COMPTEST
Services LLC

Applicant:	Kyocera
FCC ID:	OVFC51213CD
IC #:	3572A-C5121
Report #:	CT-C5121-0811-R0

RF Emissions Test Report

FCC Part 15.247
RSS 210
(WLAN)

For

Kyocera Corporation
c/o Kyocera Communication Inc.

Product:	Tri-Band CDMA Phone
Model:	C5121

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ATTESTATION

The tested device complies with the requirements in respect of all parameters subject to the test.

The test results and statements relate only to the items tested.

The test equipment used was suitable for the tests performed and within manufacturer's published specifications and operating parameters.

The test methods were consistent with the methods described in the relevant standards.

Product:	Tri-Band CDMA Cellular Phone with Bluetooth & WLAN
Model #:	C5121
FCC ID:	OVFC51213CD
IC #:	3572A-C5121
Tested in accordance with:	FCC Part 15.247, IC RSS 210
Test performed by:	Comptest Services LLC
Test Requested by:	KYOCERA Corporation C/o KYOCERA Communication Inc 8611 Balboa Avenue San Diego, CA92121
Date of Test:	August 18-19, 2011

Responsible Engineer

Benjamin Nguyen

Benjamin Nguyen
Test Engineer

Reviewed and approved by:

Tammy To
Quality Manager

1 SUMMARY OF TESTING

Section #	Rule Part	Test Description	Verdict
6	FCC § 15.247 a2, IC RSS-210 §A8.2 (1)	6 dB Bandwidth	Pass
7	FCC § 15.247 b3, IC RSS-210 §8.4(4)	Output Power	Pass
8	FCC § 15.247 e, IC RSS-210 §8.2(2)	Power Spectral Density	Pass
9	FCC § 15.247 d, IC RSS-210 §A8.5	Band-edge Compliance of Conducted Emissions	Pass
10	FCC § 15.247 d, IC RSS-210 §A8.5	Spurious RF Conducted Emissions	Pass
11	FCC § 15.107 § 15.207, IC RSS-210 §6.6	AC Power Line Conducted Emissions	Pass
12	FCC § 15.109, § 15.209, IC RSS-210 §A2.9(2)	Spurious Radiated Emissions	Pass
13	FCC § 2.1091/2.1093	SAR Tests	Pass

2 EQUIPMENT UNDER TEST INFORMATION

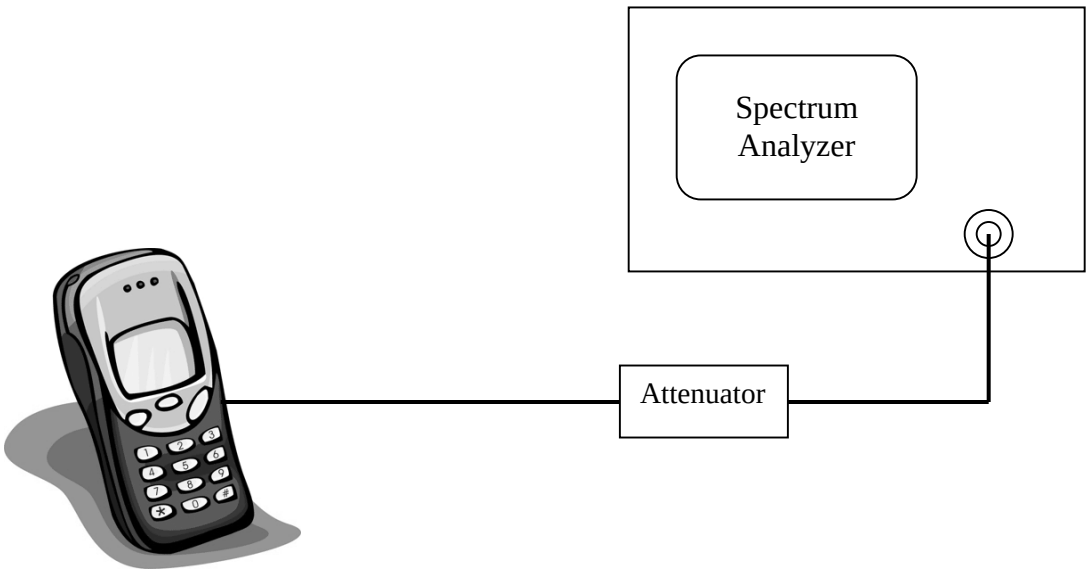
EUT Serial Number:	268435457816724086
Type:	[ ] Prototype, [X] Pre-Production, [ ] Production
Equipment Category:	Portable
TX Frequency (MHz):	2412 to 2462
Modulation Technology:	DSSS, OFDM
Modulation:	DSSS: CCK, DQPSK, DBPSK OFDM: 64QAM, 16QAM, QPSK, BPSK
Channel Numbers:	11
Mode/Data Rate:	☒ 802.11b: 11/5/2/1 Mbps ☒ 802.11g: 54/48/36/24/18/12/9/6 Mbps ☒ 802.11n: 7/6/5/4/3/2/1/0 MCS
Max. Output Power (dBm)	19.26
WLAN Antenna:	Internal
Antenna Gain (dBi):	-1.0 (Peak)

3 TEST FACILITIES

The test sites and measurement facilities used to collect data are located at 8611 Balboa Ave., San Diego, CA 92123, USA

4 TEST SETUP

The WLAN RF output of the equipment under test (EUT) was connected to the input of the spectrum analyzer through a RF cable with a specialized RF connector. The amplitude of the spectrum analyzer is corrected for the cable insertion loss and any other applicable losses. A fully charged battery was used as power supply voltage.



5 ANTENNA REQUIREMENTS

5.1 Requirements

FCC:	**§ 15.203**
IC:	**RSS-210**

1) For 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 atenna 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.

2) According to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

5.2 Antenna Information

a) The Antennas used in this product are permanently attached
b) There are no provisions for connection to an external antenna

This phone unit complies with the requirement of 15.203

6 6dB BANDWIDTH

6.1 Test Configuration

FCC:	**§ 15.247 a2**
IC:	**RSS-210 §A8.2 (a)**

The RF output port of the EUT was directly connected to the input of the spectrum analyzer with sufficient attenuation. Subsequently, the low, mid and high channels of transmitter were enabled separately to investigate the 6 dB-bandwidth for each channel. A fully charged battery was used as supply voltage.

Spectrum Analyzer Parameters:
RBW = 100kHz, VBW = 300kHz, Span=20MHz, Sweep Time = Auto

Frequencies of Interest: Spectrum was investigated from 2412 MHz – 2462 MHz.

6.2 Results and Limits:

Figure	802.11 Mode	Channel	Frequency	Data Rate (Mbps)	Measured BW (MHz)
6-1a	b	1	2412	1	7.50
6-1b		6	2437	1	7.50
6-1c		11	2462	1	7.00
6-2a	g	1	2412	6	15.25
6-2b		6	2437	6	15.40
6-2c		11	2462	6	15.55
6-3a	n	1	2412	6.5/7.2 (MSC0)	16.80
6-3b		6	2437	6.5/7.2 (MSC0)	16.20
6-3c		11	2462	6.5/7.2 (MSC0)	14.95

Limit: >= 500kHz

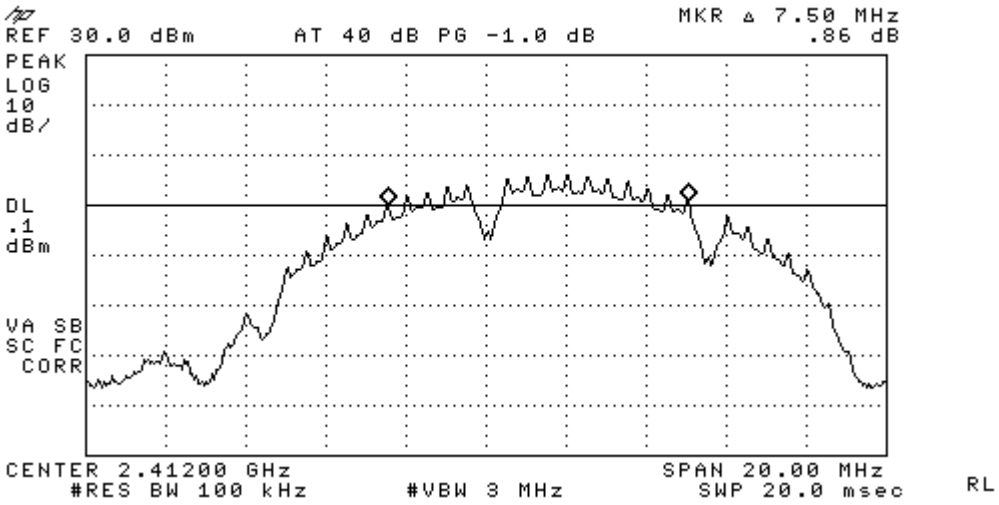


Figure 6-1a: 6 dB Bandwidth, 802.11b 1Mbps, Ch 1.

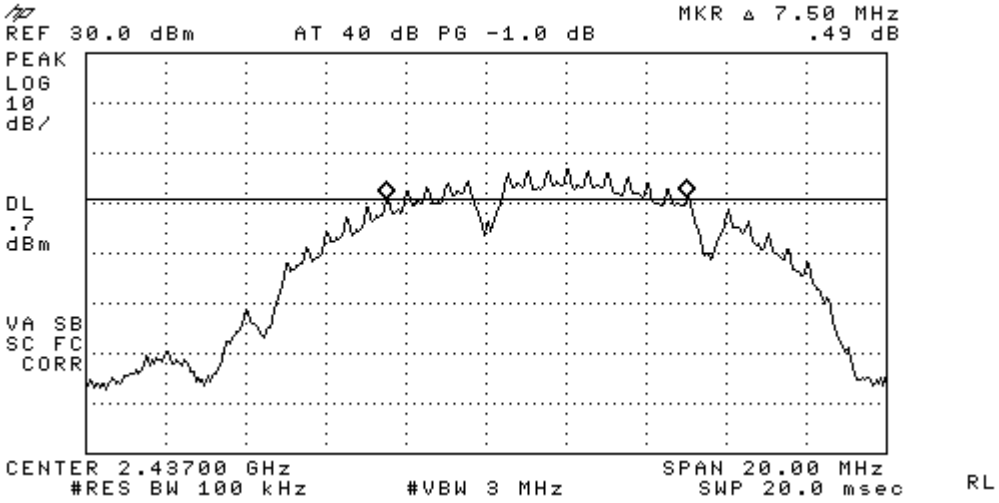


Figure 6-1b: 6 dB Bandwidth, 802.11b 1Mbps, Ch 6.

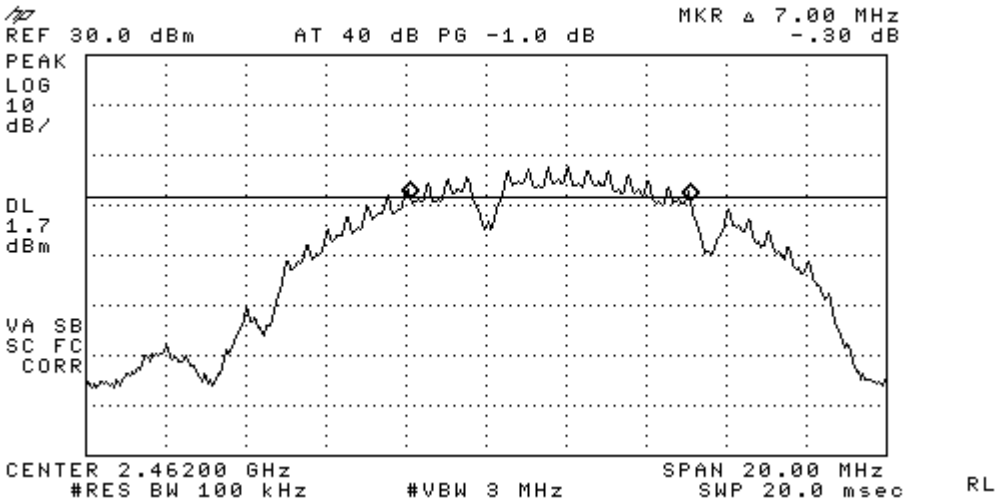


Figure 6-1c: 6 dB Bandwidth, 802.11b 1Mbps, Ch 11.

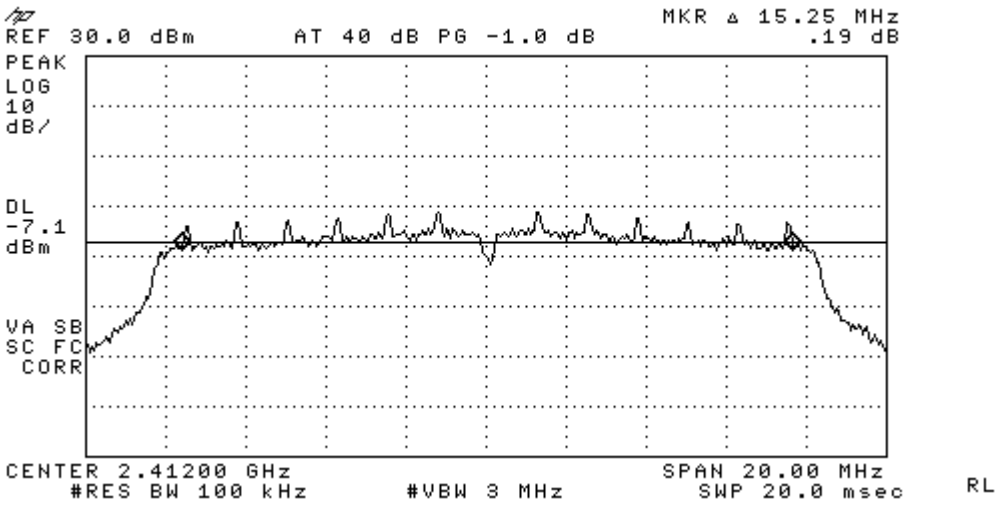


Figure 6-2a: 6 dB Bandwidth, 802.11g 6Mbps, Ch 1.

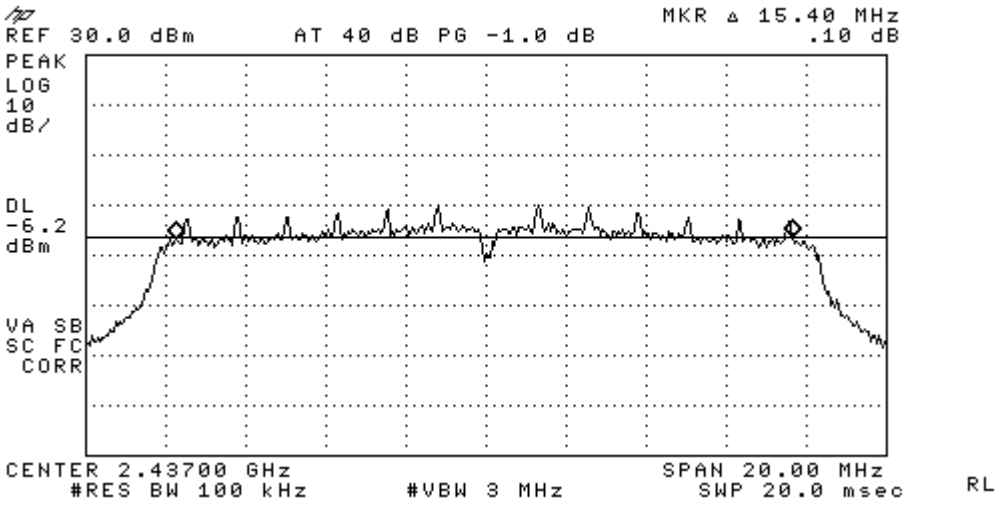


Figure 6-2b: 6 dB Bandwidth, 802.11g 6Mbps, Ch 6.

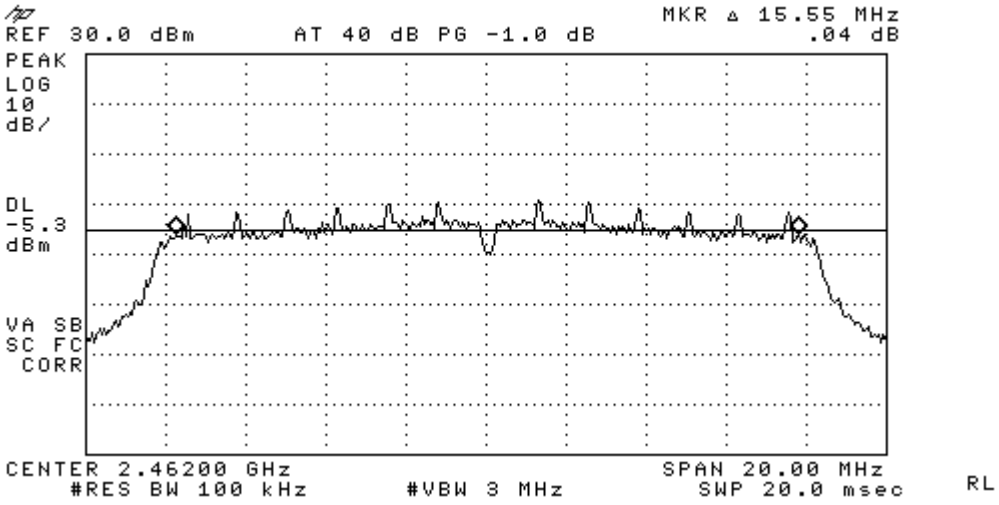


Figure 6-2c: 6 dB Bandwidth, 802.11g 6Mbps, Ch 11.

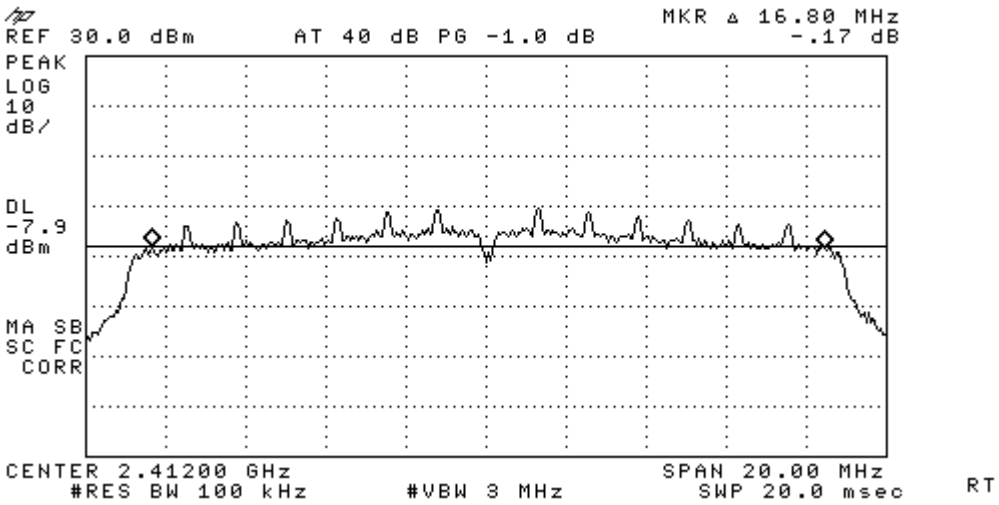


Figure 6-3a: 6 dB Bandwidth, 802.11n MSC0, Ch 1.

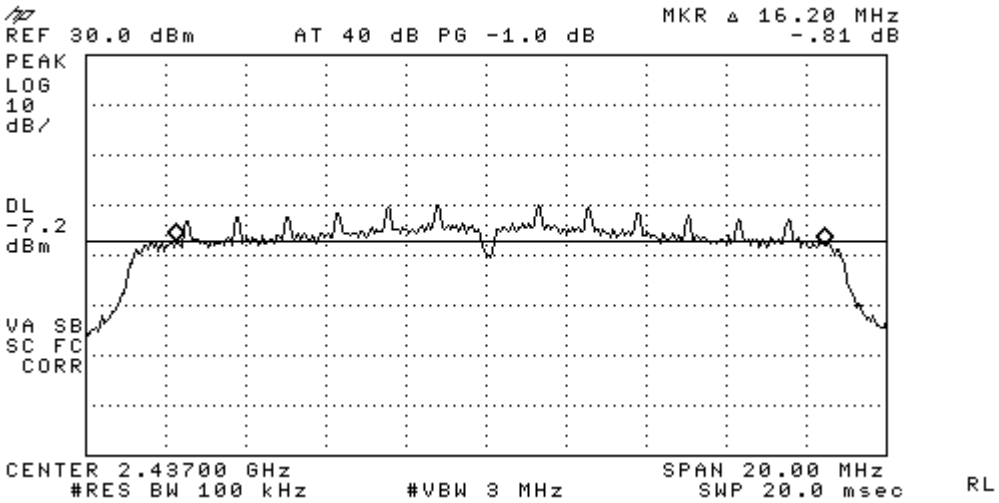


Figure 6-3b: 6 dB Bandwidth, 802.11n MSC0, Ch 6.

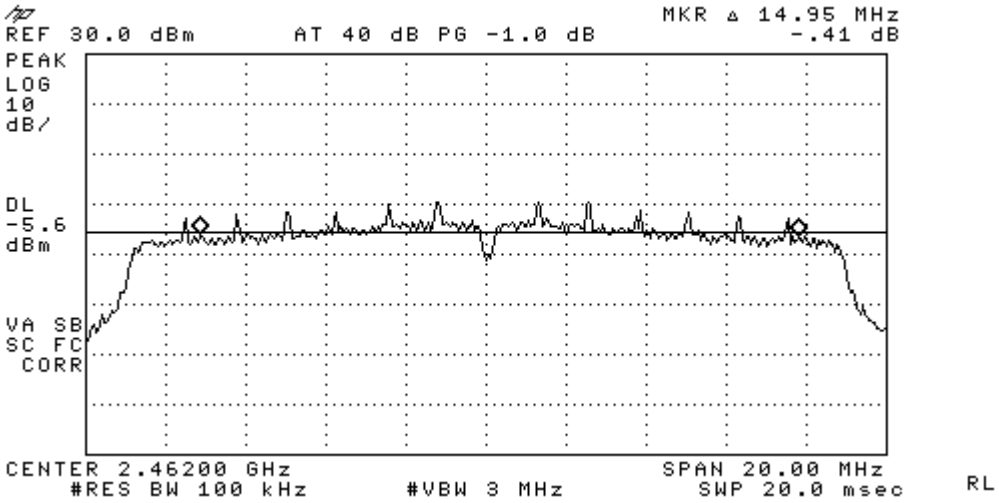


Figure 6-3c: 6 dB Bandwidth, 802.11n MSC0, Ch 11.

7 Peak OUTPUT POWER

7.1 Test Configuration

FCC:	**§ 15.247 b3**
IC:	**RSS-210 §8.4(4)**

The RF output port of the EUT was directly connected to the input of the spectrum analyzer with sufficient attenuation. Subsequently, the low, mid and high channels of transmitter were enabled separately to investigate the peak output power for each channel. A fully charged battery was used as supply voltage.

Spectrum Analyzer Parameters:
RBW = 1MHz, VBW = 3MHz, Span=40MHz, Sweep Time = Auto

Frequencies of Interest: Spectrum was investigated from 2412 MHz – 2462 MHz.

7.2 Maximum Peak Output Power Results and Limits

Mode	Data Rate (Mbps)	CONDUCTED POWER (dBm)		
		Ch 01 2412 MHz	Ch 06 2437 MHz	Ch 11 2462 MHz
802.11b	1	18.10	18.07	18.00
	2	18.31	18.03	18.28
	5.5	18.31	18.30	18.29
	11	**19.26**	**19.22**	**19.24**
802.11g	**6**	14.94	15.10	15.85
	9	14.52	14.76	15.78
	12	14.80	14.87	15.90
	18	14.48	15.18	15.53
	24	15.14	15.12	15.92
	36	14.89	15.11	15.95
	48	14.73	15.19	15.83
	54	15.25	15.28	15.98
802.11n	MCS0	14.18	14.97	15.24
	MCS1	14.51	14.69	15.61
	MCS2	14.07	14.65	15.51
	MCS3	15.14	15.44	15.57
	MCS4	14.45	15.19	15.52
	MCS5	14.78	15.02	15.52
	MCS6	14.10	15.10	15.77
	MCS7	14.22	15.54	15.85

Limit: < 30dBm (1W), for Max. antenna gain =< 6dBi

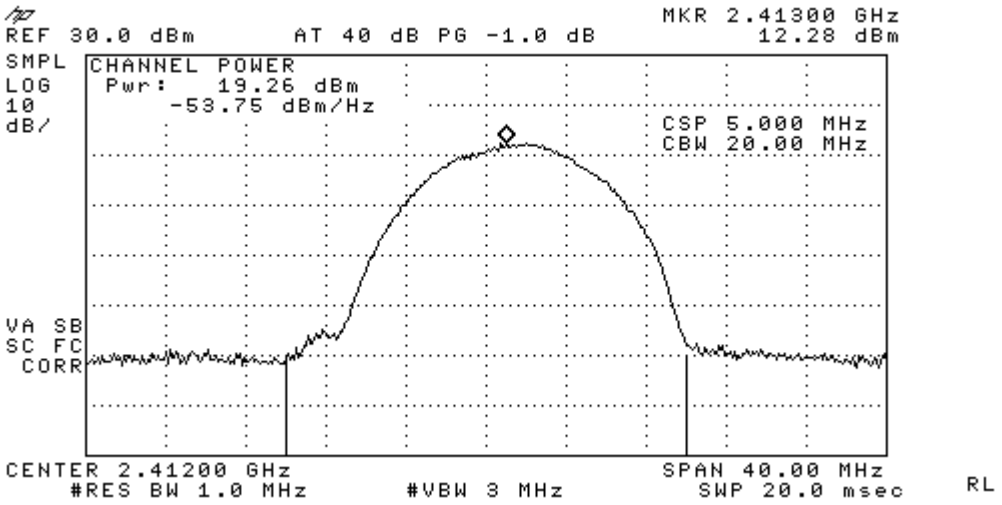


Figure 7-1: Output Power 802.11b, 11Mbps, Ch 1

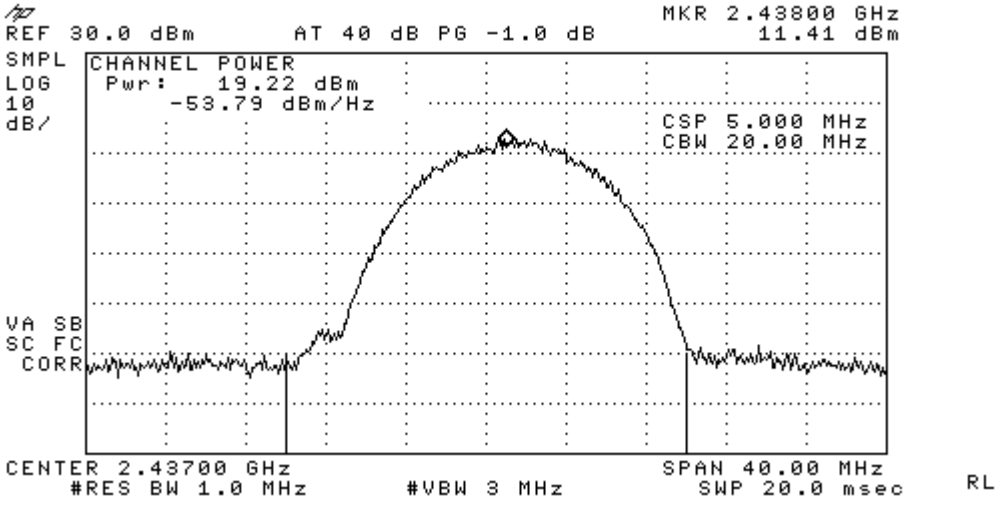


Figure 7-2: Output Power 802.11b, 11Mbps, Ch 6

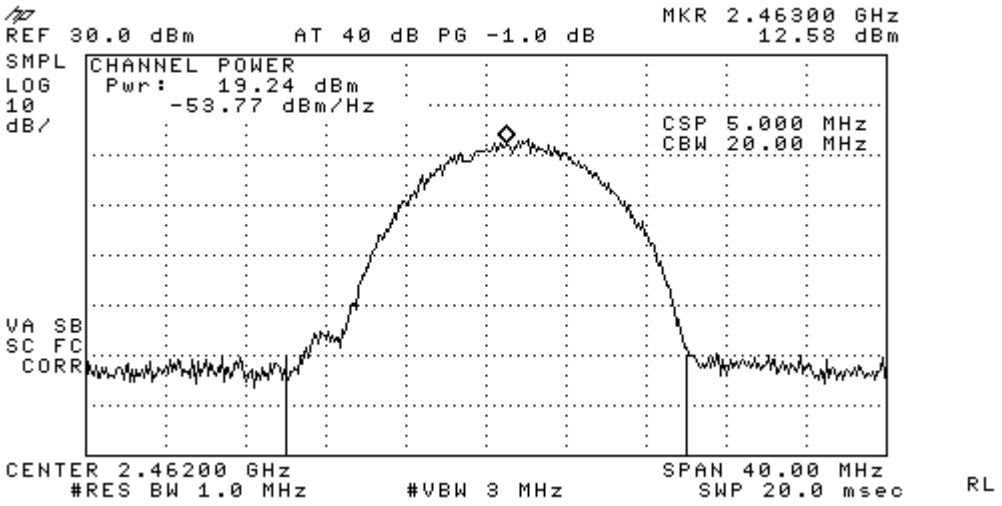


Figure 7-3: Output Power 802.11b, 11Mbps, Ch 11

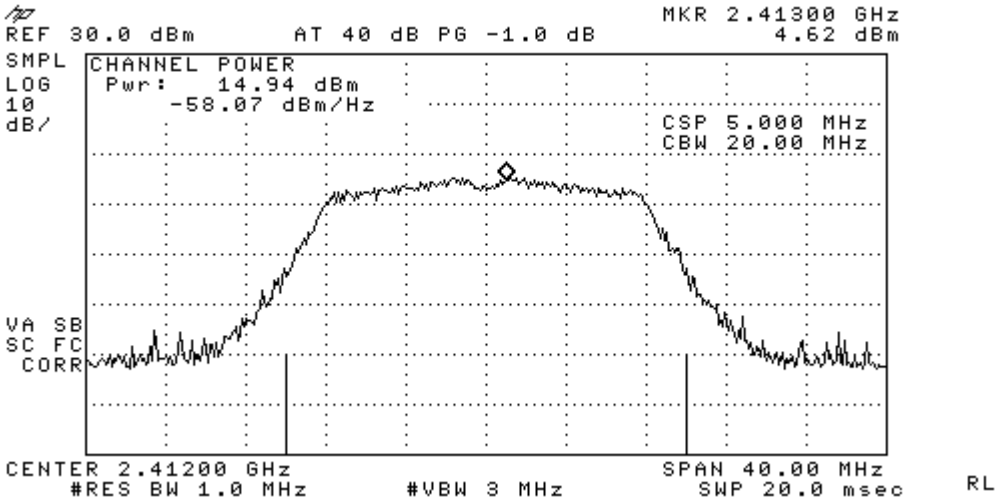


Figure 7-4: Output Power 802.11g, 6Mbps, Ch 1

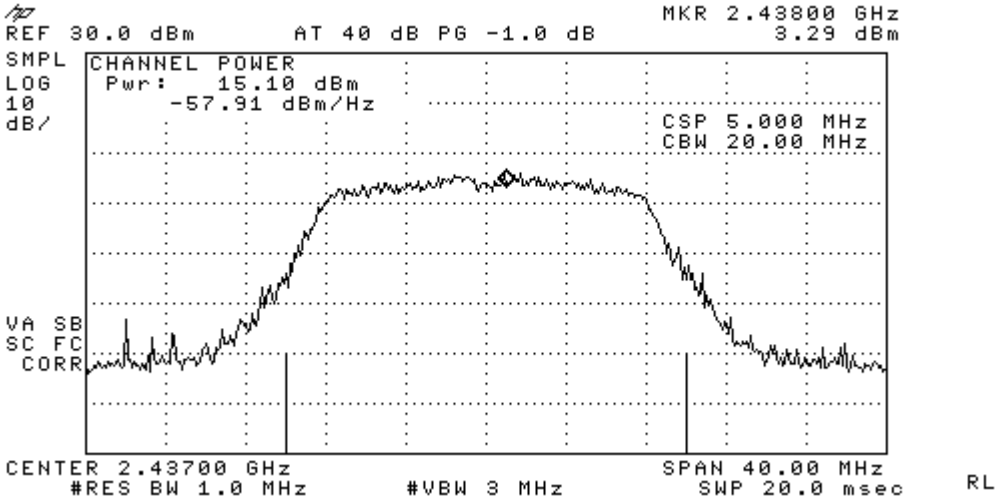


Figure 7-5: Output Power 802.11g, 6Mbps, Ch 6

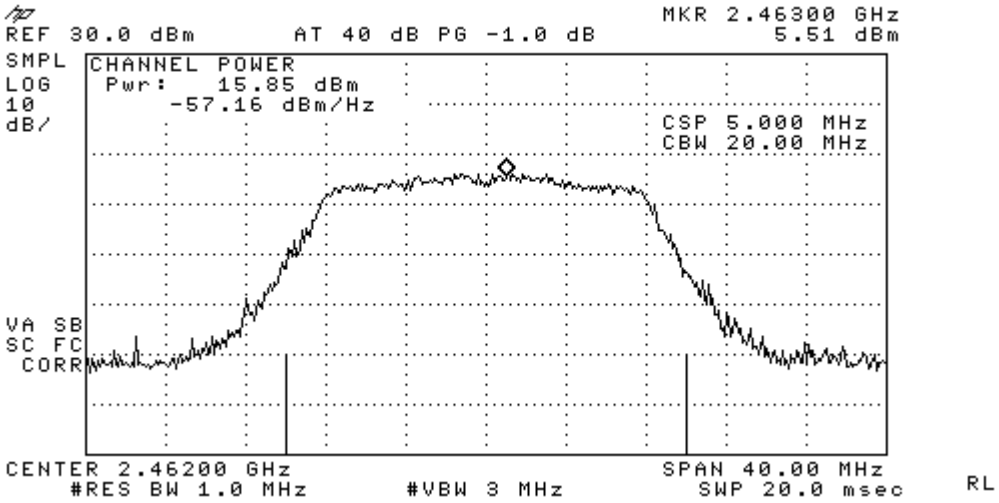


Figure 7-6: Output Power 802.11g, 6 Mbps, Ch 11

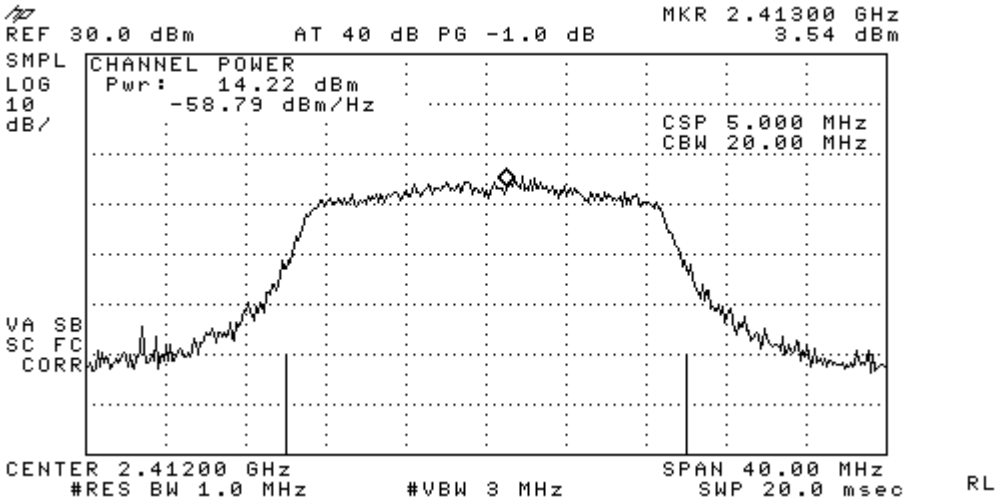


Figure 7-7: Output Power 802.11n, MSC7, Ch 1

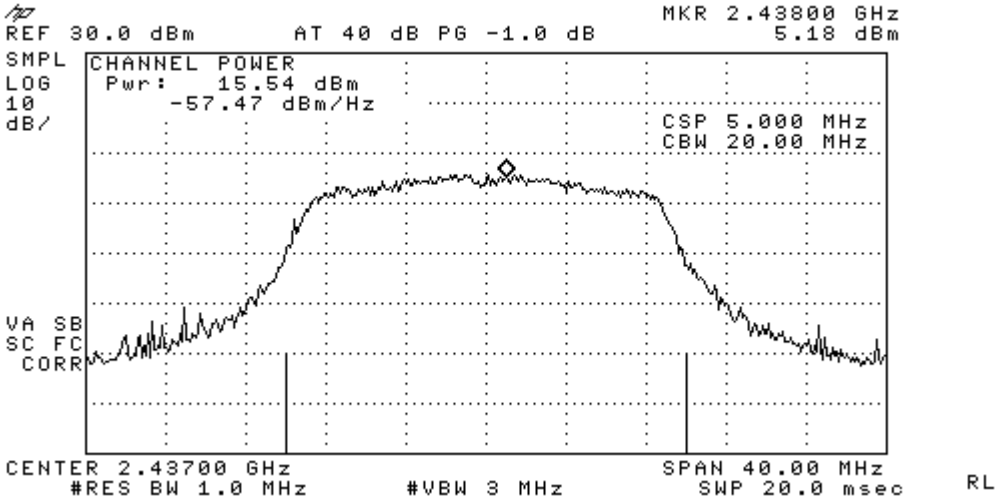


Figure 7-8: Output Power 802.11n, MSC7, Ch 6

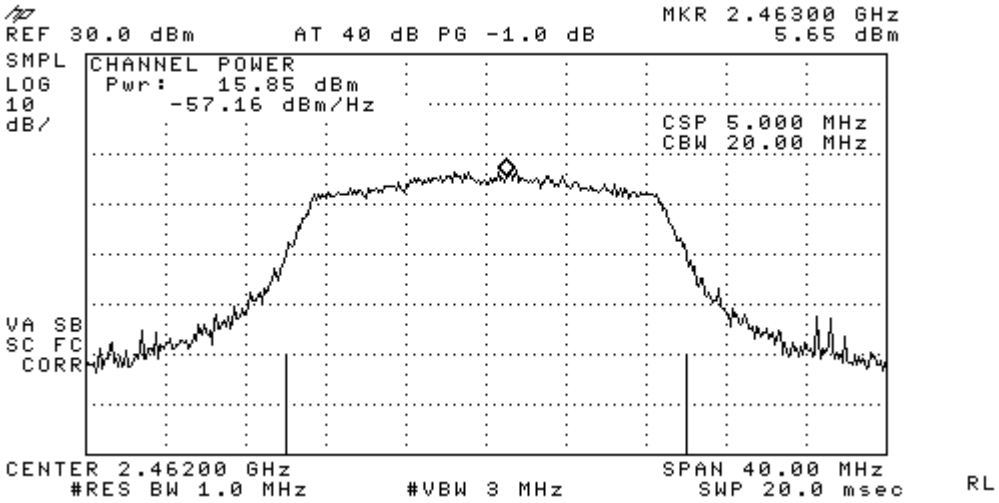


Figure 7-9: Output Power 802.11n, MSC7, Ch 11

8 POWER SPECTRAL DENSITY (PSD)

8.1 Test Configuration

FCC:	**§ 15.247 e**
IC:	**RSS-210 §A8.2(2)**

The RF output port of the EUT was directly connected to the input of the spectrum analyzer with sufficient attenuation. Subsequently, the transmitter was set in transmission mode at appropriate frequency. A fully charged battery was used as supply voltage.

Spectrum Analyzer Parameters:
RBW = 3kHz, VBW = 10kHz, Span=300kHz, Sweep Time = 100sec, DL=8dBm

Frequencies of Interest: Spectrum was investigated from 2412 MHz – 2462 MHz.

8.2 Results and Limits:

Figure	Mode	Channel	Frequency	Measured PSD (dBm)
8-1a	802.11 b	1	2412	-9.59
8-1b		6	2437	-9.10
8-1c		11	2462	-7.42
8-2a	802.11 g	1	2412	-22.47
8-2b		6	2437	-22.27
8-2c		11	2462	-21.26
8-3a	802.11 n	1	2412	-24.04
8-3b		6	2437	-23.72
8-3c		11	2462	-22.09

Limit: < 8dBm in any 3 kHz band

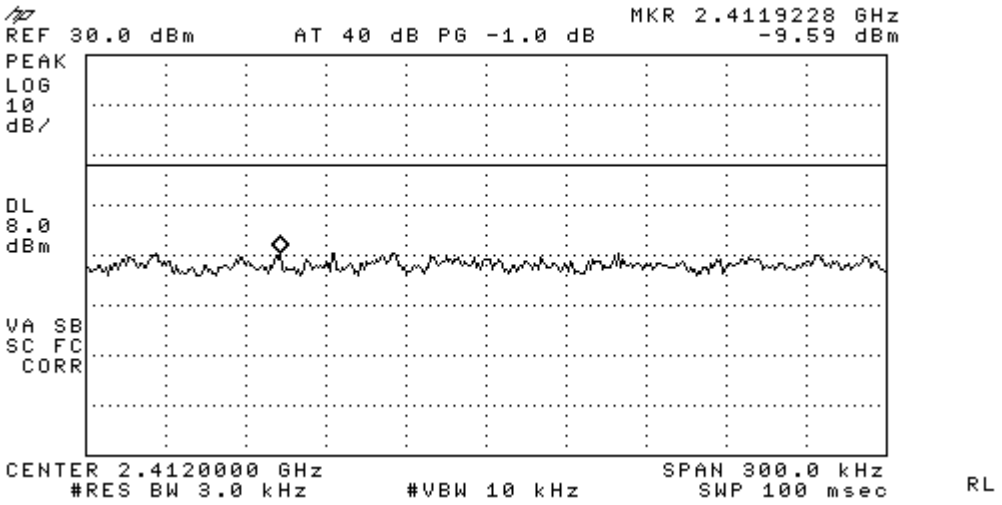


Figure 8-1a: Power Spectral Density, 802.11b, Ch 1.

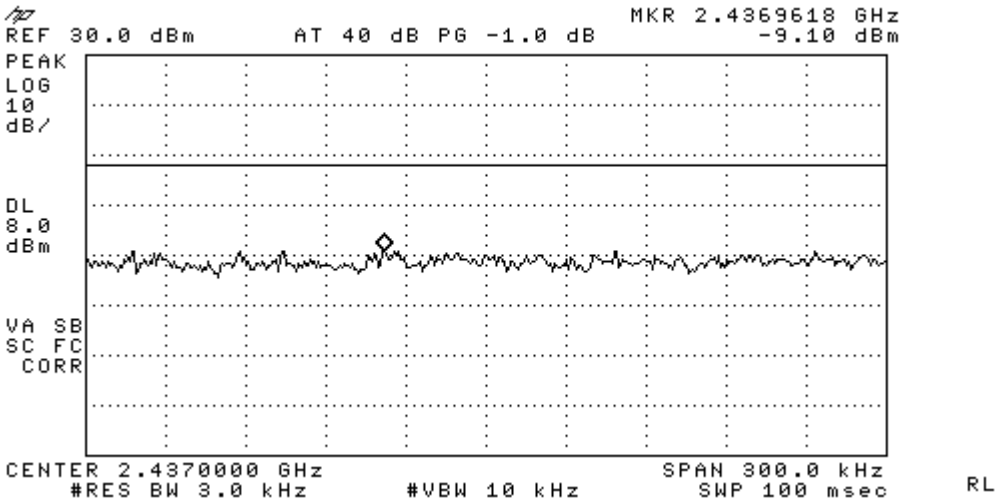


Figure 8-1b: Power Spectral Density, 802.11b, Ch 6.

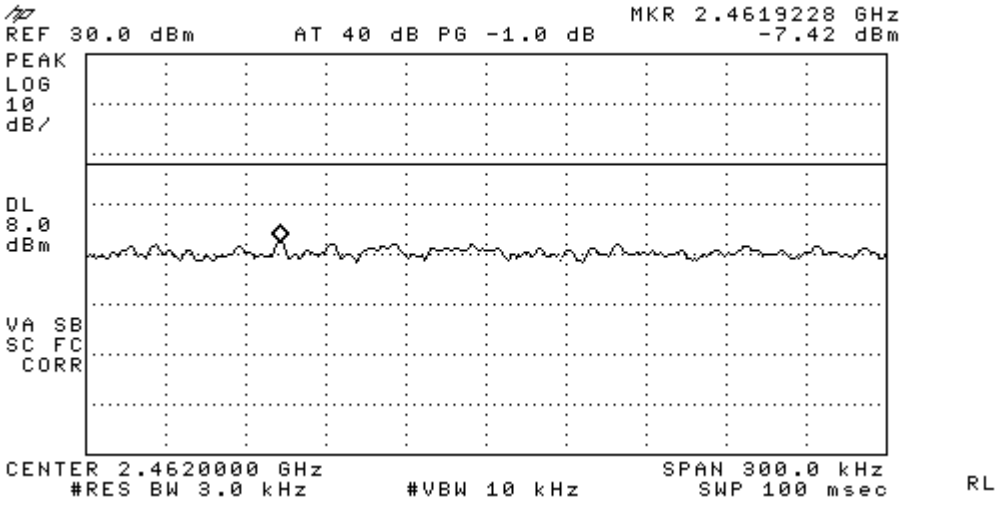


Figure 8-1c: Power Spectral Density, 802.11b, Ch 11.

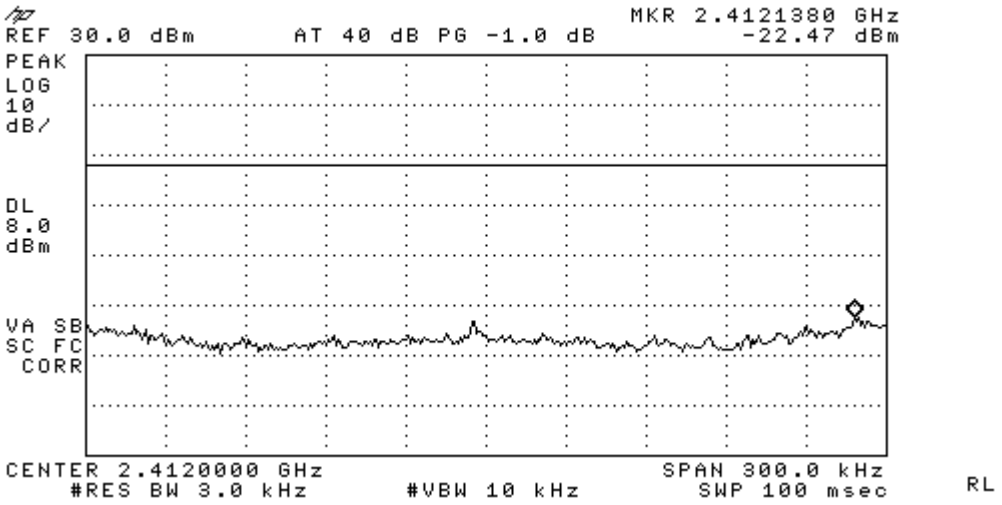


Figure 8-2a: Power Spectral Density, 802.11g, Ch 1.

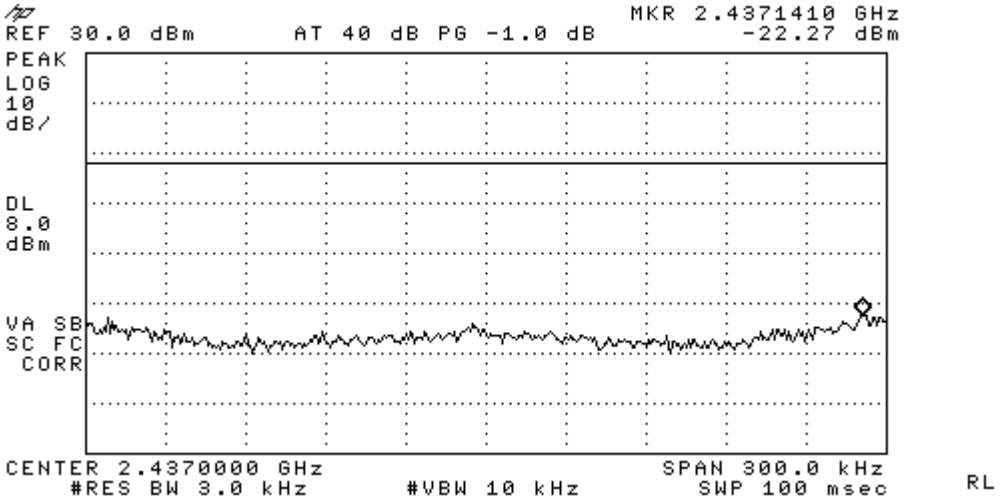


Figure 8-2b: Power Spectral Density, 802.11g, Ch 6.

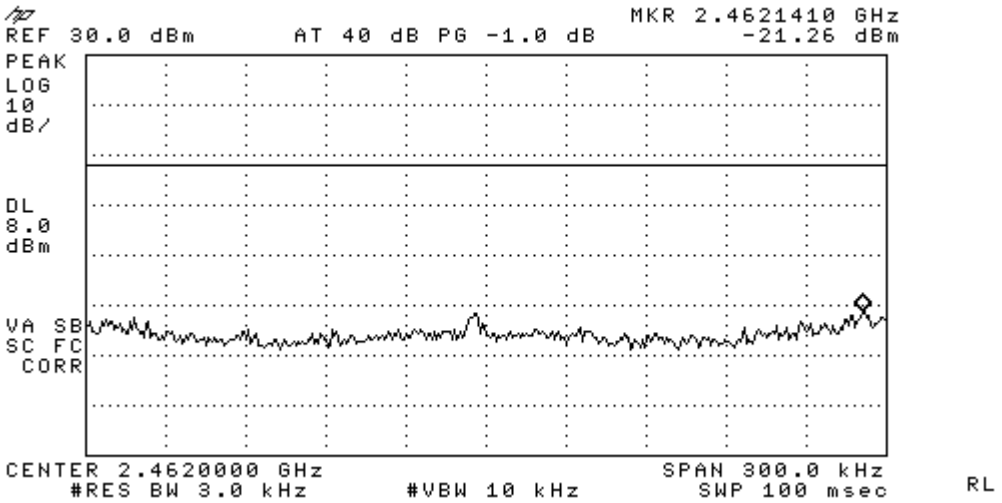


Figure 8-2c: Power Spectral Density, 802.11g, Ch 11.

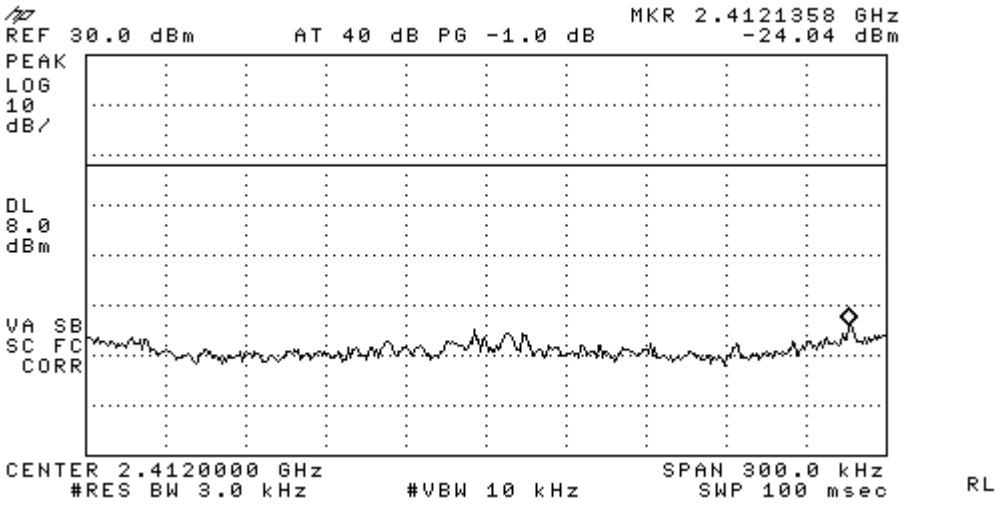


Figure 8-3a: Power Spectral Density, 802.11n, Ch 1.

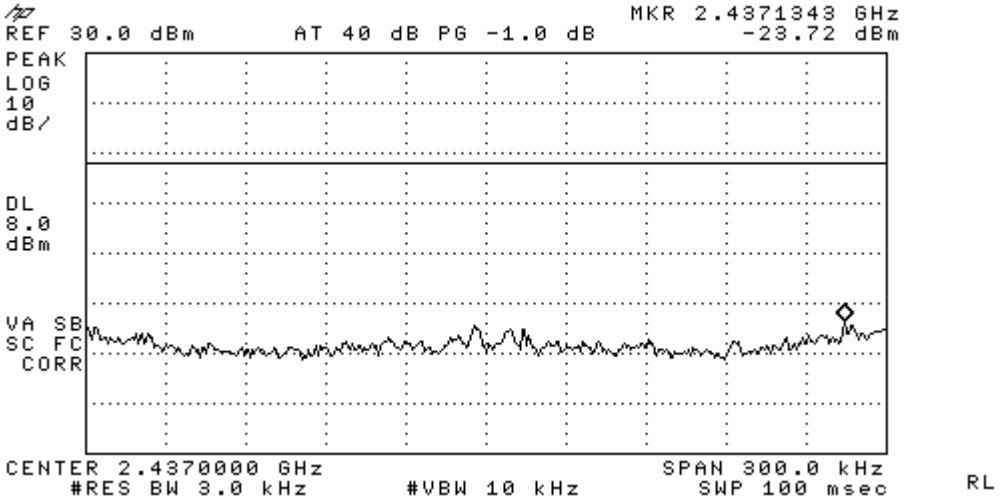


Figure 8-3b: Power Spectral Density, 802.11n, Ch 6.

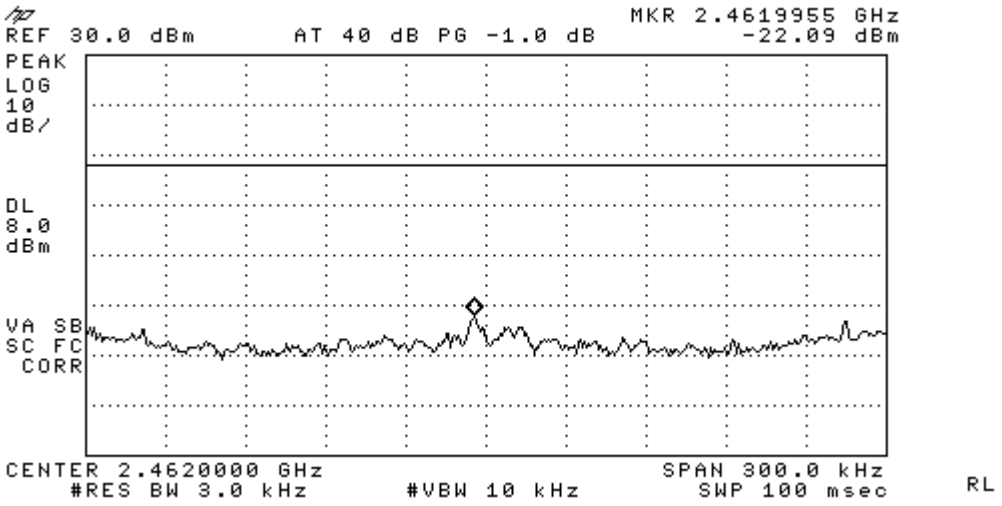


Figure 8-3c: Power Spectral Density, 802.11n, Ch 11.

9 BANDEDGE

9.1 Test Configuration

FCC:	**§ 15.247 d**
IC:	**RSS-210 §A8.5**

The RF output port of the EUT was directly connected to the input of the spectrum analyzer with sufficient attenuation. Subsequently, the low and high channels of transmitter were enabled separately to investigate the band-edge compliance of conducted emissions. To ensure the band-edge compliance when the channels are hopping, measurements were also conducted at low and high channels in this mode. A fully charged battery was used as supply voltage.

Spectrum Analyzer Parameters:
RBW = 100kHz, VBW = 300kHz, Span=50MHz, Sweep Time = Auto, DL=-20dBc
CF=2390MHz or 2483.5MHz

Frequencies of Interest: Spectrum was investigated from 2412 MHz – 2462 MHz.

9.2 Results: Bandedge

Figure	802.11 Mode	Channel	Frequency	Plot Description
9-1a	b (1Mbps)	1	2412	Low ch band edge
9-1b		11	2462	High ch band edge
9-2a	g (6Mbps)	1	2412	Low ch band edge
9-2b		11	2462	High ch band edge
9-3a	n (6.5/7.2 Mbps)	1	2412	Low ch band edge
9-3b		11	2462	High ch band edge

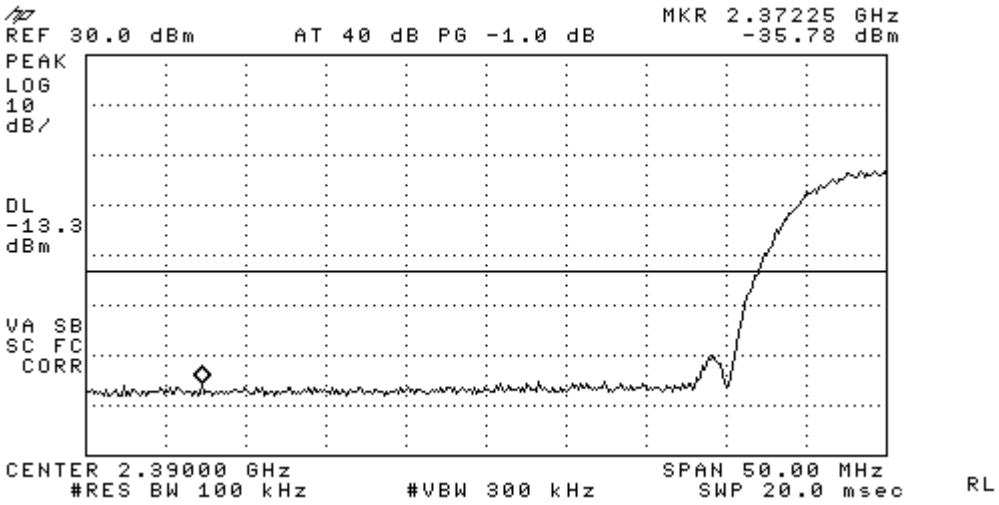


Figure 9-1a: Low band edge, 802.11b, ch1

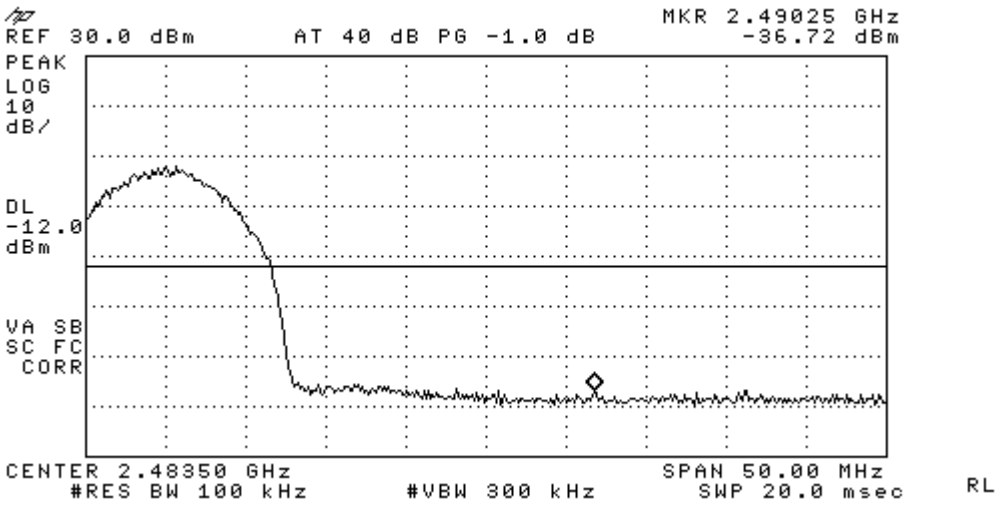


Figure 9-1b: High band edge, 802.11b, ch11.

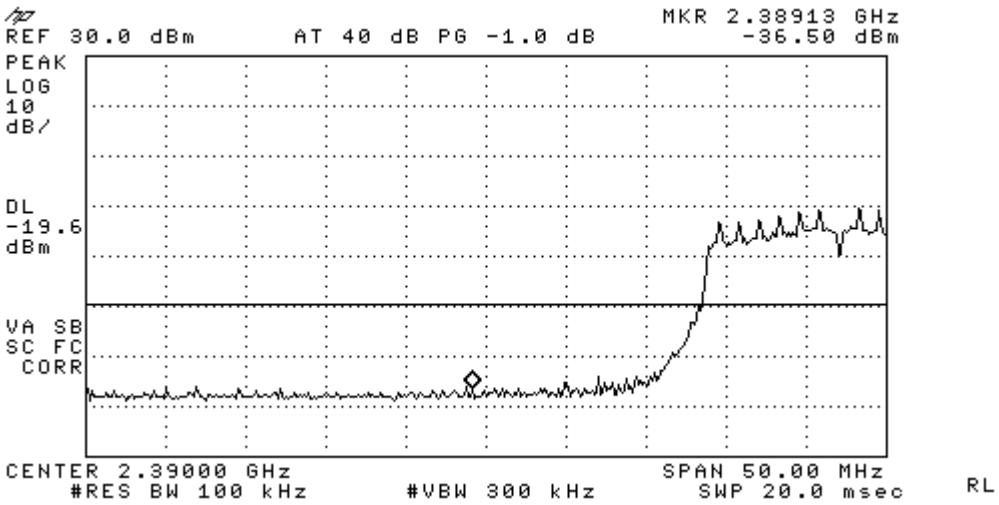


Figure 9-2a: Low band edge, 802.11g, ch1.

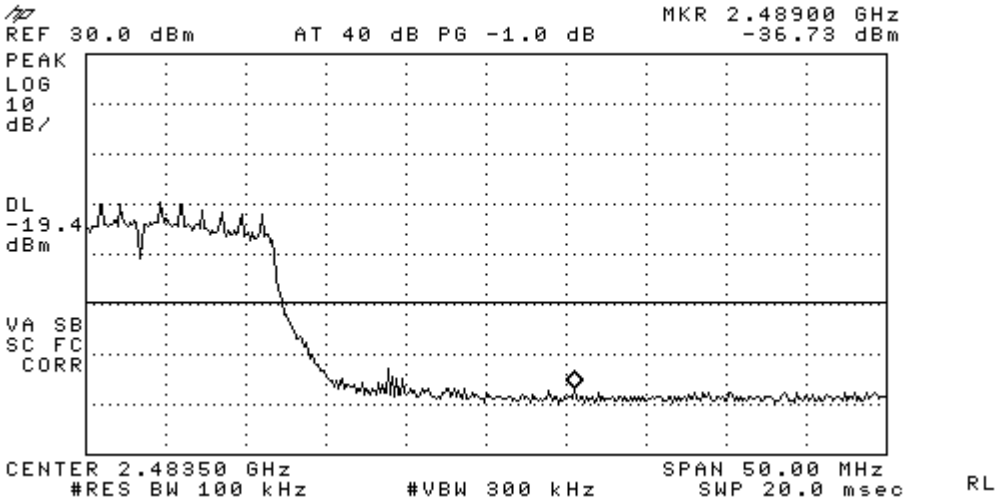


Figure 9-2b: High band edge, 802.11g, ch11.

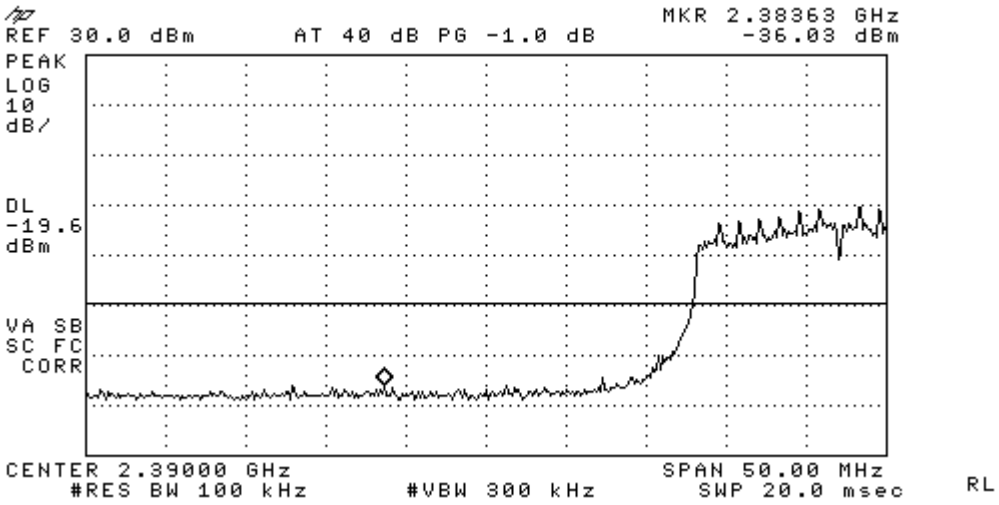


Figure 9-3a: Low band edge, 802.11n, ch1.

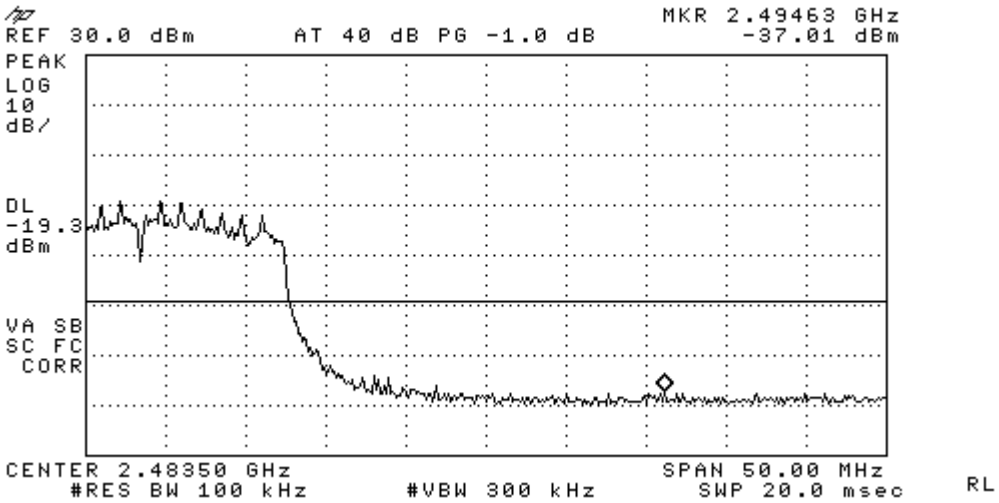


Figure 9-3b: High band edge, 802.11n, ch11.

10 SPURIOUS RF CONDUCTED EMISSIONS

10.1 Test Configuration

FCC:	**§ 15.247 d**
IC:	**RSS-210 §A8.5**

The RF output port of the EUT was directly connected to the input of the spectrum analyzer with sufficient attenuation. Subsequently, the low, mid and high channels of Bluetooth transmitter were enabled separately and the frequency spectrum was investigated for any spurious emissions. A fully charged battery was used as supply voltage.

Spectrum Analyzer Parameters:
RBW = 100kHz, VBW = 300kHz, Sweep Time = Auto, DL=-20dBc

Frequencies of Interest: Spectrum was investigated from 30MHz – 25 GHz.

10.2 Results: Conducted Spurious Emissions

Figure	Channel	Channel	Frequency	Plot Description
10-1a	b	1	2412	Low ch bandedge, 30MHz to 25GHz
10-1b		6	2437	Mid ch bandedge, 30MHz to 25GHz
10-1c		11	2462	High ch bandedge, 30MHz to 25GHz
10-2a	g	1	2412	Low ch bandedge, 30MHz to 25GHz
10-2b		6	2437	Mid ch bandedge, 30MHz to 25GHz
10-2c		11	2462	High ch bandedge, 30MHz to 25GHz
10-3a	n	1	2412	Low ch bandedge, 30MHz to 25GHz
10-3b		6	2437	Mid ch bandedge, 30MHz to 25GHz
10-3c		11	2462	High ch bandedge, 30MHz to 25GHz
Comments:				

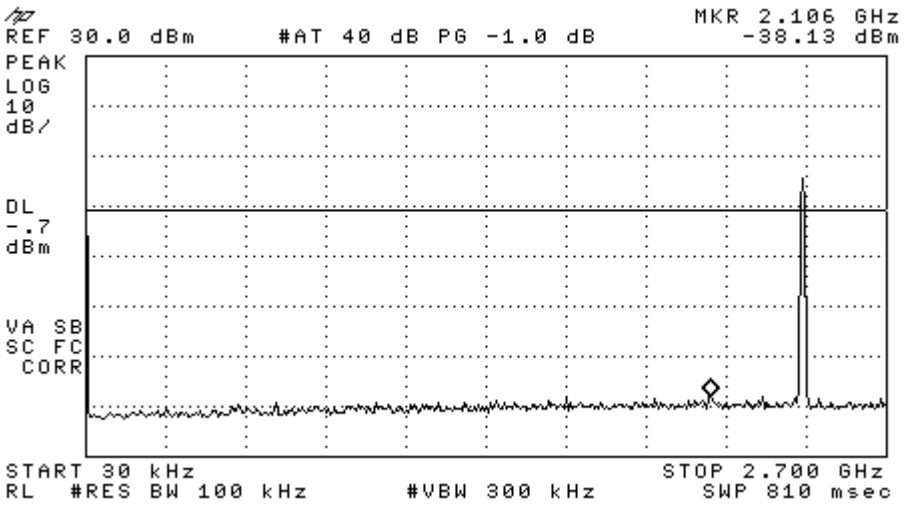


Figure 10-1a1: Conducted Spurious Emissions, 802.11b, Ch 1

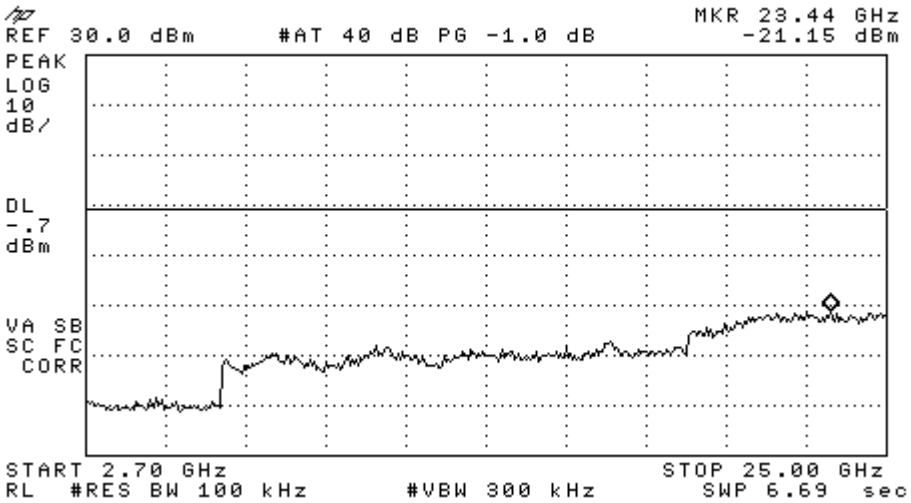


Figure 10-1a2: Conducted Spurious Emissions, 802.11b, Ch 1

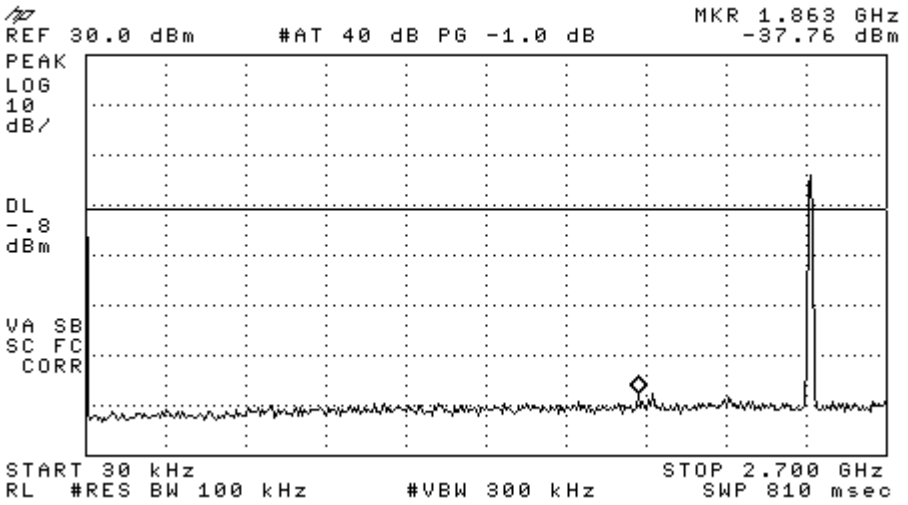


Figure 10-1b1: Conducted Spurious Emissions, 802.11b, Ch 6

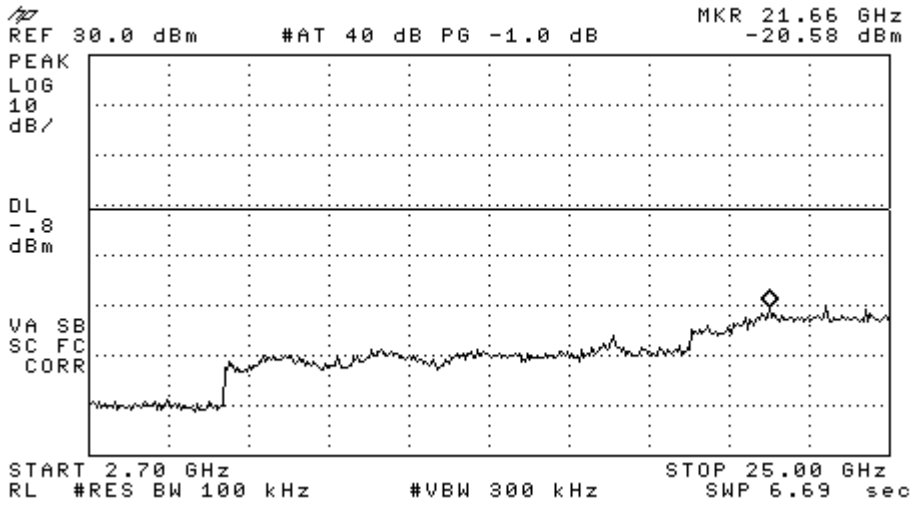


Figure 10-1b2: Conducted Spurious Emissions, 802.11b, Ch 6

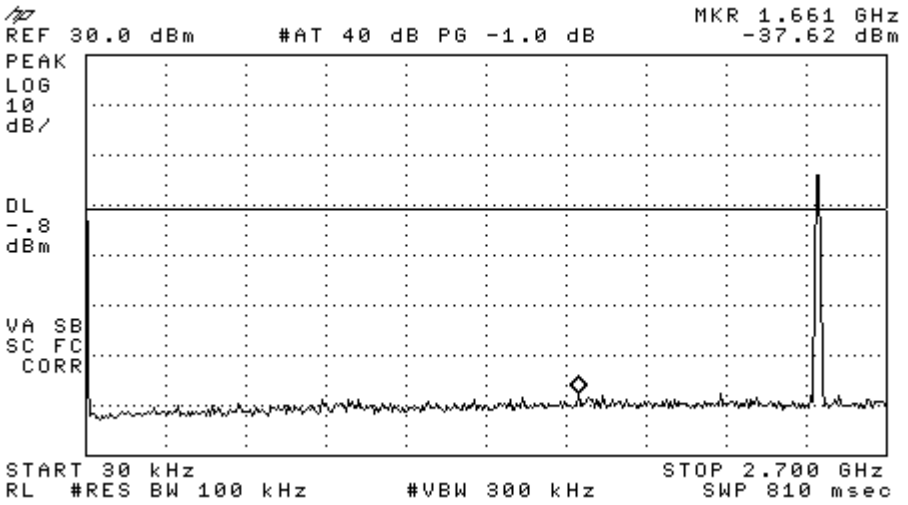


Figure 10-1c1: Conducted Spurious Emissions, 802.11b, Ch 11

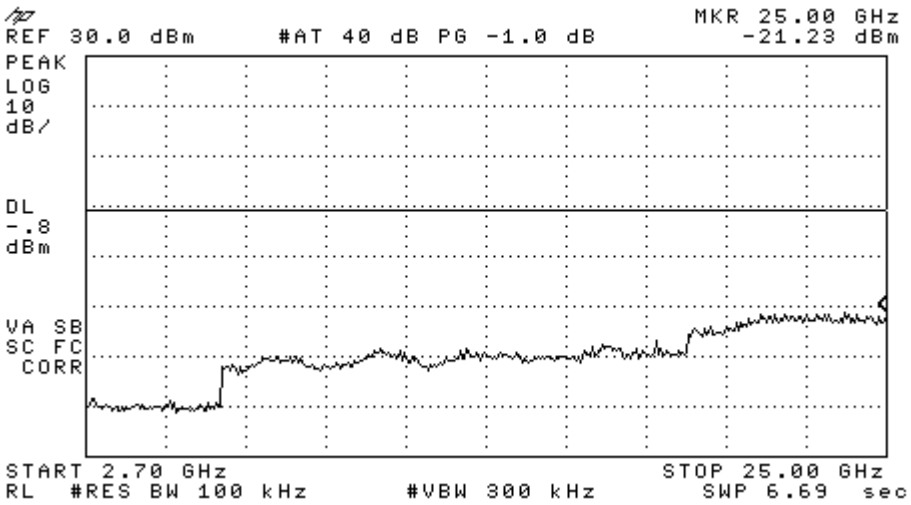


Figure 10-1c2: Conducted Spurious Emissions, 802.11b, Ch 11

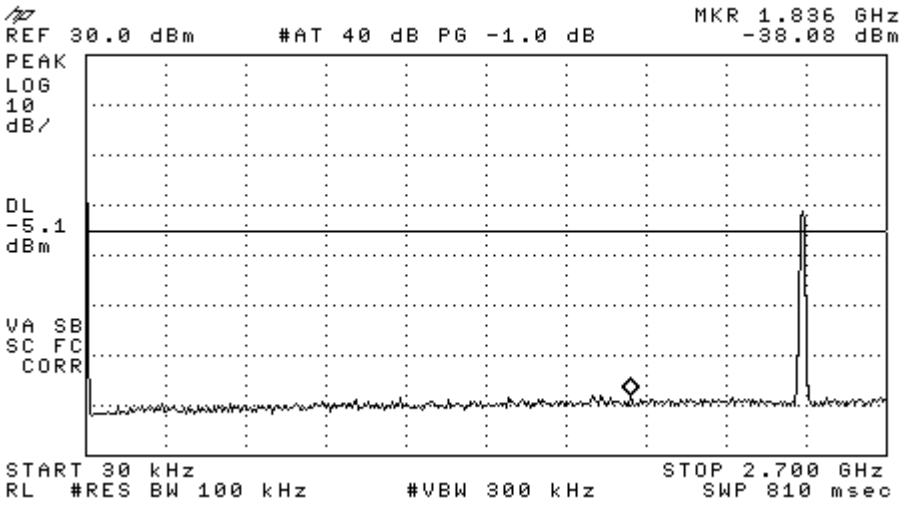


Figure 10-2a1: Conducted Spurious Emissions, 802.11g, Ch 1

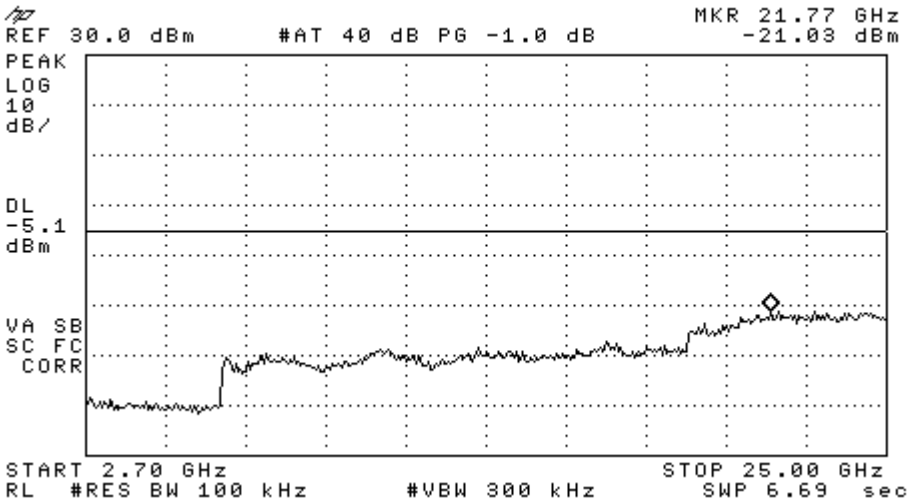


Figure 10-2a2: Conducted Spurious Emissions, 802.11g, Ch 1

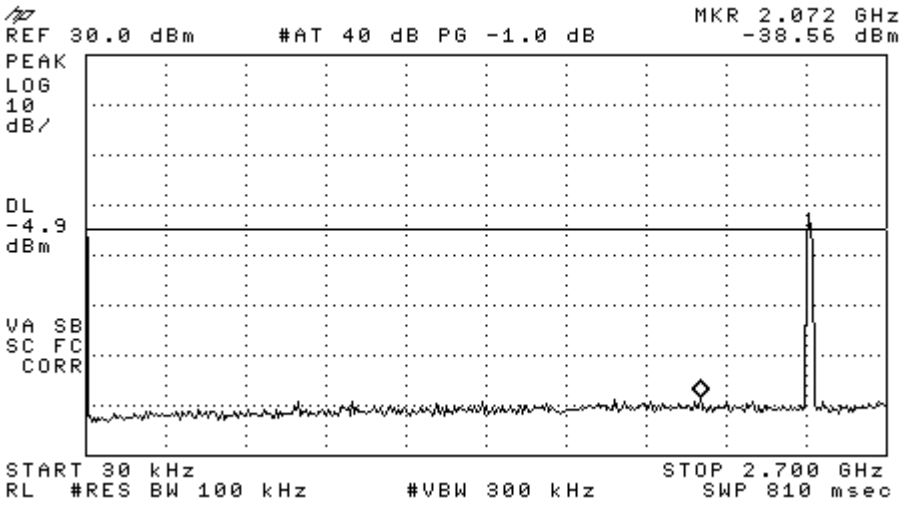


Figure 10-2b1: Conducted Spurious Emissions, 802.11g, Ch 6

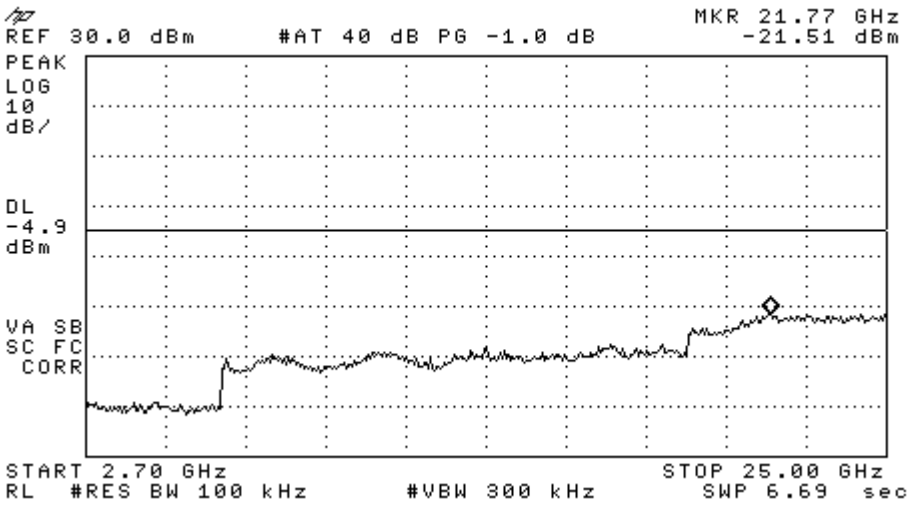


Figure 10-2b2: Conducted Spurious Emissions, 802.11g, Ch 6

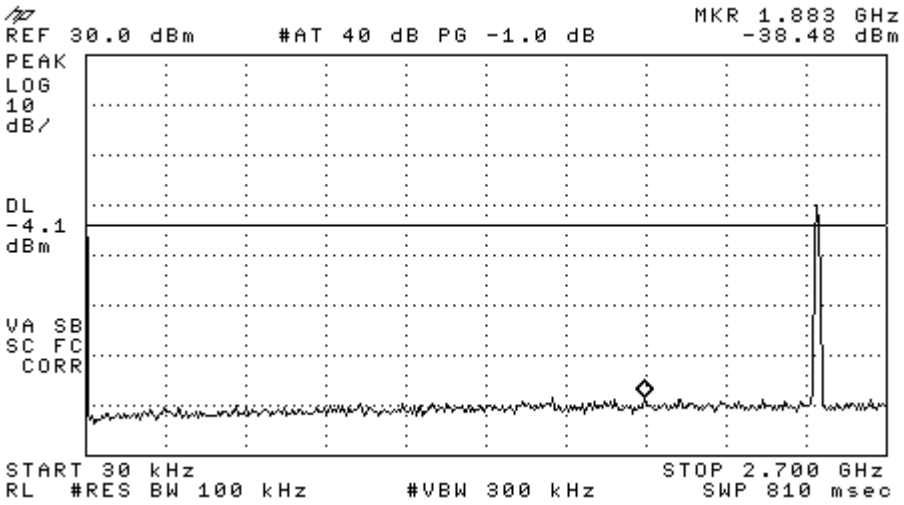


Figure 10-2c1: Conducted Spurious Emissions, 802.11g, Ch 11

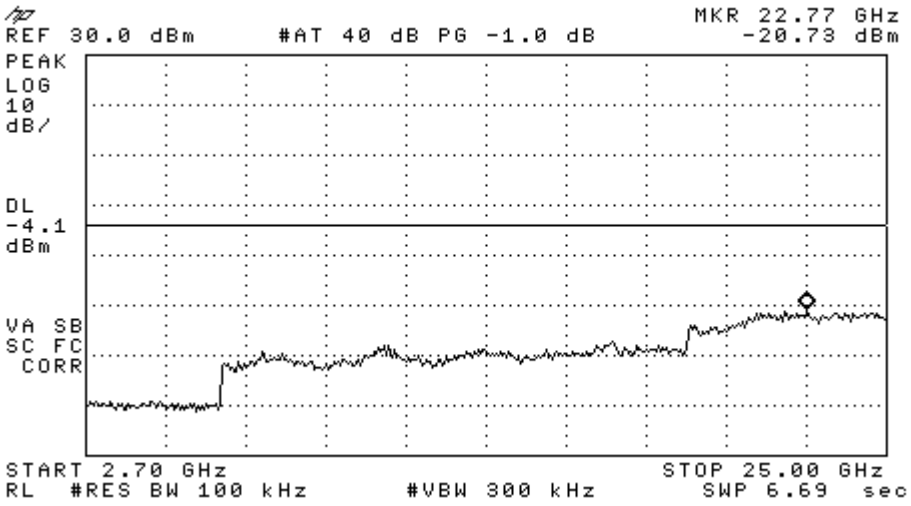


Figure 10-2c2: Conducted Spurious Emissions, 802.11g, Ch 11

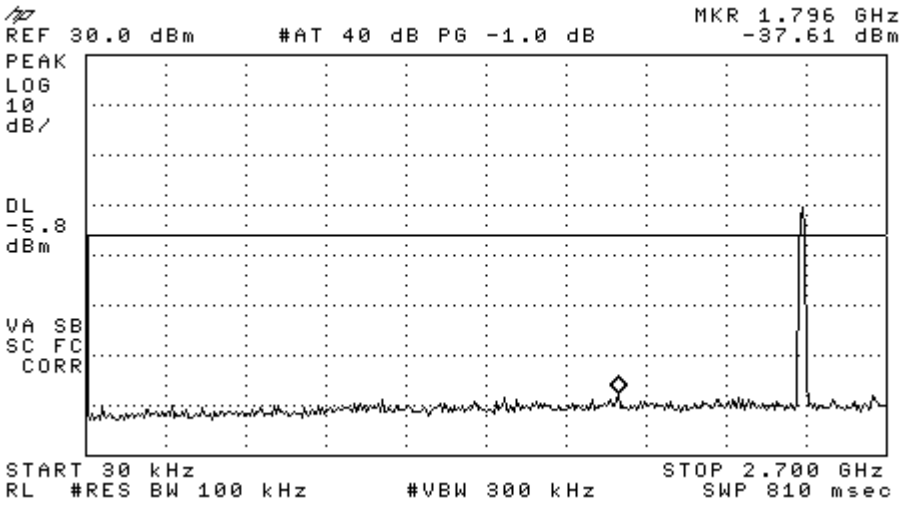


Figure 10-3a1: Conducted Spurious Emissions, 802.11n, Ch 1

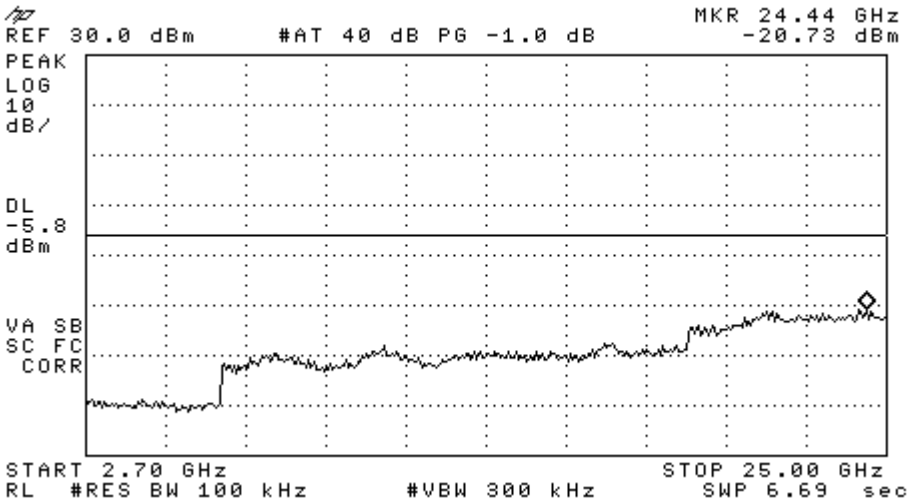


Figure 10-3a2: Conducted Spurious Emissions, 802.11n, Ch 1

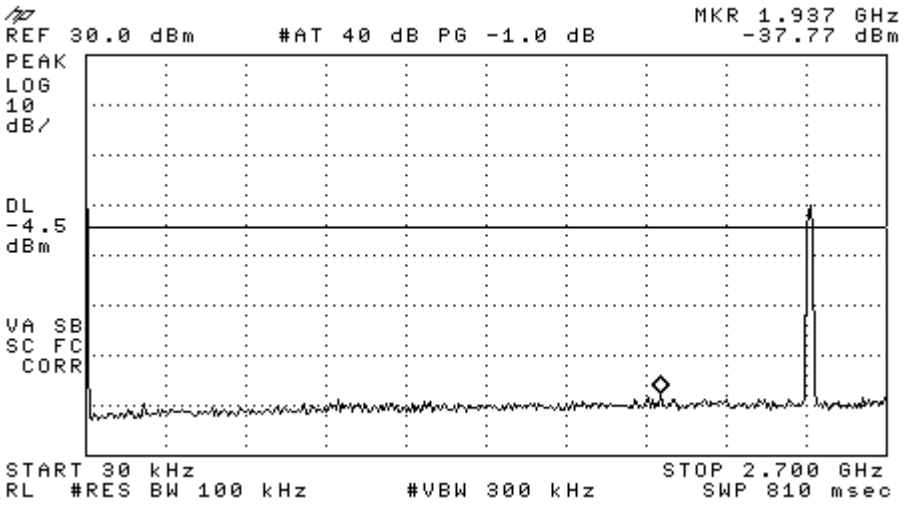


Figure 10-3b1: Conducted Spurious Emissions, 802.11n, Ch 6

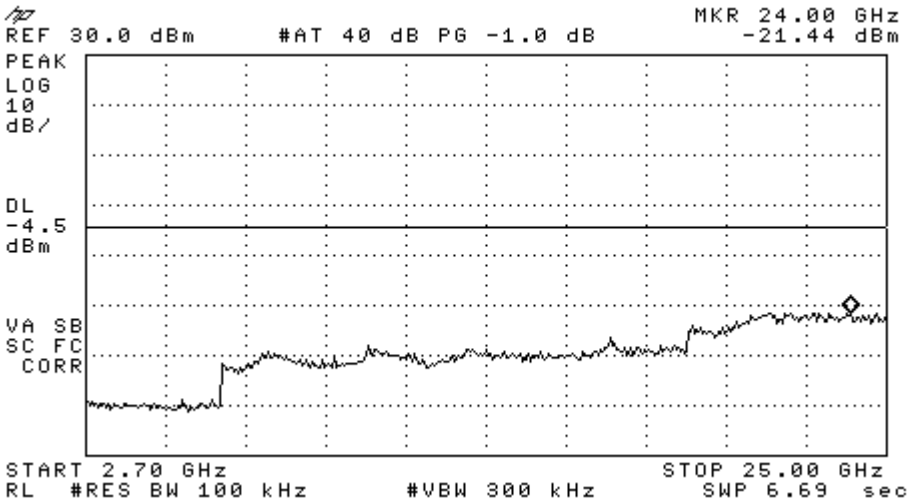


Figure 10-3b2: Conducted Spurious Emissions, 802.11n, Ch 6

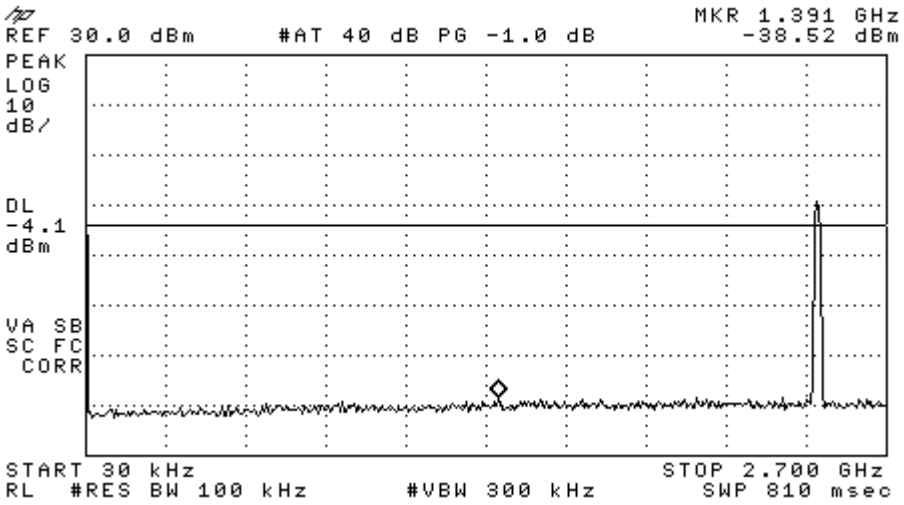


Figure 10-3c1: Conducted Spurious Emissions, 802.11n, Ch 11

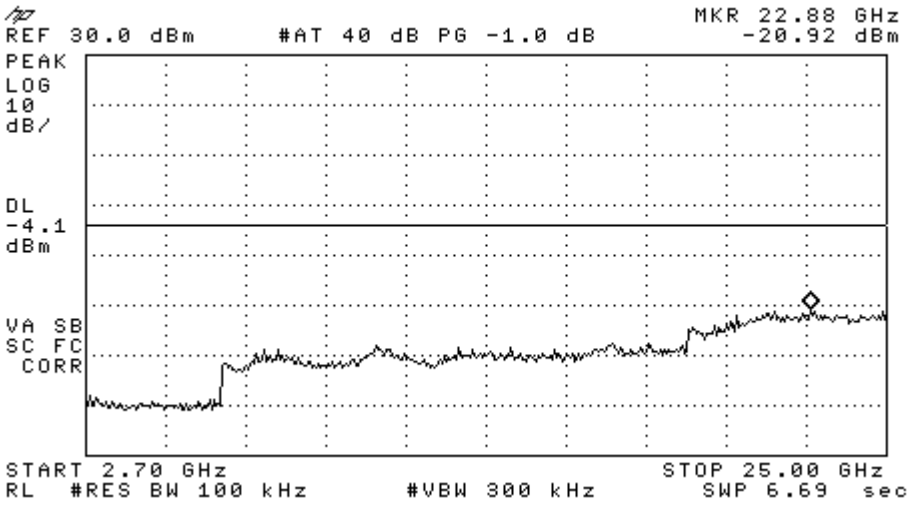


Figure 10-3c2: Conducted Spurious Emissions, 802.11n, Ch 11

11 AC POWER LINE CONDUCTED EMISSIONS

11.1 Test Configuration & Results

FCC:	**§ 15.107 § 15.207**
IC:	**RSS-210 §6.6**

See separate report

12 RADIATED EMISSIONS

12.1 Test Configuration & Results

FCC:	**§ 15.109 § 15.209**
IC:	**RSS-210 §A2.9 (2)**

See separate report

13 SAR TEST

13.1 Test Configuration & Results

FCC:	**§ 2.1091/2.1093**
IC:	**RSS-102**

See separate report

14 TEST EQUIPMENT

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

Description	Manufacturer	Model No.	Serial No.	Cal Due Date
Spectrum Analyzer	Hewlett Packard	8593EM	3710A00203	06/09/12
Spectrum Analyzer	Hewlett Packard	8595E	3911A03899	08/11/13