



RADIO TEST REPORT


Test Report No. : 10462196H

Applicant : silex technology, Inc.
Type of Equipment : Wireless LAN PCI Express Mini Card Module
Model No. : SX-PCEGN
Test standard : EN 300 328 V1.8.1: 2012-06
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 standard(s).
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.

Date of test: September 9 to 28, 2014

**Representative
test engineer:**


Yutaka Yoshida
Engineer
Consumer Technology Division

Approved by :


Takahiro Hatakeda
Leader
Consumer Technology Division



NVLAP LAB CODE: 200572-0

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<http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap>

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13-EM-F0429

REVISION HISTORY

Original Test Report No.: 10462196H

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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 : Wireless LAN PCI Express Mini Card Module
Model No. : SX-PCEGN
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC3.3V
Receipt Date of Sample : August 18, 2014
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 No: SX-PCEGN (referred to as the EUT in this report) is the Wireless LAN PCI Express Mini Card Module.

Equipment Type : Transceiver
Clock frequency : 40MHz
Method of Frequency Generation : Synthesizer
Operating voltage(Power Supply) : DC3.3V
Operating voltage (inner) : DC1.2V
Maximum Antenna Gain : 2.0dBi

	IEEE802.11b	IEEE802.11g	IEEE802.11n (20HT)	IEEE802.11n (40HT)
Frequency of operation	2412-2472MHz		2412 - 2472MHz	2422 - 2462MHz
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)	
Channel spacing	5MHz		5MHz	5MHz
Antenna type	Omni-directional			
Antenna Connector type	U.FL Alternative connector			

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Radio : EN 300 328 V1.8.1:2012-06

Title : Electromagnetic compatibility and Radio spectrum Matters (ERM);
Wideband transmission systems; Data transmission equipment operating
in the 2.4GHz ISM band and using wide band modulation techniques;
Harmonized EN covering the essential requirements of article 3.2 of the
R&TTE Directive

Purpose of test : Compliance with the R&TTE directive 1999/5/EC.

3.2 Procedures and results

No.	Item	Test Procedure	Limit	Remarks	Worst margin	Exclusions	Results
1	RF output power	Clause 5.3.2	Clause 4.3.2.1	Conducted	-	N/A	Complied
2	Power Spectral Density	Clause 5.3.3	Clause 4.3.2.2	Conducted	-	N/A	Complied
3	Duty cycle, Tx-sequence, Tx-gap	Clause 5.3.2	Clause 4.3.2.3	Conducted	-	N/A	N/A *1)
4	Medium Utilisation (MU) factor	Clause 5.3.2	Clause 4.3.2.4	Conducted	-	N/A	N/A *1)
5	Adaptivity (adaptive equipment using modulations other than FHSS)	Clause 5.3.7	Clause 4.3.2.5	Conducted	-	N/A	Complied
6	Occupied Channel Bandwidth	Clause 5.3.8	Clause 4.3.2.6	Conducted	-	N/A	Complied
7	Transmitter unwanted emissions in the out-of-band domain	Clause 5.3.9	Clause 4.3.2.7	Conducted	-	N/A	Complied
8	Transmitter unwanted emissions in the spurious domain	Clause 5.3.10	Clause 4.3.2.8	Radiated	9.2dB 551.90MHz, Vertical	N/A	Complied
9	Receiver Spurious emissions	Clause 5.3.11	Clause 4.3.2.9	Radiated	6.3dB 926.10MHz, Horizontal	N/A	Complied
10	Receiver Blocking	Clause 5.3.7	Clause 4.3.2.10	Conducted	-	N/A	Complied
Note: UL Japan, Inc. 's EMI Work Procedure 13-EM-W0420.							
*1) The test is not applicable since the EUT is an adaptive equipment and does not operate in a non-adaptive mode.							

3.3 Additions or deviations to standards

No addition, exclusion nor deviation has been made from the standard.

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3.4 Uncertainty

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

RF output power	(+) 1.5dB
Power Spectral Density and Unwanted Emissions	(+) 1.7dB
Time and Duty Cycle	(±) 0.012%

Transmitter unwanted emissions in the spurious domain and Receiver Spurious emissions

Spurious Emission (EUT height: 1.5m) (+dB)	
Measurement Distance 3m	
30MHz-300MHz	5.5dB
300MHz-1000MHz	3.9dB
1GHz-12.75GHz	4.6dB

[Transmitter unwanted emissions in the spurious domain]

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

[Receiver spurious emissions]

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

3.5 Test Location

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

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 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 Data of EMI, Test instruments, and Test set up

Refer to APPENDIX.

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

4.1 Operating Mode(s)

Mode	Remarks*												
IEEE 802.11b (11b)	5.5Mbps (Short), PN9												
IEEE 802.11g (11g)	18Mbps, PN9												
IEEE 802.11n MIMO 20MHz BW (11n-20)	MCS9, PN9												
IEEE 802.11n MIMO 40MHz BW (11n-40)	MCS9, PN9												
*The worst condition was determined based on the test result of RF output power (Mid Channel)													
*Power of the EUT was set by the software as follows;													
Power settings:													
ch	1	2	3	4	5	6	7	8	9	10	11	12	13
11b	15dBm	15dBm	15dBm	15dBm	15dBm	15dBm	15dBm	15dBm	15dBm	15dBm	15dBm	15dBm	15dBm
11g	13dBm	15dBm	15dBm	15dBm	15dBm	15dBm	15dBm	15dBm	15dBm	15dBm	15dBm	11.5dBm	13dBm
11n-20	9dBm	12dBm	12dBm	12dBm	12dBm	12dBm	12dBm	12dBm	12dBm	12dBm	11dBm	12dBm	10.5dBm
11n-40	-	-	8dBm	12.5dBm	12.5dBm	12.5dBm	12.5dBm	12.5dBm	12.5dBm	12.5dBm	8dBm	-	-

Software: 9K Atheros Radio test

Firmware: FW 1.3.0

* 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.

Details of Operating Mode(s)

Test item	Operating mode	Tested Antenna port	Tested frequency
RF output power, Power Spectral Density	Transmitting (Tx) IEEE 802.11b/g	0	2412MHz
	Transmitting (Tx) IEEE 802.11n-20	0+1, 0, 1	2442MHz 2472MHz
	Transmitting (Tx) IEEE 802.11n-40	0+1, 0, 1	2422MHz 2442MHz 2462MHz
Occupied channel bandwidth	Transmitting (Tx) IEEE 802.11b/g/n-20	0 *1)	2412MHz 2472MHz
	Transmitting (Tx) IEEE 802.11n-40	0 *1)	2422MHz 2462MHz
Transmitter unwanted emissions in the out-of-band domain, Transmitter unwanted emissions in the spurious domain	Transmitting (Tx) IEEE 802.11b/g	0	2412MHz
	Transmitting (Tx) IEEE 802.11n-20	0+1, 0, 1	2472MHz
	Transmitting (Tx) IEEE 802.11n-40	0+1, 0, 1	2422MHz 2462MHz
Adaptivity, Receiver blocking	Communication IEEE 802.11b/g	0	2412MHz
	Communication IEEE 802.11n-20	0+1	2472MHz
	Communication IEEE 802.11n-40	0+1	2422MHz 2462MHz
Receiver spurious emissions	Receiving (Rx) IEEE 802.11b/g/n-20	0+1, 0, 1	2412MHz 2472MHz
	Receiving (Rx) IEEE 802.11n-40	0+1	2422MHz 2462MHz

*1) Occupied channel bandwidth test was performed with Antenna port 0 as representative, and other tests were performed with the antenna port that had higher power as a representative.

Extreme test condition	
Temperature	-20deg.C. to +70deg.C. : operating temperature range of EUT(plug-in devices)
Voltage	Vnom:DC3.3V, Vmin:DC2.97V, Vmax:DC3.63V : operating voltage range of EUT

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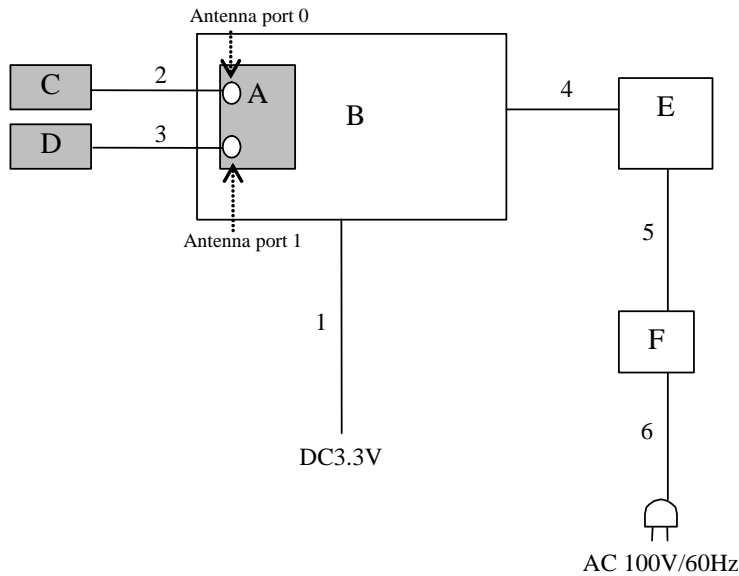
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4.2 Configuration and peripherals

[All tests except for Adaptivity and Receiver blocking]



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

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless LAN PCI Express Mini Card Module	SX-PCEGN	PP001 *1) PP002 *2)	silex technology, Inc.	EUT
B	Jig board	-	-	silex technology, Inc.	-
C	Antenna	ANTB18-119	001	silex technology, Inc.	EUT
D	Antenna	ANTB18-119	002	silex technology, Inc.	EUT
E	Laptop PC	65506	CNU1242MQ0	HP	-
F	AC Adapter	Series PPP009H	F12921113031494	HP	-

*1) Used for Antenna Terminal Conducted tests

*2) Spurious Emission tests

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	1.8	Unshielded	Unshielded	-
2	Antenna Cable	0.1	Shielded	Shielded	-
3	Antenna Cable	0.1	Shielded	Shielded	-
4	HDMI Cable	1.5	Shielded	Shielded	-
5	DC Cable	1.8	Unshielded	Unshielded	-
6	AC Cable	1.7	Unshielded	Unshielded	-

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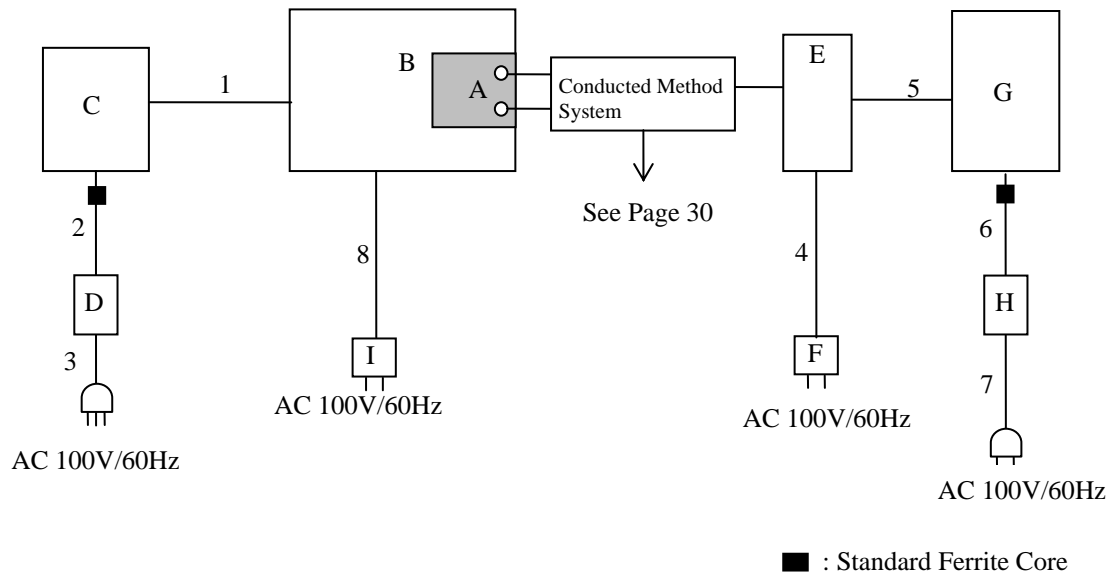
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[Adaptivity and Receiver blocking]



* 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	Remark
A	Wireless LAN PCI Express Mini Card Module	SX-PCEGN	PP003	silex technology, Inc.	EUT
B	Wireless Bridge	SX-BR-4600WAN	006661118	silex technology, Inc.	-
C	Laptop PC	Compaq 67306	CNU0092TP5	hp	-
D	AC Adaptor	PPP014H-S	F3-07110165670C	hp	-
E	Wireless LAN access point	LAN-WH450N/GR	25L326700121	Logitec	-
F	AC Adaptor	LA-15W12S	-	Logitec	-
G	Laptop PC	CF-W5AWDAXS	7HKSA86870	Panasonic	-
H	AC Adaptor	CF-AA6282A	6282AM1076146A	Panasonic	-
I	AC Adaptor	US115-05	C08-058972	UNIFIVE	-

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	LAN Cable	1.5	Unshielded	Unshielded	-
2	DC Cable	1.8	Unshielded	Unshielded	-
3	AC Cable	1.8	Unshielded	Unshielded	-
4	DC Cable	1.5	Unshielded	Unshielded	-
5	LAN Cable	1.0	Unshielded	Unshielded	-
6	DC Cable	1.8	Unshielded	Unshielded	-
7	AC Cable	1.2	Unshielded	Unshielded	-
8	DC Cable	1.8	Shielded	Shielded	-

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SECTION 5: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Instrument used	Remark
RF Output Power	Power Meter	Normal and Extreme conditions
Power Spectral Density	Spectrum Analyzer	Normal condition
Adaptivity	Spectrum Analyzer	Normal condition
Occupied Channel Bandwidth	Spectrum Analyzer	Normal condition
Transmitter unwanted emissions in the out-of band domain	Spectrum Analyzer	Normal and Extreme conditions - Detector mode: AV (RMS) - Band power was used on behalf of the time domain power function. - Filter mode: Gaussian Filter Since the data in this test report has enough margin
Receiver Blocking	Spectrum Analyzer	Normal condition

The test results are rounded off to two decimals place, so some differences might be observed.
The equipment and cables were not used for factor 0.0dB of the data sheets.

Test data : **APPENDIX**
Test result : **Pass**

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SECTION 6: Transmitter unwanted emissions in the spurious domain and Receiver spurious emissions

Test Procedure

- 1) EUT was placed on a urethane plate form of nominal size, 0.5m by 0.5m raised 1.5m above the conducting ground plane.
The Radiated Electric Field Strength intensity has been measured in semi anechoic chamber at a distance of 3m.
The measuring antenna height was varied between 1 to 4m and the turn table 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.
- 2) Exchanged the EUT to the Substitution Antenna, the measurement was set for the same height 1.5m as the EUT. The frequency below 1GHz of the Substitution Antenna was used the Half wave dipole Antenna, which was tuned the measured frequency in 1).
The frequency above 1GHz of the Substitution Antenna was used Horn Antenna.
The Substitution Antenna was connected to the Signal Generator, and the polarized electromagnetic radiation of the Substitution Antenna was matched with the one of the measuring Antenna, which was set with the Signal Generator to the measured frequency in 1). Then, we set with the Output power (CW) of the Signal Generator where the measuring electromagnetic field strength is equal to the measured value in 1) by means of varying the measuring antenna height between 1 to 4m to obtain maximum receiving level.
Its Output power of Signal Generator was recorded.
- 3) Below 1GHz:
Effective radiated power was calculated by subtracting the cable loss and the attenuator loss connected between the Signal Generator and the Substitution Antenna from the Output power of the Signal Generator recorded in 2).
For the usage of the Antenna (Horn Antenna) except for the Half wave dipole Antenna (2.15dBi) for the Substitution Antenna, the Effective radiated power was calculated by compensating the finite difference in the Antenna gain of the Half wave dipole Antenna, and Substitution Antenna.
Above 1GHz:
Equivalent isotropic radiated power was calculated by subtracting the cable loss and the attenuator loss connected between the signal generator and the substitution antenna from the output power of the signal generator recorded in 2).
For the usage of the antenna (horn antenna) for the substitution antenna, the equivalent isotropic radiated power was calculated by compensating the finite substitution antenna.

Pre-check scan setting

Frequency	Below 1GHz	Above 1GHz
Instrument used	Spectrum Analyzer	Spectrum Analyzer
IF Bandwidth	Peak, RBW: 100kHz/VBW: 300kHz	Peak, RBW: 1MHz/VBW: 3MHz
Trace mode	Max hold	Max hold

Measured setting

Frequency	Below 1GHz	Above 1GHz
Instrument used	Spectrum Analyzer	Spectrum Analyzer
IF Bandwidth	RMS, RBW: 100kHz/VBW: 300kHz	RMS, RBW: 1MHz/VBW: 3MHz
Span / sweep time	Wide enough to capture each individual emission identified / auto	Wide enough to capture each individual emission identified / auto

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

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

Test data : **APPENDIX**
Test result : **Pass**

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APPENDIX 1: Data of EMI test

RF Output Power

Test place : Ise EMC Lab. No.11/No.9 Measurement Room
Report No. : 10462196H
Date : 09/09/2014 09/16/2014 09/24/2014
Temperature/ Humidity : 24 deg. C / 60% RH 26 deg. C / 60% RH 23 deg. C / 59% RH
Engineer : Yutaka Yoshida Yutaka Yoshida Yutaka Yoshida
Mode : Tx 11b / Tx 11g

11b Antenna port 0, 5.5Mbps(short)

Test Condition	Temp.	Volt.	Freq.	P/M (AV)	Cable	Atten.	Antenna	Result	Limit	Margin
			[MHz]	Reading [dBm]	Loss [dB]	Loss [dB]	Gain [dBi]	[dBm]	[dBm]	[dB]
nom	nom	nom	2412.0	3.04	2.02	10.02	2.00	17.08	20.00	2.92
			2442.0	3.02	2.03	10.02	2.00	17.07	20.00	2.93
			2472.0	3.37	2.04	10.02	2.00	17.43	20.00	2.57
min	min	min	2412.0	2.59	2.02	10.02	2.00	16.63	20.00	3.37
			2442.0	2.41	2.03	10.02	2.00	16.46	20.00	3.54
			2472.0	2.20	2.04	10.02	2.00	16.26	20.00	3.74
min	max	max	2412.0	3.52	2.02	10.02	2.00	17.56	20.00	2.44
			2442.0	3.40	2.03	10.02	2.00	17.45	20.00	2.55
			2472.0	3.24	2.04	10.02	2.00	17.30	20.00	2.70
max	min	min	2412.0	2.07	2.02	10.02	2.00	16.11	20.00	3.89
			2442.0	2.11	2.03	10.02	2.00	16.16	20.00	3.84
			2472.0	2.38	2.04	10.02	2.00	16.44	20.00	3.56
max	max	max	2412.0	3.51	2.02	10.02	2.00	17.55	20.00	2.45
			2442.0	3.24	2.03	10.02	2.00	17.29	20.00	2.71
			2472.0	4.00	2.03	10.02	2.00	18.05	20.00	1.95

Result = Reading + Cable Loss + Attenuator Loss + Antenna Gain

11g Antenna port 0, 18Mbps

Test Condition	Temp.	Volt.	Freq.	P/M (AV)	Cable	Atten.	Antenna	Result	Limit	Margin
			[MHz]	Reading [dBm]	Loss [dB]	Loss [dB]	Gain [dBi]	[dBm]	[dBm]	[dB]
nom	nom	nom	2412.0	1.20	2.02	10.02	2.00	15.24	20.00	4.76
			2442.0	3.17	2.03	10.02	2.00	17.22	20.00	2.78
			2472.0	1.42	2.04	10.02	2.00	15.48	20.00	4.52
min	min	min	2412.0	1.06	2.02	10.02	2.00	15.10	20.00	4.90
			2442.0	2.69	2.03	10.02	2.00	16.74	20.00	3.26
			2472.0	1.45	2.04	10.02	2.00	15.51	20.00	4.49
min	max	max	2412.0	1.98	2.02	10.02	2.00	16.02	20.00	3.98
			2442.0	3.70	2.03	10.02	2.00	17.75	20.00	2.25
			2472.0	2.58	2.04	10.02	2.00	16.64	20.00	3.36
max	min	min	2412.0	0.80	2.02	10.02	2.00	14.84	20.00	5.16
			2442.0	2.22	2.03	10.02	2.00	16.27	20.00	3.73
			2472.0	1.24	2.04	10.02	2.00	15.30	20.00	4.70
max	max	max	2412.0	2.14	2.02	10.02	2.00	16.18	20.00	3.82
			2442.0	4.12	2.03	10.02	2.00	18.17	20.00	1.83
			2472.0	2.74	2.03	10.02	2.00	16.79	20.00	3.21

Result = Reading + Cable Loss + Attenuator Loss + Antenna Gain

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RF Output Power

Test place : Ise EMC Lab. No.11/No.9 Measurement Room
Report No. : 10462196H
Date : 09/09/2014 09/16/2014 09/24/2014
Temperature/ Humidity : 24 deg. C / 60% RH 26 deg. C / 60% RH 23 deg. C / 59% RH
Engineer : Yutaka Yoshida Yutaka Yoshida Yutaka Yoshida
Mode : Tx 11n-20

11n-20 Antenna port 0 + 1, MCS9

Test Condition Temp.	Volt.	Freq.	Result Antenna 0	Result Antenna 1	Result Antenna 0 + 1		Limit	Margin
		[MHz]	[mW]	[mW]	[dBm]	[mW]	[dBm]	[dB]
nom	nom	2412.0	15.67	18.88	15.38	34.55	20.00	4.62
		2442.0	29.85	49.32	18.99	79.17	20.00	1.01
		2472.0	25.88	35.08	17.85	60.96	20.00	2.15
min	min	2412.0	11.78	14.93	14.27	26.70	20.00	5.73
		2442.0	25.94	33.19	17.72	59.13	20.00	2.28
		2472.0	20.89	23.88	16.51	44.77	20.00	3.49
min	max	2412.0	16.37	19.41	15.54	35.78	20.00	4.46
		2442.0	34.20	40.74	18.75	74.94	20.00	1.25
		2472.0	27.67	28.31	17.48	55.98	20.00	2.52
max	min	2412.0	14.00	19.05	15.19	33.05	20.00	4.81
		2442.0	28.51	47.53	18.81	76.04	20.00	1.19
		2472.0	27.04	29.24	17.50	56.28	20.00	2.50
max	max	2412.0	17.66	26.18	16.42	43.84	20.00	3.58
		2442.0	38.28	53.70	19.64	91.99	20.00	0.36
		2472.0	41.88	43.65	19.32	85.53	20.00	0.68

11n-20 Antenna port 0, MCS9

Test Condition Temp.	Volt.	Freq.	P/M(AV) Reading	Cable Loss	Atten. Loss	Antenna Gain	Result	Limit	Margin
		[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dB]
nom	nom	2412.0	-2.09	2.02	10.02	2.00	11.95	20.00	8.05
		2442.0	0.70	2.03	10.02	2.00	14.75	20.00	5.25
		2472.0	0.07	2.04	10.02	2.00	14.13	20.00	5.87
min	min	2412.0	-3.33	2.02	10.02	2.00	10.71	20.00	9.29
		2442.0	0.09	2.03	10.02	2.00	14.14	20.00	5.86
		2472.0	-0.86	2.04	10.02	2.00	13.20	20.00	6.80
min	max	2412.0	-1.90	2.02	10.02	2.00	12.14	20.00	7.86
		2442.0	1.29	2.03	10.02	2.00	15.34	20.00	4.66
		2472.0	0.36	2.04	10.02	2.00	14.42	20.00	5.58
max	min	2412.0	-2.58	2.02	10.02	2.00	11.46	20.00	8.54
		2442.0	0.50	2.03	10.02	2.00	14.55	20.00	5.45
		2472.0	0.26	2.04	10.02	2.00	14.32	20.00	5.68
max	max	2412.0	-1.57	2.02	10.02	2.00	12.47	20.00	7.53
		2442.0	1.78	2.03	10.02	2.00	15.83	20.00	4.17
		2472.0	2.17	2.03	10.02	2.00	16.22	20.00	3.78

Result = Reading + Cable Loss + Attenuator Loss + Antenna Gain

11n-20 Antenna port 1, MCS9

Test Condition Temp.	Volt.	Freq.	P/M(AV) Reading	Cable Loss	Atten. Loss	Antenna Gain	Result	Limit	Margin
		[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dB]
nom	nom	2412.0	-1.28	2.02	10.02	2.00	12.76	20.00	7.24
		2442.0	2.88	2.03	10.02	2.00	16.93	20.00	3.07
		2472.0	1.39	2.04	10.02	2.00	15.45	20.00	4.55
min	min	2412.0	-2.30	2.02	10.02	2.00	11.74	20.00	8.26
		2442.0	1.16	2.03	10.02	2.00	15.21	20.00	4.79
		2472.0	-0.28	2.04	10.02	2.00	13.78	20.00	6.22
min	max	2412.0	-1.16	2.02	10.02	2.00	12.88	20.00	7.12
		2442.0	2.05	2.03	10.02	2.00	16.10	20.00	3.90
		2472.0	0.46	2.04	10.02	2.00	14.52	20.00	5.48
max	min	2412.0	-1.24	2.02	10.02	2.00	12.80	20.00	7.20
		2442.0	2.72	2.03	10.02	2.00	16.77	20.00	3.23
		2472.0	0.60	2.04	10.02	2.00	14.66	20.00	5.34
max	max	2412.0	0.14	2.02	10.02	2.00	14.18	20.00	5.82
		2442.0	3.25	2.03	10.02	2.00	17.30	20.00	2.70
		2472.0	2.35	2.03	10.02	2.00	16.40	20.00	3.60

Result = Reading + Cable Loss + Attenuator Loss + Antenna Gain

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RF Output Power

Test place	Ise EMC Lab. No.11/No.9 Measurement Room		
Report No.	10462196H		
Date	09/10/2014	09/16/2014	09/24/2014
Temperature/ Humidity	23 deg. C / 60% RH	26 deg. C / 60% RH	23 deg. C / 59% RH
Engineer	Yutaka Yoshida	Yutaka Yoshida	Yutaka Yoshida
Mode	Tx 11n-40		

11n-40 Antenna port 0 + 1, MCS9

Test Condition Temp.	Volt.	Freq.	Result Antenna 0	Result Antenna 1	Result Antenna 0 + 1		Limit	Margin
		[MHz]	[mW]	[mW]	[dBm]	[mW]	[dBm]	[dB]
nom	nom	2422.0	11.97	16.33	14.52	28.30	20.00	5.48
		2442.0	33.19	40.27	18.66	73.46	20.00	1.34
		2462.0	13.00	16.29	14.67	29.29	20.00	5.33
min	min	2422.0	10.07	11.51	13.34	21.58	20.00	6.66
		2442.0	26.73	36.56	18.01	63.29	20.00	1.99
		2462.0	9.53	12.62	13.45	22.15	20.00	6.55
min	max	2422.0	11.09	14.62	14.10	25.71	20.00	5.90
		2442.0	31.55	40.09	18.55	71.64	20.00	1.45
		2462.0	13.27	16.07	14.68	29.34	20.00	5.32
max	min	2422.0	10.74	16.07	14.28	26.81	20.00	5.72
		2442.0	25.41	41.40	18.25	66.81	20.00	1.75
		2462.0	11.69	17.78	14.69	29.48	20.00	5.31
max	max	2422.0	14.26	20.89	15.46	35.15	20.00	4.54
		2442.0	37.07	51.05	19.45	88.12	20.00	0.55
		2462.0	14.49	22.08	15.63	36.57	20.00	4.37

11n-40 Antenna port 0, MCS9

Test Condition Temp.	Volt.	Freq.	P/M(AV) Reading	Cable Loss	Atten. Loss	Antenna Gain	Result	Limit	Margin
		[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dB]
nom	nom	2422.0	-3.26	2.02	10.02	2.00	10.78	20.00	9.22
		2442.0	1.16	2.03	10.02	2.00	15.21	20.00	4.79
		2462.0	-2.92	2.04	10.02	2.00	11.14	20.00	8.86
min	min	2422.0	-4.01	2.02	10.02	2.00	10.03	20.00	9.97
		2442.0	0.22	2.03	10.02	2.00	14.27	20.00	5.73
		2462.0	-4.27	2.04	10.02	2.00	9.79	20.00	10.21
min	max	2422.0	-3.59	2.02	10.02	2.00	10.45	20.00	9.55
		2442.0	0.94	2.03	10.02	2.00	14.99	20.00	5.01
		2462.0	-2.83	2.04	10.02	2.00	11.23	20.00	8.77
max	min	2422.0	-3.73	2.02	10.02	2.00	10.31	20.00	9.69
		2442.0	0.00	2.03	10.02	2.00	14.05	20.00	5.95
		2462.0	-3.38	2.04	10.02	2.00	10.68	20.00	9.32
max	max	2422.0	-2.50	2.02	10.02	2.00	11.54	20.00	8.46
		2442.0	1.64	2.03	10.02	2.00	15.69	20.00	4.31
		2462.0	-2.44	2.03	10.02	2.00	11.61	20.00	8.39

Result = Reading + Cable Loss + Attenuator Loss + Antenna Gain

11n-40 Antenna port 1, MCS9

Test Condition Temp.	Volt.	Freq.	P/M(AV) Reading	Cable Loss	Atten. Loss	Antenna Gain	Result	Limit	Margin
		[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dB]
nom	nom	2422.0	-1.91	2.02	10.02	2.00	12.13	20.00	7.87
		2442.0	2.00	2.03	10.02	2.00	16.05	20.00	3.95
		2462.0	-1.94	2.04	10.02	2.00	12.12	20.00	7.88
min	min	2422.0	-3.43	2.02	10.02	2.00	10.61	20.00	9.39
		2442.0	1.58	2.03	10.02	2.00	15.63	20.00	4.37
		2462.0	-3.05	2.04	10.02	2.00	11.01	20.00	8.99
min	max	2422.0	-2.39	2.02	10.02	2.00	11.65	20.00	8.35
		2442.0	1.98	2.03	10.02	2.00	16.03	20.00	3.97
		2462.0	-2.00	2.04	10.02	2.00	12.06	20.00	7.94
max	min	2422.0	-1.98	2.02	10.02	2.00	12.06	20.00	7.94
		2442.0	2.12	2.03	10.02	2.00	16.17	20.00	3.83
		2462.0	-1.56	2.04	10.02	2.00	12.50	20.00	7.50
max	max	2422.0	-0.84	2.02	10.02	2.00	13.20	20.00	6.80
		2442.0	3.03	2.03	10.02	2.00	17.08	20.00	2.92
		2462.0	-0.61	2.03	10.02	2.00	13.44	20.00	6.56

Result = Reading + Cable Loss + Attenuator Loss + Antenna Gain

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RF Output Power (Worst Rate Check)

Test place	Ise EMC Lab. No.11/No.9 Measurement Room
Report No.	10462915H
Date	09/09/2014
Temperature/ Humidity	24 deg. C / 60% RH
Engineer	Yutaka Yoshida
Mode	Tx 11b / Tx 11g / Tx 11n-20

11b 2442MHz

Rate [Mbps]	Reading Antenna 0 [dBm]	Remark
1	2.90	
2(long)	2.81	
2(short)	2.76	
5.5(long)	2.94	
5.5(short)	3.02	*
11(long)	2.83	
11(short)	2.76	

*: Worst Rate

11b 2442MHz

Rate [Mbps]	Reading Antenna 1 [dBm]	Remark
1	1.31	
2(long)	1.71	
2(short)	1.78	*
5.5(long)	1.59	
5.5(short)	1.52	
11(long)	1.42	
11(short)	1.41	

*: Worst Rate

11g 2442MHz

Rate [Mbps]	Reading Antenna 0 [dBm]	Remark
6	2.92	
9	3.08	
12	2.86	
18	3.17	*
24	2.83	
36	2.71	
48	0.74	
54	-0.52	

*: Worst Rate

11g 2442MHz

Rate [Mbps]	Reading Antenna 1 [dBm]	Remark
6	0.52	
9	0.46	
12	0.67	
18	0.68	*
24	0.67	
36	0.29	
48	-1.66	
54	-2.91	

*: Worst Rate

11n-20 2442MHz

MCS Number	Reading Antenna 0		Reading Antenna 1		Result Antenna 0 + 1		Remark
	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
0	0.32	1.08	-1.89	0.65	-	-	
1	0.27	1.06	-1.81	0.66	-	-	
2	-0.02	1.00	-1.92	0.64	-	-	
3	0.30	1.07	-1.85	0.65	-	-	
4	0.25	1.06	-1.75	0.67	-	-	
5	0.04	1.01	-1.71	0.67	-	-	
6	-1.23	0.75	-3.33	0.46	-	-	
7	-1.85	0.65	-3.65	0.43	-	-	
8	0.78	1.20	2.72	1.87	4.87	3.07	
9	0.70	1.17	2.88	1.94	4.94	3.12	*
10	0.60	1.15	2.73	1.87	4.80	3.02	
11	0.52	1.13	2.58	1.81	4.68	2.94	
12	0.81	1.21	2.81	1.91	4.93	3.11	
13	0.66	1.16	2.83	1.92	4.89	3.08	
14	-0.74	0.84	1.11	1.29	3.29	2.13	
15	-1.07	0.78	0.53	1.13	2.81	1.91	

*: Worst Rate

Sample Calculation:

Result Antenna 0 + 1[mW] = Reading Antenna 0[mW] + Reading Antenna 1[mW]

Result Antenna 0 + 1[dBm] = 10*Log(Result Antenna 0 + 1[mW])

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

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RF Output Power (Worst Rate Check)

Test place	Ise EMC Lab. No.11 Measurement Room	
Report No.	10462916H	
Date	09/10/2014	09/16/2014
Temperature/ Humidity	23 deg. C / 60% RH	26 deg. C / 60% RH
Engineer	Yutaka Yoshida	Yutaka Yoshida
Mode	Tx 11n-40	

11n-40 2442MHz

MCS Number	Reading Antenna 0		Reading Antenna 1		Result Antenna 0 + 1		Remark
	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
0	0.39	1.09	-2.26	0.59	-	-	
1	0.24	1.06	-2.07	0.62	-	-	
2	0.16	1.04	-1.59	0.69	-	-	
3	0.56	1.14	-1.58	0.70	-	-	
4	0.36	1.09	-1.59	0.69	-	-	
5	0.63	1.16	-1.56	0.70	-	-	
6	-1.48	0.71	-3.59	0.44	-	-	
7	-1.92	0.64	-4.11	0.39	-	-	
8	0.65	1.16	2.90	1.95	4.93	3.11	
9	1.16	1.31	3.02	2.00	5.20	3.31	*
10	1.28	1.34	2.87	1.94	5.16	3.28	
11	0.58	1.14	2.17	1.65	4.46	2.79	
12	0.75	1.19	2.84	1.92	4.93	3.11	
13	0.60	1.15	2.81	1.91	4.85	3.06	
14	-1.19	0.76	0.46	1.11	2.72	1.87	
15	-1.62	0.69	-0.32	0.93	2.09	1.62	

*: Worst Rate

Sample Calculation:

Result Antenna 0 + 1[mW] = Reading Antenna 0[mW] + Reading Antenna 1[mW]

Result Antenna 0 + 1[dBm] = 10*Log(Result Antenna 0 + 1[mW])

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

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Power Spectral Density

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 10462196H
Date : 09/10/2014
Temperature/ Humidity : 23 deg. C / 60% RH
Engineer : Yutaka Yoshida
Mode : Tx 11b / Tx 11g

11b Antenna port 0, 5.5Mbps(short)

Test Condition		Ch	S/A	S/A	RF Output	Result	Limit	Margin
Temp.	Volt.	Freq.	Maximum Reading	Total Power Reading	Power			
		[MHz]	[dBm/MHz]	[dBm]	[dBm]	[dBm/MHz]	[dBm/MHz]	[dB]
nom	nom	2412.00	-3.14	6.27	17.08	7.67	10.00	2.33
		2442.00	-3.22	6.07	17.07	7.78	10.00	2.22
		2472.00	-2.82	6.62	17.43	7.99	10.00	2.01

Result [dBm/MHz] = S/A Maximum Reading [dBm/MHz] - S/A Total Power Reading [dBm] (*1) + RF Output Power [dBm] (*2)

(*1)Integrated value of 2400MHz to 2483.5MHz

(*2)Refer to RF Output Power

11g Antenna port 0, 18Mbps

Test Condition		Ch	S/A	S/A	RF Output	Result	Limit	Margin
Temp.	Volt.	Freq.	Maximum Reading	Total Power Reading	Power			
		[MHz]	[dBm/MHz]	[dBm]	[dBm]	[dBm/MHz]	[dBm/MHz]	[dB]
nom	nom	2412.00	-7.40	4.30	15.24	3.54	10.00	6.46
		2442.00	-5.94	5.86	17.22	5.42	10.00	4.58
		2472.00	-7.20	4.48	15.48	3.80	10.00	6.20

Result [dBm/MHz] = S/A Maximum Reading [dBm/MHz] - S/A Total Power Reading [dBm] (*1) + RF Output Power [dBm] (*2)

(*1)Integrated value of 2400MHz to 2483.5MHz

(*2)Refer to RF Output Power

UL Japan, Inc.

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Power Spectral Density

Test place Ise EMC Lab. No.11 Measurement Room
Report No. 10462196H
Date 09/10/2014
Temperature/ Humidity 23 deg. C / 60% RH
Engineer Yutaka Yoshida
Mode Tx 11n-20

11n-20 Antenna port 0 + 1, MCS9

Test Condition Temp.	Volt.	Ch Freq. [MHz]	S/A Maximum Reading [dBm/MHz]	S/A Total Power Reading [dBm]	RF Output Power [dBm]	Result [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]
nom	nom	2412.00	-7.42	4.65	15.38	3.31	10.00	6.69
		2442.00	-4.07	7.92	18.99	6.99	10.00	3.01
		2472.00	-5.16	6.79	17.85	5.90	10.00	4.10

11n-20 Antenna port 0, MCS9

Test Condition Temp.	Volt.	Ch Freq. [MHz]	S/A Maximum Reading [dBm/MHz]	S/A Total Power Reading [dBm]	RF Output Power [dBm]	Result [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]
nom	nom	2412.00	-10.89	1.18	11.95	-0.13	10.00	10.13
		2442.00	-8.17	3.70	14.75	2.89	10.00	7.11
		2472.00	-8.95	2.98	14.13	2.20	10.00	7.80

11n-20 Antenna port 1, MCS9

Test Condition Temp.	Volt.	Ch Freq. [MHz]	S/A Maximum Reading [dBm/MHz]	S/A Total Power Reading [dBm]	RF Output Power [dBm]	Result [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]
nom	nom	2412.00	-10.02	2.06	12.76	0.69	10.00	9.31
		2442.00	-6.22	5.86	16.93	4.85	10.00	5.15
		2472.00	-7.51	4.45	15.45	3.49	10.00	6.51

Result [dBm/MHz] = S/A Maximum Reading [dBm/MHz] - S/A Total Power Reading [dBm] (*1) + RF Output Power [dBm] (*2)

(*1) Integrated value of 2400MHz to 2483.5MHz

(*2) Refer to RF Output Power

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Power Spectral Density

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 10462196H
Date : 09/10/2014
Temperature/ Humidity : 23 deg. C / 60% RH
Engineer : Yutaka Yoshida
Mode : Tx 11n-40

11n-40 Antenna port 0 + 1, MCS9

Test Condition Temp.	Volt.	Ch Freq. [MHz]	S/A Maximum Reading [dBm/MHz]	S/A Total Power Reading [dBm]	RF Output Power [dBm]	Result [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]
nom	nom	2422.00	-11.41	3.62	14.52	-0.52	10.00	10.52
		2442.00	-6.94	8.05	18.66	3.68	10.00	6.32
		2462.00	-11.33	3.59	14.67	-0.25	10.00	10.25

11n-40 Antenna port 0, MCS9

Test Condition Temp.	Volt.	Ch Freq. [MHz]	S/A Maximum Reading [dBm/MHz]	S/A Total Power Reading [dBm]	RF Output Power [dBm]	Result [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]
nom	nom	2422.00	-15.17	-0.14	10.78	-4.25	10.00	14.25
		2442.00	-11.15	3.82	15.21	0.24	10.00	9.76
		2462.00	-15.09	-0.28	11.14	-3.67	10.00	13.67

11n-40 Antenna port 1, MCS9

Test Condition Temp.	Volt.	Ch Freq. [MHz]	S/A Maximum Reading [dBm/MHz]	S/A Total Power Reading [dBm]	RF Output Power [dBm]	Result [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]
nom	nom	2422.00	-13.79	1.25	12.13	-2.91	10.00	12.91
		2442.00	-9.01	5.99	16.05	1.06	10.00	8.94
		2462.00	-13.70	1.29	12.12	-2.87	10.00	12.87

Result [dBm/MHz] = S/A Maximum Reading [dBm/MHz] - S/A Total Power Reading [dBm] (*1) + RF Output Power [dBm] (*2)

(*1) Integrated value of 2400MHz to 2483.5MHz

(*2) Refer to RF Output Power

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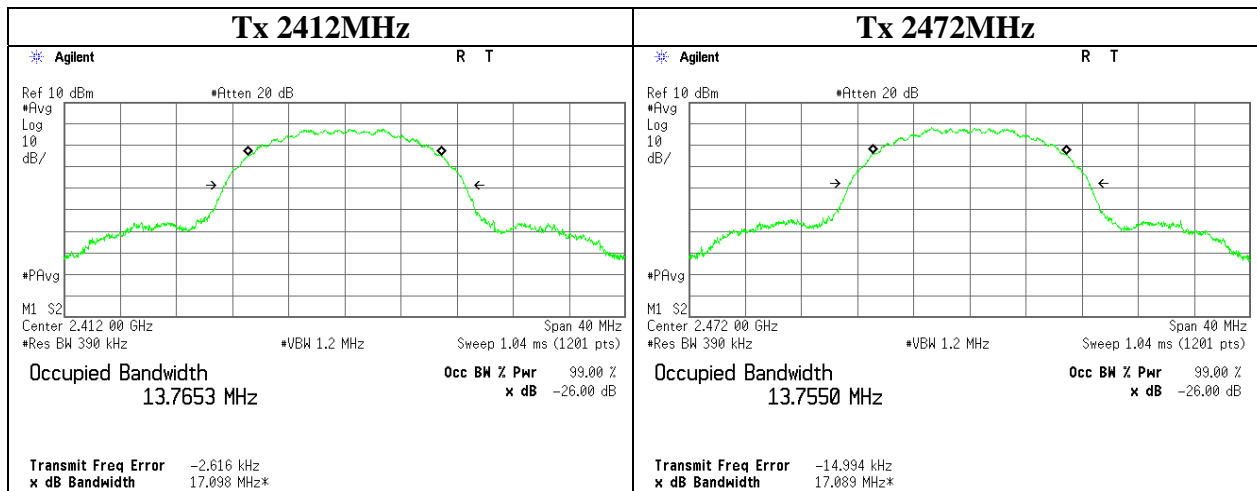
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Occupied Channel Bandwidth

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 10462196H
Date : 09/10/2014
Temperature/ Humidity : 23 deg. C / 60% RH
Engineer : Yutaka Yoshida
Mode : Tx 11b

Frequency [MHz]	Bandwidth [MHz]	Result [MHz]	Limit [MHz]
2412	13.7653	2405.1174	> 2400
2472	13.7550	2478.8775	< 2483.5



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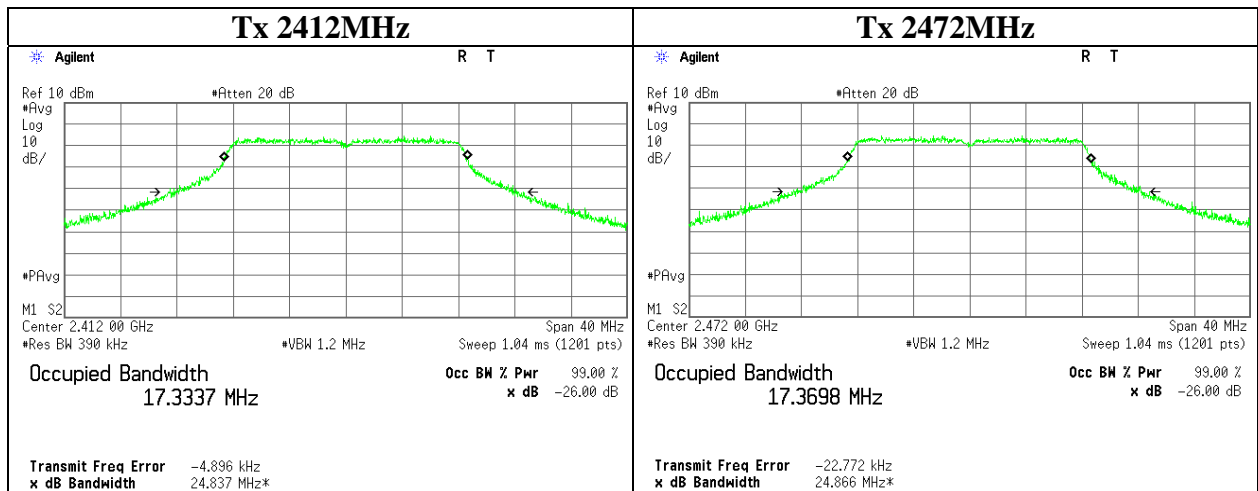
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Facsimile : +81 596 24 8124

Occupied Channel Bandwidth

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 10462196H
Date : 09/10/2014
Temperature/ Humidity : 23 deg. C / 60% RH
Engineer : Yutaka Yoshida
Mode : Tx 11g

Frequency [MHz]	Bandwidth [MHz]	Result [MHz]	Limit [MHz]
2412	17.3337	2403.3332	> 2400
2472	17.3698	2480.6849	< 2483.5



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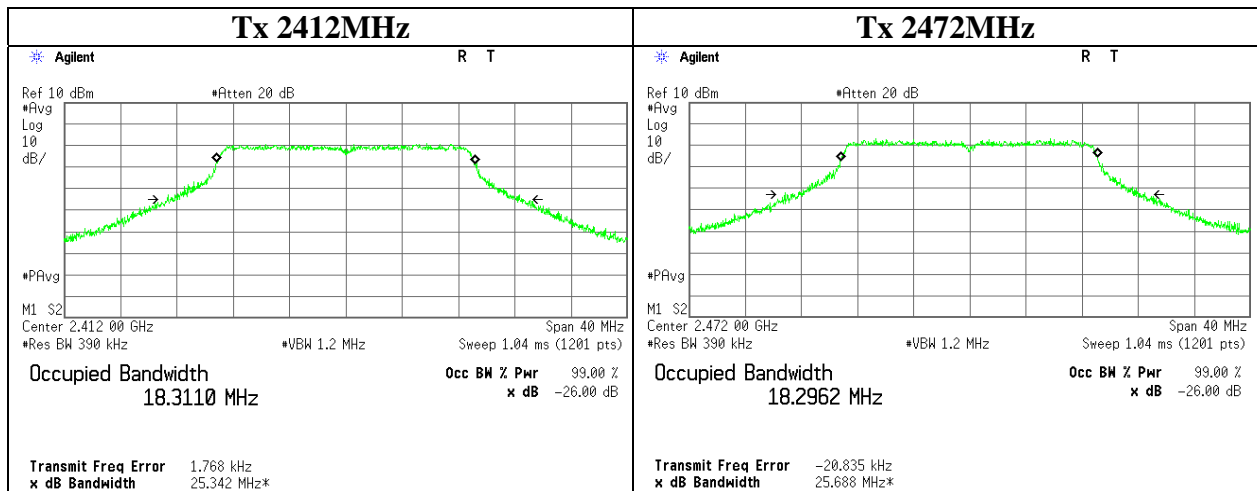
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Facsimile : +81 596 24 8124

Occupied Channel Bandwidth

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 10462196H
Date : 09/10/2014
Temperature/ Humidity : 23 deg. C / 60% RH
Engineer : Yutaka Yoshida
Mode : Tx 11n-20

Frequency [MHz]	Bandwidth [MHz]	Result [MHz]	Limit [MHz]
2412	18.3110	2402.8445	> 2400
2472	18.2962	2481.1481	< 2483.5



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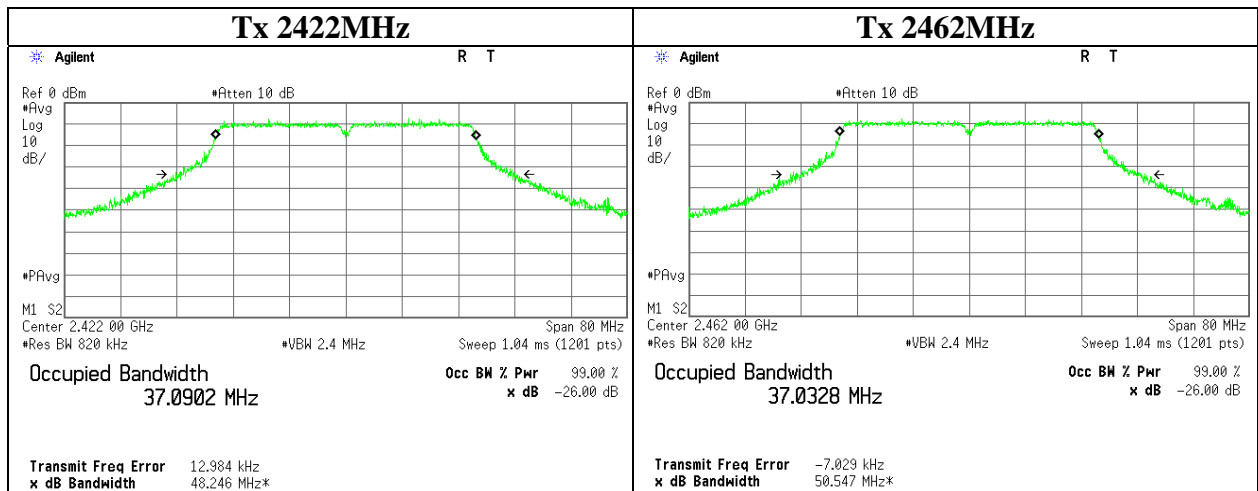
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Occupied Channel Bandwidth

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 10462196H
Date : 09/10/2014
Temperature/ Humidity : 23 deg. C / 60% RH
Engineer : Yutaka Yoshida
Mode : Tx 11n-40

Frequency [MHz]	Bandwidth [MHz]	Result [MHz]	Limit [MHz]
2422	37.0902	2403.4549	> 2400
2462	37.0328	2480.5164	< 2483.5



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Transmitter unwanted emissions in the out-of-band domain

Test place	Ise EMC Lab. No.11/No.9 Measurement Room		
Report No.	10462196H		
Date	09/10/2014	09/16/2014	09/24/2014
Temperature/ Humidity	23 deg. C / 60% RH	26 deg. C / 60% RH	23 deg. C / 59% RH
Engineer	Yutaka Yoshida	Yutaka Yoshida	Yutaka Yoshida
Mode	Tx 11b		

11b Antenna port 0, 5.5Mbps(short)

Test Condition Temp.	Volt.	Frequency [MHz]	S/A(AV) Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]	Remarks
nom	nom	2385.7	-68.36	2.01	10.02	2.00	-54.33	-20.00	34.33	Lowest ch 2400MHz- 2BW
		2399.5	-50.11	2.01	10.02	2.00	-36.08	-10.00	26.08	Lowest ch 2400MHz- BW
		2485.0	-49.81	2.05	10.02	2.00	-35.74	-10.00	25.74	Highest ch 2483.5MHz + BW
		2497.8	-68.73	2.05	10.02	2.00	-54.66	-20.00	34.66	Highest ch 2483.5MHz + 2BW
min	min	2385.7	-69.04	2.01	10.02	2.00	-55.01	-20.00	35.01	Lowest ch 2400MHz- 2BW
		2399.5	-47.42	2.01	10.02	2.00	-33.39	-10.00	23.39	Lowest ch 2400MHz- BW
		2485.0	-47.81	2.05	10.02	2.00	-33.74	-10.00	23.74	Highest ch 2483.5MHz + BW
		2497.8	-68.53	2.05	10.02	2.00	-54.46	-20.00	34.46	Highest ch 2483.5MHz + 2BW
min	max	2385.7	-68.81	2.01	10.02	2.00	-54.78	-20.00	34.78	Lowest ch 2400MHz- 2BW
		2399.5	-45.94	2.01	10.02	2.00	-31.91	-10.00	21.91	Lowest ch 2400MHz- BW
		2485.0	-47.79	2.05	10.02	2.00	-33.72	-10.00	23.72	Highest ch 2483.5MHz + BW
		2497.8	-68.31	2.05	10.02	2.00	-54.24	-20.00	34.24	Highest ch 2483.5MHz + 2BW
max	min	2385.7	-68.49	2.01	10.02	2.00	-54.46	-20.00	34.46	Lowest ch 2400MHz- 2BW
		2399.5	-52.27	2.01	10.02	2.00	-38.24	-10.00	28.24	Lowest ch 2400MHz- BW
		2485.0	-50.94	2.05	10.02	2.00	-36.87	-10.00	26.87	Highest ch 2483.5MHz + BW
		2499.8	-68.87	2.05	10.02	2.00	-54.80	-20.00	34.80	Highest ch 2483.5MHz + 2BW
max	max	2385.7	-68.45	2.01	10.02	2.00	-54.42	-20.00	34.42	Lowest ch 2400MHz- 2BW
		2399.5	-50.69	2.01	10.02	2.00	-36.66	-10.00	26.66	Lowest ch 2400MHz- BW
		2485.0	-49.74	2.05	10.02	2.00	-35.67	-10.00	25.67	Highest ch 2483.5MHz + BW
		2497.8	-67.93	2.05	10.02	2.00	-53.86	-20.00	33.86	Highest ch 2483.5MHz + 2BW

Result = Reading + Cable Loss + Attenuator Loss + Antenna Gain

*Above test result was maximum value on each 1BW.

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Transmitter unwanted emissions in the out-of-band domain

Test place	Ise EMC Lab. No.11/No.9 Measurement Room		
Report No.	10462196H		
Date	09/10/2014	09/16/2014	09/24/2014
Temperature/ Humidity	23 deg. C / 60% RH	26 deg. C / 60% RH	23 deg. C / 59% RH
Engineer	Yutaka Yoshida	Yutaka Yoshida	Yutaka Yoshida
Mode	Tx 11g		

11g Antenna port 0, 18Mbps

Test Condition Temp.	Volt.	Frequency [MHz]	S/A(AV) Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]	Remarks
nom	nom	2382.2	-66.41	2.01	10.02	2.00	-52.38	-20.00	32.38	Lowest ch 2400MHz- 2BW
		2399.5	-39.91	2.01	10.02	2.00	-25.88	-10.00	15.88	Lowest ch 2400MHz- BW
		2484.0	-39.01	2.05	10.02	2.00	-24.94	-10.00	14.94	Highest ch 2483.5MHz + BW
		2501.4	-66.98	2.05	10.02	2.00	-52.91	-20.00	32.91	Highest ch 2483.5MHz + 2BW
min	min	2382.2	-65.91	2.01	10.02	2.00	-51.88	-20.00	31.88	Lowest ch 2400MHz- 2BW
		2399.5	-39.32	2.01	10.02	2.00	-25.29	-10.00	15.29	Lowest ch 2400MHz- BW
		2484.0	-38.25	2.05	10.02	2.00	-24.18	-10.00	14.18	Highest ch 2483.5MHz + BW
		2501.4	-66.69	2.05	10.02	2.00	-52.62	-20.00	32.62	Highest ch 2483.5MHz + 2BW
min	max	2382.2	-66.00	2.01	10.02	2.00	-51.97	-20.00	31.97	Lowest ch 2400MHz- 2BW
		2399.5	-38.36	2.01	10.02	2.00	-24.33	-10.00	14.33	Lowest ch 2400MHz- BW
		2484.0	-37.42	2.05	10.02	2.00	-23.35	-10.00	13.35	Highest ch 2483.5MHz + BW
		2509.4	-63.62	2.05	10.02	2.00	-49.55	-20.00	29.55	Highest ch 2483.5MHz + 2BW
max	min	2375.2	-67.49	2.01	10.02	2.00	-53.46	-20.00	33.46	Lowest ch 2400MHz- 2BW
		2399.5	-40.28	2.01	10.02	2.00	-26.25	-10.00	16.25	Lowest ch 2400MHz- BW
		2484.0	-38.50	2.05	10.02	2.00	-24.43	-10.00	14.43	Highest ch 2483.5MHz + BW
		2509.4	-66.15	2.05	10.02	2.00	-52.08	-20.00	32.08	Highest ch 2483.5MHz + 2BW
max	max	2382.2	-66.24	2.01	10.02	2.00	-52.21	-20.00	32.21	Lowest ch 2400MHz- 2BW
		2399.5	-38.96	2.01	10.02	2.00	-24.93	-10.00	14.93	Lowest ch 2400MHz- BW
		2484.0	-37.23	2.05	10.02	2.00	-23.16	-10.00	13.16	Highest ch 2483.5MHz + BW
		2509.4	-65.83	2.05	10.02	2.00	-51.76	-20.00	31.76	Highest ch 2483.5MHz + 2BW

Result = Reading + Cable Loss + Attenuator Loss + Antenna Gain

*Above test result was maximum value on each 1BW.

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Transmitter unwanted emissions in the out-of-band domain

Test place	Ise EMC Lab. No.11/No.9 Measurement Room		
Report No.	10462196H		
Date	09/10/2014	09/16/2014	09/24/2014
Temperature/ Humidity	23 deg. C / 60% RH	26 deg. C / 60% RH	23 deg. C / 59% RH
Engineer	Yutaka Yoshida	Yutaka Yoshida	Yutaka Yoshida
Mode	Tx 11n-20		

11n-20 Antenna port 0 + 1, MCS9

Test Condition		Frequency [MHz]	Result		Result		Limit [dBm/MHz]	Margin [dB]	Remarks
Temp.	Volt.		Antenna 0 [mW/MHz]	Antenna 1 [mW/MHz]	Antenna 0+1 [mW/MHz]	Antenna 0+1 [dBm/MHz]			
nom	nom	2376.2	0.00000459	0.00000366	0.00000825	-50.84	-20.00	30.84	Lowest ch 2400MHz- 2BW
		2399.5	0.00126474	0.00161771	0.00288244	-25.40	-10.00	15.40	Lowest ch 2400MHz- BW
		2484.0	0.00304930	0.00406069	0.00710999	-21.48	-10.00	11.48	Highest ch 2483.5MHz + BW
		2502.3	0.00000387	0.00000567	0.00000954	-50.21	-20.00	30.21	Highest ch 2483.5MHz + 2BW
min	min	2376.2	0.00000433	0.00000514	0.00000947	-50.24	-20.00	30.24	Lowest ch 2400MHz- 2BW
		2399.5	0.00112357	0.00153709	0.00266066	-25.75	-10.00	15.75	Lowest ch 2400MHz- BW
		2484.0	0.00248313	0.00304159	0.00552472	-22.58	-10.00	12.58	Highest ch 2483.5MHz + BW
		2509.3	0.00001081	0.00001456	0.00002537	-45.96	-20.00	25.96	Highest ch 2483.5MHz + 2BW
min	max	2373.2	0.00000660	0.00000619	0.00001279	-48.93	-20.00	28.93	Lowest ch 2400MHz- 2BW
		2399.5	0.00140508	0.00196426	0.00336934	-24.72	-10.00	14.72	Lowest ch 2400MHz- BW
		2484.0	0.00279319	0.00317103	0.00596421	-22.24	-10.00	12.24	Highest ch 2483.5MHz + BW
		2509.3	0.00001057	0.00001287	0.00002344	-46.30	-20.00	26.30	Highest ch 2483.5MHz + 2BW
max	min	2376.2	0.00000219	0.00000259	0.00000477	-53.21	-20.00	33.21	Lowest ch 2400MHz- 2BW
		2399.5	0.00125112	0.00145982	0.00271095	-25.67	-10.00	15.67	Lowest ch 2400MHz- BW
		2484.0	0.00228402	0.00449262	0.00677664	-21.69	-10.00	11.69	Highest ch 2483.5MHz + BW
		2508.3	0.00000413	0.00000612	0.00001025	-49.89	-20.00	29.89	Highest ch 2483.5MHz + 2BW
max	max	2376.2	0.00000192	0.00000288	0.00000479	-53.20	-20.00	33.20	Lowest ch 2400MHz- 2BW
		2399.5	0.00129688	0.00186252	0.00315940	-25.00	-10.00	15.00	Lowest ch 2400MHz- BW
		2484.0	0.00415815	0.00604923	0.01020738	-19.91	-10.00	9.91	Highest ch 2483.5MHz + BW
		2508.3	0.00000385	0.00000562	0.00000947	-50.24	-20.00	30.24	Highest ch 2483.5MHz + 2BW

*Above test result was maximum value on each 1BW.

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Transmitter unwanted emissions in the out-of-band domain

Test place	Ise EMC Lab. No.11/No.9 Measurement Room		
Report No.	10462196H		
Date	09/10/2014	09/16/2014	09/24/2014
Temperature/ Humidity	23 deg. C / 60% RH	26 deg. C / 60% RH	23 deg. C / 59% RH
Engineer	Yutaka Yoshida	Yutaka Yoshida	Yutaka Yoshida
Mode	Tx 11n-20		

11n-20 Antenna port 0, MCS9

Test Condition	Temp.	Volt.	Frequency	S/A(AV)	Cable	Atten.	Antenna	Result	Limit	Margin	Remarks
			[MHz]	Reading [dBm/MHz]	Loss [dB]	Loss [dB]	Gain [dBi]	[dBm/MHz]	[dBm/MHz]	[dB]	
nom	nom		2376.2	-67.42	2.01	10.02	2.00	-53.39	-20.00	33.39	Lowest ch 2400MHz- 2BW
			2399.5	-43.01	2.01	10.02	2.00	-28.98	-10.00	18.98	Lowest ch 2400MHz- BW
			2484.0	-39.23	2.05	10.02	2.00	-25.16	-10.00	15.16	Highest ch 2483.5MHz + BW
			2502.3	-68.19	2.05	10.02	2.00	-54.12	-20.00	34.12	Highest ch 2483.5MHz + 2BW
min	min		2376.2	-67.66	2.01	10.02	2.00	-53.63	-20.00	33.63	Lowest ch 2400MHz- 2BW
			2399.5	-43.52	2.01	10.02	2.00	-29.49	-10.00	19.49	Lowest ch 2400MHz- BW
			2484.0	-40.12	2.05	10.02	2.00	-26.05	-10.00	16.05	Highest ch 2483.5MHz + BW
			2509.3	-63.73	2.05	10.02	2.00	-49.66	-20.00	29.66	Highest ch 2483.5MHz + 2BW
min	max		2373.2	-65.83	2.01	10.02	2.00	-51.80	-20.00	31.80	Lowest ch 2400MHz- 2BW
			2399.5	-42.55	2.01	10.02	2.00	-28.52	-10.00	18.52	Lowest ch 2400MHz- BW
			2484.0	-39.61	2.05	10.02	2.00	-25.54	-10.00	15.54	Highest ch 2483.5MHz + BW
			2509.3	-63.83	2.05	10.02	2.00	-49.76	-20.00	29.76	Highest ch 2483.5MHz + 2BW
max	min		2376.2	-70.63	2.01	10.02	2.00	-56.60	-20.00	36.60	Lowest ch 2400MHz- 2BW
			2399.5	-43.06	2.01	10.02	2.00	-29.03	-10.00	19.03	Lowest ch 2400MHz- BW
			2484.0	-40.48	2.05	10.02	2.00	-26.41	-10.00	16.41	Highest ch 2483.5MHz + BW
			2508.3	-67.91	2.05	10.02	2.00	-53.84	-20.00	33.84	Highest ch 2483.5MHz + 2BW
max	max		2376.2	-71.21	2.01	10.02	2.00	-57.18	-20.00	37.18	Lowest ch 2400MHz- 2BW
			2399.5	-42.90	2.01	10.02	2.00	-28.87	-10.00	18.87	Lowest ch 2400MHz- BW
			2484.0	-37.88	2.05	10.02	2.00	-23.81	-10.00	13.81	Highest ch 2483.5MHz + BW
			2508.3	-68.22	2.05	10.02	2.00	-54.15	-20.00	34.15	Highest ch 2483.5MHz + 2BW

11n-20 Antenna port 1, MCS9

Test Condition	Temp.	Volt.	Frequency	S/A(AV)	Cable	Atten.	Antenna	Result	Limit	Margin	Remarks
			[MHz]	Reading [dBm/MHz]	Loss [dB]	Loss [dB]	Gain [dBi]	[dBm/MHz]	[dBm/MHz]	[dB]	
nom	nom		2379.2	-68.39	2.01	10.02	2.00	-54.36	-20.00	34.36	Lowest ch 2400MHz- 2BW
			2399.5	-41.94	2.01	10.02	2.00	-27.91	-10.00	17.91	Lowest ch 2400MHz- BW
			2484.0	-37.98	2.05	10.02	2.00	-23.91	-10.00	13.91	Highest ch 2483.5MHz + BW
			2502.3	-66.54	2.05	10.02	2.00	-52.47	-20.00	32.47	Highest ch 2483.5MHz + 2BW
min	min		2376.2	-66.92	2.01	10.02	2.00	-52.89	-20.00	32.89	Lowest ch 2400MHz- 2BW
			2399.5	-42.16	2.01	10.02	2.00	-28.13	-10.00	18.13	Lowest ch 2400MHz- BW
			2484.0	-39.24	2.05	10.02	2.00	-25.17	-10.00	15.17	Highest ch 2483.5MHz + BW
			2509.3	-62.44	2.05	10.02	2.00	-48.37	-20.00	28.37	Highest ch 2483.5MHz + 2BW
min	max		2373.2	-66.11	2.01	10.02	2.00	-52.08	-20.00	32.08	Lowest ch 2400MHz- 2BW
			2399.5	-41.10	2.01	10.02	2.00	-27.07	-10.00	17.07	Lowest ch 2400MHz- BW
			2484.0	-39.06	2.05	10.02	2.00	-24.99	-10.00	14.99	Highest ch 2483.5MHz + BW
			2509.3	-62.98	2.05	10.02	2.00	-48.91	-20.00	28.91	Highest ch 2483.5MHz + 2BW
max	min		2376.2	-69.90	2.01	10.02	2.00	-55.87	-20.00	35.87	Lowest ch 2400MHz- 2BW
			2399.5	-42.39	2.01	10.02	2.00	-28.36	-10.00	18.36	Lowest ch 2400MHz- BW
			2484.0	-37.55	2.05	10.02	2.00	-23.48	-10.00	13.48	Highest ch 2483.5MHz + BW
			2508.3	-66.20	2.05	10.02	2.00	-52.13	-20.00	32.13	Highest ch 2483.5MHz + 2BW
max	max		2376.2	-69.44	2.01	10.02	2.00	-55.41	-20.00	35.41	Lowest ch 2400MHz- 2BW
			2399.5	-41.33	2.01	10.02	2.00	-27.30	-10.00	17.30	Lowest ch 2400MHz- BW
			2484.0	-36.25	2.05	10.02	2.00	-22.18	-10.00	12.18	Highest ch 2483.5MHz + BW
			2508.3	-66.57	2.05	10.02	2.00	-52.50	-20.00	32.50	Highest ch 2483.5MHz + 2BW

Result = Reading + Cable Loss + Attenuator Loss + Antenna Gain

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Transmitter unwanted emissions in the out-of-band domain

Test place	Ise EMC Lab. No.11 Measurement Room	
Report No.	10462196H	
Date	09/10/2014	09/24/2014
Temperature/ Humidity	23 deg. C / 60% RH	23 deg. C / 59% RH
Engineer	Yutaka Yoshida	Yutaka Yoshida
Mode	Tx 11n-40	

11n-40 Antenna port 0 + 1, MCS9

Test Condition		Frequency	Result	Result	Result	Result	Limit	Margin	Remarks
Temp.	Volt.	[MHz]	Antenna 0 [mW/MHz]	Antenna 1 [mW/MHz]	Antenna 0+1 [mW/MHz]	Antenna 0+1 [dBm/MHz]	[dBm/MHz]	[dB]	
nom	nom	2360.4	0.00000168	0.00000165	0.00000333	-54.78	-20.00	34.78	Lowest ch 2400MHz- 2BW
		2399.5	0.00062820	0.00077500	0.00140320	-28.53	-10.00	18.53	Lowest ch 2400MHz- BW
		2484.0	0.00067422	0.00094254	0.00161676	-27.91	-10.00	17.91	Highest ch 2483.5MHz + BW
		2522.0	0.00000203	0.00000207	0.00000410	-53.88	-20.00	33.88	Highest ch 2483.5MHz + 2BW
min	min	2350.4	0.00000167	0.00000185	0.00000353	-54.53	-20.00	34.53	Lowest ch 2400MHz- 2BW
		2399.5	0.00051487	0.00067671	0.00119158	-29.24	-10.00	19.24	Lowest ch 2400MHz- BW
		2484.0	0.00054714	0.00087842	0.00142556	-28.46	-10.00	18.46	Highest ch 2483.5MHz + BW
		2538.0	0.00000324	0.00000536	0.00000861	-50.65	-20.00	30.65	Highest ch 2483.5MHz + 2BW
min	max	2350.4	0.00000182	0.00000246	0.00000428	-53.68	-20.00	33.68	Lowest ch 2400MHz- 2BW
		2399.5	0.00056455	0.00088410	0.00144864	-28.39	-10.00	18.39	Lowest ch 2400MHz- BW
		2484.0	0.00073131	0.00142167	0.00215298	-26.67	-10.00	16.67	Highest ch 2483.5MHz + BW
		2548.0	0.00000361	0.00000615	0.00000976	-50.11	-20.00	30.11	Highest ch 2483.5MHz + 2BW
max	min	2358.4	0.00000191	0.00000151	0.00000342	-54.66	-20.00	34.66	Lowest ch 2400MHz- 2BW
		2399.5	0.00049854	0.00084140	0.00133994	-28.73	-10.00	18.73	Lowest ch 2400MHz- BW
		2484.0	0.00061010	0.00082433	0.00143443	-28.43	-10.00	18.43	Highest ch 2483.5MHz + BW
		2537.0	0.00000182	0.00000224	0.00000406	-53.92	-20.00	33.92	Highest ch 2483.5MHz + 2BW
max	max	2355.4	0.00000183	0.00000201	0.00000384	-54.16	-20.00	34.16	Lowest ch 2400MHz- 2BW
		2399.5	0.00071664	0.00091749	0.00163413	-27.87	-10.00	17.87	Lowest ch 2400MHz- BW
		2484.0	0.00095236	0.00135052	0.00230287	-26.38	-10.00	16.38	Highest ch 2483.5MHz + BW
		2533.0	0.00000175	0.00000270	0.00000444	-53.52	-20.00	33.52	Highest ch 2483.5MHz + 2BW

*Above test result was maximum value on each 1BW.

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Transmitter unwanted emissions in the out-of-band domain

Test place	Ise EMC Lab. No.11 Measurement Room	
Report No.	10462196H	
Date	09/10/2014	09/24/2014
Temperature/ Humidity	23 deg. C / 60% RH	23 deg. C / 59% RH
Engineer	Yutaka Yoshida	Yutaka Yoshida
Mode	Tx 11n-40	

11n-40 Antenna port 0, MCS9

Test Condition	Temp.	Volt.	Frequency	S/A(AV)	Cable	Atten.	Antenna	Result	Limit	Margin	Remarks
			[MHz]	Reading [dBm/MHz]	Loss [dB]	Loss [dB]	Gain [dBi]	[dBm/MHz]	[dBm/MHz]	[dB]	
nom	nom		2360.4	-71.78	2.01	10.02	2.00	-57.75	-20.00	37.75	Lowest ch 2400MHz- 2BW
			2399.5	-46.05	2.01	10.02	2.00	-32.02	-10.00	22.02	Lowest ch 2400MHz- BW
			2484.0	-45.78	2.05	10.02	2.00	-31.71	-10.00	21.71	Highest ch 2483.5MHz + BW
			2522.0	-71.00	2.05	10.02	2.00	-56.93	-20.00	36.93	Highest ch 2483.5MHz + 2BW
min	min		2350.4	-71.91	2.12	10.02	2.00	-57.77	-20.00	37.77	Lowest ch 2400MHz- 2BW
			2399.5	-47.02	2.12	10.02	2.00	-32.88	-10.00	22.88	Lowest ch 2400MHz- BW
			2484.0	-46.80	2.16	10.02	2.00	-32.62	-10.00	22.62	Highest ch 2483.5MHz + BW
			2538.0	-69.07	2.16	10.02	2.00	-54.89	-20.00	34.89	Highest ch 2483.5MHz + 2BW
min	max		2350.4	-71.54	2.12	10.02	2.00	-57.40	-20.00	37.40	Lowest ch 2400MHz- 2BW
			2399.5	-46.62	2.12	10.02	2.00	-32.48	-10.00	22.48	Lowest ch 2400MHz- BW
			2484.0	-45.54	2.16	10.02	2.00	-31.36	-10.00	21.36	Highest ch 2483.5MHz + BW
			2548.0	-68.60	2.16	10.02	2.00	-54.42	-20.00	34.42	Highest ch 2483.5MHz + 2BW
max	min		2358.4	-71.33	2.12	10.02	2.00	-57.19	-20.00	37.19	Lowest ch 2400MHz- 2BW
			2399.5	-47.16	2.12	10.02	2.00	-33.02	-10.00	23.02	Lowest ch 2400MHz- BW
			2484.0	-46.33	2.16	10.02	2.00	-32.15	-10.00	22.15	Highest ch 2483.5MHz + BW
			2537.0	-71.58	2.16	10.02	2.00	-57.40	-20.00	37.40	Highest ch 2483.5MHz + 2BW
max	max		2355.4	-71.52	2.12	10.02	2.00	-57.38	-20.00	37.38	Lowest ch 2400MHz- 2BW
			2399.5	-45.59	2.12	10.02	2.00	-31.45	-10.00	21.45	Lowest ch 2400MHz- BW
			2484.0	-44.39	2.16	10.02	2.00	-30.21	-10.00	20.21	Highest ch 2483.5MHz + BW
			2533.0	-71.76	2.16	10.02	2.00	-57.58	-20.00	37.58	Highest ch 2483.5MHz + 2BW

11n-40 Antenna port 1, MCS9

Test Condition	Temp.	Volt.	Frequency	S/A(AV)	Cable	Atten.	Antenna	Result	Limit	Margin	Remarks
			[MHz]	Reading [dBm/MHz]	Loss [dB]	Loss [dB]	Gain [dBi]	[dBm/MHz]	[dBm/MHz]	[dB]	
nom	nom		2360.4	-71.86	2.01	10.02	2.00	-57.83	-20.00	37.83	Lowest ch 2400MHz- 2BW
			2399.5	-45.14	2.01	10.02	2.00	-31.11	-10.00	21.11	Lowest ch 2400MHz- BW
			2484.0	-44.33	2.05	10.02	2.00	-30.26	-10.00	20.26	Highest ch 2483.5MHz + BW
			2522.0	-70.91	2.05	10.02	2.00	-56.84	-20.00	36.84	Highest ch 2483.5MHz + 2BW
min	min		2350.4	-71.46	2.12	10.02	2.00	-57.32	-20.00	37.32	Lowest ch 2400MHz- 2BW
			2399.5	-45.84	2.12	10.02	2.00	-31.70	-10.00	21.70	Lowest ch 2400MHz- BW
			2484.0	-44.74	2.16	10.02	2.00	-30.56	-10.00	20.56	Highest ch 2483.5MHz + BW
			2538.0	-66.89	2.16	10.02	2.00	-52.71	-20.00	32.71	Highest ch 2483.5MHz + 2BW
min	max		2350.4	-70.23	2.12	10.02	2.00	-56.09	-20.00	36.09	Lowest ch 2400MHz- 2BW
			2399.5	-44.68	2.12	10.02	2.00	-30.54	-10.00	20.54	Lowest ch 2400MHz- BW
			2484.0	-42.65	2.16	10.02	2.00	-28.47	-10.00	18.47	Highest ch 2483.5MHz + BW
			2548.0	-66.29	2.16	10.02	2.00	-52.11	-20.00	32.11	Highest ch 2483.5MHz + 2BW
max	min		2358.4	-72.36	2.12	10.02	2.00	-58.22	-20.00	38.22	Lowest ch 2400MHz- 2BW
			2399.5	-44.89	2.12	10.02	2.00	-30.75	-10.00	20.75	Lowest ch 2400MHz- BW
			2484.0	-45.02	2.16	10.02	2.00	-30.84	-10.00	20.84	Highest ch 2483.5MHz + BW
			2537.0	-70.69	2.16	10.02	2.00	-56.51	-20.00	36.51	Highest ch 2483.5MHz + 2BW
max	max		2355.4	-71.11	2.12	10.02	2.00	-56.97	-20.00	36.97	Lowest ch 2400MHz- 2BW
			2399.5	-44.51	2.12	10.02	2.00	-30.37	-10.00	20.37	Lowest ch 2400MHz- BW
			2484.0	-42.88	2.16	10.02	2.00	-28.70	-10.00	18.70	Highest ch 2483.5MHz + BW
			2533.0	-69.87	2.16	10.02	2.00	-55.69	-20.00	35.69	Highest ch 2483.5MHz + 2BW

Result = Reading + Cable Loss + Attenuator Loss + Antenna Gain

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Adaptivity and Receiver blocking tests

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10462196H
Date	09/03/2014
Temperature/ Humidity	24 deg. C / 56% RH
Engineer	Satofumi Matsuyama
Mode	Communication mode

Interference signal(CCA threshold) Level

11b/g/n-20

Freq. [MHz]	RF output power (EIRP) *1) [dBm]	CCA threshold level [dBm]	Antenna Gain *2) [dBi]	CCA threshold level at Antenna terminal port [dBm]
2412.0	20.00	-70.00	0.00	-70.00
2472.0	20.00	-70.00	0.00	-70.00

11n-40

Freq. [MHz]	RF output power (EIRP) *1) [dBm]	CCA threshold level [dBm]	Antenna Gain *2) [dBi]	CCA threshold level at Antenna terminal port [dBm]
2422.0	20.00	-70.00	0.00	-70.00
2462.0	20.00	-70.00	0.00	-70.00

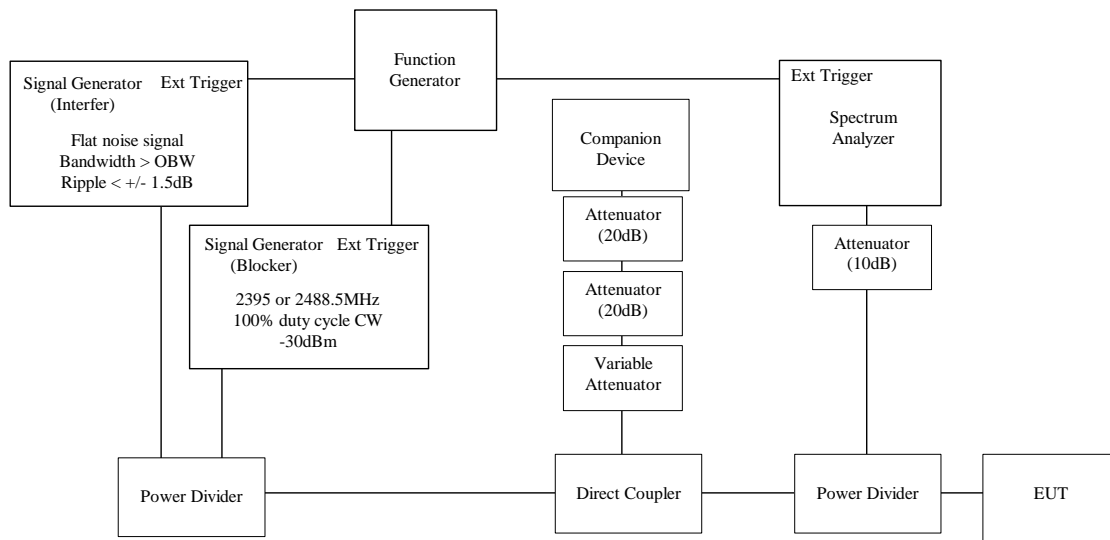
CCA threshold level = -70 [dBm/MHz] + 20 - RF output Power(EIRP) [dBm]

CCA threshold level at Antenna terminal port = CCA threshold level + EUT Antenna Gain [dBi]

*1) EIRP(Limit) was used for "RF output power(EIRP)" according to the customer's request.

*2) Antenna Gain value was used for 0dBi according to the customer's request.

CONDUCTED METHODS SYSTEM BLOCK DIAGRAM



***Signal Generator and Spectrum Analyzer were started at the same time by Function Generator. Interference signal and Blocking signal are added to EUT simultaneously as it does not change the test result phenomenologically.**

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Adaptivity and Receiver blocking tests

Test data

Declared q	Maximum Channel Occupancy Time (=13/32*q) [ms]
32	13.00

Operational Mode	Freq. [MHz]	Measured Channel Occupancy Time [ms]	Measured Channel Occupancy Time with Blocking [ms]	Limit [ms]	Results
11b	2412	0.00	0.00	13.00	Pass
	2472	0.00	0.00	13.00	Pass
11g	2412	0.00	0.00	13.00	Pass
	2472	0.00	0.00	13.00	Pass
11n-20	2412	0.00	0.00	13.00	Pass
	2472	0.00	0.00	13.00	Pass
11n-40	2422	0.00	0.00	13.00	Pass
	2462	0.00	0.00	13.00	Pass

* Even though interference or interference + blocking signal was added, transmission signal was not output.

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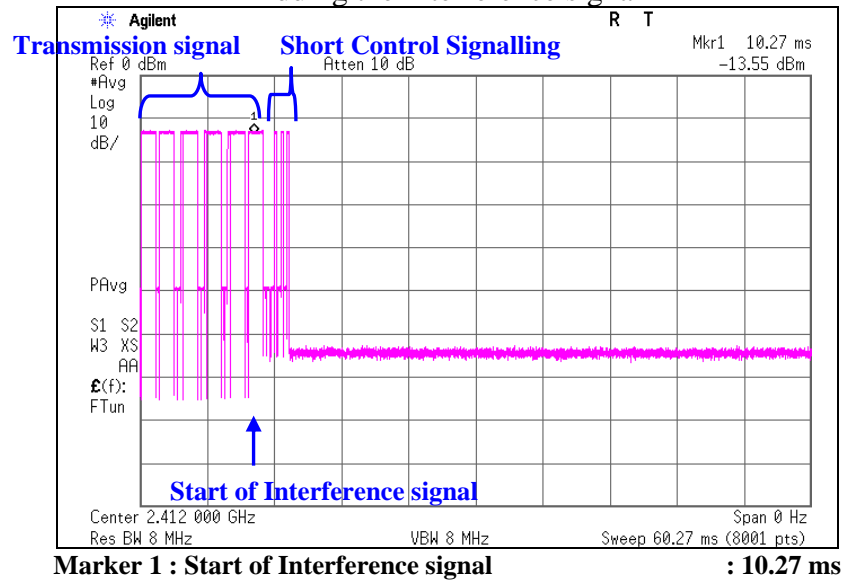
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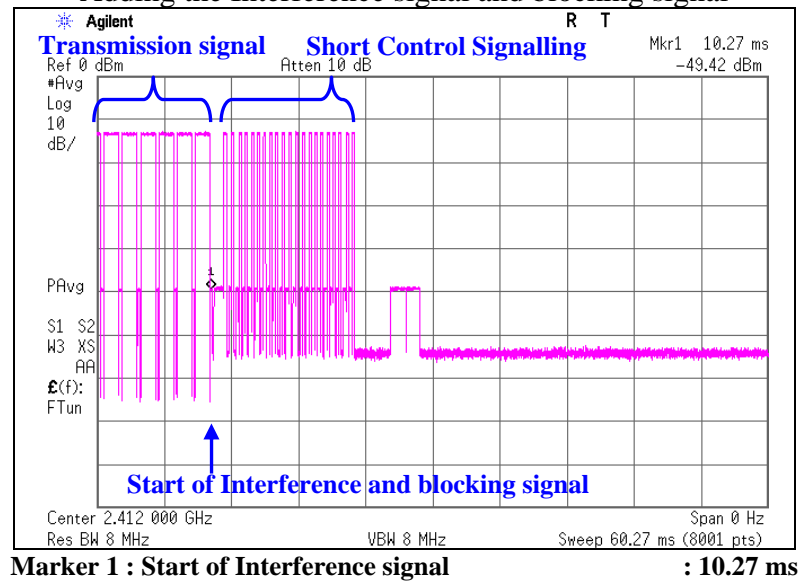
Adaptivity and Receiver blocking tests

Plot of Detection : 11b, 2412MHz

Adding the Interference signal



Adding the Interference signal and blocking signal



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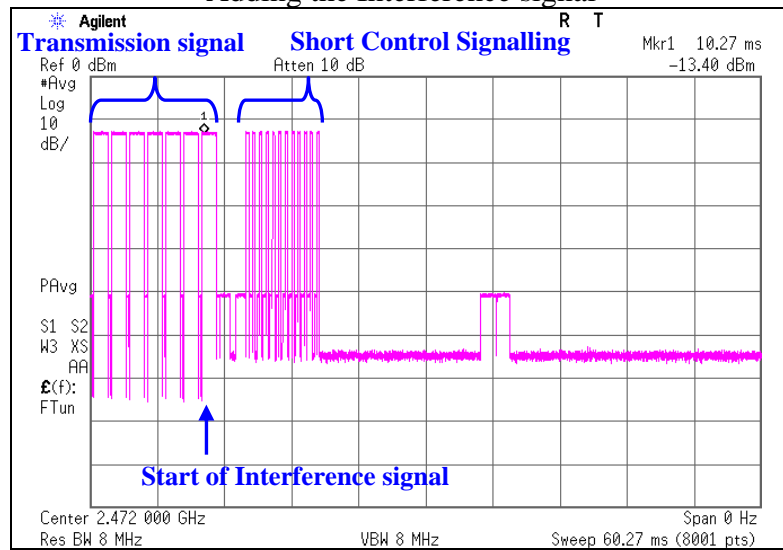
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Adaptivity and Receiver blocking tests

Plot of Detection : 11b, 2472MHz

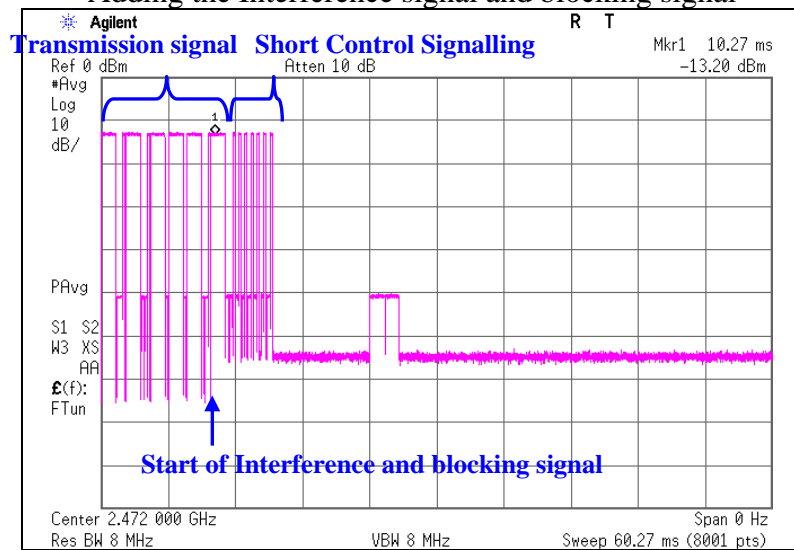
Adding the Interference signal



Marker 1 : Start of Interference signal

: 10.27 ms

Adding the Interference signal and blocking signal



Marker 1 : Start of Interference signal

: 10.27 ms

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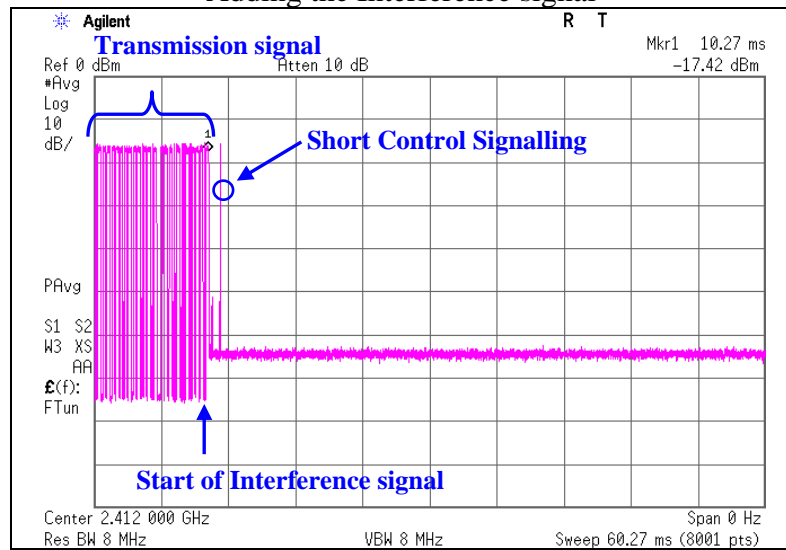
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Adaptivity and Receiver blocking tests

Plot of Detection : 11g, 2412MHz

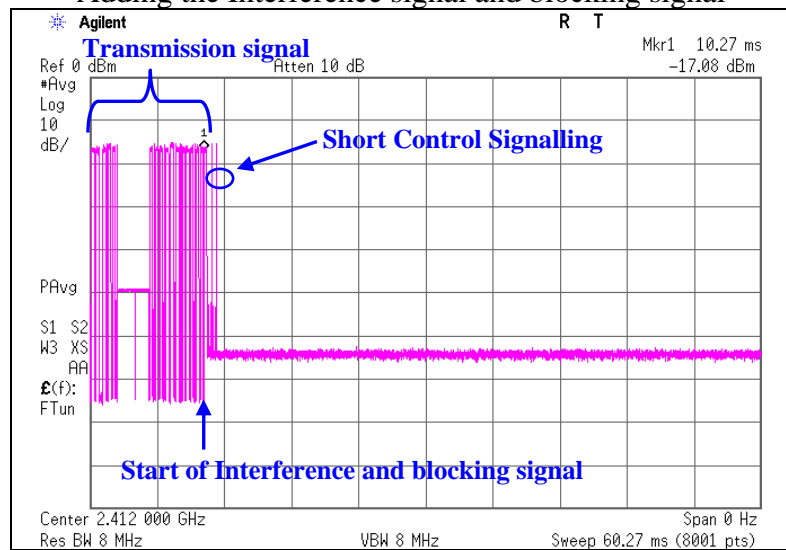
Adding the Interference signal



Marker 1 : Start of Interference signal

: 10.27 ms

Adding the Interference signal and blocking signal



Marker 1 : Start of Interference signal

: 10.27 ms

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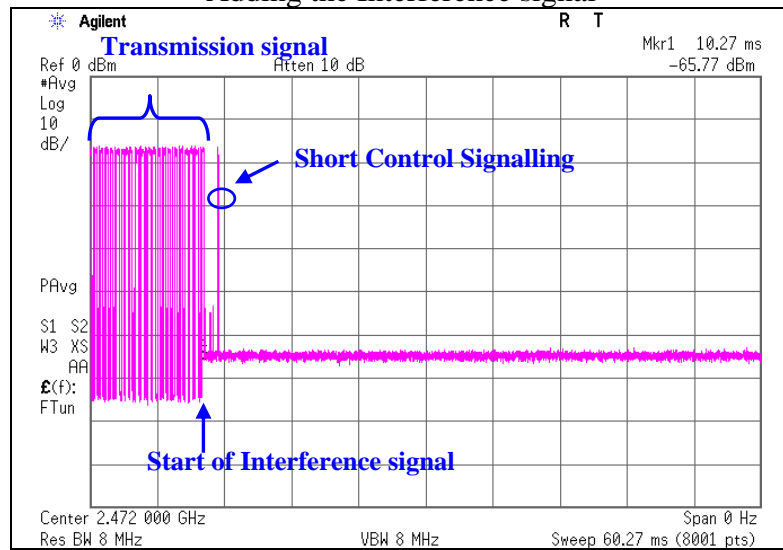
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Adaptivity and Receiver blocking tests

Plot of Detection : 11g, 2472MHz

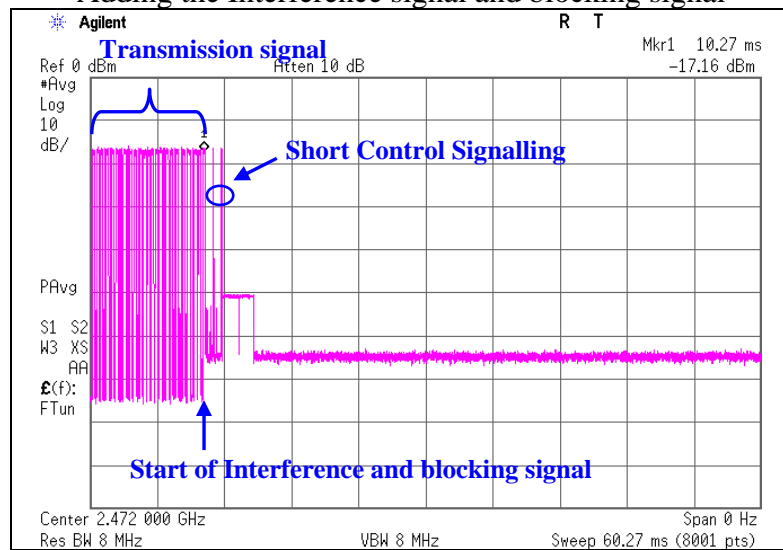
Adding the Interference signal



Marker 1 : Start of Interference signal

: 10.27 ms

Adding the Interference signal and blocking signal



Marker 1 : Start of Interference signal

: 10.27 ms

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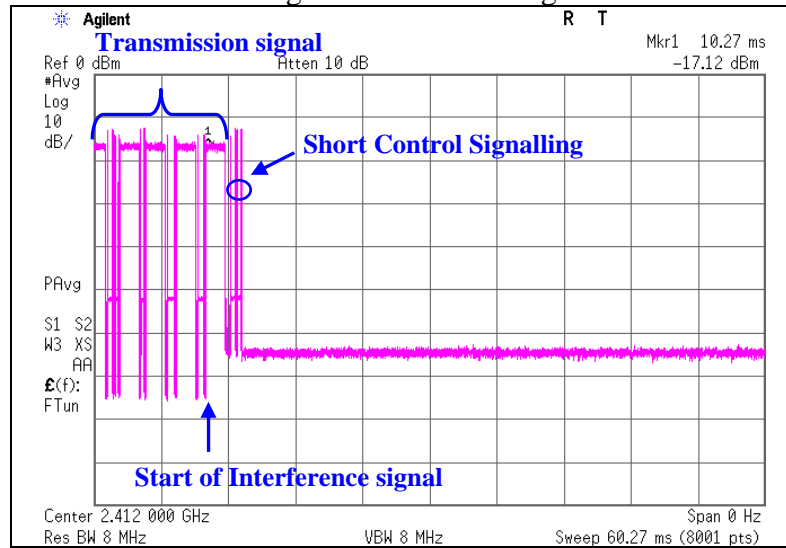
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Adaptivity and Receiver blocking tests

Plot of Detection : 11n-20, 2412MHz

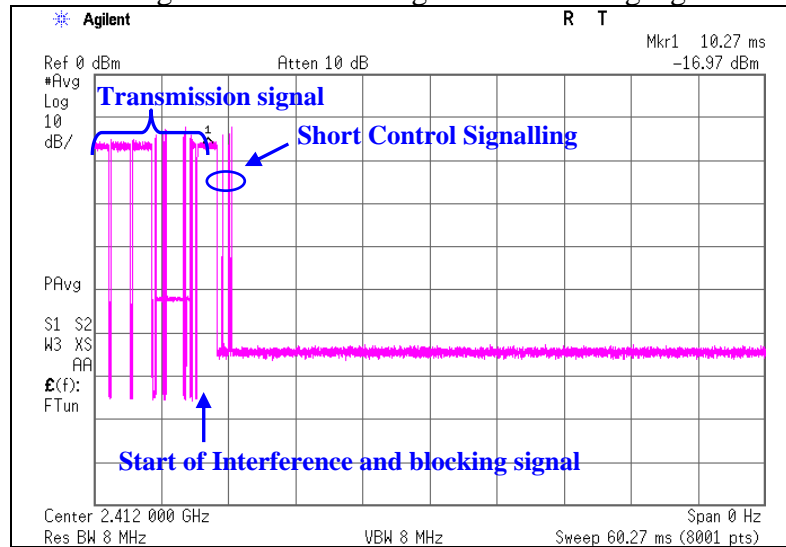
Adding the Interference signal



Marker 1 : Start of Interference signal

: 10.27 ms

Adding the Interference signal and blocking signal



Marker 1 : Start of Interference signal

: 10.27 ms

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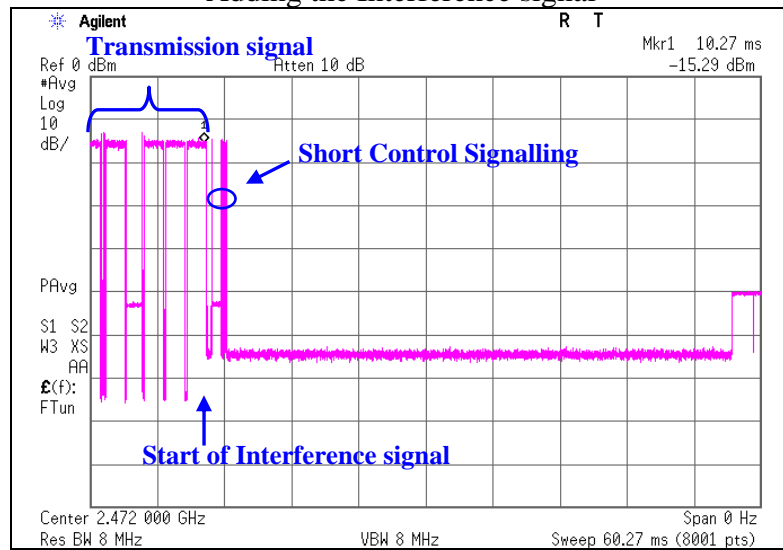
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Adaptivity and Receiver blocking tests

Plot of Detection : 11n-20, 2472MHz

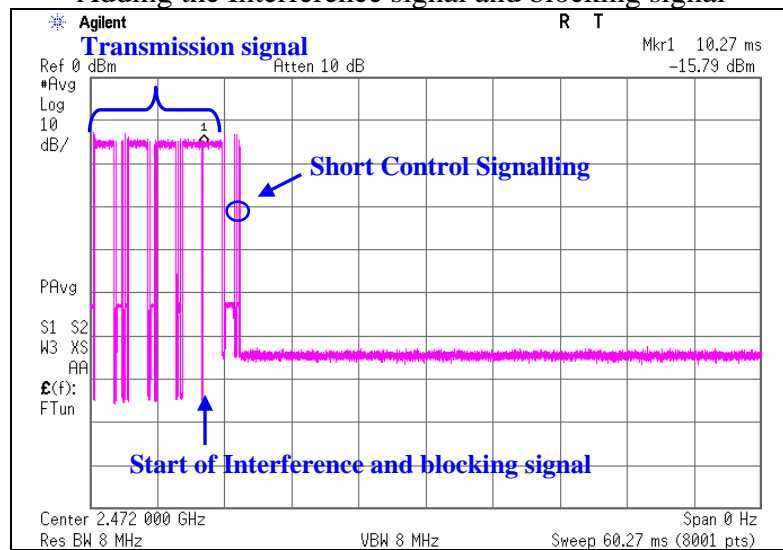
Adding the Interference signal



Marker 1 : Start of Interference signal

: 10.27 ms

Adding the Interference signal and blocking signal



Marker 1 : Start of Interference signal

: 10.27 ms

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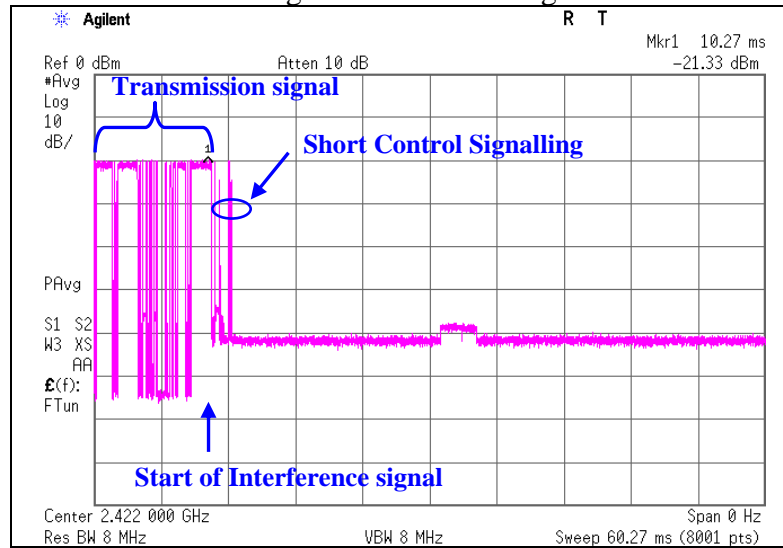
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Adaptivity and Receiver blocking tests

Plot of Detection : 11n-40, 2422MHz

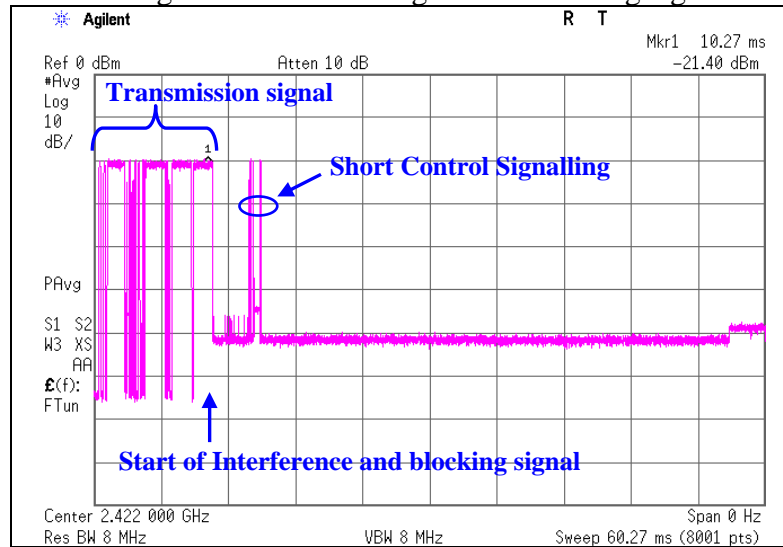
Adding the Interference signal



Marker 1 : Start of Interference signal

: 10.27 ms

Adding the Interference signal and blocking signal



Marker 1 : Start of Interference signal

: 10.27 ms

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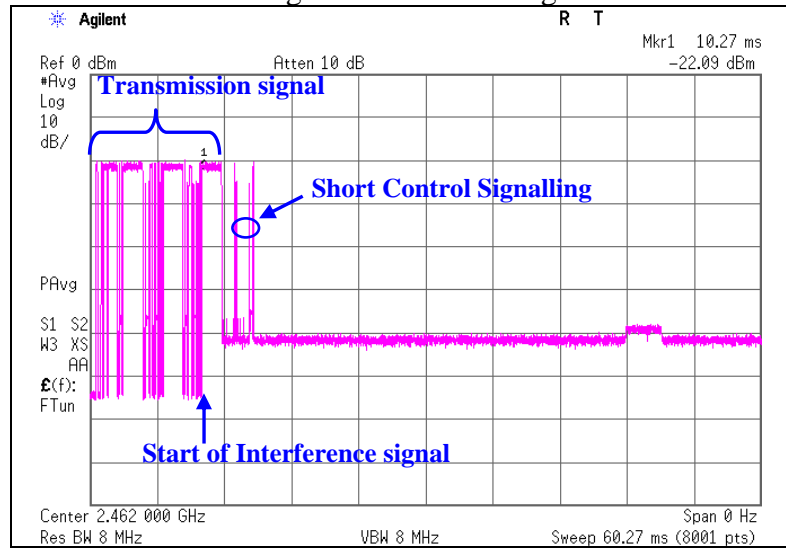
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Adaptivity and Receiver blocking tests

Plot of Detection : 11n-40, 2462MHz

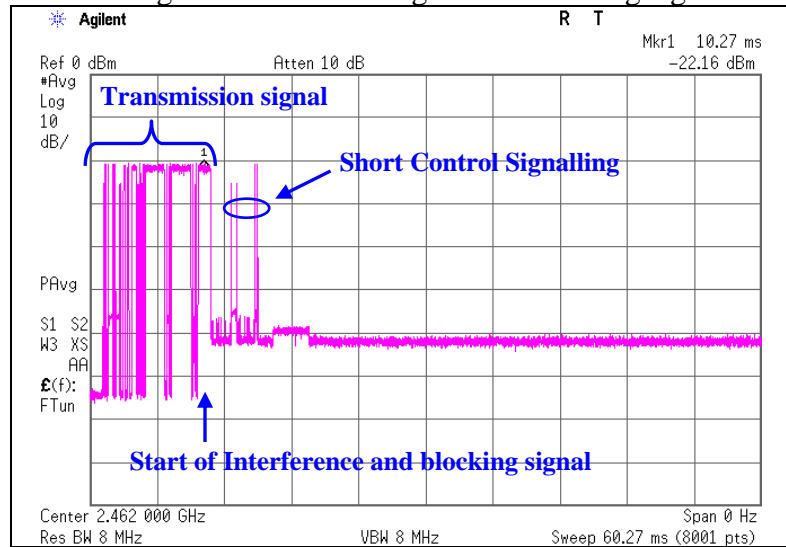
Adding the Interference signal



Marker 1 : Start of Interference signal

: 10.27 ms

Adding the Interference signal and blocking signal



Marker 1 : Start of Interference signal

: 10.27 ms

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Adaptivity and Receiver blocking tests
Short Control Signalling Transmissions

Operational Mode	Freq. [MHz]	The aggregate ON time *1) [ms]	Duty cycle *2) [%]	Limit [%]	Results
11b	2412	4.068	8.135	10	Pass
	2472	4.015	8.030	10	Pass
11g	2412	0.618	1.235	10	Pass
	2472	0.354	0.708	10	Pass
11n-20	2412	0.542	1.085	10	Pass
	2472	0.294	0.588	10	Pass
11n-40	2422	0.309	0.618	10	Pass
	2462	0.347	0.693	10	Pass

*1)The aggregate ON Time = (Number of analyzer bins showing transmission) * (dwell time per bin)

*2)Duty cycle = (The aggregate ON time / 50msec) * 100

The signal monitoring equipment consists of a spectrum analyzer with the capacity to display 8001 bins on the horizontal axis.

A time-domain resolution of 0.0075 msec/bin is achievable with a 60.27 millisecond sweep time.

The aggregate ON time is calculated by multiplying the number of bins during an observation period by the dwell time per bin, with the analyzer set to peak detection.

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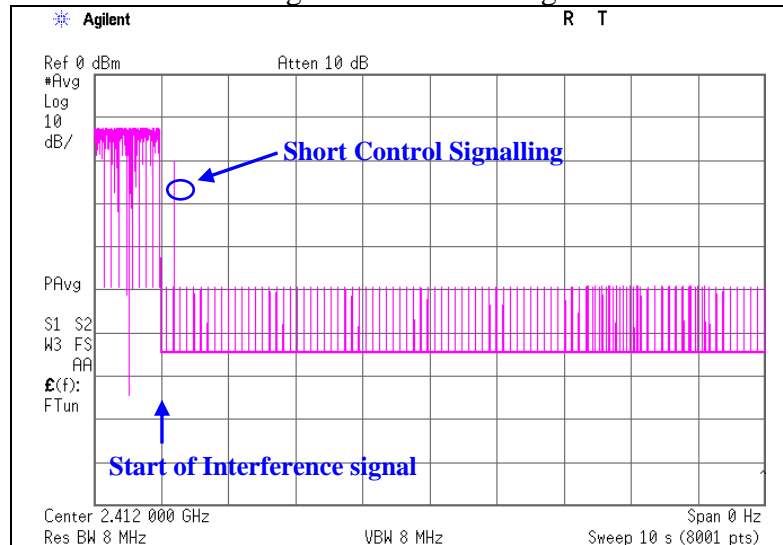
Telephone : +81 596 24 8999

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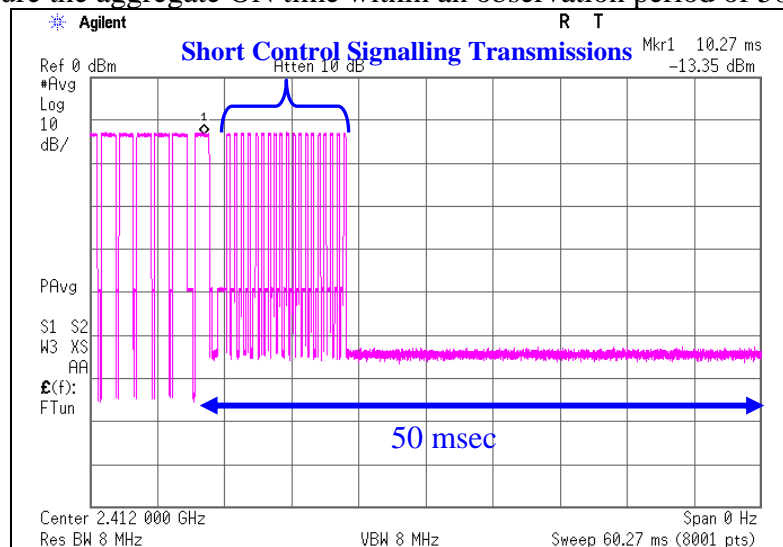
Adaptivity and Receiver blocking tests

Plot of Short Control Signalling Transmissions: 11b, 2412MHz

Adding the Interference signal



Measure the aggregate ON time within an observation period of 50 msec.



In order to obtain the aggregate ON time during an observation period of 50msec, Short Control Signalling Transmissions is observed with sweep time including observation period of 50msec.

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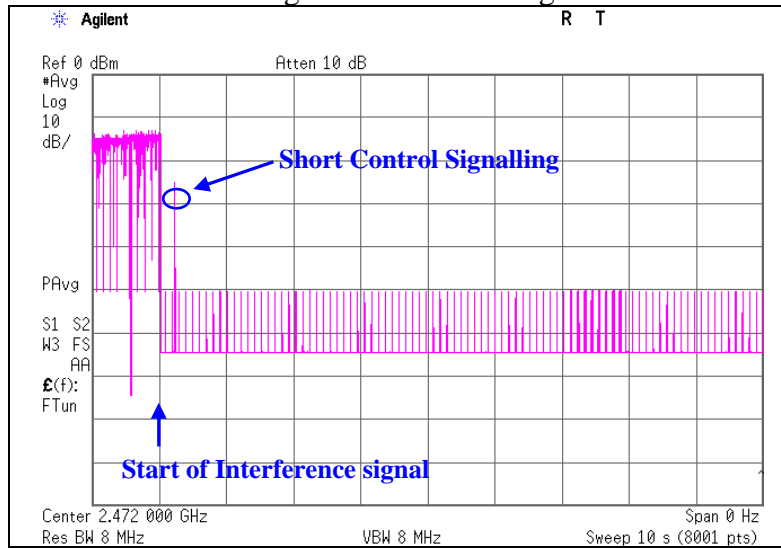
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

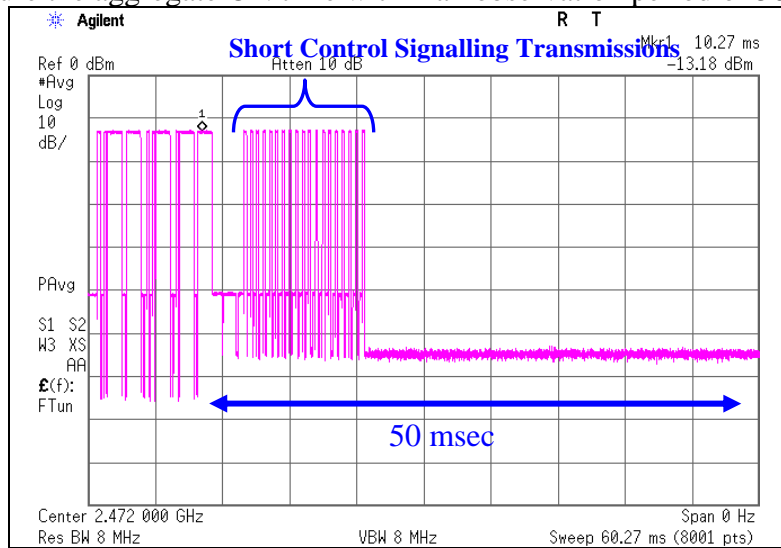
Adaptivity and Receiver blocking tests

Plot of Short Control Signalling Transmissions: 11b, 2472MHz

Adding the Interference signal



Measure the aggregate ON time within an observation period of 50 msec.



In order to obtain the aggregate ON time during an observation period of 50msec, Short Control Signalling Transmissions is observed with sweep time including observation period of 50msec.

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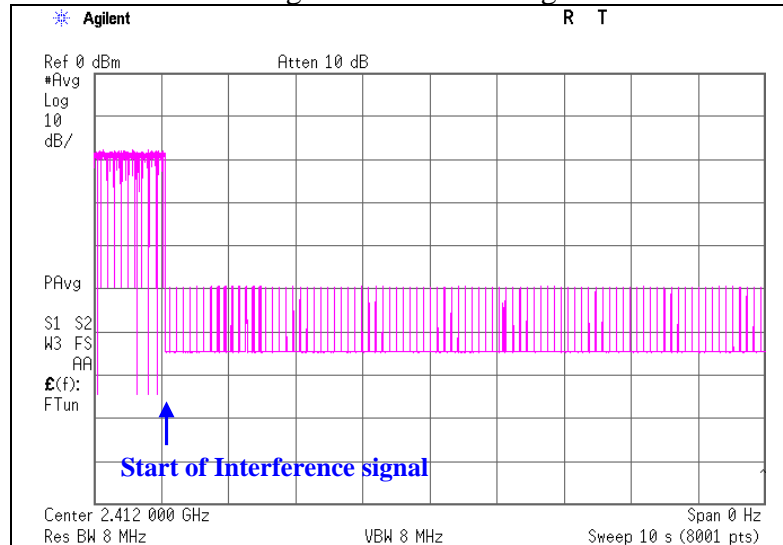
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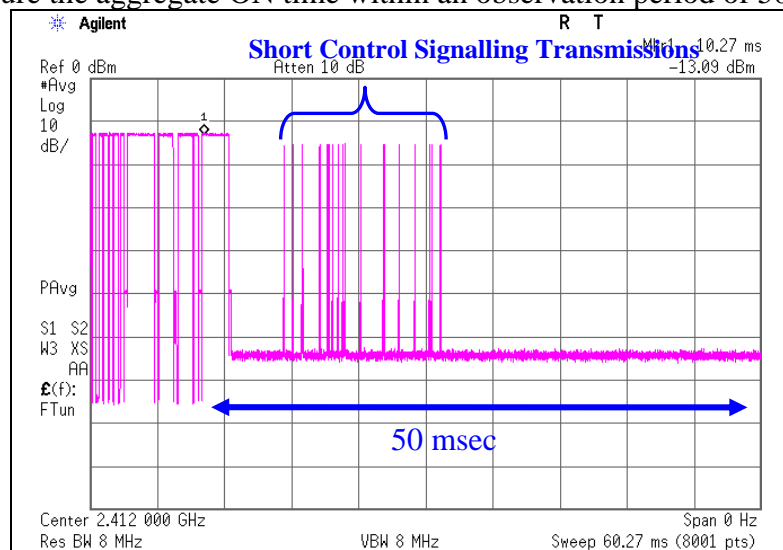
Adaptivity and Receiver blocking tests

Plot of Short Control Signalling Transmissions: 11g, 2412MHz

Adding the Interference signal



Measure the aggregate ON time within an observation period of 50 msec.



In order to obtain the aggregate ON time during an observation period of 50msec, Short Control Signalling Transmissions is observed with sweep time including observation period of 50msec.

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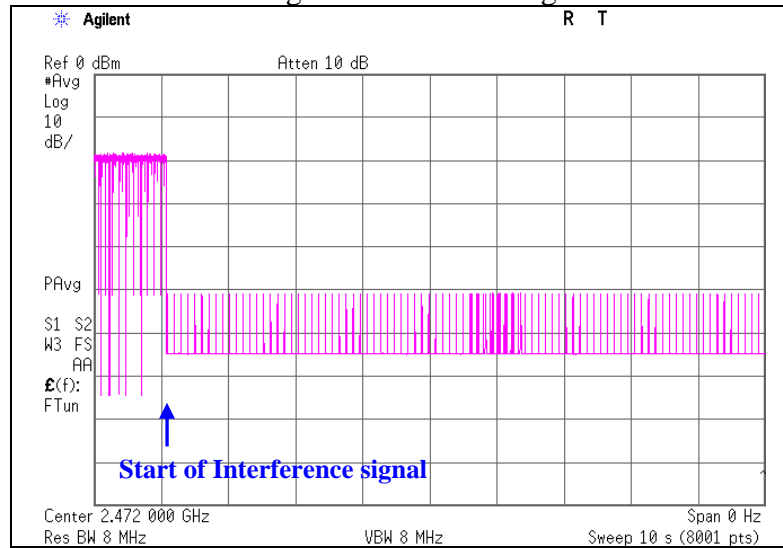
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

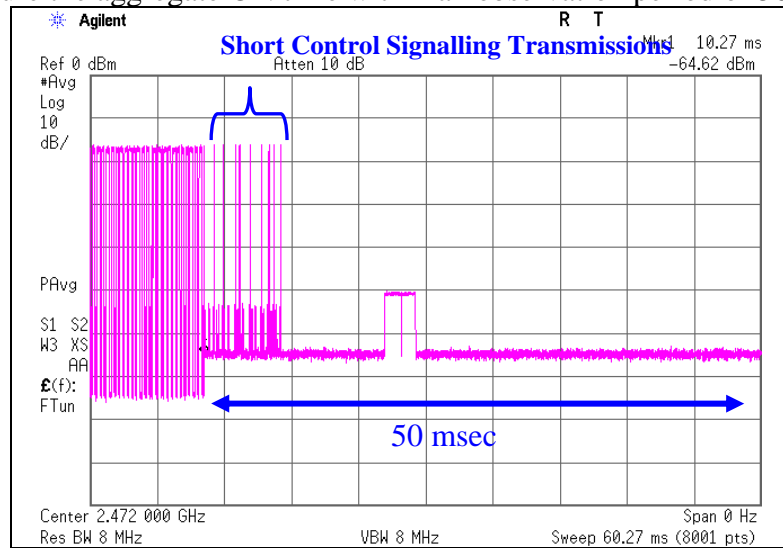
Adaptivity and Receiver blocking tests

Plot of Short Control Signaling Transmissions: 11g, 2472MHz

Adding the Interference signal



Measure the aggregate ON time within an observation period of 50 msec.



In order to obtain the aggregate ON time during an observation period of 50msec, Short Control Signalling Transmissions is observed with sweep time including observation period of 50msec.

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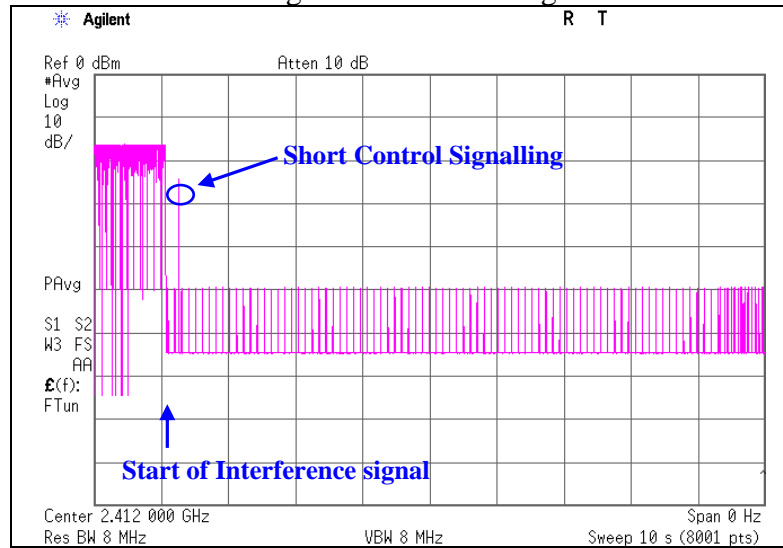
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

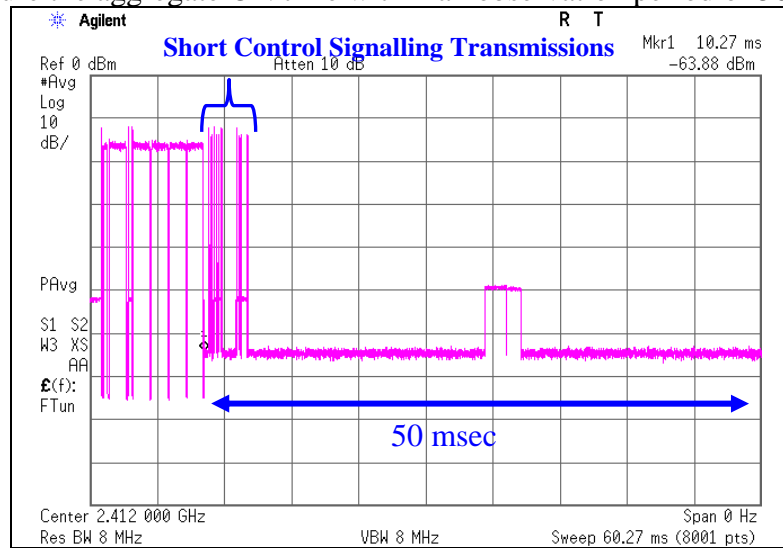
Adaptivity and Receiver blocking tests

Plot of Short Control Signaling Transmissions: 11n-20, 2412MHz

Adding the Interference signal



Measure the aggregate ON time within an observation period of 50 msec.



In order to obtain the aggregate ON time during an observation period of 50msec, Short Control Signalling Transmissions is observed with sweep time including observation period of 50msec.

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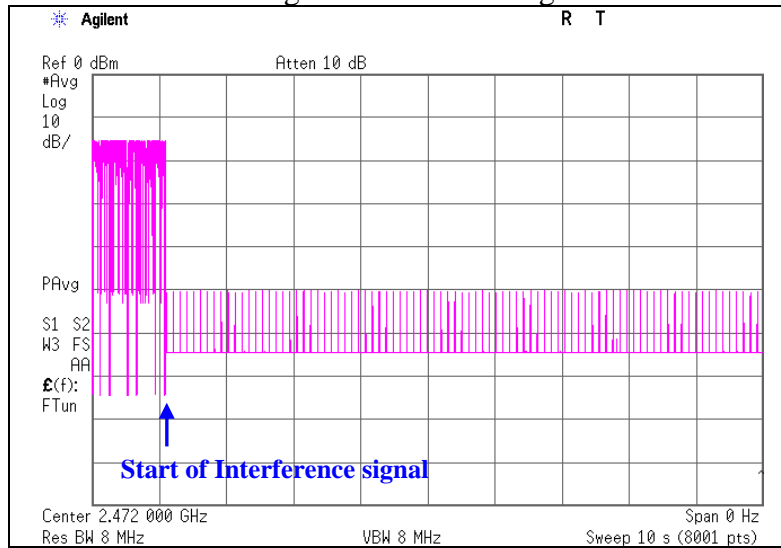
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

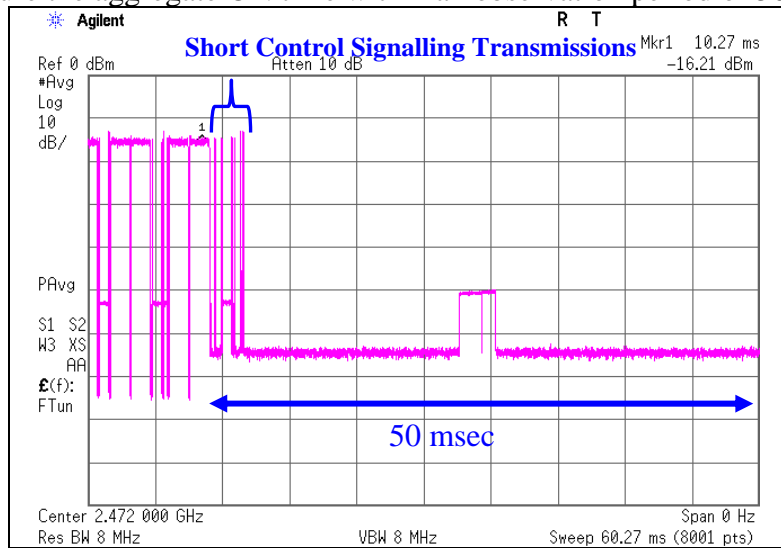
Adaptivity and Receiver blocking tests

Plot of Short Control Signaling Transmissions: 11n-20, 2472MHz

Adding the Interference signal



Measure the aggregate ON time within an observation period of 50 msec.



In order to obtain the aggregate ON time during an observation period of 50msec, Short Control Signalling Transmissions is observed with sweep time including observation period of 50msec.

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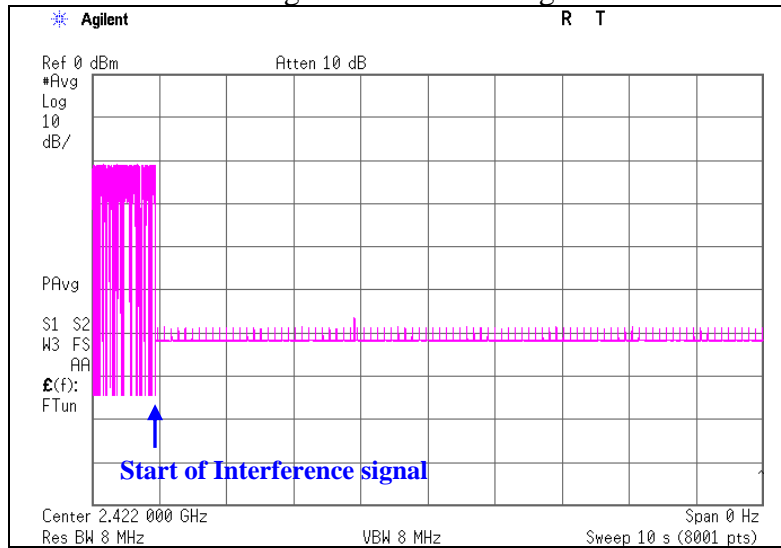
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

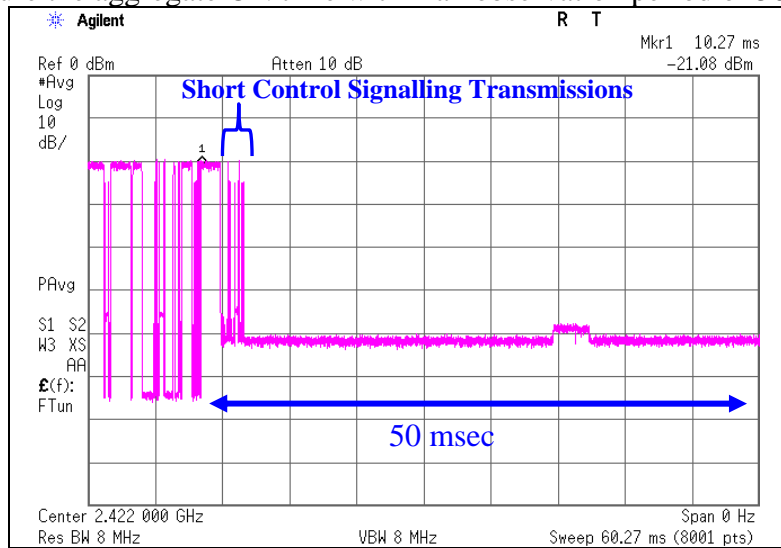
Adaptivity and Receiver blocking tests

Plot of Short Control Signaling Transmissions: 11n-40, 2422MHz

Adding the Interference signal



Measure the aggregate ON time within an observation period of 50 msec.



In order to obtain the aggregate ON time during an observation period of 50msec, Short Control Signalling Transmissions is observed with sweep time including observation period of 50msec.

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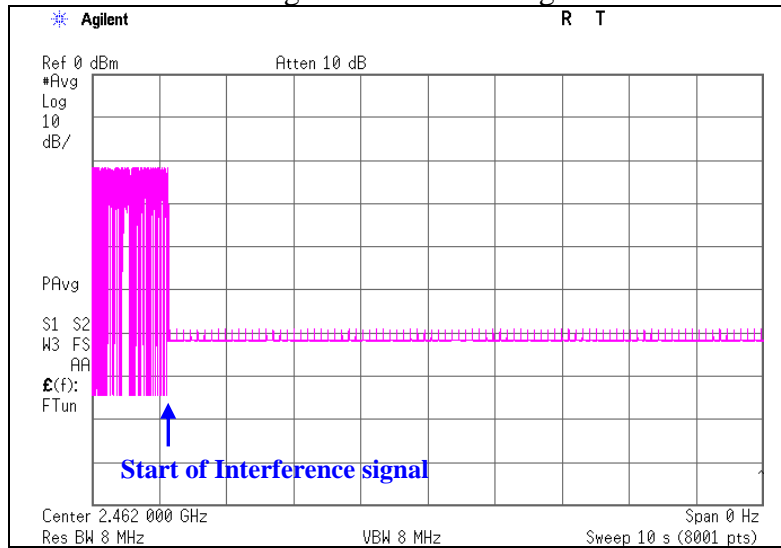
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

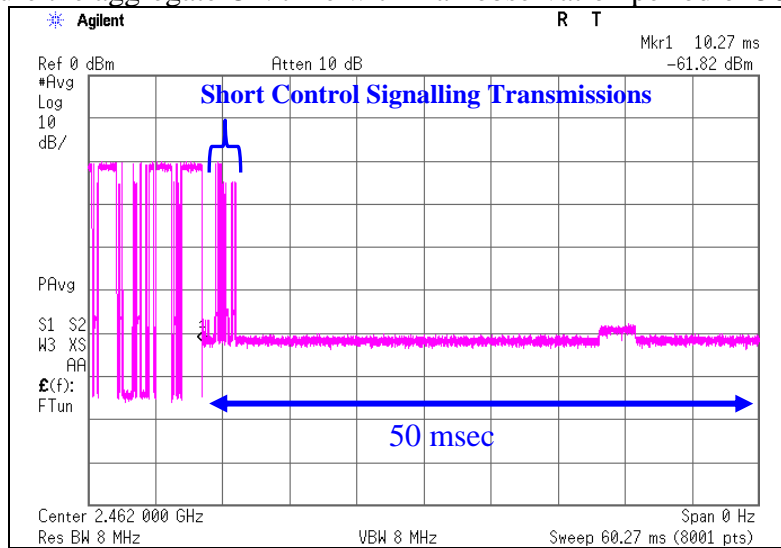
Adaptivity and Receiver blocking tests

Plot of Short Control Signaling Transmissions: 11n-40, 2462MHz

Adding the Interference signal



Measure the aggregate ON time within an observation period of 50 msec.



In order to obtain the aggregate ON time during an observation period of 50msec, Short Control Signalling Transmissions is observed with sweep time including observation period of 50msec.

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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Transmitter unwanted emissions in the spurious domain (Radiated)

Report No. 10462196H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.4 No.4
Date 09/25/2014 09/26/2014
Temperature / Humidity 24deg. C / 51% RH 24deg. C / 62% RH
Engineer Satofumi Matsuyama Tomohisa Nakagawa
(Above 1GHz) (Below 1GHz)
Mode Tx 11b

2412MHz

Frequency [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (ERP) <=1GHz, (EIRP) >1GHz [dBm]		Limit (ERP) <=1GHz, (EIRP) >1GHz [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	Rx Ant. Height [cm]	Turn Table [deg.]	Rx Ant. Height [cm]	Turn Table [deg.]	
551.90	34.3	37.1	-59.8	-50.8	3.9	2.2	9.9	-73.6	-64.6	-54.0	19.6	10.6	151	36	100	0	
4824.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	-
7236.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	-
9648.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	-
12060.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	-

Below 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15,

Above 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss

Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)

Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)

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

NS : No signal detect.

Detector : Below 1GHz: Spectrum Analyzer RMS AV(RBW:100kHz/VBW:300kHz)

Above 1GHz: Spectrum Analyzer RMS AV(RBW:1MHz/VBW:3MHz)

2472MHz

Frequency [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (ERP) <=1GHz, (EIRP) >1GHz [dBm]		Limit (ERP) <=1GHz, (EIRP) >1GHz [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
	HOR	VER	HOR	VER				HOR	VER		Rx Ant. Height [cm]	Turn Table [deg.]	Rx Ant. Height [cm]	Turn Table [deg.]			
551.90	34.0	38.2	-60.1	-49.7	3.9	2.2	9.9	-73.9	-63.5	-54.0	19.9	9.5	158	82	100	359	
4944.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
7416.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
9888.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
12360.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	

Below 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15,

Above 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss

Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)

Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)

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

NS : No signal detect.

Detector : Below 1GHz: Spectrum Analyzer RMS AV(RBW:100kHz/VBW:300kHz)

Above 1GHz: Spectrum Analyzer RMS AV(RBW:1MHz/VBW:3MHz)

UL Japan, Inc.

Ise EMC Lab.

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Transmitter unwanted emissions in the spurious domain (Radiated)

Report No. 10462196H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.4
Date 09/25/2014
Temperature / Humidity 24deg. C / 51% RH
Engineer Satofumi Matsuyama
Mode Tx 11g

No.4
09/26/2014
24deg. C / 62% RH
Tomohisa Nakagawa
(Below 1GHz)

2412MHz

Frequency [MHz]	Rx SA/TR		Tx SG		Tx	Tx	Tx Ant.	Result (ERP) <=1GHz, (EIRP) >1GHz [dBm]		Limit (ERP) <=1GHz, (EIRP) >1GHz [dBm]	Margin		Horizontal		Vertical		Remarks
	Reading [dBuV]		Reading [dBm]		Cable Loss [dB]	Ant. Gain [dBi]	Atten. Loss [dB]				[dB]		Rx Ant. Height [cm]	Turn Table [deg.]	Rx Ant. Height [cm]	Turn Table [deg.]	
	HOR	VER	HOR	VER				HOR	VER		HOR	VER					
551.90	36.0	38.5	-58.1	-49.4	3.9	2.2	9.9	-71.9	-63.2	-54.0	17.9	9.2	111	78	100	359	
4824.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
7236.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
9648.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
12060.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	

Below 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15,

Above 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss

Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)

Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)

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

NS : No signal detect.

Detector : Below 1GHz: Spectrum Analyzer RMS A V(RBW:100kHz/VBW:300kHz)

Above 1GHz: Spectrum Analyzer RMS A V(RBW:1MHz/VBW:3MHz)

2472MHz

Frequency [MHz]	Rx SA/TR		Tx SG		Tx	Tx	Tx Ant.	Result (ERP) <=1GHz, (EIRP) >1GHz [dBm]		Limit (ERP) <=1GHz, (EIRP) >1GHz [dBm]	Margin		Horizontal		Vertical		Remarks
	Reading [dBuV]		Reading [dBm]		Cable Loss [dB]	Ant. Gain [dBi]	Atten. Loss [dB]	[dBm]	[dBm]	[dB]	[dB]	[cm]	Turn Table [deg.]	Rx Ant. Height [cm]	Turn Table [deg.]		
	HOR	VER	HOR	VER												HOR	
551.90	35.4	37.4	-58.7	-50.5	3.9	2.2	9.9	-72.5	-64.3	-54.0	18.5	10.3	110	80	100	359	
4944.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
7416.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
9888.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
12360.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	

Below 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15,

Above 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss

Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)

Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)

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

NS : No signal detect.

Detector : Below 1GHz: Spectrum Analyzer RMS A V(RBW:100kHz/VBW:300kHz)

Above 1GHz: Spectrum Analyzer RMS A V(RBW:1MHz/VBW:3MHz)

UL Japan, Inc.

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Facsimile : +81 596 24 8124

Transmitter unwanted emissions in the spurious domain (Radiated)

Report No. 10462196H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.4
Date 09/25/2014 09/28/2014
Temperature / Humidity 24deg. C / 51% RH 24deg. C / 56% RH
Engineer Satofumi Matsuyama Kazuya Yoshioka
(Above 1GHz) (Below 1GHz)
Mode Tx 11n-20

2412MHz

Frequency	Rx SA/TR		Tx SG		Tx	Tx	Tx Ant.	Result		Limit	Margin		Horizontal		Vertical		Remarks	
	Reading		Reading		Cable	Ant.	Atten.	(ERP) <=1GHz, (EIRP) >1GHz	(ERP) <=1GHz, (EIRP) >1GHz				Rx Ant.	Turn	Rx Ant.	Turn		
	[dBuV]		[dBm]															Loss
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER	[dBm]	[dB]	HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
4824.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	-	
7236.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	-	
9648.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	-	
12060.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	-	

Below 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15,

Above 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss

Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)

Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)

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

NS : No signal detect.

Detector : Below 1GHz: Spectrum Analyzer RMS AV(RBW:100kHz/VBW:300kHz)

Above 1GHz: Spectrum Analyzer RMS AV(RBW:1MHz/VBW:3MHz)

2472MHz

Frequency	Rx SA/TR		Tx SG		Tx	Tx	Tx Ant.	Result (ERP) <=1GHz, (EIRP) >1GHz		Limit (ERP) <=1GHz, (EIRP) >1GHz	Margin		Horizontal		Vertical		Remarks
	Reading [dBuV]		Reading [dBm]		Cable Loss [dB]	Ant. Gain [dBi]	Atten. Loss [dB]	[dBm]			[dB]	[dB]	Rx Ant. Height [cm]	Turn Table [deg.]	Rx Ant. Height [cm]	Turn Table [deg.]	
	[MHz]	HOR	VER	HOR				VER	HOR	VER							
4944.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
7416.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
9888.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
12360.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	

Below 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15,

Above 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss

Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)

Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)

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

NS : No signal detect.

Detector : Below 1GHz: Spectrum Analyzer RMS AV(RBW:100kHz/VBW:300kHz)

Above 1GHz: Spectrum Analyzer RMS AV(RBW:1MHz/VBW:3MHz)

UL Japan, Inc.

Ise EMC Lab.

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Facsimile : +81 596 24 8124

Transmitter unwanted emissions in the spurious domain (Radiated)

Report No. 10462196H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.4
Date 09/25/2014 09/28/2014
Temperature / Humidity 24deg. C / 51% RH 24deg. C / 56% RH
Engineer Satofumi Matsuyama Kazuya Yoshioka
(Above 1GHz) (Below 1GHz)
Mode Tx 11n-40

2422MHz

Frequency	Rx SA/TR		Tx SG		Tx	Tx	Tx Ant.	Result (ERP) <=1GHz, (EIRP) >1GHz		Limit (ERP) <=1GHz, (EIRP) >1GHz	Margin		Horizontal		Vertical		Remarks
	Reading [dBuV]		Reading [dBm]		Cable Loss [dB]	Ant. Gain [dBi]	Atten. Loss [dB]	[dBm]			[dB]		Rx Ant. Height [cm]	Turn Table [deg.]	Rx Ant. Height [cm]	Turn Table [deg.]	
	[MHz]	HOR	VER	HOR				VER	HOR		VER	HOR					
4844.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
7266.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
9688.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
12110.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	

Below 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15,

Above 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss

Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)

Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)

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

NS : No signal detect.

Detector : Below 1GHz: Spectrum Analyzer RMS AV(RBW:100kHz/VBW:300kHz)

Above 1GHz: Spectrum Analyzer RMS AV(RBW:1MHz/VBW:3MHz)

2462MHz

Frequency [MHz]	Rx SA/TR		Tx SG		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (ERP) <=1GHz, (EIRP) >1GHz [dBm]		Limit (ERP) <=1GHz, (EIRP) >1GHz [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
	Reading [dBuV]		Reading [dBm]					Rx Ant. Height [cm]	Turn Table [deg.]				Rx Ant. Height [cm]	Turn Table [deg.]			
	HOR	VER	HOR	VER													
4924.00	NS	NS	-	-	-	-	-	-	-30.0	-	-	-	-	-	-		
7386.00	NS	NS	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	-	
9848.00	NS	NS	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	-	
12310.00	NS	NS	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	-	

Below 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15,

Above 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss

Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)

Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)

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

NS : No signal detect.

Detector : Below 1GHz: Spectrum Analyzer RMS AV(RBW:100kHz/VBW:300kHz)

Above 1GHz: Spectrum Analyzer RMS AV(RBW:1MHz/VBW:3MHz)

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

Receiver spurious emissions (Radiated)

Report No. 10462196H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.4
Date 09/25/2014
Temperature / Humidity 24deg. C / 51% RH
Engineer Satofumi Matsuyama
Mode Rx 11b/g/n-20

No.4
09/26/2014
24deg. C / 62% RH
Tomohisa Nakagawa
(Below 1GHz)

2412MHz

Frequency [MHz]	Rx SA/TR		Tx SG		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (ERP) <=1GHz, (EIRP) >1GHz [dBm]		Limit (ERP) <=1GHz, (EIRP) >1GHz [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
	Reading [dBuV]		Reading [dBm]					Rx Ant. Height [cm]	Turn Table [deg.]		Rx Ant. Height [cm]	Turn Table [deg.]					
	HOR	VER	HOR	VER													
926.10	31.9	30.4	-53.0	-55.6	5.1	2.2	10.1	-68.3	-70.9	-57.0	11.3	13.9	177	303	100	359	
2412.00	NS	NS	-	-	-	-	-	-	-	-47.0	-	-	-	-	-	-	

Below 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15,

Above 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss

Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)

Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)

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

NS : No signal detect.

Detector : Below 1GHz: Spectrum Analyzer RMS AV(RBW:100kHz/VBW:300kHz)

Above 1GHz: Spectrum Analyzer RMS AV(RBW:1MHz/VBW:3MHz)

2472MHz

Frequency [MHz]	Rx SA/TR		Tx SG		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (ERP) <=1GHz, (EIRP) >1GHz [dBm]		Limit (ERP) <=1GHz, (EIRP) >1GHz [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
	Reading [dBuV]		Reading [dBm]					Rx Ant. Height [cm]	Turn Table [deg.]		Rx Ant. Height [cm]	Turn Table [deg.]					
	HOR	VER	HOR	VER													
926.10	36.9	32.0	-48.0	-54.0	5.1	2.2	10.1	-63.3	-69.3	-57.0	6.3	12.3	139	229	100	359	
2472.00	NS	NS	-	-	-	-	-	-	-	-47.0	-	-	-	-	-	-	-

Below 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15,

Above 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss

Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)

Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)

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

NS : No signal detect.

Detector : Below 1GHz: Spectrum Analyzer RMS AV(RBW:100kHz/VBW:300kHz)

Above 1GHz: Spectrum Analyzer RMS AV(RBW:1MHz/VBW:3MHz)

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Receiver spurious emissions (Radiated)

Report No. 10462196H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.4
Date 09/25/2014
Temperature / Humidity 24deg. C / 51% RH
Engineer Satofumi Matsuyama
Mode Rx 11n-40

No.4
09/26/2014
24deg. C / 62% RH
Tomohisa Nakagawa
(Below 1GHz)

2422MHz

Frequency [MHz]	Rx SA/TR		Tx SG		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (ERP) <=1GHz, (EIRP) >1GHz [dBm]		Limit (ERP) <=1GHz, (EIRP) >1GHz [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
	Reading [dBuV]		Reading [dBm]					Rx Ant. Height [cm]	Turn Table [deg.]		Rx Ant. Height [cm]	Turn Table [deg.]					
	HOR	VER	HOR	VER													
926.10	33.4	28.8	-51.5	-57.2	5.1	2.2	10.1	-66.8	-72.5	-57.0	9.8	15.5	129	223	100	359	
2422.00	NS	NS	-	-	-	-	-	-	-	-47.0	-	-	-	-	-	-	

Below 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15,

Above 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss

Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)

Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)

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

NS : No signal detect.

Detector : Below 1GHz: Spectrum Analyzer RMS AV(RBW:100kHz/VBW:300kHz)

Above 1GHz: Spectrum Analyzer RMS AV(RBW:1MHz/VBW:3MHz)

2462MHz

Frequency [MHz]	Rx SA/TR		Tx SG		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (ERP) <=1GHz, (EIRP) >1GHz [dBm]		Limit (ERP) <=1GHz, (EIRP) >1GHz [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
	Reading [dBuV]		Reading [dBm]					Rx Ant. Height [cm]	Turn Table [deg.]		Rx Ant. Height [cm]	Turn Table [deg.]					
	HOR	VER	HOR	VER													
926.10	33.9	28.6	-51.0	-57.4	5.1	2.2	10.1	-66.3	-72.7	-57.0	9.3	15.7	121	228	150	0	
2462.00	NS	NS	-	-	-	-	-	-	-	-47.0	-	-	-	-	-	-	

Below 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15,

Above 1GHz: Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss

Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)

Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)

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

NS : No signal detect.

Detector : Below 1GHz: Spectrum Analyzer RMS AV(RBW:100kHz/VBW:300kHz)

Above 1GHz: Spectrum Analyzer RMS AV(RBW:1MHz/VBW:3MHz)

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APPENDIX 2: Test instruments

EMI Test Equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MRENT-116	Spectrum Analyzer	Agilent	E4440A	MY46187620	AT	2014/03/05 * 12
MRENT-117	Signal Genelator	Agilent	N5182B	MY51350370	AT	2014/04/16 * 12
MRENT-118	Signal Genelator	Rohde & Schwarz	SMC100A	1411.4002k02	AT	2014/04/24 * 12
MFG-02	Function Generator	Agilent	33250A	MY40012914	AT	2014/06/16 * 12
MADP-01	Adaptivity Test Set	UL Japan	-	1	AT	Pre Check
MCC-138	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37953/2	AT	2013/10/18 * 12
MAT-56	Attenuator(10dB)	Suhner	6810.19.A	-	AT	2014/01/15 * 12
MPD-03	Power Divider DC-12.4GHz	SUHNER	4901.19.A	-	AT	2014/05/14 * 12
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	AT	2013/12/17 * 12
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	AT	2013/11/25 * 12
MCC-138	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37953/2	AT	2013/10/18 * 12
MCC-37	Microwave Cable	Hirose Electric	U.FL-2LP-066-A-(200)	-	AT	2014/09/25 * 12
MAT-25	Attenuator(10dB)(above1G Hz)	Agilent	8493C	71642	AT	2014/06/12 * 12
MPM-12	Power Meter	Anritsu	ML2495A	0825002	AT	2014/06/16 * 12
MPSE-17	Power sensor	Anritsu	MA2411B	0738285	AT	2014/06/16 * 12
MOS-11	Thermo-Hygrometer	Custom	CTH-180	1101	AT	2014/01/14 * 12
MMM-09	DIGITAL HiTESTER	Hioki	3805	051201195	AT	2014/01/22 * 12
MCH-02	Temperature and Humidity Chamber	Tabai Spec	PL-4KP	14005424	AT	2014/01/27 * 12
MDPS-04	DC Power Supply	KENWOOD TMI	PW18-1.3AT	08016530	AT	Pre Check
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2014/02/28 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	1501	RE	2014/02/20 * 12
MJM-22	Measure	ASKUL	-	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2014/04/08 * 12
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	RE	2014/08/12 * 12
MCC-141	Microwave Cable	Junkosha	MWX221	1305S002R(1m) / 1405S146(5m)	RE	2014/06/11 * 12
MPA-12	MicroWave System Amplifier	Agilent	83017A	MY39500780	RE	2014/03/11 * 12
MHF-26	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	002	RE	2014/09/24 * 12
MTR-01	Test Receiver	Rohde & Schwarz	ES140	100084	RE	2013/11/12 * 12
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	1302	RE	2013/11/24 * 12
MLA-08	Logperiodic Antenna	Schwarzbeck	UKLP9140-A	N/A	RE	2013/11/24 * 12
MCC-50	Coaxial Cable	UL Japan	-	-	RE	2014/06/02 * 12
MAT-68	Attenuator	Anritsu	MP721B	6200961025	RE	2013/11/26 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	260833	RE	2014/03/14 * 12
MCC-127	Coaxial Cable	UL Japan	-	-	RE	2014/07/15 * 12
MDA-03	Dipole Antenna	Schwarzbeck	UHAP	991	RE	2013/10/13 * 12
YTSSG03	Signal Generator	Rohde & Schwarz	SMT02	51400043	RE	2014/08/18 * 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:

AT: Antenna Terminal Conducted tests / RE: Radiated emission test

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APPENDIX 3: Photographs of test setup

Radiated emission

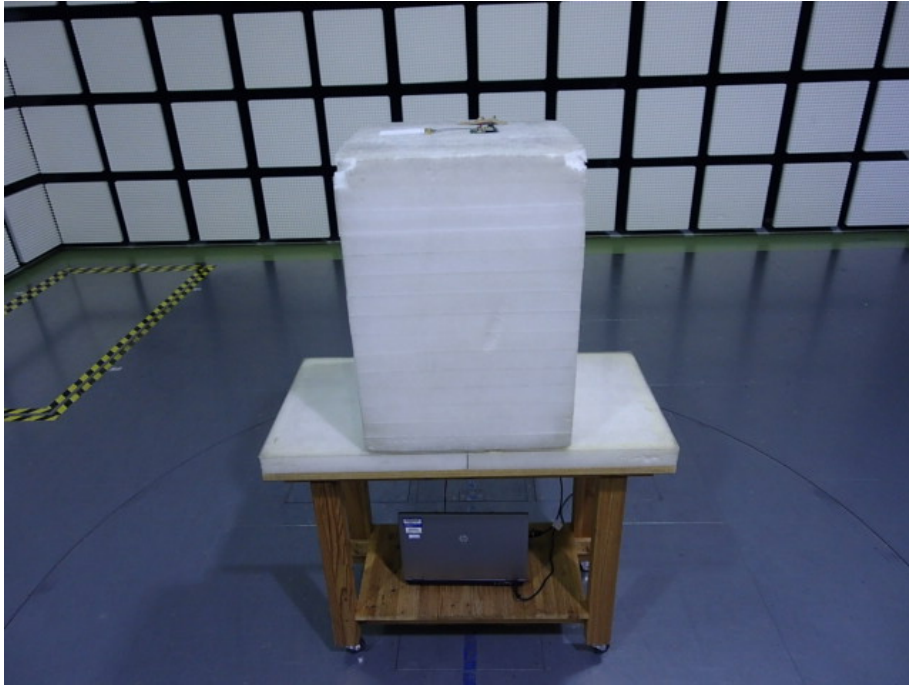


Photo 1

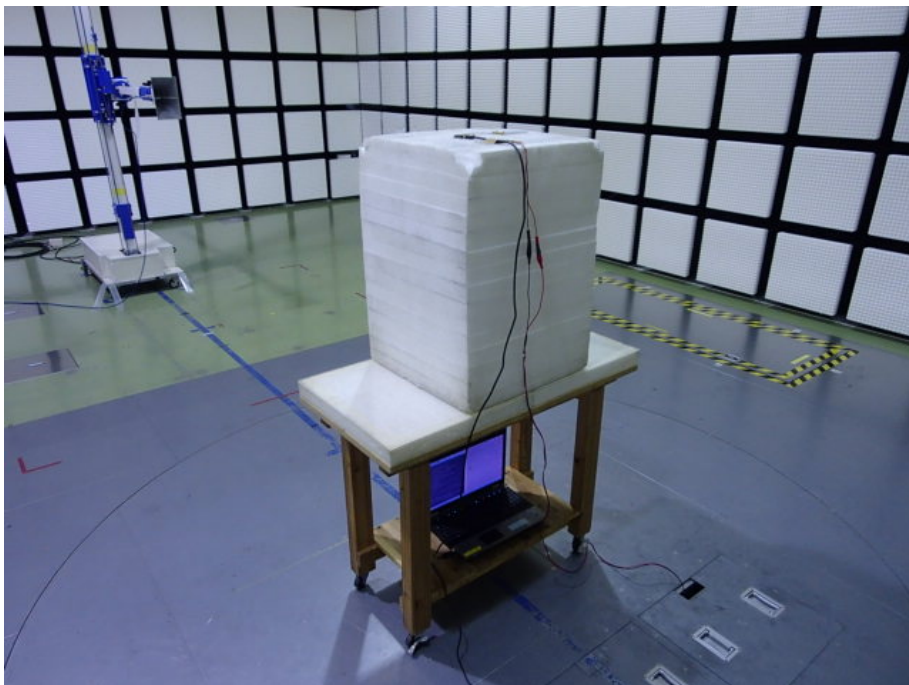


Photo 2

UL Japan, Inc.

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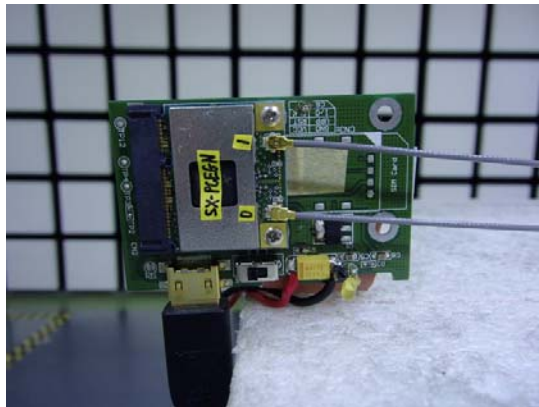
Facsimile : +81 596 24 8124

Worst Case Position
(Module: Horizontal: X-axis / Vertical: X-axis)

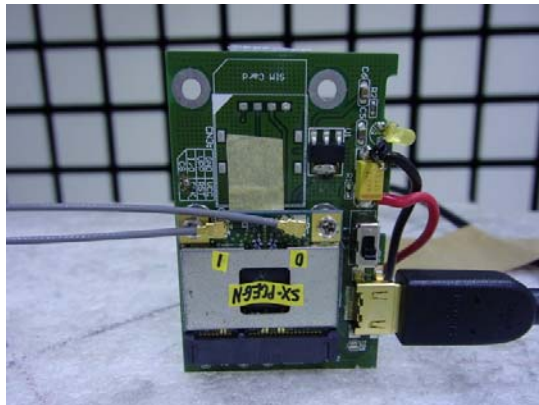
X-axis



Y-axis



Z-axis



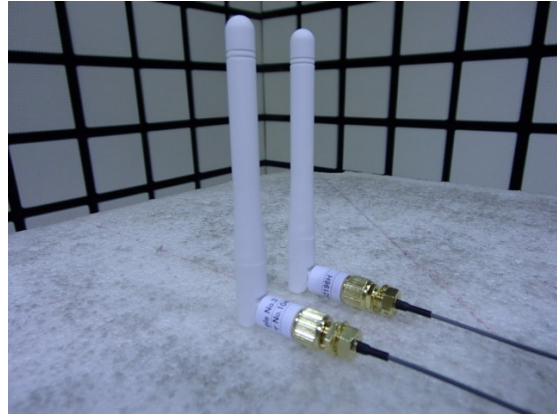
Worst Case Position

(Antenna: Horizontal: X0-axis / Vertical: Y0-axis)

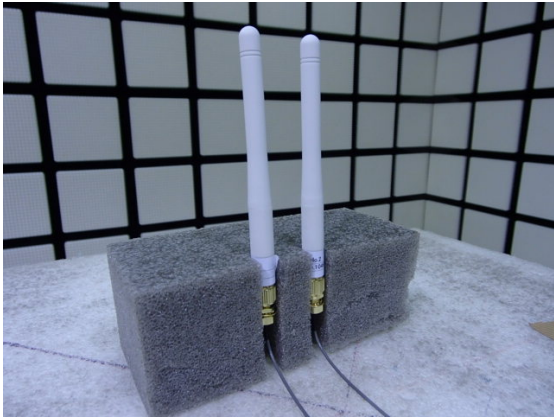
X0-axis



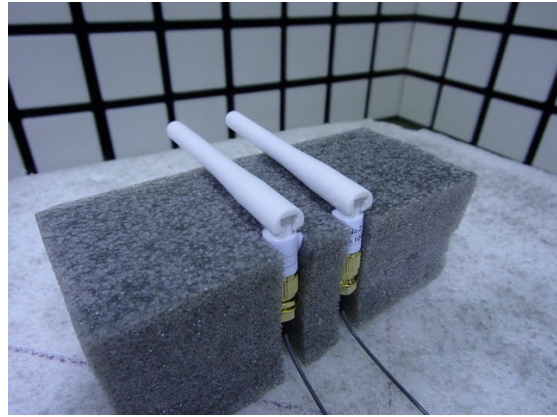
X90-axis



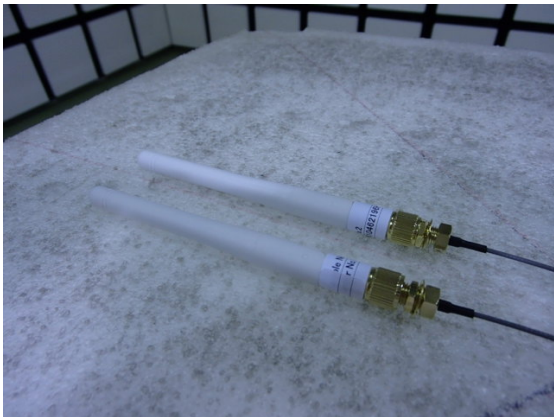
Y0-axis



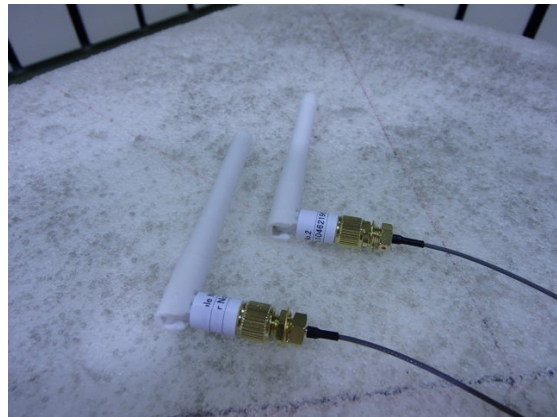
Y90-axis



Z0-axis



Z90-axis



End of Report

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