FCC 47 CFR PART 15 SUBPART E

Product Type	:	NovoConnect A Wireless Presentation & Conference System
Applicant	:	Delta Electronics Incorporated
Address	:	3 Tungyuan Road, Chungli Industrial Zone, Taoyuan County 32063 Taiwan
Trade Name	:	DELTA, VIVITEK
Model Number	:	B360
Test Specification	:	FCC 47 CFR PART 15 SUBPART E: Oct., 2012 Canada RSS-210 ISSUE 8: Dec., 2010 Canada RSS-Gen ISSUE 3: Dec., 2010 ANSI C63.4-2009
Application Purpose	:	Original
Receive Date	:	Sep. 14, 2013
Test Period	:	Sep. 23 ~ Oct. 03, 2013
Issue Date	:	Nov. 14, 2013

Issue by

A Test Lab Techno Corp.
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Taiwan Accreditation Foundation accreditation number: 1330

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Revision History

Rev.	Issue Date	Revisions	Revised By
00	Oct. 21, 2013	Initial Issue	
01	Nov. 14, 2013	Revised report information.	Joyce Liao

Verification of Compliance

Issued Date: 11/14/2013

Product Type	:	NovoConnect A Wireless Presentation & Conference System
Applicant	:	Delta Electronics Incorporated
Address	:	3 Tungyuan Road, Chungli Industrial Zone, Taoyuan County 32063 Taiwan
Trade Name	:	DELTA, VIVITEK
Model Number	:	B360
FCC ID	:	H79ESS1310
EUT Rated Voltage	:	DC 5V, 2A
Test Voltage	:	120 Vac / 60 Hz
Applicable Standard	:	FCC 47 CFR PART 15 SUBPART E: Oct., 2012 Canada RSS-210 ISSUE 8: Dec., 2010 Canada RSS-Gen ISSUE 3: Dec., 2010 ANSI C63.10-2009 ANSI C63.4-2009
Test Result	:	Complied
Application Purpose	:	Original
Performing Lab.	:	A Test Lab Techno Corp. No. 140-1, Changan Street, Bade City, Taoyuan County 334, Taiwan R.O.C. Tel：+86-3-2710188 / Fax：+86-3-2710190 Taiwan Accreditation Foundation accreditation number: 1330 http://www.atl-lab.com.tw/e-index.htm

A Test Lab Techno Corp. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by A Test Lab Techno Corp. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Approved By	:	Cran Yang	Reviewed By	:	Fly Lu
(Manager)		(Cran Yang)	(Testing Engineer)		(Fly Lu)

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1 General Information

1.1. Summary of Test Result

Standard		Item	Result	Remark
FCC	IC			
15.407(b)(6) 15.207	RSS-Gen 7.2.4	AC Power Conducted Emission	PASS	---
15.407(b) 15.205 / 15.209	RSS-210 A9.2	Radiated Emission	PASS	---
15.407(a)	RSS-210 A9.2	Maximum Conducted Output Power	PASS	---
15.407(a)	RSS-210 A9.2	26dB RF Bandwidth	Reference	---
15.407(a)(6)	RSS-210 A9.3	Peak Excursion Ratio	PASS	---
15.407(a)	RSS-210 A9.2	Peak Power Spectral Density	PASS	---
15.407(g)	RSS-210 A9.5	Frequency Stability	PASS	---
15.407(a) 15.203	RSS-210 A9.2	Antenna Requirement	PASS	---

The test results of this report relate only to the tested sample(s) identified in this report. Manufacturer or whom it may concern should recognize the pass or fail of the test result.

1.2. Measurement Uncertainty

Measurement Item	Frequency Range		Uncertainty (dB)
Conducted Emission	9kHz ~ 30MHz		± 2.020
Radiated Emission	30MHz ~ 1000MHz	Horizontal	± 3.960
		Vertical	± 3.570
	1000MHz ~ 18000MHz	Horizontal	± 3.072
		Vertical	± 3.028
	18000MHz ~ 40000MHz	Horizontal	± 3.622
		Vertical	± 3.506

2 EUT Description

Product Type	NovoConnect A Wireless Presentation & Conference System			
Trade Name	DELTA, VIVITEK (The two trade name differ from each other in selling region.)			
Model No.	B360			
Applicant	Delta Electronics Incorporated 3 Tungyuan Road, Chungli Industrial Zone, Taoyuan County 32063 Taiwan			
Manufacturer	AMPAK Technology NO.1 Jen Ai Road, Hsinchu Industrial Park, Hukou, HsinChu, Taiwan			
FCC ID	H79ESS1310			
Frequency Range	Band	Mode	Frequency Range (MHz)	Number of Channels
	U-NII Band I	IEEE 802.11a	5180 – 5240	4 Channels
		IEEE 802.11n 20 MHz	5180 – 5240	4 Channels
Modulation Type	OFDM			
EUT Type	Slave without radar detection			
Antenna Type	Chip Antenna			
Antenna Gain	2.32536 dBi			
Antenna Delivery	1*Tx + 1*Rx			
RF Output Power	IEEE 802.11a U-NII Band I : 0.022 W / 13.33 dBm IEEE 802.11n 20MHz U-NII Band I: 0.019 W / 12.87 dBm			
Emission Designator	IEEE 802.11a U-NII Band I : 17M2G1D IEEE 802.11n 20MHz U-NII Band I: 17M9G1D			

3 Test Methodology

3.1. Mode of Operation

Decision of Test ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: Normal Operation Mode
Mode 2: IEEE 802.11a Link Mode
Mode 3: IEEE 802.11n 20MHz Link Mode
Mode 4: Receiver Mode

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 802.11a mode / 5180 ~ 5240MHz:
Channel Low (5180MHz), Channel Mid (5220MHz) and Channel High (5240MHz) with 6Mbps data rate were chosen for full testing.

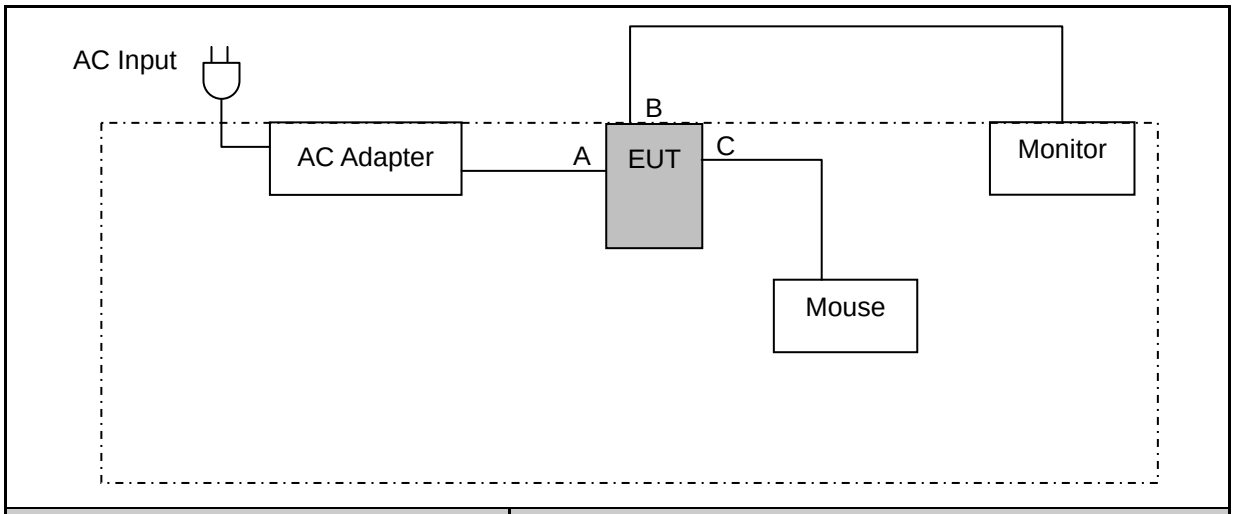
IEEE 802.11n 20 MHz Channel mode / 5180 ~ 5240MHz:
Channel Low (5180MHz), Channel Mid (5220MHz) and Channel High (5240MHz) with 6.5Mbps data rate were chosen for full testing.

3.2. EUT Exercise Software

The EUT is operated in the engineering mode to fix the TX frequency for the purposes of measurement.
According to its specifications, the EUT must comply with the requirements of Section 15.407 under the FCC Rules Part 15 Subpart E.

1.	Setup the EUT shown on 3.3.
2.	Turn on the power of all equipment.
3.	Turn on Wi-Fi function link to Notebook.
4.	EUT run test program.

3.3. Configuration of Test System Details



Signal Cable Type		Signal Cable Description
A	USB Cable	Shielded, 1.5 m with one core
B	USB Cable	Shielded, 1.8 m
C	HDMI Cable	Shielded, 0.5 m

3.4. Test Site Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	26
Humidity (%RH)	25-75	60
Barometric pressure (mbar)	860-1060	950

4 AC Power Conducted Emission Measurement

4.1. Limit

Frequency (MHz)	Quasi-peak	Average
0.15 - 0.5	66 to 56	56 to 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

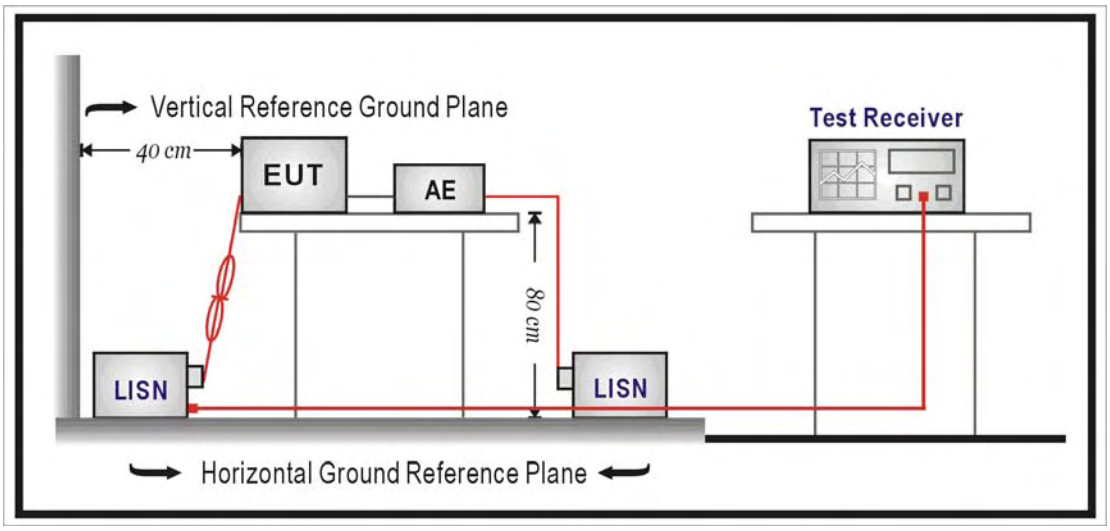
4.2. Test Instruments

Describe	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Test Receiver	R&S	ESCI	100367	06/06/2013	(1)
LISN	R&S	ENV216	101040	03/04/2013	(1)
LISN	R&S	ENV216	101041	03/04/2013	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

4.3. Test Setup



4.4. Test Procedure

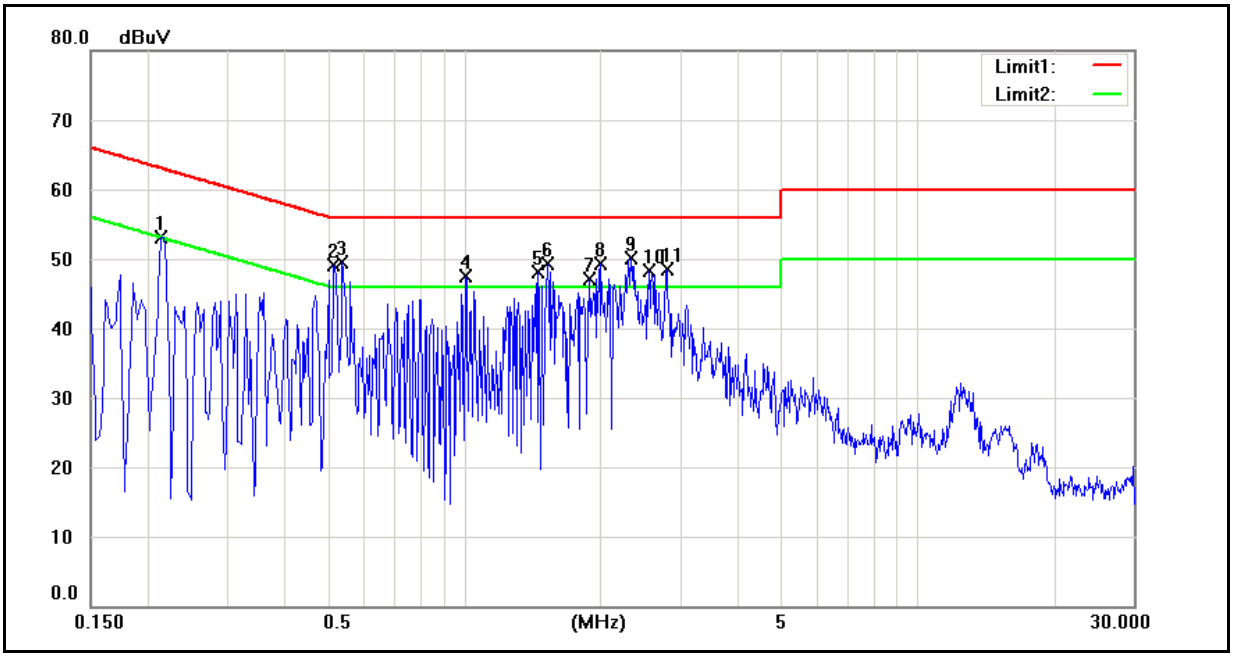
The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the back wall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and EMCO Model 3162/2 SH Line Impedance Stabilization Networks (LISN). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPR quasi-peak detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 150 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 4.1.

4.5. Test Result

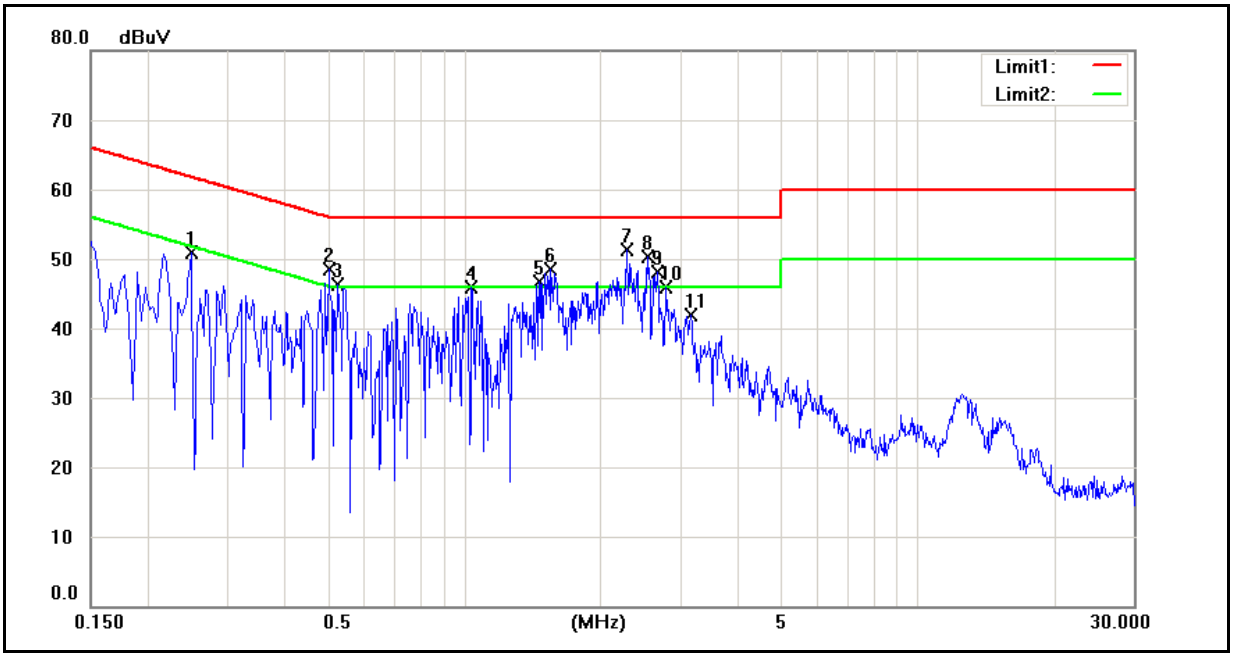
Standard:	FCC Part 15E	Line:	L1
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	B360	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Test Mode:	Mode 1	Date:	09/23/2013
		Test By:	Fly Lu
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.2140	37.76	20.96	9.62	47.38	30.58	63.05	53.05	-15.67	-22.47	Pass
2	0.5140	36.81	23.25	9.62	46.43	32.87	56.00	46.00	-9.57	-13.13	Pass
3	0.5380	36.84	22.55	9.62	46.46	32.17	56.00	46.00	-9.54	-13.83	Pass
4	1.0100	33.55	19.26	9.67	43.22	28.93	56.00	46.00	-12.78	-17.07	Pass
5	1.4620	33.93	23.04	9.68	43.61	32.72	56.00	46.00	-12.39	-13.28	Pass
6	1.5340	35.56	21.42	9.68	45.24	31.10	56.00	46.00	-10.76	-14.90	Pass
7	1.8940	31.79	20.81	9.70	41.49	30.51	56.00	46.00	-14.51	-15.49	Pass
8	2.0060	33.20	19.68	9.70	42.90	29.38	56.00	46.00	-13.10	-16.62	Pass
9	2.3380	35.17	22.44	9.71	44.88	32.15	56.00	46.00	-11.12	-13.85	Pass
10	2.5660	35.10	22.25	9.72	44.82	31.97	56.00	46.00	-11.18	-14.03	Pass
11	2.7980	29.86	15.76	9.73	39.59	25.49	56.00	46.00	-16.41	-20.51	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).
2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

Standard:	FCC Part 15E	Line:	N
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	B360	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Test Mode:	Mode 1	Date:	09/23/2013
		Test By:	Fly Lu
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.2500	21.84	5.24	9.63	31.47	14.87	61.76	51.76	-30.29	-36.89	Pass
2	0.5020	30.91	10.53	9.63	40.54	20.16	56.00	46.00	-15.46	-25.84	Pass
3	0.5260	30.56	11.00	9.63	40.19	20.63	56.00	46.00	-15.81	-25.37	Pass
4	1.0420	29.93	17.25	9.66	39.59	26.91	56.00	46.00	-16.41	-19.09	Pass
5	1.4700	34.07	18.59	9.67	43.74	28.26	56.00	46.00	-12.26	-17.74	Pass
6	1.5540	34.16	21.55	9.68	43.84	31.23	56.00	46.00	-12.16	-14.77	Pass
7	2.2900	33.08	15.69	9.71	42.79	25.40	56.00	46.00	-13.21	-20.60	Pass
8	2.5500	31.49	15.80	9.72	41.21	25.52	56.00	46.00	-14.79	-20.48	Pass
9	2.6660	31.72	18.40	9.72	41.44	28.12	56.00	46.00	-14.56	-17.88	Pass
10	2.7860	26.70	11.64	9.73	36.43	21.37	56.00	46.00	-19.57	-24.63	Pass
11	3.1580	25.78	11.43	9.73	35.51	21.16	56.00	46.00	-20.49	-24.84	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

5 Radiated Emission Measurement

5.1. Limit

Limits of Radiated Emission Measurement

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequency Range (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	10	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Note: 1. The lower limit shall apply at the transition frequencies.

2. Emission level (dBuV/m) = 20 log Emission level (uV/m).

3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

5.2. Test Instruments

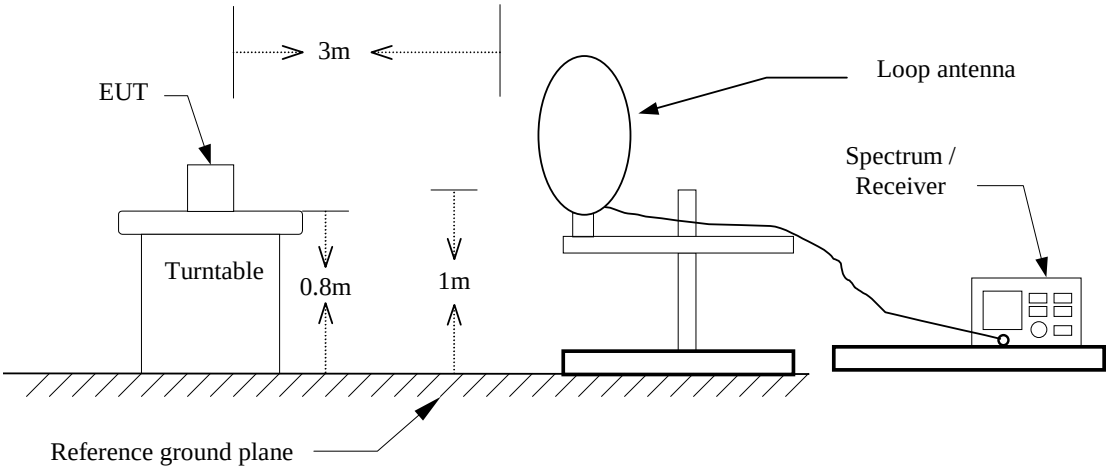
3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/21/2013	(1)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/21/2013	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/21/2013	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/21/2013	(1)
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	07/16/2013	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/10/2013	(1)
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	06/13/2013	(1)
Test Site	ATL	TE01	888001	08/27/2013	(1)

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

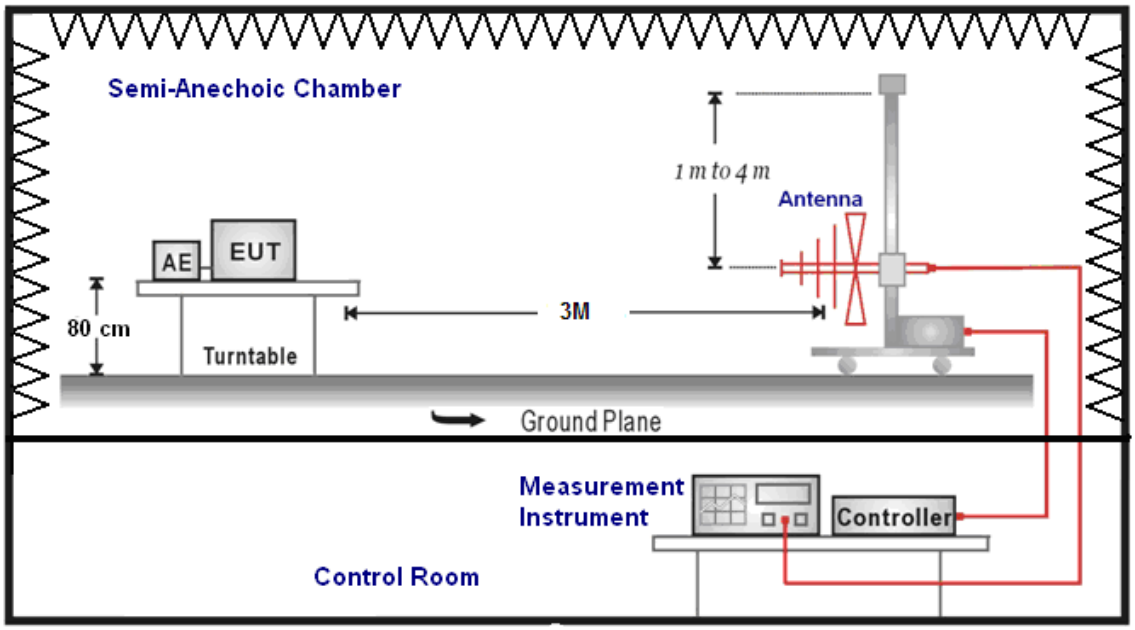
Note: N.C.R. = No Calibration Request.

5.3. Setup

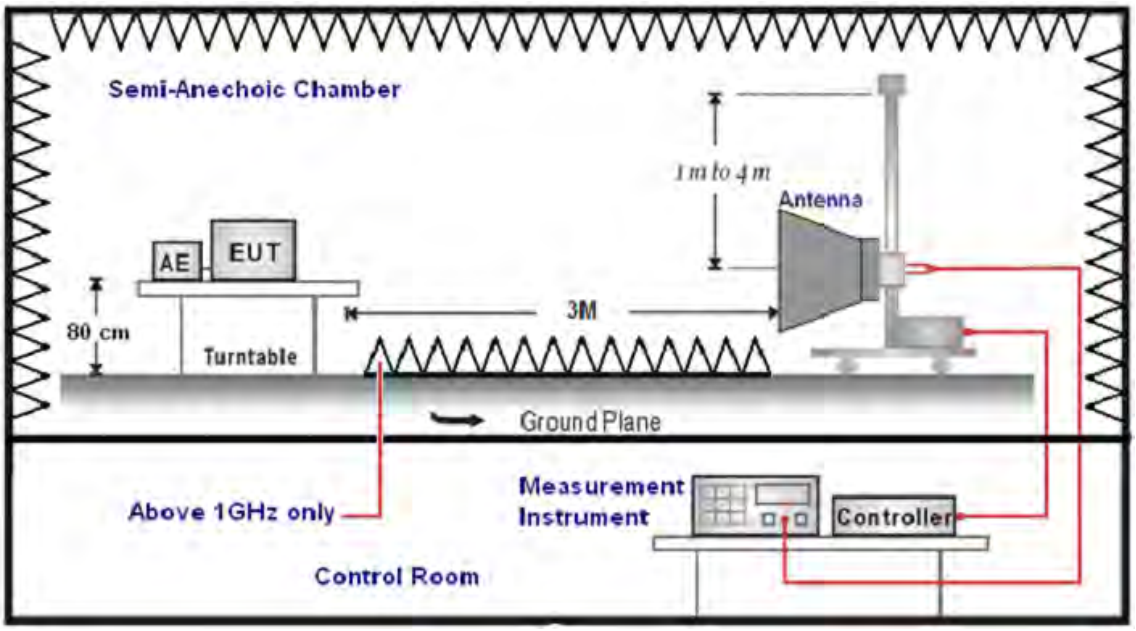
9kHz ~ 30MHz



30MHz ~ 1GHz



Above 1GHz


Semi-Anechoic Chamber
1 m to 4 m
Antenna
AE
EUT
80 cm
Turntable
3M
Ground Plane
Above 1GHz only
Measurement
Instrument
Controller
Control Room

5.4. Test Procedure

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 0.8 meters height, top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurements spectrum range from 9 kHz to 40 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 3 MHz for peak measurements and 3 MHz for average measurements.

A nonconductive material surrounded the EUT to supporting the EUT for standing on tree orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

SCHWARZBECK MESS-ELEKTRONIK Trilog-Broadband Antenna (mode SB AC VULB) at 3 Meter and the ETS-Lindgren Double-Ridged Waveguide Horn antnna (model 3117) Schwarzbeck Mess-Elektronik Broadband Horn Antenna (BBHA 9170) was used in frequencies 1 – 40 GHz at a distance of 1 meter. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20dB/decade).

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in micro volts pre meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro colts per meter (dBuV/m).

The actual field is intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

(1) Amplitude (dBuV/m) = FI (dBuV) +AF (dBuV) +CL (dBuV)-Gain (dB)
FI= Reading of the field intensity.
AF= Antenna factor.
CL= Cable loss.
P.S Amplitude is auto calculate in spectrum analyzer.

(2) Actual Amplitude (dBuV/m) = Amplitude (dBuV)-Dis(dB)
The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:
(a) For fundamental frequency : Transmitter Output < +30dBm
(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

5.5. Test Result

Below 1GHz

Standard:	FCC Part 15E	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	B360	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Test Mode:	Mode 1	Date:	09/24/2013
Ant.Polar.:	Horizontal	Test By:	Fly Lu

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
297.5000	45.40	-10.60	34.80	46.00	-11.20	QP	H
462.0000	43.17	-7.66	35.51	46.00	-10.49	QP	H
536.5000	45.14	-6.61	38.53	46.00	-7.47	QP	H
744.0000	38.97	-2.63	36.34	46.00	-9.66	QP	H
896.0000	38.07	0.28	38.35	46.00	-7.65	QP	H
961.5000	37.39	1.19	38.58	54.00	-15.42	QP	H
199.5000	43.59	-13.88	29.71	43.50	-13.79	QP	V
396.0000	43.84	-8.61	35.23	46.00	-10.77	QP	V
462.0000	45.76	-7.66	38.10	46.00	-7.90	QP	V
524.0000	45.84	-6.67	39.17	46.00	-6.83	QP	V
744.0000	35.17	-2.63	32.54	46.00	-13.46	QP	V
888.5000	37.94	0.06	38.00	46.00	-8.00	QP	V

Note: No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

Above 1GHz

Standard:	FCC Part 15E	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	B360	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Test Mode:	Mode 2	Date:	09/25/2013
Frequency:	5180MHz	Test By:	Fly Lu

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2785.000	33.99	5.36	39.35	74.00	-34.65	peak	H
4626.000	31.66	11.20	42.86	74.00	-31.14	peak	H
7594.000	28.89	20.85	49.74	74.00	-24.26	peak	H
2750.000	32.39	5.27	37.66	74.00	-36.34	peak	V
4598.000	30.30	11.14	41.44	74.00	-32.56	peak	V
7629.000	28.35	20.87	49.22	74.00	-24.78	peak	V

Standard:	FCC Part 15E	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	B360	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Test Mode:	Mode 2	Date:	09/25/2013
Frequency:	5220MHz	Test By:	Fly Lu

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2771.000	33.47	5.32	38.79	74.00	-35.21	peak	H
4591.000	32.25	11.11	43.36	74.00	-30.64	peak	H
7643.000	28.26	20.88	49.14	74.00	-24.86	peak	H
2743.000	34.80	5.25	40.05	74.00	-33.95	peak	V
4654.000	32.45	11.27	43.72	74.00	-30.28	peak	V
7629.000	29.42	20.87	50.29	74.00	-23.71	peak	V

Standard:	FCC Part 15E	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	B360	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Test Mode:	Mode 2	Date:	09/25/2013
Frequency:	5240MHz	Test By:	Fly Lu

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2799.000	33.01	5.40	38.41	74.00	-35.59	peak	H
4619.000	30.23	11.19	41.42	74.00	-32.58	peak	H
7650.000	28.33	20.89	49.22	74.00	-24.78	peak	H
2722.000	34.84	5.19	40.03	74.00	-33.97	peak	V
4598.000	32.41	11.14	43.55	74.00	-30.45	peak	V
7636.000	28.09	20.88	48.97	74.00	-25.03	peak	V

Standard:	FCC Part 15E	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	B360	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Test Mode:	Mode 3	Date:	09/25/2013
Frequency:	5180MHz	Test By:	Fly Lu

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2750.000	35.10	5.27	40.37	74.00	-33.63	peak	H
4598.000	31.23	11.14	42.37	74.00	-31.63	peak	H
7650.000	29.42	20.89	50.31	74.00	-23.69	peak	H
2785.000	33.51	5.36	38.87	74.00	-35.13	peak	V
4605.000	30.61	11.15	41.76	74.00	-32.24	peak	V
7678.000	29.97	20.90	50.87	74.00	-23.13	peak	V

Standard:	FCC Part 15E	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	B360	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Test Mode:	Mode 3	Date:	09/25/2013
Frequency:	5220MHz	Test By:	Fly Lu

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2764.000	35.22	5.31	40.53	74.00	-33.47	peak	H
4619.000	32.46	11.19	43.65	74.00	-30.35	peak	H
7629.000	29.06	20.87	49.93	74.00	-24.07	peak	H
2799.000	34.82	5.40	40.22	74.00	-33.78	peak	V
4619.000	30.72	11.19	41.91	74.00	-32.09	peak	V
7629.000	28.98	20.87	49.85	74.00	-24.15	peak	V

Standard:	FCC Part 15E	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	B360	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Test Mode:	Mode 3	Date:	09/25/2013
Frequency:	5240MHz	Test By:	Fly Lu

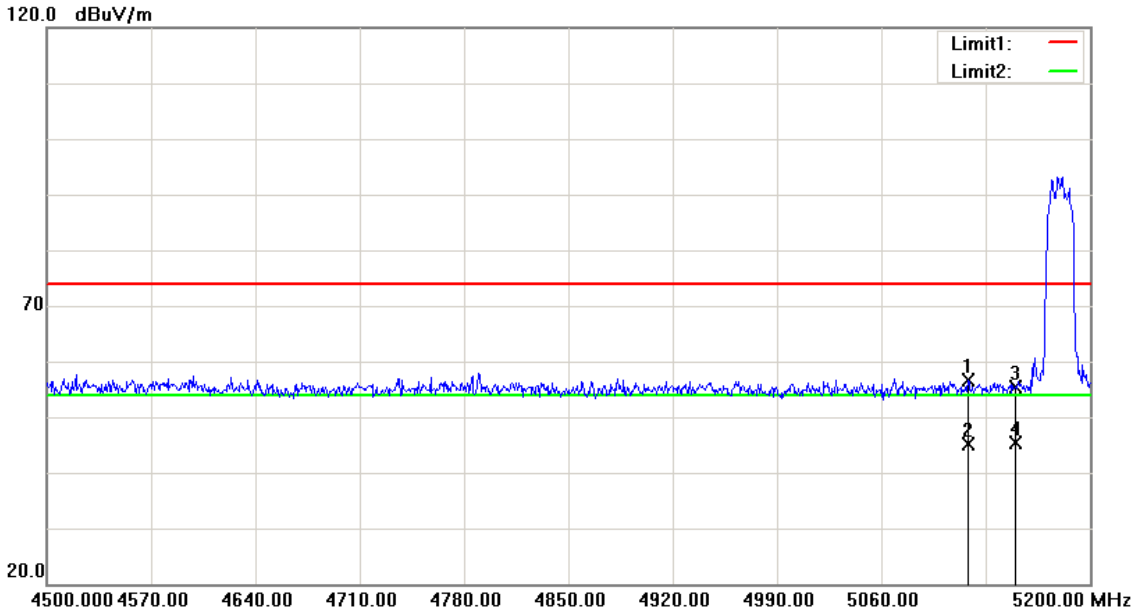
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2715.000	32.60	5.17	37.77	74.00	-36.23	peak	H
4619.000	31.32	11.19	42.51	74.00	-31.49	peak	H
7650.000	28.38	20.89	49.27	74.00	-24.73	peak	H
2771.000	33.58	5.32	38.90	74.00	-35.10	peak	V
4619.000	31.55	11.19	42.74	74.00	-31.26	peak	V
7650.000	28.19	20.89	49.08	74.00	-24.92	peak	V

Standard:	RSS-Gen	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	B360	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Test Mode:	Mode 4	Date:	09/25/2013
Modulation:	IEEE 802.11a	Test By:	Fly Lu
Frequency:	5180 MHz		

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Peak Limit (dBuV/m)	AVG. Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2778.000	33.92	5.34	39.26	74.00	54.00	-34.74	peak	H
4626.000	31.32	11.20	42.52	74.00	54.00	-31.48	peak	H
7622.000	29.75	20.86	50.61	74.00	54.00	-23.39	peak	H
2757.000	35.48	5.28	40.76	74.00	54.00	-33.24	peak	V
4626.000	32.50	11.20	43.70	74.00	54.00	-30.30	peak	V
7601.000	27.61	20.86	48.47	74.00	54.00	-25.53	peak	V

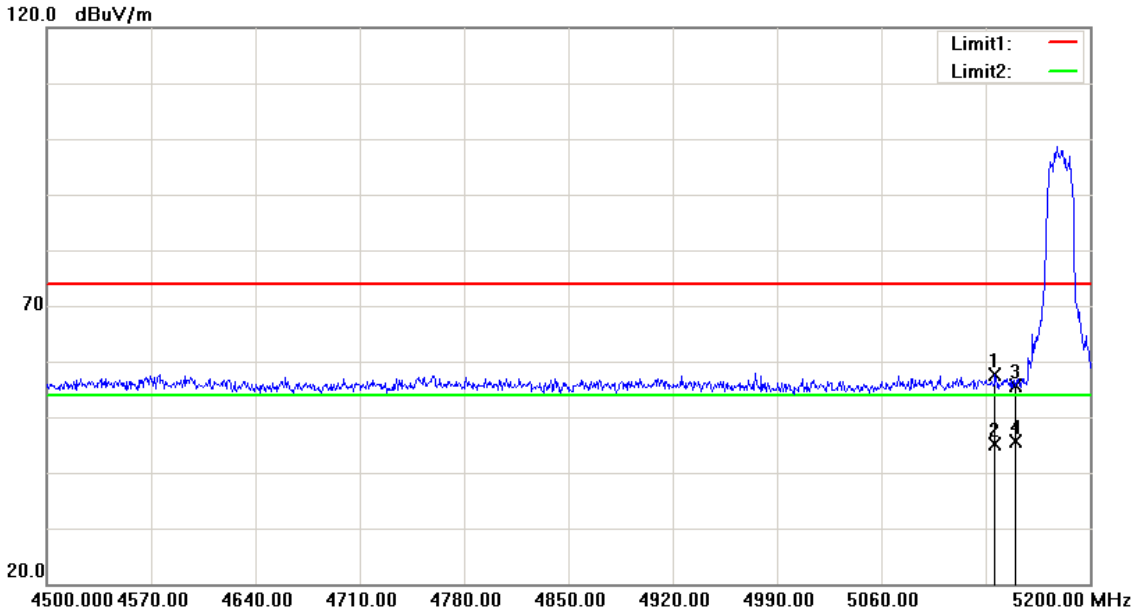
Band Edge

Standard:	FCC Part 15E	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	B360	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Test Mode:	Mode 2	Date:	09/24/2013
Frequency:	5180 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



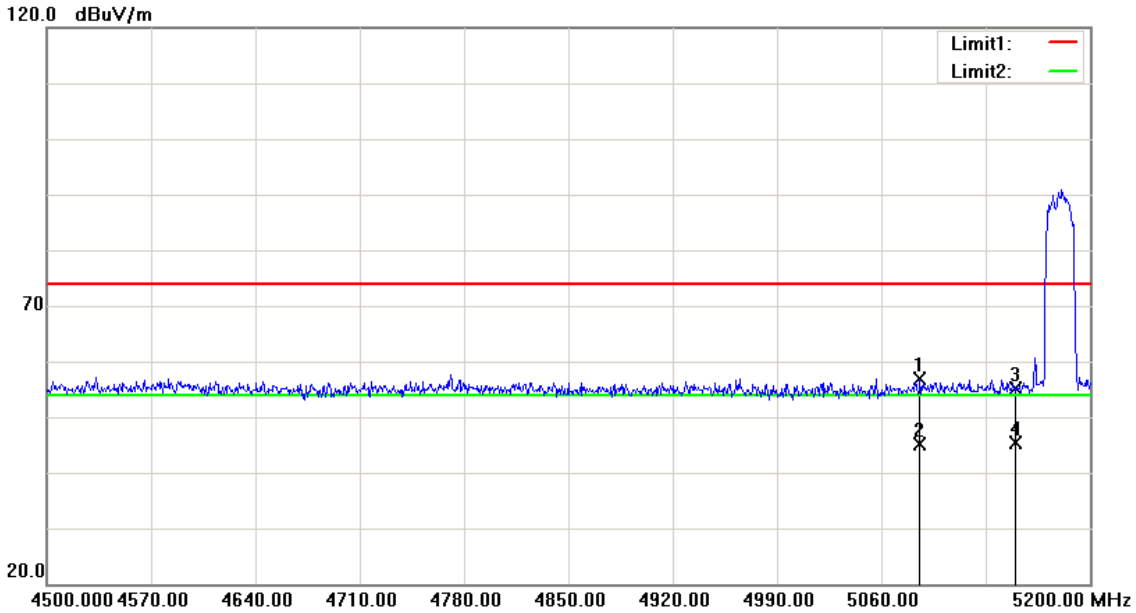
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5118.100	43.84	12.67	56.51	74.00	-17.49	peak
2	5118.100	32.54	12.67	45.21	54.00	-8.79	AVG
3	5150.000	42.59	12.81	55.40	74.00	-18.60	peak
4	5150.000	32.53	12.81	45.34	54.00	-8.66	AVG

Standard:	FCC Part 15E	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	B360	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Test Mode:	Mode 2	Date:	09/24/2013
Frequency:	5180 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



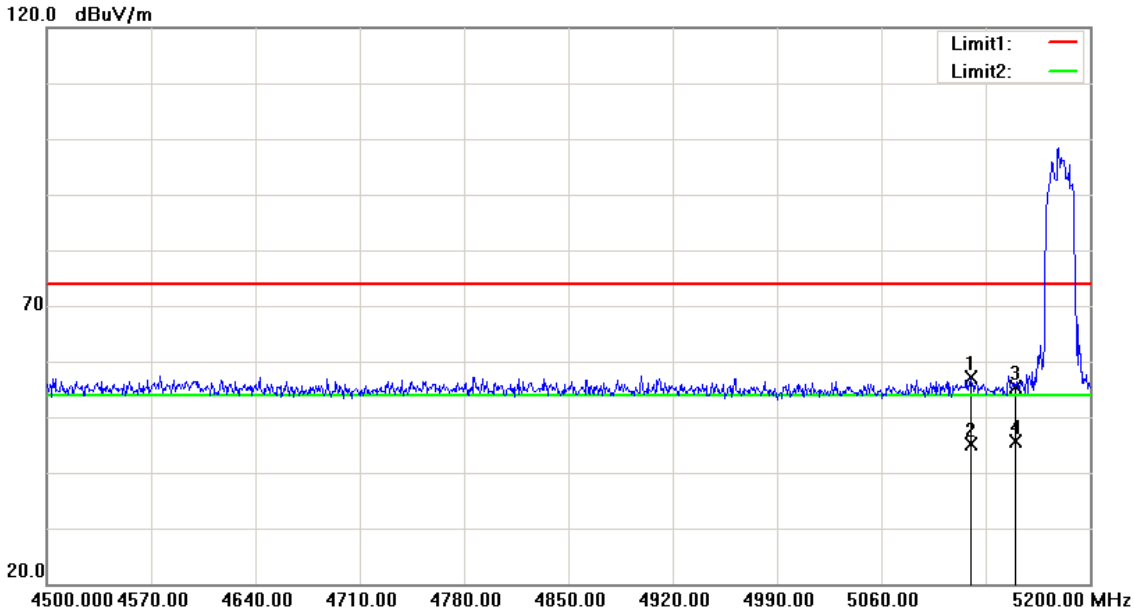
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5136.300	44.93	12.75	57.68	74.00	-16.32	peak
2	5136.300	32.42	12.75	45.17	54.00	-8.83	AVG
3	5150.000	42.83	12.81	55.64	74.00	-18.36	peak
4	5150.000	32.82	12.81	45.63	54.00	-8.37	AVG

Standard:	FCC Part 15E	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	B360	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Test Mode:	Mode 3	Date:	09/24/2013
Frequency:	5180 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5085.900	44.42	12.53	56.95	74.00	-17.05	peak
2	5085.900	32.56	12.53	45.09	54.00	-8.91	AVG
3	5150.000	42.32	12.81	55.13	74.00	-18.87	peak
4	5150.000	32.51	12.81	45.32	54.00	-8.68	AVG

Standard:	FCC Part 15E	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	B360	Temp.(℃)/Hum.(%RH):	26(℃)/60%RH
Test Mode:	Mode 3	Date:	09/24/2013
Frequency:	5180 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5120.200	44.37	12.69	57.06	74.00	-16.94	peak
2	5120.200	32.50	12.69	45.19	54.00	-8.81	AVG
3	5150.000	42.62	12.81	55.43	74.00	-18.57	peak
4	5150.000	32.73	12.81	45.54	54.00	-8.46	AVG

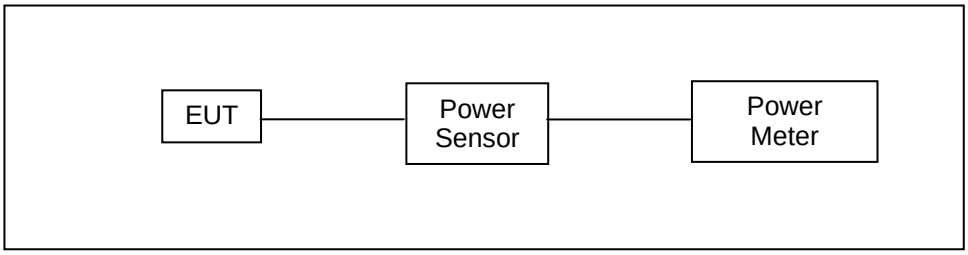
6 Maximum Conducted Output Power Measurement

6.1. Limit

Frequency Range (MHz)	Limit
5.150 ~ 5.250 GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB

Note: Where B is the 26dB emission bandwidth in MHz.

6.2. Test Setup



6.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Power Sensor	Anritsu	MA2411B	1126022	08/14/2012	(1)
Power Meter	Anritsu	ML2495A	1135009	08/14/2012	(1)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

6.4. Test Procedure

The test is performed in accordance with KDB789033: D01 General UNII Test Procedures v01r01, Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E.

6.5. Test Result

Model Number	B360		
Test Item	Maximum Conducted Output Power		
Test Mode	Mode 2: IEEE 802.11a Link Mode		
Date of Test	09/23/2013	Test Site	TE02

Frequency (MHz)	Data Rate	Average Power		Limit (dBm)
		(dBm)	(W)	
5180.0	6M	12.78	0.019	< 17
5200.0		13.07	0.020	
5220.0		13.23	0.021	
5240.0		13.33	0.022	
5180.0	54M	12.52	0.018	< 17
5200.0		12.76	0.019	
5220.0		13.00	0.020	
5240.0		13.11	0.020	

Model Number	B360		
Test Item	Maximum Conducted Output Power		
Test Mode	Mode 3: IEEE 802.11n 20MHz Link Mode		
Date of Test	09/23/2013	Test Site	TE02

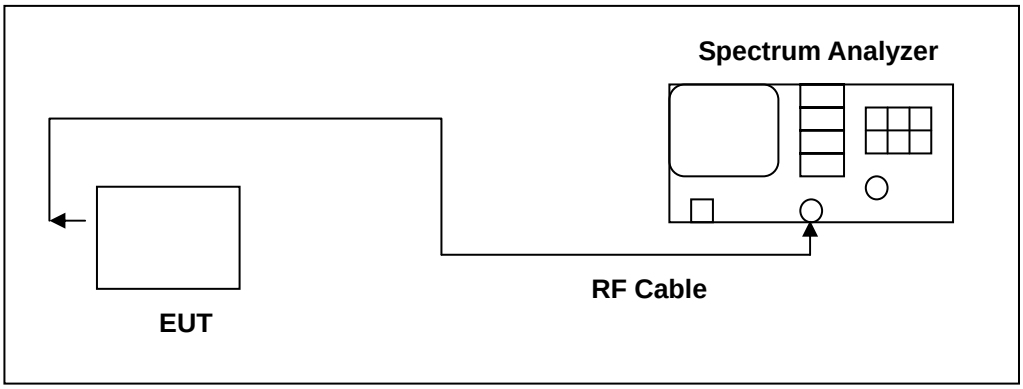
Frequency (MHz)	Data Rate	Average Power		Limit (dBm)
		(dBm)	(W)	
5180.0	6.5M	12.55	0.018	< 17
5200.0		12.57	0.018	
5220.0		12.78	0.019	
5240.0		12.87	0.019	
5180.0	65M	12.51	0.018	< 17
5200.0		12.52	0.018	
5220.0		12.72	0.019	
5240.0		12.82	0.019	

7 RF Bandwidth Measurement

7.1. Limit

N/A

7.2. Test Setup



7.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/19/2012	(1)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

7.4. Test Procedure

The test is performed in accordance with KDB789033: D01 General UNII Test Procedures v01r01, Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E.

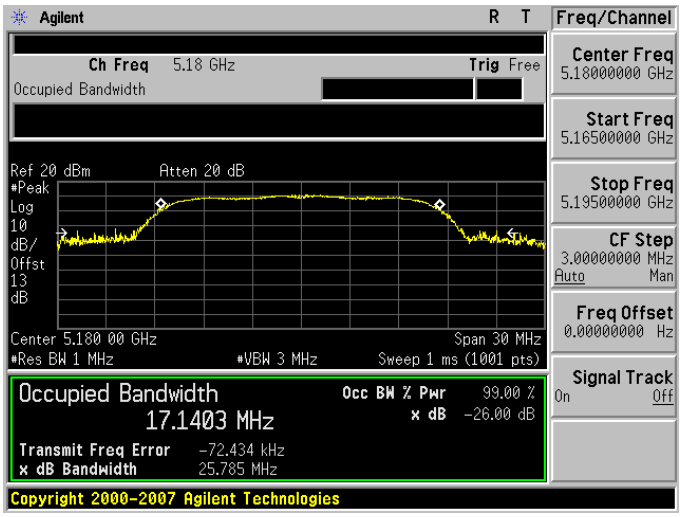
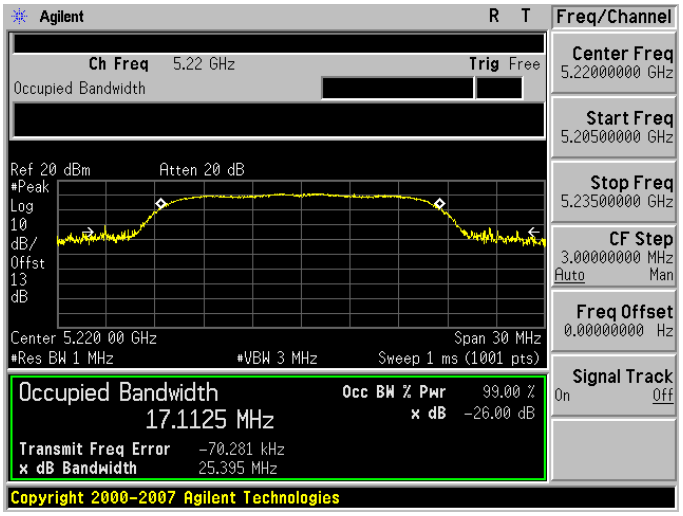
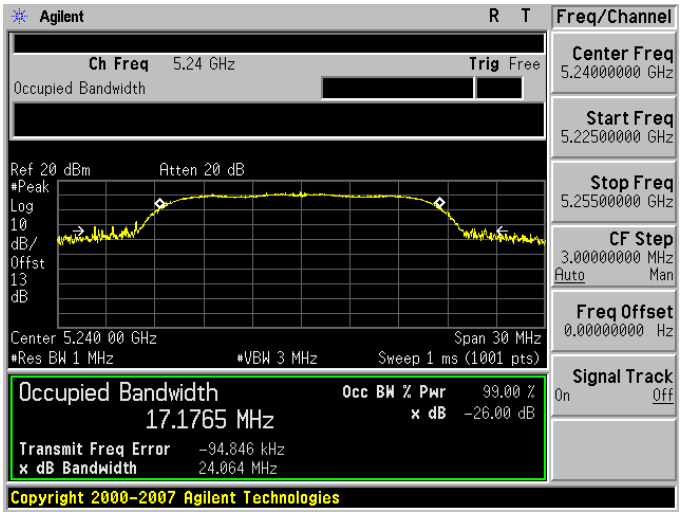
7.5. Test Result

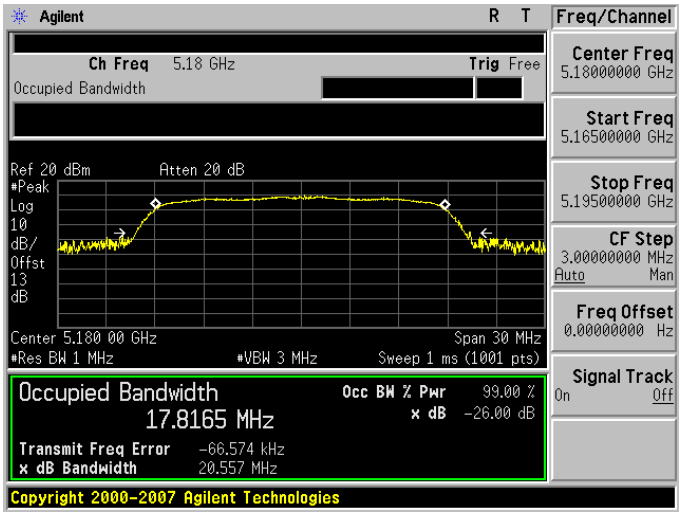
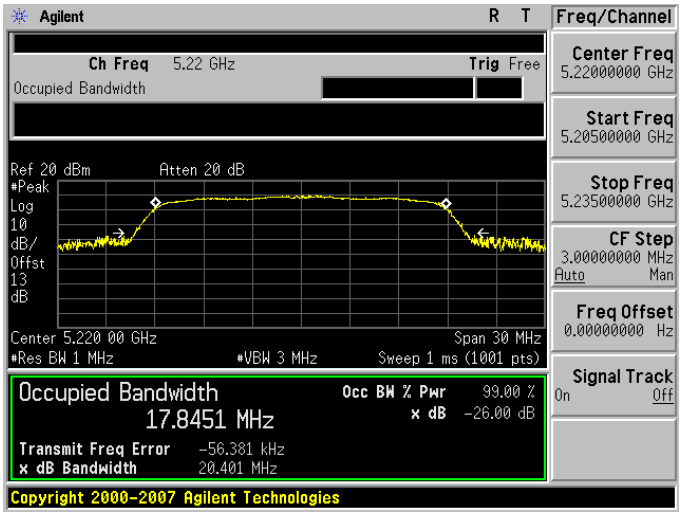
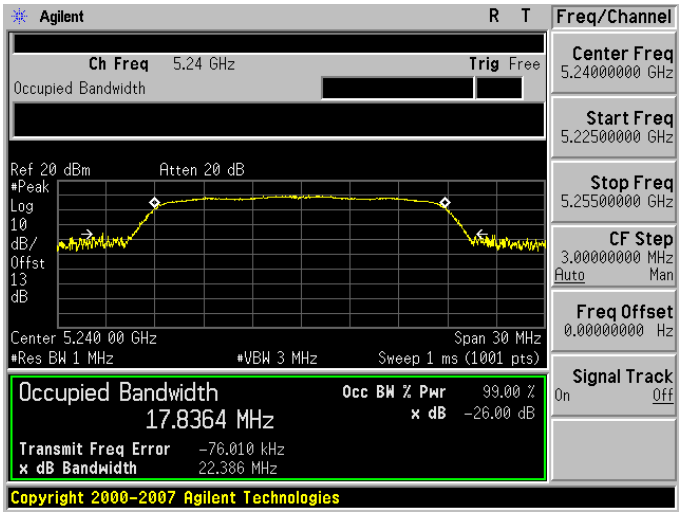
Model Number	B360			
Test Item	26dB RF Bandwidth / Occupied Bandwidth / -20dB RF Bandwidth			
Test Mode	Mode 2: IEEE 802.11a Link Mode			
Date of Test	10/03/2013		Test Site	TE02
Frequency (MHz)	26dB RF Bandwidth (MHz)	Occupied Bandwidth (MHz)	-20dB RF Bandwidth (MHz)	
5180	25.785	17.1403	---	
5220	25.395	17.1125	---	
5240	24.064	17.1765	19.075	

Model Number	B360			
Test Item	26dB RF Bandwidth			
Test Mode	Mode 3: IEEE 802.11n 20MHz Link Mode			
Date of Test	10/03/2013		Test Site	TE02
Frequency (MHz)	26dB RF Bandwidth (MHz)	Occupied Bandwidth (MHz)	-20dB RF Bandwidth (MHz)	
5180	20.557	17.8165	---	
5220	20.401	17.8451	---	
5240	22.386	17.8364	19.725	

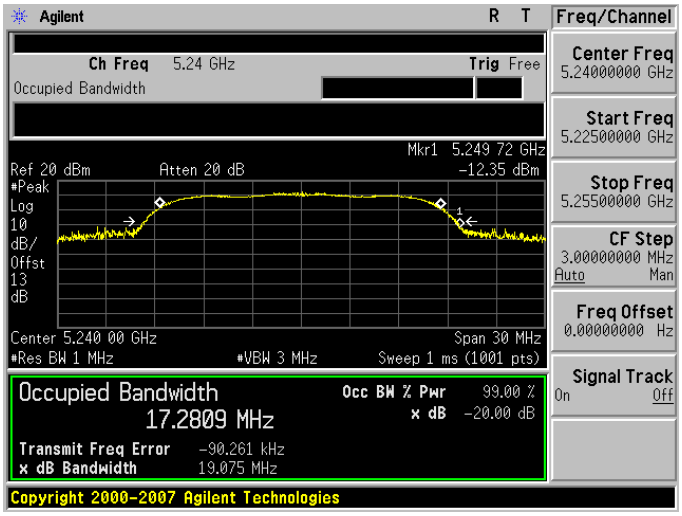
7.6. Test Graphs

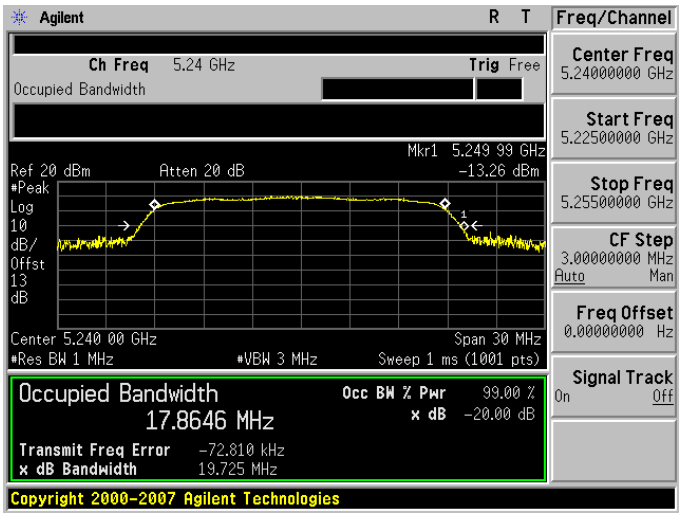
26dB RF Bandwidth and Occupied Bandwidth

Mode 2: IEEE 802.11a Link Mode	
5180	
5220	
5240	

Mode 3: IEEE 802.11n 20MHz Link Mode	
5180	
5220	
5240	

-20 dB RF Bandwidth

Mode 2: IEEE 802.11a Link Mode	
5240	

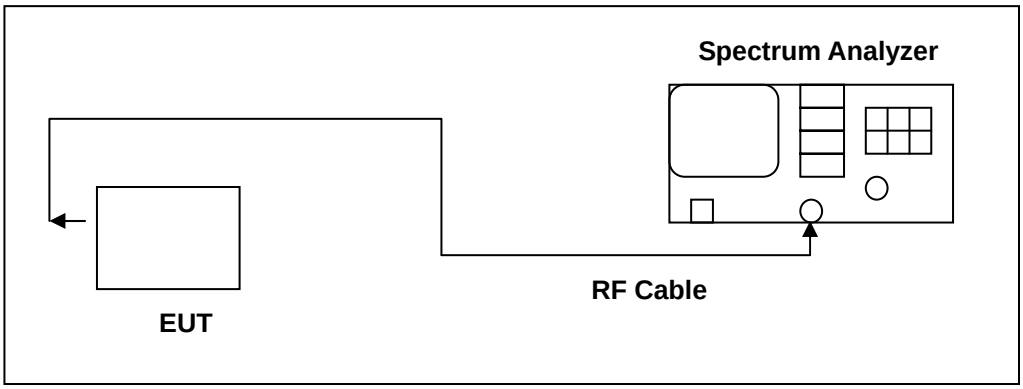
Mode 3: IEEE 802.11n 20MHz Link Mode	
5240	

8 Peak Excursion Ratio Measurement

8.1. Limit

Frequency Range (MHz)	Limit
5.150 ~ 5.250 GHz	13 dB

8.2. Test Setup



8.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/19/2012	(1)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

8.4. Test Procedure

The test is performed in accordance with KDB789033: D01 General UNII Test Procedures v01r01, Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E.

8.5. Test Result

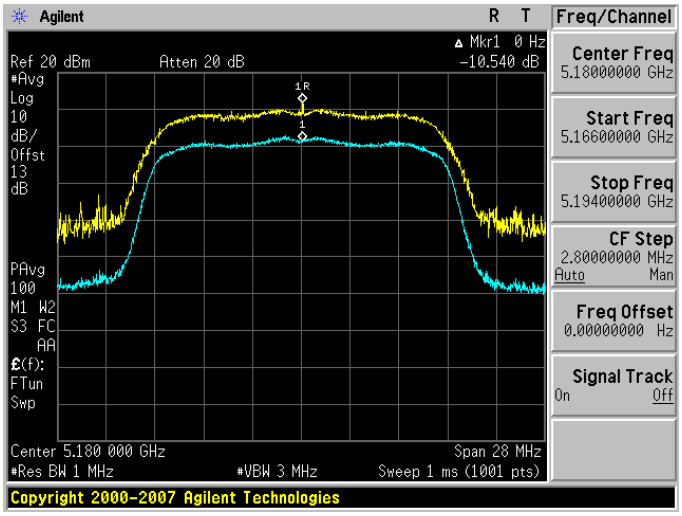
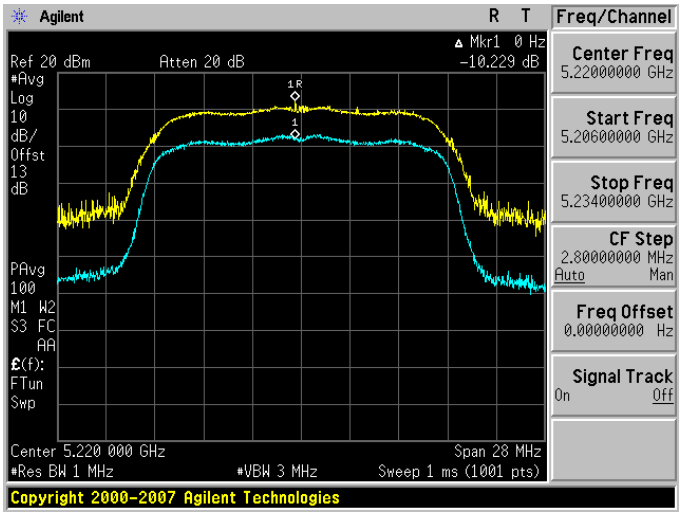
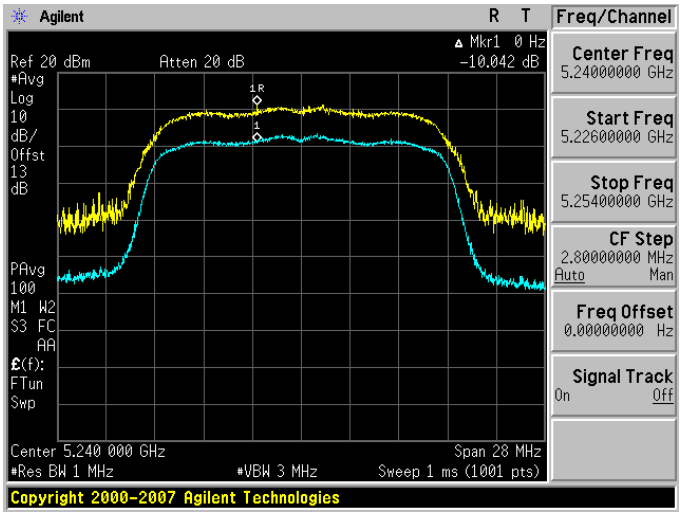
Model Number	B360		
Test Item	Peak Excursion Ratio		
Test Mode	Mode 2: IEEE 802.11a Link Mode		
Date of Test	10/03/2013	Test Site	TE02

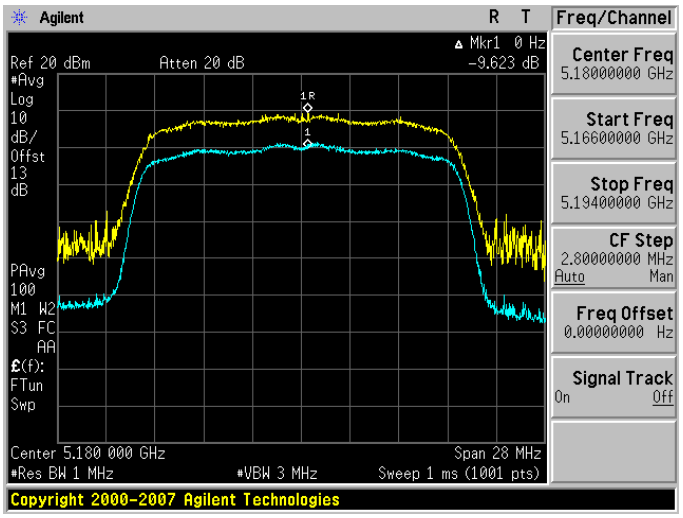
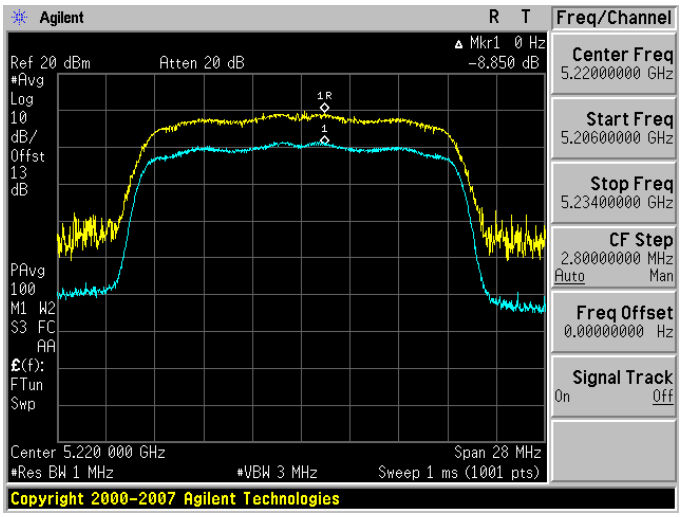
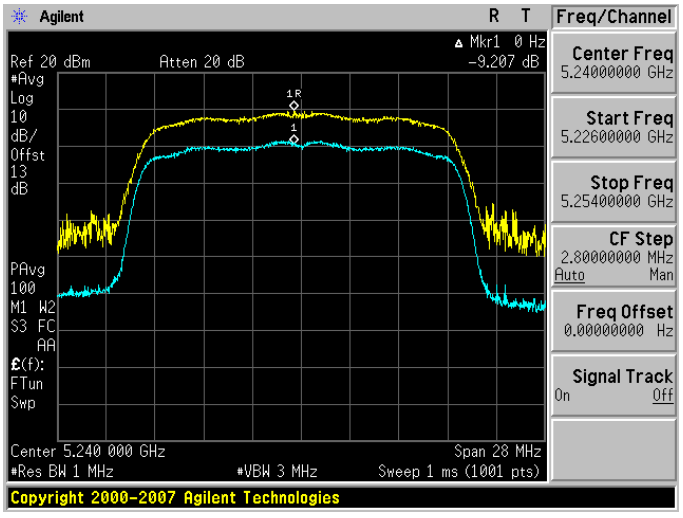
Frequency (MHz)	Measurement (dB)	Limit (dB)
5180	-10.540	< 13
5220	-10.229	
5240	-10.042	

Model Number	B360		
Test Item	Peak Excursion Ratio		
Test Mode	Mode 3: IEEE 802.11n 20MHz Link Mode		
Date of Test	10/03/2013	Test Site	TE02

Frequency (MHz)	Measurement (dB)	Limit (dB)
5180	-9.623	< 13
5220	-8.850	
5240	-9.207	

8.6. Test Graphs

Mode 2: IEEE 802.11a Link Mode	
5180	
5220	
5240	

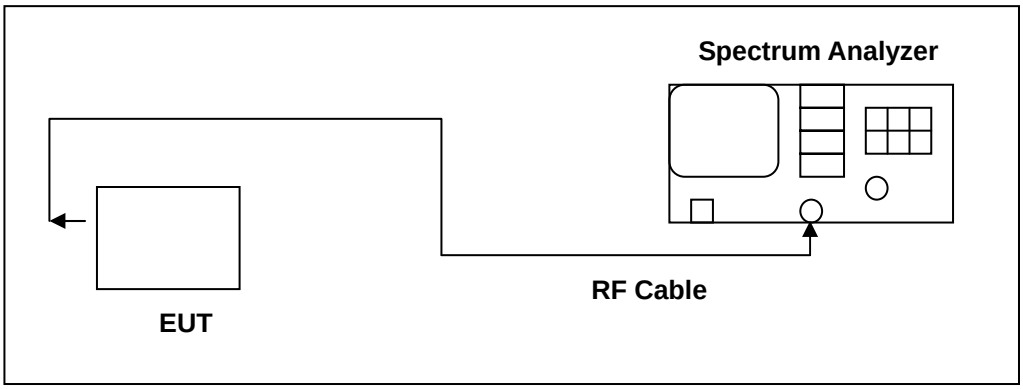
Mode 3: IEEE 802.11n 20MHz Link Mode	
5180	
5220	
5240	

9 Peak Power Spectral Density Measurement

9.1. Limit

Frequency Range (MHz)	Limit
5.150 ~ 5.250 GHz	4 dB

9.2. Test Setup



9.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/19/2012	(1)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

9.4. Test Procedure

The test is performed in accordance with KDB789033: D01 General UNII Test Procedures v01r01, Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E.

9.5. Test Result

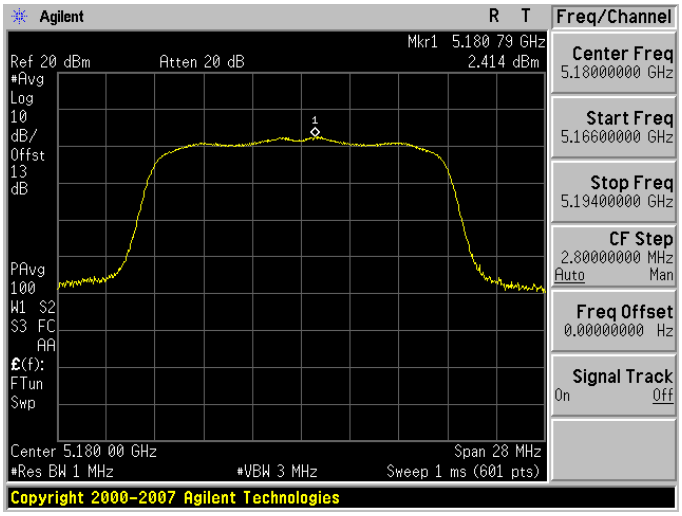
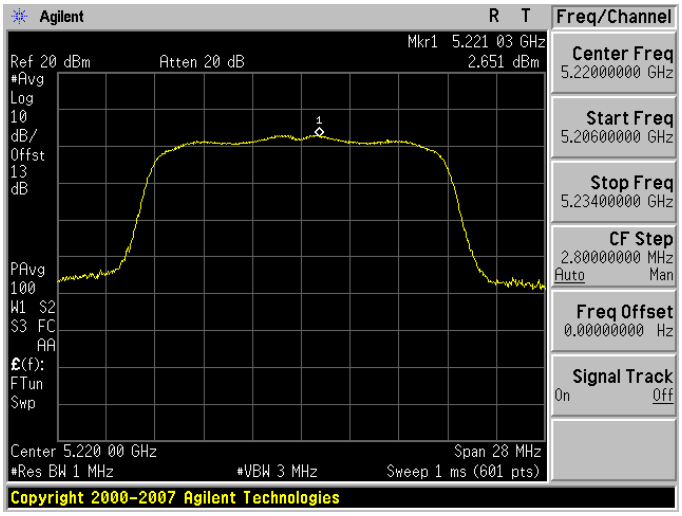
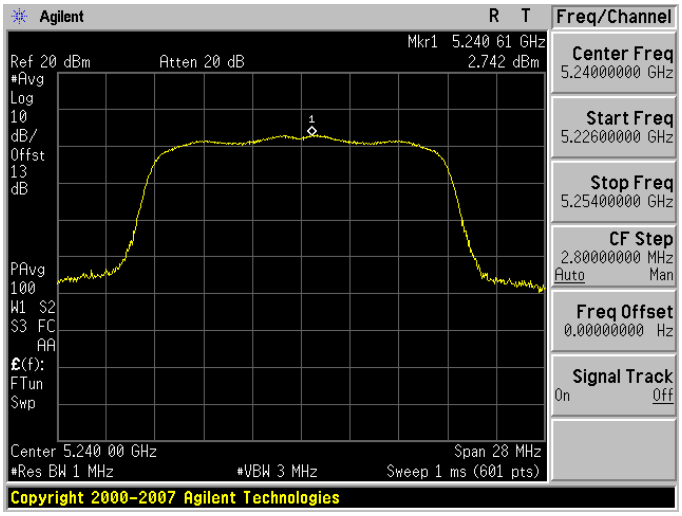
Model Number	B360		
Test Item	Peak Power Spectral Density		
Test Mode	Mode 2: IEEE 802.11a Link Mode		
Date of Test	10/03/2013	Test Site	TE02

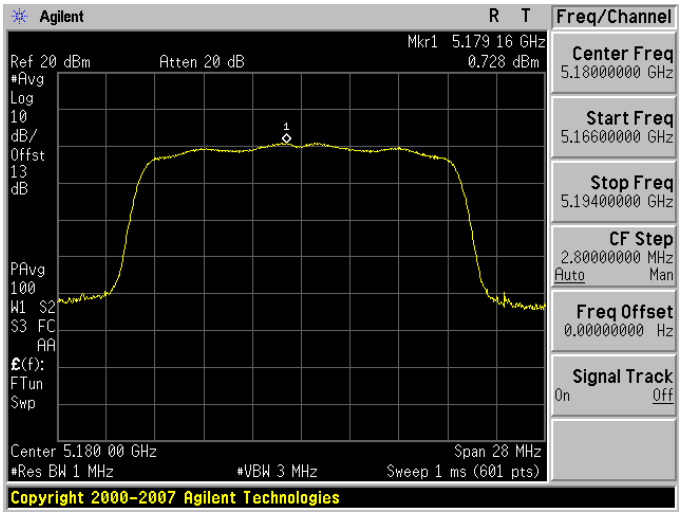
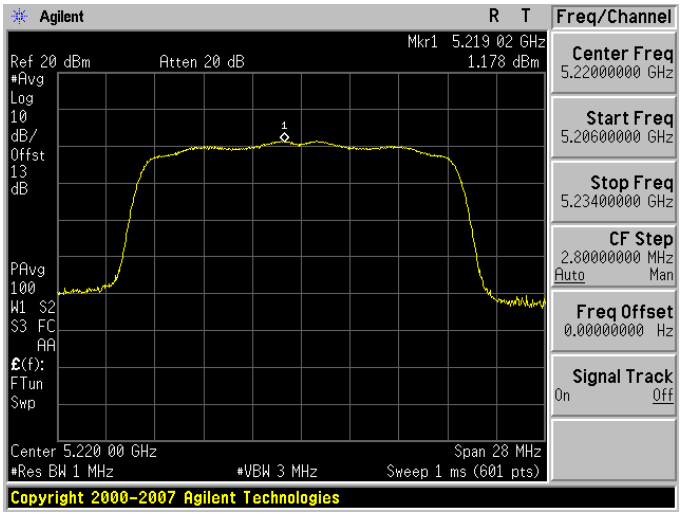
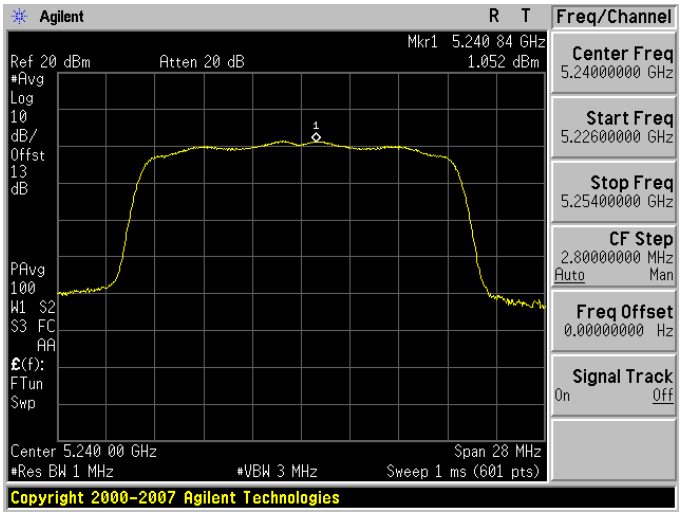
Frequency (MHz)	Measurement (dBm)	Limit (dBm)
5180	2.414	< 4
5220	2.651	
5240	2.742	

Model Number	B360		
Test Item	Peak Power Spectral Density		
Test Mode	Mode 3: IEEE 802.11n 20MHz Link Mode		
Date of Test	10/03/2013	Test Site	TE02

Frequency (MHz)	Measurement (dBm)	Limit (dBm)
5180	0.728	< 4
5220	1.178	
5240	1.052	

9.6. Test Graphs

Mode 2: IEEE 802.11a Link Mode	
5180	
5220	
5240	

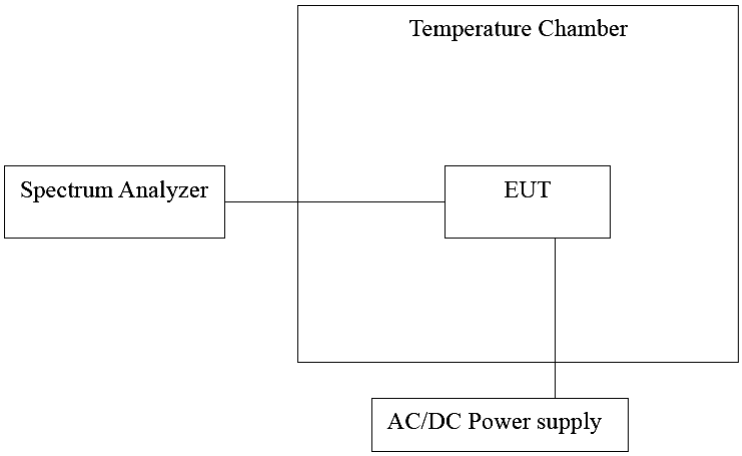
Mode 3: IEEE 802.11n 20MHz Link Mode	
5180	
5220	
5240	

10 Frequency Stability Measurement

10.1. Limit

The frequency tolerance of the carrier signal shall be maintained within the band of operation frequency over a temperature variation of –30 degrees to 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

10.2. Test Setup



10.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4408B	MY45107753	07/11/2013	(1)
Temperature & Humidity Chamber	TAICHY	MHU-225LA	980729	08/07/2013	(1)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

10.4. Test Procedure

1. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

10.5. Test Result

Temperature Variations (The manufacturer's frequency stability specification is better than 20ppm.)

Model Number	B360				
Test Mode	Mode 2				
Frequency	5220 MHz				
Date of Test	10/03/2013			Test Site	TE02
Temp. (°C)	Voltage (VAC)	Measured Frequency (MHz)	Delta Frequency (Hz)	Tolerance (ppm)	Result (Pass/Fail)
0	120	5219.9658	-34200	6.552	Pass
10		5219.9336	-66400	12.720	Pass
20		5219.9255	-74500	14.272	Pass
30		5219.9345	-65500	12.548	Pass
40		5219.9627	-37300	7.146	Pass

Model Number	B360				
Test Mode	Mode 3				
Frequency	5220 MHz				
Date of Test	10/03/2013			Test Site	TE02
Temp. (°C)	Voltage (VAC)	Measured Frequency (MHz)	Delta Frequency (Hz)	Tolerance (ppm)	Result (Pass/Fail)
0	120	5219.9369	-63100	12.088	Pass
10		5219.9652	-34800	6.667	Pass
20		5219.9255	-74500	14.272	Pass
30		5219.9198	-80200	15.364	Pass
40		5219.9367	-63300	12.126	Pass

Note: The EUT operating temperature is 0°C~40°C

Voltage Variations (The manufacturer's frequency stability specification is better than 20ppm.)

Model Number	B360				
Test Mode	Mode 2				
Frequency	5220 MHz				
Date of Test	10/03/2013			Test Site	TE02
Temp. (°(°C))	Voltage (VAC)	Measured Frequency (MHz)	Delta Frequency (Hz)	Tolerance (ppm)	Result (Pass/Fail)
20	138	5219.9352	-64800	12.414	Pass
	120	5219.9246	-75400	14.444	Pass
	102	5219.9187	-81300	15.575	Pass

Model Number	B360				
Test Mode	Mode 3				
Frequency	5220 MHz				
Date of Test	10/03/2013			Test Site	TE02
Temp. (°(°C))	Voltage (VAC)	Measured Frequency (MHz)	Delta Frequency (Hz)	Tolerance (ppm)	Result (Pass/Fail)
20	138	5219.9361	-63900	12.241	Pass
	120	5219.9255	-74500	14.272	Pass
	102	5219.9236	-76400	14.636	Pass

11 Antenna Requirement

11.1. Limit

For intentional device, according to 15.203, 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.
And According to 15.407 (a), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

11.2. Antenna Connector Construction

The antenna used in this product is Chip antenna. And the maximum gain of the antenna is 2.32536 dBi.