

APPLICATION CERTIFICATION FCC Part 15C
On Behalf of
MivaTek Limited

MivaTek Low Power Wi-Fi Module
Model No.: MODCC32

FCC ID: 2AE59-MODCC32

Prepared for : MivaTek Limited
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Report No. : ATE20162251
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Date of Report : Nov. 17, 2016

TABLE OF CONTENTS

Description	Page
Test Report Certification	
1. GENERAL INFORMATION	5
1.1. Description of Device (EUT).....	5
1.2. Carrier Frequency of Channels	6
1.3. Accessory and Auxiliary Equipment.....	6
1.4. Description of Test Facility	7
1.5. Measurement Uncertainty	7
2. MEASURING DEVICE AND TEST EQUIPMENT	8
3. OPERATION OF EUT DURING TESTING	9
3.1. Operating Mode	9
3.2. Configuration and peripherals	9
4. TEST PROCEDURES AND RESULTS	10
5. POWER LINE CONDUCTED MEASUREMENT	11
5.1. Power Line Conducted Emission Measurement Limits.....	11
5.2. Power Line Conducted Emission Measurement Results	11
6. 6DB&20DB BANDWIDTH MEASUREMENT	12
6.1. Block Diagram of Test Setup.....	12
6.2. The Requirement For Section 15.247(a)(2).....	12
6.3. EUT Configuration on Measurement	12
6.4. Operating Condition of EUT	12
6.5. Test Procedure	12
6.6. Test Result	13
7. MAXIMUM CONDUCTED (AVERAGE) OUTPUT POWER	26
7.1. Block Diagram of Test Setup.....	26
7.2. The Requirement For Section 15.247(b)(3).....	26
7.3. EUT Configuration on Measurement	26
7.4. Operating Condition of EUT	26
7.5. Test Procedure	26
7.6. Test Result	27
8. POWER SPECTRAL DENSITY MEASUREMENT	34
8.1. Block Diagram of Test Setup.....	34
8.2. The Requirement For Section 15.247(e).....	34
8.3. EUT Configuration on Measurement	34
8.4. Operating Condition of EUT	34
8.5. Test Procedure	34
8.6. Test Result	35
9. BAND EDGE COMPLIANCE TEST	42
9.1. Block Diagram of Test Setup.....	42
9.2. The Requirement For Section 15.247(d)	42
9.3. EUT Configuration on Measurement	42
9.4. Operating Condition of EUT	42
9.5. Test Procedure	42
9.6. Test Result	43

10. RADIATED SPURIOUS EMISSION TEST	65
10.1. Block Diagram of Test Setup.....	65
10.2. The Limit For Section 15.247(d)	66
10.3. Restricted bands of operation	67
10.4. Configuration of EUT on Measurement	67
10.5. Operating Condition of EUT	68
10.6. Test Procedure	68
10.7. The Field Strength of Radiation Emission Measurement Results	69
11. ANTENNA REQUIREMENT.....	100
11.1. The Requirement	100
11.2. Antenna Construction	100

Test Report Certification

Applicant : MivaTek Limited.
Address : 5/F, SPA Centre 53-55 Lockhart Road Wanchai, Hong Kong
Manufacturer 1 : Power 7 Technology(Dongguan)Co., Ltd
Address : No.28, Binjiang Street, Shishukou Village, Qiaotou Town, Dongguan City, Guangdong Province, P.R. China
Manufacturer 2 : Zhong Shan Chi Shing Electronics Company Limited / FARBELL INVESTMENTS LTD
Address : 1/F, No.16 Qian Jin 3 Rd., Tanzhou, Zhongshan, Guangdong, China. / BLK A, 8/F., Unit 10, VERSTRONG IND CTR 34-36 AU PUI WAN ST FOTAN SHATIN NT
Product : MivaTek Low Power Wi-Fi Module
Model No. : MODCC32
Trade name : n.a

Measurement Procedure Used:

**FCC Rules and Regulations Part 15 Subpart C Section 15.247: 2016
ANSI C63.10: 2013**

The EUT was tested according to DTS test procedure of Apr 08, 2016 KDB558074 D01 DTS Meas Guidance v03r05 for compliance to FCC 47CFR 15.247 requirements

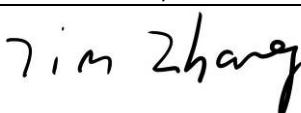
The device described above is tested by ACCURATE TECHNOLOGY CO. LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.247 limits. The measurement results are contained in this test report and ACCURATE TECHNOLOGY 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 :
Date of Report :

Oct. 27, 2016-Nov. 16, 2016

Nov. 17, 2016

Prepared by :


(Tim.zhang, Engineer)

Approved & Authorized Signer :


(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	MivaTek Low Power Wi-Fi Module
Model Number	:	MODCC32
Frequency Range	:	802.11b/g/n(20MHz): 2412-2462MHz 802.11n(40MHz): 2422-2452MHz
Number of Channels	:	802.11b/g/n (20MHz):11 802.11n (40MHz): 7
Antenna Gain	:	2.5dBi
Type of Antenna	:	PCB Antenna
Power Supply	:	DC 3.3V
Data Rate	:	802.11b: 11, 5.5, 2, 1 Mbps 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11n: up to 150Mbps
Modulation Type	:	DSSS, OFDM
Applicant	:	MIVATEK LIMITED
Address	:	5/F, SPA Centre 53-55 Lockhart Road Wanchai, Hong Kong.
Manufacturer 1	:	Power 7 Technology(Dongguan)Co., Ltd
Address	:	No.28, Binjiang Street, Shishukou Village, Qiaotou Town, Dongguan City, Guangdong Province, P.R. China.
Manufacturer 2	:	Zhong Shan Chi Shing Electronics Company Limited / FARBELL INVESTMENTS LTD
Address	:	1/F, No.16 Qian Jin 3 Rd., Tanzhou, Zhongshan, Guangdong, China. / BLK A, 8/F., Unit 10, VERSTRONG IND CTR 34-36 AU PUI WAN ST FOTAN SHATIN NT.
Date of sample received	:	Oct. 27, 2016
Date of Test	:	Oct. 27, 2016-Nov. 17, 2016

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.Accessory and Auxiliary Equipment

PC

Manufacturer: LENOVO
M/N: 4290-RT8
S/N: R9-FW93G 11/08

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	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 9, 2016	1 Year
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 9, 2016	1 Year
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 9, 2016	1 Year
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	Jan. 9, 2016	1 Year
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 14, 2016	1 Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 14, 2016	1 Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 14, 2016	1 Year
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 14, 2016	1 Year
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 9, 2016	1 Year
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 9, 2016	1 Year
Highpass Filter	Wainwright Instruments	WHKX3.6/18 G-10SS	N/A	Jan. 9, 2016	1 Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2 485-2375/2510 -60/11SS	N/A	Jan. 9, 2016	1 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

3.2. Configuration and peripherals

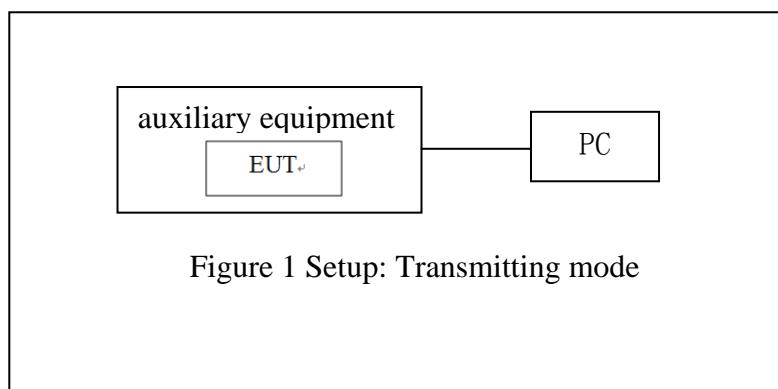


Figure 1 Setup: Transmitting mode

4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.207	Power Line Conducted Emission	N/A
Section 15.247(a)(2)	6dB&20dB 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 15.203	Antenna Requirement	Compliant

5. POWER LINE CONDUCTED MEASUREMENT

5.1.Power Line Conducted Emission Measurement Limits

Frequency (MHz)	Limit dB(μ V)	
	Quasi-peak Level	Average Level
0.15 - 0.50	66.0 – 56.0 *	56.0 – 46.0 *
0.50 - 5.00	56.0	46.0
5.00 - 30.00	60.0	50.0

NOTE1: The lower limit shall apply at the transition frequencies.
NOTE2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

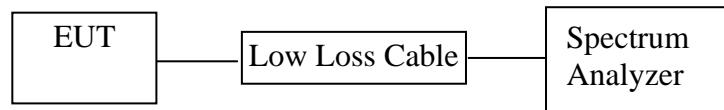
5.2.Power Line Conducted Emission Measurement Results

N/A.

Note: The power supply mode of the EUT is DC 3.3V, According to the FCC standard requirements, conducted emission is not applicable

6. 6DB&20DB BANDWIDTH MEASUREMENT

6.1. Block Diagram of Test Setup



6.2. 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.

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

1. Set resolution bandwidth (RBW) = 100 kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times RBW$.
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.

20dB bandwidth

1. Set resolution bandwidth (RBW) = 1%-5% OBW.
2. Set the video bandwidth (VBW) $\geq 3 \times RBW$.

3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Once the reference level is established, the equipment is conditioned with typical modulating signals to produce the worst-case (i.e., the widest) bandwidth. Unless otherwise specified for an unlicensed wireless device, measure the bandwidth at the -20 dB levels with respect to the reference level

6.6. Test Result

The test was performed with 802.11b				
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	20dB Bandwidth (MHz)	Limit (MHz)
Low	2412	10.32	17.598	> 0.5MHz
Middle	2437	10.32	17.135	> 0.5MHz
High	2462	10.32	17.540	> 0.5MHz

The test was performed with 802.11g				
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	20dB Bandwidth (MHz)	Limit (MHz)
Low	2412	16.60	19.740	> 0.5MHz
Middle	2437	16.60	19.392	> 0.5MHz
High	2462	16.60	19.624	> 0.5MHz

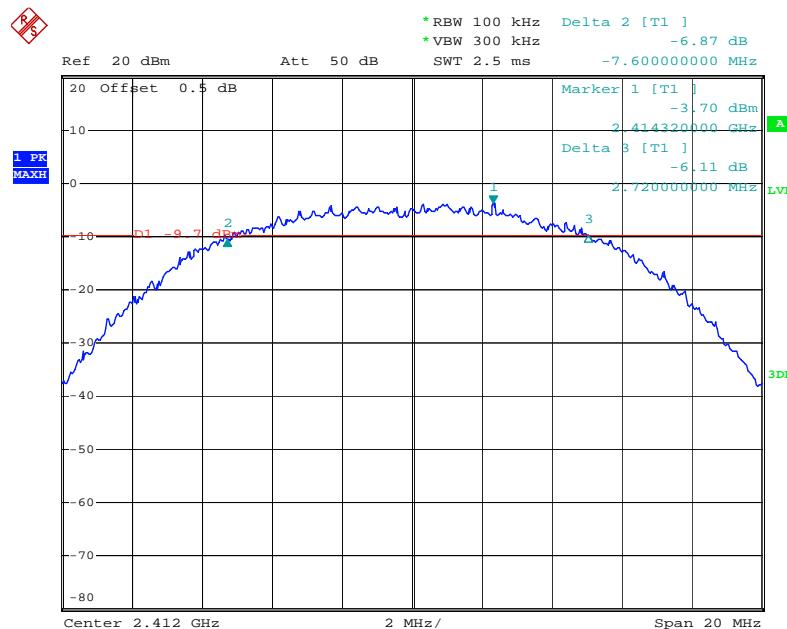
The test was performed with 802.11n (Bandwidth: 20 MHz)				
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	20dB Bandwidth (MHz)	Limit (MHz)
Low	2412	17.80	20.904	> 0.5MHz
Middle	2437	17.80	20.123	> 0.5MHz
High	2462	17.80	19.472	> 0.5MHz

The test was performed with 802.11n (Bandwidth: 40 MHz)				
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	20dB Bandwidth (MHz)	Limit (MHz)
Low	2422	36.56	40.84	> 0.5MHz
Middle	2437	36.56	40.96	> 0.5MHz
High	2452	36.56	40.96	> 0.5MHz

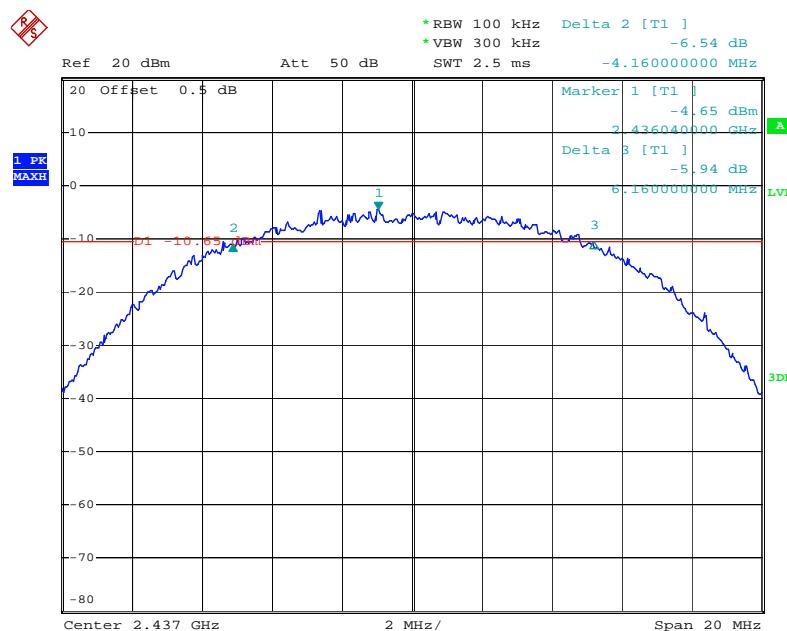
The spectrum analyzer plots are attached as below.

6dB Bandwidth

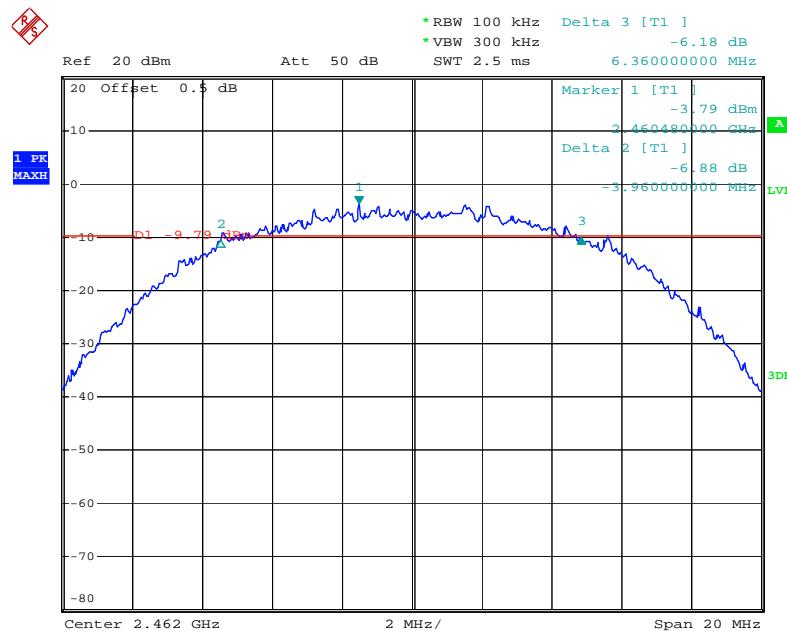
802.11b Channel Low 2412MHz



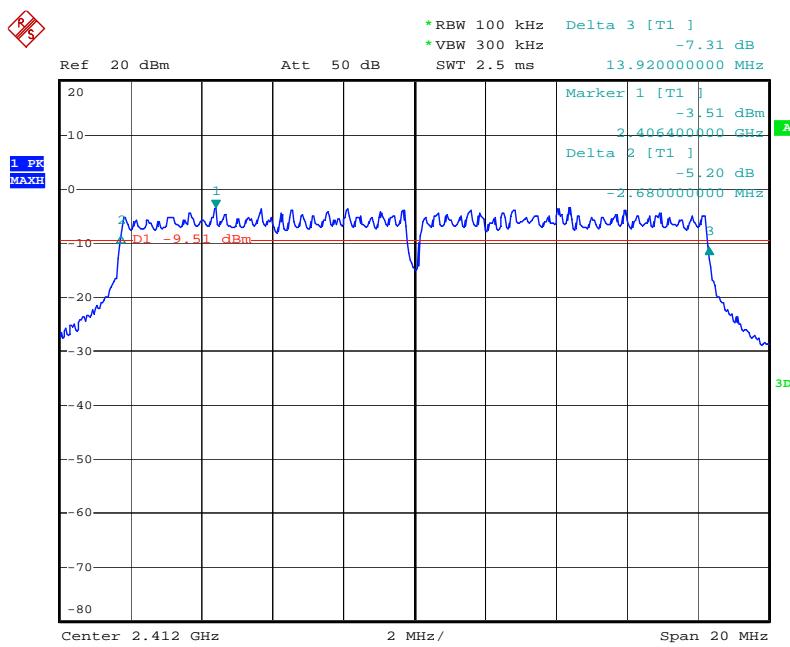
802.11b Channel Middle 2437MHz



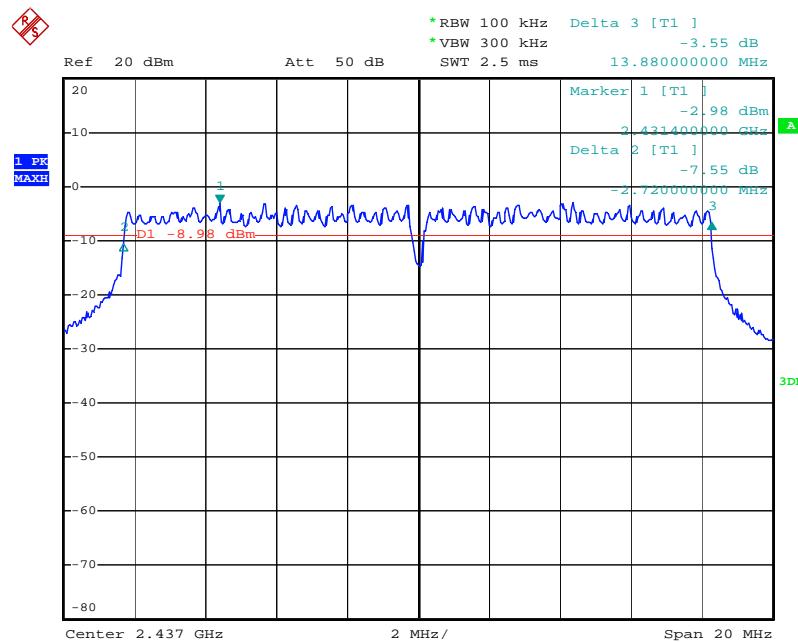
802.11b Channel High 2462MHz



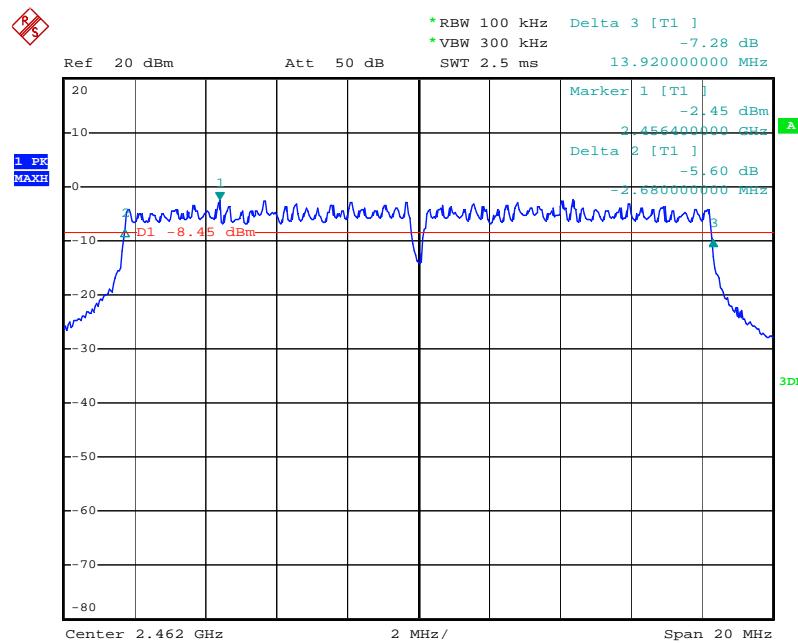
802.11g Channel Low 2412MHz



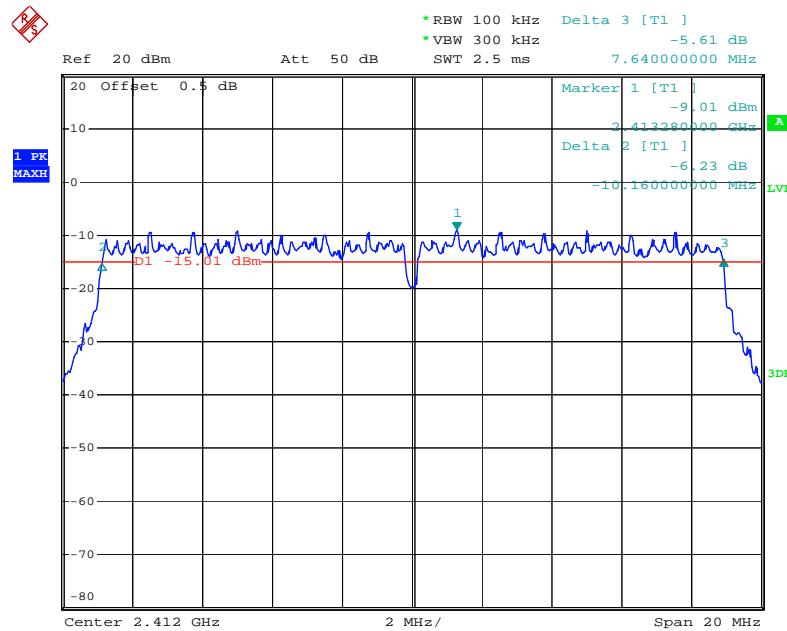
802.11g Channel Middle 2437MHz



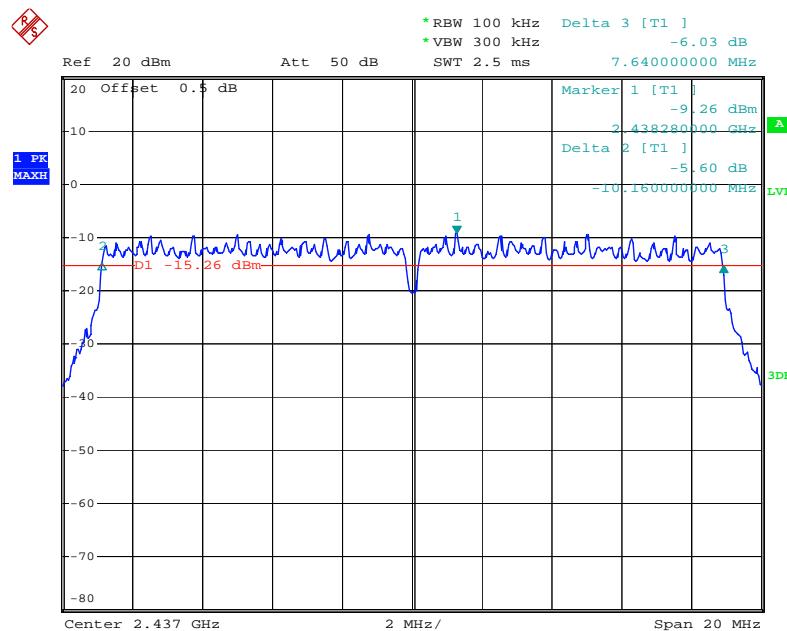
802.11g Channel High 2462MHz



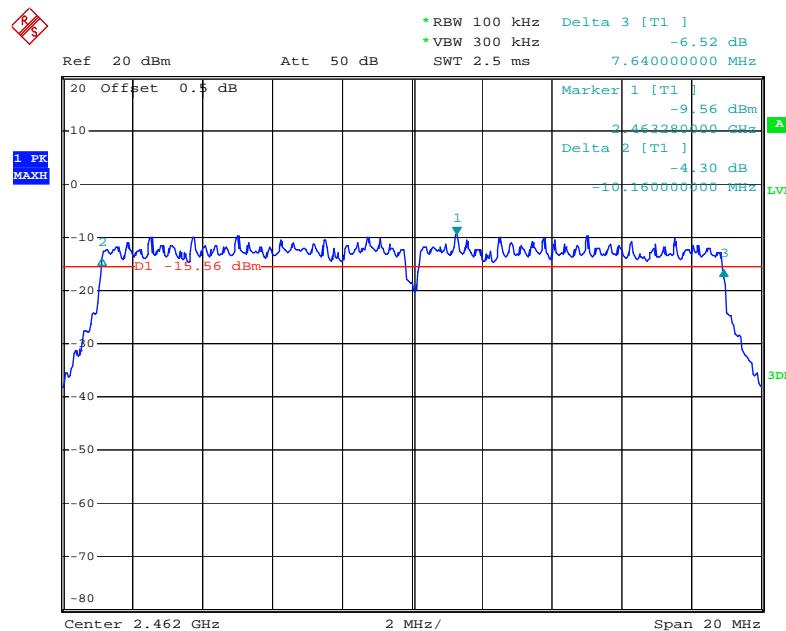
802.11n Channel Low 2412MHz (20MHz)



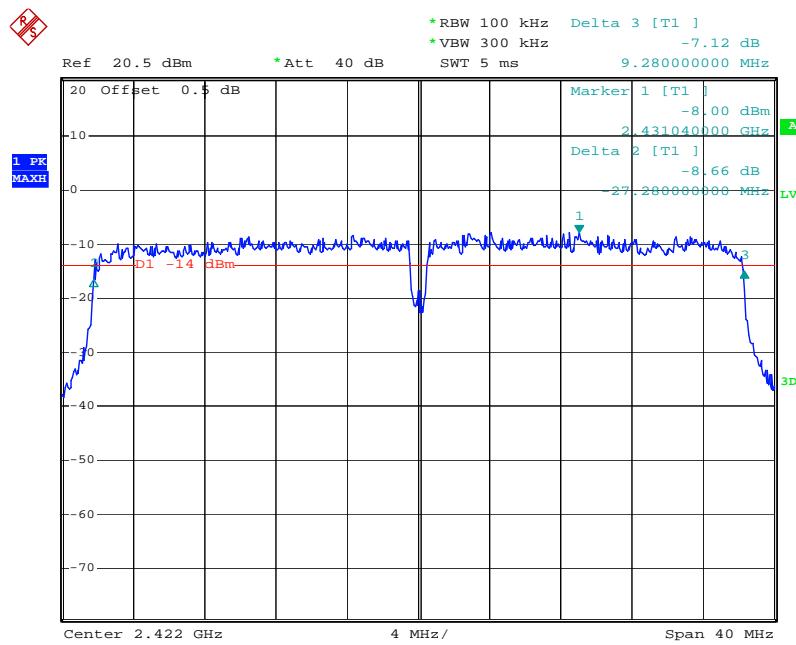
802.11n Channel Middle 2437MHz(20MHz)



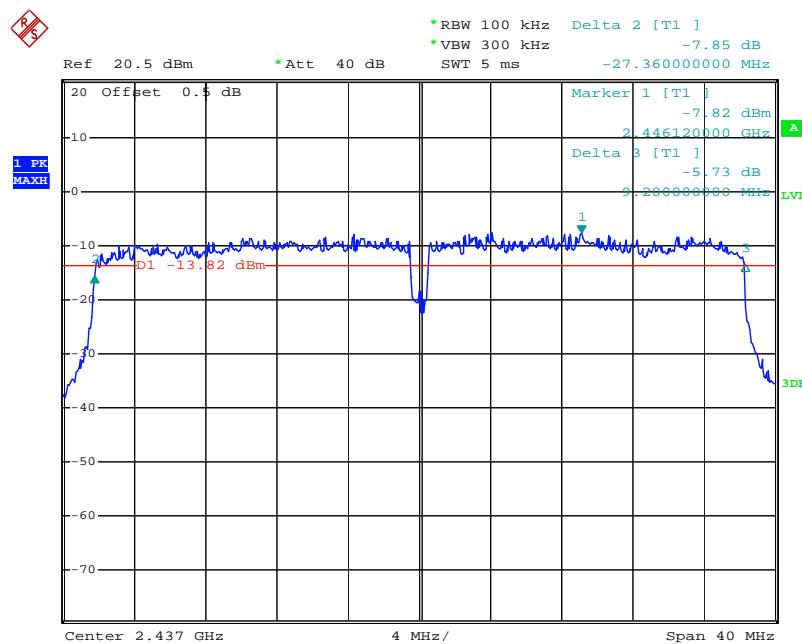
802.11n Channel High 2462MHz(20MHz)



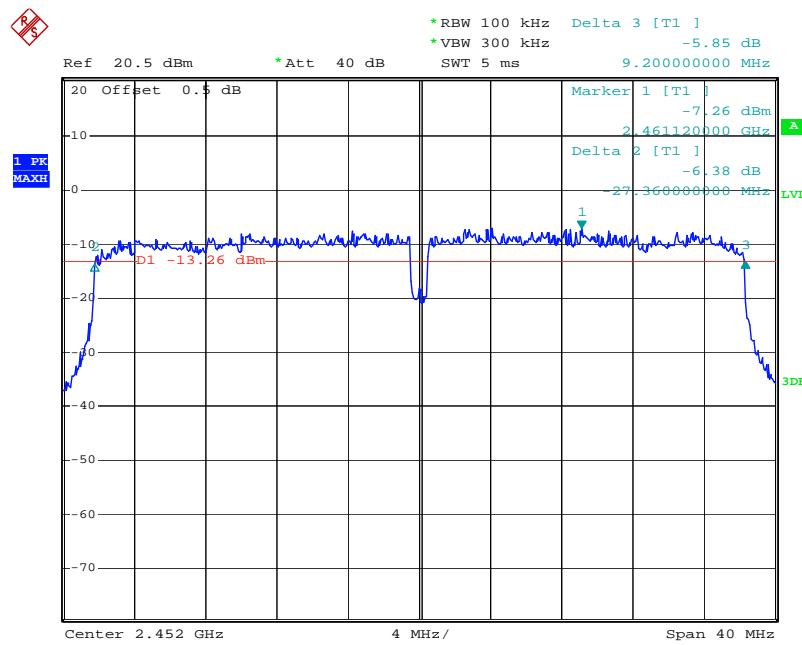
802.11n Channel Low 2422MHz (40MHz)



802.11n Channel Middle 2437MHz(40MHz)

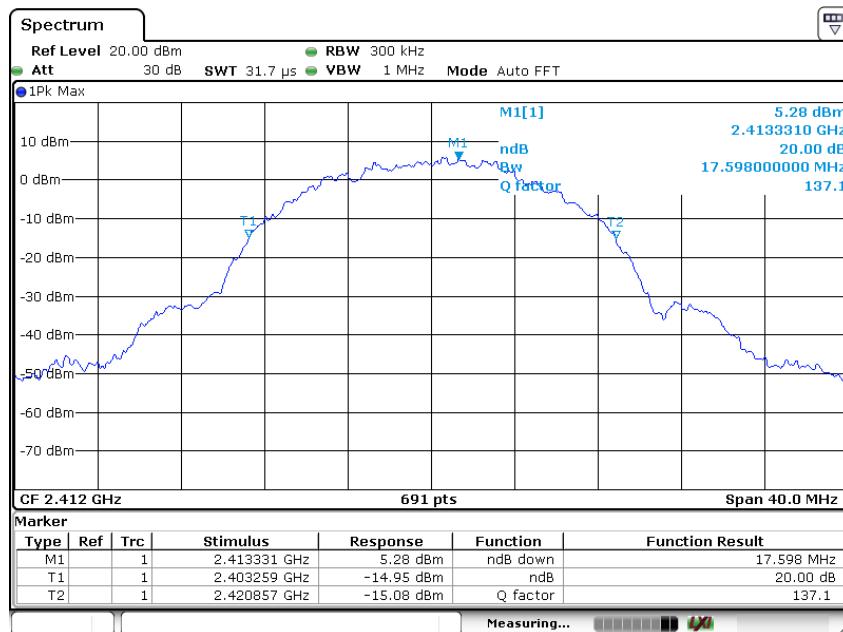


802.11n Channel High 2452MHz(40MHz)

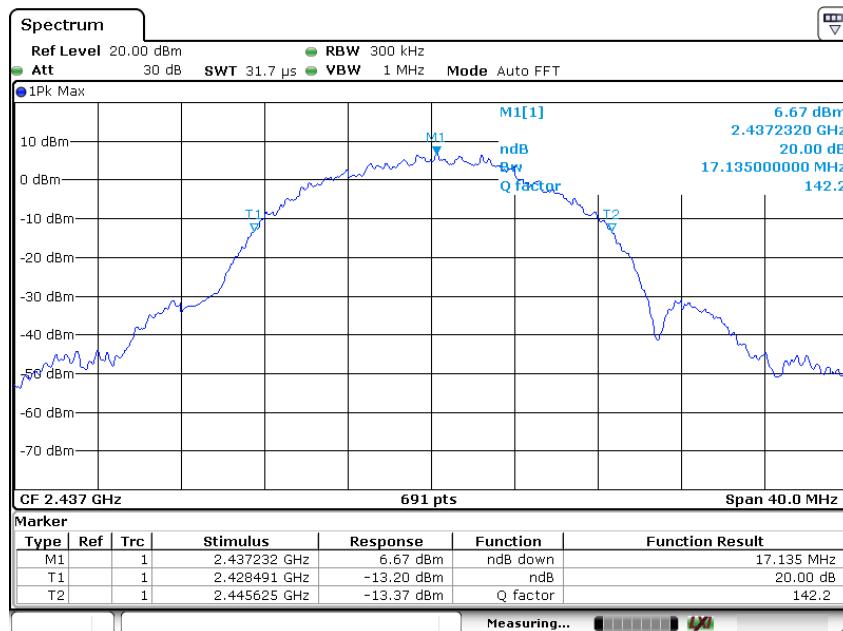


20dB Bandwidth

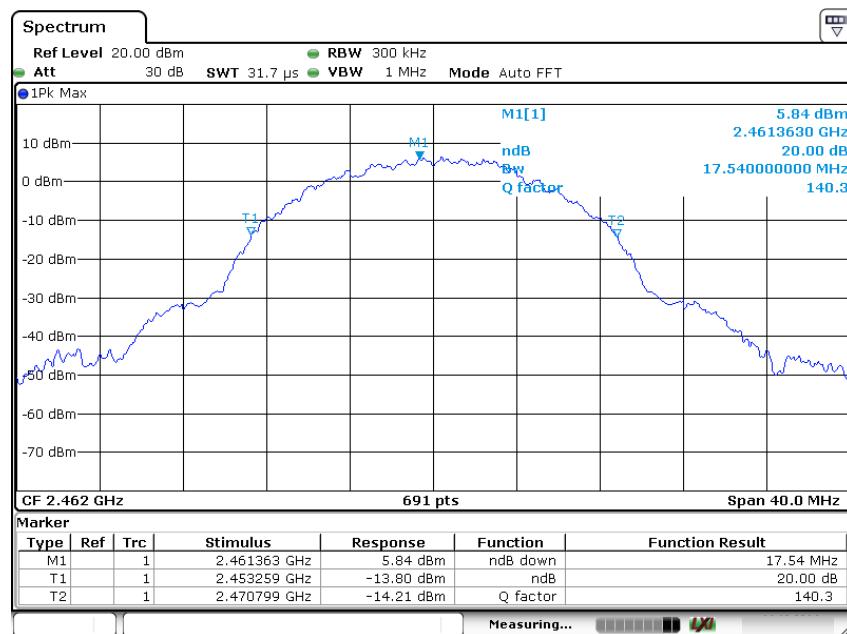
802.11b Channel Low 2412MHz



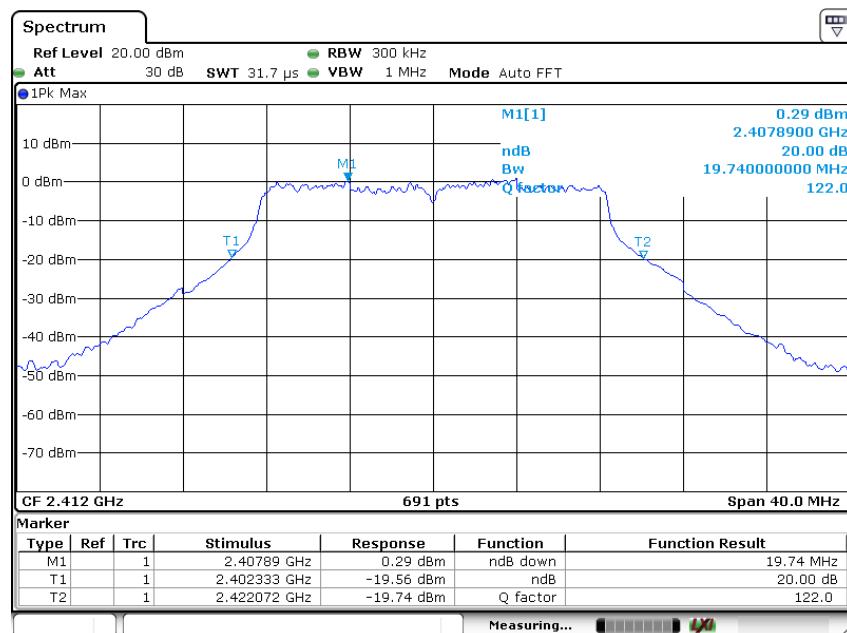
802.11b Channel Middle 2437MHz



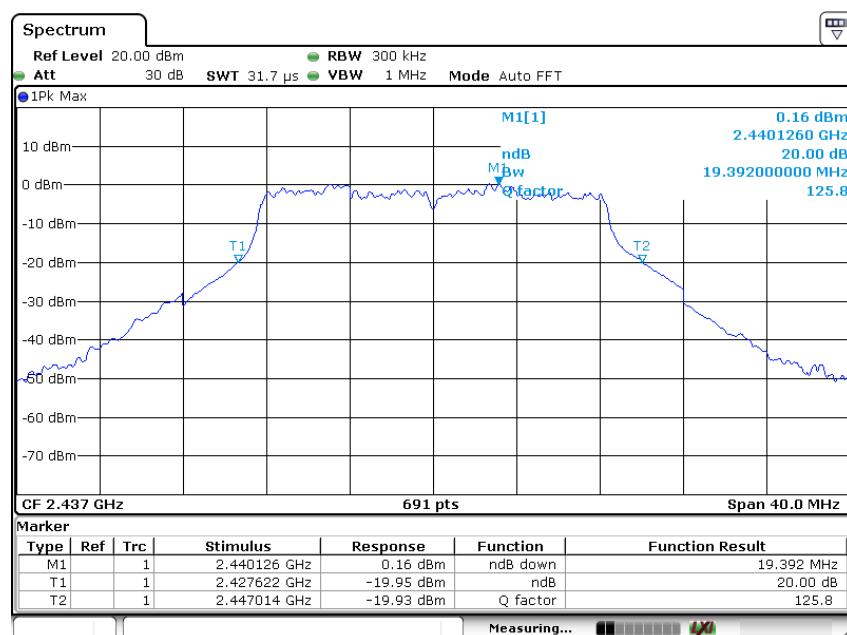
802.11b Channel High 2462MHz



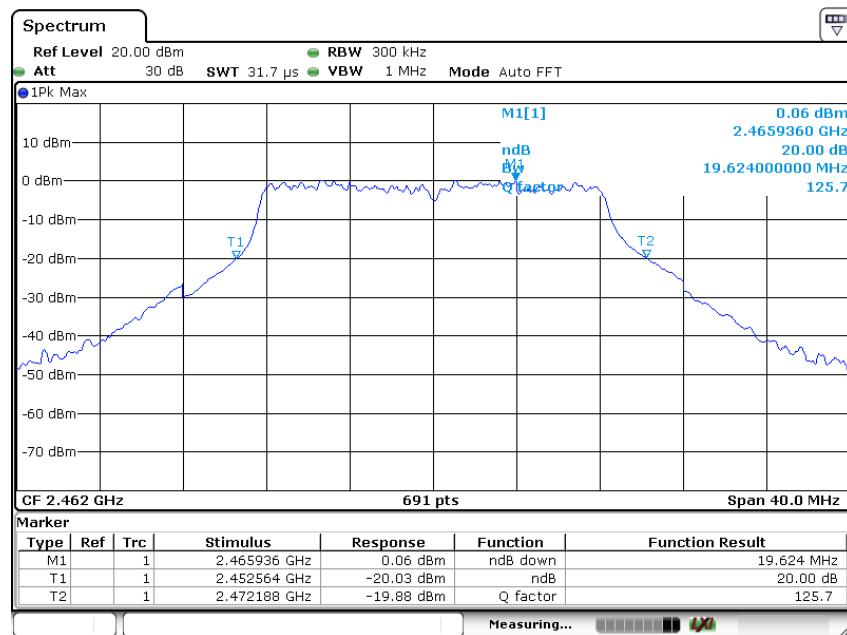
802.11g Channel Low 2412MHz



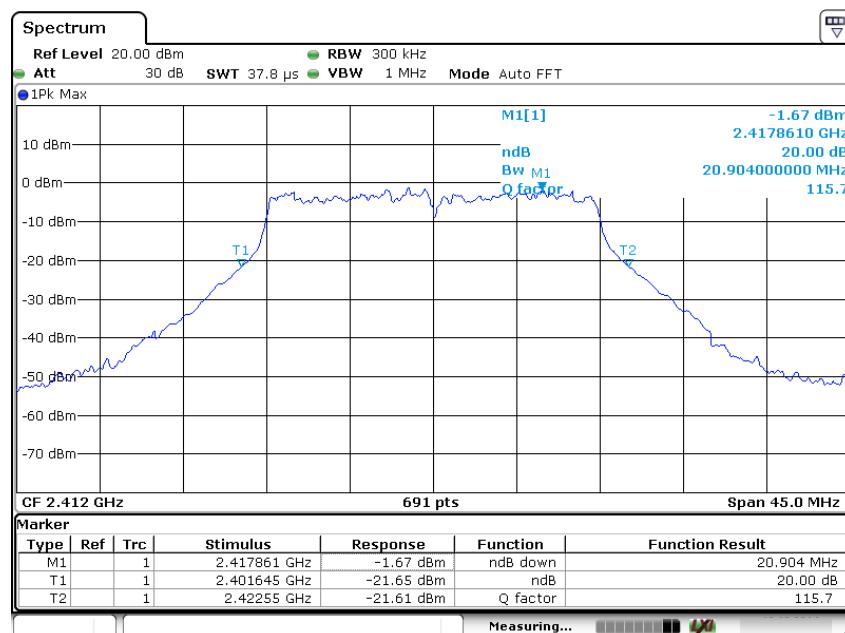
802.11g Channel Middle 2437MHz



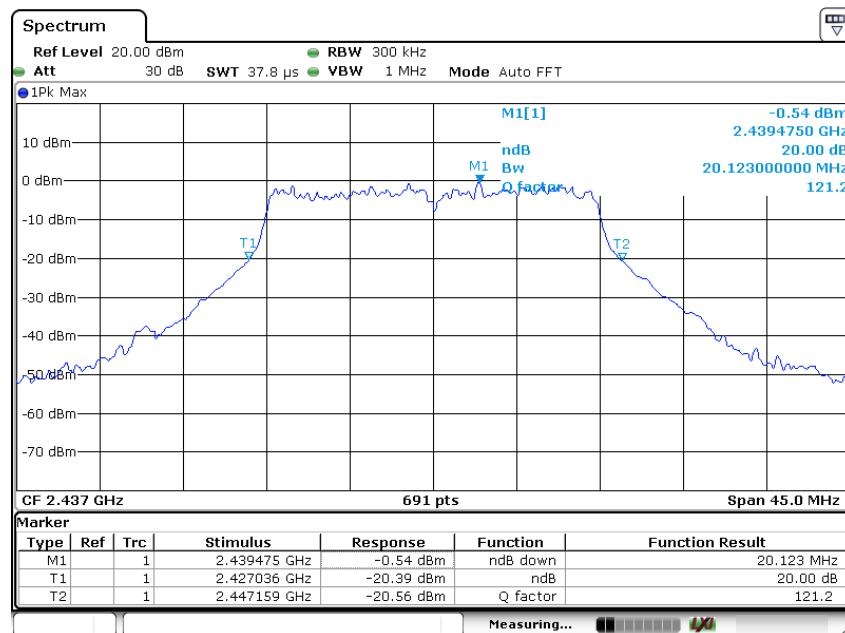
802.11g Channel High 2462MHz



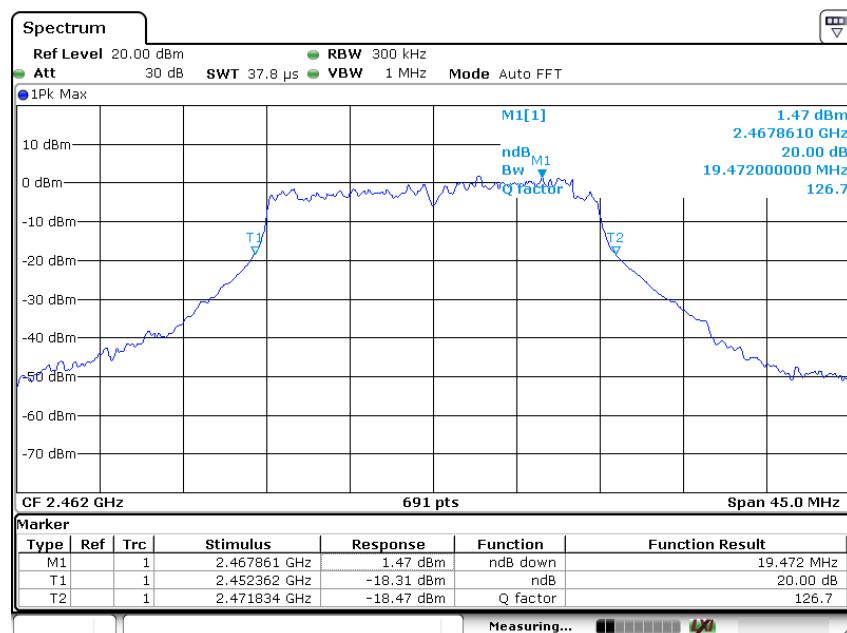
802.11n Channel Low 2412MHz (20MHz)



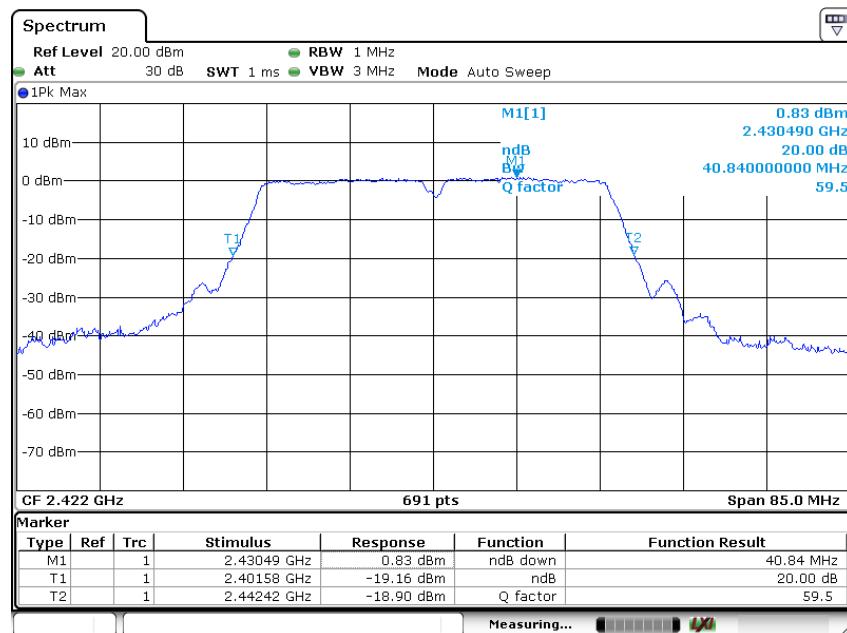
802.11n Channel Middle 2437MHz(20MHz)



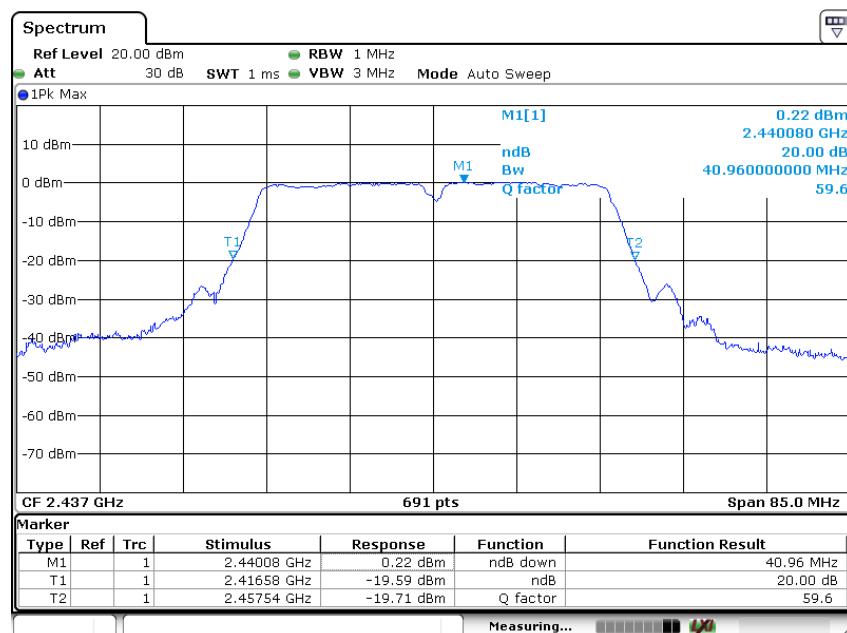
802.11n Channel High 2462MHz(20MHz)



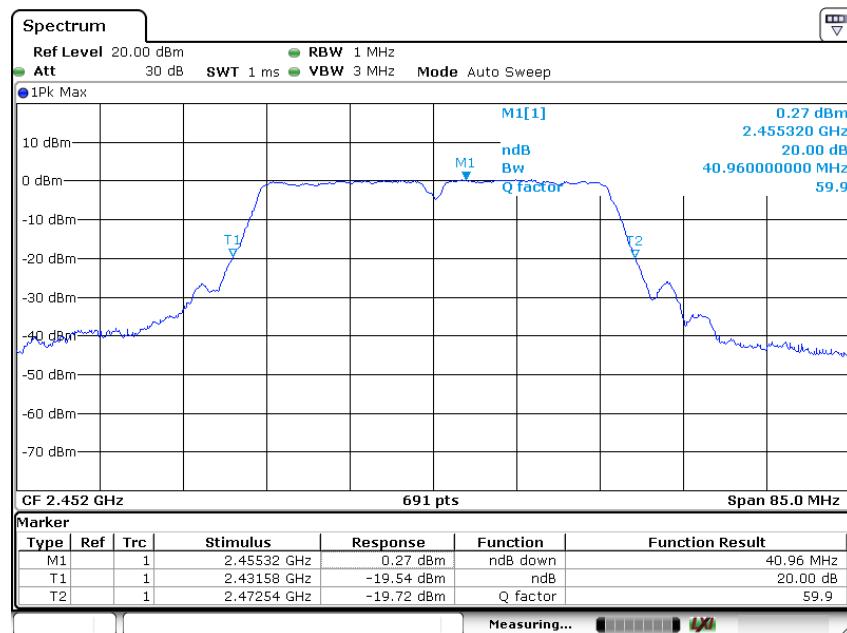
802.11n Channel Low 2422MHz (40MHz)



802.11n Channel Middle 2437MHz(40MHz)

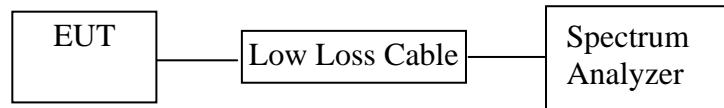


802.11n Channel High 2452MHz(40MHz)



7. MAXIMUM CONDUCTED (AVERAGE) OUTPUT POWER

7.1. Block Diagram of Test Setup



7.2. 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.

7.3. EUT Configuration on Measurement

The equipment is 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 EUT was tested according to DTS test procedure of Apr 08, 2016

KDB558074 D01 DTS Meas Guidance v03r05 for compliance to FCC 47CFR 15.247 requirements.

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

7.5.3. Set RBW = 1-5% of the OBW, not to exceed 1 MHz, VBW $\geq 3 \times$ RBW, Sweep time = auto, Set span to at least 1.5 times the OBW, Detector = RMS.

7.5.4. Measurement the Maximum conducted (average) output power.

7.6. Test Result

The test was performed with 802.11b				
Channel	Frequency (MHz)	Ave output power (dBm)	Ave output power (mW)	Limits dBm / W
Low	2412	5.20	3.311	30 dBm / 1 W
Middle	2437	5.14	3.266	30 dBm / 1 W
High	2462	5.26	3.357	30 dBm / 1 W

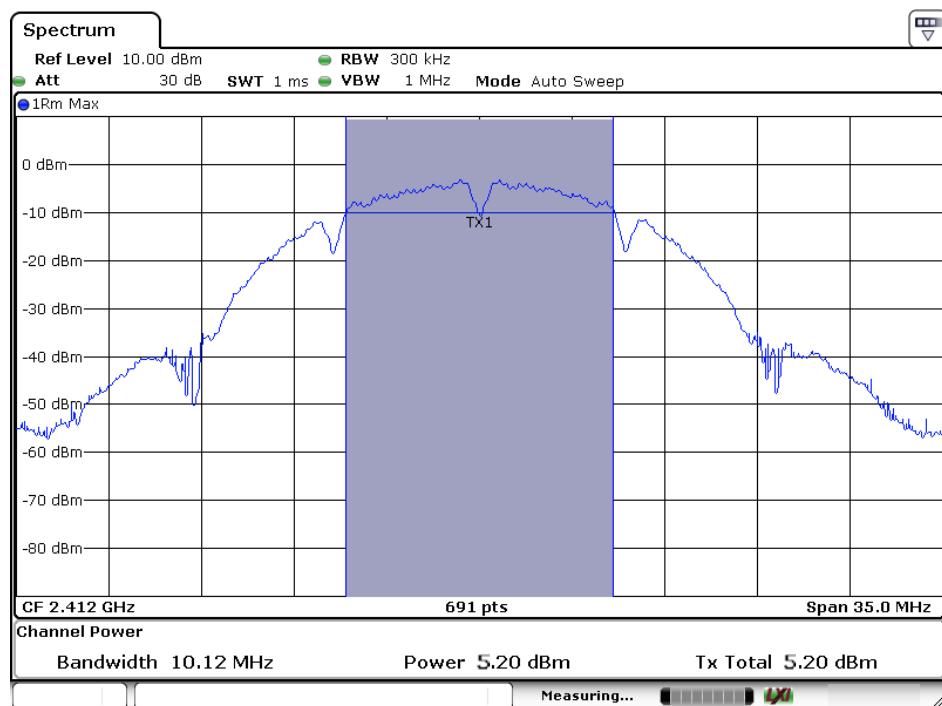
The test was performed with 802.11g				
Channel	Frequency (MHz)	Ave output power (dBm)	Ave output power (mW)	Limits dBm / W
Low	2412	4.23	2.649	30 dBm / 1 W
Middle	2437	4.12	2.582	30 dBm / 1 W
High	2462	4.46	2.793	30 dBm / 1 W

The test was performed with 802.11n (20MHz)				
Channel	Frequency (MHz)	Ave output power (dBm)	Ave output power (mW)	Limits dBm / W
Low	2412	4.26	2.667	30 dBm / 1 W
Middle	2437	4.92	3.105	30 dBm / 1 W
High	2462	4.63	2.904	30 dBm / 1 W

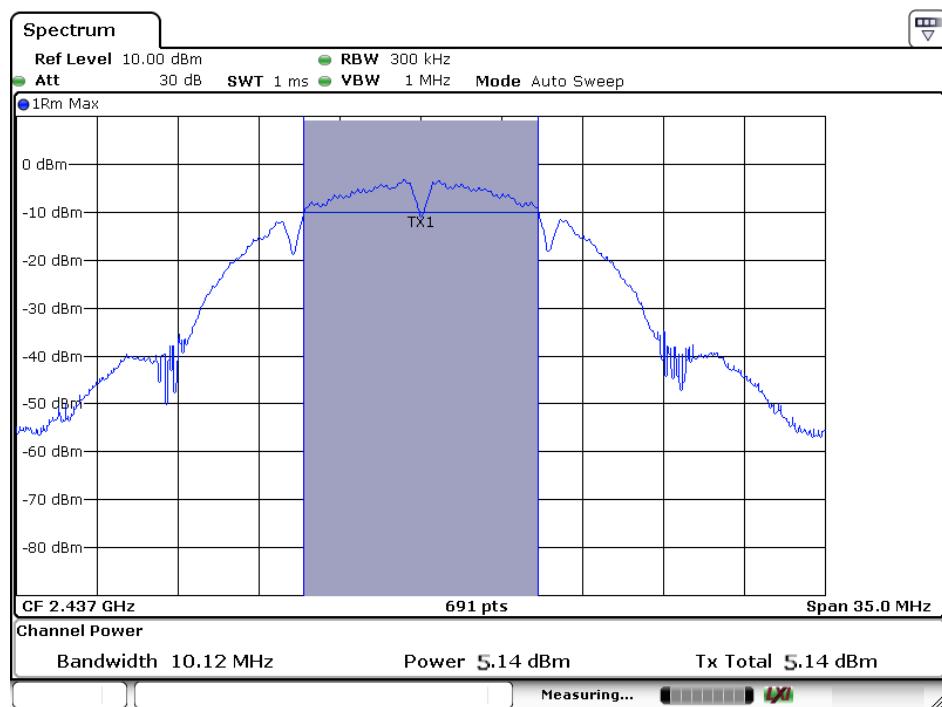
The test was performed with 802.11n (40MHz)				
Channel	Frequency (MHz)	Ave output power (dBm)	Ave output power (mW)	Limits dBm / W
Low	2422	3.88	2.443	30 dBm / 1 W
Middle	2437	3.82	2.410	30 dBm / 1 W
High	2452	3.83	2.415	30 dBm / 1 W

The spectrum analyzer plots are attached as below.

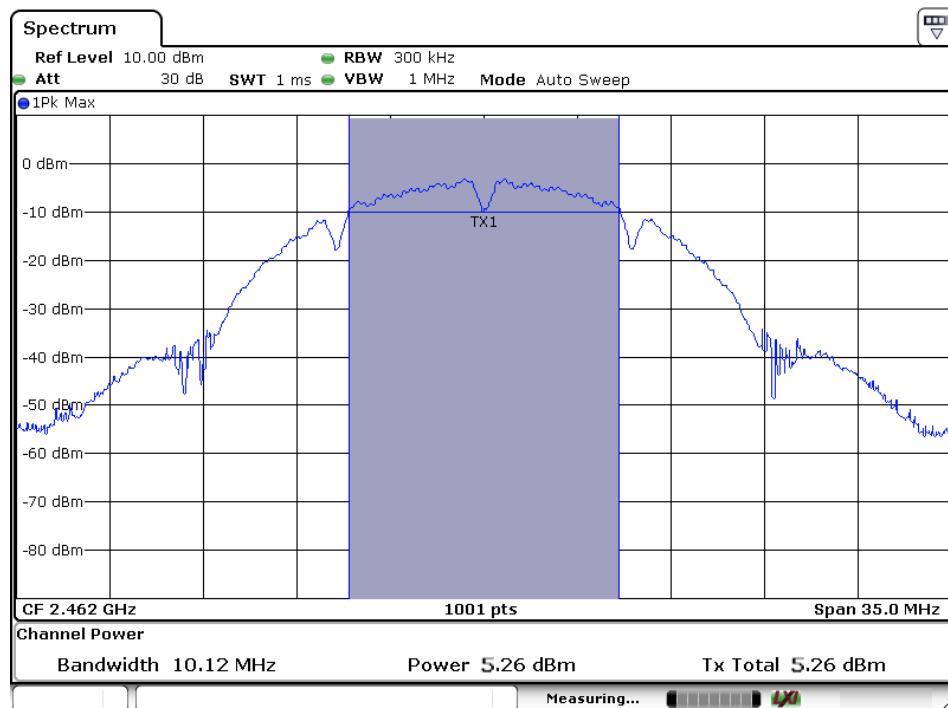
802.11b Channel Low 2412MHz



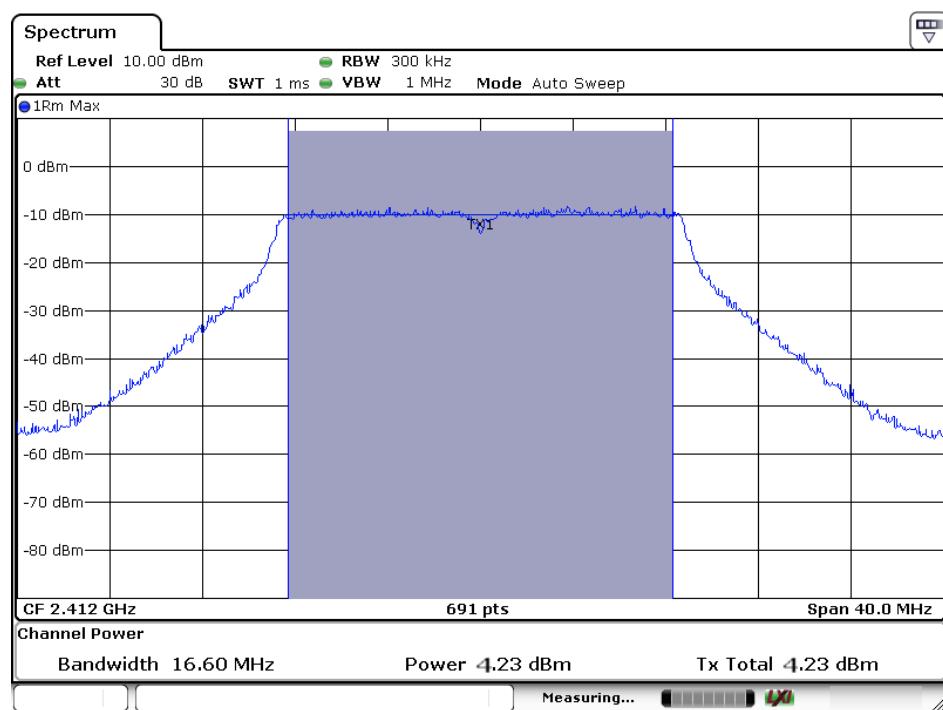
802.11b Channel Middle 2437MHz



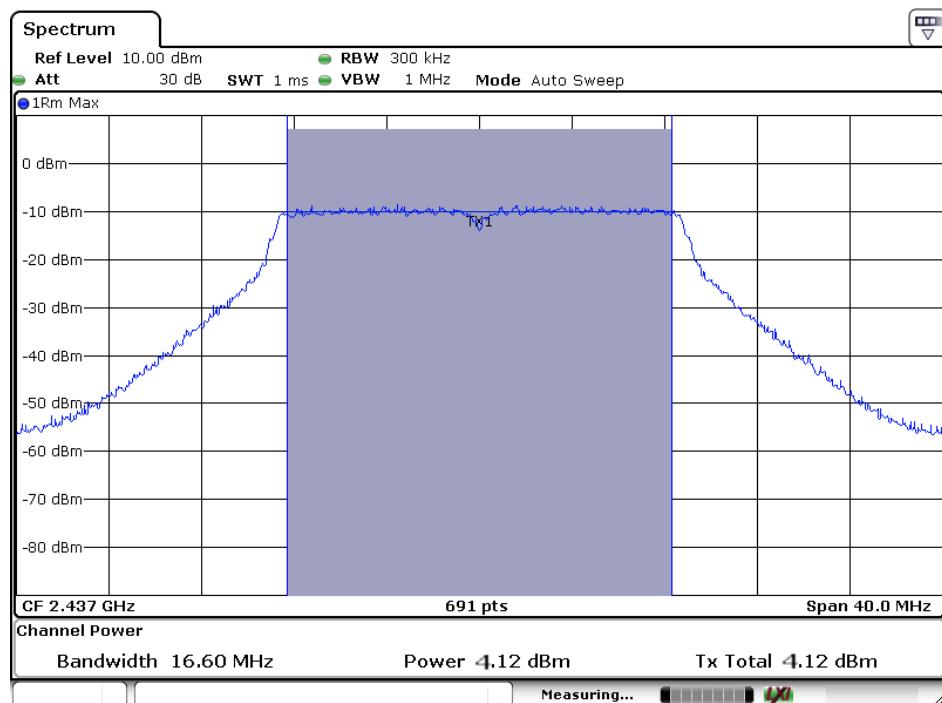
802.11b Channel High 2462MHz



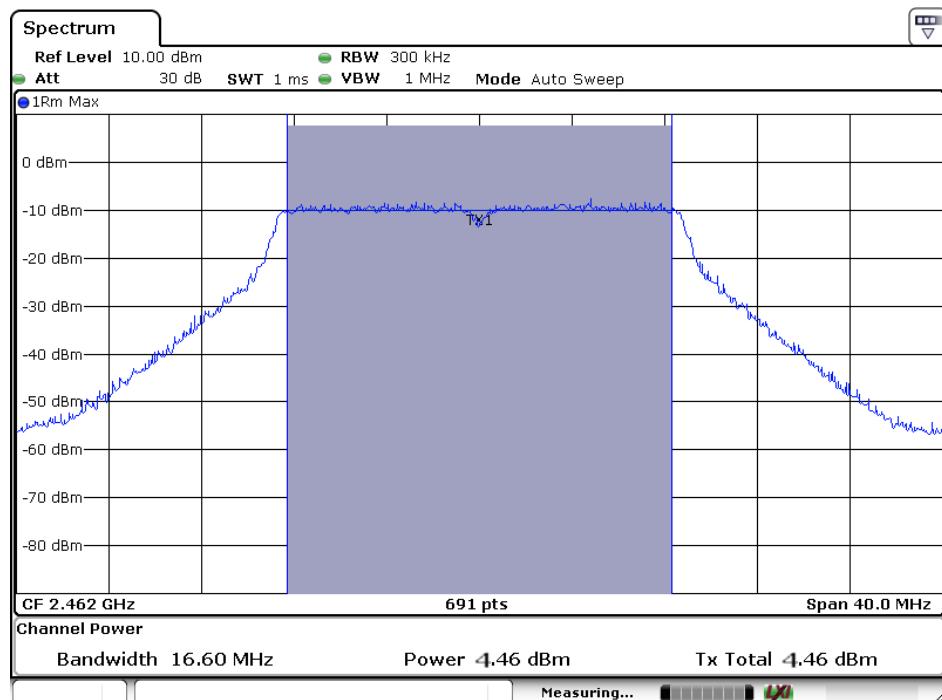
802.11g Channel Low 2412MHz



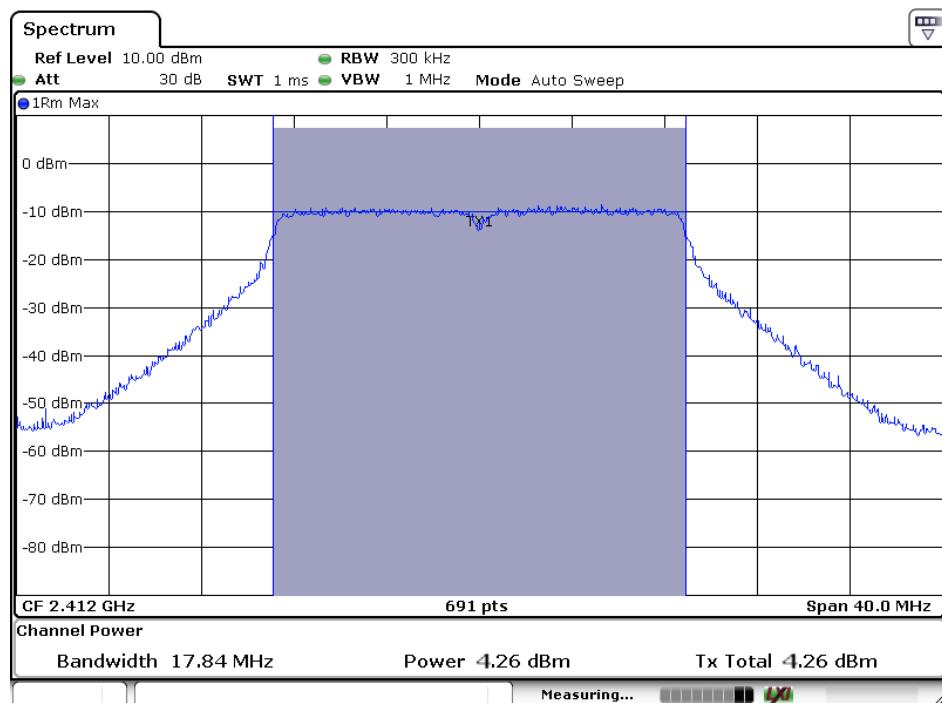
802.11g Channel Middle 2437MHz



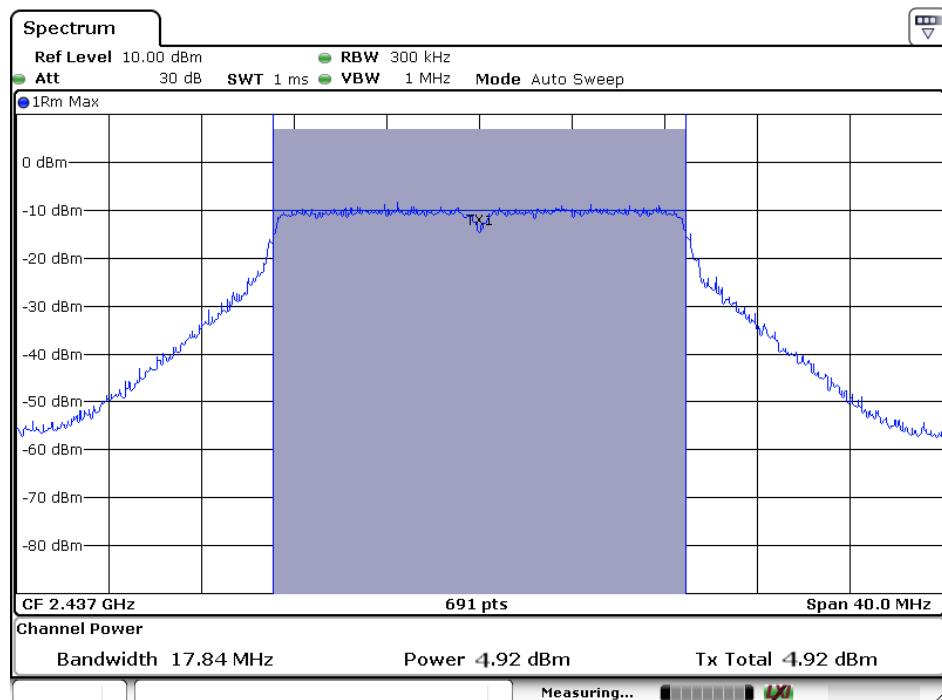
802.11g Channel High 2462MHz



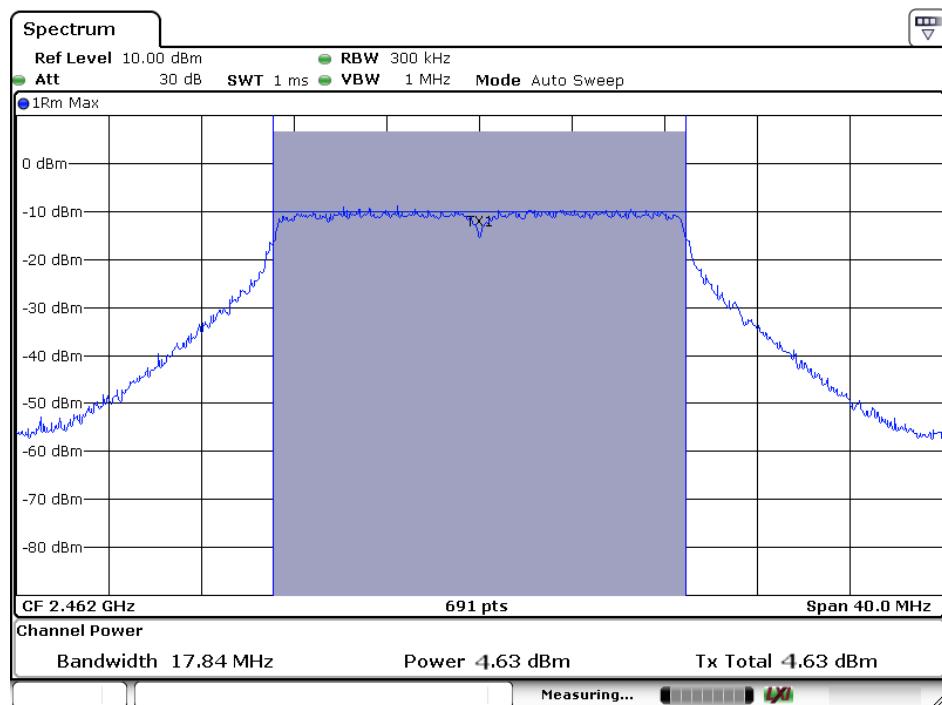
802.11n Channel Low 2412MHz (20MHz)



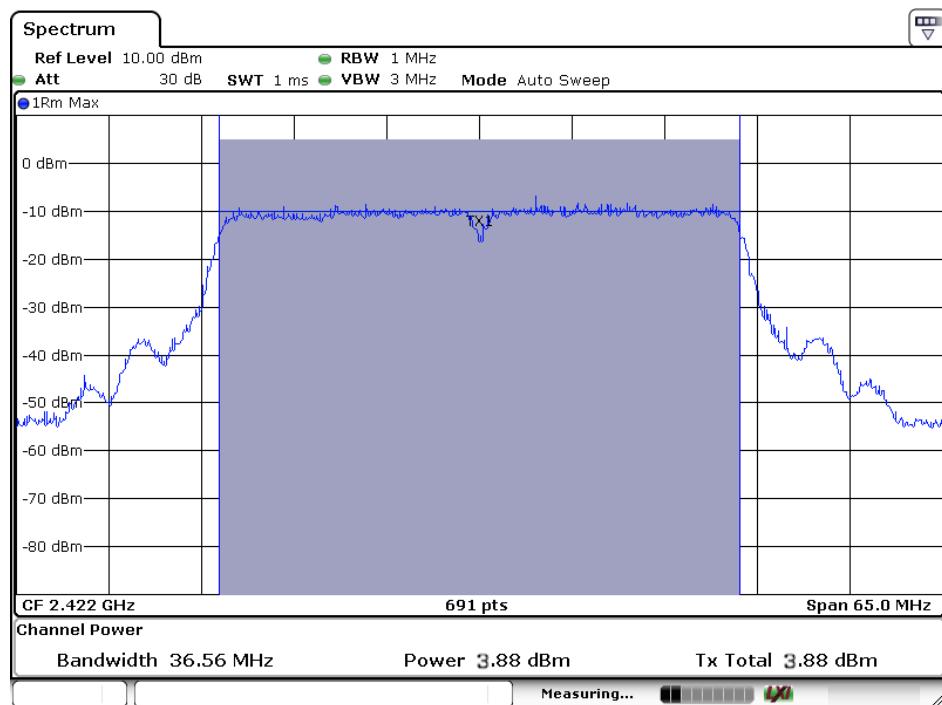
802.11n Channel Middle 2437MHz (20MHz)



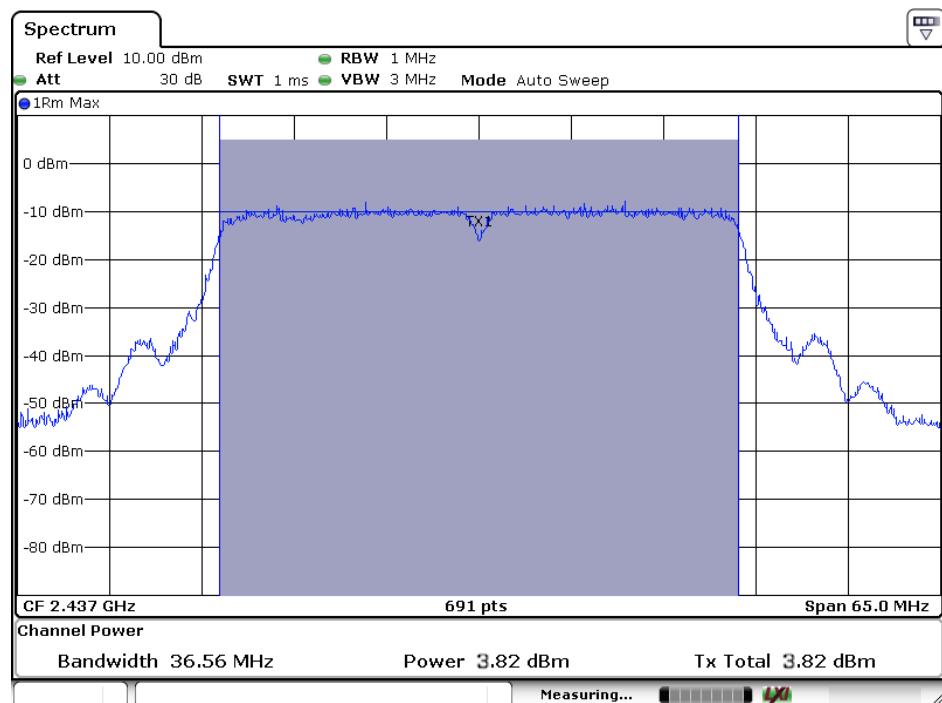
802.11n Channel High 2462MHz (20MHz)



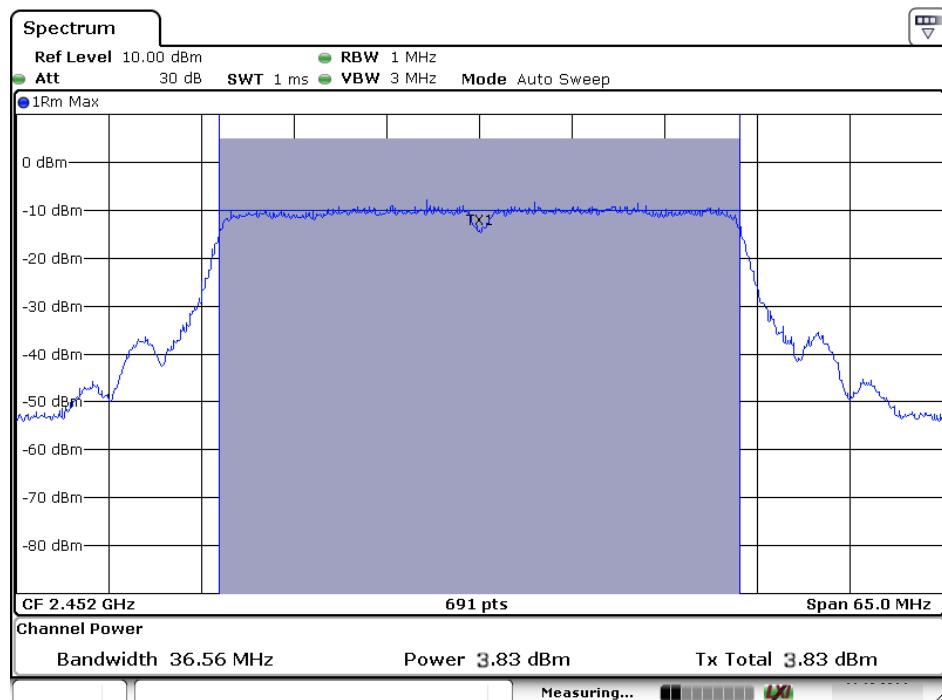
802.11n Channel Low 2422MHz (40MHz)



802.11n Channel Middle 2437MHz (40MHz)



802.11n Channel High 2452MHz (40MHz)



8. POWER SPECTRAL DENSITY MEASUREMENT

8.1. Block Diagram of Test Setup



8.2. 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.

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. We select 2412MHz, 2437MHz, 2462MHz and 2422MHz, 2437MHz, 2452MHz TX frequency to transmit.

8.5. Test Procedure

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

8.5.2. 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 $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
4. Set the VBW $\geq 3 \times \text{RBW}$.
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.

8.5.3. Measurement the maximum power spectral density.

8.6. Test Result

The test was performed with 802.11b

Channel	Frequency (MHz)	Power Spectral Density (dBm)	Limits (dBm)
Low	2412	-12.57	8 dBm
Middle	2437	-11.66	8 dBm
High	2462	-12.77	8 dBm

The test was performed with 802.11g

Channel	Frequency (MHz)	Power Spectral Density (dBm)	Limits (dBm)
Low	2412	-10.54	8 dBm
Middle	2437	-10.53	8 dBm
High	2462	-10.36	8 dBm

The test was performed with 802.11n (20MHz)

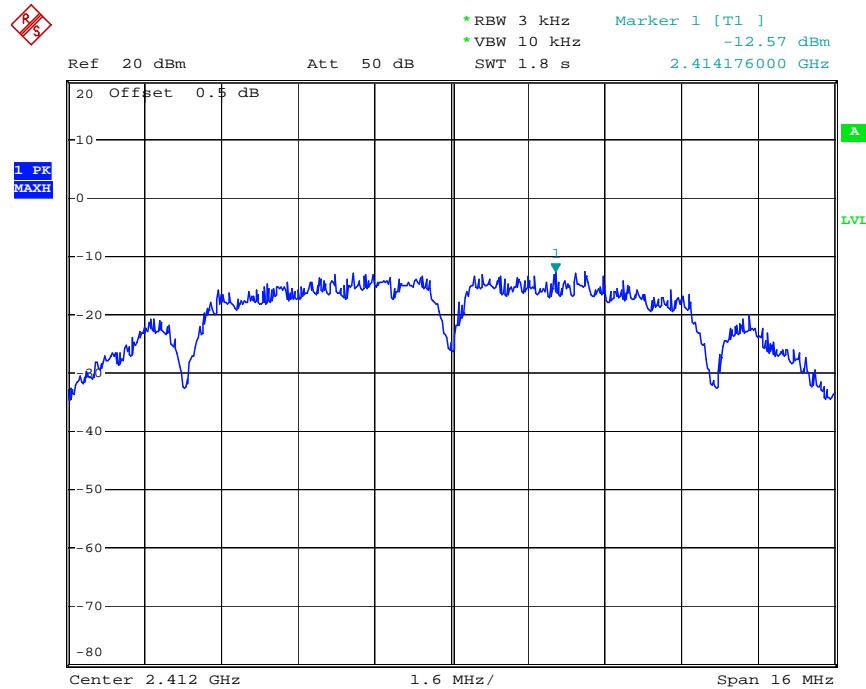
Channel	Frequency (MHz)	Power Spectral Density (dBm)	Limits (dBm)
Low	2412	-11.25	8 dBm
Middle	2437	-10.43	8 dBm
High	2462	-10.68	8 dBm

The test was performed with 802.11n (40MHz)

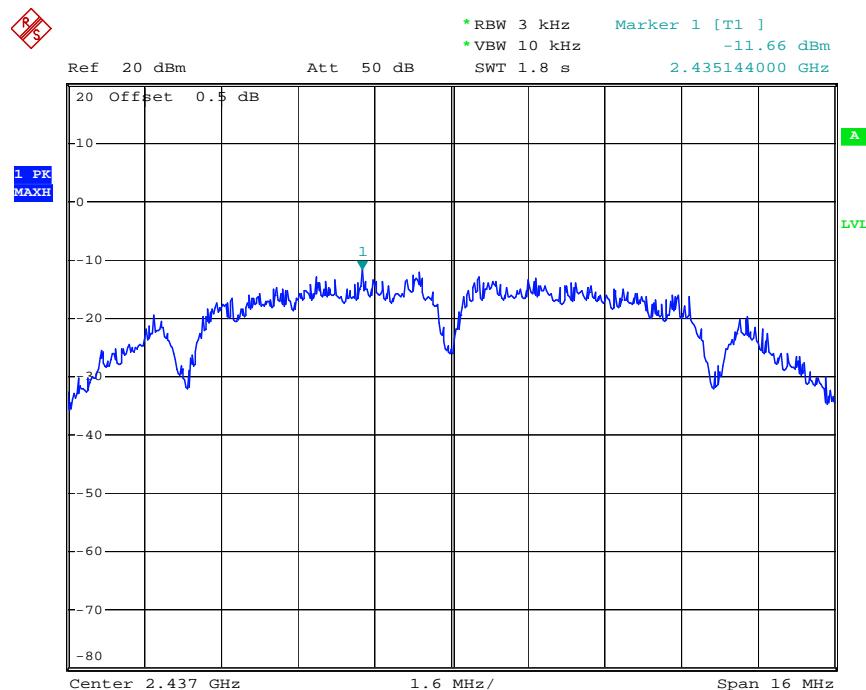
Channel	Frequency (MHz)	Power Spectral Density (dBm)	Limits (dBm)
Low	2422	-11.63	8 dBm
Middle	2437	-10.49	8 dBm
High	2452	-10.61	8 dBm

The spectrum analyzer plots are attached as below.

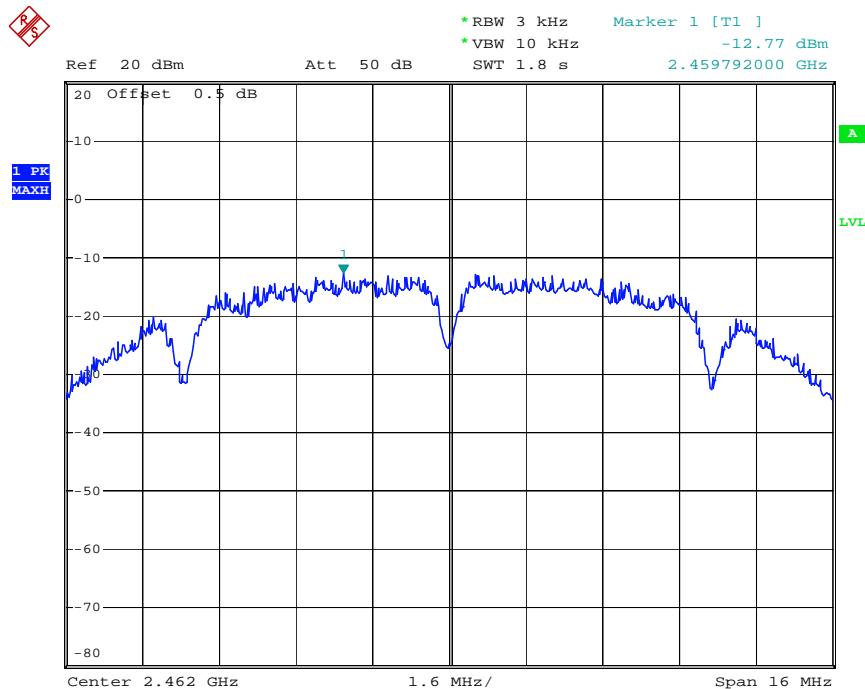
802.11b Channel Low 2412MHz



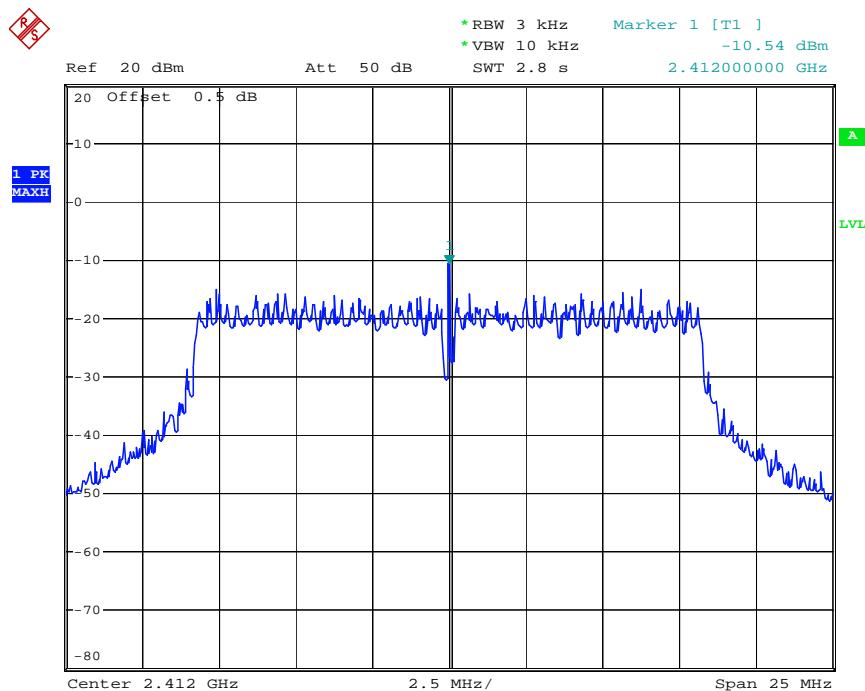
802.11b Channel Middle 2437MHz



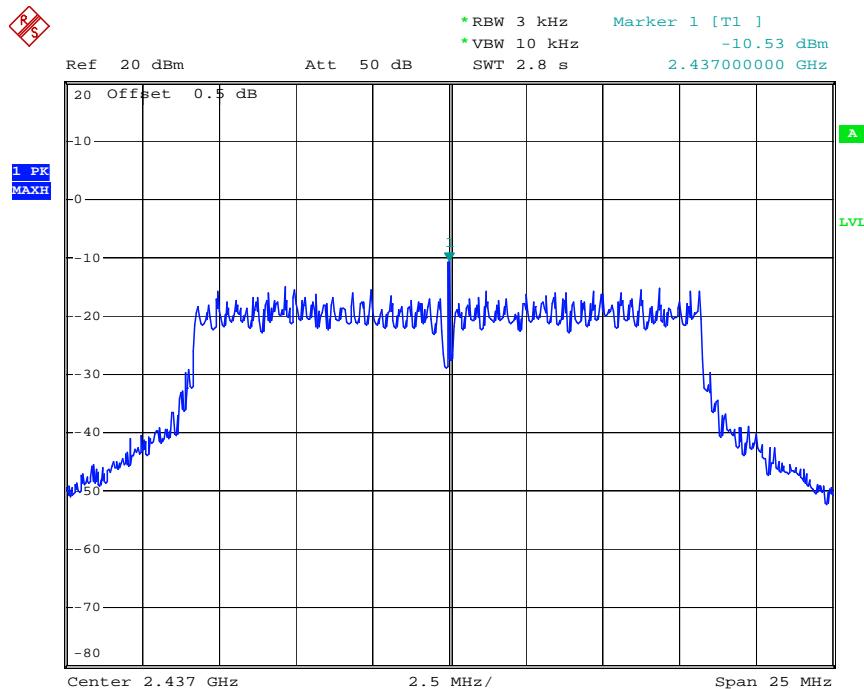
802.11b Channel High 2462MHz



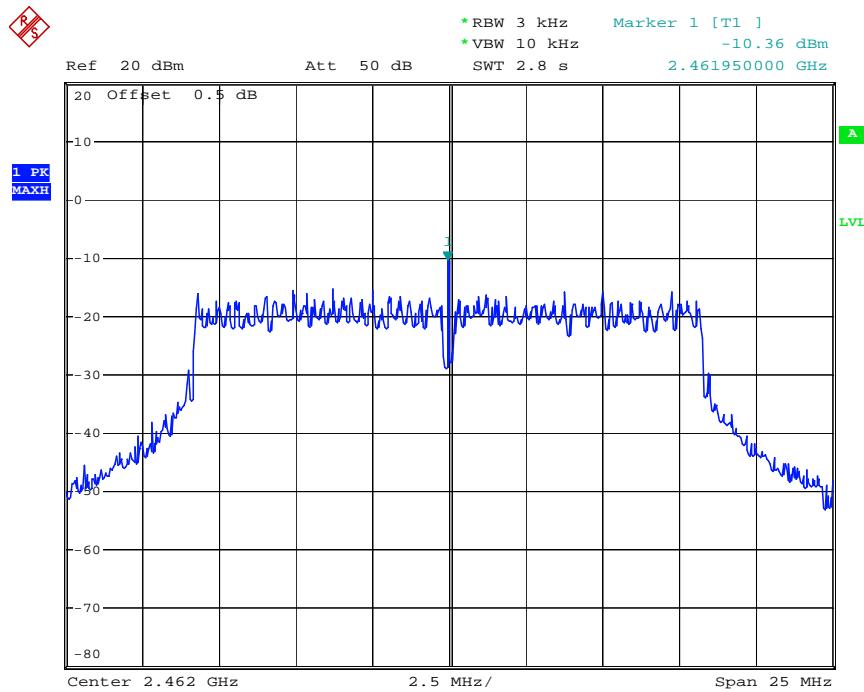
802.11g Channel Low 2412MHz



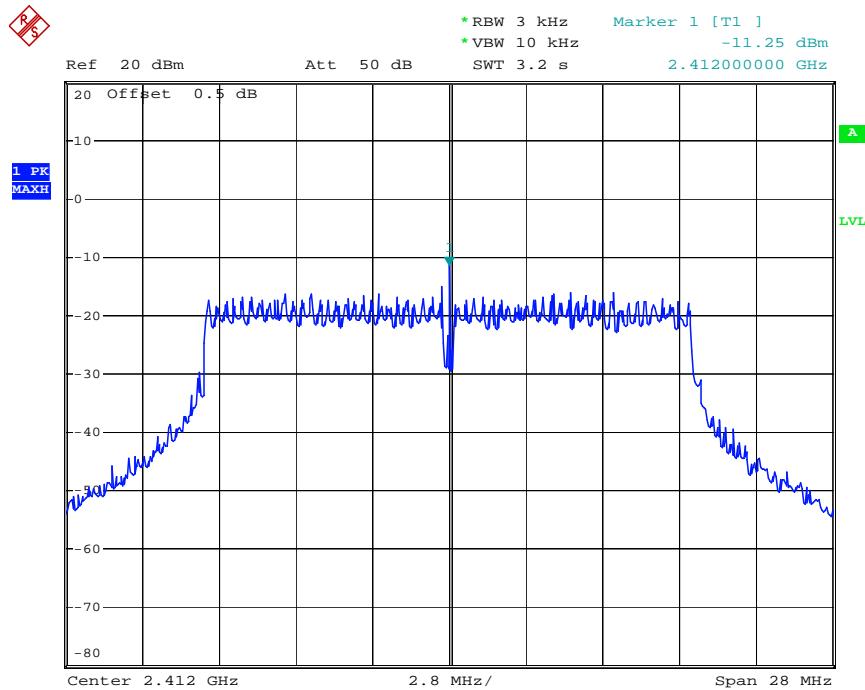
802.11g Channel Middle 2437MHz



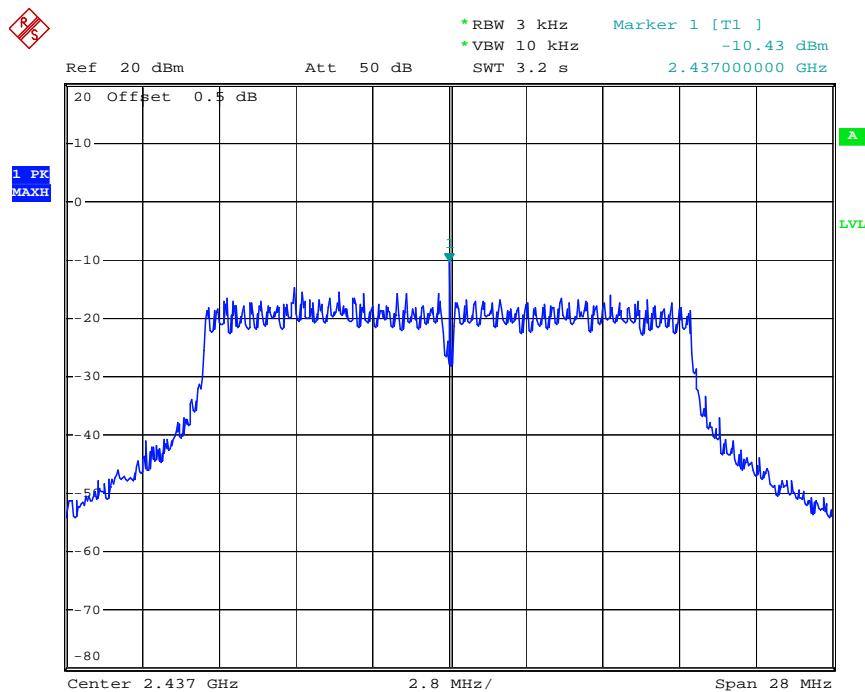
802.11g Channel High 2462MHz



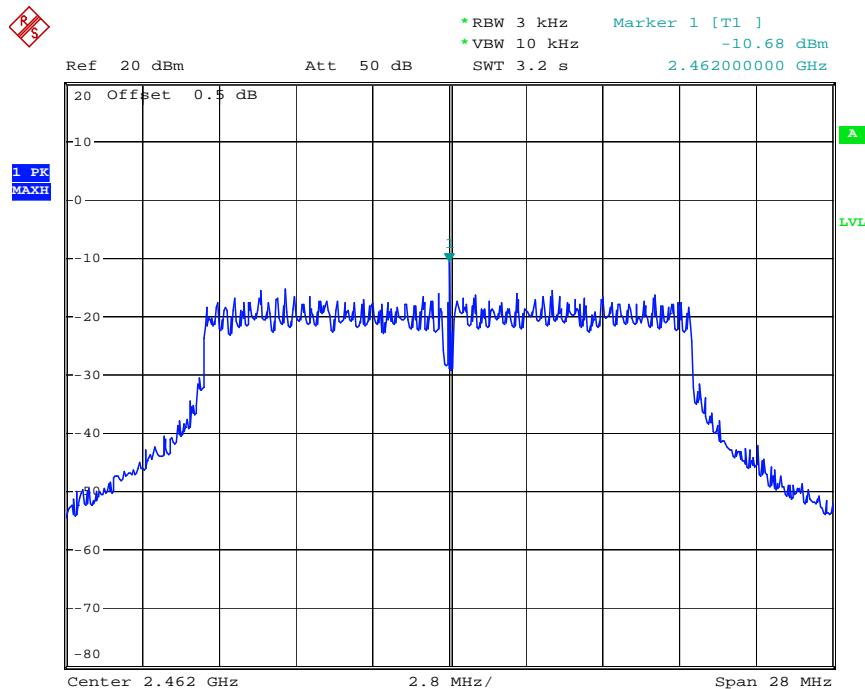
802.11n Channel Low 2412MHz (20MHz)



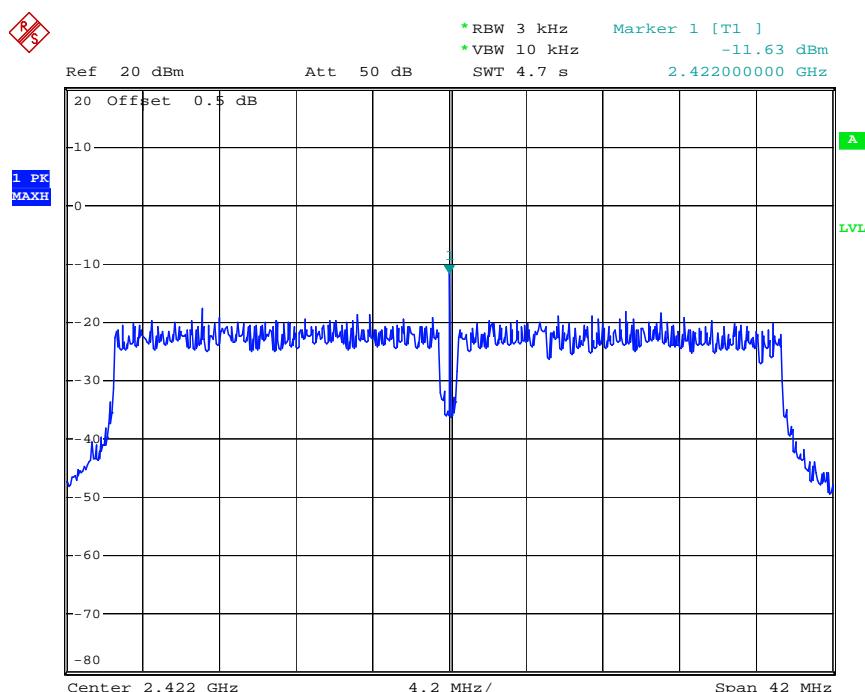
802.11n Channel Middle 2437MHz (20MHz)



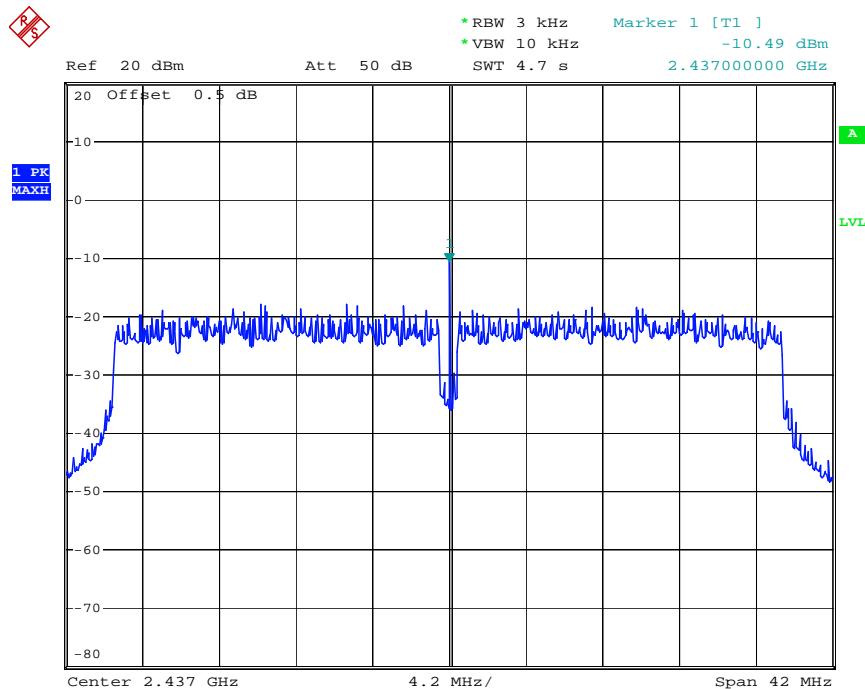
802.11n Channel High 2462MHz(20MHz)



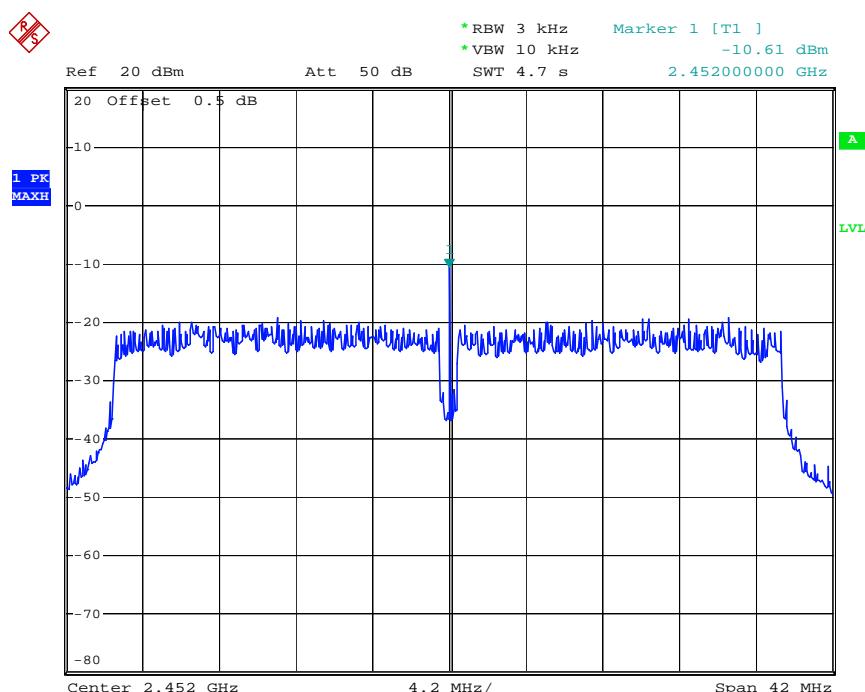
802.11n Channel Low 2422MHz (40MHz)



802.11n Channel Middle 2437MHz(40MHz)

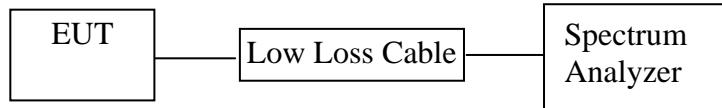


802.11n Channel High 2452MHz(40MHz)



9. BAND EDGE COMPLIANCE TEST

9.1. Block Diagram of Test Setup



9.2. 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).

9.3. 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.

9.4. Operating Condition of EUT

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

9.4.2. Turn on the power of all equipment.

9.4.3. 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.

9.5. Test Procedure

Conducted Band Edge:

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

cable.

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

Radiate Band Edge:

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

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

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

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

9.5.7. RBW=1MHz, VBW=1MHz

9.5.8. The band edges were measured and recorded.

9.6. Test Result

The test was performed with 802.11b

Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2412	43.14	> 20dBc
2462	50.33	> 20dBc

The test was performed with 802.11g

Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2412	30.08	> 20dBc
2462	45.56	> 20dBc

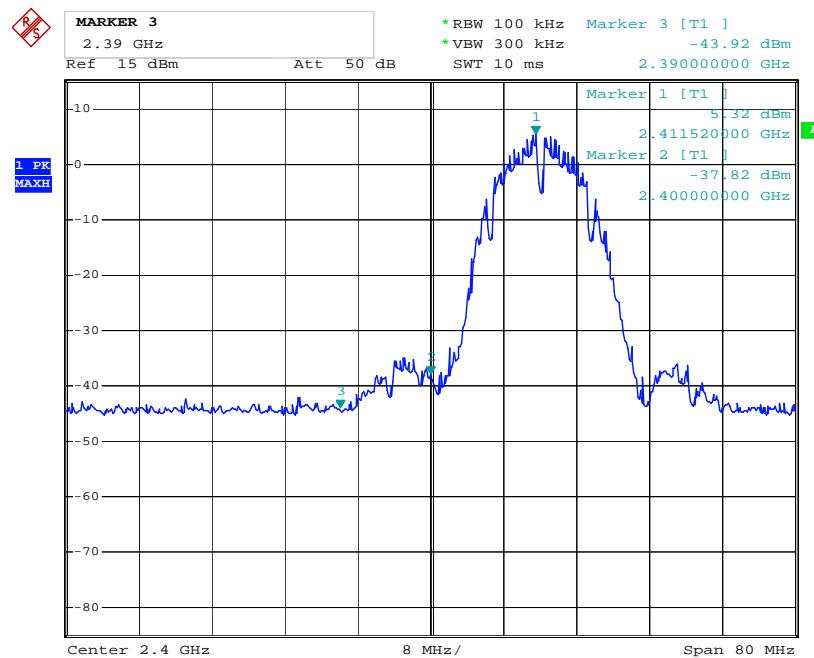
The test was performed with 802.11n (20MHz)

Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2412	31.26	> 20dBc
2462	44.10	> 20dBc

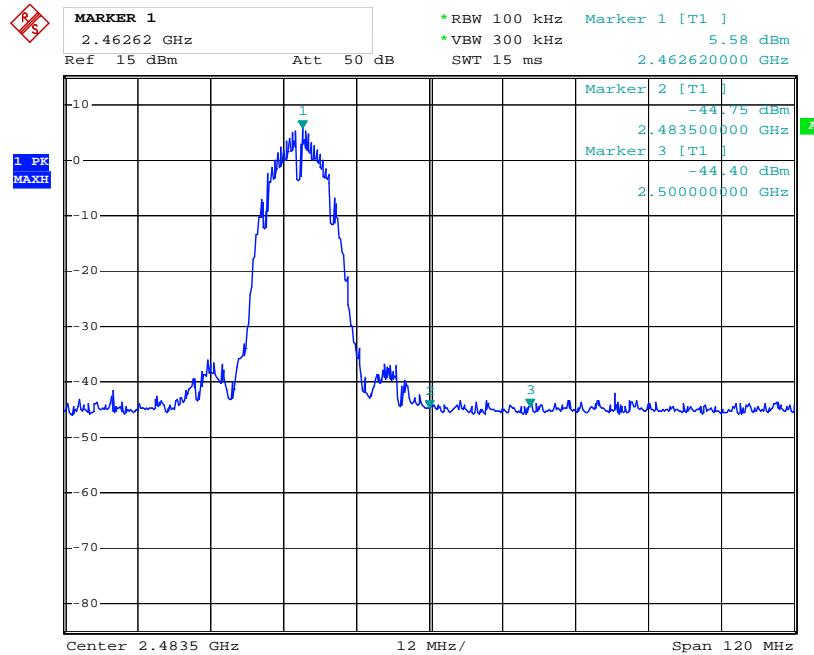
The test was performed with 802.11n (40MHz)

Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
2422	34.51	> 20dBc
2452	29.77	> 20dBc

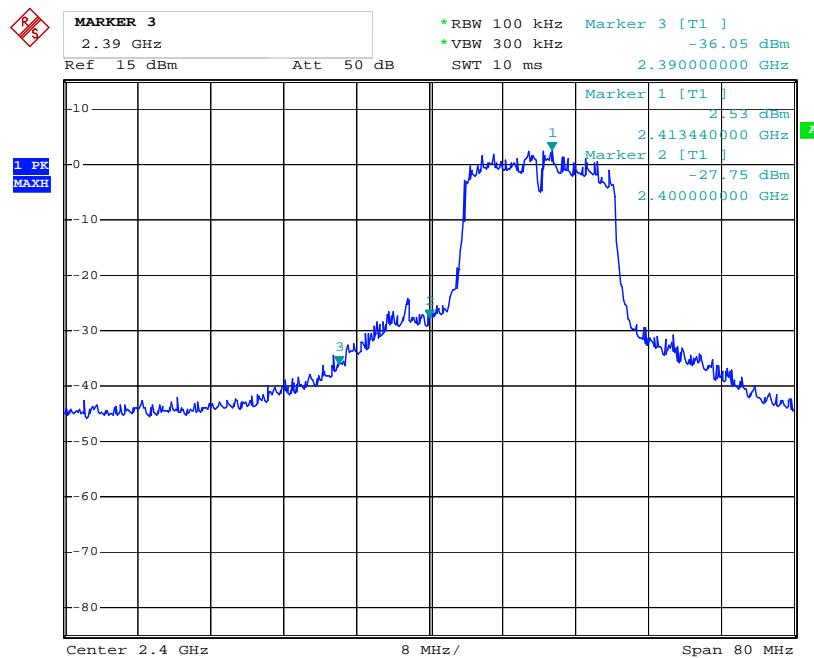
802.11b Channel Low 2412MHz



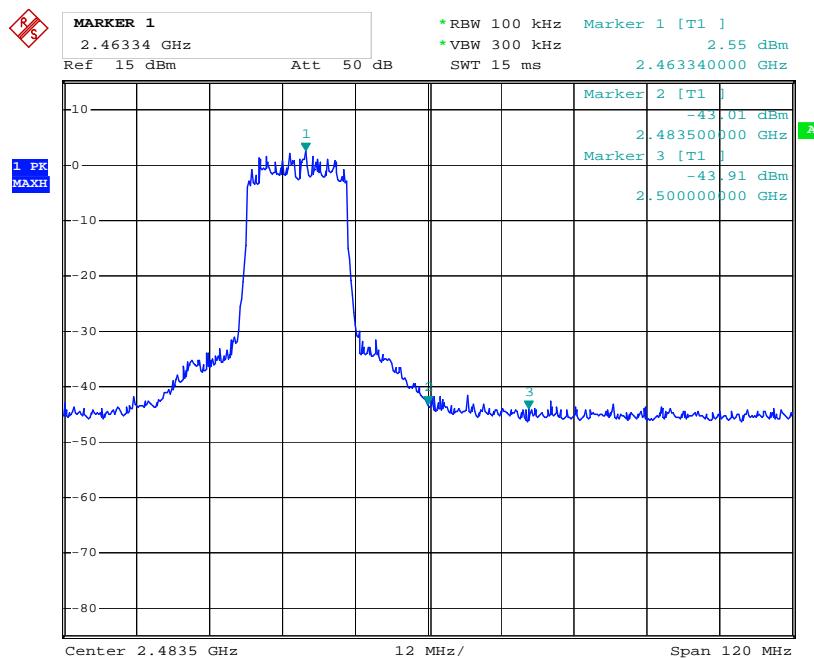
802.11b Channel High 2462MHz



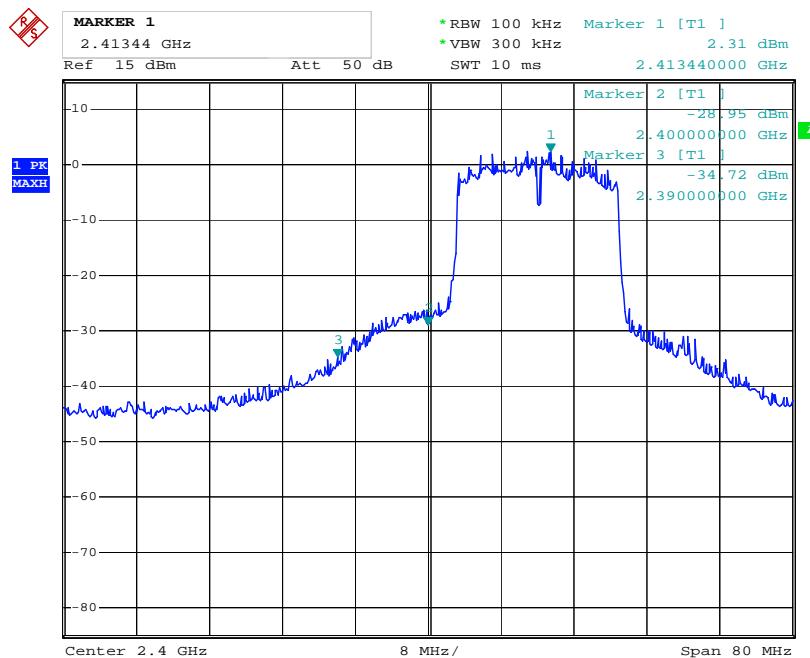
802.11g Channel Low 2412MHz



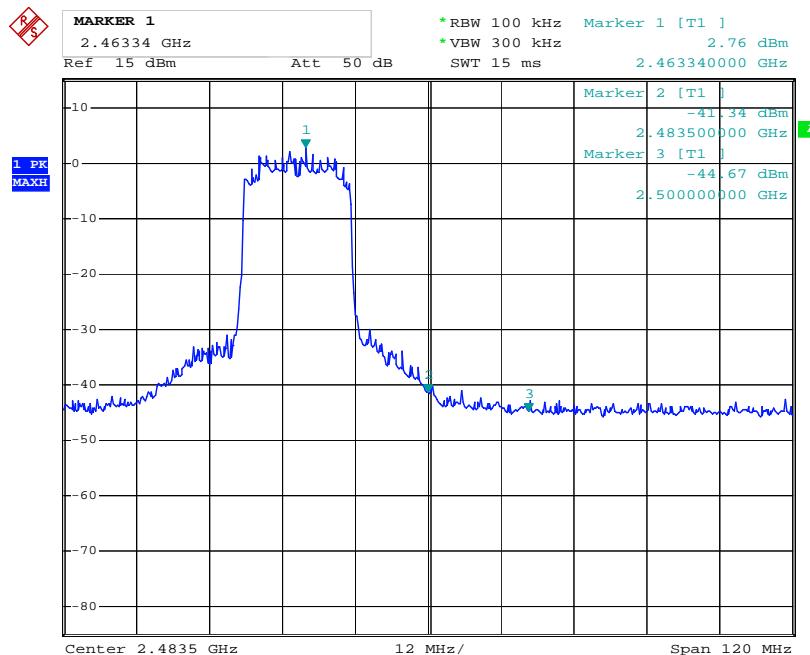
802.11g Channel High 2462MHz



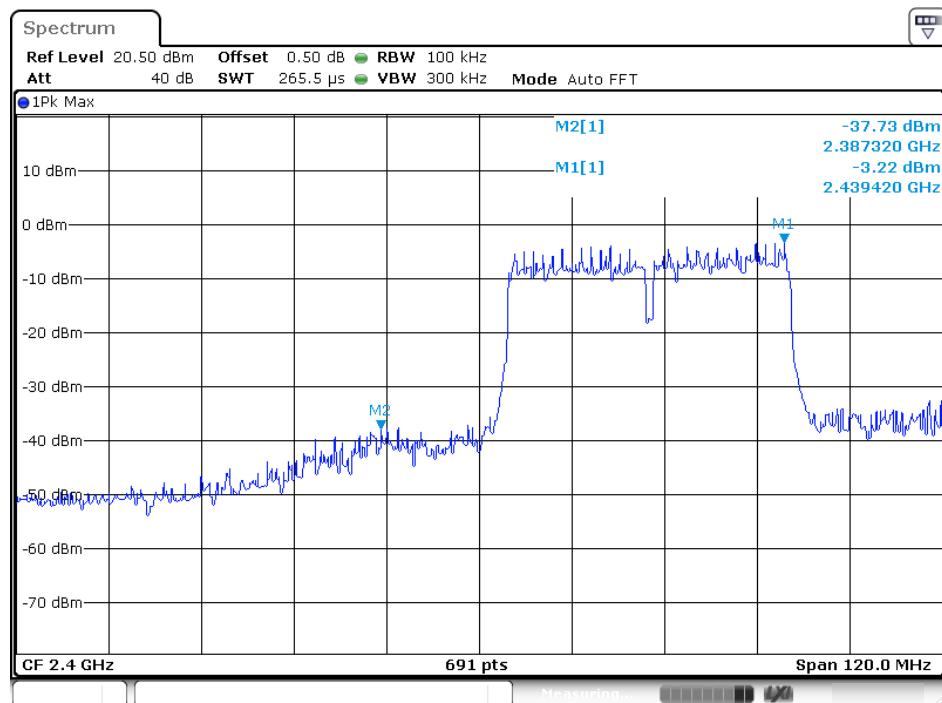
802.11n Channel Low 2412MHz (20MHz)



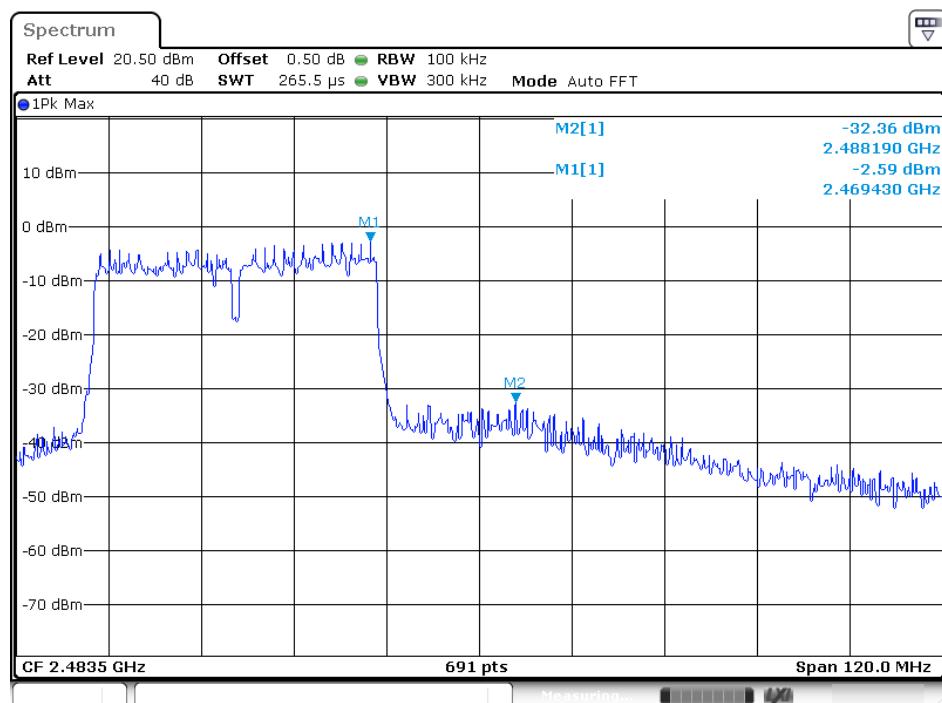
802.11n Channel High 2462MHz (20MHz)



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.

Test Procedure:

The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground(Above 1GHz). 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 bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

Let the EUT work in TX modes then measure it.

We select 2412MHz, 2462MHz TX frequency to transmit(802.11b/g/n20 mode).

We select 2422MHz, 2452MHz TX frequency to transmit(802.11n40 mode).

During the radiated emission test, the spectrum analyzer was set with the following configurations:

- 1.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
- 2.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
- 3.All modes of operation were investigated and the worst-case emissions are reported.



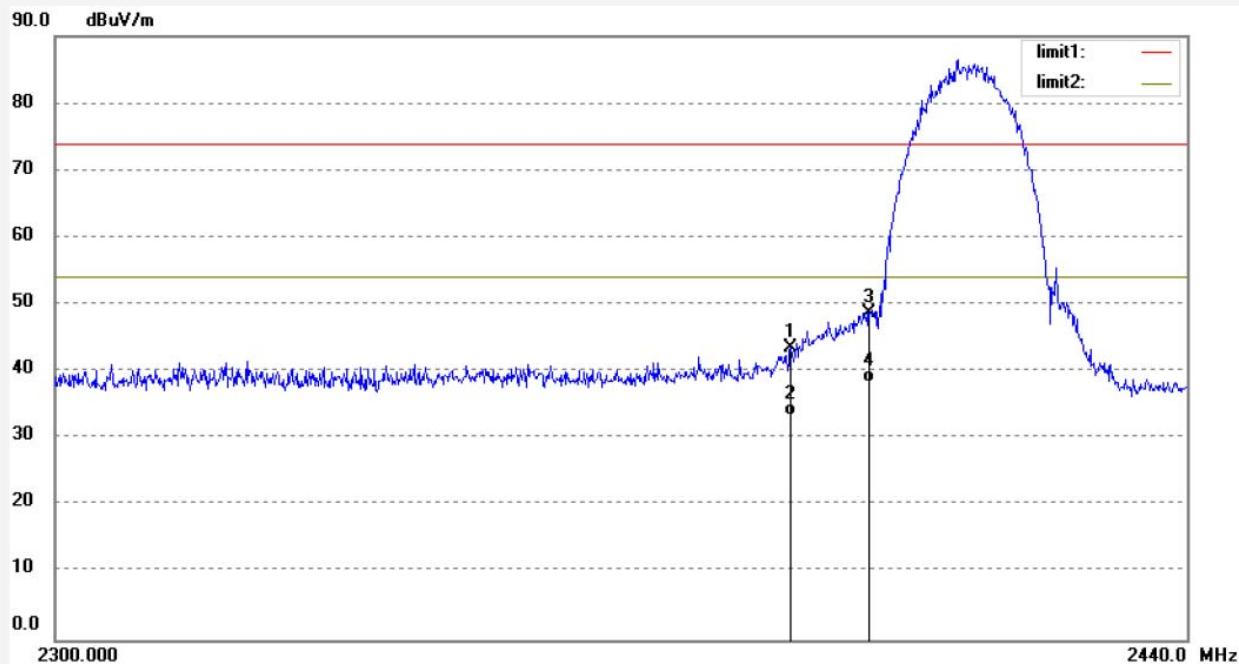
ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: ding2016 #2155	Polarization: Horizontal
Standard: FCC PK	Power Source: DC 3.3V
Test item: Radiation Test	Date: 16/11/06/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 10/41/44
EUT: MivaTek Low Power Wi-Fi Module	Engineer Signature:
Mode: TX Channel 1(802.11b)	Distance: 3m
Model: MODCC32	
Manufacturer: Power 7 Technology(Dongguan)Co., Ltd	

Note: Report No.:ATE20162251



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			

Note: Average measurement with peak detection at No.2&4



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Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: ding2016 #2156

Polarization: Vertical

Standard: FCC PK

Power Source: DC 3.3V

Test item: Radiation Test

Date: 16/11/06/

Temp.(C)/Hum.(%) 25 C / 55 %

Time: 10/44/33

EUT: MivaTek Low Power Wi-Fi Module

Engineer Signature:

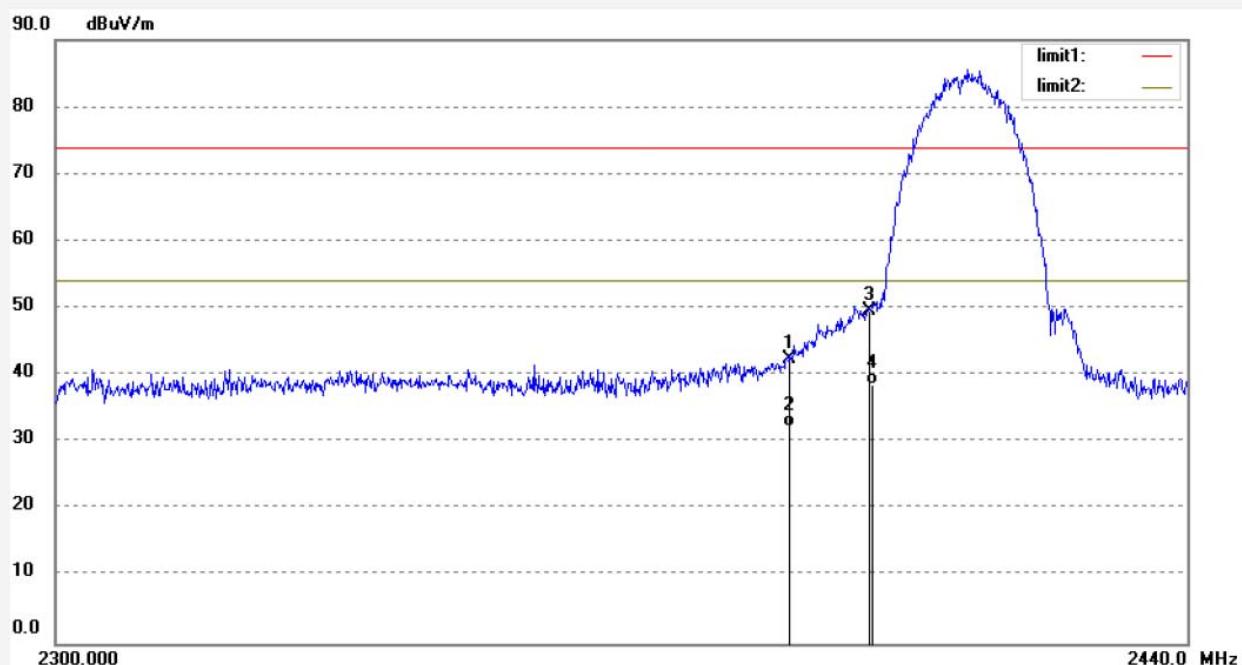
Mode: TX Channel 1(802.11b)

Distance: 3m

Model: MODCC32

Manufacturer: Power 7 Technology(Dongguan)Co., Ltd

Note: Report No.:ATE20162251



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			

Note: Average measurement with peak detection at No.2&4



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Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: ding2016 #2158

Polarization: Horizontal

Standard: FCC PK

Power Source: DC 3.3V

Test item: Radiation Test

Date: 16/11/06/

Temp.(C)/Hum.(%) 25 C / 55 %

Time: 10/53/38

EUT: MivaTek Low Power Wi-Fi Module

Engineer Signature:

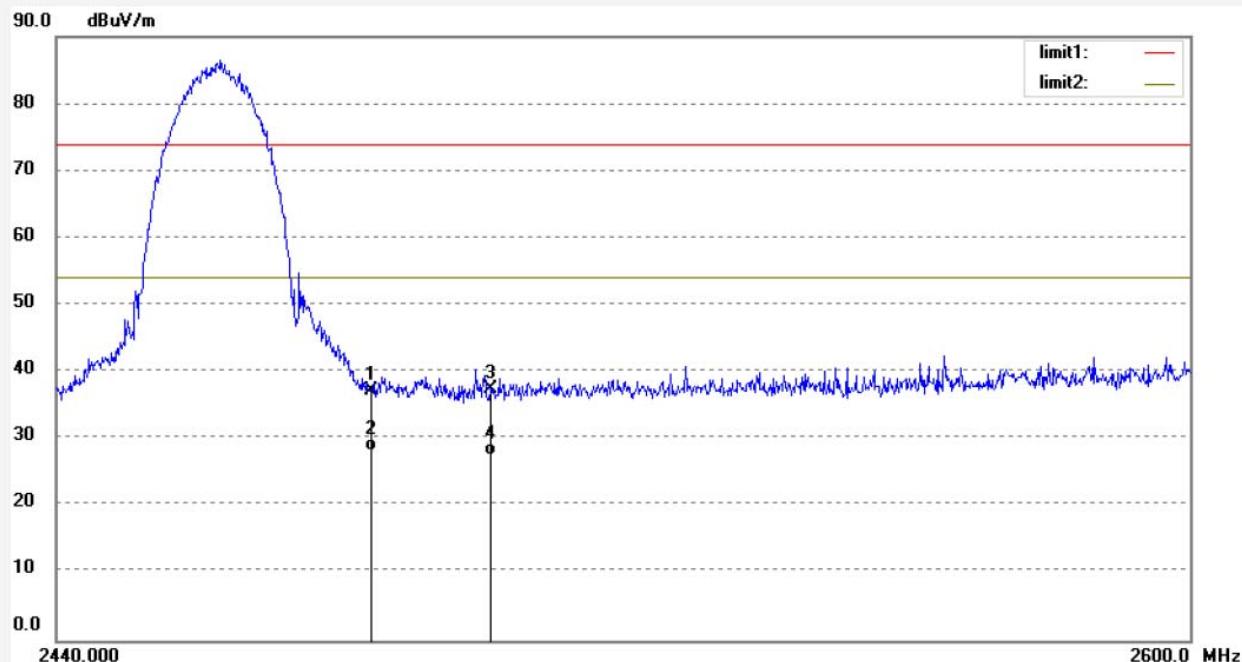
Mode: TX Channel 11(802.11b)

Distance: 3m

Model: MODCC32

Manufacturer: Power 7 Technology(Dongguan)Co., Ltd

Note: Report No.:ATE20162251



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			

Note: Average measurement with peak detection at No.2&4

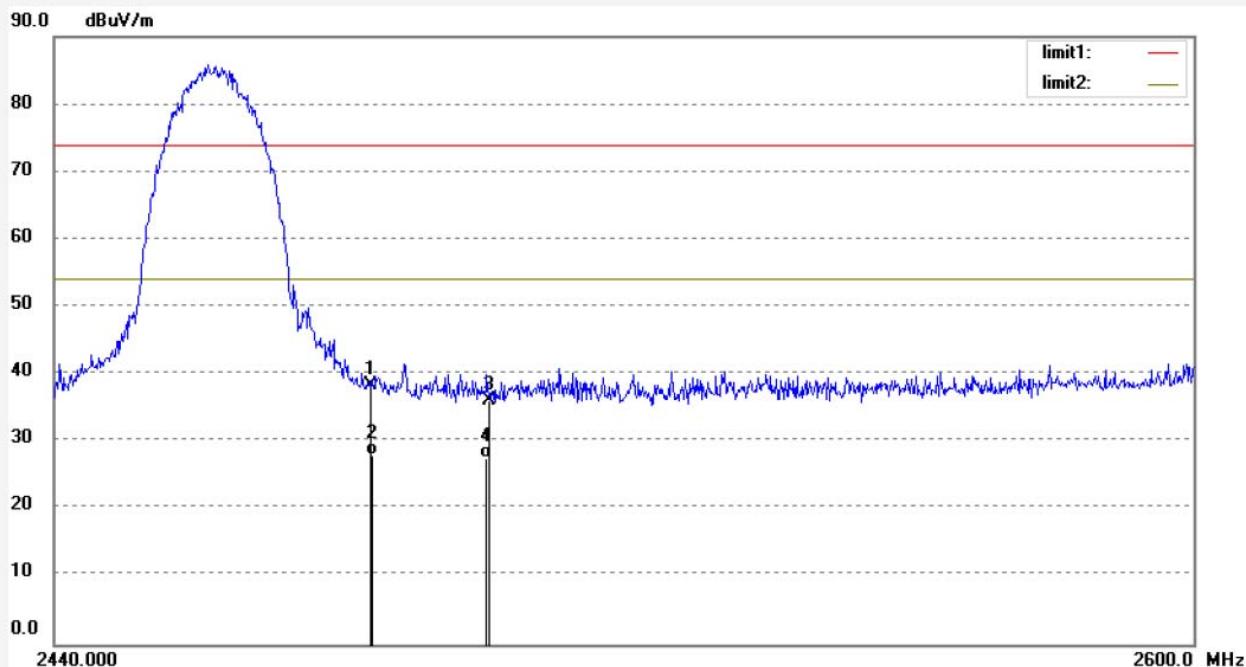


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Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.:	ding2016 #2157	Polarization:	Vertical
Standard:	FCC PK	Power Source:	DC 3.3V
Test item:	Radiation Test	Date:	16/11/06/
Temp.(C)/Hum.(%)	25 C / 55 %	Time:	10:49:32
EUT:	MivaTek Low Power Wi-Fi Module	Engineer Signature:	
Mode:	TX Channel 11(802.11b)	Distance:	3m
Model:	MODCC32		
Manufacturer:	Power 7 Technology(Dongguan)Co., Ltd		
Note:	Report No.:ATE20162251		



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			

Note: Average measurement with peak detection at No.2&4

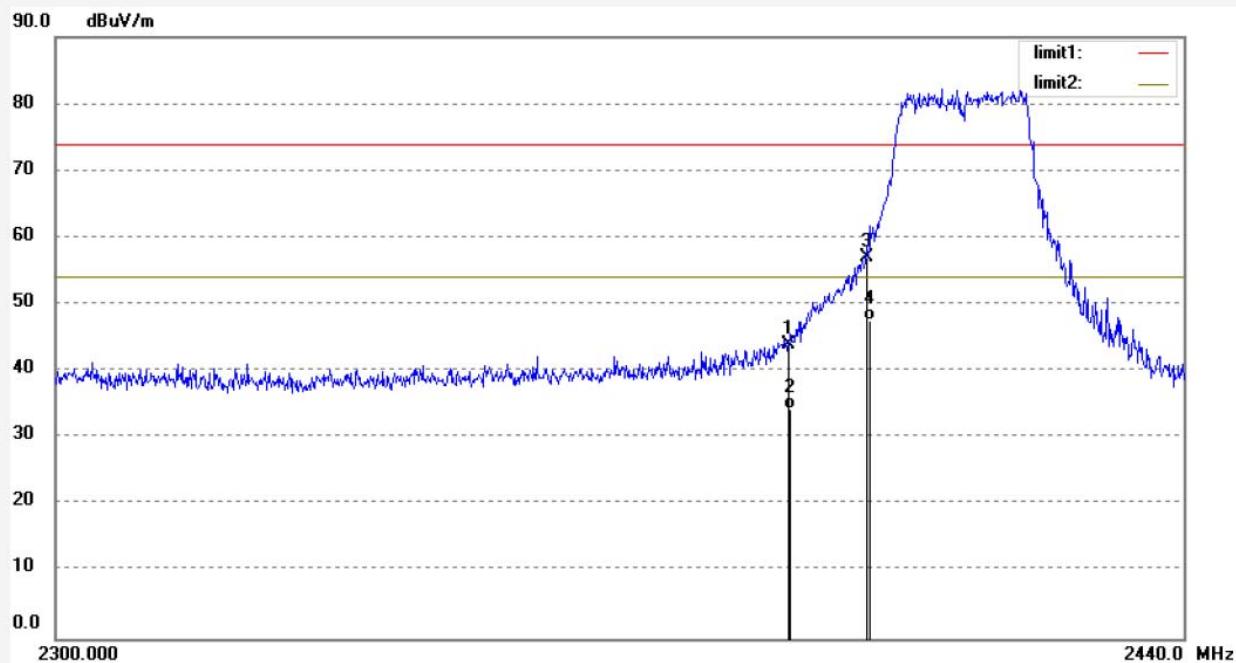


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Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: ding2016 #2162	Polarization: Horizontal
Standard: FCC PK	Power Source: DC 3.3V
Test item: Radiation Test	Date: 16/11/06/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/20/29
EUT: MivaTek Low Power Wi-Fi Module	Engineer Signature:
Mode: TX Channel 1(802.11g)	Distance: 3m
Model: MODCC32	
Manufacturer: Power 7 Technology(Dongguan)Co., Ltd	
Note: Report No.:ATE20162251	



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			

Note: Average measurement with peak detection at No.2&4



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Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: ding2016 #2161

Polarization: Vertical

Standard: FCC PK

Power Source: DC 3.3V

Test item: Radiation Test

Date: 16/11/06/

Temp.(C)/Hum.(%) 25 C / 55 %

Time: 11/16/11

EUT: MivaTek Low Power Wi-Fi Module

Engineer Signature:

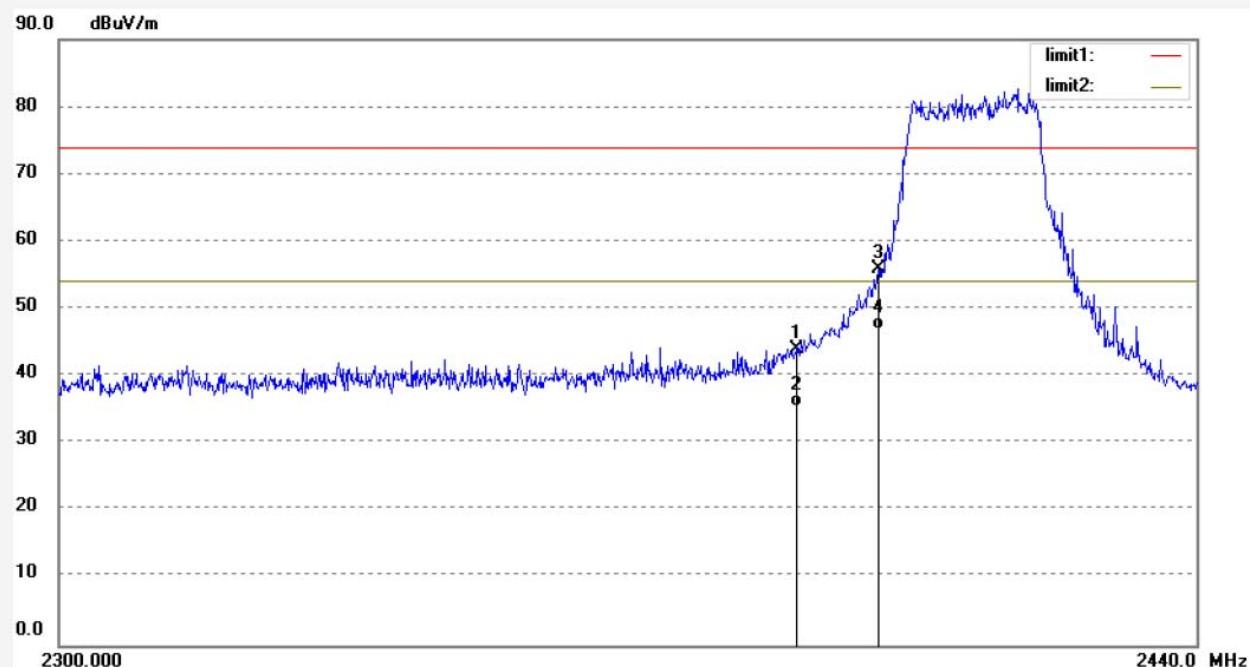
Mode: TX Channel 1(802.11g)

Distance: 3m

Model: MODCC32

Manufacturer: Power 7 Technology(Dongguan)Co., Ltd

Note: Report No.:ATE20162251



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			

Note: Average measurement with peak detection at No.2&4



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

Job No.: ding2016 #2159

Polarization: Horizontal

Standard: FCC PK

Power Source: DC 3.3V

Test item: Radiation Test

Date: 16/11/06/

Temp.(C)/Hum.(%) 25 C / 55 %

Time: 10/58/06

EUT: MivaTek Low Power Wi-Fi Module

Engineer Signature:

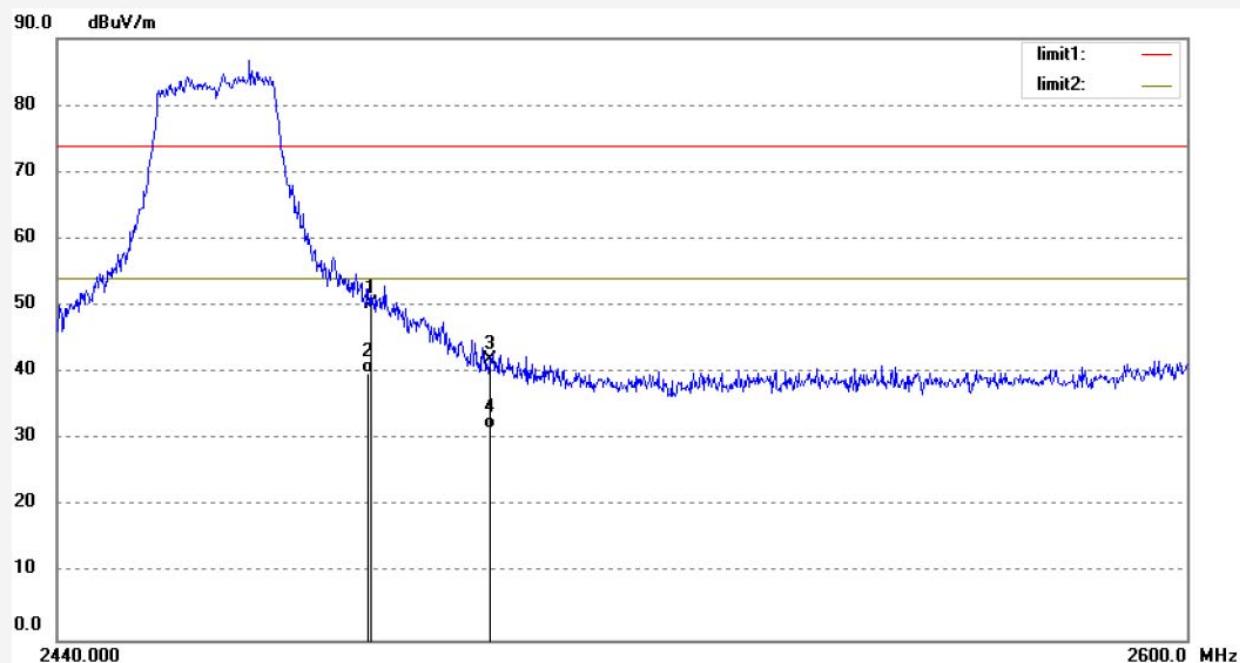
Mode: TX Channel 11(802.11g)

Distance: 3m

Model: MODCC32

Manufacturer: Power 7 Technology(Dongguan)Co., Ltd

Note: Report No.:ATE20162251



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			

Note: Average measurement with peak detection at No.2&4



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Fax:+86-0755-26503396

Job No.: ding2016 #2160

Polarization: Vertical

Standard: FCC PK

Power Source: DC 3.3V

Test item: Radiation Test

Date: 16/11/06/

Temp.(C)/Hum.(%) 25 C / 55 %

Time: 11/12/47

EUT: MivaTek Low Power Wi-Fi Module

Engineer Signature:

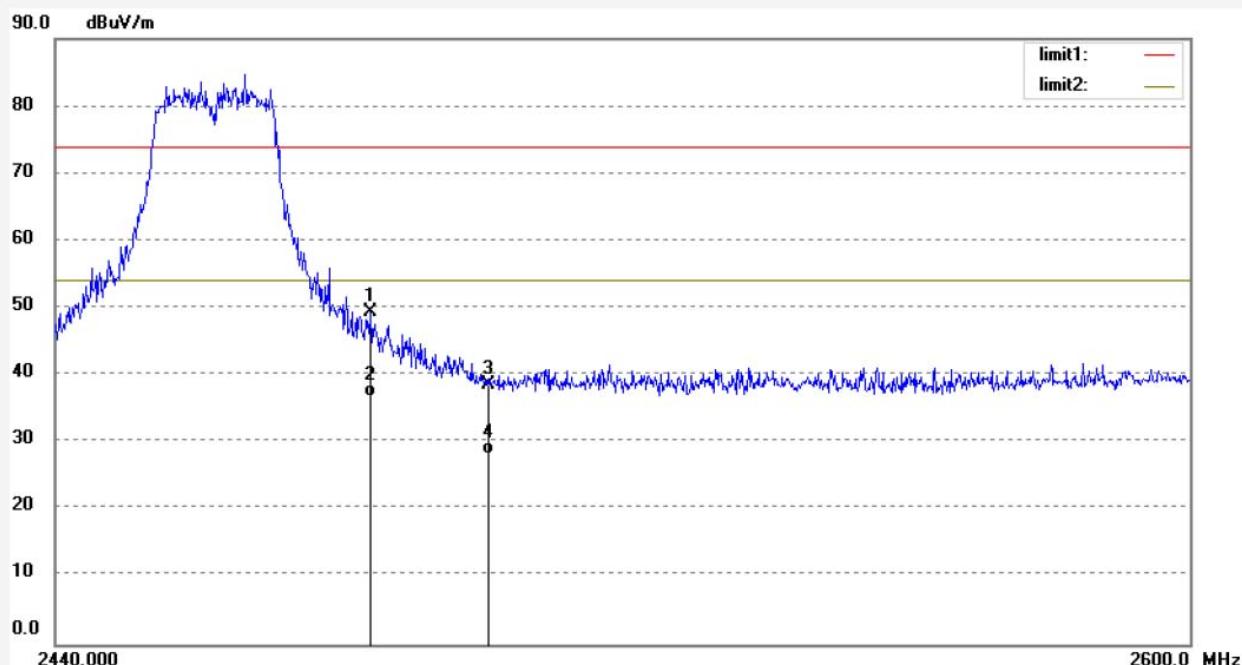
Mode: TX Channel 11(802.11g)

Distance: 3m

Model: MODCC32

Manufacturer: Power 7 Technology(Dongguan)Co., Ltd

Note: Report No.:ATE20162251



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			

Note: Average measurement with peak detection at No.2&4



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Job No.: ding2016 #2163

Polarization: Horizontal

Standard: FCC PK

Power Source: DC 3.3V

Test item: Radiation Test

Date: 16/11/06/

Temp.(C)/Hum.(%) 25 C / 55 %

Time: 11/24/33

EUT: MivaTek Low Power Wi-Fi Module

Engineer Signature:

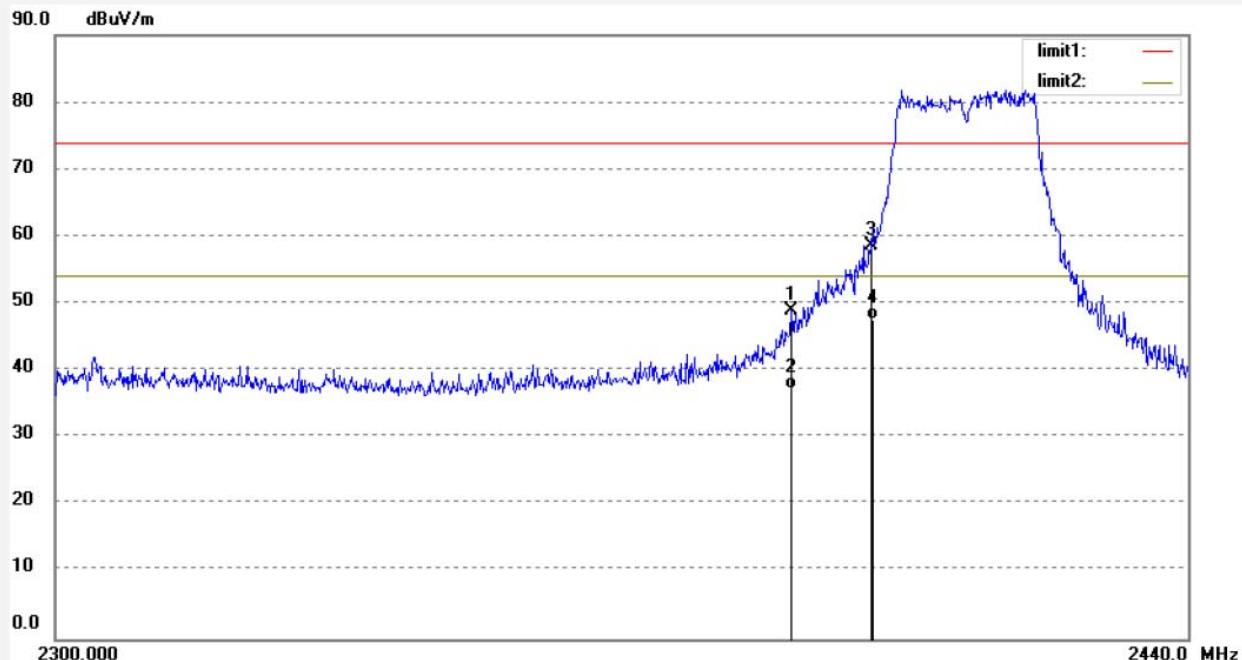
Mode: TX Channel 1(802.11n20)

Distance: 3m

Model: MODCC32

Manufacturer: Power 7 Technology(Dongguan)Co., Ltd

Note: Report No.:ATE20162251



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			

Note: Average measurement with peak detection at No.2&4



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Fax:+86-0755-26503396

Job No.: ding2016 #2164

Polarization: Vertical

Standard: FCC PK

Power Source: DC 3.3V

Test item: Radiation Test

Date: 16/11/06/

Temp.(C)/Hum.(%) 25 C / 55 %

Time: 11/29/37

EUT: MivaTek Low Power Wi-Fi Module

Engineer Signature:

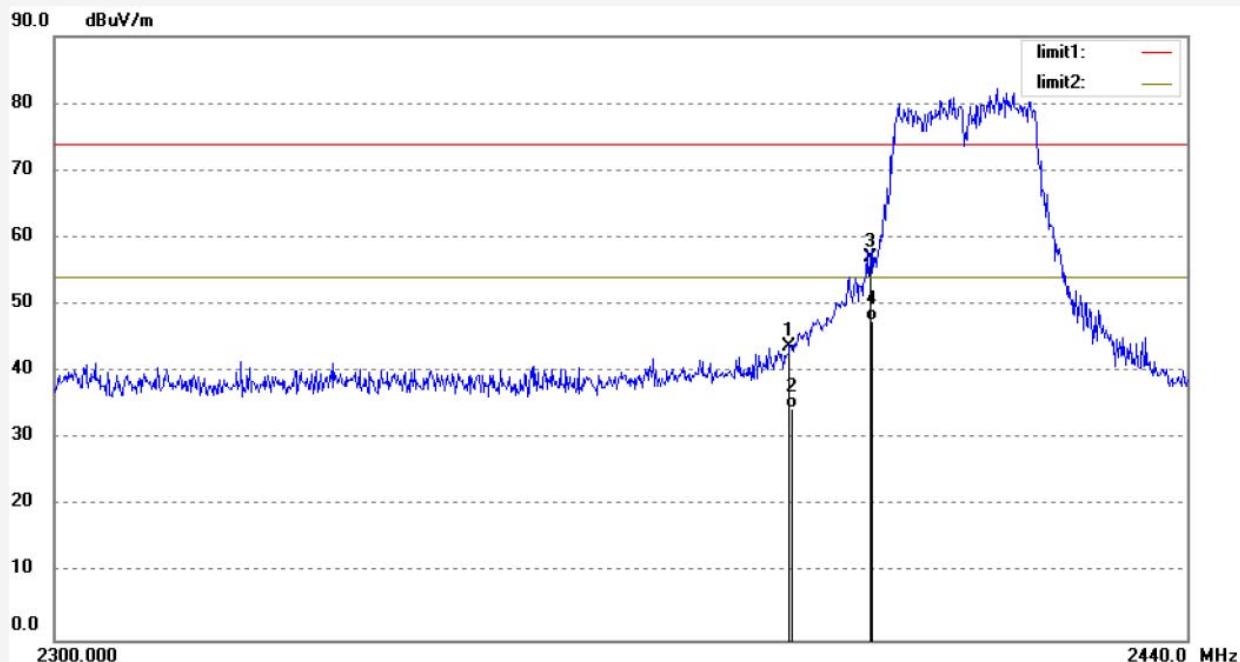
Mode: TX Channel 1(802.11n20)

Distance: 3m

Model: MODCC32

Manufacturer: Power 7 Technology(Dongguan)Co., Ltd

Note: Report No.:ATE20162251



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			

Note: Average measurement with peak detection at No.2&4



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Fax:+86-0755-26503396

Job No.: ding2016 #2166

Polarization: Horizontal

Standard: FCC PK

Power Source: DC 3.3V

Test item: Radiation Test

Date: 16/11/06/

Temp.(C)/Hum.(%) 25 C / 55 %

Time: 11/38/18

EUT: MivaTek Low Power Wi-Fi Module

Engineer Signature:

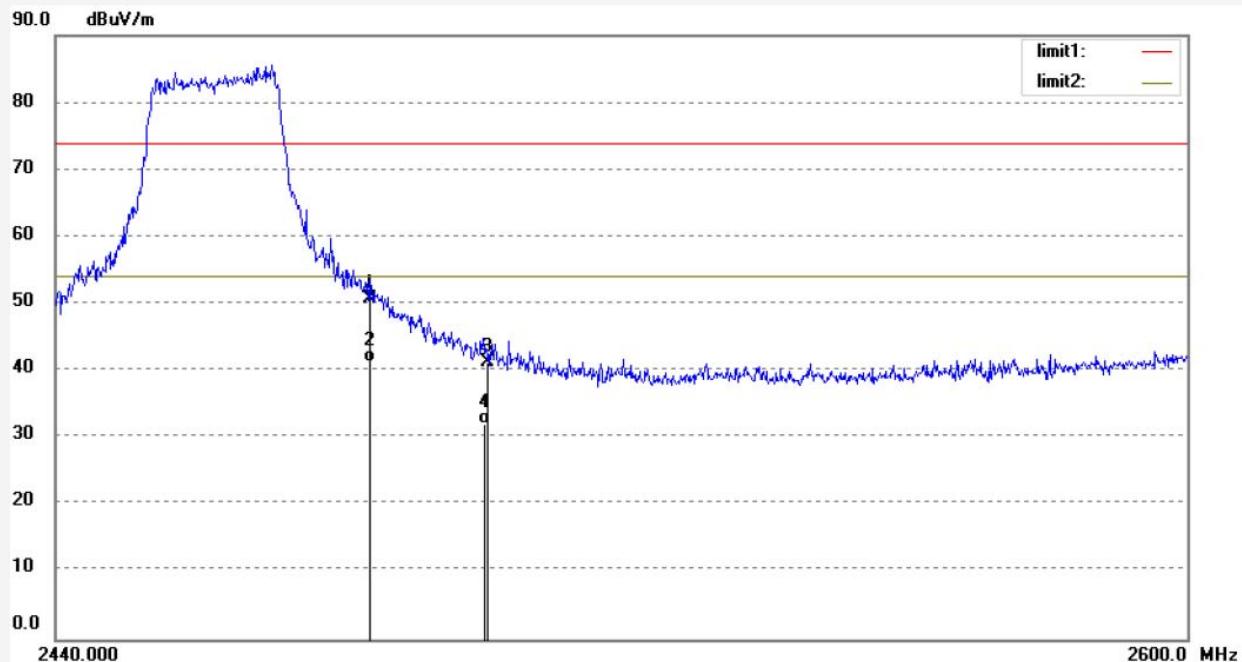
Mode: TX Channel 11(802.11n20)

Distance: 3m

Model: MODCC32

Manufacturer: Power 7 Technology(Dongguan)Co., Ltd

Note: Report No.:ATE20162251



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			

Note: Average measurement with peak detection at No.2&4



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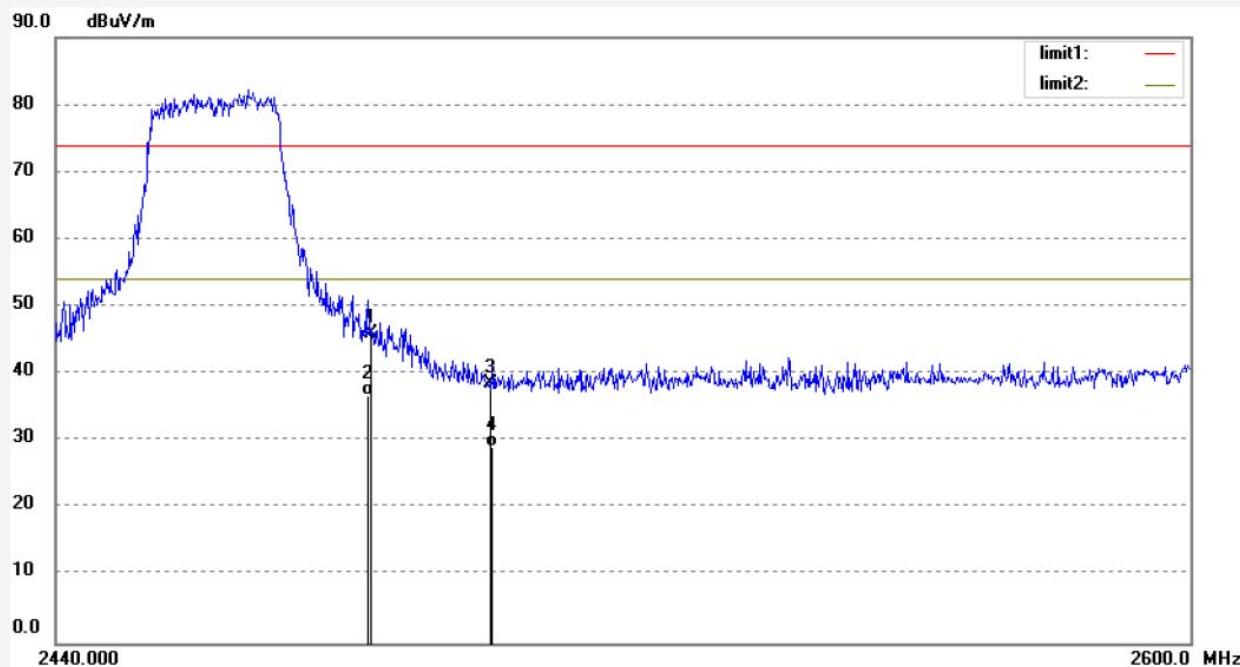
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

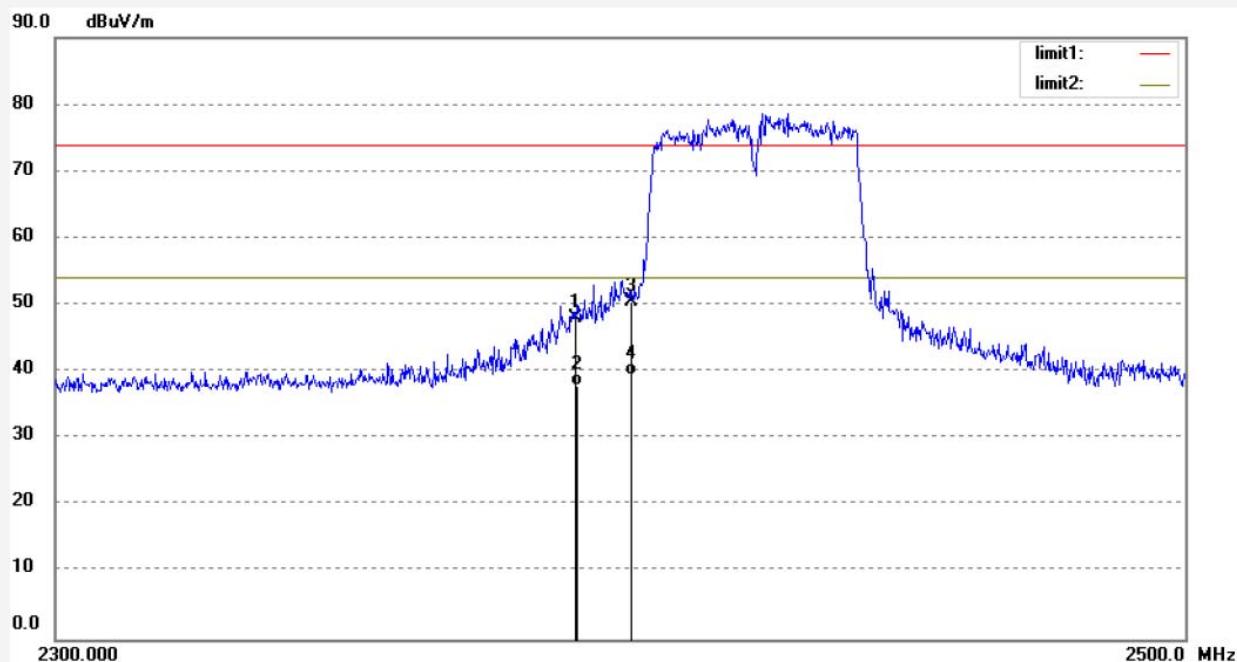
Job No.:	ding2016 #2165	Polarization:	Vertical
Standard:	FCC PK	Power Source:	DC 3.3V
Test item:	Radiation Test	Date:	16/11/06/
Temp.(C)/Hum.(%)	25 C / 55 %	Time:	11/34/50
EUT:	MivaTek Low Power Wi-Fi Module	Engineer Signature:	
Mode:	TX Channel 11(802.11n20)	Distance:	3m
Model:	MODCC32		
Manufacturer:	Power 7 Technology(Dongguan)Co., Ltd		
Note:	Report No.:ATE20162251		



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			

Note: Average measurement with peak detection at No.2&4

Job No.:	ding2016 #2170	Polarization:	Horizontal
Standard:	FCC PK	Power Source:	DC 3.3V
Test item:	Radiation Test	Date:	16/11/06/
Temp.(C)/Hum.(%)	25 C / 55 %	Time:	11/56/02
EUT:	MivaTek Low Power Wi-Fi Module	Engineer Signature:	
Mode:	TX Channel 3(802.11n40)	Distance:	3m
Model:	MODCC32		
Manufacturer:	Power 7 Technology(Dongguan)Co., Ltd		
Note:	Report No.:ATE20162251		



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			

Note: Average measurement with peak detection at No.2&4



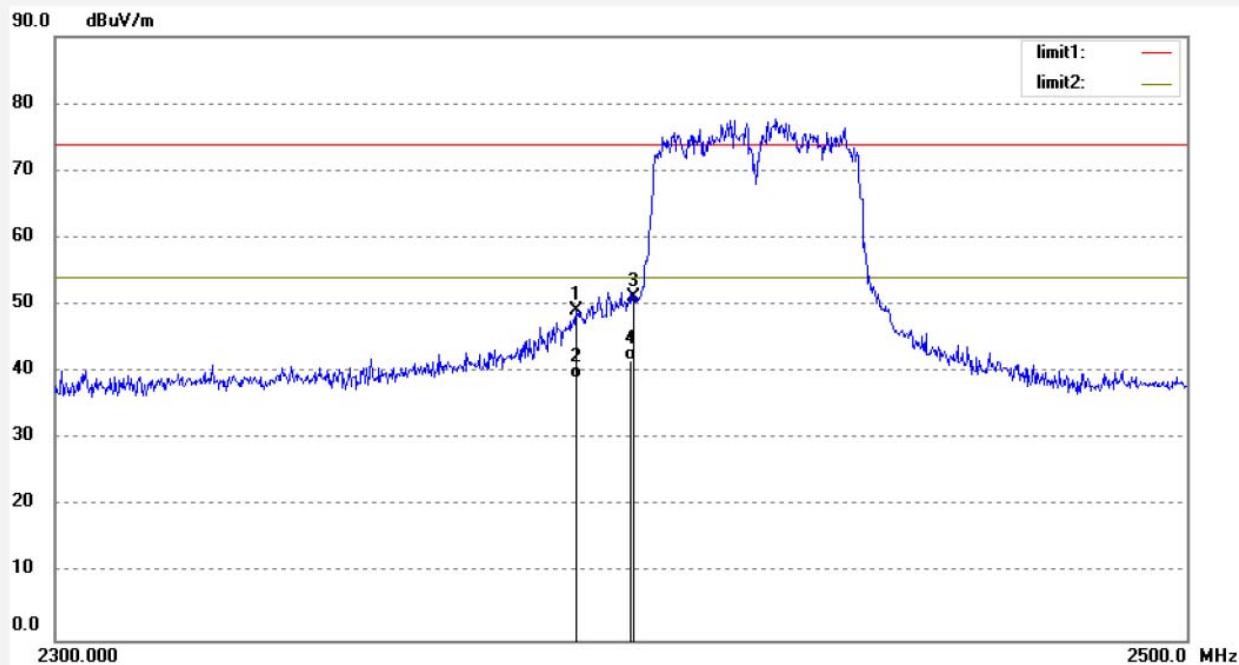
ACCURATE TECHNOLOGY CO., LTD.

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Site: 1# Chamber
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Job No.: ding2016 #2169	Polarization: Vertical
Standard: FCC PK	Power Source: DC 3.3V
Test item: Radiation Test	Date: 16/11/06/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/51/59
EUT: MivaTek Low Power Wi-Fi Module	Engineer Signature:
Mode: TX Channel 3(802.11n40)	Distance: 3m
Model: MODCC32	
Manufacturer: Power 7 Technology(Dongguan)Co., Ltd	

Note: Report No.:ATE20162251



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			

Note: Average measurement with peak detection at No.2&4



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Site: 1# Chamber
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Job No.: ding2016 #2167

Polarization: Horizontal

Standard: FCC PK

Power Source: DC 3.3V

Test item: Radiation Test

Date: 16/11/06/

Temp.(C)/Hum.(%) 25 C / 55 %

Time: 11/42/35

EUT: MivaTek Low Power Wi-Fi Module

Engineer Signature:

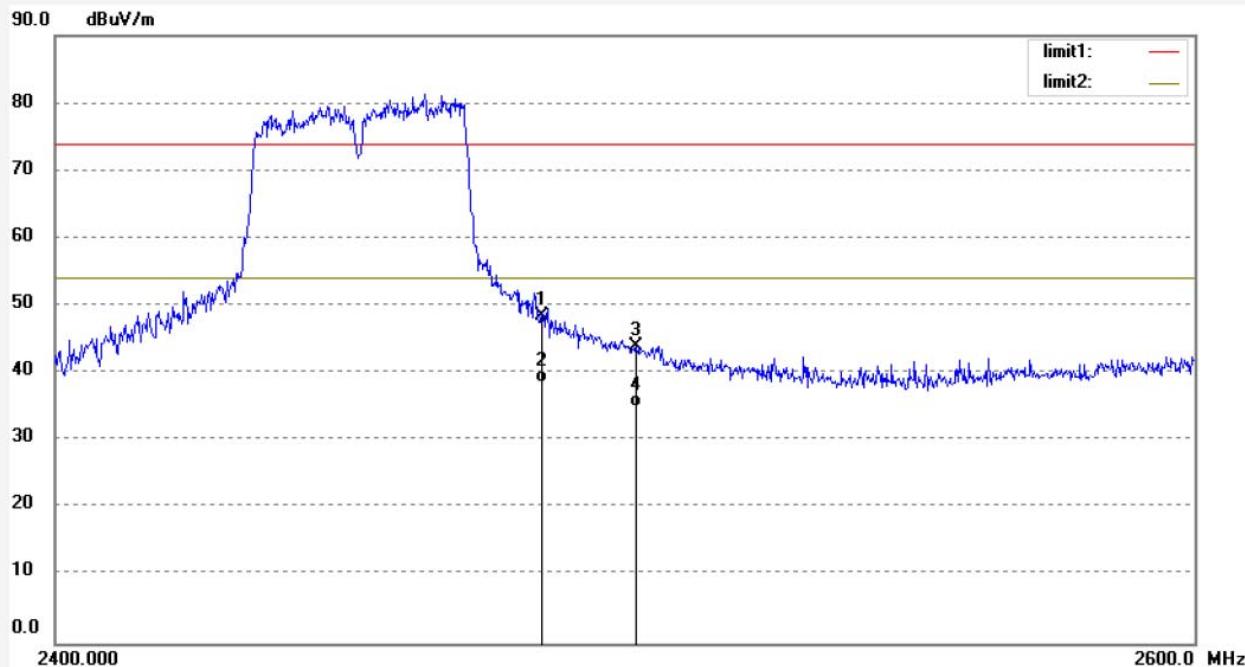
Mode: TX Channel 9(802.11n40)

Distance: 3m

Model: MODCC32

Manufacturer: Power 7 Technology(Dongguan)Co., Ltd

Note: Report No.:ATE20162251



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			

Note: Average measurement with peak detection at No.2&4

Job No.: ding2016 #2168

Polarization: Vertical

Standard: FCC PK

Power Source: DC 3.3V

Test item: Radiation Test

Date: 16/11/06/

Temp.(C)/Hum.(%) 25 C / 55 %

Time: 11/47/37

EUT: MivaTek Low Power Wi-Fi Module

Engineer Signature:

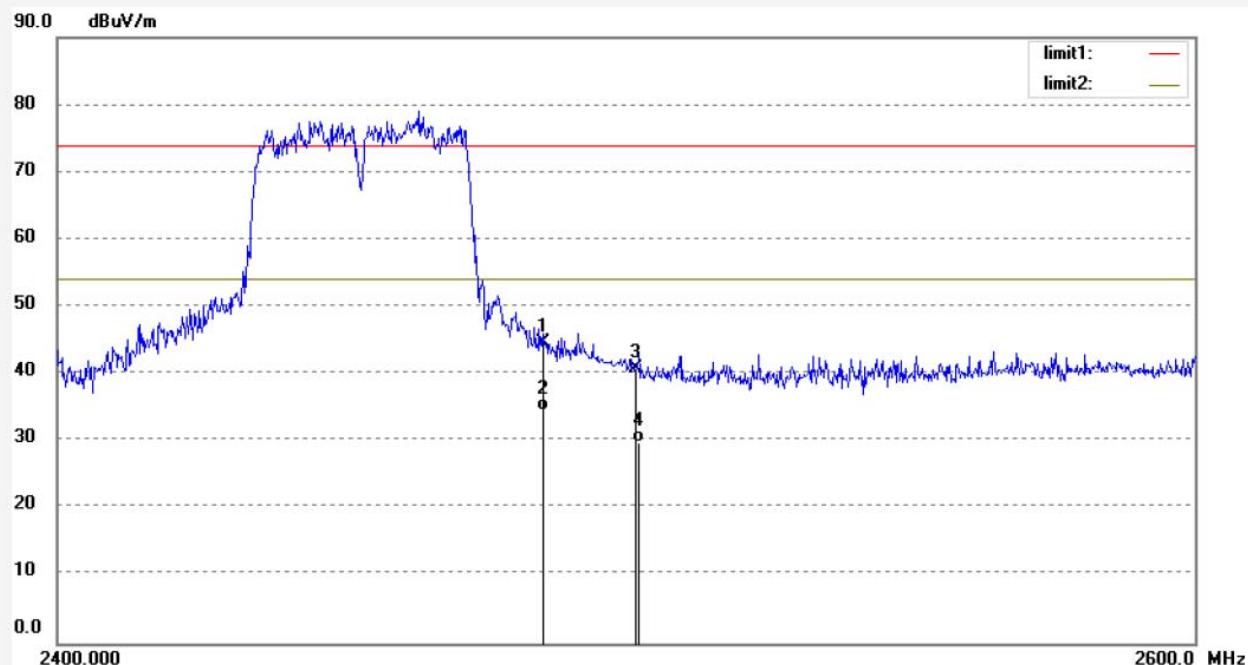
Mode: TX Channel 9(802.11n40)

Distance: 3m

Model: MODCC32

Manufacturer: Power 7 Technology(Dongguan)Co., Ltd

Note: Report No.:ATE20162251



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			

Note: Average measurement with peak detection at No.2&4

10.RADIATED SPURIOUS EMISSION TEST

10.1.Block Diagram of Test Setup

10.1.1.Block diagram of connection between the EUT and peripherals

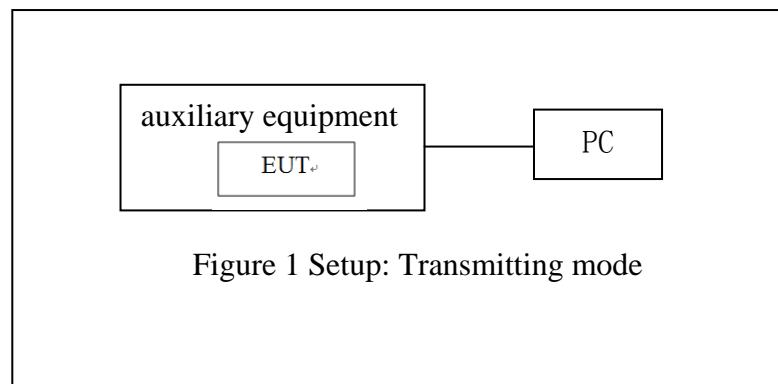
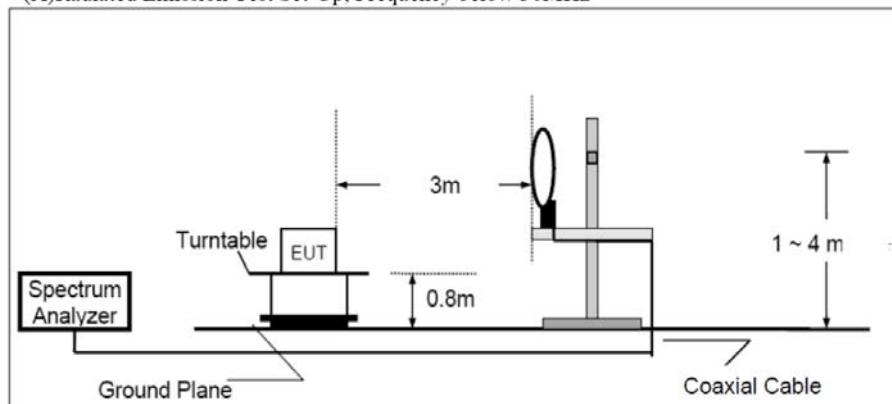


Figure 1 Setup: Transmitting mode

10.1.2.Semi-Anechoic Chamber Test Setup Diagram

(A)Radiated Emission Test Set-Up, Frequency below 30MHz



(B)Radiated Emission Test Set-Up, Frequency 30-1000MHz

