PRODUCT SAFETY AND COMPLIANCE
EMC LABORATORY

EMC TEST REPORT

Test Report Number – 23998-1 WLAN

Report Date – October 4, 2010

The test results contained herein relate only to the model(s) identified. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics.

As the responsible EMC Engineer, I hereby declare that the equipment tested as specified in this report conforms to the requirements indicated.

Signature:  Name: Albert J. Patapack

Title: EMC Engineer Date: October 4, 2010

UKAS Certificate Number: 2404

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Test Report Details

Tests Performed By:	Motorola Mobile Devices business (MDb) Product Safety and Compliance Group 600 North US Hwy 45 Libertyville, IL 60048 PH (847) 523-6167 Fax (847) 523-4538 Motorola MDb FRN: 0004321311 FCC Registration Number: 316588 Industry Canada Number: 109O-1
and by	Motorola (Beijing) Mobility Technologies Co., Ltd. Asia Global Compliance Labs No. 1 Wang Jing East Road, Chao Yang District Beijing, 100102, P. R. China PH: +86 10 8473 2610 FCC Registration Number: 177885 Industry Canada Number: 109AW-1
Tests Requested By:	Motorola Mobility, Inc. Mobile Devices Business 600 North US Hwy 45 Libertyville, IL 60048
Product Type :	Cellular Phone
Signaling Capability:	WCDMA 850/1700, GSM 850/900/1800/1900, HSDPA, HSUPA, EDGE, GPRS, Bluetooth, 802.11b/802.11g/802.11n
FCC ID:	IHDT56LW1
Serial Numbers:	352780040010267, 352779040049978
Testing Complete Date:	October 2, 2010

Applicable Standards

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

__X__Part 15 Subpart C – Intentional Radiators

Applicable Standards: ANSI 63.4 2003, RSS-210 Issue 7

Summary of Testing

Test	Test Name	Pass/Fail
1	Spectrum Bandwidth	Pass
2	Peak Power	Pass
3	Power Spectral Density	Pass
4	Spurious RF Conducted Emissions	Pass
5	AC Line Conducted Emissions	Pass

Test	Test Name	Results
1	Spectrum Bandwidth	See plots
2	Peak Power	See plots
3	Power Spectral Density	See tables
4	Spurious RF Conducted Emissions	See plots
5	AC Line Conducted Emissions	See Plots

General and Special Conditions

All testing for this report was performed with a fully charged Model SNN5843A 1390mAH Battery.

All testing was done in an indoor controlled environment. The temperature and the relative humidity were maintained within the ANSI C63.4 2003 Standard requirements during the entire duration of testing.

Equipment and Cable Configurations

The EUT was tested in a stand-alone configuration that is representative of typical use.

Measuring Equipment and Calibration Information

Equipment used by Motorola Mobile Devices business EMC lab

Manufacturer	Equipment Type	Model No.	Serial Number	Calibration Due Date
Rohde Schwarz	Receiver	ESIB40	100226	4/08/11
Agilent	Signal Analyzer	N9020A	US46470586	12/18/10
Weinschel	Attenuator	AS-6	6675	NCR
Weinschel	Attenuator	AS-6	6677	NCR

Note that the Agilent power meter and microwave preamplifier are on a two-year calibration cycle. All other equipment is on a one-year calibration cycle. All testing was performed using equipment that was within calibration at the time that the test was performed. No equipment listed in the table above was used after the specified calibration due date. If, during the course of product testing, a piece of equipment went out of calibration and that piece of equipment was needed to complete product testing, a similar piece of calibrated equipment was substituted. If a substitution was made, that new piece of equipment would be listed in the above table along with the piece that was removed from service.

Equipment used by Motorola (Beijing) Mobility Technologies Co., Ltd.

Manufacturer	Equipment Type	Model No.	Serial Number	Date of Calibration
Rohde Schwarz	Receiver	ESU40	100036	05/16/10
Rohde Schwarz	Receiver	ESCI	100650	03/07/10
Agilent	Attenuator	8491A	MY39263202	03/03/10
Rohde Schwarz	LISN	ENV216	100055	12/19/08

All test equipment was within their calibration date during the time of testing. When equipment went out of calibration during testing it was replaced using a similar piece of calibrated equipment. All these equipments are listed in the equipment list. All equipment is on a one-year calibration cycle.

Description of WLAN Transmitter

The EUT offers WLAN as a feature. The WLAN antenna is mounted inside of the EUT. The antenna installation is permanent. For a more thorough description of the functionality please refer to Exhibit 12 of this package.

As a WLAN transmitter, it is designed operate with other WLAN devices as defined by the industrial standard. In this application, the device is battery operated.

De Facto EIRP Limit – Pursuant 47 CFR 15.247(b)(4); RSS-210 Section A8.4.

Criterion: The conducted output power limit of 1-watt is based on the use of antennas with directional gains that do not exceed 6 dB_i. If transmitting antennas of directional gain greater than 6 dB_i are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dB_i.

The antenna employed by this transmitter is intended to be omni-directional, and thus will not exhibit directional gain in excess of 6 dB_i. The conducted power is less than the limits set forth (see elsewhere in this report for details).

Measurement Procedures and Data

Spectrum Bandwidth

CFR 47 Part 15.247

Measurement Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage.

The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer used the following settings:

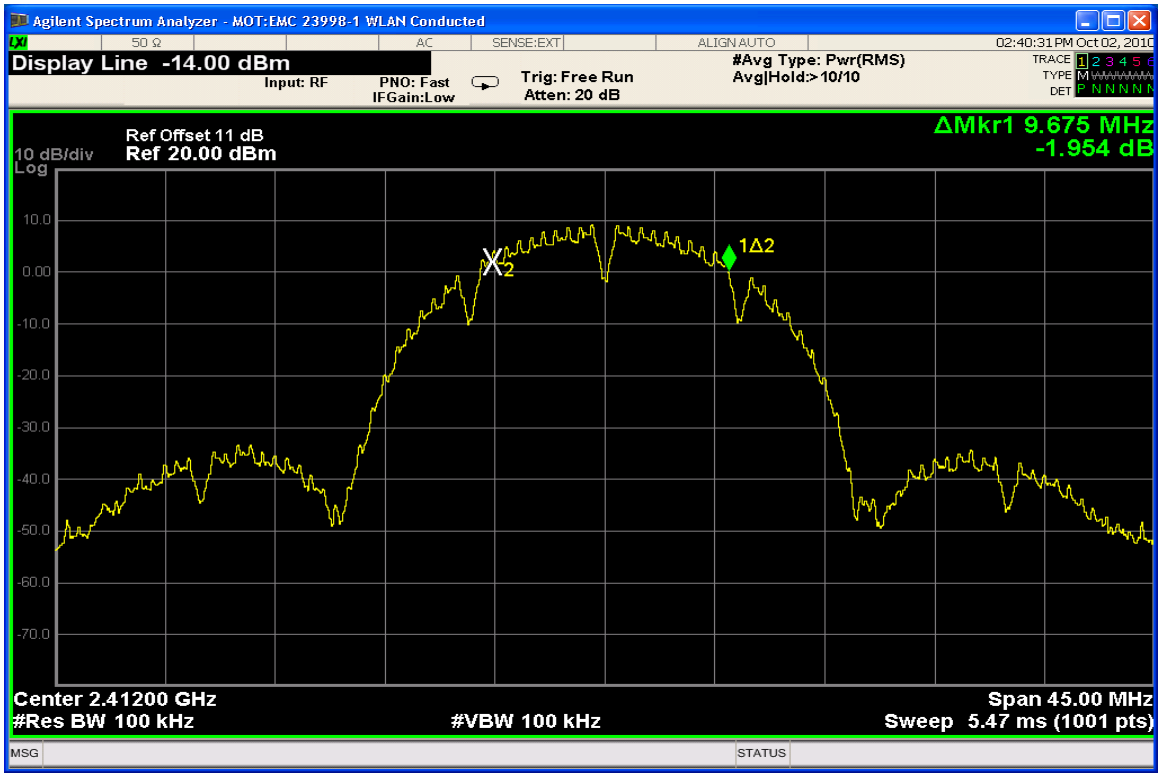
1. RBW ≥ 100 kHz
2. VBW ≥ RBW
3. Sweep = auto
4. Detector function = peak
5. Trace = max hold

The trace was allowed to stabilize. The EUT was transmitting at its maximum data rate. The marker-to-peak function was used to set the marker to the peak of the emission. The marker-delta function was used to measure 6 dB down one side of the emission. The marker-delta function and marker was moved to the other side of the emission until it was even with the reference marker. The marker-delta reading at this point was the 6 dB bandwidth of the emission. The same procedure was repeated for 20 dB bandwidth.

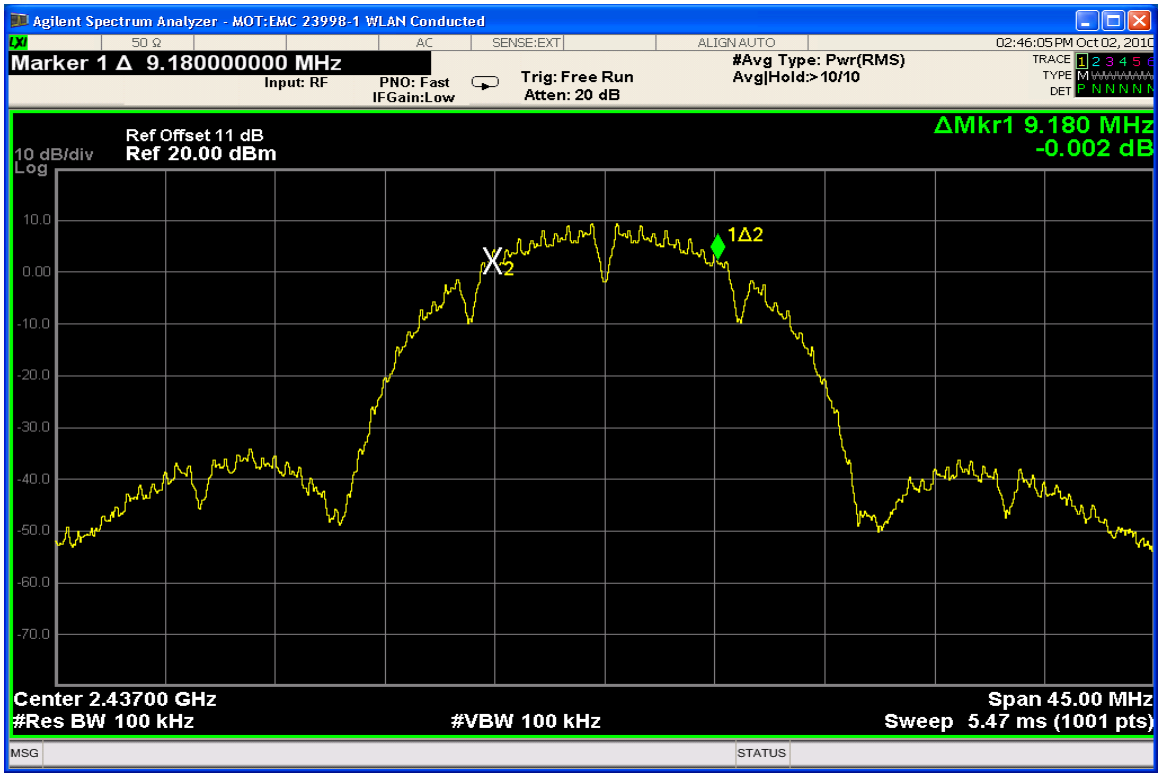
Measurement Results

See attached

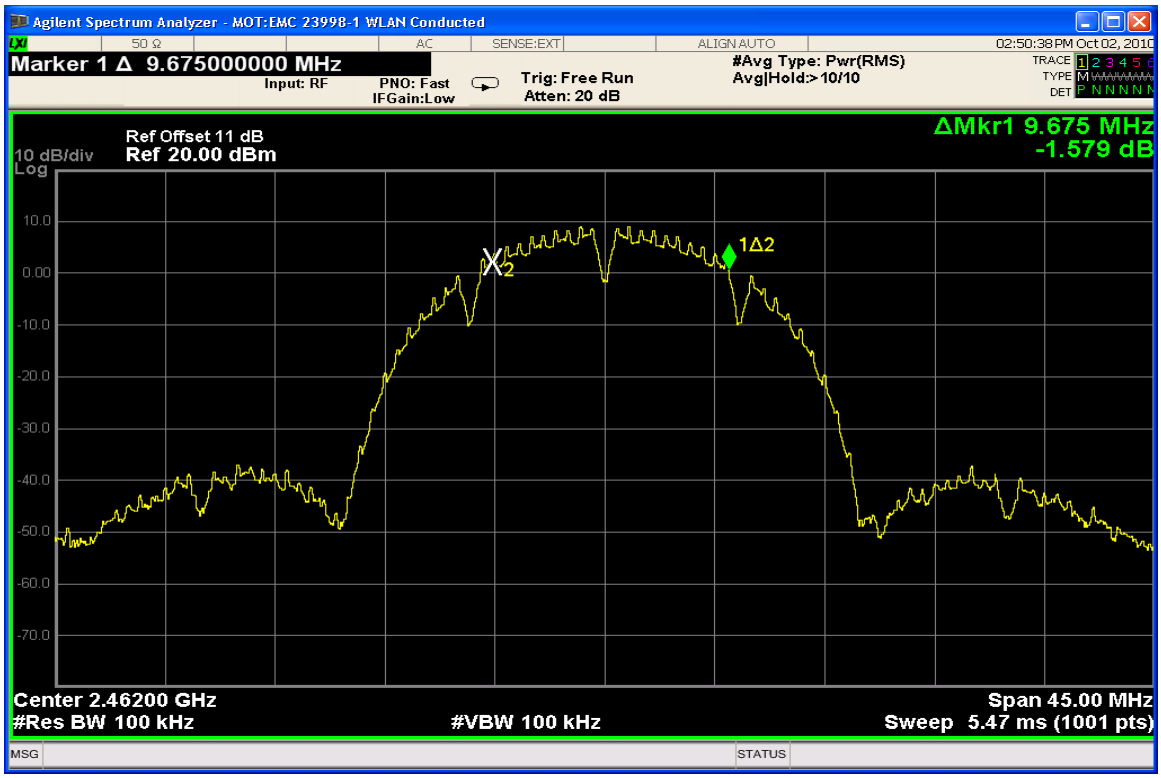
802.11b Mode



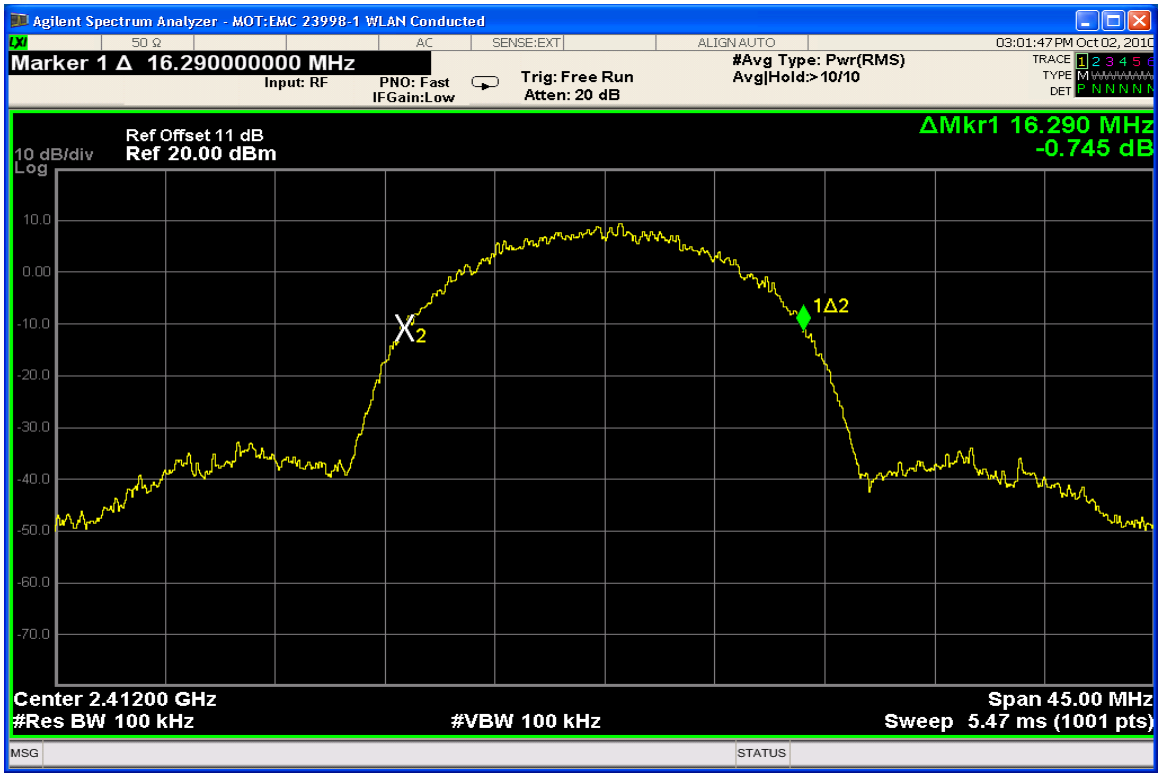
6 dB Bandwidth Channel 1 @ 1Mbps



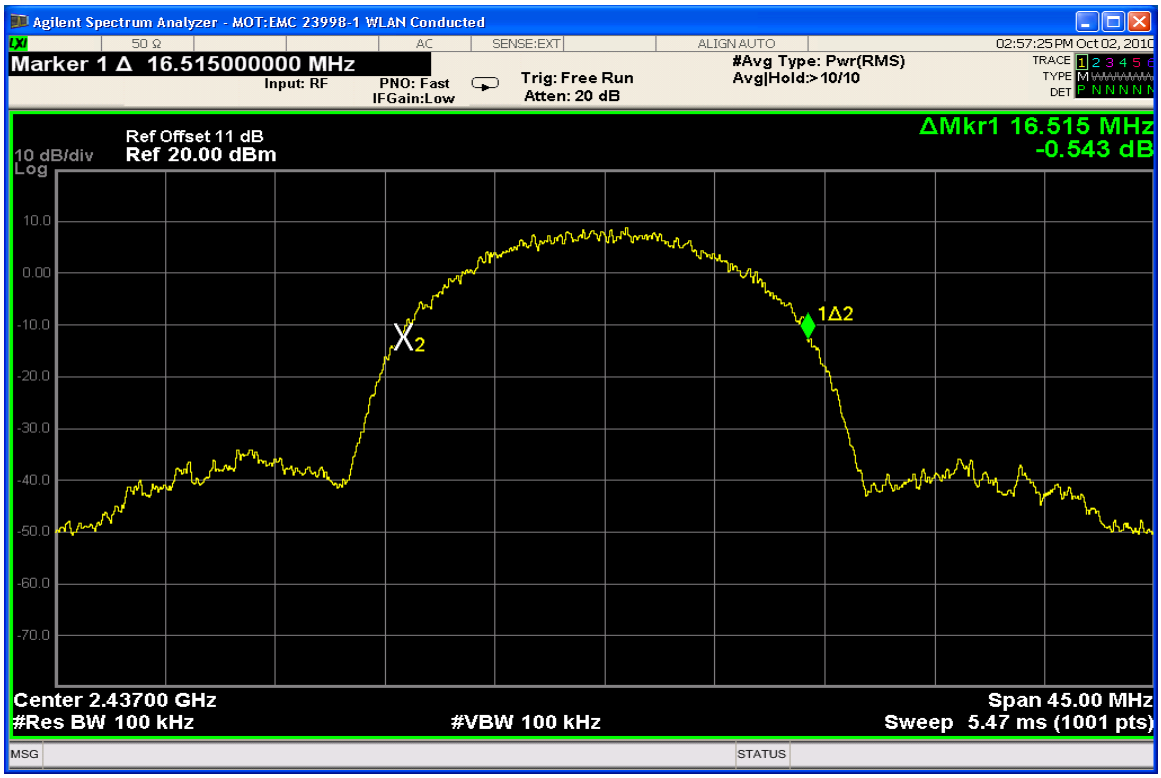
6 dB Bandwidth Channel 6 @ 1Mbps



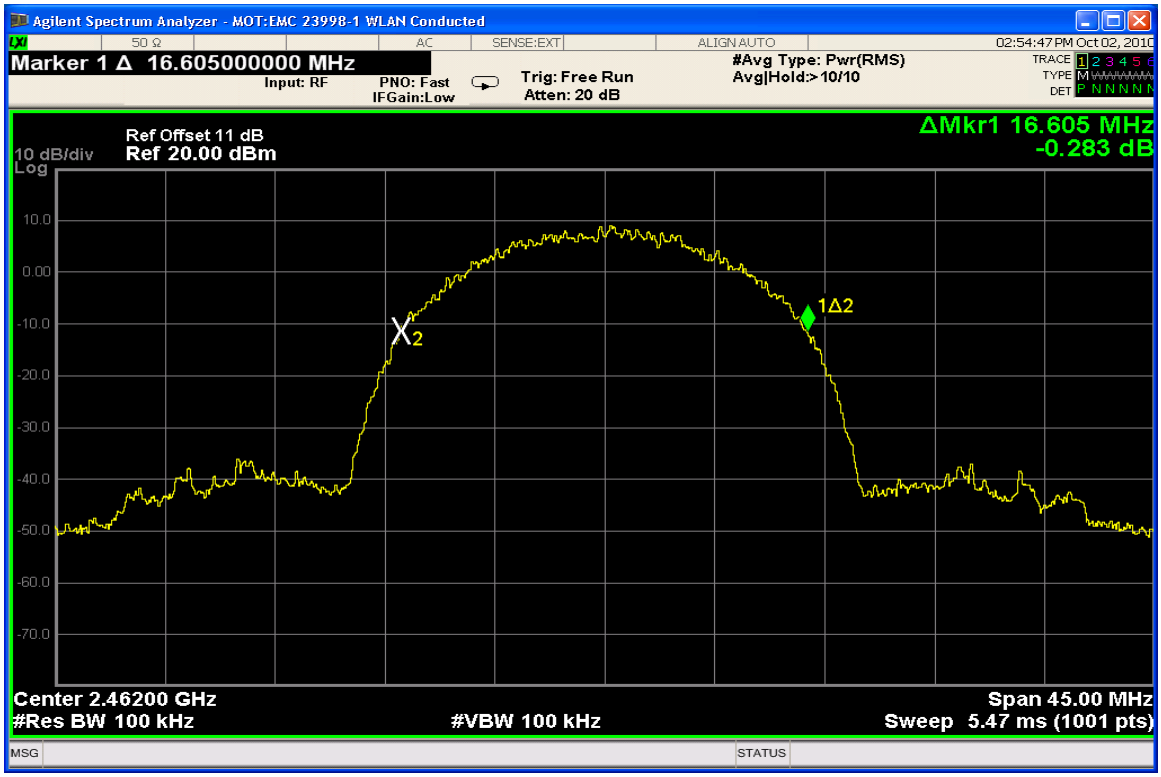
6 dB Bandwidth Channel 11 @ 1Mbps



20 dB Bandwidth Channel 1 @ 11Mbps

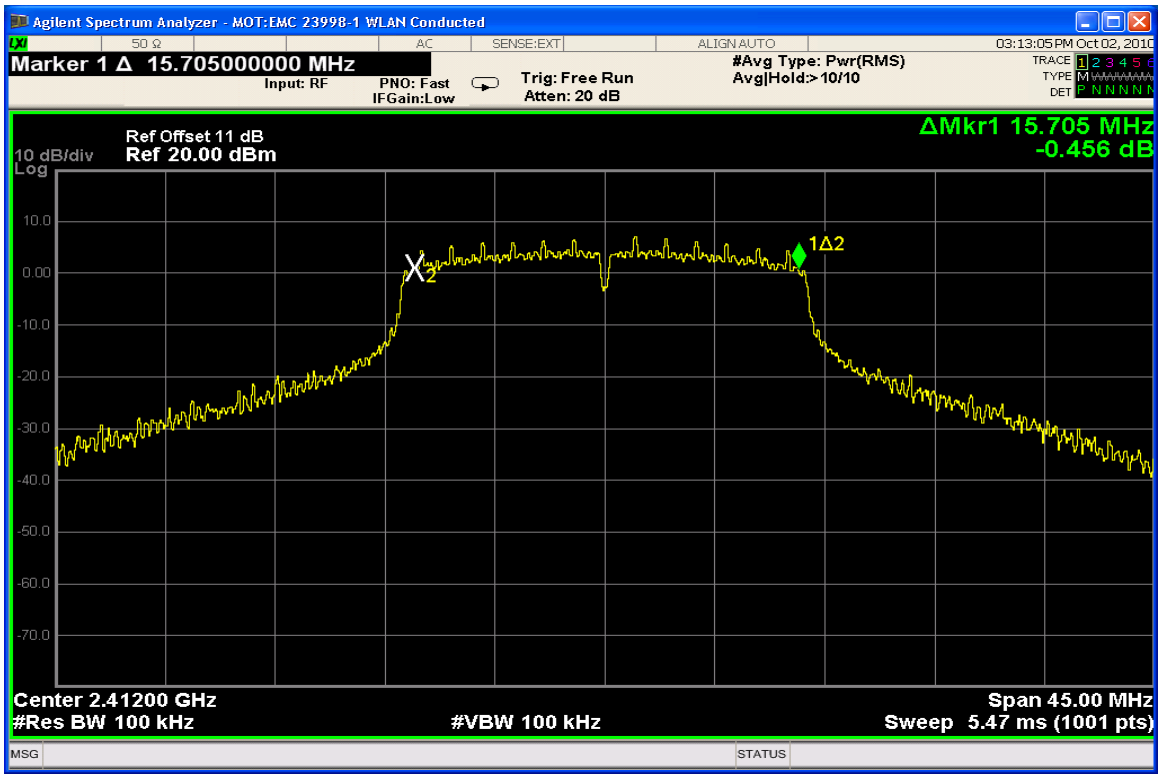


20 dB Bandwidth Channel 6 @ 11Mbps

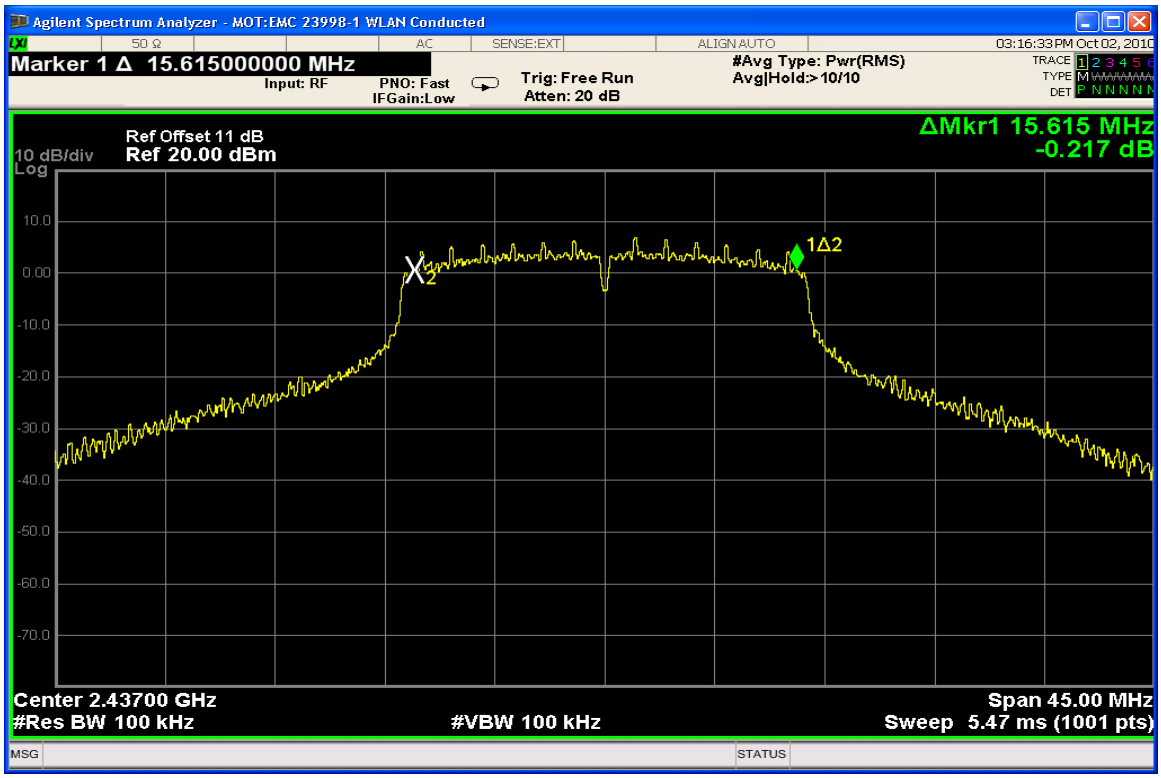


20 dB Bandwidth Channel 11 @ 11Mbps

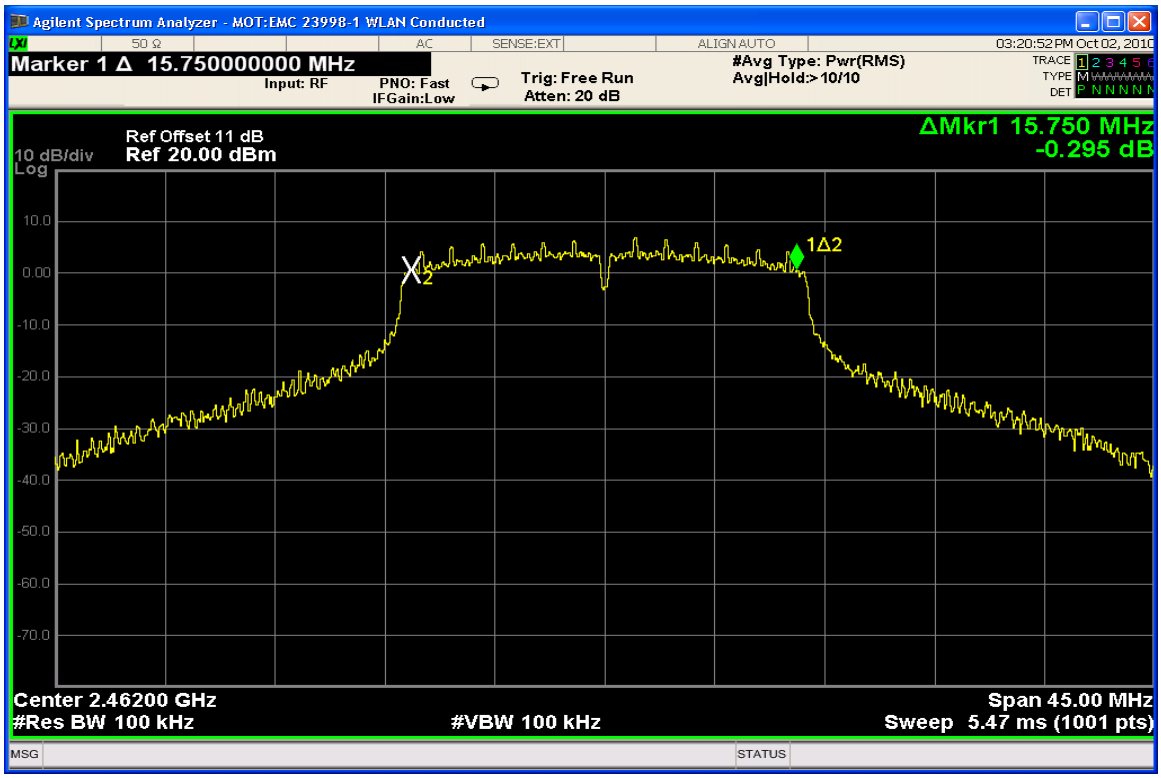
802.11g Mode



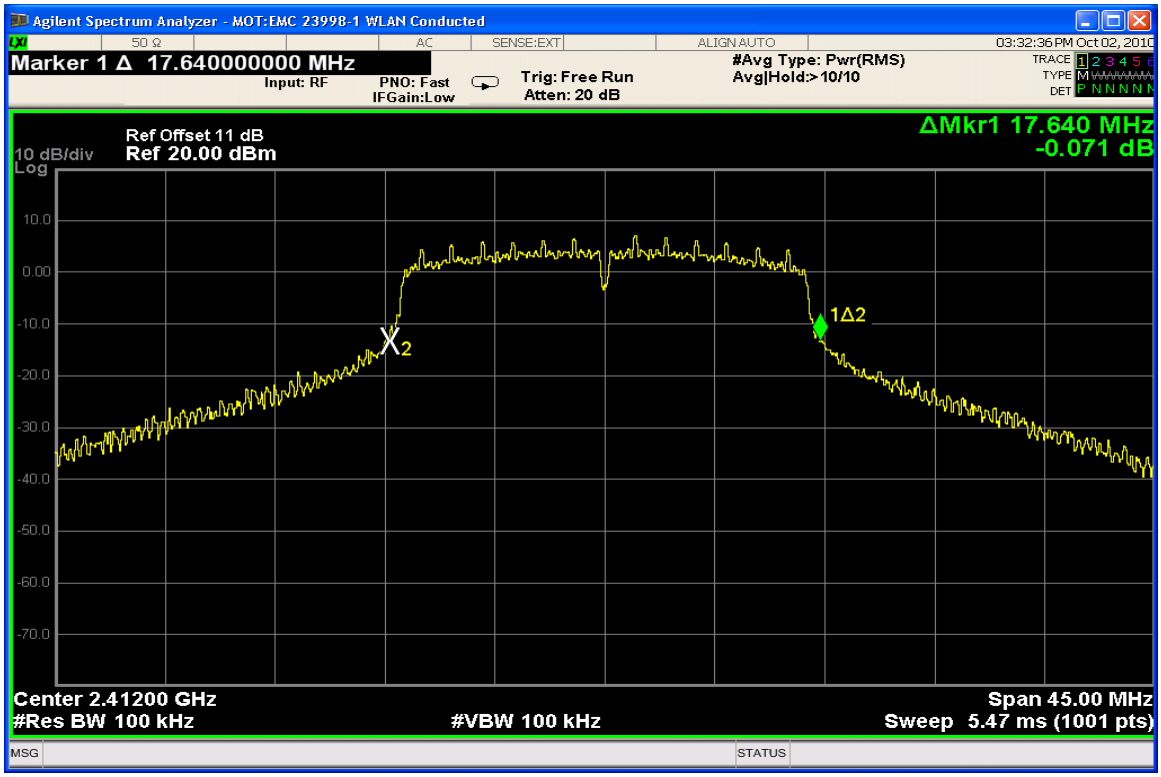
6 dB Bandwidth Channel 1 @ 6Mbps



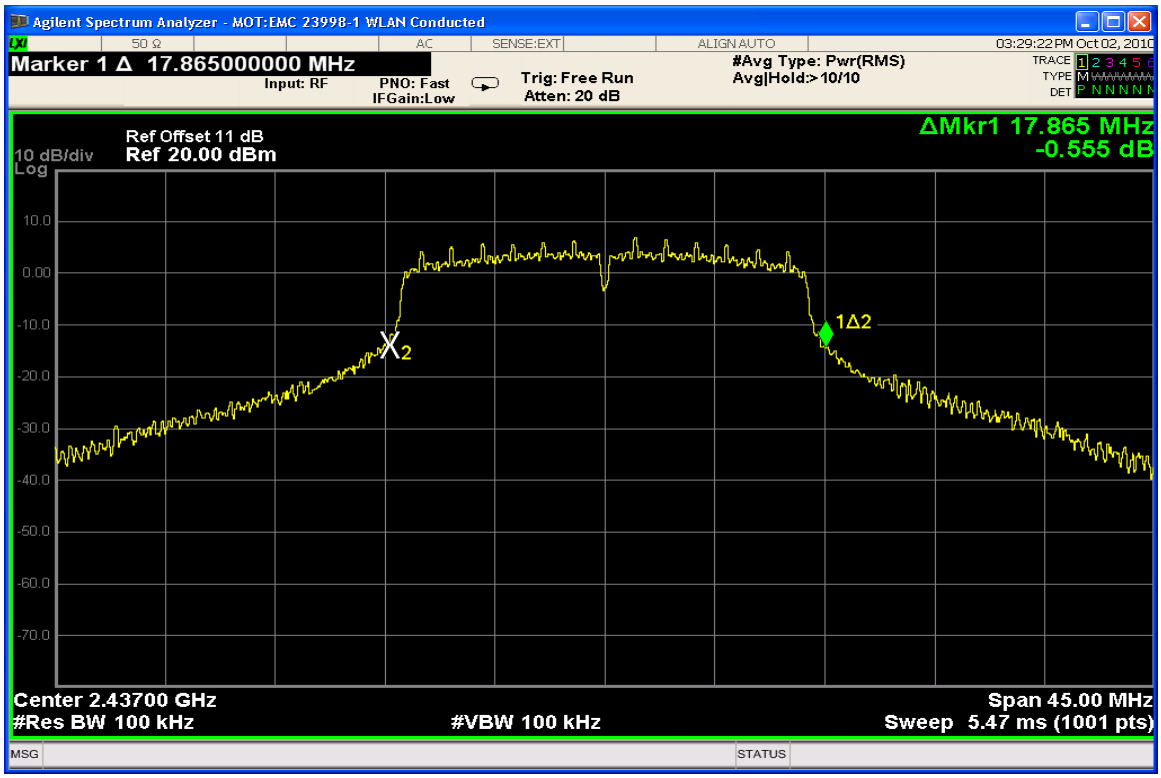
6 dB Bandwidth Channel 6 @ 6Mbps



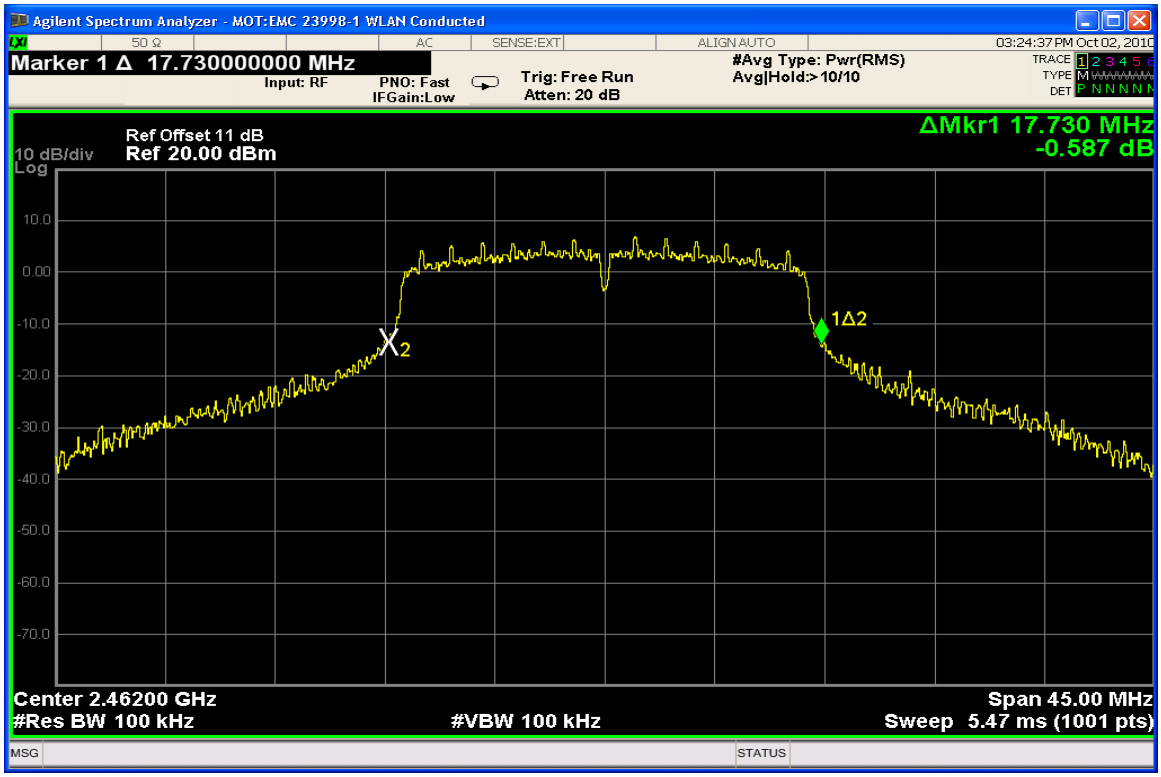
6 dB Bandwidth Channel 11 @ 6Mbps



20 dB Bandwidth Channel 1 @ 6Mbps



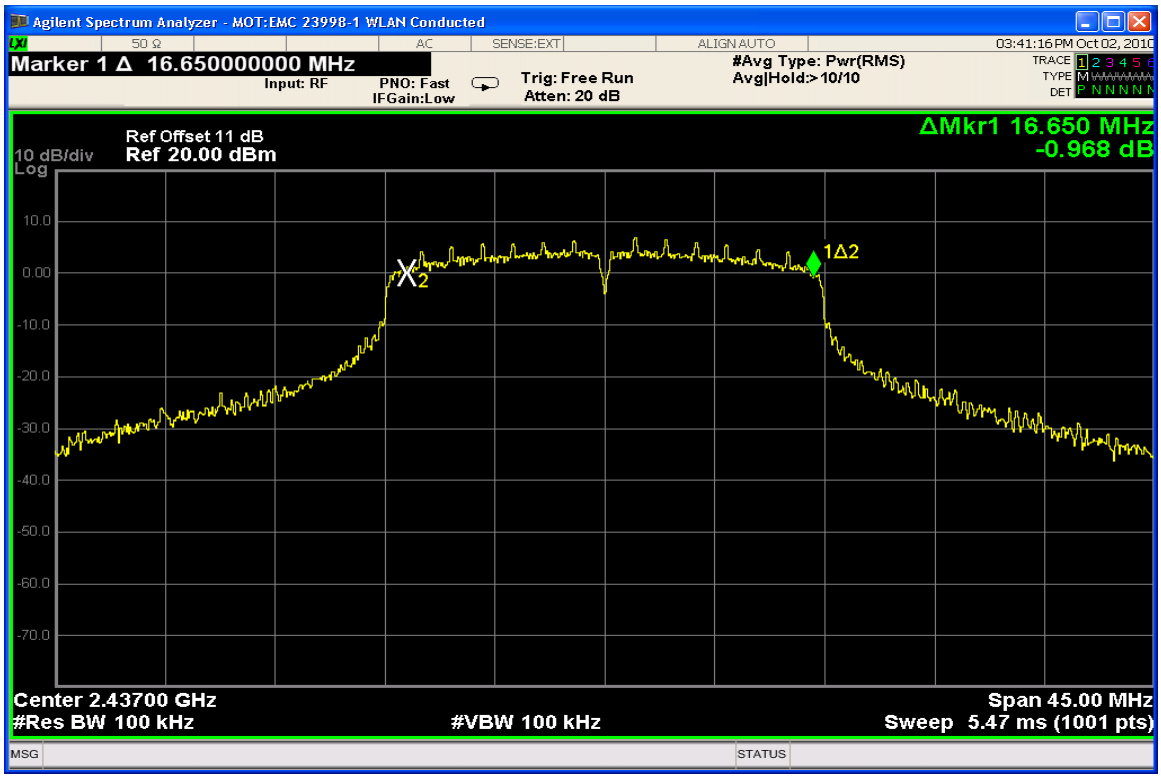
20 dB Bandwidth Channel 6 @ 6Mbps



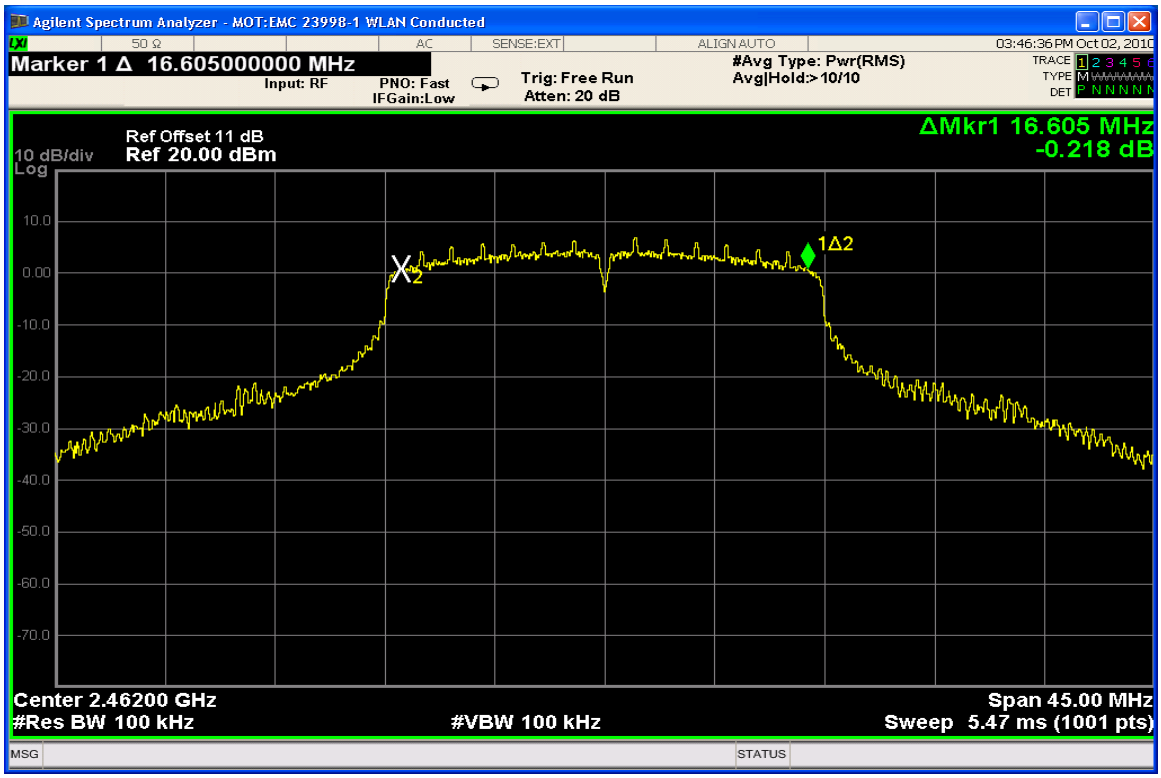
20 dB Bandwidth Channel 11 @ 6Mbps

802.11n 400ns GI

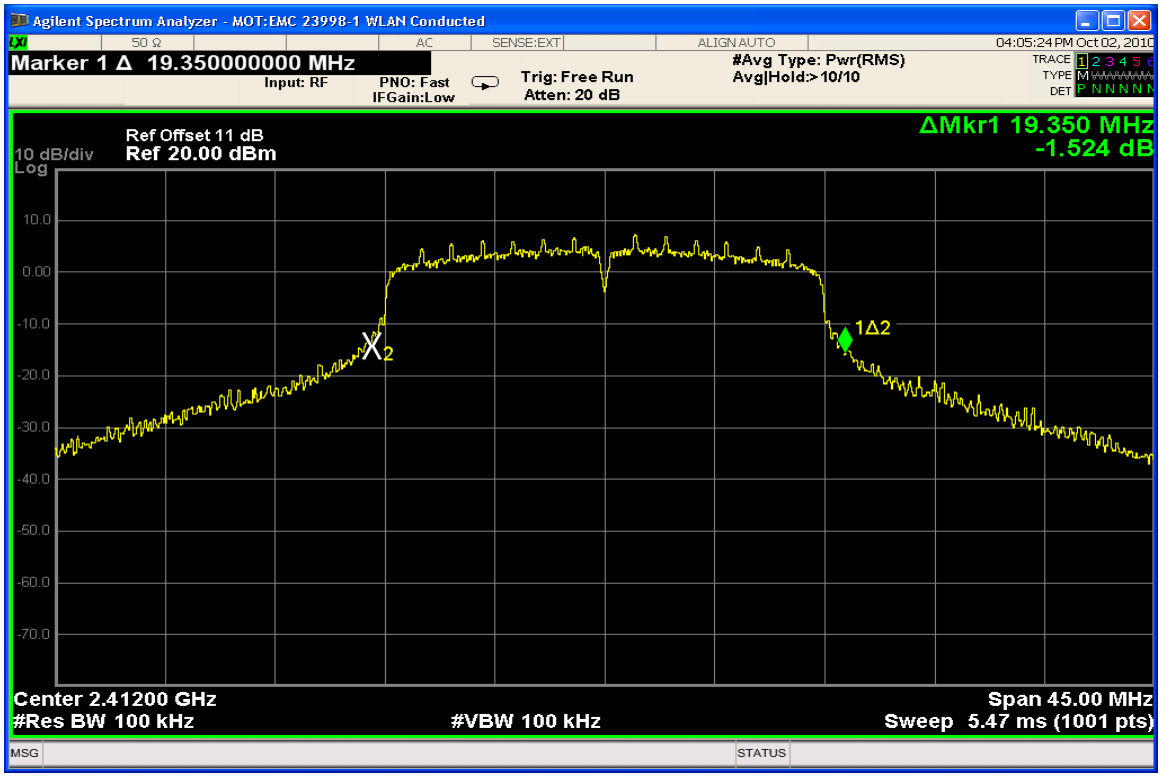
6dB Bandwidth Channel 1 @ 7.2 Mbps



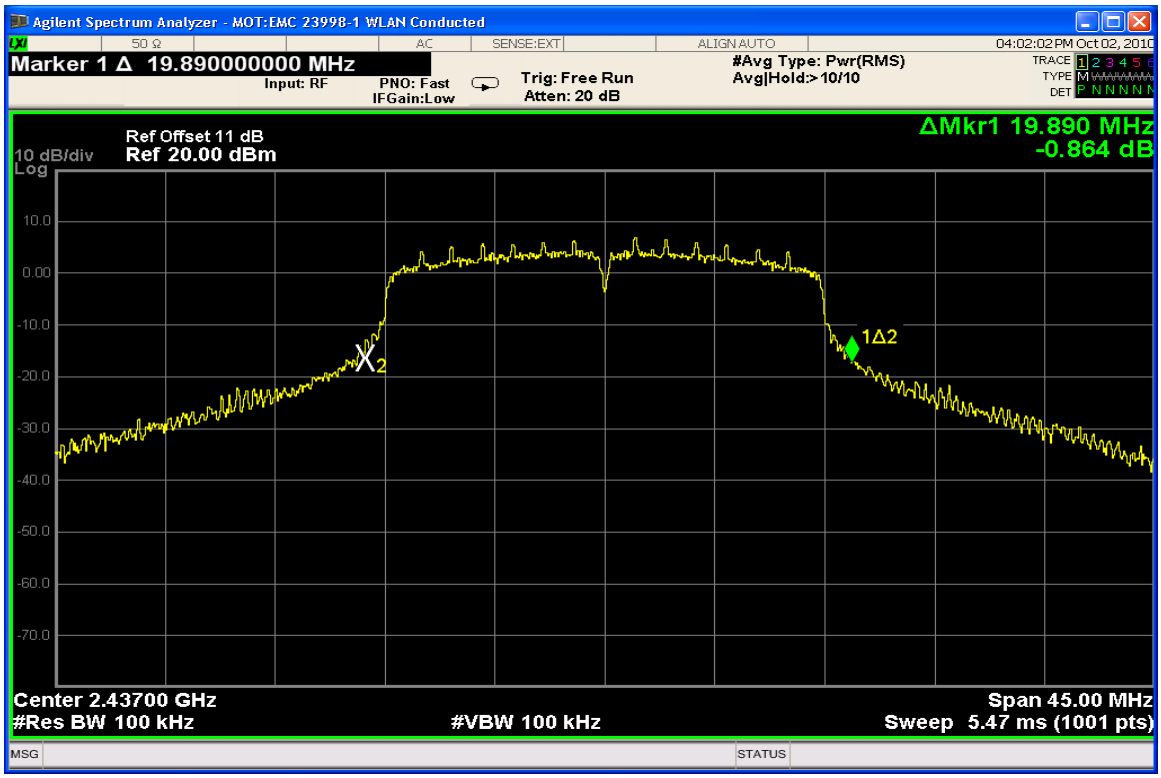
6dB Bandwidth Channel 6 @ 7.2 Mbps



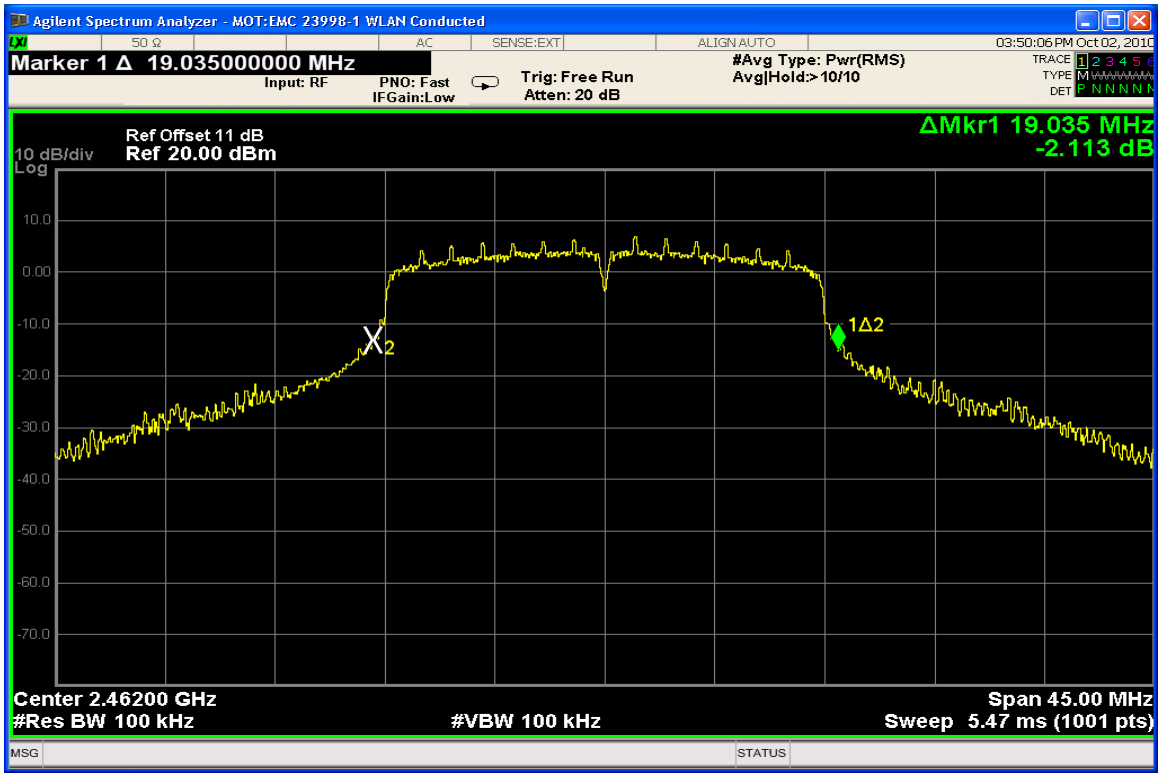
6dB Bandwidth Channel 11 @ 7.2 Mbps



20dB Bandwidth Channel 1 @ 7.2 Mbps

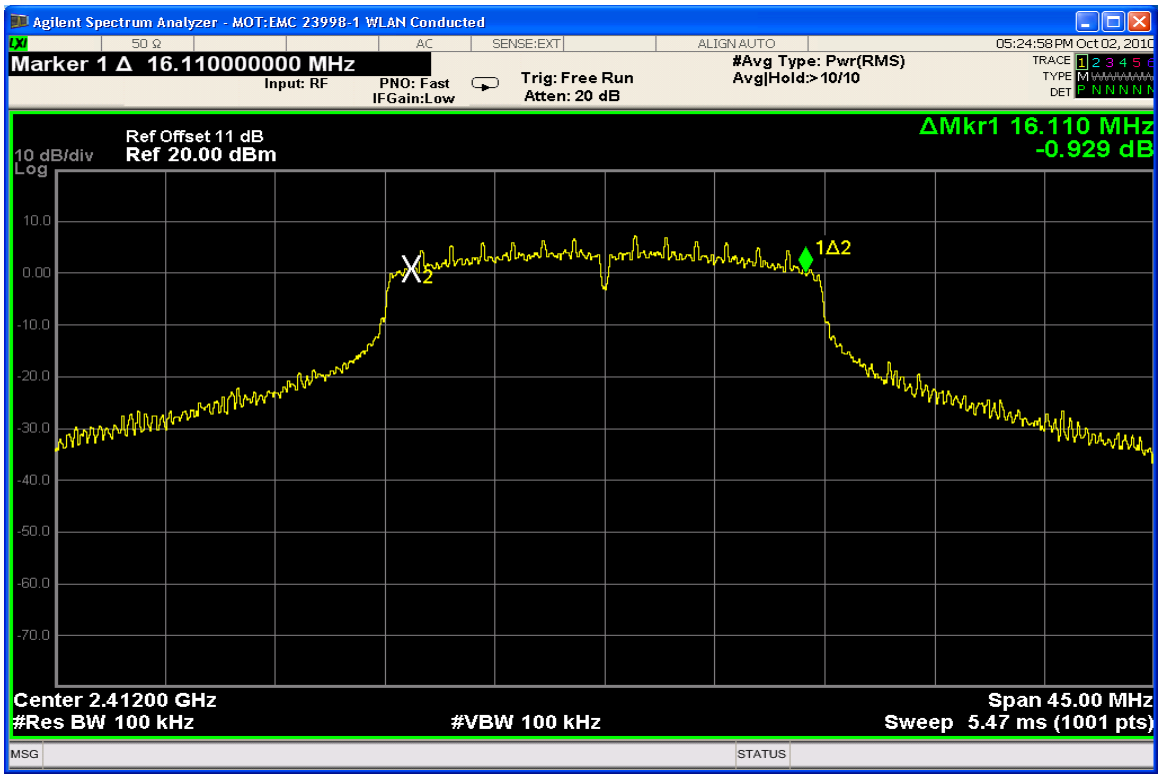


20dB Bandwidth Channel 6 @ 7.2 Mbps

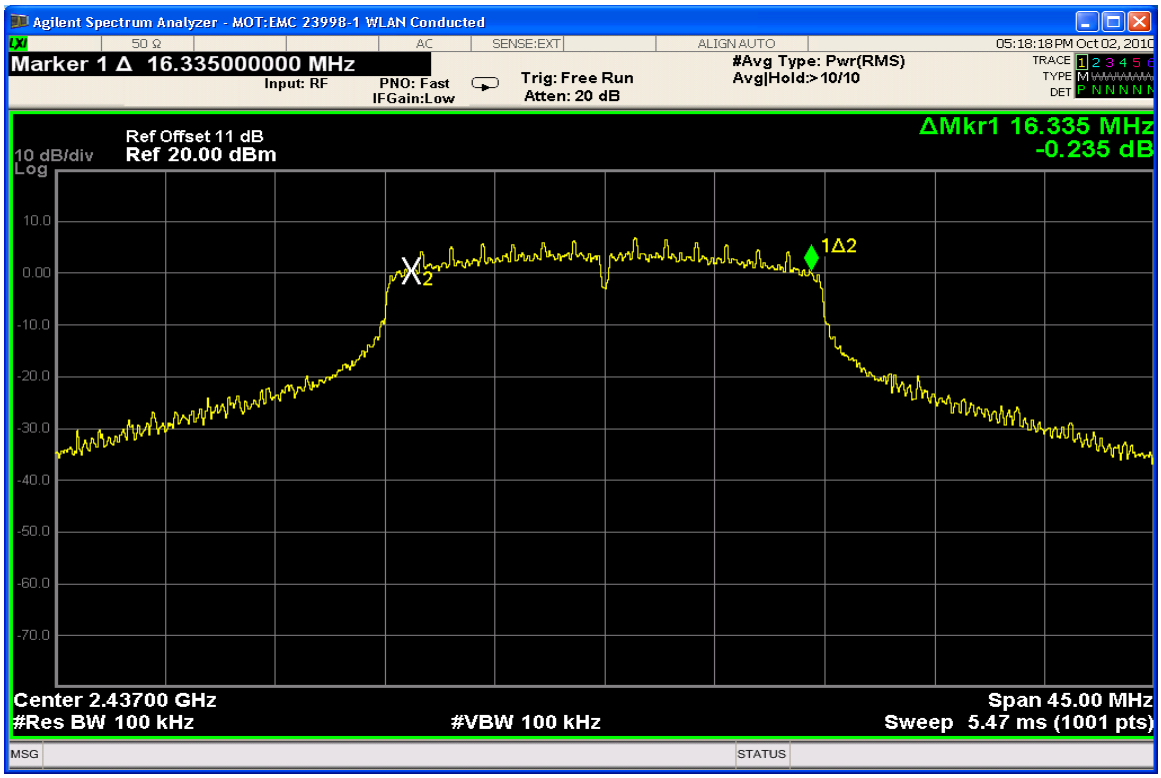


20dB Bandwidth Channel 11 @ 7.2 Mbps

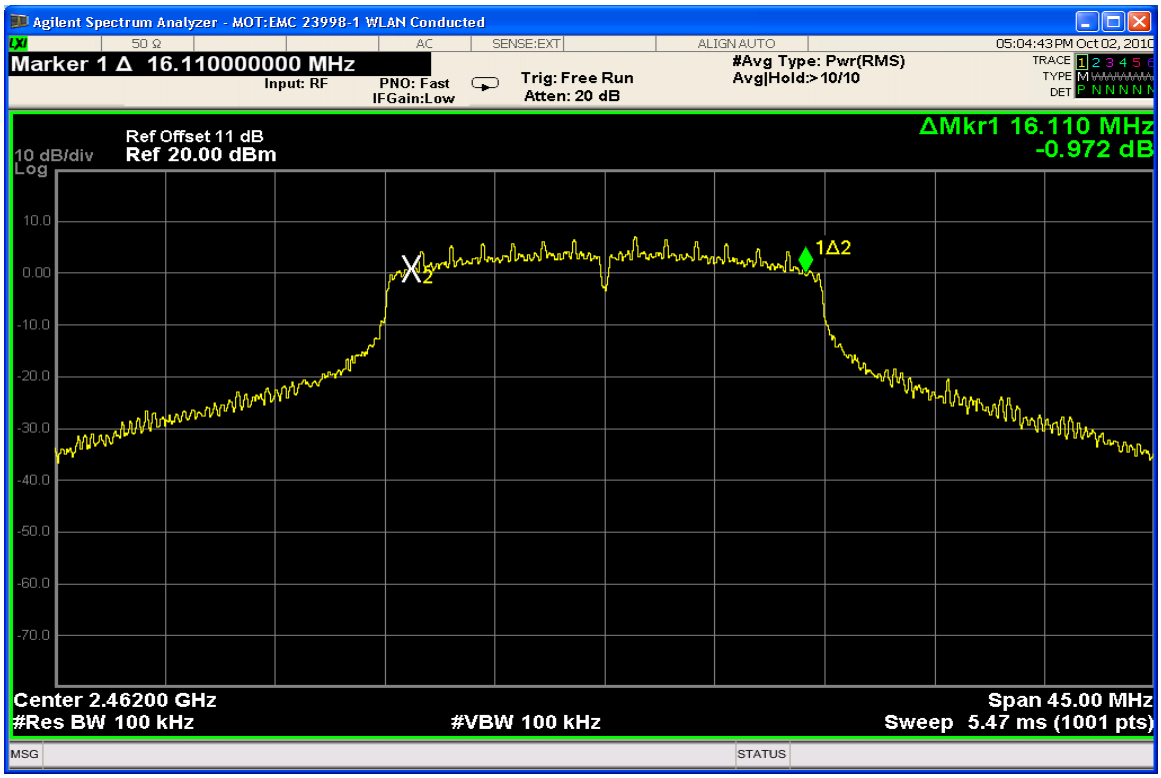
802.11n 800ns GI Mode



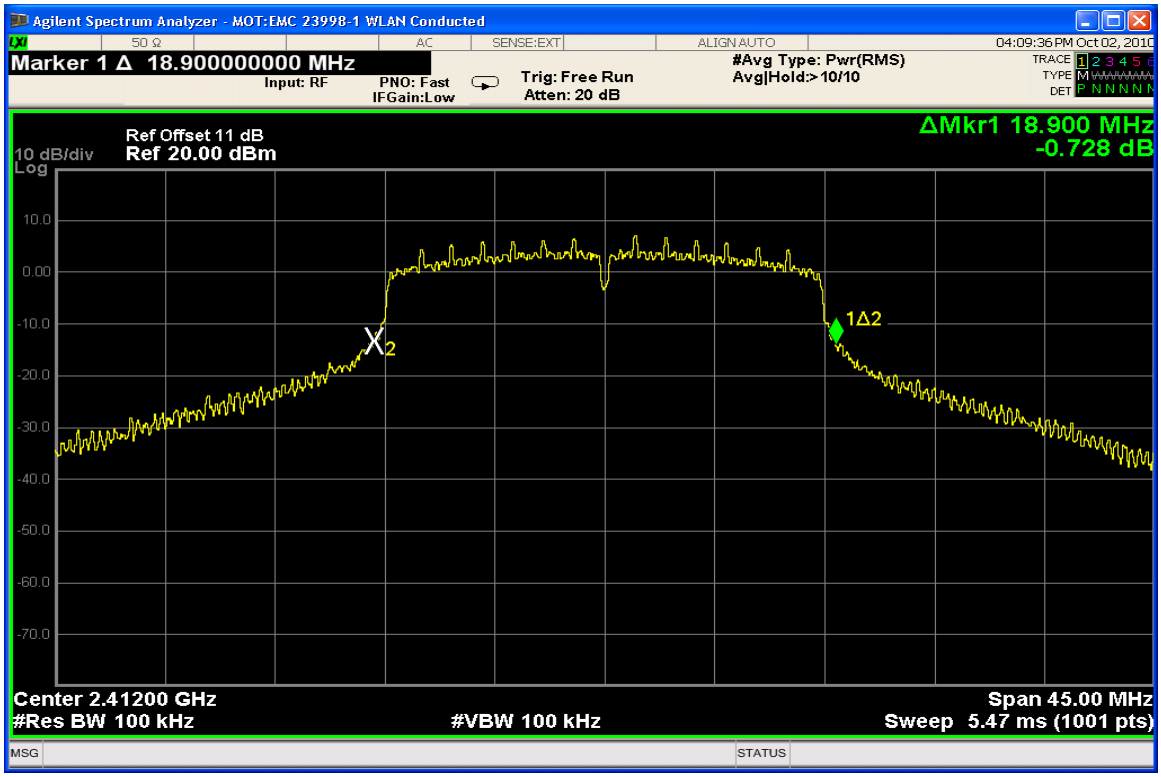
6 dB Bandwidth Channel 1 @ 6.5Mbps



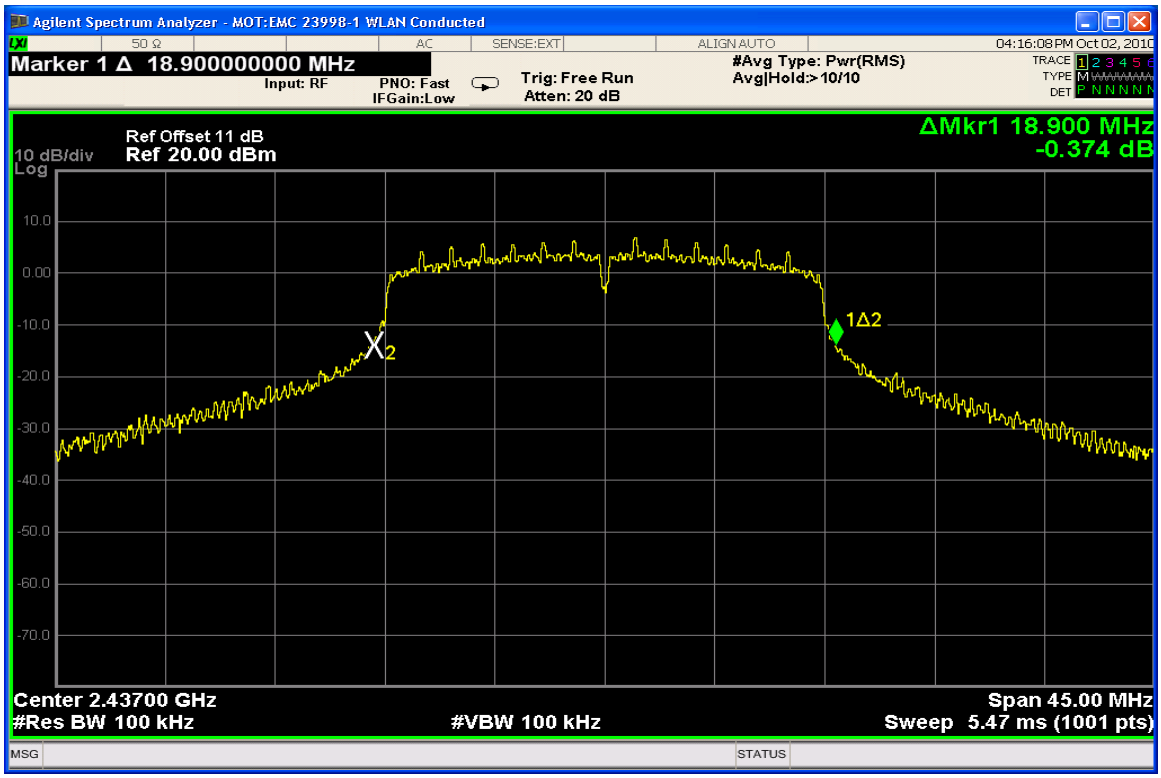
6 dB Bandwidth Channel 6 @ 6.5Mbps



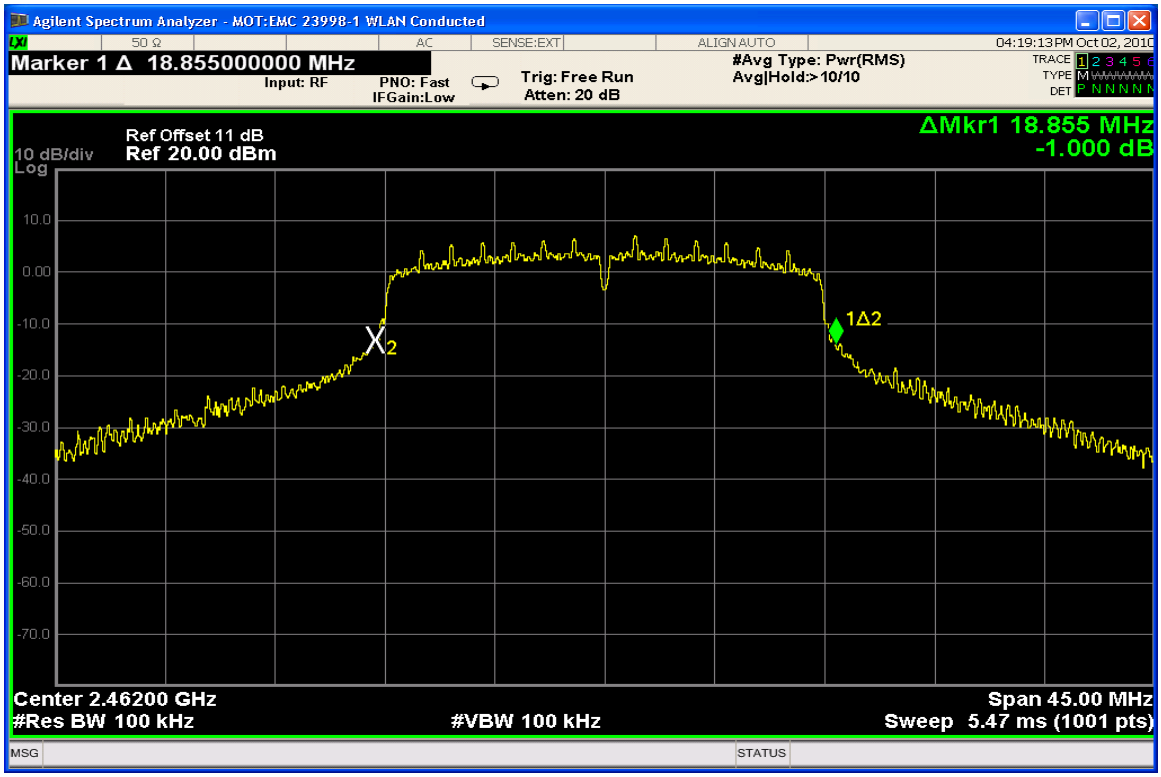
6 dB Bandwidth Channel 11 @ 6.5Mbps



20 dB Bandwidth Channel 1 @ 6.5Mbps



20 dB Bandwidth Channel 6 @ 6.5Mbps



20 dB Bandwidth Channel 11 @ 6.5Mbps

PEAK OUTPUT POWER

CFR 47 Part 15.247

Measurement Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the Spectrum analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. Initially, an average detector is used to measure power in the low, middle and high channels for all data rates. The average measurements are used to determine which data rate is to be fully tested for each supported mode. Using a peak detector, the power is then measured for the applicable data rates.

Measurement Results

See Attached

Initial average power measurments

Channel	Average power (dBm) for 802.11b Data Rates			
	1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
1	14.61	14.67	15.61	15.54
6	14.79	14.88	15.92	15.79
11	14.9	15.04	15.98	16

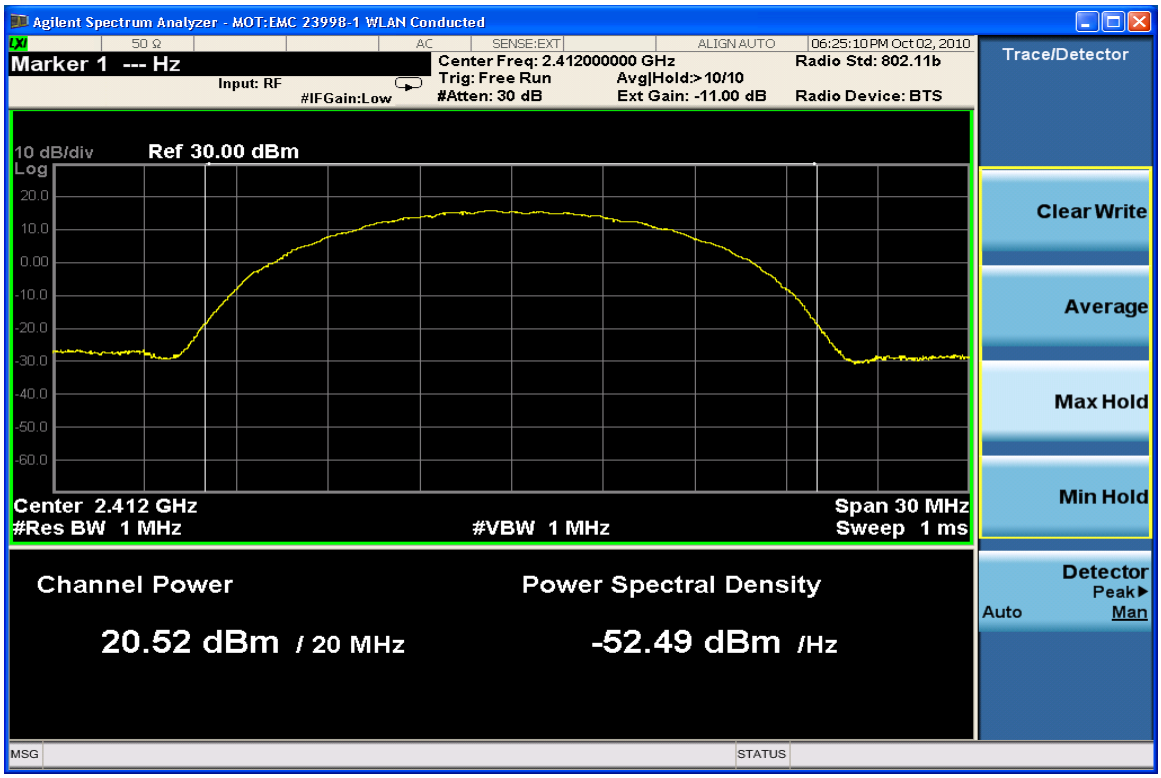
Channel	Average power (dBm) for 802.11g Data Rates							
	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
1	14.73	14.81	15.04	14.71	14.2	14.19	13.37	12.89
6	15.06	15.04	15.23	15.02	14.53	14.43	13.15	13.17
11	15.22	15.21	15.38	15.18	14.69	14.71	13.39	13.32

Channel	Average power (dBm) for 802.11n Data Rates							
	20MHz BW, 400ns GI							
	7.2 Mbps	14.4 Mbps	21.7 Mbps	28.9 Mbps	43.3 Mbps	57.8 Mbps	65 Mbps	72.2 Mbps
1	14.66	14.72	14.85	14.32	14.2	12.84	12.72	11.94
6	14.94	14.94	15.09	14.41	14.42	13.06	12.96	12.11
11	15.09	15.12	15.16	14.57	14.6	13.13	13.13	12.28

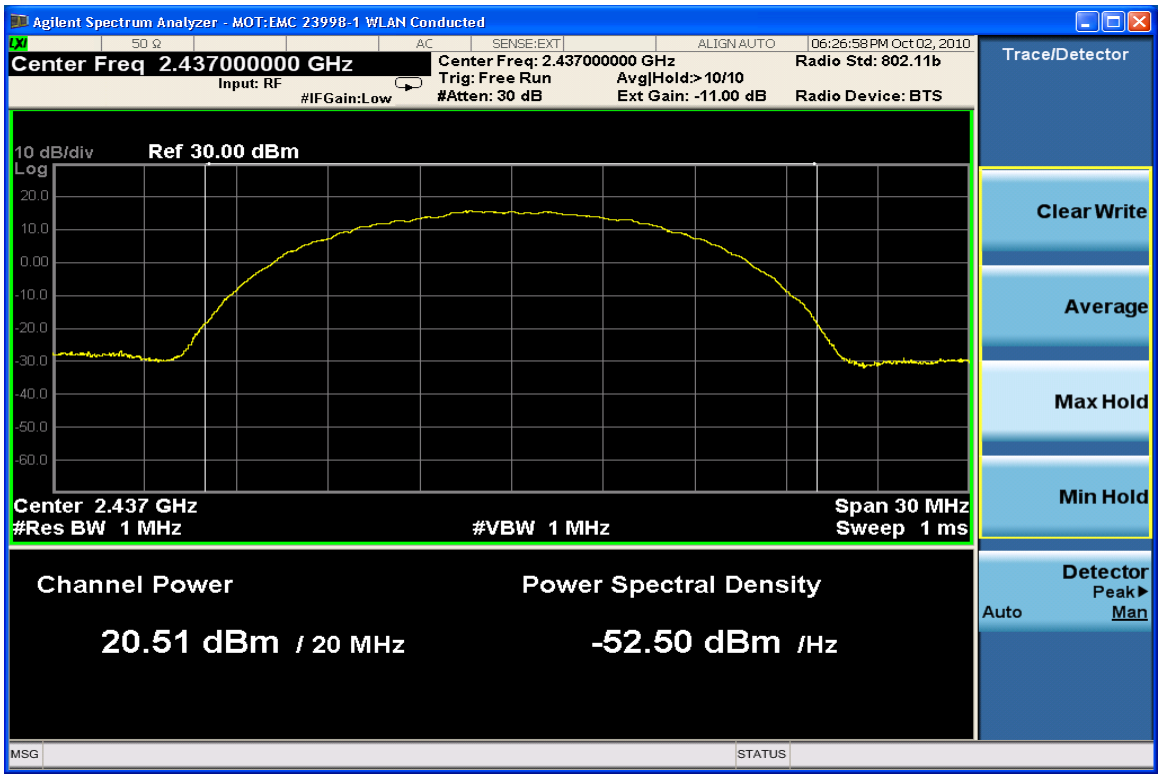
Channel	Average power (dBm) for 802.11n Data Rates							
	20MHz BW, 800ns GI							
	6.5 Mbps	13 Mbps	19.5 Mbps	26 Mbps	39 Mbps	52 Mbps	58.5 Mbps	65 Mbps
1	14.71	14.85	14.88	14.38	14.42	12.94	12.39	11.66
6	14.95	15.08	15.11	14.51	14.63	13.15	12.61	11.95
11	15.07	15.27	15.3	14.67	14.72	13.28	13.3	12.07

Based on these initial measurements, it was determined that testing will be performed in the 11Mbps data rate for the 802.11b mode, the 6Mbps data rate for the 802.11g mode, the 7.2Mbps data rate for 802.11n 400ns GI mode and 6.5Mbps data rate for 802.11n 800ns GI mode. Plots showing the peak power measurements for the applicable data rates follow.

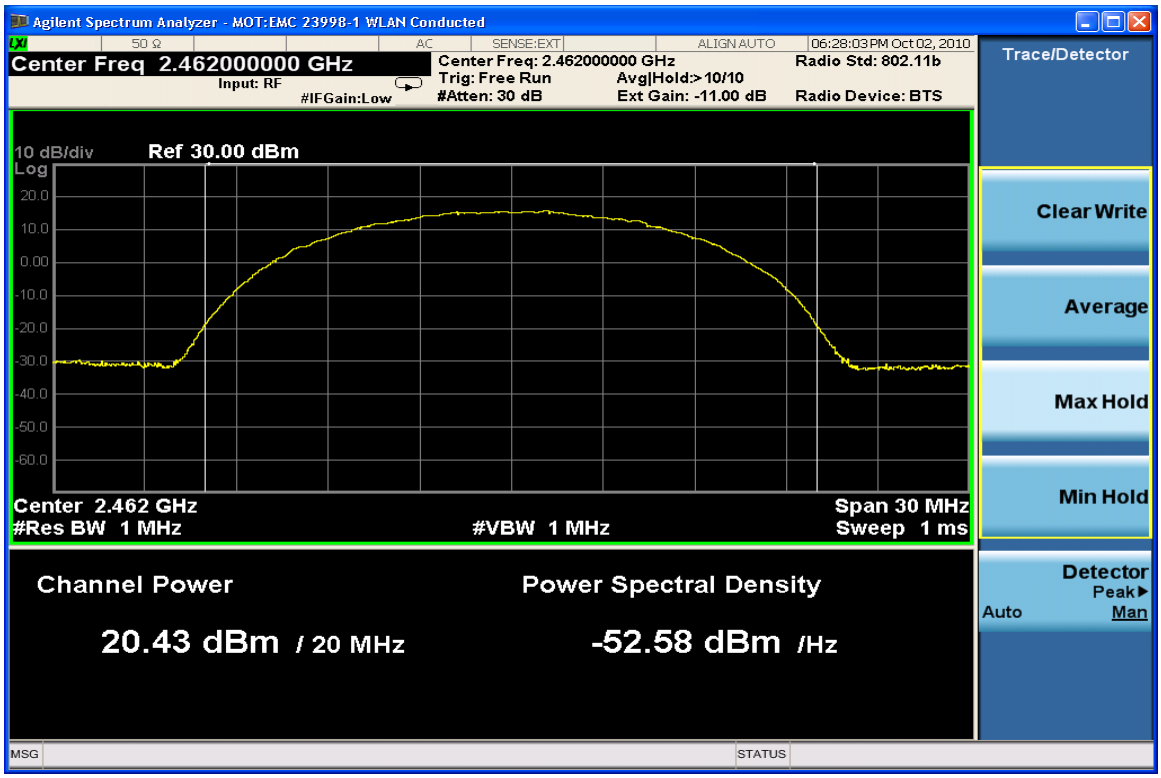
802.11b Mode



Max. Power Channel 1 @ 11Mbps

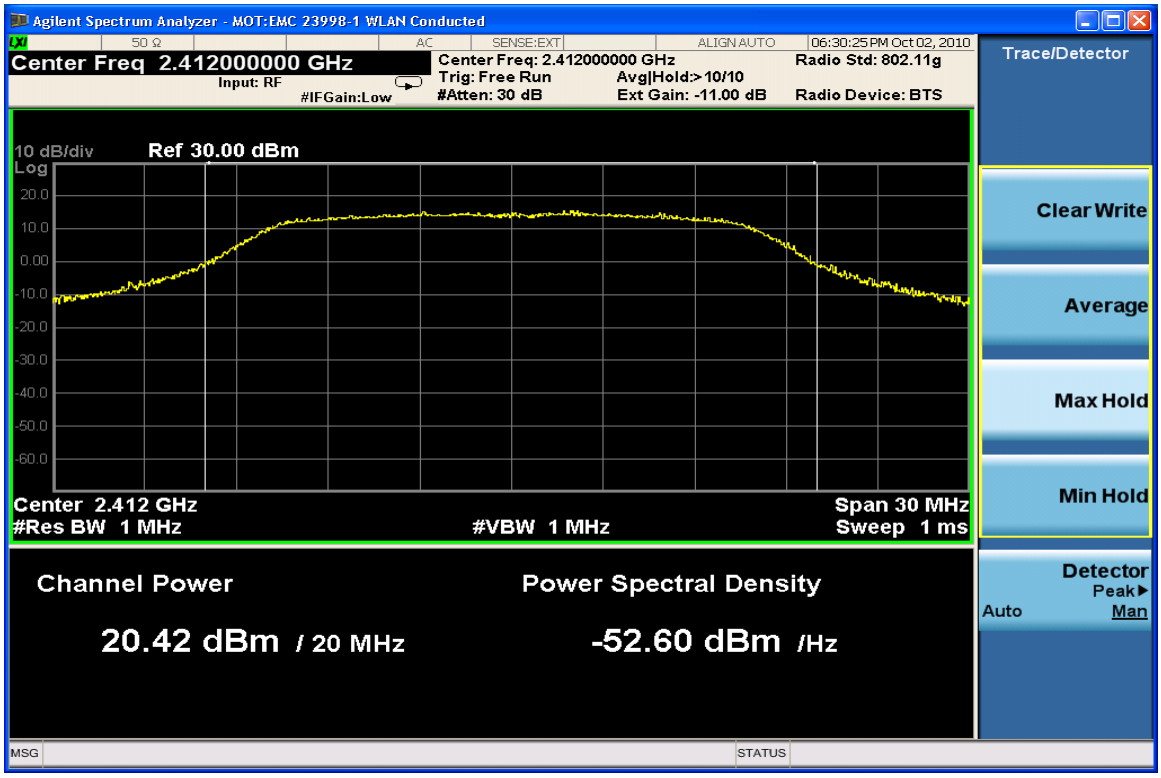


Max. Power Channel 6 @ 11Mbps

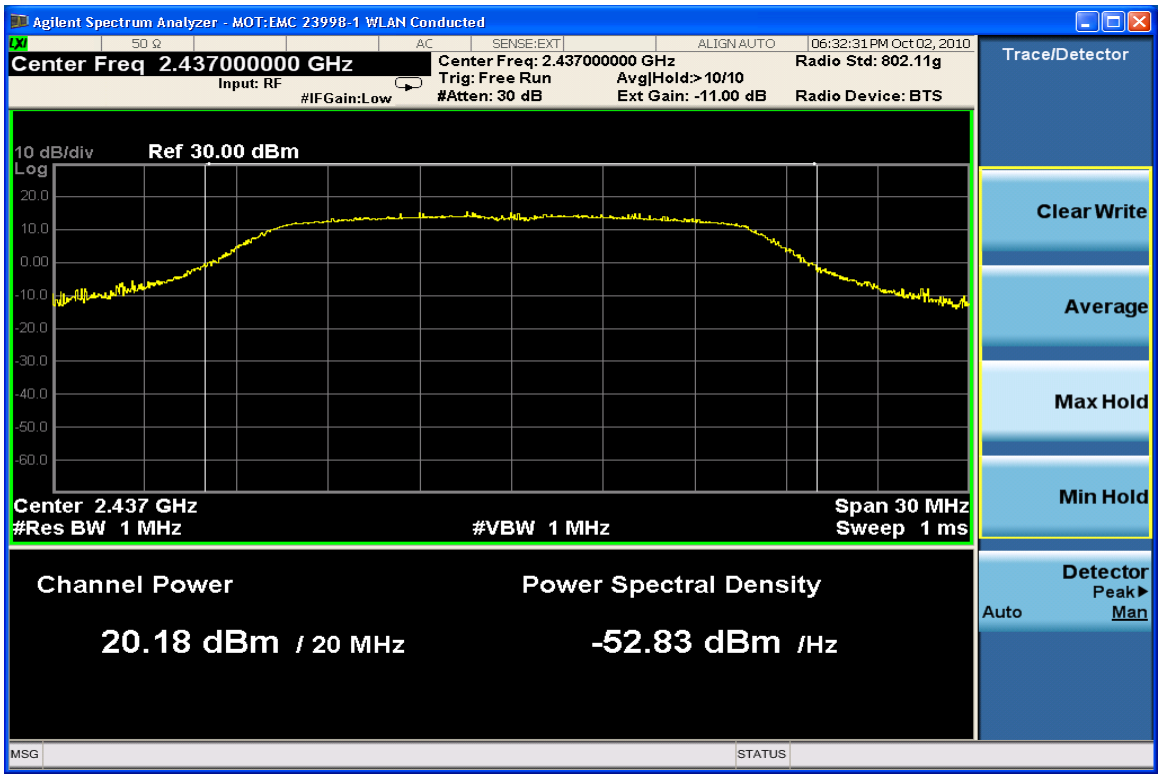


Max. Power Channel 11 @ 11Mbps

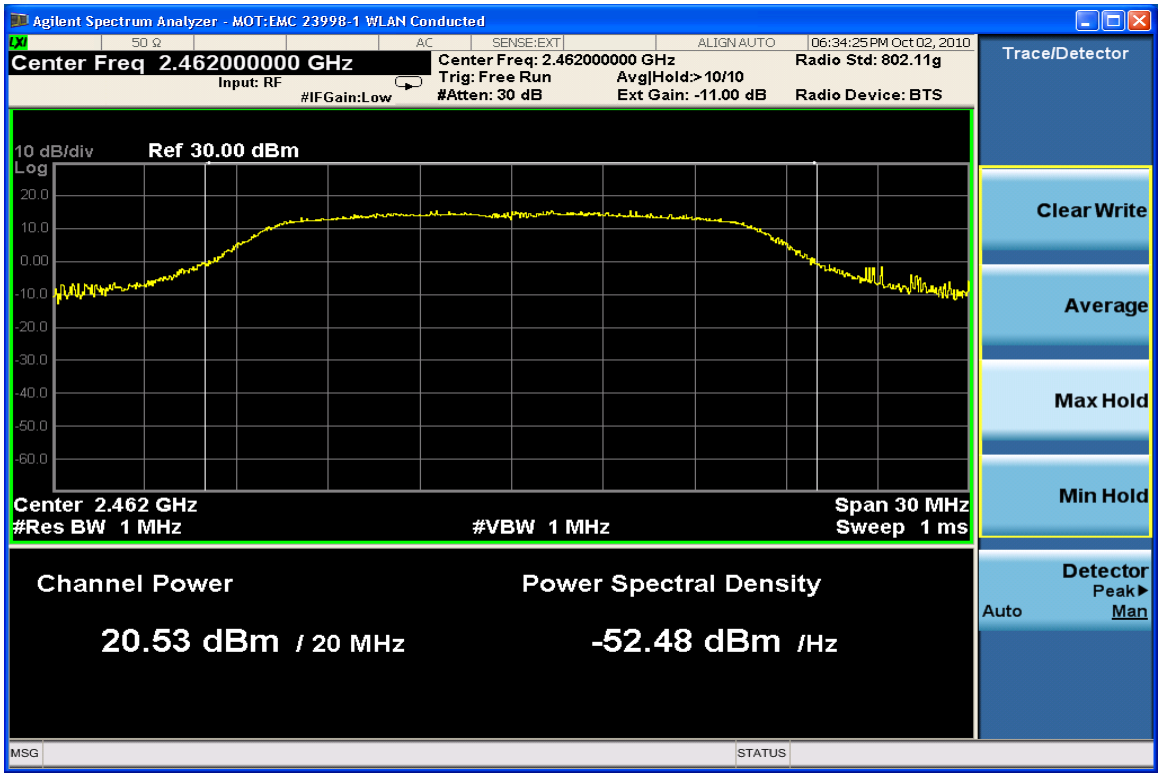
802.11g Mode



Max. Power Channel 1 @ 6Mbps

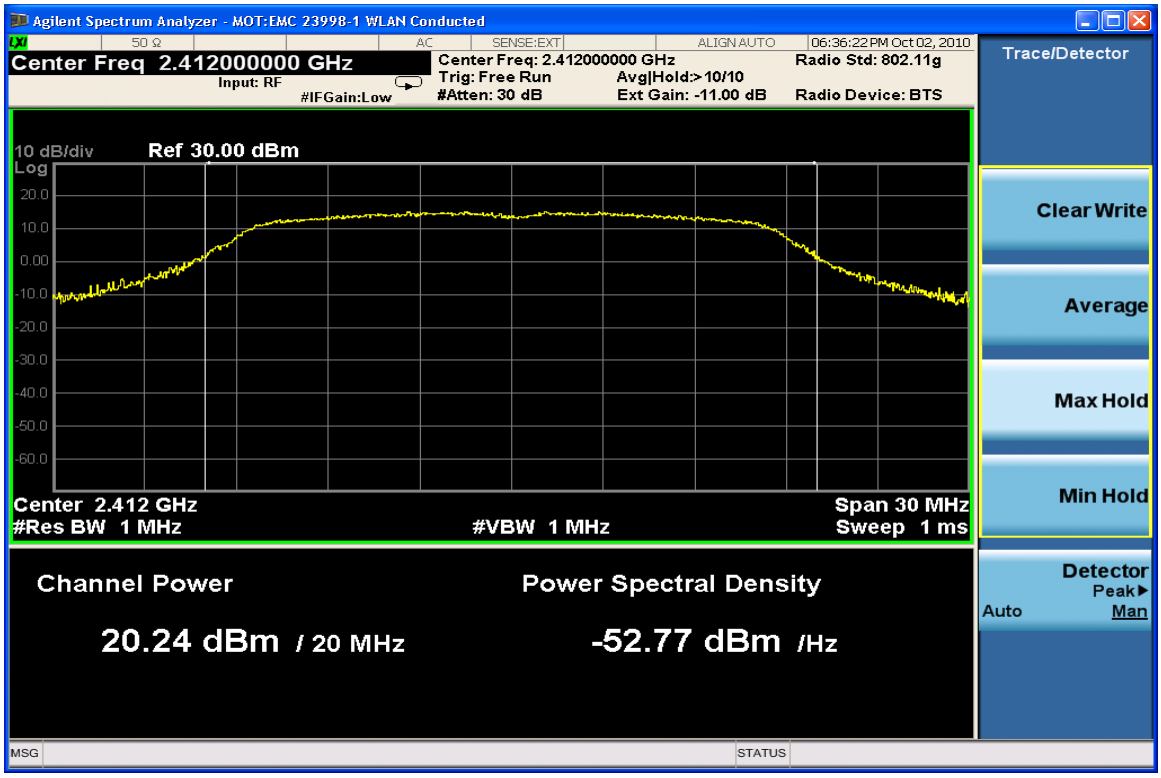


Max. Power Channel 6 @ 6Mbps

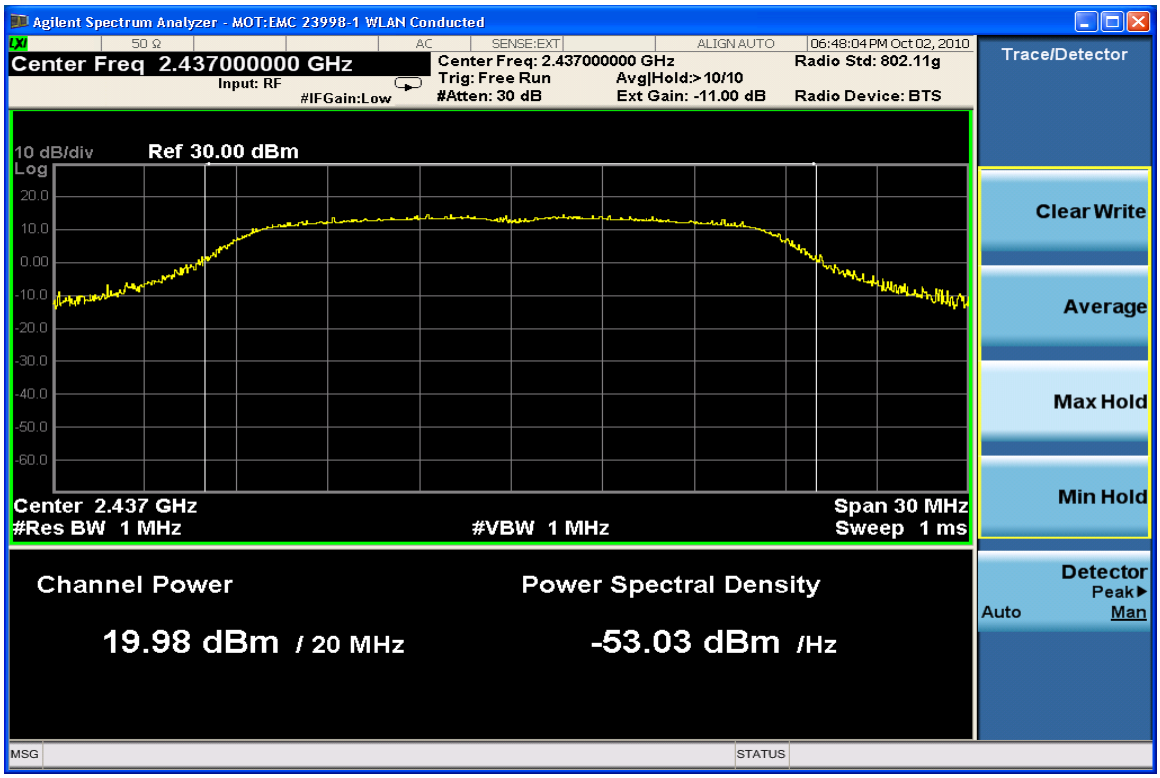


Max. Power Channel 11 @ 6Mbps

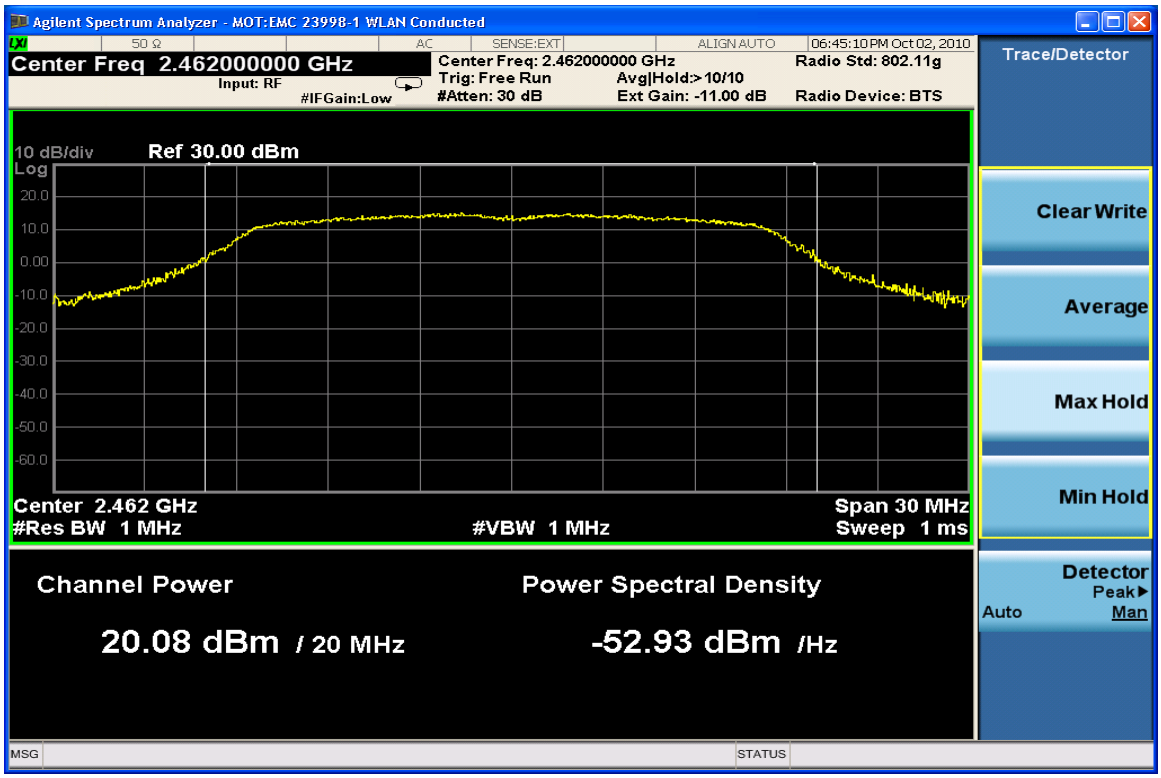
802.11n 400ns GI Mode



Max. Power Channel 1 @ 7.2Mbps

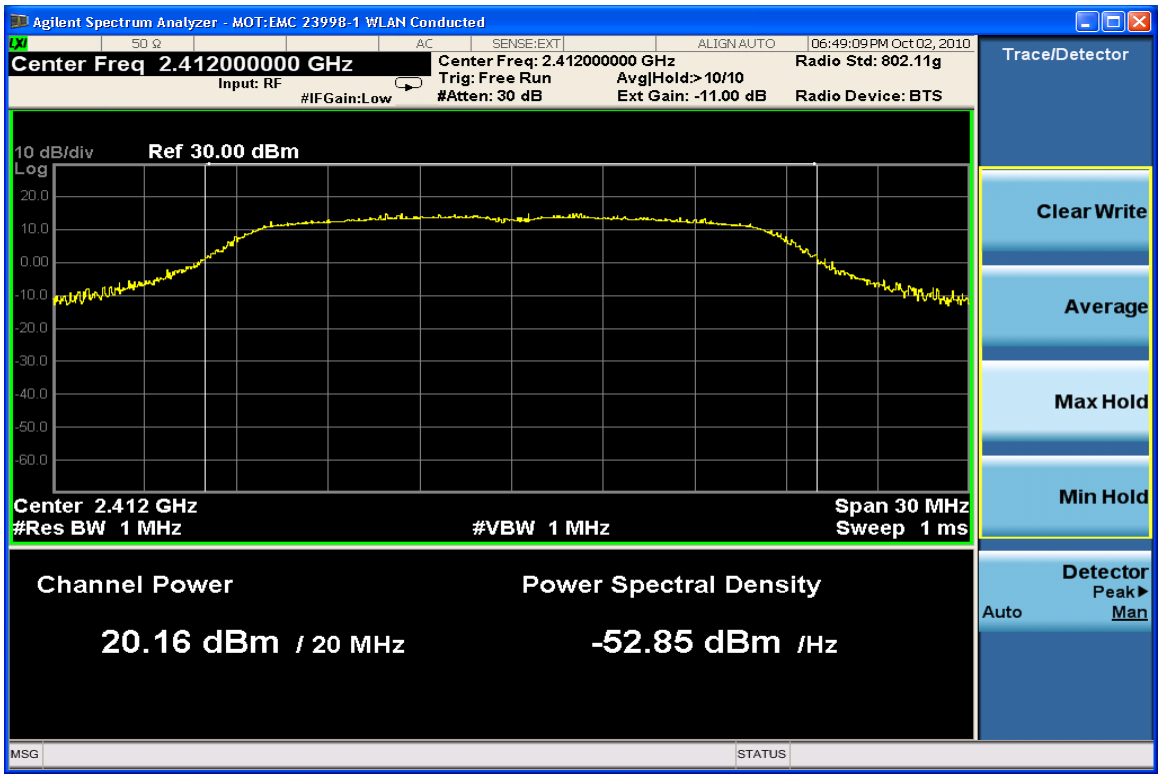


Max. Power Channel 6 @ 7.2Mbps

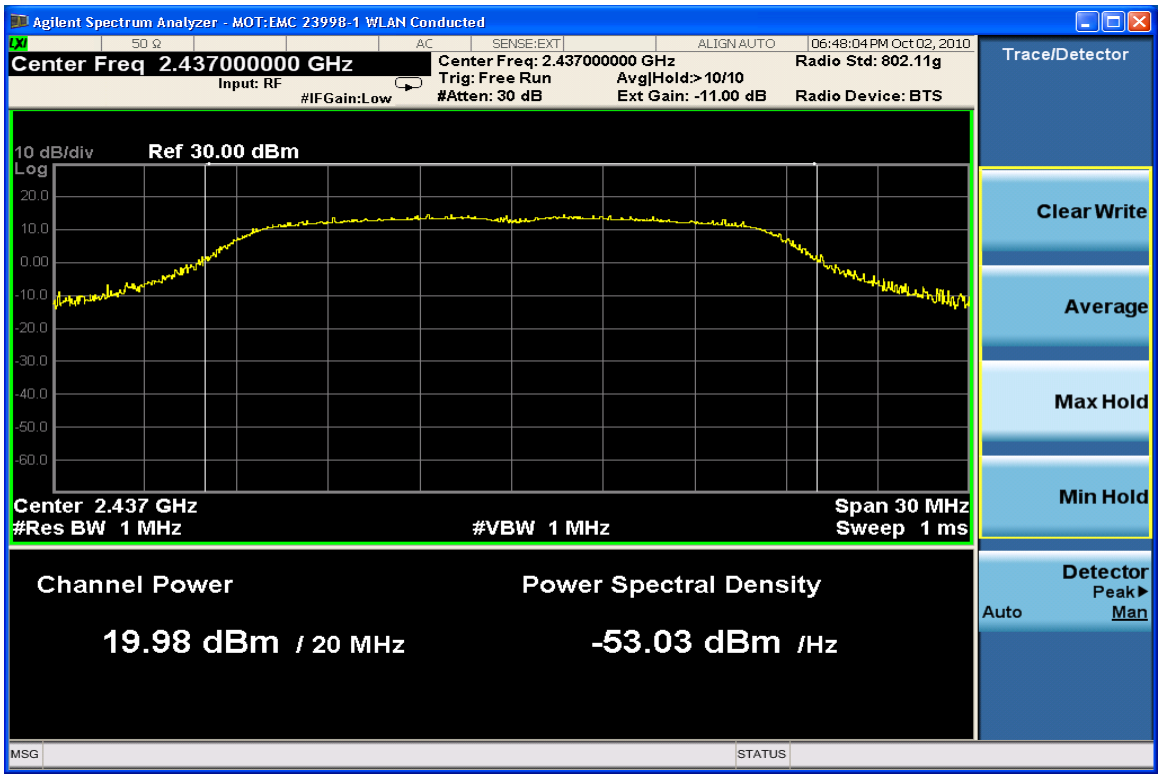


Max. Power Channel 11 @ 7.2Mbps

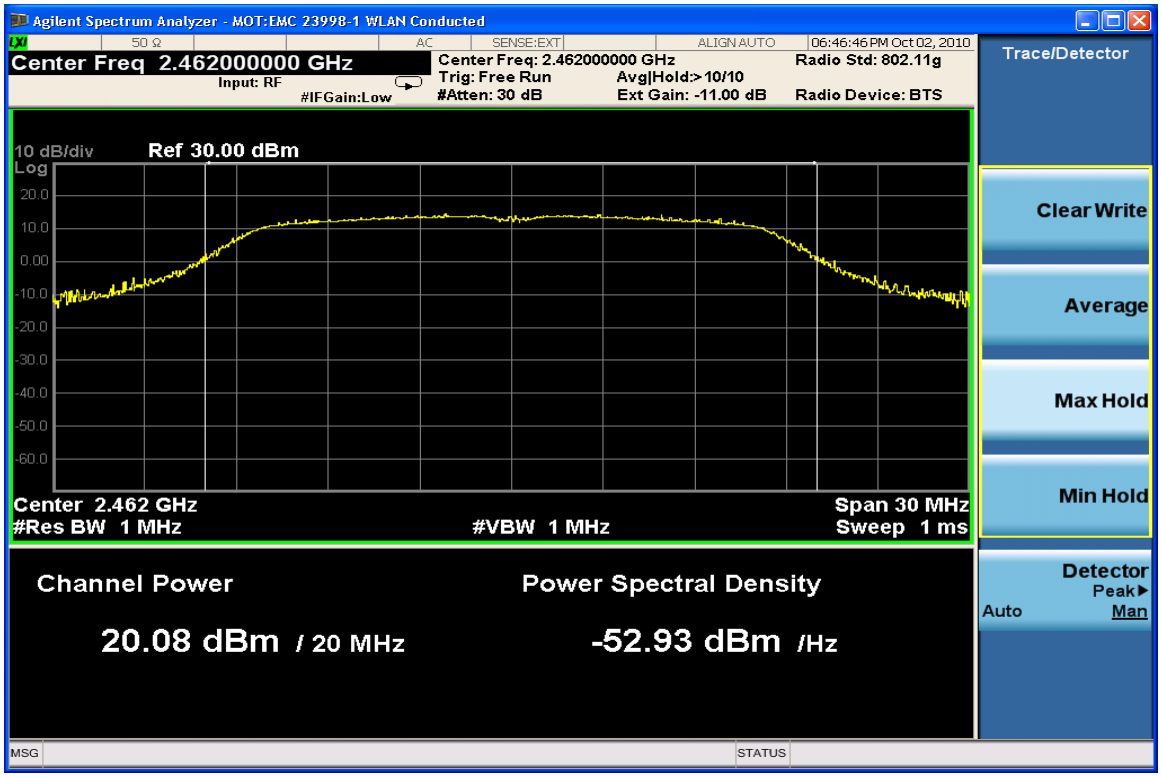
802.11n 800ns GI Mode



Max. Power Channel 1 @ 6.5 Mbps



Max. Power Channel 6 @ 6.5 Mbps



Max. Power Channel 11 @ 6.5 Mbps

Power Spectral Density

CFR 47 Part 15.247

Measurement Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage.

The WLAN DSSS function of the EUT was enabled. The spectrum analyzer used the following settings:

1. Span = 300 kHz
2. VBW =30 kHz
3. RBW=3 kHz
4. Sweep = 50 ms
5. Detector function = peak
6. Trace = max hold

The trace was allowed to stabilize. The EUT was transmitting at its maximum data rate.

Measurement Results

2412 MHz	2437MHz	2462MHz
-11.81	-10.78	-14.06

802.11 b @ 11Mbps

2412 MHz	2437MHz	2462MHz
-16.80	-17.42	-17.69

802.11 g @ 6Mbps

2412 MHz	2437MHz	2462MHz
-19.11	-19.14	-18.97

802.11n 400ns GI @ 7.2Mbps

2412 MHz	2437MHz	2462MHz
-16.59	-18.16	-17.29

802.11n 800ns GI @ 6.5Mbps

SPURIOUS RF CONDUCTED EMISSIONS

CFR 47 Part 15.247

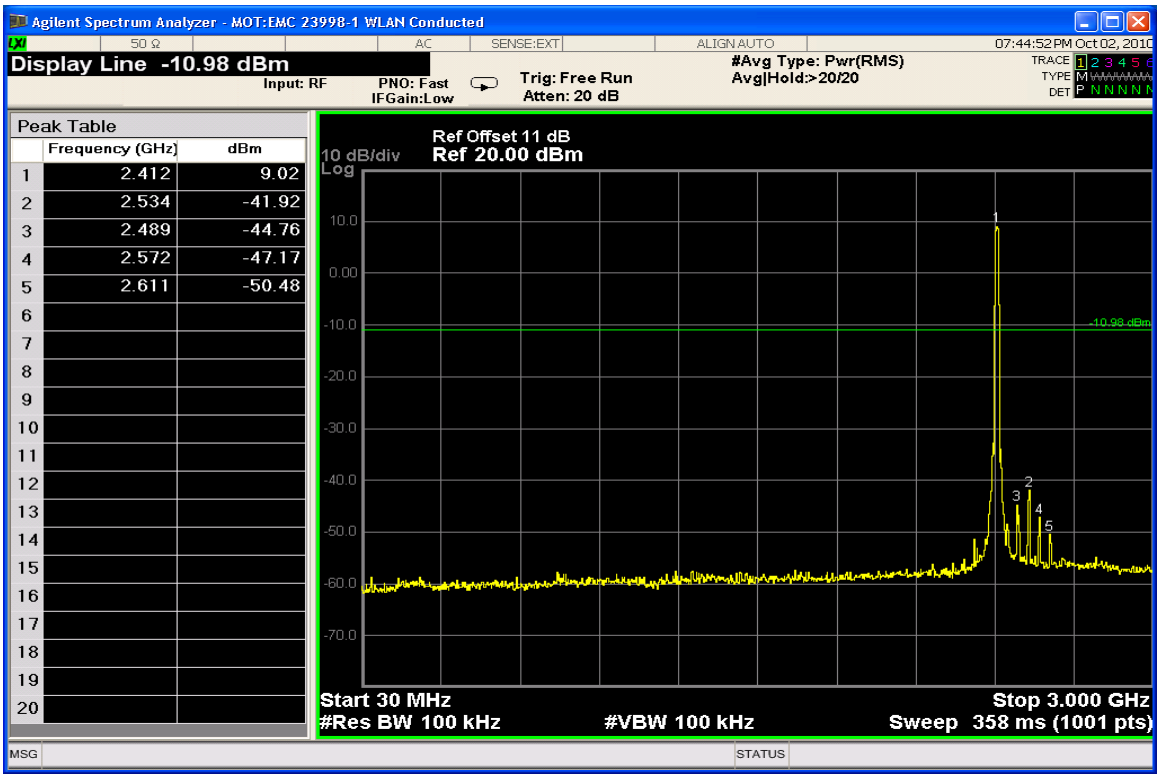
Measurement Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage.

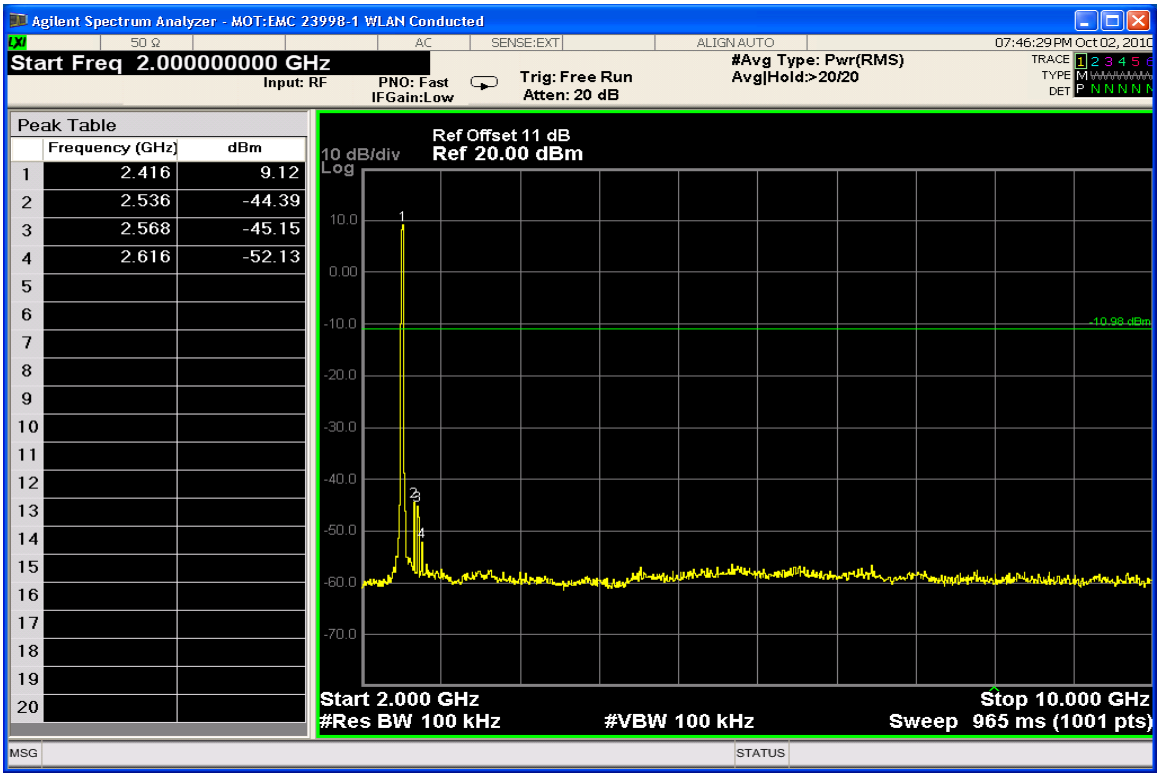
Measurement Results

See attached:

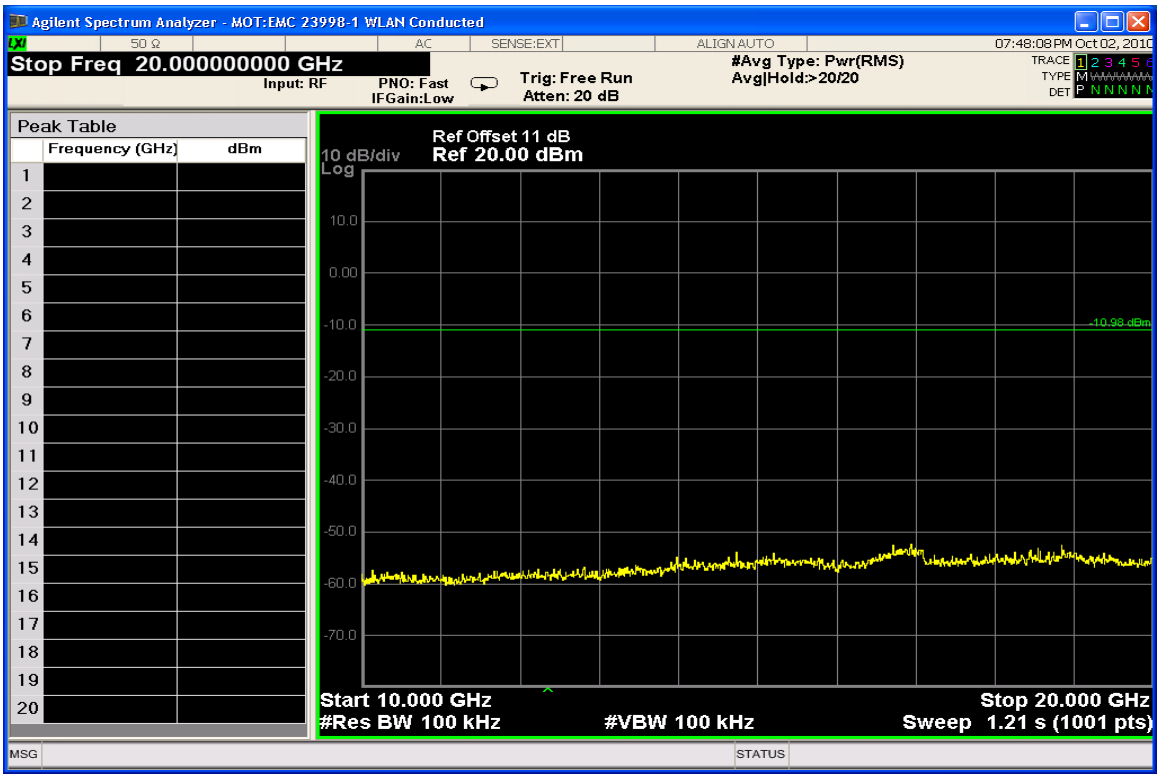
802.11b Mode @ 11Mbps



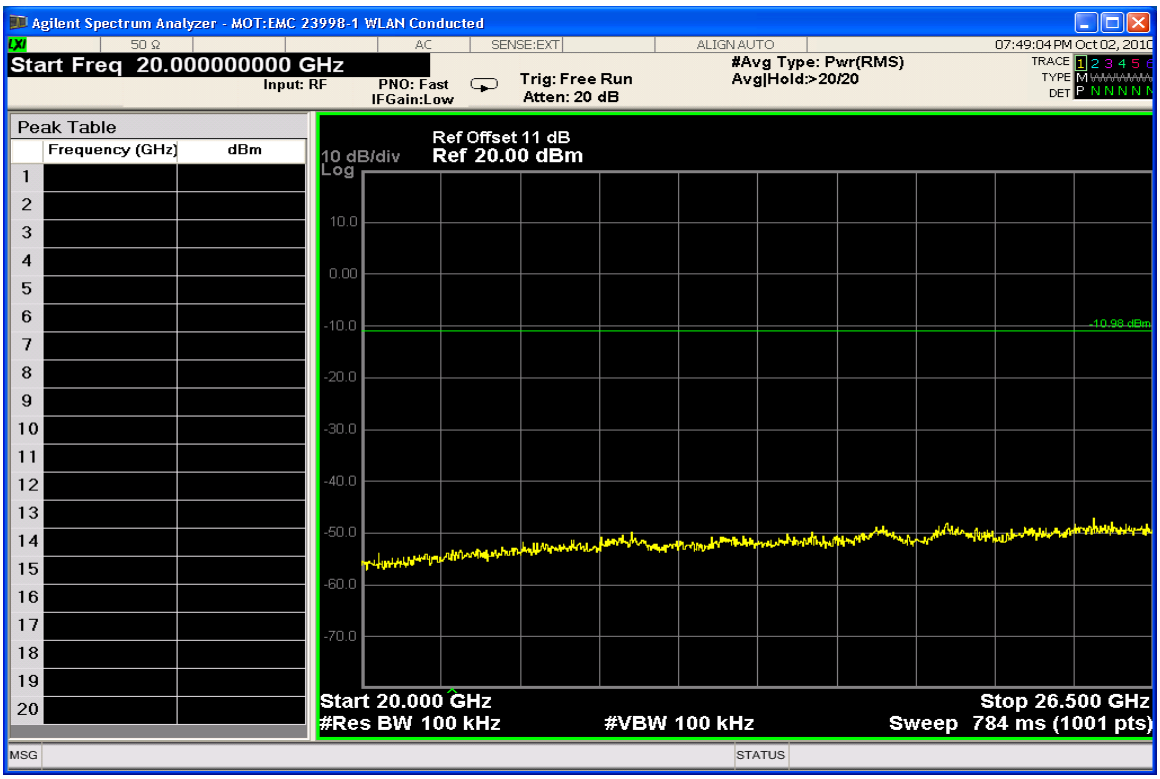
Conducted Spurious Emissions 30-3000 MHz (Low Channel)



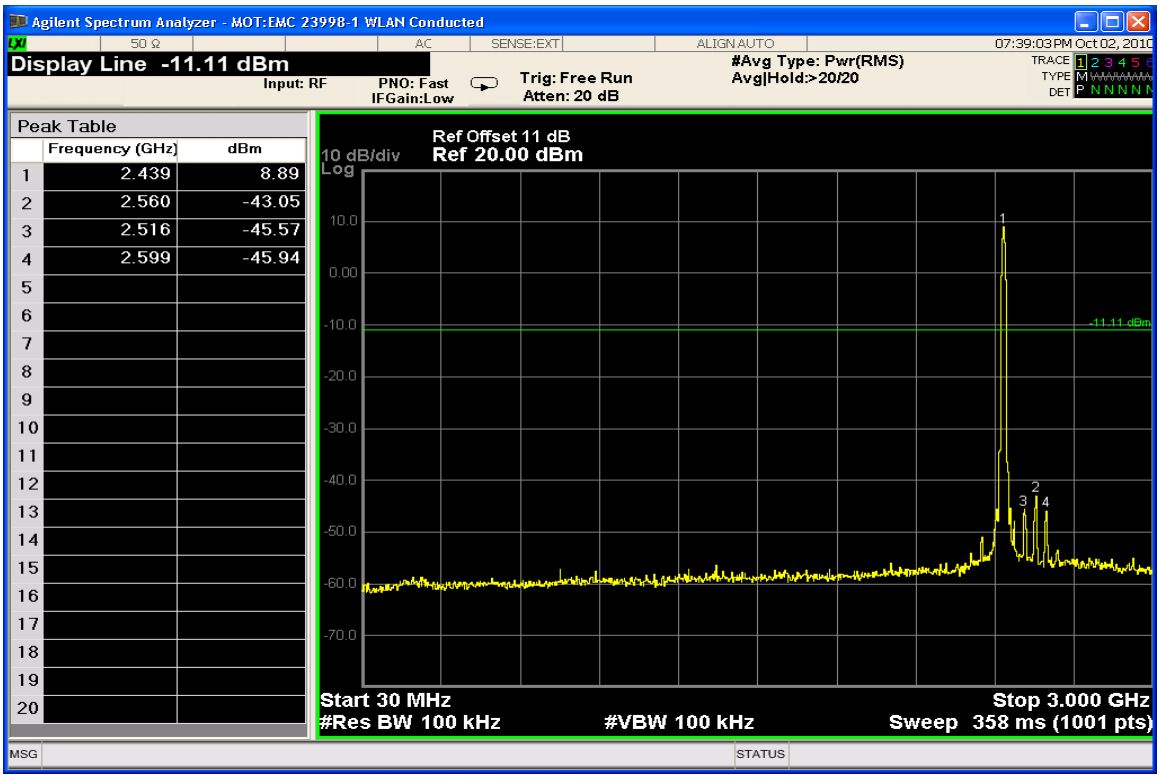
Conducted Spurious Emissions 2-10 GHz (Low Channel)



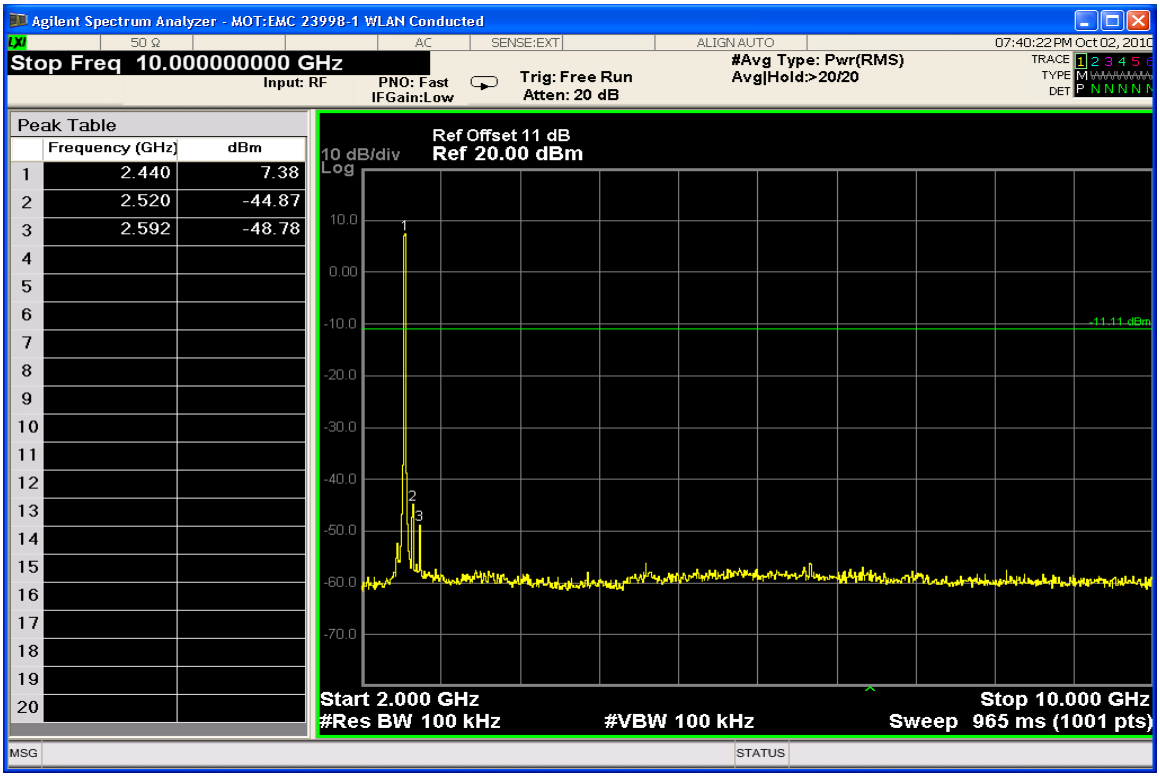
Conducted Spurious Emissions 10-20 GHz (Low Channel)



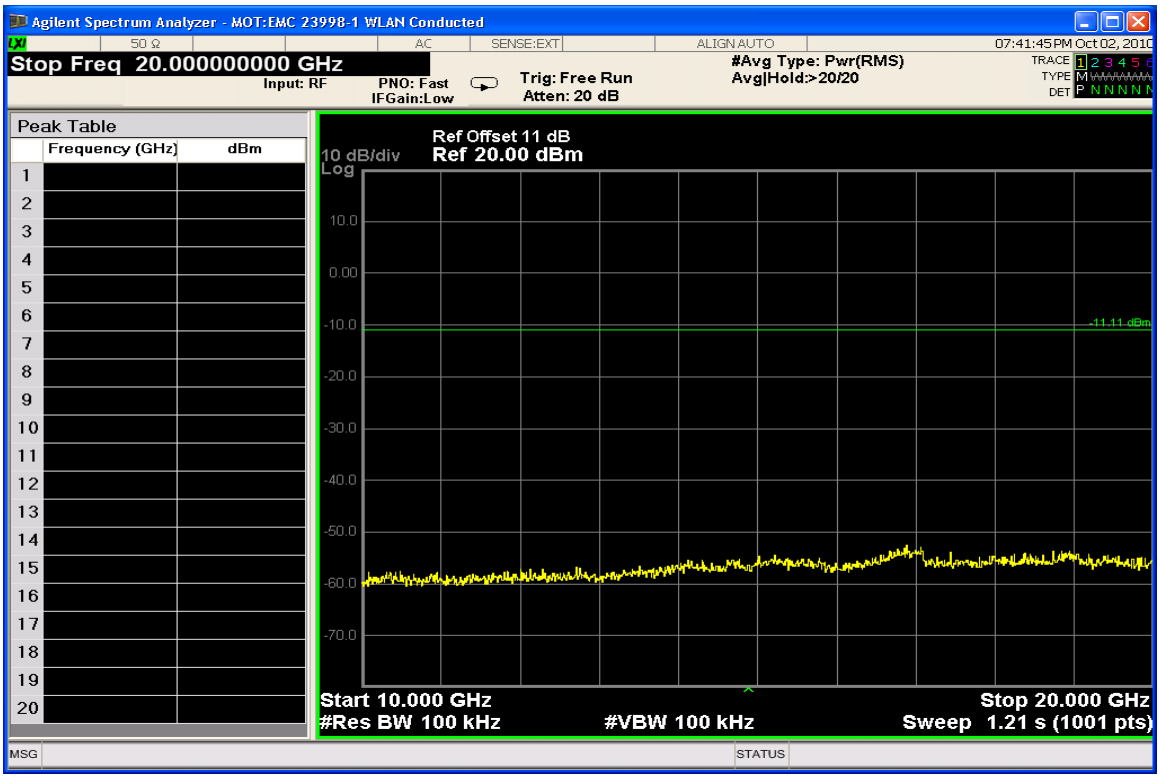
Conducted Spurious Emissions 20-26.5 GHz (Low Channel)



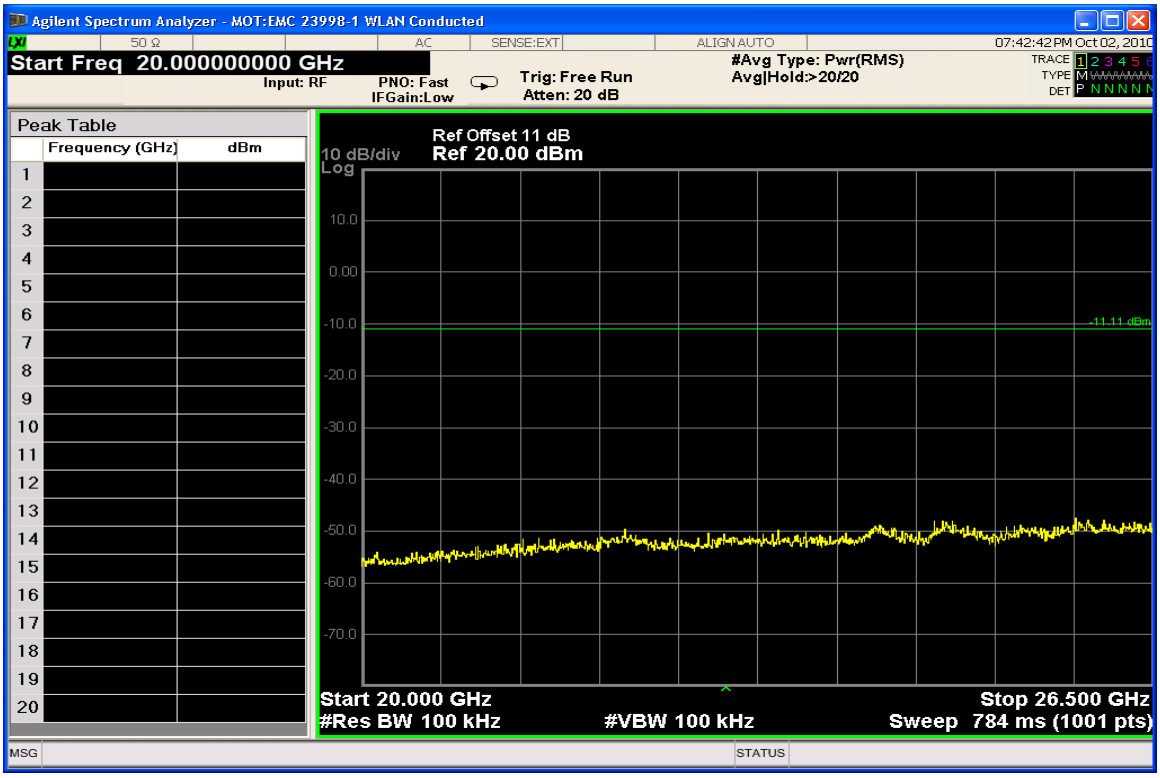
Conducted Spurious Emissions 30-3000 MHz (Mid Channel)



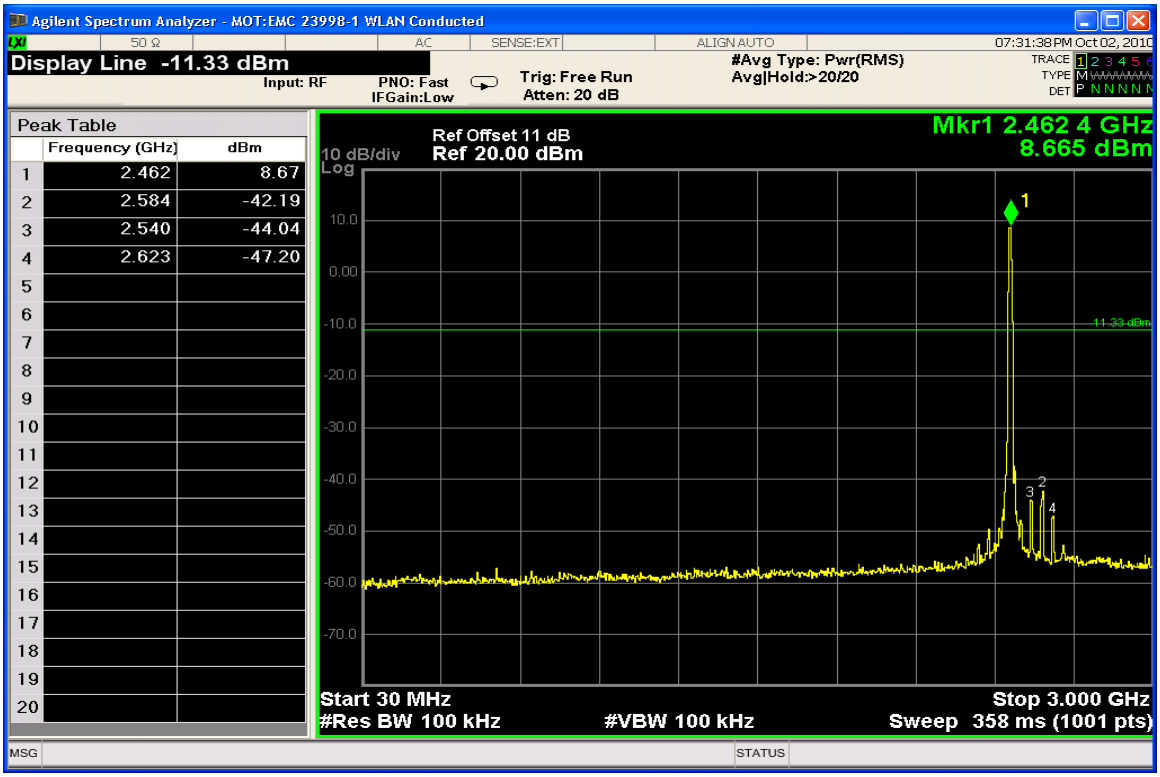
Conducted Spurious Emissions 2-10 GHz (Mid Channel)



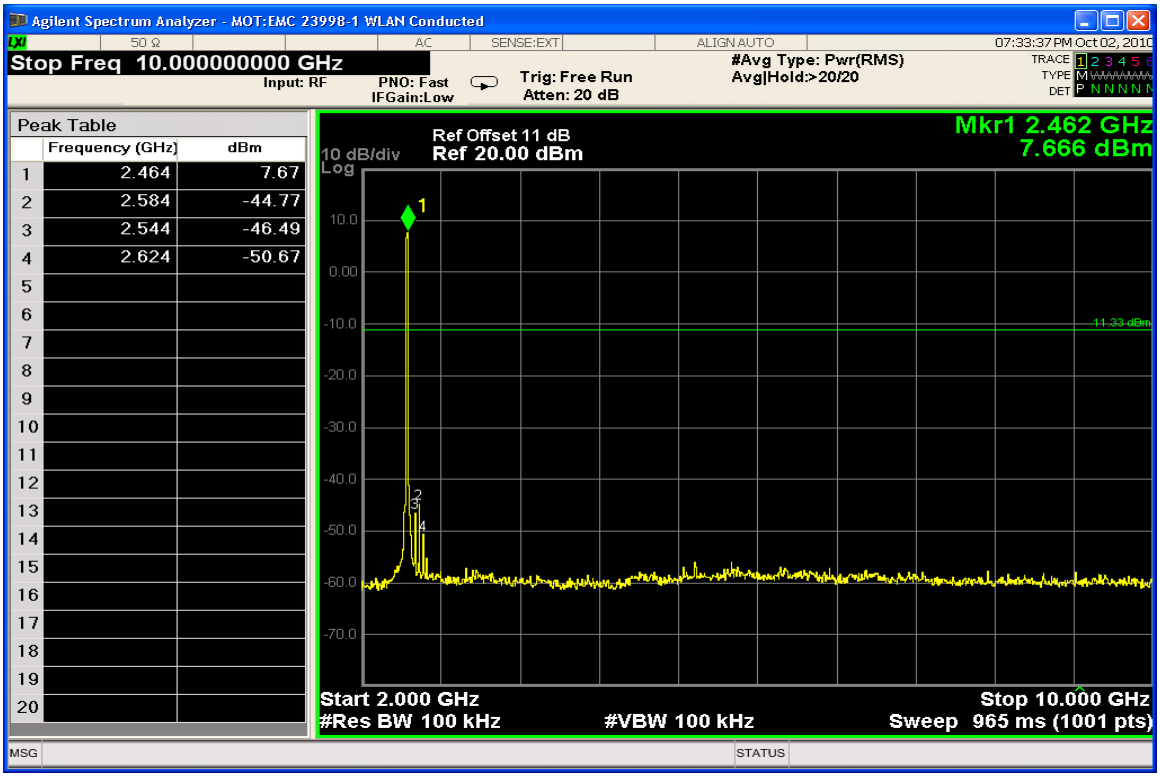
Conducted Spurious Emissions 10-20 GHz (Mid Channel)



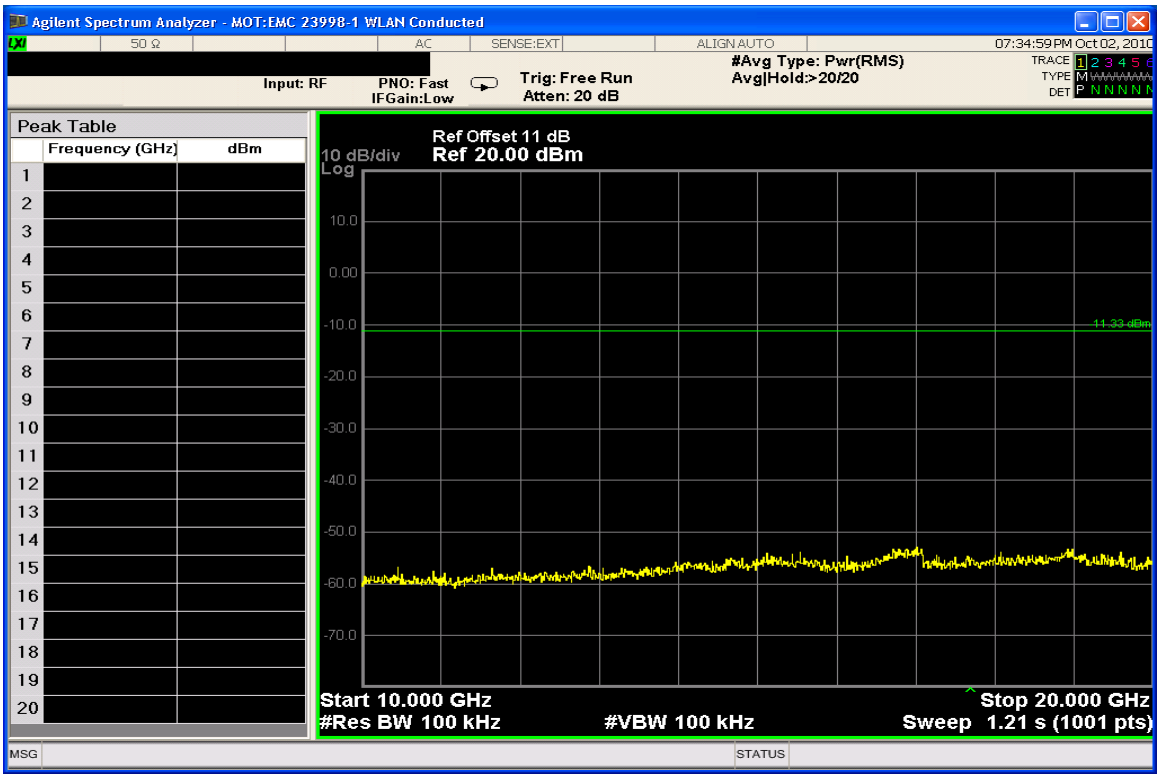
Conducted Spurious Emissions 20-26.5 GHz (Mid Channel)



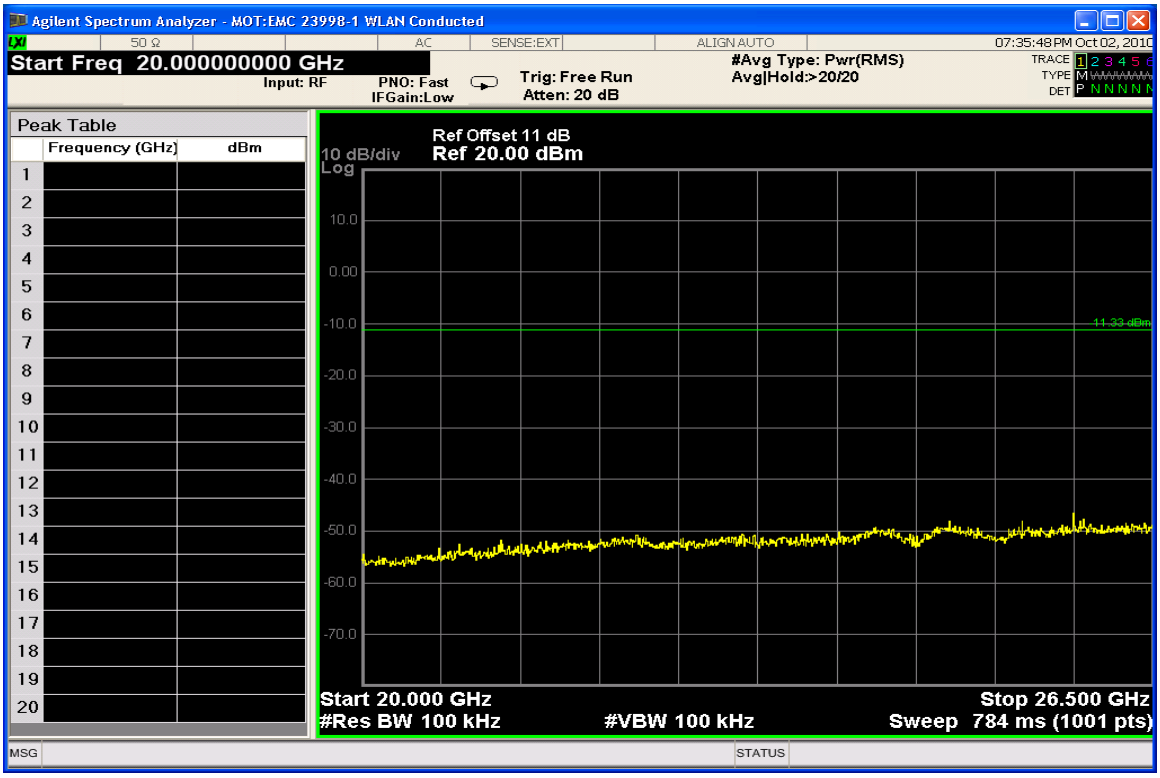
Conducted Spurious Emissions 30-3000 MHz (High Channel)



Conducted Spurious Emissions 2-10 GHz (High Channel)

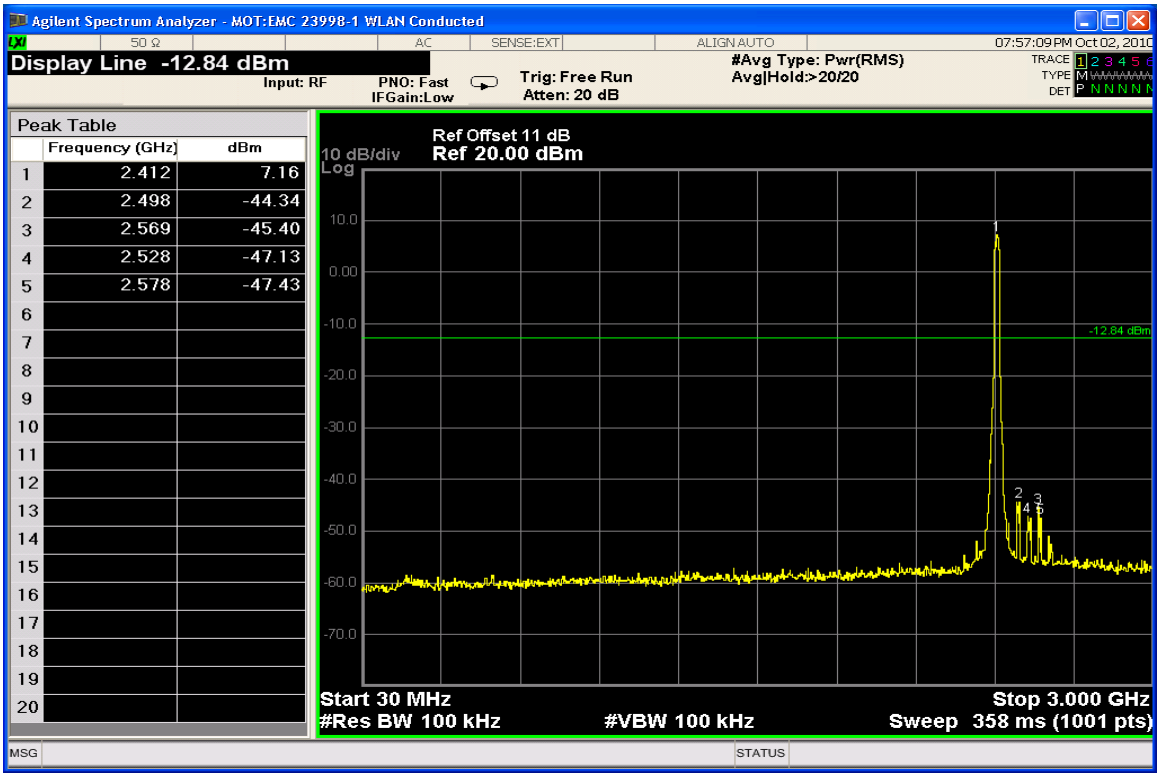


Conducted Spurious Emissions 10-20 GHz (High Channel)

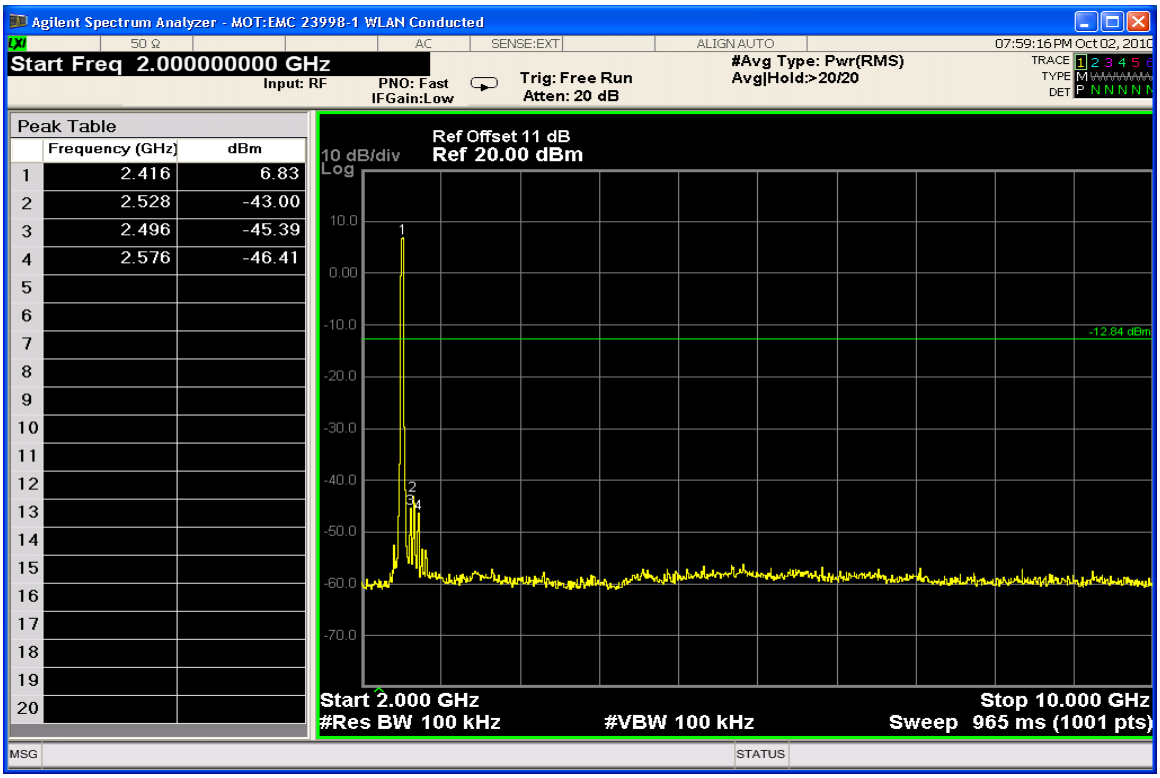


Conducted Spurious Emissions 20-26.5 GHz (High Channel)

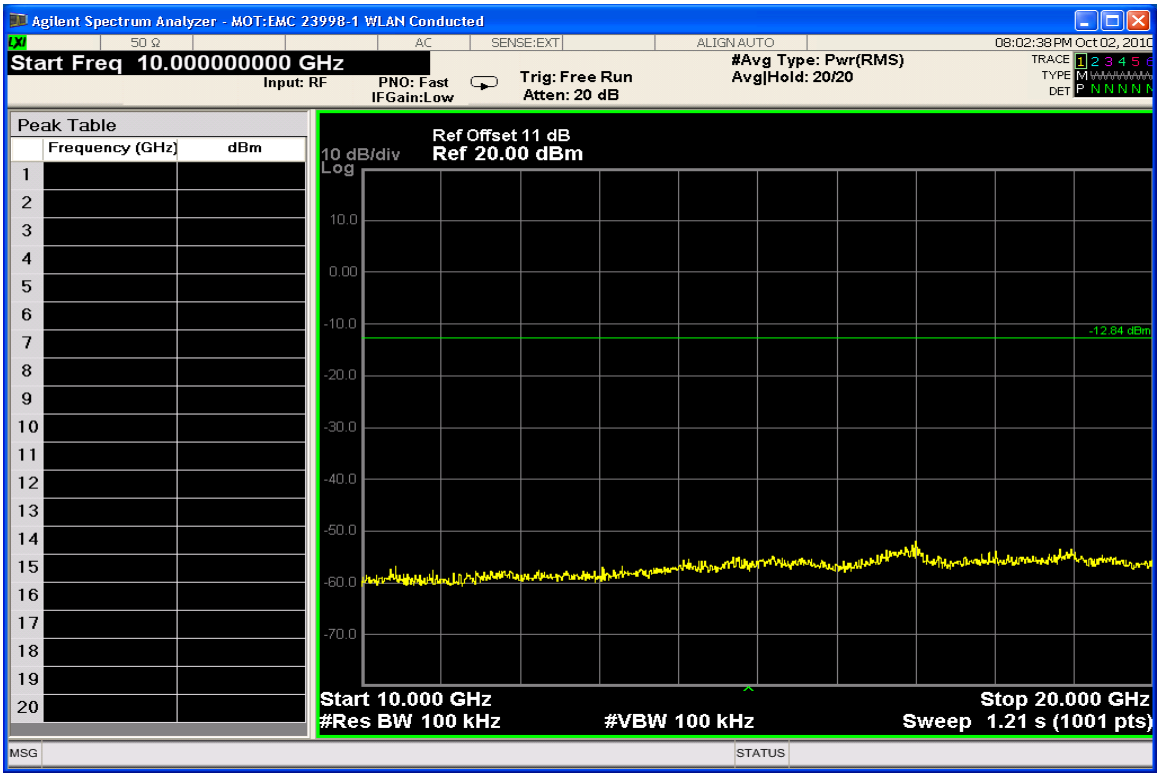
802.11g @ 6Mbps



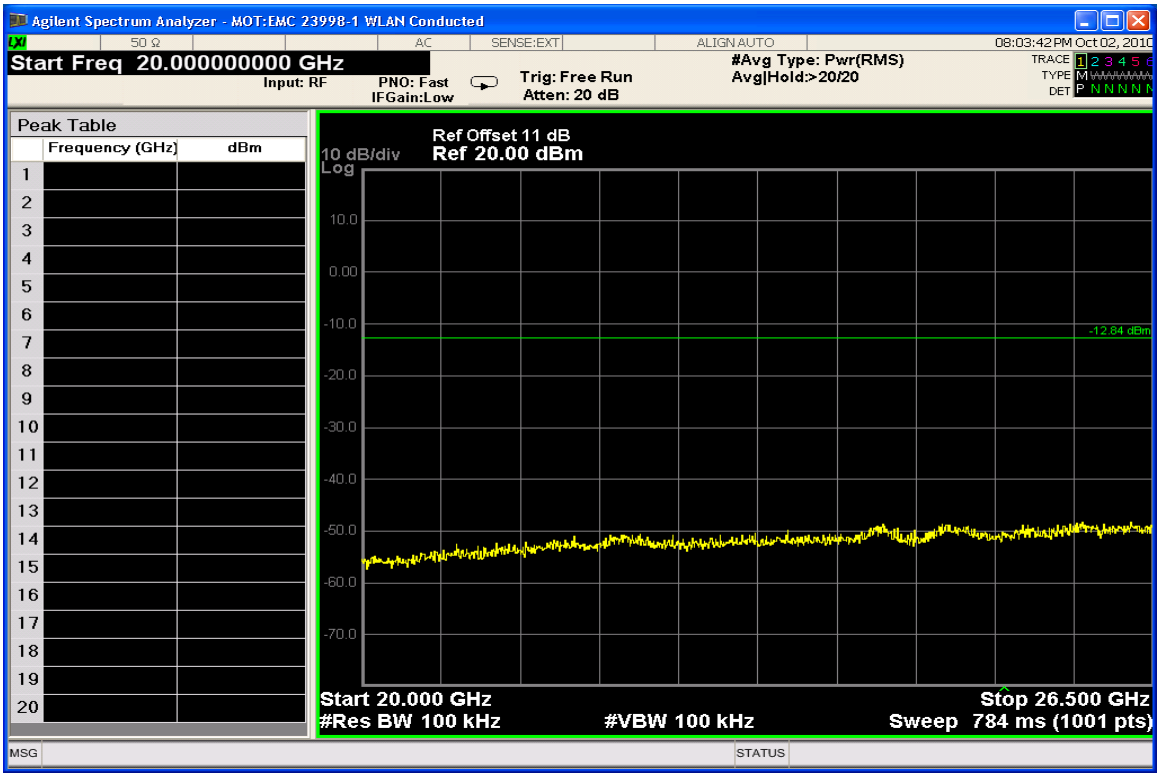
Conducted Spurious Emissions 30-3000 MHz (Low Channel)



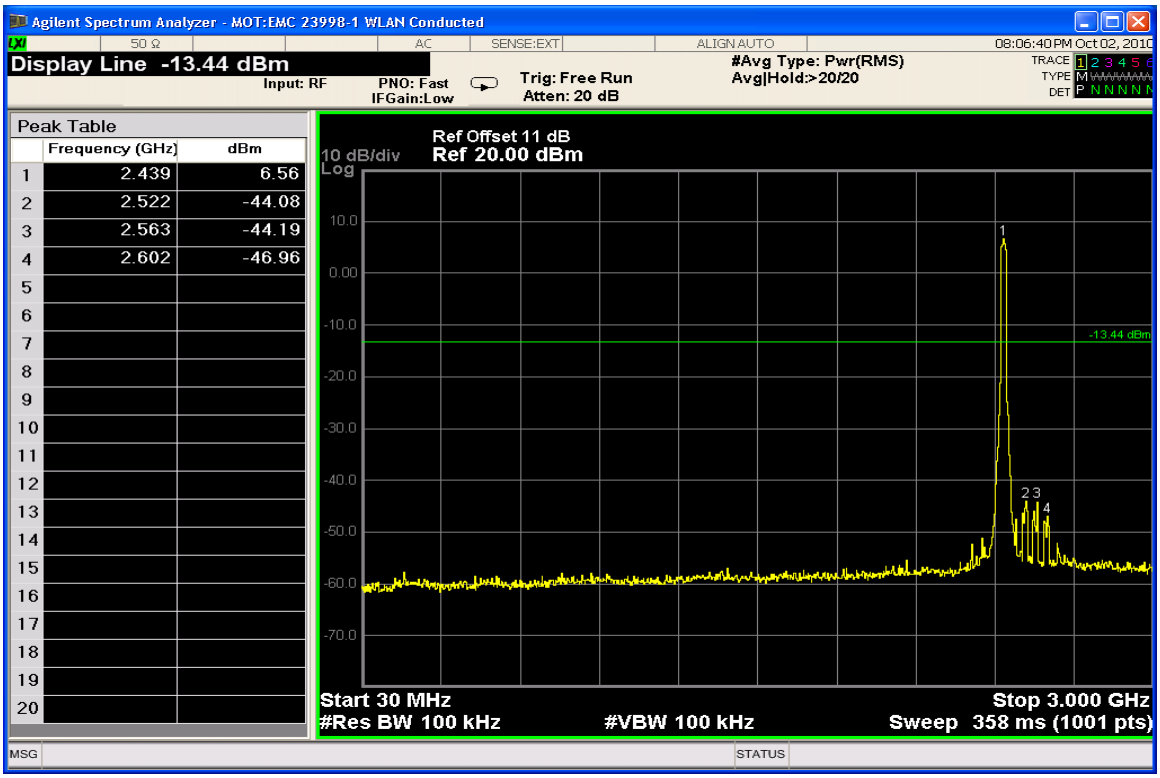
Conducted Spurious Emissions 2-10 GHz (Low Channel)



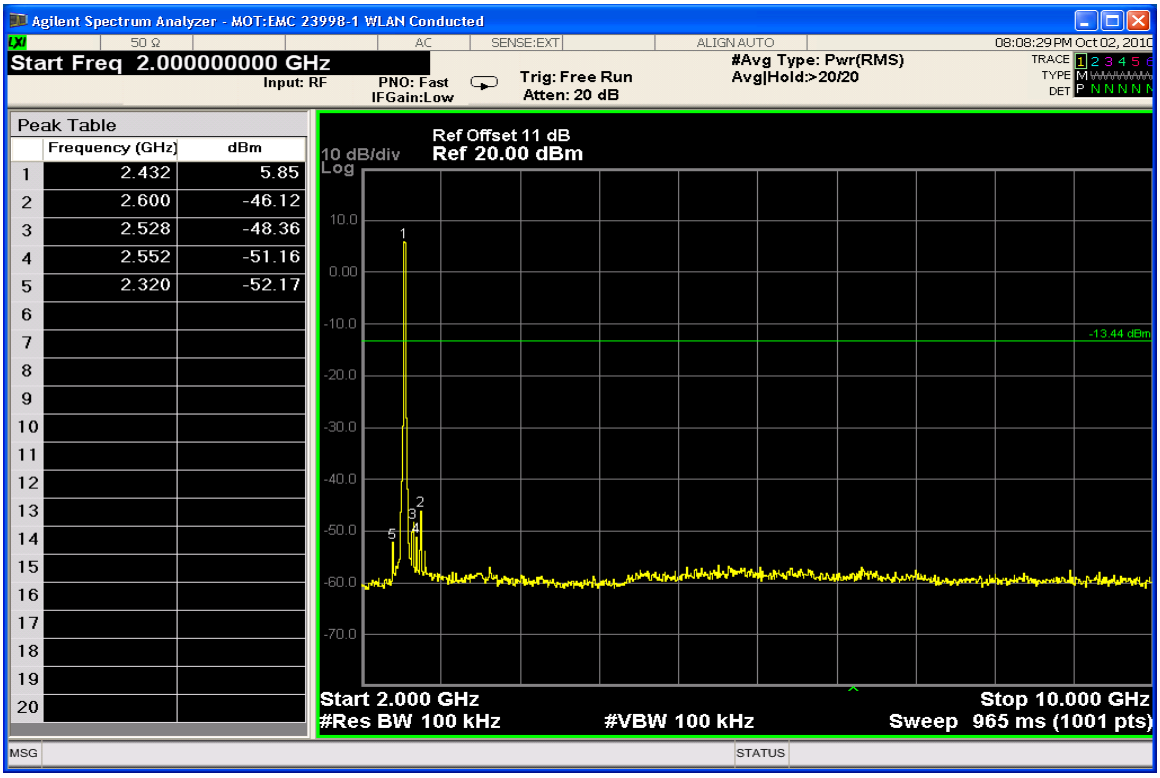
Conducted Spurious Emissions 10-20 GHz (Low Channel)



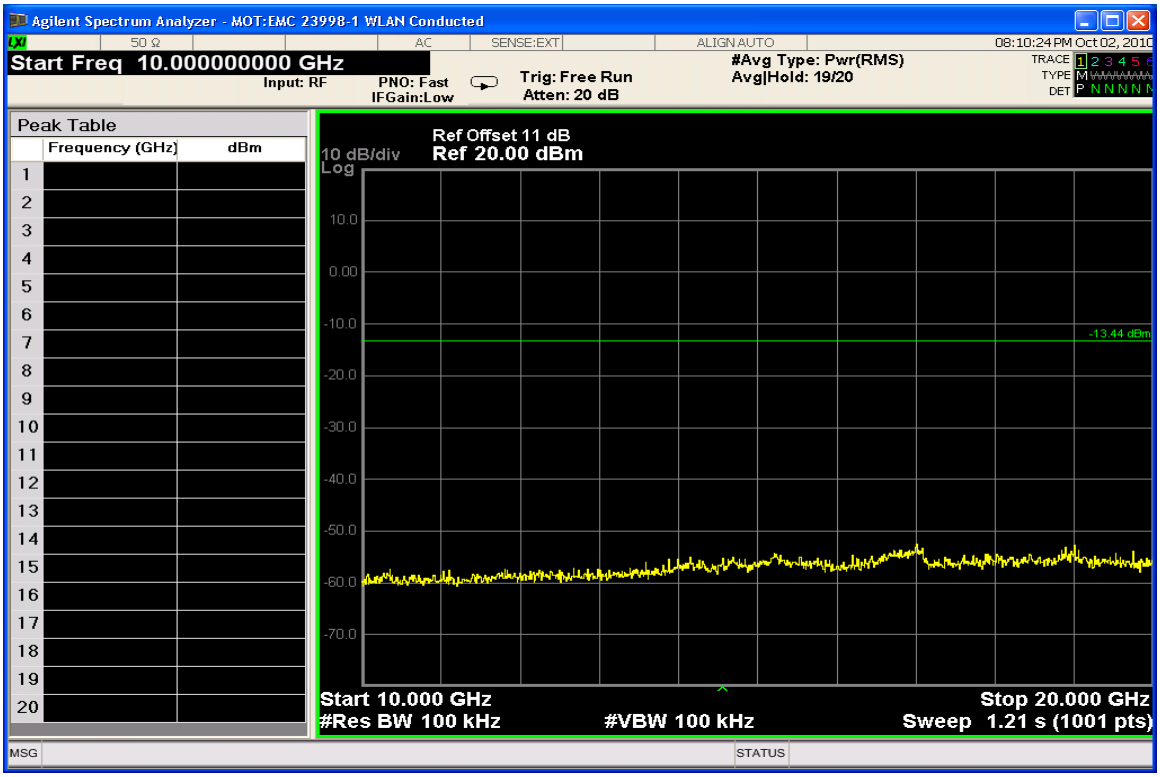
Conducted Spurious Emissions 20-26.5 GHz (Low Channel)



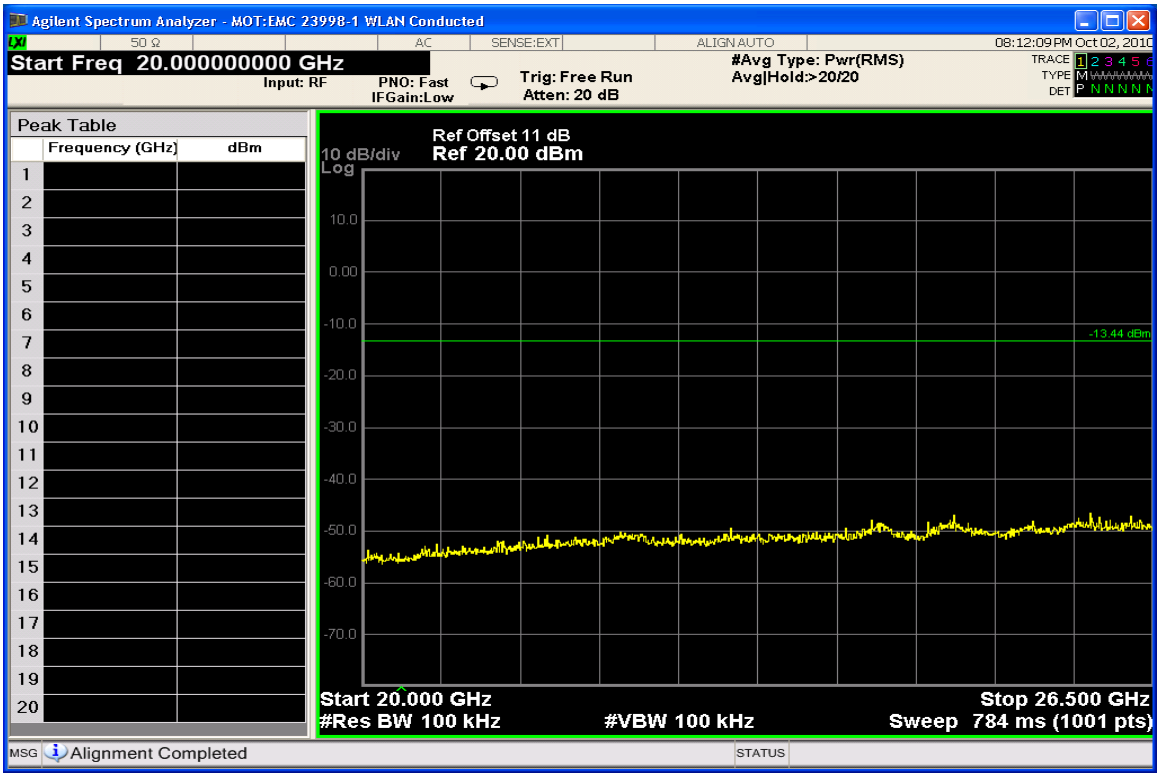
Conducted Spurious Emissions 30-3000 MHz (Mid Channel)



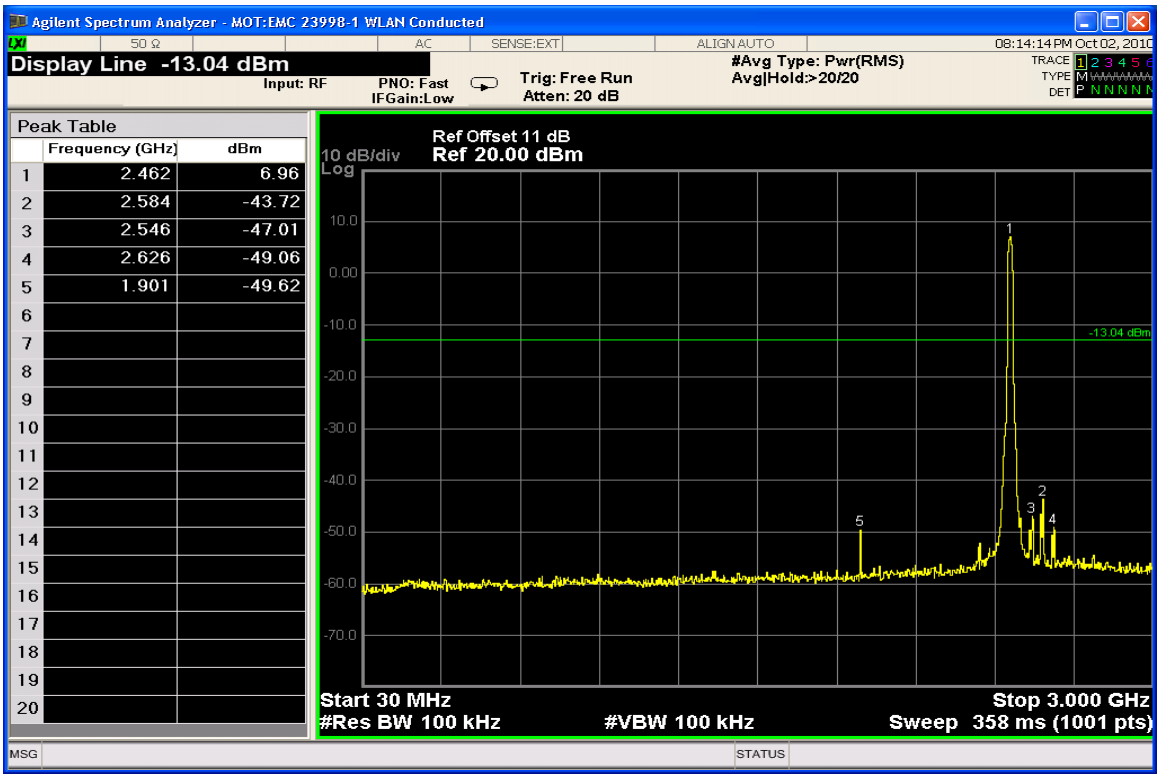
Conducted Spurious Emissions 2-10 GHz (Mid Channel)



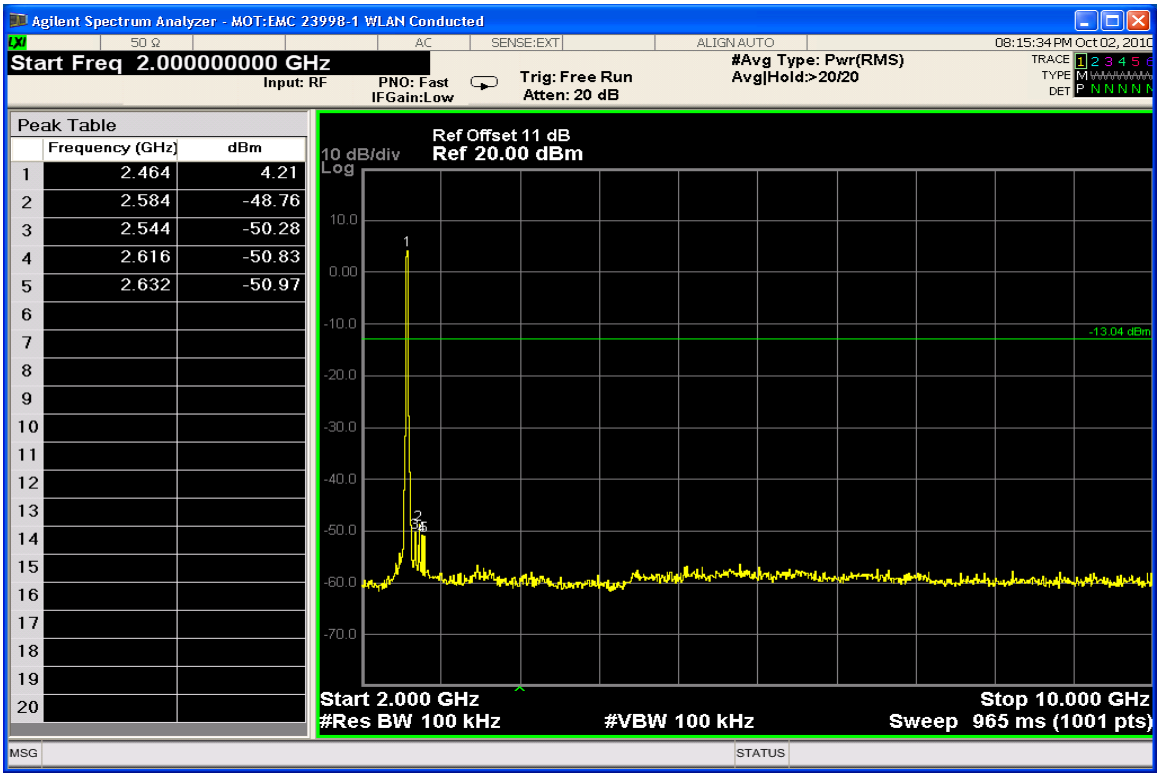
Conducted Spurious Emissions 10-20 GHz (Mid Channel)



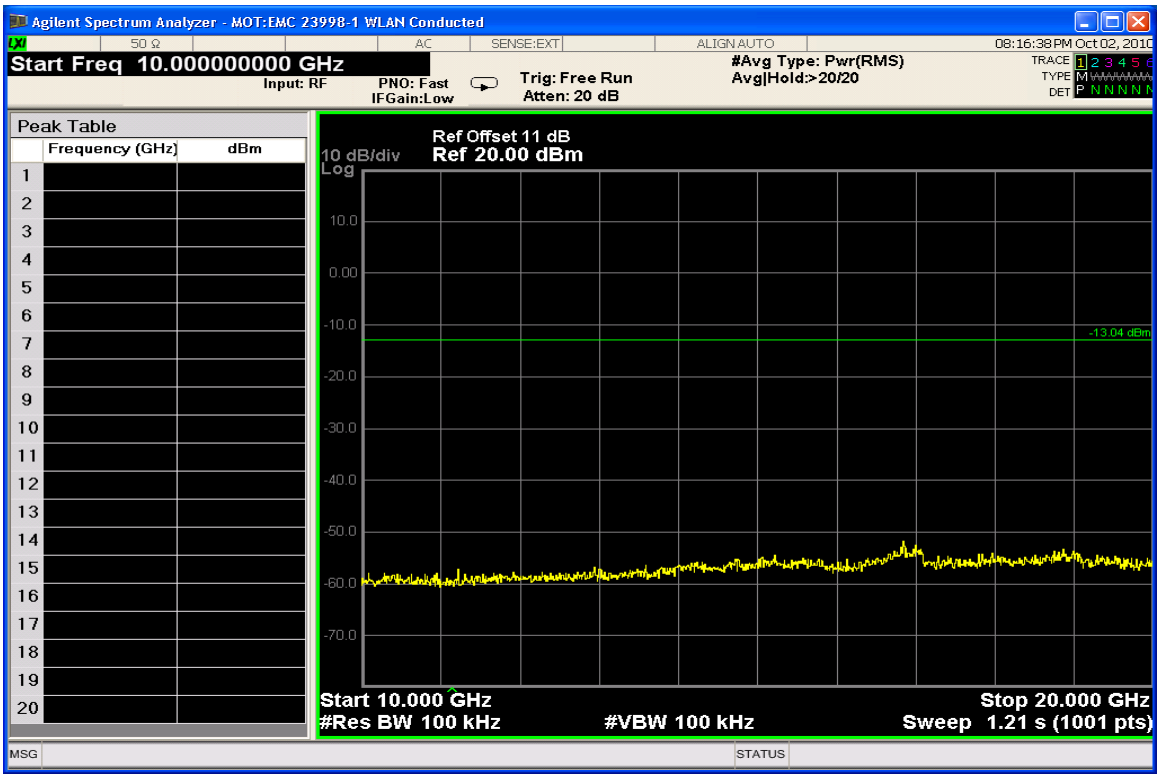
Conducted Spurious Emissions 20-26.5 GHz (Mid Channel)



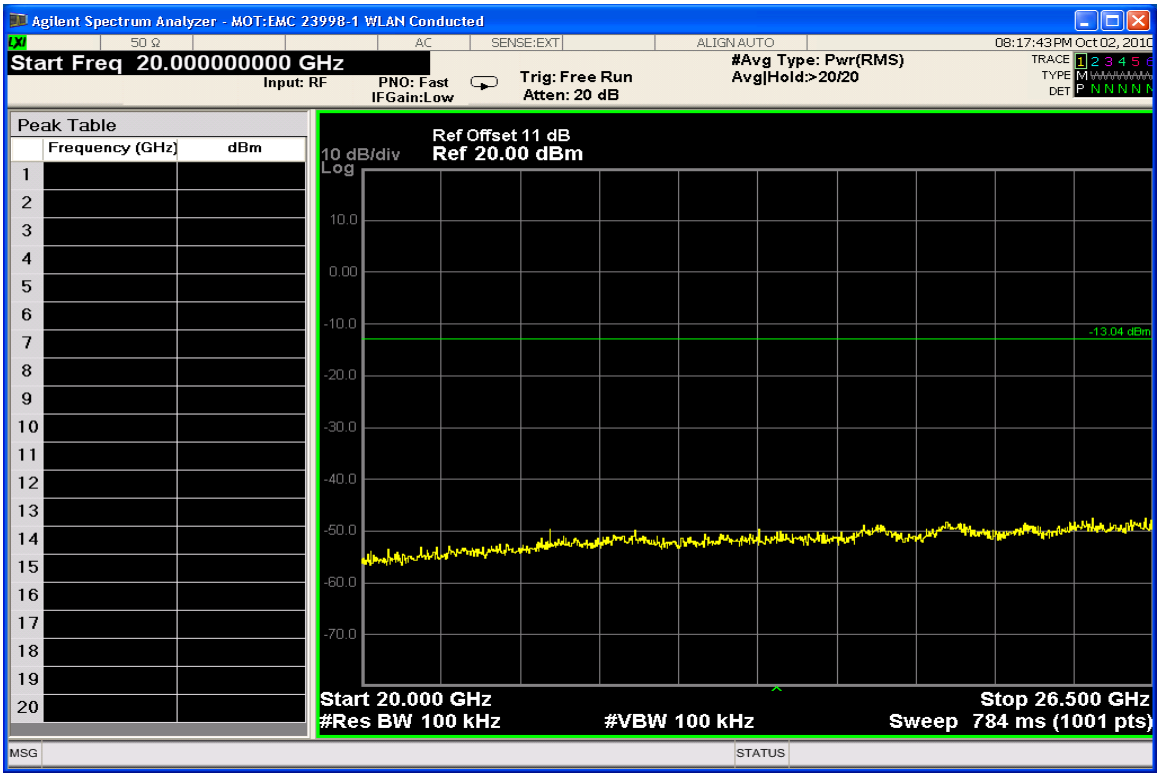
Conducted Spurious Emissions 30-3000 MHz (High Channel)



Conducted Spurious Emissions 2-10 GHz (High Channel)

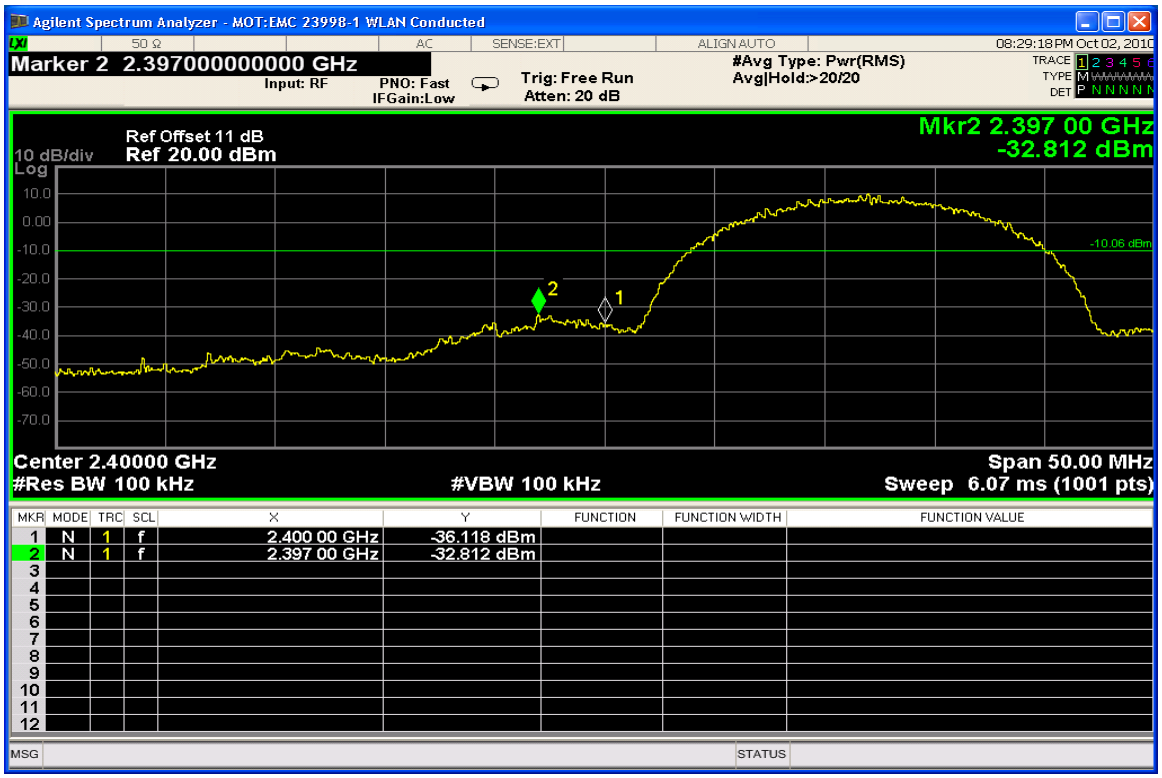


Conducted Spurious Emissions 10-20 GHz (High Channel)

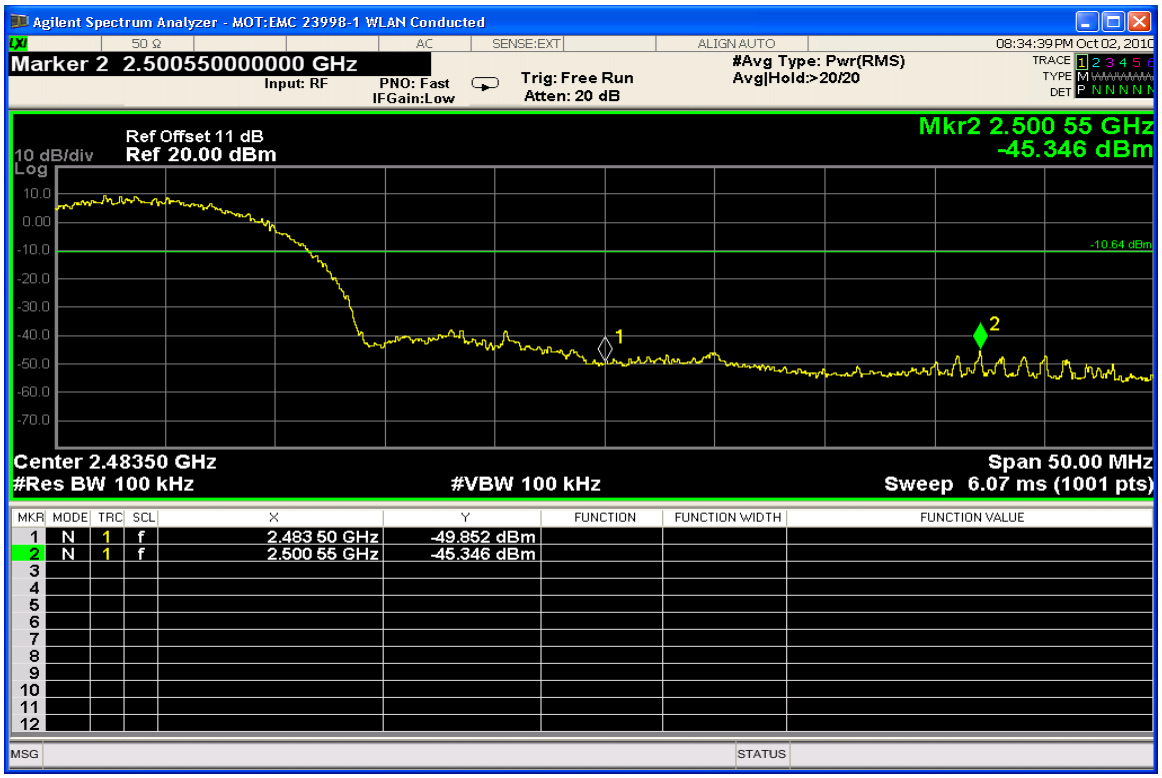


Conducted Spurious Emissions 20-26.5 GHz (High Channel)

802.11b @ 11Mbps Band edge

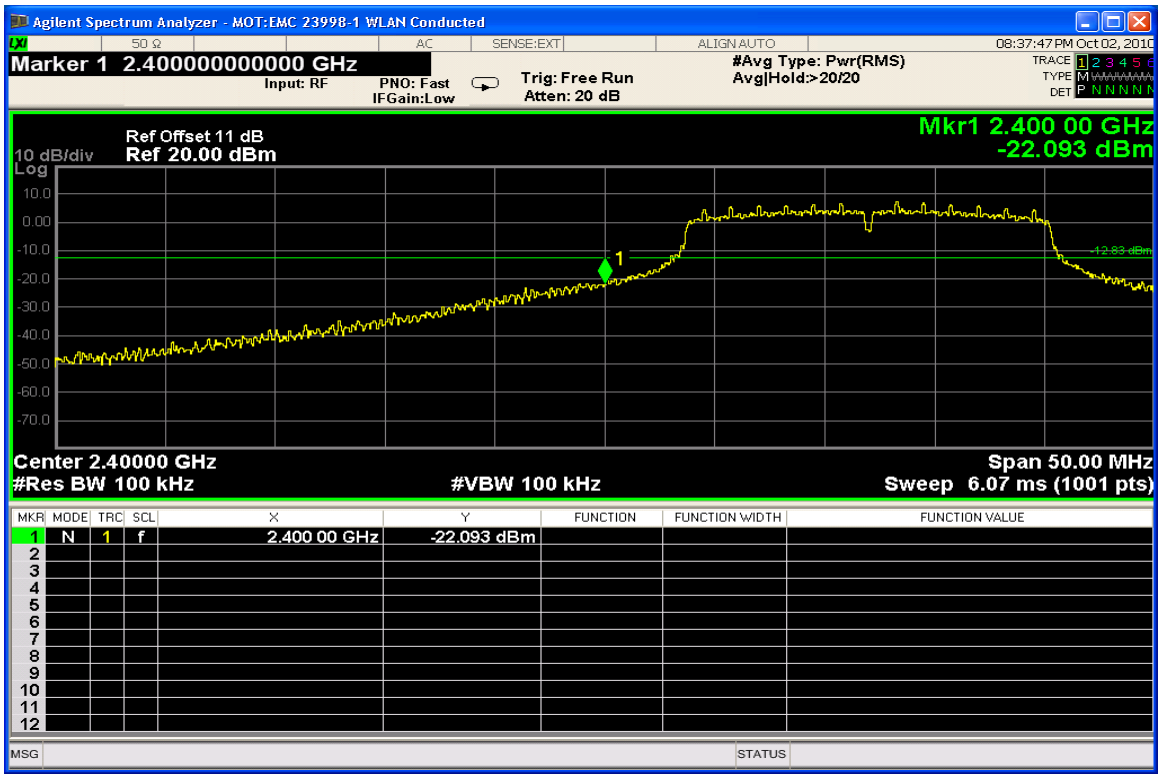


Channel 1 @ 11Mbps – Lower Band Edge

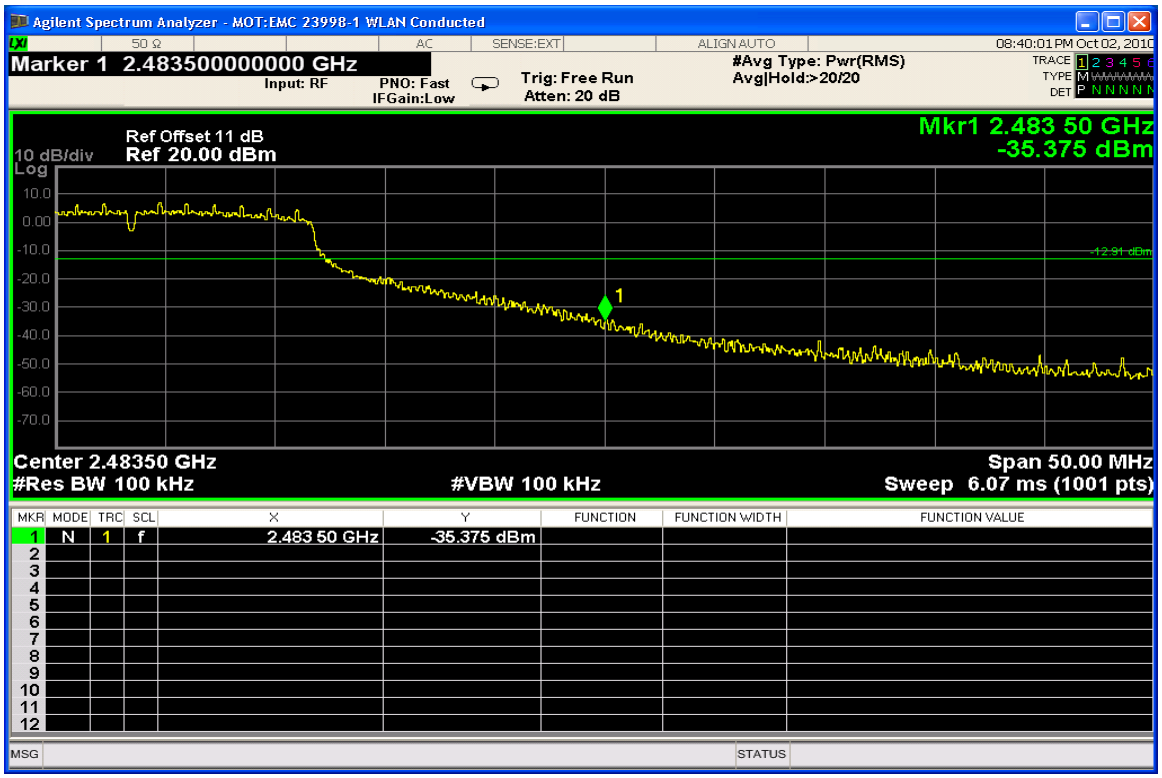


Channel 11 @ 11Mbps – Upper Band Edge

802.11g @ 6Mbps Band Edge

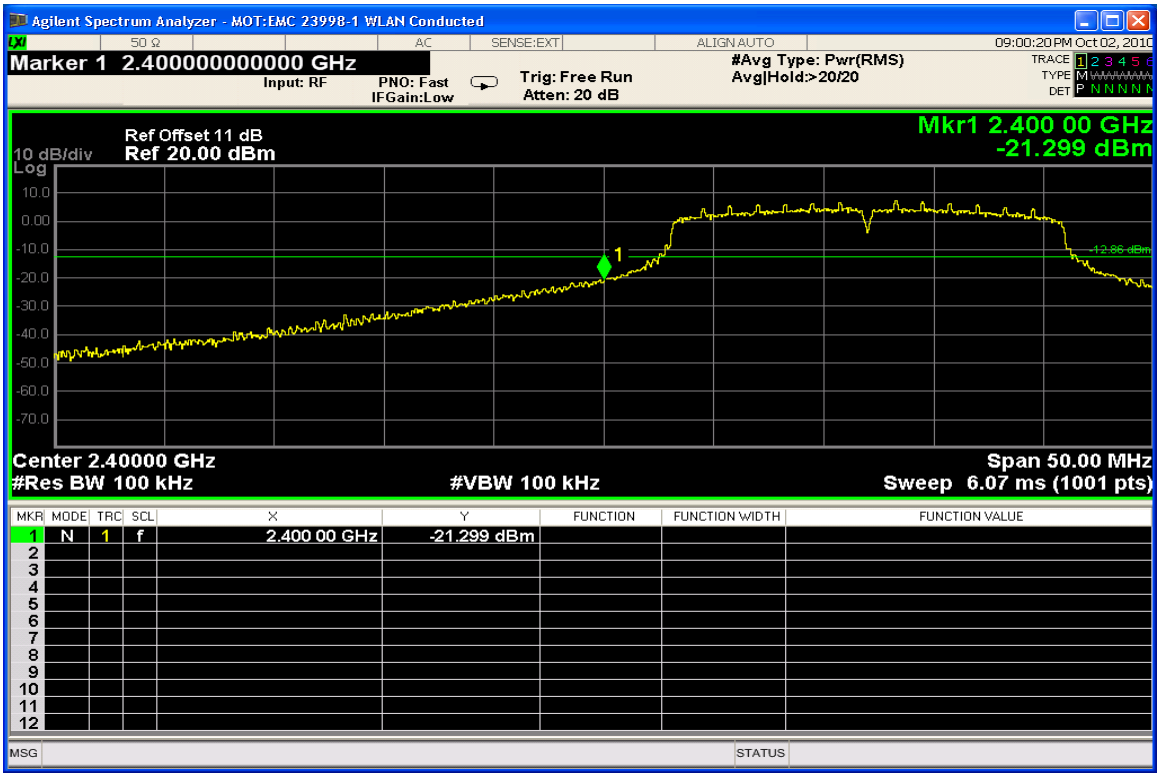


Channel 1 @ 6Mbps – Lower Band Edge



Channel 11 @ 6Mbps – Upper Band Edge

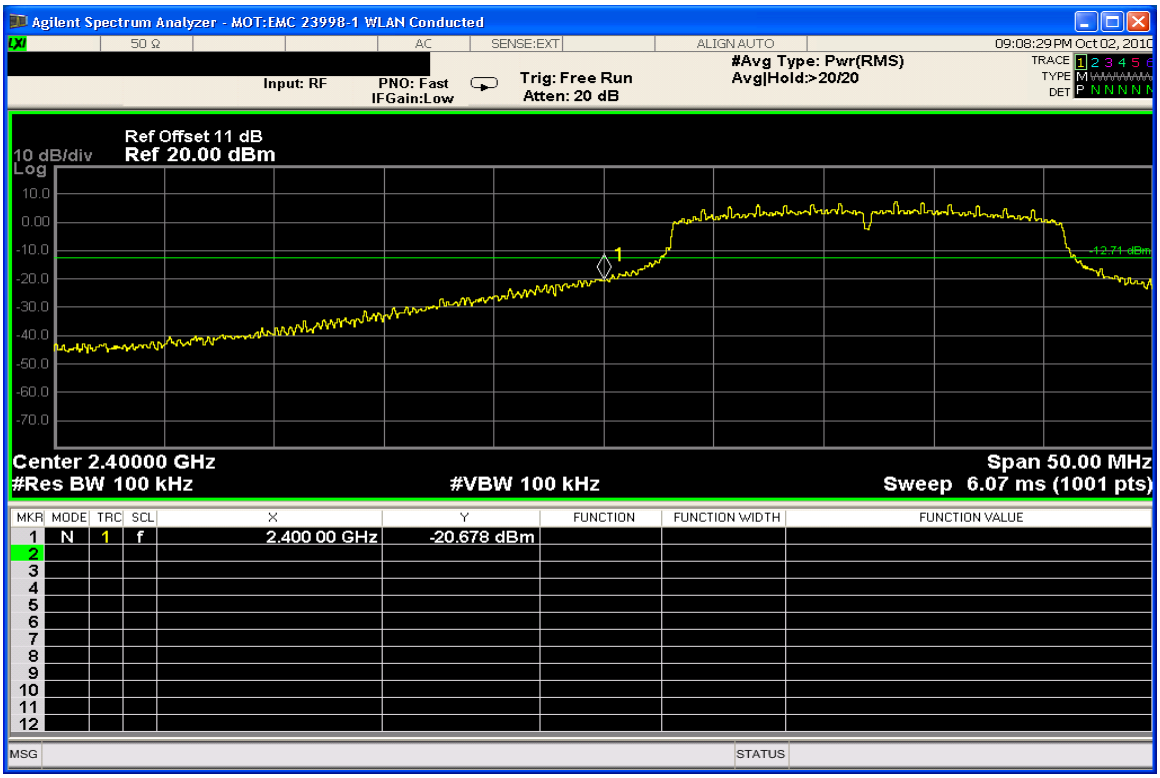
802.11n 400ns GI @ 6.5Mbps Band Edge



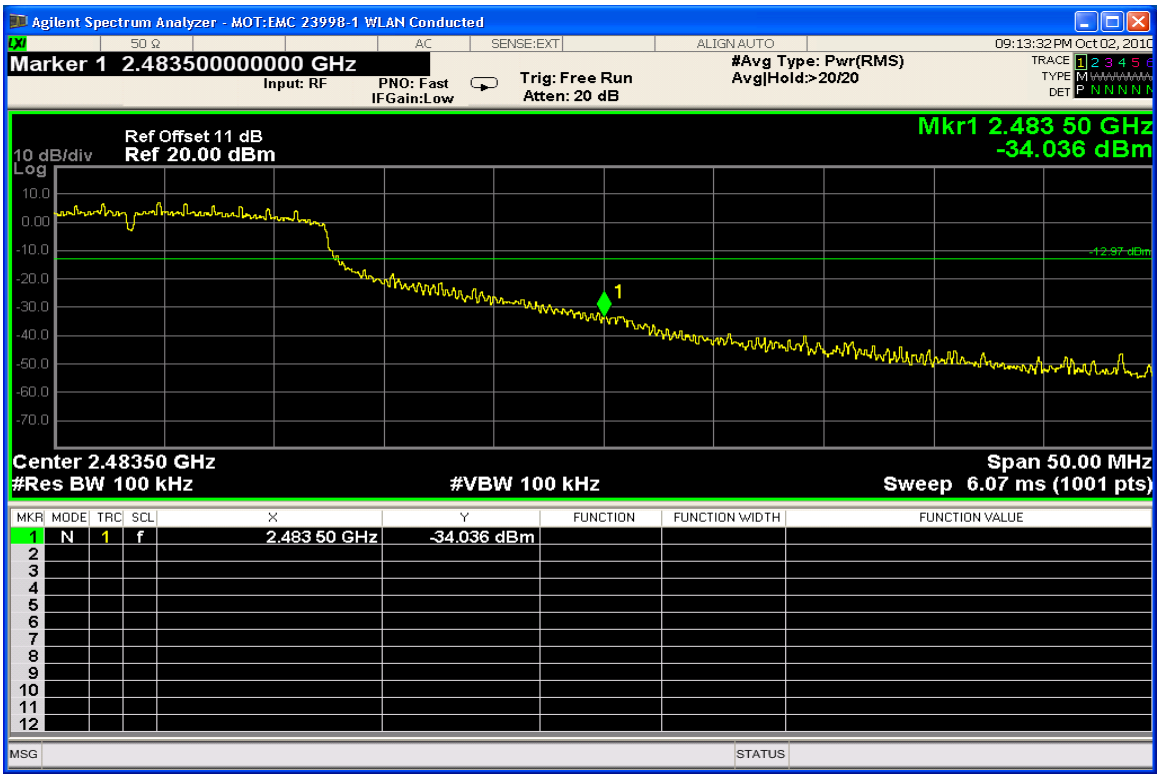
Channel 1 @ 7.2Mbps – Lower Band Edge

Channel 11 @ 7.2Mbps – Upper Band Edge

802.11n 800ns GI @ 6.5Mbps Band Edge



Channel 1 @ 6.5Mbps – Lower Band Edge



Channel 11 @ 6.5Mbps – Upper Band Edge

AC LINE CONDUCTED EMISSIONS

CFR 47 Part 15.207

Measurement Procedure

Measured levels of ac power line conducted emission shall be the radio-noise voltage from the line probe or across the 50 Ω LISN port, where permitted, terminated into a 50 Ω noise meter, or where permitted or required, the radio-noise current on the power line sensed by a current probe.

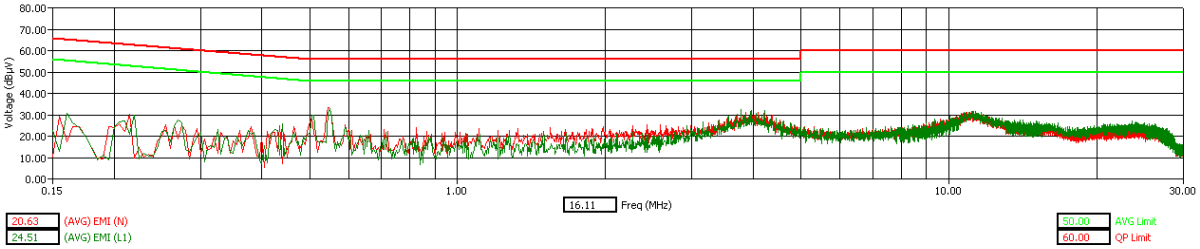
All radio-noise voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord or calibrated extension cord by the use of mating plugs and receptacles on the EUT and LISN. Equipment shall be tested with power cords that are normally supplied using an LISN, the 50 Ω measuring port is terminated by a 50 Ω radio-noise meter or a 50 Ω resistive load. All other ports are terminated in 50 Ω.

Detectors – Quasi Peak and Average Detector.

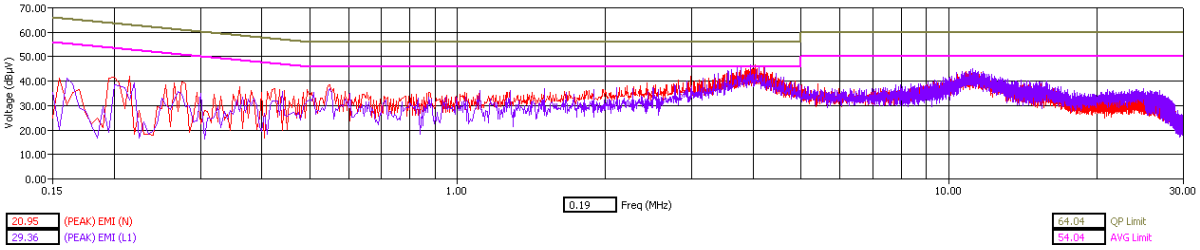
Measurement Results

See attached:

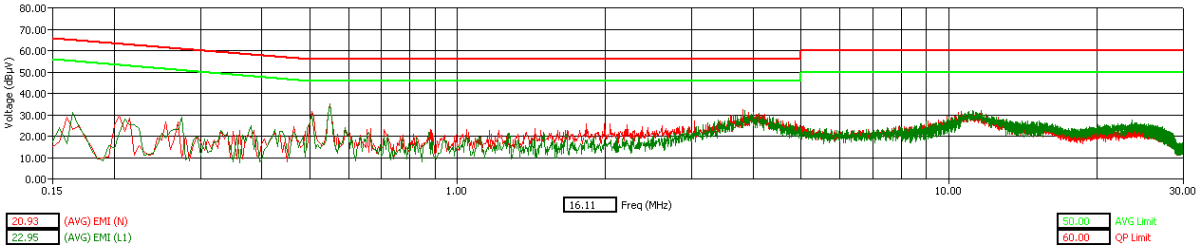
802.11b @ 11Mbps



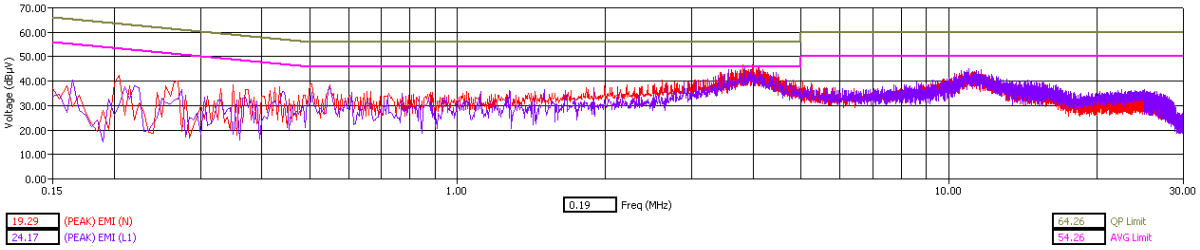
WLAN Channel 1 - Tx Mode - AVG Detector



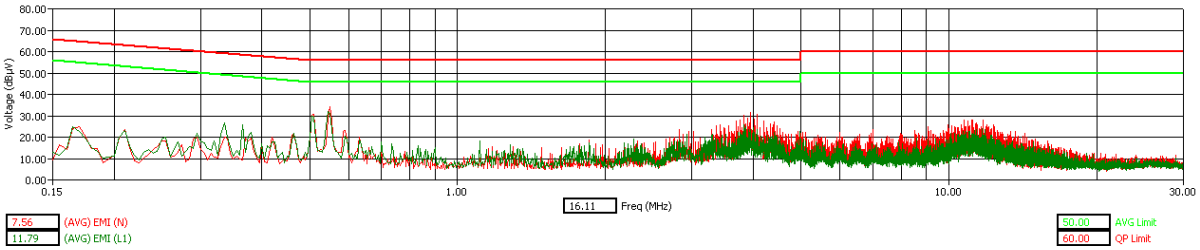
WLAN Channel 1 - Tx Mode –Peak Detector



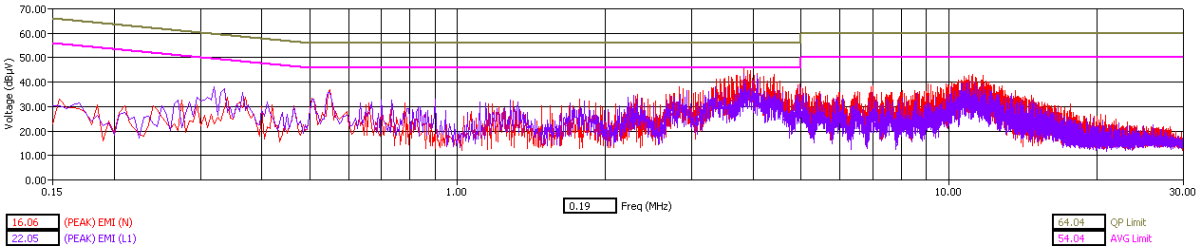
WLAN Channel 6 - Tx Mode - AVG Detector



WLAN Channel 6 - Tx Mode - Peak Detector

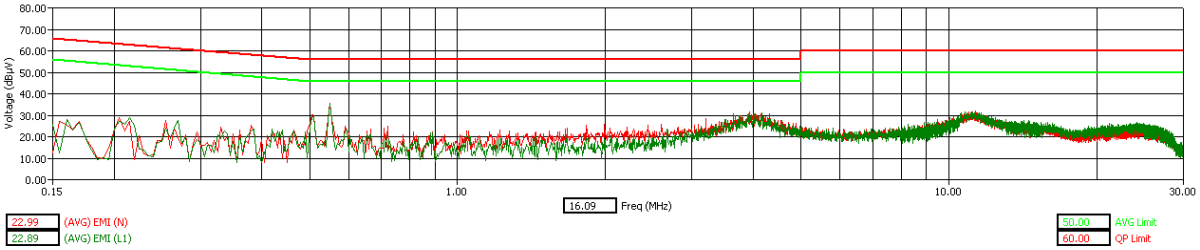


WLAN Channel 11 - Tx Mode - AVG Detector

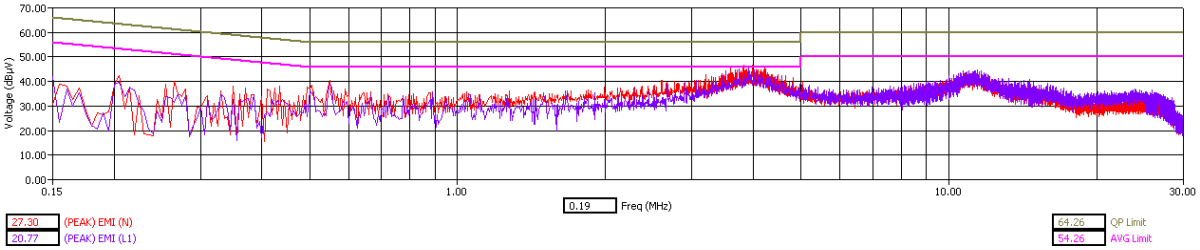


WLAN Channel 11 - Tx Mode - Peak Detector

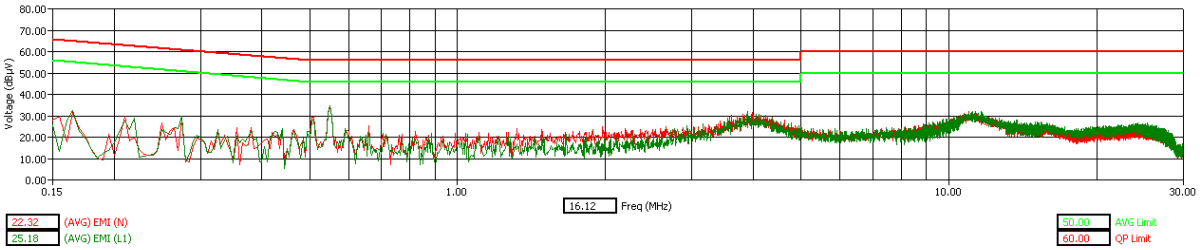
802.11g @ 6Mbps



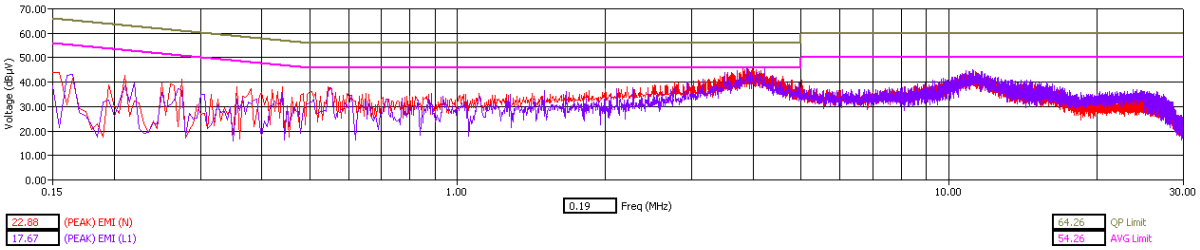
WLAN Channel 1 - Tx Mode - AVG Detector



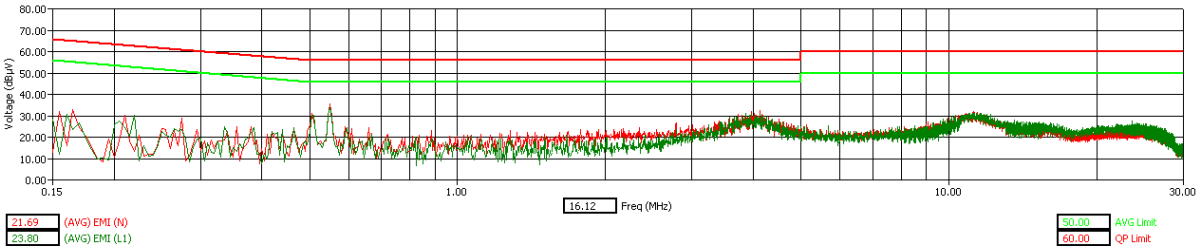
WLAN Channel 1 - Tx Mode –Peak Detector



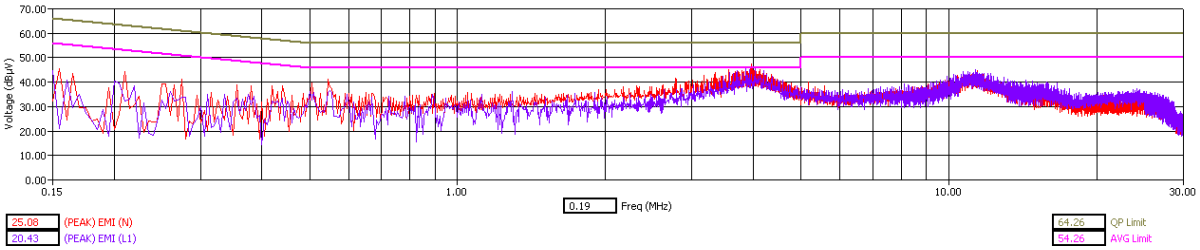
WLAN Channel 6 - Tx Mode - AVG Detector



WLAN Channel 6 - Tx Mode - Peak Detector



WLAN Channel 11 - Tx Mode - AVG Detector



WLAN Channel 11 - Tx Mode - Peak Detector

End of Test Report