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Measured Radio Frequency Emissions
From

L-Com WLAN Transceiver
FCC ID: MYF-LCUSB

Report No. 417124-559
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For:
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Summary
Tests for compliance with FCC Regulations, CFR 47, Part 15 and with Industry Canada RSS-210/Gen, were performed on a L-Com, FCC ID: MYF-LCUSB. This device under test (DUT) is subject to the rules and regulations as a transceiver.

In testing completed on March 20, 2010, the DUT tested met the allowed specifications for radiated emissions by 0.5 dB. Radiated digital emissions meet the Class B regulatory limit by more than 4.2 dB, and AC power line conducted emissions meet the Class B regulatory limit by 0.2 dB.

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1 Introduction

This L-Com transceiver was tested for compliance with FCC Regulations, Part 15, adopted under Docket 87-389, April 18, 1989 as subsequently amended, and with Industry Canada RSS-210/Gen, Issue 7, June 2007. Tests were performed at the University of Michigan Radiation Laboratory Willow Run Test Range following the procedures described in ANSI C63.4-2003 "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz".
FCC OET guidelines for Measurement of Digital Transmission Systems Operating under Section 15.247 were also followed. The Site description and attenuation characteristics of the Open Site facility are on file with FCC Laboratory, Columbia, Maryland (FCC Reg. No: 91050) and with Industry Canada, Ottawa, ON (File Ref. No: IC 2057A-1).

2 Test Procedure and Equipment Used

The pertinent test equipment commonly used in our facility for measurements is listed in Table 2.1 below. The middle column identifies the specific equipment used in these tests. The quality system employed at the University of Michigan Radiation Laboratory Willow Run Test Range has been established to ensure all equipment has a clearly identifiable classification, calibration expiry date, and that all calibrations are traceable to national standards.

Table 2.1 Test Equipment.

Test Instrument	Used	Manufacturer/Model	Q Number
Spectrum Analyzer (9kHz-26GHz)	X	Hewlett-Packard 8593E, SN: 3412A01131	HP8593E1
Spectrum Analyzer (9kHz-6.5GHz)	X	Hewlett-Packard 8595E, SN: 3543A01546	JDB8595E
Power Meter		Hewlett-Packard, 432A	HP432A1
Harmonic Mixer (26-40 GHz)		Hewlett-Packard 11970A, SN: 3003A08327	HP11970A1
Harmonic Mixer (40-60 GHz)		Hewlett-Packard 11970U, SN: 2332A00500	HP11970U1
Harmonic Mixer (75-110 GHz)		Hewlett-Packard 11970W, SN: 2521A00179	HP11970W1
Harmonic Mixer (140-220 GHz)		Pacific Millimeter Prod., GMA, SN: 26	PMPGMA1
S-Band Std. Gain Horn	X	S/A, Model SGH-2.6	SBAND1
C-Band Std. Gain Horn	X	University of Michigan, NRL design	CBAND1
XN-Band Std. Gain Horn	X	University of Michigan, NRL design	XNBAND1
X-Band Std. Gain Horn		S/A, Model 12-8.2	XBAND1
X-band horn (8.2- 12.4 GHz)		Narda 640	XBAND2
X-band horn (8.2- 12.4 GHz)	X	Scientific Atlanta , 12-8.2, SN: 730	XBAND3
K-band horn (18-26.5 GHz)	X	FXR, Inc., K638KF	KBAND1
Ka-band horn (26.5-40 GHz)		FXR, Inc., U638A	KABAND1
U-band horn (40-60 GHz)		Custom Microwave, HO19	UBAND1
W-band horn(75-110 GHz)		Custom Microwave, HO10	WBAND1
G-band horn (140-220 GHz)		Custom Microwave, HO5R	GBAND1
Bicone Antenna (30-250 MHz)	X	University of Michigan, RLBC-1	LBBIC1
Bicone Antenna (200-1000 MHz)	X	University of Michigan, RLBC-2	HBBIC1
Dipole Antenna Set (30-1000 MHz)	X	University of Michigan, RLDP-1,-2,-3	UMDIP1
Dipole Antenna Set (30-1000 MHz)		EMCO 3121C, SN: 992 (Ref. Antennas)	EMDIP1
Active Rod Antenna (30 Hz-50 MHz)		EMCO 3301B, SN: 3223	EMROD1
Active Loop Antenna (30 Hz-50 MHz)		EMCO 6502, SN:2855	EMLOOP1
Ridge-horn Antenna (300-5000 MHz)	X	University of Michigan	UMRH1
Amplifier (5-1000 MHz)	X	Avantek, A11-1, A25-1S	AVAMP1
Amplifier (5-4500 MHz)	X	Avantek	AVAMP2
Amplifier (4.5-13 GHz)	X	Avantek, AFT-12665	AVAMP3
Amplifier (6-16 GHz)	X	Trek	TRAMP1
Amplifier (16-26 GHz)	X	Avantek	AVAMP4
LISN Box	X	University of Michigan	UMLISN1
Signal Generator	X	Hewlett-Packard 8657B	HPSG1

3 Device Under Test

3.1 Description and Block Diagram

The DUT is a spread spectrum transceiver operating in the 2400 - 2483.5 MHz band. The system tested consists of a laptop computer, USB radio, coaxial cable, amplifier, filter (with the 500 mW amplifier) and one antenna. The DUT is designed and manufactured by L-Com, Inc.

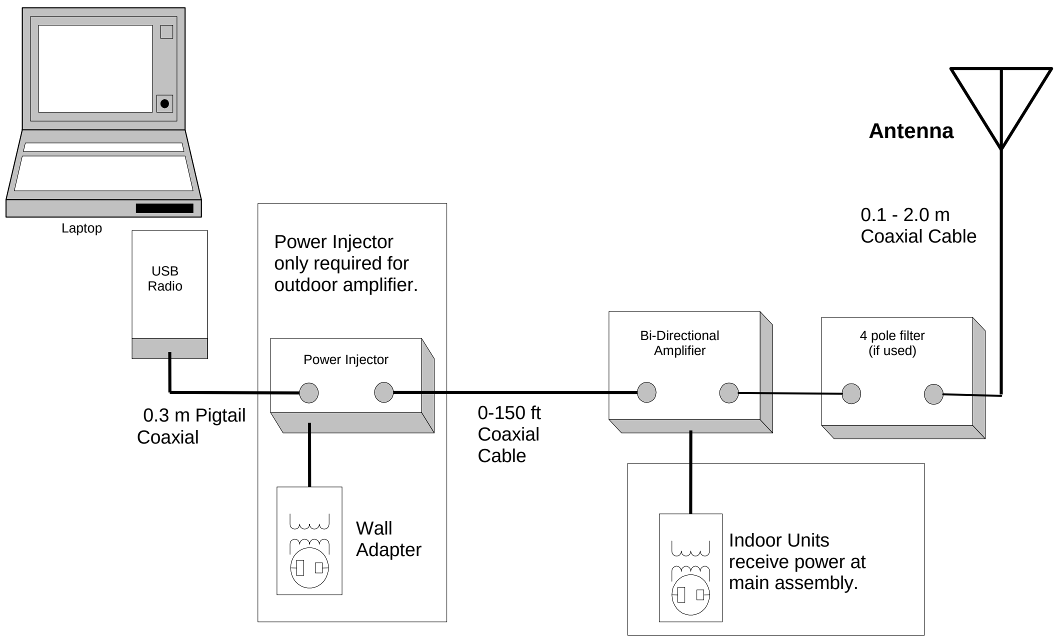


Figure 3.1 Block Diagram

Device	[Make], Model	[S/N],P/N	EMC Consideration
Equipment Under Test			
Indoor Amplifier	[L-Com, Inc.], HA2401RTGU-500	[A]	fully tested
Outdoor Amplifier	[L-Com, Inc.], HA2401RTGU-500	[B]	partially tested
Indoor Amplifier	[L-Com, Inc.], HA2401RTGU-250	[A]	fully tested
Outdoor Amplifier	[L-Com, Inc.], HA2401RTGU-250	[B]	partially tested
USB Radio	[L-Com, Inc.],	[001]	Photos only
USB Radio	[L-Com, Inc.],	[002]	Class B compliant
Bias-T	[L-Com, Inc.], XA-BT2406-20RTJ	[001]	
Amplifier DC Supply	[DVE], DSA-15P-12 US	[090090]	9 VDC
Bandpass Filter	[L-Com, Inc.], BPF24-406	[090090]	Required for 500 mW amplifier kit
Antenna	[L-Com, Inc.], HG2402RD-RSF	-	2.0 dBi per manuf. sheet
Peripheral / Test Setup Equipment			
Laptop Computer	[Gateway], SOLO 5300	3500729	Class B compliant
Variable Attenuator	[Hewlett Packard], 8494B	1516A06819	0-11 dB

Cable(s)	[Make], Model	Length	EMC Consideration
Radio to Amp Cable	[L-Com]	50 ft	3dB/50ft @ 2.437 GHz
Radio to Bias-T Cable	[L-Com], Comscope WBC-100	2 ft	0.2 dB loss @2.437 GHz

3.2 Variants & Samples

There are five primary configurations for this system, three of which are fully tested.

(1) An outdoor amplifier (model HA2401RTG-500) with DC injector power feed, RF filter, and antenna.
(2) An indoor amplifier (model HA2401RTGI-500) with DC power fed directly into a jack on the amplifier, RF filter, and antenna. (fully tested)
(3) An outdoor amplifier (model HA2401RTG-250) with DC injector power feed and antenna.
(4) An indoor amplifier (model HA2401RTGI-250) with DC power fed directly into a jack on the amplifier and antenna. (fully tested)
(5) The radio connected to the same antenna without additional cabling or amplifier, i.e. the system with the amplifier “depopulated”. (fully tested)

Samples, as outlined above, were provided. The radio has been designed to operate with up to 12 channels from 2412 to 2462 MHz; HOWEVER, WHEN SOLD WITH THE AMPLIFIERS LISTED HEREIN, ONLY CHANNEL 6 (2437 MHZ) IS ACTIVATED. As noted above, three configurations are fully tested for emissions compliance, (1) the USB radio + antenna, (2) the USB radio + indoor amplifier (250 mW) + antenna, and (3) the USB radio + indoor amplifier (500 mW) + filter + antenna. These systems are manufactured with RP-TNC connectors and may be installed by End-Users. Also please note, THROUGOUT TESTING, ATTENUATION (SIMULATING INCREASED CABLE LENGTH) BETWEEN THE RADIO AND AMPLIFIER WAS VARIED BETWEEN 0 AND 10 DB, AND THE WORST CASE EMISSIONS WERE RECORDED. This was done to verify worst case conditions with the AGC amplifier employed. It is demonstrated in this test report that the tested configurations accurately depict the worst case emissions from the EUT.

Note: All amplifier models consist of the same PCB, with an input attenuator/AGC circuit. Output power is TUNED ONLY BY THE MANUFACTURER FOR DIFFERENT OUTPUT POWER LEVELS. Since the amplifier models herein have an amplification stage biased independent from the input power level, the spectral integrity of the device is consistent across all models in this test report. Furthermore, THE AMPLIFIERS USED IN THIS FILING ARE ONLY TO BE SOLD AS A COMPLETE SYSTEM AS SHOWN WITHIN THIS APPLICATION (USB radio + DC Injector (if outdoor) + Amplifier(if employed) + filter(with 500 mW amplifier only) + Antenna).

3.3 Modes of Operation

As an 802.11 b/g mode device, the following modes of operation are employed.

802.11b Rate (Mbps)	packet length (ms)	802.11g Rate (Mbps)	packet length (ms)	802.11g Rate (Mbps)	packet length (ms)
1	12.4	6	2.07	24	0.535
2	6.3	9	1.39	36	0.366
5.5	2.42	12	1	48	0.28
11	1.31	18	0.7	54	0.25

However, no duty factor is employed for demonstrating compliance of this equipment, as the EUT is programmed to transmit continuous.

3.4 EMI Relevant Modifications

No modifications were made to the DUT by this laboratory during testing.

3.5 Exemptions

None.

4 Emission Limits

4.1 Radiated Emission Limits

Since the DUT is a spread spectrum device, wherein the radiated emissions are subject to emissions limits in the restricted bands The applicable frequencies, through ten harmonics, are given below in Table 4.1. Emission limits from digital circuitry are specified in Table 4.2.

Table 4.1. Tx. Radiated Emission Limits (FCC: 15.247/15.209; IC: RSS-210e A2.9).

Frequency (MHz)	Fundamental Ave. Elim (3m)		Spurious* Ave. Elim (3m)	
	(µV/m)	dB (µV/m)	(µV/m)	dB (µV/m)
2400-2483.5	---		---	
2310-2390 2483.5-2500 4500-5250	Restricted Bands		500	54.0
7250-7750 14470-14500 17700-21400 22010-23120 23600-24000	Restricted Bands		500	54.0

1) Emissions radiated outside of the specified frequency bands shall meet the general radiated emission limits in Section 15.209 (Class B).
2) Peak field strength of any emission above 1GHz shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. (FCC 15.35)

Table 4.2. Spurious Emission Limits (FCC: 15.33, .35, .109/209; IC: RSS-210 2.7, T2)

Freq. (MHz)	Elim (3m) µV/m	Elim dB(µV/m)
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
960-2000	500	54.0

Note: Average readings apply above 1000 MHz (1 MHz BW), Quasi-Peak readings apply to 1000 MHz (120 kHz RBW), PRF of intentional emissions > 20 Hz for QPK to apply.

4.2 Power Line Conducted Emissions Limits

Table 4.3 Emission Limits (FCC:15.107 (CISPR); IC: RSS-Gen, 7.2.2 T2).

Frequency (MHz)	Class A (dBµV)		Class B (dBµV)	
	Quasi-peak	Average	Quasi-peak	Average
.150 - 0.50	79	66	66 - 56*	56 - 46*
0.50 - 5	73	60	56	46
5 - 30	73	60	60	50

Notes:
1. The lower limit shall apply at the transition frequency
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15-0.50 MHz:
   *Class B Quasi-peak: dBµV = 50.25 - 19.12*log(f)
   *Class B Average: dBµV = 40.25 - 19.12*log(f)
3. 9 kHz RBW

5 Measurement Procedures

5.1 Semi-Anechoic Chamber Radiated Emissions

To become familiar with the radiated emission behavior of the DUT, the device is first studied and measured in our shielded semi-anechoic chamber. In the chamber there is a set-up similar to that of an outdoor 3-meter site, with a turntable, an antenna mast, and a ground plane. Instrumentation includes spectrum analyzers and other equipment as needed.

The DUT is laid on the test table as shown in the included block diagram and/or photographs. A shielded loop antenna is employed when studying emissions from 9 kHz to 30 MHz. Above 30 MHz and below 250 MHz a biconical antenna is employed. Above 250 MHz a ridge or and standard gain horn antennas are used. The spectrum analyzer resolution and video bandwidths are set so as to measure the DUT emission without decreasing the emission bandwidth (EBW) of the device. Emissions are studied for all orientations (3-axes) of the DUT and all test antenna polarizations. In the chamber, spectrum and modulation characteristics of intentional carriers are recorded. Receiver spurious emissions are measured with an appropriate carrier signal applied. Associated test data is presented in subsequent sections.

5.2 Outdoor Radiated Emissions

After measurements are performed indoors, emissions on our outdoor 3-meter Open Area Test Site (OATS) are made, when applicable. If the DUT connects to auxiliary equipment and is table or floor standing, the configurations prescribed in ANSI C63.4 are employed. Alternatively, an on-table layout more representative of actual use may be employed if the resulting emissions appear to be worst-case in such a configuration. Any intentionally radiating elements are placed on the test table flat, on their side, and on their end (3-axes) and worst case emissions are recorded. For each configuration the DUT is rotated 360 degrees about its azimuth and the receive antenna is raised and lowered between 1 and 4 meters to maximize radiated emissions from the device. Receiver spurious emissions are measured with an appropriate carrier signal applied. For devices with intentional emissions below 30 MHz, our shielded loop antenna at a 1 meter receive height is used. Low frequency field extrapolation to the regulatory limit distance is employed as needed. Emissions between 30 MHz and 1 GHz are measured using tuned dipoles and/or biconical antennas. Care is taken to ensure that the RBW and VBW used meet the regulatory requirements, and that the EBW of the DUT is not reduced. The Photographs included in this report show the Test Setup.

5.3 Radiated Field Computations

To convert the dBm values measured on the spectrum analyzer to dB(µV/m), we use expression

$$E3(dB\mu V/m) = 107 + PR + KA - KG + KE - CF$$

where

where	PR	=	power recorded on spectrum analyzer, dBm, measured at 3 m
	KA	=	antenna factor, dB/m
	KG	=	pre-amplifier gain, including cable loss, dB
	KE	=	duty correction factor, dB
	CF	=	distance conversion (employed only if limits are specified at alternate distance), dB

When presenting the data at each frequency, the highest measured emission under all of the possible DUT orientations (3-axes) is given.

5.4 Indoor Power Line Conducted Emissions

When applicable, power line conducted emissions are measured in our semi-anechoic chamber. If the DUT connects to auxiliary equipment and is table or floor standing, the configurations prescribed in

ANSI C63.4 are employed. Alternatively, an on-table layout more representative of actual use may be employed if the resulting emissions appear to be worst-case in such a configuration.

The conducted emissions measured with the spectrum analyzer and recorded (in dBμV) from 0-2 MHz and 2-30 MHz for both the ungrounded (Hi) and grounded (Lo) conductors. The spectrum analyzer is set to peak-hold mode in order to record the highest peak throughout the course of functional operation. Only when the emission exceeds or is near the limit are quasi-peak and average detection used.

5.5 Supply Voltage Variation

Measurements of the variation in the fundamental radiated emission were performed with the supply voltage varied by no less than 85% and 115% of the nominal rated value. For battery operated equipment, tests were performed using a new battery, and worst case emissions are re-checked employing a new battery.

6 Test Results

6.1 Radiated Emissions

6.1.1 Peak-to-Average Ratio (15.35(b))

For the measurements presented here (for emissions in restricted bands), the DUT was programmed to transmit continuous, and such was verified with spectrum analyzer set to zero-span mode. See Figure 6.1. Average measurements were made using 1 MHz RBW and 100 Hz VBW. Peak spurious measurements are made using 1 MHz RBW and 3 MHz VBW.

6.1.2 Emission Bandwidth (15.247(a)(2))

For this test, the DUT was put in a test mode for continuous data transmission, and the amplifier was attached, including 0-10 dB of attenuation, to the radio. The EUT was placed in front of the standard gain horn in the worst possible orientation. The analyzer was set for RBW=100 kHz, VBW=300 kHz, SPAN=30 MHz. The 6-dB bandwidth and 26 dB EBW were measured for lowest, middle, and highest channels available. The IC 99% Power Bandwidth was also measured, and is reported below. See figure 6.2.

Configuration	Data Rate (Mbps)	Channel	6 dB BW (MHz)	26 dB BW (MHz)	IC 99% Pwr BW (MHz)
AGC Amplifier + Filter (HA2401RTG(I)-500)	11 (802.11 b)	6	9.60	18.40	14.85
	54 (802.11 g)	6	16.80	29.60	18.15
AGC Amplifier (HA2401RTG(I)-250)	11 (802.11 b)	6	9.70	18.50	14.70
	54 (802.11 g)	6	16.80	26.70	17.10
Radio Alone	11 (802.11 b)	1	10.05	18.53	14.63
		6	10.13	18.30	14.78
		11	10.05	18.45	14.70
	54 (802.11 g)	1	16.73	19.80	16.88
		6	16.73	19.65	16.88
		11	16.73	19.80	16.88

6.1.3 Radiated Spurious Emissions

Digital emissions were not tested for the USB radio + antenna stand alone configuration as the manufacturer has DoC documentation showing compliance, which is included with this filing. Digital emissions were verified when the amplifiers are employed. Outdoor amplifier configurations were verified only for spurious emissions, as the addition of the bias-T and change in cable configuration could result in a change in such. (Otherwise, the HA2401RTG series amplifiers are identical to the HA2401RTG series amplifiers.)

6.2 Conducted Emissions

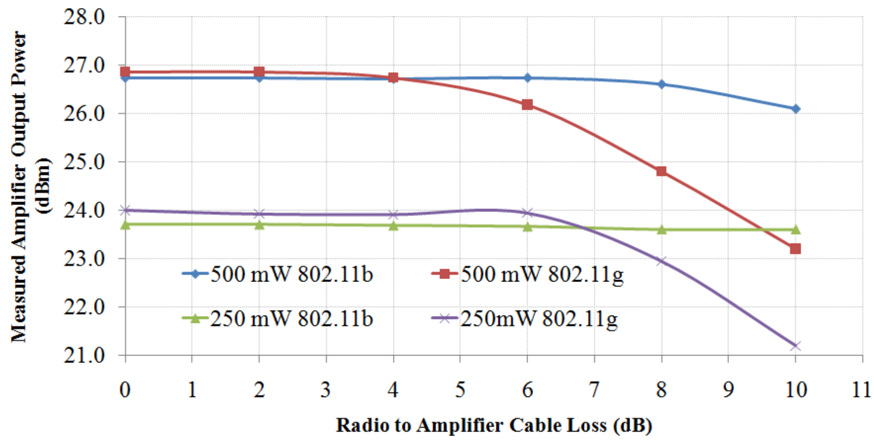
6.2.1 Output Power (15.247(b))

DUT output power is computed from antenna port conducted emissions. Since the emission bandwidth of the DUT is greater than the maximum RBW of the spectrum analyzer employed, power output Option 2, Method 1 of the FCC's DTS measurement procedures is used in determining output power. The SA is sample detected, with a SPAN = 40 MHz, RBW = 1 MHz, VBW = 3 MHz and data is power averaged over 100 traces. Output power is computed via the SA's internal integration routine across the 26 dB EBW. See Figure 6.3.

Configuration	Data Rate (Mbps)	Channel	Output Power (dBm)
AGC Amplifier + Filter (HA2401RTG(I)-500)	11 (802.11 b)	6	26.96
	54 (802.11 g)	6	26.77
AGC Amplifier (HA2401RTG(I)-250)	11 (802.11 b)	6	23.24
	54 (802.11 g)	6	23.97
Radio Alone	11 (802.11 b)	1	14.3
		6	14.1
		11	14.2
	54 (802.11 g)	1	10.9
		6	10.1
		11	10.2

6.2.2 AGC Amplifier Performance

AGC amplifier compliance must be demonstrated over a range of input power levels. Output power measurements (as above) were taken as the attenuation between the radio and amplifier was varied. Results of this testing are below. THESE AGC AMPLIFIERS SHOULD NOT BE OPERATED WITH GREATER THAN 8 DB (100 FT) OF COAXIAL CABLE BETWEEN THE RADIO AND AMPLIFIER. For attenuation greater than 8 dB, the amplifier begins to shutdown in 802.11 g mode, rendering the system non-functional.



6.2.3 Computed Health Hazard EM Radiation Level

The following table summarizes the power density at a distance of 20 cm from the device as calculated from FCC OET Bulletin 65.

Table 6.3 Potential Health Hazard Radiation Level

Ant.	Ant.Gain (dBi)	Po (mW)	EIRP (mW)	S (mW/cm^2)
PCB	2	497	787	0.157

The following equations were used in calculating the operating distance (R).

$$EIRP(mW) = Po(mW) \cdot 10^{\frac{Gain(dB)}{10}} \quad \text{and} \quad S(mW/cm^2) = \frac{EIRP(mW)}{4 \cdot \Pi \cdot R(cm)^2}, \; R = 20 \text{ cm}$$

6.2.4 Peak Output Power Reduction (15.247(b)(4)(i))

No configuration of this system results in an EIRP value of 36 dBm or greater. Thus, peak output power reduction is unnecessary.

6.2.5 RF Antenna Conducted Spurious Emissions (15.247(c))

For this test, the DUT was put in a test mode for continuous data transmission, and the amplifier was attached, including 0-10 dB of attenuation, to the radio. The spectrum analyzer was connected where the antenna attaches to the system. The analyzer was set for RBW = 100 kHz, VBW = 300 kHz, the frequency was swept from 0 to 25 GHz. In all cases, emissions are more than 30 dB below the carrier level. Also included in are plots demonstrating band-edge compliance.

6.2.6 Power Spectral Density and Line Spacing (15.247(d))

For this test, the DUT was put in a test mode for continuous data transmission, and the amplifier was attached, including 0-10 dB of attenuation, to the radio. The spectrum analyzer was connected where the antenna attaches to the system. The spectrum was first scanned for the maximum spectrum peaks and then at these peaks the sweep was repeated with RBW=3 kHz, VBW=300 kHz, SPAN=300 kHz, and RBW=1 kHz, VBW=300 kHz, SPAN=100 kHz. See Figure 6.5. The readings obtained are:

Configuration	Data Rate (Mbps)	Channel	PSD (dBm/3kHz)	Line Spacing (kHz)
AGC Amplifier + Filter (HA2401RTG(I)-500)	11 (802.11 b)	6	1.38	5.5
	54 (802.11 g)	6	0.18	2.0
AGC Amplifier (HA2401RTG(I)-250)	11 (802.11 b)	6	-0.57	5.5
	54 (802.11 g)	6	-0.39	2.0
Radio Alone	11 (802.11 b)	1	-9.9	5.5
		6	-10.1	5.5
		11	-9.9	5.5
	54 (802.11 g)	1	-16.2	4.0
		6	-16.4	4.0
		11	-16.4	4.0

6.2.7 AC Power Line Conducted Emissions (15.207)

The RF amplifier is powered from a switching power supply. Conducted emissions were measured using a LISN in the standard set-up. Photographs of the set-up are included here. Prior certification of the USB radio demonstrates that the FCC Class B line conducted emissions limits are met by the USB card and an associated computer, and such was verified with the test PC. The manufacturer of the system is not responsible for the sale or distribution of the computer/access point used with the USB card. Also note that the amplifiers used in these configurations contain no internal oscillators or low frequency sources, making it unlikely that these added components could corrupt the AC conducted emissions demonstrated in the USB card filing. The original USB radio’s test report has been included in this filing for reference.

Table 6.1(a) Highest Emissions Measured

Radiated Emissions										
#	Freq. MHz	Ant. Used	Ant. Pol.	Pr. (avg) dBm	Ka dB/m	Kg dB	E3 dBμV/m	E3lim dBμV/m	Pass dB	Comments
1	**Configuration:**									
2	Power Supply Used		DC Inj.	Input Attenuation		Amp Pwr Rating		Output Filter		Antenna
3	DSA-15P-12 US		No	0-10 dB		500 mW		BPF24-406		HG2402RD-RSF
4										
5	**802.11b mode (11 Mbps)**									
6	2437.0									Middle channel
7	2390.0	Horn S	H/V	-76.1	21.4	- 1.2	53.5	54.0	**0.5**	Mid
8	2483.5	Horn S	H/V	-77.3	21.5	- 1.2	52.4	54.0	1.6	Mid
9	4874.0	Horn C	H/V	-45.5	25.5	37.0	50.0	54.0	4.0	Mid
10	7311.0	Horn XN	H/V	-43.9	25.5	36.0	52.6	54.0	1.4	Mid
11	12185.0	Horn X	H/V	-65.5	25.5	34.0	33.0	54.0	21.0	Mid
12	19496.0	Horn K	H/V	-69.1	32.3	32.0	38.2	54.0	15.8	Mid, noise
13										
14	* Ave: measured with 1 MHz RBW and 10 Hz VBW									
15	** Peak was measured to be 7.55 dB above average in a 1 MHz RBW									
16										
17	**802.11g mode (54 Mbps)**									
18	2437.0									Middle channel
19	2390.0	Horn S	H/V	-77.3	21.4	- 1.2	52.3	54.0	1.7	Mid
20	2483.5	Horn S	H/V	-77.4	21.5	- 1.2	52.3	54.0	**1.7**	Mid
21	4874.0	Horn C	H/V	-51.8	25.5	37.0	43.7	54.0	10.3	Mid
22	7311.0	Horn XN	H/V	-46.7	25.5	36.0	49.8	54.0	4.2	Mid
23	12185.0	Horn X	H/V	-67.4	25.5	34.0	31.1	54.0	22.9	Mid
24	19496.0	Horn K	H/V	-69.1	32.3	32.0	38.2	54.0	15.8	Mid, noise
25										
26	* Ave: measured with 1 MHz RBW and 10 Hz VBW									
27	** Peak was measured to be 11.58 dB above average in a 1 MHz RBW									
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U. of Mich; Meas. 01/15/2010-03/12/2010

Table 6.1(b) Highest Emissions Measured

Radiated Emissions										
#	Freq. MHz	Ant. Used	Ant. Pol.	Pr. (avg) dBm	Ka dB/m	Kg dB	E3 dBµV/m	E3lim dBµV/m	Pass dB	Comments
1	**Configuration:**									
2	Power Supply Used		DC Inj.	Input Attenuation		Amp Pwr Rating		Output Filter		Antenna
3	DSA-15P-12 US		No	0-10 dB		250 mW		None		HG2402RD-RSF
4										
5	**802.11b mode (11 Mbps)**									
6	2437.0									Middle channel
7	2390.0	Horn S	H/V	-80.1	21.4	- 1.2	49.5	54.0	**4.5**	Mid
8	2483.5	Horn S	H/V	-81.9	21.5	- 1.2	47.8	54.0	6.2	Mid
9	4874.0	Horn C	H/V	-46.9	25.5	37.0	48.6	54.0	5.4	Mid
10	7311.0	Horn XN	H/V	-48.9	25.5	36.0	47.6	54.0	6.4	Mid
11	12185.0	Horn X	H/V	-68.1	25.5	34.0	30.4	54.0	23.6	Mid, noise
12	19496.0	Horn K	H/V	-69.1	32.3	32.0	38.2	54.0	15.8	Mid, noise
13										
14	* Ave: measured with 1 MHz RBW and 10 Hz VBW									
15	** Peak was measured to be 7.55 dB above average in a 1 MHz RBW									
16										
17	**802.11g mode (54 Mbps)**									
18	2437.0									Middle channel
19	2390.0	Horn S	H/V	-76.7	21.4	- 1.2	52.9	54.0	**1.1**	Mid
20	2483.5	Horn S	H/V	-78.3	21.5	- 1.2	51.3	54.0	2.7	Mid
21	4874.0	Horn C	H/V	-47.1	25.5	37.0	48.4	54.0	5.6	Mid
22	7311.0	Horn XN	H/V	-48.3	25.5	36.0	48.2	54.0	5.8	Mid
23	12185.0	Horn X	H/V	-68.9	25.5	34.0	29.6	54.0	24.4	Mid, noise
24	19496.0	Horn K	H/V	-69.1	32.3	32.0	38.2	54.0	15.8	Mid, noise
25										
26	* Ave: measured with 1 MHz RBW and 10 Hz VBW									
27	** Peak was measured to be 11.58 dB above average in a 1 MHz RBW									
28										
29										
30										
31										
32										
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U. of Mich; Meas. 01/15/2010-03/12/2010

Table 6.1(b) Highest Emissions Measured - IEEE 802.11b mode

Radiated Emissions										Radio Alone; FCC/IC
#	Freq. MHz	Ant. Used	Ant. Pol.	Pr. (avg)** dBm	Ka dB/m	Kg dB	E3 dBµV/m	E3lim (avg)** dBµV/m	Pass dB	Comments
1	2412.0									Low channel
2	2437.0									Mid channel
3	2462.0									High channel
4										
5	2390.0	Horn S	H/V	-78.0	21.4	- 1.2	51.6	54.0	2.4	Low
6	2390.0	Horn S	H/V	-78.0	21.4	- 1.2	51.6	54.0	2.4	Mid
7	2390.0	Horn S	H/V	-78.0	21.4	- 1.2	51.6	54.0	2.4	High
8	2483.5	Horn S	H/V	-77.8	21.5	- 1.2	51.9	54.0	2.1	Low
9	2483.5	Horn S	H/V	-77.8	21.5	- 1.2	51.9	54.0	2.1	Mid
10	2483.5	Horn S	H/V	-77.8	21.5	- 1.2	51.9	54.0	**2.1**	High
11	4824.0	Horn C	H/V	-61.2	25.5	37.0	34.3	54.0	19.7	Low
12	4874.0	Horn C	H/V	-54.8	25.5	37.0	40.7	54.0	13.3	Mid
13	4924.0	Horn C	H/V	-56.6	25.5	37.0	38.9	54.0	15.1	High
14	7236.0	Horn XN	H/V	-53.8	25.5	36.0	42.7	N/A	-	Low
15	7311.0	Horn XN	H/V	-53.5	25.5	36.0	43.0	54.0	11.0	Mid
16	7386.0	Horn XN	H/V	-54.4	25.5	36.0	42.1	54.0	11.9	High
17	9648.0	Horn X	H/V		25.5	34.0	-	N/A	-	Low
18	9748.0	Horn X	H/V		25.5	34.0	-	N/A	-	Mid
19	9848.0	Horn X	H/V		25.5	34.0	-	N/A	-	High
20	12060.0	Horn X	H/V	-68.5	25.5	34.0	30.0	54.0	24.0	Low, noise
21	12185.0	Horn X	H/V	-68.5	25.5	34.0	30.0	54.0	24.0	Mid, noise
22	12310.0	Horn X	H/V	-68.7	25.5	34.0	29.8	54.0	24.2	High, noise
23	14472.0	Horn Ku	H/V	-69.5	25.5	17.3	45.7	54.0	8.3	Low
24	14622.0	Horn Ku	H/V		25.5	17.3	-	N/A	-	Mid
25	14772.0	Horn Ku	H/V		25.5	17.3	-	N/A	-	High
26	16884.0	Horn Ku	H/V		32.3	34.0	-	N/A	-	Low
27	17059.0	Horn Ku	H/V		32.3	34.0	-	N/A	-	Mid
28	17234.0	Horn Ku	H/V		32.3	34.0	-	N/A	-	High
29	19296.0	Horn K	H/V	-69.3	32.3	32.0	38.0	54.0	16.0	Low, noise
30	19496.0	Horn K	H/V	-69.3	32.3	32.0	38.0	54.0	16.0	Mid, noise
31	19696.0	Horn K	H/V	-69.2	32.3	32.0	38.1	54.0	15.9	High, noise
32	21708.0	Horn K	H/V		32.3	32.0	-	N/A	-	Low
33	21933.0	Horn K	H/V		32.3	32.0	-	N/A	-	Mid
34	22158.0	Horn K	H/V	-66.7	32.3	32.0	40.6	54.0	13.4	High
35	24120.0	Horn Ka	H/V		32.3	32.0	-	N/A	-	Low
36	24370.0	Horn Ka	H/V		32.3	32.0	-	N/A	-	Mid
37	24620.0	Horn Ka	H/V		32.3	32.0	-	N/A	-	High
38										
39	**Configuration:**									
40	Power Supply Used		DC Inj.	Input Attenuation		Amp / Pwr		Output Filter		Antenna
41	None		No	0 dB		None		None		HG2402RD-RSF
42	* Ave: measured with 1 MHz RBW and 100 Hz VBW, ** Peak was measured to be 7.55 dB above average in a 1 MHz RBW									

U. of Mich; Meas. 01/15/2010-03/12/2010

Table 6.1(c) Highest Emissions Measured - IEEE 802.11g mode

					Radiated Emissions					Radio Alone; FCC/IC
#	Freq. MHz	Ant. Used	Ant. Pol.	Pr. (avg)** dBm	Ka dB/m	Kg dB	E3 dBμV/m	E3lim (avg)** dBμV/m	Pass dB	Comments
1	2412.0									Low channel
2	2437.0									Mid channel
3	2462.0									High channel
4										
5	2390.0	Horn S	H/V	-77.2	21.4	- 1.2	52.4	54.0	1.6	Low
6	2390.0	Horn S	H/V	-77.2	21.4	- 1.2	52.4	54.0	1.6	Mid
7	2390.0	Horn S	H/V	-77.2	21.4	- 1.2	52.4	54.0	1.6	High
8	2483.5	Horn S	H/V	-76.5	21.5	- 1.2	53.2	54.0	0.8	Low
9	2483.5	Horn S	H/V	-76.5	21.5	- 1.2	53.2	54.0	0.8	Mid
10	2483.5	Horn S	H/V	-76.5	21.5	- 1.2	53.2	54.0	**0.8**	High
11	4824.0	Horn C	H/V	-58.7	25.5	37.0	36.8	54.0	17.2	Low
12	4874.0	Horn C	H/V	-58.0	25.5	37.0	37.5	54.0	16.5	Mid
13	4924.0	Horn C	H/V	-59.6	25.5	37.0	35.9	54.0	18.1	High
14	7236.0	Horn XN	H/V	-58.9	25.5	36.0	37.6	N/A	-	Low
15	7311.0	Horn XN	H/V	-59.2	25.5	36.0	37.3	54.0	16.7	Mid
16	7386.0	Horn XN	H/V	-60.2	25.5	36.0	36.3	54.0	17.7	High
17	9648.0	Horn X	H/V		25.5	34.0	-	N/A	-	Low
18	9748.0	Horn X	H/V		25.5	34.0	-	N/A	-	Mid
19	9848.0	Horn X	H/V		25.5	34.0	-	N/A	-	High
20	12060.0	Horn X	H/V	-68.5	25.5	34.0	30.0	54.0	24.0	Low, noise
21	12185.0	Horn X	H/V	-68.5	25.5	34.0	30.0	54.0	24.0	Mid, noise
22	12310.0	Horn X	H/V	-68.7	25.5	34.0	29.8	54.0	24.2	High, noise
23	14472.0	Horn Ku	H/V	-69.5	25.5	17.3	45.7	54.0	8.3	Low
24	14622.0	Horn Ku	H/V		25.5	17.3	-	N/A	-	Mid
25	14772.0	Horn Ku	H/V		25.5	17.3	-	N/A	-	High
26	16884.0	Horn Ku	H/V		32.3	34.0	-	N/A	-	Low
27	17059.0	Horn Ku	H/V		32.3	34.0	-	N/A	-	Mid
28	17234.0	Horn Ku	H/V		32.3	34.0	-	N/A	-	High
29	19296.0	Horn K	H/V	-69.3	32.3	32.0	38.0	54.0	16.0	Low, noise
30	19496.0	Horn K	H/V	-69.3	32.3	32.0	38.0	54.0	16.0	Mid, noise
31	19696.0	Horn K	H/V	-69.2	32.3	32.0	38.1	54.0	15.9	High, noise
32	21708.0	Horn K	H/V		32.3	32.0	-	N/A	-	Low
33	21933.0	Horn K	H/V		32.3	32.0	-	N/A	-	Mid
34	22158.0	Horn K	H/V	-66.7	32.3	32.0	40.6	54.0	13.4	High
35	24120.0	Horn Ka	H/V		32.3	32.0	-	N/A	-	Low
36	24370.0	Horn Ka	H/V		32.3	32.0	-	N/A	-	Mid
37	24620.0	Horn Ka	H/V		32.3	32.0	-	N/A	-	High
38										
39	**Configuration:**									
40	Power Supply Used		DC Inj.	Input Attenuation		Amp / Pwr		Output Filter		Antenna
41	None		No	0 dB		None		None		HG2402RD-RSF
42	* Ave: measured with 1 MHz RBW and 100 Hz VBW, ** Peak was measured to be 11.58 dB above average in a 1 MHz RBW									

U. of Mich; Meas. 01/15/2010-03/12/2010

Table 6.2 Highest Digital Radiated Emissions Measured

L-COM, HAKIT 500 mW;FCC/IC/CISPR B												
#	Freq. MHz	Ant. Used	Ant. Pol.	Pr dBm	Det. Used	Ka dB/m	Kg dB	E3 dBµV/m	FCC E3lim dBµV/m	IC/CE E3lim dBµV/m	Margin dB	Comments
1	38.9	Bic	H	-76.4	Pk	11.0	25.4	16.2	40.0	40.5	23.8	
2	38.9	Bic	V	-67.3	Pk	11.0	25.4	25.3	40.0	40.5	14.7	
3	48.2	Bic	H	-72.8	Pk	9.3	25.3	18.3	40.0	40.5	21.7	
4	55.2	Bic	V	-64.2	Pk	8.5	25.2	26.1	40.0	40.5	13.9	
5	55.2	Bic	H	-65.1	Pk	8.5	25.2	25.2	40.0	40.5	14.8	
6	65.6	Bic	H	-66.0	Pk	7.8	25.0	23.7	40.0	40.5	16.3	
7	72.5	Bic	V	-70.3	Pk	7.6	24.9	19.3	40.0	40.5	20.7	
8	80.5	Bic	H	-65.5	Pk	7.6	24.8	24.3	40.0	40.5	15.7	
9	144.9	Bic	V	-71.8	Pk	12.1	23.9	23.3	43.5	40.5	17.2	
10	148.4	Bic	H	-70.9	Pk	12.3	23.9	24.6	43.5	40.5	15.9	
11	148.4	Bic	V	-72.4	Pk	12.3	23.9	23.1	43.5	40.5	17.4	
12	167.5	Bic	V	-71.4	Pk	13.6	23.6	25.6	43.5	40.5	14.9	
13	240.0	Bic	V	-70.4	Pk	14.7	22.7	28.5	46.0	47.5	17.5	
14	300.0	SBic	V	-66.0	Pk	17.9	22.0	36.9	46.0	47.5	9.1	
15	304.5	SBic	H	-73.2	Pk	18.1	21.9	29.9	46.0	47.5	16.1	
16	307.6	SBic	H	-72.4	Pk	18.2	21.9	30.9	46.0	47.5	15.1	
17	319.4	SBic	H	-73.6	Pk	18.6	21.8	30.3	46.0	47.5	15.7	
18	332.6	SBic	H	-67.3	Pk	19.1	21.6	37.2	46.0	47.5	8.8	
19	336.1	SBic	H	-65.9	Pk	19.2	21.6	38.8	46.0	47.5	7.2	
20	783.3	SBic	V	-74.7	QPk	27.2	17.6	41.8	46.0	47.5	4.2	
21	1303.0	R-Horn	H/V	-54.9	Pk	20.7	28.0	44.8	54.0	54.0	9.2	
22	1700.0	R-Horn	H/V	-58.8	Pk	21.8	28.0	42.0	54.0	54.0	12.0	
23	1080.0	R-Horn	H/V	-58.9	Pk	20.0	28.0	40.1	54.0	54.0	13.9	
24	1103.0	R-Horn	H/V	-59.6	Pk	20.1	28.0	39.5	54.0	54.0	14.5	
25	1200.0	R-Horn	H/V	-62.8	Pk	20.4	28.0	36.6	54.0	54.0	17.4	
26	1508.0	R-Horn	H/V	-63.7	Pk	21.3	28.0	36.7	54.0	54.0	17.3	
27	3234.0	R-Horn	H/V	-67.9	Pk	26.1	24.7	40.4	54.0	54.0	13.6	
28	3733.0	R-Horn	H/V	-68.4	Pk	27.6	23.7	42.6	54.0	54.0	11.4	
29	3999.0	R-Horn	H/V	-68.7	Pk	28.4	23.1	43.7	54.0	54.0	10.3	
30												
31												
32												
33												
34												
35												
36												
37												
38												
41												
42												
43												

Meas. 03/20/2010; U of Mich.

Table 6.3 Highest AC Power Line Conducted Emissions Measured

L-COM, DSA-15P-12 (500 mW amplifier w/ filter); FCC/IC/CISPR B												
	Freq.	Line	Peak Det., dBµV		Pass	QP Det., dBµV		Pass	Ave. Det., dBµV		Pass	
#	MHz	Side	Vtest	Vlim*	dB*	Vtest	Vlim	dB	Vtest	Vlim	dB	Comments
1	0.16	Lo	61.5	55.2	- 6.3	57.2	65.3	8.1	47.8	55.2	7.4	
2	0.28	Lo	52.5	50.9	- 1.6	48.1	61.0	12.9	39.8	50.9	11.1	
3	0.38	Lo	59.3	48.2	-11.2	45.3	58.2	12.9	39.2	48.2	9.0	
4	0.44	Lo	51.3	47.0	- 4.3	46.1	57.1	11.0	38.7	47.0	8.3	
5	0.55	Lo	52.8	46.0	- 6.8	47.9	56.0	8.1	42.8	46.0	3.2	
6	0.55	Lo	51.8	46.0	- 5.8	47.5	56.0	8.5	42.6	46.0	3.4	
7	0.60	Lo	55.1	46.0	- 9.1	50.4	56.0	5.6	44.2	46.0	1.8	
8	0.66	Lo	49.6	46.0	- 3.6	45.0	56.0	11.0	35.9	46.0	10.1	
9	0.76	Lo	50.5	46.0	- 4.5	45.8	56.0	10.2	41.9	46.0	4.1	
10	0.77	Lo	50.6	46.0	- 4.6	46.6	56.0	9.4	42.8	46.0	3.2	
11	0.82	Lo	53.0	46.0	- 7.0	48.2	56.0	7.8	41.5	46.0	4.5	
12	0.88	Lo	50.9	46.0	- 4.9	46.8	56.0	9.2	38.6	46.0	7.4	
13	1.04	Lo	51.5	46.0	- 5.5	47.0	56.0	9.0	41.0	46.0	5.0	
14	1.04	Lo	51.2	46.0	- 5.2	46.8	56.0	9.2	41.1	46.0	4.9	
15	1.26	Lo	50.1	46.0	- 4.1	45.6	56.0	10.4	40.3	46.0	5.7	
16	1.31	Lo	49.1	46.0	- 3.1	45.4	56.0	10.6	37.2	46.0	8.8	
17	1.31	Lo	50.5	46.0	- 4.5	45.2	56.0	10.8	37.1	46.0	8.9	
18	1.53	Lo	49.4	46.0	- 3.4	44.2	56.0	11.8	36.4	46.0	9.6	
19	1.75	Lo	49.3	46.0	- 3.3	44.3	56.0	11.7	37.4	46.0	8.6	
20	27.00	Lo	38.0	50.0	12.0		60.0			50.0		
21												
22	0.27	Hi	57.6	51.0	- 6.6	55.4	61.0	5.6	43.4	51.0	7.6	
23	0.27	Hi	58.2	51.0	- 7.2	55.2	61.0	5.8	43.4	51.0	7.6	
24	0.38	Hi	59.8	48.2	-11.6	54.2	58.2	4.1	43.6	48.2	4.6	
25	0.44	Hi	50.0	47.1	- 2.9	44.8	57.2	12.4	37.8	47.1	9.3	
26	0.55	Hi	53.0	46.0	- 7.0	50.6	56.0	5.4	44.7	46.0	1.3	
27	0.55	Hi	52.9	46.0	- 6.9	49.7	56.0	6.3	43.6	46.0	2.4	
28	0.60	Hi	55.9	46.0	- 9.9	51.5	56.0	4.5	45.8	46.0	**0.2**	
29	0.71	Hi	50.4	46.0	- 4.4	47.3	56.0	8.7	36.8	46.0	9.2	
30	0.77	Hi	53.0	46.0	- 7.0	49.9	56.0	6.1	43.8	46.0	2.2	
31	0.87	Hi	51.7	46.0	- 5.7	47.9	56.0	8.1	39.7	46.0	6.3	
32	0.87	Hi	51.8	46.0	- 5.8	47.7	56.0	8.3	40.0	46.0	6.0	
33	0.99	Hi	51.6	46.0	- 5.6	48.6	56.0	7.4	41.4	46.0	4.6	
34	1.04	Hi	50.8	46.0	- 4.8	46.6	56.0	9.4	42.3	46.0	3.7	
35	1.15	Hi	50.0	46.0	- 4.0	46.7	56.0	9.3	36.6	46.0	9.4	
36	1.26	Hi	49.5	46.0	- 3.5	45.7	56.0	10.3	41.0	46.0	5.0	
37	1.37	Hi	49.5	46.0	- 3.5	46.1	56.0	9.9	36.8	46.0	9.2	
38	1.37	Hi	49.7	46.0	- 3.7	46.1	56.0	9.9	35.7	46.0	10.3	
39	1.64	Hi	47.2	46.0	- 1.2	45.5	56.0	10.5	36.3	46.0	9.7	
40	1.86	Hi	47.2	46.0	- 1.2	44.4	56.0	11.6	34.5	46.0	11.5	
41	11.32	Hi	42.0	50.0	8.0		60.0			50.0		
42	27.00	Hi	37.0	50.0	13.0		60.0			50.0		
40												

**Average limit* Meas. 03/02/2010; U of Mich.

Since Vpeak >= Vqp >= Vave and if Vtestpeak < Vavelim, then Vqplim and Vavelim are met.

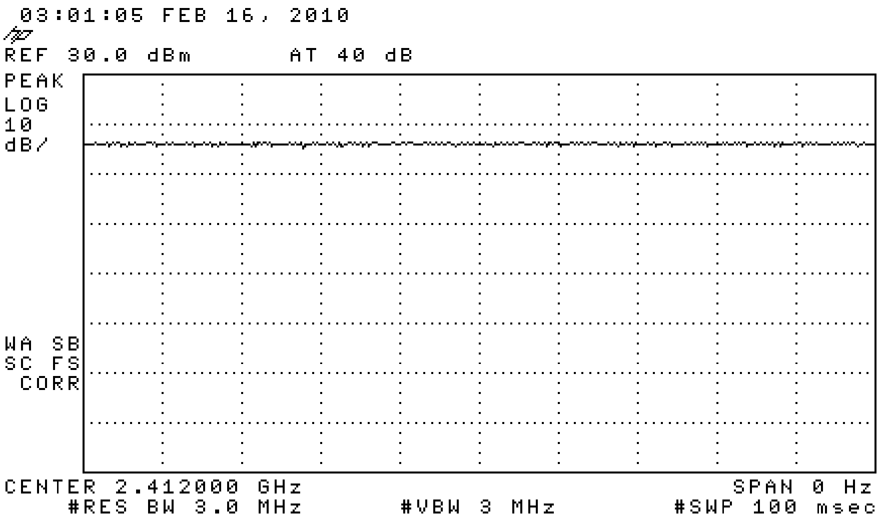


Figure 6.1(a) Worst Case 802.11 b mode continuous Tx verification.

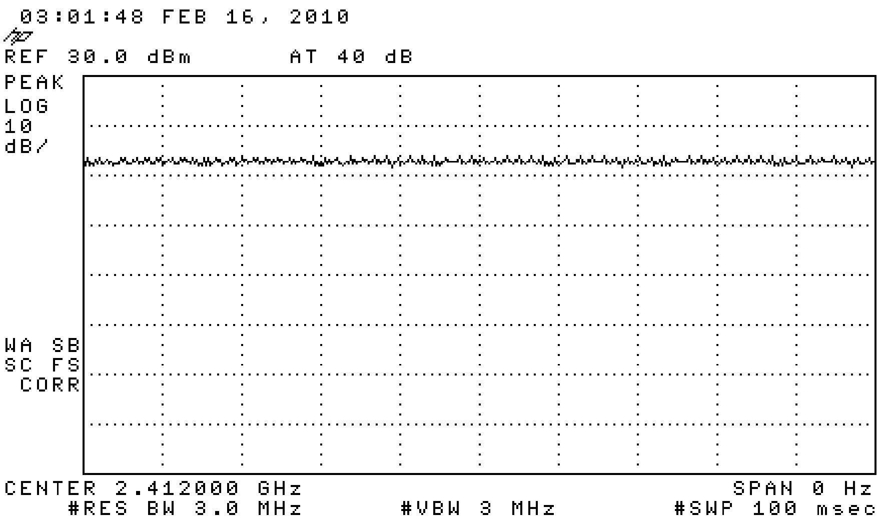


Figure 6.1(b) Worst Case 802.11 g mode continuous Tx verification.

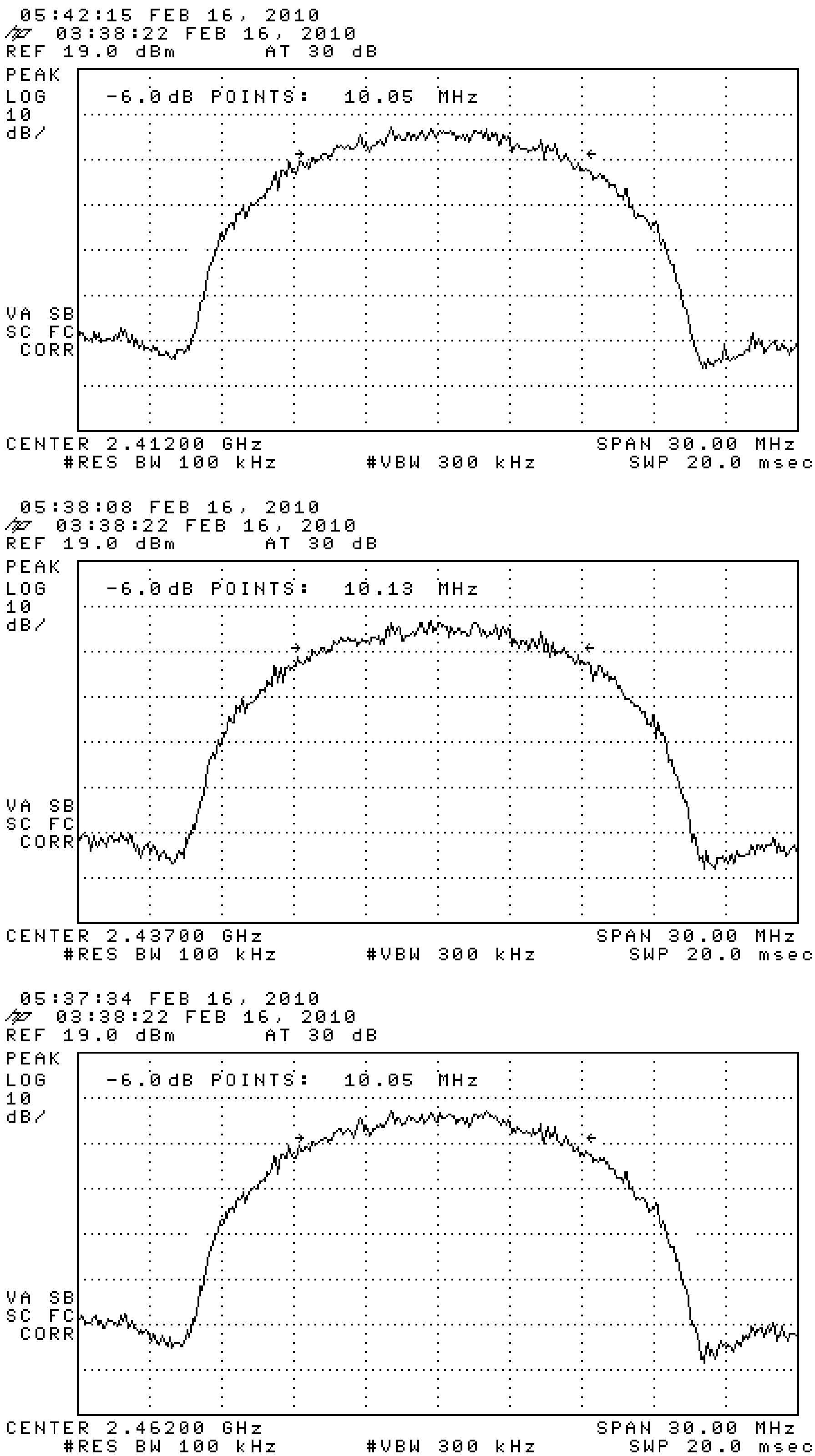


Figure 6.2(a) Radio Alone 802.11 b 6 dB Emission Bandwidth.
(top) Low Channel, (middle) Middle Channel, (bottom) High Channel

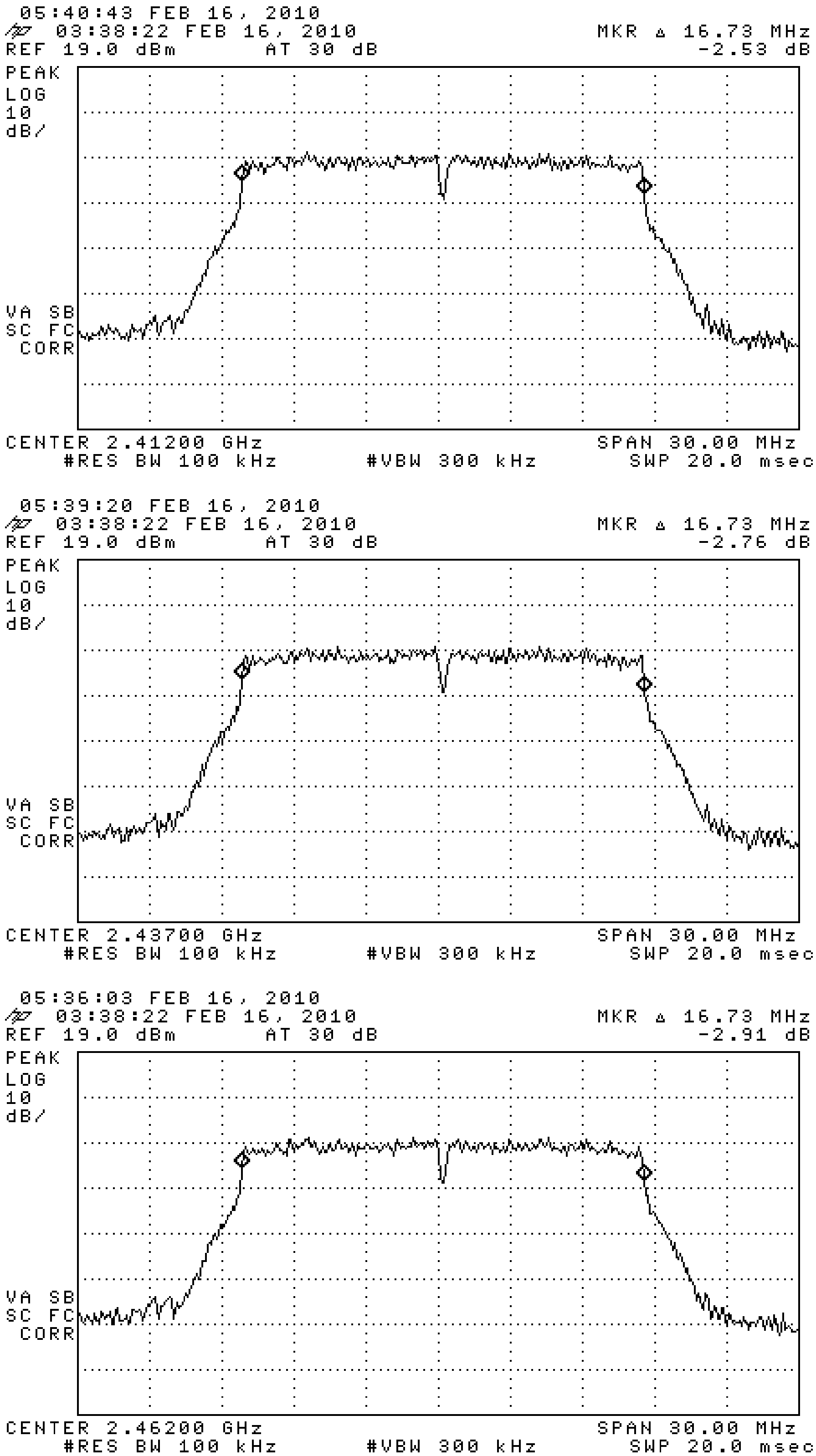


Figure 6.2(b) Radio Alone 802.11 g 6 dB Emission Bandwidth.
(top) Low Channel, (middle) Middle Channel, (bottom) High Channel

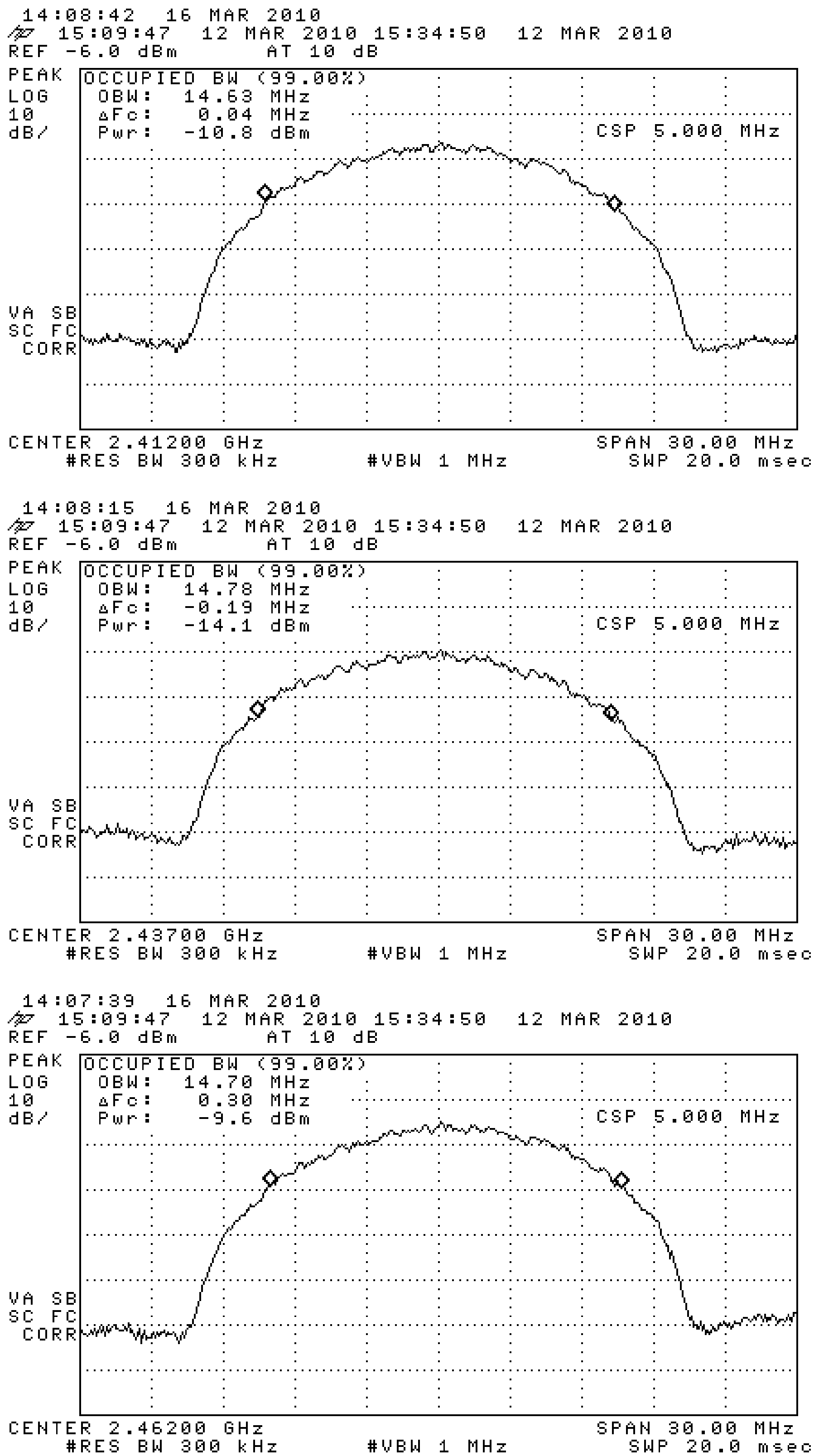
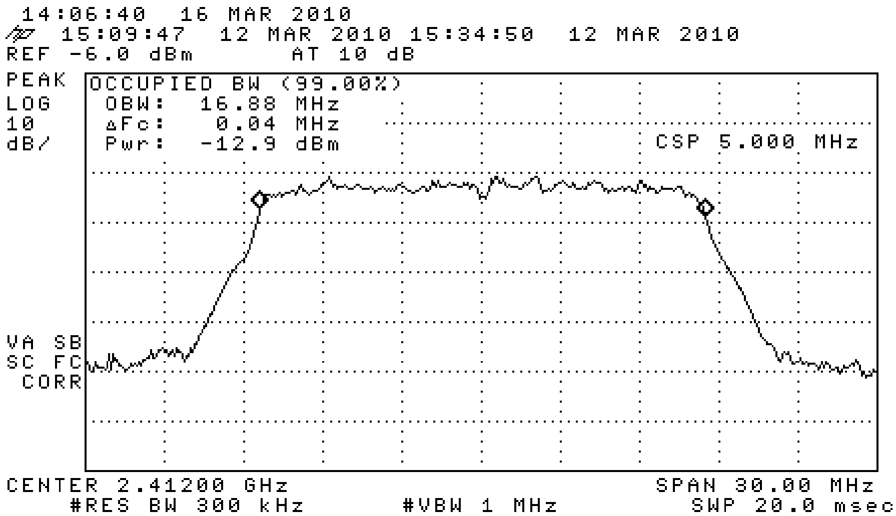
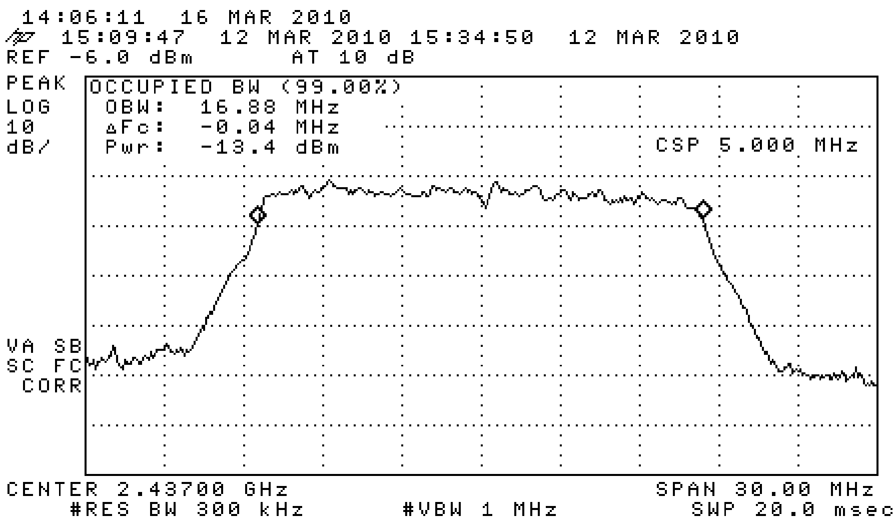


Figure 6.2(c) Radio Alone 802.11 b IC 99% Power Bandwidth.
(top) Low Channel, (middle) Middle Channel, (bottom) High Channel





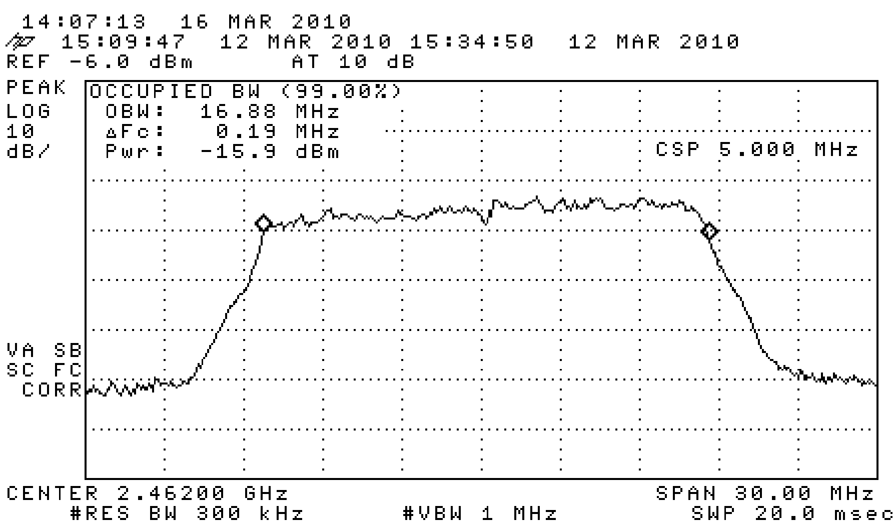
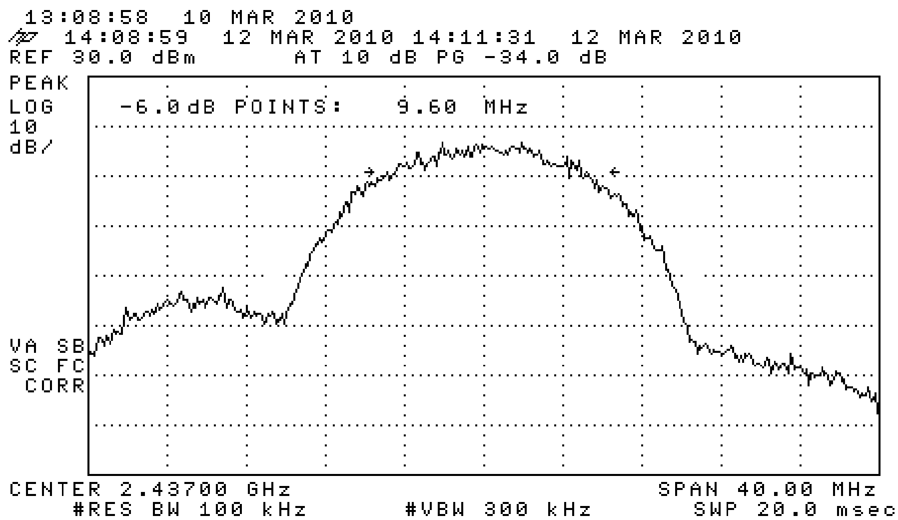


Figure 6.2(d) Radio Alone 802.11 g IC 99% Power Bandwidth.
(top) Low Channel, (middle) Middle Channel, (bottom) High Channel



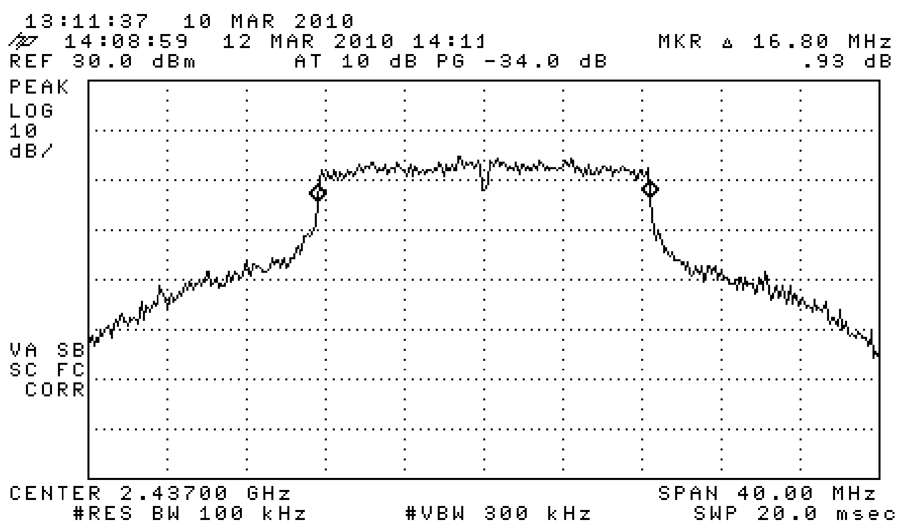
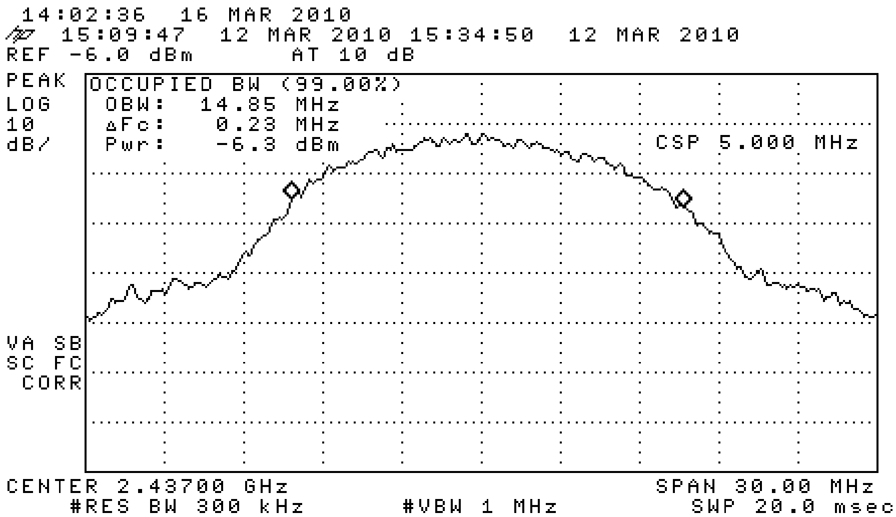


Figure 6.2(e) Radio + 500 mW Amplifier + Filter. 6 dB Emission Bandwidth (Middle Channel). (top) 802.11b mode, (bottom) 802.11g mode



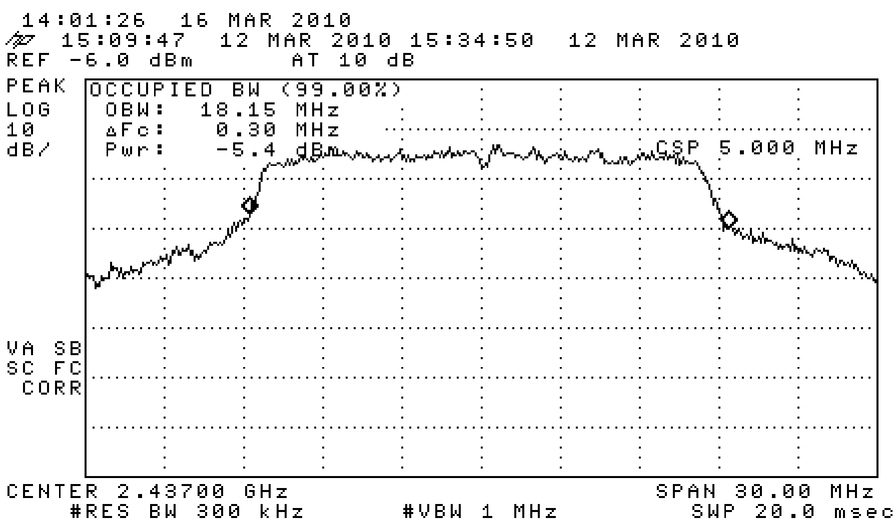
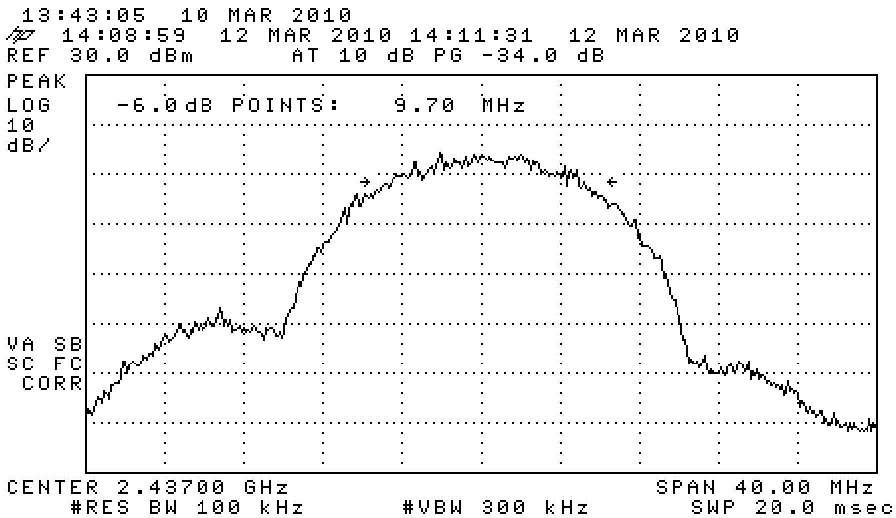


Figure 6.2(f) Radio + 500 mW Amplifier + Filter. IC 99% Power Bandwidth (Middle Channel). (top) 802.11b mode, (bottom) 802.11g mode



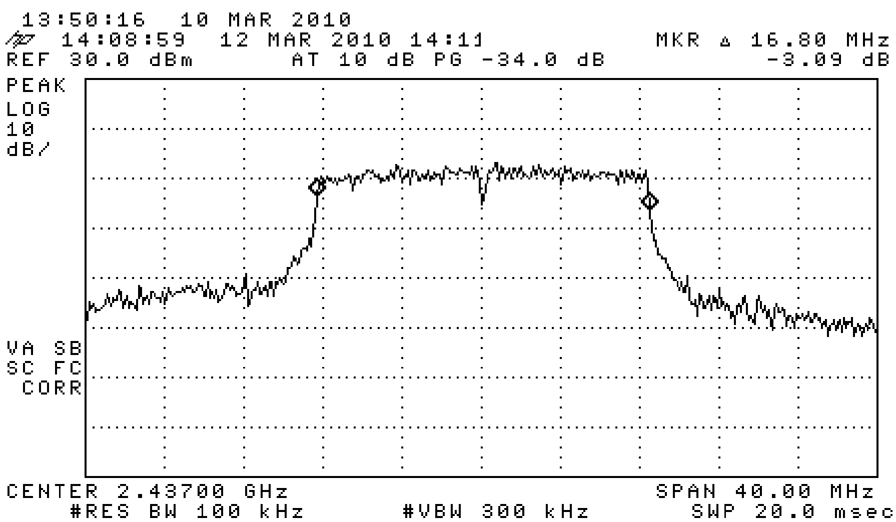
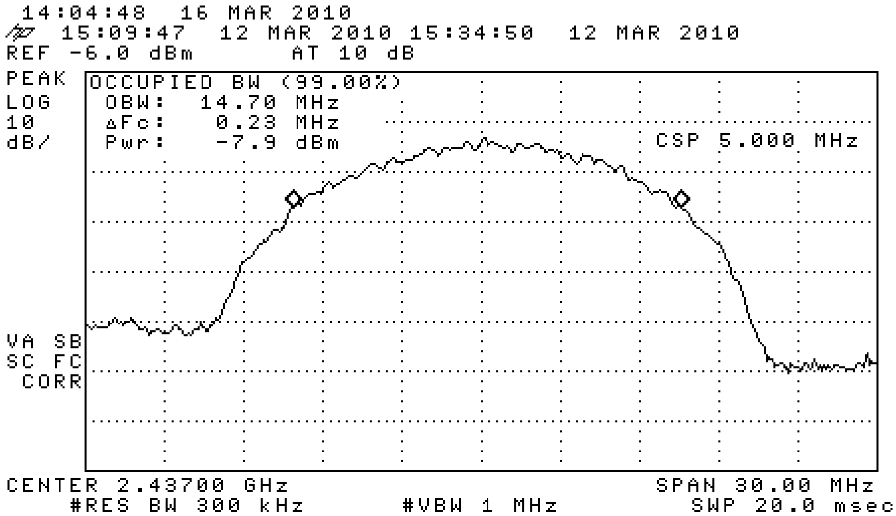


Figure 6.2(g) Radio + 250 mW Amplifier 6 dB Emission Bandwidth (Middle Channel).
(top) 802.11b mode, (bottom) 802.11g mode



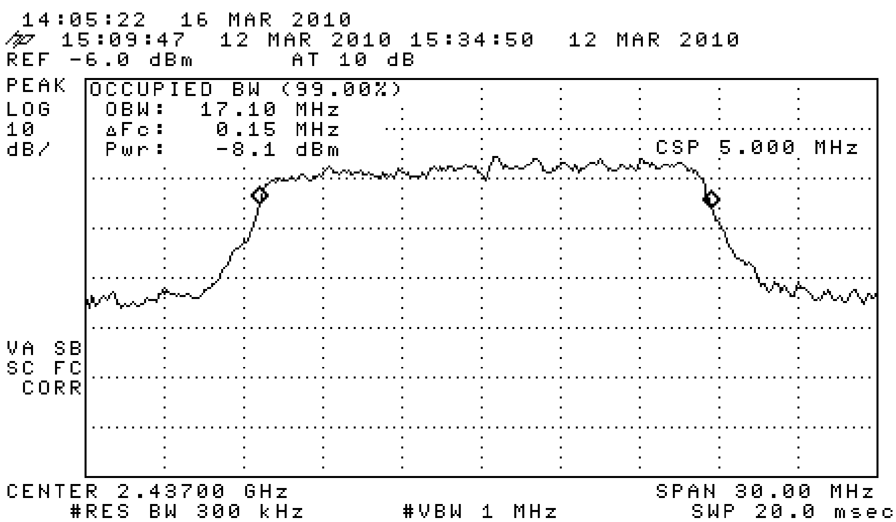


Figure 6.2(h) Radio + 250 mW Amplifier IC 99% Power Bandwidth (Middle Channel). (top) 802.11b mode, (bottom) 802.11g mode

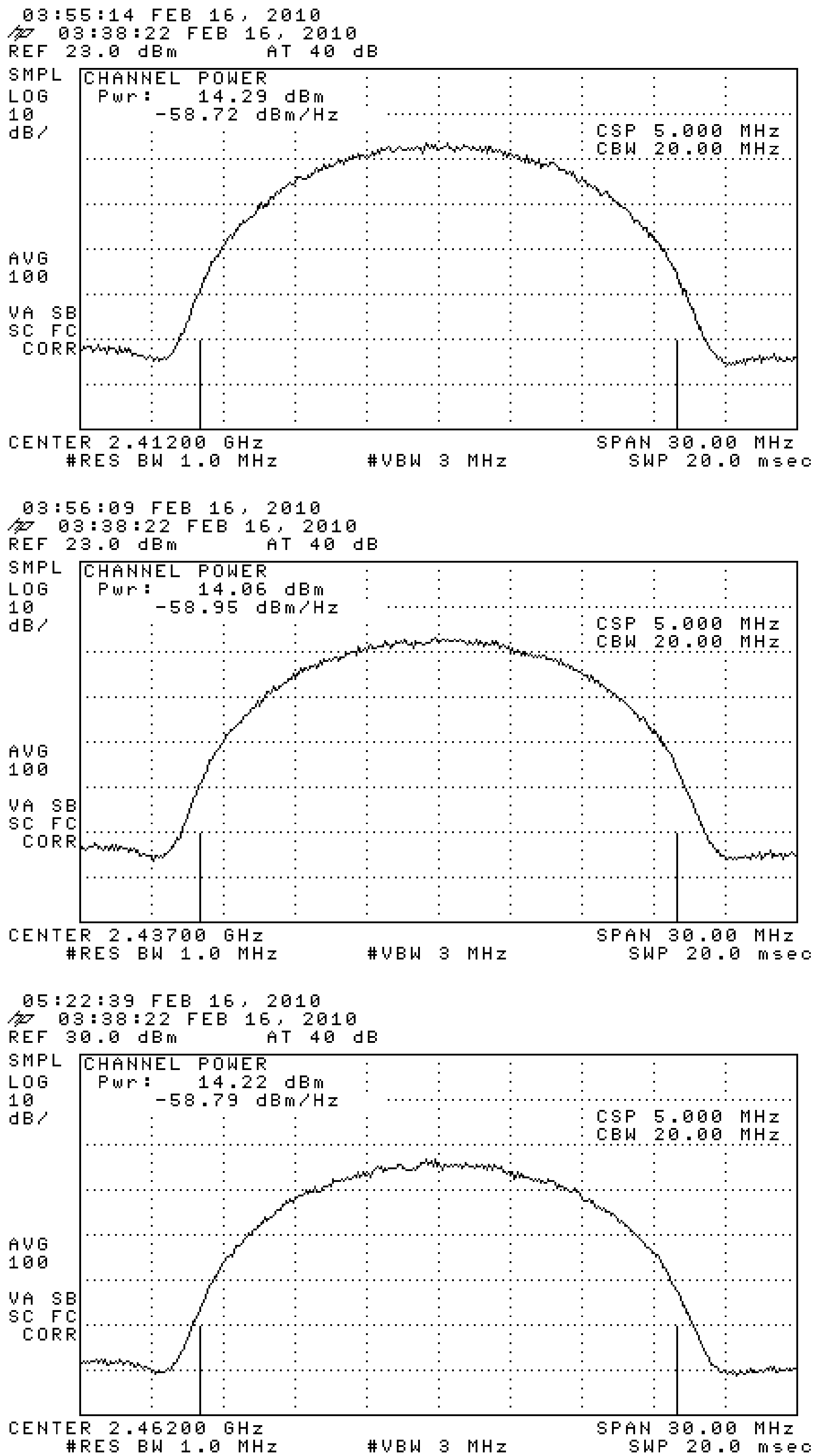
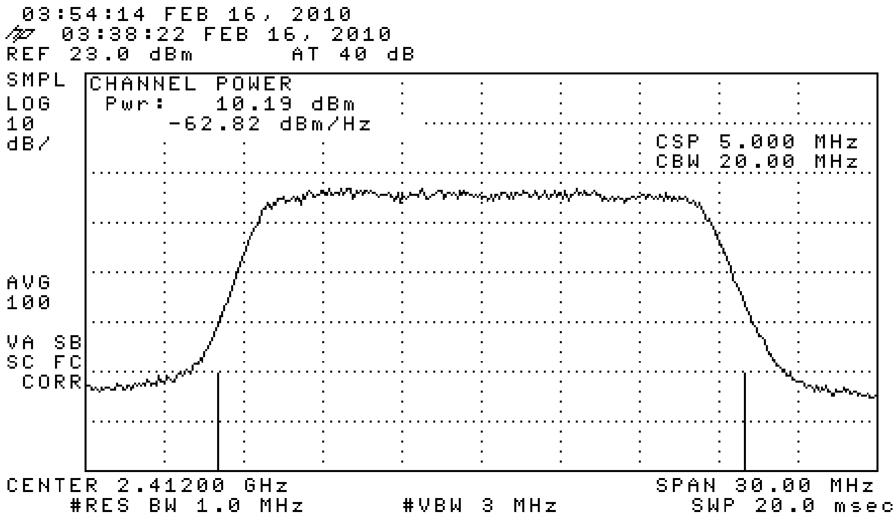
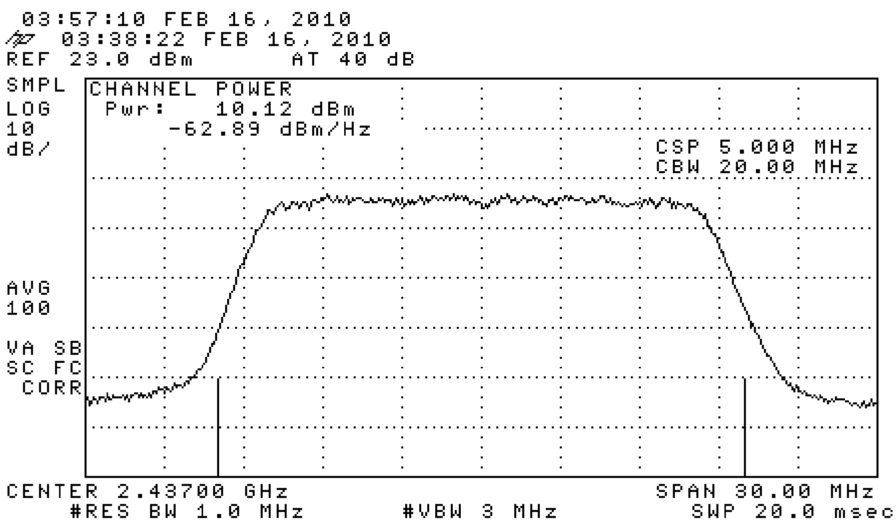


Figure 6.3(a) Radio Alone Output Power (802.11 b mode).
(top) Low Channel, (middle) Middle Channel, (bottom) High Channel





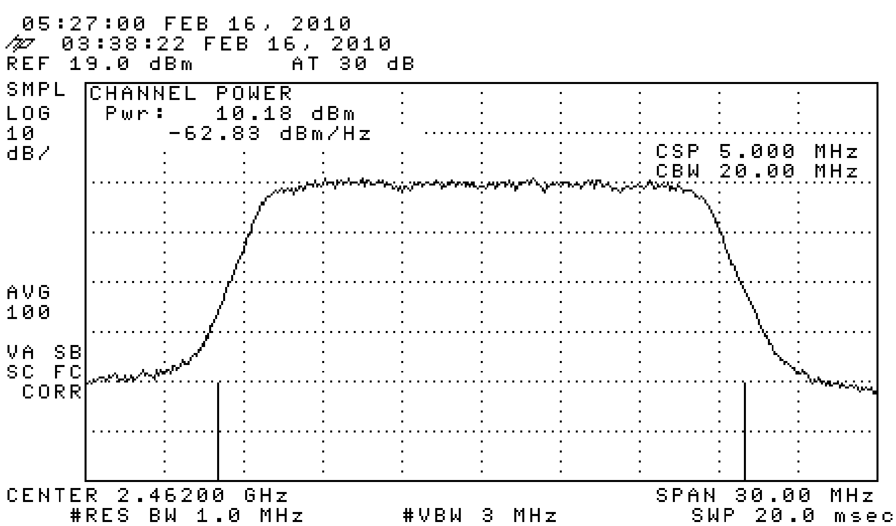
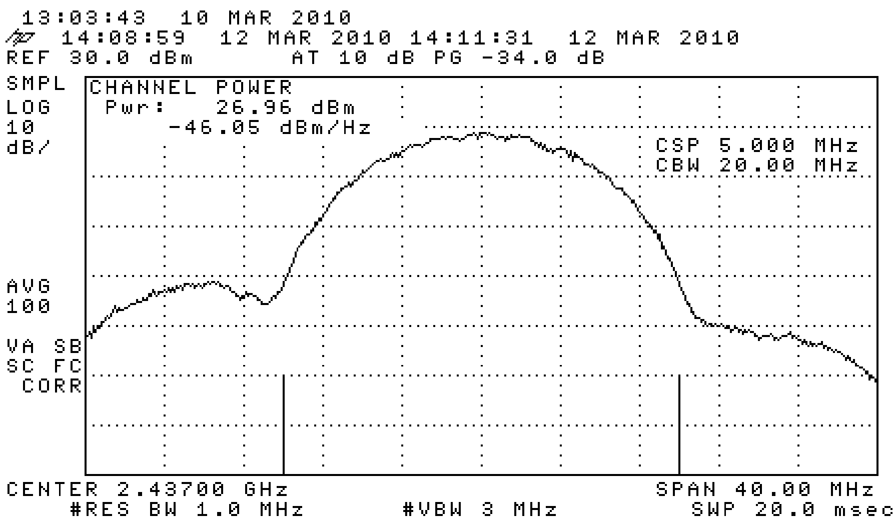


Figure 6.3(b) Radio Alone Output Power (802.11 g mode).
(top) Low Channel, (middle) Middle Channel, (bottom) High Channel



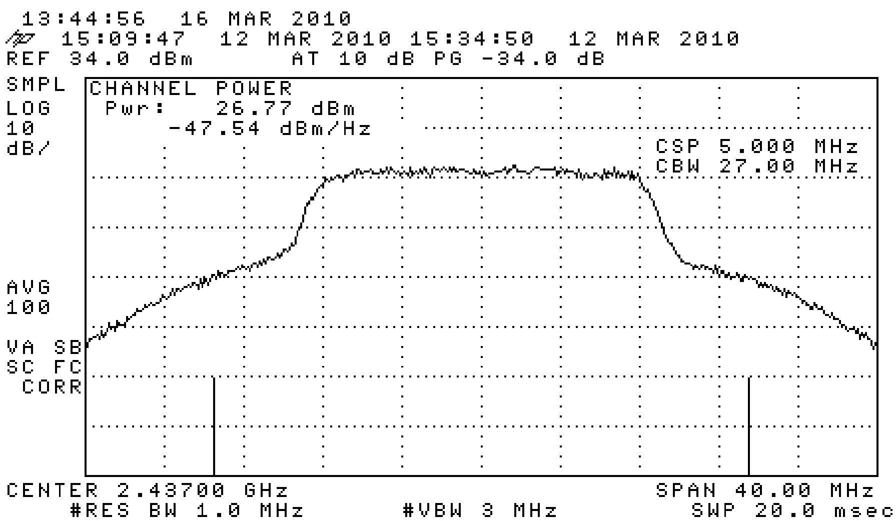
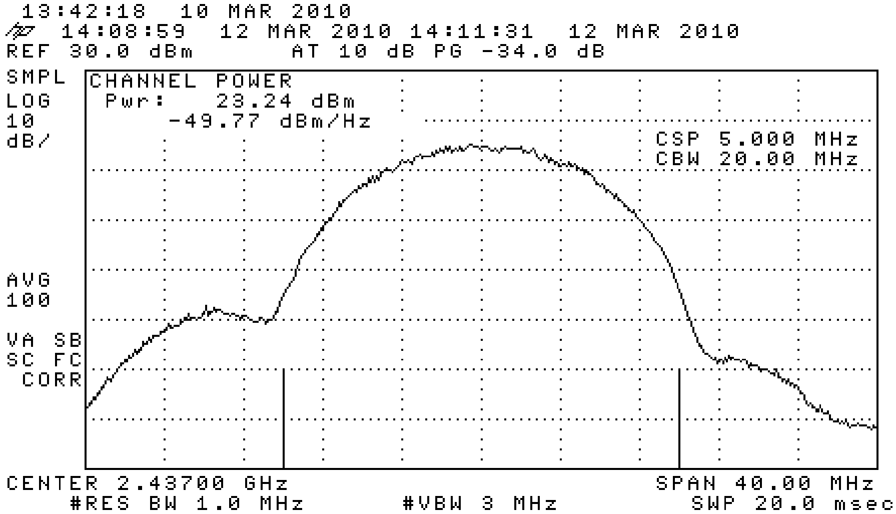


Figure 6.3(c) Radio + 500 mW Amplifier + Filter Output Power (Middle Channel). (top) 802.11b mode, (bottom) 802.11g mode.



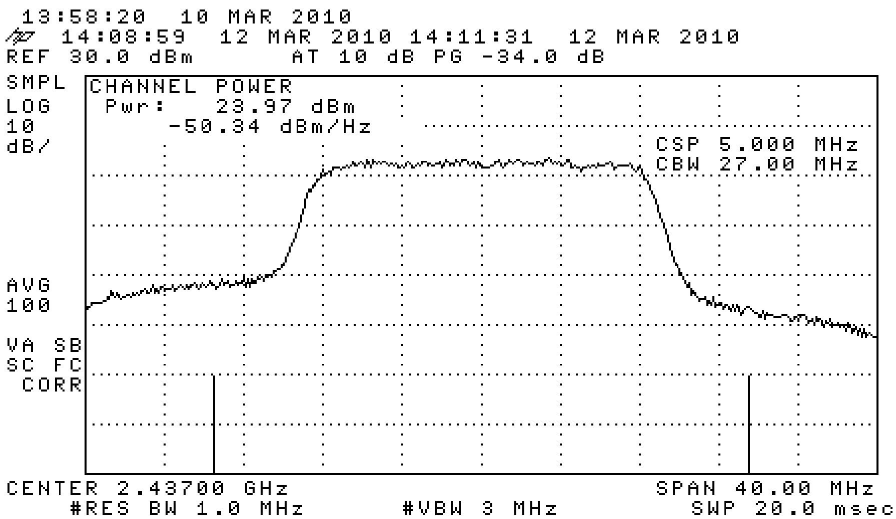
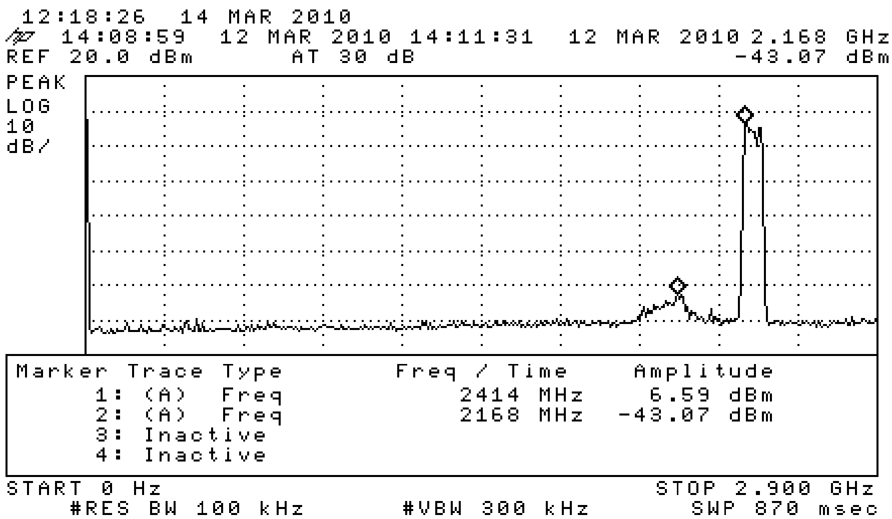
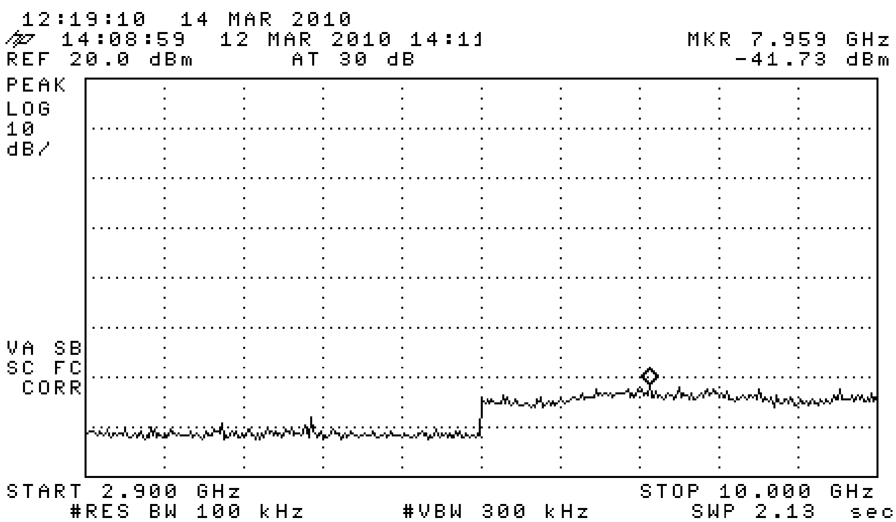


Figure 6.3(d) Radio + 250 mW Amplfier Output Power (Middle Channel).
(top) 802.11b mode, (bottom) 802.11g mode.





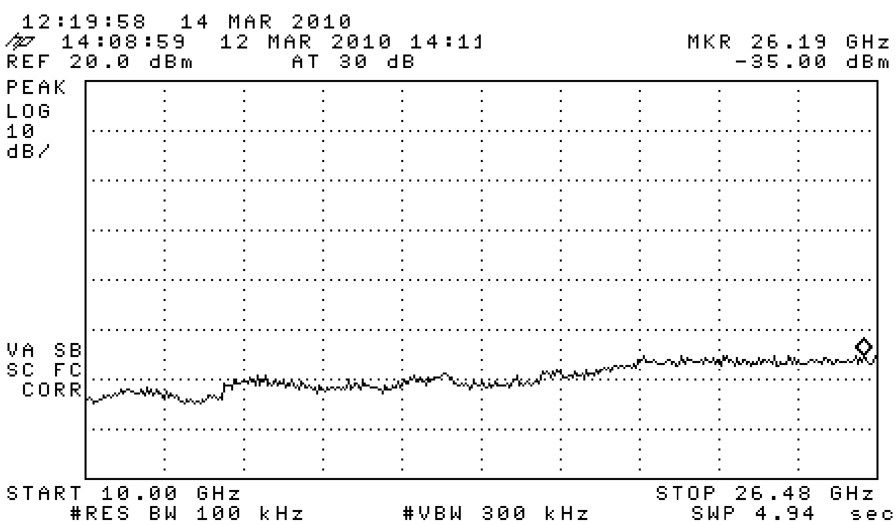
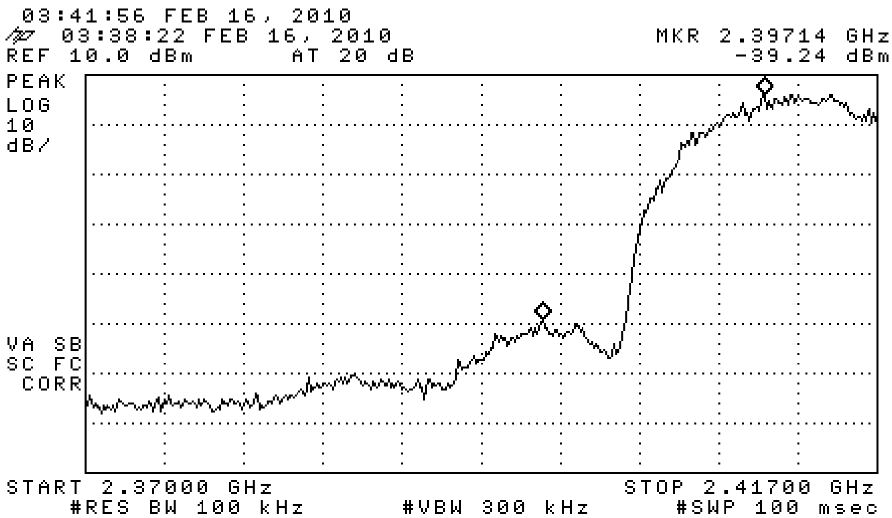


Figure 6.4(a) Radio Alone Conducted Spurrious Emissions (802.11 b mode).
(low, mid, and high channels)



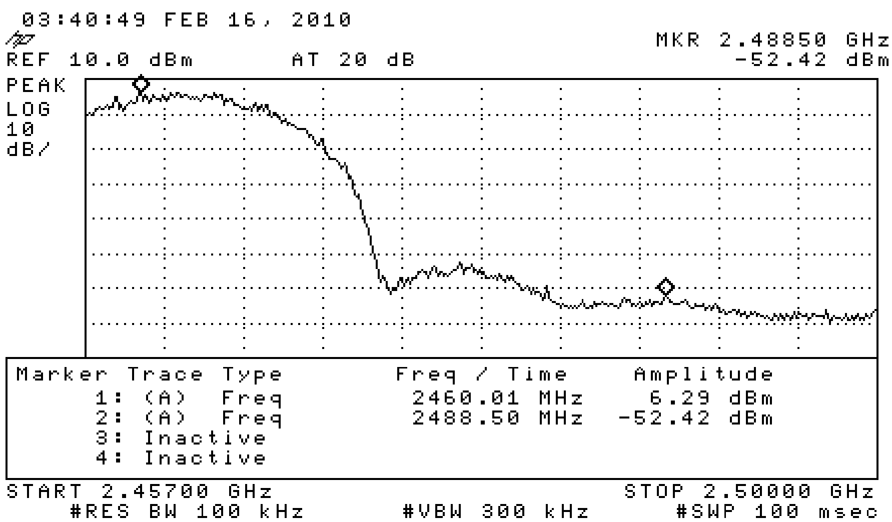


Figure 6.4(b) Radio Alone Conducted Band-Edge Spurrious Emissions (802.11 b mode) (low, mid, and high channels)

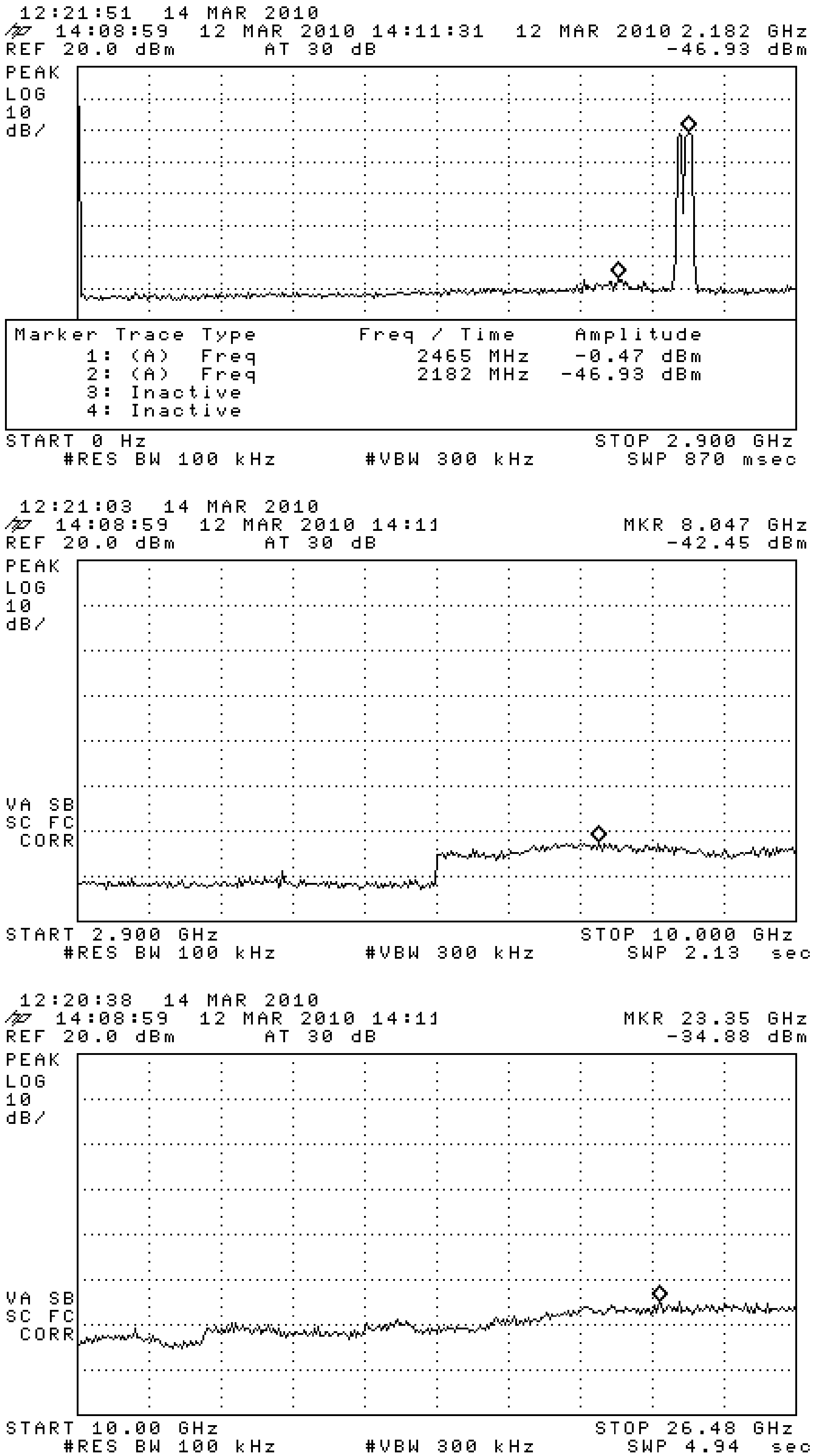
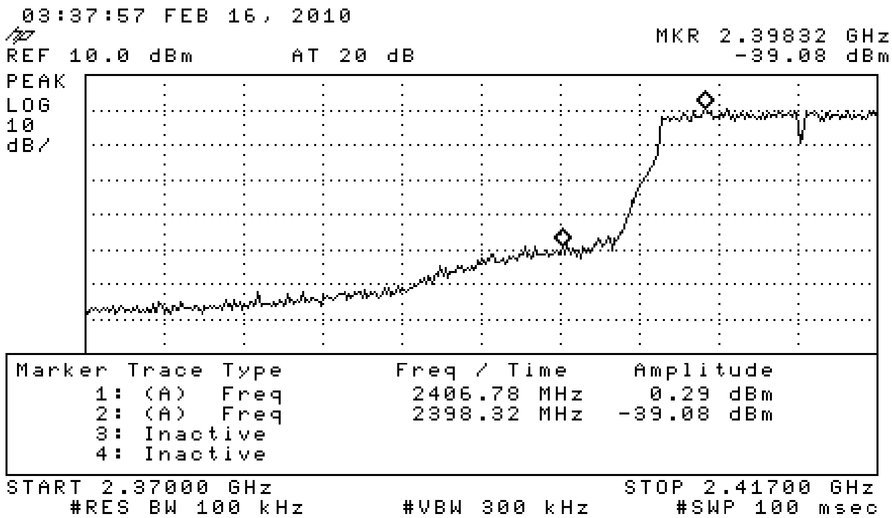


Figure 6.4(c) Radio Alone Conducted Spurrious Emissions (802.11 g mode).
(low, mid, and high channels)



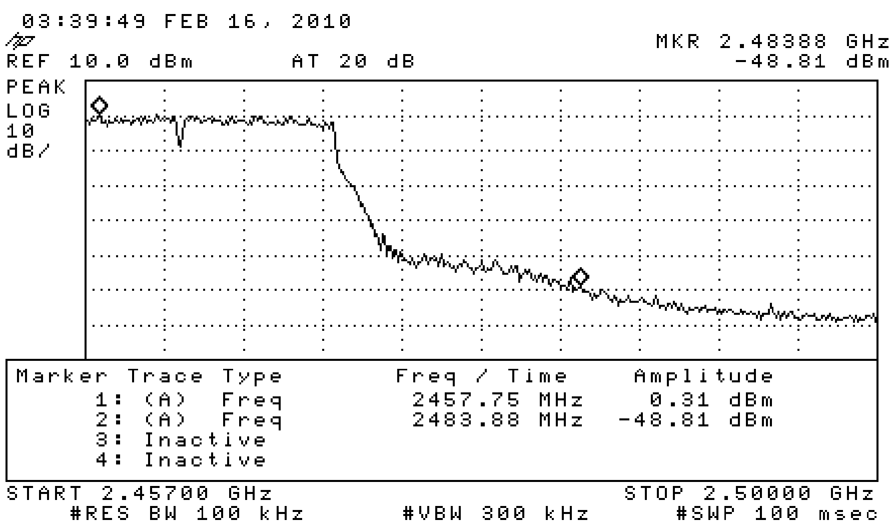


Figure 6.4(d) Radio Alone Conducted Band-Edge Spurrious Emissions (802.11 g mode) (low, mid, and high channels)

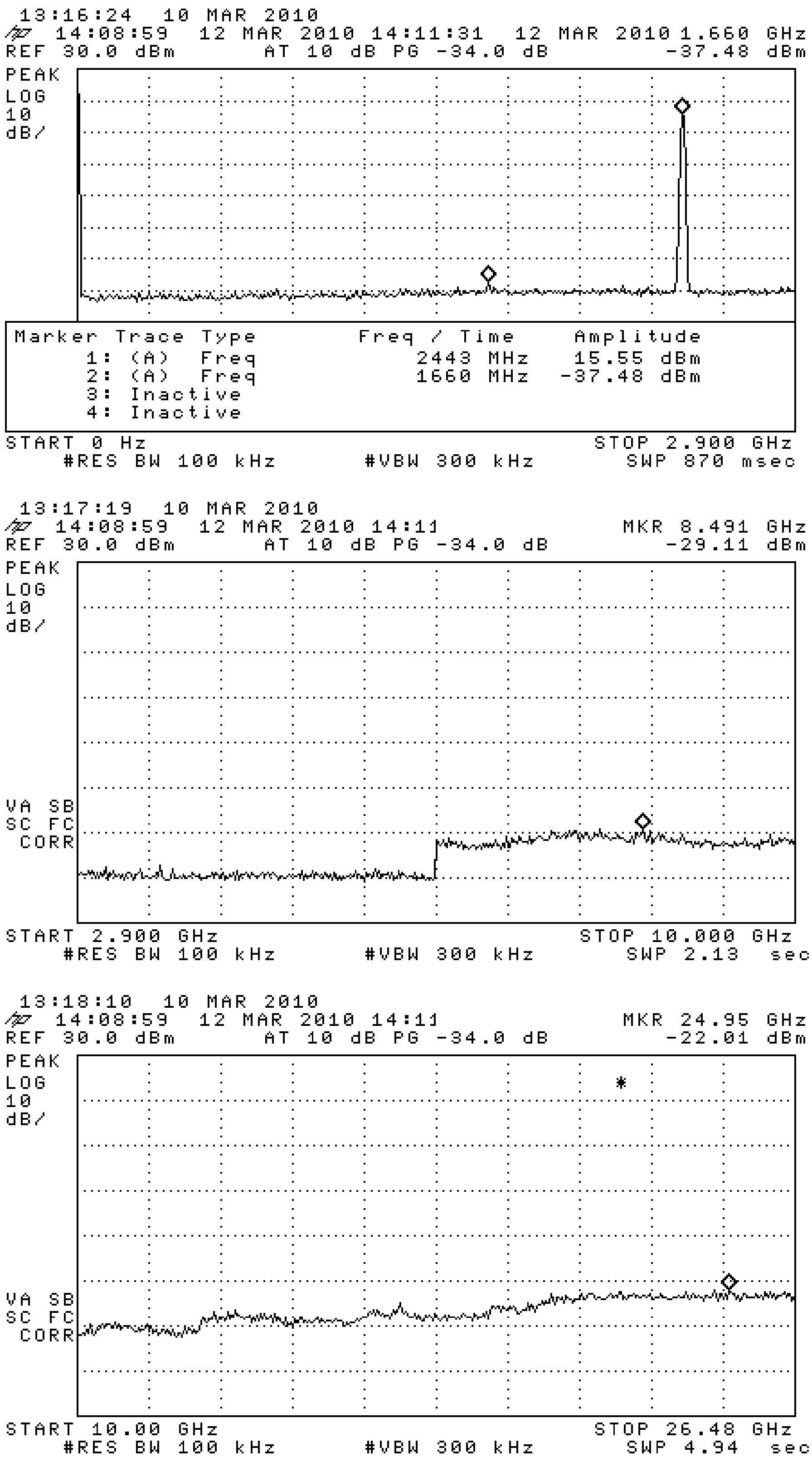


Figure 6.4(e) Radio+500 mW Amplifier +Filter Conducted Spurrious Emissions (Middle Channel). (802.11b mode)

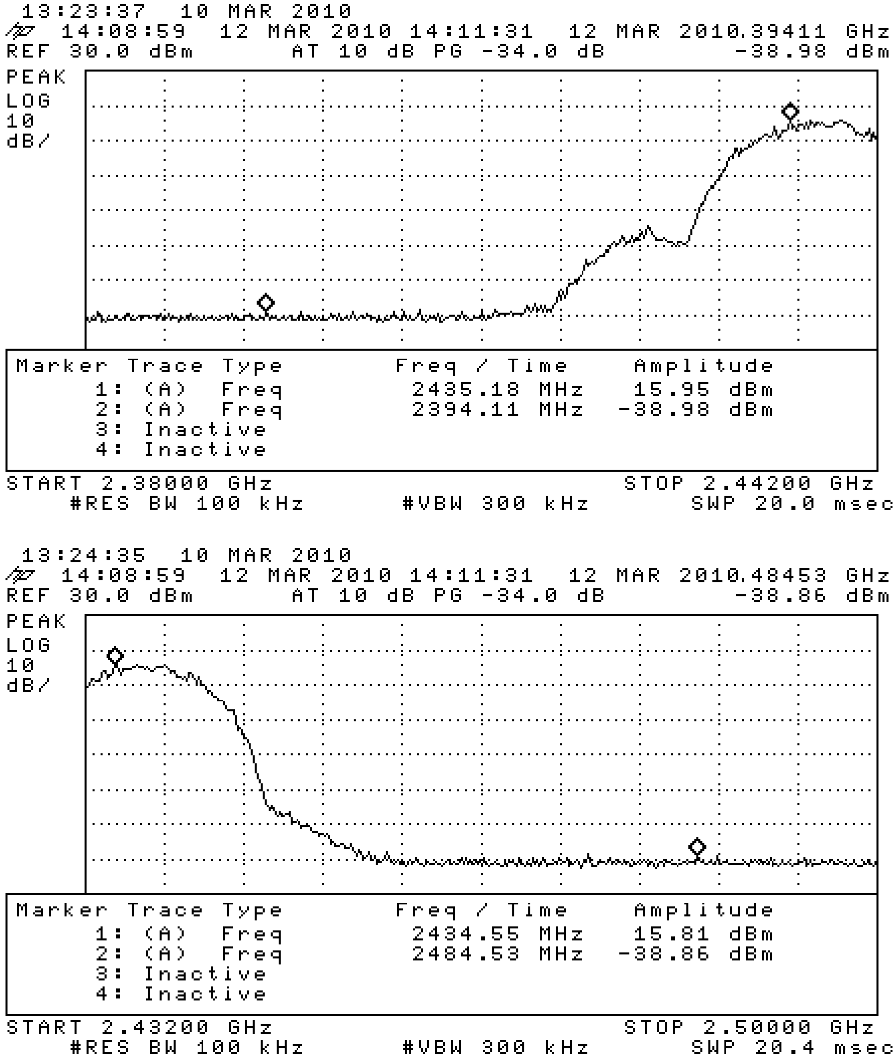
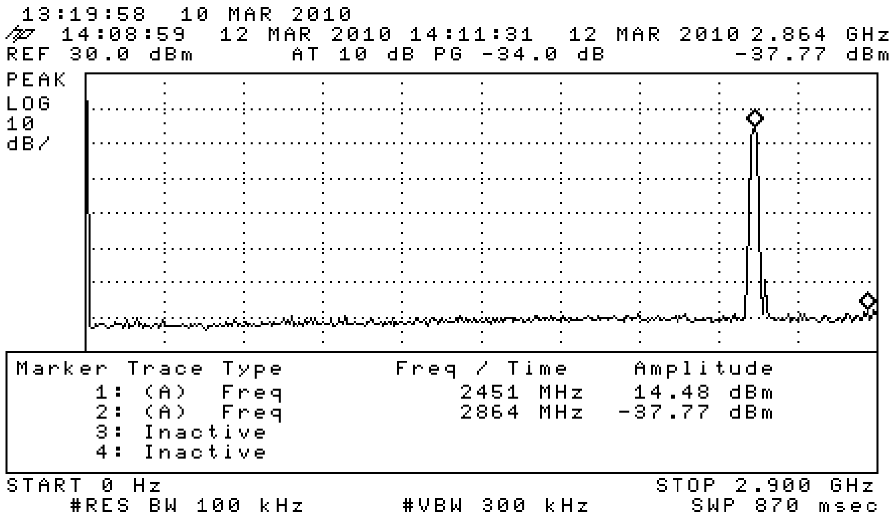
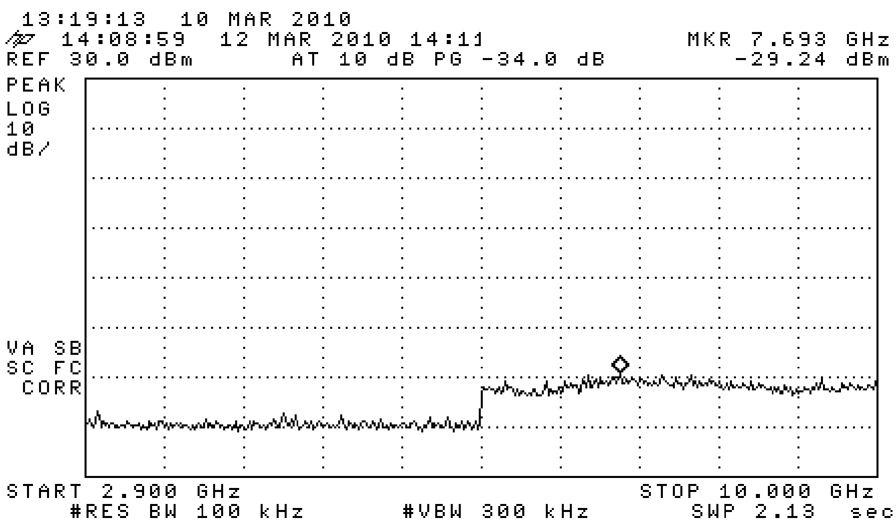


Figure 6.4(f) Radio+500 mW Amplifier Conducted Band-Edge Spurrious Emissions (Middle Channel). (802.11b mode)





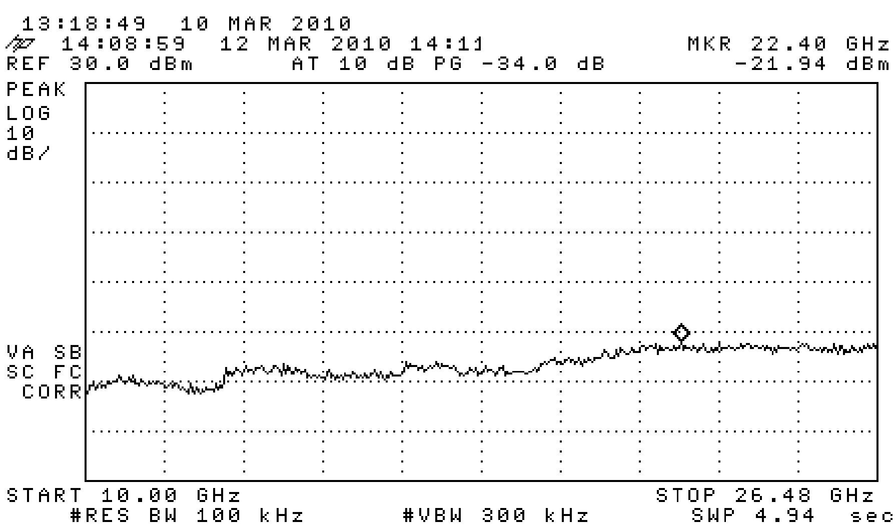
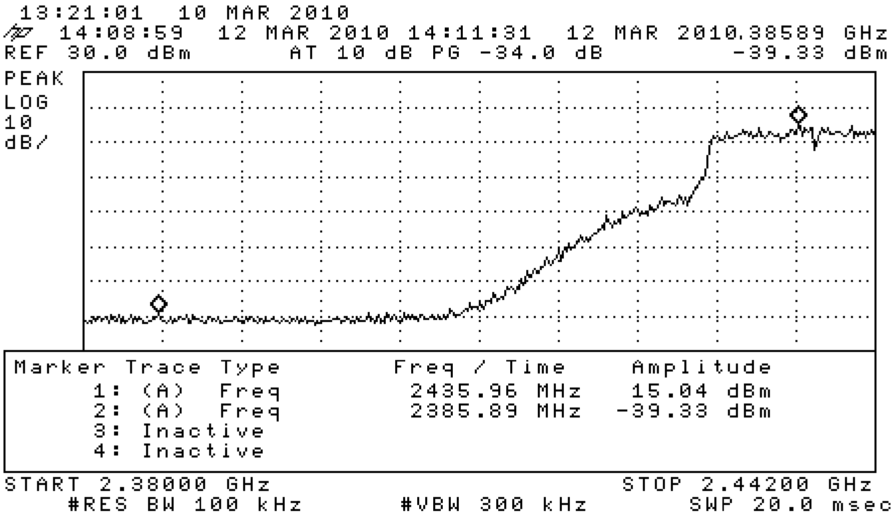


Figure 6.4(g) Radio+500 mW Amplifier + Filter Conducted Spurrious Emissions (Middle Channel). (802.11g mode)



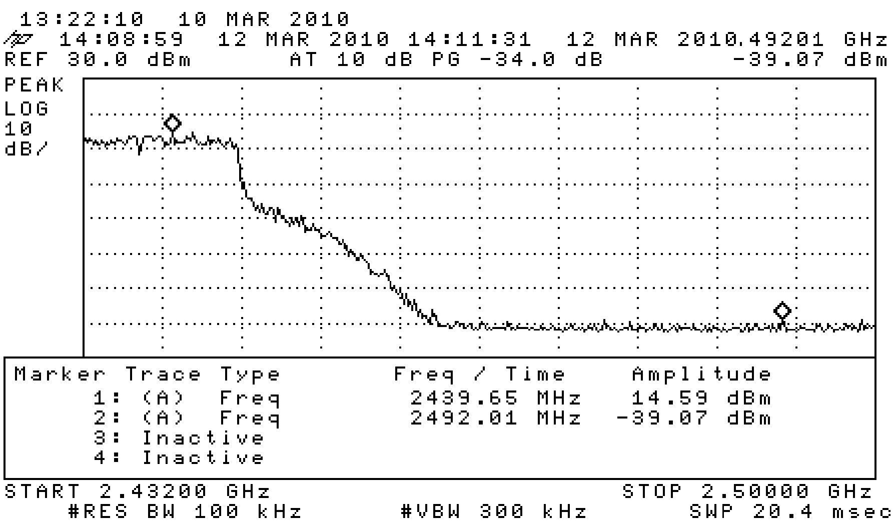


Figure 6.4(h) Radio+500 mW Amplifier + Filter Conducted Band-Edge Spurrious Emissions (Middle Channel).
(802.11g mode)

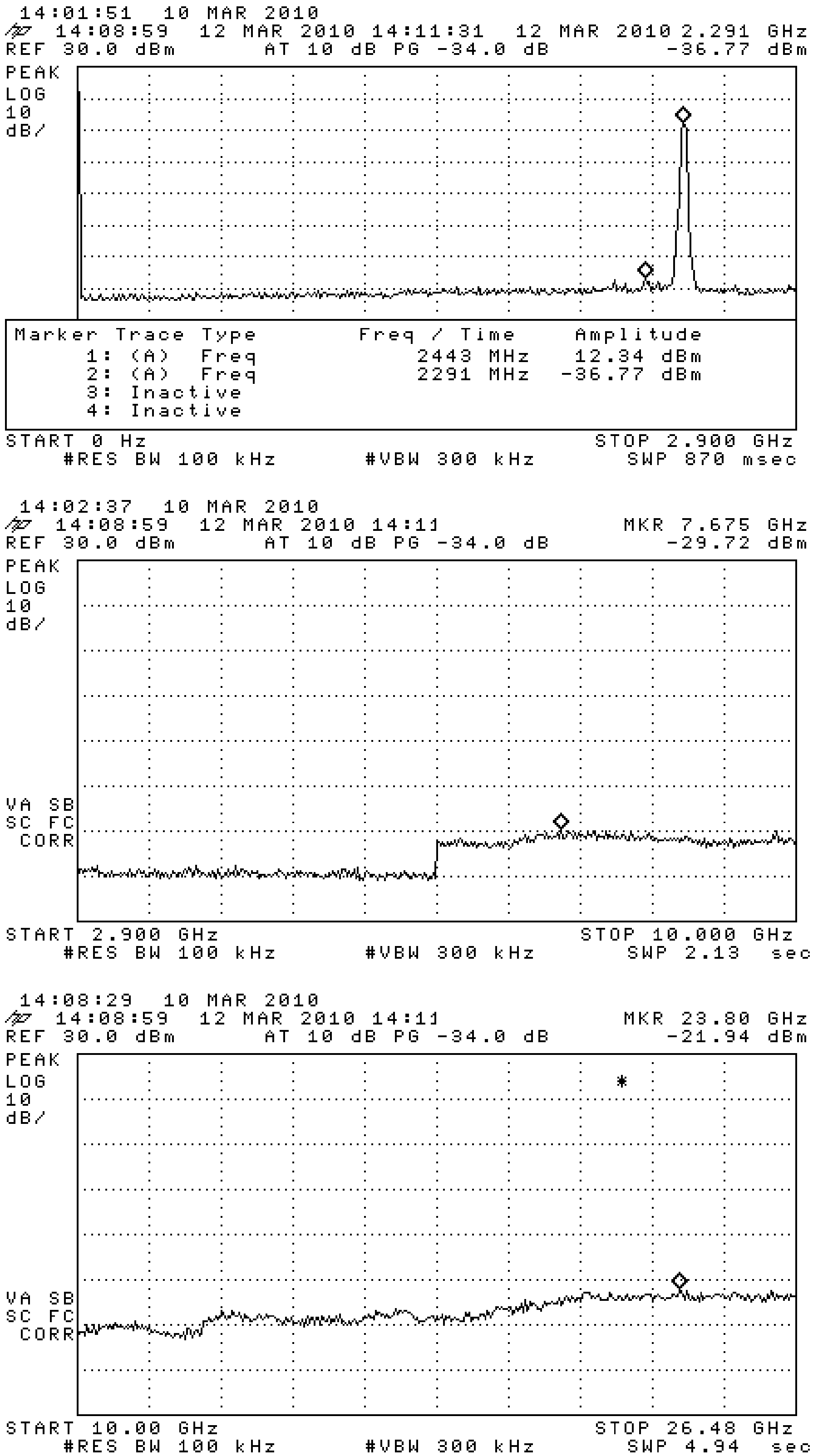
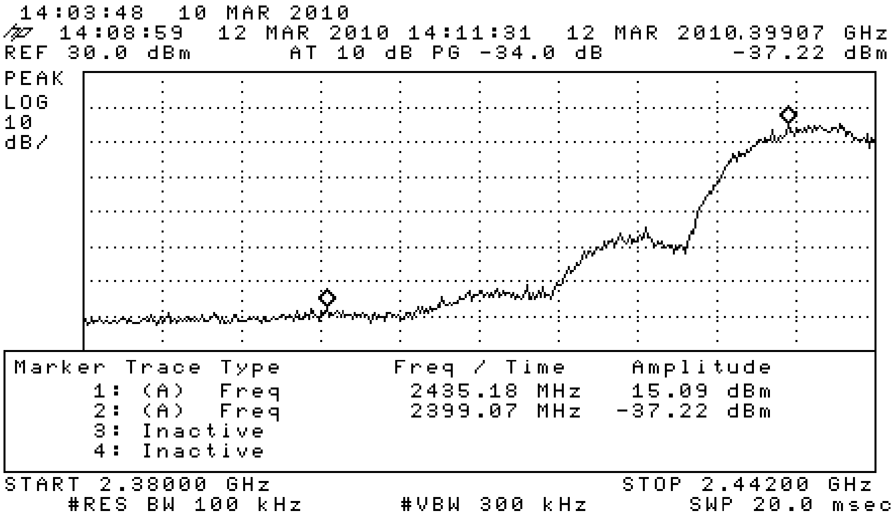


Figure 6.4(i) Radio+250 mW Amplifier Conducted Spurrious Emissions (Middle Channel). (802.11b mode)



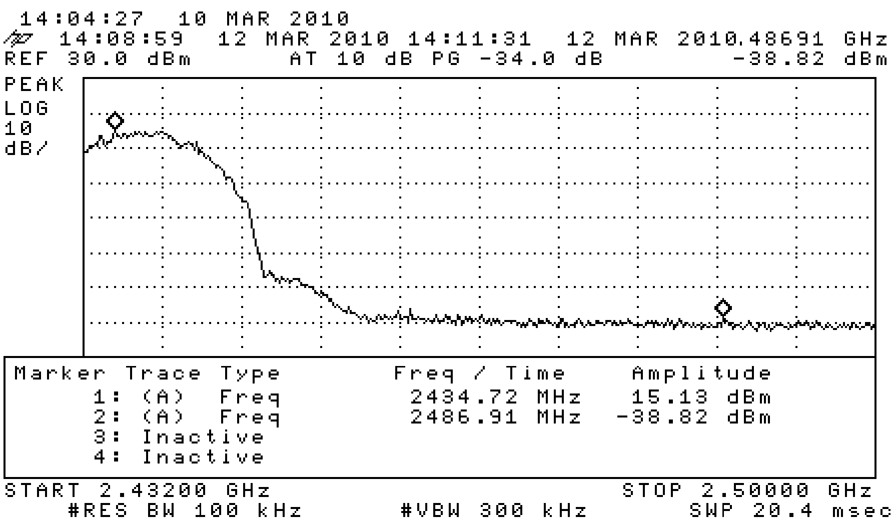


Figure 6.4(j) Radio+250 mW Amplifier Conducted Band-Edge Spurrious Emissions (Middle Channel).
(802.11b mode)

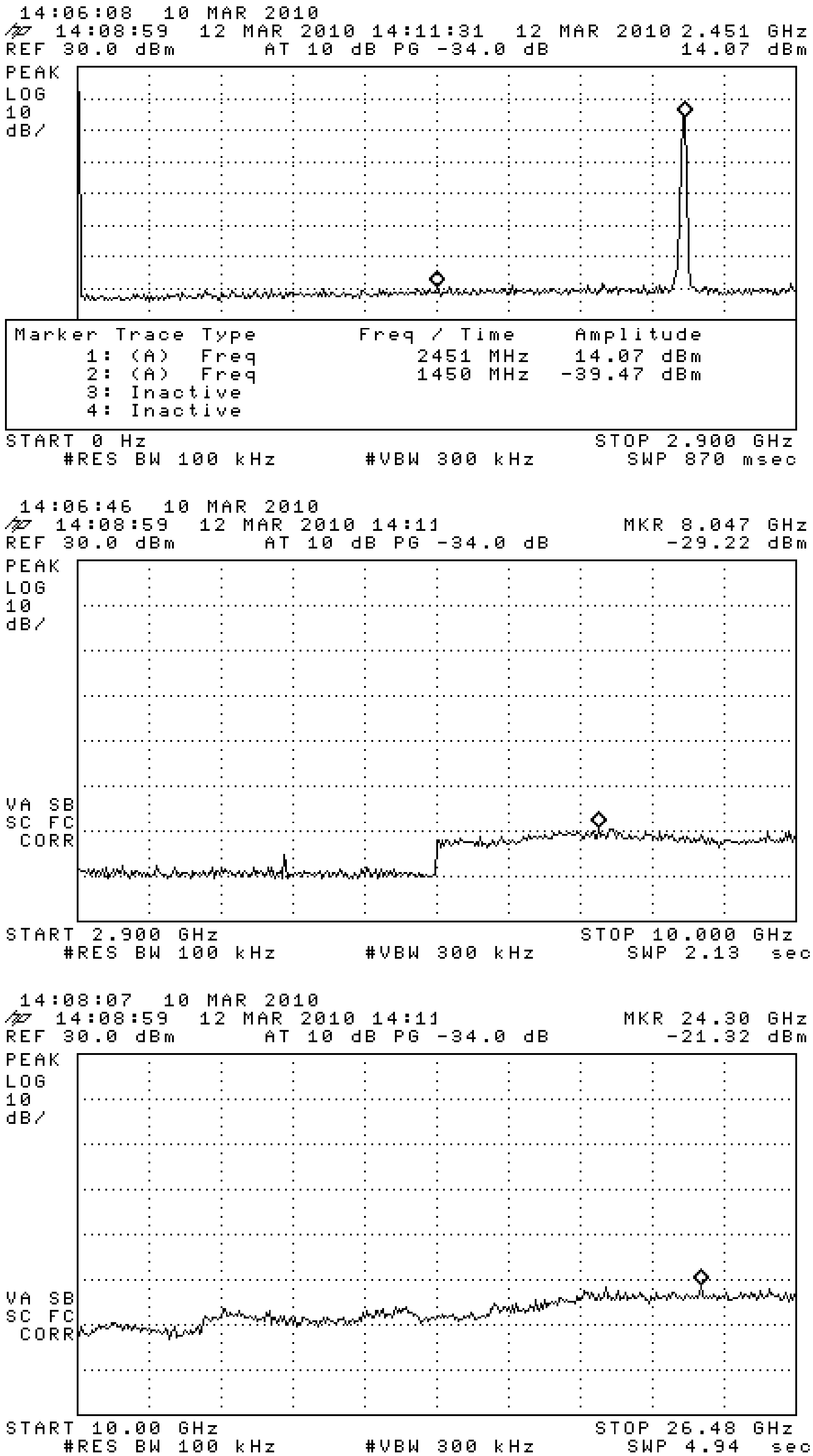
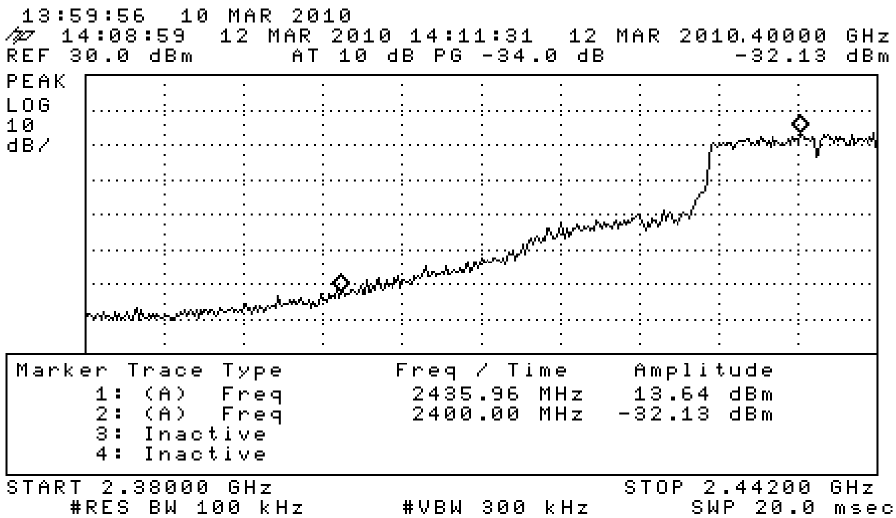


Figure 6.4(k) Radio+250 mW Amplifier Conducted Spurrious Emissions (Middle Channel). (802.11g mode)



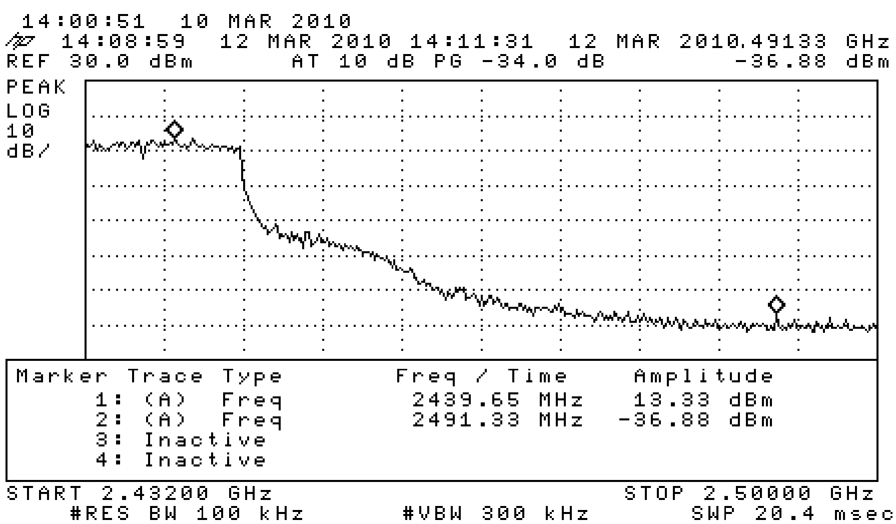


Figure 6.4(l) Radio+250 mW Amplifier Conducted Band-Edge Spurrious Emissions (Middle Channel).
(802.11g mode)

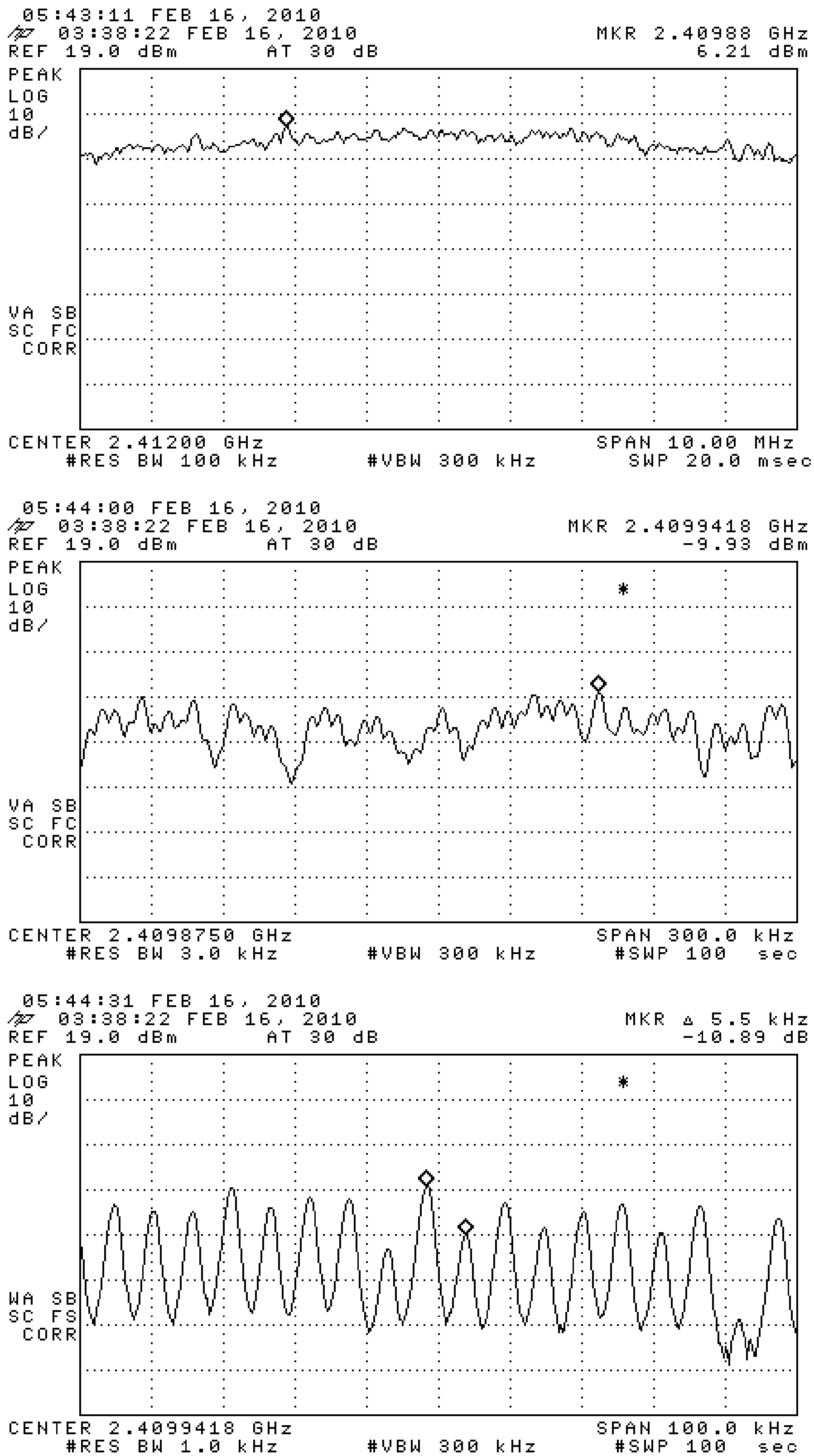


Figure 6.5(a) Radio Alone Power Spectral Density (802.11 b mode).
(only low channel plots shown)

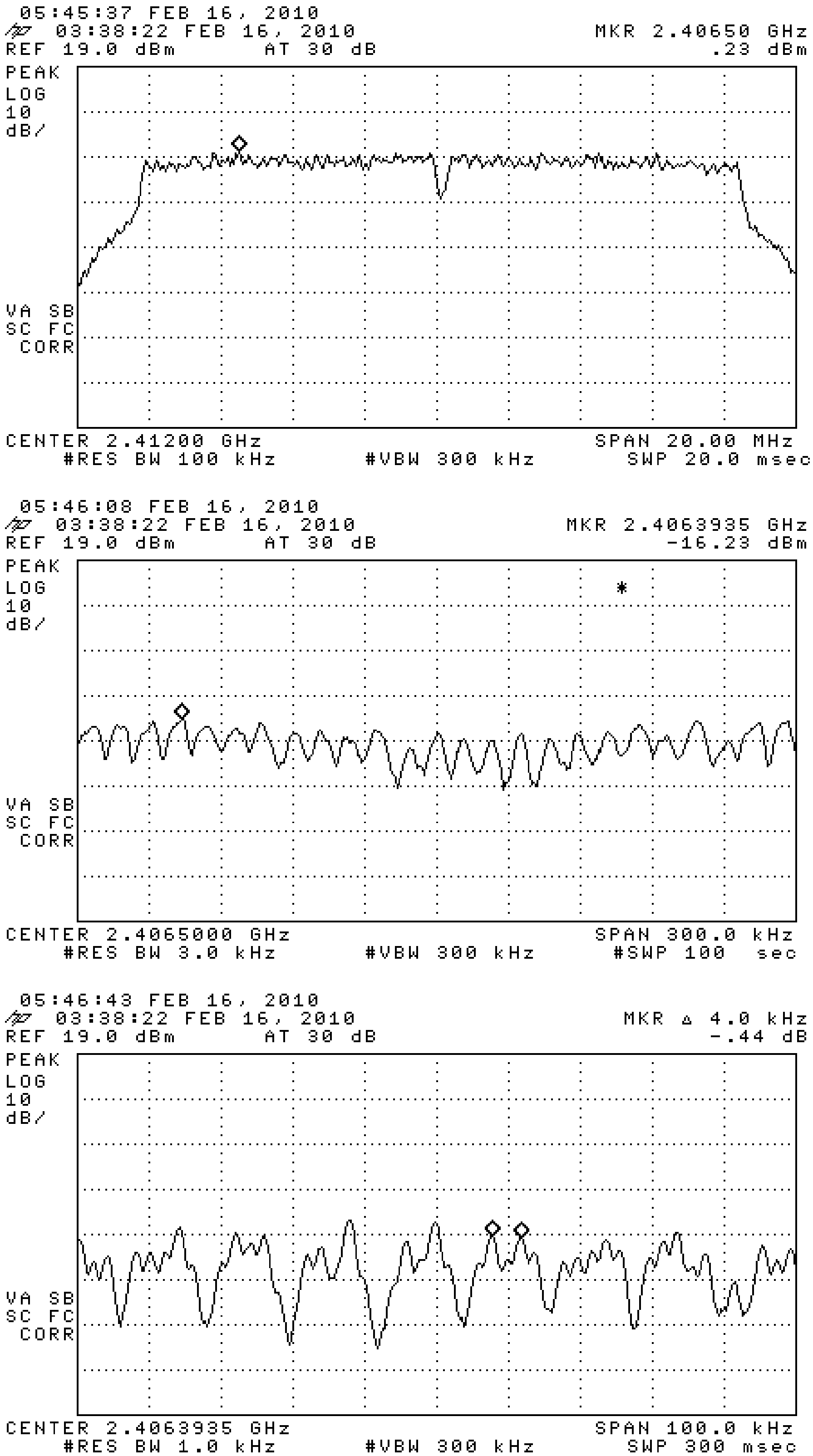
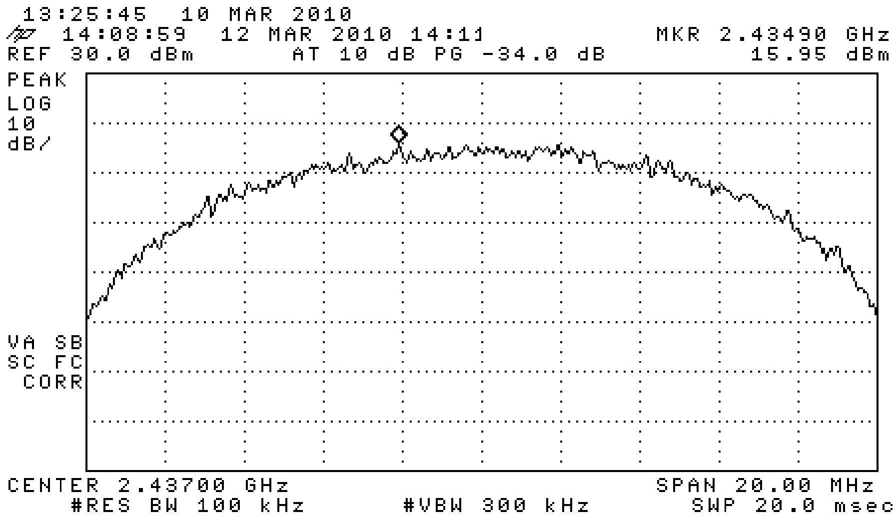
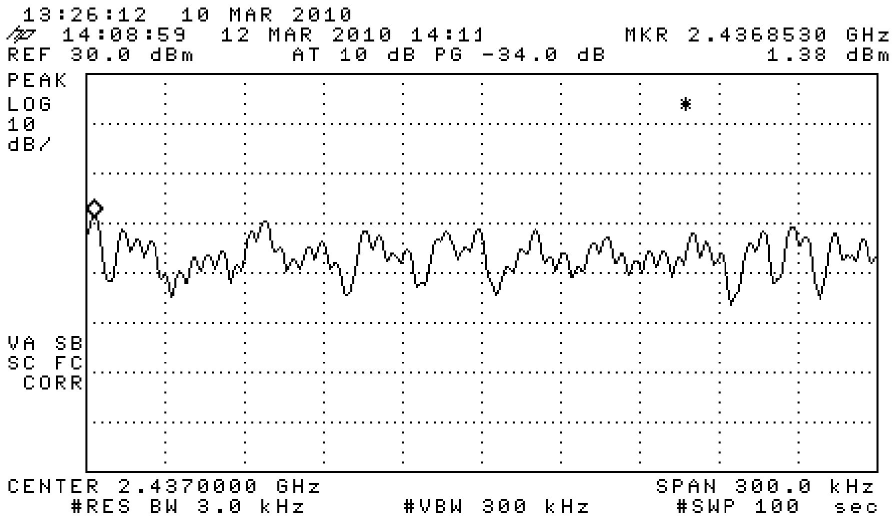


Figure 6.5(b) Radio Alone Power Spectral Density (802.11 g mode).
(only low channel plots shown)





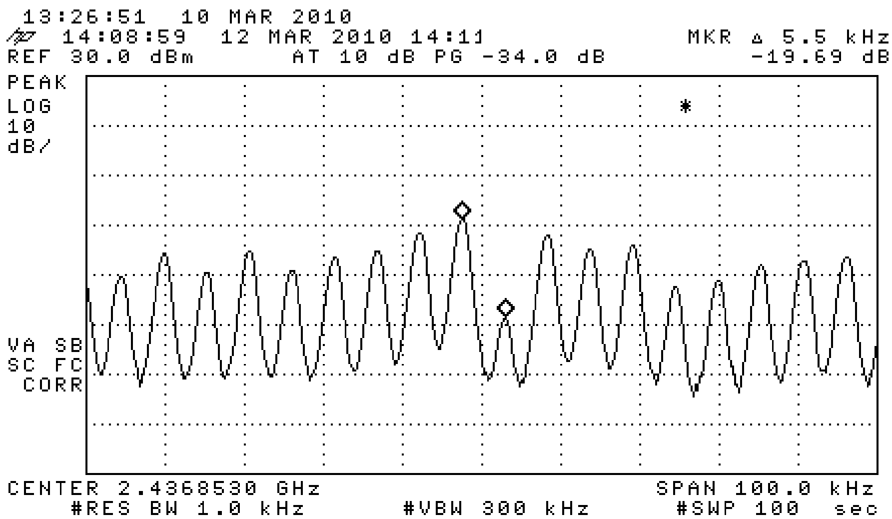
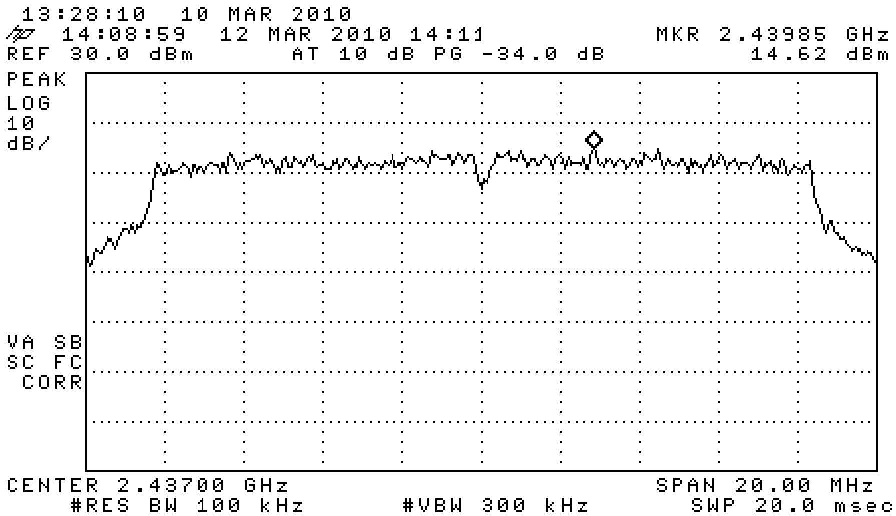
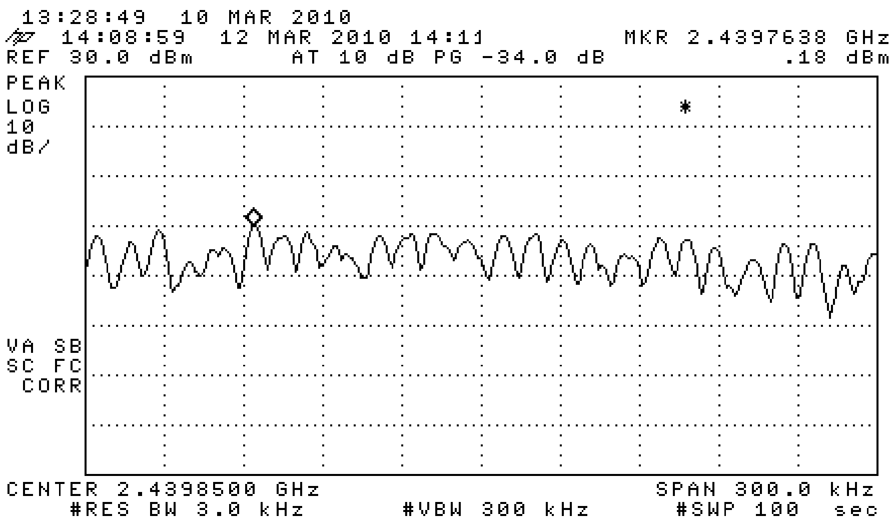


Figure 6.5(c) Radio + 500 mW Amplifier + Filter Power Spectral Density (802.11 b mode). (middle channel)





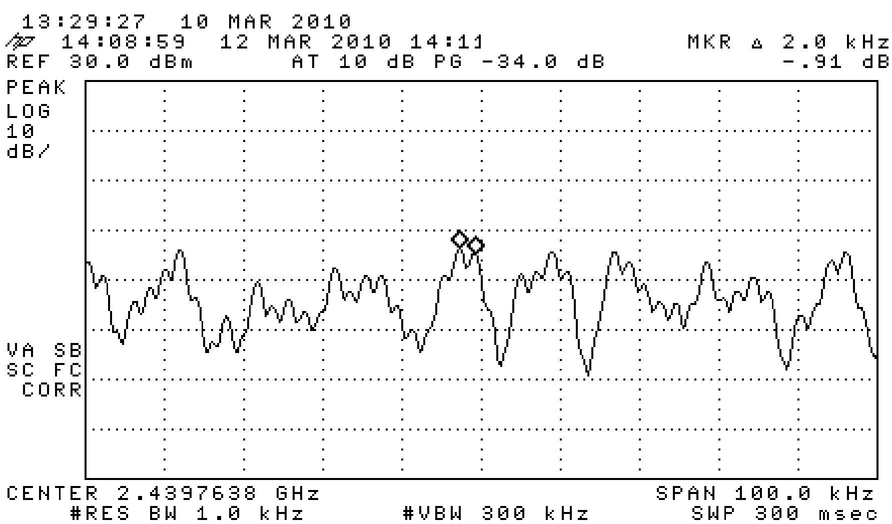


Figure 6.5(d) Radio + 500 mW Amplifier + Filter Power Spectral Density (802.11 g mode).
(middle channel)

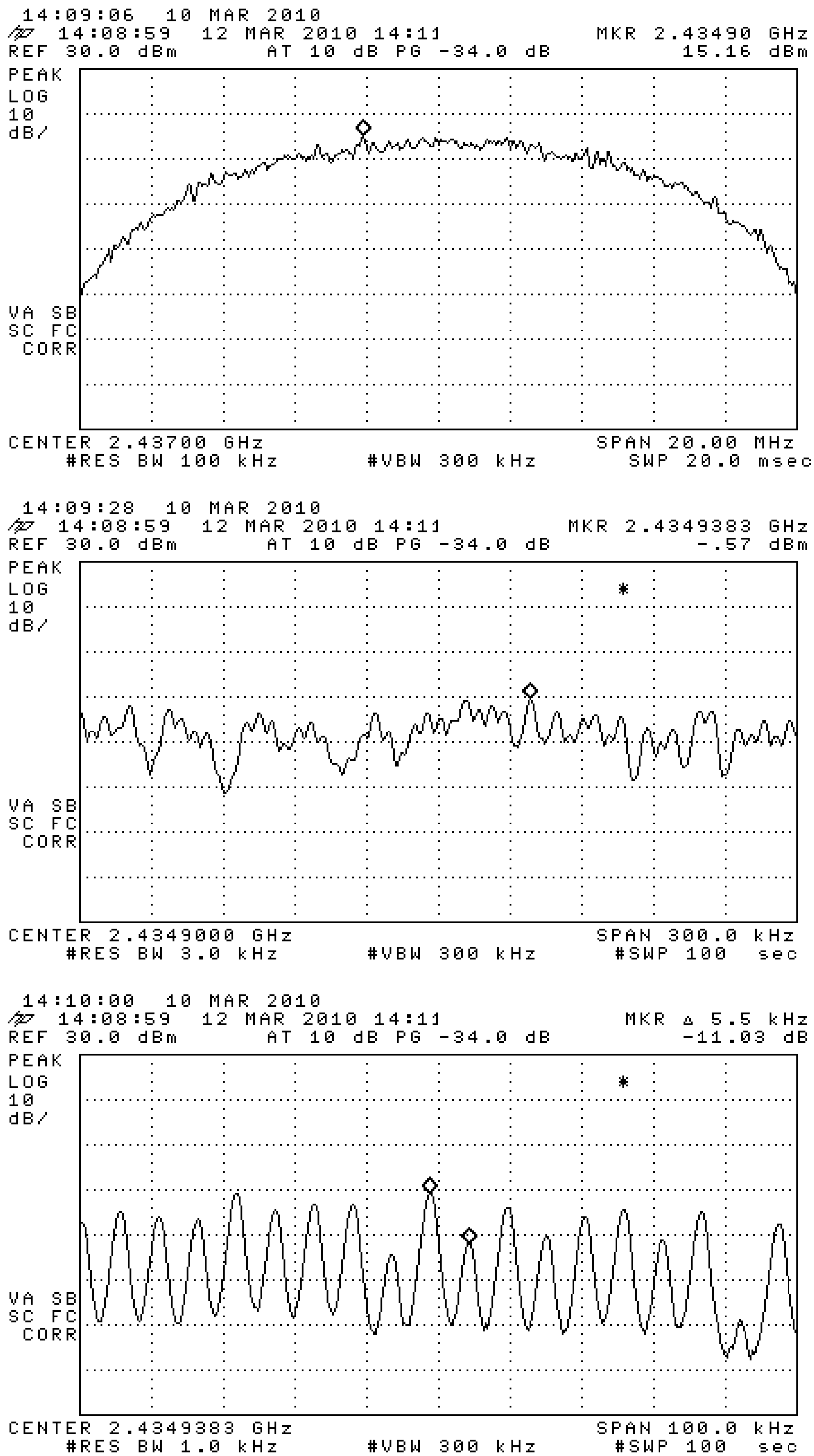
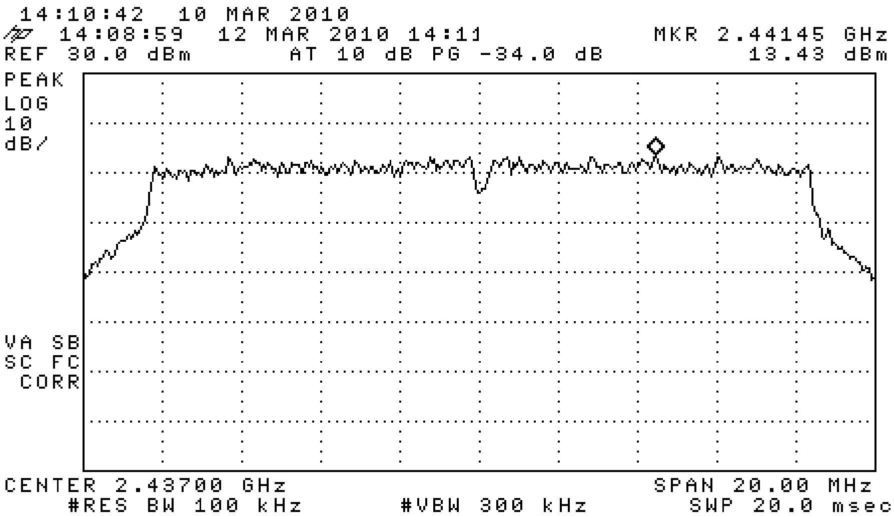
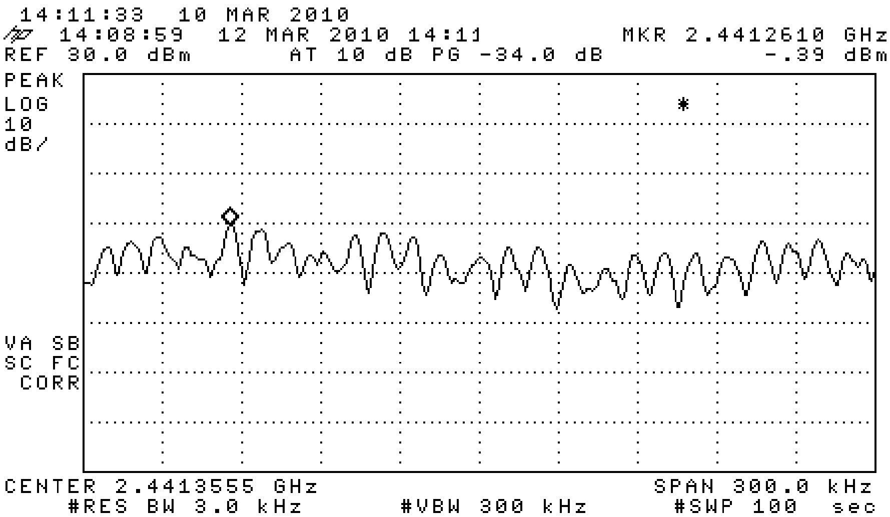


Figure 6.5(e) Radio + 250 mW Amplifier Power Spectral Density (802.11 b mode). (middle channel)





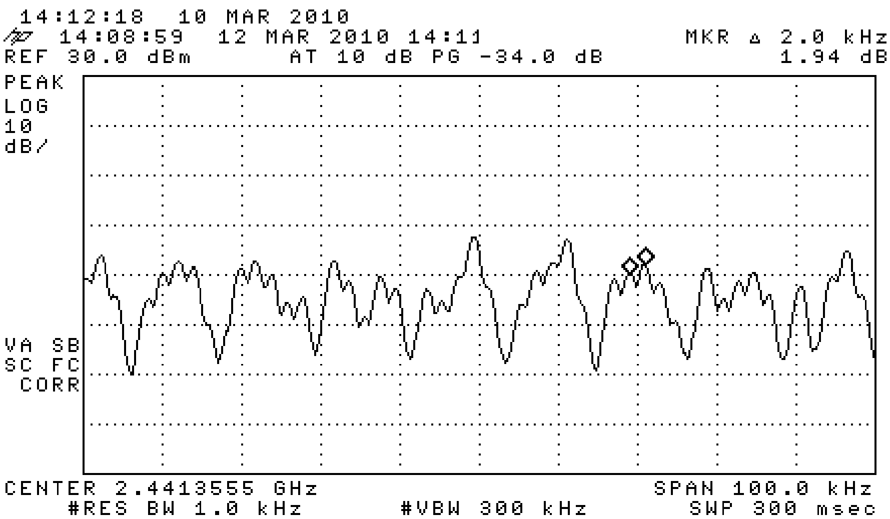


Figure 6.5(f) Radio + 250 mW Amplifier Power Spectral Density (802.11 g mode).
(middle channel)

Photograph 6.1: Radiated Test Setup on OATS and in Chamber

Photograph 6.2: OATS Close-UP and Conducted Test Setup