



RADIO TEST REPORT

Test Report No. : 32AE0138-HO-02

Applicant : silex technology, Inc.
Type of Equipment : Wireless LAN PCI Express Mini Card Module
Model No. : SX-PCEGN
Test standard : EN 300 328 V1.7.1: 2006-10
Test Result : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above standard(s).
4. The test results in this report are traceable to the national or international standards.

Date of test: April 27 to August 31, 2011

Representative
test engineer: T. Shimada
Takumi Shimada
Engineer of WiSE Japan,
UL Verification Service

Approved by : T. Hatakeda
Takahiro Hatakeda
Leader of WiSE Japan,
UL Verification Service

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SECTION 1: Customer information

Company Name : silex technology, Inc.
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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 : April 21, 2011
Country of Mass-production : Japan
Condition of EUT : Engineering 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 V1.7.1:2006-10
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 essential requirements
under 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

[DSSS]

Item	Test Procedure	Limit	Worst margin	Results	Remarks
Equivalent isotropic radiated power	Clause 5.7.2	Clause 4.3.1.2	-	Complied	Conducted
Maximum e.i.r.p. spectral density	Clause 5.7.3	Clause 4.3.2.2	-	Complied	Conducted
Frequency range	Clause 5.7.4	Clause 4.3.3.2	-	Complied	Conducted
Medium access protocol	-	Clause 4.3.5.2	-	Complied*1)	-
Transmitter spurious emissions	Clause 5.7.5	Clause 4.3.6.2	19.2dB 3216.01MHz Vertical (11n-20, Lch) 3229.34MHz Vertical (11n-40, Lch)	Complied	Radiated
Receiver spurious emissions	Clause 5.7.6	Clause 4.3.7.2	5.1dB 2489.97MHz Vertical (11b/g/n-20, Hch)	Complied	Radiated
Note: UL Japan, Inc. 's EMI Work Procedure 13-EM-W0420 and 13-EM-W0452. *1) The test was not performed because the EUT is a WLAN device and meets the requirements by its specification (CSMA/CA with ACK (CSMA with Collision Avoidance/with acknowledge)).					

3.3 Additions or deviations to standards

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

3.4 Uncertainty

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

Equivalent isotropic radiated power and Maximum e.i.r.p spectral power density

The measurement uncertainty for this test is 1.5dB.

Frequency range

The measurement uncertainty for this test is 1×10^{-5} .

Spurious emissions (Radiated)

Spurious Emission (EUT height: 1.5m) (+dB)	
Measurement Distance 3m	
30MHz-300MHz	5.4dB
300MHz-1000MHz	3.7dB
1GHz-12.75GHz	4.3dB

[Spurious emissions (Radiated)]

[Transmitter spurious emissions] 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.

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3.5 Test Location

UL Japan, Inc. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
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	FCC Registration Number	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	313583	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	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	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	134570	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	4.75 x 5.4 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	-	-	8.0 x 4.5 x 2.8m	2.0 x 2.0m	-
No.10 measurement room	-	-	2.6 x 2.8 x 2.5m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

* 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 Test set up, Data of EMI, and Test instruments

Refer to APPENDIX 1 to 3.

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

4.1 Operating Mode(s)

Mode	Remarks*
IEEE 802.11b (11b)	5.5Mbps (Long), PN9
IEEE 802.11g (11g)	18Mbps, PN9
IEEE 802.11n MIMO 20MHz BW (11n-20)	MCS 13, PN9
IEEE 802.11n MIMO 40MHz BW (11n-40)	MCS 8, PN9
*The worst condition was determined based on the test result of Equivalent isotropic radiated 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 12dBm 11dBm 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	
* 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) for 2.4GHz band

Test Item	Operating Mode	Tested Antenna	Tested frequency
Equivalent isotropic radiated power	11b Tx	0	2412MHz
	11g Tx		2442MHz
	11n-20 Tx	0+1	2472MHz
	11n-40 Tx	0+1	2422MHz 2442MHz 2462MHz
Frequency range Maximum e.i.r.p. spectral density	11b Tx	0	2412MHz
	11g Tx		2472MHz
	11n-20 Tx	0 *1)	
	11n-40 Tx		2422MHz 2462MHz
Transmitter Spurious Emission (Radiated)	11b Tx	0	2412MHz
	11g Tx		2472MHz
	11n-20 Tx	0+1	
	11n-40 Tx	0+1	2422MHz 2462MHz
Receiver Spurious Emission (Radiated)	11b/g Rx	0/1 *2)	2412MHz
	11n-20 Rx		2472MHz
	11n-40 Rx		2422MHz
			2462MHz
*1) The result for the active transmit chain was corrected to be valid for all transmit chains.			
*2) Simultaneous reception was done with ANT0 and ANT1.			

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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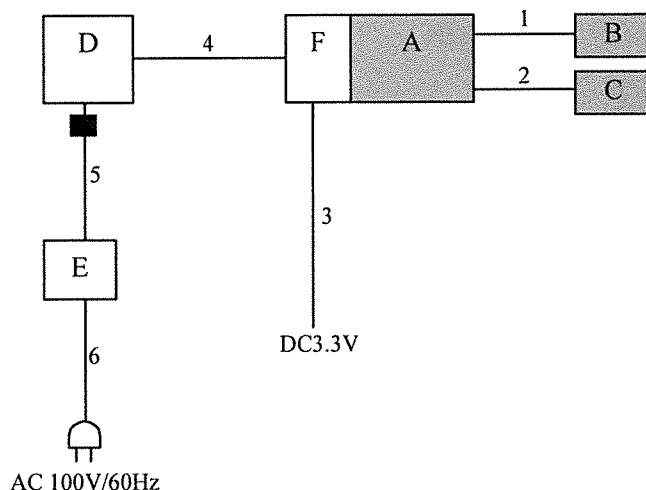
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4.2 Configuration and peripherals



■ : Standard Ferrite Core

* 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	008092-011870 *1) 008092-011871 *2)	silex technology, Inc.	EUT
B	Antenna	ANTB18-119	001	silex technology, Inc.	EUT
C	Antenna	ANTB18-119	002	silex technology, Inc.	EUT
D	Laptop PC	7661-CB9	L3-R2056 07/12	lenovo	-
E	AC Adapter	92P1213	11S92P1213Z1ZBGK7AH 11F	lenevo	-
F	Jig board	-	-	silex technology, Inc.	-

*1) Used for Antenna Terminal Conducted tests

*2) Spurious Emission tests

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Antenna Cable	0.1	Shielded	Shielded	-
2	Antenna Cable	0.1	Shielded	Shielded	-
3	DC Cable	1.5	Unshielded	Unshielded	-
4	Signal Cable	0.3	Shielded	Shielded	-
5	DC Cable	1.8	Unshielded	Unshielded	-
6	AC Cable	1.0	Unshielded	Unshielded	-

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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
Equivalent isotropic radiated power	Power Meter (Sensor: 50MHz BW)	Normal and Extreme conditions
Maximum e.i.r.p. spectral density	Spectrum Analyzer	Option 1 of EN300 328 V1.7.1 Clause 5.7.3
Frequency range	Spectrum Analyzer	Option 1 of EN300 328 V1.7.1 Clause 5.7.4 Normal and Extreme conditions

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**

SECTION 6: Radiated emissions

Test Procedure

- 1) EUT was placed on a platform of nominal size, 0.5m by 0.5m, raised 1.5m above the conducting ground plane. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The Radiated Electric Field Strength 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. Spurious emissions were observed with enough time according to the test standard.
- 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) 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.

Frequency	Below 1GHz	Above 1GHz
Instrument used	Spectrum Analyzer	Spectrum Analyzer
IF Bandwidth	PK: RBW: 100kHz/VBW: 30kHz	PK: RBW: 100kHz/VBW: 30kHz

- 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**

APPENDIX 1: Photographs of test setup

Radiated emission

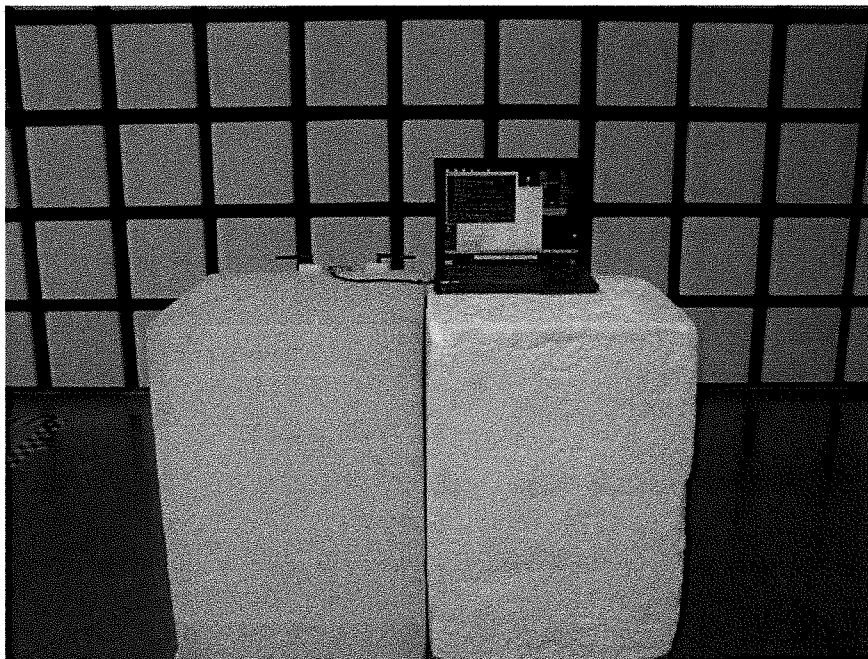


Photo 1

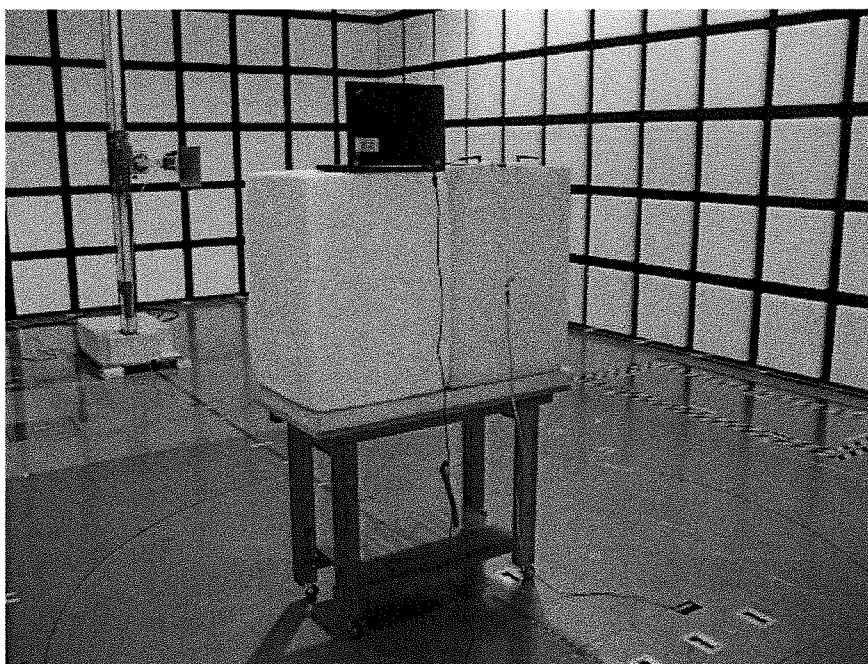
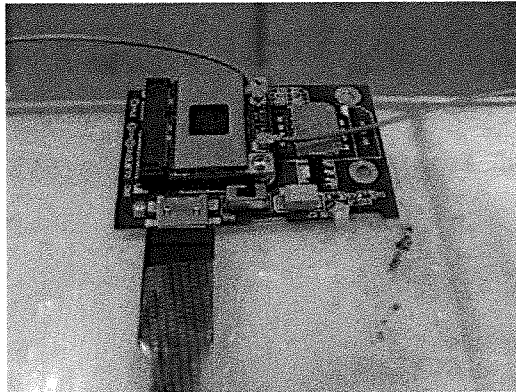


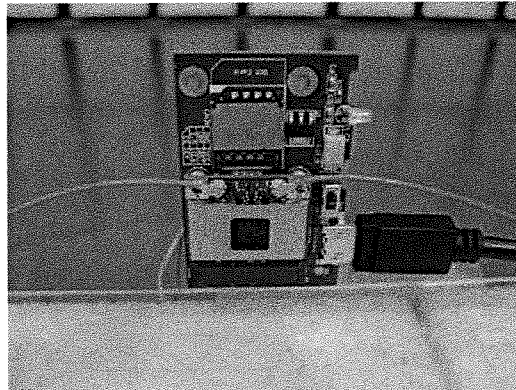
Photo 2

Worst Case Position

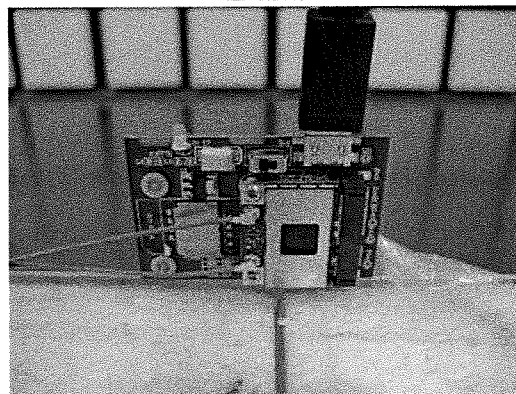
Module
(Horizontal: X-axis/ Vertical:X-axis)
X-axis



Y-axis



Z-axis

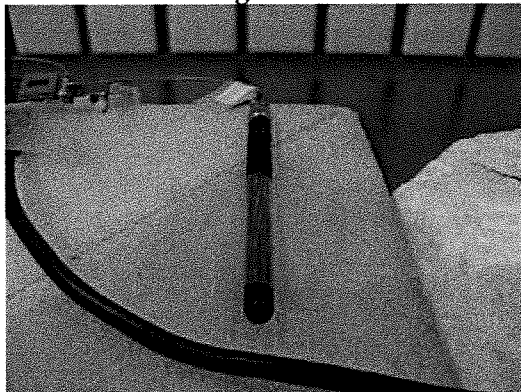


Worst Case Position

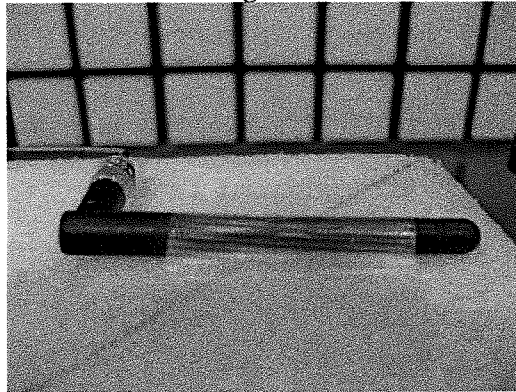
Antenna

(Horizontal: 90deg Y-axis/ Vertical:0deg Y-axis)

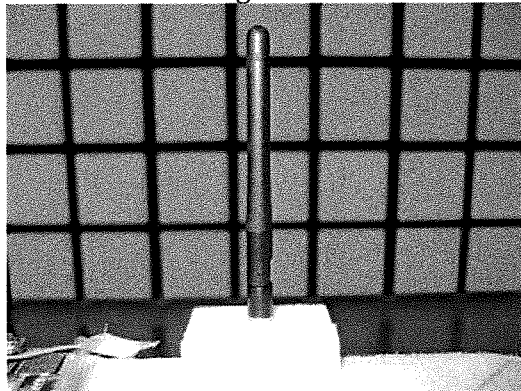
0deg X-axis



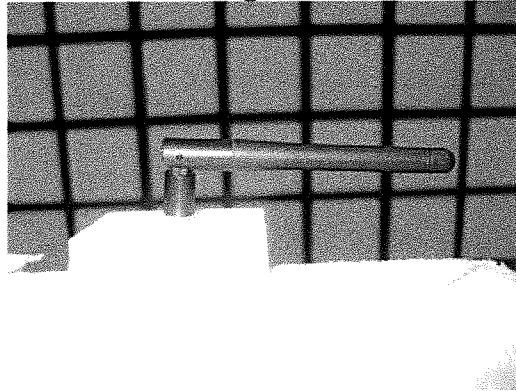
90deg X-axis



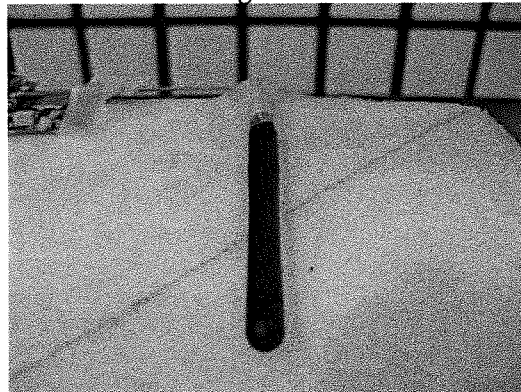
0deg Y-axis



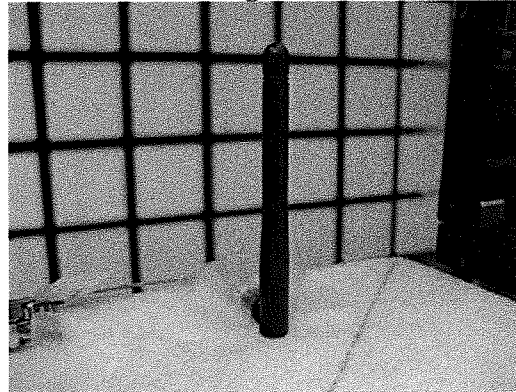
90deg Y-axis



0deg Z-axis



90deg Z-axis



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APPENDIX 2: Data of EMI test

Equivalent isotropic radiated power

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 32AE0138-HO-02
Date : 05/10/2011 05/27/2011
Temperature/ Humidity : 25 deg.C / 55 %RH 21deg. C / 74% RH
Engineer : Kazuya Yoshioka Yutaka Yoshida
Mode : 11b Tx / 11g Tx, Antenna 0

11b, 5.5Mbps(Long)

Test Condition	Freq.	P/M(AV)	Cable	Atten.	Antenna	Duty	Result	Limit	Margin
Temp.	Volt.	Reading	Loss	Loss	Gain	factor	-10dBW(100mW)		
		[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[dBm]	[dB]
nom	nom	2412.0	2.90	1.76	9.99	2.00	16.68	20.00	3.32
		2442.0	3.86	1.78	9.99	2.00	17.66	20.00	2.34
		2472.0	3.63	1.78	9.99	2.00	17.43	20.00	2.57
min	min	2412.0	2.31	1.76	9.99	2.00	16.09	20.00	3.91
		2442.0	2.86	1.78	9.99	2.00	16.66	20.00	3.34
		2472.0	2.20	1.78	9.99	2.00	16.00	20.00	4.00
min	max	2412.0	3.27	1.76	9.99	2.00	17.05	20.00	2.95
		2442.0	4.15	1.78	9.99	2.00	17.95	20.00	2.05
		2472.0	3.70	1.78	9.99	2.00	17.50	20.00	2.50
max	min	2412.0	1.99	1.76	9.99	2.00	15.77	20.00	4.23
		2442.0	2.89	1.78	9.99	2.00	16.69	20.00	3.31
		2472.0	2.34	1.78	9.99	2.00	16.14	20.00	3.86
max	max	2412.0	3.01	1.76	9.99	2.00	16.79	20.00	3.21
		2442.0	4.03	1.78	9.99	2.00	17.83	20.00	2.17
		2472.0	3.45	1.78	9.99	2.00	17.25	20.00	2.75

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss + Antenna Gain + Duty factor

11g, 18Mbps

Test Condition	Freq.	P/M(AV)	Cable	Atten.	Antenna	Duty	Result	Limit	Margin
Temp.	Volt.	Reading	Loss	Loss	Gain	factor	-10dBW(100mW)		
		[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[dBm]	[dB]
nom	nom	2412.0	1.47	1.76	9.99	2.00	15.33	20.00	4.67
		2442.0	3.83	1.78	9.99	2.00	17.71	20.00	2.29
		2472.0	1.62	1.78	9.99	2.00	15.50	20.00	4.50
min	min	2412.0	0.33	1.76	9.99	2.00	14.19	20.00	5.81
		2442.0	2.83	1.78	9.99	2.00	16.71	20.00	3.29
		2472.0	1.06	1.78	9.99	2.00	14.94	20.00	5.06
min	max	2412.0	2.06	1.76	9.99	2.00	15.92	20.00	4.08
		2442.0	4.59	1.78	9.99	2.00	18.47	20.00	1.53
		2472.0	2.67	1.78	9.99	2.00	16.55	20.00	3.45
max	min	2412.0	0.65	1.76	9.99	2.00	14.51	20.00	5.49
		2442.0	4.18	1.78	9.99	2.00	18.06	20.00	1.94
		2472.0	1.38	1.78	9.99	2.00	15.26	20.00	4.74
max	max	2412.0	1.66	1.76	9.99	2.00	15.52	20.00	4.48
		2442.0	5.03	1.78	9.99	2.00	18.91	20.00	1.09
		2472.0	2.41	1.78	9.99	2.00	16.29	20.00	3.71

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss + Antenna Gain + Duty factor

Equivalent isotropic radiated power
(Worst Rate Check)

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32AE0138-HO-02
Date 04/27/2011 05/10/2011
Temperature/ Humidity 22 deg.C / 65 %RH 25 deg.C / 55 %RH
Engineer Yutaka Yoshida Kazuya Yoshioka
Mode 11b Tx / 11g Tx

11b Antenna 0, 2442MHz

Rate	Reading	Duty Factor	Result	Remark
[Mbps]	[dBm]	[dB]	[dBm]	
1	3.65	0.01	3.66	
2(Long)	3.69	0.01	3.70	
2(Short)	3.73	0.01	3.74	
5.5(Long)	3.86	0.03	3.89	*
5.5(Short)	3.85	0.02	3.87	
11(Long)	3.80	0.04	3.84	
11(Short)	3.73	0.04	3.77	

*: Worst Rate

11b Antenna 1, 2442MHz

Rate	Reading	Duty Factor	Result	Remark
[Mbps]	[dBm]	[dB]	[dBm]	
1	2.33	0.01	2.34	
2(Long)	2.36	0.01	2.37	*
2(Short)	2.26	0.01	2.27	
5.5(Long)	2.28	0.03	2.31	
5.5(Short)	2.27	0.02	2.29	
11(Long)	2.24	0.04	2.28	
11(Short)	2.25	0.05	2.30	

*: Worst Rate

11g Antenna 0, 2442MHz

Rate	Reading	Duty Factor	Result	Remark
[Mbps]	[dBm]	[dB]	[dBm]	
6	3.69	0.03	3.72	
9	3.86	0.04	3.90	
12	3.86	0.05	3.91	
18	3.83	0.11	3.94	*
24	3.79	0.14	3.93	
36	3.00	0.20	3.20	
48	1.22	0.26	1.48	
54	-0.19	0.31	0.12	

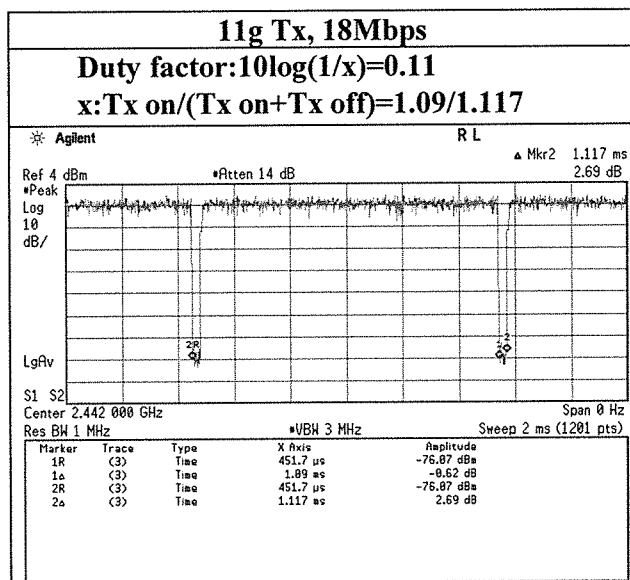
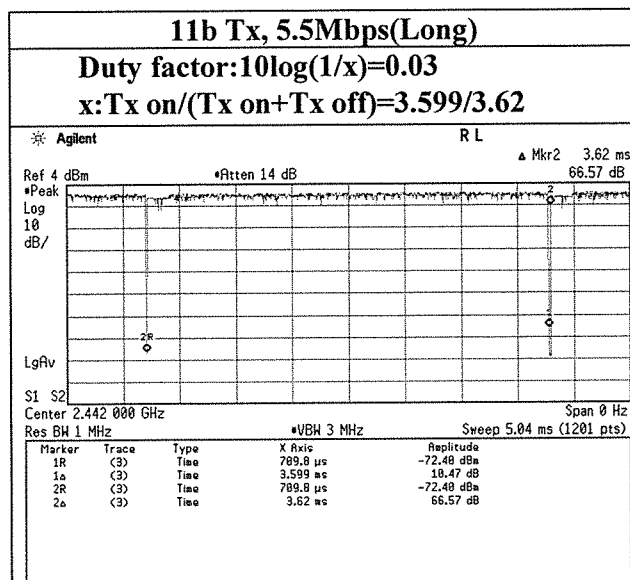
*: Worst Rate

11g Antenna 1, 2442MHz

Rate	Reading	Duty Factor	Result	Remark
[Mbps]	[dBm]	[dB]	[dBm]	
6	1.16	0.03	1.19	
9	1.28	0.04	1.32	
12	1.33	0.05	1.38	
18	1.30	0.11	1.41	
24	1.31	0.14	1.45	*
36	1.01	0.20	1.21	
48	-0.95	0.26	-0.69	
54	-2.17	0.31	-1.86	

Sample Calculation:

Equivalent isotropic radiated power



Equivalent isotropic radiated power

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32AE0138-HO-02
Date 05/10/2011 05/27/2011
Temperature/ Humidity 25 deg.C / 55 %RH 21deg. C / 74% RH
Engineer Kazuya Yoshioka Yutaka Yoshida
Mode 11n-20 Tx, Antenna 0 + 1

11n-20, Antenna 0 + 1, MCS 13

Test Condition Temp.	Volt.	Freq.	Result Antenna 0	Result Antenna 1	Result Antenna 0 + 1		Limit -10dBW(100mW)	Margin
		[MHz]	[mW]	[mW]	[dBm]	[mW]	[dBm]	[dB]
nom	nom	2412.0	14.45	16.11	14.85	30.56	20.00	5.15
		2442.0	36.14	34.04	18.46	70.18	20.00	1.54
		2472.0	21.83	23.07	16.52	44.89	20.00	3.48
min	min	2412.0	11.94	14.29	14.19	26.23	20.00	5.81
		2442.0	33.11	33.81	18.26	66.92	20.00	1.74
		2472.0	16.83	24.38	16.15	41.20	20.00	3.85
min	max	2412.0	17.78	18.92	15.65	36.71	20.00	4.35
		2442.0	42.66	41.11	19.23	83.77	20.00	0.77
		2472.0	26.42	30.76	17.57	57.19	20.00	2.43
max	min	2412.0	12.05	13.55	14.08	25.60	20.00	5.92
		2442.0	34.91	26.42	17.88	61.34	20.00	2.12
		2472.0	17.78	19.36	15.70	37.15	20.00	4.30
max	max	2412.0	17.66	18.11	15.54	35.77	20.00	4.46
		2442.0	46.13	41.30	19.42	87.44	20.00	0.58
		2472.0	28.91	25.35	17.34	54.26	20.00	2.66

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss + Antenna Gain + Duty fac

Equivalent isotropic radiated power

11n-20, Antenna 0, MCS 13

Test Condition Temp.	Volt.	Freq.	P/M(AV) Reading	Cable Loss	Atten. Loss	Antenna Gain	Duty factor	Result		Limit	Margin
		[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dB]	[dBm]	[mW]	-10dBW(100mW) [dBm]	[dB]
nom	nom	2412.0	-2.66	1.76	9.99	2.00	0.51	11.60	14.45	20.00	8.40
		2442.0	1.30	1.78	9.99	2.00	0.51	15.58	36.14	20.00	4.42
		2472.0	-0.89	1.78	9.99	2.00	0.51	13.39	21.83	20.00	6.61
min	min	2412.0	-3.49	1.76	9.99	2.00	0.51	10.77	11.94	20.00	9.23
		2442.0	0.92	1.78	9.99	2.00	0.51	15.20	33.11	20.00	4.80
		2472.0	-2.02	1.78	9.99	2.00	0.51	12.26	16.83	20.00	7.74
min	max	2412.0	-1.76	1.76	9.99	2.00	0.51	12.50	17.78	20.00	7.50
		2442.0	2.02	1.78	9.99	2.00	0.51	16.30	42.66	20.00	3.70
		2472.0	-0.06	1.78	9.99	2.00	0.51	14.22	26.42	20.00	5.78
max	min	2412.0	-3.45	1.76	9.99	2.00	0.51	10.81	12.05	20.00	9.19
		2442.0	1.15	1.78	9.99	2.00	0.51	15.43	34.91	20.00	4.57
		2472.0	-1.78	1.78	9.99	2.00	0.51	12.50	17.78	20.00	7.50
max	max	2412.0	-1.79	1.76	9.99	2.00	0.51	12.47	17.66	20.00	7.53
		2442.0	2.36	1.78	9.99	2.00	0.51	16.64	46.13	20.00	3.36
		2472.0	0.33	1.78	9.99	2.00	0.51	14.61	28.91	20.00	5.39

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss + Antenna Gain + Duty factor

11n-20, Antenna 1, MCS 13

Test Condition Temp.	Volt.	Freq.	P/M(AV) Reading	Cable Loss	Atten. Loss	Antenna Gain	Duty factor	Result		Limit	Margin
		[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dB]	[dBm]	[mW]	-10dBW(100mW) [dBm]	[dB]
nom	nom	2412.0	-2.19	1.76	9.99	2.00	0.51	12.07	16.11	20.00	7.93
		2442.0	1.04	1.78	9.99	2.00	0.51	15.32	34.04	20.00	4.68
		2472.0	-0.65	1.78	9.99	2.00	0.51	13.63	23.07	20.00	6.37
min	min	2412.0	-2.71	1.76	9.99	2.00	0.51	11.55	14.29	20.00	8.45
		2442.0	1.01	1.78	9.99	2.00	0.51	15.29	33.81	20.00	4.71
		2472.0	-0.41	1.78	9.99	2.00	0.51	13.87	24.38	20.00	6.13
min	max	2412.0	-1.49	1.76	9.99	2.00	0.51	12.77	18.92	20.00	7.23
		2442.0	1.86	1.78	9.99	2.00	0.51	16.14	41.11	20.00	3.86
		2472.0	0.60	1.78	9.99	2.00	0.51	14.88	30.76	20.00	5.12
max	min	2412.0	-2.94	1.76	9.99	2.00	0.51	11.32	13.55	20.00	8.68
		2442.0	-0.06	1.78	9.99	2.00	0.51	14.22	26.42	20.00	5.78
		2472.0	-1.41	1.78	9.99	2.00	0.51	12.87	19.36	20.00	7.13
max	max	2412.0	-1.68	1.76	9.99	2.00	0.51	12.58	18.11	20.00	7.42
		2442.0	1.88	1.78	9.99	2.00	0.51	16.16	41.30	20.00	3.84
		2472.0	-0.24	1.78	9.99	2.00	0.51	14.04	25.35	20.00	5.96

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss + Antenna Gain + Duty factor

Equivalent isotropic radiated power
(Worst Rate Check)

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32AE0138-HO-02
Date 04/27/2011 05/10/2011
Temperature/ Humidity 22 deg.C / 65%RH 25 deg.C / 55 %RH
Engineer Yutaka Yoshida Kazuya Yoshioka
Mode 11n-20 Tx

11n-20 2442MHz

MCS Number	Reading Antenna 0 [dBm]	Reading Antenna 1 [dBm]	Duty Factor [dB]	Result Antena 0		Result Antenna 1		Result Antenna 0 + 1		Remark
				[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
0	1.45	1.28	0.03	1.48	1.41	1.31	1.35	-	-	
1	1.42	1.24	0.07	1.49	1.41	1.31	1.35	-	-	
2	1.38	1.19	0.12	1.50	1.41	1.31	1.35	-	-	
3	1.36	1.18	0.15	1.51	1.42	1.33	1.36	-	-	
4	1.30	1.12	0.21	1.51	1.42	1.33	1.36	-	-	
5	1.23	1.07	0.28	1.51	1.42	1.35	1.36	-	-	
6	0.12	0.09	0.24	0.36	1.09	0.33	1.08	-	-	
7	-0.50	-0.59	0.37	-0.13	0.97	-0.22	0.95	-	-	
8	1.61	1.43	0.04	1.65	1.46	1.47	1.40	4.57	2.86	
9	1.58	1.33	0.15	1.73	1.49	1.48	1.41	4.62	2.90	
10	1.52	1.28	0.21	1.73	1.49	1.49	1.41	4.62	2.90	
11	1.49	1.21	0.29	1.78	1.51	1.50	1.41	4.65	2.92	
12	1.39	1.13	0.41	1.80	1.51	1.54	1.43	4.68	2.94	
13	1.30	1.04	0.51	1.81	1.52	1.55	1.43	4.69	2.95	*
14	0.01	-0.13	0.60	0.61	1.15	0.47	1.11	3.55	2.27	
15	-0.41	-0.73	0.63	0.22	1.05	-0.10	0.98	3.07	2.03	

*: Worst Rate

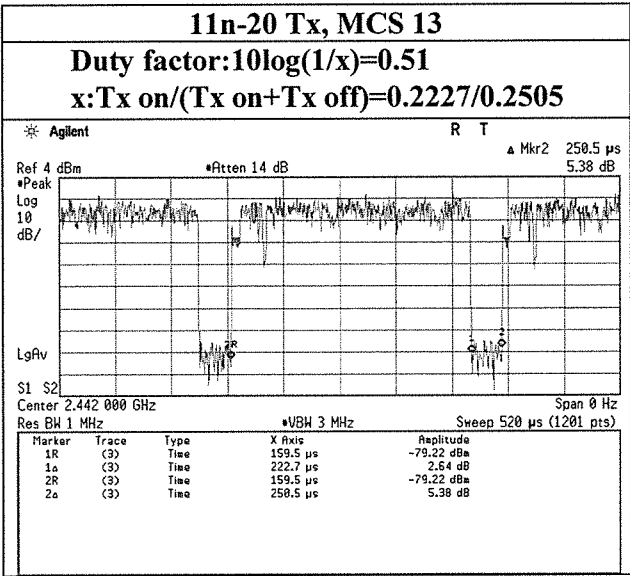
Sample Calculation:

Result Antenna 0/1[dBm]= Reading Antenna 0/1[dBm] + Duty factor[dB]

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

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

Equivalent isotropic radiated power



Equivalent isotropic radiated power

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32AE0138-HO-02
Date 05/10/2011 05/27/2011
Temperature/ Humidity 25 deg.C / 55 %RH 21deg. C / 74% RH
Engineer Kazuya Yoshioka Yutaka Yoshida
Mode 11n-40 Tx, Antenna 0 + 1

11n-40, Antenna 0 + 1, MCS 8

Test Condition	Temp.	Volt.	Freq. [MHz]	Result Antenna 0 [mW]	Result Antenna 1 [mW]	Result Antenna 0 + 1		Limit -10dBW(100mW) [dBm]	Margin [dB]
						[dBm]	[mW]		
nom	nom	nom	2422.0	12.30	12.39	13.93	24.69	20.00	6.07
			2442.0	37.76	36.39	18.70	74.15	20.00	1.30
			2462.0	12.65	14.62	14.36	27.27	20.00	5.64
min	min	min	2422.0	9.02	11.89	13.20	20.90	20.00	6.80
			2442.0	30.34	30.69	17.86	61.03	20.00	2.14
			2462.0	9.86	12.88	13.57	22.75	20.00	6.43
min	max	max	2422.0	12.68	15.70	14.53	28.38	20.00	5.47
			2442.0	41.78	41.40	19.20	83.18	20.00	0.80
			2462.0	13.21	17.50	14.87	30.71	20.00	5.13
max	min	min	2422.0	10.30	11.27	13.34	21.58	20.00	6.66
			2442.0	30.55	31.19	17.91	61.74	20.00	2.09
			2462.0	10.40	11.80	13.46	22.20	20.00	6.54
max	max	max	2422.0	14.45	14.86	14.67	29.31	20.00	5.33
			2442.0	48.87	43.35	19.65	92.22	20.00	0.35
			2462.0	15.00	15.92	14.90	30.92	20.00	5.10

Equivalent isotropic radiated power

11n-40, Antenna 0, MCS 8

Test Condition Temp.	Volt.	Freq. [MHz]	P/M(AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Duty factor [dB]	Result		Limit -10dBW(100mW) [dBm]	Margin [dB]
								[dBm]	[mW]		
nom	nom	2422.0	-3.00	1.77	9.99	2.00	0.14	10.90	12.30	20.00	9.10
		2442.0	1.86	1.78	9.99	2.00	0.14	15.77	37.76	20.00	4.23
		2462.0	-2.89	1.78	9.99	2.00	0.14	11.02	12.65	20.00	8.98
min	min	2422.0	-4.35	1.77	9.99	2.00	0.14	9.55	9.02	20.00	10.45
		2442.0	0.91	1.78	9.99	2.00	0.14	14.82	30.34	20.00	5.18
		2462.0	-3.97	1.78	9.99	2.00	0.14	9.94	9.86	20.00	10.06
min	max	2422.0	-2.87	1.77	9.99	2.00	0.14	11.03	12.68	20.00	8.97
		2442.0	2.30	1.78	9.99	2.00	0.14	16.21	41.78	20.00	3.79
		2462.0	-2.70	1.78	9.99	2.00	0.14	11.21	13.21	20.00	8.79
max	min	2422.0	-3.77	1.77	9.99	2.00	0.14	10.13	10.30	20.00	9.87
		2442.0	0.94	1.78	9.99	2.00	0.14	14.85	30.55	20.00	5.15
		2462.0	-3.74	1.78	9.99	2.00	0.14	10.17	10.40	20.00	9.83
max	max	2422.0	-2.30	1.77	9.99	2.00	0.14	11.60	14.45	20.00	8.40
		2442.0	2.98	1.78	9.99	2.00	0.14	16.89	48.87	20.00	3.11
		2462.0	-2.15	1.78	9.99	2.00	0.14	11.76	15.00	20.00	8.24

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss + Antenna Gain + Duty factor

11n-40, Antenna 1, MCS 8

Test Condition Temp.	Volt.	Freq. [MHz]	P/M(AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Duty factor [dB]	Result		Limit -10dBW(100mW) [dBm]	Margin [dB]
								[dBm]	[mW]		
nom	nom	2422.0	-2.97	1.77	9.99	2.00	0.14	10.93	12.39	20.00	9.07
		2442.0	1.70	1.78	9.99	2.00	0.14	15.61	36.39	20.00	4.39
		2462.0	-2.26	1.78	9.99	2.00	0.14	11.65	14.62	20.00	8.35
min	min	2422.0	-3.15	1.77	9.99	2.00	0.14	10.75	11.89	20.00	9.25
		2442.0	0.96	1.78	9.99	2.00	0.14	14.87	30.69	20.00	5.13
		2462.0	-2.81	1.78	9.99	2.00	0.14	11.10	12.88	20.00	8.90
min	max	2422.0	-1.94	1.77	9.99	2.00	0.14	11.96	15.70	20.00	8.04
		2442.0	2.26	1.78	9.99	2.00	0.14	16.17	41.40	20.00	3.83
		2462.0	-1.48	1.78	9.99	2.00	0.14	12.43	17.50	20.00	7.57
max	min	2422.0	-3.38	1.77	9.99	2.00	0.14	10.52	11.27	20.00	9.48
		2442.0	1.03	1.78	9.99	2.00	0.14	14.94	31.19	20.00	5.06
		2462.0	-3.19	1.78	9.99	2.00	0.14	10.72	11.80	20.00	9.28
max	max	2422.0	-2.18	1.77	9.99	2.00	0.14	11.72	14.86	20.00	8.28
		2442.0	2.46	1.78	9.99	2.00	0.14	16.37	43.35	20.00	3.63
		2462.0	-1.89	1.78	9.99	2.00	0.14	12.02	15.92	20.00	7.98

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss + Antenna Gain + Duty factor

UL Japan, Inc.

Head Office EMC Lab.

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Equivalent isotropic radiated power
(Worst Rate Check)

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32AE0138-HO-02
Date 04/27/2011 05/10/2011
Temperature/ Humidity 22 deg.C / 65%RH 25 deg.C / 55 %RH
Engineer Yutaka Yoshida Kazuya Yoshioka
Mode 11n-40 Tx

11n-40 2442MHz

MCS Number	Reading Antenna 0 [dBm]	Reading Antenna 1 [dBm]	Duty Factor [dB]	Result Antena 0		Result Antenna 1		Result Antenna 0 + 1		Remark
				[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
0	1.73	1.73	0.05	1.78	1.51	1.78	1.51	-	-	
1	1.68	1.62	0.10	1.78	1.51	1.72	1.49	-	-	
2	1.61	1.60	0.22	1.83	1.52	1.82	1.52	-	-	
3	1.50	1.49	0.29	1.79	1.51	1.78	1.51	-	-	
4	1.44	1.44	0.42	1.86	1.53	1.86	1.53	-	-	
5	1.36	1.35	0.53	1.89	1.55	1.88	1.54	-	-	
6	-1.02	-1.52	0.58	-0.44	0.90	-0.94	0.81	-	-	
7	-1.86	-2.16	0.62	-1.24	0.75	-1.54	0.70	-	-	
8	1.86	1.70	0.14	2.00	1.58	1.84	1.53	4.93	3.11	*
9	1.61	1.59	0.28	1.89	1.55	1.87	1.54	4.89	3.08	
10	1.51	1.47	0.42	1.93	1.56	1.89	1.55	4.92	3.10	
11	1.43	1.38	0.50	1.93	1.56	1.88	1.54	4.92	3.10	
12	1.09	0.42	0.65	1.74	1.49	1.07	1.28	4.43	2.77	
13	1.10	0.39	0.85	1.95	1.57	1.24	1.33	4.62	2.90	
14	-1.30	-1.77	0.90	-0.40	0.91	-0.87	0.82	2.38	1.73	
15	-1.75	-2.16	0.87	-0.88	0.82	-1.29	0.74	1.93	1.56	

*: Worst Rate

Sample Calculation:

Result Antenna 0/1 [dBm] = Reading Antenna 0/1 [dBm] + Duty factor [dB]

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

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

UL Japan, Inc.

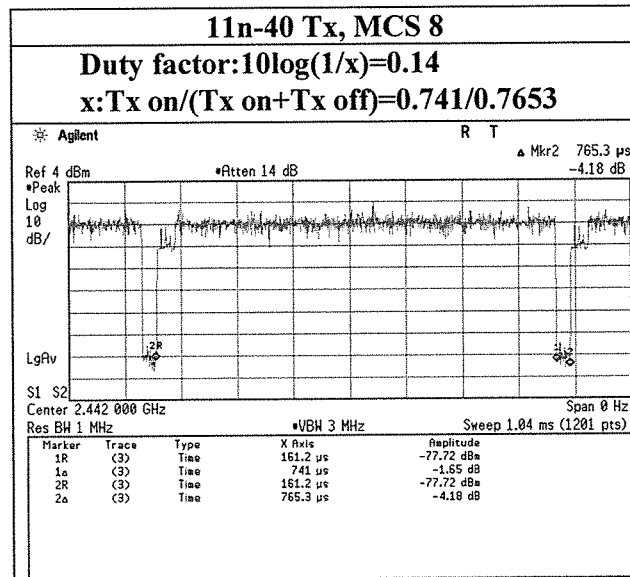
Head Office EMC Lab.

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

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

Equivalent isotropic radiated power



Maximum e.i.r.p. spectral density

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32AE0138-HO-02
Date 05/27/2011
Temperature/ Humidity 21deg. C/ 74% RH
Engineer Yutaka Yoshida
Mode 11b Tx / 11g Tx, Antenna 0

11b

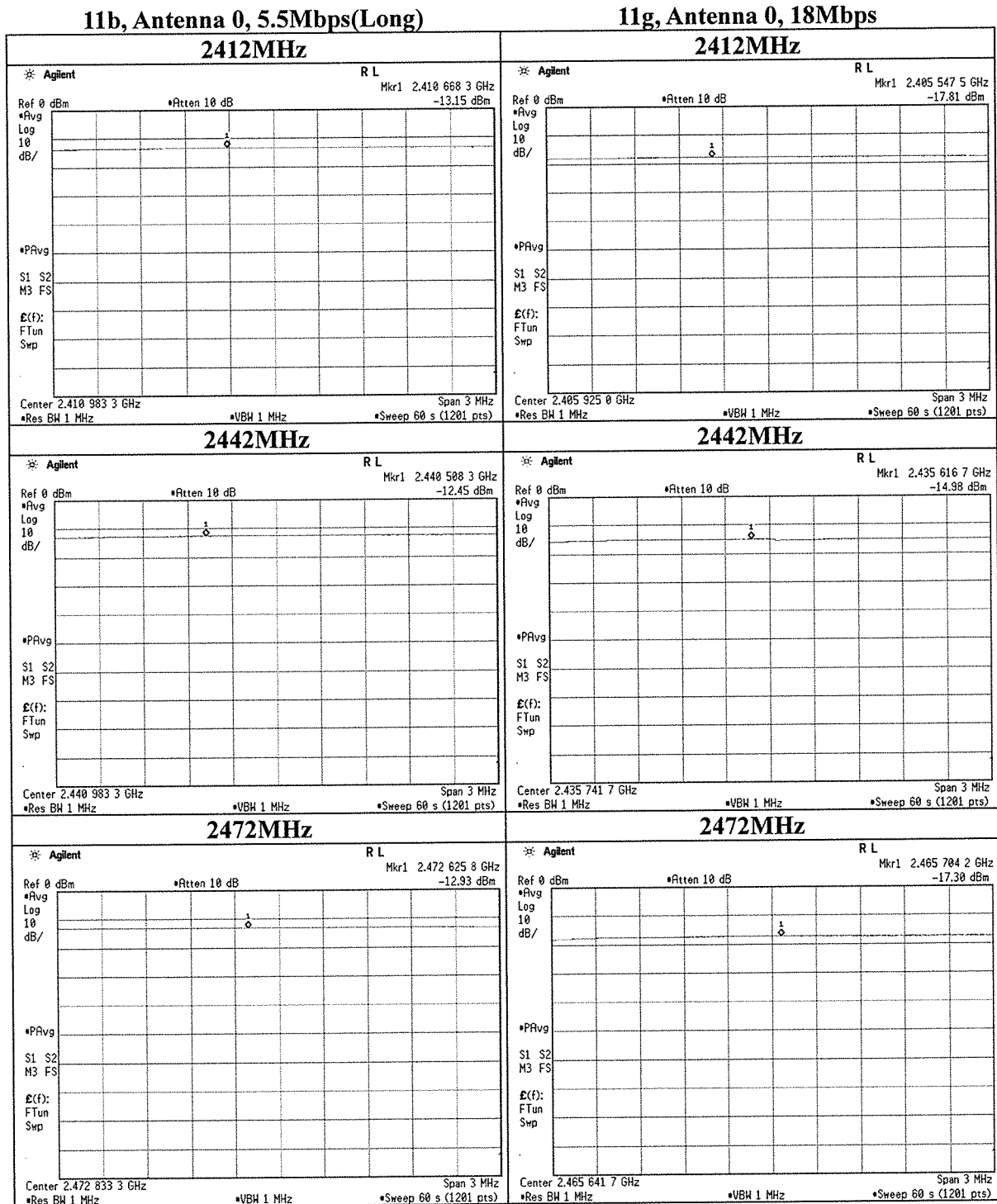
Freq.	Reading	Cable Loss	Atten. Loss	Antenna Gain	Duty Factor	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dB]	-20dBW(10mW) per 1MHz [dBm]	[dBm]	[dB]
2412.0	-13.15	1.78	16.10	2.00	0.03	6.76	10.00	3.24
2442.0	-12.45	1.78	16.10	2.00	0.03	7.46	10.00	2.54
2472.0	-12.93	1.78	16.10	2.00	0.03	6.98	10.00	3.02

11g

Freq.	Reading	Cable Loss	Atten. Loss	Antenna Gain	Duty Factor	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dB]	-20dBW(10mW) per 1MHz [dBm]	[dBm]	[dB]
2412.0	-17.81	1.78	16.10	2.00	0.11	2.18	10.00	7.82
2442.0	-14.98	1.78	16.10	2.00	0.11	5.01	10.00	4.99
2472.0	-17.30	1.78	16.10	2.00	0.11	2.69	10.00	7.31

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss + Antenna Gain + Duty factor

Maximum e.i.r.p. spectral density



Maximum e.i.r.p. spectral density

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 32AE0138-HO-02
Date : 05/27/2011
Temperature/ Humidity : 21deg. C / 74% RH
Engineer : Yutaka Yoshida
Mode : 11n-20 Tx / 11n-40 Tx, Antenna 0

11n-20, Antenna 0

Freq.	Reading	Cable Loss	Atten. Loss	Antenna Gain	Duty Factor	Number of Chains	Result -20dBW(10mW) per 1MHz	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dB]		[dBm]	[dBm]	[dB]
2412.0	-21.60	1.78	16.10	2.00	0.51	2	1.80	10.00	8.20
2442.0	-17.93	1.78	16.10	2.00	0.51	2	5.47	10.00	4.53
2472.0	-19.54	1.78	16.10	2.00	0.51	2	3.86	10.00	6.14

11n-40, Antenna 0

Freq.	Reading	Cable Loss	Atten. Loss	Antenna Gain	Duty Factor	Number of Chains	Result -20dBW(10mW) per 1MHz	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dB]		[dBm]	[dBm]	[dB]
2422.0	-25.16	1.77	16.10	2.00	0.14	2	-2.14	10.00	12.14
2442.0	-20.16	1.78	16.10	2.00	0.14	2	2.87	10.00	7.13
2462.0	-24.95	1.78	16.10	2.00	0.14	2	-1.92	10.00	11.92

Result = Reading + Cable Loss + Attenuator Loss + Antenna Gain + Duty factor + 10*Log(Number of Chains)

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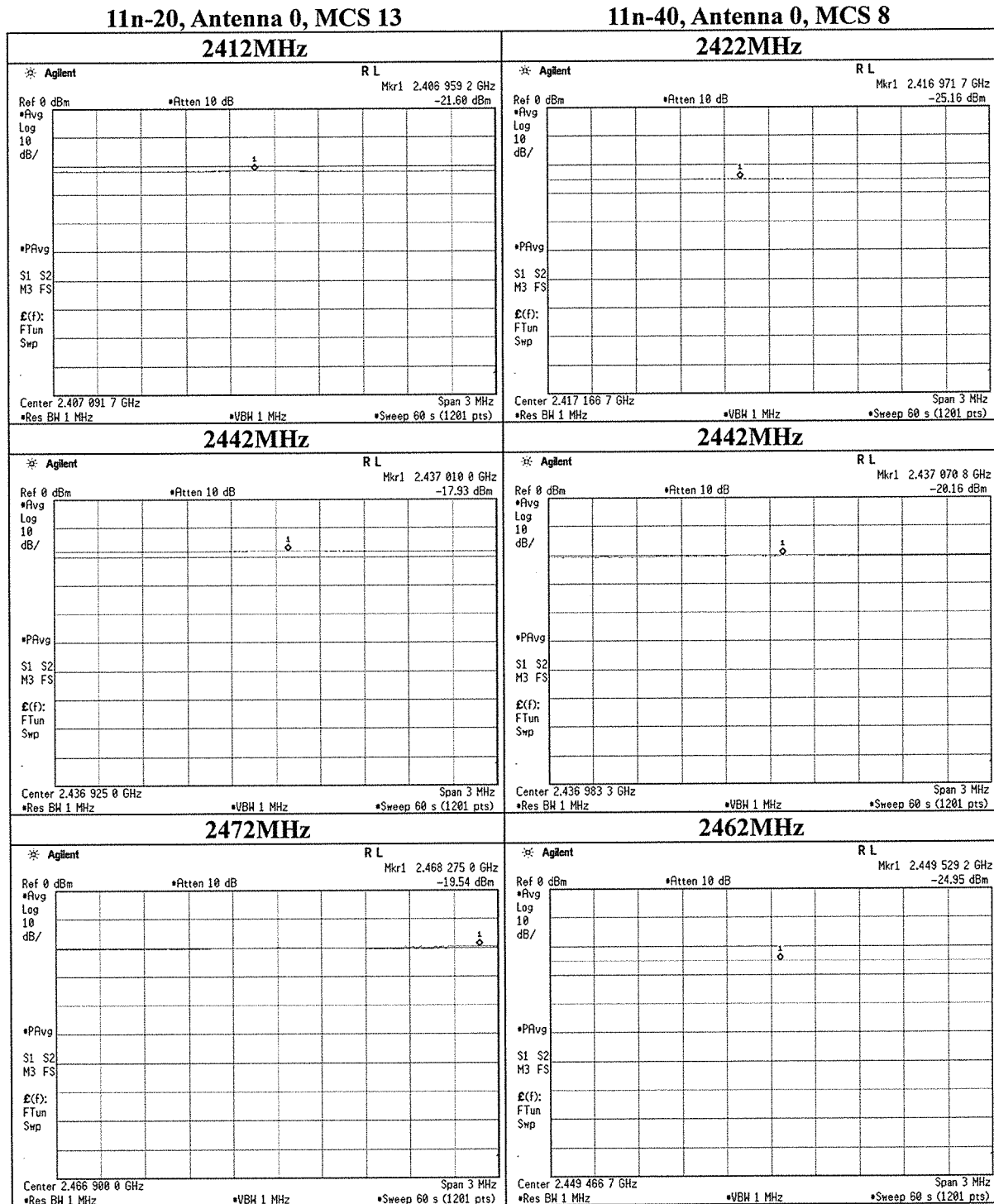
Head Office EMC Lab.

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

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

Maximum e.i.r.p. spectral density



Frequency range

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32AE0138-HO-02
Date 05/27/2011
Temperature/ Humidity 21deg. C / 74% RH
Engineer Yutaka Yoshida
Mode 11b Tx / 11g Tx, Antenna 0

11b

Test Condition	Freq.	Result	Limit	Margin
Temp. Volt.	[MHz]	[MHz]	[MHz]	[MHz]
nom	nom	2412.00	2403.38	2400.00
		2472.00	2480.62	2483.50
min	min	2412.00	2403.46	2400.00
		2472.00	2480.62	2483.50
min	max	2412.00	2403.38	2400.00
		2472.00	2480.71	2483.50
max	min	2412.00	2403.46	2400.00
		2472.00	2480.62	2483.50
max	max	2412.00	2403.38	2400.00
		2472.00	2480.71	2483.50

11g

Test Condition	Freq.	Result	Limit	Margin
Temp. Volt.	[MHz]	[MHz]	[MHz]	[MHz]
nom	nom	2412.00	2401.96	2400.00
		2472.00	2482.08	2483.50
min	min	2412.00	2401.96	2400.00
		2472.00	2482.33	2483.50
min	max	2412.00	2401.54	2400.00
		2472.00	2482.54	2483.50
max	min	2412.00	2402.00	2400.00
		2472.00	2482.12	2483.50
max	max	2412.00	2401.96	2400.00
		2472.00	2482.38	2483.50

The value of limit line where the power drops to -30dBm (specified in the Standard)
is calculated and decided as follows :

Limit of the Standard - Cable Loss - Attenuator Loss - Antenna Gain - Duty Factor = Limit line

11b

Freq.	Limit	Cable loss	Atten. loss	Antenna Gain	Duty Factor	Limit line
[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dB]	[dBm]
2400.0	-30.00	1.76	16.10	2.00	0.03	-49.9
2483.5	-30.00	1.78	16.10	2.00	0.03	-49.9

11g

Freq.	Limit	Cable loss	Atten. loss	Antenna Gain	Duty Factor	Limit line
[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dB]	[dBm]
2400.0	-30.00	1.76	16.10	2.00	0.11	-50.0
2483.5	-30.00	1.78	16.10	2.00	0.11	-50.0

UL Japan, Inc.

Head Office EMC Lab.

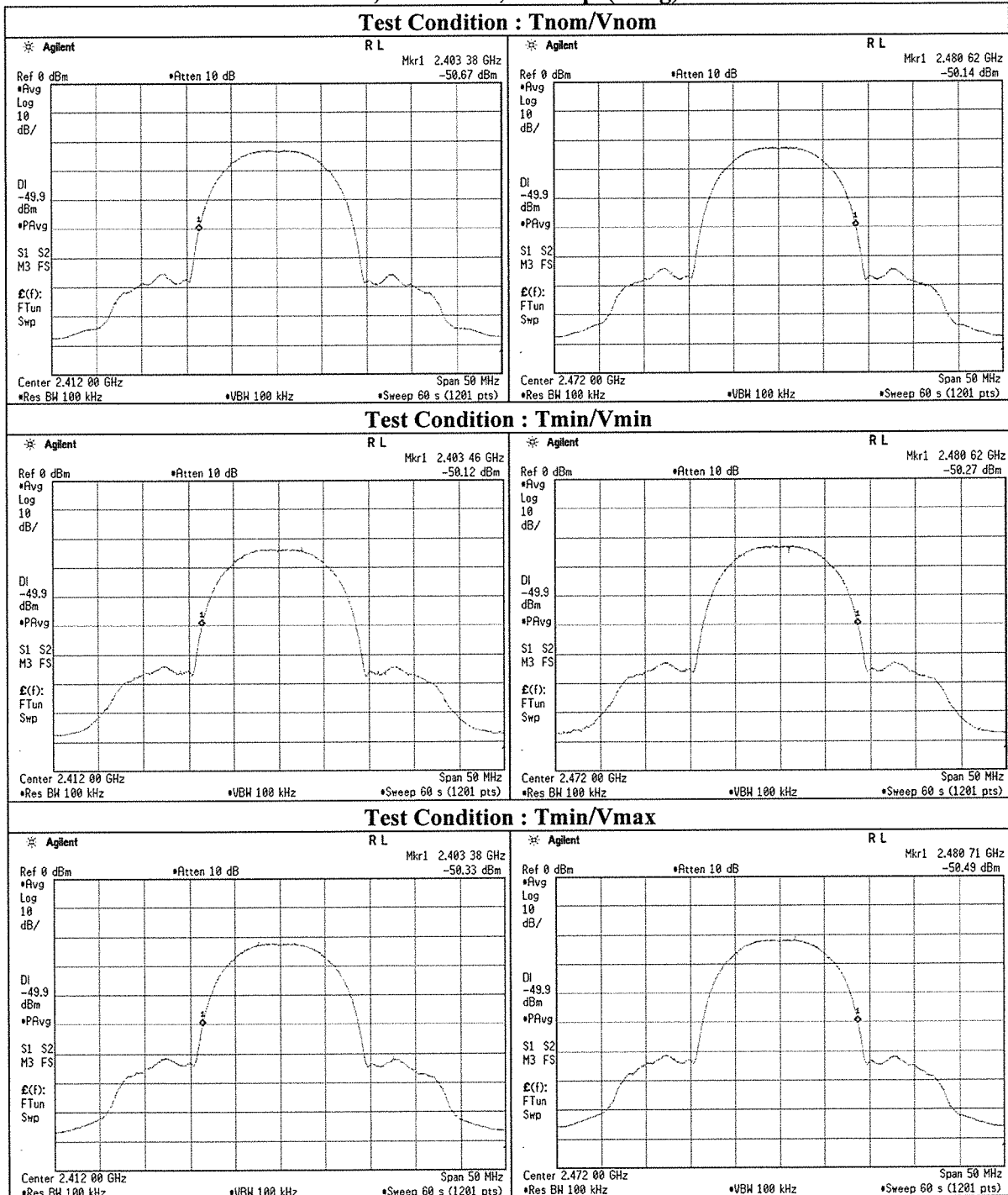
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

Frequency range

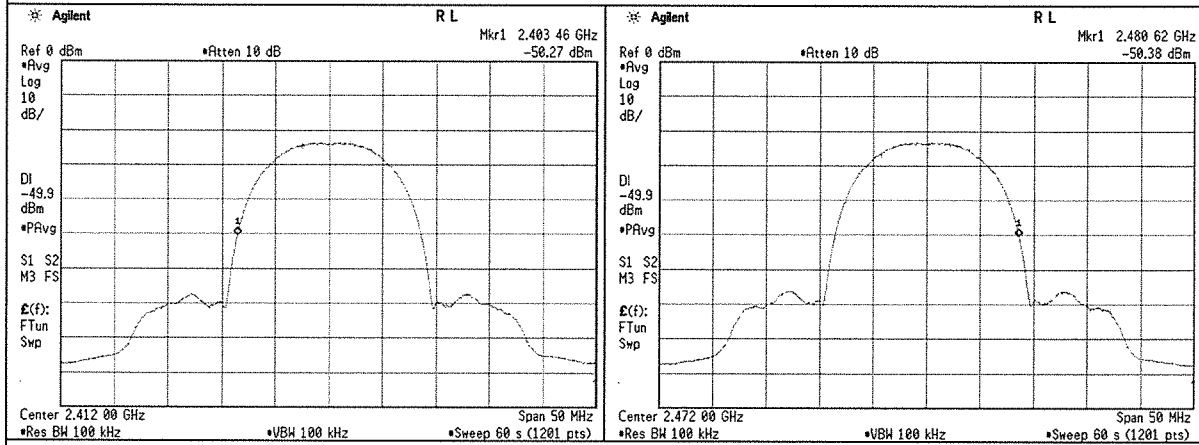
11b, Antenna 0, 5.5Mbps(Long)



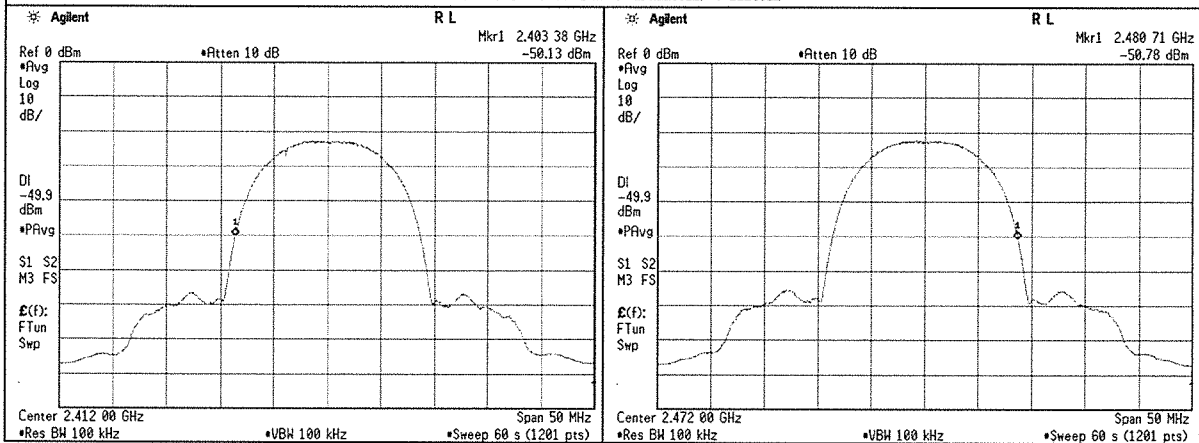
Frequency range

11b, Antenna 0, 5.5Mbps(Long)

Test Condition : Tmax/Vmin



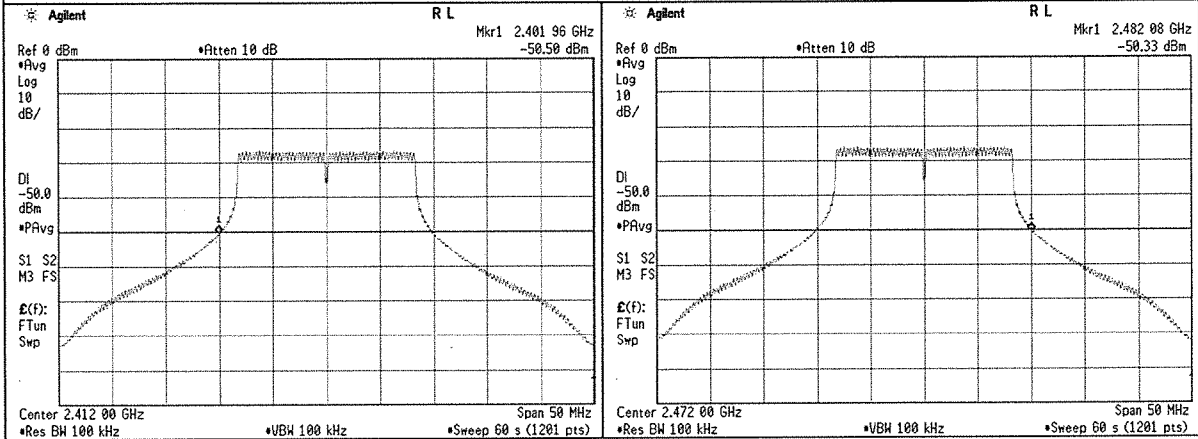
Test Condition : Tmax/Vmax



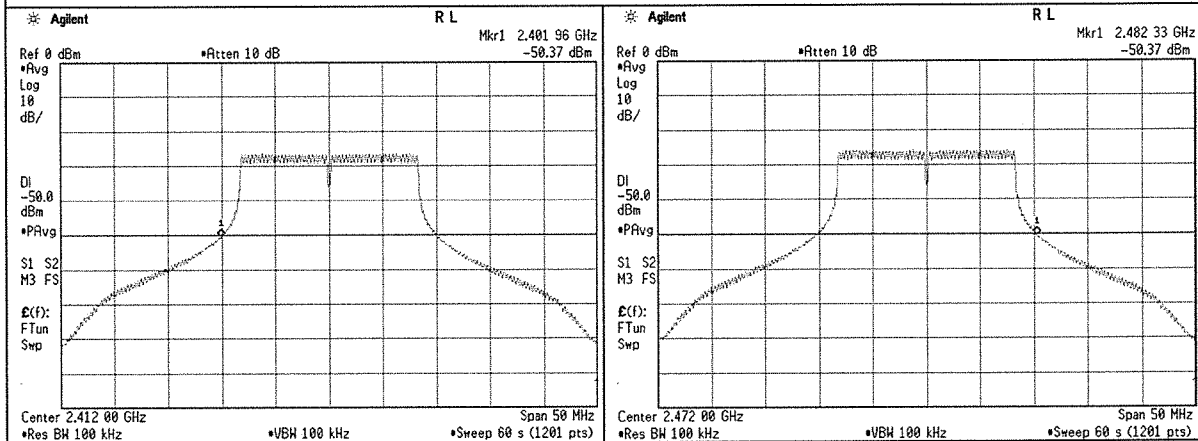
Frequency range

11g, Antenna 0, 18Mbps

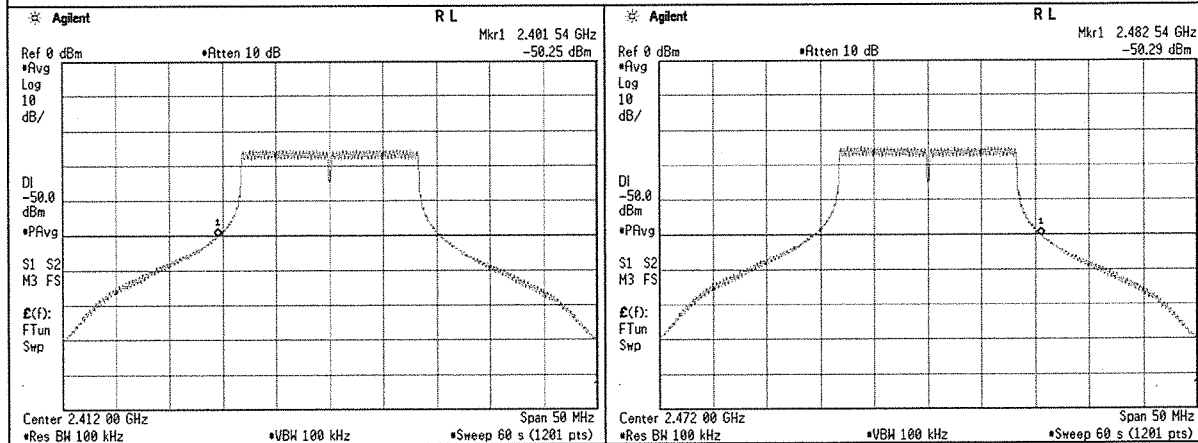
Test Condition : Tnom/Vnom



Test Condition : Tmin/Vmin



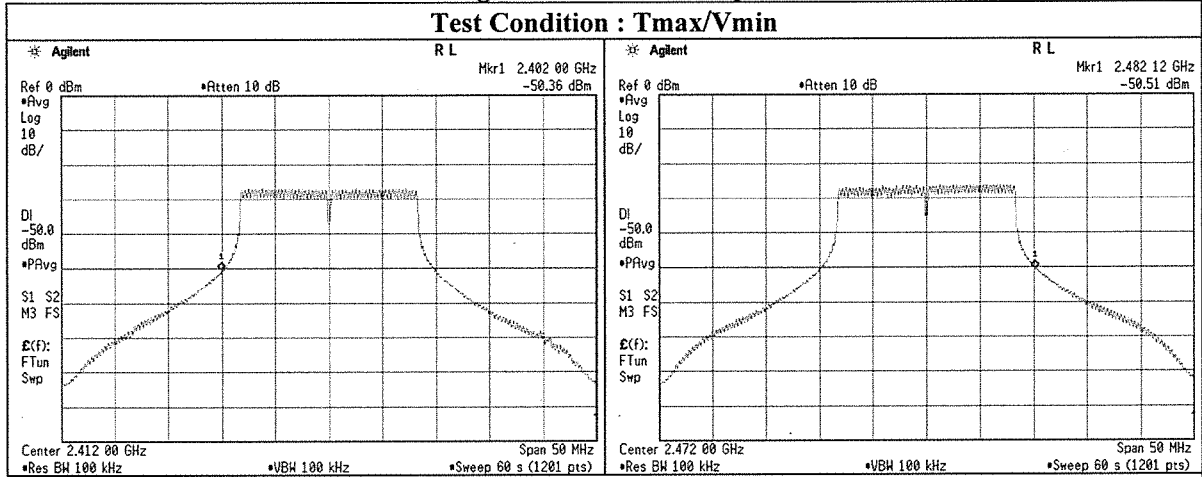
Test Condition : Tmin/Vmax



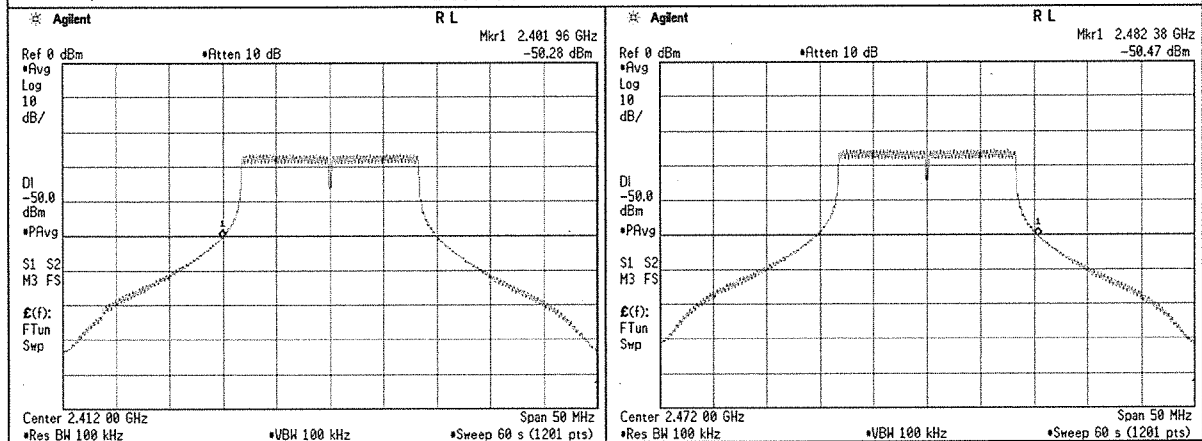
Frequency range

11g, Antenna 0, 18Mbps

Test Condition : Tmax/Vmin



Test Condition : Tmax/Vmax



Frequency range

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32AE0138-HO-02
Date 05/27/2011
Temperature/ Humidity 21deg. C / 74% RH
Engineer Yutaka Yoshida
Mode 11n-20 Tx / 11n-40 Tx, Antenna 0

11n-20

Test Condition		Freq.	Result	Limit	Margin
Temp.	Volt.	[MHz]	[MHz]	[MHz]	[MHz]
nom	nom	2412.00	2401.79	2400.00	1.79
		2472.00	2482.92	2483.50	0.58
min	min	2412.00	2401.88	2400.00	1.88
		2472.00	2482.71	2483.50	0.79
min	max	2412.00	2401.62	2400.00	1.62
		2472.00	2483.21	2483.50	0.29
max	min	2412.00	2401.88	2400.00	1.88
		2472.00	2482.71	2483.50	0.79
max	max	2412.00	2401.58	2400.00	1.58
		2472.00	2483.25	2483.50	0.25

11n-40

Test Condition		Freq.		Limit	Margin
Temp.	Volt.	[MHz]		[MHz]	[MHz]
nom	nom	2412.00	2403.08	2400.00	3.08
		2472.00	2480.92	2483.50	2.58
min	min	2412.00	2403.17	2400.00	3.17
		2472.00	2480.92	2483.50	2.58
min	max	2412.00	2402.92	2400.00	2.92
		2472.00	2481.17	2483.50	2.33
max	min	2412.00	2403.17	2400.00	3.17
		2472.00	2481.08	2483.50	2.42
max	max	2412.00	2403.00	2400.00	3.00
		2472.00	2481.17	2483.50	2.33

The value of limit line where the power drops to -30dBm (specified in the Standard)
is calculated and decided as follows :

Limit line =

Limit of the Standard - Cable Loss - Attenuator Loss - Antenna Gain - Duty Factor - Antenna Corrected Value

11n-20

Freq.	Limit	Cable	Atten.	Antenna	Duty	Antenna	Limit
[MHz]	[dBm]	loss	loss	Gain	Factor	Corrected Value	line
		[dB]	[dB]	[dBi]	[dB]	[dB]	[dBm]
2400.0	-30.00	1.76	16.10	2.00	0.51	3.01	-53.4
2483.5	-30.00	1.78	16.10	2.00	0.51	3.01	-53.4

11n-40

Freq.	Limit	Cable	Atten.	Antenna	Duty	Antenna	Limit
[MHz]	[dBm]	loss	loss	Gain	Factor	Corrected Value	line
		[dB]	[dB]	[dBi]	[dB]	[dB]	[dBm]
2400.0	-30.00	1.76	16.10	2.00	0.14	3.01	-53.0
2483.5	-30.00	1.78	16.10	2.00	0.14	3.01	-53.0

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Head Office EMC Lab.

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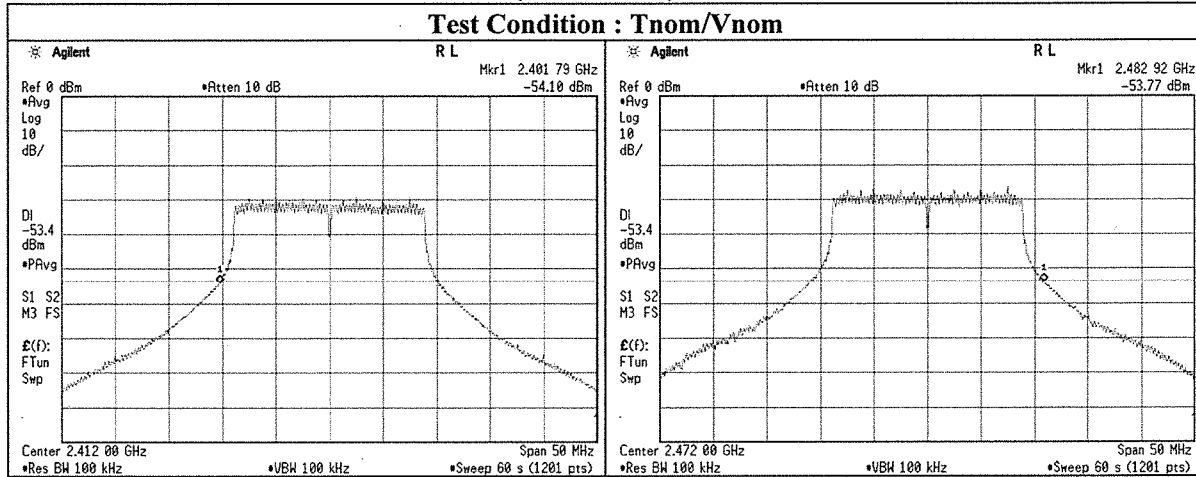
Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

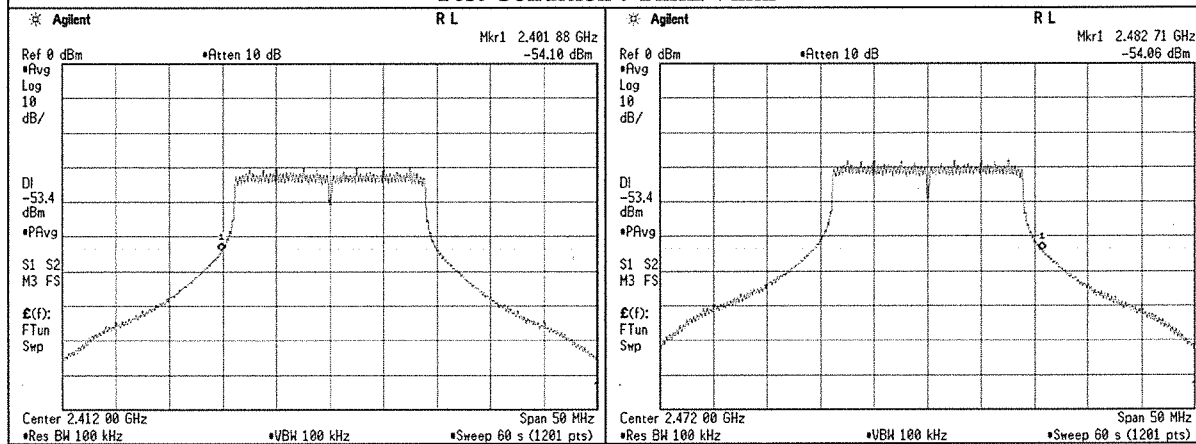
Frequency range

11n-20, Antenna 0, MCS13

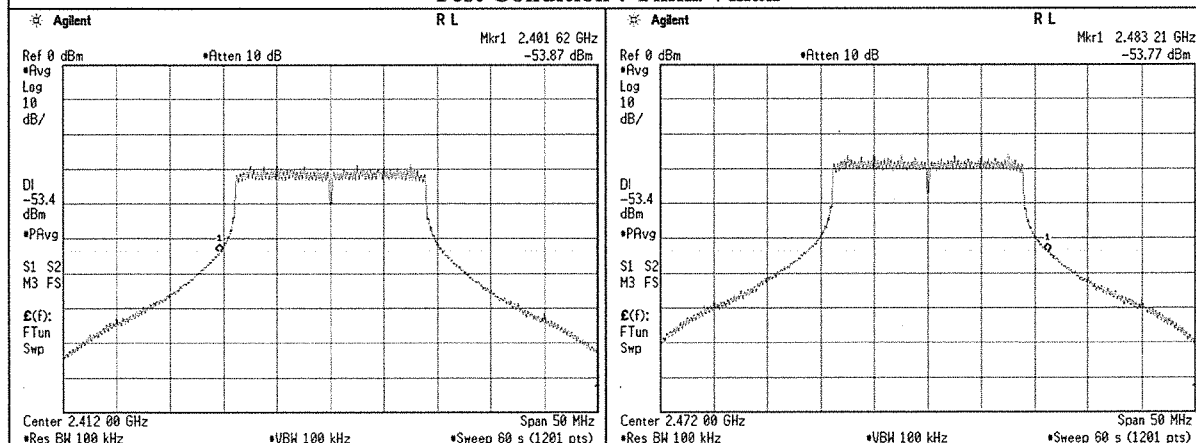
Test Condition : Tnom/Vnom



Test Condition : Tmin/Vmin



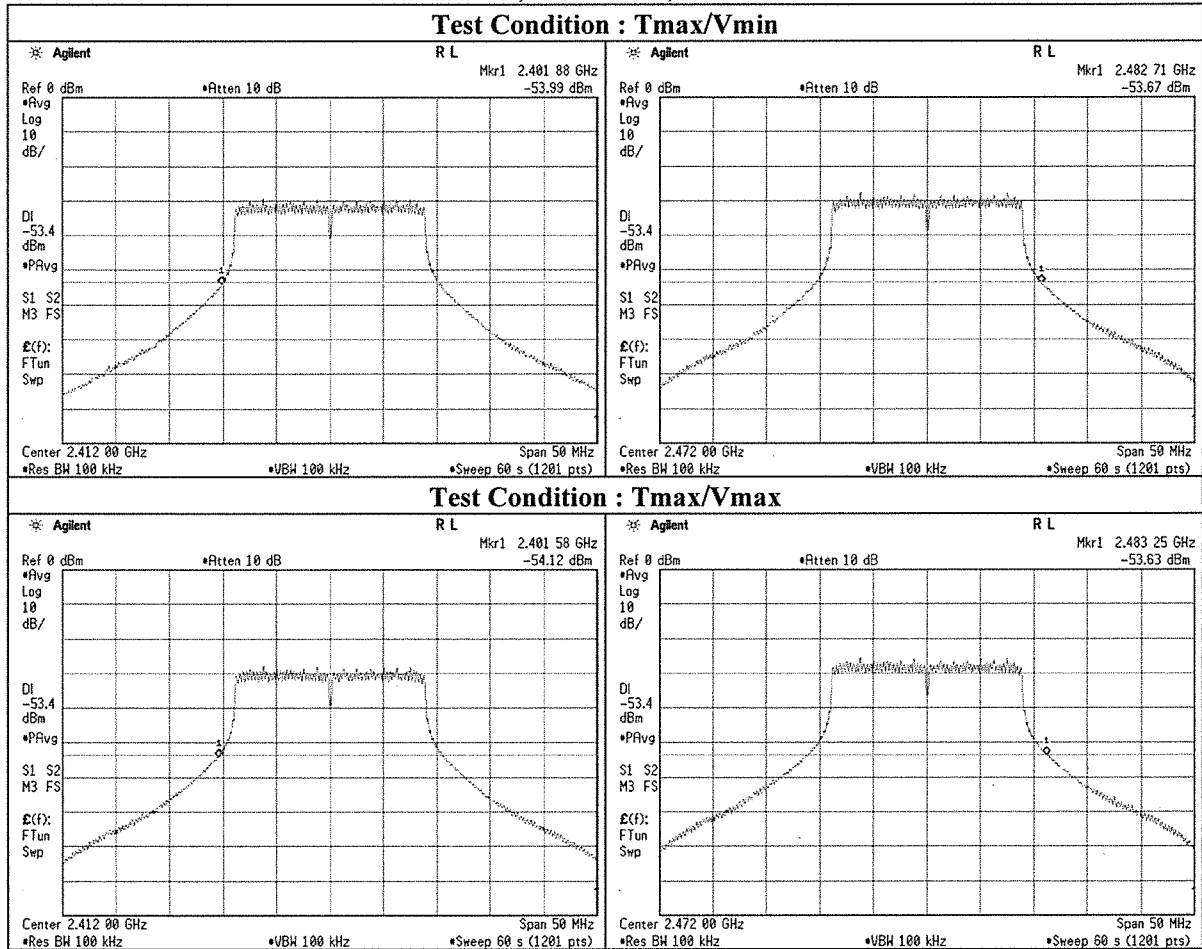
Test Condition : Tmin/Vmax



Frequency range

11n-20, Antenna 0, MCS13

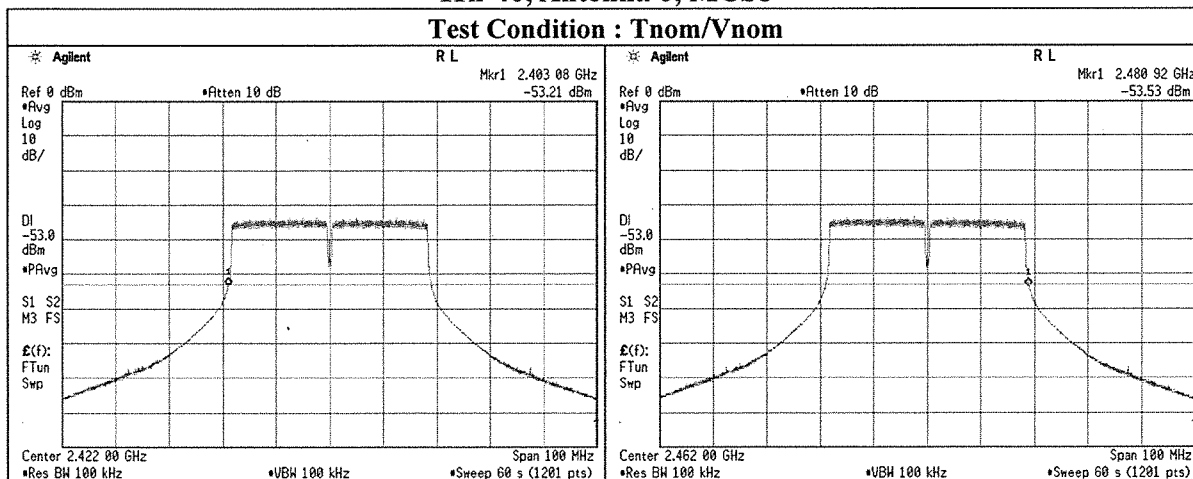
Test Condition : Tmax/Vmin



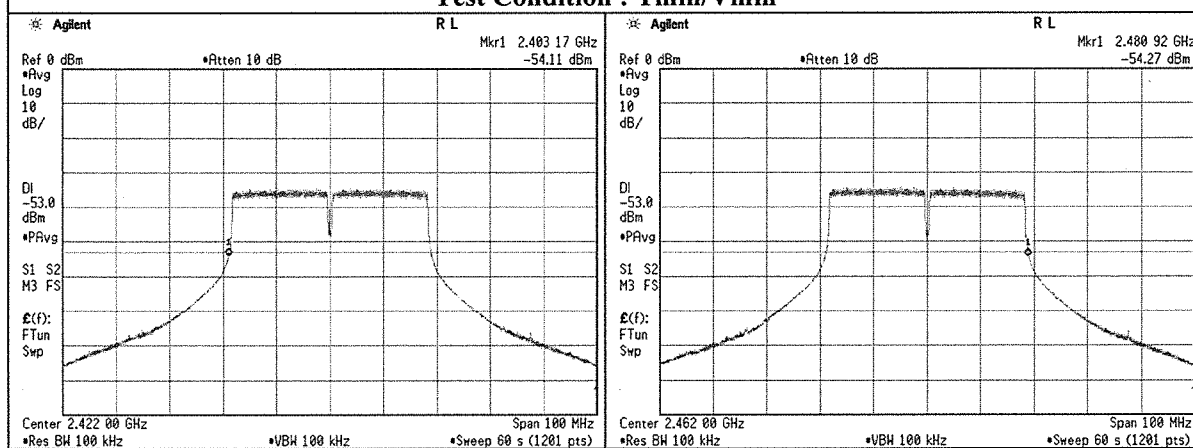
Frequency range

11n-40, Antenna 0, MCS8

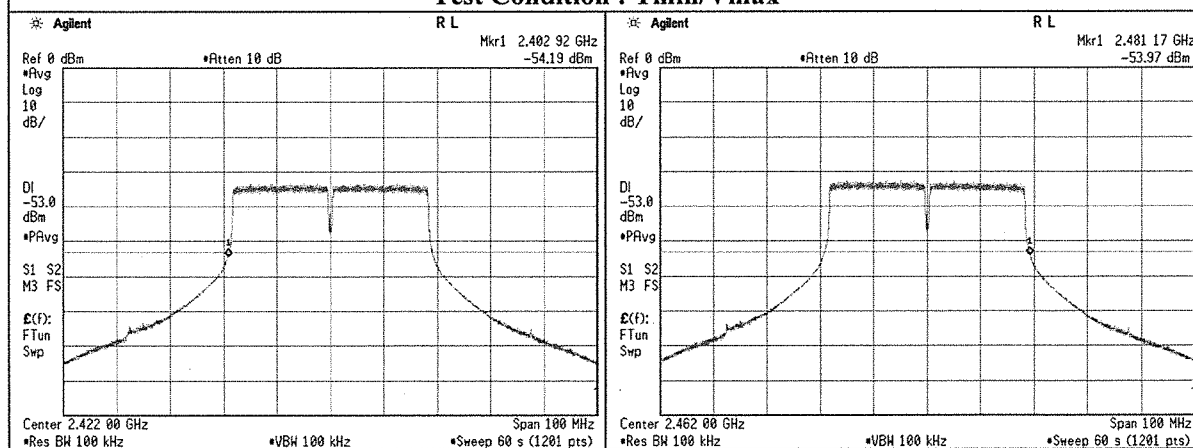
Test Condition : Tnom/Vnom



Test Condition : Tmin/Vmin



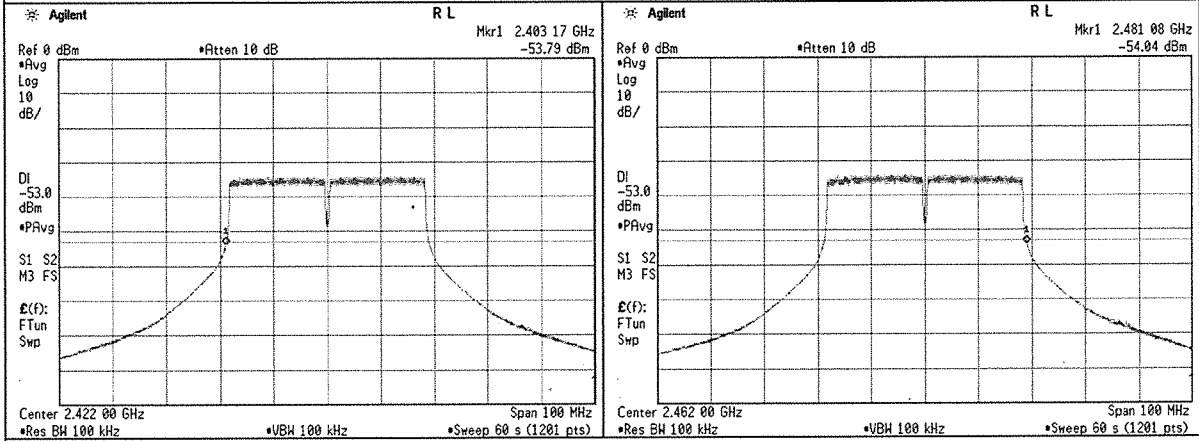
Test Condition : Tmin/Vmax



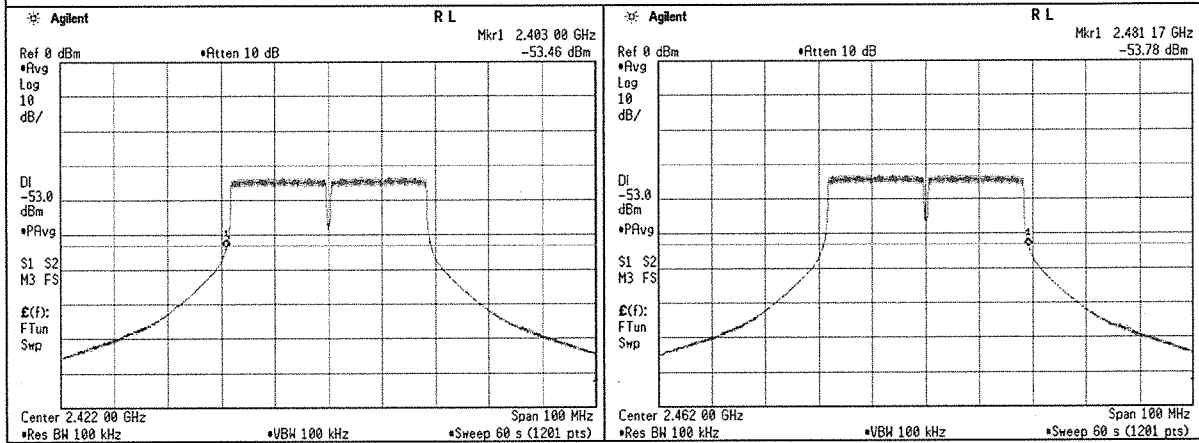
Frequency range

11n-40, Antenna 0, MCS8

Test Condition : Tmax/Vmin



Test Condition : Tmax/Vmax



Transmitter spurious emissions (Radiated)

Test place Head Office EMC Lab. No.4 Anechoic Chamber
Report No. 32AE0138-HO-02
Date 08/30/2011 08/31/2011
Temperature/ Humidity 24 deg. C / 56% RH 25 deg. C / 66% RH
Engineer Satofumi Matsuyama Takumi Shimada
(Below 1GHz) (Above 1GHz)
Mode 11b Tx 2412MHz, Antenna 0

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) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal Rx Ant. Turn Height Table [cm] [deg.]		Vertical Rx Ant. Turn Height Table [cm] [deg.]		Remarks
	HOR	VER	HOR	VER				HOR	VER		HOR	VER					
128.03	47.3	37.2	-56.1	-60.0	1.7	2.2	9.9	-67.7	-71.6	-36.0	31.7	35.6	150	9	167	86	
151.46	44.5	39.4	-54.9	-55.3	1.8	2.2	9.9	-66.6	-67.0	-36.0	30.6	31.0	143	16	150	9	
3216.02	43.2	43.9	-60.8	-59.3	4.4	11.6	0.0	-55.8	-54.3	-30.0	25.8	24.3	174	117	178	123	
4824.00	37.6	41.3	-62.1	-58.2	5.4	12.1	0.0	-57.6	-53.7	-30.0	27.6	23.7	150	44	169	117	
7236.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
9648.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
12060.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15

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 : S/A PK (RBW: 100kHz, VBW: 30kHz)

UL Japan, Inc.

Head Office EMC Lab.

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

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

Transmitter spurious emissions (Radiated)

Test place Head Office EMC Lab. No.4 Anechoic Chamber
Report No. 32AE0138-HO-02
Date 08/30/2011 08/31/2011
Temperature/ Humidity 24 deg. C / 56% RH 25 deg. C / 66% RH
Engineer Satofumi Matsuyama Takumi Shimada
(Below 1GHz) (Above 1GHz)
Mode 11b Tx 2472MHz, Antenna 0

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) [dBm]		Limit (ERP) [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.]	
127.92	47.5	37.4	-55.9	-59.8	1.7	2.2	9.9	-67.5	-71.4	-36.0	31.5	35.4	150	18	150	87	
152.02	44.4	39.2	-55.0	-55.5	1.9	2.2	9.9	-66.8	-67.3	-36.0	30.8	31.3	141	8	150	10	
3296.02	41.7	41.3	-63.1	-63.5	4.4	11.7	0.0	-58.0	-58.4	-30.0	28.0	28.4	150	203	187	205	
4944.00	37.4	42.4	-62.9	-66.4	5.5	12.1	0.0	-58.5	-62.0	-30.0	28.5	32.0	150	180	181	115	
7416.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
9888.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
12360.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15

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 : S/A PK (RBW: 100kHz, VBW: 30kHz)

Transmitter spurious emissions (Radiated)

Test place Head Office EMC Lab. No.4 Anechoic Chamber
Report No. 32AE0138-HO-02
Date 08/30/2011 08/31/2011
Temperature/ Humidity 24 deg. C / 56% RH 25 deg. C / 66% RH
Engineer Satofumi Matsuyama Takumi Shimada
(Below 1GHz) (Above 1GHz)
Mode 11g Tx 2412MHz, Antenna 0

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height [cm]	Turn Table [deg.]	Rx Ant. Height [cm]	Turn Table [deg.]	
	[MHz]	HOR	VER	HOR				VER	HOR		VER	HOR	VER	HOR	VER	HOR	
128.34	46.1	37.2	-57.3	-60.0	1.7	2.2	9.9	-68.9	-71.6	-36.0	32.9	35.6	150	11	183	98	
151.85	43.8	39.1	-55.6	-55.6	1.8	2.2	9.9	-67.3	-67.3	-36.0	31.3	31.3	150	2	150	12	
3216.01	46.6	46.0	-57.4	-57.2	4.4	11.6	0.0	-52.4	-52.2	-30.0	22.4	22.2	118	180	180	208	
4824.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
7236.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
9648.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
12060.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15

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 : S/A PK (RBW: 100kHz, VBW: 30kHz)

Transmitter spurious emissions (Radiated)

Test place Head Office EMC Lab. No.4 Anechoic Chamber
 Report No. 32AE0138-HO-02
 Date 08/30/2011 08/31/2011
 Temperature/ Humidity 24 deg. C / 56% RH 25 deg. C / 66% RH
 Engineer Satofumi Matsuyama Takumi Shimada
 (Below 1GHz) (Above 1GHz)
 Mode 11g Tx 2472MHz, Antenna 0

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) [dBm]		Limit (ERP) [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.]	
128.32	48.0	38.5	-55.4	-58.7	1.7	2.2	9.9	-67.0	-70.3	-36.0	31.0	34.3	150	13	174	105	
151.86	44.0	39.0	-55.4	-55.7	1.8	2.2	9.9	-67.1	-67.4	-36.0	31.1	31.4	123	10	150	28	
3296.02	42.2	42.4	-58.1	-62.4	4.4	11.7	0.0	-53.0	-57.3	-30.0	23.0	27.3	161	198	162	7	
4944.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
7416.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
9888.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
12360.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15

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 : S/A PK (RBW: 100kHz, VBW: 30kHz)

UL Japan, Inc.

Head Office EMC Lab.

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

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

Transmitter spurious emissions (Radiated)

Test place : Head Office EMC Lab. No.4 Anechoic Chamber
Report No. : 32AE0138-HO-02
Date : 08/30/2011 08/31/2011
Temperature/ Humidity : 24 deg. C / 56% RH 25 deg. C / 66% RH
Engineer : Satofumi Matsuyama Takumi Shimada
(Below 1GHz) (Above 1GHz)
Mode : 11n-20 Tx 2412MHz, Antenna 0+1

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) [dBm]		Limit (ERP) [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.]	
128.16	45.6	36.6	-57.8	-60.6	1.7	2.2	9.9	-69.4	-72.2	-36.0	33.4	36.2	150	8	180	105	
151.53	44.1	38.0	-55.3	-56.7	1.8	2.2	9.9	-67.0	-68.4	-36.0	31.0	32.4	150	3	150	18	
3216.01	49.4	49.0	-54.6	-54.2	4.4	11.6	0.0	-49.6	-49.2	-30.0	19.6	19.2	152	160	180	124	
4824.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
7236.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
9648.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
12060.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15

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 : S/A PK (RBW: 100kHz, VBW: 30kHz)

Transmitter spurious emissions (Radiated)

Test place : Head Office EMC Lab. No.4 Anechoic Chamber
Report No. : 32AE0138-HO-02
Date : 08/30/2011 08/31/2011
Temperature/ Humidity : 24 deg. C / 56% RH 25 deg. C / 66% RH
Engineer : Satofumi Matsuyama Takumi Shimada
(Below 1GHz) (Above 1GHz)
Mode : 11n-20 Tx 2472MHz, Antenna 0+1

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) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal Rx Ant. Turn Height Table [cm] [deg.]		Vertical Rx Ant. Turn Height Table [cm] [deg.]		Remarks
	HOR	VER	HOR	VER				HOR	VER		HOR	VER					
127.65	45.8	34.5	-57.6	-62.7	1.7	2.2	9.9	-69.2	-74.3	-36.0	33.2	38.3	150	11	175	84	
151.50	43.2	38.2	-56.2	-56.5	1.8	2.2	9.9	-67.9	-68.2	-36.0	31.9	32.2	129	26	150	2	
3296.02	45.0	45.7	-59.8	-59.1	4.4	11.7	0.0	-54.7	-54.0	-30.0	24.7	24.0	112	180	200	122	
4944.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
7416.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
9888.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
12360.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15

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 : S/A PK (RBW: 100kHz, VBW: 30kHz)

Transmitter spurious emissions (Radiated)

Test place : Head Office EMC Lab. No.4 Anechoic Chamber
Report No. : 32AE0138-HO-02
Date : 08/30/2011 08/31/2011
Temperature/ Humidity : 24 deg. C / 56% RH 25 deg. C / 66% RH
Engineer : Satofumi Matsuyama Takumi Shimada
(Below 1GHz) (Above 1GHz)
Mode : 11n-40 Tx 2422MHz, Antenna 0+1

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) [dBm]		Limit (ERP) [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.]	
128.24	46.0	35.8	-57.4	-61.4	1.7	2.2	9.9	-69.0	-73.0	-36.0	33.0	37.0	150	8	178	96	
150.99	43.7	37.9	-55.7	-56.8	1.8	2.2	9.9	-67.4	-68.5	-36.0	31.4	32.5	137	18	150	11	
3229.34	48.3	48.9	-54.5	-54.2	4.4	11.6	0.0	-49.5	-49.2	-30.0	19.5	19.2	139	158	153	15	
4844.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
7266.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
9688.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
12110.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15

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 : S/A PK (RBW: 100kHz, VBW: 30kHz)

Transmitter spurious emissions (Radiated)

Test place : Head Office EMC Lab. No.4 Anechoic Chamber
Report No. : 32AE0138-HO-02
Date : 08/30/2011 08/31/2011
Temperature/ Humidity : 24 deg. C / 56% RH 25 deg. C / 66% RH
Engineer : Satofumi Matsuyama Takumi Shimada
(Below 1GHz) (Above 1GHz)
Mode : 11n-40 Tx 2462MHz, Antenna 0+1

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) [dBm]		Limit (ERP) [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.]	
128.31	47.3	36.7	-56.1	-60.5	1.7	2.2	9.9	-67.7	-72.1	-36.0	31.7	36.1	150	3	171	86	
151.52	44.7	37.8	-54.7	-56.9	1.8	2.2	9.9	-66.4	-68.6	-36.0	30.4	32.6	138	7	150	9	
3282.68	45.6	45.1	-58.5	-59.0	4.4	11.7	0.0	-53.4	-53.9	-30.0	23.4	23.9	162	159	161	14	
4924.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
7386.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
9848.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	
12310.00	NS	NS	-	-	-	-	-	-	-	-30.0	-	-	-	-	-	-	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15

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 : S/A PK (RBW: 100kHz, VBW: 30kHz)

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Receiver spurious emissions (Radiated)

Test place : Head Office EMC Lab. No.4 Anechoic Chamber
Report No. : 32AE0138-HO-02
Date : 08/30/2011 08/31/2011
Temperature/ Humidity : 24 deg. C / 56% RH 25 deg. C / 66% RH
Engineer : Satofumi Matsuyama Satofumi Matsuyama
(Below 1GHz) (Above 1GHz)
Mode : 11b/g/n-20 Rx 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) [dBm]		Limit (ERP) [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.]	
128.06	40.8	32.7	-62.6	-64.5	1.7	2.2	9.9	-74.2	-76.1	-57.0	17.2	19.1	150	12	178	85	
152.73	41.0	38.4	-58.4	-56.3	1.9	2.2	9.9	-70.2	-68.1	-57.0	13.2	11.1	114	130	150	8	
1049.89	53.2	52.5	-56.3	-59.1	2.5	6.4	0.0	-54.5	-57.3	-47.0	7.5	10.3	208	291	150	162	
1412.28	48.9	42.2	-58.4	-66.7	2.9	7.8	0.0	-55.7	-64.0	-47.0	8.7	17.0	150	230	137	161	
2412.00	NS	NS	-	-	-	-	-	-	-	-47.0	-	-	-	-	-	-	
2489.73	47.8	46.2	-57.8	-58.2	3.8	10.9	0.0	-52.8	-53.2	-47.0	5.8	6.2	150	103	113	60	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15

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 : S/A PK (RBW: 100kHz, VBW: 30kHz)

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Receiver spurious emissions (Radiated)

Test place : Head Office EMC Lab. No.4 Anechoic Chamber
Report No. : 32AE0138-HO-02
Date : 08/30/2011 08/31/2011
Temperature/ Humidity : 24 deg. C / 56% RH 25 deg. C / 66% RH
Engineer : Satofumi Matsuyama Satofumi Matsuyama
(Below 1GHz) (Above 1GHz)
Mode : 11b/g/n-20 Rx 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) [dBm]		Limit (ERP) [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.]	
128.82	40.3	34.2	-63.1	-63.0	1.7	2.2	9.9	-74.7	-74.6	-57.0	17.7	17.6	150	10	188	99	
153.39	41.2	38.6	-58.2	-56.1	1.9	2.2	9.9	-70.0	-67.9	-57.0	13.0	10.9	134	95	150	3	
1047.73	52.4	53.4	-57.1	-58.2	2.5	6.4	0.0	-55.3	-56.4	-47.0	8.3	9.4	211	272	150	164	
1411.17	48.0	45.5	-59.3	-63.4	2.9	7.8	0.0	-56.6	-60.7	-47.0	9.6	13.7	150	224	123	164	
2472.00	NS	NS	-	-	-	-	-	-	-	-47.0	-	-	-	-	-	-	
2489.97	47.4	47.9	-58.2	-56.5	3.8	10.3	0.0	-53.8	-52.1	-47.0	6.8	5.1	150	102	112	67	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15

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 : S/A PK (RBW: 100kHz, VBW: 30kHz)

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Receiver spurious emissions (Radiated)

Test place : Head Office EMC Lab. No.4 Anechoic Chamber
Report No. : 32AE0138-HO-02
Date : 08/30/2011 08/31/2011
Temperature/ Humidity : 24 deg. C / 56% RH 25 deg. C / 66% RH
Engineer : Satofumi Matsuyama Satofumi Matsuyama
(Below 1GHz) (Above 1GHz)
Mode : 11n-40 Rx 2422MHz

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) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal Rx Ant. Turn Height Table		Vertical Rx Ant. Turn Height Table		Remarks
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
128.39	41.0	33.9	-62.4	-63.3	1.7	2.2	9.9	-74.0	-74.9	-57.0	17.0	17.9	150	6	194	102	
153.22	41.5	38.9	-57.9	-55.8	1.9	2.2	9.9	-69.7	-67.6	-57.0	12.7	10.6	119	141	150	5	
1044.88	54.0	53.4	-55.5	-58.2	2.5	6.4	0.0	-53.7	-56.4	-47.0	6.7	9.4	212	274	150	21	
1412.18	48.0	46.9	-59.3	-62.0	2.9	7.8	0.0	-56.6	-59.3	-47.0	9.6	12.3	150	224	126	161	
2422.00	NS	NS	-	-	-	-	-	-	-	-47.0	-	-	-	-	-	-	
2490.08	46.6	46.8	-59.0	-57.6	3.8	10.3	0.0	-54.6	-53.2	-47.0	7.6	6.2	150	104	113	62	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15

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 : S/A PK (RBW: 100kHz, VBW: 30kHz)

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Receiver spurious emissions (Radiated)

Test place Head Office EMC Lab. No.4 Anechoic Chamber
Report No. 32AE0138-HO-02
Date 08/30/2011 08/31/2011
Temperature/ Humidity 24 deg. C / 56% RH 25 deg. C / 66% RH
Engineer Satofumi Matsuyama Satofumi Matsuyama
(Below 1GHz) (Above 1GHz)
Mode 11n-40 Rx 2462MHz

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) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal Rx Ant. Height [cm]		Vertical Rx Ant. Height [cm]		Remarks
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	Table	deg.	Table	deg.	
128.35	40.7	33.7	-62.7	-63.5	1.7	2.2	9.9	-74.3	-75.1	-57.0	17.3	18.1	150	9	184	93	
153.58	41.2	38.3	-58.2	-56.4	1.9	2.2	9.9	-70.0	-68.2	-57.0	13.0	11.2	120	137	150	7	
1044.53	52.3	52.8	-57.2	-58.8	2.5	6.4	0.0	-55.4	-57.0	-47.0	8.4	10.0	215	272	150	20	
1409.83	45.3	47.6	-62.0	-61.3	2.9	7.7	0.0	-59.3	-58.6	-47.0	12.3	11.6	171	253	129	163	
2462.00	NS	NS	-	-	-	-	-	-	-	-47.0	-	-	-	-	-	-	
2490.29	47.6	46.4	-58.0	-58.0	3.8	10.3	0.0	-53.6	-53.6	-47.0	6.6	6.6	150	104	112	61	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15

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 : S/A PK (RBW: 100kHz, VBW: 30kHz)

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APPENDIX 3: Test instruments

EMI Test Equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	AT	2011/02/15 * 12
MPM-09	Power Meter	Anritsu	ML2495A	6K00003348	AT	2010/09/10 * 12
MPSE-12	Power sensor	Anritsu	MA2411B	011598	AT	2010/09/10 * 12
MAT-22	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2011/03/14 * 12
MTA-09	Terminator	HP	HP 909D	03745	AT	2011/02/01 * 12
MCC-114	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	290212/4	AT	2010/08/05 * 12
MCC-37	Microwave Cable	Hirose Electric	U.FL-2LP-066-A-(200)	-	AT	2010/09/29 * 12
MDPS-03	DC Power Supply	Kikusui	PMC35-2A	13090501	AT	Pre Check
MCH-04	Temperature and Humidity Chamber	Tabai Espec	PL-2KP	14015723	AT	2010/08/03 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-201	-	AT	2011/02/23 * 12
MMM-14	DIGITAL HiTESTER	Hioki	3805	070500641	AT	2010/06/10 * 12 *1)
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2011/03/01 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	-	RE	2011/02/23 * 12
MJM-07	Measure	PROMART	SEN1955	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MRENT-95	Spectrum Analyzer	Agilent	E4440A	MY45305081	RE	2011/06/30 * 12
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	RE	2011/08/11 * 12
MCC-18	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX 104	148048-143(1m) / 292410(5m)	RE	2010/09/30 * 12
MPA-12	MicroWave System Amplifier	Agilent	83017A	MY39500780	RE	2011/03/10 * 12
MTR-07	Test Receiver	Rohde & Schwarz	ESCI	100635	RE	2010/10/27 * 12
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	1302	RE	2011/08/17 * 12
MLA-08	Logperiodic Antenna	Schwarzbeck	UKLP9140-A	N/A	RE	2011/08/17 * 12
MCC-50	Coaxial Cable	UL Japan	-	-	RE	2011/03/25 * 12
MAT-51	Attenuator(6dB)	Weinschel	2	AS3557	RE	2011/01/14 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	260833	RE	2011/03/04 * 12
MSG-09	Signal Generator	Wiltron	68247B	674005	RE	2011/02/05 * 12
MDA-01	Dipole Antenna	Schwarzbeck	VHAP	1018	RE	2010/10/16 * 12
KSG-05	Signal Generator	Rohde & Schwarz	SMR40	100137	RE	2011/08/30 * 12
MCC-129	Microwave Cable(1-33GHz)	HUBER+SUHNER	SF103/11PC3.5-31	54307/3	RE	2011/01/06 * 12
MHA-05	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	253	RE	2011/06/19 * 12

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

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

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

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

Test Item:

RE: Radiated Emission

AT: Antenna Terminal Conducted test

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