



優耐檢測

Shenzhen United Testing Technology Co., Ltd.

Report No.: UNI-1410085

## FCC TEST REPORT

Prepared For :	Ralinwi Nanjing Electronic Technology Co., Ltd.
Product Name:	tiny embedded Wi-Fi module
Model :	TinyCon2005, TinyCon2005-LS/LM/LG/LR
Prepared By :	Shenzhen United Testing Technology Co., Ltd. 4F, Block B Unit 2, Jianxing Building, Chaguang Industry Area, Nanshan District, Shenzhen, China Tel: 86-755-86180996 Fax: 86-755-86180156
Test Date:	October 13, 2014 to October 23, 2014
Date of Report :	October 23, 2014
Report No.:	UNI-1410085

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## 1 TEST CERTIFICATION

<b>Product:</b>	tiny embedded Wi-Fi module
<b>Model:</b>	TinyCon2005, TinyCon2005-LS/LM/LG/LR
<b>Applicant:</b>	Ralinwi Nanjing Electronic Technology Co., Ltd. Room 404,Building 6,No.6 Su Yuan Road, Xuanwu District Nanjing China
<b>Factory:</b>	Ralinwi Nanjing Electronic Technology Co., Ltd. Room 404,Building 6,No.6 Su Yuan Road, Xuanwu District Nanjing China
<b>Trade Mark:</b>	
<b>Tested:</b>	October 13, 2014 to October 23, 2014
<b>Operational Frequency Range:</b>	IEEE 802.11b/g, 802.11n HT20: 2412-2462MHz IEEE 802.11n HT40 : 2422MHz-2452MHz
<b>Modulation Type:</b>	IEEE 802.11b : DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g : OFDM (64QAM, 16AQM, QPSK, BPSK) IEEE 802.11n HT20/40 : OFDM (64QAM, 16QAM, QPSK, BPSK)
<b>Channel Spacing</b>	IEEE 802.11b/g/n: 5MHz
<b>Air Data Rate</b>	IEEE 802.11b : 11, 5.5, 2, 1 Mbps IEEE 802.11g : 54, 48, 36, 24, 18, 12, 9, 6 Mbps IEEE 802.11n HT20 : 150, 117 ,104, 78, 65, 58.5, 52, 39, 26, 19.5, 13, 6 Mbps IEEE 802.11n HT40 : 150, 117 ,104, 78, 65, 58.5, 52, 39, 26, 19.5, 13, 6 Mbps
<b>Frequency Selection</b>	By software
<b>Channel Number</b>	IEEE 802.11b/g ,802.11n HT20 : 11 Channels IEEE 802.11n HT40 : 7 Channels
<b>Antenna:</b>	Ceramic antenna used. Gain -0.8dBi
<b>FCC ID:</b>	2ADGHTINYCON
<b>Applicable Standards:</b>	FCC Part 15.247

The test report was prepared by Shenzhen United Testing Technology Co., Ltd. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.



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Shenzhen United Testing Technology Co., Ltd.

Report No.: UNI-1410085

Prepared by :

Michael Su

Michael Su /Assistant Engineer

Reviewer :

Mike Yong

Mike Yong/Supervisor

Approved & Authorized Signer :

Hoffer Lau

Hoffer Lau/ Manager

**2.0 Test Equipment**

Item	Test Equipment	Manufacturer	Model No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	June. 30 2014	June. 29 2015
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	Jul. 03 2014	Jul. 02 2015
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	Feb. 25 2014	Feb. 24 2015
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	June 29 2014	June 28 2015
6	Horn Antenna	ETS-LINDGREN	3160	June. 30 2014	June. 29 2015
7	EMI Test Software	AUDIX	E3	N/A	N/A
8	Amplifier(100kHz-3GHz)	HP	8347A	Jul. 03 2014	Jul. 02 2015
9	Amplifier(2GHz-20GHz)	HP	8349B	Jul. 03 2014	Jul. 02 2015
10	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	June. 30 2014	June. 29 2015
11	Band filter	Amindeon	82346	June. 30 2014	June. 29 2015
12	Constant temperature and humidity box	Oregon Scientific	BA-888	May 11 2014	May 10 2015
13	D.C. Power Supply	Instek	PS-3030	May 11 2014	May 10 2015
14	Universal radio communication tester	Rohde & Schwarz	CMU200	May 11 2014	May 10 2015
15	Splitter	Agilent	11636B	May 11 2014	May 10 2015
16	EMI Test Receiver	Rohde & Schwarz	ESCS30	Jul. 03 2014	Jul. 02 2015
17	LISN	Schwarebeck	NSLK 8126	Jul. 03 2014	Jul. 02 2015



### 3.0 Technical Details

#### 3.1 Summary of test results

**The EUT has been tested according to the following specifications:**

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.107 & 15.207	Conducted Emission Test	PASS	Complies
FCC Part 15 Subpart C Paragraph 15.247(a)(2) Limit	Spectrum bandwidth of a Orthogonal Frequency Division Multiplex System Limit: 6dB bandwidth>500kHz	PASS	Complies
FCC Part 15, Paragraph 15.247(b)	Maximum peak output power Limit: max. 30dBm	PASS	Complies
FCC Part 15, Paragraph 15.109,15.205 & 15.209	Transmitter Radiated Emission Limit: Table 15.209	PASS	Complies
FCC Part 15, Paragraph 15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Complies
FCC Part 15, Paragraph 15.247(d)	Out of Band Emission and Restricted Band Radiation Limit: 20dB less than peak value of fundamental frequency Restricted band limit: Table 15.209	PASS	Complies

### 4.0 Test LAB Details

All Tests Performed at

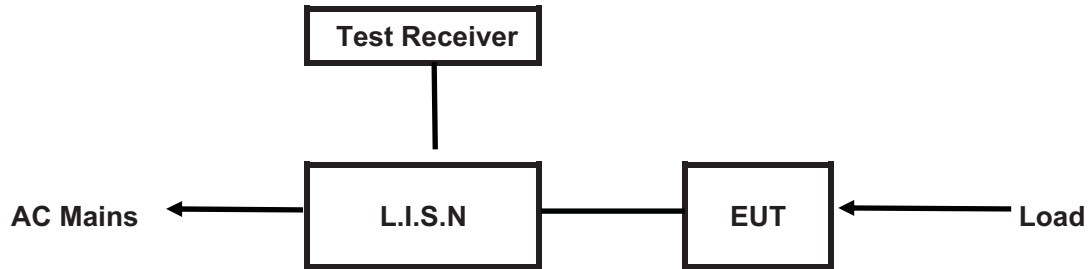
Name: ShenZhen CTL Testing Technology Co.,Ltd

Address: Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen, Guangdong, China

FCC Registration Number: 970318

## 5. Power Line Conducted Emission Test

### 5.1 Schematics of the test



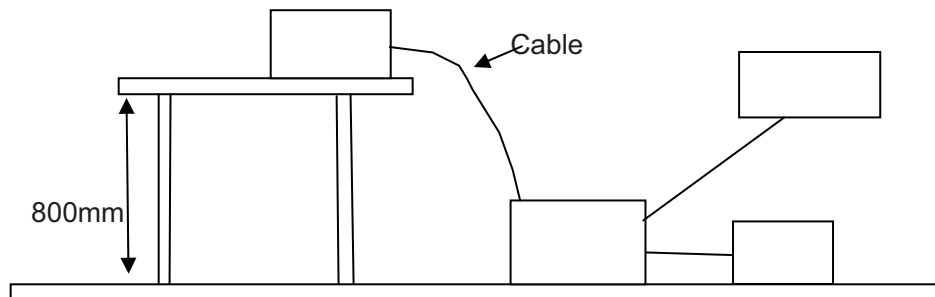
EUT: Equipment Under Test

### 5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2003. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4 –2003.

Test Voltage: 120V~, 60Hz

Block diagram of Test setup



### 5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2003. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

**A. EUT**

Device	Manufacturer	Model	FCC ID
tiny embedded Wi-Fi module	Ralinwi Nanjing Electronic Technology Co., Ltd.	TinyCon2005, TinyCon2005-LS/LM/LG/LR	2ADGHTINYCON

**B. Internal Device**

Device	Manufacturer	Model	FCC ID/DOC
N/A			

**C. Peripherals**

Device	Manufacturer	Model	FCC ID/DOC	Cable
--	--	--	--	--

**5.4 EUT Operating Condition**

Operating condition is according to ANSI C63.4 -2003.

A Setup the EUT and simulators as shown on follow

B Enable AF signal and confirm EUT active to normal condition

**5.5 Power line conducted Emission Limit according to Paragraph 15.107, 15.207**

Frequency (MHz)	Class A Limits (dBμV)		Class B Limits (dBμV)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ~ 0.50	79.0	66.0	66.0~56.0*	56.0~46.0*
0.50 ~ 5.00	73.0	60.0	56.0	46.0
5.00 ~ 30.00	73.0	60.0	60.0	50.0

Notes: 1. \*Decreasing linearly with logarithm of frequency.

2. The tighter limit shall apply at the transition frequencies

**5.6 Test Results**

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.





**A: Conducted Emission on Live Terminal (150kHz to 30MHz)**

**EUT Operating Environment**

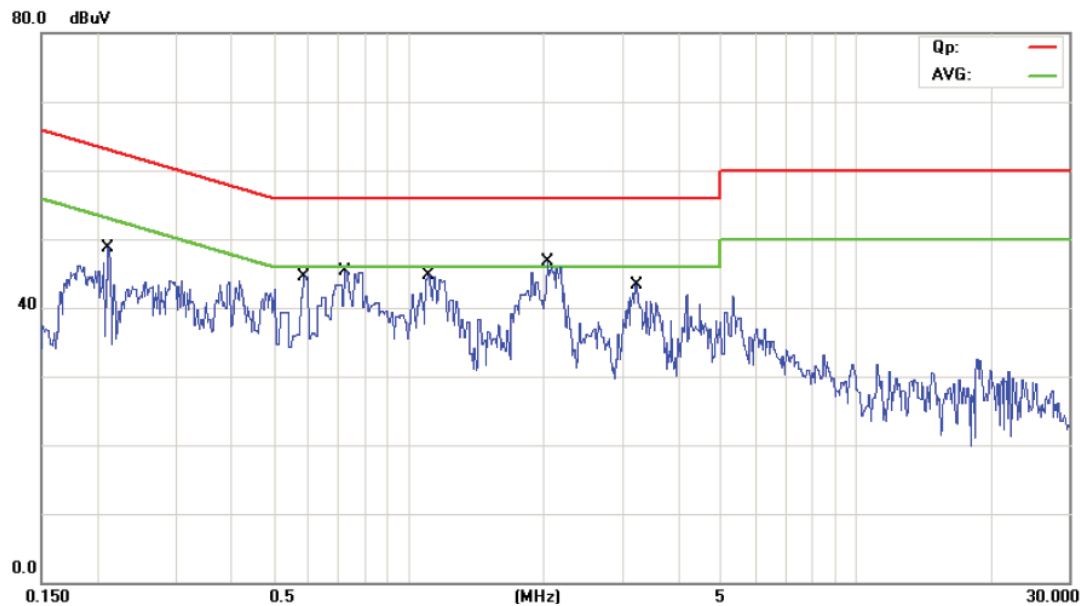
Temperature: 25°C Humidity: 75%RH Atmospheric Pressure: 101 KPa

**EUT set Condition: Keep WIFI Transmitting**

**Equipment Level: Class B**

**Results: Pass**

Please refer to following diagram for individual



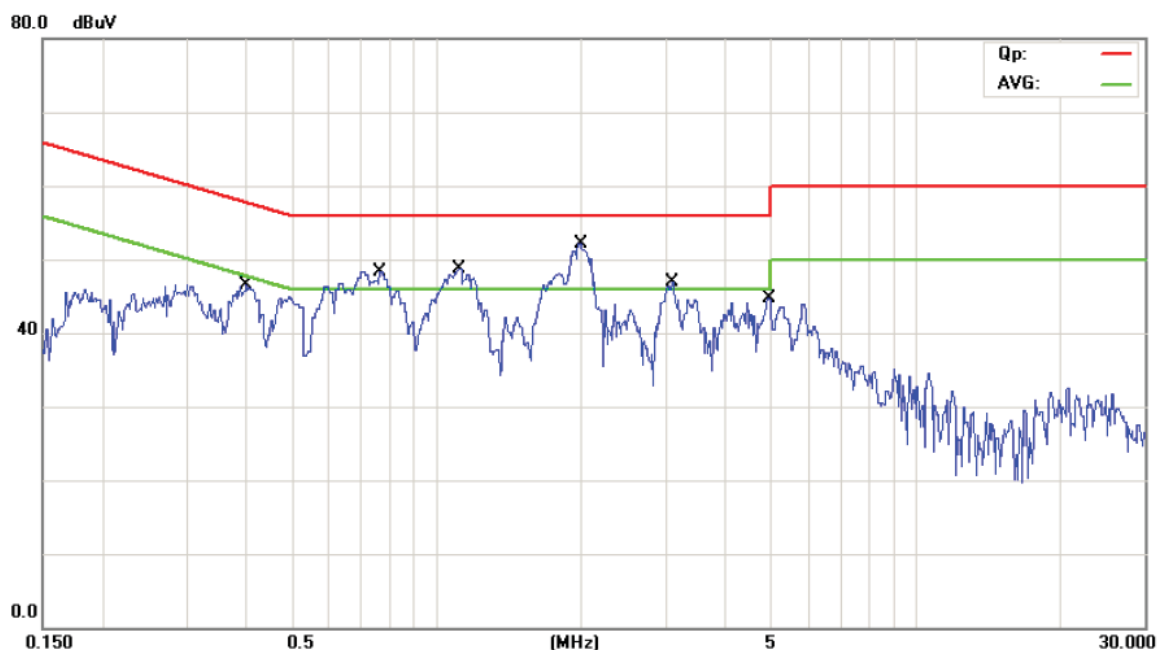
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB	dBuV	dBuV	dB		
1		0.2101	19.50	11.06	30.56	63.20	-32.64	QP	
2		0.2101	0.70	11.06	11.76	53.20	-41.44	AVG	
3		0.5862	24.60	11.46	36.06	56.00	-19.94	QP	
4		0.5862	9.30	11.46	20.76	46.00	-25.24	AVG	
5		0.7216	27.40	11.61	39.01	56.00	-16.99	QP	
6		0.7216	12.50	11.61	24.11	46.00	-21.89	AVG	
7		1.1071	27.30	11.94	39.24	56.00	-16.76	QP	
8		1.1071	12.90	11.94	24.84	46.00	-21.16	AVG	
9	*	2.0430	30.20	12.32	42.52	56.00	-13.48	QP	
10		2.0430	17.60	12.32	29.92	46.00	-16.08	AVG	
11		3.2014	23.30	12.78	36.08	56.00	-19.92	QP	
12		3.2014	9.60	12.78	22.38	46.00	-23.62	AVG	

**B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)****EUT Operating Environment**

Temperature: 25°C Humidity: 75%RH Atmospheric Pressure: 101 KPa

**EUT set Condition: Keep WIFI Transmitting****Equipment Level: Class B****Results: Pass**

Please refer to following diagram for individual



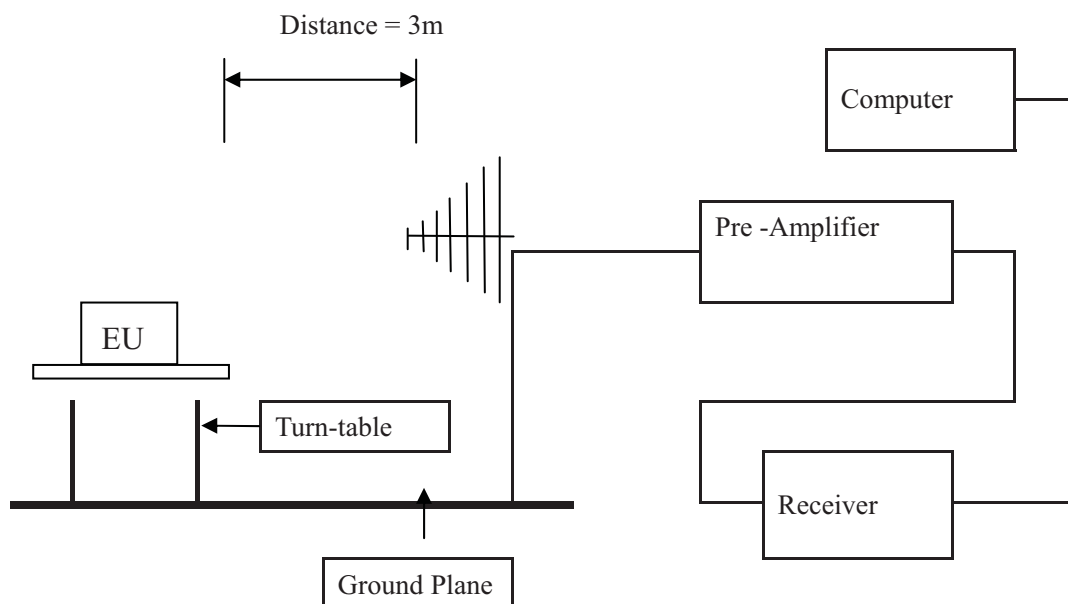
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.3977	33.00	11.26	44.26	57.90	-13.64	QP	
2		0.3977	13.20	11.26	24.46	47.90	-23.44	AVG	
3		0.7631	34.10	11.65	45.75	56.00	-10.25	QP	
4		0.7631	15.90	11.65	27.55	46.00	-18.45	AVG	
5		1.1135	34.30	11.95	46.25	56.00	-9.75	QP	
6		1.1135	16.80	11.95	28.75	46.00	-17.25	AVG	
7	*	1.9892	37.60	12.30	49.90	56.00	-6.10	QP	
8		1.9892	23.80	12.30	36.10	46.00	-9.90	AVG	
9		3.0943	30.00	12.74	42.74	56.00	-13.26	QP	
10		3.0943	14.30	12.74	27.04	46.00	-18.96	AVG	
11		4.8990	27.70	13.46	41.16	56.00	-14.84	QP	
12		4.8990	15.60	13.46	29.06	46.00	-16.94	AVG	

## 6 Radiated Emission Test

### 6.1 Test Method and test Procedure:

- (1) The EUT was tested according to ANSI C63.4 –2003. The radiated test was performed at CTL Laboratory. This site is on file with the FCC laboratory division, Registration No. 970318
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2003.
- (3) The frequency spectrum from 30 MHz to 25 GHz was investigated. All readings from 30 MHz to 1 GHz are Quasi-peak values with a resolution bandwidth of 120 kHz. For measurement above 1GHz, peak values with RBW=1MHz, VBW=3MHz and PK detector. AV value with RBW=1MHz, VBW=3MHz and RMS detector. Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "QP" in the data table.
- (6) The antenna polarization : Vertical polarization and Horizontal polarization.

### Block diagram of Test setup



### 6.2 Configuration of The EUT

Same as section 5.3 of this report

### 6.3 EUT Operating Condition

Same as section 5.4 of this report.



6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

**Frequencies in restricted band are complied to limit on Paragraph 15.209 and 15.109**

Frequency Range (MHz)	Distance (m)	Field strength (dB $\mu$ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

- Note:
1. RF Voltage (dBuV) = 20 log RF Voltage ( $\mu$ V)
  2. In the Above Table, the higher limit applies at the band edges.
  3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT



Test result

General Radiated Emission Data and Harmonics Radiated Emission Data

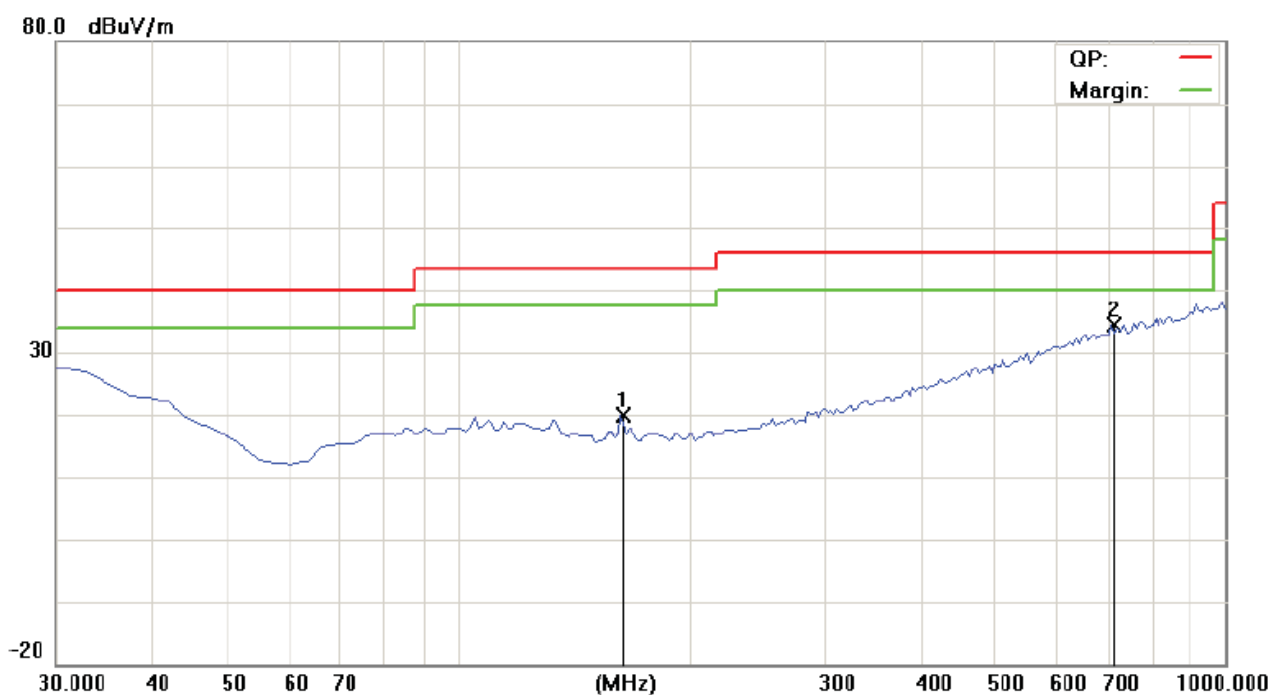
Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: Keep Transmitting

Results: Pass

Test Figure:

H

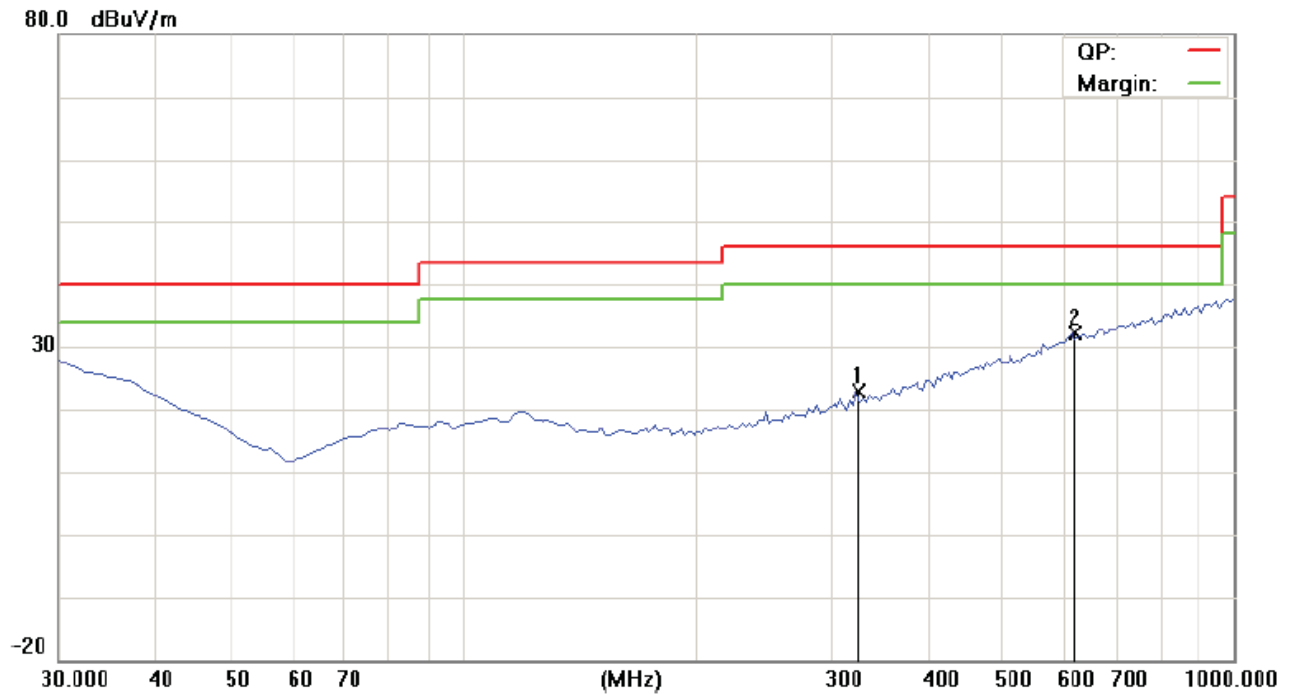


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		163.3750	35.23	-15.42	19.81	43.50	-23.69	peak	0	
2	*	711.4250	34.87	-0.37	34.50	46.00	-11.50	peak	0	



Test Figure:

V



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		323.4250	33.58	-10.73	22.85	46.00	-23.15	peak	0	
2	*	619.2750	34.01	-1.83	32.18	46.00	-13.82	peak	0	



Operation Mode: Transmitting under CH01 for 11b at 11Mbps

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
4824.00	48.82 ( PK )	H	74(Peak)/ 54(AV)
4824.00	49.59 ( PK )	V	74(Peak)/ 54(AV)
7236.00	--	H/V	74(Peak)/ 54(AV)
9648.00	--	H/V	74(Peak)/ 54(AV)
12060	--	H/V	74(Peak)/ 54(AV)
14472	--	H/V	74(Peak)/ 54(AV)
16884	--	H/V	74(Peak)/ 54(AV)
19296	--	H/V	74(Peak)/ 54(AV)
21708	--	H/V	74(Peak)/ 54(AV)
24120	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

3. For 802.11b mode at 11Mbps



Operation Mode: Transmitting under CH06 for 11b at 11Mbps

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
4874.00	51.12 ( PK )	H	74(Peak)/ 54(AV)
4874.00	49.31 ( PK )	V	74(Peak)/ 54(AV)
7311.00	--	H/V	74(Peak)/ 54(AV)
9748.00	--	H/V	74(Peak)/ 54(AV)
12185	--	H/V	74(Peak)/ 54(AV)
14622	--	H/V	74(Peak)/ 54(AV)
17059	--	H/V	74(Peak)/ 54(AV)
19496	--	H/V	74(Peak)/ 54(AV)
21933	--	H/V	74(Peak)/ 54(AV)
24370	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

3. For 802.11b mode at 11Mbps





**Operation Mode: Transmitting under CH11 for 11b at 11Mbps**

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
4924	49.29 ( PK )	H	74(Peak)/ 54(AV)
4924	50.13 ( PK )	V	74(Peak)/ 54(AV)
7386	--	H/V	74(Peak)/ 54(AV)
9848	--	H/V	74(Peak)/ 54(AV)
12310	--	H/V	74(Peak)/ 54(AV)
14772	--	H/V	74(Peak)/ 54(AV)
17234	--	H/V	74(Peak)/ 54(AV)
19696	--	H/V	74(Peak)/ 54(AV)
22158	--	H/V	74(Peak)/ 54(AV)
24620	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

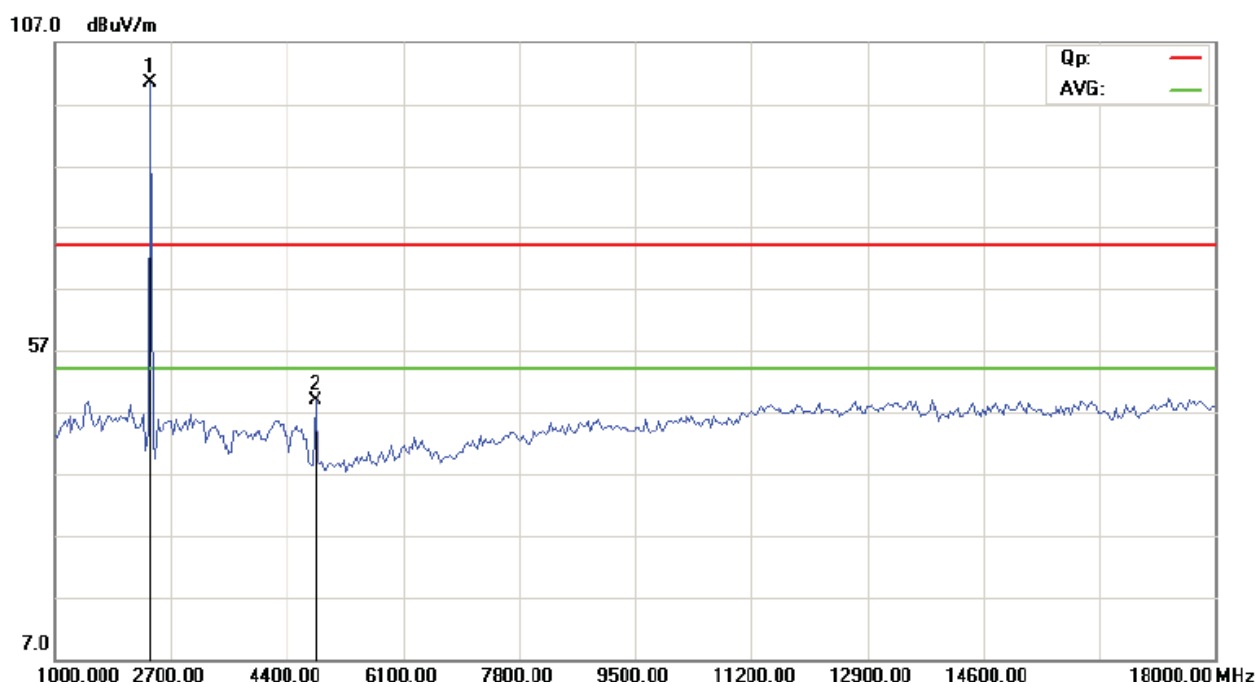
2. Remark "---" means that the emissions level is too low to be measured

3. For 802.11b mode at 11Mbps

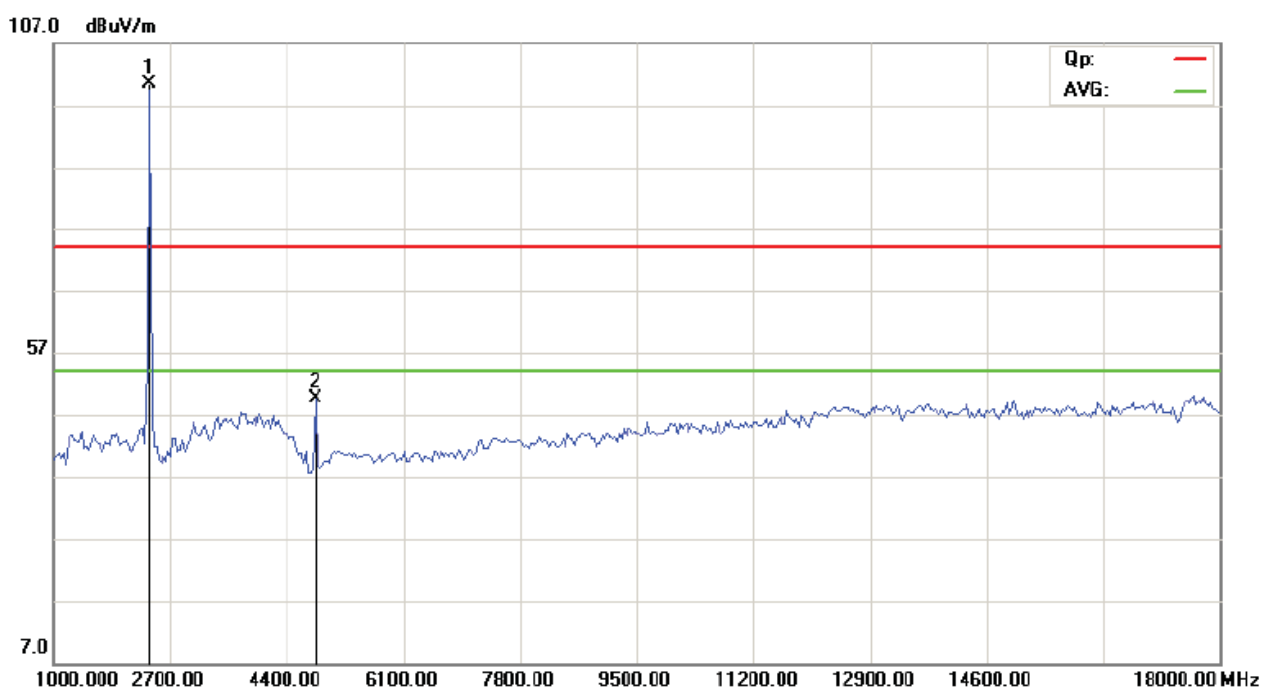


Please refer to the following test plots for details:

**CH01 at 11Mbps: Horizontal**

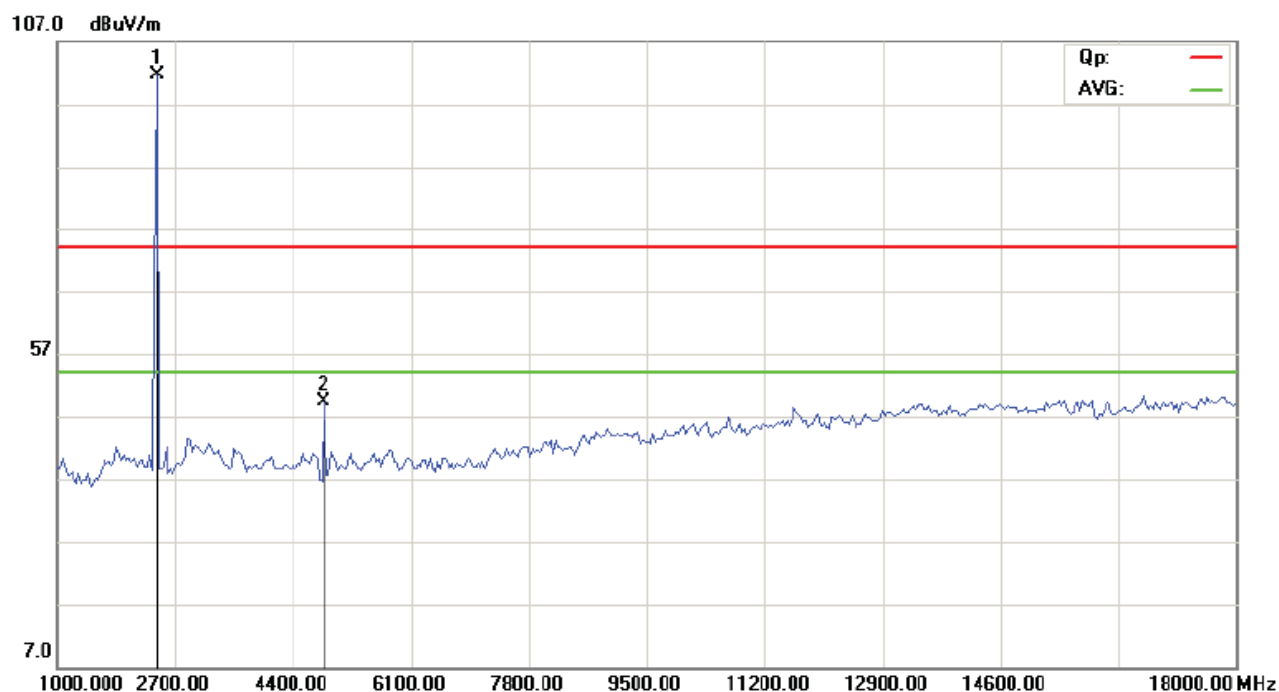


**CH01 at 11Mbps: Vertical**

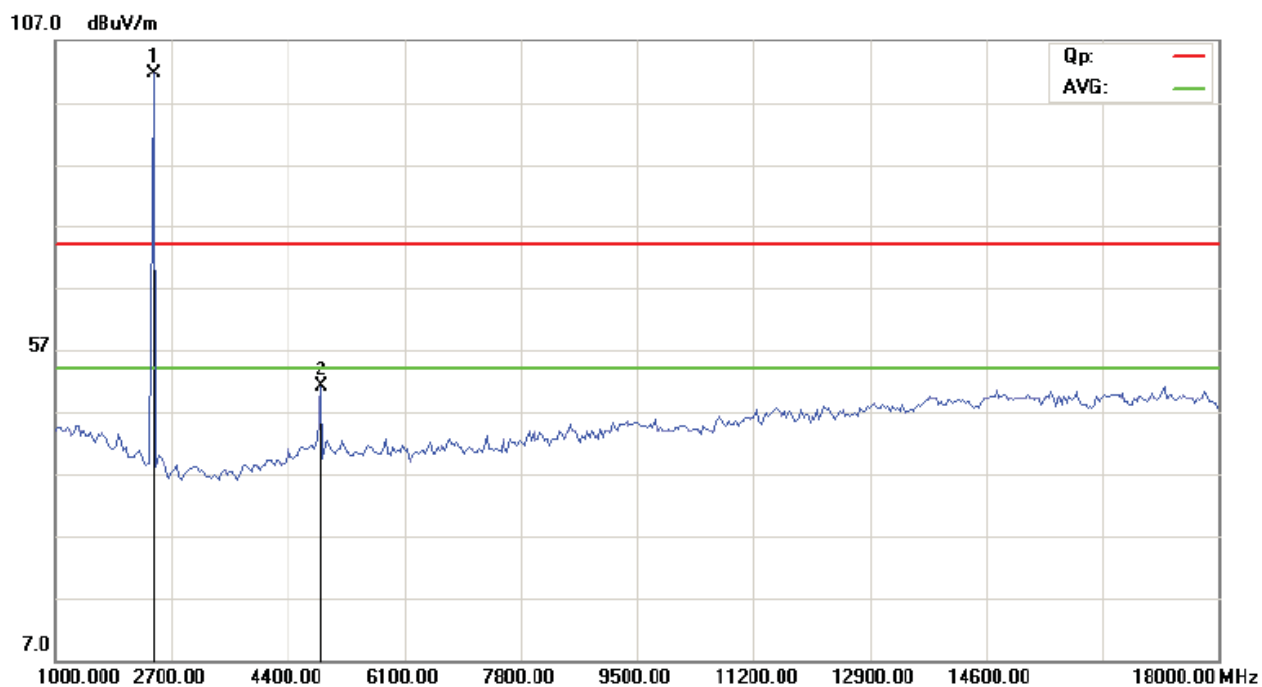




CH06 at 11Mbps: Vertical

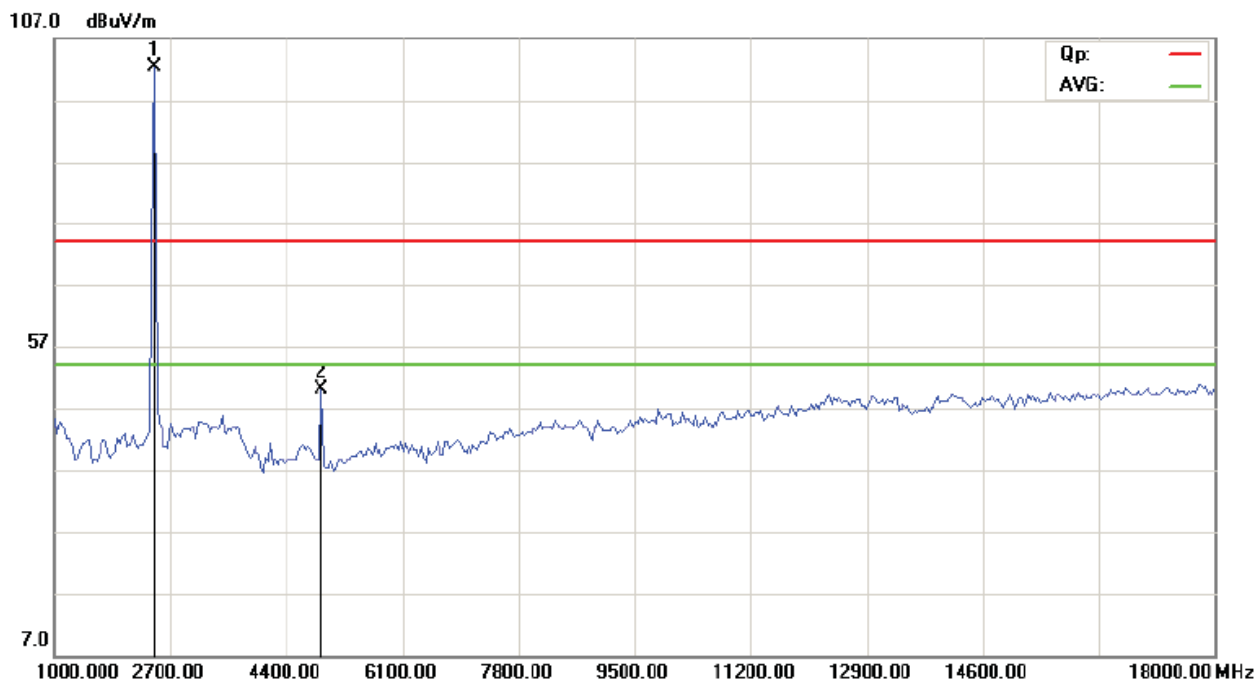


CH06 at 11Mbps: Horizontal

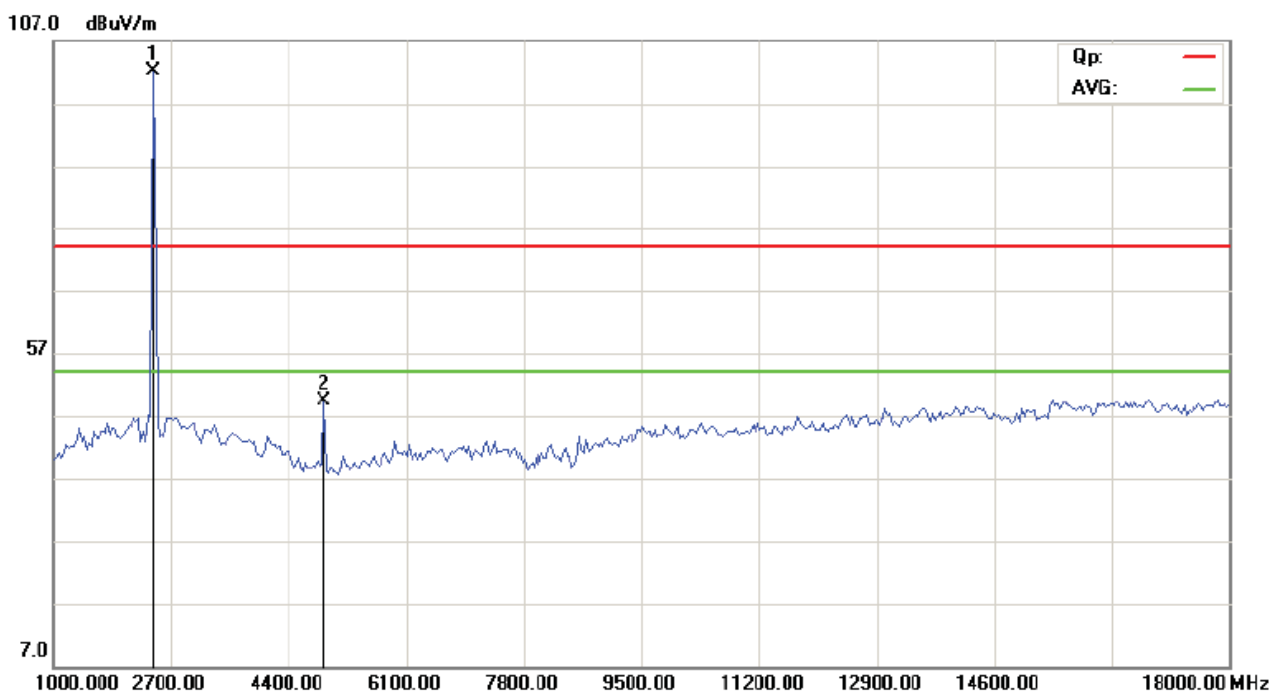




### CH11 at 11Mbps: Vertical



### CH11at 11Mbps: Horizontal



Note: For radiated Emissions from 18-25GHz, it is only the floor noise.



**Operation Mode: Transmitting under CH01 for 11g at 54 Mbps**

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
4824.00	48.78 ( PK )	H	74(Peak)/ 54(AV)
4824.00	49.32 ( PK )	V	74(Peak)/ 54(AV)
7236.00	--	H/V	74(Peak)/ 54(AV)
9648.00	--	H/V	74(Peak)/ 54(AV)
12060	--	H/V	74(Peak)/ 54(AV)
14472	--	H/V	74(Peak)/ 54(AV)
16684	--	H/V	74(Peak)/ 54(AV)
19296	--	H/V	74(Peak)/ 54(AV)
21708	--	H/V	74(Peak)/ 54(AV)
24120	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

3. For 802.11g mode 54Mbps

**Operation Mode: Transmitting under CH06 for 11g at 54 Mbps**

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
4874.00	50.47 ( PK )	H	74(Peak)/ 54(AV)
4874.00	51.32 ( PK )	V	74(Peak)/ 54(AV)
7311.00	--	H/V	74(Peak)/ 54(AV)
9748.00	--	H/V	74(Peak)/ 54(AV)
12185	--	H/V	74(Peak)/ 54(AV)
14622	--	H/V	74(Peak)/ 54(AV)
17059	--	H/V	74(Peak)/ 54(AV)
19496	--	H/V	74(Peak)/ 54(AV)
21933	--	H/V	74(Peak)/ 54(AV)
24370	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

3. For 802.11g mode 54Mbps



**Operation Mode: Transmitting under CH11 for 11g at 54 Mbps**

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
4924	50.08 ( PK )	H	74(Peak)/ 54(AV)
4924	49.64 ( PK )	V	74(Peak)/ 54(AV)
7386	--	H/V	74(Peak)/ 54(AV)
9848	--	H/V	74(Peak)/ 54(AV)
12310	--	H/V	74(Peak)/ 54(AV)
14772	--	H/V	74(Peak)/ 54(AV)
17234	--	H/V	74(Peak)/ 54(AV)
19696	--	H/V	74(Peak)/ 54(AV)
22158	--	H/V	74(Peak)/ 54(AV)
24620	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

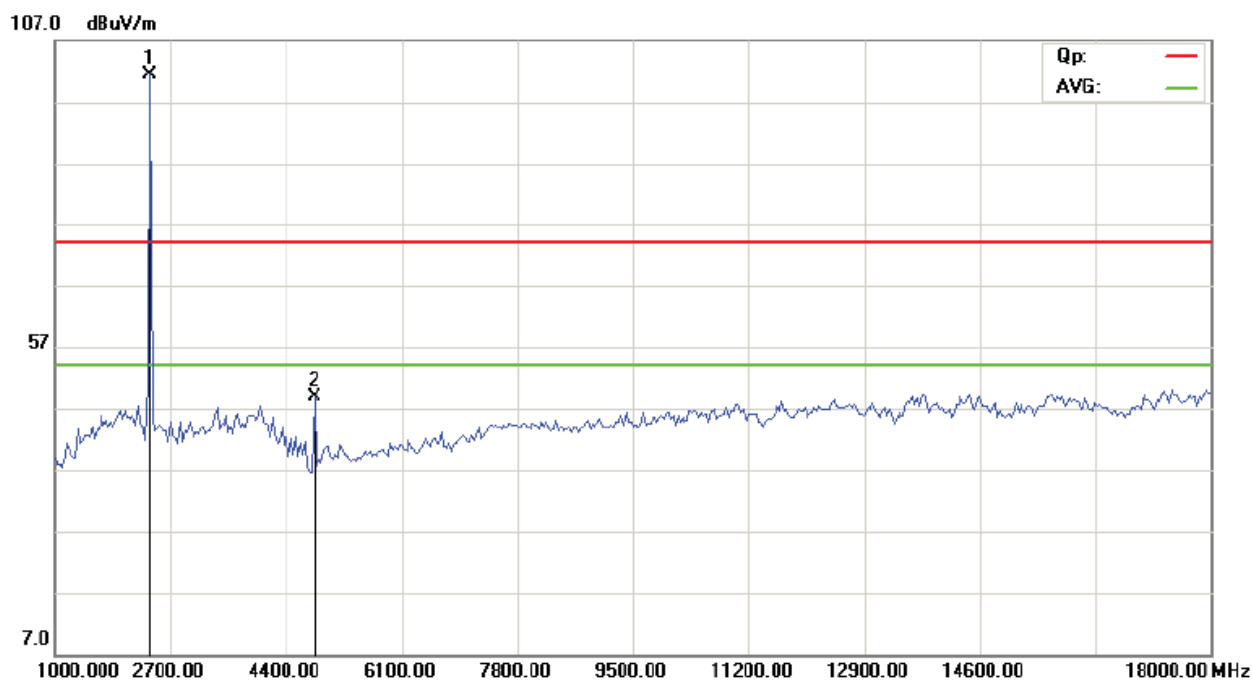
2. Remark "---" means that the emissions level is too low to be measured

3. For 802.11g mode 54Mbps

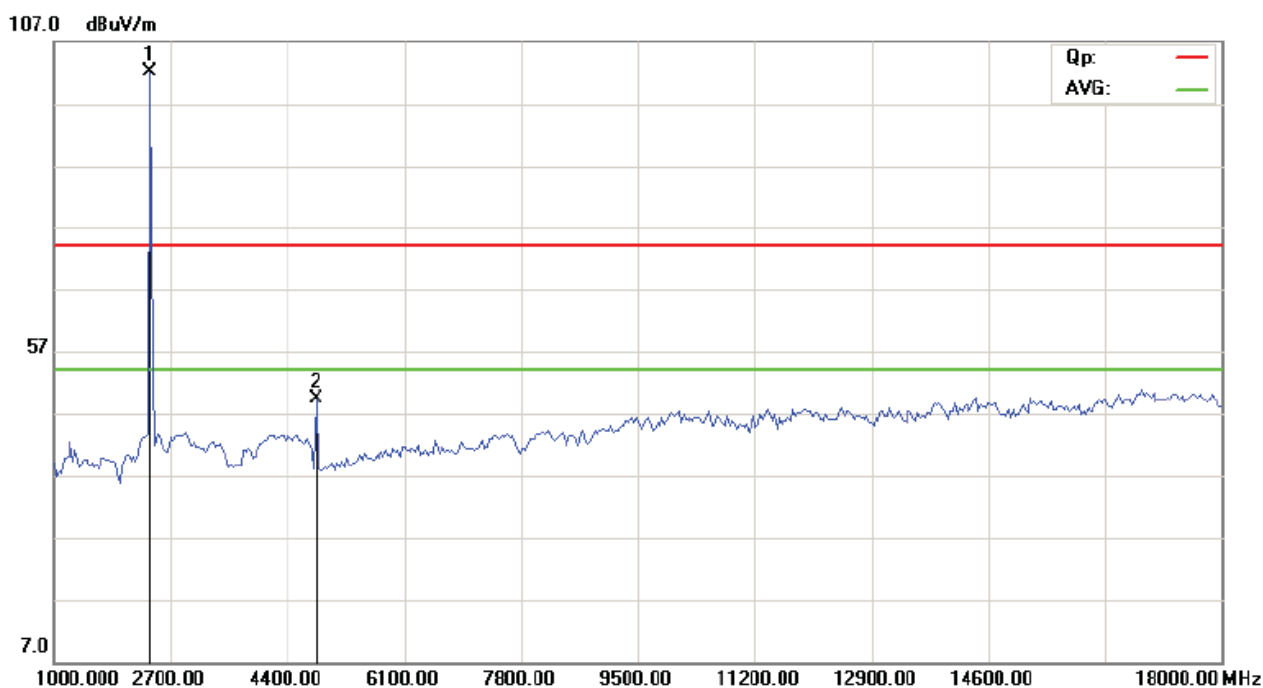


Please refer to the following test plots for details:

**CH01 at 54Mbps: Horizontal**

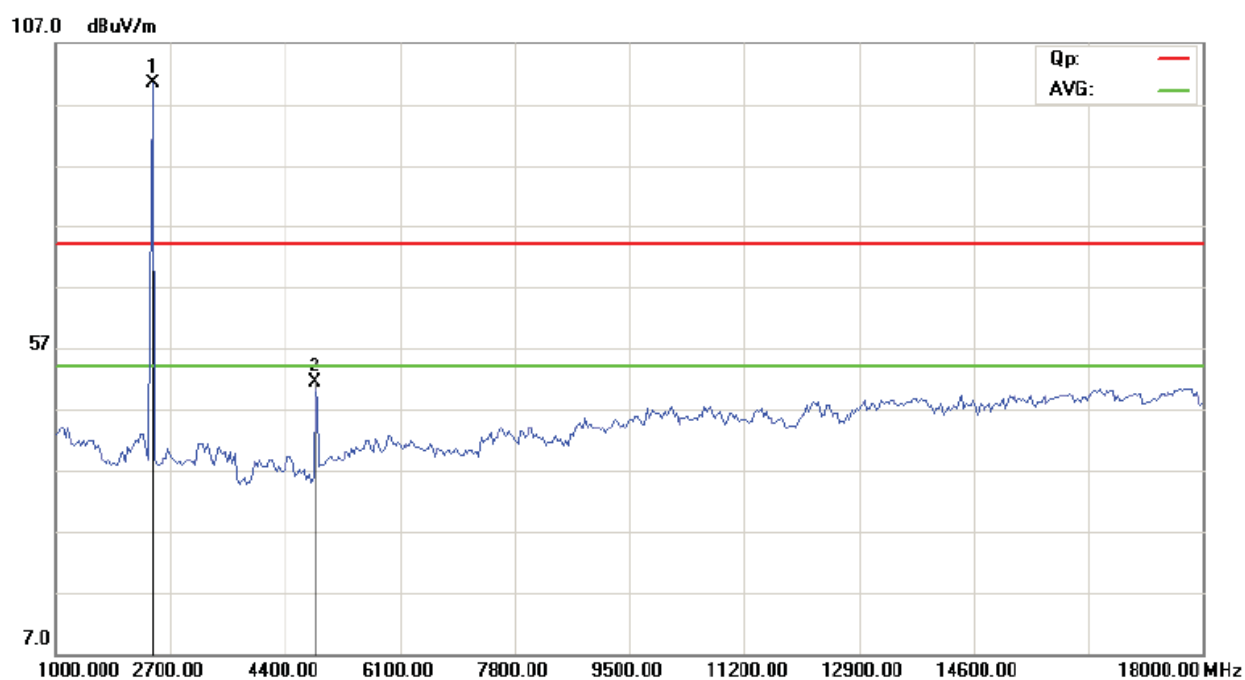


**CH01 at 54Mbps: Vertical**

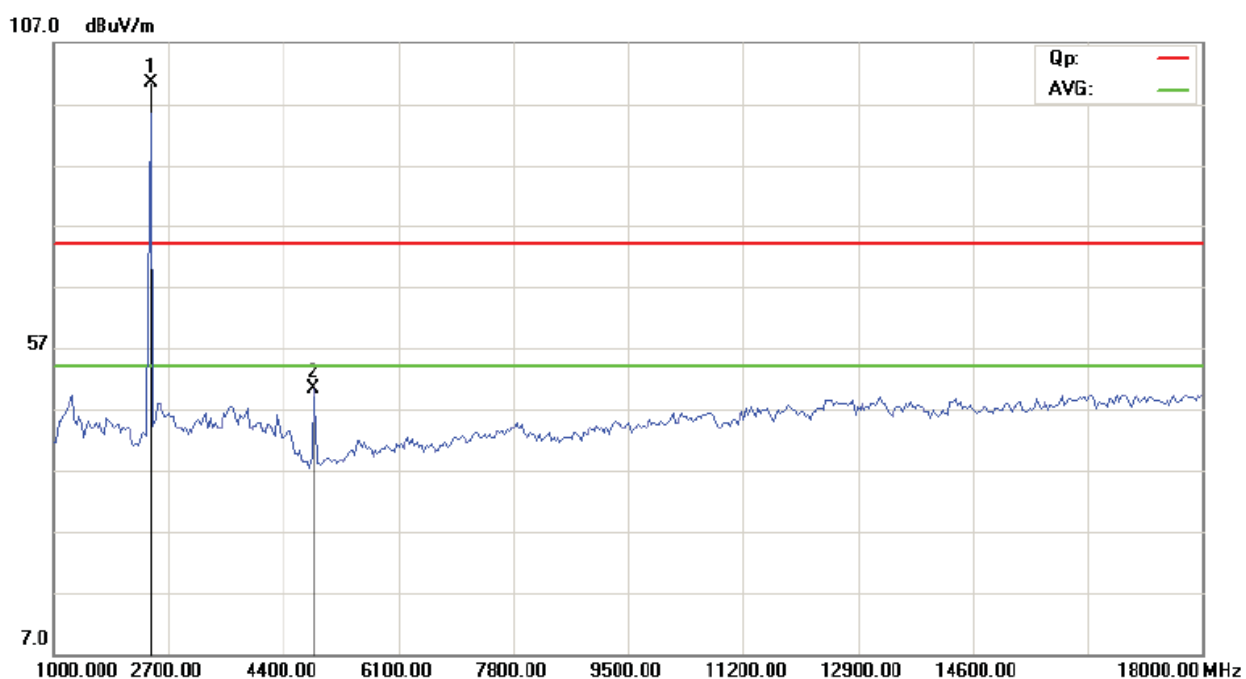




CH06 at 54Mbps: Vertical



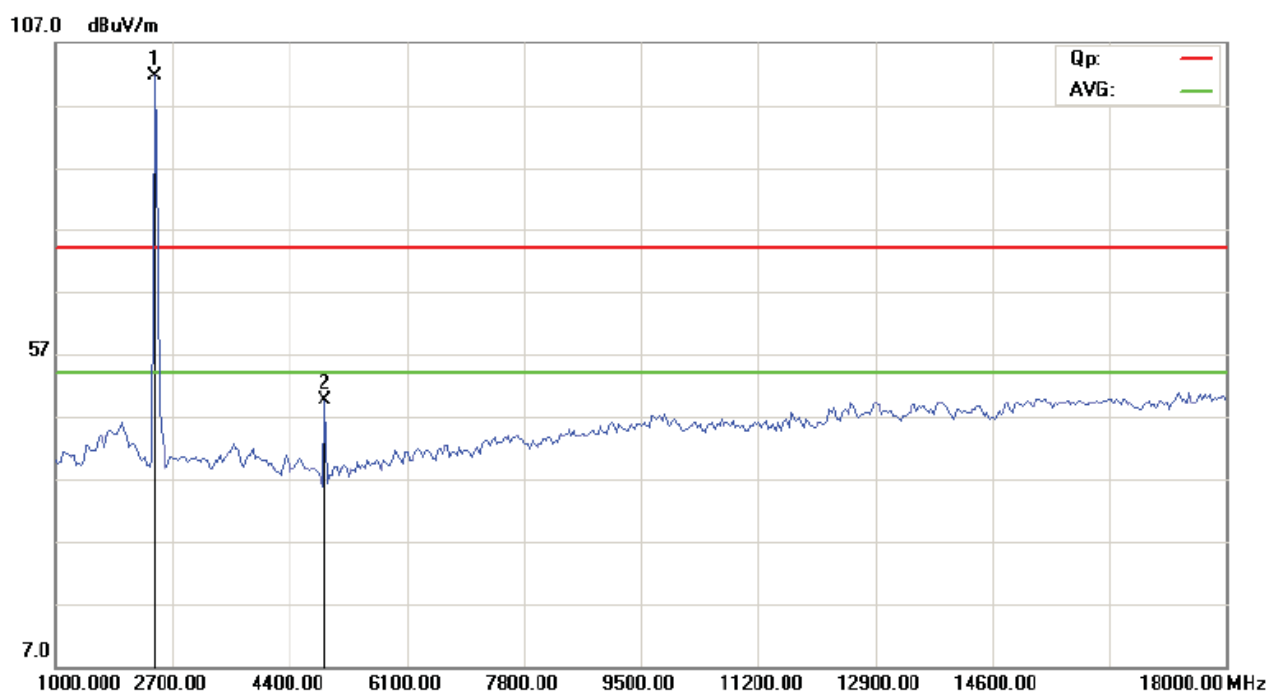
CH06 at 54Mbps: Horizontal



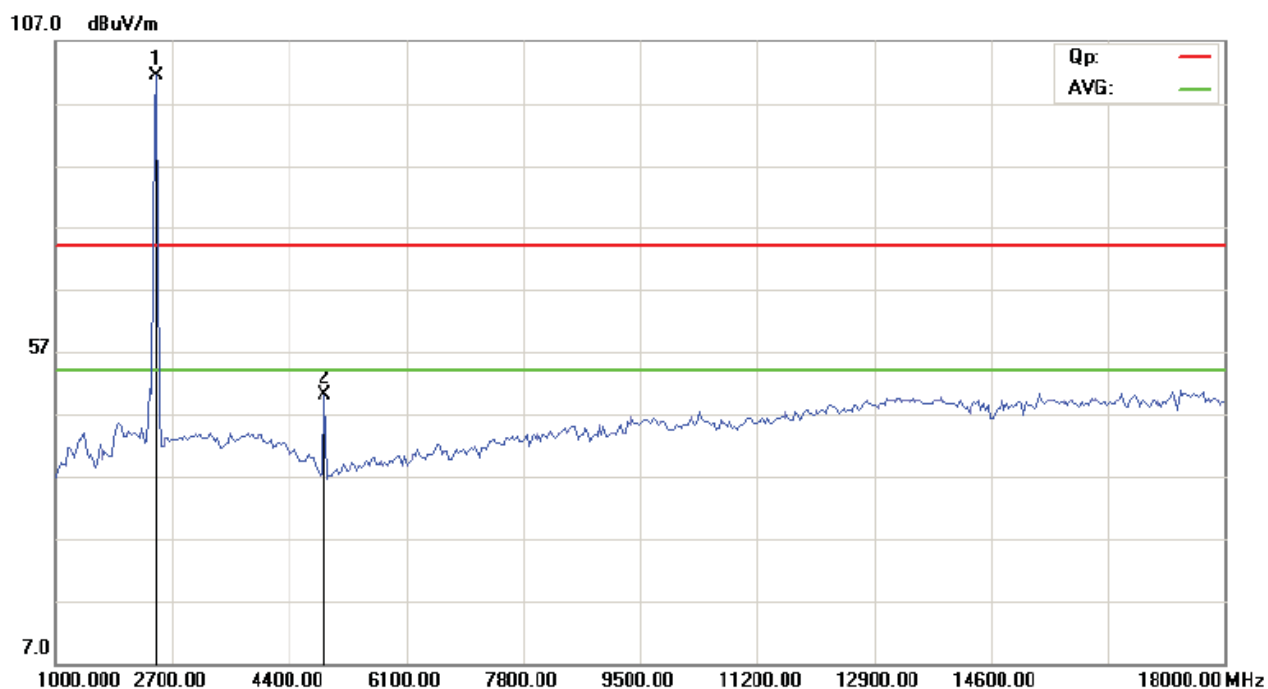




CH11 at 54Mbps: Vertical



CH11 at 54 Mbps: Horizontal



Note: For radiated Emissions from 18-25GHz, it is only the floor noise.



**Operation Mode: Transmitting under CH01 for 11n HT20 at 65Mbps**

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
4824.00	48.35 ( PK )	H	74(Peak)/ 54(AV)
4824.00	50.59 ( PK )	V	74(Peak)/ 54(AV)
7236.00	--	H/V	74(Peak)/ 54(AV)
9648.00	--	H/V	74(Peak)/ 54(AV)
12060	--	H/V	74(Peak)/ 54(AV)
14472	--	H/V	74(Peak)/ 54(AV)
16684	--	H/V	74(Peak)/ 54(AV)
19296	--	H/V	74(Peak)/ 54(AV)
21708	--	H/V	74(Peak)/ 54(AV)
24120	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

3. For 802.11n HT20 at 65Mbps



Operation Mode: Transmitting under CH06 for 11n HT20 at 65Mbps

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
2437.00	102.05 (PK)	H	74(Peak)/ 54(AV)
2437.00	102.01 (PK)	V	74(Peak)/ 54(AV)
4874.00	50.54 (PK)	H	74(Peak)/ 54(AV)
4874.00	47.88 (PK)	V	74(Peak)/ 54(AV)
7311.00	--	H/V	74(Peak)/ 54(AV)
9748.00	--	H/V	74(Peak)/ 54(AV)
12185	--	H/V	74(Peak)/ 54(AV)
14622	--	H/V	74(Peak)/ 54(AV)
17059	--	H/V	74(Peak)/ 54(AV)
19496	--	H/V	74(Peak)/ 54(AV)
21933	--	H/V	74(Peak)/ 54(AV)
24370	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

3. For 802. 11n HT20 at 65bps

Operation Mode: Transmitting under CH11 for 11n HT20 at 65Mbps

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
4924	49.19 (PK)	H	74(Peak)/ 54(AV)
4924	50.14 (PK)	V	74(Peak)/ 54(AV)
7386	--	H/V	74(Peak)/ 54(AV)
9848	--	H/V	74(Peak)/ 54(AV)
12310	--	H/V	74(Peak)/ 54(AV)
14772	--	H/V	74(Peak)/ 54(AV)
17234	--	H/V	74(Peak)/ 54(AV)
19696	--	H/V	74(Peak)/ 54(AV)
22158	--	H/V	74(Peak)/ 54(AV)
24620	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

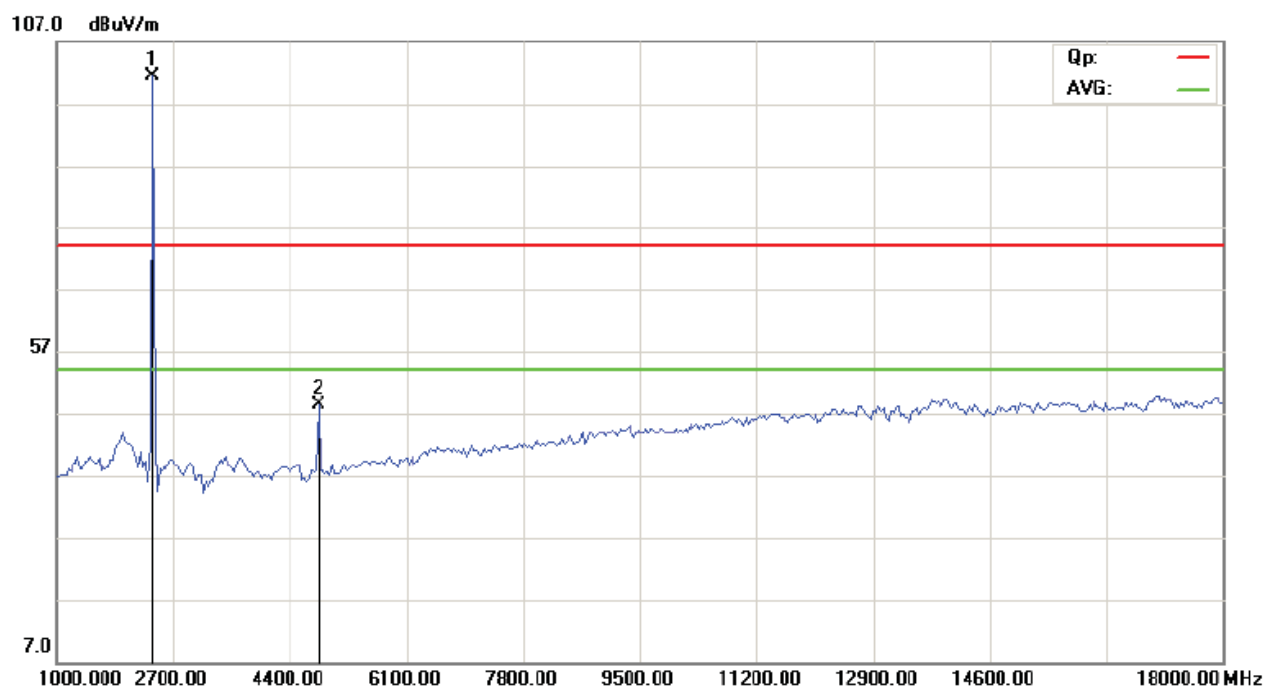
2. Remark "---" means that the emissions level is too low to be measured

3. For 802. 11n HT20 at 65bps

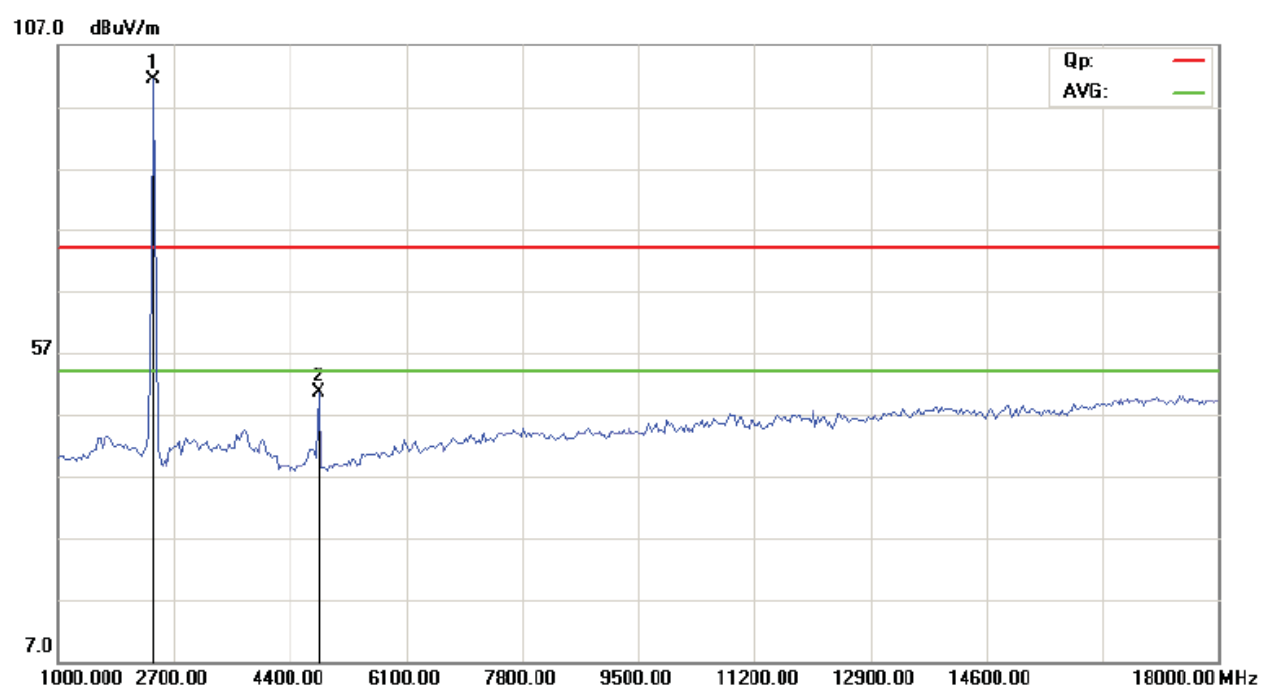


Please refer to the following test plots for details:

**CH01 at 11n HT20: Horizontal**

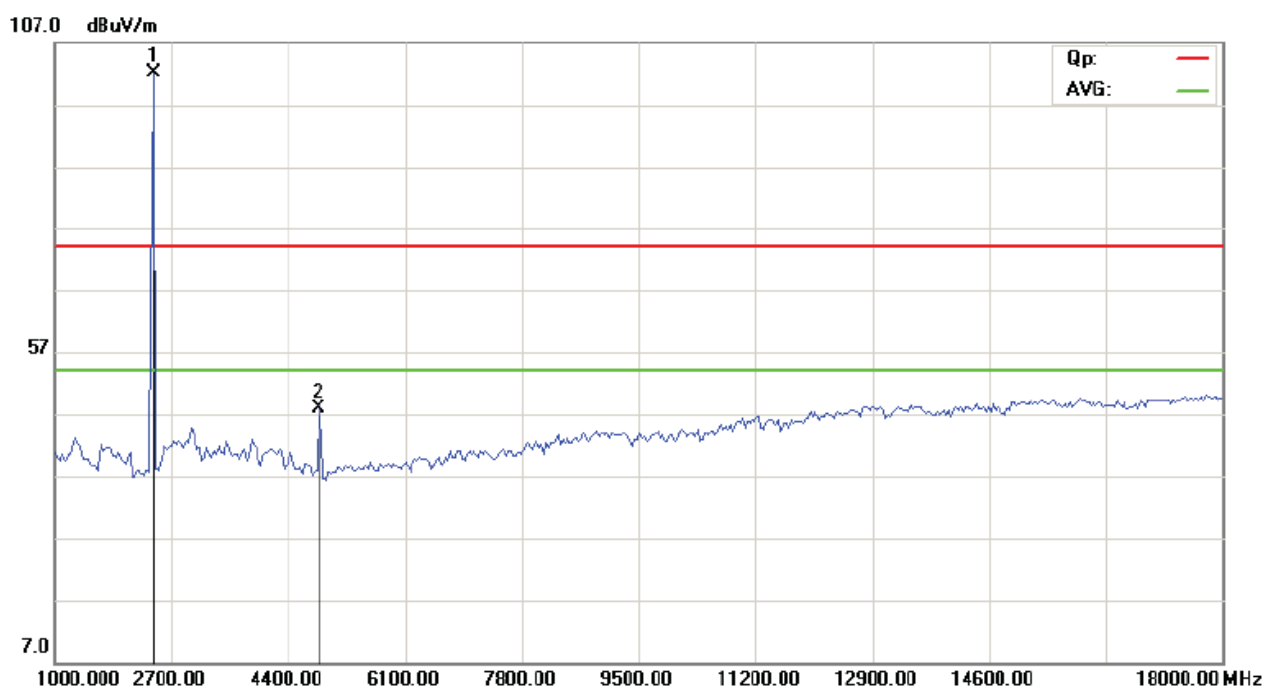


**CH01 at 11n HT20: Vertical**

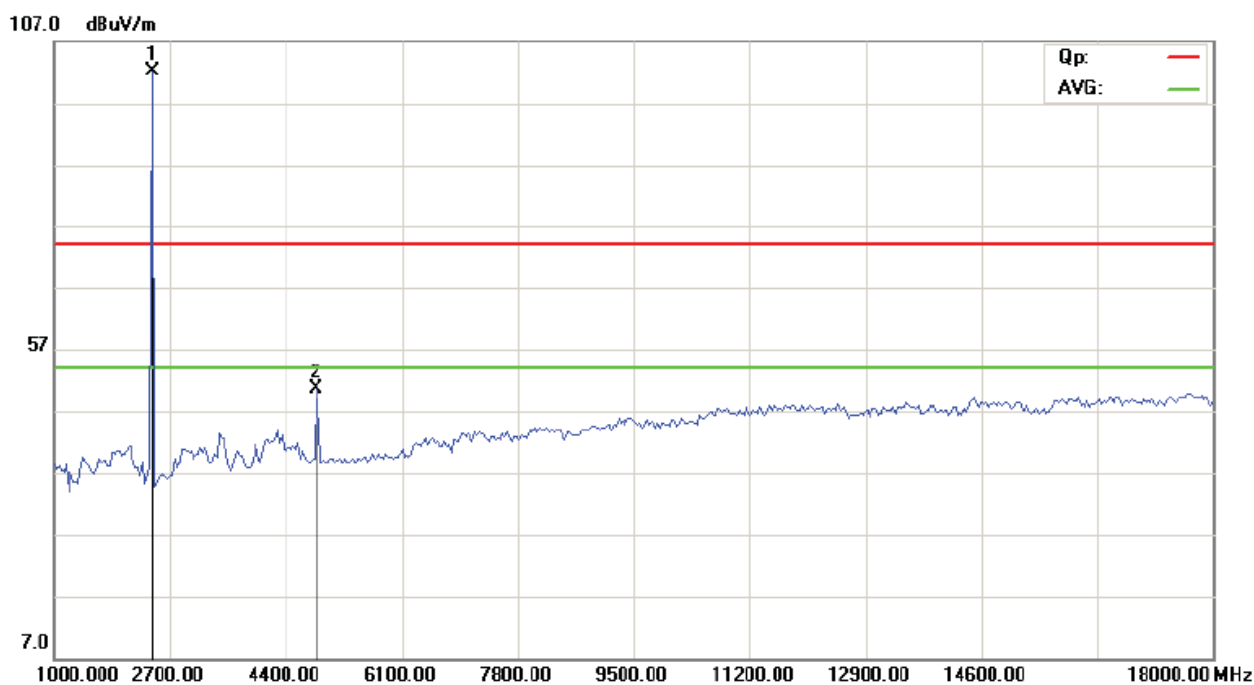




CH06 at 11n HT20: Vertical

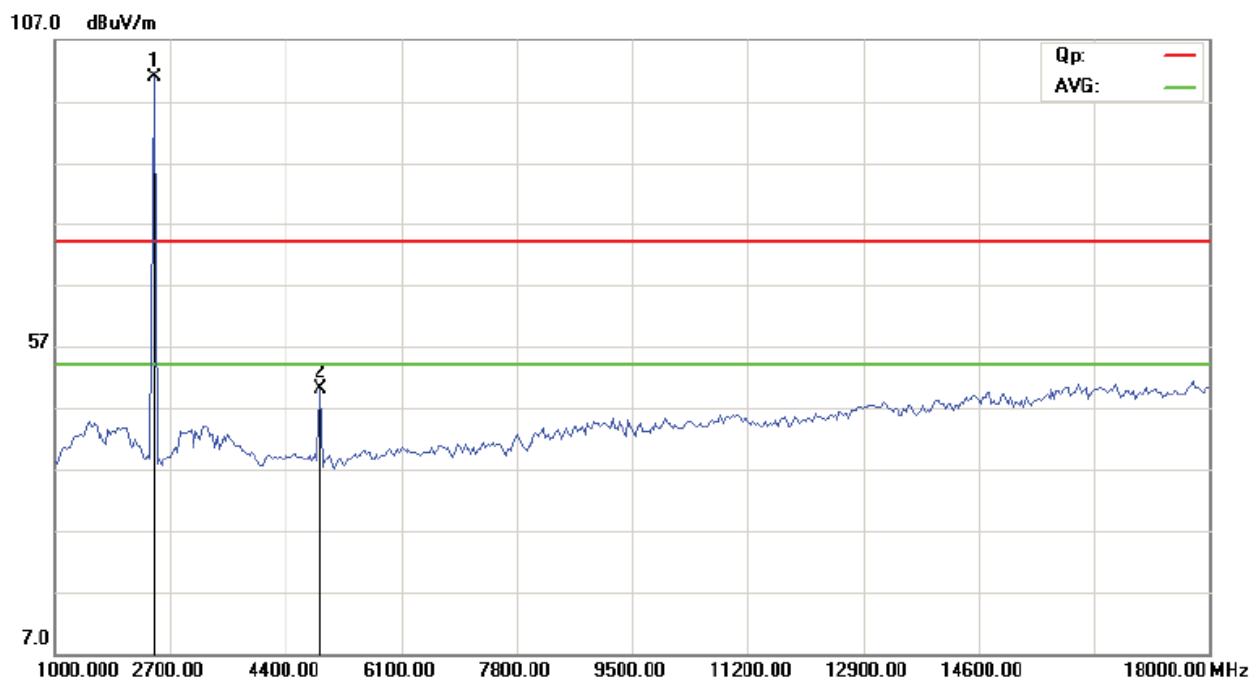


CH06 at 11n HT20: Horizontal

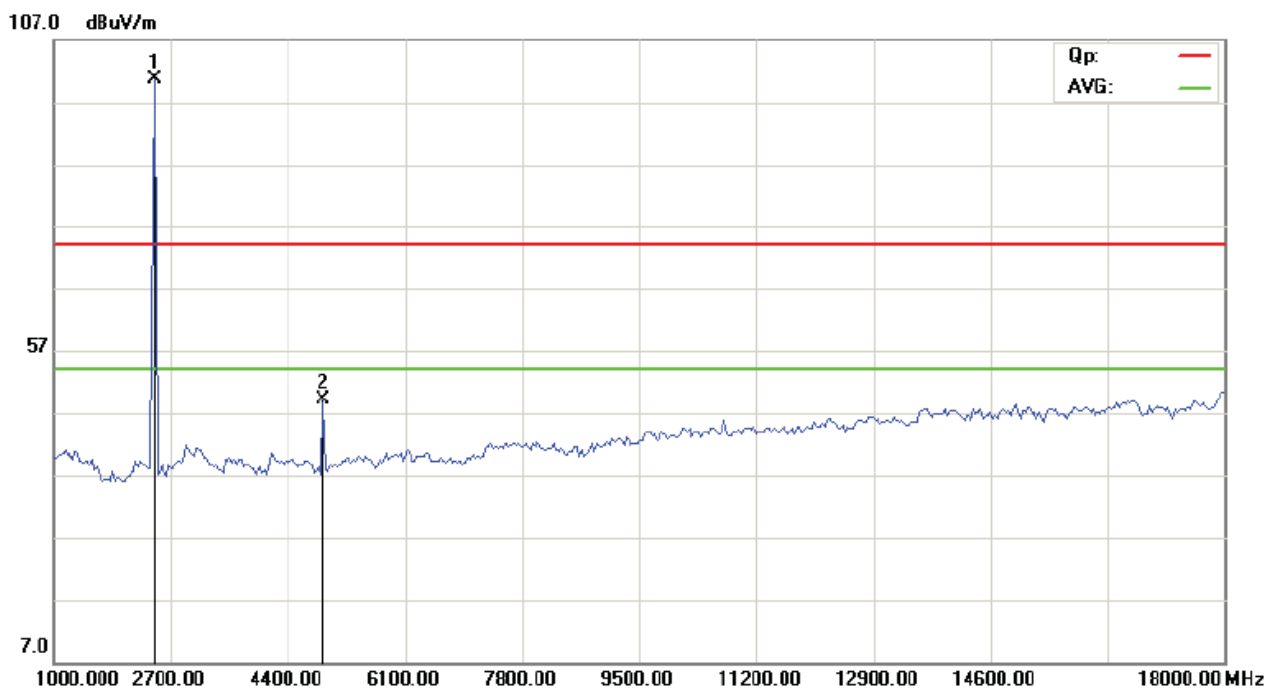




CH11 at 11n HT20: Vertical



CH11 at 11n HT20: Horizontal



Note: For radiated Emissions from 18-25GHz, it is only the floor noise.



**Operation Mode: Transmitting under CH01 for 11n HT40 at 65Mbps**

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
4844.00	48.52 ( PK )	H	74(Peak)/ 54(AV)
4844.00	49.21 ( PK )	V	74(Peak)/ 54(AV)
7266.00	--	H/V	74(Peak)/ 54(AV)
9688.00	--	H/V	74(Peak)/ 54(AV)
12110	--	H/V	74(Peak)/ 54(AV)
14532	--	H/V	74(Peak)/ 54(AV)
16954	--	H/V	74(Peak)/ 54(AV)
19376	--	H/V	74(Peak)/ 54(AV)
21798	--	H/V	74(Peak)/ 54(AV)
24220	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

3. For 802.11n HT40 at 65bps

**Operation Mode: Transmitting under CH04 for 11n HT40 at 65Mbps**

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
4874.00	49.68 ( PK )	H	74(Peak)/ 54(AV)
4874.00	50.29 ( PK )	V	74(Peak)/ 54(AV)
7311.00	--	H/V	74(Peak)/ 54(AV)
9748.00	--	H/V	74(Peak)/ 54(AV)
12185	--	H/V	74(Peak)/ 54(AV)
14622	--	H/V	74(Peak)/ 54(AV)
17059	--	H/V	74(Peak)/ 54(AV)
19496	--	H/V	74(Peak)/ 54(AV)
21933	--	H/V	74(Peak)/ 54(AV)
24370	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

3. For 802.11n HT40 at 65bps



**Operation Mode: Transmitting under CH7 for 11n HT40 at 65Mbps**

Frequency (MHz)	Level@3m (dBμV/m)	Antenna Polarity	Limit@3m (dBμV/m)
4904	49.32 ( PK )	H	74(Peak)/ 54(AV)
4904	49.08 ( PK )	V	74(Peak)/ 54(AV)
7356	--	H/V	74(Peak)/ 54(AV)
9808	--	H/V	74(Peak)/ 54(AV)
12260	--	H/V	74(Peak)/ 54(AV)
14712	--	H/V	74(Peak)/ 54(AV)
17164	--	H/V	74(Peak)/ 54(AV)
19616	--	H/V	74(Peak)/ 54(AV)
22068	--	H/V	74(Peak)/ 54(AV)
24520	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

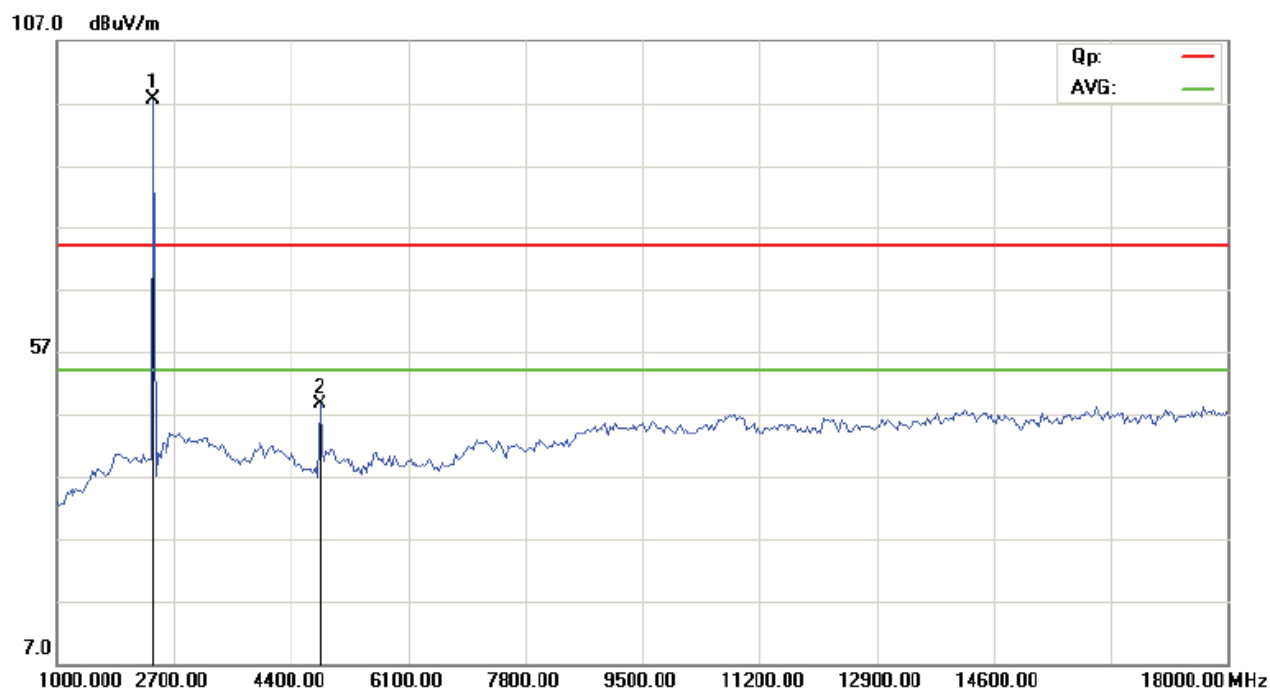
2. Remark "---" means that the emissions level is too low to be measured

3. For 802. 11n HT40 at 65bps

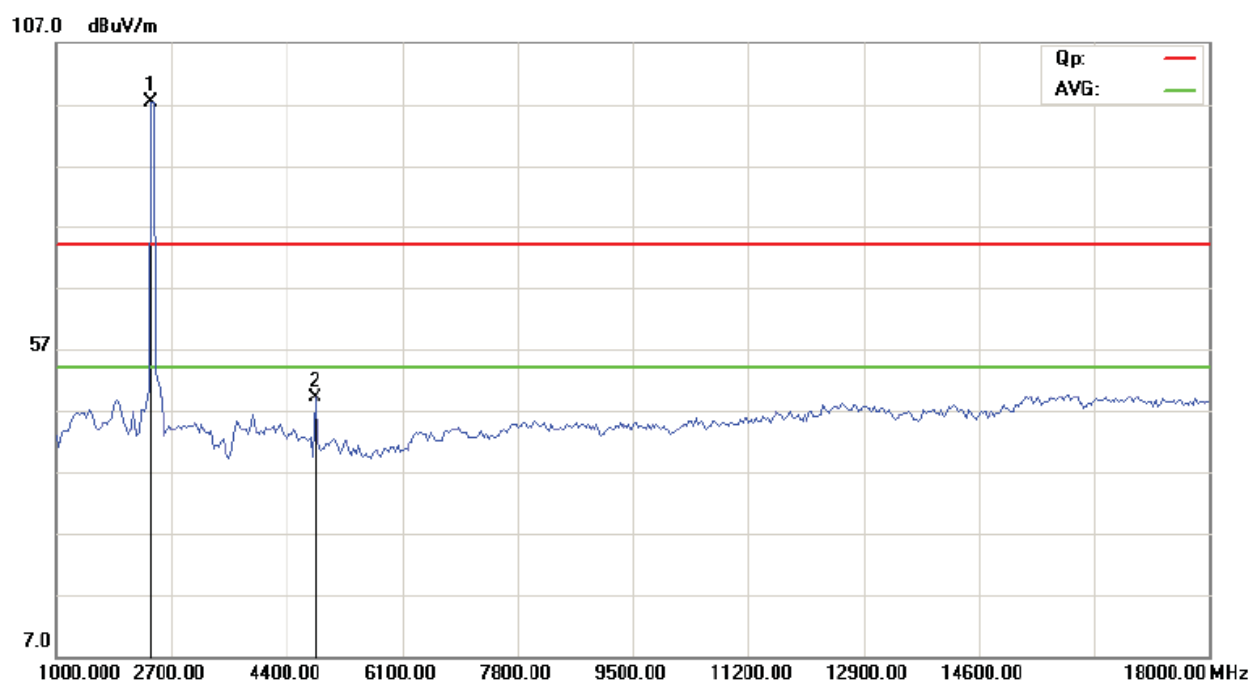


Please refer to the following test plots for details:

**CH01 at 11n HT40: Horizontal**

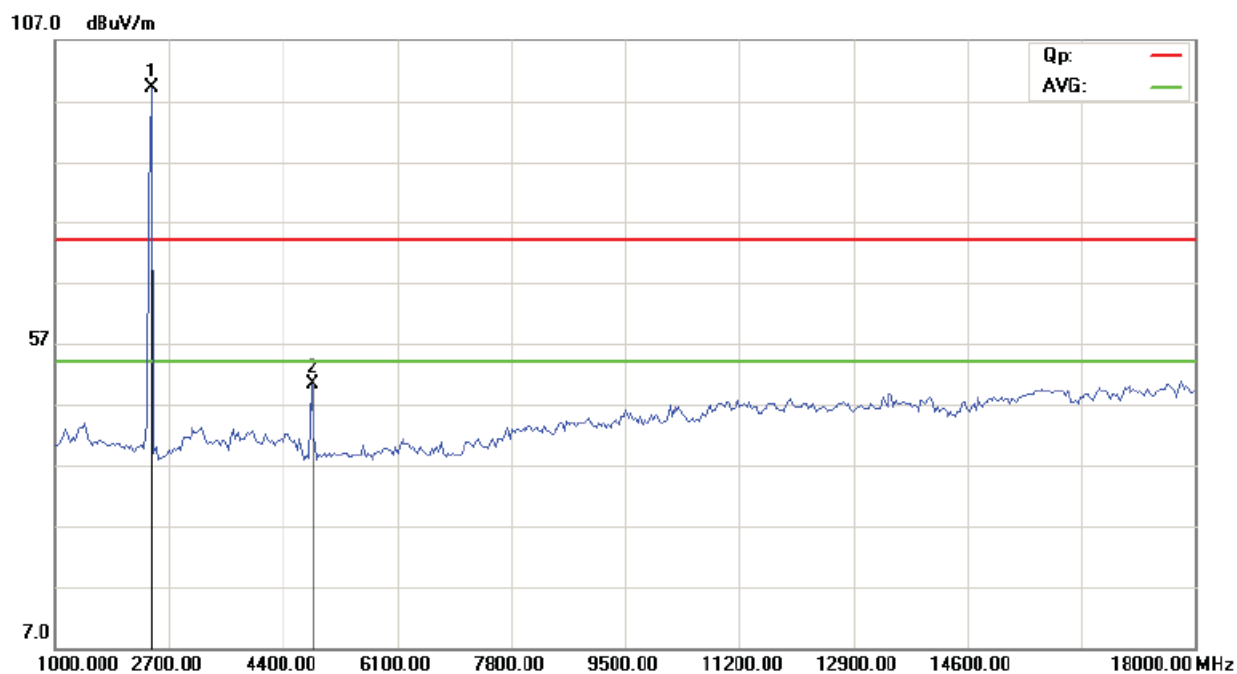


**CH01 at 11n HT40: Vertical**

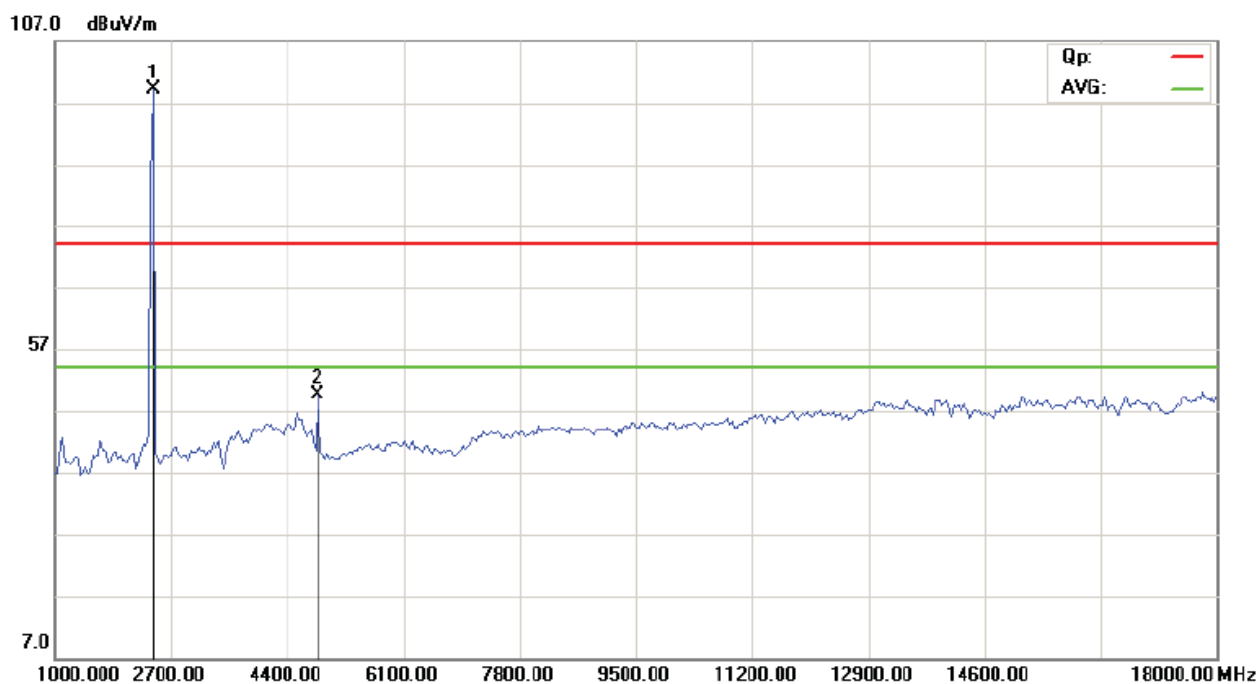




CH04 at 11n HT40: Vertical

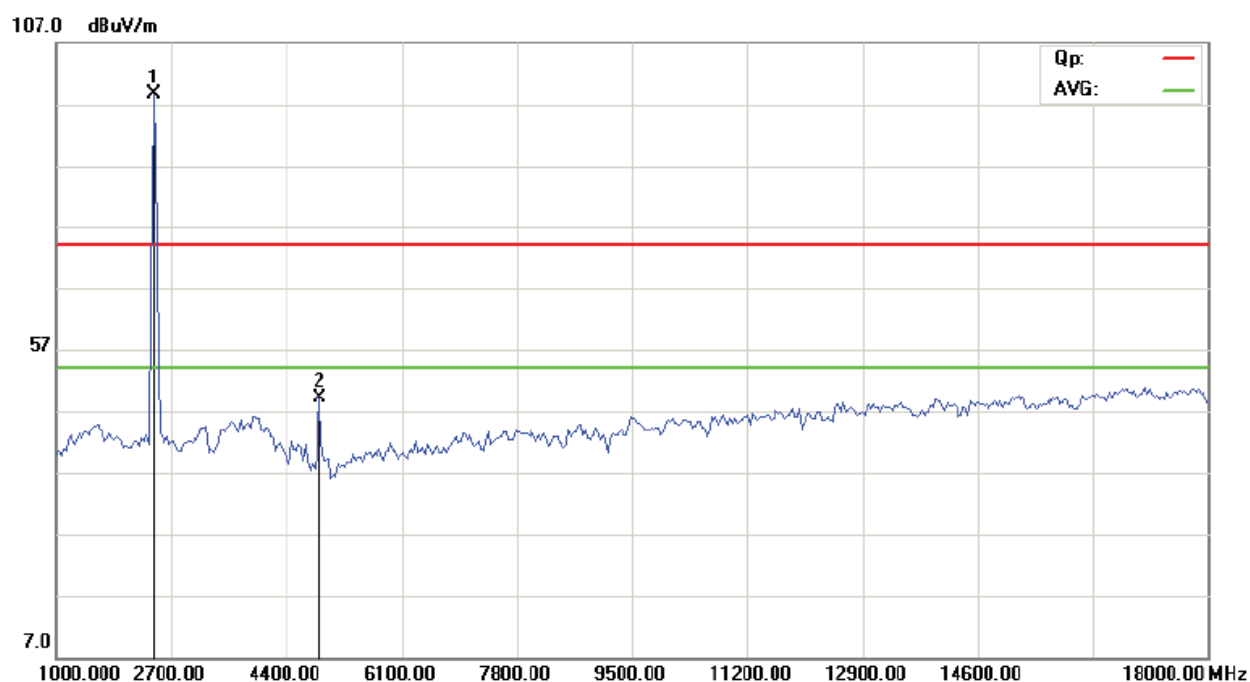


CH04 at 11n HT40: Horizontal

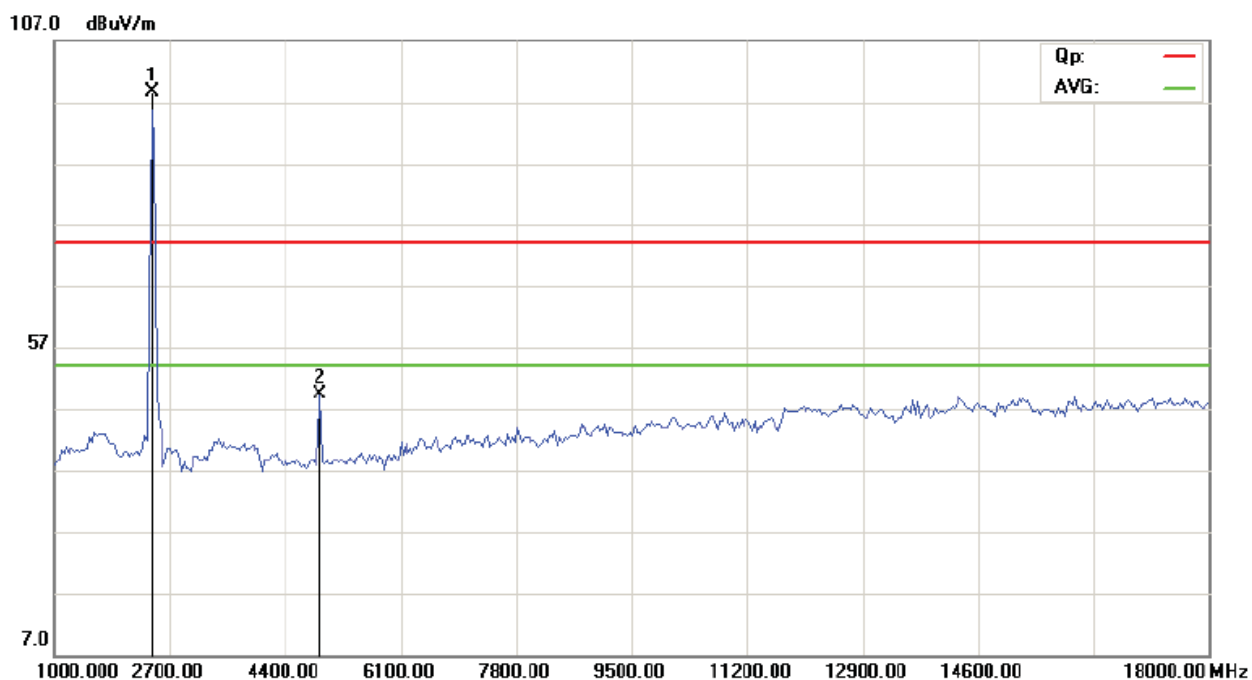




CH7 at 11n HT40: Vertical



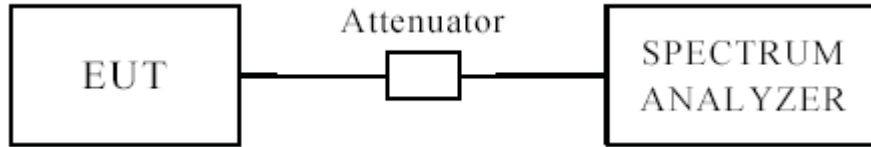
CH7 at 11n HT40: Horizontal



Note: For radiated Emissions from 18-25GHz, it is only the floor noise.

## 7.0 6dB Bandwidth Measurement

### 7.1 Test Setup



### 7.2 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is >500kHz

### 7.3 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.

### 7.4 Test Result



EUT	tiny embedded Wi-Fi module		Model	TinyCon2005	
Mode	802.11b		Input Voltage	120V~	
Temperature	24 deg. C,		Humidity	56% RH	
Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
1	2412	1	10.08	0.5	Pass
6	2437	1	10.08	0.5	Pass
11	2462	1	10.08	0.5	Pass
1	2412	11	9.48	0.5	Pass
6	2437	11	9.48	0.5	Pass
11	2462	11	9.48	0.5	Pass

EUT	tiny embedded Wi-Fi module		Model	TinyCon2005	
Mode	802.11g		Input Voltage	120V~	
Temperature	24 deg. C,		Humidity	56% RH	
Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
1	2412	54	16.56	0.5	Pass
6	2437	54	16.56	0.5	Pass
11	2462	54	16.56	0.5	Pass



EUT	tiny embedded Wi-Fi module		Model	TinyCon2005	
Mode	802.11n		Input Voltage	120V~	
Temperature	24 deg. C,		Humidity	56% RH	
Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
HT20					
1	2412	65	17.76	0.5	Pass
6	2437	65	17.76	0.5	Pass
11	2462	65	17.76	0.5	Pass
HT40					
1	2422	65	36.50	0.5	Pass
4	2437	65	36.50	0.5	Pass
7	2452	65	36.50	0.5	Pass



### 1. 802.11b at 1Mbps of CH01



DELTA MARKER 2

10.08 MHz

Ref 20 dBm

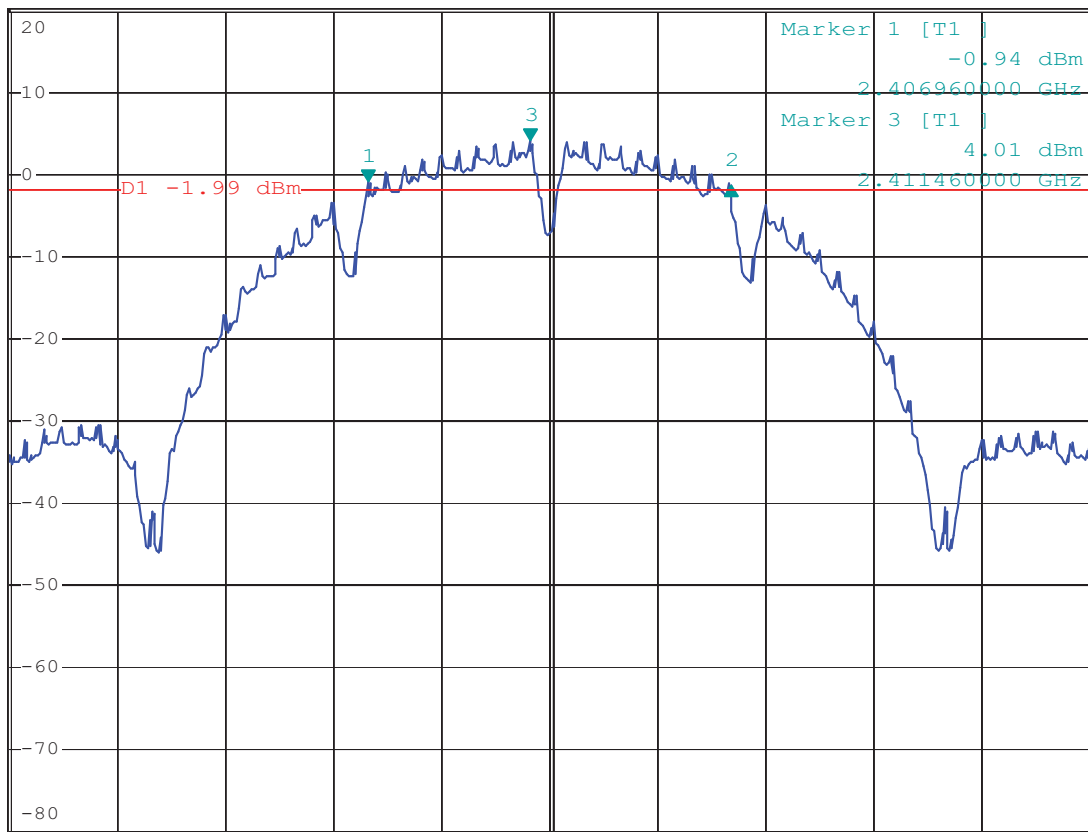
\* Att 30 dB

\* RBW 100 kHz Delta 2 [T1 ]

\* VBW 300 kHz -0.55 dB

\* SWT 5 ms 10.08000000 MHz

1 PK  
MAXH



Center 2.412 GHz

3 MHz/

Span 30 MHz



## 2. 802.11b at 1Mbps of CH06



### DELTA MARKER 2

10.08 MHz

Ref 20 dBm

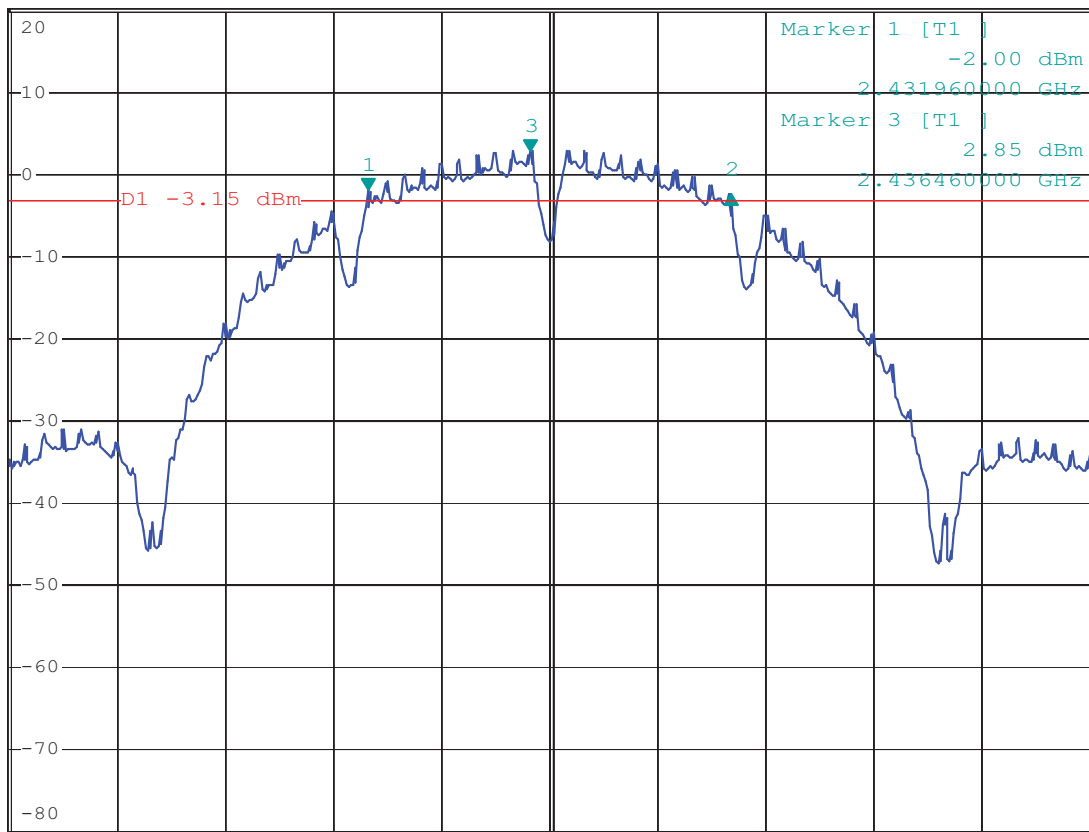
\* Att 30 dB

\* RBW 100 kHz Delta 2 [T1 ]

\* VBW 300 kHz -0.49 dB

\* SWT 5 ms 10.08000000 MHz

1 PK  
MAXH



Center 2.437 GHz

3 MHz/

Span 30 MHz





### 3. 802.11b at 1Mbps of CH11



DELTA MARKER 2

10.08 MHz

Ref 20 dBm

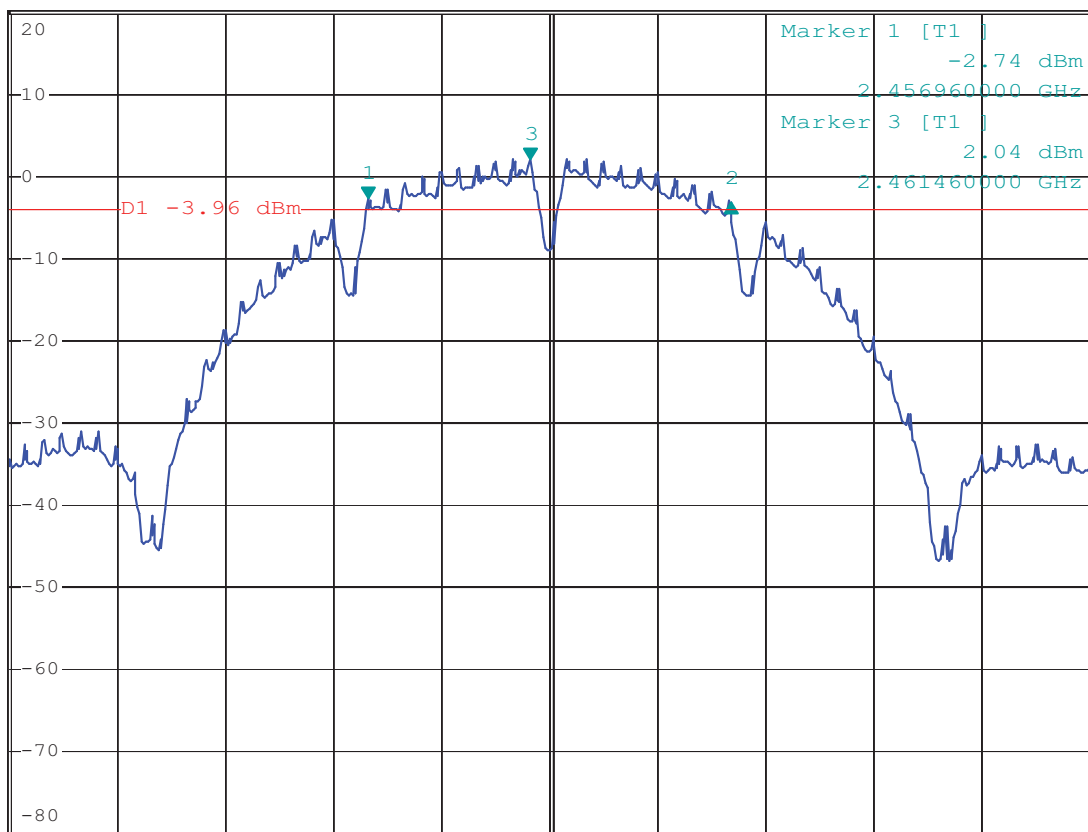
\* Att 30 dB

\* RBW 100 kHz Delta 2 [T1 ]

\* VBW 300 kHz -0.47 dB

\* SWT 5 ms 10.08000000 MHz

1 PK  
MAXH



Center 2.462 GHz

3 MHz /

Span 30 MHz



#### 4. 802.11b at 11Mbps of CH01



DELTA MARKER 2

9.48 MHz

Ref 20 dBm

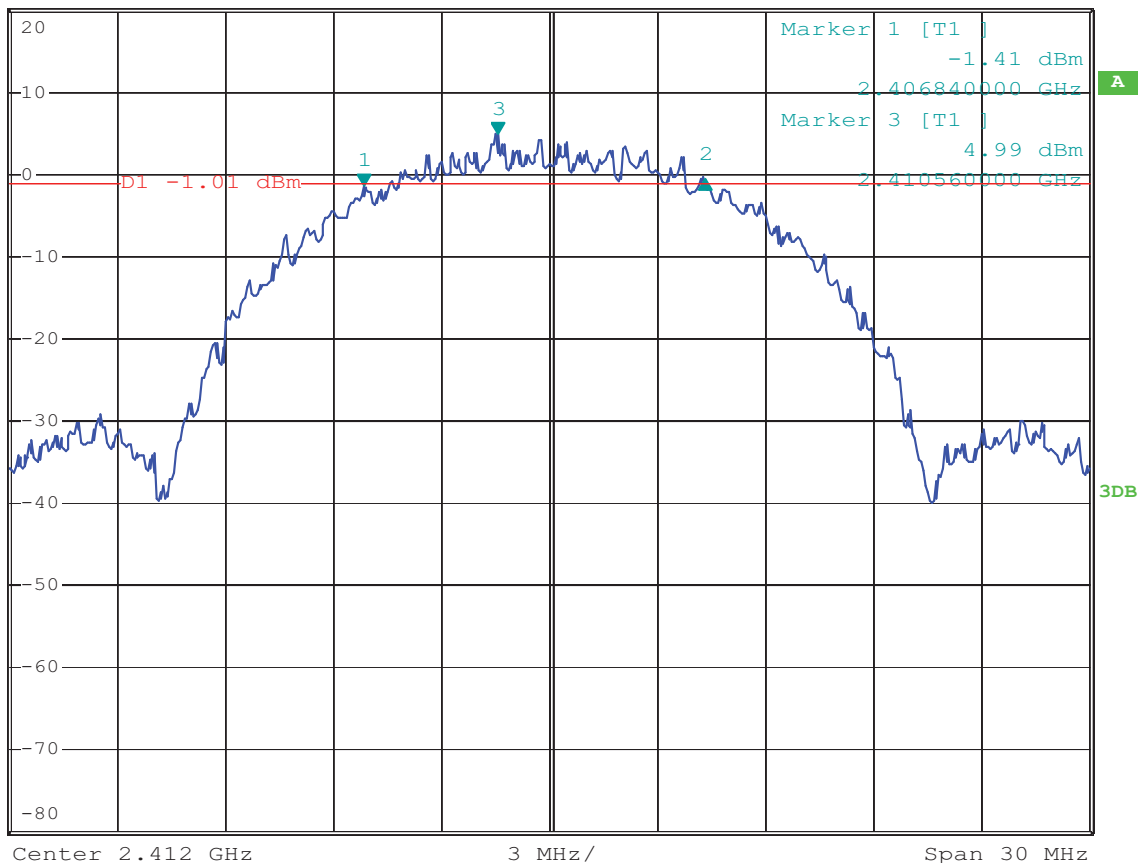
\*Att 30 dB

\*RBW 100 kHz Delta 2 [T1 ]

\*VBW 300 kHz 0.91 dB

\*SWT 5 ms 9.480000000 MHz

1 PK  
MAXH





## 5. 802.11b at 11Mbps of CH06



DELTA MARKER 2

9.48 MHz

Ref 20 dBm

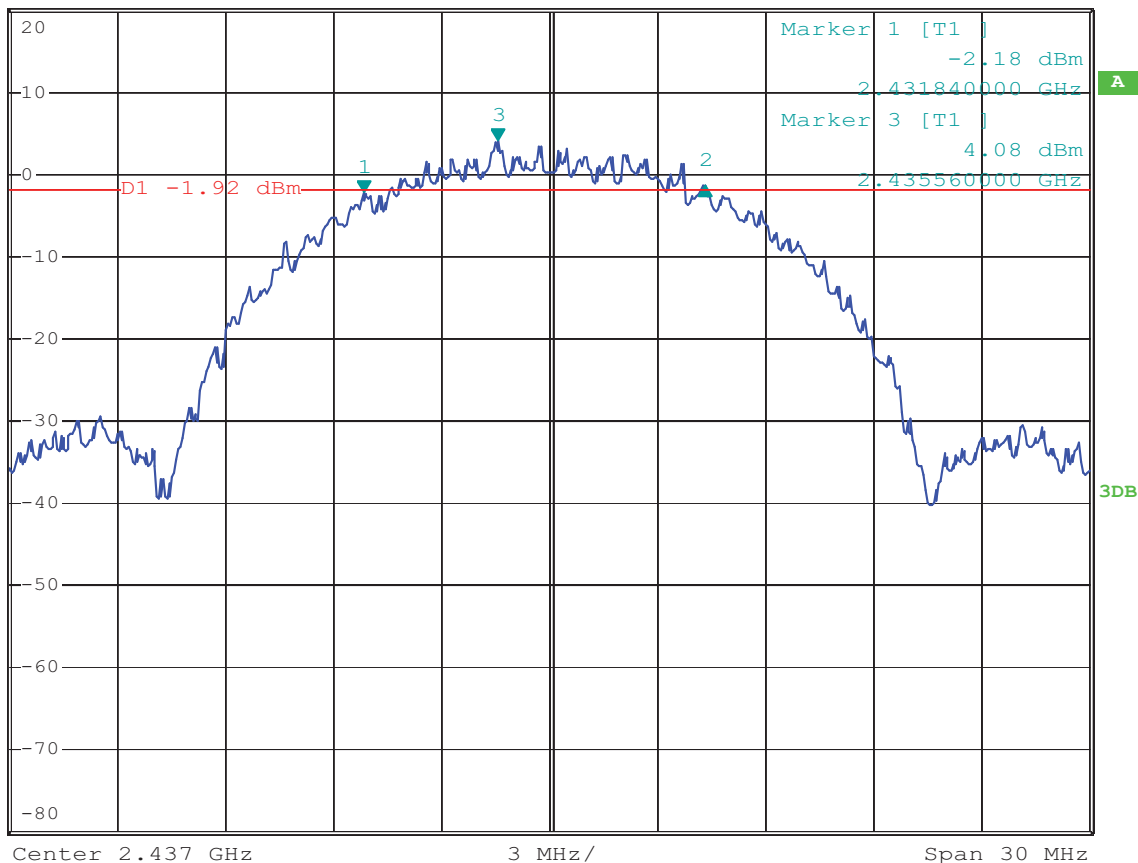
\*Att 30 dB

\*RBW 100 kHz Delta 2 [T1]

\*VBW 300 kHz 0.69 dB

\*SWT 5 ms 9.48000000 MHz

1 PK  
MAXH





## 6. 802.11b at 11Mbps of CH11



DELTA MARKER 2

9.48 MHz

Ref 20 dBm

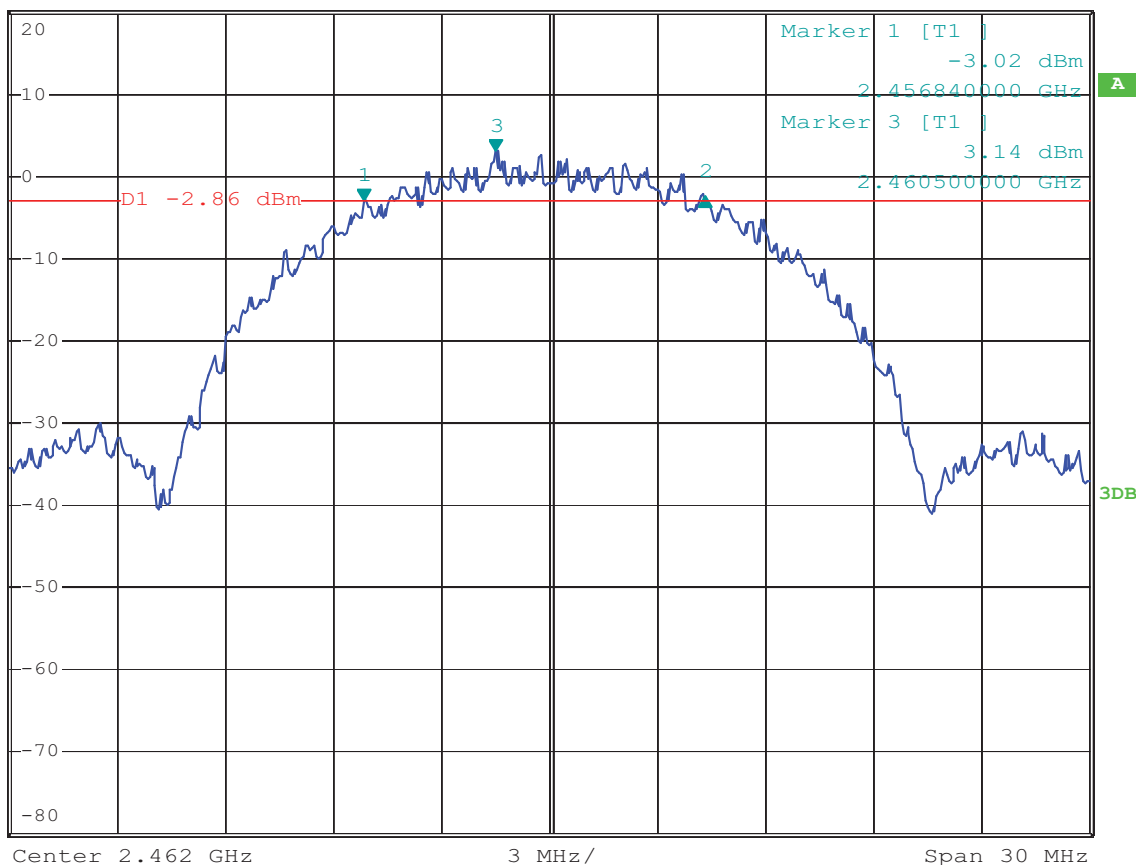
\* Att 30 dB

\* RBW 100 kHz Delta 2 [T1 ]

\* VBW 300 kHz 0.59 dB

\* SWT 5 ms 9.48000000 MHz

1 PK  
MAXH





## 7. 802.11g at 54 Mbps of CH01



### DELTA MARKER 2

16.56 MHz

Ref 20 dBm

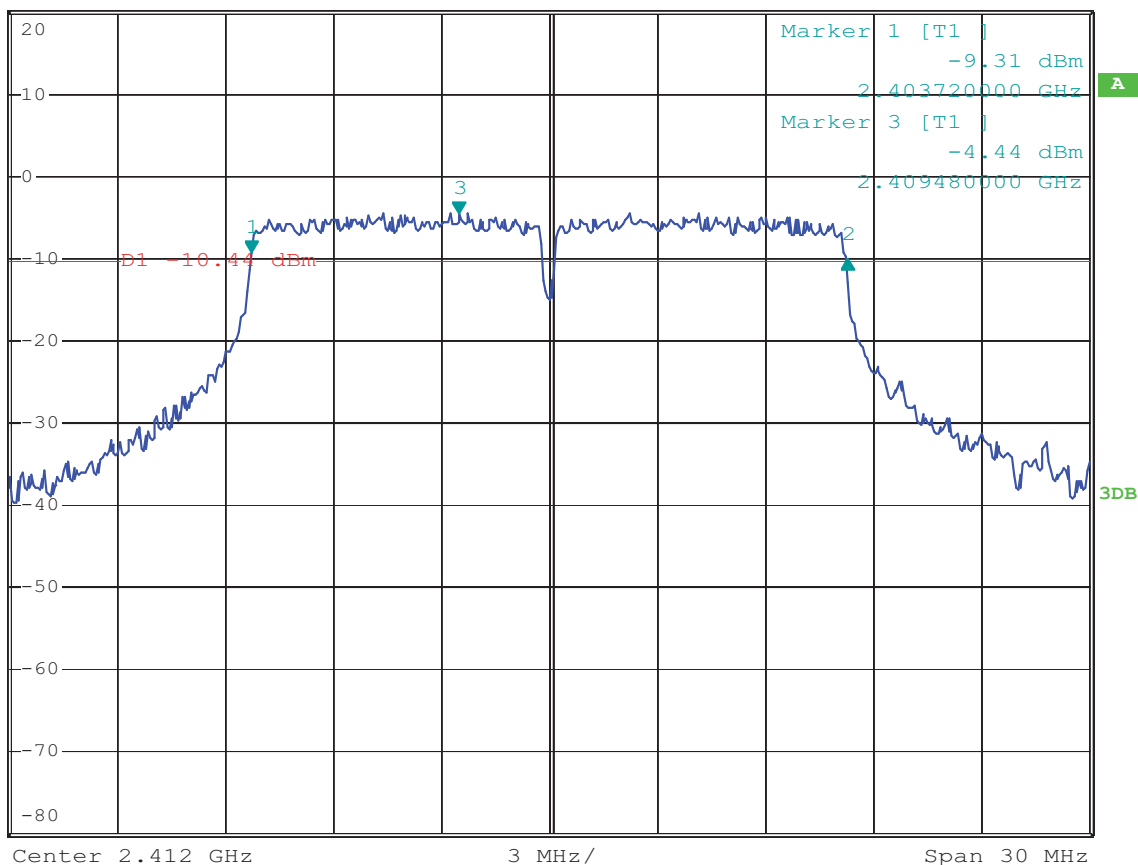
\* Att 30 dB

\* RBW 100 kHz Delta 2 [T1 ]

\* VBW 300 kHz -0.64 dB

\* SWT 5 ms 16.56000000 MHz

1 PK  
MAXH





## 8. 802.11g at 54 Mbps of CH06



### DELTA MARKER 2

16.56 MHz

Ref 20 dBm

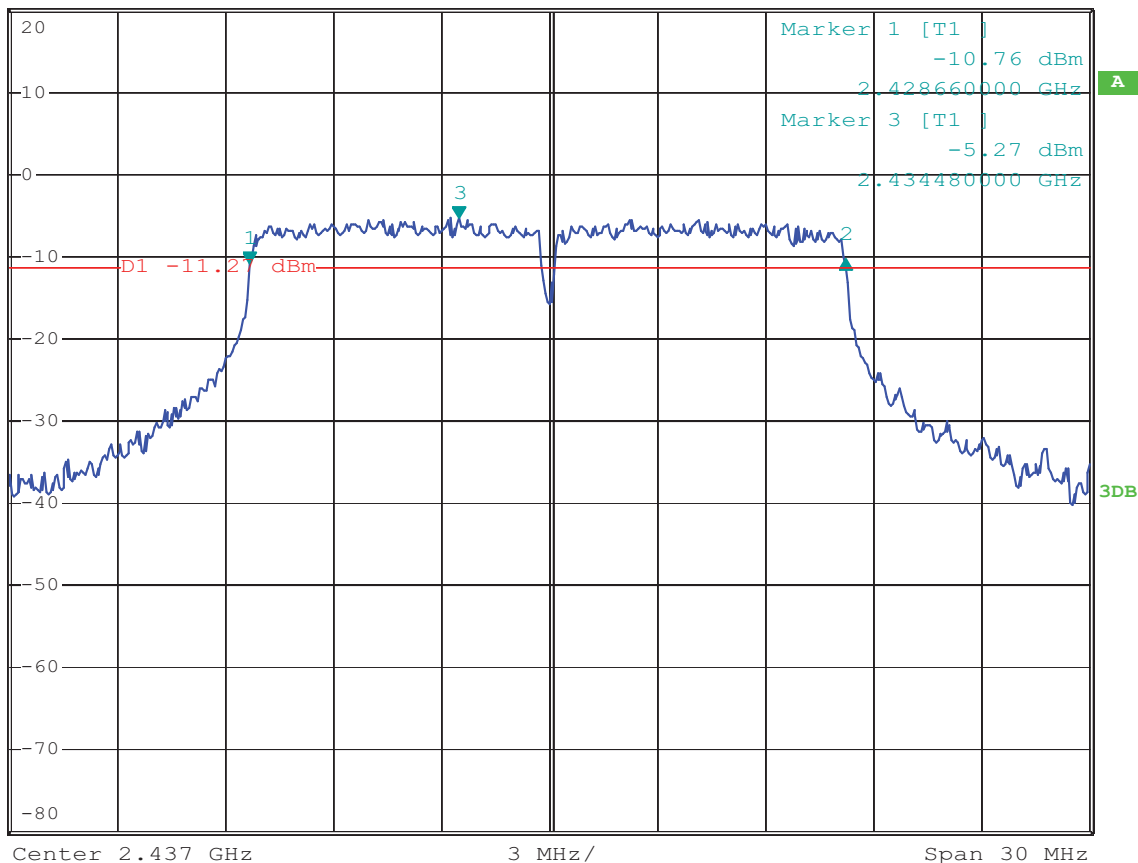
\* Att 30 dB

\* RBW 100 kHz Delta 2 [T1 ]

\* VBW 300 kHz 0.37 dB

\* SWT 5 ms 16.56000000 MHz

1 PK  
MAXH





## 9. 802.11g at 54 Mbps of CH11



### DELTA MARKER 2

16.56 MHz

Ref 20 dBm

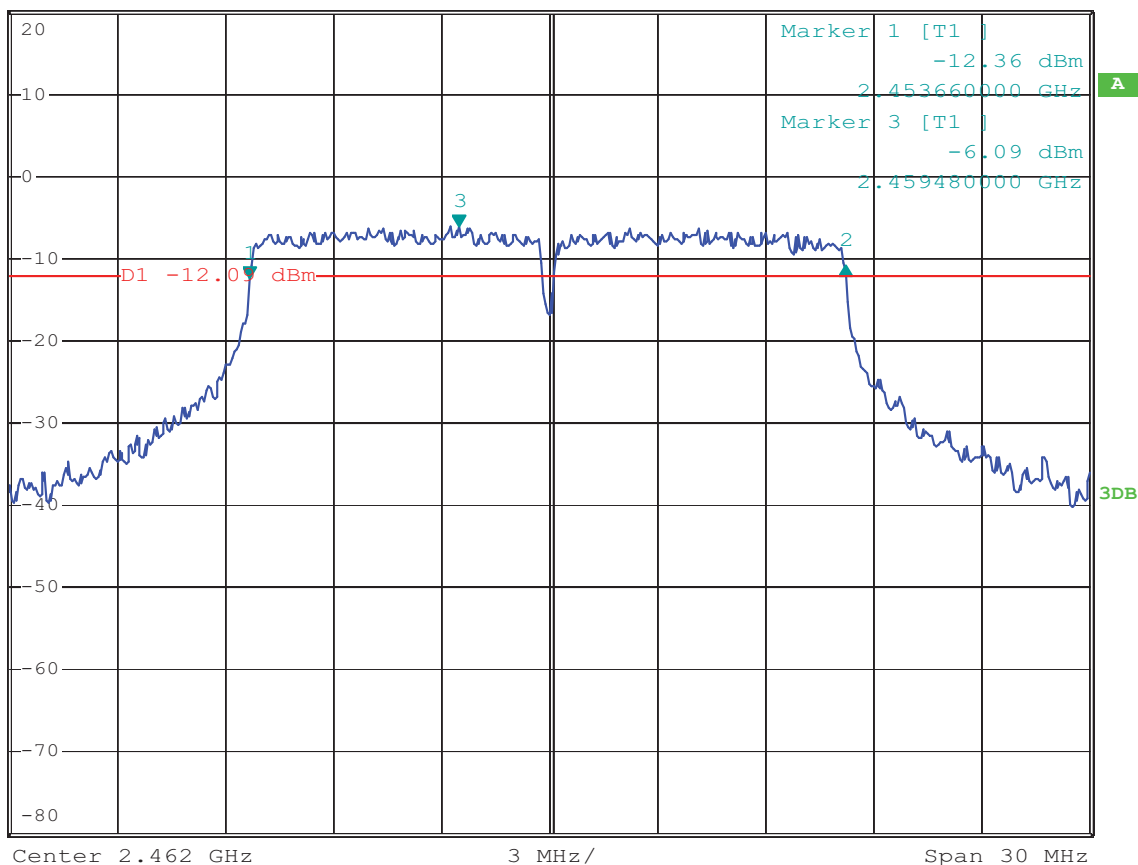
\* Att 30 dB

\* RBW 100 kHz Delta 2 [T1 ]

\* VBW 300 kHz 1.57 dB

\* SWT 5 ms 16.56000000 MHz

1 PK  
MAXH





10. 802.11n at HT20 of CH01



DELTA MARKER 2

17.76 MHz

Ref 20 dBm

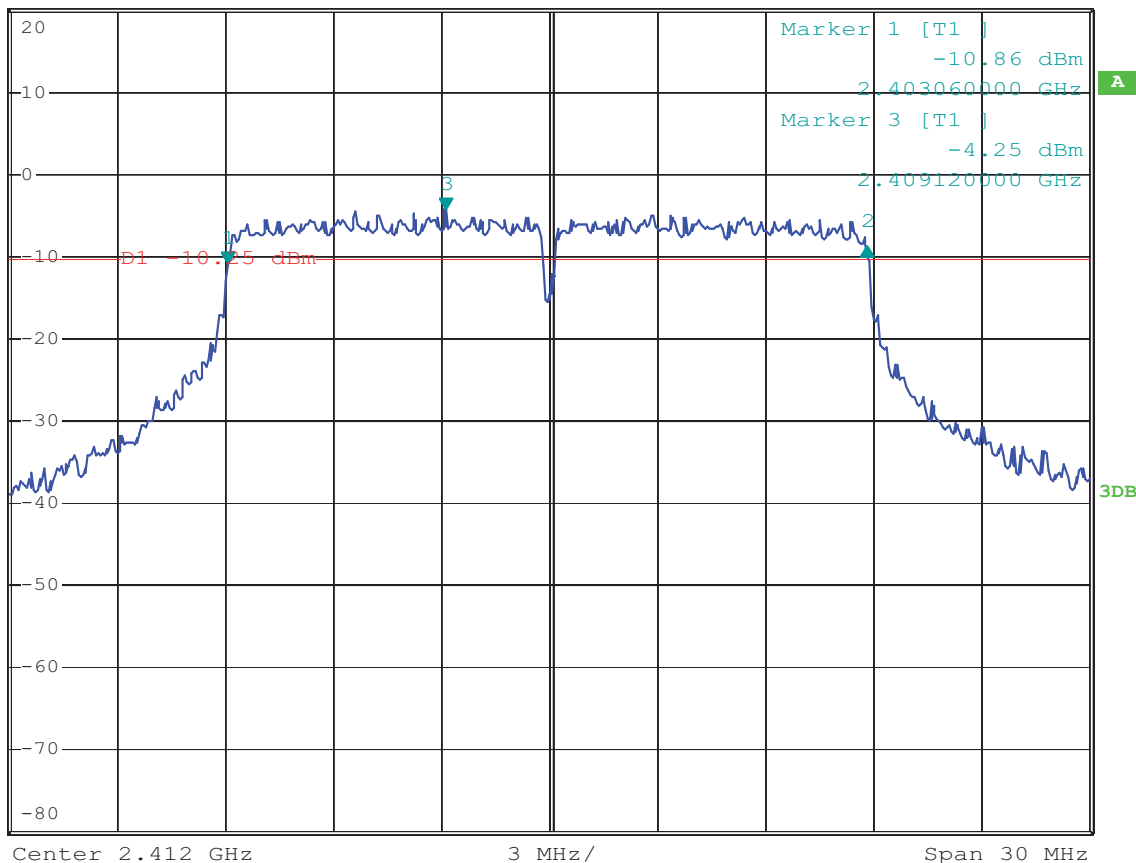
\*Att 30 dB

\*RBW 100 kHz Delta 2 [T1 ]

\*VBW 300 kHz 2.00 dB

\*SWT 5 ms 17.76000000 MHz

1 PK  
MAXH







## 11. 802.11n at HT20 of CH06



### DELTA MARKER 2

17.76 MHz

Ref 20 dBm

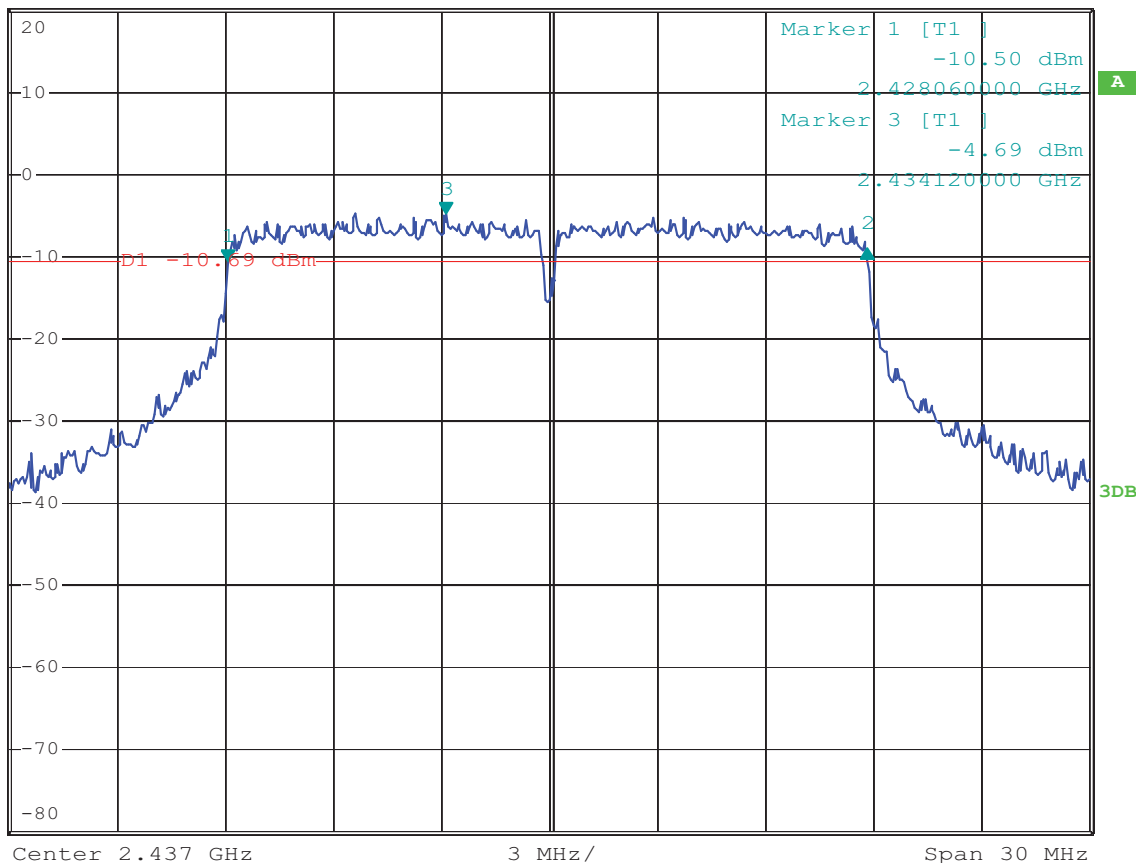
\*Att 30 dB

\*RBW 100 kHz Delta 2 [T1]

\*VBW 300 kHz 1.61 dB

\*SWT 5 ms 17.76000000 MHz

1 PK  
MAXH





## 12. 802.11n at HT20 of CH11



### DELTA MARKER 2

17.76 MHz

Ref 20 dBm

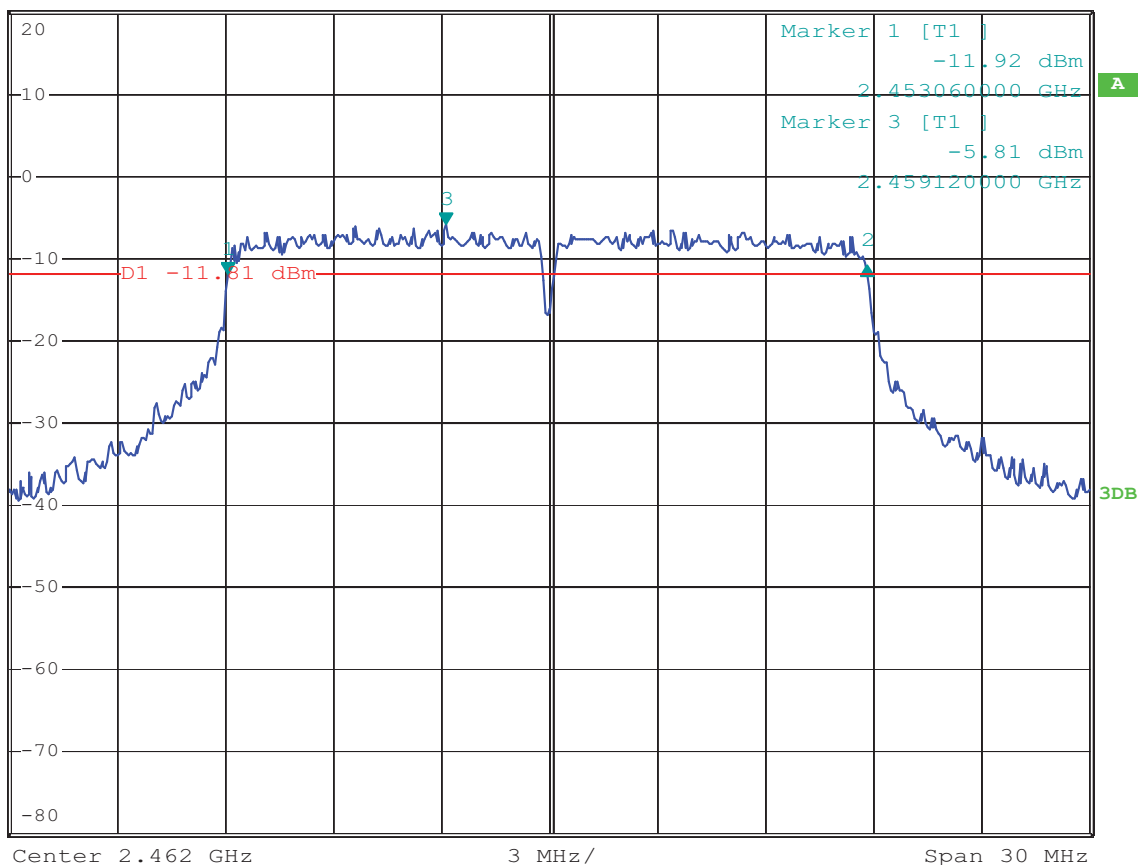
\*Att 30 dB

\*RBW 100 kHz Delta 2 [T1]

\*VBW 300 kHz 1.09 dB

\*SWT 5 ms 17.76000000 MHz

1 PK  
MAXH





13. 802.11n at HT40 of CH01



DELTA MARKER 2

36.5 MHz

Ref 20 dBm

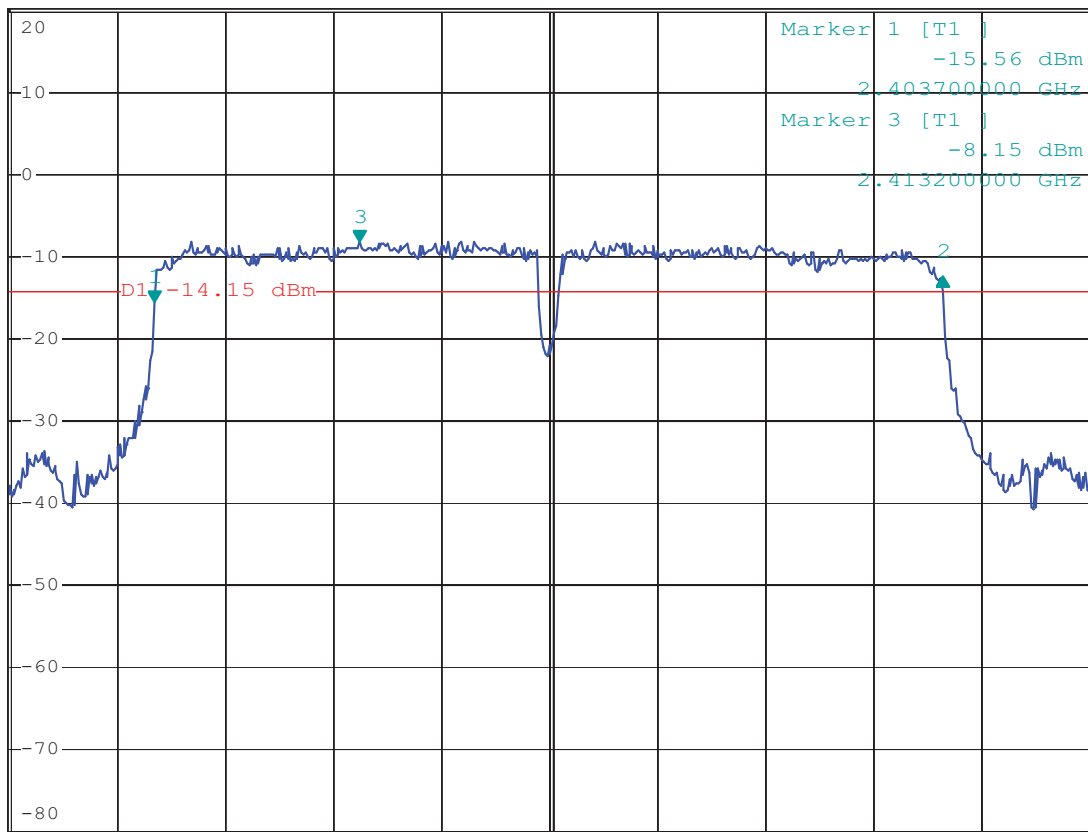
\* Att 30 dB

\* RBW 100 kHz Delta 2 [T1 ]

\* VBW 300 kHz 3.04 dB

\* SWT 5 ms 36.50000000 MHz

1 PK  
MAXH



Center 2.422 GHz

5 MHz/

Span 50 MHz



14. 802.11n at HT40 of CH04



DELTA MARKER 2

36.5 MHz

Ref 20 dBm

\*Att 30 dB

\*RBW 100 kHz

Delta 2 [T1]

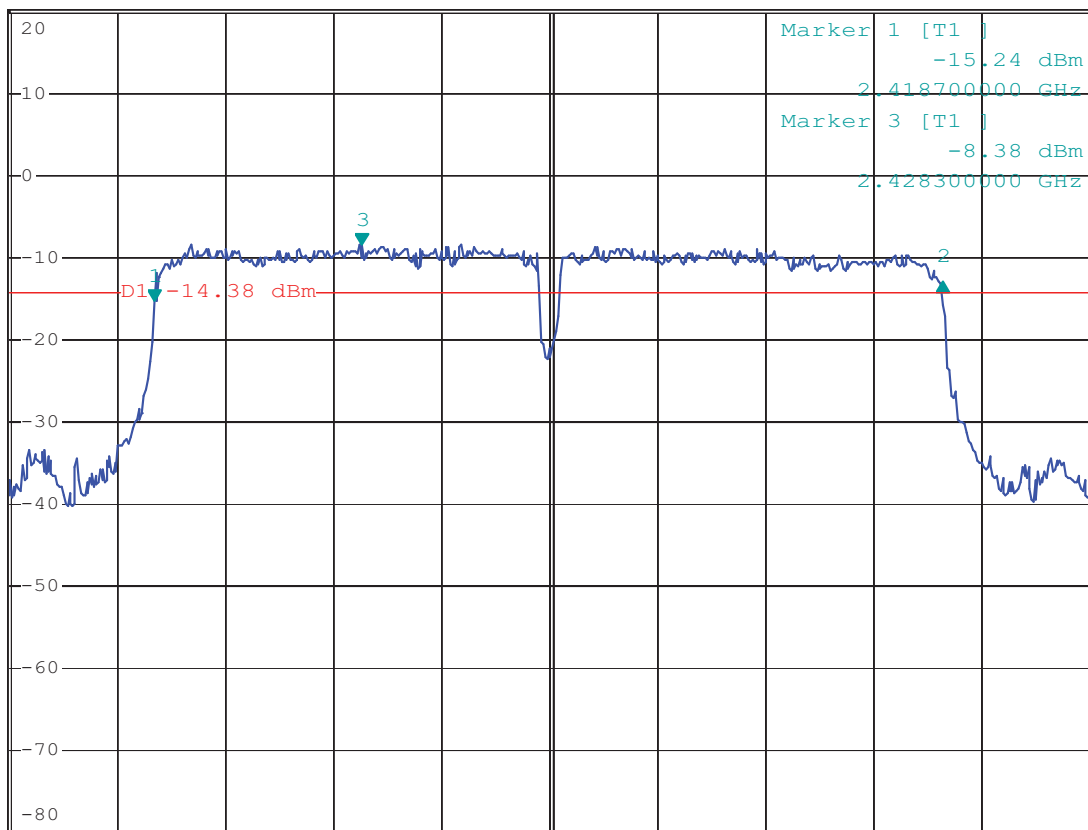
\*VBW 300 kHz

2.29 dB

\*SWT 5 ms

36.50000000 MHz

1 PK  
MAXH



Center 2.437 GHz

5 MHz/

Span 50 MHz



15. 802.11n at HT40 of CH07



DELTA MARKER 2

36.5 MHz

Ref 20 dBm

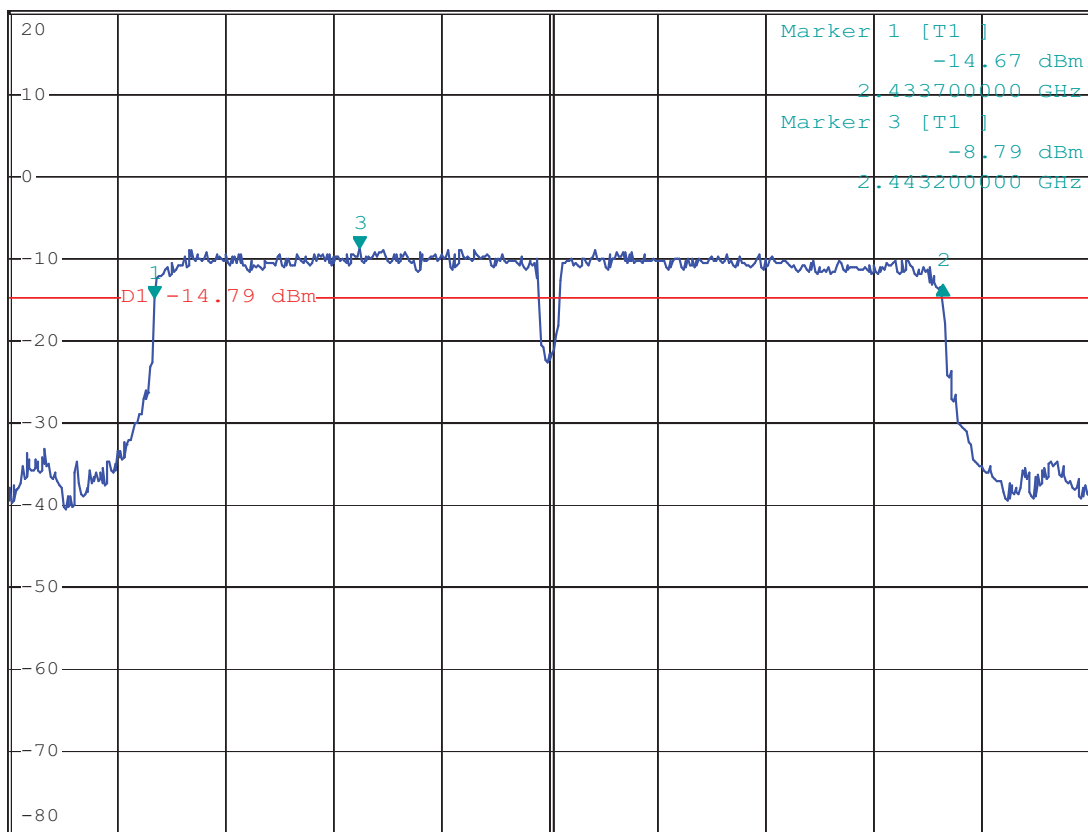
\* Att 30 dB

\* RBW 100 kHz Delta 2 [T1 ]

\* VBW 300 kHz 1.36 dB

\* SWT 5 ms 36.50000000 MHz

1 PK  
MAXH



Center 2.452 GHz

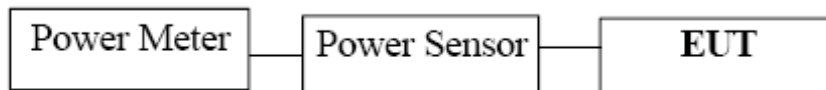
5 MHz/

Span 50 MHz



## 8. Maximum Peak Output Power

### 8.1 Test Setup



### 8.2 Limits of Maximum Peak Output Power

The Maximum Peak Output Power Measurement is 30dBm.

### 8.3 Test Procedure

The RF power output was measured with a Power meter connected to the RF Antenna connector ( conducted measurement ) while EUT was operating in transmit mode at the appropriate centre frequency.

**Note: the peak power was measured**

Equipment list:

Power meter	Anritsu	ML2487A	6K00003613	2014-08-22	2015-08-21
Power sensor	Anritsu	MA2491A	32263	2014-08-22	2015-08-21

Remark: Witness test at Shenzhen Timeway Technology consulting Co Ltd

**8.4 Test Results**

EUT	tiny embedded Wi-Fi module		Model	TinyCon2005	
Mode	802.11b 11Mbps		Input Voltage	120V~	
Temperature	24 deg. C,		Humidity	56% RH	
Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail	
1	2412	19.87	30	Pass	
6	2437	19.65	30	Pass	
11	2462	18.52	30	Pass	

Note: 1. At final test to get the worst-case emission at 11Mbps for CH01, CH06 and CH11

2. The result basic equation calculation as follow:

$$\text{Peak Power Output} = \text{Peak Power Reading} + \text{Cable loss} + \text{Attenuator}$$

EUT	tiny embedded Wi-Fi module		Model	TinyCon2005	
Mode	802.11g		Input Voltage	120V~	
Temperature	24 deg. C,		Humidity	56% RH	
Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail	
1	2412	17.75	30	Pass	
6	2437	17.25	30	Pass	
11	2462	16.58	30	Pass	

Note: 1. At final test to get the worst-case emission at 54Mbps for CH01, CH06 and CH11

2. The result basic equation calculation as follow:

$$\text{Peak Power Output} = \text{Peak Power Reading} + \text{Cable loss} + \text{Attenuator}$$



EUT	tiny embedded Wi-Fi module		Model	TinyCon2005	
Mode	802.11n HT20		Input Voltage	120V~	
Temperature	24 deg. C,		Humidity	56% RH	
Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail	
1	2412	17.82	30	Pass	
6	2437	17.27	30	Pass	
11	2462	16.59	30	Pass	

Note: 1. At final test to get the worst-case emission at 65Mbps for CH01, CH06 and CH11

2. The result basic equation calculation as follow:

Peak Power Output = Peak Power Reading + Cable loss + Attenuator

EUT	tiny embedded Wi-Fi module		Model	TinyCon2005	
Mode	802.11n HT40		Input Voltage	120V~	
Temperature	24 deg. C,		Humidity	56% RH	
Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail	
1	2422	17.47	30	Pass	
5	2437	17.13	30	Pass	
7	2452	16.73	30	Pass	

Note: 1. At final test to get the worst-case emission at 65Mbps for CH01, CH06 and CH11

2. The result basic equation calculation as follow:

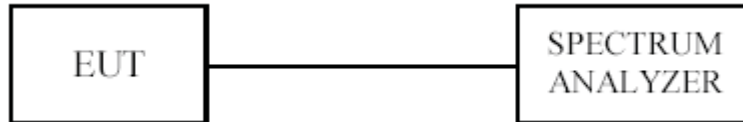
Peak Power Output = Peak Power Reading + Cable loss + Attenuator





## 9. Power Spectral Density Measurement

### 9.1 Test Setup



### 9.2 Limits of Power Spectral Density Measurement

The Maximum Power Spectral Density Measurement is 8dBm.

### 9.3 Test Procedure

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW = 10 kHz.
3. Set the VBW  $\geq$  30 kHz.
4. Set the span to 1.5 times the DTS channel bandwidth.
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.
11. The resulting peak PSD level must be  $\leq$  8 dBm.

**9.4 Test Result**

EUT		tiny embedded Wi-Fi module		Model	TinyCon2005	
Mode		802.11b 1Mbps		Input Voltage	120V~	
Temperature		24 deg. C,		Humidity	56% RH	
Channel	Channel Frequency (MHz)		Final RF Power Level (dBm)		Maximum Limit (dBm)	Pass/ Fail
1Mbps						
1	2412		-6.40		8	Pass
6	2437		-7.42		8	Pass
11	2462		-8.20		8	Pass

**Note:** At final test to get the worst-case emission at 1Mbps for CH01, CH06 and CH11

EUT		tiny embedded Wi-Fi module		Model		TinyCon2005	
Mode		802.11b 11Mbps		Input Voltage		120V~	
Temperature		24 deg. C,		Humidity		56% RH	
Channel	Channel Frequency (MHz)		Final RF Power Level (dBm)		Maximum Limit (dBm)		Pass/ Fail
11Mbps							
1	2412		-5.31		8		Pass
6	2437		-5.75		8		Pass
11	2462		-6.57		8		Pass

**Note:** At final test to get the worst-case emission at 11Mbps for CH01, CH06 and CH11



EUT		tiny embedded Wi-Fi module		Model		TinyCon2005	
Mode		802.11g		Input Voltage		120V~	
Temperature		24 deg. C,		Humidity		56% RH	
Channel	Channel Frequency (MHz)		Final RF Power Level (dBm)		Maximum Limit (dBm)		Pass/ Fail
54Mbps							
1	2412		-12.56		8		Pass
6	2437		-13.54		8		Pass
11	2462		-14.25		8		Pass

**Note:** At final test to get the worst-case emission at 54Mbps for CH01, CH06 and CH11

EUT		tiny embedded Wi-Fi module		Model		TinyCon2005	
Mode		802.11n HT20		Input Voltage		120V~	
Temperature		24 deg. C,		Humidity		56% RH	
Channel	Channel Frequency (MHz)		Final RF Power Level (dBm)		Maximum Limit (dBm)		Pass/ Fail
11n HT20							
1	2412		-12.01		8		Pass
6	2437		-12.75		8		Pass
11	2462		-13.29		8		Pass

**Note:** At final test to get the worst-case emission at 65M for CH01, CH06 and CH11



EUT		tiny embedded Wi-Fi module		Model		TinyCon2005	
Mode		802.11n HT40		Input Voltage		120V~	
Temperature		24 deg. C,		Humidity		56% RH	
Channel	Channel Frequency (MHz)		Final RF Power Level (dBm)		Maximum Limit (dBm)		Pass/ Fail
11n HT40							
1	2422		-14.63		8		Pass
4	2437		-14.44		8		Pass
7	2452		-15.05		8		Pass

**Note:** At final test to get the worst-case emission at 65Mfor CH01, CH04 and CH07



## 9.5 Photo of Power Spectral Density Measurement

### 1. 802.11b at 1Mbps of CH01



MARKER 1

2.41266528 GHz

Ref 20 dBm

\*Att 30 dB

\*RBW 10 kHz

Marker 1 [T1 ]

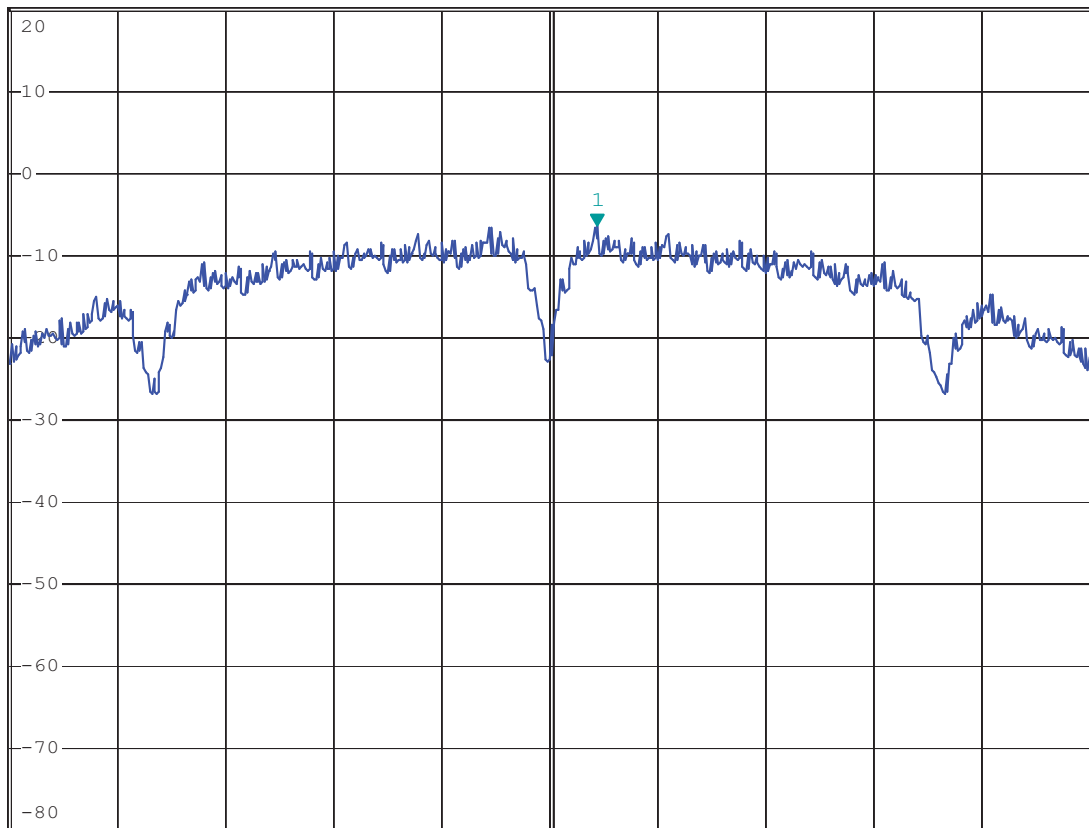
\*VBW 30 kHz

-6.40 dBm

\*SWT 155 ms

2.412665280 GHz

1 PK  
MAXH



Center 2.412 GHz

1.512 MHz/

Span 15.12 MHz



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2. 802.11b at 1Mbps of CH06



MARKER 1

2.43766528 GHz

Ref 20 dBm

\*Att 30 dB

\*RBW 10 kHz

Marker 1 [T1]

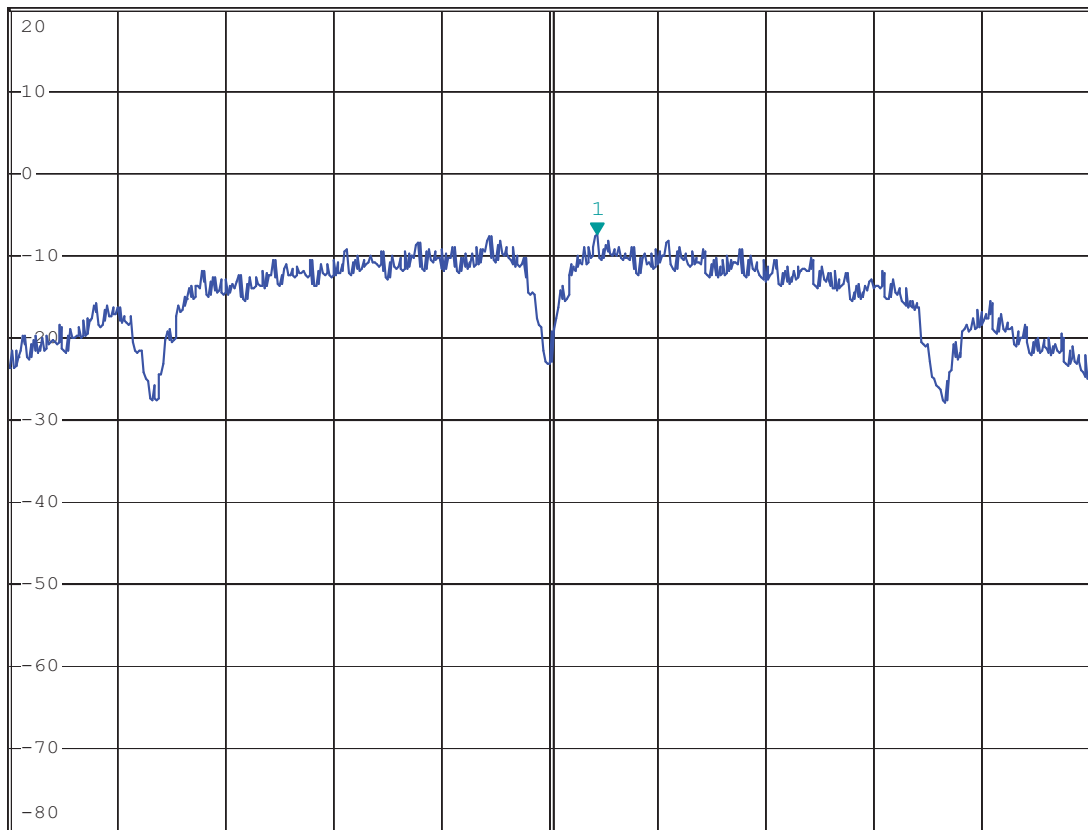
\*VBW 30 kHz

-7.42 dBm

\*SWT 155 ms

2.437665280 GHz

1 PK  
MAXH



Center 2.437 GHz

1.512 MHz/

Span 15.12 MHz



3. 802.11b at 1Mbps of CH11



MARKER 1

2.46266528 GHz

Ref 20 dBm

\*Att 30 dB

\*RBW 10 kHz

Marker 1 [T1]

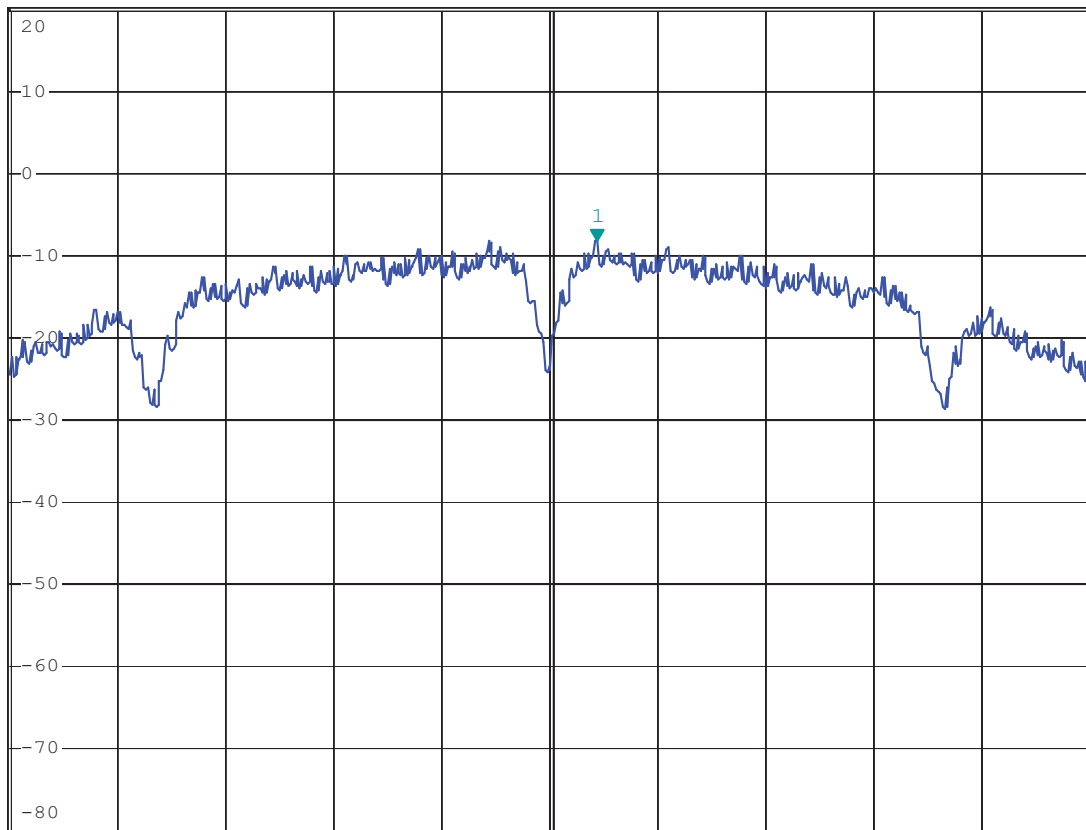
\*VBW 30 kHz

-8.20 dBm

\*SWT 155 ms

2.462665280 GHz

1 PK  
MAXH



Center 2.462 GHz

1.512 MHz/

Span 15.12 MHz



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4. 802.11b at 11Mbps of CH01



MARKER 1

2.41052112 GHz

Ref 20 dBm

\* Att 30 dB

\* RBW 10 kHz

Marker 1 [T1 ]

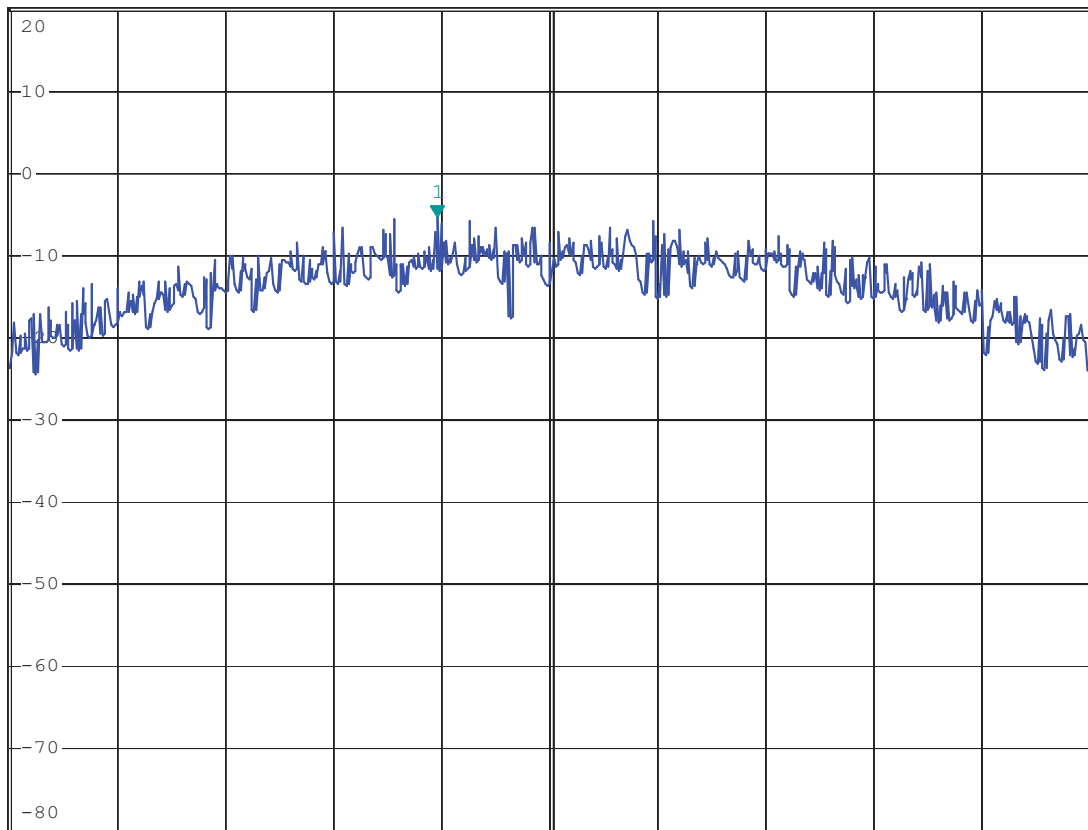
\* VBW 30 kHz

-5.31 dBm

\* SWT 145 ms

2.410521120 GHz

1 PK  
MAXH



Center 2.412 GHz

1.422 MHz/

Span 14.22 MHz





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5. 802.11b at 11Mbps of CH06



MARKER 1

2.43552112 GHz

Ref 20 dBm

\* Att 30 dB

\* RBW 10 kHz

Marker 1 [T1]

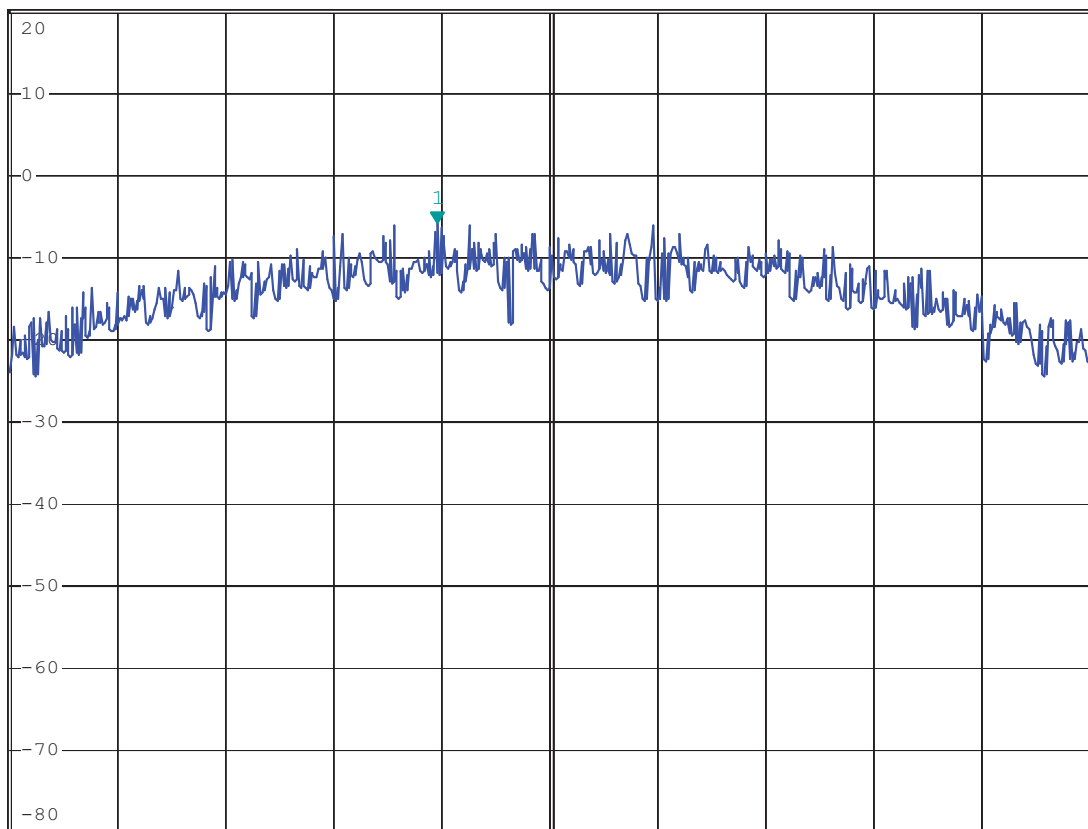
\* VBW 30 kHz

-5.75 dBm

\* SWT 145 ms

2.435521120 GHz

1 PK  
MAXH



Center 2.437 GHz

1.422 MHz/

Span 14.22 MHz



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Report No.: UNI-1410085

6. 802.11b at 11Mbps of CH11



MARKER 1

2.46052112 GHz

Ref 20 dBm

\* Att 30 dB

\* RBW 10 kHz

\* VBW 30 kHz

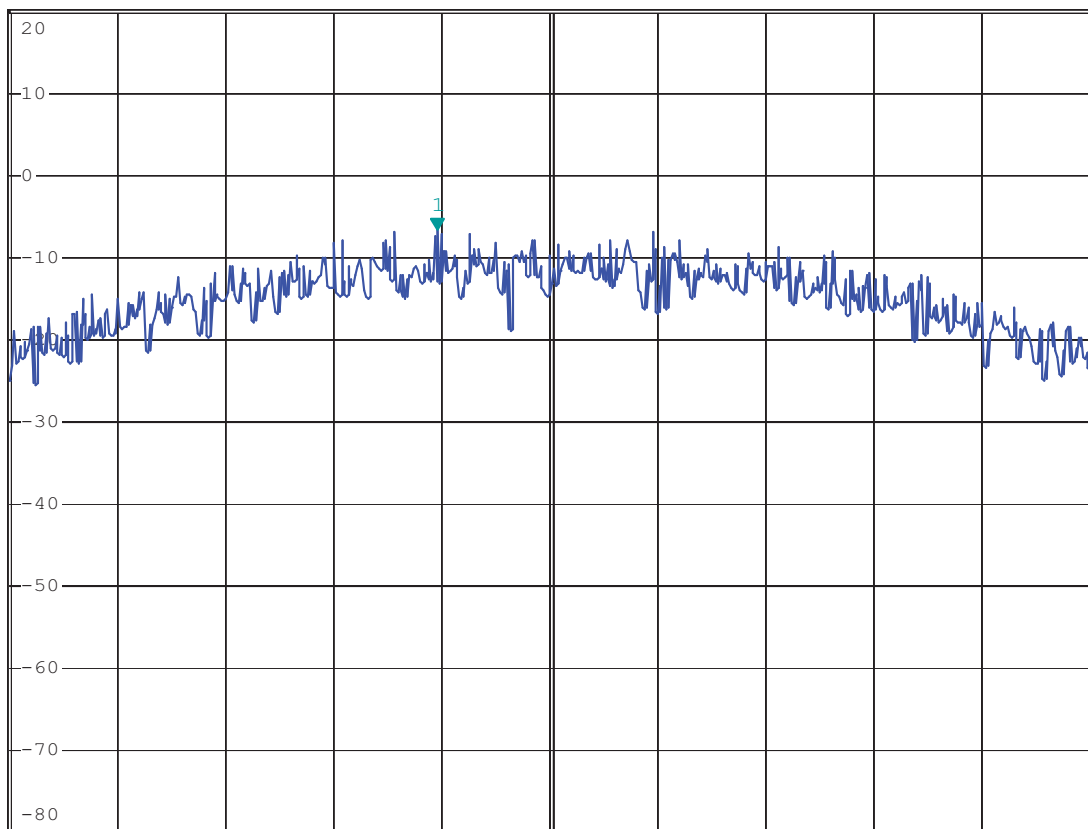
\* SWT 145 ms

Marker 1 [T1]

-6.57 dBm

2.460521120 GHz

1 PK  
MAXH



Center 2.462 GHz

1.422 MHz/

Span 14.22 MHz



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7. 802.11g at 54Mbps of CH1



MARKER 1

2.40762816 GHz

Ref 20 dBm

\* Att 30 dB

\* RBW 10 kHz

\* VBW 30 kHz

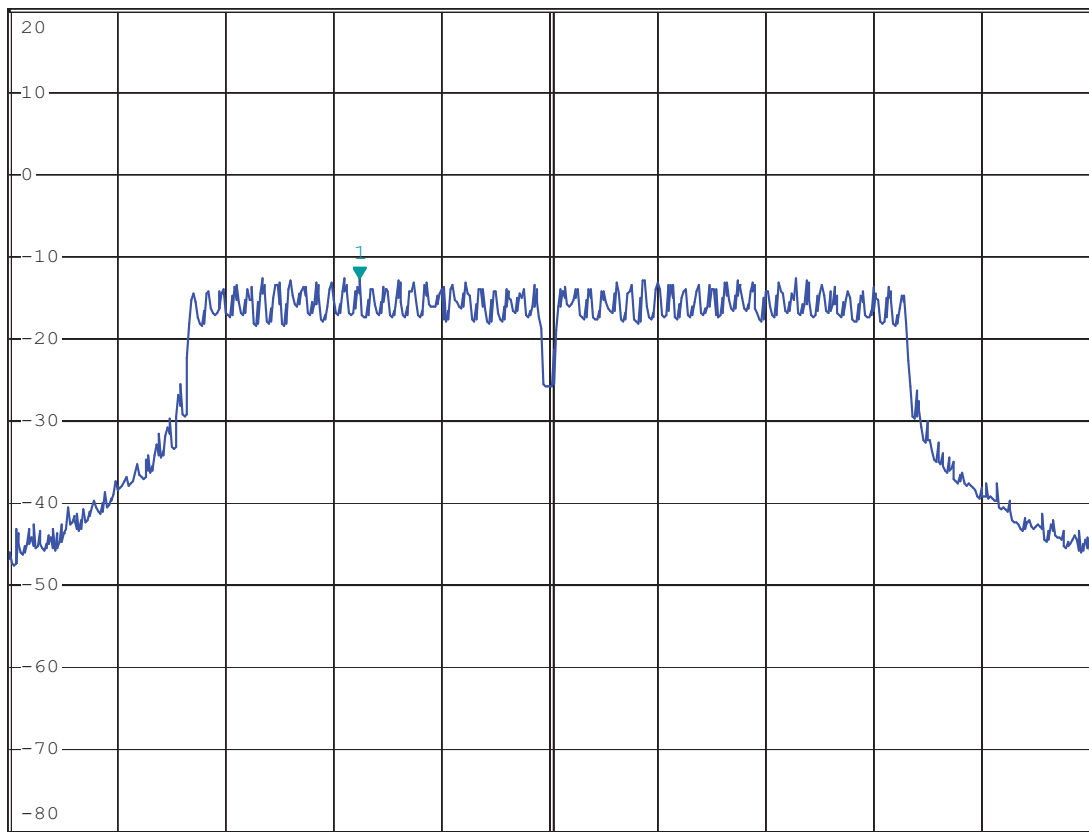
\* SWT 250 ms

Marker 1 [T1 ]

-12.56 dBm

2.407628160 GHz

1 PK  
MAXH



Center 2.412 GHz

2.484 MHz/

Span 24.84 MHz



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Report No.: UNI-1410085

8. 802.11g at 54Mbps of CH6



MARKER 1

2.43918592 GHz

Ref 20 dBm

\*Att 30 dB

\*RBW 10 kHz

Marker 1 [T1]

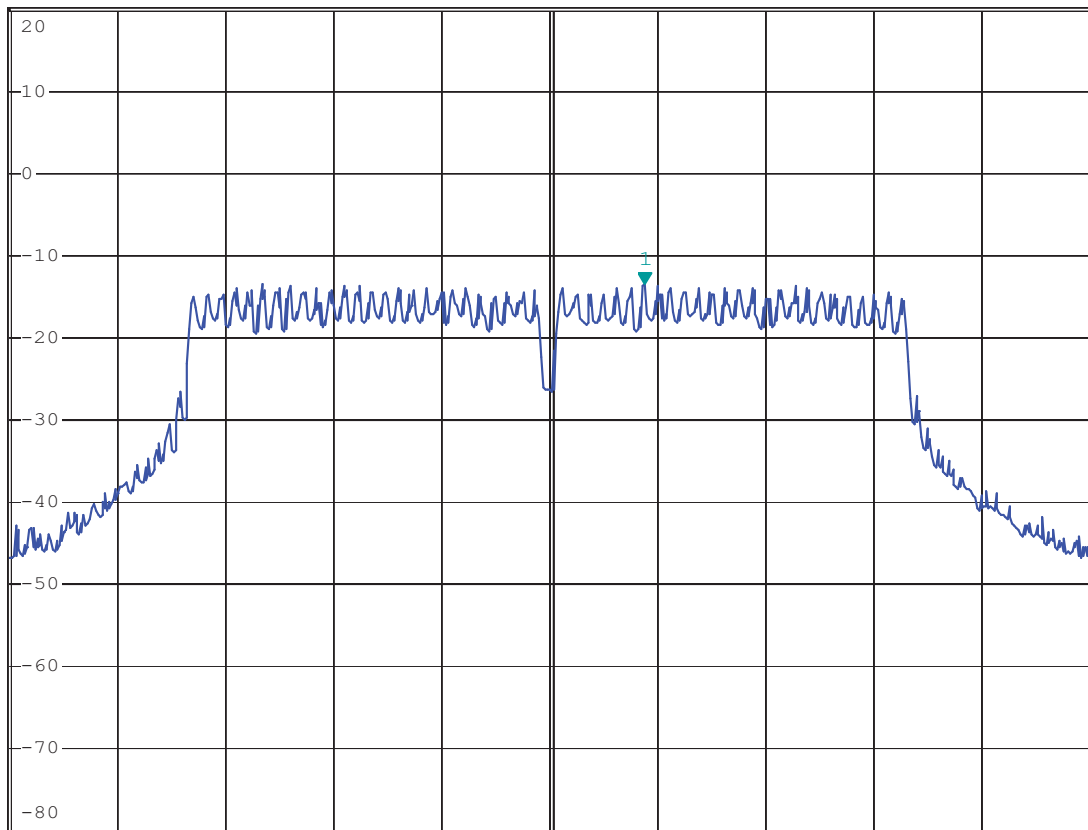
\*VBW 30 kHz

-13.54 dBm

\*SWT 250 ms

2.439185920 GHz

1 PK  
MAXH



Center 2.437 GHz

2.484 MHz/

Span 24.84 MHz



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Shenzhen United Testing Technology Co., Ltd.

Report No.: UNI-1410085

9. 802.11g at 54Mbps of CH11



MARKER 1

2.45539256 GHz

Ref 20 dBm

\* Att 30 dB

\* RBW 10 kHz

Marker 1 [T1 ]

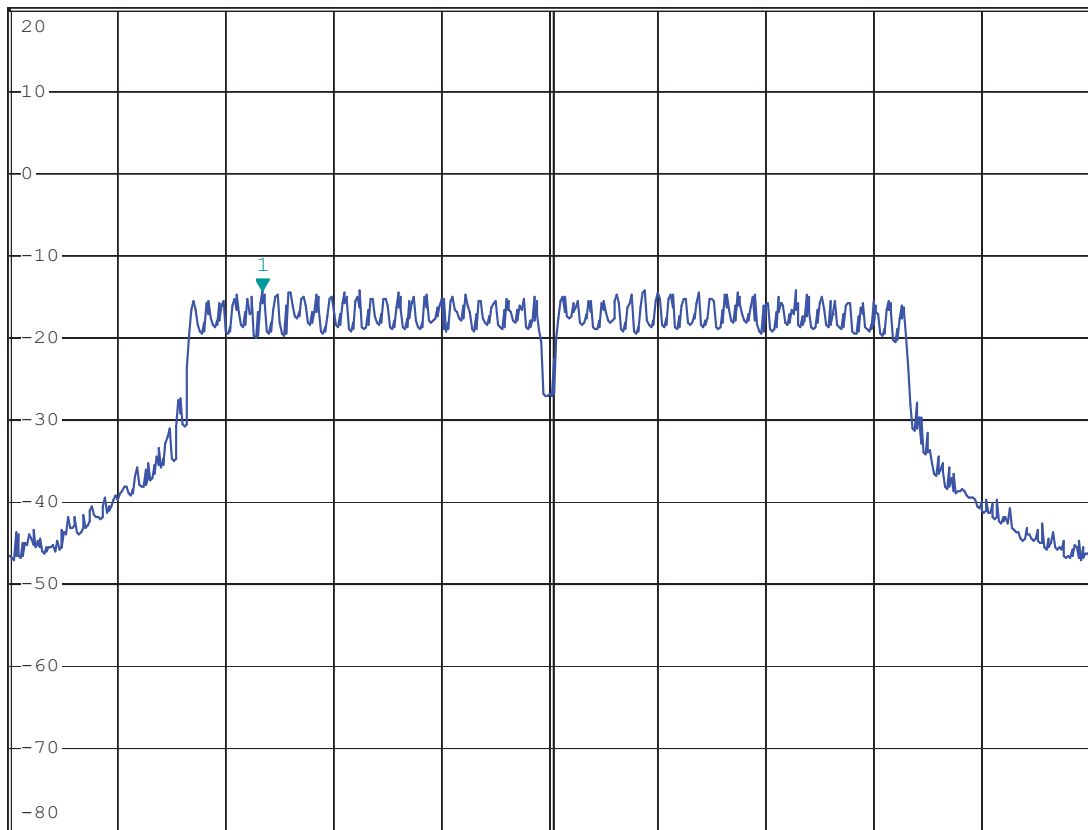
\* VBW 30 kHz

-14.25 dBm

\* SWT 250 ms

2.455392560 GHz

1 PK  
MAXH



Center 2.462 GHz

2.484 MHz/

Span 24.84 MHz



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Report No.: UNI-1410085

10. 802.11n at HT20 of CH01 65Mbps



MARKER 1

2.4098688 GHz

Ref 20 dBm

\*Att 30 dB

\*RBW 10 kHz

Marker 1 [T1]

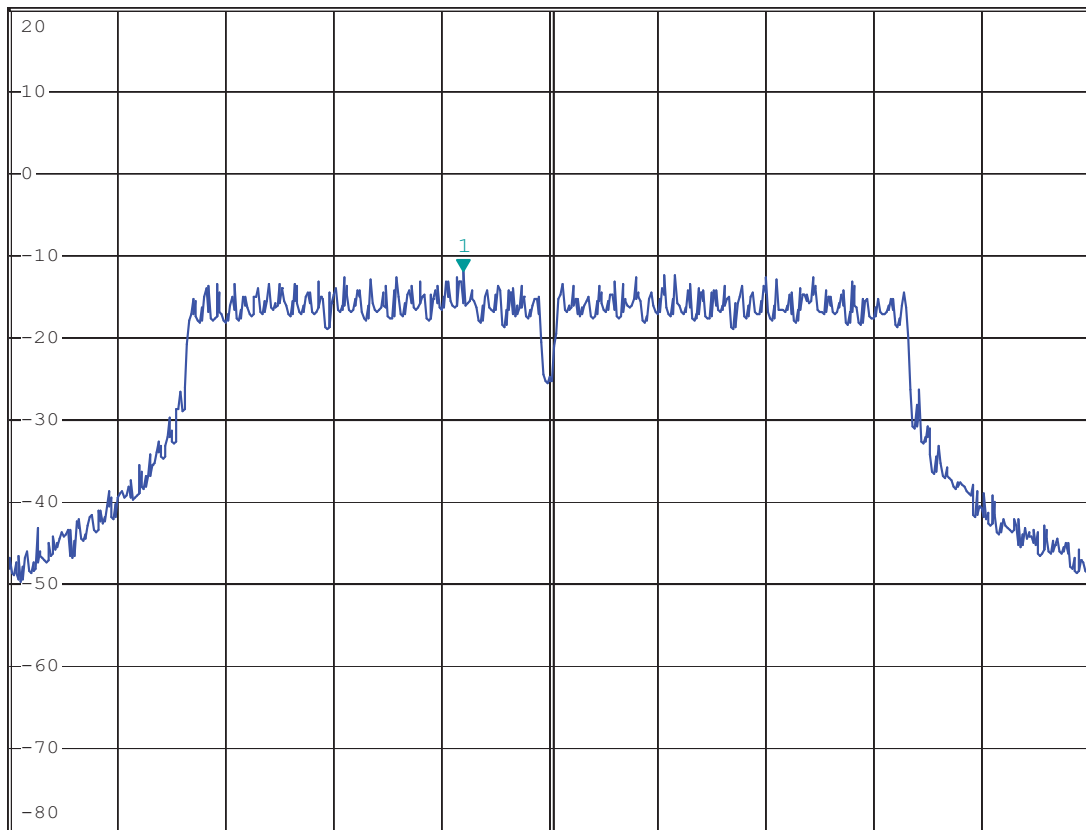
\*VBW 30 kHz

-12.01 dBm

\*SWT 270 ms

2.409868800 GHz

1 PK  
MAXH



Center 2.412 GHz

2.664 MHz/

Span 26.64 MHz



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Shenzhen United Testing Technology Co., Ltd.

Report No.: UNI-1410085

11. 802.11n at HT20 of CH06 65Mbps



MARKER 1

2.43034 GHz

Ref 20 dBm

\*Att 30 dB

\*RBW 10 kHz

Marker 1 [T1]

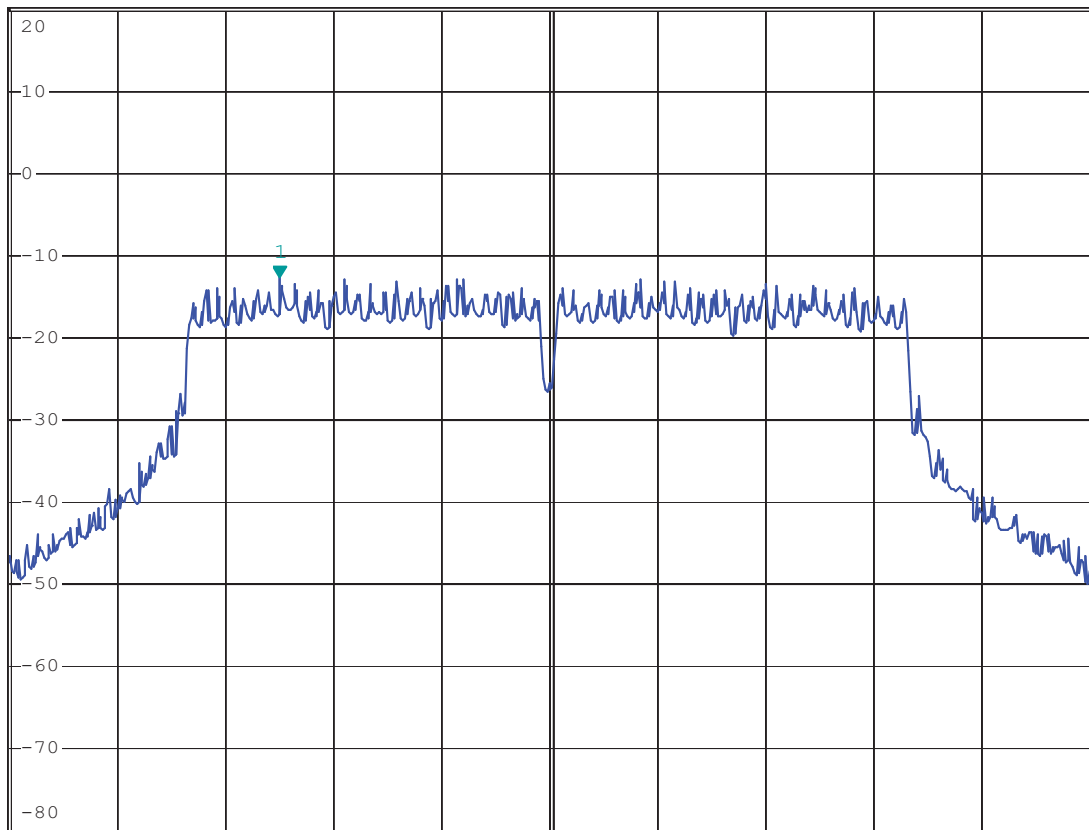
\*VBW 30 kHz

-12.75 dBm

\*SWT 270 ms

2.430340000 GHz

1 PK  
MAXH



Center 2.437 GHz

2.664 MHz/

Span 26.64 MHz



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Report No.: UNI-1410085

12. 802.11n at HT20 of CH11 65Mbps



MARKER 1

2.4598688 GHz

Ref 20 dBm

\* Att 30 dB

\* RBW 10 kHz

Marker 1 [T1 ]

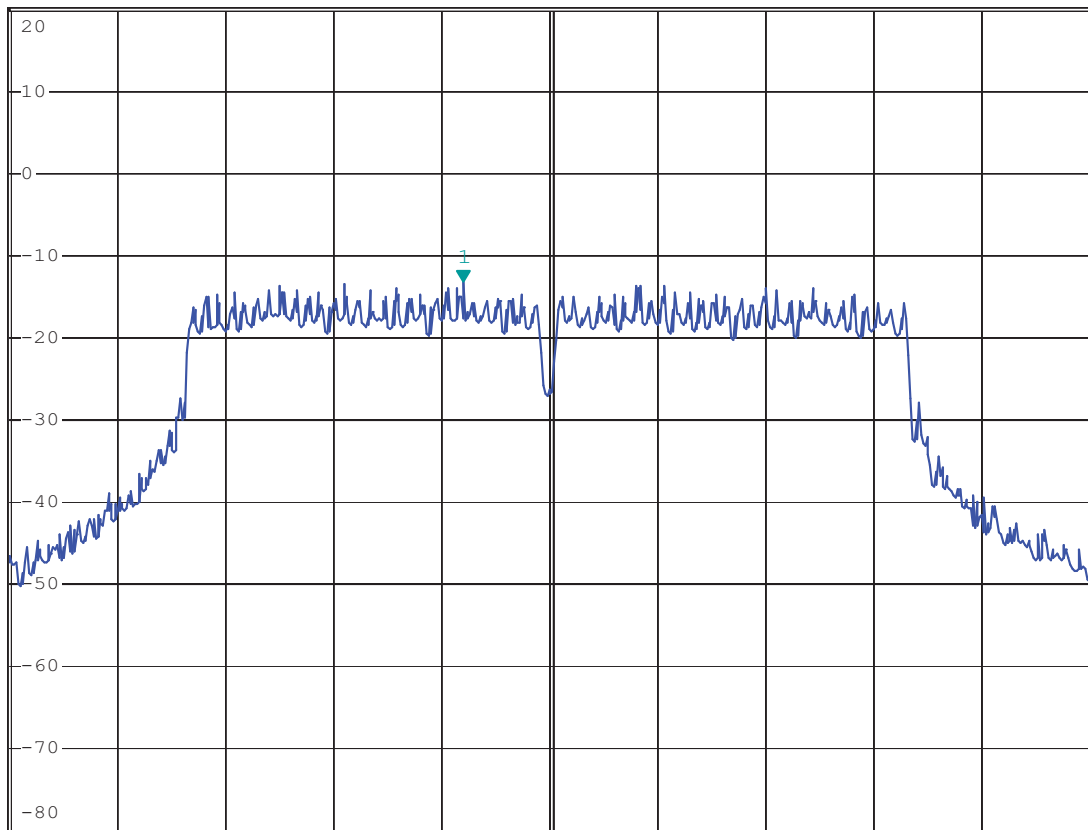
\* VBW 30 kHz

-13.29 dBm

\* SWT 270 ms

2.459868800 GHz

1 PK  
MAXH



Center 2.462 GHz

2.664 MHz/

Span 26.64 MHz





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Report No.: UNI-1410085

13. 802.11n at HT40 of CH01 65Mbps



MARKER 1

2.414116 GHz

Ref 20 dBm

\* Att 30 dB

\* RBW 10 kHz

Marker 1 [T1 ]

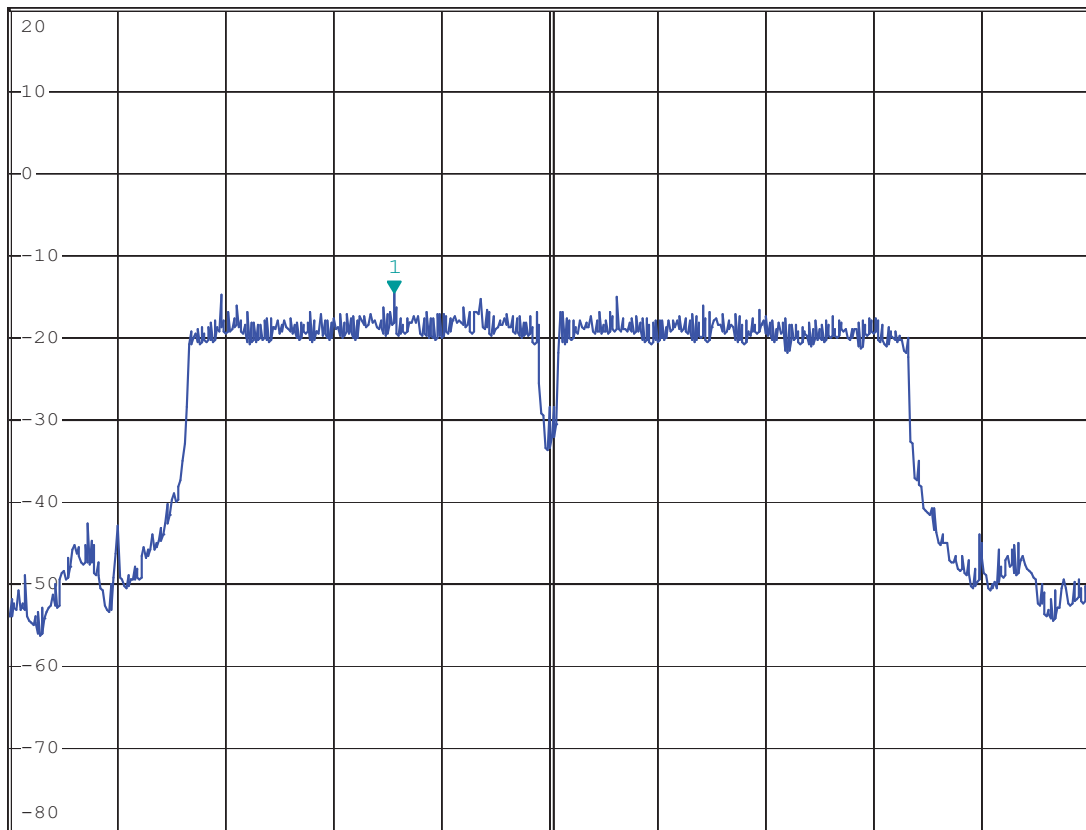
\* VBW 30 kHz

-14.63 dBm

\* SWT 560 ms

2.414116000 GHz

1 PK  
MAXH



Center 2.422 GHz

5.475 MHz/

Span 54.75 MHz



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Report No.: UNI-1410085

14. 802.11n at HT40 of CH04 65Mbps



MARKER 1

2.4403945 GHz

Ref 20 dBm

\* Att 30 dB

\* RBW 10 kHz

Marker 1 [T1]

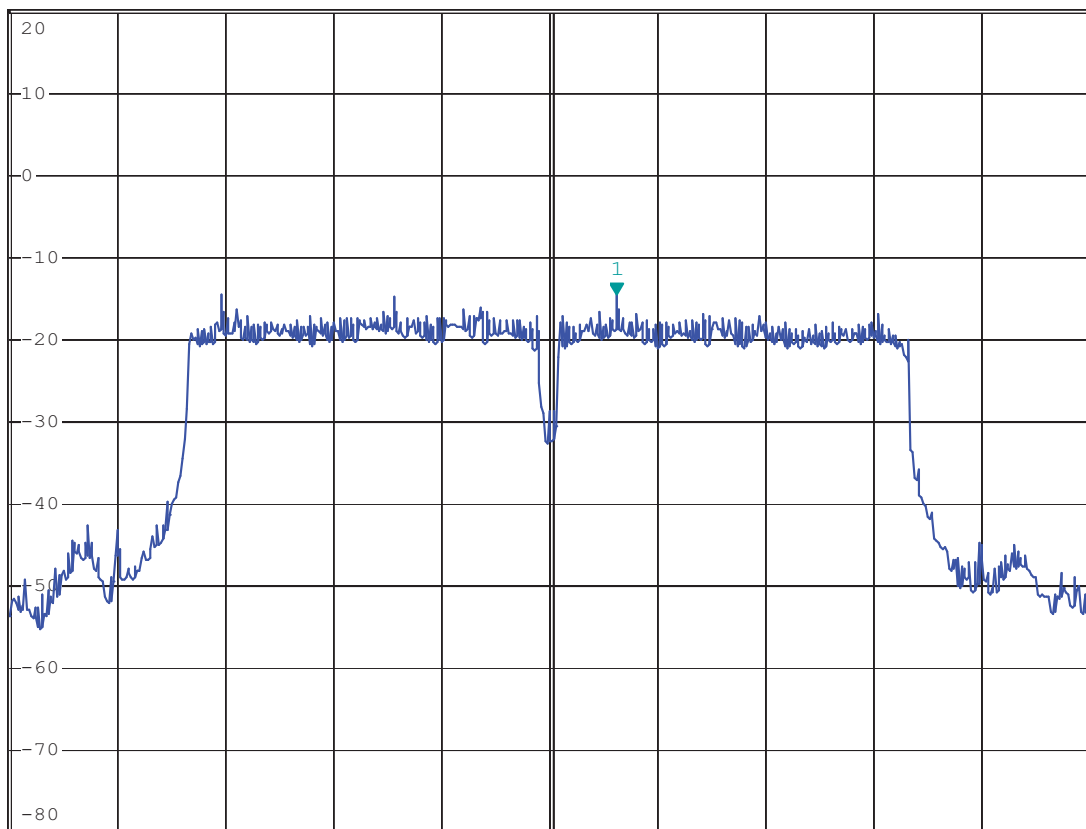
\* VBW 30 kHz

-14.44 dBm

\* SWT 560 ms

2.440394500 GHz

1 PK  
MAXH



Center 2.437 GHz

5.475 MHz/

Span 54.75 MHz



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Report No.: UNI-1410085

15. 802.11n at HT40 of CH07 65Mbps



MARKER 1

2.435356 GHz

Ref 20 dBm

\* Att 30 dB

\* RBW 10 kHz

Marker 1 [T1 ]

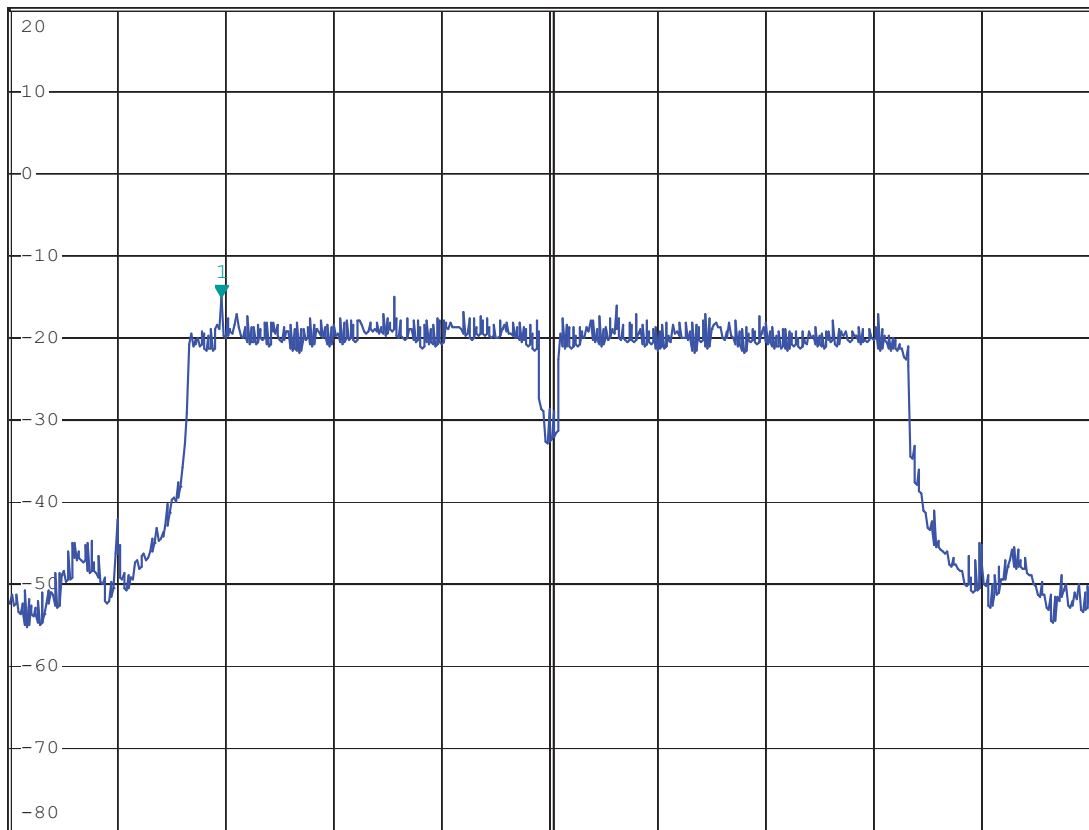
\* VBW 30 kHz

-15.05 dBm

\* SWT 560 ms

2.435356000 GHz

1 PK  
MAXH



Center 2.452 GHz

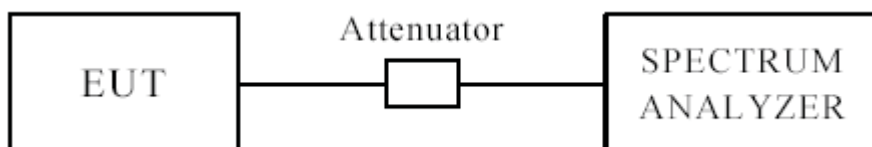
5.475 MHz/

Span 54.75 MHz



## 10 Out of Band Measurement

### 10.1 Test Setup for band edge



The restricted band requirement based on radiated emission test; please see the clause 6 for the test setup

### 10.2 Limits of Out of Band Emissions Measurement

1. Below  $-20\text{dB}$  of the highest emission level of operating band (in 100kHz Resolution Bandwidth).
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

### 10.3 Test Procedure

For signals in the restricted bands above and below the 2.4-2.483GHz allocated band a measurement was made of radiated emission test.( Peak values with RBW=1MHz, VBW=3MHz and PK detector. AV value with RBW=1MHz, VBW=3MHz and RMS detector)

For bandage test, the spectrum set as follows: RBW=100kHz,VBW=300 kHz. A conducted measurement used

### 10.4 Test Result

Please see next pages

Note: For band-edge measurement, the frequency from 30MHz-25GHz was tested. And It met the FCC rule.



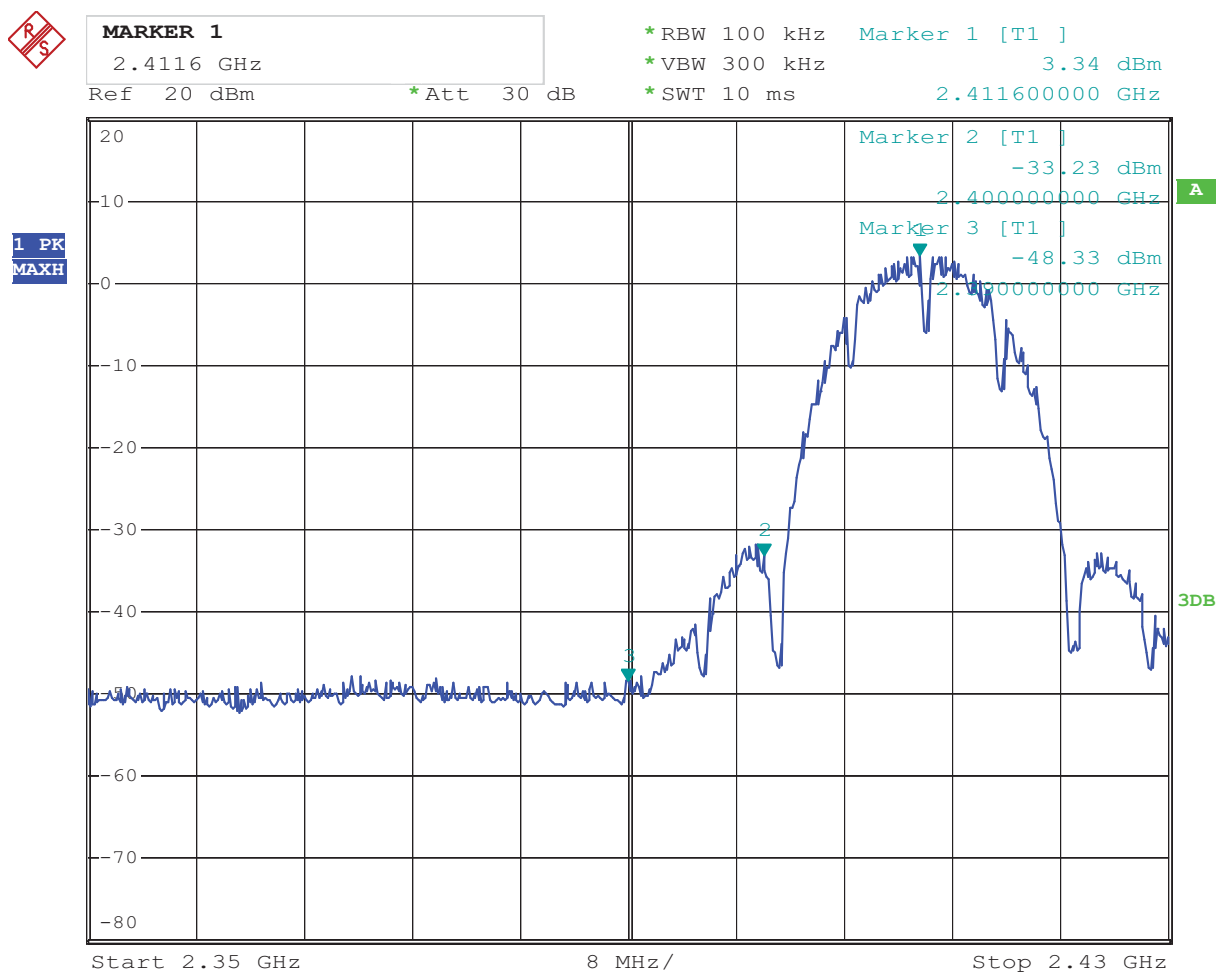
For 802.11b mode

CH01 at 1Mbps

### 10.4 Band-edge Measurement

EUT	tiny embedded Wi-Fi module	Model	TinyCon2005
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



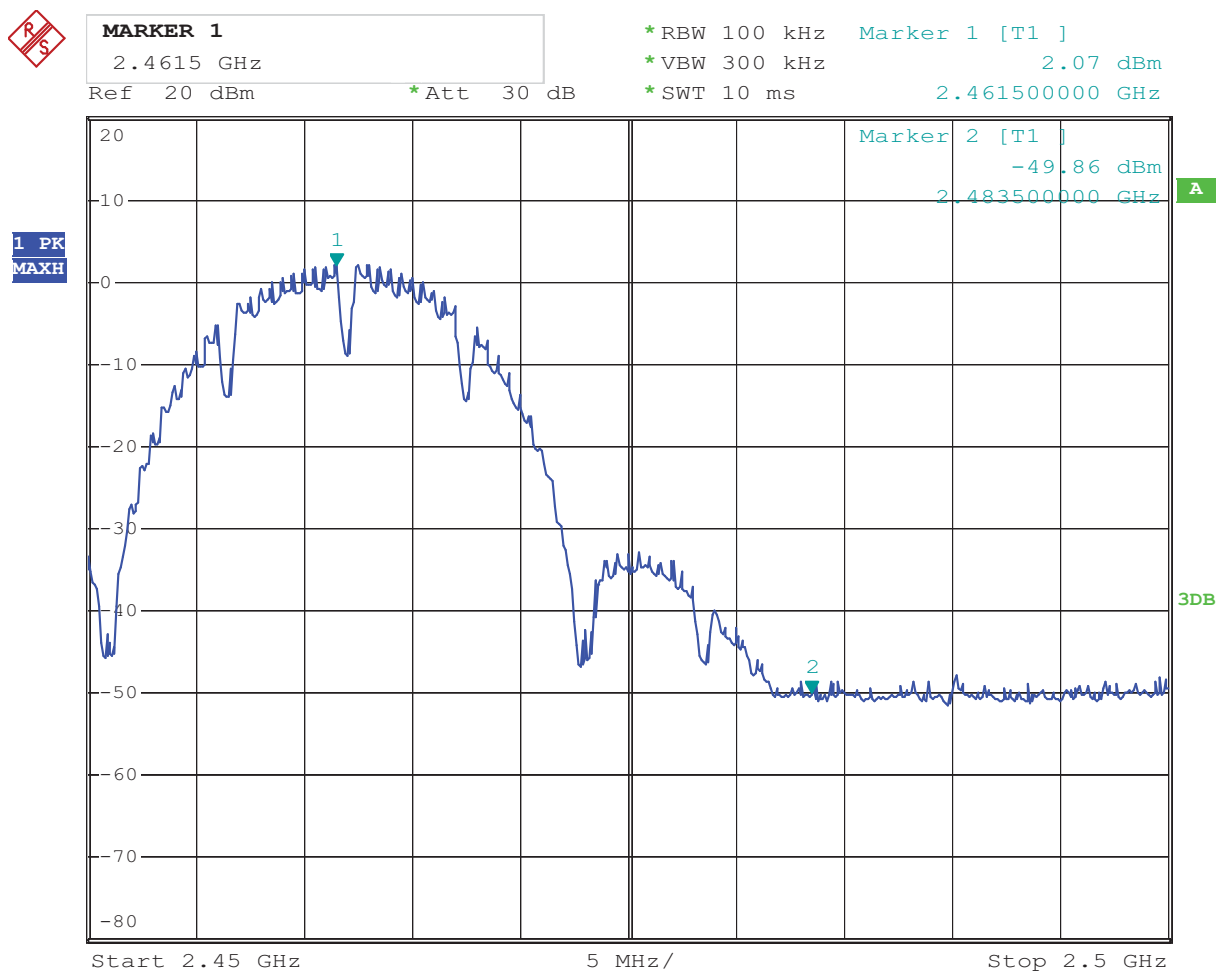


CH11 at 1Mbps

10.4 Band-edge Measurement

EUT	tiny embedded Wi-Fi module	Model	TinyCon2005
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:





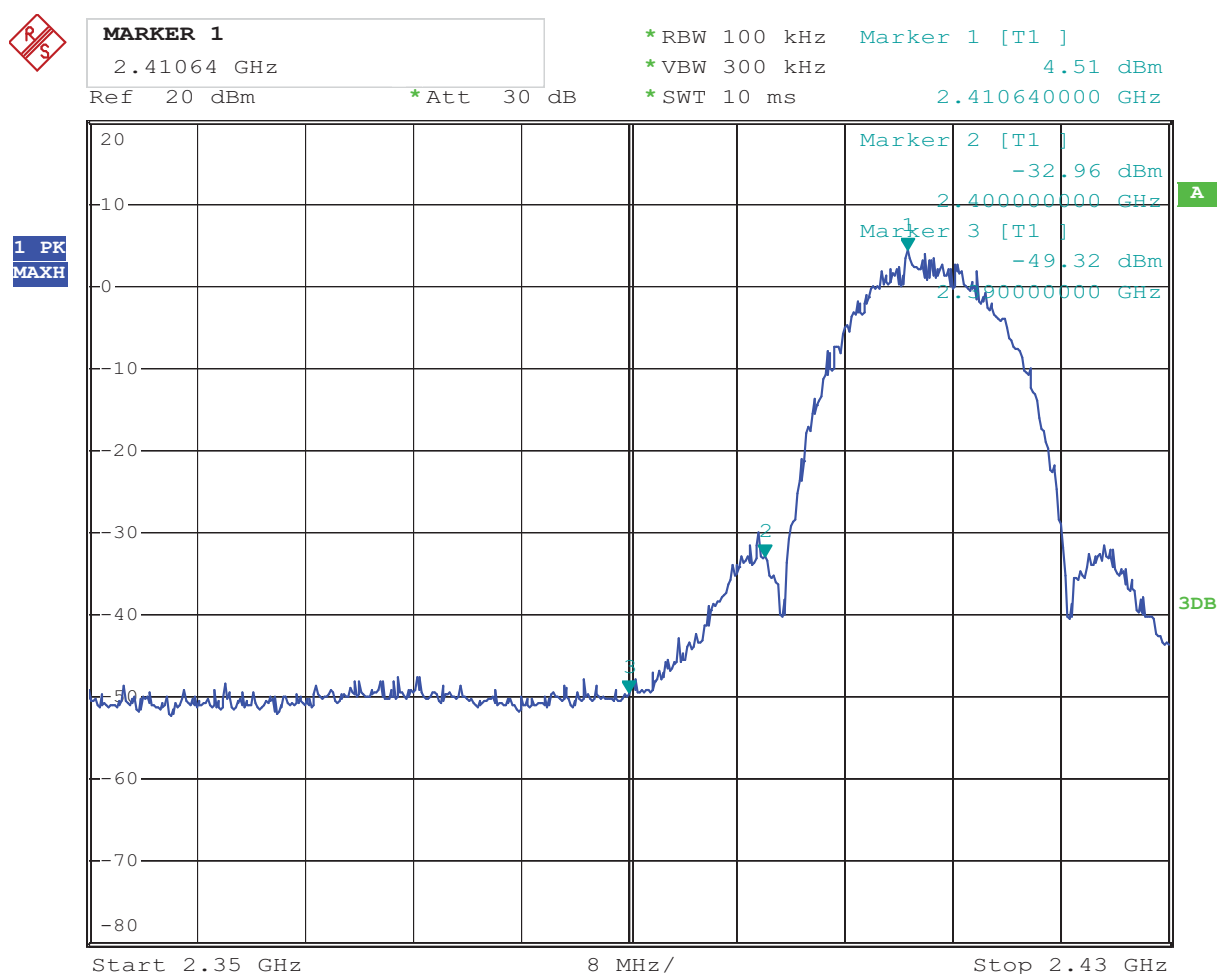
For 802.11b mode

CH01 at 11Mbps

#### 10.4 Band-edge Measurement

EUT	tiny embedded Wi-Fi module	Model	TinyCon2005
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



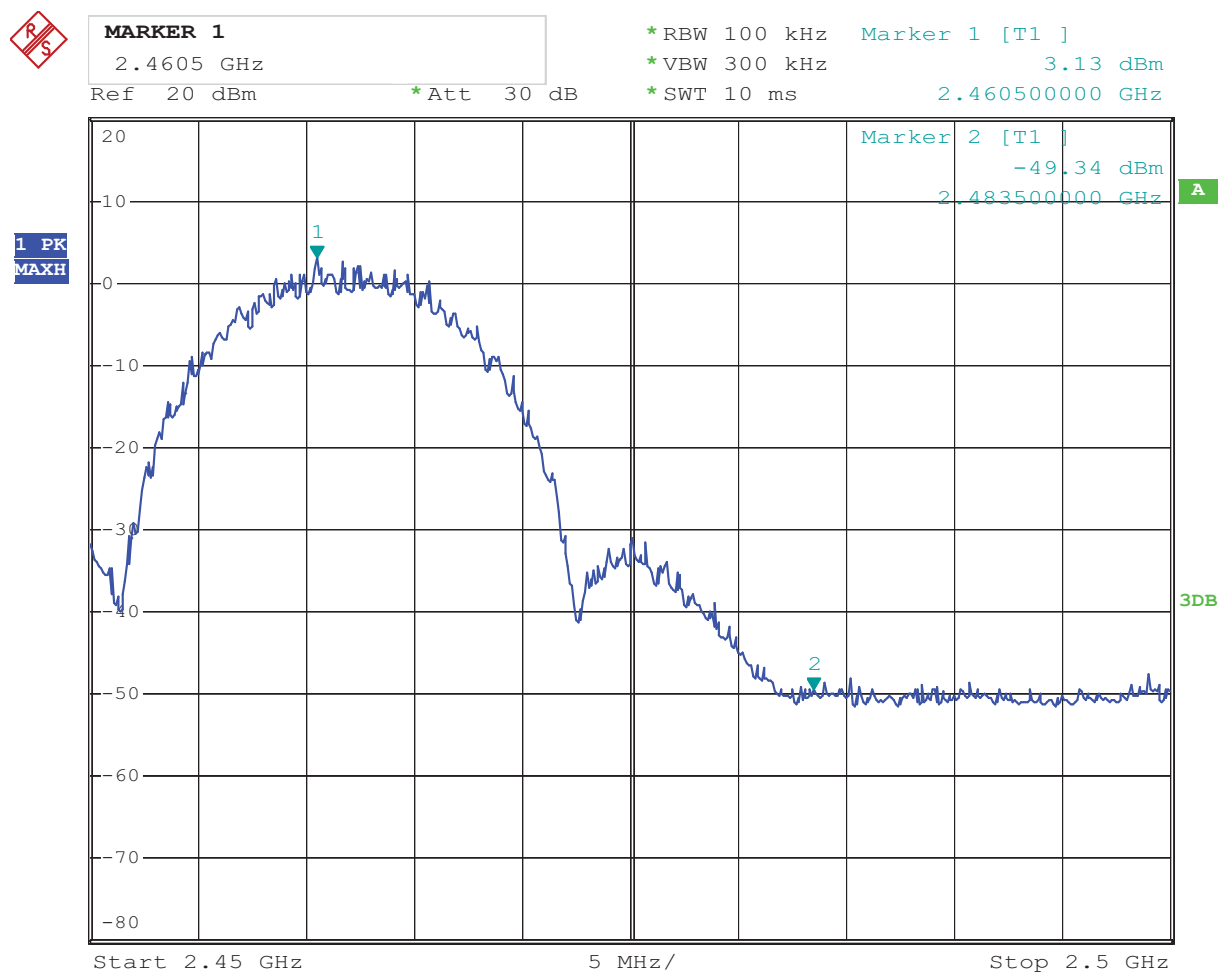


CH11 at 11Mbps

### 10.4 Band-edge Measurement

EUT	tiny embedded Wi-Fi module	Model	TinyCon2005
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

#### Test Figure:







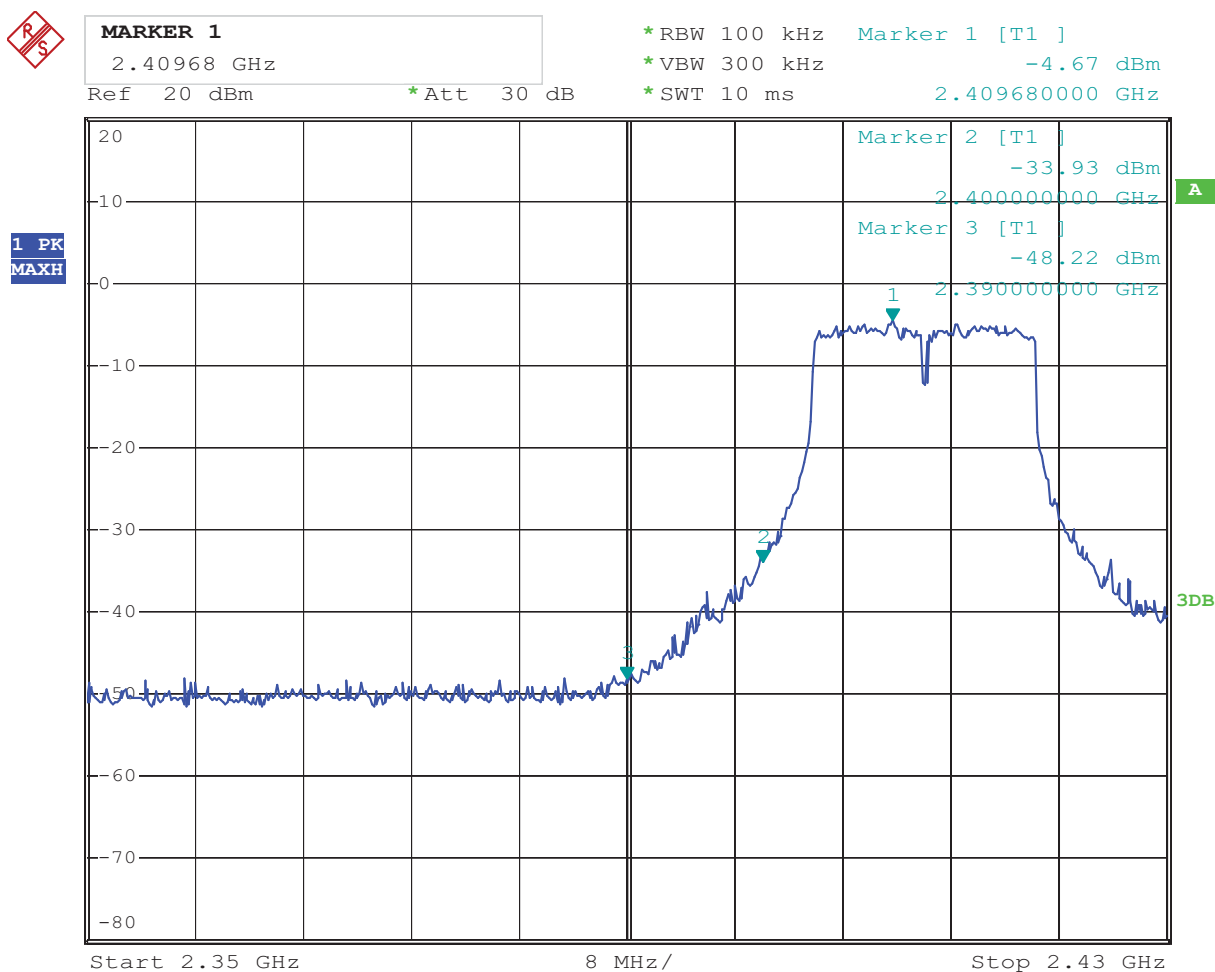
For 802.11g mode

CH01 at 54Mbps

### 10.4 Band-edge Measurement

EUT	tiny embedded Wi-Fi module	Model	TinyCon2005
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

#### Test Figure:



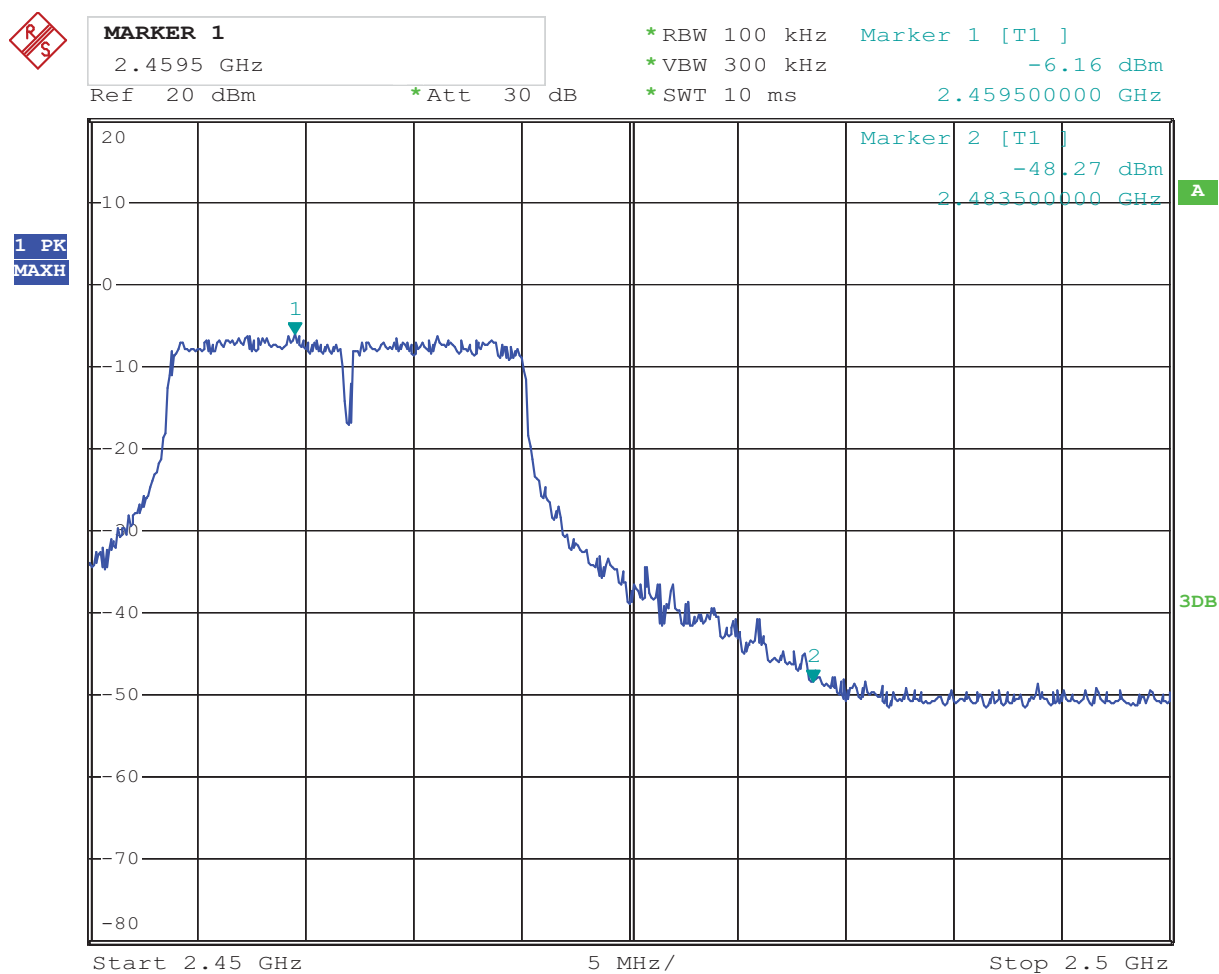


CH11 at 54Mbps

### 10.4 Band-edge Measurement

EUT	tiny embedded Wi-Fi module	Model	TinyCon2005
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

#### Test Figure:





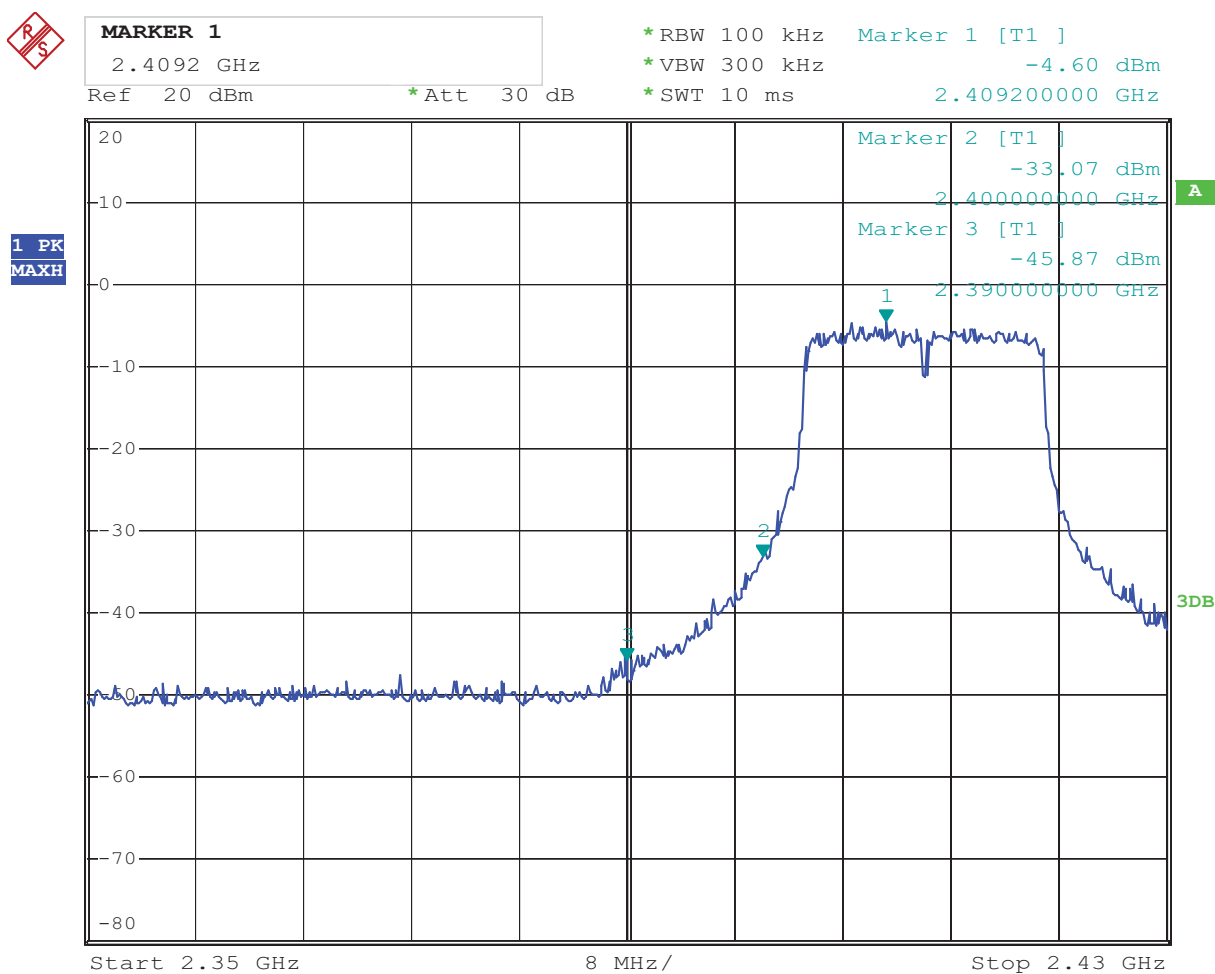
For 802.11n mode

CH01 at HT20 65Mbps

#### 10.4 Band-edge Measurement

EUT	tiny embedded Wi-Fi module	Model	TinyCon2005
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



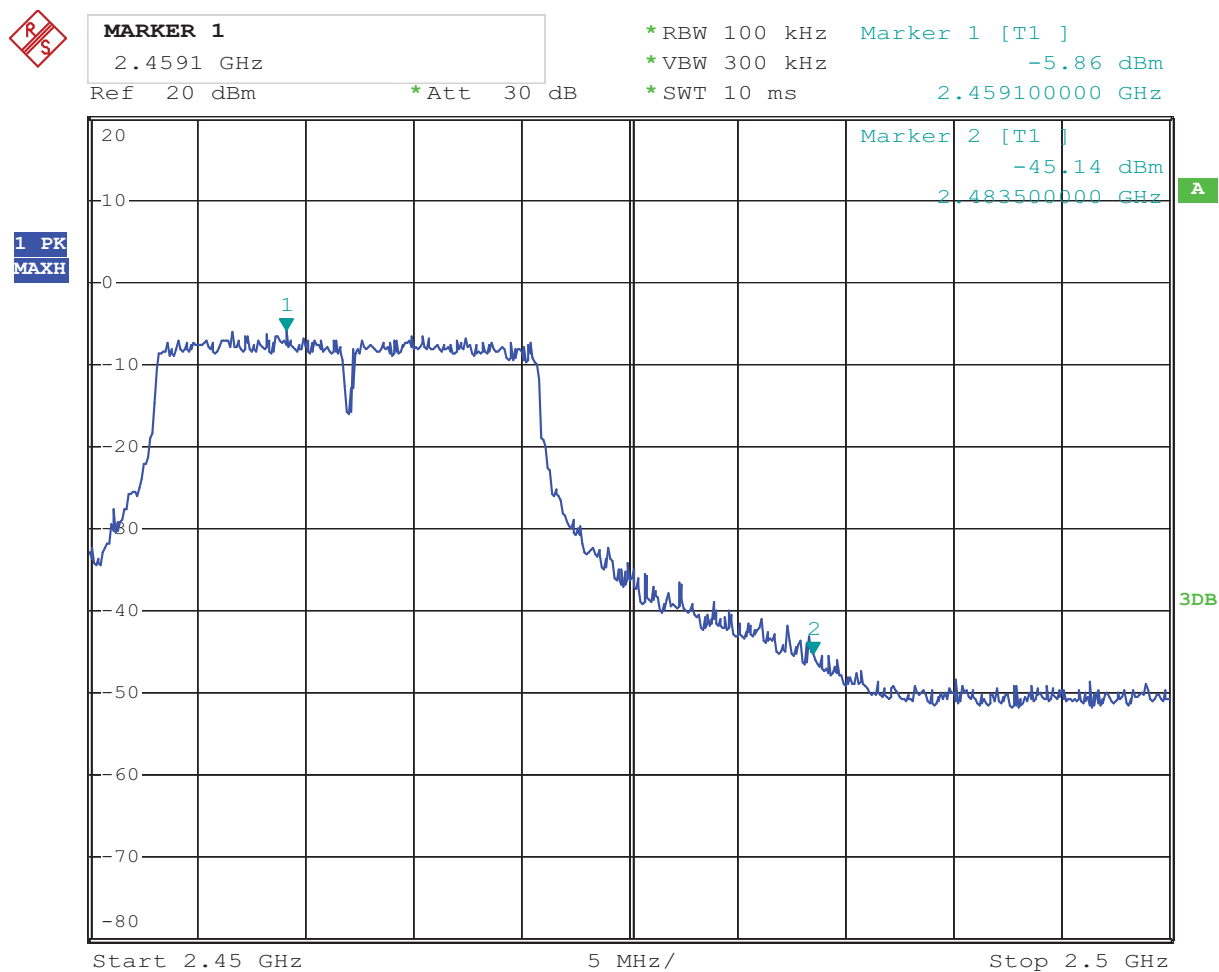


CH11 at HT20 65Mbps

### 10.4 Band-edge Measurement

EUT	tiny embedded Wi-Fi module	Model	TinyCon2005
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

#### Test Figure:





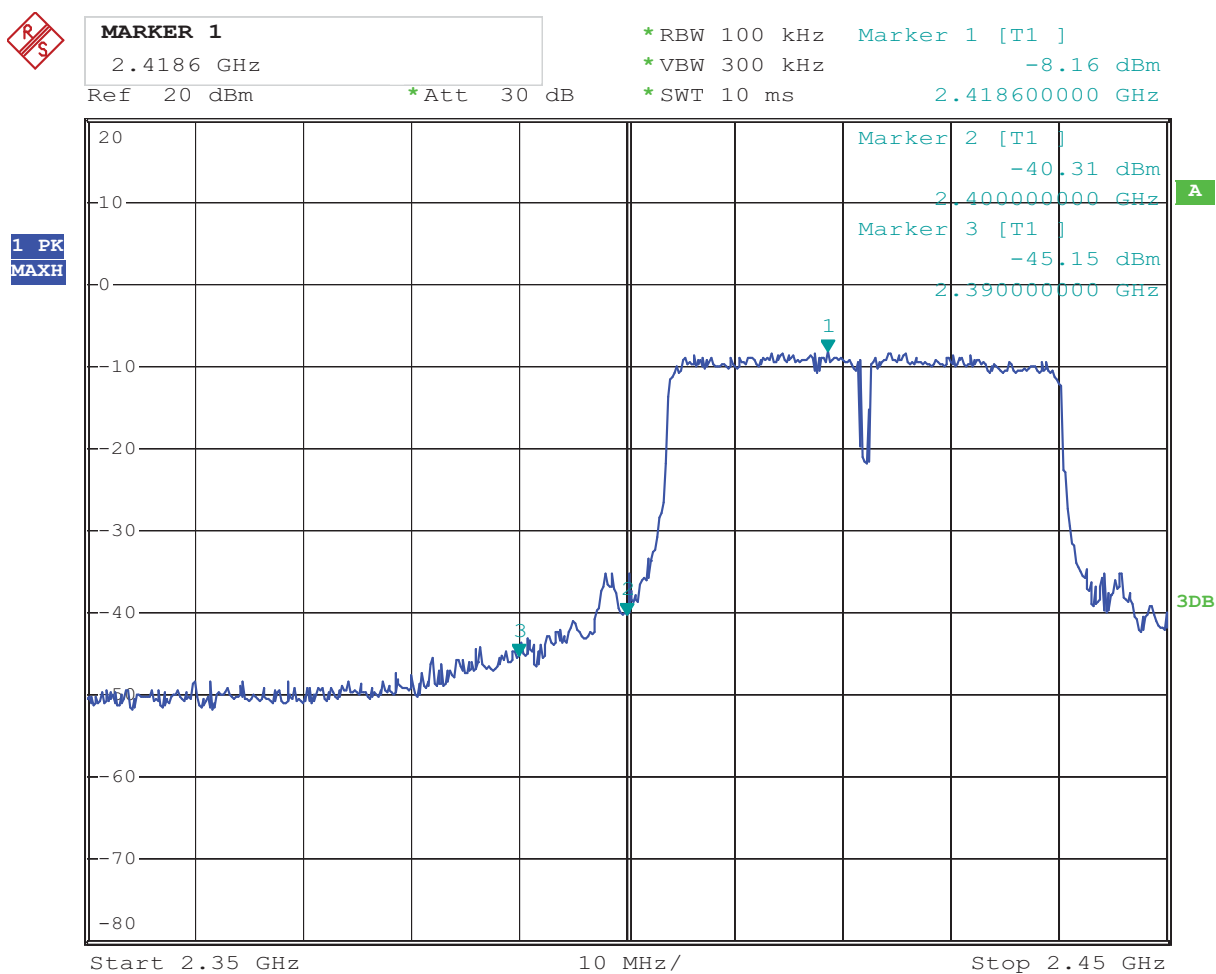
For 802.11n mode

CH01 at HT40 65Mbps

#### 10.4 Band-edge Measurement

EUT	tiny embedded Wi-Fi module	Model	TinyCon2005
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Test Figure:



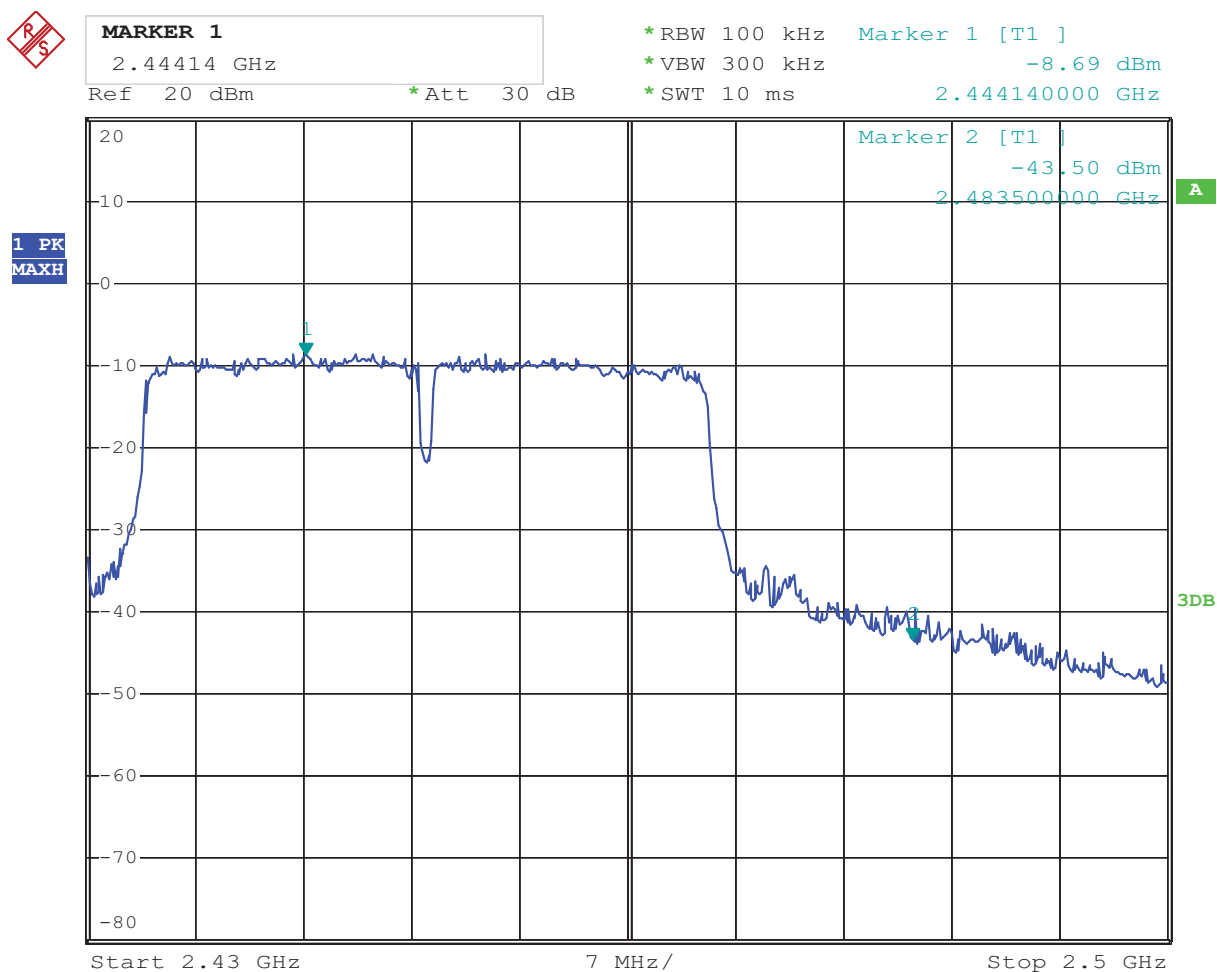


CH7 at HT40 65Mbps

### 10.4 Band-edge Measurement

EUT	tiny embedded Wi-Fi module	Model	TinyCon2005
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

#### Test Figure:





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For 802.11b mode

CH01 at 11Mbps

10.4 Restricted band Measurement

EUT	tiny embedded Wi-Fi module	Model	TinyCon2005
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

Horizontal

2400	PK (dB $\mu$ V/m)	55.19	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	38.29		54(dB $\mu$ V/m)
2390	PK (dB $\mu$ V/m)	45.83	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	--		54(dB $\mu$ V/m)

Vertical

2400	PK (dB $\mu$ V/m)	59.21	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	41.33		54(dB $\mu$ V/m)
2390	PK (dB $\mu$ V/m)	45.18	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	--		54(dB $\mu$ V/m)



For 802.11b mode

CH11 at 11Mbps

10.4 Restricted band Measurement

EUT	tiny embedded Wi-Fi module		Model	TinyCon2005
Mode	Keeping Transmitting		Input Voltage	120V~
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
Vertical				
2483.500	PK (dBμV/m)	45.67	Limit	74(dBμV/m)
	AV (dBμV/m)	--		54(dBμV/m)

Horizontal

2483.500	PK (dB $\mu$ V/m)	44.16	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	--		54(dB $\mu$ V/m)





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For 802.11g mode

CH01 at 54Mbps

#### 10.4 Restricted band Measurement

EUT	tiny embedded Wi-Fi module	Model	TinyCon2005
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

#### Horizontal

2390.000	PK (dB $\mu$ V/m)	51.29	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	--		54(dB $\mu$ V/m)
2400.000	PK (dB $\mu$ V/m)	65.91	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	49.06		54(dB $\mu$ V/m)

#### Vertical

2390.000	PK (dB $\mu$ V/m)	52.89	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	--		54(dB $\mu$ V/m)
2400.000	PK (dB $\mu$ V/m)	69.13	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	51.27		54(dB $\mu$ V/m)



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For 802.11g mode

CH11 at 54Mbps

### 10.4 Restricted band Measurement

EUT	tiny embedded Wi-Fi module	Model	TinyCon2005
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

#### Vertical

2483.500	PK (dB $\mu$ V/m)	48.86	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	--		54(dB $\mu$ V/m)

#### Horizontal

2483.500	PK (dB $\mu$ V/m)	45.06	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	--		54(dB $\mu$ V/m)



## 優耐檢測

Shenzhen United Testing Technology Co., Ltd.

Report No.: UNI-1410085

For 802.11n (HT20) mode

CH1 at 65Mbps

### 10.4 Restricted band Measurement

EUT	tiny embedded Wi-Fi module	Model	TinyCon2005
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

#### Vertical

2390.000	PK (dB $\mu$ V/m)	50.28	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	--		54(dB $\mu$ V/m)
2400.000	PK (dB $\mu$ V/m)	66.12	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	49.33		54(dB $\mu$ V/m)

#### Horizontal

2390.000	PK (dB $\mu$ V/m)	49.78	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	--		54(dB $\mu$ V/m)
2400.000	PK (dB $\mu$ V/m)	68.06	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	50.23		54(dB $\mu$ V/m)



## 優耐檢測

Shenzhen United Testing Technology Co., Ltd.

Report No.: UNI-1410085

For 802.11n (HT20) mode

CH11 at 65Mbps

### 10.4 Restricted band Measurement

EUT	tiny embedded Wi-Fi module	Model	TinyCon2005
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

#### Vertical

2483.500	PK (dB $\mu$ V/m)	49.12	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	--		54(dB $\mu$ V/m)

#### Horizontal

2483.500	PK (dB $\mu$ V/m)	46.06	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	--		54(dB $\mu$ V/m)



## 優耐檢測

Shenzhen United Testing Technology Co., Ltd.

Report No.: UNI-1410085

For 802.11n (HT40) mode

CH1 at 65Mbps

### 10.4 Restricted band Measurement

EUT	tiny embedded Wi-Fi module	Model	TinyCon2005
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

#### Horizontal

2390.000	PK (dB $\mu$ V/m)	61.08	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	43.22		54(dB $\mu$ V/m)
2400.000	PK (dB $\mu$ V/m)	66.72	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	48.16		54(dB $\mu$ V/m)

#### Vertical

2390.000	PK (dB $\mu$ V/m)	64.32	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	45.01		54(dB $\mu$ V/m)
2400.000	PK (dB $\mu$ V/m)	68.32	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	50.39		54(dB $\mu$ V/m)



# 優耐檢測

Shenzhen United Testing Technology Co., Ltd.

Report No.: UNI-1410085

For 802.11n (HT40) mode

CH7 at 65Mbps

## 10.4 Restricted band Measurement

EUT	tiny embedded Wi-Fi module	Model	TinyCon2005
Mode	Keeping Transmitting	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK

### Horizontal

2483.500	PK (dB $\mu$ V/m)	66.92	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	48.77		54(dB $\mu$ V/m)

### Vertical

2483.500	PK (dB $\mu$ V/m)	63.06	Limit	74(dB $\mu$ V/m)
	AV (dB $\mu$ V/m)	46.52		54(dB $\mu$ V/m)



## **11.0 Antenna Requirement**

### **11.1 Standard Applicable**

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitter antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### **11.2 Antenna Connected construction**

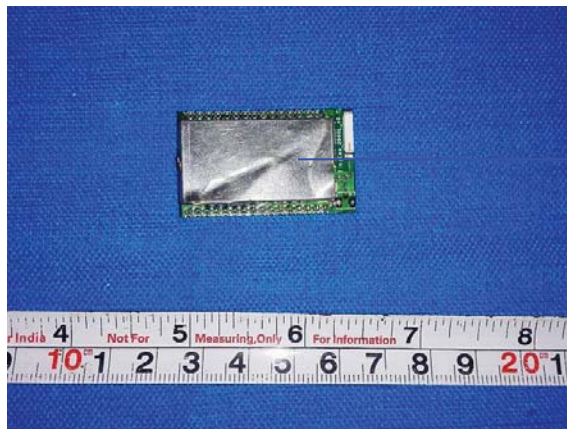
Ceramic antenna used. The maximum Gain of the antennas is -0.8dBi.

## 12.0 FCC ID Label

### FCC ID: 2ADGHTINYCON

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

#### Mark Location:

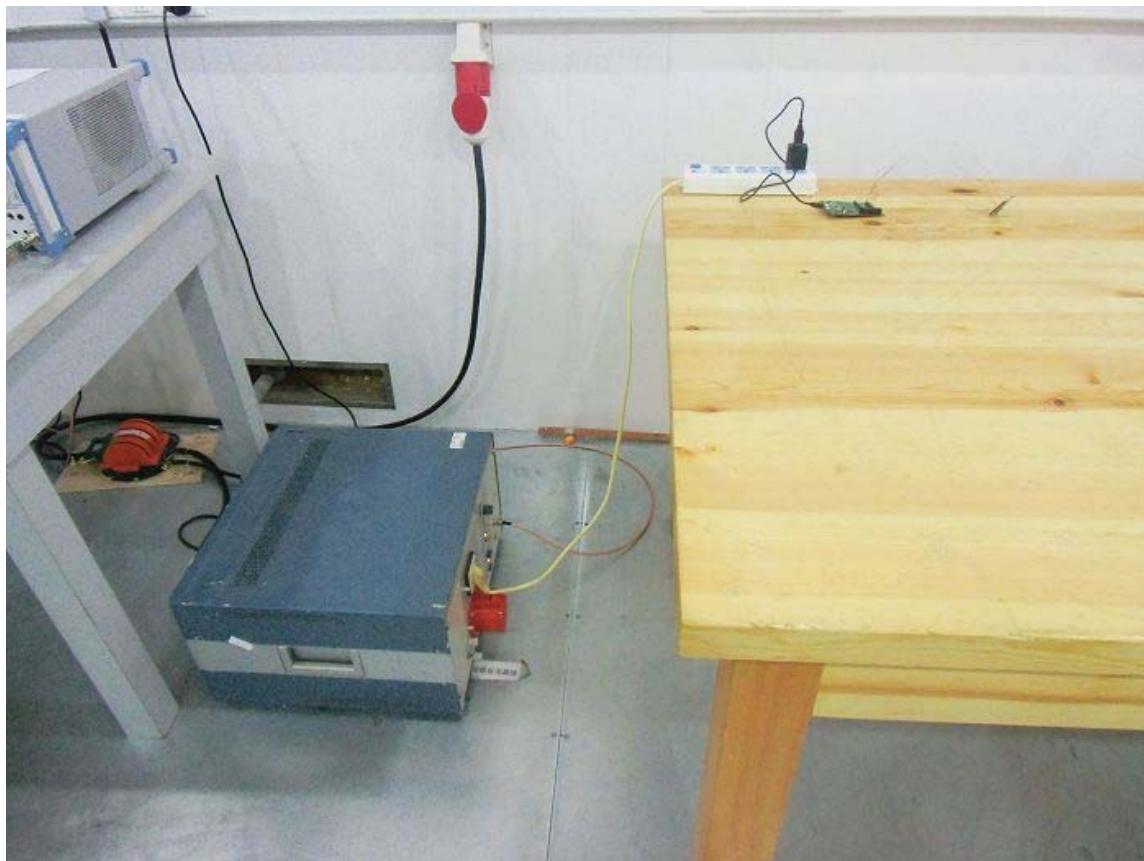


FCC ID Label Location

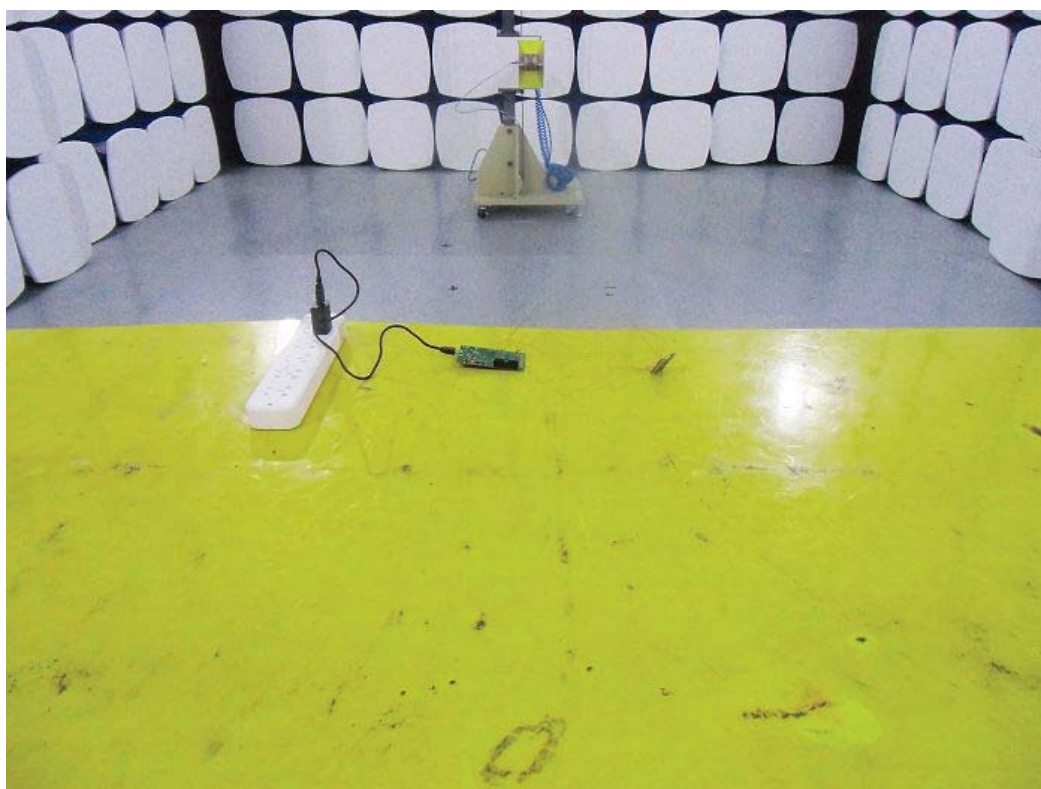
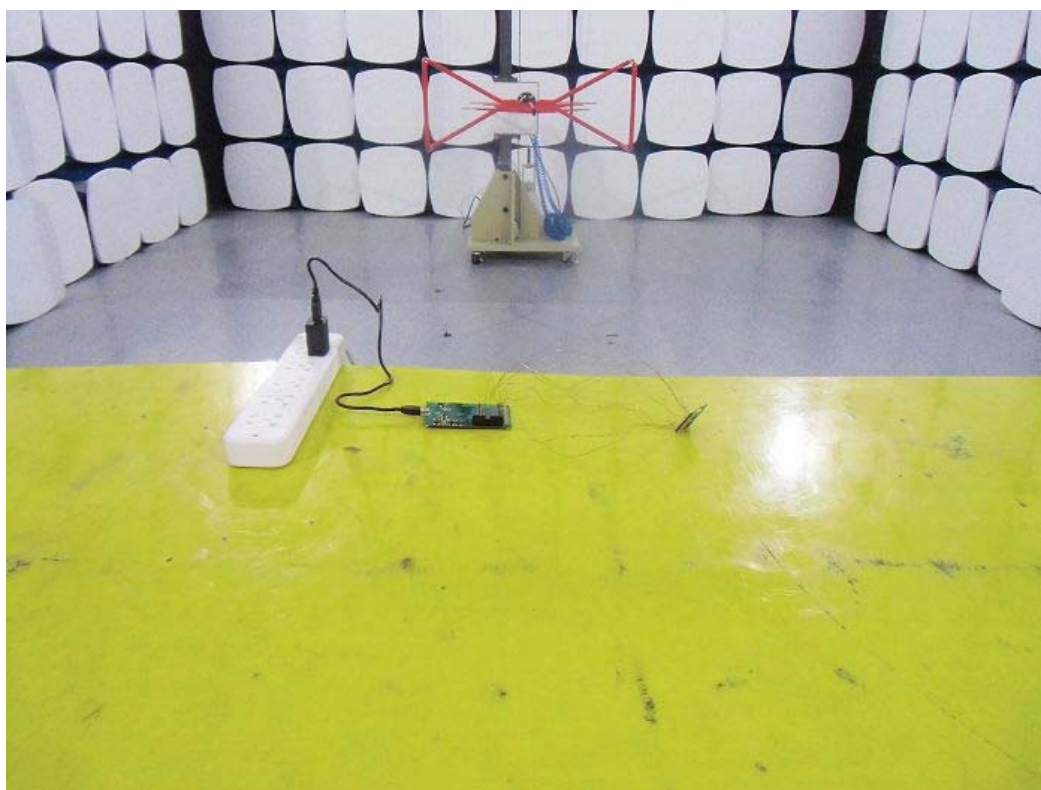


## 13 PHOTOGRAPHS OF THE TEST CONFIGURATION

### Conducted Emissions



Radiated Emissions





## PHOTOGRAPHS OF EUT

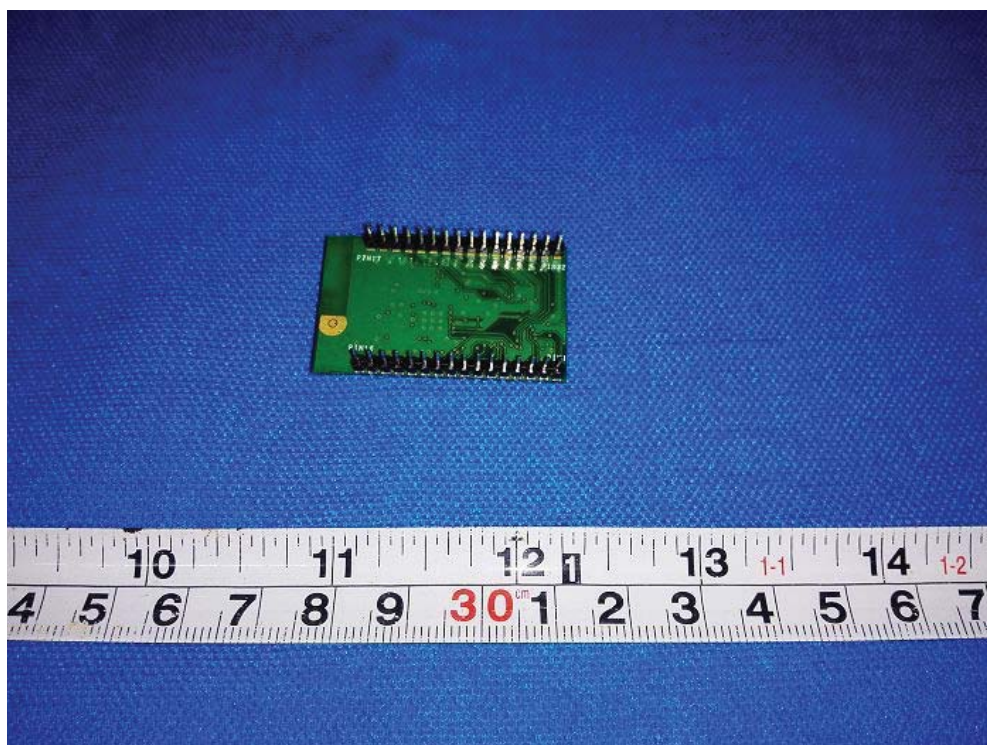


Photo 1

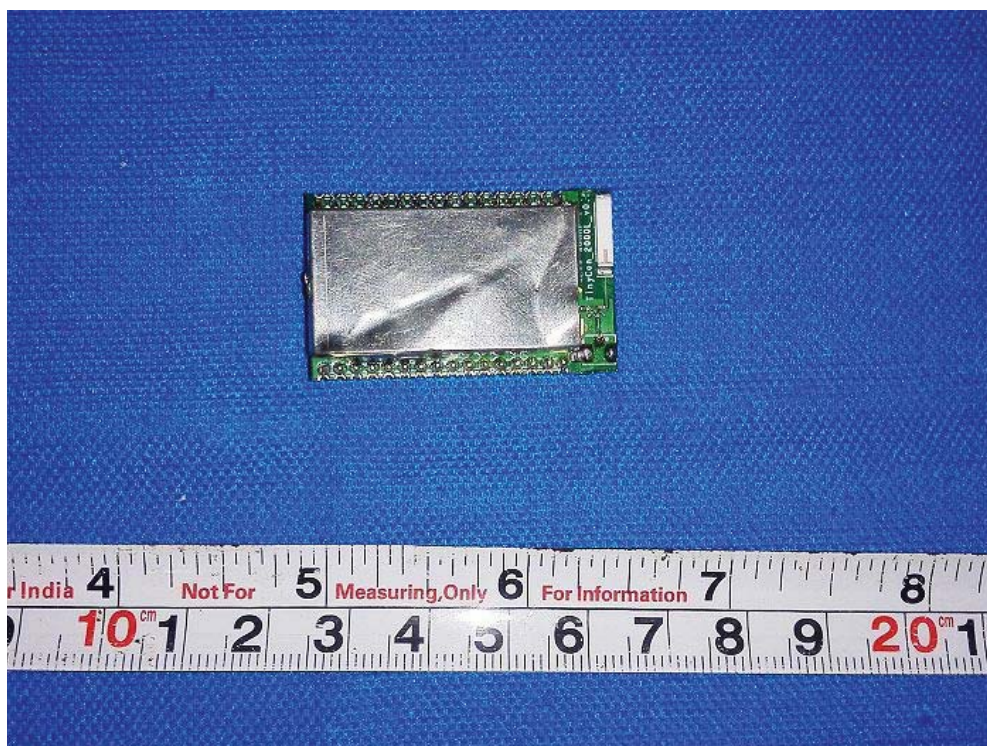


Photo 2

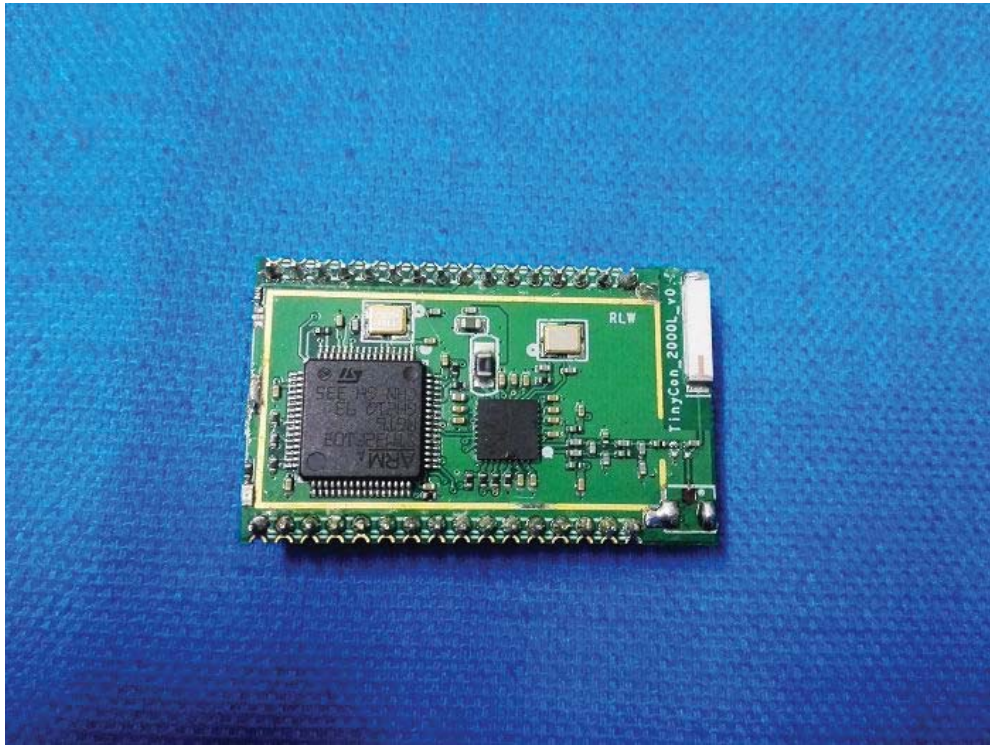


Photo 3

**The Report End**