RADIO TEST REPORT

Test Report No. : 11832513H-A

Applicant	:	**silex technology, Inc.**
Type of Equipment	:	**PCI Express Half mini card WLAN module**
Model No.	:	**SX-PCEAN2**
FCC ID	:	**N6C-SXPCEAN2**
Test regulation	:	**FCC Part 15 Subpart C: 2017 (Class II Permissive change) *Spurious emission test only**
Test Result	:	**Complied**

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. 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)

Date of test: July 26 to August 3, 2017

Representative test engineer:
Tomohisa Nakagawa
Engineer
Consumer Technology Division

Approved by:
Tsubasa Takayama
Engineer
Consumer Technology Division

NVLAP TESTING
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/

REVISION HISTORY

Original Test Report No.: 11832513H-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	11832513H-A	August 29, 2017	-	-

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

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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	:	PCI Express Half mini card WLAN module
Model No.	:	SX-PCEAN2
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 3.3 V
Receipt Date of Sample	:	July 26, 2017
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-PCEAN2 (referred to as the EUT in this report) is a PCI Express Half mini card WLAN module.

General Specification

Clock frequency(ies) in the system	:	40 MHz

Radio Specification

Radio Type	:	Transceiver
Method of Frequency Generation	:	Synthesizer
Power Supply (inner)	:	DC 1.2 V

Radio Specification

	IEEE802.11b	IEEE802.11g/n (20 M band)	IEEE802.11a/n (20 M band)	IEEE802.11n (40 M band)
Frequency of operation	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
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)	
Channel spacing	5 MHz		20 MHz	2.4 GHz: 5 MHz 5 GHz: 40 MHz
Antenna type	Dipole antenna : STAF corporation			
Antenna Gain	2.4 GHz: 0.4 dBi (Max), -2.00 dB (Min) 5 GHz: 0.76 dBi (Max), -3.07 dB (Min)			
Antenna Connector type	SMA-P (REVERSE)			

*1) IEEE 802.11bgn-20/ n-40 (2412 MHz -2462 MHz, 2422 MHz - 2452 MHz) are applied for this test report.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part 15 Subpart C FCC Part 15 final revised on June 14, 2017 and effective July 14, 2017
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
Spurious Emission Restricted Band Edges	**FCC:** KDB 558074 D01 DTS Meas Guidance v04	**FCC:** Section15.247(d)	1.7 dB 57.577 MHz, QP, 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 v04 12.2.7.					

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

FCC 15.31 (e)

The RF Module has own regulator.
The RF Module is constantly provided voltage through own regulator regardless of input voltage (DC 3.3 V).
Therefore, this EUT complies with the requirement.

FCC Part 15.203/212 Antenna requirement

The EUT has a unique antenna connector (SMA-P (REVERSE)).
Therefore the equipment complies with the requirement of 15.203.

3.3 Addition to standard

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.

Test distance	Radiated emission (+/-) 9 kHz - 30 MHz
3 m	3.8 dB
10 m	3.6 dB

Polarity	Radiated emission (Below 1 GHz)			
	(3 m*) (+/-)		(10 m*) (+/-)	
	30 MHz - 200 MHz	200 MHz - 1000 MHz	30 MHz - 200 MHz	200 MHz - 1000 MHz
Horizontal	5.0 dB	5.3 dB	5.0 dB	5.0 dB
Vertical	5.2 dB	6.3 dB	5.0 dB	5.0 dB

Radiated emission (Above 1 GHz)				
(3 m*) (+/-)		(1 m*) (+/-)		(10 m*) (+/-)
1 GHz - 6 GHz	6 GHz - 18 GHz	10 GHz - 26.5 GHz	26.5 GHz - 40 GHz	1 GHz - 18 GHz
5.2 dB	5.5 dB	5.5 dB	5.4 dB	5.5 dB

*Measurement distance

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.

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)	11Mbps (Short GI), PN9
IEEE 802.11g (11g)	12Mbps, PN9
IEEE 802.11n MIMO 20MHz BW (11n-20)	MCS 9 (Short GI), PN9
IEEE 802.11n MIMO 40MHz BW (11n-40)	MCS 9 (Short GI), PN9
*The worst condition was determined based on the test result of Maximum Peak Output Power (Mid Channel)	
*The power value of the EUT was set for testing as follows (setting value might be different from product specification value); - Power Setting: Refer to the following table. - Software: art2 ver4.4 *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]

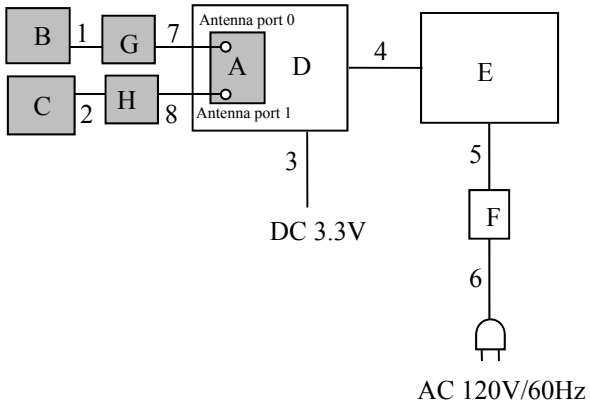
Operation	Frequency	Power Setting [dBm]
11b	2412MHz	13.5
	2437MHz	15.0
	2462MHz	11.5
11g	2412MHz	13.5
	2437MHz	16.5
	2462MHz	11.5
11n MIMO 20Mband	2412MHz	11.5
	2437MHz	16.0
	2462MHz	10.5
11n MIMO 40Mband	2422MHz	5.5
	2437MHz	14.5
	2452MHz	4.5

*The details of Operating mode(s)

Test Item	Operating Mode	Tested Antenna port	Tested frequency
Radiated Spurious Emission (Below 1GHz)	11n-20 Tx *1)	0+1	2437MHz *1)
Radiated Spurious Emission (Above 1GHz)	11b Tx	0	2412MHz 2437MHz 2462MHz
	11n-20 Tx *2)	0+1	
	11g Tx *3)	0	2412MHz 2462MHz
	11n-40 Tx	0+1	2422MHz 2437MHz 2462MHz

*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) This mode was performed only band-edge for confirmation.

4.2 Configuration and peripherals



* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.
* The test was performed using a typical evaluation board (Jig board).

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	PCI Express Half Mini Card WLAN Module	SX-PCEAN2	M7011538	silex technology, Inc.	EUT
B	Antenna	1019-013A	-	STAF Corporation	EUT
C	Antenna	1019-013A	-	STAF Corporation	EUT
D	Jig board	-	-	-	-
E	Laptop PC	CF-n8HWCDP	OBKSA08702	Panasonic	-
F	AC Adapter	CF-AA6372B	6372BM409X21200B	Panasonic	-
G	Filter	HFCN-2000	-	Mini-Circuits	EUT
H	Filter	HFCN-2000	-	Mini-Circuits	EUT

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Antenna Cable	0.15(Short Cable) 5.15 (Long Cable)	Shielded	Shielded	-
2	Antenna Cable	0.15(Short Cable) 5.15 (Long Cable)	Shielded	Shielded	-
3	DC Cable	3.00	Unshielded	Unshielded	-
4	LAN Cable	3.00	Unshielded	Unshielded	-
5	DC Cable	1.10	Unshielded	Unshielded	-
6	AC Cable	0.90	Unshielded	Unshielded	-
7	Antenna Cable	0.15	Shielded	Shielded	-
8	Antenna Cable	0.15	Shielded	Shielded	-

SECTION 5: Radiated Spurious Emission

Test Procedure

It was measured based on "11.0 Emissions in non-restricted frequency bands" of "KDB 558074 D01 DTS Meas Guidance v04".

[For below 1 GHz]
EUT was placed on a urethane platform of nominal size, 0.5 m by 1.0 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

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

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

Test Antennas are used as below;

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

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

20 dBc was applied to the frequency over the limit of FCC 15.209 and outside the restricted band of FCC15.205.

Frequency	Below 1 GHz	Above 1 GHz		20 dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV *1)	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	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: 300kHz
Test Distance	3 m	3.7 m*2) / 4.45 m *3) (1 GHz – 10GHz), 1 m *4) (10 GHz – 26.5 GHz)		3.7 m *2) / 4.45 m *3) (1 GHz – 10 GHz), 1 m *4) (10 GHz – 26.5 GHz)

*1) Average Power Measurement was performed based on 6. 0 & 12.2.5 of "KDB 558074 D01 DTS Meas Guidance v04".
*2) Distance Factor: 20 x log (3.7 m / 3.0 m) = 1.83 dB (No.2 Semi Anechoic Chamber)
*3) Distance Factor: 20 x log (4.45 m / 3.0 m) = 3.43 dB (No.3 Semi Anechoic Chamber)
*4) Distance Factor: 20 x log (1.0 m / 3.0 m) = -9.5 dB

- The noise levels were confirmed at each position of X, Y and Z axes of EUT (Antenna and Module) 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

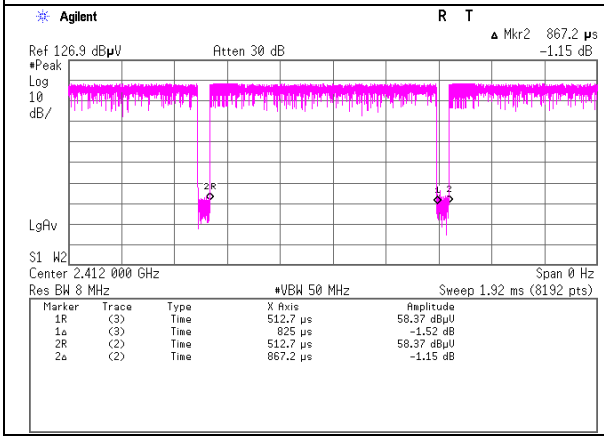
APPENDIX 1: Test data

Burst rate confirmation

Report No.	11832513H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	July 26, 2017
Temperature / Humidity	24 deg. C / 68 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx

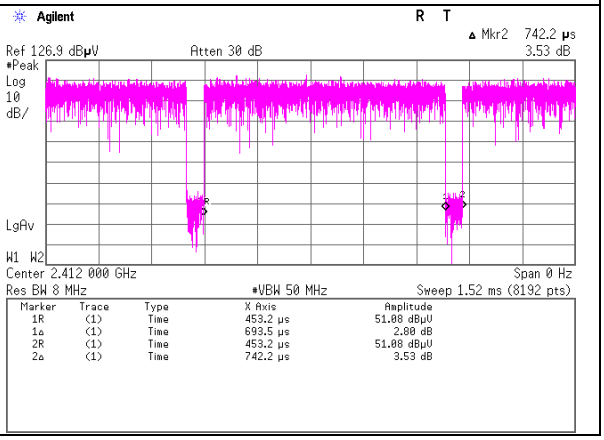
11b 11 Mbps

Tx on / (Tx on + Tx off) = 0.951
Tx on / (Tx on + Tx off) * 100 = 95.1 %
Duty factor = 10 * log (0.8672 / 0.825) = 0.22 dB



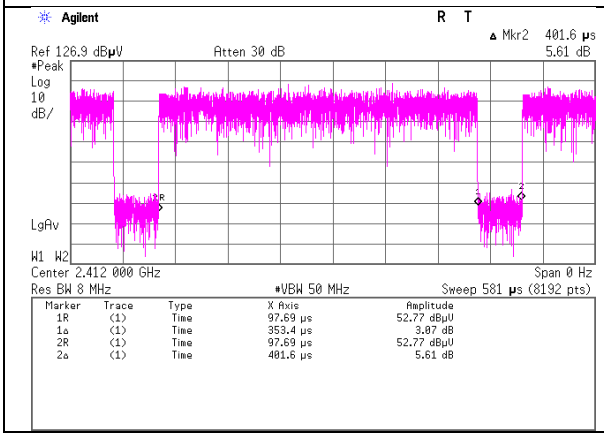
11g 12 Mbps

Tx on / (Tx on + Tx off) = 0.934
Tx on / (Tx on + Tx off) * 100 = 93.4 %
Duty factor = 10 * log (0.7422 / 0.6935) = 0.29 dB



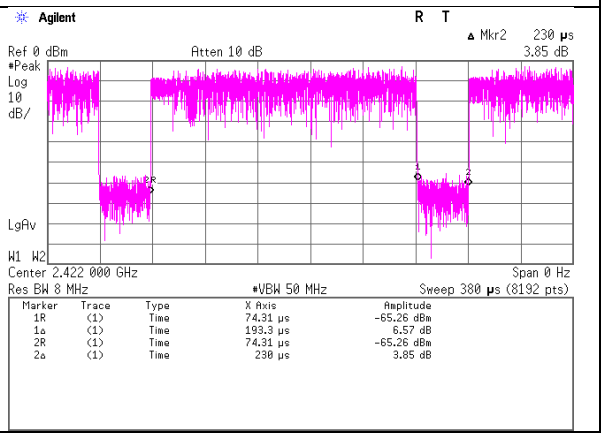
11n-20 MCS 9

Tx on / (Tx on + Tx off) = 0.880
Tx on / (Tx on + Tx off) * 100 = 88.0 %
Duty factor = 10 * log (0.4016 / 0.3534) = 0.56 dB



11n-40 MCS 9

Tx on / (Tx on + Tx off) = 0.840
Tx on / (Tx on + Tx off) * 100 = 84.0 %
Duty factor = 10 * log (0.23 / 0.1933) = 0.75 dB



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

Radiated Spurious Emission
(Short ANT Cable)

Report No.	11832513H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.3
Date	July 26, 2017	July 29, 2017
Temperature / Humidity	24 deg. C / 68 % RH	24 deg. C / 61 % RH
Engineer	Tomohisa Nakagawa	Shuichi Ohyama
	(1 GHz -10 GHz)	(10 GHz -26.5 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	45.0	27.0	4.8	34.6	-	42.2	73.9	31.7	
Hori	2502.040	PK	55.2	27.0	5.0	34.6	-	52.6	73.9	21.3	
Hori	4824.000	PK	42.1	31.3	7.5	33.8	-	47.1	73.9	26.8	Floor noise
Hori	7236.000	PK	42.5	35.7	8.3	33.9	-	52.6	73.9	21.3	Floor noise
Hori	9648.000	PK	42.9	38.2	9.2	34.5	-	55.8	73.9	18.1	Floor noise
Hori	2390.000	AV	36.6	27.0	4.8	34.6	0.2	34.0	53.9	19.9	*1)
Hori	2502.040	AV	49.1	27.0	5.0	34.6	0.2	46.7	53.9	7.2	
Hori	4824.000	AV	32.8	31.3	7.5	33.8	-	37.8	53.9	16.1	Floor noise
Hori	7236.000	AV	33.7	35.7	8.3	33.9	-	43.8	53.9	10.1	Floor noise
Hori	9648.000	AV	34.3	38.2	9.2	34.5	-	47.2	53.9	6.7	Floor noise
Vert	2390.000	PK	52.8	27.0	4.8	34.6	-	50.0	73.9	23.9	
Vert	2502.040	PK	57.1	27.0	5.0	34.6	-	54.5	73.9	19.4	
Vert	4824.000	PK	41.6	31.3	7.5	33.8	-	46.6	73.9	27.3	Floor noise
Vert	7236.000	PK	42.6	35.7	8.3	33.9	-	52.7	73.9	21.2	Floor noise
Vert	9648.000	PK	42.4	38.2	9.2	34.5	-	55.3	73.9	18.6	Floor noise
Vert	2390.000	AV	43.1	27.0	4.8	34.6	0.2	40.5	53.9	13.4	*1)
Vert	2502.040	AV	45.4	27.0	5.0	34.6	0.2	43.0	53.9	10.9	
Vert	4824.000	AV	32.7	31.3	7.5	33.8	-	37.7	53.9	16.2	Floor noise
Vert	7236.000	AV	33.4	35.7	8.3	33.9	-	43.5	53.9	10.4	Floor noise
Vert	9648.000	AV	34.1	38.2	9.2	34.5	-	47.0	53.9	6.9	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 (3.7 m / 3.0 m) = 1.83 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

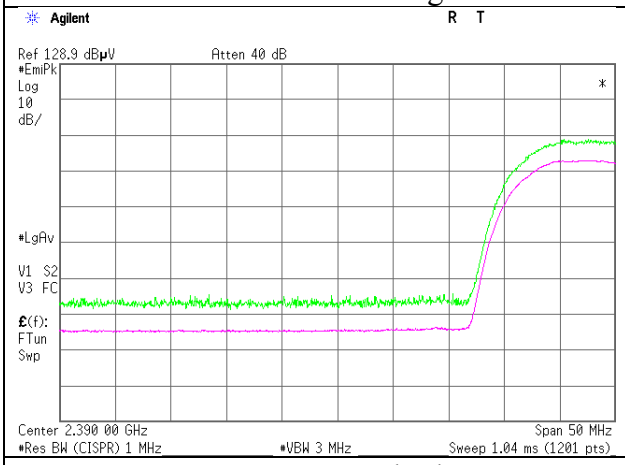
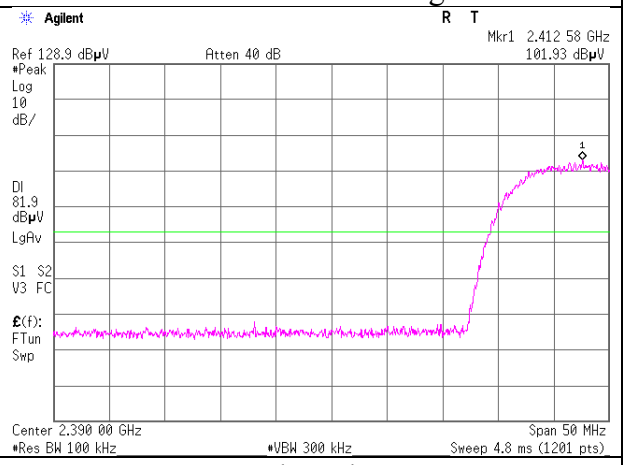
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	101.9	27.0	5.0	34.6	99.3	-	-	Carrier
Hori	2400.000	PK	40.7	27.0	4.9	34.6	38.0	79.3	41.3	
Vert	2412.000	PK	101.9	27.0	5.0	34.6	99.3	-	-	Carrier
Vert	2400.000	PK	49.4	27.0	4.9	34.6	46.7	79.3	32.6	

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

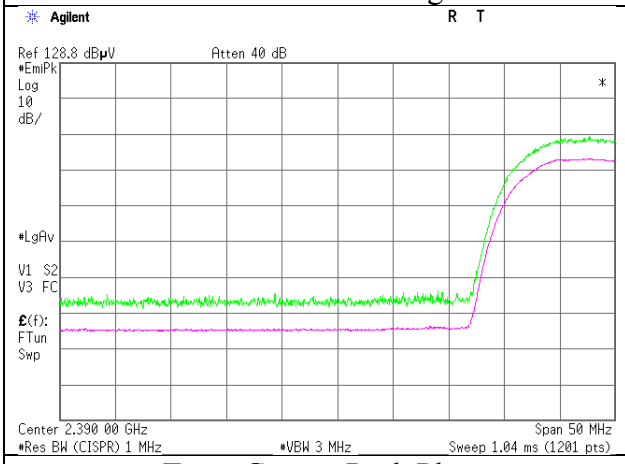
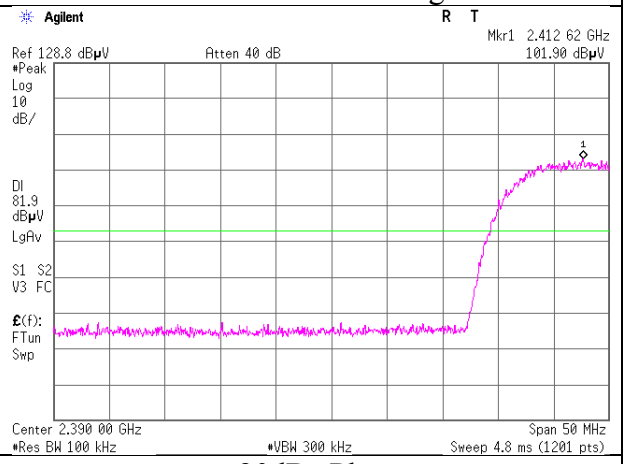
Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	11832513H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	July 26, 2017
Temperature / Humidity	24 deg. C / 68 % RH
Engineer	Tomohisa Nakagawa (1 GHz -10 GHz)
Mode	Tx 11b 2412 MHz

Horizontal

Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical

Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

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

Radiated Spurious Emission
(Short ANT Cable)

Report No.	11832513H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.3
Date	July 26, 2017	July 29, 2017
Temperature / Humidity	24 deg. C / 68 % RH	24 deg. C / 61 % RH
Engineer	Tomohisa Nakagawa	Shuichi Ohyama
	(1 GHz -10 GHz)	(10 GHz -26.5 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	2519.040	PK	56.6	27.0	5.0	34.6	-	54.0	73.9	19.9	
Hori	4874.000	PK	42.3	31.4	7.5	33.8	-	47.4	73.9	26.5	Floor noise
Hori	7311.000	PK	42.3	35.7	8.4	33.9	-	52.5	73.9	21.4	Floor noise
Hori	9748.000	PK	42.3	38.2	9.1	34.5	-	55.1	73.9	18.8	Floor noise
Hori	2519.040	AV	43.6	27.0	5.0	34.6	0.2	41.2	53.9	12.7	
Hori	4874.000	AV	35.1	31.4	7.5	33.8	-	40.2	53.9	13.7	Floor noise
Hori	7311.000	AV	35.5	35.7	8.4	33.9	-	45.7	53.9	8.2	Floor noise
Hori	9748.000	AV	35.7	38.2	9.1	34.5	-	48.5	53.9	5.4	Floor noise
Vert	2519.040	PK	53.1	27.0	5.0	34.6	-	50.5	73.9	23.4	
Vert	4874.000	PK	42.5	31.4	7.5	33.8	-	47.6	73.9	26.3	Floor noise
Vert	7311.000	PK	41.5	35.7	8.4	33.9	-	51.7	73.9	22.2	Floor noise
Vert	9748.000	PK	43.6	38.2	9.1	34.5	-	56.4	73.9	17.5	Floor noise
Vert	2519.040	AV	45.0	27.0	5.0	34.6	0.2	42.6	53.9	11.3	
Vert	4874.000	AV	34.5	31.4	7.5	33.8	-	39.6	53.9	14.3	Floor noise
Vert	7311.000	AV	35.0	35.7	8.4	33.9	-	45.2	53.9	8.7	Floor noise
Vert	9748.000	AV	35.7	38.2	9.1	34.5	-	48.5	53.9	5.4	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 (3.7 m / 3.0 m) = 1.83 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Short ANT Cable)

Report No.	11832513H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.3
Date	July 26, 2017	July 29, 2017
Temperature / Humidity	24 deg. C / 68 % RH	24 deg. C / 61 % RH
Engineer	Tomohisa Nakagawa	Shuichi Ohyama
	(1 GHz -10 GHz)	(10 GHz -26.5 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	53.0	27.0	5.0	34.6	-	50.4	73.9	23.5	
Hori	2500.000	PK	53.7	27.0	5.0	34.6	-	51.1	73.9	22.8	
Hori	4924.000	PK	41.7	31.5	7.4	33.8	-	46.8	73.9	27.1	Floor noise
Hori	7386.000	PK	42.3	35.8	8.4	34.0	-	52.5	73.9	21.4	Floor noise
Hori	9848.000	PK	42.9	38.2	9.1	34.5	-	55.7	73.9	18.2	Floor noise
Hori	2483.500	AV	44.3	27.0	5.0	34.6	0.2	41.9	53.9	12.0	*1)
Hori	2500.000	AV	46.4	27.0	5.0	34.6	0.2	44.0	53.9	9.9	
Hori	4924.000	AV	34.5	31.5	7.4	33.8	-	39.6	53.9	14.3	Floor noise
Hori	7386.000	AV	35.5	35.8	8.4	34.0	-	45.7	53.9	8.2	Floor noise
Hori	9848.000	AV	37.2	38.2	9.1	34.5	-	50.0	53.9	3.9	Floor noise
Vert	2483.500	PK	51.4	27.0	5.0	34.6	-	48.8	73.9	25.1	
Vert	2500.000	PK	52.2	27.0	5.0	34.6	-	49.6	73.9	24.3	
Vert	4924.000	PK	41.7	31.5	7.4	33.8	-	46.8	73.9	27.1	Floor noise
Vert	7386.000	PK	42.9	35.8	8.4	34.0	-	53.1	73.9	20.8	Floor noise
Vert	9848.000	PK	42.5	38.2	9.1	34.5	-	55.3	73.9	18.6	Floor noise
Vert	2483.500	AV	42.7	27.0	5.0	34.6	0.2	40.3	53.9	13.6	*1)
Vert	2500.000	AV	45.1	27.0	5.0	34.6	0.2	42.7	53.9	11.2	
Vert	4924.000	AV	35.3	31.5	7.4	33.8	-	40.4	53.9	13.5	Floor noise
Vert	7386.000	AV	36.6	35.8	8.4	34.0	-	46.8	53.9	7.1	Floor noise
Vert	9848.000	AV	37.2	38.2	9.1	34.5	-	50.0	53.9	3.9	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).

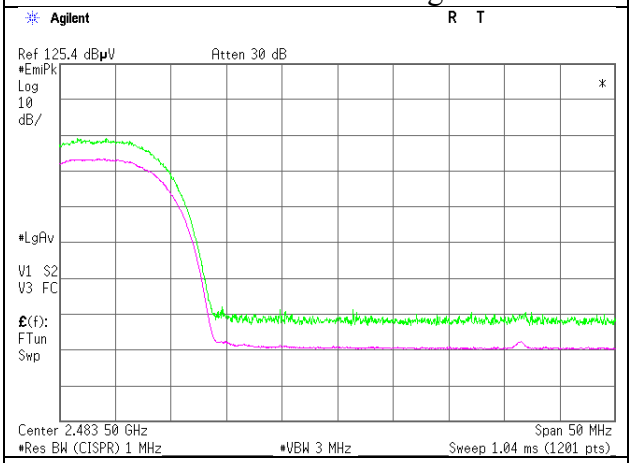
Distance factor: 1 GHz - 10 GHz 20log (3.7 m / 3.0 m) = 1.83 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	11832513H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	July 26, 2017
Temperature / Humidity	24 deg. C / 68 % RH
Engineer	Tomohisa Nakagawa (1 GHz -10 GHz)
Mode	Tx 11b 2462 MHz

Horizontal

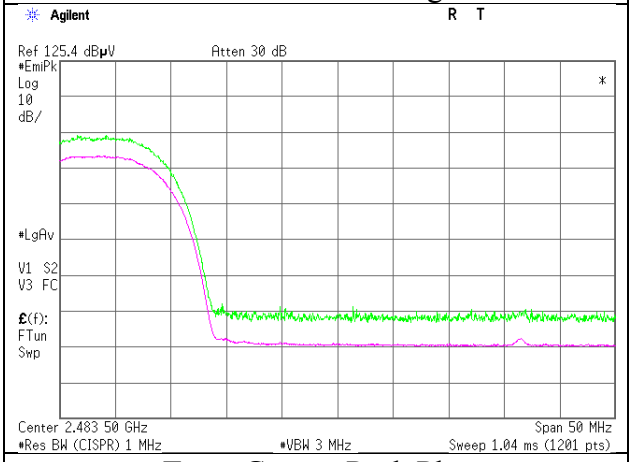
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

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

Radiated Spurious Emission
(Short ANT Cable)

Report No.	11832513H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	July 26, 2017
Temperature / Humidity	24 deg. C / 68 % RH
Engineer	Tomohisa Nakagawa
	(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	63.9	27.0	4.8	34.6	-	61.1	73.9	12.8	
Hori	2390.000	AV	51.2	27.0	4.8	34.6	0.3	48.7	53.9	5.2	*1)
Vert	2390.000	PK	63.9	27.0	4.8	34.6	-	61.1	73.9	12.8	
Vert	2390.000	AV	49.6	27.0	4.8	34.6	0.3	47.1	53.9	6.8	*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 (3.7 m / 3.0 m) = 1.83 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB
*1) Not Out of Band emission(Leakage Power)

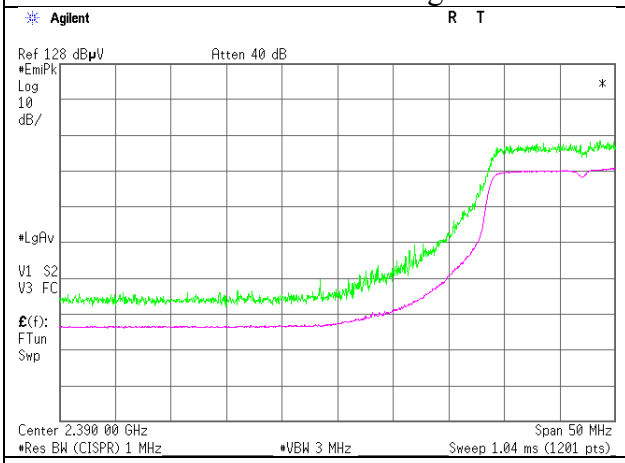
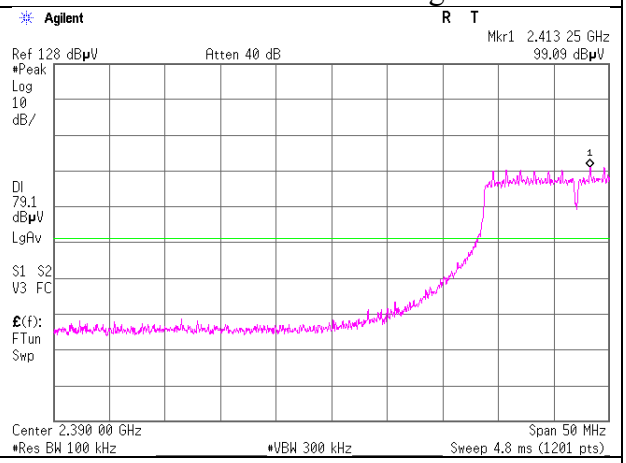
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	99.1	27.0	5.0	34.6	96.5	-	-	Carrier
Hori	2400.000	PK	68.1	27.0	4.9	34.6	65.4	76.5	11.1	
Vert	2412.000	PK	99.0	27.0	5.0	34.6	96.4	-	-	Carrier
Vert	2400.000	PK	67.1	27.0	4.9	34.6	64.4	76.4	12.0	

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

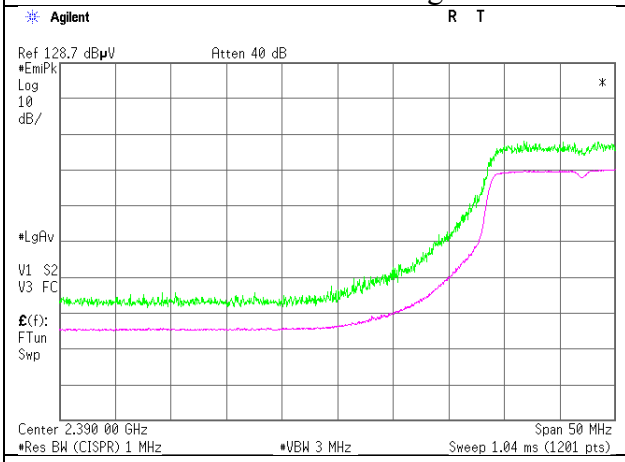
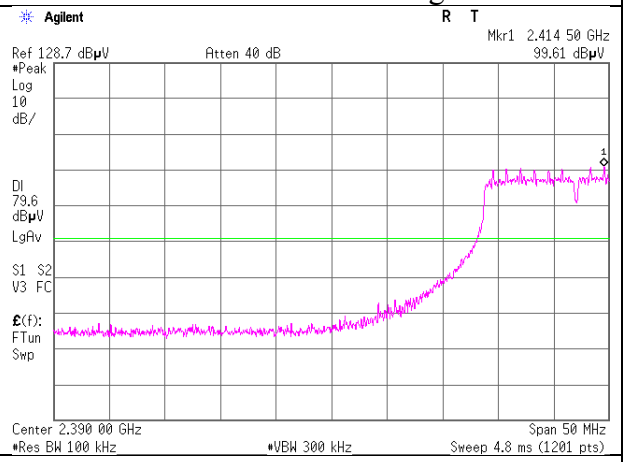
Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	11832513H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	July 26, 2017
Temperature / Humidity	24 deg. C / 68 % RH
Engineer	Tomohisa Nakagawa (1 GHz -10 GHz)
Mode	Tx 11g 2412 MHz

Horizontal

Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical

Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

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

Radiated Spurious Emission
(Short ANT Cable)

Report No.	11832513H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	July 26, 2017
Temperature / Humidity	24 deg. C / 68 % RH
Engineer	Tomohisa Nakagawa
	(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	61.9	27.0	5.0	34.6	-	59.3	73.9	14.6	
Hori	2483.500	AV	49.2	27.0	5.0	34.6	0.3	46.9	53.9	7.0	*1)
Vert	2483.500	PK	60.1	27.0	5.0	34.6	-	57.5	73.9	16.4	
Vert	2483.500	AV	47.4	27.0	5.0	34.6	0.3	45.1	53.9	8.8	*1)

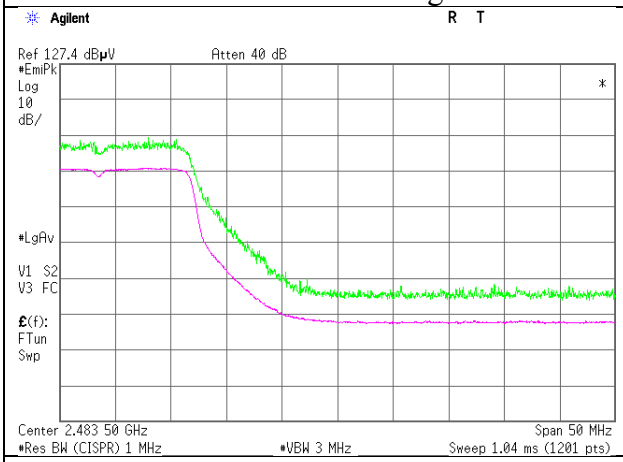
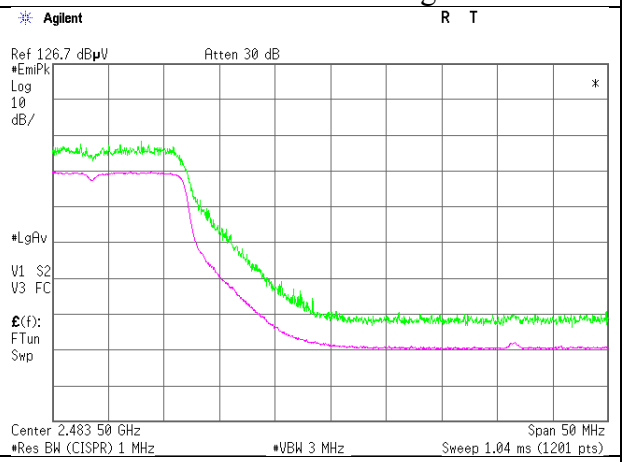
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*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 (3.7 m / 3.0 m) = 1.83 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

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

Reference Plot for band-edge

Horizontal	Vertical
Restricted-band band-edge Plot	Restricted-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	Trace Green : Peak Plot Trace Purple : Average Plot

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

Radiated Spurious Emission
(Short ANT Cable)

Report No.	11832513H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.3	No.3
Date	July 27, 2017	July 29, 2017
Temperature / Humidity	25 deg. C / 59 % RH	24 deg. C / 61 % RH
Engineer	Tomohisa Nakagawa	Shuichi Ohyama
	(1 GHz -10 GHz)	(10 GHz -26.5 GHz)
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	27.7	6.7	32.4	-	61.4	73.9	12.5	
Hori	2502.040	PK	55.3	27.9	6.8	32.4	-	57.6	73.9	16.3	
Hori	4824.000	PK	41.3	31.7	8.9	31.4	-	50.5	73.9	23.4	Floor noise
Hori	7236.000	PK	41.4	36.1	10.3	32.1	-	55.7	73.9	18.2	Floor noise
Hori	9648.000	PK	42.2	38.6	10.9	32.9	-	58.8	73.9	15.1	Floor noise
Hori	2390.000	AV	41.3	27.7	6.7	32.4	0.6	43.9	53.9	10.0	*1)
Hori	2502.040	AV	44.0	27.9	6.8	32.4	0.6	46.9	53.9	7.0	
Hori	4824.000	AV	30.5	31.7	8.9	31.4	-	39.7	53.9	14.2	Floor noise
Hori	7236.000	AV	31.9	36.1	10.3	32.1	-	46.2	53.9	7.7	Floor noise
Hori	9648.000	AV	32.7	38.6	10.9	32.9	-	49.3	53.9	4.6	Floor noise
Vert	2390.000	PK	57.6	27.7	6.7	32.4	-	59.6	73.9	14.3	
Vert	2502.040	PK	51.6	27.9	6.8	32.4	-	53.9	73.9	20.0	
Vert	4824.000	PK	40.2	31.7	8.9	31.4	-	49.4	73.9	24.5	Floor noise
Vert	7236.000	PK	42.8	36.1	10.3	32.1	-	57.1	73.9	16.8	Floor noise
Vert	9648.000	PK	43.7	38.6	10.9	32.9	-	60.3	73.9	13.6	Floor noise
Vert	2390.000	AV	44.3	27.7	6.7	32.4	0.6	46.9	53.9	7.0	*1)
Vert	2502.040	AV	39.6	27.9	6.8	32.4	0.6	42.5	53.9	11.4	
Vert	4824.000	AV	31.3	31.7	8.9	31.4	-	40.5	53.9	13.4	Floor noise
Vert	7236.000	AV	32.3	36.1	10.3	32.1	-	46.6	53.9	7.3	Floor noise
Vert	9648.000	AV	33.3	38.6	10.9	32.9	-	49.9	53.9	4.0	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 (4.45 m / 3.0 m) = 3.43 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

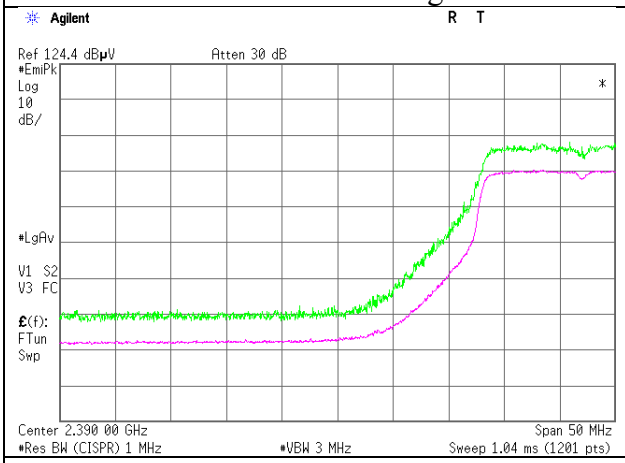
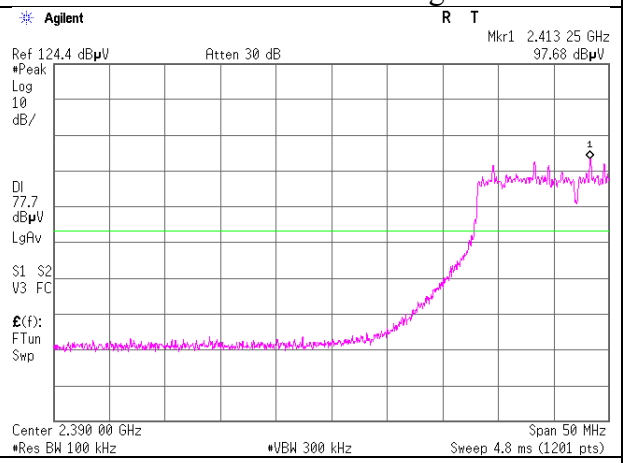
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	97.6	27.7	6.8	32.4	99.7	-	-	Carrier
Hori	2400.000	PK	66.5	27.7	6.8	32.4	68.6	79.7	11.1	
Vert	2412.000	PK	97.8	27.7	6.8	32.4	99.9	-	-	Carrier
Vert	2400.000	PK	66.4	27.7	6.8	32.4	68.5	79.9	11.4	

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

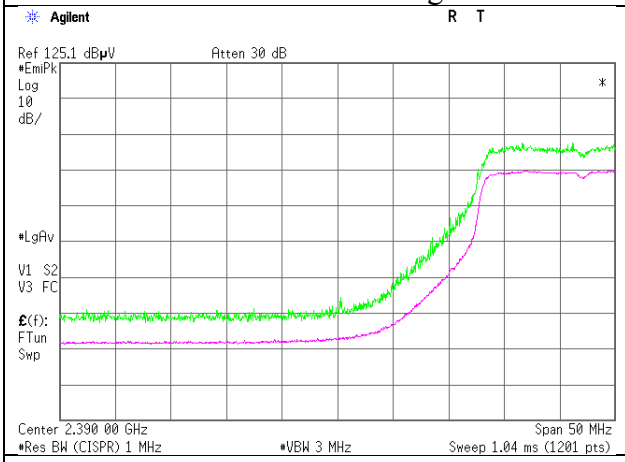
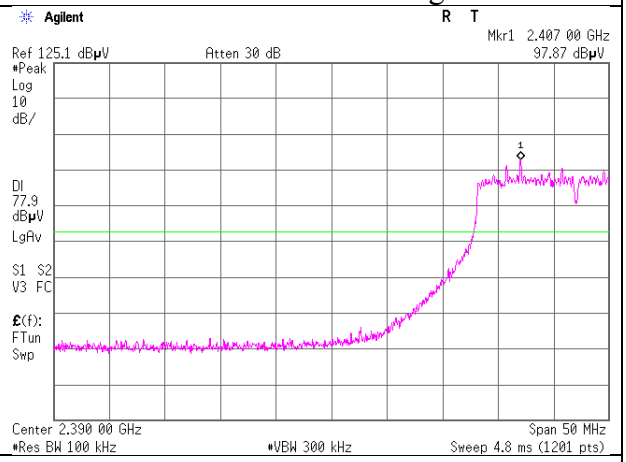
Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	11832513H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	July 27, 2017
Temperature / Humidity	25 deg. C / 59 % RH
Engineer	Tomohisa Nakagawa (1 GHz -10 GHz)
Mode	Tx 11n-20 2412 MHz

Horizontal

Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical

Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

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

Radiated Spurious Emission
(Short ANT Cable)

Report No.	11832513H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	July 27, 2017	July 29, 2017	August 2, 2017
Temperature / Humidity	25 deg. C / 59 % RH	24 deg. C / 61 % RH	22 deg. C / 59 % RH
Engineer	Tomohisa Nakagawa (1 GHz -10 GHz)	Shuichi Ohyama (10 GHz -26.5 GHz)	Yuta Moriya (Below 1 GHz)
Mode	Tx 11n-20 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	125.017	QP	36.7	13.4	7.6	27.8	-	29.9	43.5	13.6	
Hori	375.007	QP	41.4	15.2	9.3	27.6	-	38.3	46.0	7.7	
Hori	600.000	QP	41.7	19.1	10.1	28.0	-	42.9	46.0	3.1	
Hori	624.993	QP	38.8	19.3	10.2	27.9	-	40.4	46.0	5.6	
Hori	749.991	QP	35.1	20.3	10.7	27.4	-	38.7	46.0	7.3	
Hori	799.997	QP	34.8	20.8	10.9	27.2	-	39.3	46.0	6.7	
Hori	2519.998	PK	52.8	27.9	6.8	32.4	-	55.1	73.9	18.8	
Hori	4874.000	PK	40.9	31.9	8.9	31.4	-	50.3	73.9	23.6	Floor noise
Hori	7311.000	PK	42.1	36.2	10.3	32.2	-	56.4	73.9	17.5	Floor noise
Hori	9748.000	PK	42.4	38.7	11.0	33.0	-	59.1	73.9	14.8	Floor noise
Hori	2519.998	AV	44.5	27.9	6.8	32.4	0.6	47.4	53.9	6.5	
Hori	4874.000	AV	33.0	31.9	8.9	31.4	-	42.4	53.9	11.5	Floor noise
Hori	7311.000	AV	34.1	36.2	10.3	32.2	-	48.4	53.9	5.5	Floor noise
Hori	9748.000	AV	34.3	38.7	11.0	33.0	-	51.0	53.9	2.9	Floor noise
Vert	40.158	QP	44.2	14.1	6.8	28.2	-	36.9	40.0	3.1	
Vert	57.577	QP	50.8	8.6	7.0	28.1	-	38.3	40.0	1.7	
Vert	92.629	QP	43.5	8.5	7.4	28.0	-	31.4	43.5	12.1	
Vert	124.977	QP	40.0	13.4	7.6	27.8	-	33.2	43.5	10.3	
Vert	249.973	QP	39.3	11.7	8.5	27.1	-	32.4	46.0	13.6	
Vert	624.983	QP	35.8	19.3	10.2	27.9	-	37.4	46.0	8.6	
Vert	2519.998	PK	53.7	27.9	6.8	32.4	-	56.0	73.9	17.9	
Vert	4874.000	PK	41.1	31.9	8.9	31.4	-	50.5	73.9	23.4	Floor noise
Vert	7311.000	PK	43.2	36.2	10.3	32.2	-	57.5	73.9	16.4	Floor noise
Vert	9748.000	PK	42.6	38.7	11.0	33.0	-	59.3	73.9	14.6	Floor noise
Vert	2519.998	AV	45.5	27.9	6.8	32.4	0.6	48.4	53.9	5.5	
Vert	4874.000	AV	32.6	31.9	8.9	31.4	-	42.0	53.9	11.9	Floor noise
Vert	7311.000	AV	34.6	36.2	10.3	32.2	-	48.9	53.9	5.0	Floor noise
Vert	9748.000	AV	34.3	38.7	11.0	33.0	-	51.0	53.9	2.9	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 (4.45 m / 3.0 m) = 3.43 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Short ANT Cable)

Report No.	11832513H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.3	No.3
Date	July 27, 2017	July 29, 2017
Temperature / Humidity	25 deg. C / 59 % RH	24 deg. C / 61 % RH
Engineer	Tomohisa Nakagawa	Shuichi Ohyama
	(1 GHz -10 GHz)	(10 GHz -26.5 GHz)
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	54.9	27.8	6.8	32.4	-	57.1	73.9	16.8	
Hori	2499.940	PK	51.4	27.8	6.8	32.4	-	53.6	73.9	20.3	
Hori	4924.000	PK	39.8	32.0	9.0	31.3	-	49.5	73.9	24.4	Floor noise
Hori	7386.000	PK	41.5	36.3	10.2	32.2	-	55.8	73.9	18.1	Floor noise
Hori	9848.000	PK	40.6	38.8	11.0	33.0	-	57.4	73.9	16.5	Floor noise
Hori	2483.500	AV	44.6	27.8	6.8	32.4	0.6	47.4	53.9	6.5	*1)
Hori	2499.940	AV	44.1	27.8	6.8	32.4	0.6	46.9	53.9	7.0	
Hori	4924.000	AV	30.2	32.0	9.0	31.3	-	39.9	53.9	14.0	Floor noise
Hori	7386.000	AV	31.1	36.3	10.2	32.2	-	45.4	53.9	8.5	Floor noise
Hori	9848.000	AV	33.0	38.8	11.0	33.0	-	49.8	53.9	4.1	Floor noise
Vert	2483.500	PK	53.8	27.8	6.8	32.4	-	56.0	73.9	17.9	
Vert	2499.940	PK	50.5	27.8	6.8	32.4	-	52.7	73.9	21.2	
Vert	4924.000	PK	40.1	32.0	9.0	31.3	-	49.8	73.9	24.1	Floor noise
Vert	7386.000	PK	42.5	36.3	10.2	32.2	-	56.8	73.9	17.1	Floor noise
Vert	9848.000	PK	41.4	38.8	11.0	33.0	-	58.2	73.9	15.7	Floor noise
Vert	2483.500	AV	43.4	27.8	6.8	32.4	0.6	46.2	53.9	7.7	*1)
Vert	2499.940	AV	43.4	27.8	6.8	32.4	0.6	46.2	53.9	7.7	
Vert	4924.000	AV	33.0	32.0	9.0	31.3	-	42.7	53.9	11.2	Floor noise
Vert	7386.000	AV	33.7	36.3	10.2	32.2	-	48.0	53.9	5.9	Floor noise
Vert	9848.000	AV	33.0	38.8	11.0	33.0	-	49.8	53.9	4.1	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 (4.45 m / 3.0 m) = 3.43 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

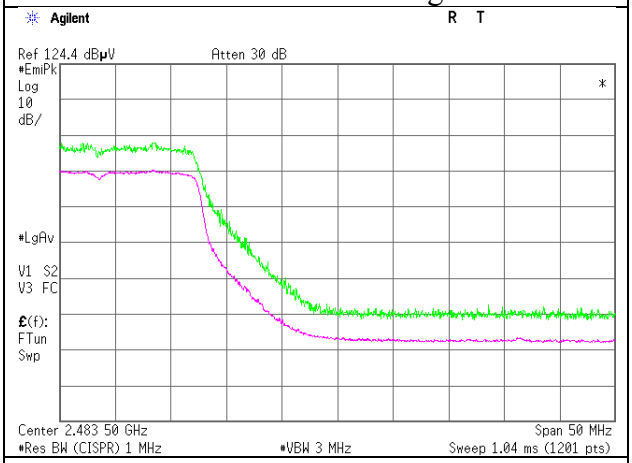
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	11832513H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	July 27, 2017
Temperature / Humidity	25 deg. C / 59 % RH
Engineer	Tomohisa Nakagawa (1 GHz -10 GHz)
Mode	Tx 11n-20 2462 MHz

Horizontal

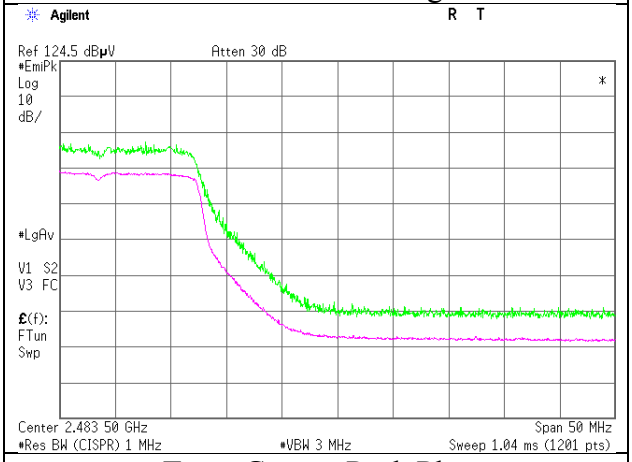
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

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

Radiated Spurious Emission
(Short ANT Cable)

Report No.	11832513H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.3	No.3
Date	July 27, 2017	July 29, 2017
Temperature / Humidity	25 deg. C / 59 % RH	24 deg. C / 61 % RH
Engineer	Tomohisa Nakagawa	Shuichi Ohyama
	(1 GHz -10 GHz)	(10 GHz -26.5 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	57.5	27.7	6.7	32.4	-	59.5	73.9	14.4	
Hori	2499.948	PK	50.0	27.8	6.8	32.4	-	52.2	73.9	21.7	
Hori	4844.000	PK	40.7	31.8	8.9	31.4	-	50.0	73.9	23.9	Floor noise
Hori	7266.000	PK	41.7	36.1	10.3	32.2	-	55.9	73.9	18.0	Floor noise
Hori	9688.000	PK	41.8	38.6	10.9	32.9	-	58.4	73.9	15.5	Floor noise
Hori	2390.000	AV	45.1	27.7	6.7	32.4	0.8	47.9	53.9	6.1	*1)
Hori	2499.948	AV	39.9	27.8	6.8	32.4	0.8	42.9	53.9	11.1	
Hori	4844.000	AV	31.8	31.8	8.9	31.4	-	41.1	53.9	12.8	Floor noise
Hori	7266.000	AV	32.2	36.1	10.3	32.2	-	46.4	53.9	7.5	Floor noise
Hori	9688.000	AV	32.4	38.6	10.9	32.9	-	49.0	53.9	4.9	Floor noise
Vert	2390.000	PK	57.7	27.7	6.7	32.4	-	59.7	73.9	14.2	
Vert	2499.948	PK	48.9	27.8	6.8	32.4	-	51.1	73.9	22.8	
Vert	4844.000	PK	40.5	31.8	8.9	31.4	-	49.8	73.9	24.1	Floor noise
Vert	7266.000	PK	42.2	36.1	10.3	32.2	-	56.4	73.9	17.5	Floor noise
Vert	9688.000	PK	42.6	38.6	10.9	32.9	-	59.2	73.9	14.7	Floor noise
Vert	2390.000	AV	45.9	27.7	6.7	32.4	0.8	48.7	53.9	5.3	*1)
Vert	2499.948	AV	39.3	27.8	6.8	32.4	0.8	42.3	53.9	11.7	
Vert	4844.000	AV	30.8	31.8	8.9	31.4	-	40.1	53.9	13.8	Floor noise
Vert	7266.000	AV	32.1	36.1	10.3	32.2	-	46.3	53.9	7.6	Floor noise
Vert	9688.000	AV	32.7	38.6	10.9	32.9	-	49.3	53.9	4.6	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 (4.45 m / 3.0 m) = 3.43 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	89.9	27.7	6.8	32.4	92.0	-	-	Carrier
Hori	2400.000	PK	59.4	27.7	6.8	32.4	61.5	72.0	10.5	
Vert	2422.000	PK	91.5	27.7	6.8	32.4	93.6	-	-	Carrier
Vert	2400.000	PK	58.8	27.7	6.8	32.4	60.9	73.6	12.7	

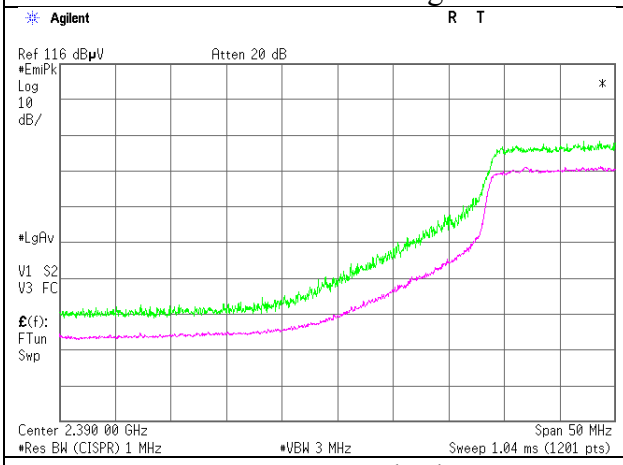
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	11832513H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	July 27, 2017
Temperature / Humidity	25 deg. C / 59 % RH
Engineer	Tomohisa Nakagawa (1 GHz -10 GHz)
Mode	Tx 11n-40 2422 MHz

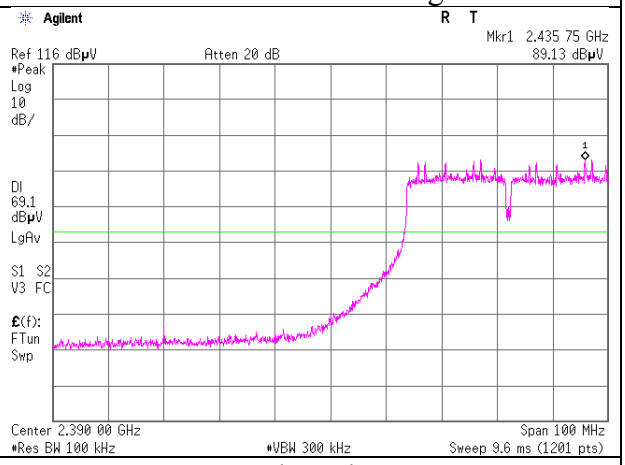
Horizontal

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

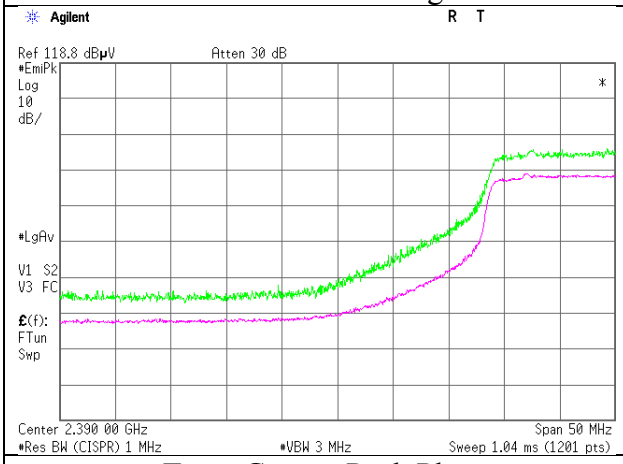
Authorized-band band-edge Plot



20dBc Plot

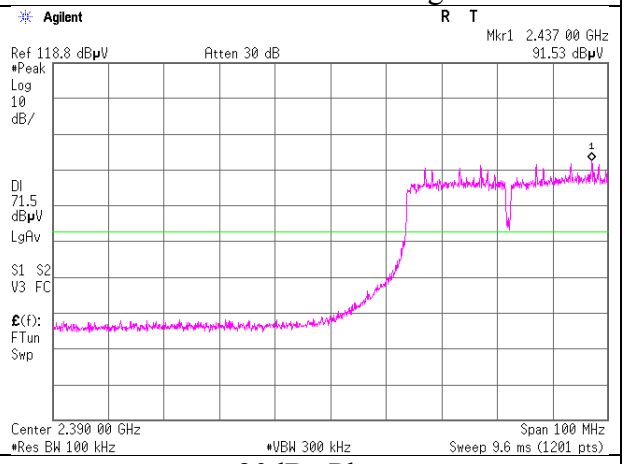
Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Authorized-band band-edge Plot



20dBc Plot

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

Radiated Spurious Emission
(Short ANT Cable)

Report No.	11832513H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.3	No.3
Date	July 27, 2017	July 29, 2017
Temperature / Humidity	25 deg. C / 59 % RH	24 deg. C / 61 % RH
Engineer	Tomohisa Nakagawa	Shuichi Ohyama
	(1 GHz -10 GHz)	(10 GHz -26.5 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	2499.944	PK	58.4	27.8	6.8	32.4	-	60.6	73.9	13.3	
Hori	4874.000	PK	41.1	31.9	8.9	31.4	-	50.5	73.9	23.4	Floor noise
Hori	7311.000	PK	43.8	36.2	10.3	32.2	-	58.1	73.9	15.8	Floor noise
Hori	9748.000	PK	41.6	38.7	11.0	33.0	-	58.3	73.9	15.6	Floor noise
Hori	2499.944	AV	48.2	27.8	6.8	32.4	0.8	51.2	53.9	2.8	
Hori	4874.000	AV	32.7	31.9	8.9	31.4	-	42.1	53.9	11.8	Floor noise
Hori	7311.000	AV	34.6	36.2	10.3	32.2	-	48.9	53.9	5.0	Floor noise
Hori	9748.000	AV	34.4	38.7	11.0	33.0	-	51.1	53.9	2.8	Floor noise
Vert	2499.944	PK	56.8	27.8	6.8	32.4	-	59.0	73.9	14.9	
Vert	4874.000	PK	41.0	31.9	8.9	31.4	-	50.4	73.9	23.5	Floor noise
Vert	7311.000	PK	42.5	36.2	10.3	32.2	-	56.8	73.9	17.1	Floor noise
Vert	9748.000	PK	42.0	38.7	11.0	33.0	-	58.7	73.9	15.2	Floor noise
Vert	2499.944	AV	46.9	27.8	6.8	32.4	0.8	49.9	53.9	4.1	
Vert	4874.000	AV	32.6	31.9	8.9	31.4	-	42.0	53.9	11.9	Floor noise
Vert	7311.000	AV	34.1	36.2	10.3	32.2	-	48.4	53.9	5.5	Floor noise
Vert	9748.000	AV	34.4	38.7	11.0	33.0	-	51.1	53.9	2.8	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 (4.45 m / 3.0 m) = 3.43 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Short ANT Cable)

Report No.	11832513H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.3	No.3
Date	July 27, 2017	July 29, 2017
Temperature / Humidity	25 deg. C / 59 % RH	24 deg. C / 61 % RH
Engineer	Tomohisa Nakagawa	Shuichi Ohyama
	(1 GHz -10 GHz)	(10 GHz -26.5 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	57.6	27.8	6.8	32.4	-	59.8	73.9	14.1	
Hori	2500.000	PK	46.5	27.9	6.8	32.4	-	48.8	73.9	25.1	
Hori	4904.000	PK	40.6	32.0	8.9	31.4	-	50.1	73.9	23.8	Floor noise
Hori	7356.000	PK	41.6	36.3	10.2	32.2	-	55.9	73.9	18.0	Floor noise
Hori	9808.000	PK	41.5	38.7	11.0	33.0	-	58.2	73.9	15.7	Floor noise
Hori	2483.500	AV	46.0	27.8	6.8	32.4	0.8	49.0	53.9	5.0	*1)
Hori	2500.000	AV	40.9	27.9	6.8	32.4	0.8	44.0	53.9	10.0	
Hori	4904.000	AV	31.9	32.0	8.9	31.4	-	41.4	53.9	12.5	Floor noise
Hori	7356.000	AV	31.7	36.3	10.2	32.2	-	46.0	53.9	7.9	Floor noise
Hori	9808.000	AV	34.2	38.7	11.0	33.0	-	50.9	53.9	3.0	Floor noise
Vert	2483.500	PK	58.0	27.8	6.8	32.4	-	60.2	73.9	13.7	
Vert	2500.000	PK	47.7	27.9	6.8	32.4	-	50.0	73.9	23.9	
Vert	4904.000	PK	40.4	32.0	8.9	31.4	-	49.9	73.9	24.0	Floor noise
Vert	7356.000	PK	42.2	36.3	10.2	32.2	-	56.5	73.9	17.4	Floor noise
Vert	9808.000	PK	42.4	38.7	11.0	33.0	-	59.1	73.9	14.8	Floor noise
Vert	2483.500	AV	38.9	27.8	6.8	32.4	0.8	41.9	53.9	12.1	*1)
Vert	2500.000	AV	36.3	27.9	6.8	32.4	0.8	39.4	53.9	14.6	
Vert	4904.000	AV	32.3	32.0	8.9	31.4	-	41.8	53.9	12.1	Floor noise
Vert	7356.000	AV	33.7	36.3	10.2	32.2	-	48.0	53.9	5.9	Floor noise
Vert	9808.000	AV	34.2	38.7	11.0	33.0	-	50.9	53.9	3.0	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 (4.45 m / 3.0 m) = 3.43 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

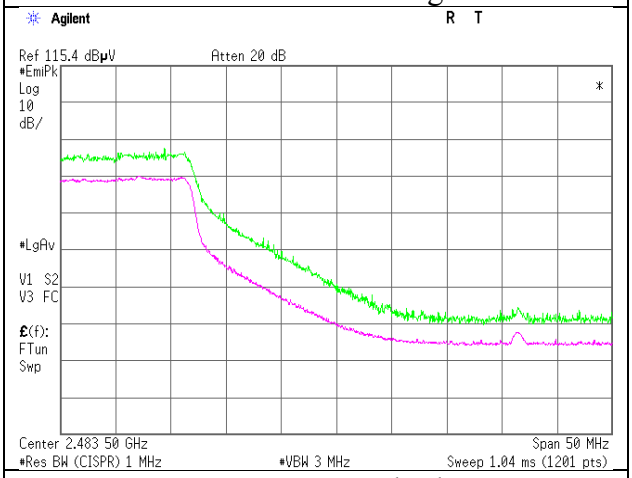
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission
(Reference Plot for band-edge)

Report No.	11832513H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	July 27, 2017
Temperature / Humidity	25 deg. C / 59 % RH
Engineer	Tomohisa Nakagawa (1 GHz -10 GHz)
Mode	Tx 11n-40 2452 MHz

Horizontal

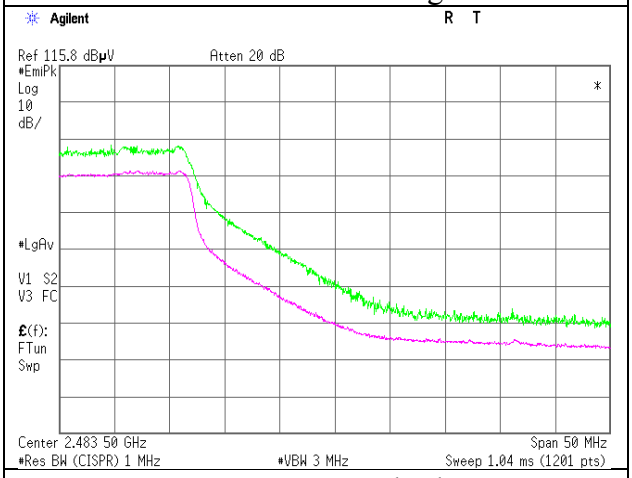
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

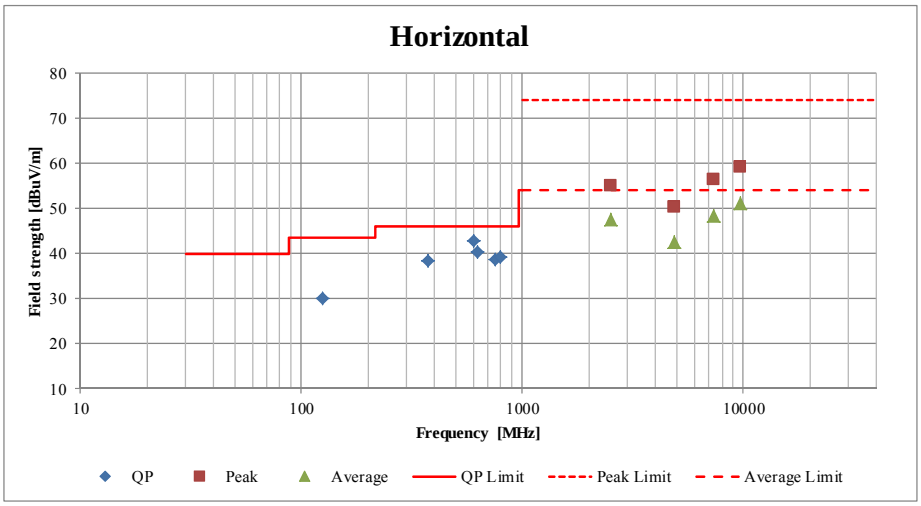
* Final result of restricted band edge was shown in tabular data.

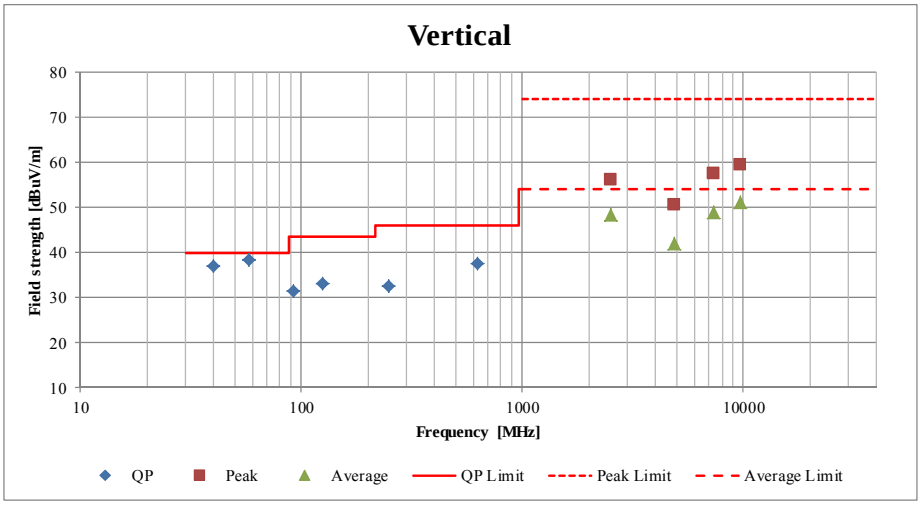
Radiated Spurious Emission

(Short ANT Cable)

(Plot data, Worst case)

Report No.	11832513H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.2	No.2	No.2
Date	July 27, 2017	July 29, 2017	August 2, 2017
Temperature / Humidity	25 deg. C / 59 % RH	24 deg. C / 61 % RH	22 deg. C / 59 % RH
Engineer	Tomohisa Nakagawa (1 GHz -10 GHz)	Shuichi Ohyama (10 GHz -26.5 GHz)	Yuta Moriya (Below 1 GHz)
Mode	Tx 11n-20 2437 MHz		





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

Radiated Spurious Emission
(Long ANT Cable)

Report No.	11832513H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.2
Date	August 3, 2017
Temperature / Humidity	23 deg. C / 55 % RH
Engineer	Hiroyuki Furutaka
Mode	Tx 11n-20 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	125.000	QP	43.8	13.2	7.6	27.8	-	36.8	43.5	6.7	
Hori	249.993	QP	46.1	11.7	8.5	27.1	-	39.2	46.0	6.8	
Hori	375.000	QP	43.0	15.2	9.3	27.6	-	39.9	46.0	6.1	
Hori	600.000	QP	40.7	19.1	10.1	28.0	-	41.9	46.0	4.1	
Hori	799.991	QP	35.6	20.8	10.9	27.2	-	40.1	46.0	5.9	
Hori	874.993	QP	36.7	21.8	11.1	26.9	-	42.7	46.0	3.3	
Hori	2520.040	PK	55.1	27.0	5.0	34.6	-	52.5	73.9	21.4	
Hori	4874.000	PK	44.3	31.4	7.1	33.8	-	49.0	73.9	24.9	Floor noise
Hori	7311.000	PK	45.0	35.7	8.5	33.9	-	55.3	73.9	18.6	Floor noise
Hori	9748.000	PK	45.8	38.2	8.9	34.5	-	58.4	73.9	15.5	Floor noise
Hori	2520.040	AV	46.4	27.0	5.0	34.6	0.6	44.4	53.9	9.5	
Hori	4874.000	AV	34.6	31.4	7.1	33.8	-	39.3	53.9	14.6	Floor noise
Hori	7311.000	AV	34.6	35.7	8.5	33.9	-	44.9	53.9	9.0	Floor noise
Hori	9748.000	AV	34.6	38.2	8.9	34.5	-	47.2	53.9	6.7	Floor noise
Vert	33.080	QP	37.5	16.5	6.8	28.2	-	32.6	40.0	7.4	
Vert	56.300	QP	47.1	8.7	7.0	28.1	-	34.7	40.0	5.3	
Vert	125.000	QP	47.8	13.2	7.6	27.8	-	40.8	43.5	2.7	
Vert	250.000	QP	44.0	11.7	8.5	27.1	-	37.1	46.0	8.9	
Vert	600.000	QP	39.9	19.1	10.1	28.0	-	41.1	46.0	4.9	
Vert	800.000	QP	34.8	20.8	10.9	27.2	-	39.3	46.0	6.7	
Vert	875.000	QP	35.4	21.8	11.1	26.9	-	41.4	46.0	4.6	
Vert	2520.040	PK	54.5	27.0	5.0	34.6	-	51.9	73.9	22.0	
Vert	4874.000	PK	43.4	31.4	7.1	33.8	-	48.1	73.9	25.8	Floor noise
Vert	7311.000	PK	44.9	35.7	8.5	33.9	-	55.2	73.9	18.7	Floor noise
Vert	9748.000	PK	45.3	38.2	8.9	34.5	-	57.9	73.9	16.0	Floor noise
Vert	2520.040	AV	46.6	27.0	5.0	34.6	0.6	44.6	53.9	9.3	
Vert	4874.000	AV	34.4	31.4	7.1	33.8	-	39.1	53.9	14.8	Floor noise
Vert	7311.000	AV	35.5	35.7	8.5	33.9	-	45.8	53.9	8.1	Floor noise
Vert	9748.000	AV	35.1	38.2	8.9	34.5	-	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 (3.7 m / 3.0 m) = 1.83 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2016/08/02 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2016/12/13 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2017/05/29 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2017/02/24 * 12
MCC-216	Microwave Cable	Junkosha	MWX221	1604S253(1 m) / 1608S087(5 m)	RE	2016/08/29 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2017/01/16 * 12
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE	2017/02/24 * 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	2016/10/20 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	1301	RE	2017/01/20 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE	-
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2017/05/22 * 12
MCC-167	Microwave Cable	Junkosha	MWX221	1404S374(1m) / 1405S074(5m)	RE	2017/05/29 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2017/03/21 * 12
MMM-08	DIGITAL HiTESTER	Hioki	3805	051201197	RE	2017/01/19 * 12
MHF-25	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	001	RE	2016/09/21 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2017/05/14 * 12
MHA-17	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170307	RE	2017/06/30 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2016/10/21 * 12
MBA-08	Biconical Antenna	Schwarzbeck	VHA9103B	08031	RE	2016/09/29 * 12
MLA-21	Logperiodic Antenna(200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-190	RE	2017/01/05 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2017/02/24 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2016/11/28 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2016/09/13 * 12
MMM-01	Digital Tester	Fluke	FLUKE 26-3	78030611	RE	2016/08/23 * 12

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

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

Test Item: RE: Radiated Emission test