RF TEST REPORT

Test item	:	Industrial PDA
Model No.	:	BIP-1530
Order No.	:	DEMC1206-00819
Date of receipt	:	2012-06-04
Test duration	:	2012-07-30 ~ 2012-08-28 & 2012-09-27 ~ 2012-10-04
Date of issue	:	2012-09-21
Use of report	:	FCC Original Grant

Applicant : Bluebird Soft Inc.
1242, Gaepo-dong ,Gangnam-Gu, Seoul, Korea

Test laboratory : Digital EMC Co., Ltd.
683-3, Yubang-Dong, Cheoin-Gu, Yongin-Si, Kyunggi-Do, 449-080, Korea

Test specification	:	FCC Part 15 Subpart C 247
Test environment	:	See appended test report
Test result	:	☒ Pass ☐ Fail

The test results presented in this test report are limited only to the sample supplied by applicant and the use of this test report is inhibited other than its purpose. This test report shall not be reproduced except in full, without the written approval of DIGITAL EMC CO., LTD.

Tested by:	Witnessed by:	Reviewed by:
Engineer H.H.Lee	N/A	Deputy General Manager Will Lee

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1. GENERAL INFORMATION

Applicant	:	Bluebird Soft Inc.
Address	:	1242, Gaepo-dong ,Gangnam-Gu, Seoul, Korea
FCC ID	:	SS4BIP1530
EUT	:	Industrial PDA
Model	:	BIP-1530
Additional Model(s)	:	N/A
Data of Test	:	2012-07-30 ~ 2012-08-28 & 2012-09-27 ~ 2012-10-04
Contact person	:	Yong Yeon Kim

2. EUT DESCRIPTION

Product	Industrial PDA
Model Name	BIP-1530
Power Supply	DC 7.4V
Battery type	Standard Battery: Lithium Battery
Frequency Range	2412 ~ 2462MHz
Max. RF Output Power	802.11b: 19.11dBm 802.11g: 19.48dBm
Modulation Type	802.11b: DSSS/CCK 802.11g: OFDM
Antenna Specification	Antenna Type: FPCB Antenna Gain: 1.15 dBi(PK)

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3. TEST METHODOLOGY

The measurement procedure described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz(ANSI C63.4-2003) and KDB558074 D01

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version :2003) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version: 2003)

3.4 DESCRIPTION OF TEST MODES

The EUT has been tested with the operating condition for maximizing the emission characteristics. A test program is used to control the EUT for staying in continuous transmitting. The following test modes were chosen as the worst case mode for full test.

Test cases

Test Case 1 (Basic Test Case)	EUT + PINPAD (13.56MHz RFID)
Test Case 2 (Additional Test Case)	EUT + Finger scan
Test Case 3 (Additional Test Case)	EUT + Payment
Test Case 4 (Additional Test Case)	EUT + Battery Cover

This EUT has 4 optional external modules so above 4 test cases were tested for compliance.

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4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The open area test site(OATS) or semi anechoic chamber and conducted measurement facility used to collect the radiated and conducted test data are located at the 683-3, Yubang-Dong, Yongin-Si, Gyunggi-Do, 449-080, South Korea. The site is constructed in conformance with the requirements.

- Semi anechoic chamber registration Number : 678747

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and peak, quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

6. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

* The antennas of this E.U.T are permanently attached.
* Therefore this E.U.T Complies with the requirement of §15.203

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7. TEST RESULT

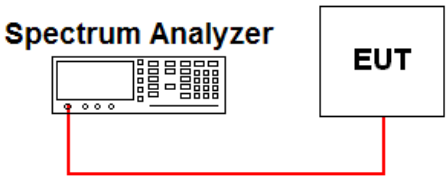
7.1 6dB Bandwidth Measurement

Test Requirements and limit, §15.247(d)

The bandwidth at 6dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the receive antenna while the EUT is operating in transmission mode at the appropriate frequencies.

The minimum permissible 6dB bandwidth is 500 kHz.

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer and used following test procedure of KDB558074.

1. Set resolution bandwidth (RBW) = 1-5 % of the emission bandwidth (EBW). **Actual RBW = 200 KHz**
2. Set the video bandwidth (VBW) ≥ 3 x RBW. **Actual VBW = 620 KHz**
3. Detector = **Peak**.
4. Trace mode = **max hold**.
5. Sweep = **auto couple**.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission. Compare the resultant bandwidth with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is 1-5 %.

▣ TEST RESULTS: Comply

Test Mode	Data Rate	Frequency [MHz]	Test Results [MHz]
802.11b	11Mbps	2412	12.400
		2437	12.440
		2462	12.430
802.11g	54Mbps	2412	16.480
		2437	16.480
		2462	16.490

Note: This test item was performed at test case 1.

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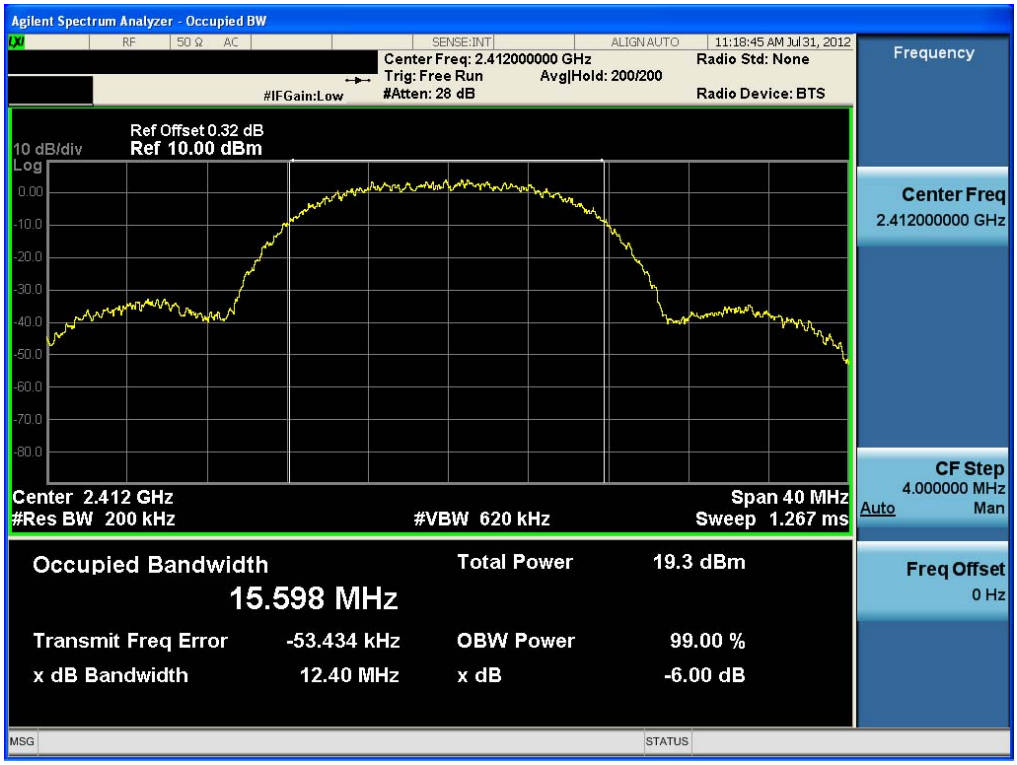
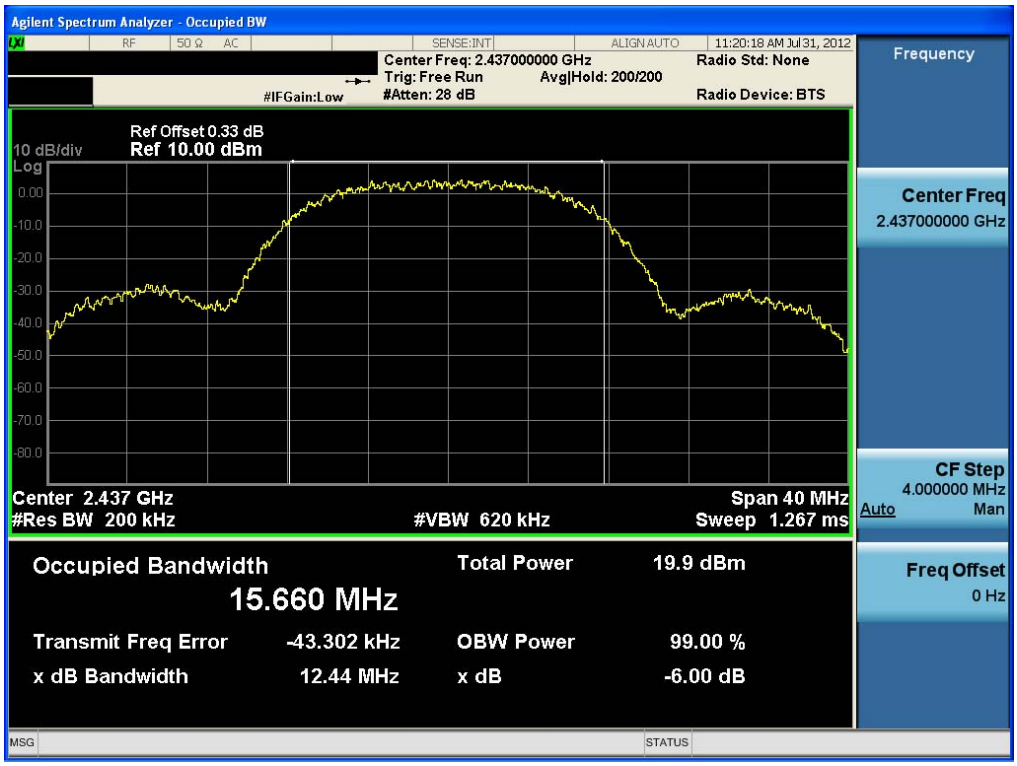
▣ RESULT PLOTS

6 dB Bandwidth Test Mode: 802.11b & 11Mbps & 2412MHz



6 dB Bandwidth Test Mode: 802.11b & 11Mbps & 2437MHz



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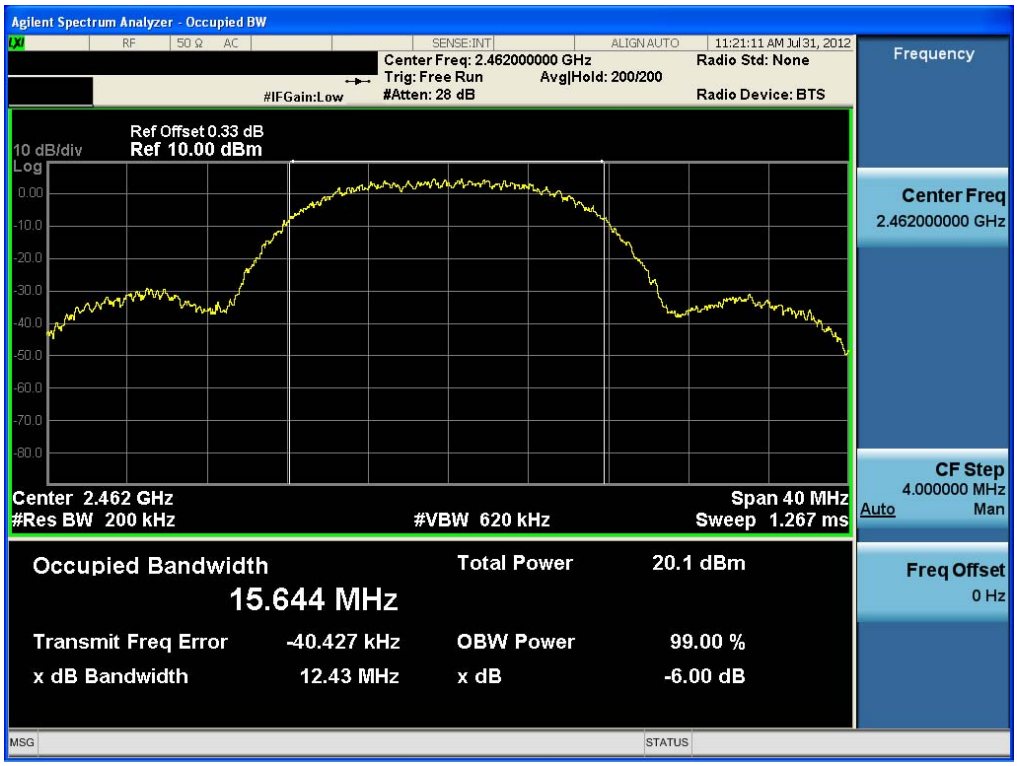
6 dB Bandwidth Test Mode: 802.11b & 11Mbps & 2462MHz



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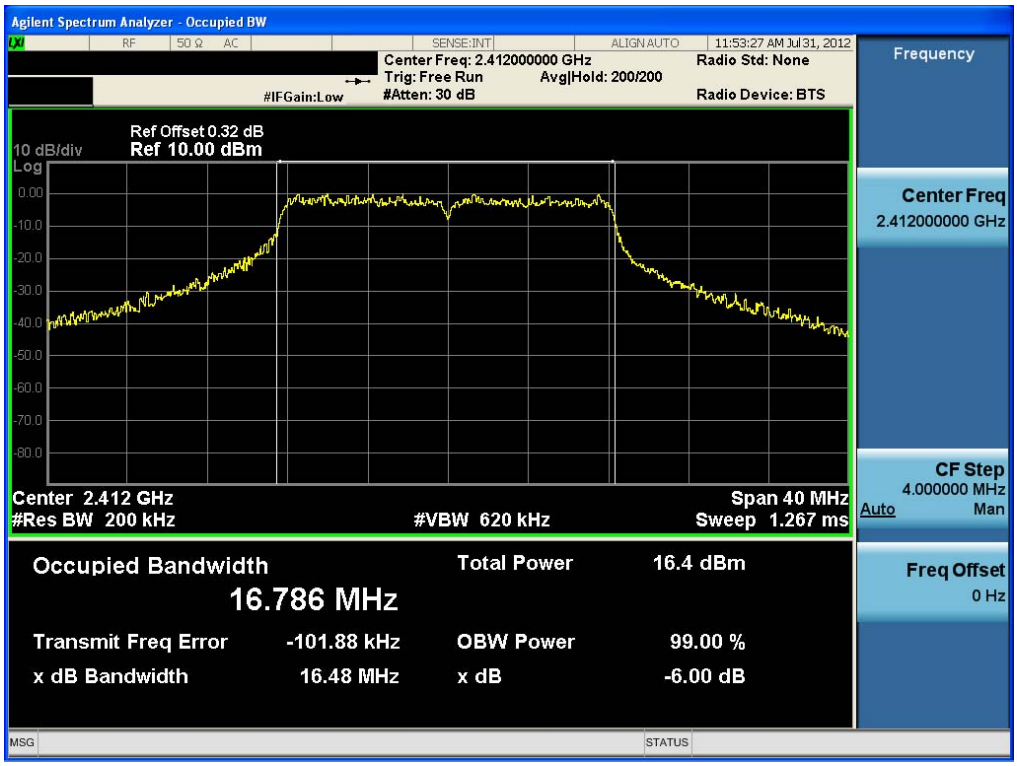
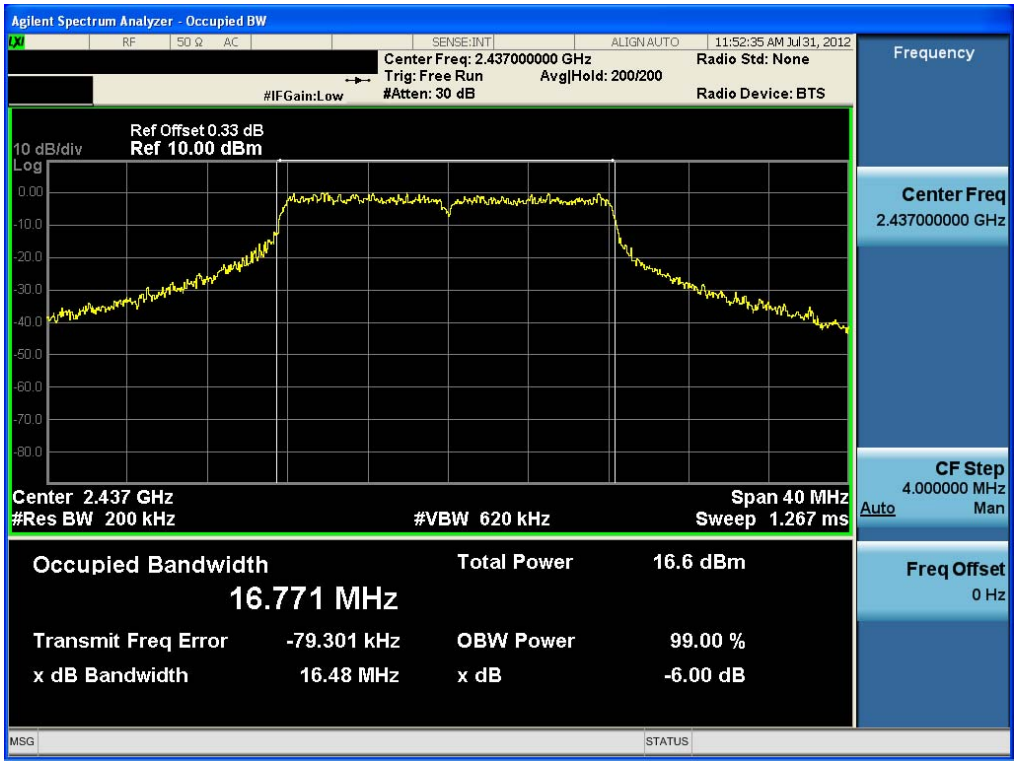
6 dB Bandwidth Test Mode: 802.11g & 54Mbps & 2412MHz



6 dB Bandwidth Test Mode: 802.11g & 54Mbps & 2437MHz



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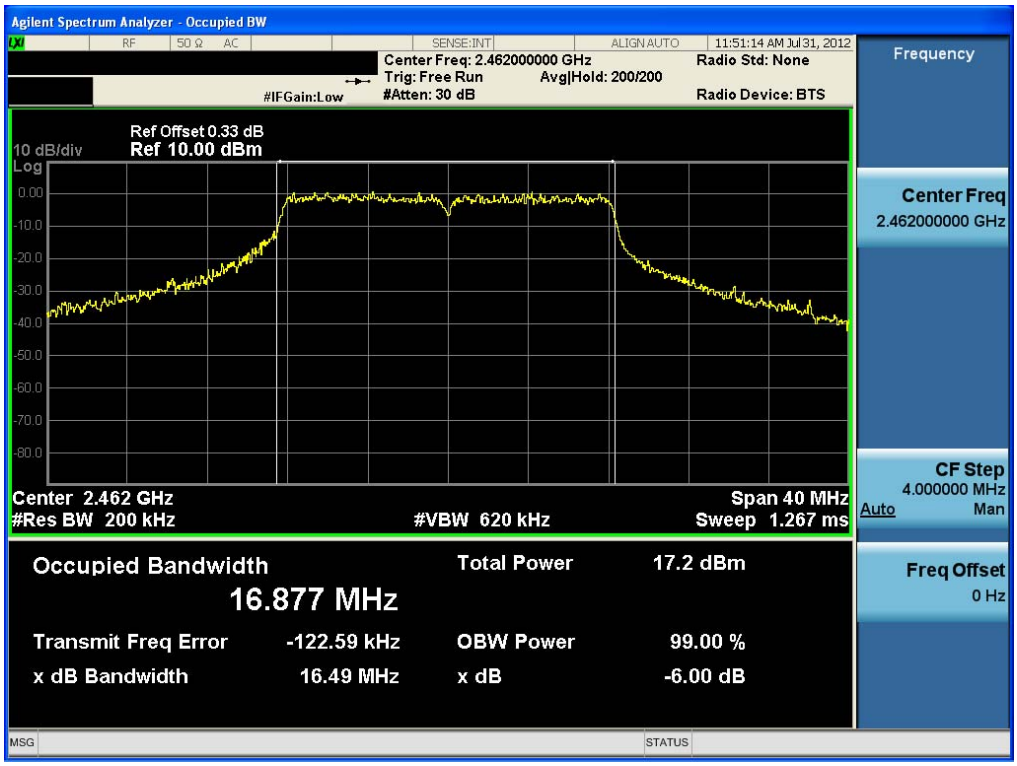
6 dB Bandwidth Test Mode: 802.11g & 54Mbps & 2462MHz



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7.2 Maximum Peak Conducted Output Power

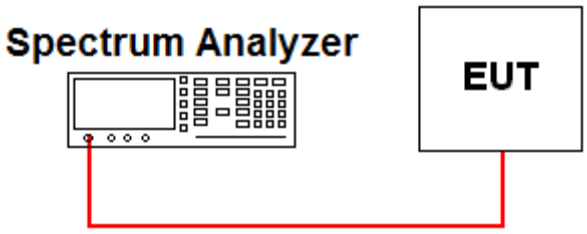
Test Requirements and limit, §15.247(d)

A transmitter antenna terminal of EUT is connected to the input of a spectrum analyzer.

Measurement is made while the EUT is operating in transmission mode at the appropriate frequencies.

The maximum permissible conducted output power is 1 Watt.

▣ TEST CONFIGURATION



Note: Tests were performed all possible data rates and the worst case data were reported.

▣ TEST CONFIGURATION:

Maximum Peak Conducted Output Power is measured using Measurement Procedure PK2 of KDB558074.

1. Set the **RBW = 1 MHz**.
2. Set the **VBW = 3 MHz**.
3. Set the span to a value that is **5-30 %** greater than the EBW.
4. Detector = **peak**.
5. Sweep time = **auto couple**.
6. Trace mode = **max hold**.
7. Allow trace to fully stabilize.
8. Use the spectrum analyzer's integrated band power measurement function with band limits set equal to the EBW band edges (for some analyzers, this may require a manual override to ensure use of peak detector). If the spectrum analyzer does not have a band power function, sum the spectrum levels (in linear power units) at 1 MHz intervals extending across the EBW of the spectrum.

▣ TEST RESULTS: Comply

Test Mode	Data Rate	Test Results[dBm]		
		2412MHz	2437MHz	2462MHz
802.11b	**1 Mbps**	18.20	18.92	**19.11**
802.11g	**6 Mbps**	18.22	18.48	**19.48**

Note 1 : The cable loss was corrected using the offset value of the spectrum analyzer.
Note 2 : This test item was performed at test case 1.

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▣ RESULT PLOTS

Peak Output Power Test Mode: 802.11b & 11Mbps & 2412MHz

Peak Output Power Test Mode: 802.11b & 11Mbps & 2437MHz

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Peak Output Power Test Mode: 802.11b & 11Mbps & 2462MHz

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Peak Output Power Test Mode: 802.11g & 54Mbps & 2412MHz

Peak Output Power Test Mode: 802.11g & 54Mbps & 2437MHz

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Peak Output Power Test Mode: 802.11g & 54Mbps & 2462MHz

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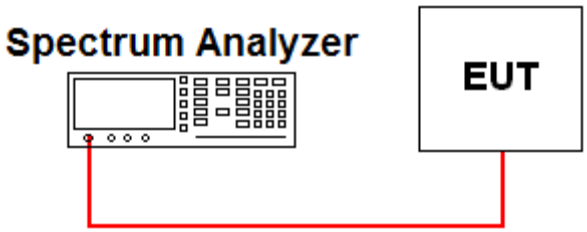
7.3 Maximum Power Spectral Density

Test requirements and limit, §15.247(d)

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

Minimum Standard –specifies a conducted power spectral density (PSD) limit of 8 dBm in any 3 kHz band segment within the fundamental EBW during any time interval of continuous transmission.

▣ TEST CONFIGURATION



▣ TEST PROCEDURE:

The Measurement Procedure **PKPSD of KDB558074** is used.
1. Set the **RBW = 100 kHz**.
2. Set the **VBW ≥ 300 kHz**.
3. Set the span to **5-30 %** greater than the EBW.
4. Detector = **peak**.
5. Sweep time = **auto couple**.
6. Trace mode = **max hold**.
7. Allow trace to fully stabilize.
8. Use the **peak marker function** to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
9. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where **BWCF = 10log (3 kHz/100 kHz = -15.2 dB)**.
10. The resulting peak PSD level must be ≤ 8 dBm.

▣ TEST RESULTS: Comply

Test Mode	Data Rate	Frequency [MHz]	S/A Reading [dBm]	B.W.C.F [dB]	PKPSD [dBm]
802.11b	11Mbps	2412	2.101	-15.2	-13.10
		2437	2.683	-15.2	-12.52
		2462	3.431	-15.2	-11.77
802.11g	54Mbps	2412	-0.250	-15.2	-15.45
		2437	0.370	-15.2	-14.83
		2462	1.152	-15.2	-14.05

Note 1: The cable loss was corrected using the offset value of the spectrum analyzer.
Note 2: This test item was performed at test case 1.

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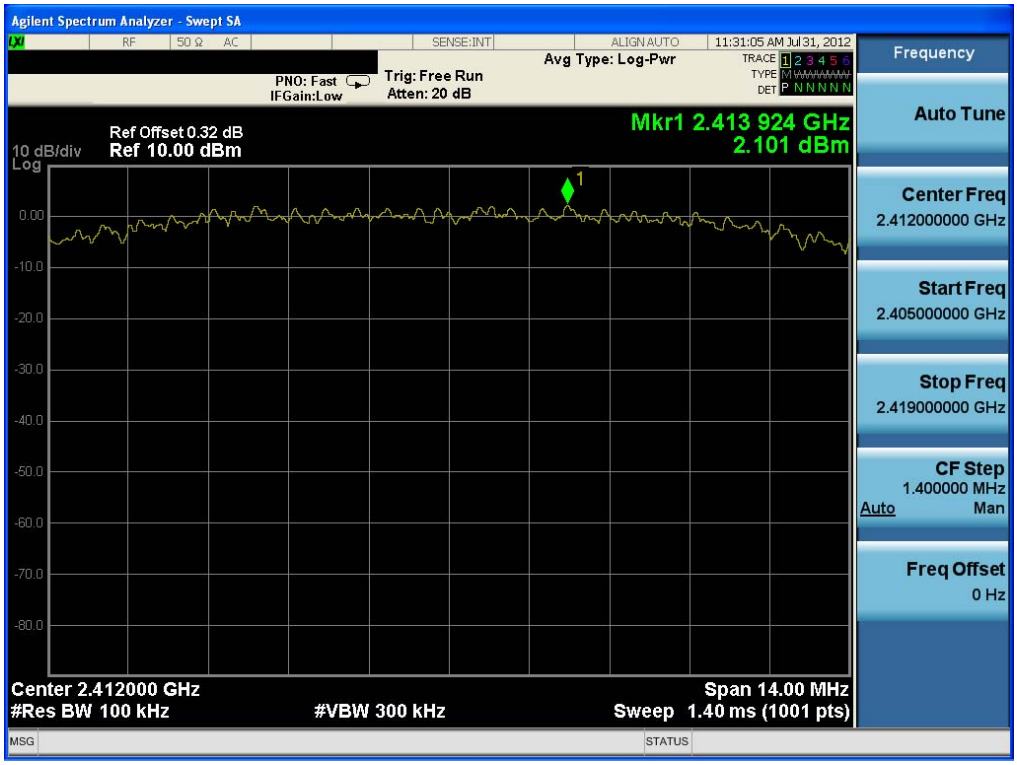
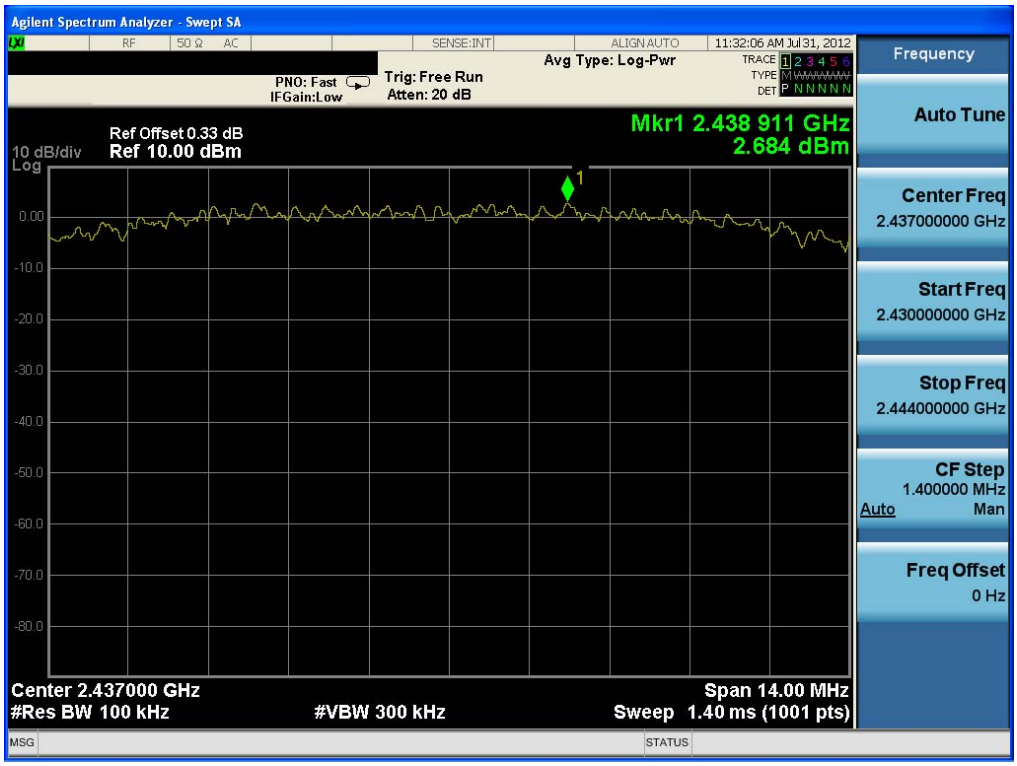
▣ RESULT PLOTS

Maximum PKPSD Test Mode: 802.11b & 11Mbps & 2412MHz



Maximum PKPSD Test Mode: 802.11b & 11Mbps & 2437MHz



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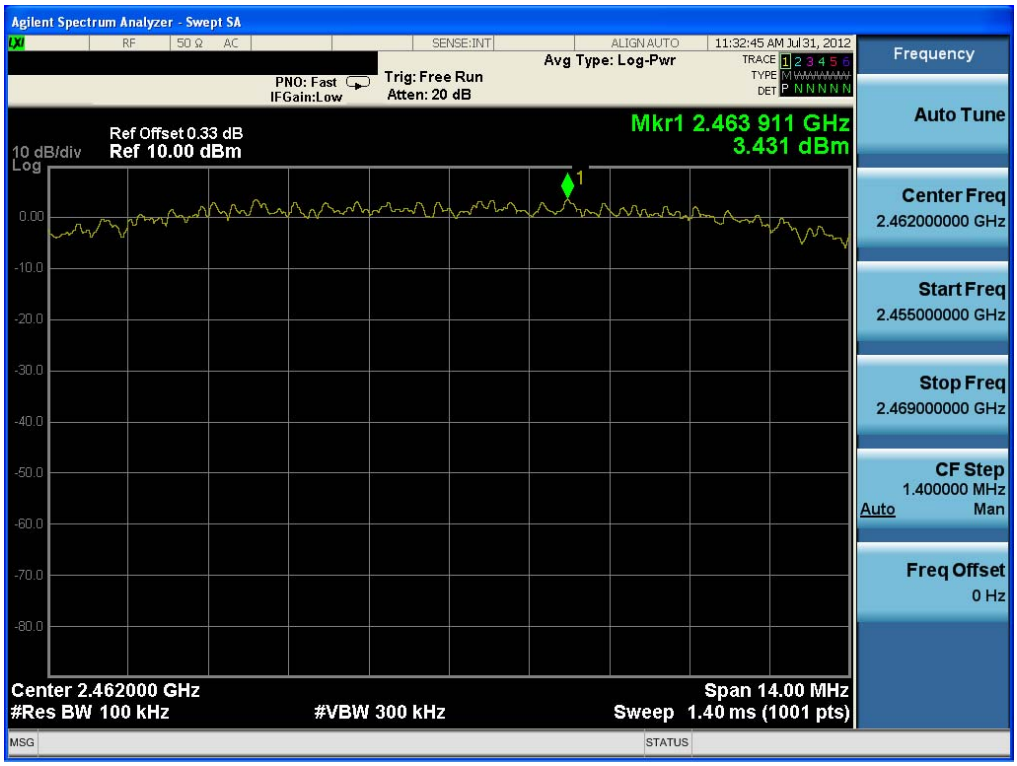
Maximum PKPSD Test Mode: 802.11b & 11Mbps & 2462MHz



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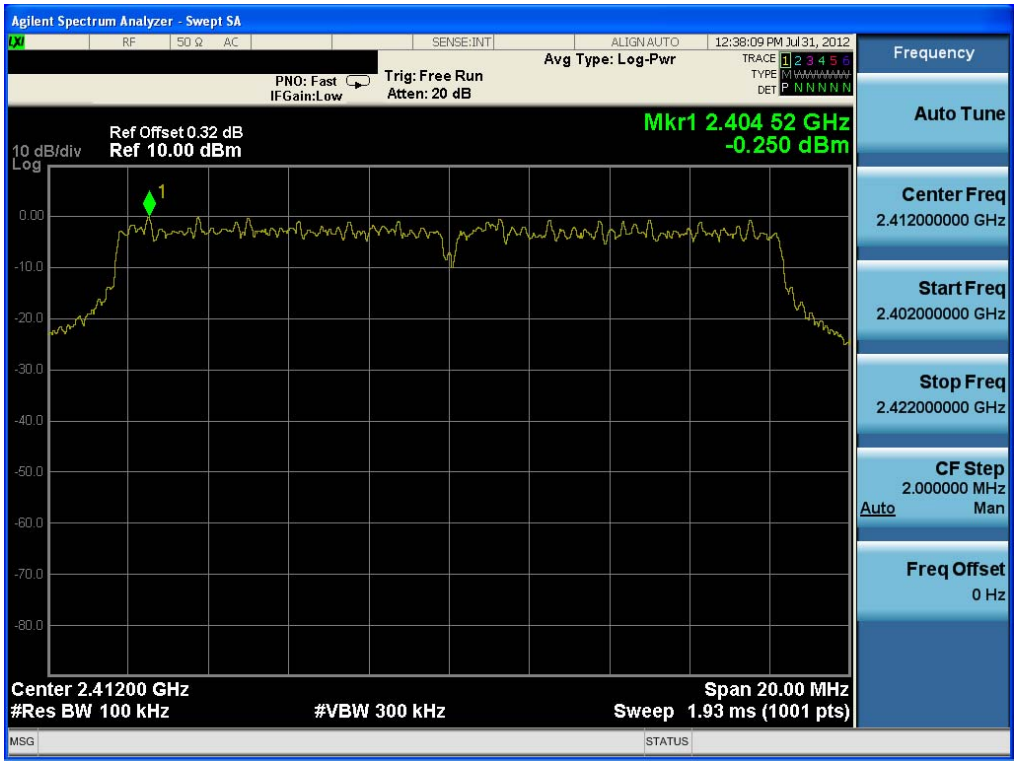
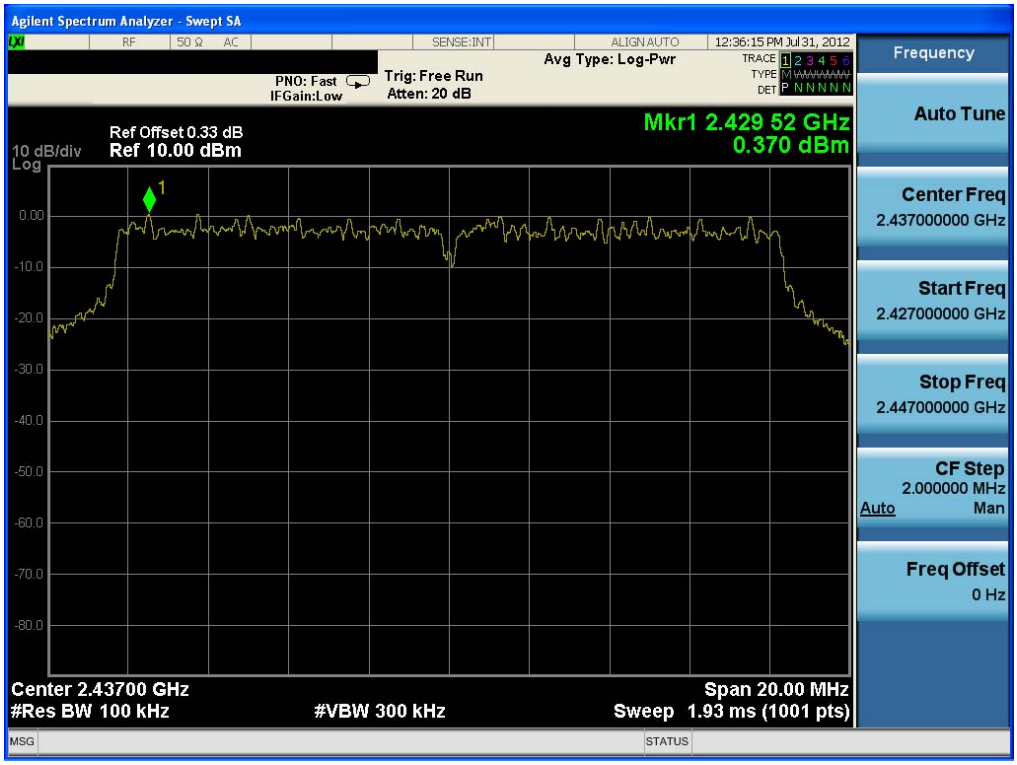
Maximum PKPSD Test Mode: 802.11g & 54Mbps & 2412MHz



Maximum PKPSD Test Mode: 802.11g & 54Mbps & 2437MHz



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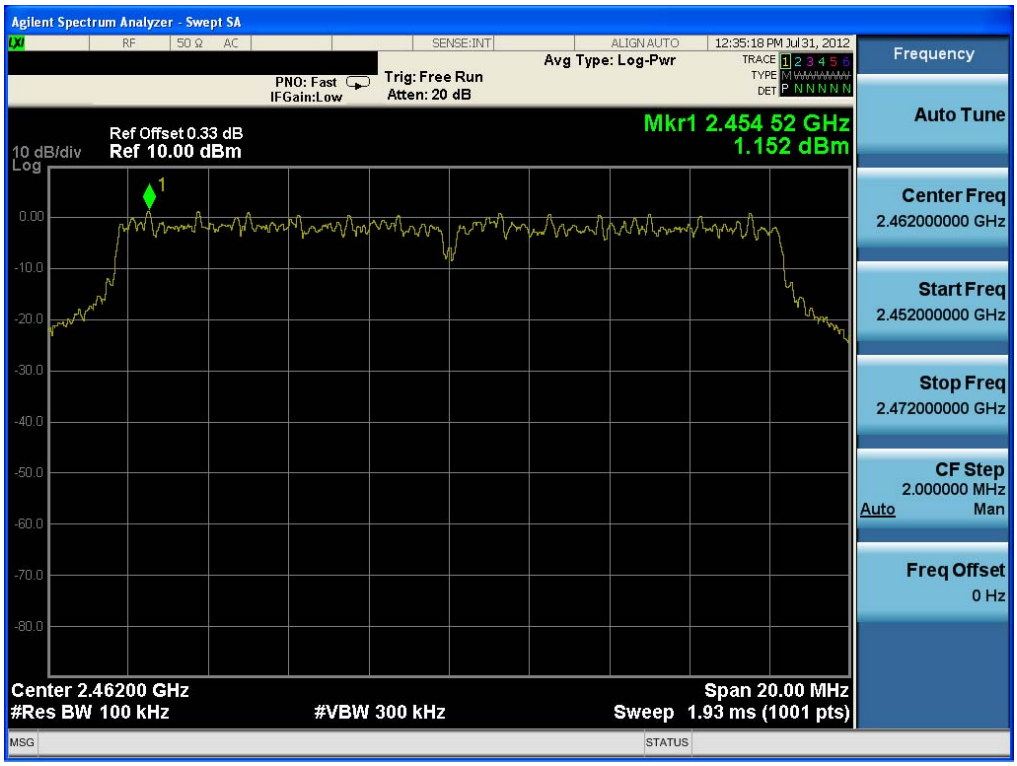
Maximum PKPSD Test Mode: 802.11g & 54Mbps & 2462MHz



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7.4 Out of Band Emissions at the Band Edge/ Conducted Spurious

Test requirements and limit, §15.247(d)

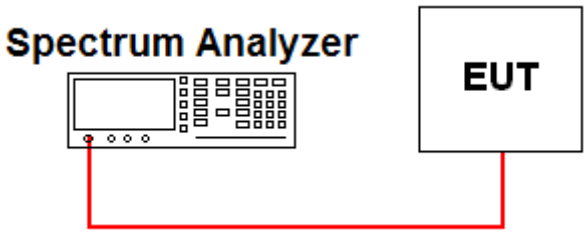
§15.247(d) specifies that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:

If **the peak output power procedure** is used to measure the fundamental emission power to demonstrate compliance to **15.247(b)(3)** requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated **by at least 20 dB** relative to the maximum measured in-band peak PSD level.

If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to **15.247(b)(3)** requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured inband average PSD level.

In either case, attenuation to levels below the general emission limits specified in **§15.209(a)** is not required.

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer.

- Measurement Procedure 1 – Reference Level

1. Set the **RBW = 100 kHz**.
2. Set the **VBW ≥ 300 kHz**.
3. Set the span to **5-30 %** greater than the EBW.
4. Detector = **peak**.
5. Sweep time = **auto couple**.
6. Trace mode = **max hold**.
7. Allow trace to fully stabilize.
8. Use the **peak marker function** to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
   Next, **determine the power** in 100 kHz band segments outside of the authorized frequency band using the following measurement:

- Measurement Procedure 2 - Unwanted Emissions

1. Set **RBW = 100 kHz**.
2. Set **VBW ≥ 300 kHz**.
3. Set **span to encompass the spectrum** to be examined.
4. Detector = **peak**.
5. Trace Mode = **max hold**.
6. Sweep = **auto couple**.
7. Allow the trace to stabilize (this may take some time, depending on the extent of the span).

Note: This test item was performed at test case 1.

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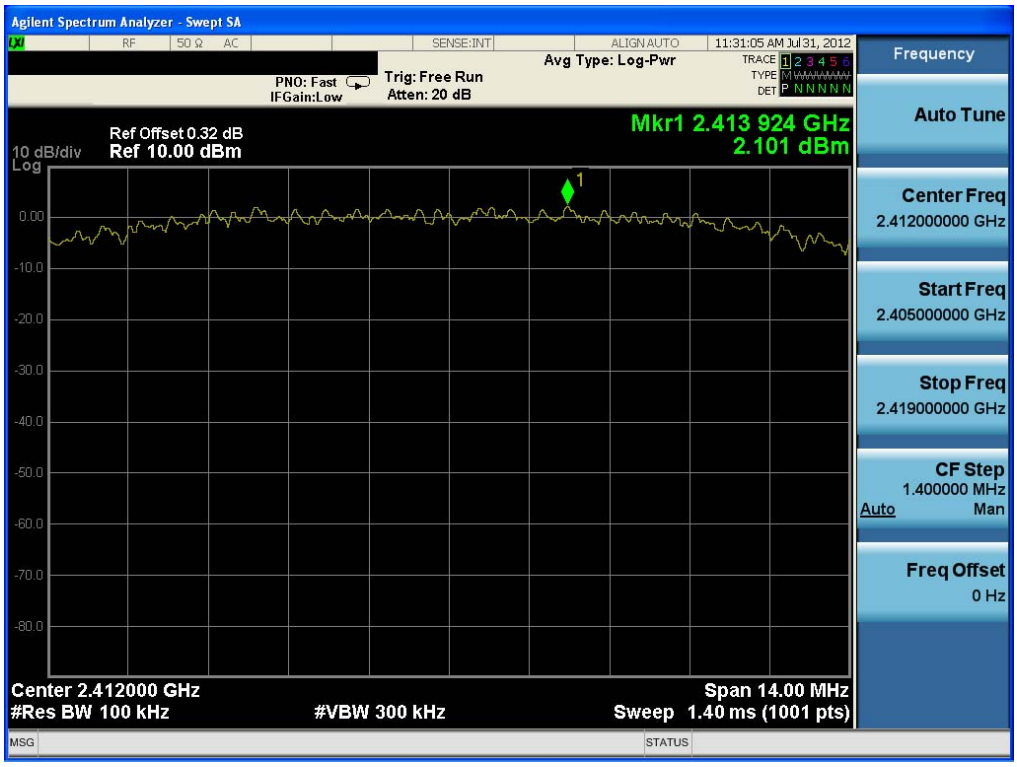
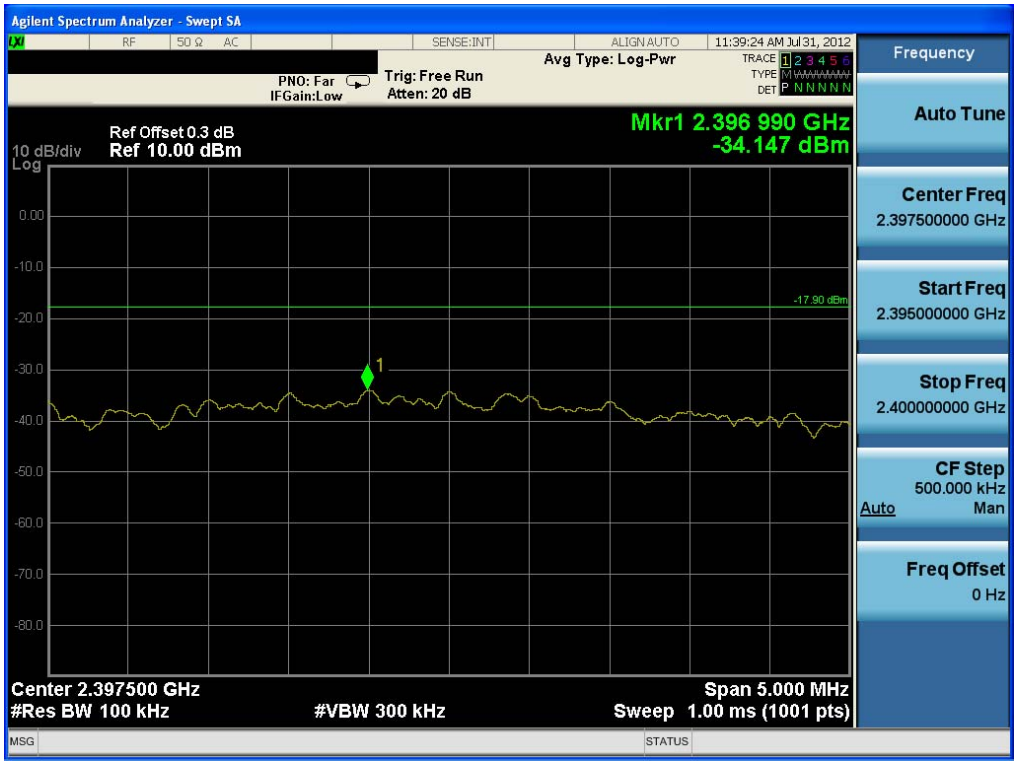
▣ RESULT PLOTS

802.11b & 11Mbps & 2412MHz

Reference



Low Band-edge



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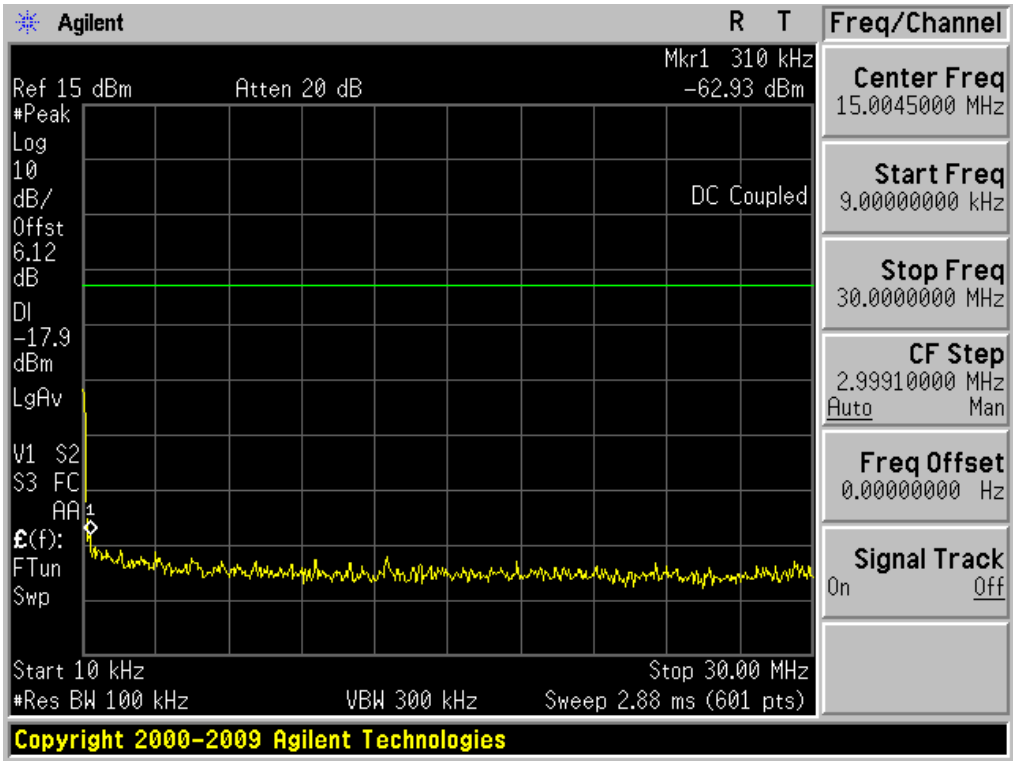
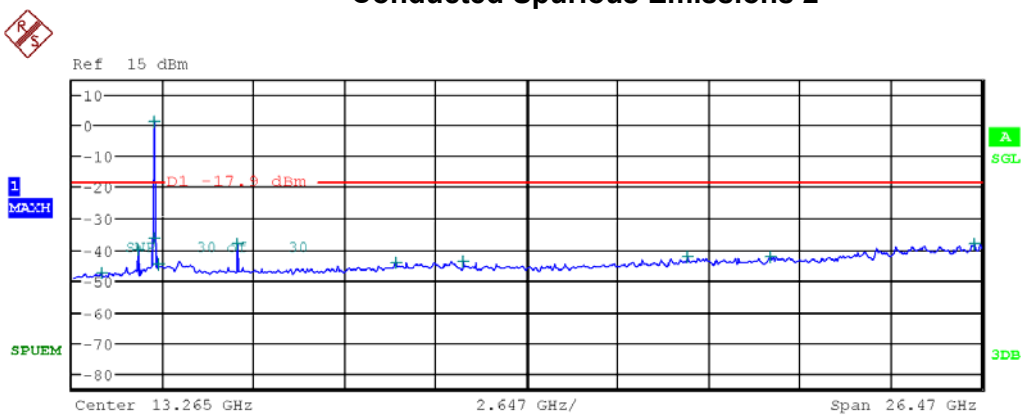
Conducted Spurious Emissions 1



Conducted Spurious Emissions 2



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	100.00 k	884.182000 M	-47.83	-200.00
1.000 G	2.000 G	100.00 k	1.947000 G	-40.07	-200.00
2.000 G	2.400 G	100.00 k	2.397511 G	-36.33	-200.00
2.400 G	2.483 G	100.00 k	2.412692 G	1.17	-200.00
2.483 G	3.000 G	100.00 k	2.516441 G	-44.94	-200.00
3.000 G	6.000 G	100.00 k	4.824000 G	-38.23	-200.00
6.000 G	10.000 G	100.00 k	9.455500 G	-44.50	-200.00
10.000 G	14.000 G	100.00 k	11.389000 G	-44.06	-200.00
14.000 G	18.000 G	100.00 k	17.937500 G	-42.73	-200.00
18.000 G	22.000 G	100.00 k	20.349000 G	-42.32	-200.00
22.000 G	26.500 G	100.00 k	26.271062 G	-38.27	-200.00

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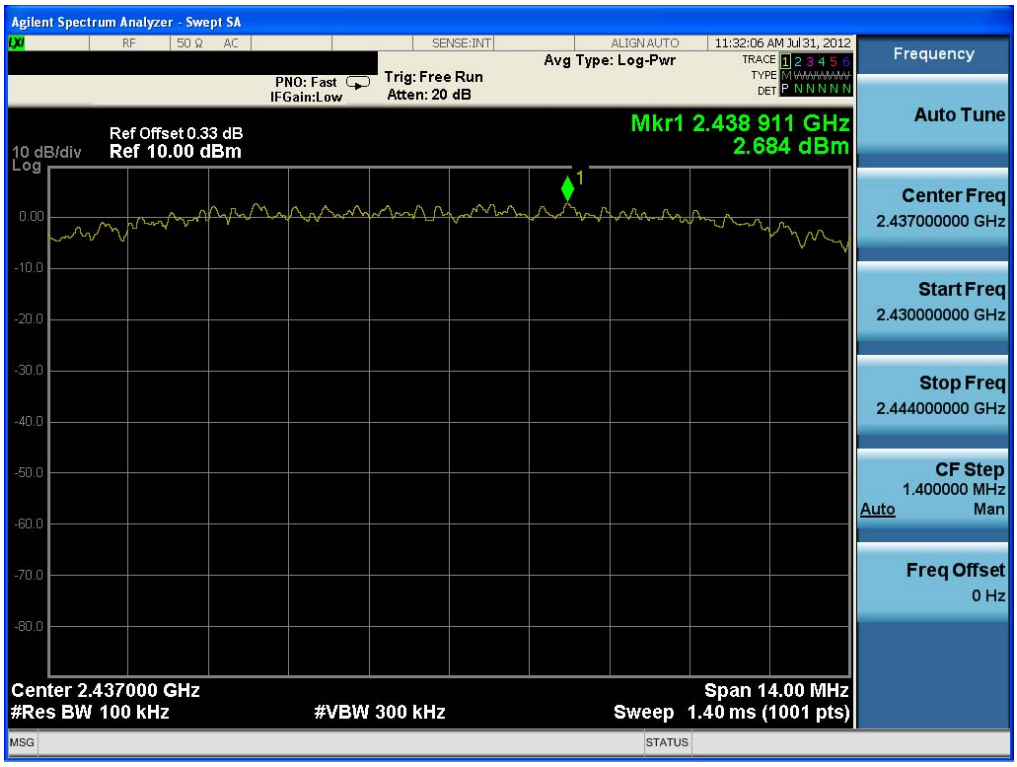
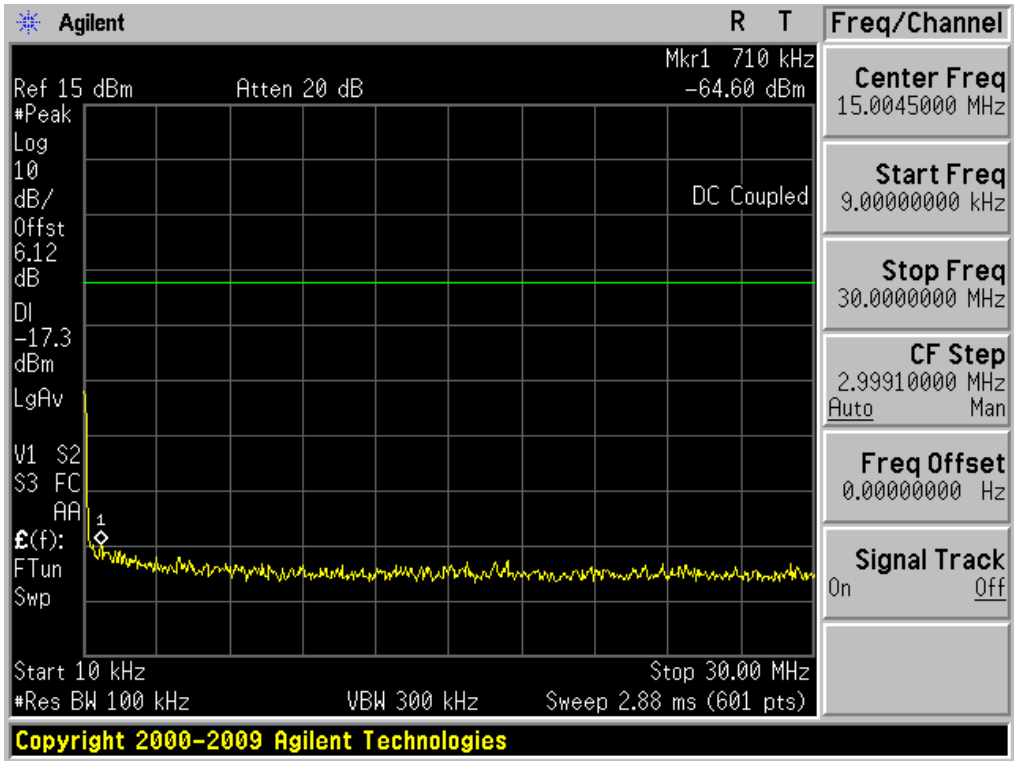
802.11b & 11Mbps & 2437MHz

Reference



Conducted Spurious Emissions 1



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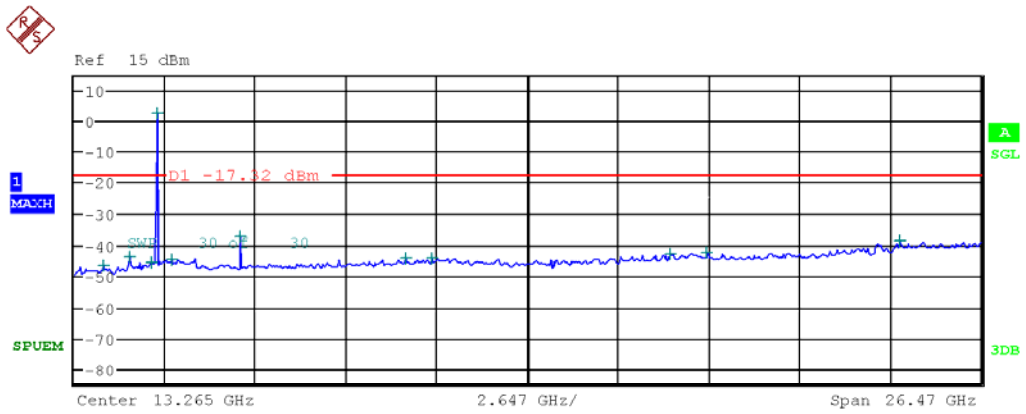
Conducted Spurious Emissions 2



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
30.000 M	1.000 G	100.00 k	863.424000 M	-46.55	-200.00
1.000 G	2.000 G	100.00 k	1.624800 G	-44.10	-200.00
2.000 G	2.400 G	100.00 k	2.287778 G	-45.74	-200.00
2.400 G	2.483 G	100.00 k	2.437692 G	2.71	-200.00
2.483 G	3.000 G	100.00 k	2.875868 G	-44.81	-200.00
3.000 G	6.000 G	100.00 k	4.873875 G	-37.51	-200.00
6.000 G	10.000 G	100.00 k	9.704500 G	-44.25	-200.00
10.000 G	14.000 G	100.00 k	10.474500 G	-44.35	-200.00
14.000 G	18.000 G	100.00 k	17.437500 G	-42.77	-200.00
18.000 G	22.000 G	100.00 k	18.503500 G	-42.61	-200.00
22.000 G	26.500 G	100.00 k	24.124000 G	-38.84	-200.00

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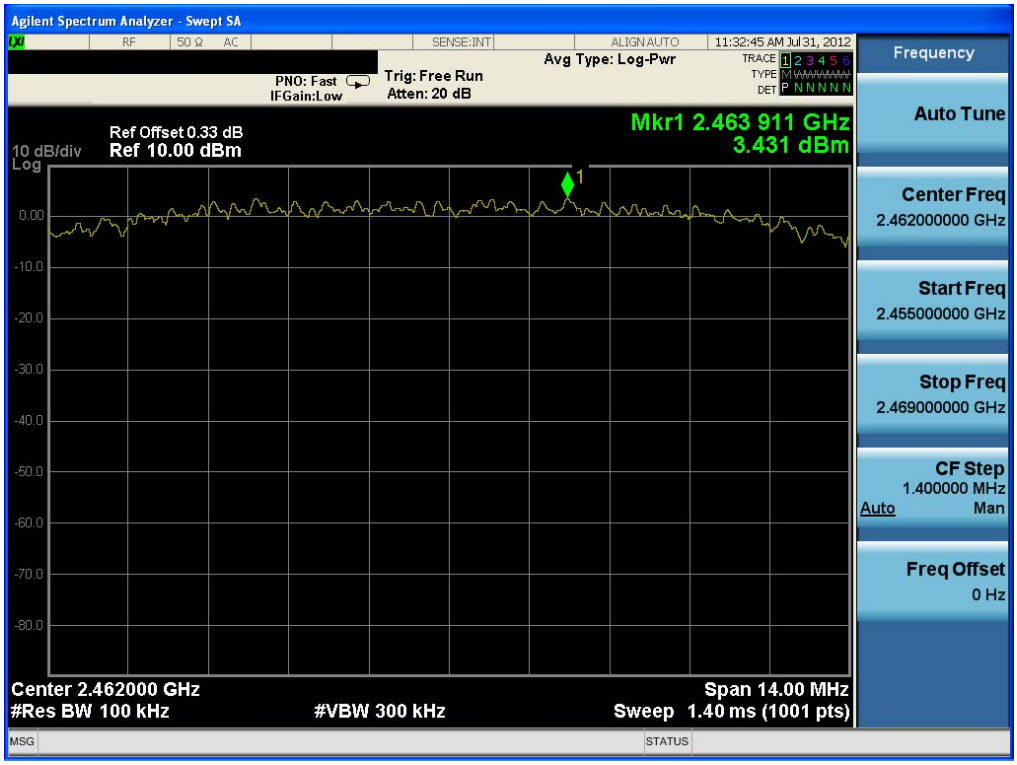
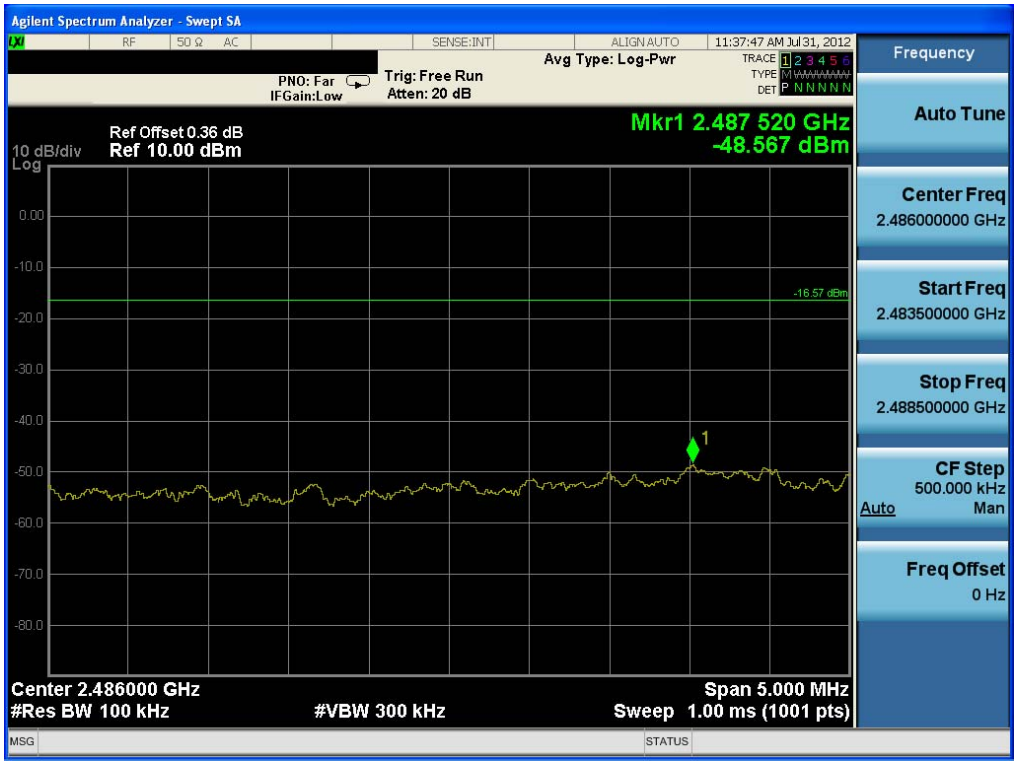
802.11b & 11Mbps & 2462MHz

Reference



High Band-edge



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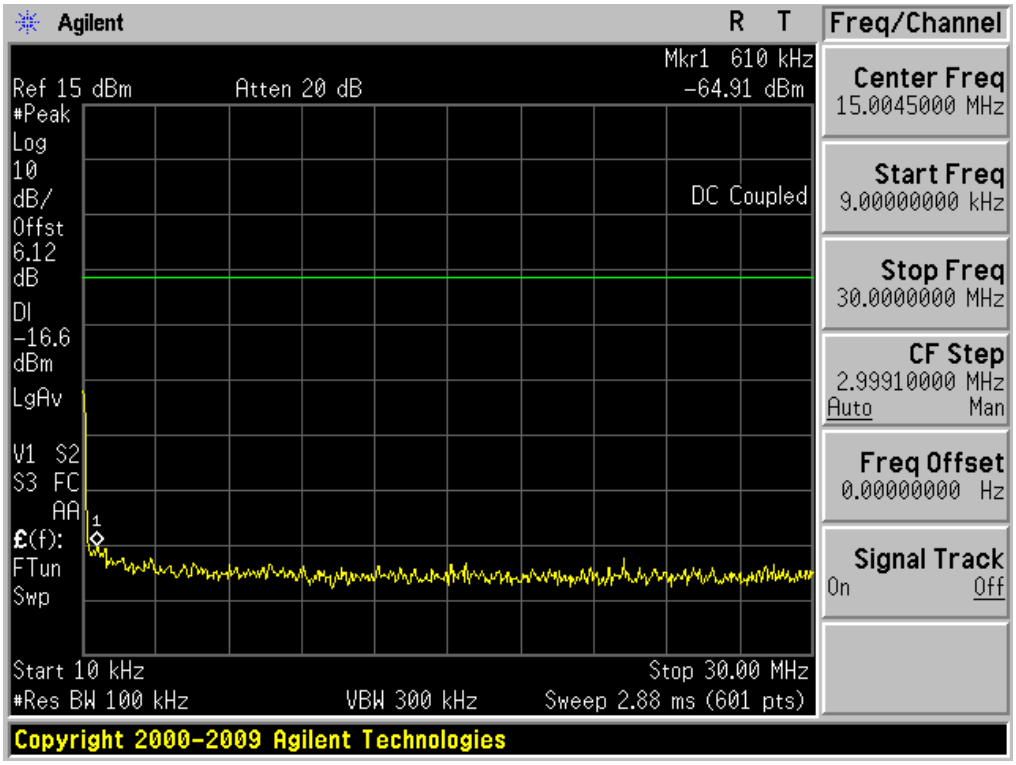
Conducted Spurious Emissions 1



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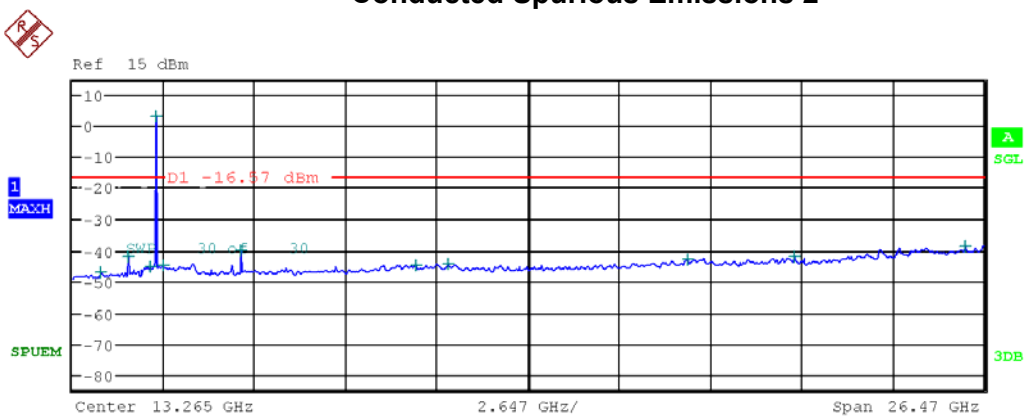

Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	100.00 k	829.086000 M	-47.40	-200.00
1.000 G	2.000 G	100.00 k	1.641400 G	-42.27	-200.00
2.000 G	2.400 G	100.00 k	2.297467 G	-45.32	-200.00
2.400 G	2.483 G	100.00 k	2.462692 G	2.96	-200.00
2.483 G	3.000 G	100.00 k	2.678048 G	-44.70	-200.00
3.000 G	6.000 G	100.00 k	4.924125 G	-39.97	-200.00
6.000 G	10.000 G	100.00 k	9.978500 G	-44.89	-200.00
10.000 G	14.000 G	100.00 k	10.933500 G	-44.41	-200.00
14.000 G	18.000 G	100.00 k	17.890000 G	-42.96	-200.00
18.000 G	22.000 G	100.00 k	20.988000 G	-42.23	-200.00
22.000 G	26.500 G	100.00 k	25.949875 G	-38.60	-200.00

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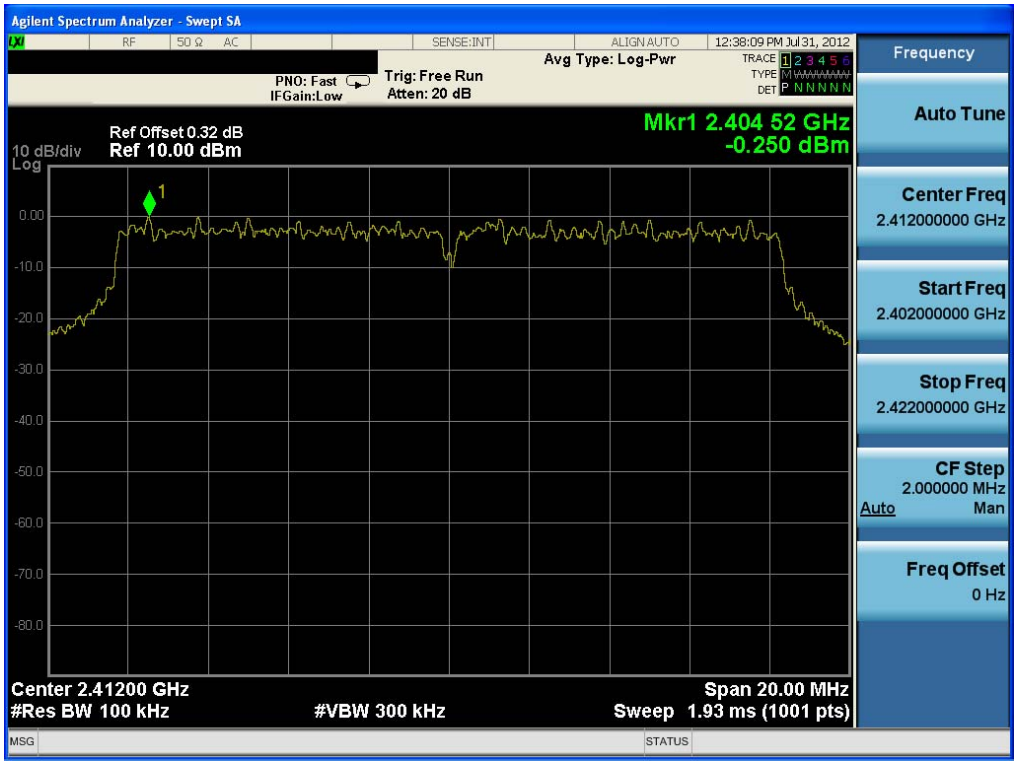
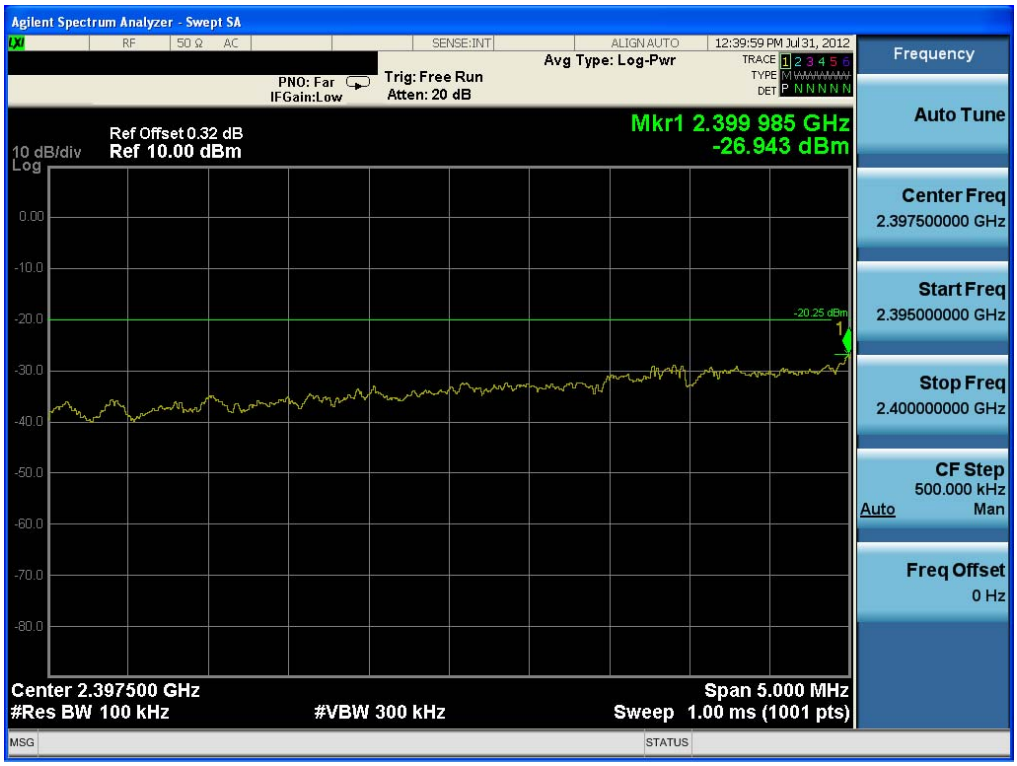
802.11g & 54Mbps & 2412MHz

Reference



Low Band-edge



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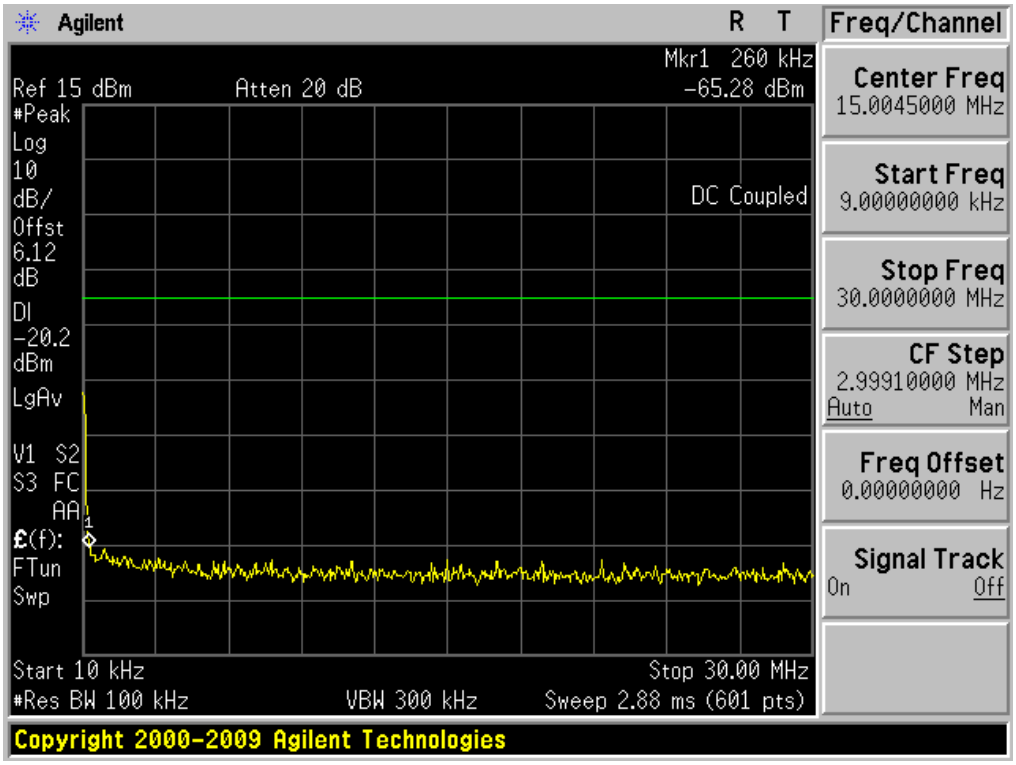
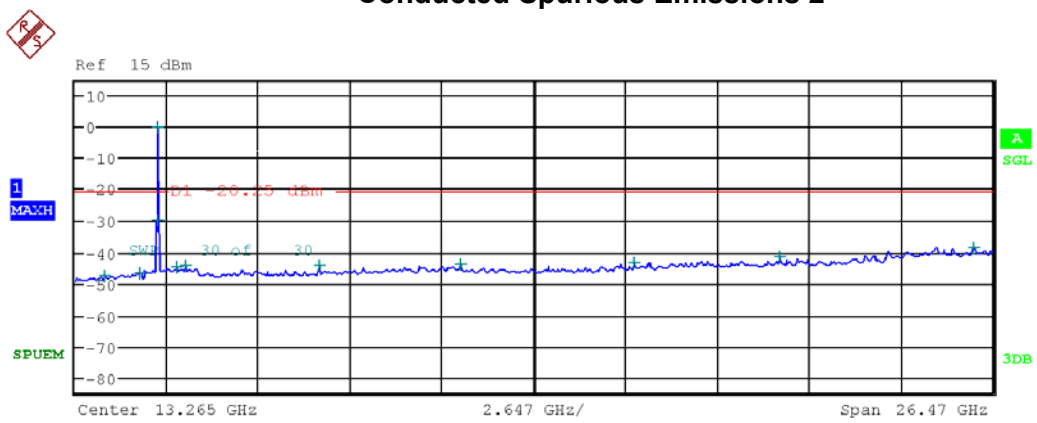
Conducted Spurious Emissions 1



Conducted Spurious Emissions 2



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
30.000 M	1.000 G	100.00 k	891.554000 M	-47.86	-200.00
1.000 G	2.000 G	100.00 k	1.898000 G	-46.70	-200.00
2.000 G	2.400 G	100.00 k	2.399289 G	-29.68	-200.00
2.400 G	2.483 G	100.00 k	2.405745 G	-0.16	-200.00
2.483 G	3.000 G	100.00 k	2.965854 G	-44.98	-200.00
3.000 G	6.000 G	100.00 k	3.216000 G	-44.29	-200.00
6.000 G	10.000 G	100.00 k	7.070000 G	-44.27	-200.00
10.000 G	14.000 G	100.00 k	11.126000 G	-44.06	-200.00
14.000 G	18.000 G	100.00 k	16.148000 G	-43.33	-200.00
18.000 G	22.000 G	100.00 k	20.354000 G	-41.53	-200.00
22.000 G	26.500 G	100.00 k	25.943687 G	-38.81	-200.00

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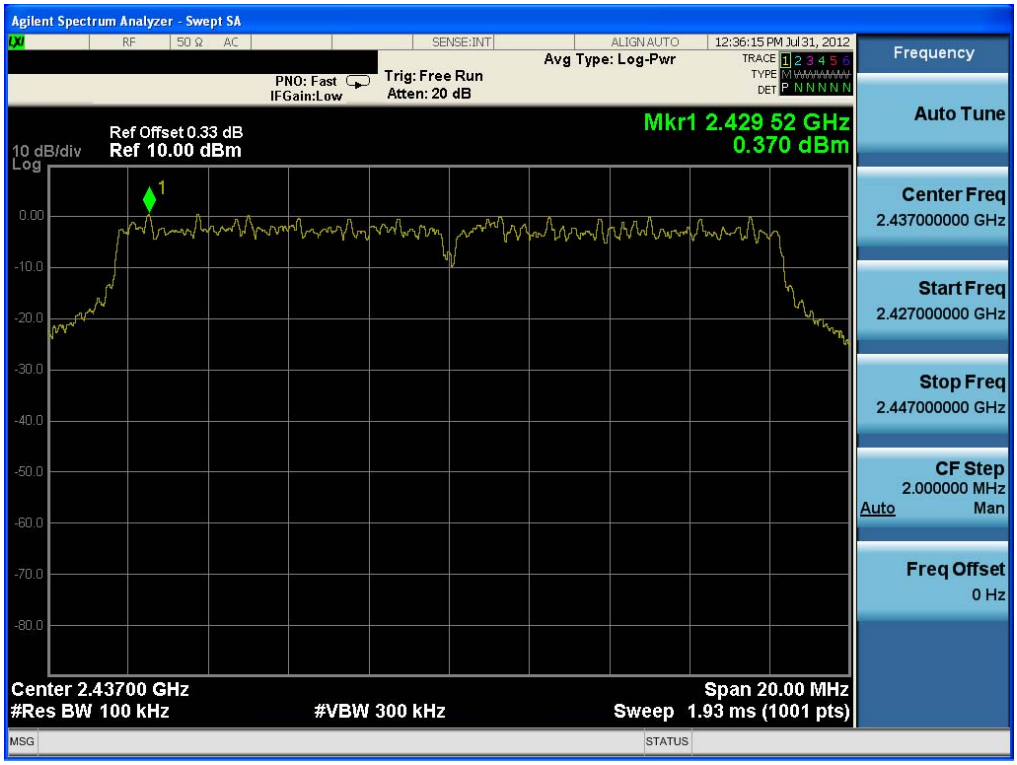
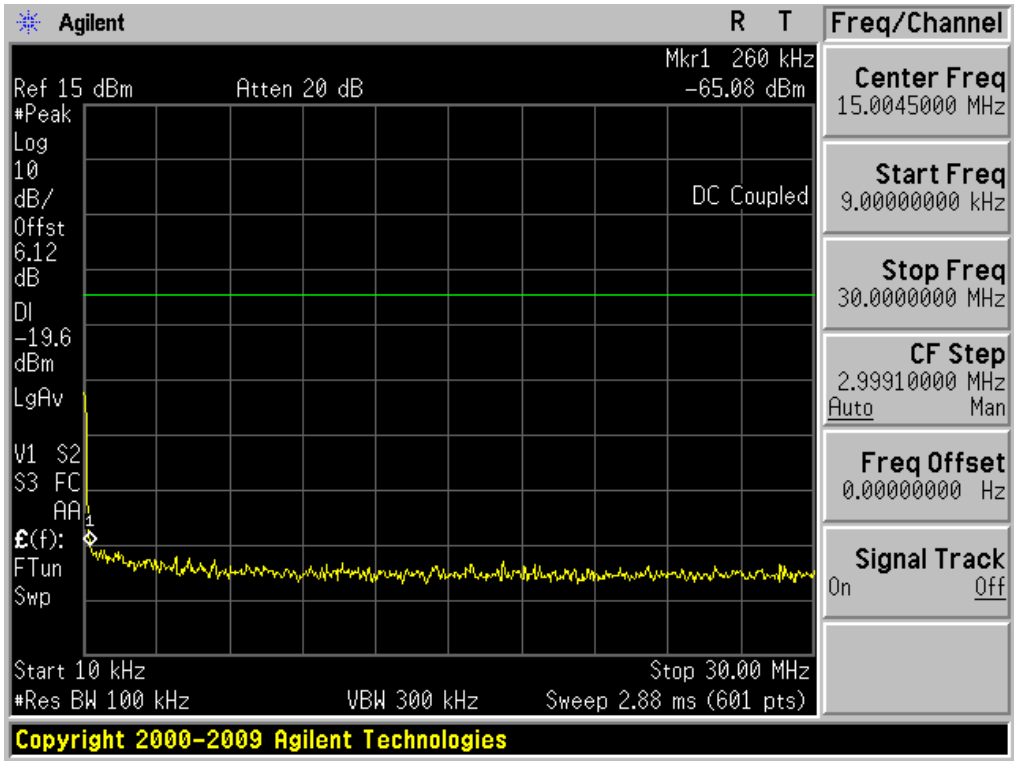
802.11g & 54Mbps & 2437MHz

Reference



Conducted Spurious Emissions 1



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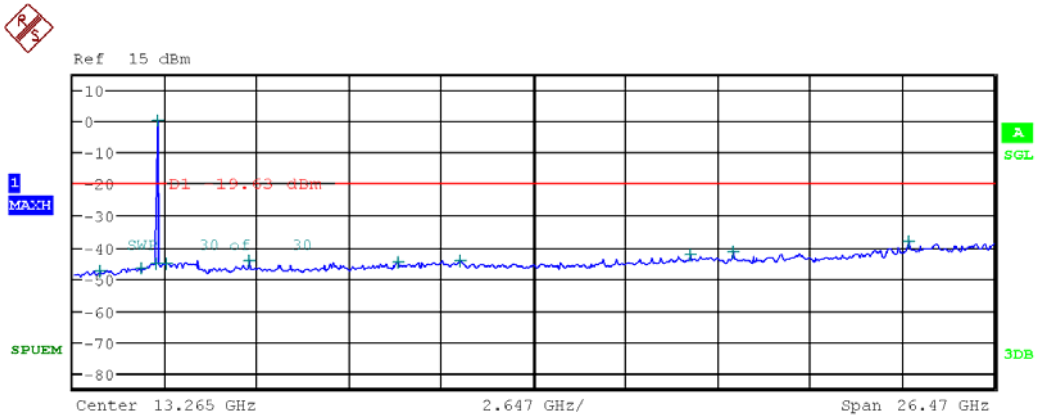
Conducted Spurious Emissions 2



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
30.000 M	1.000 G	100.00 k	810.462000 M	-47.72	-200.00
1.000 G	2.000 G	100.00 k	1.971000 G	-46.78	-200.00
2.000 G	2.400 G	100.00 k	2.392133 G	-45.38	-200.00
2.400 G	2.483 G	100.00 k	2.431997 G	0.33	-200.00
2.483 G	3.000 G	100.00 k	2.689870 G	-45.14	-200.00
3.000 G	6.000 G	100.00 k	5.077125 G	-44.51	-200.00
6.000 G	10.000 G	100.00 k	9.383000 G	-44.68	-200.00
10.000 G	14.000 G	100.00 k	11.135500 G	-44.25	-200.00
14.000 G	18.000 G	100.00 k	17.741500 G	-42.34	-200.00
18.000 G	22.000 G	100.00 k	19.002500 G	-41.79	-200.00
22.000 G	26.500 G	100.00 k	24.056500 G	-38.37	-200.00

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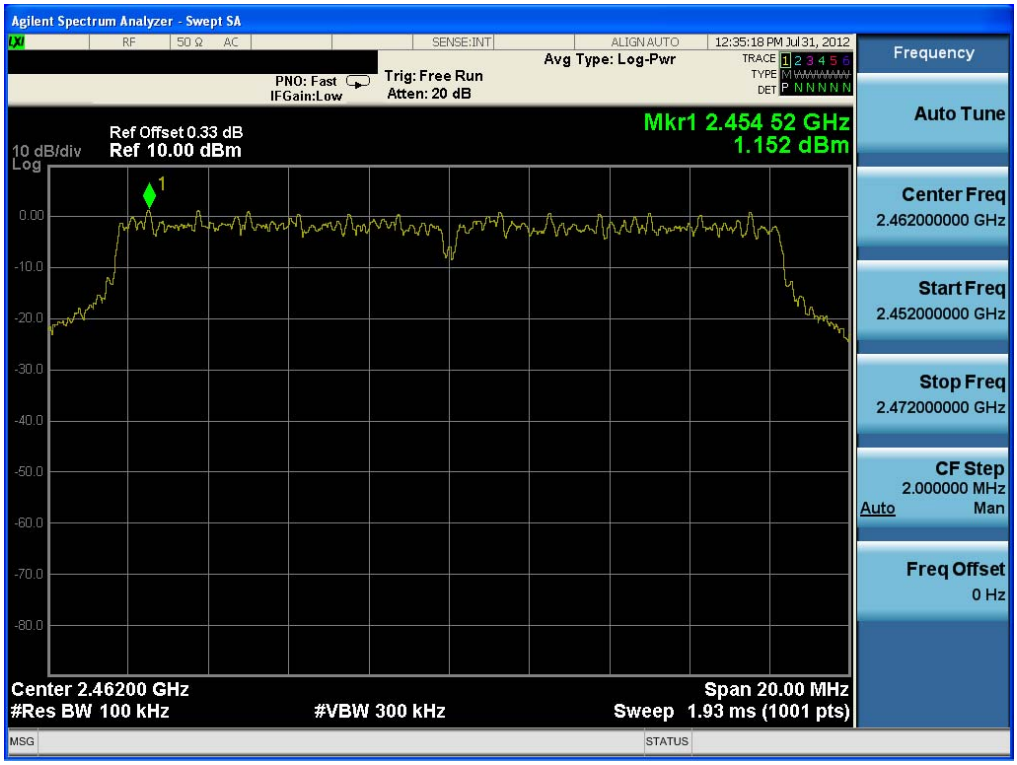
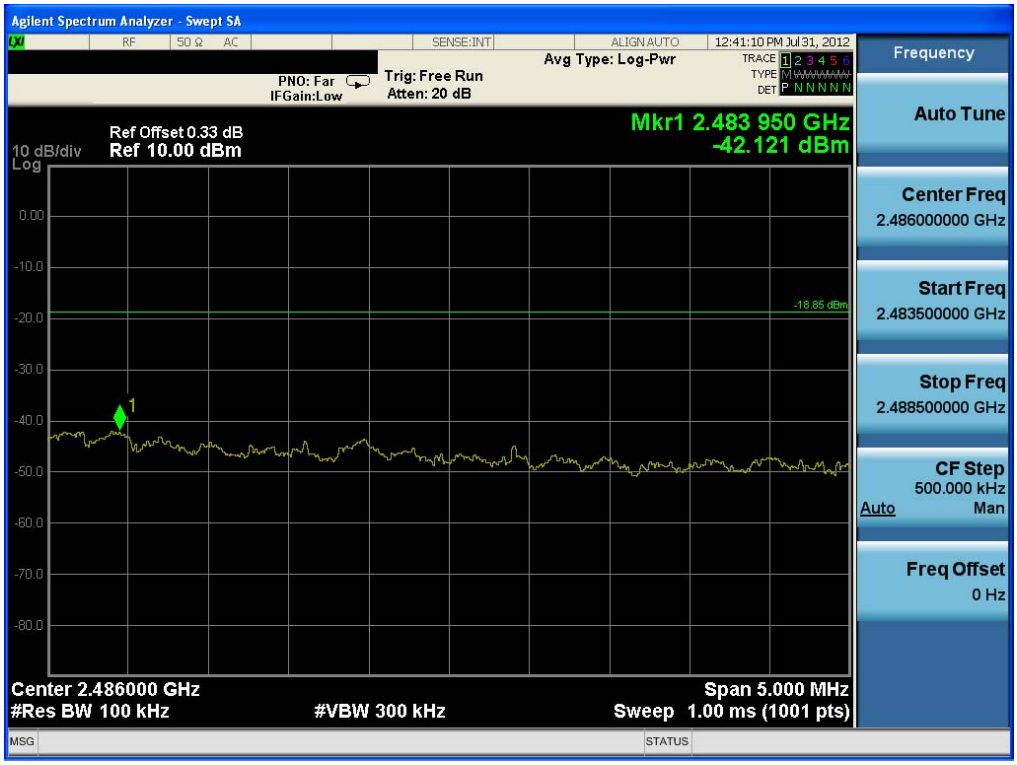
802.11g & 54Mbps & 2462MHz

Reference



High Band-edge



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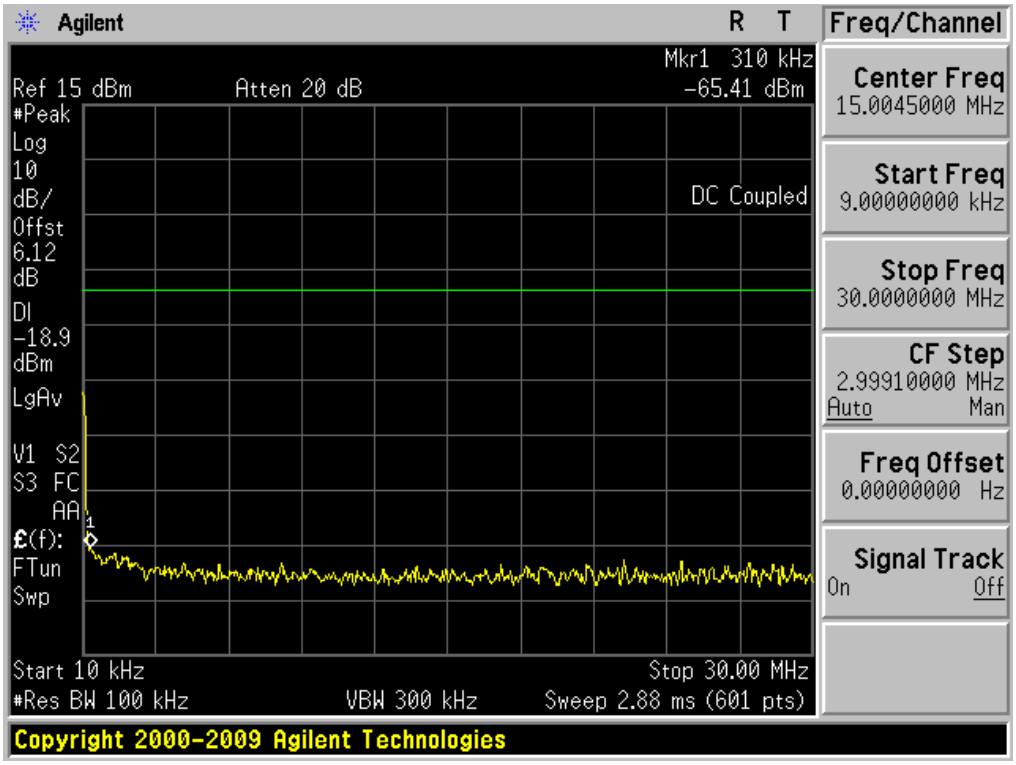
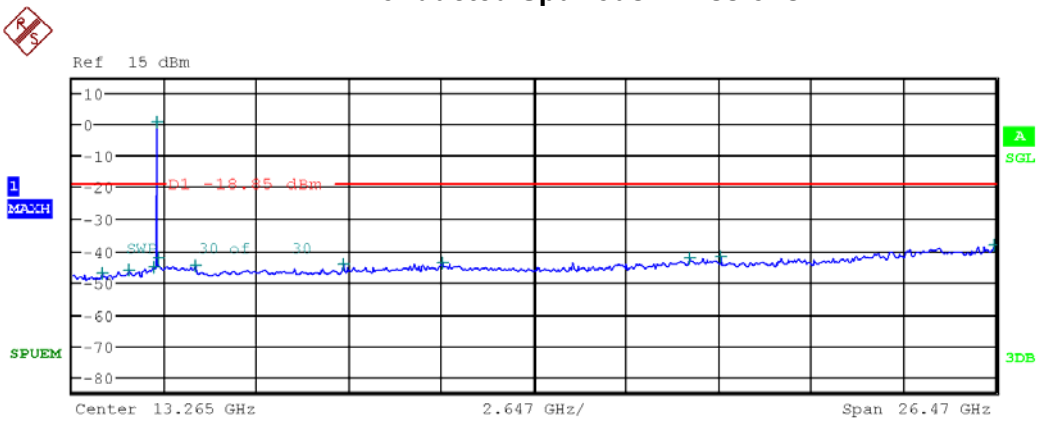
Conducted Spurious Emissions 1



Conducted Spurious Emissions 2



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
30.000 M	1.000 G	100.00 k	872.348000 M	-47.06	-200.00
1.000 G	2.000 G	100.00 k	1.641400 G	-46.25	-200.00
2.000 G	2.400 G	100.00 k	2.371733 G	-45.42	-200.00
2.400 G	2.483 G	100.00 k	2.456997 G	0.58	-200.00
2.483 G	3.000 G	100.00 k	2.485623 G	-42.36	-200.00
3.000 G	6.000 G	100.00 k	3.551625 G	-44.67	-200.00
6.000 G	10.000 G	100.00 k	7.806000 G	-44.32	-200.00
10.000 G	14.000 G	100.00 k	10.619500 G	-43.83	-200.00
14.000 G	18.000 G	100.00 k	17.739000 G	-42.60	-200.00
18.000 G	22.000 G	100.00 k	18.593500 G	-42.21	-200.00
22.000 G	26.500 G	100.00 k	26.461188 G	-38.19	-200.00

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7.5 Radiated Measurement.

Test Requirements and limit, §15.247(d)

1. In any 100kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a) and (b), then the 15.209(a) limit in the table below has to be followed

▪ **FCC Part 15.209(a) and (b)**

Frequency (MHz)	Limit (uV/m) @ 3m
30 ~ 88	100 **
88 ~ 216	150 **
216 ~ 960	200 **
Above 960	500

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

▪ **FCC Part 15.205 (a):** Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1300 ~ 1427	3600 ~ 4400	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1435 ~ 1626.5	4.5 ~ 5.15	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~	149.9 ~ 150.05	1645.5 ~ 1646.5	5.35 ~ 5.46	17.7 ~ 21.4
4.125 ~ 4.128	12.52025	156.52475 ~	1660 ~ 1710	7.25 ~ 7.75	22.01 ~ 23.12
4.17725 ~ 4.17775	12.57675 ~	156.52525	1718.8 ~ 1722.2	8.025 ~ 8.5	23.6 ~ 24.0
4.20725 ~ 4.20775	12.57725	156.7 ~ 156.9	2200 ~ 2300	9.0 ~ 9.2	31.2 ~ 31.8
6.215 ~ 6.218	13.36 ~ 13.41	162.0125 ~ 167.17	2310 ~ 2390	9.3 ~ 9.5	36.43 ~ 36.5
6.26775 ~ 6.26825	16.42 ~ 16.423	167.72 ~ 173.2	2483.5 ~ 2500	10.6 ~ 12.7	Above 38.6
6.31175 ~ 6.31225	16.69475 ~	240 ~ 285	2655 ~ 2900	13.25 ~ 13.4	
8.291 ~ 8.294	16.69525	322 ~ 335.4	3260 ~ 3267		
8.362 ~ 8.366	16.80425 ~	399.90 ~ 410	3332 ~ 3339		
8.37625 ~ 8.38675	16.80475	608 ~ 614	3345.8 ~ 3358		
	25.5 ~ 25.67	960 ~ 1240			
	37.5 ~ 38.25				
	73 ~ 74.6				
	74.8 ~ 75.2				

▪ **FCC Part 15.205(b):** The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

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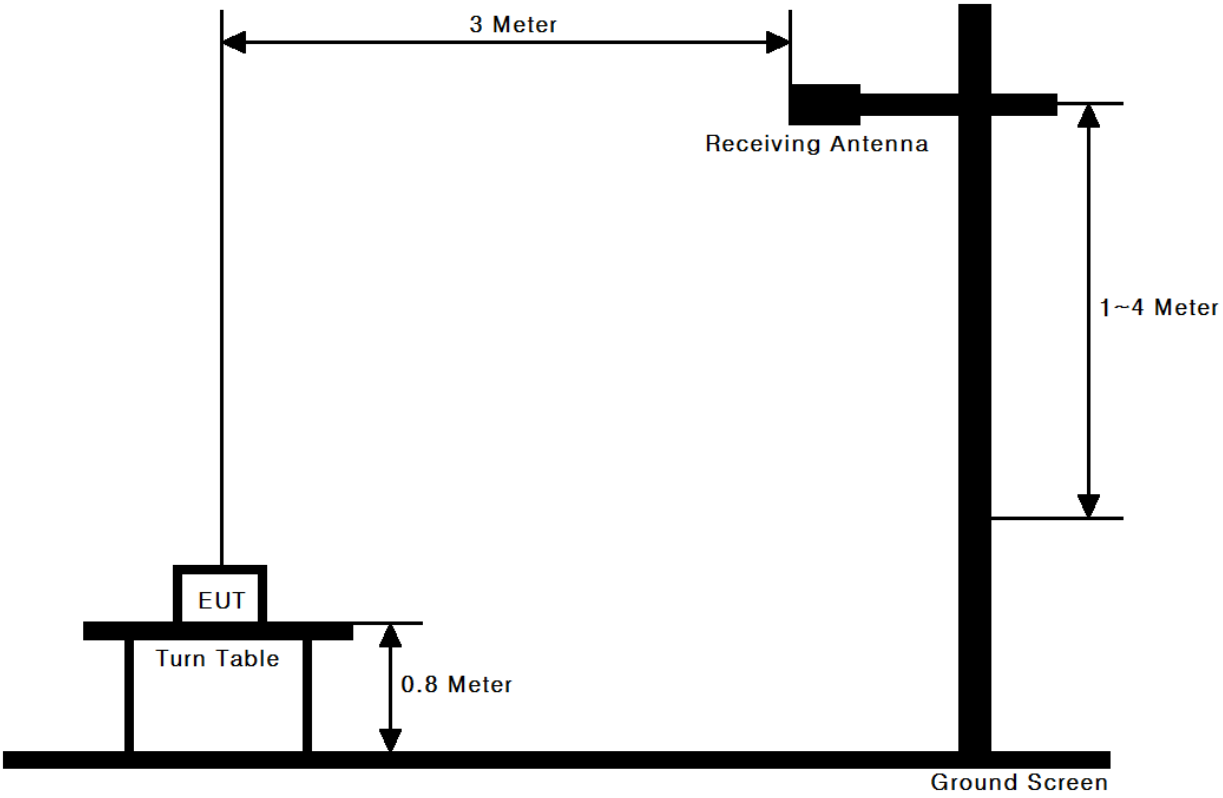
Test Configuration



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8 m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

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9KHz ~ 25GHz Data(*802.11b & 11Mbps*) Test Case 1

▪ Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2385.961	H	Z	PK	54.06	-4.73	49.33	74.00	24.67
2385.997	H	Z	AV	48.13	-4.73	43.40	54.00	10.60
4824.015	V	X	PK	56.04	2.23	58.27	74.00	15.73
4824.025	V	X	AV	51.18	2.23	53.41	54.00	0.59
-	-	-	-	-	-	-	-	-

▪ Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.024	V	X	PK	55.07	2.92	57.99	74.00	16.01
4874.016	V	X	AV	50.59	2.92	53.51	54.00	0.49
-	-	-	-	-	-	-	-	-

▪ Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2487.889	H	X	PK	57.05	-4.66	52.39	74.00	21.61
2487.891	H	X	AV	50.30	-4.66	45.64	54.00	8.36
4924.026	V	X	PK	53.64	2.67	56.31	74.00	17.69
4924.026	V	X	AV	47.48	2.67	50.15	54.00	3.85
-	-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were reported greater than listed emissions above table.
2. Above listed point data is the worst case data.
3. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain

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9KHz ~ 25GHz Data(*802.11g & 54Mbps*) Test Case 1

▪ Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2389.865	H	Z	PK	57.43	-4.73	52.70	74.00	21.30
2390.000	H	Z	AV	44.54	-4.73	39.81	54.00	14.19
4824.025	V	X	PK	59.29	2.23	61.52	74.00	12.48
4823.460	V	X	AV	45.77	2.23	48.00	54.00	6.00
-	-	-	-	-	-	-	-	-

▪ Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.023	V	X	PK	58.61	2.92	61.53	74.00	12.47
4874.469	V	X	AV	45.08	2.92	48.00	54.00	6.00
-	-	-	-	-	-	-	-	-

▪ Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.688	H	X	PK	61.92	-4.66	57.26	74.00	16.74
2483.500	H	X	AV	45.98	-4.66	41.32	54.00	12.68
4924.096	V	X	PK	57.80	2.67	60.47	74.00	13.53
4923.386	V	X	AV	42.67	2.67	45.34	54.00	8.66
-	-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were reported greater than listed emissions above table.
2. Above listed point data is the worst case data.
3. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain

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9KHz ~ 25GHz Data(*802.11b & 11Mbps*) Test Case 2

▪ Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2385.967	H	Z	PK	54.33	-4.73	49.60	74.00	24.40
2385.991	H	Z	AV	48.13	-4.73	43.40	54.00	10.60
4824.038	V	X	PK	56.39	2.23	58.62	74.00	15.38
4824.028	V	X	AV	51.21	2.23	53.44	54.00	0.56
-	-	-	-	-	-	-	-	-

▪ Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4924.026	V	X	PK	55.57	2.92	58.49	74.00	15.51
4924.025	V	X	AV	50.54	2.92	53.46	54.00	0.54
-	-	-	-	-	-	-	-	-

▪ Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2487.861	H	X	PK	57.02	-4.66	52.36	74.00	21.64
2487.899	H	X	AV	50.29	-4.66	45.63	54.00	8.37
4924.036	V	X	PK	53.59	2.67	56.26	74.00	17.74
4924.024	V	X	AV	47.51	2.67	50.18	54.00	3.82
-	-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were reported greater than listed emissions above table.
2. Above listed point data is the worst case data.
3. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain

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9KHz ~ 25GHz Data(*802.11g & 54Mbps*) Test Case 2

▪ Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2389.835	H	Z	PK	56.99	-4.73	52.26	74.00	21.74
2390.000	H	Z	AV	44.56	-4.73	39.83	54.00	14.17
4824.088	V	X	PK	58.92	2.23	61.15	74.00	12.85
4823.474	V	X	AV	45.77	2.23	48.00	54.00	6.00
-	-	-	-	-	-	-	-	-

▪ Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.031	V	X	PK	57.54	2.92	60.46	74.00	13.54
4874.450	V	X	AV	45.09	2.92	48.01	54.00	5.99
-	-	-	-	-	-	-	-	-

▪ Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.685	H	X	PK	61.70	-4.66	57.04	74.00	16.96
2483.500	H	X	AV	45.99	-4.66	41.33	54.00	12.67
4924.059	V	X	PK	57.58	2.67	60.25	74.00	13.75
4923.404	V	X	AV	42.65	2.67	45.32	54.00	8.68
-	-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were reported greater than listed emissions above table.
2. Above listed point data is the worst case data.
3. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain

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9KHz ~ 25GHz Data(*802.11b & 11Mbps*) Test Case 3

▪ Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2385.961	H	Z	PK	54.54	-4.73	49.81	74.00	24.19
2386.000	H	Z	AV	48.13	-4.73	43.40	54.00	10.60
4824.017	V	X	PK	56.48	2.23	58.71	74.00	15.29
4824.012	V	X	AV	51.24	2.23	53.47	54.00	0.53
-	-	-	-	-	-	-	-	-

▪ Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.030	V	X	PK	54.95	2.92	57.87	74.00	16.13
4874.030	V	X	AV	50.55	2.92	53.47	54.00	0.53
-	-	-	-	-	-	-	-	-

▪ Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2487.861	H	X	PK	55.51	-4.66	50.85	74.00	23.15
2487.899	H	X	AV	50.35	-4.66	45.69	54.00	8.31
4924.036	V	X	PK	52.15	2.67	54.82	74.00	19.18
4924.024	V	X	AV	47.42	2.67	50.09	54.00	3.91
-	-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were reported greater than listed emissions above table.
2. Above listed point data is the worst case data.
3. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain

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9KHz ~ 25GHz Data(*802.11g & 54Mbps*) Test Case 3

▪ Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2389.866	H	Z	PK	56.68	-4.73	51.95	74.00	22.05
2390.000	H	Z	AV	44.56	-4.73	39.83	54.00	14.17
4824.072	V	X	PK	58.62	2.23	60.85	74.00	13.15
4823.458	V	X	AV	45.82	2.23	48.05	54.00	5.95
-	-	-	-	-	-	-	-	-

▪ Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.095	V	X	PK	59.54	2.92	62.46	74.00	11.54
4874.461	V	X	AV	45.13	2.92	48.05	54.00	5.95
-	-	-	-	-	-	-	-	-

▪ Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.663	H	X	PK	61.40	-4.66	56.74	74.00	17.26
2483.500	H	X	AV	46.03	-4.66	41.37	54.00	12.63
4924.027	V	X	PK	57.23	2.67	59.90	74.00	14.10
4923.386	V	X	AV	42.60	2.67	45.27	54.00	8.73
-	-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were reported greater than listed emissions above table.
2. Above listed point data is the worst case data.
3. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain

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9KHz ~ 25GHz Data(*802.11b & 11Mbps*) Test Case 4

▪ Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2385.958	H	Z	PK	52.86	-4.73	48.13	74.00	25.87
2386.000	H	Z	AV	48.20	-4.73	43.47	54.00	10.53
4824.015	V	X	PK	54.75	2.23	56.98	74.00	17.02
4824.009	V	X	AV	50.96	2.23	53.19	54.00	0.81
-	-	-	-	-	-	-	-	-

▪ Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.045	V	X	PK	55.85	2.92	58.77	74.00	15.23
4874.028	V	X	AV	50.35	2.92	53.27	54.00	0.73
-	-	-	-	-	-	-	-	-

▪ Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2487.861	H	X	PK	56.29	-4.66	51.63	74.00	22.37
2487.890	H	X	AV	50.30	-4.66	45.64	54.00	8.36
4924.024	V	X	PK	52.98	2.67	55.65	74.00	18.35
4924.013	V	X	AV	47.41	2.67	50.08	54.00	3.92
-	-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were reported greater than listed emissions above table.
2. Above listed point data is the worst case data.
3. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain

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9KHz ~ 25GHz Data(*802.11g & 54Mbps*) Test Case 4

▪ Lowest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2389.822	H	Z	PK	58.69	-4.73	53.96	74.00	20.04
2390.000	H	Z	AV	44.52	-4.73	39.79	54.00	14.21
4824.022	V	X	PK	60.55	2.23	62.78	74.00	11.22
4823.452	V	X	AV	45.74	2.23	47.97	54.00	6.03
-	-	-	-	-	-	-	-	-

▪ Middle Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.111	V	X	PK	59.17	2.92	62.09	74.00	11.91
4874.439	V	X	AV	45.06	2.92	47.98	54.00	6.02
-	-	-	-	-	-	-	-	-

▪ Highest Channel

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.663	H	X	PK	61.71	-4.66	57.05	74.00	16.95
2483.500	H	X	AV	46.02	-4.66	41.36	54.00	12.64
4924.027	V	X	PK	57.64	2.67	60.31	74.00	13.69
4923.386	V	X	AV	42.60	2.67	45.27	54.00	8.73
-	-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were reported greater than listed emissions above table.
2. Above listed point data is the worst case data.
3. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain

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7.6 POWERLINE CONDUCTED EMISSIONS

Test Requirements and limit, §15.247(d)

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (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

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT is placed on a wooden table 80 cm above the reference groundplane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.

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▣ RESULT PLOTS

AC Line Conducted Emissions (Graph)

Test Mode: Test Case 1 & 802.11b

Digital EMC

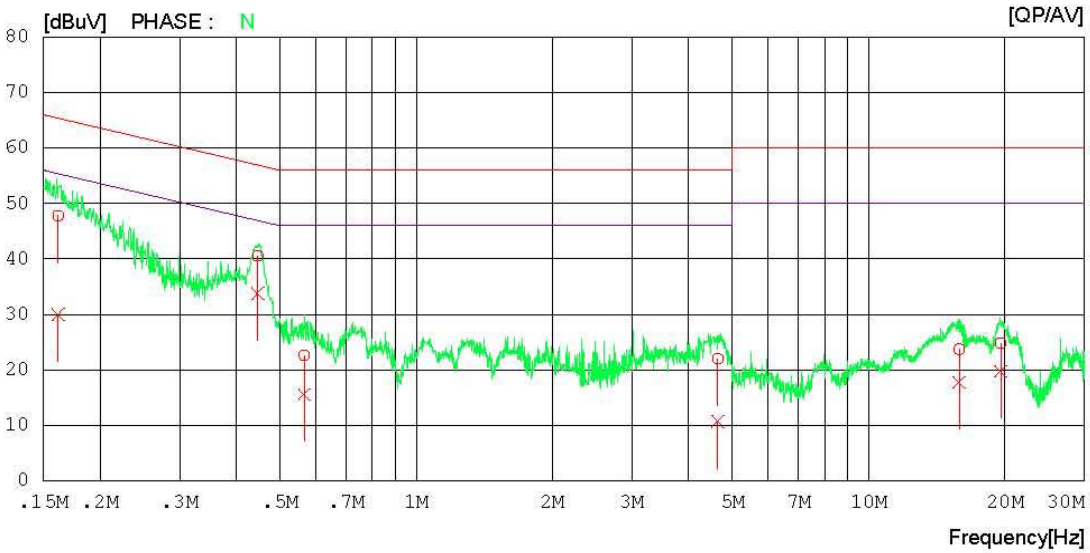
Results of Conducted Emission

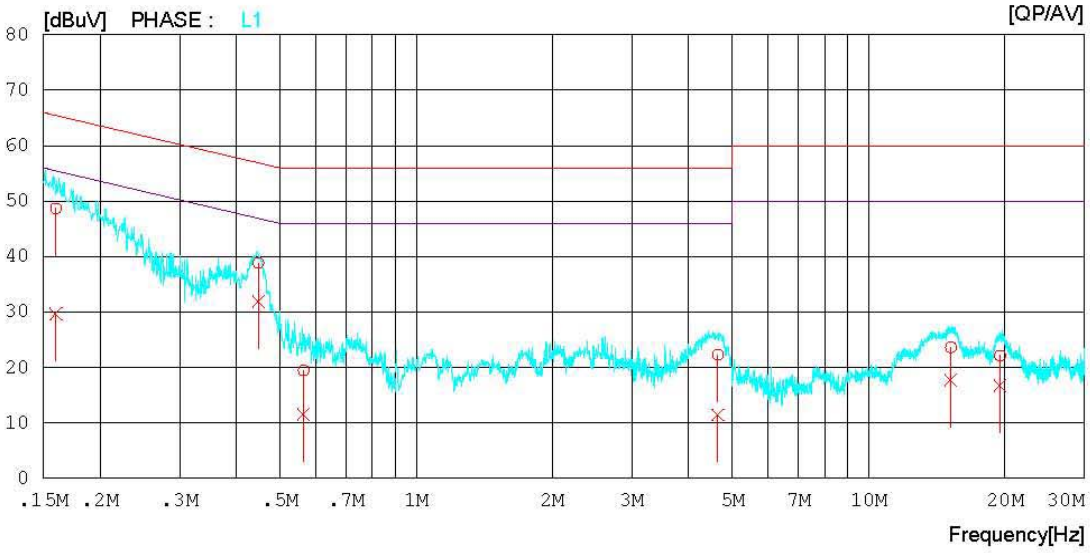
Digital EMC
Date : 2012-08-28

Model No.	:	BIP-1530	Referrence No.	:	
Type	:		Power Supply	:	120V 60Hz
Serial No.	:		Temp/Humi.	:	26 'C 49 % R.H
Test Condition	:	WLAN-11b	Operator	:	

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV





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AC Line Conducted Emissions (List)

Test Mode: Test Case 1 & 802.11b

Results of Conducted Emission

Digital EMC
Date : 2012-08-28

Model No.	: BIP-1530	Referrence No.	:
Type	:	Power Supply	: 120V 60Hz
Serial No.	:	Temp/Humi.	: 26 'C 49 % R.H
Test Condition	: WLAN-11b	Operator	:

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV

NO	FREQ	READING QP	READING AV	C.FACTOR	RESULT QP	RESULT AV	LIMIT QP	LIMIT AV	MARGIN QP	MARGIN AV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.16164	47.5	29.7	0.3	47.8	30.0	65.4	55.4	17.6	25.4	N
2	0.44674	40.3	33.6	0.2	40.5	33.8	56.9	46.9	16.4	13.1	N
3	0.56618	22.4	15.3	0.2	22.6	15.5	56.0	46.0	33.4	30.5	N
4	4.64100	21.6	10.3	0.4	22.0	10.7	56.0	46.0	34.0	35.3	N
5	15.85000	22.7	16.8	1.0	23.7	17.8	60.0	50.0	36.3	32.2	N
6	19.57200	23.6	18.5	1.2	24.8	19.7	60.0	50.0	35.2	30.3	N
7	0.15989	48.4	29.4	0.3	48.7	29.7	65.5	55.5	16.8	25.8	L1
8	0.44801	38.7	31.7	0.2	38.9	31.9	56.9	46.9	18.0	15.0	L1
9	0.56396	19.3	11.3	0.2	19.5	11.5	56.0	46.0	36.5	34.5	L1
10	4.64150	21.9	11.0	0.4	22.3	11.4	56.0	46.0	33.7	34.6	L1
11	15.19400	22.7	16.8	0.9	23.6	17.7	60.0	50.0	36.4	32.3	L1
12	19.51750	20.9	15.6	1.2	22.1	16.8	60.0	50.0	37.9	33.2	L1

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AC Line Conducted Emissions (Graph)

Test Mode: Test Case 1 & 802.11g

Digital EMC

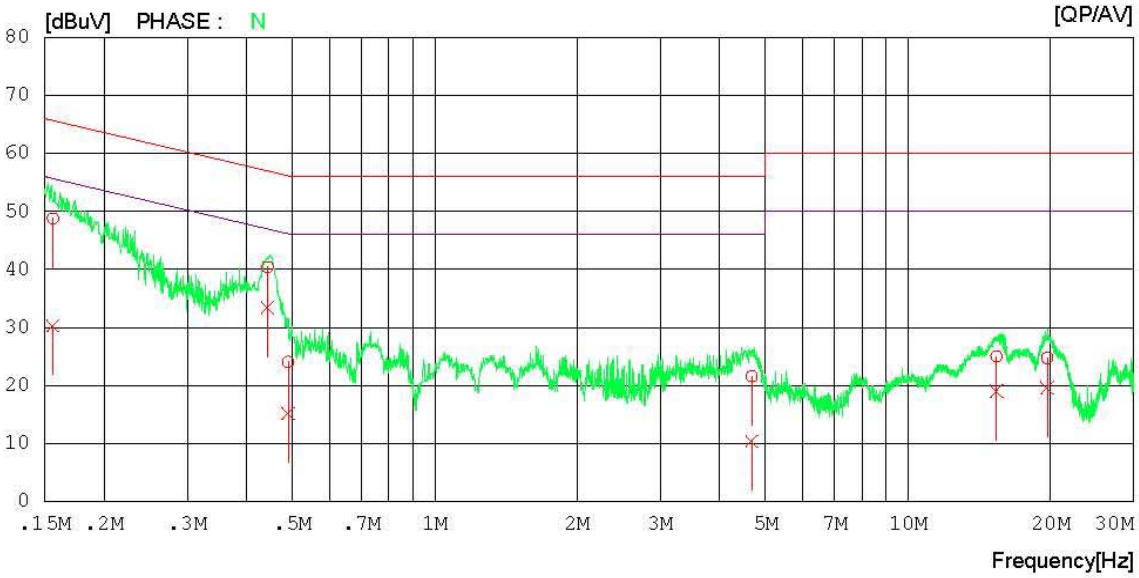
Results of Conducted Emission

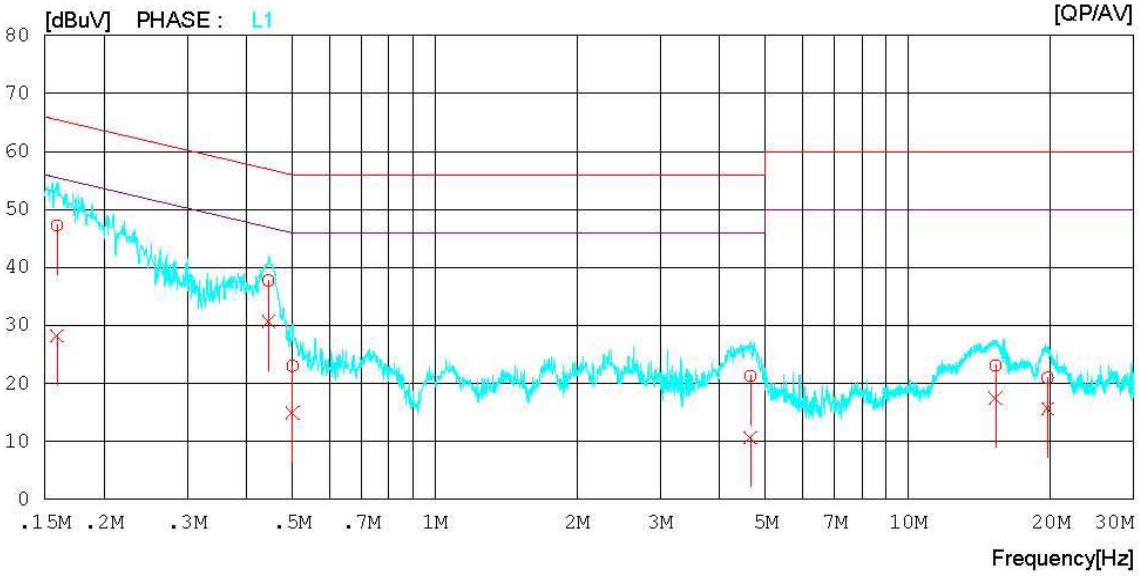
Digital EMC
Date : 2012-08-28

Model No.	:	BIP-1530	Referrence No.	:	
Type	:		Power Supply	:	120V 60Hz
Serial No.	:		Temp/Humi.	:	26 'C 49 % R.H
Test Condition	:	WLAN-11g	Operator	:	

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV





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AC Line Conducted Emissions (List)

Test Mode: Test Case 1 & 802.11g

Results of Conducted Emission

Digital EMC
Date : 2012-08-28

Model No.	: BIP-1530	Referrence No.	:
Type	:	Power Supply	: 120V 60Hz
Serial No.	:	Temp/Humi.	: 26 'C 49 % R.H
Test Condition	: WLAN-11g	Operator	:

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV

NO	FREQ	READING QP	READING AV	C.FACTOR	RESULT QP	RESULT AV	LIMIT QP	LIMIT AV	MARGIN QP	MARGIN AV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.15609	48.5	30.0	0.3	48.8	30.3	65.7	55.7	16.9	25.4	N
2	0.44368	40.2	33.1	0.2	40.4	33.3	57.0	47.0	16.6	13.7	N
3	0.49030	23.9	14.9	0.2	24.1	15.1	56.2	46.2	32.1	31.1	N
4	4.67700	21.2	9.9	0.4	21.6	10.3	56.0	46.0	34.4	35.7	N
5	15.38100	24.0	18.0	1.0	25.0	19.0	60.0	50.0	35.0	31.0	N
6	19.68850	23.5	18.4	1.2	24.7	19.6	60.0	50.0	35.3	30.4	N
7	0.15923	47.0	27.9	0.3	47.3	28.2	65.5	55.5	18.2	27.3	L1
8	0.44508	37.6	30.5	0.2	37.8	30.7	57.0	47.0	19.2	16.3	L1
9	0.50078	22.8	14.8	0.2	23.0	15.0	56.0	46.0	33.0	31.0	L1
10	4.64650	20.9	10.2	0.4	21.3	10.6	56.0	46.0	34.7	35.4	L1
11	15.31400	22.1	16.5	1.0	23.1	17.5	60.0	50.0	36.9	32.5	L1
12	19.73600	19.8	14.5	1.2	21.0	15.7	60.0	50.0	39.0	34.3	L1

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Test Mode: Test Case 2 & 802.11b

Digital EMC

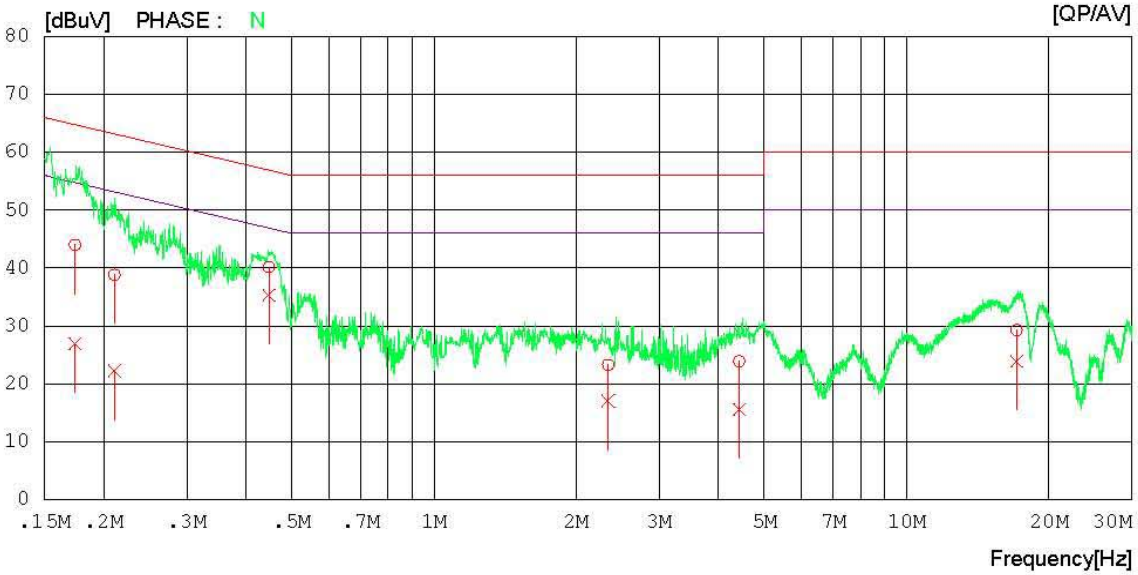
Results of Conducted Emission

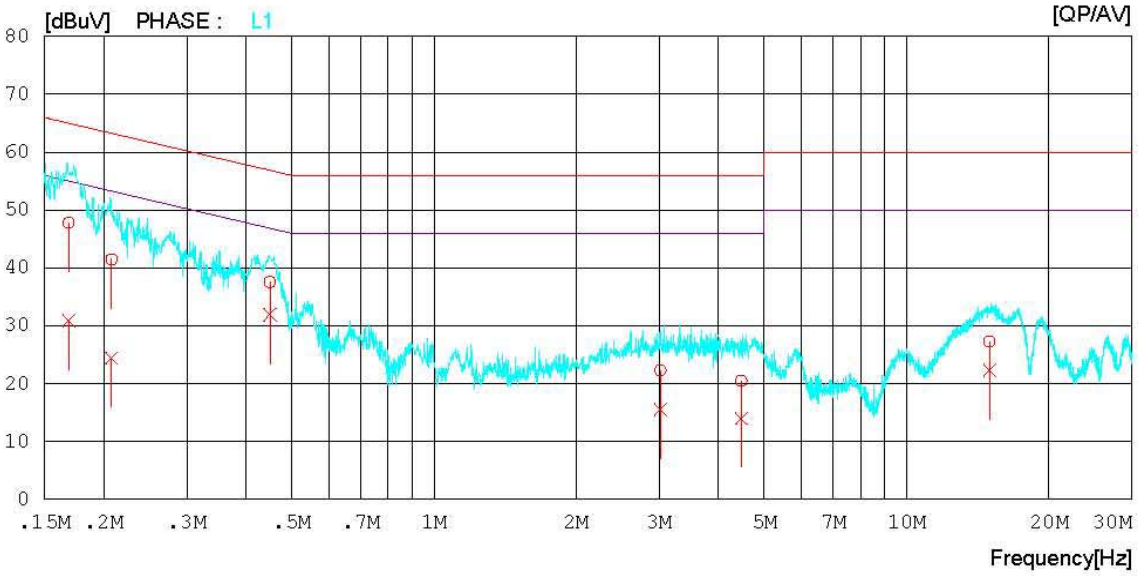
Digital EMC
Date : 2012-08-28

Model No.	:	BIP-1530	Referrence No.	:	
Type	:		Power Supply	:	120V 60Hz
Serial No.	:		Temp/Humi.	:	26 'C 49 % R.H
Test Condition	:	WLAN 11b	Operator	:	

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV





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AC Line Conducted Emissions (List)

Test Mode: Test Case 2 & 802.11b

Results of Conducted Emission

Digital EMC
Date : 2012-08-28

Model No.	: BIP-1530	Referrence No.	:
Type	:	Power Supply	: 120V 60Hz
Serial No.	:	Temp/Humi.	: 26 'C 49 % R.H
Test Condition	: WLAN 11b	Operator	:

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV

NO	FREQ	READING QP	READING AV	C.FACTOR	RESULT QP	RESULT AV	LIMIT QP	LIMIT AV	MARGIN QP	MARGIN AV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.17408	43.8	26.7	0.2	44.0	26.9	64.8	54.8	20.8	27.9	N
2	0.21089	38.6	22.0	0.2	38.8	22.2	63.2	53.2	24.4	31.0	N
3	0.44780	39.9	35.1	0.2	40.1	35.3	56.9	46.9	16.8	11.6	N
4	2.33750	23.0	16.7	0.3	23.3	17.0	56.0	46.0	32.7	29.0	N
5	4.42550	23.5	15.2	0.4	23.9	15.6	56.0	46.0	32.1	30.4	N
6	17.10650	28.2	22.8	1.1	29.3	23.9	60.0	50.0	30.7	26.1	N
7	0.16876	47.6	30.7	0.2	47.8	30.9	65.0	55.0	17.2	24.1	L1
8	0.20781	41.3	24.2	0.2	41.5	24.4	63.3	53.3	21.8	28.9	L1
9	0.44985	37.4	31.7	0.2	37.6	31.9	56.9	46.9	19.3	15.0	L1
10	3.01550	21.9	15.2	0.4	22.3	15.6	56.0	46.0	33.7	30.4	L1
11	4.47300	20.1	13.6	0.4	20.5	14.0	56.0	46.0	35.5	32.0	L1
12	14.99000	26.4	21.5	0.9	27.3	22.4	60.0	50.0	32.7	27.6	L1

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AC Line Conducted Emissions (Graph)

Test Mode: Test Case 2 & 802.11g

Digital EMC

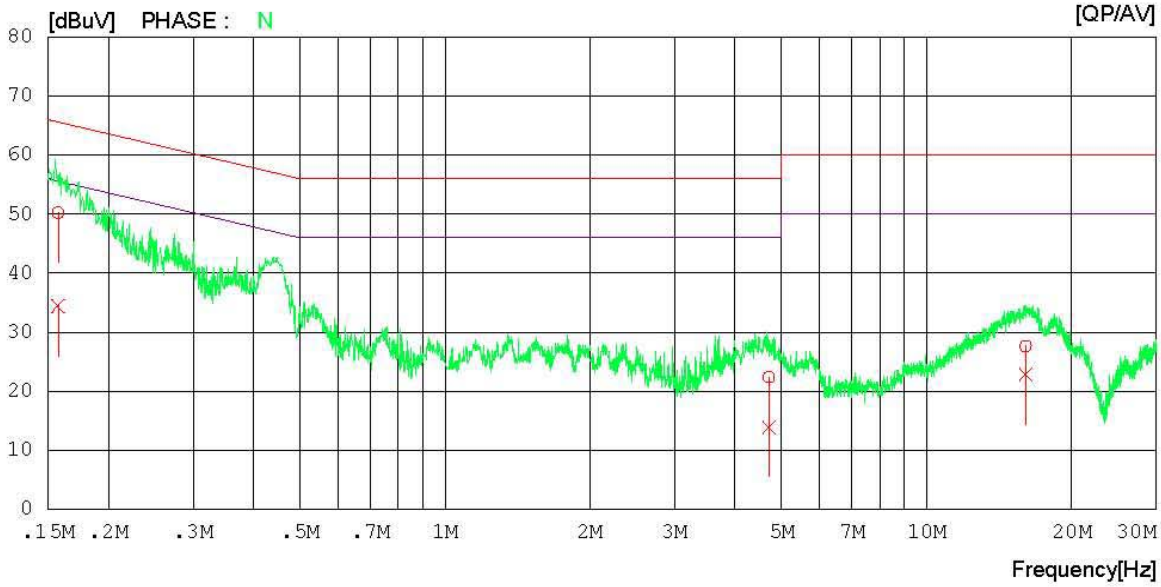
Results of Conducted Emission

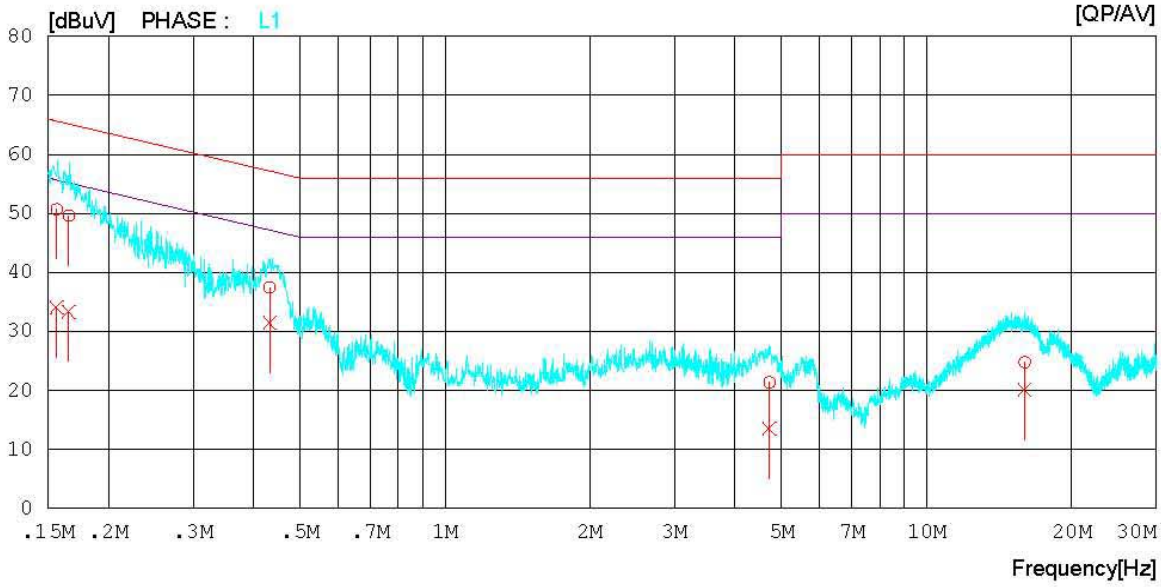
Digital EMC
Date : 2012-08-28

Model No.	:	BIP-1530	Referrence No.	:	
Type	:		Power Supply	:	120V 60Hz
Serial No.	:		Temp/Humi.	:	26 'C 49 % R.H
Test Condition	:	WLAN 11g	Operator	:	

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV





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AC Line Conducted Emissions (List)

Test Mode: Test Case 2 & 802.11g

Results of Conducted Emission

Digital EMC
Date : 2012-08-28

Model No.	:	BIP-1530	Referrence No.	:	
Type	:		Power Supply	:	120V 60Hz
Serial No.	:		Temp/Humi.	:	26 'C 49 % R.H
Test Condition	:	WLAN 11g	Operator	:	

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV

NO	FREQ	READING QP	READING AV	C.FACTOR	RESULT QP	RESULT AV	LIMIT QP	LIMIT AV	MARGIN QP	MARGIN AV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.15728	49.9	34.1	0.3	50.2	34.4	65.6	55.6	15.4	21.2	N
2	4.70650	22.0	13.5	0.4	22.4	13.9	56.0	46.0	33.6	32.1	N
3	16.06200	26.6	21.8	1.0	27.6	22.8	60.0	50.0	32.4	27.2	N
4	0.15625	50.4	33.8	0.3	50.7	34.1	65.7	55.7	15.0	21.6	L1
5	0.16548	49.3	33.0	0.3	49.6	33.3	65.2	55.2	15.6	21.9	L1
6	0.43265	37.2	31.2	0.3	37.5	31.5	57.2	47.2	19.7	15.7	L1
7	4.71900	21.0	13.1	0.4	21.4	13.5	56.0	46.0	34.6	32.5	L1
8	15.99350	23.8	19.2	1.0	24.8	20.2	60.0	50.0	35.2	29.8	L1

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Test Mode: Test Case 3 & 802.11b

Digital EMC

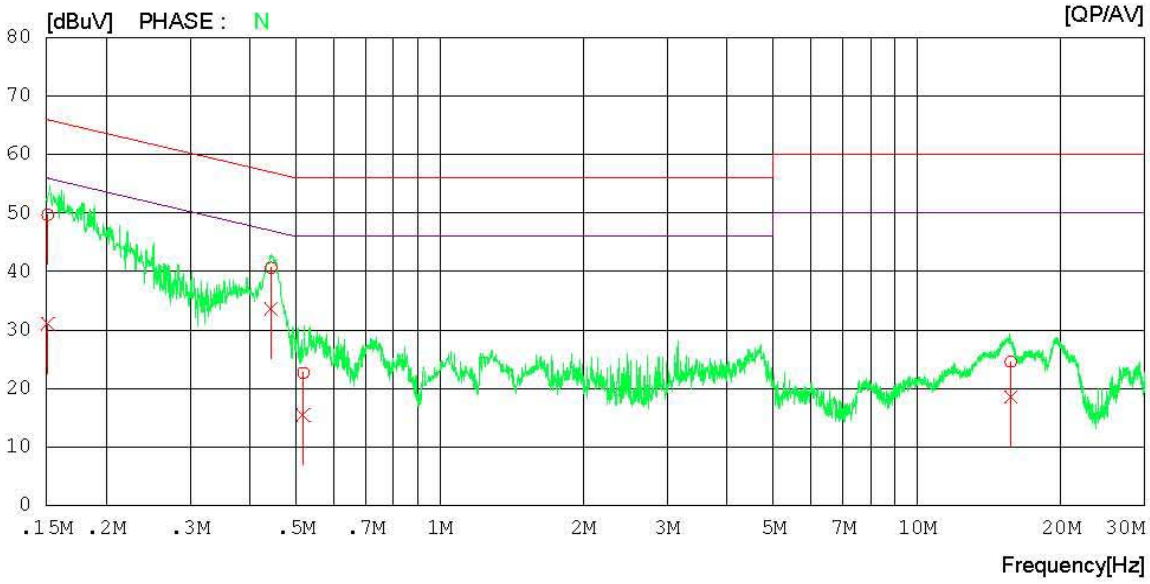
Results of Conducted Emission

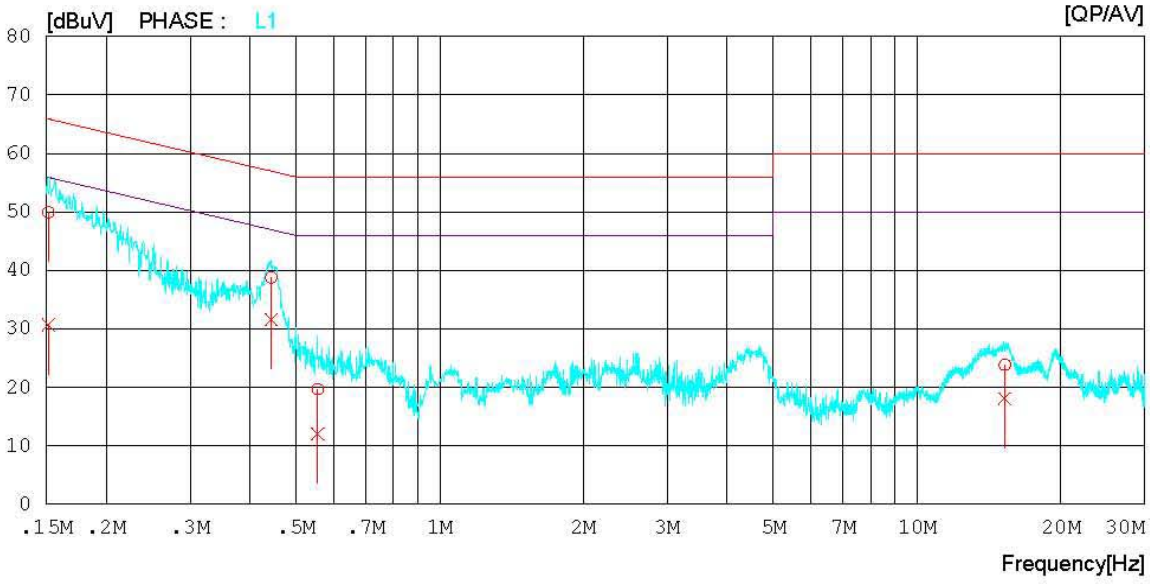
Digital EMC
Date : 2012-08-28

Model No.	:	BIP-1530	Referrence No.	:	
Type	:		Power Supply	:	120V 60Hz
Serial No.	:		Temp/Humi.	:	26 'C 49 % R.H
Test Condition	:	WLAN 11b	Operator	:	

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV





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AC Line Conducted Emissions (List)

Test Mode: Test Case 3 & 802.11b

Results of Conducted Emission

Digital EMC
Date : 2012-08-28

Model No.	:	BIP-1530	Referrence No.	:	
Type	:		Power Supply	:	120V 60Hz
Serial No.	:		Temp/Humi.	:	26 'C 49 % R.H
Test Condition	:	WLAN 11b	Operator	:	

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV

NO	FREQ	READING QP	READING AV	C.FACTOR	RESULT QP	RESULT AV	LIMIT QP	LIMIT AV	MARGIN QP	MARGIN AV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.15101	49.4	30.8	0.3	49.7	31.1	65.9	55.9	16.2	24.8	N
2	0.44365	40.4	33.4	0.2	40.6	33.6	57.0	47.0	16.4	13.4	N
3	0.51803	22.5	15.3	0.2	22.7	15.5	56.0	46.0	33.3	30.5	N
4	15.71850	23.6	17.5	1.0	24.6	18.5	60.0	50.0	35.4	31.5	N
5	0.15155	49.6	30.4	0.3	49.9	30.7	65.9	55.9	16.0	25.2	L1
6	0.44375	38.6	31.4	0.2	38.8	31.6	57.0	47.0	18.2	15.4	L1
7	0.55529	19.5	11.9	0.2	19.7	12.1	56.0	46.0	36.3	33.9	L1
8	15.27700	22.9	17.1	1.0	23.9	18.1	60.0	50.0	36.1	31.9	L1

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AC Line Conducted Emissions (Graph)

Test Mode: Test Case 3 & 802.11g

Digital EMC

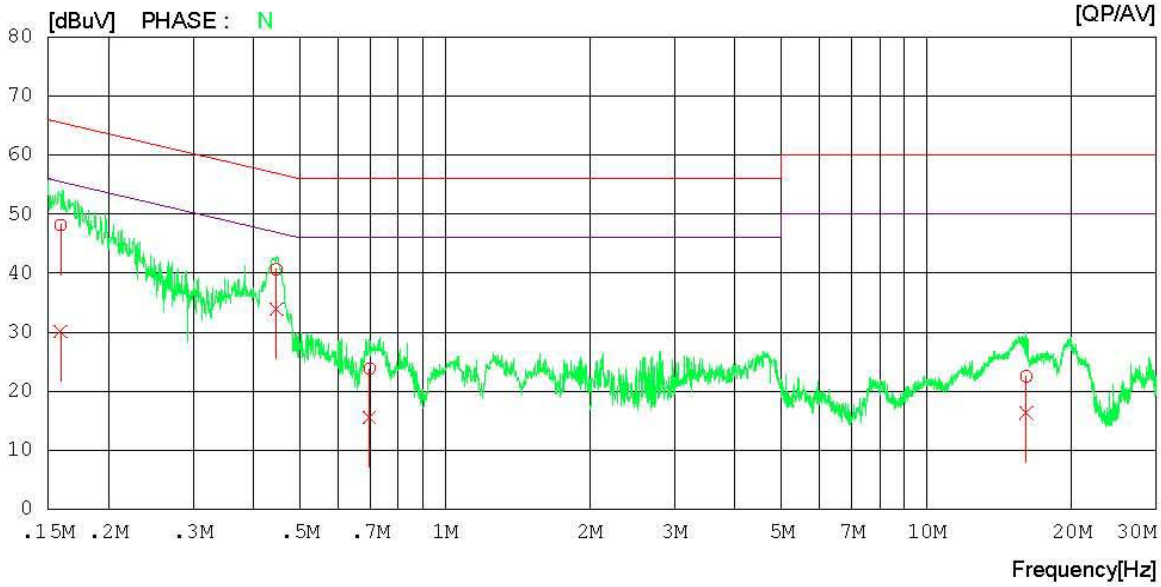
Results of Conducted Emission

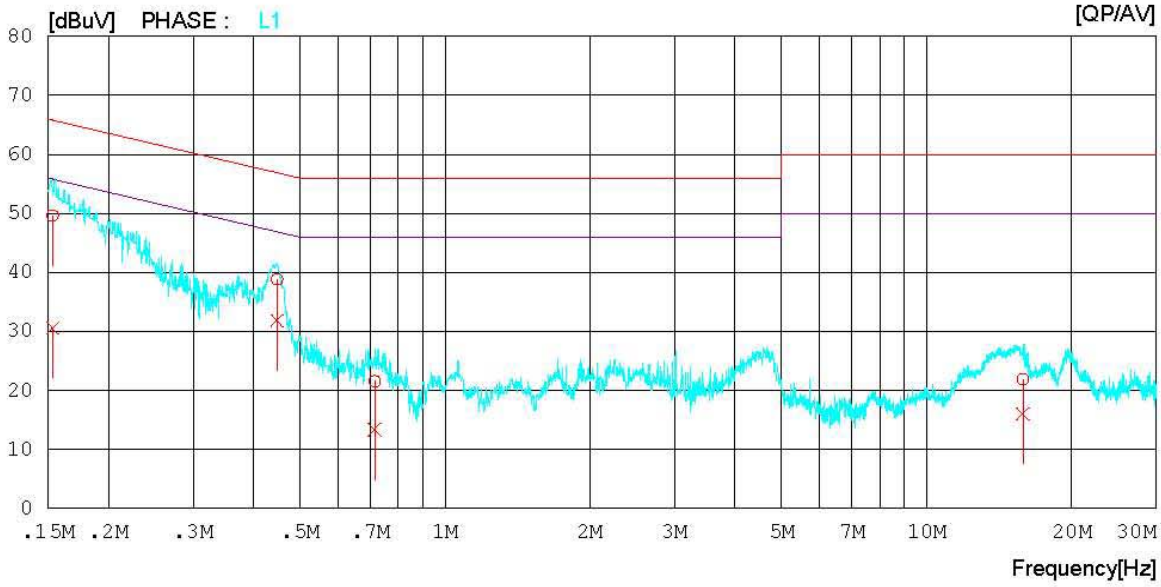
Digital EMC
Date : 2012-08-28

Model No.	:	BIP-1530	Referrence No.	:	
Type	:		Power Supply	:	120V 60Hz
Serial No.	:		Temp/Humi.	:	26 'C 49 % R.H
Test Condition	:	WLAN 11g	Operator	:	

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV





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AC Line Conducted Emissions (List)

Test Mode: Test Case 3 & 802.11g

Results of Conducted Emission

Digital EMC
Date : 2012-08-28

Model No.	:	BIP-1530	Referrence No.	:	
Type	:		Power Supply	:	120V 60Hz
Serial No.	:		Temp/Humi.	:	26 'C 49 % R.H
Test Condition	:	WLAN 11g	Operator	:	

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV

NO	FREQ	READING QP	READING AV	C.FACTOR	RESULT QP	RESULT AV	LIMIT QP	LIMIT AV	MARGIN QP	MARGIN AV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.15914	47.9	29.8	0.3	48.2	30.1	65.5	55.5	17.3	25.4	N
2	0.44674	40.4	33.7	0.2	40.6	33.9	56.9	46.9	16.3	13.0	N
3	0.69736	23.6	15.3	0.2	23.8	15.5	56.0	46.0	32.2	30.5	N
4	16.11150	21.5	15.3	1.0	22.5	16.3	60.0	50.0	37.5	33.7	N
5	0.15331	49.3	30.3	0.3	49.6	30.6	65.8	55.8	16.2	25.2	L1
6	0.44795	38.6	31.7	0.2	38.8	31.9	56.9	46.9	18.1	15.0	L1
7	0.71499	21.4	13.2	0.2	21.6	13.4	56.0	46.0	34.4	32.6	L1
8	15.85000	20.9	15.1	1.0	21.9	16.1	60.0	50.0	38.1	33.9	L1

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Test Mode: Test Case 4 & 802.11b

Digital EMC

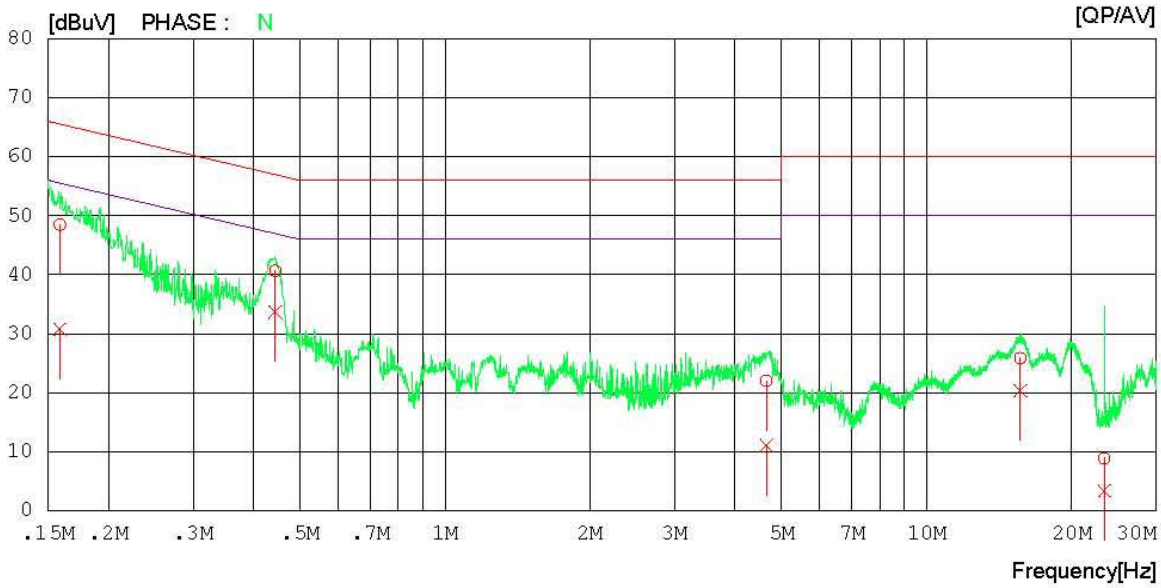
Results of Conducted Emission

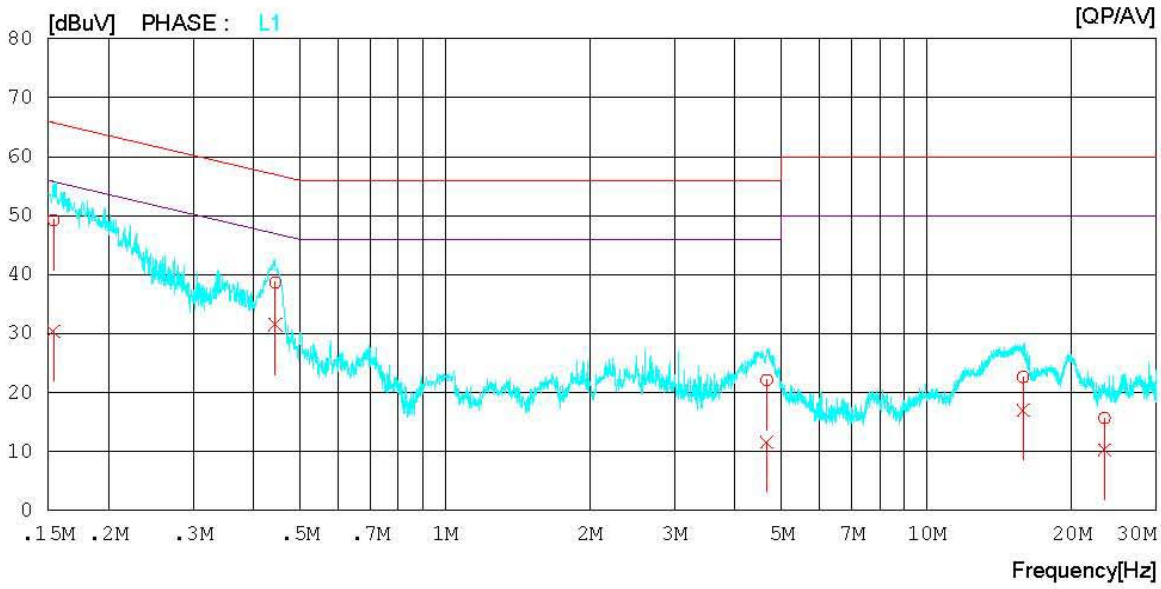
Digital EMC
Date : 2012-08-28

Model No.	:	BIP-1530	Referrence No.	:	
Type	:		Power Supply	:	120V 60Hz
Serial No.	:		Temp/Humi.	:	26 'C 49 % R.H
Test Condition	:	WLAN 11b	Operator	:	

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV





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AC Line Conducted Emissions (List)

Test Mode: Test Case 4 & 802.11b

Results of Conducted Emission

Digital EMC
Date : 2012-08-28

Model No.	:	BIP-1530	Referrence No.	:	
Type	:		Power Supply	:	120V 60Hz
Serial No.	:		Temp/Humi.	:	26 'C 49 % R.H
Test Condition	:	WLAN 11b	Operator	:	

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV

NO	FREQ	READING QP	READING AV	C.FACTOR	RESULT QP	RESULT AV	LIMIT QP	LIMIT AV	MARGIN QP	MARGIN AV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.15876	48.2	30.4	0.3	48.5	30.7	65.5	55.5	17.0	24.8	N
2	0.44435	40.4	33.4	0.2	40.6	33.6	57.0	47.0	16.4	13.4	N
3	4.65050	21.6	10.7	0.4	22.0	11.1	56.0	46.0	34.0	34.9	N
4	15.65250	24.9	19.3	1.0	25.9	20.3	60.0	50.0	34.1	29.7	N
5	23.39000	7.6	2.0	1.3	8.9	3.3	60.0	50.0	51.1	46.7	N
6	0.15396	49.0	30.2	0.3	49.3	30.5	65.8	55.8	16.5	25.3	L1
7	0.44434	38.5	31.3	0.2	38.7	31.5	57.0	47.0	18.3	15.5	L1
8	4.65900	21.8	11.2	0.4	22.2	11.6	56.0	46.0	33.8	34.4	L1
9	15.86900	21.7	16.0	1.0	22.7	17.0	60.0	50.0	37.3	33.0	L1
10	23.42500	14.4	9.0	1.3	15.7	10.3	60.0	50.0	44.3	39.7	L1

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AC Line Conducted Emissions (Graph)

Test Mode: Test Case 4 & 802.11g

Digital EMC

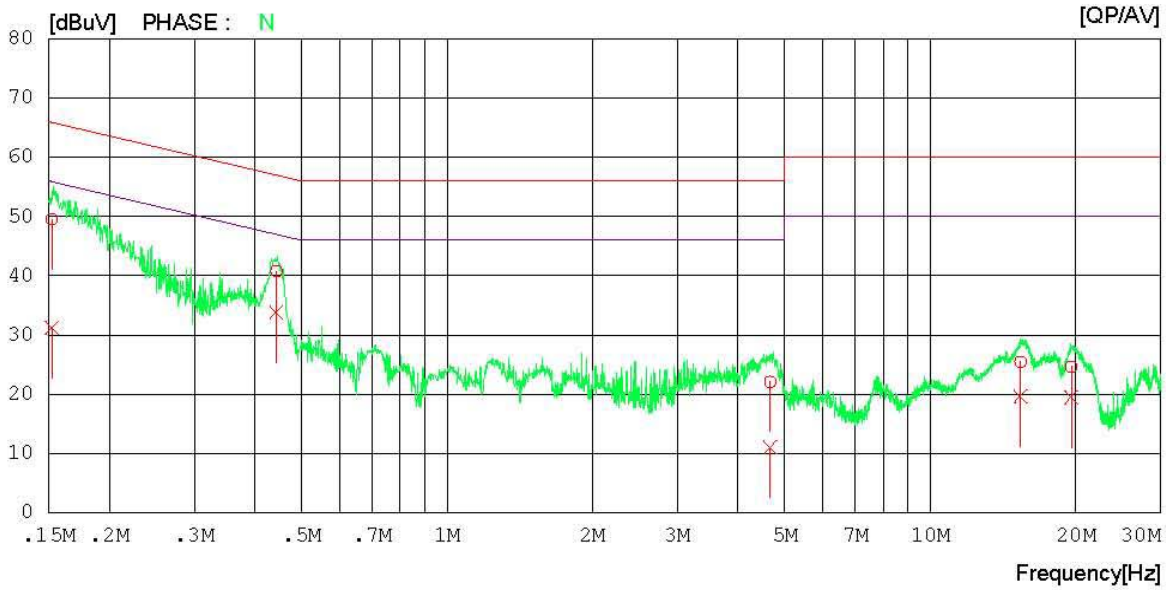
Results of Conducted Emission

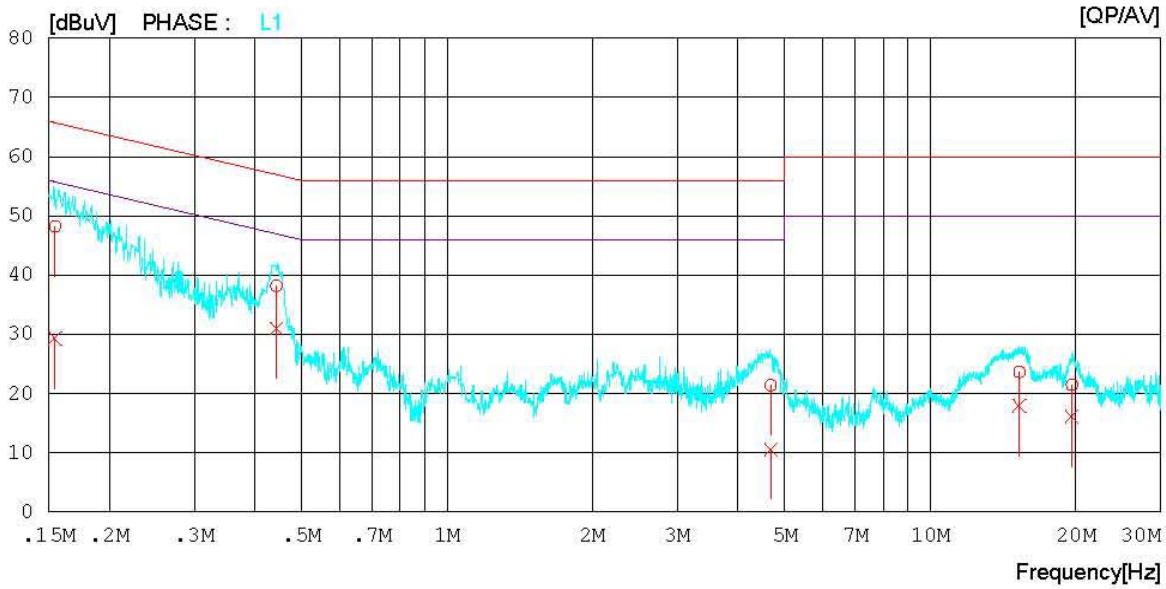
Digital EMC
Date : 2012-08-28

Model No.	:	BIP-1530	Referrence No.	:	
Type	:		Power Supply	:	120V 60Hz
Serial No.	:		Temp/Humi.	:	26 'C 49 % R.H
Test Condition	:	WLAN 11g	Operator	:	

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV





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AC Line Conducted Emissions (List)

Test Mode: Test Case 4 & 802.11g

Results of Conducted Emission

Digital EMC
Date : 2012-08-28

Model No.	:	BIP-1530	Referrence No.	:	
Type	:		Power Supply	:	120V 60Hz
Serial No.	:		Temp/Humi.	:	26 'C 49 % R.H
Test Condition	:	WLAN 11g	Operator	:	

Memo :

LIMIT : CISPR22_B QP
CISPR22_B AV

NO	FREQ	READING QP	READING AV	C.FACTOR	RESULT QP	RESULT AV	LIMIT QP	LIMIT AV	MARGIN QP	MARGIN AV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.15224	49.2	30.9	0.3	49.5	31.2	65.9	55.9	16.4	24.7	N
2	0.44390	40.6	33.6	0.2	40.8	33.8	57.0	47.0	16.2	13.2	N
3	4.66800	21.7	10.6	0.4	22.1	11.0	56.0	46.0	33.9	35.0	N
4	15.37600	24.5	18.6	1.0	25.5	19.6	60.0	50.0	34.5	30.4	N
5	19.58150	23.5	18.3	1.2	24.7	19.5	60.0	50.0	35.3	30.5	N
6	0.15458	47.9	29.1	0.3	48.2	29.4	65.8	55.8	17.6	26.4	L1
7	0.44379	38.0	30.8	0.2	38.2	31.0	57.0	47.0	18.8	16.0	L1
8	4.68100	21.0	10.2	0.4	21.4	10.6	56.0	46.0	34.6	35.4	L1
9	15.29750	22.6	17.0	1.0	23.6	18.0	60.0	50.0	36.4	32.0	L1
10	19.64350	20.3	15.0	1.2	21.5	16.2	60.0	50.0	38.5	33.8	L1

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8. LIST OF TEST EQUIPMENT

Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent	E4440A	12/09/18	13/09/18	MY45304199
Spectrum Analyzer	Rohde Schwarz	FSQ26	12/01/09	13/01/09	200445
Spectrum Analyzer	Agilent	N9020A	12/01/09	13/01/09	MY49100833
Power Splitter	Anritsu	K241B	12/09/17	13/09/17	020611
Digital Multimeter	H.P	34401A	12/03/05	13/03/05	3146A13475, US36122178
Signal Generator	Rohde Schwarz	SMR20	12/03/05	13/03/05	101251
Vector Signal Generator	Rohde Schwarz	SMJ100A	12/01/09	13/01/09	100148
Bluetooth Tester	TESCOM	TC-3000B	12/07/01	13/07/01	3000B000268
Thermo hygrometer	BODYCOM	BJ5478	12/01/13	13/01/13	090205-2
DC Power Supply	HP	6622A	12/03/05	13/03/05	3448A03760
High-pass filter	Wainwright	WHNX3.0	N/A	N/A	9
LOOP Antenna	ETS	6502	10/10/29	12/10/29	3471
BILOG ANTENNA	SCHAFFNER	CBL6112D	10/12/21	12/12/21	2737
HORN ANT	ETS	3115	12/02/20	13/02/20	6419
HORN ANT	A.H.Systems	SAS-574	11/03/25	13/03/25	154
Amplifier (22dB)	H.P	8447E	12/01/09	13/01/09	2945A02865
Amplifier (30dB)	Agilent	8449B	12/03/05	13/03/05	3008A00370
EMI TEST RECEIVER	R&S	ESU	12/03/05	13/03/05	100014
EMI TEST RECEIVER	R&S	ESCI	12/03/06	13/03/06	100364
CVCF	KIKUSUI	PCR1000L	12/09/15	13/09/15	14110610
ARTIFICIAL MAINS NETWORK	R&S	ESH2-Z5	12/09/18	13/09/18	828739/006
RFI/Field intensity Meter	KYORITSU	KNM-2402	12/07/02	13/07/02	4N-170-3

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