FCC 47 CFR PART 15 SUBPART E

for

MONSTER Tower

Model: BTW218

Brand: MONSTER

Test Report Number:
C140821Z04-RP1-2
Issued Date: October 11, 2014

Issued for

ACOUSTMAX INTERNATIONAL CO., LTD
Unit D16/F Cheuk Nang Plaza 250 Hennessy Road Wanchai Hong Kong China

Issued by:

Compliance Certification Services (Shenzhen) Inc.
No.10-1 Mingkeda Logistics park, No.18, Huanguan South Rd.,
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A2LA ACCREDITED TESTING CERT #2861.01

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	October 11, 2014	Initial Issue	ALL	Sabrina Wang

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1. TEST CERTIFICATION

Product	MONSTER Tower
Model	BTW218
Brand	MONSTER
Tested	August 21~October 11, 2014
Applicant	**ACOUSTMAX INTERNATIONAL CO., LTD** Unit D16/F Cheuk Nang Plaza 250 Hennessy Road Wanchai Hong Kong China
Manufacturer	**Musilab Electronic (DongGuan) Co., Ltd** A2, LinDong 3 Road, LinCun, TangXia Town, DongGuan City, Guangdong Province, China

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

We hereby certify that:

Compliance Certification Services Inc. tested the above equipment. 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 conducted and radiated emission limits of FCC Rules Part 15.407、FCC 14-30.

The TEST RESULTS of this report relate only to the tested sample identified in this report.

Approved by:

Sunday Hu
Supervisor of EMC Dept.
Compliance Certification Service Inc.

Reviewed by:

Ruby Zhang
Supervisor of Report Dept.
Compliance Certification Service Inc.

2. EUT DESCRIPTION

Product	MONSTER Tower
Model Number	BTW218
Brand	MONSTER
Model Discrepancy	N/A
Serial Number	C140821Z04-RP1-2
Received Date	August 21, 2014
Power Supply	DC5V supplied by PC or DC11.1V supplied by the battery or AC100~240V~, 50/60Hz supplied by the AC power
Frequency Range	UNII Band IV 5736MHz ~ 5814MHz
Transmit Power	UNII Band IV Antenna 1 : 11.97 dBm Antenna 2 : 8.36 dBm
Modulation Technique	OFDM (QPSK, BPSK, 16-QAM, 64-QAM)
Number of Channels	UNII Band IV 3Channels
Antenna Specification	Antenna 1: PCB Type Antenna with 3.2dBi gain (Max) Antenna 2: PCB Type Antenna with 3.2dBi gain (Max)
Channels Spacing	26MHz
Temperature Range	0°C ~ 45°C
Hardware Version	SPKV002
Software Version	SPKV002

Note: *1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.*

Operation Frequency:

UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE (U-NII)	
CHANNEL	**MHz**
Low	5736
Mid	5762
High	5814

Remark:

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: **2AAIN-BTW218** filing to comply with Section 15.407 of the FCC Part 15, Subpart E Rules and FCC 14-30.

3. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4 Radiated testing was performed at an antenna to EUT distance 3 meters. The tests documented in this report were performed in accordance with ANSI C63.4: 2009 and FCC CFR 47 Part 15.207, 15.209 ,15.407 and FCC 14-30,.
Radio testing was performed according to KDB DA 02-2138、KDB 789033 D02、KDB 905462 D06；

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed for RF field strength measurement to meet the Commissions requirement, and is operated in a manner intended to generate the maximum emission in a continuous normal application.

3.2 EUT EXERCISE

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.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is positioned at 0.8 m above the ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4, the conducted emission from the EUT is measured in the frequency range between 0.15 MHz and 30MHz, using the CISPR Quasi-Peak detector mode.

Radiated Emissions

The EUT is placed on the turntable, which is 0.8 m above the ground plane. The turntable is then rotated for 360 degrees to determine the proper orientation for the maximum emission level. The EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission level. And, each emission is to be maximized by changing the horizontal and vertical polarization of the receiving antenna. 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 is a 2x2 configuration spatial MIMO (2TX & 2RX) without beam forming function.

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, which worst case was in normal link mode only.

UNII Band IV:

5736 ~ 5814MHz:
Channel Low (5736MHz), Channel Mid (5762MHz) and Channel High (5814MHz) were chosen for full testing.

4. SETUP OF EQUIPMENT UNDER TEST

4.1 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Equipment	Model No.	Serial No.	FCC ID	Brand	Data Cable	Power Cord
1	PC	Dcsmif	805CV2X	N/A	DELL	N/A	Unshielded 1.50m
2	Keyboard	SK-8115	CN-0DJ313-71616-82P-0YTB	N/A	DELL	Shielded 1.50m	N/A
3	Monitor	E17OSC	CN-DOV539-64180-DAP-3E1S	N/A	DELL	Shielded 1.80m	Unshielded 2.00m
4	Printer	D1668	CB767-0008	N/A	HP	Shielded 1.40m	Unshielded 1.50m
5	Modem	DU-562M	DU562MSG B1	N/A	ACEEX	Unshielded 1.40m	N/A
6	Mouse	KB212-B	CN09RRC447511680996	N/A	DELL	Shielded 1.45m	N/A
7	IPOD	A1285	YM91546Y3QY	N/A	APPLE	Unshielded 1.20m	N/A
8	Notebook	B475	WB04861612	N/A	Lenovo	Unshielded 1.80m	Unshielded 1.80m

Note:

Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.2 CONFIGURATION OF SYSTEM UNDER TEST

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

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at
No.10-1 Mingkeda Logistics park, No.18, Huanguan South Rd., Guan Lan Town, Baoan District, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 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 ACCREDITATIONS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

USA	**A2LA**
China	**CNAS**

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

USA	**FCC**
Japan	**VCCI(C-3478, R-3135, T-652, G-624)**
Canada	**INDUSTRY CANADA**
Taiwan	**BSMI**

Copies of granted accreditation certificates are available for downloading from our web site, http://www.ccsrf.com

5.4 MEASUREMENT UNCERTAINTY

Parameter	Uncertainty
RF frequency	+/-1 * 10-5
RF power conducted	+/- 1,5 dB
RF power radiated	+/- 6 dB
Spurious emissions, conducted	+/- 3 dB
Spurious emissions, radiated	+/- 6 dB
Humidity	+/- 5 %
Temperature	+/- 1°C
Time	+/-10 %

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

6. FCC PART 15 REQUIREMENTS

6.1 6dB BANDWIDTH MEASUREMENT

6.1.1LIMIT

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

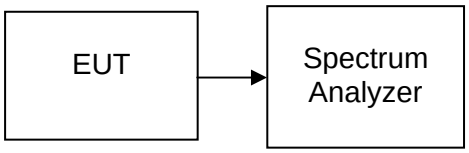
6.1.2TEST INSTRUMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US44300399	03/01/2014	03/01/2015

6.1.3TEST PROCEDURES (please refer to measurement standard)

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 100kHz, VBW = 300kHz, Span = 50MHz, Sweep = auto.
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

6.1.4TEST SETUP



6.1.5TEST RESULTS

No non-compliance noted

Test Data

Test mode: 5736 ~ 5814MHz

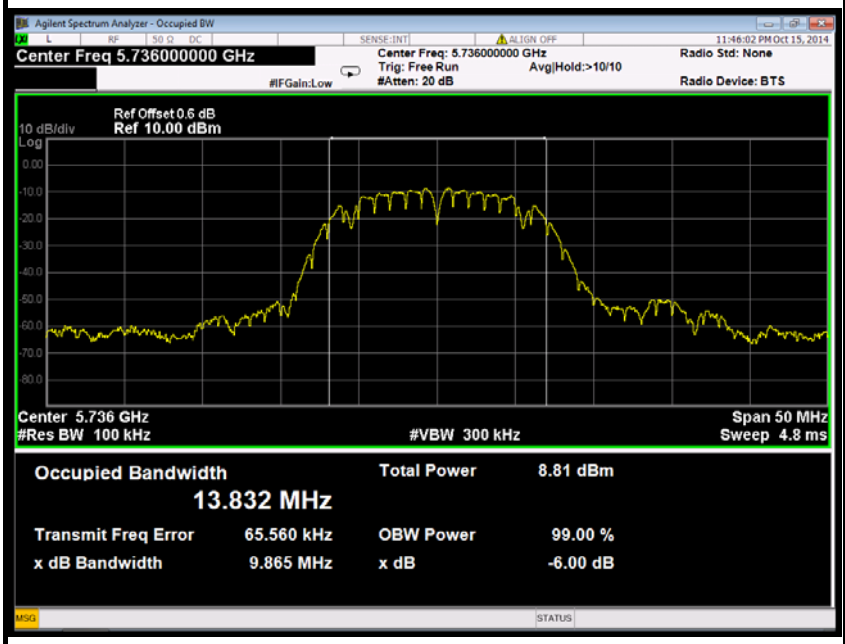
Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 1	Antenna 2
Low	5736	9.865	9.858
Mid	5762	9.862	9.860
High	5814	9.863	9.864

Test Plot

5736 ~ 5814MHz

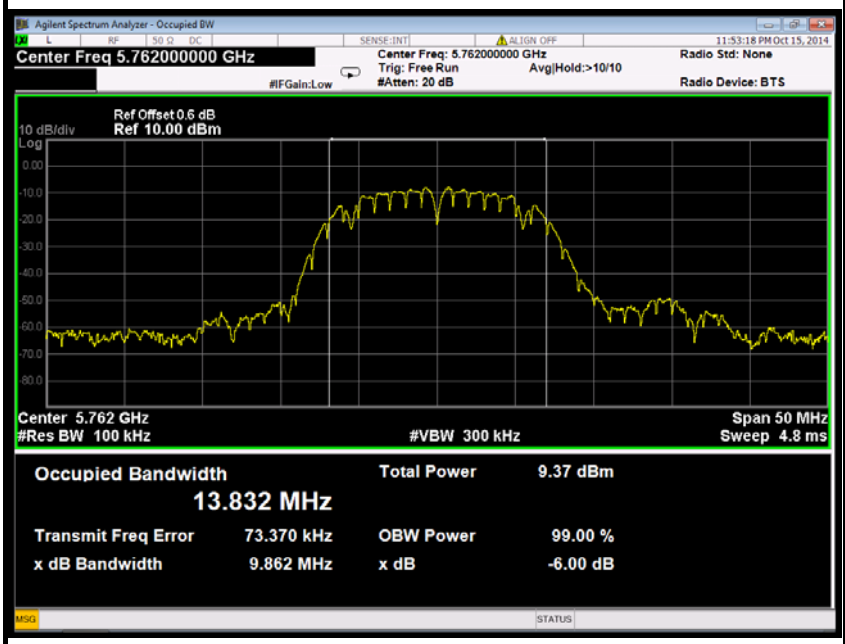
6dB Bandwidth (CH Low)

Antenna 1



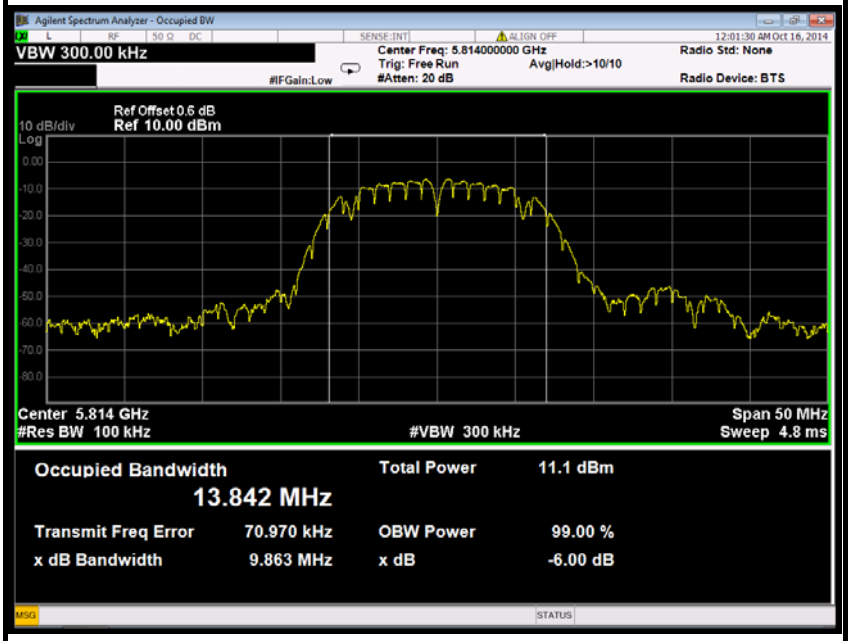
6dB Bandwidth (CH Mid)

Antenna 1



6dB Bandwidth (CH High)

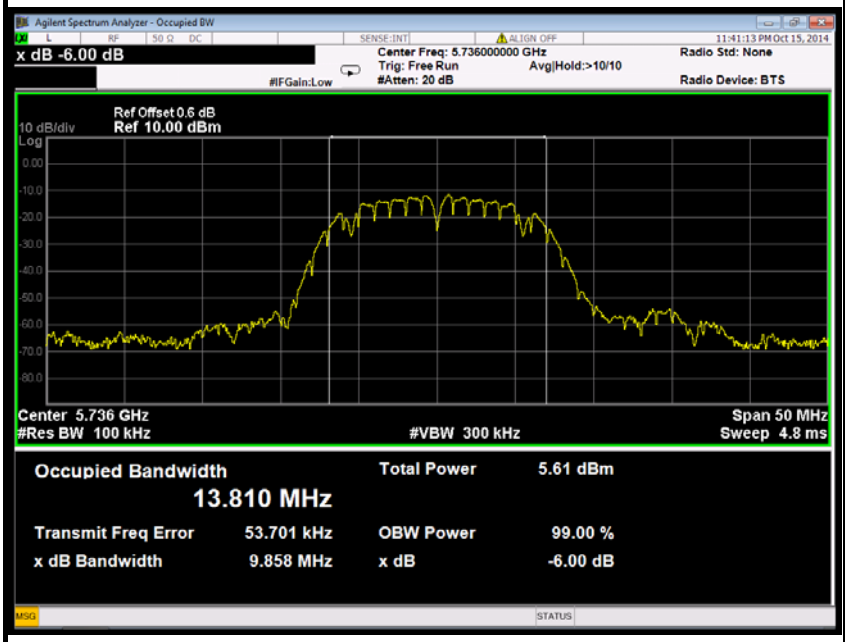
Antenna 1



5736 ~ 5814MHz

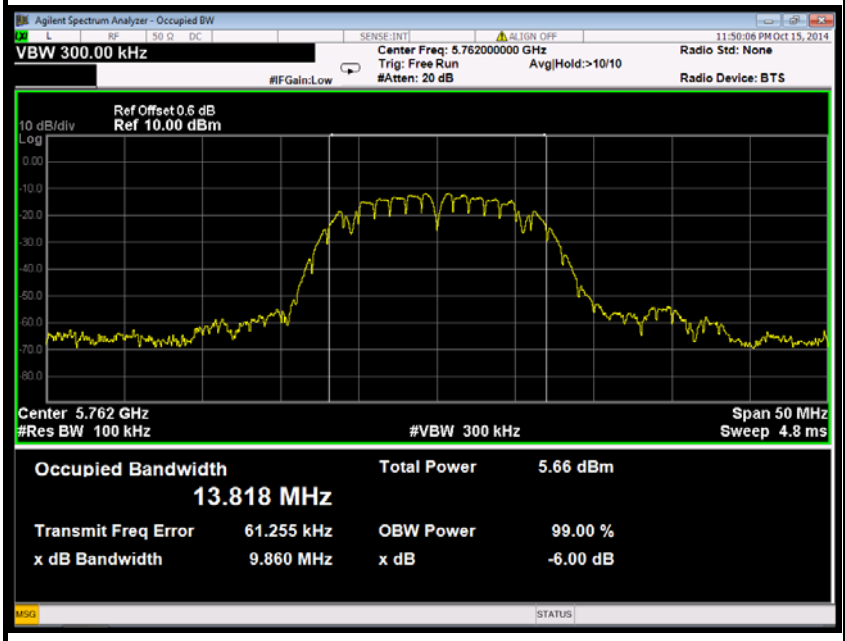
6dB Bandwidth (CH Low)

Antenna 2



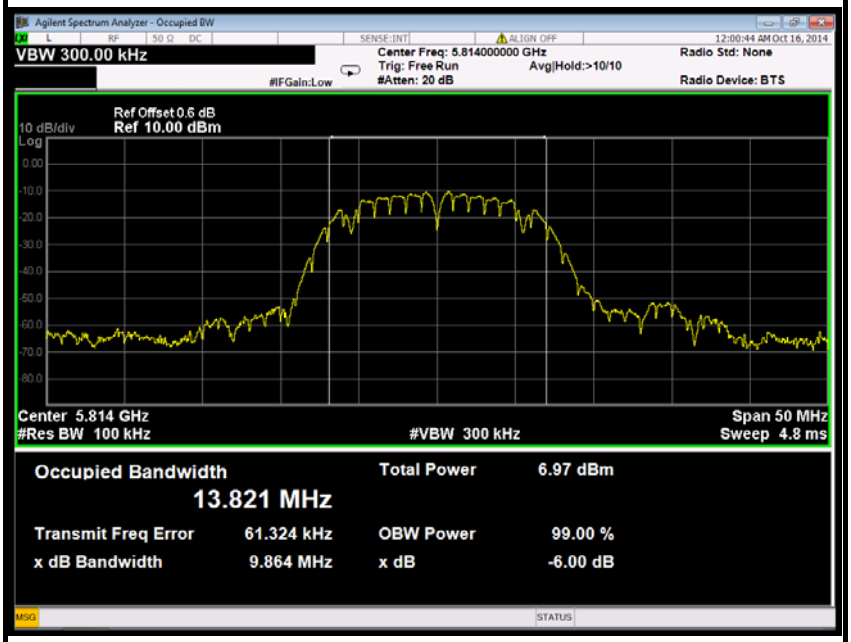
6dB Bandwidth (CH Mid)

Antenna 2



6dB Bandwidth (CH High)

Antenna 2



6.2 26dB EMISSION BANDWIDTH

6.2.1LIMIT

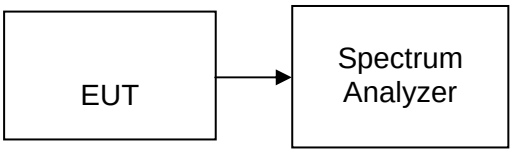
According to §15.303(c), for purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Compliance with the emissions limits is based on the use of measurement instrumentation employing a peak detector function with an instrument resolutions bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

6.2.2MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	N9010A	MY52221469	10/25/2013	10/24/2014

Remark: *Each piece of equipment is scheduled for calibration once a year.*

6.2.3TEST CONFIGURATION



6.2.4TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low-loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW > 1%EBW, VBW > RBW, Span >26dB bandwidth, Detector = Peak, and Sweep = auto.
4. Mark the peak frequency and –26dB (upper and lower) frequency.
5. Repeat until all the rest channels were investigated.

6.2.5TEST RESULTS

No non-compliance noted

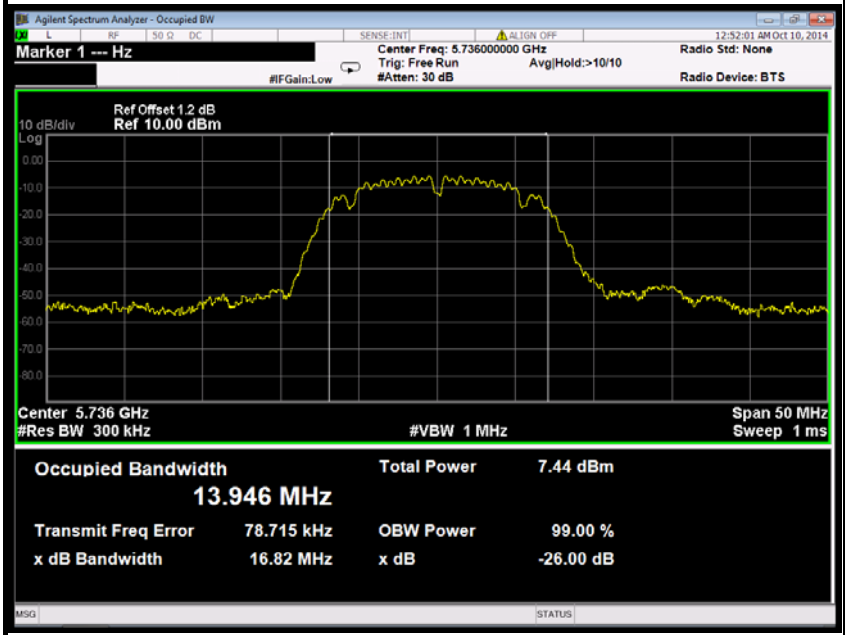
Test mode: 5736 ~ 5814MHz

Channel	Frequency (MHz)	Bandwidth(B) (MHz)	
		Antenna 1	Antenna 2
Low	5736	16.82	16.80
Mid	5762	16.79	16.80
High	5814	16.81	16.82

5736 ~ 5814MHz

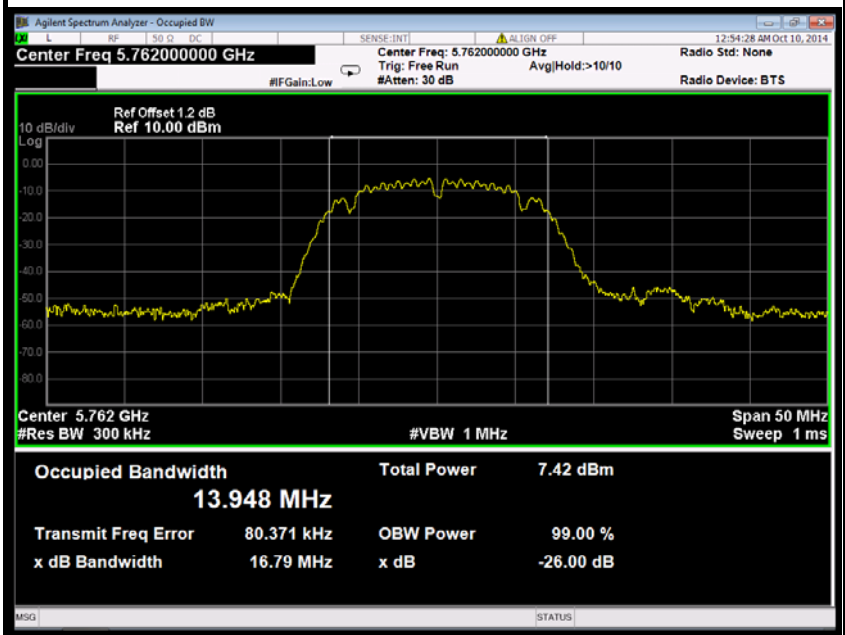
26dB Bandwidth (CH Low)

Antenna 1



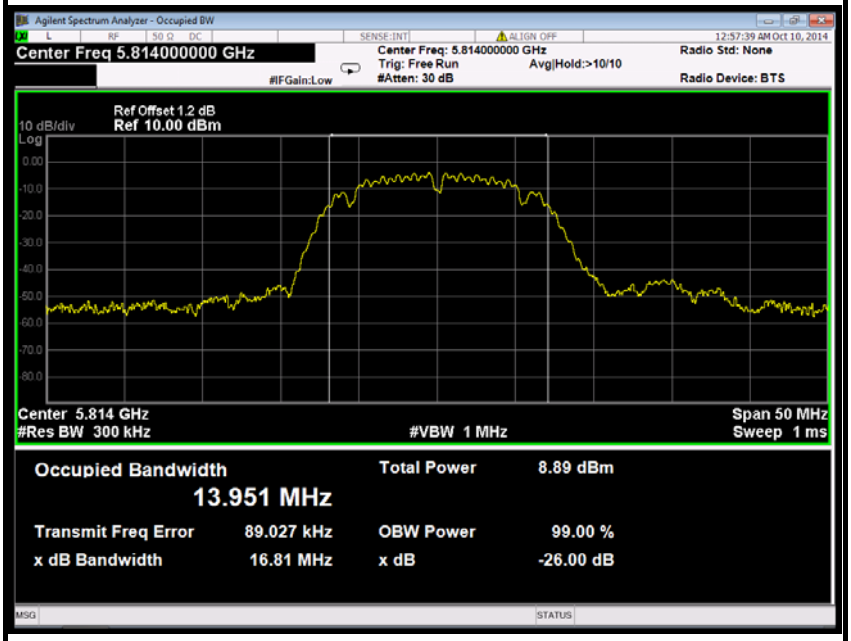
26dB Bandwidth (CH Mid)

Antenna 1



26dB Bandwidth (CH High)

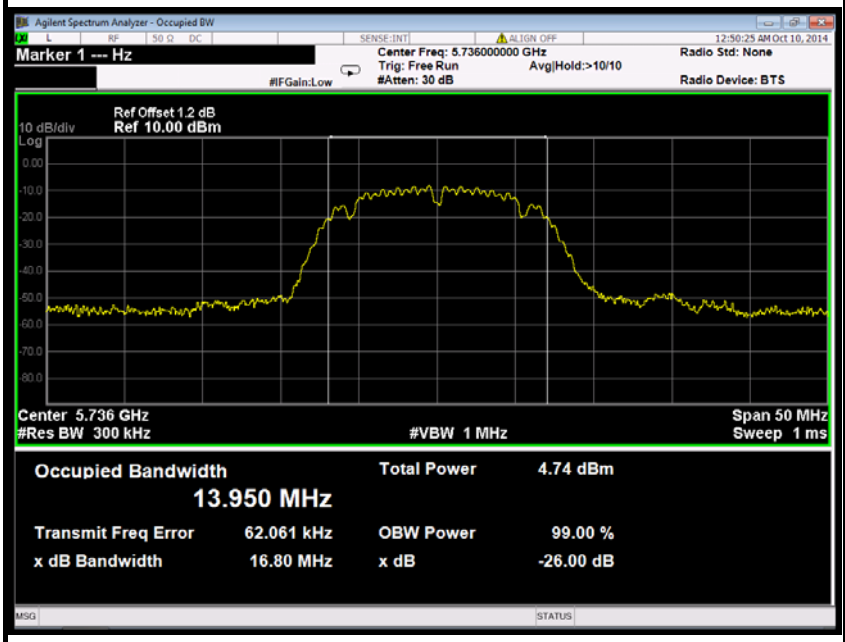
Antenna 1



5736 ~ 5814MHz

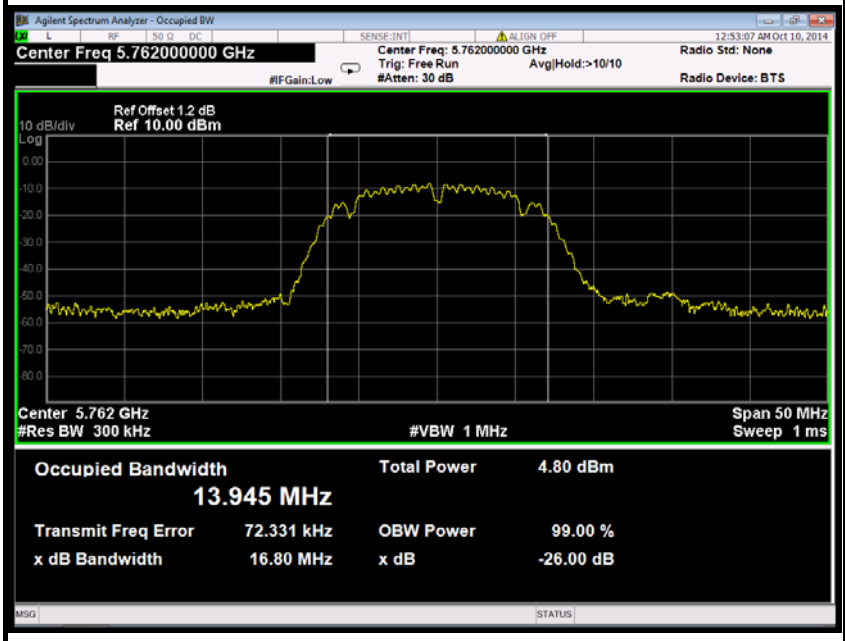
26dB Bandwidth (CH Low)

Antenna 2



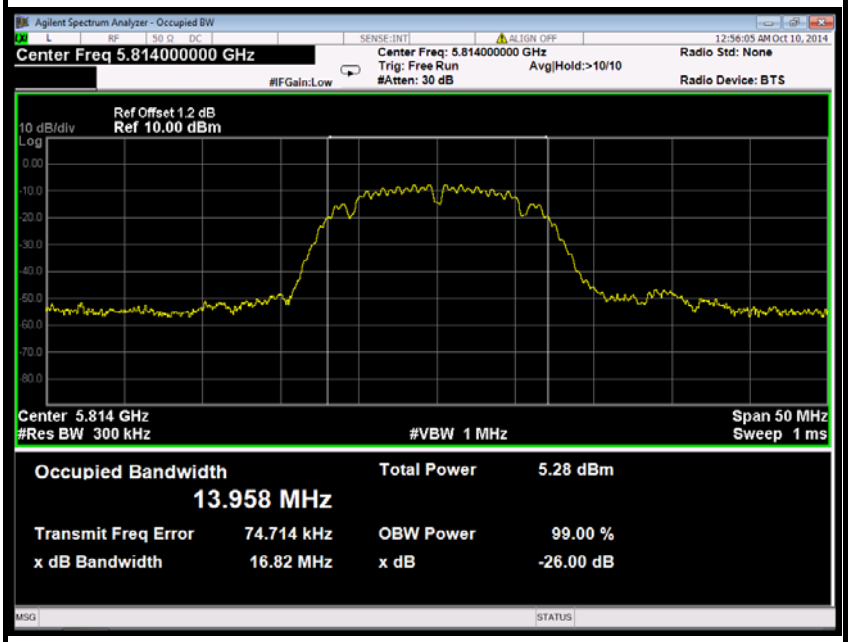
26dB Bandwidth (CH Mid)

Antenna 2



26dB Bandwidth (CH High)

Antenna 2



6.3 PEAK POWER

6.3.1 LIMIT

According to §15.407(a)& FCC R&O FCC 14 - 30,

(1) (i) For an outdoor access point operating in the band 5.15 – 5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(2) (ii) For an indoor access point operating in the band 5.15 – 5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

If transmitting antennas of directional gain greater than 6dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

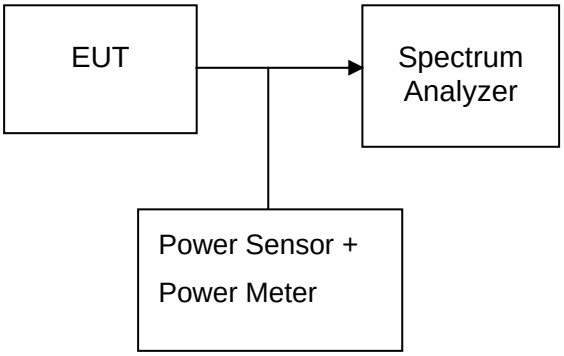
6.3.2MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Calibration Due
Spectrum Analyzer	Agilent	N9010A	MY52221469	10/25/2013	10/24/2014
Power Meter	Anritsu	ML2495A	1204003	03/01/2014	03/01/2015
Power Sensor	Anritsu	MA2411B	1126150	03/01/2014	03/01/2015

Remark: *Each piece of equipment is scheduled for calibration once a year.*

6.3.3TEST CONFIGURATIONS

The EUT was connected to a spectrum analyzer through a 50Ω RF cable.



6.3.4TEST PROCEDURE

Set span to encompass the entire emission bandwidth (EBW) of the signal.

Set RBW = 1 MHz / Set VBW = 3 MHz.

Use sample detector mode if bin width (i.e., span/number of points in spectrum display) < 0.5 RBW. Otherwise use peak detector mode. Use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at full control power for entire sweep of every sweep. If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to “free run”.·Trace average 100 traces in power averaging mode. Compute power by integrating the spectrum across the 26 dB EBW of the signal. The integration can be performed using the spectrum analyzer’s band power measurement function with band limits set equal to the EBW band edges or by summing power levels in each 1 MHz band in linear power terms. The 1 MHz band power levels to be summed can be obtained by averaging, in linear power terms, power levels in each frequency bin across the 1 MHz.

6.3.5TEST RESULTS

No non-compliance noted

6.3.6TEST DATA

Test mode: 5736 ~ 5814MHz

Antenna 1

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (dBm)	Result
Low	5736	10.54	0.01282	30.00	PASS
Mid	5762	11.08	0.01574		PASS
High	5814	11.97	0.00100		PASS

Antenna 2

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (dBm)	Result
Low	5736	7.35	0.00578	30.00	PASS
Mid	5762	7.62	0.00685		PASS
High	5814	8.36	0.00100		PASS

6.4 BAND EDGES MEASUREMENT

6.4.1LIMIT

According to §15.407(b)

(1) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

6.4.2MEASUREMENT EQUIPMENT USED

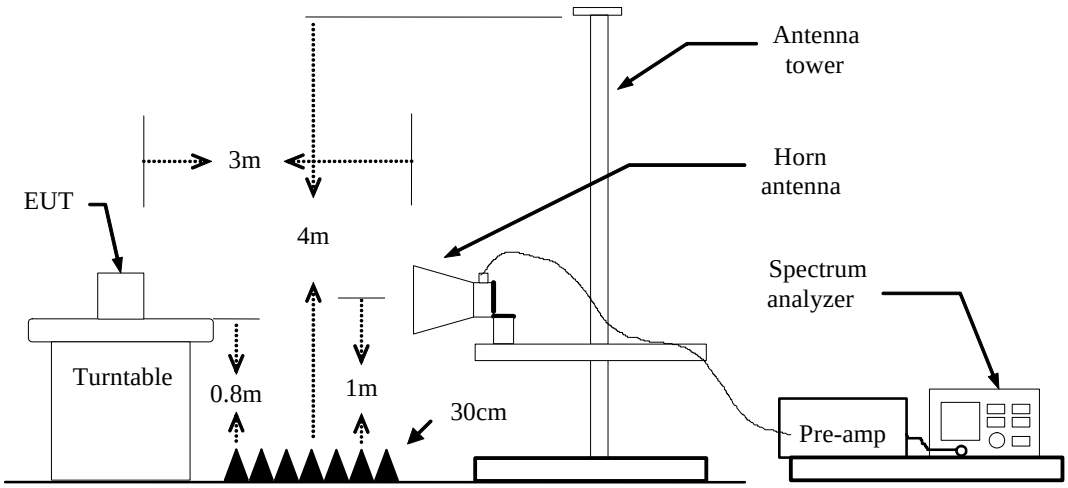
Radiated Emission Test Site 966（2）					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	03/01/2014	03/01/2015
Spectrum Analyzer	Agilent	N9010A	MY52221469	10/25/2013	10/24/2014
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	03/09/2014	03/08/2015
Amplifier	MITEQ	AM-1604-3000	1123808	03/18/2014	03/18/2015
High Noise Amplifier	Agilent	8449B	3008A01838	03/18/2014	03/18/2015
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	07/10/2014	07/09/2015
Bilog Antenna	SCHAFFNER	CBL6143	5082	03/01/2014	03/01/2015
Horn Antenna	SCHWARZBECK	BBHA9120	D286	03/01/2014	03/01/2015
Loop Antenna	COM-POWER	AL-130	121044	09/27/2014	09/26/2015
Turn Table	N/A	N/A	N/A	N.C.R	N.C.R
Controller	Sunol Sciences	SC104V	022310-1	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/28/2014	02/28/2015
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The FCC Site Registration number is 101879.

3. N.C.R = No Calibration Required.

6.4.3TEST CONFIGURATION



6.4.4TEST 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=AUTO
   (b) AVERAGE: RBW=1MHz / VBW=11Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

6.4.5TEST RESULT

26dB

Test mode: 5736 ~ 5814MHz

Antenna 1:

1. Operating Frequency: 5736-5814MHz
2. CH Low: 5736MHz, CH High: 5814MHz
3. 26dB bandwidth: CH Low: 16.82MHz, CH High: 16.81MHz
4. Frequency Range: 5727.59MHz, 5822.405MHz

Antenna 2:

1. Operating Frequency: 5736-5814MHz
2. CH Low: 5736MHz, CH High: 5814MHz
3. 26dB bandwidth: CH Low: 16.80MHz, CH High: 16.82MHz
4. Frequency Range: 5727.6MHz, 5822.41MHz

Because the mentioned conditions, the test is not applicable.

6.5 PEAK POWER SPECTAL DENSITY

6.5.1LIMIT

According to §15.407(a) & FCC R&O FCC 14-30

(1) (i) For an outdoor access point operating in the band 5.15 – 5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(2) (ii) For an indoor access point operating in the band 5.15 – 5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

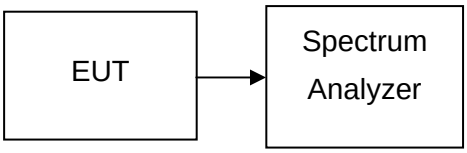
If transmitting antennas of directional gain greater than 6dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

6.5.2MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	N9010A	MY52221469	10/25/2013	10/24/2014

Remark: *Each piece of equipment is scheduled for calibration once a year.*

6.5.3TEST CONFIGURATION



6.5.4TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
   Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. For devices operating in the bands 5.15-5.25 GHz,Set the spectrum analyzer as RBW = 1MHz, VBW = 3MHz, Span = 30MHz, Sweep=1.2ms
3. For devices operating in the bands 5.725-5.85 GHz,Set the spectrum analyzer as RBW = 470kHz, VBW = 1.5MHz, Span = 50MHz, Sweep=1ms
4. Record the max. reading.
5. Repeat the above procedure until the measurements for all frequencies are completed

6.5.5TEST RESULTS

Test Data

Test mode: 5736 ~ 5814MHz

Antenna 1

Channel	Frequency (MHz)	PPSD (dBm)	factor	Limit (dBm)	Margin	Result
Low	5736	-4.597	0.27	30	-34.328	PASS
Mid	5762	-3.829	0.27		-33.560	PASS
High	5814	-2.038	0.27		-31.769	PASS

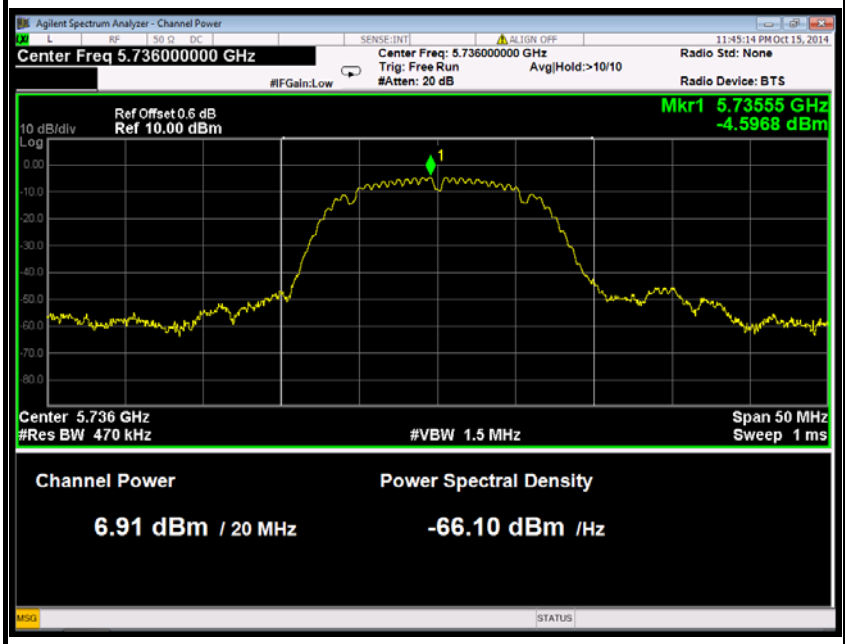
Antenna 2

Channel	Frequency (MHz)	PPSD (dBm)	factor	Limit (dBm)	Margin	Result
Low	5736	-7.679	0.27	30	-37.410	PASS
Mid	5762	-7.493	0.27		-37.225	PASS
High	5814	-5.905	0.27		-35.637	PASS

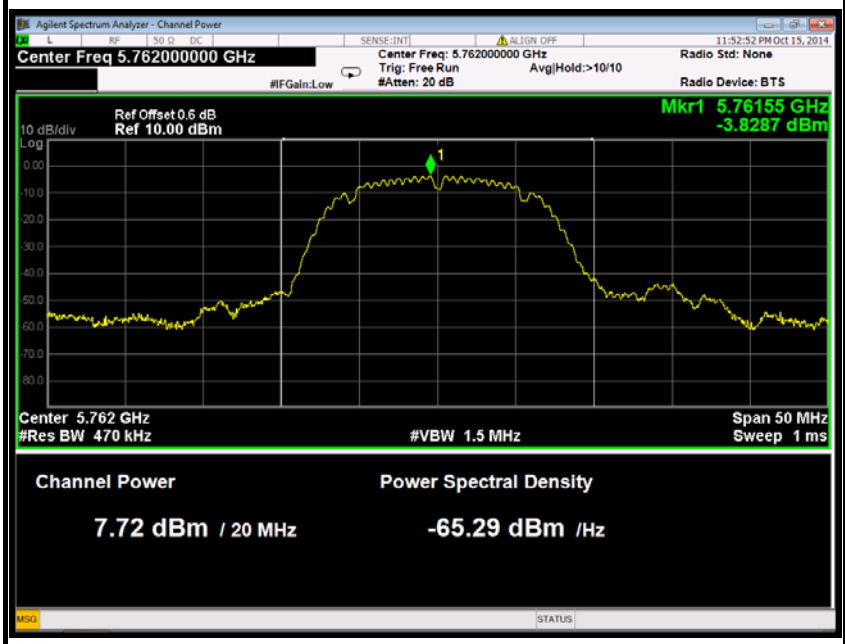
Remark: factor =10*log10(500/RBW)

Test Plot

5736 ~ 5814MHz
PPSD (CH Low)
Antenna 1

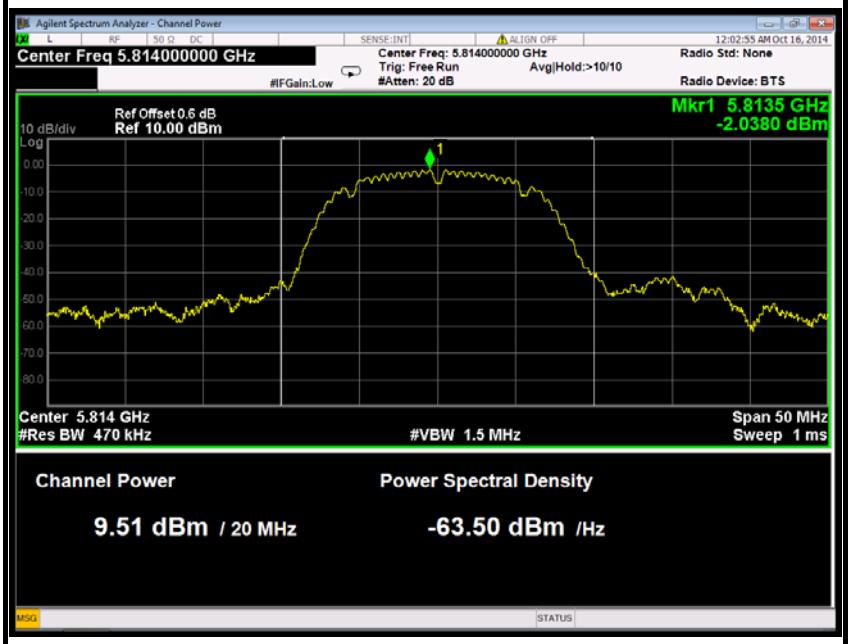


PPSD (CH Mid)
Antenna 1

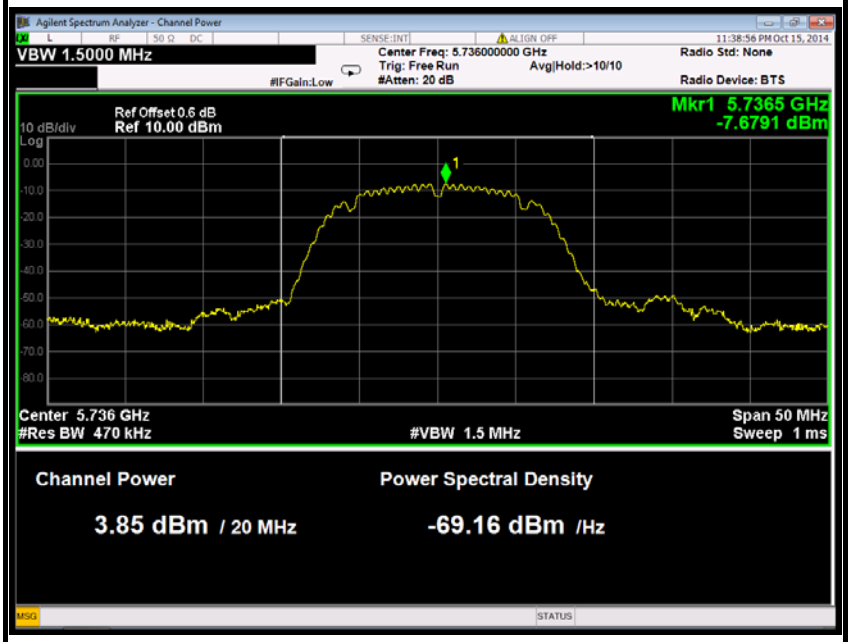


PPSD (CH High)

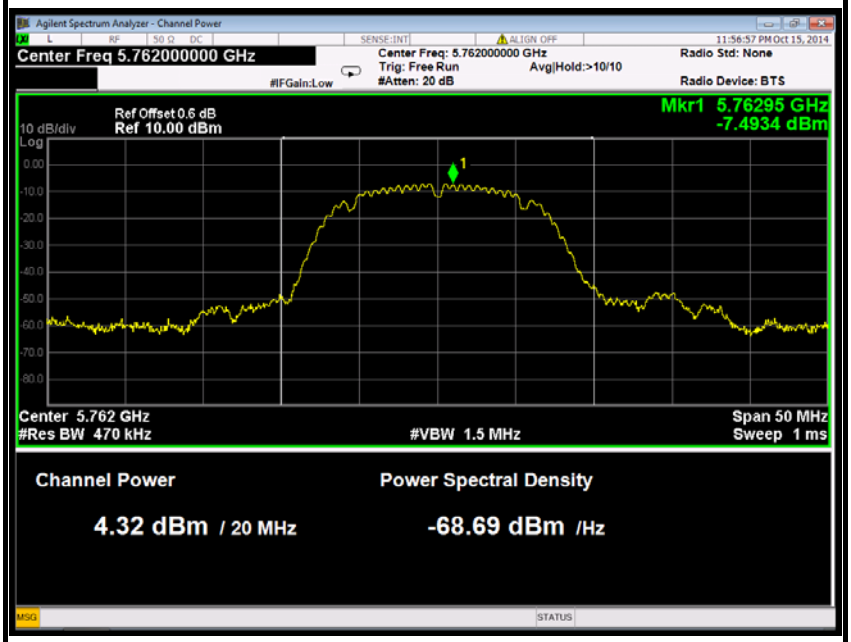
Antenna 1



5736 ~ 5814MHz
PPSD (CH Low)
Antenna 2

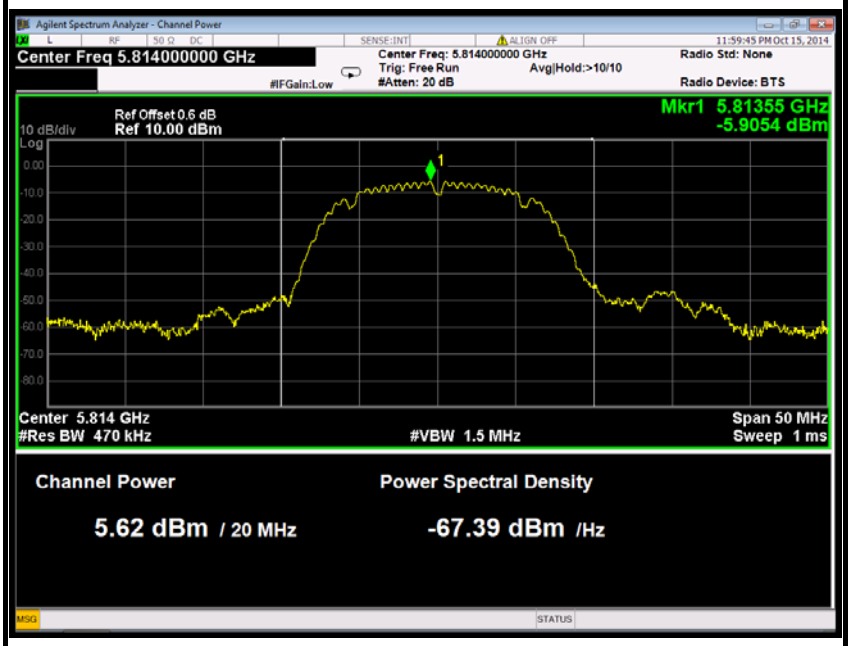


PPSD (CH Mid)
Antenna 2



PPSD (CH High)

Antenna 2



6.6 RADIATED UNDESIABLE EMISSION

6.6.1 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 (μV/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.

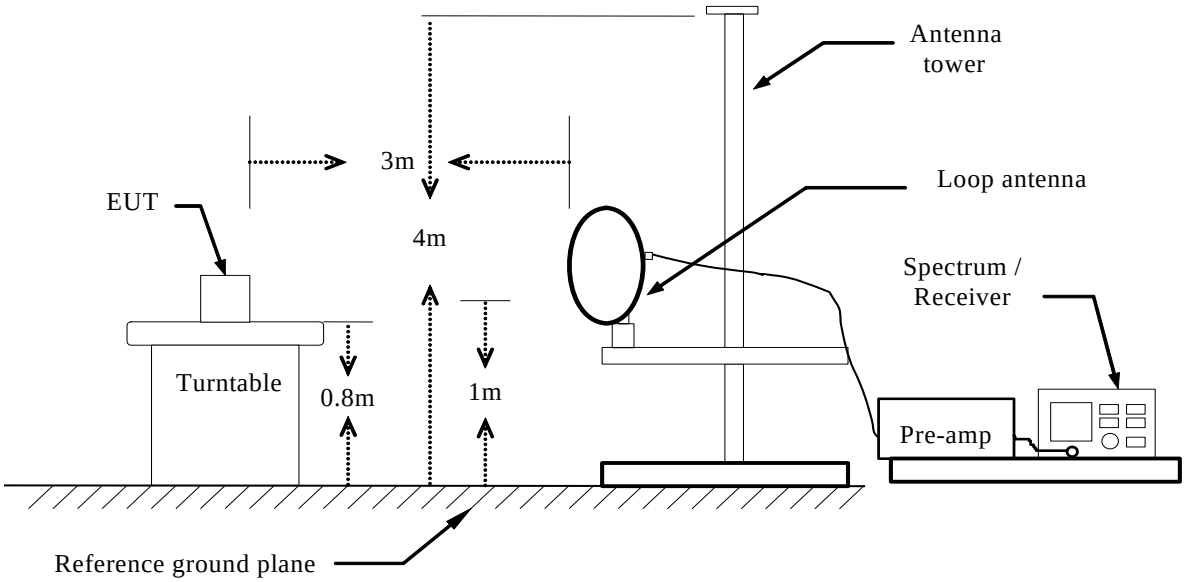
Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

6.6.2TEST INSTRUMENTS

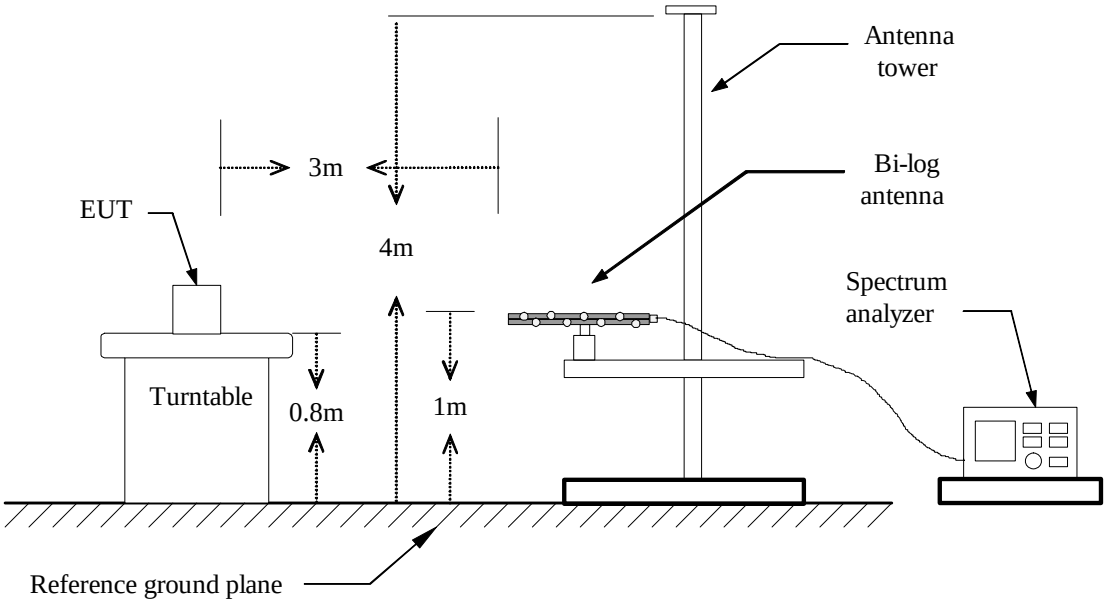
Radiated Emission Test Site 966（2）					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	03/01/2014	03/01/2015
Spectrum Analyzer	Agilent	N9010A	MY52221469	10/25/2013	10/24/2014
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	03/09/2014	03/08/2015
Amplifier	MITEQ	AM-1604-3000	1123808	03/18/2014	03/18/2015
High Noise Amplifier	Agilent	8449B	3008A01838	03/18/2014	03/18/2015
Board-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170-497	07/10/2014	07/09/2015
Bilog Antenna	SCHAFFNER	CBL6143	5082	03/01/2014	03/01/2015
Horn Antenna	SCHWARZBECK	BBHA9120	D286	03/01/2014	03/01/2015
Loop Antenna	COM-POWER	AL-130	121044	09/27/2014	09/26/2015
Turn Table	N/A	N/A	N/A	N.C.R	N.C.R
Controller	Sunol Sciences	SC104V	022310-1	N.C.R	N.C.R
Controller	CT	N/A	N/A	N.C.R	N.C.R
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/28/2014	02/28/2015
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2			

6.6.3TEST CONFIGURATION

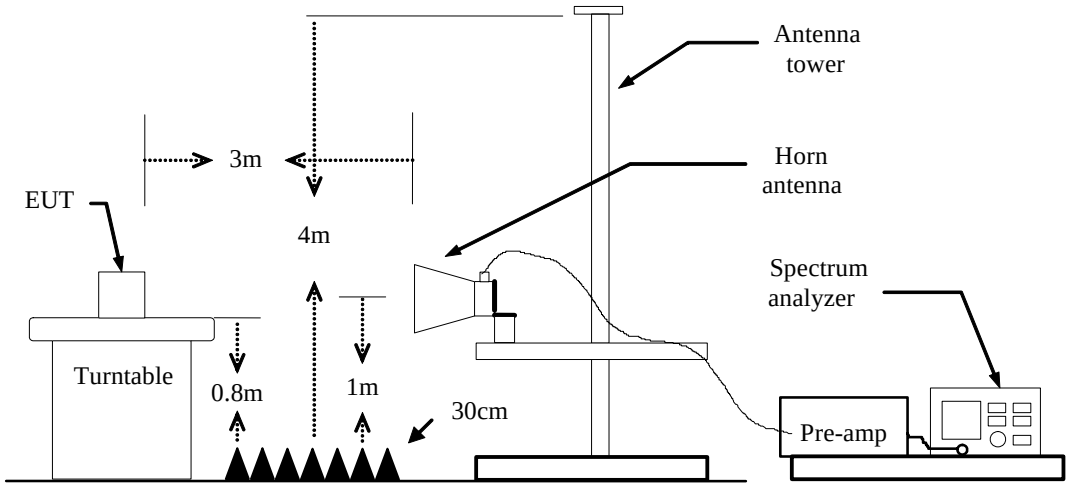
Below 30MHz



Below 1 GHz



Above 1 GHz



For the actual test configuration, please refer to the related item – Photographs of the test configuration.

6.6.4TEST 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.

6.6.5DATA SAPLE

Below 1GHz

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
XXX.XXXX	36.37	-12.20	24.17	40.00	-15.83	V	QP

Frequency (MHz) = Emission frequency in MHz
Reading (dBuV) = Uncorrected Analyzer / Receiver reading
Correct Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
Result (dBuV/m) = Reading (dBuV) + Corr. Factor (dB/m)
Limit (dBuV/m) = Limit stated in standard
Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)
Q.P. = Quasi-peak Reading

Above 1GHz

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
XXXX.XXXX	62.09	-11.42	50.67	74.00	-23.33	V	Peak
XXXX.XXXX	49.78	-11.42	38.36	54.00	-15.64	V	AVG

Frequency (MHz) = Emission frequency in MHz
Reading (dBuV) = Uncorrected Analyzer / Receiver reading
Correction Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
Result (dBuV/m) = Reading (dBuV) + Corr. Factor (dB/m)
Limit (dBuV/m) = Limit stated in standard
Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)
Peak = Peak Reading
AVG = Average Reading

Calculation Formula

Margin (dB) = Result (dBuV/m) – Limits (dBuV/m)
Result (dBuV/m) = Reading (dBuV) + Correction Factor

6.6.6TEST RESULTS

Below 1 GHz

Test Mode: TX **Tested by:** Eve Wang

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** October 9, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
33.8800	50.05	-14.06	35.99	40.00	-4.01	V	QP
99.8400	60.21	-23.70	36.51	43.50	-6.99	V	QP
198.7800	58.34	-22.75	35.59	43.50	-7.91	V	QP
359.8000	56.44	-17.41	39.03	46.00	-6.97	V	QP
376.2900	55.37	-16.74	38.63	46.00	-7.37	V	QP
829.2800	45.32	-10.56	34.76	46.00	-11.24	V	QP
33.8800	49.03	-14.06	34.97	40.00	-5.03	H	QP
166.7700	61.03	-22.80	38.23	43.50	-5.27	H	QP
371.4400	55.40	-17.11	38.29	46.00	-7.71	H	QP
395.6900	55.68	-16.24	39.44	46.00	-6.56	H	QP
700.2700	45.63	-11.94	33.69	46.00	-12.31	H	QP
770.1100	47.96	-11.13	36.83	46.00	-9.17	H	QP

Remark:

1. *No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz)*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz 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.*
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) – Quasi-peak limit (dBuV/m).*

Above 1 GHz

Antenna 1

Test Mode: TX / 5736MHz / (CH Low) **Tested by:** Eve Wang

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** October 9, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
6276.000	37.29	4.58	41.87	74.00	-32.13	V	peak
6984.000	37.38	7.63	45.01	74.00	-28.99	V	peak
7752.000	37.24	9.17	46.41	74.00	-27.59	V	peak
8364.000	37.18	9.45	46.63	74.00	-27.37	V	peak
9360.000	36.66	10.14	46.80	74.00	-27.20	V	peak
10068.000	37.02	12.19	49.21	74.00	-24.79	V	peak
6204.000	37.47	4.27	41.74	74.00	-32.26	H	Peak
6984.000	37.44	7.63	45.07	74.00	-28.93	H	Peak
7728.000	37.36	9.12	46.48	74.00	-27.52	H	Peak
8364.000	36.99	9.45	46.44	74.00	-27.56	H	peak
9168.000	37.25	9.58	46.83	74.00	-27.17	H	peak
9948.000	36.50	11.83	48.33	74.00	-25.67	H	peak

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.*
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).*

Test Mode: TX / 5762MHz / (CH Mid) **Tested by:** Eve Wang

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** October 9, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
6240.000	37.48	4.42	41.90	74.00	-32.10	V	peak
6984.000	37.61	7.63	45.24	74.00	-28.76	V	peak
7752.000	37.53	9.17	46.70	74.00	-27.30	V	peak
8400.000	37.10	9.43	46.53	74.00	-27.47	V	peak
9372.000	36.75	10.17	46.92	74.00	-27.08	V	peak
10092.000	37.23	12.27	49.50	74.00	-24.50	V	peak
6288.000	37.13	4.63	41.76	74.00	-32.24	H	Peak
6960.000	37.34	7.53	44.87	74.00	-29.13	H	Peak
7752.000	37.37	9.17	46.54	74.00	-27.46	H	Peak
8436.000	37.34	9.41	46.75	74.00	-27.25	H	peak
9264.000	36.80	9.86	46.66	74.00	-27.34	H	peak
9600.000	36.07	10.83	46.90	74.00	-27.10	H	peak

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.*
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).*

Test Mode: TX / 5814MHz / (CH High) **Tested by:** Eve Wang

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** October 9, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
6216.000	37.39	4.32	41.71	74.00	-32.29	V	peak
6984.000	37.31	7.63	44.94	74.00	-29.06	V	peak
7776.000	37.36	9.21	46.57	74.00	-27.43	V	peak
8364.000	37.12	9.45	46.57	74.00	-27.43	V	peak
9348.000	36.60	10.10	46.70	74.00	-27.30	V	peak
10308.000	36.32	12.93	49.25	74.00	-24.75	V	peak
6228.000	37.28	4.37	41.65	74.00	-32.35	H	Peak
6960.000	37.50	7.53	45.03	74.00	-28.97	H	Peak
7752.000	37.29	9.17	46.46	74.00	-27.54	H	Peak
8508.000	37.32	9.37	46.69	74.00	-27.31	H	peak
9600.000	36.18	10.83	47.01	74.00	-26.99	H	peak
10296.000	36.55	12.90	49.45	74.00	-24.55	H	peak

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.*
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).*

Antenna 2

Test Mode: TX / 5736MHz / (CH Low) **Tested by:** Eve Wang

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** October 9, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
6984.000	38.88	7.63	46.51	74.00	-27.49	V	peak
7212.000	38.17	8.11	46.28	74.00	-27.72	V	peak
7752.000	37.24	9.17	46.41	74.00	-27.59	V	peak
8364.000	36.68	9.45	46.13	74.00	-27.87	V	peak
9360.000	35.66	10.14	45.80	74.00	-28.20	V	peak
10068.000	37.02	12.19	49.21	74.00	-24.79	V	peak
6204.000	36.97	4.27	41.24	74.00	-32.76	H	Peak
6984.000	36.44	7.63	44.07	74.00	-29.93	H	Peak
7728.000	36.86	9.12	45.98	74.00	-28.02	H	Peak
8364.000	35.99	9.45	45.44	74.00	-28.56	H	peak
8832.000	35.94	9.19	45.13	74.00	-28.87	H	peak
9168.000	36.75	9.58	46.33	74.00	-27.67	H	peak

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.*
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).*

Test Mode: TX / 5762MHz / (CH Mid) **Tested by:** Eve Wang

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** October 9, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
6492.000	37.41	5.51	42.92	74.00	-31.08	V	peak
6984.000	38.61	7.63	46.24	74.00	-27.76	V	peak
7212.000	37.73	8.11	45.84	74.00	-28.16	V	peak
7752.000	38.03	9.17	47.20	74.00	-26.80	V	peak
8400.000	37.60	9.43	47.03	74.00	-26.97	V	peak
9372.000	36.75	10.17	46.92	74.00	-27.08	V	peak
6288.000	38.63	4.63	43.26	74.00	-30.74	H	Peak
6960.000	38.84	7.53	46.37	74.00	-27.63	H	Peak
7236.000	39.01	8.16	47.17	74.00	-26.83	H	Peak
7752.000	37.87	9.17	47.04	74.00	-26.96	H	peak
8436.000	38.34	9.41	47.75	74.00	-26.25	H	peak
9804.000	35.28	11.42	46.70	74.00	-27.30	H	peak

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.*
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).*

Test Mode: TX / 5814MHz / (CH High) **Tested by:** Eve Wang

Ambient temperature: 24°C **Relative humidity:** 52% RH **Date:** October 9, 2014

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
6216.000	38.89	4.32	43.21	74.00	-30.79	V	peak
7020.000	38.77	7.74	46.51	74.00	-27.49	V	peak
7212.000	38.29	8.11	46.40	74.00	-27.60	V	peak
7776.000	38.86	9.21	48.07	74.00	-25.93	V	peak
8364.000	38.62	9.45	48.07	74.00	-25.93	V	peak
9348.000	37.60	10.10	47.70	74.00	-26.30	V	peak
6480.000	38.20	5.46	43.66	74.00	-30.34	H	Peak
6960.000	38.00	7.53	45.53	74.00	-28.47	H	Peak
7752.000	37.29	9.17	46.46	74.00	-27.54	H	Peak
8508.000	36.32	9.37	45.69	74.00	-28.31	H	peak
9276.000	36.91	9.89	46.80	74.00	-27.20	H	peak
10296.000	36.05	12.90	48.95	74.00	-25.05	H	peak

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.*
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).*

6.7 CONDUCTED UNDESIRABLE EMISSION

6.7.1LIMIT

According to 15.407(b) ,

(1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

(2) For transmitters operating in the 5.725–5.850 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of –17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of –27 dBm/MHz.

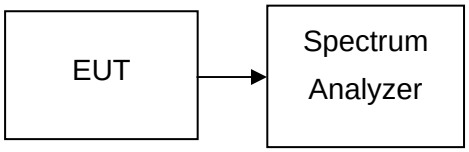
(3) The provisions of §15.205 apply to intentional radiators operating under this section.

6.7.2MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	N9010A	MY52221469	10/25/2013	10/24/2014

Remark: *Each piece of equipment is scheduled for calibration once a year.*

6.7.3TEST CONFIGURATION



6.7.4TEST PROCEDURE

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz. The video bandwidth is set to 1 MHz. Peak detection measurements are compared to the average EIRP limit, adjusted for the maximum antenna gain. If necessary, additional average detection measurements are made.

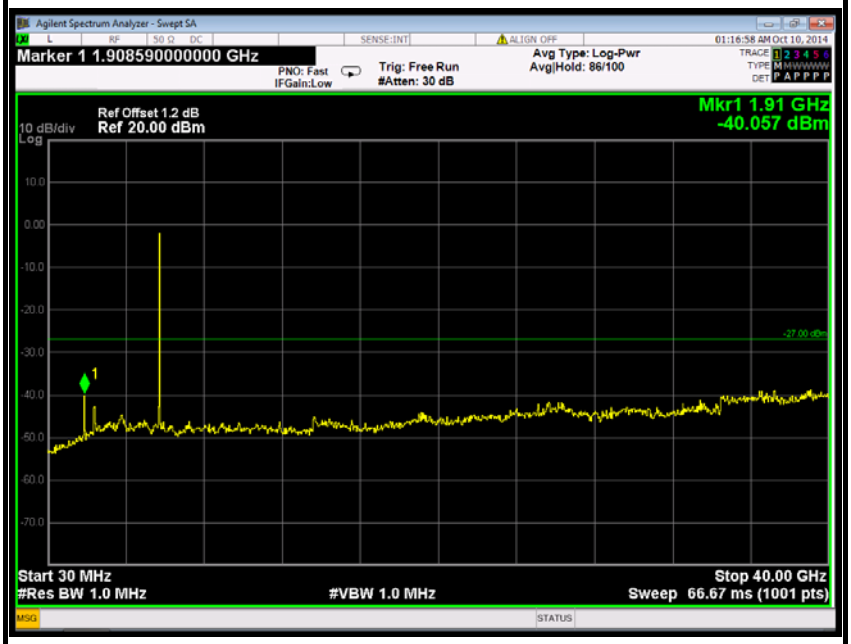
Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

6.7.5TEST RESULTS

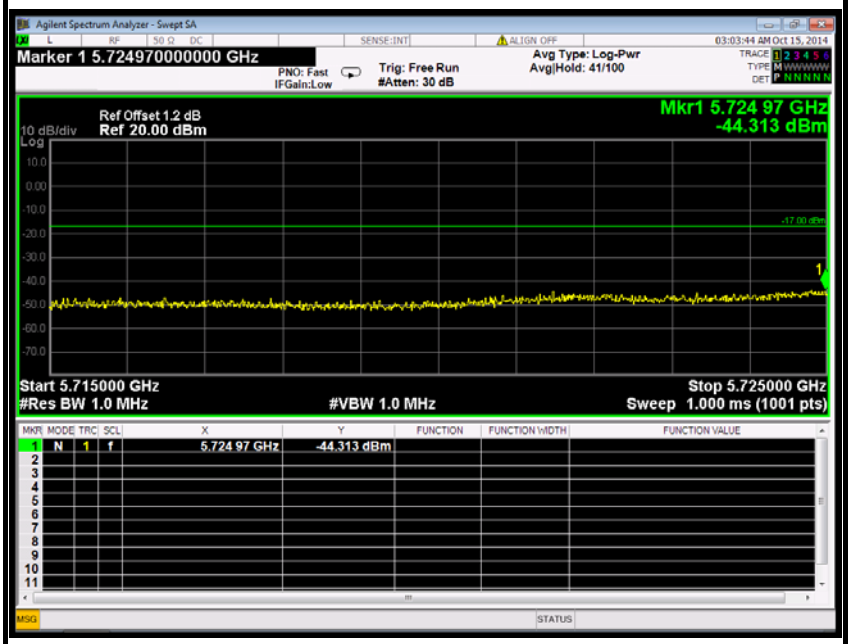
No non-compliance noted

Test Plot

5736 ~ 5814MHz
CH Low
Antenna 1

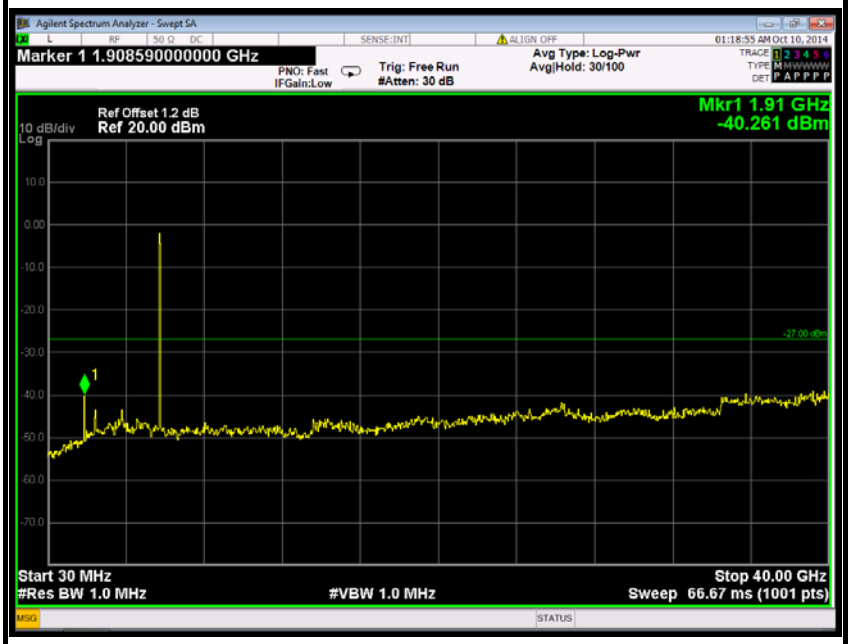


5.715 ~ 5.725 GHz
Antenna 1



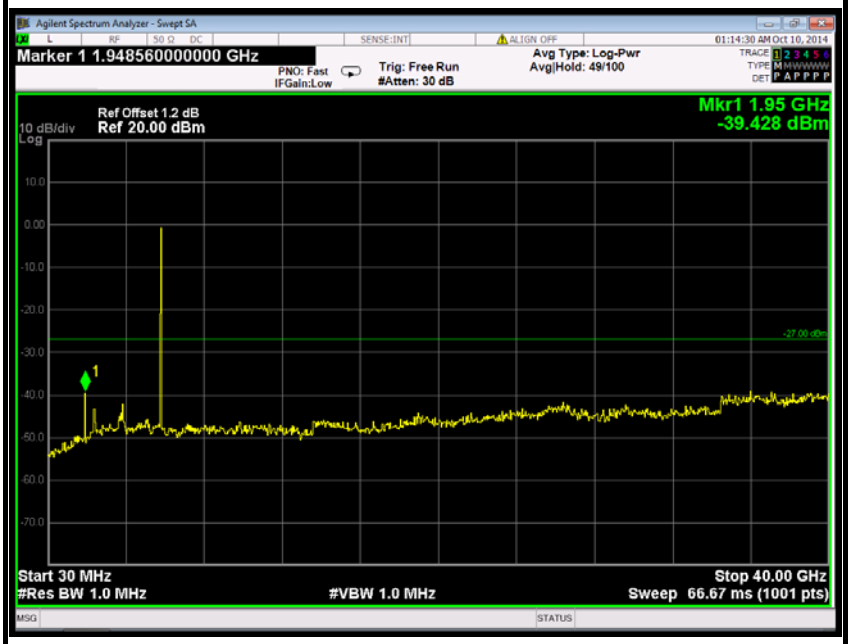
CH Mid

Antenna 1



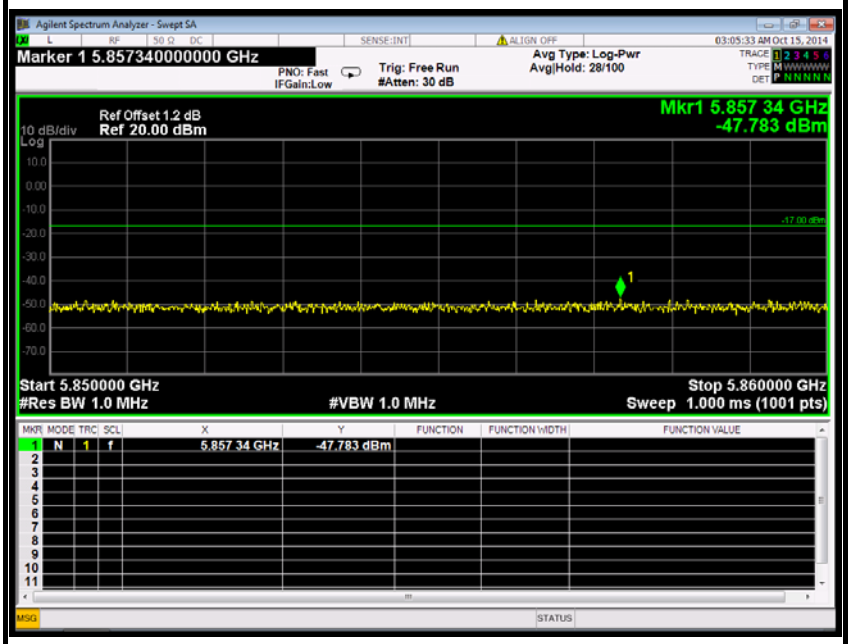
CH High

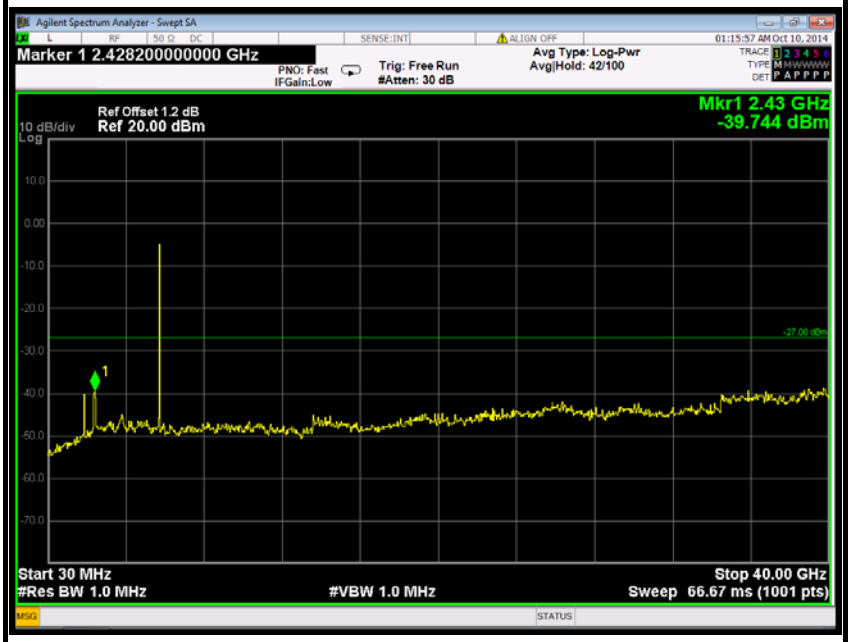
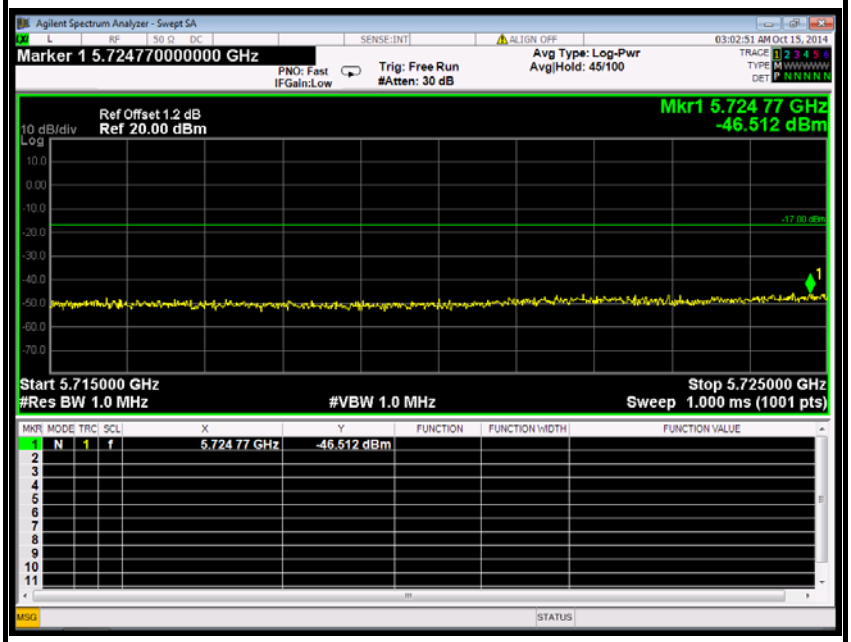
Antenna 1



5.85 ~ 5.86GHz

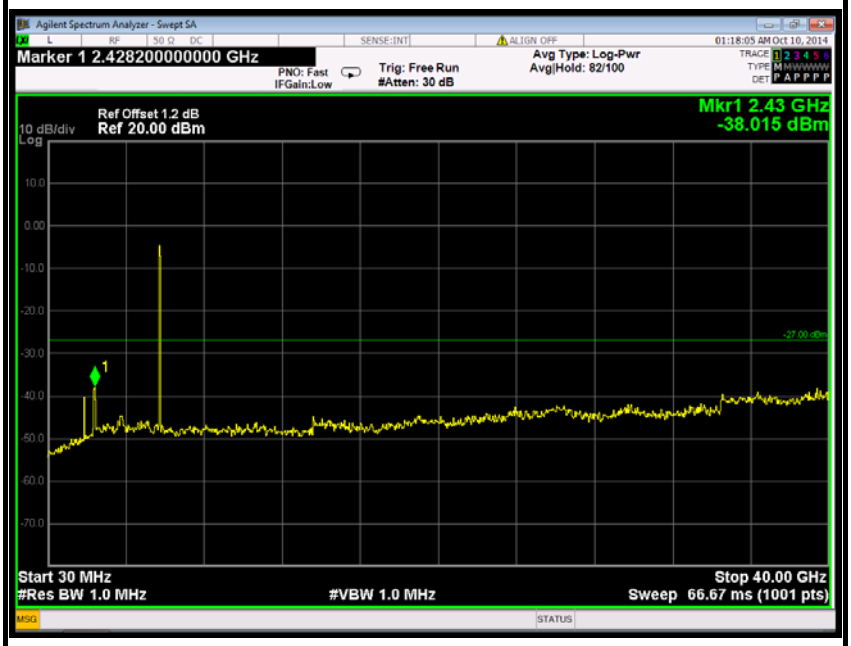
Antenna 1



5736 ~ 5814MHz
CH Low
Antenna 2

5.715 ~ 5.725 GHz
Antenna 2


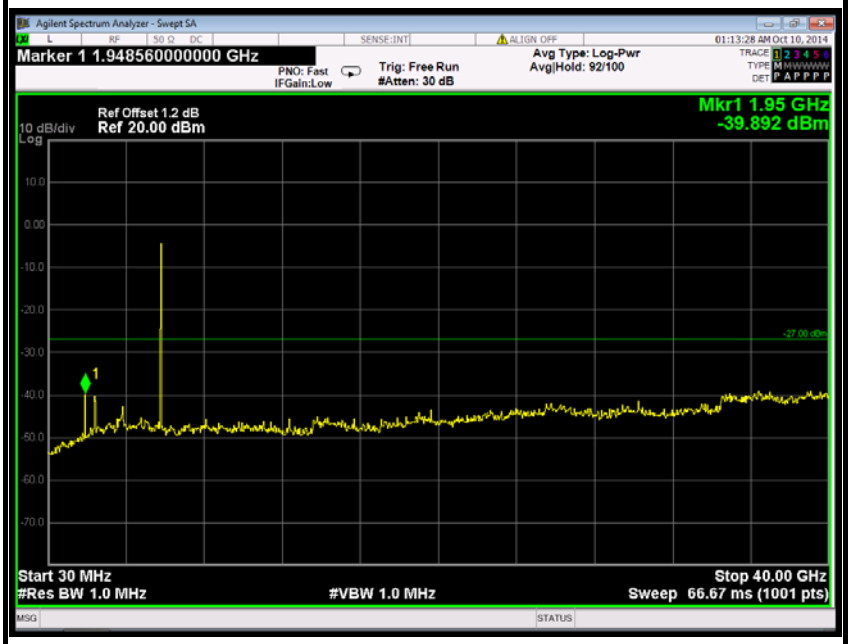
CH Mid

Antenna 2



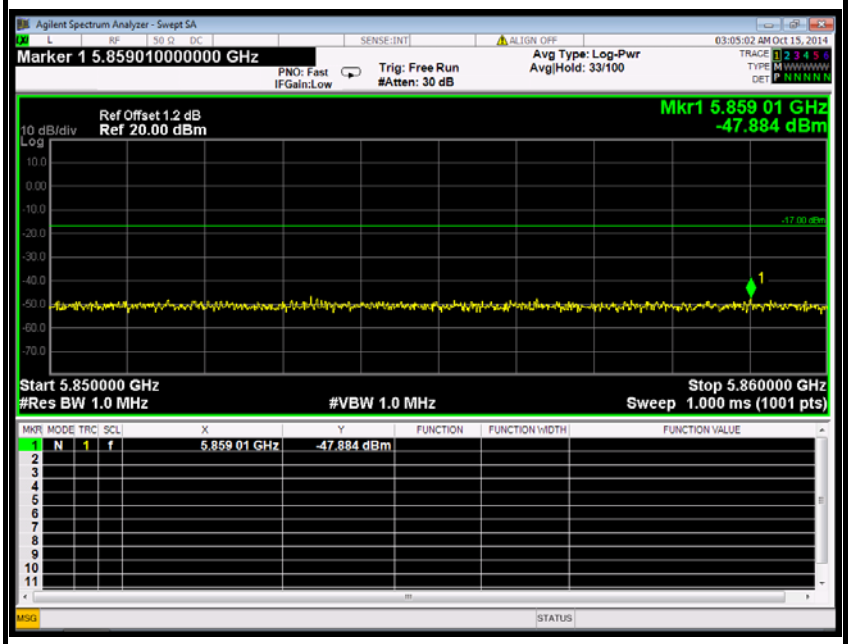
CH High

Antenna 2



5.85 ~ 5.86 GHz

Antenna 2



6.8 POWERLINE CONDUCTED EMISSIONS

6.8.1LIMIT

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, 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 or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

** Decreases with the logarithm of the frequency.*

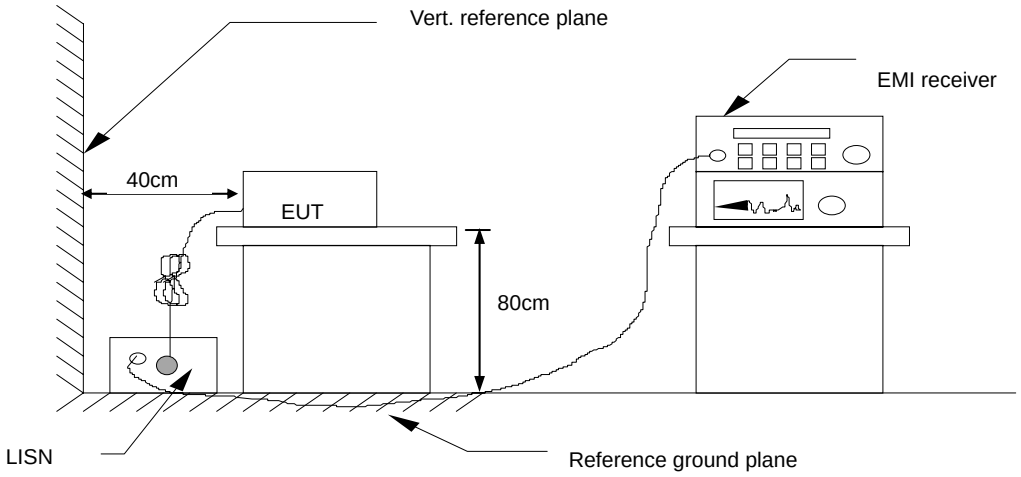
6.8.2TEST INSTRUMENTS

Conducted Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI	100783	03/09/2014	03/08/2015
LISN(EUT)	ROHDE&SCHWARZ	ENV216	101543-WX	04/20/2014	04/19/2015
LISN	EMCO	3825/2	8901-1459	03/09/2014	03/08/2015
Temp. / Humidity Meter	VICTOR	HTC-1	N/A	03/17/2014	03/17/2015
Test S/W	FARAD	EZ-EMC/ CCS-3A1-CE			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. N.C.R = No Calibration Request.

6.8.3TEST CONFIGURATION



6.8.4TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

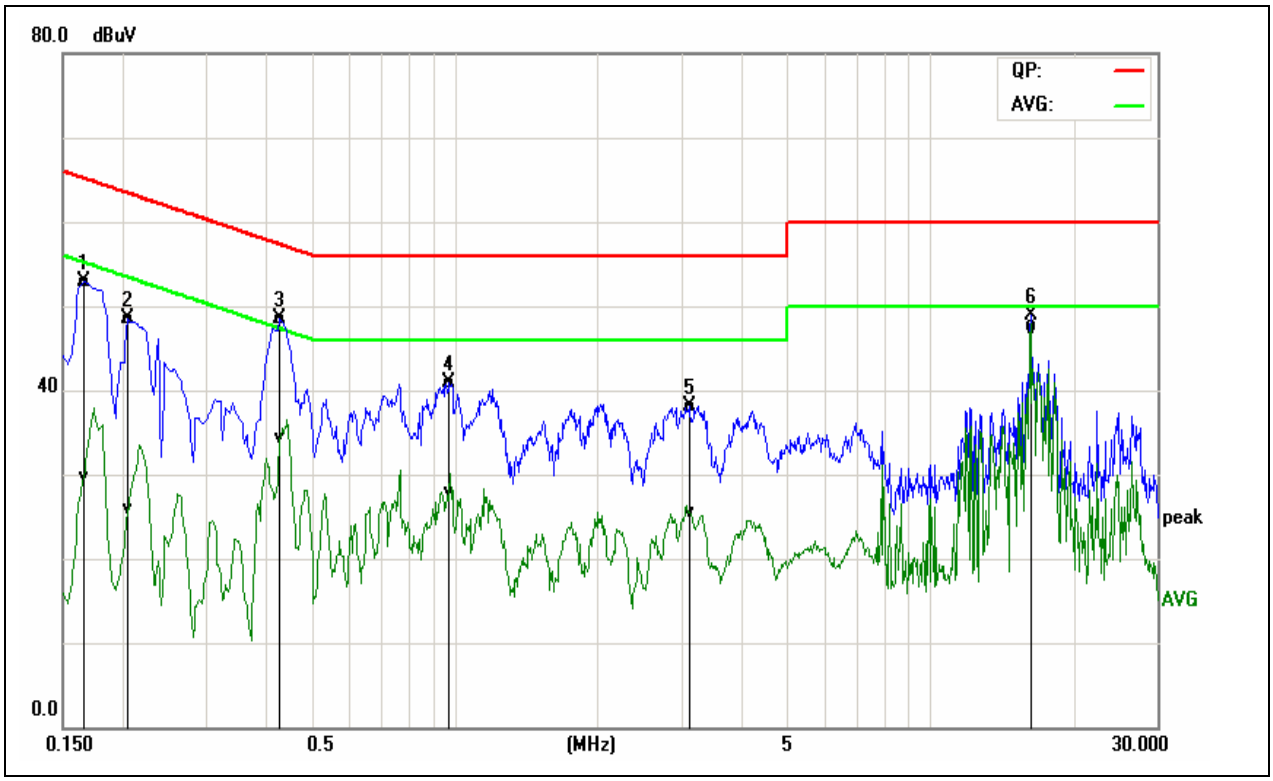
6.8.5DATA SAMPLE

Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XXXX	32.69	25.65	11.52	44.21	37.17	65.78	55.79	-21.57	-18.62	Pass

Factor = Insertion loss of LISN + Cable Loss
Result = Quasi-peak Reading/ Average Reading + Factor
Limit = Limit stated in standard
Margin = Result (dBuV) – Limit (dBuV)

6.8.6TEST RESULTS

Model No.	BTW218	**RBW,VBW**	9 kHz
Environmental Conditions	22°C, 45% RH	**Test Mode**	Mode 2
Tested by	Eve Wang	**Line**	L1
Test Date	September 9, 2014		

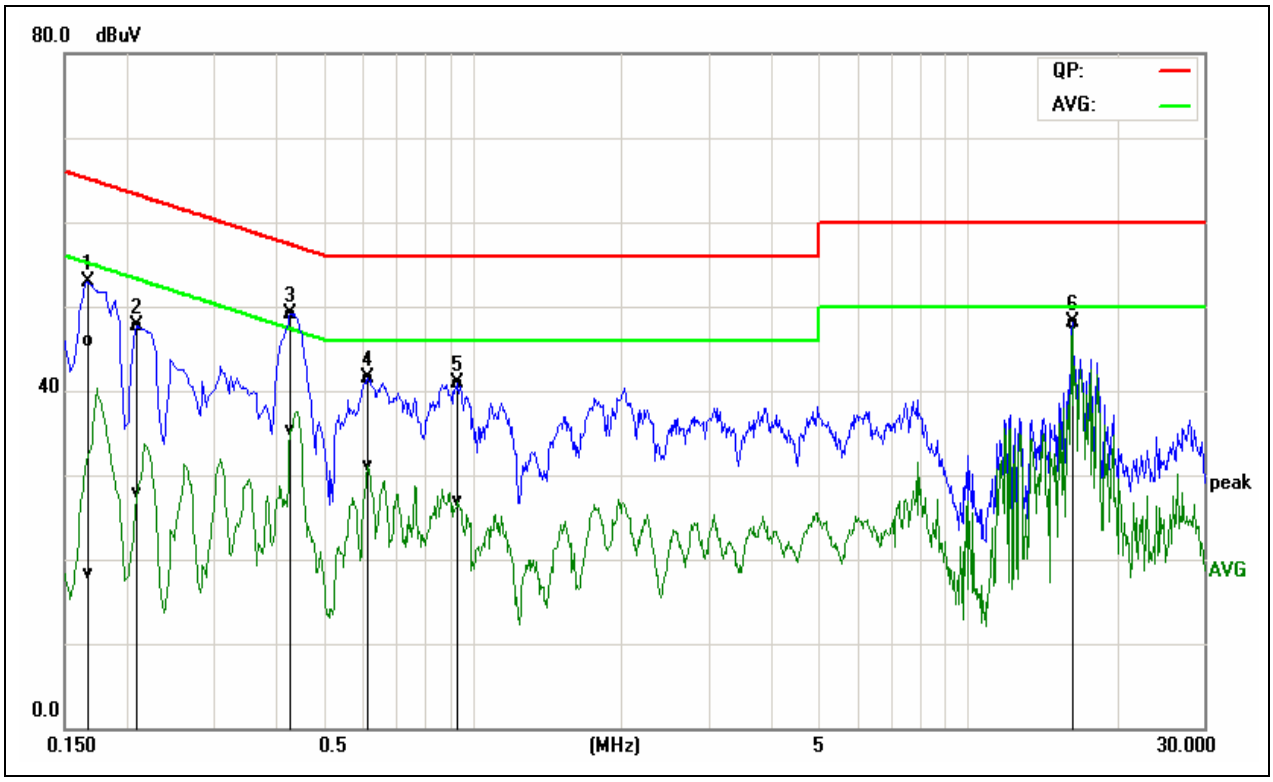


Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
0.1660	43.36	20.12	9.61	52.97	29.73	65.15	55.16	-12.18	-25.43	Pass
0.2060	38.76	16.23	9.69	48.45	25.92	63.36	53.37	-14.91	-27.45	Pass
0.4300	38.78	24.60	9.68	48.46	34.28	57.25	47.25	-8.79	-12.97	Pass
0.9780	31.18	18.26	9.72	40.90	27.98	56.00	46.00	-15.10	-18.02	Pass
3.1180	28.40	15.79	9.71	38.11	25.50	56.00	46.00	-17.89	-20.50	Pass
16.2291	37.77	37.01	9.89	47.66	46.90	60.00	50.00	-12.34	-3.10	Pass

Remark:

1. *Measuring frequencies from 0.15 MHz to 30MHz.*
2. *The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.*
3. *The IF bandwidth of SPA between 0.15MHz to 30MHz was 10kHz; the IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9kHz;*
4. *L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)*

Model No.	BTW218	**RBW,VBW**	9 kHz
Environmental Conditions	22°C, 45% RH	**Test Mode**	Mode 2
Tested by	Eve Wang	**Line**	L2
Test Date	September 9, 2014		



Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
0.1685	36.05	8.54	9.78	45.83	18.32	65.03	55.03	-19.20	-36.71	Pass
0.2100	37.99	18.04	9.79	47.78	27.83	63.20	53.21	-15.42	-25.38	Pass
0.4300	39.41	25.55	9.70	49.11	35.25	57.25	47.25	-8.14	-12.00	Pass
0.6140	31.72	21.37	9.69	41.41	31.06	56.00	46.00	-14.59	-14.94	Pass
0.9340	31.04	17.12	9.79	40.83	26.91	56.00	46.00	-15.17	-19.09	Pass
16.2300	38.49	37.77	9.71	48.20	47.48	60.00	50.00	-11.80	-2.52	Pass

Remark:

1. *Measuring frequencies from 0.15 MHz to 30MHz.*
2. *The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.*
3. *The IF bandwidth of SPA between 0.15MHz to 30MHz was 10kHz; the IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9kHz;*
4. *L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)*

6.9 FREQUENCY STABILITY

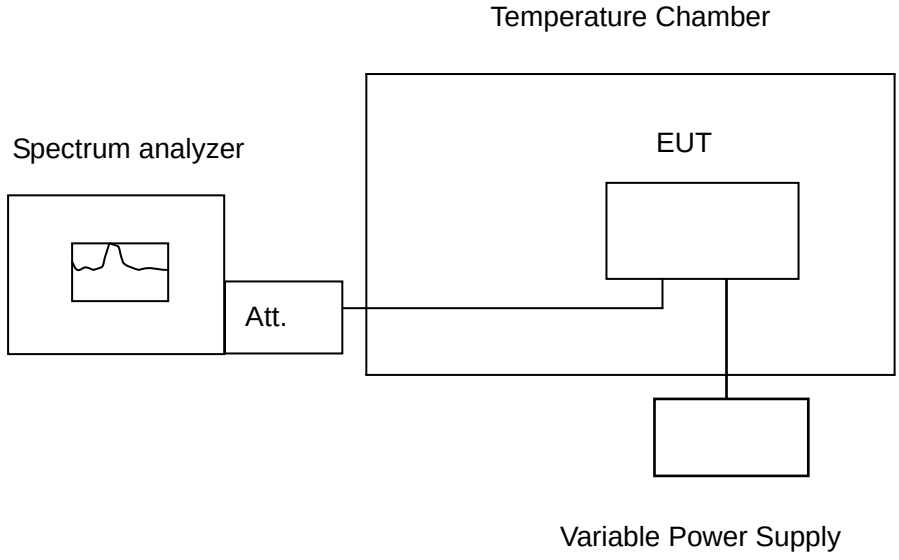
6.9.1LIMIT

According to §15.407(g), manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the operational description.

6.9.2TEST INSTRUMENTS

Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/01/2014	03/01/2015
DC Power Supply	DAZHENG	PS-605D	20018978	N.C.R	N.C.R
AC POWER SOUCE	UMART	HPA1010	N/A	N.C.R	N.C.R
Power Meter	Anritsu	ML2495A	1204003	03/01/2014	03/01/2015
Power Sensor	Anritsu	MA2411B	1126150	03/01/2014	03/01/2015
Temperature Chamber	TERCHY	MHG-800N	E21104	11/18/2013	11/18/2014
Temp. / Humidity Meter	Anymetre	JR913	N/A	02/28/2014	02/28/2015

6.9.3TEST CONFIGURATION



Remark: *Measurement setup for testing on Antenna connector*

6.9.4TEST PROCEDURE

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20^{o}C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to –20^{o}C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10^{o}C increased per stage until the highest temperature of +50^{o}C reached.

6.9.5TEST RESULTS

No non-compliance noted.

Test Data
Antenna 1

5736MHz **(Low)**

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5735.994943	5725-5850	PASS
40	120	5735.992617	5725-5850	PASS
30	120	5735.973890	5725-5850	PASS
20	120	5735.964134	5725-5850	PASS
10	120	5735.981432	5725-5850	PASS
0	120	5735.967545	5725-5850	PASS
-10	120	5735.971569	5725-5850	PASS
-20	120	5735.991933	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	102	5735.968960	5725-5850	PASS
	120	5735.960044	5725-5850	PASS
	138	5735.956168	5725-5850	PASS

5736 MHz **(High)**

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5735.952629	5725-5850	PASS
40	120	5735.965066	5725-5850	PASS
30	120	5735.950612	5725-5850	PASS
20	120	5735.993163	5725-5850	PASS
10	120	5735.960094	5725-5850	PASS
0	120	5735.979041	5725-5850	PASS
-10	120	5735.949624	5725-5850	PASS
-20	120	5735.982325	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	102	5735.996693	5725-5850	PASS
	120	5735.984208	5725-5850	PASS
	138	5735.951555	5725-5850	PASS

5814MHz **(Low)**

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5813.956605	5725-5850	PASS
40	120	5813.962003	5725-5850	PASS
30	120	5813.965040	5725-5850	PASS
20	120	5813.967859	5725-5850	PASS
10	120	5813.950618	5725-5850	PASS
0	120	5813.968655	5725-5850	PASS
-10	120	5813.958812	5725-5850	PASS
-20	120	5813.991657	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	102	5813.981187	5725-5850	PASS
	120	5813.988278	5725-5850	PASS
	138	5813.953362	5725-5850	PASS

5814 MHz **(High)**

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5813.973630	5725-5850	PASS
40	120	5813.958857	5725-5850	PASS
30	120	5813.969152	5725-5850	PASS
20	120	5813.951208	5725-5850	PASS
10	120	5813.978396	5725-5850	PASS
0	120	5813.997863	5725-5850	PASS
-10	120	5813.976745	5725-5850	PASS
-20	120	5813.978516	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	102	5813.960288	5725-5850	PASS
	120	5813.979581	5725-5850	PASS
	138	5813.993512	5725-5850	PASS

Antenna 1

5736MHz **(Low)**

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5735.961912	5725-5850	PASS
40	120	5735.989777	5725-5850	PASS
30	120	5735.978732	5725-5850	PASS
20	120	5735.985000	5725-5850	PASS
10	120	5735.972865	5725-5850	PASS
0	120	5735.981650	5725-5850	PASS
-10	120	5735.963577	5725-5850	PASS
-20	120	5735.981327	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	102	5735.983167	5725-5850	PASS
	120	5735.971409	5725-5850	PASS
	138	5735.987772	5725-5850	PASS

5736 MHz **(High)**

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5735.985592	5725-5850	PASS
40	120	5735.987317	5725-5850	PASS
30	120	5735.960026	5725-5850	PASS
20	120	5735.998279	5725-5850	PASS
10	120	5735.965932	5725-5850	PASS
0	120	5735.964771	5725-5850	PASS
-10	120	5735.957175	5725-5850	PASS
-20	120	5735.969145	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	102	5735.981273	5725-5850	PASS
	120	5735.985432	5725-5850	PASS
	138	5735.987352	5725-5850	PASS

5814MHz **(Low)**

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5813.998559	5725-5850	PASS
40	120	5813.958245	5725-5850	PASS
30	120	5813.959884	5725-5850	PASS
20	120	5813.955103	5725-5850	PASS
10	120	5813.981998	5725-5850	PASS
0	120	5813.992213	5725-5850	PASS
-10	120	5813.986379	5725-5850	PASS
-20	120	5813.953001	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	102	5813.963168	5725-5850	PASS
	120	5813.960216	5725-5850	PASS
	138	5813.997617	5725-5850	PASS

5814 MHz **(High)**

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
50	120	5813.985982	5725-5850	PASS
40	120	5813.976334	5725-5850	PASS
30	120	5813.955179	5725-5850	PASS
20	120	5813.998528	5725-5850	PASS
10	120	5813.992059	5725-5850	PASS
0	120	5813.974890	5725-5850	PASS
-10	120	5813.997818	5725-5850	PASS
-20	120	5813.981491	5725-5850	PASS

Environment Temperature (°C)	Volage (V)	Measured Frequency (MHz)	limit Range	Test Result
20	102	5813.998271	5725-5850	PASS
	120	5813.951914	5725-5850	PASS
	138	5813.967935	5725-5850	PASS