Report No.:SZ12030210E04

TESTING
CNAS L3572

FCC/IC TEST REPORT

Issued to

Shenzhen Grandsun Electronic Co., Ltd.

For

A50 HEADSET

Model Name:	TXD
Trade Name:	ASTRO
Brand Name:	ASTRO GAMING
FCC ID:	BZ9GS1041000
IC ID:	10276A-GS1041000
Standard:	47 CFR Part 15 Subpart C
	RSS-210 issue 8: 2010 Annex 2.9
Test date:	May 15, 2012 – June 18, 2012
Issue date:	June 28, 2012

By

Shenzhen Morlab Communications Technology Co., Ltd.

Tested by Tu Lang
Tu Lang
Date 2012.6.28

Approved by Wei Yanquan
Wei Yanquan
Date 2012.6.28

Review by Huang Pulong
Huang Pulong
Date 2012.6.28

TABLE OF CONTENTS

Version		
Version NO.	Date	Description
1.0	June 28, 2012	Initial creation of document

1. GENERAL INFORMATION

1.1 EUT Description

EUT Type..... Mixamp ™ TX (Transmitter)
Serial No. ..... (n.a., marked #1 by test site)
Hardware Version v07
Software Version..... A
Applicant ..... Shenzhen Grandsun Electronic Co., Ltd.
Pingdi Gaoqiao Industry Zone, Longgang District, Shenzhen, China
Manufacturer ..... Shenzhen Grandsun Electronic Co., Ltd.
Pingdi Gaoqiao Industry Zone, Longgang District, Shenzhen, China
Modulation Type..... DSSS
Operation Frequency ..... 5736~5814MHz
Power supply ..... USB Power supply

Note 1: The EUT is Mixamp ™ TX (Transmitter) which is a part of the Wireless Headphone System, the Wireless Headphone System consists of two parts: A50 Headset and Mixamp ™ TX, the Mixamp ™ TX was tested in this report. During the measurement, the EUT was operated in the engineering operating mode as a transmitter, the TX frequency was fixed at 5736, 5762 and 5814MHz which were for the purpose of the measurements.

Note 2: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C for the EUT FCC ID Certification, according to RSS-210 issue 8: 2010 Annex 2.9 for the EUT Industry Canada Certification.

No.	Identity	Document Title
1	47 CFR Part 15 (11-10-01Edition)	Radio Frequency Devices
2	RSS-210 issue 8: 2010, Annex 2.9	Devices Operating in Frequency Bands for Any Application

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Result
1	47 CFR Part 15: §15.203	Antenna Requirement	Compliance
2	47 CFR Part 15: §15.207 RSS-Gen: §7.2.2	Conducted Emission	Compliance
3	47 CFR Part 15: §15.249(a)(d) RSS-210 issue 8: §A2.9(a)	Field Strength Measurement	Compliance
4	47 CFR Part 15: §15.249(e) RSS-210 issue 8: §A2.9(b)	TX Spurious Emission	Compliance
5	47 CFR Part 15: §15.249(d)	Band Edge Measurement	Compliance
6	RSS-Gen §4.6.1	99% Power Bandwidth	Compliance

NOTE:

1 All measurements contained in this report were conducted with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Equipment in the range of 9 kHz to 40GHz for FCC ID Certification, conducted with RSS-Gen Issue 3, General Requirements and Information for the Certification of Radio Apparatus for IC Certification.

1.3 Facilities and Accreditations

1.3.1 Facilities

Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L3572.

All measurement facilities used to collect the measurement data are located at 3/F, Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen, 518055 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22; the FCC registration number is 741109.

1.3.2 Test Environment Conditions

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

Temperature (°C):	15 - 35
Relative Humidity (%):	30 - 60
Atmospheric Pressure (kPa):	86 - 106

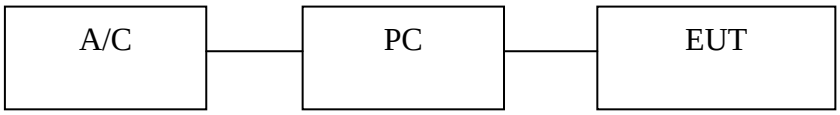
1.3.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Uncertainty of Conducted Emission:	±1.8dB
Uncertainty of Radiated Emission:	±3.1dB

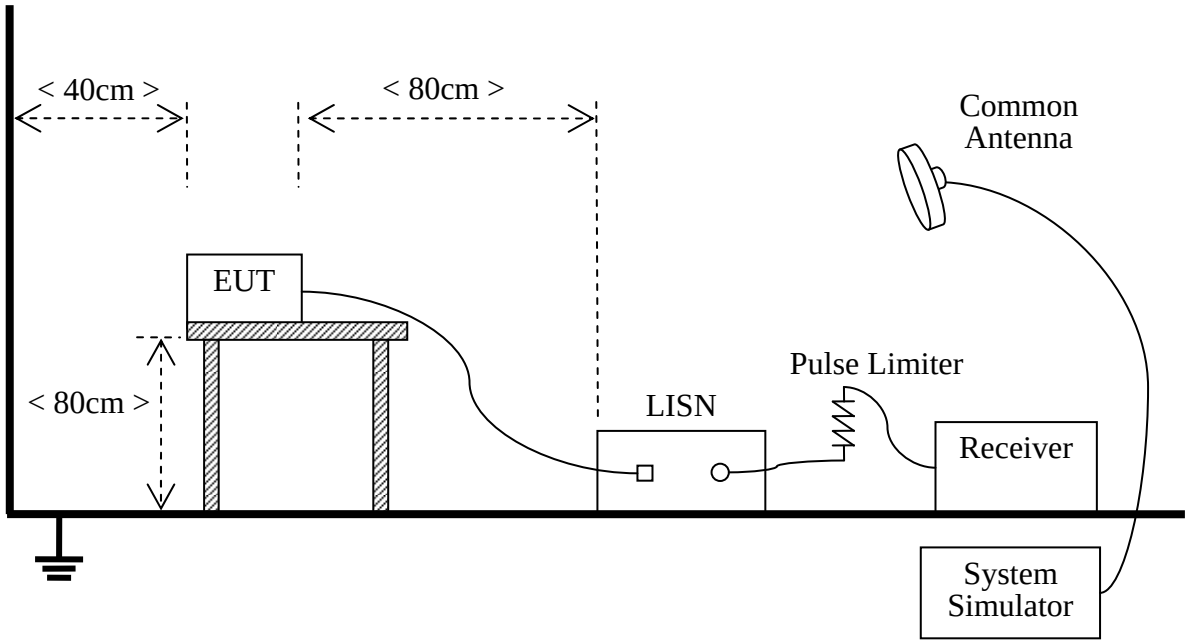
2. TEST SETUP AND EQUIPMENTS LIST

2.1 Configuration of Tested System



2.2 Conducted Emission Measurement

A. Test Setup:



The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides 50Ω/50μH of coupling impedance for the measuring instrument. The Common Antenna is used for the call between the EUT and the System Simulator (SS). A Pulse Limiter is used to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.

B. Test Procedure

1. The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted on a variable-height antenna master tower.

2. For each suspected emission, the EUT is arranged to its worst case and then the Test Antenna is tuned to the heights from 1 to 4m and the Turn Table is tuned from 0 to 360 degrees to find the maximum reading.

3. The Test Antenna is a bi-log one, and its height is varied from 1 to 4m above the ground to determine the maximum value of the field strength. Both the vertical and the horizontal polarizations of the Test Antenna are considered to perform the tests.

4. The maximum radiated emission is searched using PK and QP detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with QP detectors.

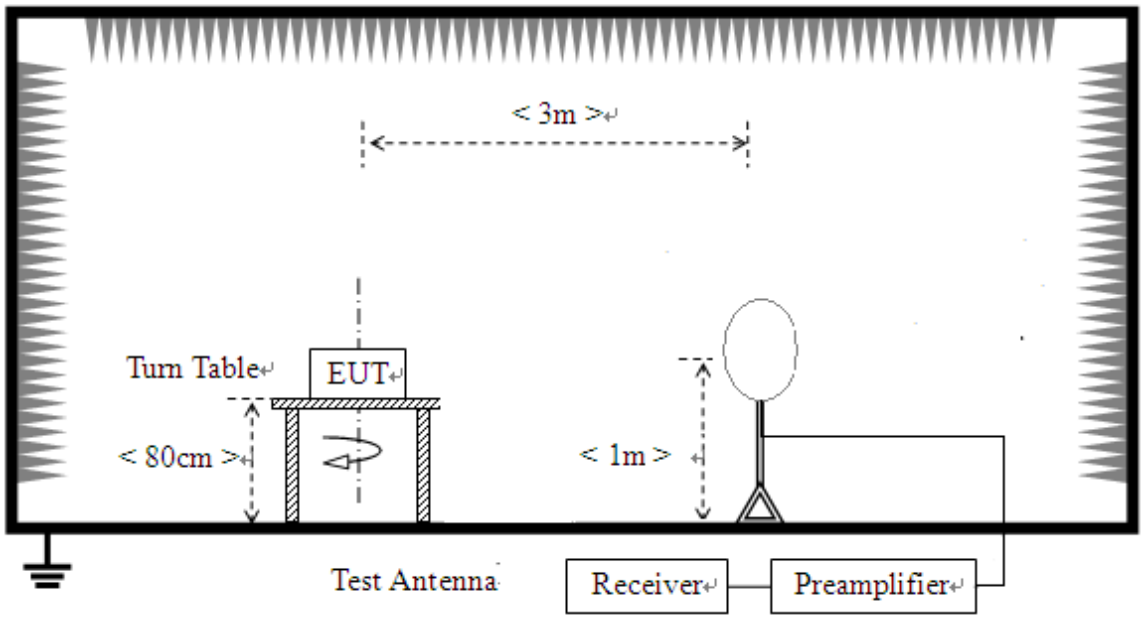
C. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date
EMC Analyzer	Agilent	E7405A	US44210471	2012.05
Receiver	Narda	PMM 9060	001WX11001	2011.12
Receiver	Narda	PMM 9010	595WX11007	2011.11
LISN	Schwarzbeck	NSLK 8127	812744	2012.05
Pulse Limiter (20dB)	Schwarzbeck	VTSD 9561-D	9391	(n.a.)
System Simulator	Agilent	E5515C	GB43130131	2012.05
T-Flash Card	SanDisk	256MB	(n.a.)	(n.a.)

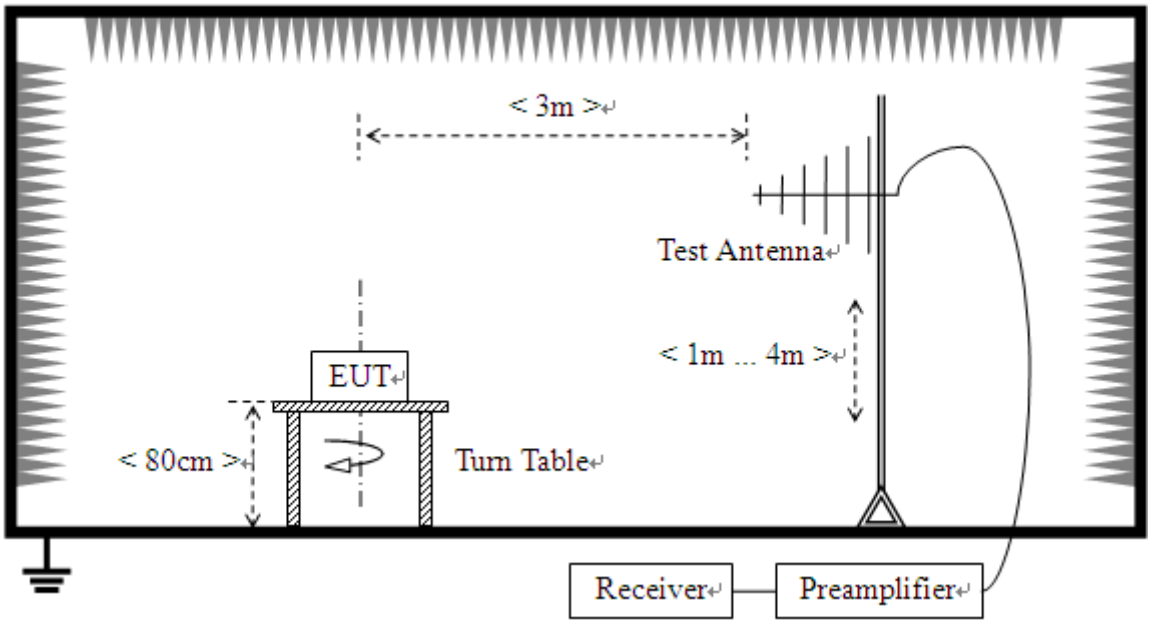
2.3 Radiated Emission Measurement

A. Test Setup:

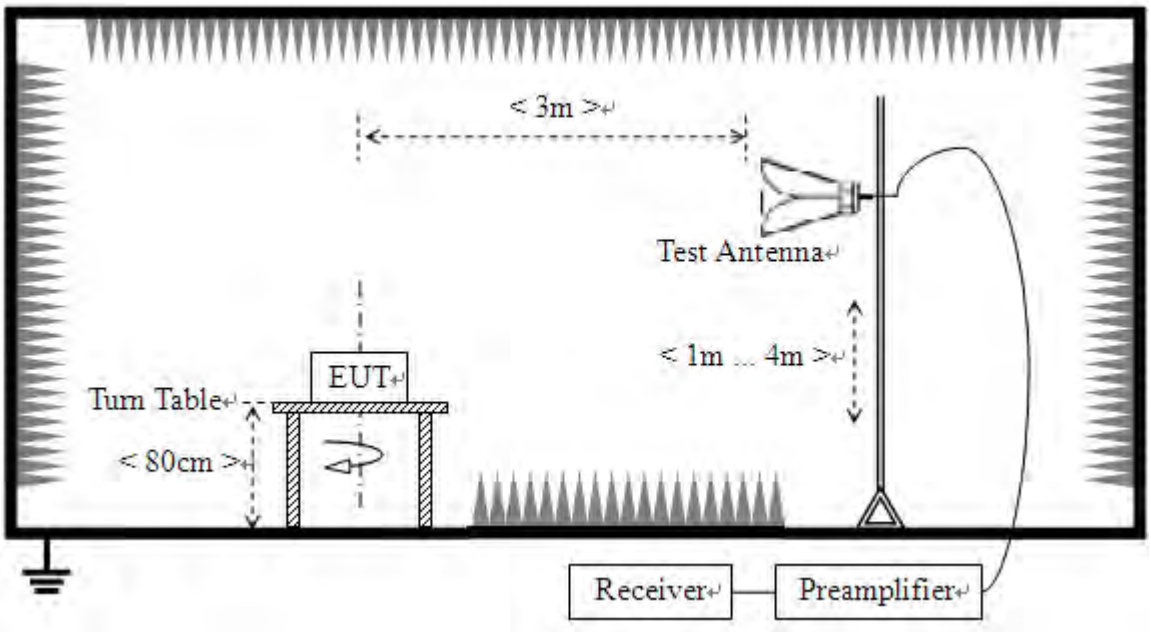
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to1GHz



3) For radiated emissions above 1GHz



B. Test Procedure

The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor, cable loss and so on of the site (factors) is calculated to correct the reading. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted on a variable-height antenna master tower.

For the test Antenna:

1) In the frequency range of 9KHz to 30MHz, magnetic field is measured with Loop Test Antenna.

The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.

2) In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

C. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date
EMC Analyzer	Agilent	E7405A	US44210471	2012.05
Receiver	Narda	PMM 9060	001WX11001	2011.12

Description	Manufacturer	Model	Serial No.	Cal. Date
Receiver	Narda	PMM 9010	595WX11007	2011.11
Semi-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	2012.05
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-274	2012.05
Test Antenna - Horn	Schwarzbeck	BBHA 9120D	9120D-963	2012.05
Test Antenna -Loop	Schwarzbeck	FMZB 1519	1519-022	2012.05
Test Antenna - Horn	R&S	HL050S7	71688	2012.05
Test Antenna - Horn	Amplifier Research	AT4550	308276	2012.05

3. REQUIREMENTS

3.1 Antenna requirement

3.1.1 Applicable Standard

According to FCC 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

Result: Compliant

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.

3.2 Conducted Emission

3.2.1 Applicable Standard

According to section 15.207(a) and RSS-Gen §7.2.2 Conducted Emission Limits is as following:

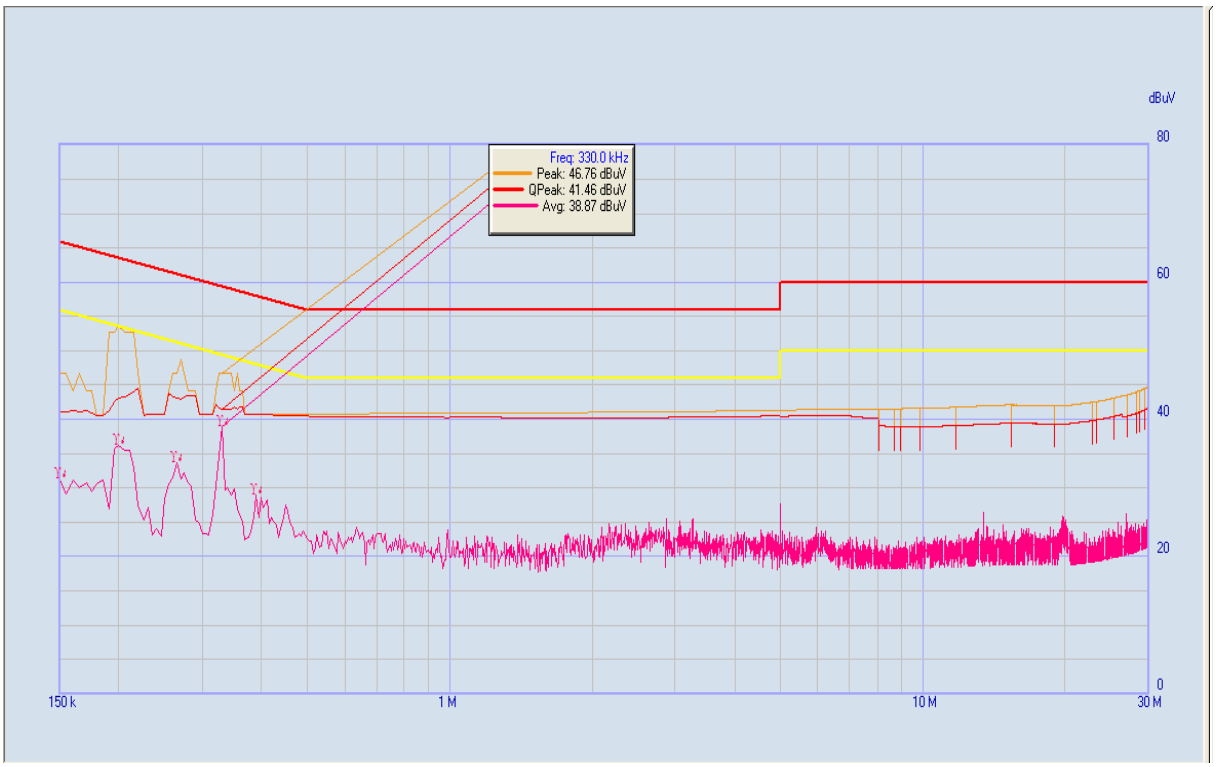
Frequency range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

NOTE:

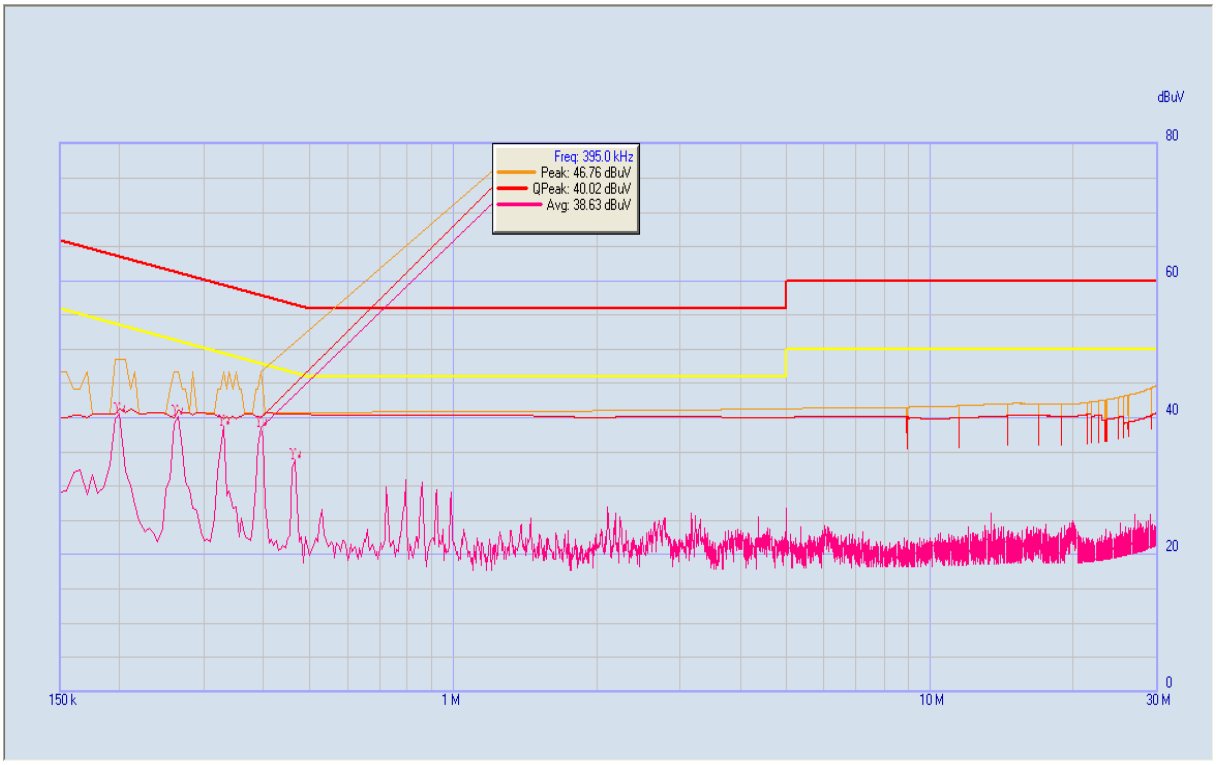
1. The limit is applicable to Class B ITE.
2. The lower limit shall apply at the band edges.
3. The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

3.2.2 Test Result

A. Test Plots And Suspicious Points:



(Plot A: L Phase)



(Plot B: N Phase)

Result: Compliant

3.3 Radiated Emission

3.3.1 Applicable Standard

According to section 15.249(a) and RSS-210 issue 8, §A2.9(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Frequency (MHz)	Field strength of Fundamental	Field strength of Harmonics	Distance (m)
902~928	50mV/m (94dBμV/m)	500μV/m (54dBμV/m)	3
2400~2483.5	50mV/m (94dBμV/m)	500μV/m (54dBμV/m)	3
5725~5875	50mV/m (94dBμV/m)	500μV/m (54dBμV/m)	3

According to section 15.249(d) and RSS-210 issue 8, §A2.9(b), Emission Radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in Section 15.209 and RSS-210:

Frequency range (MHz)	Field Strength		Field Strength Limitation at 3m Measurement Dist	
	μV/m	Dist	(uV/m)	(dBuV/m)
0.009 - 0.490	2400/F(KHz)	300m	10000* 2400/F(KHz)	20log 2400/F(KHz) + 80
0.490 - 1.705	2400/F(KHz)	30m	100* 2400/F(KHz)	20log 2400/F(KHz) + 40
1.705 - 30.00	30	30m	100*30	20log 30 + 40
30.0 - 88.0	100	3m	100	20log 100
88.0 - 216.0	150	3m	150	20log 150
216.0 - 960.0	200	3m	200	20log 200
Above 960.0	500	3m	500	20log 500

According to section 15.249(e) and RSS-210 issue 8, for frequencies above 1000MHz, the above field strength limits are based on average limits. 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.

Note:

1) The tighter limit shall apply at the boundary between two frequency range.
2) Limitation expressed in dBuV/m is calculated by 20log Emission Level(uV/m).
3) If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula of $Ld1 = Ld2 * (d2/d1)^{2.}$
   Example: F.S Limit at 30m distance is 30uV/m, then F.S Limitation at 3m distance is adjusted as $Ld1 = L1 = 30uV/m * (10)^2 = 100 * 30uV/m$

3.3.2 Test Result

The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

Note: All radiated emission tests were performed in X, Y, Z axis direction, and only the worst axis test condition was recorded in this test report.

3.3.2.1 Radiated Spurious Emission Measurement Result (below 1GHz)

A. TX CH High (5736MHz)

Frequency (MHz)	Detector Mode (PK/QP)	Polar. (H/V)	Reading (dBμV)	Factor (dB)	Actual Emission (dBμV/m)	Limits (dBμV/m)	Verdict
167.36	Peak	H	53.95	-19.27	34.68	43.5	PASS
421.26	Peak	H	56.05	-17.43	38.62	46	PASS
597.16	Peak	H	51.67	-17.02	34.65	46	PASS
950.67	Peak	H	53.33	-14.26	39.07	46	PASS
167.36	Peak	V	52.84	-19.27	33.57	43.5	PASS
421.26	Peak	V	55.08	-17.43	37.65	46	PASS
597.16	Peak	V	51.42	-17.02	34.40	46	PASS
950.67	Peak	V	52.5	-14.26	38.24	46	PASS

B. TX CH High (5762MHz)

Frequency (MHz)	Detector Mode (PK/QP)	Polar. (H/V)	Reading (dBμV)	Factor (dB)	Actual Emission (dBμV/m)	Limits (dBμV/m)	Verdict
167.36	Peak	H	54.55	-19.27	35.28	43.5	PASS
421.26	Peak	H	57.03	-17.43	39.60	46	PASS
597.16	Peak	H	52.64	-17.02	35.64	46	PASS
950.67	Peak	H	53.23	-14.26	38.97	46	PASS
167.36	Peak	V	54.64	-19.27	35.37	43.5	PASS
421.26	Peak	V	56.08	-17.43	38.65	46	PASS
597.16	Peak	V	51.06	-17.02	34.04	46	PASS
950.67	Peak	V	52.68	-14.26	38.42	46	PASS

C. TX CH High (5814MHz)

Frequency (MHz)	Detector Mode (PK/QP)	Polar. (H/V)	Reading (dBµV)	Factor (dB)	Actual Emission (dBµV/m)	Limits (dBµV/m)	Verdict
167.36	Peak	H	56.1	-19.27	37.52	43.5	PASS
421.26	Peak	H	56.32	-17.43	39.64	46	PASS
597.16	Peak	H	52.11	-17.02	34.61	46	PASS
950.67	Peak	H	52.24	-14.26	38.16	46	PASS
167.36	Peak	V	57.29	-19.27	37.86	43.5	PASS
421.26	Peak	V	54.44	-17.43	36.65	46	PASS
597.16	Peak	V	50.58	-17.02	33.26	46	PASS
950.67	Peak	V	52.44	-14.26	37.42	46	PASS

NOTE:

1. No further spurious emissions detected from the lowest internal frequency and 30MHz.
2. Measuring frequencies from the lowest internal frequency to 1GHz.
3. Radiated emissions measured in frequency range from 30MHz to 1000MHz were made with an instrument using Peak/QP detector mode.
4. The Factor = Cable loss + Antenna factor – Amplifier factor.

3.3.2.2 Radiated Spurious Emission Measurement Result (above 1GHz)

A. TX CH High (5736MHz)

Fre (MHz)	Polar (H/V)	Reading_Peak (dBμV)	Reading_Avg (dBμV)	Total Factor (dB)	PEAK (dBμV/m)	AVG (dBμV/m)	Limits		Result (Pass /Fail)	Emissions Type
							Peak	AVG		
5736.0	H	90.68	81.66	3.3	93.98	84.96	114	94	PASS	F
4936.1	H	36.04	--	1.9	37.94	--	74	54	PASS	S
11472.0	H	--	--		--	--	74	54	PASS	H
17208.0	H	--	--		--	--	74	54	PASS	H
22944	H	--	--		--	--	74	54	PASS	H
28680	H	--	--		--	--	74	54	PASS	H
34416	H	--	--		--	--	74	54	PASS	H
5736.0	V	85.56	75.34	3.3	88.86	78.64	114	94	PASS	F
4936.1	V	38.36	--	1.9	38.26	--	74	54	PASS	S
11472.0	V	--	--		--	--	74	54	PASS	H
17208.0	V	--	--		--	--	74	54	PASS	H
22944	V	--	--		--	--	74	54	PASS	H
28680	V	--	--		--	--	74	54	PASS	H
34416	V	--	--		--	--	74	54	PASS	H

B. TX CH High (5762MHz)

Fre (MHz)	Polar (H/V)	Reading_Peak (dBμV)	Reading_Avg (dBμV)	Total Factor (dB)	PEAK (dBμV/m)	AVG (dBμV/m)	Limits		Result (Pass /Fail)	Emissions Type
							Peak	AVG		
5762.0	H	90.12	81.36	3.9	94.02	85.26	114	94	PASS	F
4936.1	H	34.52	--	1.9	36.42	--	74	54	PASS	S
11524	H	--	--		--	--	74	54	PASS	H
17286	H	--	--		--	--	74	54	PASS	H
23048	H	--	--		--	--	74	54	PASS	H
28810	H	--	--		--	--	74	54	PASS	H
34572	H	--	--		--	--	74	54	PASS	H
5762.0	V	87.7	75.4	3.9	91.6	79.3	114	94	PASS	F
4936.1	V	32.75	--	1.9	34.65	--	74	54	PASS	S
11524	V	--	--		--	--	74	54	PASS	H
17286	V	--	--		--	--	74	54	PASS	H

23048	V	--	--		--	--	74	54	PASS	H
28810	V	--	--		--	--	74	54	PASS	H
34572	V	--	--		--	--	74	54	PASS	H

C. TX CH High (5814MHz)

Fre (MHz)	Polar (H/V)	Reading_Peak (dBµV)	Reading_Avg (dBµV)	Total Factor (dB)	PEAK (dBµV/m)	AVG (dBµV/m)	Limits		Result (Pass /Fail)	Emissions Type
							Peak	AVG		
5814.0	H	91.01	81.94	4.1	95.11	86.04	114	94	PASS	F
4936.1	H	33.43	--	1.9	35.33	--	74	54	PASS	S
11628	H	--	--		--	--	74	54	PASS	H
17442	H	--	--		--	--	74	54	PASS	H
23256	H	--	--		--	--	74	54	PASS	H
29070	H	--	--		--	--	74	54	PASS	H
34884	H	--	--		--	--	74	54	PASS	H
5814.0	V	86.7	75.8	4.1	90.8	79.9	114	94	PASS	F
4936.1	V	33.74	--	1.9	35.64	--	74	54	PASS	S
11628	V	--	--		--	--	74	54	PASS	H
17442	V	--	--		--	--	74	54	PASS	H
23256	V	--	--		--	--	74	54	PASS	H
29070	V	--	--		--	--	74	54	PASS	H
34884	V	--	--		--	--	74	54	PASS	H

Note:

1. Measuring frequencies from 1GHz to 40GHz.
2. Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20 dB.
3. “F” denotes fundamental frequency, “H” demotes harmonics frequency, “S” denotes spurious frequency.
4. Measurement of data 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. The Factor = Cable loss + Antenna factor – Amplifier factor.

Result: Compliant

3.4 Band Edge

3.4.1 Applicable Standard

According to 15.249(d), out band emission except for harmonics shall be comply with §15.209 or at least attenuated by 50dB below the level of the fundamental.

3.4.2 Test SET-UP (Block Diagram of Configuration)

Same as 2.3 A Radiated Emission Measurement.

3.4.3 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
4. Repeat above procedures until all measured frequencies were complete.

3.4.4 Measurement Equipment Used

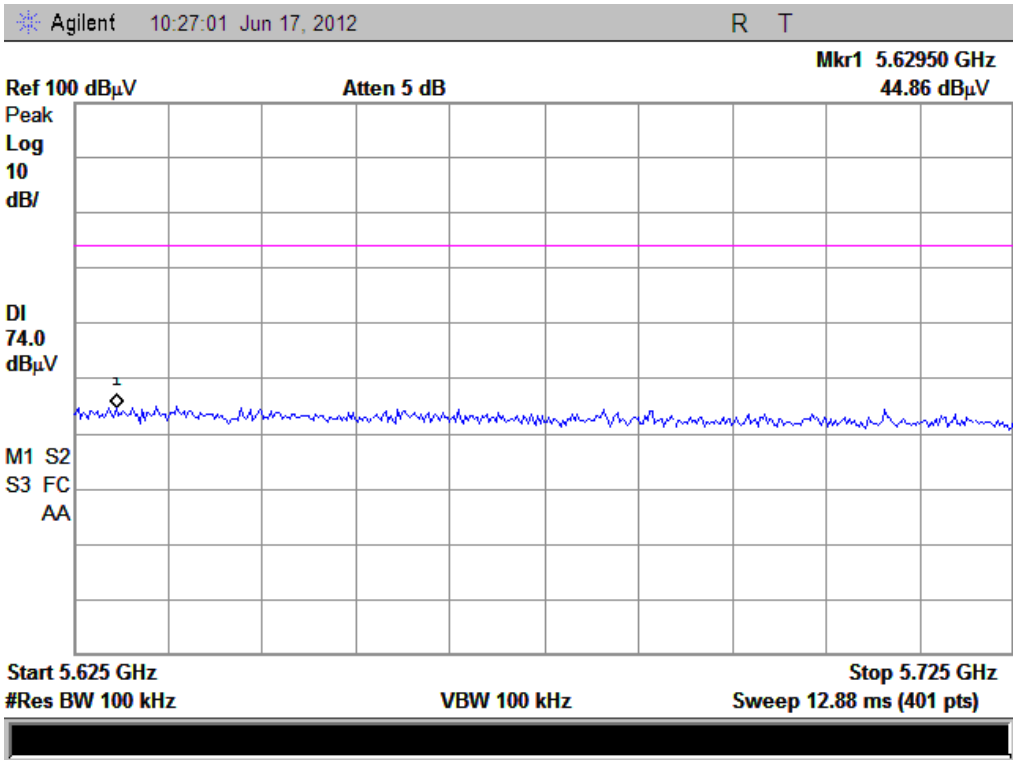
Same as 2.3 C Radiated Emission Measurement.

3.4.5 Measurement Data

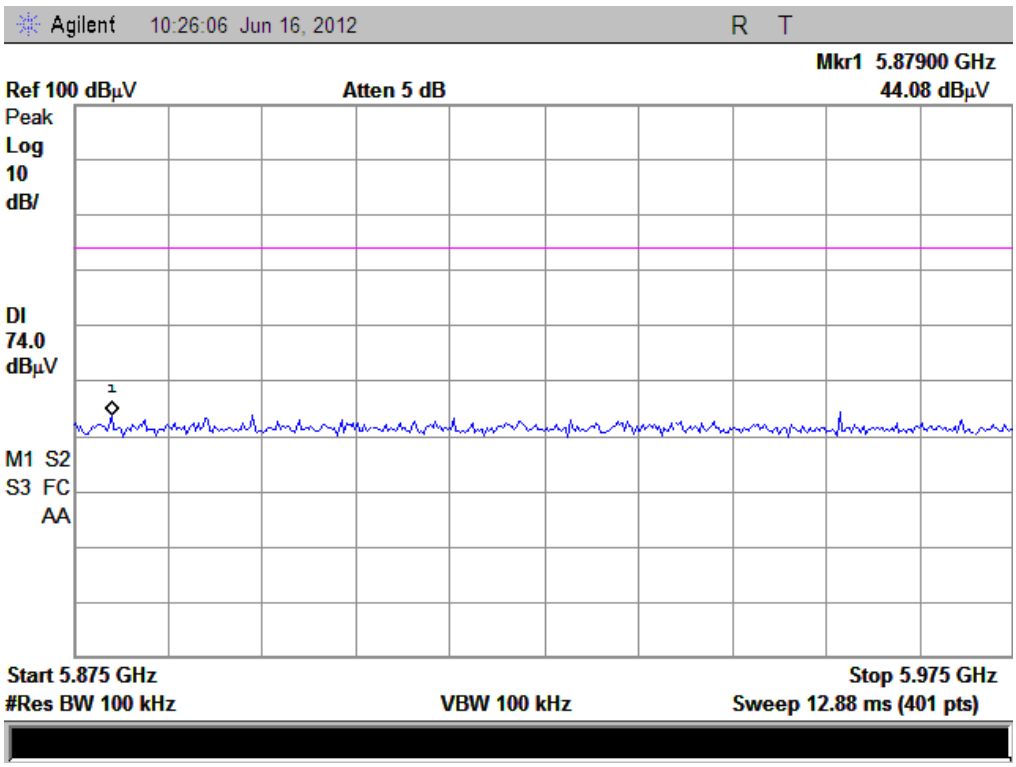
Test Result:

1. Lower band edge: Emission radiated outside of the lower edge is attenuated by at least 50 dB below the level of the fundamental.
2. Upper band edge: Emission radiated outside of the upper edge is attenuated by at least 50 dB below the level of the fundamental.

Refer to attached data plots as follows.



(Plot A: Lower band edge)



(Plot B: Upper band edge)

Result: Compliant

3.5 99% Occupied Bandwidth

3.5.1 Applicable Standard

According to RSS-Gen §4.6.1, when an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.

3.5.2 Test SET-UP (Block Diagram of Configuration)

Same as 2.3 A Radiated Emission Measurement.

3.5.3 Measurement Procedure

1. Place the EUT on the table and set it in 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% of the approximate emission bandwidth, VBW=3times RBW, Span=approximately 20 dB below the peak level. Sweep=auto
4. Turn on the 99% bandwidth function, max rading.
5. Repeat above procedures until all frequency measured were complete.

3.5.4 Measurement Equipment Used

Same as 2.3 C Radiated Emission Measurement.

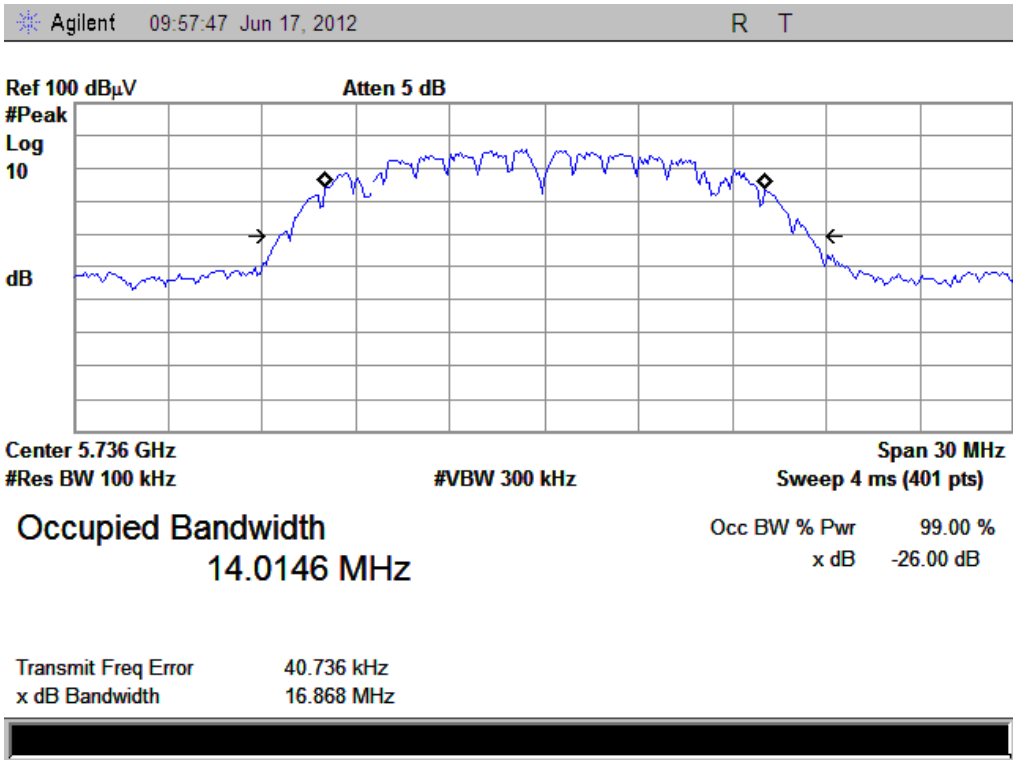
3.5.5 Measurement Data

5736 Channel = 14.0146MHz

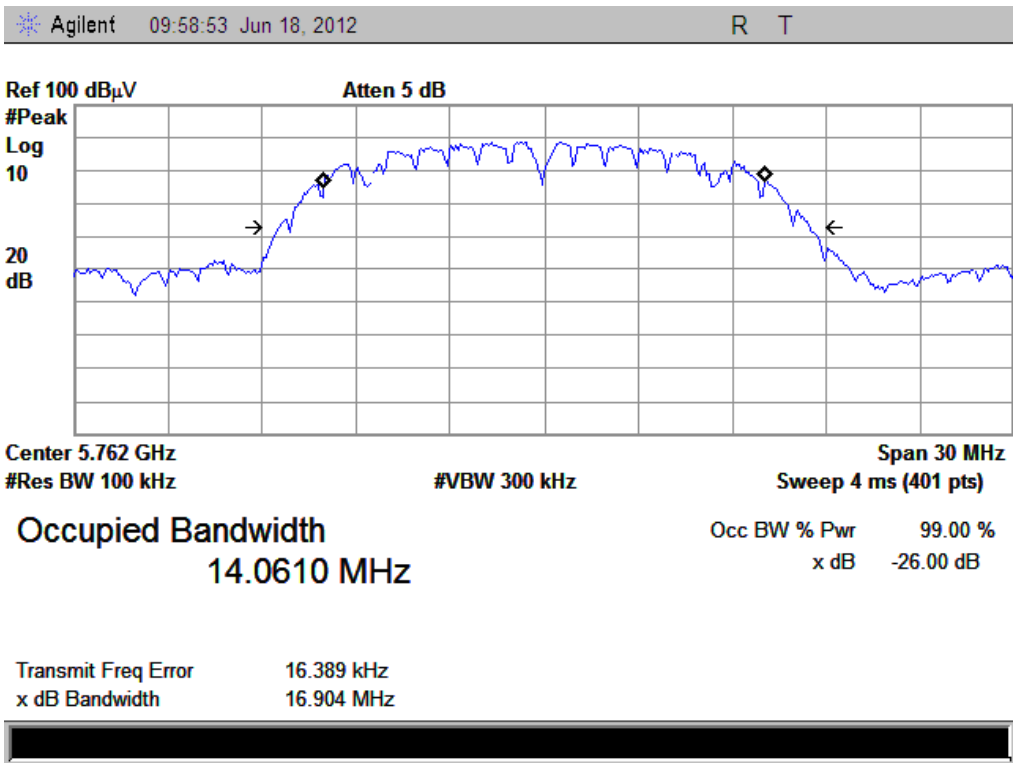
5762 Channel = 14.0610MHz

5814 Channel = 14.0046MHz

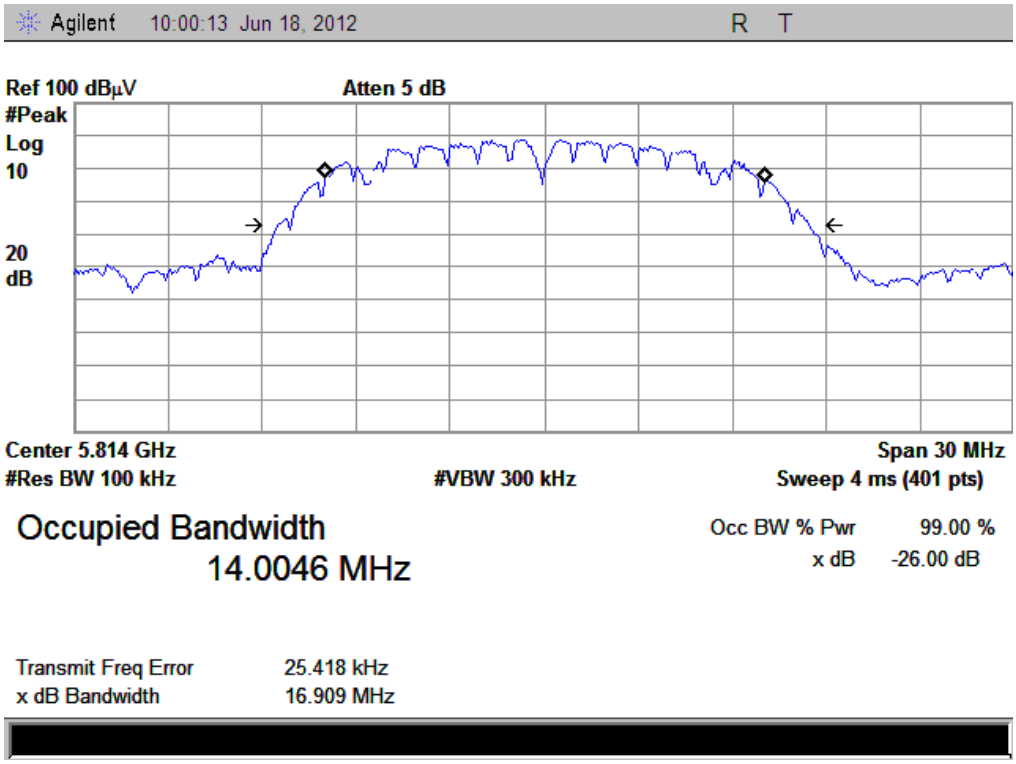
Refer to attached data plots as follows.



(Plot A: 5736 Channel)



(Plot B: 5762 Channel)



(Plot C: 5814 Channel)

Result: Compliant

** END OF REPORT **