RF TEST REPORT

Applicant	NOKIA Shanghai Bell Co. Ltd.
FCC ID	2ADZRG240WFV2
Product	7368 ISAM GPON ONU
Brand	NOKIA
Model	G-240W-F
Report No.	YBA1707-0068RF01R2
Issue Date	October 19, 2017

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 15C (2017)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Performed by: Xianqing Li *Approved by: Kai Xu*

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Summary of measurement results

Number	Summary of measurements of results	Clause in FCC rules	Verdict
1	Maximum Average conducted output power	15.247(b)(3)	PASS
2	6 dB bandwidth	15.247(a)(2)	PASS
3	Power spectral density	15.247(e)	PASS
4	Band Edge	15.247(d)	PASS
5	Spurious RF Conducted Emissions	15.247(d)	PASS
6	Radiated Emissions in restricted frequency bands	15.247(d),15.205,15.209	PASS
7	Radiated Emissions	15.247(d),15.205,15.209	PASS
8	Conducted Emissions	15.207	PASS
Date of Testing: July 13, 2017~August 3, 2017			

1. Test Laboratory

1.1. Notes of the test report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above. This report must not be used by the client to claim product certification, approval, or endorsement by any government agencies.

1.2. Test facility

CNAS (accreditation number: L2264)

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

FCC (recognition number is 428261)

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

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

VCCI (recognition number is C-4595, T-2154, R-4113, G-10766)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

1.3. Testing Location

Company:	TA Technology (Shanghai) Co., Ltd.
Address:	No.145, Jintang Rd, Tangzhen Industry Park, Pudong
City:	Shanghai
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E-mail:	xukai@ta-shanghai.com

2. General Description of Equipment under Test

Client Information

Applicant	NOKIA Shanghai Bell Co. Ltd
Applicant address	388, Ningqiao road, Pudong Jinqiao, Shanghai, P.R. China 201206
Manufacturer	NOKIA Shanghai Bell Co. Ltd
Manufacturer address	388, Ningqiao road, Pudong Jinqiao, Shanghai, P.R. China 201206

General information

EUT Description	
Model:	G-240W-F
Hardware Version:	PEM 1
Software Version:	3FE46606AFEA40
Power Supply:	AC adapter
Antenna Type:	External Antenna
Antenna Connector:	A permanently attached antenna (meet with the standard FCC Part 15.203 requirement)
Antenna Gain:	5 dBi
Test Mode:	802.11b 802.11g, 802.11n(HT20/HT40);
Modulation Type:	802.11b: DSSS; 802.11g/n(HT20/HT40): OFDM
Max. Conducted Power	Wi-Fi 2.4G :19.47dBm
Operating Frequency Range(s)	802.11b/g/n(HT20): 2412 ~ 2462 MHz 802.11n(HT40): 2422 ~ 2452 MHz
EUT Accessory	
Adapter	Manufacturer: DONGGUAN SHILONG FUHUA ELECTRONIC CO., LTD Model: UES18W3-120150SPAU
Note: The information of the EUT is declared by the manufacturer.	

Information of configuration

Configuration NO.:	Kit Code	EMA Code	Part Description	Power Adaptor
1	3FE47245AA	3FE47087AA	GPON indoor ONT, 2POTS, 4GE, WIFI 200mW, SC/APC, Nokia Logo, 5dBi antenna. 1.5m CAT-5E Ethernet cable with RJ-45 endpoint, 1.5m RJ-11 cable, AC/DC power adapter	UES18W3-120150SPAU
2	3FE47245AB	3FE47087AB	GPON indoor ONT, 2POTS, 4GE, WIFI 200mW, SC/APC, ETB Logo, 5dBi antenna. 1.5m CAT-5E Ethernet cable with RJ-45 endpoint, 1.5m RJ-11 cable, AC/DC power adapter	UES18W3-120150SPAU
Note: During the test, the test was performed in two configurations; only the worst case (configuration 1) will be recorded in this report.				

3. Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards

- **FCC CFR47 Part 15C (2017) Radio Frequency Devices**
- **ANSI C63.10 (2013)**
- **KDB 558074 D01 DTS Meas Guidance v04**
- **KDB 662911 D01 Multiple Transmitter Output v02r01**

4. Test Configuration

Test Mode

The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

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.

In order to find the worst case condition, Pre-tests are needed at the presence of different data rate. Preliminary tests have been done on all the configuration for confirming worst case. Data rate below means worst-case rate of each test item.

Worst-case data rates are shown as following table.

Band	Data Rate		
	Antenna 1	Antenna 2	MIMO
802.11b	1 Mbps	1 Mbps	/
802.11g	6 Mbps	6 Mbps	/
802.11n HT20	MCS0	MCS0	MCS8
802.11n HT40	MCS0	MCS0	MCS8

The worst case Antenna mode for each of the following tests for Wi-Fi:

Test Cases	Antenna 1	Antenna 2	MIMO
Average Power Output –Conducted	802.11b/g	802.11b/g	802.11n HT20/ HT40
6dB Bandwidth	802.11b/g	/	802.11n HT20/ HT40
Band Edge	802.11b/g	/	802.11n HT20/ HT40
Power Spectral Density	802.11b/g	802.11b/g	802.11n HT20/ HT40
Spurious RF Conducted Emissions	802.11b/g/n HT20/ HT40	802.11b/g/n HT20/ HT40	802.11n HT20/ HT40
Radiates Emission in the Restricted Band	802.11b/g	/	802.11n HT20/ HT40
Radiates Emission	802.11b/g	/	802.11n HT20/ HT40
Conducted Emission	802.11b/g	/	802.11n HT20/ HT40

5. Test Case Results

5.1. Average Power Output –Conducted

Ambient condition

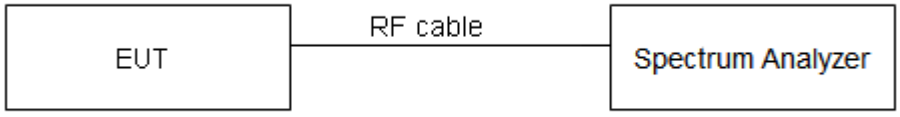
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

During the process of the testing, The EUT was connected to Spectrum Analyzer with a known loss. The EUT is max power transmission with proper modulation. The Average detector is used. We use Maximum Average Conducted Output Power Level Method in KDB 558074 D01/KDB662911 D01 for this test.

The conducted Power is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically.

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: 1 Watt."

Average Output Power	≤ 1W (30dBm)

Measurement Uncertainty

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

Test Results

SISO ANT 1

Network Standards	Carrier frequency (MHz)	Average Output Power (dBm)	Limit (dBm)	Conclusion
802.11b	2412	18.71	30	PASS
	2437	19.47	30	PASS
	2462	19.39	30	PASS
802.11g	2412	18.19	30	PASS
	2437	19.21	30	PASS
	2462	18.73	30	PASS

SISO ANT 2

Network Standards	Carrier frequency (MHz)	Average Output Power (dBm)	Limit (dBm)	Conclusion
802.11b	2412	18.27	30	PASS
	2437	19.28	30	PASS
	2462	18.97	30	PASS
802.11g	2412	17.97	30	PASS
	2437	18.49	30	PASS
	2462	18.40	30	PASS

MIMO

Network Standards	Carrier frequency (MHz)	Average Output Power (dBm)						Limit (dBm)	Conclusion
		Antenna 1		Antenna 2		Total Power			
		(dBm)	(mW)	(dBm)	(mW)	(mW)	(dBm)		
802.11n HT20	2412	15.63	36.56	16.31	42.76	79.31	18.99	30	PASS
	2437	15.80	38.02	16.71	46.88	84.90	19.29	30	PASS
	2462	15.95	39.35	16.42	43.85	83.21	19.20	30	PASS
802.11n HT40	2422	14.91	30.97	16.34	43.05	74.03	18.69	30	PASS
	2437	16.04	40.18	16.8	47.86	88.04	19.44	30	PASS
	2452	15.26	33.57	16.35	43.15	76.72	18.84	30	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power $=10\log(10^{(\text{Power antenna1 in dBm}/10)}+10^{(\text{Power antenna2 in dBm}/10)})$.

2. The manufacturer declared the transmitter output signals is CDD mode. And $N_{ss}=2$. According to KDB 662911 D01 Multiple Transmitter Output v02r01 2)f)(i): If all antennas have the same gain, Directional gain = G_{ANT} + Array Gain,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \le 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 $\log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \ge 5$.

So directional gain = G_{ANT} + Array Gain $=5+0=5$ dBi<6dBi. So the power limt is 30dBm

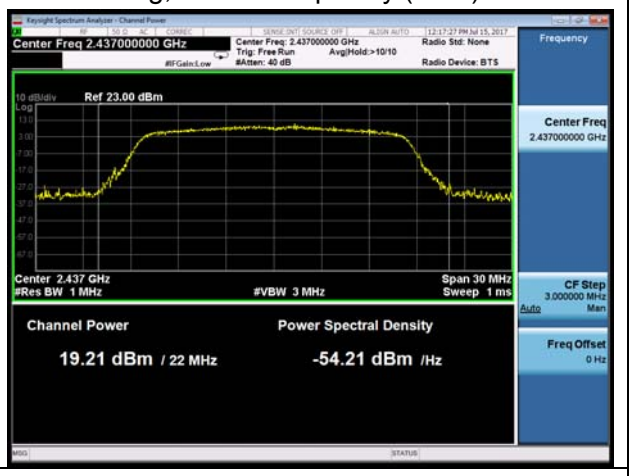
SISO ANT 1

802.11b, Carrier frequency (MHz): 2412

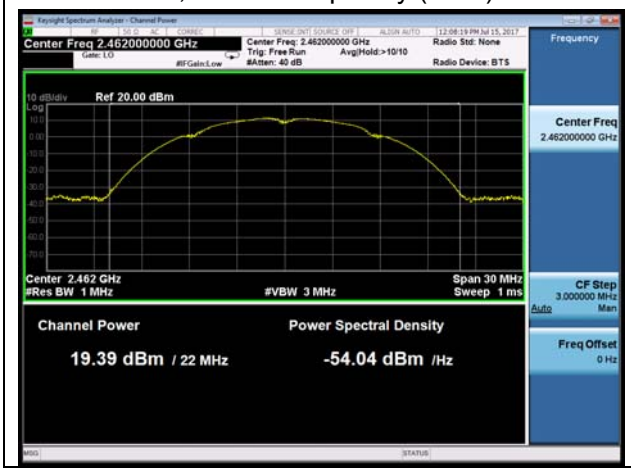
802.11g, Carrier frequency (MHz): 2412

802.11b, Carrier frequency (MHz): 2437

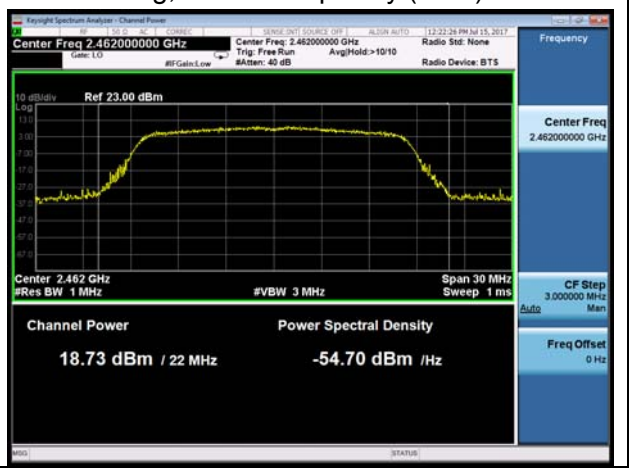
802.11g, Carrier frequency (MHz): 2437



802.11b, Carrier frequency (MHz):2462

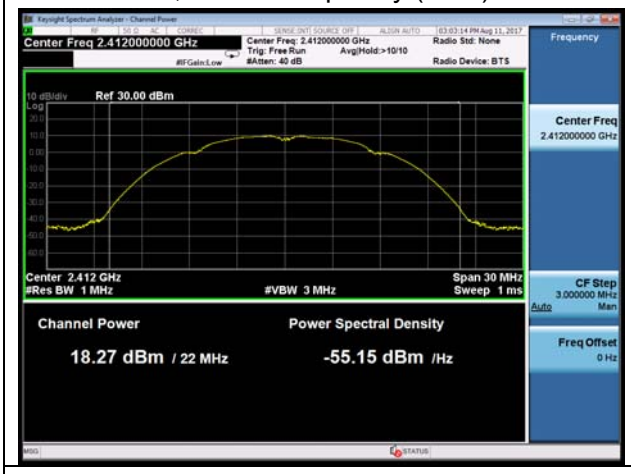


802.11g, Carrier frequency (MHz):2462

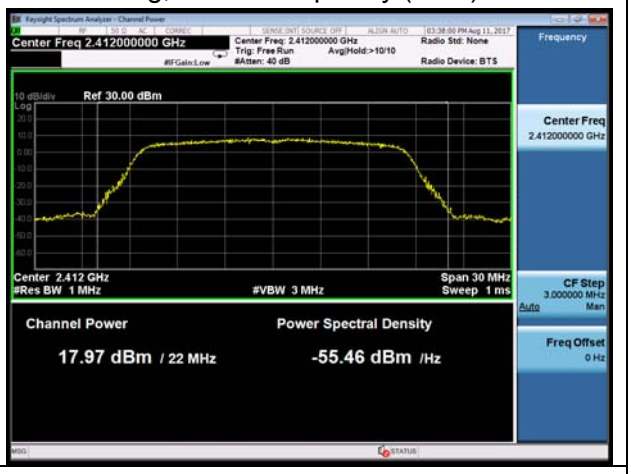


SISO ANT 2

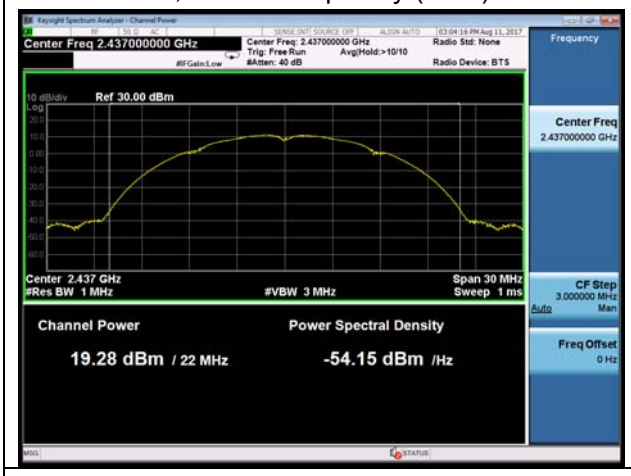
802.11b, Carrier frequency (MHz): 2412



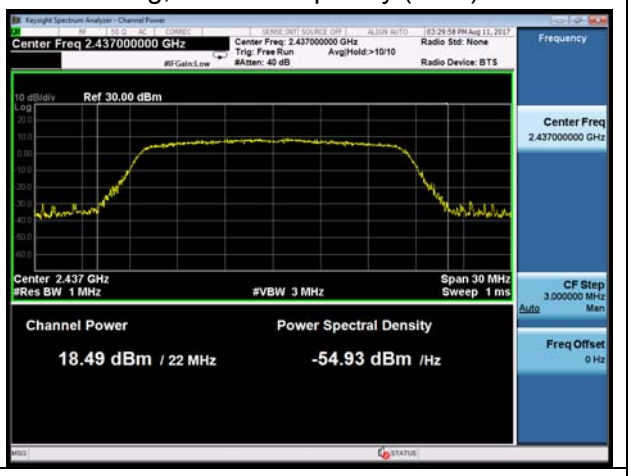
802.11g, Carrier frequency (MHz): 2412



802.11b, Carrier frequency (MHz): 2437

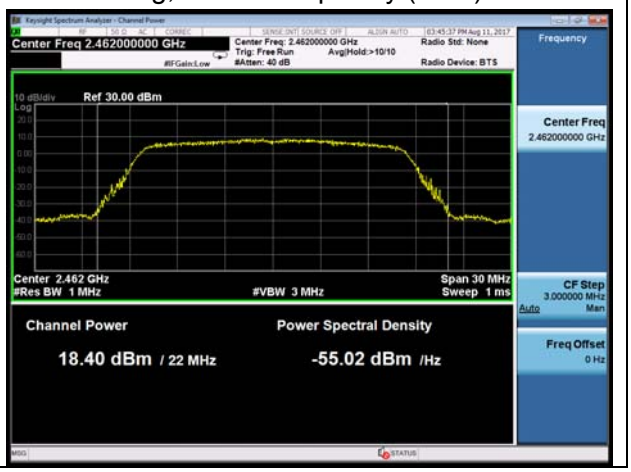


802.11g, Carrier frequency (MHz): 2437



802.11b, Carrier frequency (MHz):2462

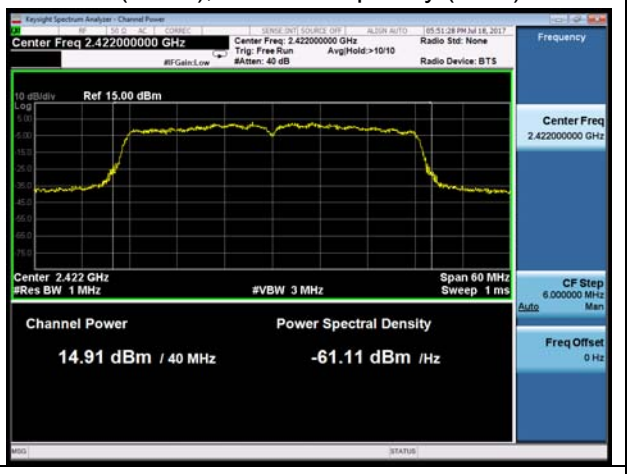
802.11g, Carrier frequency (MHz):2462



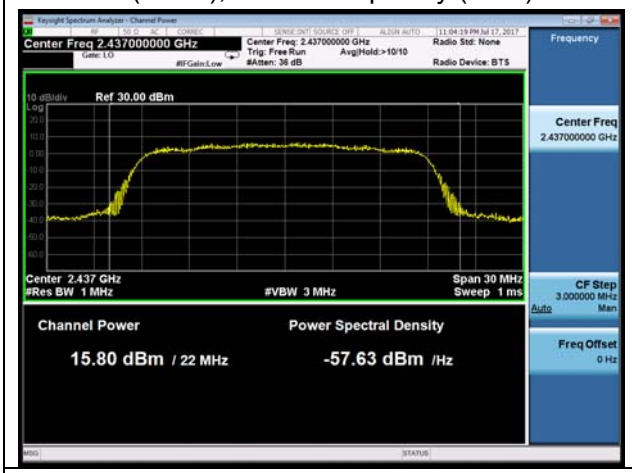
MIMO ANT1

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

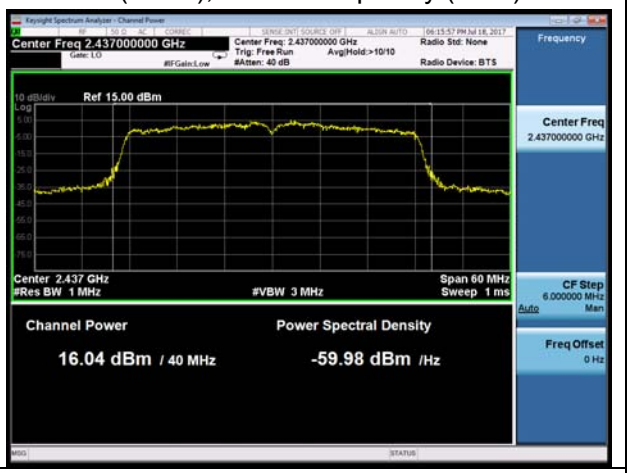
802.11n(HT40), Carrier frequency (MHz): 2422



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

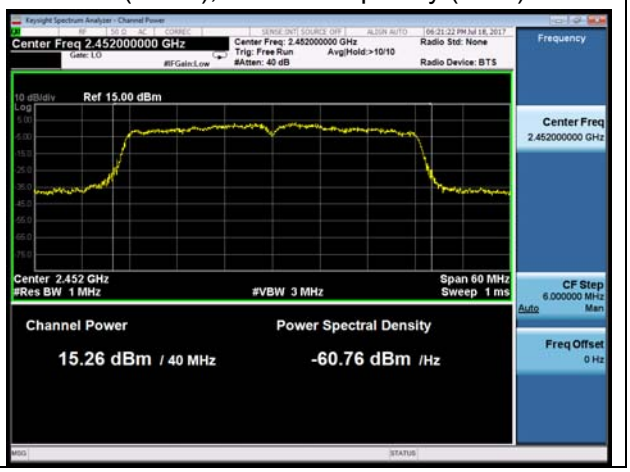


802.11n(HT40), Carrier frequency (MHz): 2437



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

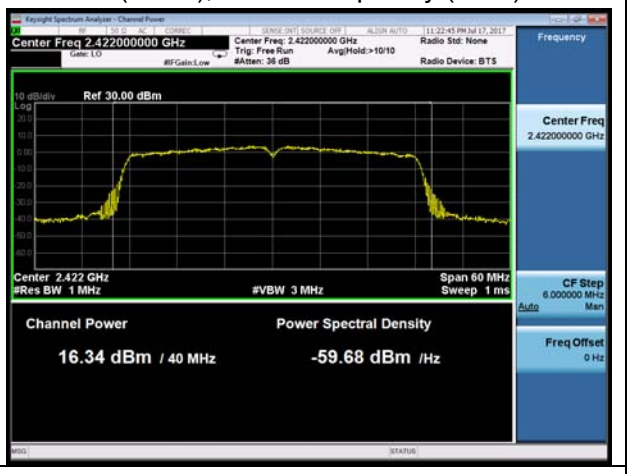
802.11n(HT40), Carrier frequency (MHz):2452



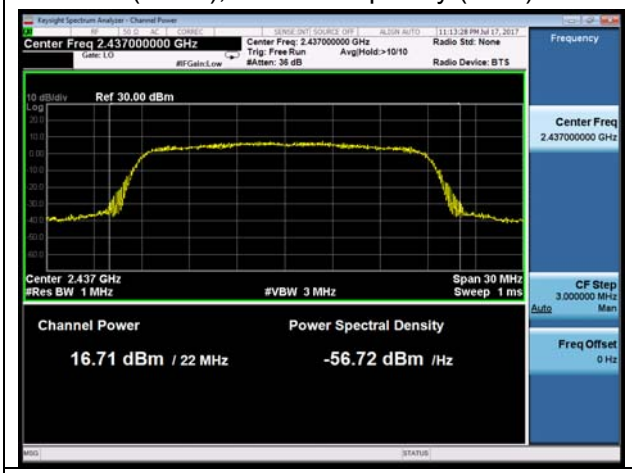
MIMO ANT2

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

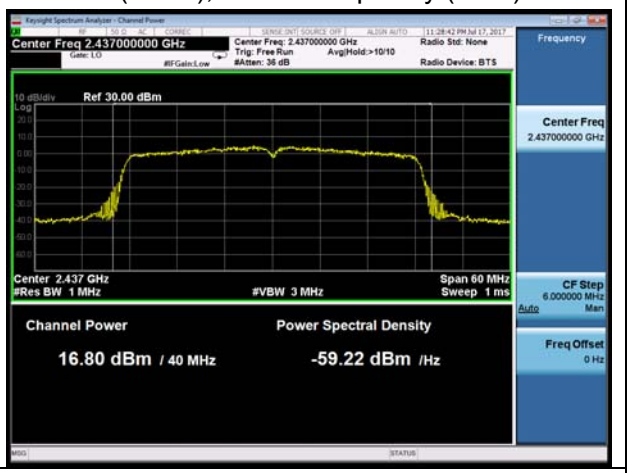
802.11n(HT40), Carrier frequency (MHz): 2422



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

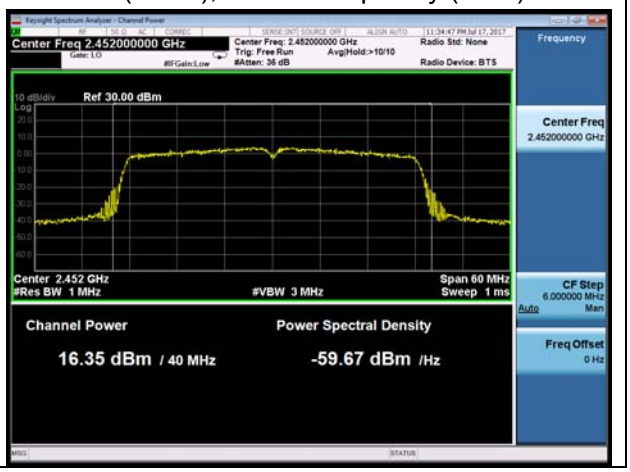


802.11n(HT40), Carrier frequency (MHz): 2437



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

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



5.2. 6dB Bandwidth

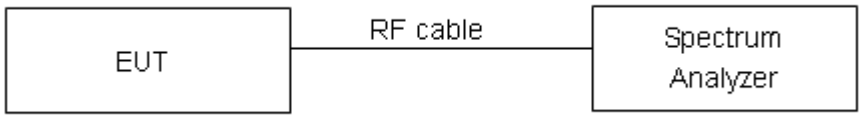
Ambient condition

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 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.

Test Results:

SISO ANT1

Network Standards	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
802.11b	2412	14.041	9.091	500	PASS
	2437	14.018	9.089	500	PASS
	2462	13.995	9.086	500	PASS
802.11g	2412	16.360	16.330	500	PASS
	2437	16.366	16.340	500	PASS
	2462	16.368	16.330	500	PASS

MIMO

Network Standards	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
802.11n HT20	2412	17.401	15.090	500	PASS
	2437	17.387	15.040	500	PASS
	2462	17.382	15.080	500	PASS
802.11n HT40	2422	35.760	32.620	500	PASS
	2437	35.778	35.000	500	PASS
	2452	35.783	33.810	500	PASS

SISO ANT1

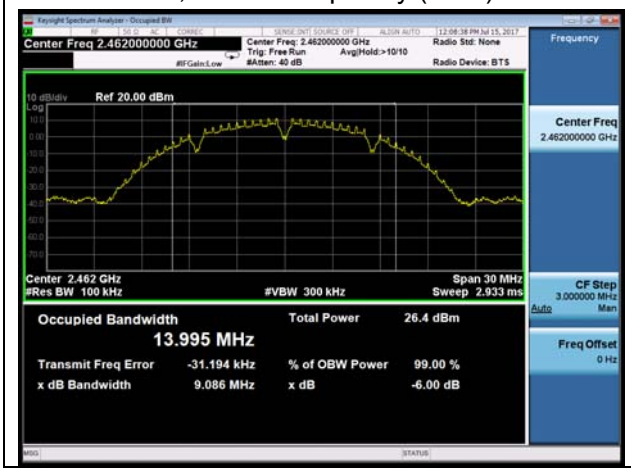
802.11b, Carrier frequency (MHz): 2412

802.11g, Carrier frequency (MHz): 2412

802.11b, Carrier frequency (MHz): 2437

802.11g, Carrier frequency (MHz): 2437

802.11b, Carrier frequency (MHz):2462

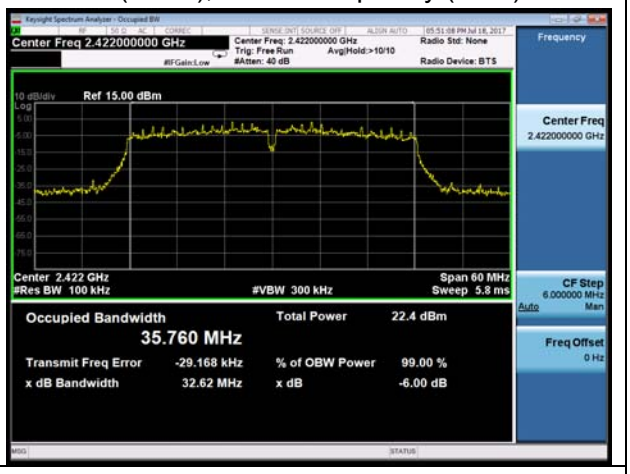


802.11g, Carrier frequency (MHz):2462

MIMO

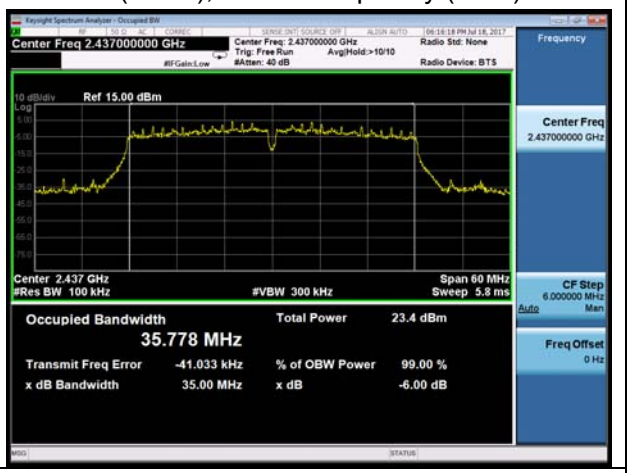
802.11n(HT20), Carrier frequency (MHz): 2412

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



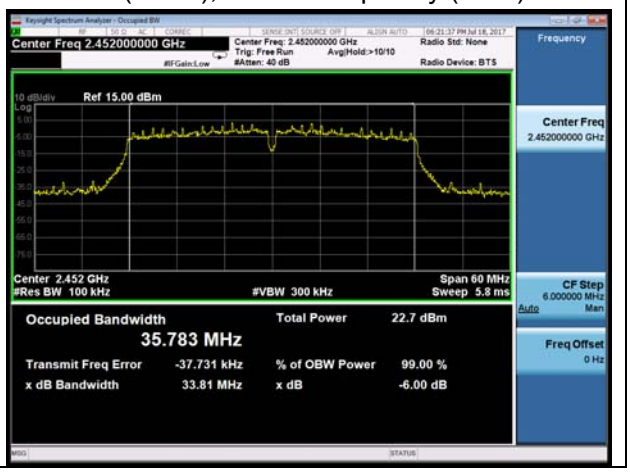
802.11n(HT20), Carrier frequency (MHz): 2437

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



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

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



5.3. Band Edge

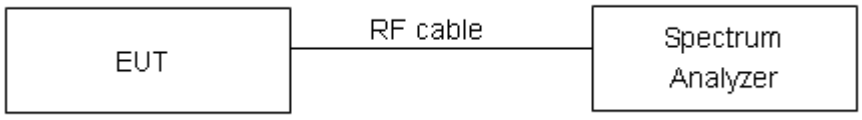
Ambient condition

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 100 kHz and VBW is set to 300 kHz 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, provided the transmitter demonstrates compliance with the peak conducted power limits.”

Measurement Uncertainty

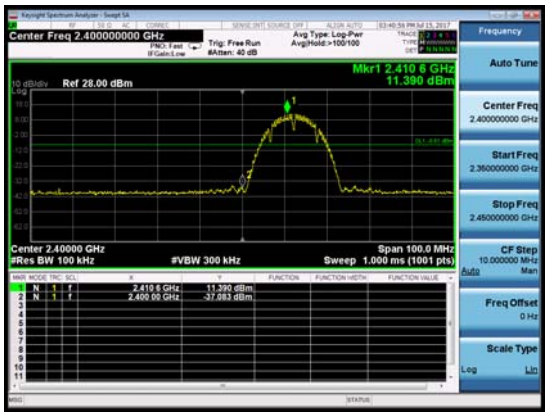
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96.

Frequency	Uncertainty
2GHz-3GHz	1.407 dB

Test Results:

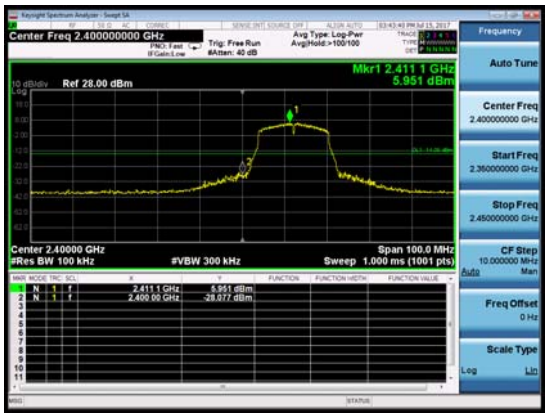
SISO ANT1

802.11b, Channel No.: 1



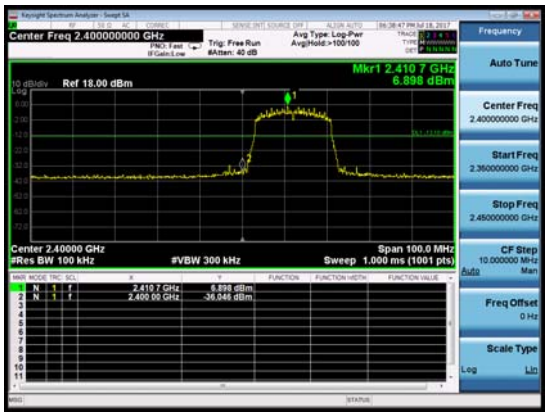
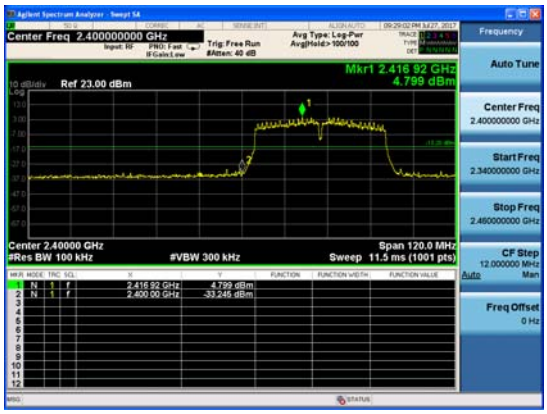
802.11b, Channel No.: 11

802.11g, Channel No.: 1



802.11g, Channel No.: 11

MIMO

802.11n(HT20), Channel No.: 1	802.11n(HT20), Channel No.: 11
	
802.11n(HT40), Channel No.: 3	**802.11n(HT40), Channel No.: 9**
	

5.4. Power Spectral Density

Ambient condition

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

Method of Measurement

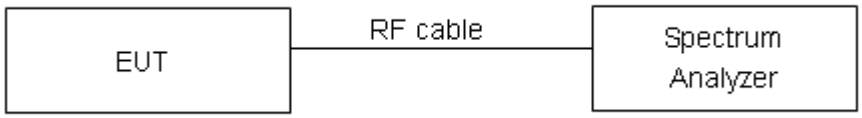
The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable.

RBW is set to 3 kHz and VBW is set to 10 kHz for BLE/ Wi-Fi 2.4G on spectrum analyzer.

Set the span to 1.5 times the DTS channel bandwidth. Sweep time = auto couple. Trace mode = max hold. The Average power spectral density is recorded.

The conducted Power is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically.

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	≤ 8 dBm / 3kHz

Measurement Uncertainty

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

Test Results:

SISO ANT1

Network Standards	Channel Number	Power Spectral Density (dBm / 3kHz)	Limit (dBm / 3kHz)	Conclusion
802.11b	1	-18.380	8	PASS
	6	-13.038	8	PASS
	11	-13.119	8	PASS
802.11g	1	-15.667	8	PASS
	6	-14.771	8	PASS
	11	-15.137	8	PASS

SISO ANT2

Network Standards	Channel Number	Power Spectral Density (dBm / 3kHz)	Limit (dBm / 3kHz)	Conclusion
802.11b	1	-15.377	8	PASS
	6	-13.644	8	PASS
	11	-13.734	8	PASS
802.11g	1	-15.700	8	PASS
	6	-17.360	8	PASS
	11	-15.337	8	PASS

MIMO

Network Standards	Channel Number	Power Spectral Density (dBm / 3kHz)						Limit (dBm / 3kHz)	Conclusion
		Antenna 1		Antenna 2		Total PSD			
		(dBm / 3kHz)	(mW/ 3kHz)	(dBm / 3kHz)	(mW/ 3kHz)	(mW/ 3kHz)	(dBm / 3kHz)		
802.11n HT20	1	-18.200	0.015	-17.316	0.018	0.034	-14.725	8	PASS
	6	-17.612	0.017	-17.043	0.020	0.037	-14.307	8	PASS
	11	-17.789	0.017	-17.098	0.019	0.036	-14.419	8	PASS
802.11n	3	-21.444	0.007	-20.426	0.009	0.016	-17.894	8	PASS

HT40	6	-20.482	0.009	-20.249	0.009	0.018	-17.353	8	PASS
	9	-20.926	0.008	-20.687	0.008	0.017	-17.794	8	PASS

Note: 1. For Total PSD, according to KDB 662911 D01 Multiple Transmitter Output v02r01 2)a),the power spectral density=$10\log(10^{(\text{PSD antenna1 in dBm/10})}+10^{(\text{PSD antenna2 in dBm/10})})$

2. The manufacturer declared the transmitter output signals is CDD mode. And N_{ss}=2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 2)f)(i): If all antennas have the same gain, Directional gain = G_{ANT} + Array Gain, For power spectral density (PSD) measurements on all devices, Array Gain = 10 $\log(N_{ANT}/N_{SS})$ dB=0.

So directional gain = G_{ANT} + Array Gain =5+0=5 dBi<6dBi. So the power limt is 8dBm.

SISO ANT1

802.11b, Channel No.: 1

802.11g, Channel No.: 1

802.11b, Channel No.: 6

802.11g, Channel No.: 6

802.11b, Channel No.: 11

802.11g, Channel No.: 11

SISO ANT2

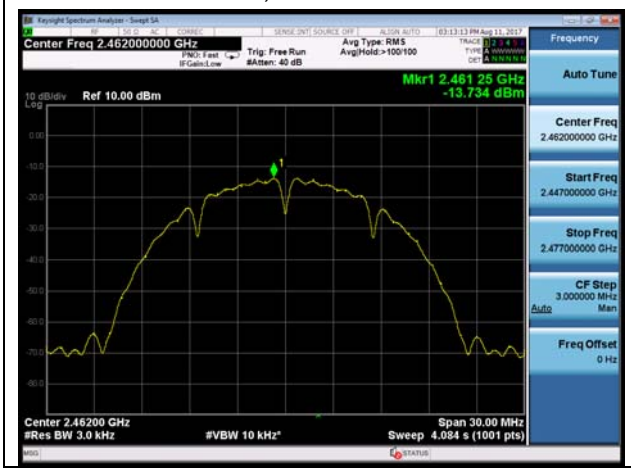
802.11b, Channel No.: 1

802.11g, Channel No.: 1

802.11b, Channel No.: 6

802.11g, Channel No.: 6

802.11b, Channel No.: 11



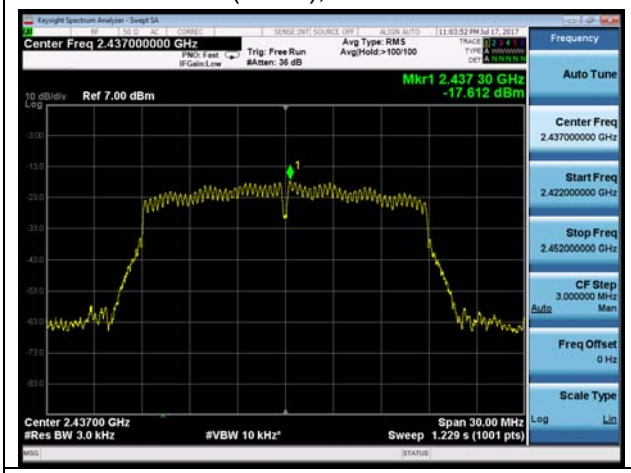
802.11g, Channel No.: 11

MIMO ANT1

802.11n(HT20), Channel No. 1

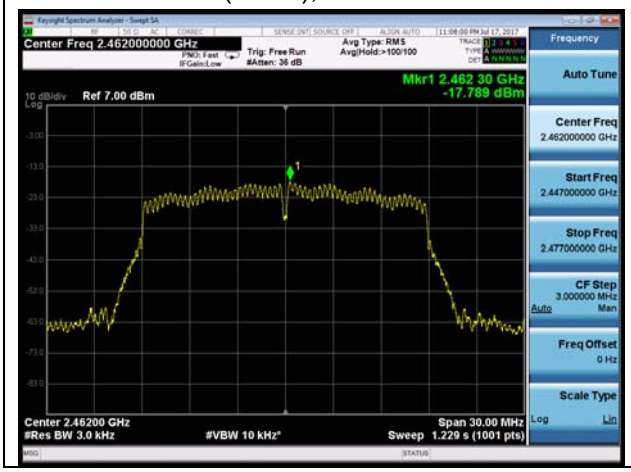
802.11n(HT40), Channel No. 3

802.11n(HT20), Channel No. 6



802.11n(HT40), Channel No. 6

802.11n(HT20), Channel No. 11



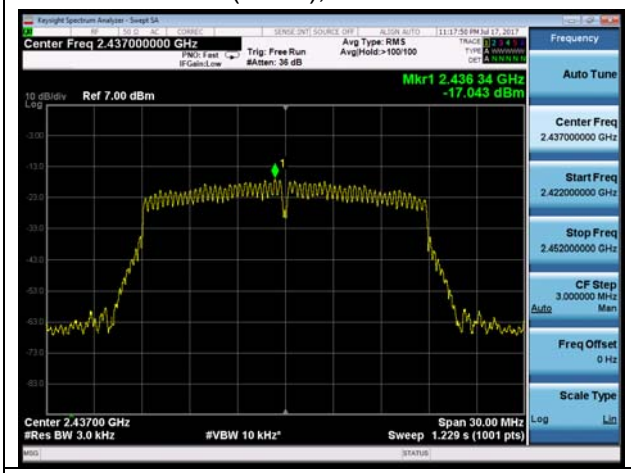
802.11n(HT40), Channel No. 9

MIMO ANT2

802.11n(HT20), Channel No. 1

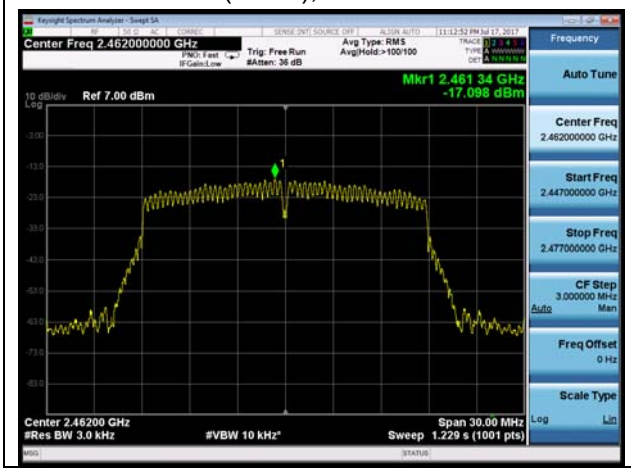
802.11n(HT40), Channel No. 3

802.11n(HT20), Channel No. 6



802.11n(HT40), Channel No. 6

802.11n(HT20), Channel No. 11



802.11n(HT40), Channel No. 9

5.5. 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. Set RBW to100kHz and VBW to 300 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.”

Antenna 1

Network Standards	Carrier frequency (MHz)	Reference value (dBm)	Limit
802.11b	2412	7.746	-12.254
	2437	9.126	-10.874
	2462	5.479	-14.521
802.11g	2412	4.565	-15.435
	2437	7.263	-12.737
	2462	3.758	-16.242
802.11n HT20	2412	3.618	-16.382
	2437	6.569	-13.431
	2462	3.651	-16.349
802.11n HT40	2422	-1.48	-21.48
	2437	1.854	-18.146
	2452	1.245	-18.755

MIMO

Network Standards	Carrier frequency (MHz)	Reference value (dBm)	Limit
802.11n HT20	2412	-2.966	-22.966
	2437	-1.985	-21.985
	2462	-3.834	-23.834
802.11n HT40	2422	-7.391	-27.391
	2437	-5.253	-25.253
	2452	-6.286	-26.286

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-26GHz	1.407 dB

Test Results:

If disturbances were found more than 20dB below limit line, the mark is not required for the EUT.

The signal beyond the limit is carrier.

SISO ANT 1

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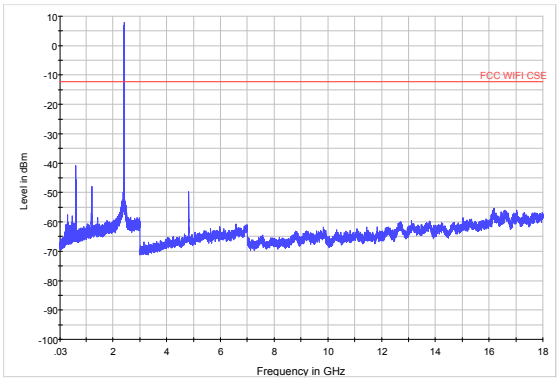
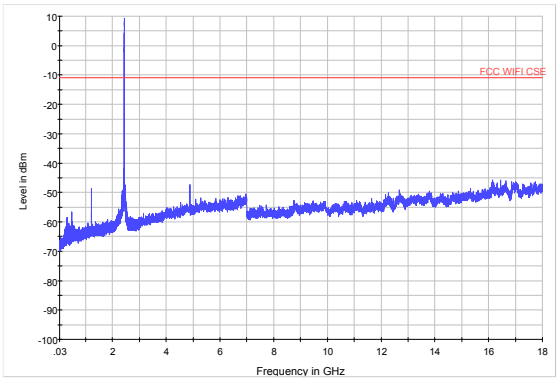
<td> 

802.11b CH1 3GHz to 18GHz</td>
<td> 

802.11b CH6 3GHz to 18GHz</td>
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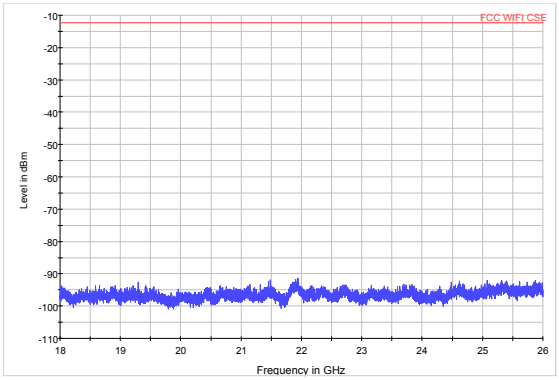
<td> 

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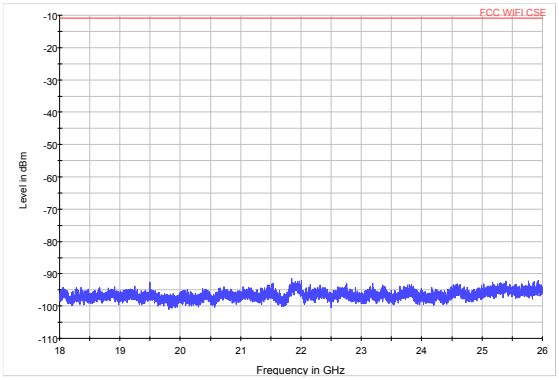
<td> 

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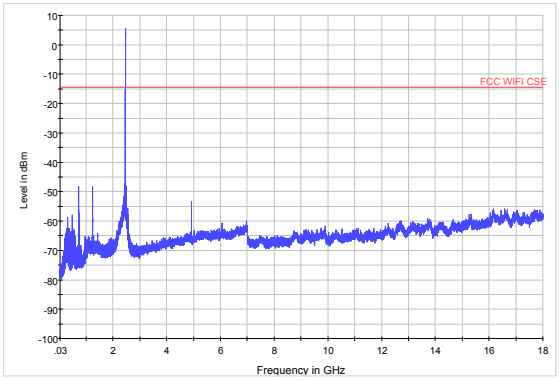
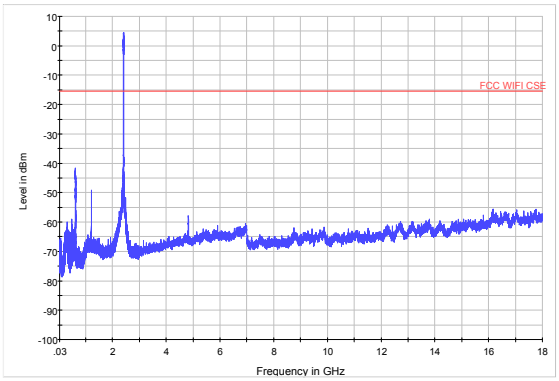
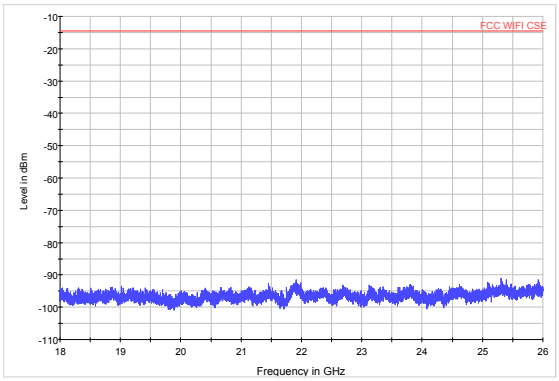


802.11b CH11 3GHz to 18GHz



802.11g CH1 3GHz to 18GHz



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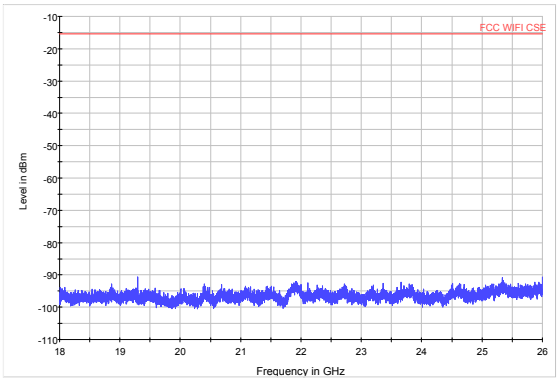

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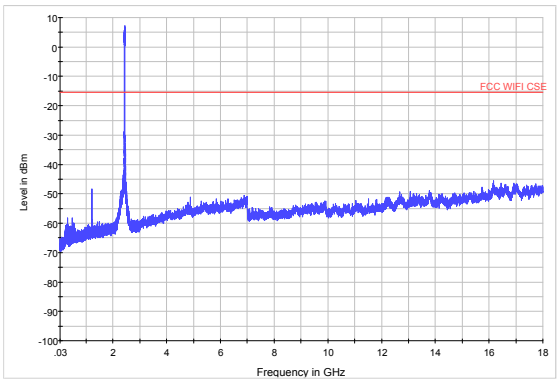

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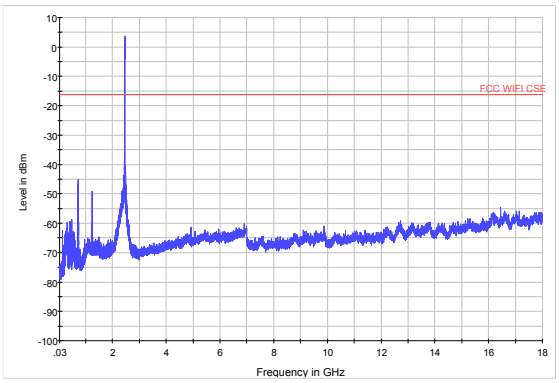

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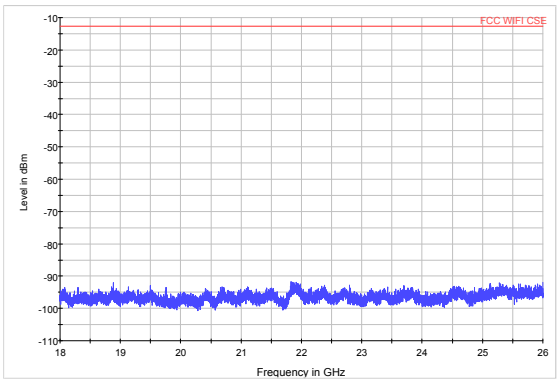
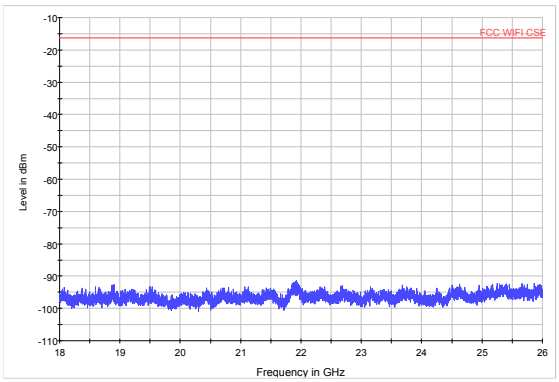


802.11g CH6 18GHz to 26.5GHz



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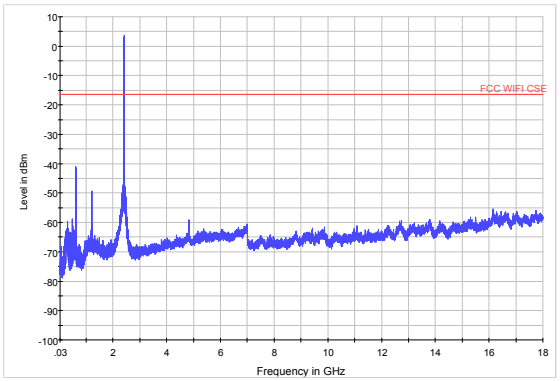

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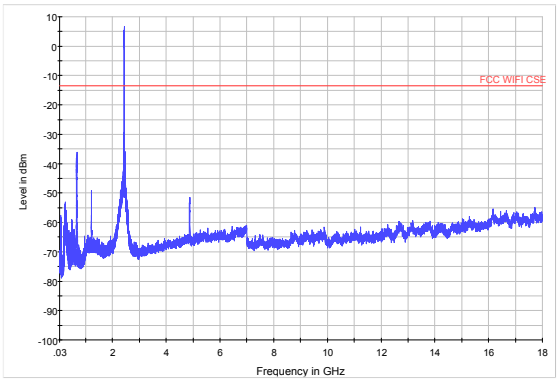

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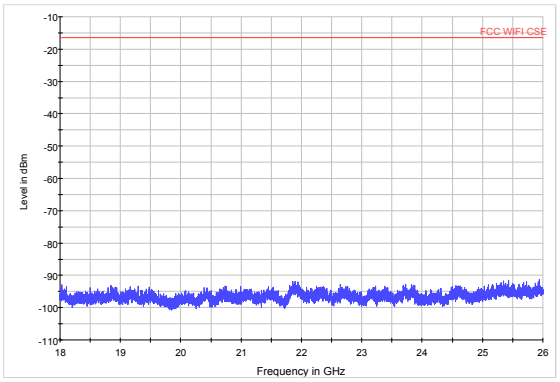
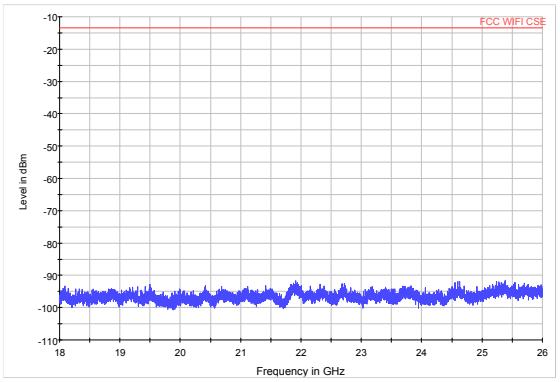


802.11n (HT20) CH1 18GHz to 26.5GHz



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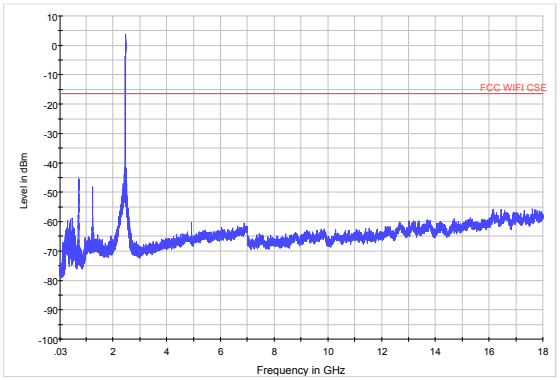
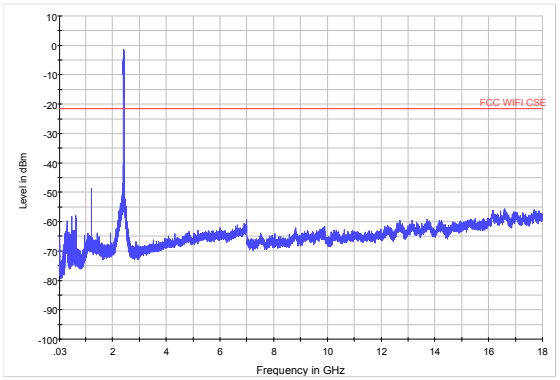
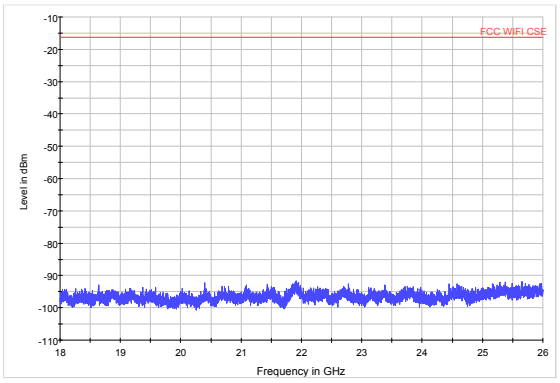


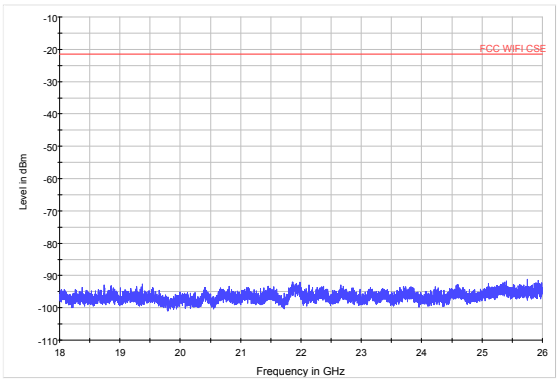
802.11n (HT20) CH11 3GHz to 18GHz



802.11n (HT40) CH3 3GHz to 18GHz



802.11n (HT20) CH11 18GHz to 26.5GHz



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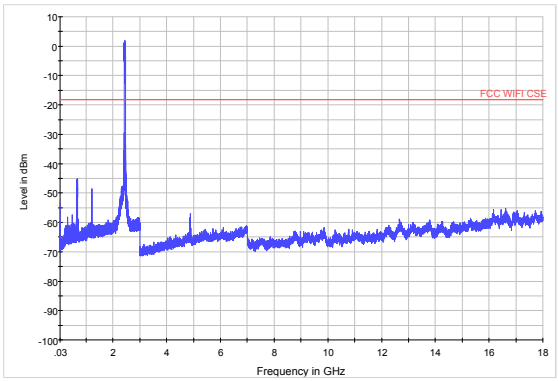

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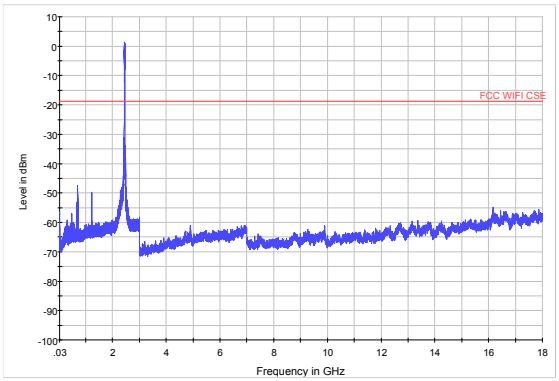
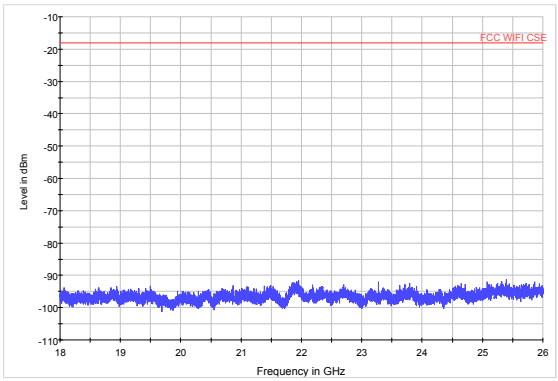
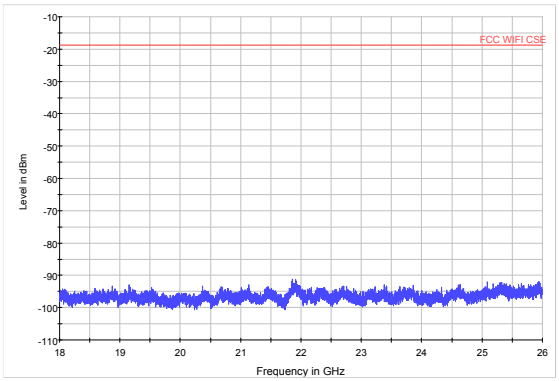


802.11n (HT40) CH9 3GHz to 18GHz

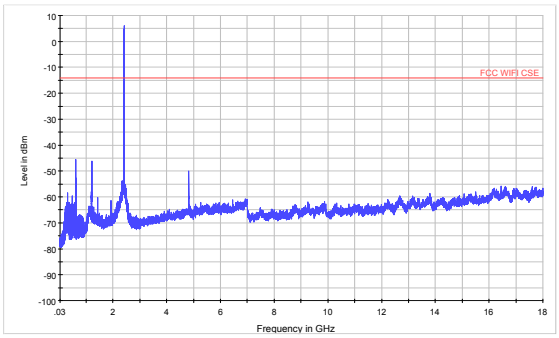


802.11n (HT40) CH6 18GHz to 26.5GHz

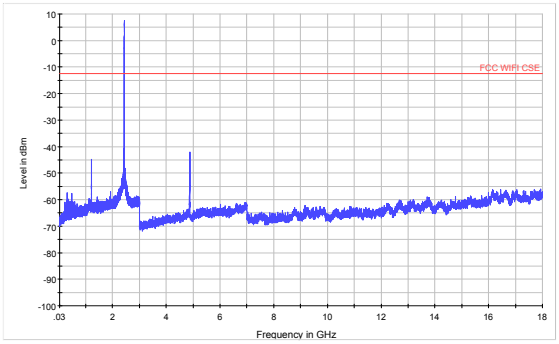


802.11n (HT40) CH9 18GHz to 26.5GHz

SISO ANT 2



802.11b CH1 3GHz to 18GHz



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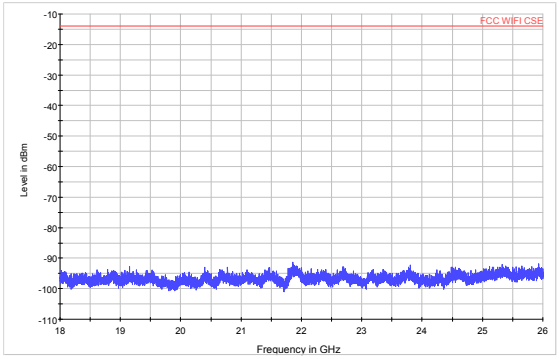
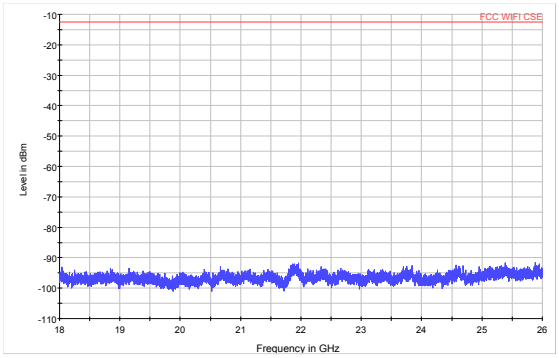
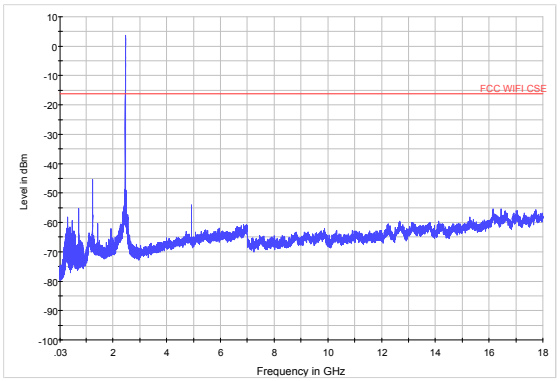


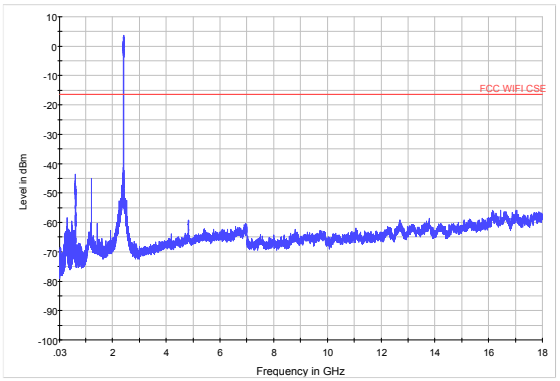
802.11b CH1 18GHz to 26.5GHz



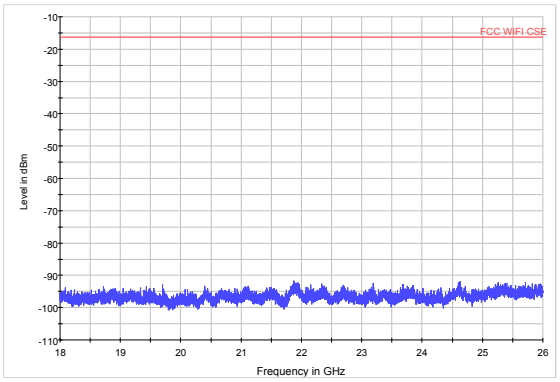
802.11b CH6 18GHz to 26.5GHz



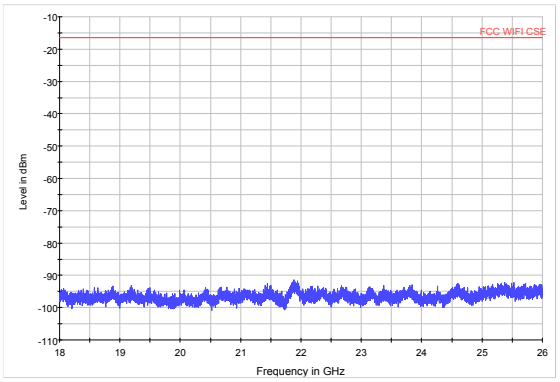
802.11b CH11 3GHz to 18GHz



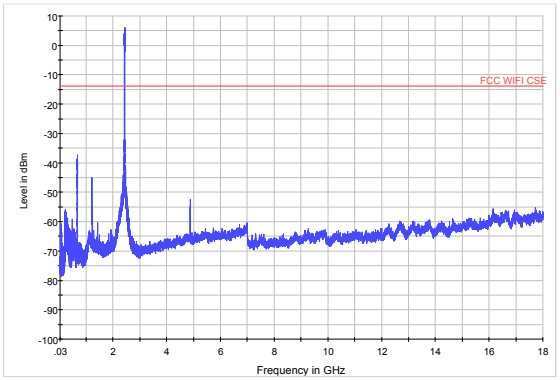
802.11g CH1 3GHz to 18GHz



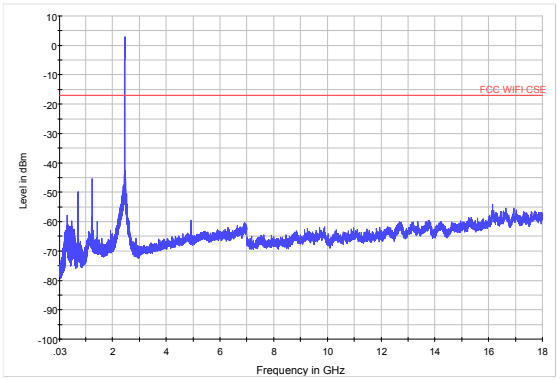
802.11b CH11 18GHz to 26.5GHz



802.11g CH1 18GHz to 26.5GHz



802.11g CH6 3GHz to 18GHz



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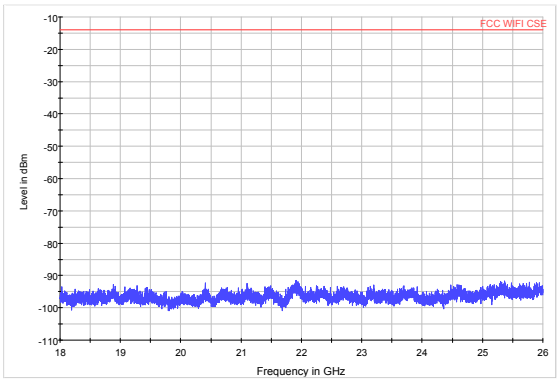

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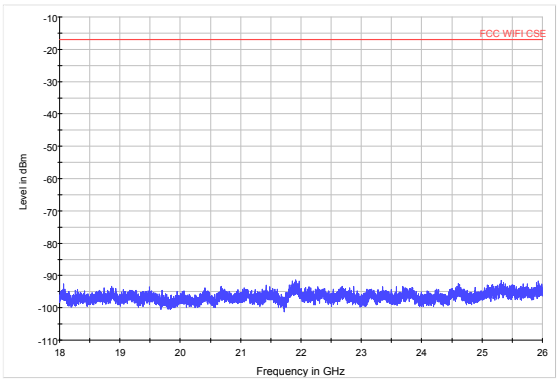

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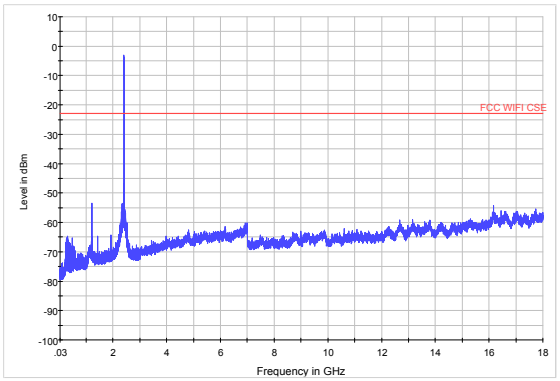
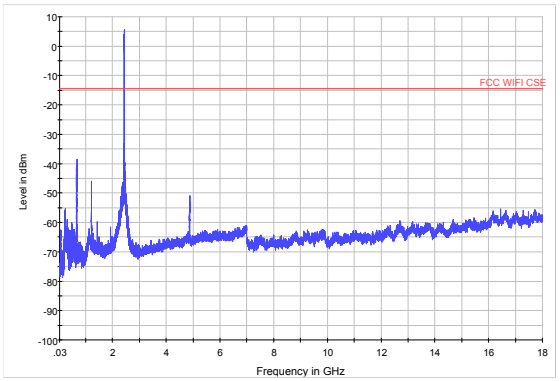


802.11n (HT20) CH1 3GHz to 18GHz



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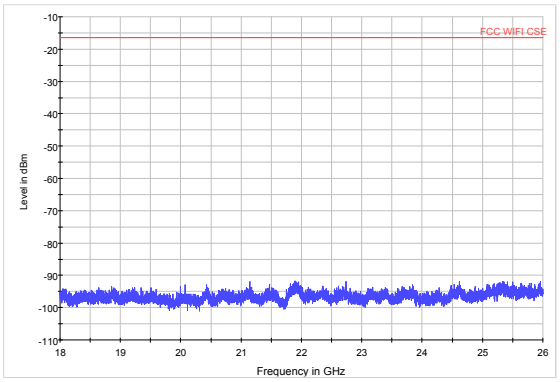
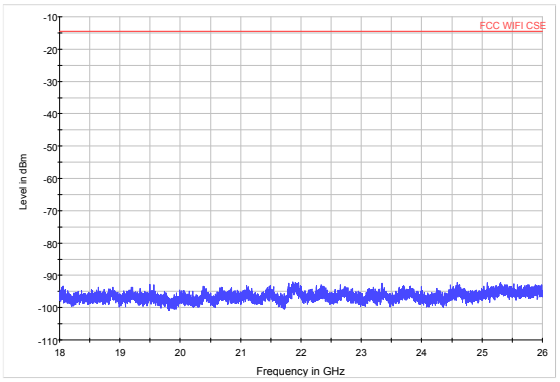


802.11n (HT20) CH1 18GHz to 26.5GHz



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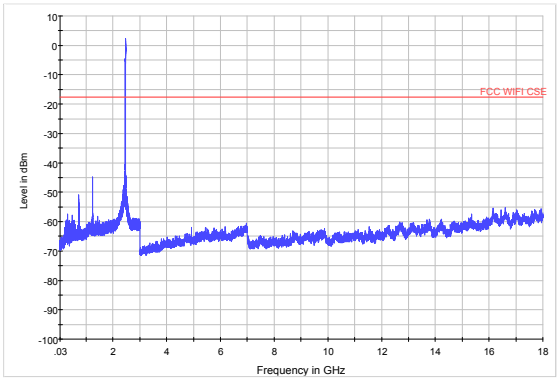

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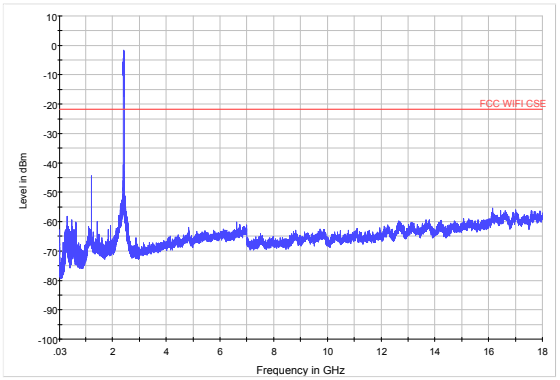
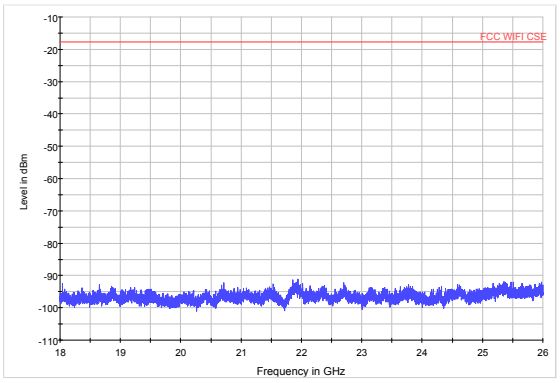
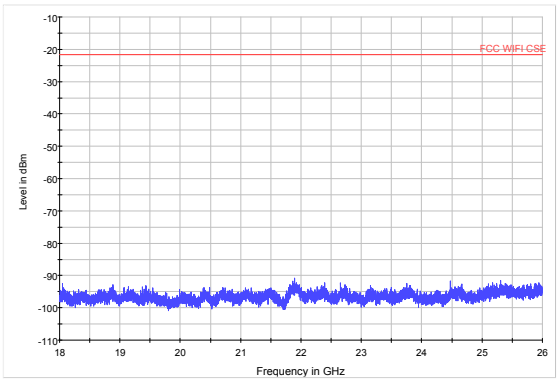


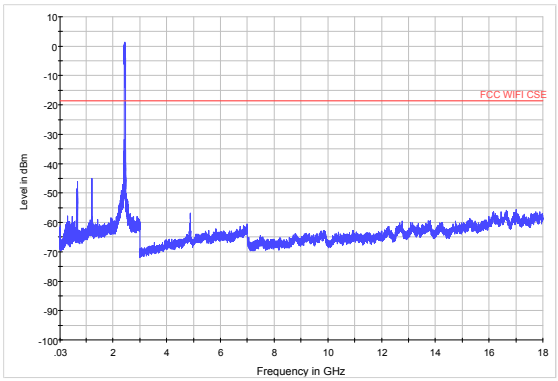
802.11n (HT40) CH3 3GHz to 18GHz



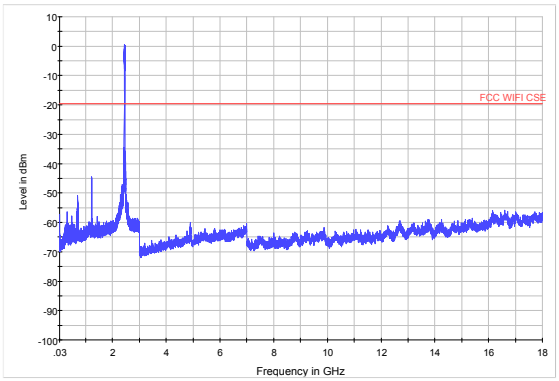
802.11n (HT20) CH11 18GHz to 26.5GHz



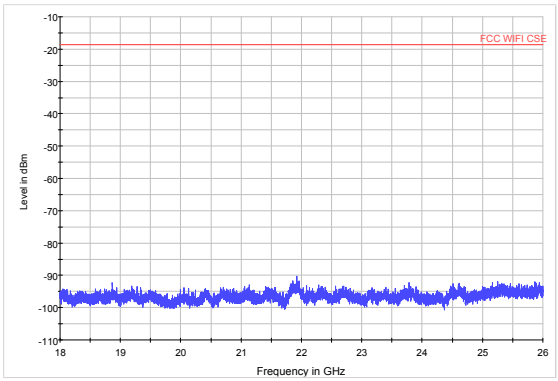
802.11n (HT40) CH3 18GHz to 26.5GHz



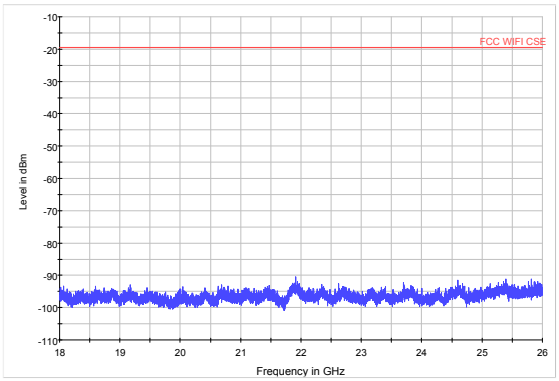
802.11n (HT40) CH6 3GHz to 18GHz



802.11n (HT40) CH9 3GHz to 18GHz

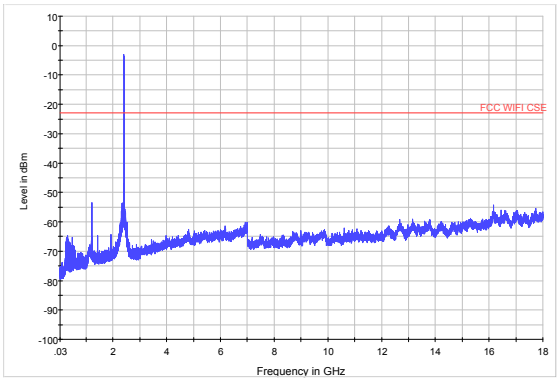


802.11n (HT40) CH6 18GHz to 26.5GHz

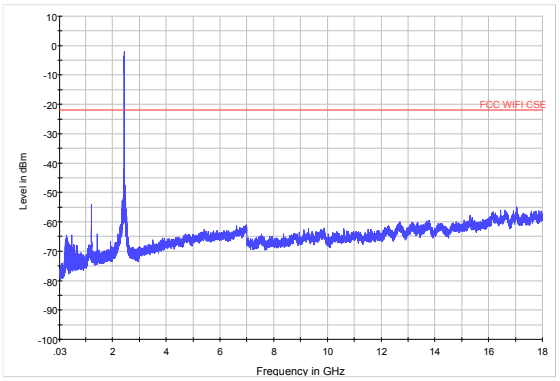


802.11n (HT40) CH9 18GHz to 26.5GHz

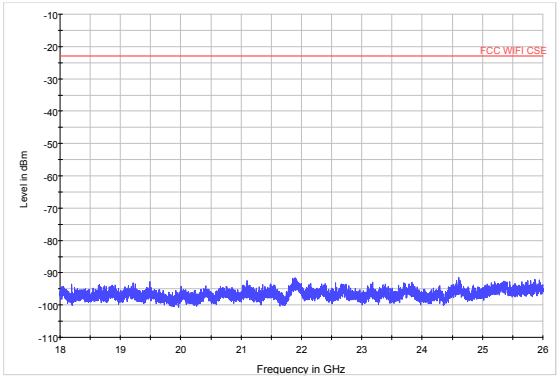
MIMO



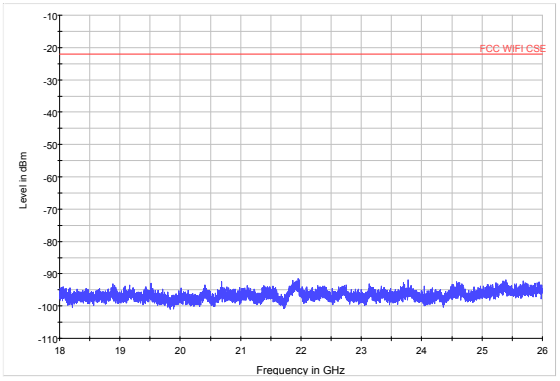
802.11n (HT20) CH1 3GHz to 18GHz



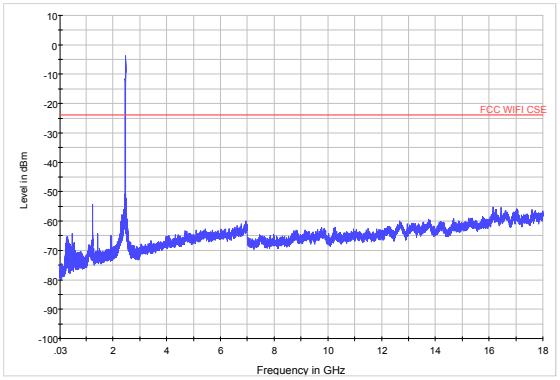
802.11n (HT20) CH6 3GHz to 18GHz



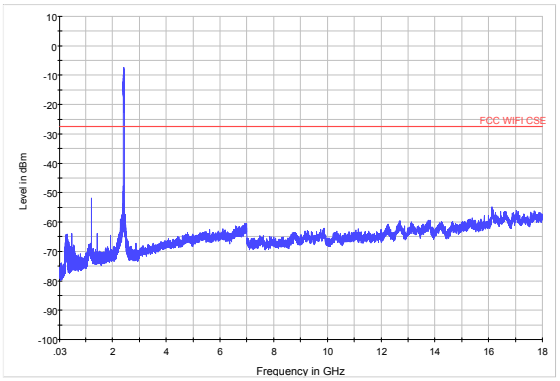
802.11n (HT20) CH1 18GHz to 26.5GHz



802.11n (HT20) CH6 18GHz to 26.5GHz



802.11n (HT20) CH11 3GHz to 18GHz



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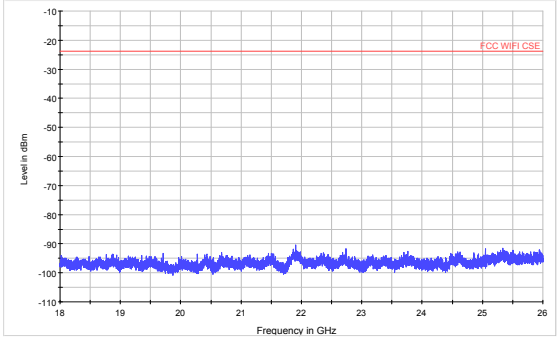
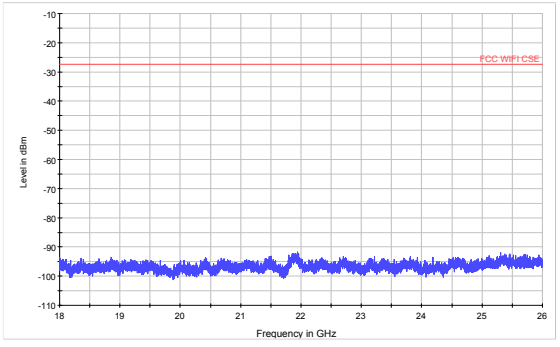
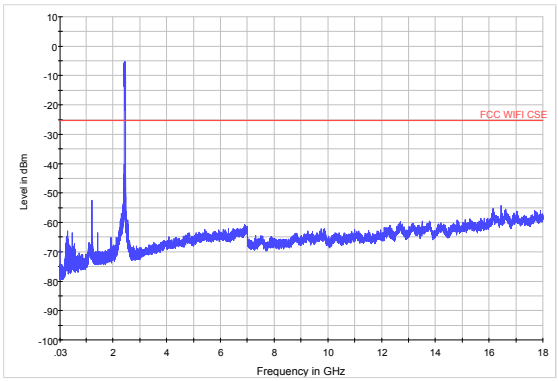


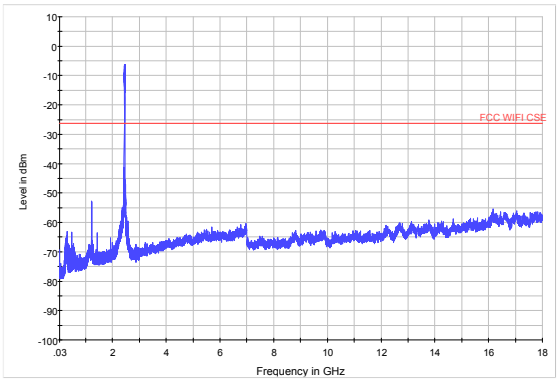
802.11n (HT20) CH11 18GHz to 26.5GHz



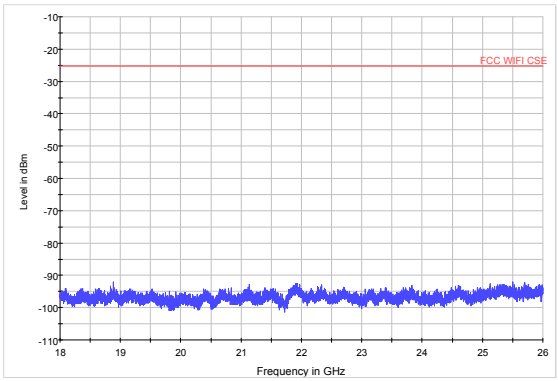
802.11n (HT40) CH3 18GHz to 26.5GHz



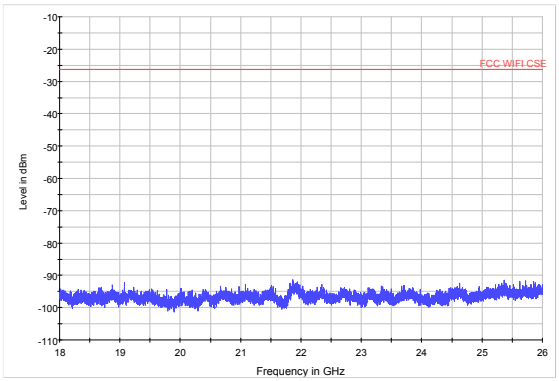
802.11n (HT40) CH6 3GHz to 18GHz



802.11n (HT40) CH9 3GHz to 18GHz



802.11n (HT40) CH6 18GHz to 26.5GHz



802.11n (HT40) CH9 18GHz to 26.5GHz

5.6. Radiated Emissions in the Restricted Band

Ambient condition

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

Method of Measurement

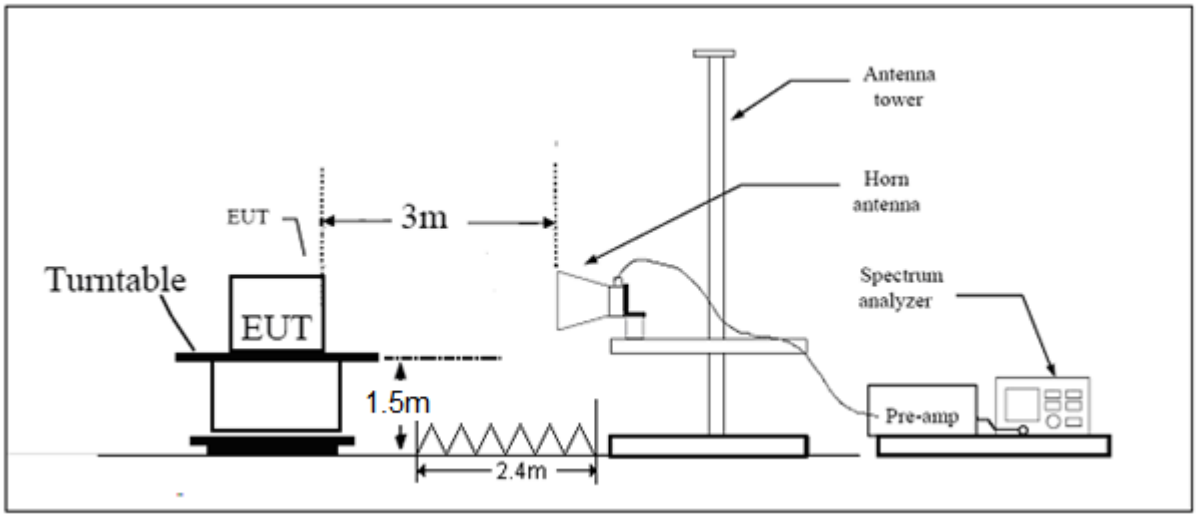
The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. 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. Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, and the emissions less than 20 dB below the permissible value are reported.

Set the spectrum analyzer in the following:
(a) PEAK: RBW=1MHz /VBW=3MHz / Sweep=AUTO
(b) AVERAGE: RBW=1MHz /VBW=3MHz / 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 (Y axis) and the antenna is vertical.

The test is in transmitting mode.

Test setup



Note: Area side: 2.4mX3.6m

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

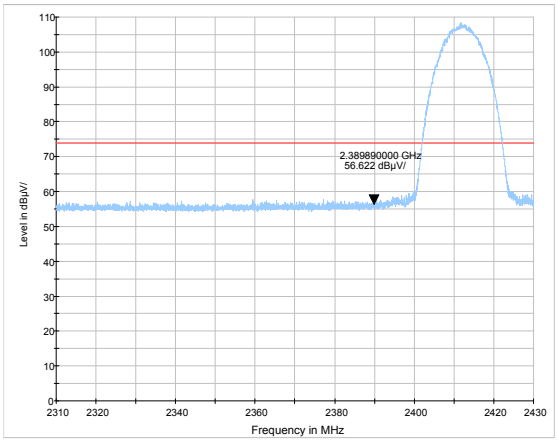
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96, U= 3.55 dB.

Test Results:

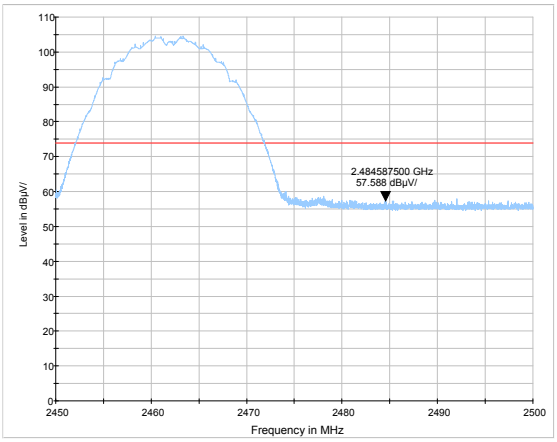
SISO ANT 1

The signal beyond the limit is carrier.

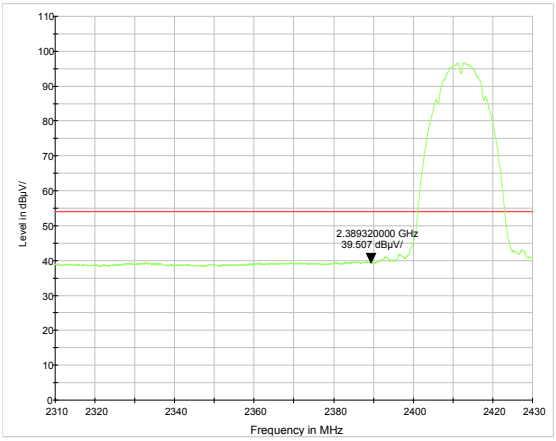
802.11b-Channel 1: Peak



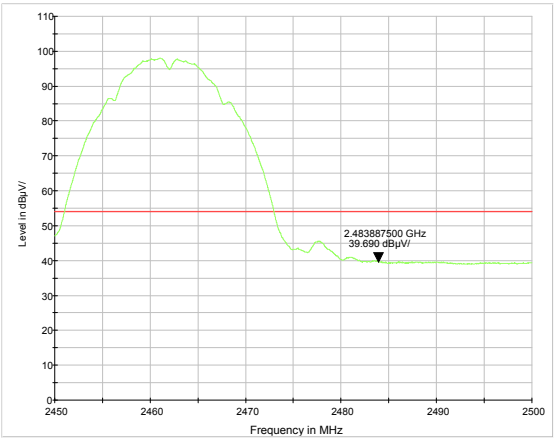
802.11b-Channel 11: Peak



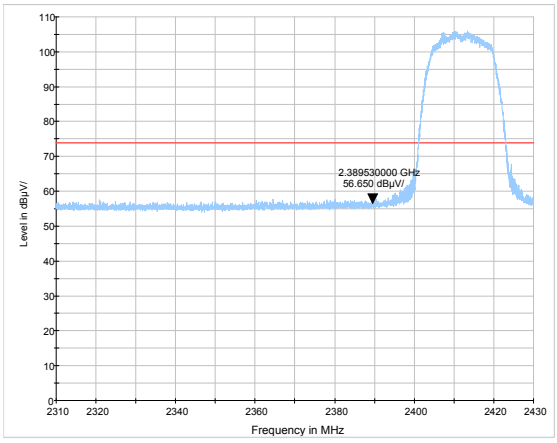
802.11b-Channel 1: Average



802.11b-Channel 11: Average



802.11g-Channel 1: Peak



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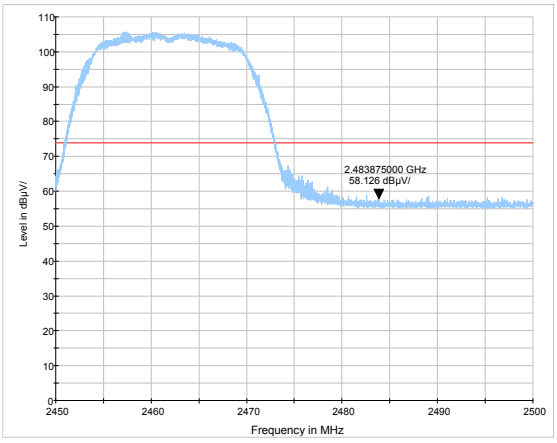

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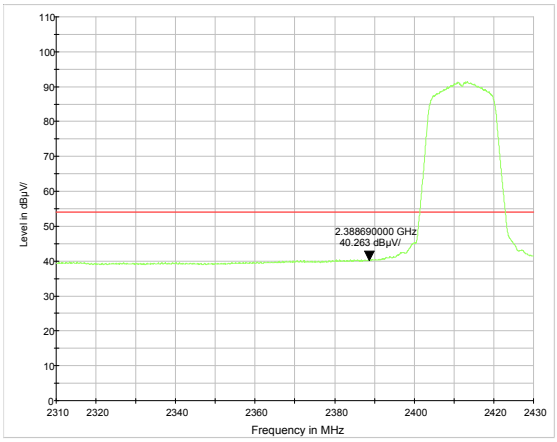
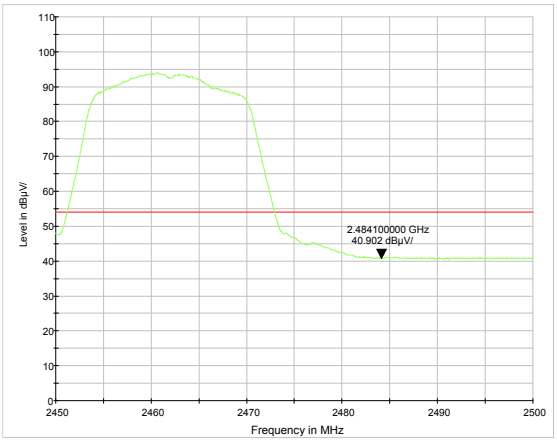
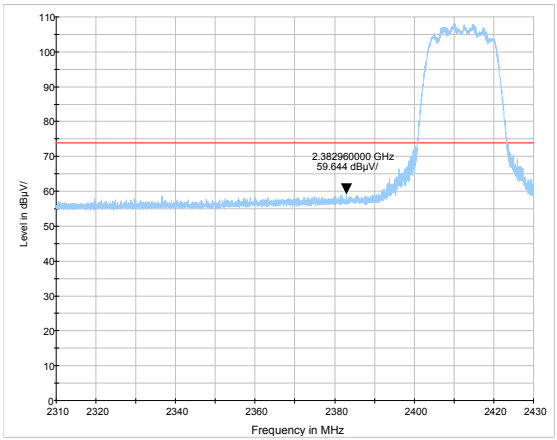


802.11g-Channel 11: Average

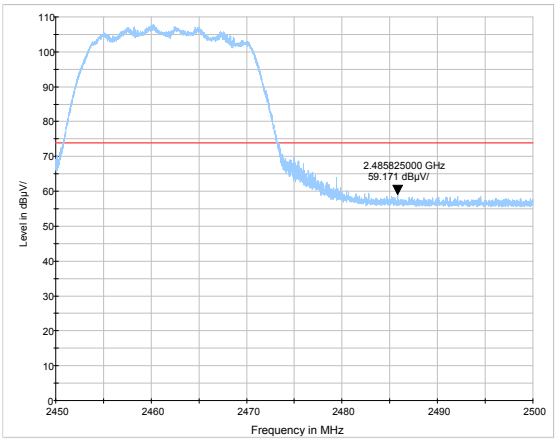


MIMO

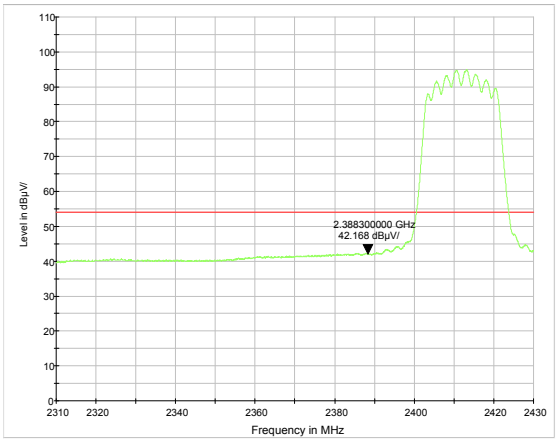
802.11n HT20 -Channel 1: Peak



802.11n HT20-Channel 11: Peak



802.11n HT20-Channel 1: Average



802.11n HT20-Channel 11: Average