



Part 15C

TEST REPORT

Product Name	WIFI/BT Combo wireless module
Model	M26H002
Brand Name	FOXCONN
FCC ID	MCLM26H002
Client	Hon Hai Precision Ind. Co.,Ltd.

TA Technology (Shanghai) Co., Ltd.

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GENERAL SUMMARY

Product Name	WIFI/BT Combo wireless module	Model	M26H002
FCC ID	MCLM26H002	Report No.	RXA1301-0014RF02R2
Client	Hon Hai Precision Ind. Co.,Ltd.		
Manufacturer	Hon Hai Precision Ind. Co.,Ltd.		
Reference Standard(s)	FCC CFR47 Part 15C (2013) Radio Frequency Devices 15.205 Restricted bands of operation; 15.207 Conducted limits; 15.209 Radiated emission limits; general requirements; 15.247 Operation within the bands 902-928 MHz,2400-2483.5 MHz, and 5725-5850MHz. 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) KDB 558074 D01 DTS Meas Guidance v02 Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247		
Conclusion	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. General Judgment: Pass  (Stamp) Date of issue: February 26th, 2013		
Comment	The test result only responds to the measured sample.		

Approved by 杨伟中
Director

Revised by 唐凯
RF Manager

Performed by 王峰
RF Engineer

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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.

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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: Hon Hai Precision Ind. Co.,Ltd.
Address: 5F-1, 5 Hsin-An Road, Hsinchu Science-Based Industrial Park
City: /
Postal Code: /
Country: /

1.4. Manufacturer Information

Company: Hon Hai Precision Ind. Co.,Ltd.
Address: 5F-1, 5 Hsin-An Road, Hsinchu Science-Based Industrial Park
City: /
Postal Code: /
Country: /

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1.5. Information of EUT

General information

Name of EUT:	WIFI/BT Combo wireless module	
MAC:	A41731673970	
Hardware Version:	v.015	
Software Version:	MFG-8787-WIFI-SD-BT-SD-WIN-X86-1.2.7.33-14.0.11.p74	
Antenna Information	Type	External Antenna
	Antenna 1 Part NO.	MSA-3411-25GC1-A1-B300MU
	Antenna 2 Part NO.	MSA-3411-25GC1-A1-B300MM
	Cable Length	300mm
	Antenna 1 Max Gain	4.46dBi
	Antenna 2 Max Gain	4.2dBi
Device Operating Configurations:		
Network Standards:	802.11b, 802.11g, 802.11n(HT20/HT40); (tested)	
Max Conducted Power	20.25 dBm	
Operating Frequency Range(s)	2400MHz~ 2483.5 MHz	

Equipment Under Test (EUT) is WIFI/BT Combo wireless module. The detail about these is in chapter 1.5 in this report. The EUT supports WiFi functions.

The EUT consist of two type of WIFI antennas. The Part NO of antenna 1 is MSA-3411-25GC1-A1-B300MU, The Part NO of antenna 2 is MSA-3411-25GC1-A1-B300MM.

The gain of antenna 1 is bigger than antenna 2. The radiation test cases were all tested for antenna 1, then the worst emission was found and this mode was tested for antenna 2.

The sample under test was selected by the Client.

Components list please refer to documents of the manufacturer.

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1.6. Test Date

The test performed from January 25, 2013 to January 31, 2013.

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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	18 Mbps	1/6/11
		802.11n HT20	MCS4	1/6/11
		802.11n HT40	MCS6	3/6/9
	Minimum 6dB bandwidth	802.11b	11 Mbps	1/6/11
		802.11g	18 Mbps	1/6/11
		802.11n HT20	MCS4	1/6/11
		802.11n HT40	MCS6	3/6/9
	Band Edges compliance	802.11b	11 Mbps	1/11
		802.11g	18 Mbps	1/11
		802.11n HT20	MCS4	1/11
		802.11n HT40	MCS6	3/9
	Power spectral Density	802.11b	11 Mbps	1/6/11
		802.11g	18 Mbps	1/6/11
		802.11n HT20	MCS4	1/6/11
		802.11n HT40	MCS6	3/6/9
	Conducted Spurious Emission	802.11b	11 Mbps	1/6/11
		802.11g	18 Mbps	1/6/11
		802.11n HT20	MCS4	1/6/11
		802.11n HT40	MCS6	3/6/9
	Conducted Emissions	802.11b	11 Mbps	6
		802.11g	18 Mbps	6
		802.11n HT20	MCS4	6

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		802.11n HT40	MCS6	6
Radiated Test cases	Spurious Radiated Emissions in the restricted band	802.11b	11 Mbps	1/11
		802.11g	18 Mbps	1/11
		802.11n HT20	MCS4	1/11
		802.11n HT40	MCS6	3/9
	Radiates Emission	802.11b	11 Mbps	6
		802.11g	18 Mbps	6
		802.11n HT20	MCS4	6
		802.11n HT40	MCS6	6

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

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2.3. Peak Power Output –Conducted

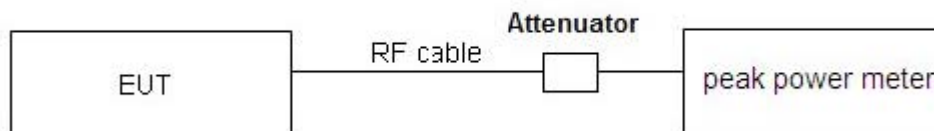
Ambient condition

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)
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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.

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Test Results: Pass

Network Standards	Data Rate	Peak Output Power (dBm)		
		CH 1	CH 6	CH 11
802.11b	1 Mbps	19.64	19.65	19.69
	2 Mbps	19.53	19.77	19.91
	5.5 Mbps	19.68	19.89	20.02
	11 Mbps	19.69	19.98	20.25
802.11g	6 Mbps	18.54	17.94	18.56
	9 Mbps	18.75	17.25	18.56
	12 Mbps	19.03	17.26	18.76
	18 Mbps	18.49	17.37	19.47
	24 Mbps	18.83	17.29	18.09
	36 Mbps	18.74	17.23	18.52
	48 Mbps	18.68	17.12	18.29
	54 Mbps	18.76	17.24	18.27
802.11n HT20	MCS0	18.62	18.18	18.32
	MCS1	18.48	17.54	18.23
	MCS2	18.85	17.43	18.19
	MCS3	18.82	17.38	18.18
	MCS4	18.86	17.36	18.16
	MCS5	18.38	17.41	18.15
	MCS6	18.81	17.39	18.13
	MCS7	18.72	17.38	18.09
Network Standards	Data Rate	Peak Output Power (dBm)		
		CH 3	CH 6	CH 9
802.11n HT40	MCS0	18.65	18.25	17.26
	MCS1	18.62	18.31	17.29
	MCS2	18.52	18.24	17.23
	MCS3	18.93	18.13	17.16
	MCS4	19.02	18.23	17.24
	MCS5	19.06	18.27	17.31
	MCS6	19.07	18.31	17.32
	MCS7	19.01	18.15	17.17

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

2.4. Occupied Bandwidth (6dB)

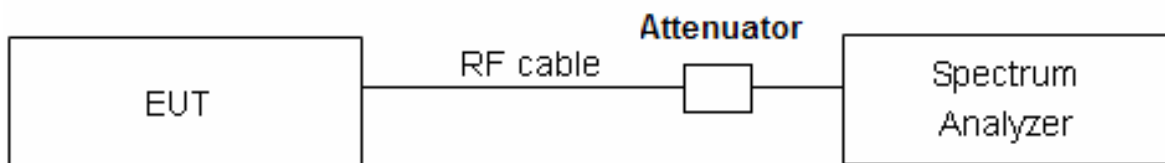
Ambient condition

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
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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.

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Test Results:

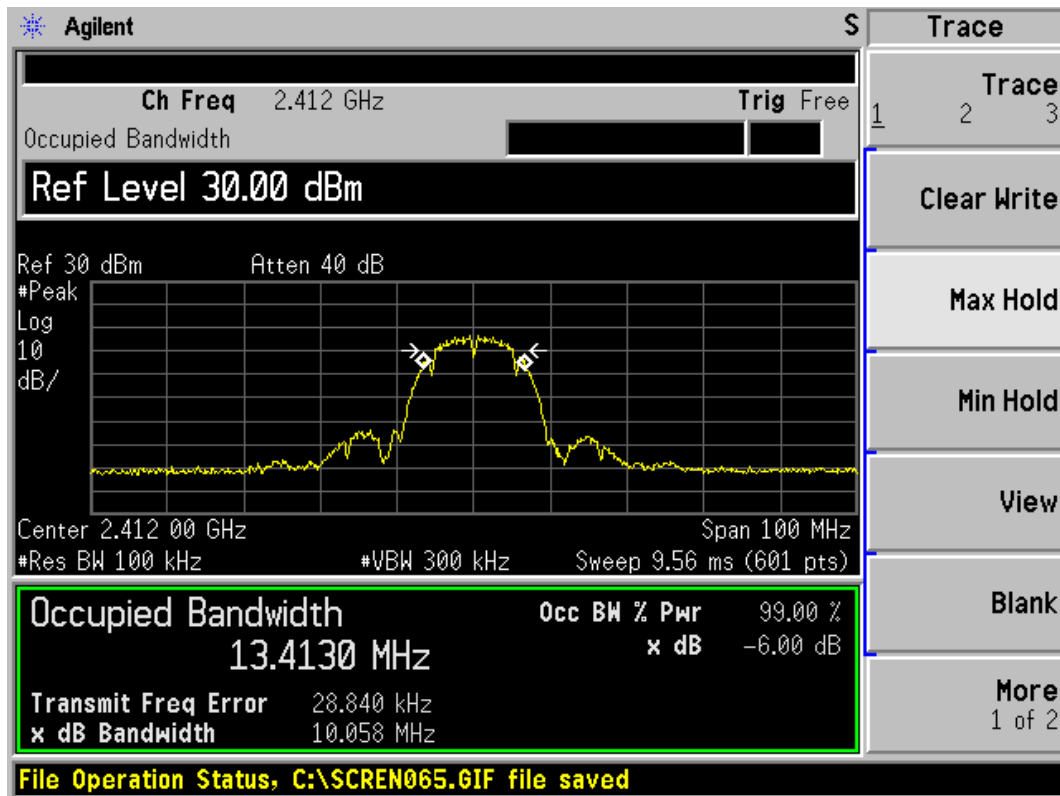
Network Standards	Carrier frequency (MHz)	Minimum 6dB bandwidth (MHz)	Conclusion
802.11b	2412	10.058	PASS
	2437	10.044	PASS
	2462	10.042	PASS
802.11g	2412	16.756	PASS
	2437	16.733	PASS
	2462	16.744	PASS
802.11n HT20	2412	17.951	PASS
	2437	17.949	PASS
	2462	17.961	PASS
802.11n HT40	2422	36.720	PASS
	2437	36.705	PASS
	2452	36.730	PASS

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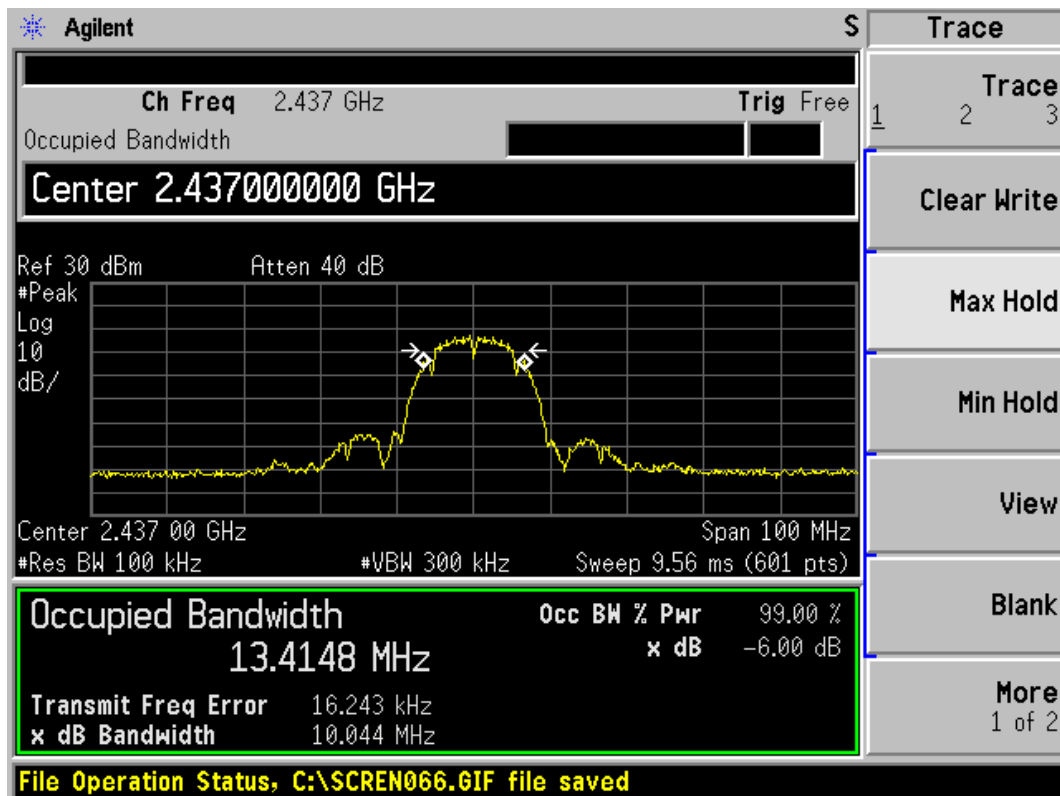
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802.11b



802.11b, Carrier frequency (MHz): 2412

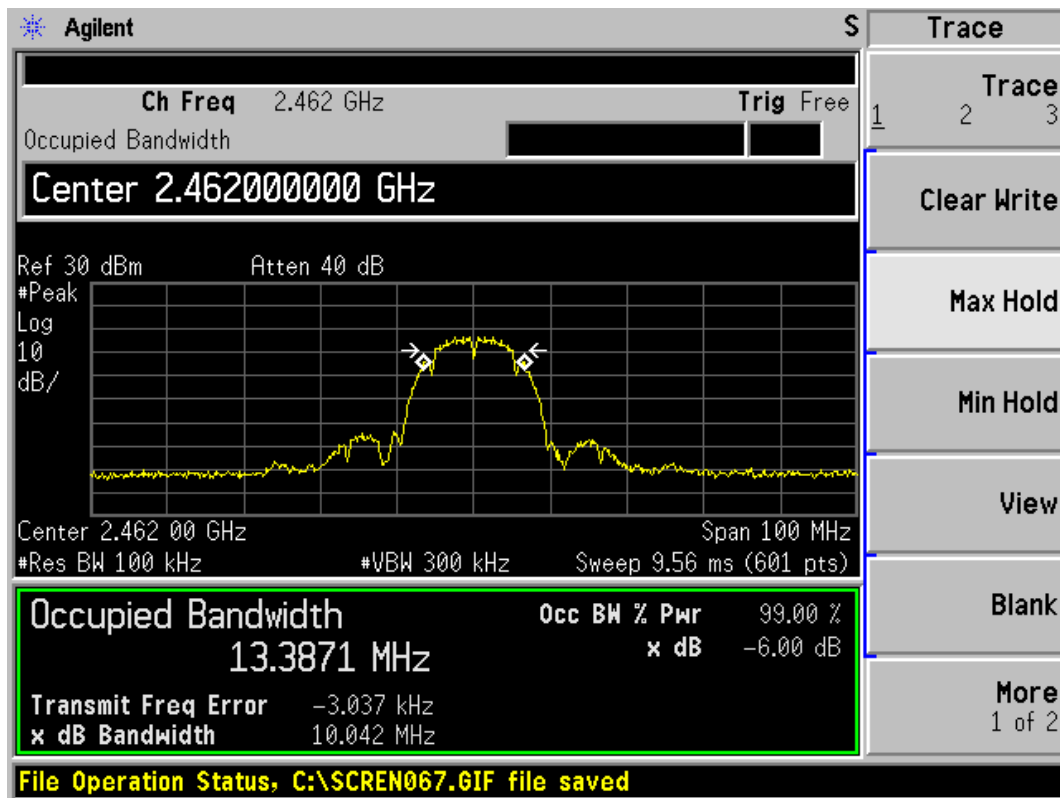


802.11b, Carrier frequency (MHz): 2437

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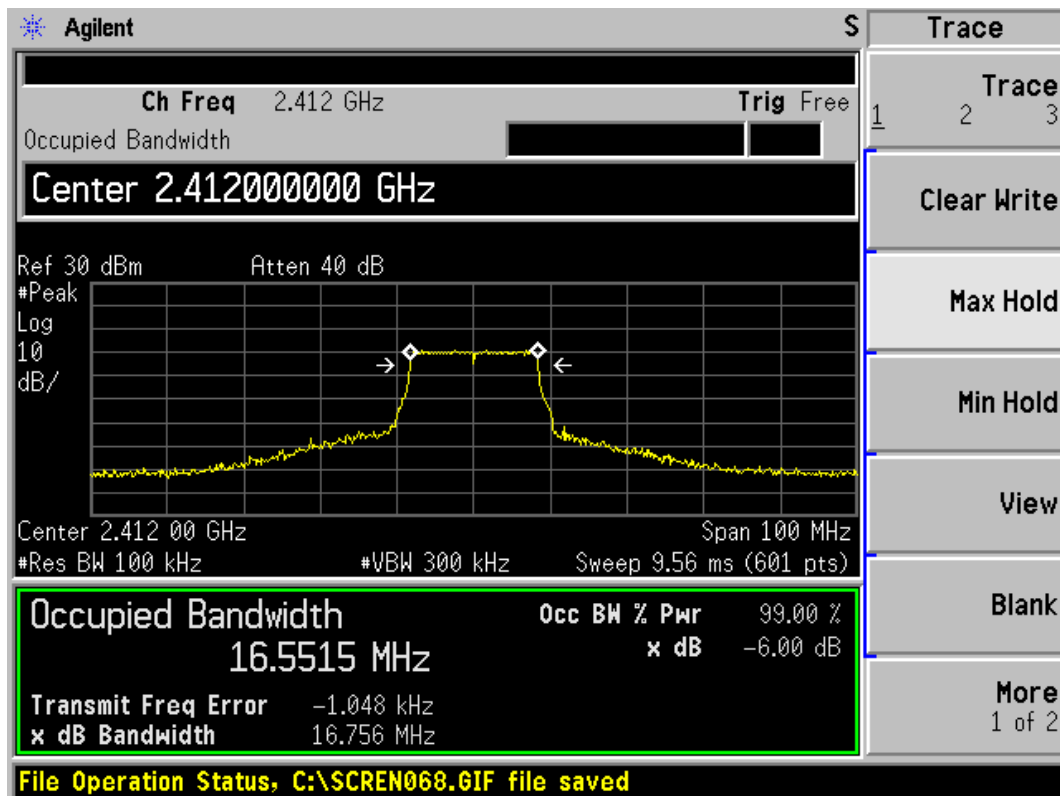
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802.11b, Carrier frequency (MHz):2462

802.11g

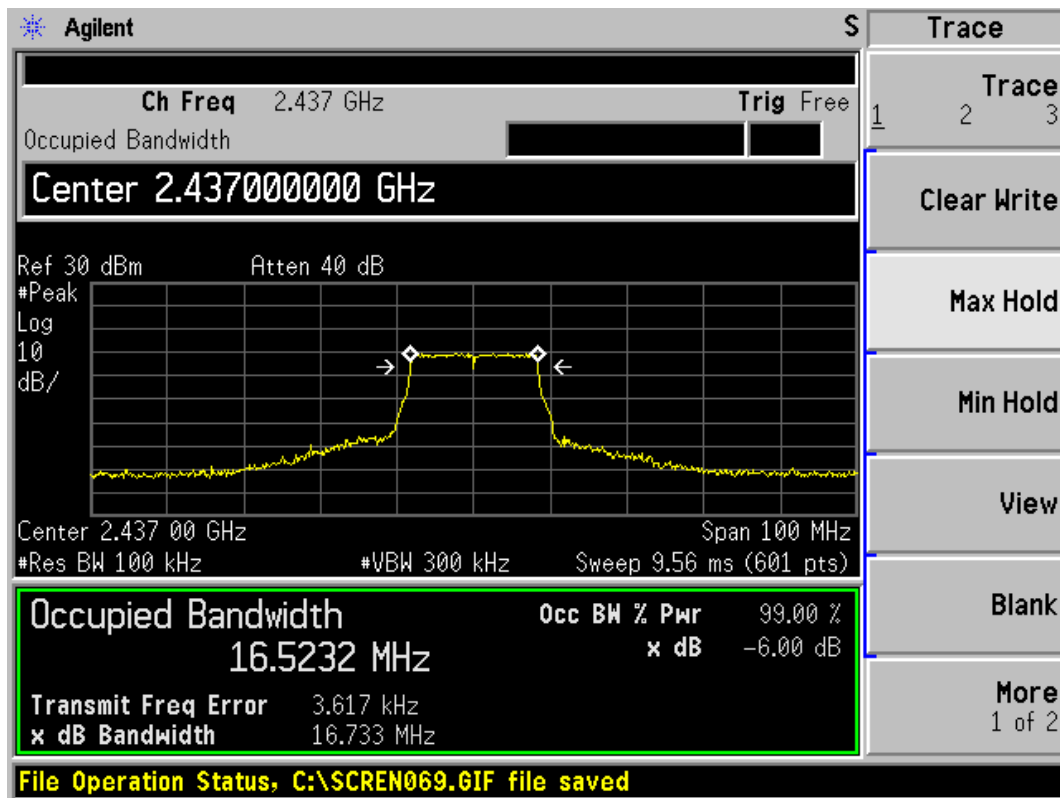


802.11g, Carrier frequency (MHz): 2412

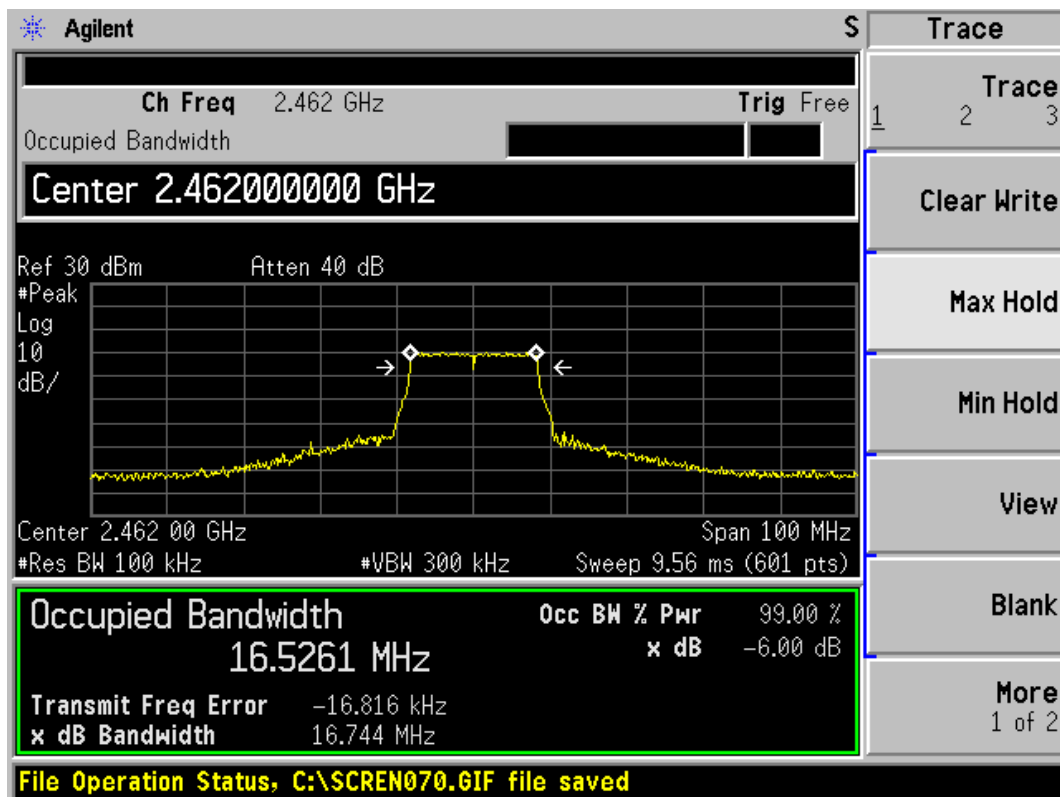
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802.11g, Carrier frequency (MHz): 2437



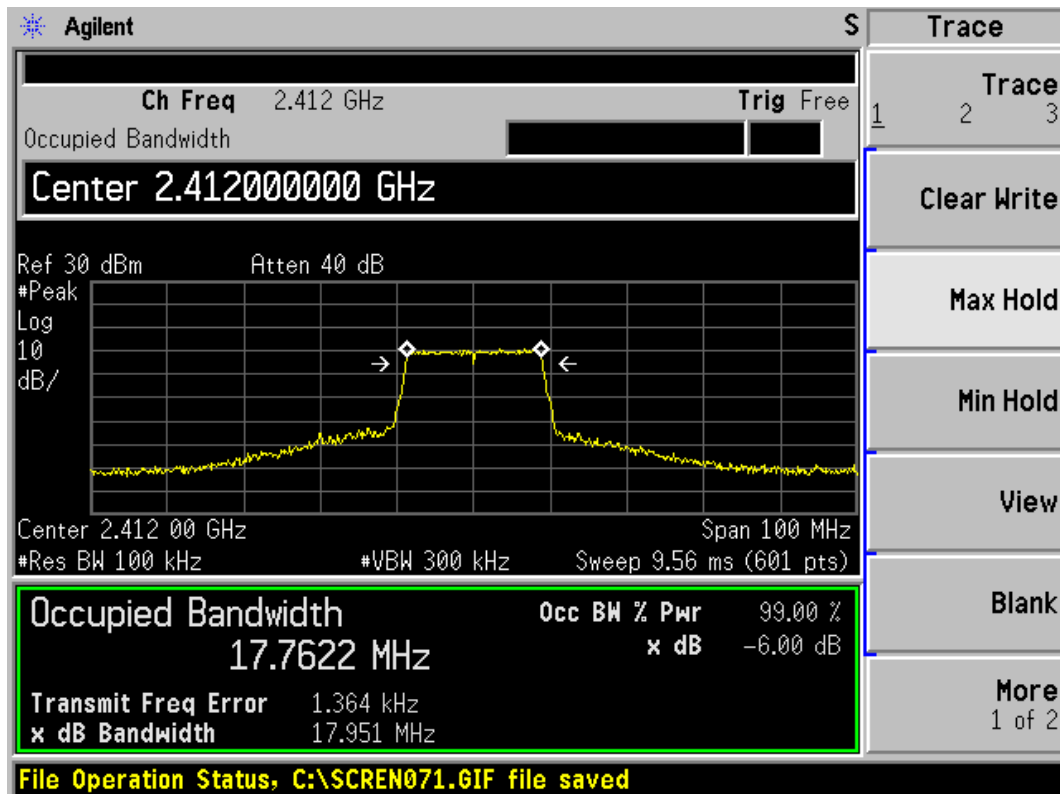
802.11g, Carrier frequency (MHz):2462

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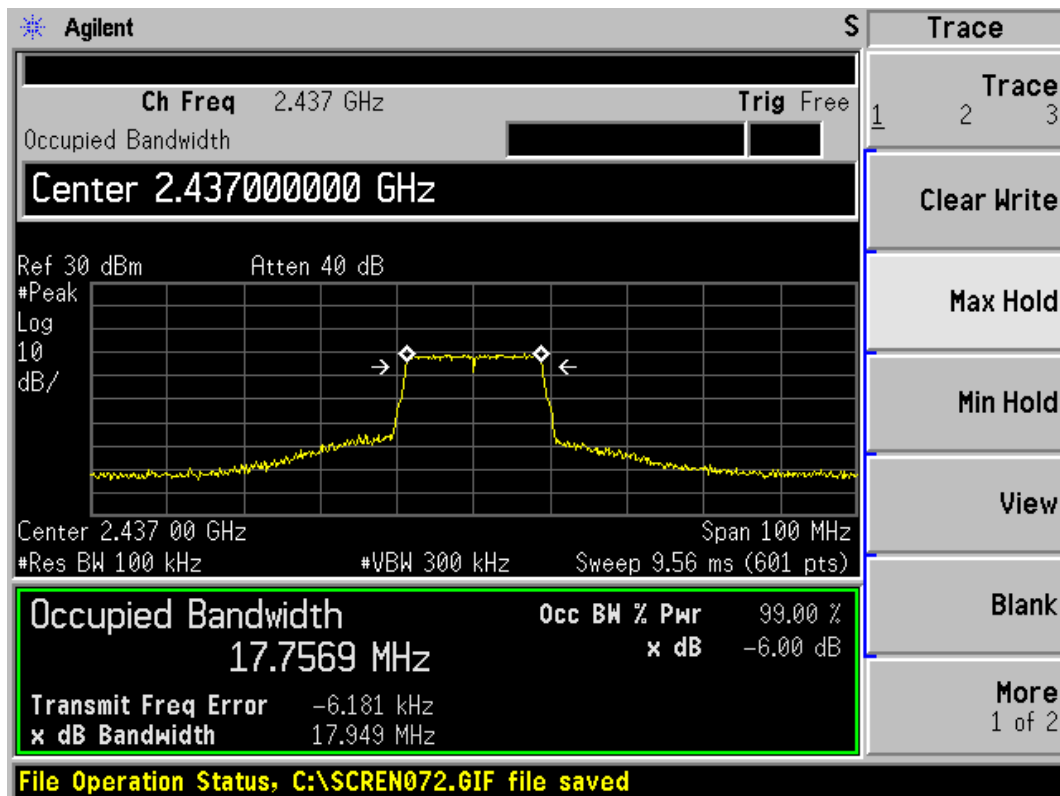
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802.11n (HT20)



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

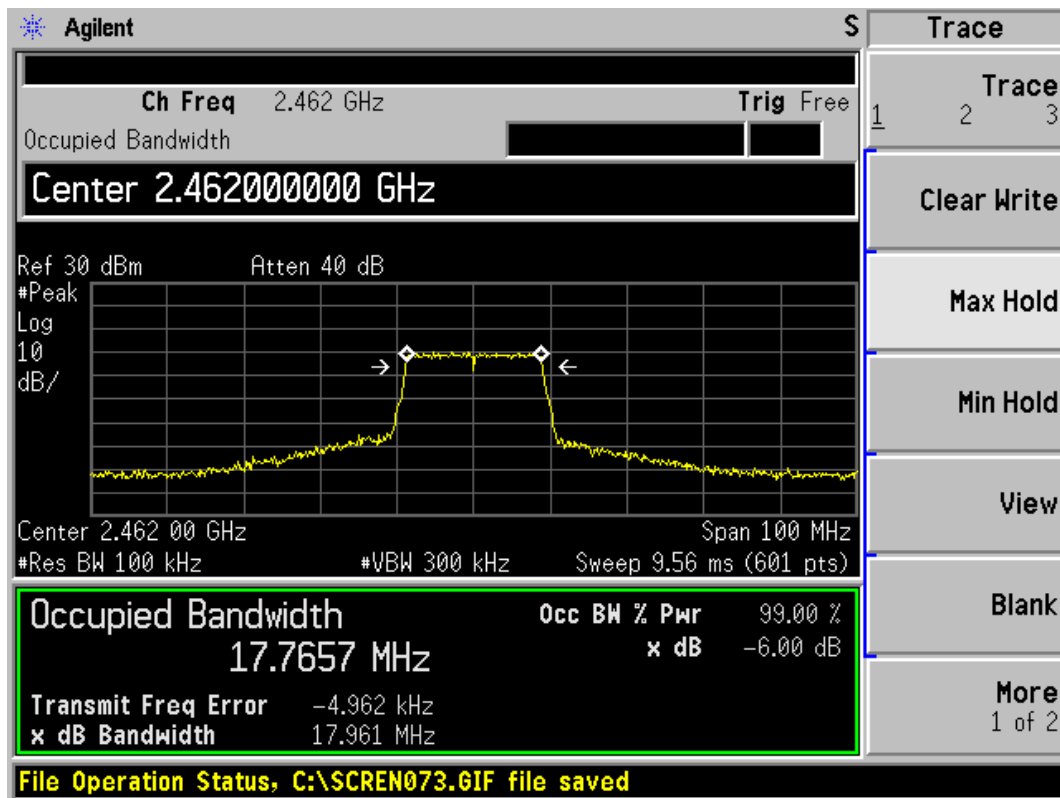


802.11n (HT20), Carrier frequency (MHz): 2437

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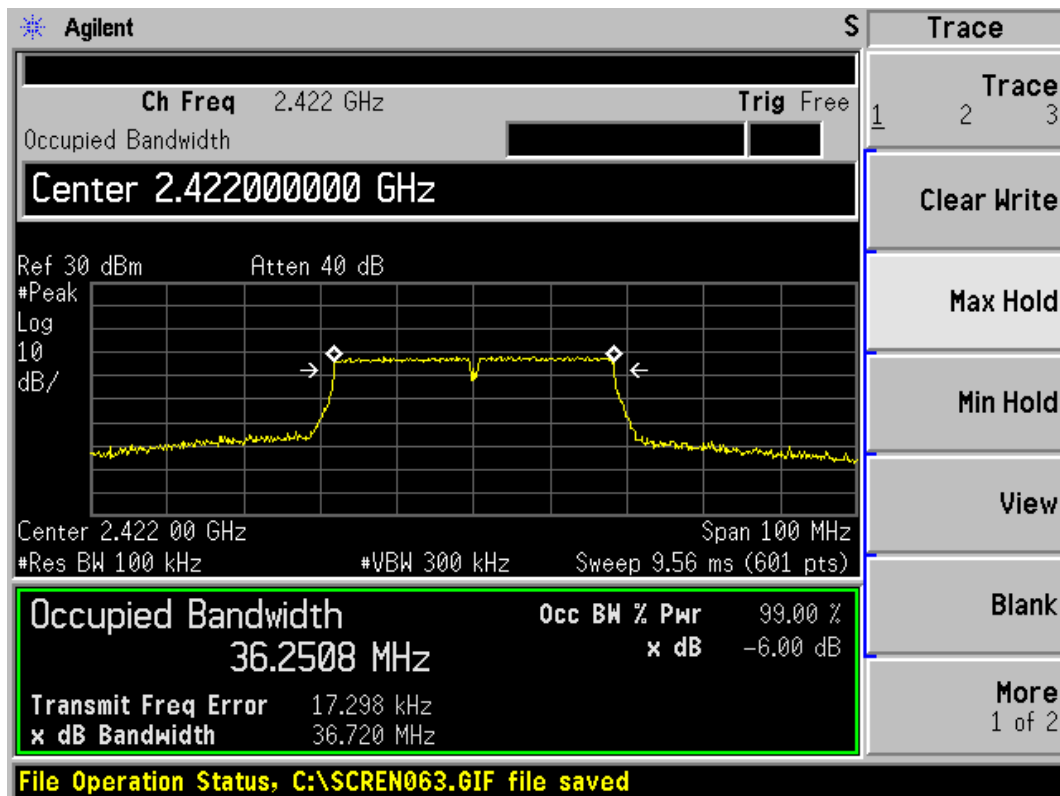
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802.11n (HT20), Carrier frequency (MHz):2462

802.11n (HT40)

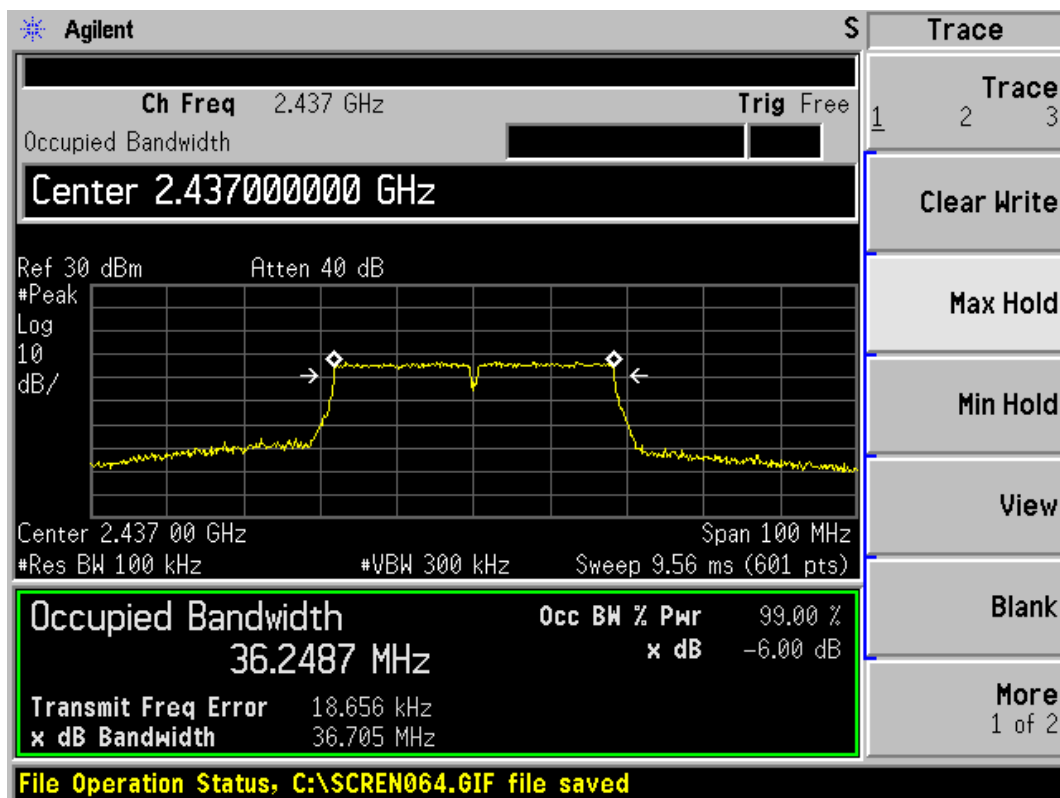


802.11n (HT40), Carrier frequency (MHz): 2422

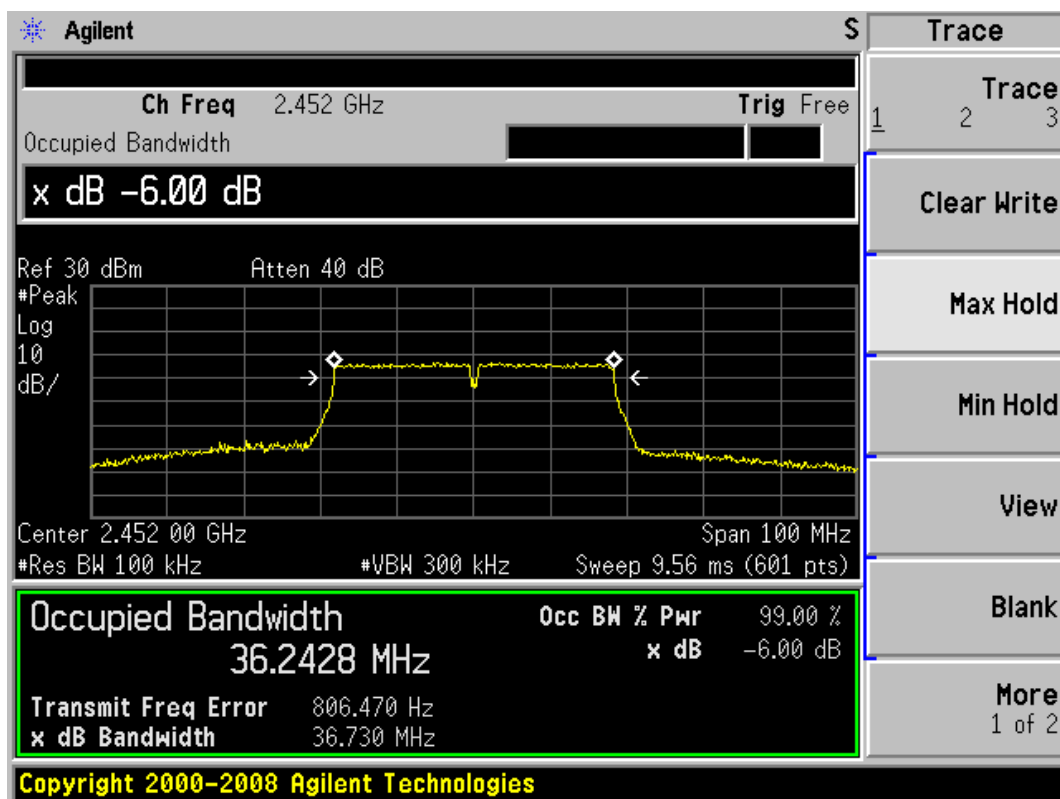
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802.11n (HT40), Carrier frequency (MHz): 2437



802.11n (HT40), Carrier frequency (MHz):2452

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2.5. Band Edge Compliance

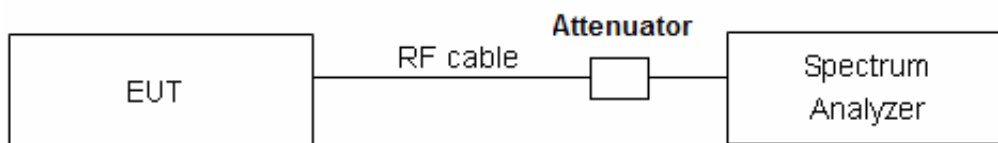
Ambient condition

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
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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

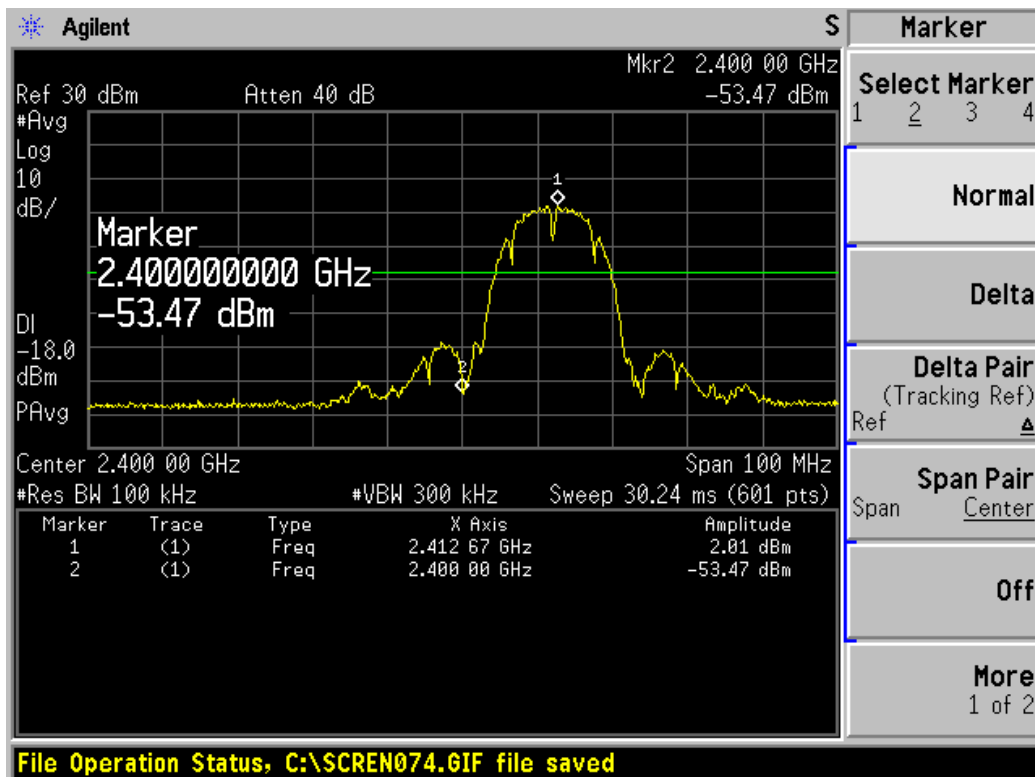
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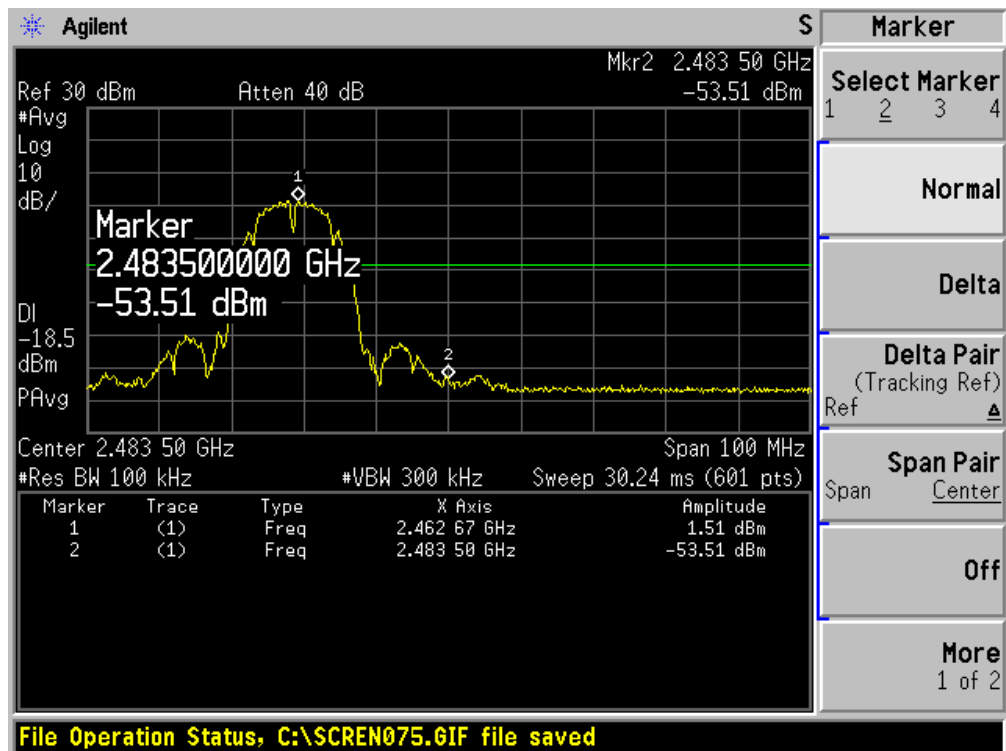
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Test Results: PASS

802.11b



802.11b, Channel No.: 1



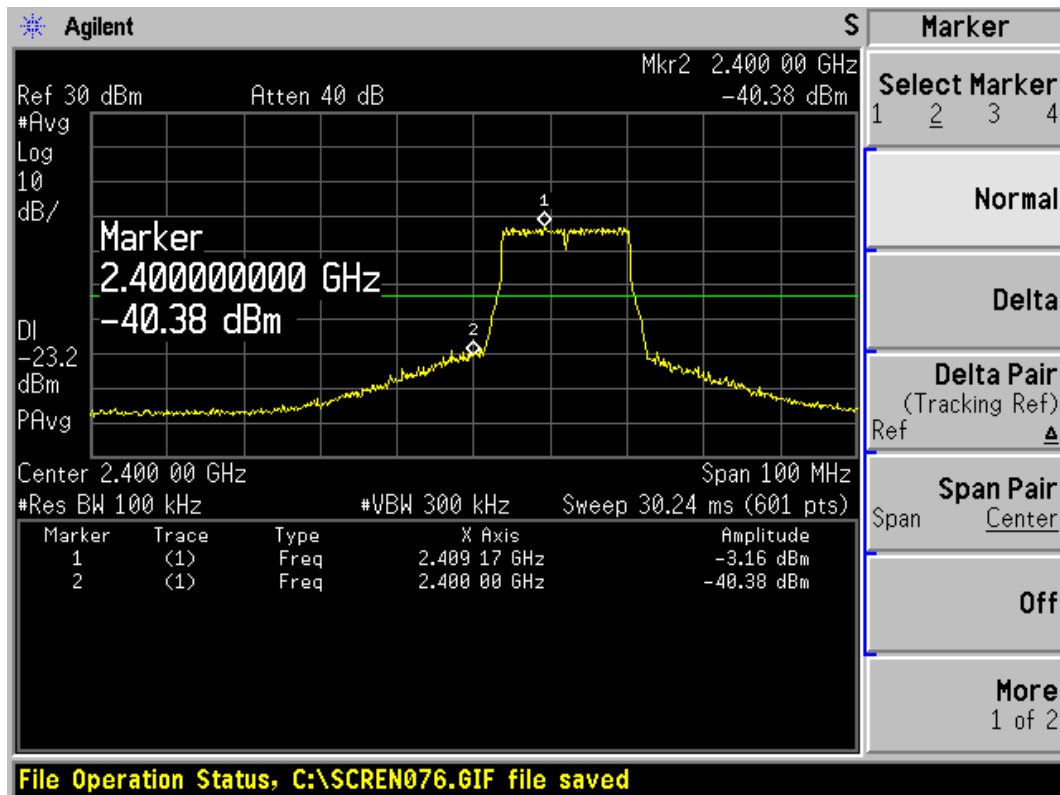
802.11b, Channel No.: 11

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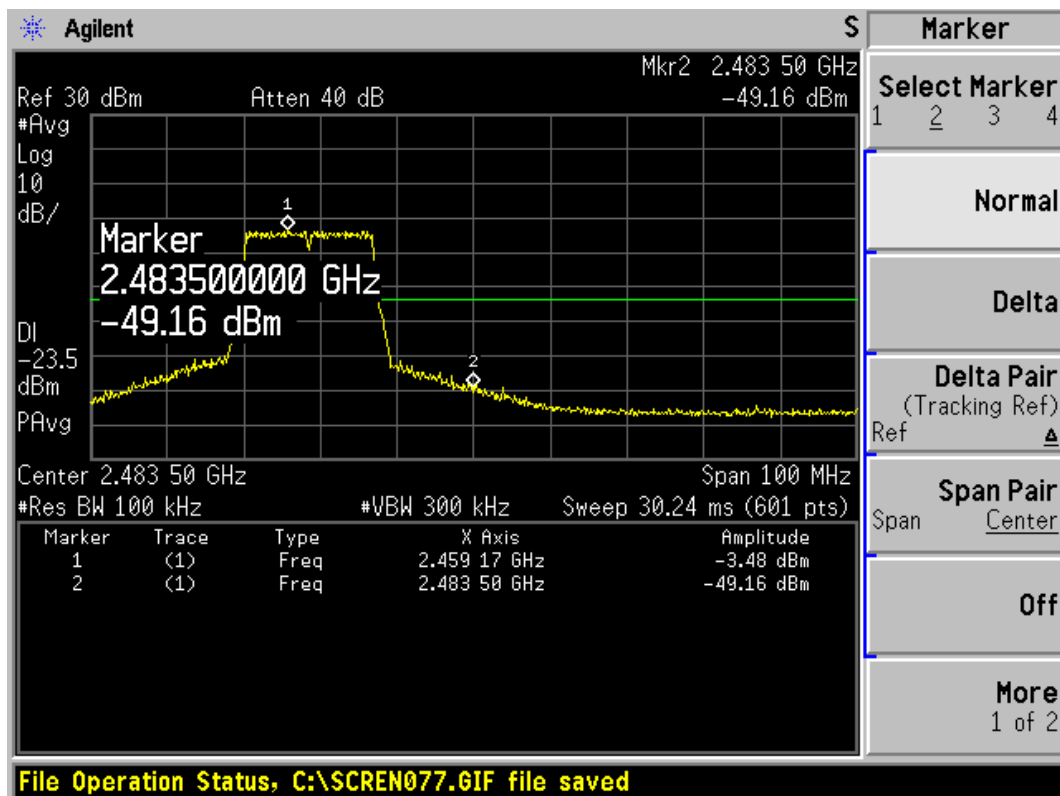
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802.11g



802.11g, Channel No.: 1



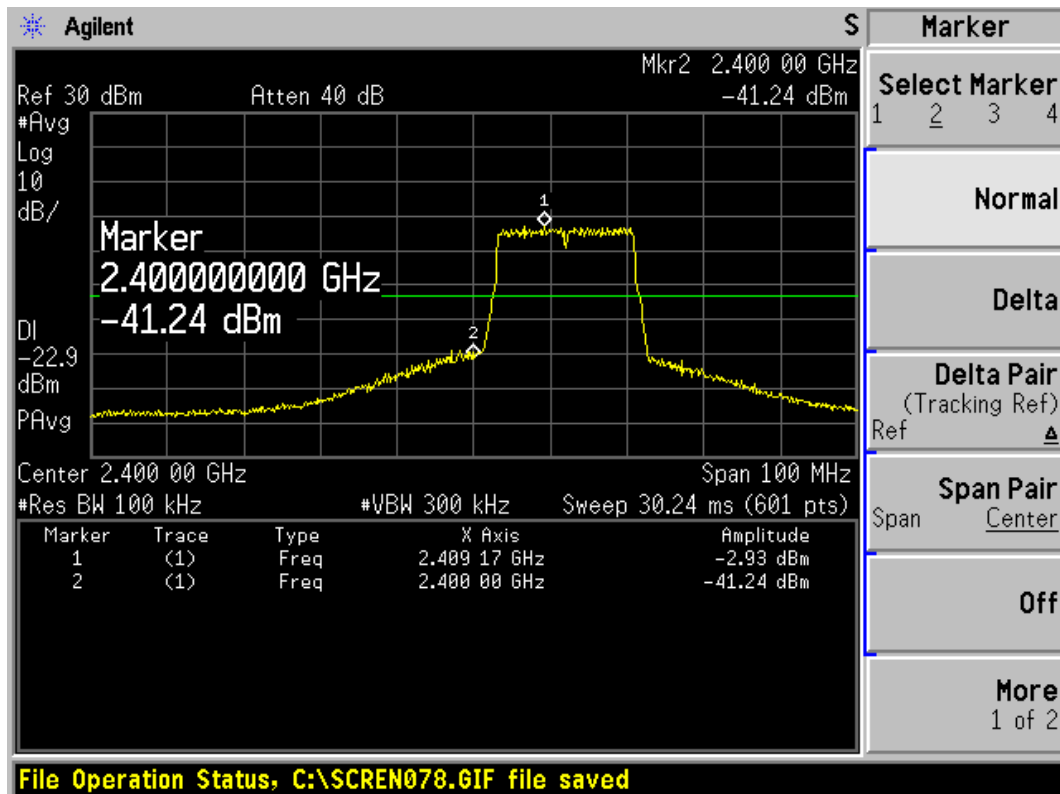
802.11g, Channel No.: 11

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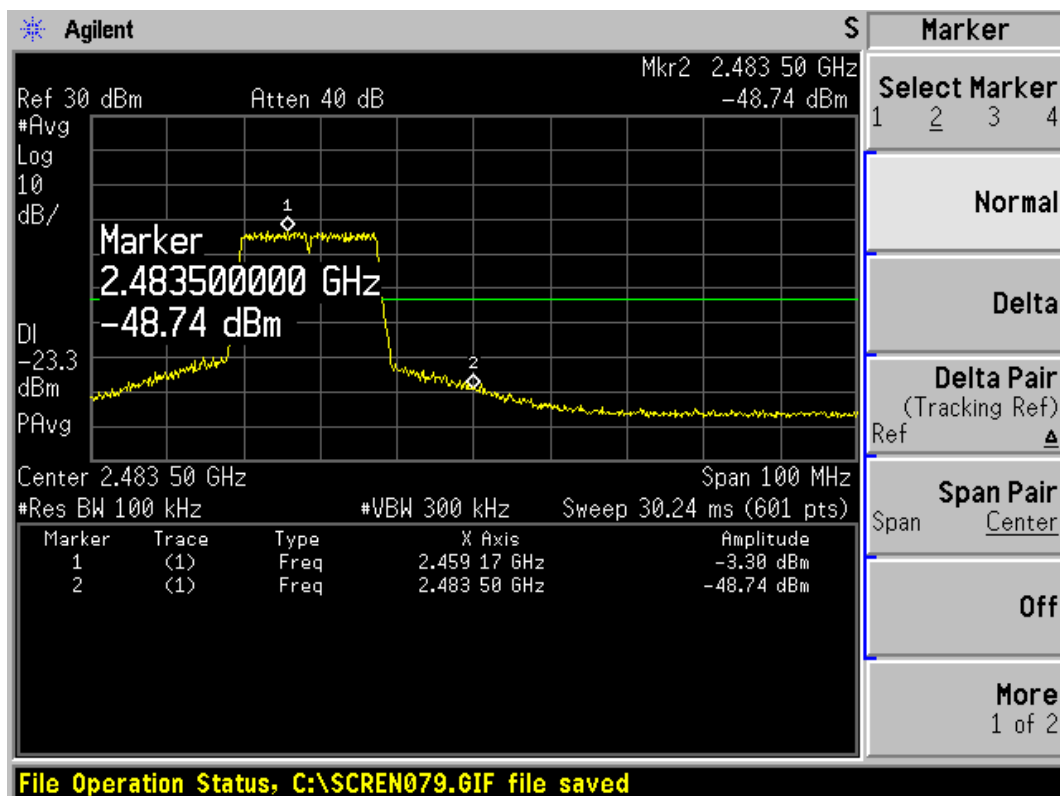
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802.11n (HT20)



802.11n (HT20), Channel No.: 1



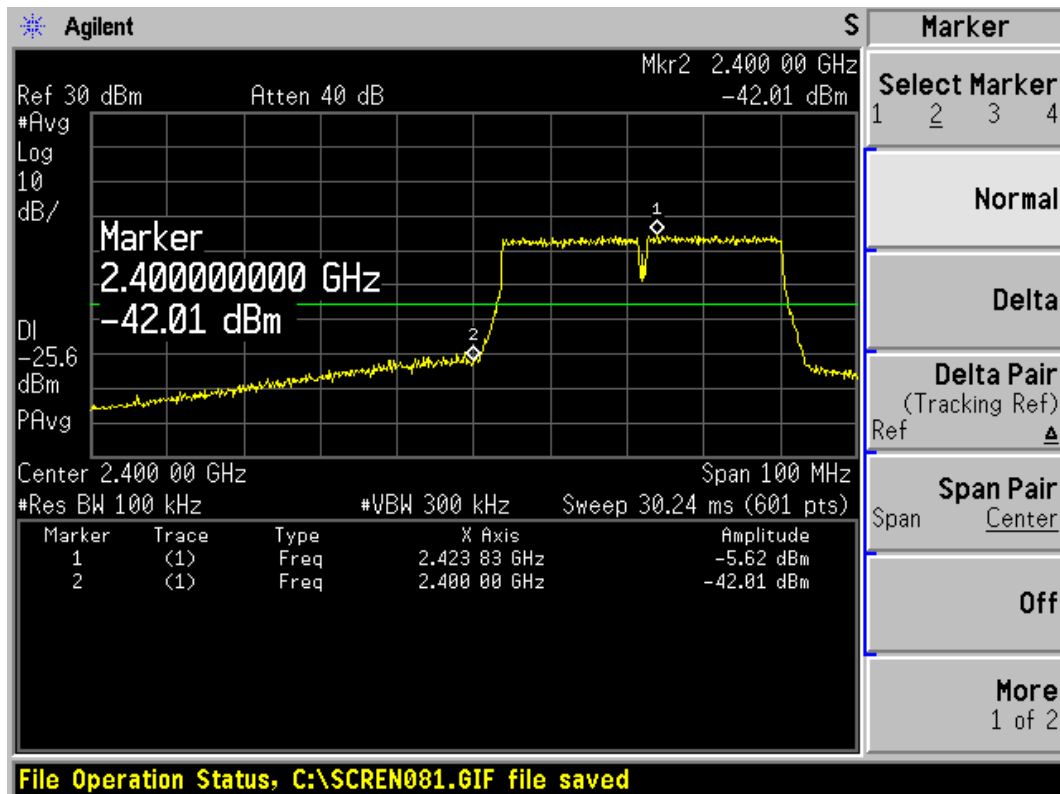
802.11n (HT20), Channel No.: 11

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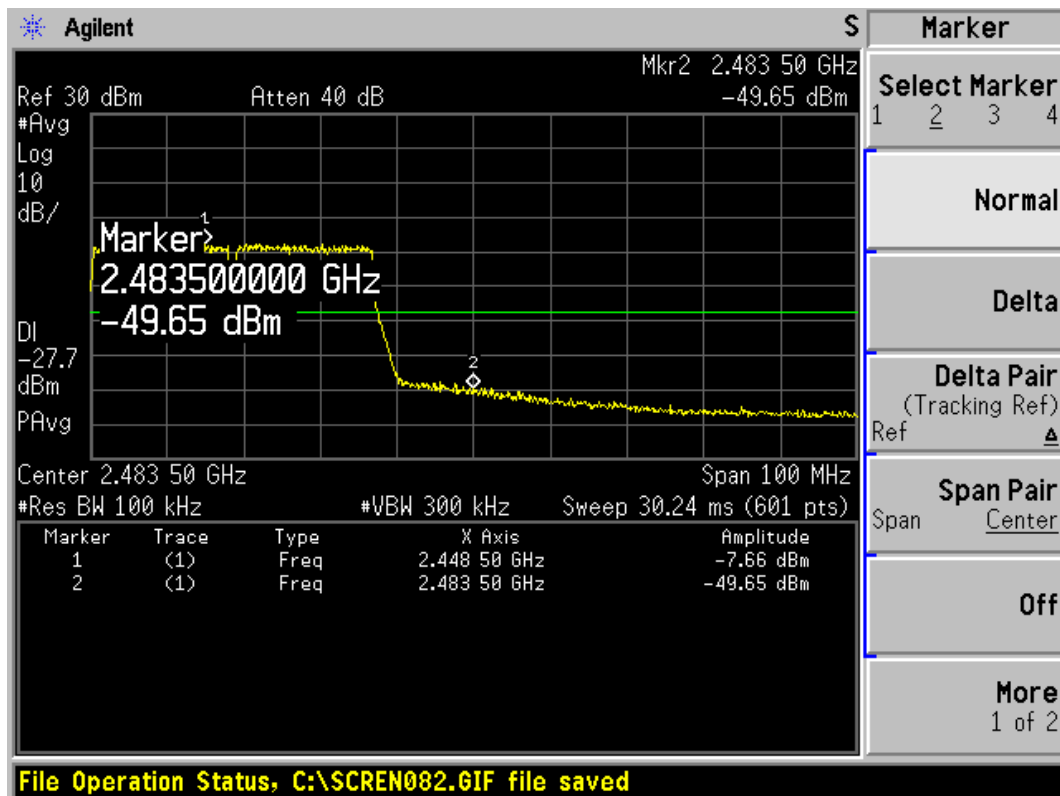
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802.11n (HT40)



802.11n (HT40), Channel No.: 3



802.11n (HT40), Channel No.: 9

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:

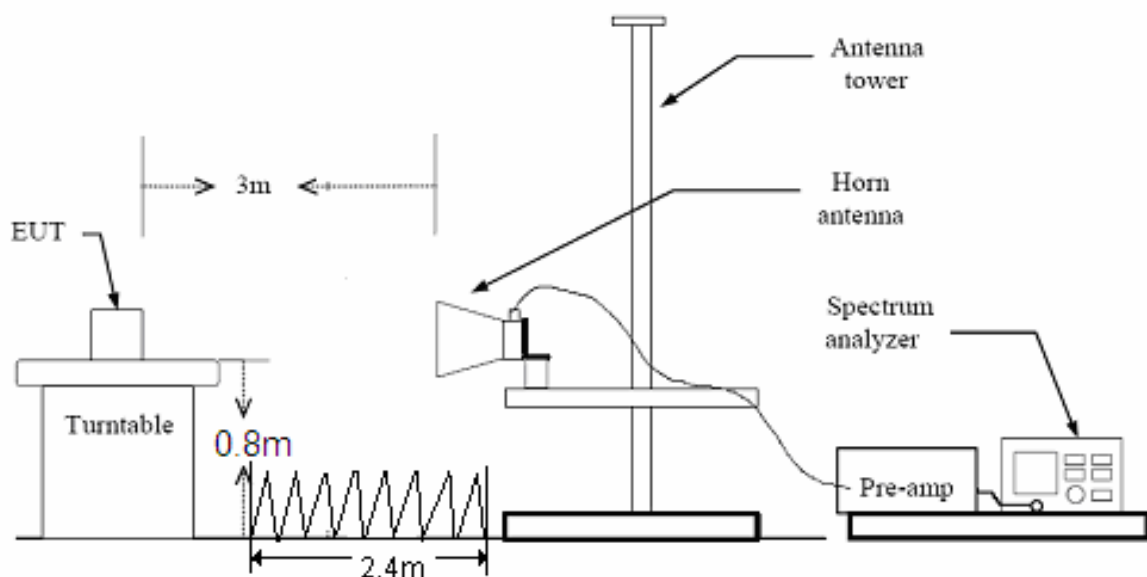
- (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
- (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

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



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Note: Area side: 2.4m X 3.6m

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.

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Test Results: PASS

WLAN Antenna 1 Test Results:

Channel.	Fre. (MHz)	Detecti on Type	Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading value (dBuV/m)	Correct Factor (dB)	Antenna Height (m)	Table Angle (Degree)
802.11b, Ch1	2392.35	PK	55.013	74	18.987	60.313	-5.3	1.05	0
802.11b, Ch1	2390.43	AV	41.633	54	12.367	46.933	-5.3	1.05	180
802.11b, Ch 11	2482.66	PK	55.729	74	18.271	60.229	-4.5	1.05	135
802.11b, Ch 11	2483.11	AV	42.569	54	11.431	47.069	-4.5	1.25	45
802.11gCh1	2391.57	PK	69.628	74	4.372	74.928	-5.3	1.01	90
802.11g Ch1	2390.76	AV	44.645	54	9.355	49.945	-5.3	1.02	180
802.11g Ch 11	2483.28	PK	67.194	74	6.806	71.694	-4.5	1.02	45
802.11g Ch 11	2483.48	AV	45.437	54	8.563	50.737	-5.3	1.05	0
802.11n HT20,Ch1	2390.55	PK	72.437	74	1.563	77.737	-5.3	1.05	45
802.11n HT20,Ch1	2390.10	AV	51.953	54	2.047	57.253	-5.3	1.05	90
802.11n HT20,Ch11	2483.4	PK	67.014	74	6.986	71.514	-4.5	1.05	115
802.11n HT20,Ch11	2483.48	AV	46.467	54	7.533	50.967	-4.5	1.05	0
802.11n HT4,Ch3	2392.08	PK	58.872	74	15.128	64.172	-5.3	1.15	90
802.11n HT40,Ch3	2394.06	AV	41.861	54	12.139	47.161	-5.3	1.05	90
802.11n HT4,Ch9	2480.98	PK	58.422	74	15.578	62.922	-4.5	1.20	180
802.11n HT40,Ch9	2479.99	AV	43.278	54	10.722	47.778	-4.5	1.05	180

Remark: Value = Reading value + Correction factor

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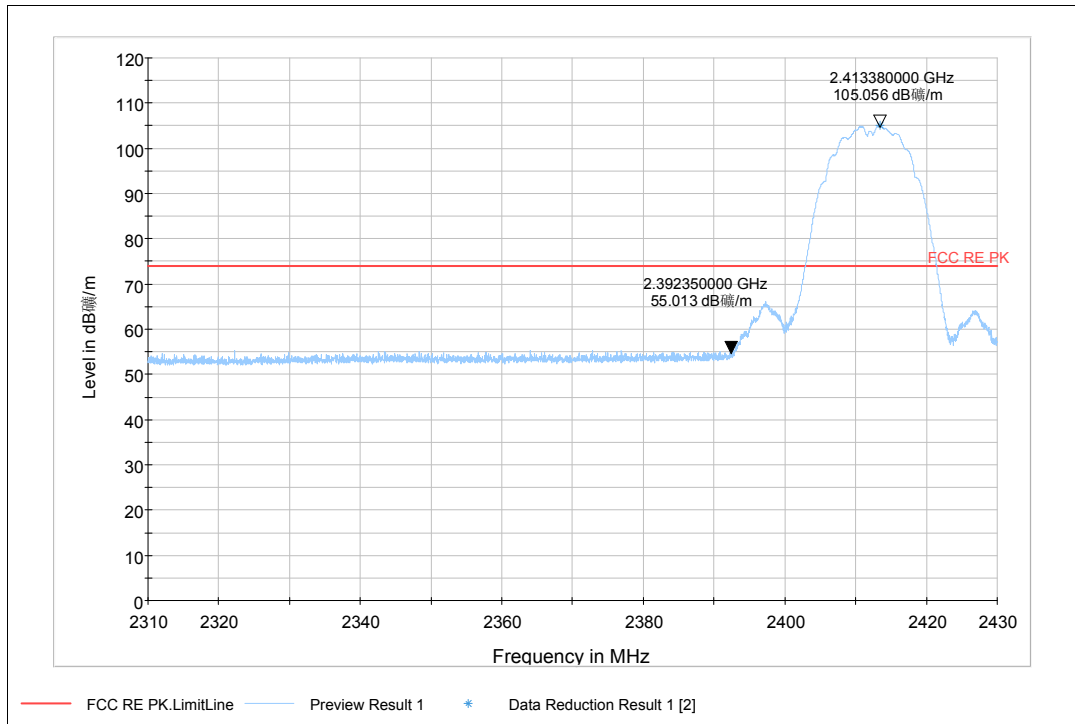
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802.11b-Channel 1:

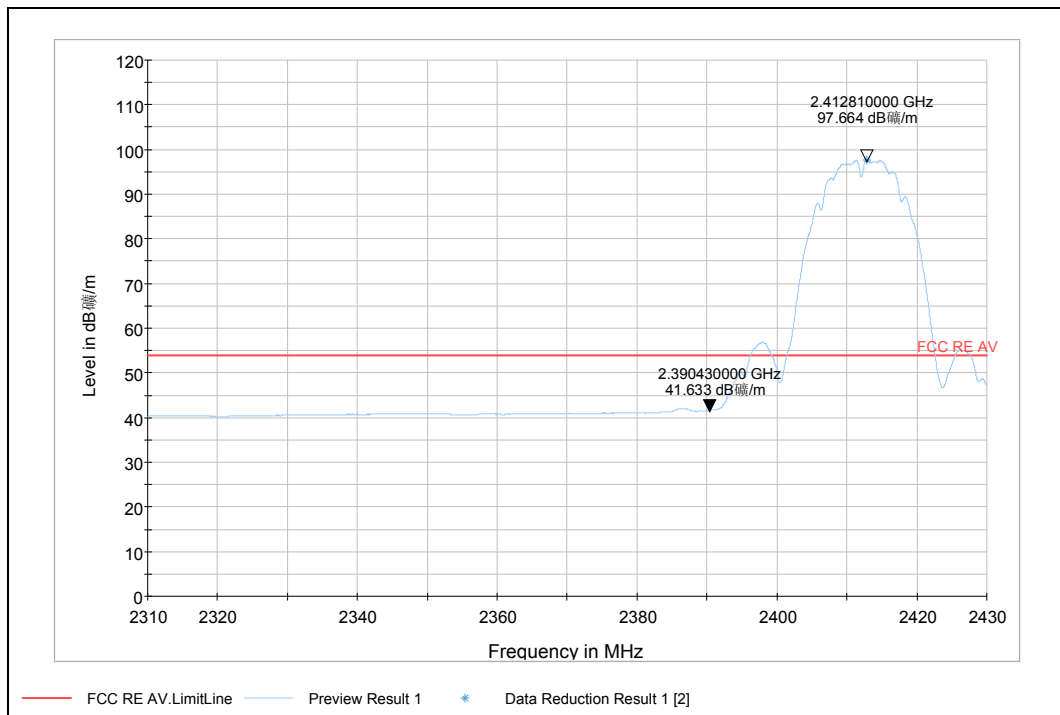
Peak



Note: The signal beyond the limit is carrier

Channel 1

Average



Note: The signal beyond the limit is carrier

Channel 1

TA Technology (Shanghai) Co., Ltd.

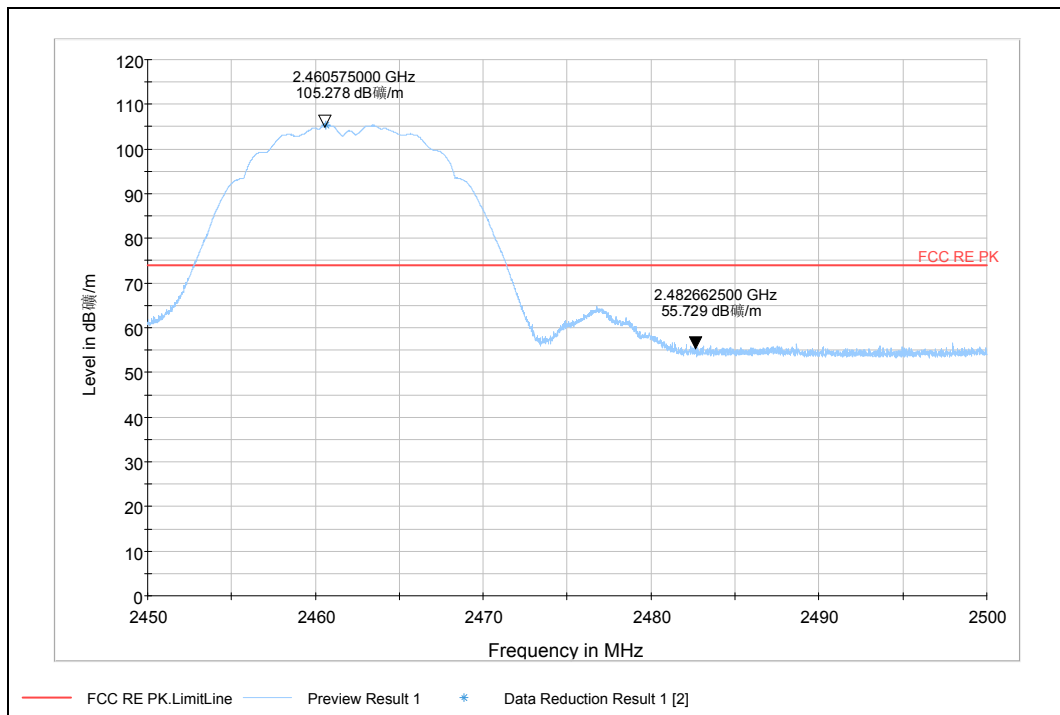
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802.11b-Channel 11:

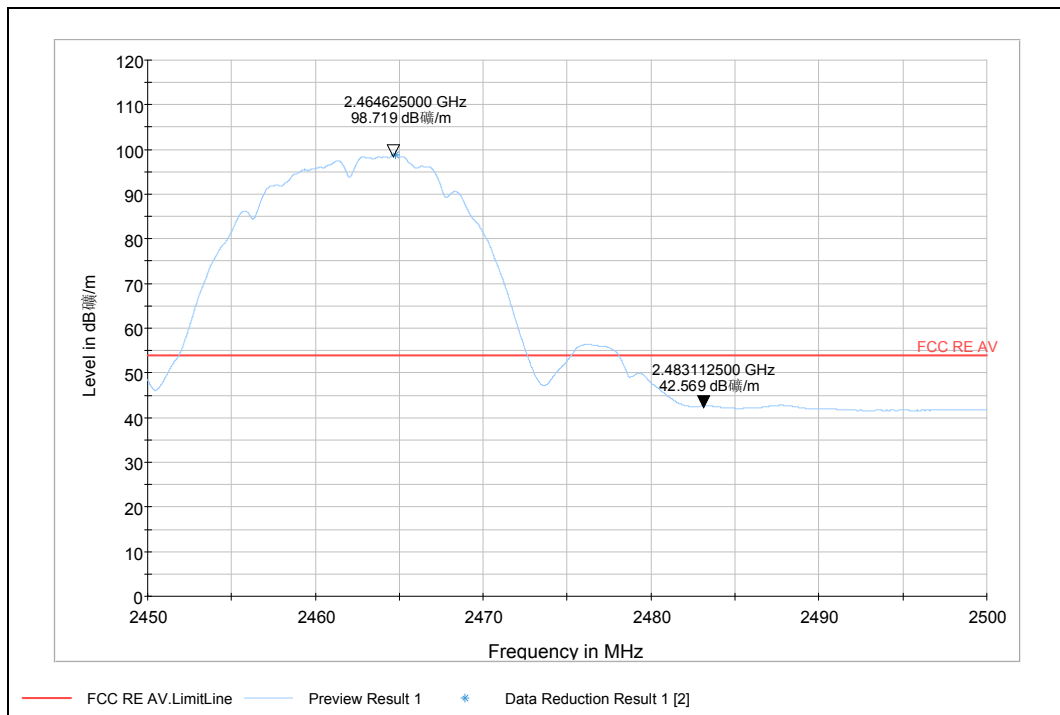
Peak



Note: The signal beyond the limit is carrier

Channel 11

Average



Note: The signal beyond the limit is carrier

Channel 11

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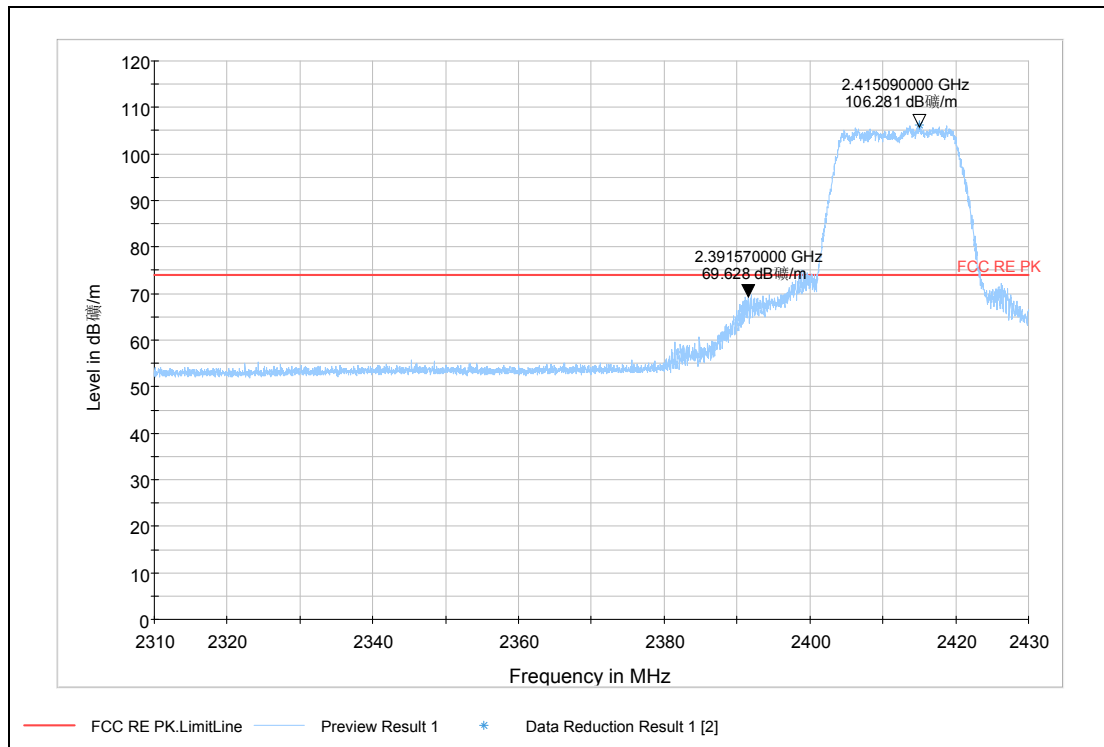
Test Report

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802.11g-Channel 1:

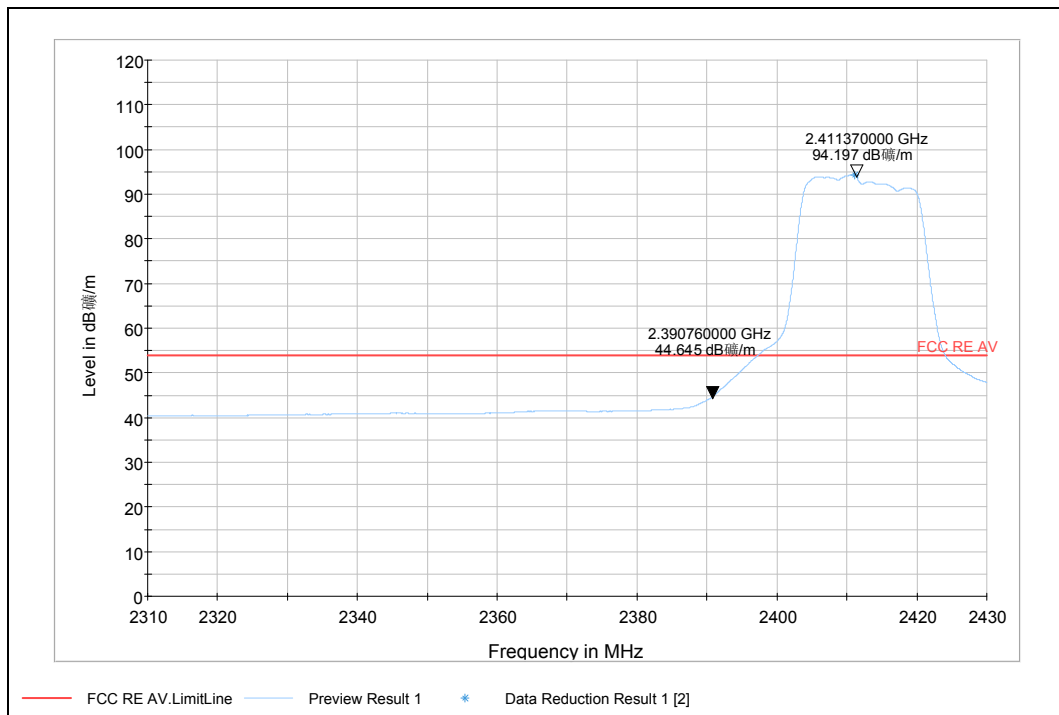
Peak



Note: The signal beyond the limit is carrier

Channel 1

Average



Note: The signal beyond the limit is carrier

Channel 1

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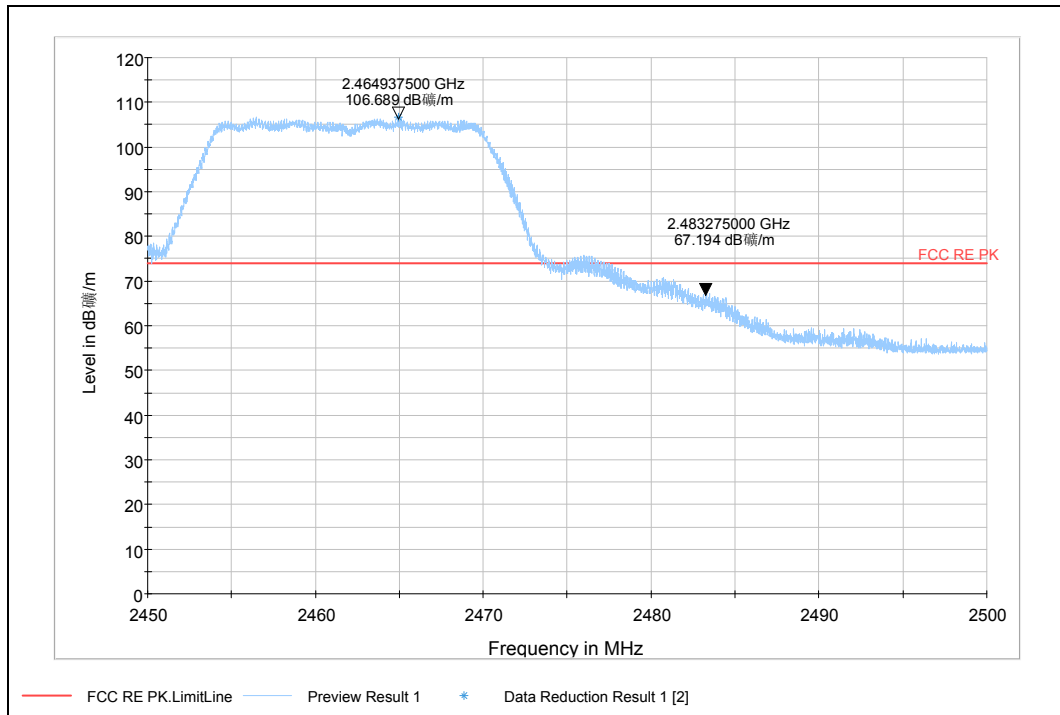
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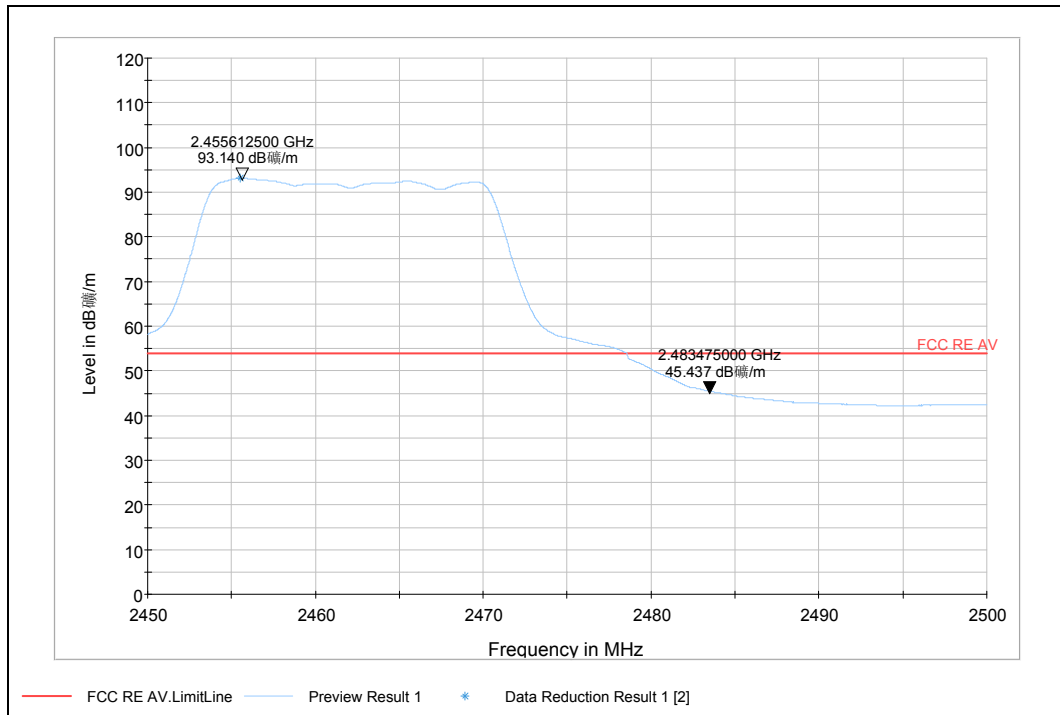
802.11g-Channel 11:

Peak



Note: The signal beyond the limit is carrier
Channel 11

Average



Note: The signal beyond the limit is carrier
Channel 11

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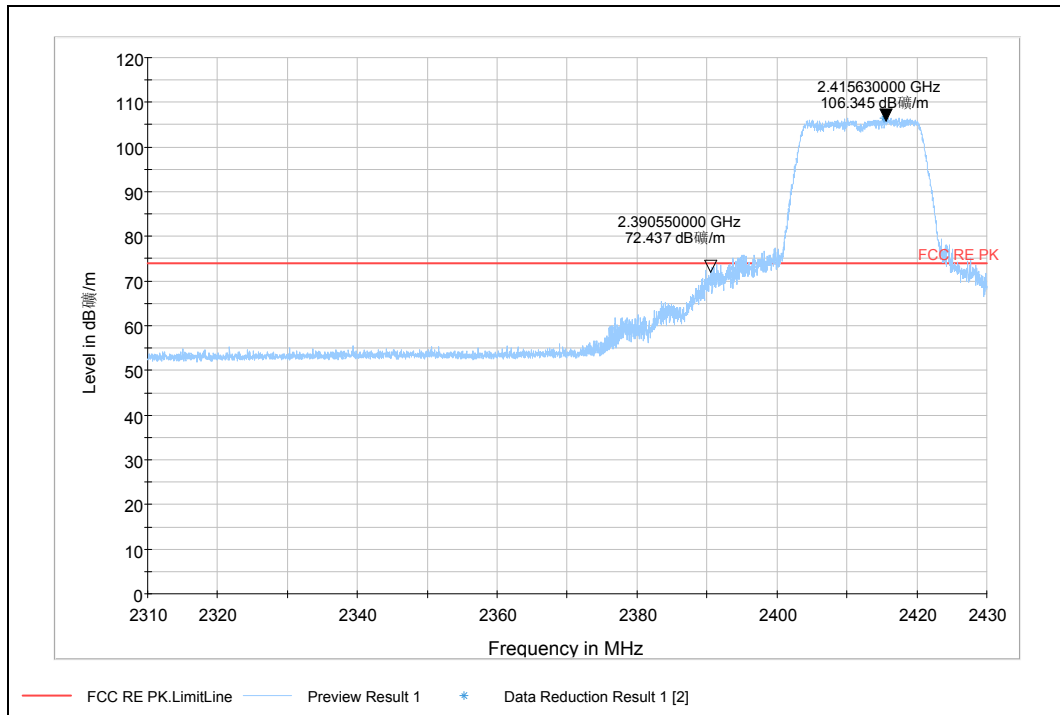
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802.11n (HT20)-Channel 1:

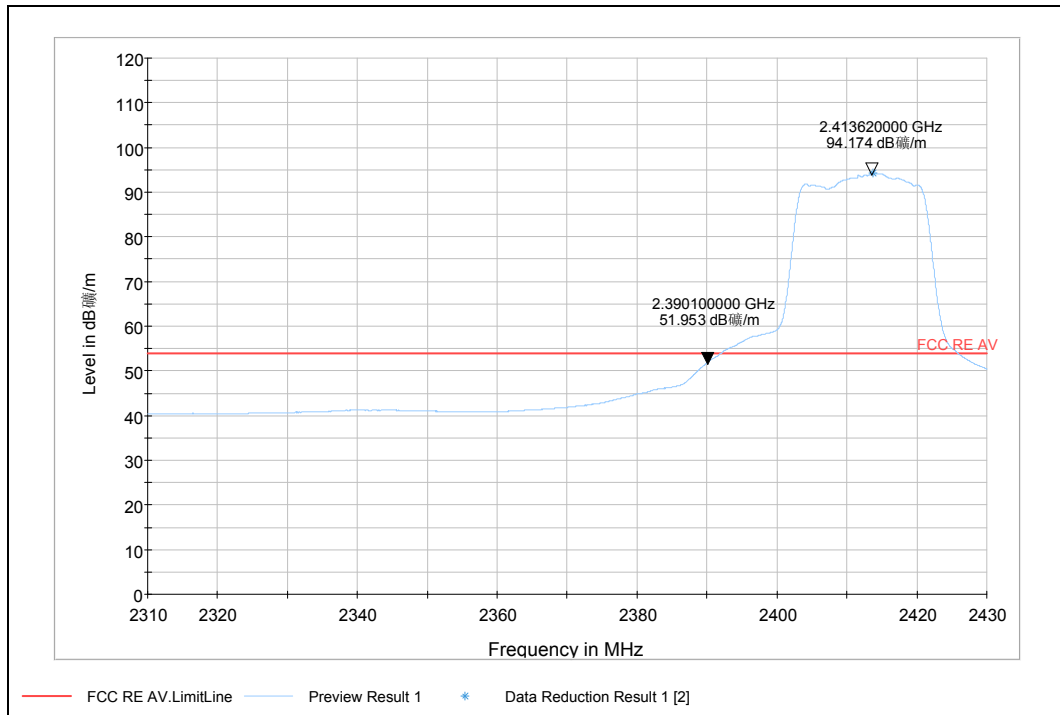
Peak



Note: The signal beyond the limit is carrier

Channel 1

Average



Note: The signal beyond the limit is carrier

Channel 1

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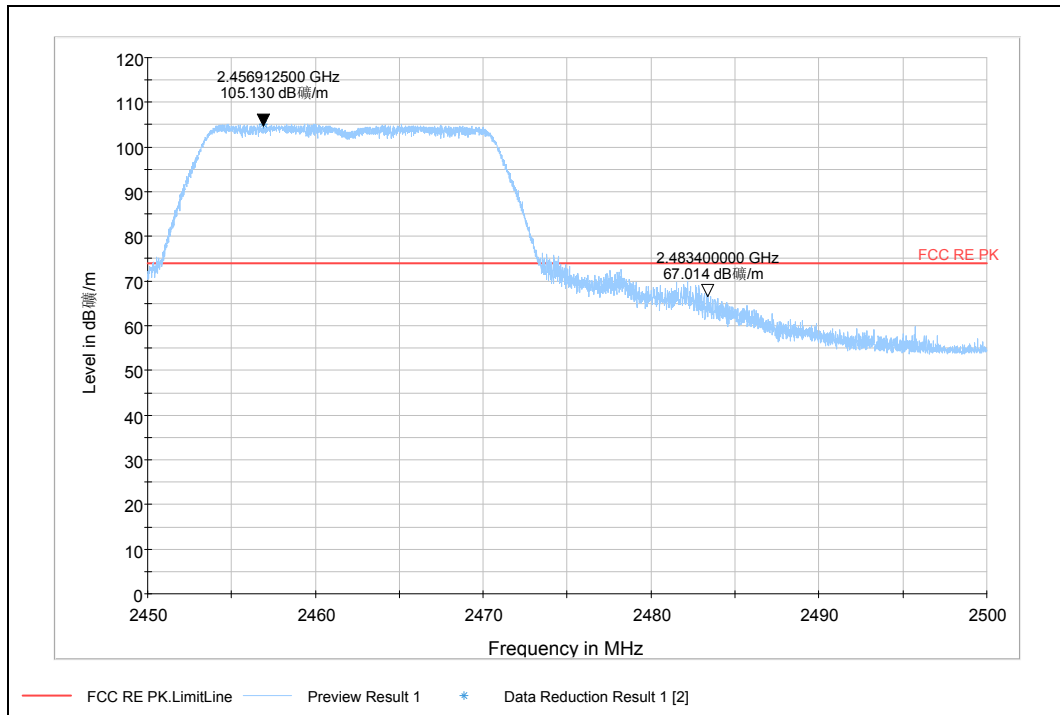
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802.11n (HT20)-Channel 11:

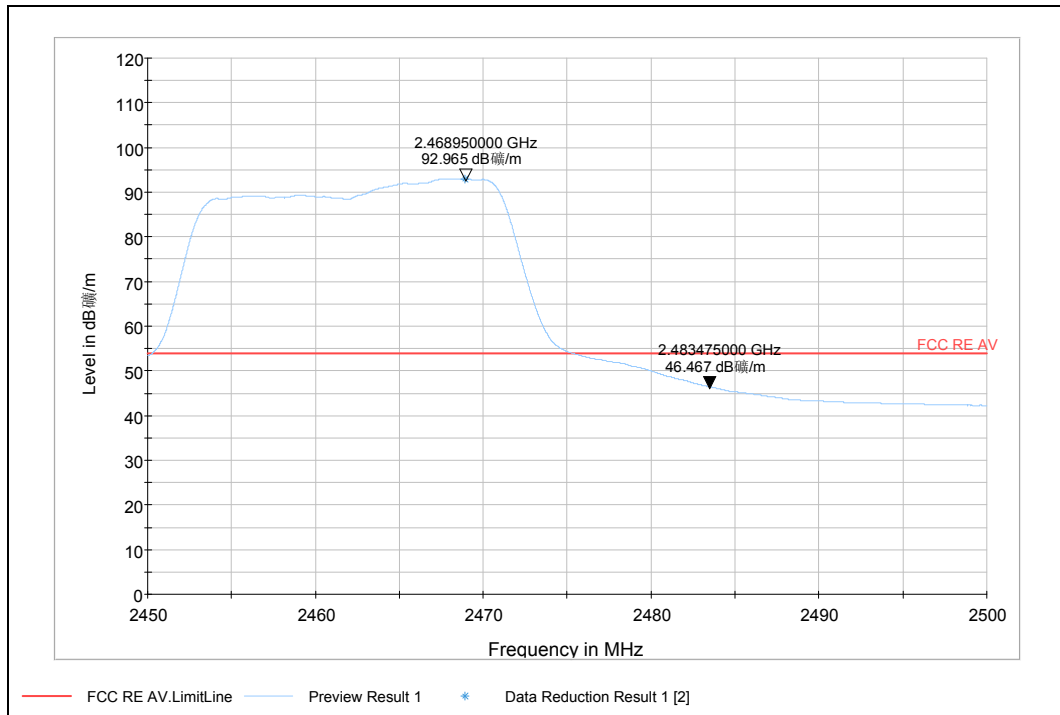
Peak



Note: The signal beyond the limit is carrier

Channel 11

Average



Note: The signal beyond the limit is carrier

Channel 11

TA Technology (Shanghai) Co., Ltd.

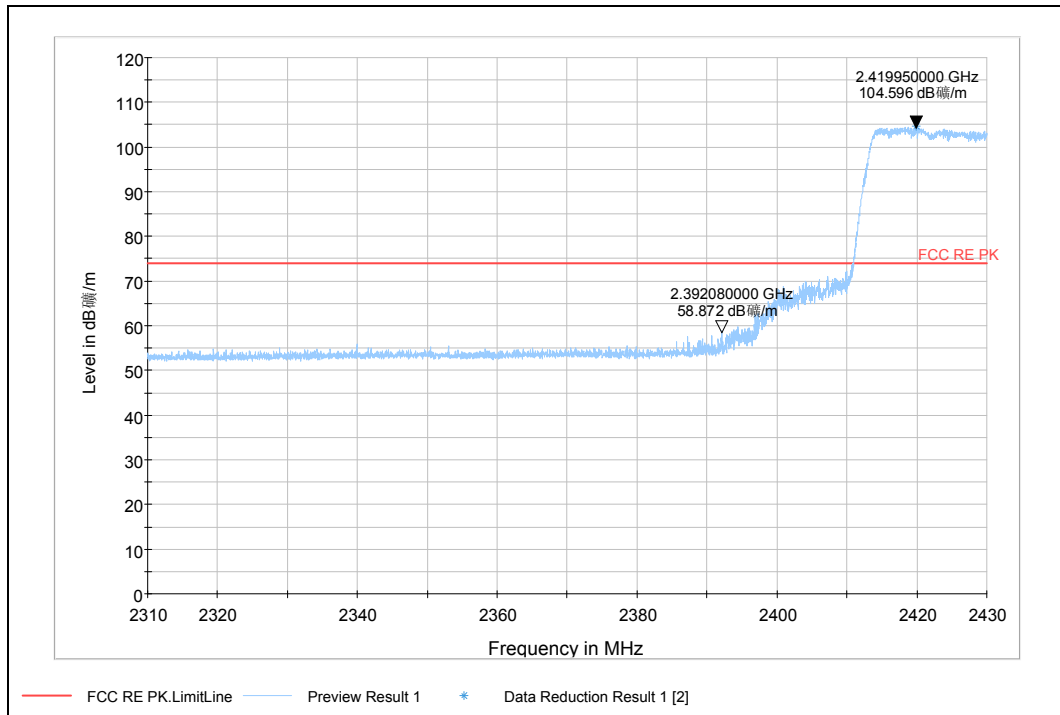
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802.11n (HT40)-Channel 3:

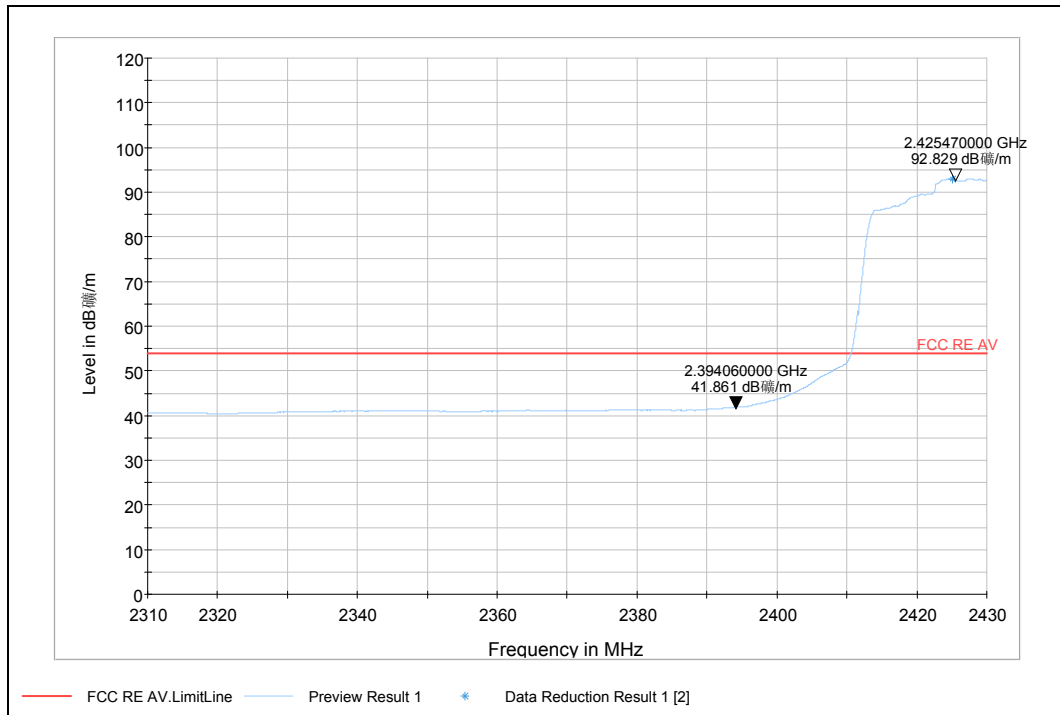
Peak



Note: The signal beyond the limit is carrier

Channel 3

Average



Note: The signal beyond the limit is carrier

Channel 3

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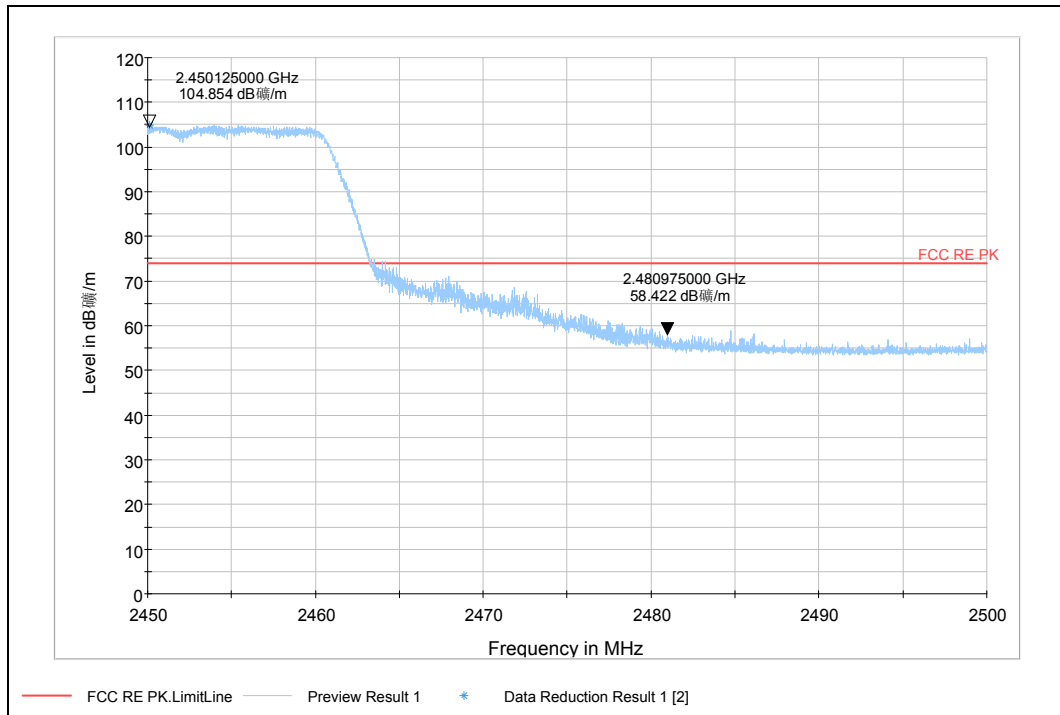
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802.11n (HT40)-Channel 9:

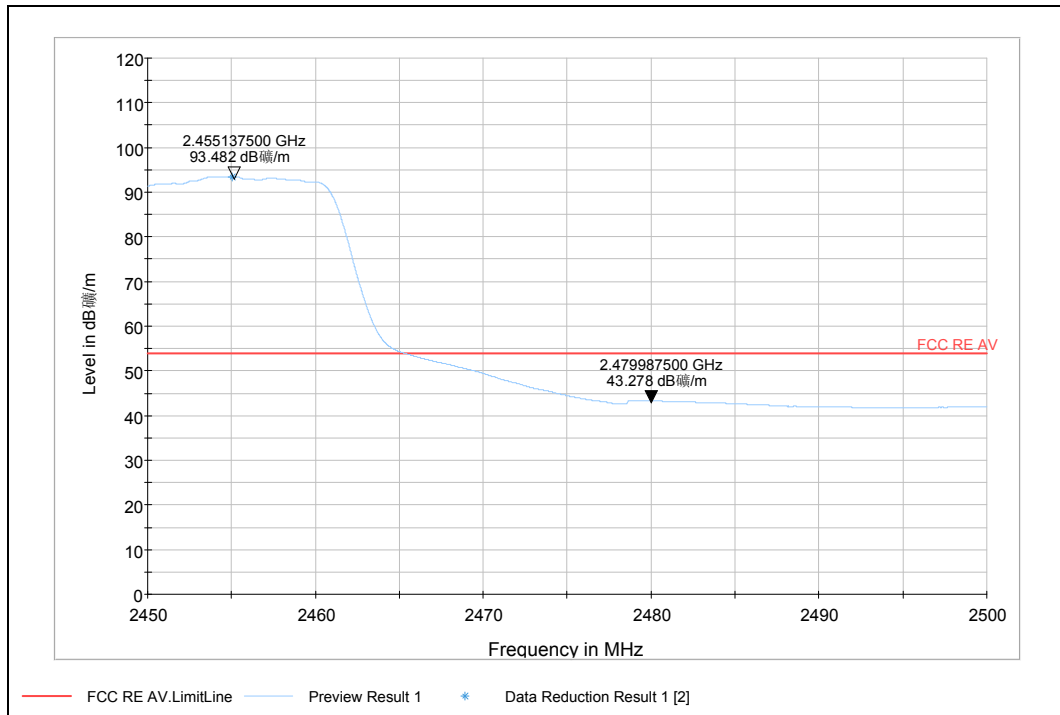
Peak



Note: The signal beyond the limit is carrier

Channel 9

Average



Note: The signal beyond the limit is carrier

Channel 9

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WLAN Antenna 2 Test Results:

Channel.	Fre. (MHz)	Detection Type	Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading value (dBuV/m)	Correct Factor (dB)	Antenna Height (m)	Table Angle (Degree)
802.11n HT20,Ch1	2389.55	PK	70.8	74	3.2	76.1	-5.3	1.05	90
802.11n HT20,Ch1	2390.19	AV	50.9	54	3.1	56.2	-5.3	1.05	90
802.11n HT20,Ch11	2483.55	PK	64.9	74	9.1	69.4	-4.5	1.05	180
802.11n HT20,Ch11	2483.5	AV	44.8	54	9.2	49.3	-4.5	1.05	180

Remark: Value = Reading value + Correction factor

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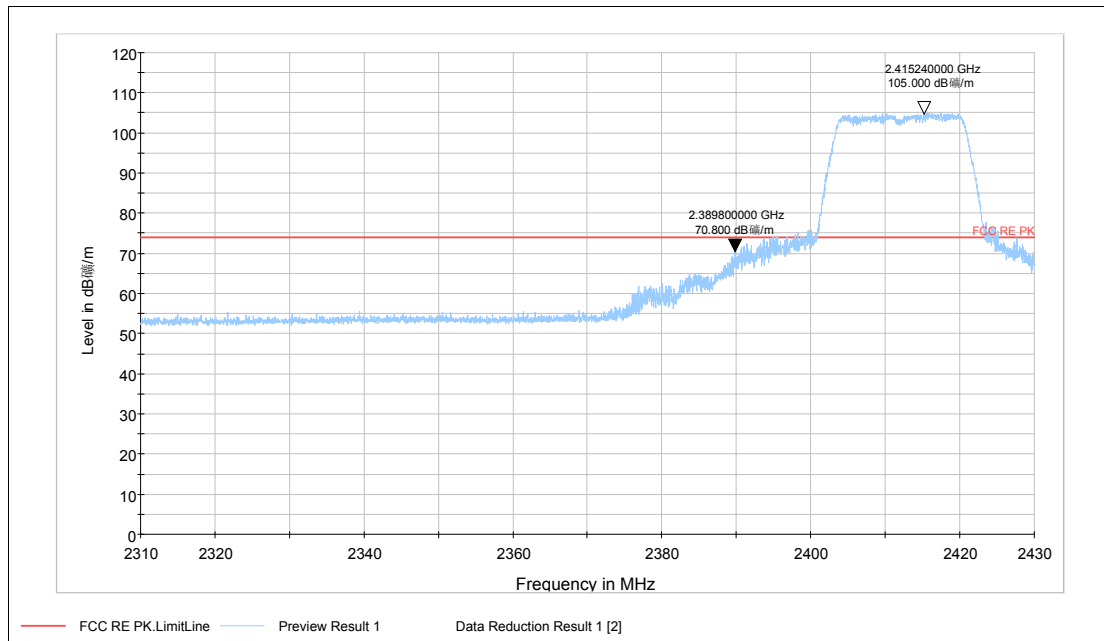
Test Report

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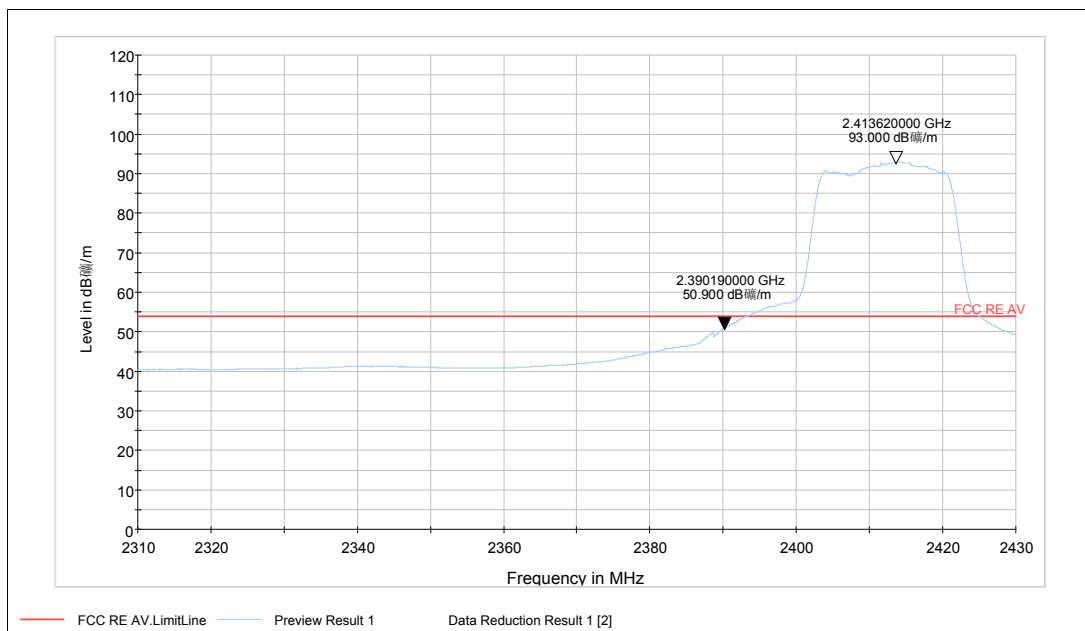
802.11n (HT20)-Channel 1:

Peak



Note: The signal beyond the limit is carrier
Channel 1

Average



Note: The signal beyond the limit is carrier
Channel 1

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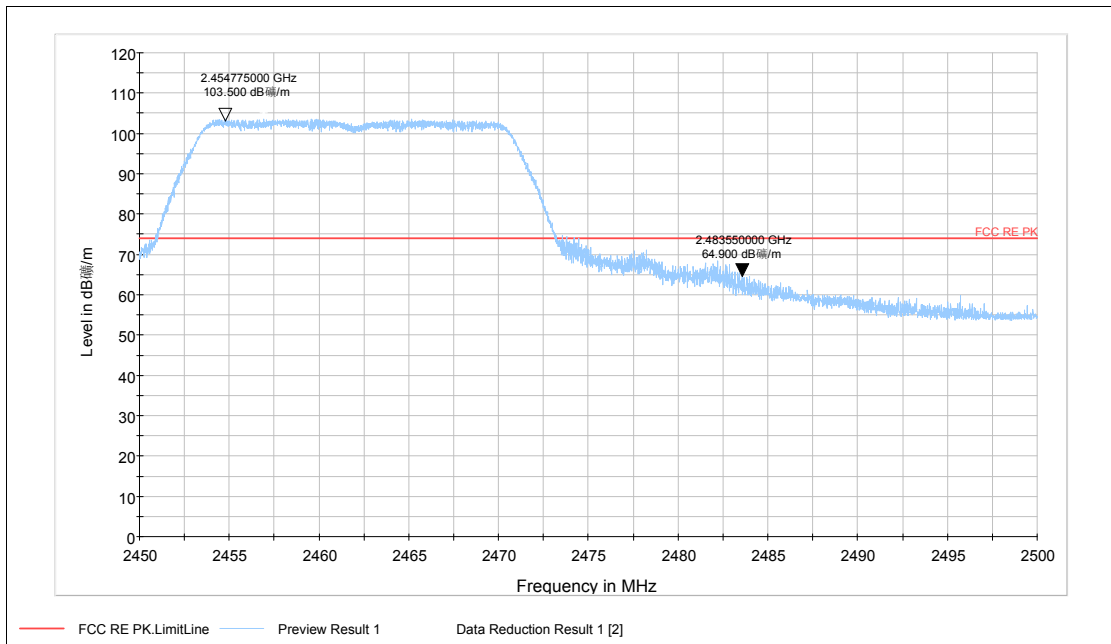
Test Report

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802.11n (HT20)-Channel 11:

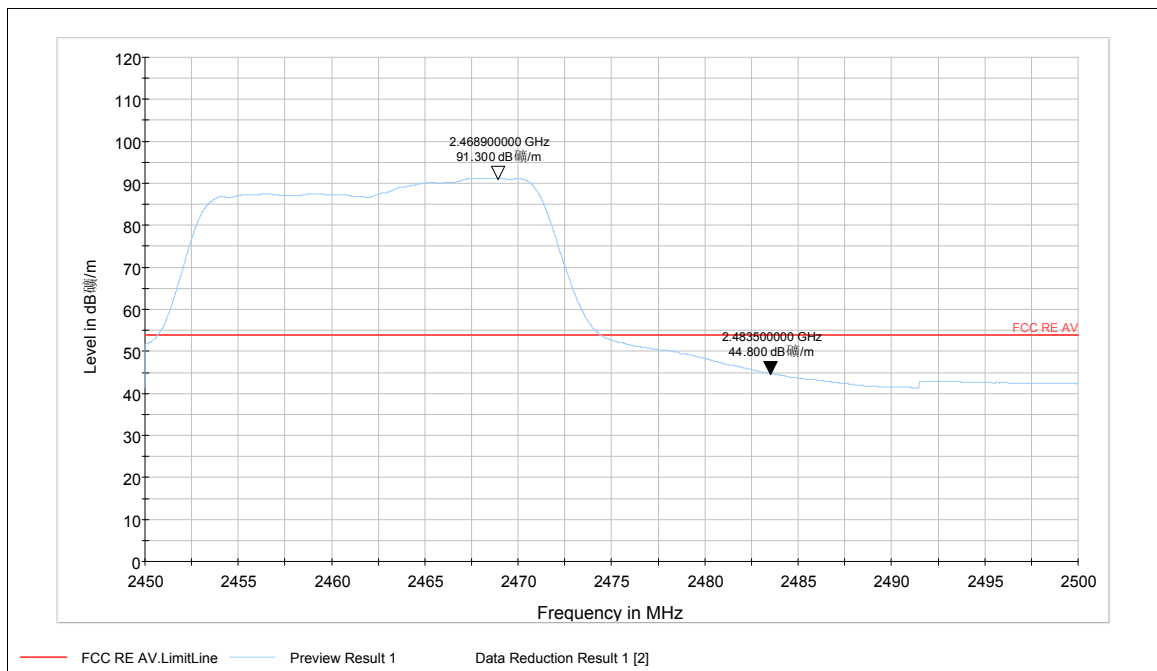
Peak



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

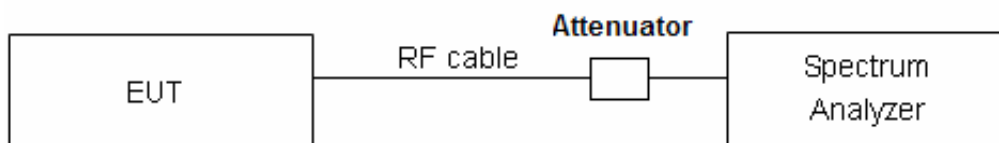
Ambient condition

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 100 kHz and VBW is set to 300 kHz on spectrum analyzer. Set the span to at least 1.5 times the DTS channel bandwidth and the sweep time is 10s. The peak power spectral density is recorded. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(3\text{ kHz}/100\text{kHz}) = -15.2\text{ dB}$.

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 $k = 2$, $U = 0.75\text{dB}$.

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Test Results:

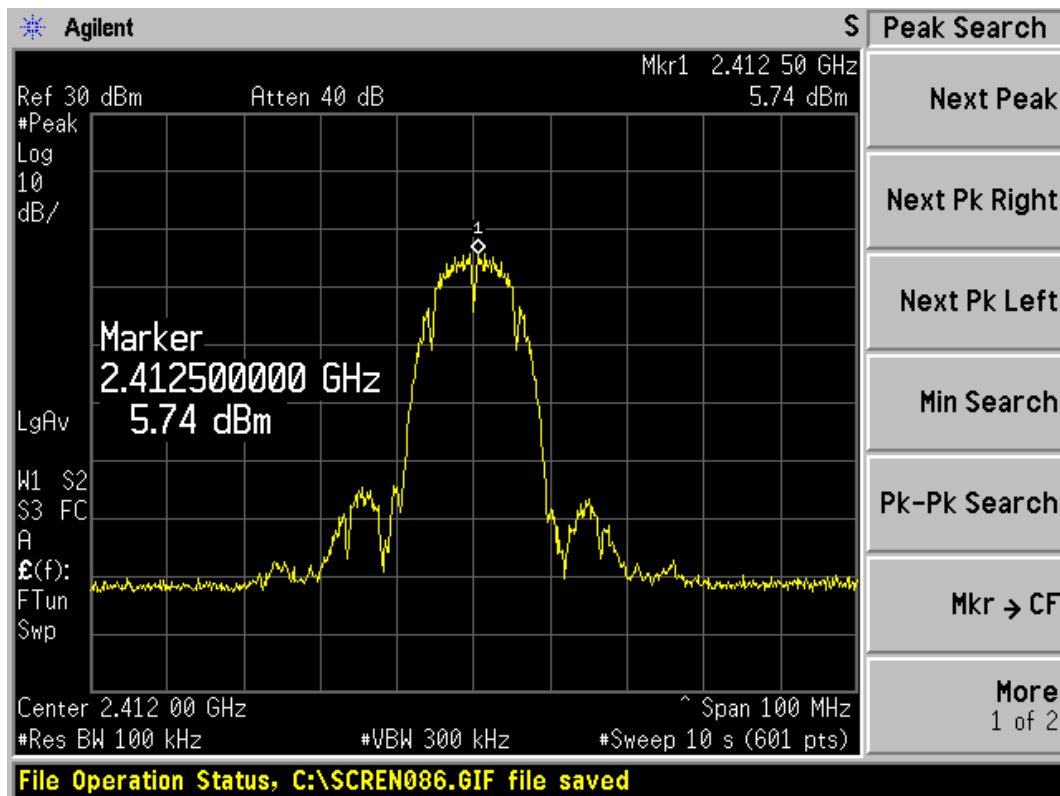
Network Standards	Channel Number	Power Spectral Density dBm / 3kHz	Conclusion
802.11b	1	-9.46	PASS
	6	-9.14	PASS
	11	-8.63	PASS
802.11g	1	-14.84	PASS
	6	-15.89	PASS
	11	-14.52	PASS
802.11n HT20	1	-13.78	PASS
	6	-15.38	PASS
	11	-14.3	PASS
802.11n HT40	3	-17.78	PASS
	6	-18.68	PASS
	9	-18.28	PASS

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

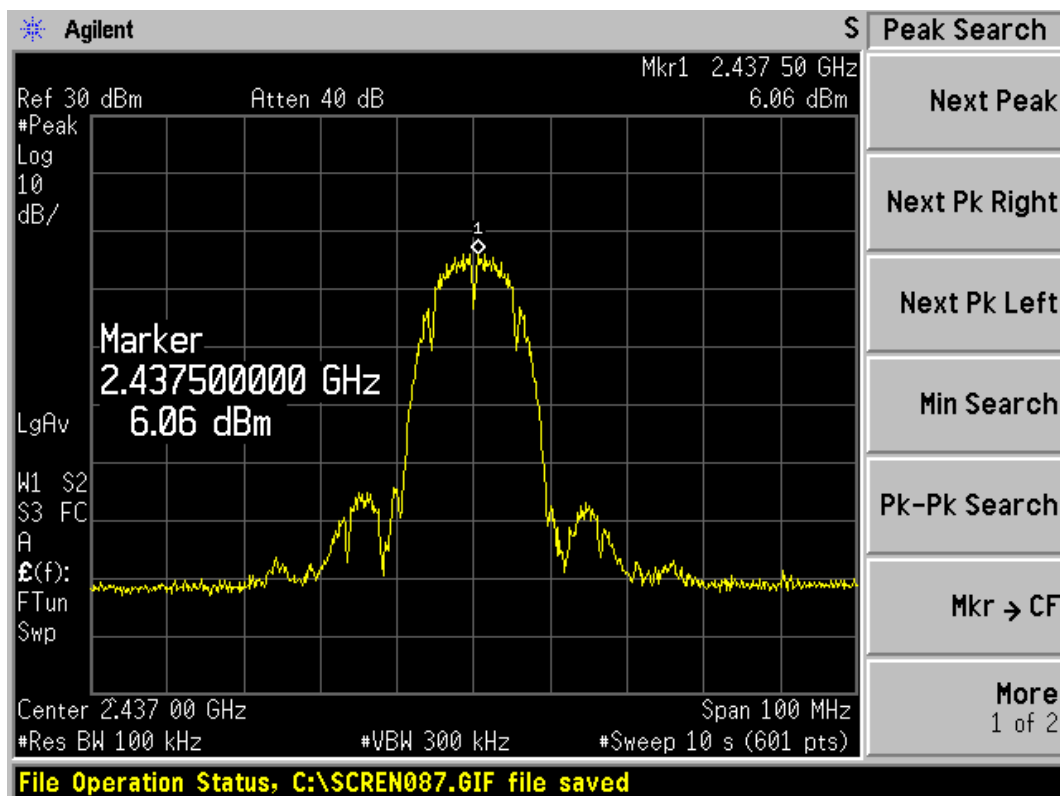
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802.11b



802.11b, Channel No.: 1

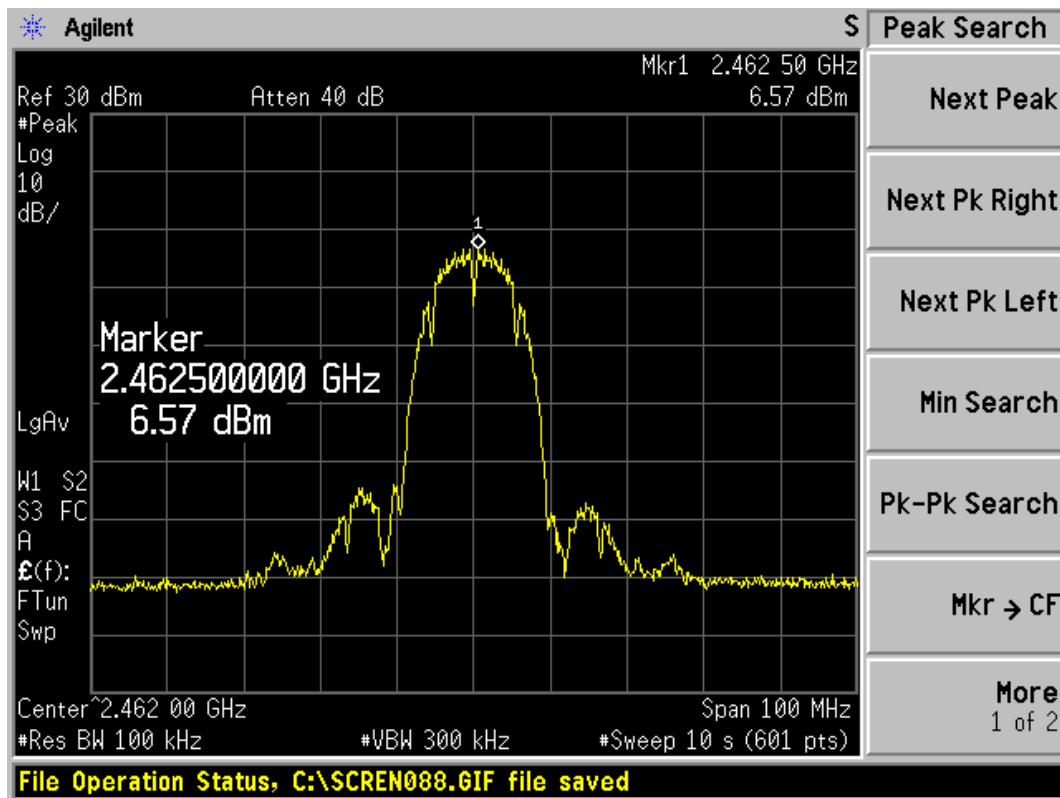


802.11b, Channel No.: 6

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

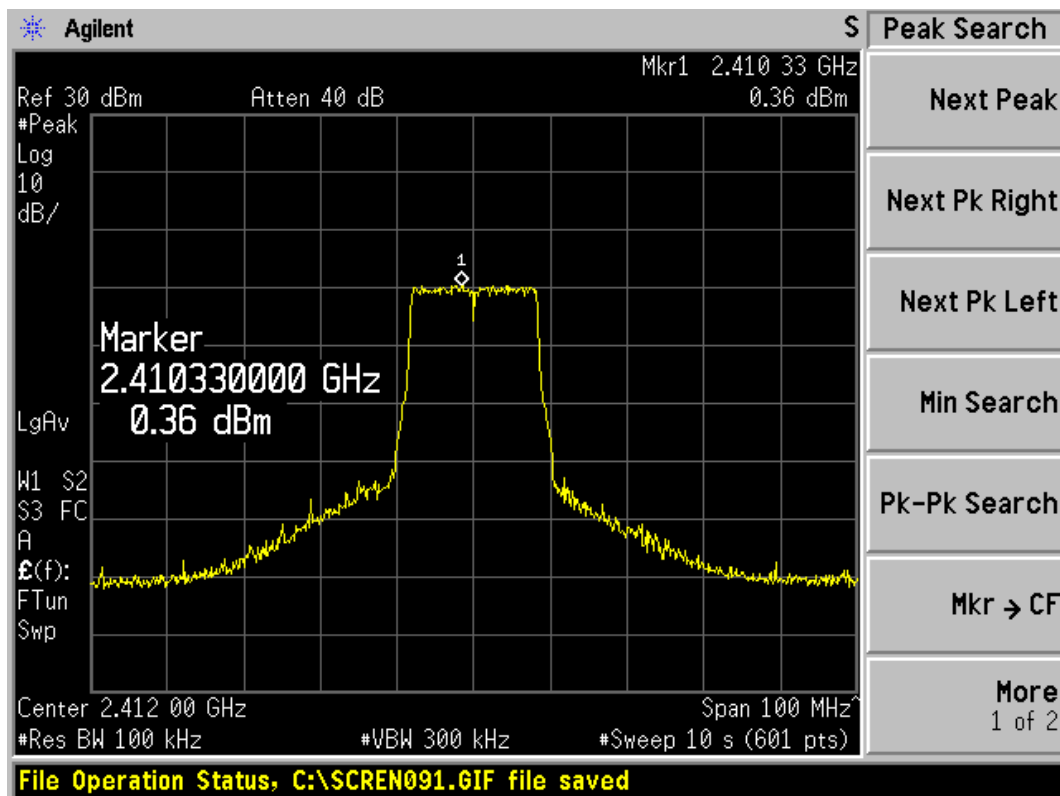
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802.11b, Channel No.: 11

802.11g

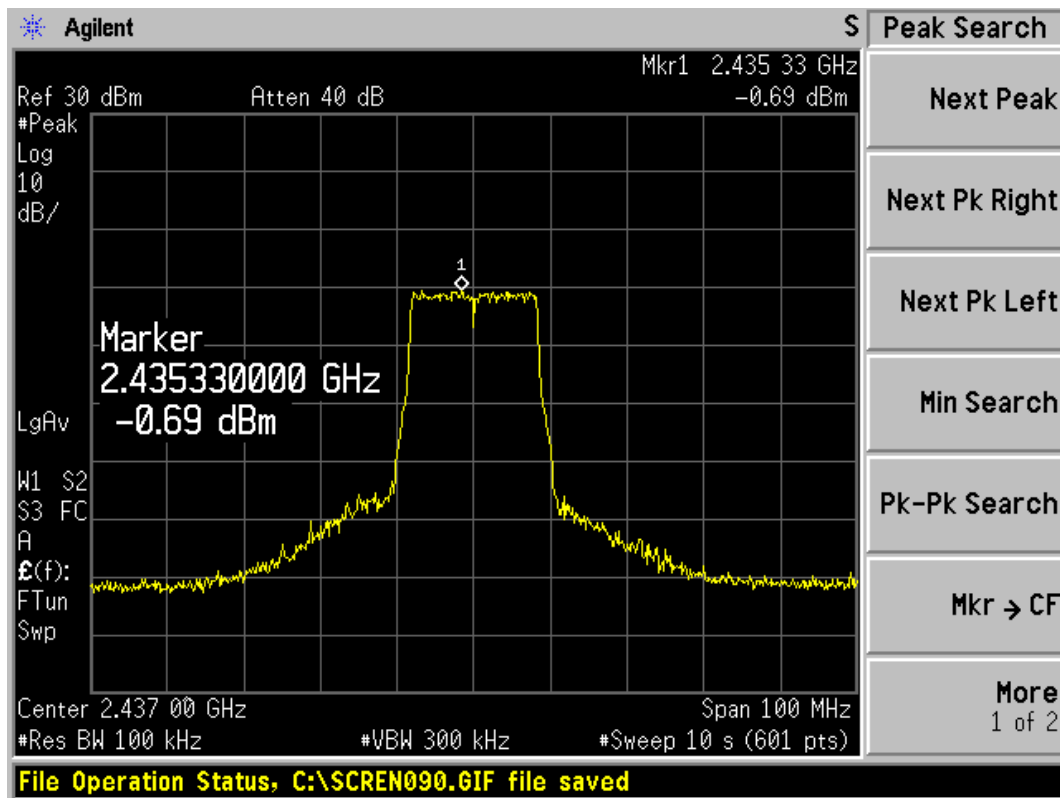


802.11g, Channel No.: 1

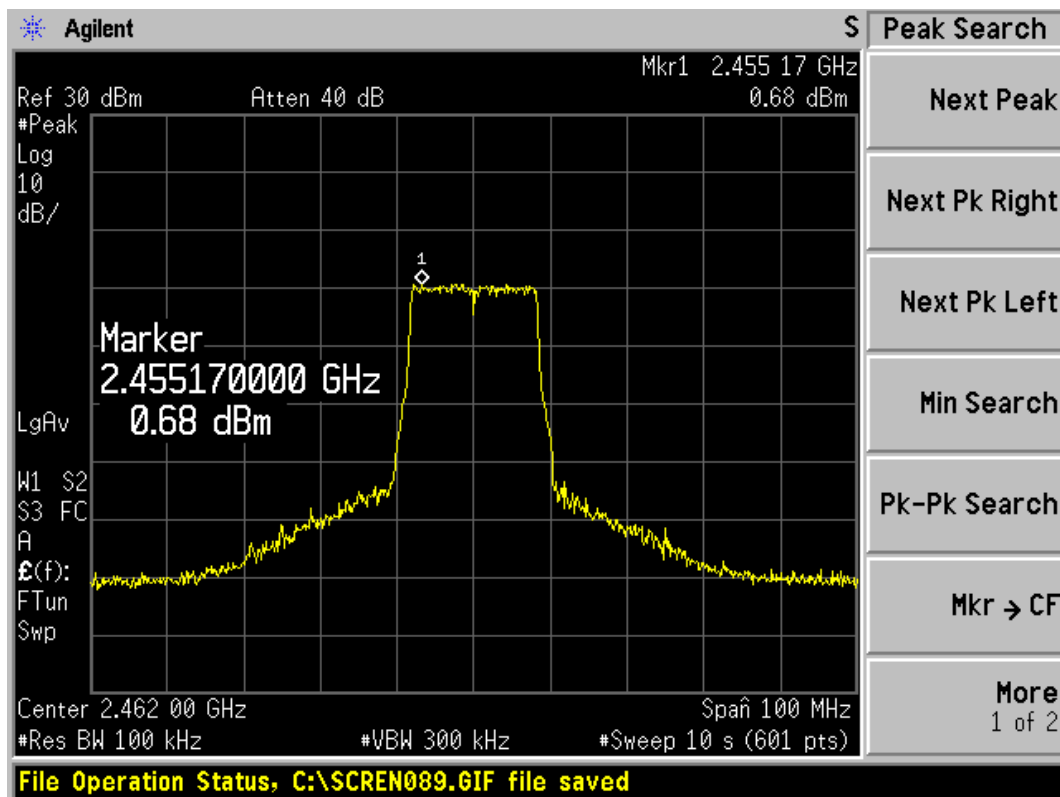
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802.11g, Channel No.: 6



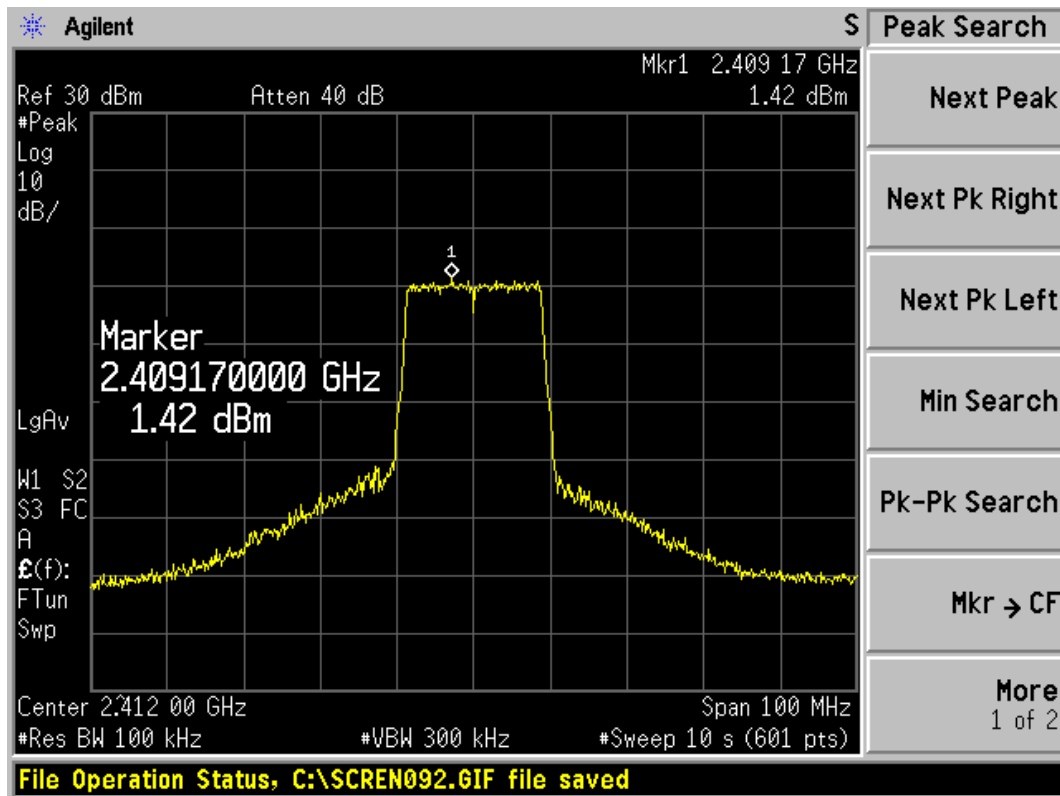
802.11g, Channel No.: 11

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Test Report

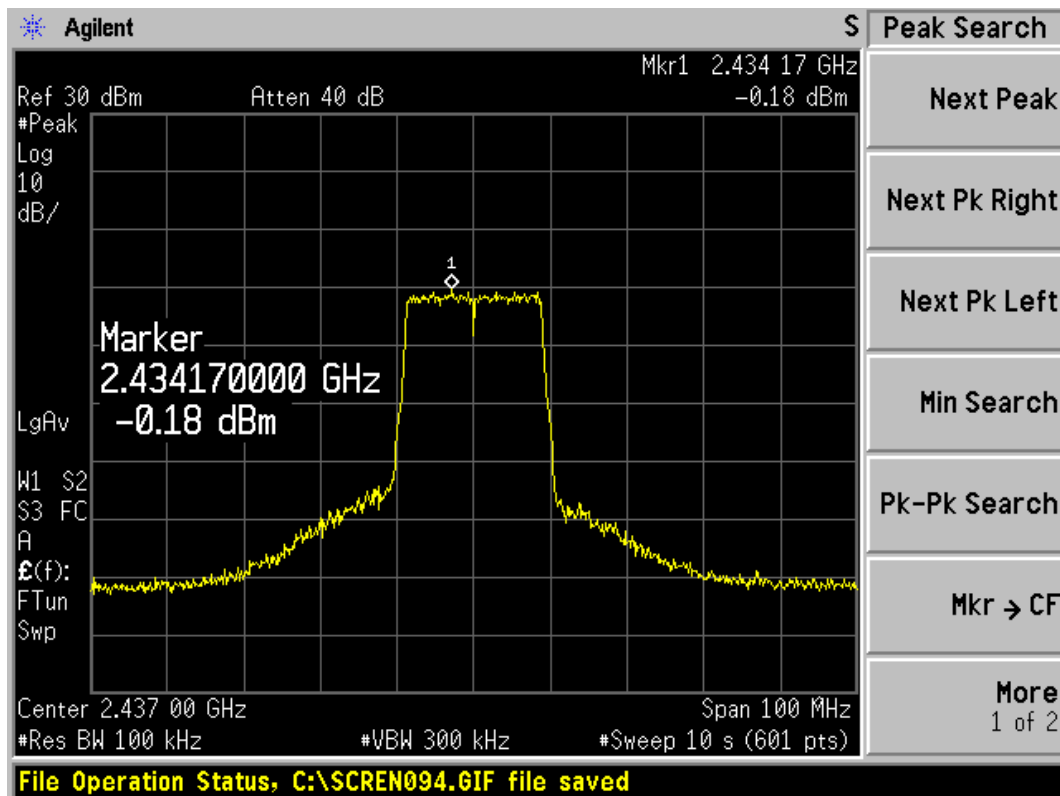
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802.11n (HT20)



802.11n (HT20), Channel No.: 1

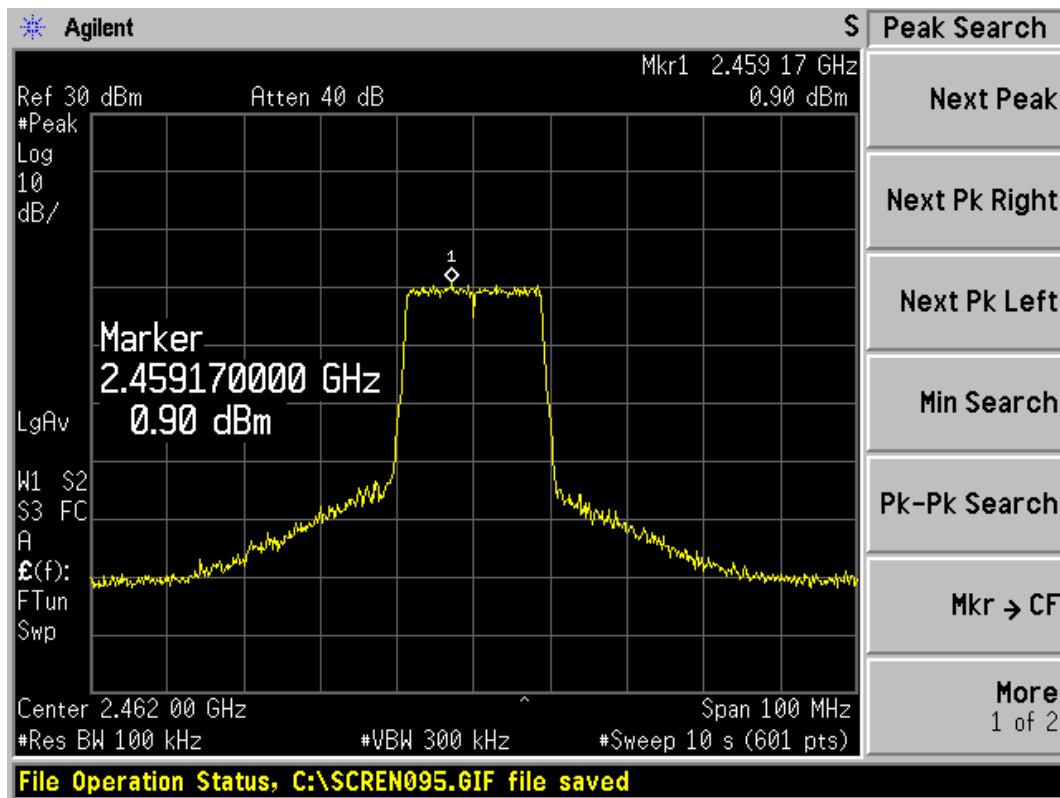


802.11n (HT20), Channel No.: 6

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

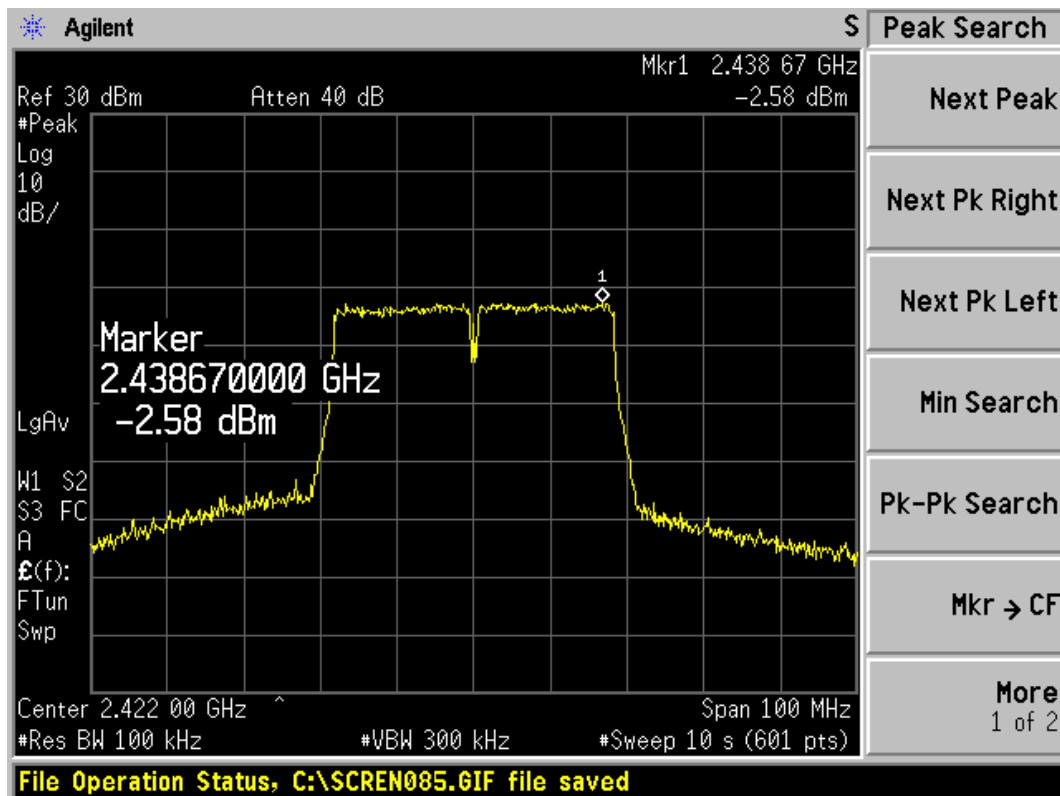
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802.11n (HT20), Channel No.: 11

802.11n (HT40)

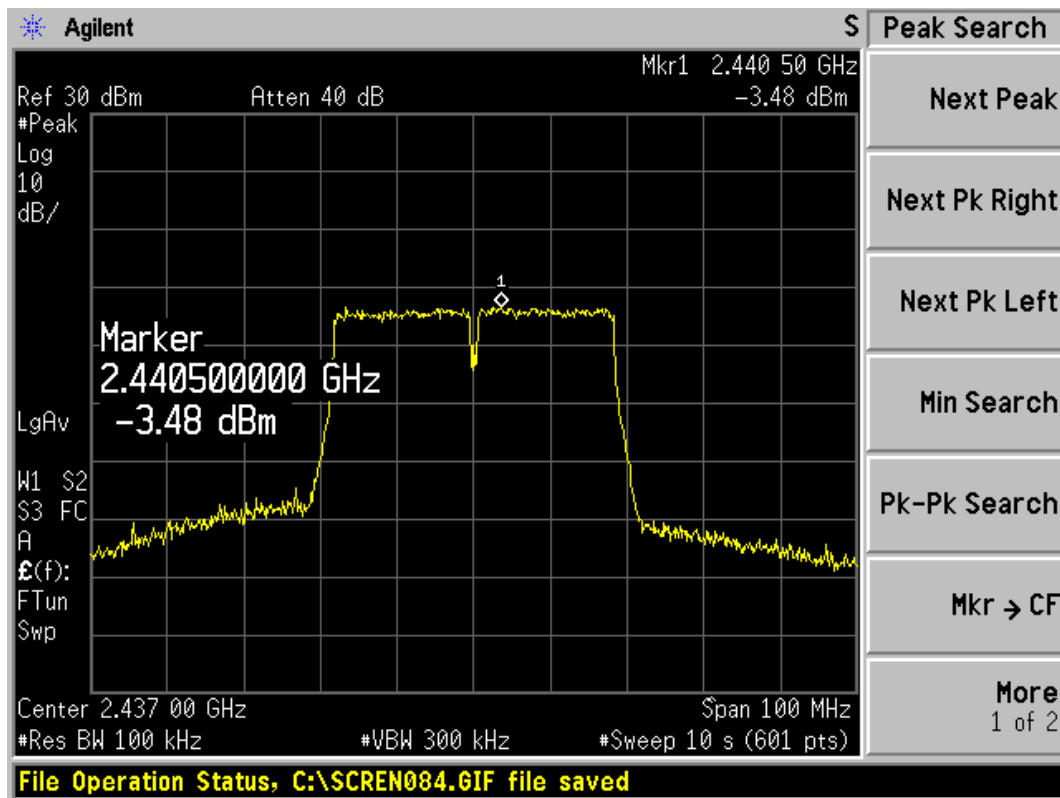


802.11n (HT40), Channel No.: 3

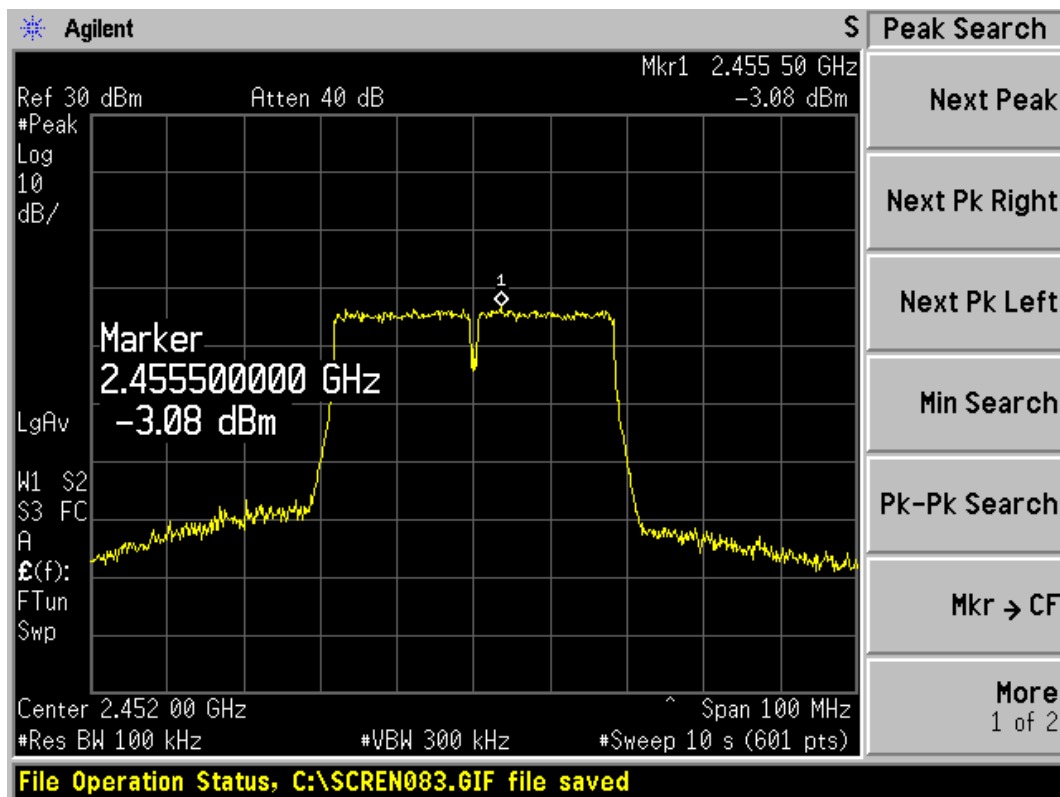
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802.11n (HT40), Channel No.: 6



802.11n (HT40), Channel No.: 9

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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 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) 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	Carrier frequency (MHz)	Reference value (dBm)	Limit
802.11b	2412	19.69	≤ -0.31
	2437	19.98	≤ -0.02
	2462	20.25	≤ 0.25
802.11g	2412	18.49	≤ -1.51
	2437	17.37	≤ -2.63
	2462	19.47	≤ -0.53
802.11n UT20	2412	18.86	≤ -1.14

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802.11n HT40	2437	17.36	≤ -2.64
	2462	18.16	≤ -1.84
	2422	19.07	≤ -0.93
	2437	18.31	≤ -1.69
	2452	17.32	≤ -2.68

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

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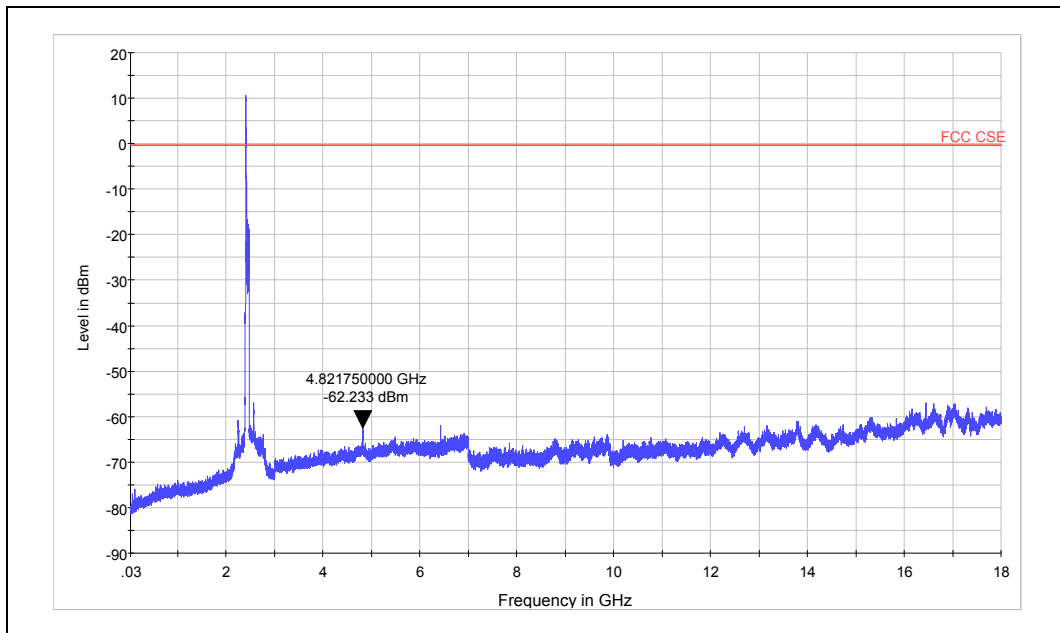
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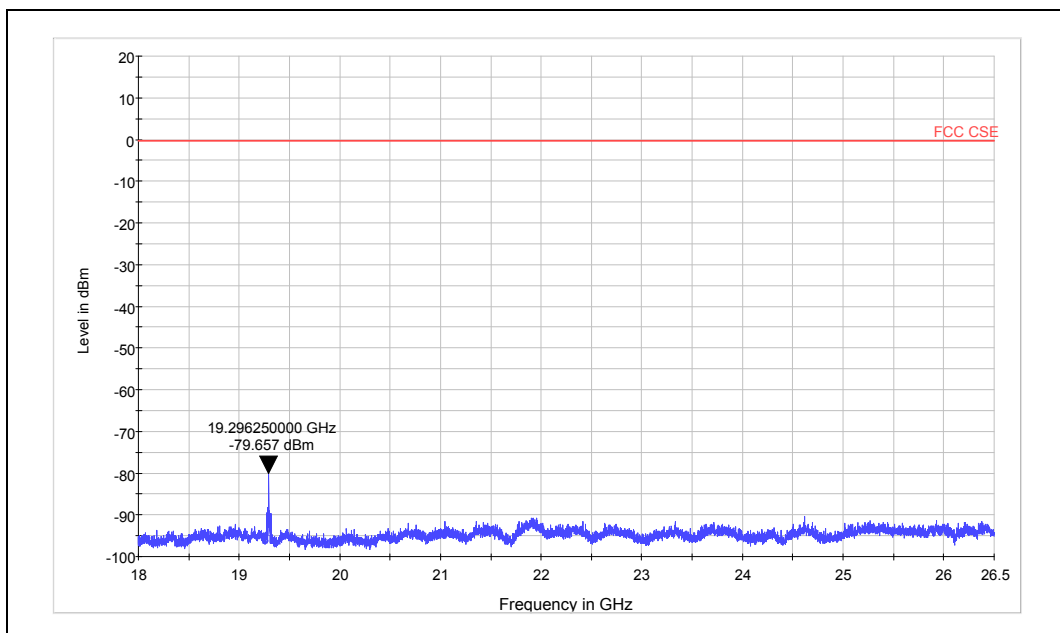
Test Results:

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

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Harmonic	TX ch.1 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4822	-62.233	-0.31
3	7236	Nf	-0.31
4	9648	Nf	-0.31
5	12060	Nf	-0.31
6	14472	Nf	-0.31
7	16884	Nf	-0.31
8	19296	-79.657	-0.31
9	21708	Nf	-0.31
10	24120	Nf	-0.31
Nf: noise floor			

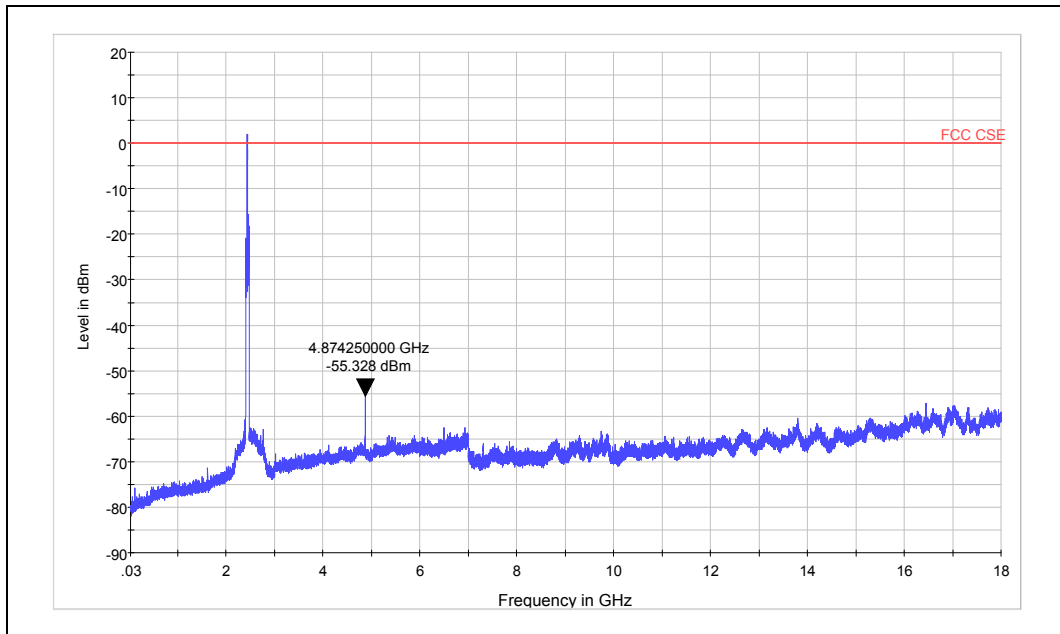
TA Technology (Shanghai) Co., Ltd.

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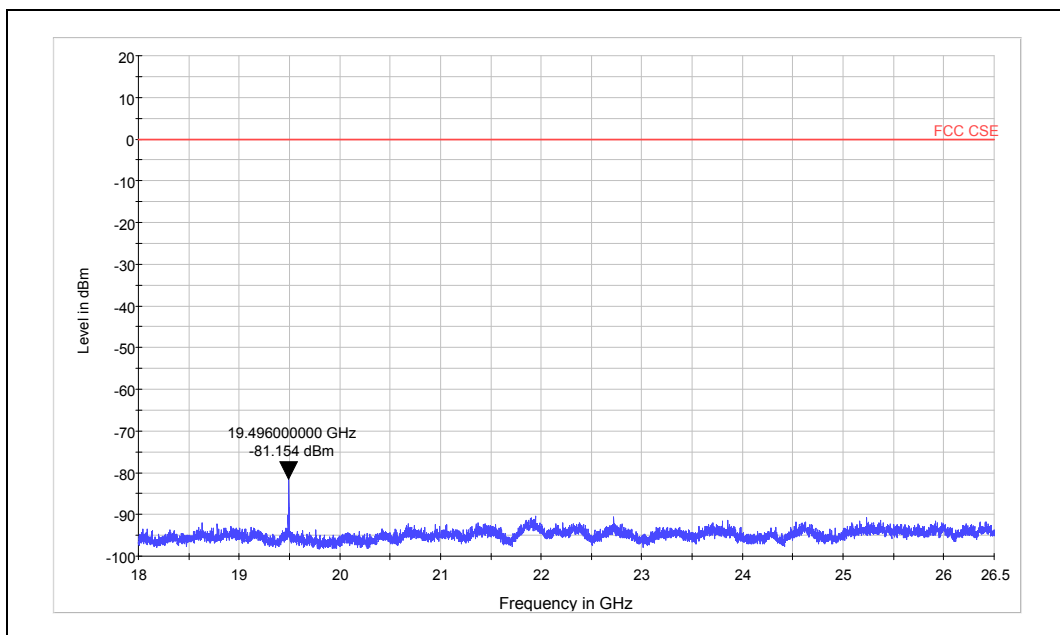
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802.11b CH6



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

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Harmonic	TX ch.6 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4874	-55.328	-0.02
3	7311	Nf	-0.02
4	9748	Nf	-0.02
5	12185	Nf	-0.02
6	14622	Nf	-0.02
7	17059	Nf	-0.02
8	19496	-81.154	-0.02
9	21933	Nf	-0.02
10	24370	Nf	-0.02
Nf: noise floor			

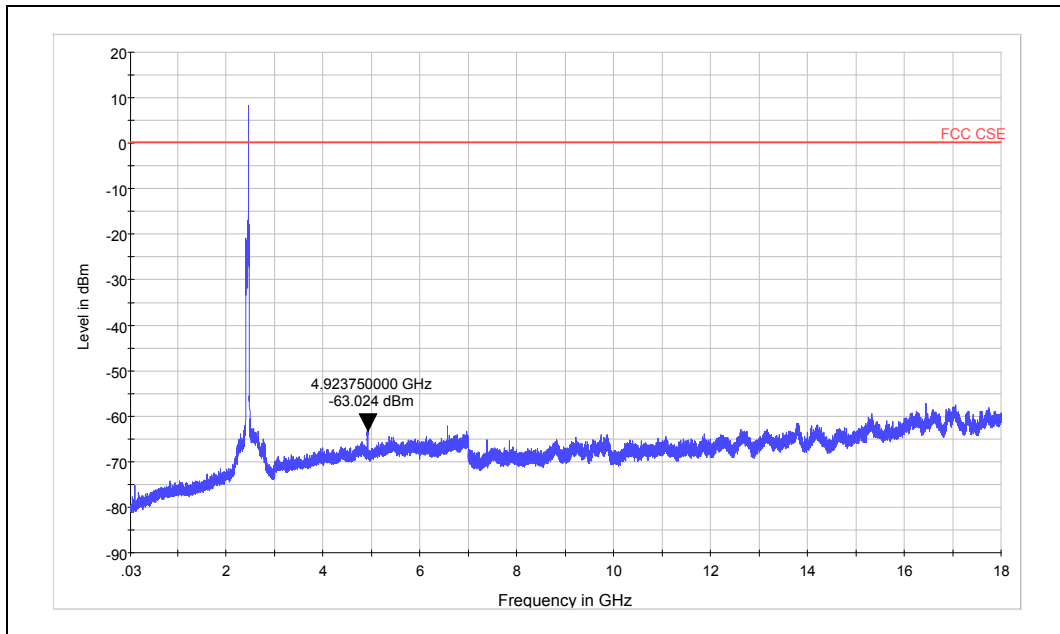
TA Technology (Shanghai) Co., Ltd.

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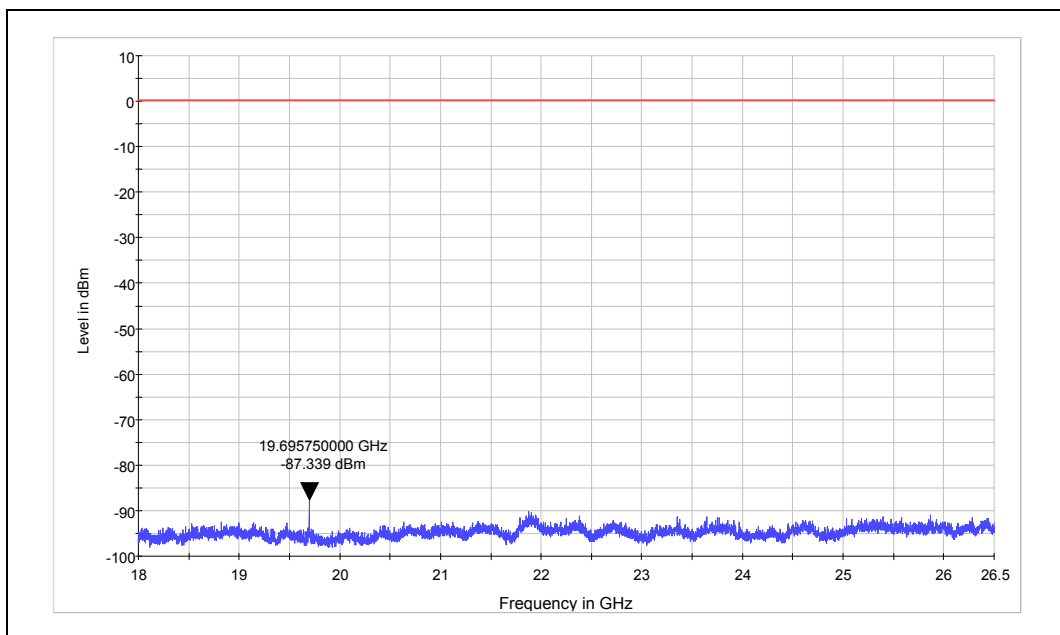
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802.11b CH11



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

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Harmonic	TX ch.11 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4924	-63.024	0.25
3	7386	Nf	0.25
4	9848	Nf	0.25
5	12310	Nf	0.25
6	14772	Nf	0.25
7	17234	Nf	0.25
8	19696	-87.339	0.25
9	22158	Nf	0.25
10	24620	Nf	0.25
Nf: noise floor			

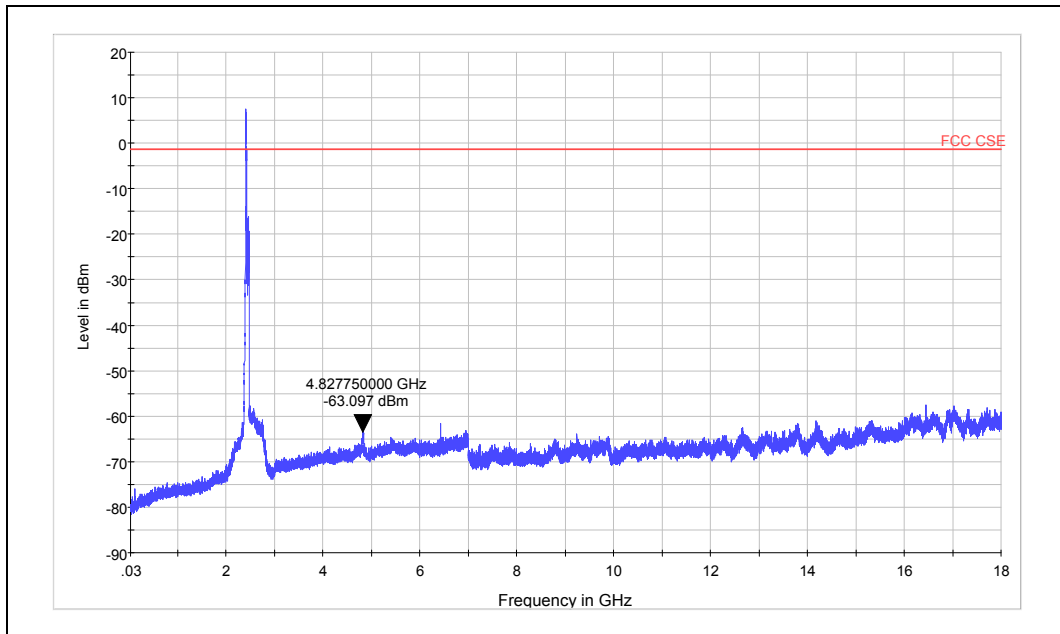
TA Technology (Shanghai) Co., Ltd.

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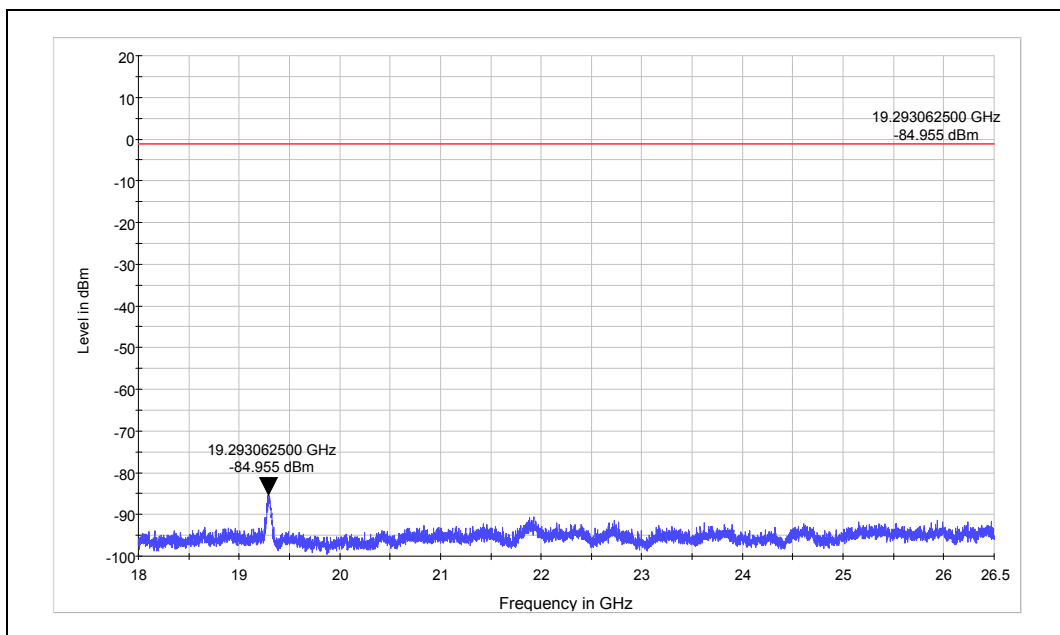
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802.11g CH1



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

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Harmonic	TX ch.1 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4828	-63.097	-1.51
3	7236	Nf	-1.51
4	9648	Nf	-1.51
5	12060	Nf	-1.51
6	14472	Nf	-1.51
7	16884	Nf	-1.51
8	19293	-84.955	-1.51
9	21708	Nf	-1.51
10	24120	Nf	-1.51
Nf: noise floor			

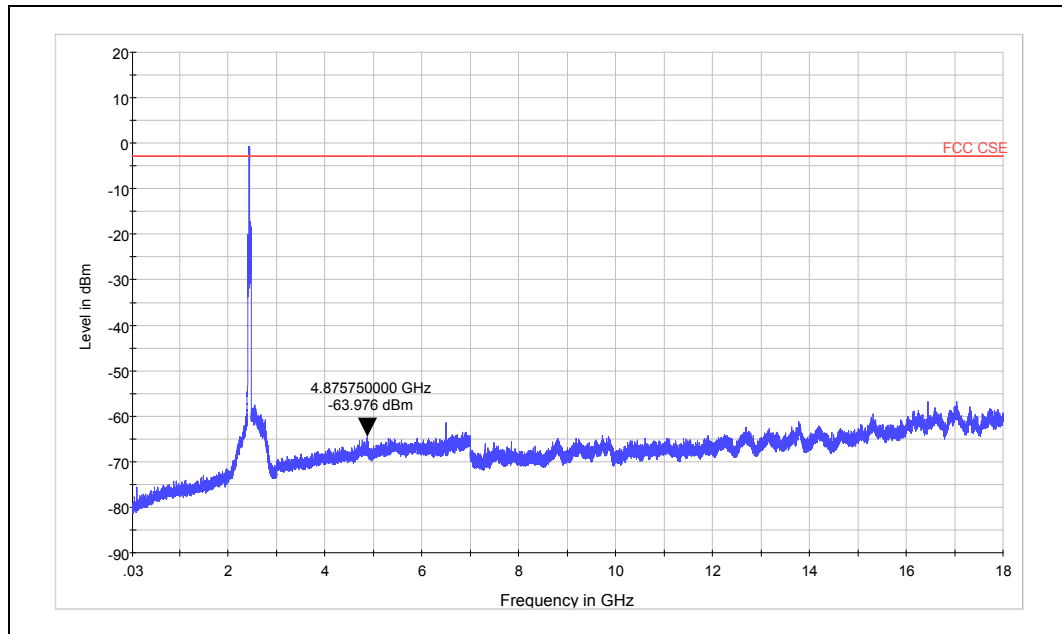
TA Technology (Shanghai) Co., Ltd.

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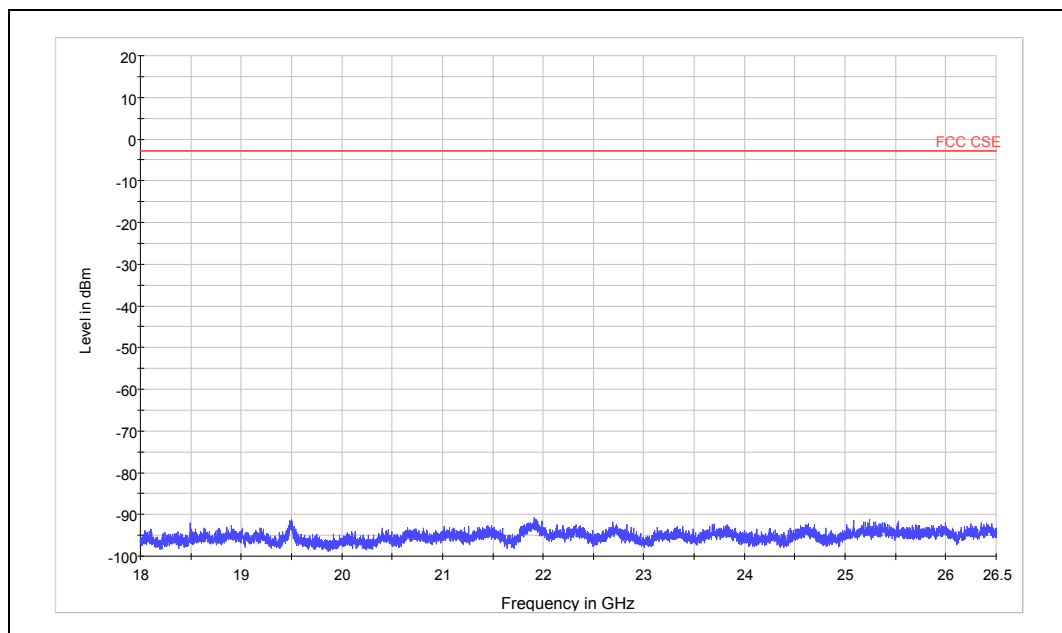
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802.11g CH6



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

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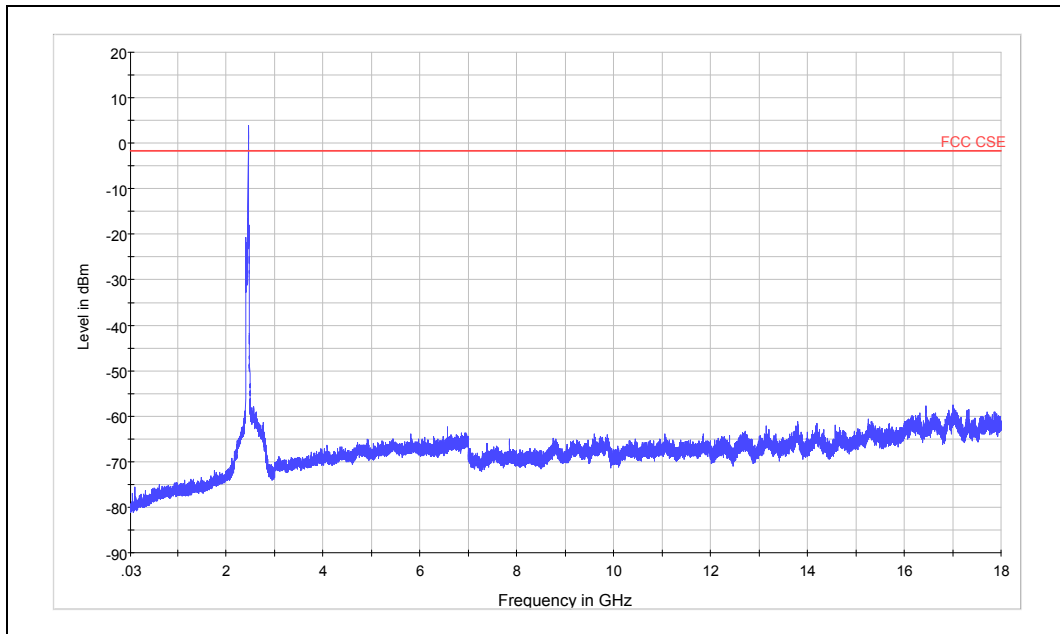
Harmonic	TX ch.6 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4876	-63.976	-2.63
3	7311	Nf	-2.63
4	9748	Nf	-2.63
5	12185	Nf	-2.63
6	14622	Nf	-2.63
7	17059	Nf	-2.63
8	19496	Nf	-2.63
9	21933	Nf	-2.63
10	24370	Nf	-2.63
Nf: noise floor			

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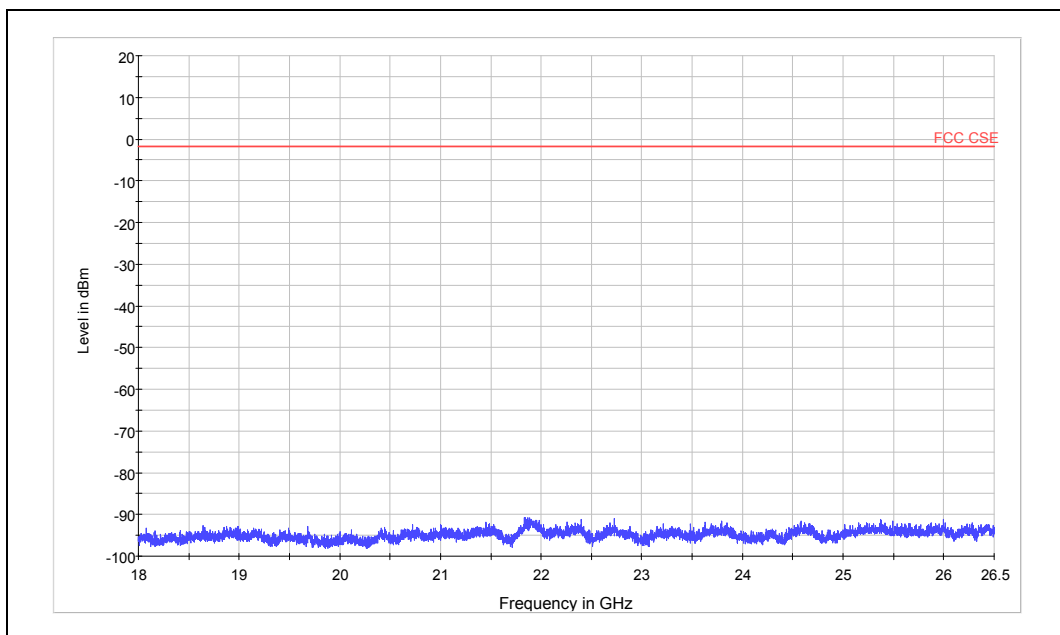
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802.11g CH11



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

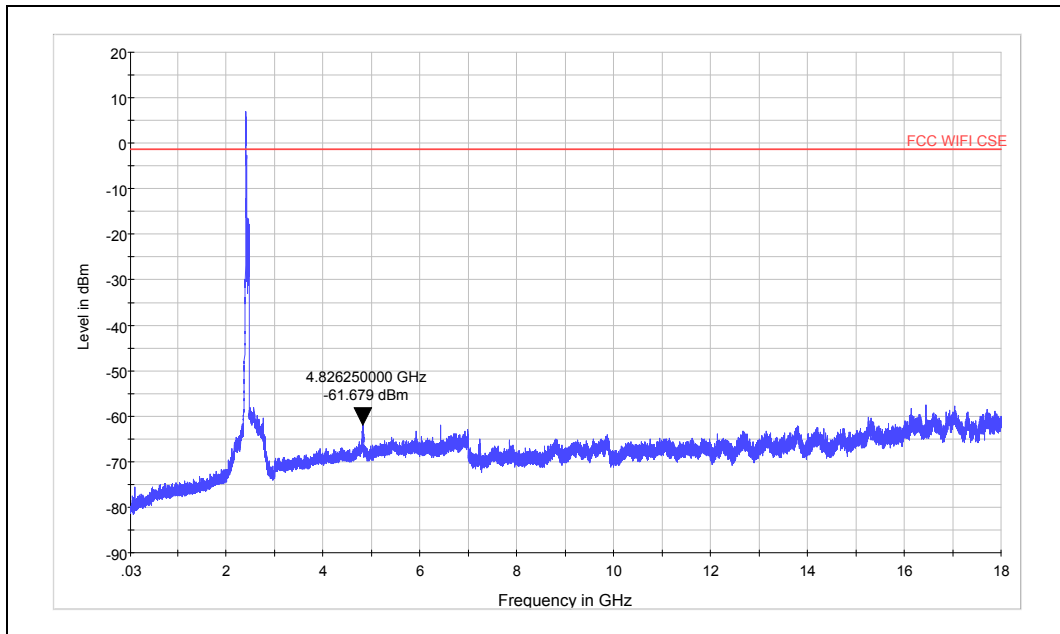
TA Technology (Shanghai) Co., Ltd.

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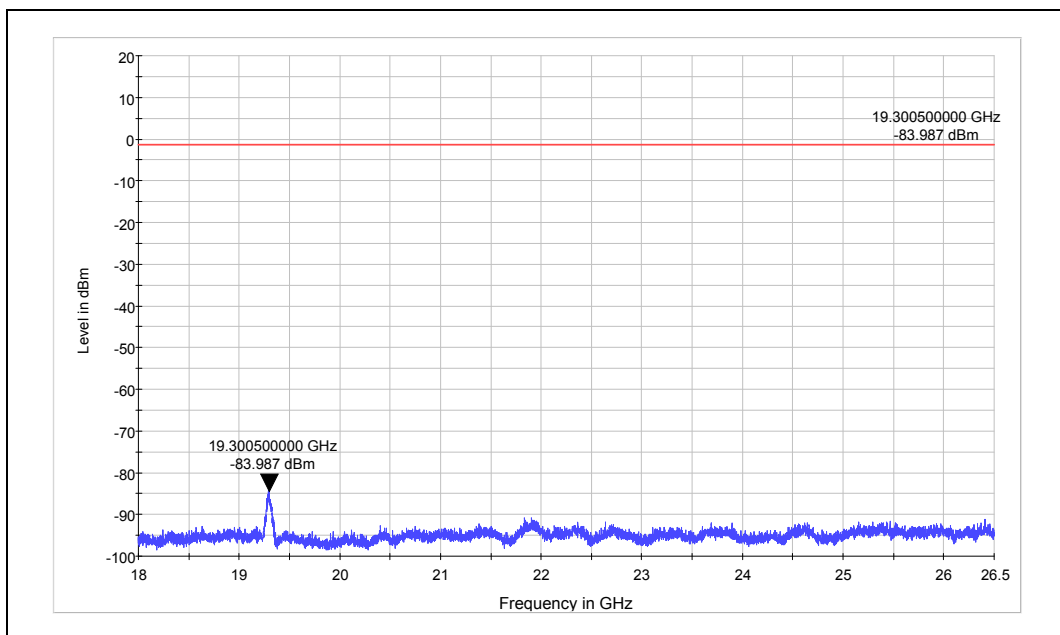
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802.11n (HT20) CH1



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

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Harmonic	TX ch.1 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4826	-61.679	-1.14
3	7236	Nf	-1.14
4	9648	Nf	-1.14
5	12060	Nf	-1.14
6	14472	Nf	-1.14
7	16884	Nf	-1.14
8	19301	-83.987	-1.14
9	21708	Nf	-1.14
10	24120	Nf	-1.14
Nf: noise floor			

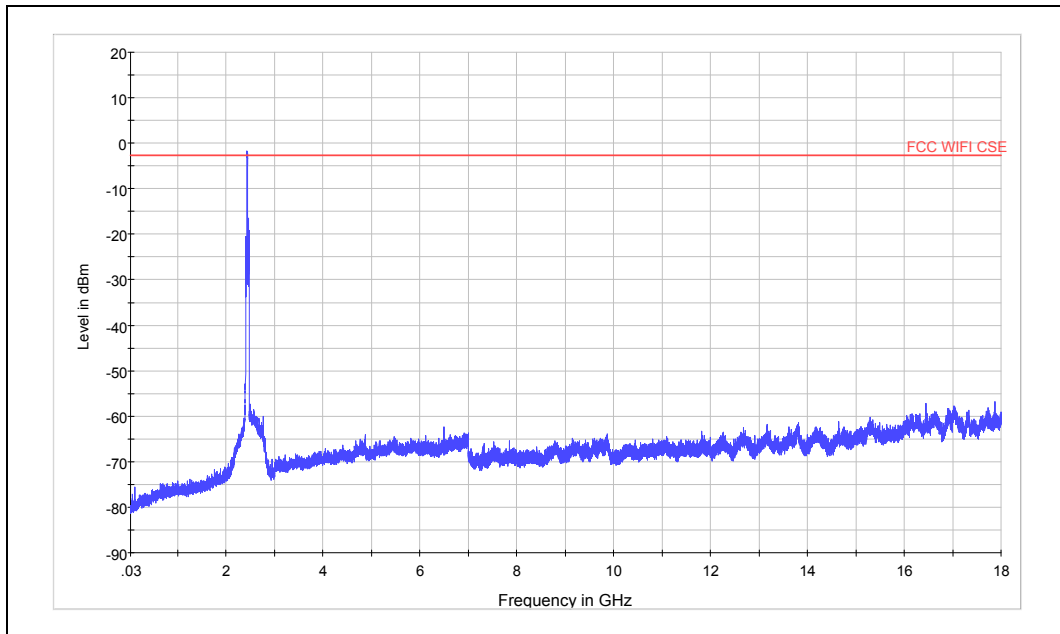
TA Technology (Shanghai) Co., Ltd.

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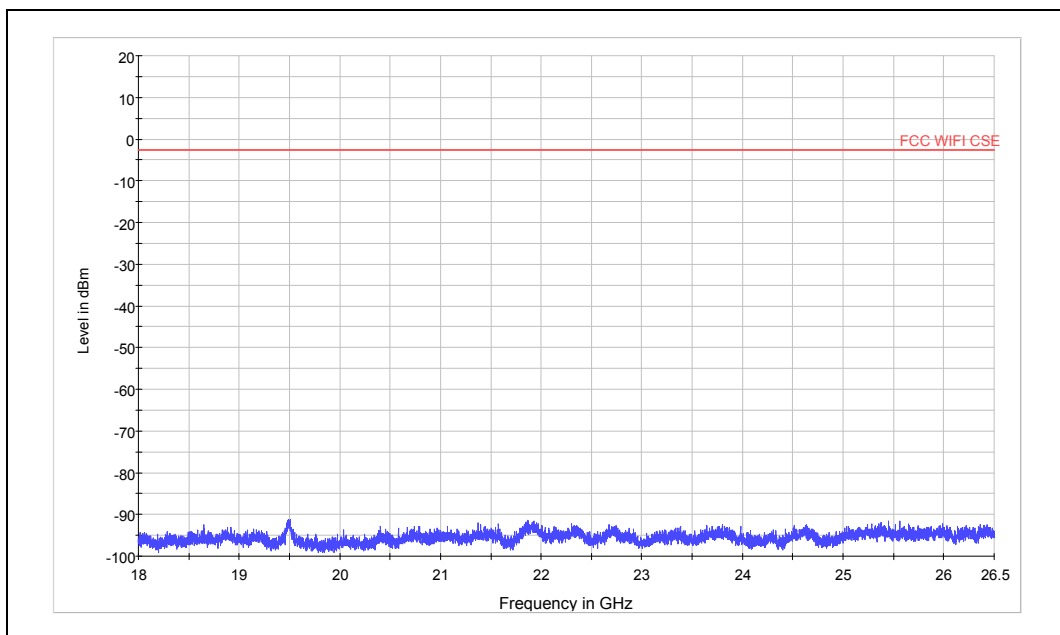
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802.11n (HT20) CH6



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

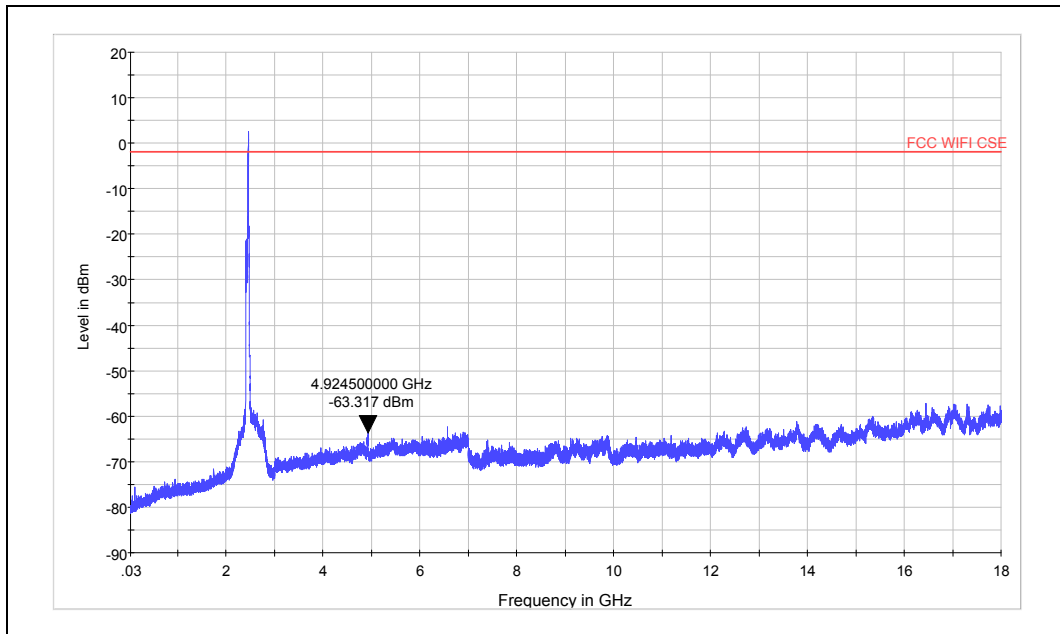
TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RXA1301-0014RF02R4

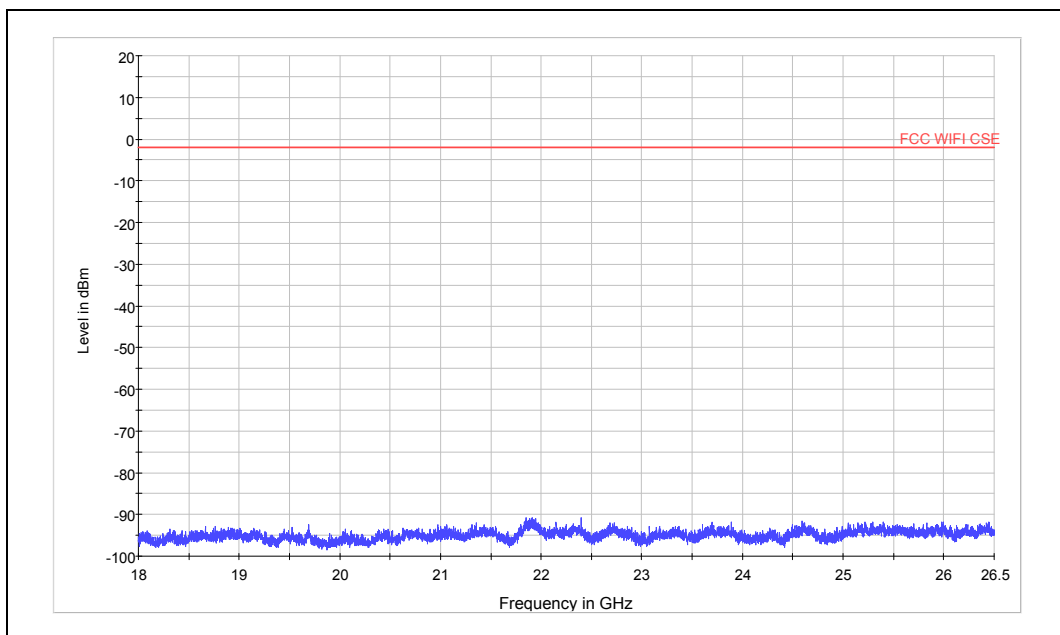
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802.11n (HT20) CH11



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

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Harmonic	TX ch.11 Frequency (MHz)	Level (dBm)	Limit (dBm)
2	4925	-63.317	-1.84
3	7386	Nf	-1.84
4	9848	Nf	-1.84
5	12310	Nf	-1.84
6	14772	Nf	-1.84
7	17234	Nf	-1.84
8	19696	Nf	-1.84
9	22158	Nf	-1.84
10	24620	Nf	-1.84
Nf: noise floor			

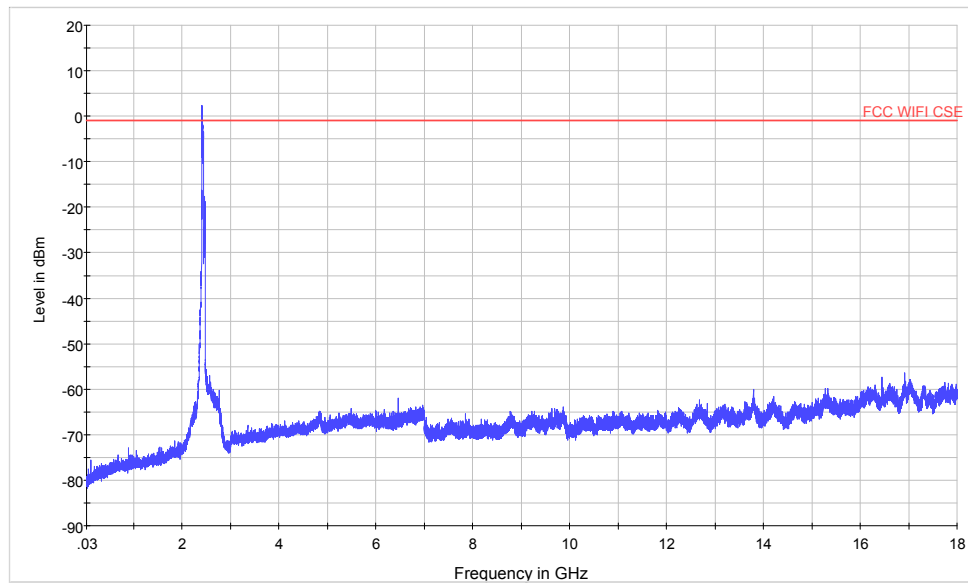
TA Technology (Shanghai) Co., Ltd.

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Report No.: RXA1301-0014RF02R4

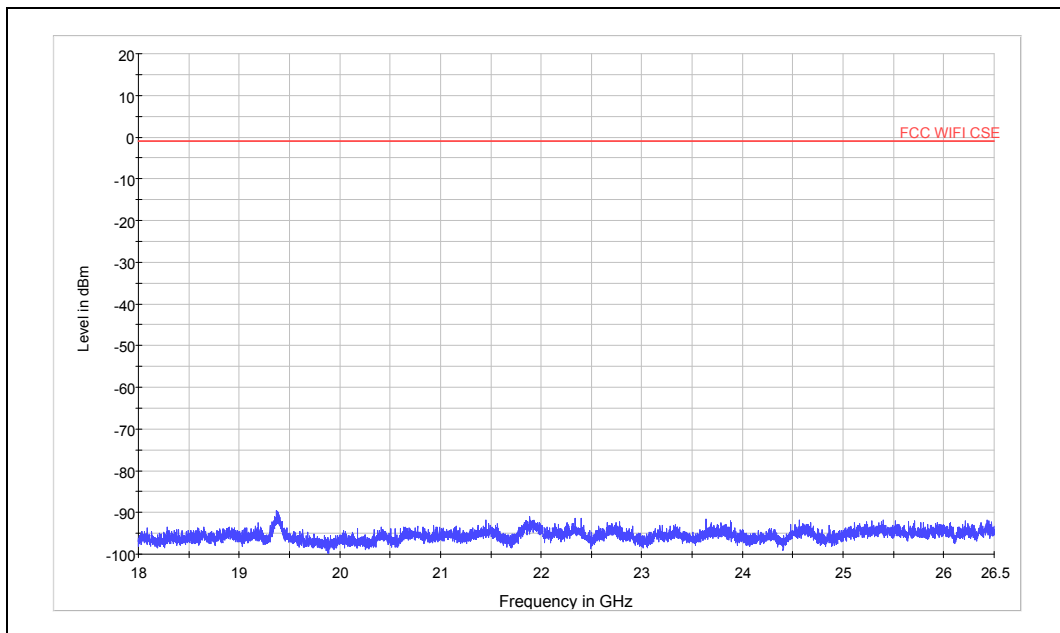
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802.11n (HT40) CH3



Note: The signal beyond the limit is carrier

Spurious RF conducted emissions from 30MHz to 18GHz



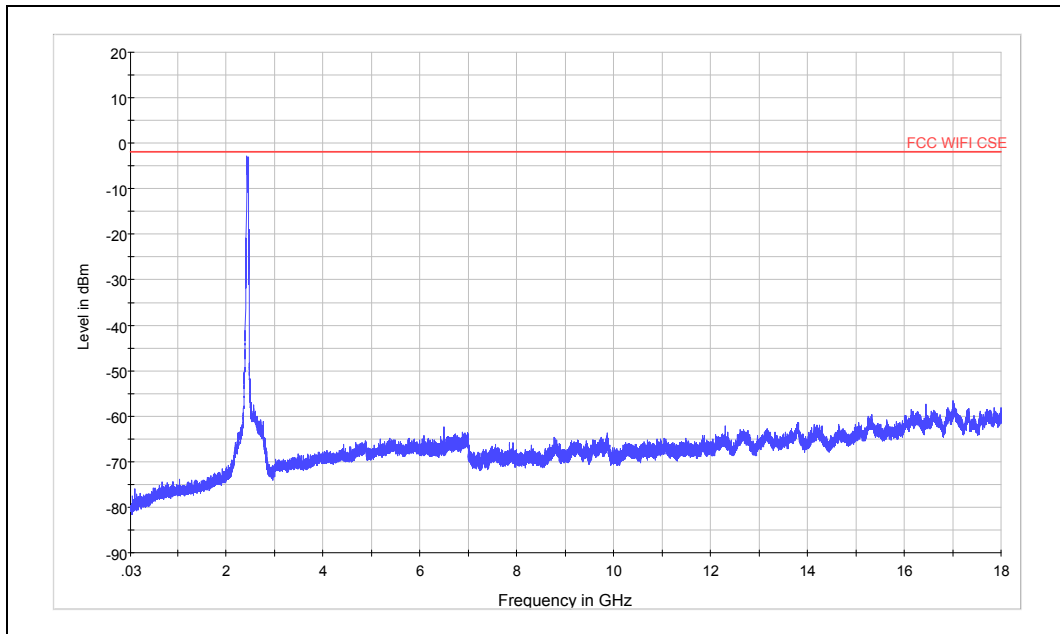
Spurious RF conducted emissions from 18GHz to 26.5GHz

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

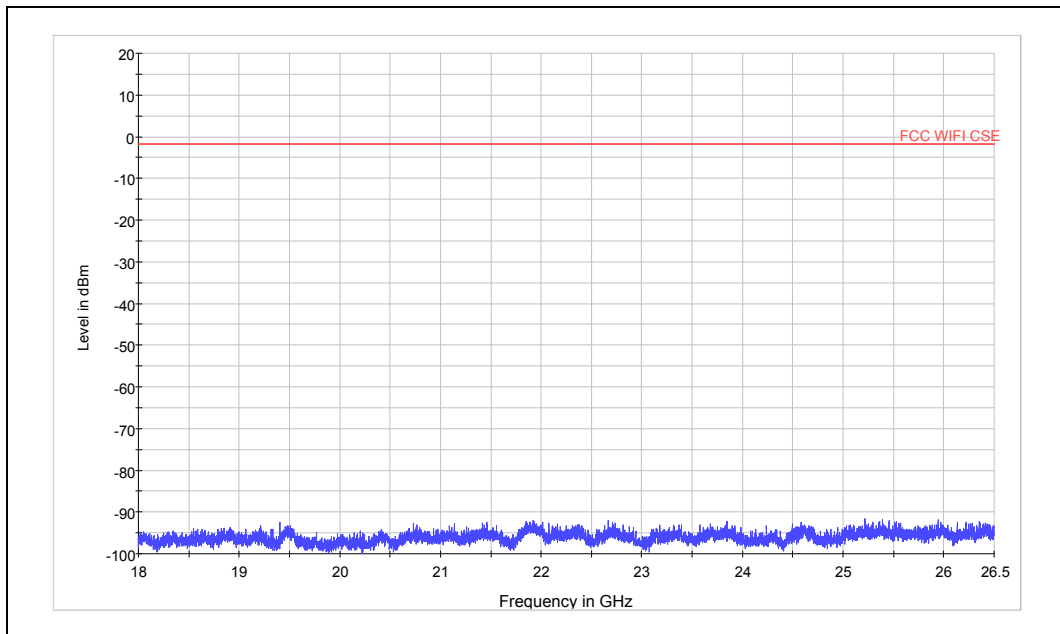
Report No.: RXA1301-0014RF02R4

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802.11n (HT40) CH6



Spurious RF conducted emissions from 30MHz to 18GHz



Spurious RF conducted emissions from 18GHz to 26.5GHz

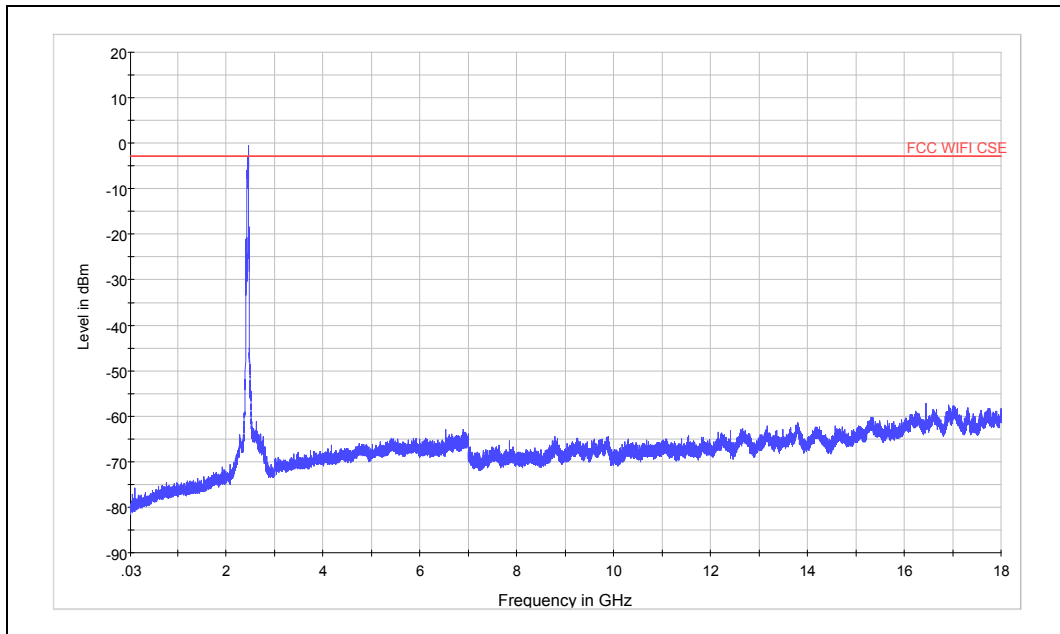
TA Technology (Shanghai) Co., Ltd.

Test Report

Report No.: RXA1301-0014RF02R4

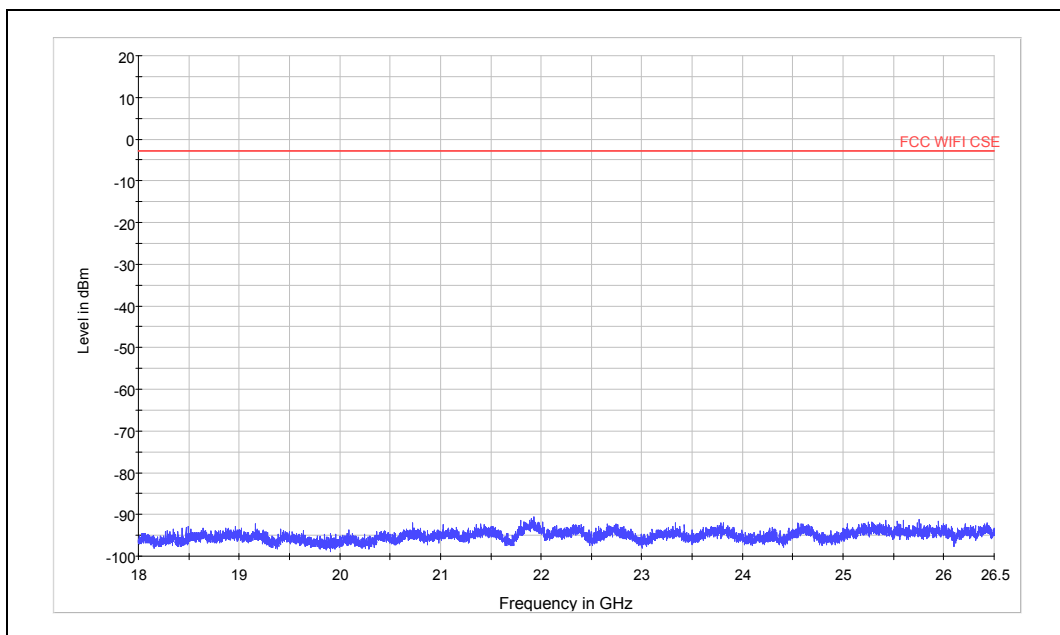
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802.11n (HT40) CH9



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

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 test is in transmitting mode.

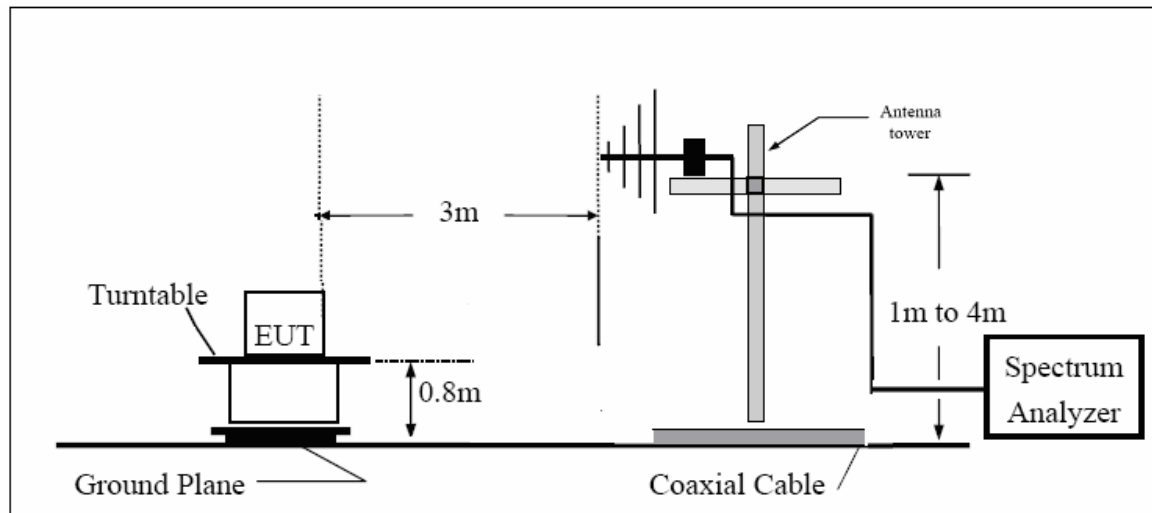
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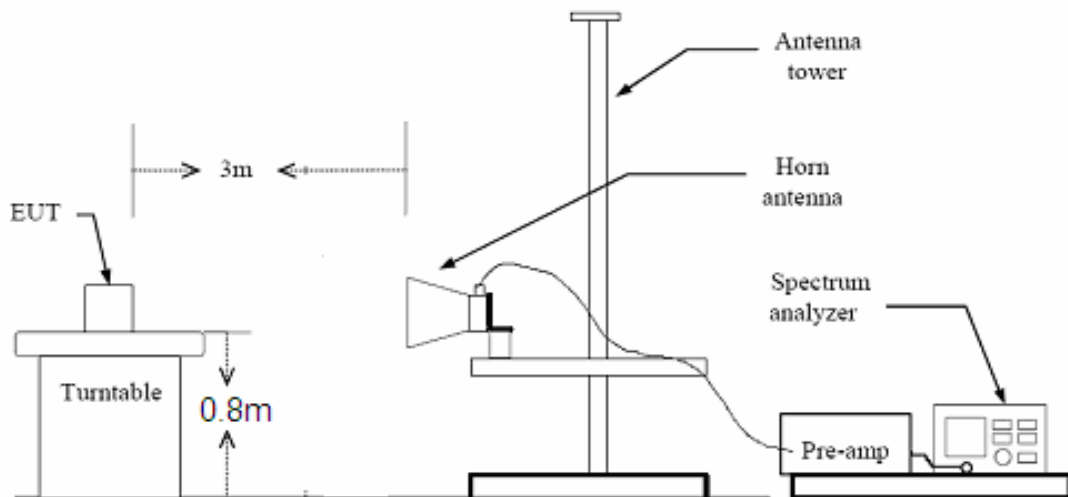
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Test setup

30MHz~~~ 1GHz



Above 1GHz



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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

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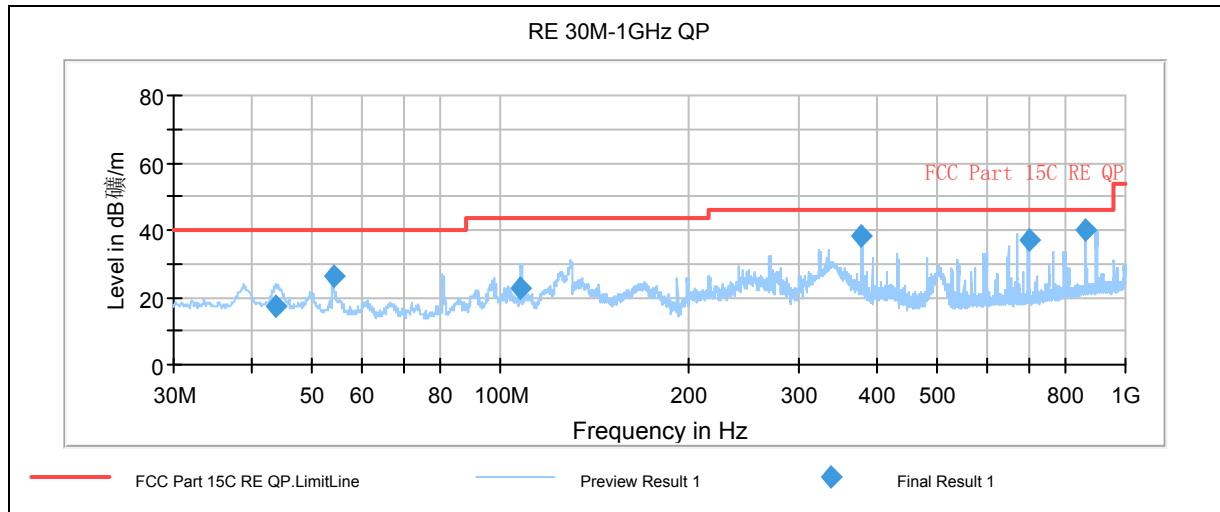
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Test result

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Note: a font (Level in dBμV/m) in the test plot = (level in dBμV/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)
43.810503	17.3	121.0	V	331.0	40.2	-22.9	22.7	40.0
54.072481	26.4	125.0	V	126.0	50.7	-24.3	13.6	40.0
107.932894	22.8	196.0	H	46.0	49.7	-26.9	20.7	43.5
377.602500	38.0	100.0	H	76.0	61.6	-23.6	8.0	46.0
699.392000	37.3	121.0	H	45.0	55.3	-18.0	8.7	46.0
863.998750	40.0	100.0	H	39.0	55.4	-15.4	6.0	46.0

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

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

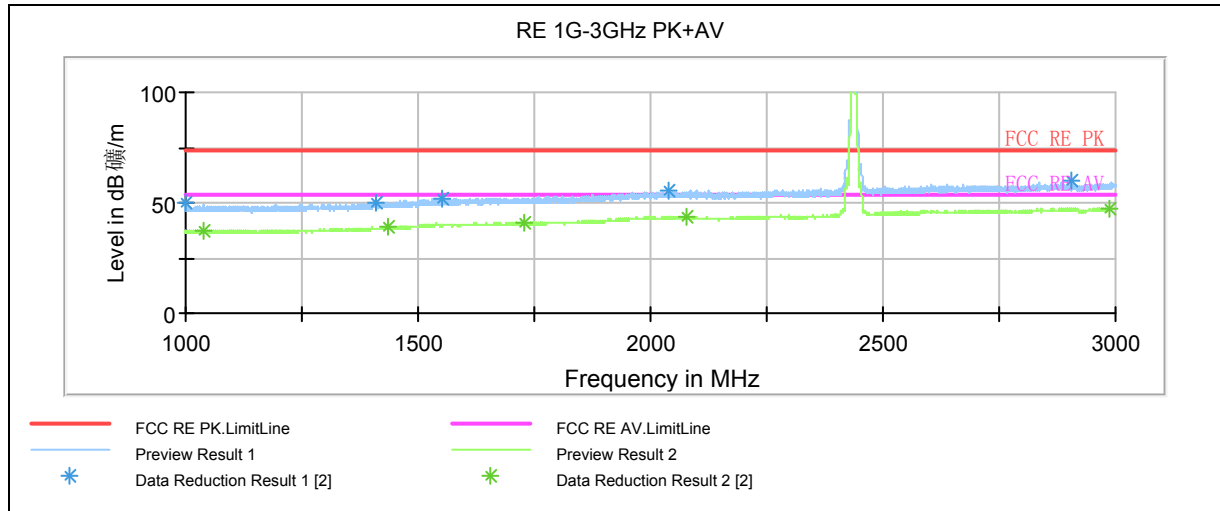
3. Margin = Limit – Quasi-Peak

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Note: a font (Level in dBμV/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)
1038.250000	46.5	100.0	H	52.0	48.7	-2.2
1435.250000	47.9	100.0	H	134.0	48.7	-0.8
1729.750000	50.4	100.0	H	104.0	49.4	1.0
2076.500000	52.7	100.0	V	301.0	48.8	3.9
2436.000000	108.8	100.0	H	15.0	103.7	5.1
2987.500000	56.8	100.0	H	82.0	48.6	8.2

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

2. Peak = Reading value + Correction factor

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)
1001.500000	36.6	100.0	H	52.0	39.2	-2.6
1410.000000	37.9	100.0	H	75.0	38.9	-1.0
1549.750000	39.5	100.0	H	75.0	39.1	0.4
2038.250000	42.8	100.0	V	240.0	39.1	3.7
2436.250000	103.0	100.0	H	15.0	97.9	5.1
2905.250000	46.2	100.0	H	141.0	38.6	7.6

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

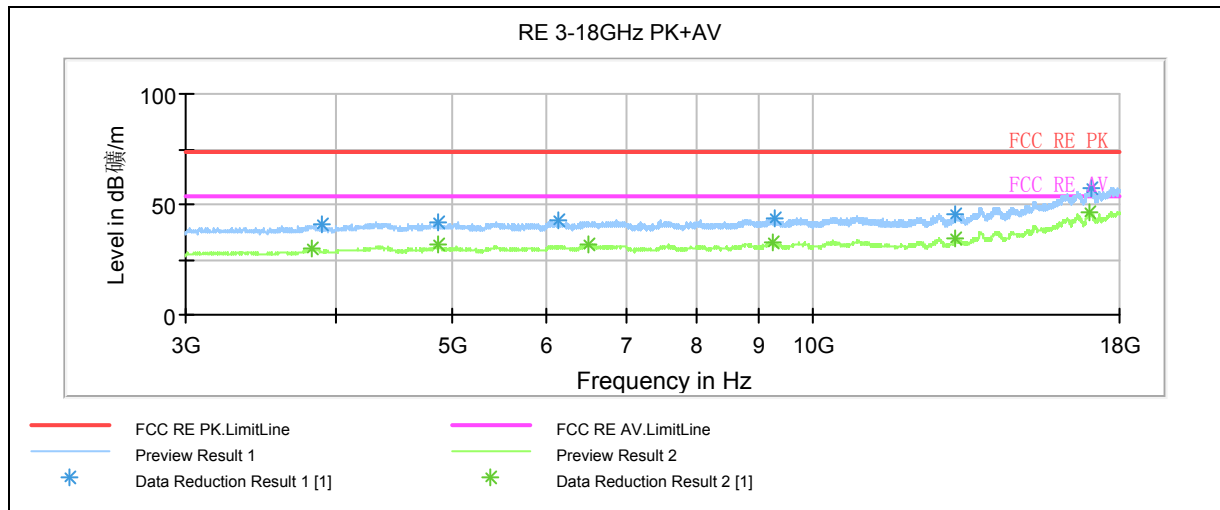
2. Average= Reading value + Correction factor

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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)
3901.875000	40.5	100.0	V	0.0	41.1	-0.6
4861.875000	41.9	100.0	H	219.0	39.9	2.0
6142.500000	42.6	100.0	V	304.0	38.7	3.9
9286.875000	43.7	100.0	H	0.0	35.1	8.6
13147.500000	45.8	100.0	H	219.0	33.1	12.7
17032.500000	57.7	100.0	H	154.0	36	21.7

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

2. Peak = Reading value + Correction factor

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)
3826.875000	29.8	100.0	H	266.0	29.9	-0.1
4873.125000	31.6	100.0	V	22.0	29.7	1.9
6498.750000	31.9	100.0	V	72.0	27.3	4.6
9241.875000	32.6	100.0	H	1.0	23.8	8.8
13134.375000	34.4	100.0	V	97.0	21.6	12.8
17015.625000	46.8	100.0	H	1.0	25	21.8

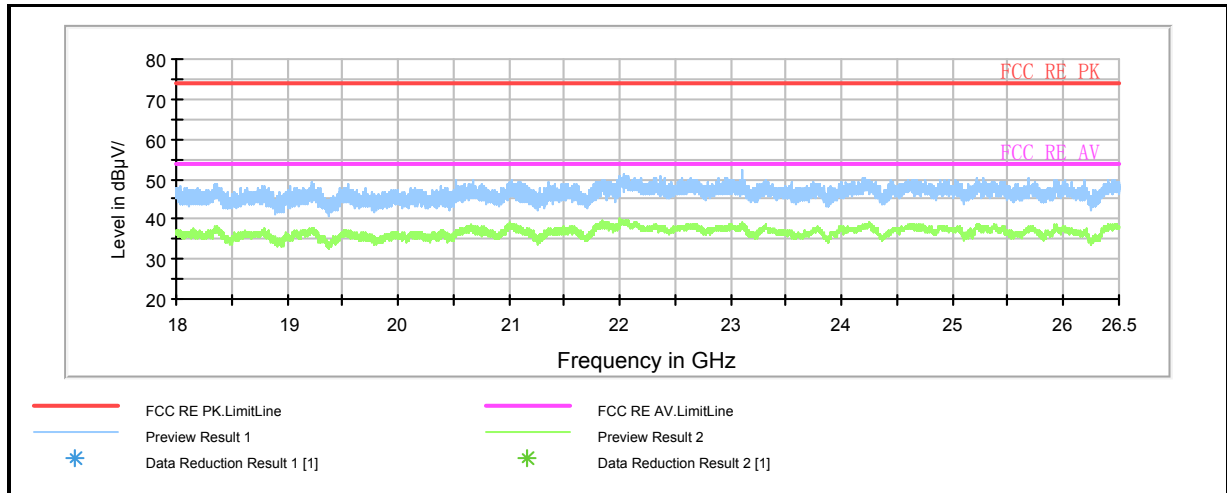
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

2. Average= Reading value + Correction factor

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

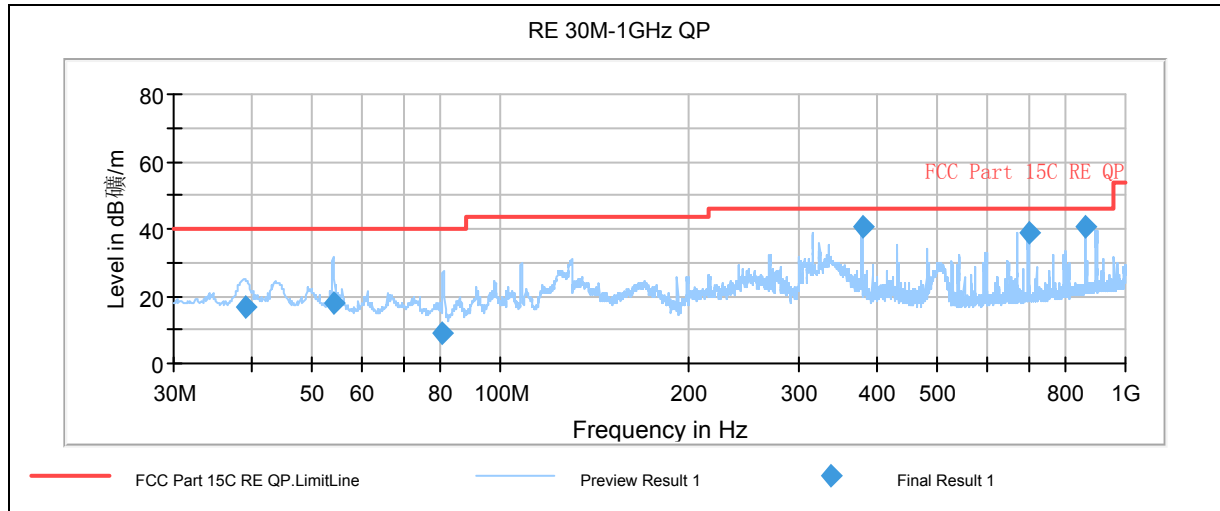
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802.11g CH6



Note: a font (Level in dB 磁/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)
39.191485	17.0	100.0	V	336.0	39.4	-22.4	23.0	40.0
54.072481	18.2	100.0	V	175.0	42.5	-24.3	21.8	40.0
80.963634	8.7	176.0	V	281.0	38.5	-29.8	31.3	40.0
378.809250	40.8	125.0	V	0.0	64.4	-23.6	5.2	46.0
699.392750	38.6	120.0	H	37.0	56.6	-18.0	7.4	46.0
863.998750	40.8	100.0	H	34.0	56.2	-15.4	5.2	46.0

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

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

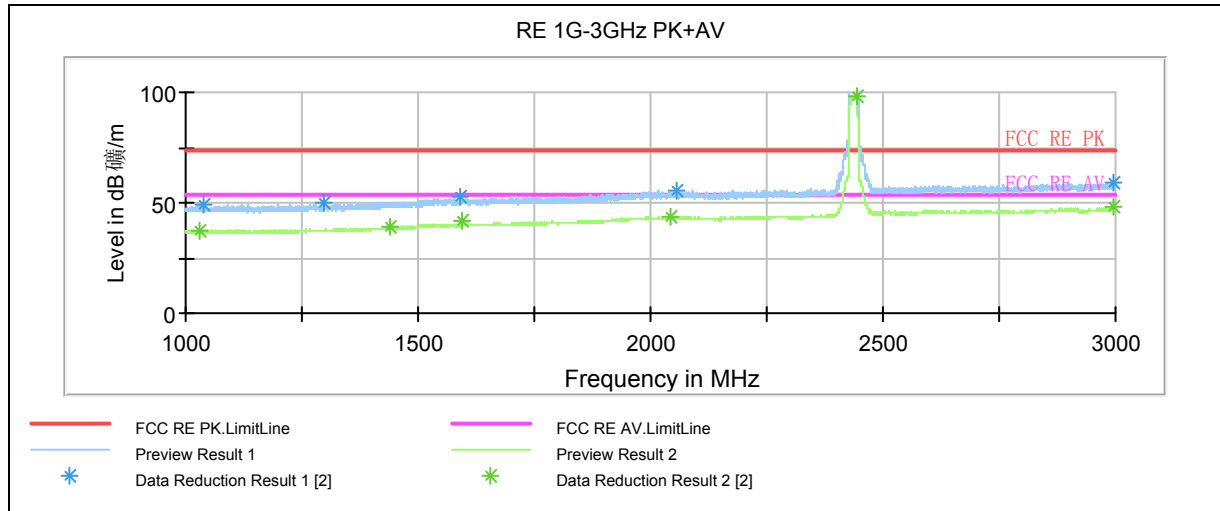
3. Margin = Limit – Quasi-Peak

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

Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz

Frequency (MHz)	Peak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBμV/m)	Correct Factor (dB)
1030.750000	48.2	100.0	V	274.0	50.4	-2.2
1440.750000	47.9	100.0	H	104.0	48.6	-0.7
1596.000000	50.7	100.0	V	104.0	49.8	0.9
2045.000000	54.2	100.0	H	74.0	50.6	3.6
2444.000000	105.5	100.0	H	3.0	100.2	5.3
2994.750000	57.1	100.0	H	104.0	48.9	8.2

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

2. Peak = Reading value + Correction factor

Frequency (MHz)	Average (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBμV/m)	Correct Factor (dB)
1039.500000	36.7	100.0	H	273.0	38.9	-2.2
1299.500000	37.2	100.0	V	340.0	38.8	-1.6
1591.250000	39.9	100.0	V	56.0	39.2	0.7
2055.250000	42.7	100.0	V	326.0	39.1	3.6
2438.500000	97.4	100.0	H	26.0	92.3	5.1
2995.000000	47.1	100.0	H	0.0	38.9	8.2

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

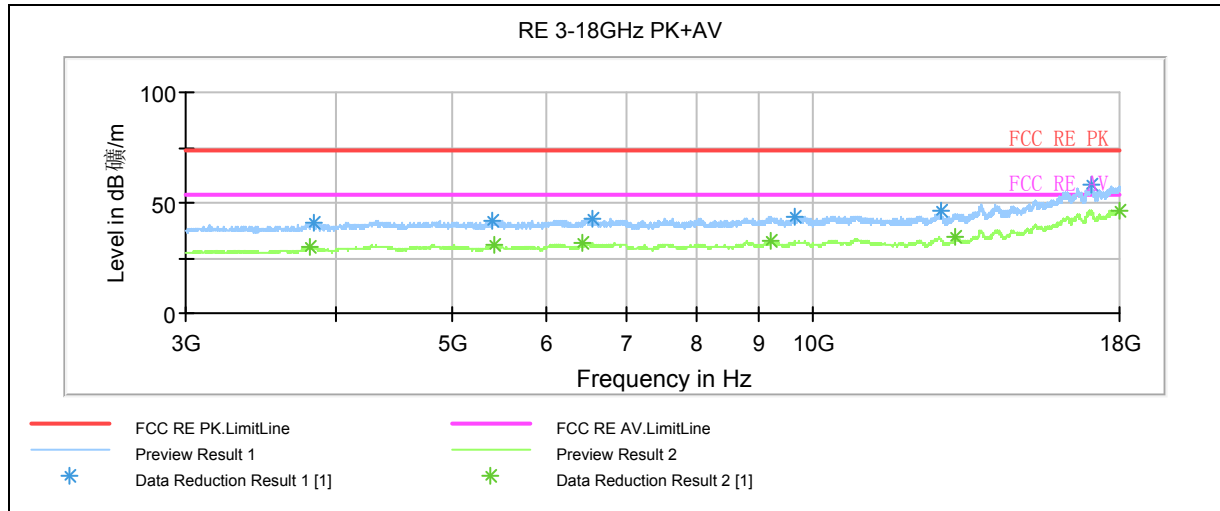
2. Average= Reading value + Correction factor

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Note: a font (Level in dBμV/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)
3836.250000	40.9	100.0	V	326.0	41.1	-0.2
5405.625000	42.0	100.0	H	74.0	39.4	2.6
6551.250000	43.0	100.0	V	109.0	38.4	4.6
9673.125000	43.5	100.0	H	53.0	34.7	8.8
12768.750000	46.0	100.0	H	85.0	33.3	12.7
17041.875000	58.1	100.0	V	229.0	36.5	21.6

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

2. Peak = Reading value + Correction factor

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)
3810.000000	29.6	100.0	H	133.0	29.9	-0.3
5430.000000	31.2	100.0	H	74.0	28.4	2.8
6431.250000	31.9	100.0	V	0.0	27.6	4.3
9232.500000	32.6	100.0	H	0.0	23.8	8.8
13143.750000	34.3	100.0	V	251.0	21.5	12.8
17992.500000	46.7	100.0	V	240.0	23.2	23.5

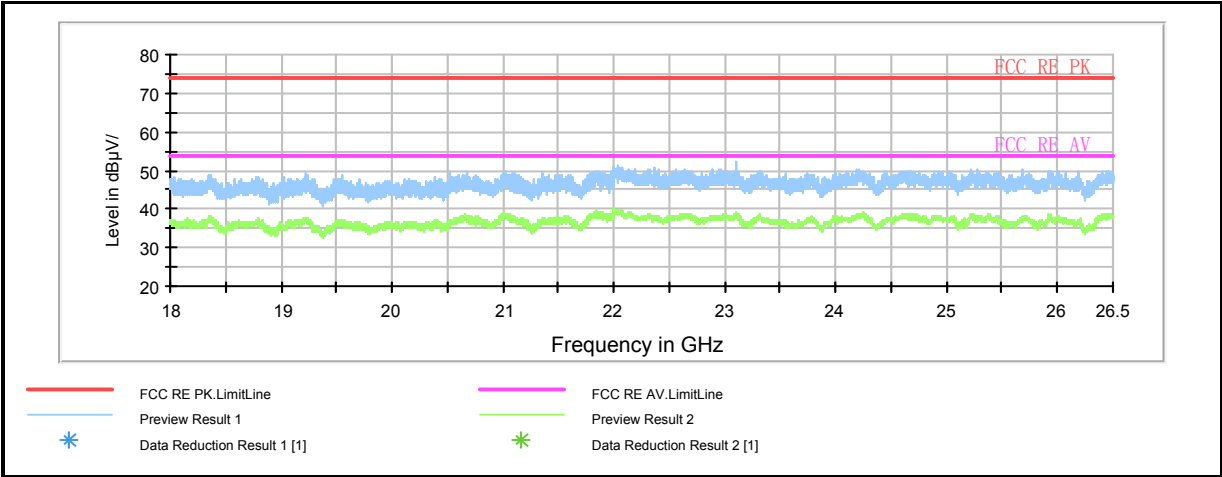
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

2. Average= Reading value + Correction factor

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

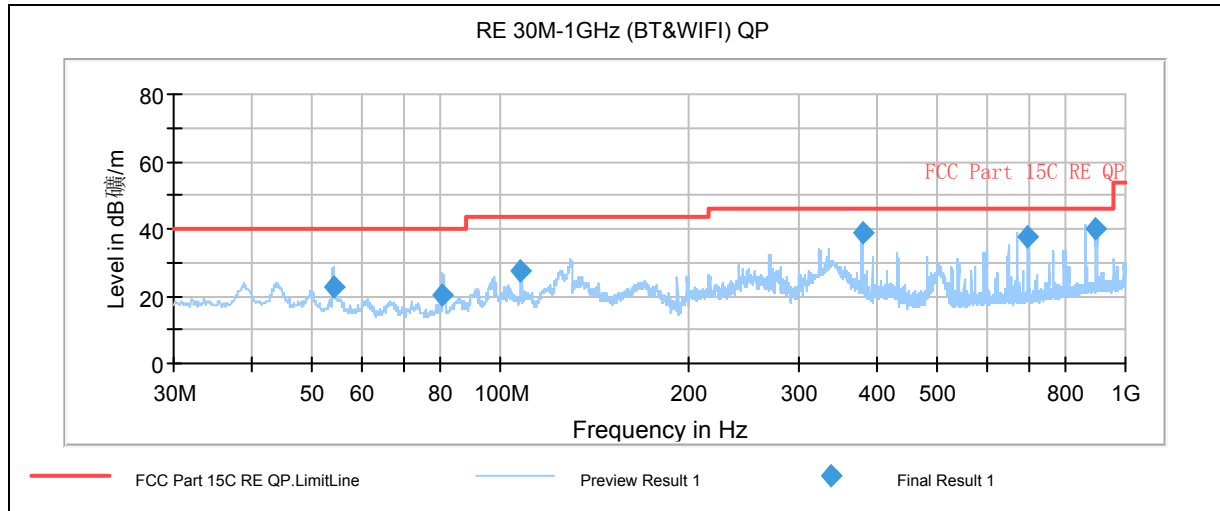
TA Technology (Shanghai) Co., Ltd.

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802.11n (HT20) CH6



Note: a font (Level in dB 电/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)
53.987500	23.0	100.0	V	185.0	49	-26.0	21.0	40.0
80.947500	20.3	125.0	V	299.0	52.1	-31.8	21.7	40.0
107.902500	27.3	125.0	H	52.0	55.8	-28.5	17.2	43.5
378.810000	39.0	125.0	V	0.0	64.3	-25.3	6.4	46.0
697.057500	37.6	121.0	H	43.0	56.8	-19.2	8.0	46.0
896.190000	40.0	100.0	H	29.0	56.3	-16.3	10.0	46.0

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

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

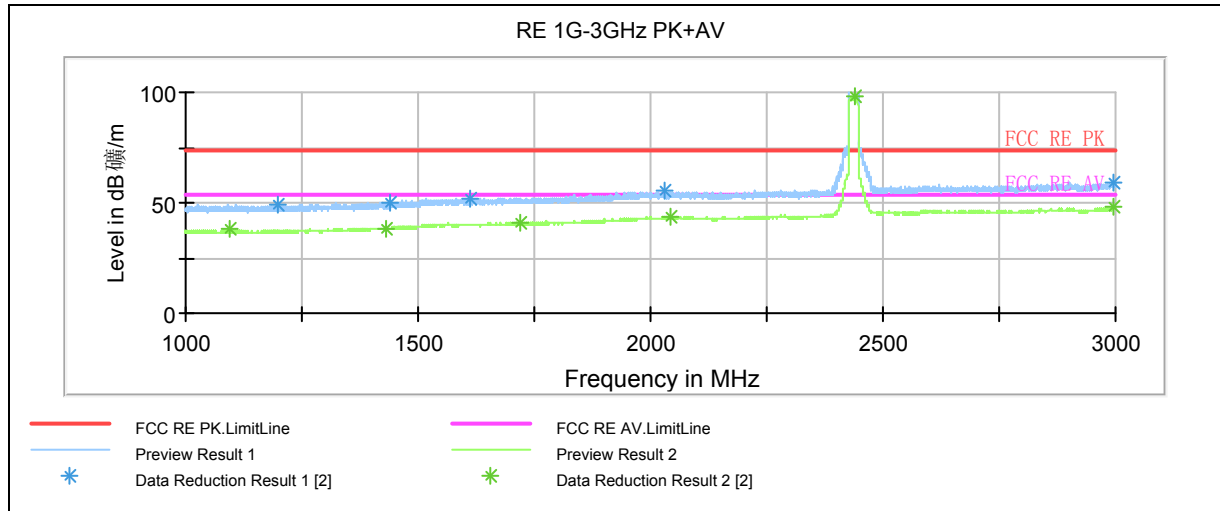
3. Margin = Limit – Quasi-Peak

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Note: a font (Level in dB (dBμV/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)
1095.500000	48.1	100.0	H	171.0	50.5	-2.4
1430.500000	47.4	100.0	H	86.0	48.2	-0.8
1720.750000	50.7	100.0	V	231.0	49.6	1.1
2042.750000	53.2	100.0	H	71.0	49.5	3.7
2440.000000	105.9	100.0	V	41.0	100.7	5.2
2997.000000	57.7	100.0	V	321.0	49.5	8.2

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

2. Peak = Reading value + Correction factor

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)
1196.500000	36.9	100.0	H	250.0	39.1	-2.2
1440.250000	38.2	100.0	V	186.0	38.9	-0.7
1611.000000	40.0	100.0	V	246.0	39.2	0.8
2032.250000	42.7	100.0	V	313.0	39.1	3.6
2443.750000	97.4	100.0	V	31.0	92.1	5.3
2996.250000	47.0	100.0	V	351.0	38.8	8.2

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

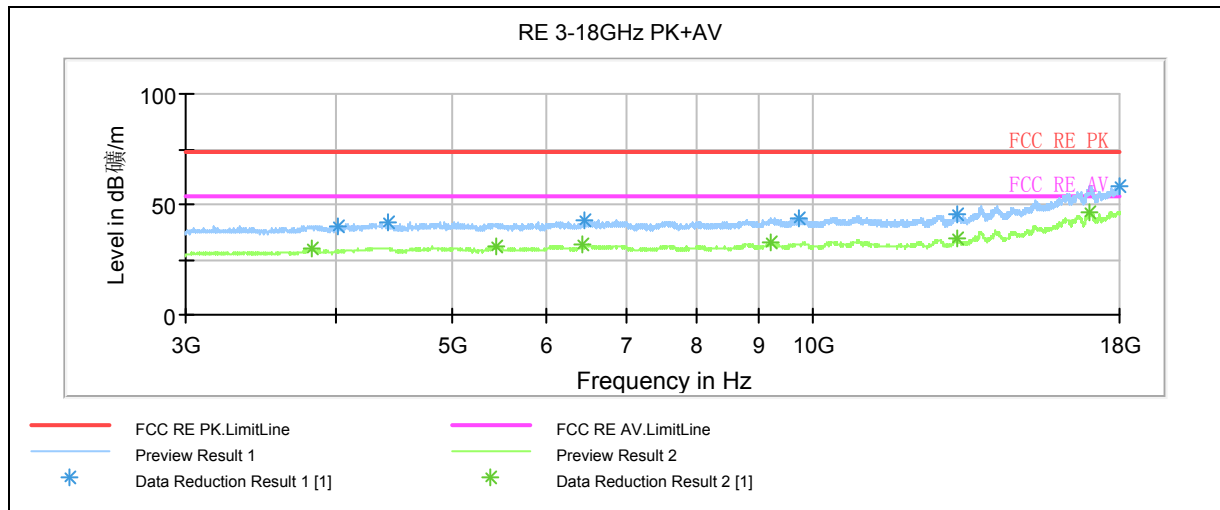
2. Average= Reading value + Correction factor

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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)
4025.625000	40.4	100.0	V	0.0	40.9	-0.5
4426.875000	41.9	100.0	H	177.0	40.7	1.2
6448.125000	42.5	100.0	V	225.0	38	4.5
9733.125000	43.9	100.0	H	58.0	35.2	8.7
13168.125000	45.5	100.0	V	247.0	32.8	12.7
17990.625000	58.0	100.0	V	0.0	34.5	23.5

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

2. Peak = Reading value + Correction factor

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)
3823.125000	29.8	100.0	H	80.0	29.9	-0.1
5443.125000	30.6	100.0	H	58.0	27.8	2.8
6431.250000	31.8	100.0	V	0.0	27.5	4.3
9232.500000	33.0	100.0	V	333.0	24.2	8.8
13158.750000	34.3	100.0	H	256.0	21.6	12.7
17017.500000	46.6	100.0	H	233.0	24.8	21.8

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

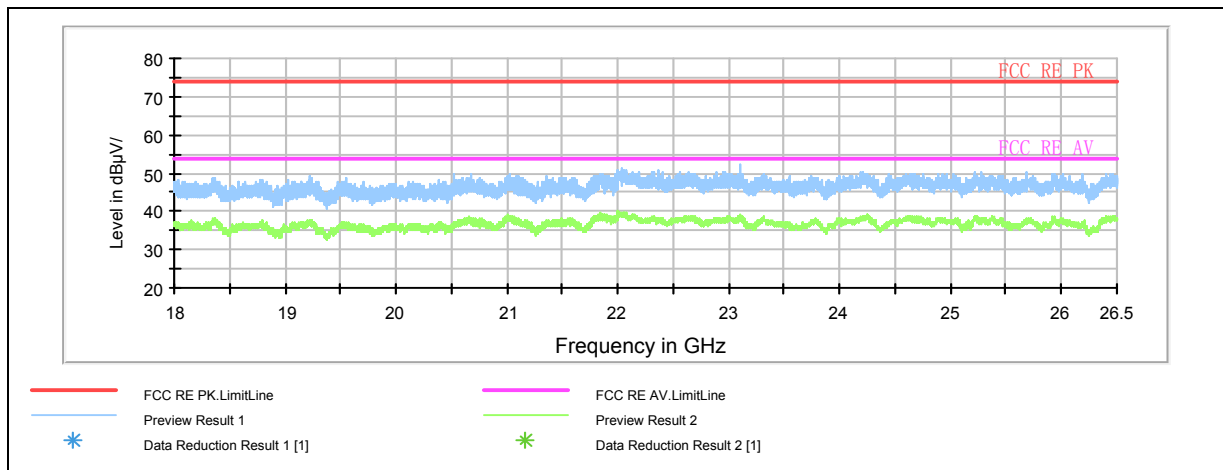
2. Average= Reading value + Correction factor

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

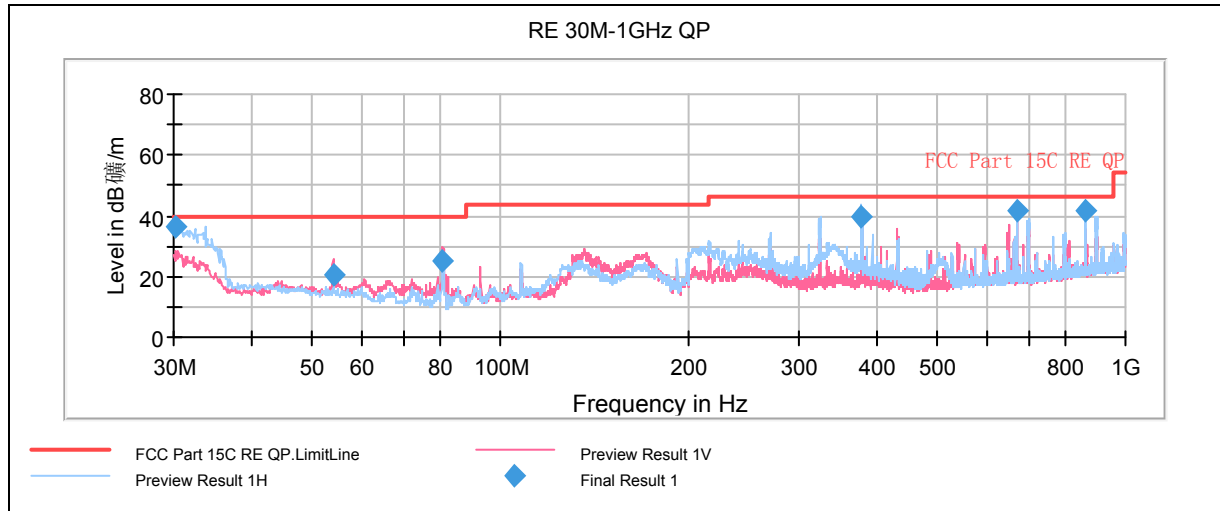
TA Technology (Shanghai) Co., Ltd.

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Note: a font (Level in dB 磁/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)
30.246894	36.6	100.0	H	90.0	58.4	-21.8	3.4	40.0
54.112481	20.3	100.0	V	278.0	44.6	-24.3	19.7	40.0
80.922688	24.8	125.0	V	302.0	54.7	-29.9	15.2	40.0
377.600500	40.0	100.0	H	65.0	63.6	-23.6	6.0	46.0
671.978750	42.0	125.0	H	95.0	60.2	-18.2	4.0	46.0
863.998750	41.4	100.0	H	32.0	56.8	-15.4	4.6	46.0

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

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

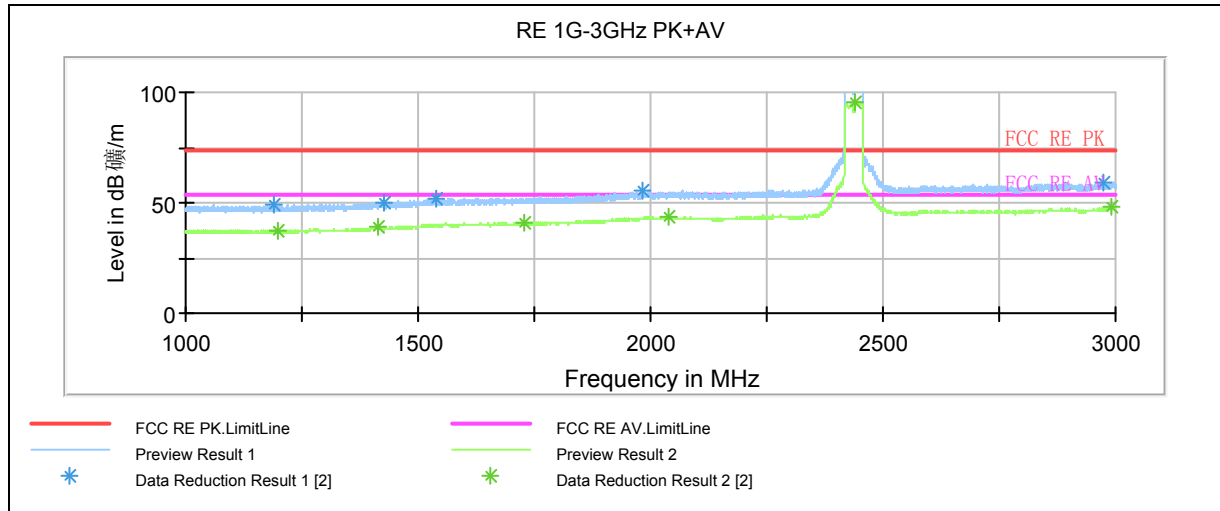
3. Margin = Limit – Quasi-Peak

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Note: a font (Level in dBμV/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)
1197.250000	46.7	100.0	V	71.0	48.9	-2.2
1411.750000	47.5	100.0	H	225.0	48.5	-1.0
1728.500000	51.1	100.0	H	10.0	50.1	1.0
2039.500000	52.9	100.0	V	317.0	49.2	3.7
2439.500000	103.3	100.0	V	18.0	98.1	5.2
2993.250000	57.2	100.0	H	249.0	49	8.2

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

2. Peak = Reading value + Correction factor

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)
1188.500000	36.6	100.0	H	69.0	38.8	-2.2
1426.750000	37.8	100.0	H	156.0	38.7	-0.9
1538.750000	39.8	100.0	H	0.0	39.2	0.6
1984.750000	42.6	100.0	V	166.0	39.2	3.4
2444.750000	94.6	100.0	V	18.0	89.3	5.3
2975.250000	46.7	100.0	V	212.0	38.5	8.2

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

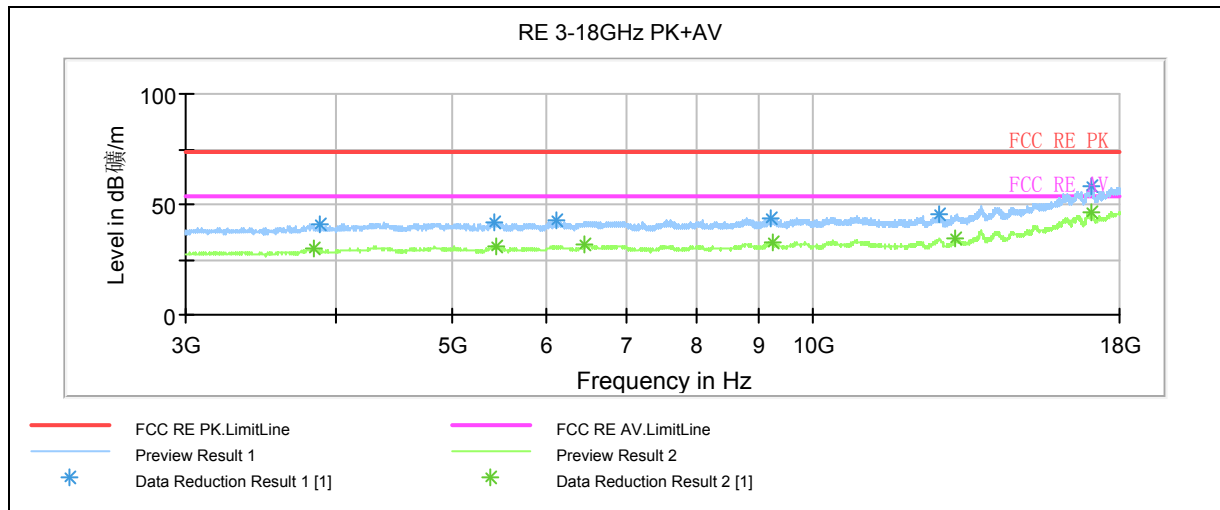
2. Average= Reading value + Correction factor

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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)
3885.000000	41.2	100.0	H	243.0	41.6	-0.4
5430.000000	41.8	100.0	V	226.0	39	2.8
6101.250000	42.5	100.0	V	268.0	38.8	3.7
9213.750000	43.3	100.0	V	322.0	34.4	8.9
12750.000000	45.3	100.0	H	176.0	32.7	12.6
17028.750000	58.5	100.0	V	334.0	36.8	21.7

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

2. Peak = Reading value + Correction factor

Frequency (MHz)	Average (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)
3838.125000	29.7	100.0	V	0.0	29.9	-0.2
5435.625000	31.3	100.0	V	301.0	28.5	2.8
6457.500000	31.8	100.0	V	0.0	27.1	4.7
9253.125000	32.8	100.0	H	210.0	24.1	8.7
13138.125000	34.2	100.0	H	0.0	21.4	12.8
17028.750000	46.6	100.0	V	334.0	24.9	21.7

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

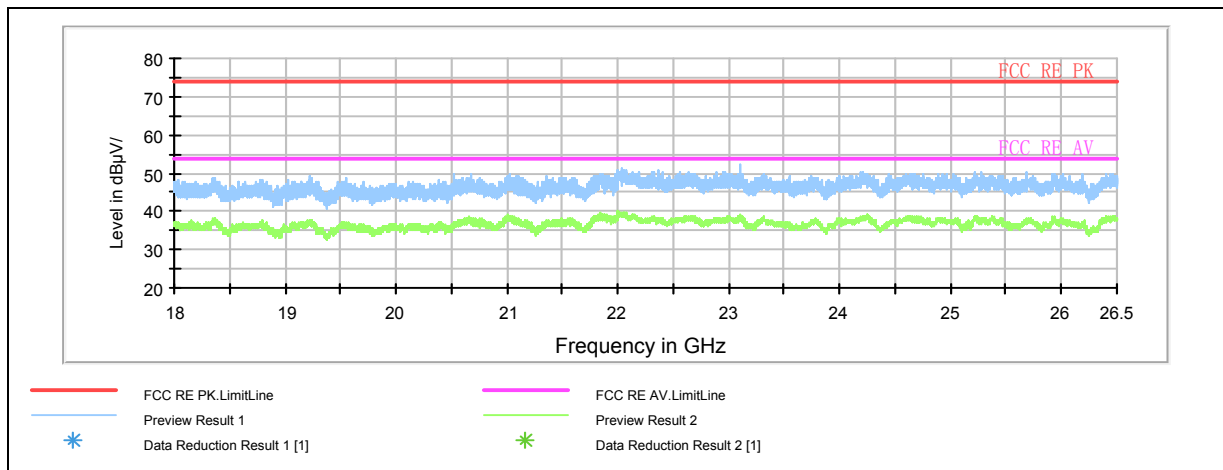
2. Average= Reading value + Correction factor

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

2.10. Conducted Emissions

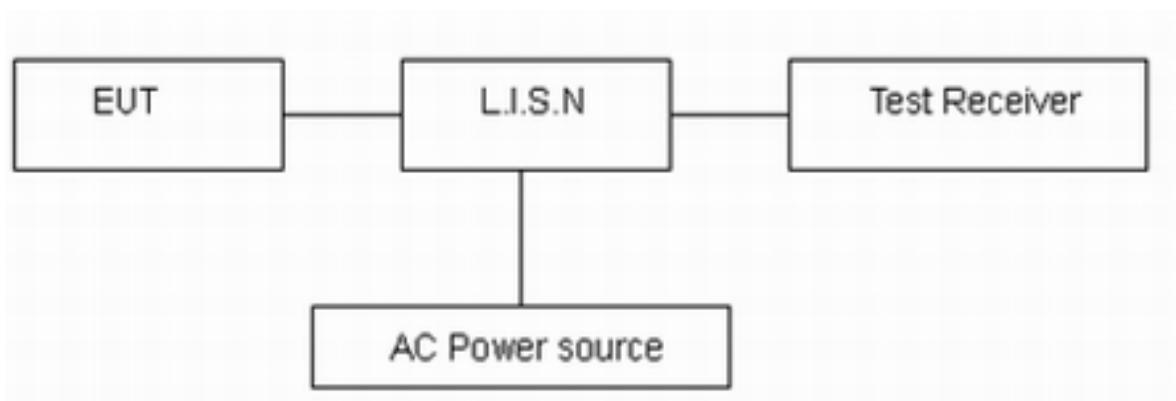
Ambient condition

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(dBμV)	
	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.

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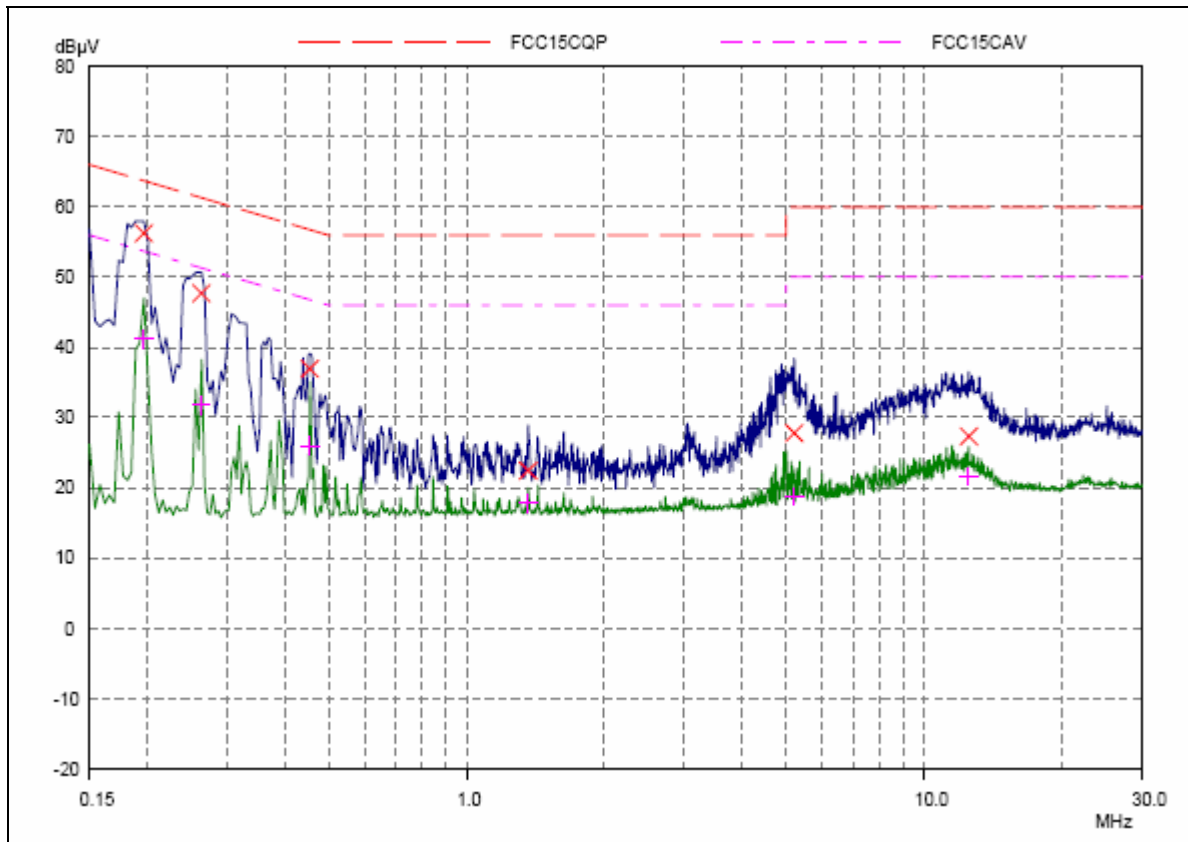
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Test Results:

802.11b CH6



Final Measurement Results					
Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.19687	56.21	63.74	7.53	L1	gnd
0.26328	47.72	61.33	13.61	L1	gnd
0.45468	36.93	56.79	19.86	L1	gnd
1.36484	22.45	56.00	33.55	L1	gnd
5.20468	27.78	60.00	32.22	L1	gnd
12.5289	27.30	60.00	32.70	L1	gnd
Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.19687	41.16	53.74	12.58	L1	gnd
0.26328	31.72	51.33	19.61	L1	gnd
0.45468	25.92	46.79	20.87	L1	gnd
1.36484	17.77	46.00	28.23	L1	gnd
5.20468	18.67	50.00	31.33	L1	gnd
12.5289	21.55	50.00	28.45	L1	gnd

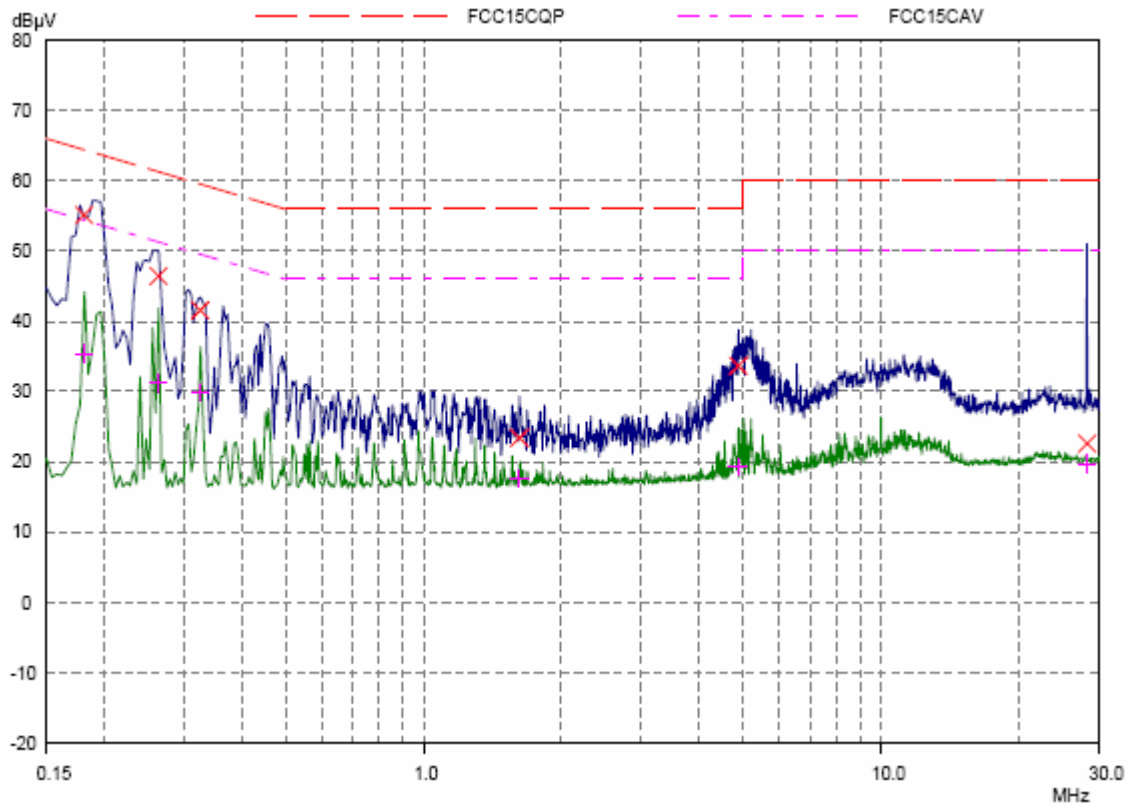
L Line

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Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.18125	55.11	64.43	9.32	N	gnd
0.26328	46.46	61.33	14.87	N	gnd
0.32578	41.55	59.56	18.01	N	gnd
1.61875	23.39	56.00	32.61	N	gnd
4.88046	33.66	56.00	22.34	N	gnd
28.2125	22.57	60.00	37.43	N	gnd
Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.18125	35.43	54.43	19.00	N	gnd
0.26328	31.17	51.33	20.16	N	gnd
0.32578	29.83	49.56	19.73	N	gnd
1.61875	17.61	46.00	28.39	N	gnd
4.88046	19.30	46.00	26.70	N	gnd
28.2125	19.68	50.00	30.32	N	gnd

N Line

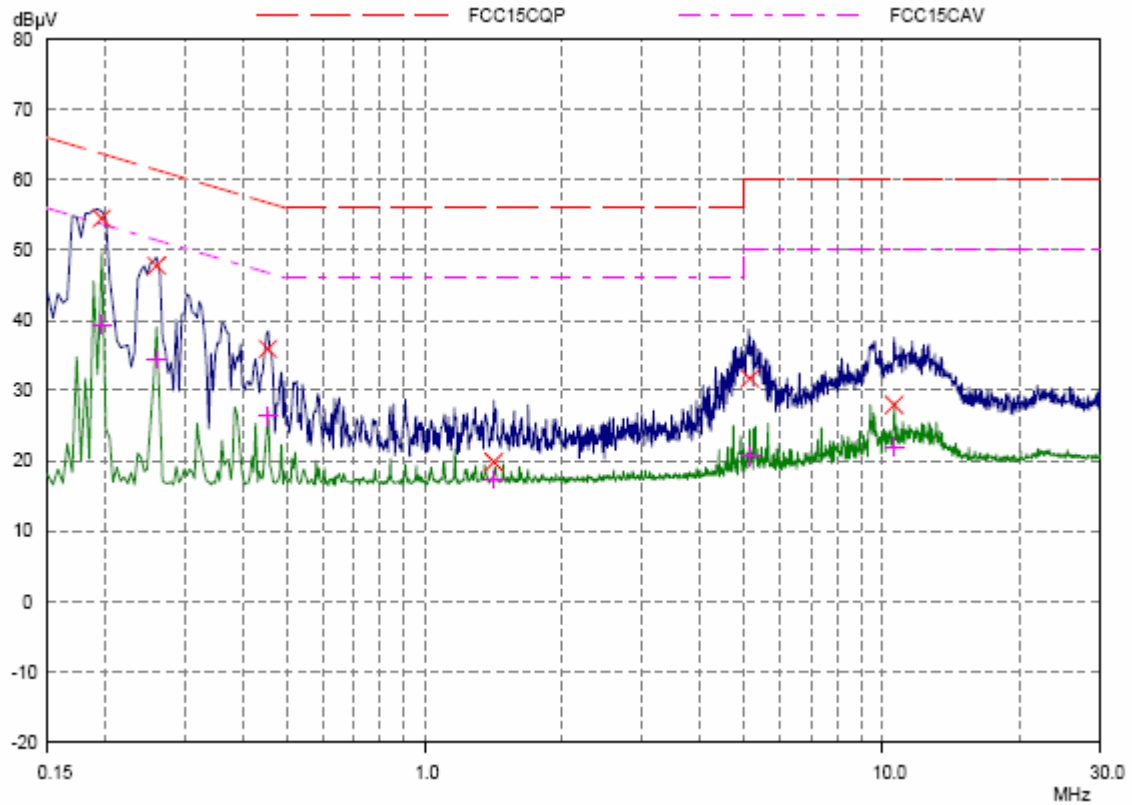
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Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.19687	54.49	63.74	9.25	L1	gnd
0.25937	47.77	61.45	13.68	L1	gnd
0.45468	35.95	56.79	20.84	L1	gnd
1.41562	19.80	56.00	36.20	L1	gnd
5.13828	31.71	60.00	28.29	L1	gnd
10.63828	27.95	60.00	32.05	L1	gnd

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.19687	39.37	53.74	14.37	L1	gnd
0.25937	34.38	51.45	17.07	L1	gnd
0.45468	26.37	46.79	20.42	L1	gnd
1.41562	17.32	46.00	28.68	L1	gnd
5.13828	20.55	50.00	29.45	L1	gnd
10.63828	22.03	50.00	27.97	L1	gnd

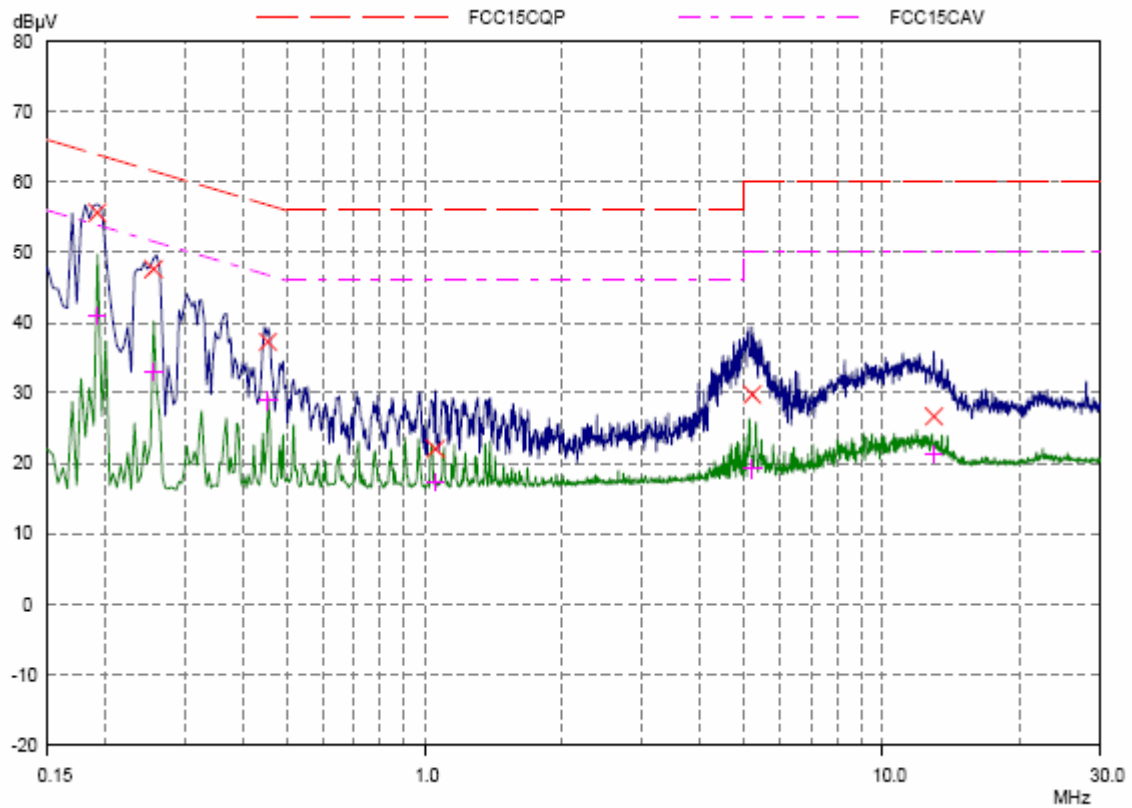
L Line

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Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.19298	55.66	63.91	8.25	N	gnd
0.25546	47.58	61.58	14.00	N	gnd
0.45468	37.25	56.79	19.54	N	gnd
1.05625	22.03	56.00	33.97	N	gnd
5.19298	29.77	60.00	30.23	N	gnd
12.97031	26.68	60.00	33.32	N	gnd

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.19298	41.05	53.91	12.86	N	gnd
0.25546	33.04	51.58	18.54	N	gnd
0.45468	28.90	46.79	17.89	N	gnd
1.05625	17.25	46.00	28.75	N	gnd
5.19298	19.17	50.00	30.83	N	gnd
12.97031	21.27	50.00	28.73	N	gnd

N Line

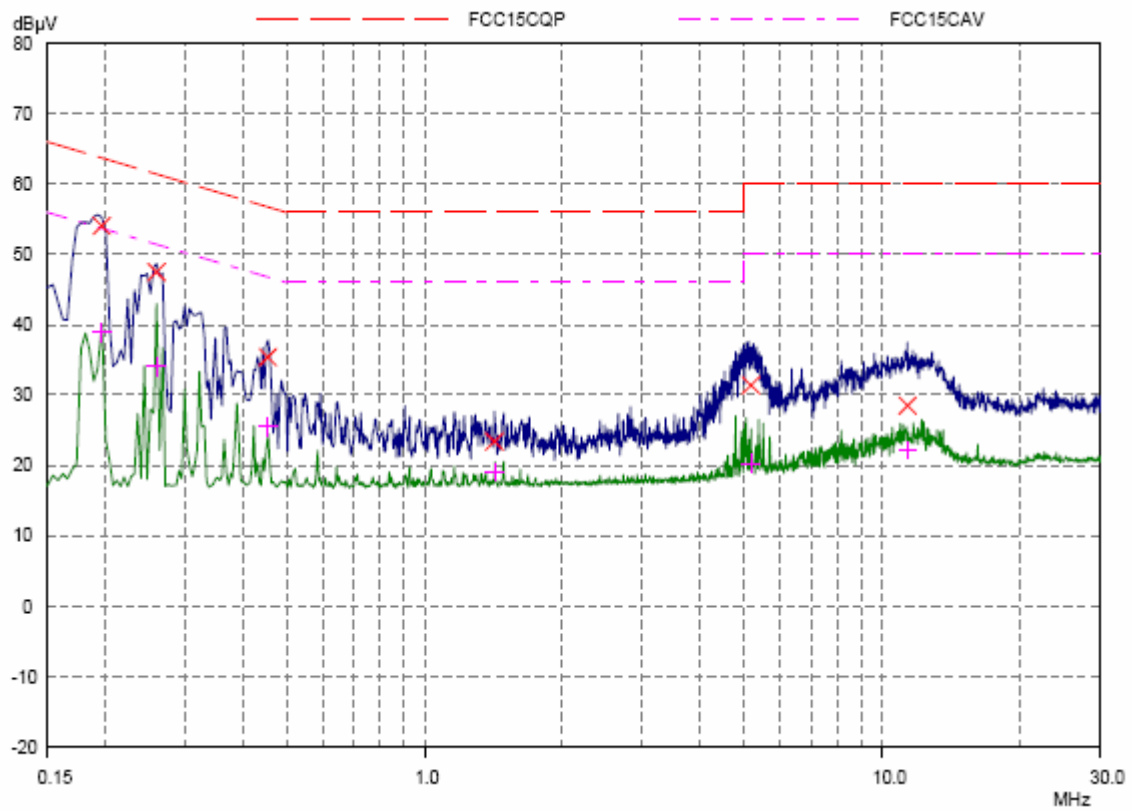
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Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.19687	54.05	63.74	9.69	L1	gnd
0.25937	47.49	61.45	13.96	L1	gnd
0.45468	35.37	56.79	21.42	L1	gnd
1.41953	23.38	56.00	32.62	L1	gnd
5.17734	31.39	60.00	28.61	L1	gnd
11.34531	28.45	60.00	31.55	L1	gnd

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.19687	38.93	53.74	14.81	L1	gnd
0.25937	34.03	51.45	17.42	L1	gnd
0.45468	25.54	46.79	21.25	L1	gnd
1.41953	19.03	46.00	26.97	L1	gnd
5.17734	20.24	50.00	29.76	L1	gnd
11.34531	22.11	50.00	27.89	L1	gnd

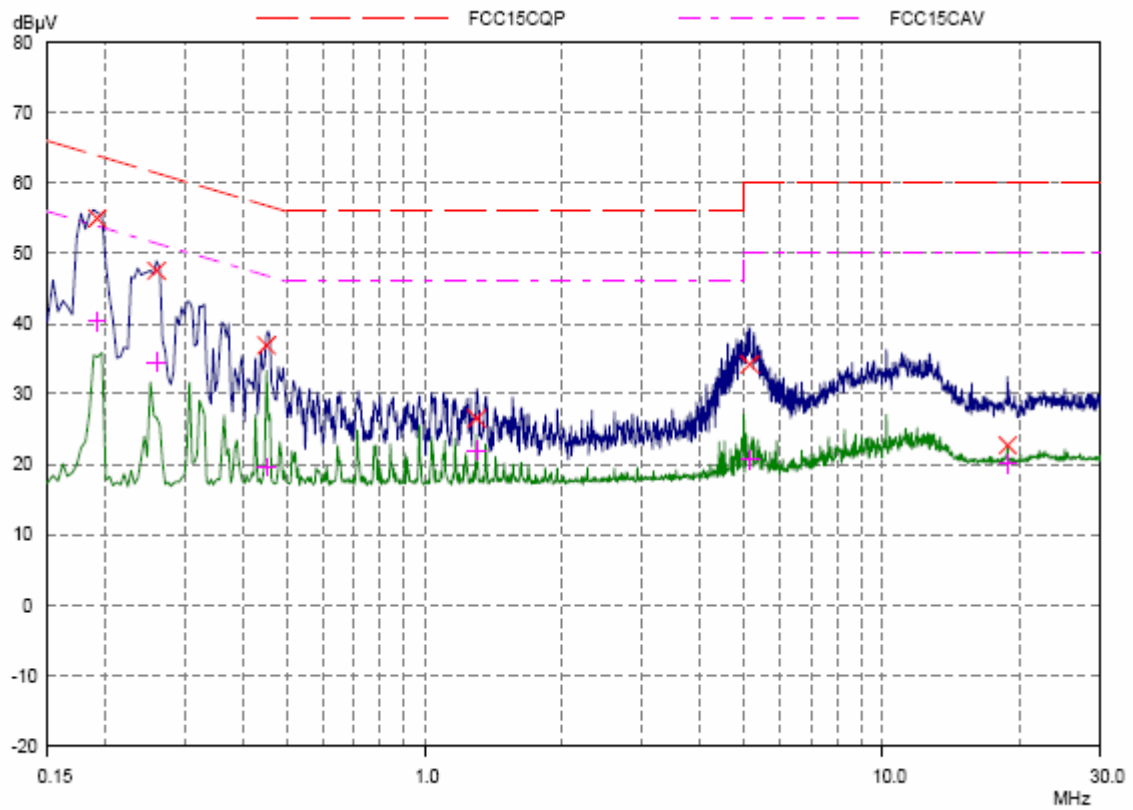
L Line

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Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.19296	54.98	63.91	8.93	N	gnd
0.25937	47.53	61.45	13.92	N	gnd
0.45078	38.89	56.86	19.97	N	gnd
1.30234	26.52	56.00	29.48	N	gnd
5.13628	34.21	60.00	25.79	N	gnd
18.78281	22.65	60.00	37.35	N	gnd
Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.19296	40.36	53.91	13.55	N	gnd
0.25937	34.54	51.45	16.91	N	gnd
0.45078	19.52	46.86	27.34	N	gnd
1.30234	22.03	46.00	23.97	N	gnd
5.13628	20.63	50.00	29.37	N	gnd
18.78281	20.02	50.00	29.98	N	gnd

N Line

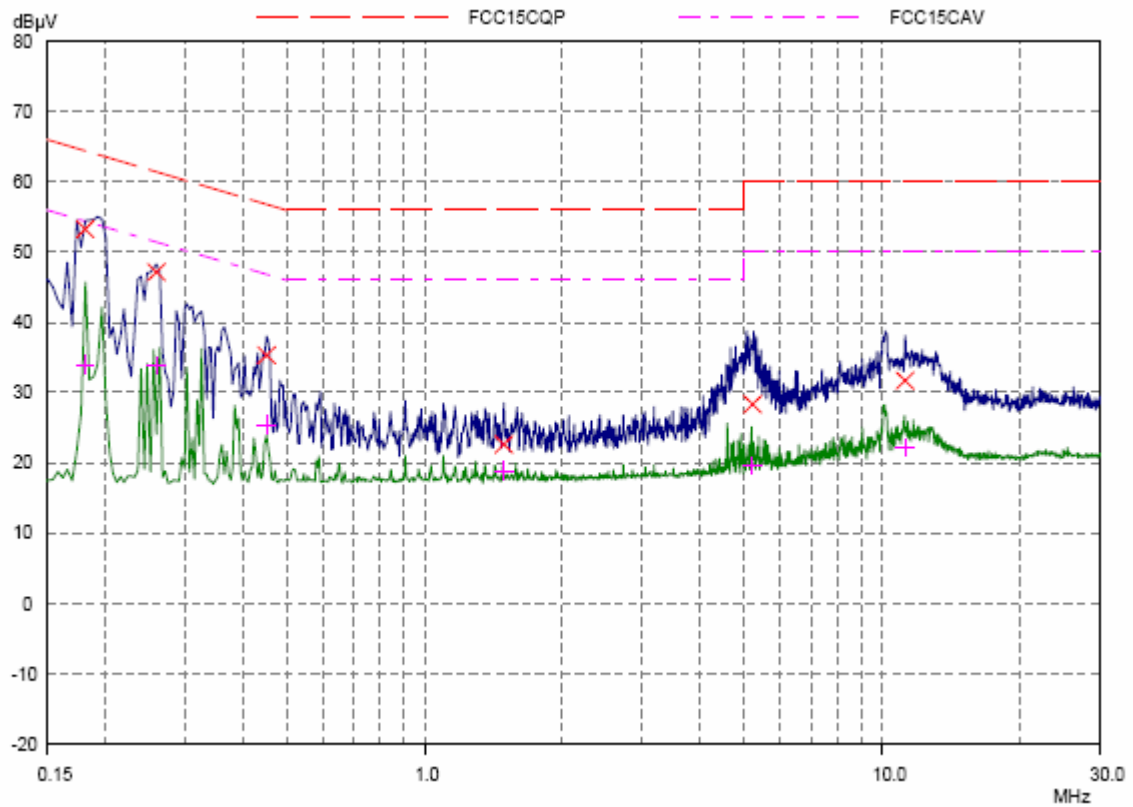
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Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.18125	53.27	64.43	11.16	L1	gnd
0.25937	47.15	61.45	14.30	L1	gnd
0.45078	35.31	56.86	21.55	L1	gnd
1.48984	22.61	56.00	33.39	L1	gnd
5.20859	28.30	60.00	31.70	L1	gnd
11.22031	31.70	60.00	28.30	L1	gnd

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.18125	33.95	54.43	20.48	L1	gnd
0.25937	33.80	51.45	17.65	L1	gnd
0.45078	25.38	46.86	21.48	L1	gnd
1.48984	18.82	46.00	27.18	L1	gnd
5.20859	19.58	50.00	30.42	L1	gnd
11.22031	22.18	50.00	27.82	L1	gnd

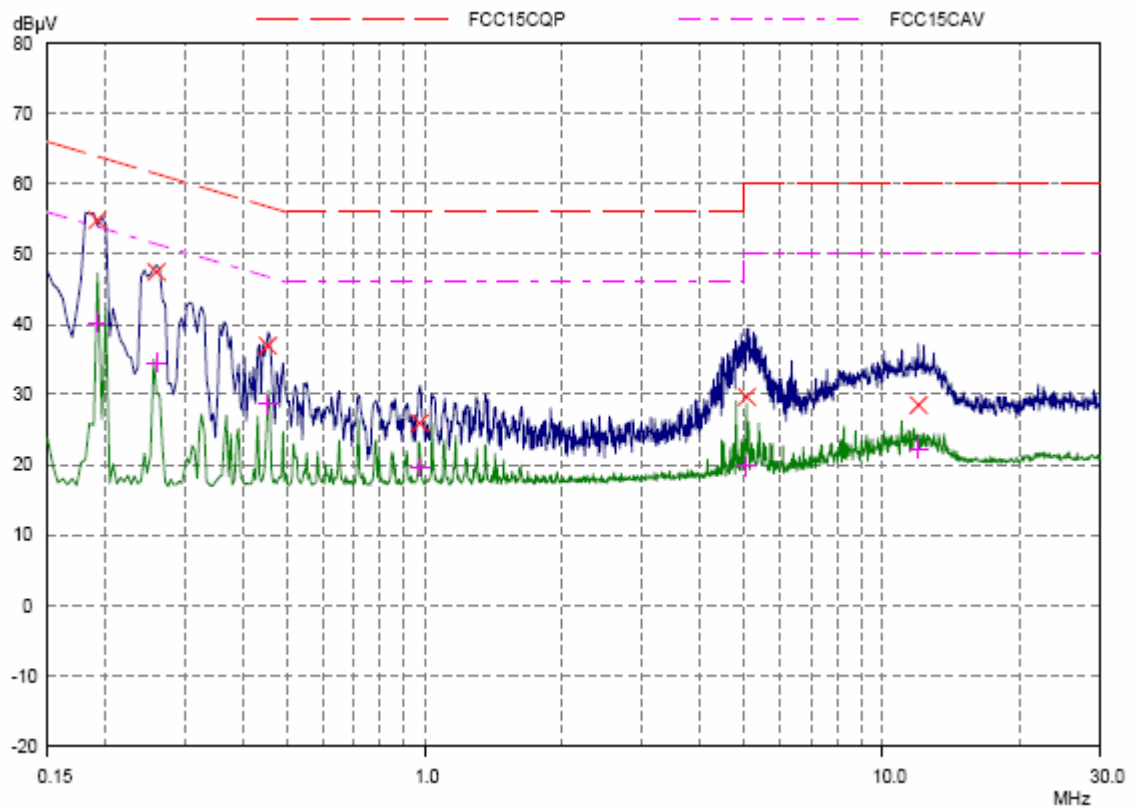
L Line

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Final Measurement Results

Frequency MHz	QP Level dBμV	QP Limit dBμV	QP Delta dB	Phase -	PE -
0.19298	54.84	63.91	9.07	N	gnd
0.25937	47.47	61.45	13.98	N	gnd
0.45468	36.93	56.79	19.86	N	gnd
0.97812	25.89	56.00	30.11	N	gnd
5.05625	29.65	60.00	30.35	N	gnd
12.01718	28.46	60.00	31.54	N	gnd

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB	Phase -	PE -
0.19298	40.19	53.91	13.72	N	gnd
0.25937	34.49	51.45	16.96	N	gnd
0.45468	28.57	46.79	18.22	N	gnd
0.97812	19.60	46.00	26.40	N	gnd
5.05625	19.81	50.00	30.19	N	gnd
12.01718	22.26	50.00	27.74	N	gnd

N Line

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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	2012-01-16	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	10 dB Attenuator	3M-10	WENSCHER	Z6264	2013-01-08	One year
13	Wideband Power Sensors	N1923A	Agilent	MY51220004	2012-06-01	One year
14	Universal Radio Communication Tester	E5515C	Agilent	MY48367192	2012-06-30	One year

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