



Part 15C

TEST REPORT

Product Name	Embedded WIFI module
Model	HF-LPB
FCC ID	AZY-HF-LPB
Client	High-Flying Electronics Technology Co.,Ltd
Manufacturer	High-Flying Electronics Technology Co.,Ltd
Date of issue	March 27, 2013

TA Technology (Shanghai) Co., Ltd.

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

Report No.: RXA1301-0126RF01R1

Page 2 of 78

GENERAL SUMMARY

Reference Standard(s)	<p>FCC CFR47 Part 15C (2013) 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. (2009)</p> <p>KDB 558074 D01 DTS Meas Guidance v02 Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247</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>
Comment	<p>The test result only responds to the measured sample.</p>

Approved by
Director

Revised by
RF Manager

Performed by
RF Engineer

TABLE OF CONTENT

1. General Information	4
1.1. Notes of the test report	4
1.2. Testing laboratory	5
1.3. Applicant Information	5
1.4. Manufacturer Information	5
1.5. Information of EUT	6
1.6. Test Date	6
2. Test Information	7
2.1. Test Mode	7
2.2. Summary of test results	8
2.3. Peak Power Output –Conducted	9
2.4. Occupied Bandwidth (6dB)	11
2.5. Band Edge Compliance	17
2.6. Spurious Radiated Emissions in the restricted band	21
2.7. Power Spectral Density	30
2.8. Spurious RF Conducted Emissions	36
2.9. Radiates Emission	53
2.10. Conducted Emissions	68
2. Main Test Instruments	75
ANNEX A: EUT Appearance and Test Setup	76
A.1 EUT Appearance	76
A.2 Test Setup	77

1. General Information

1.1. Notes of the test report

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS), and accreditation number: L2264.

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 428261.

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 8510A.

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.

If the electrical report is inconsistent with the printed one, it should be subject to the latter.

TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RXA1301-0126RF01R1

Page 5 of 78

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

1.3. Applicant Information

Company: High-Flying Electronics Technology Co.,Ltd
Address: Room 511,#7Building,No.365 Chuanhong Road Pudong District,
Shanghai
City: Shanghai
Postal Code: 201202
Country: China

1.4. Manufacturer Information

Company: High-Flying Electronics Technology Co.,Ltd
Address: Room 511,#7Building,No.365 Chuanhong Road Pudong District,
Shanghai
City: Shanghai
Postal Code: 201202
Country: China

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

Report No.: RXA1301-0126RF01R1

Page 6 of 78

1.5. Information of EUT

General information

Name of EUT:	Embedded WIFI module
IMEI:	/
Hardware Version:	1.1
Software Version:	1.2.0
Antenna Type:	Internal Antenna
Device Operating Configurations:	
Network Standards:	802.11b, 802.11g, 802.11n(HT20); (tested)
Test Modulation:	(802.11b)DSSS; (802.11g)OFDM 802.11n(HT20)
Power Supply:	Battery or Adapter
Max Conducted Power	17.65 dBm
Operating Frequency Range(s)	2400MHz~ 2483.5 MHz

Equipment Under Test (EUT) is Embedded WIFI module. 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 performed from January 28, 2013 to March 25, 2013.

TA Technology (Shanghai) Co., Ltd.

Test Report

2. Test Information

2.1. Test Mode

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the worst case was recorded.

The final configuration from all the combinations and the worst-case data rates were investigated by measuring the maximum power across all the data rates and modulation modes under section 2.3.

Based on the worst configuration found above, the RF power setting is set individually to meet FCC compliance limit for the final conducted and radiated tests.

Results of test modes, data rates and test channels are shown as following table.

	Test items	Modes	Data Rate	Test channel
Conducted Test cases	Peak Power Output –Conducted	802.11b	11 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
	Minimum 6dB bandwidth	802.11b	11 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
	Band Edges compliance	802.11b	11 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	MCS0	1/11
	Power spectral Density	802.11b	11 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
Conducted Spurious Emission	802.11b	11 Mbps	1/6/11	
	802.11g	6 Mbps	1/6/11	
	802.11n HT20	MCS0	1/6/11	
Conducted Emissions	802.11b	11 Mbps	6	
	802.11g	6 Mbps	6	
	802.11n HT20	MCS0	6	
Radiated Test cases	Spurious Radiated Emissions in the restricted band	802.11b	11 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	MCS0	1/11
	Radiates Emission	802.11b	11 Mbps	6
		802.11g	6 Mbps	6
		802.11n HT20	MCS0	6

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

Report No.: RXA1301-0126RF01R1

Page 8 of 78

2.2. 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

2.3. Peak Power Output –Conducted

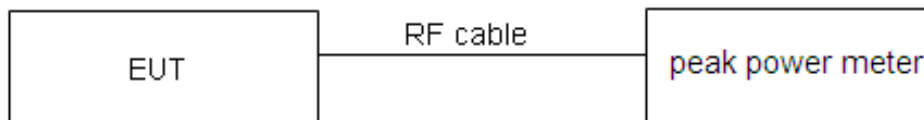
Ambient condition

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 peak power meter through an external attenuator and a known loss cable. The EUT is max power transmission with proper modulation. We use 5.2.1 Maximum Peak Conducted Output Power Level Method in KDB 558074 D01 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	$\leq 1\text{W}$ (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.: RXA1301-0126RF01R1

Page 10 of 78

Test Results: Pass

Network Standards	Data Rate	Peak Output Power (dBm)		
		CH 1	CH 6	CH 11
802.11b	1 Mbps	14.73	15.11	16.43
	2 Mbps	14.78	15.15	16.51
	5.5 Mbps	15.63	15.64	17.43
	11 Mbps	15.86	16.09	17.65
802.11g	6 Mbps	12.18	12.63	13.91
	9 Mbps	11.96	12.54	13.79
	12 Mbps	11.94	12.31	12.87
	18 Mbps	11.77	12.12	12.54
	24 Mbps	11.46	12.02	11.36
	36 Mbps	10.56	11.45	10.64
	48 Mbps	9.68	10.06	10.12
	54 Mbps	9.36	9.57	9.64
802.11n HT20	MCS0	8.54	9.15	10.36
	MCS1	8.44	9.04	10.31
	MCS2	8.36	8.89	10.22
	MCS3	8.15	8.73	10.01
	MCS4	7.54	8.24	9.15
	MCS5	6.86	7.34	8.64
	MCS6	6.28	6.34	7.12
	MCS7	5.54	5.92	6.04

Note: The maximum output power values are marked in bold.

2.4. Occupied Bandwidth (6dB)

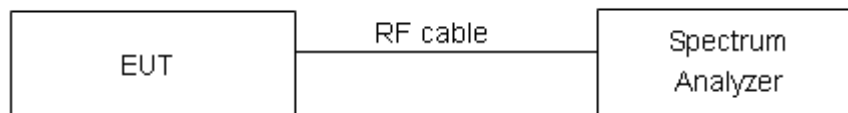
Ambient condition

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

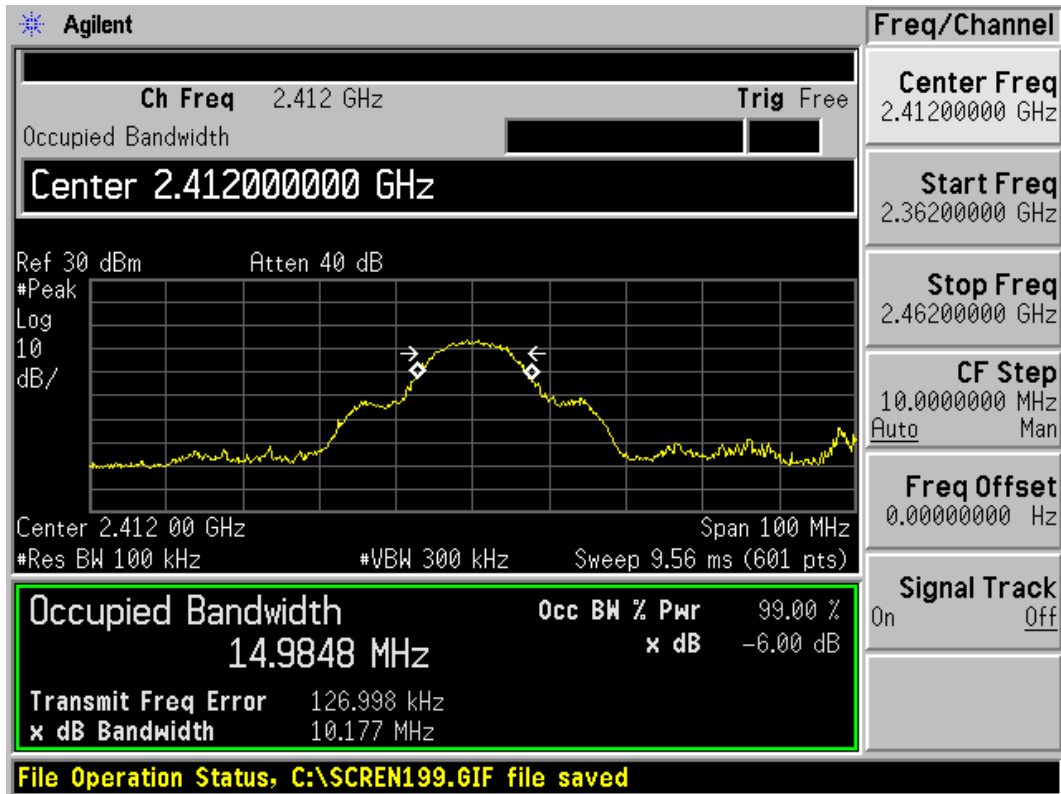
Report No.: RXA1301-0126RF01R1

Page 12 of 78

Test Results:

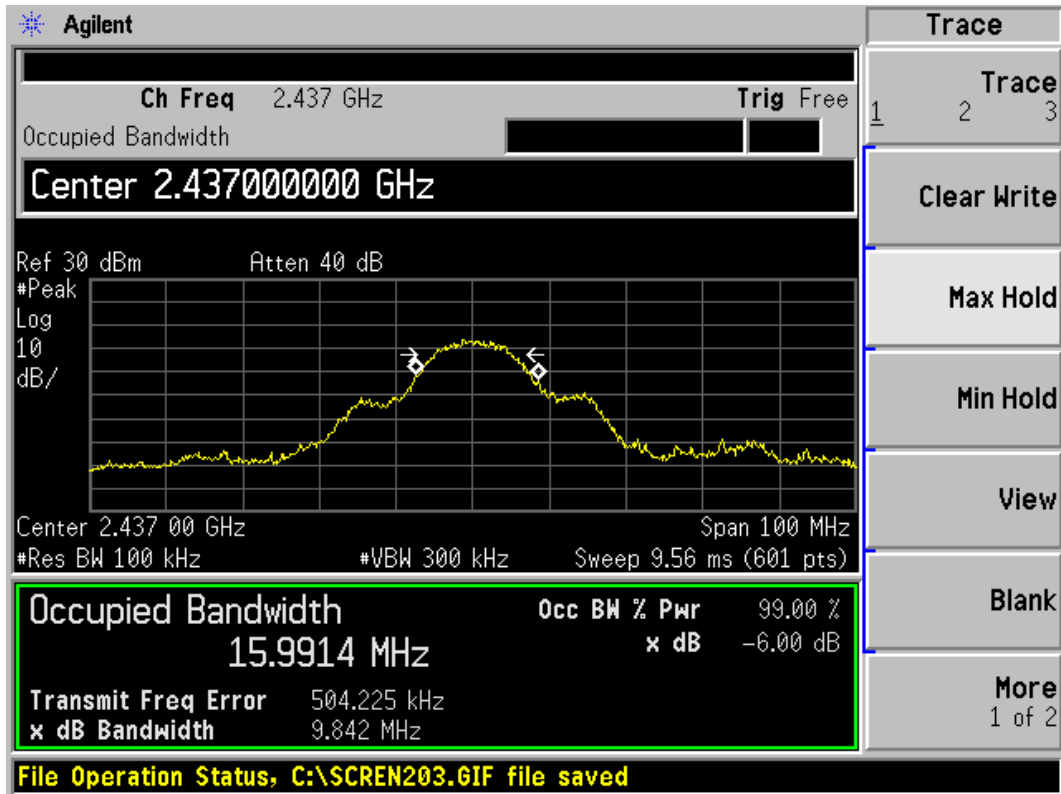
Network Standards	Carrier frequency (MHz)	Minimum 6dB bandwidth (MHz)	Conclusion
802.11b	2412	10.177	PASS
	2437	9.842	PASS
	2462	9.688	PASS
802.11g	2412	16.514	PASS
	2437	16.469	PASS
	2462	16.495	PASS
802.11n HT20	2412	14.535	PASS
	2437	16.251	PASS
	2462	17.387	PASS

802.11b

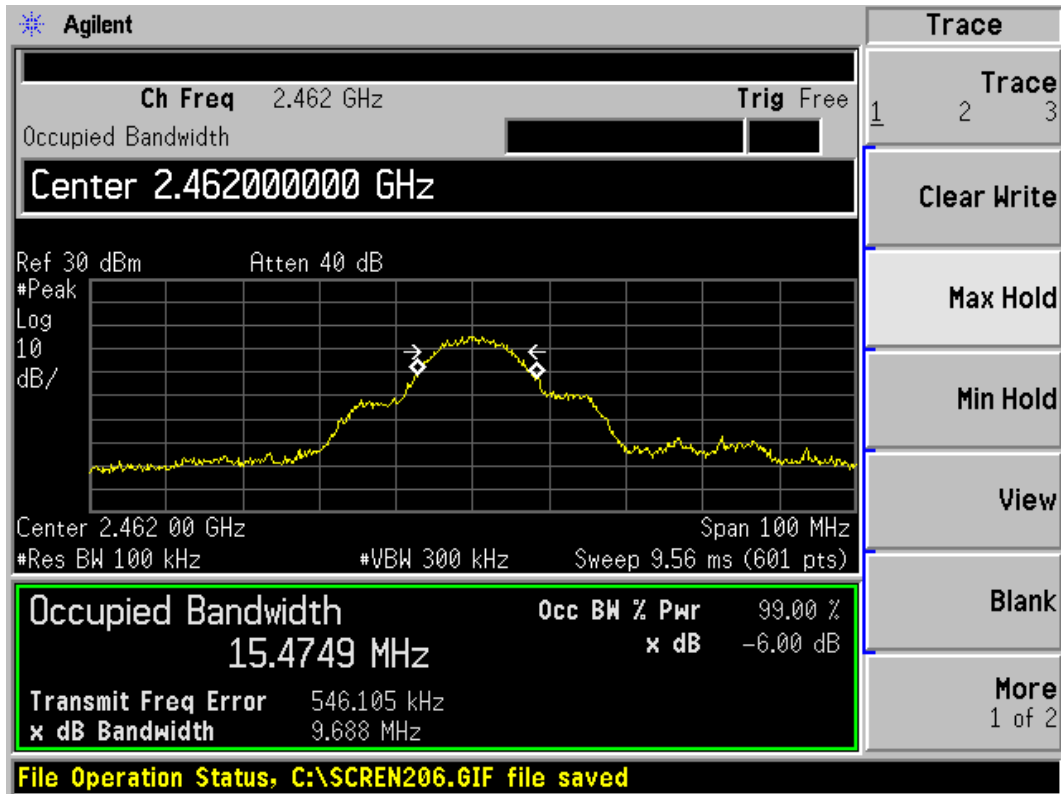


802.11b, Carrier frequency (MHz): 2412

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



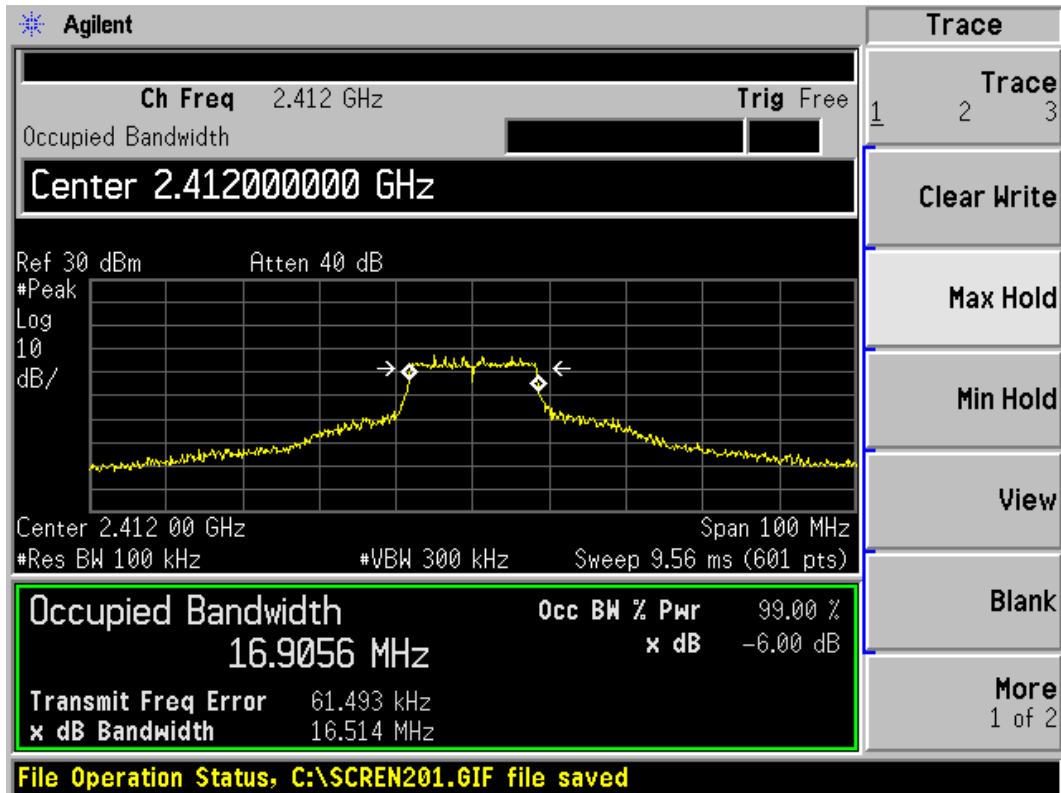
802.11b, Carrier frequency (MHz): 2437



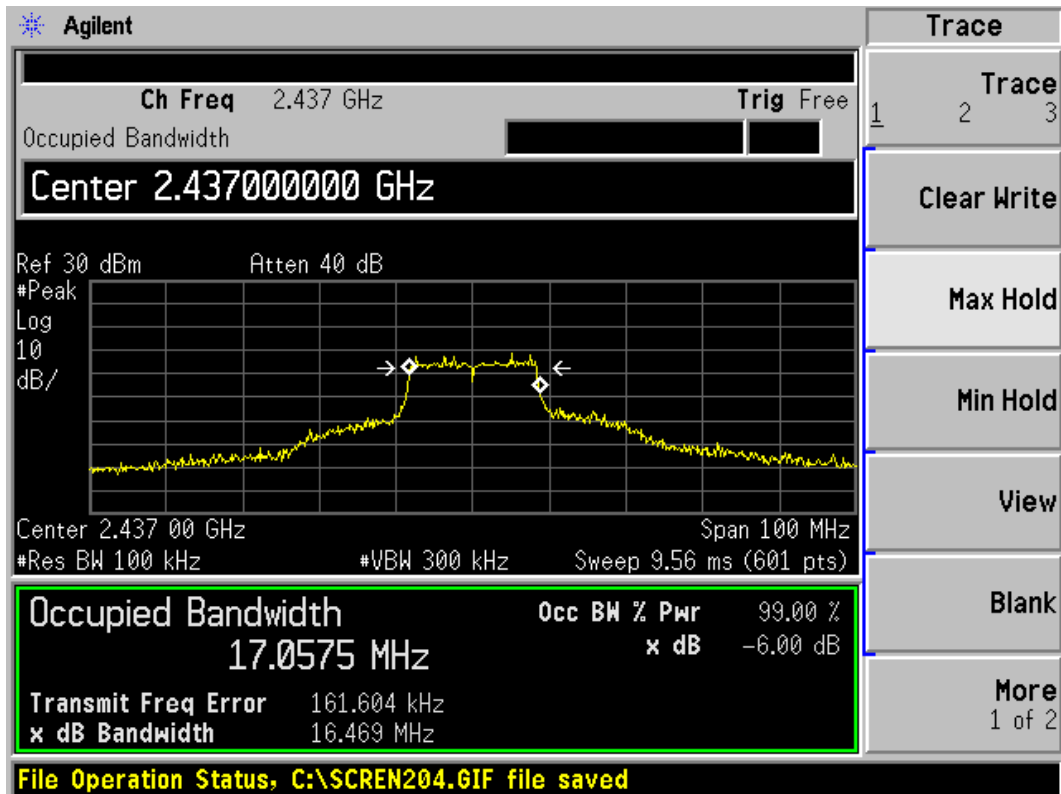
802.11b, Carrier frequency (MHz):2462

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

802.11g

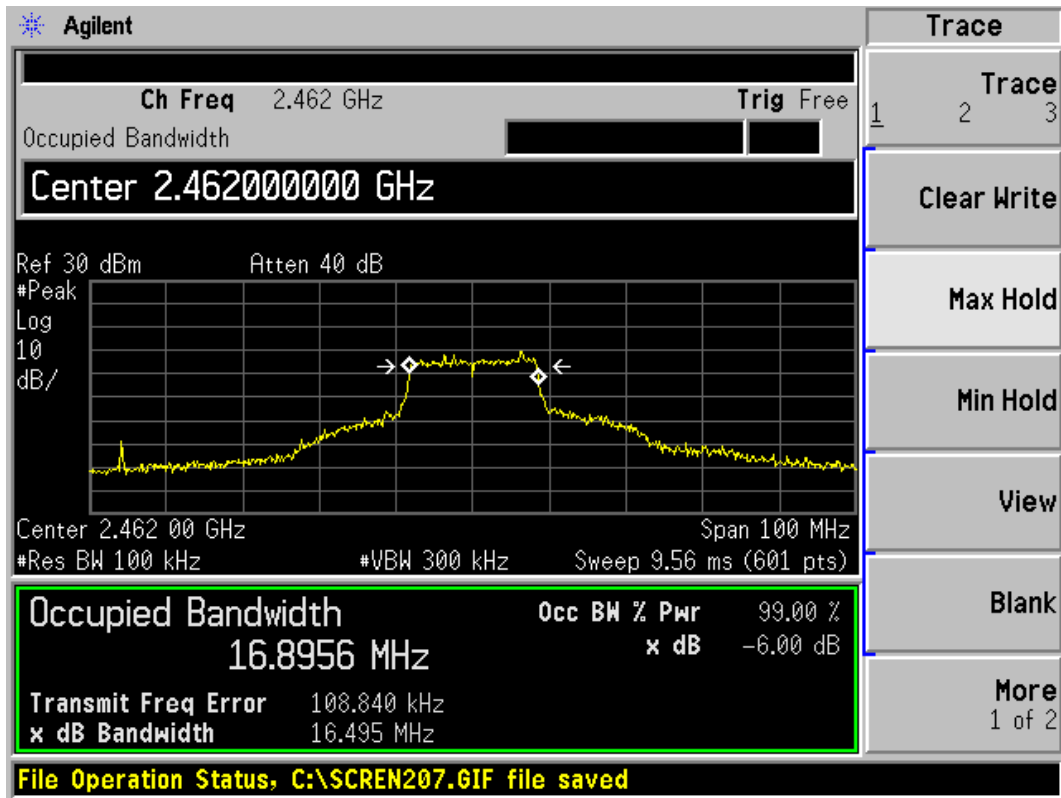


802.11g, Carrier frequency (MHz): 2412



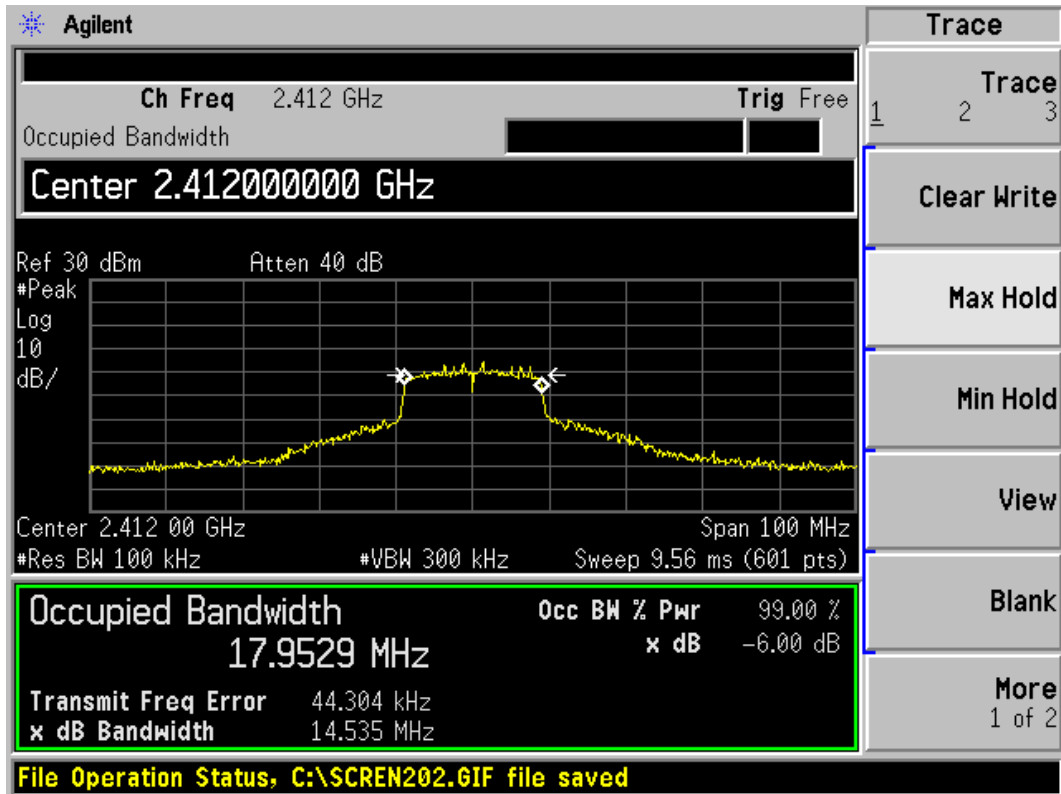
802.11g, Carrier frequency (MHz): 2437

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



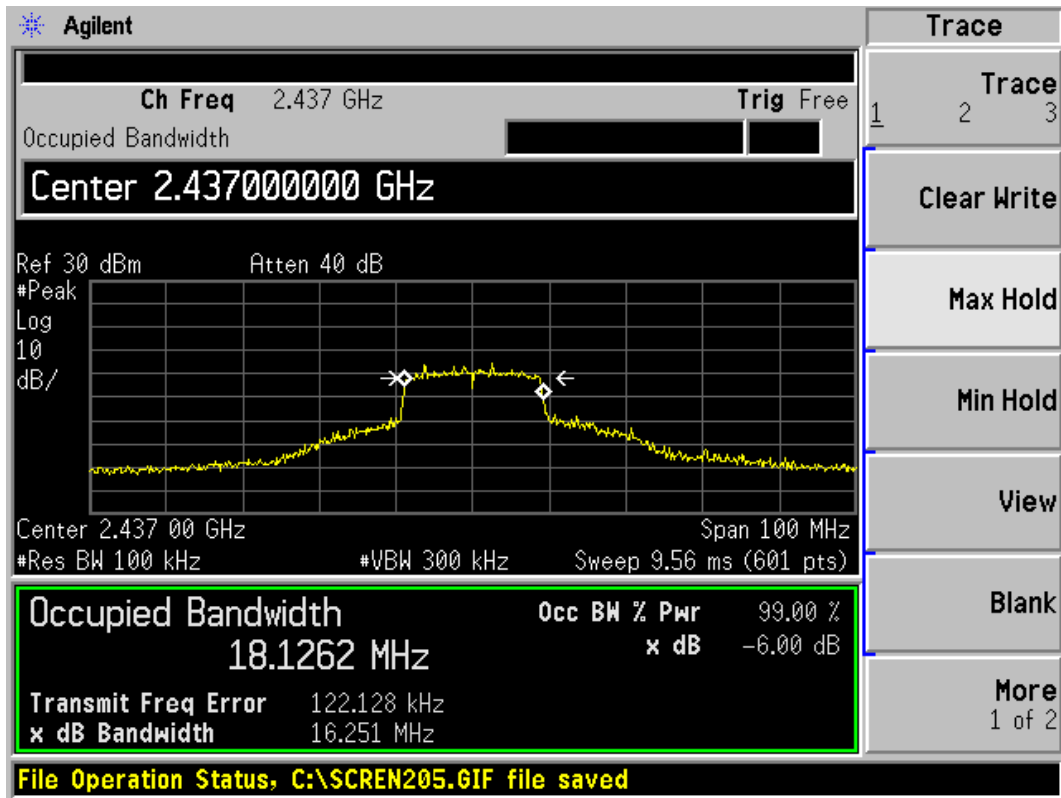
802.11g, Carrier frequency (MHz):2462

802.11n (HT20)

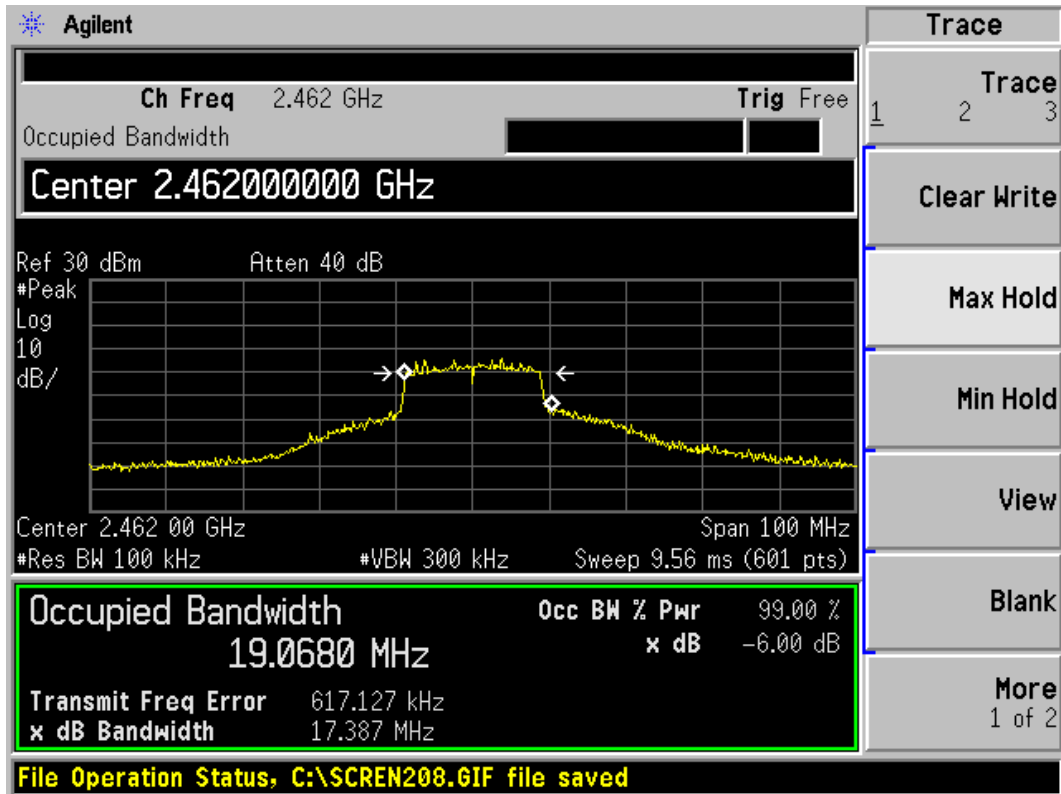


802.11n (HT20), Carrier frequency (MHz): 2412

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



802.11n (HT20), Carrier frequency (MHz): 2437



802.11n (HT20), Carrier frequency (MHz):2462

2.5. Band Edge Compliance

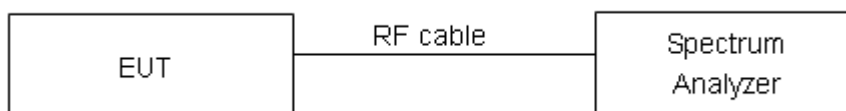
Ambient condition

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

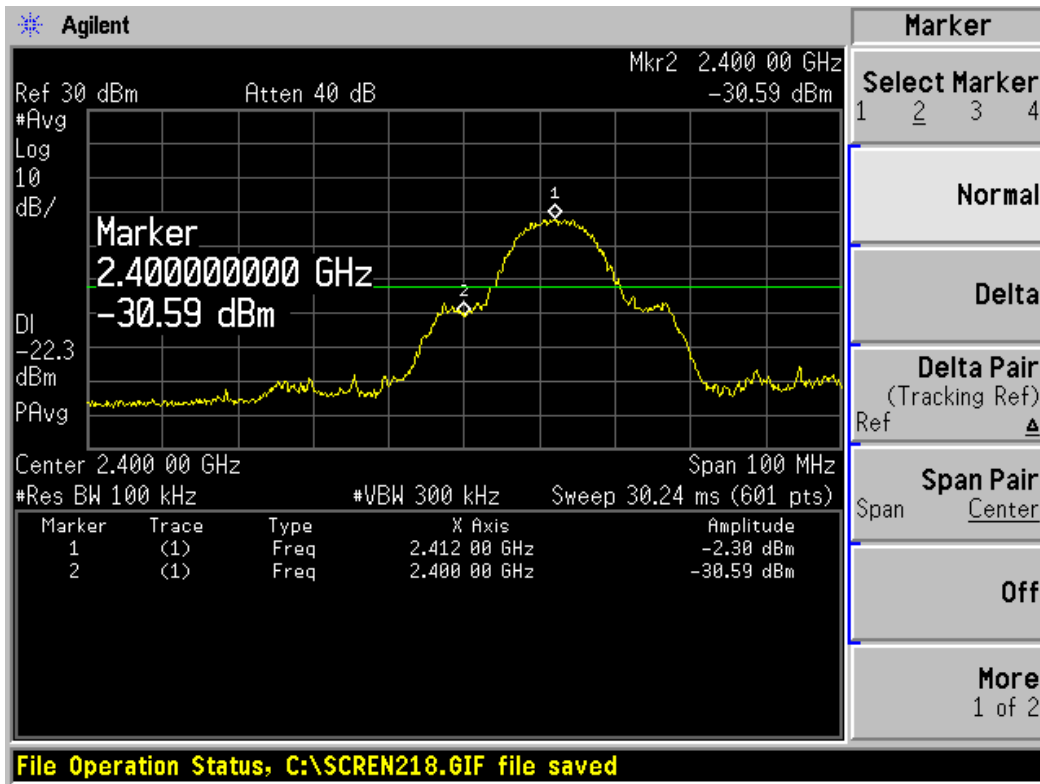
TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RXA1301-0126RF01R1

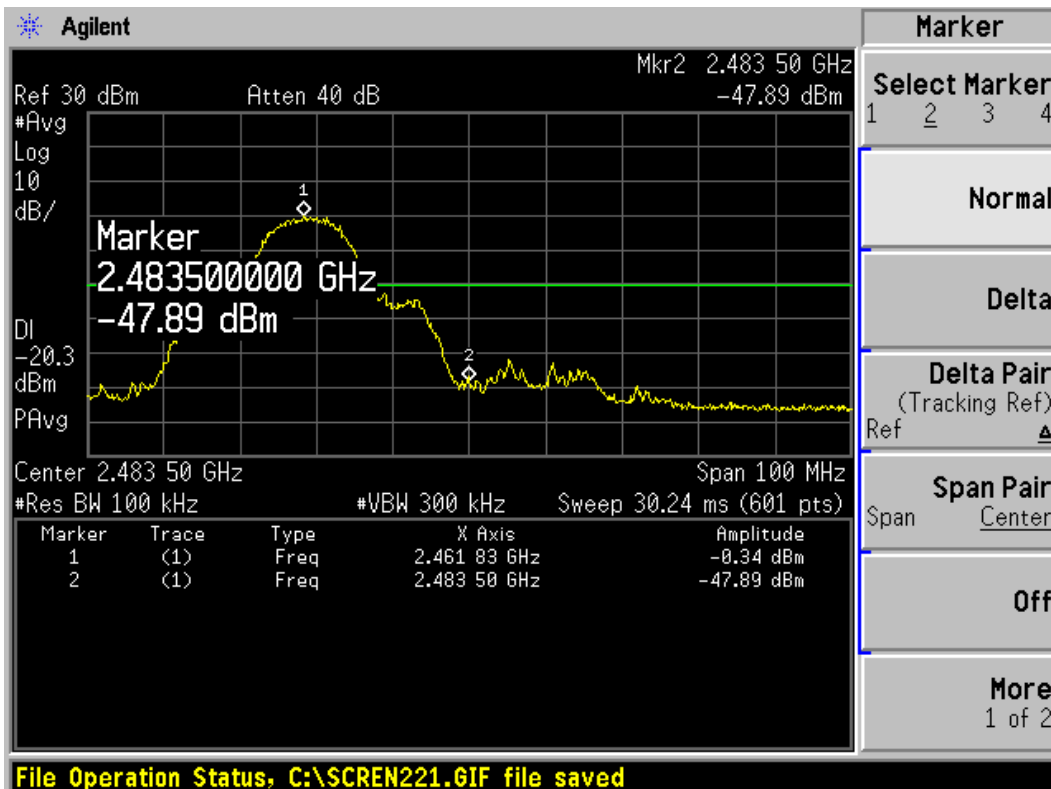
Page 18 of 78

Test Results: PASS

802.11b



802.11b, Channel No.: 1



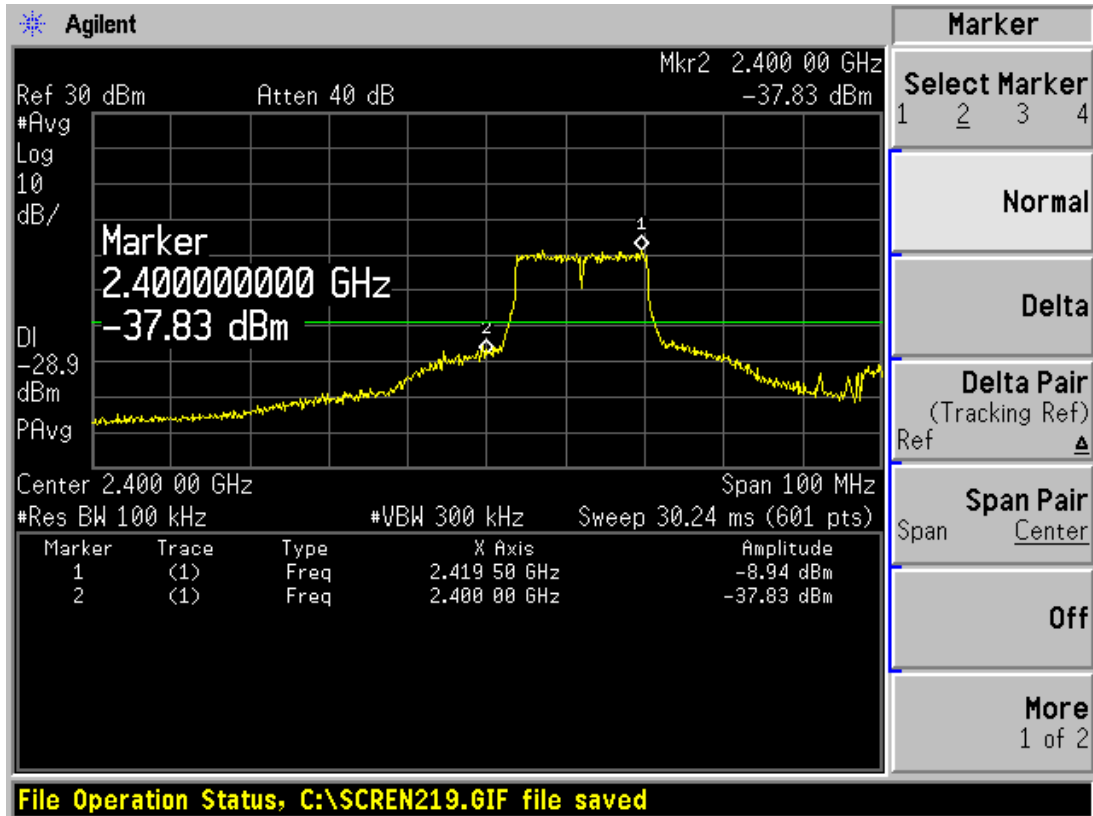
802.11b, Channel No.: 11

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

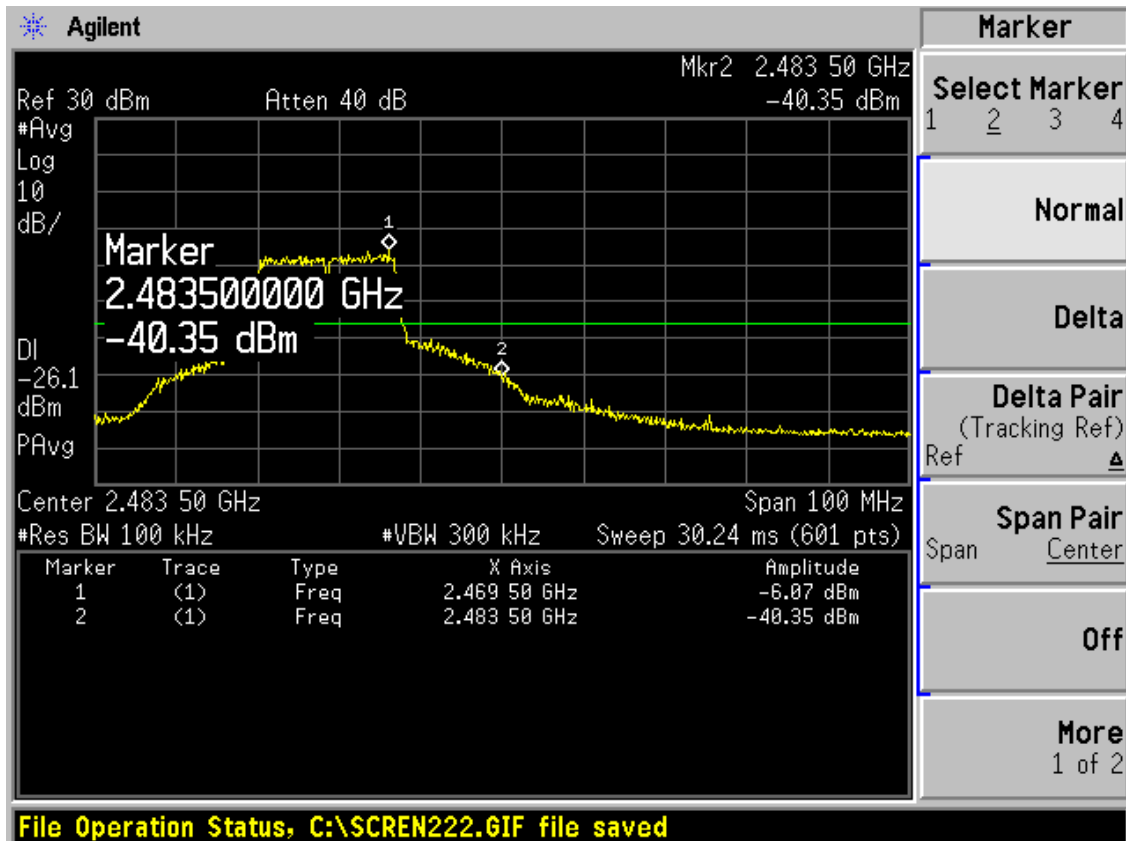
Report No.: RXA1301-0126RF01R1

Page 19 of 78

802.11g



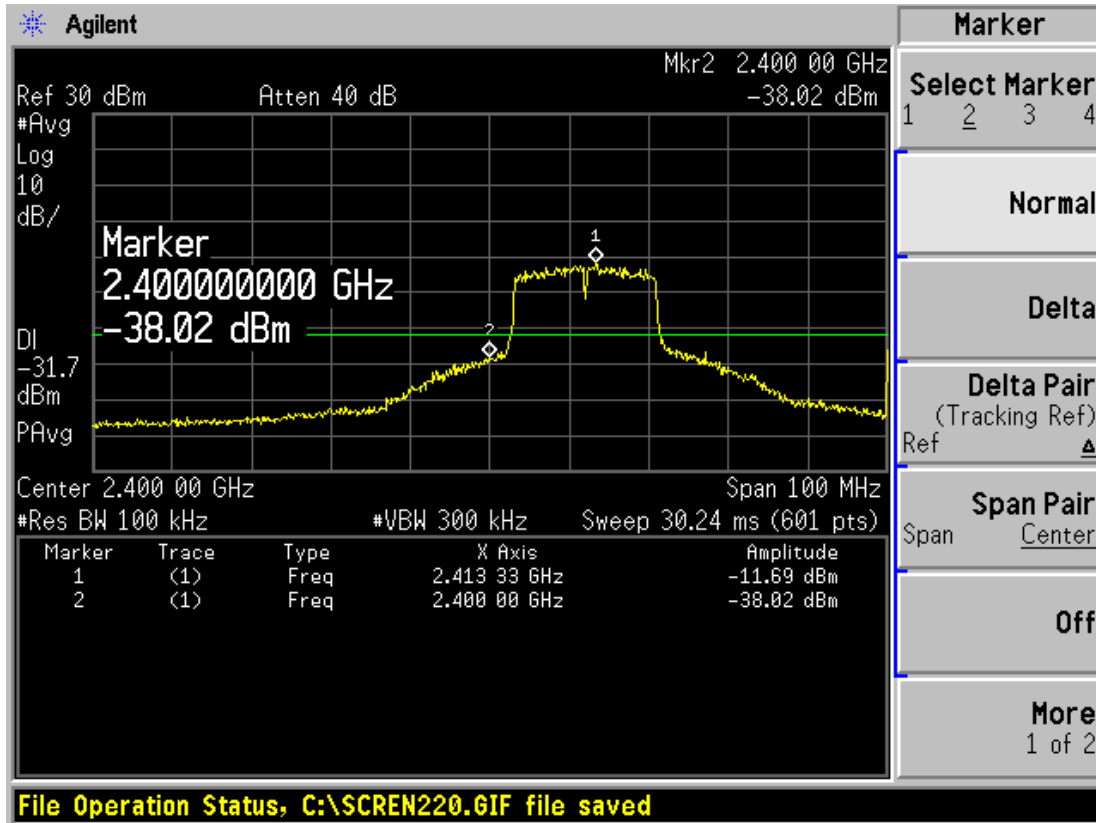
802.11g, Channel No.: 1



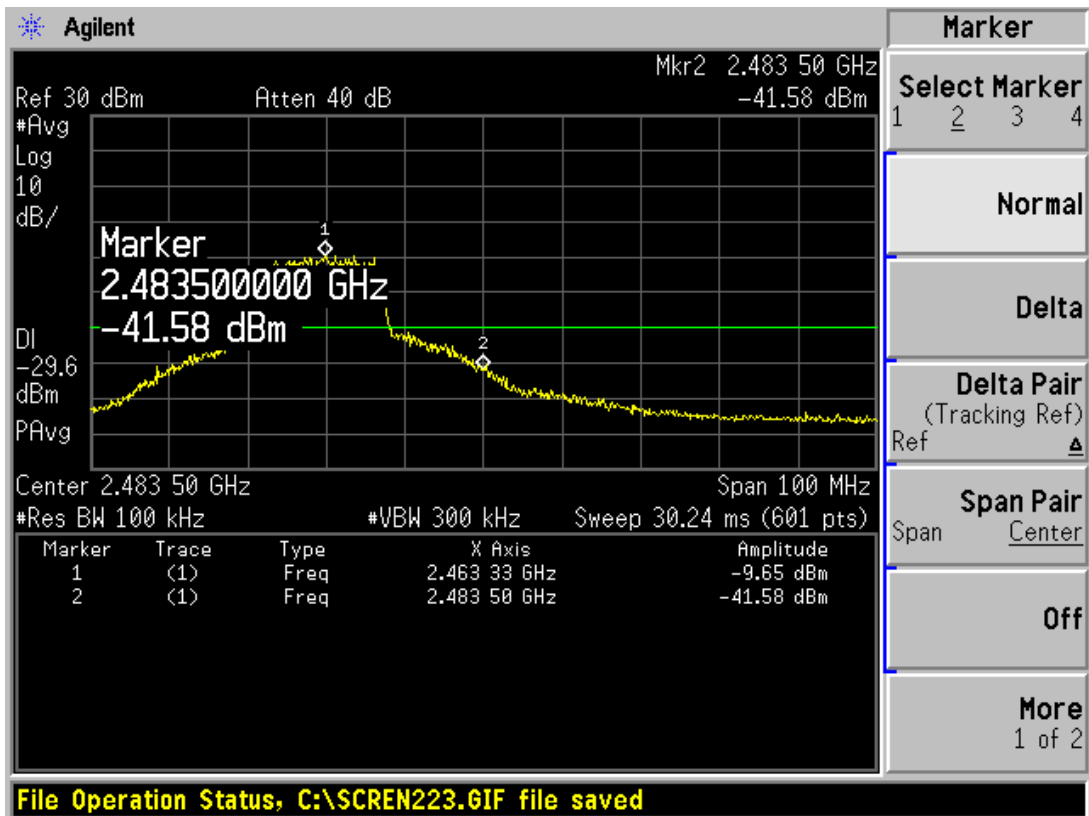
802.11g, Channel No.: 11

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

802.11n (HT20)



802.11n (HT20), Channel No.: 1



802.11n (HT20), Channel No.: 11

2.6. 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:

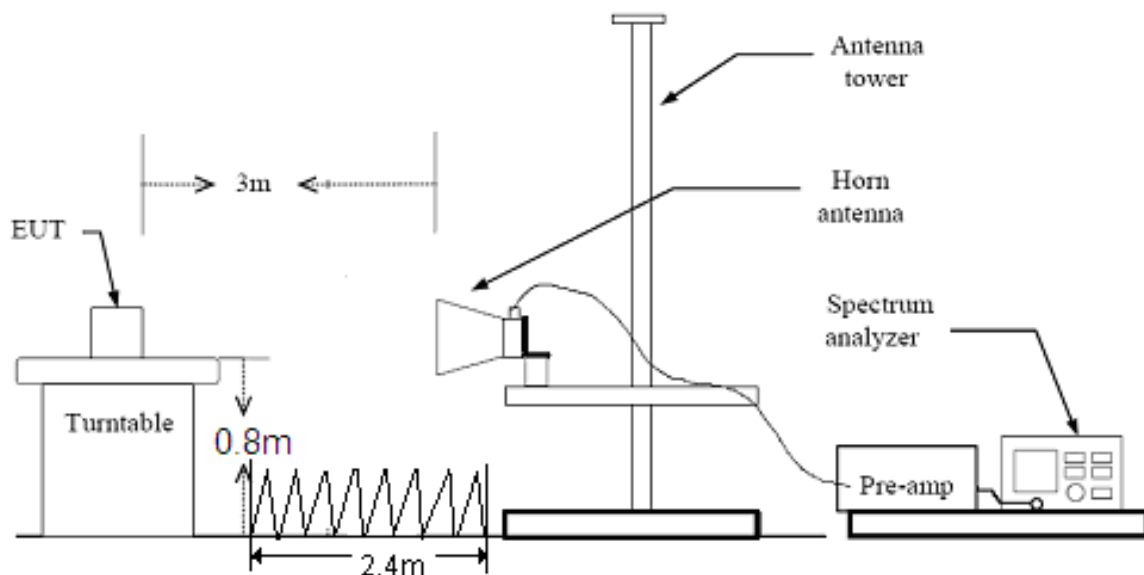
- (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
- (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

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

The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the antenna is vertical.

The test is in transmitting mode.

Test setup



Note: Area side: 2.4m X 3.6m

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

Report No.: RXA1301-0126RF01R1

Page 22 of 78

Limits

Spurious Radiated Emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

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

§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.

Peak Limit=74 dBuV/m

Average Limit=54 dBuV/m

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U = 3.55$ dB.

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

Report No.: RXA1301-0126RF01R1

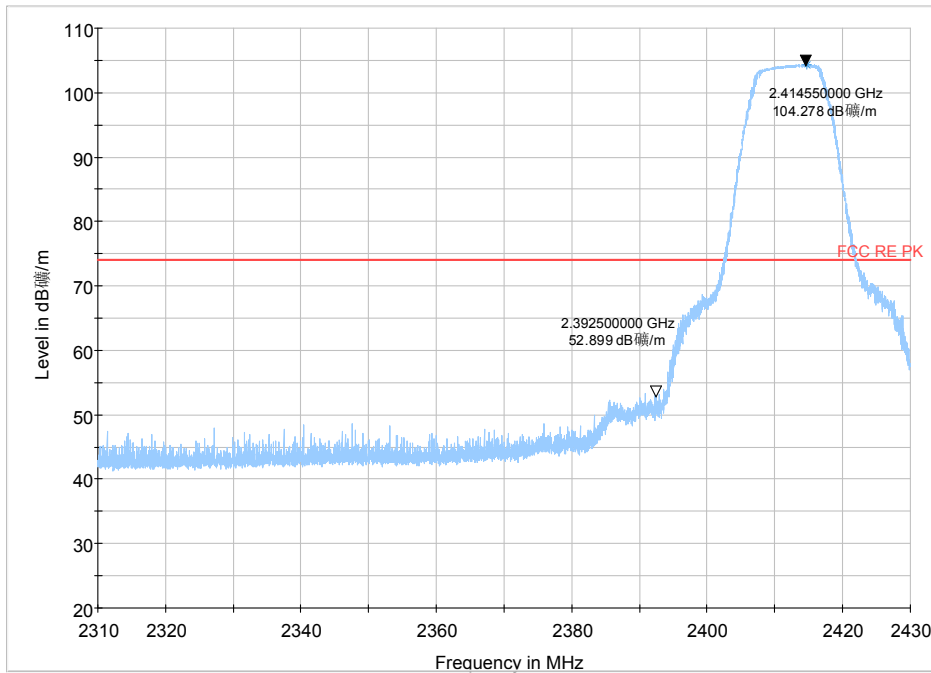
Page 23 of 78

Test Results: PASS

Channel.	Fre. (MHz)	Detection Type	Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	PASS /FAIL
802.11b, Ch1	2392.5	PK	52.90	74	21.1	1.05	0	PASS
802.11b, Ch1	2391.09	AV	39.36	54	14.64	1.05	180	PASS
802.11b, Ch 11	2480.02	PK	61.61	74	12.39	1.05	135	PASS
802.11b, Ch 11	2483.33	AV	43.40	54	10.6	1.25	45	PASS
802.11g ,Ch1	2390.76	PK	67.80	74	6.2	1.01	90	PASS
802.11g ,Ch1	2390.63	AV	38.17	54	15.83	1.02	180	PASS
802.11g ,Ch 11	2481.69	PK	70.47	74	3.53	1.02	45	PASS
802.11g ,Ch 11	2481.68	AV	39.66	54	14.34	1.05	0	PASS
802.11n HT20,Ch1	2391.83	PK	68.60	74	5.4	1.05	45	PASS
802.11n HT20,Ch1	2390.15	AV	43.20	54	10.8	1.05	90	PASS
802.11n HT20,Ch11	2482.29	PK	71.66	74	2.34	1.05	115	PASS
802.11n HT20,Ch11	2481.87	AV	44.43	54	9.57	1.05	0	PASS

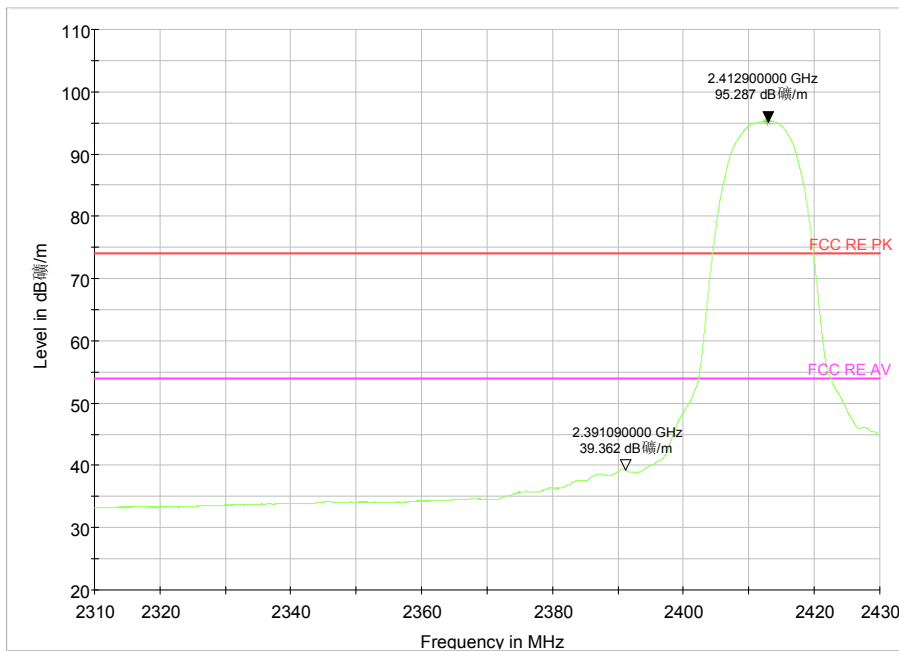
802.11b-Channel 1:

Peak



Note: The signal beyond the limit is carrier
Channel 1

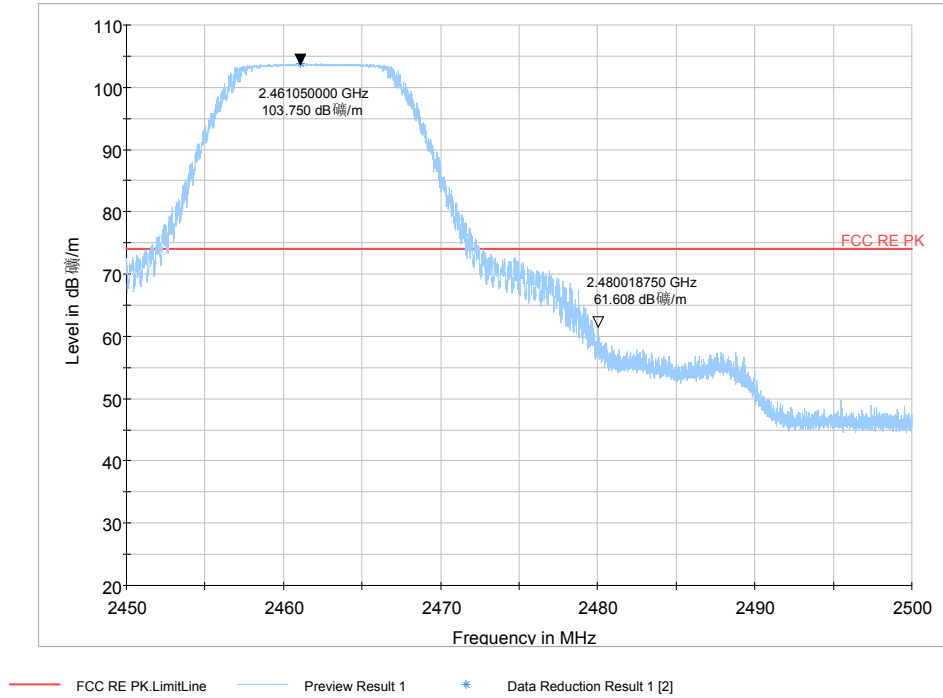
Average



Note: The signal beyond the limit is carrier
Channel 1

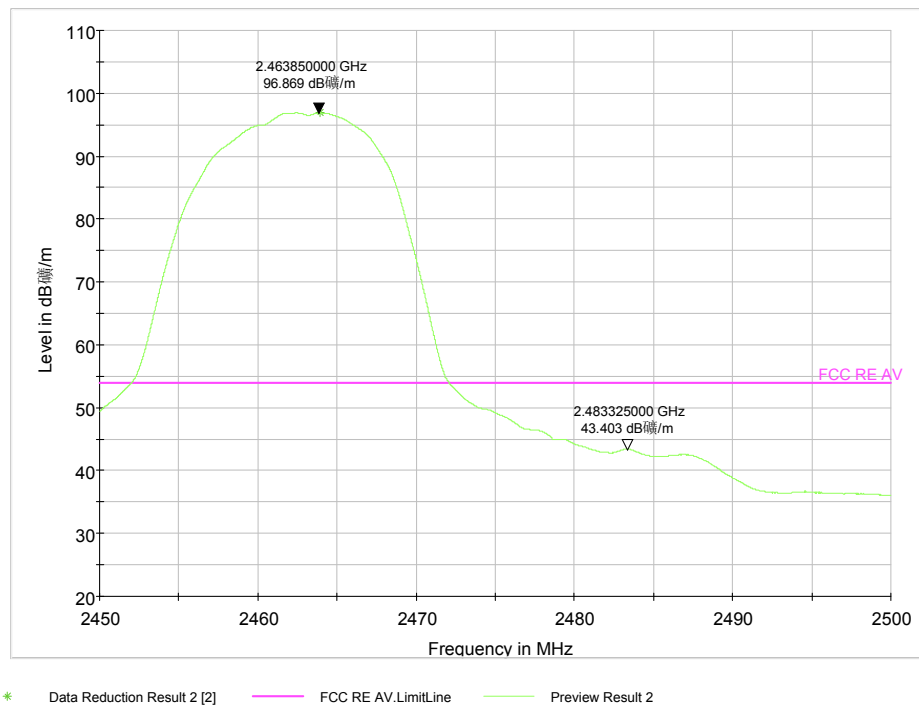
802.11b-Channel 11:

Peak



Note: The signal beyond the limit is carrier
Channel 11

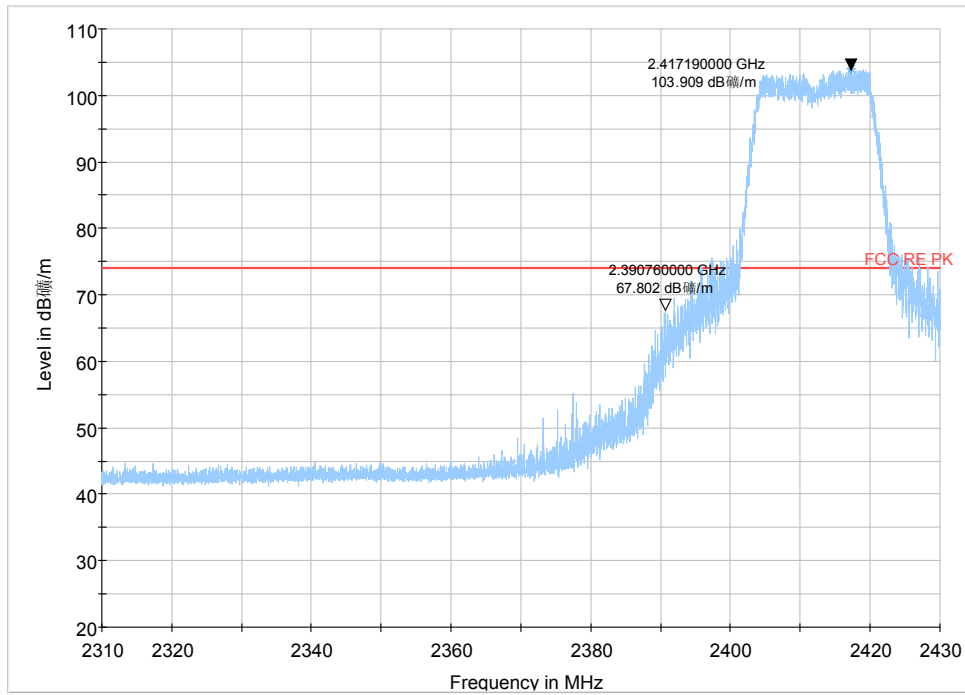
Average



Note: The signal beyond the limit is carrier
Channel 11

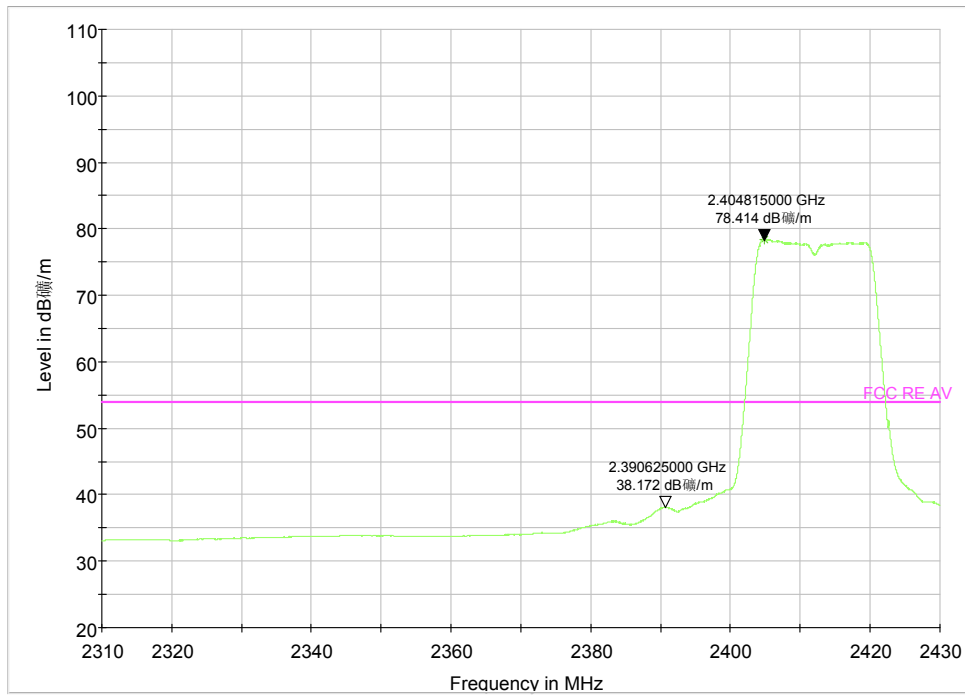
802.11g-Channel 1:

Peak



— FCC RE PK.LimitLine — Preview Result 1 * Data Reduction Result 1 [2]

Note: The signal beyond the limit is carrier
Channel 1
Average

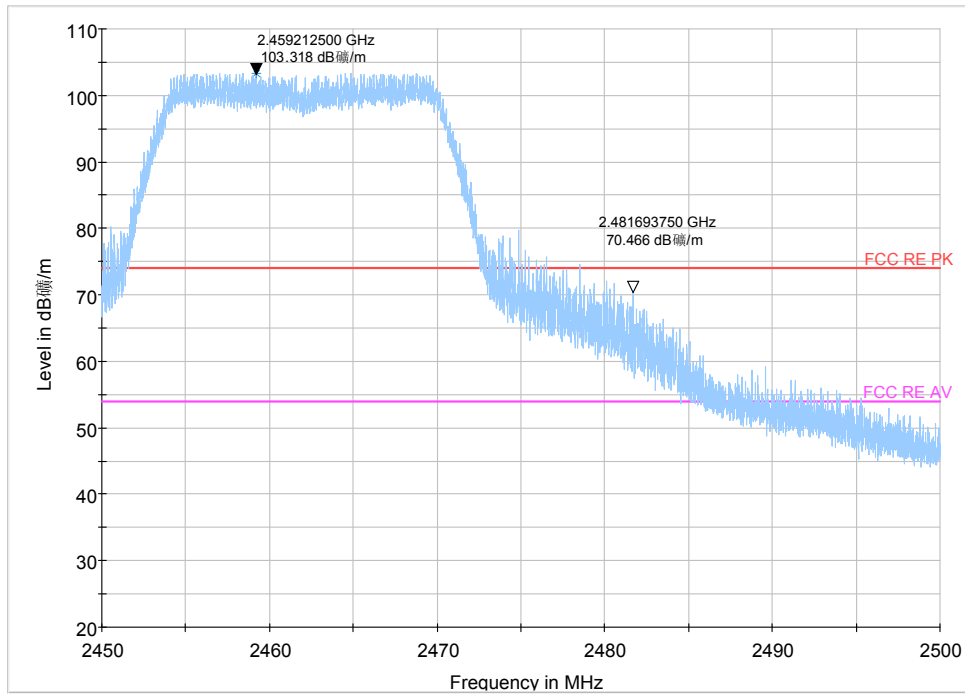


* Data Reduction Result 2 [2] — FCC RE AV.LimitLine — Preview Result 2

Note: The signal beyond the limit is carrier
Channel 1

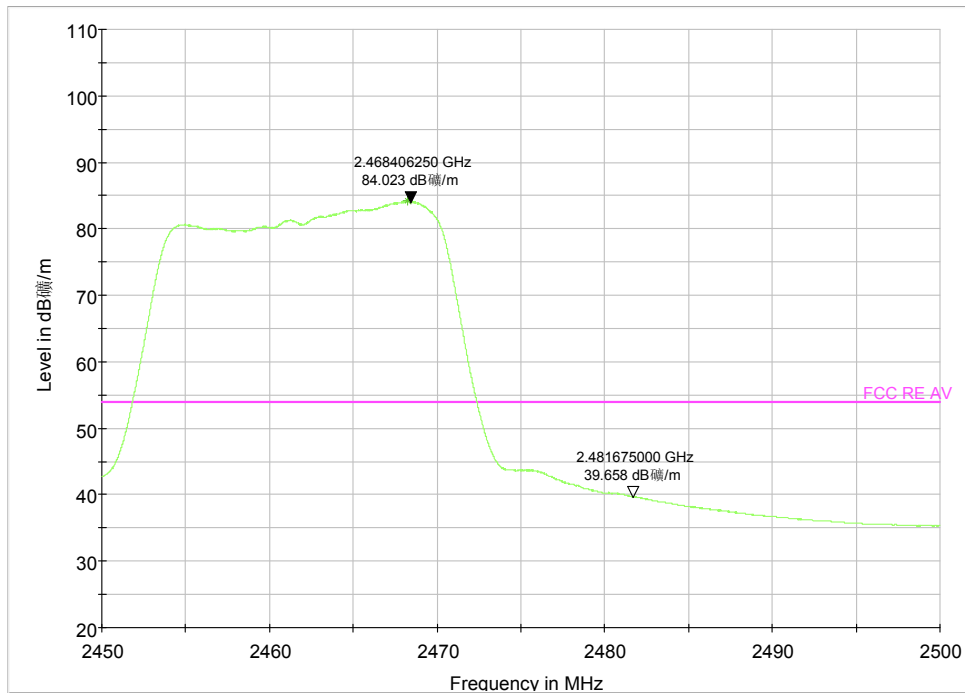
802.11g-Channel 11:

Peak



— FCC RE PK.LimitLine — FCC RE AV.LimitLine — Preview Result 1 * Data Reduction Result 1 [2]

Note: The signal beyond the limit is carrier
Channel 11
Average

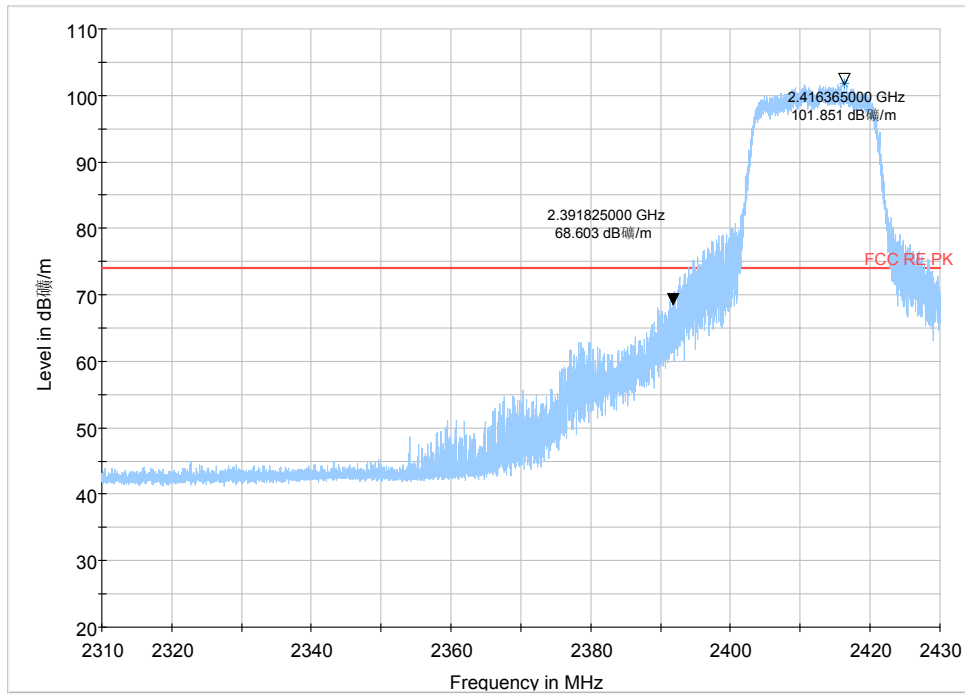


— FCC RE AV.LimitLine — Preview Result 2 * Data Reduction Result 2 [2]

Note: The signal beyond the limit is carrier
Channel 11

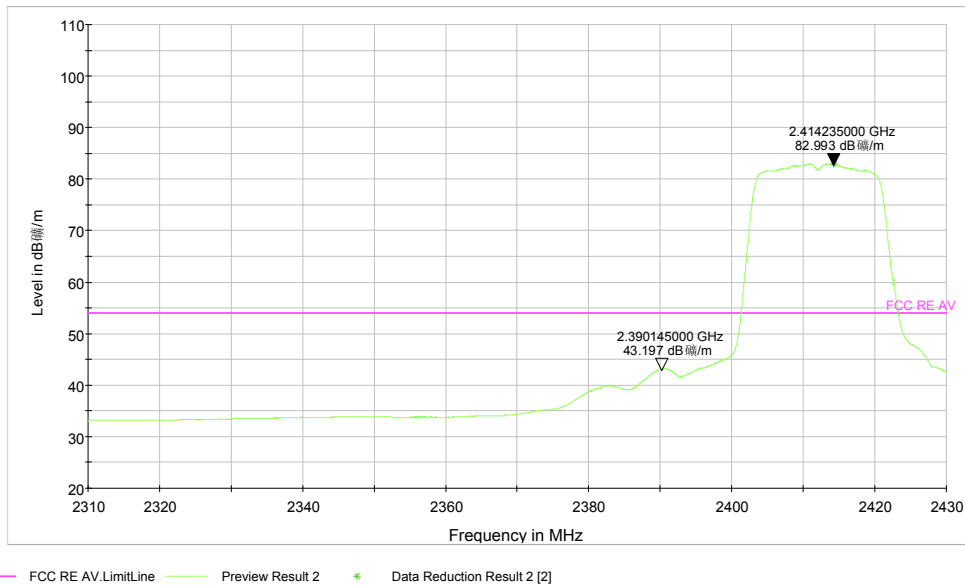
802.11n (HT20)-Channel 1:

Peak



Note: The signal beyond the limit is carrier
Channel 1

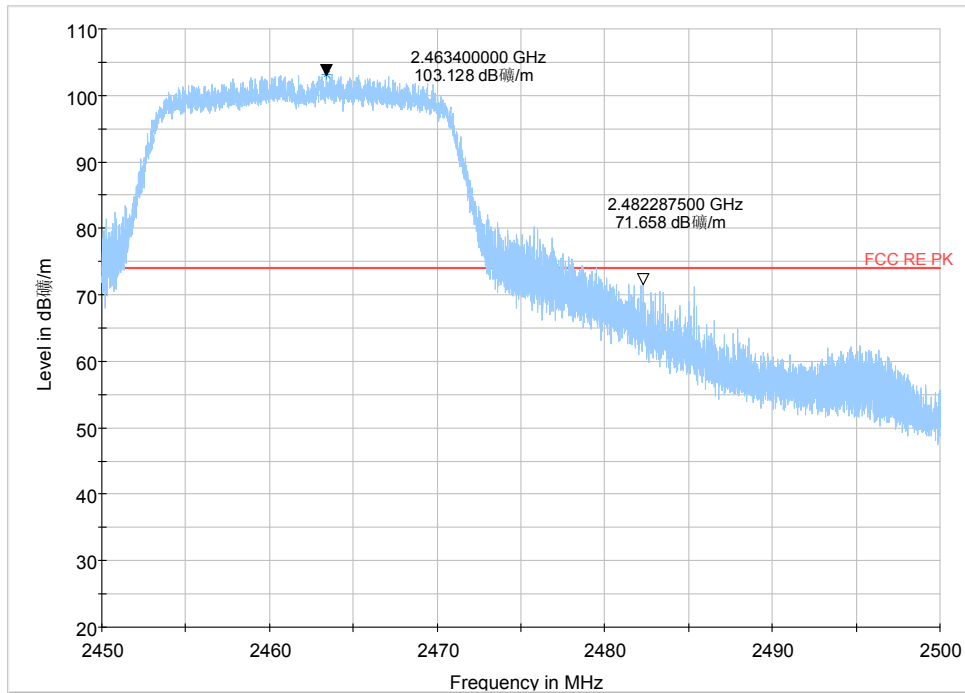
Average



Note: The signal beyond the limit is carrier
Channel 1

802.11n (HT20)-Channel 11:

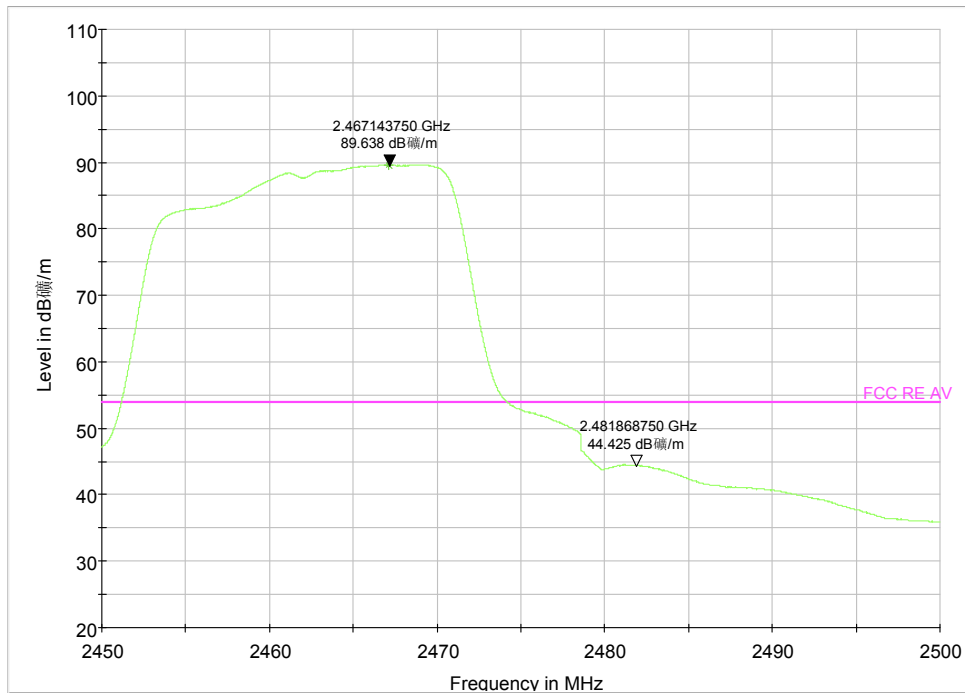
Peak



Note: The signal beyond the limit is carrier

Channel 11

Average



Note: The signal beyond the limit is carrier

Channel 11

2.7. Power Spectral Density

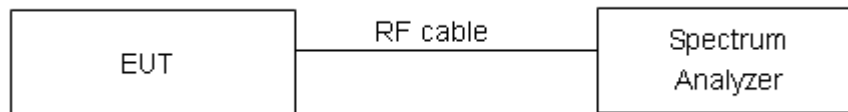
Ambient condition

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 3 kHz and VBW is set to 10 kHz on spectrum analyzer. Set the span to at least 1.5 times the DTS channel bandwidth. Sweep time = auto couple. Trace mode = max hold. 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

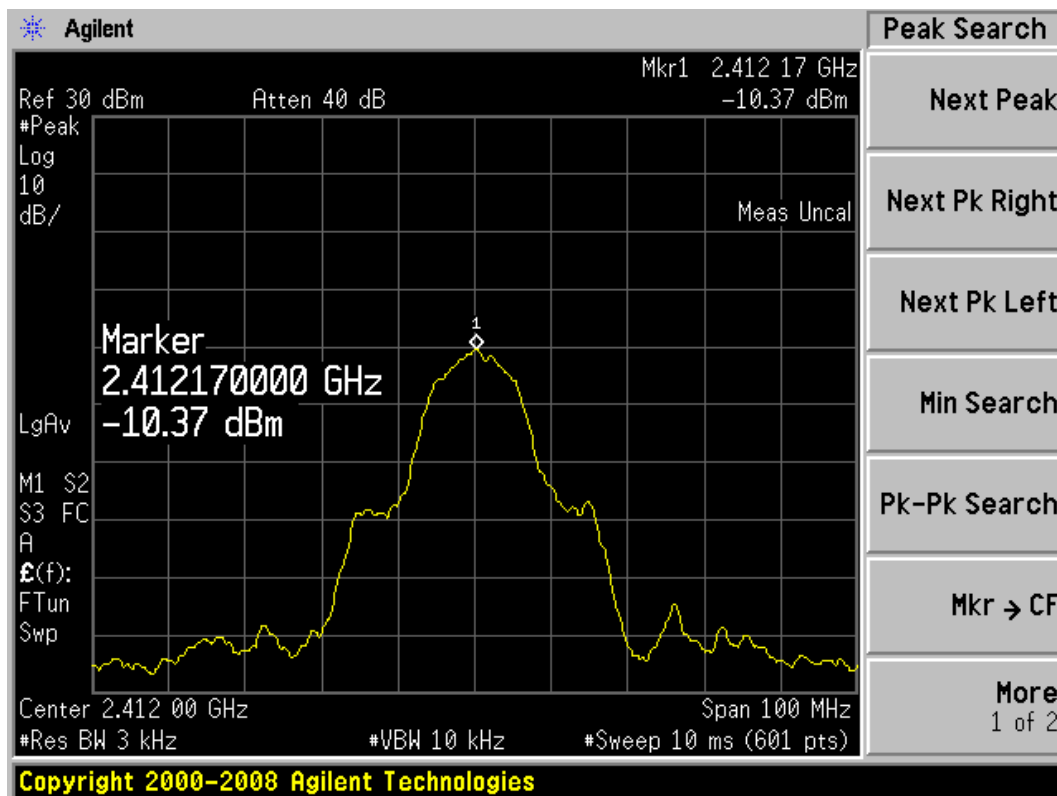
Report No.: RXA1301-0126RF01R1

Page 31 of 78

Test Results:

Network Standards	Channel Number	Power Spectral Density dBm / 3kHz	Conclusion
802.11b	1	-10.37	PASS
	6	-13	PASS
	11	-13.86	PASS
802.11g	1	-17.71	PASS
	6	-18.53	PASS
	11	-19.04	PASS
802.11n HT20	1	-20.77	PASS
	6	-22.68	PASS
	11	-23.23	PASS

802.11b

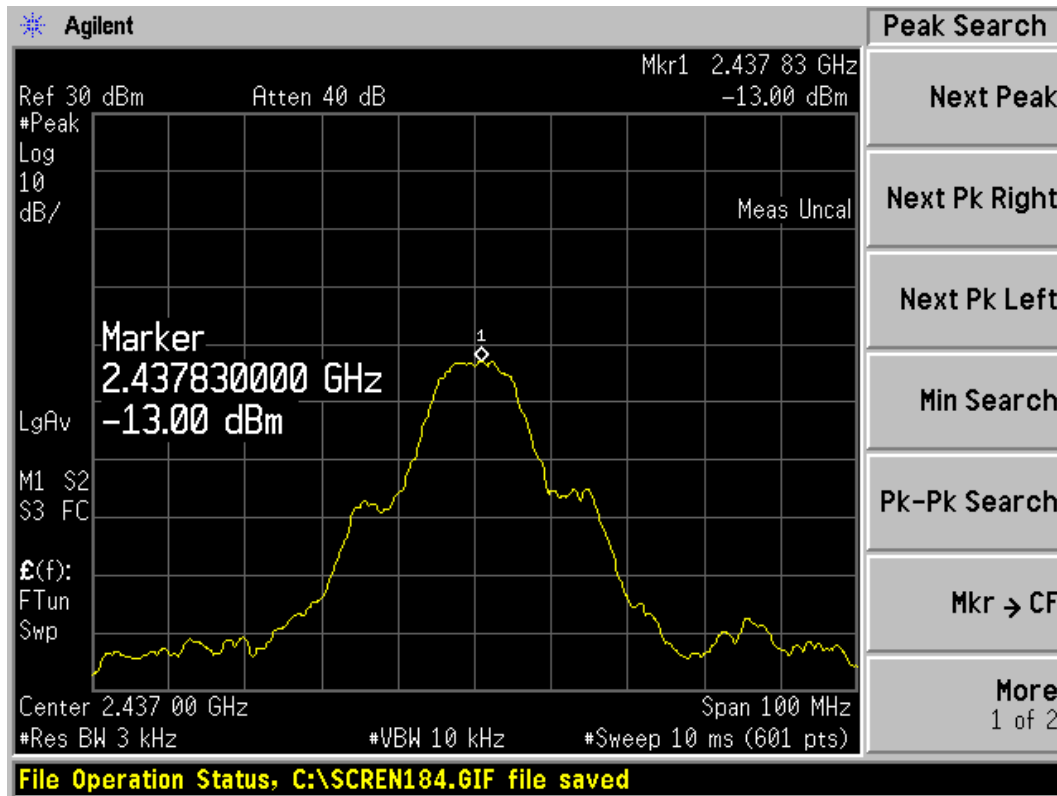


802.11b, Channel No.: 1

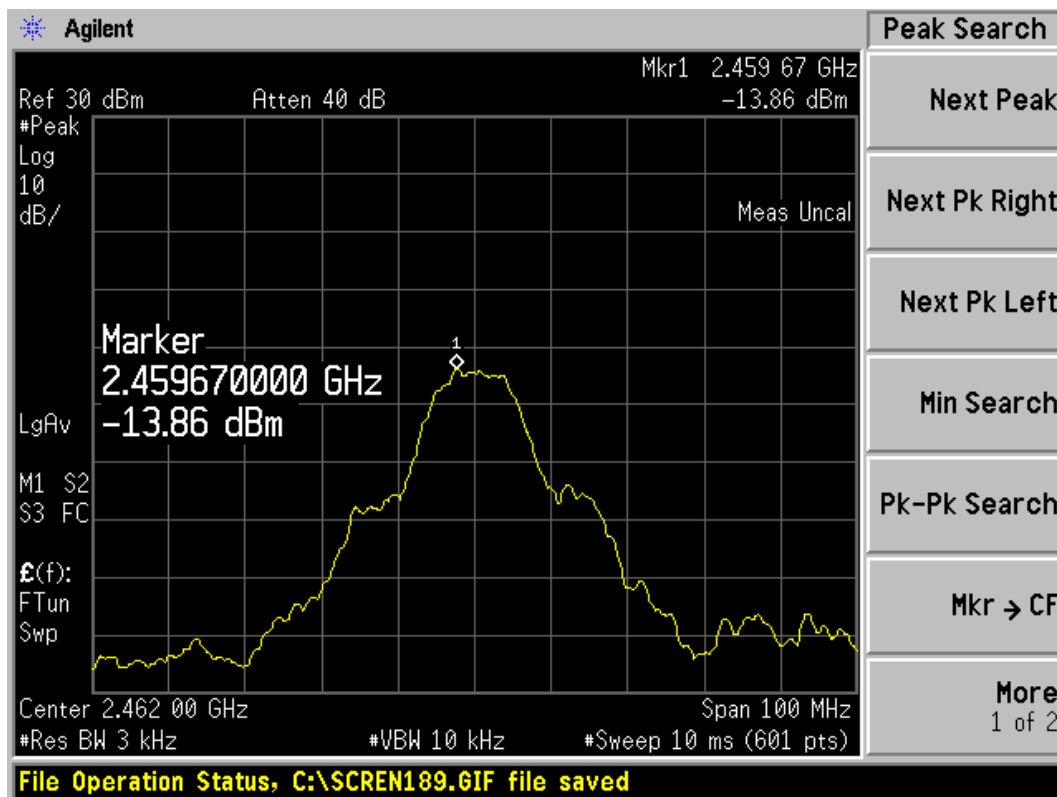
TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RXA1301-0126RF01R1

Page 32 of 78



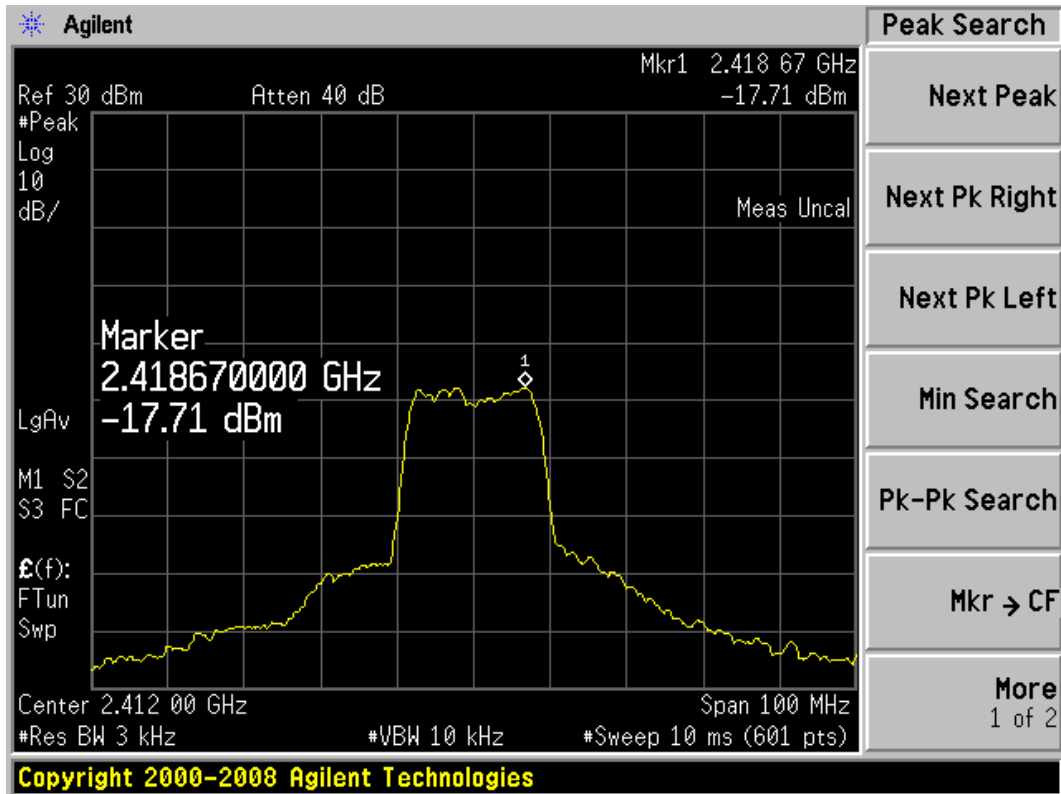
802.11b, Channel No.: 6



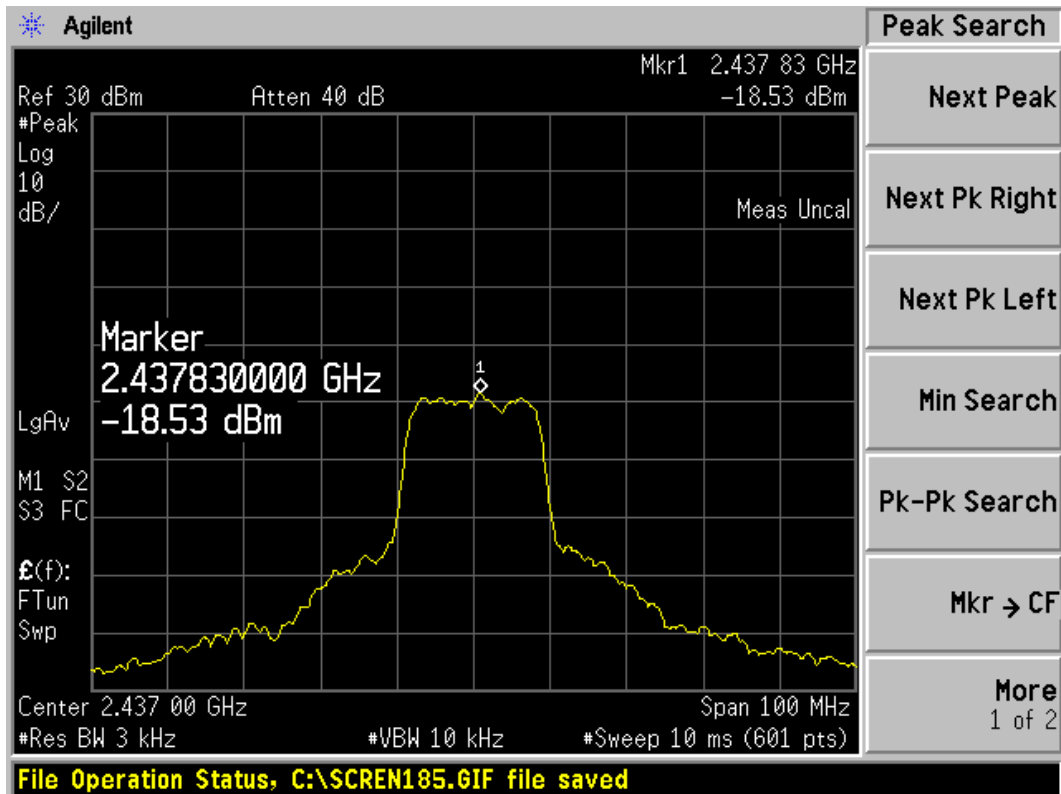
802.11b, Channel No.: 11

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

802.11g



802.11g, Channel No.: 1

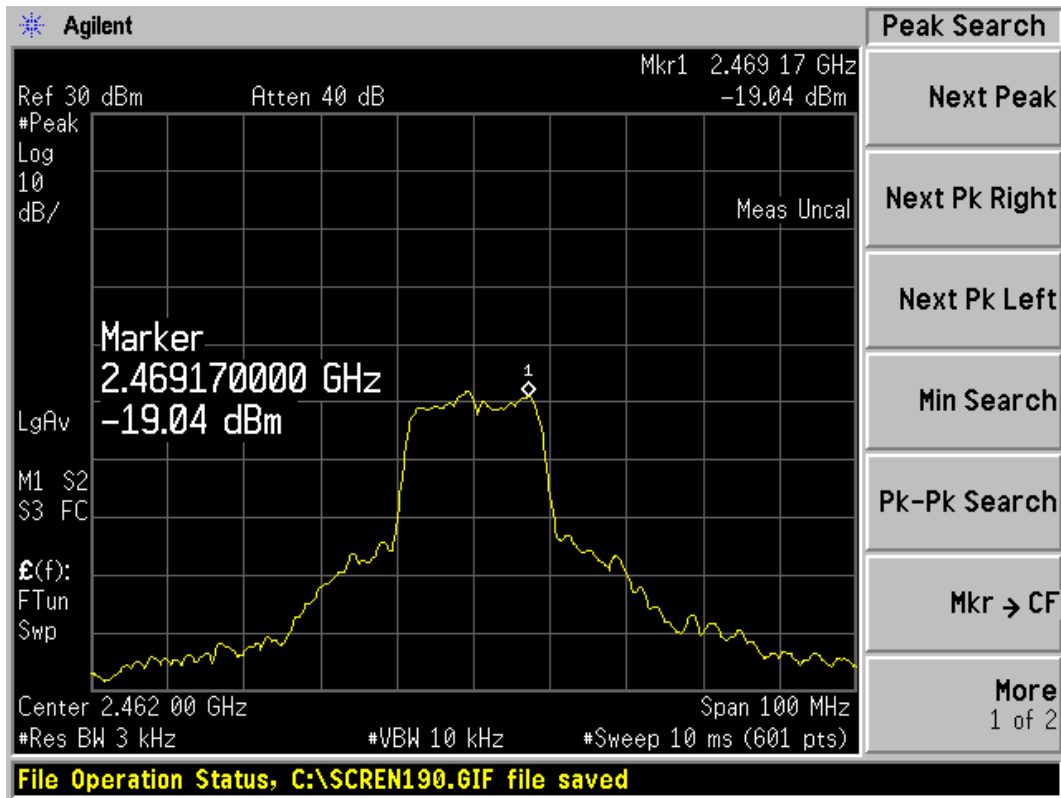


802.11g, Channel No.: 6

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

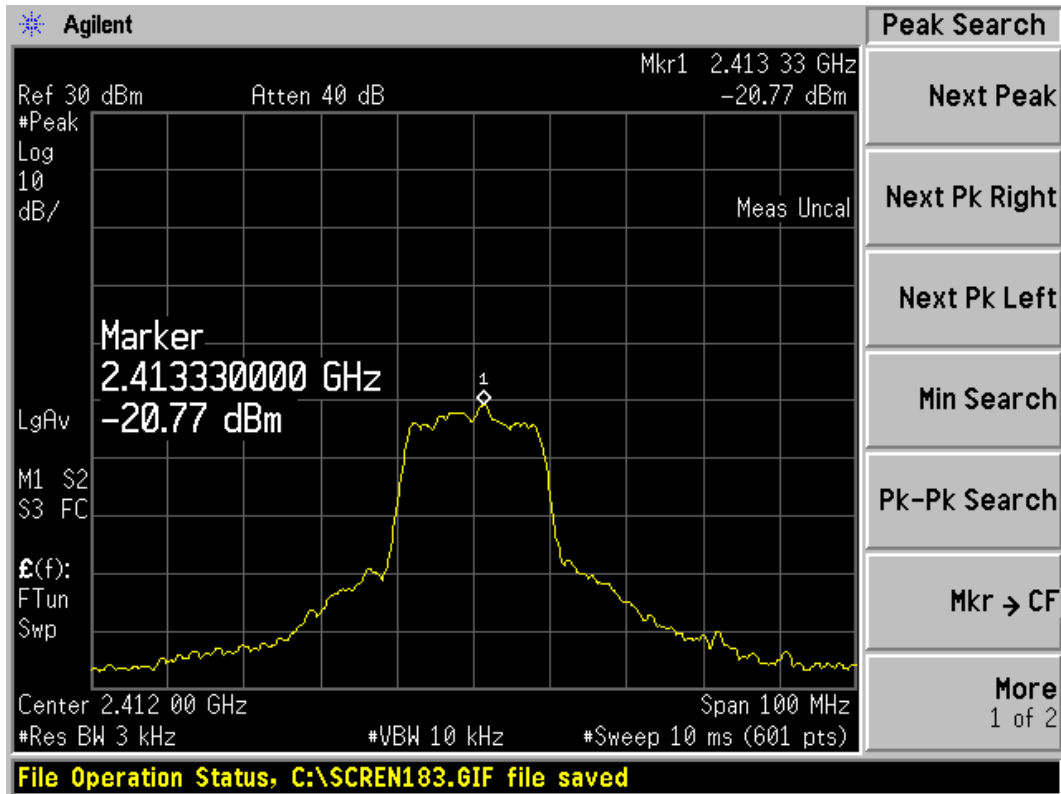
Report No.: RXA1301-0126RF01R1

Page 34 of 78



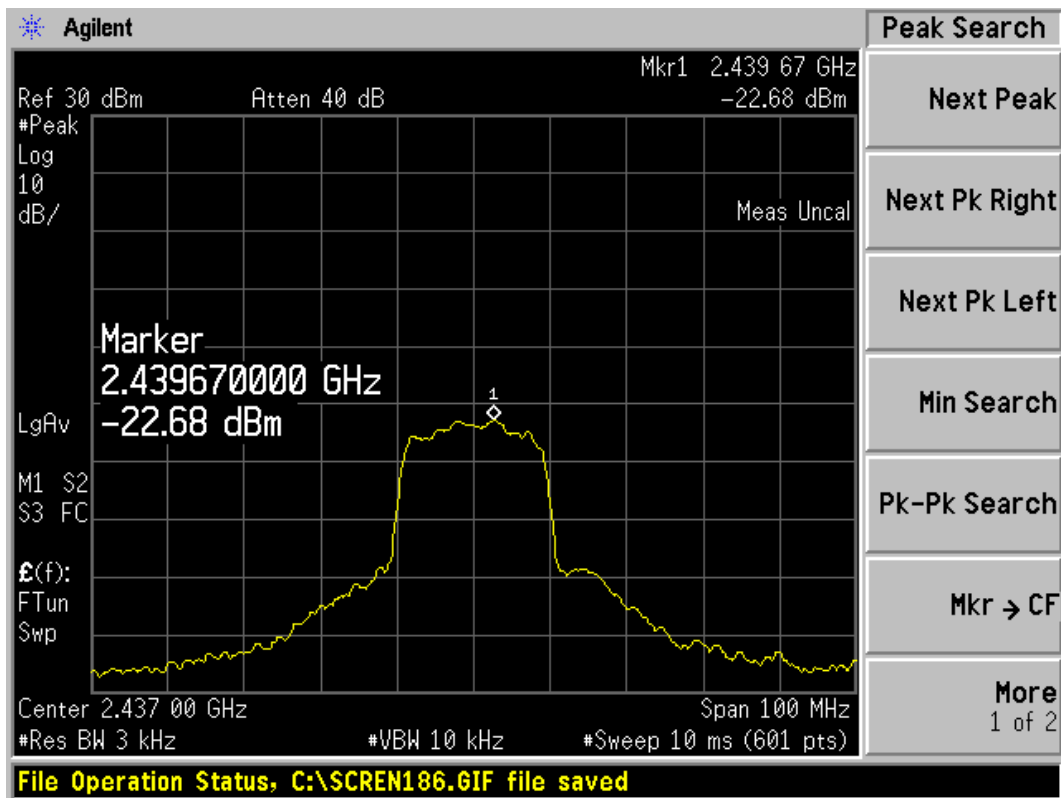
802.11g, Channel No.: 11

802.11n (HT20)

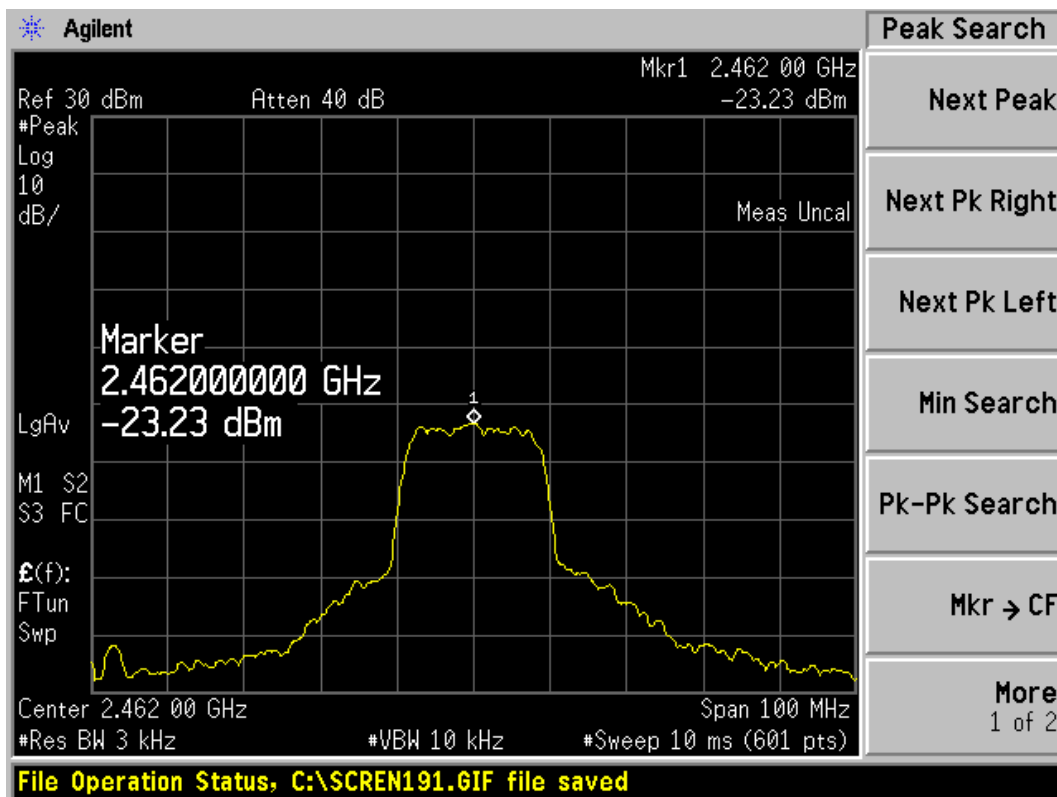


802.11n (HT20), Channel No.: 1

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



802.11n (HT20), Channel No.: 6



802.11n (HT20), Channel No.: 11

TA Technology (Shanghai) Co., Ltd.

Test Report

2.8. 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 the 10th harmonic of the carrier. The peak detector is used. RBW and VBW are set to 100 kHz, Sweep is set to ATUO.

The test is in transmitting mode.

Test setup



Limits

Rule Part 15.247(d) pacifies 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	Carrier frequency (MHz)	Reference value (dBm)	Limit
802.11b	2412	15.86	≤-4.14
	2437	16.09	≤-3.91
	2462	17.65	≤-2.35
802.11g	2412	12.18	≤-7.82
	2437	12.63	≤-7.37
	2462	13.91	≤-6.09
802.11n HT20	2412	8.54	≤-11.46
	2437	9.15	≤-10.85
	2462	10.36	≤-9.64

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

Report No.: RXA1301-0126RF01R1

Page 37 of 78

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

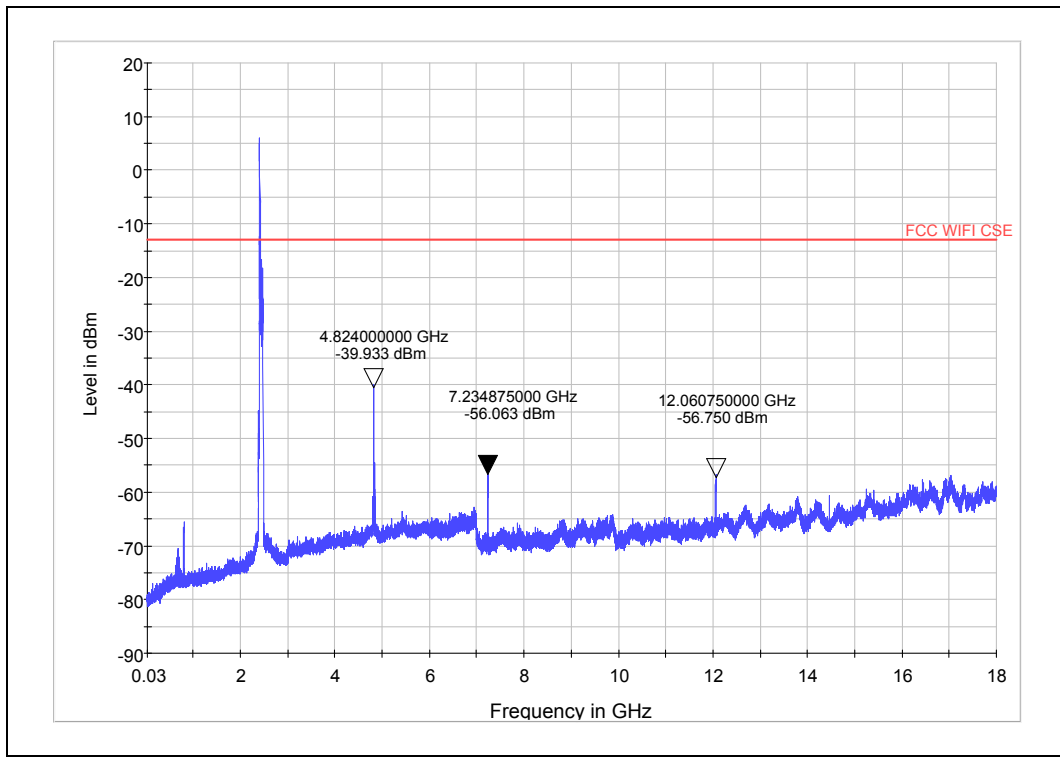
TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RXA1301-0126RF01R1

Page 38 of 78

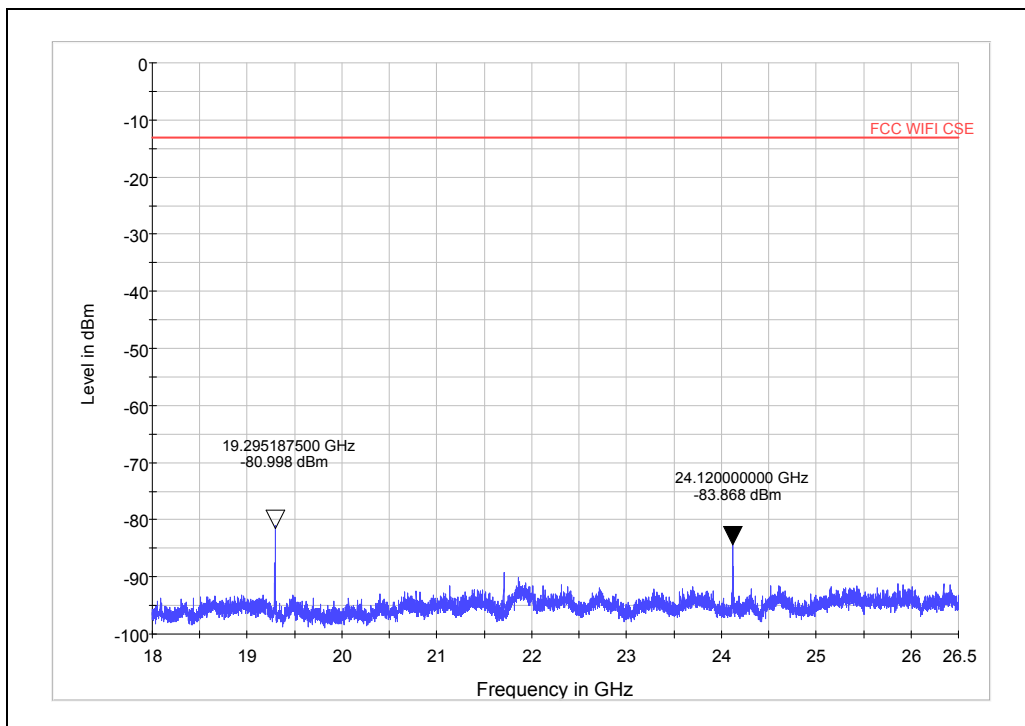
Test Results:

802.11b CH1



Note: The signal beyond the limit is carrier

Spurious RF conducted emissions from 30MHz to 18GHz



Spurious RF conducted emissions from 18GHz to 26.5GHz

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

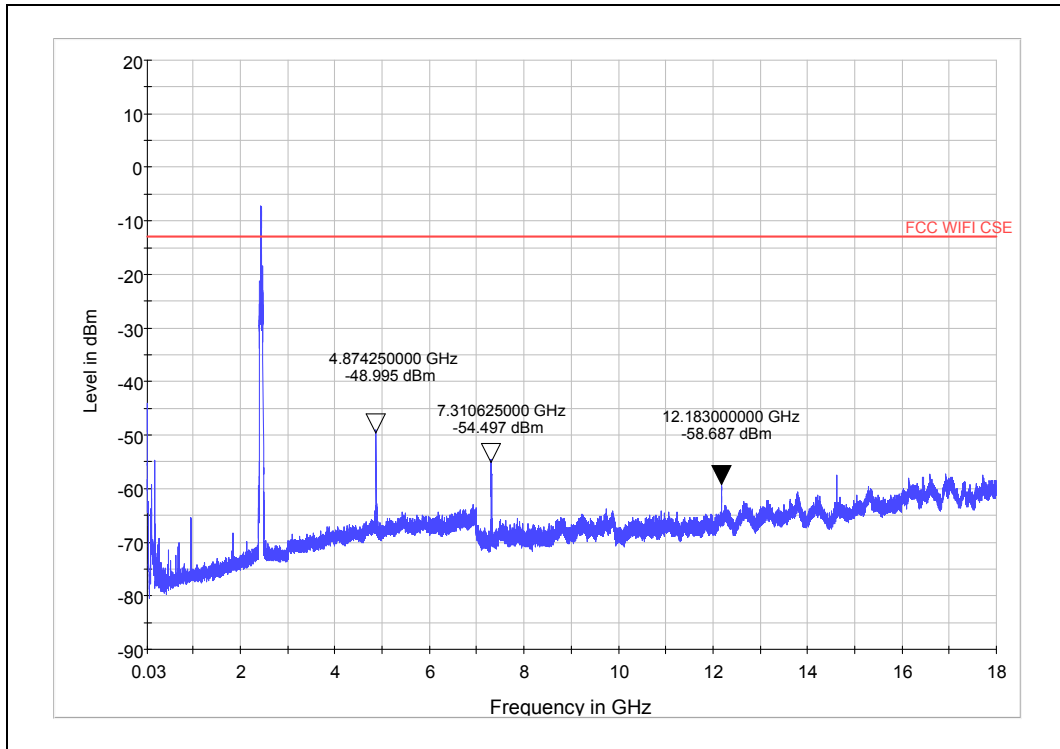
Report No.: RXA1301-0126RF01R1

Page 39 of 78

Harmonic	TX ch.1 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4824	-39.93	-4.14
3	7235	-56.06	-4.14
4	9648	Nf	-4.14
5	12061	Nf	-4.14
6	14472	Nf	-4.14
7	16884	Nf	-4.14
8	19296	-79.657	-4.14
9	21708	Nf	-4.14
10	24120	Nf	-4.14
Nf: noise floor			

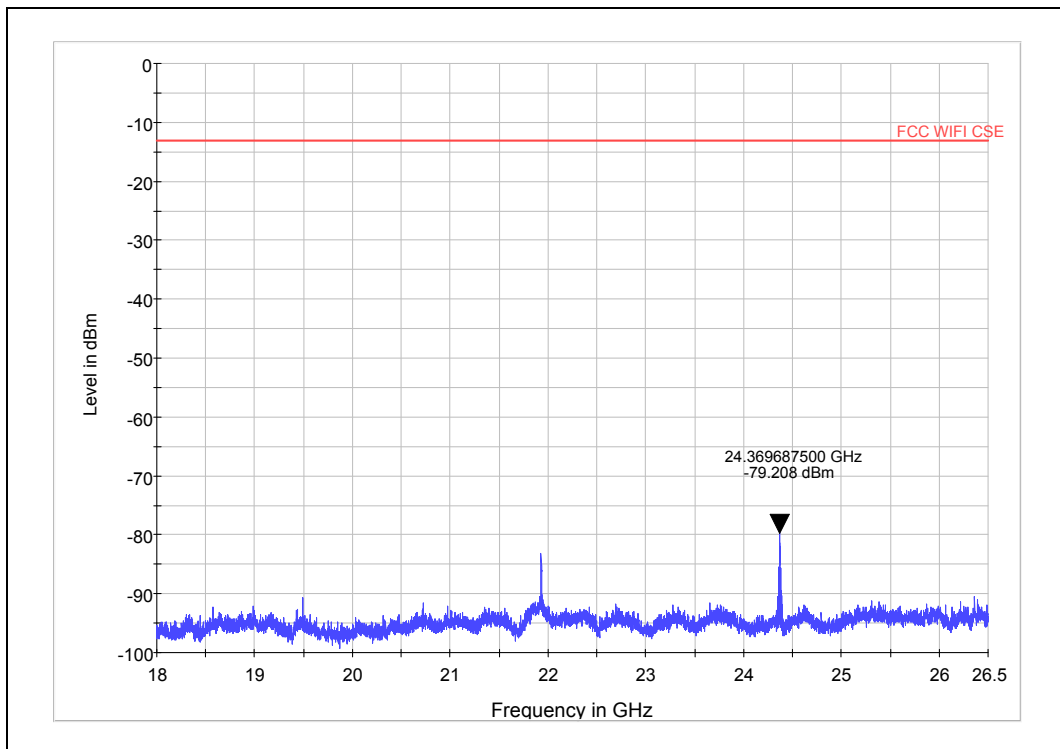
TA Technology (Shanghai) Co., Ltd. Test Report

802.11b CH6



Note: The signal beyond the limit is carrier

Spurious RF conducted emissions from 30MHz to 18GHz



Spurious RF conducted emissions from 18GHz to 26.5GHz

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

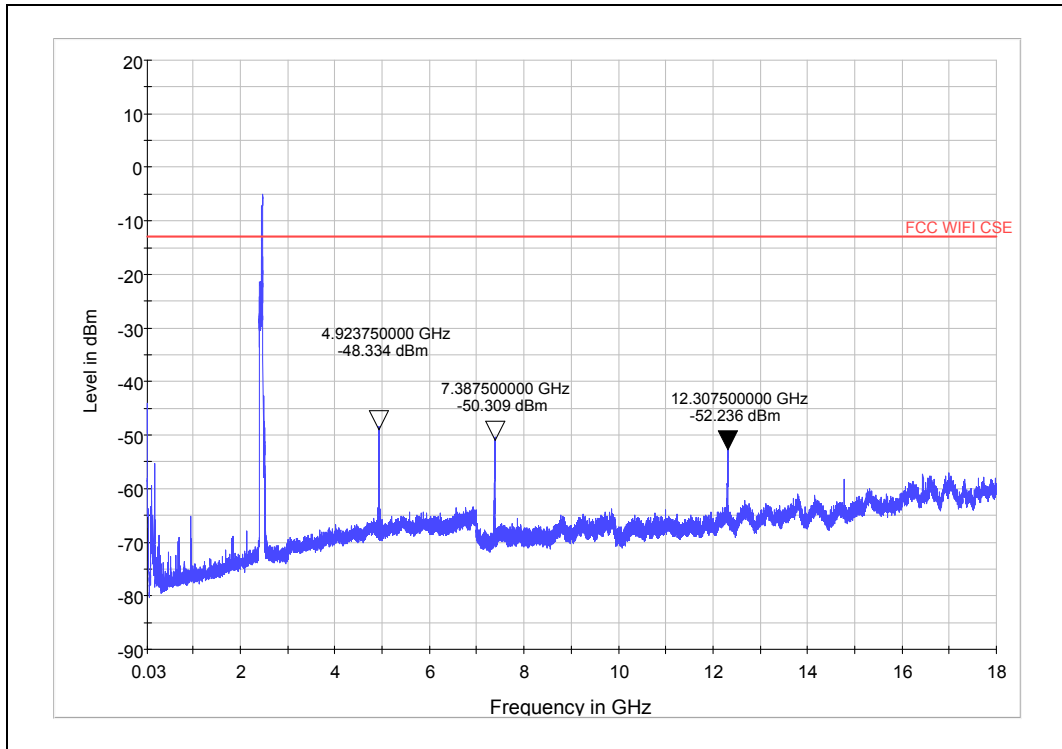
Report No.: RXA1301-0126RF01R1

Page 41 of 78

Harmonic	TX ch.6 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4874	-49.00	-3.91
3	7311	-54.50	-3.91
4	9748	Nf	-3.91
5	12183	-58.69	-3.91
6	14622	Nf	-3.91
7	17059	Nf	-3.91
8	19496	Nf	-3.91
9	21933	Nf	-3.91
10	24370	Nf	-3.91
Nf: noise floor			

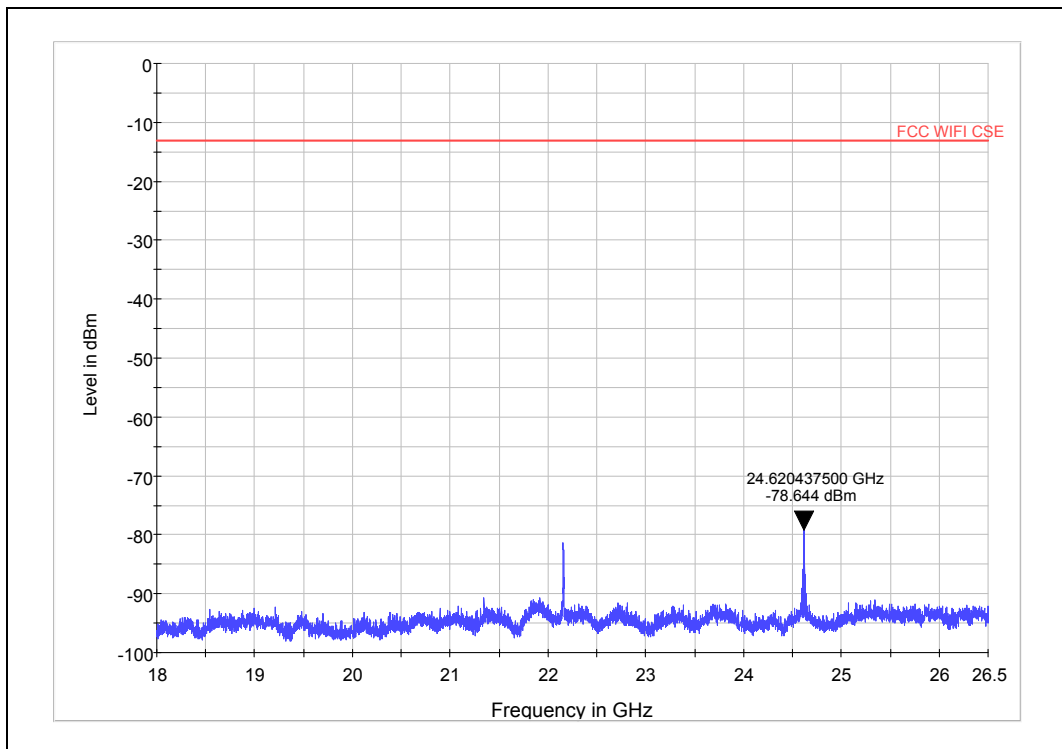
TA Technology (Shanghai) Co., Ltd. Test Report

802.11b CH11



Note: The signal beyond the limit is carrier

Spurious RF conducted emissions from 30MHz to 18GHz



Spurious RF conducted emissions from 18GHz to 26.5GHz

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

Report No.: RXA1301-0126RF01R1

Page 43 of 78

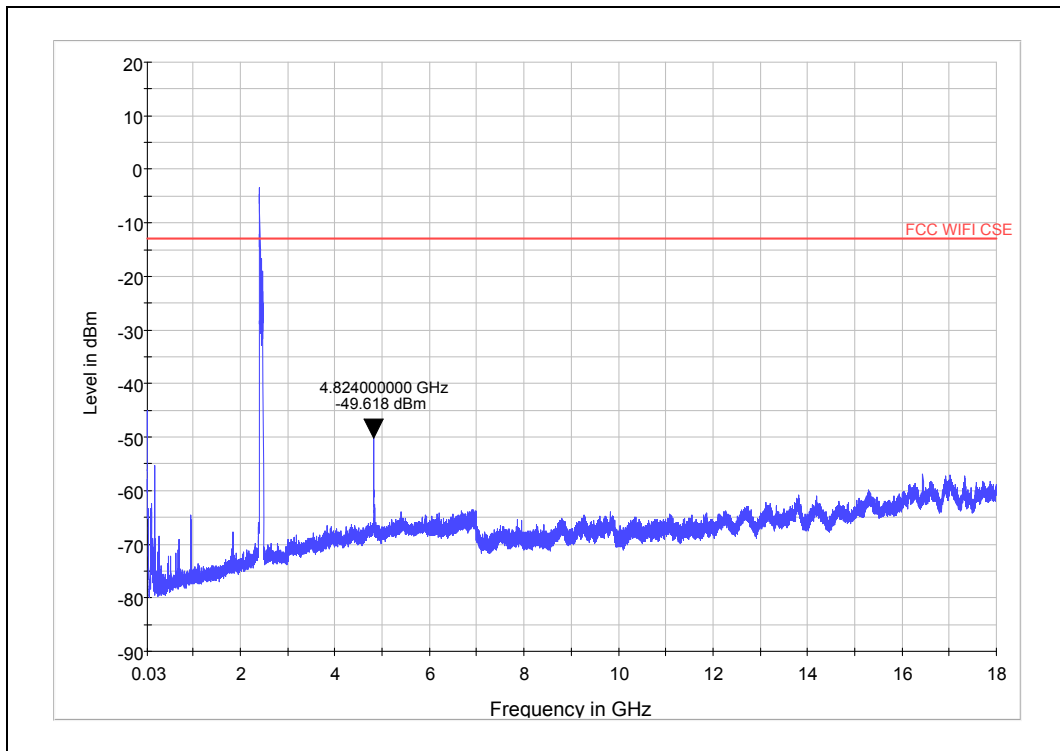
Harmonic	TX ch.11 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4924	-48.33	-2.35
3	7388	-50.31	-2.35
4	9848	Nf	-2.35
5	12308	-52.24	-2.35
6	14772	Nf	-2.35
7	17234	Nf	-2.35
8	19696	Nf	-2.35
9	22158	Nf	-2.35
10	24620	Nf	-2.35
Nf: noise floor			

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

Report No.: RXA1301-0126RF01R1

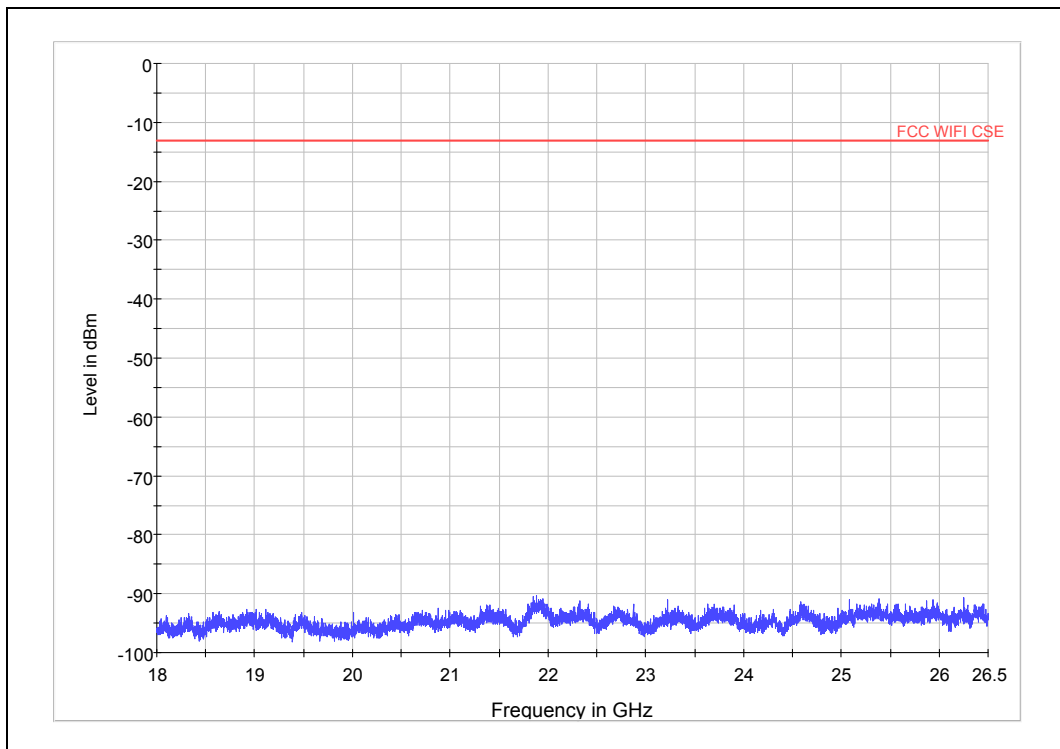
Page 44 of 78

802.11g CH1



Note: The signal beyond the limit is carrier

Spurious RF conducted emissions from 30MHz to 18GHz



Spurious RF conducted emissions from 18GHz to 26.5GHz

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

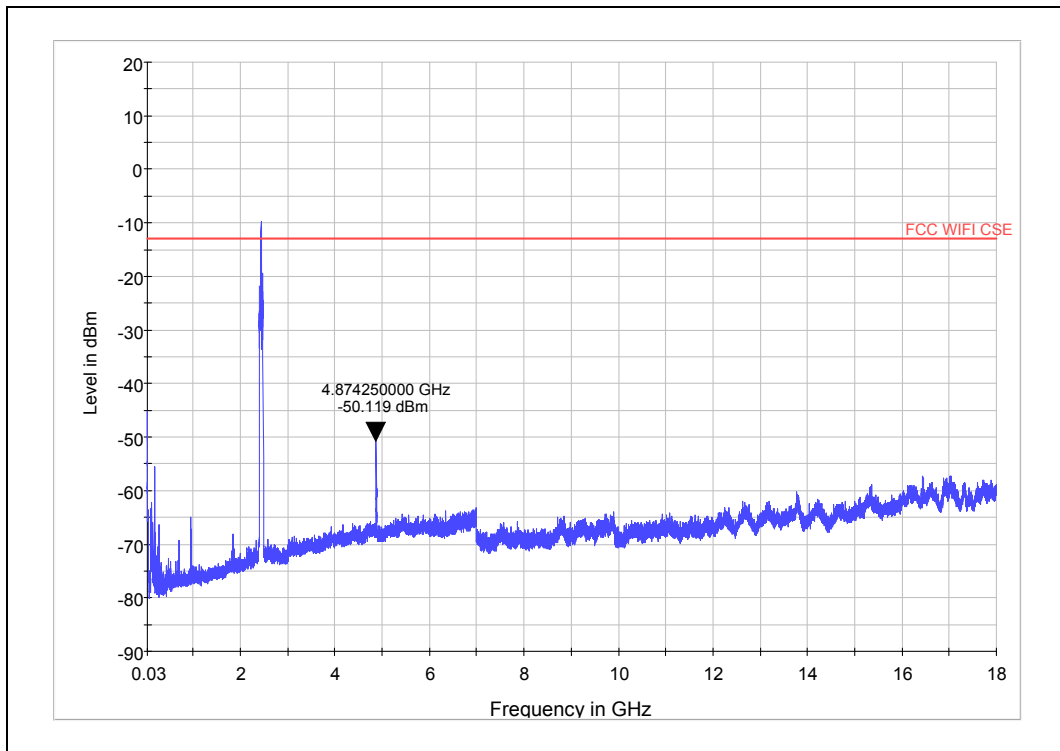
Report No.: RXA1301-0126RF01R1

Page 45 of 78

Harmonic	TX ch.1 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4824	-49.62	-7.82
3	7236	Nf	-7.82
4	9648	Nf	-7.82
5	12060	Nf	-7.82
6	14472	Nf	-7.82
7	16884	Nf	-7.82
8	19293	Nf	-7.82
9	21708	Nf	-7.82
10	24120	Nf	-7.82
Nf: noise floor			

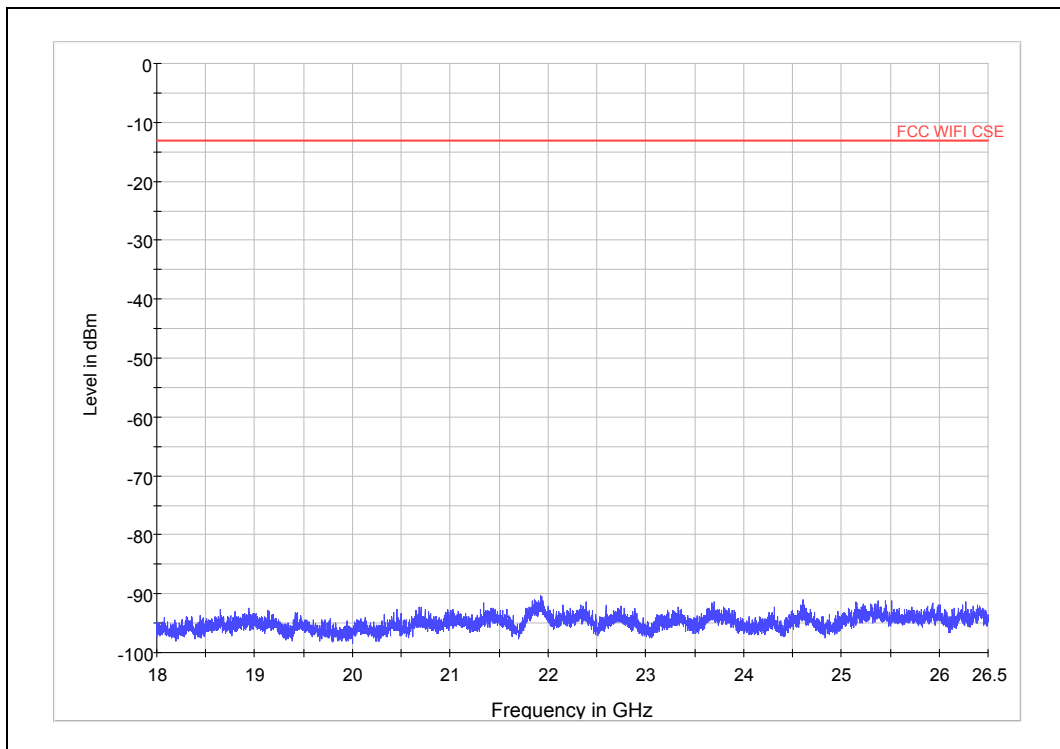
TA Technology (Shanghai) Co., Ltd. Test Report

802.11g CH6



Note: The signal beyond the limit is carrier

Spurious RF conducted emissions from 30MHz to 18GHz



Spurious RF conducted emissions from 18GHz to 26.5GHz

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

Report No.: RXA1301-0126RF01R1

Page 47 of 78

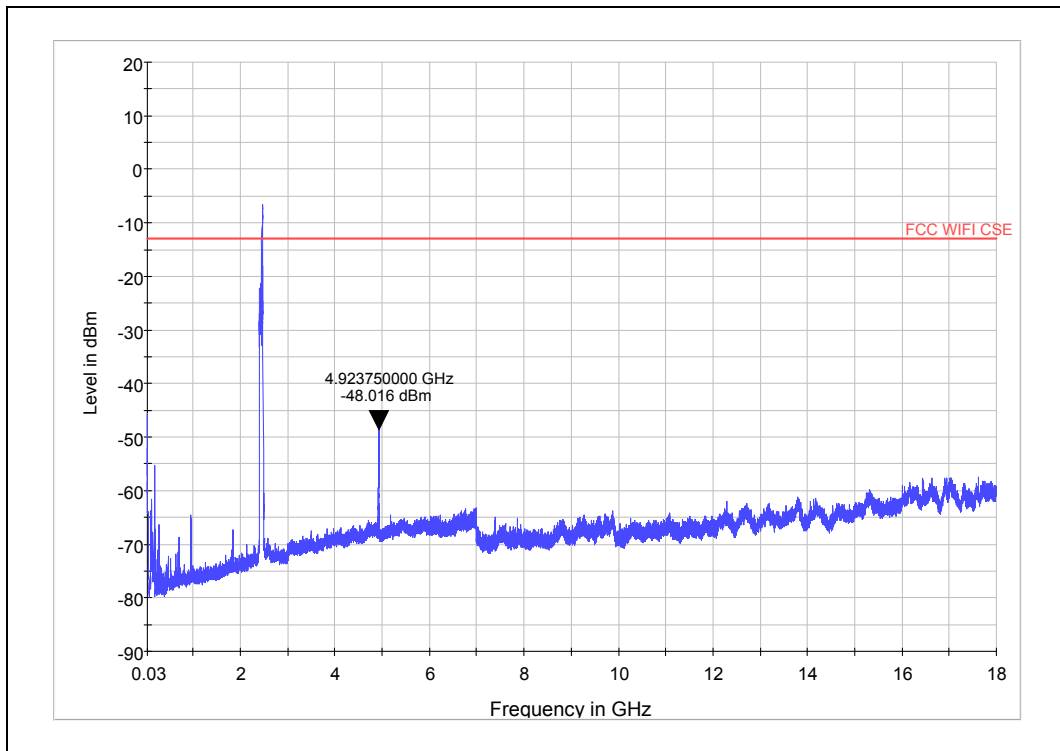
Harmonic	TX ch.6 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4874	-50.12	-7.37
3	7311	Nf	-7.37
4	9748	Nf	-7.37
5	12185	Nf	-7.37
6	14622	Nf	-7.37
7	17059	Nf	-7.37
8	19496	Nf	-7.37
9	21933	Nf	-7.37
10	24370	Nf	-7.37
Nf: noise floor			

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

Report No.: RXA1301-0126RF01R1

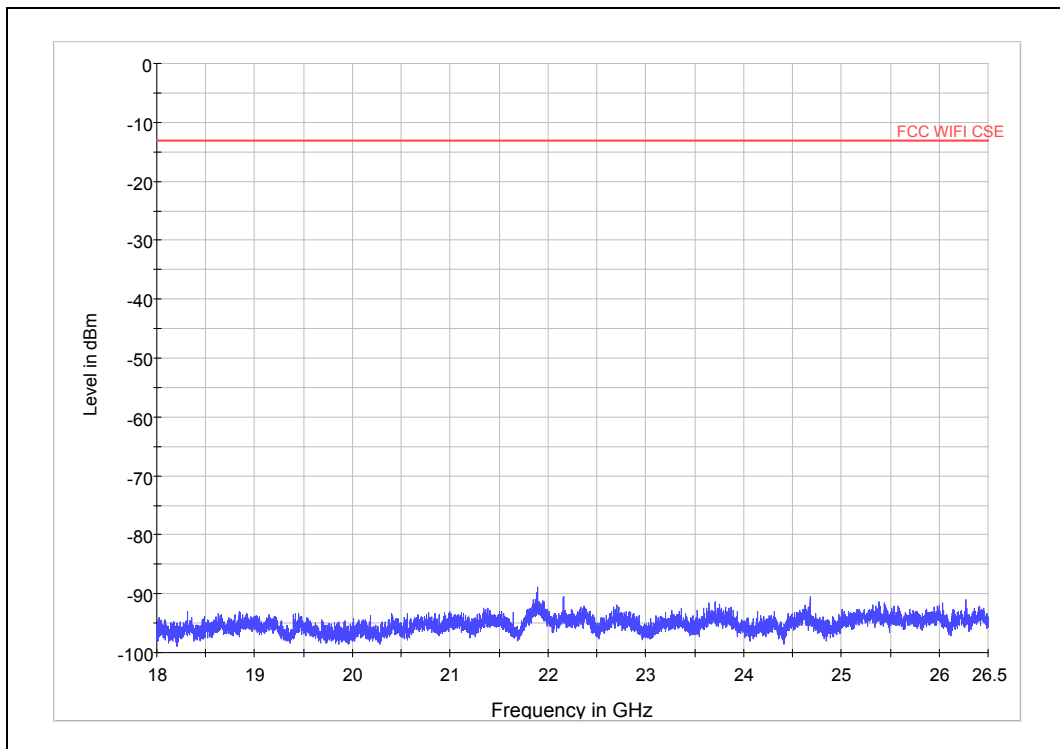
Page 48 of 78

802.11g CH11



Note: The signal beyond the limit is carrier

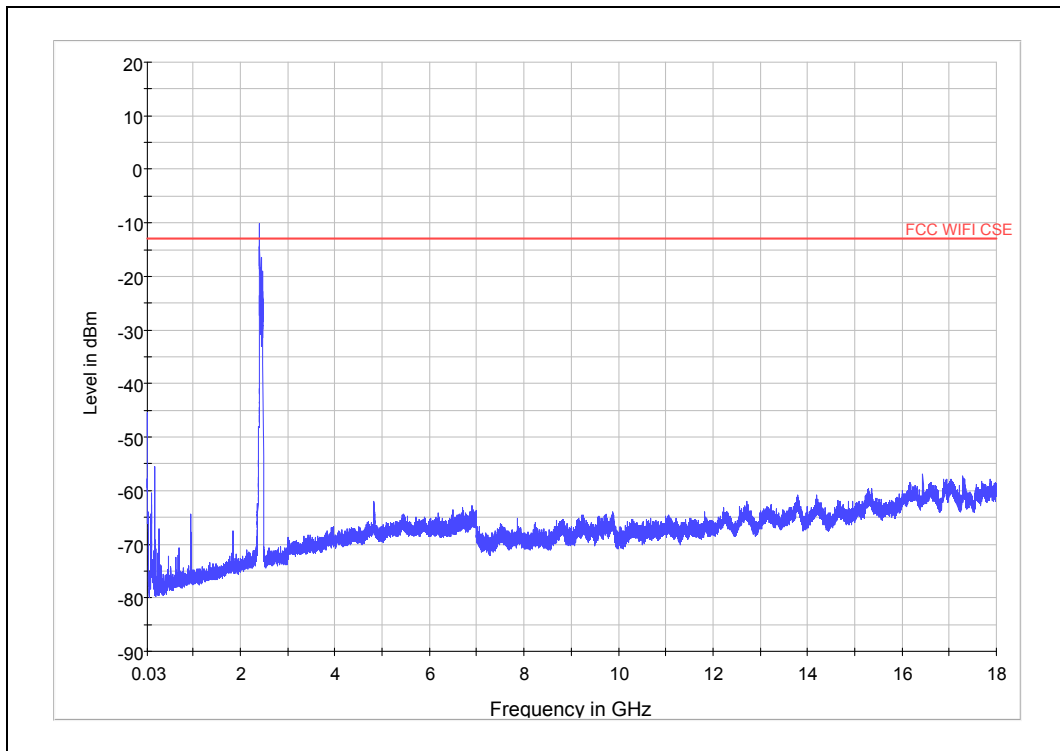
Spurious RF conducted emissions from 30MHz to 18GHz



Spurious RF conducted emissions from 18GHz to 26.5GHz

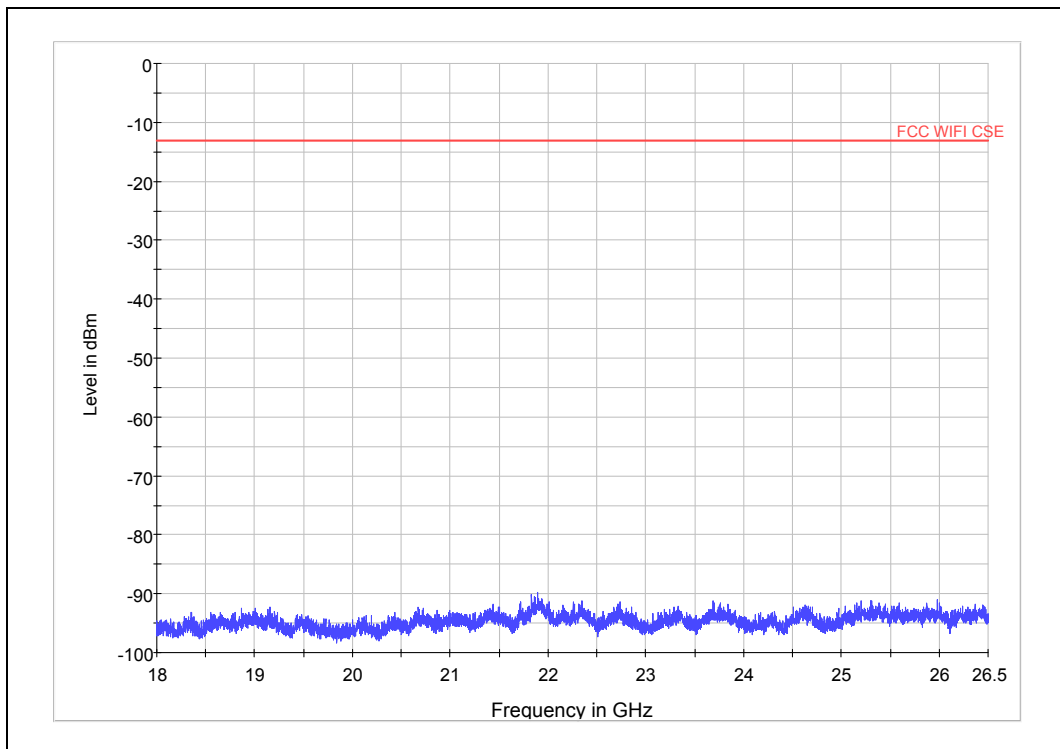
TA Technology (Shanghai) Co., Ltd. Test Report

802.11n (HT20) CH1



Note: The signal beyond the limit is carrier

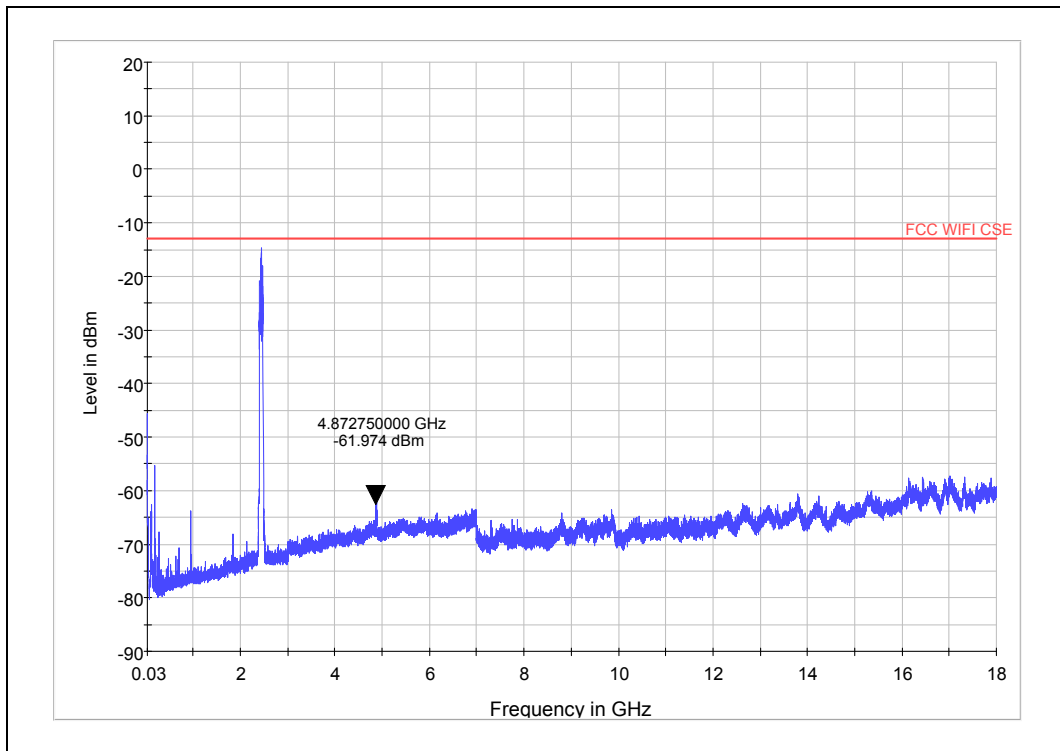
Spurious RF conducted emissions from 30MHz to 18GHz



Spurious RF conducted emissions from 18GHz to 26.5GHz

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

802.11n (HT20) CH6



Note: The signal beyond the limit is carrier

Spurious RF conducted emissions from 30MHz to 18GHz



Spurious RF conducted emissions from 18GHz to 26.5GHz

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

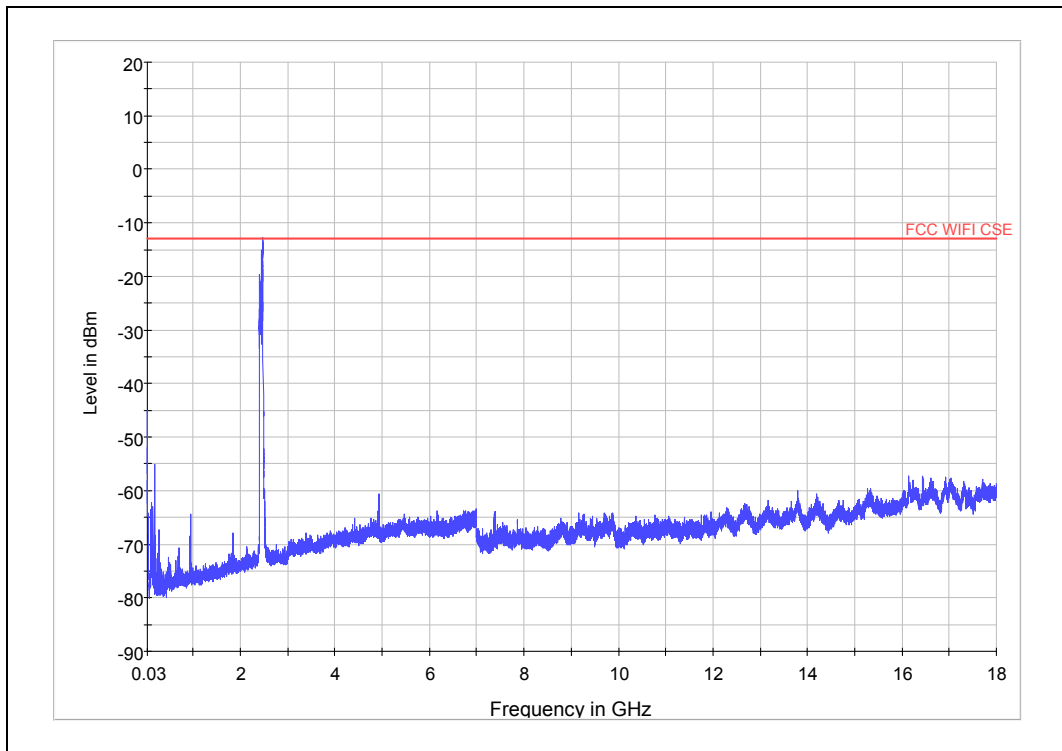
Report No.: RXA1301-0126RF01R1

Page 51 of 78

Harmonic	TX ch.1 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4873	-61.97	-10.85
3	6995	Nf	-10.85
4	9748	Nf	-10.85
5	12185	Nf	-10.85
6	14622	Nf	-10.85
7	17059	Nf	-10.85
8	19496	Nf	-10.85
9	21933	Nf	-10.85
10	24370	Nf	-10.85
Nf: noise floor			

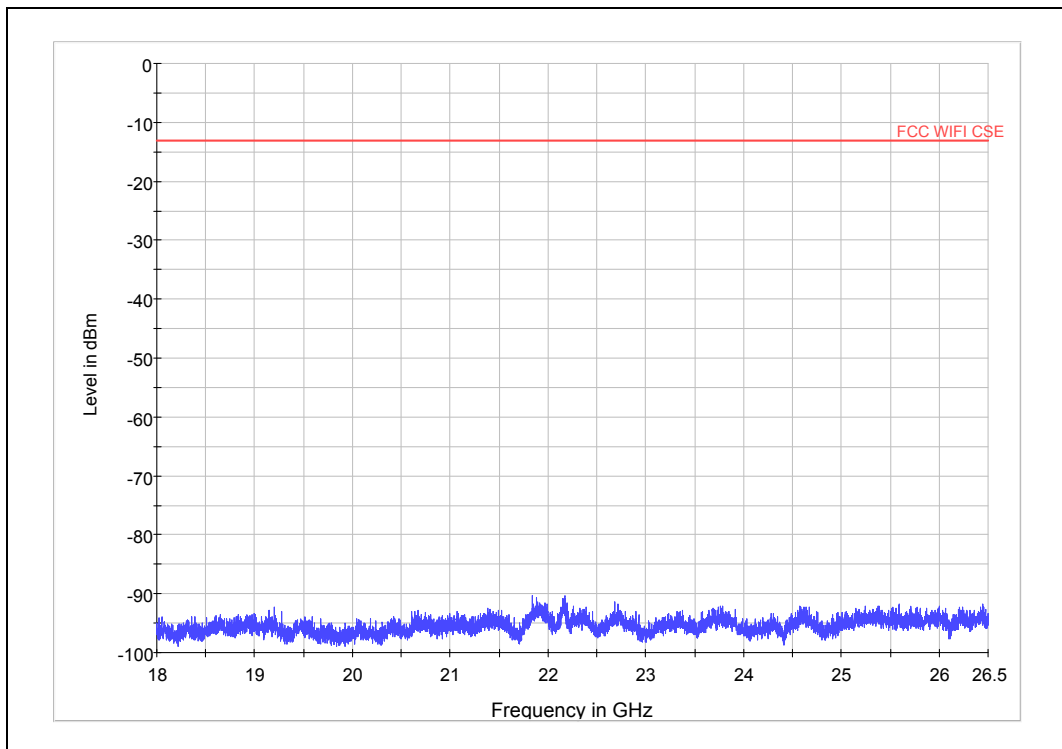
TA Technology (Shanghai) Co., Ltd. Test Report

802.11n (HT20) CH11



Note: The signal beyond the limit is carrier

Spurious RF conducted emissions from 30MHz to 18GHz



Spurious RF conducted emissions from 18GHz to 26.5GHz

2.9. 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 C63.4-2009. 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 the 10th harmonic of the carrier.

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 (detector: Peak and Quasi-Peak)

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

Above 1GHz(detector: Peak):

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

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

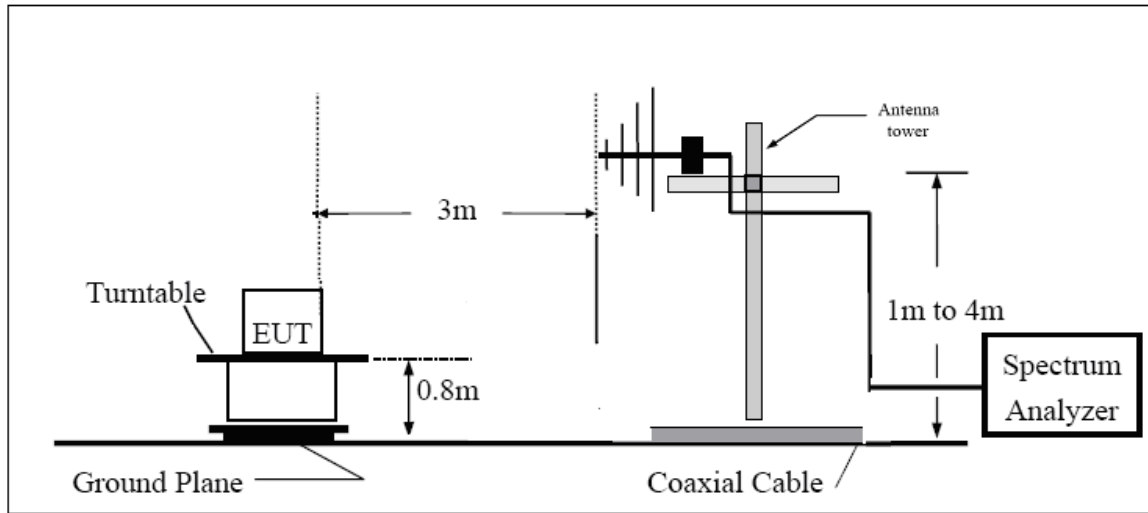
All channels' radiated emission was measured at the following position: EUT stand-up position (z, axis), lie-down position (x, y axis). The worst emission point was found in the middle channel at z axis and recorded.

The test is in transmitting mode.

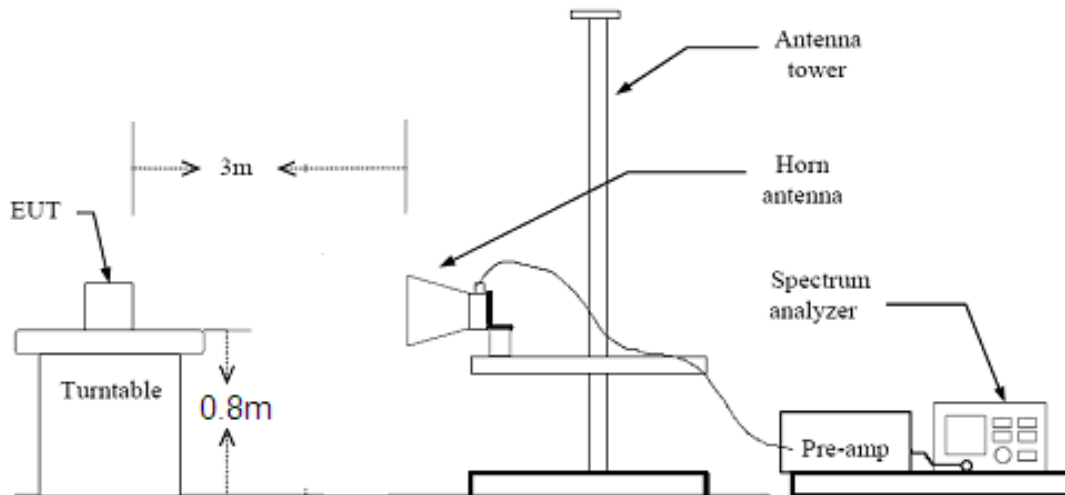
TA Technology (Shanghai) Co., Ltd. Test Report

Test setup

30MHz~~~ 1GHz



Above 1GHz



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

Report No.: RXA1301-0126RF01R1

Page 55 of 78

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 $k = 1.96$.

Frequency	Uncertainty
30MHz-200MHz	4.19 dB
200MHz-1GHz	3.63 dB
Above 1GHz	3.68 dB

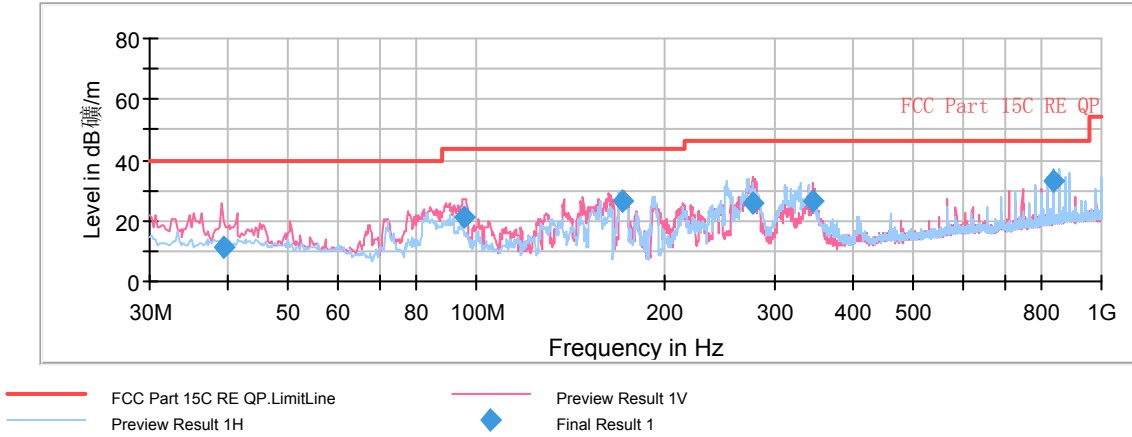
TA Technology (Shanghai) Co., Ltd. Test Report

Report No.: RXA1301-0126RF01R1

Page 56 of 78

Test result 802.11b CH6

RE 30M-1GHz (BT&WIFI) QP

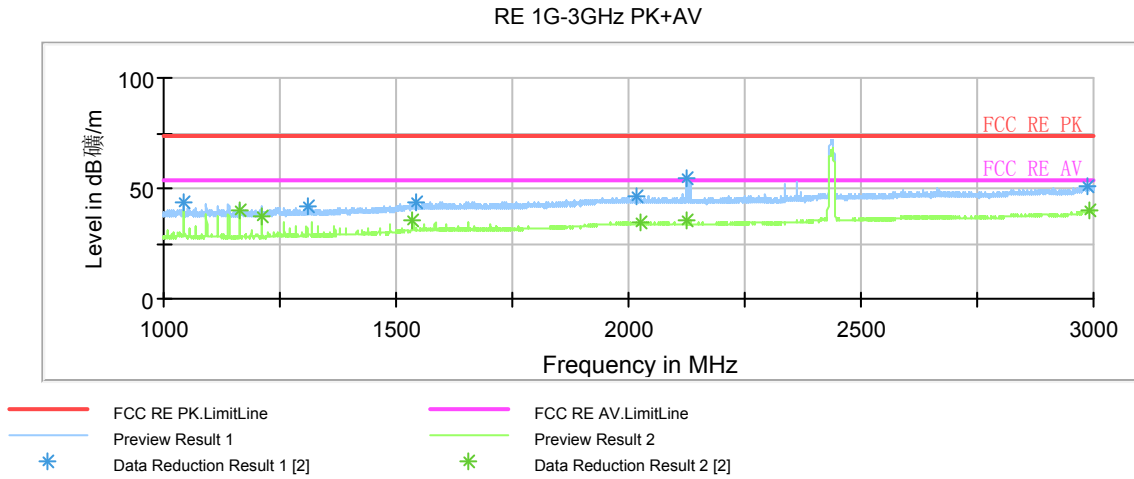


Note: a font (Level in dB μ V/m) in the test plot = (level in dBuV/m)
Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
39.515000	11.3	175.0	V	307.0	35.2	-23.9	28.7	40.0
95.657500	20.8	100.0	V	10.0	49.0	-28.2	22.7	43.5
171.645000	26.3	100.0	V	297.0	57.7	-31.4	17.2	43.5
276.890000	25.6	196.0	V	313.0	53.5	-27.9	20.4	46.0
344.630000	26.3	100.0	V	29.0	52.4	-26.1	19.7	46.0
837.020000	32.8	125.0	H	135.0	50.1	-17.3	13.2	46.0

- Remark:**
1. Quasi-Peak = Reading value + Correction factor
 2. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)
 3. Margin = Limit – Quasi-Peak

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



Note: a font (Level in dB/m) in the test plot = (level in dBuV/m)

Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

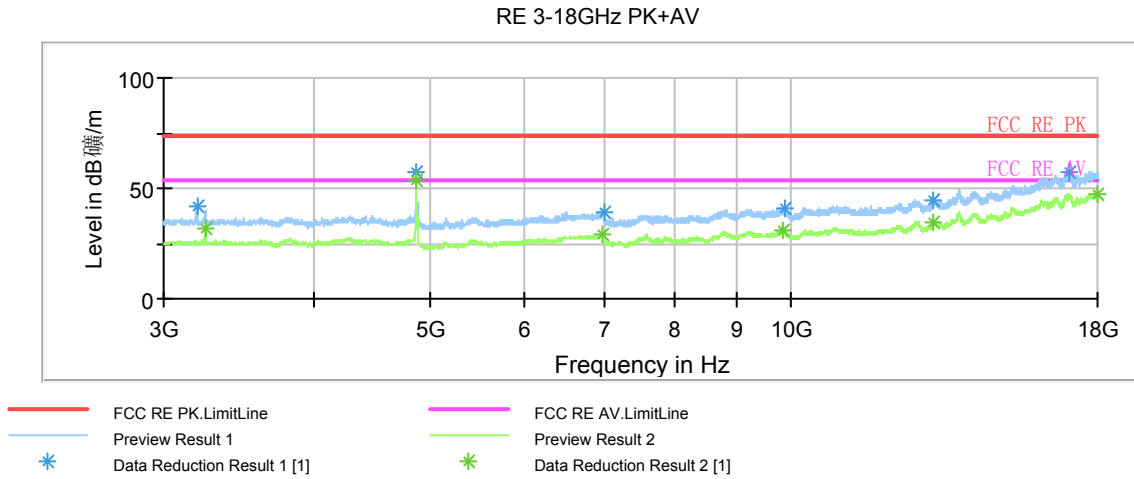
Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1044.000000	43.6	150.0	V	214.0	55.9	-12.3	30.4	74
1308.250000	42.0	100.0	H	220.0	53.7	-11.7	32	74
1541.250000	43.5	150.0	V	75.0	52.9	-9.4	30.5	74
2019.250000	46.1	150.0	H	0.0	52.5	-6.4	27.9	74
2126.250000	54.2	100.0	V	193.0	60.6	-6.4	19.8	74
2986.250000	50.6	100.0	H	260.0	52.4	-1.8	23.4	74

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1164.000000	40.0	150.0	V	231.0	52.3	-12.3	14	54
1212.000000	37.1	100.0	H	180.0	49.4	-12.3	16.9	54
1536.250000	35.5	100.0	V	261.0	45	-9.5	18.5	54
2025.500000	34.5	100.0	V	286.0	40.9	-6.4	19.5	54
2126.250000	35.7	100.0	V	193.0	42.1	-6.4	18.3	54
2989.500000	39.9	100.0	V	231.0	41.7	-1.8	14.1	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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



Note: a font (Level in dB 磁/m) in the test plot = (level in dBuV/m)
Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3196.875000	42.0	100.0	V	296.0	44.6	-2.6	32	74
4873.125000	57.5	100.0	V	191.0	55.6	1.9	16.5	74
6993.750000	39.1	100.0	V	0.0	34.1	5.0	34.9	74
9862.500000	41.0	100.0	V	0.0	31.1	9.9	33	74
13156.875000	44.8	100.0	H	150.0	32.1	12.7	29.2	74
17066.250000	57.4	100.0	V	239.0	36.1	21.3	16.6	74

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

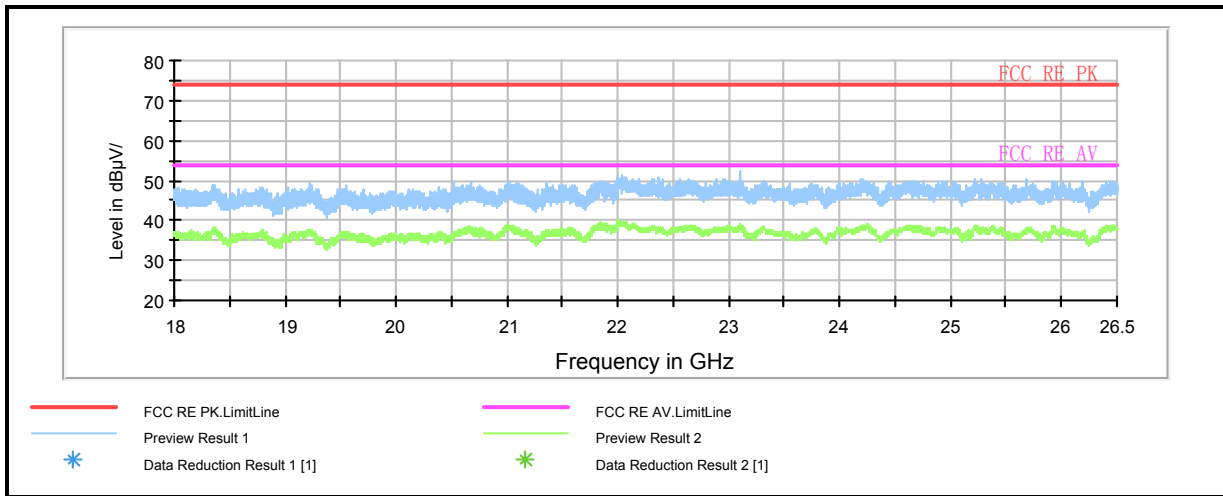
Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3249.375000	31.8	100.0	V	319.0	34.2	-2.4	22.2	54
4873.125000	53.6	100.0	V	191.0	51.7	1.9	0.4	54
6960.000000	29.1	100.0	H	150.0	24.3	4.8	24.9	54
9856.875000	31.0	100.0	H	139.0	21.1	9.9	23	54
13123.125000	34.9	100.0	H	115.0	22.1	12.8	19.1	54
17986.875000	47.4	100.0	H	12.0	23.9	23.5	6.6	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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

Report No.: RXA1301-0126RF01R1

Page 59 of 78

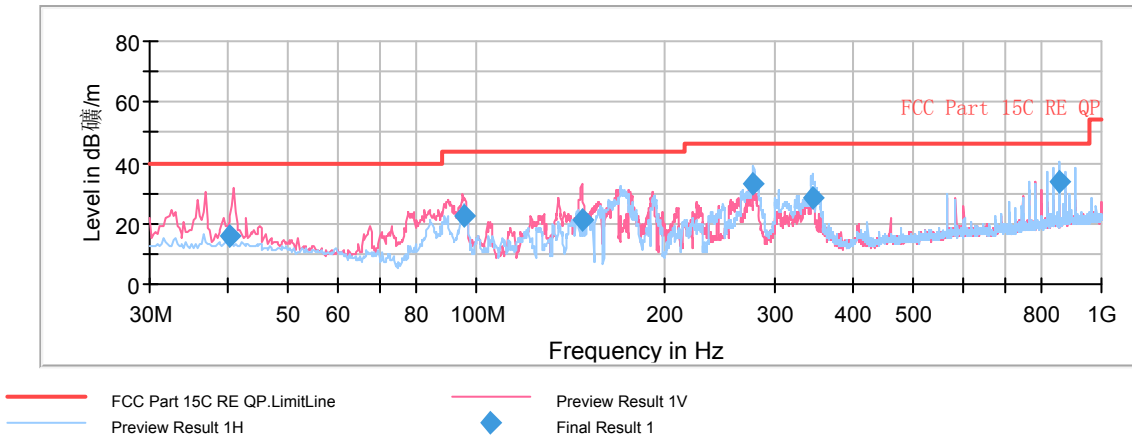


Note: a font (Level in dBuV/m) in the test plot = (level in dBuV/m)
Radiates Emission from 18GHz to 26.5GHz

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

802.11g CH6

RE 30M-1GHz (BT&WIFI) QP



Note: a font (Level in dB/m) in the test plot = (level in dBuV/m)
Radiates Emission from 30MHz to 1GHz

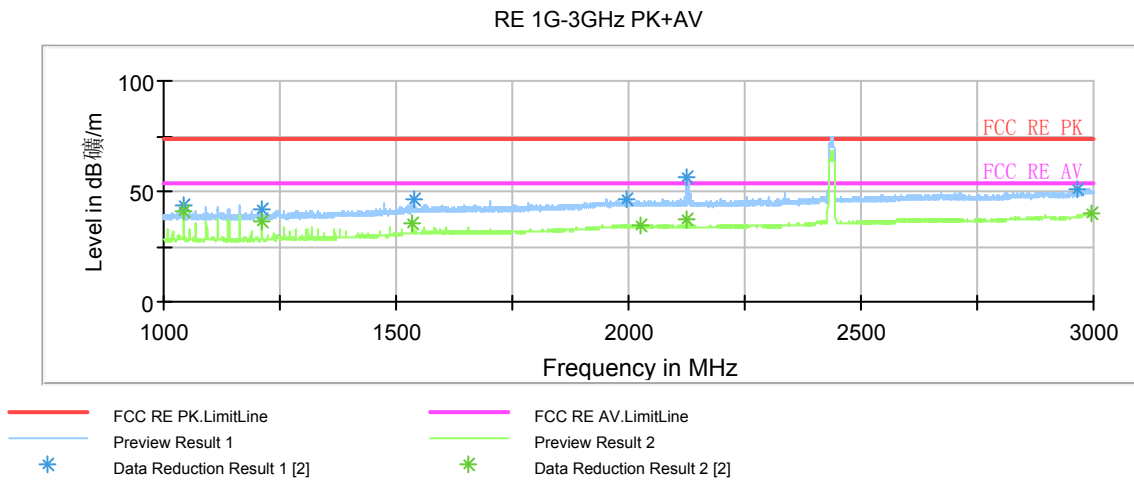
Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
40.332500	16.1	175.0	V	149.0	40	-23.9	23.9	40.0
95.772500	22.2	100.0	V	103.0	50.3	-28.1	21.3	43.5
147.430000	21.3	100.0	V	268.0	53.9	-32.6	22.2	43.5
277.132500	32.8	100.0	H	90.0	60.7	-27.9	13.2	46.0
344.305000	28.6	100.0	H	302.0	54.7	-26.1	17.4	46.0
855.007500	33.7	120.0	H	131.0	50.9	-17.2	12.3	46.0

- Remark: 1. Quasi-Peak = Reading value + Correction factor**
2. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)
3. Margin = Limit – Quasi-Peak

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

Report No.: RXA1301-0126RF01R1

Page 61 of 78



Note: a font (Level in dB 磁/m) in the test plot = (level in dBuV/m)

Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

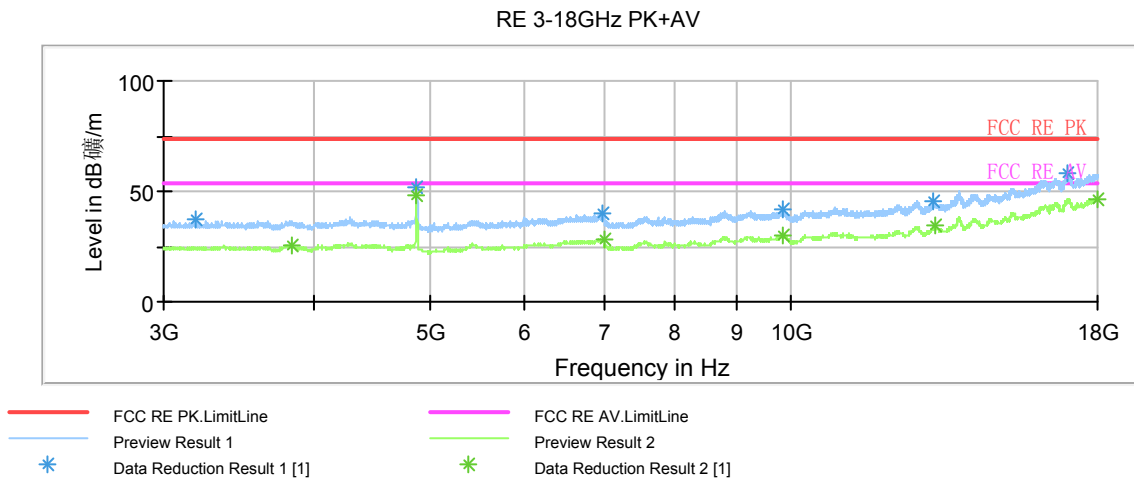
Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1044.000000	43.8	150.0	V	279.0	56.1	-12.3	30.2	74
1212.000000	41.5	100.0	H	178.0	53.8	-12.3	32.5	74
1539.750000	46.4	100.0	V	131.0	55.8	-9.4	27.6	74
1995.250000	46.0	150.0	H	197.0	52.4	-6.4	28	74
2124.250000	56.2	100.0	V	165.0	62.6	-6.4	17.8	74
2965.000000	51.1	100.0	H	0.0	53.1	-2.0	22.9	74

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1044.000000	40.5	100.0	H	162.0	52.8	-12.3	13.5	54
1212.250000	36.4	100.0	H	234.0	48.7	-12.3	17.6	54
1536.000000	35.2	100.0	V	259.0	44.7	-9.5	18.8	54
2024.750000	34.8	100.0	V	259.0	41.2	-6.4	19.2	54
2124.250000	37.1	100.0	V	165.0	43.5	-6.4	16.9	54
2994.750000	39.8	100.0	H	20.0	41.6	-1.8	14.2	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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



Note: a font (Level in dB 磁/m) in the test plot = (level in dBuV/m)
Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3191.250000	37.6	150.0	V	337.0	40.2	-2.6	36.4	74
4873.125000	51.8	150.0	V	153.0	49.9	1.9	22.2	74
6961.875000	40.1	150.0	V	60.0	35.3	4.8	33.9	74
9849.375000	42.1	150.0	H	345.0	32.3	9.8	31.9	74
13149.375000	45.4	100.0	H	122.0	32.7	12.7	28.6	74
17008.125000	58.0	100.0	V	250.0	36.1	21.9	16	74

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

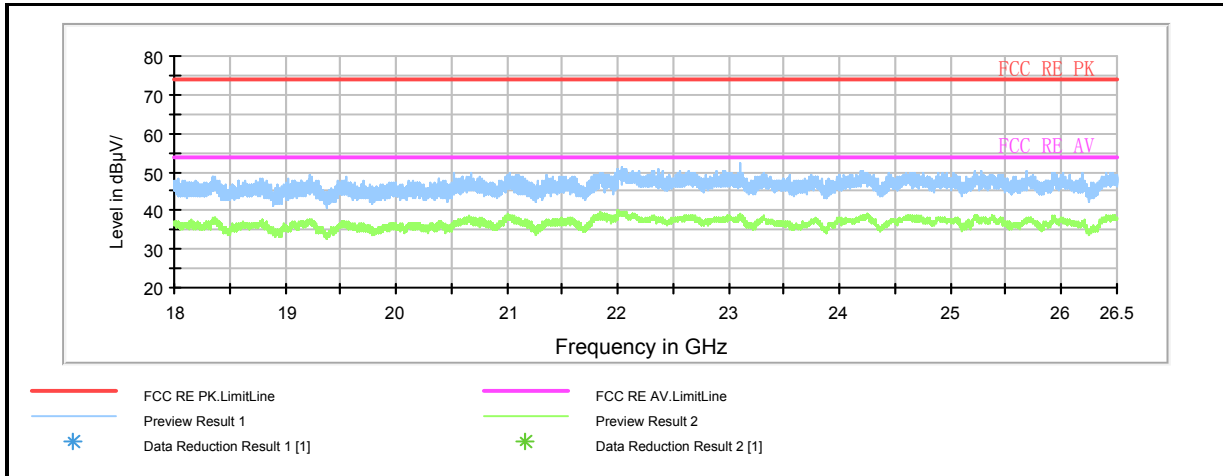
Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3830.625000	25.7	100.0	V	0.0	25.8	-0.1	28.3	54
4873.125000	47.9	150.0	V	153.0	46	1.9	6.1	54
6993.750000	28.5	100.0	V	162.0	23.5	5.0	25.5	54
9838.125000	30.0	150.0	V	230.0	20.2	9.8	24	54
13160.625000	34.1	100.0	H	35.0	21.4	12.7	19.9	54
17998.125000	46.7	150.0	V	164.0	23.2	23.5	7.3	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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

Report No.: RXA1301-0126RF01R1

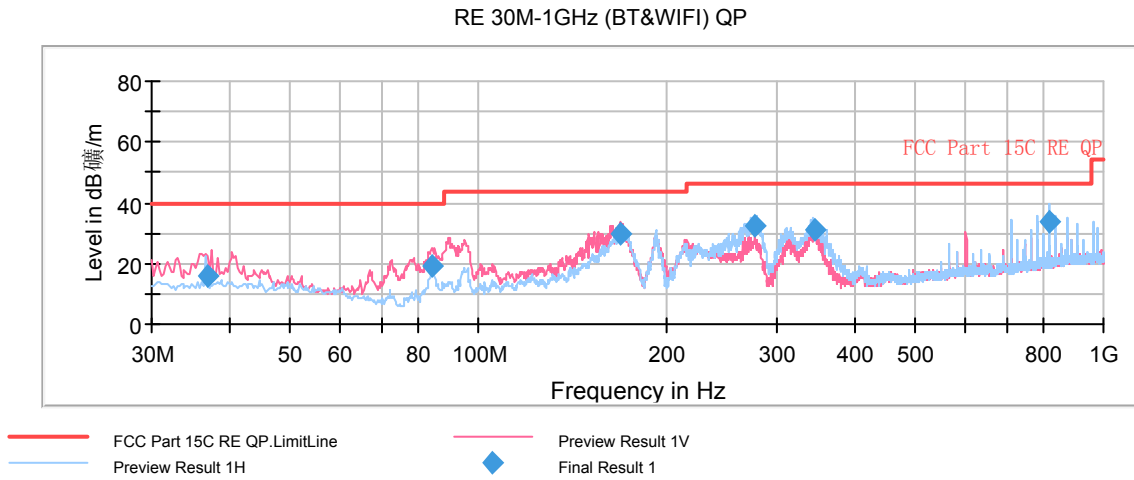
Page 63 of 78



Note: a font (Level in dBµV/m) in the test plot = (level in dBuV/m)
Radiates Emission from 18GHz to 26.5GHz

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

802.11n (HT20) CH6



Note: a font (Level in dB/m) in the test plot = (level in dBuV/m)
Radiates Emission from 30MHz to 1GHz

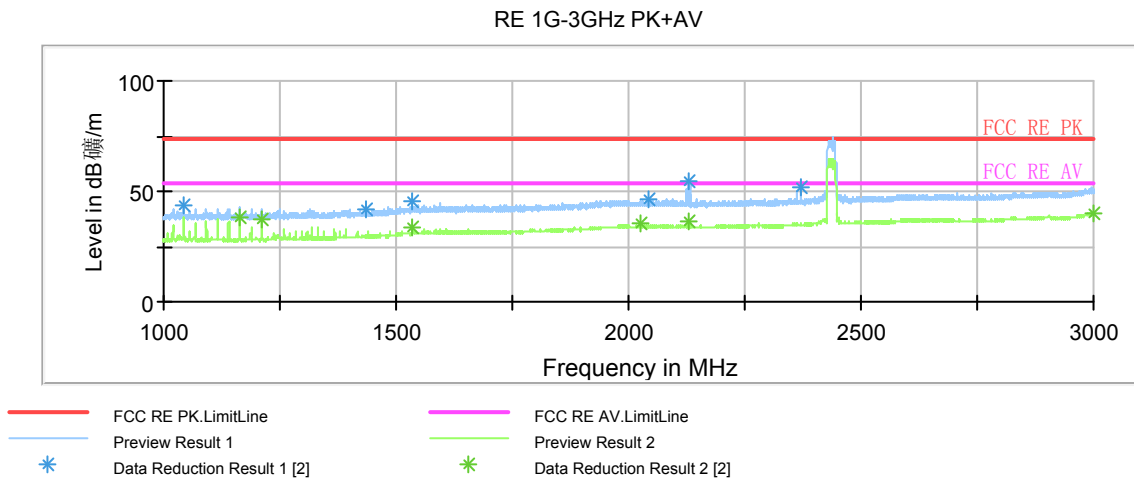
Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
36.937500	15.8	101.0	V	170.0	40	-24.2	24.2	40.0
84.387500	19.3	121.0	V	0.0	49.9	-30.6	20.7	40.0
168.527500	30.0	101.0	V	254.0	61.5	-31.5	13.5	43.5
277.740000	32.2	101.0	H	66.0	60.1	-27.9	13.8	46.0
344.377500	31.3	101.0	H	288.0	57.4	-26.1	14.8	46.0
818.995000	33.7	101.0	H	334.0	51	-17.3	12.3	46.0

Remark: 1. Quasi-Peak = Reading value + Correction factor

2. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

3. Margin = Limit – Quasi-Peak

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



Note: a font (Level in dB 磁/m) in the test plot = (level in dBuV/m)

Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

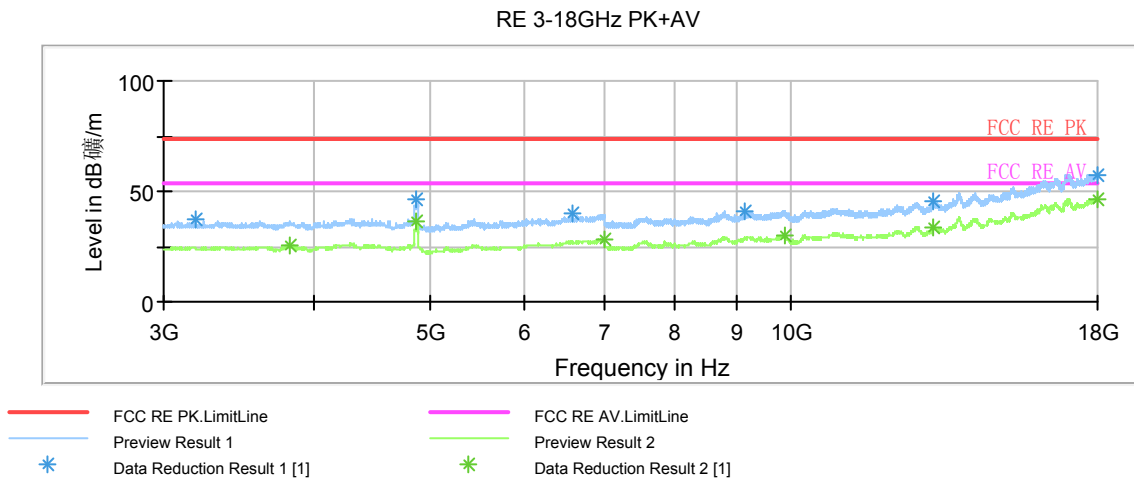
Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1044.250000	44.0	100.0	H	159.0	56.3	-12.3	30	74
1434.750000	42.0	100.0	V	199.0	52.8	-10.8	32	74
1535.750000	45.0	100.0	V	261.0	54.5	-9.5	29	74
2042.750000	46.1	150.0	V	320.0	52.4	-6.3	27.9	74
2128.750000	54.3	100.0	V	176.0	60.8	-6.5	19.7	74
2369.000000	51.8	100.0	H	239.0	57.3	-5.5	22.2	74

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1164.250000	38.2	100.0	H	175.0	50.5	-12.3	15.8	54
1212.000000	37.2	100.0	H	231.0	49.5	-12.3	16.8	54
1536.250000	33.4	100.0	V	261.0	42.9	-9.5	20.6	54
2025.000000	35.0	100.0	V	184.0	41.4	-6.4	19	54
2128.750000	36.0	100.0	V	176.0	42.5	-6.5	18	54
2998.250000	40.1	150.0	H	215.0	41.9	-1.8	13.9	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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



Note: a font (Level in dB/m) in the test plot = (level in dBuV/m)
Radiates Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3185.625000	37.3	150.0	V	168.0	39.9	-2.6	36.7	74
4871.250000	46.0	150.0	V	221.0	44.1	1.9	28	74
6575.625000	39.6	150.0	V	46.0	35.2	4.4	34.4	74
9161.250000	40.9	100.0	V	248.0	32.2	8.7	33.1	74
13153.125000	45.3	100.0	H	152.0	32.6	12.7	28.7	74
17996.250000	57.6	150.0	V	300.0	34.1	23.5	16.4	74

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

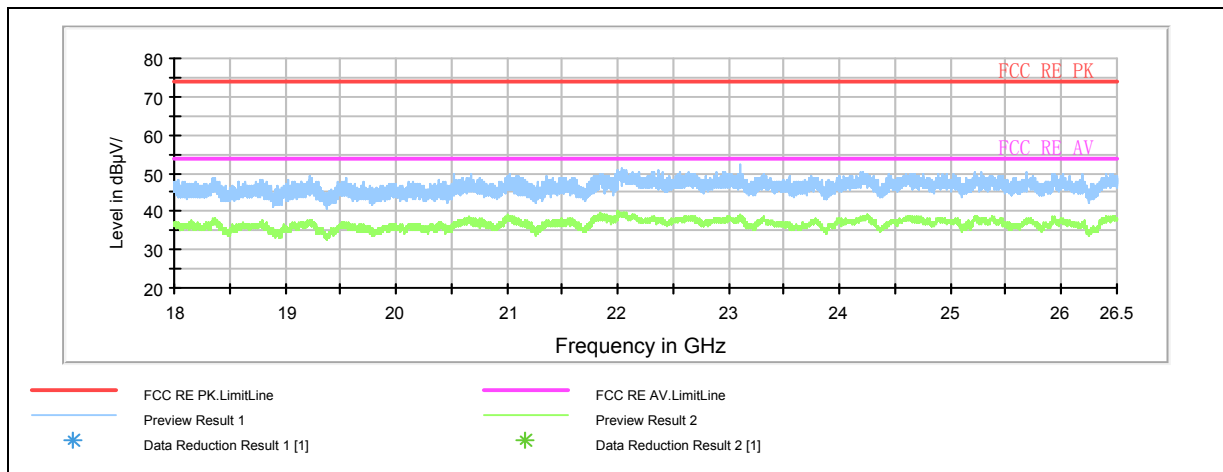
Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3821.250000	25.6	150.0	V	0.0	25.7	-0.1	28.4	54
4871.250000	36.7	150.0	V	221.0	34.8	1.9	17.3	54
6997.500000	28.5	150.0	V	35.0	23.5	5.0	25.5	54
9864.375000	30.0	150.0	V	3.0	20.1	9.9	24	54
13145.625000	34.0	150.0	V	110.0	21.2	12.8	20	54
18000.000000	46.6	100.0	H	107.0	23.1	23.5	7.4	54

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

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

Report No.: RXA1301-0126RF01R1

Page 67 of 78



Note: a font (Level in dB μ V/m) in the test plot = (level in dBuV/m)
Radiates Emission from 18GHz to 26.5GHz

2.10. Conducted Emissions

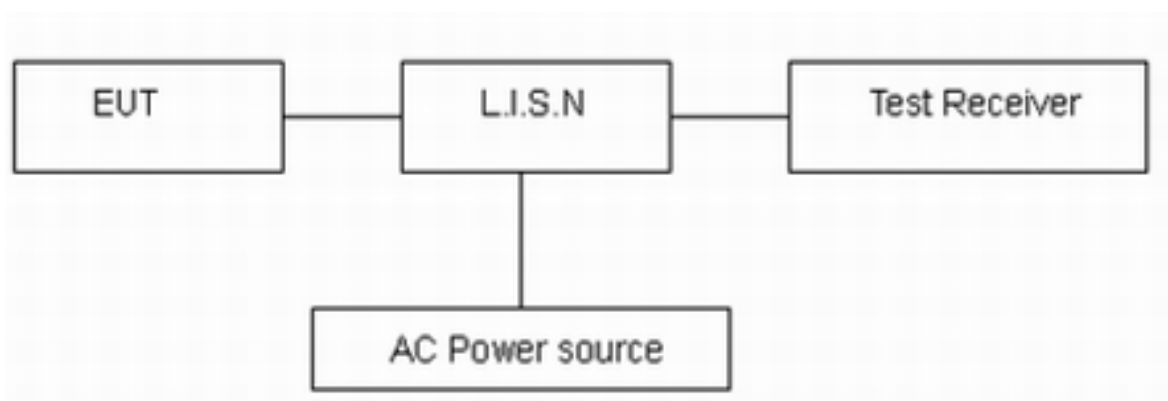
Ambient condition

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

Method of Measurement

The EUT IS placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSIC63.4-2009. Connect the AC power line of the EUT to the LISN Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9kHz, VBW is set to 30kHz. The measurement result should include both L line and N line. The test is in transmitting mode.

Test setup



Note: AC Power source is used to change the voltage from 220V/50Hz to 110V/60Hz.

Limits

Frequency (MHz)	Conducted Limits(dB μ V)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46 *
0.5 - 5	56	46
5 - 30	60	50

*: Decreases with the logarithm of the frequency.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U = 2.69$ dB.

TA Technology (Shanghai) Co., Ltd.

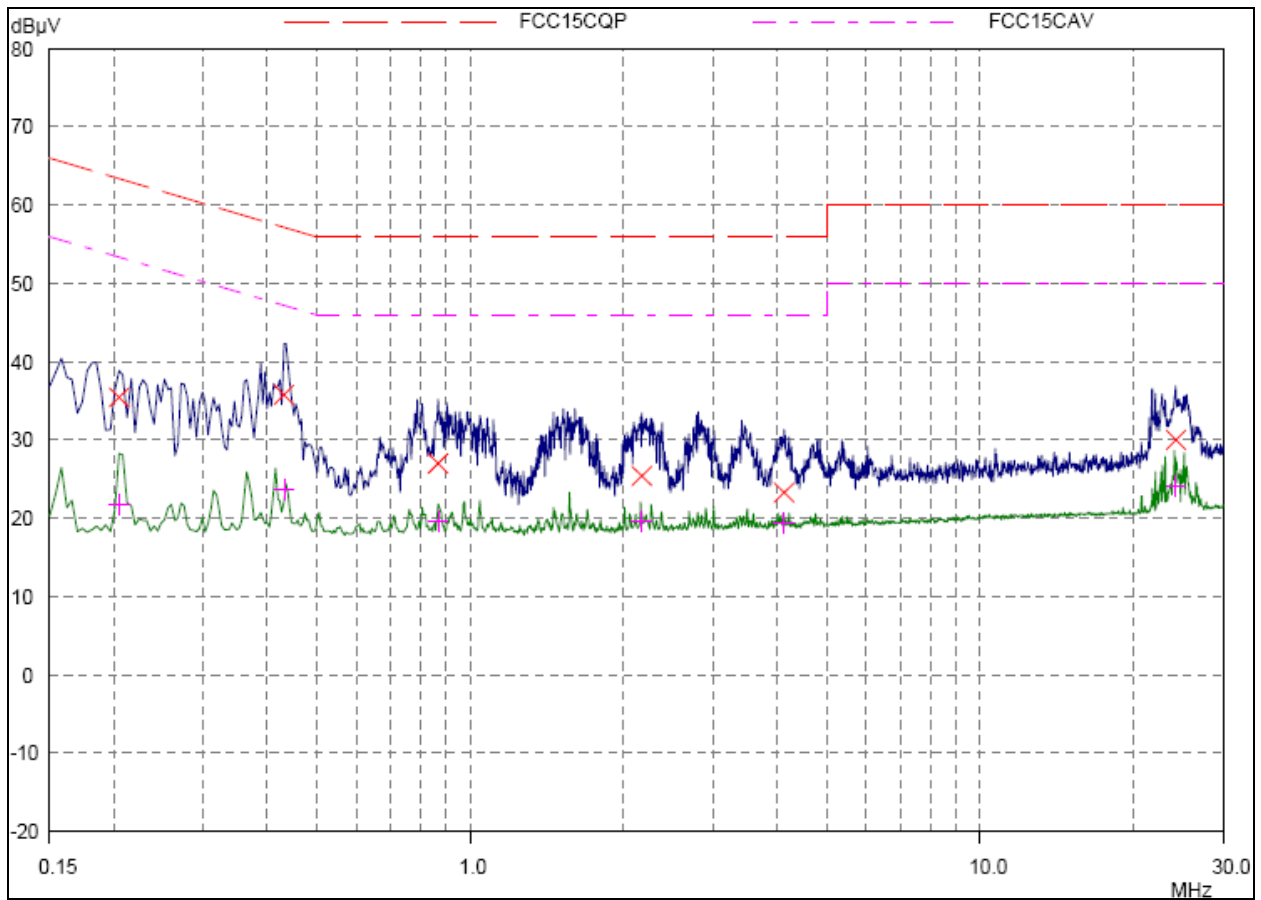
Test Report

Report No.: RXA1301-0126RF01R1

Page 69 of 78

Test Results:

802.11b CH6



L Line

Final Measurement Results

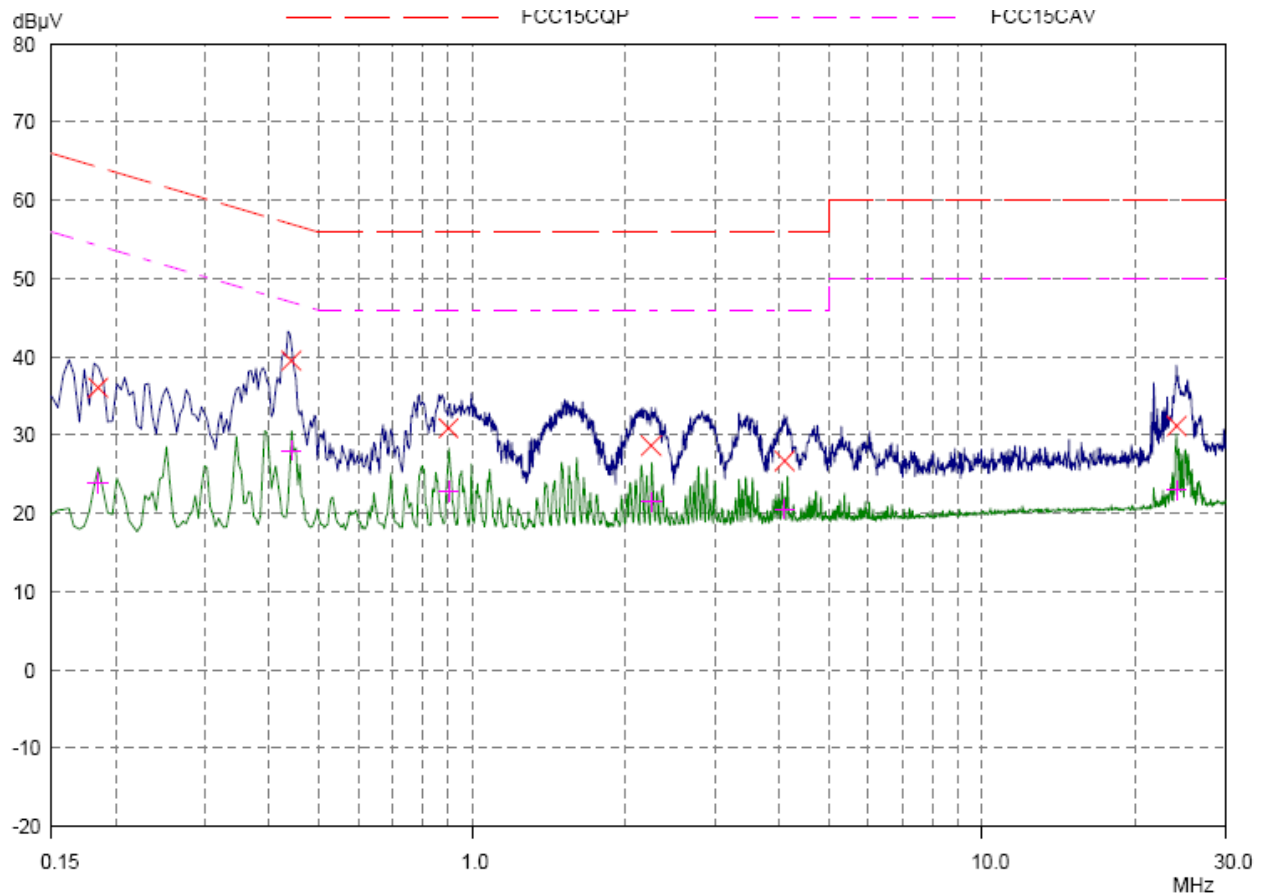
Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -
0.20468	35.44	63.42	27.98	L1
0.43125	35.78	57.23	21.45	L1
0.86484	27.02	56.00	28.98	L1
2.16953	25.39	56.00	30.61	L1
4.12655	23.26	56.00	32.74	L1
24.17734	30.02	60.00	29.98	L1

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -
0.20468	21.71	53.42	31.71	L1
0.43125	23.64	47.23	23.59	L1
0.86484	19.65	46.00	26.35	L1
2.16953	19.58	46.00	26.42	L1
4.12655	19.40	46.00	26.60	L1
24.17734	24.09	50.00	25.91	L1

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

Report No.: RXA1301-0126RF01R1

Page 70 of 78



N Line

Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -
0.18515	36.09	64.25	28.16	N
0.44296	39.51	57.01	17.50	N
0.9	30.89	56.00	25.11	N
2.24375	28.68	56.00	27.32	N
4.0953	26.71	56.00	29.29	N
24.05625	31.18	60.00	28.82	N

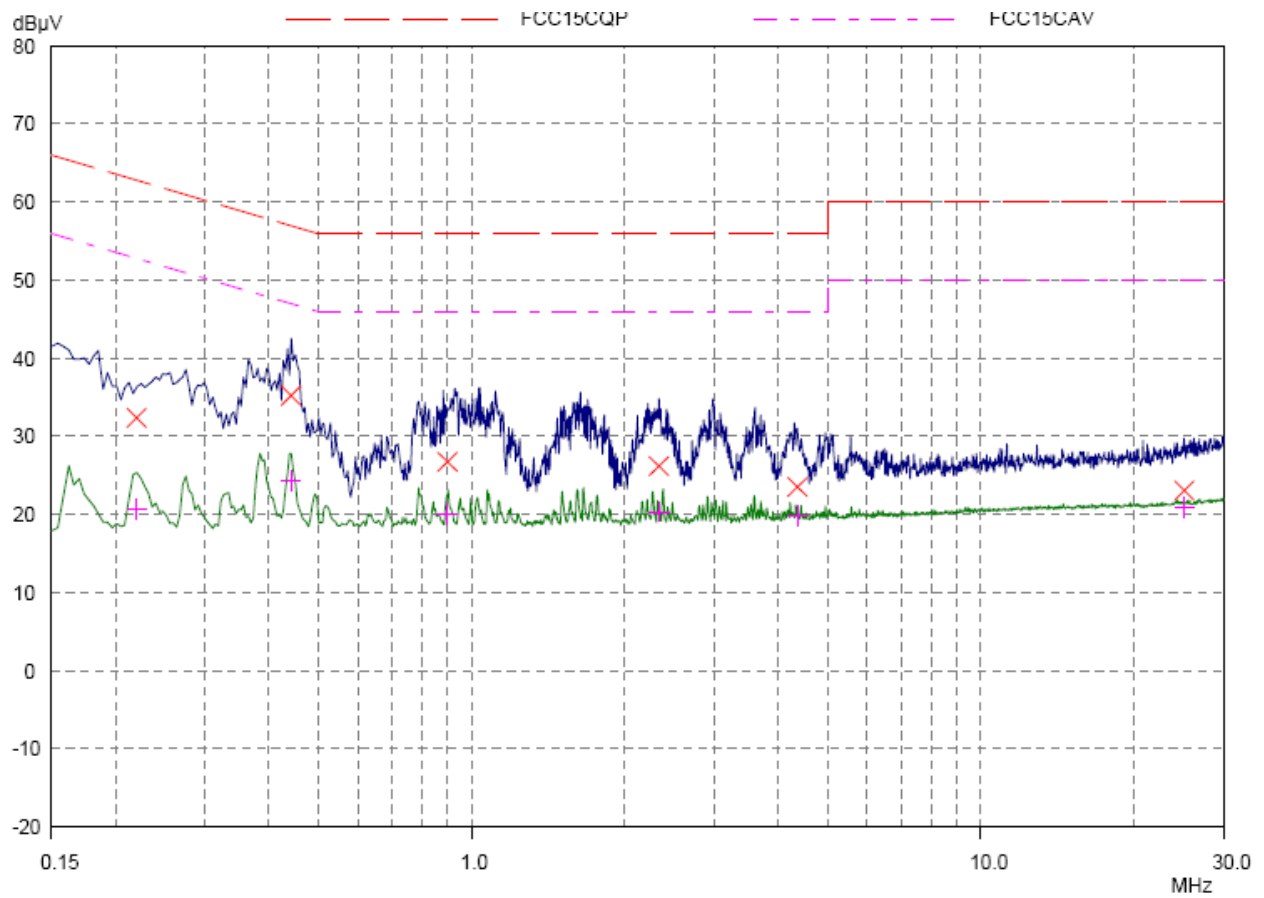
Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -
0.18515	23.97	54.25	30.28	N
0.44296	28.06	47.01	18.95	N
0.9	22.86	46.00	23.14	N
2.24375	21.43	46.00	24.57	N
4.0953	20.53	46.00	25.47	N
24.05625	22.98	50.00	27.02	N

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

Report No.: RXA1301-0126RF01R1

Page 71 of 78

802.11g CH6



L Line

Final Measurement Results

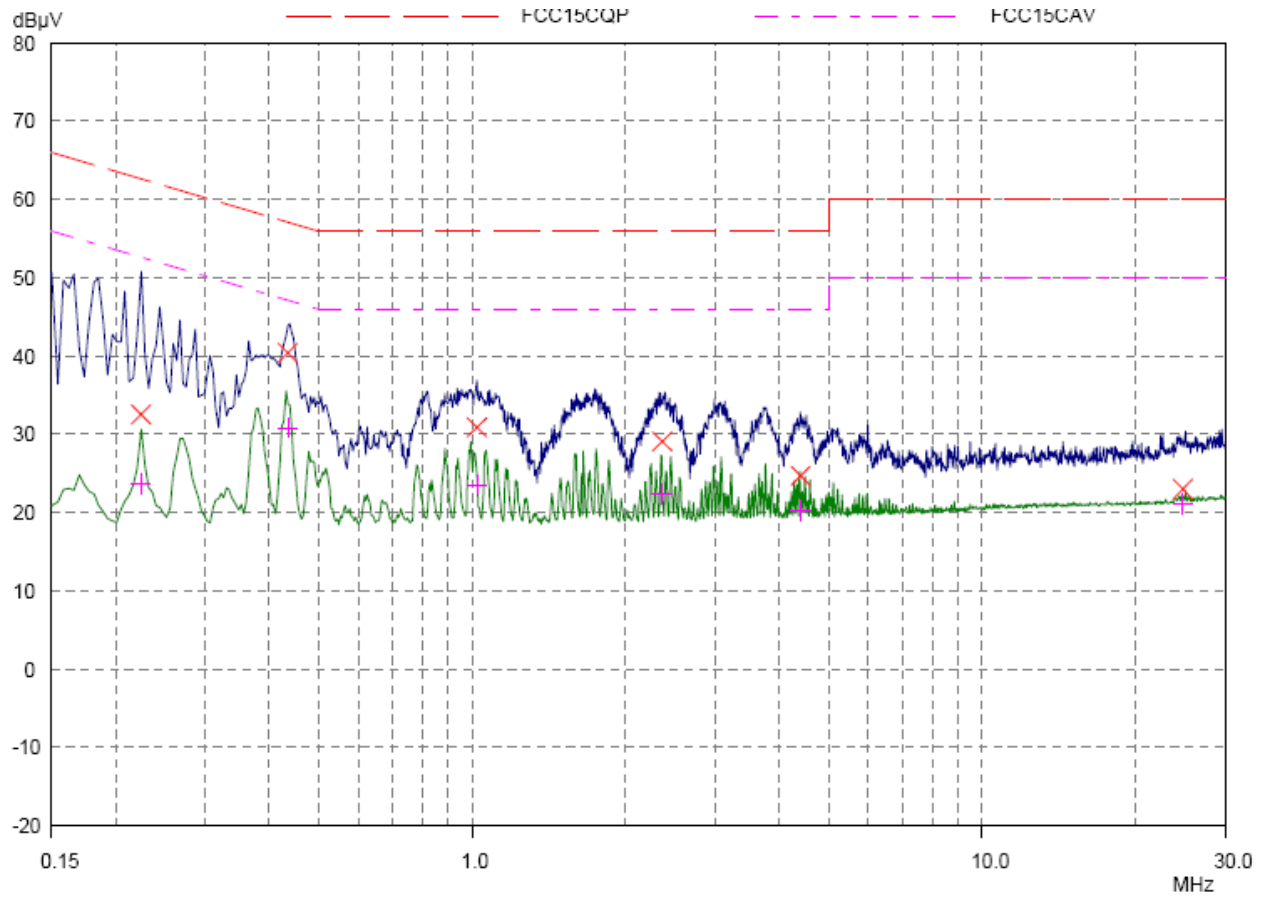
Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -
0.22031	32.38	62.81	30.43	L1
0.44296	35.25	57.01	21.76	L1
0.89609	26.75	56.00	29.25	L1
2.33359	26.18	56.00	29.82	L1
4.36484	23.52	56.00	32.48	L1
25.0875	23.07	60.00	36.93	L1

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -
0.22031	20.74	52.81	32.07	L1
0.44296	24.31	47.01	22.70	L1
0.89609	20.12	46.00	25.88	L1
2.33359	20.31	46.00	25.69	L1
4.36484	19.86	46.00	26.14	L1
25.0875	20.92	50.00	29.08	L1

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

Report No.: RXA1301-0126RF01R1

Page 72 of 78



N Line

Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -
0.22421	32.56	62.66	30.10	N
0.43515	40.38	57.15	16.77	N
1.02109	30.92	56.00	25.08	N
2.35703	29.10	56.00	26.90	N
4.40781	24.71	56.00	31.29	N
24.7125	23.03	60.00	36.97	N

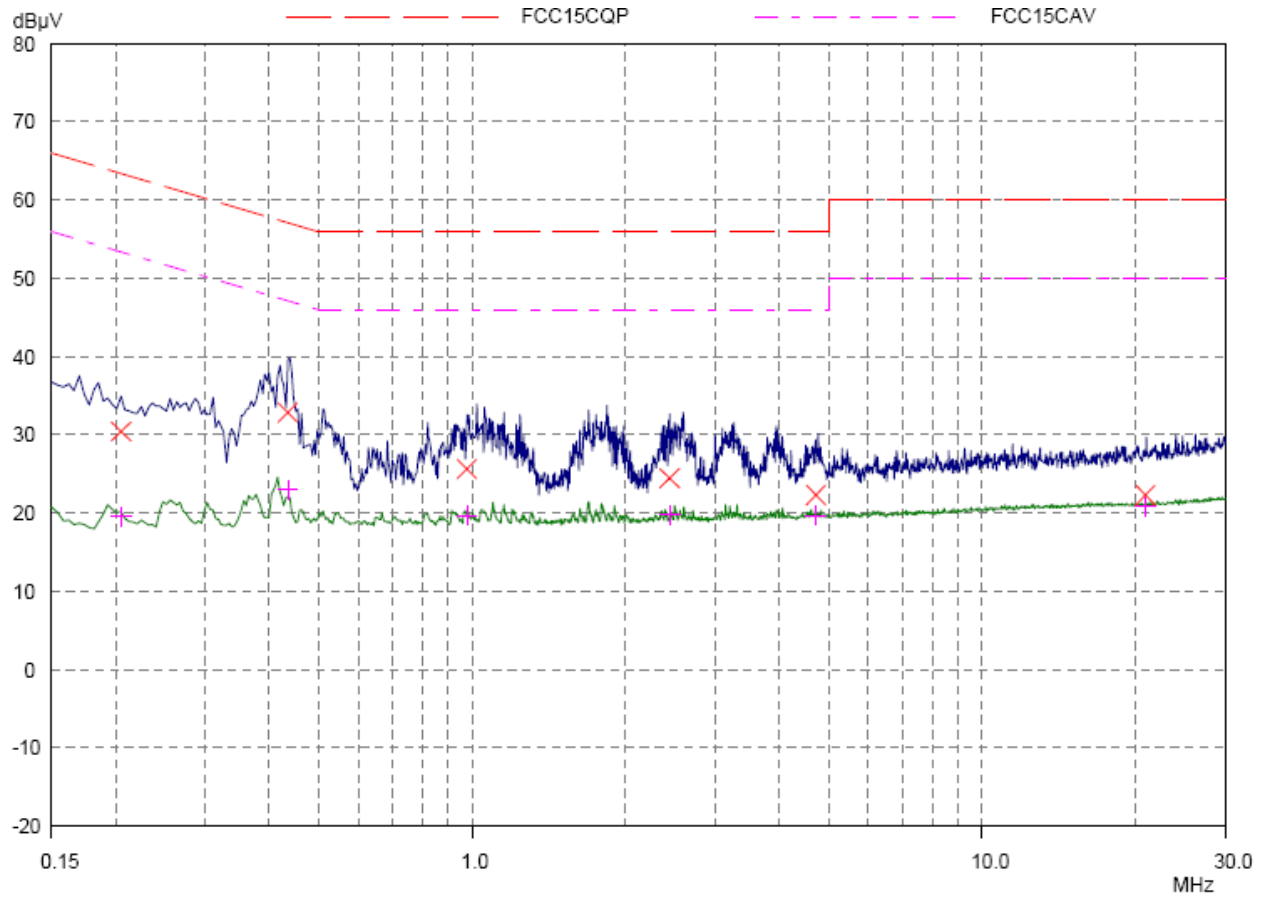
Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -
0.22421	23.71	52.66	28.95	N
0.43515	30.81	47.15	16.34	N
1.02109	23.57	46.00	22.43	N
2.35703	22.39	46.00	23.61	N
4.40781	20.20	46.00	25.80	N
24.7125	21.14	50.00	28.86	N

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

Report No.: RXA1301-0126RF01R1

Page 73 of 78

802.11n (HT20) CH6



L Line

Final Measurement Results

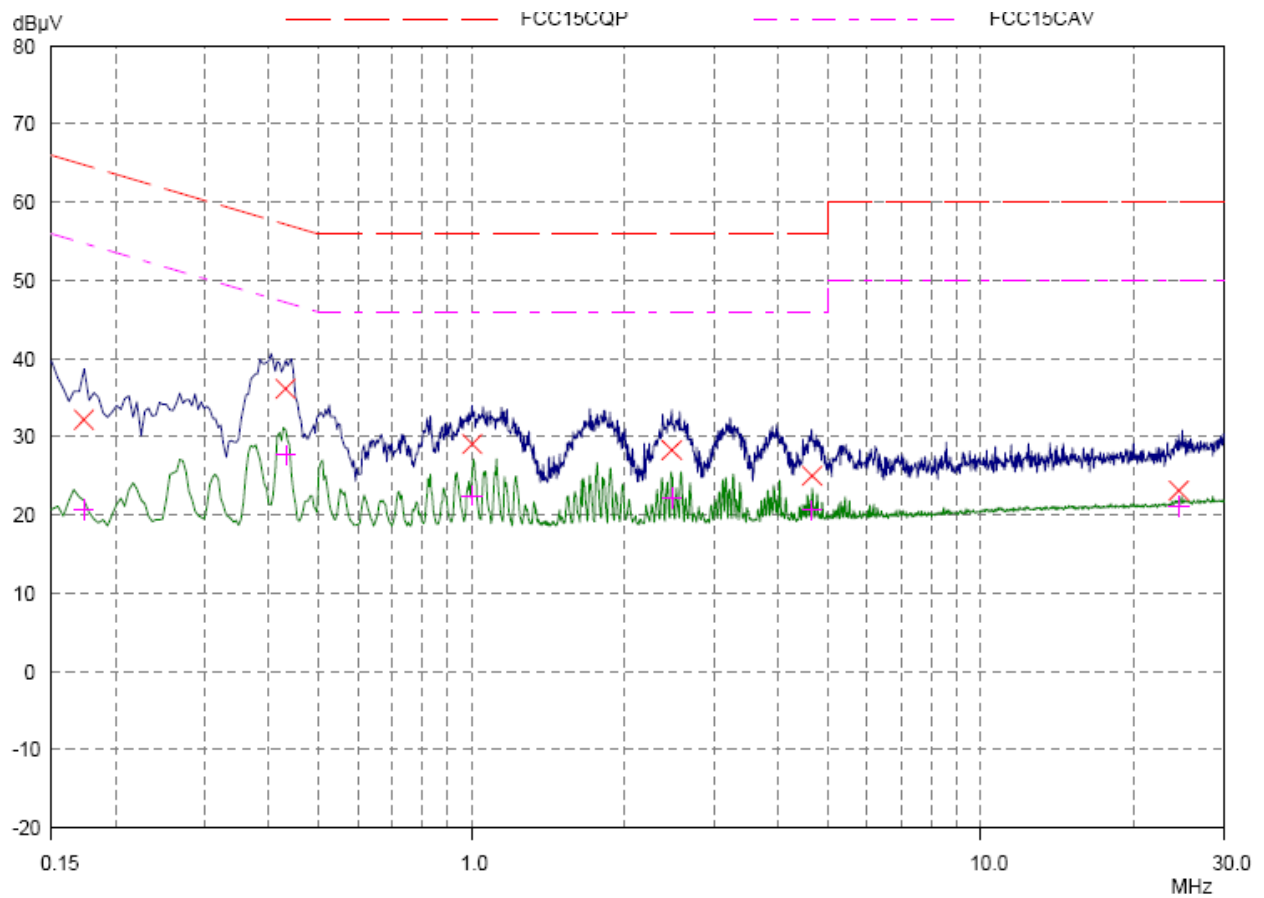
Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -
0.20468	30.42	63.42	33.00	L1
0.43515	32.84	57.15	24.31	L1
0.97812	25.65	56.00	30.35	L1
2.44296	24.46	56.00	31.54	L1
4.7164	22.32	56.00	33.68	L1
20.89609	22.32	60.00	37.68	L1

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -
0.20468	19.56	53.42	33.86	L1
0.43515	22.98	47.15	24.17	L1
0.97812	19.68	46.00	26.32	L1
2.44296	19.79	46.00	26.21	L1
4.7164	19.67	46.00	26.33	L1
20.89609	20.85	50.00	29.15	L1

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

Report No.: RXA1301-0126RF01R1

Page 74 of 78



N Line

Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -
0.17343	32.20	64.79	32.59	N
0.43125	36.16	57.23	21.07	N
1.00546	29.08	56.00	26.92	N
2.47421	28.32	56.00	27.68	N
4.66562	25.05	56.00	30.95	N
24.49765	23.12	60.00	36.88	N

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -
0.17343	20.71	54.79	34.08	N
0.43125	27.62	47.23	19.61	N
1.00546	22.50	46.00	23.50	N
2.47421	22.23	46.00	23.77	N
4.66562	20.63	46.00	25.37	N
24.49765	21.13	50.00	28.87	N

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

Report No.: RXA1301-0126RF01R1

Page 75 of 78

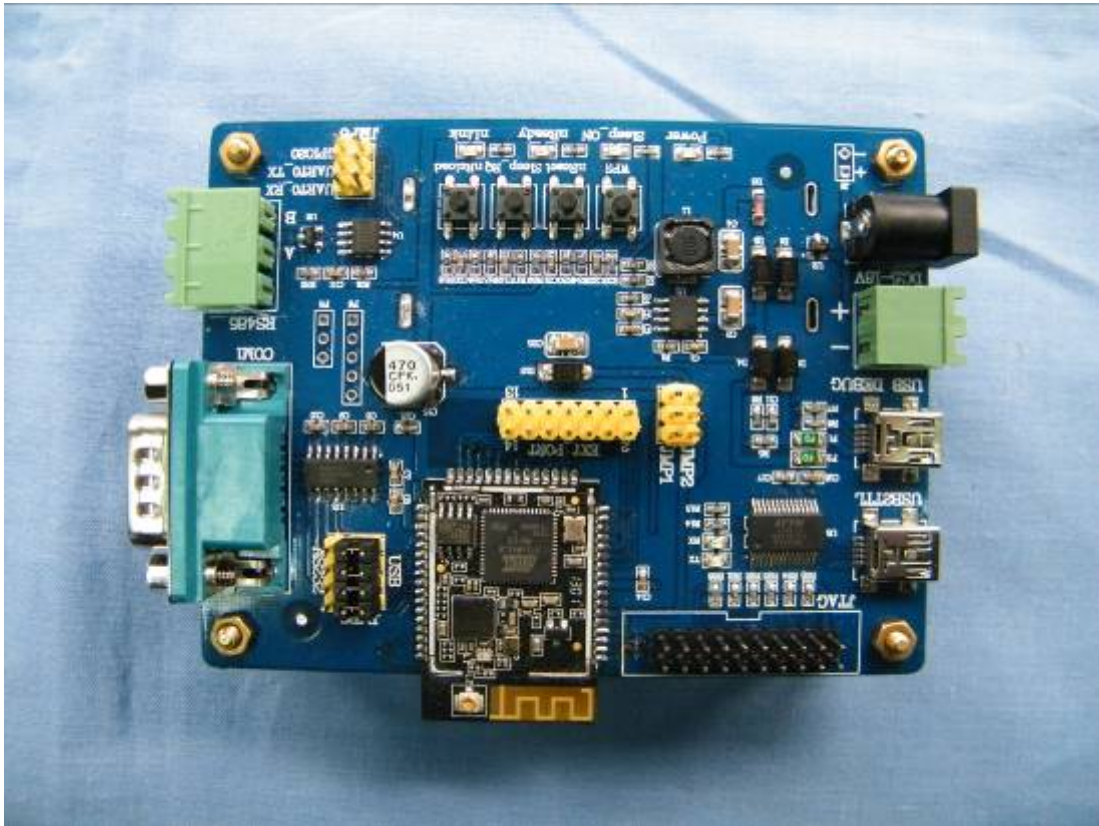
2. Main Test Instruments

No.	Name	Type	Manufacturer	Serial Number	Calibration Date	Valid Period
01	EMI Test Receiver	ESCI	R&S	100948	2012-06-30	One year
02	TRILOG Broadband Antenna	VULB 9163	Schwarzbeck	9163-201	2010-06-20	Three years
03	Double Ridged Waveguide Horn Antenna	HF907	R&S	100126	2012-07-02	Three years
04	EMI Test Receiver	ESCS30	R&S	100138	2013-01-15	One year
05	LISN	ENV216	R&S	101171	2010-04-16	Three years
06	PSG Analog Signal Generator	E8257D	Agilent	MY49281101	2012-06-30	One year
07	ESG Vector Signal Generator	E4438C	Agilent	MY49070900	2012-06-30	One year
08	Spectrum Analyzer	E4445A	Agilent	MY46181146	2012-06-30	One year
09	Power Splitter	SHX-GF2-2-13	Hua Xiang	10120101	NA	NA
10	MOB COMMS DC SUPPLY	66319D	Agilent	MY43004105	2012-06-30	One year
11	Peak Power Analyzer	8990B	Agilent	51000109	2012-06-01	One year
12	Wideband Power Sensors	N1923A	Agilent	MY51220004	2012-06-01	One year
13	Universal Radio Communication Tester	E5515C	Agilent	MY48367192	2012-06-30	One year

*****END OF REPORT *****

ANNEX A: EUT Appearance and Test Setup

A.1 EUT Appearance



a: EUT

Picture 1 Constituents of EUT

A.2 Test Setup



30M Hz-1GHz



Above 1GHz

Picture 2 Radiated Emission Test Setup

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

Report No.: RXA1301-0126RF01R1

Page 78 of 78



Picture 3 Conducted Emission Test Setup