RF TEST REPORT

Test item	:	Industrial PDA
Model No.	:	BIP-1500
Order No.	:	1202-00288
Date of receipt	:	2012-02-24
Test duration	:	2012-03-13 ~ 2012-03-27
Date of issue	:	2012-04-09
Use of report	:	FCC Original Grant

Applicant : Bluebird Soft Inc.
558-5, Sinsa-dong, Kangnam-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

Tested by:	Witnessed by:	Reviewed by:
Engineer S.K.Ryu	N/A	Technical Director Harvey Sung

Table of Contents

1. GENERAL INFORMATION 3
2. EUT DESCRIPTION 3
3. TEST METHODOLOGY 4
3.1 EUT CONFIGURATION 4
3.2 EUT EXERCISE 4
3.3 GENERAL TEST PROCEDURES 4
3.4 DESCRIPTION OF TEST MODES 4
4. INSTRUMENT CALIBRATION 5
5. FACILITIES AND ACCREDITATIONS 5
5.1 FACILITIES 5
5.2 EQUIPMENT 5
6. ANTENNA REQUIREMENTS 5
7. TEST RESULT 6
7.1 6dB Bandwidth Measurement & Test Case 1 6
7.2 Maximum Peak Conducted Output Power & Test Case 1 11
7.3 Maximum Power Spectral Density & Test Case 1 16
7.4 Out of Band Emissions at the Band Edge/ Conducted Spurious Emissions & Test Case 1 21
7.5 Radiated Measurement. 32
7.5.1 Radiated Spurious Emissions. 32
7.6 POWERLINE CONDUCTED EMISSIONS 42
8. LIST OF TEST EQUIPMENT 59

1. GENERAL INFORMATION

Applicant	:	Bluebird Soft Inc.
Address	:	558-5, Sinsa-dong, Kangnam-gu, Seoul, Korea
FCC ID	:	SS4BIP1500
EUT	:	Industrial PDA
Model	:	BIP-1500
Additional Model(s)	:	N/A
Data of Test	:	2012-03-13 ~ 2012-03-27
Contact person	:	In-Gu, Kim

2. EUT DESCRIPTION

Product	Industrial PDA
Model Name	BIP-1500
Power Supply	DC 7.4V
Battery type	Standard Battery: Lithium Battery
Frequency Range	2412 ~ 2462MHz
Max. RF Output Power	802.11b: 16.56dBm 802.11g: 14.83dBm
Modulation Type	802.11b: DSSS/CCK 802.11g: OFDM
Antenna Specification	Antenna Type: FPCB Antenna Gain: 1.15 dBi(PK)

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.

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

7. TEST RESULT

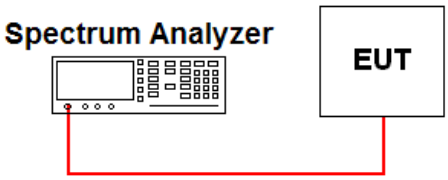
7.1 6dB Bandwidth Measurement & Test Case 1

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.

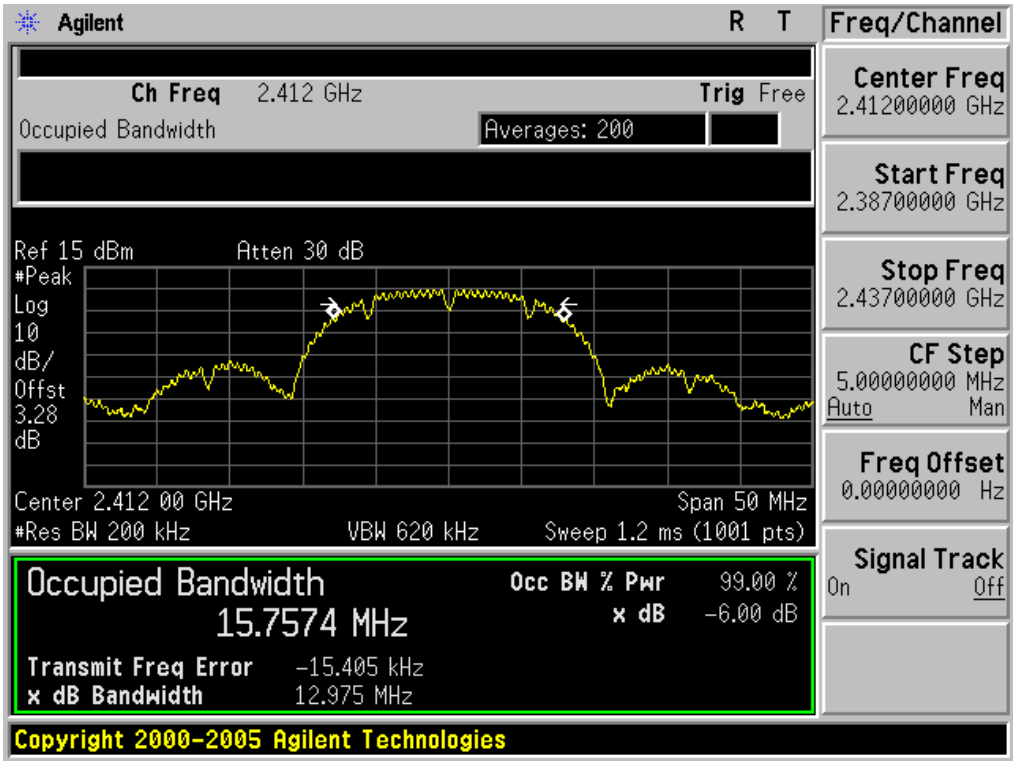
1. Set resolution bandwidth (RBW) = 1-5 % of the emission bandwidth (EBW). **Actual RBW = 200 KHz**
2. Set the video bandwidth (VBW) ≥ 3 x RBW. **Actual VBW = 620 KHz**
3. Detector = **Peak**.
4. Trace mode = **max hold**.
5. Sweep = **auto couple**.
6. Allow the trace to stabilize.
7. Measure the maximum 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

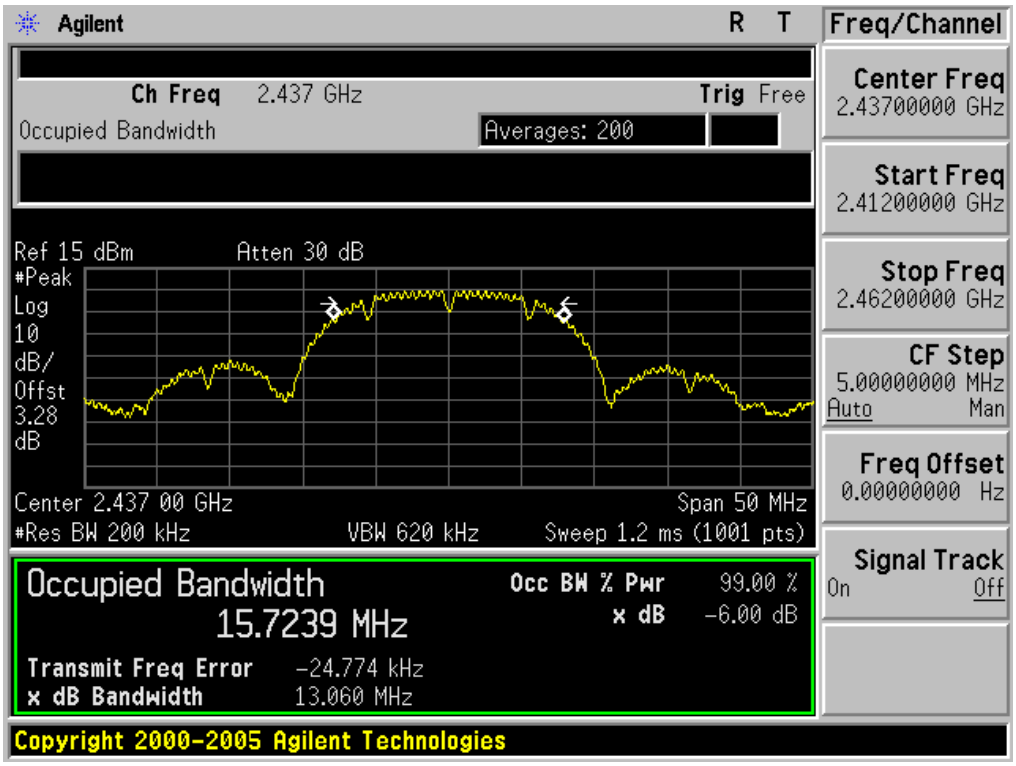
Test Mode	Data Rate	Frequency [MHz]	Test Results [MHz]
802.11b	1Mbps	2412	12.975
		2437	13.060
		2462	12.656
802.11g	6Mbps	2412	16.615
		2437	16.549
		2462	16.528

▣ RESULT PLOTS

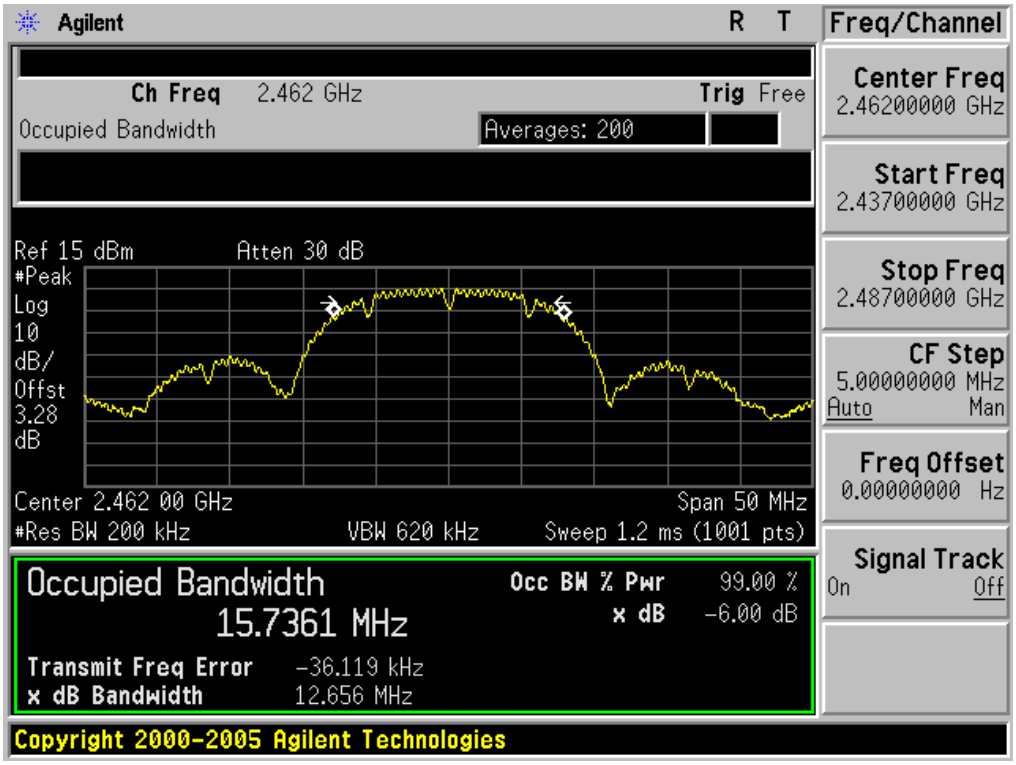
6 dB Bandwidth Test Mode: 802.11b & 1Mbps & 2412MHz



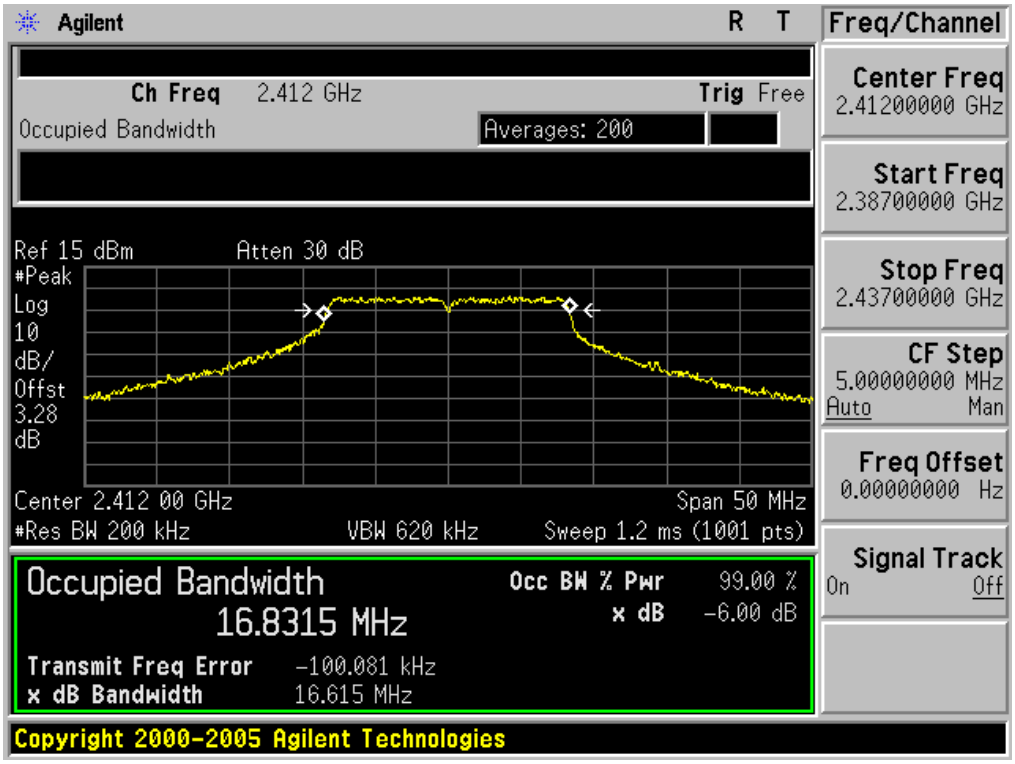
6 dB Bandwidth Test Mode: 802.11b & 1Mbps & 2437MHz



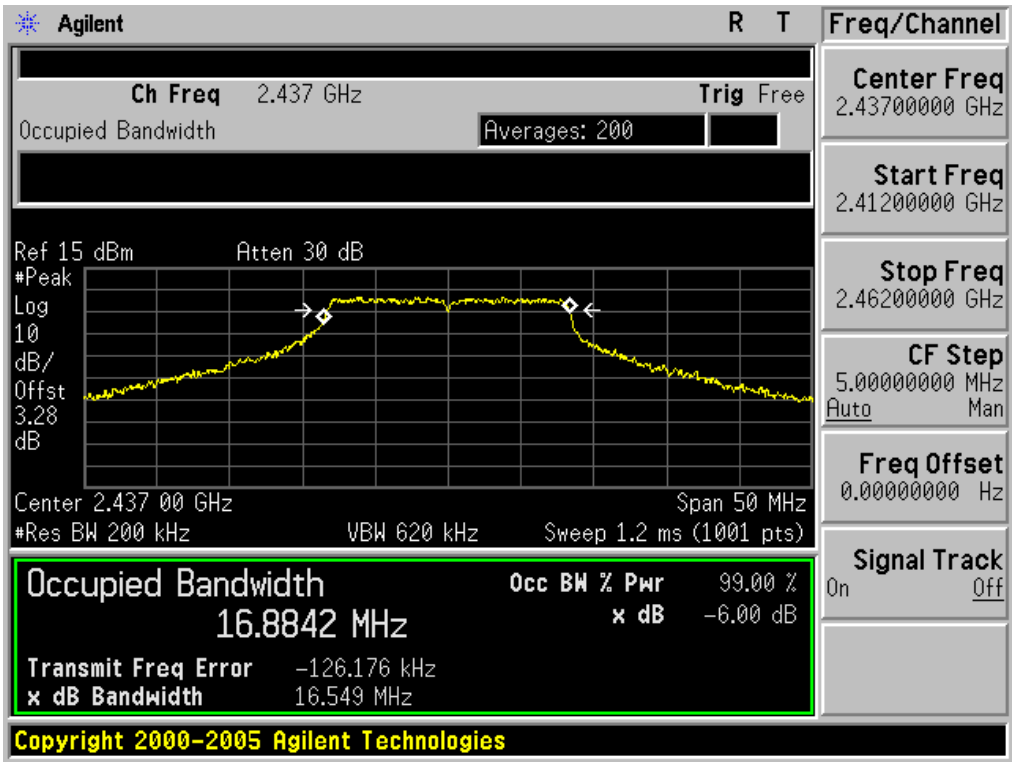
6 dB Bandwidth Test Mode: 802.11b & 1Mbps & 2462MHz



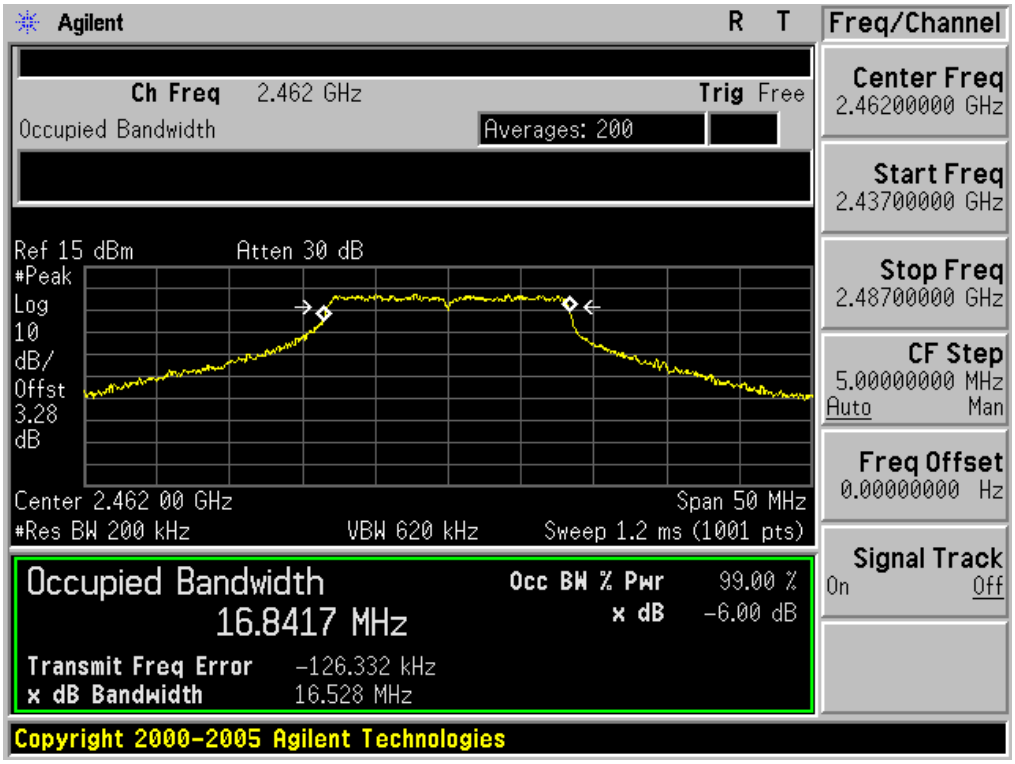
6 dB Bandwidth Test Mode: 802.11g & 6Mbps & 2412MHz



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



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



7.2 Maximum Peak Conducted Output Power & Test Case 1

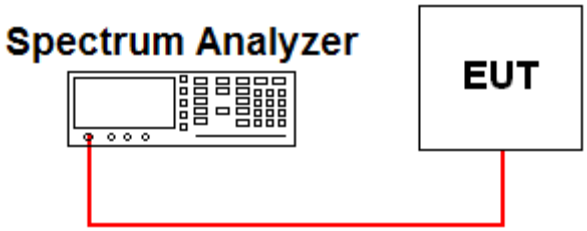
Test Requirements and limit, §15.247(d)

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.

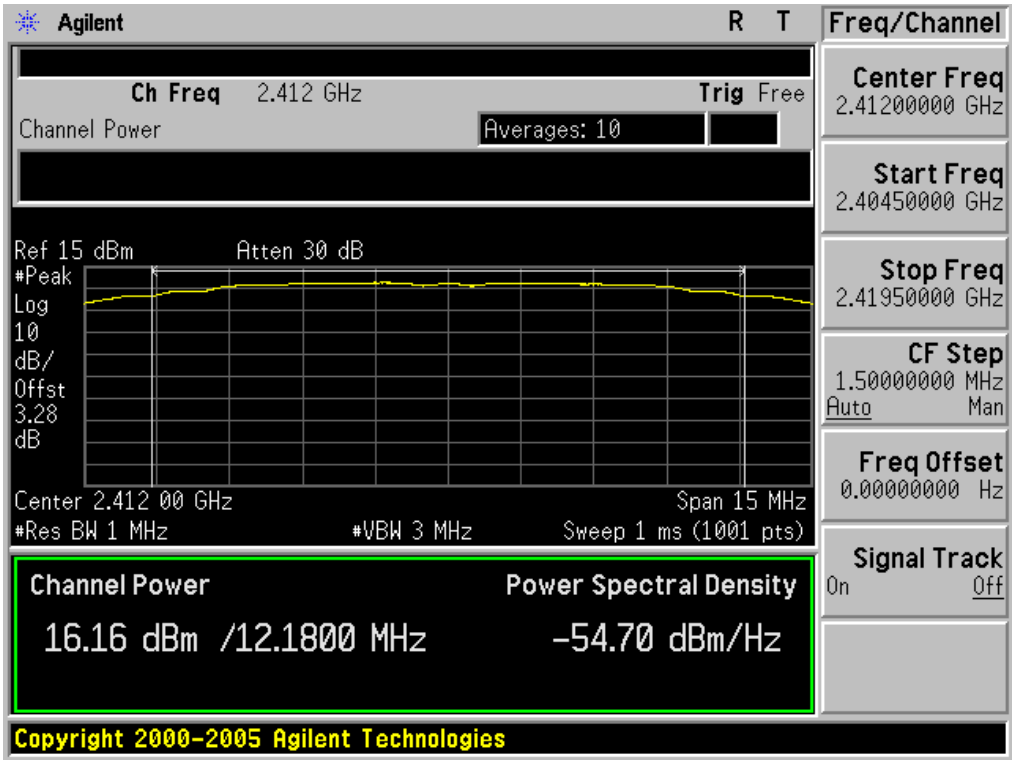
▣ TEST RESULTS: Comply

Test Mode	Data Rate	Test Results[dBm]		
		2412MHz	2437MHz	2462MHz
802.11b	**1 Mbps**	16.16	16.13	**16.56**
802.11g	**6 Mbps**	13.95	14.47	14.83

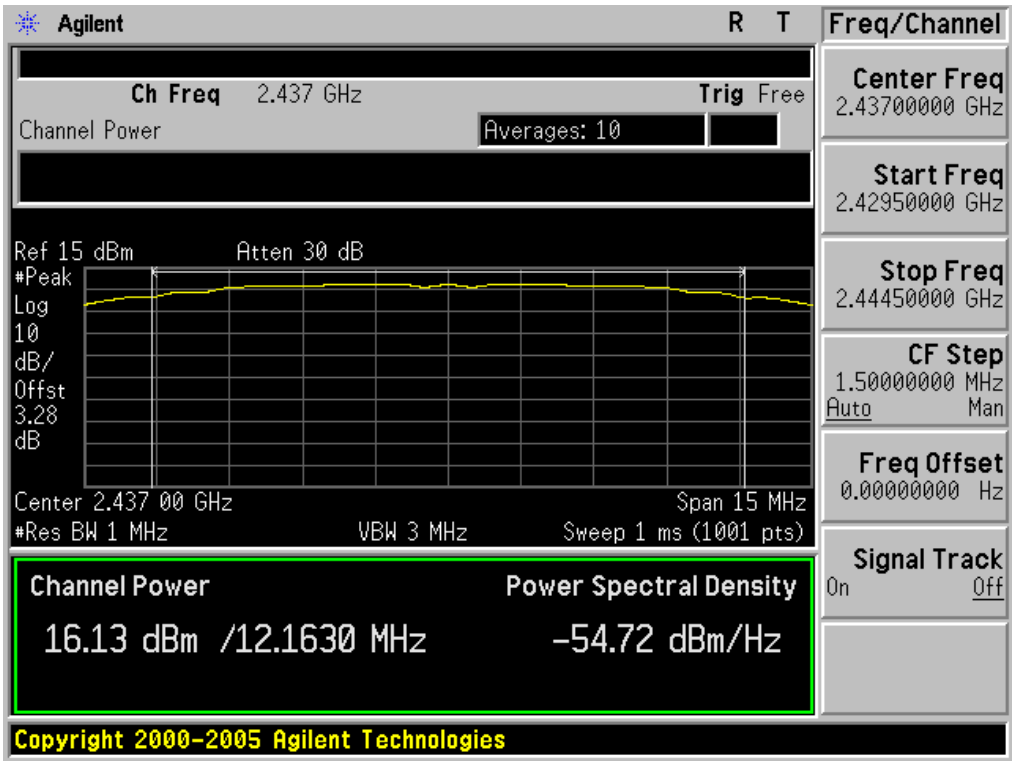
Note : The cable loss was corrected using the offset value of the spectrum analyzer.

▣ RESULT PLOTS

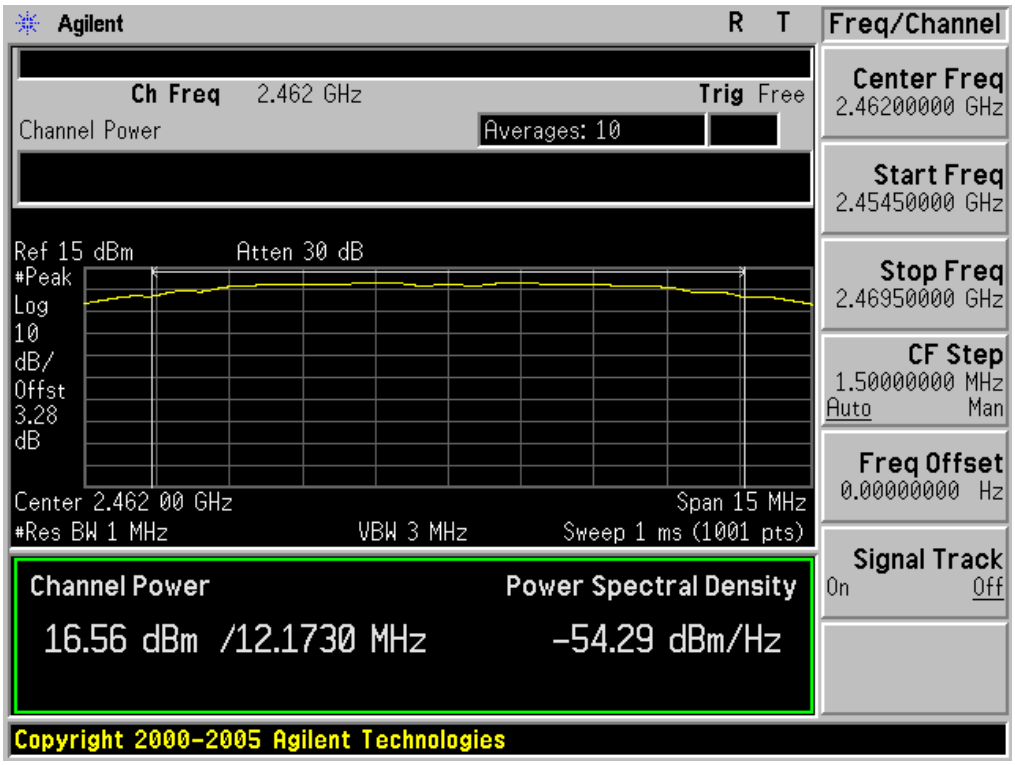
Peak Output Power Test Mode: 802.11b & 1Mbps & 2412MHz



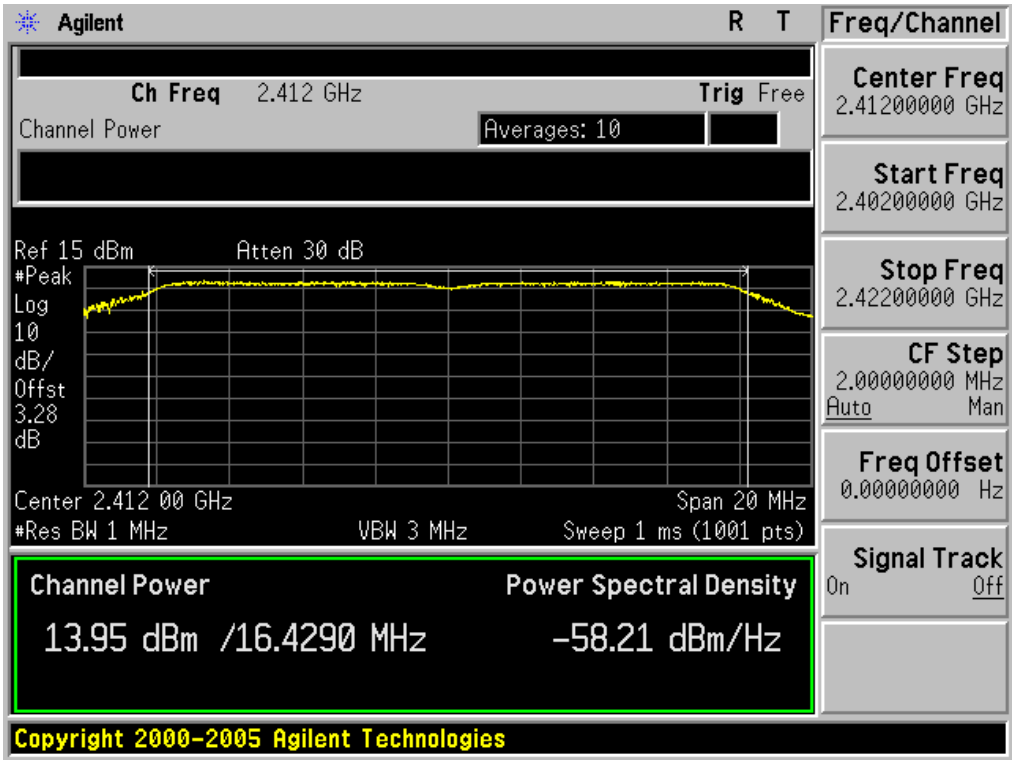
Peak Output Power Test Mode: 802.11b & 1Mbps & 2437MHz



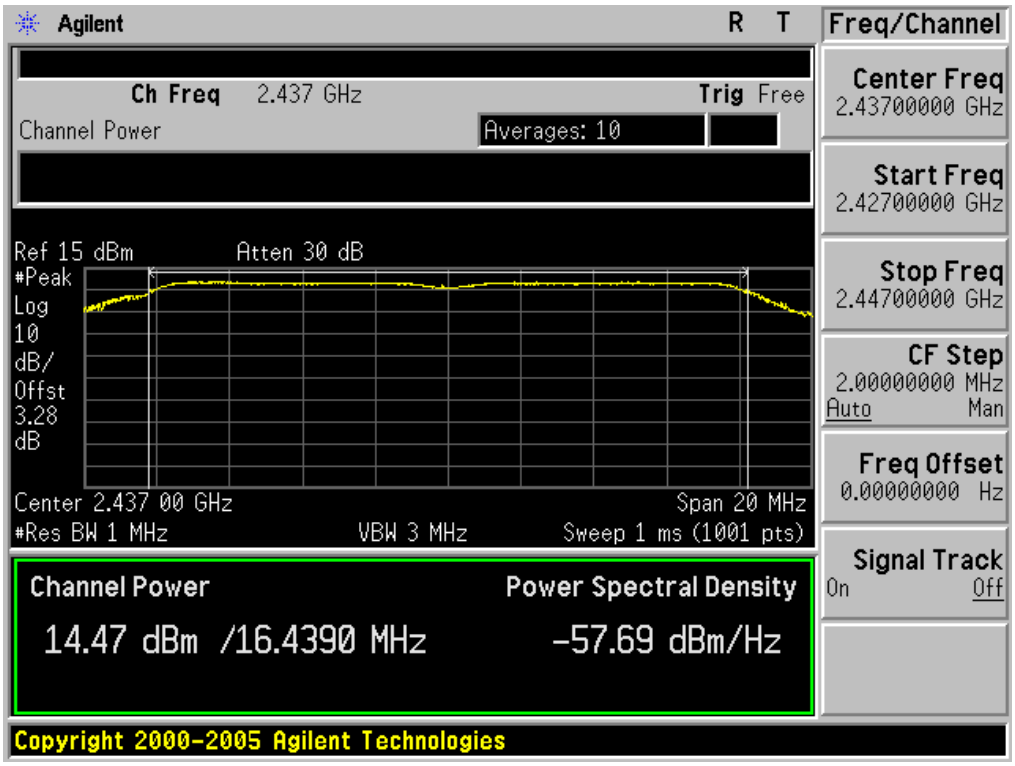
Peak Output Power Test Mode: 802.11b & 1Mbps & 2462MHz



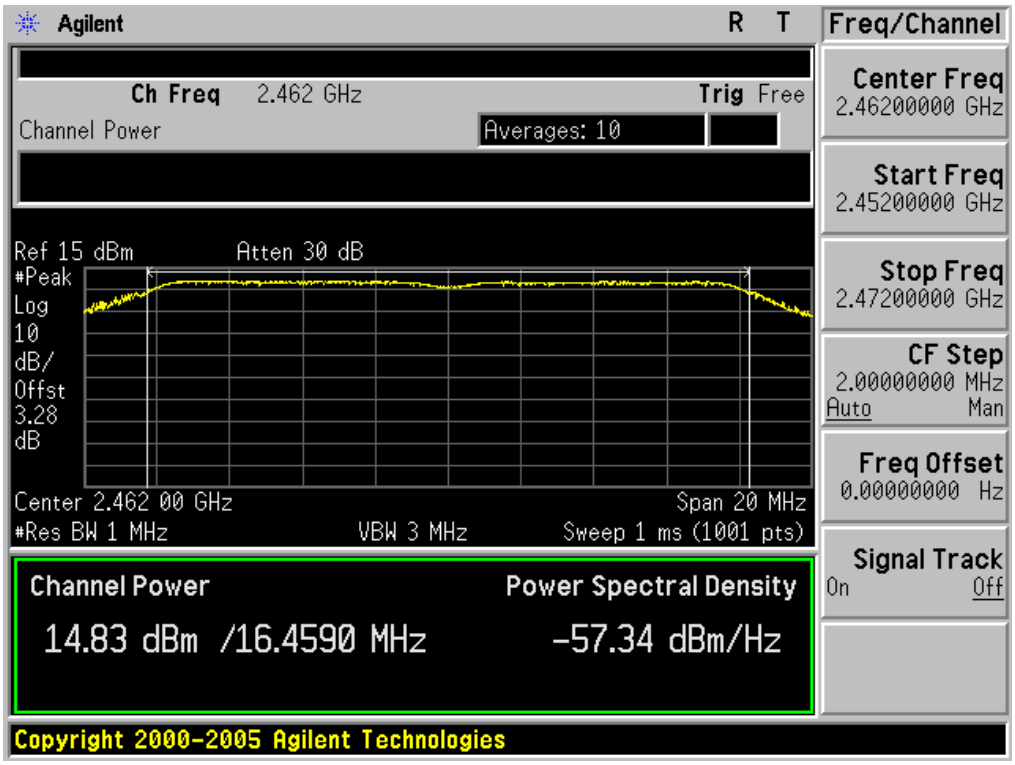
Peak Output Power Test Mode: 802.11g & 6Mbps & 2412MHz



Peak Output Power Test Mode: 802.11g & 6Mbps & 2437MHz



Peak Output Power Test Mode: 802.11g & 6Mbps & 2462MHz



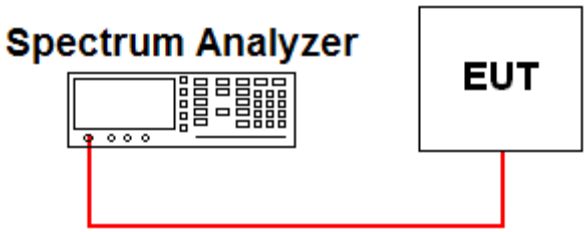
7.3 Maximum Power Spectral Density & Test Case 1

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.

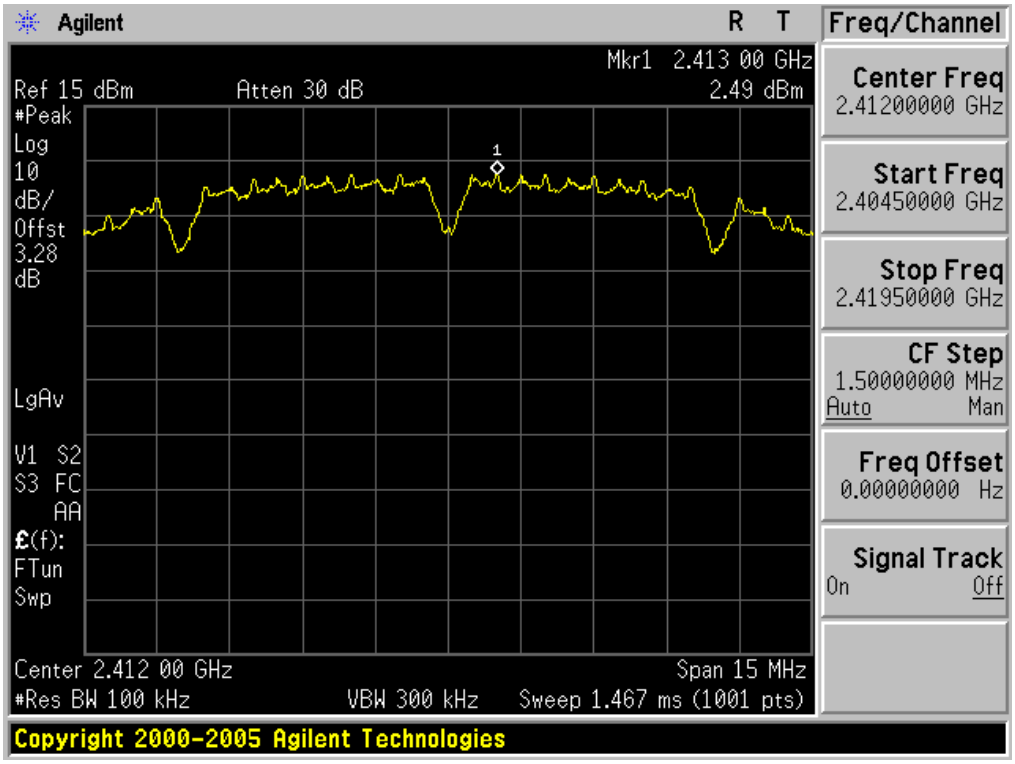
▣ TEST RESULTS: Comply

Test Mode	Data Rate	Frequency [MHz]	S/A Reading [dBm]	B.W.C.F [dB]	PKPSD [dBm]
802.11b	1Mbps	2412	2.49	-15.2	-12.71
		2437	3.16	-15.2	-12.04
		2462	3.13	-15.2	-12.07
802.11g	6Mbps	2412	0.41	-15.2	-14.79
		2437	0.80	-15.2	-14.40
		2462	1.00	-15.2	-14.20

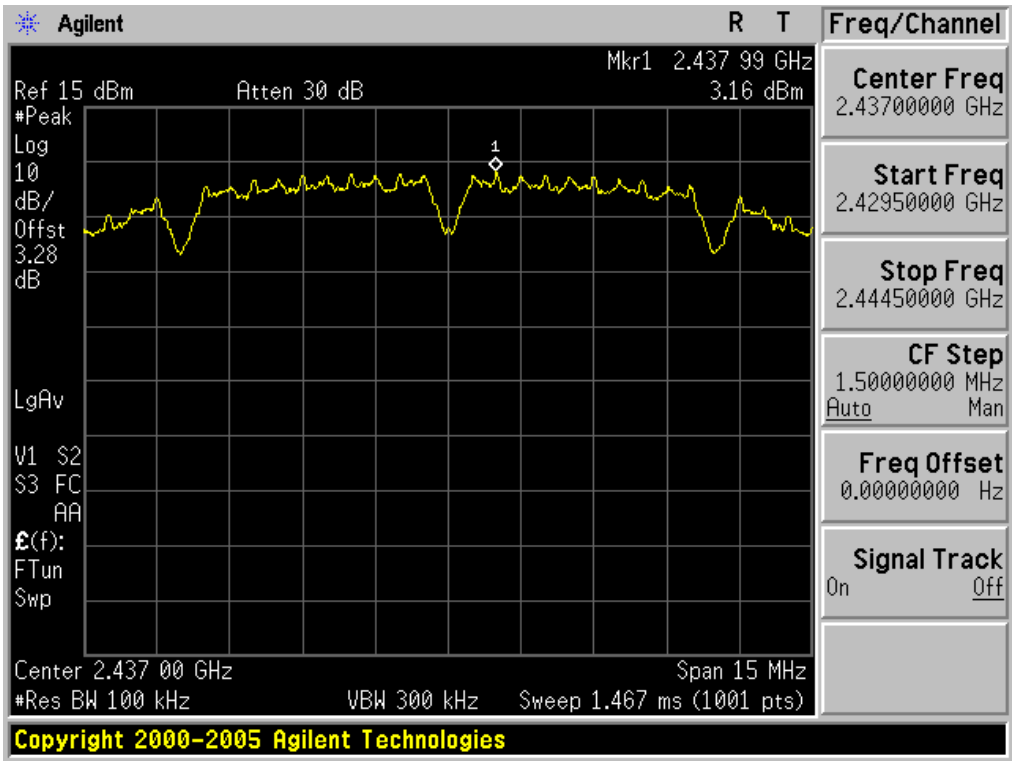
Note : The cable loss was corrected using the offset value of the spectrum analyzer.

▣ RESULT PLOTS

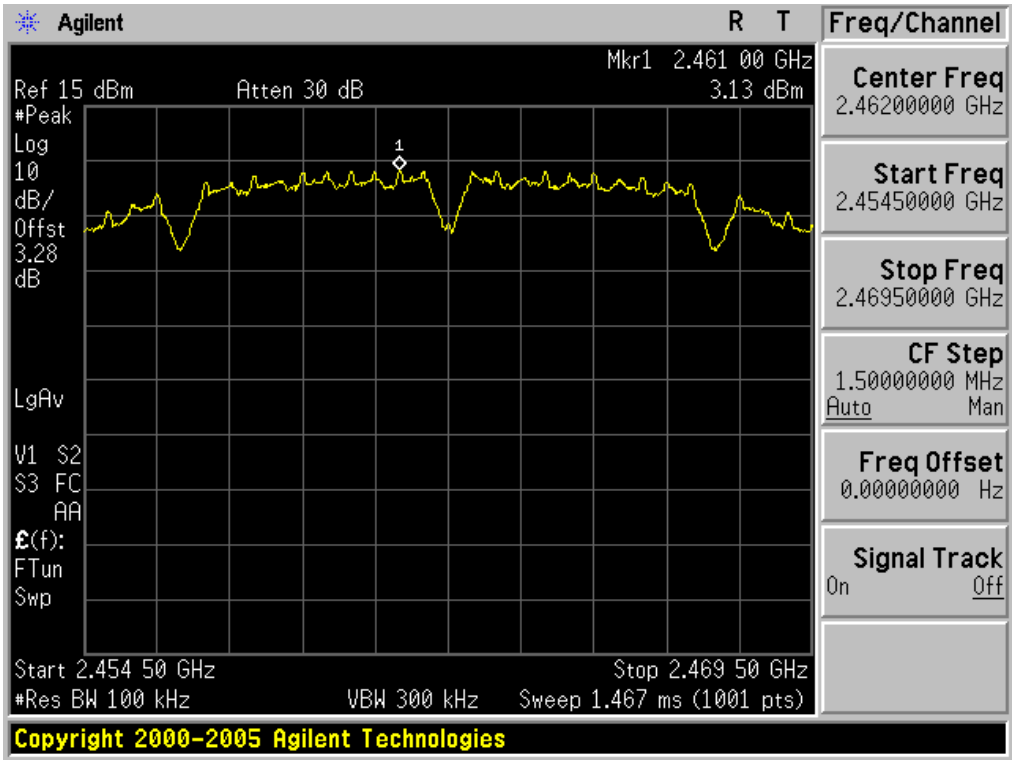
Maximum PKPSD Test Mode: 802.11b & 1Mbps & 2412MHz



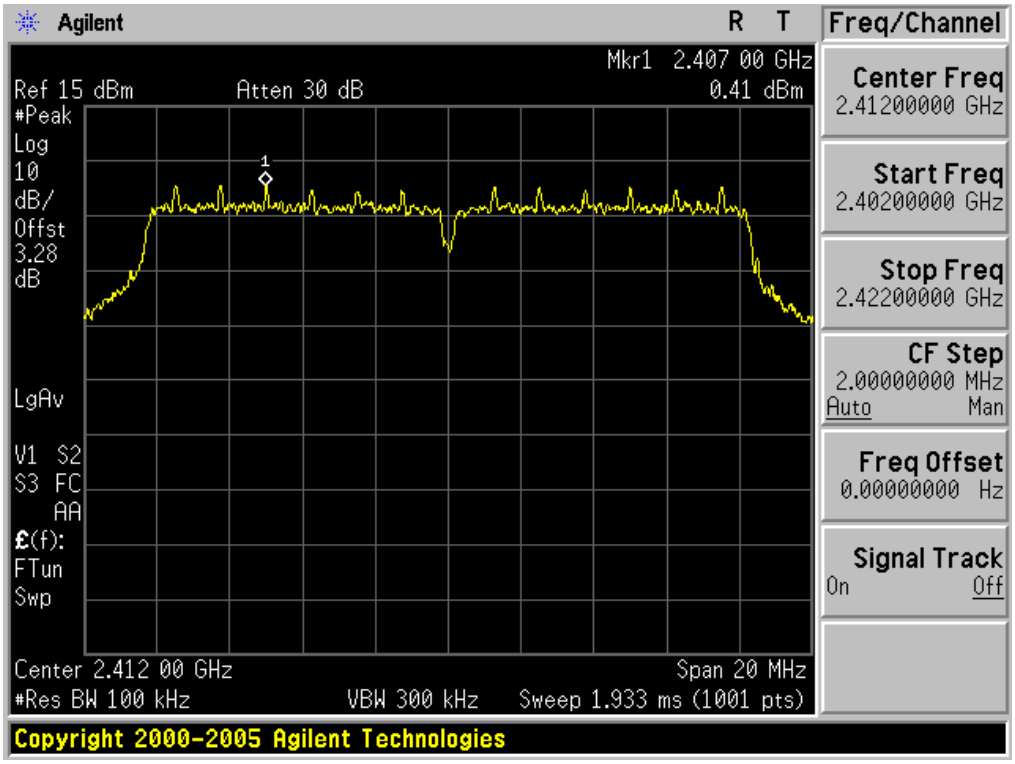
Maximum PKPSD Test Mode: 802.11b & 1Mbps & 2437MHz



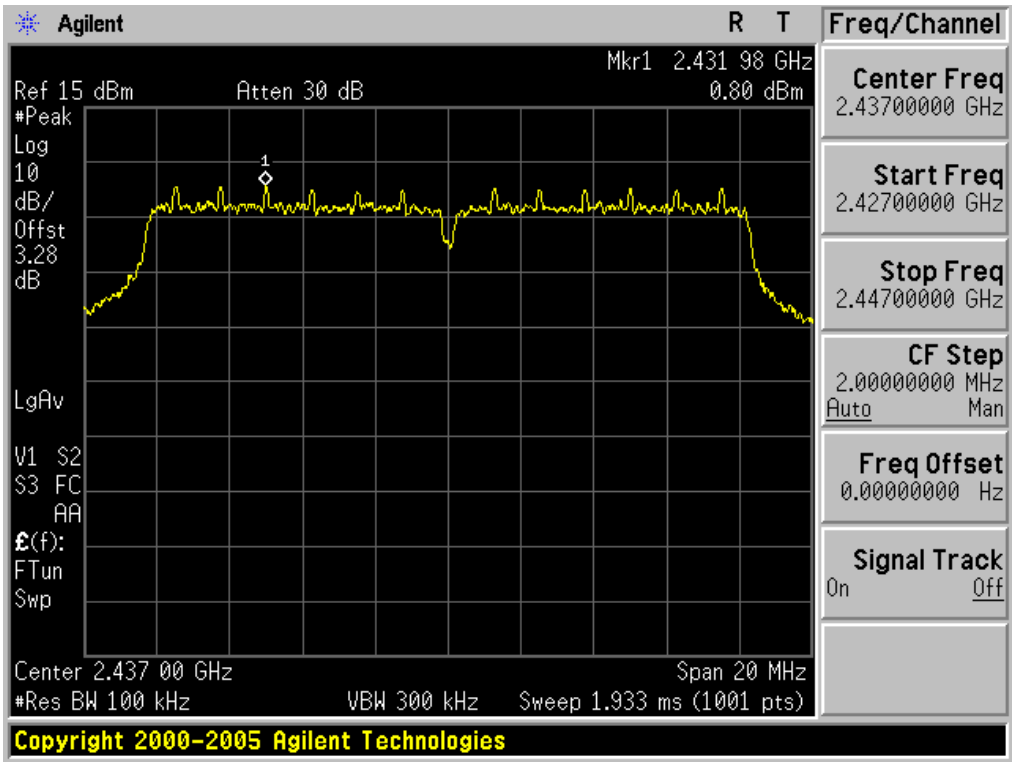
Maximum PKPSD Test Mode: 802.11b & 1Mbps & 2462MHz



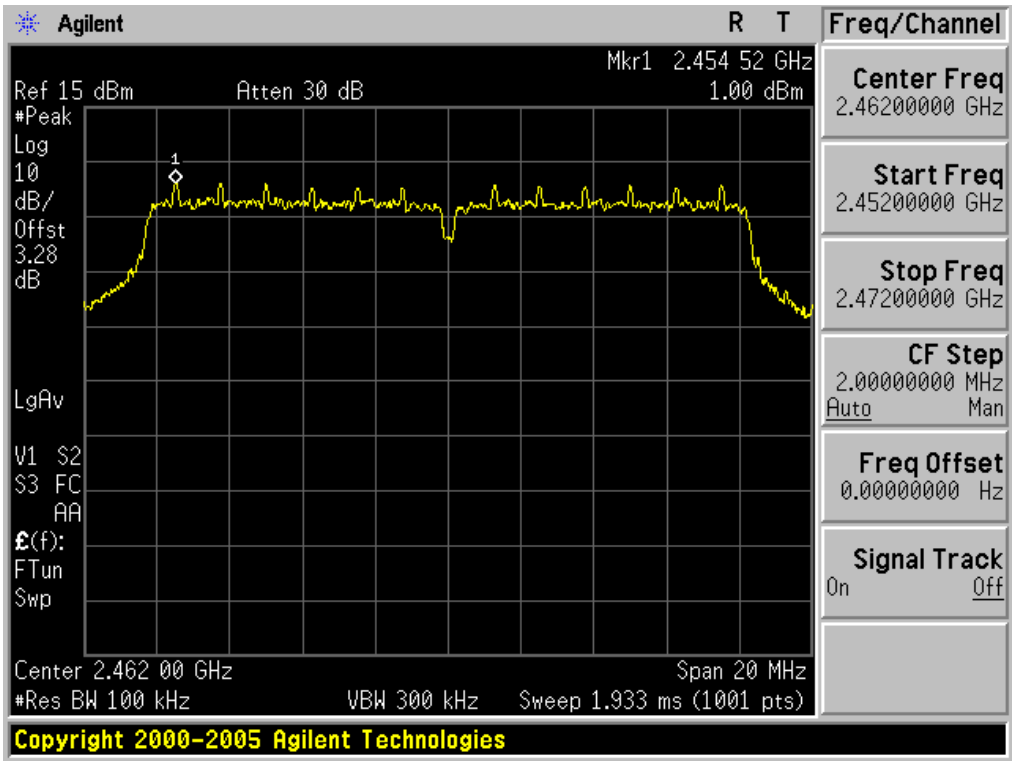
Maximum PKPSD Test Mode: 802.11g & 6Mbps & 2412MHz



Maximum PKPSD Test Mode: 802.11g & 6Mbps & 2437MHz



Maximum PKPSD Test Mode: 802.11g & 6Mbps & 2462MHz



7.4 Out of Band Emissions at the Band Edge/ Conducted Spurious Emissions & Test Case 1

Test requirements and limit, §15.247(d)

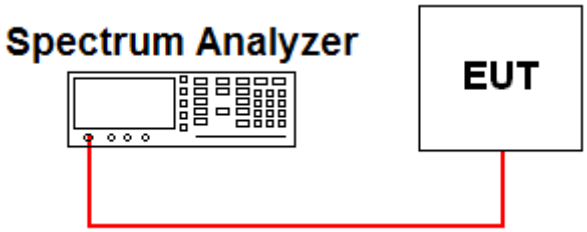
§15.247(d) specifies that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:

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:

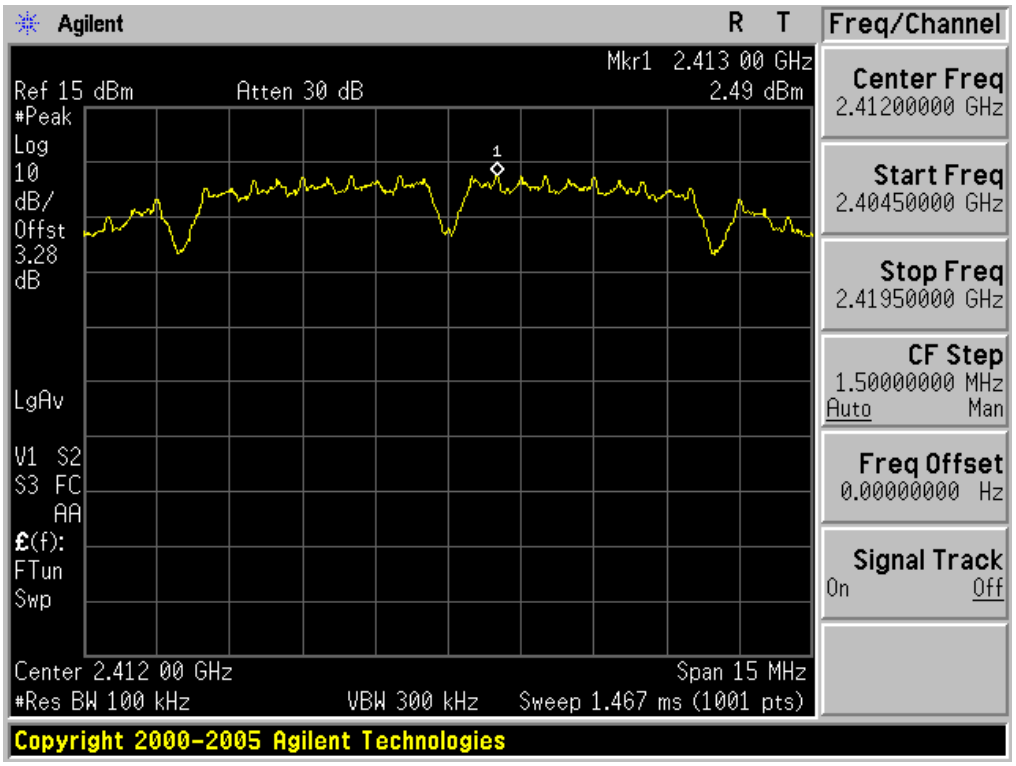
- Measurement Procedure 2 - Unwanted Emissions

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).

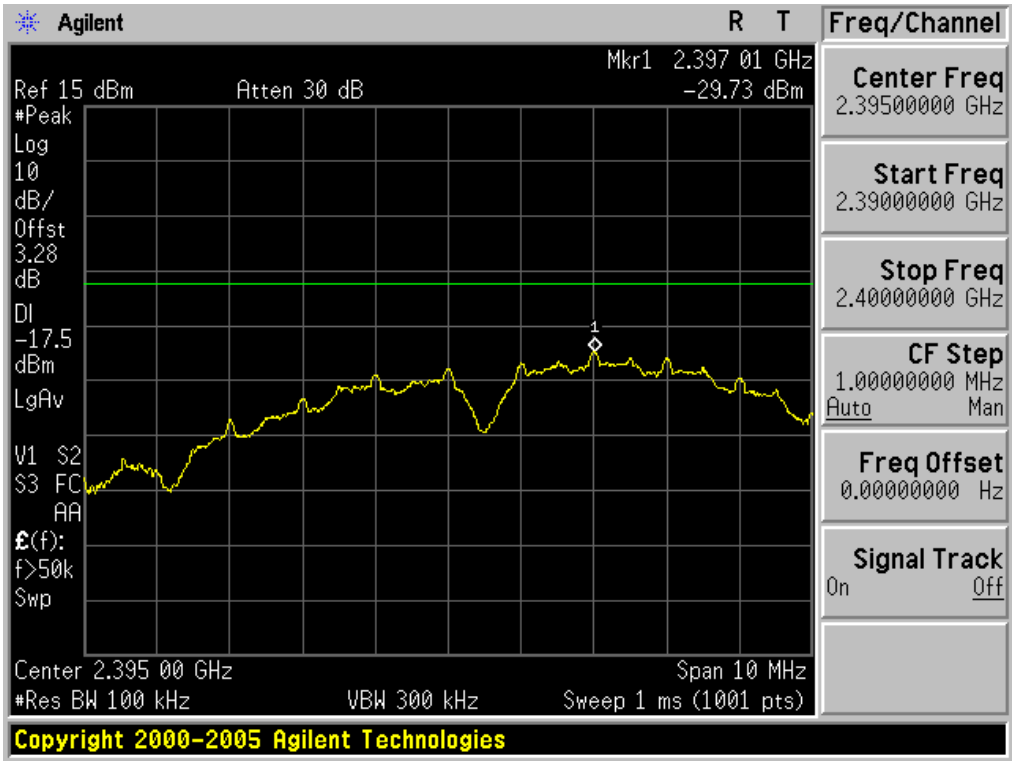
▣ RESULT PLOTS

802.11b & 1Mbps & 2412MHz

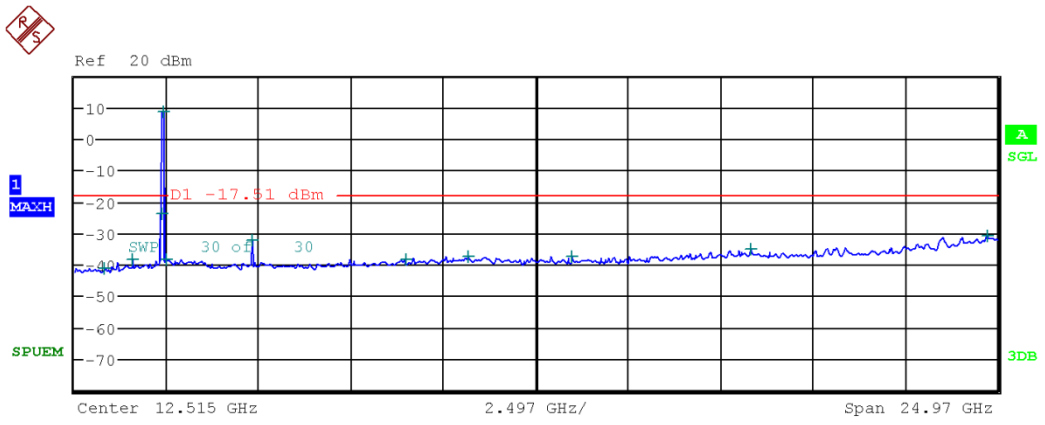
Reference



Low Band-edge



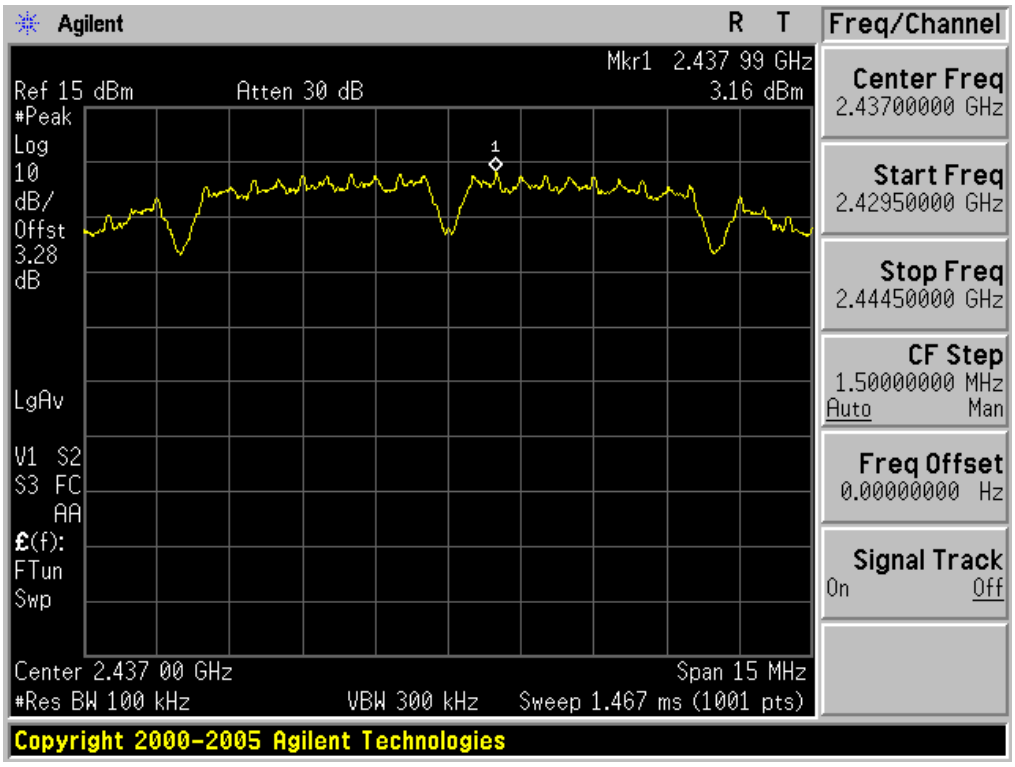
Conducted Spurious Emissions



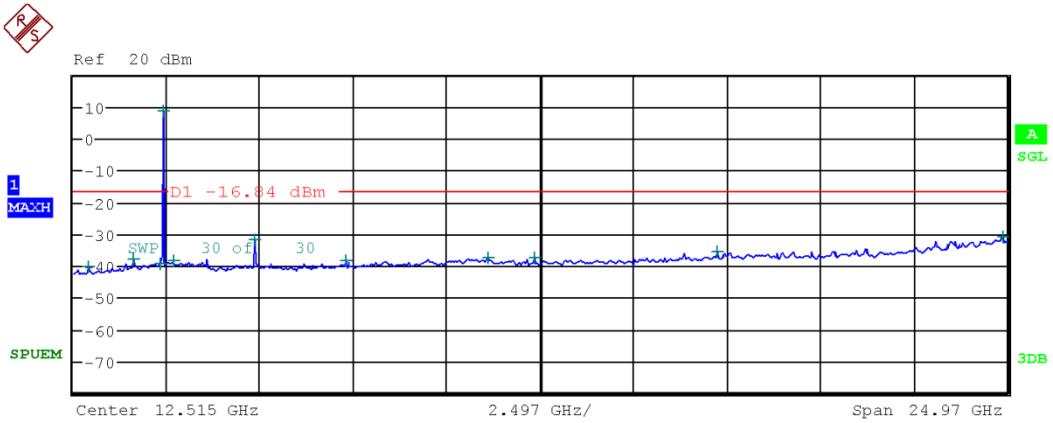
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
30.000 M	1.000 G	100.00 k	849.650000 M	-41.08	-200.00
1.000 G	2.000 G	100.00 k	1.608000 G	-38.40	-200.00
2.000 G	2.400 G	100.00 k	2.397000 G	-23.71	-200.00
2.400 G	2.483 G	100.00 k	2.412984 G	8.65	-200.00
2.483 G	3.000 G	100.00 k	2.503902 G	-38.26	-200.00
3.000 G	6.000 G	100.00 k	4.824000 G	-32.41	-200.00
6.000 G	9.000 G	100.00 k	8.986667 G	-38.29	-200.00
9.000 G	12.000 G	100.00 k	10.680000 G	-37.46	-200.00
12.000 G	15.000 G	100.00 k	13.495000 G	-37.51	-200.00
15.000 G	20.000 G	100.00 k	18.320556 G	-34.99	-200.00
20.000 G	25.000 G	100.00 k	24.718889 G	-31.05	-200.00

802.11b & 1Mbps & 2437MHz

Reference



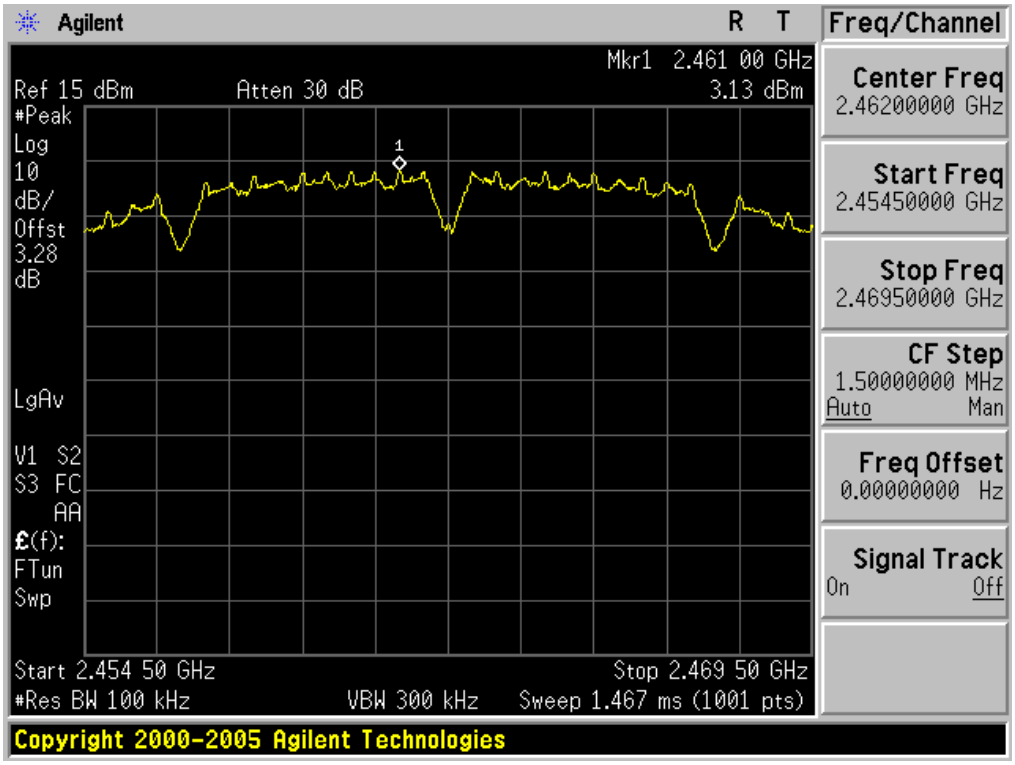
Conducted Spurious Emissions



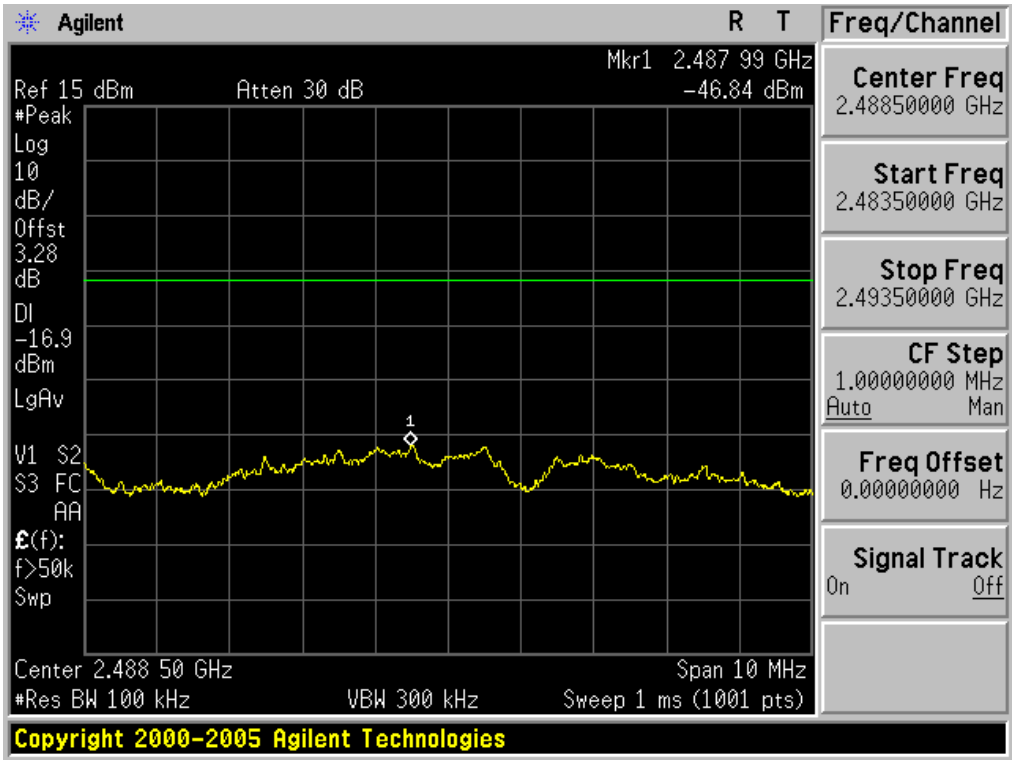
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
30.000 M	1.000 G	100.00 k	418.000000 M	-40.34	-200.00
1.000 G	2.000 G	100.00 k	1.625000 G	-38.14	-200.00
2.000 G	2.400 G	100.00 k	2.359360 G	-39.23	-200.00
2.400 G	2.483 G	100.00 k	2.437993 G	8.67	-200.00
2.483 G	3.000 G	100.00 k	2.713497 G	-38.62	-200.00
3.000 G	6.000 G	100.00 k	4.874000 G	-31.78	-200.00
6.000 G	9.000 G	100.00 k	7.304000 G	-38.30	-200.00
9.000 G	12.000 G	100.00 k	11.116333 G	-37.45	-200.00
12.000 G	15.000 G	100.00 k	12.364000 G	-37.68	-200.00
15.000 G	20.000 G	100.00 k	17.227222 G	-35.60	-200.00
20.000 G	25.000 G	100.00 k	24.864444 G	-30.75	-200.00

802.11b & 1Mbps & 2462MHz

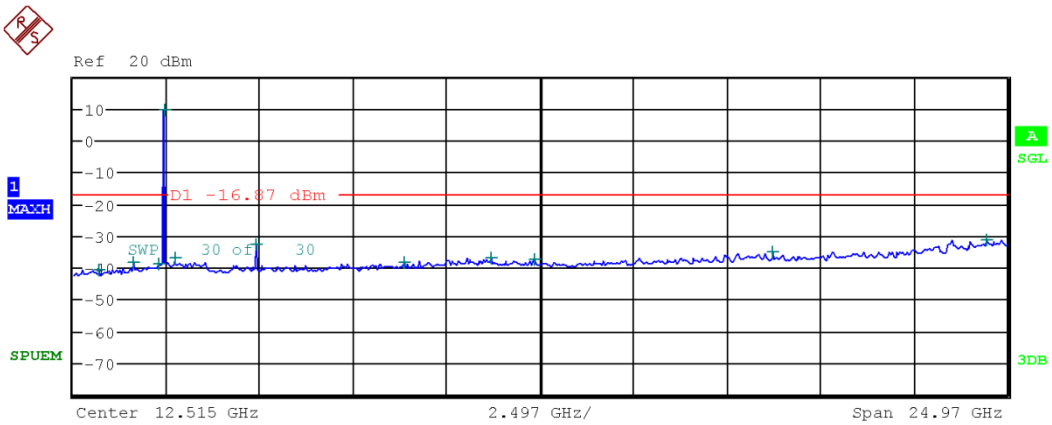
Reference



High Band-edge



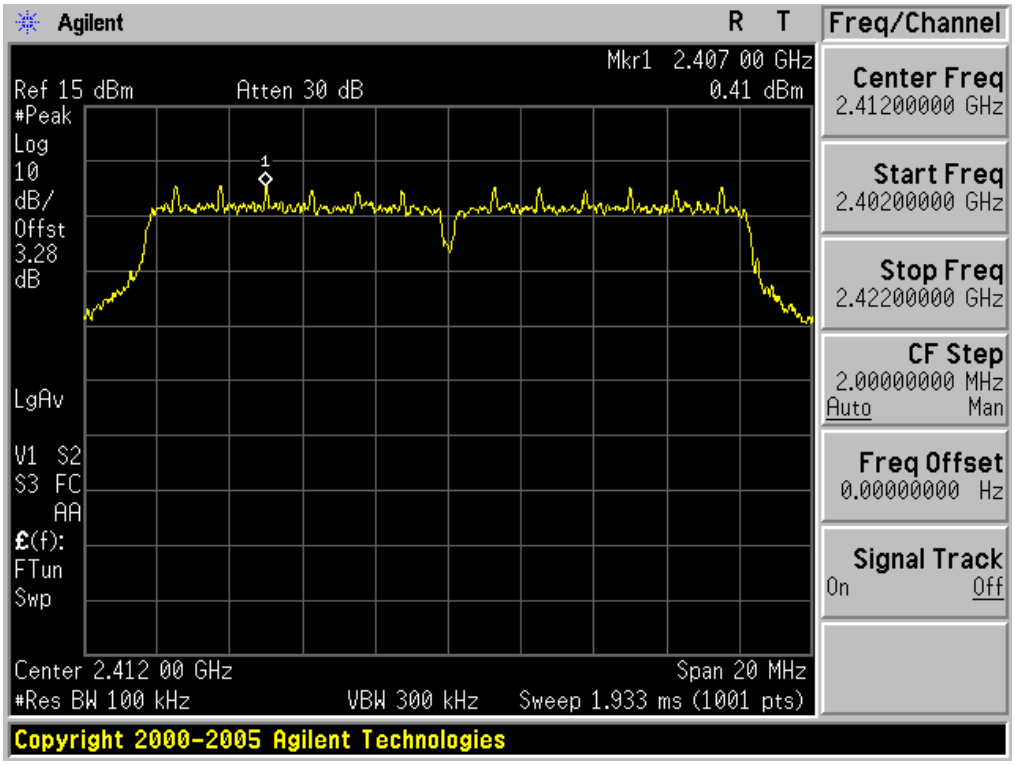
Conducted Spurious Emissions



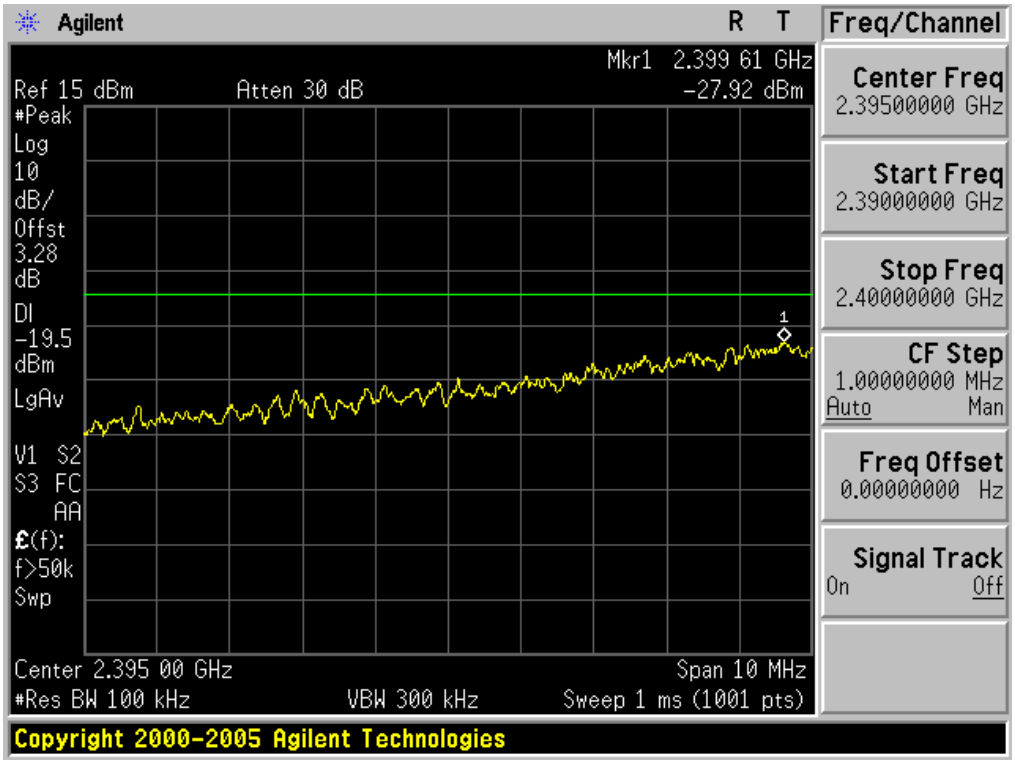
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
30.000 M	1.000 G	100.00 k	701.240000 M	-40.92	-200.00
1.000 G	2.000 G	100.00 k	1.642000 G	-38.41	-200.00
2.000 G	2.400 G	100.00 k	2.329240 G	-39.10	-200.00
2.400 G	2.483 G	100.00 k	2.463001 G	9.29	-200.00
2.483 G	3.000 G	100.00 k	2.745985 G	-37.19	-200.00
3.000 G	6.000 G	100.00 k	4.924000 G	-32.74	-200.00
6.000 G	9.000 G	100.00 k	8.861667 G	-38.57	-200.00
9.000 G	12.000 G	100.00 k	11.181000 G	-36.88	-200.00
12.000 G	15.000 G	100.00 k	12.369000 G	-37.68	-200.00
15.000 G	20.000 G	100.00 k	18.736111 G	-35.13	-200.00
20.000 G	25.000 G	100.00 k	24.432222 G	-31.29	-200.00

802.11g & 6Mbps & 2412MHz

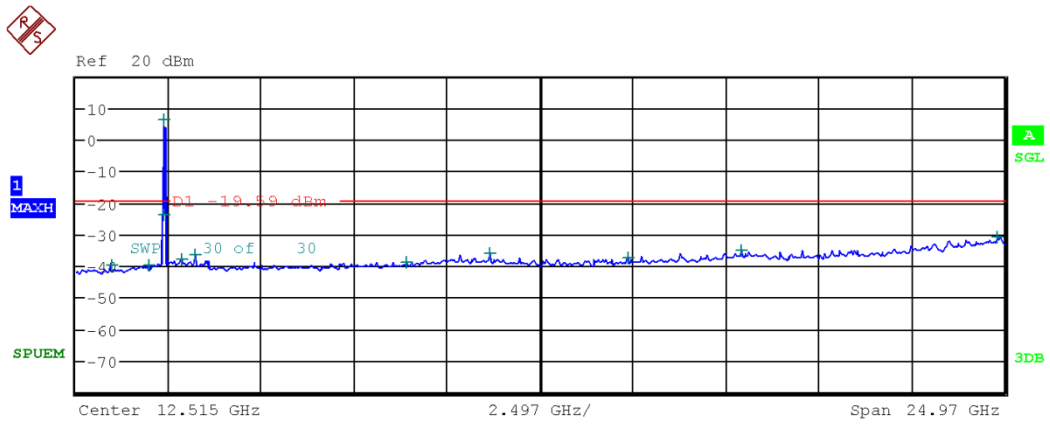
Reference



Low Band-edge



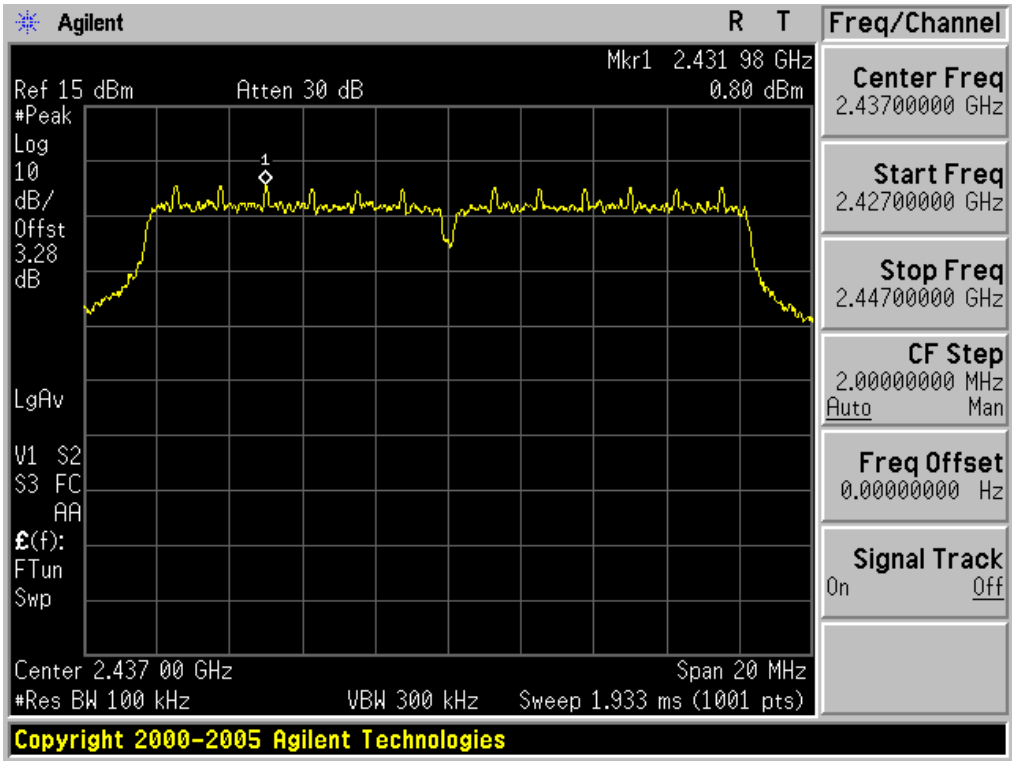
Conducted Spurious Emissions



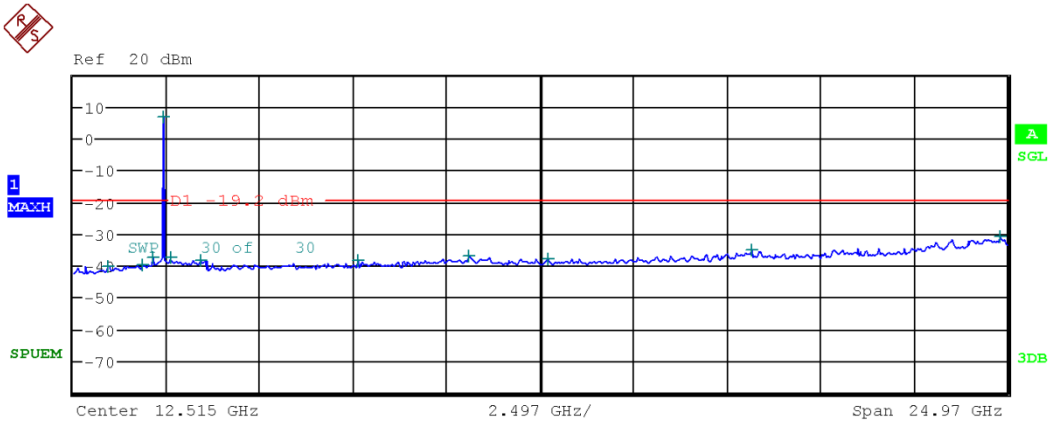
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	100.00 k	982.540000 M	-40.00	-200.00
1.000 G	2.000 G	100.00 k	1.981000 G	-39.63	-200.00
2.000 G	2.400 G	100.00 k	2.400000 G	-24.09	-200.00
2.400 G	2.483 G	100.00 k	2.404509 G	5.99	-200.00
2.483 G	3.000 G	100.00 k	2.876402 G	-38.19	-200.00
3.000 G	6.000 G	100.00 k	3.216000 G	-36.42	-200.00
6.000 G	9.000 G	100.00 k	8.896667 G	-38.78	-200.00
9.000 G	12.000 G	100.00 k	11.145333 G	-36.33	-200.00
12.000 G	15.000 G	100.00 k	14.885667 G	-37.47	-200.00
15.000 G	20.000 G	100.00 k	17.907222 G	-35.24	-200.00
20.000 G	25.000 G	100.00 k	24.809444 G	-31.06	-200.00

802.11g & 6Mbps & 2437MHz

Reference



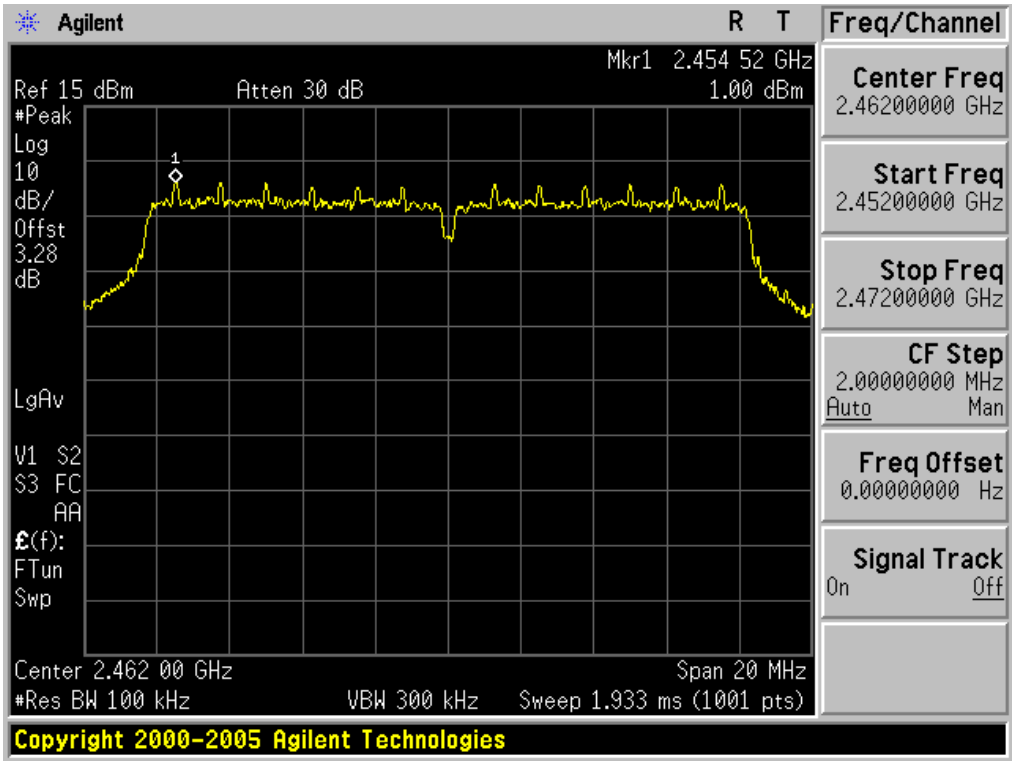
Conducted Spurious Emissions



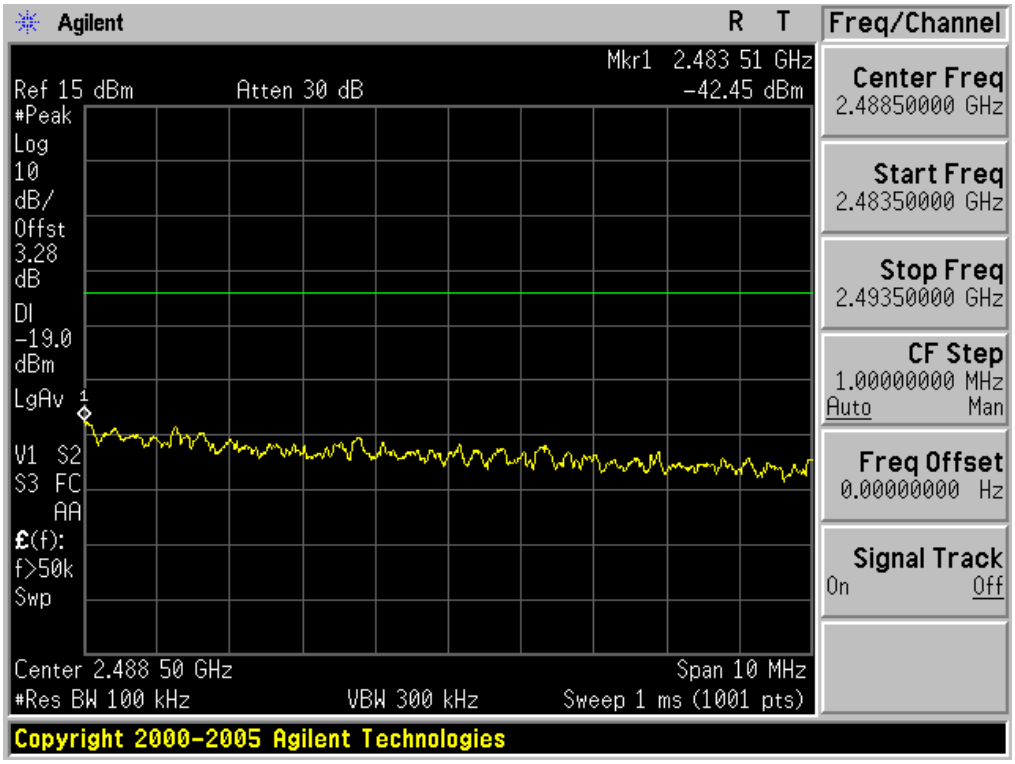
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
30.000 M	1.000 G	100.00 k	964.110000 M	-40.19	-200.00
1.000 G	2.000 G	100.00 k	1.876000 G	-39.84	-200.00
2.000 G	2.400 G	100.00 k	2.153640 G	-37.51	-200.00
2.400 G	2.483 G	100.00 k	2.432001 G	6.65	-200.00
2.483 G	3.000 G	100.00 k	2.642427 G	-37.71	-200.00
3.000 G	6.000 G	100.00 k	3.449667 G	-38.25	-200.00
6.000 G	9.000 G	100.00 k	7.623333 G	-38.54	-200.00
9.000 G	12.000 G	100.00 k	10.590667 G	-37.13	-200.00
12.000 G	15.000 G	100.00 k	12.717000 G	-37.87	-200.00
15.000 G	20.000 G	100.00 k	18.139444 G	-35.06	-200.00
20.000 G	25.000 G	100.00 k	24.812778 G	-31.10	-200.00

802.11g & 6Mbps & 2462MHz

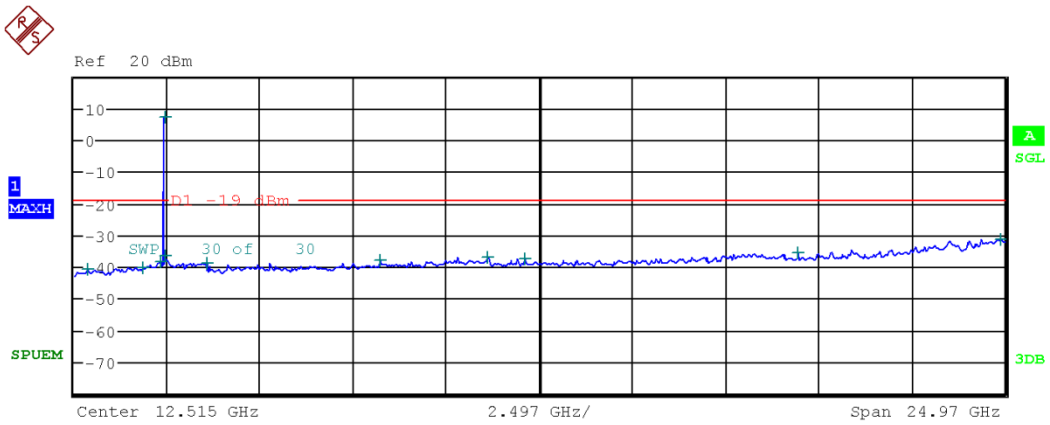
Reference



High Band-edge



Conducted Spurious Emissions



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
30.000 M	1.000 G	100.00 k	404.420000 M	-40.96	-200.00
1.000 G	2.000 G	100.00 k	1.867000 G	-40.40	-200.00
2.000 G	2.400 G	100.00 k	2.367080 G	-38.68	-200.00
2.400 G	2.483 G	100.00 k	2.469535 G	7.16	-200.00
2.483 G	3.000 G	100.00 k	2.484171 G	-36.52	-200.00
3.000 G	6.000 G	100.00 k	3.598667 G	-38.84	-200.00
6.000 G	9.000 G	100.00 k	8.235333 G	-38.02	-200.00
9.000 G	12.000 G	100.00 k	11.095333 G	-36.84	-200.00
12.000 G	15.000 G	100.00 k	12.100000 G	-37.57	-200.00
15.000 G	20.000 G	100.00 k	19.432778 G	-35.86	-200.00
20.000 G	25.000 G	100.00 k	24.891111 G	-31.37	-200.00

7.5 Radiated Measurement.

7.5.1 Radiated Spurious Emissions.

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

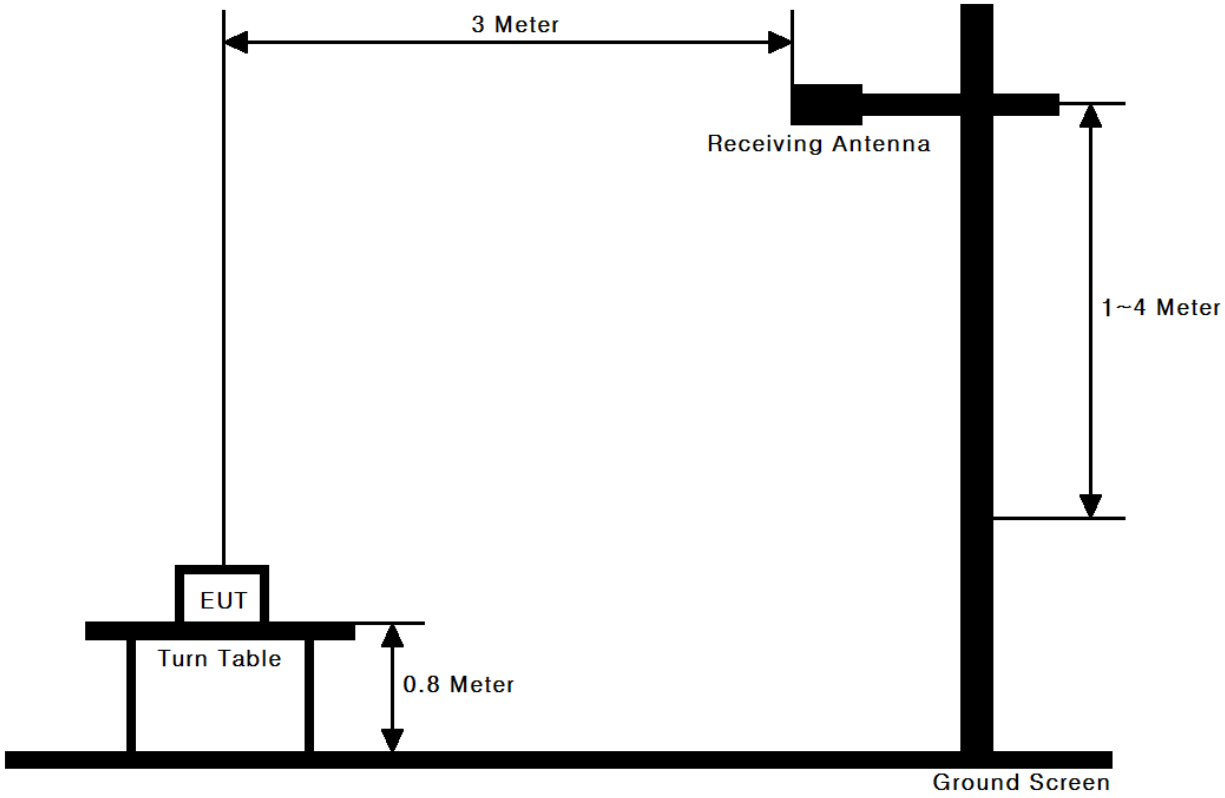
** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part,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

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.

30MHz ~ 25GHz Data(*802.11b & 1Mbps*) 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)
2397.030	V	Y	PK	58.32	-1.01	57.31	74.00	16.69
2397.030	V	Y	AV	48.90	-1.01	47.89	54.00	6.11
4824.050	V	Y	PK	51.10	8.34	59.44	74.00	14.56
4824.030	V	Y	AV	43.29	8.34	51.63	54.00	2.37
-	-	-	-	-	-	-	-	-

▪ 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)
4874.040	V	Y	PK	50.25	8.51	58.76	74.00	15.24
4874.040	V	Y	AV	41.86	8.51	50.37	54.00	3.63
-	-	-	-	-	-	-	-	-

▪ 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)
2487.750	V	Y	PK	53.91	-1.06	52.85	74.00	21.15
2487.750	V	Y	AV	42.89	-1.06	41.83	54.00	12.17
4924.000	V	Y	PK	50.47	8.57	59.04	74.00	14.96
4924.000	V	Y	AV	42.05	8.57	50.62	54.00	3.38
-	-	-	-	-	-	-	-	-

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

30MHz ~ 25GHz Data(*802.11g & 6Mbps*) 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)
2399.600	V	Y	PK	48.67	-1.01	47.66	74.00	26.34
2399.600	V	Y	AV	31.25	-1.01	30.24	54.00	23.76
4824.000	V	Y	PK	50.68	8.34	59.02	74.00	14.98
4824.000	V	Y	AV	40.86	8.34	49.20	54.00	4.80
-	-	-	-	-	-	-	-	-

▪ 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)
4870.370	V	Y	PK	52.52	8.51	61.03	74.00	12.97
4870.370	V	Y	AV	40.28	8.51	48.79	54.00	5.21
-	-	-	-	-	-	-	-	-

▪ 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)
2484.900	V	Y	PK	42.15	-1.06	41.09	74.00	32.91
2484.900	V	Y	AV	36.97	-1.06	35.91	54.00	18.09
4926.230	V	Y	PK	52.65	8.57	61.22	74.00	12.78
4926.230	V	Y	AV	41.28	8.57	49.85	54.00	4.15
-	-	-	-	-	-	-	-	-

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

30MHz ~ 25GHz Data(*802.11b & 1Mbps*) 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)
2398.040	V	Y	PK	58.96	-1.01	57.95	74.00	16.05
2398.040	V	Y	AV	49.05	-1.01	48.04	54.00	5.96
4824.010	V	Y	PK	50.89	8.34	59.23	74.00	14.77
4824.010	V	Y	AV	43.01	8.34	51.35	54.00	2.65
-	-	-	-	-	-	-	-	-

▪ 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)
4874.010	V	Y	PK	50.01	8.51	58.52	74.00	15.48
4874.010	V	Y	AV	41.00	8.51	49.51	54.00	4.49
-	-	-	-	-	-	-	-	-

▪ 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)
2487.770	V	Y	PK	52.67	-1.06	51.61	74.00	22.39
2487.770	V	Y	AV	41.86	-1.06	40.80	54.00	13.20
4924.000	V	Y	PK	49.95	8.57	58.52	74.00	15.48
4924.000	V	Y	AV	41.85	8.57	50.42	54.00	3.58
-	-	-	-	-	-	-	-	-

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

30MHz ~ 25GHz Data(*802.11g & 6Mbps*) 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)
2399.540	V	Y	PK	47.68	-1.01	46.67	74.00	27.33
2399.540	V	Y	AV	31.65	-1.01	30.64	54.00	23.36
4824.000	V	Y	PK	50.12	8.34	58.46	74.00	15.54
4824.000	V	Y	AV	39.87	8.34	48.21	54.00	5.79
-	-	-	-	-	-	-	-	-

▪ 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)
4874.000	V	Y	PK	52.64	8.51	61.15	74.00	12.85
4874.000	V	Y	AV	40.01	8.51	48.52	54.00	5.48
-	-	-	-	-	-	-	-	-

▪ 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)
2484.580	V	Y	PK	42.98	-1.06	41.92	74.00	32.08
2484.580	V	Y	AV	37.00	-1.06	35.94	54.00	18.06
4924.000	V	Y	PK	52.34	8.57	60.91	74.00	13.09
4924.000	V	Y	AV	40.56	8.57	49.13	54.00	4.87
-	-	-	-	-	-	-	-	-

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

30MHz ~ 25GHz Data(*802.11b & 1Mbps*) 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)
2398.160	V	Y	PK	58.38	-1.01	57.37	74.00	16.63
2398.160	V	Y	AV	48.97	-1.01	47.96	54.00	6.04
4824.000	V	Y	PK	50.24	8.34	58.58	74.00	15.42
4824.000	V	Y	AV	42.10	8.34	50.44	54.00	3.56
-	-	-	-	-	-	-	-	-

▪ 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)
4874.000	V	Y	PK	50.24	8.51	58.75	74.00	15.25
4874.000	V	Y	AV	41.23	8.51	49.74	54.00	4.26
-	-	-	-	-	-	-	-	-

▪ 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)
2486.980	V	Y	PK	53.24	-1.06	52.18	74.00	21.82
2486.980	V	Y	AV	42.15	-1.06	41.09	54.00	12.91
4924.000	V	Y	PK	50.25	8.57	58.82	74.00	15.18
4924.000	V	Y	AV	41.25	8.57	49.82	54.00	4.18
-	-	-	-	-	-	-	-	-

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

30MHz ~ 25GHz Data(*802.11g & 6Mbps*) 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)
2398.640	V	Y	PK	56.98	-1.01	55.97	74.00	18.03
2398.640	V	Y	AV	32.01	-1.01	31.00	54.00	23.00
4824.000	V	Y	PK	49.86	8.34	58.20	74.00	15.80
4824.000	V	Y	AV	39.54	8.34	47.88	54.00	6.12
-	-	-	-	-	-	-	-	-

▪ 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)
4874.000	V	Y	PK	51.86	8.51	60.37	74.00	13.63
4874.000	V	Y	AV	40.53	8.51	49.04	54.00	4.96
-	-	-	-	-	-	-	-	-

▪ 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)
2485.240	V	Y	PK	43.02	-1.06	41.96	74.00	32.04
2485.240	V	Y	AV	37.02	-1.06	35.96	54.00	18.04
4924.000	V	Y	PK	51.86	8.57	60.43	74.00	13.57
4924.000	V	Y	AV	40.25	8.57	48.82	54.00	5.18
-	-	-	-	-	-	-	-	-

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

30MHz ~ 25GHz Data(*802.11b & 1Mbps*) 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)
2398.840	V	Y	PK	58.25	-1.01	57.24	74.00	16.76
2398.840	V	Y	AV	48.36	-1.01	47.35	54.00	6.65
4824.000	V	Y	PK	51.24	8.34	59.58	74.00	14.42
4824.000	V	Y	AV	42.01	8.34	50.35	54.00	3.65
-	-	-	-	-	-	-	-	-

▪ 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)
4874.000	V	Y	PK	50.86	8.51	59.37	74.00	14.63
4874.000	V	Y	AV	41.55	8.51	50.06	54.00	3.94
-	-	-	-	-	-	-	-	-

▪ 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)
2485.340	V	Y	PK	52.86	-1.06	51.80	74.00	22.20
2485.340	V	Y	AV	42.06	-1.06	41.00	54.00	13.00
4924.000	V	Y	PK	50.76	8.57	59.33	74.00	14.67
4924.000	V	Y	AV	41.34	8.57	49.91	54.00	4.09
-	-	-	-	-	-	-	-	-

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

30MHz ~ 25GHz Data(*802.11g & 6Mbps*) 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)
2399.580	V	Y	PK	57.01	-1.01	56.00	74.00	18.00
2399.580	V	Y	AV	33.54	-1.01	32.53	54.00	21.47
4824.000	V	Y	PK	49.24	8.34	57.58	74.00	16.42
4824.000	V	Y	AV	38.99	8.34	47.33	54.00	6.67
-	-	-	-	-	-	-	-	-

▪ 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)
4874.000	V	Y	PK	51.35	8.51	59.86	74.00	14.14
4874.000	V	Y	AV	40.21	8.51	48.72	54.00	5.28
-	-	-	-	-	-	-	-	-

▪ 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)
2484.440	V	Y	PK	44.25	-1.06	43.19	74.00	30.81
2484.440	V	Y	AV	38.33	-1.06	37.27	54.00	16.73
4924.000	V	Y	PK	50.99	8.57	59.56	74.00	14.44
4924.000	V	Y	AV	40.39	8.57	48.96	54.00	5.04
-	-	-	-	-	-	-	-	-

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

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.

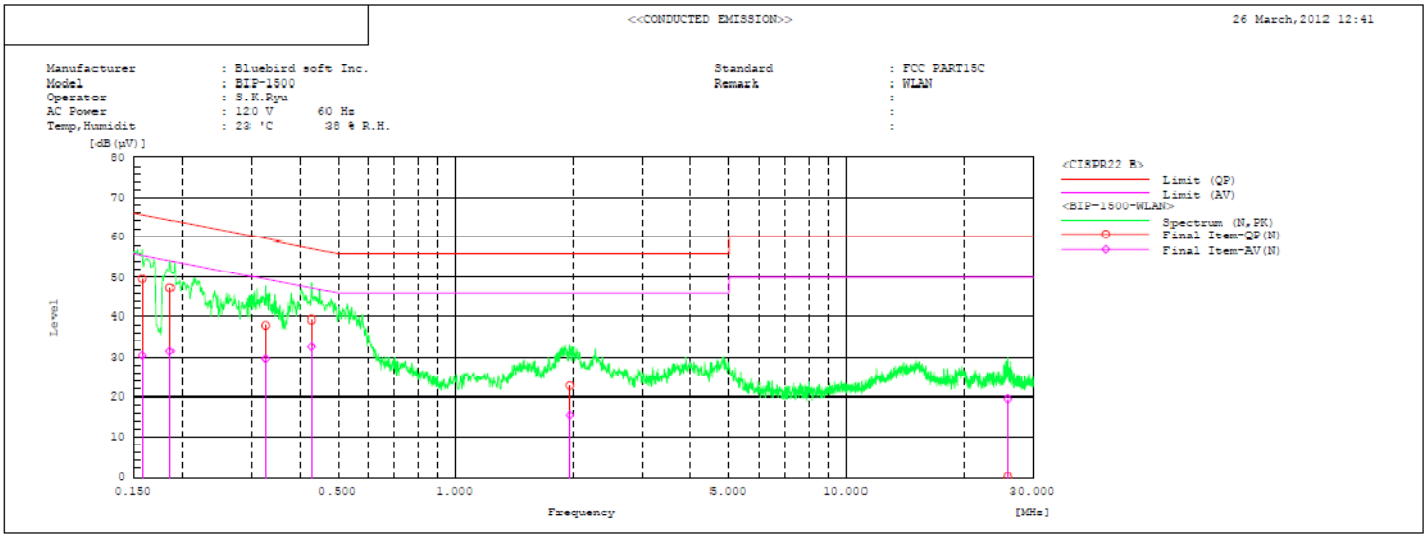
TEST PROCEDURE

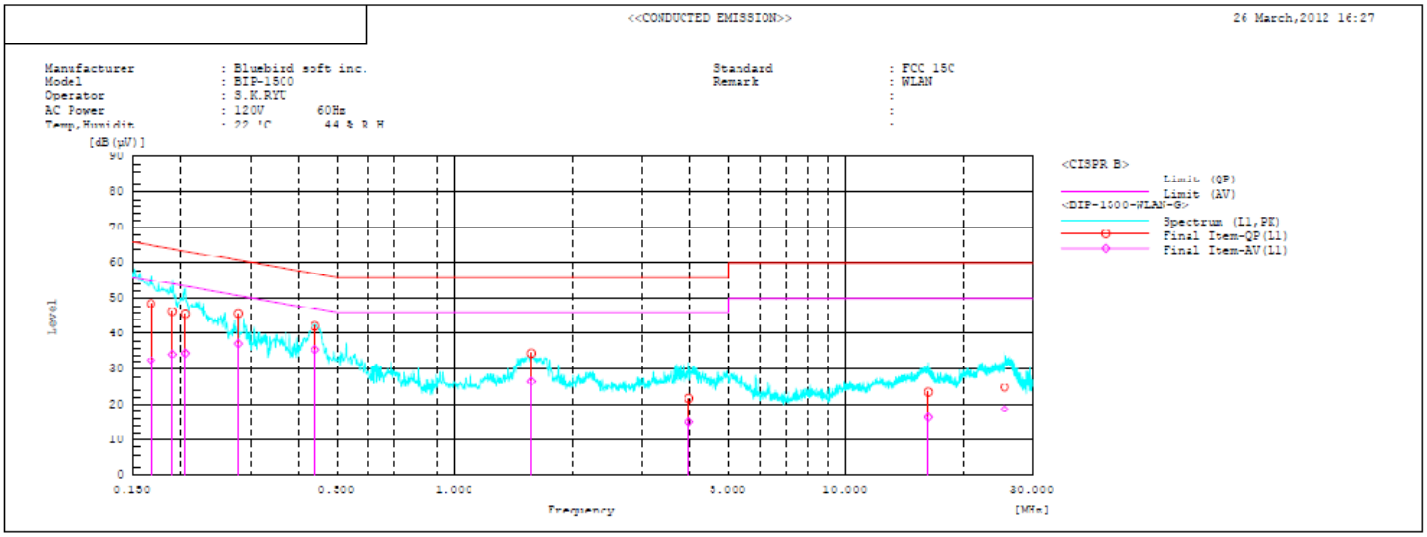
1. The EUT is placed on a wooden table 80 cm above the reference groundplane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.

▣ RESULT PLOTS

AC Line Conducted Emissions (Graph)

Test Mode: Test Case 1 & 802.11b & 1Mbps & 2437MHz





AC Line Conducted Emissions (List)

Test Mode: Test Case 1 & 802.11b & 1Mbps & 2437MHz

Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(µV)]	Reading AV [dB(µV)]	c.f [dB]	Result QP [dB(µV)]	Result AV [dB(µV)]	Limit QP [dB(µV)]	Limit AV [dB(µV)]	Margin QP [dB]	Margin AV [dB]	Remark
1	0.168	49.5	30.4	0.1	49.6	30.5	65.6	55.6	16.0	25.1	
2	0.186	47.2	31.4	0.1	47.3	31.5	64.2	54.2	16.9	22.7	
3	0.326	37.9	29.5	0.1	38.0	29.6	59.6	49.6	21.6	20.0	
4	0.429	39.2	32.5	0.1	39.3	32.6	57.3	47.3	18.0	14.7	
5	1.956	22.6	15.2	0.2	22.8	15.4	56.0	46.0	33.2	30.6	
6	25.958	0.0	18.3	1.3	0.0	19.6	60.0	50.0	0.0	30.4	

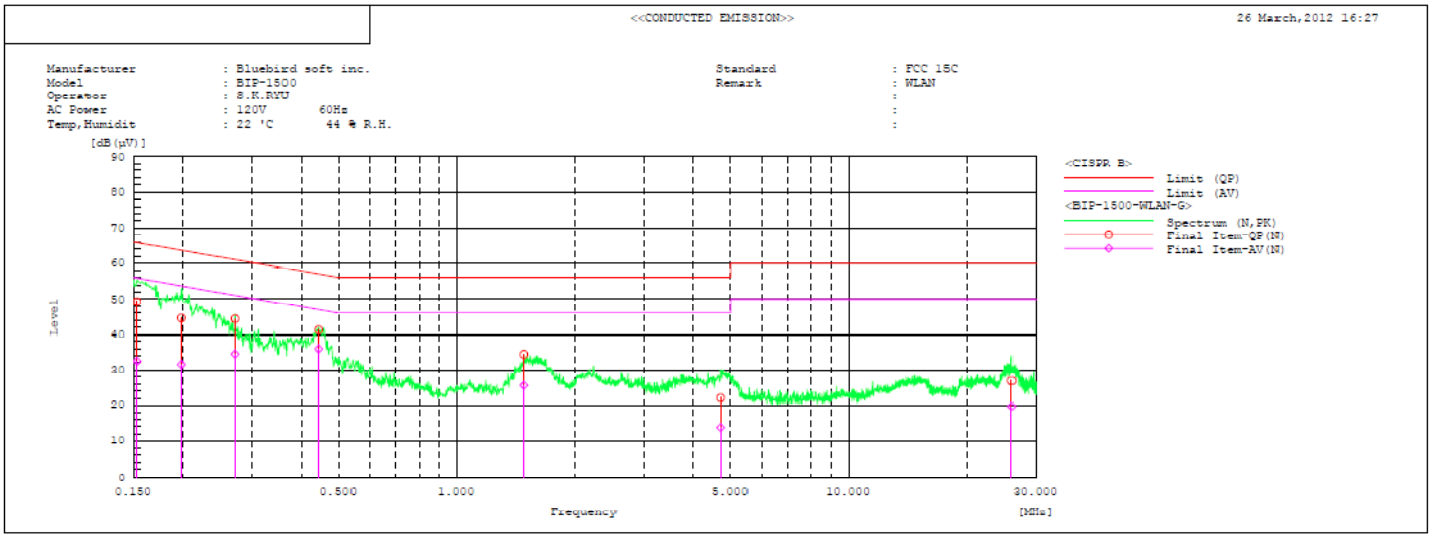
Final Result

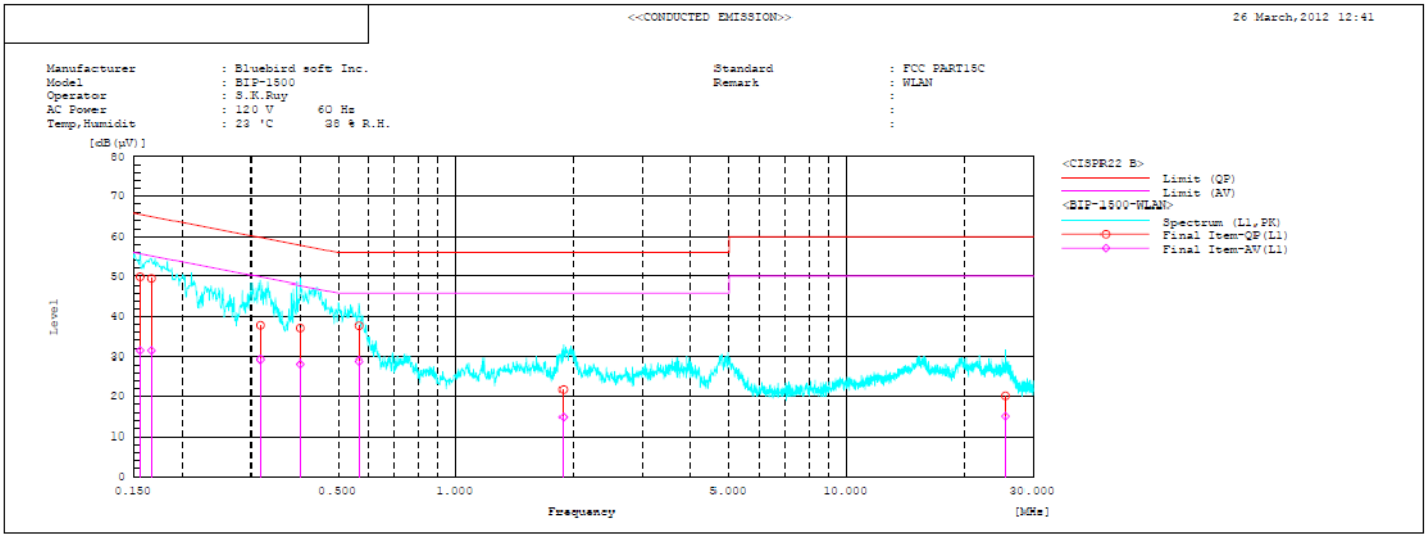
--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(µV)]	Reading AV [dB(µV)]	c.f [dB]	Result QP [dB(µV)]	Result AV [dB(µV)]	Limit QP [dB(µV)]	Limit AV [dB(µV)]	Margin QP [dB]	Margin AV [dB]	Remark
1	0.167	48.4	32.2	0.2	48.6	32.4	65.1	55.1	16.5	22.7	
2	0.189	46.1	34.1	0.2	46.3	34.3	64.1	54.1	17.8	19.8	
3	0.205	45.4	34.4	0.2	45.6	34.6	63.4	53.4	17.8	18.8	
4	0.280	45.5	37.0	0.2	45.7	37.2	60.8	50.8	15.1	13.6	
5	0.439	42.1	35.4	0.2	42.3	35.6	57.1	47.1	14.8	11.5	
6	1.571	34.4	26.4	0.2	34.6	26.6	56.0	46.0	21.4	19.4	
7	3.965	21.4	14.6	0.4	21.8	15.0	56.0	46.0	34.2	31.0	
8	16.263	22.5	15.3	1.0	23.5	16.3	60.0	50.0	36.5	33.7	
9	25.397	23.5	17.5	1.3	24.8	18.8	60.0	50.0	35.2	31.2	

AC Line Conducted Emissions (Graph)

Test Mode: Test Case 1 & 802.11g & 6Mbps & 2437MHz





AC Line Conducted Emissions (List)

Test Mode: Test Case 1 & 802.11g & 6Mbps & 2437MHz

Final Result

--- N Phase ---

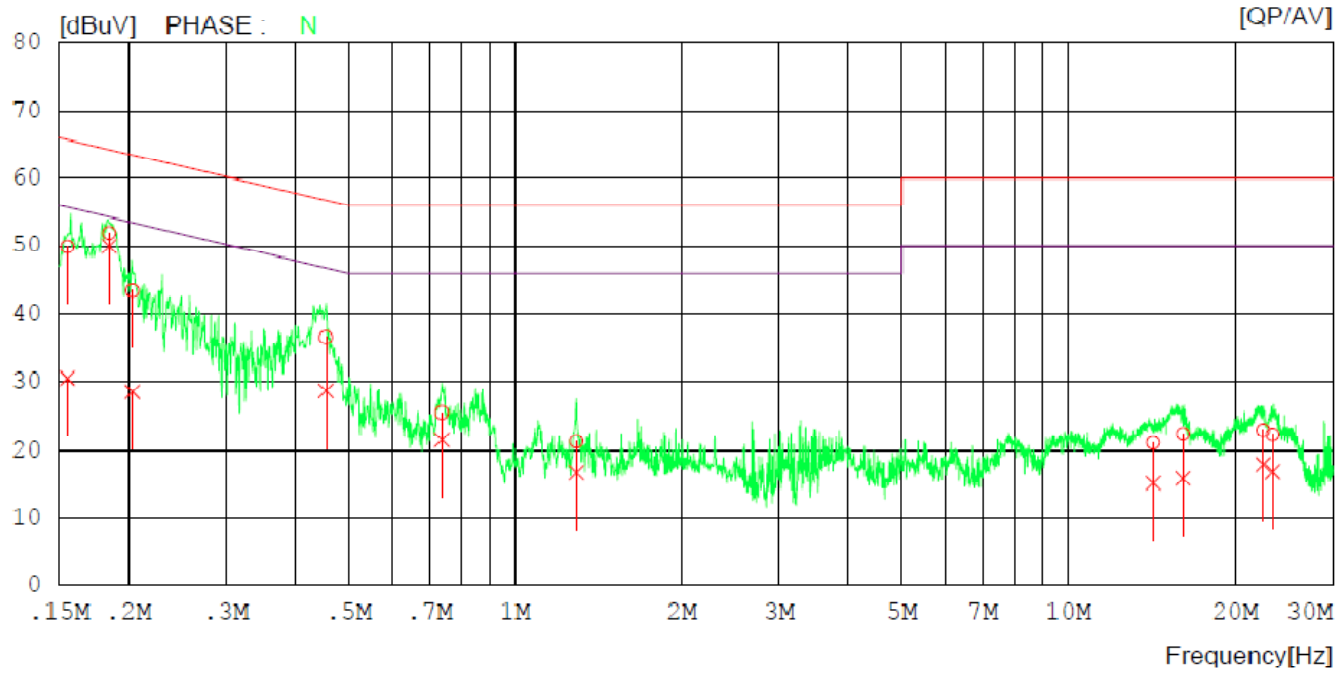
No.	Frequency [MHz]	Reading QP [dB(µV)]	Reading AV [dB(µV)]	c.f [dB]	Result QP [dB(µV)]	Result AV [dB(µV)]	Limit QP [dB(µV)]	Limit AV [dB(µV)]	Margin QP [dB]	Margin AV [dB]	Remark
1	0.153	49.2	32.4	0.1	49.3	32.5	65.8	55.8	16.5	23.3	
2	0.198	44.5	31.5	0.1	44.6	31.6	63.7	53.7	19.1	22.1	
3	0.271	44.3	34.4	0.1	44.4	34.5	61.1	51.1	16.7	16.6	
4	0.444	41.2	35.8	0.1	41.3	35.9	57.0	47.0	15.7	11.1	
5	1.483	34.2	25.4	0.2	34.4	25.6	56.0	46.0	21.6	20.4	
6	4.709	21.8	13.5	0.3	22.1	13.8	56.0	46.0	33.9	32.2	
7	26.010	25.6	18.4	1.3	26.9	19.7	60.0	50.0	33.1	30.3	

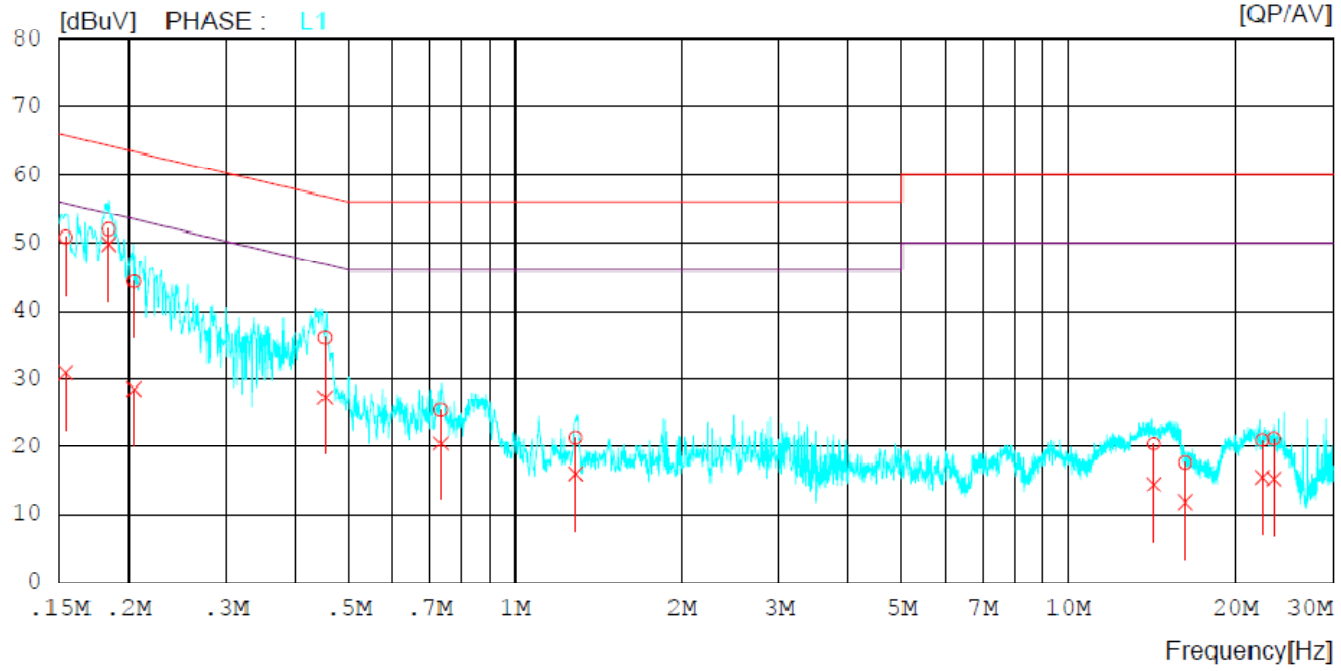
Final Result

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(µV)]	Reading AV [dB(µV)]	c.f [dB]	Result QP [dB(µV)]	Result AV [dB(µV)]	Limit QP [dB(µV)]	Limit AV [dB(µV)]	Margin QP [dB]	Margin AV [dB]	Remark
1	0.156	49.6	31.2	0.2	49.8	31.4	65.7	55.7	15.9	24.3	
2	0.167	49.2	31.2	0.2	49.4	31.4	65.1	55.1	15.7	23.7	
3	0.316	37.6	29.1	0.2	37.8	29.3	59.8	49.8	22.0	20.5	
4	0.401	36.9	28.0	0.2	37.1	28.2	57.8	47.8	20.7	19.6	
5	0.566	37.5	28.7	0.2	37.7	28.9	56.0	46.0	18.3	17.1	
6	1.885	21.5	14.5	0.3	21.8	14.8	56.0	46.0	34.2	31.2	
7	25.573	18.9	13.7	1.3	20.2	15.0	60.0	50.0	39.8	35.0	

Test Mode: Test Case 2 & 802.11b & 1Mbps & 2437MHz





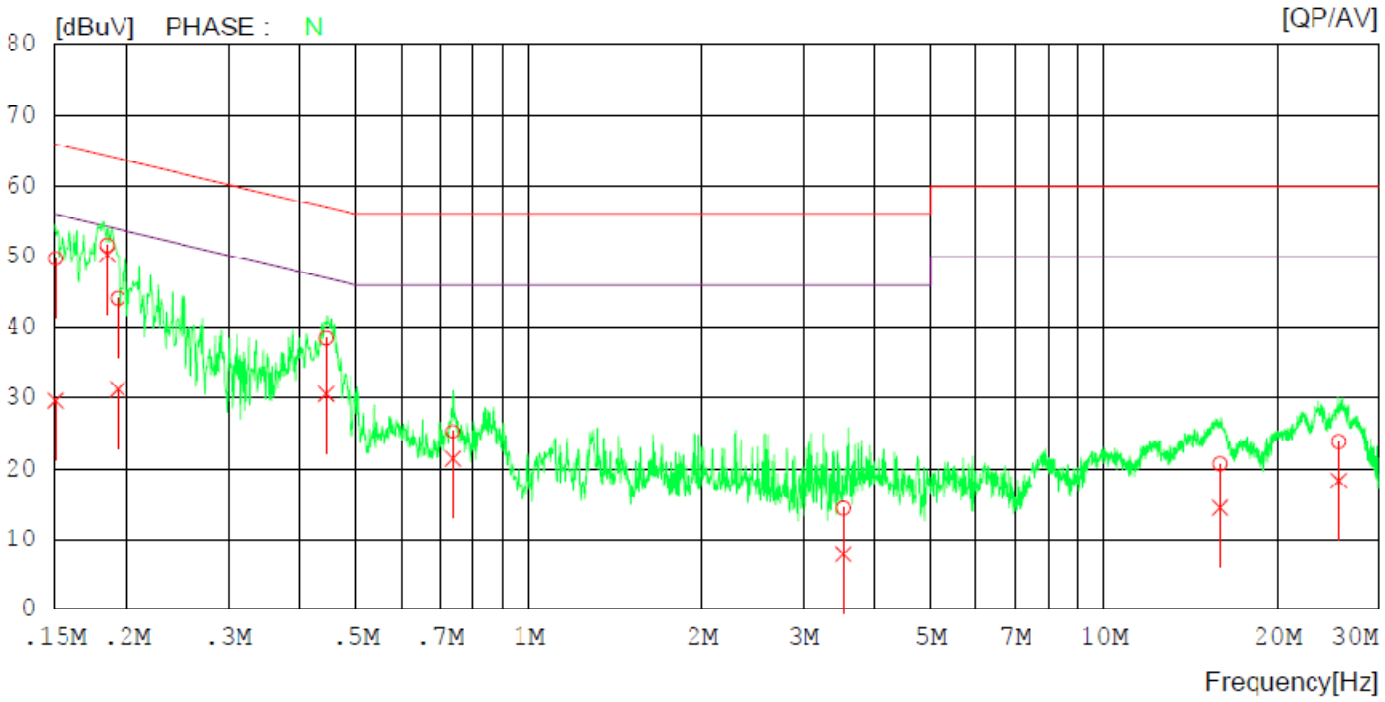
AC Line Conducted Emissions (List)

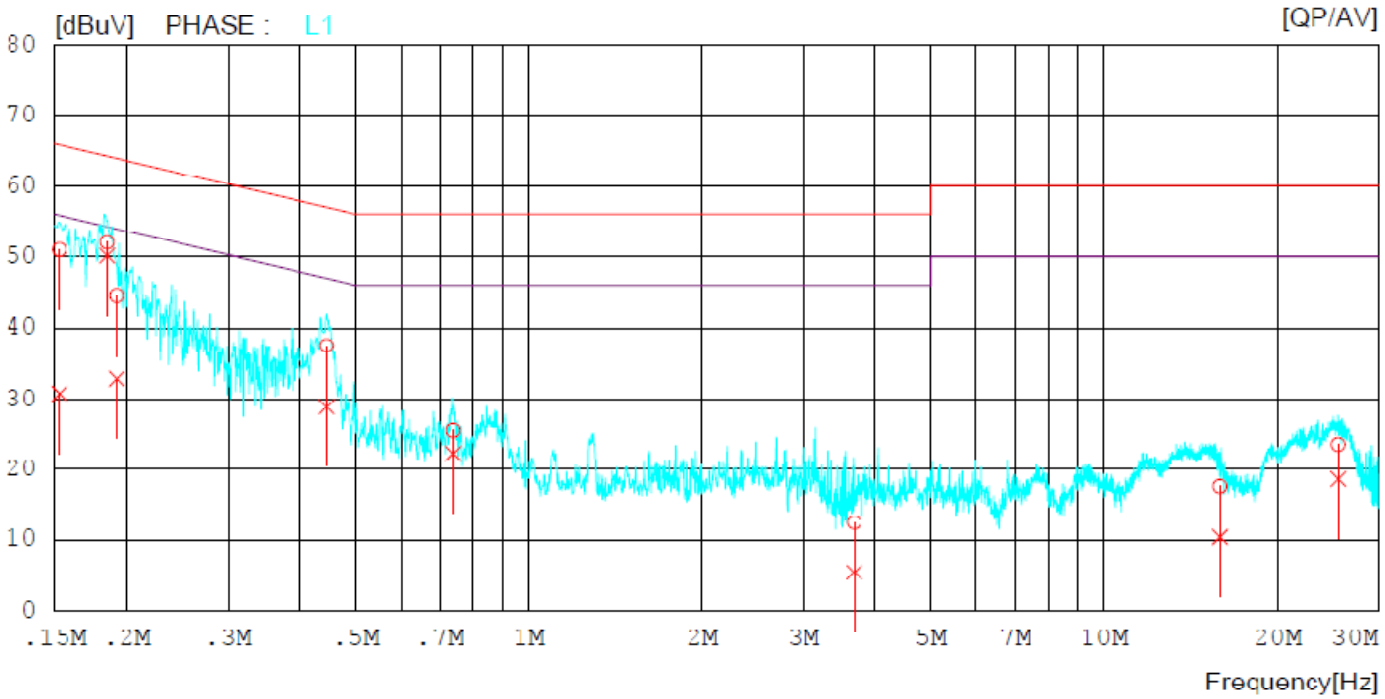
Test Mode: Test Case 2 & 802.11b & 1Mbps & 2437MHz

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	0.15519	49.6	30.2	0.3	49.9	30.5	65.7	55.7	15.8	25.2	N
2	0.18470	51.7	49.8	0.2	51.9	50.0	64.3	54.3	12.4	4.3	N
3	0.20341	43.3	28.3	0.2	43.5	28.5	63.5	53.5	20.0	25.0	N
4	0.45495	36.4	28.5	0.2	36.6	28.7	56.8	46.8	20.2	18.1	N
5	0.73716	25.3	21.3	0.2	25.5	21.5	56.0	46.0	30.5	24.5	N
6	1.29100	21.0	16.4	0.3	21.3	16.7	56.0	46.0	34.7	29.3	N
7	14.22500	20.2	14.2	0.9	21.1	15.1	60.0	50.0	38.9	34.9	N
8	16.09150	21.4	14.8	1.0	22.4	15.8	60.0	50.0	37.6	34.2	N
9	22.47900	21.7	16.7	1.2	22.9	17.9	60.0	50.0	37.1	32.1	N
10	23.39650	21.1	15.6	1.2	22.3	16.8	60.0	50.0	37.7	33.2	N
11	0.15403	50.5	30.6	0.3	50.8	30.9	65.8	55.8	15.0	24.9	L1
12	0.18424	51.8	49.6	0.2	52.0	49.8	64.3	54.3	12.3	4.5	L1
13	0.20480	44.3	28.3	0.2	44.5	28.5	63.4	53.4	18.9	24.9	L1
14	0.45373	35.9	27.1	0.2	36.1	27.3	56.8	46.8	20.7	19.5	L1
15	0.73431	25.2	20.3	0.2	25.4	20.5	56.0	46.0	30.6	25.5	L1
16	1.28650	21.1	15.7	0.3	21.4	16.0	56.0	46.0	34.6	30.0	L1
17	14.26450	19.5	13.5	0.9	20.4	14.4	60.0	50.0	39.6	35.6	L1
18	16.23050	16.6	10.7	1.0	17.6	11.7	60.0	50.0	42.4	38.3	L1
19	22.38700	19.8	14.3	1.2	21.0	15.5	60.0	50.0	39.0	34.5	L1
20	23.53850	20.0	14.0	1.2	21.2	15.2	60.0	50.0	38.8	34.8	L1

AC Line Conducted Emissions (Graph)

Test Mode: Test Case 2 & 802.11g & 6Mbps & 2437MHz



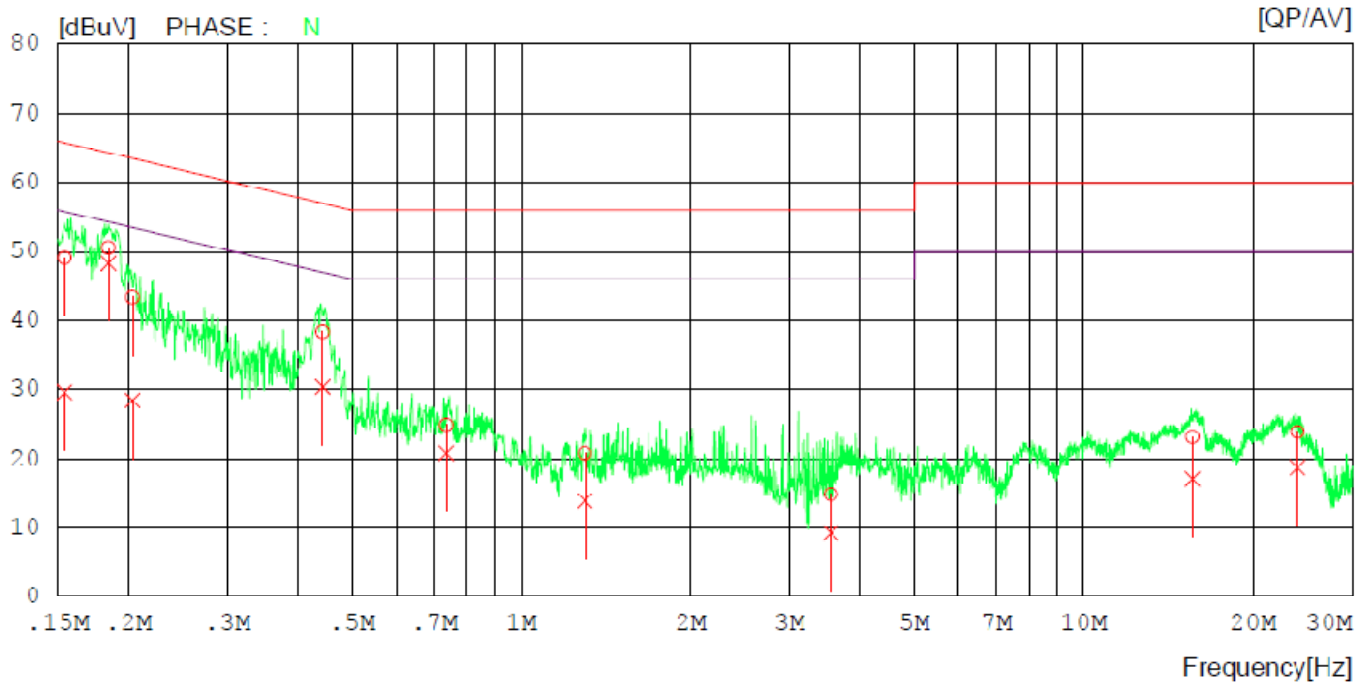


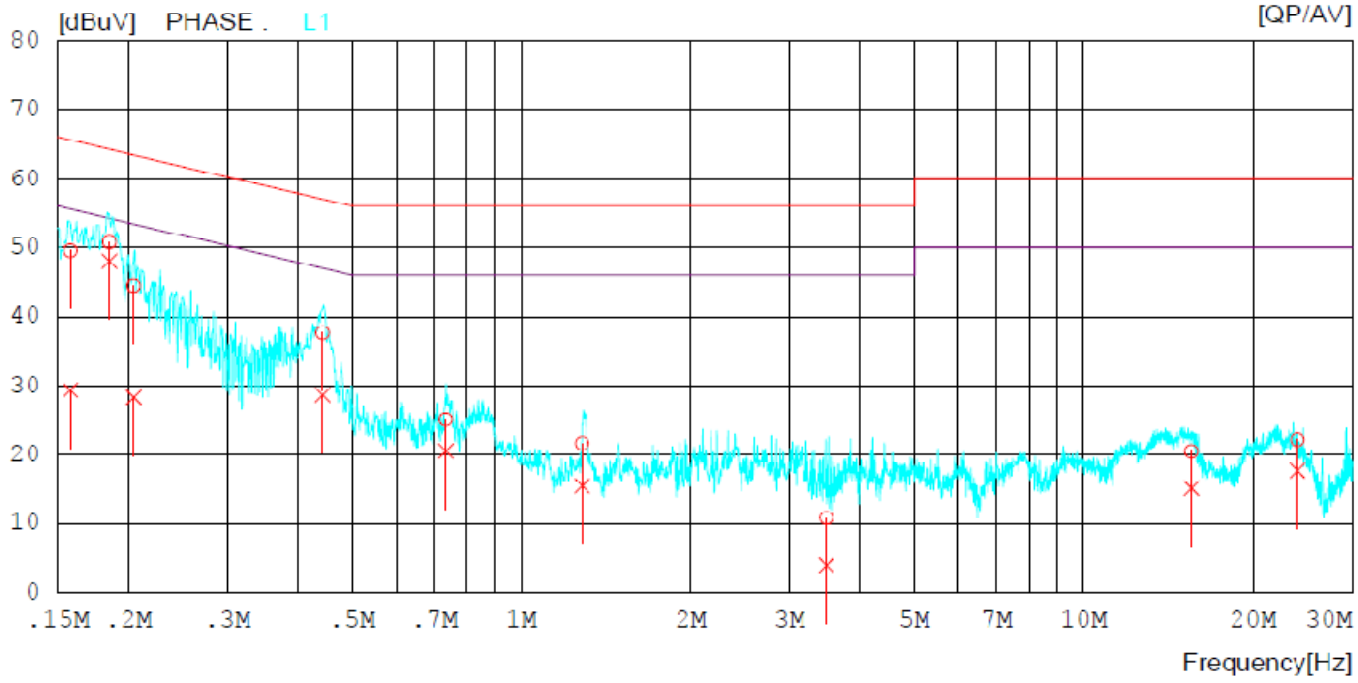
AC Line Conducted Emissions (List)

Test Mode: Test Case 2 & 802.11g & 6Mbps & 2437MHz

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	0.15024	49.5	29.3	0.3	49.8	29.6	66.0	56.0	16.2	26.4	N
2	0.18491	51.5	50.1	0.2	51.7	50.3	64.3	54.3	12.6	4.0	N
3	0.19301	43.9	31.0	0.2	44.1	31.2	63.9	53.9	19.8	22.7	N
4	0.44438	38.2	30.3	0.2	38.4	30.5	57.0	47.0	18.6	16.5	N
5	0.73684	25.1	21.2	0.2	25.3	21.4	56.0	46.0	30.7	24.6	N
6	3.51600	13.9	7.4	0.4	14.3	7.8	56.0	46.0	41.7	38.2	N
7	15.90500	19.7	13.4	1.0	20.7	14.4	60.0	50.0	39.3	35.6	N
8	25.56300	22.5	17.0	1.3	23.8	18.3	60.0	50.0	36.2	31.7	N
9	0.15277	50.7	30.5	0.3	51.0	30.8	65.8	55.8	14.8	25.0	L1
10	0.18498	51.8	49.9	0.2	52.0	50.1	64.3	54.3	12.3	4.2	L1
11	0.19203	44.2	32.6	0.2	44.4	32.8	63.9	53.9	19.5	21.1	L1
12	0.44478	37.3	28.6	0.2	37.5	28.8	57.0	47.0	19.5	18.2	L1
13	0.73708	25.3	22.1	0.2	25.5	22.3	56.0	46.0	30.5	23.7	L1
14	3.67650	12.0	5.0	0.4	12.4	5.4	56.0	46.0	43.6	40.6	L1
15	15.90000	16.6	9.3	1.0	17.6	10.3	60.0	50.0	42.4	39.7	L1
16	25.51300	22.3	17.3	1.3	23.6	18.6	60.0	50.0	36.4	31.4	L1

Test Mode: Test Case 3 & 802.11b & 1Mbps & 2437MHz





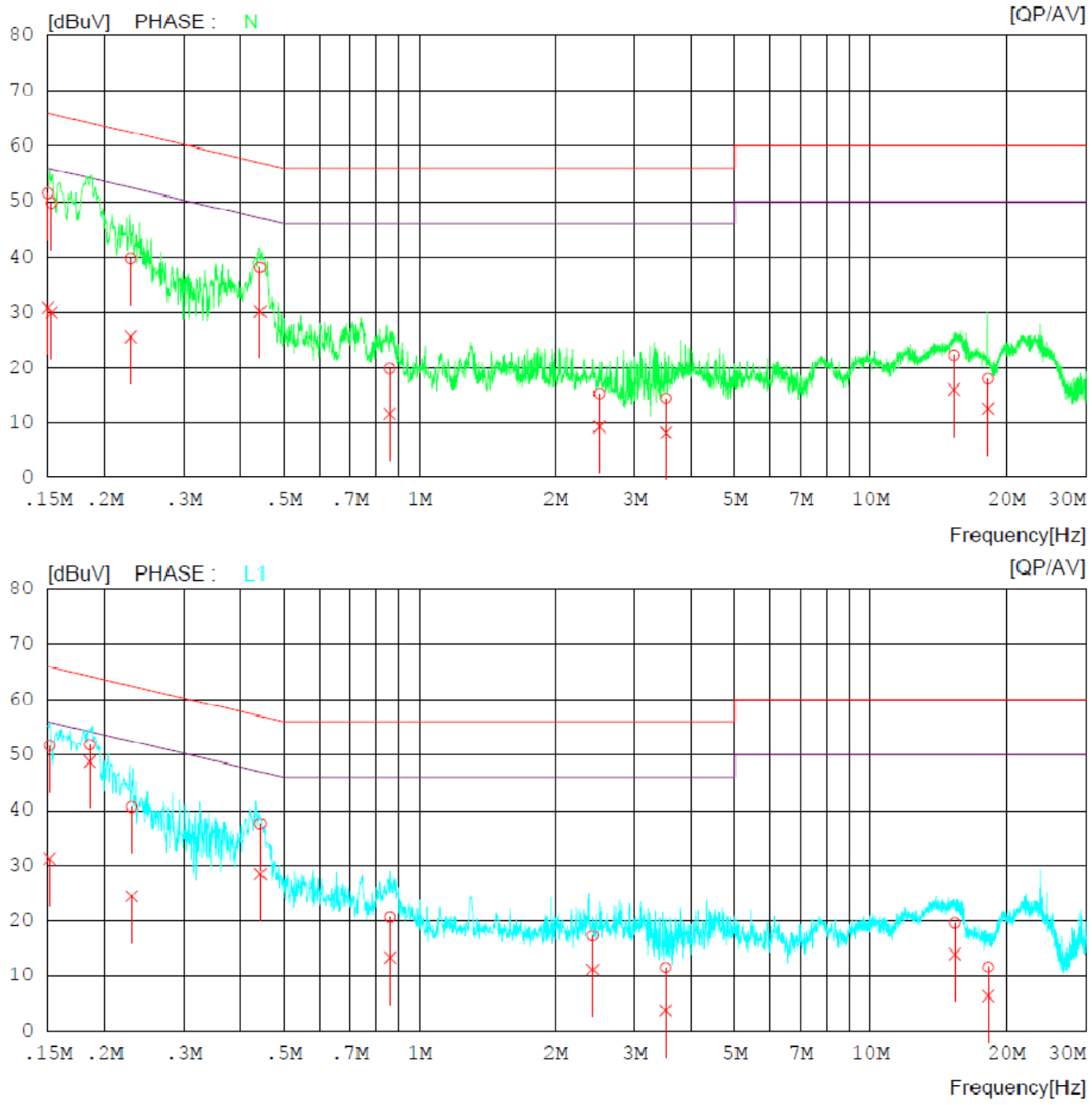
AC Line Conducted Emissions (List)

Test Mode: Test Case 3 & 802.11b & 1Mbps & 2437MHz

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	0.15408	48.8	29.3	0.3	49.1	29.6	65.8	55.8	16.7	26.2	N
2	0.18441	50.4	48.1	0.2	50.6	48.3	64.3	54.3	13.7	6.0	N
3	0.20350	43.2	28.2	0.2	43.4	28.4	63.5	53.5	20.1	25.1	N
4	0.44343	38.2	30.1	0.2	38.4	30.3	57.0	47.0	18.6	16.7	N
5	0.73570	24.7	20.6	0.2	24.9	20.8	56.0	46.0	31.1	25.2	N
6	1.29700	20.5	13.5	0.3	20.8	13.8	56.0	46.0	35.2	32.2	N
7	3.55300	14.4	8.8	0.4	14.8	9.2	56.0	46.0	41.2	36.8	N
8	15.60750	22.1	16.0	1.0	23.1	17.0	60.0	50.0	36.9	33.0	N
9	24.00200	22.6	17.5	1.2	23.8	18.7	60.0	50.0	36.2	31.3	N
10	0.15786	49.2	29.1	0.3	49.5	29.4	65.6	55.6	16.1	26.2	L1
11	0.18516	50.6	47.8	0.2	50.8	48.0	64.3	54.3	13.5	6.3	L1
12	0.20466	44.3	28.1	0.2	44.5	28.3	63.4	53.4	18.9	25.1	L1
13	0.44338	37.4	28.4	0.2	37.6	28.6	57.0	47.0	19.4	18.4	L1
14	0.73443	24.9	20.3	0.2	25.1	20.5	56.0	46.0	30.9	25.5	L1
15	1.28300	21.3	15.2	0.3	21.6	15.5	56.0	46.0	34.4	30.5	L1
16	3.48850	10.4	3.6	0.4	10.8	4.0	56.0	46.0	45.2	42.0	L1
17	15.54100	19.5	14.1	1.0	20.5	15.1	60.0	50.0	39.5	34.9	L1
18	24.00100	21.0	16.5	1.2	22.2	17.7	60.0	50.0	37.8	32.3	L1

AC Line Conducted Emissions (Graph)

Test Mode: Test Case 3 & 802.11g & 6Mbps & 2437MHz

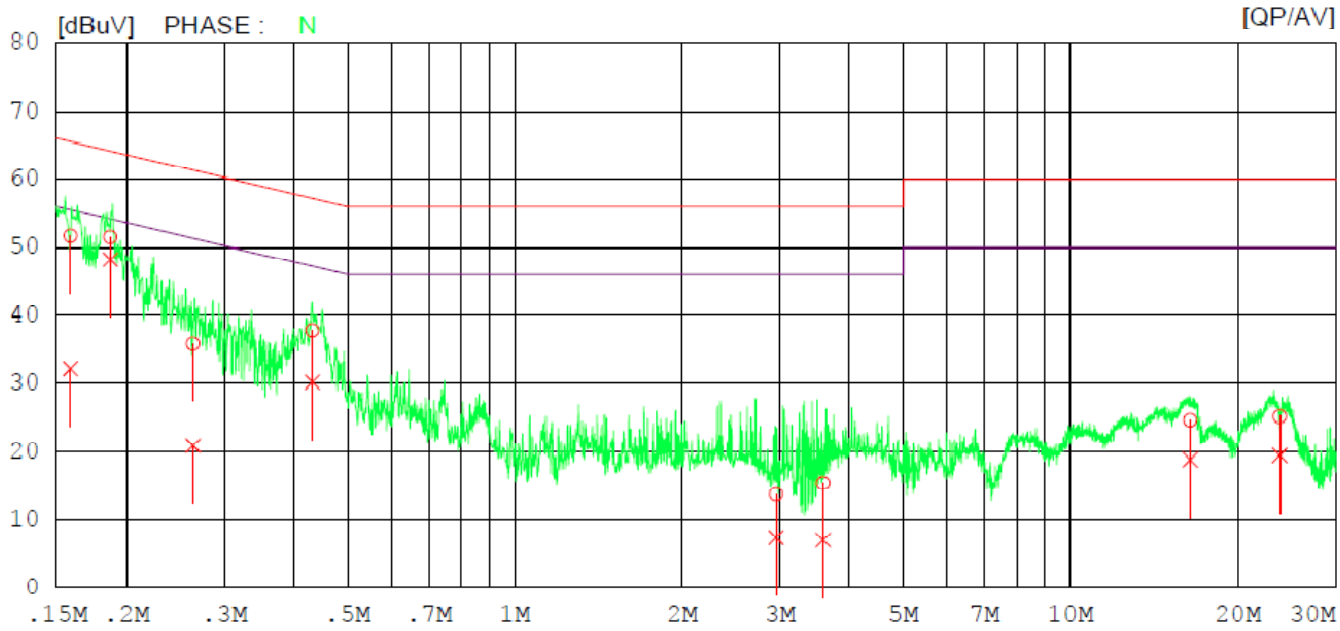


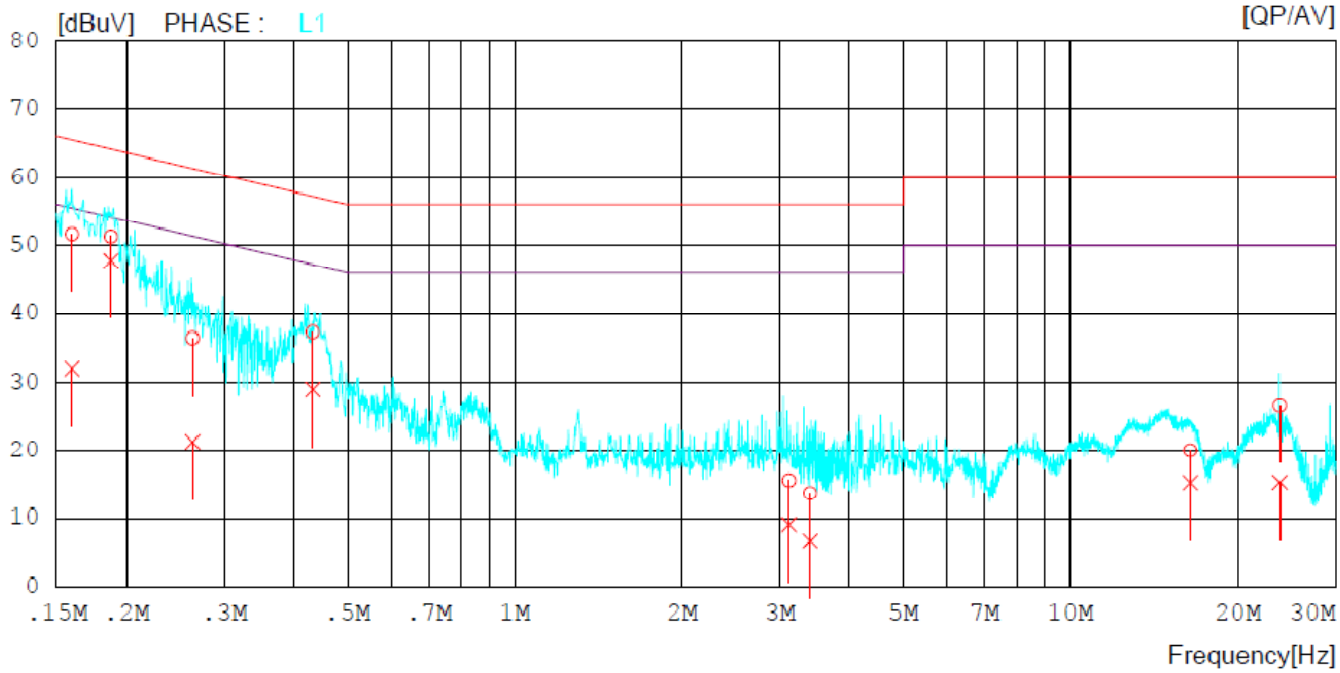
AC Line Conducted Emissions (List)

Test Mode: Test Case 3 & 802.11g & 6Mbps & 2437MHz

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	0.15001	51.2	30.6	0.3	51.5	30.9	66.0	56.0	14.5	25.1	N
2	0.15283	49.4	29.7	0.3	49.7	30.0	65.8	55.8	16.1	25.8	N
3	0.22861	39.6	25.3	0.2	39.8	25.5	62.5	52.5	22.7	27.0	N
4	0.44364	38.0	30.0	0.2	38.2	30.2	57.0	47.0	18.8	16.8	N
5	0.85920	19.5	11.3	0.3	19.8	11.6	56.0	46.0	36.2	34.4	N
6	2.50300	15.1	9.0	0.3	15.4	9.3	56.0	46.0	40.6	36.7	N
7	3.52300	14.1	7.9	0.4	14.5	8.3	56.0	46.0	41.5	37.7	N
8	15.31400	21.3	15.1	1.0	22.3	16.1	60.0	50.0	37.7	33.9	N
9	18.19550	16.9	11.4	1.1	18.0	12.5	60.0	50.0	42.0	37.5	N
10	0.15135	51.4	30.9	0.3	51.7	31.2	65.9	55.9	14.2	24.7	L1
11	0.18555	51.7	48.6	0.2	51.9	48.8	64.2	54.2	12.3	5.4	L1
12	0.22966	40.4	24.1	0.2	40.6	24.3	62.5	52.5	21.9	28.2	L1
13	0.44393	37.3	28.3	0.2	37.5	28.5	57.0	47.0	19.5	18.5	L1
14	0.86165	20.4	13.0	0.3	20.7	13.3	56.0	46.0	35.3	32.7	L1
15	2.42150	17.0	10.8	0.3	17.3	11.1	56.0	46.0	38.7	34.9	L1
16	3.51300	11.1	3.3	0.4	11.5	3.7	56.0	46.0	44.5	42.3	L1
17	15.39050	18.6	12.9	1.0	19.6	13.9	60.0	50.0	40.4	36.1	L1
18	18.20650	10.5	5.2	1.1	11.6	6.3	60.0	50.0	48.4	43.7	L1

Test Mode: Test Case 4 & 802.11b & 1Mbps & 2437MHz





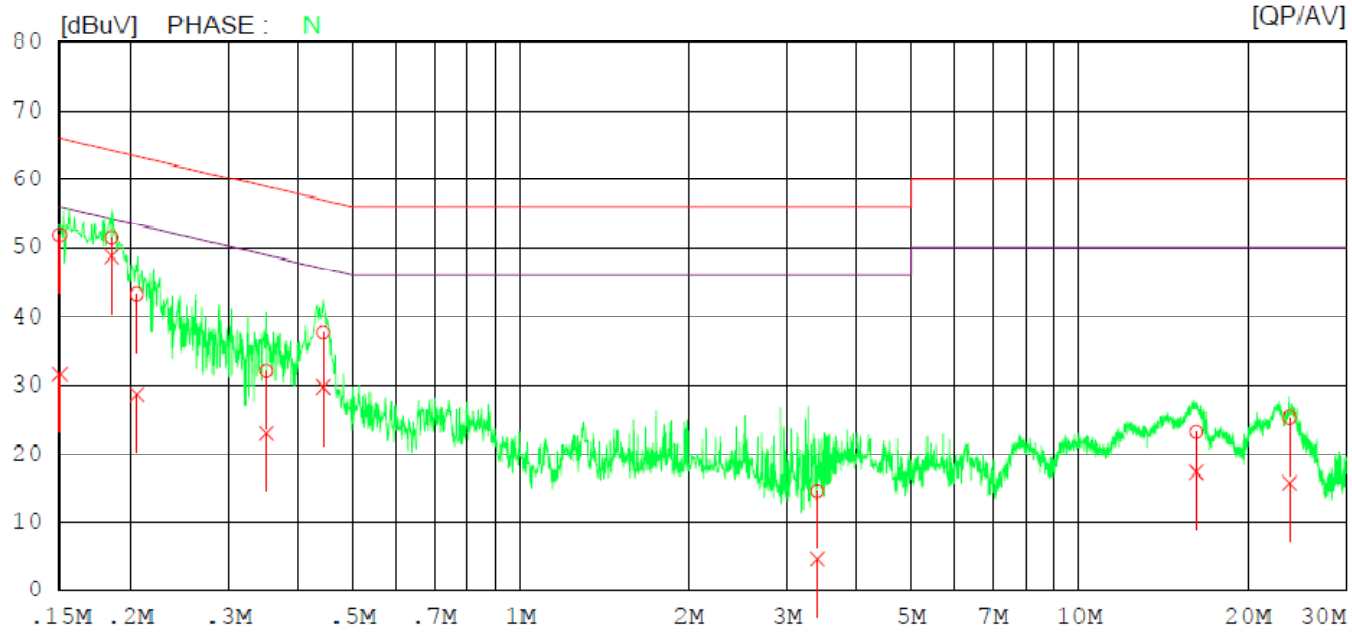
AC Line Conducted Emissions (List)

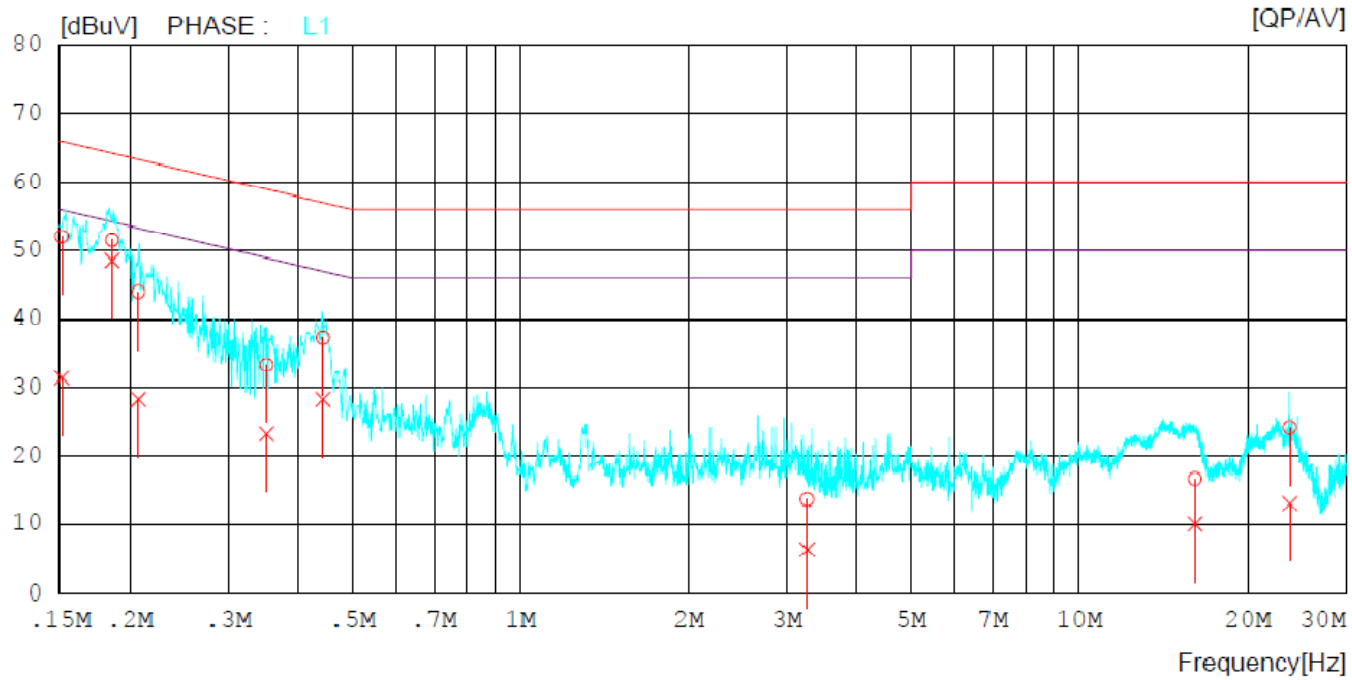
Test Mode: Test Case 4 & 802.11b & 1Mbps & 2437MHz

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	0.15854	51.4	31.8	0.3	51.7	32.1	65.5	55.5	13.8	23.4	N
2	0.18709	51.3	48.0	0.2	51.5	48.2	64.2	54.2	12.7	6.0	N
3	0.26345	35.7	20.6	0.2	35.9	20.8	61.3	51.3	25.4	30.5	N
4	0.43100	37.5	29.9	0.3	37.8	30.2	57.2	47.2	19.4	17.0	N
5	2.95100	13.4	7.2	0.3	13.7	7.5	56.0	46.0	42.3	38.5	N
6	3.58850	14.9	6.7	0.4	15.3	7.1	56.0	46.0	40.7	38.9	N
7	16.41650	23.6	17.8	1.0	24.6	18.8	60.0	50.0	35.4	31.2	N
8	23.79650	23.9	18.2	1.2	25.1	19.4	60.0	50.0	34.9	30.6	N
9	0.15959	51.3	31.7	0.3	51.6	32.0	65.5	55.5	13.9	23.5	L1
10	0.18749	51.1	47.6	0.2	51.3	47.8	64.1	54.1	12.8	6.3	L1
11	0.26311	36.3	21.1	0.2	36.5	21.3	61.3	51.3	24.8	30.0	L1
12	0.43251	37.0	28.6	0.3	37.3	28.9	57.2	47.2	19.9	18.3	L1
13	3.11450	15.2	8.7	0.4	15.6	9.1	56.0	46.0	40.4	36.9	L1
14	3.40000	13.3	6.2	0.4	13.7	6.6	56.0	46.0	42.3	39.4	L1
15	16.41750	19.0	14.3	1.0	20.0	15.3	60.0	50.0	40.0	34.7	L1
16	23.80250	25.4	14.2	1.2	26.6	15.4	60.0	50.0	33.4	34.6	L1

AC Line Conducted Emissions (Graph)

Test Mode: Test Case 4 & 802.11g & 6Mbps & 2437MHz





AC Line Conducted Emissions (List)

Test Mode: Test Case 4 & 802.11g & 6Mbps & 2437MHz

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	0.15000	51.5	31.3	0.3	51.8	31.6	66.0	56.0	14.2	24.4	N
2	0.18586	51.3	48.6	0.2	51.5	48.8	64.2	54.2	12.7	5.4	N
3	0.20603	43.1	28.5	0.2	43.3	28.7	63.4	53.4	20.1	24.7	N
4	0.35140	31.8	22.7	0.3	32.1	23.0	58.9	48.9	26.8	25.9	N
5	0.44378	37.6	29.6	0.2	37.8	29.8	57.0	47.0	19.2	17.2	N
6	3.39700	14.2	4.2	0.4	14.6	4.6	56.0	46.0	41.4	41.4	N
7	16.20150	22.2	16.3	1.0	23.2	17.3	60.0	50.0	36.8	32.7	N
8	23.80750	24.1	14.6	1.2	25.3	15.8	60.0	50.0	34.7	34.2	N
9	0.15118	51.8	31.1	0.3	52.1	31.4	65.9	55.9	13.8	24.5	L1
10	0.18609	51.3	48.4	0.2	51.5	48.6	64.2	54.2	12.7	5.6	L1
11	0.20731	43.7	28.0	0.2	43.9	28.2	63.3	53.3	19.4	25.1	L1
12	0.35164	33.0	22.8	0.3	33.3	23.1	58.9	48.9	25.6	25.8	L1
13	0.44331	37.0	28.0	0.2	37.2	28.2	57.0	47.0	19.8	18.8	L1
14	3.25700	13.2	5.9	0.4	13.6	6.3	56.0	46.0	42.4	39.7	L1
15	16.11300	15.6	9.0	1.0	16.6	10.0	60.0	50.0	43.4	40.0	L1
16	23.80400	22.9	11.8	1.2	24.1	13.0	60.0	50.0	35.9	37.0	L1

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	11/09/30	12/09/30	MY45304199
Spectrum Analyzer	Rohde Schwarz	FSQ26	12/01/09	13/01/09	200445
Spectrum Analyzer	Agilent	N9020A	12/01/09	13/01/09	MY49100833
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
Virtual Power Meter(S/W)	Rohde Schwarz	R&S Power Viewer Plus	-	-	V 4.1.0
Power SENSOR	Rohde Schwarz	NRP-Z81	11/06/04	12/06/04	1137.9009.02-101001-EA
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	11/09/30	12/09/30	9
BICONICAL ANT.	Schwarzbeck	VHA 9103	10/12/21	12/12/21	91031946
LOG-PERIODIC ANT.	Schwarzbeck	UHALP9108A	10/07/07	12/07/07	590
BILOG ANTENNA	SCHAFFNER	CBL6112B	10/07/14	12/07/14	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 (25dB)	Agilent	8447D	12/03/05	13/03/05	2944A10144
Amplifier (30dB)	Agilent	8449B	12/03/05	13/03/05	3008A01590
Attenuator(10dB)	WEINSCHEL	23-10-34	12/01/09	13/01/09	BP4386
EMI TEST RECEIVER	R&S	ESU	12/03/05	13/03/05	100014
Spectrum Analyzer(CE)	H.P	8591E	12/01/09	13/01/09	3649A05889
LISN	Kyoritsu	KNW-407	11/07/02	12/07/02	8-317-8
LISN	Kyoritsu	KNW-242	12/03/05	13/03/05	8-654-15
CVCF	NF Electronic	4420	12/01/09	13/01/09	304935/337980
50 ohm Terminator	HME	CT-01	11/07/02	12/07/02	N/A
RFI/FIELD Intensity Meter	Kyoritsu	KNM-2402	12/03/05	13/03/05	4N-170-3