FCC RF TEST REPORT

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

LTE Digital Mobile Handset

ISSUED TO
ZTE Corporation

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, P. R. China

Tested by: Cao Shaodong (Engineer)
Date: Jun. 12, 2016

Approved by: Wei Yanquan (Chief Engineer)
Date: Jun. 12, 2016

Report No.:	BL-SZ1650193-603
EUT Type:	LTE Digital Mobile Handset
Model Name:	BGH Joy A20
Brand Name:	ZTE
Test Standard:	47 CFR Part 15 Subpart C
FCC ID:	SRQ-A210
Test conclusion:	Pass
Test Date:	May 23, 2016 ~ May 29, 2016
Date of Issue:	Jun. 12, 2016

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Revision History

Version	Issue Date	Revisions Content
Rev. 01	Jun. 12, 2016	Initial Issue

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1 ADMINISTRATIVE DATA (GENERAL INFORMATION)

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100
Fax Number	+86 755 6182 4271

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1. The laboratory has been listed by US Federal Communications Commission to perform electromagnetic emission measurements. The recognition numbers of test site are 832625. The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Laboratory Condition

Ambient Temperature	20 to 25℃
Ambient Relative Humidity	45% - 55%
Ambient Pressure	100 kPa - 102 kPa

1.4 Announce

(1) The test report reference to the report template version v5.2.

(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

(3) The test report is invalid if there is any evidence and/or falsification.

(4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.

(5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.

(6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without

prior written approval from the laboratory.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	ZTE Corporation
Address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, P. R. China

2.2 Manufacturer Information

Manufacturer	ZTE Corporation
Address	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, P. R. China

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Type	LTE Digital Mobile Handset
Model Name Under Test	BGH Joy A20
Series Model Name	ZTE Blade A210
Description of Model name differentiation	The equipment mode ZTE Blade A210 and BGH Joy A20 are the EUT model, the electrical parameters and internal structure of circuit are same. Only the model name is different.
Hardware Version	BGH_JOY_A20_V1AMB_B
Software Version	BGH_Joy_A20_ARMovistar_1.01
Dimensions (Approx.)	134.8 × 67.5 × 10.15 mm
Weight (Approx.)	150 g
Network and Wireless connectivity	2G Network GSM/GPRS/EDGE 850/900/1800/1900 MHz 3G Network WCDMA/HSDPA/HSUPA Band II/IV/V 4G Network FDD LTE Band2/4/7/12/17/28 Bluetooth 3.0, Bluetooth 4.0 Low Energy (BLE) WIFI 802.11b, 802.11g and 802.11n(HT20/40) GPS, FM, GLONASS

2.5 Ancillary Equipment

Ancillary Equipment 1	Battery	
	Brand Name	N/A
	Model No.	Li3822T43P3h675053
	Serial No.	N/A
	Capacitance	2200 mAh

	Rated Voltage	3.8 V
	Extreme Voltage	4.2 V
Ancillary Equipment 2	Charger	
	Brand Name	Ruide
	Model No.	STC-A51-D
	Rated Input	100-240 V~, 200 mA, 50/60 Hz
	Rated Output	5 V⎓, 1 A
Ancillary Equipment 3	USB Cable	
	Length(Approx.)	700 mm
Ancillary Equipment 4	Earphone	
	Length(Approx.)	1.2 m

2.6 Technical Information

The requirement for the following technical information of the EUT was tested in this report:

TX/ RX Operating Range	802.11b/g/n(20 MHz): 2.412 GHz - 2.462 GHz f_c = 2412 MHz + (N-1)*5 MHz, where - f_c = “Operating Frequency” in MHz, - N = “Channel Number” with the range from 1 to 11. 802.11n(40 MHz): 2.422 GHz - 2.452 GHz f_c = 2412 MHz + (N-1)*5 MHz, where - f_c = “Operating Frequency” in MHz, - N = “Channel Number” with the range from 3 to 9.
Modulation Type	DSSS, OFDM
Antenna Type	PIFA Antenna
Antenna Gain	2.1 dBi
About the Product	The equipment is LTE Digital Mobile Handset, it contains WIFI Modules operating at 2.4 GHz ISM band. Only the WIFI was tested in this report.

Modulation technology	Modulation Type	Transfer Rate (Mbps)	The Frequency Equal to the Transmission Rate of Modulation Signal
DSSS (802.11b)	DBPSK	1	1 MHz
	DQPSK	2	
	CCK	5.5/ 11	1.375 MHz
OFDM (802.11g)	BPSK	6 / 9	1 MHz
	QPSK	12 / 18	
	16QAM	24 / 36	
	64QAM	48 / 54	
OFDM (802.11n-20MHz)	BPSK	6.5	1 MHz
	QPSK	13/19.5	
	16QAM	26/39	
	64QAM	52/58.5/65	
OFDM (802.11n-40MHz)	BPSK	13.5	1 MHz
	QPSK	27/40.5	

	16QAM	54/81/108	
	64QAM	121.5/135	

Note: Preliminary tests were performed in different data rate in above table to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel
Output Power	11b/11g/11n20/11n40	1/6/6.5 Mbps	1/6/11
6dB Bandwidth	11b/11g/11n20/11n40	1/6/6.5 Mbps	1/6/11
Conducted Spurious Emission	11b/11g/11n20/11n40	1/6/6.5 Mbps	1/6/11
Conducted Emission	11b/11g/11n20/11n40	1/6/6.5 Mbps	1/6/11
Radiated Spurious Emission	11b/11g/11n20/11n40	1/6/6.5 Mbps	1/6/11
Band Edge	11b/11g/11n20/11n40	1/6/6.5 Mbps	1/6/11
Power spectral density (PSD)	11b/11g/11n20/11n40	1/6/6.5 Mbps	1/6/11

Note: The above EUT information in section 2.4 and 2.6 was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

2.7 Additional Instructions

EUT Software Settings:

During testing. Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Power level setup in software		
Test Software Version	WiFi_Tx	
Mode	Channel	Power Set
11b	All	15
11g	All	14
11n (HT20)	All	13
11n (HT40)	All	13

Run Software

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15, Subpart C (10-1-14 Edition)	Miscellaneous Wireless Communications Services
2	KDB Publication 558074 D01v03r05	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247
3	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

3.2 Verdict

No.	Description	FCC Part No.	Test Result	Verdict
1	Antenna Requirement	15.203 15.247(b)	Note1	Pass
2	Output Power	15.247(b)	ANNEX A.1	Pass
3	6dB Bandwidth	15.247(a)	ANNEX A.2	Pass
4	Conducted Spurious Emission	15.247(d)	ANNEX A.3	Pass
5	Band Edge(Authorized-band band-edge)	15.247(d)	ANNEX A.4	Pass
6	Conducted Emission	15.207	ANNEX A.5	Pass
7	Radiated Spurious Emission	15.209 15.247(d)	ANNEX A.6	Pass
8	Power spectral density (PSD)	15.247(e)	ANNEX A.7	Pass
Note 1: Please refer to section 5.1				

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

During the measurement, the normal environmental conditions were within the listed ranges:

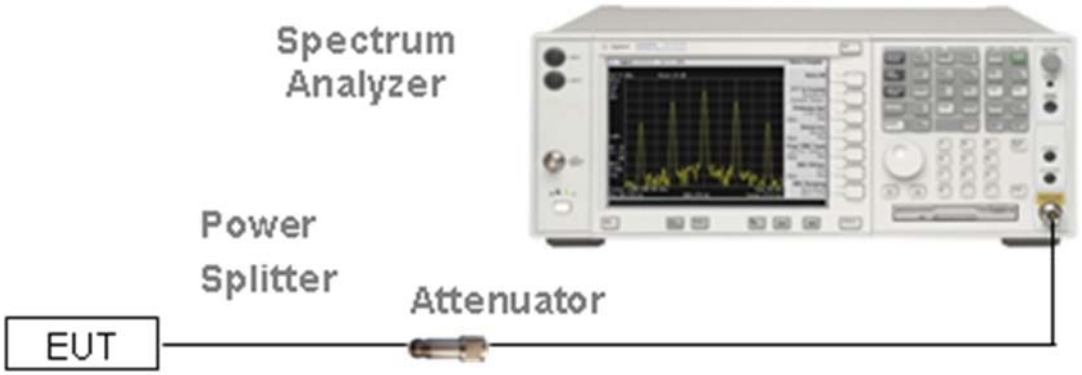
Relative Humidity	45% - 55%	
Atmospheric Pressure	100 kPa - 102 kPa	
Temperature	NT (Normal Temperature)	+22℃ to +25℃
Working Voltage of the EUT	NV (Normal Voltage)	3.6 V

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-30	103118	2015.07.16	2016.07.15
Vector Signal Generator	ROHDE&SCHWARZ	SMBV100A	177746	2015.07.16	2016.07.15
Signal Generator	ROHDE&SCHWARZ	SMB100A	260592	2015.07.01	2016.06.30
Switch Unit with OSP-B157	ROHDE&SCHWARZ	OSP120	101270	2015.07.16	2016.07.15
Spectrum Analyzer	AGILENT	E4440A	MY45304434	2015.10.15	2016.10.14
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2015.07.14	2016.07.13
LISN	SCHWARZBECK	NSLK 8127	8127-687	2015.07.14	2016.07.13
Bluetooth Tester	ROHDE&SCHWARZ	CBT	101005	2015.07.16	2016.07.15
Power Splitter	KMW	DCPD-LDC	1305003215	2015.07.01	2016.06.30
Power Sensor	ROHDE&SCHWARZ	NRP-Z21	103971	2015.07.21	2016.07.20
Attenuator (20 dB)	KMW	ZA-S1-201	110617091	--	--
Attenuator (6 dB)	KMW	ZA-S1-61	1305003189	--	--
DC Power Supply	ROHDE&SCHWARZ	HMP2020	018141664	2015.07.17	2016.07.16
Temperature Chamber	ANGELANTIONI SCIENCE	NTH64-40A	1310	2015.08.07	2016.08.06
Test Antenna-Loop(9 kHz-30 MHz)	SCHWARZBECK	FMZB 1519	1519-037	2015.07.22	2017.07.21
Test Antenna-Bi-Log(30 MHz-3 GHz)	SCHWARZBECK	VULB 9163	9163-624	2015.07.22	2017.07.21
Test Antenna-Horn(1-18 GHz)	SCHWARZBECK	BBHA 9120D	9120D-1148	2015.07.22	2017.07.21
Test Antenna-Horn(15-26.5 GHz)	SCHWARZBECK	BBHA 9170	9170-305	2015.07.22	2017.07.21
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2015.02.28	2017.02.27
Shielded Enclosure	ChangNing	CN-130701	130703	--	--

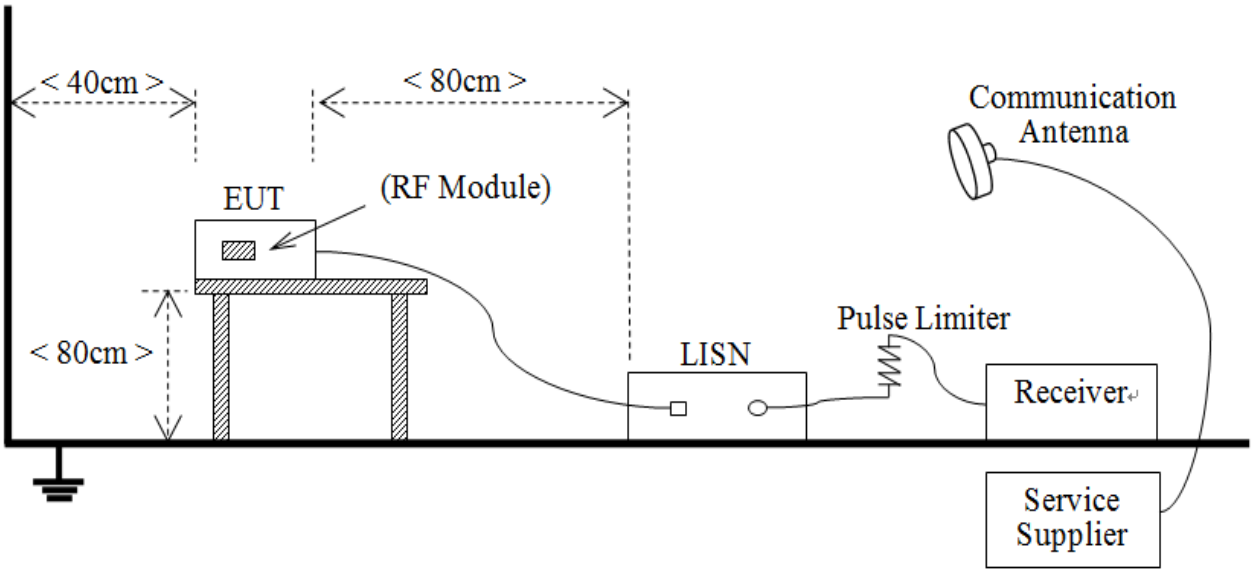
4.3 Description of Test Setup

4.3.1 For Antenna Port Test



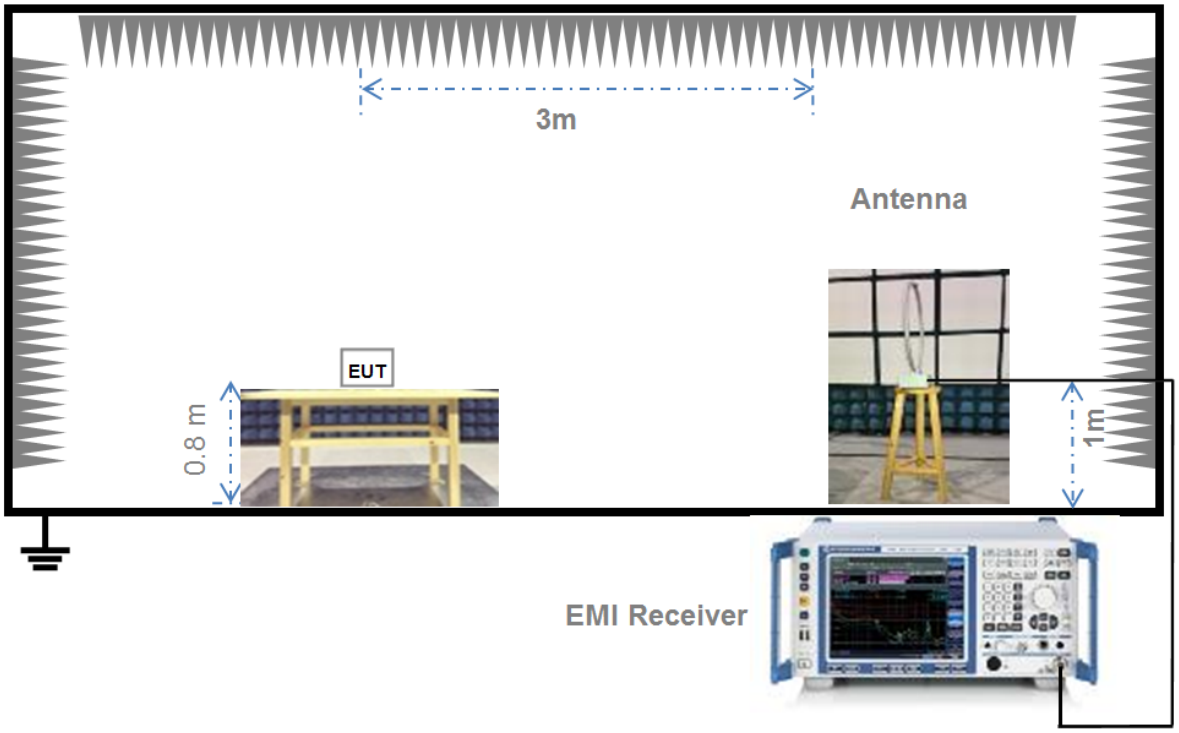
(Diagram 1)

4.3.2 For AC Power Supply Port Test



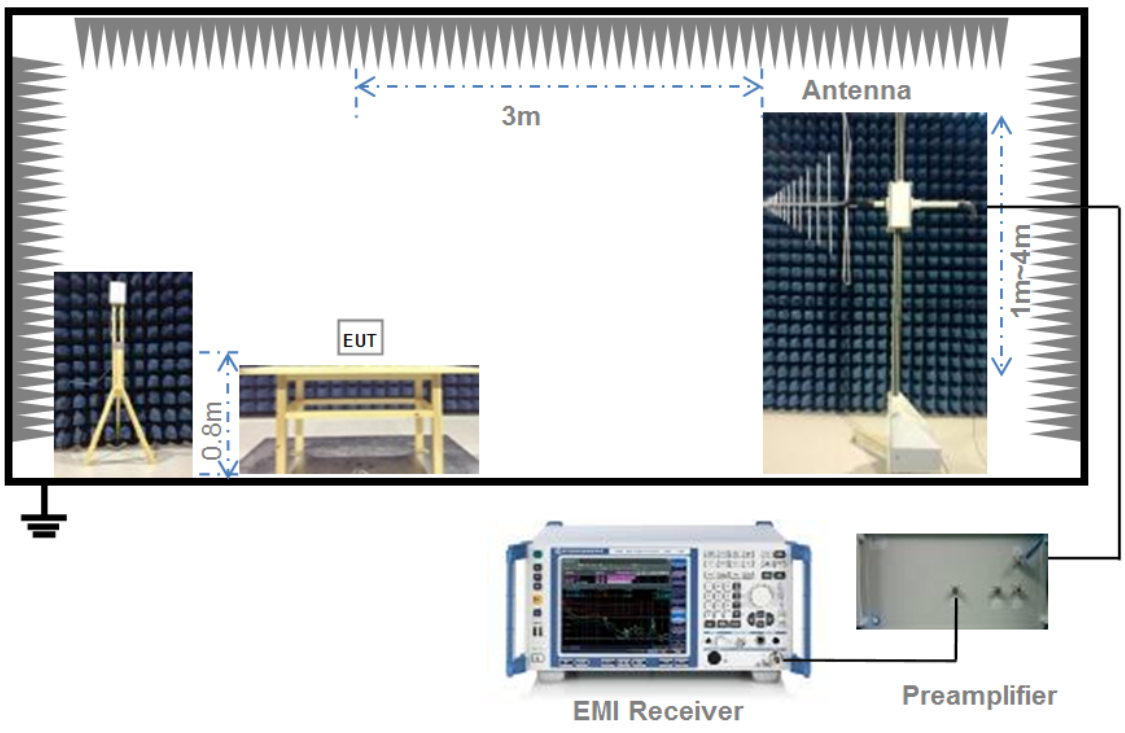
(Diagram 2)

4.3.3 For Radiated Test (Below 30 MHz)



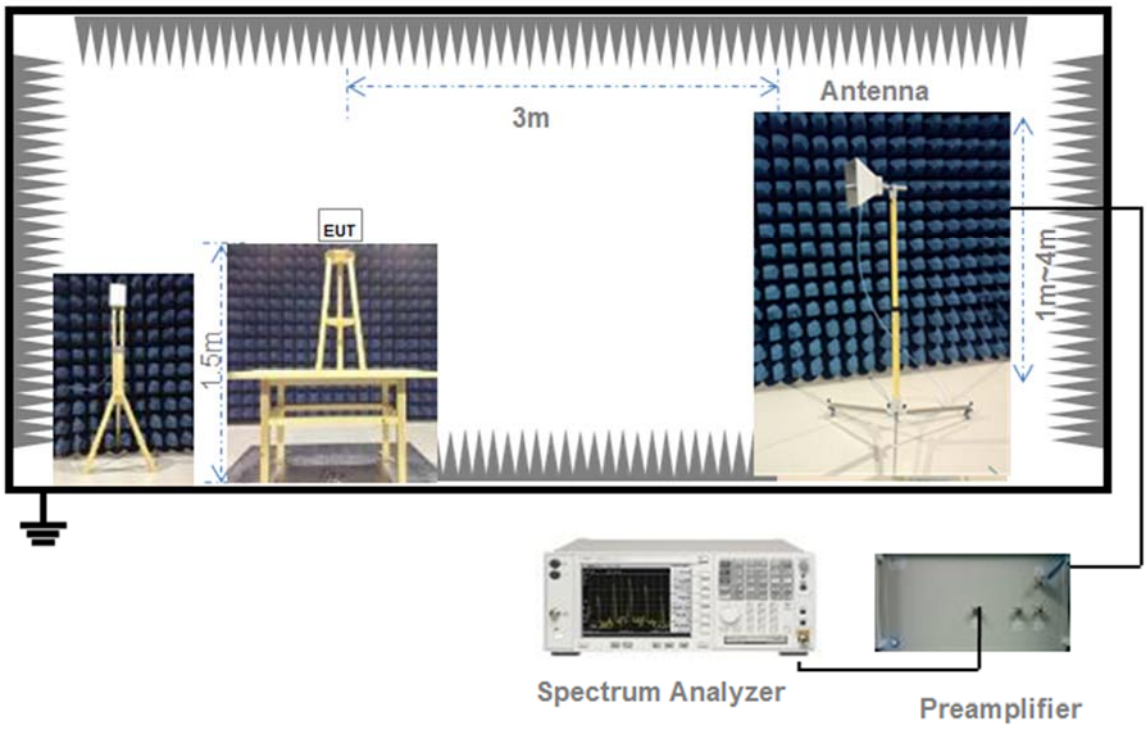
(Diagram 3)

4.3.4 For Radiated Test (30 MHz-1 GHz)



(Diagram 4)

4.3.5 For Radiated Test (Above 1 GHz)



(Diagram 5)

5 TEST ITEMS

5.1 Antenna Requirements

5.1.1 Standard Applicable

FCC §15.203 & 15.247(b)

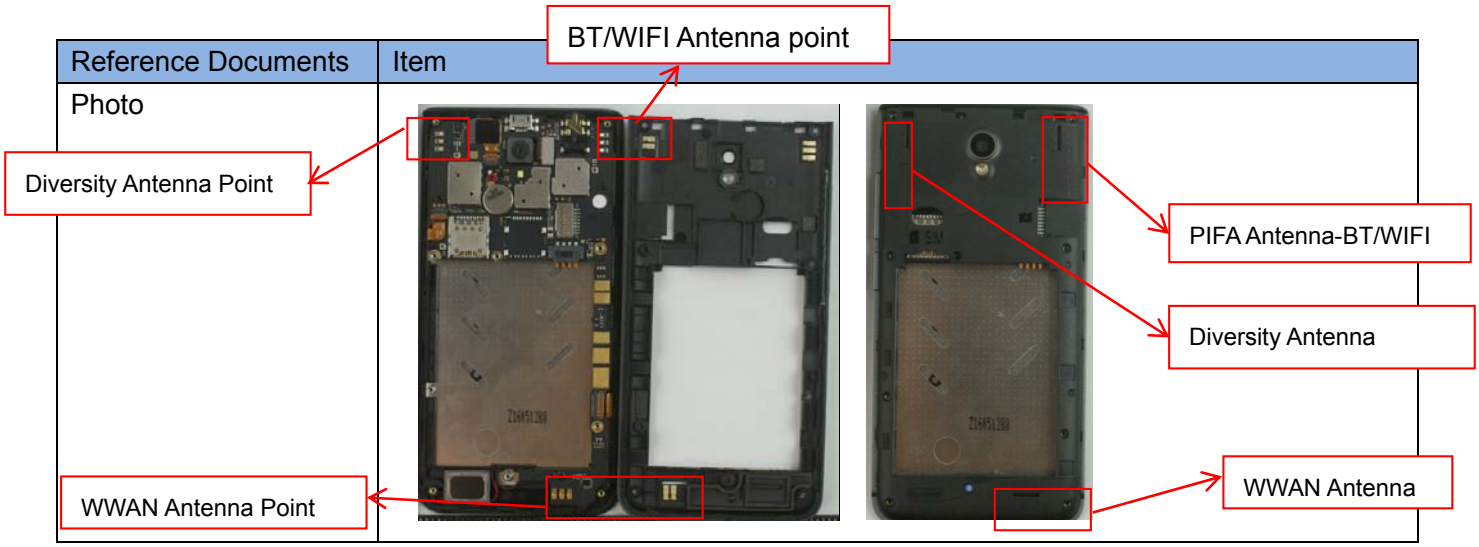
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

If directional gain of transmitting antennas is greater than 6 dBi, the power shall be reduced by the same level in dB comparing to gain minus 6 dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

5.1.2 Antenna Anti-Replacement Construction

The Antenna Anti-Replacement as following method:

Protected Method	Description
The antenna is An embedded-in	An embedded-in antenna design is used.

Reference Documents	Item
Photo	

5.1.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

5.2 Output Power

5.2.1 Test Limit

FCC § 15.247(b)

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements.

5.2.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.2.3 Test Procedure

Maximum peak conducted output power

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

Maximum conducted (average) output power (Reporting Only)

a) As an alternative to spectrum analyzer or EMI receiver measurements, measurements may be performed

using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.

1) The EUT is configured to transmit continuously, or to transmit with a constant duty factor.

2) At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.

3) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a

factor of five.

b) If the transmitter does not transmit continuously, measure the duty cycle (x) of the transmitter output signal as

described in Section 6.0.

c) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.

d) Adjust the measurement in dBm by adding 10log (1/x), where x is the duty cycle to the measurement result.

Measurements of duty cycle

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal.

Set the center frequency of the instrument to the center frequency of the transmission.

Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value.

Set VBW ≥ RBW. Set detector = peak or average.

The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T ≤ 16.7 microseconds.)

5.2.4 Test Result

Please refer to ANNEX A.1.

5.3 6dB Bandwidth

5.3.1 Limit

FCC §15.247(a)

Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW. The 6 dB bandwidth must be greater than 500 kHz.

5.3.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.3.3 Test Procedure

Use the following spectrum analyzer settings:

Set RBW = 100 kHz.

Set the video bandwidth (VBW) ≥ 3 RBW.

Detector = Peak.

Trace mode = max hold.

Sweep = auto couple.

Allow the trace to stabilize.

Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.3.4 Test Result

Please refer to ANNEX A.2.

5.4 Conducted Spurious Emission

5.4.1 Limit

FCC §15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

5.4.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.4.3 Test Procedure

The DTS rules specify that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:

a) If the maximum peak conducted output power procedure was used to demonstrate compliance as described in 9.1, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 20 dBc).

b) If maximum conducted (average) output power was used to demonstrate compliance as described in 9.2, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 30 dBc).

c) In either case, attenuation to levels below the 15.209 general radiated emissions limits is not required.

The following procedures shall be used to demonstrate compliance to these limits. Note that these procedures can be used in either an antenna-port conducted or radiated test set-up. Radiated tests must conform to the test site requirements and utilize maximization procedures defined herein.

Reference level measurement

Establish a reference level by using the following procedure:

Set instrument center frequency to DTS channel center frequency.

Set the span to ≥ 1.5 times the DTS bandwidth.

Set the RBW = 100 kHz.

Set the VBW ≥ 3 x RBW.

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum PSD level.

Emission level measurement

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.

Set the RBW = 100 kHz.

Set the VBW ≥ 3 x RBW.

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in 11.1 a) or 11.1 b). Report the three highest emissions relative to the limit.

5.4.4 Test Result

Please refer to ANNEX A.3.

5.5 Band Edge (Authorized-band band-edge)

5.5.1 Limit

FCC §15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

5.5.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.5.3 Test Procedure

The following procedures may be used to determine the peak or average field strength or power of an unwanted emission that is within 2 MHz of the authorized band edge. If a peak detector is utilized, use the procedure described in 13.2.1. Use the procedure described in 13.2.2 when using an average detector and the EUT can be configured to transmit continuously (i.e., duty cycle $\geqslant$ 98%). Use the procedure described in 13.2.3 when using an average detector and the EUT cannot be configured to transmit continuously but the duty cycle is constant (i.e., duty cycle variations are less than ± 2 percent). Use the procedure described in 13.2.4 when using an average detector for those cases where the EUT cannot be configured to transmit continuously and the duty cycle is not constant (duty cycle variations equal or exceed 2 percent).

When using a peak detector to measure unwanted emissions at or near the band edge (within 2 MHz of the authorized band), the following integration procedure can be used.

Set instrument center frequency to the frequency of the emission to be measured (must be within 2 MHz of the authorized band edge).

Set span to 2 MHz

RBW = 100 kHz.

VBW $\geqslant$ 3 x RBW.

Detector = peak.

Sweep time = auto.

Trace mode = max hold.

Allow sweep to continue until the trace stabilizes (required measurement time may increase for low duty cycle applications)

Compute the power by integrating the spectrum over 1 MHz using the analyzer's band power measurement function with band limits set equal to the emission frequency (femission) ± 0.5 MHz. If the instrument does not have a band power function, then sum the amplitude levels (in power units) at 100 kHz intervals extending across the 1 MHz spectrum defined by femission ± 0.5 MHz.

5.5.4 Test Result

Please refer to ANNEX A.4.

5.6 Conducted Emission

5.6.1 Limit

FCC §15.207

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

5.6.2 Test Setup

See section 4.4.2 for test setup description for the AC power supply port. The photo of test setup please refer to ANNEX B.

5.6.3 Test Procedure

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.
Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz) for which the device is capable of operation. A device rated for 50/60 Hz operation need not be tested at both frequencies provided the radiated and line conducted emissions are the same at both frequencies.

5.6.4 Test Result

Please refer to ANNEX A.5.

5.7 Radiated Spurious Emission

5.7.1 Limit

FCC §15.209&15.247(c)

Radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Note:

1. Field Strength (dBμV/m) = 20*log[Field Strength (μV/m)].
2. In the emission tables above, the tighter limit applies at the band edges.
3. For Above 1000 MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
4. For above 1000 MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK).

Test Setup

See section 4.3.3-4.3.5 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.7.2 Test Procedure

The measurement frequency range is from 9 kHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported, Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

5.7.3 Test Result

Please refer to ANNEX A.6.

5.8 Band Edge (Restricted-band band-edge)

5.8.1 Limit

FCC §15.209&15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

5.8.2 Test Setup

See section 4.3.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.8.3 Test Procedure

Span = wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products which fall outside of the authorized band of operation

RBW ≥ 1% of the span

VBW ≥ RBW

Sweep = auto

Detector function = peak /AV

Trace = max hold

Allow the trace to stabilize.

E [dBμV/m] =UR + AT + AFactor [dB]; AT =LCable loss [dB] - Gpreamp [dB]

AT: Total correction Factor except Antenna

UR: Receiver Reading

Gpreamp: Preamplifier Gain

AFactor: Antenna Factor at 3m

5.8.4 Test Result

Please refer to ANNEX A.7.

5.9 Power Spectral density (PSD)

5.9.1 Limit

FCC §15.247(d)

The same method of determining the conducted output power shall be used to determine the power spectral density. If a peak output power is measured, then a peak power spectral density measurement is required. If an average output power is measured, then an average power spectral density measurement should be used.

5.9.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.9.3 Test Procedure

Set analyzer center frequency to DTS channel center frequency.

Set the span to 1.5 times the DTS bandwidth.

Set the RBW to: 3 kHz $\leqslant$ RBW $\leqslant$ 100 kHz.

Set the VBW $\geqslant$ 3 RBW.

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

5.9.4 Test Result

Please refer to ANNEX A.8.

ANNEX A TEST RESULT

A.1 Output Power

Duty Cycle

Test Mode	Duty Cycle	T (ms)	1/T(kHz)
802.11b	1.00	34.17	0.03
802.11g	0.94	1.37	0.73
802.11n-20 MHz	0.95	1.27	0.79
802.11n-40 MHz	0.89	0.61	1.64

Peak Power Test Data

802.11b Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	15.06	32.06	30	1000	Pass
Middle	15.22	33.27			Pass
High	17.69	58.75			Pass

802.11g Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	19.27	84.53	30	1000	Pass
Middle	19.35	86.10			Pass
High	19.65	92.26			Pass

802.11n-20 MHz Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	18.48	70.47	30	1000	Pass
Middle	18.44	69.82			Pass
High	18.75	74.99			Pass

802.11n-40 MHz Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	18.45	69.98	30	1000	Pass
Middle	18.61	72.61			Pass
High	18.88	77.27			Pass

A.2 Bandwidth

Test Data

802.11b Mode:

Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	9.1180	12.2629	≥500
Middle	10.0810	12.8045	≥500
High	9.6430	12.8175	≥500

802.11g Mode:

Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	14.0720	16.2757	≥500
Middle	15.7760	16.5415	≥500
High	16.3640	16.5143	≥500

802.11n-20MHz Mode:

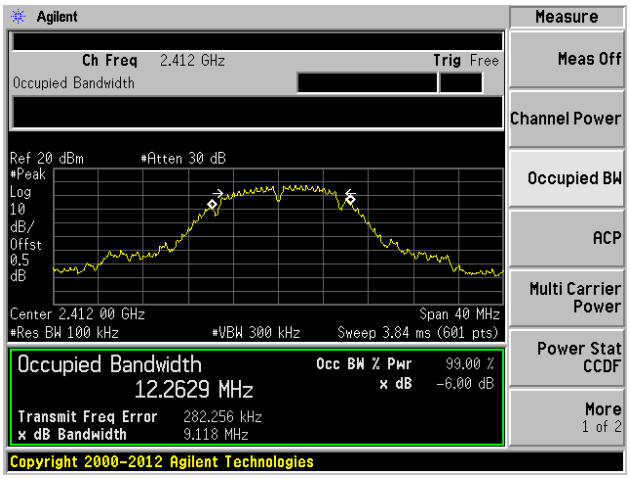
Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	14.0300	17.4230	≥500
Middle	16.4200	17.6726	≥500
High	17.6420	17.6548	≥500

802.11n-40MHz Mode:

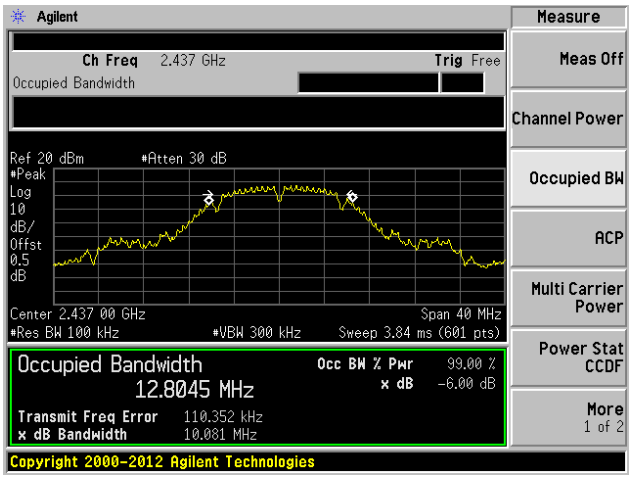
Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	33.8110	35.3633	≥500
Middle	35.5760	36.0787	≥500
High	29.0680	35.5058	≥500

Test plots

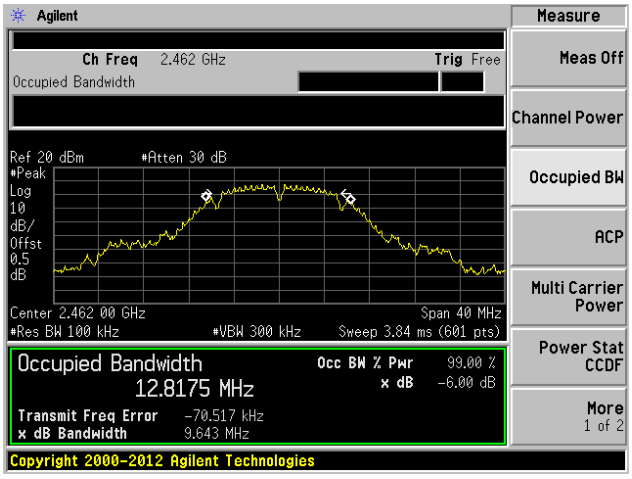
802.11b LOW CHANNEL



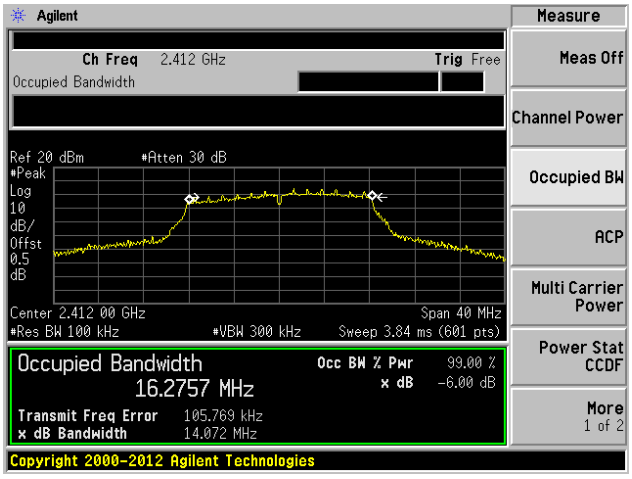
802.11b MIDDLE CHANNEL



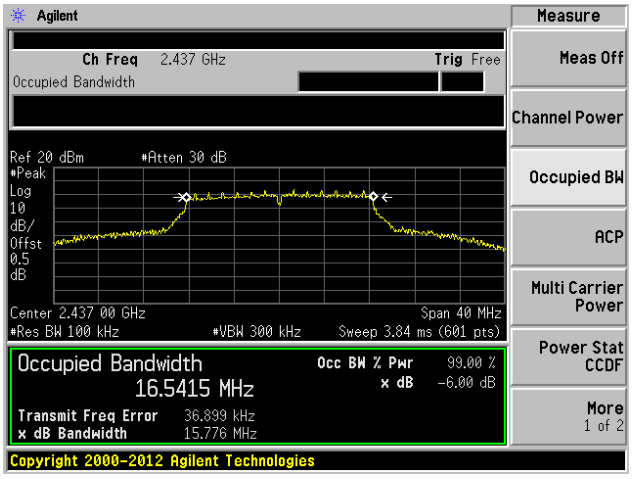
802.11b HIGH CHANNEL



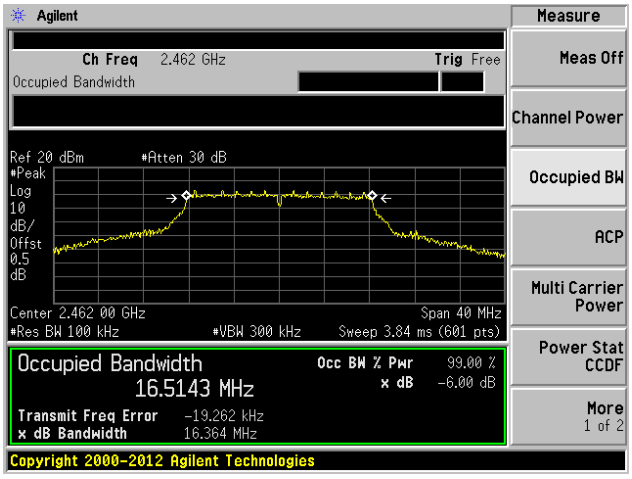
802.11g LOW CHANNEL



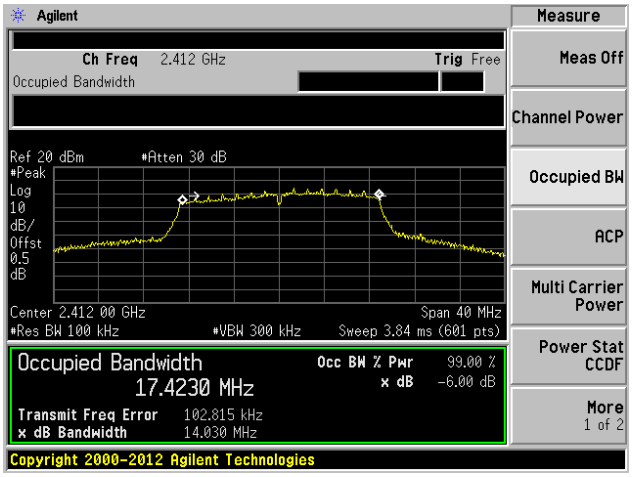
802.11g MIDDLE CHANNEL



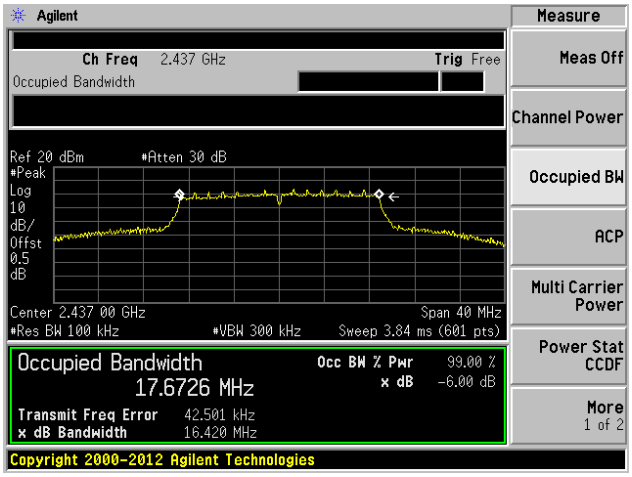
802.11g HIGH CHANNEL



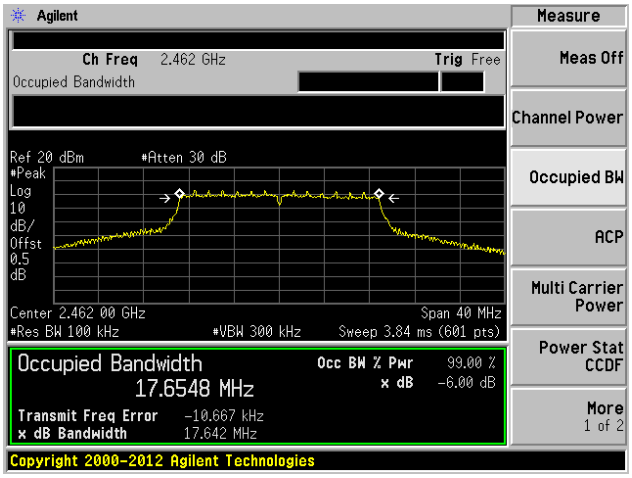
802.11n-20 MHz LOW CHANNEL



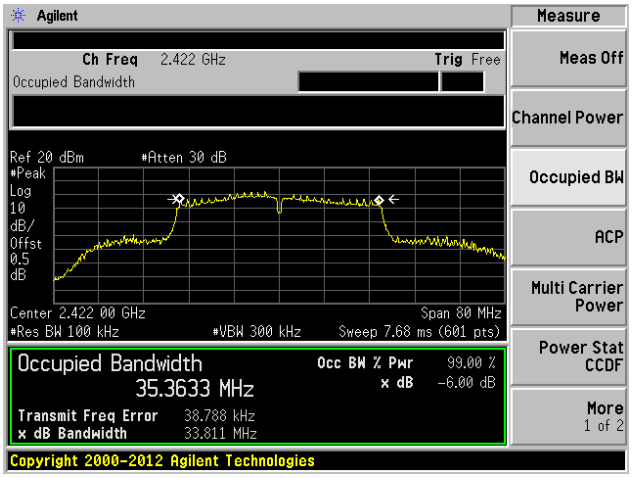
802.11 n-20 MHz MIDDLE CHANNEL



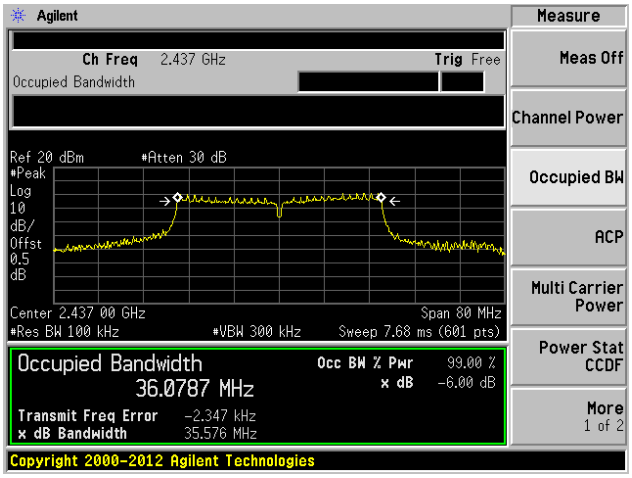
802.11n-20 MHz HIGH CHANNEL



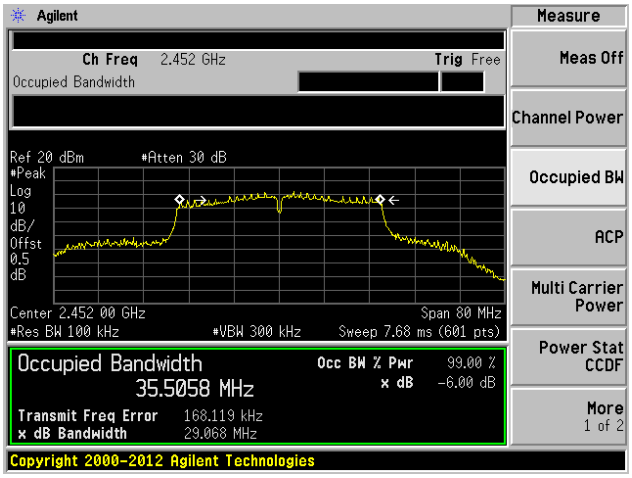
802.11n-40 MHz LOW CHANNEL



802.11n-40 MHz MIDDLE CHANNEL



802.11n-40 MHz HIGH CHANNEL



A.3 Conducted Spurious Emissions

Test Data

802.11b Mode:

Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-40.68	7.40	-12.60	Pass
Middle	-43.96	6.82	-13.18	Pass
High	-39.06	6.80	-13.20	Pass

802.11g Mode:

Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-57.09	4.04	-15.96	Pass
Middle	-55.32	2.93	-17.07	Pass
High	-49.72	3.14	-16.86	Pass

802.11n-20MHz Mode:

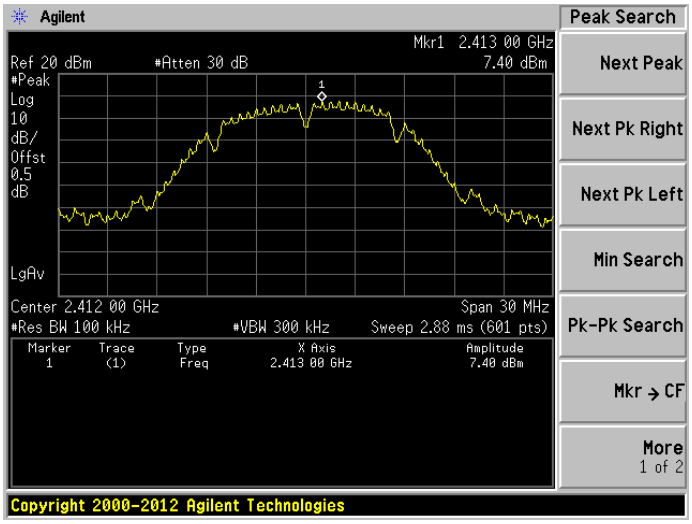
Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-53.21	4.21	-15.79	Pass
Middle	-55.24	3.23	-16.77	Pass
High	-51.97	3.13	-16.87	Pass

802.11n-40MHz Mode:

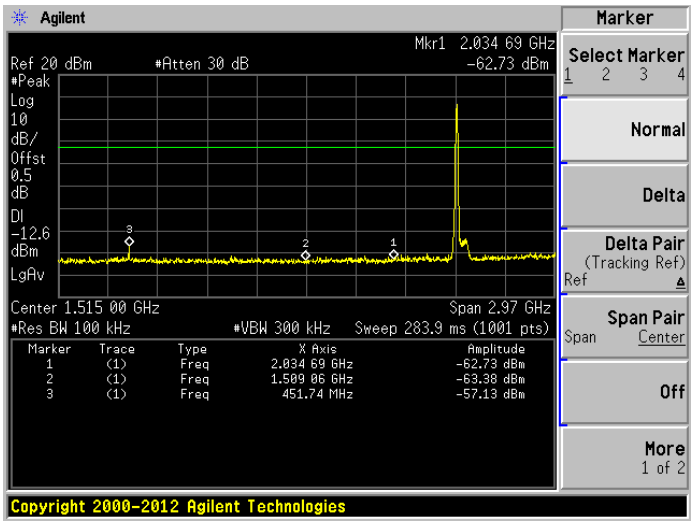
Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-55.60	2.04	-17.96	Pass
Middle	-56.10	0.96	-19.04	Pass
High	-54.44	1.56	-18.44	Pass

Test Plots

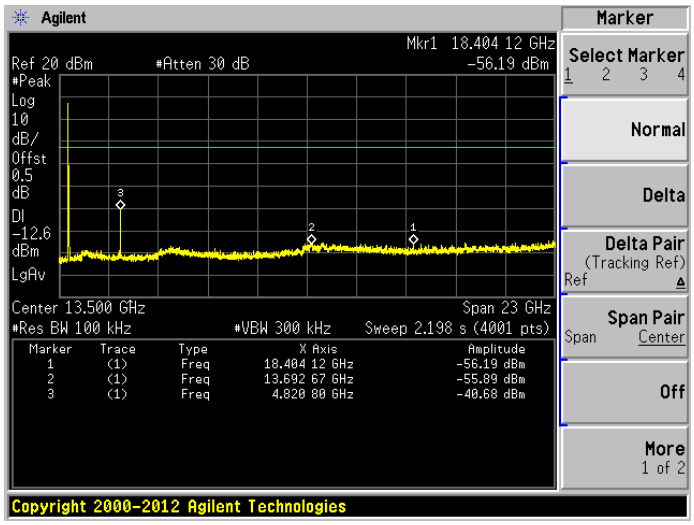
802.11b LOW CHANNEL CARRIER LEVEL



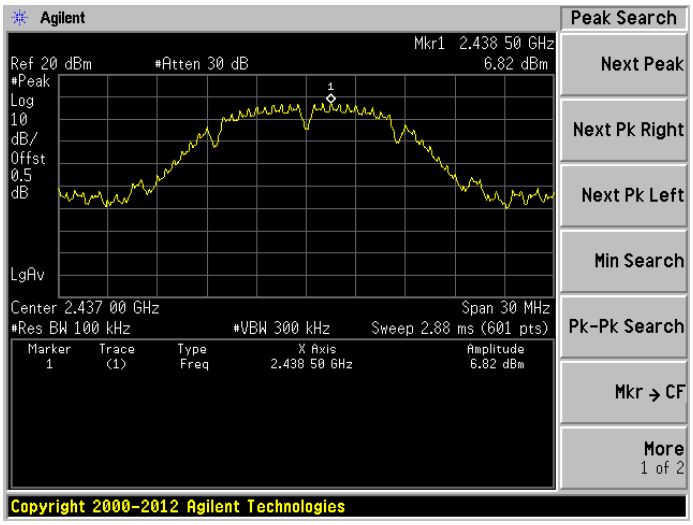
802.11b LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



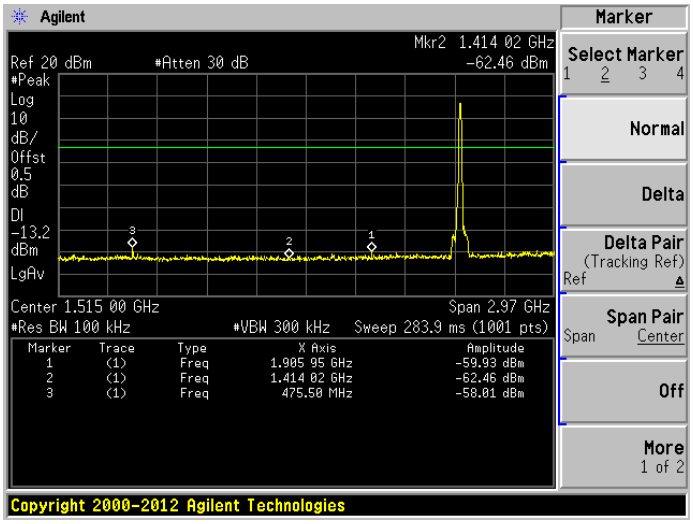
802.11b LOW CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



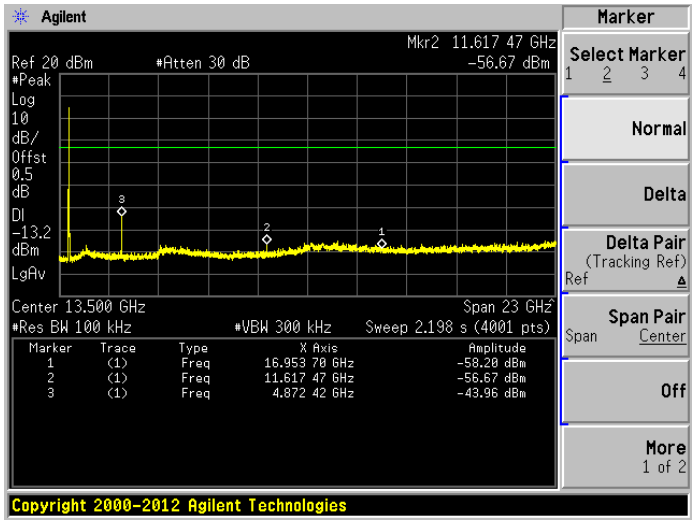
802.11b MIDDLE CHANNEL CARRIER LEVEL



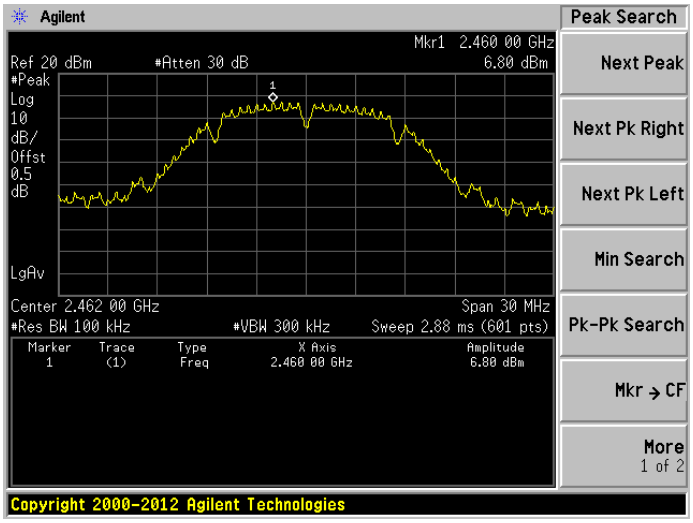
802.11b MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



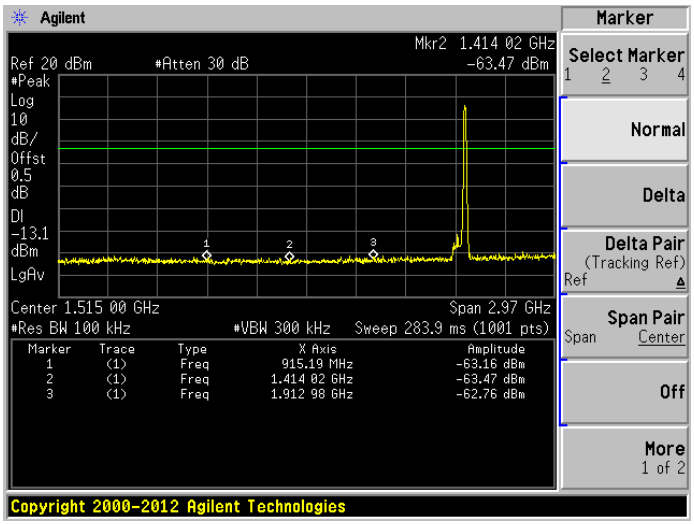
802.11b MIDDLE CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



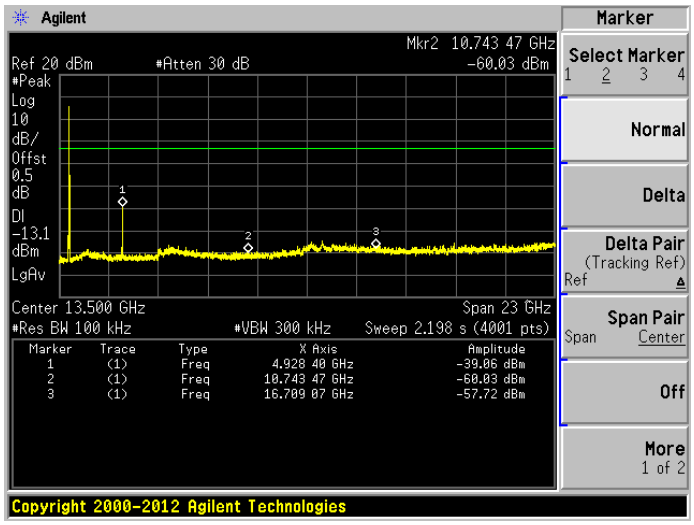
802.11b HIGH CHANNEL CARRIER LEVEL



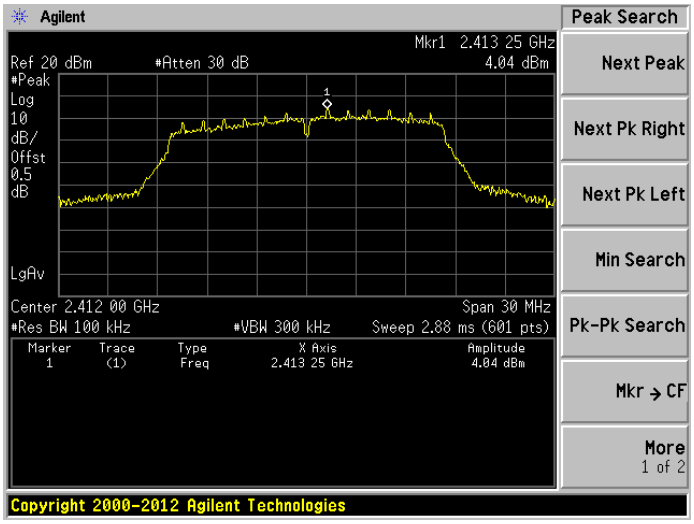
802.11b HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



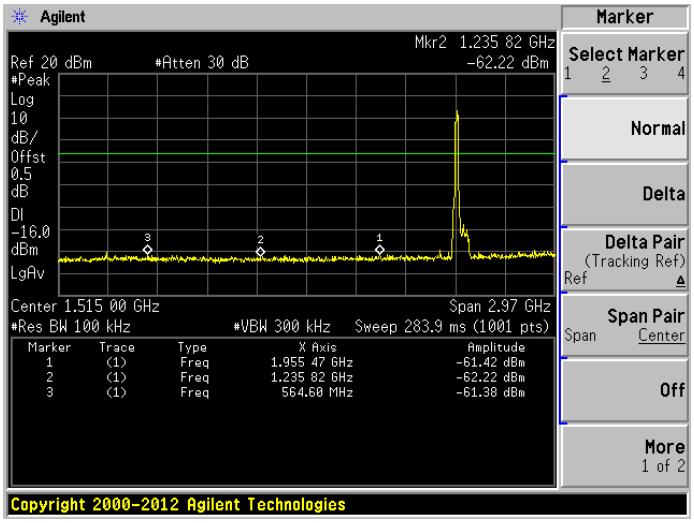
802.11b HIGH CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



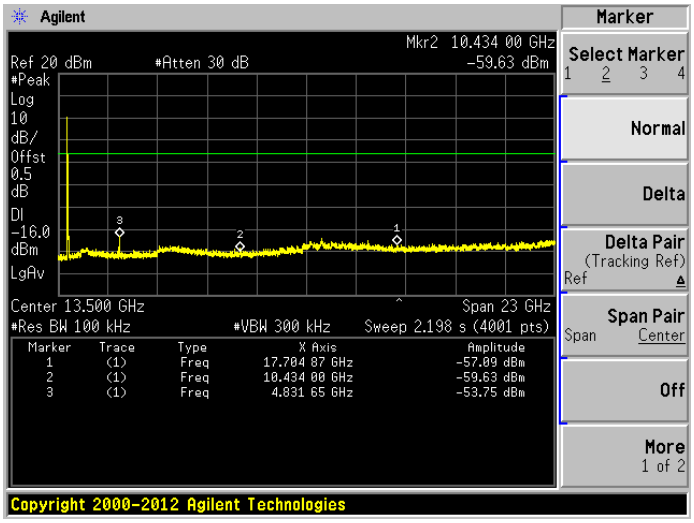
802.11g LOW CHANNEL CARRIER LEVEL



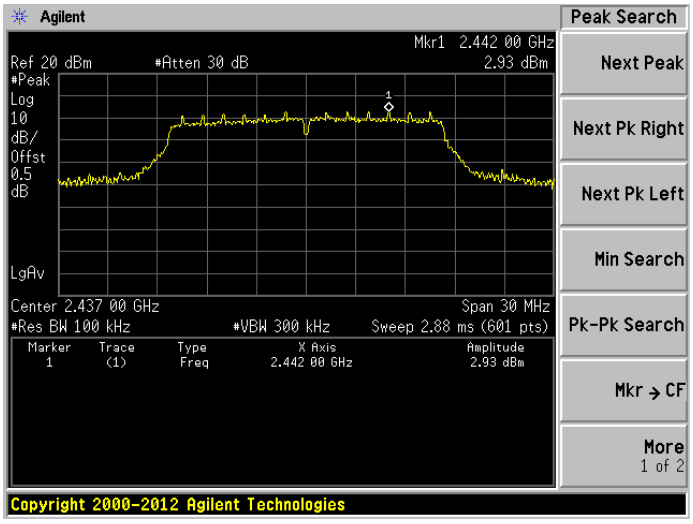
802.11g LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



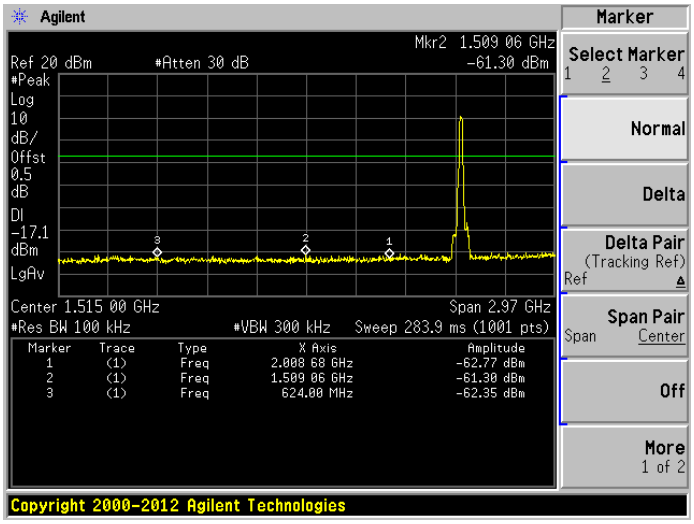
802.11g LOW CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



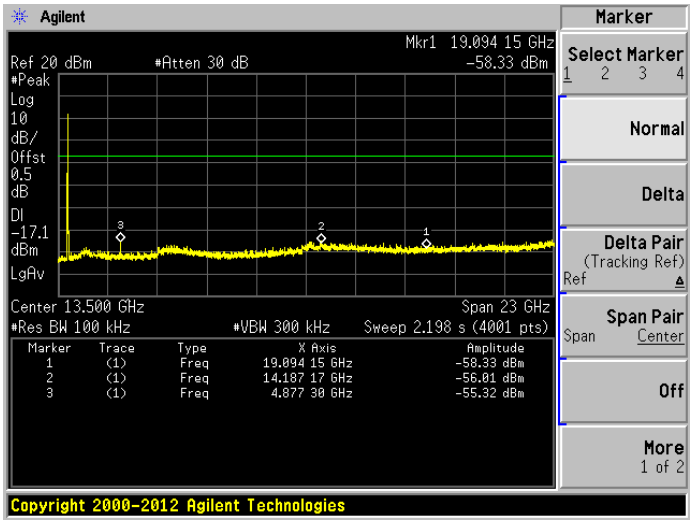
802.11g MIDDLE CHANNEL CARRIER LEVEL



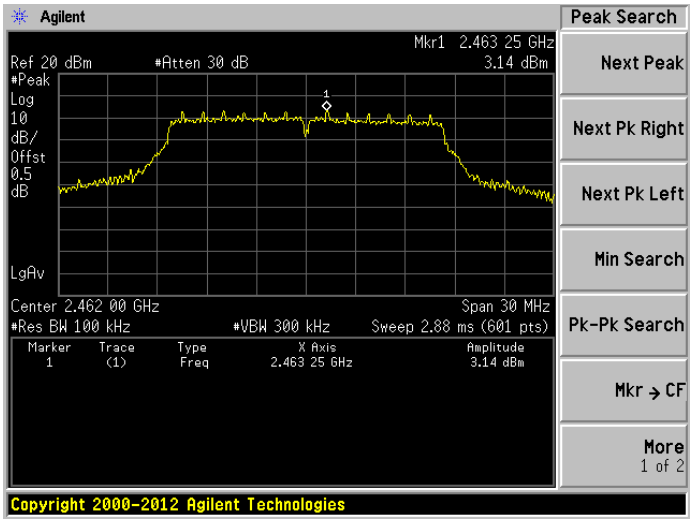
802.11g MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



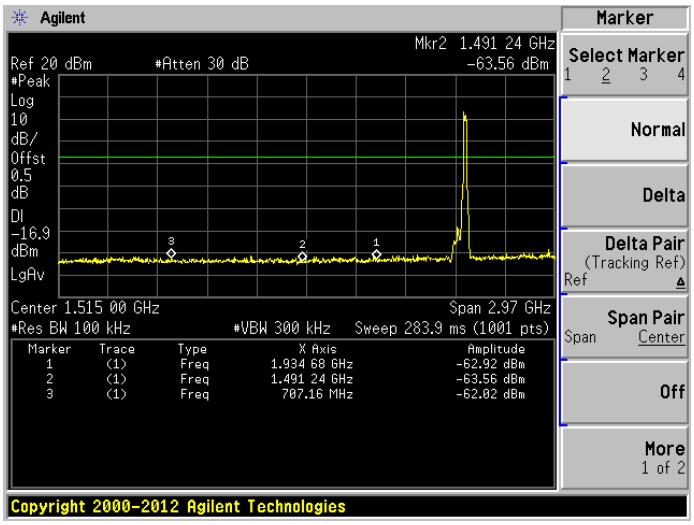
802.11g MIDDLE CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



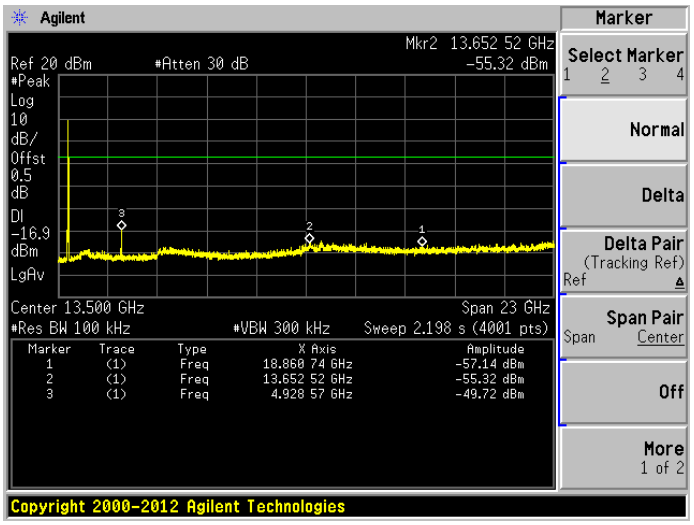
802.11g HIGH CHANNEL CARRIER LEVEL



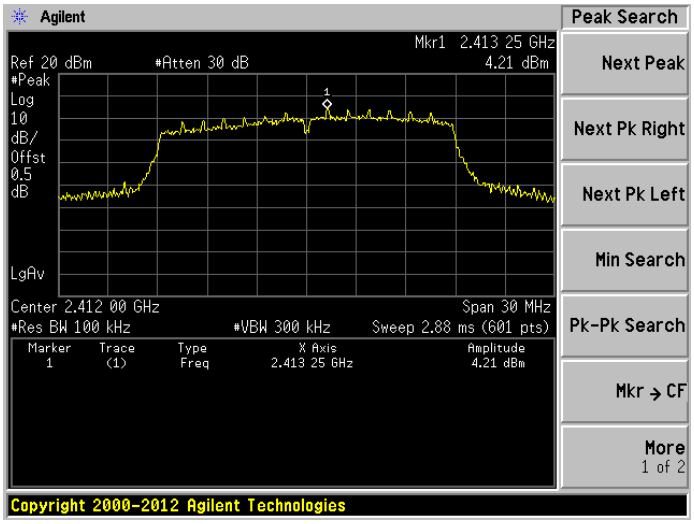
802.11g HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



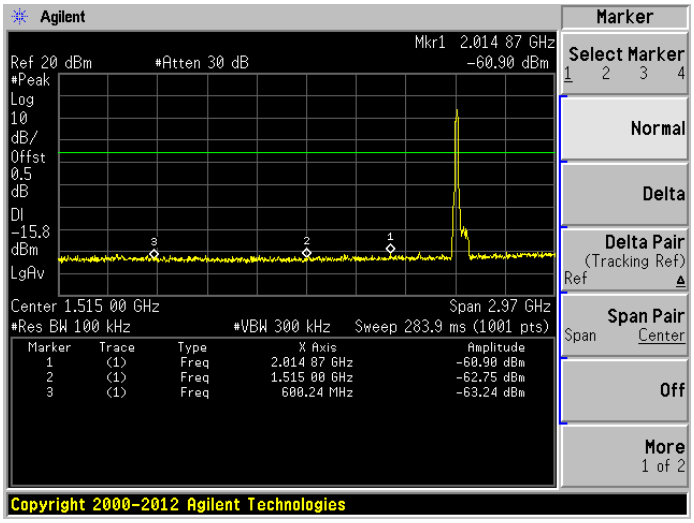
802.11g HIGH CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



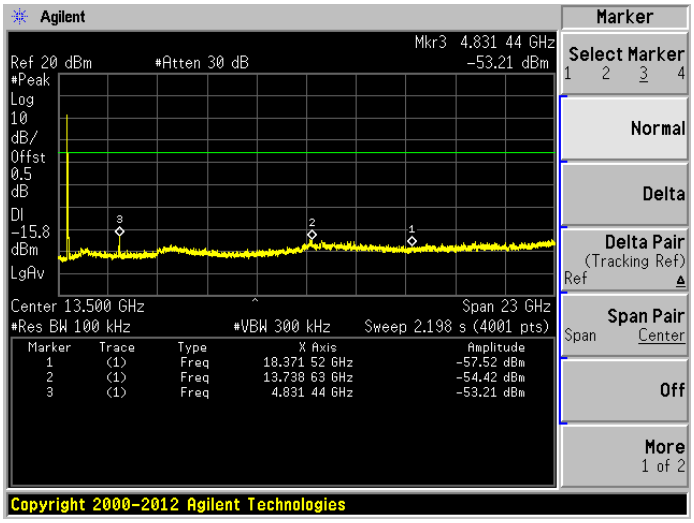
802.11n-20 MHz LOW CHANNEL CARRIER LEVEL



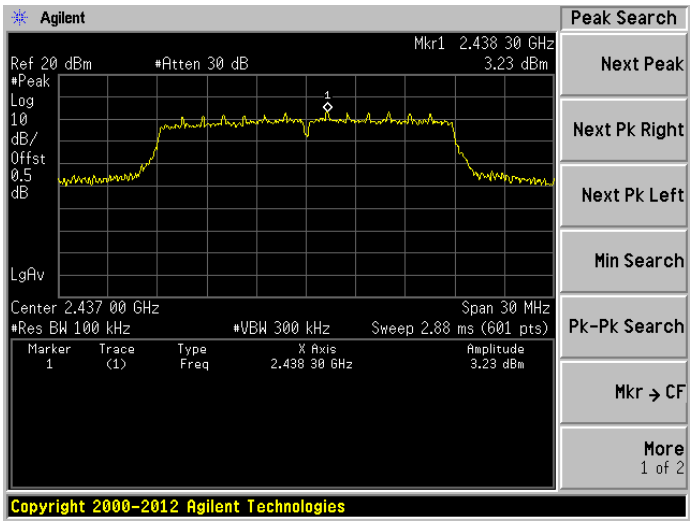
802.11n-20 MHz LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



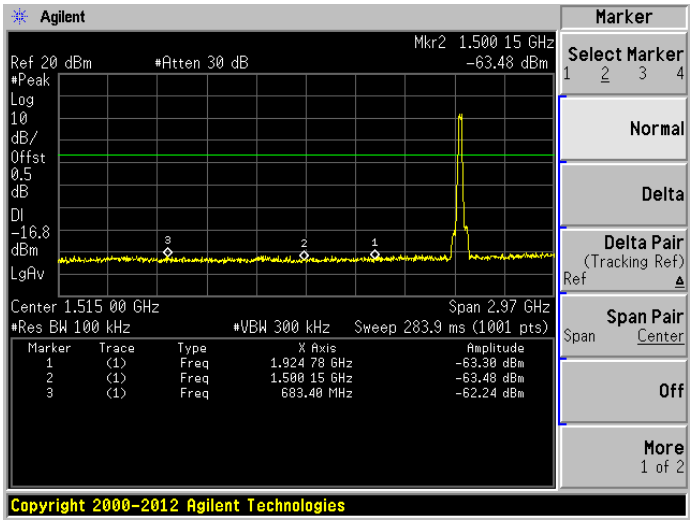
802.11n-20 MHz LOW CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



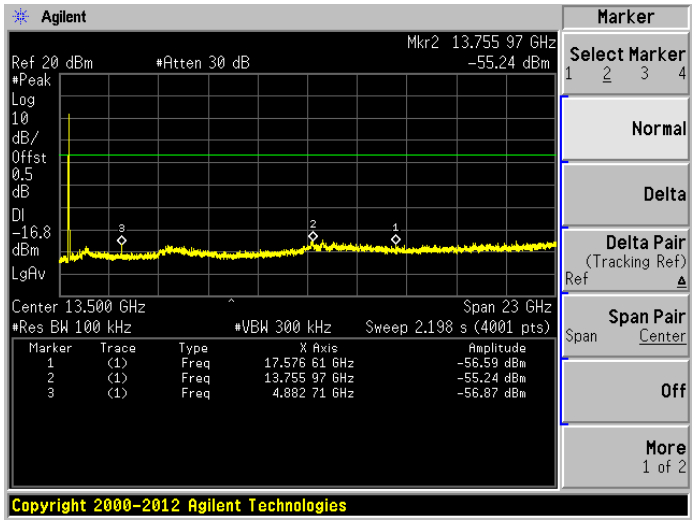
802.11n-20 MHz MIDDLE CHANNEL CARRIER LEVEL



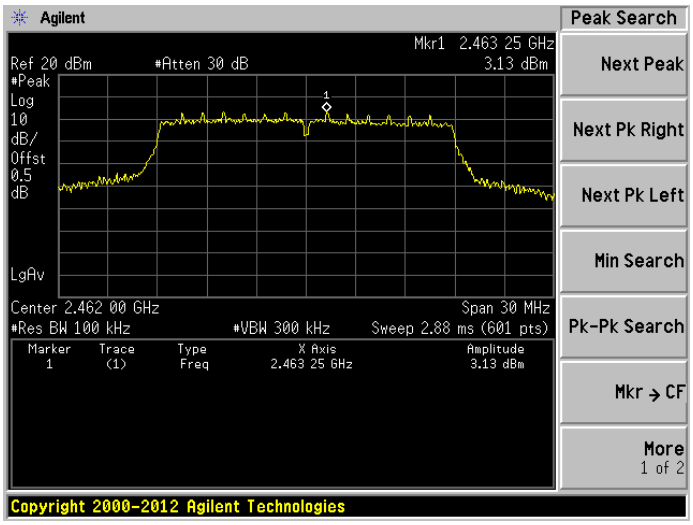
802.11n-20 MHz MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



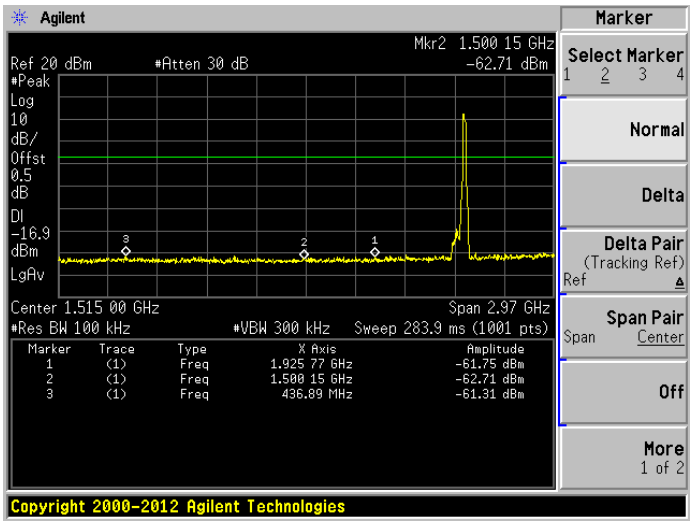
802.11n-20 MHz MIDDLE CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



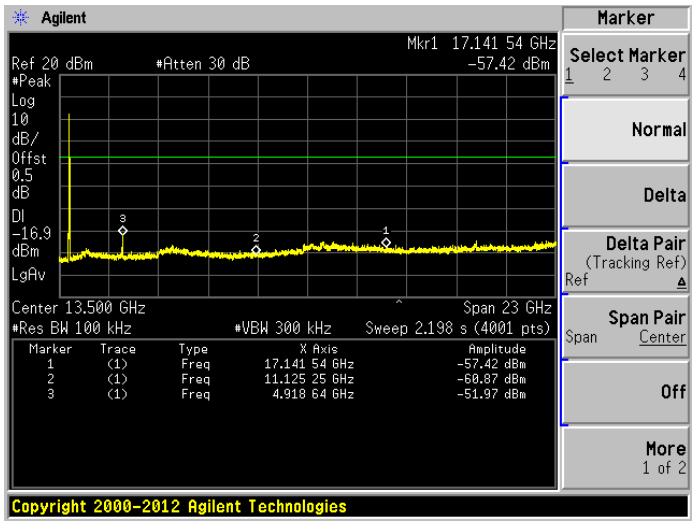
802.11n-20 MHz HIGH CHANNEL CARRIER LEVEL



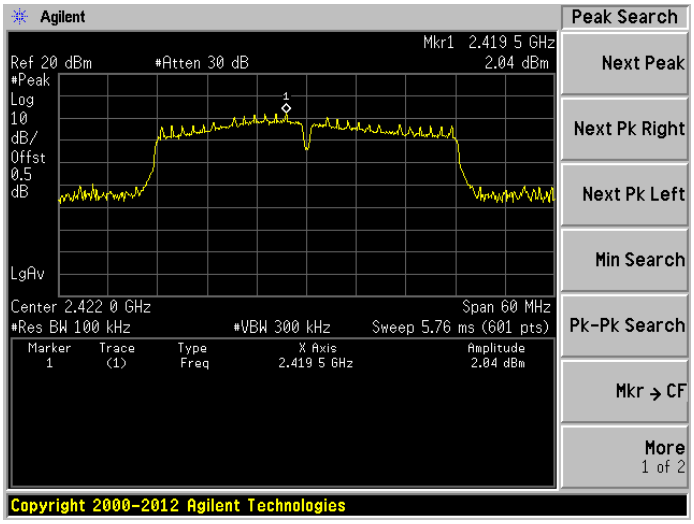
802.11n-20 MHz HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



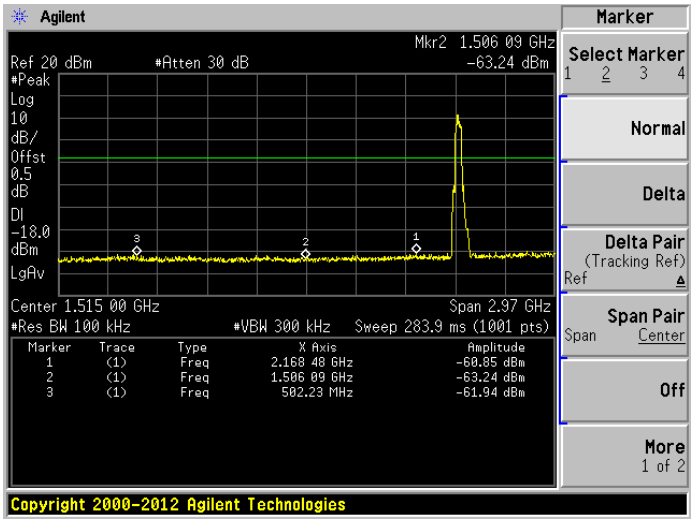
802.11n-20 MHz HIGH CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



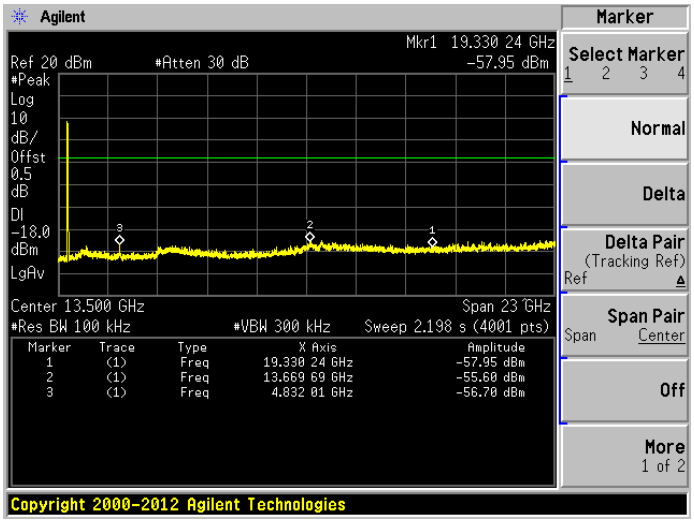
802.11n-40 MHz LOW CHANNEL CARRIER LEVEL



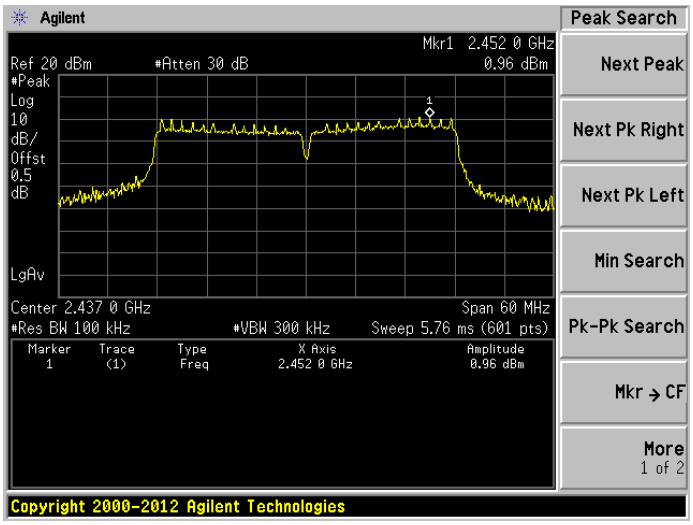
802.11n-40 MHz LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



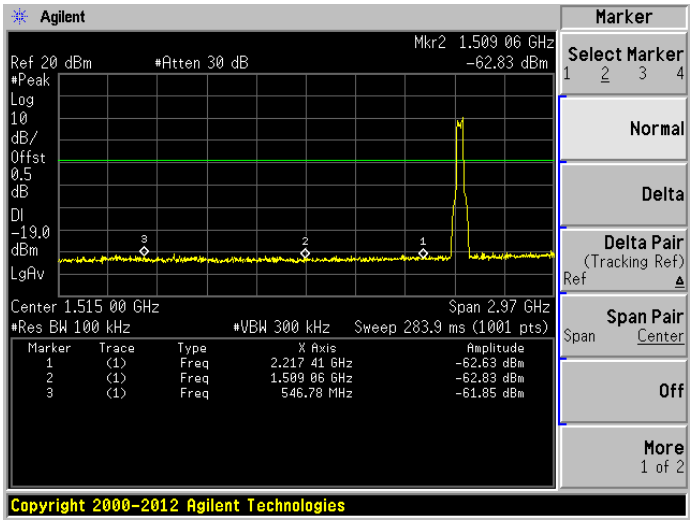
802.11n-40 MHz LOW CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



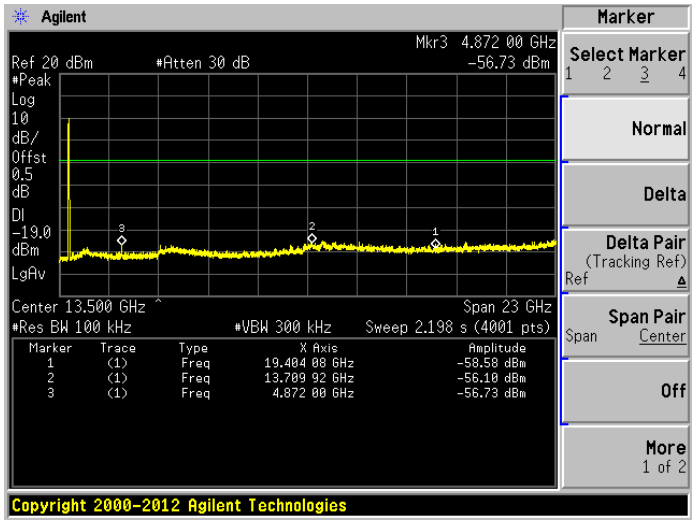
802.11n-40 MHz MIDDLE CHANNEL CARRIER LEVEL



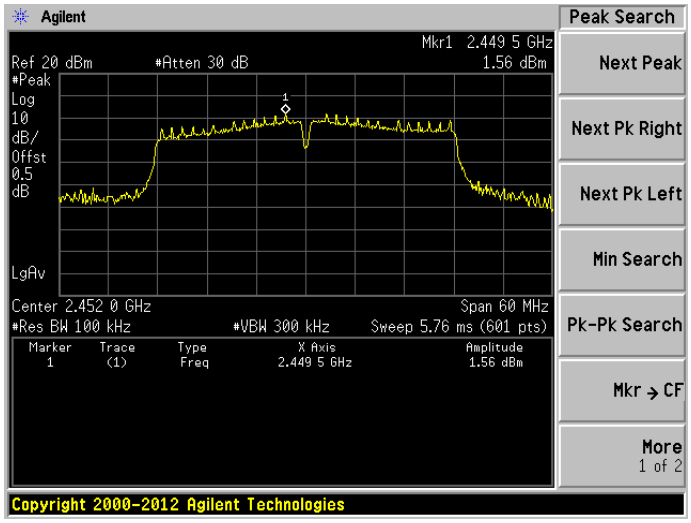
802.11n-40 MHz MIDDLE CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



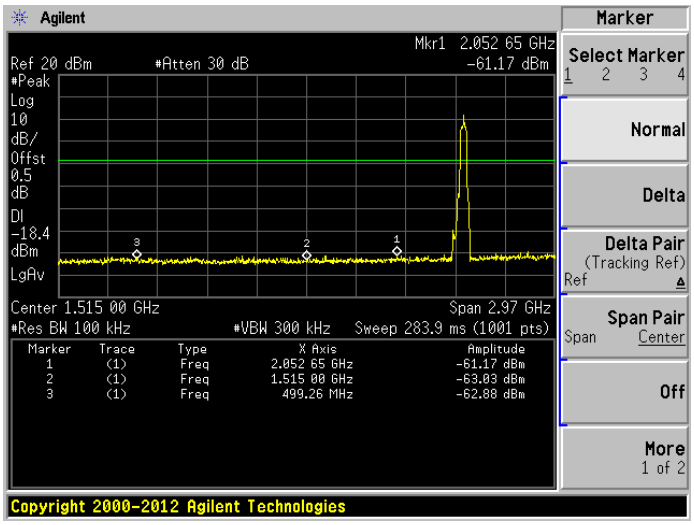
802.11n-40 MHz MIDDLE CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



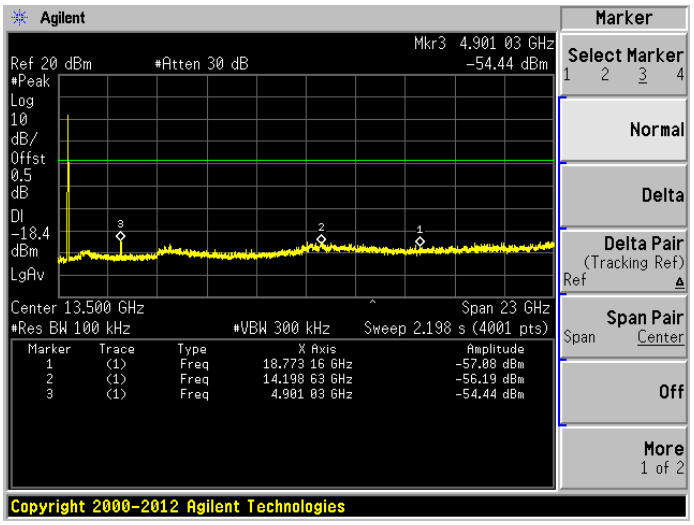
802.11n-40 MHz HIGH CHANNEL CARRIER LEVEL



802.11-n40 MHz HIGH CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



802.11n-40 MHz HIGH CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



A.4 Band Edge (Authorized-band band-edge)

Test Data

The lowest and highest channels are tested to verify the band edge emissions. Please refer to the following the plots for emissions values.

802.11b Mode：

Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-35.89	7.40	-12.60	Pass
High Channel	-46.89	6.80	-13.20	Pass

802.11g Mode：

Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-25.66	4.04	-15.96	Pass
High Channel	-39.73	3.14	-16.86	Pass

802.11n-20 MHz Mode:

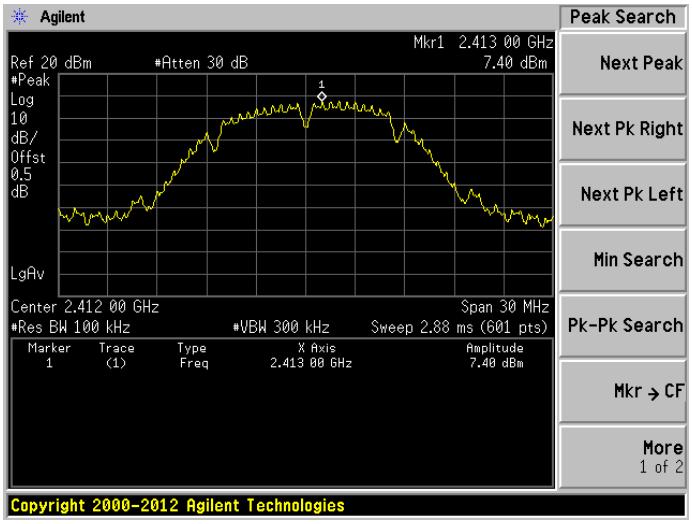
Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-24.12	4.21	-15.79	Pass
High Channel	-37.75	3.13	-16.87	Pass

802.11n-40 MHz Mode:

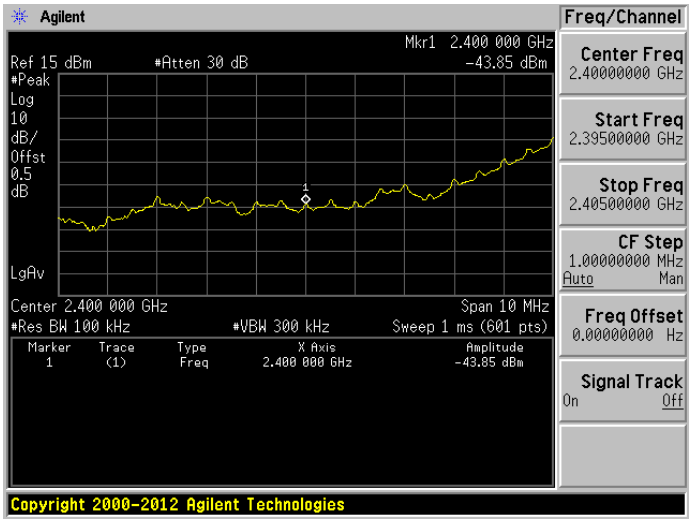
Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-25.00	2.04	-17.96	Pass
High Channel	-31.44	1.56	-18.44	Pass

Test Plots

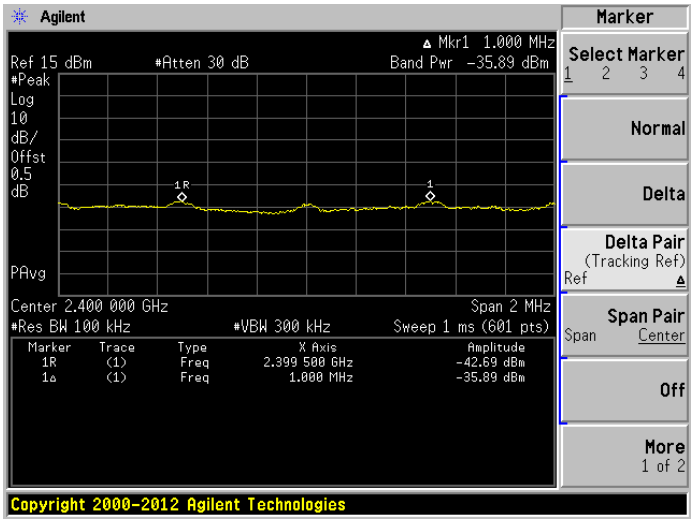
802.11b LOW CHANNEL, Carrier level



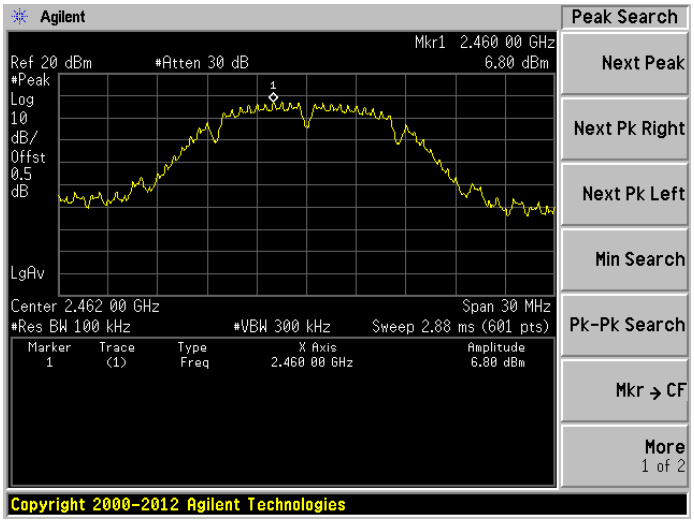
802.11b LOW CHANNEL, Reference level



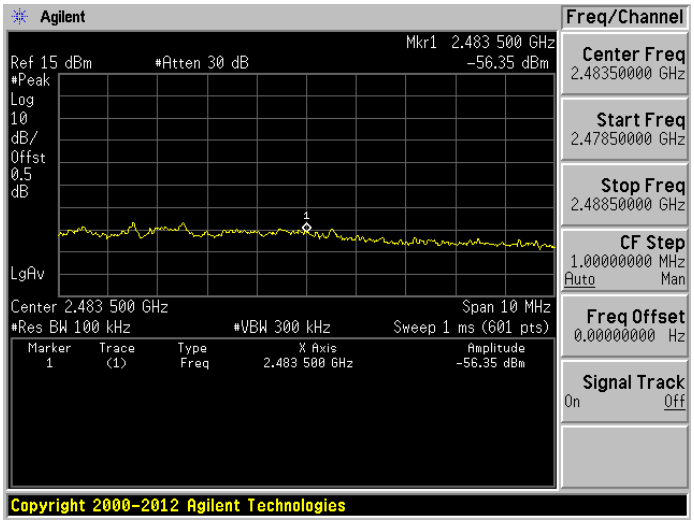
802.11b LOW CHANNEL, Band Edge



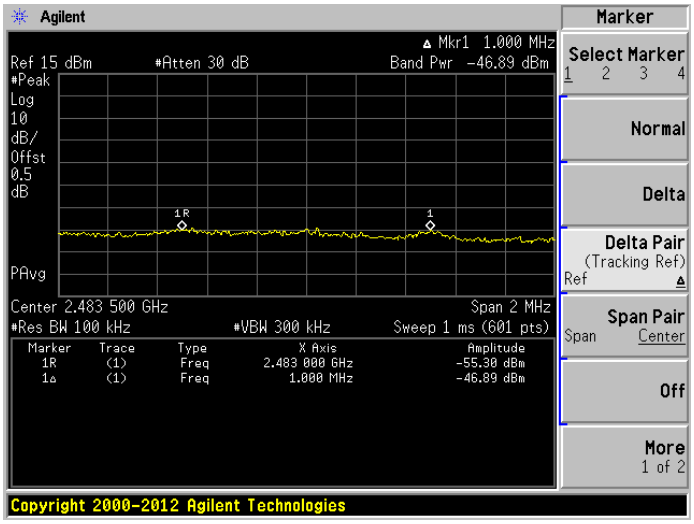
802.11b HIGH CHANNEL, Carrier level



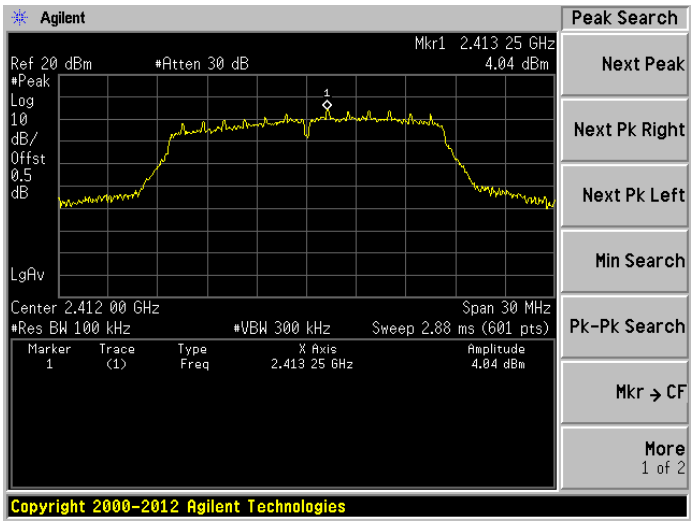
802.11b HIGH CHANNEL, Reference level



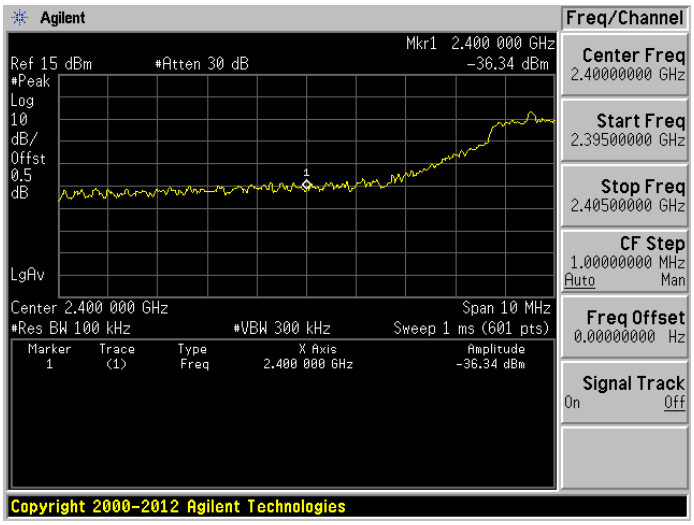
802.11b HIGH CHANNEL, Band Edge



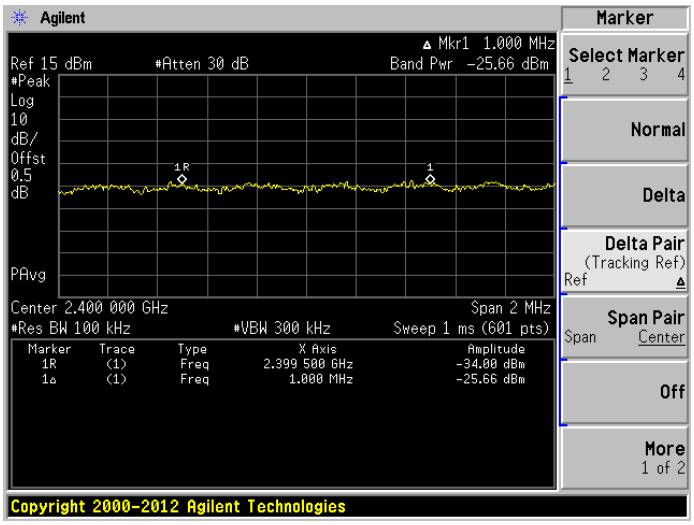
802.11g LOW CHANNEL, Carrier level



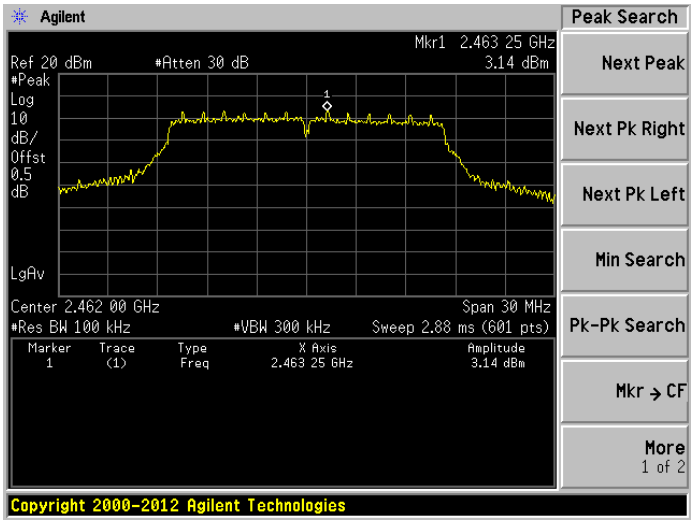
802.11g LOW CHANNEL, Reference level



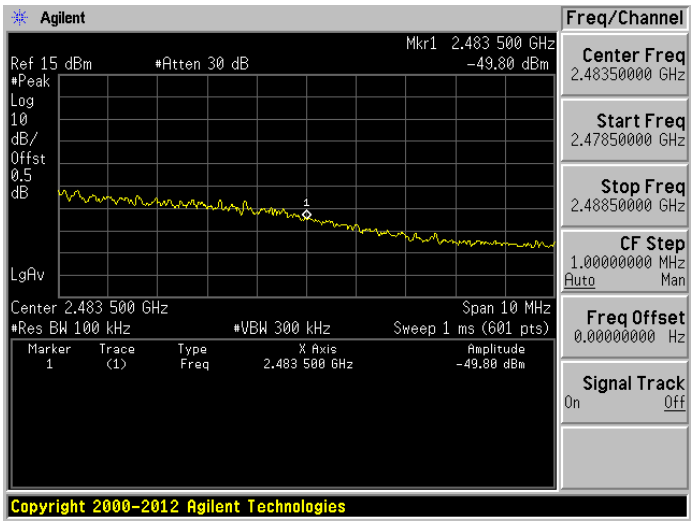
802.11g LOW CHANNEL, Band Edge



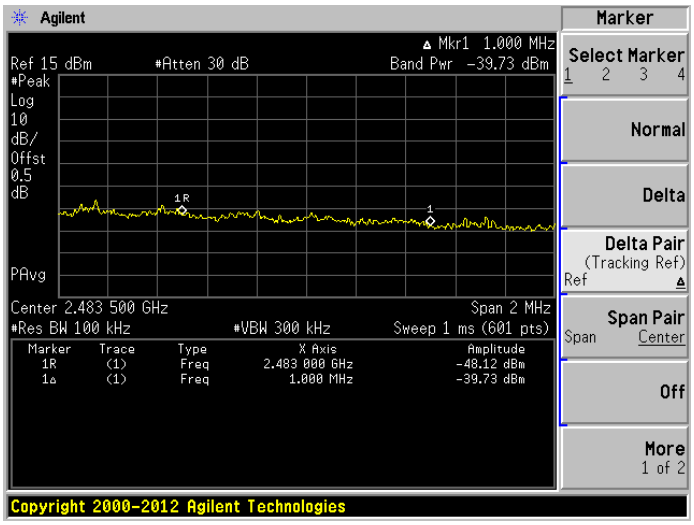
802.11g HIGH CHANNEL, Carrier level



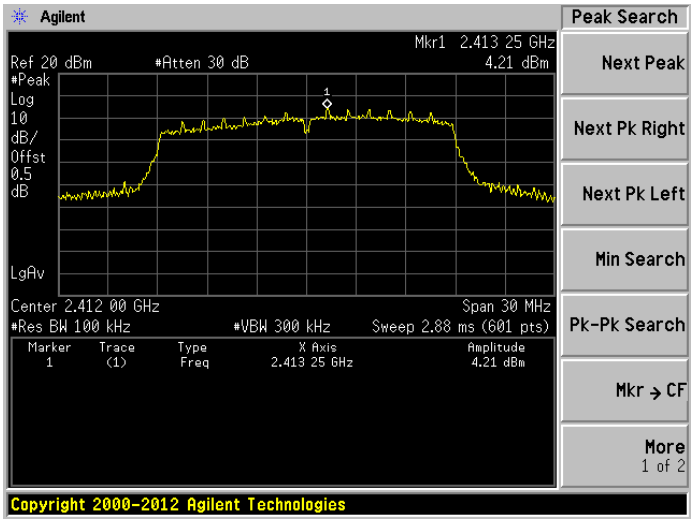
802.11g HIGH CHANNEL, Reference level



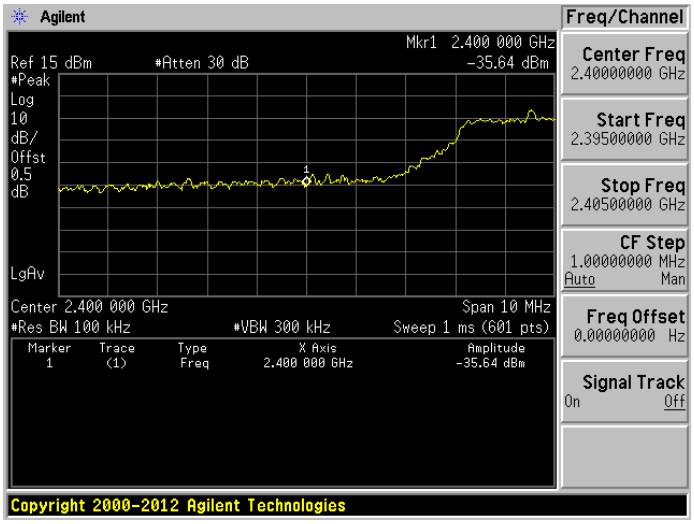
802.11g HIGH CHANNEL, Band Edge



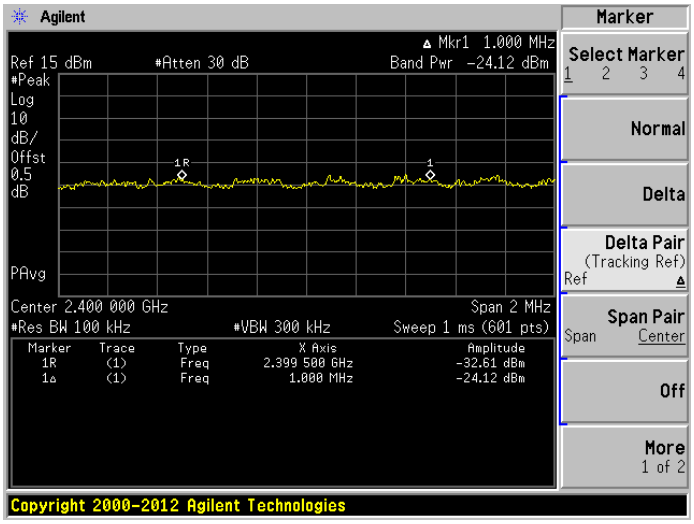
802.11n-20 MHz LOW CHANNEL, Carrier level



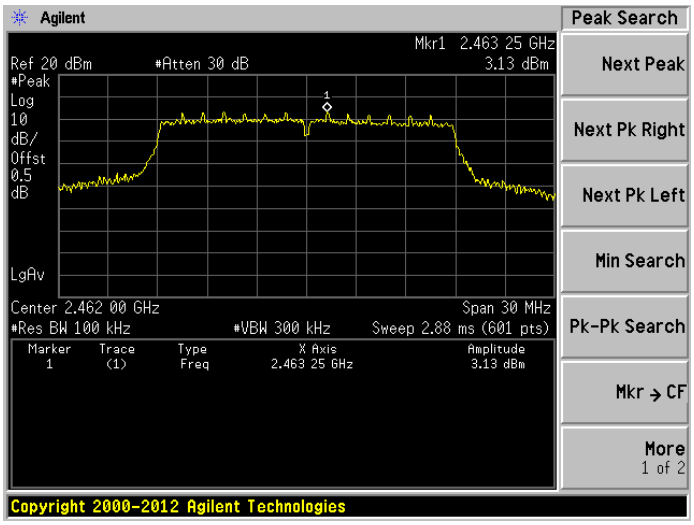
802.11n-20 MHz LOW CHANNEL, Reference level



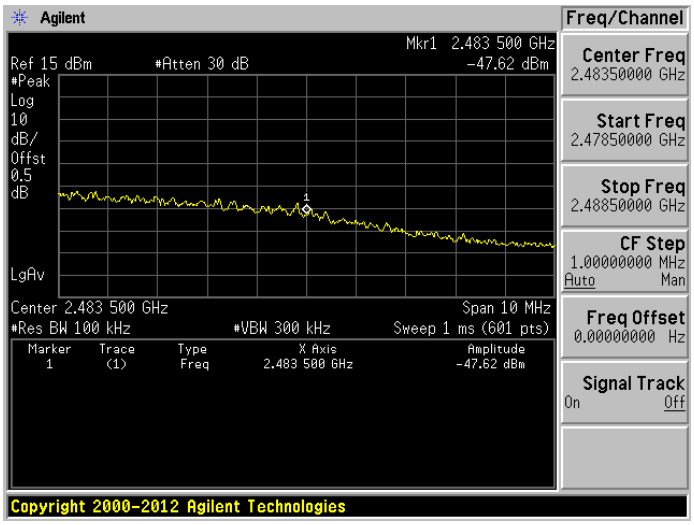
802.11n-20 MHz LOW CHANNEL, Band Edge



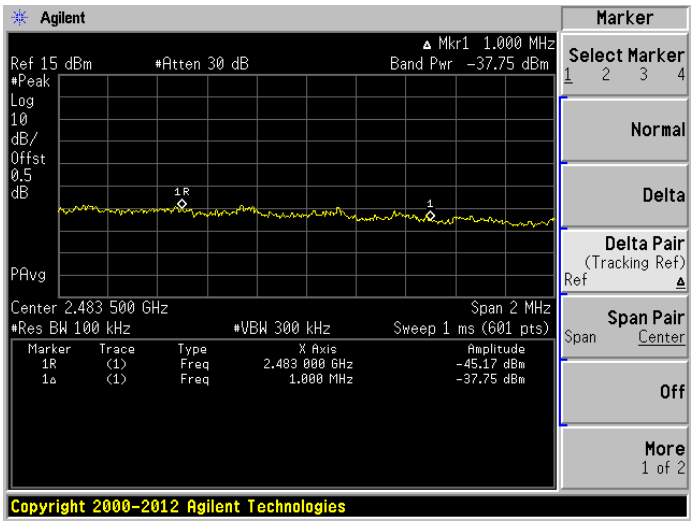
802.11n-20 MHz HIGH CHANNEL, Carrier level



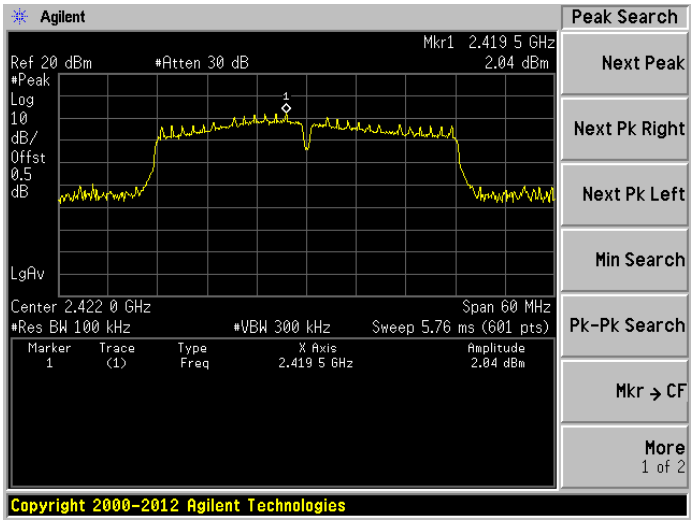
802.11n-20 MHz HIGH CHANNEL, Reference level



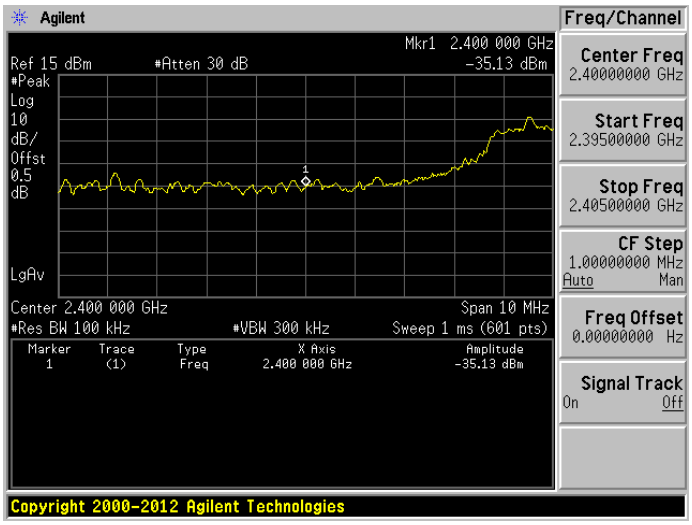
802.11n-20 MHz HIGH CHANNEL, Band Edge



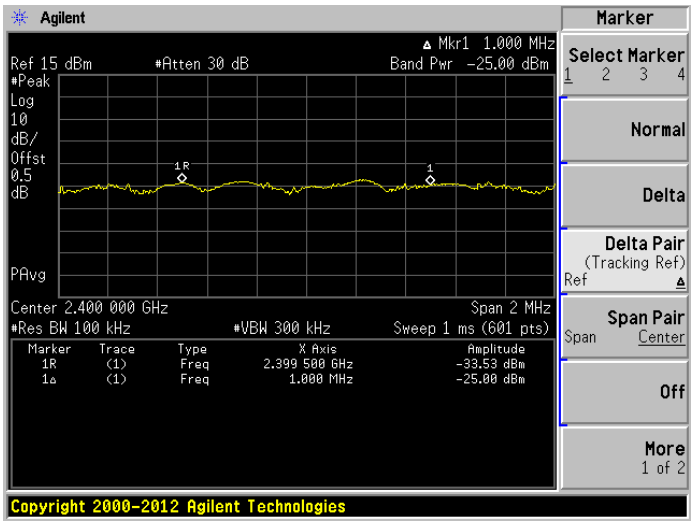
802.11n-40 MHz LOW CHANNEL, Carrier level



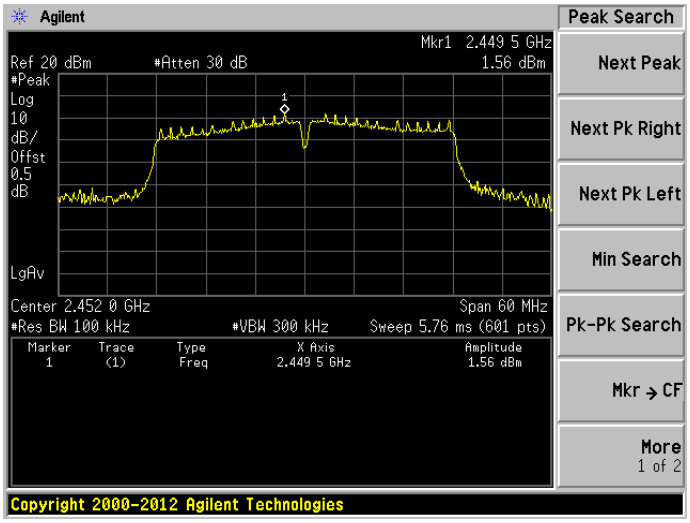
802.11n-40 MHz LOW CHANNEL, Reference level



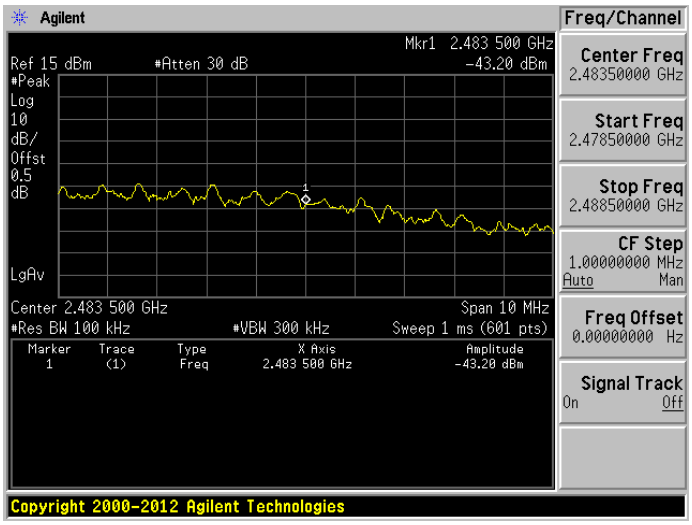
802.11n-40 MHz LOW CHANNEL, Band Edge



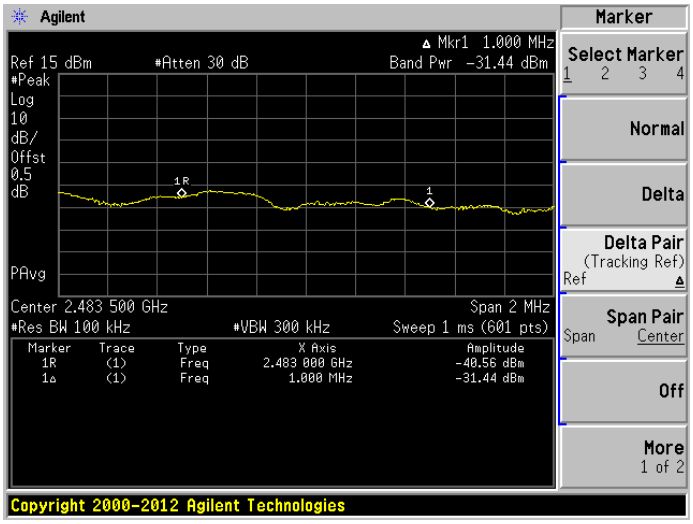
802.11n-40 MHz HIGH CHANNEL, Carrier level



802.11n-40 MHz HIGH CHANNEL, Reference level



802.11n-40 MHz HIGH CHANNEL, Band Edge

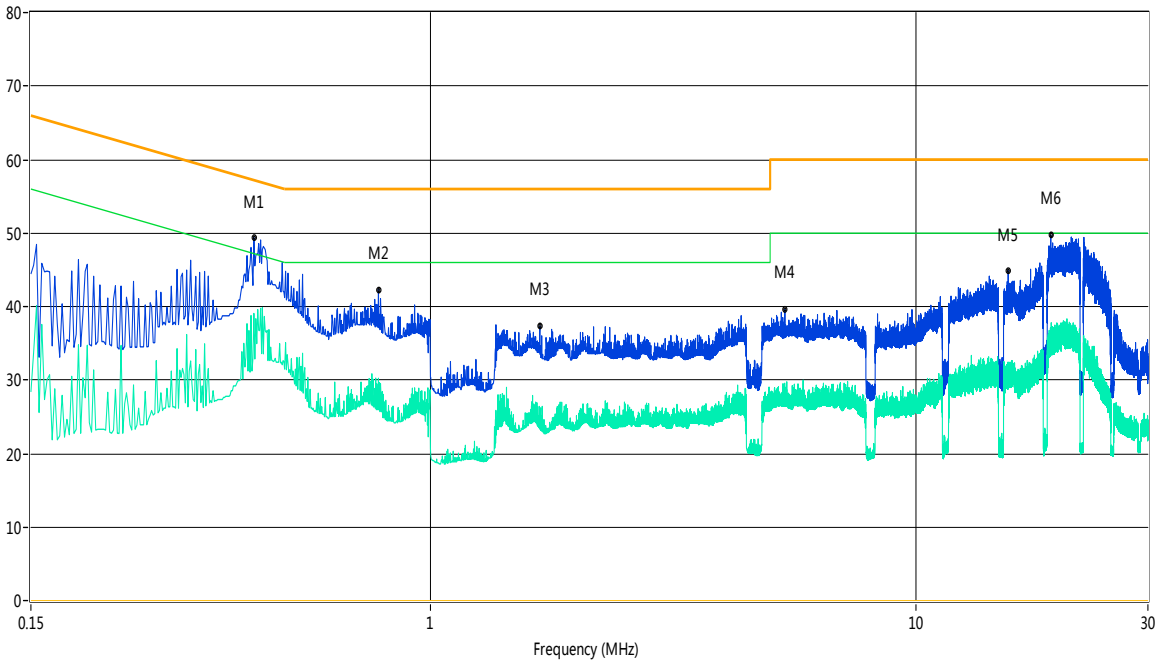


A.5 Conducted Emissions

Note 1: The EUT is working in the Normal link mode.
Note 2: Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 60 Hz and 240 VAC, 50 Hz) for which the device is capable of operation. So, the configuration 120 VAC, 60 Hz and 240 VAC, 50 Hz were tested respectively, but only the worst configuration (120 VAC, 60 Hz) shown here.

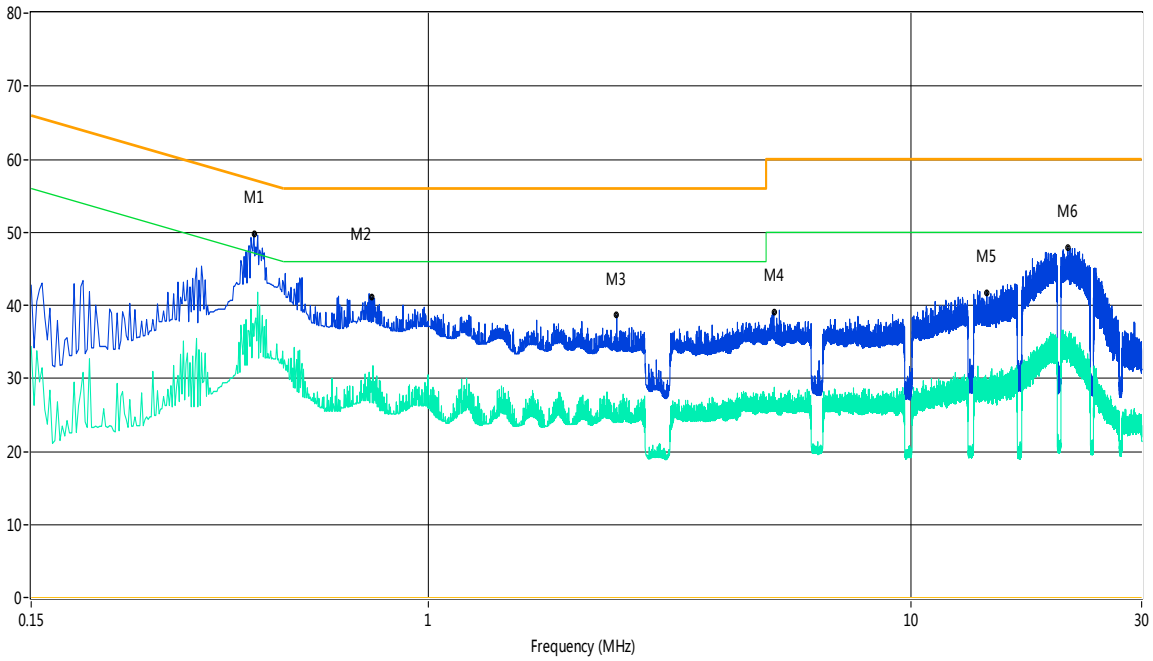
Test Data and Plots

PHASE L



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.43	49.4	11.00	57.9	8.50	Peak	L Line	Pass
1**	0.43	39.1	11.00	47.9	8.80	AV	L Line	Pass
2	0.78	42.3	11.00	56.0	13.70	Peak	L Line	Pass
2**	0.78	30.3	11.00	46.0	15.70	AV	L Line	Pass
3	1.68	37.4	11.00	56.0	18.60	Peak	L Line	Pass
3**	1.68	26.0	11.00	46.0	20.00	AV	L Line	Pass
4	5.36	39.6	11.00	60.0	20.40	Peak	L Line	Pass
4**	5.36	29.1	11.00	50.0	20.90	AV	L Line	Pass
5	15.47	45.0	11.00	60.0	15.00	Peak	L Line	Pass
5**	15.47	31.6	11.00	50.0	18.40	AV	L Line	Pass
6	18.93	49.7	11.00	60.0	10.30	Peak	L Line	Pass
6**	18.93	35.7	11.00	50.0	14.30	AV	L Line	Pass

PHASE N



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.43	49.9	11.00	57.9	8.00	Peak	N Line	Pass
1**	0.43	35.8	11.00	47.9	12.10	AV	N Line	Pass
2	0.76	41.1	11.00	56.0	14.90	Peak	N Line	Pass
2**	0.76	29.7	11.00	46.0	16.30	AV	N Line	Pass
3	2.45	38.7	11.00	56.0	17.30	Peak	N Line	Pass
3**	2.45	26.0	11.00	46.0	20.00	AV	N Line	Pass
4	5.19	39.0	11.00	60.0	21.00	Peak	N Line	Pass
4**	5.19	27.2	11.00	50.0	22.80	AV	N Line	Pass
5	14.34	41.7	11.00	60.0	18.30	Peak	N Line	Pass
5**	14.34	28.5	11.00	50.0	21.50	AV	N Line	Pass
6	21.08	47.9	11.00	60.0	12.10	Peak	N Line	Pass
6**	21.08	34.7	11.00	50.0	15.30	AV	N Line	Pass

A.6 Radiated Spurious Emission

Note 1: The symbol of “--” in the table which means not application.

Note 2: For the test data above 1 GHz，According the ANSI C63.10-2013, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

Note 3: The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

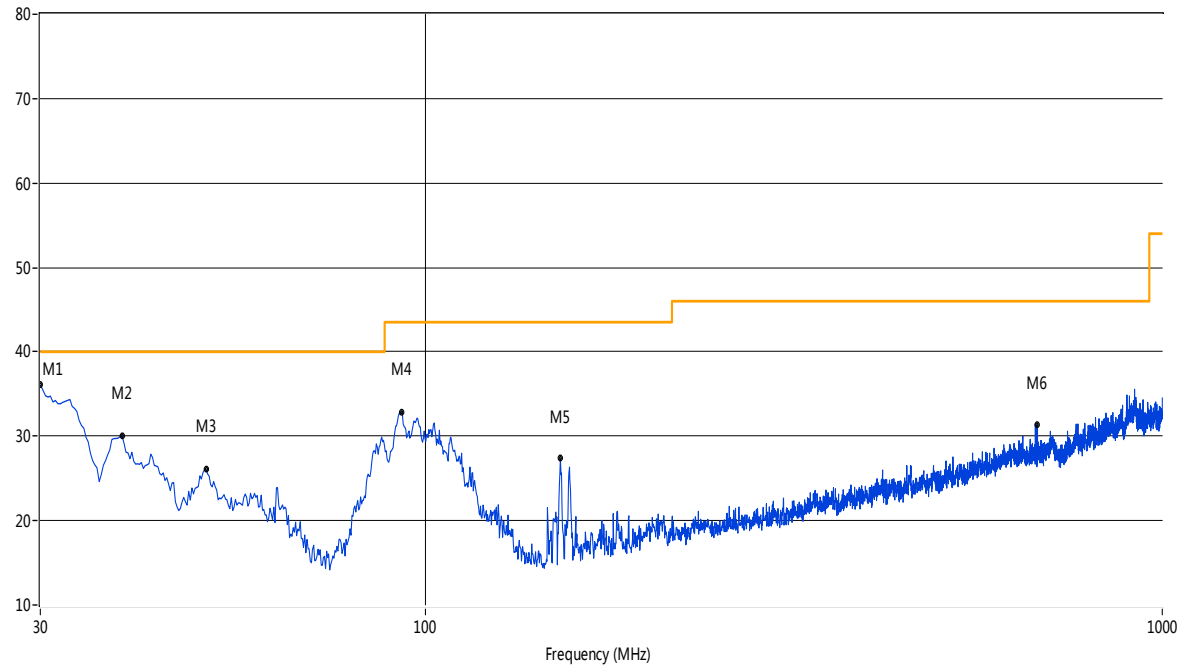
Note 4: Below 1 GHz, the configuration is normal link mode.

Note 5: Above 1GHz the marked spikes near 2400 MHz with circle should be ignored because they are Fundamental signal and test highest frequency is (1 GHz ~ 10th Harmonic).

Below 1G

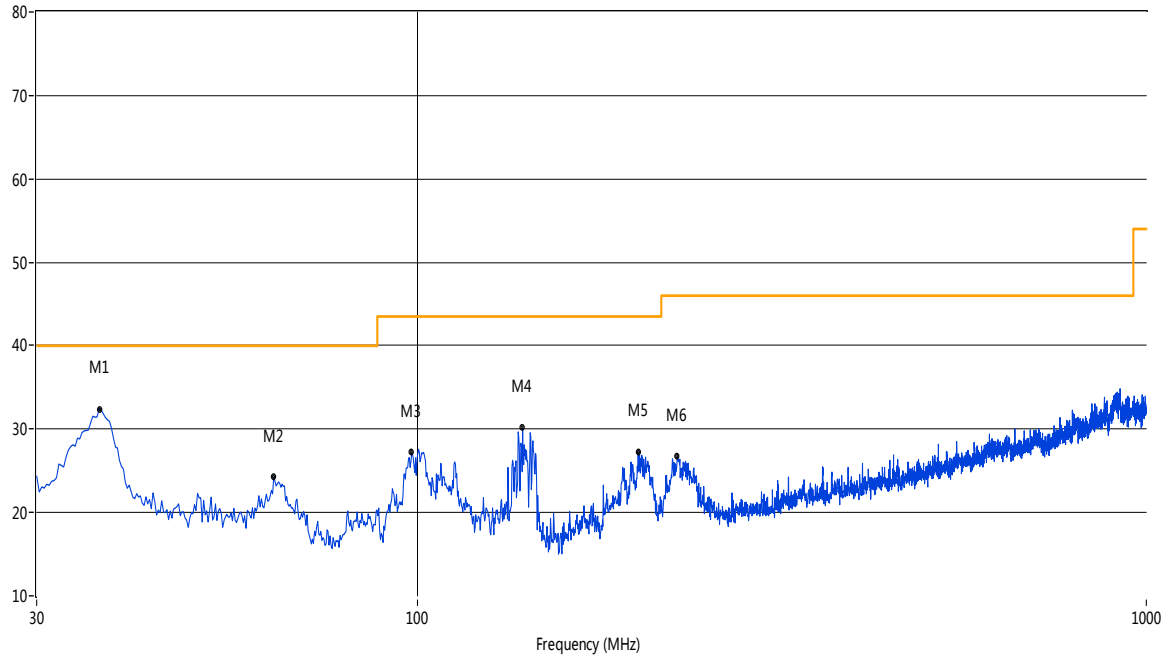
Test Data and plots

30 MHz to 1 GHz, ANT V



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	30.00	36.11	-21.71	40.0	3.89	Peak	359.80	100	Vertical	N/A
1**	30.00	20.55	-21.71	40.0	19.45	QP	359.80	100	Vertical	Pass
2	38.73	30.07	-19.95	40.0	9.93	Peak	359.80	100	Vertical	N/A
2**	38.73	19.48	-19.95	40.0	20.52	QP	359.80	100	Vertical	Pass
3	50.37	26.07	-18.57	40.0	13.93	Peak	144.00	100	Vertical	N/A
3**	50.37	19.02	-18.57	40.0	20.98	QP	144.00	100	Vertical	Pass
4	92.79	32.88	-21.10	43.5	10.62	Peak	314.80	100	Vertical	N/A
4**	92.79	21.36	-21.10	43.5	22.14	QP	314.80	100	Vertical	Pass
5	152.43	27.38	-23.18	43.5	16.12	Peak	237.90	100	Vertical	N/A
5**	152.43	22.00	-23.18	43.5	21.5	QP	237.90	100	Vertical	Pass
6	677.07	31.39	-9.40	46.0	14.61	Peak	98.10	100	Vertical	N/A
6**	677.07	23.01	-9.40	46.0	22.99	QP	98.10	100	Vertical	Pass

30 MHz to 1 GHz, ANT H



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	36.55	32.42	-20.74	40.0	7.58	Peak	55.00	100	Horizontal	N/A
1**	36.55	18.16	-20.74	40.0	21.84	QP	55.00	100	Horizontal	Pass
2	63.46	24.30	-20.39	40.0	15.70	Peak	38.50	100	Horizontal	N/A
2**	63.46	17.63	-20.39	40.0	22.37	QP	38.50	100	Horizontal	Pass
3	98.12	27.19	-20.37	43.5	16.31	Peak	101.70	100	Horizontal	N/A
3**	98.12	20.69	-20.37	43.5	22.81	QP	101.70	100	Horizontal	Pass
4	139.34	30.16	-23.38	43.5	13.34	Peak	81.90	100	Horizontal	N/A
4**	139.34	20.54	-23.38	43.5	22.96	QP	81.90	100	Horizontal	Pass
5	200.68	27.27	-19.96	43.5	16.23	Peak	58.50	100	Horizontal	N/A
5**	200.68	21.00	-19.96	43.5	22.5	QP	58.50	100	Horizontal	Pass
6	227.10	26.69	-19.58	46.0	19.31	Peak	285.40	100	Horizontal	N/A
6**	227.10	22.79	-19.58	46.0	23.21	QP	285.40	100	Horizontal	Pass

Above 1G

Test data :

1 GHz to 25 GHz, ANT V 802.11b Low Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1559.36	44.56	-4.01	74	29.44	Peak	175.3	100	Vertical	Pass
2	2413.65	98.09	0.01	74	-24.09	Peak	315.8	100	Vertical	N/A
3	2897.53	50.92	2.58	74	23.08	Peak	200.8	100	Vertical	Pass
4	3457.39	47.88	9.6	74	26.12	Peak	344.1	100	Vertical	Pass
5	4725.32	52.64	13.61	74	21.36	Peak	255.3	100	Vertical	Pass
6	23841.93	44.02	8.24	74	29.98	Peak	303.9	150	Vertical	Pass

1 GHz to 25 GHz, ANT H 802.11b Low Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1887.78	45.97	-2.98	74	28.03	Peak	149.6	100	Horizontal	Pass
2	2161.71	48.65	-0.96	74	25.35	Peak	218.6	150	Horizontal	Pass
3	2413.15	108.46	-0.05	74	-34.46	Peak	130.7	150	Horizontal	N/A
4	2450.64	54.71	-0.46	74	19.29	Peak	130.7	150	Horizontal	Pass
5	4823.99	56.16	13.76	74	17.84	Peak	130.6	199.40	Horizontal	Pass
6	4823.99	52.52	13.76	54	1.48	AV	130.6	199.40	Horizontal	Pass

1 GHz to 25 GHz, ANT V 802.11b Middle Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1372.41	44.26	-4.56	74	29.74	Peak	242.5	100	Vertical	Pass
2	2069.73	46.45	-1.84	74	27.55	Peak	292.6	100	Vertical	Pass
3	2438.14	95.31	-0.49	74	-21.31	Peak	135	100	Vertical	N/A
4	2732.57	51.01	1.86	74	22.99	Peak	14.1	100	Vertical	Pass
5	4469.63	51.17	12.5	74	22.83	Peak	360	100	Vertical	Pass
6	18240.85	43.86	8.46	74	30.14	Peak	133.1	150	Vertical	Pass

1 GHz to 25 GHz, ANT H 802.11b Middle Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1878.28	45.35	-3	74	28.65	Peak	0.5	100	Horizontal	Pass
2	2110.22	50.14	-1.32	74	23.86	Peak	207.3	100	Horizontal	Pass
3	2438.14	104.96	-0.49	74	-30.96	Peak	314.4	100	Horizontal	N/A
4	2863.53	51.79	2.01	74	22.21	Peak	188.2	100	Horizontal	Pass
5	4814.55	52.12	13.95	74	21.88	Peak	0.3	100	Horizontal	Pass
6	22034.94	44.70	13.06	74	29.30	Peak	31.1	150	Horizontal	Pass

1 GHz to 25 GHz, ANT V 802.11b High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1396.9	44.1	-4.56	74	29.9	Peak	180.1	100	Vertical	Pass
2	2059.74	46.79	-2	74	27.21	Peak	349.4	100	Vertical	Pass
3	2460.63	95.09	-0.6	74	-21.09	Peak	20.7	100	Vertical	N/A
4	2852.04	50.6	1.97	74	23.4	Peak	0.5	100	Vertical	Pass
5	4476.38	51.94	12.6	74	22.06	Peak	206.3	100	Vertical	Pass
6	22693.84	45.52	10.80	74	28.48	Peak	63.9	150	Vertical	Pass

1 GHz to 25 GHz, ANT H 802.11b High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1780.8	44.9	-3.71	74	29.1	Peak	200	100	Horizontal	Pass
2	2194.2	48	-0.66	74	26	Peak	1	100	Horizontal	Pass
3	2460.13	104.3	-0.61	74	-30.3	Peak	313.7	100	Horizontal	N/A
4	2823.04	51.1	2.07	74	22.9	Peak	169	100	Horizontal	Pass
5	4924.02	52.56	13.86	74	21.44	Peak	303.3	100	Horizontal	Pass
6	20547.42	47.82	10.80	74	26.18	Peak	28.5	150	Horizontal	Pass

1 GHz to 25 GHz, ANT V 802.11g Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1618.35	43.94	-4.28	74	30.06	Peak	312.2	100	Vertical	Pass
2	1953.26	46.6	-2.45	74	27.4	Peak	358.1	100	Vertical	Pass
3	2415.15	97.54	0.01	74	-23.54	Peak	199.4	100	Vertical	N/A
4	2820.04	50.15	2.11	74	23.85	Peak	255.5	100	Vertical	Pass
5	4712.57	52.07	13.44	74	21.93	Peak	-0.7	100	Vertical	Pass
6	19688.85	49.02	9.88	74	24.98	Peak	54.4	150	Vertical	Pass

1 GHz to 25 GHz, ANT H 802.11g Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1918.27	45.64	-2.51	74	28.36	Peak	263.3	100	Horizontal	Pass
2	2297.18	48.56	-0.33	74	25.44	Peak	61.5	100	Horizontal	Pass
3	2416.65	105.23	-0.05	74	-31.23	Peak	320.4	100	Horizontal	N/A
4	2473.13	53.2	-0.52	74	20.8	Peak	307.9	100	Horizontal	Pass
5	3260.18	47.57	9.06	74	26.43	Peak	330	100	Horizontal	Pass
6	3260.18	47.57	9.06	74	26.43	Peak	330	100	Horizontal	Pass

1 GHz to 25 GHz, ANT V 802.11g Middle Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1342.91	44.9	-4.64	74	29.1	Peak	312.6	100	Vertical	Pass
2	1816.8	45.09	-3.62	74	28.91	Peak	198.7	100	Vertical	Pass
3	2443.64	96.96	-0.44	74	-22.96	Peak	40.4	100	Vertical	N/A
4	2854.04	50.63	1.99	74	23.37	Peak	9	100	Vertical	Pass
5	4613.6	51.59	12.94	74	22.41	Peak	195.5	100	Vertical	Pass
6	21925.13	47.84	11.81	74	26.16	Peak	291.4	150	Vertical	Pass

1 GHz to 25 GHz, ANT H 802.11g Middle Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1524.37	43.97	-4.37	74	30.03	Peak	29.6	100	Horizontal	Pass
2	2059.74	47.03	-2	74	26.97	Peak	321.2	100	Horizontal	Pass
3	2442.64	105.58	-0.37	74	-31.58	Peak	314.5	100	Horizontal	N/A
4	2854.04	50.35	1.99	74	23.65	Peak	302	100	Horizontal	Pass
5	4697.58	52.01	13.26	74	21.99	Peak	41.9	100	Horizontal	Pass
6	21156.41	42.81	10.80	74	31.19	Peak	273	150	Horizontal	Pass

1 GHz to 25 GHz, ANT V 802.11g High Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1410.9	44.85	-4.6	74	29.15	Peak	360.6	100	Vertical	Pass
2	1846.79	45.17	-3.23	74	28.83	Peak	317.8	100	Vertical	Pass
3	2455.64	96.54	-0.52	74	-22.54	Peak	90.6	100	Vertical	N/A
4	2854.54	50.73	2.01	74	23.27	Peak	353.7	100	Vertical	Pass
5	4642.84	52.13	13.07	74	21.87	Peak	287.6	100	Vertical	Pass
6	21475.87	46.07	11.20	74	27.94	Peak	141.3	150	Vertical	Pass

1 GHz to 25 GHz, ANT H 802.11g High Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1420.39	45.26	-4.58	74	28.74	Peak	204.1	100	Horizontal	Pass
2	2415.65	54.1	0.02	74	19.9	Peak	318.2	100	Horizontal	Pass
3	2456.14	105.65	-0.55	74	-31.65	Peak	305.1	100	Horizontal	N/A
4	2979.51	50.3	2.26	74	23.7	Peak	121.9	100	Horizontal	Pass
5	4416.4	51.63	12.48	74	22.37	Peak	327.3	100	Horizontal	Pass
6	20487.52	44.74	8.88	74	29.26	Peak	26.6	150	Horizontal	Pass

1 GHz to 25 GHz, ANT V 802.11n20 Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1671.33	43.83	-4.24	74	30.17	Peak	172.2	100	Vertical	Pass
2	2127.22	47.26	-0.95	74	26.74	Peak	13.8	100	Vertical	Pass
3	2414.65	95.26	-0.04	74	-21.26	Peak	204.2	100	Vertical	N/A
4	2811.05	51.03	1.91	74	22.97	Peak	191.2	100	Vertical	Pass
5	4639.09	52.13	13.16	74	21.87	Peak	20.3	100	Vertical	Pass
6	22613.98	47.28	10.01	74	26.72	Peak	110.5	150	Vertical	Pass

1 GHz to 25 GHz, ANT H 802.11n20 Low Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1657.34	44.85	-4.18	74	29.15	Peak	111.4	100	Horizontal	Pass
2	1941.77	47.14	-2.51	74	26.86	Peak	86.3	100	Horizontal	Pass
3	2415.65	105.24	0.02	74	-31.24	Peak	299.6	100	Horizontal	N/A
4	2472.63	53.24	-0.52	74	20.76	Peak	305.9	100	Horizontal	Pass
5	2989	50.23	2.44	74	23.77	Peak	211.4	100	Horizontal	Pass
6	21296.17	47.34	13.21	74	26.66	Peak	54	150	Horizontal	Pass

1 GHz to 25 GHz, ANT V 802.11n20 Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1556.86	44.27	-4.01	74	29.73	Peak	358	100	Vertical	Pass
2	2152.71	48.4	-1.09	74	25.6	Peak	185.9	100	Vertical	Pass
3	2445.14	96.36	-0.44	74	-22.36	Peak	110	100	Vertical	N/A
4	2797.05	50.76	1.71	74	23.24	Peak	154.1	100	Vertical	Pass
5	4705.82	52.02	13.33	74	21.98	Peak	-0.7	100	Vertical	Pass
6	22584.03	43.60	9.76	74	30.40	Peak	243.9	150	Vertical	Pass

1 GHz to 25 GHz, ANT H 802.11n20 Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1793.8	45.15	-3.72	74	28.85	Peak	148	100	Horizontal	Pass
2	2220.19	48.19	-0.3	74	25.81	Peak	274.4	100	Horizontal	Pass
3	2444.64	105.03	-0.42	74	-31.03	Peak	299.6	100	Horizontal	N/A
4	2853.04	51.68	1.97	74	22.32	Peak	173.5	100	Horizontal	Pass
5	4723.82	51.87	13.63	74	22.13	Peak	225	100	Horizontal	Pass
6	19299.50	50.19	9.26	74	23.81	Peak	27	150	Horizontal	Pass

1 GHz to 25 GHz, ANT V 802.11n20 High Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1394.4	44.94	-4.45	74	29.06	Peak	305.5	100	Vertical	Pass
2	2182.2	49.83	-0.9	74	24.17	Peak	216.7	100	Vertical	Pass
3	2456.64	95.37	-0.51	74	-21.37	Peak	26.6	100	Vertical	N/A
4	2850.54	50.59	1.97	74	23.41	Peak	261.4	100	Vertical	Pass
5	4692.33	52.25	13.24	74	21.75	Peak	165.6	100	Vertical	Pass
6	20277.87	49.45	12.68	74	24.55	Peak	338.6	150	Vertical	Pass

1 GHz to 25 GHz, ANT H 802.11n20 High Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1768.81	44.58	-3.8	74	29.42	Peak	70.8	100	Horizontal	Pass
2	2129.72	48.42	-1.01	74	25.58	Peak	141.2	100	Horizontal	Pass
3	2455.64	104.69	-0.53	74	-30.69	Peak	312.9	100	Horizontal	N/A
4	2851.54	50.36	1.94	74	23.64	Peak	319.2	100	Horizontal	Pass
5	4511.62	51.26	12.73	74	22.74	Peak	179.1	100	Horizontal	Pass
6	24221.30	48.57	10.83	74	25.43	Peak	205.2	150	Horizontal	Pass

1 GHz to 25 GHz, ANT V 802.11n40 Low Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1795.3	44.94	-3.76	74	29.06	Peak	8.1	100	Vertical	Pass
2	2207.7	47.89	-0.31	74	26.11	Peak	287.5	100	Vertical	Pass
3	2415.65	92.71	0.02	74	-18.71	Peak	122	100	Vertical	N/A
4	2729.07	50.76	1.76	74	23.24	Peak	65.1	100	Vertical	Pass
5	4528.87	51.5	12.64	74	22.5	Peak	340.7	100	Vertical	Pass
6	20008.32	46.95	12.33	74	27.05	Peak	128.3	150	Vertical	Pass

1 GHz to 25 GHz, ANT H 802.11n40 Low Channel										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1551.36	44.96	-4.04	74	29.04	Peak	230.3	100	Horizontal	Pass
2	2062.23	47.01	-1.98	74	26.99	Peak	0	100	Horizontal	Pass
3	2416.65	102.82	-0.05	74	-28.82	Peak	306.3	100	Horizontal	N/A
4	2757.06	50.89	1.91	74	23.11	Peak	52.1	100	Horizontal	Pass
5	4461.38	51.6	12.42	74	22.4	Peak	165.4	100	Horizontal	Pass
6	21985.03	47.91	11.23	74	26.09	Peak	297.4	150	Horizontal	Pass

1 GHz to 25 GHz, ANT V 802.11n40 Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1259.44	44.51	-5.19	74	29.49	Peak	184.8	100	Vertical	Pass
2	1894.28	46.17	-2.92	74	27.83	Peak	4.5	100	Vertical	Pass
3	2453.14	93.32	-0.48	74	-19.32	Peak	96.3	100	Vertical	N/A
4	2743.06	51.32	1.61	74	22.68	Peak	2.4	100	Vertical	Pass
5	4844.54	52.04	13.59	74	21.96	Peak	53.8	100	Vertical	Pass
6	19049.92	44.74	11.69	74	29.26	Peak	8.1	150	Vertical	Pass

1 GHz to 25 GHz, ANT H 802.11n40 Middle Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1867.78	46.5	-3.02	74	27.5	Peak	149.4	100	Horizontal	Pass
2	2207.7	48.21	-0.31	74	25.79	Peak	174.1	100	Horizontal	Pass
3	2451.64	102.35	-0.45	74	-28.35	Peak	319.1	100	Horizontal	N/A
4	2845.04	50.49	1.92	74	23.51	Peak	211.5	100	Horizontal	Pass
5	4703.57	52.23	13.32	74	21.77	Peak	90.1	100	Horizontal	Pass
6	18573.63	47.19	9.88	74	26.81	Peak	150.9	150	Horizontal	Pass

1 GHz to 25 GHz, ANT V 802.11n40 High Channel

No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1299.43	44.76	-4.72	74	29.24	Peak	312.6	100	Vertical	Pass
2	1986.25	47.46	-2.52	74	26.54	Peak	337.8	100	Vertical	Pass
3	2450.64	92.74	-0.46	74	-18.74	Peak	86.5	100	Vertical	N/A
4	2864.53	51	2.12	74	23	Peak	17.6	100	Vertical	Pass
5	4731.32	52.36	13.64	74	21.64	Peak	318.2	100	Vertical	Pass
6	18303.25	48.14	9.46	74	25.86	Peak	343	150	Vertical	Pass

1 GHz to 25 GHz, ANT H 802.11n40 High Channel

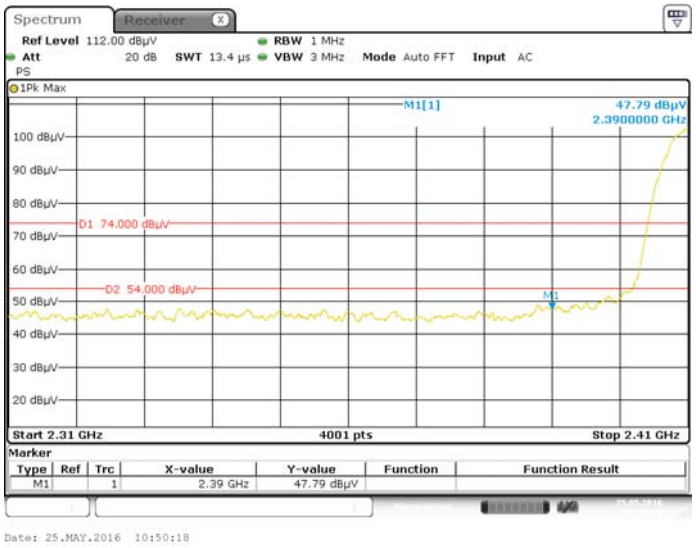
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict
1	1555.86	44.13	-4.09	74	29.87	Peak	331.2	100	Horizontal	Pass
2	2260.18	48.65	-0.55	74	25.35	Peak	281.1	100	Horizontal	Pass
3	2449.64	102.83	-0.48	74	-28.83	Peak	306.3	100	Horizontal	N/A
4	2856.54	51.07	2.02	74	22.93	Peak	205.5	100	Horizontal	Pass
5	4676.58	51.84	13.11	74	22.16	Peak	34.8	100	Horizontal	Pass
6	24900.17	45.01	10.52	74	28.99	Peak	233.7	150	Horizontal	Pass

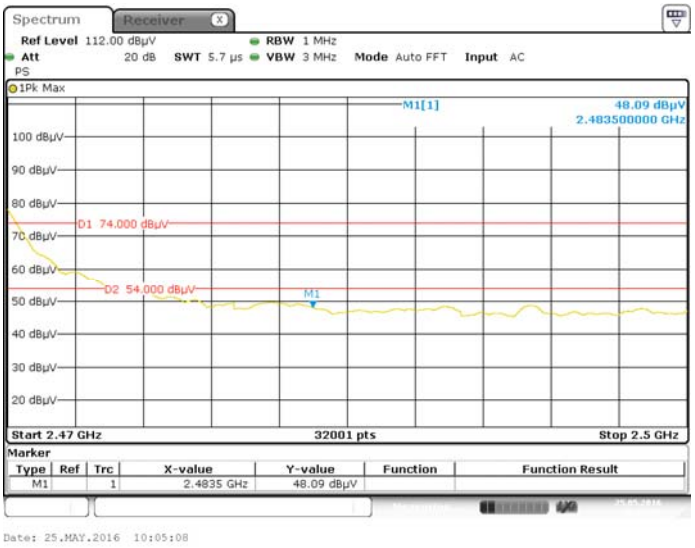
A.7 Band-Edge (Restricted-band band-edge)

Test Data

802.11b Mode：

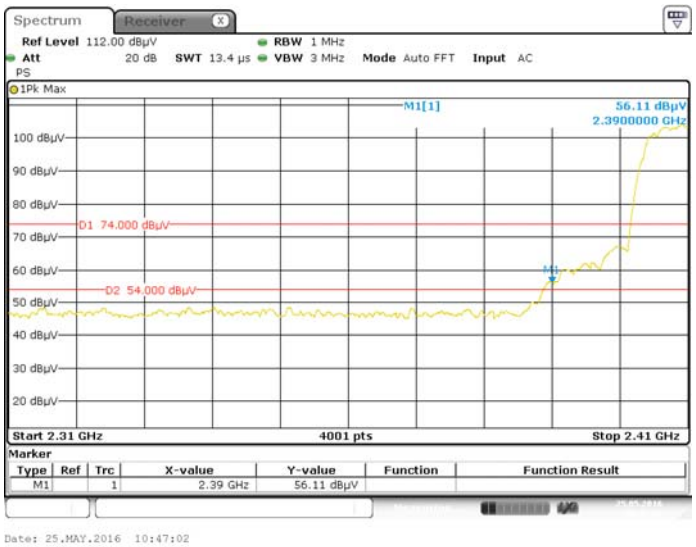
LOW CHANNEL, PEAK, AV	HIGH CHANNEL, PEAK, AV

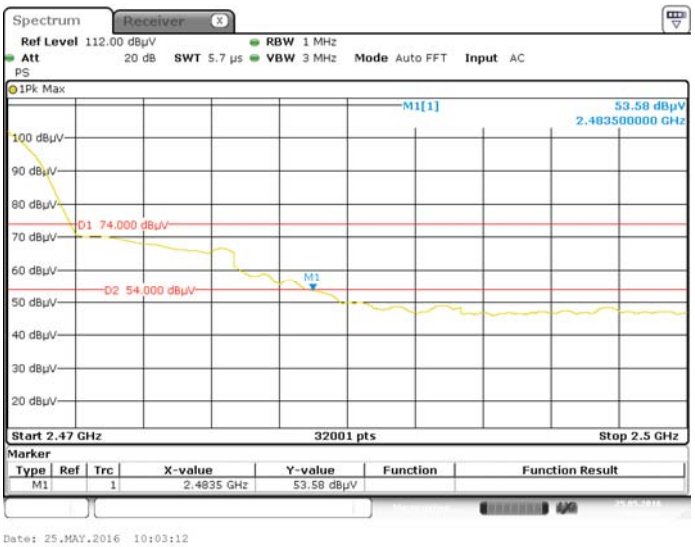




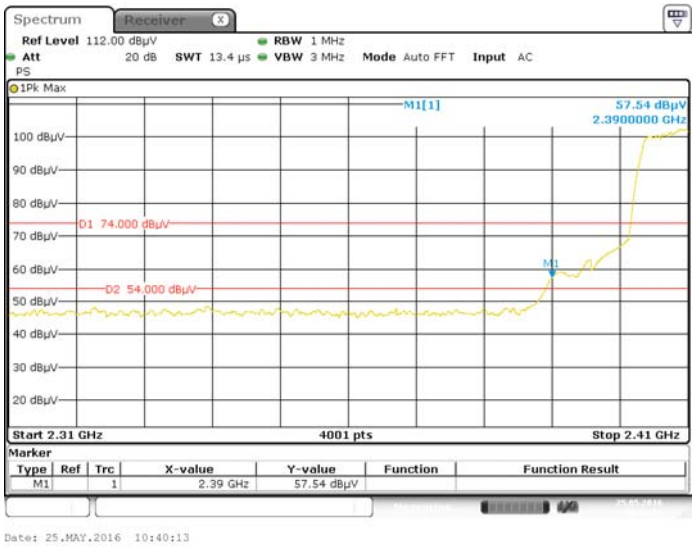
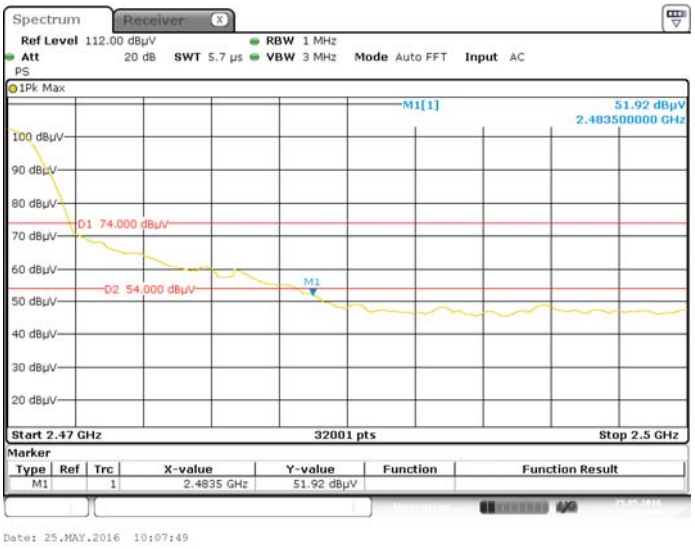
802.11g Mode：

LOW CHANNEL, PEAK, AV	HIGH CHANNEL, PEAK, AV

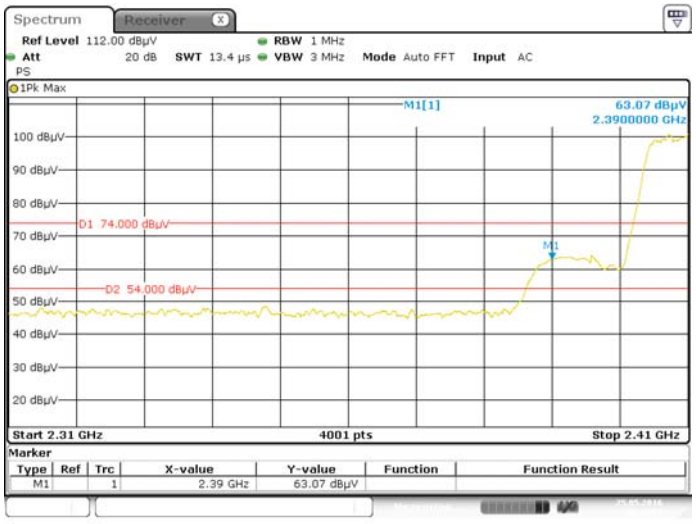
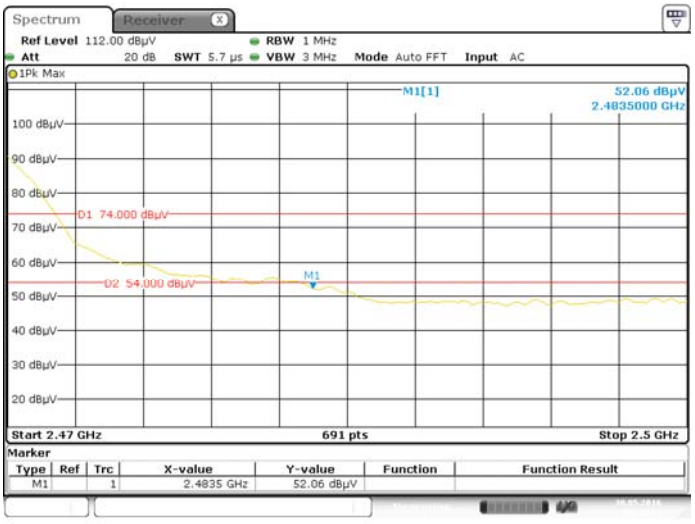




802.11n-20 MHz Mode：

Low CHANNEL, PEAK, AV	HIGH CHANNEL, PEAK, AV
	

802.11n-40 MHz Mode

Low CHANNEL, PEAK, AV	HIGH CHANNEL, PEAK, AV
	

A.8 Power Spectral Density (PSD)

Test Data

802.11b Mode:

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-8.63	8
Middle	-10.17	8
High	-12.01	8

802.11g Mode:

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-13.66	8
Middle	-14.52	8
High	-12.03	8

802.11n-20 MHz Mode:

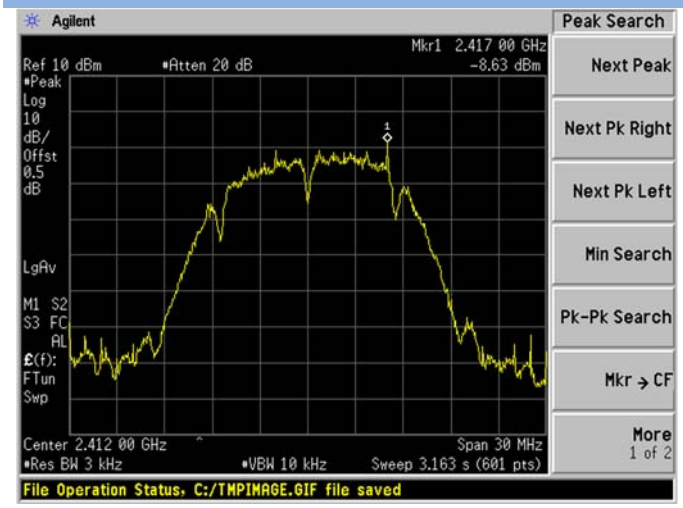
Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-14.00	8
Middle	-15.31	8
High	-13.21	8

802.11n-40 MHz Mode:

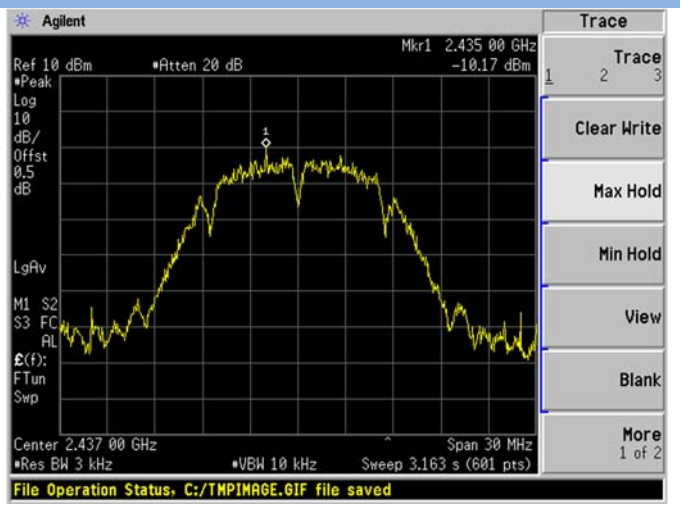
Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-16.70	8
Middle	-16.95	8
High	-17.01	8

Test plots

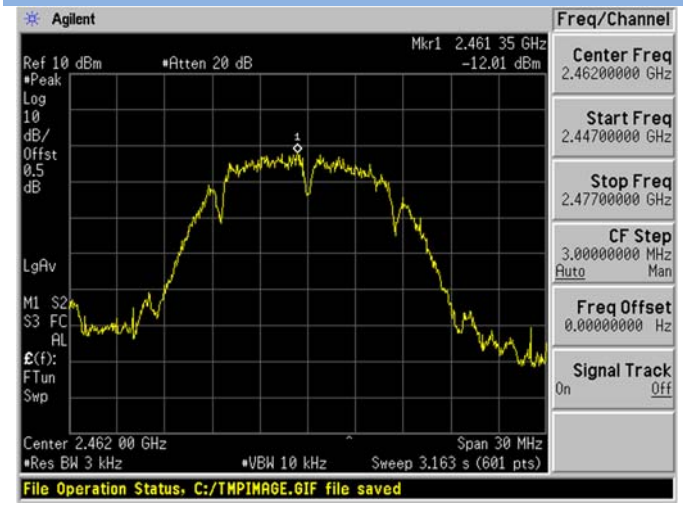
802.11b LOW CHANNEL



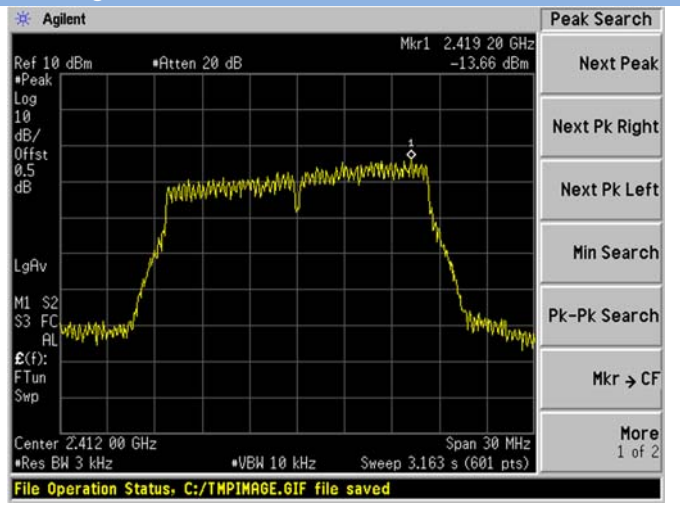
802.11b MIDDLE CHANNEL



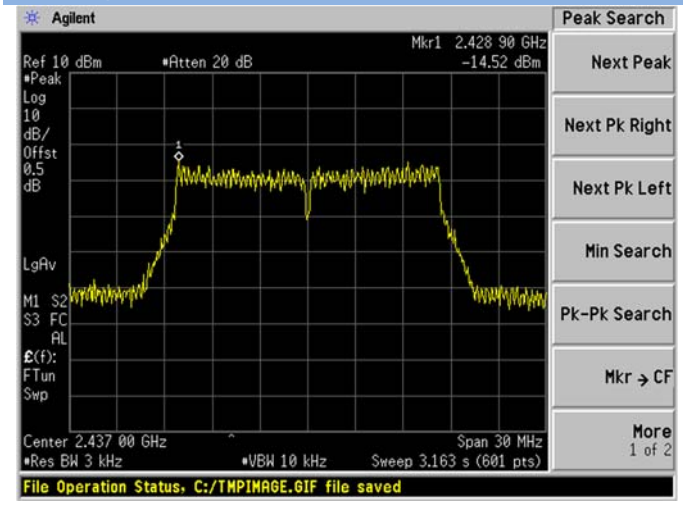
802.11b HIGH CHANNEL



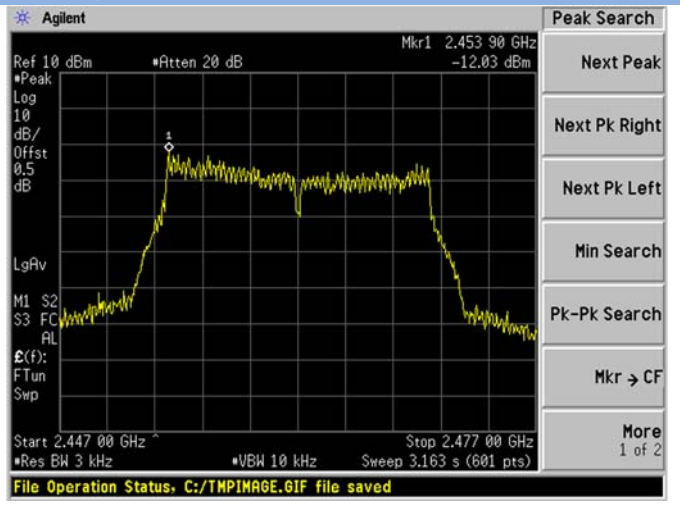
802.11g LOW CHANNEL



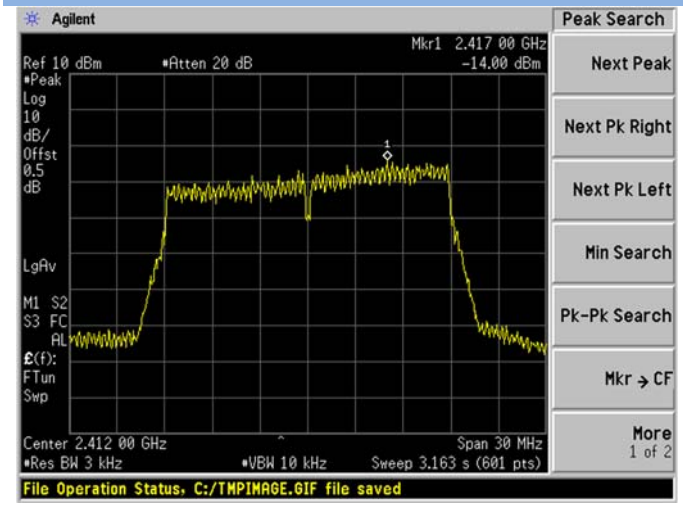
802.11g MIDDLE CHANNEL



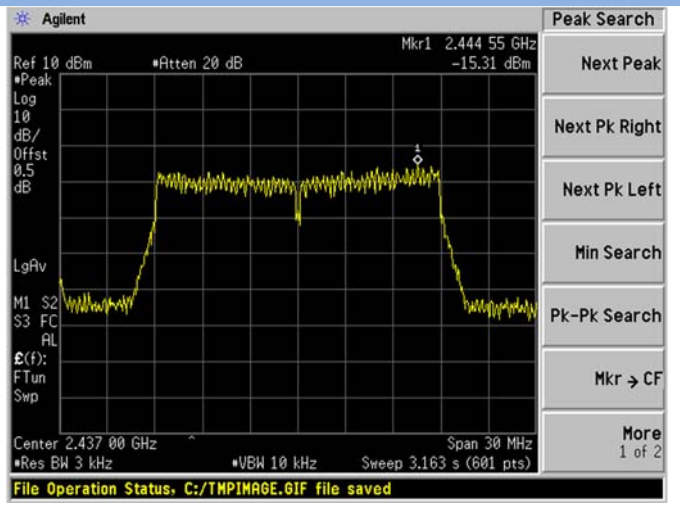
802.11g HIGH CHANNEL



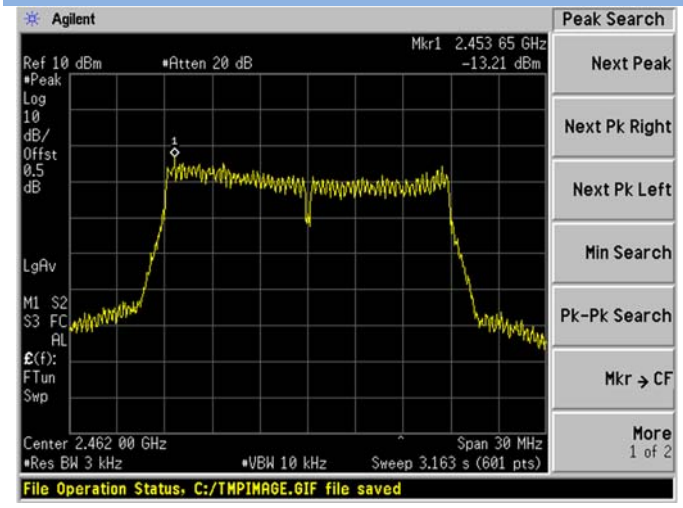
802.11n-20 MHz LOW CHANNEL



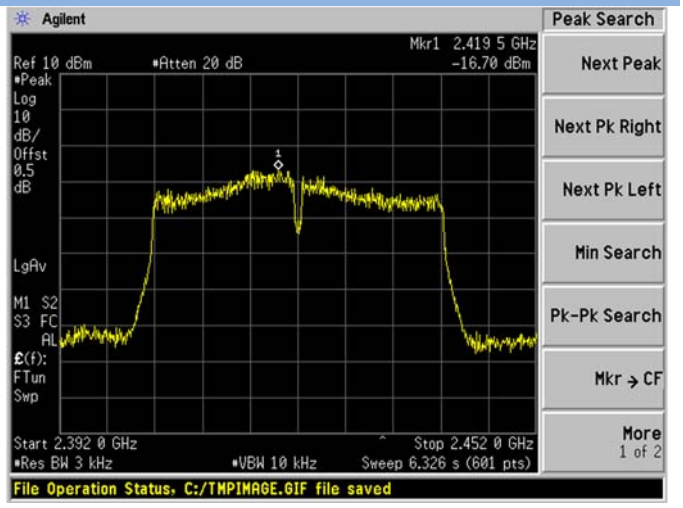
802.11 n-20 MHz MIDDLE CHANNEL



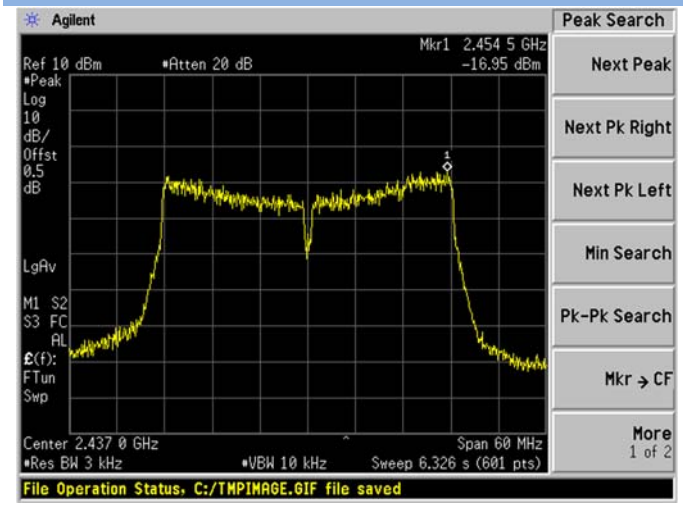
802.11n-20 MHz HIGH CHANNEL



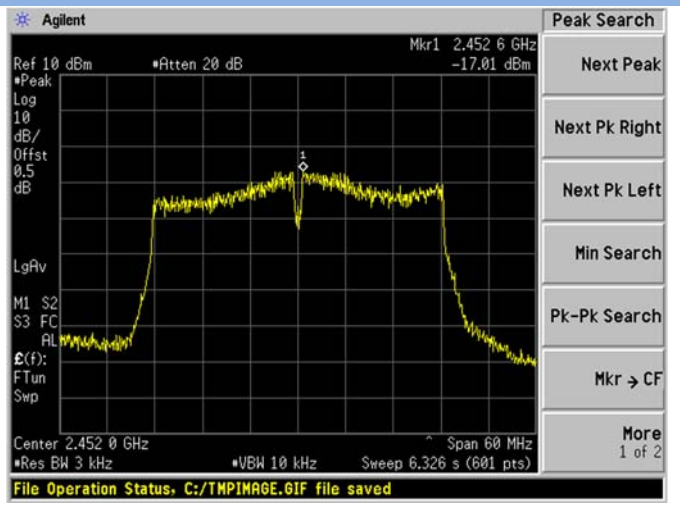
802.11n-40 MHz LOW CHANNEL



802.11n-40 MHz MIDDLE CHANNEL



802.11n-40 MHz HIGH CHANNEL



ANNEX B TEST SETUP PHOTOS

Please refer the document “BL- SZ1650193-AR.pdf”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL- SZ1650193-AW.pdf”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL- SZ1650193-AI.pdf”.

--END OF REPORT--