APPLICATION CERTIFICATION FCC Part 15C
On Behalf of
HONG KONG NATURAL SOUND ELECTRONICS LIMITED

MID
Model No.: PC803BXC, Quiver

FCC ID: PWK-PC803BXC

Prepared for	:	HONG KONG NATURAL SOUND ELECTRONICS LIMITED
Address	:	FLAT/RM M 4/F CONTINENTAL MANSION 300 KING'S ROAD HONG KONG
Prepared by	:	ACCURATE TECHNOLOGY CO., LTD
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Report Number	:	ATE20150661
Date of Test	:	Apr 02-13,2015
Date of Report	:	Apr 14,2015

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Test Report Certification

Applicant : HONG KONG NATURAL SOUND ELECTRONICS LIMITED

Manufacturer : Natural Sound Electronics (Shenzhen) Co., Ltd.

EUT Description : MID

(A) MODEL NO.: PC803BXC, Quiver

(B) SERIAL NO.: N/A

(C) POWER SUPPLY: DC 5V (Power by Adapter)&DC 3.7V (Battery)

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247
ANSI C63.10: 2013

The EUT was tested according to DTS test procedure of Jun 05, 2014 KDB558074 D01 DTS Meas Guidance v03r02 for compliance to FCC 47CFR 15.247 requirements

The device described above is tested by ACCURATE TECHNOLOGY CO. LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.247 limits. The measurement results are contained in this test report and ACCURATE TECHNOLOGY CO. LTD is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of ACCURATE TECHNOLOGY CO. LTD.

Date of Test : Apr 02-13,2015

Date of Report: Apr 14,2015

Prepared by : Eric Zhang

(Eric Zhang, Engineer)

Approved & Authorized Signer : Sean Liu

(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

EUT	:	MID
Model Number	:	PC803BXC, Quiver Note: These samples are same except for the model number is difference. So we prepare the PC803BXC for test
Frequency Range	:	802.11b/g/n(20MHz): 2412-2462MHz 802.11n(40MHz): 2422-2452MHz Bluetooth 4.0: 2402-2480MHz
Number of Channels	:	802.11b/g/n (20MHz):11 802.11n (40MHz): 7 Bluetooth 4.0: 40
Antenna Gain	:	1.0dBi
Power Supply	:	DC 5V (Power by adapter)&DC 3.7V(Battery)
Adapter	:	Model number: AW010WR-0500200UU Input: AC 100-240V; 50/60Hz 0.4A Output: DC 5V/2A USB line: Non-shielded, Non-detachable, 1.5m
Modulation mode	:	GFSK DSSS,OFDM
Applicant	:	HONG KONG NATURAL SOUND ELECTRONICS LIMITED
Address	:	FLAT/RM M 4/F CONTINENTAL MANSION 300 KING'S ROAD HONG KONG
Manufacturer	:	Natural Sound Electronics (Shenzhen) Co., Ltd.
Address	:	4th Building, Xinyuan Industrial Zone, Gushu Village, Bao'an District, Shenzhen, China
Date of sample received	:	Apr 02,2015
Date of Test	:	Apr 02-13,2015

1.2.Carrier Frequency of Channels

802.11b, 802.11g, 802.11n (20MHz)

Channel	Frequency(MHz)	Channel	Frequency(MHz)
01	2412	07	2442
02	2417	08	2447
03	2422	09	2452
04	2427	10	2457
05	2432	11	2462
06	2437	---	---

802.11n (40MHz)

Channel	Frequency(MHz)	Channel	Frequency(MHz)
---	---	07	2442
---	---	08	2447
03	2422	09	2452
04	2427	---	---
05	2432	---	---
06	2437	---	---

1.3.Special Accessory and Auxiliary Equipment

n.a.

1.4.Description of Test Facility

EMC Lab : Accredited by TUV Rheinland Shenzhen

Listed by FCC
The Registration Number is 752051

Listed by Industry Canada
The Registration Number is 5077A-2

Accredited by China National Accreditation Committee for Laboratories
The Certificate Registration Number is L3193

Name of Firm : ACCURATE TECHNOLOGY CO. LTD
Site Location : F1, Bldg. A, Changyuan New Material Port, Keyuan Rd. Science & Industry Park, Nanshan, Shenzhen, Guangdong P.R. China

1.5.Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.23dB, k=2
Radiated emission expanded uncertainty (9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty (30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty (Above 1GHz)	=	4.06dB, k=2

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Cal. Interval
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 10, 2015	One Year
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 10, 2015	One Year
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 10, 2015	One Year
Pre-Amplifier	Rohde&Schwarz	CBLU1183540-01	3791	Jan. 10, 2015	One Year
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 15, 2015	One Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 15, 2015	One Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 15, 2015	One Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1067	Jan. 15, 2015	One Year
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 10, 2015	One Year
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 10, 2015	One Year
Highpass Filter	Wainwright Instruments	WHKX3.6/18G-10SS	N/A	Jan. 10, 2015	One Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2485-2375/2510-60/11SS	N/A	Jan. 10, 2015	One Year
Switch Unit with OSP-B157	Rohde & Schwarz	OSP120	101130	Jun. 05, 2014	One Year

3. OPERATION OF EUT DURING TESTING

3.1.Operating Mode

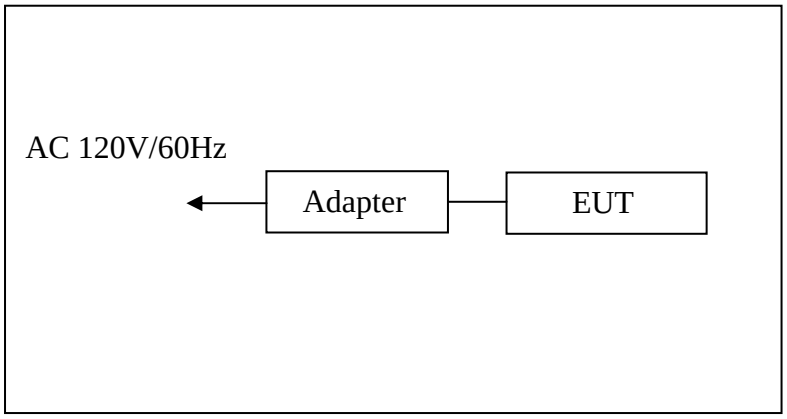
The mode is used: **1.802.11b Transmitting mode**
Low Channel: 2412MHz
Middle Channel: 2437MHz
High Channel: 2462MHz

2.802.11g Transmitting mode
Low Channel: 2412MHz
Middle Channel: 2437MHz
High Channel: 2462MHz

3.802.11n (20MHz) Transmitting mode
Low Channel: 2412MHz
Middle Channel: 2437MHz
High Channel: 2462MHz

4.802.11n (40MHz) Transmitting mode
Low Channel: 2422MHz
Middle Channel: 2437MHz
High Channel: 2452MHz
5. Charging

3.2.Configuration and peripherals

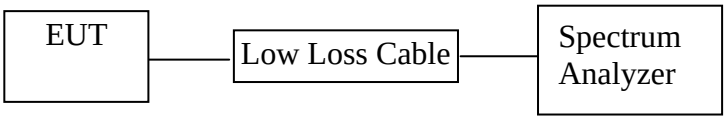


4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.247(a)(2)	6dB Bandwidth Test	Compliant
Section 15.247(e)	Power Spectral Density Test	Compliant
Section 15.247(b)(3)	Maximum Peak Output Power Test	Compliant
Section 15.247(d)	Band Edge Compliance Test	Compliant
Section 15.247(d) Section 15.209	Radiated Spurious Emission Test	Compliant
Section 15.247(d)	Conducted Spurious Emission Test	Compliant
Section 15.207	AC Power Line Conducted Emission Test	Compliant
Section 15.203	Antenna Requirement	Compliant

5. 6DB BANDWIDTH MEASUREMENT

5.1.Block Diagram of Test Setup



5.2.The Requirement For Section 15.247(a)(2)

Section 15.247(a)(2): Systems using digital modulation techniques may operate in the 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

5.3.EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

5.4.Operating Condition of EUT

5.4.1.Setup the EUT and simulator as shown as Section 5.1.

5.4.2.Turn on the power of all equipment.

5.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462 and 2422-2452MHz. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz TX frequency to transmit.

5.5.Test Procedure

1. Set resolution bandwidth (RBW) = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.6.Test Result

The test was performed with 802.11b			
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
Low	2412	10.14	> 0.5MHz
Middle	2437	10.14	> 0.5MHz
High	2462	10.14	> 0.5MHz

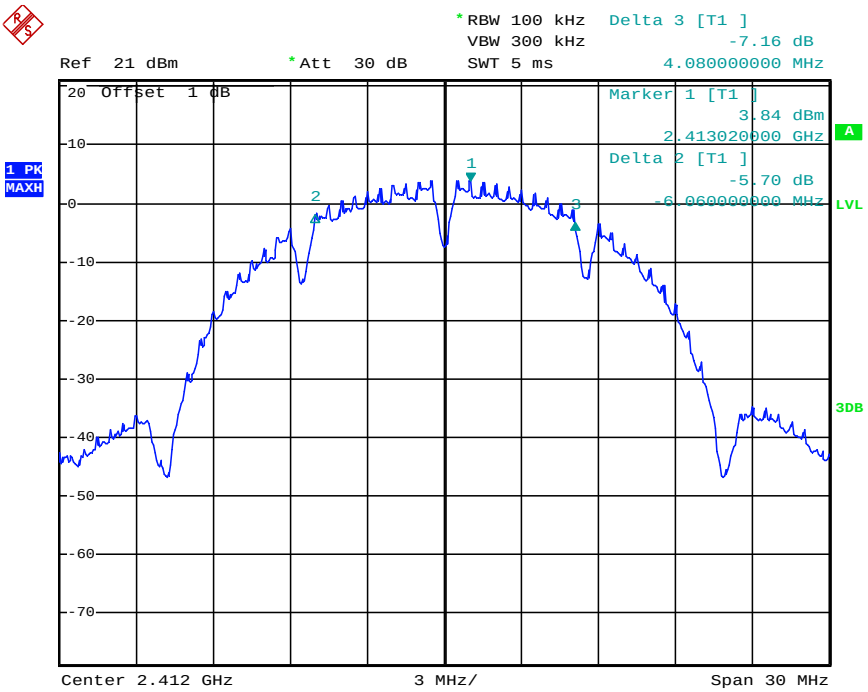
The test was performed with 802.11g			
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
Low	2412	16.62	> 0.5MHz
Middle	2437	16.62	> 0.5MHz
High	2462	16.62	> 0.5MHz

The test was performed with 802.11n (Bandwidth: 20 MHz)			
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
Low	2412	17.82	> 0.5MHz
Middle	2437	17.82	> 0.5MHz
High	2462	17.82	> 0.5MHz

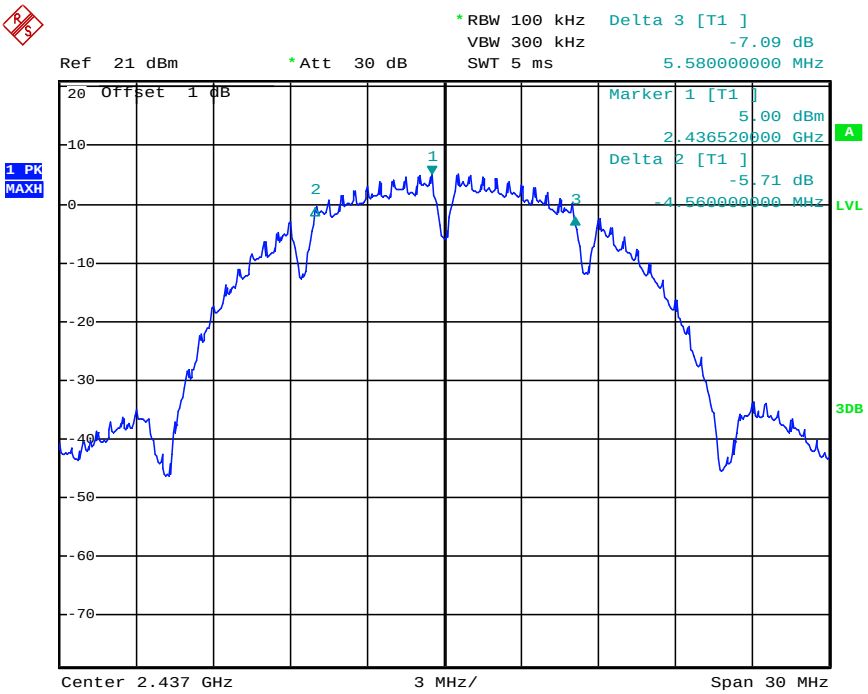
The test was performed with 802.11n (Bandwidth: 40 MHz)			
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
Low	2422	36.50	> 0.5MHz
Middle	2437	36.50	> 0.5MHz
High	2452	36.50	> 0.5MHz

The spectrum analyzer plots are attached as below.

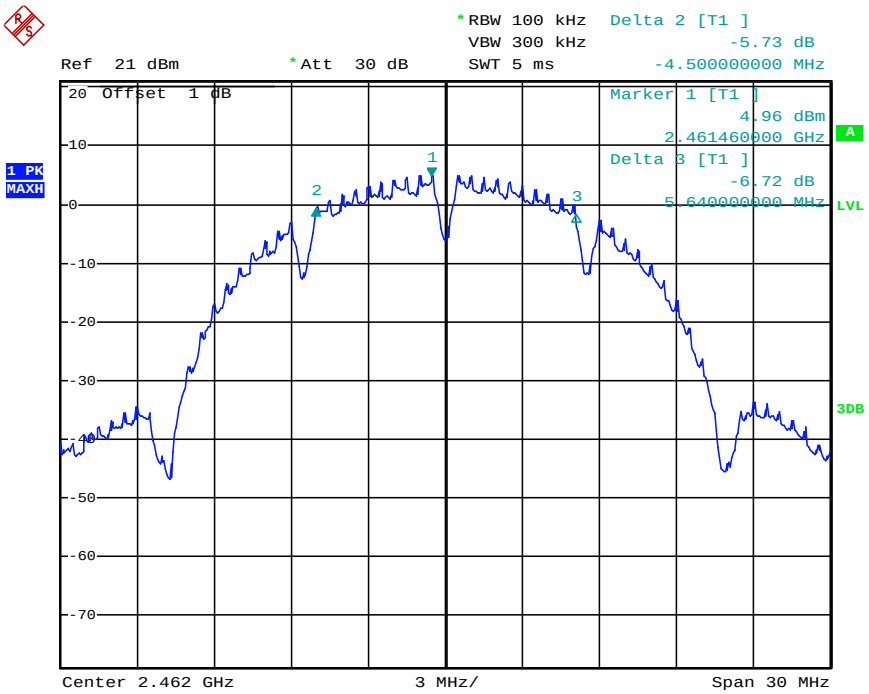
802.11b Channel Low 2412MHz



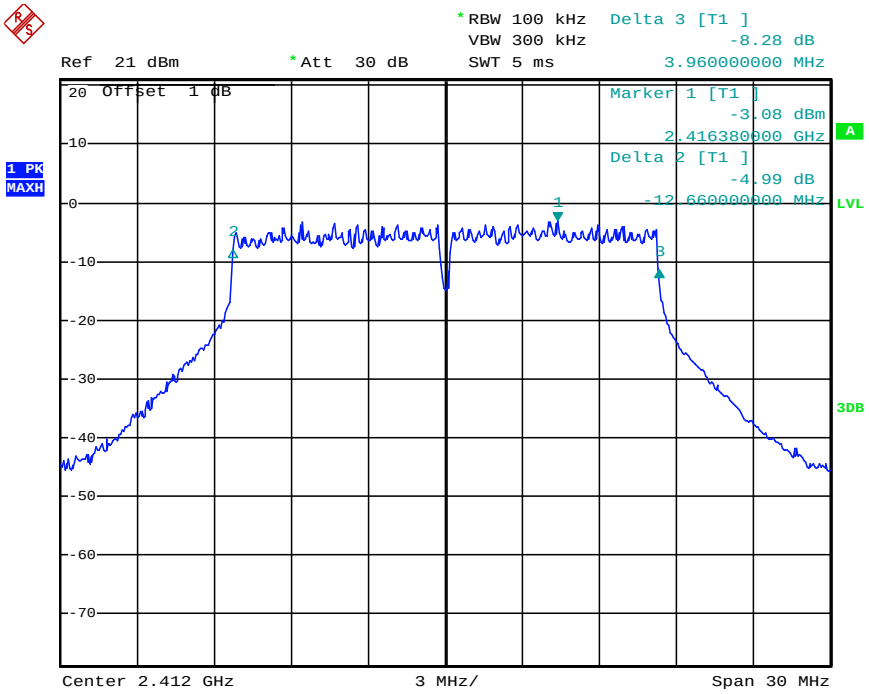
802.11b Channel Middle 2437MHz



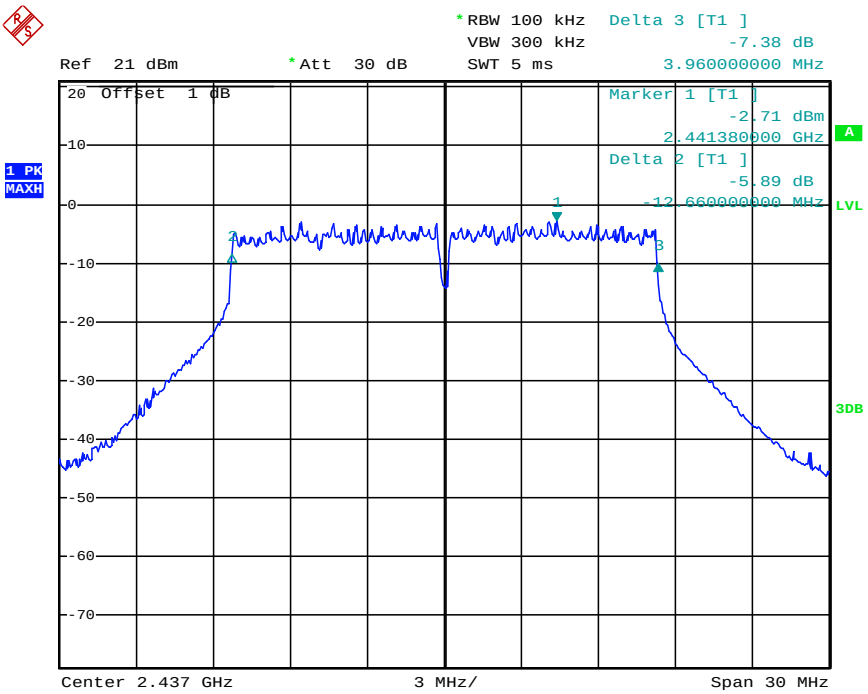
802.11b Channel High 2462MHz



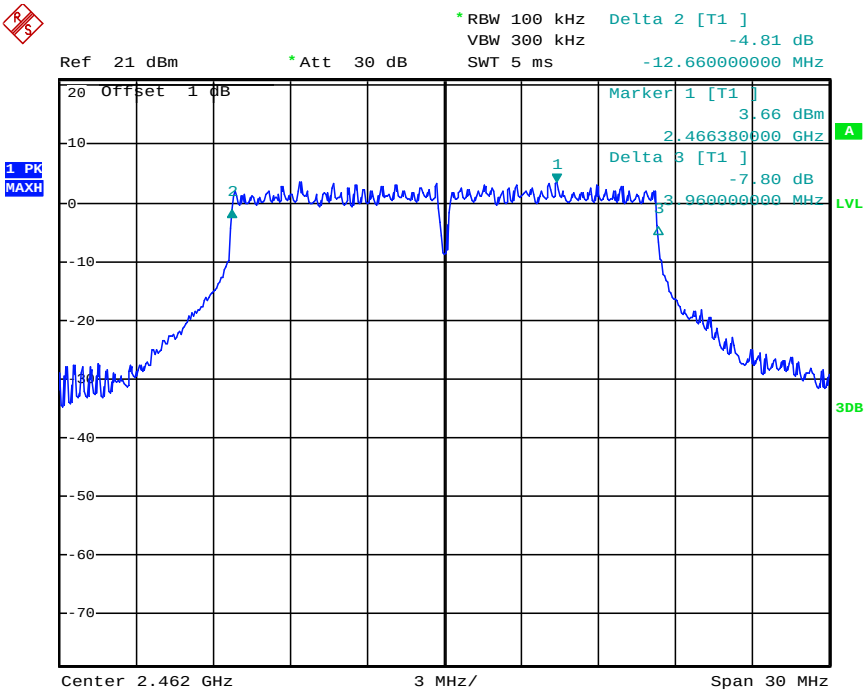
802.11g Channel Low 2412MHz



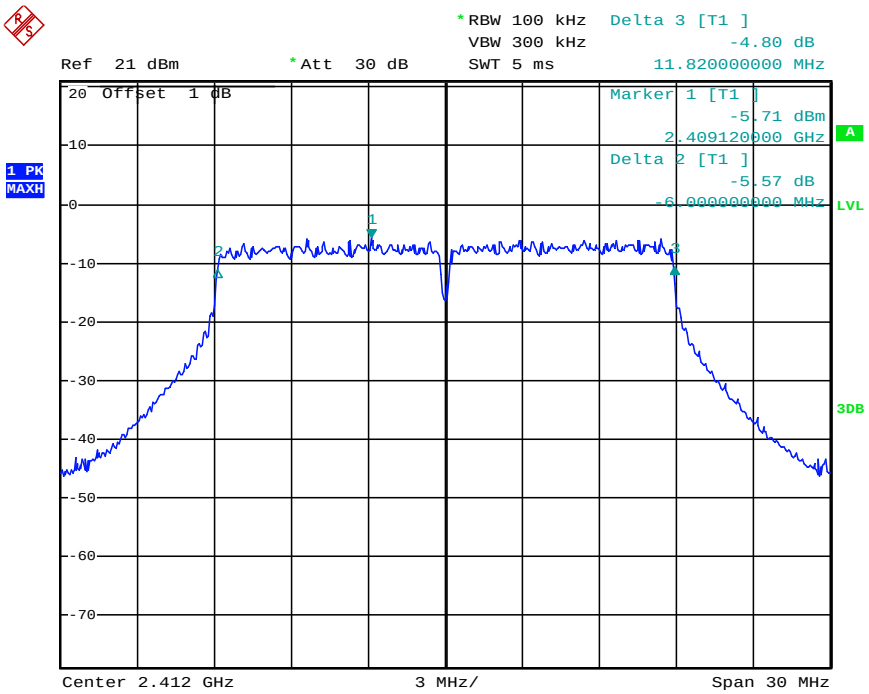
802.11g Channel Middle 2437MHz



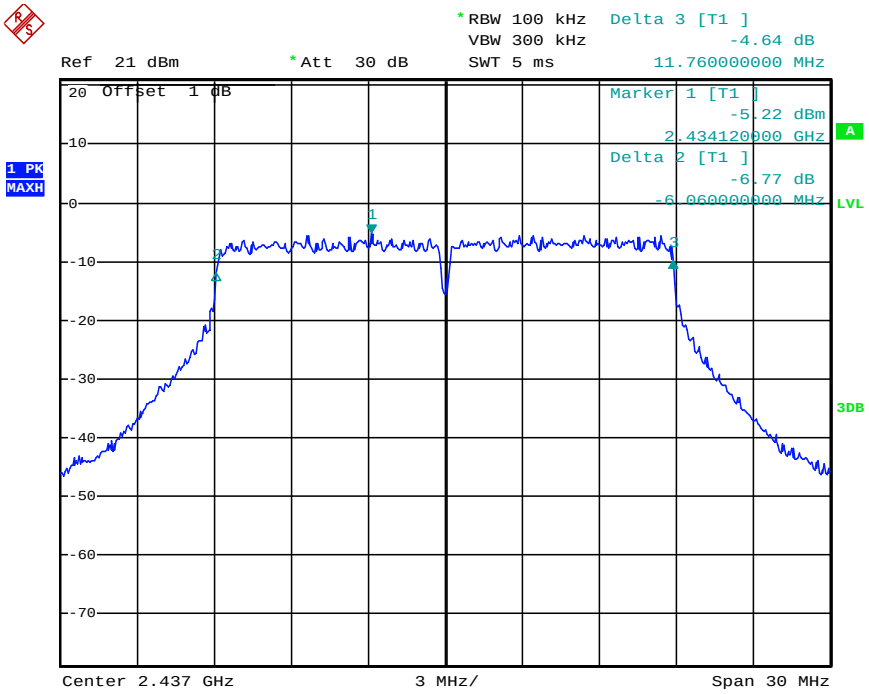
802.11g Channel High 2462MHz



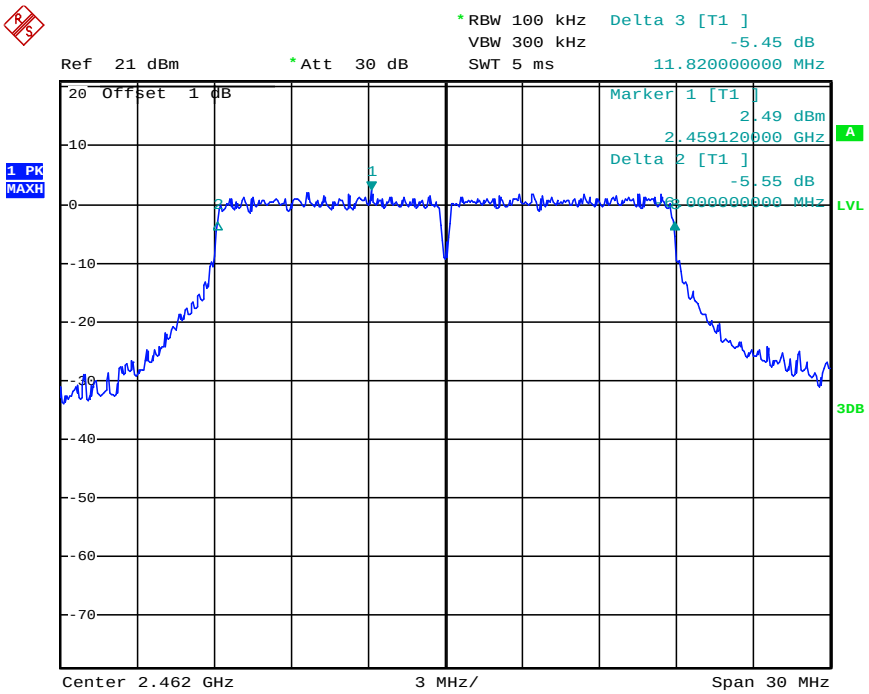
802.11n Channel Low 2412MHz (20MHz)



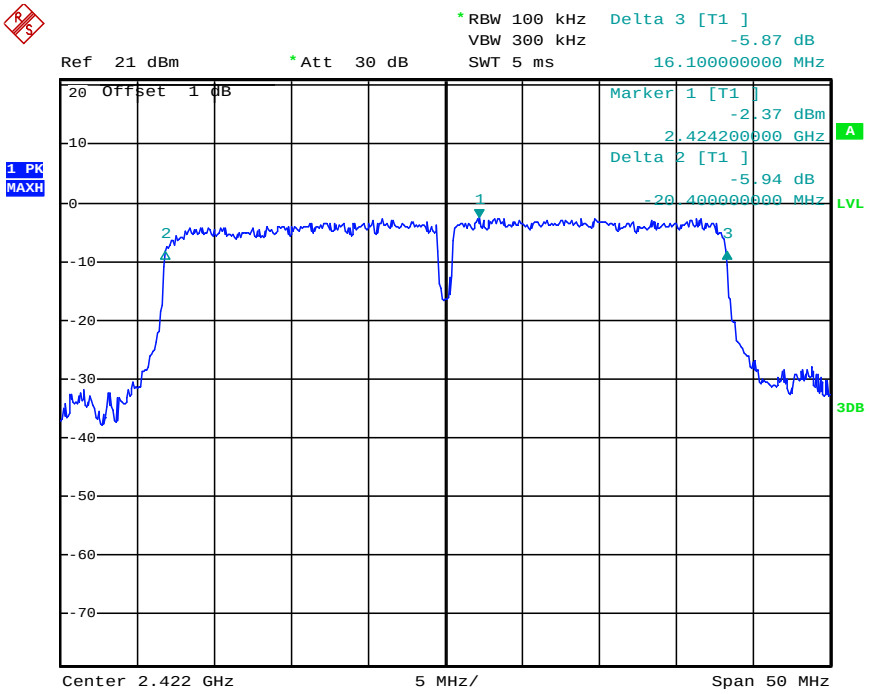
802.11n Channel Middle 2437MHz(20MHz)



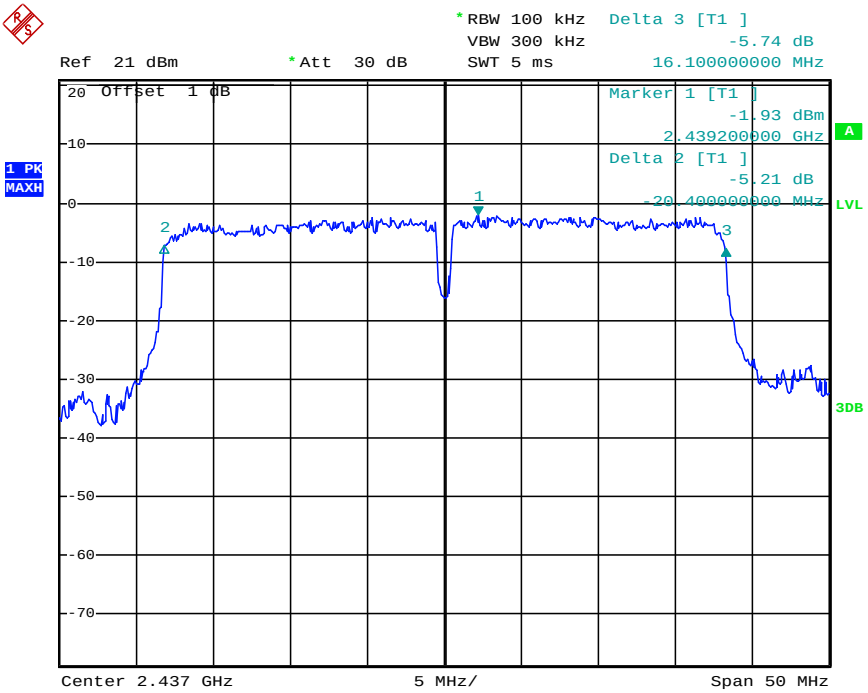
802.11n Channel High 2462MHz(20MHz)



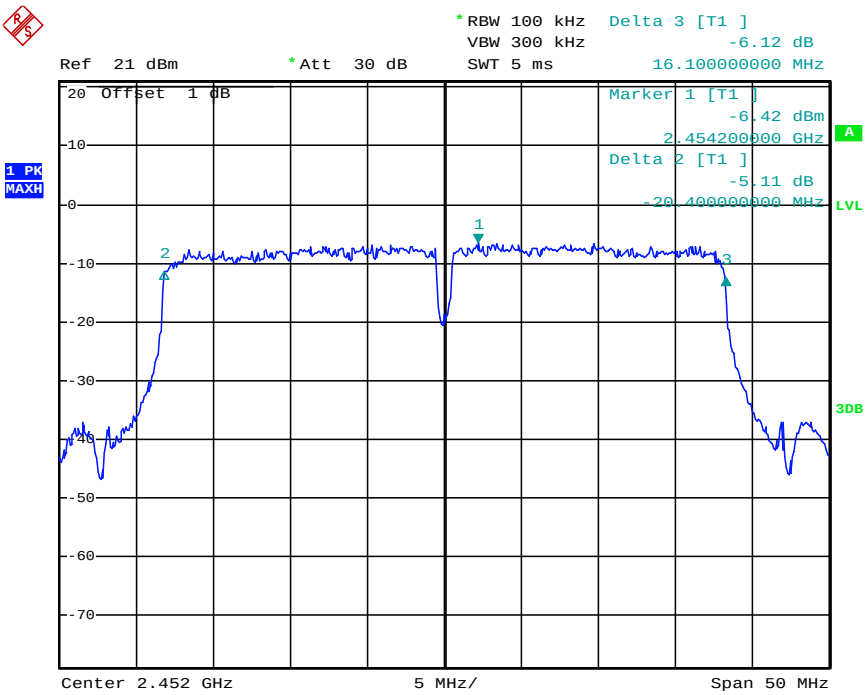
802.11n Channel Low 2422MHz (40MHz)



802.11n Channel Middle 2437MHz(40MHz)

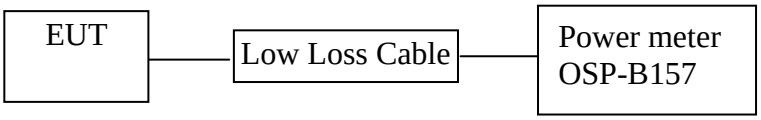


802.11n Channel High 2452MHz(40MHz)



6. MAXIMUM OUTPUT POWER

6.1.Block Diagram of Test Setup



6.2.The Requirement For Section 15.247(b)(3)

Section 15.247(b)(3): For systems using digital modulation in the 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz bands: 1 Watt.

6.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.4.Operating Condition of EUT

6.4.1.Setup the EUT and simulator as shown as Section 6.1.

6.4.2.Turn on the power of all equipment.

6.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462 and 2422-2452MHz. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz TX frequency to transmit.

6.5.Test Procedure

6.5.1.The EUT was tested according to DTS test procedure of Jun 05, 2014 KDB558074 D01 DTS Meas Guidance v03r02 for compliance to FCC 47CFR 15.247 requirements.

6.5.2.The transmitter output was connected to the power meter through a low loss cable.

6.5.3.Measurement the maximum Peak output power.

6.6.Test Result

The test was performed with 802.11b				
Channel	Frequency (MHz)	Peak Output Power(dBm)	Peak Output Power(mW)	Limits dBm / W
Low	2412	8.75	7.50	30 dBm / 1 W
Middle	2437	8.64	7.31	30 dBm / 1 W
High	2462	8.60	7.24	30 dBm / 1 W

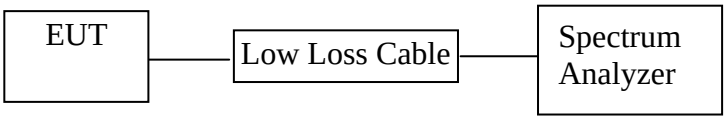
The test was performed with 802.11g				
Channel	Frequency (MHz)	Peak Output Power(dBm)	Peak Output Power(mW)	Limits dBm / W
Low	2412	7.55	5.69	30 dBm / 1 W
Middle	2437	7.15	5.19	30 dBm / 1 W
High	2462	7.62	5.78	30 dBm / 1 W

The test was performed with 802.11n (20MHz)				
Channel	Frequency (MHz)	Peak Output Power(dBm)	Peak Output Power(mW)	Limits dBm / W
Low	2412	6.52	4.49	30 dBm / 1 W
Middle	2437	6.55	4.52	30 dBm / 1 W
High	2462	6.26	4.23	30 dBm / 1 W

The test was performed with 802.11n (40MHz)				
Channel	Frequency (MHz)	Peak Output Power(dBm)	Peak Output Power(mW)	Limits dBm / W
Low	2422	5.60	3.63	30 dBm / 1 W
Middle	2437	5.41	3.48	30 dBm / 1 W
High	2452	5.78	3.78	30 dBm / 1 W

7. POWER SPECTRAL DENSITY MEASUREMENT

7.1.Block Diagram of Test Setup



7.2.The Requirement For Section 15.247(e)

Section 15.247(e): For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

7.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

7.4.Operating Condition of EUT

7.4.1.Setup the EUT and simulator as shown as Section 7.1.

7.4.2.Turn on the power of all equipment.

7.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462 and 2422-2452MHz. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz TX frequency to transmit.

7.5.Test Procedure

7.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.

7.5.2.Measurement Procedure PKPSD:

This procedure must be used if maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit, and is optional if the maximum (average) conducted output power was used to demonstrate compliance.

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.

3. Set the RBW 3 kHz ≤ RBW ≤ 100 kHz.
4. Set the VBW ≥ 3 x RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

7.5.3.Measurement the maximum power spectral density.

7.6.Test Result

The test was performed with 802.11b			
Channel	Frequency (MHz)	Power Spectral Density (dBm)	Limits (dBm)
Low	2412	-19.25	8 dBm
Middle	2437	-18.72	8 dBm
High	2462	-18.25	8 dBm

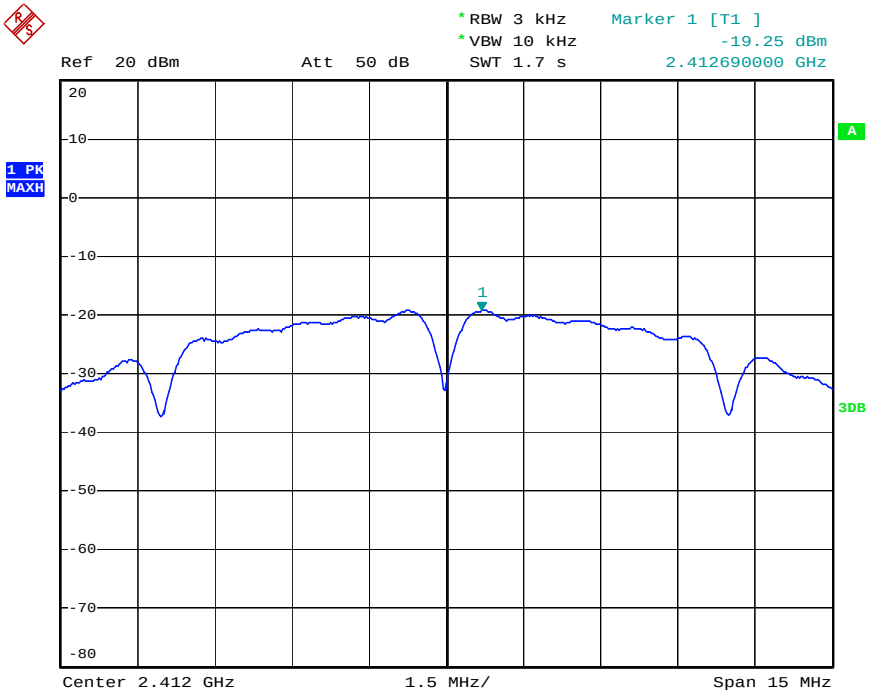
The test was performed with 802.11g			
Channel	Frequency (MHz)	Power Spectral Density (dBm)	Limits (dBm)
Low	2412	-19.73	8 dBm
Middle	2437	-19.12	8 dBm
High	2462	-18.57	8 dBm

The test was performed with 802.11n (20MHz)			
Channel	Frequency (MHz)	Power Spectral Density (dBm)	Limits (dBm)
Low	2412	-28.09	8 dBm
Middle	2437	-26.98	8 dBm
High	2462	-26.41	8 dBm

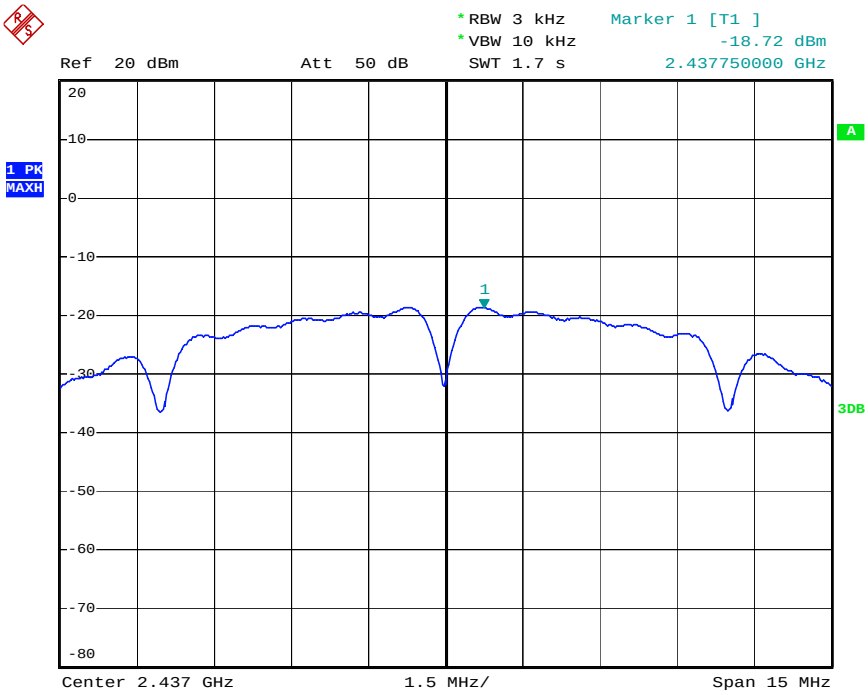
The test was performed with 802.11n (40MHz)			
Channel	Frequency (MHz)	Power Spectral Density (dBm)	Limits (dBm)
Low	2422	-29.17	8 dBm
Middle	2437	-29.33	8 dBm
High	2452	-29.52	8 dBm

The spectrum analyzer plots are attached as below.

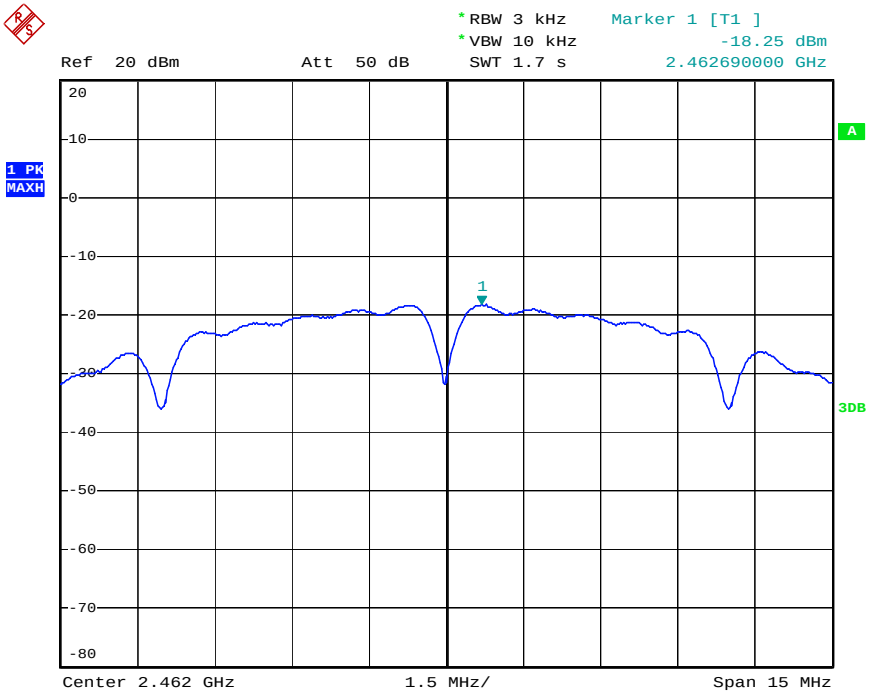
802.11b Channel Low 2412MHz



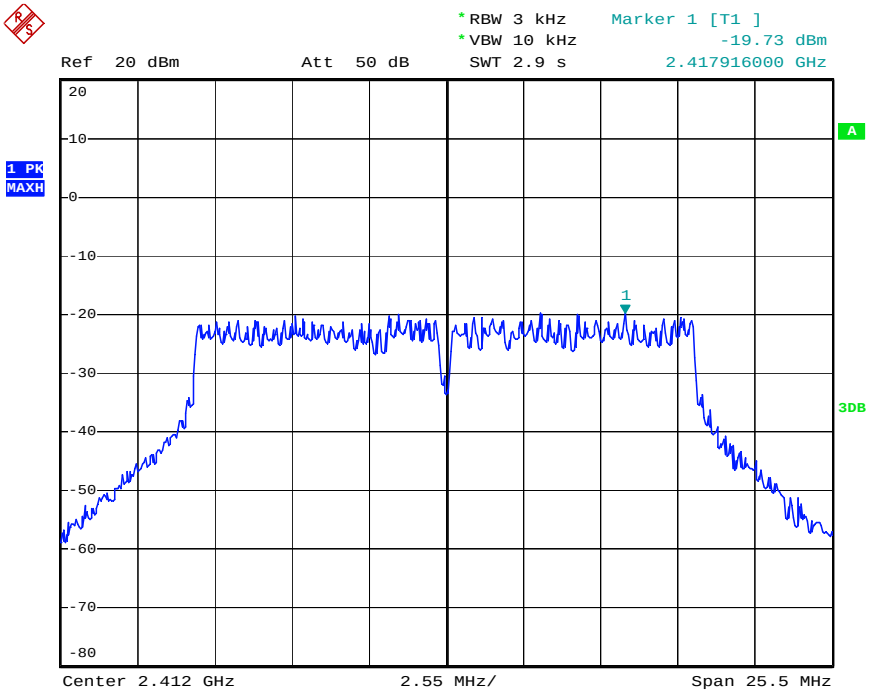
802.11b Channel Middle 2437MHz



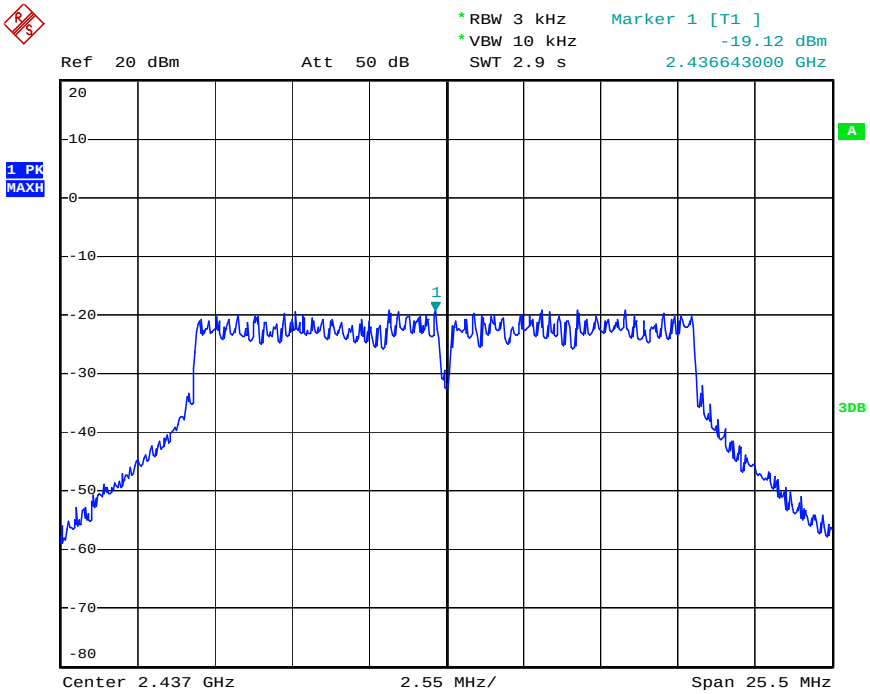
802.11b Channel High 2462MHz



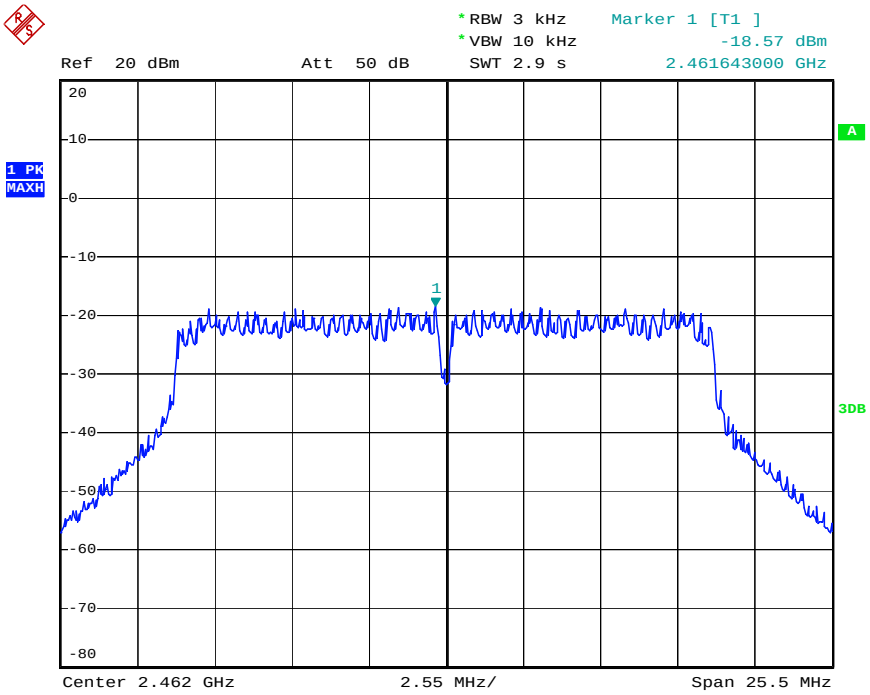
802.11g Channel Low 2412MHz



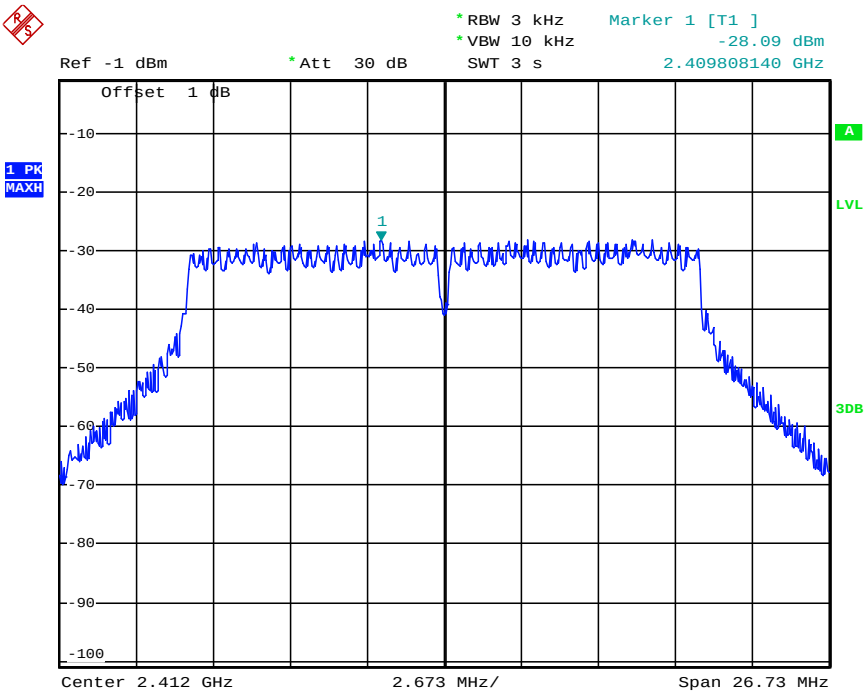
802.11g Channel Middle 2437MHz



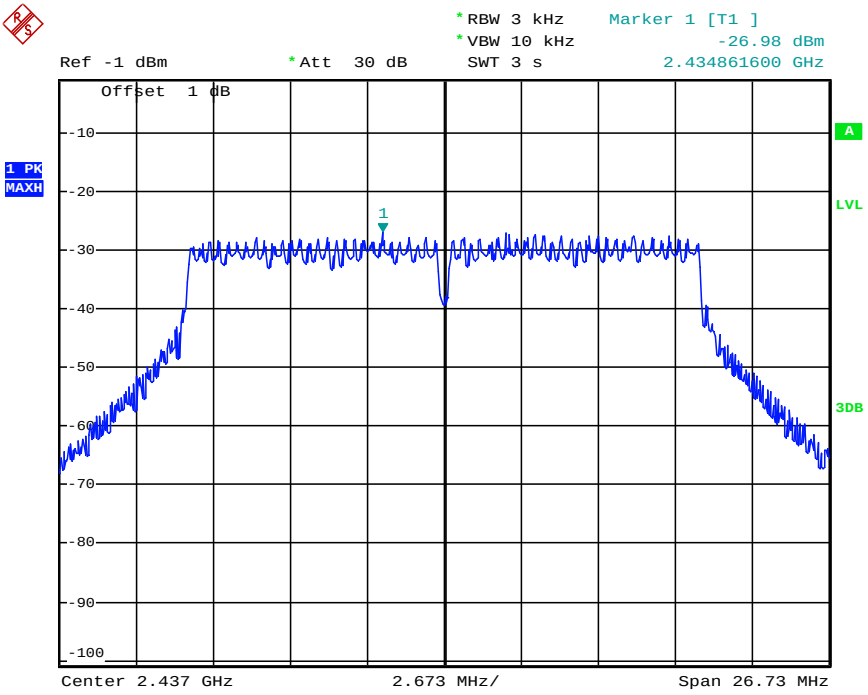
802.11g Channel High 2462MHz



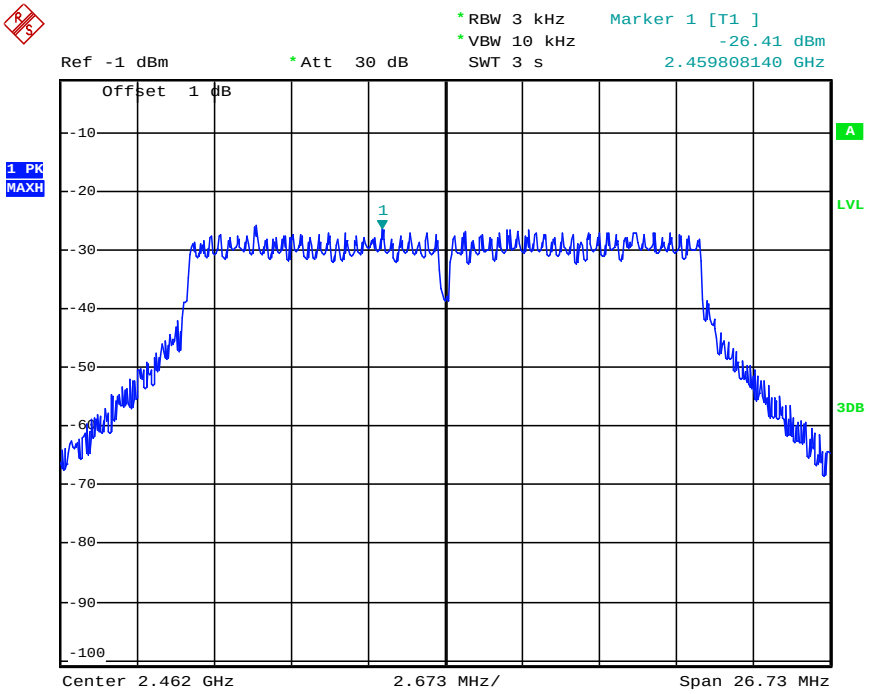
802.11n Channel Low 2412MHz (20MHz)



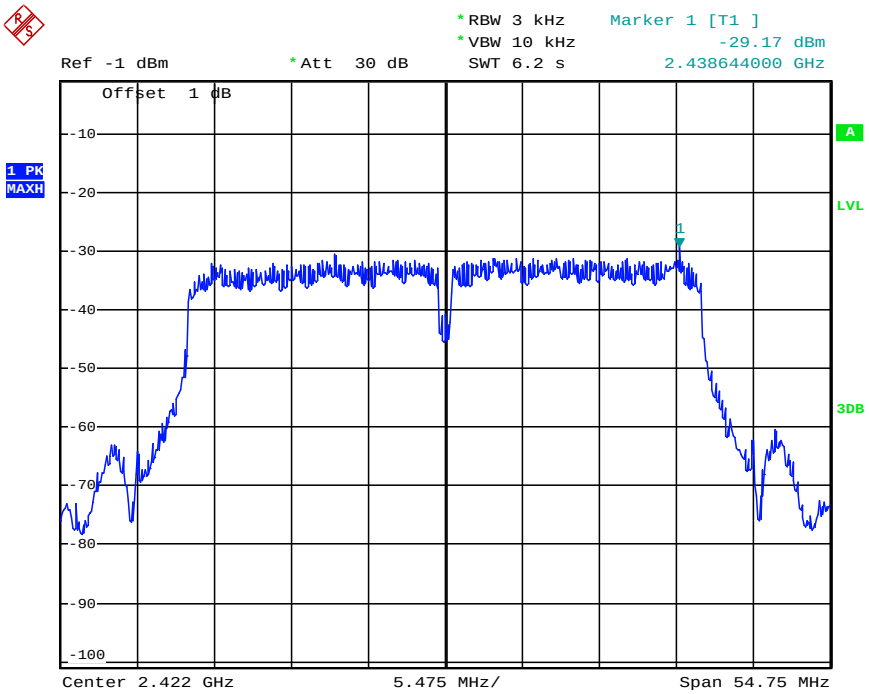
802.11n Channel Middle 2437MHz (20MHz)



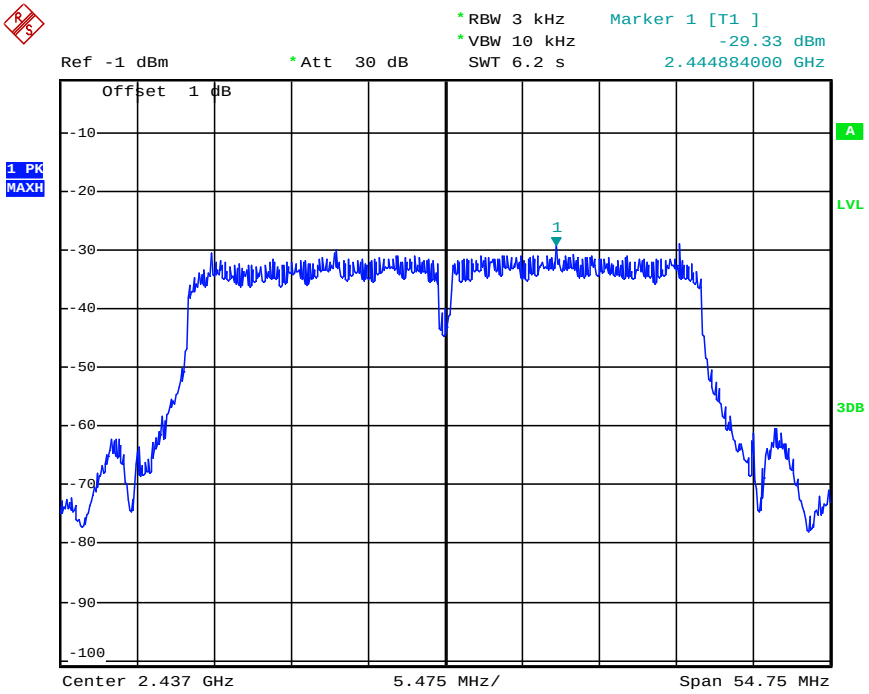
802.11n Channel High 2462MHz(20MHz)



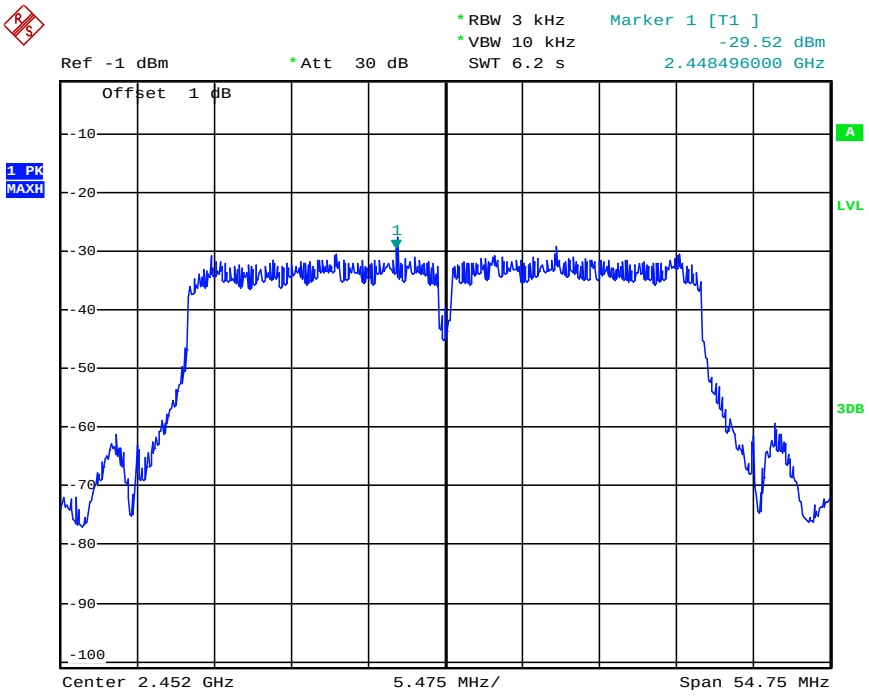
802.11n Channel Low 2422MHz (40MHz)



802.11n Channel Middle 2437MHz(40MHz)

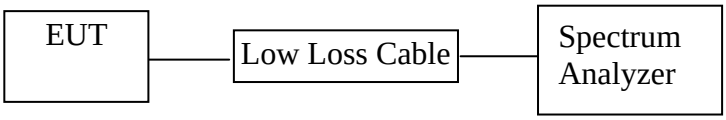


802.11n Channel High 2452MHz(40MHz)



8. BAND EDGE COMPLIANCE TEST

8.1.Block Diagram of Test Setup



8.2.The Requirement For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

8.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

8.4.Operating Condition of EUT

8.4.1.Setup the EUT and simulator as shown as Section 8.1.

8.4.2.Turn on the power of all equipment.

8.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462 and 2422-2452MHz MHz. We select 2412MHz, 2462MHz and 2422MHz, 2452MHz TX frequency to transmit.

8.5.Test Procedure

Conducted Band Edge:

8.5.1. The transmitter output was connected to the spectrum analyzer via a low loss cable.

8.5.2. Set RBW of spectrum analyzer to 100kHz and VBW to 300kHz.

Radiate Band Edge:

8.5.3. The EUT is placed on a turntable, which is 0.8m above the ground plane and worked at highest radiated power.

8.5.4. The turntable was rotated for 360 degrees to determine the position of maximum emission level.

8.5.5. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.

8.5.6. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:

RBW=1MHz, VBW=1MHz

8.5.7. The band edges was measured and recorded.

8.6. Test Result

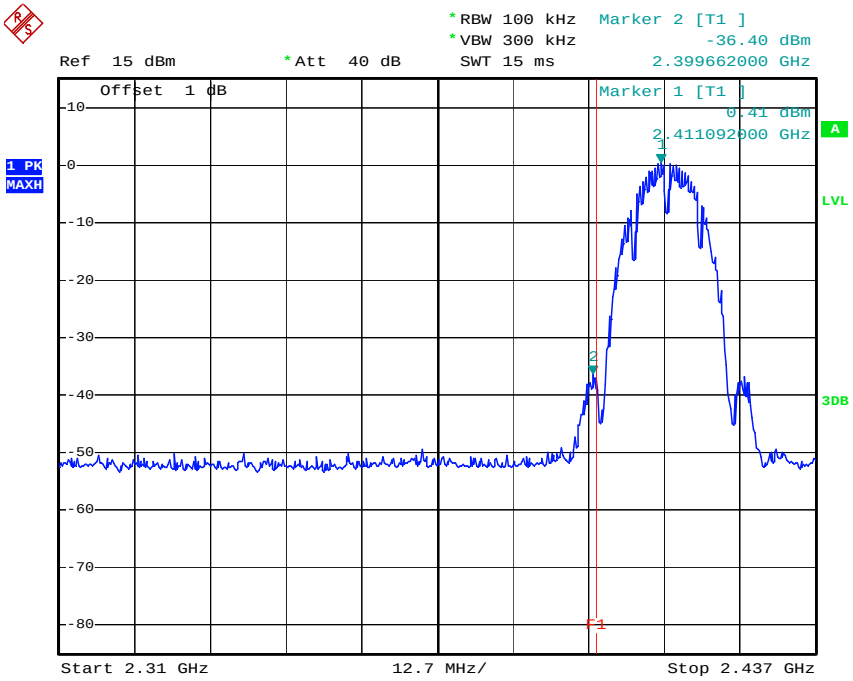
The test was performed with 802.11b		
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2412	36.81	> 20dBc
2462	50.12	> 20dBc

The test was performed with 802.11g		
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2412	32.63	> 20dBc
2462	44.59	> 20dBc

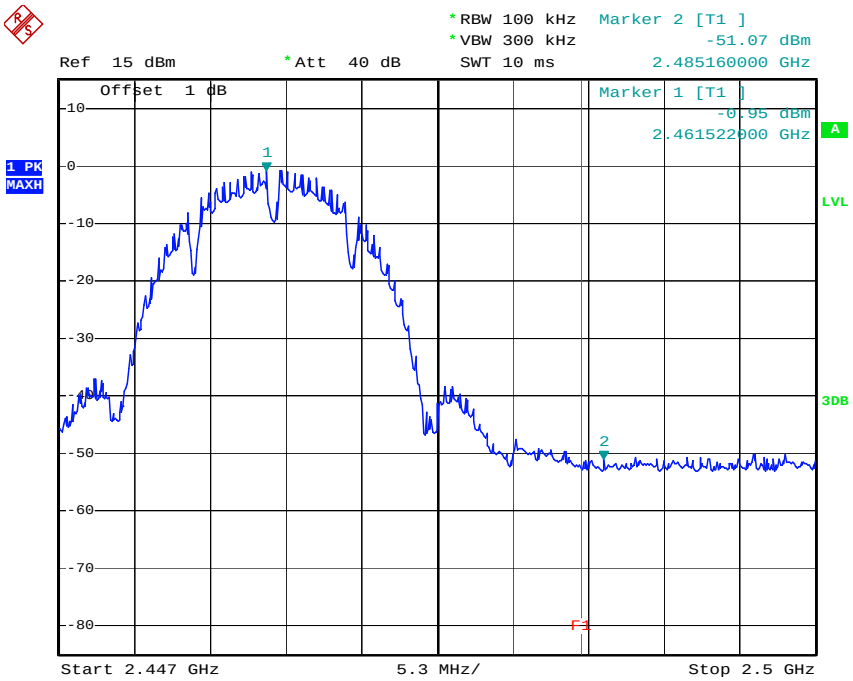
The test was performed with 802.11n (20MHz)		
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2412	30.32	> 20dBc
2462	44.17	> 20dBc

The test was performed with 802.11n (40MHz)		
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2422	27.13	> 20dBc
2452	43.12	> 20dBc

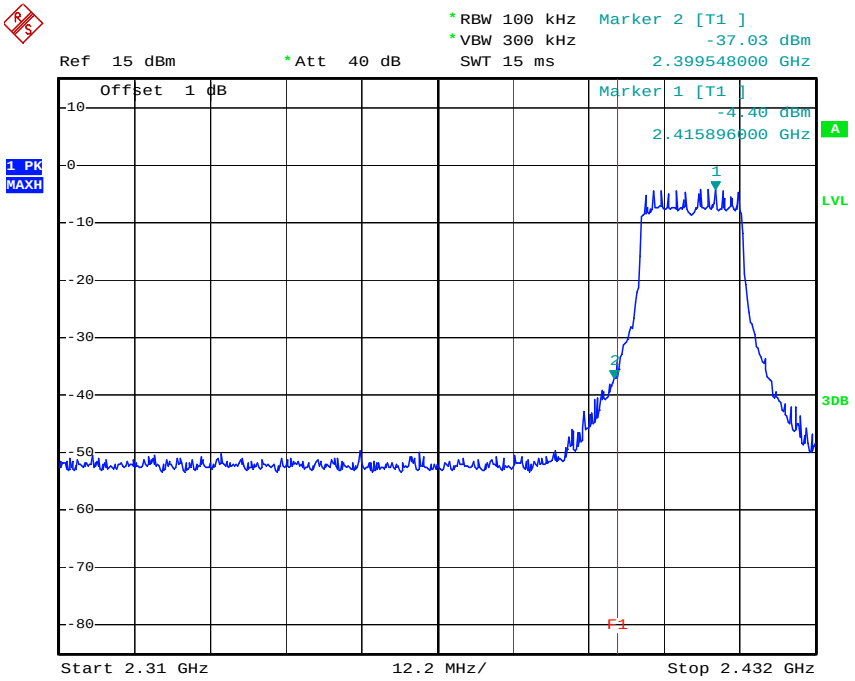
802.11b Channel Low 2412MHz



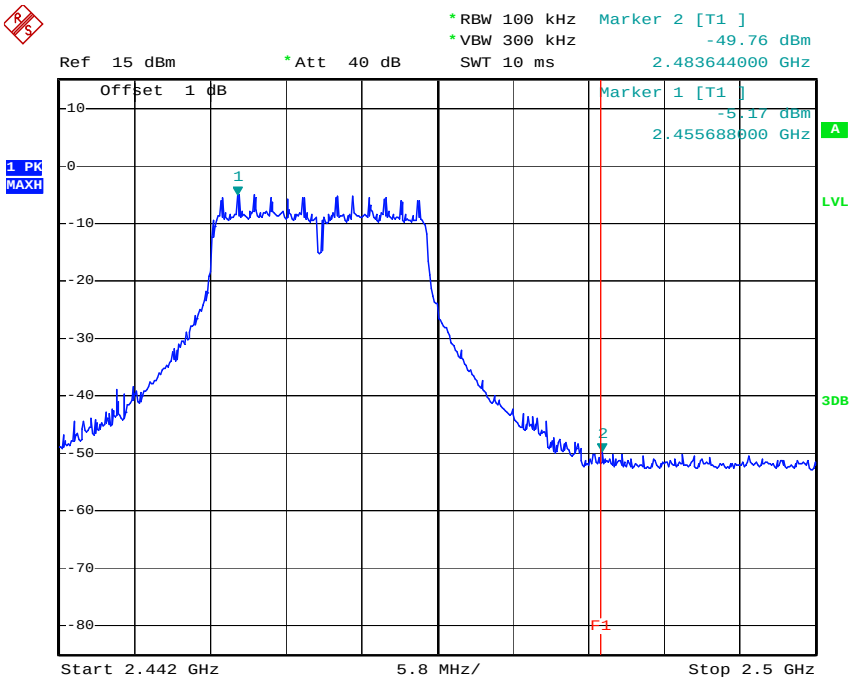
802.11b Channel High 2462MHz



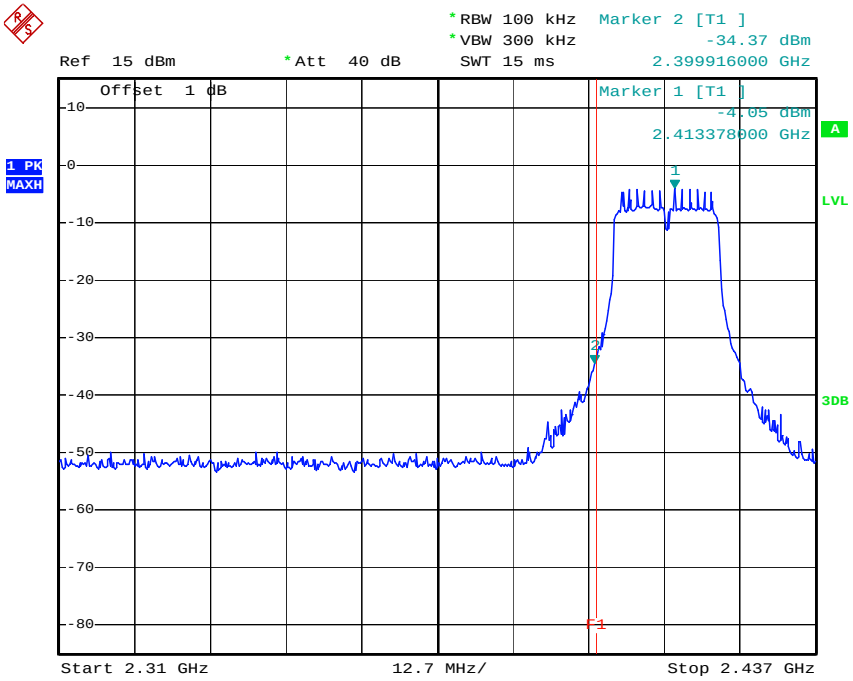
802.11g Channel Low 2412MHz



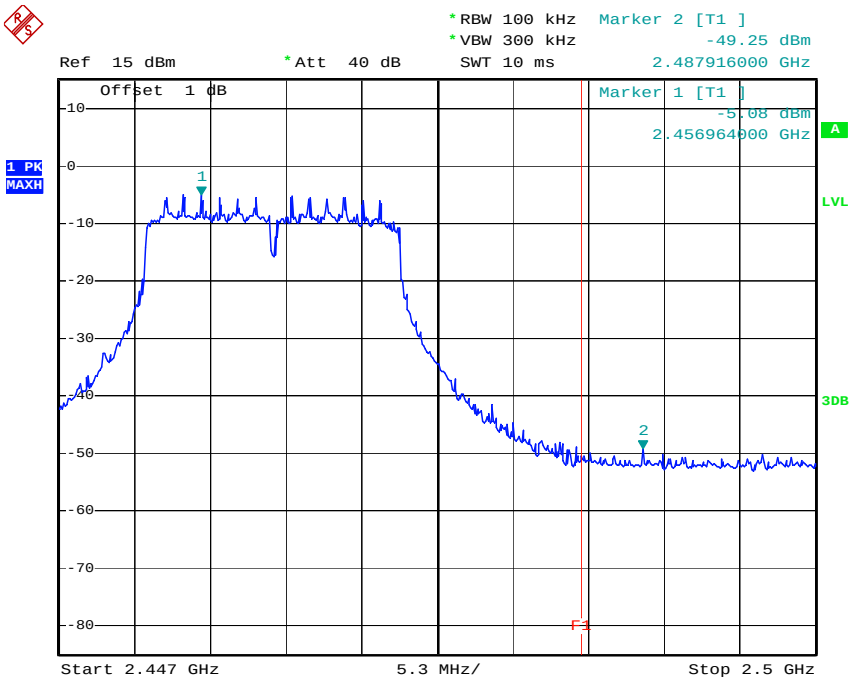
802.11g Channel High 2462MHz



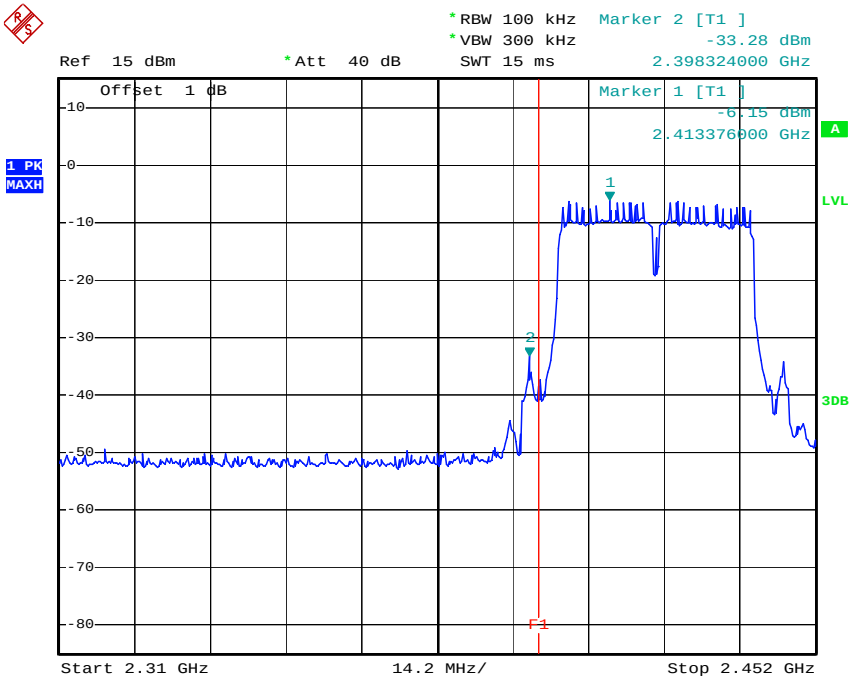
802.11n Channel Low 2412MHz (20MHz)



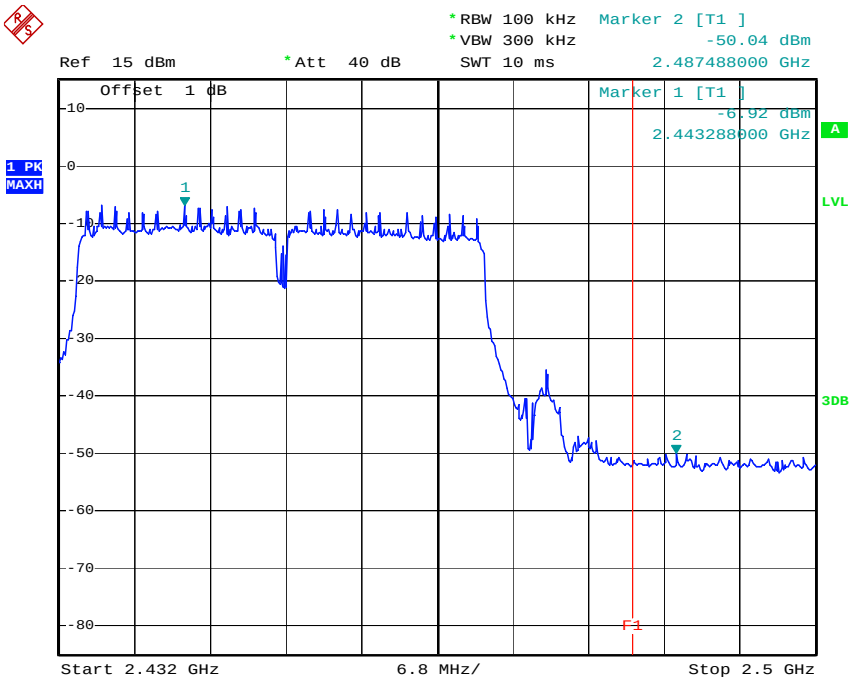
802.11n Channel High 2462MHz (20MHz)



802.11n Channel Low 2422MHz (40MHz)



802.11n Channel High 2452MHz (40MHz)



Radiated Band Edge Result

Note:1. Emissions attenuated more than 20 dB below the permissible value are not reported.

2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

   Result = Reading + Corrected Factor

3. Display the measurement of peak values.

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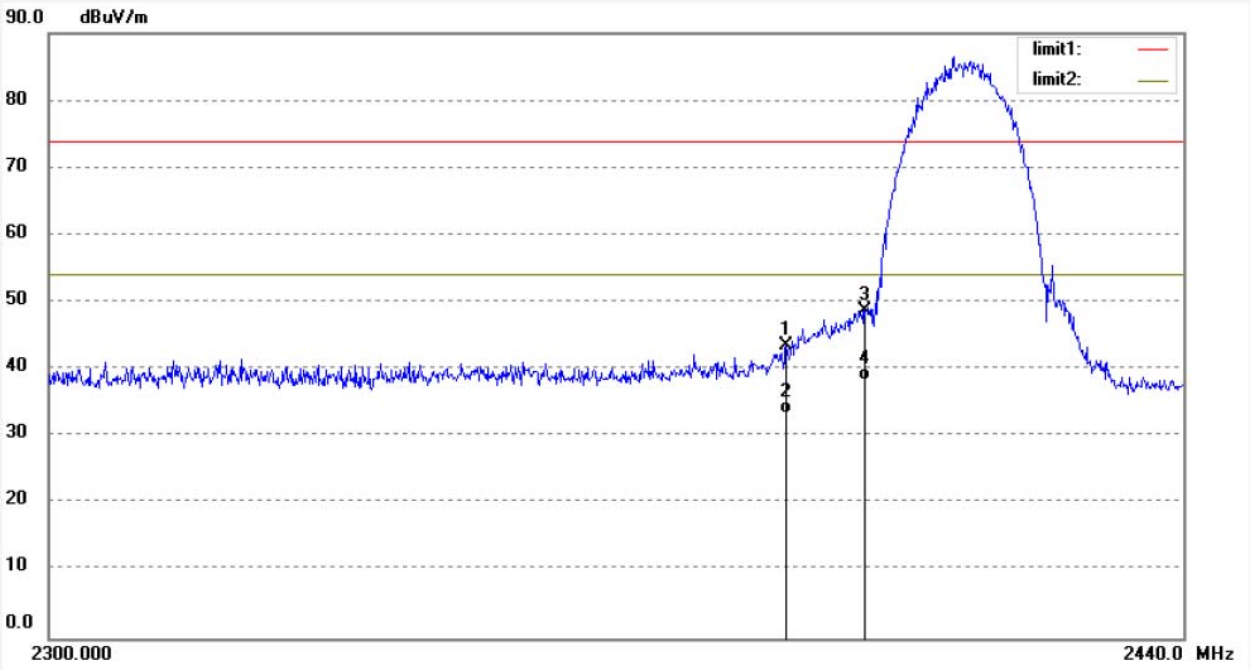
Fax:+86-0755-26503396

Job No.: STAR2014 #2155	Polarization: Horizontal
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 15/04/13/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/41/44
EUT: MID	Engineer Signature:
Mode: TX Channel 1(802.11b)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	49.93	-6.31	43.62	74.00	-30.38	peak			
2	2390.000	39.70	-6.31	33.39	54.00	-20.61	AVG			
3	2400.000	54.89	-6.28	48.61	74.00	-25.39	peak			
4	2400.000	44.58	-6.28	38.30	54.00	-15.70	AVG			

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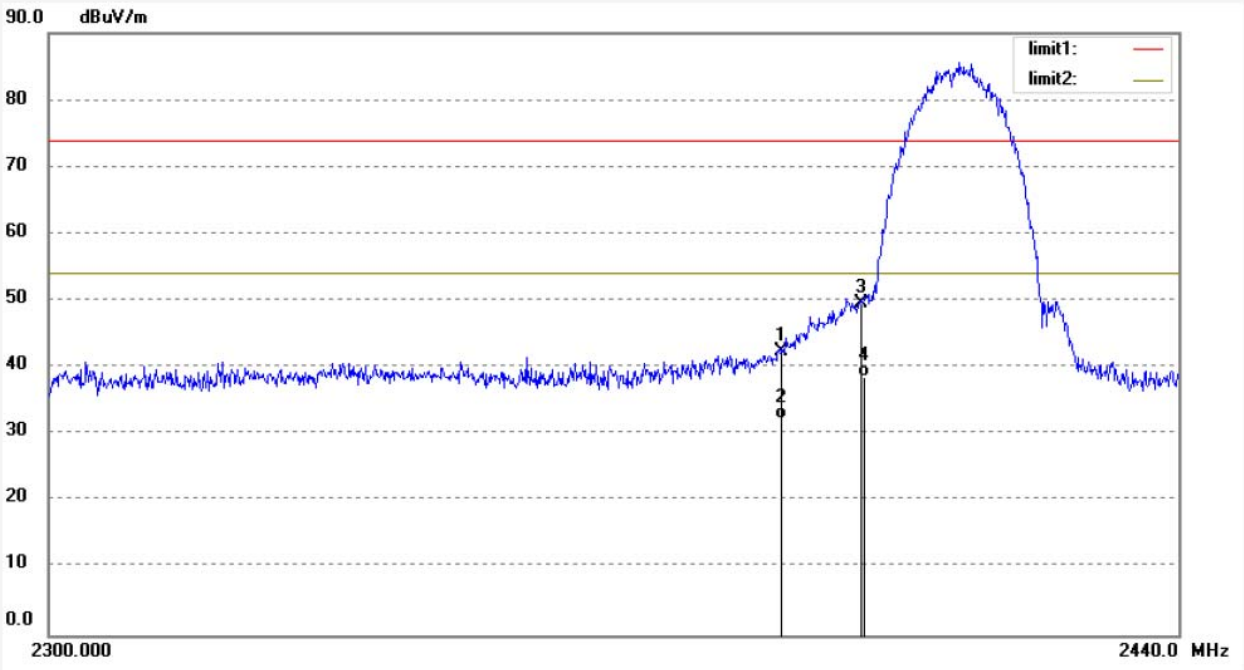
Job No.: STAR2014 #2156	Polarization: Vertical
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 15/04/13/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/44/33
EUT: MID	Engineer Signature:
Mode: TX Channel 1(802.11b)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	48.83	-6.31	42.52	74.00	-31.48	peak			
2	2390.000	38.61	-6.31	32.30	54.00	-21.70	AVG			
3	2400.000	55.90	-6.28	49.62	74.00	-24.38	peak			
4	2400.000	44.86	-6.28	38.58	54.00	-15.42	AVG			

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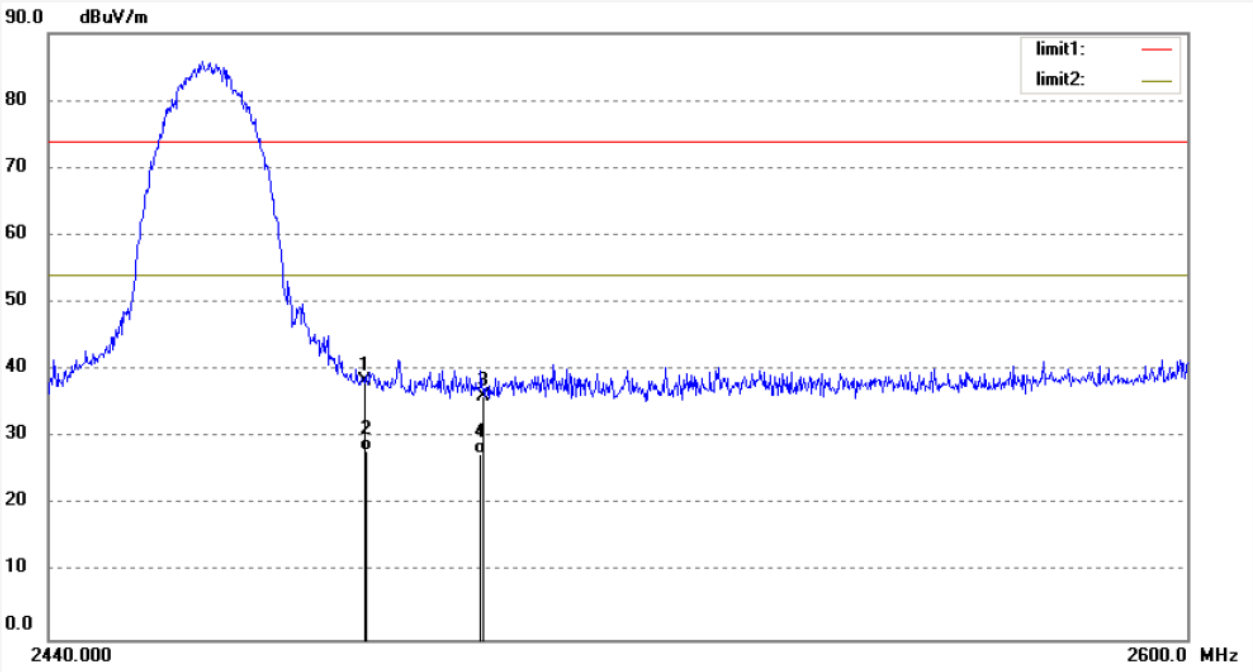
Job No.: STAR2014 #2157	Polarization: Vertical
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 15/04/13/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/49/32
EUT: MID	Engineer Signature:
Mode: TX Channel 11(802.11b)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	44.39	-6.04	38.35	74.00	-35.65	peak			
2	2483.500	34.14	-6.04	28.10	54.00	-25.90	AVG			
3	2500.000	42.04	-6.00	36.04	74.00	-37.96	peak			
4	2500.000	33.67	-6.00	27.67	54.00	-26.33	AVG			

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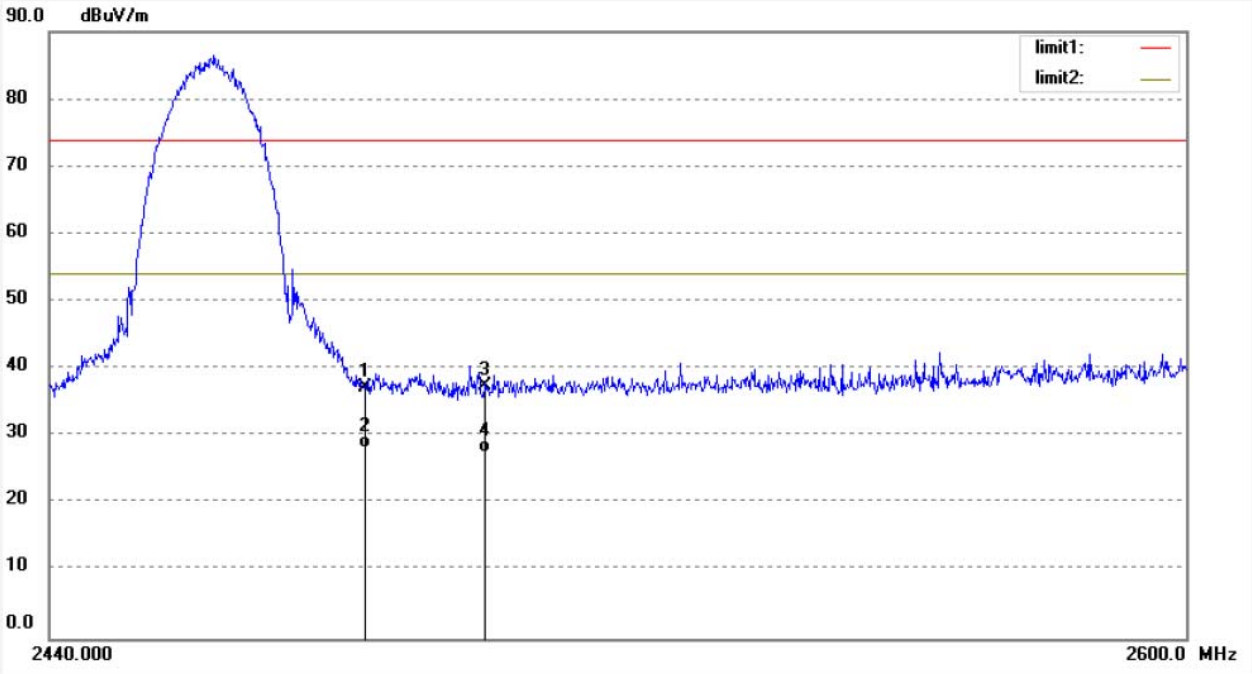
Job No.: STAR2014 #2158	Polarization: Horizontal
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 15/04/13/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/53/38
EUT: MID	Engineer Signature:
Mode: TX Channel 11(802.11b)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	43.34	-6.04	37.30	74.00	-36.70	peak			
2	2483.500	34.25	-6.04	28.21	54.00	-25.79	AVG			
3	2500.000	43.53	-6.00	37.53	74.00	-36.47	peak			
4	2500.000	33.67	-6.00	27.67	54.00	-26.33	AVG			

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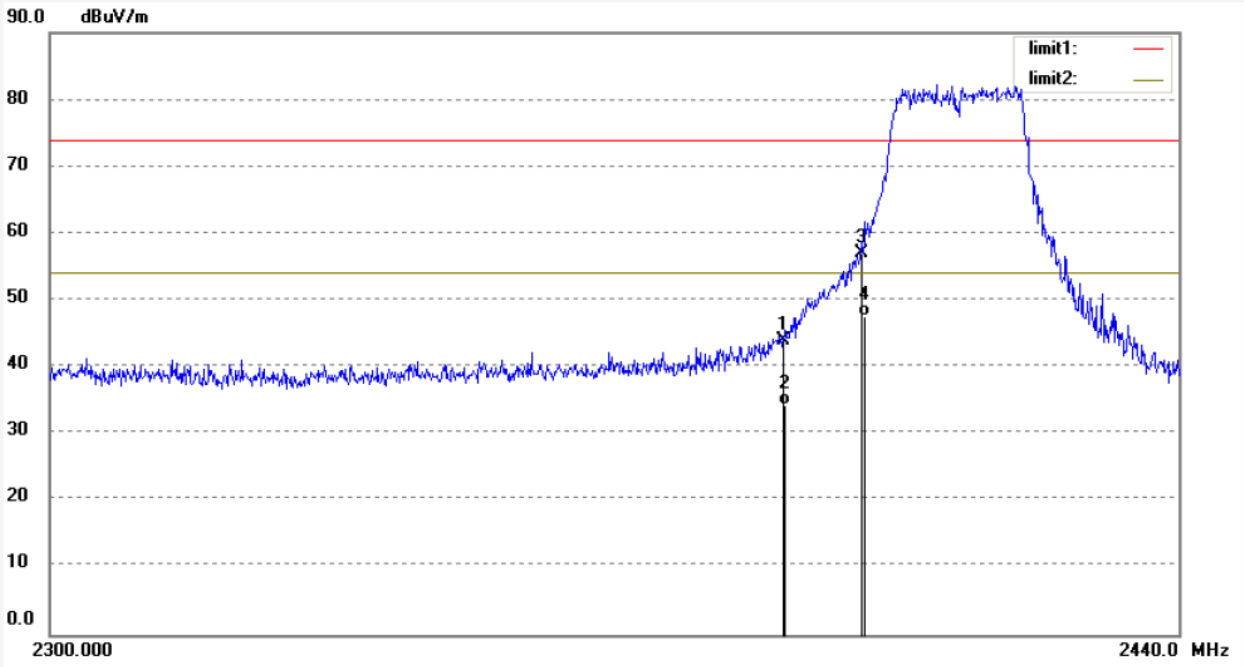
Job No.: STAR2014 #2162	Polarization: Horizontal
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 15/04/13/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/20/29
EUT: MID	Engineer Signature:
Mode: TX Channel 1(802.11g)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	50.25	-6.31	43.94	74.00	-30.06	peak			
2	2390.000	40.52	-6.31	34.21	54.00	-19.79	AVG			
3	2400.000	63.34	-6.28	57.06	74.00	-16.94	peak			
4	2400.000	53.83	-6.28	47.55	54.00	-6.45	AVG			

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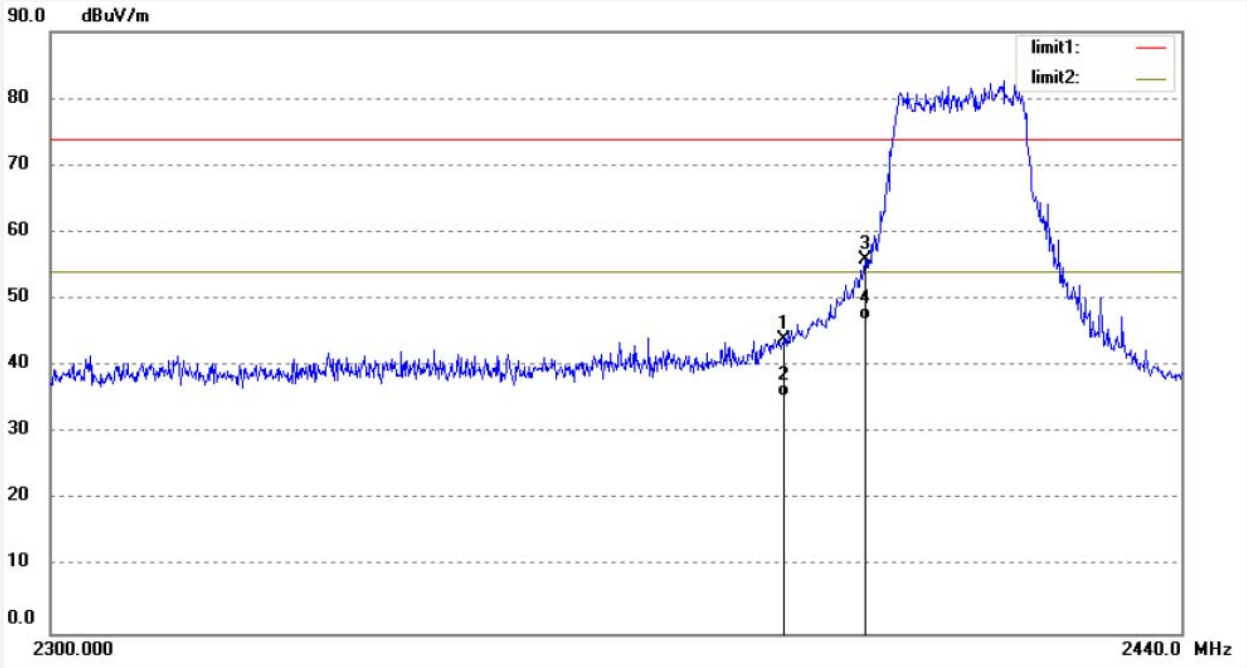
Job No.: STAR2014 #2161	Polarization: Vertical
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 15/04/13/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/16/11
EUT: MID	Engineer Signature:
Mode: TX Channel 1(802.11g)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	50.22	-6.31	43.91	74.00	-30.09	peak			
2	2390.000	41.69	-6.31	35.38	54.00	-18.62	AVG			
3	2400.000	62.27	-6.28	55.99	74.00	-18.01	peak			
4	2400.000	53.30	-6.28	47.02	54.00	-6.98	AVG			

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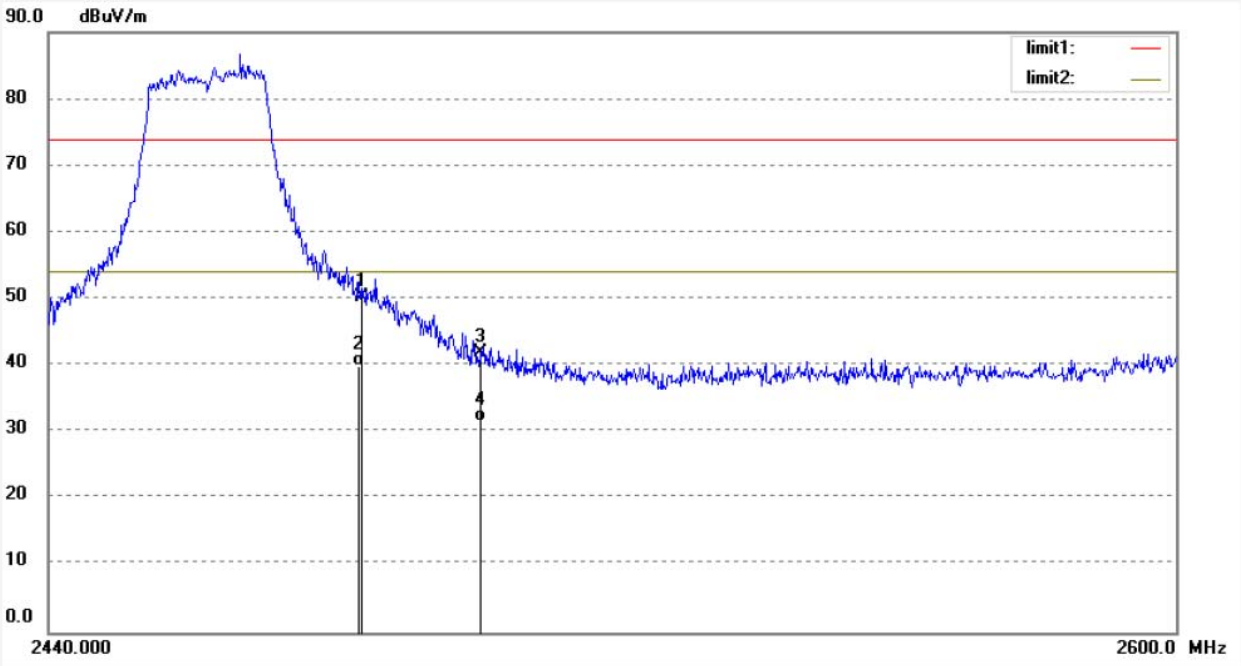
Fax:+86-0755-26503396

Job No.: STAR2014 #2159	Polarization: Horizontal
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 15/04/13/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/58/06
EUT: MID	Engineer Signature:
Mode: TX Channel 11(802.11g)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	56.32	-6.04	50.28	74.00	-23.72	peak			
2	2483.500	46.04	-6.04	40.00	54.00	-14.00	AVG			
3	2500.000	47.96	-6.00	41.96	74.00	-32.04	peak			
4	2500.000	37.51	-6.00	31.51	54.00	-22.49	AVG			

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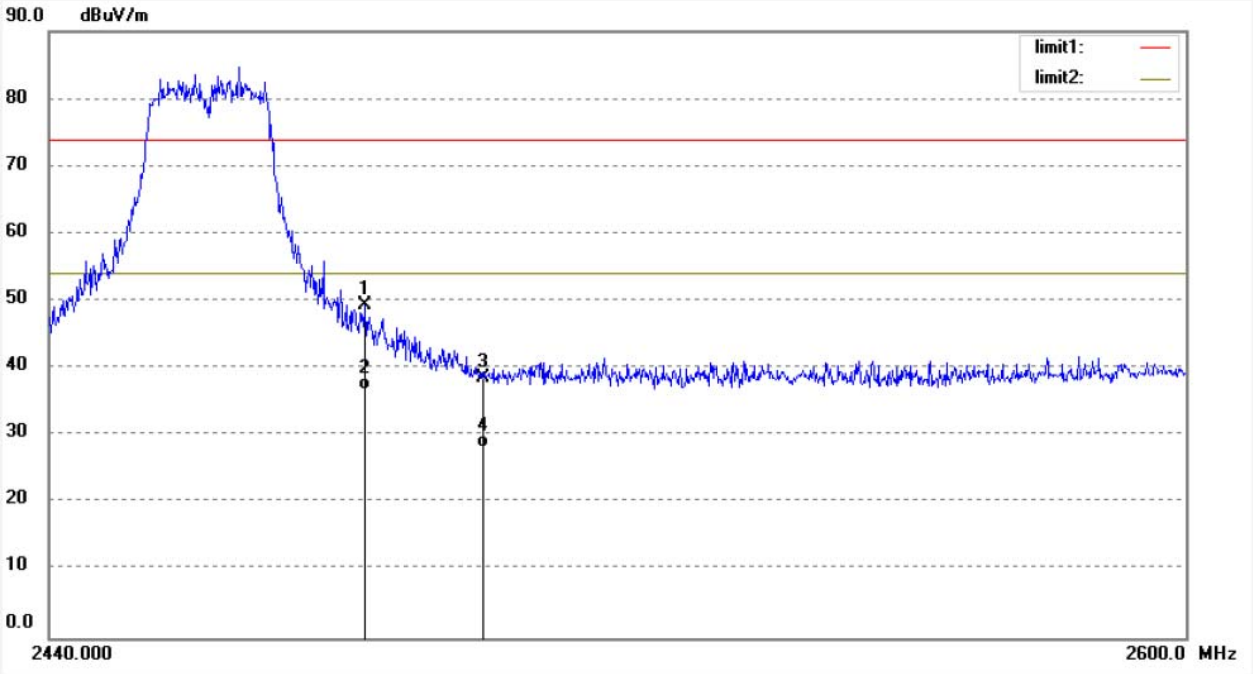
Job No.: STAR2014 #2160	Polarization: Vertical
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 15/04/13/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/12/47
EUT: MID	Engineer Signature:
Mode: TX Channel 11(802.11g)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	55.49	-6.04	49.45	74.00	-24.55	peak			
2	2483.500	42.80	-6.04	36.76	54.00	-17.24	AVG			
3	2500.000	44.56	-6.00	38.56	74.00	-35.44	peak			
4	2500.000	34.26	-6.00	28.26	54.00	-25.74	AVG			

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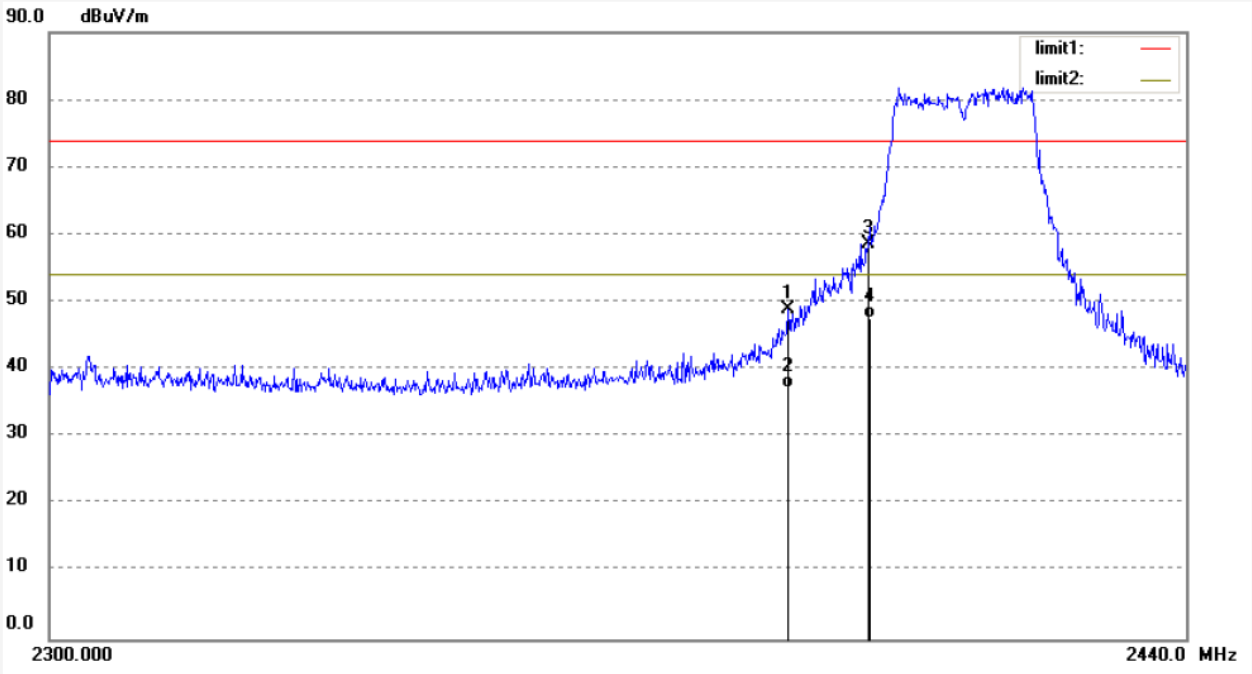
Job No.: STAR2014 #2163	Polarization: Horizontal
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 15/04/13/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/24/33
EUT: MID	Engineer Signature:
Mode: TX Channel 1(802.11n)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	55.22	-6.31	48.91	74.00	-25.09	peak			
2	2390.000	43.59	-6.31	37.28	54.00	-16.72	AVG			
3	2400.000	64.98	-6.28	58.70	74.00	-15.30	peak			
4	2400.000	53.89	-6.28	47.61	54.00	-6.39	AVG			

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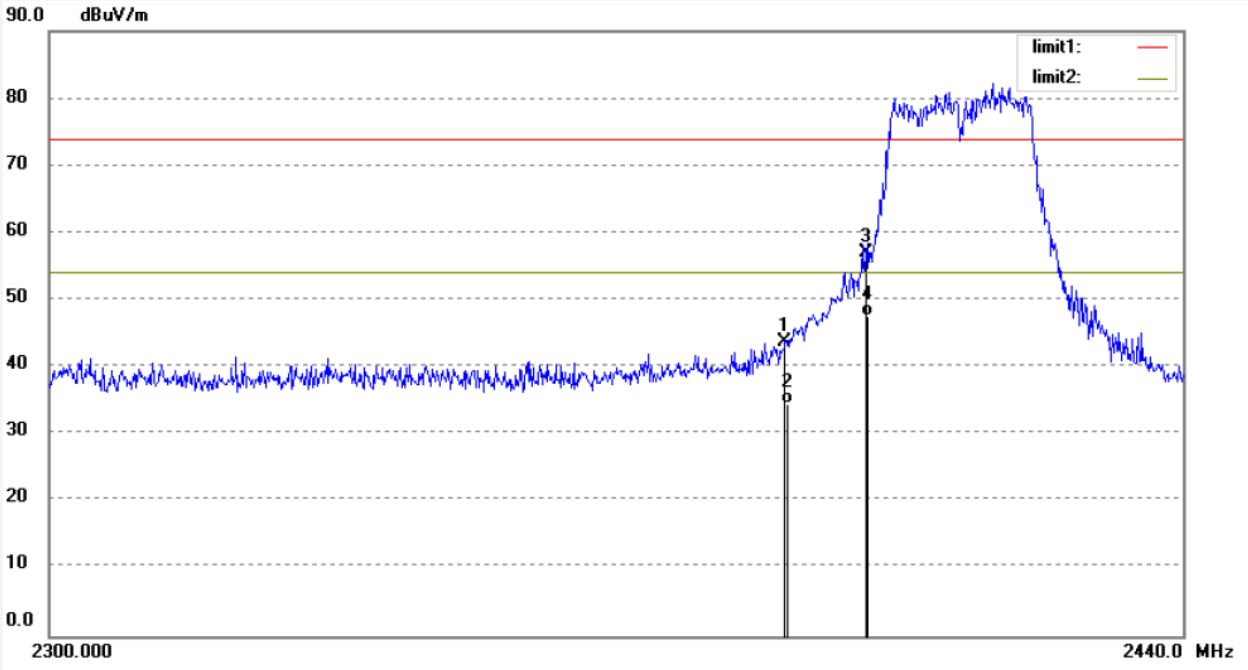
Job No.: STAR2014 #2164	Polarization: Vertical
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 15/04/13/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/29/37
EUT: MID	Engineer Signature:
Mode: TX Channel 1(802.11n)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	50.07	-6.31	43.76	74.00	-30.24	peak			
2	2390.000	40.76	-6.31	34.45	54.00	-19.55	AVG			
3	2400.000	63.32	-6.28	57.04	74.00	-16.96	peak			
4	2400.000	53.88	-6.28	47.60	54.00	-6.40	AVG			

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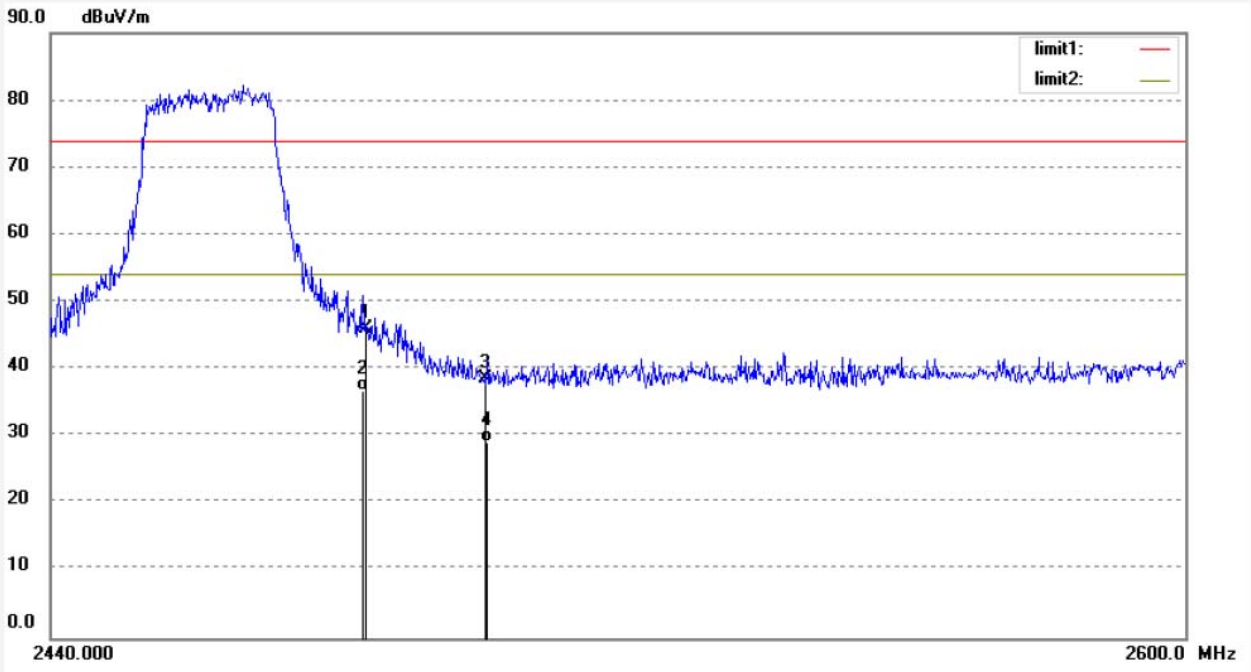
Job No.: STAR2014 #2165	Polarization: Vertical
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 15/04/13/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/34/50
EUT: MID	Engineer Signature:
Mode: TX Channel 11(802.11n)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	52.07	-6.04	46.03	74.00	-27.97	peak			
2	2483.500	42.89	-6.04	36.85	54.00	-17.15	AVG			
3	2500.000	44.48	-6.00	38.48	74.00	-35.52	peak			
4	2500.000	35.10	-6.00	29.10	54.00	-24.90	AVG			

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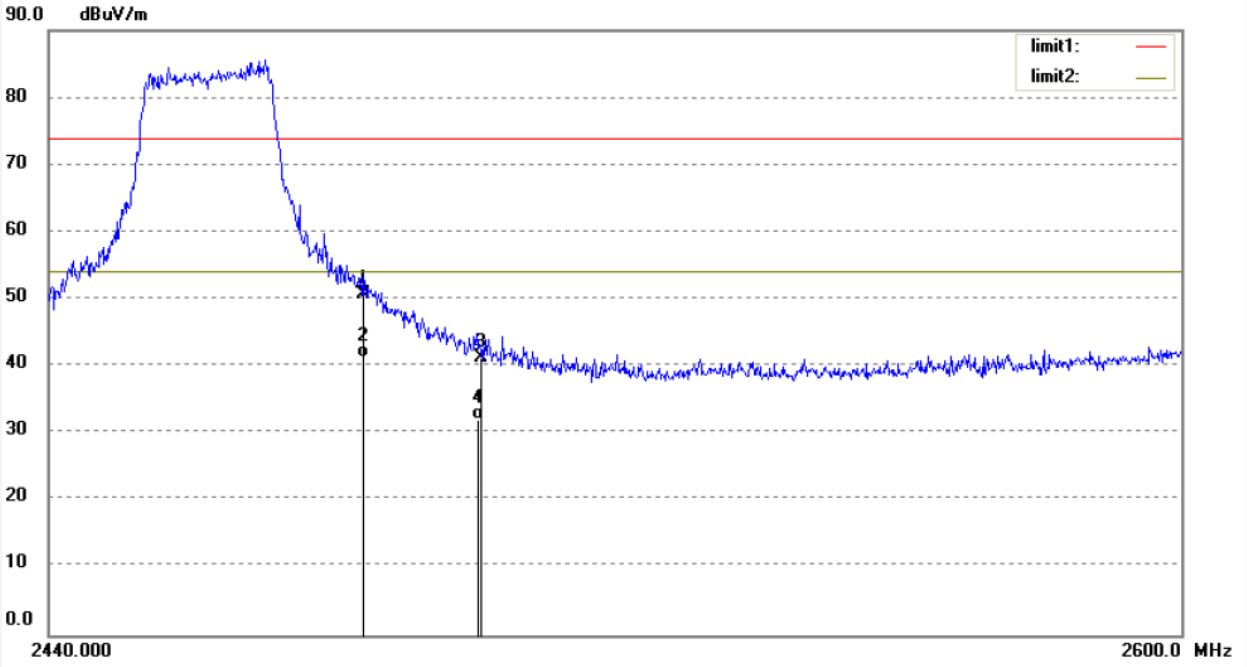
Job No.: STAR2014 #2166	Polarization: Horizontal
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 15/04/13/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/38/18
EUT: MID	Engineer Signature:
Mode: TX Channel 11(802.11n)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	56.88	-6.04	50.84	74.00	-23.16	peak			
2	2483.500	47.25	-6.04	41.21	54.00	-12.79	AVG			
3	2500.000	47.36	-6.00	41.36	74.00	-32.64	peak			
4	2500.000	38.15	-6.00	32.15	54.00	-21.85	AVG			

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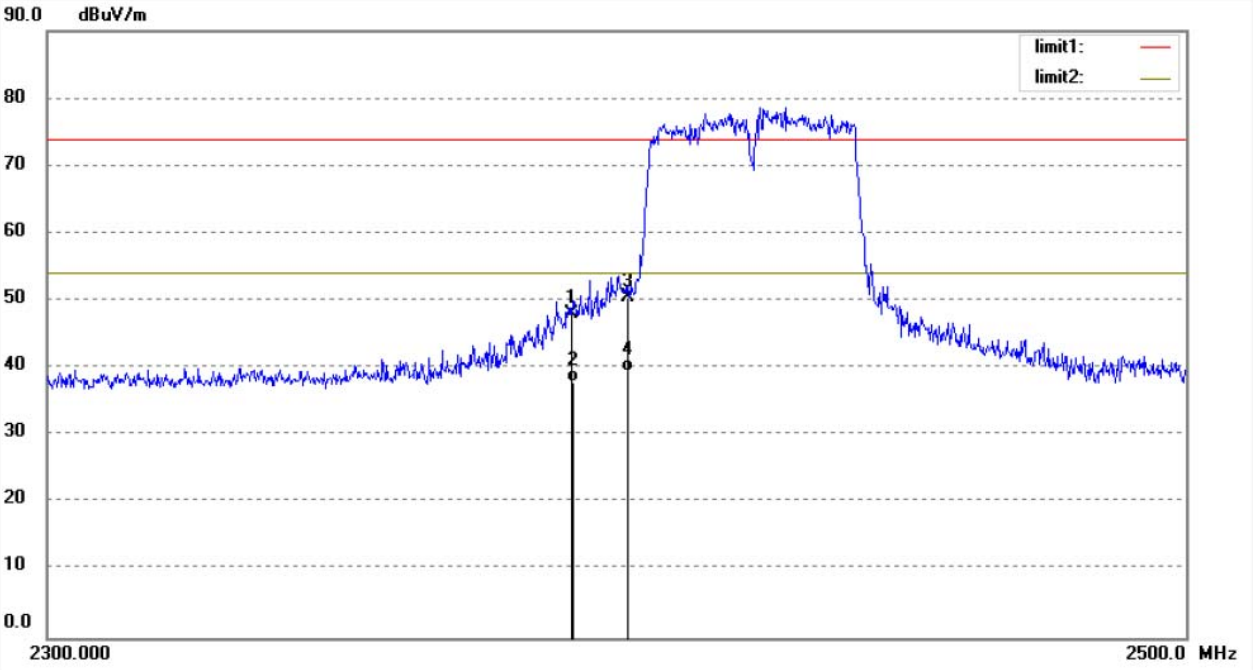
Job No.: STAR2014 #2170	Polarization: Horizontal
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 15/04/13/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/56/02
EUT: MID	Engineer Signature:
Mode: TX Channel 3(802.11n)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	54.29	-6.31	47.98	74.00	-26.02	peak			
2	2390.000	44.25	-6.31	37.94	54.00	-16.06	AVG			
3	2400.000	56.82	-6.28	50.54	74.00	-23.46	peak			
4	2400.000	45.78	-6.28	39.50	54.00	-14.50	AVG			

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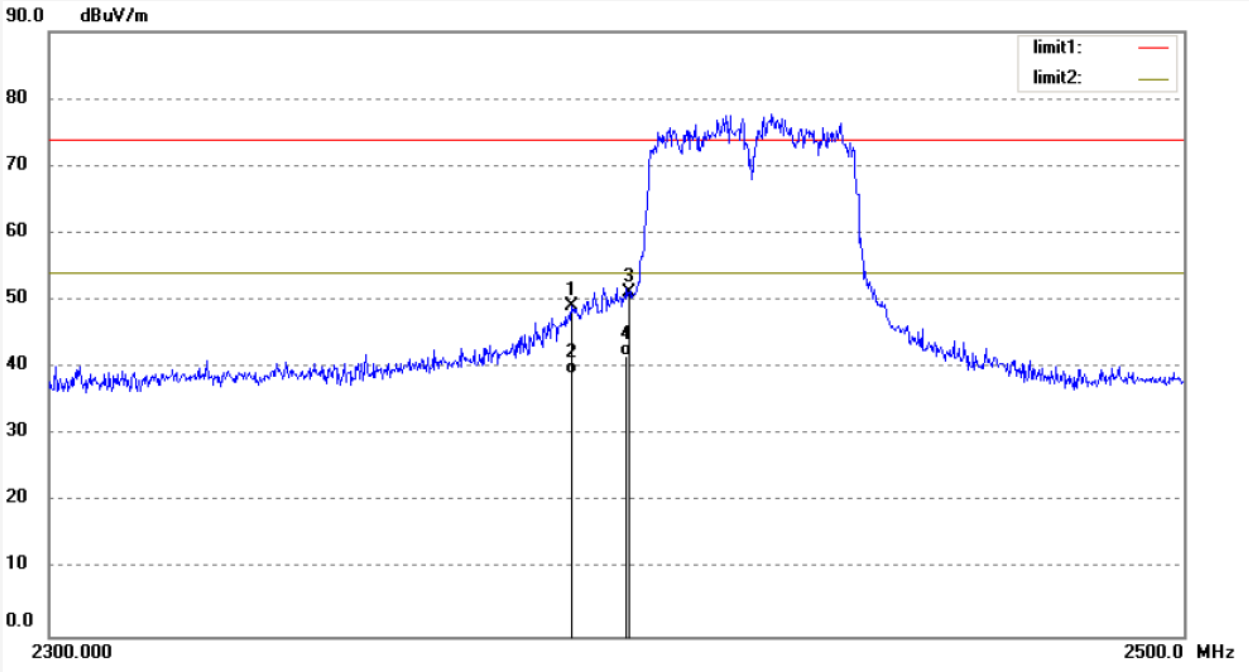
Job No.: STAR2014 #2169	Polarization: Vertical
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 15/04/13/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/51/59
EUT: MID	Engineer Signature:
Mode: TX Channel 3(802.11n)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	55.55	-6.31	49.24	74.00	-24.76	peak			
2	2390.000	45.26	-6.31	38.95	54.00	-15.05	AVG			
3	2400.000	57.57	-6.28	51.29	74.00	-22.71	peak			
4	2400.000	48.02	-6.28	41.74	54.00	-12.26	AVG			

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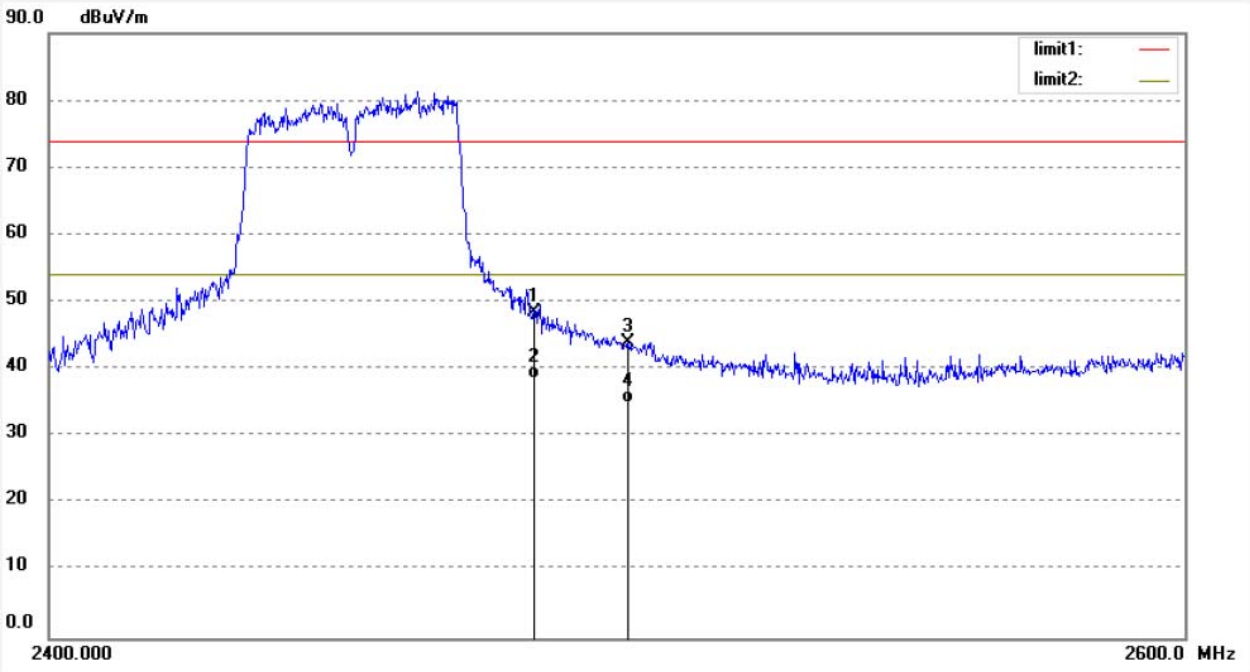
Job No.: STAR2014 #2167	Polarization: Horizontal
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 15/04/13/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/42/35
EUT: MID	Engineer Signature:
Mode: TX Channel 9(802.11n)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	54.45	-6.04	48.41	74.00	-25.59	peak			
2	2483.500	44.58	-6.04	38.54	54.00	-15.46	AVG			
3	2500.000	50.07	-6.00	44.07	74.00	-29.93	peak			
4	2500.000	40.89	-6.00	34.89	54.00	-19.11	AVG			

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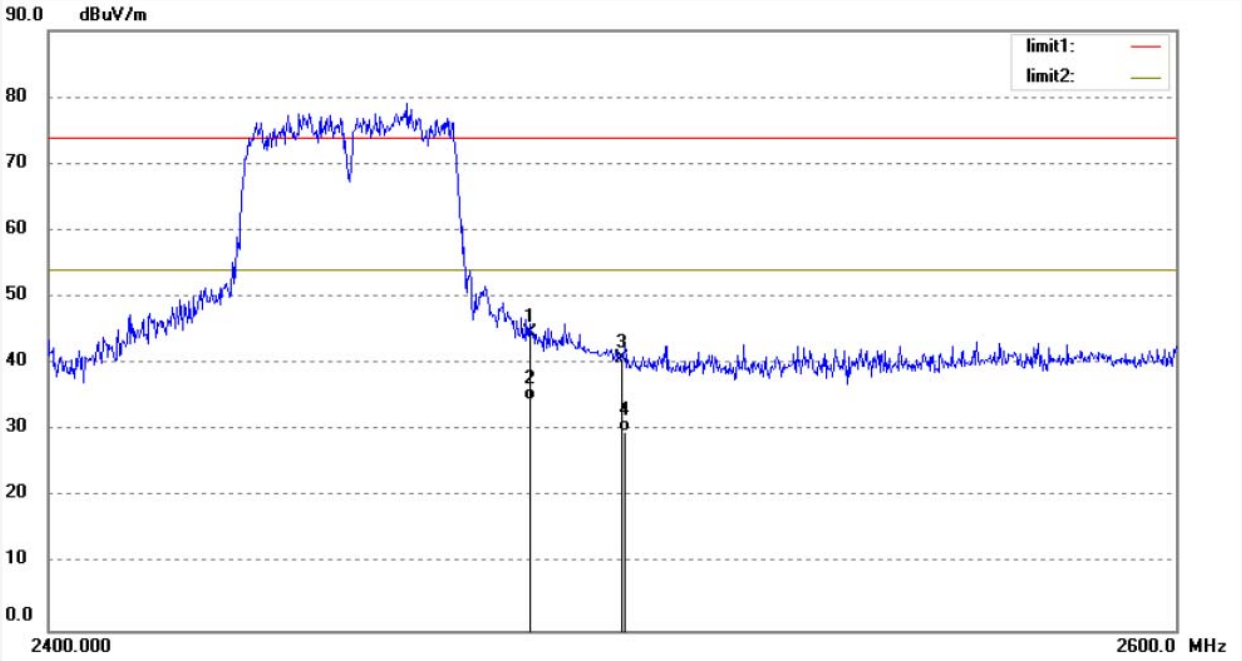
Job No.: STAR2014 #2168	Polarization: Vertical
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 15/04/13/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/47/37
EUT: MID	Engineer Signature:
Mode: TX Channel 9(802.11n)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	50.65	-6.04	44.61	74.00	-29.39	peak			
2	2483.500	40.52	-6.04	34.48	54.00	-19.52	AVG			
3	2500.000	46.92	-6.00	40.92	74.00	-33.08	peak			
4	2500.000	35.79	-6.00	29.79	54.00	-24.21	AVG			

9. RADIATED SPURIOUS EMISSION TEST

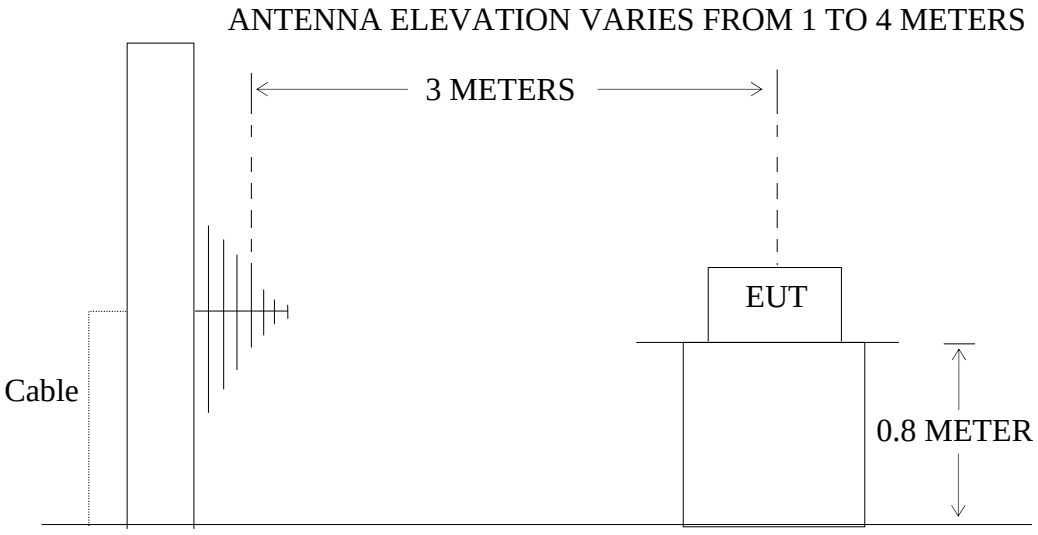
9.1.Block Diagram of Test Setup

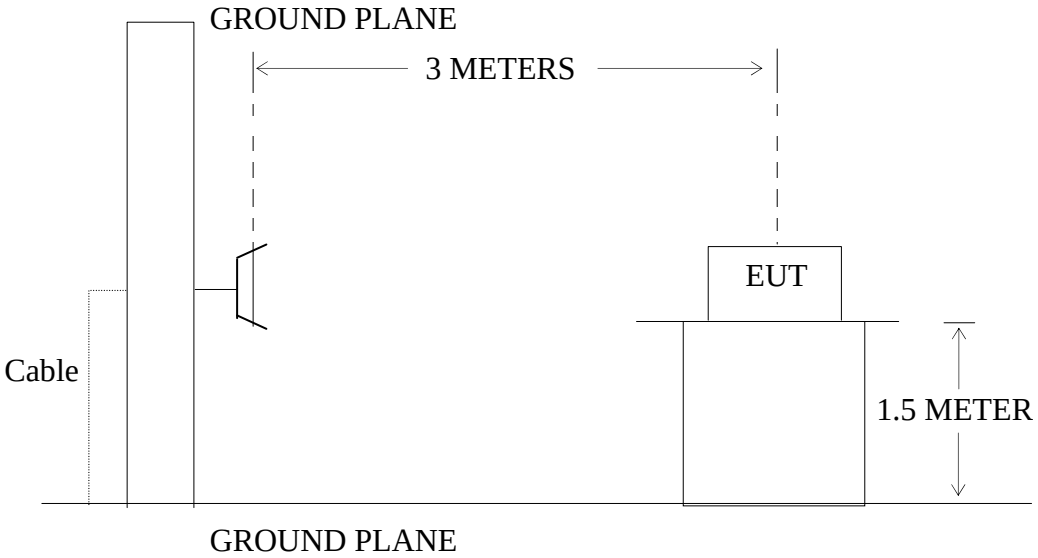
9.1.1.Block diagram of connection between the EUT and peripherals

EUT

Setup: Transmitting mode

9.1.2.Semi-Anechoic Chamber Test Setup Diagram





9.2.The Limit For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

9.3.Restricted bands of operation

9.3.1.FCC Part 15.205 Restricted bands of operation

(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	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

[1]Until February 1, 1999, this restricted band shall be 0.490-0.510
[2]Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

9.4. Configuration of EUT on Measurement

The equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

9.5. Operating Condition of EUT

9.5.1. Setup the EUT and simulator as shown as Section 9.1.

9.5.2. Turn on the power of all equipment.

9.5.3. Let the EUT work in TX modes measure it. The transmit frequency are 2412-2462 and 2422-2452MHz. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz TX frequency to transmit.

9.6. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna.
For emission measurements above 1 GHz, the EUT shall be placed at a height of 1.5 m above the floor on a support that is RF transparent for the frequencies of interest. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

The final measurement in band 9-90 kHz, 110-490 kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.
When average radiated emissions measurements are specified there is also a limit on the peak emissions level which is 20 dB above the applicable maximum permitted average emission limit

RBW (120 kHz), VBW (300 kHz) for QP detector below 1GHz
Peak detector above 1GHz
RBW (1 MHz), VBW (3MHz) for Peak measurement
RBW (1 MHz), VBW (10Hz) for AV measurement

If the peak-detected amplitude can be shown to comply with the average limit, then it is not necessary to perform a separate average measurement.

9.7.The Field Strength of Radiation Emission Measurement Results

Note: 1. The fundamental radiated emissions were reduced by Band Reject Filter in the attached plots.

2. The EUT is tested radiation emission at each test mode(802.11 b/g/n) in three axes. The worst emissions are reported in all test mode and channels.

3. The 18-25GHz emissions are not reported, because the levels are too low against the limit.

Below 1G

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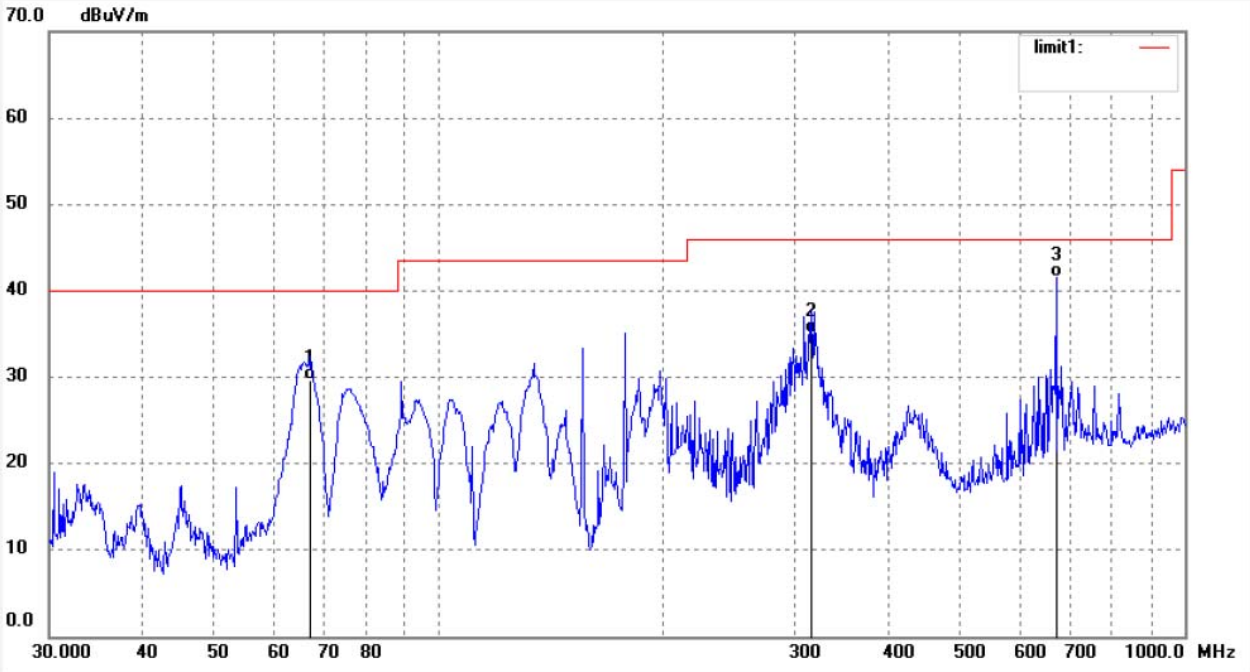
Job No.: STAR2015 #515	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 15/04/10/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/18/47
EUT: MID	Engineer Signature:
Mode: TX Channel 6(802.11b)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	67.3109	50.88	-21.26	29.62	40.00	-10.38	QP			
2	315.8599	52.64	-17.51	35.13	46.00	-10.87	QP			
3	672.3103	51.75	-10.25	41.50	46.00	-4.50	QP			

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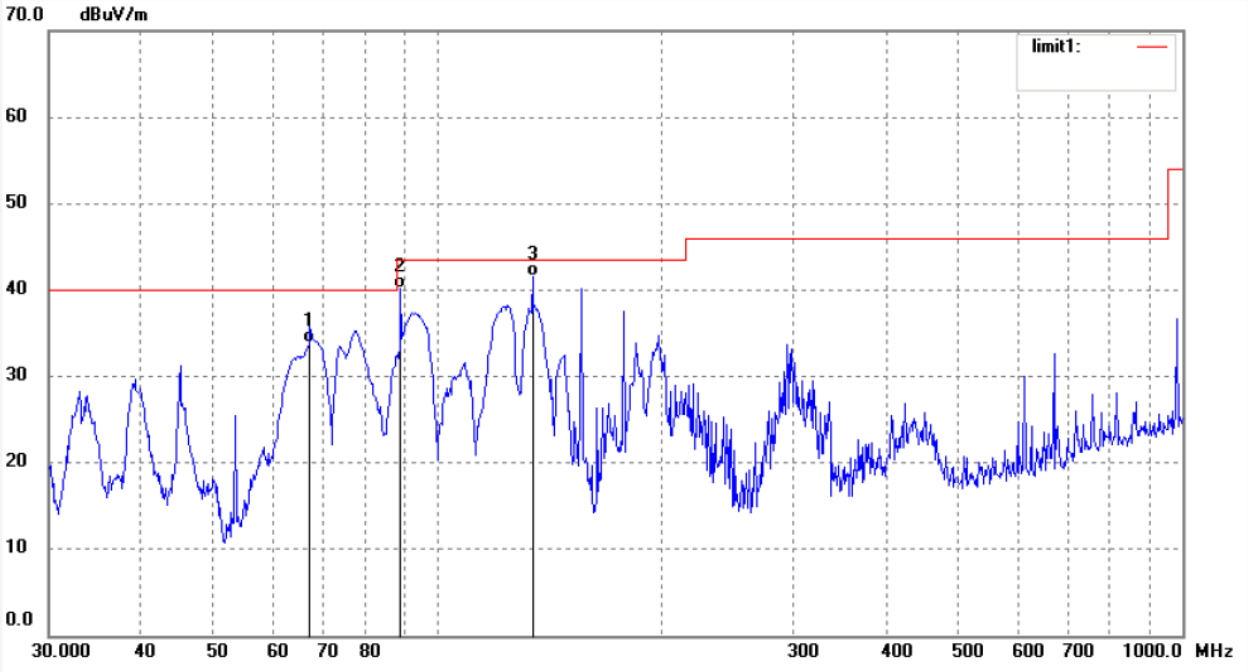
Job No.: STAR2015 #514	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 15/04/10/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/14/34
EUT: MID	Engineer Signature:
Mode: TX Channel 6(802.11b)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	67.3109	55.10	-21.26	33.84	40.00	-6.16	QP			
2	89.1578	61.86	-21.67	40.19	43.50	-3.31	QP			
3	134.0193	64.82	-23.22	41.60	43.50	-1.90	QP			

Above 1G

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Site: 1# Chamber
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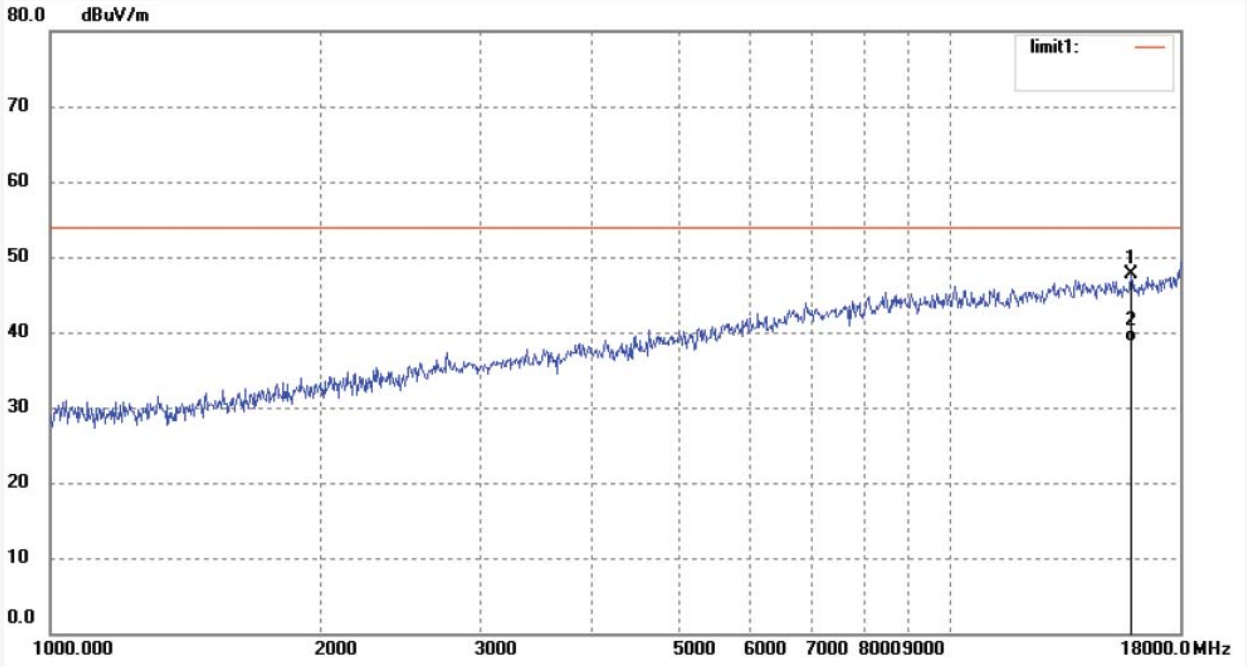
Fax:+86-0755-26503396

Job No.: star2014 #1983	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/50Hz
Test item: Radiation Test	Date: 15/04/09/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/01/10
EUT: MID	Engineer Signature: STAR
Mode: TX Channel 1(802.11b)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	15882.369	34.49	13.17	47.66	54.00	-6.34	peak			
2	15882.369	25.63	13.17	38.80	54.00	-15.20	AVG			

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Site: 1# Chamber
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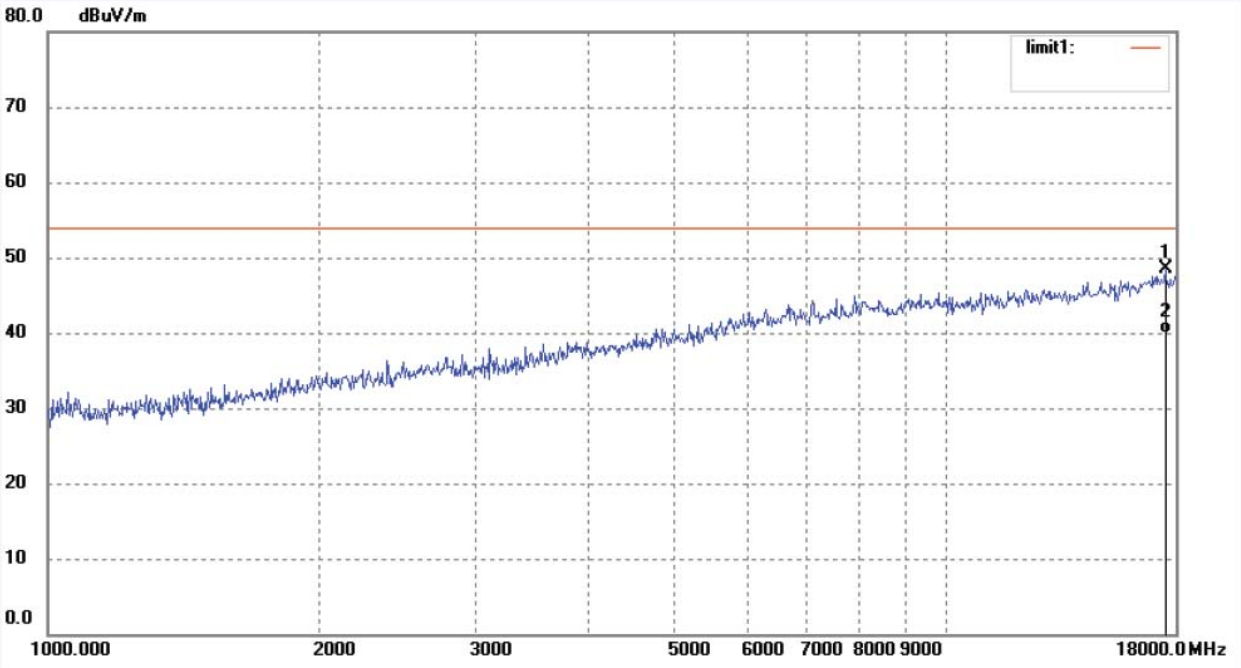
Fax:+86-0755-26503396

Job No.: star2014 #1984	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/50Hz
Test item: Radiation Test	Date: 15/04/09/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/04/58
EUT: MID	Engineer Signature: STAR
Mode: TX Channel 1(802.11b)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	17534.582	30.78	17.68	48.46	54.00	-5.54	peak			
2	17534.582	22.17	17.68	39.85	54.00	-14.15	AVG			

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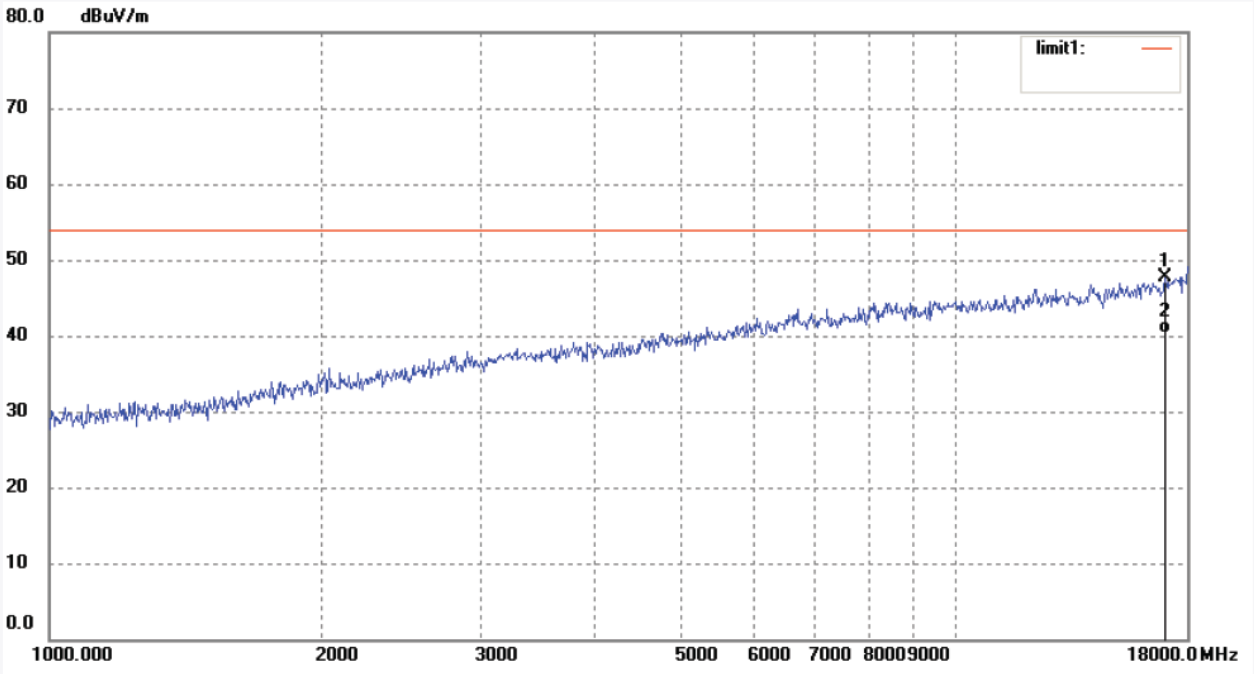
Job No.: star2014 #1985	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/50Hz
Test item: Radiation Test	Date: 15/04/09/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/08/37
EUT: MID	Engineer Signature: STAR
Mode: TX Channel 6(802.11b)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	17031.551	32.35	15.34	47.69	54.00	-6.31	peak			
2	17031.551	24.91	15.34	40.25	54.00	-13.75	AVG			

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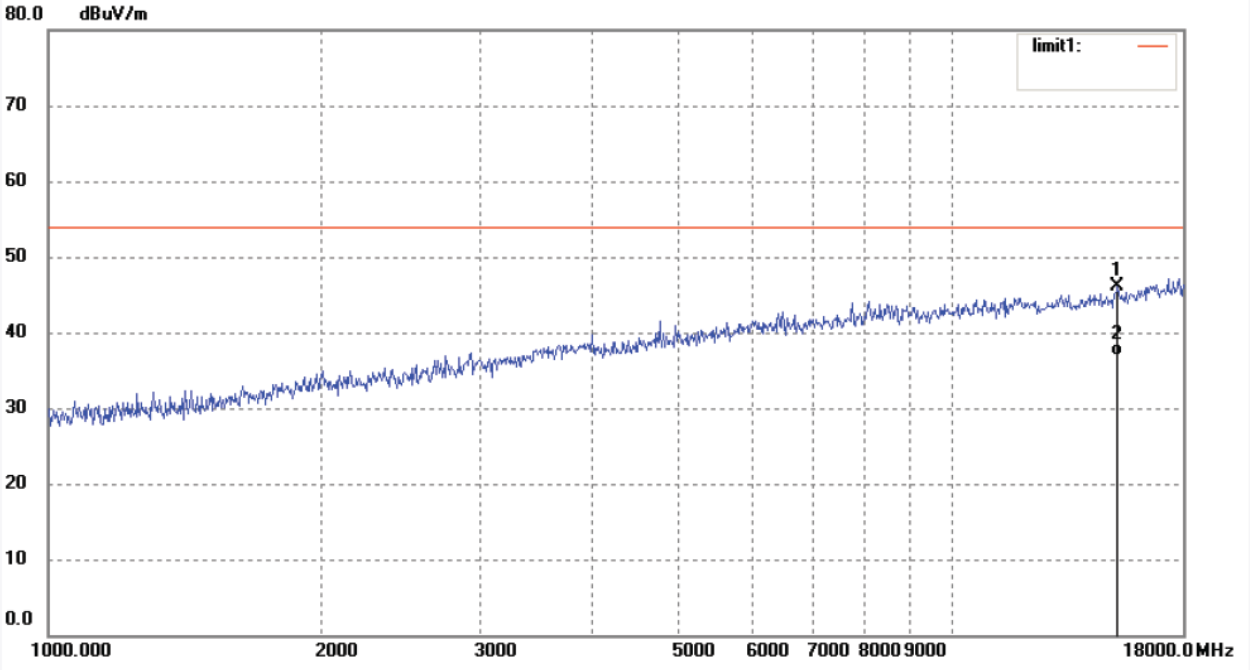
Fax:+86-0755-26503396

Job No.: star2014 #1986	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/50Hz
Test item: Radiation Test	Date: 15/04/09/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/12/27
EUT: MID	Engineer Signature: STAR
Mode: TX Channel 6(802.11b)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	15248.165	32.69	13.50	46.19	54.00	-7.81	peak			
2	15248.165	23.50	13.50	37.00	54.00	-17.00	AVG			

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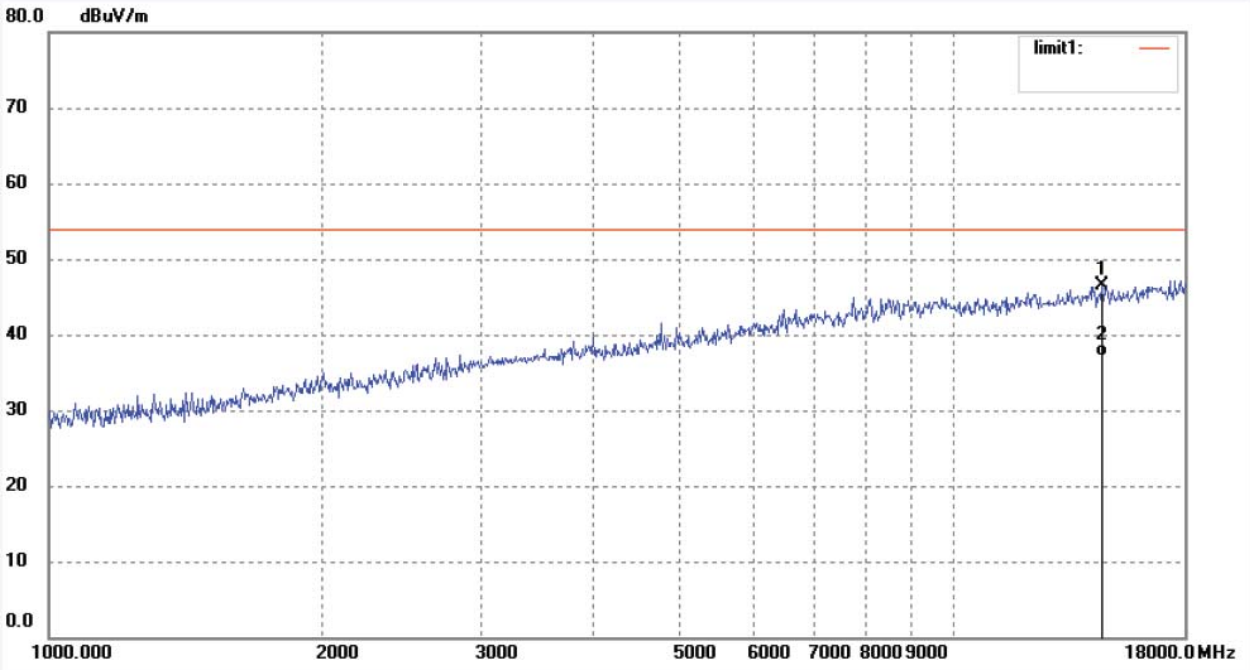
Job No.: star2014 #1987	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/50Hz
Test item: Radiation Test	Date: 15/04/09/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/15/27
EUT: MID	Engineer Signature: STAR
Mode: TX Channel 11(802.11b)	Distance: 3m
Model: PC803BXC	
Manufacturer: Natural Sound	

Note: Report No.:ATE20150661



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	14596.737	32.14	14.42	46.56	54.00	-7.44	peak			
2	14596.737	22.69	14.42	37.11	54.00	-16.89	AVG			