FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 8

CERTIFICATION TEST REPORT

FOR

Portable Game Machine with Wireless LAN

MODEL NUMBER: FTR-001 and FTR-001(-01)

FCC ID: BKEFTR001N
IC: 4360A-FTR001N

REPORT NUMBER: 10233134H-R1

ISSUE DATE: April 23, 2014

Prepared for
NINTENDO CO., LTD
11-1 KAMITOBA-HOKATATE-CHO, MINAMI-KU
KYOTO, KYOTO, 601-8501, JAPAN

Prepared by
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***Models differences are explained within the body of this report**

NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address, http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap

Revision History

Rev.	Issue Date	Revisions	Revised By
--	03/25/14	Initial Issue	T.Hatakeda
1	04/23/14	P.5: Correction of test methodology From ANSI C63.10-2009 to ANSI C63.4-2003 P.7: Correction of number of adapter P.19, 34: Correction of test procedure P.14, 15, 16, 29, 30, 31, 43, 45: Correction of test data P.21,36: Addition of test data This report is a revised version of 10233134H. 10233134H is replaced with this report.	T.Hatakeda

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	NINTENDO CO., LTD 11-1 KAMITOBA-HOKOTATE-CHO, MINAMI-KU KYOTO, KYOTO, 601-8501, JAPAN
EUT DESCRIPTION:	Portable Game Machine with Wireless LAN
MODEL:	FTR-001 and FTR-001(-01)
TESTED MODEL:	FTR-001
SERIAL NUMBER:	No. PW908022197 (Radiated and Conducted tests), No. PW908022326 (Antenna Terminal Conducted test)
DATE TESTED:	March 5 to 7, 2014

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-210 Issue 8 Annex 8	Pass
INDUSTRY CANADA RSS-GEN Issue 3	Pass

UL Japan, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Japan, Inc based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Japan, Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Japan, Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL Japan, Inc. By:

Takahiro Hatakeda
Leader of WiSE Japan
UL Verification Services
UL Japan, Inc.

Tested By:

Shinya Watanabe
Engineer of WiSE Japan
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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 3, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN.

UL Japan, Inc. is accredited by NVLAP, Laboratory Code 200572-0
The full scope of accreditation can be viewed at
http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

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4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

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

Test room (semi-anechoic chamber)	**Conducted emission (±dB)**
	150kHz-30MHz
No.1	3.5dB
No.2	3.5dB
No.3	3.6dB
No.4	3.5dB

Test room (semi-anechoic chamber)	**Radiated emission**						
	(3m*)(±dB)				**(1m*)(±dB)**		**(0.5m*)(±dB)**
	9kHz -30MHz	30MHz - 300MHz	300MHz -1GHz	1GHz -10GHz	10GHz -18GHz	18GHz -26.5GHz	26.5GHz -40GHz
No.1	4.0dB	5.1dB	5.0dB	5.1dB	6.0dB	4.9dB	4.3dB
No.2	3.9dB	5.2dB	5.0dB	4.9dB	5.9dB	4.7dB	4.2dB
No.3	4.3dB	5.1dB	5.2dB	5.2dB	6.0dB	4.8dB	4.2dB
No.4	4.6dB	5.2dB	5.0dB	5.2dB	6.0dB	5.7dB	4.2dB

*3m/1m/0.5m = Measurement distance

Power meter (±dB)	
Below 1GHz	Above 1GHz
0.7dB	1.5dB

Antenna terminal conducted emission and Power density (±dB)			**Antenna terminal conducted emission (±dB)**		**Channel power (±dB)**
Below 1GHz	1GHz-3GHz	3GHz-18GHz	18GHz-26.5GHz	26.5GHz-40GHz	
1.5dB	1.7dB	2.8dB	2.8dB	2.9dB	2.6dB

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is Portable Game Machine with Wireless LAN. The Portable Game Machine has one Antenna & three kinds of AC Adapters and its Hardware version is 2.0.

5.2. ACCESSORY AND MODEL DIFFERENECS

The difference between model FTR-001 and FTR-001(-01) is the CPU security function of the initial program loader installed in each model. The hardware of both models is identical. There is no change in radio frequency, RF output power, radio frequency circuitry, antenna, PCB, or functional capabilities.
The difference between mode A and mode B is that the mode A has crystal part number DSX321G and Mode B has crystal part number CX3225SB. The two crystals are compatible and are electrically identical having same radio parameters.

5.3. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2412-2472	802.11b	9.11	8.15
2412-2462	802.11g	13.80	23.99

Model No/: ANT-FTR-X12, PIFA antenna, -0.95 dBi.

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing version 0.19.2 (r51853).
The test utility software used during testing was f8003, rev. 11/22/2011.

The radio utilizes with a maximum gain of –0.95 dBi (PIFA antenna : ANT-FTR-X12).

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5.5. WORST-CASE CONFIGURATIONS

The worst-case data rate for each mode is determined to be as follows, based on preliminary tests of the chipset utilized in this radio.

All final tests in the 802.11b mode were made at 1 Mb/s.
All final tests in the 802.11g mode were made at 6 Mb/s.

Radiated emission below 1GHz was performed on 11g Lch mode as a representative which was the worst mode in data above 1GHz.
Conducted emission and Radiated emission above 1GHz were performed with B type on the worst mode of A type test data.

The EUT was investigated in three orthogonal orientations X,Y, and Z. Z was found to be worst-case orientation.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
EUT AC Adapter	Mitsumi	WAP-002 (USA)	-	N/A
EUT AC Adapter	Tabuchi	WAP-002 (USA)	-	N/A
EUT AC Adapter	Nichicon	WAP-002 (USA)	-	N/A
Headset	-	-	-	N/A

I/O CABLES (RADIATED AND LINE CONDUCTED TEST CONFIGURATION)

I/O CABLE LIST						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	DC	1.9	DC	Unshielded	1.9m	
2	Headset	0.9	AUDIO	Unshielded	0.9m	

TEST SETUP

The EUT is connected to a Jig card and host laptop computer via a USB cable during the tests. Test software exercised the radio card. The Jig card is removed after the setup.

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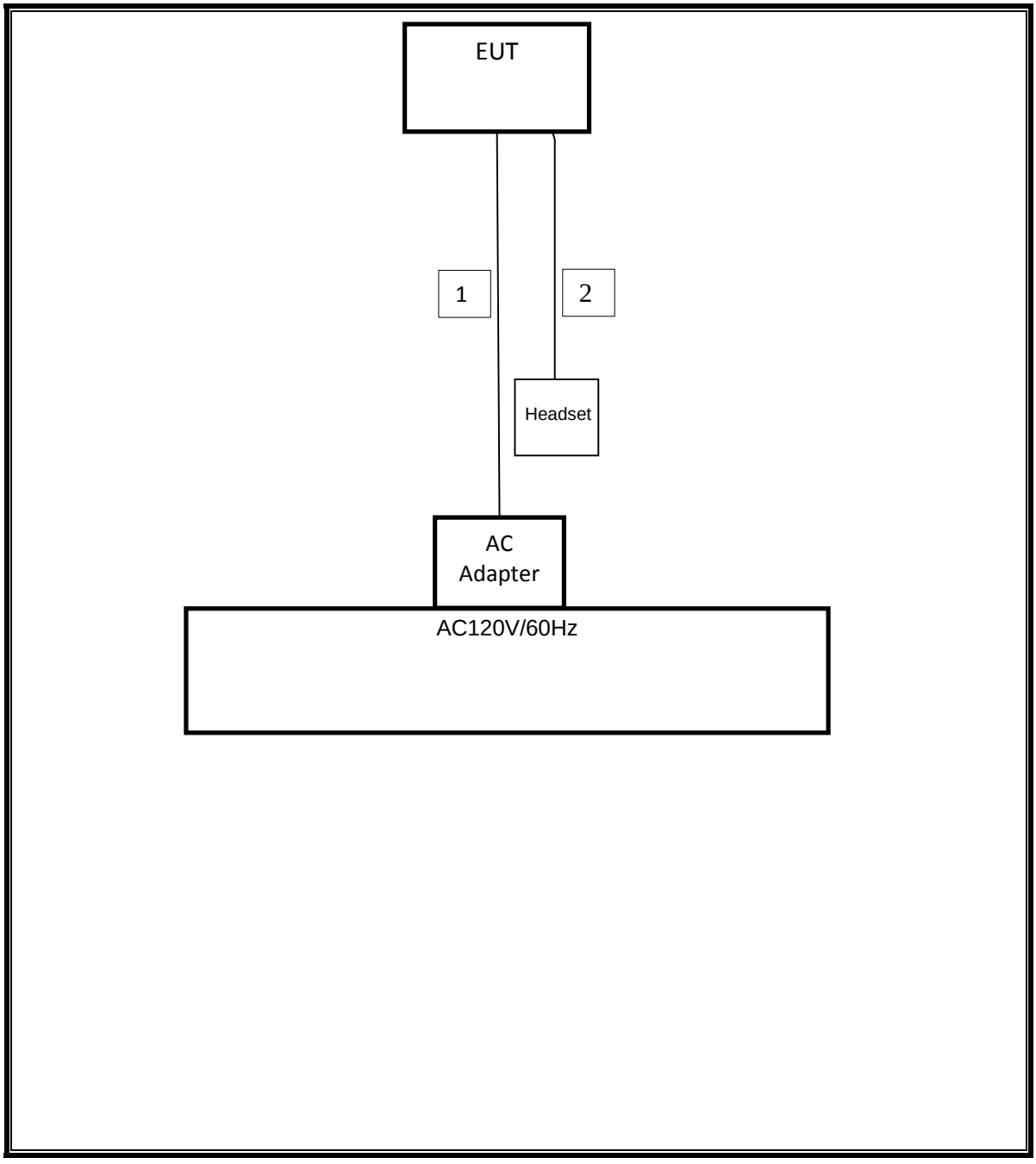
SETUP DIAGRAM



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TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE/CE	2014/02/27 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	1301	RE/CE	2014/02/20 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE/CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MRENT-114	Spectrum Analyzer	Agilent	E4440A	MY46187105	RE	2013/11/11 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2013/05/17 * 12
MCC-133	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336164/4(1m) / 340640(5m)	RE	2013/09/27 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2013/03/12 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2013/05/17 * 12
MHF-25	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	001	RE	2013/09/01 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2013/08/20 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2013/10/13 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2013/10/13 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2013/07/23 * 12
MAT-70	Attenuator(6dB)	Agilent	8491A-006	MY52460153	RE	2013/04/05 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2013/03/12 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-201	1401	AT	2014/02/20 * 12
MPM-12	Power Meter	Anritsu	ML2495A	0825002	AT	2013/06/12 * 12
MPSE-17	Power sensor	Anritsu	MA2411B	0738285	AT	2013/06/12 * 12
MRENT-115	Spectrum Analyzer	Agilent	E4440A	MY4618390	AT	2014/02/28 * 12
MCC-35	Microwave Cable	Hirose Electric	U.FL-2LP-066-A-(200)	-	AT	2013/09/27 * 12
MAT-22	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2013/03/21 * 12
MLS-07	LISN(AMN)	Schwarzbeck	NSLK8127	8127364	CE	2014/01/27 * 12
MCC-112	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/SFM141(3m)/sucoform141-PE(1m)/421-010(1.5m)/RFM-E321(Switcher)	-/00640	CE	2013/07/23 * 12
MAT-66	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2014/01/29 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2013/05/30 * 12

The expiration date of the calibration is the end of the expired month.
As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.
Test Item: RE: Radiated emission, CE: Conducted emission, AT: Antenna Terminal Conducted test

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6. ANTENNA PORT TEST RESULTS

6.1 802.11b MODE IN THE 2.4 GHz BAND

6.1.1 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	12.104	0.5
Middle	2442	12.087	0.5
High	2472	12.091	0.5

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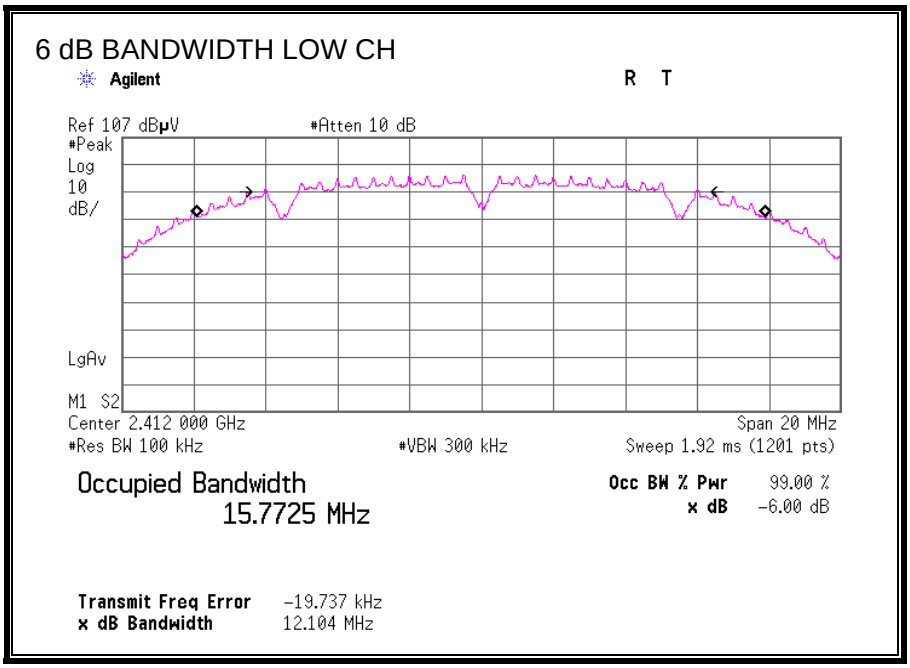
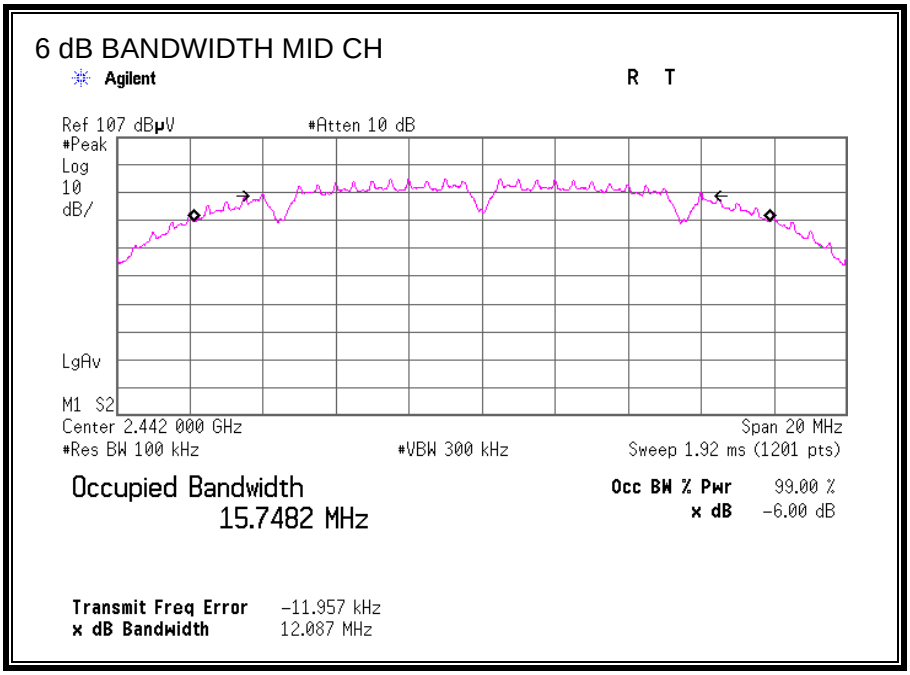
6 dB BANDWIDTH





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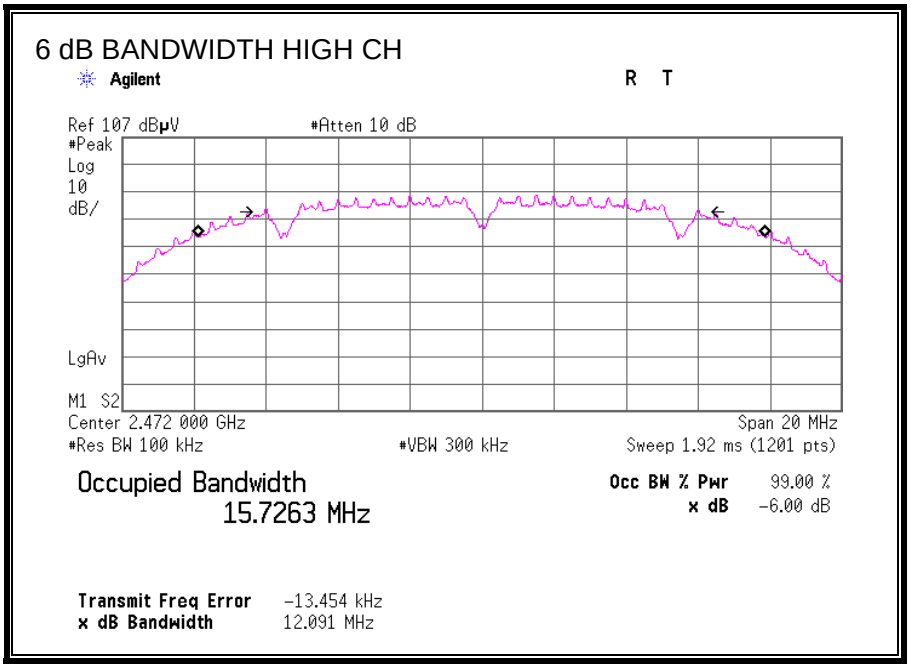

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6.1.2 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	15.8673
Middle	2442	15.8462
High	2472	15.7419

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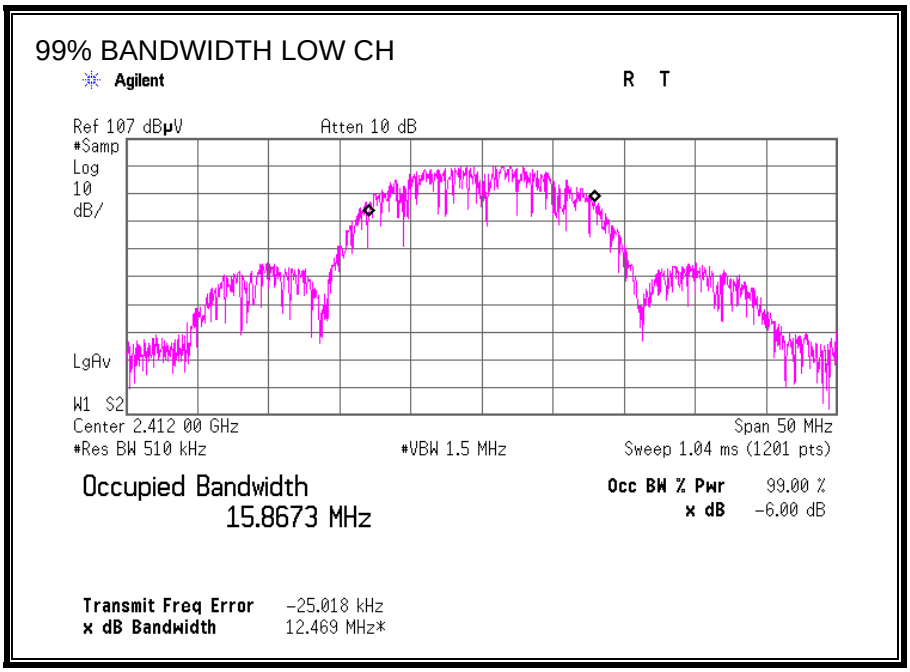
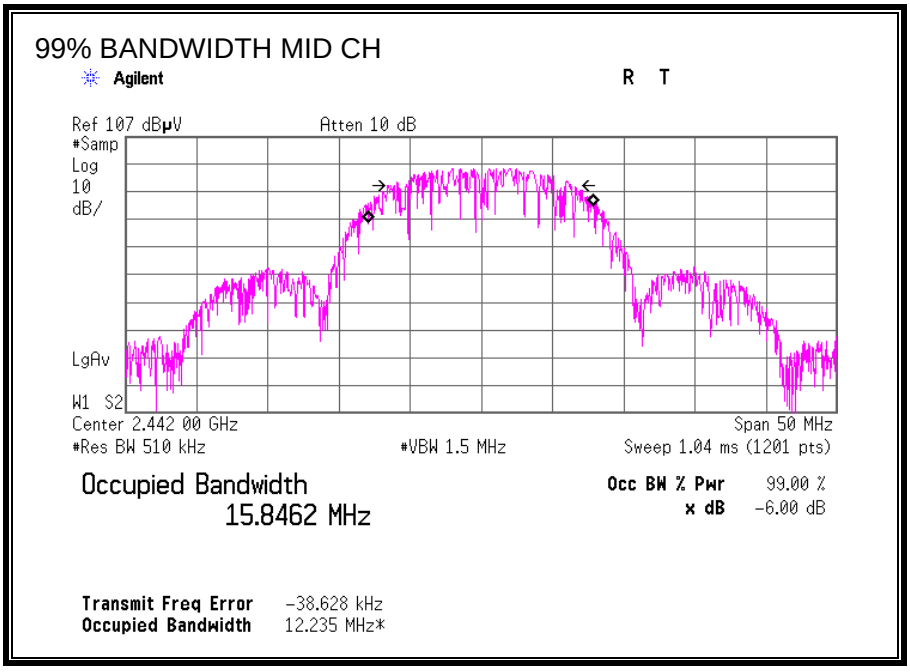
99% BANDWIDTH





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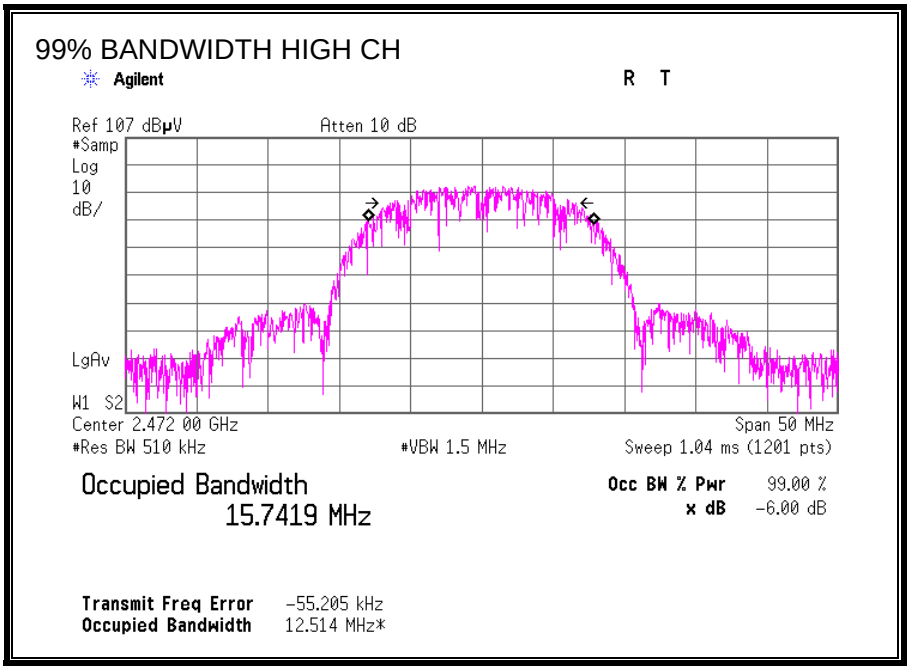

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6.1.3 OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

Peak power is measured using a wide bandwidth Peak Power Meter.

The cable assembly insertion loss of 10.76 dB (including 10.01 dB pad and 0.75 dB cable for 2412MHz/2442MHz) or 10.77 dB (including 10.01 dB pad and 0.76 dB cable for 2472MHz) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	Power Meter Reading (dBm)	Limit (dBm)	Margin (dB)
Low	2412	9.11	30	20.89
Middle	2442	8.15	30	21.85
High	2472	1.78	30	28.22

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6.1.4 AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 10.76 dB (including 10.01 dB pad and 0.75 dB cable for 2412MHz/2442MHz) or 10.77 dB (including 10.01 dB pad and 0.76 dB cable for 2472MHz) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Power (dBm)
Low	2412	6.75
Middle	2442	5.75
High	2472	-0.52

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6.1.5 POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured based on 10.2 of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 (Issued on April 9, 2013)"

RESULTS

The cable assembly insertion loss of 10.76 dB (including 10.01 dB pad and 0.75 dB cable for 2412MHz/2442MHz) or 10.77 dB (including 10.01 dB pad and 0.76 dB cable for 2472MHz) was added to PPSD value.

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-17.36	8	25.36
Middle	2442	-19.06	8	27.06
High	2472	-24.49	8	32.49

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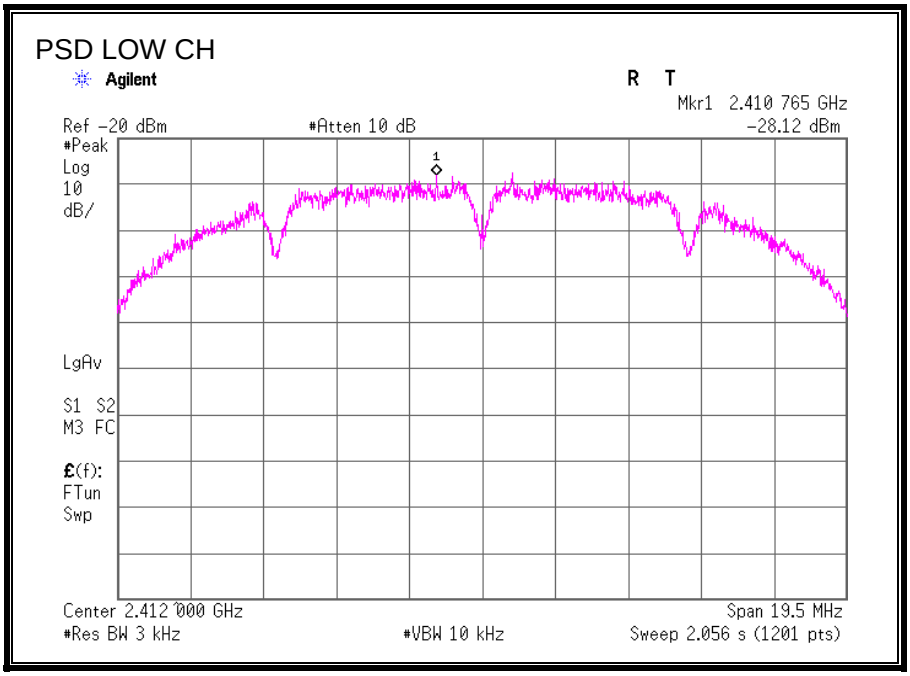
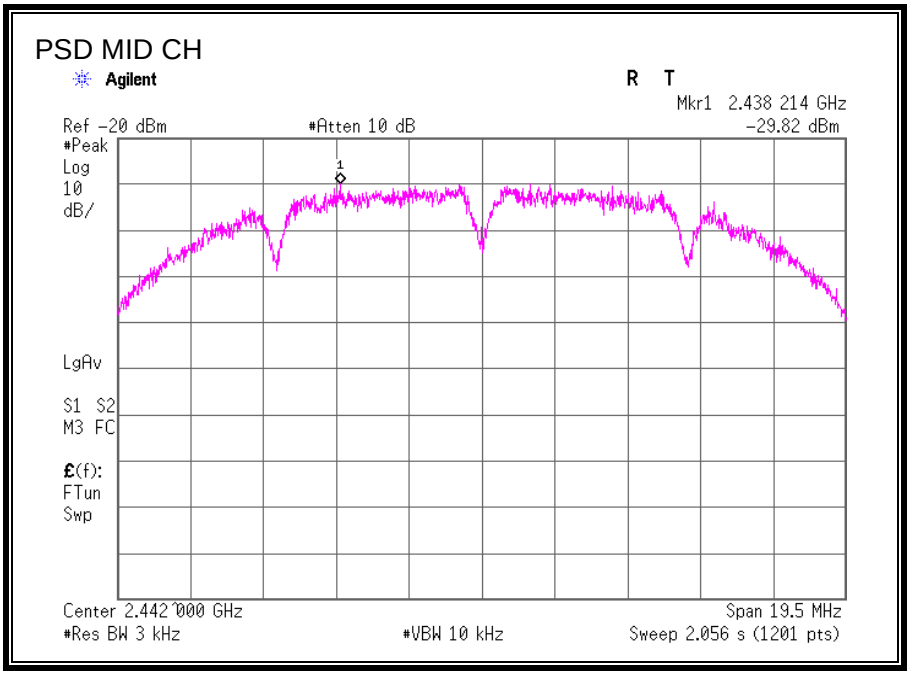
POWER SPECTRAL DENSITY

PSD LOW CH



PSD MID CH



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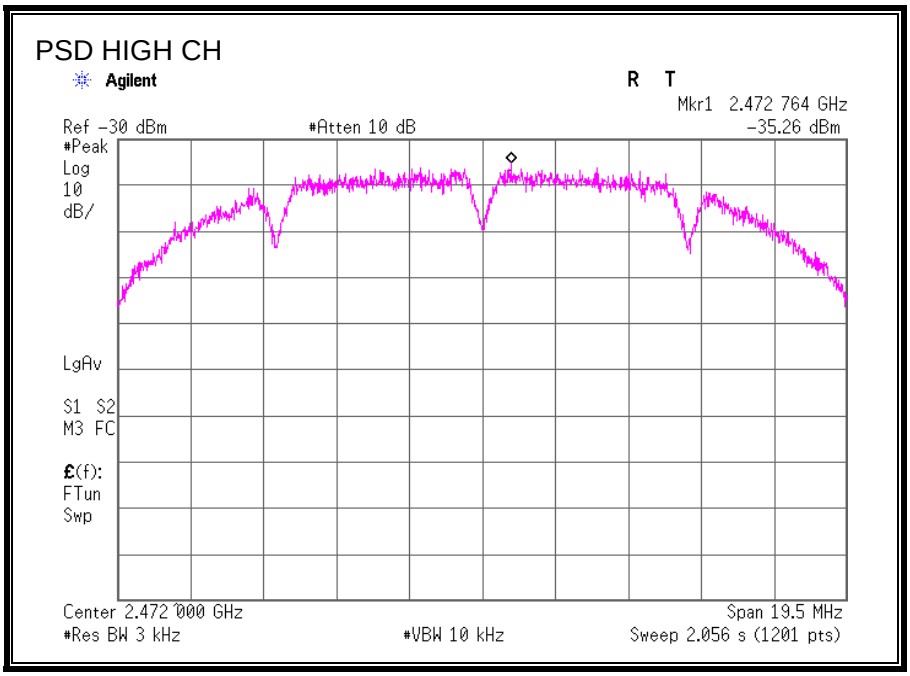
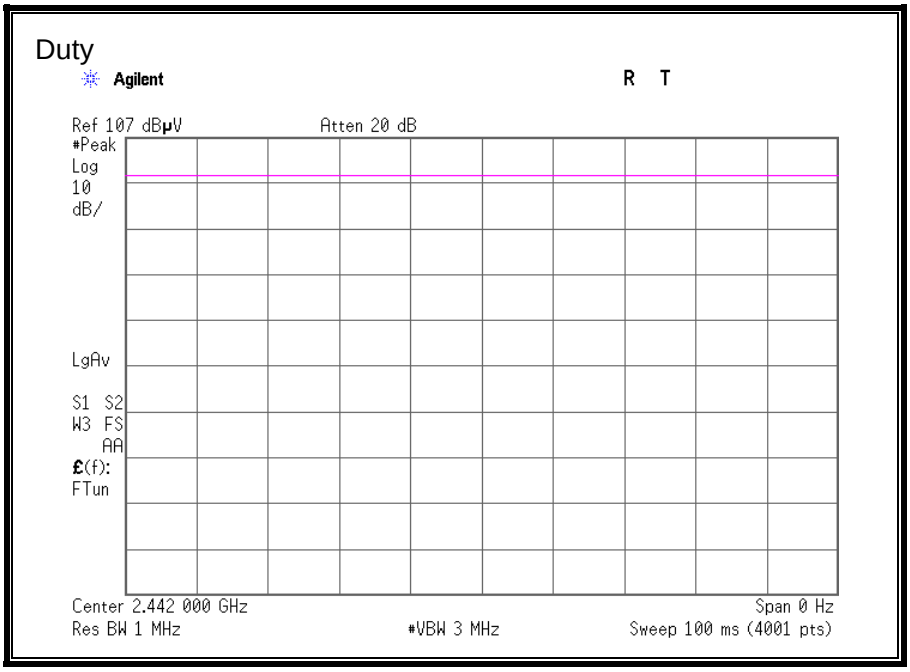
PSD HIGH CH



Duty



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6.1.6 CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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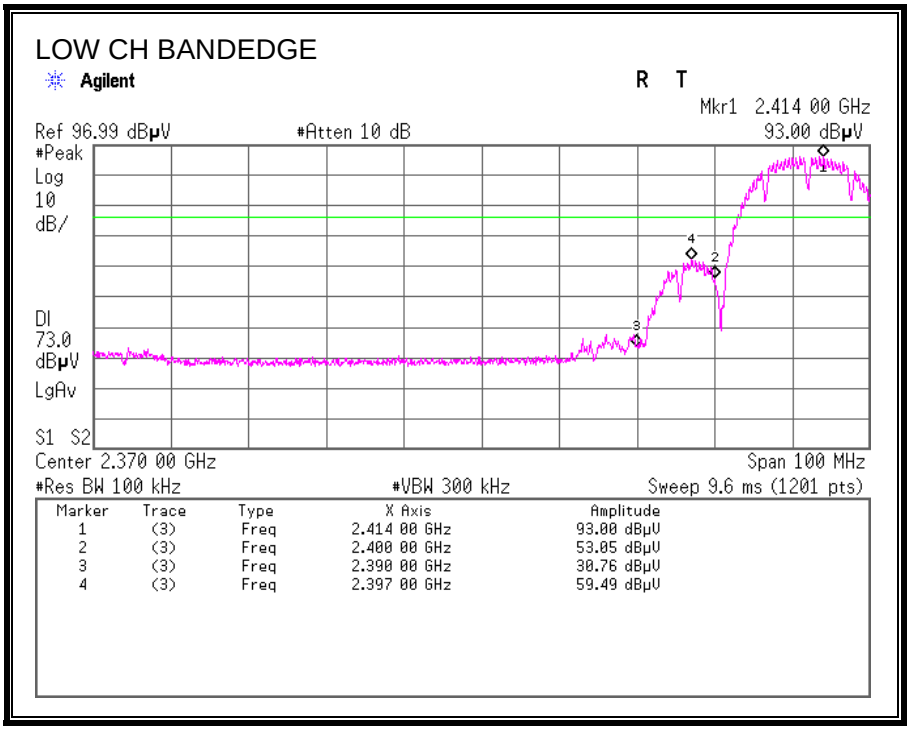
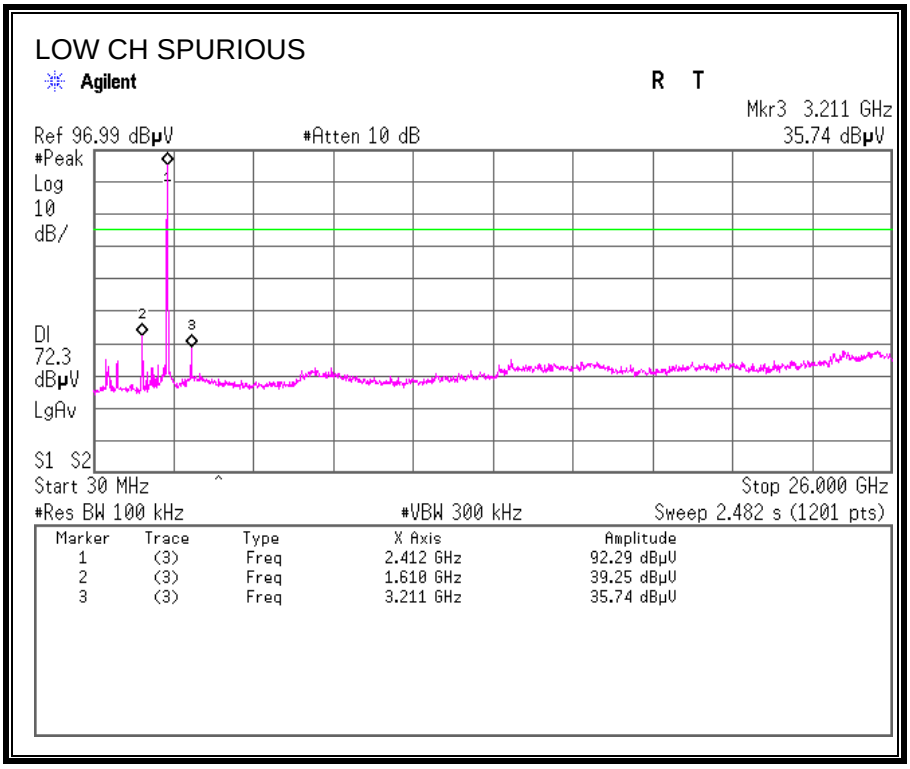
RESULTS

SPURIOUS EMISSIONS, LOW CHANNEL





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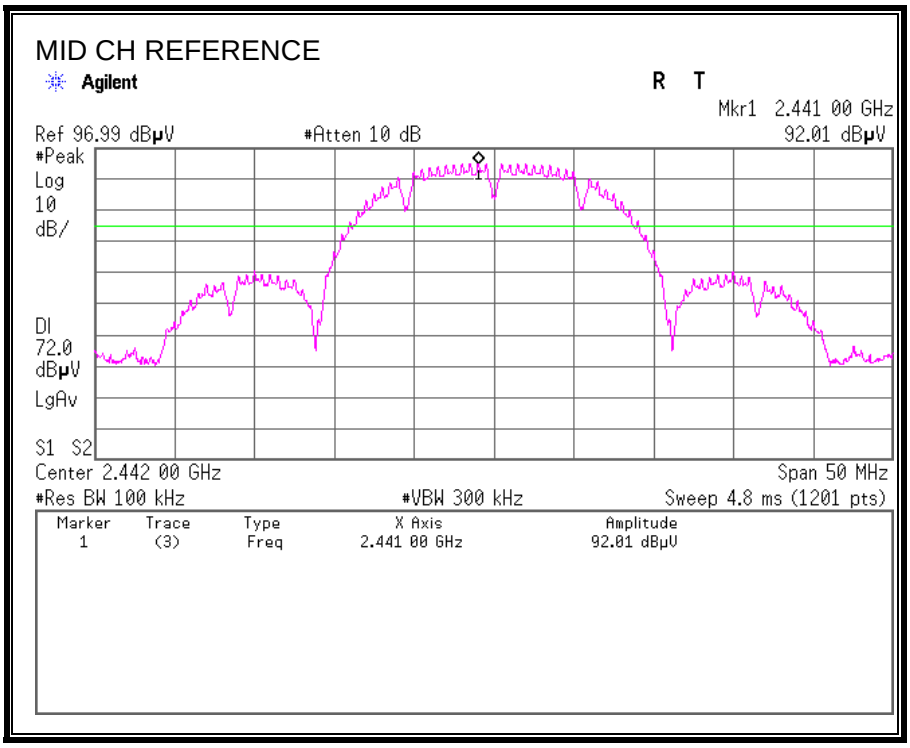
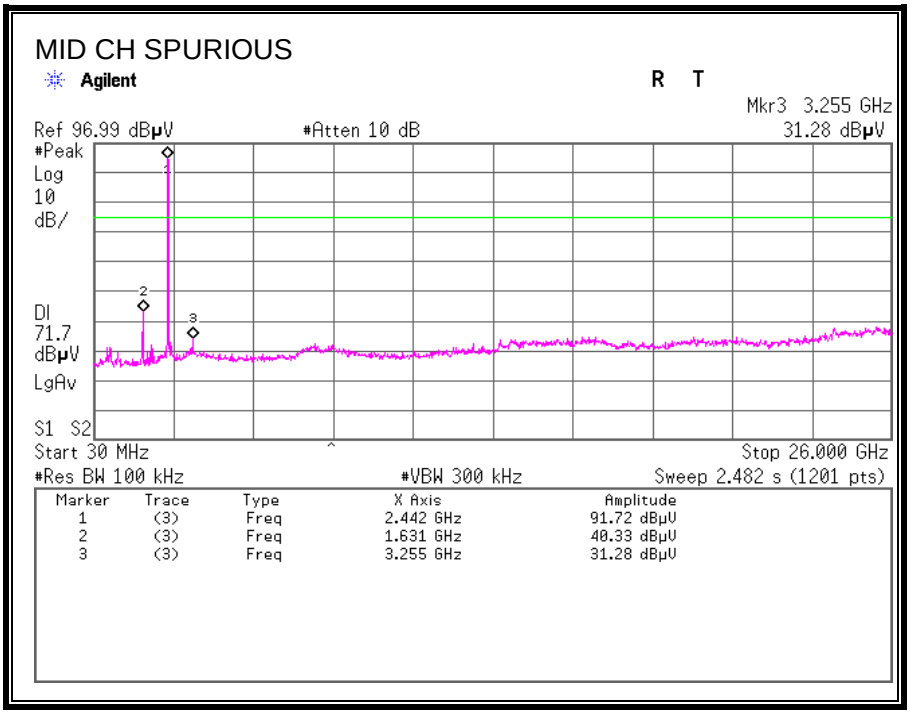
SPURIOUS EMISSIONS, MID CHANNEL





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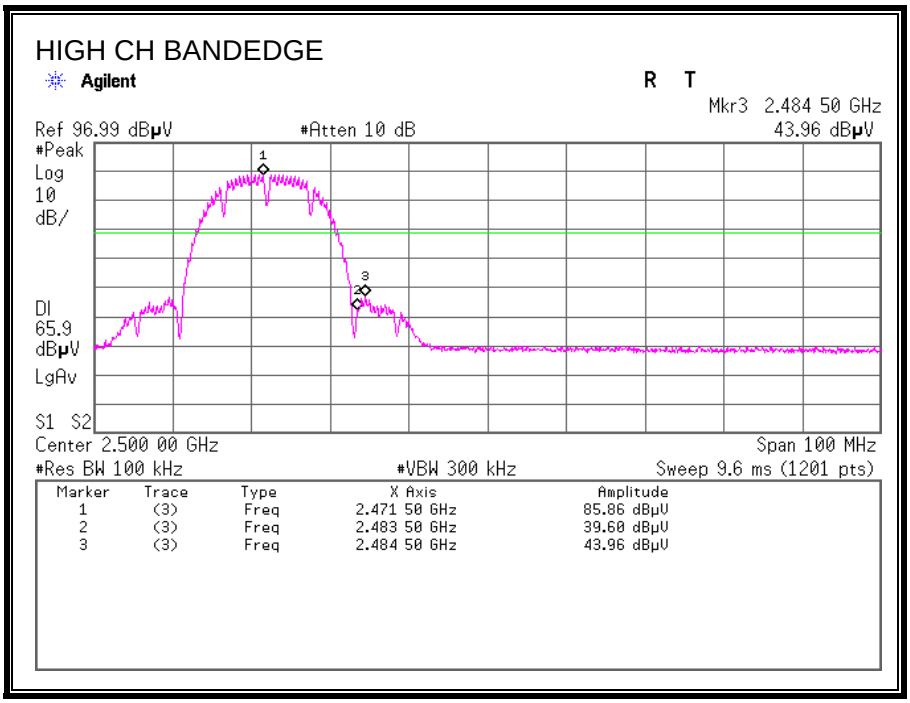
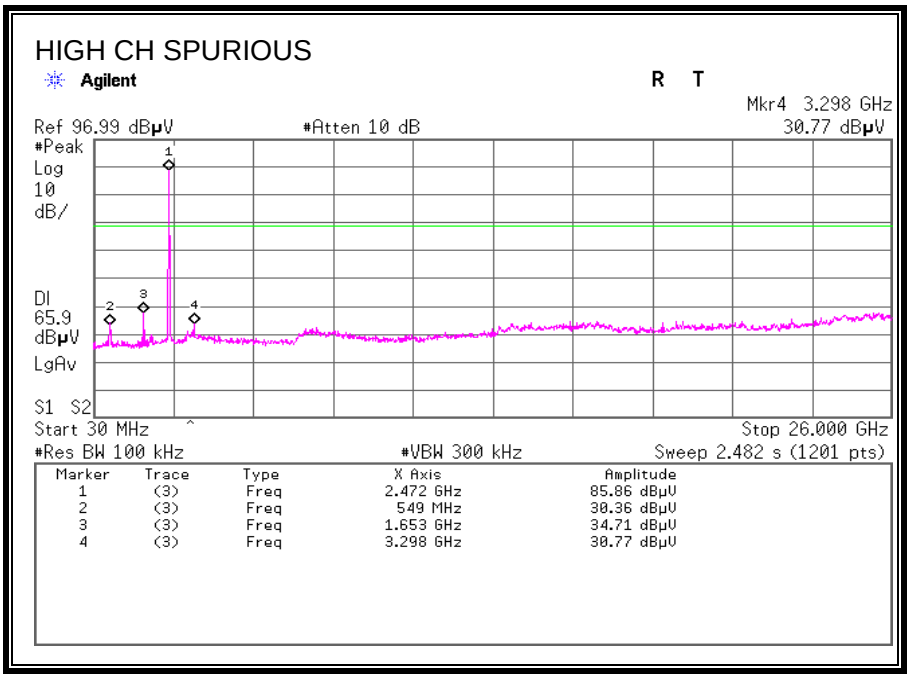
SPURIOUS EMISSIONS, HIGH CHANNEL





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6.2 802.11g MODE IN THE 2.4 GHz BAND

6.2.1 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-210 A8.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412	16.398	0.5
Middle	2437	16.390	0.5
High	2462	16.329	0.5

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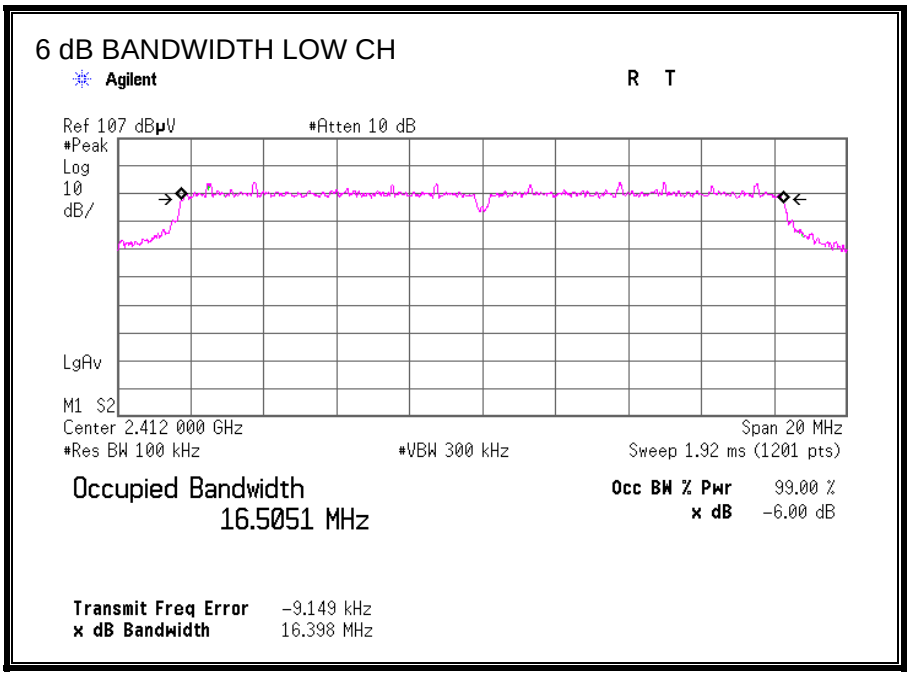
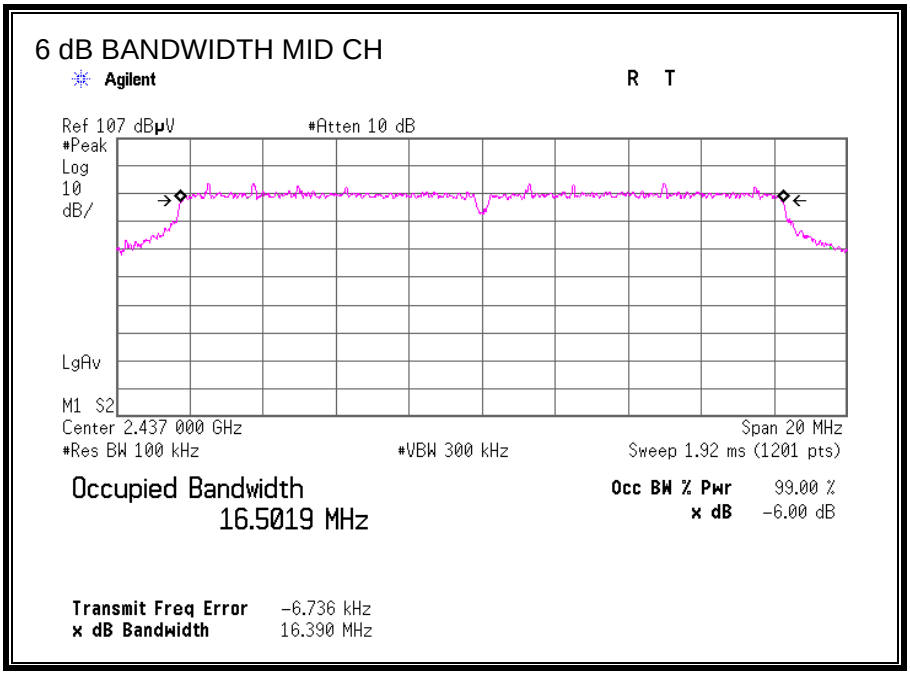
6 dB BANDWIDTH





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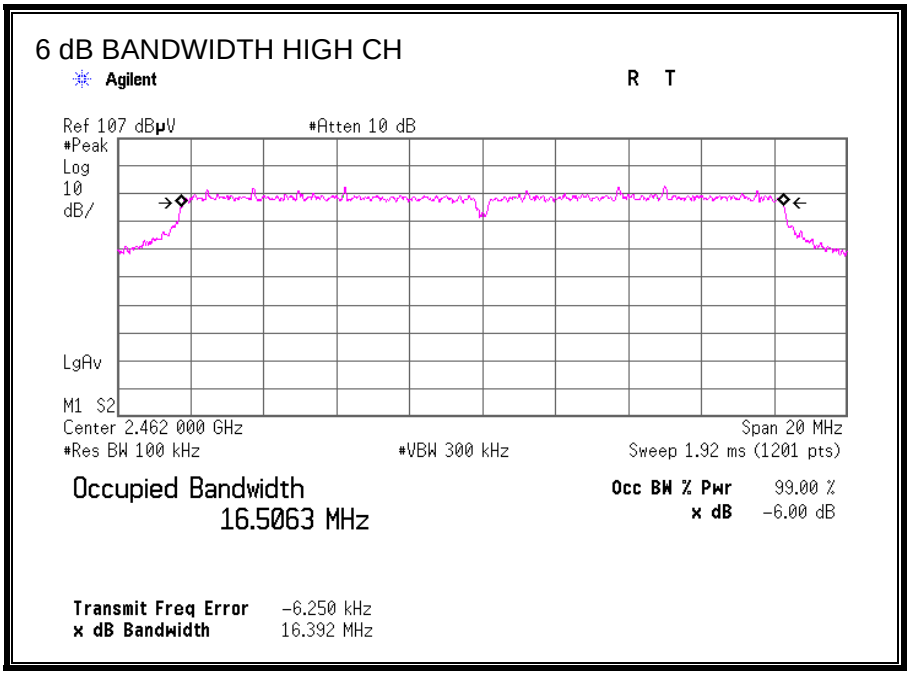

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6.2.2 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	2412	16.6301
Middle	2437	16.7869
High	2462	16.6435

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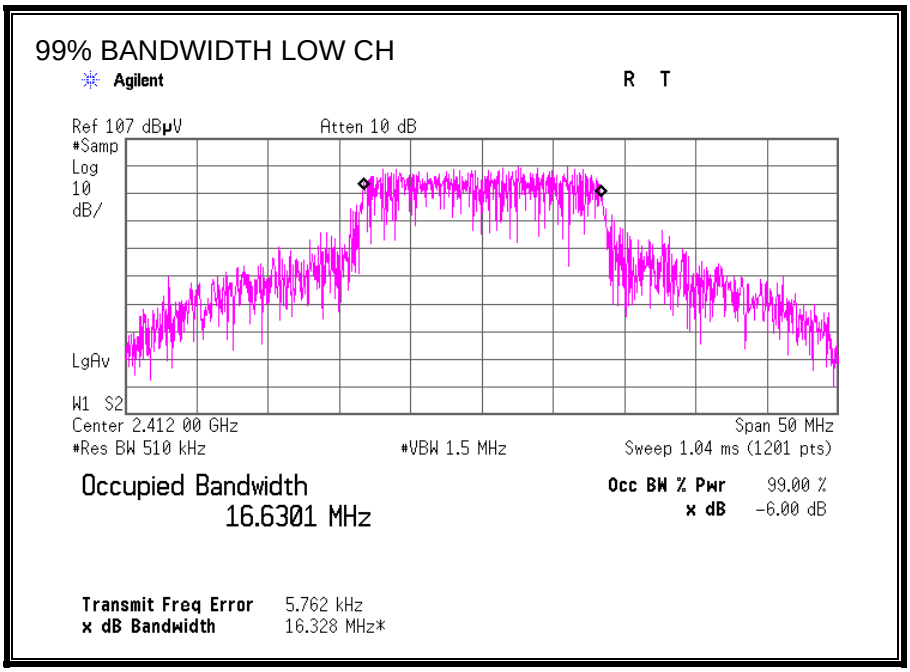
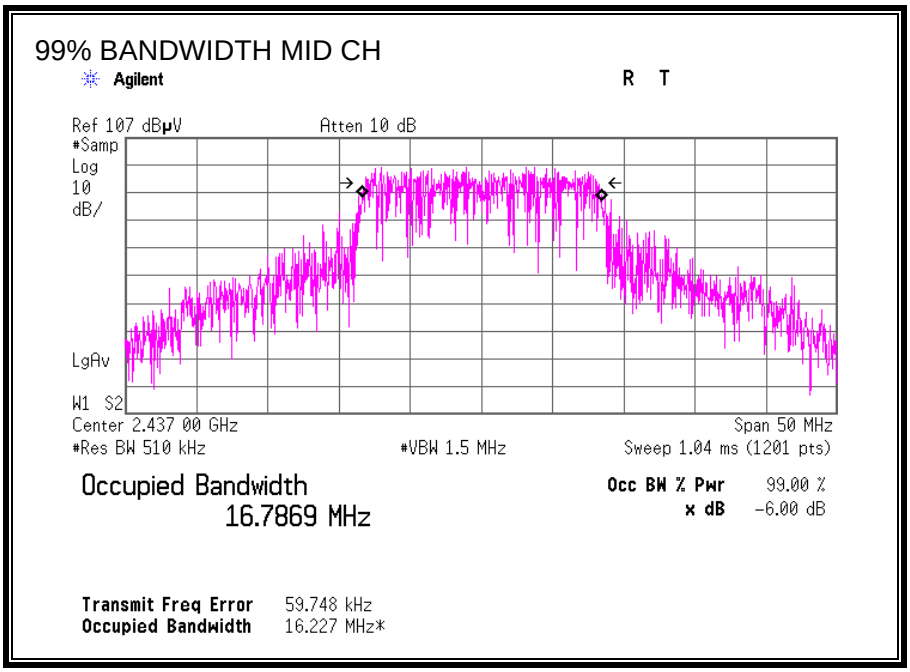
99% BANDWIDTH





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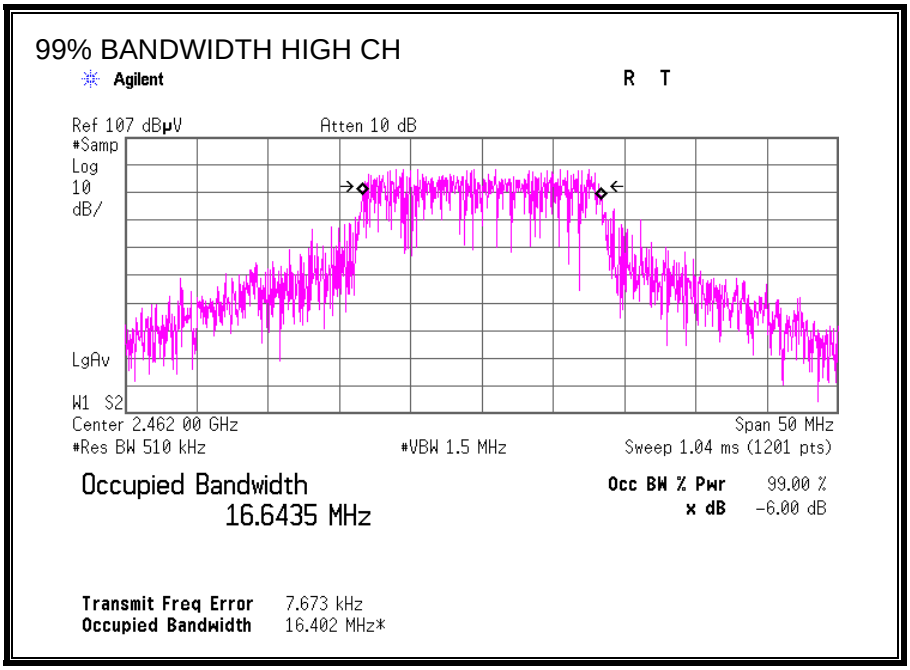

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6.2.3 OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-210 A8.4

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

Peak power is measured using a wide bandwidth Peak Power Meter.

The cable assembly insertion loss of 10.76 dB (including 10.01 dB pad and 0.75 dB cable for 2412MHz/2442MHz) or 10.77 dB (including 10.01 dB pad and 0.76 dB cable for 2472MHz) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

Channel	Frequency (MHz)	Power Meter (dBm)	Limit (dBm)	Margin (dB)
Low	2412	13.75	30	16.25
Middle	2437	13.80	30	16.20
High	2462	12.82	30	17.18

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6.2.4 AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 10.76 dB (including 10.01 dB pad and 0.75 dB cable for 2412MHz/2442MHz) or 10.77 dB (including 10.01 dB pad and 0.76 dB cable for 2472MHz) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Power (dBm)
Low	2412	6.15
Middle	2437	5.81
High	2462	4.76

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6.2.5 POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-210 A8.2 (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

Output power was measured based on the use of a peak measurement, therefore the power spectral density was measured based on 10.2 of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 (Issued on April 9, 2013)"

RESULTS

The cable assembly insertion loss of 10.76 dB (including 10.01 dB pad and 0.75 dB cable for 2412MHz/2442MHz) or 10.77 dB (including 10.01 dB pad and 0.76 dB cable for 2472MHz) was added to PPSD value.

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412	-19.09	8	27.09
Middle	2437	-19.63	8	27.63
High	2462	-20.17	8	28.17

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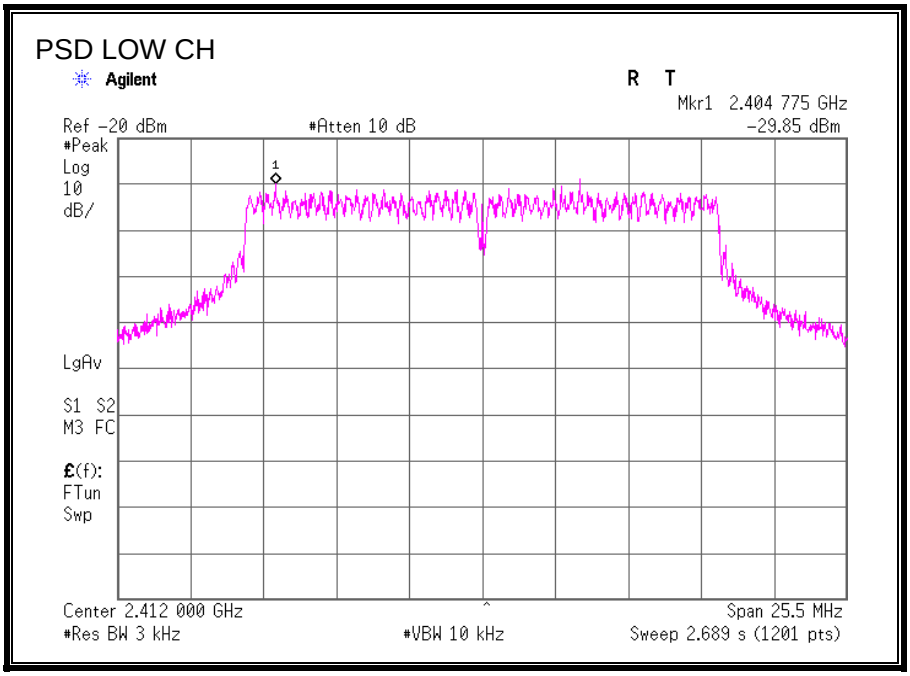
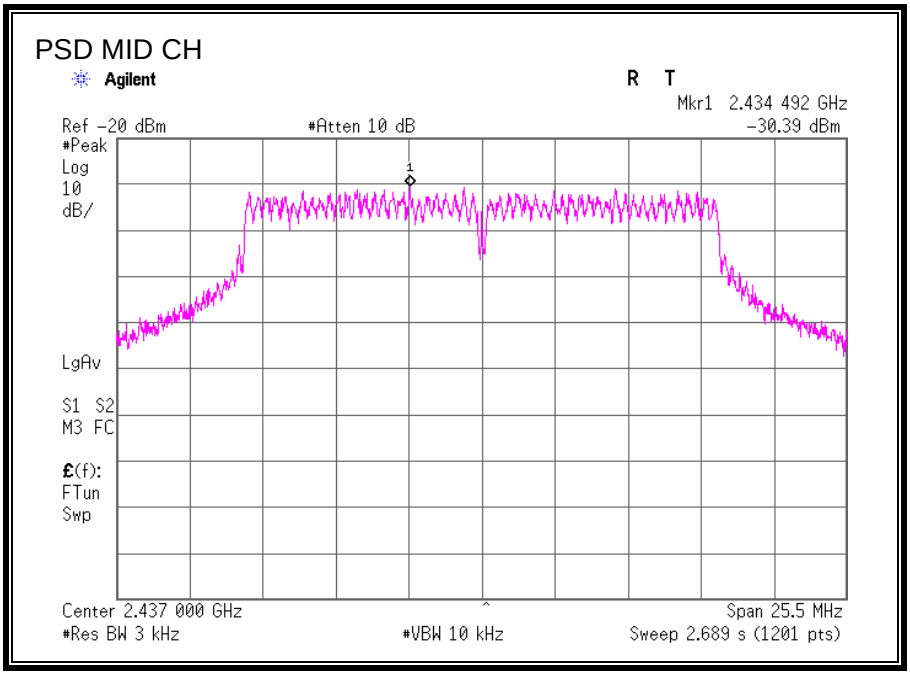
POWER SPECTRAL DENSITY

PSD LOW CH



PSD MID CH



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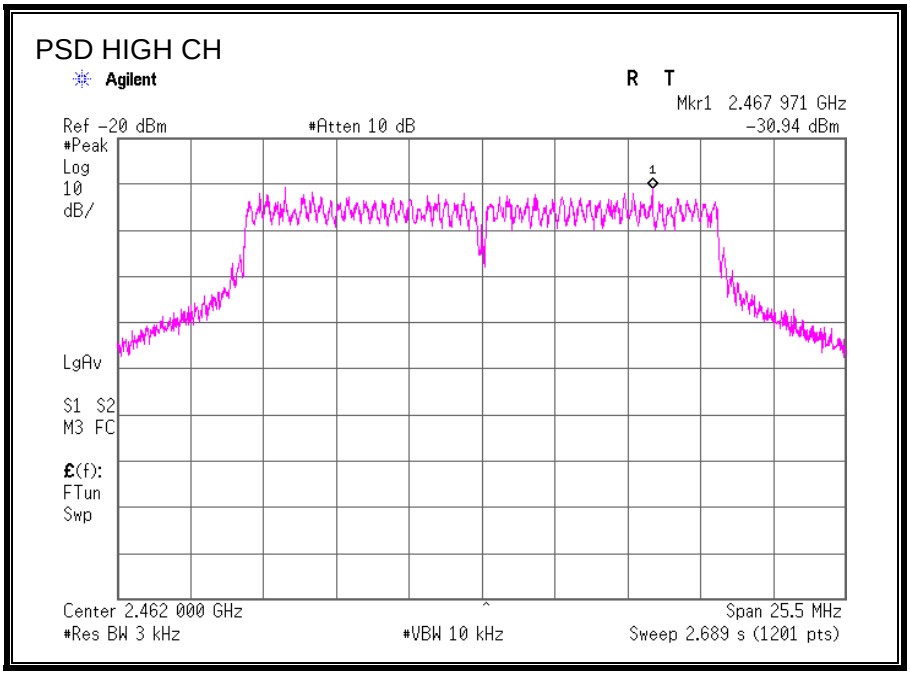
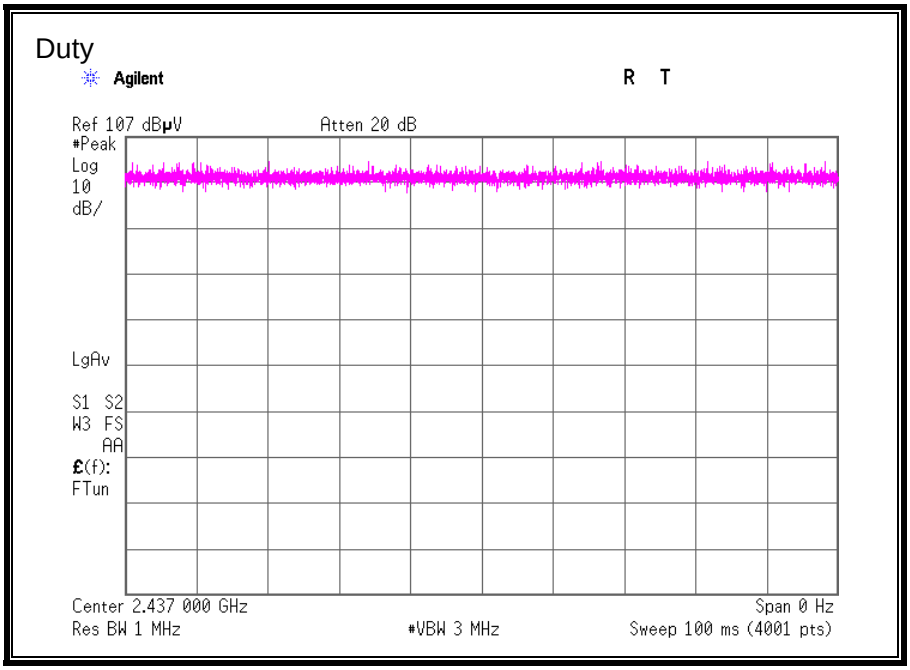
PSD HIGH CH



Duty



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6.2.6 CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

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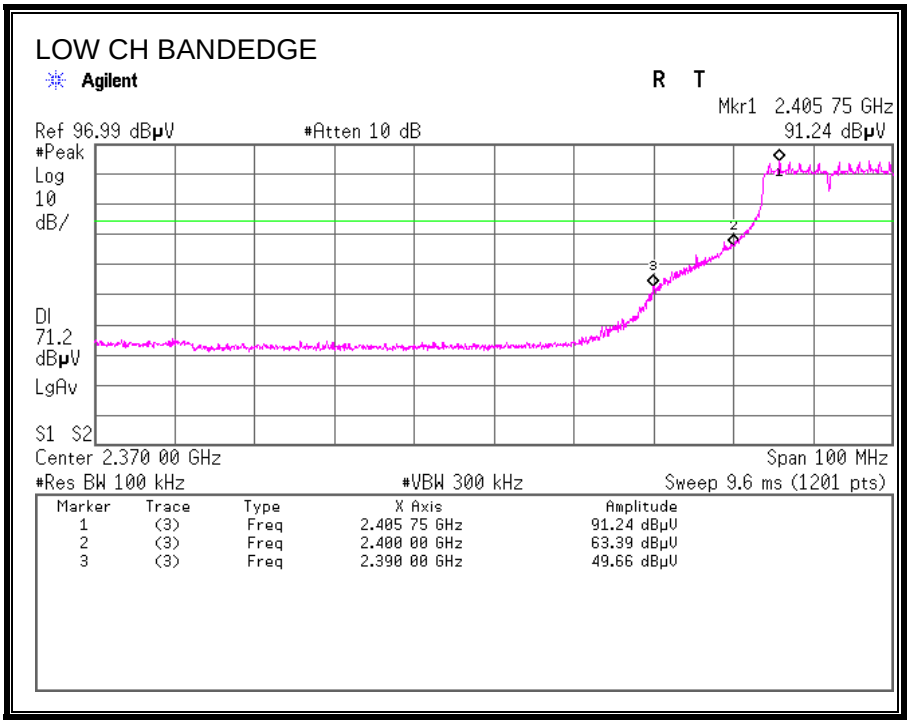
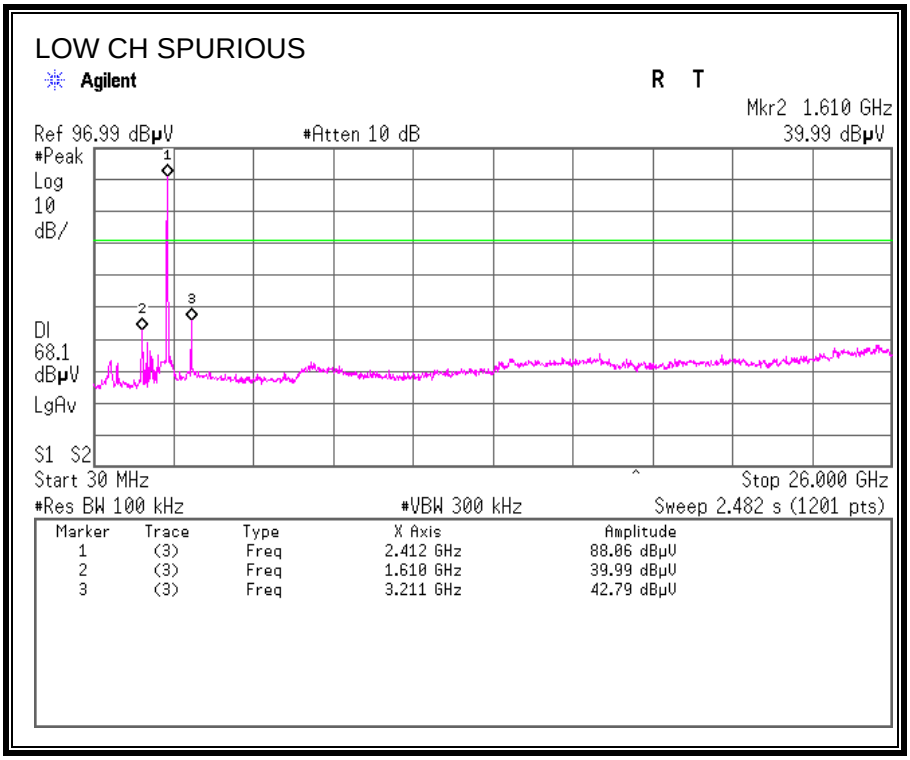
RESULTS

SPURIOUS EMISSIONS, LOW CHANNEL





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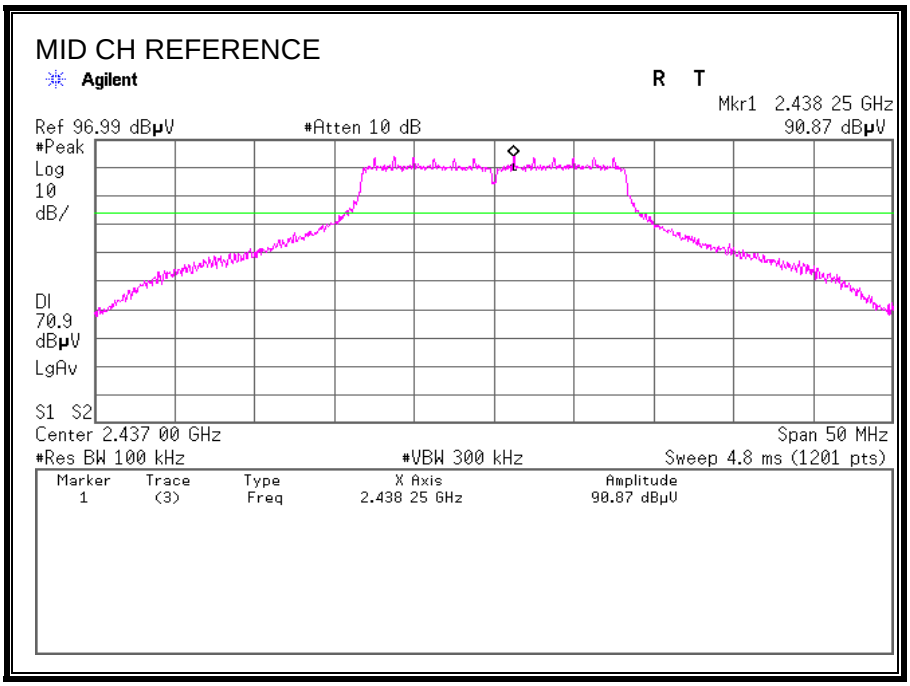
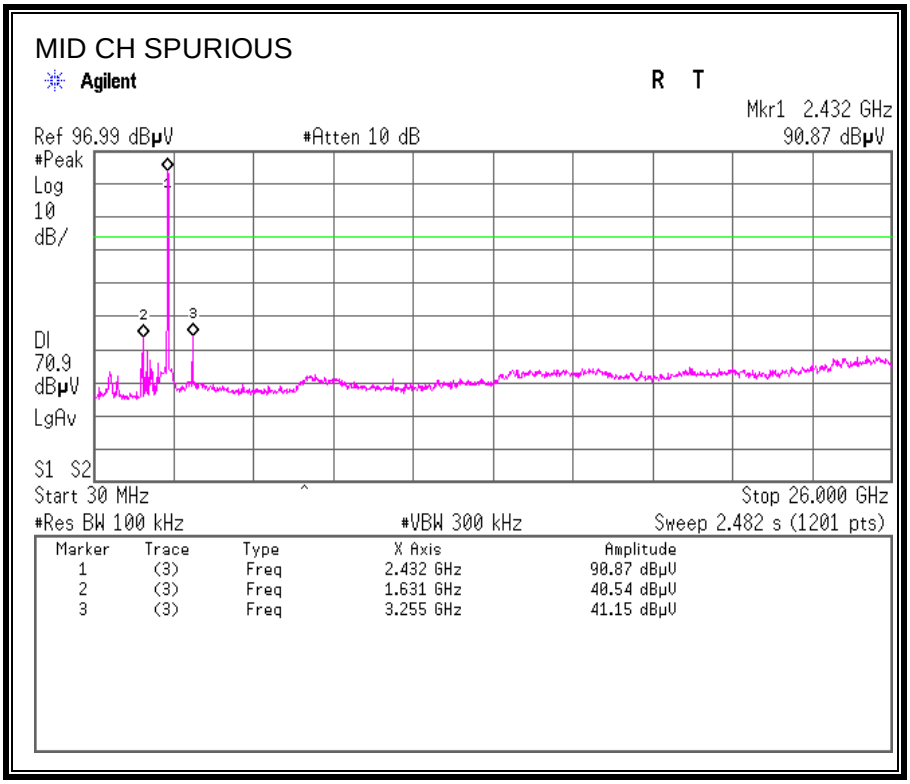
SPURIOUS EMISSIONS, MID CHANNEL





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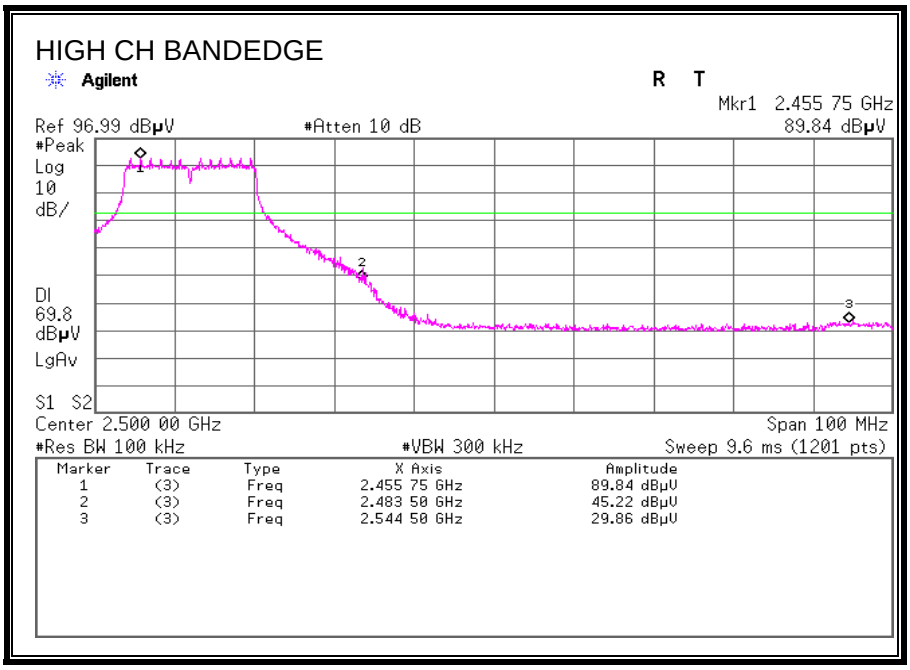
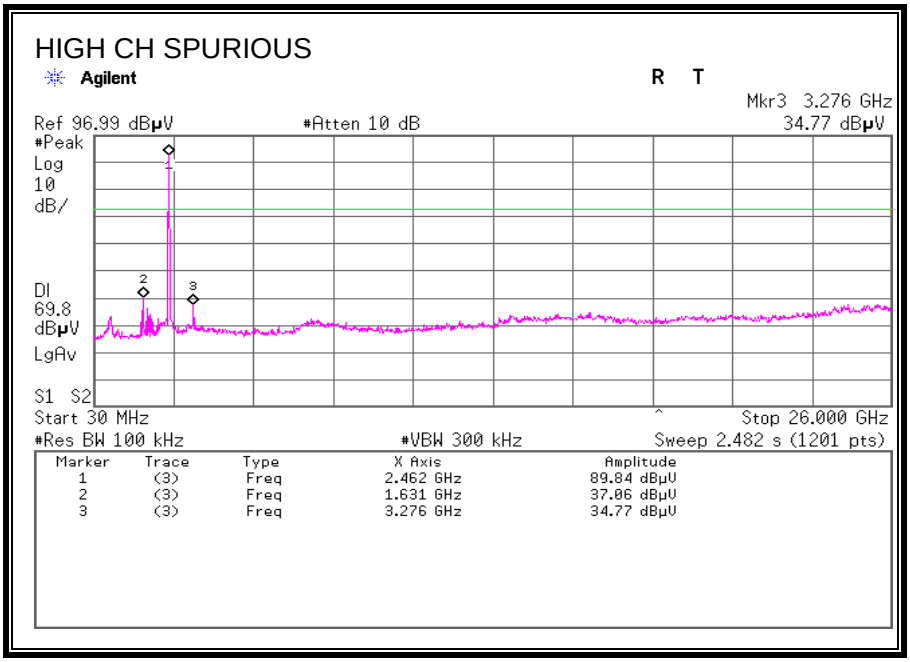
SPURIOUS EMISSIONS, HIGH CHANNEL





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7 RADIATED TEST RESULTS

7.1 LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 2.5 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

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7.2 TRANSMITTER ABOVE 1 GHz

7.2.1 TX ABOVE 1 GHz FOR 802.11b MODE IN THE 2.4 GHz BAND

HARMONICS AND SPURIOUS EMISSIONS

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10233134H
Date	03/05/2014
Temperature/ Humidity	22 deg.C/ 33% RH
Engineer	Katsunori Okai
Mode	11b Tx_A

Low Ch, 2412MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	42.6	28.2	3.1	32.4	41.5	73.9	32.4	
Hori	2400.000	PK	56.5	28.2	3.1	32.4	55.4	-	-	See 20dBc Data Sheet
Hori	2412.000	PK	96.3	28.2	3.1	32.4	95.2	-	-	See 20dBc Data Sheet
Hori	4824.000	PK	40.3	30.5	4.6	31.4	44.0	73.9	29.9	
Hori	7236.000	PK	41.0	35.8	5.8	32.3	50.3	73.9	23.6	
Hori	9648.000	PK	39.5	39.1	6.8	33.0	52.4	73.9	21.5	
Hori	2390.000	AV	40.0	28.2	3.1	32.4	38.9	53.9	15.1	
Hori	4824.000	AV	32.3	30.5	4.6	31.4	36.0	53.9	17.9	
Hori	7236.000	AV	32.2	35.8	5.8	32.3	41.5	53.9	12.4	
Hori	9648.000	AV	31.3	39.1	6.8	33.0	44.2	53.9	9.7	
Vert	2390.000	PK	45.8	28.2	3.1	32.4	44.7	73.9	29.2	
Vert	2400.000	PK	57.9	28.2	3.1	32.4	56.8	-	-	See 20dBc Data Sheet
Vert	2412.000	PK	94.6	28.2	3.1	32.4	93.5	-	-	See 20dBc Data Sheet
Vert	4824.000	PK	41.4	30.5	4.6	31.4	45.1	73.9	28.8	
Vert	7236.000	PK	41.1	35.8	5.8	32.3	50.4	73.9	23.5	
Vert	9648.000	PK	40.3	39.1	6.8	33.0	53.2	73.9	20.7	
Vert	2390.000	AV	38.3	28.2	3.1	32.4	37.2	53.9	16.7	
Vert	4824.000	AV	32.7	30.5	4.6	31.4	36.4	53.9	17.6	
Vert	7236.000	AV	33.4	35.8	5.8	32.3	42.7	53.9	11.2	
Vert	9648.000	AV	31.7	39.1	6.8	33.0	44.6	53.9	9.3	

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	96.3	28.2	3.1	32.4	95.2	-	-	Carrier
Hori	2400.000	PK	56.5	28.2	3.1	32.4	55.4	73.9	18.5	
Vert	2412.000	PK	94.6	28.2	3.1	32.4	93.5	-	-	Carrier
Vert	2400.000	PK	57.9	28.2	3.1	32.4	56.8	73.9	17.1	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amprifier)

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Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10233134H
Date	03/05/2014
Temperature/ Humidity	22 deg.C/ 33% RH
Engineer	Katsunori Okai
Mode	11b Tx_A

Mid Ch, 2442MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	4884.000	PK	40.7	30.6	4.6	31.4	44.5	73.9	29.4	
Hori	7326.000	PK	41.5	35.9	5.9	32.4	50.9	73.9	23.0	
Hori	9768.000	PK	41.1	39.4	6.8	33.0	54.3	73.9	19.6	
Hori	4884.000	AV	31.9	30.6	4.6	31.4	35.7	53.9	18.2	
Hori	7326.000	AV	32.0	35.9	5.9	32.4	41.4	53.9	12.5	
Hori	9768.000	AV	31.8	39.4	6.8	33.0	45.0	53.9	8.9	
Vert	4884.000	PK	41.0	30.6	4.6	31.4	44.8	73.9	29.1	
Vert	7326.000	PK	42.0	35.9	5.9	32.4	51.4	73.9	22.5	
Vert	9768.000	PK	41.6	39.4	6.8	33.0	54.8	73.9	19.1	
Vert	4884.000	AV	32.2	30.6	4.6	31.4	36.0	53.9	17.9	
Vert	7326.000	AV	32.4	35.9	5.9	32.4	41.8	53.9	12.1	
Vert	9768.000	AV	32.1	39.4	6.8	33.0	45.3	53.9	8.6	

High Ch, 2472MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2483.500	PK	49.0	28.4	3.1	32.3	48.2	73.9	25.7	
Hori	4944.000	PK	40.3	30.7	4.6	31.4	44.2	73.9	29.7	
Hori	7416.000	PK	41.0	36.1	5.9	32.4	50.6	73.9	23.3	
Hori	9888.000	PK	41.7	39.7	6.9	33.1	55.2	73.9	18.7	
Hori	2483.500	AV	44.2	28.4	3.1	32.3	43.4	53.9	10.5	
Hori	4944.000	AV	31.1	30.7	4.6	31.4	35.0	53.9	18.9	
Hori	7416.000	AV	31.6	36.1	5.9	32.4	41.2	53.9	12.7	
Hori	9888.000	AV	32.0	39.7	6.9	33.1	45.5	53.9	8.4	
Vert	2483.500	PK	52.0	28.4	3.1	32.3	51.2	73.9	22.7	
Vert	4944.000	PK	41.2	30.7	4.6	31.4	45.1	73.9	28.8	
Vert	7416.000	PK	42.2	36.1	5.9	32.4	51.8	73.9	22.1	
Vert	9888.000	PK	43.1	39.7	6.9	33.1	56.6	73.9	17.3	
Vert	2483.500	AV	46.7	28.4	3.1	32.3	45.9	53.9	8.0	
Vert	4944.000	AV	32.2	30.7	4.6	31.4	36.1	53.9	17.8	
Vert	7416.000	AV	32.8	36.1	5.9	32.4	42.4	53.9	11.5	
Vert	9888.000	AV	33.1	39.7	6.9	33.1	46.6	53.9	7.3	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

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7.2.2 TX ABOVE 1 GHz FOR 802.11g MODE IN THE 2.4 GHz BAND

HARMONICS AND SPURIOUS EMISSIONS

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10233134H
Date	03/05/2014
Temperature/ Humidity	22 deg.C/ 33% RH
Engineer	Katsunori Okai
Mode	11g Tx_A

Low Ch, 2412MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	69.2	28.2	3.1	32.4	68.1	73.9	5.8	
Hori	2400.000	PK	68.5	28.2	3.1	32.4	67.4	73.9	6.5	See 20dBc Data Sheet
Hori	2412.000	PK	95.9	28.2	3.1	32.4	94.8	-	-	See 20dBc Data Sheet
Hori	4824.000	PK	41.1	30.5	4.6	31.4	44.8	73.9	29.1	
Hori	7236.000	PK	40.7	35.8	5.8	32.3	50.0	73.9	23.9	
Hori	9648.000	PK	39.8	39.1	6.8	33.0	52.7	73.9	21.2	
Hori	2390.000	AV	48.4	28.2	3.1	32.4	47.3	53.9	6.6	
Hori	4824.000	AV	32.0	30.5	4.6	31.4	35.7	53.9	18.2	
Hori	7236.000	AV	32.3	35.8	5.8	32.3	41.6	53.9	12.3	
Hori	9648.000	AV	32.0	39.1	6.8	33.0	44.9	53.9	9.0	
Vert	2390.000	PK	67.1	28.2	3.1	32.4	66.0	73.9	7.9	
Vert	2400.000	PK	66.0	28.2	3.1	32.4	64.9	73.9	9.0	See 20dBc Data Sheet
Vert	2412.000	PK	93.0	28.2	3.1	32.4	91.9	-	-	See 20dBc Data Sheet
Vert	4824.000	PK	40.8	30.5	4.6	31.4	44.5	73.9	29.4	
Vert	7236.000	PK	40.7	35.8	5.8	32.3	50.0	73.9	23.9	
Vert	9648.000	PK	40.6	39.1	6.8	33.0	53.5	73.9	20.4	
Vert	2390.000	AV	47.4	28.2	3.1	32.4	46.3	53.9	7.6	
Vert	4824.000	AV	33.0	30.5	4.6	31.4	36.7	53.9	17.2	
Vert	7236.000	AV	34.0	35.8	5.8	32.3	43.3	53.9	10.6	
Vert	9648.000	AV	31.6	39.1	6.8	33.0	44.5	53.9	9.4	

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	95.9	28.2	3.1	32.4	94.8	-	-	Carrier
Hori	2400.000	PK	68.5	28.2	3.1	32.4	67.4	73.9	6.5	
Vert	2412.000	PK	93.0	28.2	3.1	32.4	91.9	-	-	Carrier
Vert	2400.000	PK	66.0	28.2	3.1	32.4	64.9	73.9	9.0	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amprifier)

UL Japan, Inc. Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN TEL: +81 596 24 8116 FAX: +81 596 24 8124

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10233134H
Date	03/05/2014
Temperature/ Humidity	22 deg.C/ 33% RH
Engineer	Katsunori Okai
Mode	11g Tx_A

Mid Ch, 2437MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	4874.000	PK	40.8	30.6	4.6	31.4	44.6	73.9	29.3	
Hori	7311.000	PK	41.4	35.9	5.9	32.4	50.8	73.9	23.1	
Hori	9748.000	PK	40.8	39.4	6.8	33.0	54.0	73.9	19.9	
Hori	4874.000	AV	32.1	30.6	4.6	31.4	35.9	53.9	18.0	
Hori	7311.000	AV	31.7	35.9	5.9	32.4	41.1	53.9	12.8	
Hori	9748.000	AV	31.6	39.4	6.8	33.0	44.8	53.9	9.1	
Vert	4874.000	PK	40.6	30.6	4.6	31.4	44.4	73.9	29.5	
Vert	7311.000	PK	41.7	35.9	5.9	32.4	51.1	73.9	22.8	
Vert	9748.000	PK	40.9	39.4	6.8	33.0	54.1	73.9	19.8	
Vert	4874.000	AV	33.1	30.6	4.6	31.4	36.9	53.9	17.0	
Vert	7311.000	AV	32.4	35.9	5.9	32.4	41.8	53.9	12.1	
Vert	9748.000	AV	32.3	39.4	6.8	33.0	45.5	53.9	8.4	

High Ch, 2462MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2483.500	PK	67.3	28.4	3.1	32.3	66.5	73.9	7.4	
Hori	4924.000	PK	39.9	30.7	4.6	31.4	43.8	73.9	30.1	
Hori	7386.000	PK	40.8	36.1	5.9	32.4	50.4	73.9	23.5	
Hori	9848.000	PK	41.1	39.6	6.9	33.1	54.5	73.9	19.4	
Hori	2483.500	AV	47.8	28.4	3.1	32.3	47.0	53.9	6.9	
Hori	4924.000	AV	30.9	30.7	4.6	31.4	34.8	53.9	19.1	
Hori	7386.000	AV	31.6	36.1	5.9	32.4	41.2	53.9	12.7	
Hori	9848.000	AV	31.8	39.6	6.9	33.1	45.2	53.9	8.7	
Vert	2483.500	PK	56.8	28.4	3.1	32.3	56.0	73.9	17.9	
Vert	4924.000	PK	41.1	30.7	4.6	31.4	45.0	73.9	28.9	
Vert	7386.000	PK	41.8	36.1	5.9	32.4	51.4	73.9	22.5	
Vert	9848.000	PK	42.1	39.6	6.9	33.1	55.5	73.9	18.4	
Vert	2483.500	AV	45.4	28.4	3.1	32.3	44.6	53.9	9.3	
Vert	4924.000	AV	31.8	30.7	4.6	31.4	35.7	53.9	18.2	
Vert	7386.000	AV	31.9	36.1	5.9	32.4	41.5	53.9	12.4	
Vert	9848.000	AV	30.8	39.6	6.9	33.1	44.2	53.9	9.7	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

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Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10233134H
Date	03/07/2014
Temperature/ Humidity	20 deg.C/ 32% RH
Engineer	Shinya Watanabe
Mode	11g Tx_B

Low Ch, 2412MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	70.8	28.2	2.5	32.4	69.1	73.9	4.8	
Hori	2400.000	PK	68.6	28.2	2.5	32.4	66.9	73.9	7.0	See 20dBc Data Sheet
Hori	2412.000	PK	92.8	28.2	2.5	32.4	91.1	-	-	See 20dBc Data Sheet
Hori	4824.000	PK	40.6	30.5	4.4	31.4	44.1	73.9	29.8	
Hori	7236.000	PK	41.9	35.8	5.3	32.3	50.7	73.9	23.2	
Hori	9648.000	PK	42.1	39.1	6.3	33.0	54.5	73.9	19.4	
Hori	2390.000	AV	50.9	28.2	2.5	32.4	49.2	53.9	4.7	
Hori	4824.000	AV	30.6	30.5	4.4	31.4	34.1	53.9	19.8	
Hori	7236.000	AV	30.7	35.8	5.3	32.3	39.5	53.9	14.4	
Hori	9648.000	AV	31.8	39.1	6.3	33.0	44.2	53.9	9.7	
Vert	2390.000	PK	68.8	28.2	2.5	32.4	67.1	73.9	6.8	
Vert	2400.000	PK	68.0	28.2	2.5	32.4	66.3	73.9	7.6	See 20dBc Data Sheet
Vert	2412.000	PK	95.9	28.2	2.5	32.4	94.2	-	-	See 20dBc Data Sheet
Vert	4824.000	PK	41.1	30.5	4.4	31.4	44.6	73.9	29.3	
Vert	7236.000	PK	42.6	35.8	5.3	32.3	51.4	73.9	22.5	
Vert	9648.000	PK	42.6	39.1	6.3	33.0	55.0	73.9	18.9	
Vert	2390.000	AV	49.5	28.2	2.5	32.4	47.8	53.9	6.1	
Vert	4824.000	AV	30.5	30.5	4.4	31.4	34.0	53.9	19.9	
Vert	7236.000	AV	31.2	35.8	5.3	32.3	40.0	53.9	13.9	
Vert	9648.000	AV	31.2	39.1	6.3	33.0	43.6	53.9	10.3	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	92.8	28.2	2.5	32.4	91.1	-	-	Carrier
Hori	2400.000	PK	68.6	28.2	2.5	32.4	66.9	71.1	4.2	
Vert	2412.000	PK	95.9	28.2	2.5	32.4	94.2	-	-	Carrier
Vert	2400.000	PK	68.0	28.2	2.5	32.4	66.3	74.2	7.9	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amprifier)

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WORST-CASE RADIATED EMISSIONS BELOW 1 GHz

HORIZONTAL AND VERTICAL DATA

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10233134H
Date	03/06/2012
Temperature/ Humidity	20 deg.C/ 32% RH
Engineer	Shinya Watanabe
Mode	Tx 11g 2412MHz_A

With Mitsumi AC Adaptor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	57.949	QP	22.5	8.2	7.5	32.2	6.0	40.0	34.0	
Hori	71.000	QP	23.2	6.3	7.7	32.2	5.0	40.0	35.0	
Hori	108.998	QP	25.9	11.4	8.2	32.1	13.4	43.5	30.1	
Hori	335.910	QP	29.5	15.5	10.1	32.0	23.1	46.0	22.9	
Hori	402.169	QP	34.2	17.5	10.6	32.0	30.3	46.0	15.7	
Hori	571.945	QP	30.9	19.1	11.6	32.1	29.5	46.0	16.5	
Vert	57.949	QP	29.7	8.2	7.5	32.2	13.2	40.0	26.8	
Vert	71.000	QP	31.2	6.3	7.7	32.2	13.0	40.0	27.0	
Vert	109.539	QP	28.1	11.4	8.2	32.1	15.6	43.5	27.9	
Vert	335.910	QP	21.9	15.5	10.1	32.0	15.5	46.0	30.5	
Vert	402.169	QP	28.3	17.5	10.6	32.0	24.4	46.0	21.6	
Vert	571.945	QP	33.2	19.1	11.6	32.1	31.8	46.0	14.2	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

With Tabuchi AC Adaptor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	49.142	QP	23.3	11.2	7.3	32.1	9.7	40.0	30.3	
Hori	71.228	QP	29.0	6.3	7.7	32.2	10.8	40.0	29.2	
Hori	335.981	QP	29.9	15.5	10.1	32.0	23.5	46.0	22.5	
Hori	402.169	QP	34.3	17.5	10.6	32.0	30.4	46.0	15.6	
Hori	417.089	QP	30.8	17.6	10.7	32.0	27.1	46.0	18.9	
Hori	562.928	QP	24.9	19.0	11.6	32.1	23.4	46.0	22.6	
Vert	49.142	QP	35.7	11.2	7.3	32.1	22.1	40.0	17.9	
Vert	71.228	QP	33.9	6.3	7.7	32.2	15.7	40.0	24.3	
Vert	335.981	QP	22.3	15.5	10.1	32.0	15.9	46.0	30.1	
Vert	402.169	QP	28.5	17.5	10.6	32.0	24.6	46.0	21.4	
Vert	417.089	QP	26.2	17.6	10.7	32.0	22.5	46.0	23.5	
Vert	562.928	QP	31.8	19.0	11.6	32.1	30.3	46.0	15.7	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

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Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10233134H
Date	03/06/2012
Temperature/ Humidity	20 deg.C/ 32% RH
Engineer	Shinya Watanabe
Mode	Tx 11g 2412MHz_A

With Nichicon AC Adaptor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	49.137	QP	22.4	11.2	7.3	32.1	8.8	40.0	31.2	
Hori	71.987	QP	23.7	6.4	7.7	32.2	5.6	40.0	34.4	
Hori	335.910	QP	28.3	15.5	10.1	32.0	21.9	46.0	24.1	
Hori	402.169	QP	34.9	17.5	10.6	32.0	31.0	46.0	15.0	
Hori	435.781	QP	29.4	17.7	10.8	32.0	25.9	46.0	20.1	
Hori	563.247	QP	22.7	19.0	11.6	32.1	21.2	46.0	24.8	
Vert	49.137	QP	35.9	11.2	7.3	32.1	22.3	40.0	17.7	
Vert	71.987	QP	31.2	6.4	7.7	32.2	13.1	40.0	26.9	
Vert	335.910	QP	22.0	15.5	10.1	32.0	15.6	46.0	30.4	
Vert	402.169	QP	28.4	17.5	10.6	32.0	24.5	46.0	21.5	
Vert	435.781	QP	22.4	17.7	10.8	32.0	18.9	46.0	27.1	
Vert	563.247	QP	31.8	19.0	11.6	32.1	30.3	46.0	15.7	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

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HORIZONTAL AND VERTICAL DATA

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10233134H
Date	03/06/2012
Temperature/ Humidity	20 deg.C/ 32% RH
Engineer	Shinya Watanabe
Mode	Tx 11g 2412MHz_B

With Mitsumi AC Adaptor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	54.020	QP	34.0	9.5	7.4	32.1	18.8	40.0	21.2	
Hori	103.046	QP	29.3	10.6	8.1	32.1	15.9	43.5	27.6	
Hori	336.473	QP	22.3	15.5	10.1	32.0	15.9	46.0	30.1	
Hori	402.169	QP	34.0	17.5	10.6	32.0	30.1	46.0	15.9	
Hori	423.447	QP	21.9	17.7	10.7	32.0	18.3	46.0	27.7	
Hori	588.979	QP	22.3	19.4	11.7	32.1	21.3	46.0	24.7	
Vert	54.020	QP	32.1	9.5	7.4	32.1	16.9	40.0	23.1	
Vert	103.046	QP	32.0	10.6	8.1	32.1	18.6	43.5	24.9	
Vert	336.473	QP	22.2	15.5	10.1	32.0	15.8	46.0	30.2	
Vert	402.169	QP	28.9	17.5	10.6	32.0	25.0	46.0	21.0	
Vert	423.447	QP	22.0	17.7	10.7	32.0	18.4	46.0	27.6	
Vert	588.979	QP	22.4	19.4	11.7	32.1	21.4	46.0	24.6	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

With Tabuchi AC Adaptor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	52.252	QP	23.1	10.1	7.4	32.1	8.5	40.0	31.5	
Vert	52.252	QP	31.9	10.1	7.4	32.1	17.3	40.0	22.7	
Hori	75.451	QP	30.0	6.6	7.7	32.2	12.1	40.0	27.9	
Vert	75.451	QP	35.9	6.6	7.7	32.2	18.0	40.0	22.0	
Hori	350.501	QP	22.3	16.0	10.2	32.0	16.5	46.0	29.5	
Vert	350.501	QP	21.9	16.0	10.2	32.0	16.1	46.0	29.9	
Hori	402.169	QP	34.5	17.5	10.6	32.0	30.6	46.0	15.4	
Vert	402.169	QP	29.0	17.5	10.6	32.0	25.1	46.0	20.9	
Hori	423.447	QP	22.2	17.7	10.7	32.0	18.6	46.0	27.4	
Vert	423.447	QP	22.3	17.7	10.7	32.0	18.7	46.0	27.3	
Hori	518.837	QP	21.8	18.4	11.3	32.1	19.4	46.0	26.6	
Vert	518.837	QP	22.2	18.4	11.3	32.1	19.8	46.0	26.2	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

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Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10233134H
Date	03/06/2012
Temperature/ Humidity	20 deg.C/ 32% RH
Engineer	Shinya Watanabe
Mode	Tx 11g 2412MHz_B

With Nichicon AC Adaptor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	49.154	QP	33.4	11.2	7.3	32.1	19.8	40.0	20.2	
Hori	70.478	QP	24.2	6.3	7.7	32.2	6.0	40.0	34.0	
Hori	335.070	QP	22.9	15.5	10.1	32.0	16.5	46.0	29.5	
Hori	402.169	QP	33.9	17.5	10.6	32.0	30.0	46.0	16.0	
Hori	423.447	QP	23.3	17.7	10.7	32.0	19.7	46.0	26.3	
Hori	558.117	QP	22.0	18.9	11.5	32.1	20.3	46.0	25.7	
Vert	49.154	QP	36.4	11.2	7.3	32.1	22.8	40.0	17.2	
Vert	70.478	QP	31.8	6.3	7.7	32.2	13.6	40.0	26.4	
Vert	335.070	QP	21.9	15.5	10.1	32.0	15.5	46.0	30.5	
Vert	402.169	QP	28.9	17.5	10.6	32.0	25.0	46.0	21.0	
Vert	423.447	QP	22.1	17.7	10.7	32.0	18.5	46.0	27.5	
Vert	558.117	QP	25.2	18.9	11.5	32.1	23.5	46.0	22.5	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

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8 AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

RSS-Gen 7.2.4

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

ANSI C63.4

UL Japan, Inc. Head Office EMC Lab.
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RESULTS

With Mitsumi AC Adaptor A

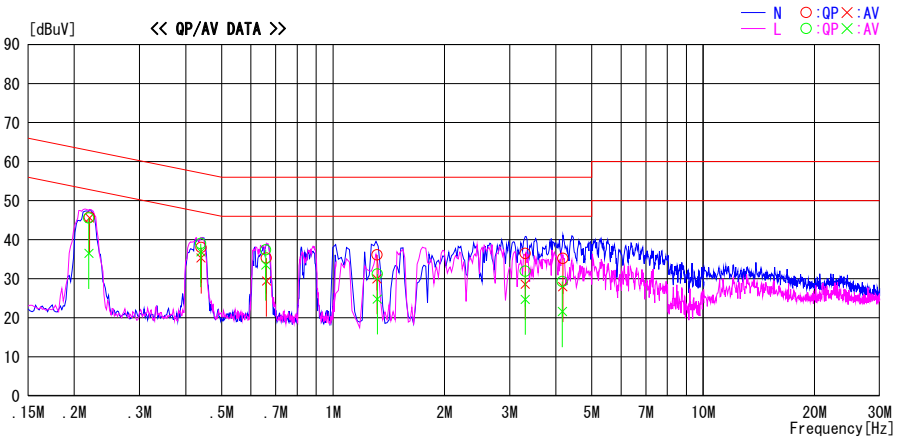
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2014/03/06

Report No. : 10233134H
Power : AC 120V / 60Hz
Temp./Humi. : 20deg.C / 32% RH
Engineer : Shinya Watanabe

Mode / Remarks : Tx 11g 6Mbps 2412MHz AC Adapter:Mitsumi

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.21974	32.3	32.2	13.4	45.7	45.6	62.8	52.8	17.1	7.2	N	
0.43994	24.6	21.9	13.4	38.0	35.3	57.1	47.1	19.1	11.8	N	
0.66084	21.9	16.0	13.4	35.3	29.4	56.0	46.0	20.7	16.6	N	
1.31517	22.5	16.4	13.6	36.1	30.0	56.0	46.0	19.9	16.0	N	
3.30657	22.6	14.7	13.9	36.5	28.6	56.0	46.0	19.5	17.4	N	
4.17903	21.2	14.0	14.0	35.2	28.0	56.0	46.0	20.8	18.0	N	
0.21877	32.2	23.1	13.4	45.6	36.5	62.9	52.9	17.3	16.4	L	
0.43942	25.6	23.5	13.4	39.0	36.9	57.1	47.1	18.1	10.2	L	
0.65834	24.0	20.1	13.4	37.4	33.5	56.0	46.0	18.6	12.5	L	
1.31717	17.6	11.2	13.6	31.2	24.8	56.0	46.0	24.8	21.2	L	
3.30475	18.0	10.8	13.9	31.9	24.7	56.0	46.0	24.1	21.3	L	
4.16468	15.3	7.6	14.0	29.3	21.6	56.0	46.0	26.7	24.4	L	

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

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With Mitsumi AC Adaptor_B

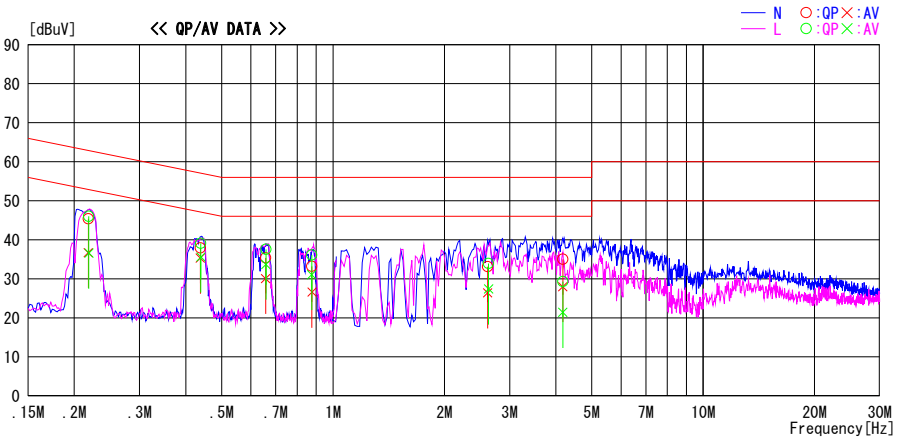
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2014/03/06

Report No. : 10233134H
Power : AC 120V / 60Hz
Temp./Humi. : 20deg.C / 32% RH
Engineer : Shinya Watanabe

Mode / Remarks : Tx 11g 6Mbps 2412MHz AC Adapter:Mitsumi

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.21800	32.0	23.3	13.4	45.4	36.7	62.9	52.9	17.5	16.2	N	
0.43816	24.5	21.9	13.4	37.9	35.3	57.1	47.1	19.2	11.8	N	
0.65736	22.0	16.7	13.4	35.4	30.1	56.0	46.0	20.6	15.9	N	
0.87701	19.8	13.2	13.4	33.2	26.6	56.0	46.0	22.8	19.4	N	
2.61587	19.4	12.7	13.7	33.1	26.4	56.0	46.0	22.9	19.6	N	
4.17903	21.0	14.0	14.0	35.0	28.0	56.0	46.0	21.0	18.0	N	
0.21874	32.6	23.2	13.4	46.0	36.6	62.9	52.9	16.9	16.3	L	
0.43942	25.7	22.2	13.4	39.1	35.6	57.1	47.1	18.0	11.5	L	
0.65910	24.2	20.3	13.4	37.6	33.7	56.0	46.0	18.4	12.3	L	
0.87575	22.7	17.7	13.4	36.1	31.1	56.0	46.0	19.9	14.9	L	
2.63022	20.2	13.7	13.7	33.9	27.4	56.0	46.0	22.1	18.6	L	
4.17903	15.3	7.4	14.0	29.3	21.4	56.0	46.0	26.7	24.6	L	

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

UL Japan, Inc. Head Office EMC Lab.
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RESULTS

With Tabuchi AC Adaptor A

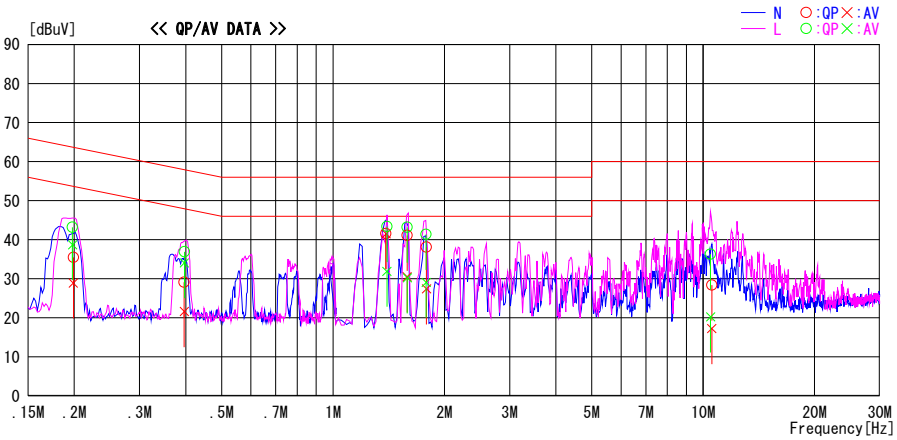
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2014/03/06

Report No. : 10233134H
Power : AC 120V / 60Hz
Temp./Humi. : 20deg.C / 32% RH
Engineer : Shinya Watanabe

Mode / Remarks : Tx 11g 6Mbps 2412MHz AC Adapter:Tabuchi

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.19888	22.2	15.6	13.3	35.5	28.9	63.7	53.7	28.2	24.8	N	
0.39617	15.7	8.2	13.4	29.1	21.6	57.9	47.9	28.8	26.3	N	
1.39106	28.0	27.9	13.6	41.6	41.5	56.0	46.0	14.4	4.5	N	
1.58582	27.5	16.9	13.6	41.1	30.5	56.0	46.0	14.9	15.5	N	
1.78776	24.5	13.8	13.6	38.1	27.4	56.0	46.0	17.9	18.6	N	
10.55270	13.5	2.3	14.9	28.4	17.2	60.0	50.0	31.6	32.8	N	
0.19761	29.9	25.4	13.3	43.2	38.7	63.7	53.7	20.5	15.0	L	
0.39662	23.5	20.7	13.4	36.9	34.1	57.9	47.9	21.0	13.8	L	
1.39806	29.8	18.3	13.6	43.4	31.9	56.0	46.0	12.6	14.1	L	
1.58750	29.6	16.6	13.6	43.2	30.2	56.0	46.0	12.8	15.8	L	
1.78376	27.8	15.5	13.6	41.4	29.1	56.0	46.0	14.6	16.9	L	
10.47234	21.4	5.3	14.9	36.3	20.2	60.0	50.0	23.7	29.8	L	

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

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With Tabuchi AC Adaptor_B

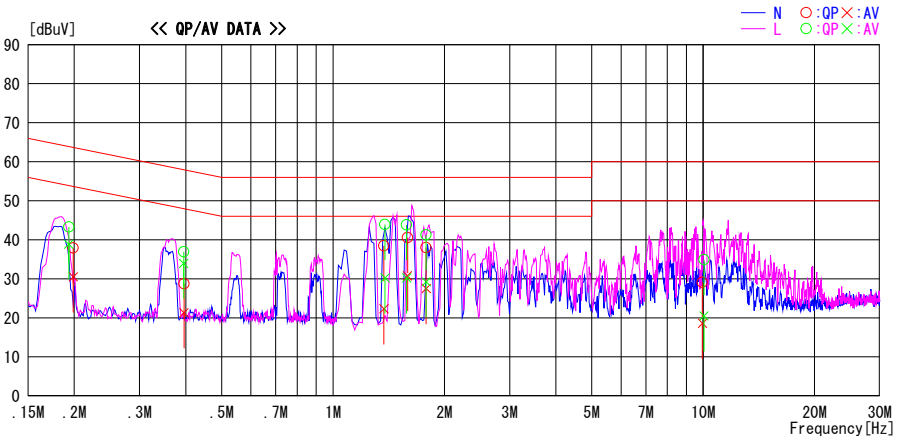
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2014/03/06

Report No. : 10233134H
Power : AC 120V / 60Hz
Temp./Humi. : 20deg.C / 32% RH
Engineer : Shinya Watanabe

Mode / Remarks : Tx 11g 6Mbps 2412MHz AC Adapter:Tabuchi

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.19865	24.6	17.2	13.3	37.9	30.5	63.7	53.7	25.8	23.2	N	
0.39573	15.3	7.9	13.4	28.7	21.3	57.9	47.9	29.2	26.6	N	
1.37225	24.9	8.7	13.6	38.5	22.3	56.0	46.0	17.5	23.7	N	
1.58958	27.0	17.2	13.6	40.6	30.8	56.0	46.0	15.4	15.2	N	
1.78458	24.4	13.9	13.6	38.0	27.5	56.0	46.0	18.0	18.5	N	
9.95913	14.4	3.9	14.7	29.1	18.6	60.0	50.0	30.9	31.4	N	
0.19313	30.0	25.6	13.3	43.3	38.9	63.9	53.9	20.6	15.0	L	
0.39494	23.5	20.6	13.4	36.9	34.0	58.0	48.0	21.1	14.0	L	
1.38100	30.3	16.6	13.6	43.9	30.2	56.0	46.0	12.1	15.8	L	
1.58094	30.2	16.6	13.6	43.8	30.2	56.0	46.0	12.2	15.8	L	
1.78435	27.7	15.6	13.6	41.3	29.2	56.0	46.0	14.7	16.8	L	
10.05000	20.1	5.7	14.8	34.9	20.5	60.0	50.0	25.1	29.5	L	

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

UL Japan, Inc. Head Office EMC Lab.
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RESULTS

With Nichicon AC Adaptor_A

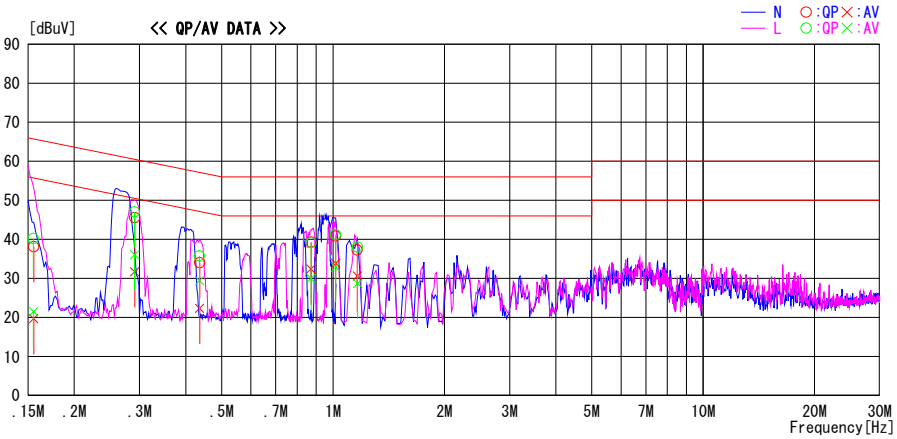
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2014/03/06

Report No. : 10233134H
Power : AC 120V / 60Hz
Temp./Humi. : 20deg.C / 32% RH
Engineer : Shinya Watanabe

Mode / Remarks : Tx 11g 6Mbps 2412MHz AC Adapter:Nichicon

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.15523	24.8	6.4	13.3	38.1	19.7	65.7	55.7	27.6	36.0	N	
0.29136	32.2	18.3	13.4	45.6	31.7	60.5	50.5	14.9	18.8	N	
0.43605	20.6	8.9	13.4	34.0	22.3	57.1	47.1	23.1	24.8	N	
0.87212	25.9	19.0	13.4	39.3	32.4	56.0	46.0	16.7	13.6	N	
1.01638	27.4	20.5	13.4	40.8	33.9	56.0	46.0	15.2	12.1	N	
1.16316	23.9	17.2	13.4	37.3	30.6	56.0	46.0	18.7	15.4	N	
0.15503	26.9	8.2	13.3	40.2	21.5	65.7	55.7	25.5	34.2	L	
0.29101	33.6	22.7	13.4	47.0	36.1	60.5	50.5	13.5	14.4	L	
0.43551	22.3	16.0	13.4	35.7	29.4	57.1	47.1	21.4	17.7	L	
0.87182	25.7	16.6	13.4	39.1	30.0	56.0	46.0	16.9	16.0	L	
1.01621	27.8	19.5	13.4	41.2	32.9	56.0	46.0	14.8	13.1	L	
1.16559	24.6	15.3	13.4	38.0	28.7	56.0	46.0	18.0	17.3	L	

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

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With Nichicon AC Adaptor_B

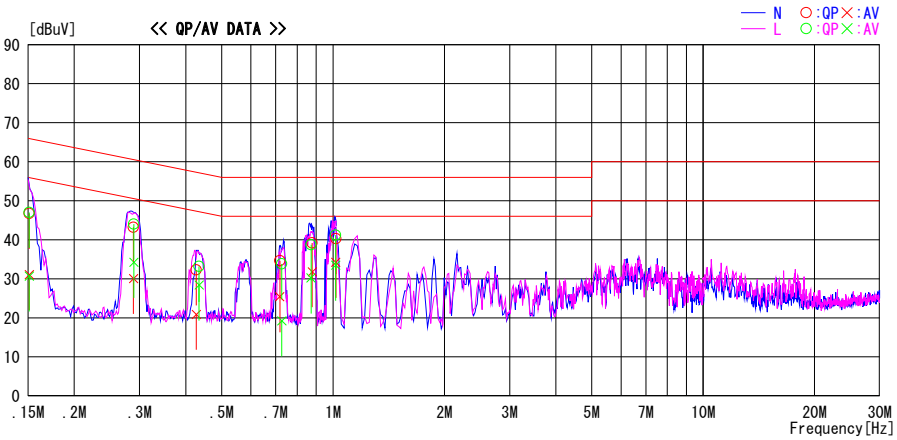
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2014/03/06

Report No. : 10233134H
Power : AC 120V / 60Hz
Temp./Humi. : 20deg.C / 32% RH
Engineer : Shinya Watanabe

Mode / Remarks : Tx 11g 6Mbps 2412MHz AC Adapter:Nichicon

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.15100	33.4	17.8	13.3	46.7	31.1	65.9	55.9	19.2	24.8	N	
0.28899	29.8	16.7	13.4	43.2	30.1	60.6	50.6	17.4	20.5	N	
0.42722	18.9	7.5	13.4	32.3	20.9	57.3	47.3	25.0	26.4	N	
0.71838	21.3	12.0	13.4	34.7	25.4	56.0	46.0	21.4	20.6	N	
0.87878	25.8	18.4	13.4	39.2	31.8	56.0	46.0	16.8	14.2	N	
1.01734	26.9	20.8	13.4	40.3	34.2	56.0	46.0	15.7	11.8	N	
0.15100	33.7	17.4	13.3	47.0	30.7	65.9	55.9	18.9	25.2	L	
0.28948	30.6	20.8	13.4	44.0	34.2	60.5	50.5	16.5	16.3	L	
0.43473	19.8	15.0	13.4	33.2	28.4	57.2	47.2	24.0	18.8	L	
0.72710	20.4	5.8	13.4	33.8	19.2	56.0	46.0	22.2	26.8	L	
0.87187	25.3	16.8	13.4	38.7	30.2	56.0	46.0	17.3	15.8	L	
1.01699	27.8	20.1	13.4	41.2	33.5	56.0	46.0	14.8	12.5	L	

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

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