.0	10.1	31.9	-	26.6	46.0	19.4	
Hori	325.526	QP	32.2	14.1	10.1	31.9	-	24.5	46.0	21.5	
Hori	742.453	QP	33.4	20.2	12.6	31.8	-	34.4	46.0	11.6	
Hori	874.959	QP	35.0	21.8	13.3	31.1	-	39.0	46.0	7.0	
Hori	2483.500	PK	50.6	26.8	6.9	32.6	-	51.7	73.9	22.2	
Hori	4960.000	PK	42.0	31.5	9.0	31.7	-	50.8	73.9	23.1	Floor noise
Hori	7440.000	PK	42.3	35.5	10.3	32.7	-	55.4	73.9	18.5	Floor noise
Hori	9920.000	PK	44.4	37.2	11.1	33.4	-	59.3	73.9	14.6	Floor noise
Hori	20880.060	PK	44.4	38.2	-1.0	33.0	-	48.6	73.9	25.3	
Hori	2483.500	AV	36.7	26.8	6.9	32.6	1.7	39.5	53.9	14.4	*1)
Hori	4960.000	AV	33.3	31.5	9.0	31.7	-	42.1	53.9	11.8	Floor noise
Hori	7440.000	AV	31.0	35.5	10.3	32.7	-	44.1	53.9	9.8	Floor noise
Hori	9920.000	AV	32.1	37.2	11.1	33.4	-	47.0	53.9	6.9	Floor noise
Hori	20880.060	AV	37.9	38.2	-1.0	33.0	-	42.1	53.9	11.8	
Vert	272.228	QP	31.3	13.0	9.7	32.0	-	22.0	46.0	24.0	
Vert	296.989	QP	40.7	13.5	9.9	31.9	-	32.2	46.0	13.8	
Vert	321.736	QP	28.2	14.0	10.1	31.9	-	20.4	46.0	25.6	
Vert	325.526	QP	26.7	14.1	10.1	31.9	-	19.0	46.0	27.0	
Vert	742.453	QP	30.2	20.2	12.6	31.8	-	31.2	46.0	14.8	
Vert	874.959	QP	34.2	21.8	13.3	31.1	-	38.2	46.0	7.8	
Vert	2483.500	PK	50.5	26.8	6.9	32.6	-	51.6	73.9	22.3	
Vert	4960.000	PK	41.8	31.5	9.0	31.7	-	50.6	73.9	23.3	Floor noise
Vert	7440.000	PK	42.3	35.5	10.3	32.7	-	55.4	73.9	18.5	Floor noise
Vert	9920.000	PK	44.4	37.2	11.1	33.4	-	59.3	73.9	14.6	Floor noise
Vert	20880.060	PK	49.4	38.2	-1.0	33.0	-	53.6	73.9	20.3	
Vert	2483.500	AV	36.9	26.8	6.9	32.6	1.7	39.7	53.9	14.2	*1)
Vert	4960.000	AV	33.3	31.5	9.0	31.7	-	42.1	53.9	11.8	Floor noise
Vert	7440.000	AV	30.8	35.5	10.3	32.7	-	43.9	53.9	10.0	Floor noise
Vert	9920.000	AV	32.1	37.2	11.1	33.4	-	47.0	53.9	6.9	Floor noise
Vert	20880.060	AV	46.0	38.2	-1.0	33.0	-	50.2	53.9	3.7	

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

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

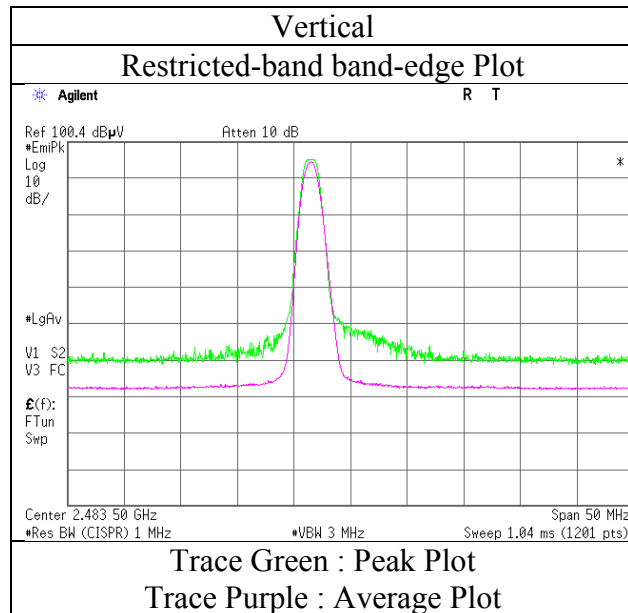
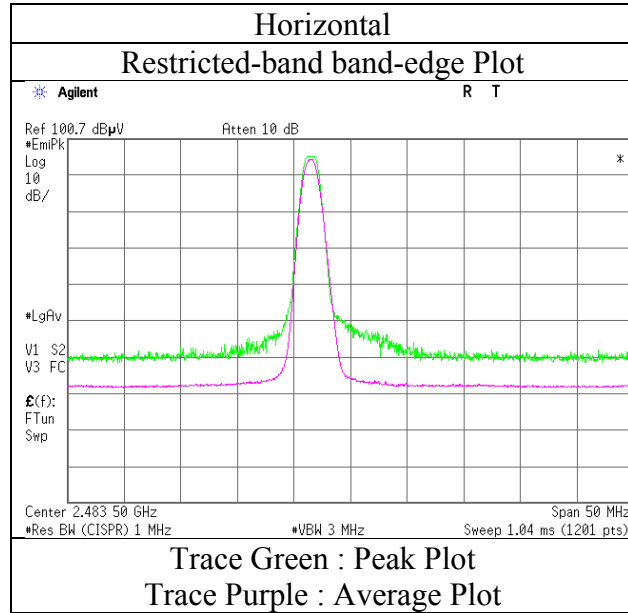
Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
 10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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

Radiated Spurious Emission

Reference Plot for band-edge (Antenna : M/N H2U84W1H1S)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11182619H
Date	June 20, 2016
Temperature / Humidity	22 deg. C / 62 % RH
Engineer	Keisuke Kawamura
Mode	Tx BT LE 2480 MHz



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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

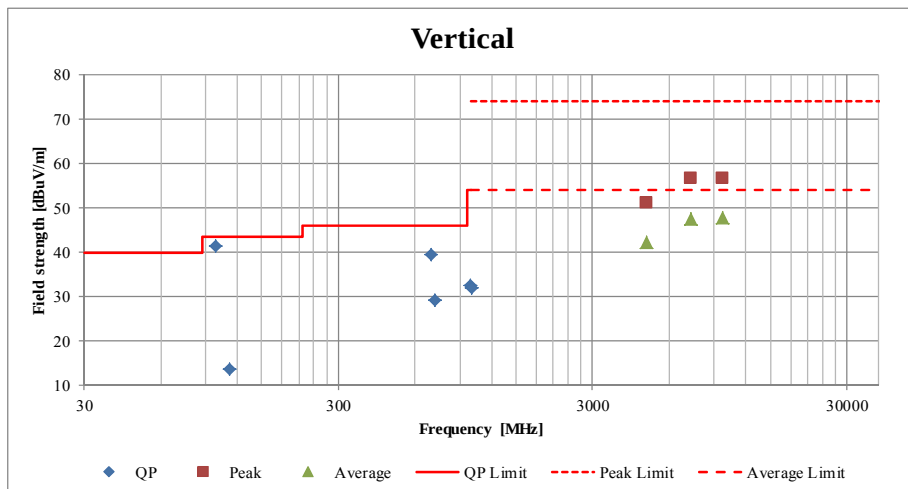
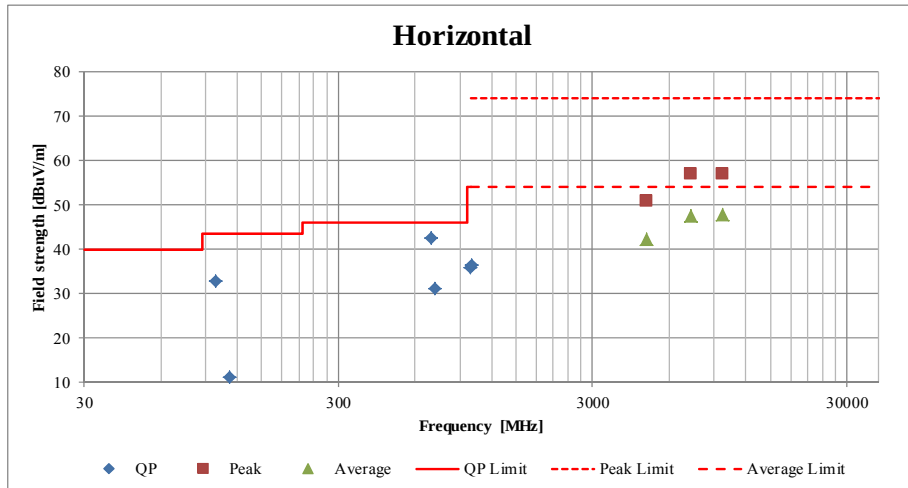
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Plot data, Worst case (Antenna : M/N H2U84W1H1S)

Report No.	11182619H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.4	No.3
Date	June 21, 2016	August 9, 2016	August 18, 2016
Temperature / Humidity	21 deg. C / 54 % RH	27 deg. C / 48 % RH	22 deg. C / 48 % RH
Engineer	Keisuke Kawamura (Above 10 GHz)	Tomoki Matsui (1 GHz - 10 GHz)	Takafumi Noguchi (Below 1 GHz)
Mode	Tx 11g 2437 MHz		



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

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

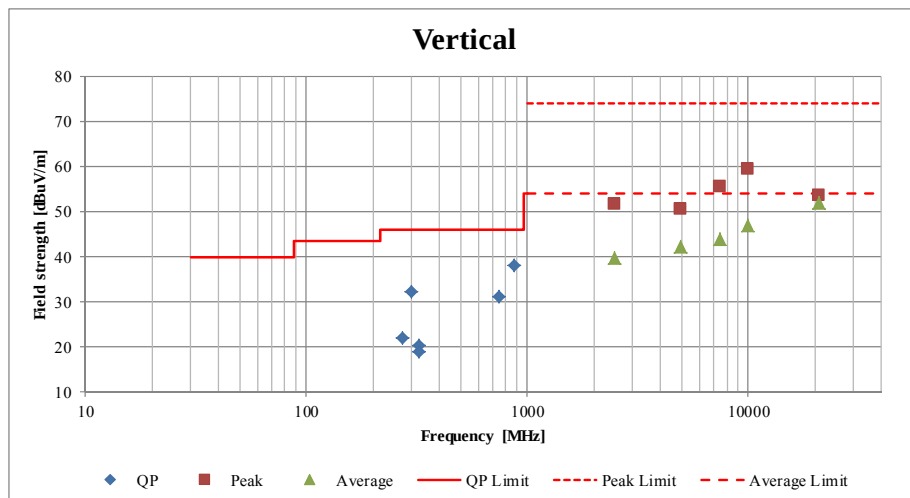
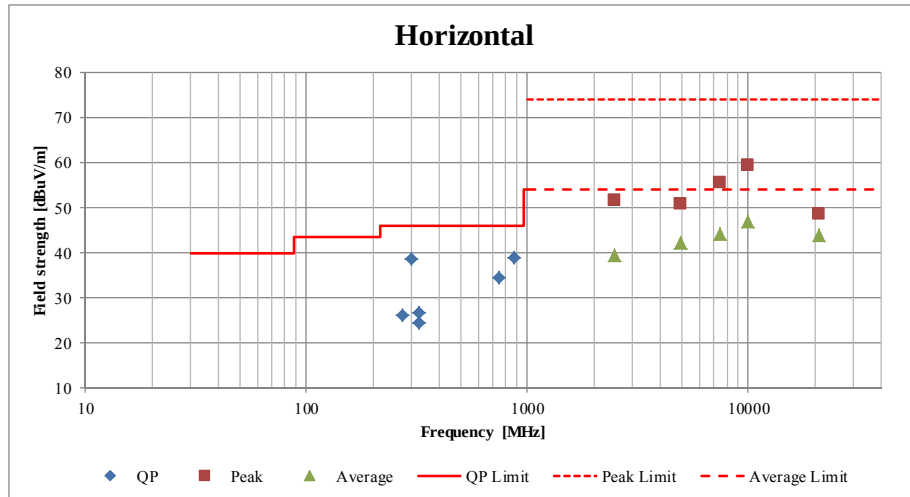
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Plot data, Worst case (Antenna : M/N H2U84W1H1S)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber		
Report No.	11182619H		
Date	June 20, 2016	June 21, 2016	August 19, 2016
Temperature / Humidity	22 deg. C / 62 % RH	21 deg. C / 54 % RH	22 deg. C / 54 % RH
Engineer	Keisuke Kawamura (1 GHz - 10 GHz)	Keisuke Kawamura (Above 10 GHz)	Takafumi Noguchi (Below 1 GHz)
Mode	Tx BT LE 2480 MHz		



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

UL Japan, Inc.

Ise EMC Lab.

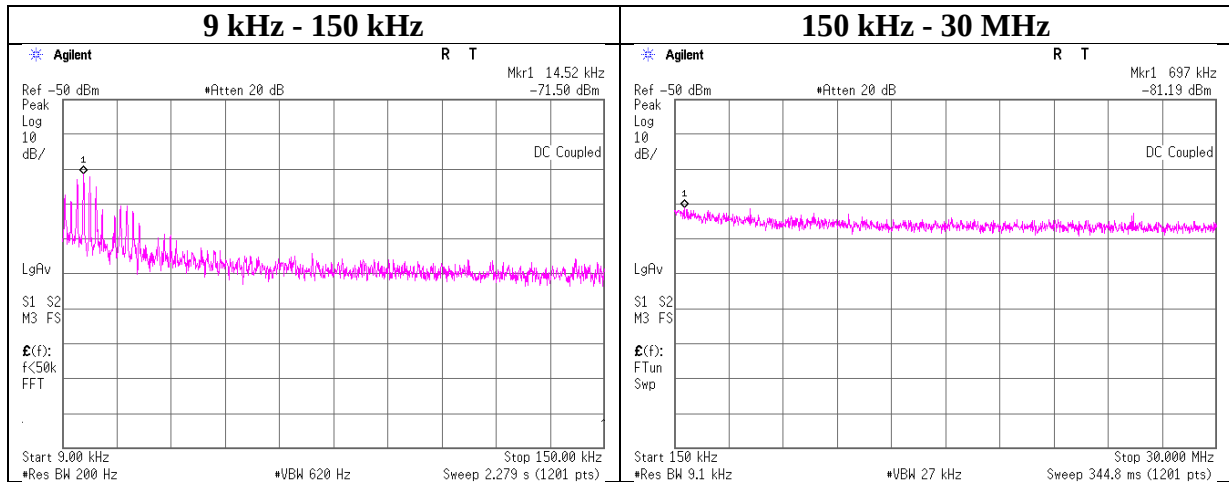
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 11182619H
Date : March 31, 2016
Temperature / Humidity : 22 deg. C / 33 % RH
Engineer : Yutaka Yoshida
Mode : Tx 11g 2437 MHz



Frequency	Reading	Cable Loss	Attenuator Loss	Antenna Gain	N (Number of Output)	EIRP	Distance	Ground bounce	E (field strength)	Limit	Margin	Remark
[kHz]	[dBm]	[dB]	[dB]	[dBi]		[dBm]	[m]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
14.52	-71.5	0.90	10.0	3.25	1.00	-57.3	300	6.00	3.94	44.3	40.4	
697.00	-81.2	0.90	10.0	3.25	1.00	-67.0	30.0	6.00	14.2	30.7	16.5	

$E = \text{EIRP} - 20 \log(D) + \text{Ground bounce} + 104.8 \text{ [dBuV/m]}$

$\text{EIRP} = \text{Reading} + \text{Cable Loss} + \text{Attenuator Loss} + \text{Antenna Gain} + 10 * \log(N)$

UL Japan, Inc.

Ise EMC Lab.

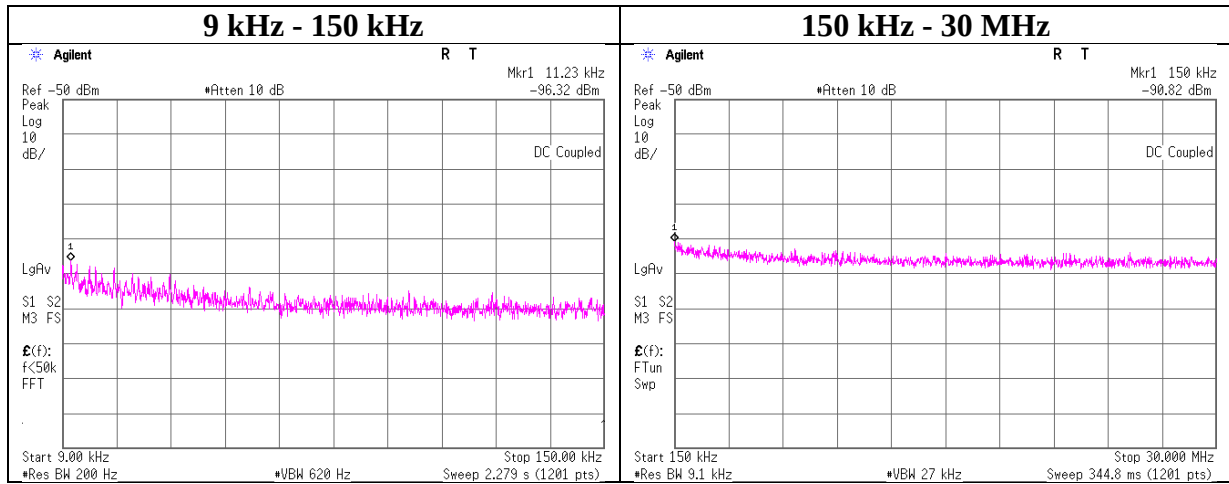
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11182619H
Date	March 30, 2016
Temperature / Humidity	22 deg. C / 27 % RH
Engineer	Yutaka Yoshida
Mode	Tx BT LE 2402 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
11.23	-96.3	0.90	10.0	3.25	1.00	-82.1	300	6.00	-20.9	46.5	67.4	
150.00	-90.8	0.90	10.0	3.25	1.00	-76.6	300	6.00	-15.4	24.0	39.4	

$E = \text{EIRP} - 20 \log(D) + \text{Ground bounce} + 104.8 \text{ [dBuV/m]}$

$\text{EIRP} = \text{Reading} + \text{Cable Loss} + \text{Attenuator Loss} + \text{Antenna Gain} + 10 * \log(N)$

UL Japan, Inc.

Ise EMC Lab.

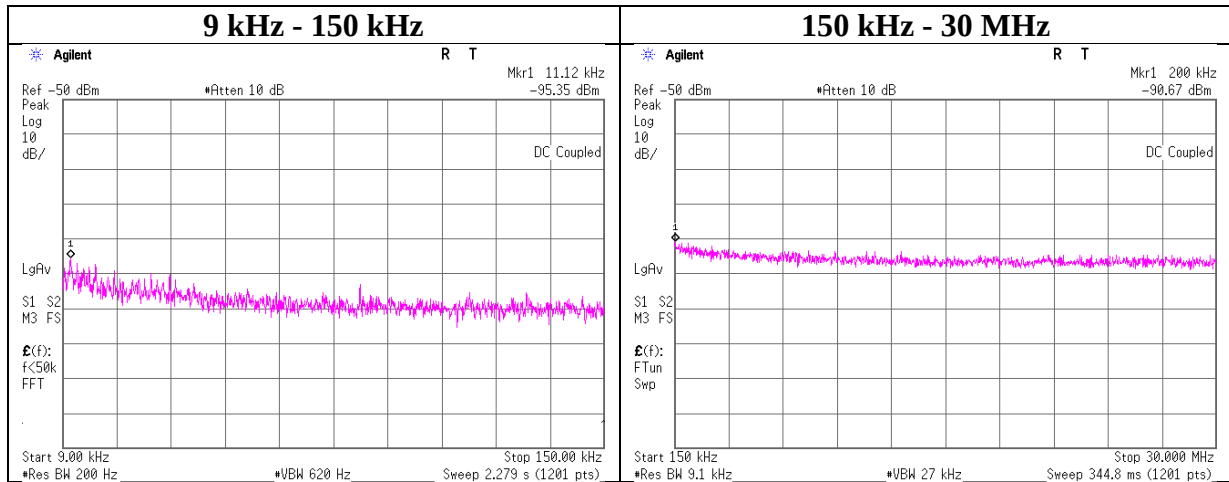
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11182619H
Date	March 30, 2016
Temperature / Humidity	22 deg. C / 27 % RH
Engineer	Yutaka Yoshida
Mode	Tx BT LE 2440 MHz



Frequency	Reading	Cable Loss	Attenuator Loss	Antenna Gain	N	EIRP	Distance	Ground bounce	E	Limit	Margin	Remark
[kHz]	[dBm]	[dB]	[dB]	[dBi]	(Number of Output)	[dBm]	[m]	[dB]	(field strength) [dBuV/m]	[dBuV/m]	[dB]	
11.12	-95.4	0.90	10.0	3.25	1.00	-81.2	300	6.00	-19.9	46.6	66.5	
200.00	-90.7	0.90	10.0	3.25	1.00	-76.5	300	6.00	-15.2	21.5	36.7	

$$E = \text{EIRP} - 20 \log(D) + \text{Ground bounce} + 104.8 \text{ [dBuV/m]}$$

$$\text{EIRP} = \text{Reading} + \text{Cable Loss} + \text{Attenuator Loss} + \text{Antenna Gain} + 10 * \log(N)$$

UL Japan, Inc.

Ise EMC Lab.

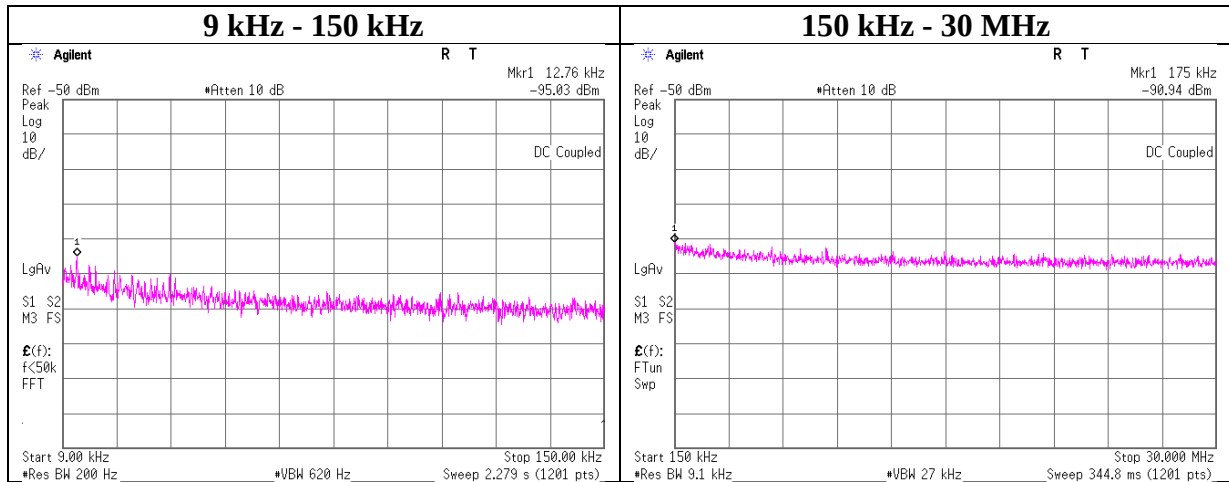
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11182619H
Date	March 30, 2016
Temperature / Humidity	22 deg. C / 27 % RH
Engineer	Yutaka Yoshida
Mode	Tx BT LE 2480 MHz



Frequency	Reading	Cable	Attenuator	Antenna	N	EIRP	Distance	Ground	E	Limit	Margin	Remark
[kHz]	[dBm]	Loss	Loss	Gain	(Number	[dBm]	[m]	bounce	(field strength)	[dBuV/m]	[dB]	
		[dB]	[dB]	[dBi]	of Output			[dB]	[dBuV/m]			
12.76	-95.0	0.90	10.0	3.25	1.00	-80.9	300	6.00	-19.6	45.4	65.0	
175.00	-90.9	0.90	10.0	3.25	1.00	-76.8	300	6.00	-15.5	22.7	38.2	

$E = \text{EIRP} - 20 \log(D) + \text{Ground bounce} + 104.8 \text{ [dBuV/m]}$

$\text{EIRP} = \text{Reading} + \text{Cable Loss} + \text{Attenuator Loss} + \text{Antenna Gain} + 10 * \log(N)$

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Power Density

Test place	Ise EMC Lab.		
Report No.	11182619H		
Measurement Room	No.11	No.11	No.6
Date	March 30, 2016	March 31, 2016	August 25, 2016
Temperature / Humidity	22 deg. C / 27 % RH	23 deg. C / 33 % RH	28 deg. C / 39 % RH
Engineer	Yutaka Yoshida	Yutaka Yoshida	Tomoki Matsui
Mode	Tx		

11b

Freq.	Reading	Cable Loss	Atten. Loss	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2412.00	-15.24	1.64	10.03	-3.57	8.00	11.57
2437.00	-14.55	1.66	10.03	-2.86	8.00	10.86
2462.00	-15.38	1.67	10.03	-3.68	8.00	11.68

11g

Freq.	Reading	Cable Loss	Atten. Loss	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2412.00	-24.87	1.64	10.03	-13.20	8.00	21.20
2437.00	-21.84	1.66	10.03	-10.15	8.00	18.15
2462.00	-24.97	1.67	10.03	-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	-25.31	1.64	10.03	-13.64	8.00	21.64
2437.00	-22.07	1.66	10.03	-10.38	8.00	18.38
2462.00	-25.88	1.67	10.03	-14.18	8.00	22.18

11n-40

Freq.	Reading	Cable Loss	Atten. Loss	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2422.00	-31.86	1.65	10.03	-20.18	8.00	28.18
2437.00	-30.38	1.66	10.03	-18.69	8.00	26.69
2452.00	-31.12	1.66	10.03	-19.43	8.00	27.43

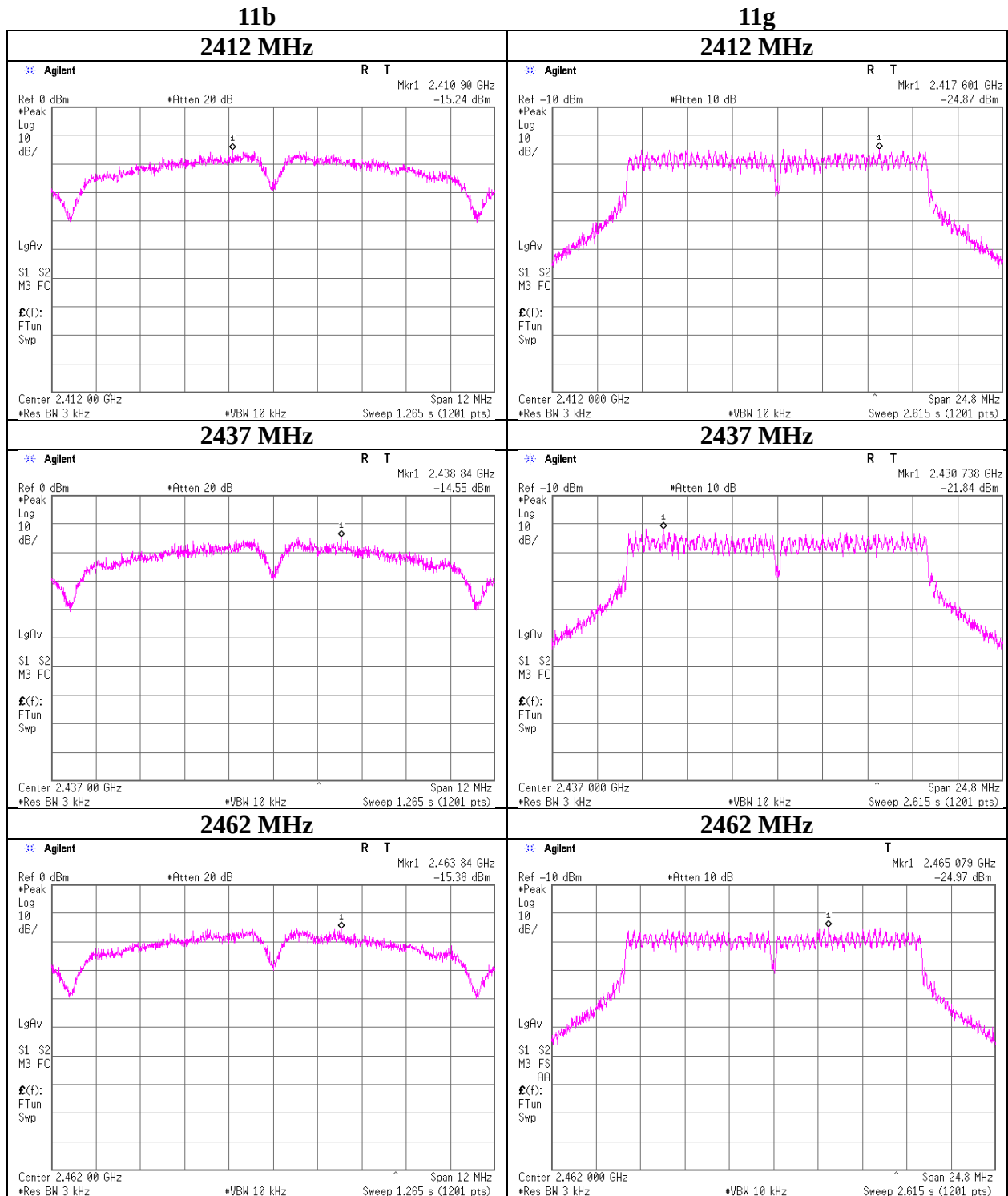
BT LE

Freq.	Reading	Cable Loss	Atten. Loss	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2402.00	-25.33	1.94	10.03	-13.36	8.00	21.36
2440.00	-25.04	1.96	10.03	-13.05	8.00	21.05
2480.00	-24.51	1.97	10.03	-12.51	8.00	20.51

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

Power Density



UL Japan, Inc.

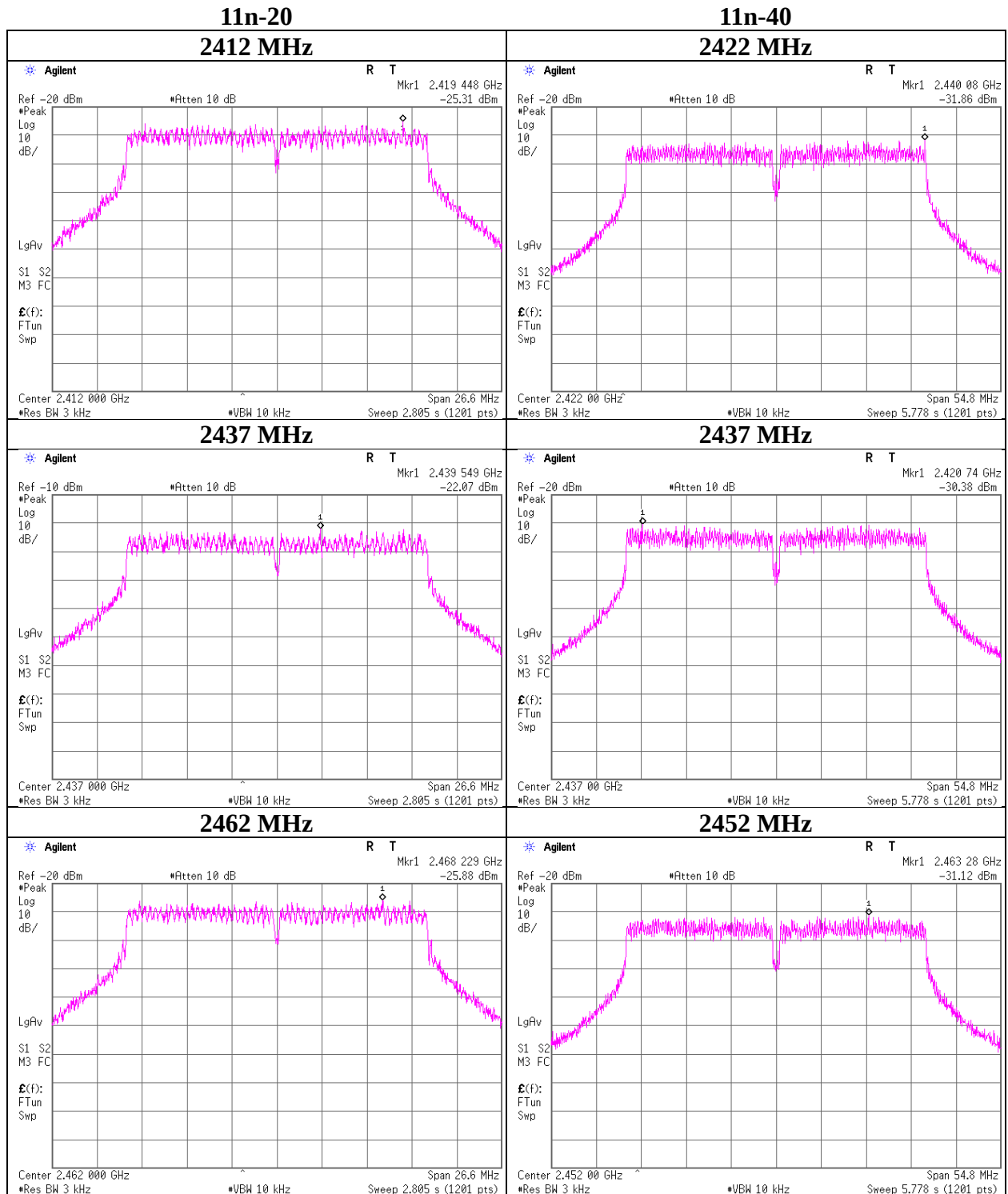
Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Power Density



UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

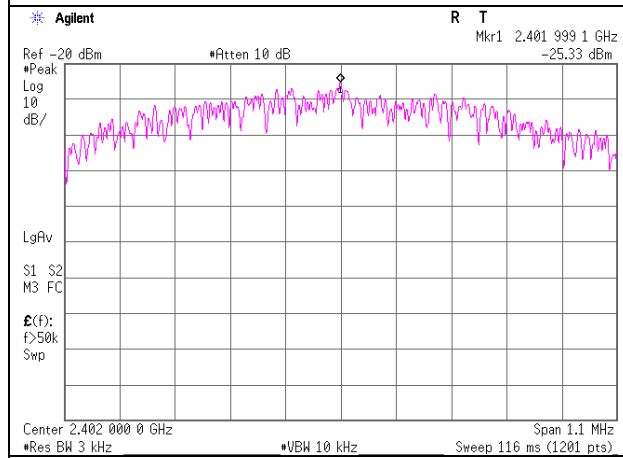
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

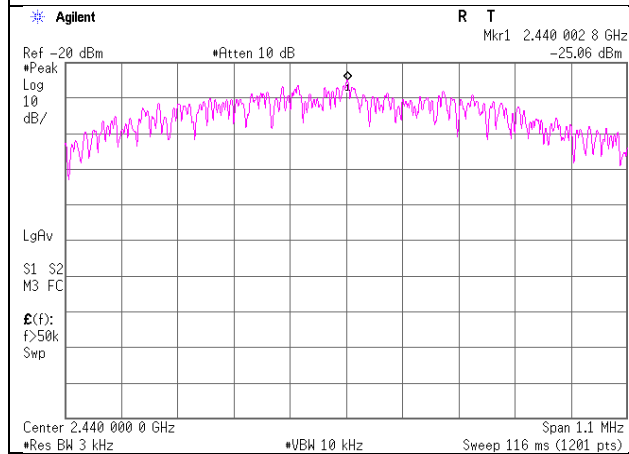
Power Density

BT LE

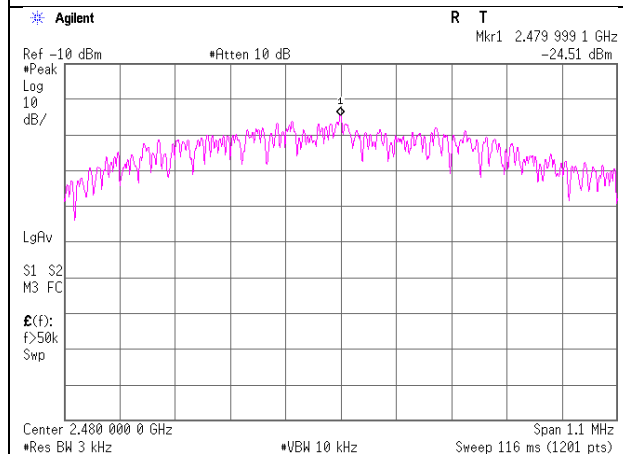
2402 MHz



2440 MHz



2480 MHz



UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

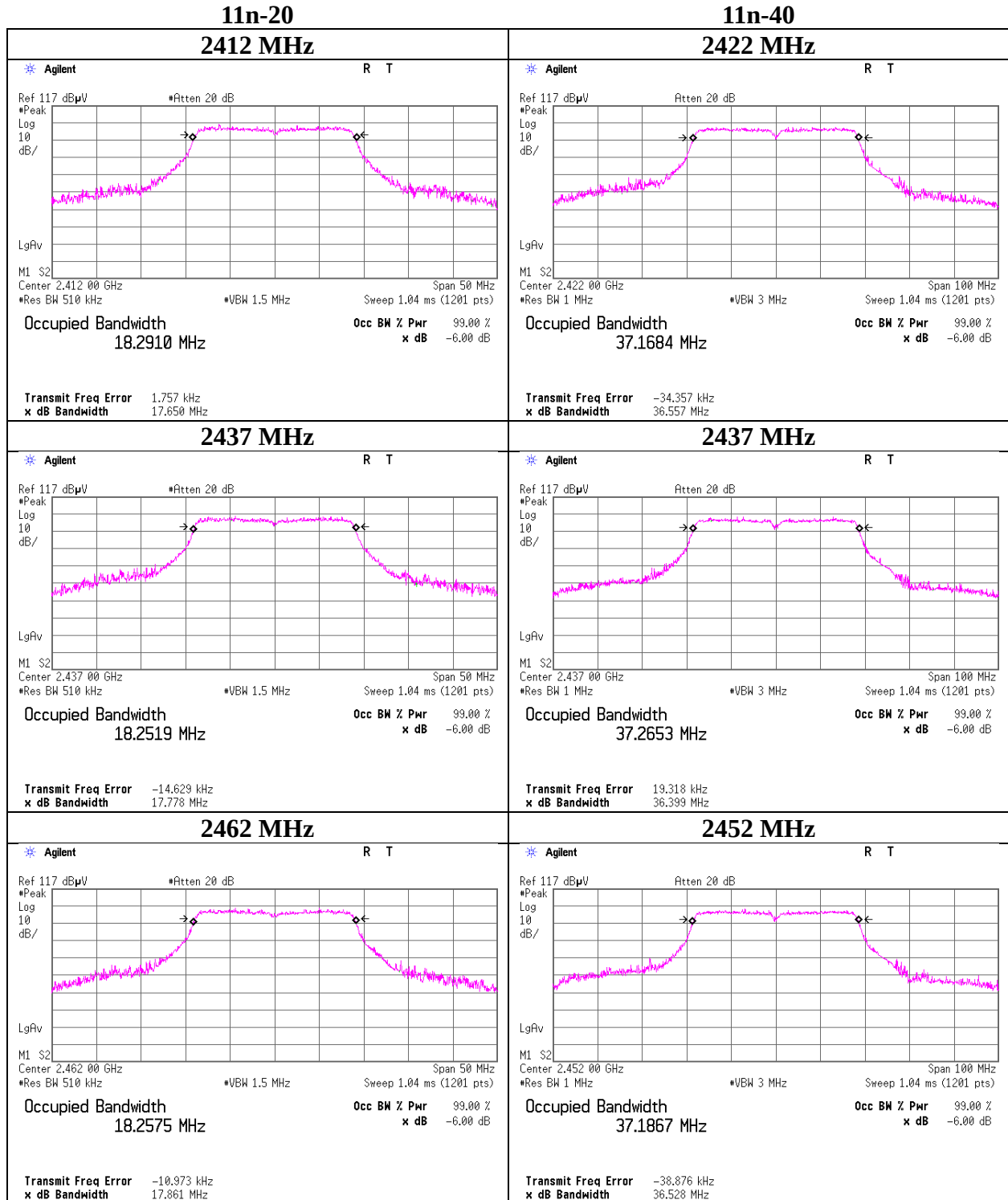
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99% Occupied Bandwidth

Test place
Report No.
Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.11 Measurement Room
11182619H
March 31, 2016
23 deg. C / 33 % RH
Yutaka Yoshia
Tx 11n-20 / 11n-40



UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

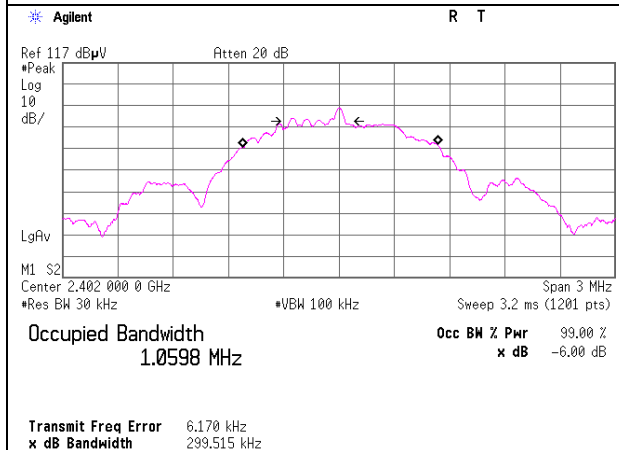
Facsimile : +81 596 24 8124

99% Occupied Bandwidth

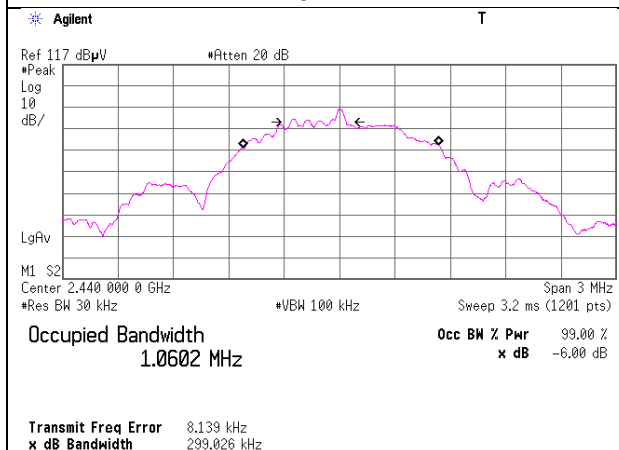
Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11182619H
Date	March 30, 2016
Temperature / Humidity	22 deg. C / 27 % RH
Engineer	Yutaka Yoshida
Mode	Tx BT LE

BT LE

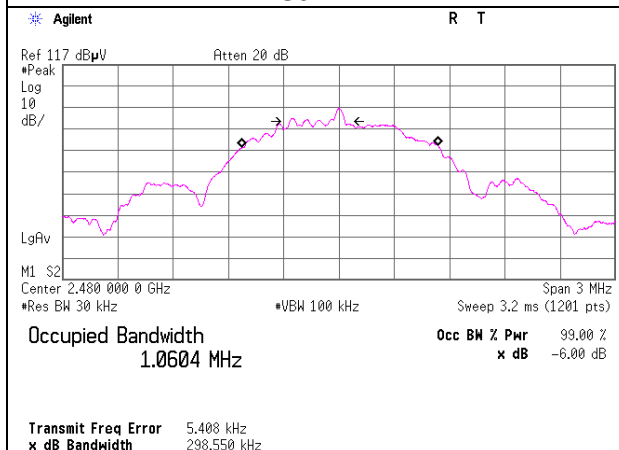
2402 MHz



2440 MHz



2480 MHz



UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-01	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 10m	DA-06881	CE	2016/09/02 * 12
MOS-27	Thermo-Hygrometer	CUSTOM	CTH-201	A08Q26	CE	2016/01/21 * 12
MJM-25	Measure	KOMELON	KMC-36	-	CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	CE/RE	-
MTR-09	EMI Test Receiver	Rohde & Schwarz	ESU26	100412	CE	2016/06/25 * 12
MLS-25	LISN(AMN)	Schwarzbeck	NSLK8127	8127-731	CE(EUT)	2016/07/21 * 12
MTA-30	Terminator	TME	CT-01	-	CE	2016/01/15 * 12
MCC-03	Coaxial Cable	Fujikura/Suhner/TSJ	5D-2W(20m)/3D-2W(7.5m)/RG400u(1.5m)/RFM-E421(Switcher)	-/01068(Switcher)	CE	2016/06/29 * 12
MAT-64	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2016/01/14 * 12
MMM-03	Digital Tester	Fluke	FLUKE 26-3	78030621	CE	2016/08/23 * 12
MPM-16	Power Meter	Agilent	8990B	MY51000271	AT	2016/04/07 * 12
MPSE-22	Power sensor	Agilent	N1923A	MY54070003	AT	2016/04/07 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	AT	2016/08/17 * 12
MCC-206	Microwave Cable	RS Components	R-132G7210200CD	-	AT	2016/02/08 * 12
MCC-171	Microwave Cable	Junkosha	MWX221	1409S494	AT	2016/03/11 * 12
MAT-25	Attenuator(10dB)(above 1GHz)	Agilent	8493C	71642	AT	2016/06/15 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-201	1401	AT	2016/01/21 * 12
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2015/10/02 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	1501	RE	2016/01/21 * 12
MJM-26	Measure	KOMELON	KMC-36	-	RE	-
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	RE	
MCC-141	Microwave Cable	Junkosha	MWX221	1305S002R(1m) / 1405S146(5m)	RE	2016/06/21 * 12
MPA-12	MicroWave System Amplifier	Agilent	83017A	00650	RE	2015/10/01 * 12
MMM-10	DIGITAL HiTESTER	Hioki	3805	051201148	RE	2016/01/18 * 12
MHF-26	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	002	RE	2016/09/19 * 12
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2015/10/01 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	1301	RE	2016/01/21 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE	-
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2016/05/19 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2015/09/02 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2015/10/11 * 12
MLA-22	Logperiodic Antenna(200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-191	RE	2016/01/30 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2016/07/26 * 12
MAT-70	Attenuator(6dB)	Agilent	8491A-006	MY52460153	RE	2016/04/05 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2016/03/24 * 12
MMM-08	DIGITAL HiTESTER	Hioki	3805	051201197	RE	2016/01/13 * 12
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE	2015/11/06 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2016/05/29 * 12
MCC-167	Microwave Cable	Junkosha	MWX221	1404S374(1m) / 1405S074(5m)	RE	2016/05/20 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2016/03/24 * 12
MHF-25	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	001	RE	2015/09/16 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2016/05/29 * 12

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

The expiration date of the calibration is the end of the expired month.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

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

Test Item: CE: Conducted Emission test
 RE: Radiated Emission test
 AT: Antenna Terminal Conducted test

APPENDIX 3: Photographs of test setup

Conducted Emission

(Antenna : M/N 146153)

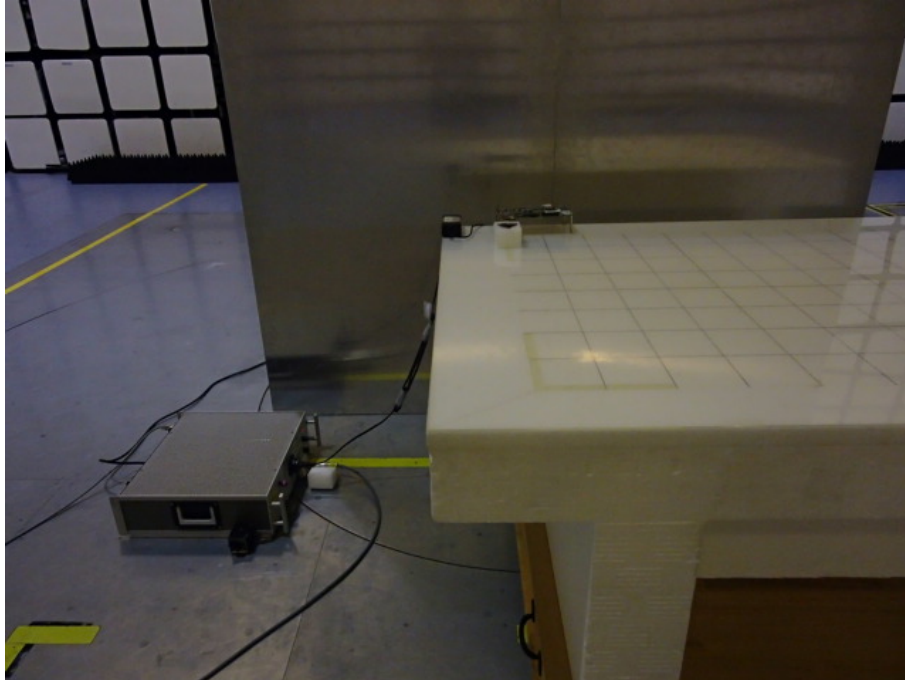


Photo 1

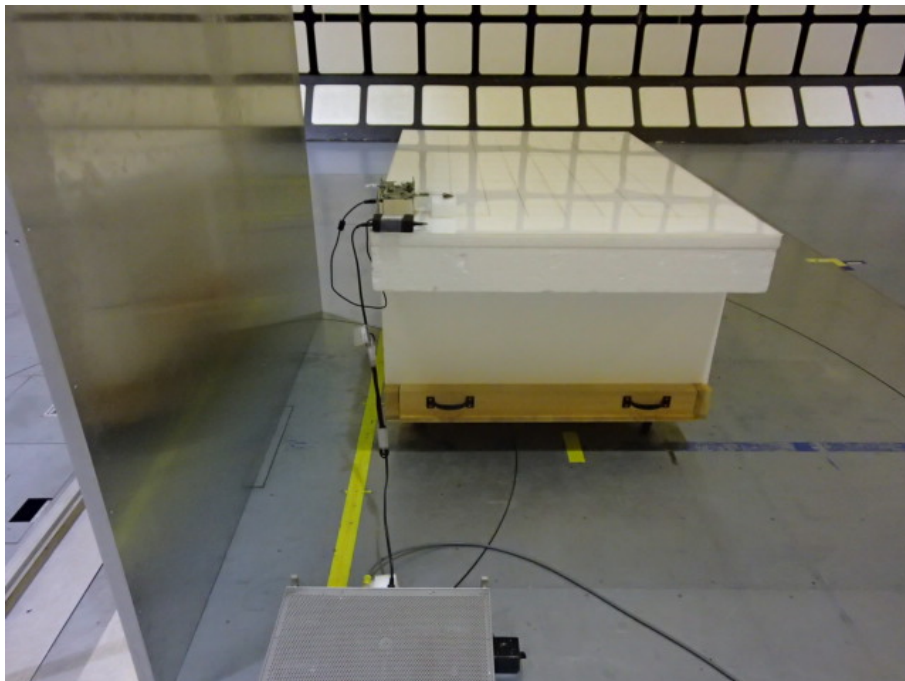


Photo 2

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Emission
(Antenna : M/N H2U84W1H1S)

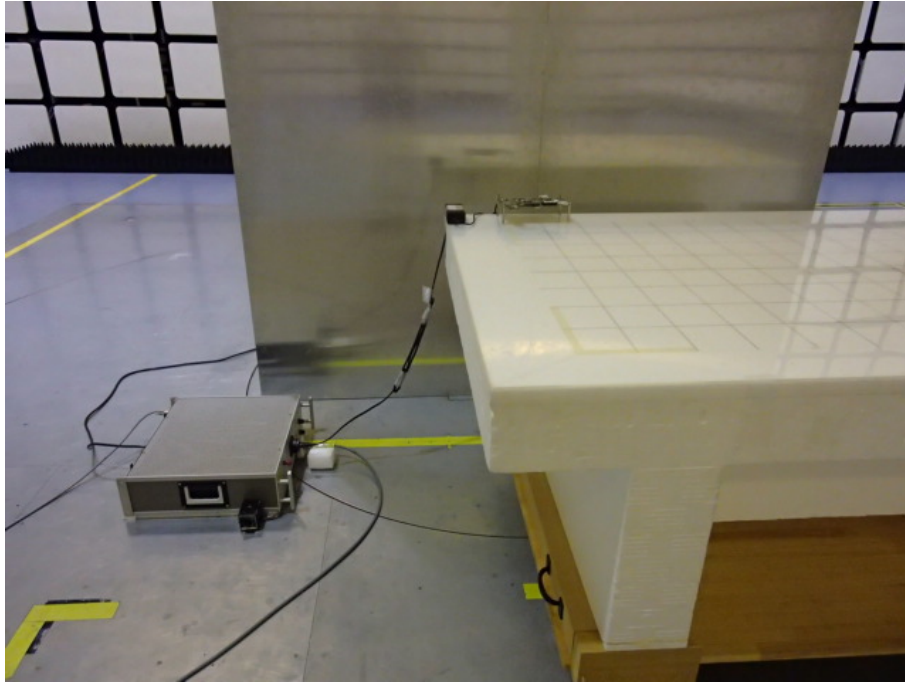


Photo 1

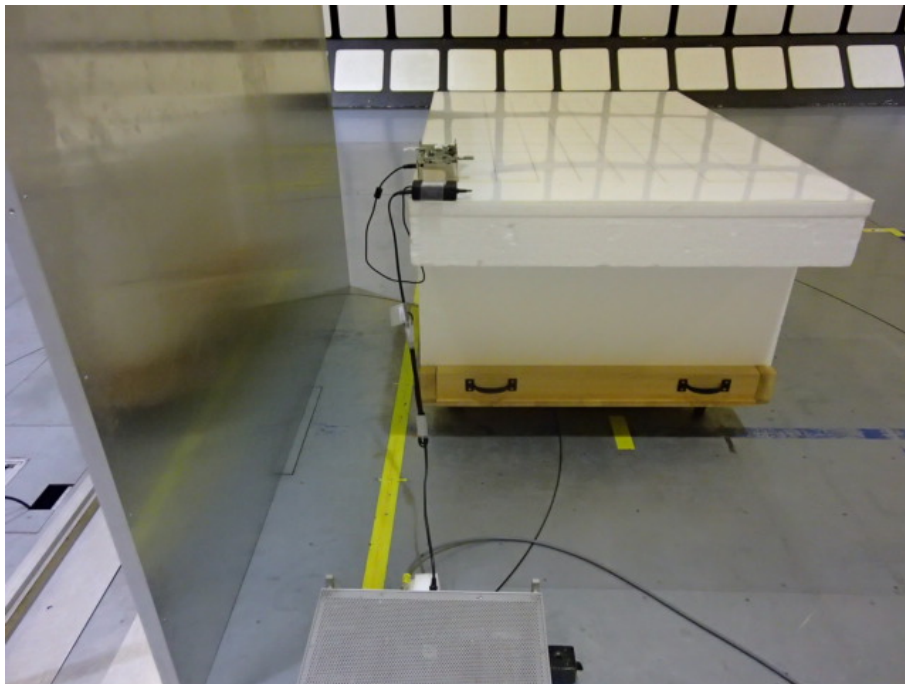


Photo 2

Radiated Spurious Emission
(Antenna : M/N 146153)

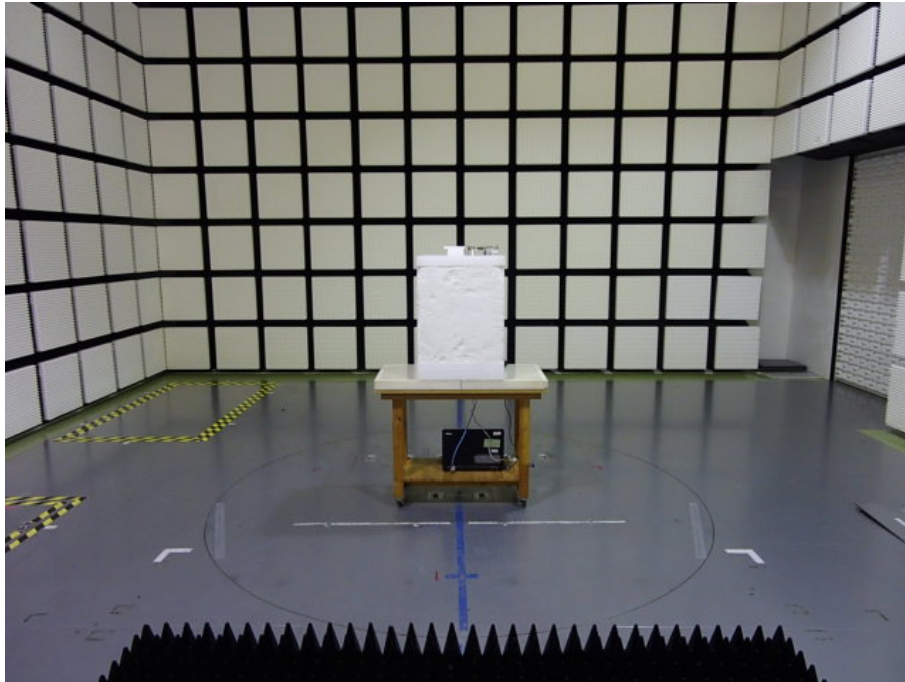


Photo 1

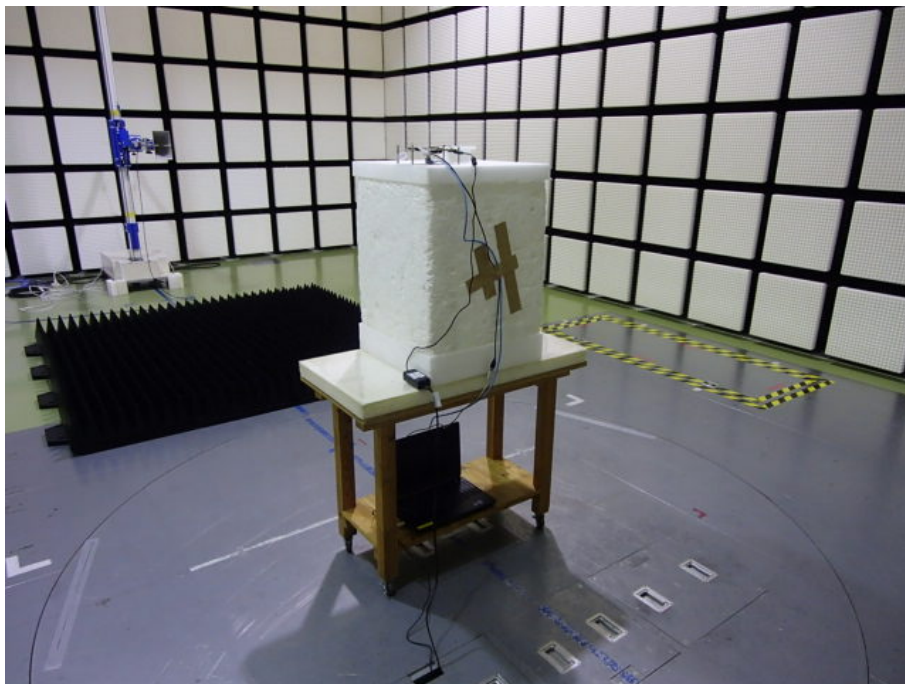
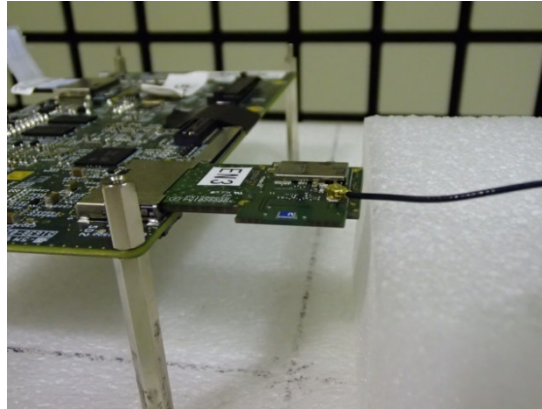


Photo 2

Worst Case Position
(Antenna : M/N 146153)

Module
(Horizontal: X-axis/ Vertical:X-axis)

X-axis



Y-axis



Z-axis



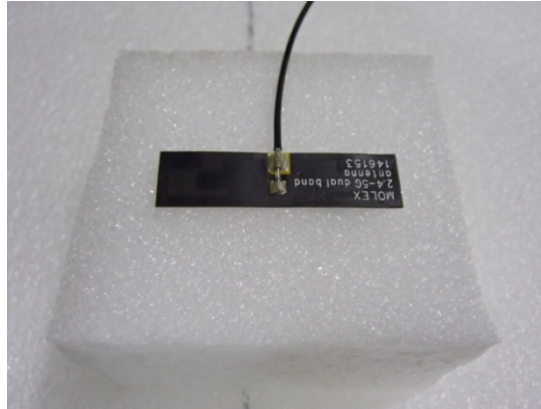
Worst Case Position

(Antenna : M/N 146153)

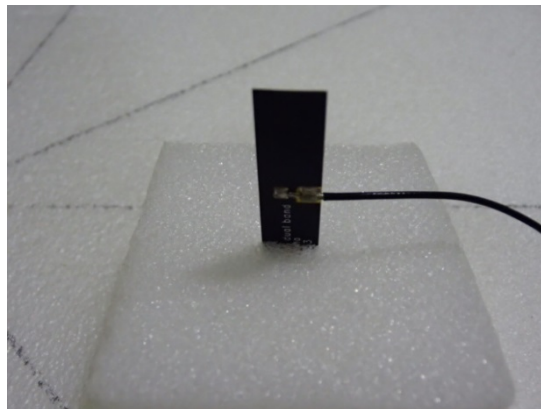
Antenna

(Horizontal: X-axis/ Vertical:Y-axis)

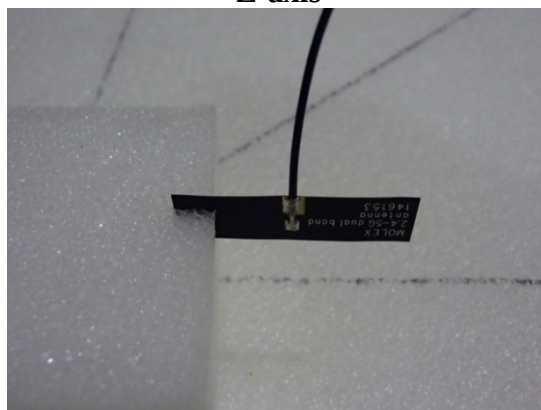
X-axis



Y-axis



Z-axis



Radiated Spurious Emission
(Antenna : M/N 146153)

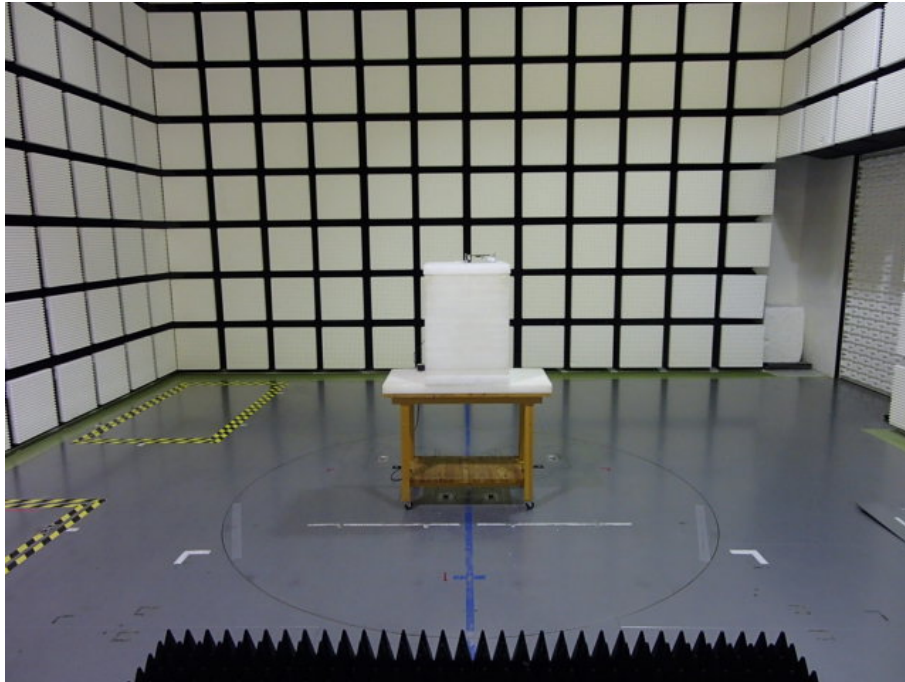


Photo 1

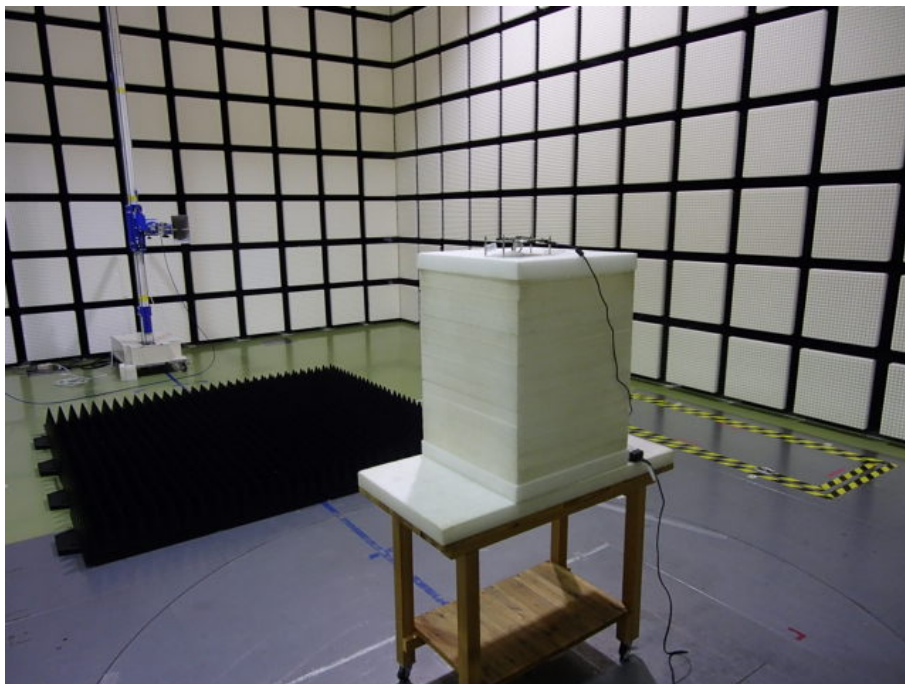


Photo 2

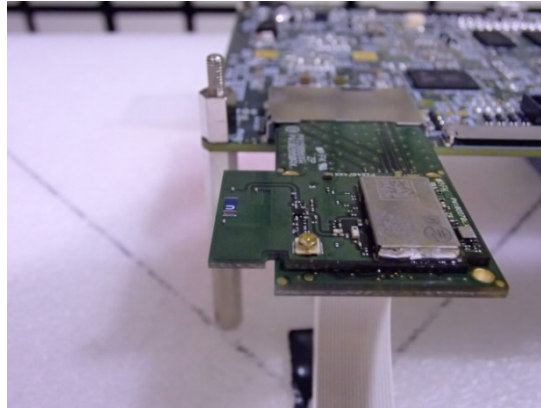
Worst Case Position

(Antenna : M/N 146153)

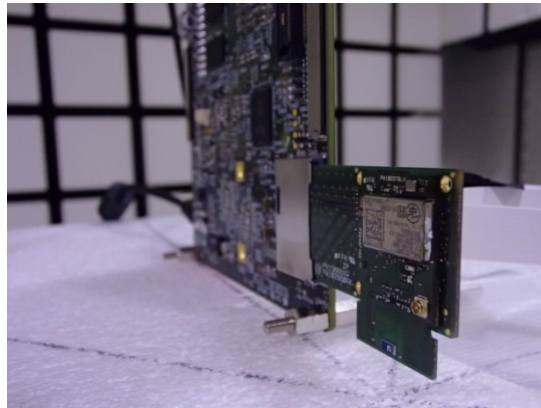
Module and Antenna

(Horizontal: X-axis/ Vertical:X-axis)

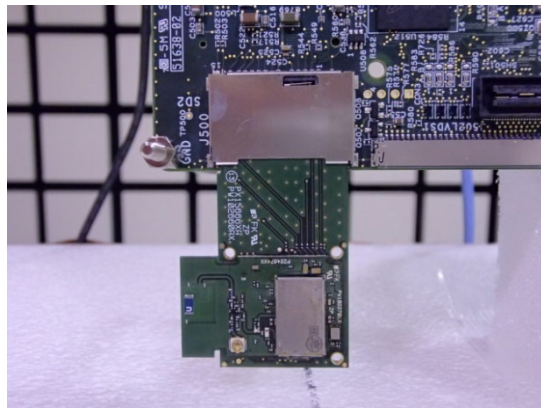
X-axis



Y-axis



Z-axis



End of Report

UL Japan, Inc.

Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124