



Report No.: RZA2010-1143RF15C-WiFi



Part 15C

TEST REPORT

Product Name modu W

Model modu W

FCC ID WQKW1000

Client modu LTD.

TA Technology (Shanghai) Co., Ltd.



GENERAL SUMMARY

Product Name	modu W	Model	modu W
FCC ID	WQKW1000	Report No.	RZA2010-1143RF15C-WiFi
Client	modu LTD.		
Manufacturer	YuHua TelTech(Shanghai) Co., Ltd.		
Reference Standard(s)	<p>FCC CFR47 Part 15C (2009-12) Radio Frequency Devices</p> <p>15.205 Restricted bands of operation;</p> <p>15.207 Conducted limits;</p> <p>15.209 Radiated emission limits; general requirements;</p> <p>15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850MHz.</p> <p>ANSI C63.4 Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9 KHz to 40GHz. (2003)</p> <p>KDB 558074 Measurement of Digital Transmission Systems Operating under Section 15.247 (2005)</p>		
Conclusion	<p>This portable wireless equipment has been measured in all cases requested by the relevant standards. Test results in Chapter 2 of this test report are below limits specified in the relevant standards.</p> <p>General Judgment: Pass</p> <p style="text-align: right;">(Stamp) 报告专用章 Date of issue: August 13th, 2010</p> 		
Comment	The test result only responds to the measured sample.		

Approved by 杨伟中 Revised by 徐凯 Performed by 杜瑞伟
 Yang Weizhong Xu Kai Du Ruwei

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 3 of 140

TABLE OF CONTENT

1. General Information	4
1.1. Notes of the test report	4
1.2. Testing laboratory	4
1.3. Applicant Information	5
1.4. Manufacturer Information.....	5
1.5. Information of EUT.....	6
1.6. Test Date	7
2. Test Information	8
2.1. Summary of test results	8
2.2. Peak Power Output –Conducted.....	9
2.3. Occupied Bandwidth (6dB)	29
2.4. Band Edge Compliance	34
2.5. Spurious Radiated Emissions in the restricted band.....	37
2.6. Power Spectral Density.....	42
2.7. Spurious RF Conducted Emissions	47
2.8. Radiates Emission	61
2.9. Conducted Emissions	111
2. Main Test Instruments	136
ANNEX A: EUT Appearance and Test Setup.....	137
A.1 EUT Appearance.....	137
A.2 Test Setup	139

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 4 of 140

1. General Information

1.1. Notes of the test report

TA Technology (Shanghai) Co., Ltd. guarantees the reliability of the data presented in this test report, which is the results of measurements and tests performed for the items under test on the date and under the conditions stated in this test report and is based on the knowledge and technical facilities available at TA Technology (Shanghai) Co., Ltd. at the time of execution of the test.

TA Technology (Shanghai) Co., Ltd. is liable to the client for the maintenance by its personnel of the confidentiality of all information related to the items under test and the results of the test. This report only refers to the item that has undergone the test.

This report standalone dose not constitute or imply by its own an approval of the product by the certification Bodies or competent Authorities. This report cannot be used partially or in full for publicity and/or promotional purposes without previous written approval of **TA Technology (Shanghai) Co., Ltd.** and the Accreditation Bodies, if it applies.

1.2. Testing laboratory

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong
City: Shanghai
Post code: 201201
Country: P. R. China
Contact: Yang Weizhong
Telephone: +86-021-50791141/2/3
Fax: +86-021-50791141/2/3-8000
Website: <http://www.ta-shanghai.com>
E-mail: yangweizhong@ta-shanghai.com

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 5 of 140

1.3. Applicant Information

Company: modu LTD.
Address: Atir-Yeda 17
City: Kefar-Saba
Postal Code: 44643
Country: Israel
Contact: Guy Badichi
Telephone: 972-54-9222168
Fax: 972-9-8648383

1.4. Manufacturer Information

Company: YuHua TelTech(Shanghai) Co., Ltd.
Address: 4F/2,District B,No.1000 Jinhai Road,Pudong,Shanghai,
City: Shanghai
Postal Code: /
Country: P.R.China
Telephone: 021-51156088-1707
Fax: 021-51156099

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 6 of 140

1.5. Information of EUT

General information

Name of EUT:	modu W
Device Operating Configurations:	
IMEI or SN:	A0303001E0000121
Network Standards:	802.11b, 802.11g
Test Modulation:	DSSS OFDM CCK
Antenna Type:	Internal Antenna
Power Supply:	Battery or Adapter
Max Conducted Power	14.55dBm
Extreme Voltage:	Minimum: 3.45V Maximum: 4.2V
Extreme Temperature:	Lowest: -20°C Highest: +55°C
Operating Frequency Range(s)	2400MHz~ 2483.5 MHz
Hardware Version:	MUW-T
Software Version:	MUW-V

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 7 of 140

Auxiliary equipment details

AE1: Battery

Model: US293350
Manufacturer: Formosa
S/N: /

AE2: Adapter

Model: DCH3-050US-0002
Manufacturer: Emerson
S/N: /

AE2: Earphone(Black)

Model: SL-600
Manufacturer: Fujikon
S/N: /

AE3: Earphone(White)

Model: WS-EC-638
Manufacturer: WELLSONIC
S/N: /

Equipment Under Test (EUT) is model W. The detail about these is in chapter 1.5 in this report. The EUT supports WiFi.

The sample under test was selected by the Client.

Components list please refer to documents of the manufacturer.

1.6. Test Date

The test is performed from July 27, 2010 to August 13, 2010.

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 8 of 140

2. Test Information

2.1. Summary of test results

Number	Summary of measurements of results	Clause in FCC rules	Verdict
1	Peak Power Output –Conducted	15.247(b)(3)	PASS
2	Minimum 6dB bandwidth	15.247(a)(2)	PASS
3	Band Edges compliance	15.247(d)	PASS
4	Spurious Radiated Emissions in the restricted band	15.247(d),15.205,15.209	PASS
5	Power spectral Density	15.247(e)	PASS
6	Conducted Spurious Emission	15.247	PASS
7	Radiates Emission	15.247(d),15.205,15.209	PASS
8	Conducted Emissions	15.207,15.107	PASS

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 9 of 140

2.2. Peak Power Output –Conducted

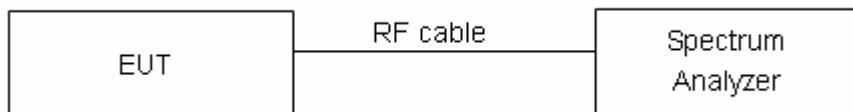
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~ 25°C	45% ~ 50%	101.5kPa

Methods of Measurement

During the process of the testing, The EUT was connected to the spectrum analyzer through an external attenuator and a known loss cable. The EUT is max power transmission with proper modulation. The peak detector is used.RBW is set to 1MHz,VBW is set to 1MHz.These measurements have been tested at following channels: 1, 6, and 11. We use the Method #3 in KDB 558074 for this test.

Test Setup



Limits

Rule Part 15.247 (b) (3) specifies that " For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt."

Peak Output Power	≤ 1W (30dBm)
-------------------	--------------

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$. $U = 0.44$ dB.

TA Technology (Shanghai) Co., Ltd.
Test Report

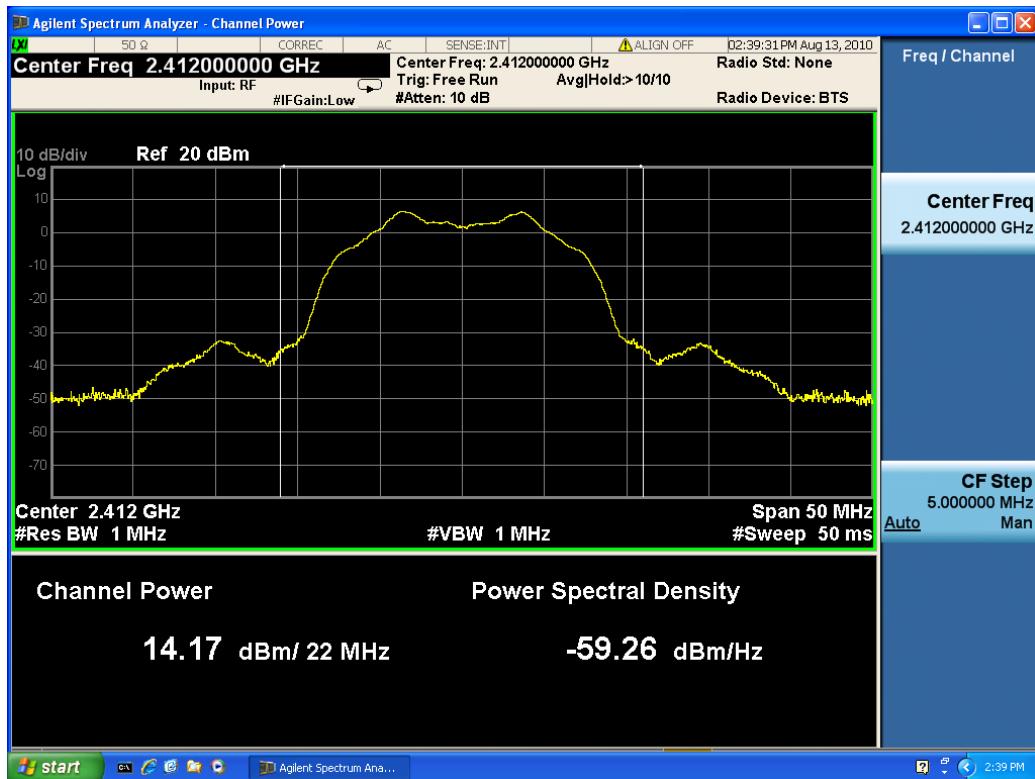
Report No.: RZA2010-1143RF15C-WiFi

Page 10 of 140

Test Results: Pass

Network Standards	Rate (Mbps)	Peak Output Power (dBm)		
		CH 1	CH 6	CH 11
802.11b	1	14.17	14.46	14.55
	2	14.16	14.45	14.26
	5.5	14.16	14.43	14.54
	11	13.98	14.44	14.01
802.11g	6	10.50	10.10	10.07
	9	10.48	9.83	10.03
	12	10.17	9.93	9.89
	18	10.19	9.75	9.94
	24	10.20	9.73	9.92
	36	10.11	10.01	9.93
	48	10.15	9.89	9.98
	54	10.16	9.84	9.90

802.11b

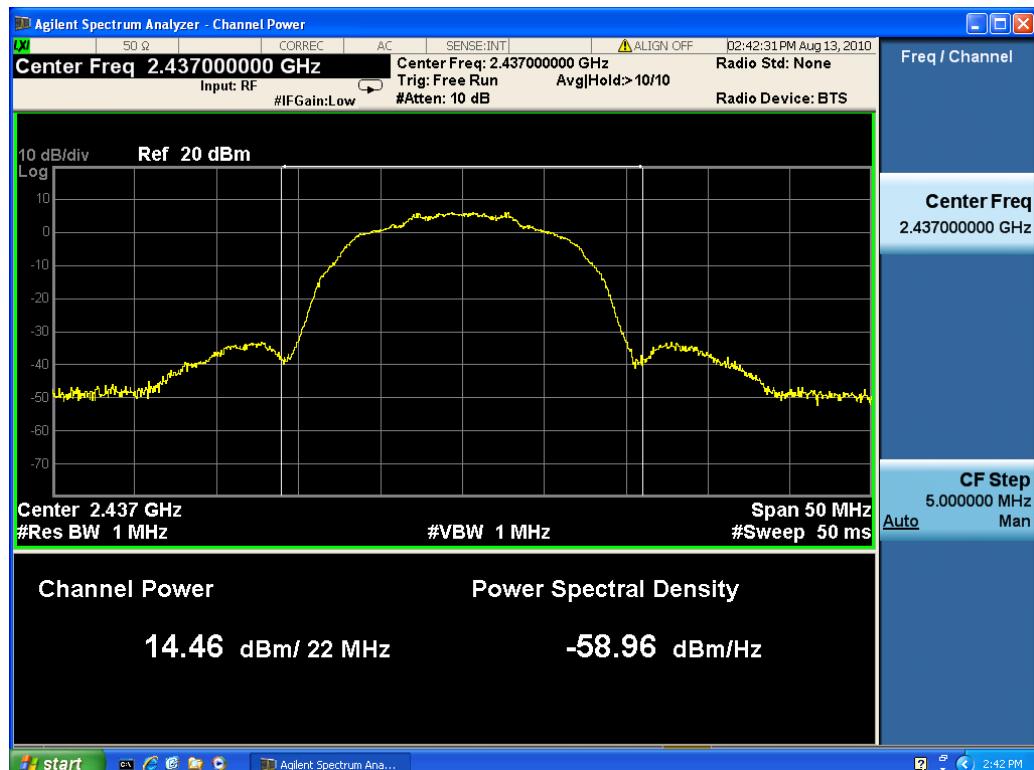


Channel1, Rate 1(Mbps)

TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 11 of 140



Channel 6, Rate 1(Mbps)



Channel 11, Rate 1(Mbps)

TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

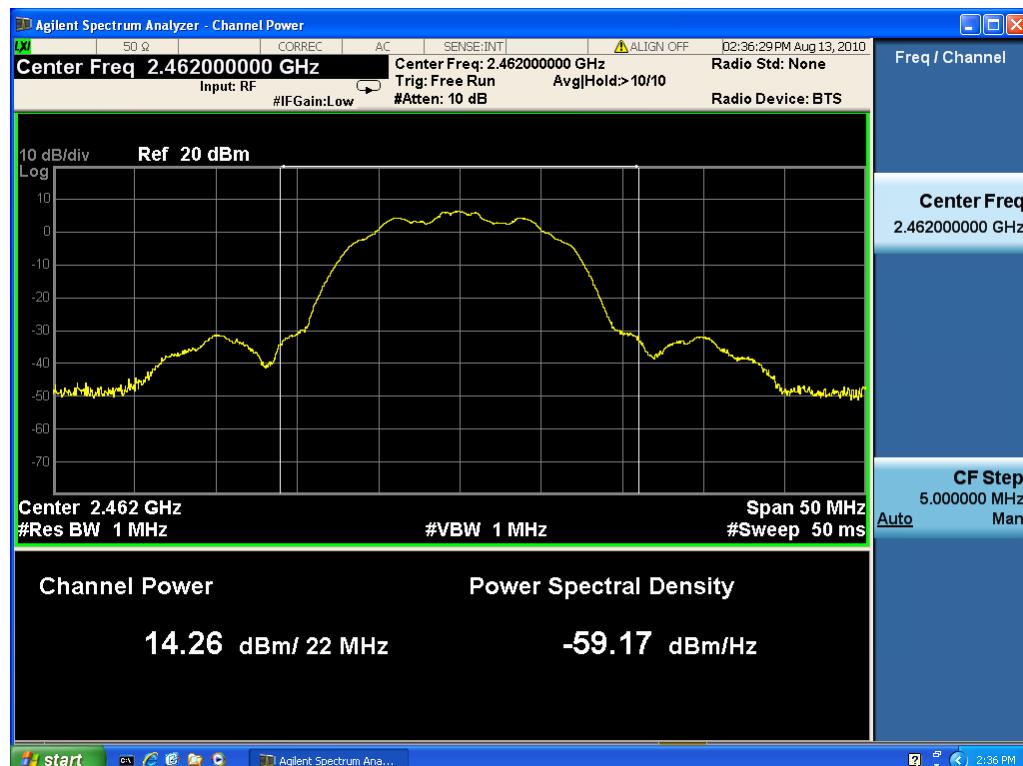
Page 12of 140



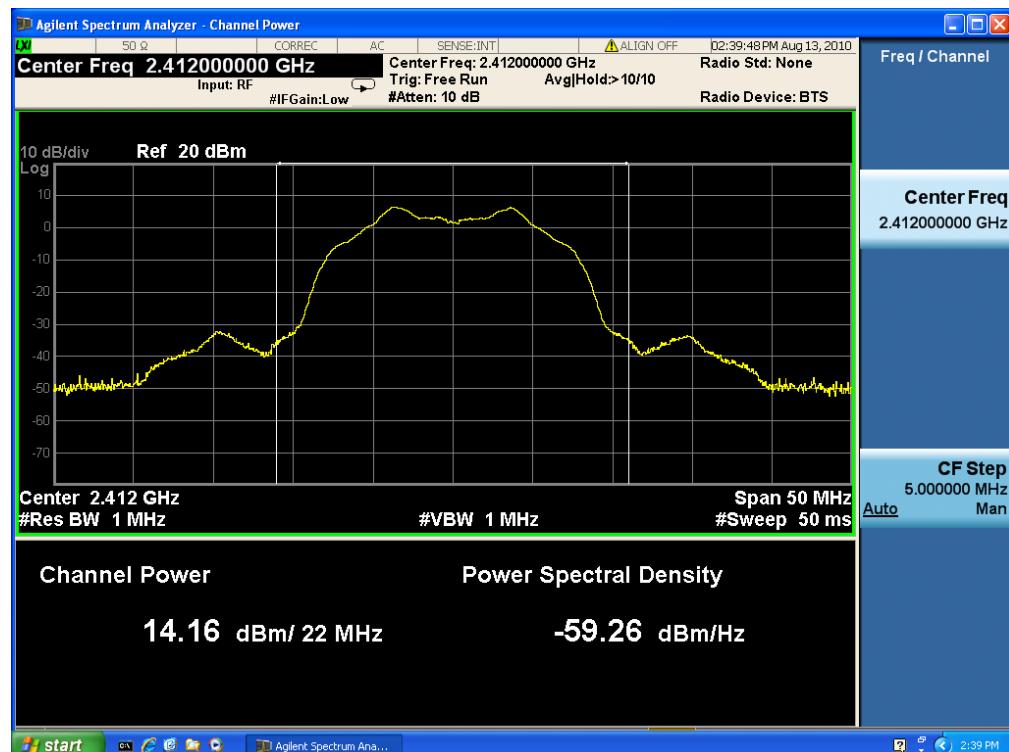
TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 13of 140



Channel 11,Rate 2(Mbps)



Channel1,Rate 5.5(Mbps)

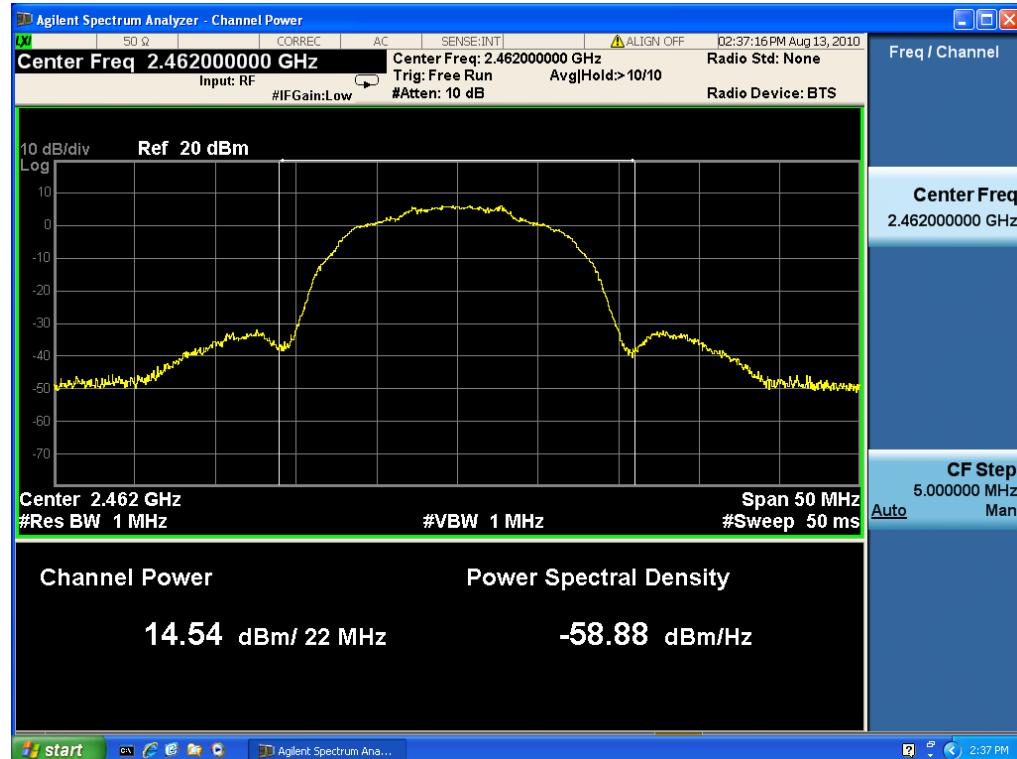
TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 14of 140



Channel 6, Rate 5.5(Mbps)



Channel 11, Rate 5.5(Mbps)

TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 15of 140



Channel 1,Rate 11(Mbps)

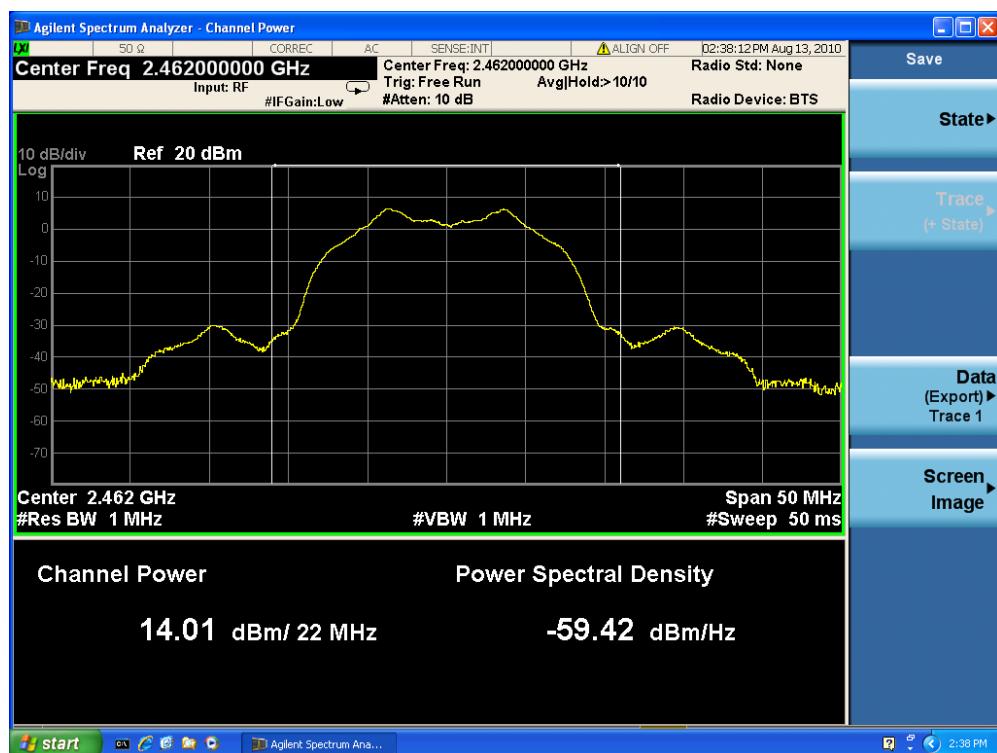


Channel 6,Rate 11(Mbps)

TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 16of 140



TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 17of 140

802.11g



Channel1,Rate 6(Mbps)



Channel 6,Rate 6(Mbps)

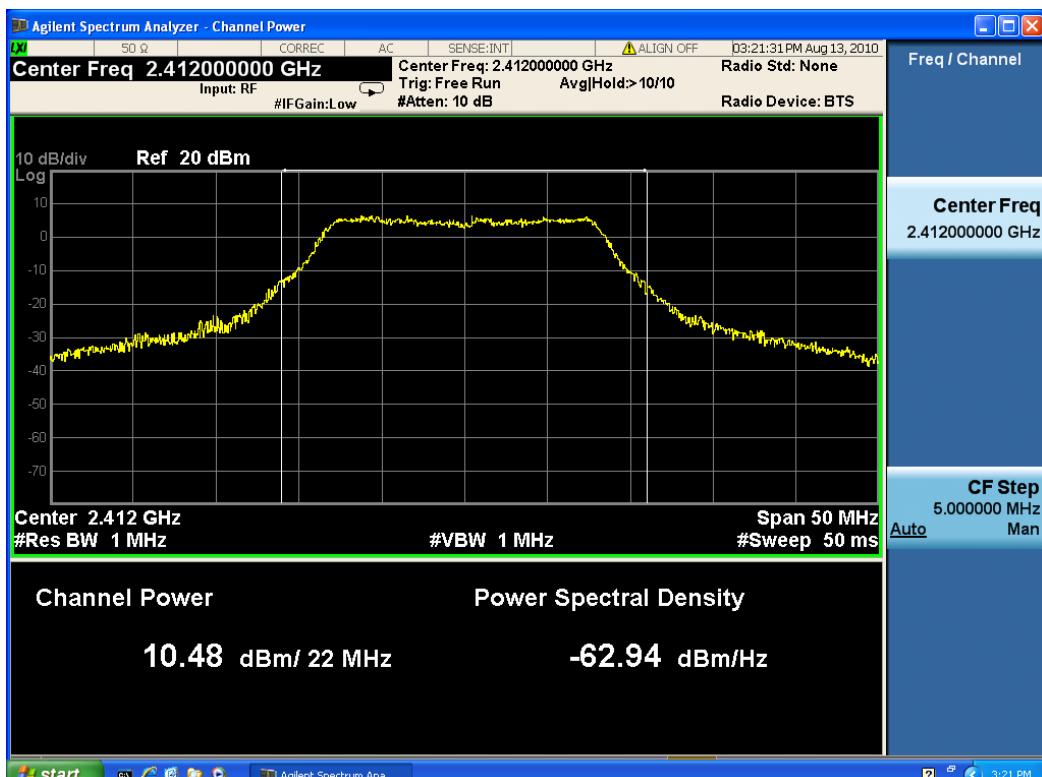
TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 18of 140



Channel 11, Rate 6(Mbps)



Channel 1, Rate 9(Mbps)

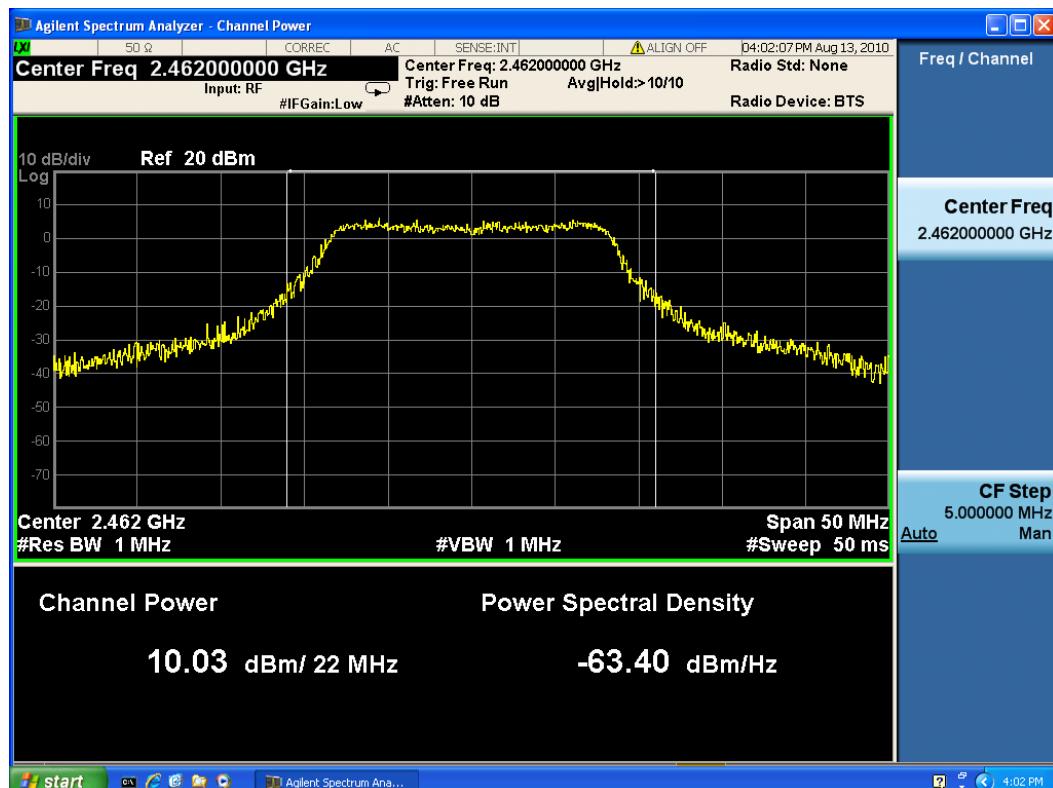
TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 19of 140



Channel 6,Rate 9(Mbps)



Channel 11,Rate 9(Mbps)

TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 20 of 140



Channel1,Rate 12(Mbps)



Channel 6, Rate 12(Mbps)

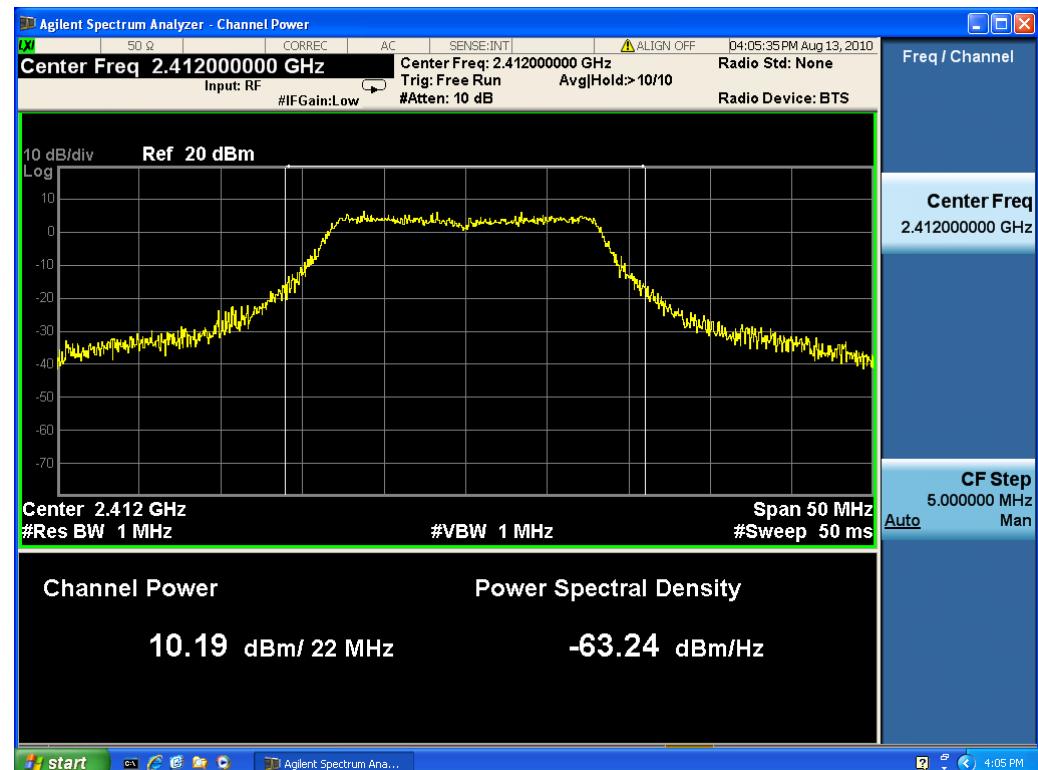
TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 21of 140



Channel 11,Rate 12(Mbps)

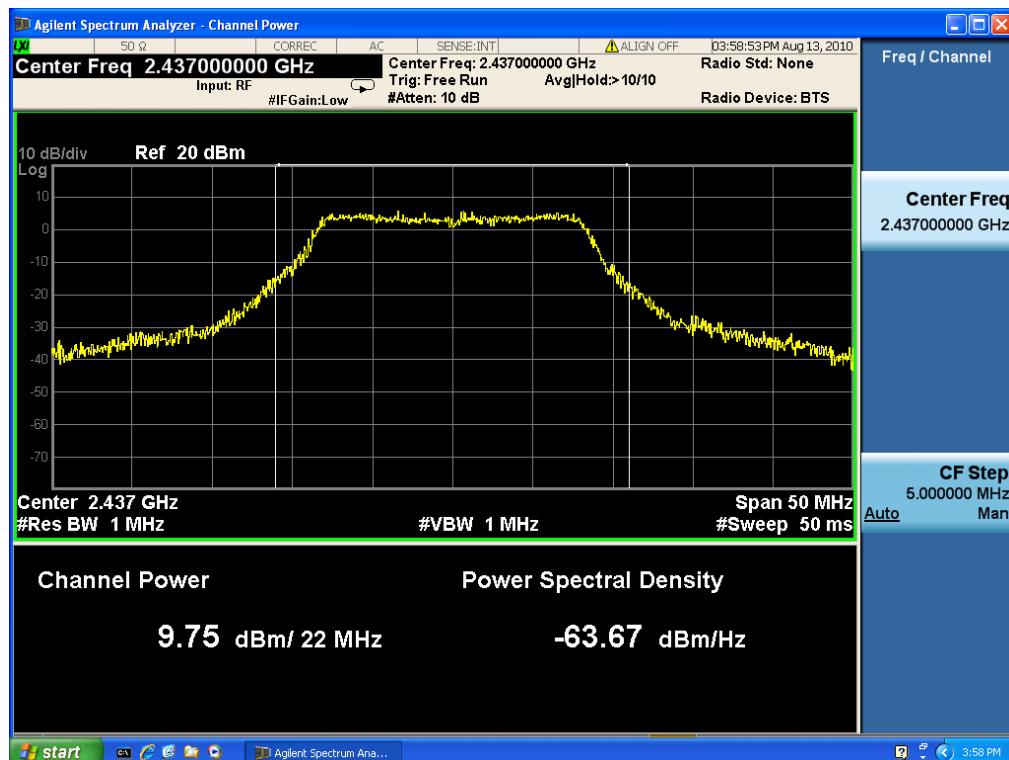


Channel 1,Rate 18(Mbps)

TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 22of 140



Channel 6,Rate 18(Mbps)

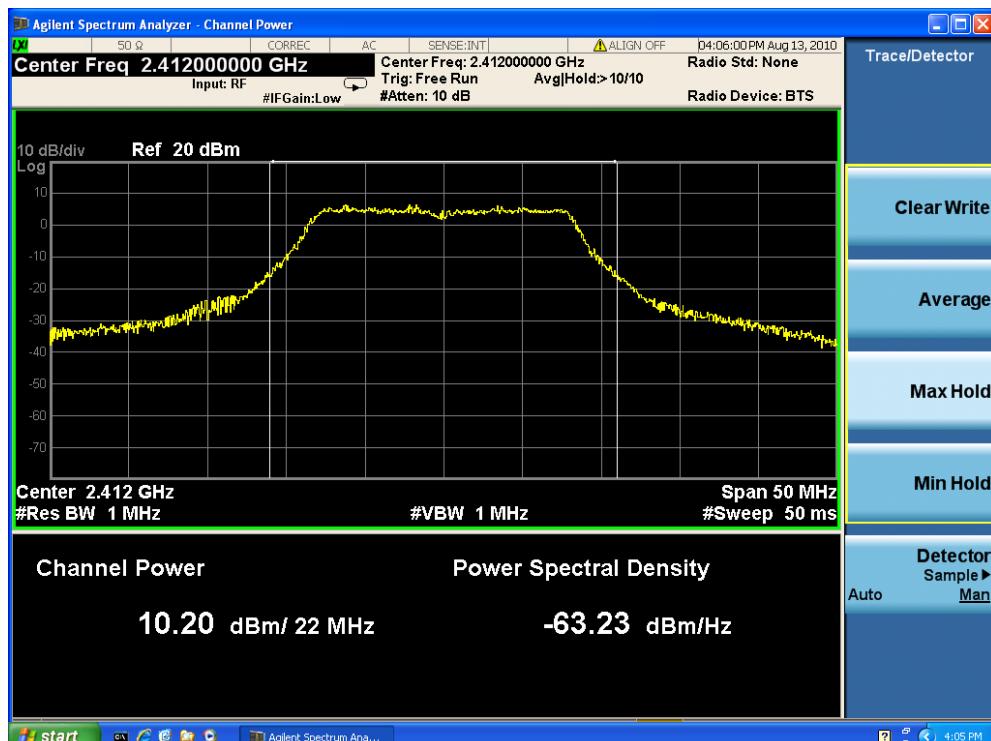


Channel 11,Rate 18(Mbps)

TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 23of 140



Channel1,Rate 24(Mbps)



Channel 6,Rate 24(Mbps)

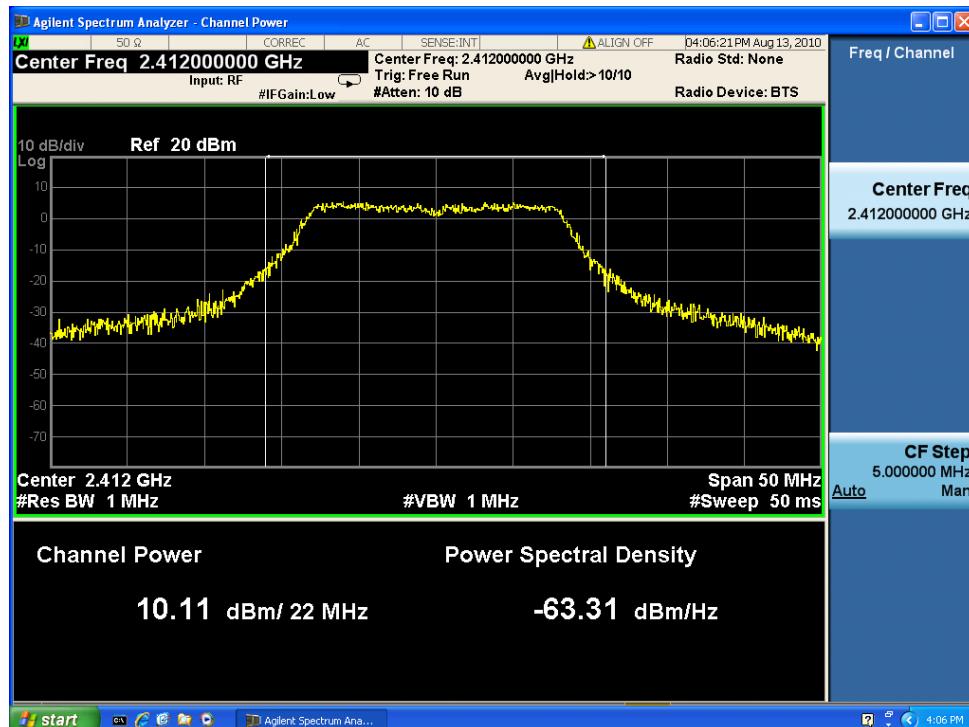
TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 24of 140



Channel 11,Rate 24(Mbps)



Channel 1,Rate 36(Mbps)

TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 25of 140



Channel 6, Rate 36(Mbps)

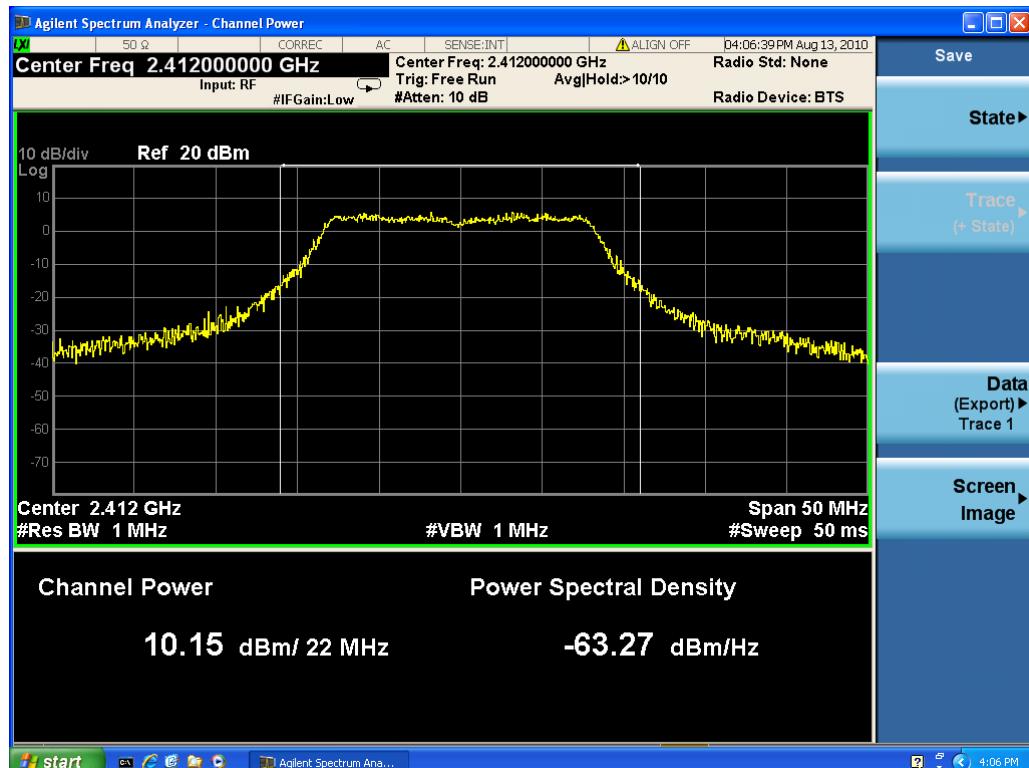


Channel 11, Rate 36(Mbps)

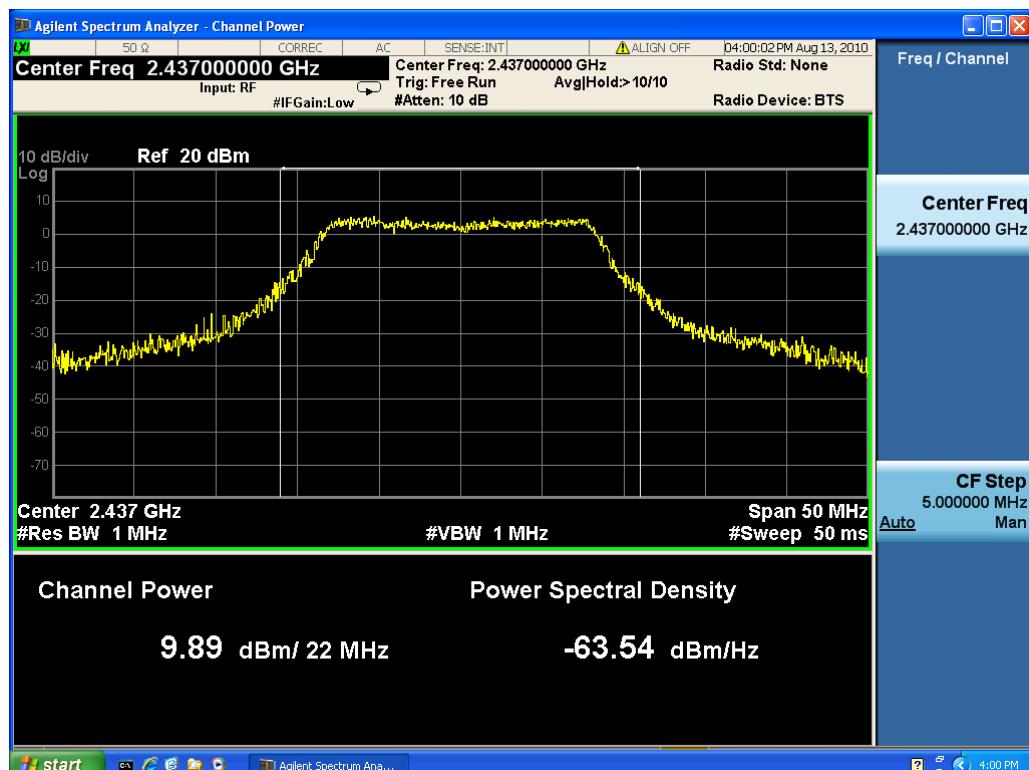
TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 26 of 140



Channel1, Rate 48(Mbps)



Channel 6, Rate 48(Mbps)

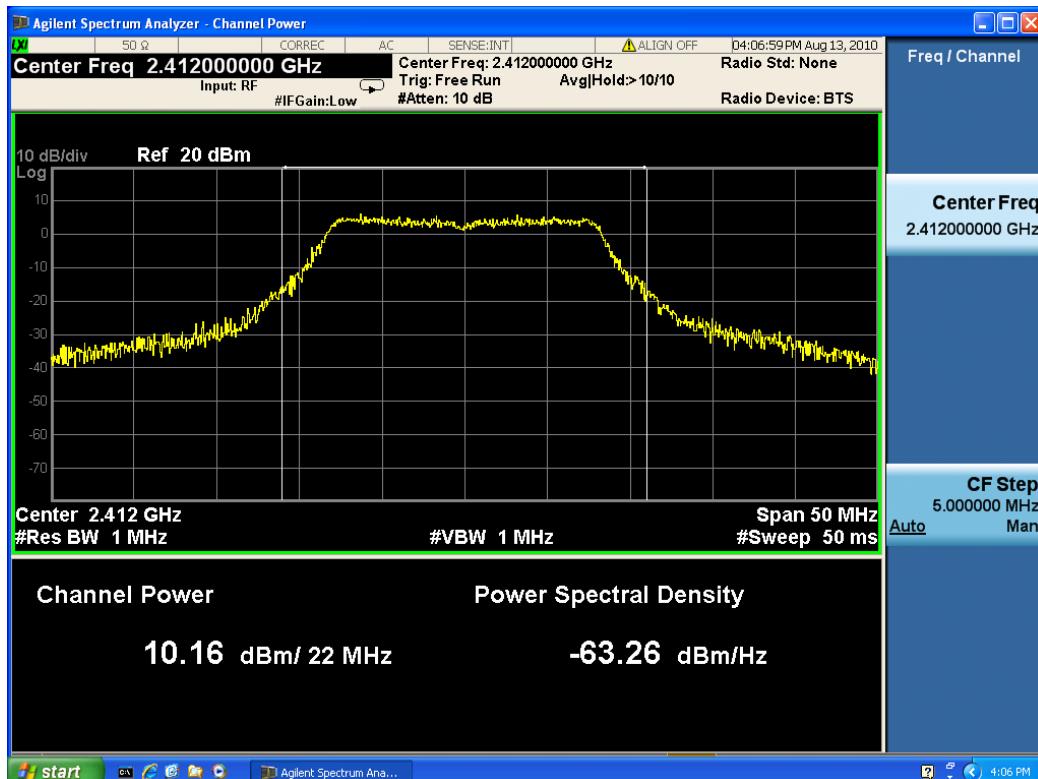
TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 27 of 140



Channel 11, Rate 48(Mbps)



Channel 1, Rate 54(Mbps)

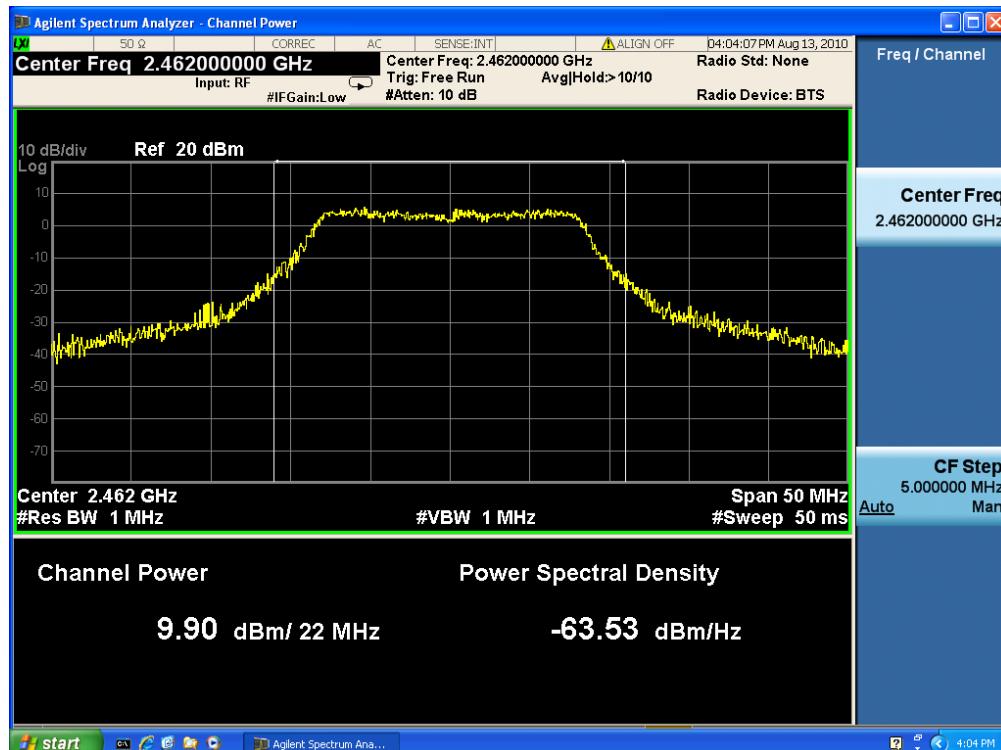
TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 28 of 140



Channel 6, Rate 54(Mbps)



Channel 11, Rate 54(Mbps)

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 29 of 140

2.3. Occupied Bandwidth (6dB)

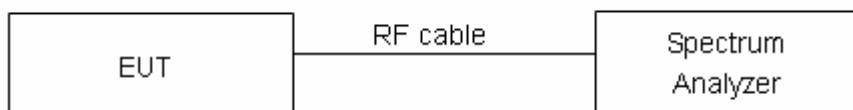
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable. RBW is set to 100 kHz, VBW is set to 300 kHz on spectrum analyzer.

Test Setup



Limits

Rule Part 15.247 (a) (2) specifies that “Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.”

minimum 6 dB bandwidth	≥ 500 kHz
------------------------	----------------

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$. $U = 936$ Hz.

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 30 of 140

Test Results:

Network Standards	Bit Rate	Carrier frequency (MHz)	Minimum 6 dB bandwidth (MHz)	Conclusion
802.11b	1Mbps	2412	10.07	PASS
		2437	9.823	PASS
		2462	9.833	PASS
802.11g	6Mbps	2412	16.55	PASS
		2437	16.56	PASS
		2462	16.52	PASS

802.11b

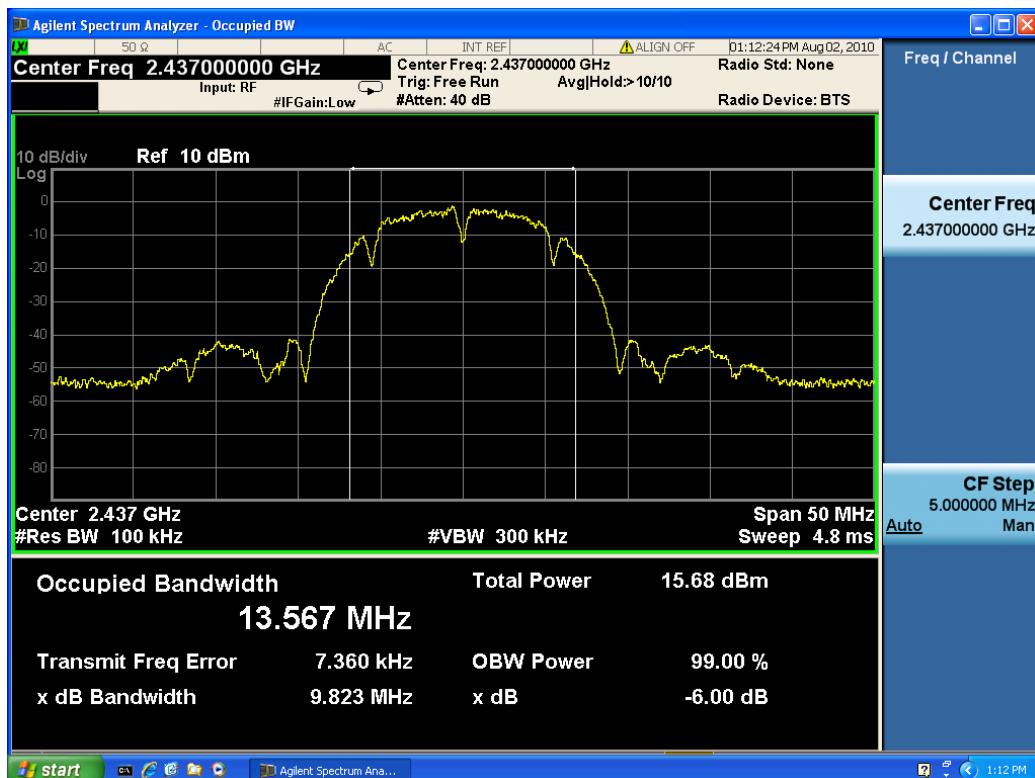


802.11b, Carrier frequency (MHz): 2412

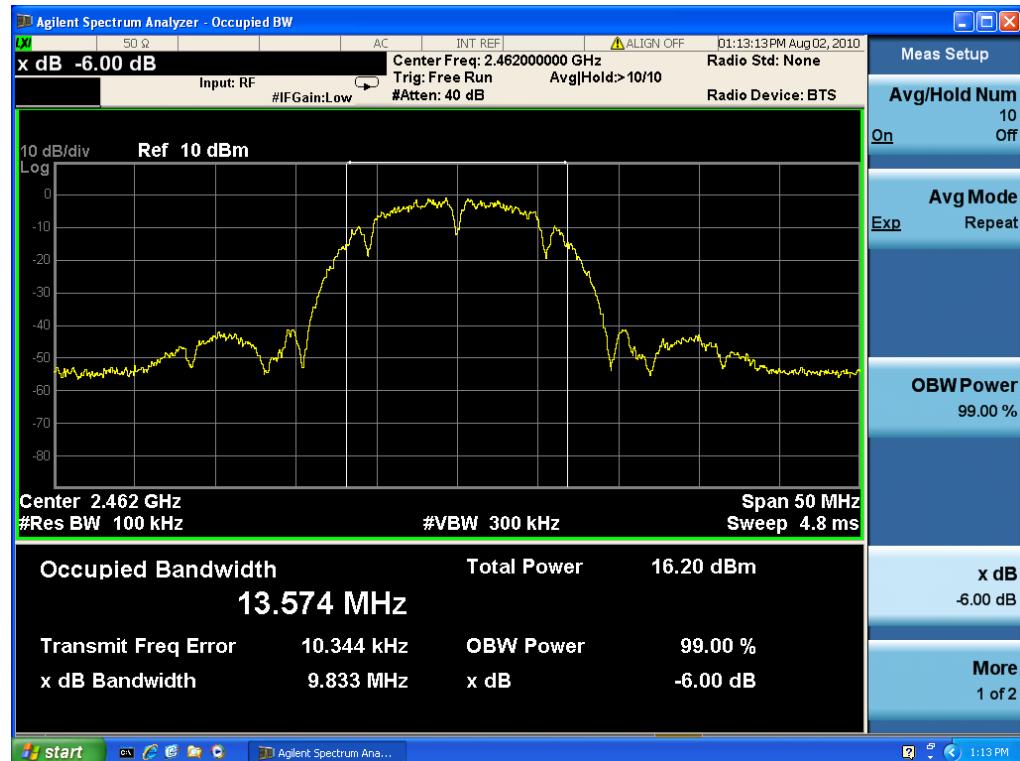
TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 31 of 140



802.11b, Carrier frequency (MHz): 2437



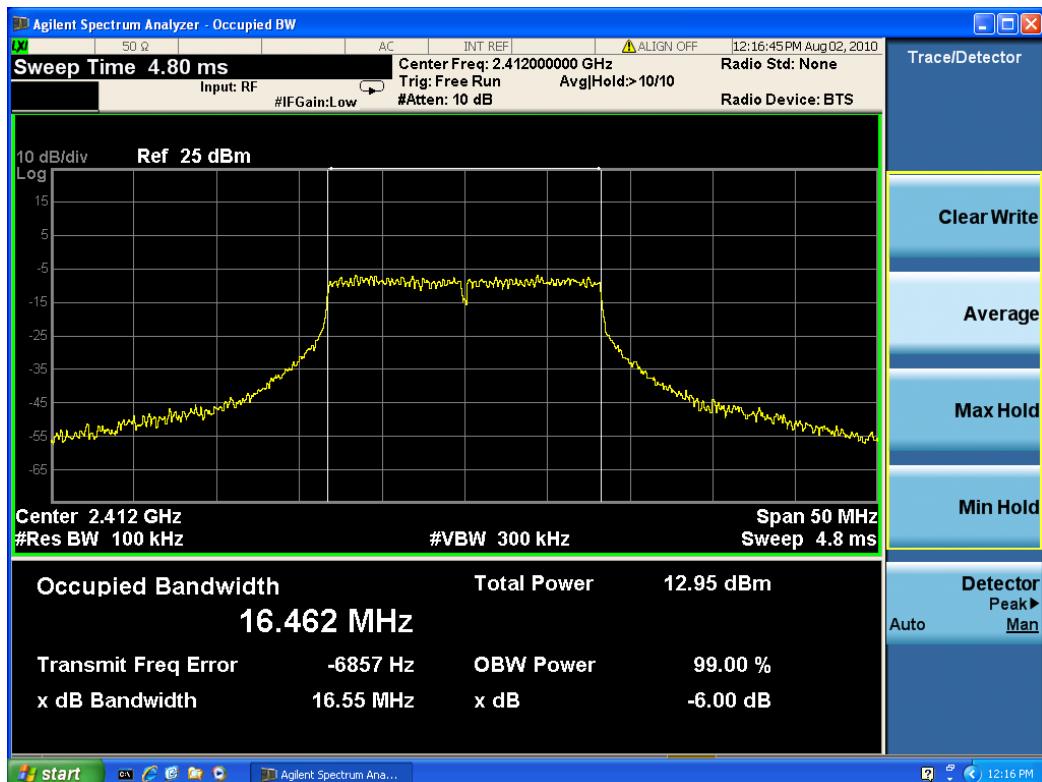
802.11b, Carrier frequency (MHz): 2462

TA Technology (Shanghai) Co., Ltd.
Test Report

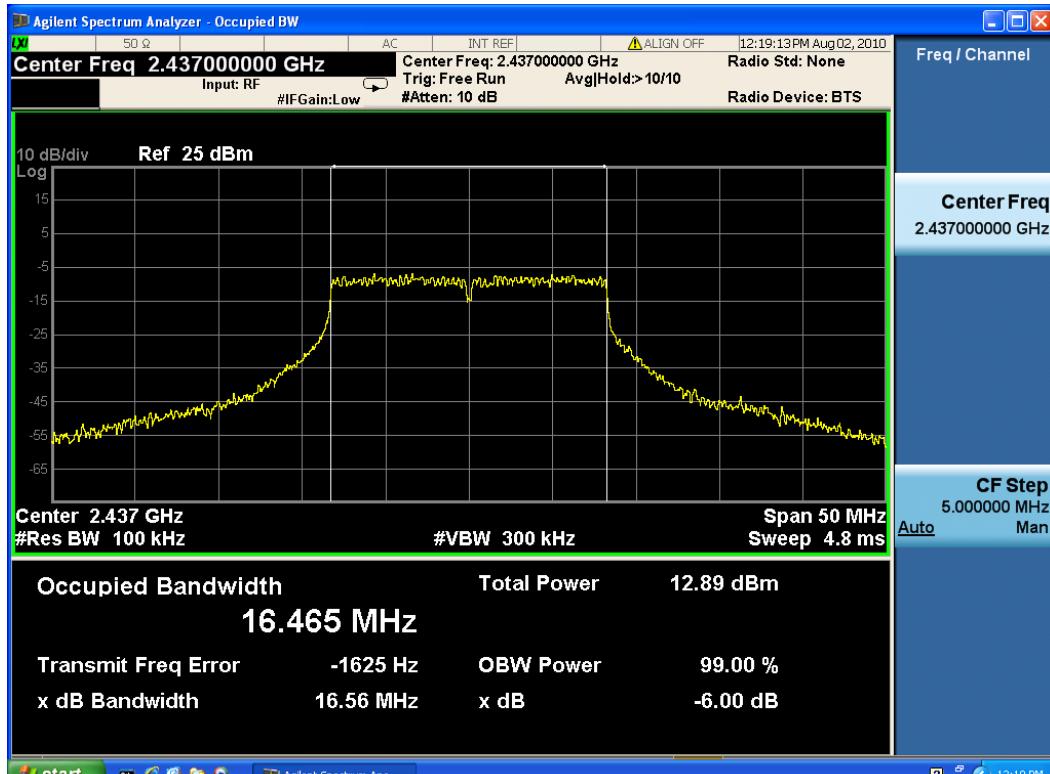
Report No.: RZA2010-1143RF15C-WiFi

Page 32 of 140

802.11g



802.11g, Carrier frequency (MHz): 2412

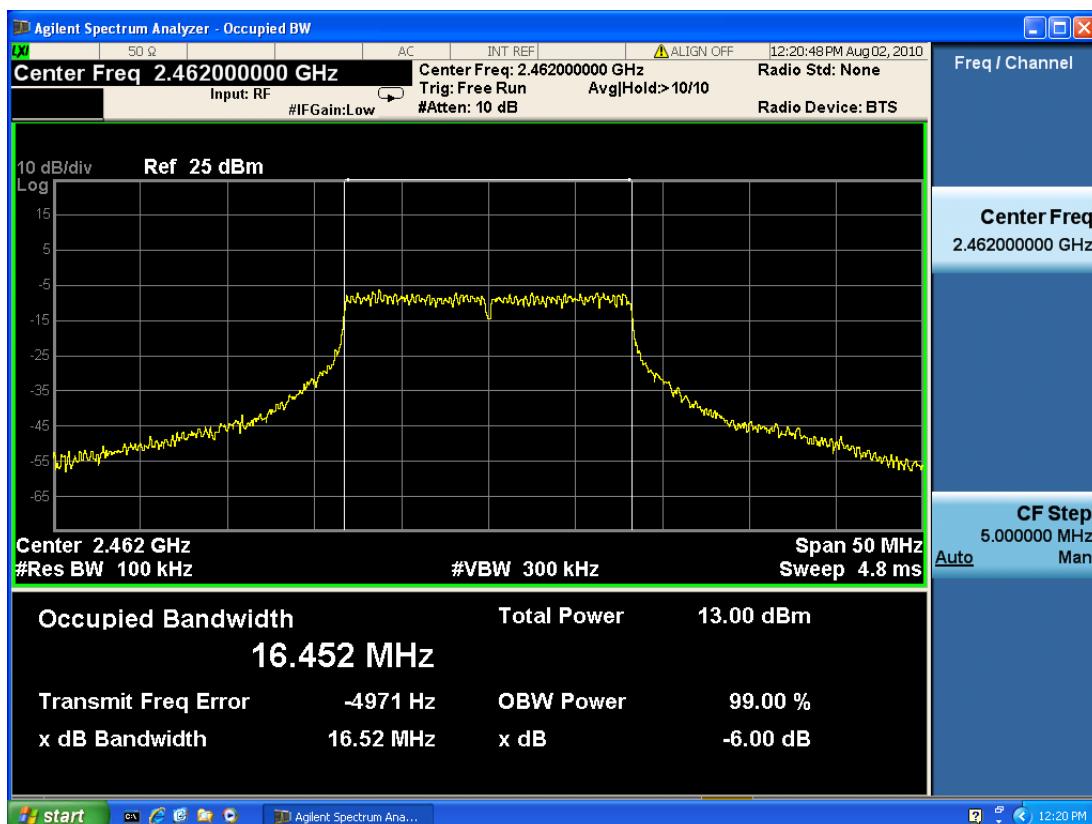


802.11g, Carrier frequency (MHz): 2437

TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 33 of 140



802.11g, Carrier frequency (MHz): 2462

TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 34 of 140

2.4. Band Edge Compliance

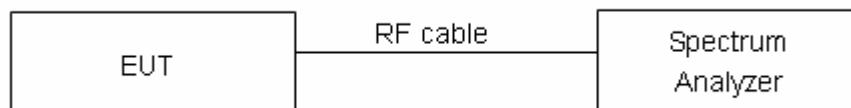
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable the band edge of the lowest and highest channels were measured. The peak detector is used and RBW is set to 100kHz and VBW is set to 300kHz on spectrum analyzer. Spectrum analyzer plots are included on the following pages.

Test Setup



Limits

Rule Part 15.247(d) specifies that “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.”

Limit	≥20 dB
-------	--------

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
2GHz-3GHz	1.407 dB

TA Technology (Shanghai) Co., Ltd.

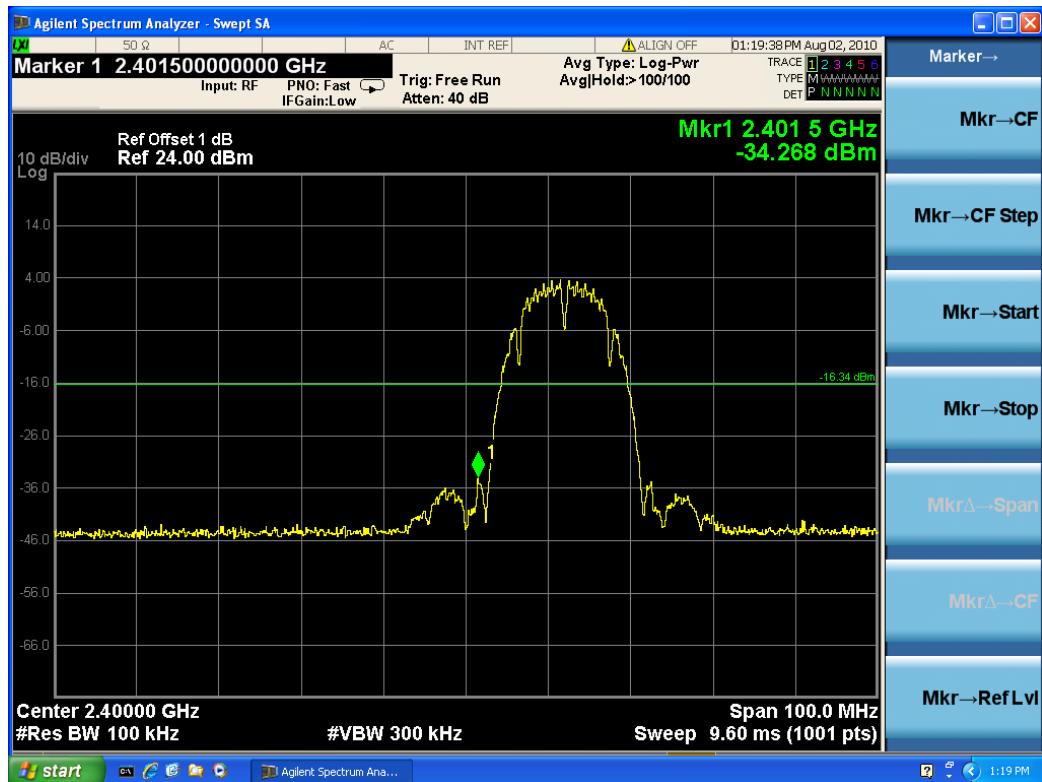
Test Report

Report No.: RZA2010-1143RF15C-WiFi

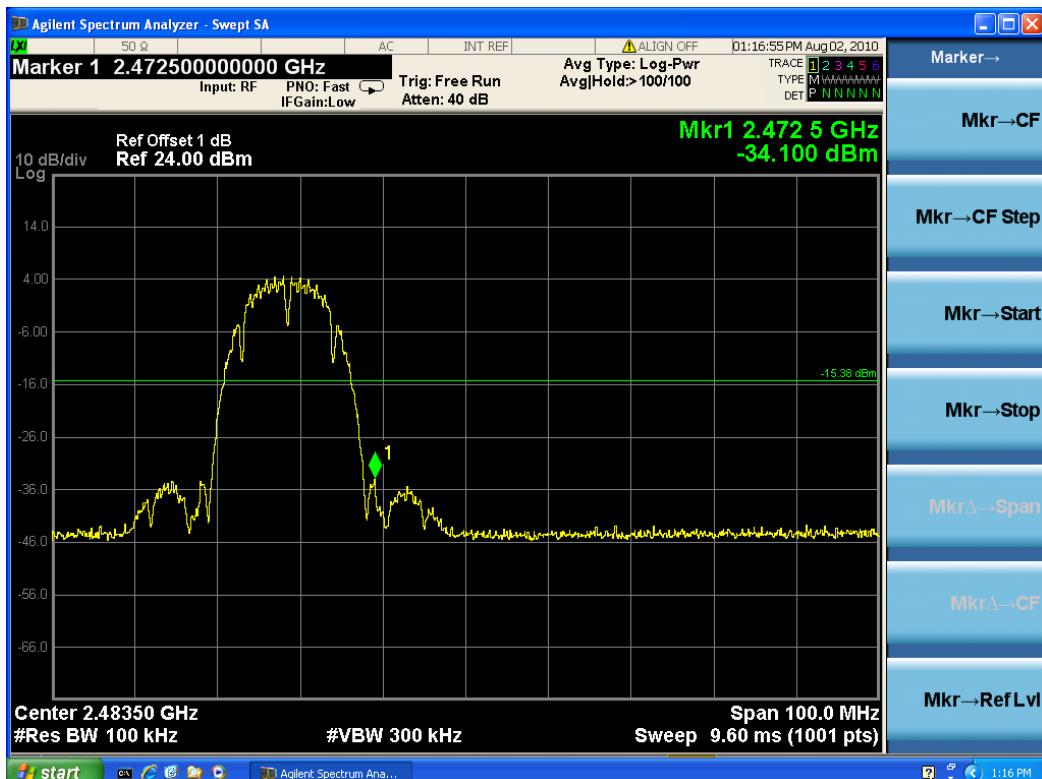
Page 35 of 140

Test Results:

802.11b



802.11b, Channel No.: 1



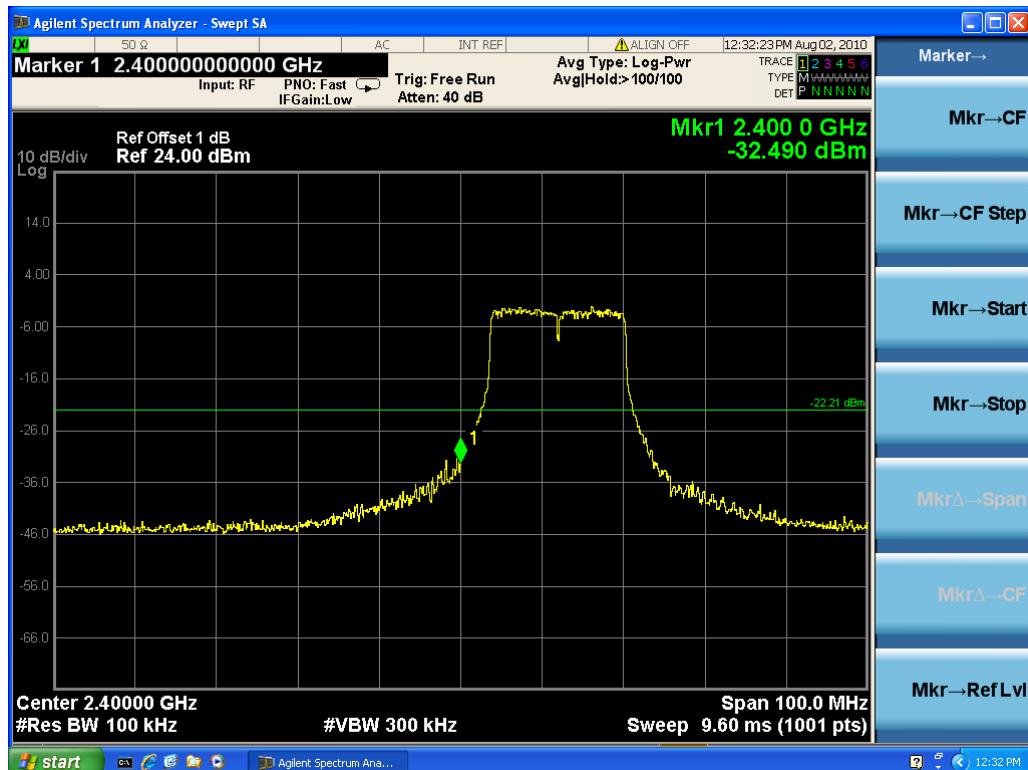
802.11b, Channel No.: 11

TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 36of 140

802.11g



802.11g, Channel No.: 1



802.11g, Channel No.: 11

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 37 of 140

2.5. Spurious Radiated Emissions in the restricted band

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. RBW is set to 100kHz. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.

Set the spectrum analyzer in the following:

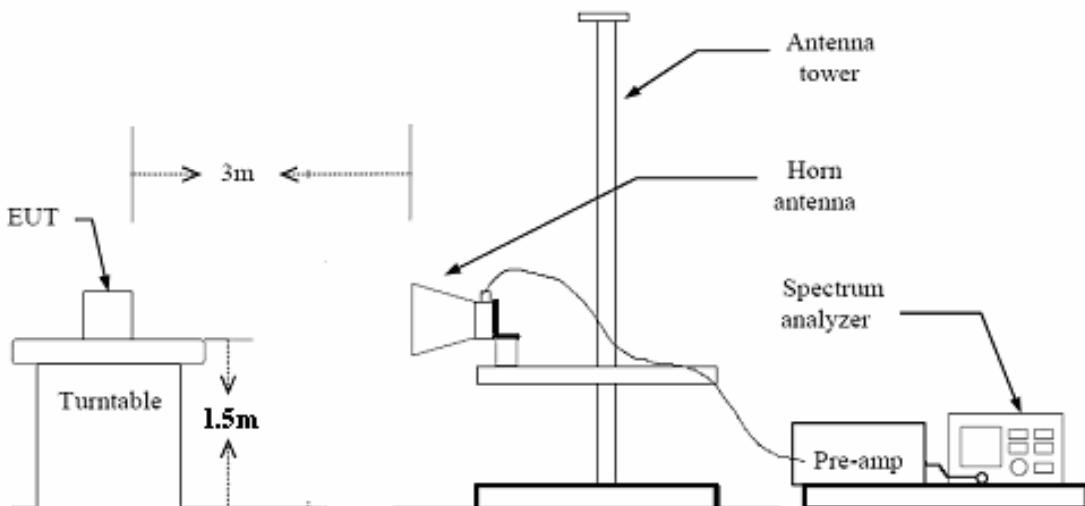
- PEAK: RBW=VBW=1MHz / Sweep=AUTO
- AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

This setting method can refer to **KDB 558074**.

EUT in X-axis orientation is the worst case, the test is only for this case.

The test is in transmit mode.

Test setup



TA Technology (Shanghai) Co., Ltd.

Test Report

Limits

Rule Part 15.247(d) specifies that “In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).”

Limit in restricted band

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

§15.35(b)

There is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$. $U=3.92$ dB.

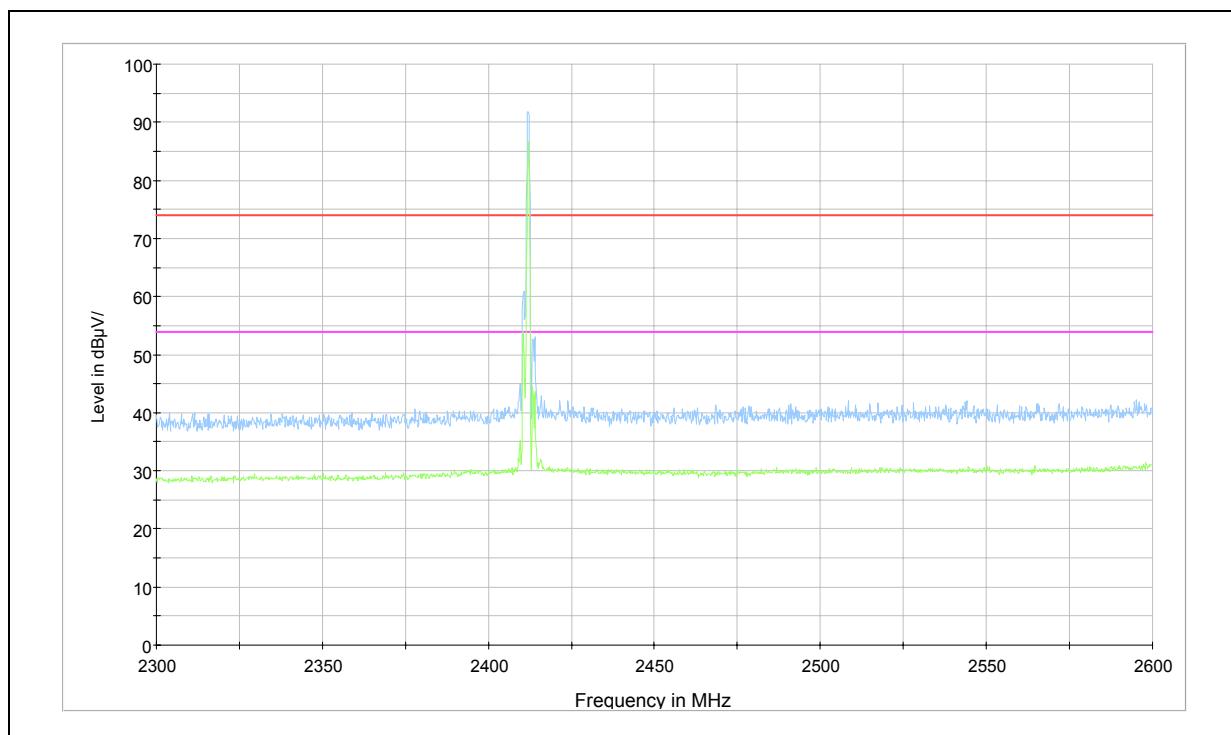
TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 39 of 140

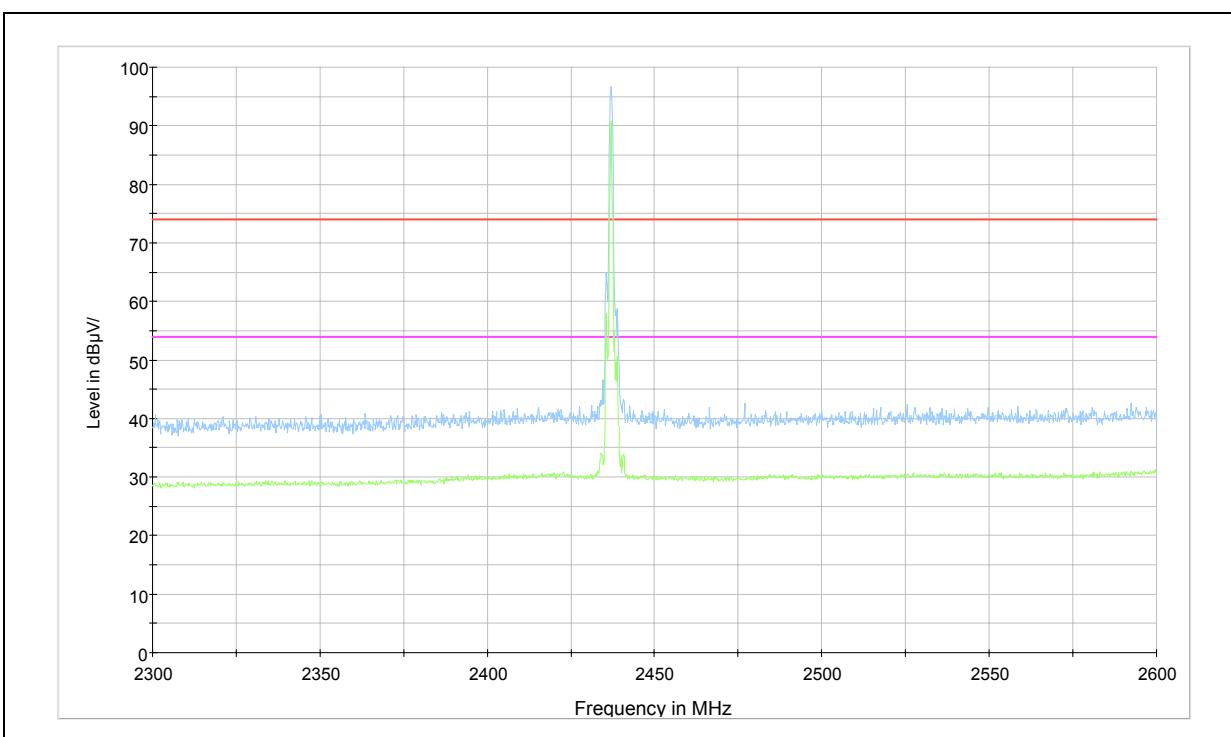
Test Results:

802.11b-Channel 1:



Note: The signal beyond the limit is carrier
Channel 1

802.11b-Channel 6:



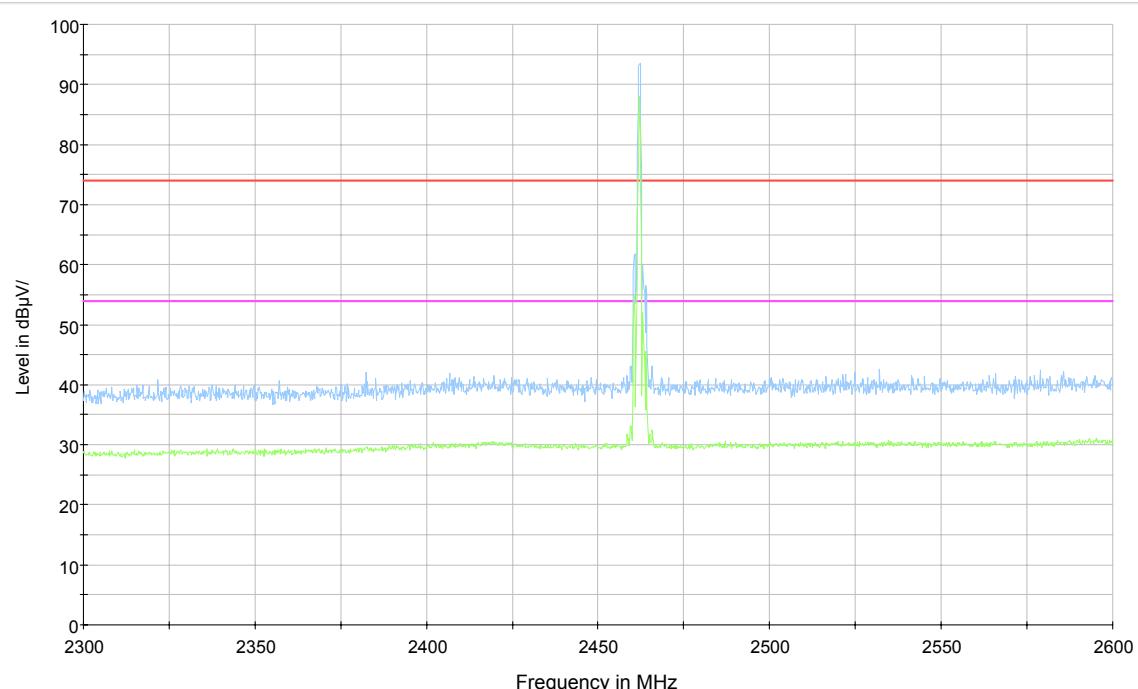
Note: The signal beyond the limit is carrier
Channel 6

**TA Technology (Shanghai) Co., Ltd.
Test Report**

Report No.: RZA2010-1143RF15C-WiFi

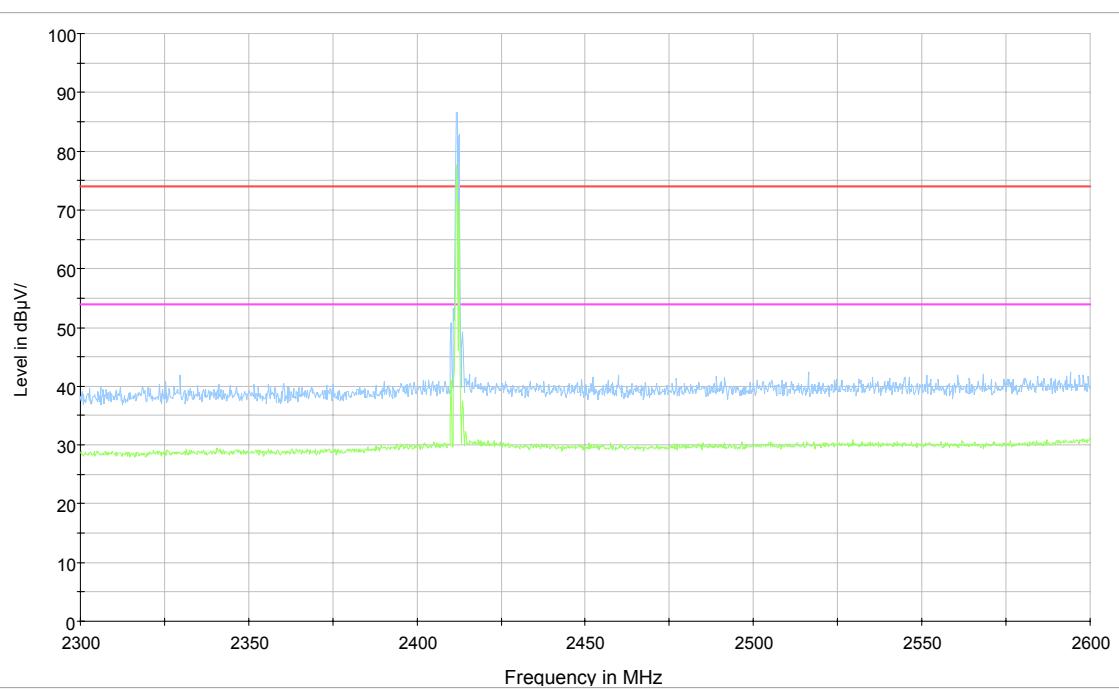
Page 40 of 140

802.11b-Channel 11:



Note: The signal beyond the limit is carrier
Channel 11

802.11g-Channel 1:



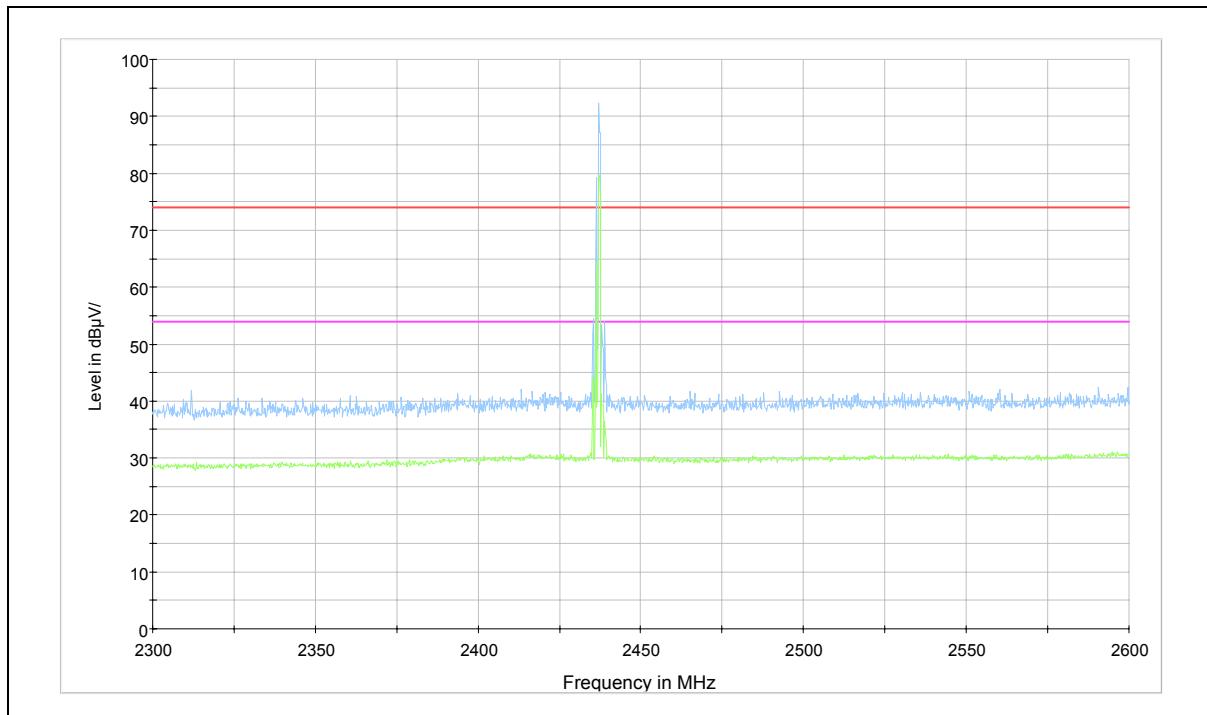
Note: The signal beyond the limit is carrier
Channel 1

**TA Technology (Shanghai) Co., Ltd.
Test Report**

Report No.: RZA2010-1143RF15C-WiFi

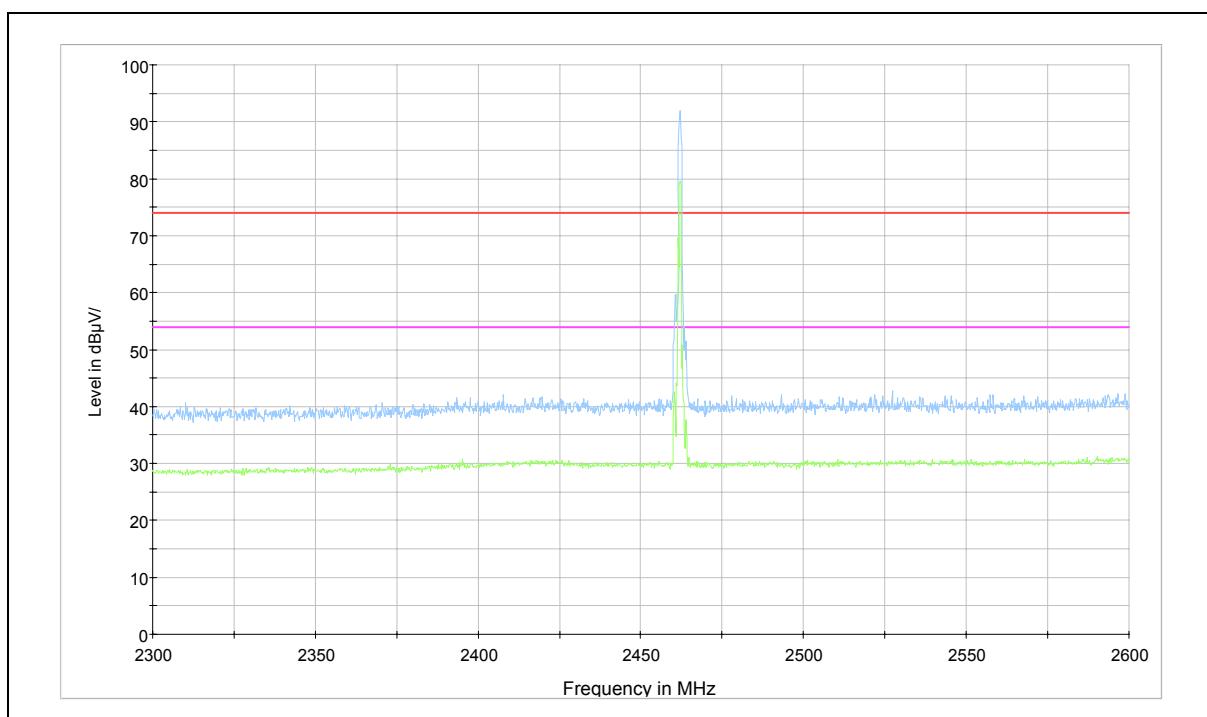
Page 41of 140

802.11 g-Channel 6:



Note: The signal beyond the limit is carrier
Channel 6

802.11 g-Channel 11:



Note: The signal beyond the limit is carrier
Channel 11

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 42 of 140

2.6. Power Spectral Density

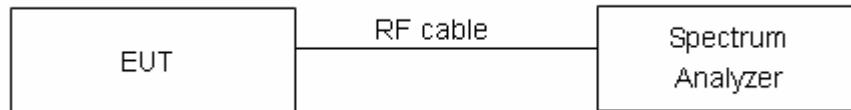
Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable. RBW is set to 3kHz and VBW is set to 30kHz on spectrum analyzer. Set the span is 300kHz and the sweep time is 100s. The peak power spectral density is recorded.

Test setup



Limits

Rule Part 15.247(e) specifies that "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."

Limits	$\leq 8 \text{ dBm} / 3\text{kHz}$
--------	------------------------------------

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$. $U = 0.75\text{dB}$.

TA Technology (Shanghai) Co., Ltd.

Test Report

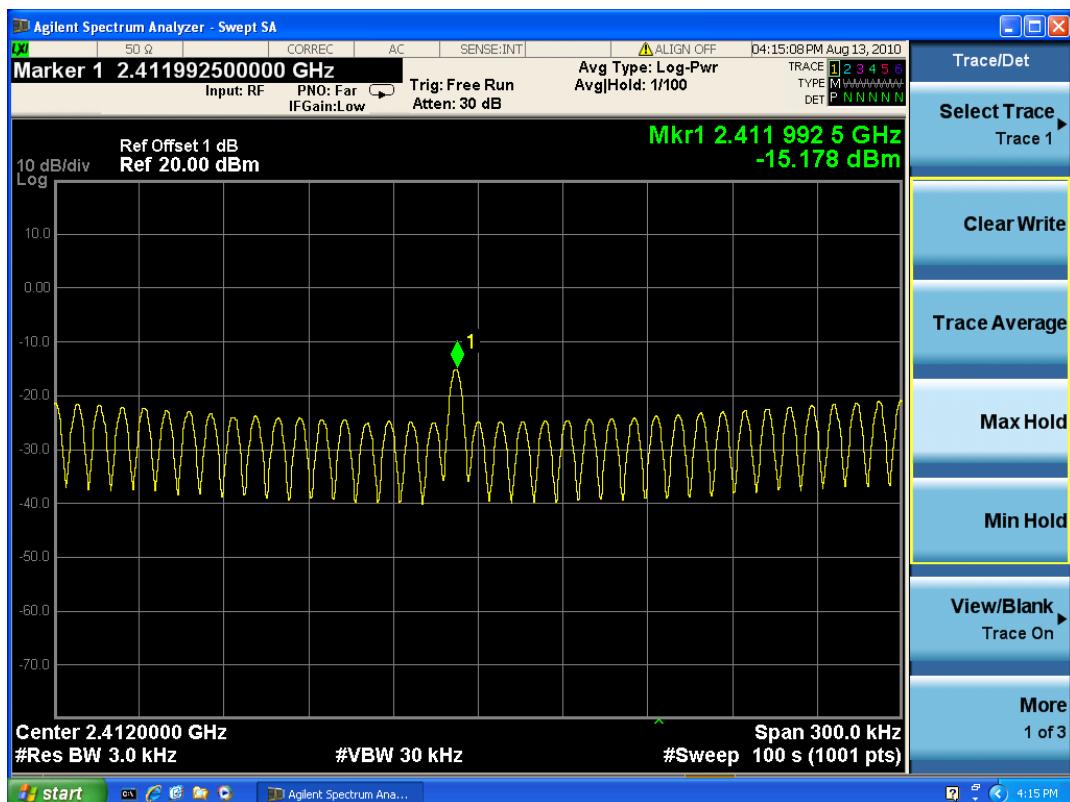
Report No.: RZA2010-1143RF15C-WiFi

Page 43 of 140

Test Results:

Network Standards	Bit Rate	Channel Number	Power Spectral Density dBm / 3kHz	Conclusion
802.11b	1Mbps	1	-15.178	PASS
		6	-15.970	PASS
		11	-16.624	PASS
802.11g	6Mbps	1	-13.761	PASS
		6	-15.207	PASS
		11	-15.785	PASS

802.11b

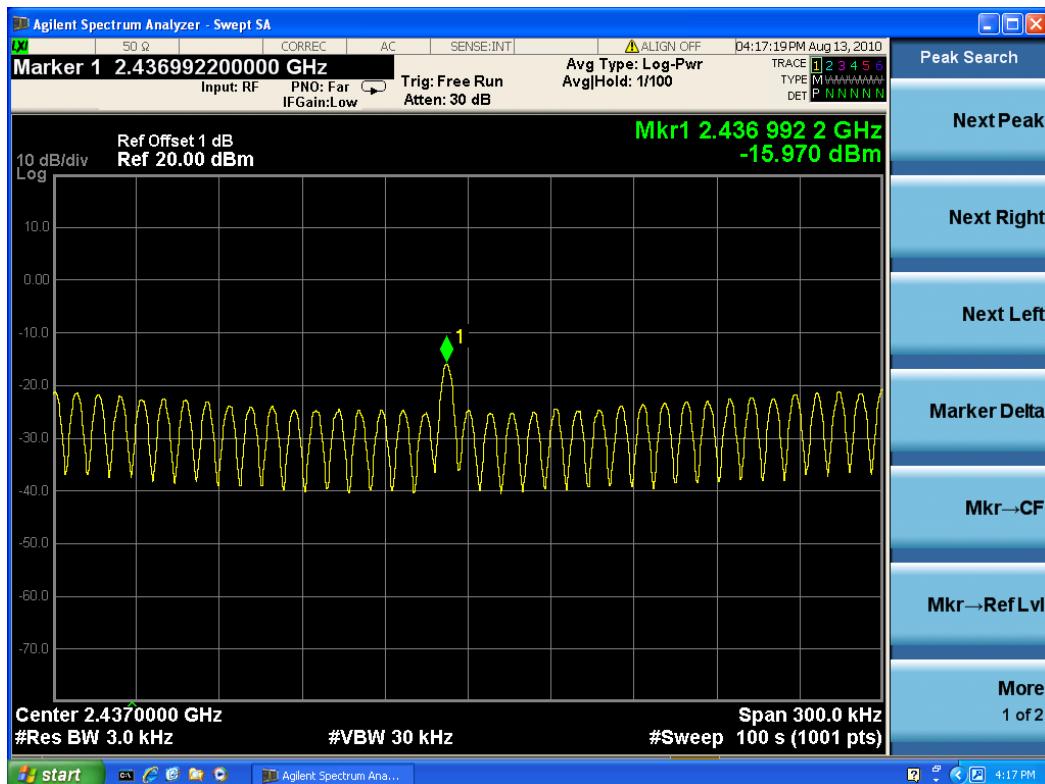


802.11b, Channel No.: 1

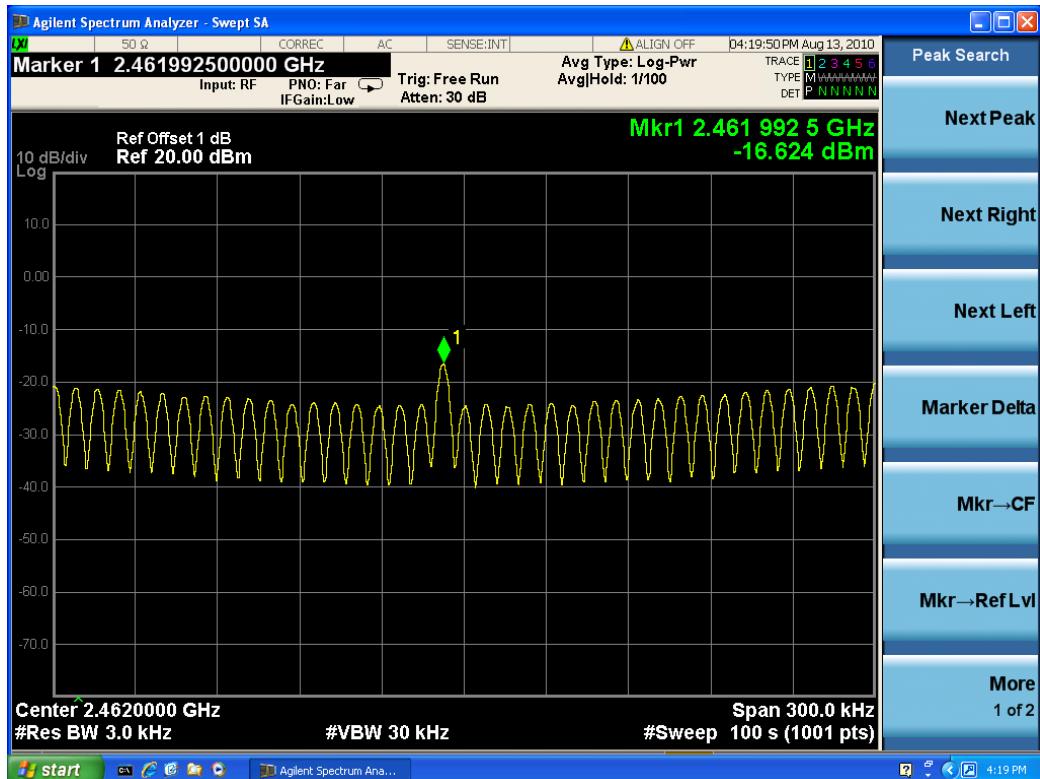
TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 44 of 140



802.11b, Channal No.: 6



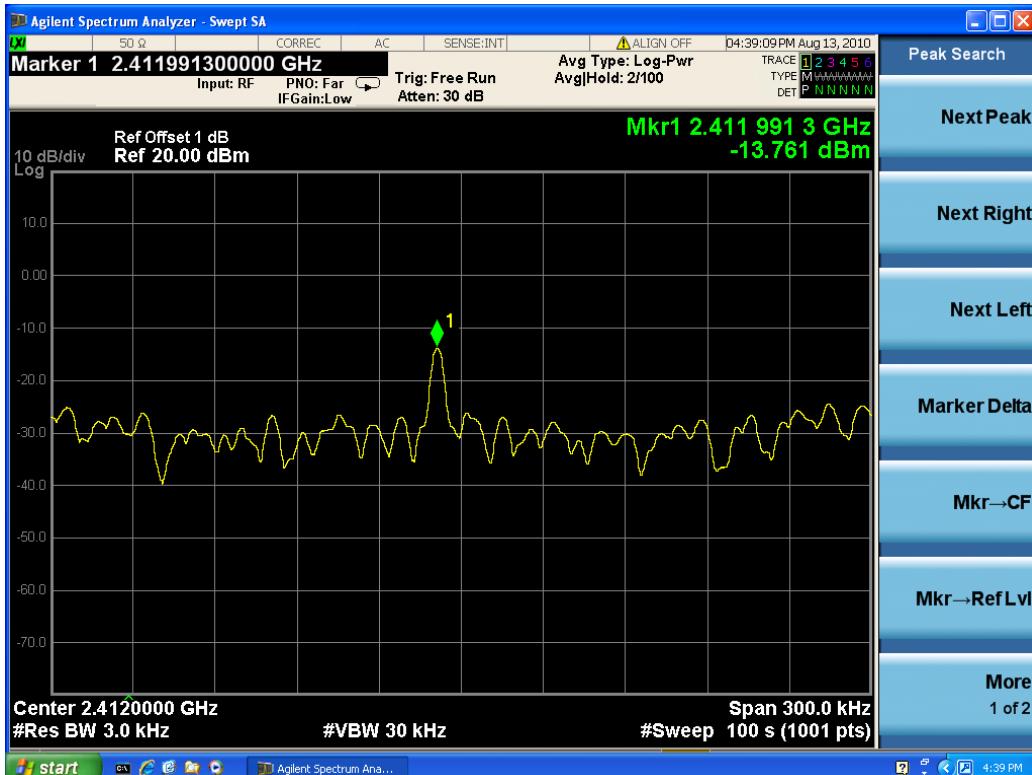
802.11b, Channal No.: 11

TA Technology (Shanghai) Co., Ltd. Test Report

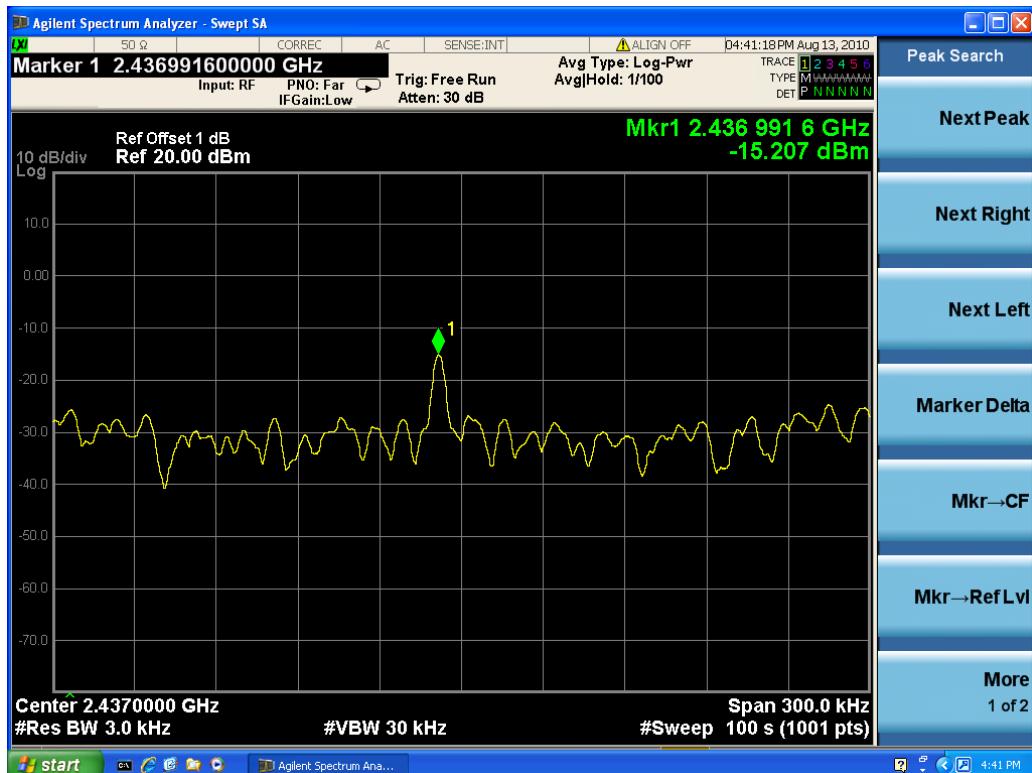
Report No.: RZA2010-1143RF15C-WiFi

Page 45 of 140

802.11g



802.11g, Channal No.: 1

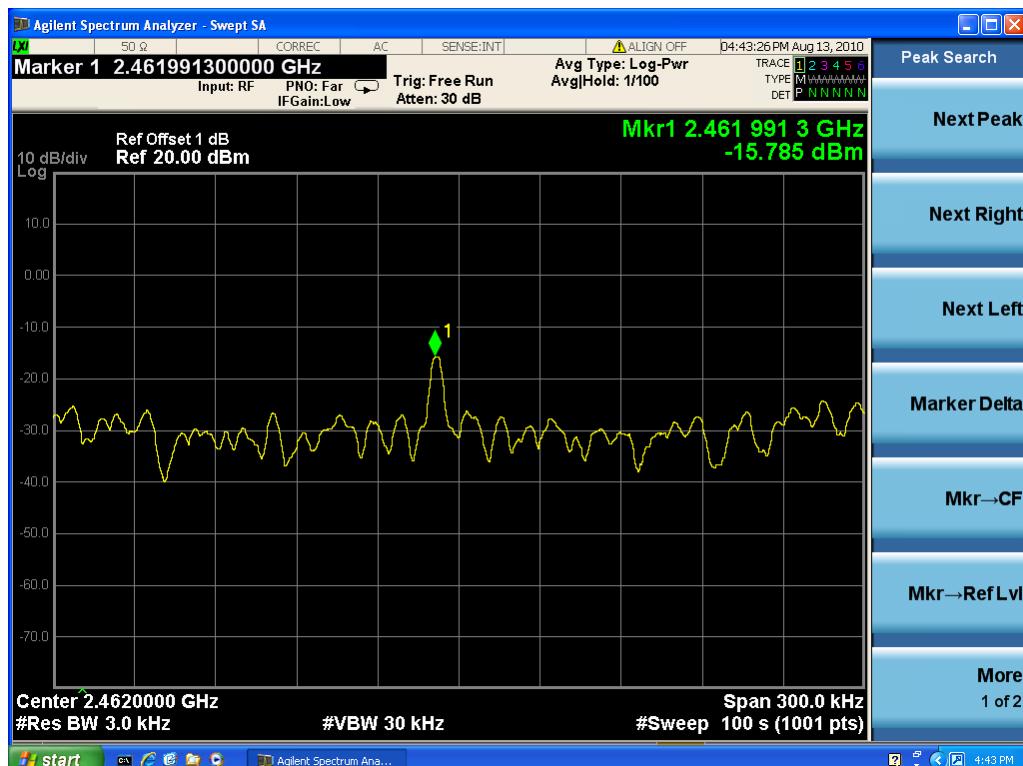


802.11g, Channal No.: 6

TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 46of 140



802.11g, Channal No.: 11

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 47 of 140

2.7. Spurious RF Conducted Emissions

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer and Bluetooth test set via a power splitter with a known loss. The spectrum analyzer scans from 30MHz to 26.5GHz. The peak detector is used. RBW and VBW are set to 100 kHz, Sweep is set to ATUO.

The test is in transmit mode.

Test setup



Limits

Rule Part 15.247(d) specifies that “In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.”

Network Standards	Bit Rate	Carrier frequency (MHz)	Reference value (dBm)	Limit
802.11b	1Mbps	2412	14.17	≤-5.83
		2437	14.46	≤-5.54
		2462	14.55	≤-5.45
802.11g	6Mbps	2412	10.50	≤-9.5
		2437	10.10	≤-9.9
		2462	10.07	≤-9.93

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 48 of 140

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
100kHz-2GHz	0.684 dB
2GHz-26.5GHz	1.407 dB

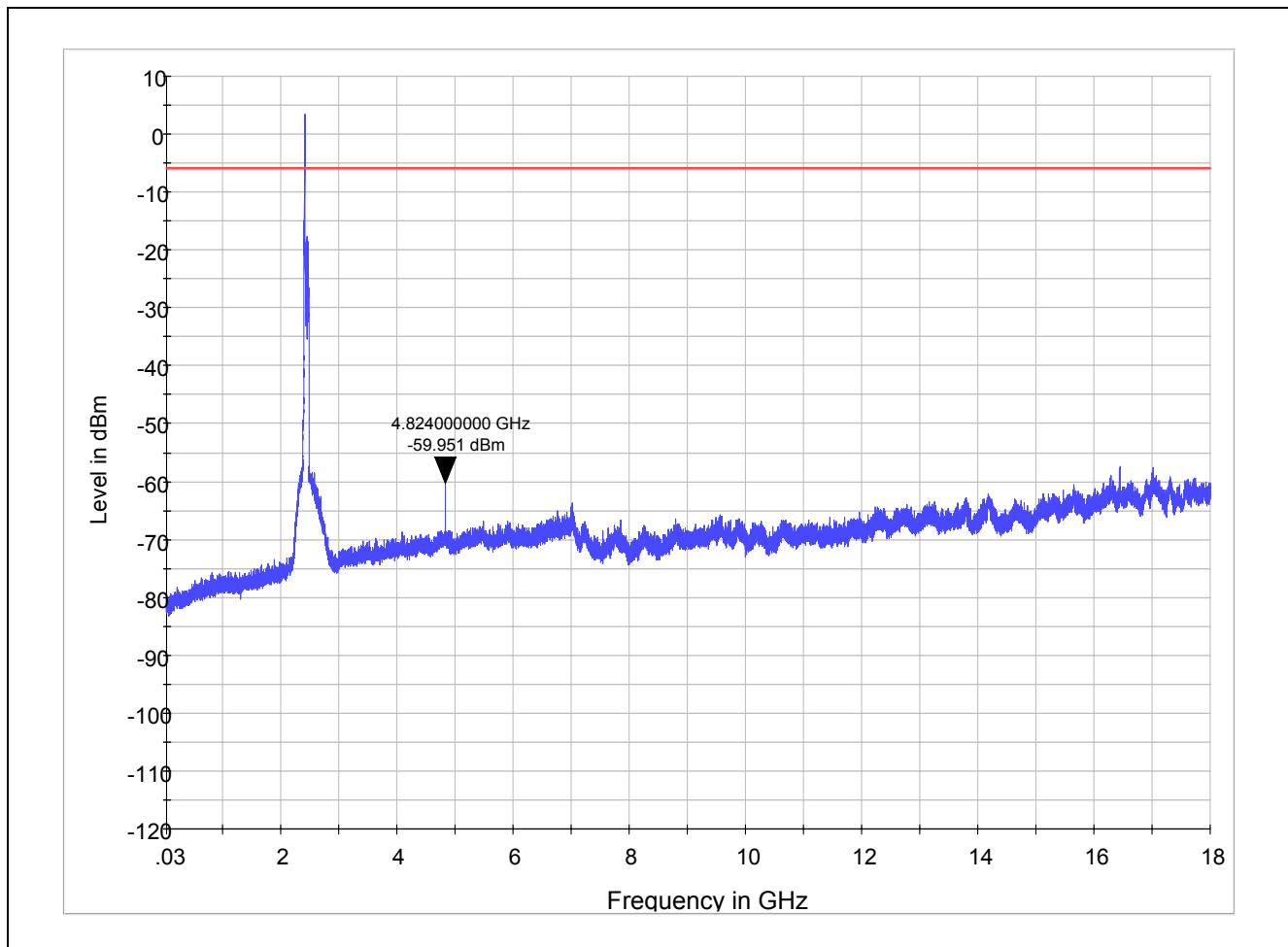
TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 49 of 140

Test Results:

802.11b CH1



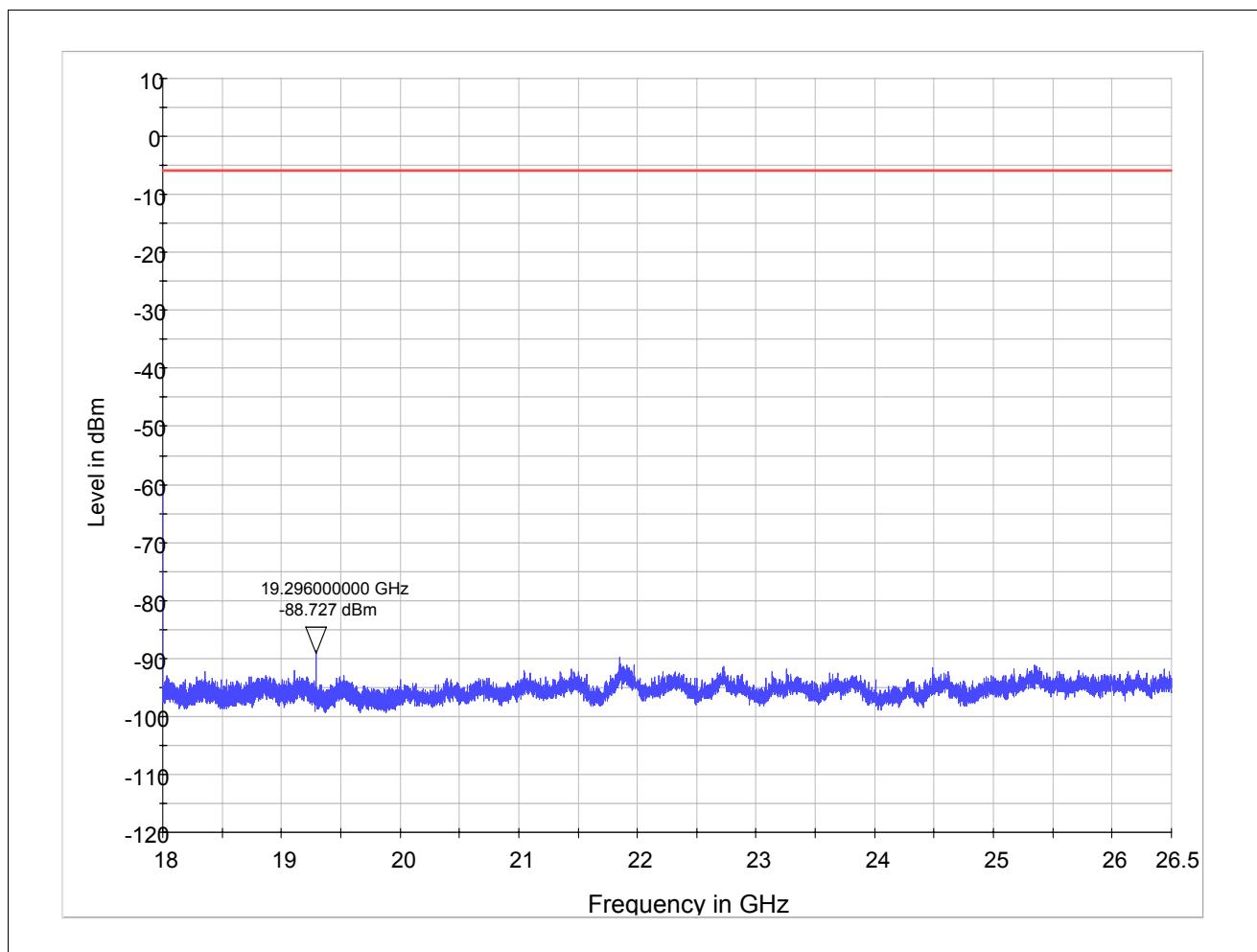
Note: The signal beyond the limit is carrier

Spurious RF conducted emissions from 30MHz to 18GHz

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 50 of 140



Spurious RF conducted emissions from 18GHz to 26.5GHz

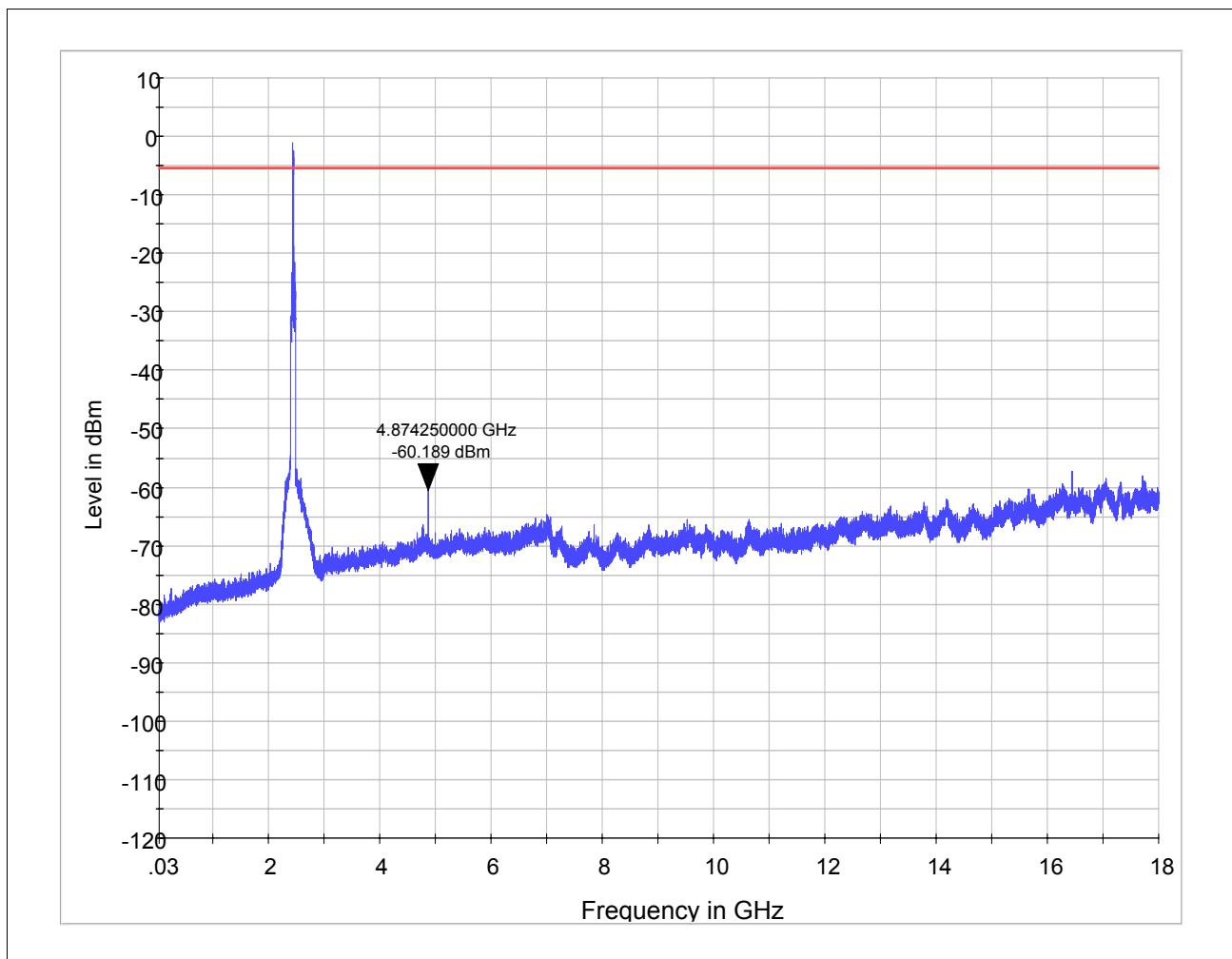
Harmonic	TX ch.1 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4824	-59.951	-5.85
8	19296	-88.727	-5.85

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 51 of 140

802.11b CH6



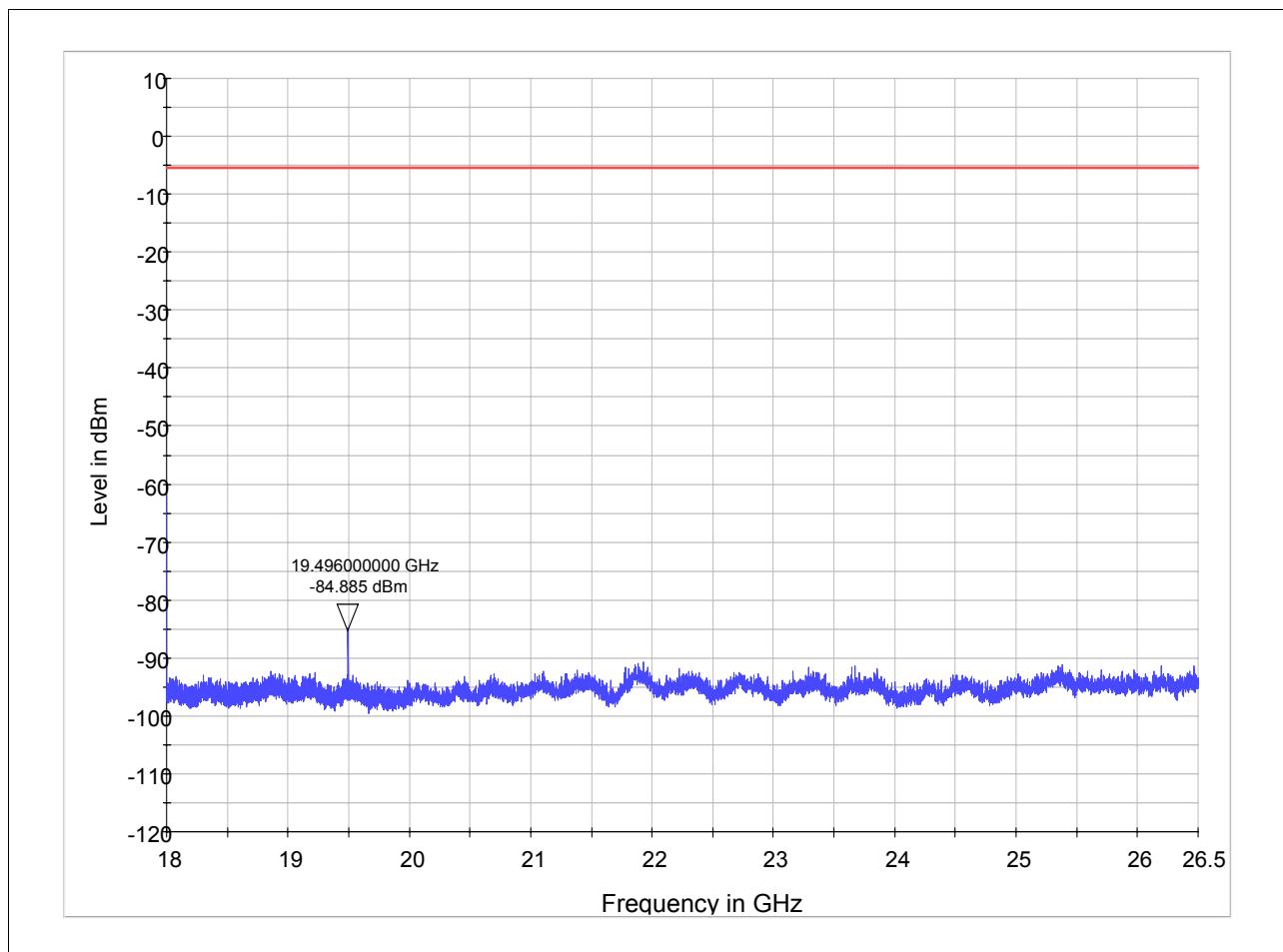
Note: The signal beyond the limit is carrier

Spurious RF conducted emissions from 30MHz to 18GHz

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 52of 140



Spurious RF conducted emissions from 18GHz to 26.5GHz

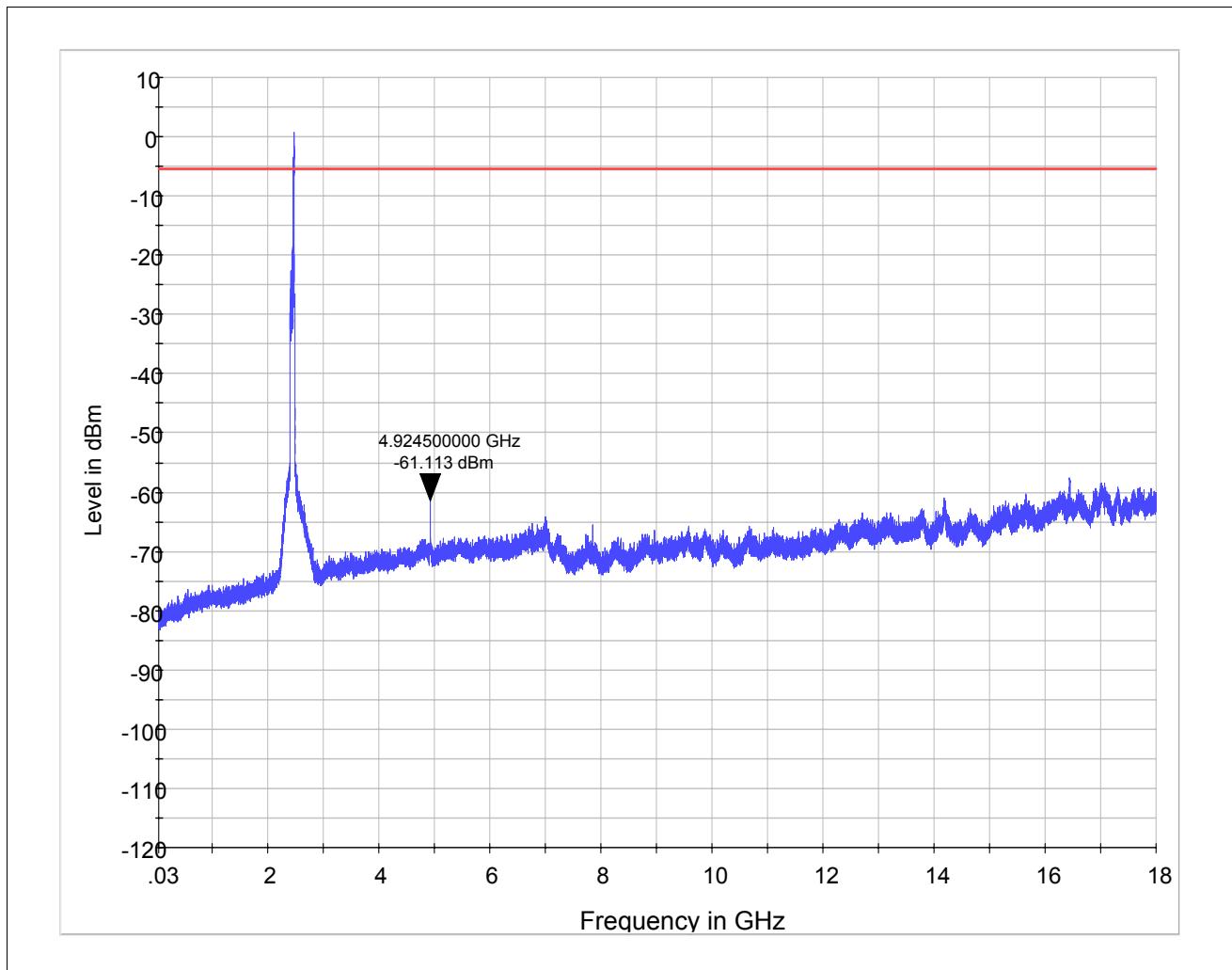
Harmonic	TX ch.6 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4874.25	-60.189	-5.52
8	19496	-84.885	-5.52

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 53 of 140

802.11b CH11



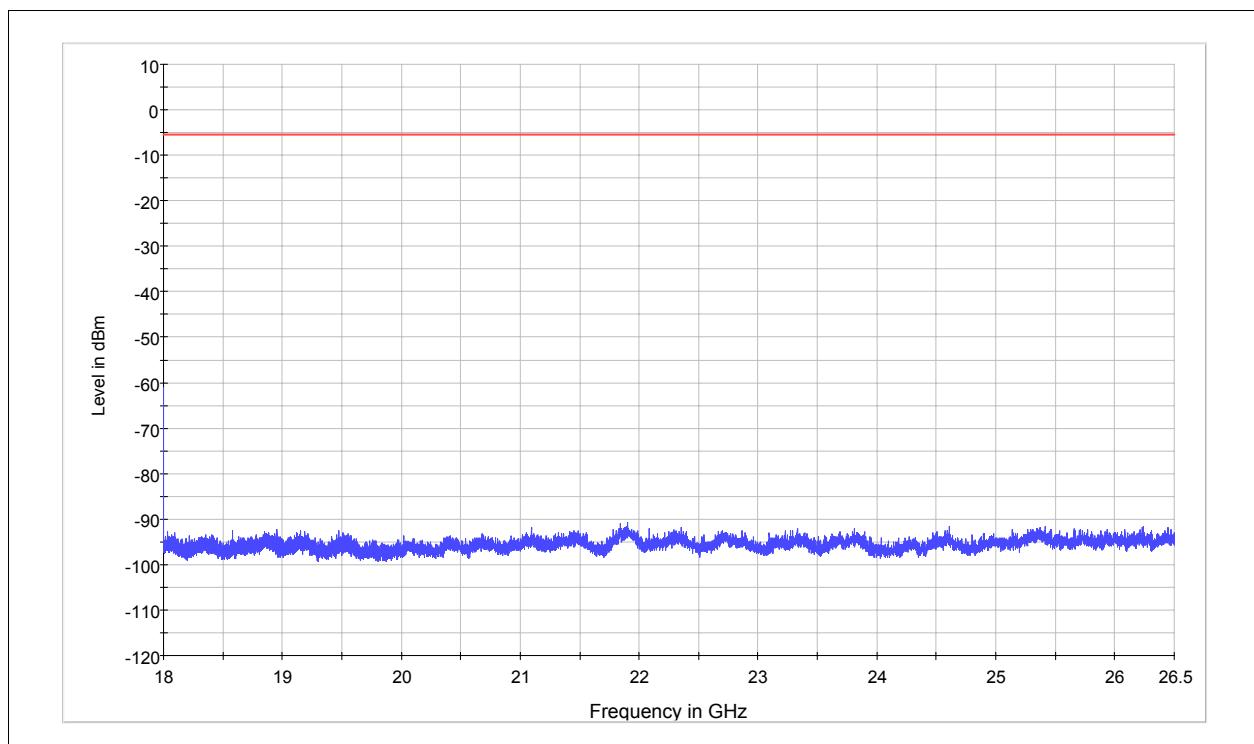
Note: The signal beyond the limit is carrier

Spurious RF conducted emissions from 30MHz to 18GHz

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 54of 140



Spurious RF conducted emissions from 18GHz to 26.5GHz

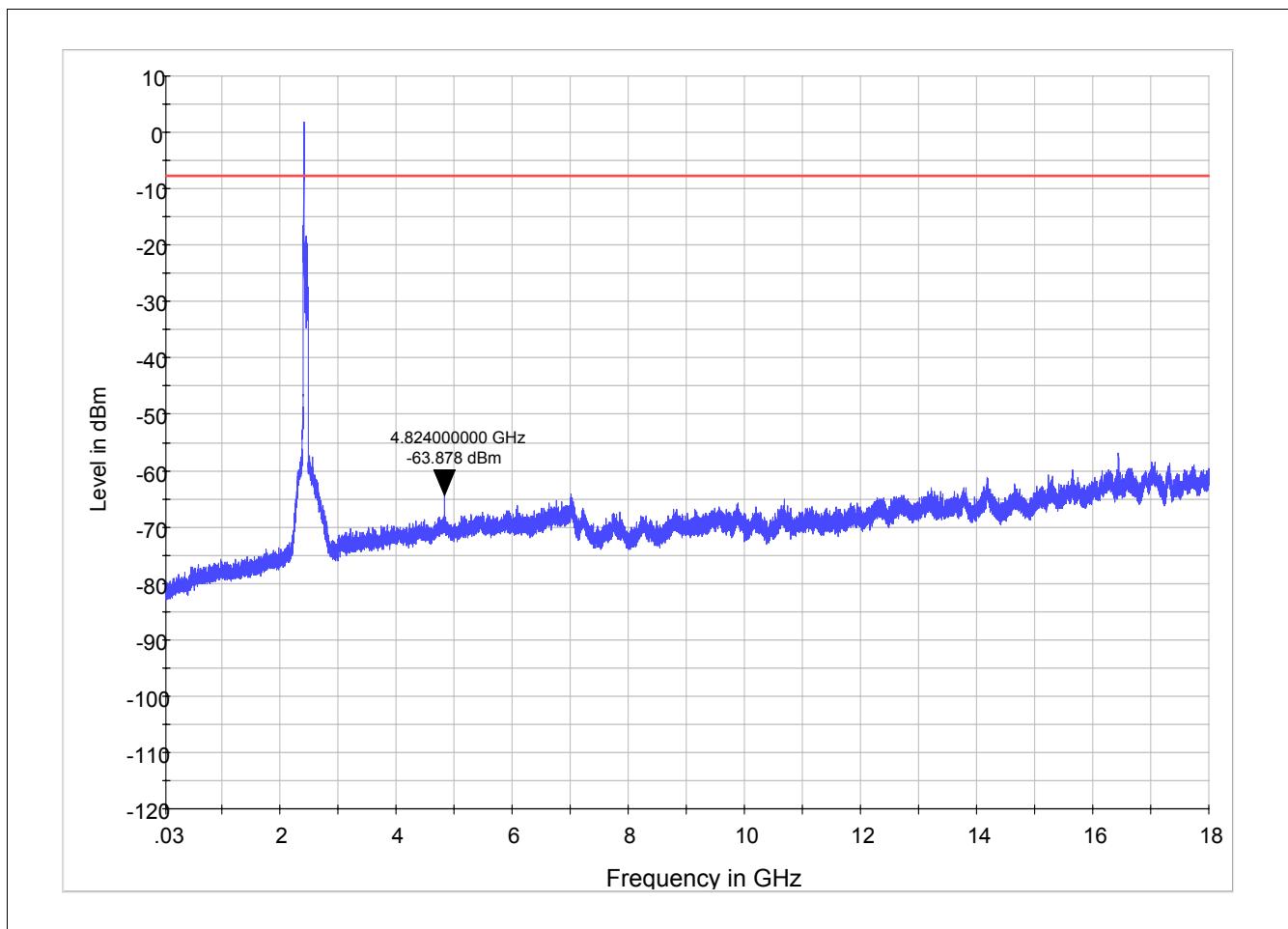
Harmonic	TX ch.11 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4924.5	-61.113	-5.56

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 55 of 140

802.11g CH1



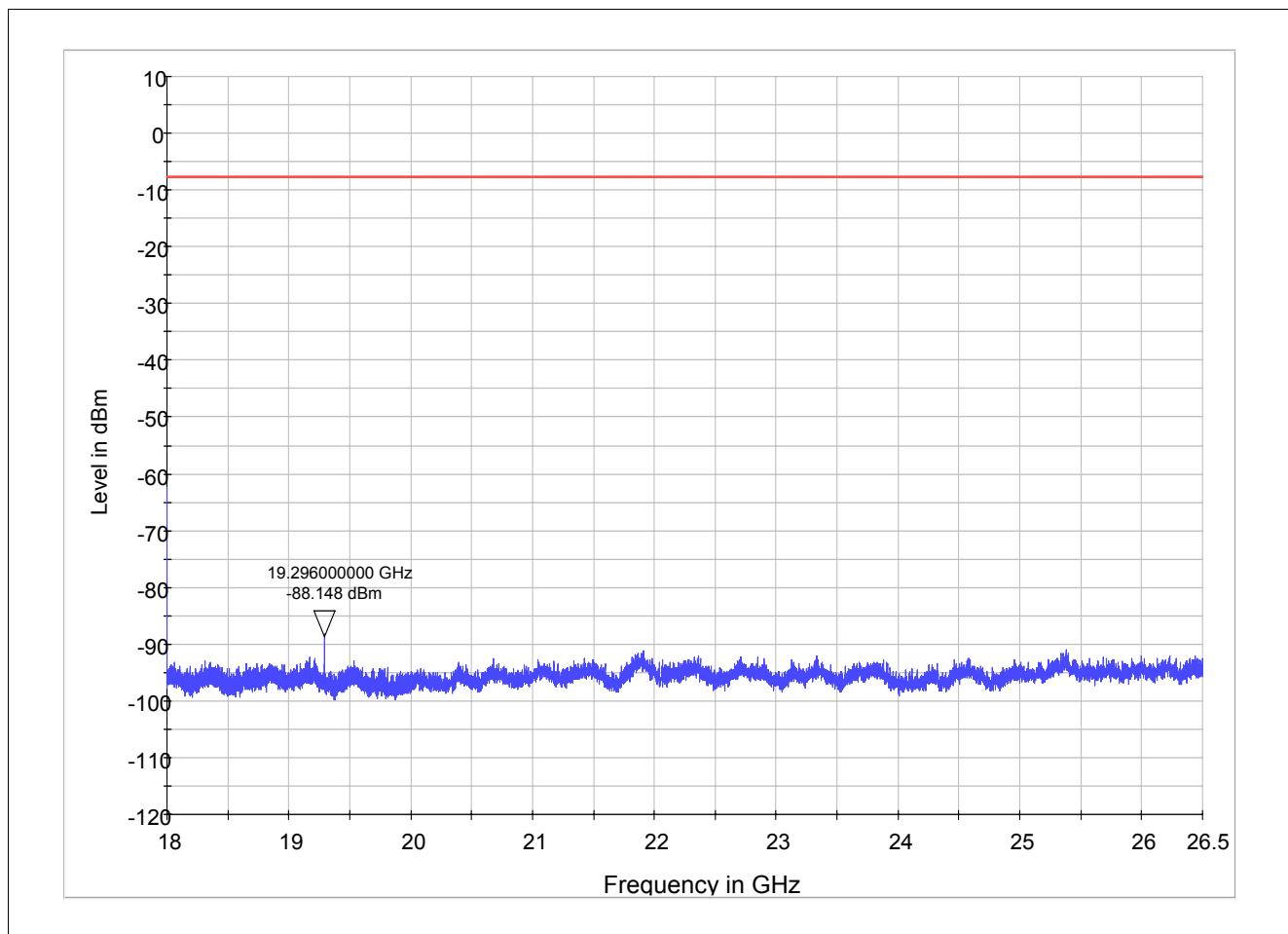
Note: The signal beyond the limit is carrier

Spurious RF conducted emissions from 30MHz to 18GHz

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 56 of 140



Spurious RF conducted emissions from 18GHz to 26.5GHz

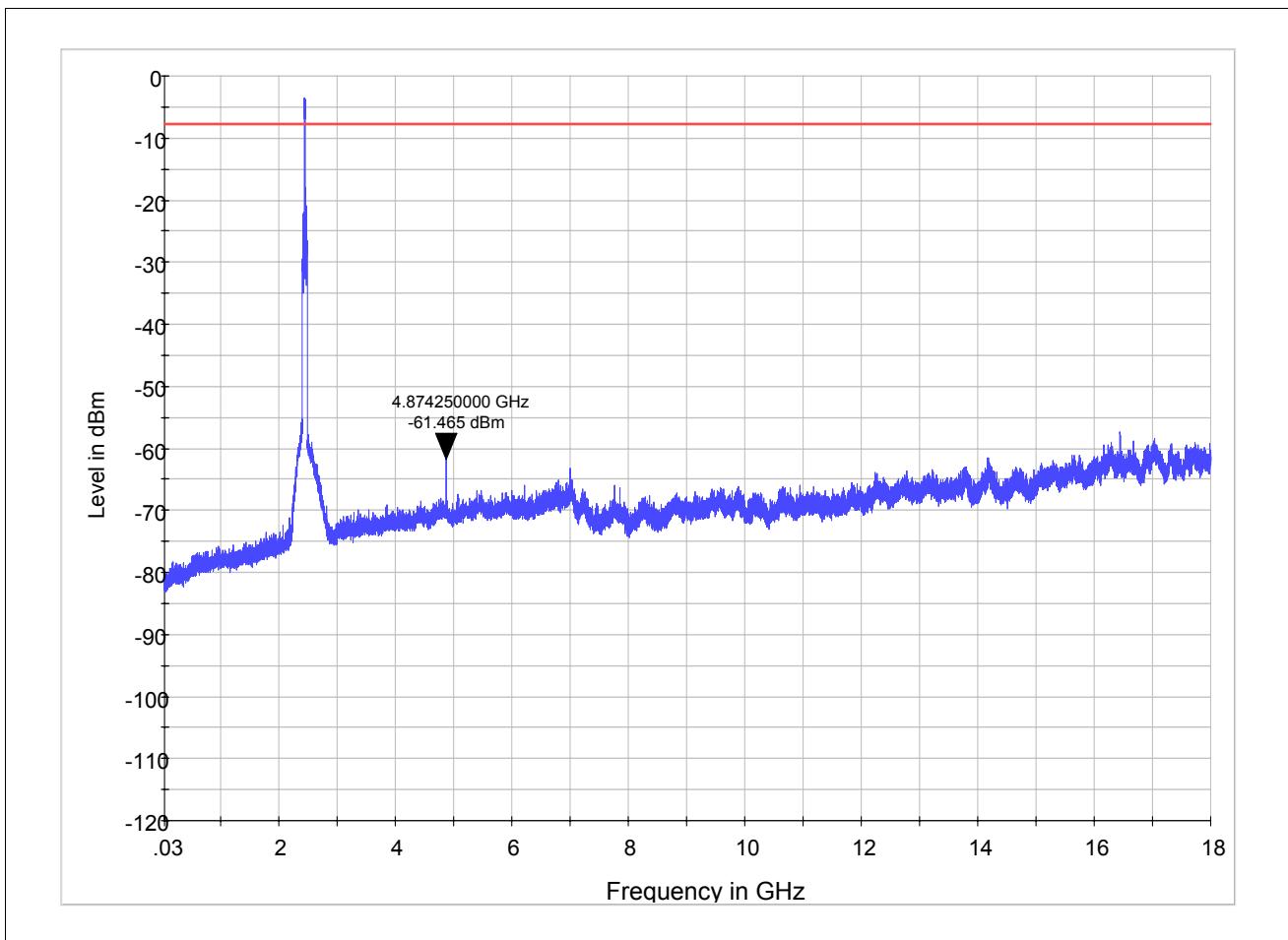
Harmonic	TX ch.1 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4824	-63.878	-7.69
8	19296	-88.148	-7.69

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 57 of 140

802.11g CH6



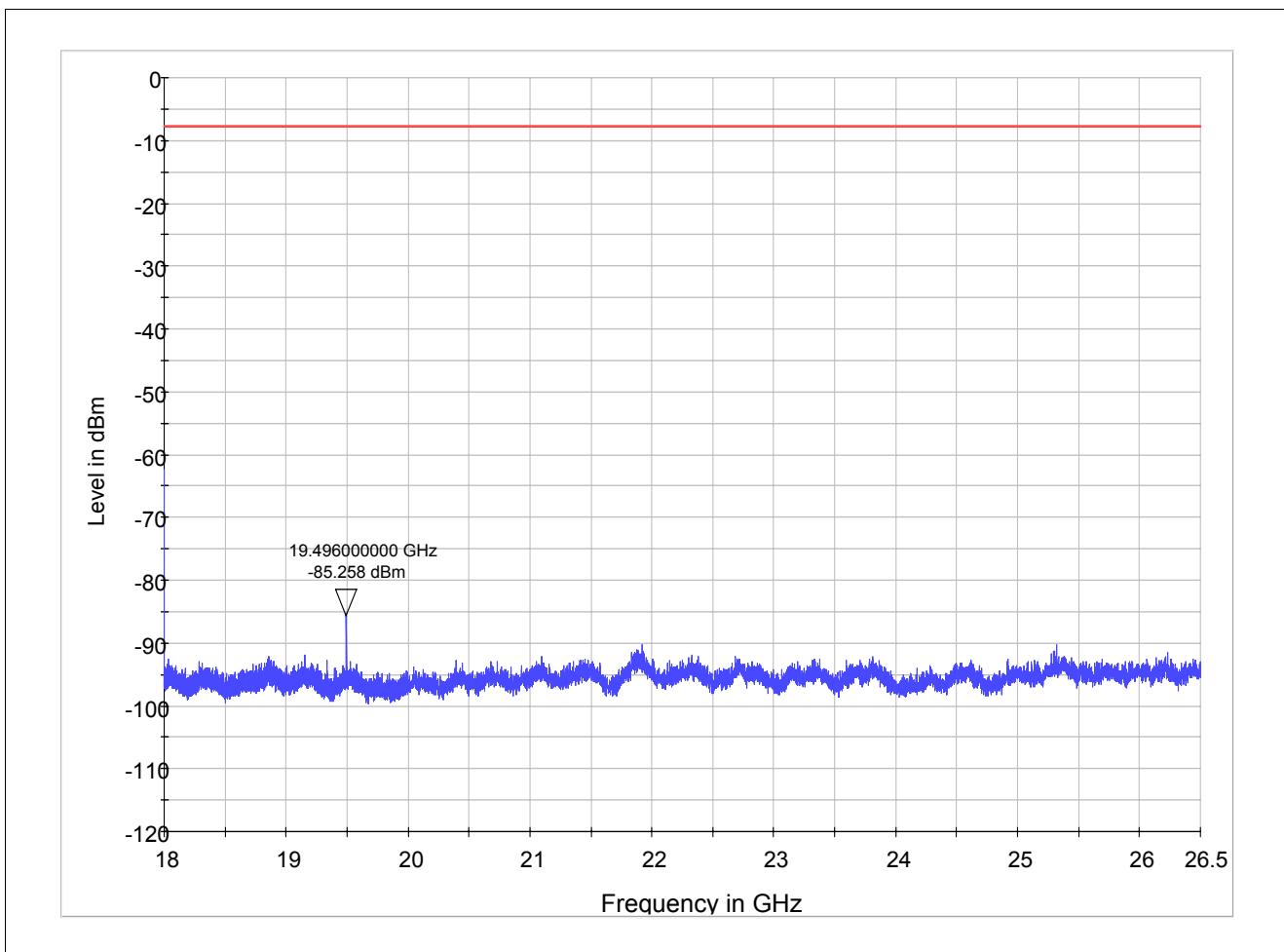
Note: The signal beyond the limit is carrier

Spurious RF conducted emissions from 30MHz to 18GHz

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 58 of 140



Spurious RF conducted emissions from 18GHz to 26.5GHz

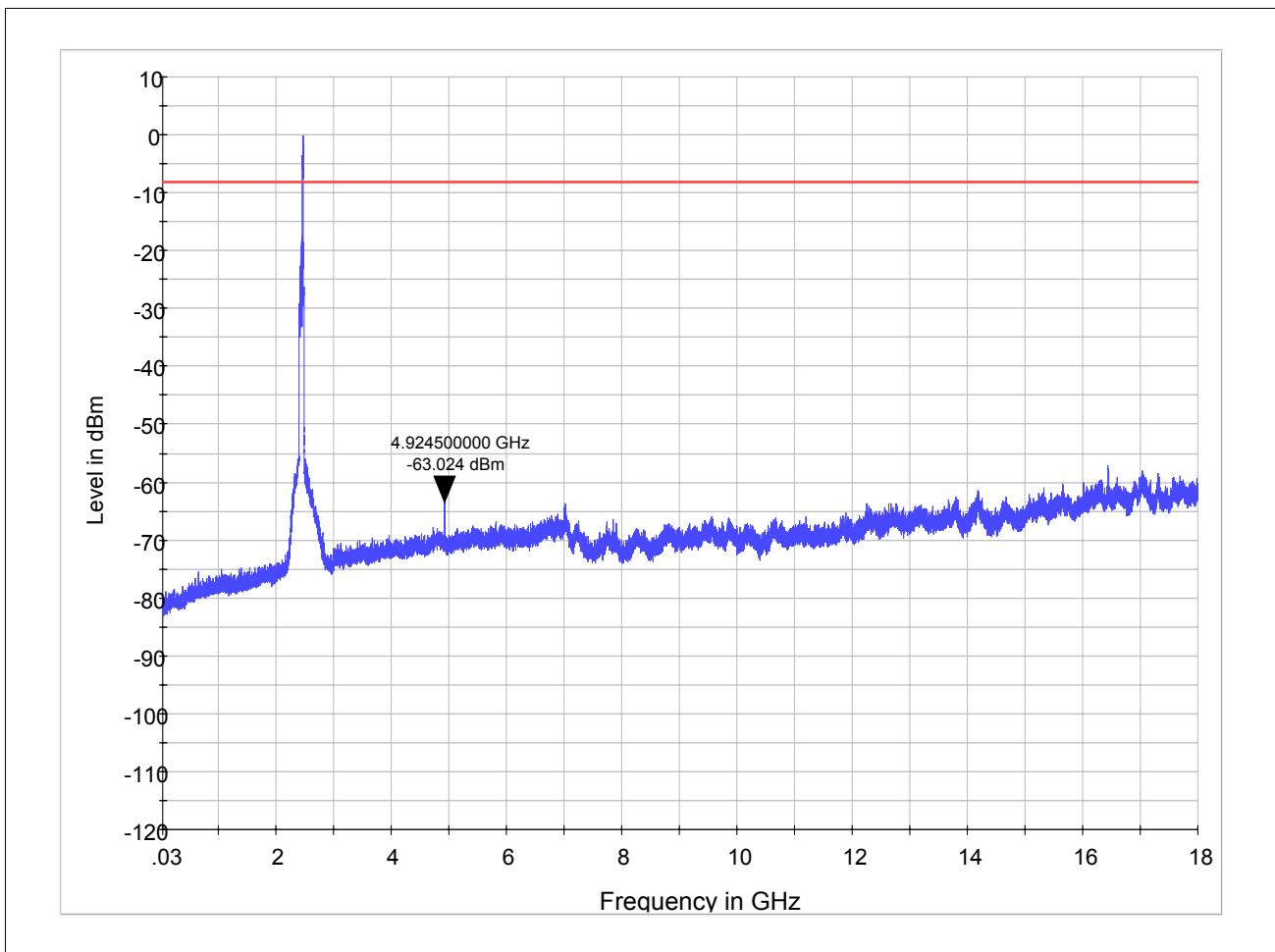
Harmonic	TX ch.6 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4874.25	-61.465	-7.73
8	19496	-85.258	-7.73

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 59of 140

802.11g CH11



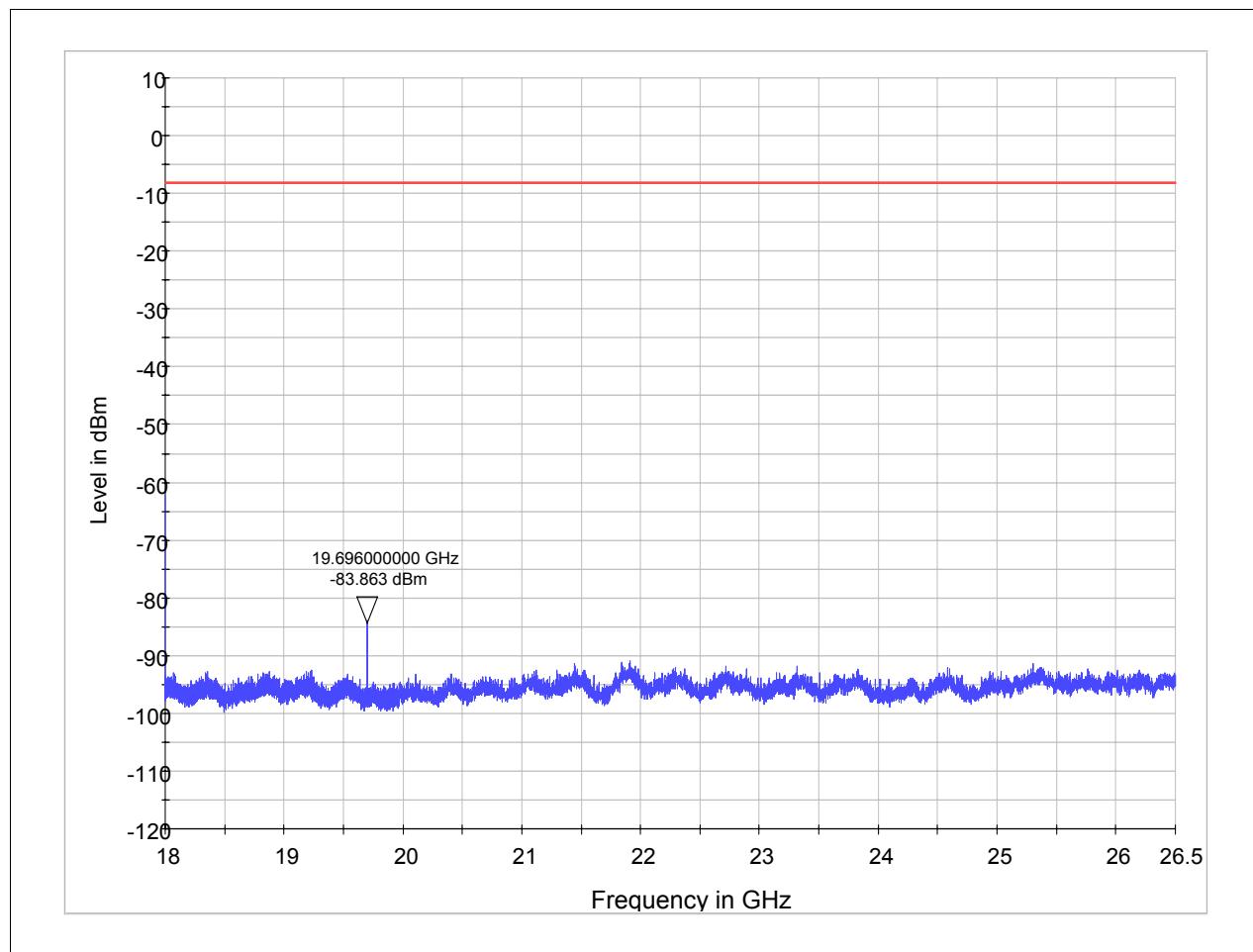
Note: The signal beyond the limit is carrier

Spurious RF conducted emissions from 30MHz to 18GHz

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 60 of 140



Spurious RF conducted emissions from 18GHz to 26.5GHz

Harmonic	TX ch.11 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4924.5	-63.024	-8.06
8	19696	-83.863	-8.06

TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 61 of 140

2.8. Radiates Emission

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The test set-up was made in accordance to the general provisions of ANSI C63.4-2003. The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The radiated emissions measurements were made in a typical installation configuration. Sweep the whole frequency band through the range from 30MHz to 26GHz During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.

Set the spectrum analyzer in the following:

Below 1GHz:

RBW=100kHz / VBW=300kHz / Sweep=AUTO

Above 1GHz:

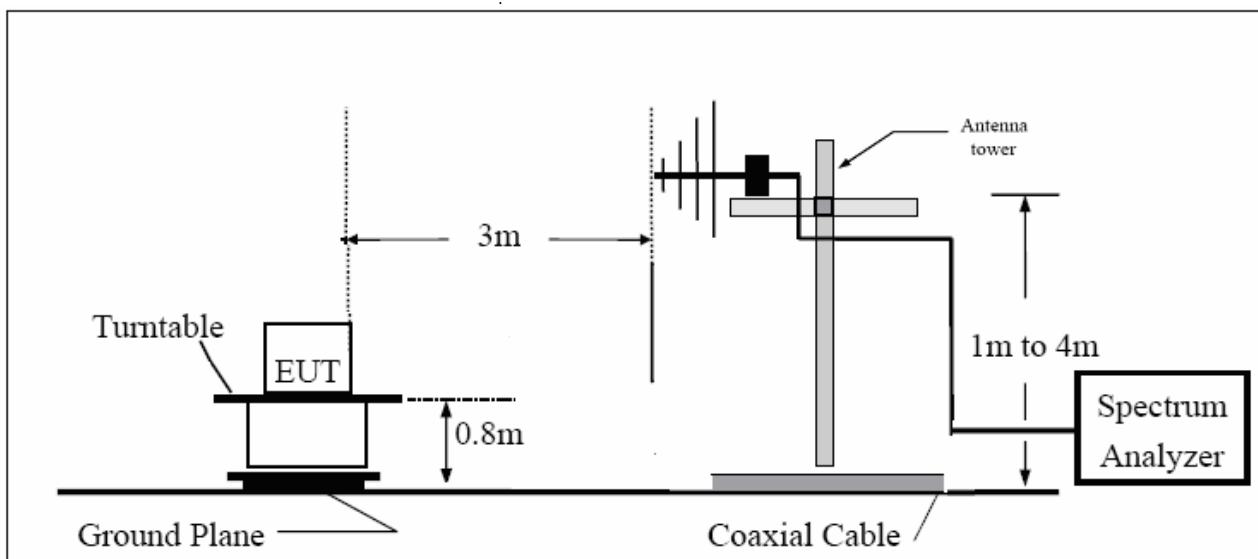
(a) PEAK: RBW=1MHz VBW=3MHz/ Sweep=AUTO

(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

The test is in transmit mode.

Test setup

Below 1GHz

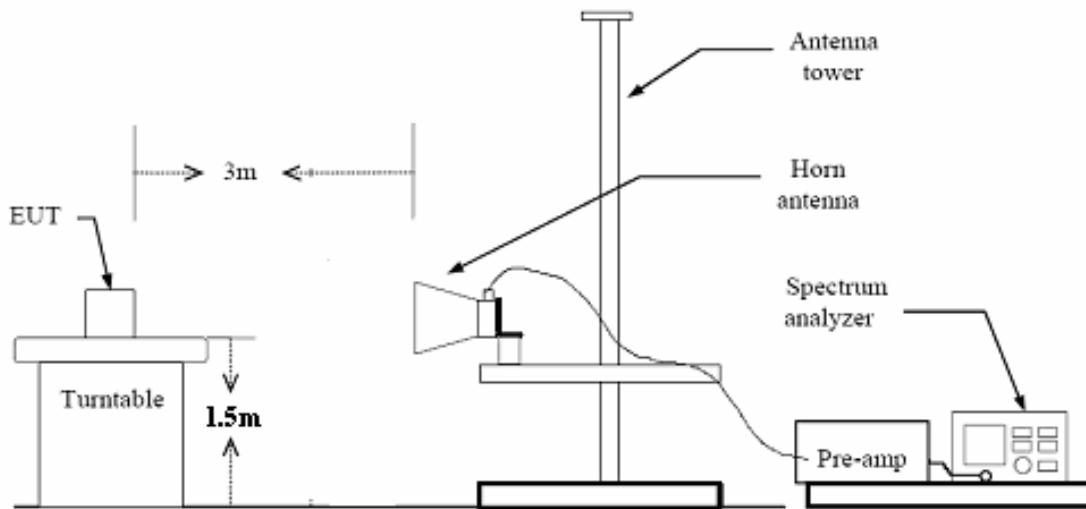


TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 62 of 140

Above 1GHz



Limits

Rule Part 15.247(d) specifies that “In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).”

Limit in restricted band

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above960	500	54

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$. $U=3.92$ dB.

TA Technology (Shanghai) Co., Ltd.
Test Report

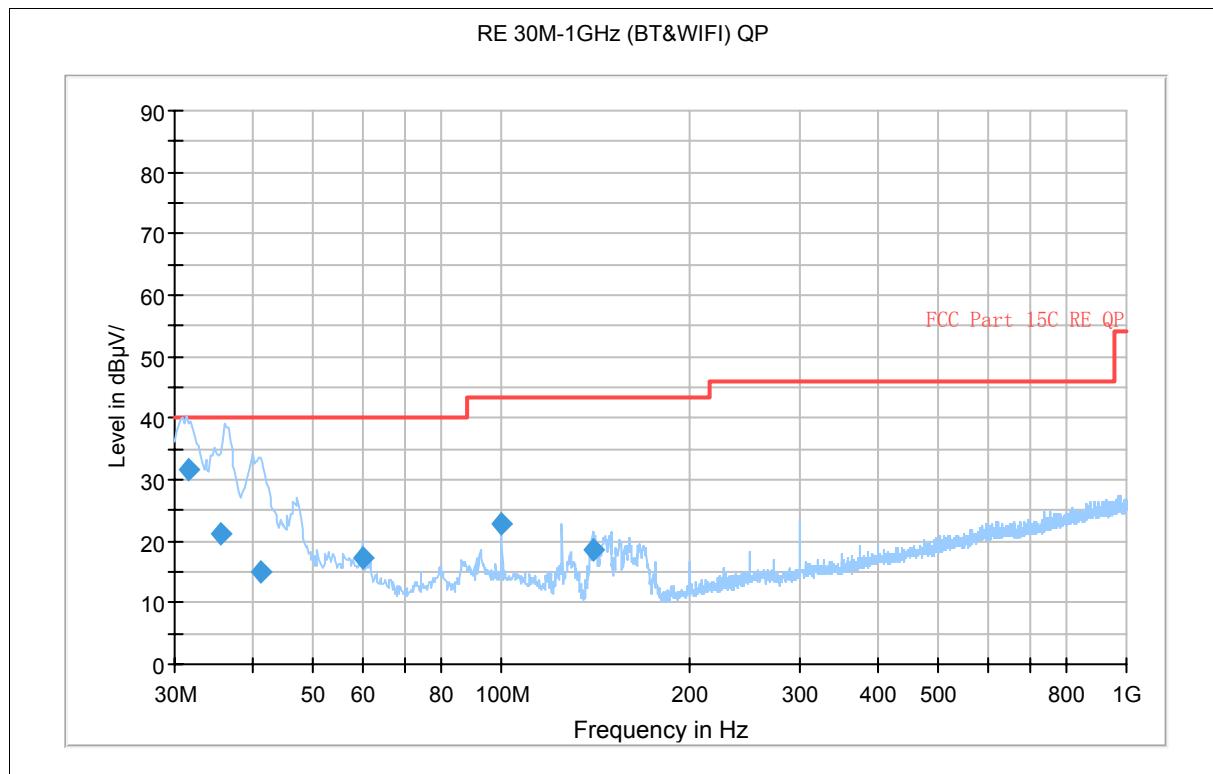
Report No.: RZA2010-1143RF15C-WiFi

Page 63 of 140

Test result

Eut with Black Earphone

802.11b CH1



Radiates Emission from 30MHz to 1GHz

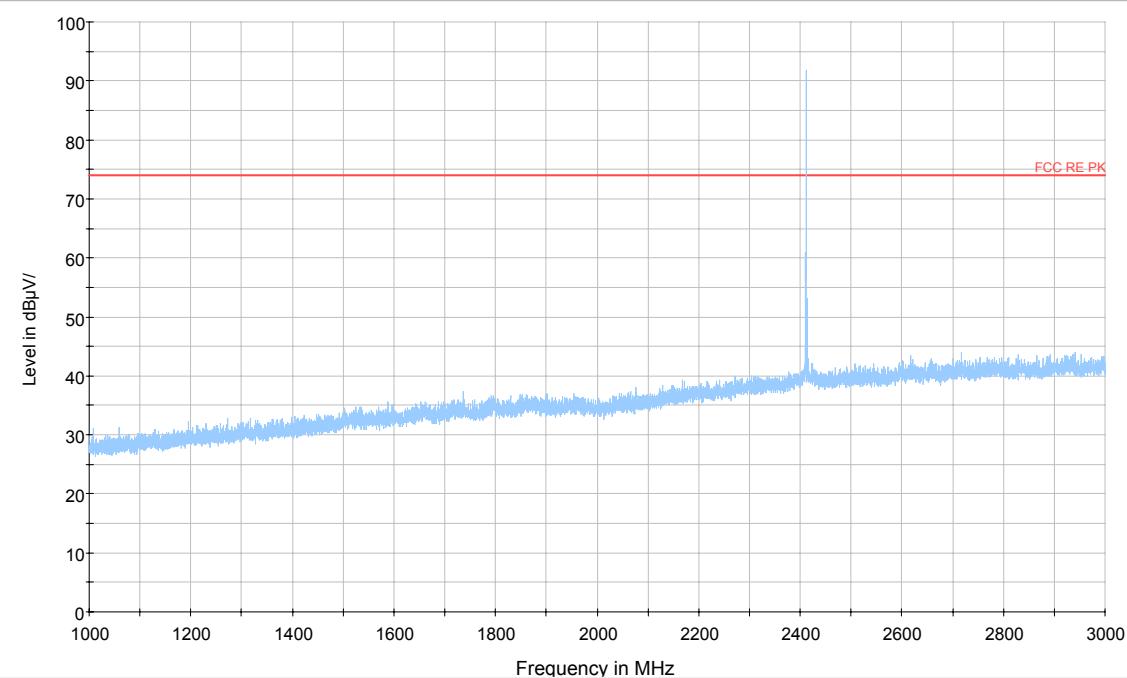
Frequency (MHz)	Quasi-Peak (dB μ V/m)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dB μ V/m)
31.575000	31.8	100.0	V	46.0	8.2	40.0
35.462500	21.3	100.0	H	315.0	18.7	40.0
41.312500	15.0	125.0	H	284.0	25.0	40.0
59.987500	17.2	100.0	V	136.0	22.8	40.0
100.000000	22.7	100.0	V	285.0	20.8	43.5
140.017500	18.6	100.0	V	0.0	24.9	43.5

**TA Technology (Shanghai) Co., Ltd.
Test Report**

Report No.: RZA2010-1143RF15C-WiFi

Page 64 of 140

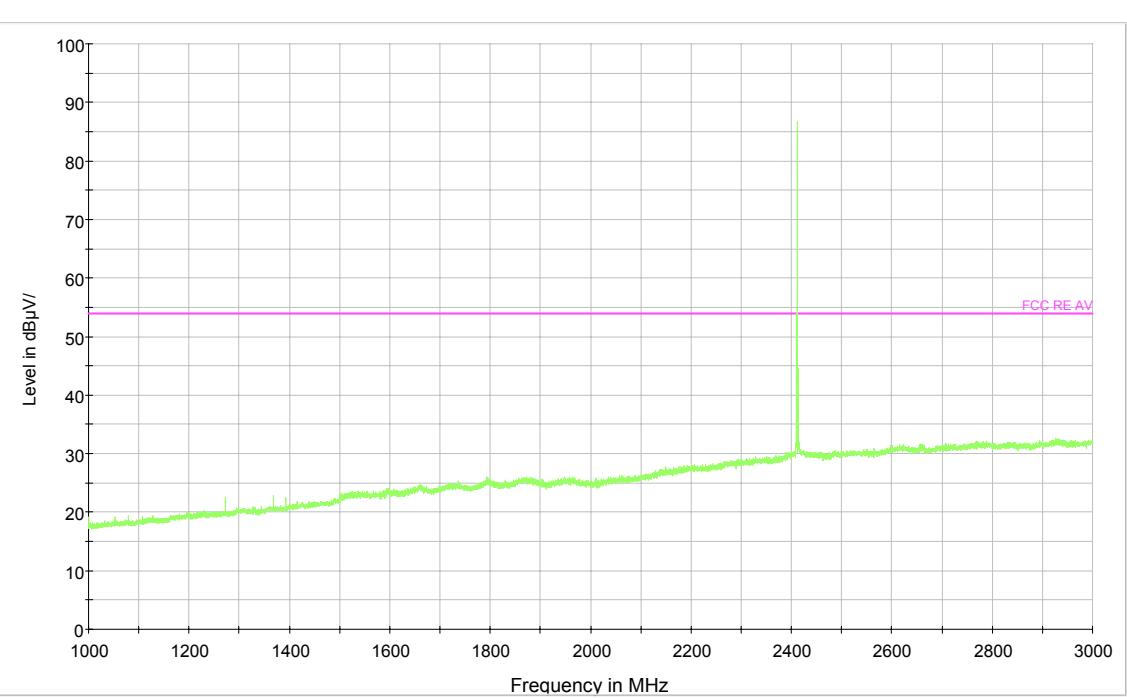
Peak



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

Average



Note: The signal beyond the limit is carrier.

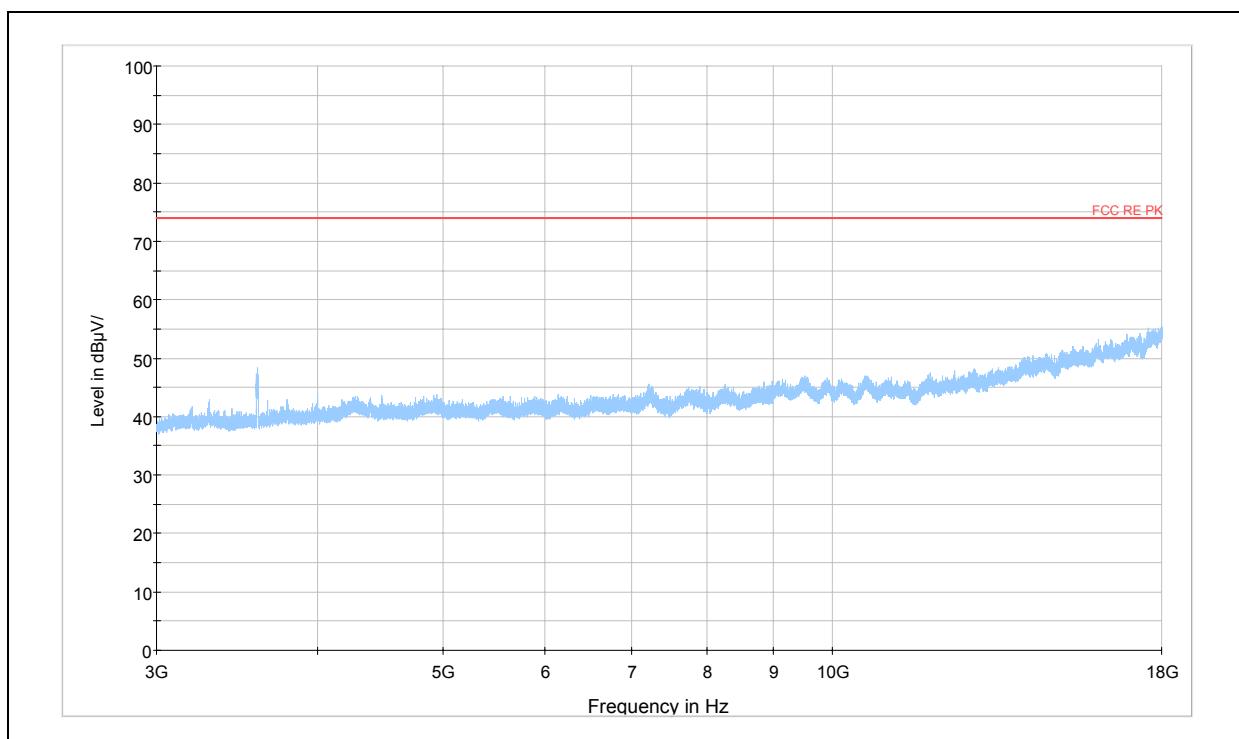
Radiates Emission from 1GHz to 3GHz

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

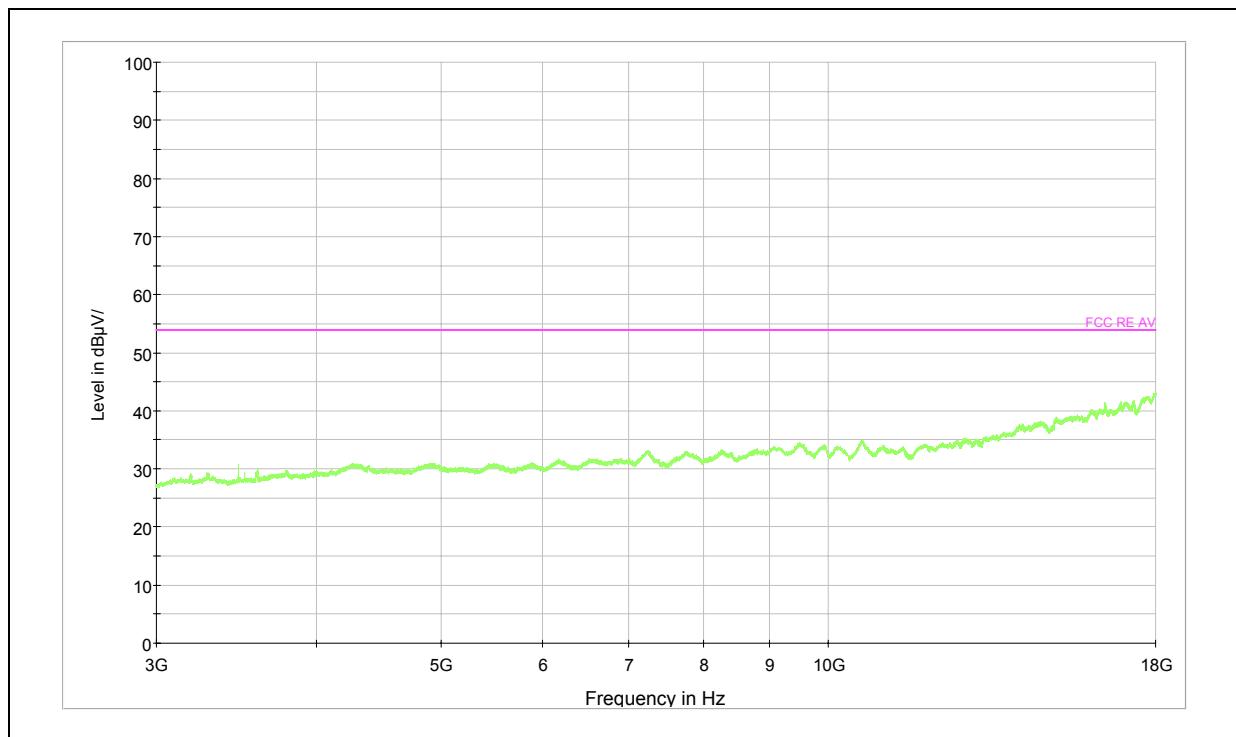
Page 65 of 140

Peak



Radiates Emission from 3GHz to 18GHz

Average



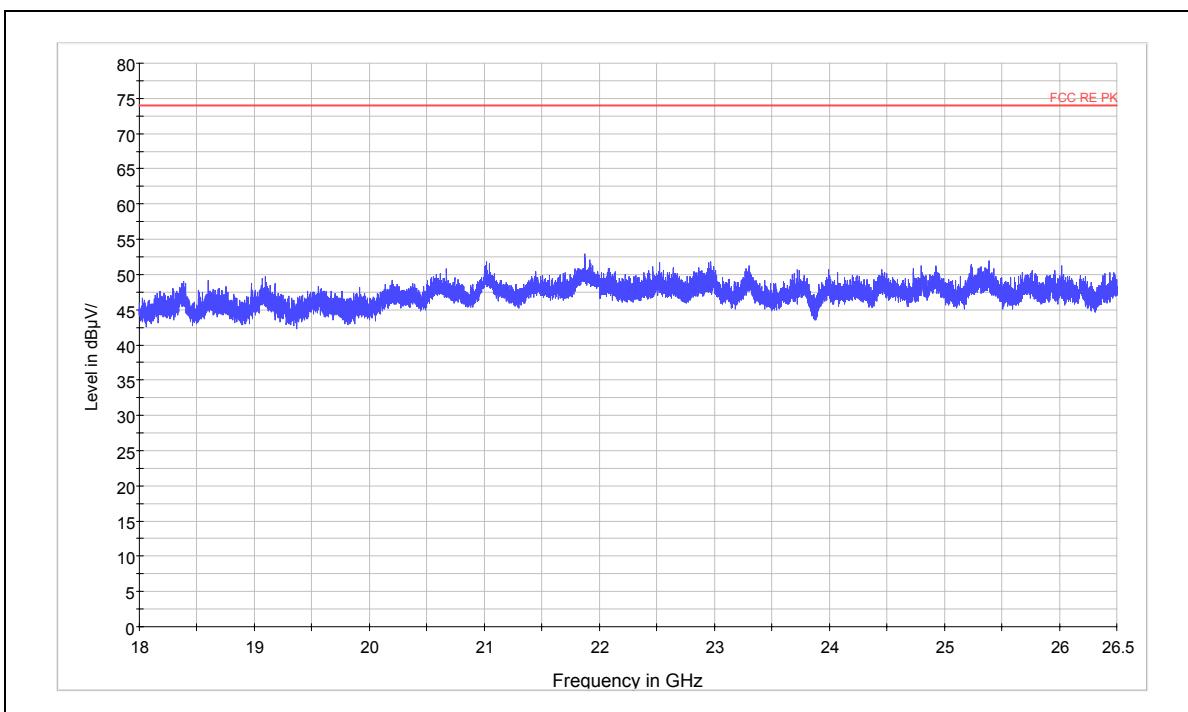
Radiates Emission from 3GHz to 18GHz

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

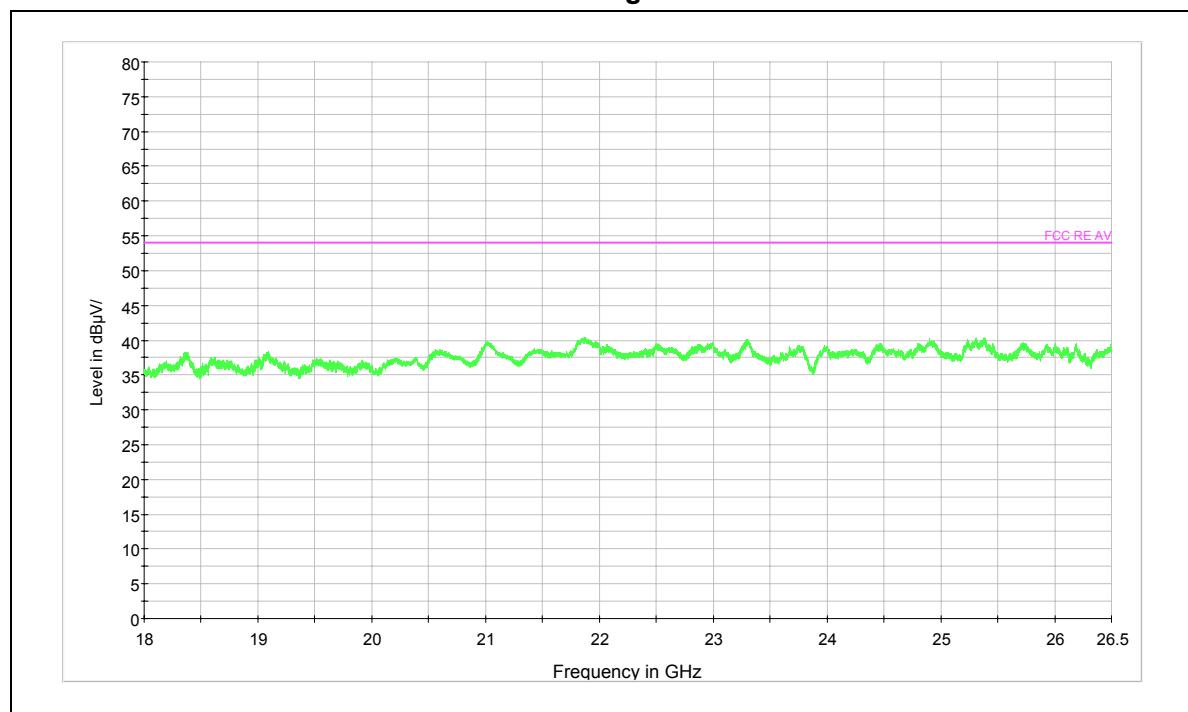
Page 66of 140

Peak



Radiates Emission from 18GHz to 26.5GHz

Average



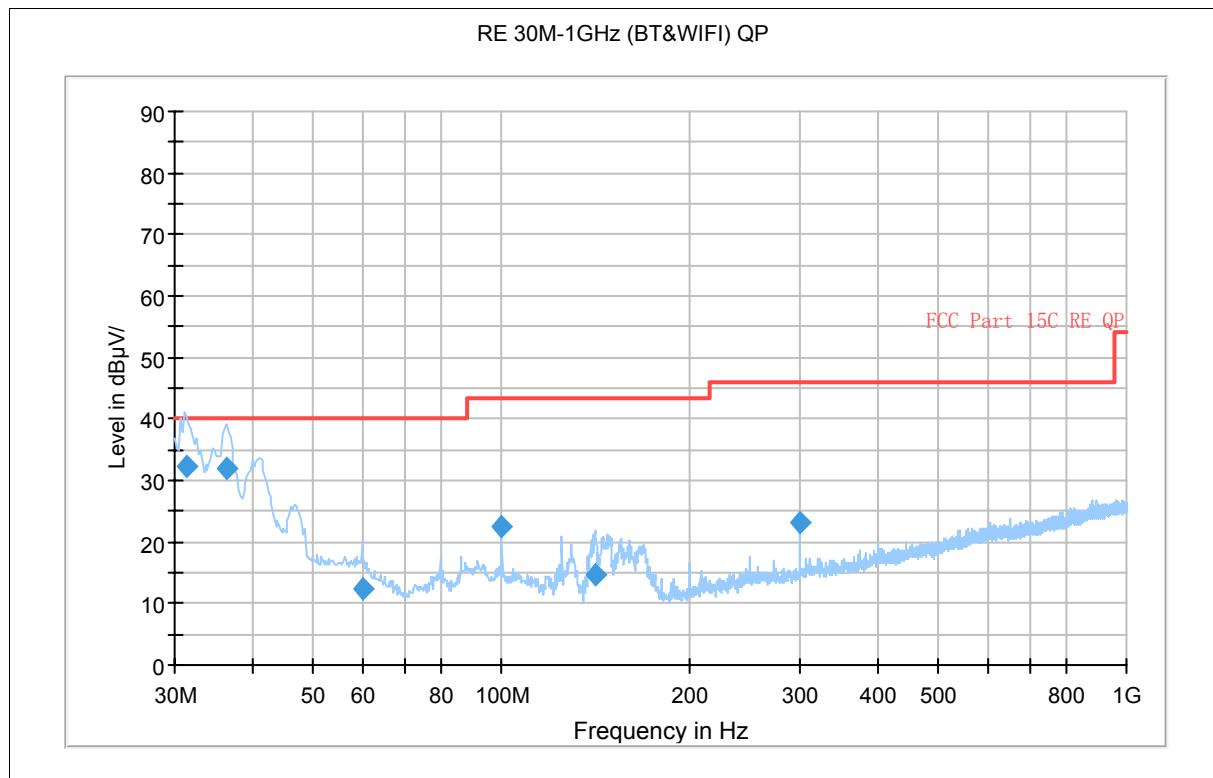
Radiates Emission from 18GHz to 26.5GHz

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 67 of 140

802.11b CH6



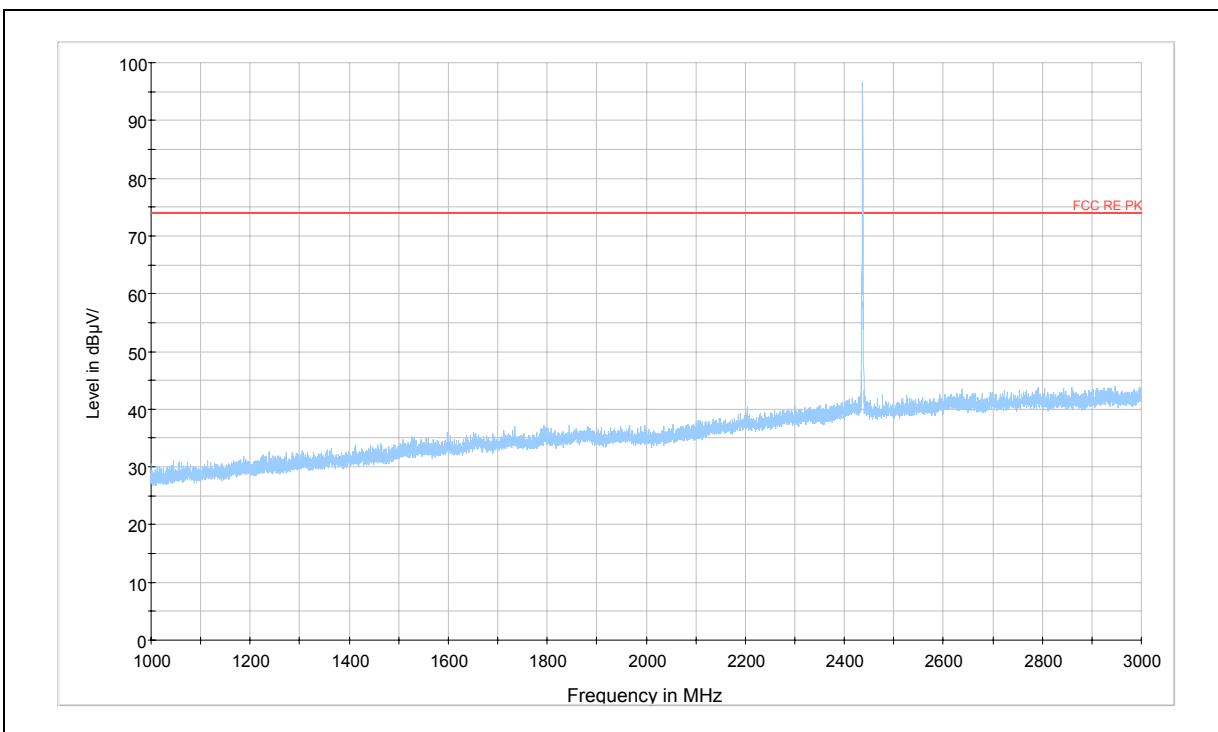
Frequency (MHz)	QuasiPeak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dBuV/m)
31.452500	32.1	100.0	V	0.0	7.9	40.0
36.425000	32.0	100.0	V	299.0	8.0	40.0
59.987500	12.3	116.0	H	315.0	27.7	40.0
100.000000	22.6	100.0	V	270.0	20.9	43.5
141.305000	14.6	100.0	V	0.0	28.9	43.5
300.022500	23.1	100.0	H	297.0	22.9	46.0

**TA Technology (Shanghai) Co., Ltd.
Test Report**

Report No.: RZA2010-1143RF15C-WiFi

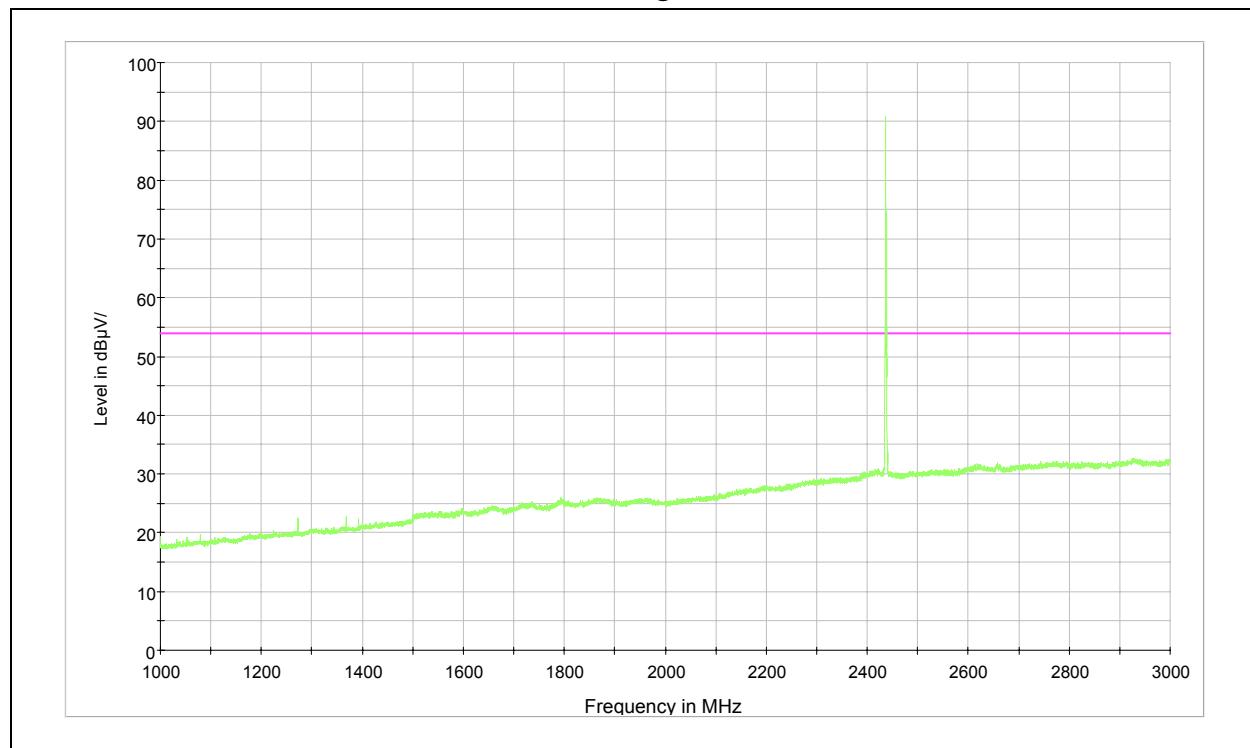
Page 68 of 140

Peak



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 3GHz

Average



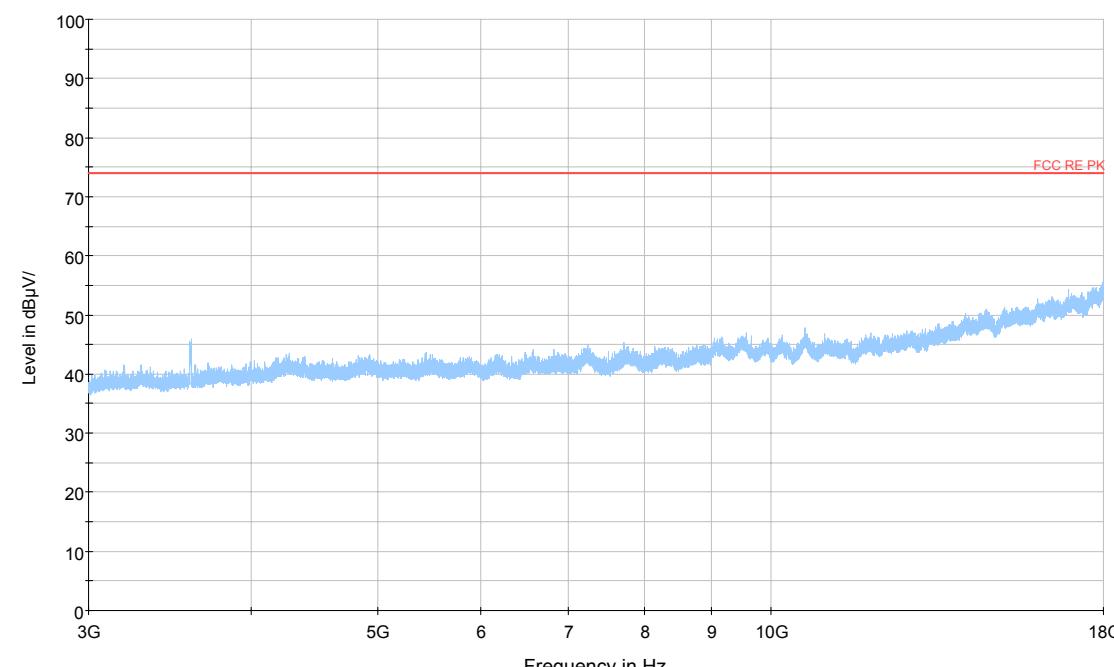
Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 3GHz

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

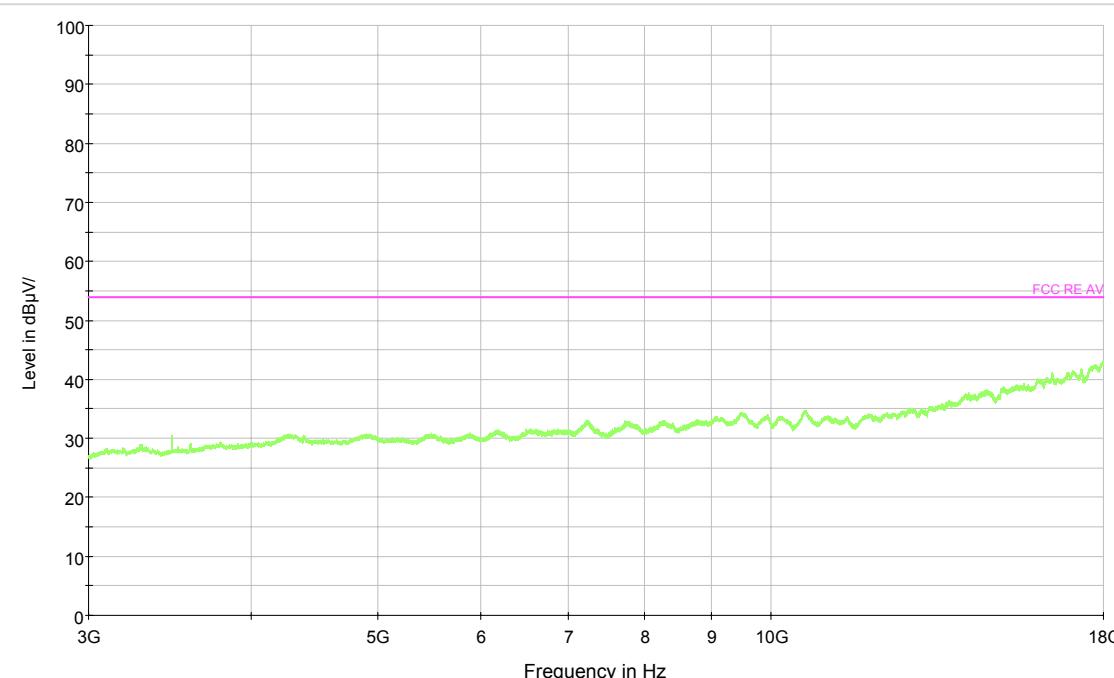
Page 69 of 140

Peak



Radiates Emission from 3GHz to 18GHz

Average



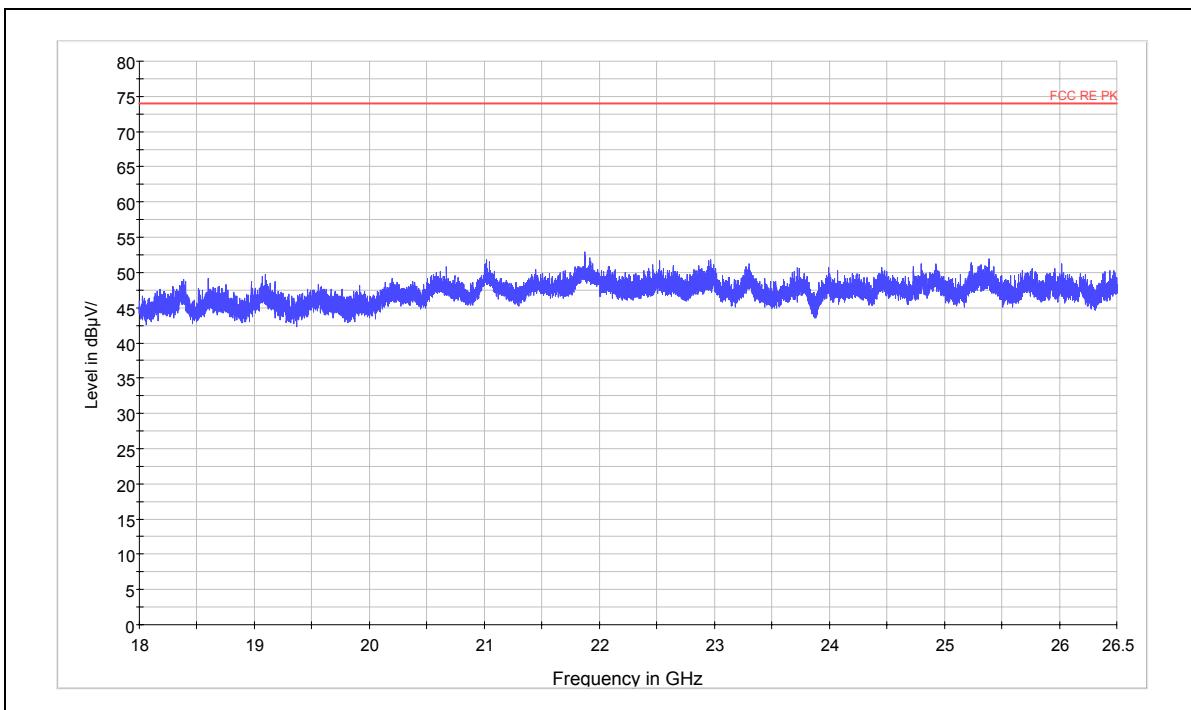
Radiates Emission from 3GHz to 18GHz

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

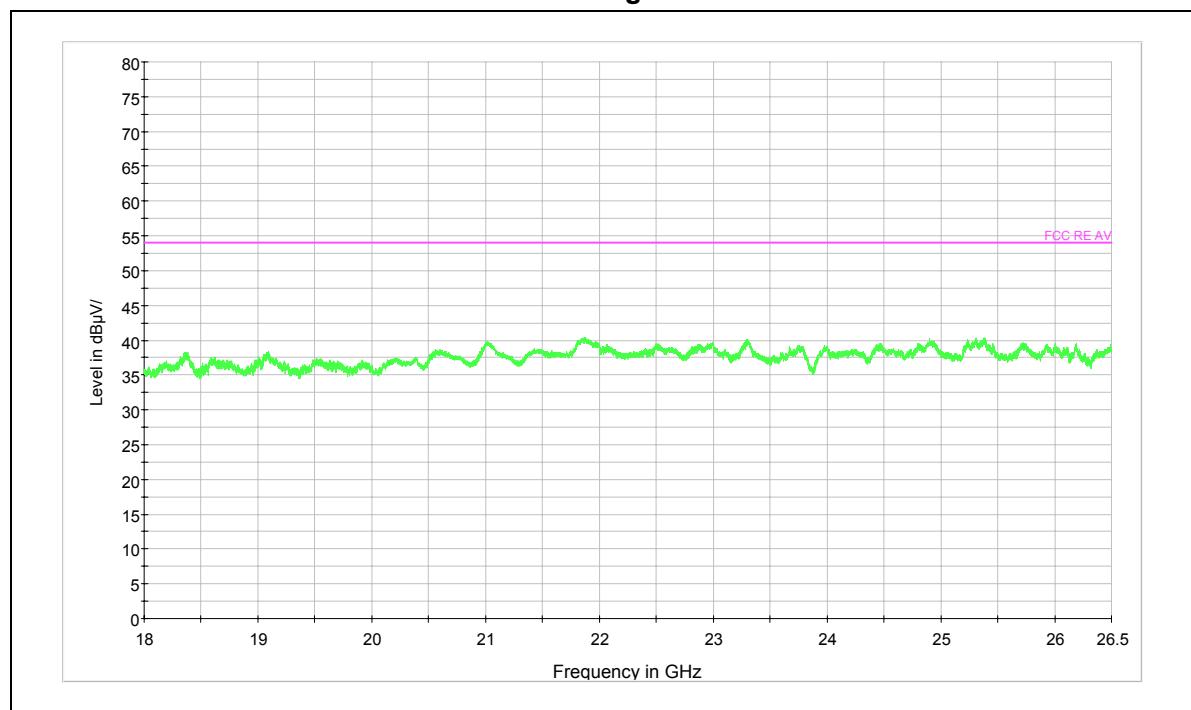
Page 70 of 140

Peak



Radiates Emission from 18GHz to 26.5GHz

Average



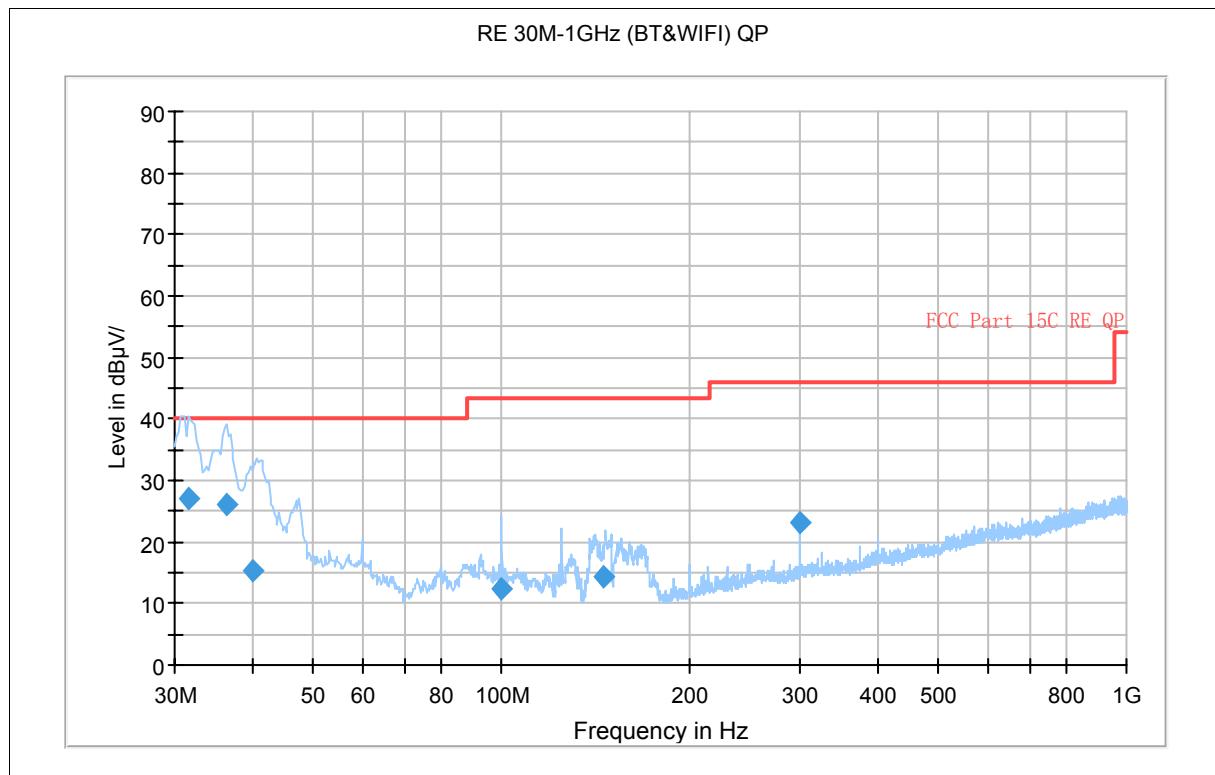
Radiates Emission from 18GHz to 26.5GHz

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 71of 140

802.11b CH11



Radiates Emission from 30MHz to 1GHz

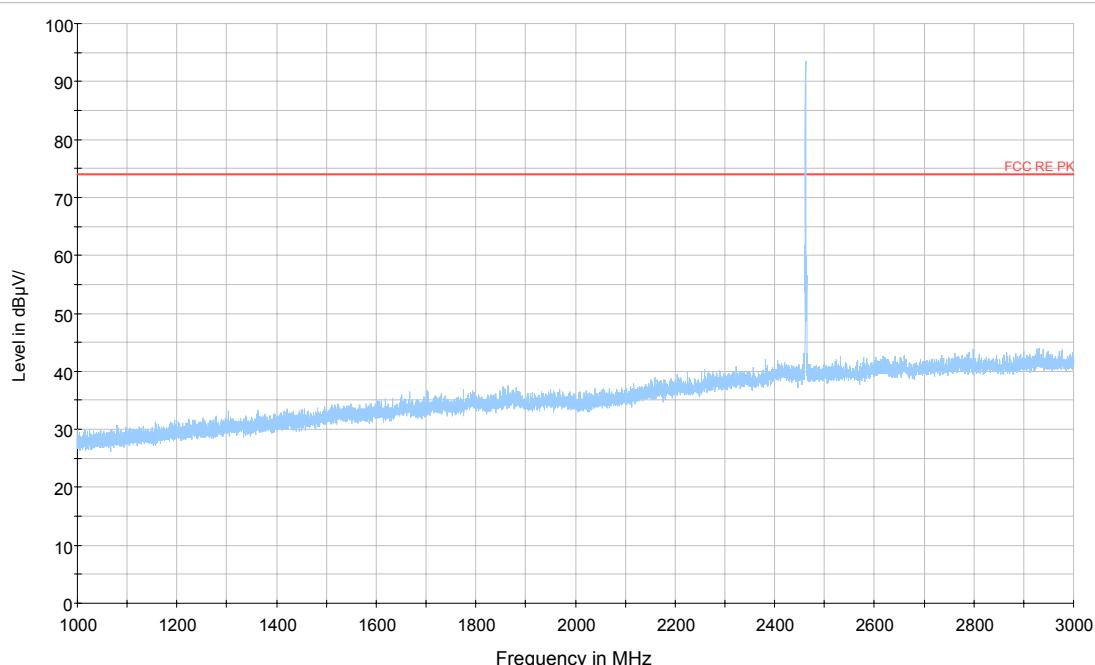
Frequency (MHz)	QuasiPeak (dB μ V/m)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dB μ V/m)
31.572500	27.1	100.0	V	315.0	12.9	40.0
36.425000	26.1	100.0	V	308.0	13.9	40.0
40.070000	15.2	125.0	H	284.0	24.8	40.0
100.000000	12.3	125.0	H	315.0	31.2	43.5
146.082500	14.5	100.0	V	3.0	29.0	43.5
300.022500	23.2	100.0	H	299.0	22.8	46.0

**TA Technology (Shanghai) Co., Ltd.
Test Report**

Report No.: RZA2010-1143RF15C-WiFi

Page 72 of 140

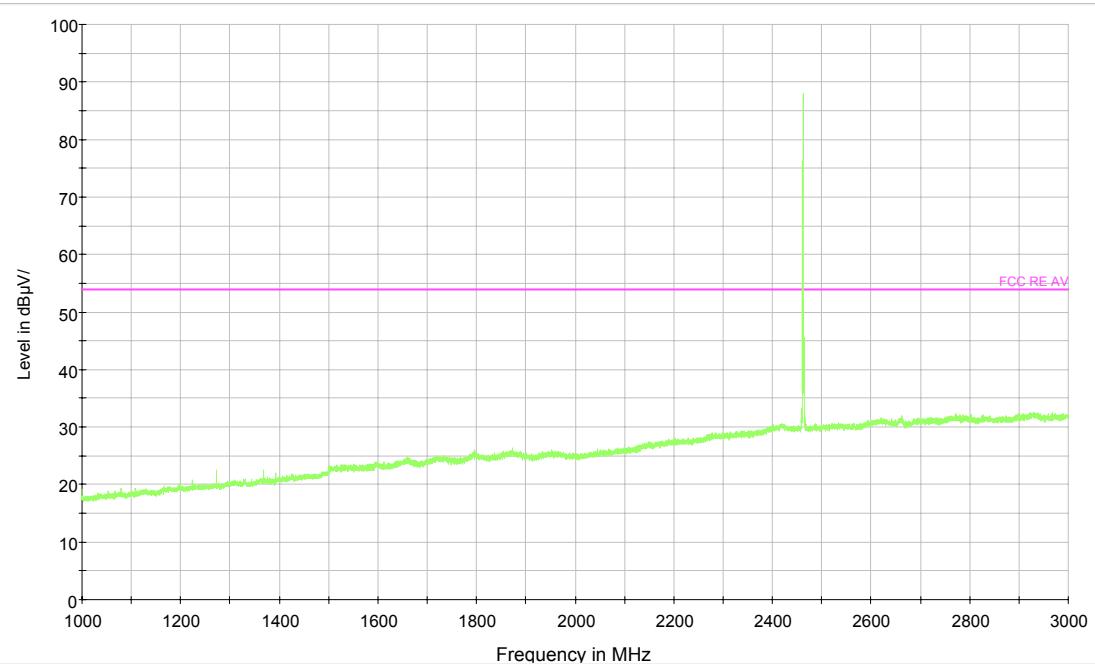
Peak



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

Average



Note: The signal beyond the limit is carrier.

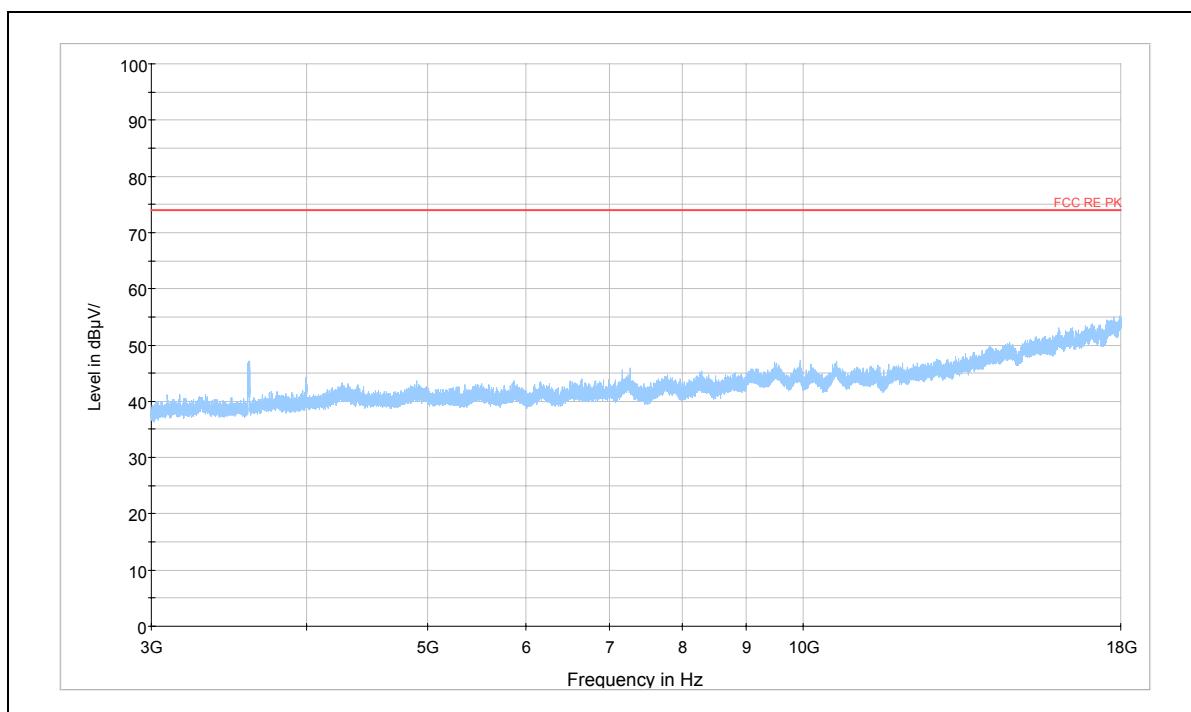
Radiates Emission from 1GHz to 3GHz

**TA Technology (Shanghai) Co., Ltd.
Test Report**

Report No.: RZA2010-1143RF15C-WiFi

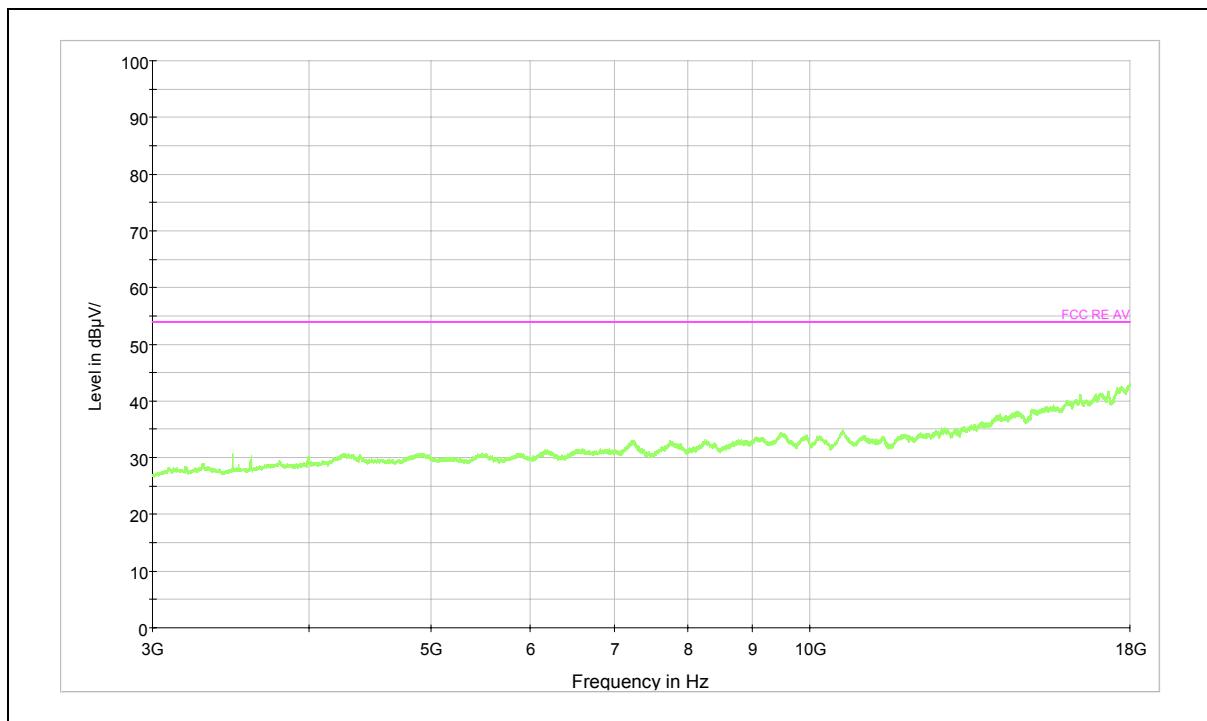
Page 73 of 140

Peak



Radiates Emission from 3GHz to 18GHz

Average



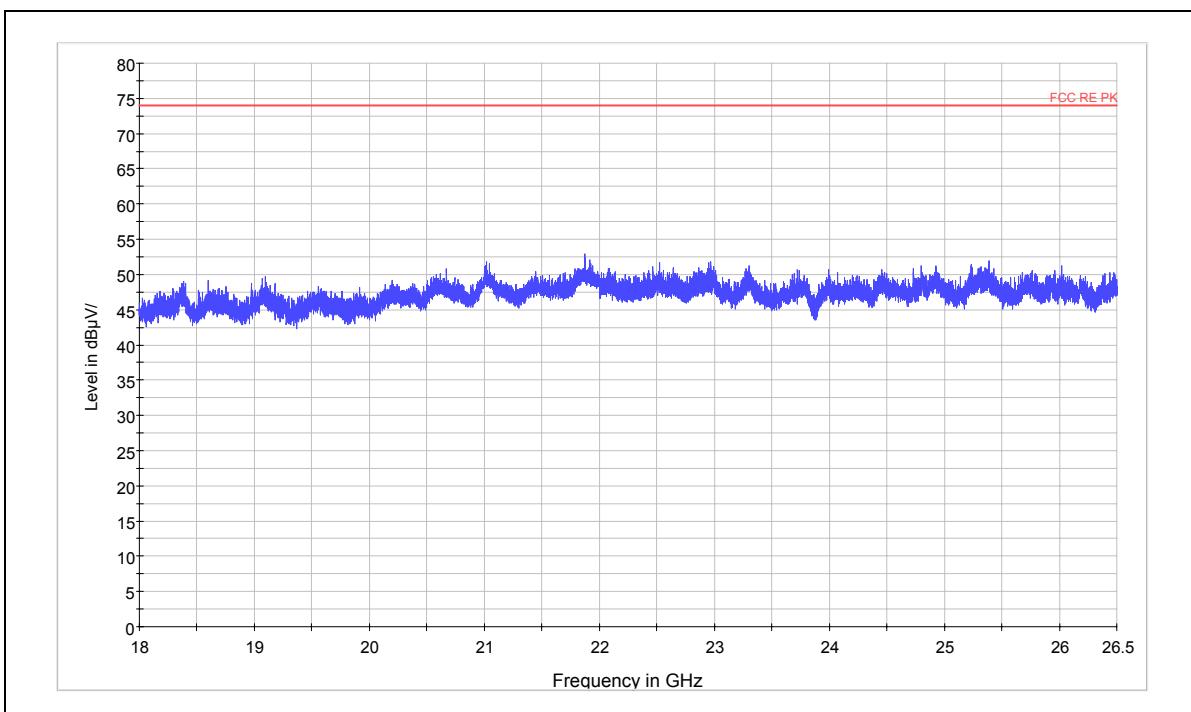
Radiates Emission from 3GHz to 18GHz

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

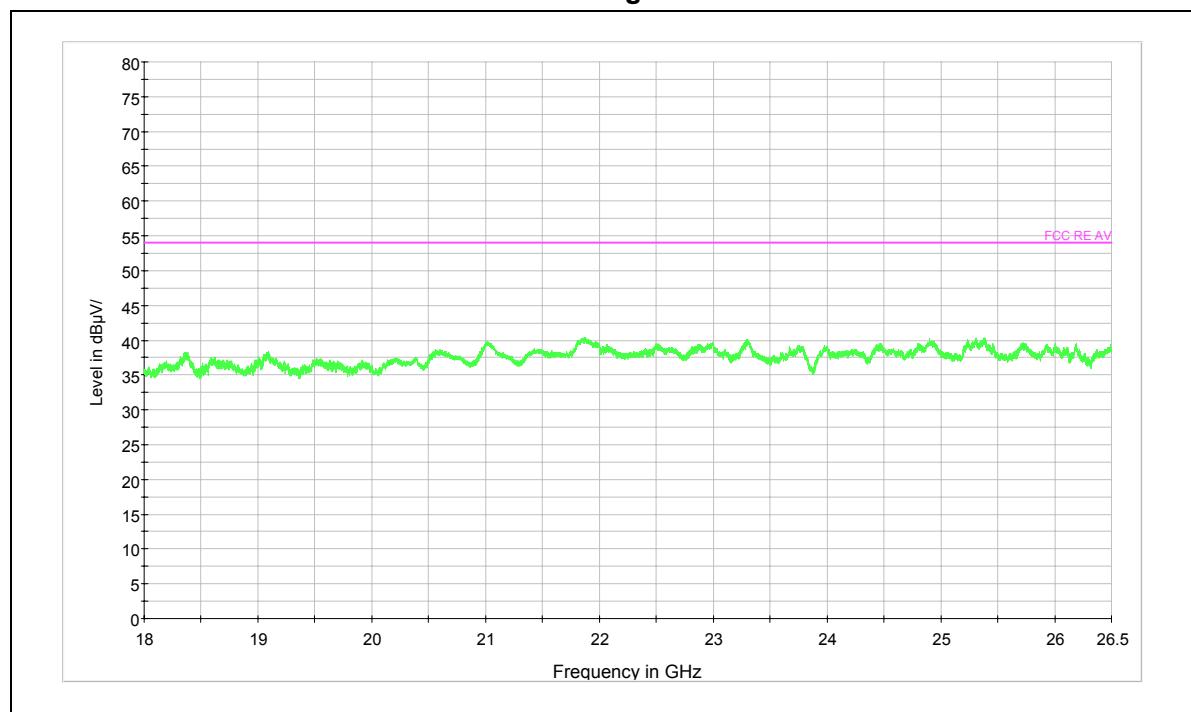
Page 74of 140

Peak



Radiates Emission from 18GHz to 26.5GHz

Average



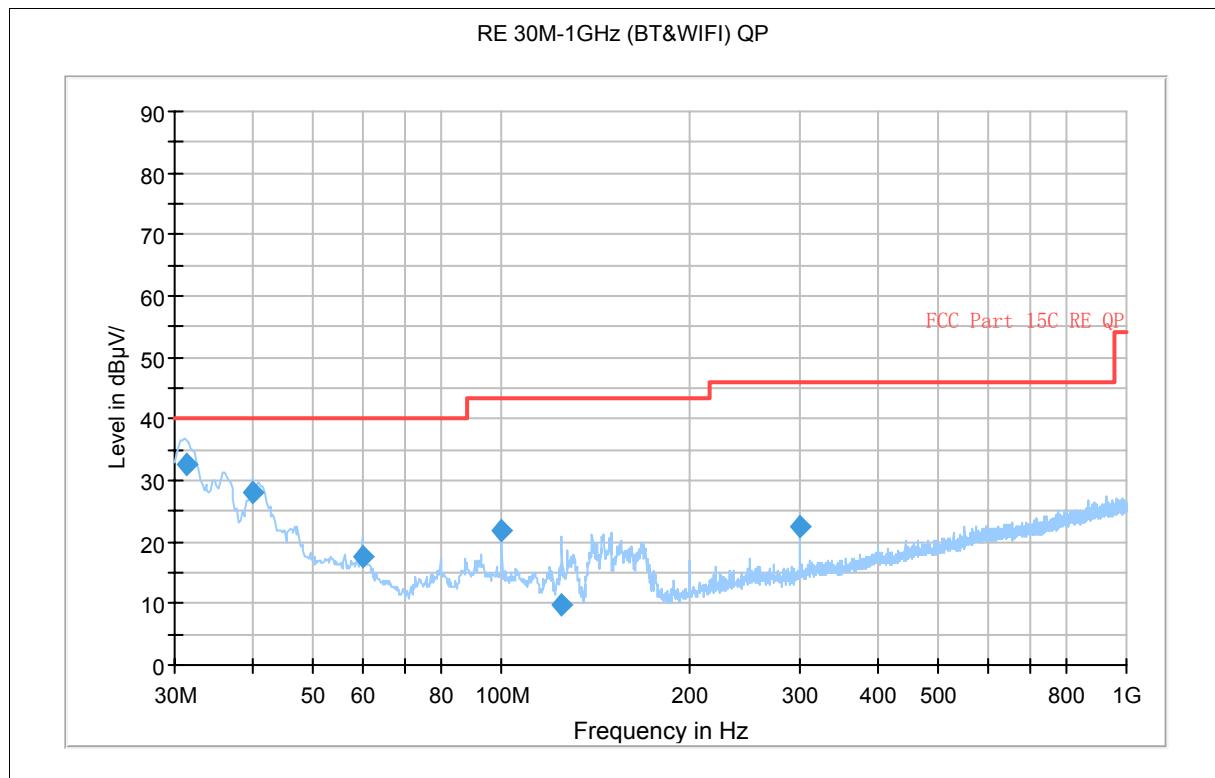
Radiates Emission from 18GHz to 26.5GHz

TA Technology (Shanghai) Co., Ltd.
Test Report

Report No.: RZA2010-1143RF15C-WiFi

Page 75of 140

802.11g CH1



Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	QuasiPeak (dB μ V/m)	Height (cm)	Polarization	Azimuth (deg)	Margin (dB)	Limit (dB μ V/m)
31.372500	32.7	100.0	V	315.0	7.3	40.0
40.022500	27.9	125.0	V	225.0	12.1	40.0
59.987500	17.7	100.0	V	46.0	22.3	40.0
100.000000	21.7	100.0	V	10.0	21.8	43.5
125.017500	9.9	125.0	H	234.0	33.6	43.5
300.022500	22.6	100.0	H	306.0	23.4	46.0