



**FCC 47 CFR PART 15 SUBPART C
(Class II Permissive Change)**

TEST REPORT

For

802.11bgn WLAN + BT Combo Card

Trade Name: Broadcom

Model: BCM94330UARTSDB

Issued to

**Broadcom Corporation
190 Mathilda Avenue, Sunnyvale, CA 94086**

Issued by

**Compliance Certification Services Inc.
No.11, Wugong 6th Rd., Wugu Dist.,
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Issued Date: May 30, 2013



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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	May 30, 2013	Initial Issue	ALL	Angel Cheng



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1. TEST RESULT CERTIFICATION

Applicant: Broadcom Corporation
 190 Mathilda Avenue, Sunnyvale, CA 94086

Equipment Under Test: 802.11bgn WLAN + BT Combo Card

Trade Name: Broadcom

Model Number: BCM94330UARTSDB

Date of Test: April 13 ~May 28, 2013

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart C	No non-compliance noted

We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2009 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247.

The test results of this report relate only to the tested sample EUT identified in this report.

Approved by:

Reviewed by:

Miller Lee
 Section Manager
 Compliance Certification Services Inc.

Gina Lo
 Section Manager
 Compliance Certification Services Inc.



2. EUT DESCRIPTION

Product	802.11bgn WLAN + BT Combo Card
Trade Name	Broadcom
Model Number	BCM94330UARTSDB
Model Discrepancy	N/A
Received Date	April 1, 2013
Power Supply	1. Power Adapter lenovo / ADP-18AW I/P: 100-240V, 0.4A, 50-60Hz O/P: 12V, 1.5A 2. Battery: Sony / L12N2P01 Rating: 3.75V 6.70Ah, 25Wh
Frequency Range	IEEE 802.11b/g mode: 2412 ~ 2462 MHz IEEE 802.11n HT 20 MHz mode: 2412 ~ 2462 MHz
Transmit Power (Peak Power)	0.045 W
Modulation Technique	IEEE 802.11b mode: DSSS (1, 2, 5.5 and 11 Mbps) IEEE 802.11g mode: OFDM (6, 9, 12, 18, 24, 36, 48 and 54 Mbps) IEEE 802.11n HT 20 MHz mode: OFDM (6.5, 7.2, 13, 14.4, 14.44, 19.5, 21.7, 26, 28.89, 28.9, 39, 43.3, 43.33 52, 57.78, 57.8, 58.5, 65.0, 72.2, 78, 86.67, 104, 115.56, 117, 130, 144.44 Mbps)
Number of Channels	IEEE 802.11b/g mode: 11 Channels IEEE 802.11n HT 20 MHz mode: 11 Channels
Antenna Gain	PIFA Antenna / Main Antenna : APP5P-700018 / Gain: 1.13dBi Aux Antenna: APP5P-700019 / Gain: -0.63 dBi
Class II Permissive Change	The product will be installed in the following models of notebooks/laptops: Model: 1. 20284..... (The dots "." in the model name can be 0 to 9, A to Z, a to z, - or blank) 2. 80BR..... (The dots "." in the model name can be 0 to 9, A to Z, a to z, - or blank) All the specification and layout are identical except they come with different model numbers for marketing purposes. The product was installed in Notebook for model: 20284 during the test.

Remark:

1. The sample selected for test was production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: **QDS-BRCM1065** filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.



3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4: 2009 and FCC CFR 47 Part 15.207, 15.209, 15.247 and KDB558074.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4.



3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	(²)
13.36 - 13.41	322 - 335.4		

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.



3.5 DESCRIPTION OF TEST MODES

The EUT (model: BCM94330UARTSDB) had been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting mode was programmed.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode only.

IEEE 802.11b mode:

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 1Mbps data rate were chosen for full testing.

IEEE 802.11g mode:

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 MHz mode:

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6.5Mbps data rate were chosen for full testing.



4. INSTRUMENT CALIBRATION

4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Remark: Each piece of equipment is scheduled for calibration once a year and Loop Antenna is scheduled for calibration once three years.

3M Chamber Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510268	11/06/2013
EMI Test Receiver	R&S	ESCI	100064	02/28/2014
Pre-Amplifier	Mini-Circuits	ZFL-1000LN	SF350700823	01/12/2014
Pre-Amplifier	MITEQ	AFS44-00102650-42-10P-44	1415367	11/19/2013
Bilog Antenna	Sunol Sciences	JB3	A030105	10/02/2013
Horn Antenna	EMCO	3117	00055165	02/13/2014
Horn Antenna	EMCO	3116	2487	10/10/2013
Loop Antenna	EMCO	6502	8905/2356	06/10/2013
Turn Table	CCS	CC-T-1F	N/A	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
Site NSA	CCS	N/A	N/A	12/22/2013
Test S/W	EZ-EMC (CCS-3A1RE)			



4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
3M Semi Anechoic Chamber / 30M~200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683

Remark: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.



5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.
Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)
Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

No.139, Wugong Rd., Wugu Industrial Park, New Taipei City 24891, Taiwan. (R.O.C.)

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.




Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."



5.3 TABLE OF ACCREDITATIONS AND LISTINGS

* No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	
Taiwan	TAF	LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-210, RSS-310 IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12.2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17 FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959 FCC Method -47 CFR Part 15 Subpart B IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11	
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	



6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix II for the actual connections between EUT and support equipment.

6.2 SUPPORT EQUIPMENT

No.	Equipment	Model No.	Serial No.	FCC ID	Trade Name	Data Cable	Power Cord
	N/A						

Remark:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



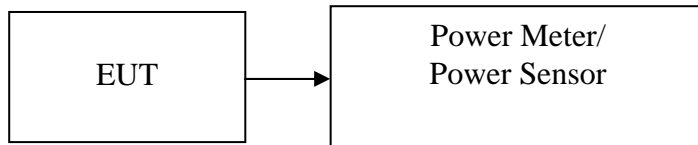
7. FCC PART 15.247 REQUIREMENTS

7.1 AVERAGE POWER

LIMIT

None; for reporting purposes only.

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the Power Meter. The Power Meter is set to the Average power detection.

TEST RESULTS

No non-compliance noted



Test Data

Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	16.15	0.0412	1.00	PASS
Mid	2437	17.70	0.0589		PASS
High	2462	15.67	0.0369		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	13.62	0.0230	1.00	PASS
Mid	2437	15.10	0.0324		PASS
High	2462	11.43	0.0139		PASS

Test mode: IEEE 802.11n HT 20 MHz Channel mode

Channel	Frequency (MHz)	Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	12.82	0.0191	1.00	PASS
Mid	2437	15.47	0.0352		PASS
High	2462	11.34	0.0136		PASS

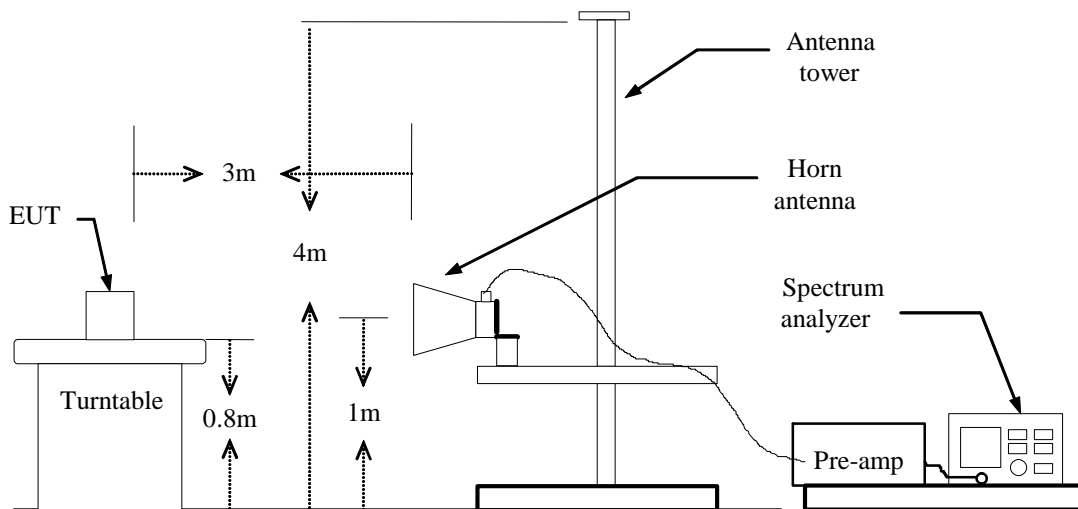


7.2 BAND EDGES MEASUREMENT

LIMIT

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum 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, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

Test Configuration



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
 - (a) PEAK: RBW=1MHz VBW=3MHz / Sweep = 100ms
 - (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

TEST RESULTS

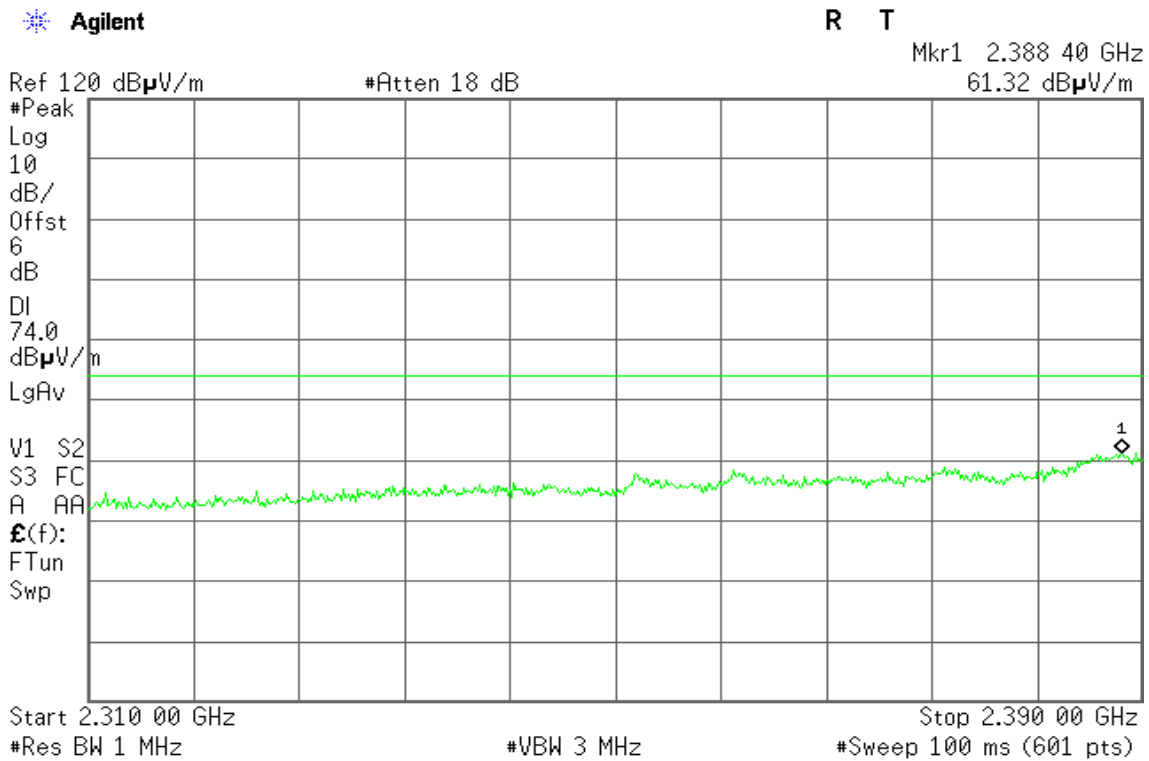
Refer to attach spectrum analyzer data chart.



Band Edges (IEEE 802.11b mode / CH Low)

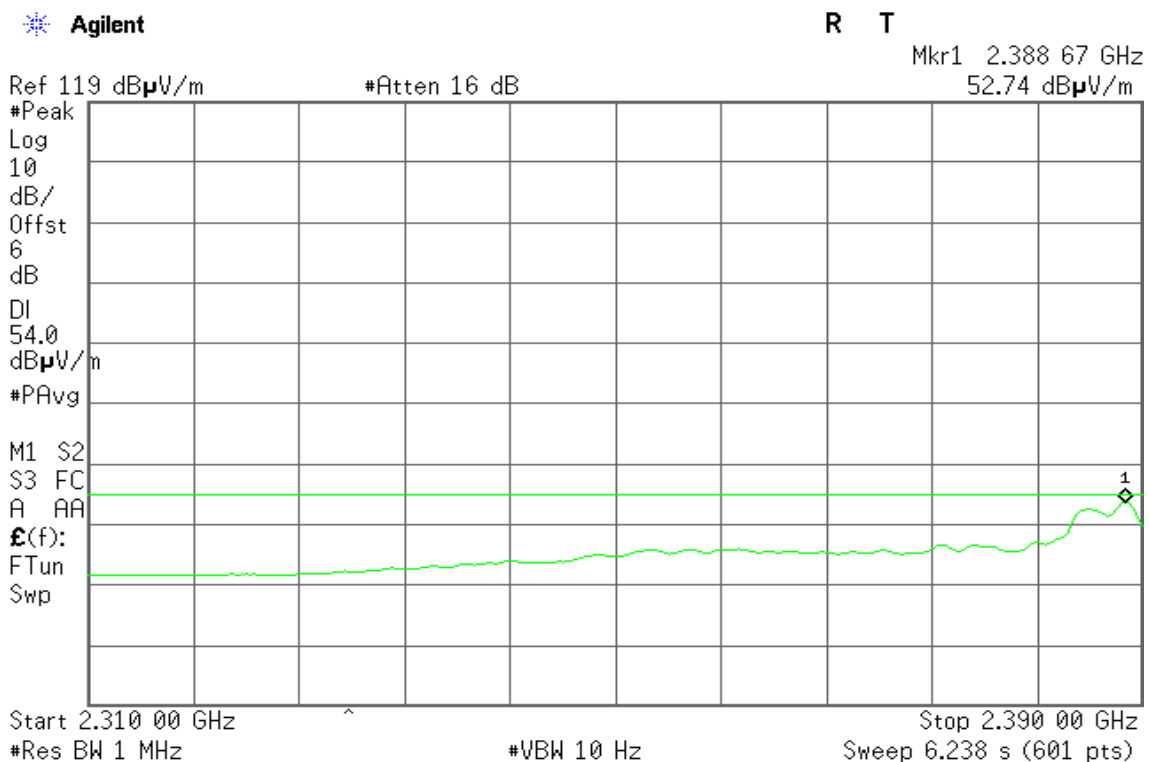
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

Polarity: Vertical





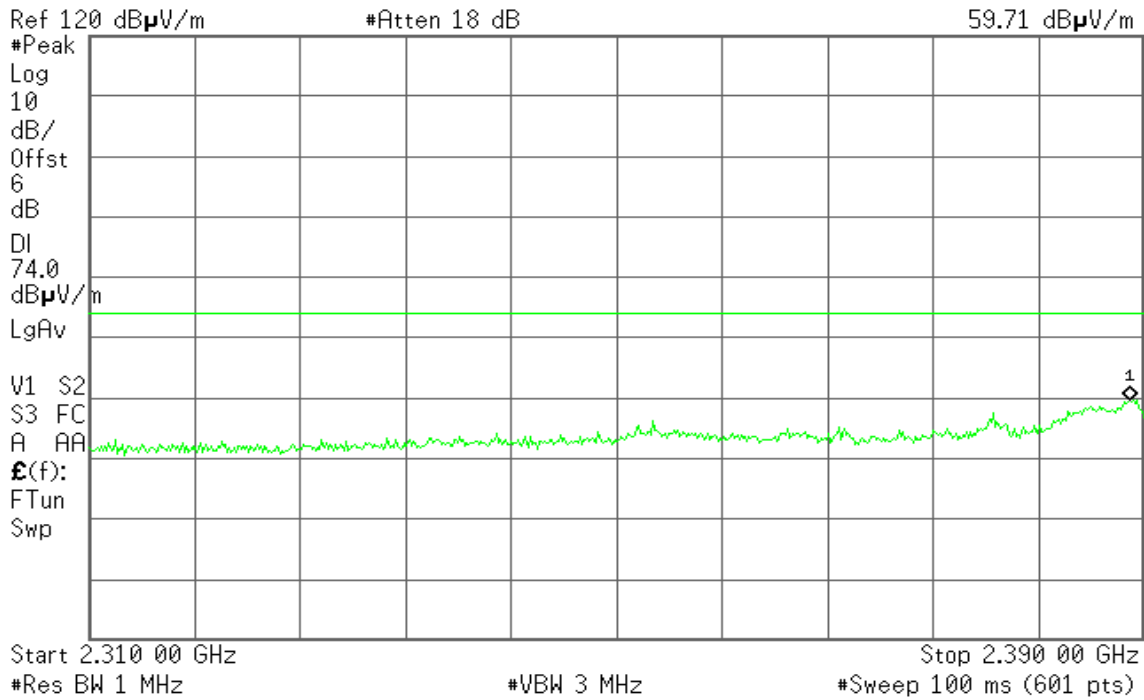
Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.388 93 GHz
59.71 dB μ V/m



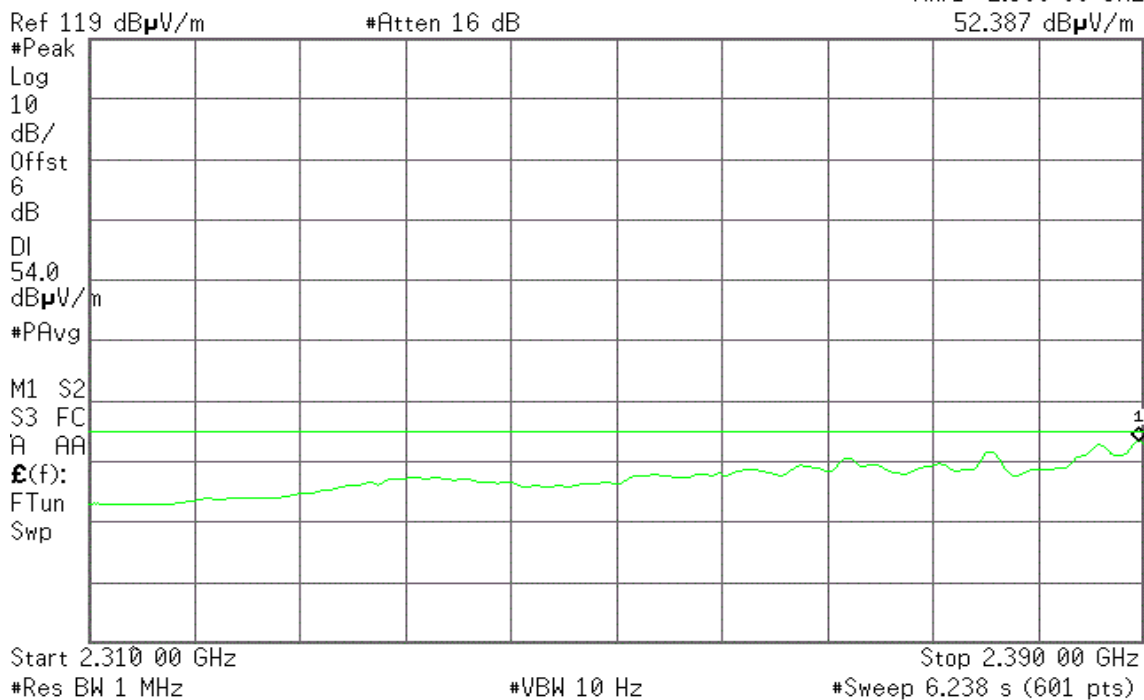
Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.389 60 GHz
52.387 dB μ V/m

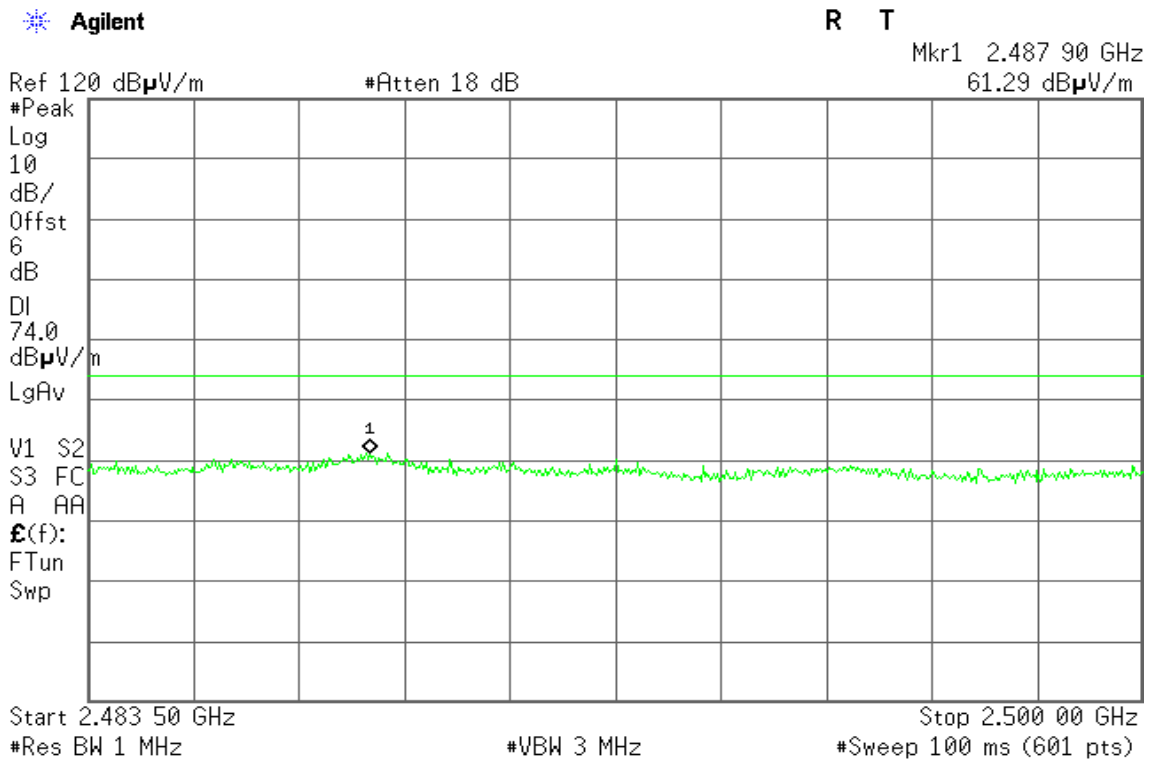




Band Edges (IEEE 802.11b mode / CH High)

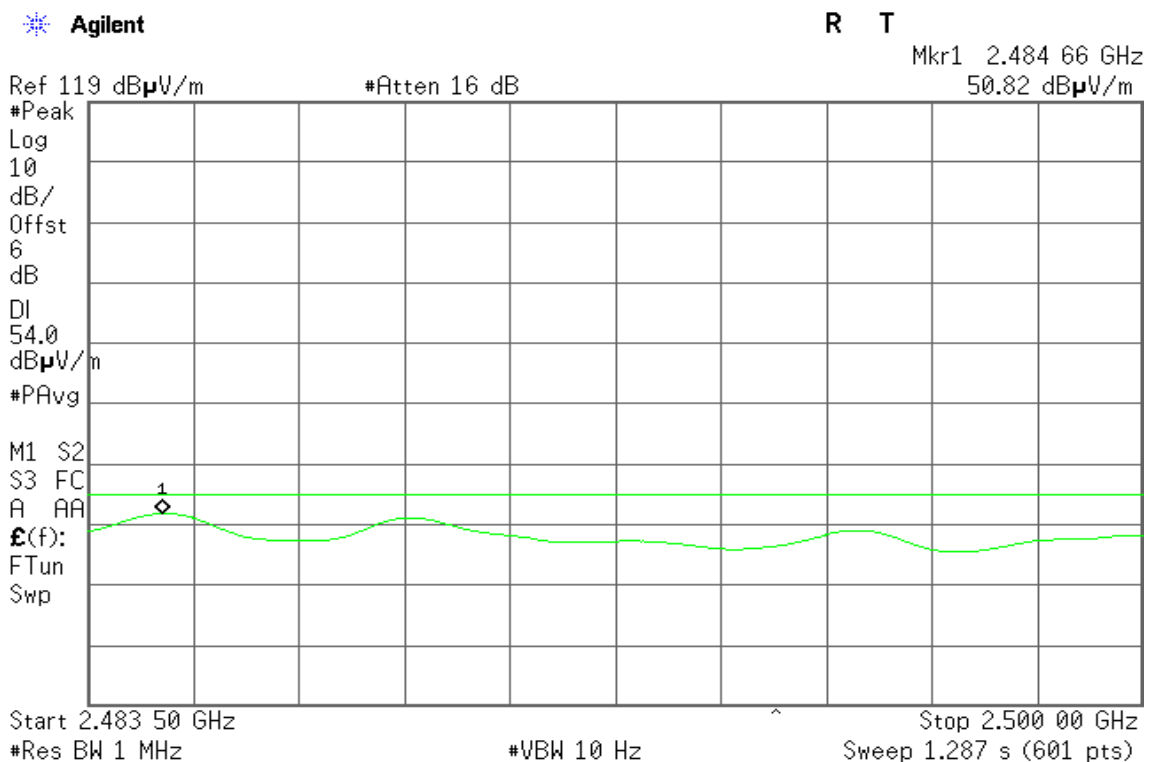
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

Polarity: Vertical





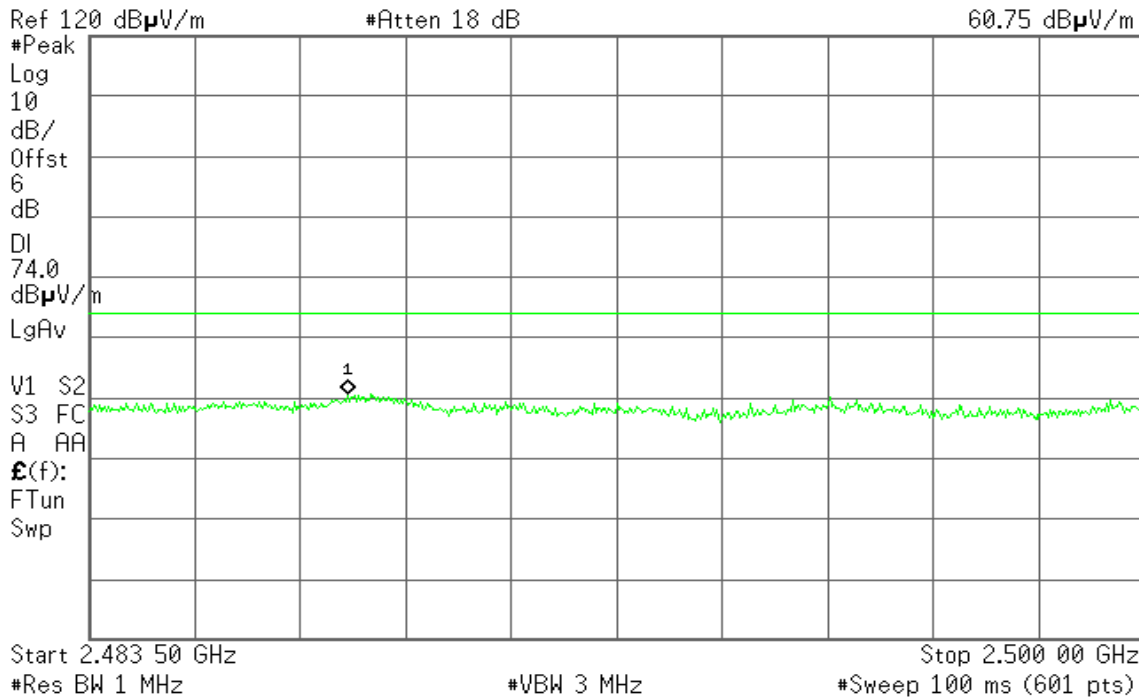
Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.487 54 GHz
60.75 dB μ V/m



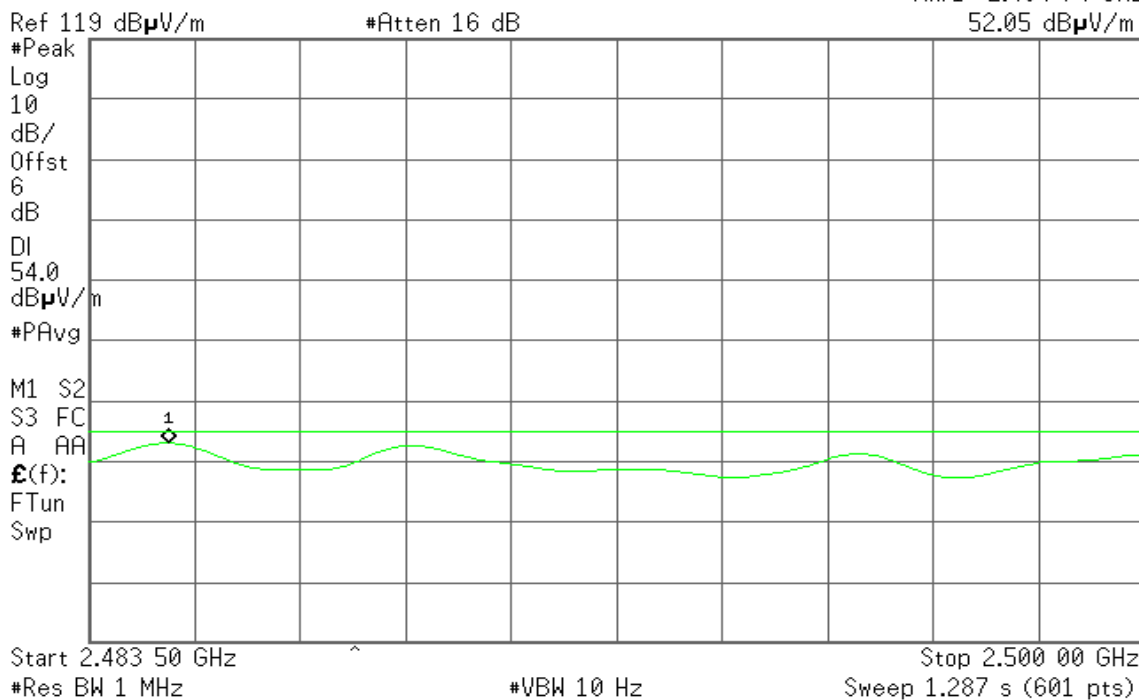
Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.484 74 GHz
52.05 dB μ V/m

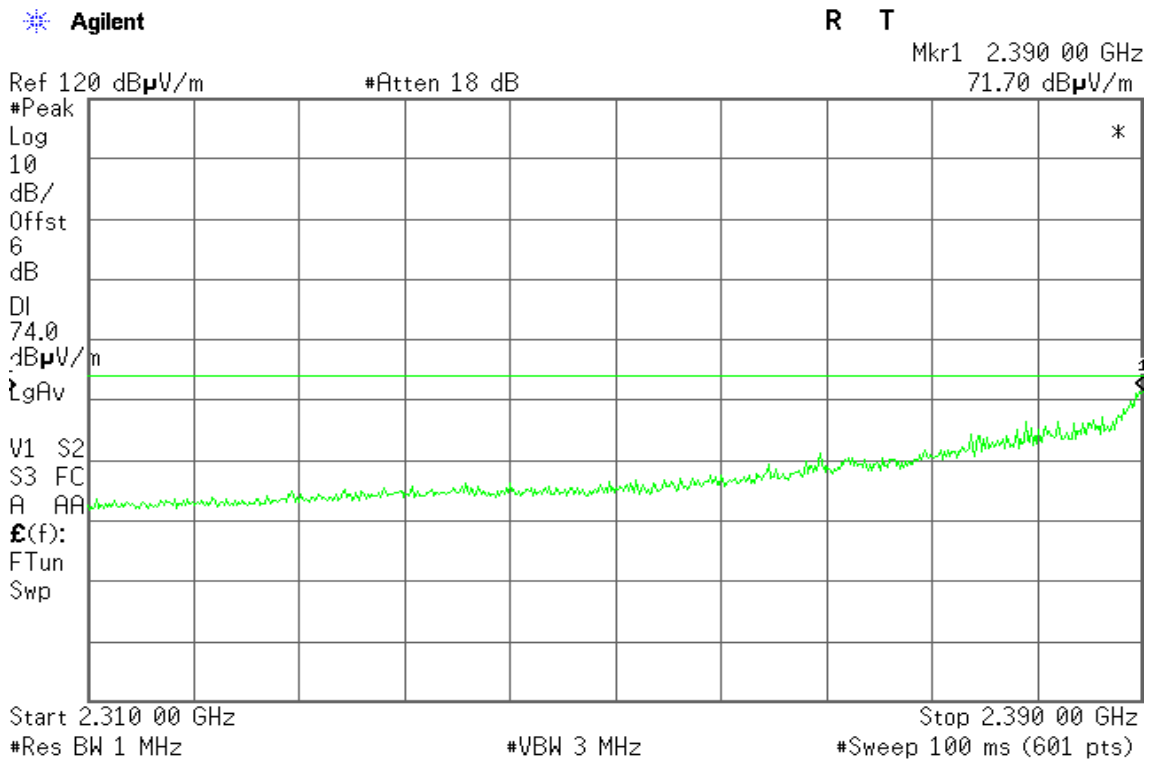




Band Edges (IEEE 802.11g mode / CH Low)

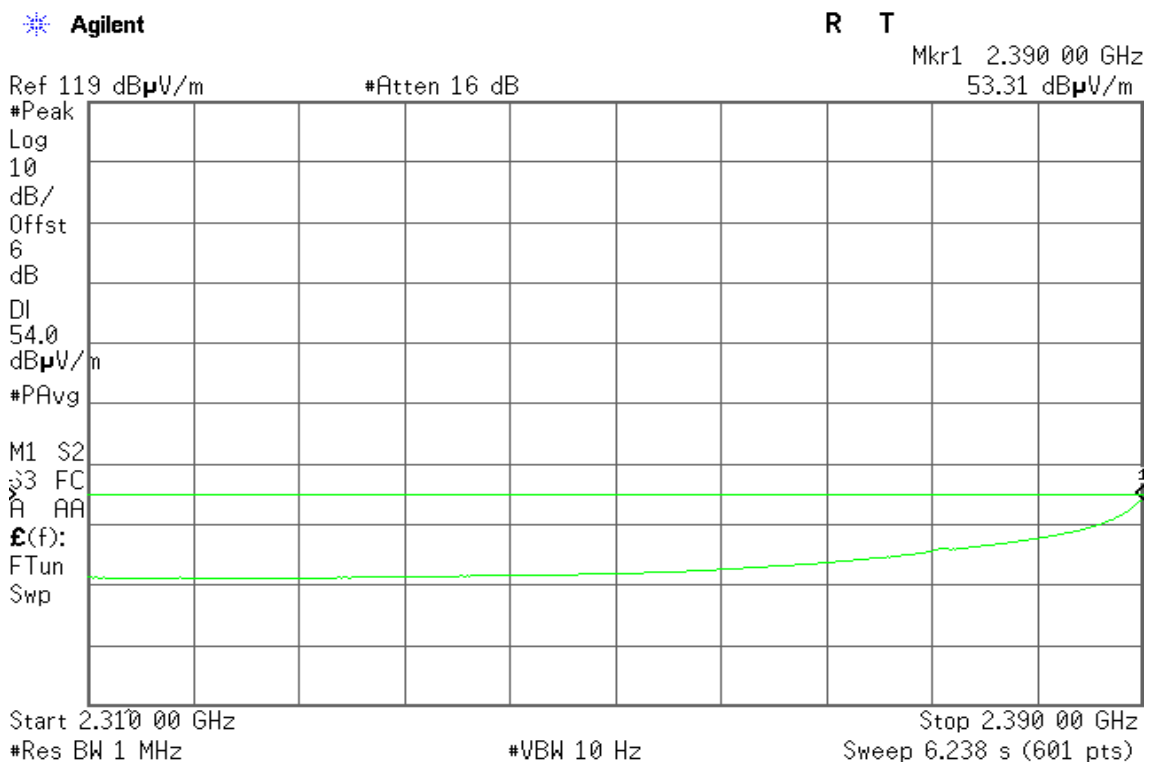
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

Polarity: Vertical





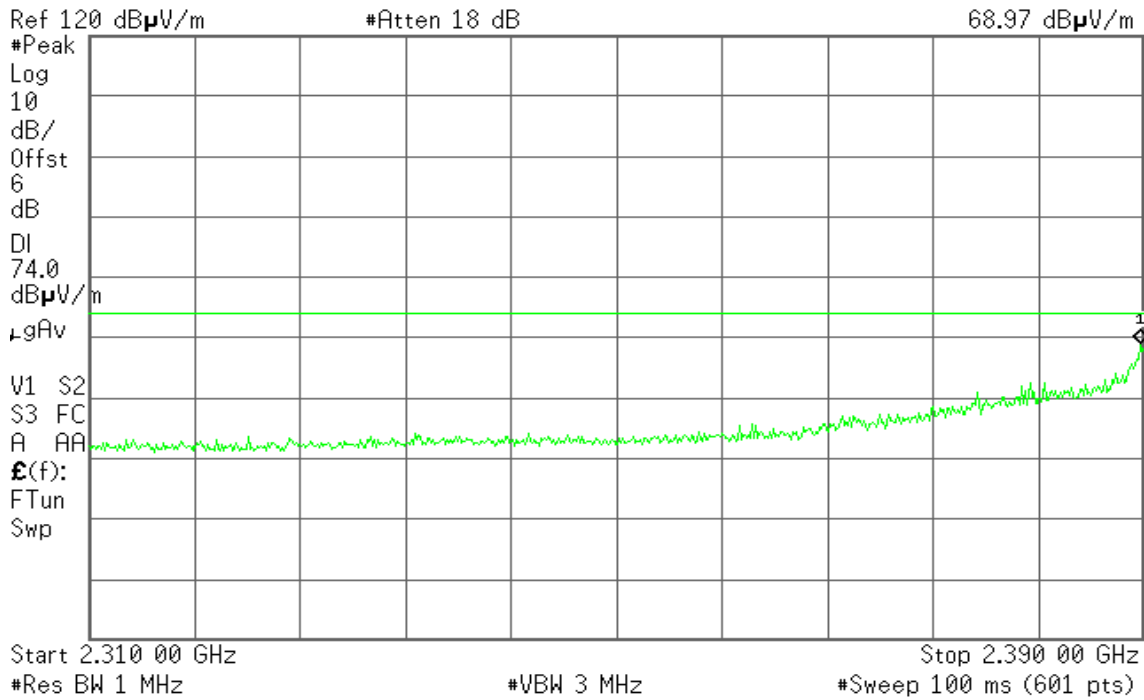
Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.389 73 GHz
68.97 dB μ V/m



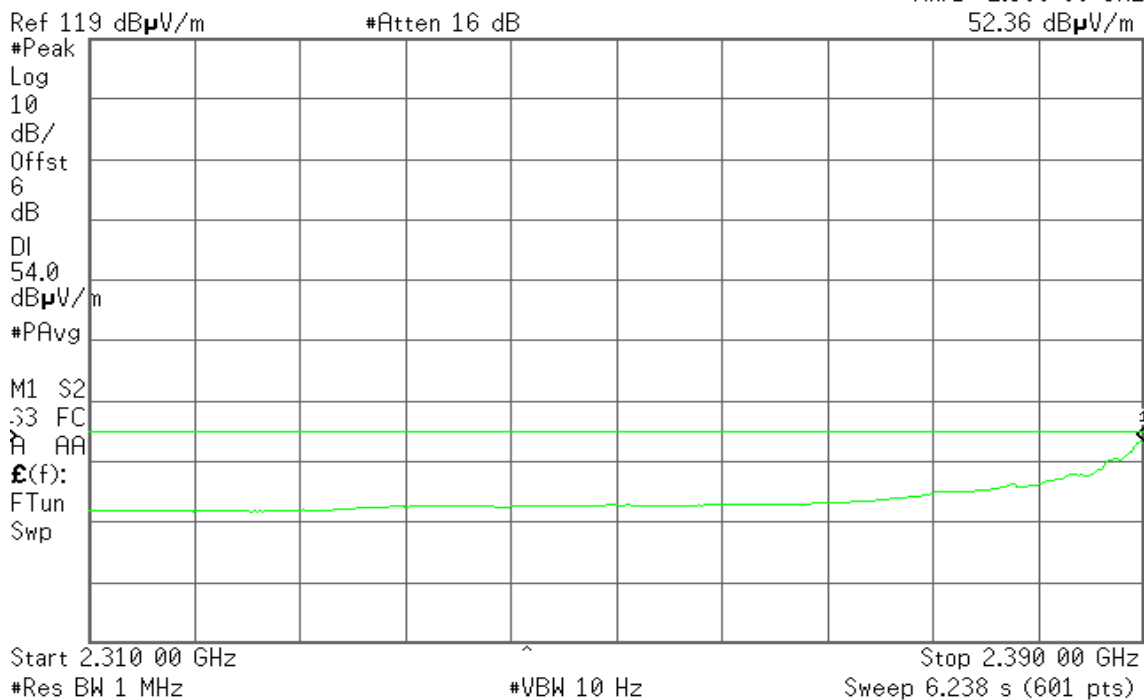
Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.390 00 GHz
52.36 dB μ V/m

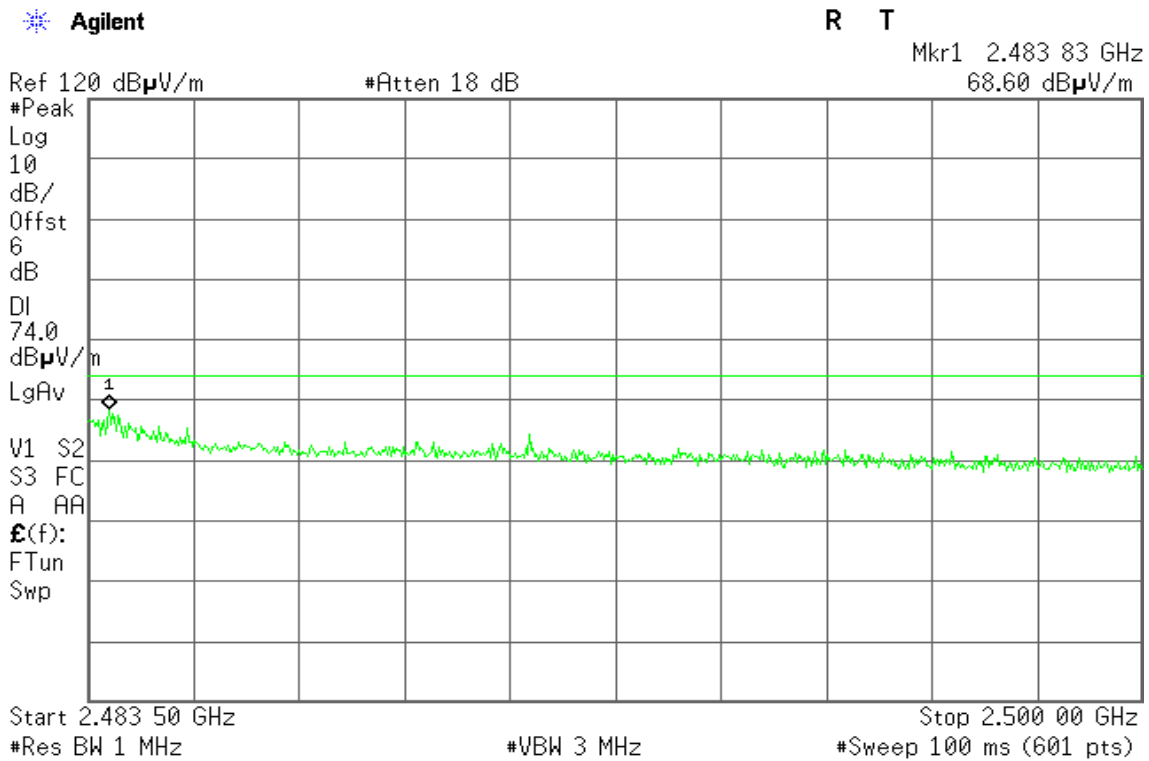




Band Edges (IEEE 802.11g mode / CH High)

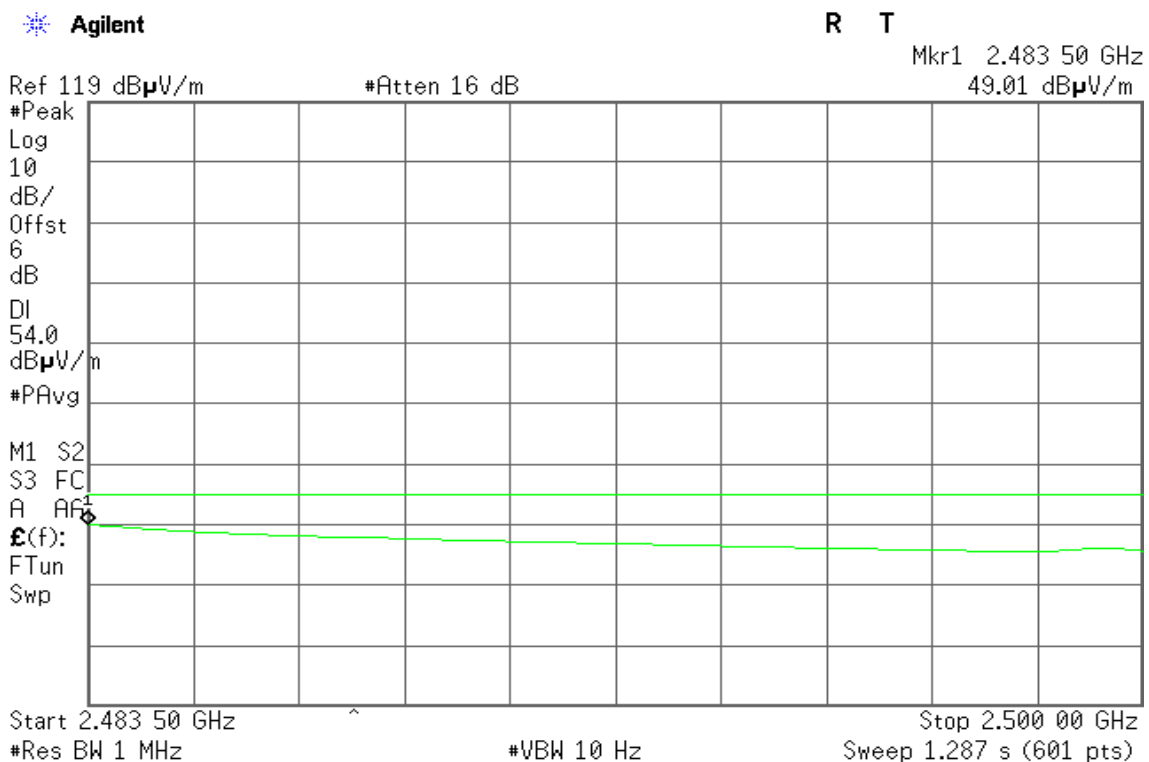
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

Polarity: Vertical





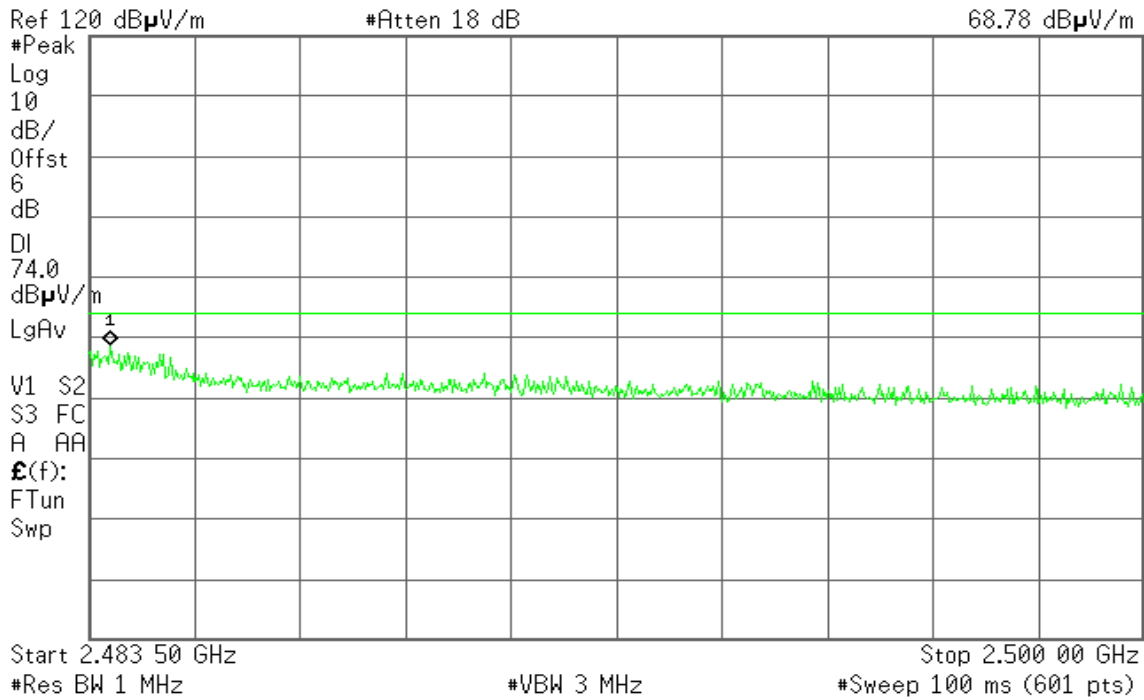
Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 83 GHz
68.78 dB μ V/m



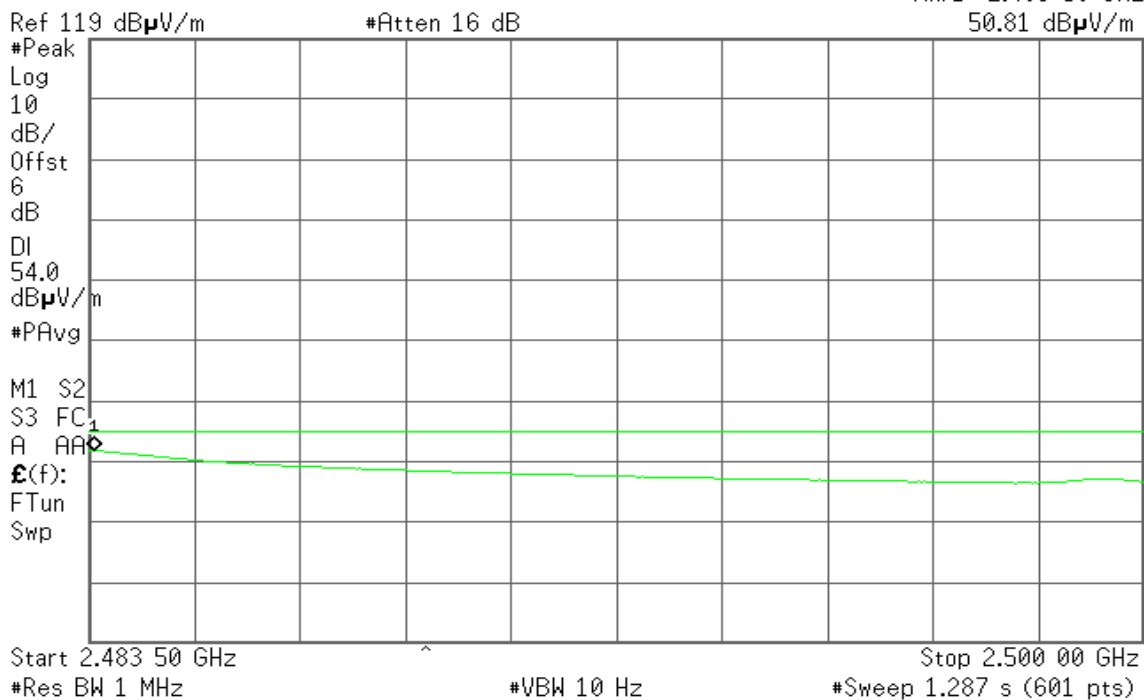
Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 58 GHz
50.81 dB μ V/m





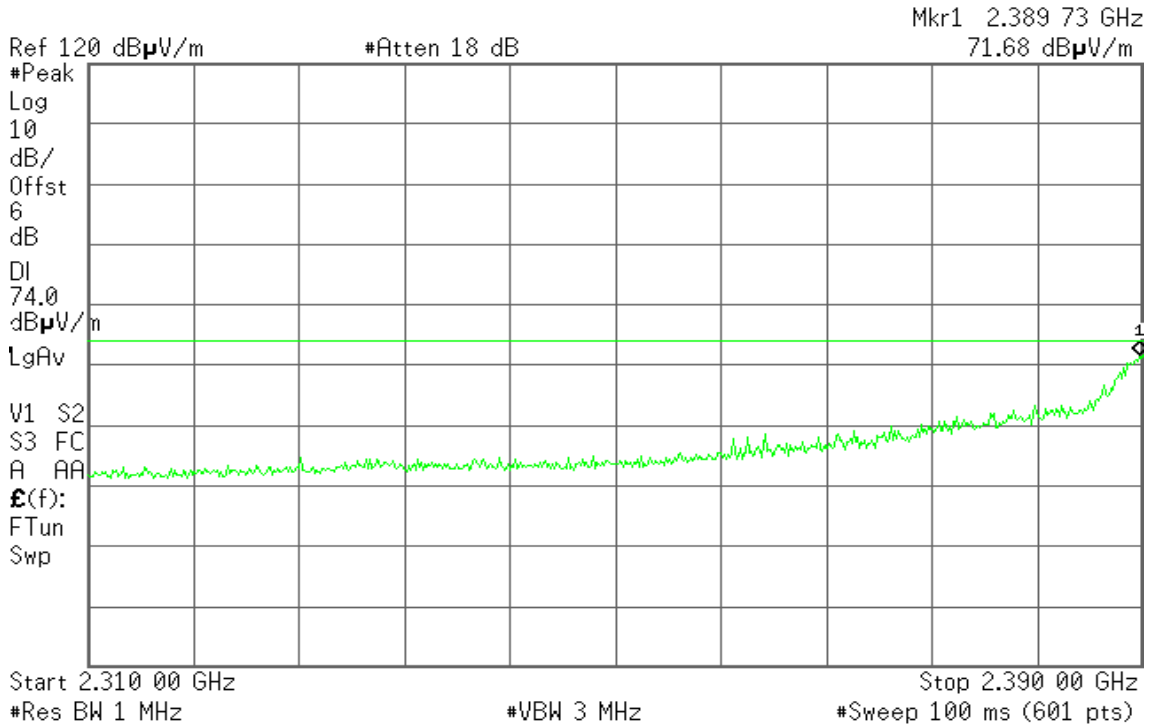
Band Edges (IEEE 802.11n HT 20 MHz mode / CH Low)

Detector mode: Peak

Polarity: Vertical

Agilent

R T

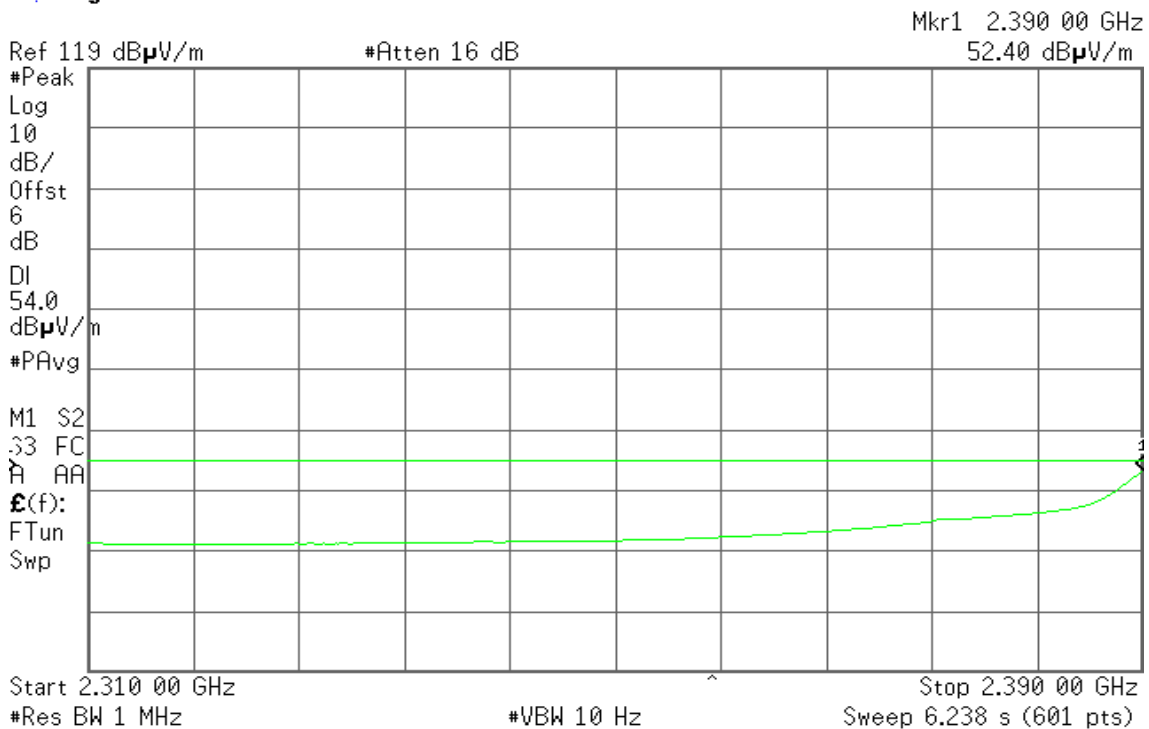


Detector mode: Average

Polarity: Vertical

Agilent

R T





Detector mode: Peak

Polarity: Horizontal

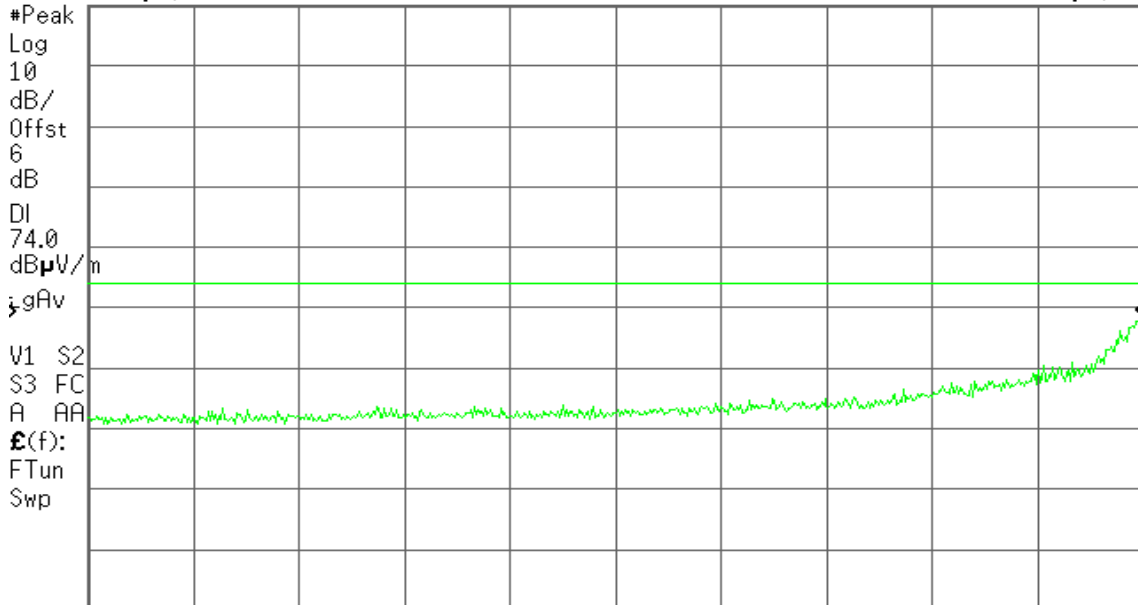
Agilent

R T

Mkr1 2.390 00 GHz
68.60 dB μ V/m

Ref 120 dB μ V/m

#Atten 18 dB



Start 2.310 00 GHz

Stop 2.390 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

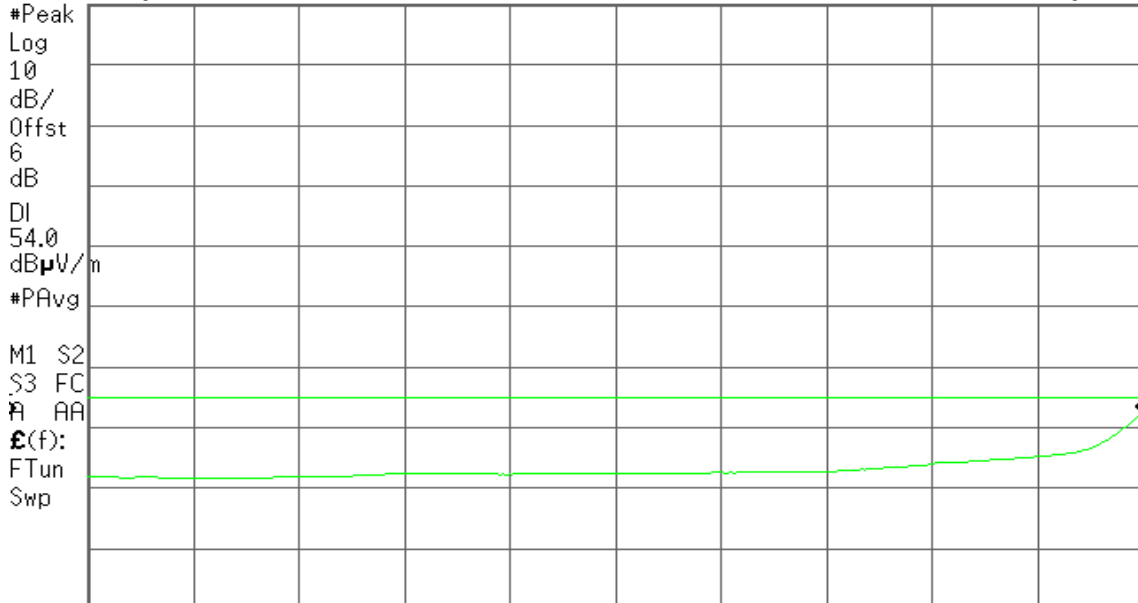
Agilent

R T

Mkr1 2.390 00 GHz
51.49 dB μ V/m

Ref 119 dB μ V/m

#Atten 16 dB



Start 2.310 00 GHz

Stop 2.390 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

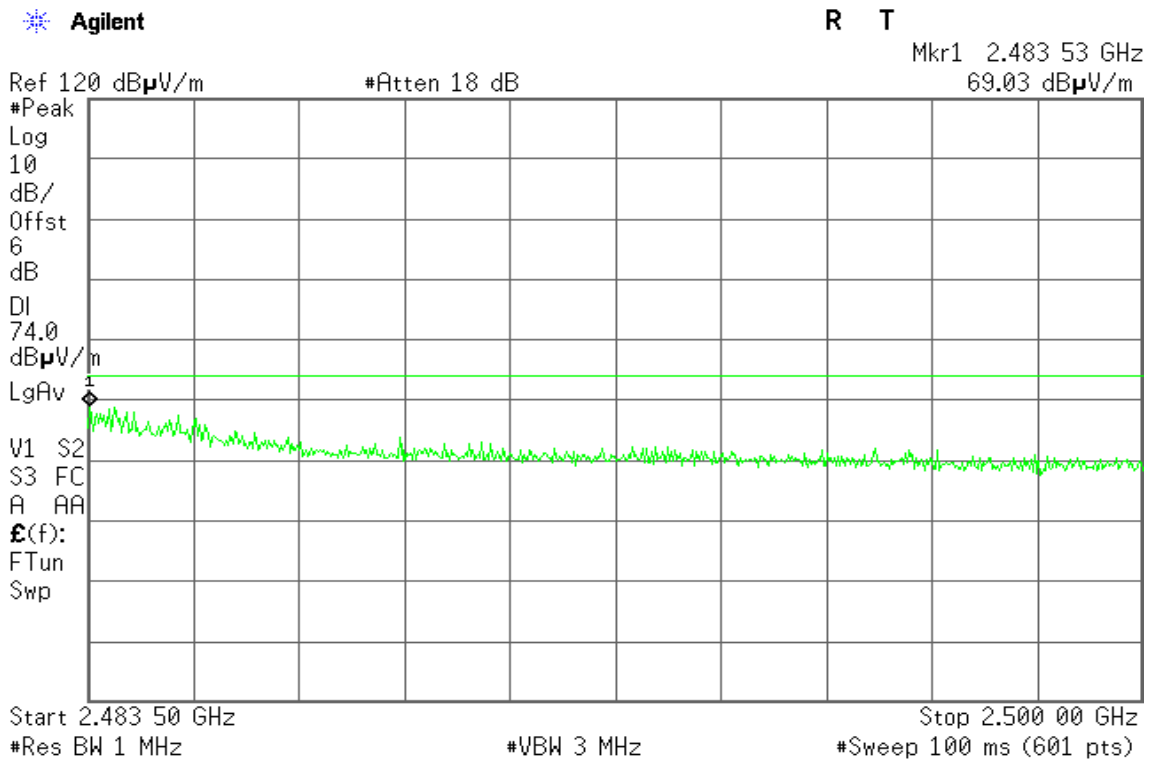
Sweep 6.238 s (601 pts)



Band Edges (IEEE 802.11n HT 20 MHz mode / CH High)

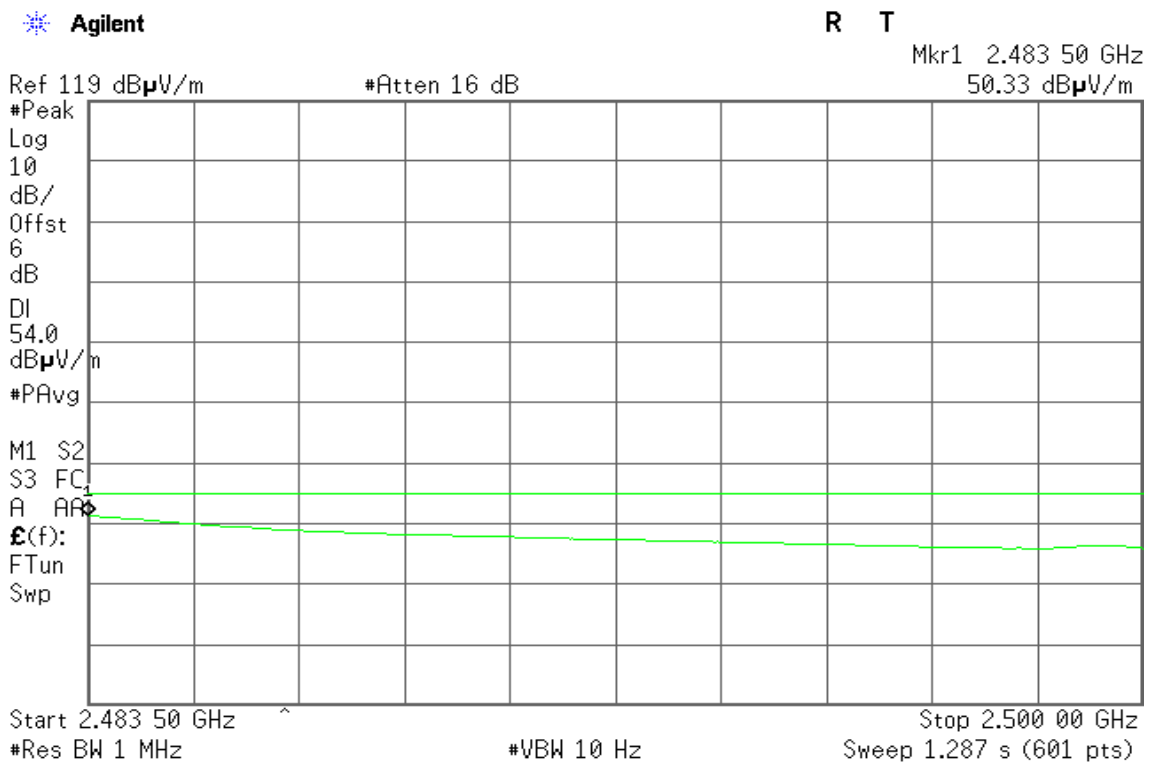
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

Polarity: Vertical





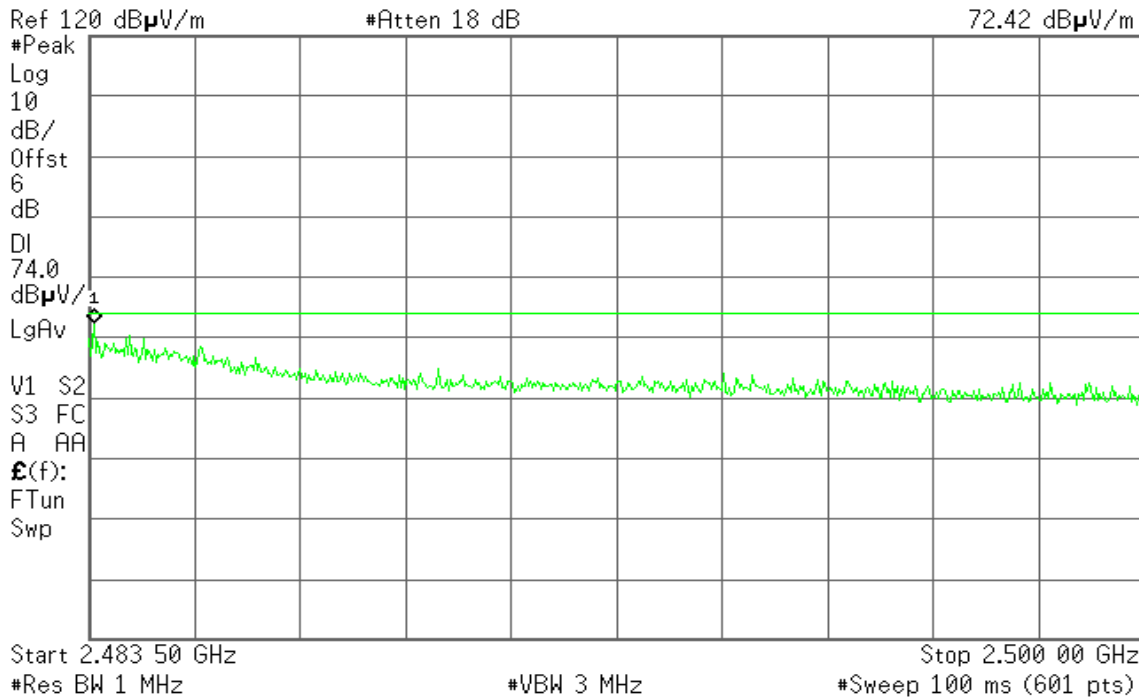
Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 58 GHz
72.42 dB μ V/m



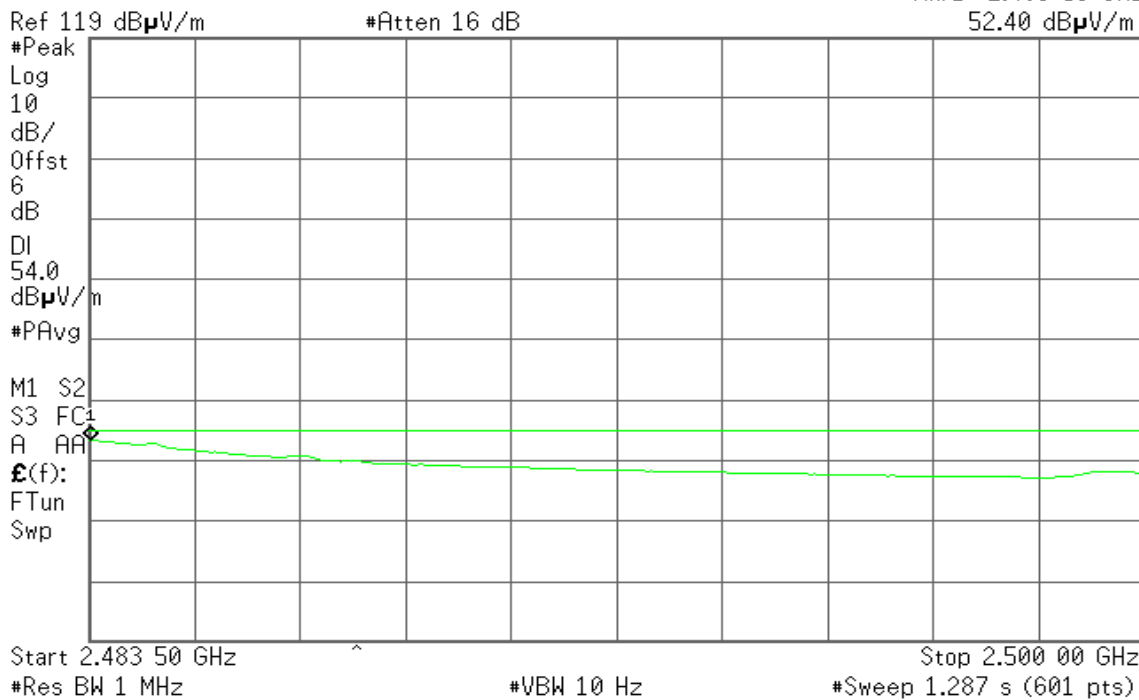
Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 53 GHz
52.40 dB μ V/m





7.3 RADIATED EMISSIONS

LIMIT

1. According to §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 ($\mu\text{V}/\text{m}$)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

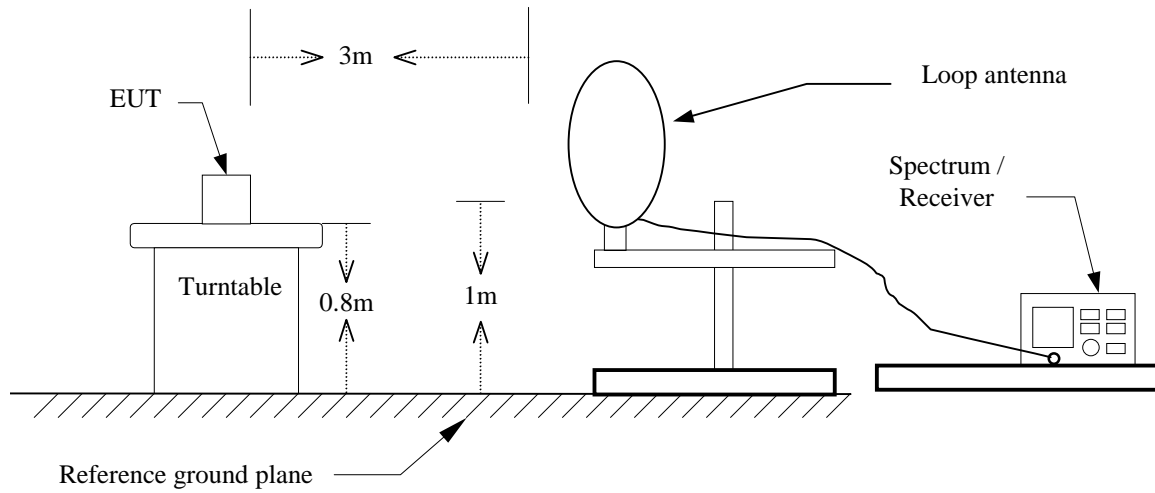
2. In the emission table above, the tighter limit applies at the band edges.

Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$ at 3-meter)	Field Strength (dB $\mu\text{V}/\text{m}$ at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

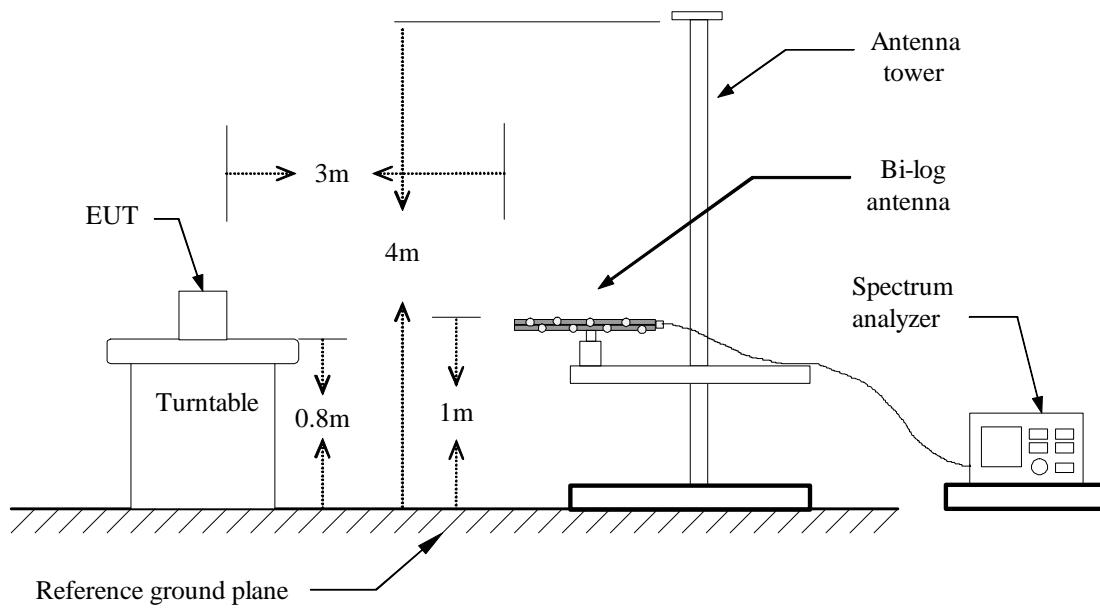


Test Configuration

9kHz ~ 30MHz

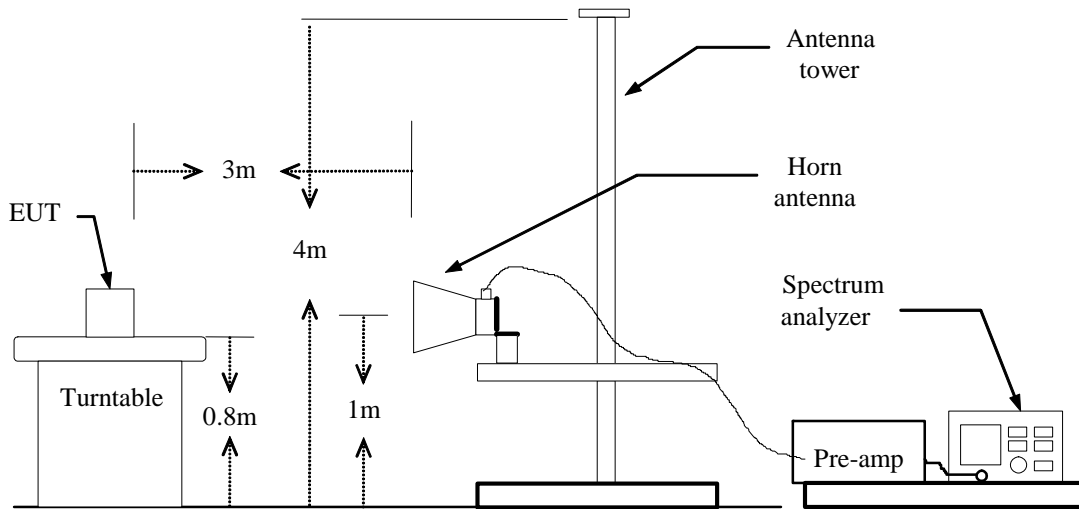


Below 1 GHz





Above 1 GHz





TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:
Below 1GHz:
RBW=100kHz / VBW=300kHz / Sweep=AUTO
Above 1GHz:
(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

**Below 1GHz****Operation Mode:** Normal Link**Test Date:** April 13, 2013**Temperature:** 27°C**Tested by:** Rex Huang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant. Pol. (H/V)
33.2333	58.33	-22.83	35.50	40.00	-4.50	Peak	V
65.5667	66.95	-35.30	31.65	40.00	-8.35	Peak	V
419.6167	59.32	-25.01	34.31	46.00	-11.69	Peak	V
479.4333	63.96	-23.76	40.20	46.00	-5.80	Peak	V
539.2500	60.41	-22.92	37.49	46.00	-8.51	Peak	V
560.2667	63.91	-22.72	41.19	46.00	-4.81	Peak	V
34.8500	57.24	-24.02	33.22	40.00	-6.78	Peak	H
107.6000	61.51	-30.39	31.12	43.50	-12.38	Peak	H
159.3333	64.88	-29.24	35.64	43.50	-7.86	Peak	H
240.1667	70.36	-29.81	40.55	46.00	-5.45	Peak	H
780.1333	55.44	-19.23	36.21	46.00	-9.79	Peak	H
899.7667	51.94	-17.34	34.60	46.00	-11.40	Peak	H

Remark:

1. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).
2. Radiated emissions measured were made with an instrument using peak/quasi-peak detector mode.
3. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).

**Above 1 GHz****Operation Mode:** TX / IEEE 802.11b / CH Low**Test Date:** April 13, 2013**Temperature:** 27°C**Tested by:** Rex Huang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2490.000	56.57	-0.14	56.43	74.00	-17.57	peak	V
2490.000	45.97	-0.14	45.83	54.00	-8.17	AVG	V
2576.667	56.04	0.11	56.15	74.00	-17.85	peak	V
2576.667	45.91	0.11	46.02	54.00	-7.98	AVG	V
4825.000	44.91	6.12	51.03	74.00	-22.97	peak	V
4825.000	41.06	6.12	47.18	54.00	-6.82	AVG	V
2483.333	56.17	-0.17	56.00	74.00	-18.00	peak	H
2483.333	46.09	-0.17	45.92	54.00	-8.08	AVG	H
2526.667	55.91	-0.03	55.88	74.00	-18.12	peak	H
2526.667	45.42	-0.03	45.39	54.00	-8.61	AVG	H
2573.333	56.86	0.11	56.97	74.00	-17.03	peak	H
2573.333	45.72	0.11	45.83	54.00	-8.17	AVG	H

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** TX / IEEE 802.11b / CH Mid**Test Date:** May 28, 2013**Temperature:** 27°C**Tested by:** Rex Huang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2076.667	52.67	-1.28	51.39	74.00	-22.61	peak	V
2363.333	56.83	-0.62	56.21	74.00	-17.79	peak	V
2363.333	45.61	-0.62	44.99	54.00	-9.01	AVG	V
2510.000	56.59	-0.07	56.52	74.00	-17.48	peak	V
2510.000	45.42	-0.07	45.35	54.00	-8.65	AVG	V
4875.000	50.97	6.24	57.21	74.00	-16.79	peak	V
4875.000	47.34	6.24	53.58	54.00	-0.42	AVG	V
7300.000	47.15	10.60	57.75	74.00	-16.25	peak	V
7300.000	43.02	10.60	53.62	54.00	-0.38	AVG	V
1993.333	52.54	-1.50	51.04	74.00	-22.96	peak	H
2510.000	57.79	-0.07	57.72	74.00	-16.28	peak	H
2510.000	46.94	-0.07	46.87	54.00	-7.13	AVG	H
2600.000	57.27	0.18	57.45	74.00	-16.55	peak	H
2600.000	45.64	0.18	45.82	54.00	-8.18	AVG	H
4866.667	47.76	6.22	53.98	74.00	-20.02	peak	H
4866.667	44.87	6.22	51.09	54.00	-2.91	AVG	H
7300.000	44.25	10.60	54.85	74.00	-19.15	peak	H
7300.000	39.15	10.60	49.75	54.00	-4.25	AVG	H

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11b / CH High

Test Date: April 13, 2013

Temperature: 27°C

Tested by: Rex Huang

Humidity: 53 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2536.667	57.19	0.00	57.19	74.00	-16.81	peak	V
2536.667	46.85	0.00	46.85	54.00	-7.15	AVG	V
2576.667	55.19	0.11	55.30	74.00	-18.70	peak	V
2576.667	45.17	0.11	45.28	54.00	-8.72	AVG	V
4925.000	45.46	6.37	51.83	74.00	-22.17	peak	V
4925.000	40.27	6.37	46.64	54.00	-7.36	AVG	V
2540.000	56.61	0.01	56.62	74.00	-17.38	peak	H
2540.000	47.17	0.01	47.18	54.00	-6.82	AVG	H
2623.333	55.67	0.25	55.92	74.00	-18.08	peak	H
2623.333	44.48	0.25	44.73	54.00	-9.27	AVG	H
4925.000	47.94	6.37	54.31	74.00	-19.69	peak	H
4925.000	46.03	6.37	52.40	54.00	-1.60	AVG	H

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** TX / IEEE 802.11g / CH Low**Test Date:** April 13, 2013**Temperature:** 27°C**Tested by:** Rex Huang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2493.333	55.33	-0.13	55.20	74.00	-18.80	peak	V
2493.333	45.51	-0.13	45.38	54.00	-8.62	AVG	V
2576.667	54.89	0.11	55.00	74.00	-19.00	peak	V
2576.667	44.78	0.11	44.89	54.00	-9.11	AVG	V
4825.000	46.58	6.12	52.70	74.00	-21.30	peak	V
4825.000	36.39	6.12	42.51	54.00	-11.49	AVG	V
2470.000	55.81	-0.22	55.59	74.00	-18.41	peak	H
2470.000	45.87	-0.22	45.65	54.00	-8.35	AVG	H
2533.333	55.36	-0.01	55.35	74.00	-18.65	peak	H
2533.333	44.73	-0.01	44.72	54.00	-9.28	AVG	H
2576.667	57.00	0.11	57.11	74.00	-16.89	peak	H
2576.667	46.09	0.11	46.20	54.00	-7.80	AVG	H

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11g / CH Mid

Test Date: May 28, 2013

Temperature: 27°C

Tested by: Rex Huang

Humidity: 53 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2356.667	55.45	-0.65	54.80	74.00	-19.20	peak	V
2356.667	44.96	-0.65	44.31	54.00	-9.69	AVG	V
2516.667	55.30	-0.05	55.25	74.00	-18.75	peak	V
2516.667	45.80	-0.05	45.75	54.00	-8.25	AVG	V
2600.000	55.13	0.18	55.31	74.00	-18.69	peak	V
2600.000	45.09	0.18	45.27	54.00	-8.73	AVG	V
4875.000	48.07	6.24	54.31	74.00	-19.69	peak	V
4875.000	42.99	6.24	49.23	54.00	-4.77	AVG	V
7300.000	46.31	10.60	56.91	74.00	-17.09	peak	V
7300.000	38.28	10.60	48.88	54.00	-5.12	AVG	V
2033.333	52.36	-1.37	50.99	74.00	-23.01	peak	H
2520.000	56.24	-0.04	56.20	74.00	-17.80	peak	H
2520.000	45.70	-0.04	45.66	54.00	-8.34	AVG	H
2603.333	56.58	0.19	56.77	74.00	-17.23	peak	H
2603.333	45.61	0.19	45.80	54.00	-8.20	AVG	H
4875.000	43.77	6.24	50.01	74.00	-23.99	peak	H

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11g / CH High

Test Date: April 13, 2013

Temperature: 27°C

Tested by: Rex Huang

Humidity: 53 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2383.333	54.41	-0.55	53.86	74.00	-20.14	peak	V
2383.333	44.65	-0.55	44.10	54.00	-9.90	AVG	V
2540.000	55.07	0.01	55.08	74.00	-18.92	peak	V
2540.000	46.17	0.01	46.18	54.00	-7.82	AVG	V
2583.333	53.53	0.13	53.66	74.00	-20.34	peak	V
2583.333	43.43	0.13	43.56	54.00	-10.44	AVG	V
2536.667	55.62	0.00	55.62	74.00	-18.38	peak	H
2536.667	45.21	0.00	45.21	54.00	-8.79	AVG	H
2630.000	56.00	0.26	56.26	74.00	-17.74	peak	H
2630.000	45.70	0.26	45.96	54.00	-8.04	AVG	H
4925.000	46.46	6.37	52.83	74.00	-21.17	peak	H
4925.000	37.26	6.37	43.63	54.00	-10.37	AVG	H

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11n HT 20 MHz mode / CH Low Test Date: April 13, 2013

Temperature: 27°C

Tested by: Rex Huang

Humidity: 53 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2493.333	56.08	-0.13	55.95	74.00	-18.05	peak	V
2493.333	45.85	-0.13	45.72	54.00	-8.28	AVG	V
2576.667	55.41	0.11	55.52	74.00	-18.48	peak	V
2576.667	45.45	0.11	45.56	54.00	-8.44	AVG	V
7233.333	45.56	10.48	56.04	74.00	-17.96	peak	V
7233.333	34.95	10.48	45.43	54.00	-8.57	AVG	V
2156.667	52.62	-1.13	51.49	74.00	-22.51	peak	H
2576.667	58.20	0.11	58.31	74.00	-15.69	peak	H
2576.667	47.51	0.11	47.62	54.00	-6.38	AVG	H
4825.000	43.65	6.12	49.77	74.00	-24.23	peak	H
7233.333	42.23	10.48	52.71	74.00	-21.29	peak	H
7233.333	32.19	10.48	42.67	54.00	-11.33	AVG	H

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11n HT 20 MHz mode / CH Mid **Test Date:** April 13, 2013

Temperature: 27°C

Tested by: Rex Huang

Humidity: 53 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2360.000	57.32	-0.63	56.69	74.00	-17.31	peak	V
2360.000	45.98	-0.63	45.35	54.00	-8.65	AVG	V
2530.000	57.07	-0.02	57.05	74.00	-16.95	peak	V
2530.000	46.43	-0.02	46.41	54.00	-7.59	AVG	V
2553.333	56.53	0.05	56.58	74.00	-17.42	peak	V
2553.333	46.15	0.05	46.20	54.00	-7.80	AVG	V
2520.000	56.95	-0.04	56.91	74.00	-17.09	peak	H
2520.000	46.26	-0.04	46.22	54.00	-7.78	AVG	H
2603.333	59.71	0.19	59.90	74.00	-14.10	peak	H
2603.333	47.73	0.19	47.92	54.00	-6.08	AVG	H
4866.667	46.78	6.22	53.00	74.00	-21.00	peak	H
4866.667	40.26	6.22	46.48	54.00	-7.52	AVG	H

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).



Operation Mode: TX / IEEE 802.11n HT 20 MHz mode / CH High **Test Date:** April 13, 2013

Temperature: 27°C

Tested by: Rex Huang

Humidity: 53 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2530.000	55.24	-0.02	55.22	74.00	-18.78	peak	V
2530.000	45.20	-0.02	45.18	54.00	-8.82	AVG	V
2546.667	54.86	0.03	54.89	74.00	-19.11	peak	V
2546.667	44.34	0.03	44.37	54.00	-9.63	AVG	V
2573.333	54.94	0.11	55.05	74.00	-18.95	peak	V
2573.333	45.70	0.11	45.81	54.00	-8.19	AVG	V
2540.000	55.74	0.01	55.75	74.00	-18.25	peak	H
2540.000	44.97	0.01	44.98	54.00	-9.02	AVG	H
2626.667	55.76	0.25	56.01	74.00	-17.99	peak	H
2626.667	44.96	0.25	45.21	54.00	-8.79	AVG	H
4925.000	46.72	6.37	53.09	74.00	-20.91	peak	H
4925.000	36.69	6.37	43.06	54.00	-10.94	AVG	H

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).