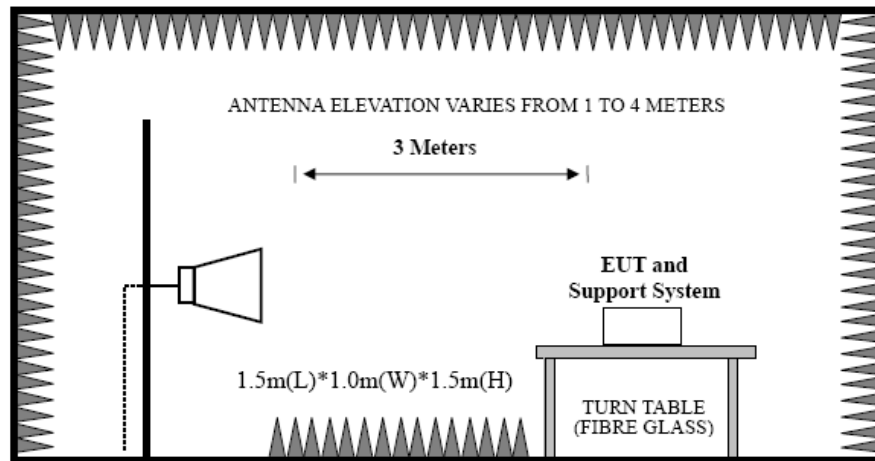


5 BAND EDGE COMPLIANCE TEST

5.1 Limit

All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits

5.2 Block Diagram of Test setup



5.3 Test Procedure

EUT was placed on a turn table, which is 1.5 m high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it working in test mode, then test it. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of emissions

Peak : RBW = 1MHz, VBW = 1MHz, Detector=PEAK detector, Sweep time = auto.

AV : RBW = 1MHz, VBW = 10Hz, Detector=PEAK detector, Sweep time = auto.

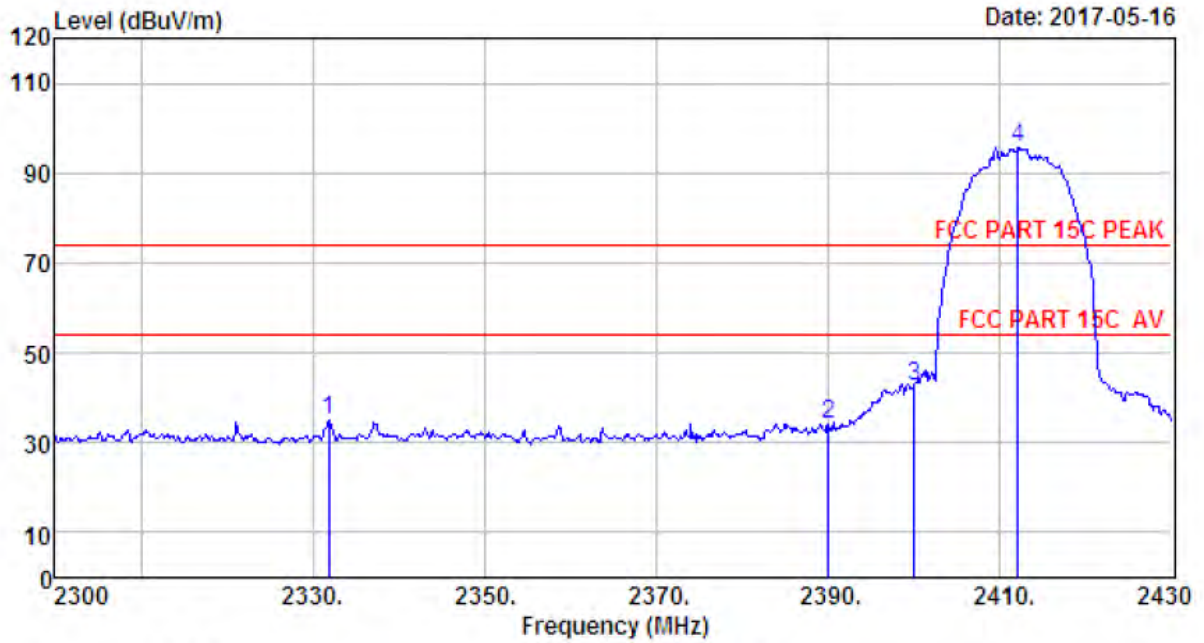
5.4 Test Result

Pass (The testing data was attached in the next pages.)

Note: 1、 For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.

2、 The frequency 2412 MHz and 2462 MHz is fundamental frequency which no limit, the limit on plots is automatically generated by the software, it's not fundamental limit, we can't remove it.

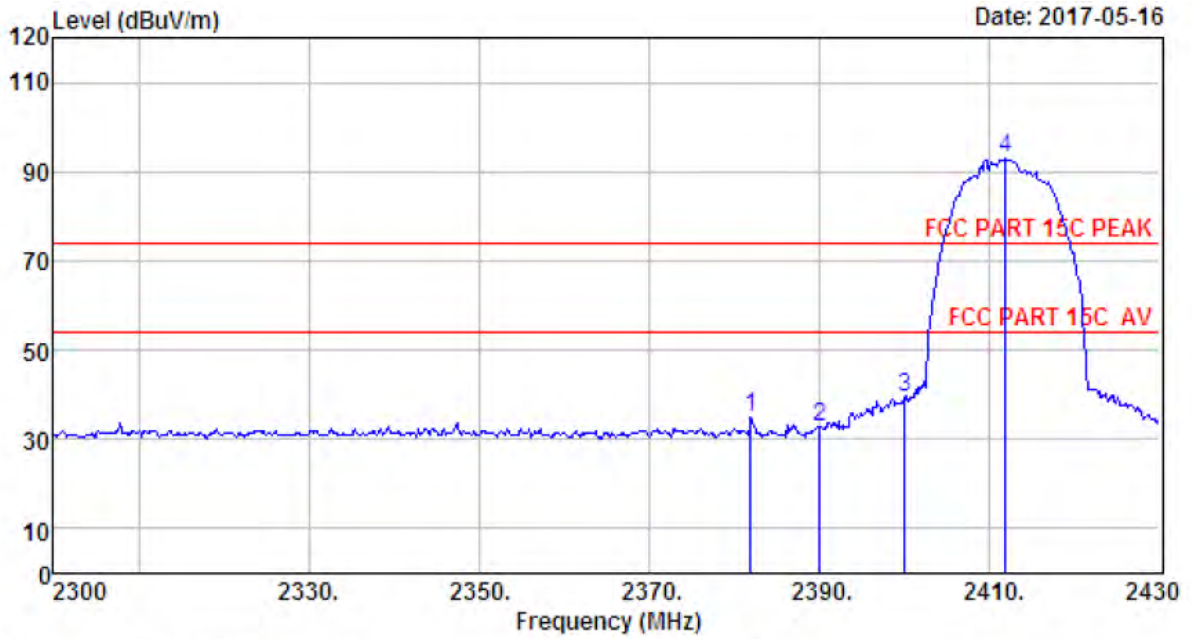
5.5 Test Data



Site no. : 1# 966 Chamber Data no. : 417
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11b CH1 2412TX
 Antenna a

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBUV)	Emission Level (dBUV/m)	Limits (dBUV/m)	Margin (dB)	Remark
1	2331.85	27.73	6.54	34.59	35.13	34.81	74.00	39.19	Peak
2	2390.00	27.64	6.62	34.62	34.59	34.23	74.00	39.77	Peak
3	2400.00	27.61	6.62	34.64	42.86	42.45	74.00	31.55	Peak
4	2412.06	27.60	6.64	34.64	96.23	95.83	74.00	-21.83	Peak

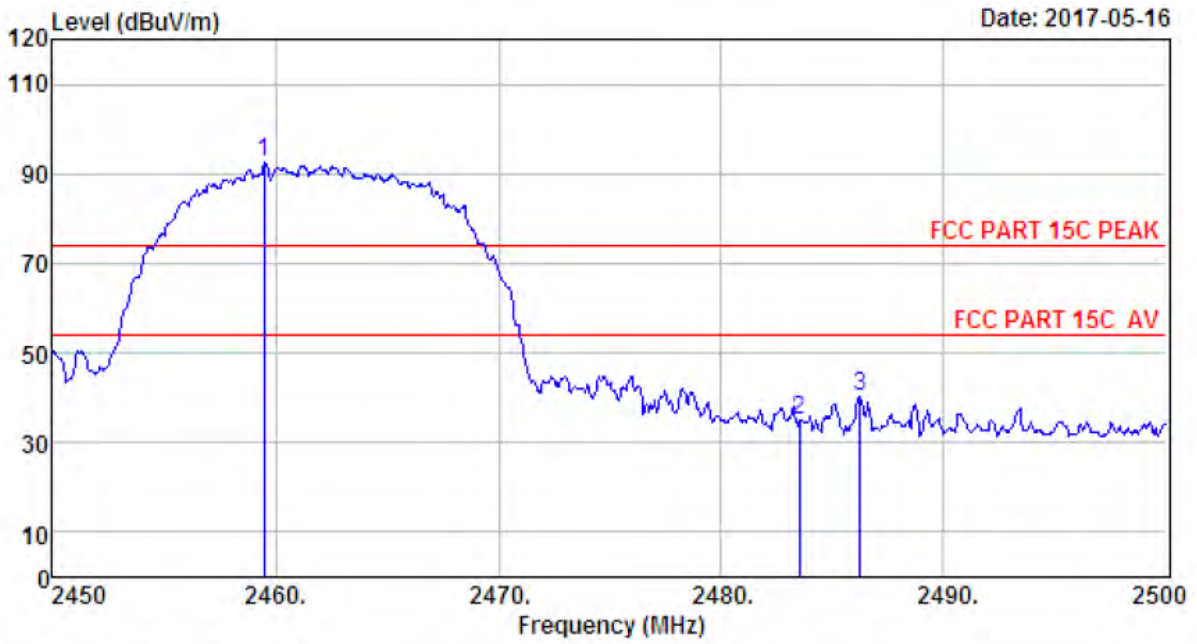
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 418
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11b CH1 2412TX
 Antenna a

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2381.90	27.64	6.60	34.62	35.45	35.07	74.00	38.93	Peak
2	2390.00	27.64	6.62	34.62	33.00	32.64	74.00	41.36	Peak
3	2400.00	27.61	6.62	34.64	39.91	39.50	74.00	34.50	Peak
4	2411.80	27.60	6.64	34.64	93.25	92.85	74.00	-18.85	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

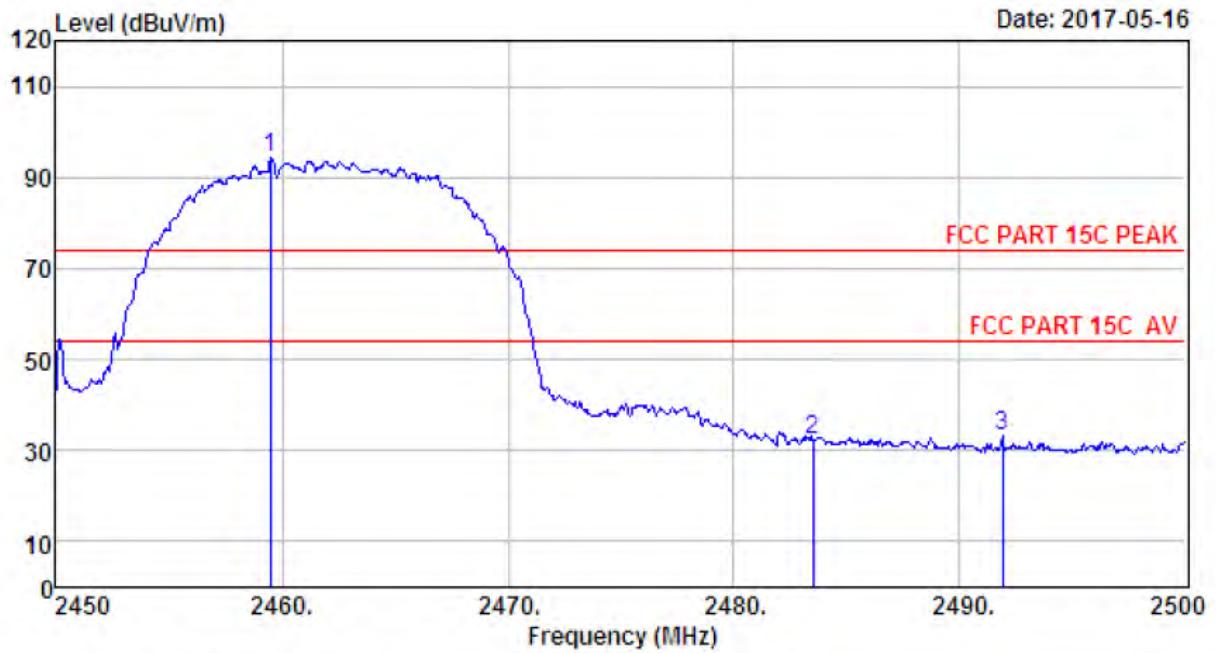


```

Site no.       : 1# 966 Chamber           Data no.   : 419
Dis. / Ant.    : 3m  ANT 1-18G          Ant. pol.  : HORIZONTAL
Limit         : FCC PART 15C PEAK
Env. / Ins.    : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer      : Tony
EUI           : Wireless Speaker
Power         : AC 120V/60Hz
M/N           : Beoplay M3
Test Mode     : IEEE 802.11b CH11 2462TX
                Antenna a
    
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2459.50	27.59	6.69	34.98	93.39	92.69	74.00	-18.69	Peak
2	2483.50	27.58	6.71	35.11	35.67	34.85	74.00	39.15	Peak
3	2486.25	27.58	6.71	35.11	41.14	40.32	74.00	33.68	Peak

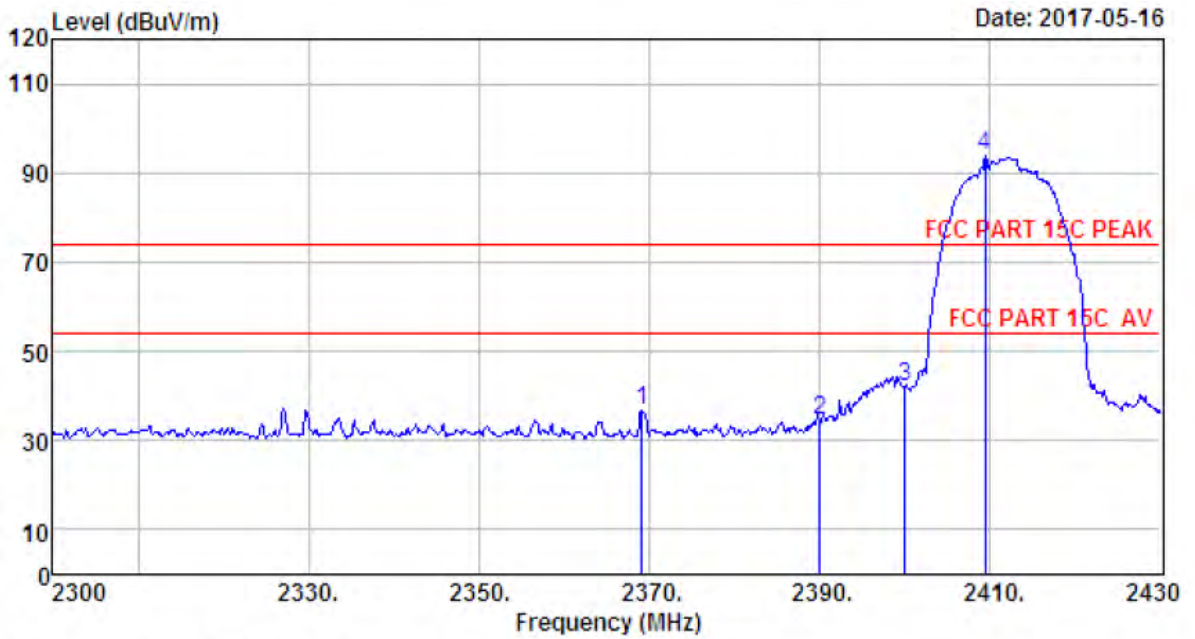
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 420
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11b CH11 2462TX
 Antenna a

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2459.50	27.59	6.69	34.98	95.03	94.33	74.00	-20.33	Peak
2	2483.50	27.58	6.71	35.11	33.24	32.42	74.00	41.58	Peak
3	2491.90	27.58	6.73	35.24	33.93	33.00	74.00	41.00	Peak

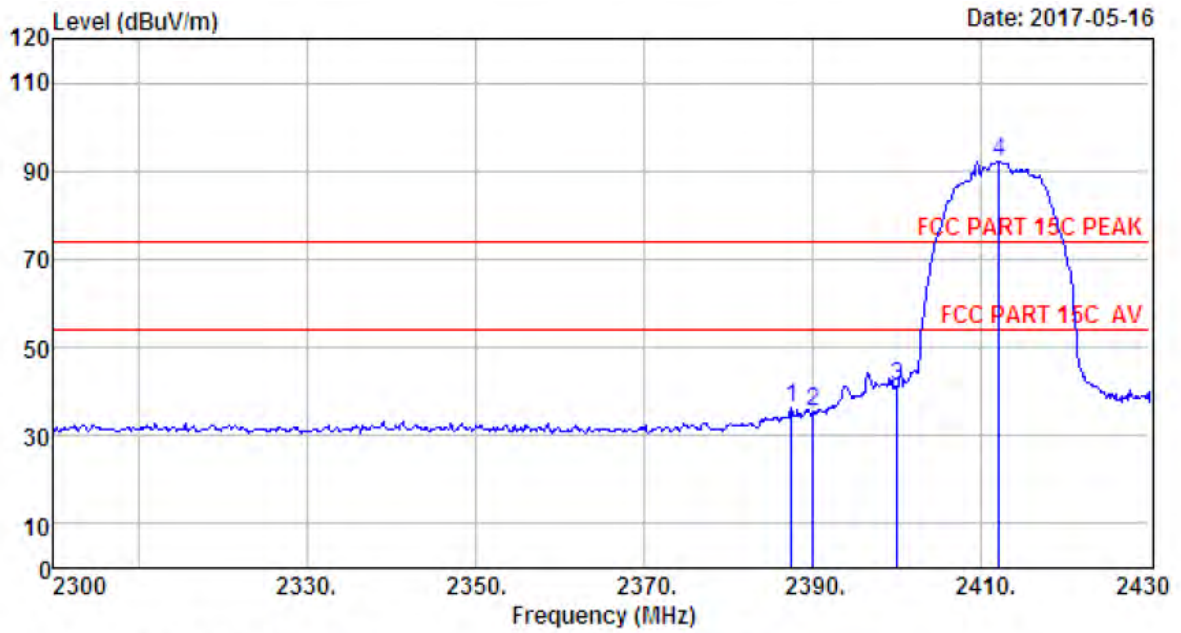
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 433
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUI : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11b CH1 2412TX
 Antenna b

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2369.16	27.67	6.60	34.59	37.19	36.87	74.00	37.13	Peak
2	2390.00	27.64	6.62	34.62	34.80	34.44	74.00	39.56	Peak
3	2400.00	27.61	6.62	34.64	42.39	41.98	74.00	32.02	Peak
4	2409.46	27.60	6.64	34.64	94.15	93.75	74.00	-19.75	Peak

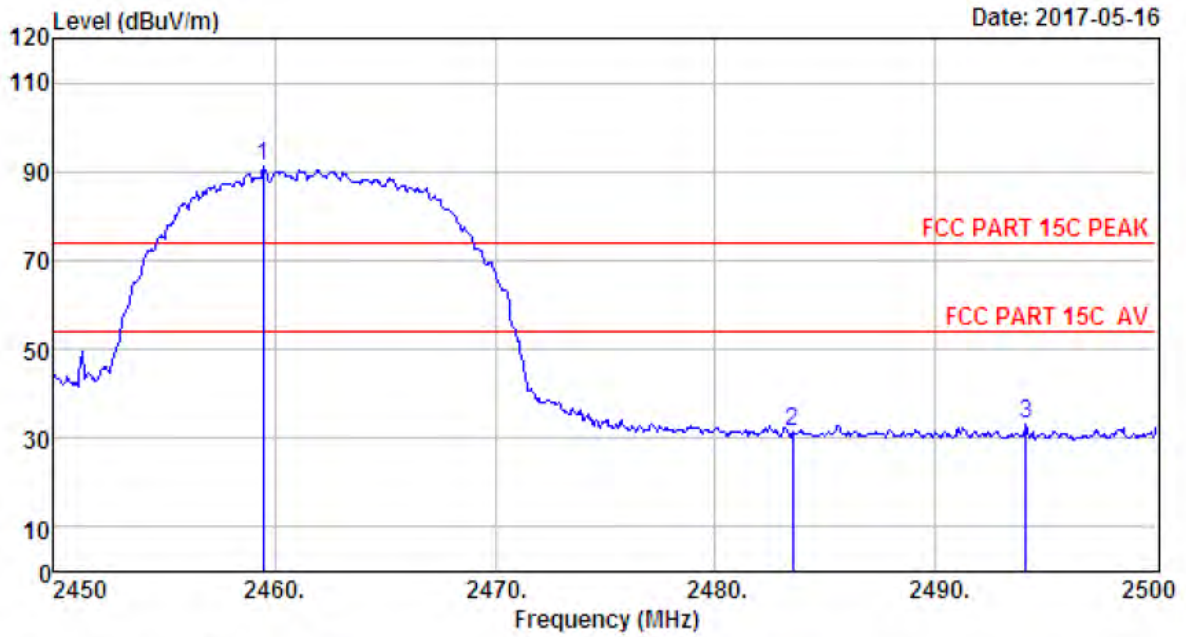
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 434
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11b CH1 2412TX
 Antenna b

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2387.49	27.64	6.62	34.62	36.76	36.40	74.00	37.60	Peak
2	2390.00	27.64	6.62	34.62	35.78	35.42	74.00	38.58	Peak
3	2400.00	27.61	6.62	34.64	41.40	40.99	74.00	33.01	Peak
4	2412.06	27.60	6.64	34.64	92.54	92.14	74.00	-18.14	Peak

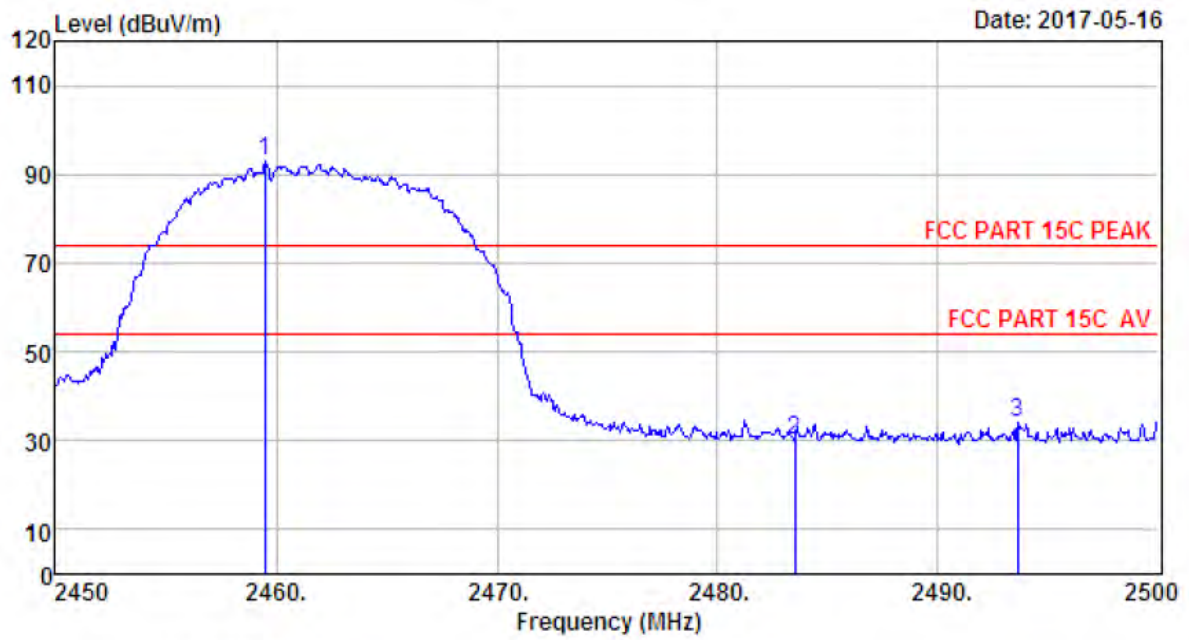
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 435
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11b CH11 2462TX
 Antenna b

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBUV)	Emission Level (dBUV/m)	Limits (dBUV/m)	Margin (dB)	Remark
1	2459.50	27.59	6.69	34.98	92.10	91.40	74.00	-17.40	Peak
2	2483.50	27.58	6.71	35.11	32.15	31.33	74.00	42.67	Peak
3	2494.10	27.58	6.73	35.24	34.32	33.39	74.00	40.61	Peak

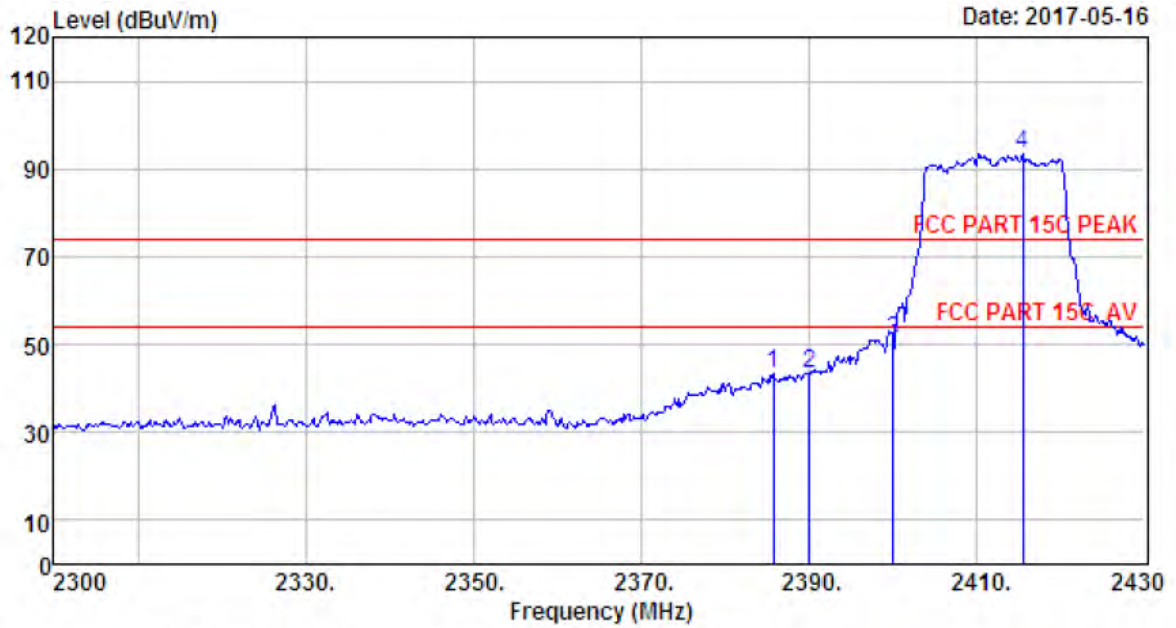
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading,
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 436
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11b CH11 2462TX
 Antenna b

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBUV)	Emission Level (dBUV/m)	Limits (dBUV/m)	Margin (dB)	Remark
1	2459.50	27.59	6.69	34.98	93.88	93.18	74.00	-19.18	Peak
2	2483.50	27.58	6.71	35.11	30.73	29.91	74.00	44.09	Peak
3	2493.60	27.58	6.73	35.24	34.93	34.00	74.00	40.00	Peak

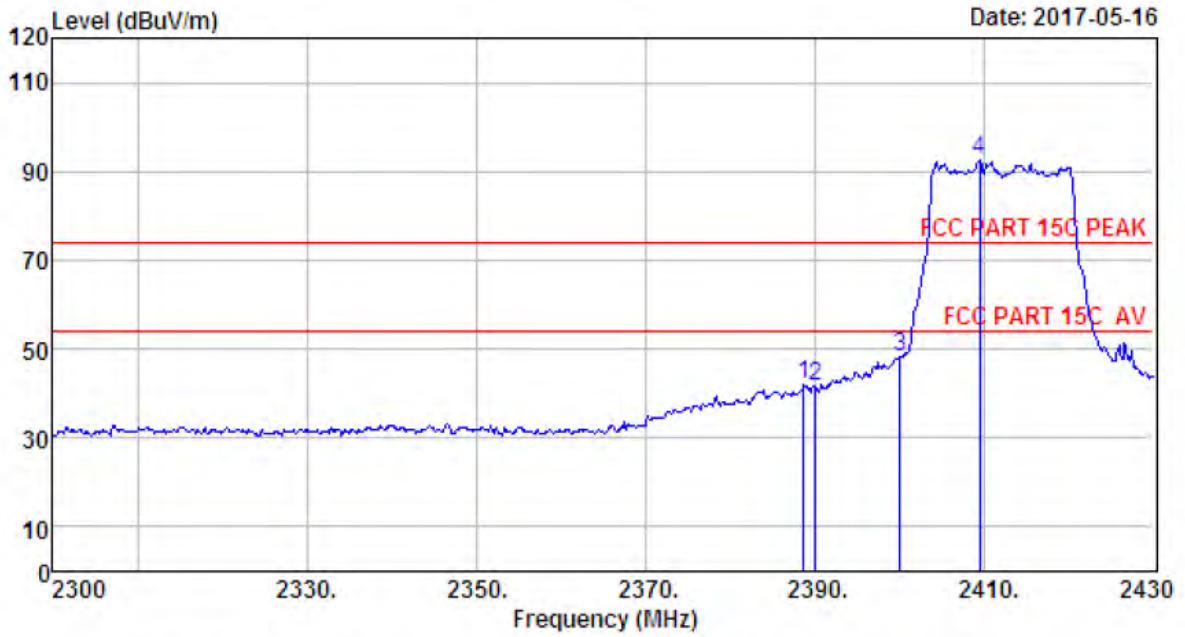
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 421
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11g CH1 2412TX
 Antenna a

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2385.67	27.64	6.62	34.62	43.55	43.19	74.00	30.81	Peak
2	2390.00	27.64	6.62	34.62	43.88	43.52	74.00	30.48	Peak
3	2400.00	27.61	6.62	34.64	51.38	50.97	74.00	23.03	Peak
4	2415.44	27.60	6.64	34.64	93.88	93.48	74.00	-19.48	Peak

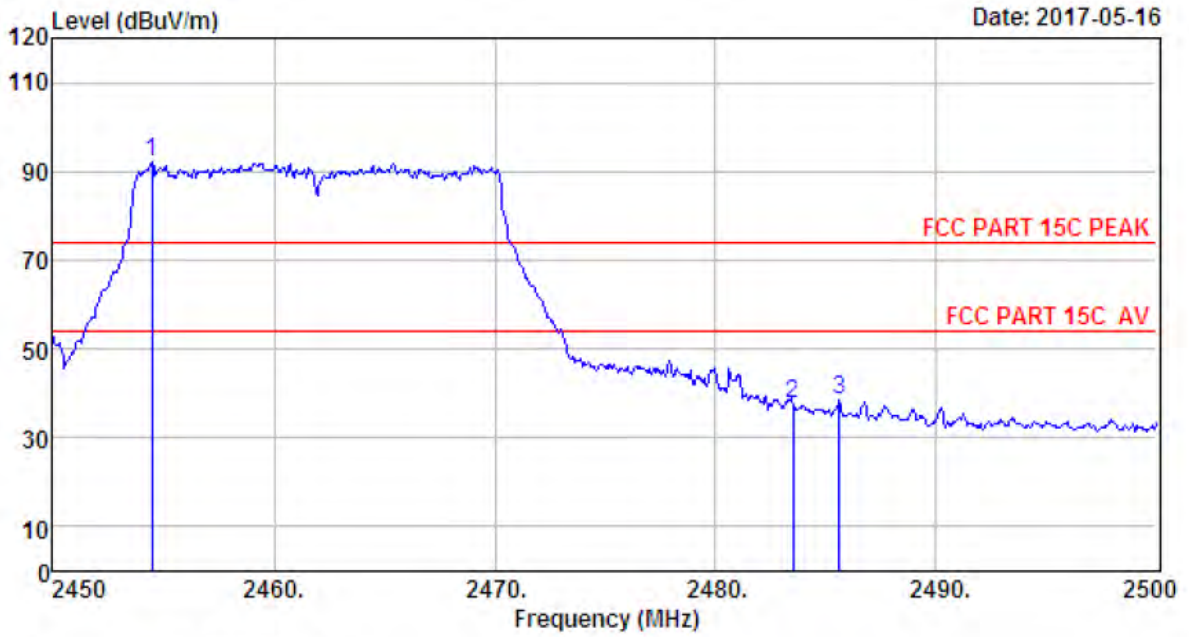
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 422
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11g CH1 2412TX
 Antenna a

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2388.66	27.64	6.62	34.62	42.28	41.92	74.00	32.08	Peak
2	2390.00	27.64	6.62	34.62	42.10	41.74	74.00	32.26	Peak
3	2400.00	27.61	6.62	34.64	48.63	48.22	74.00	25.78	Peak
4	2409.46	27.60	6.64	34.64	92.77	92.37	74.00	-18.37	Peak

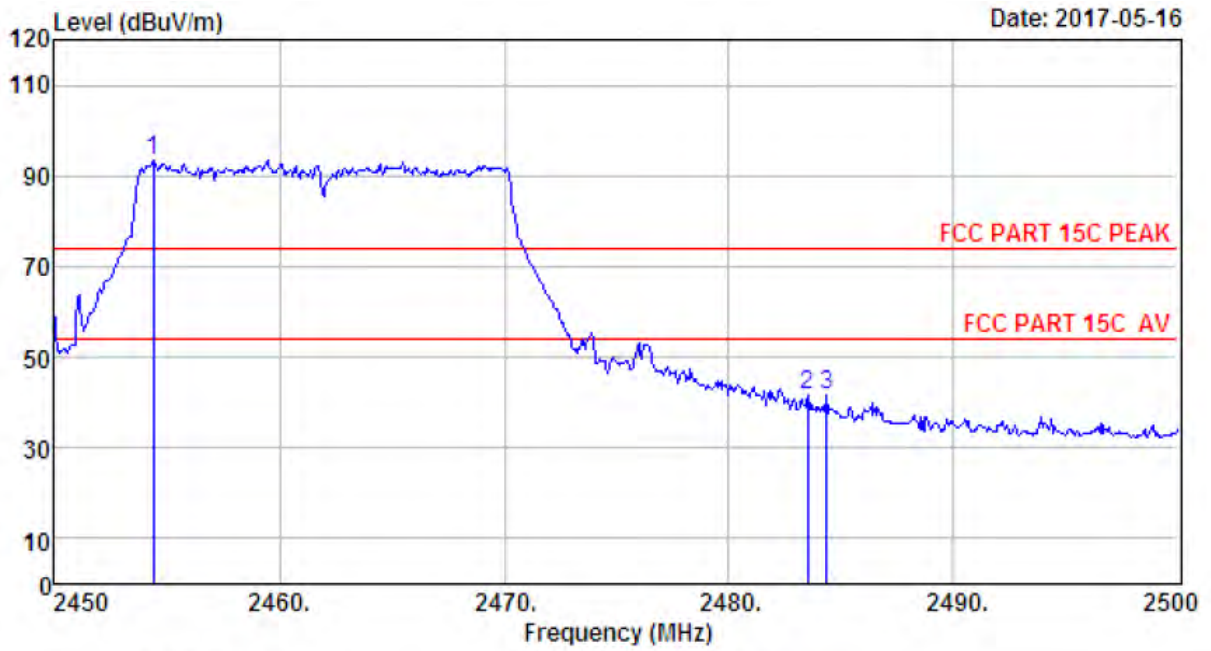
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 423
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUI : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11g CH11 2462TX
 Antenna a

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2454.50	27.59	6.69	34.98	92.91	92.21	74.00	-18.21	Peak
2	2483.50	27.58	6.71	35.11	38.42	37.60	74.00	36.40	Peak
3	2485.60	27.58	6.71	35.11	39.26	38.44	74.00	35.56	Peak

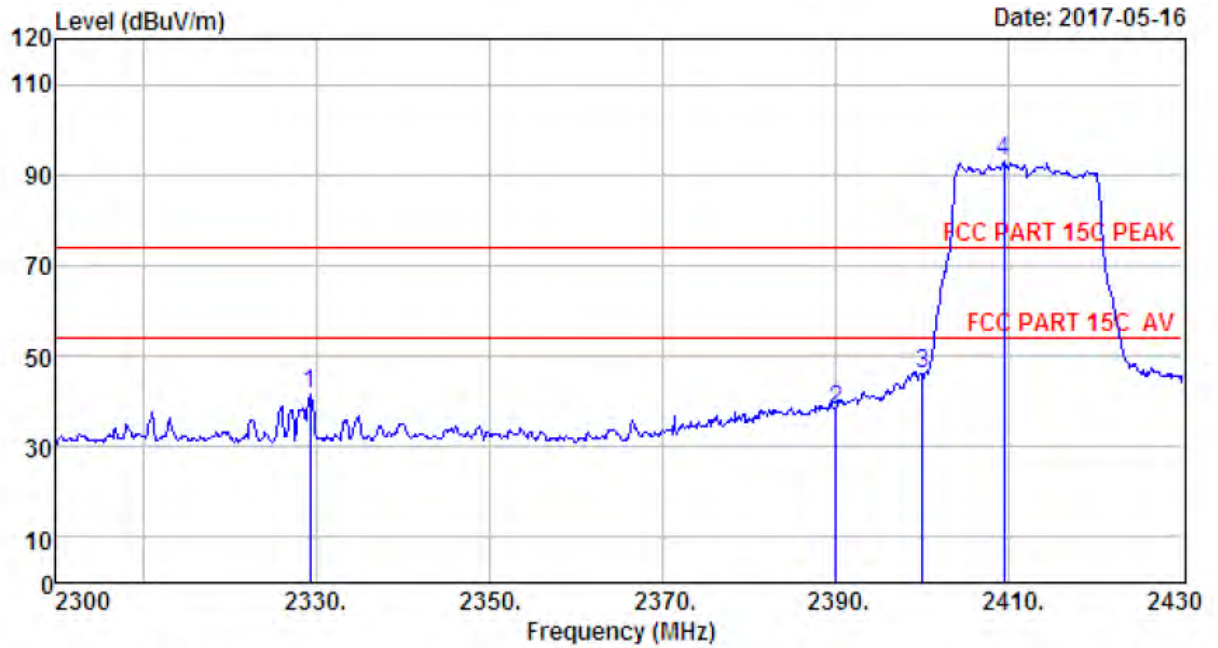
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 424
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUI : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11g CH11 2462TX
 Antenna a

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2454.40	27.59	6.69	34.98	94.19	93.49	74.00	-19.49	Peak
2	2483.50	27.58	6.71	35.11	42.45	41.63	74.00	32.37	Peak
3	2484.35	27.58	6.71	35.11	42.24	41.42	74.00	32.58	Peak

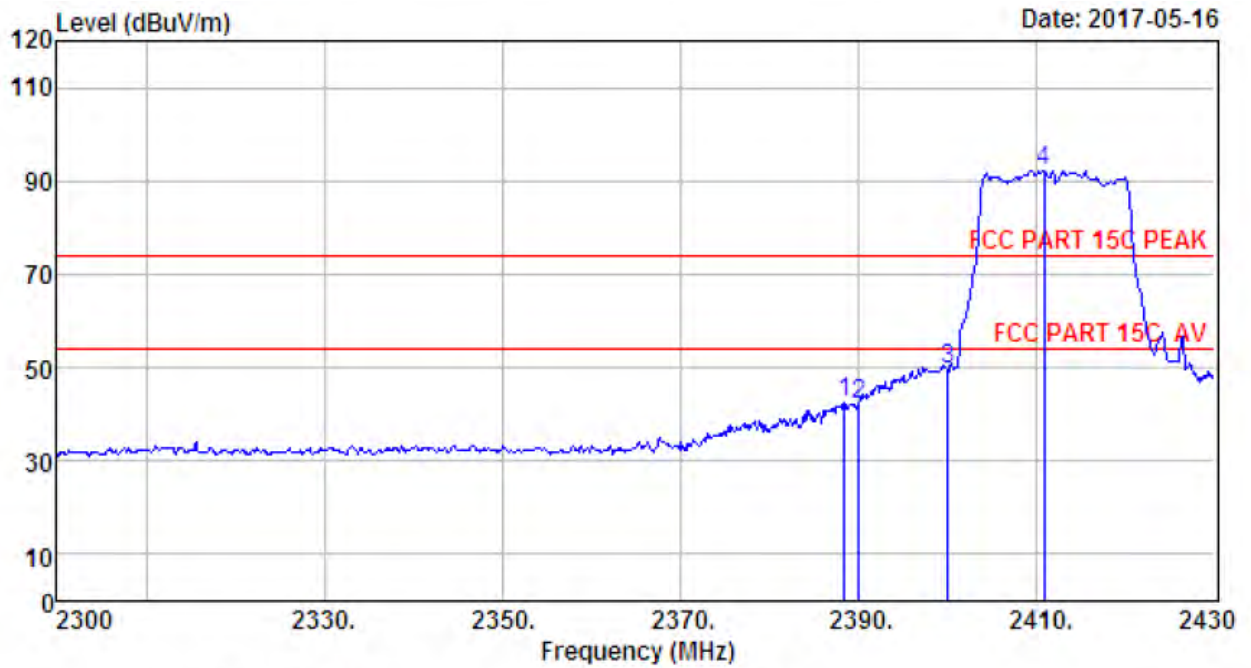
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 437
 Dis. / Ant. : 3m ANI 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11g CH1 2412TX
 Antenna b

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2329.25	27.73	6.54	34.59	41.90	41.58	74.00	32.42	Peak
2	2390.00	27.64	6.62	34.62	38.37	38.01	74.00	35.99	Peak
3	2400.00	27.61	6.62	34.64	46.52	46.11	74.00	27.89	Peak
4	2409.46	27.60	6.64	34.64	93.17	92.77	74.00	-18.77	Peak

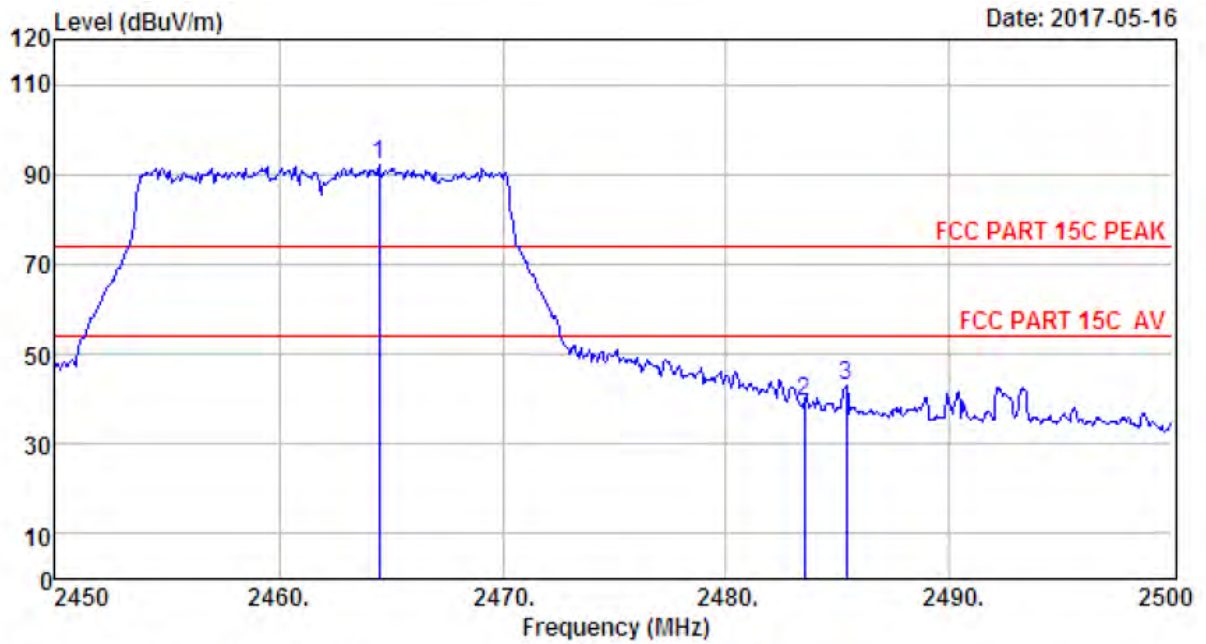
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 438
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11g CH1 2412TX
 Antenna b

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2388.40	27.64	6.62	34.62	43.06	42.70	74.00	31.30	Peak
2	2390.00	27.64	6.62	34.62	42.48	42.12	74.00	31.88	Peak
3	2400.00	27.61	6.62	34.64	49.84	49.43	74.00	24.57	Peak
4	2410.76	27.60	6.64	34.64	92.68	92.28	74.00	-18.28	Peak

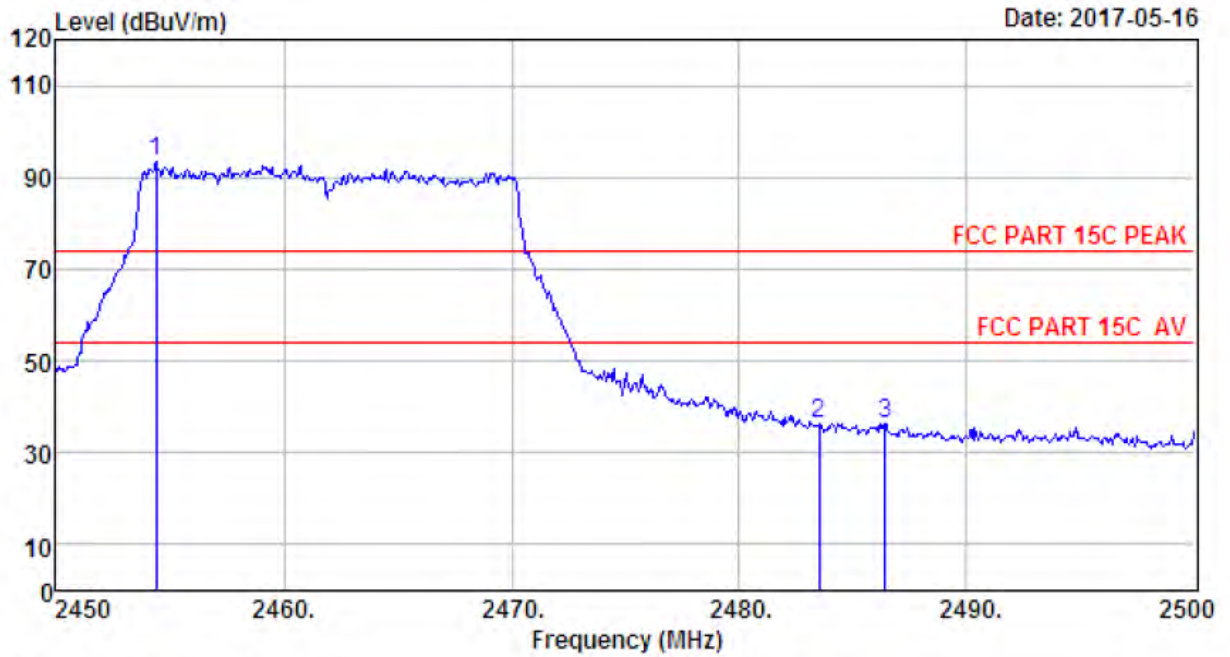
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 439
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUI : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11g CH11 2462TX
 Antenna b

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2464.50	27.58	6.69	34.98	92.80	92.09	74.00	-18.09	Peak
2	2483.50	27.58	6.71	35.11	40.24	39.42	74.00	34.58	Peak
3	2485.40	27.58	6.71	35.11	43.61	42.79	74.00	31.21	Peak

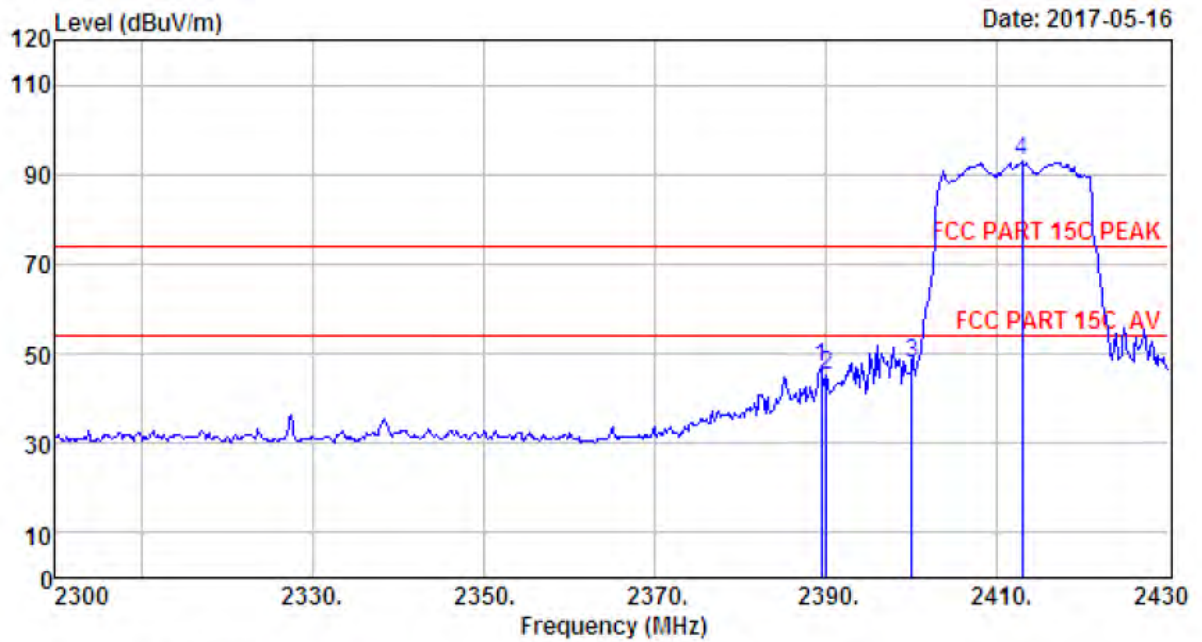
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 440
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11g CH11 2462TX
 Antenna b

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBUV)	Emission Level (dBUV/m)	Limits (dBUV/m)	Margin (dB)	Remark
1	2454.40	27.59	6.69	34.98	93.96	93.26	74.00	-19.26	Peak
2	2483.50	27.58	6.71	35.11	37.18	36.36	74.00	37.64	Peak
3	2486.40	27.58	6.71	35.11	37.31	36.49	74.00	37.51	Peak

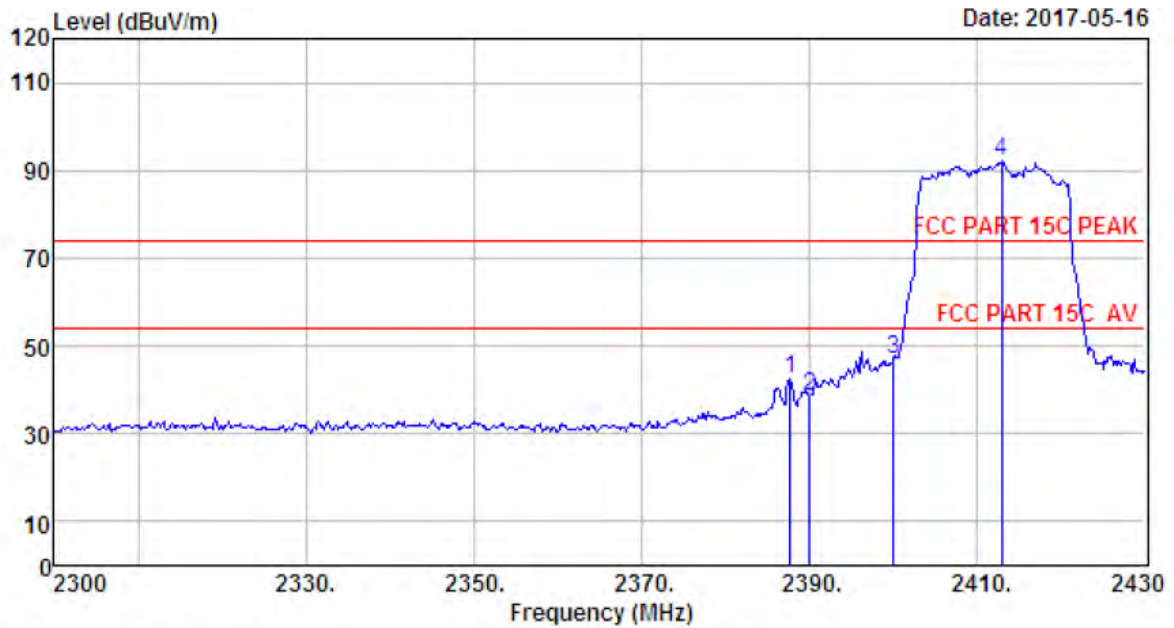
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading,
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 425
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11n HT20 CH1 2412TX
 Antenna a+b

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2389.44	27.64	6.62	34.62	47.50	47.14	74.00	26.86	Peak
2	2390.00	27.64	6.62	34.62	45.75	45.39	74.00	28.61	Peak
3	2400.00	27.61	6.62	34.64	48.14	47.73	74.00	26.27	Peak
4	2412.84	27.60	6.64	34.64	93.27	92.87	74.00	-18.87	Peak

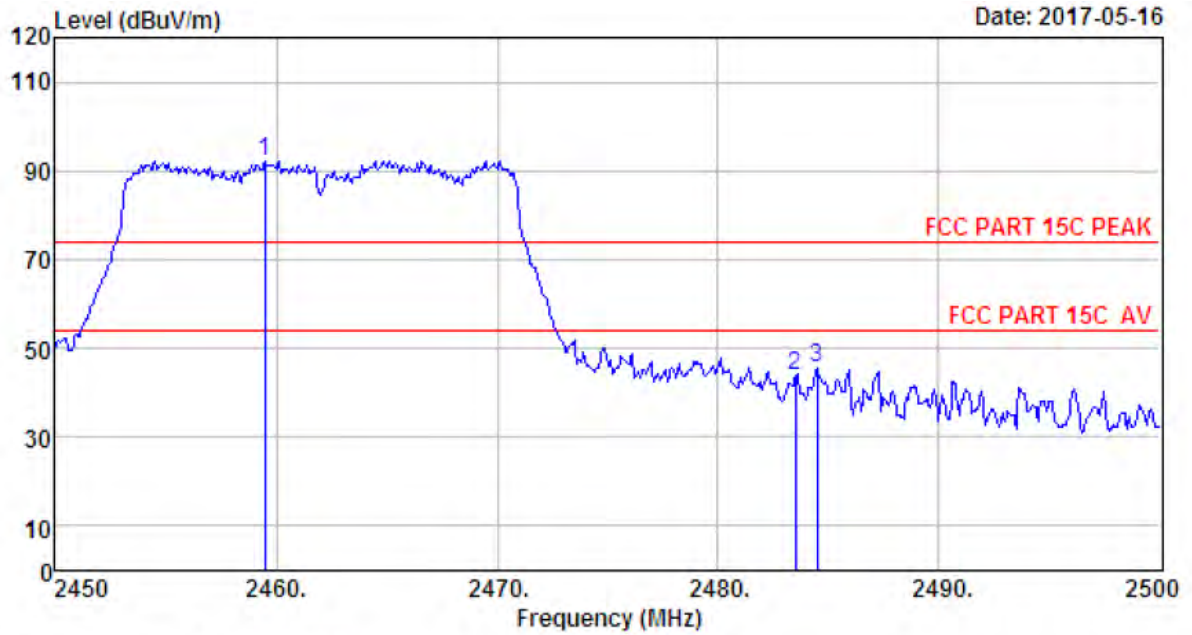
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 426
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11n HT20 CH1 2412TX
 Antenna a+b

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBUV)	Emission Level (dBUV/m)	Limits (dBUV/m)	Margin (dB)	Remark
1	2387.75	27.64	6.62	34.62	42.92	42.56	74.00	31.44	Peak
2	2390.00	27.64	6.62	34.62	39.02	38.66	74.00	35.34	Peak
3	2400.00	27.61	6.62	34.64	47.51	47.10	74.00	26.90	Peak
4	2412.84	27.60	6.64	34.64	92.47	92.07	74.00	-18.07	Peak

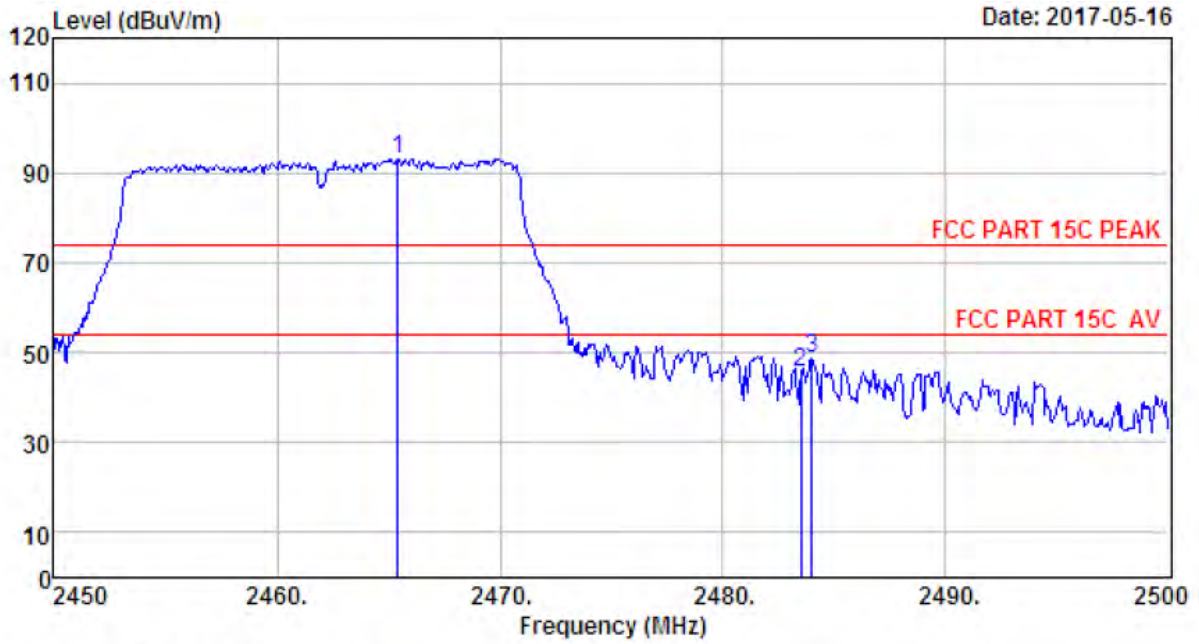
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 427
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11n HT20 CH11 2462TX
 Antenna a+b

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2459.50	27.59	6.69	34.98	92.83	92.13	74.00	-18.13	Peak
2	2483.50	27.58	6.71	35.11	44.79	43.97	74.00	30.03	Peak
3	2484.50	27.58	6.71	35.11	46.52	45.70	74.00	28.30	Peak

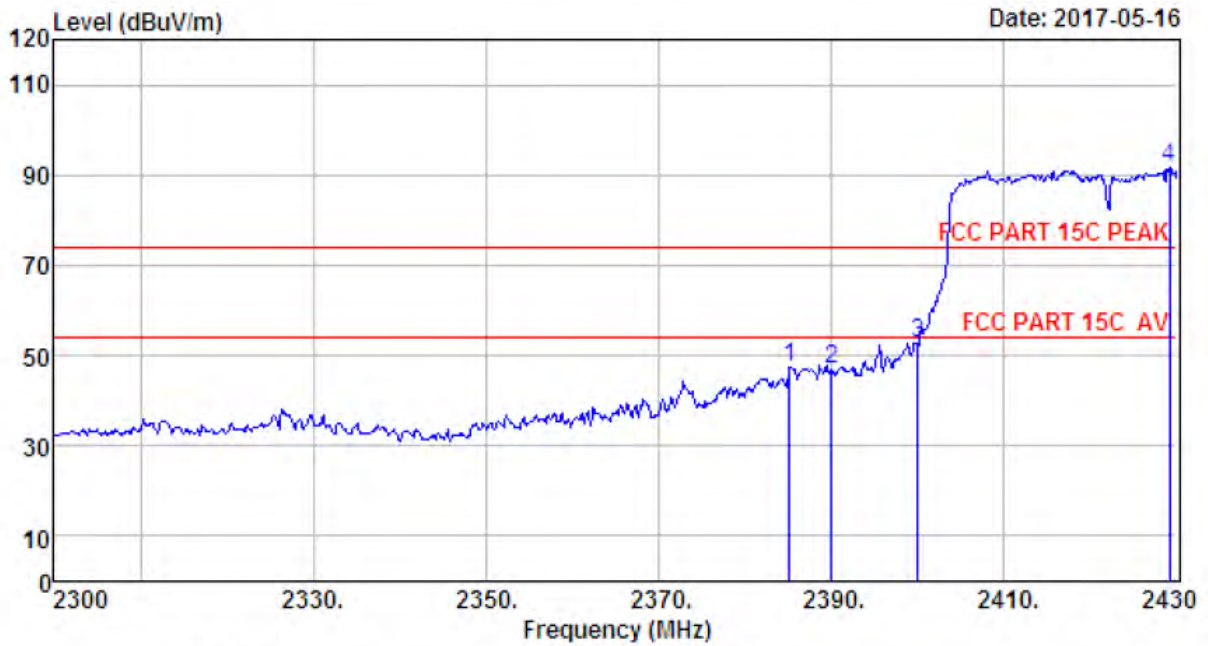
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 428
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11n HT20 CH11 2462TX
 Antenna a+b

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2465.40	27.58	6.69	34.98	93.74	93.03	74.00	-19.03	Peak
2	2483.50	27.58	6.71	35.11	46.55	45.73	74.00	28.27	Peak
3	2484.00	27.58	6.71	35.11	49.47	48.65	74.00	25.35	Peak

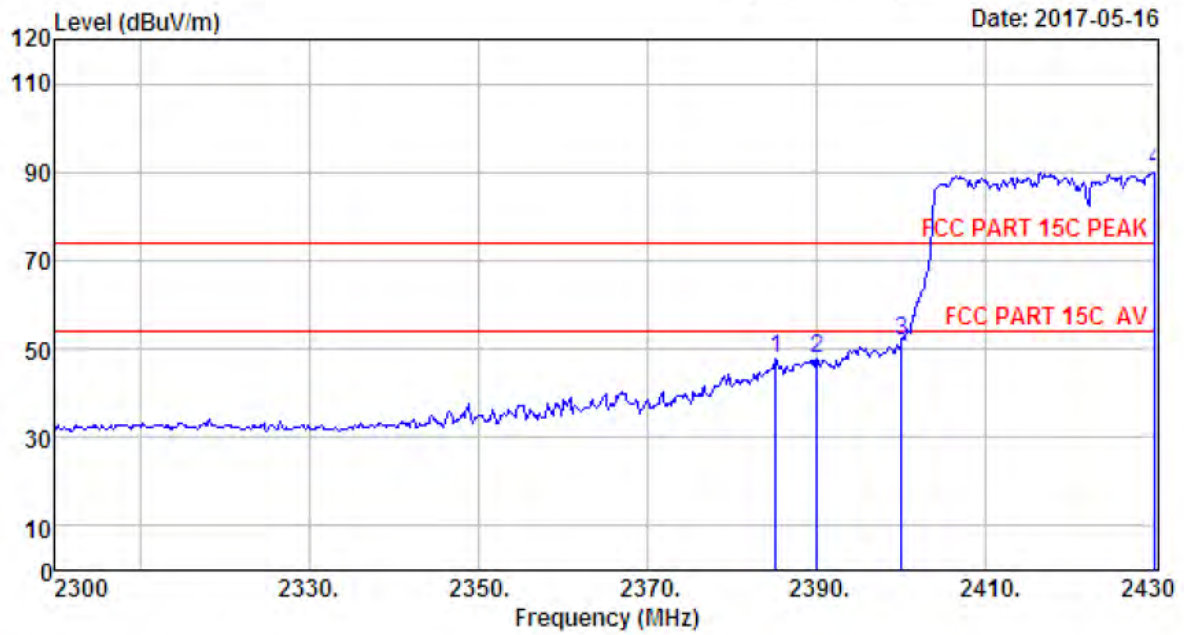
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 429
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11n HT40 CH3 2422TX
 Antenna a+b

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2385.15	27.64	6.60	34.62	47.58	47.20	74.00	26.80	Peak
2	2390.00	27.64	6.62	34.62	47.09	46.73	74.00	27.27	Peak
3	2400.00	27.61	6.62	34.64	52.97	52.56	74.00	21.44	Peak
4	2429.09	27.60	6.66	34.74	91.95	91.47	74.00	-17.47	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 430
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11n HT40 CH3 2422TX
 Antenna a+b

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2385.15	27.64	6.60	34.62	48.26	47.88	74.00	26.12	Peak
2	2390.00	27.64	6.62	34.62	48.34	47.98	74.00	26.02	Peak
3	2400.00	27.61	6.62	34.64	52.20	51.79	74.00	22.21	Peak
4	2430.00	27.60	6.66	34.74	90.71	90.23	74.00	-16.23	Peak

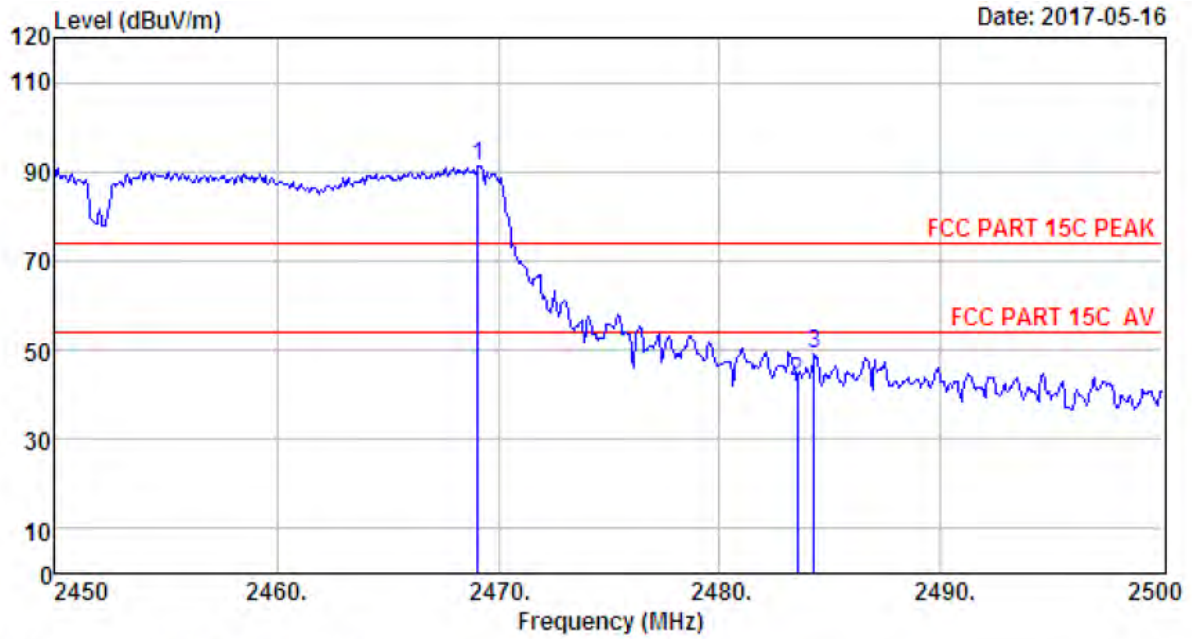
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 431
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11n HT40 CH9 2452TX
 Antenna a+b

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2467.00	27.58	6.69	34.98	91.17	90.46	74.00	-16.46	Peak
2	2483.50	27.58	6.71	35.11	40.13	39.31	74.00	34.69	Peak
3	2484.25	27.58	6.71	35.11	41.74	40.92	74.00	33.08	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 1# 966 Chamber Data no. : 432
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Speaker
 Power : AC 120V/60Hz
 M/N : Beoplay M3
 Test Mode : IEEE 802.11n HT40 CH9 2452TX
 Antenna a+b

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2469.10	27.58	6.69	34.98	91.78	91.07	74.00	-17.07	Peak
2	2483.50	27.58	6.71	35.11	43.57	42.75	74.00	31.25	Peak
3	2484.25	27.58	6.71	35.11	49.91	49.09	74.00	24.91	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

6 6dB & 20dB Bandwidth Test

6.1 Limit

For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz

6.2 Test Procedure for 6dB

- 1, The transmitter output (antenna port) was connected to the spectrum analyzer. Connect EUT antenna terminal to the spectrum analyzer with a low loss SMA cable.
- 2, Follow the test procedure as described in KDB 558074
 - (1). Set resolution bandwidth (RBW) = 100 kHz.
 - (2). Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
 - (3). Detector = Peak.
 - (4). Trace mode = max hold.
 - (5). Sweep = auto couple.
 - (6). Allow the trace to stabilize.
 - (7). Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.3 Test Procedure for 20dB

- 1, The transmitter output (antenna port) was connected to the spectrum analyzer. Connect EUT antenna terminal to the spectrum analyzer with a low loss SMA cable.
- 2, Follow the test procedure as described in C63.10
 - (1). The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW.
 - (2). The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW, unless otherwise specified by the applicable requirement.
 - (3). Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than $[10 \log (OBW/RBW)]$ below the reference level. Specific guidance is given in 4.1.5.2.
 - (4). Steps a) through c) might require iteration to adjust within the specified tolerances.
 - (5). The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target “-xx dB down” requirement; that is, if the requirement calls for measuring the -20 dB OBW, the instrument noise floor at the selected RBW shall be at least 30 dB below the reference value.
 - (6). Set detection mode to peak and trace mode to max hold.
 - (7). Determine the reference value: Set the EUT to transmit an unmodulated carrier or modulated signal, as applicable. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
 - (8). Determine the “-xx dB down amplitude” using $[(\text{reference value}) - xx]$. Alternatively, this calculation may be made by using the marker-delta function of the instrument.
 - (9). If the reference value is determined by an unmodulated carrier, then turn the EUT modulation ON, and either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise, the trace from step g) shall be used for step j).
 - (10). Place two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the “_xx dB down amplitude” determined in step h). If a marker is below this “-xx dB down amplitude” value,

then it shall be as close as possible to this value. The occupied bandwidth is the frequency difference between the two markers. Alternatively, set a marker at the lowest frequency of the envelope of the spectral display, such that the marker is at or slightly below the “_xx dB down amplitude” determined in step h). Reset the marker-delta function and move the marker to the other side of the emission until the delta marker amplitude is at the same level as the reference marker amplitude. The marker-delta frequency reading at this point is the specified emission bandwidth.

(11). The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

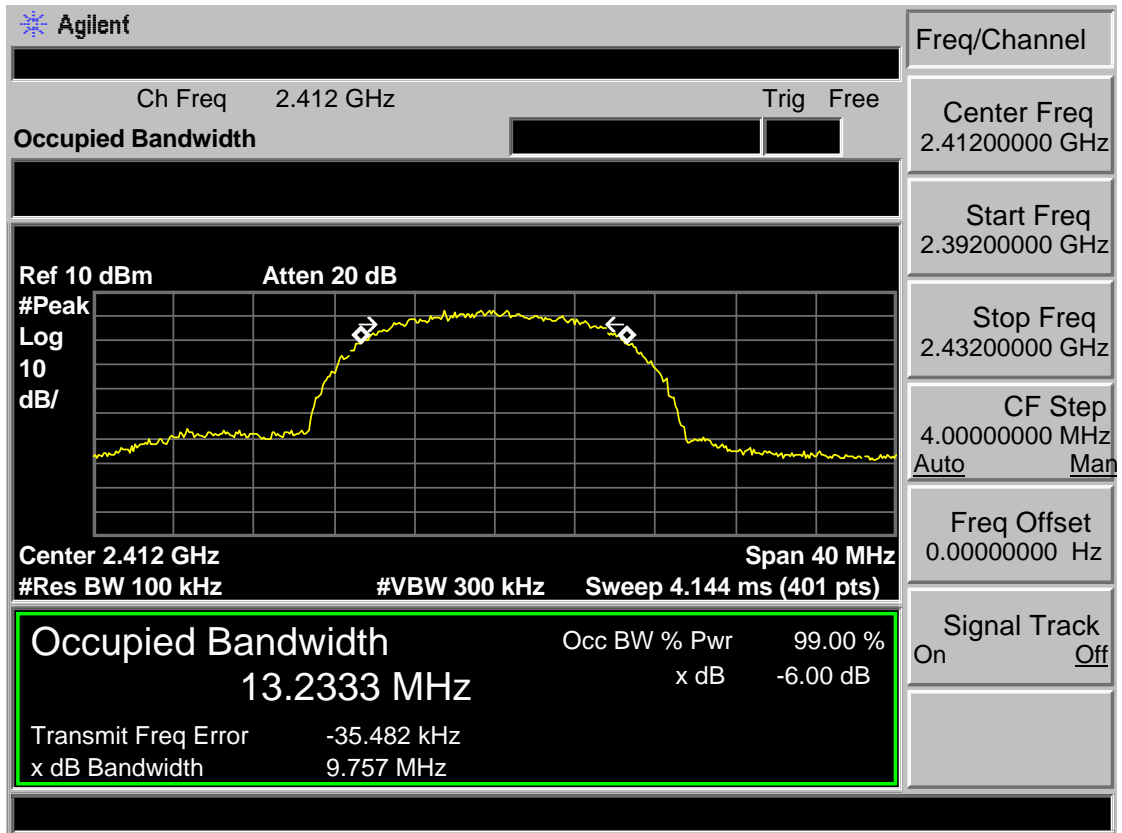
6.4 Test Result

EUT: Wireless Speaker				
M/N: Beoplay M3				
Test date: 2017-05-25		Tested by: Tony.Tang		Test site: RF Site
Test Mode	CH	6dB bandwidth (MHz)	20dB bandwidth (MHz)	Limit (KHz)
Antenna 0				
IEEE 802.11 b	CH1	9.757	15.163	>500
	CH6	9.957	15.185	>500
	CH11	9.816	15.200	>500
IEEE 802.11 g	CH1	16.600	18.485	>500
	CH6	16.668	18.445	>500
	CH11	16.588	18.451	>500
IEEE 802.11 n HT 20	CH1	17.784	19.428	>500
	CH6	17.783	19.437	>500
	CH11	17.657	19.364	>500
IEEE 802.11 n HT 40	CH1	36.415	40.482	>500
	CH4	36.473	40.206	>500
	CH7	36.459	40.396	>500
Antenna 1				
IEEE 802.11 b	CH1	9.788	15.400	>500
	CH6	9.490	15.354	>500
	CH11	9.842	15.376	>500
IEEE 802.11 g	CH1	16.626	18.666	>500
	CH6	16.638	18.585	>500
	CH11	16.604	18.474	>500
IEEE 802.11 n HT 20	CH1	17.762	19.409	>500
	CH6	17.779	19.384	>500
	CH11	17.773	19.446	>500
IEEE 802.11 n HT 40	CH1	36.394	40.320	>500
	CH4	36.449	40.114	>500
	CH7	36.464	40.385	>500
Conclusion : PASS				

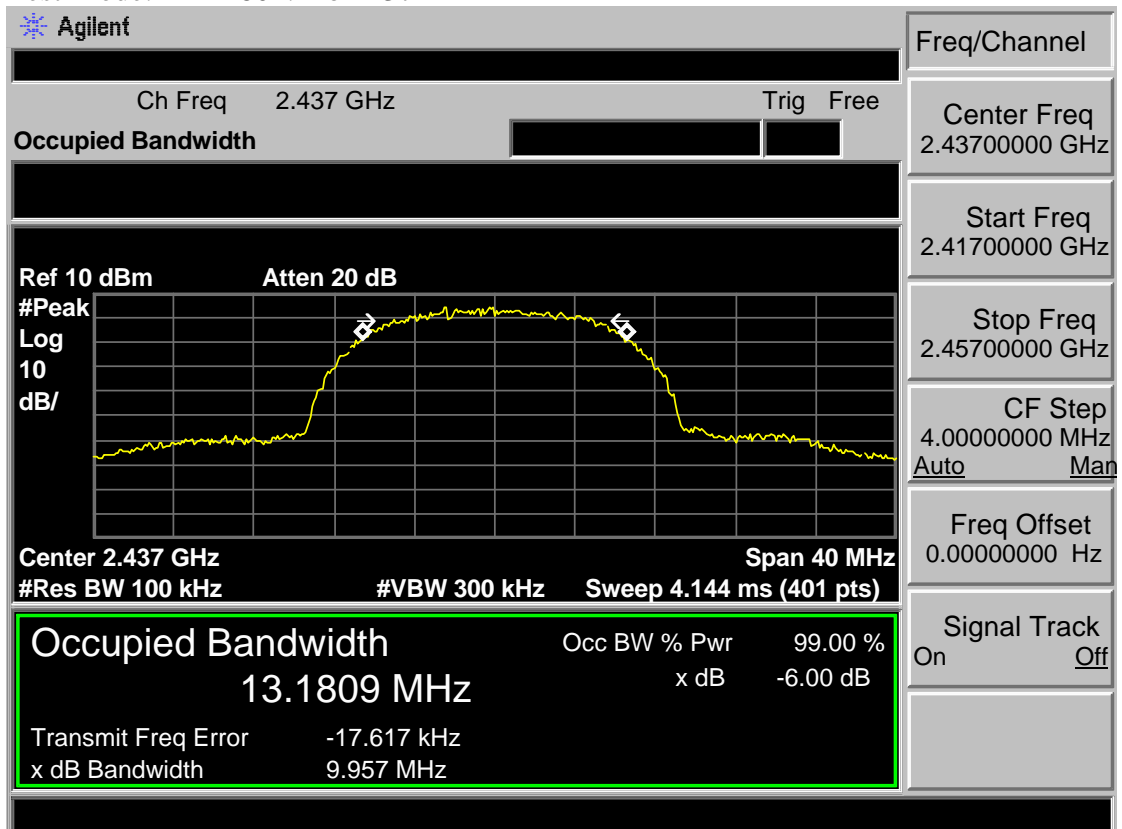
6.5 6dB Test Data

Antenna 0

Test Mode: IEEE 802.11b 2412MHz



Test Mode: IEEE 802.11b 2437MHz



Test Mode: IEEE 802.11b 2462MHz

Agilent

Freq/Channel

Ch Freq 2.462 GHz
Trig Free

Occupied Bandwidth

█

Center Freq
2.46200000 GHz

Start Freq
2.44200000 GHz

Stop Freq
2.48200000 GHz

CF Step
4.00000000 MHz
Auto Man

Freq Offset
0.00000000 Hz

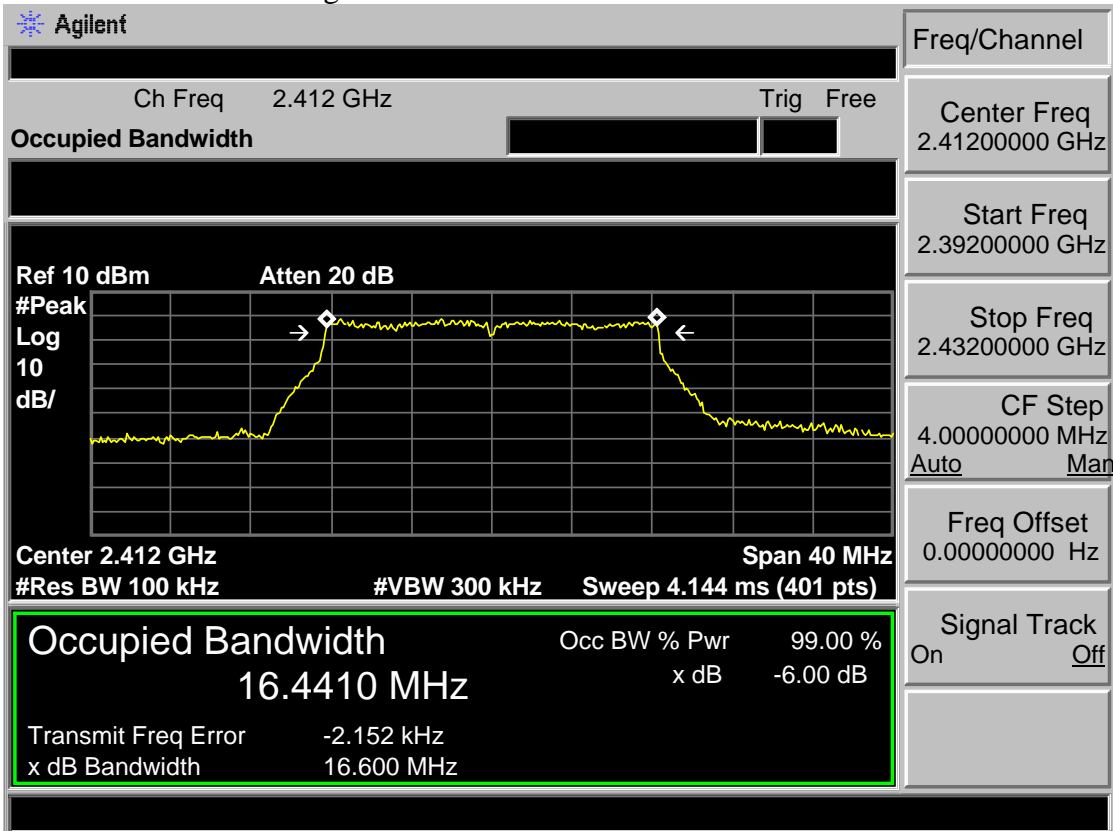
Signal Track
On Off

Center 2.462 GHz
#Res BW 100 kHz

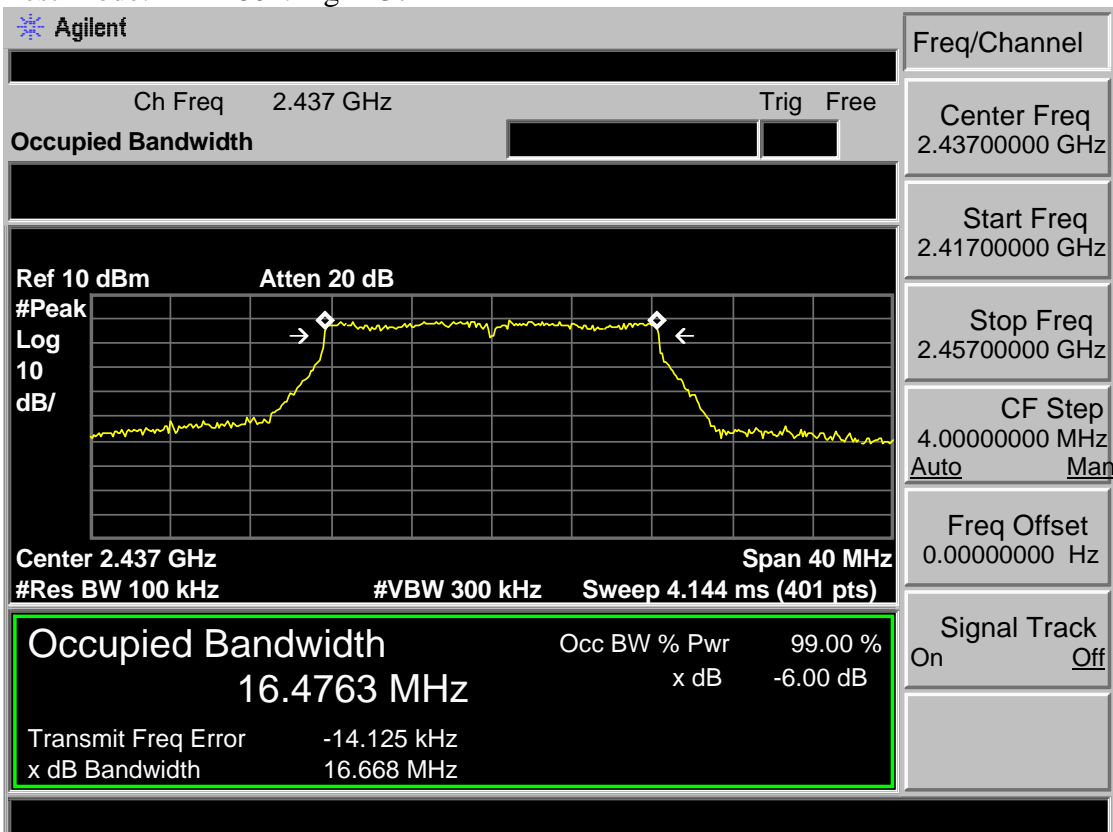
Span 40 MHz
#VBW 300 kHz Sweep 4.144 ms (401 pts)

Occupied Bandwidth	Occ BW % Pwr	99.00 %
13.2073 MHz	x dB	-6.00 dB
Transmit Freq Error	-31.101 kHz	
x dB Bandwidth	9.816 MHz	

Test Mode: IEEE 802.11g 2412MHz



Test Mode: IEEE 802.11g 2437MHz



Test Mode: IEEE 802.11g 2462MHz

Agilent

Freq/Channel

Ch Freq 2.462 GHz
Occupied Bandwidth

Trig Free

Ref 10 dBm Atten 20 dB

Center Freq 2.4620000 GHz

Start Freq 2.4420000 GHz

Stop Freq 2.4820000 GHz

CF Step 4.0000000 MHz

Auto Man

Freq Offset 0.0000000 Hz

Center 2.462 GHz

#Res BW 100 kHz

Span 40 MHz

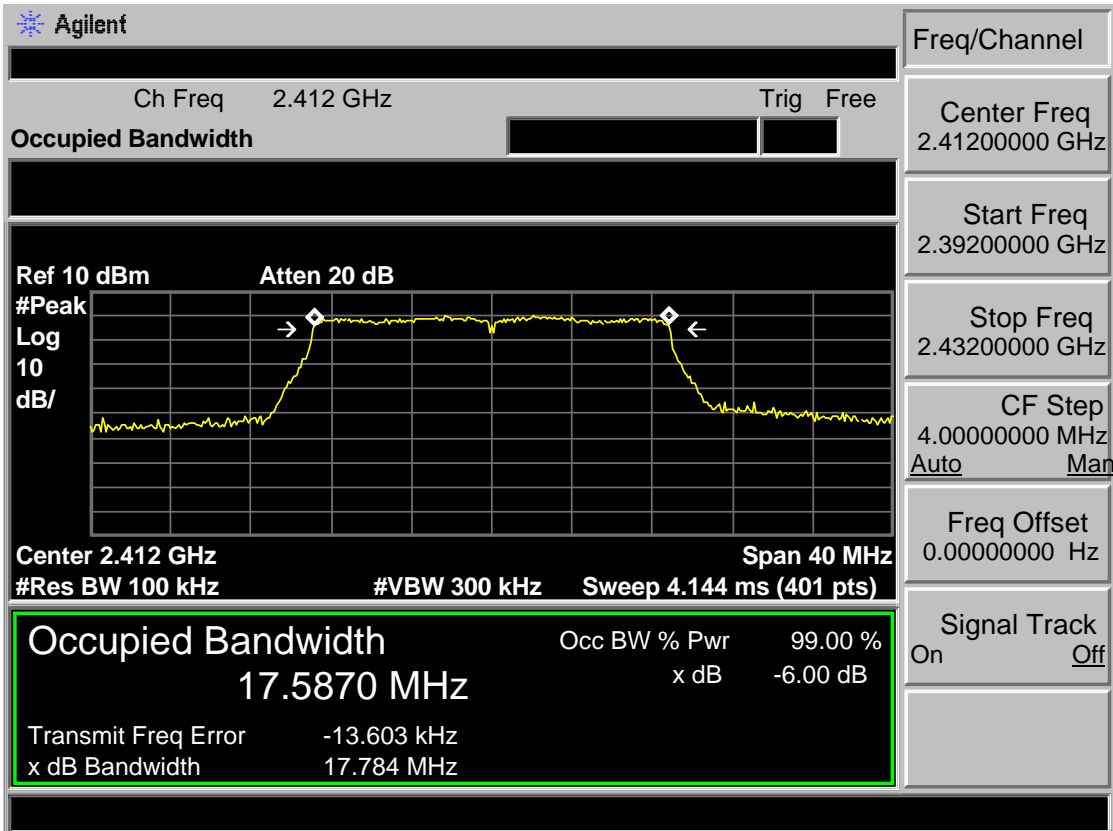
#VBW 300 kHz Sweep 4.144 ms (401 pts)

Signal Track

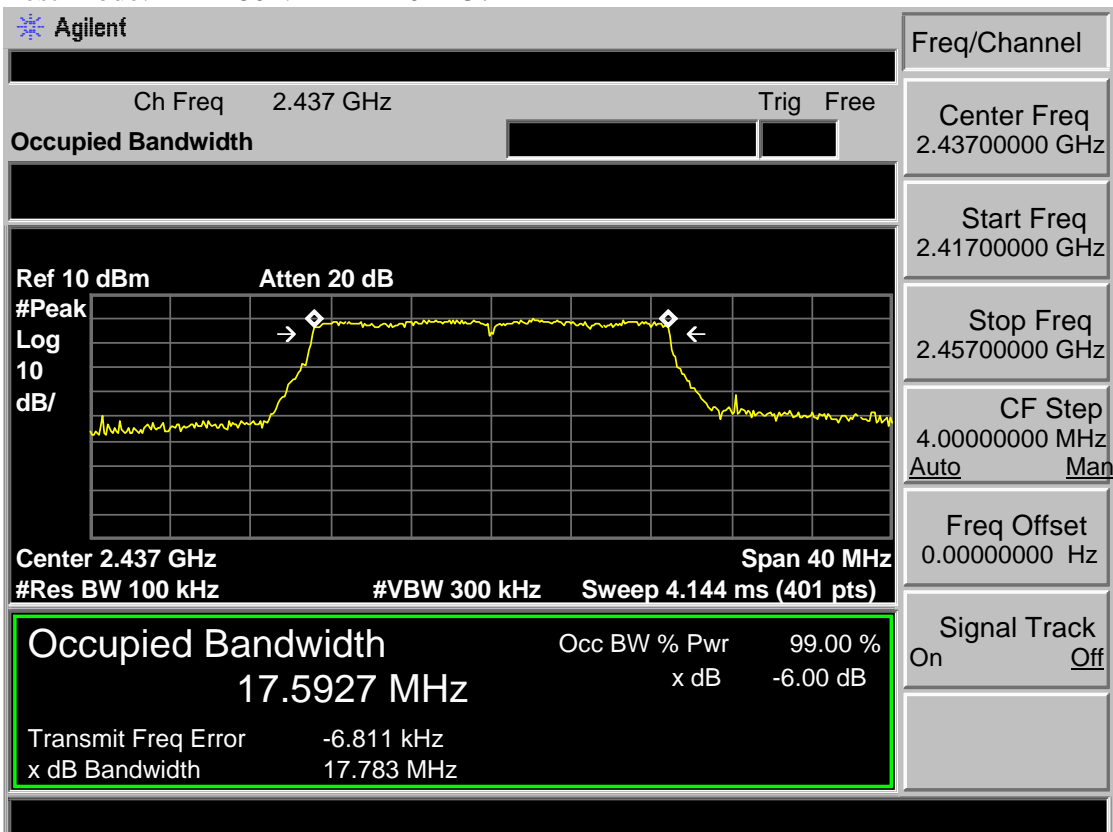
On Off

Occupied Bandwidth	Occ BW % Pwr	99.00 %
16.4319 MHz	x dB	-6.00 dB
Transmit Freq Error	-13.232 kHz	
x dB Bandwidth	16.588 MHz	

Test Mode: IEEE 802.11n HT20 2412MHz



Test Mode: IEEE 802.11n HT20 2437MHz



Test Mode: IEEE 802.11n HT20 2462MHz

Agilent

Ch Freq 2.462 GHz Trig Free

Occupied Bandwidth

Center 2.462 GHz Span 40 MHz
 #Res BW 100 kHz #VBW 300 kHz Sweep 4.144 ms (401 pts)

Freq/Channel

Center Freq 2.46200000 GHz

Start Freq 2.44200000 GHz

Stop Freq 2.48200000 GHz

CF Step 4.00000000 MHz
Auto Man

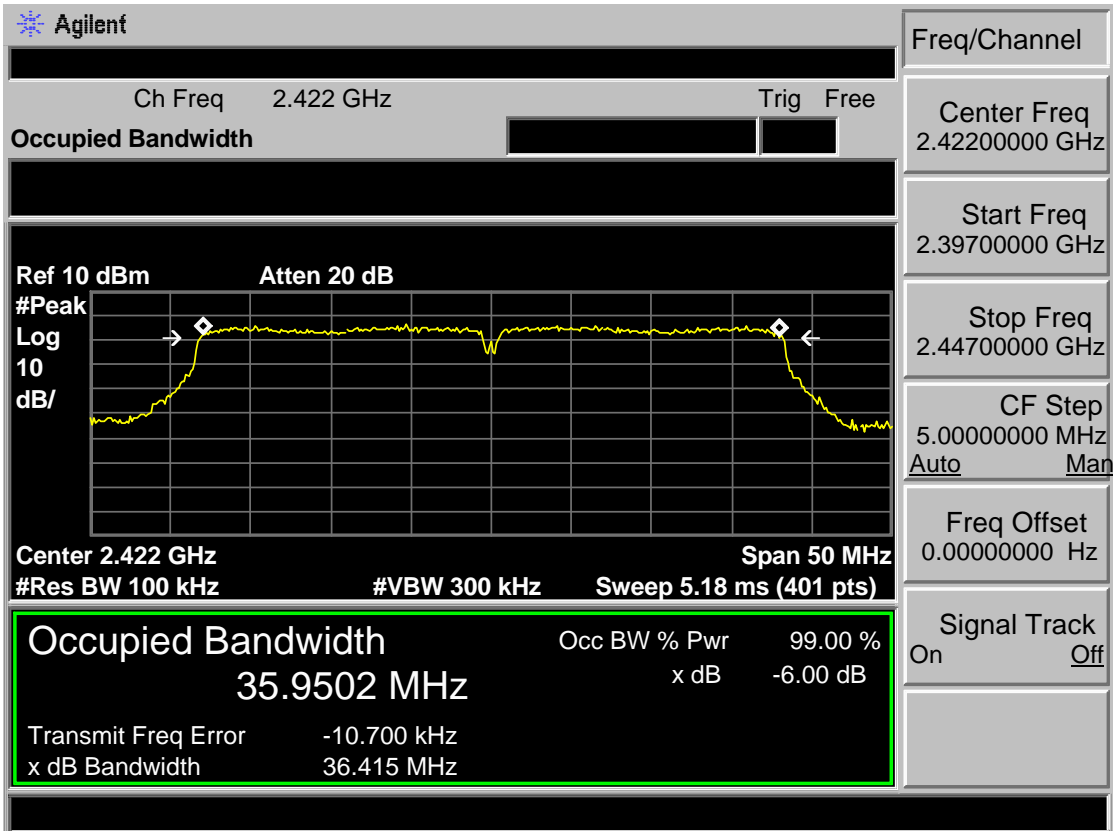
Freq Offset 0.00000000 Hz

Signal Track On Off

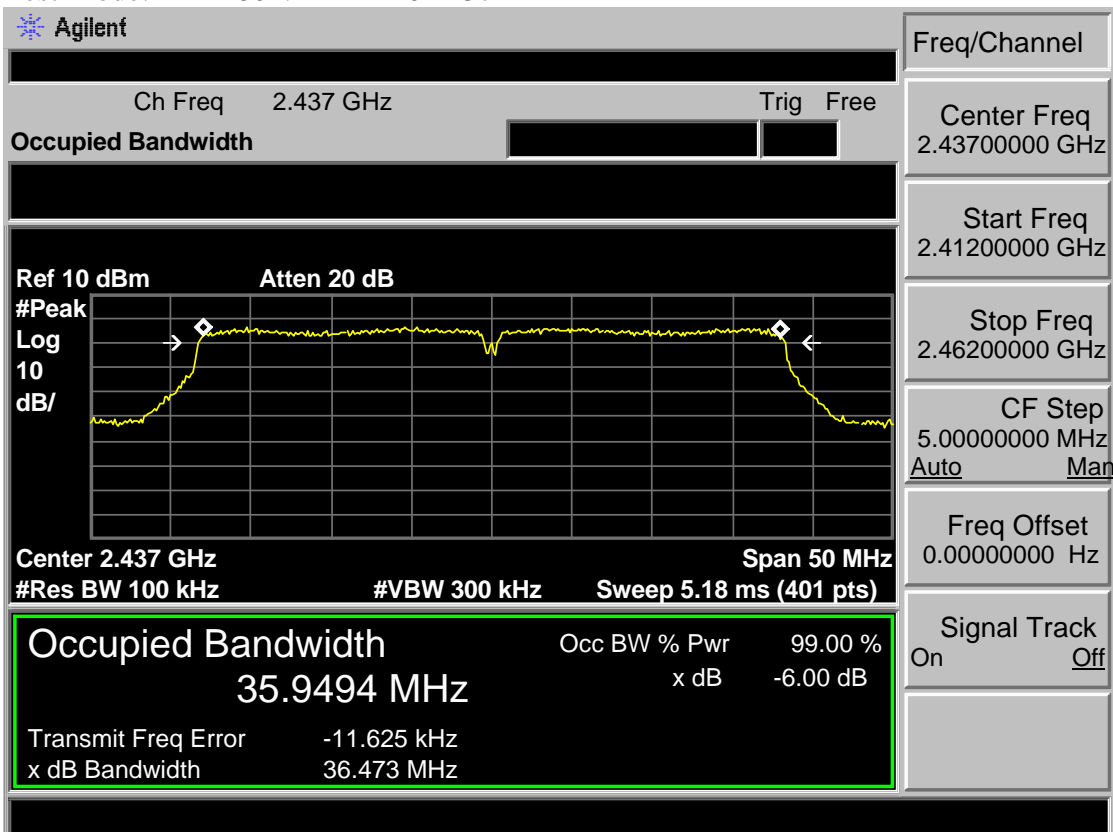
Occupied Bandwidth Occ BW % Pwr 99.00 %
 17.5829 MHz x dB -6.00 dB

Transmit Freq Error -3.130 kHz
 x dB Bandwidth 17.657 MHz

Test Mode: IEEE 802.11n HT40 2422MHz



Test Mode: IEEE 802.11n HT40 2437MHz



Test Mode: IEEE 802.11n HT40 2452MHz

Agilent

Ch Freq 2.452 GHz Trig Free

Occupied Bandwidth

Ref 10 dBm Atten 20 dB

#Peak Log 10 dB/

Center 2.452 GHz Span 50 MHz

#Res BW 100 kHz #VBW 300 kHz Sweep 5.18 ms (401 pts)

Occupied Bandwidth Occ BW % Pwr 99.00 %

35.9313 MHz

x dB -6.00 dB

Transmit Freq Error -9.855 kHz

x dB Bandwidth 36.459 MHz

Freq/Channel

Center Freq 2.45200000 GHz

Start Freq 2.42700000 GHz

Stop Freq 2.47700000 GHz

CF Step 5.00000000 MHz

Auto Man

Freq Offset 0.00000000 Hz

Signal Track On Off

Antenna 1

Test Mode: IEEE 802.11b 2412MHz

Agilent

Ch Freq 2.412 GHz Trig Free

Occupied Bandwidth

Ref 10 dBm Atten 20 dB

#Peak Log 10 dB/

Center 2.412 GHz Span 40 MHz

#Res BW 100 kHz #VBW 300 kHz Sweep 4.144 ms (401 pts)

Occupied Bandwidth	Occ BW % Pwr	99.00 %
13.1233 MHz	x dB	-6.00 dB
Transmit Freq Error	-43.594 kHz	
x dB Bandwidth	9.788 MHz	

Freq/Channel

Center Freq 2.41200000 GHz

Start Freq 2.39200000 GHz

Stop Freq 2.43200000 GHz

CF Step 4.00000000 MHz Auto Man

Freq Offset 0.00000000 Hz

Signal Track On Off

Test Mode: IEEE 802.11b 2437MHz

Agilent

Ch Freq 2.437 GHz Trig Free

Occupied Bandwidth

Ref 10 dBm Atten 20 dB

#Peak Log 10 dB/

Center 2.437 GHz Span 40 MHz

#Res BW 100 kHz #VBW 300 kHz Sweep 4.144 ms (401 pts)

Occupied Bandwidth	Occ BW % Pwr	99.00 %
13.0734 MHz	x dB	-6.00 dB
Transmit Freq Error	-24.654 kHz	
x dB Bandwidth	9.490 MHz	

Freq/Channel

Center Freq 2.43700000 GHz

Start Freq 2.41700000 GHz

Stop Freq 2.45700000 GHz

CF Step 4.00000000 MHz Auto Man

Freq Offset 0.00000000 Hz

Signal Track On Off

Test Mode: IEEE 802.11b 2462MHz

Agilent

Ch Freq 2.462 GHz Trig Free

Occupied Bandwidth

Ref 10 dBm Atten 20 dB

#Peak Log 10 dB/

Center 2.462 GHz Span 40 MHz

#Res BW 100 kHz #VBW 300 kHz Sweep 4.144 ms (401 pts)

Occupied Bandwidth Occ BW % Pwr 99.00 %

13.1303 MHz x dB -6.00 dB

Transmit Freq Error -22.005 kHz

x dB Bandwidth 9.842 MHz

Freq/Channel

Center Freq 2.46200000 GHz

Start Freq 2.44200000 GHz

Stop Freq 2.48200000 GHz

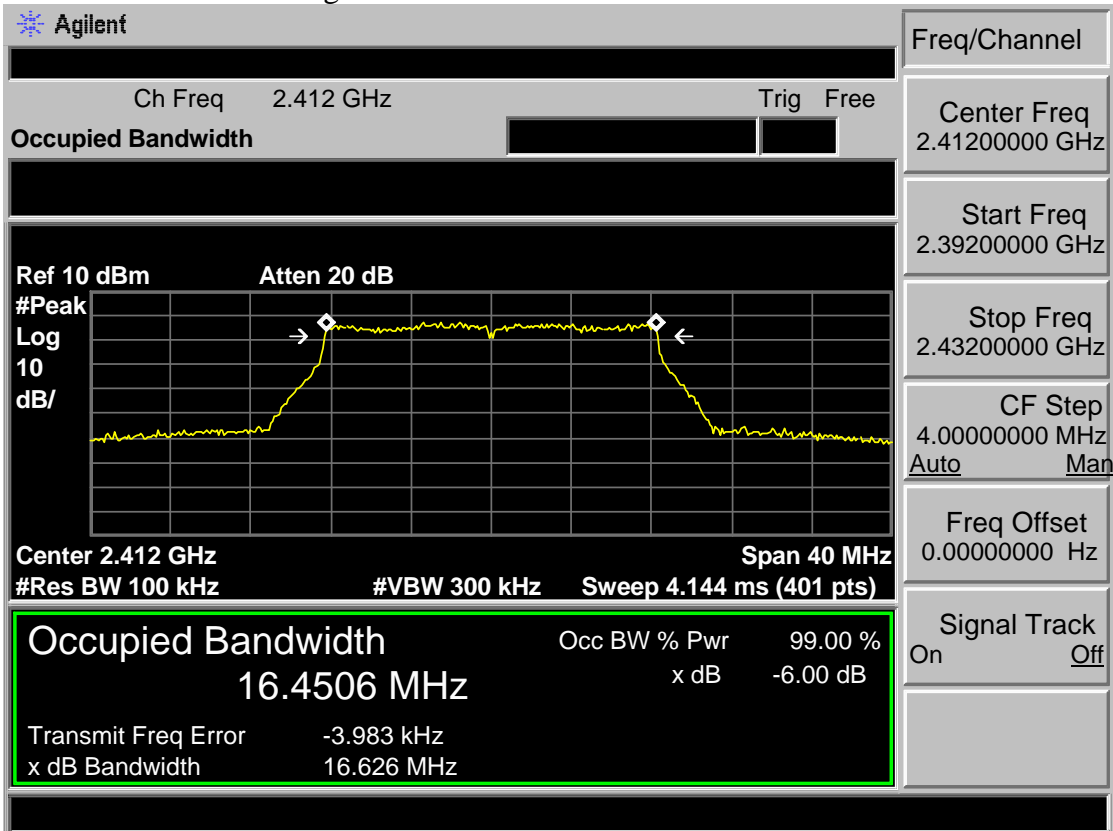
CF Step 4.00000000 MHz

Auto Man

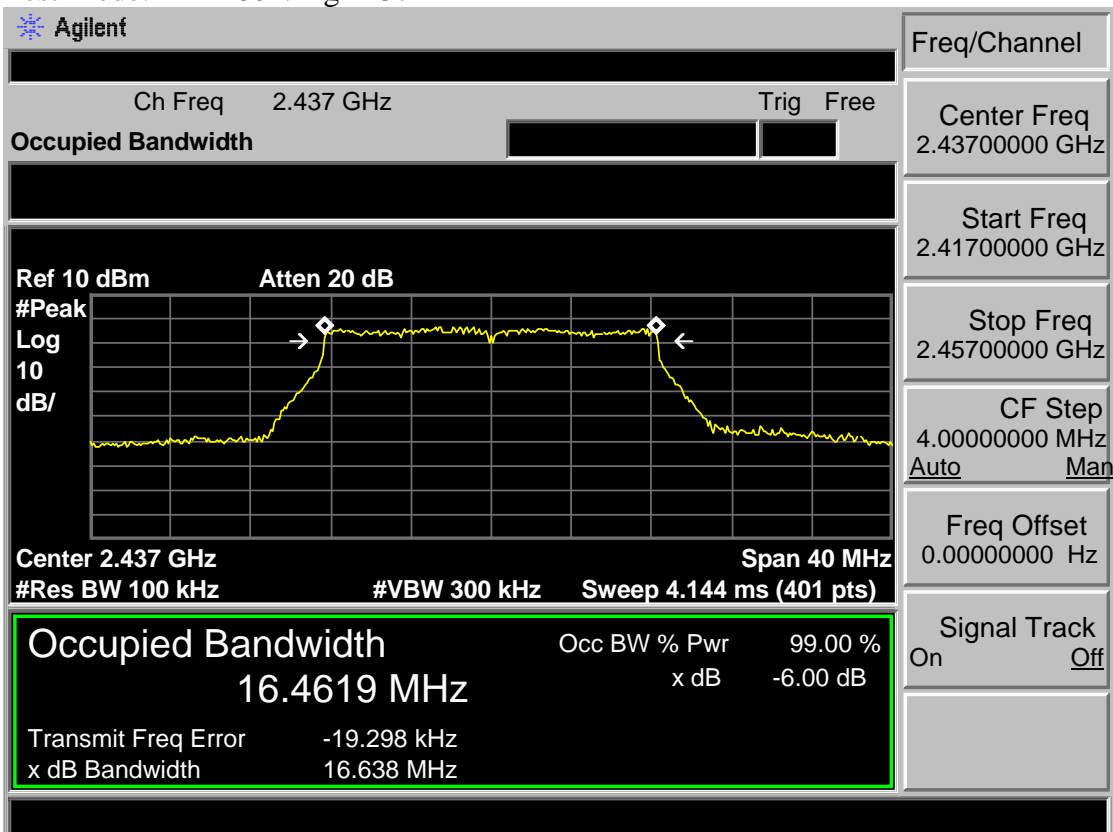
Freq Offset 0.00000000 Hz

Signal Track On Off

Test Mode: IEEE 802.11g 2412MHz



Test Mode: IEEE 802.11g 2437MHz



Test Mode: IEEE 802.11g 2462MHz

Agilent

Freq/Channel	
Center Freq	2.46200000 GHz
Start Freq	2.44200000 GHz
Stop Freq	2.48200000 GHz
CF Step	4.00000000 MHz
Auto	Man
Freq Offset	0.00000000 Hz
Signal Track	On <u>Off</u>

Ch Freq	2.462 GHz	Trig	Free
Occupied Bandwidth			

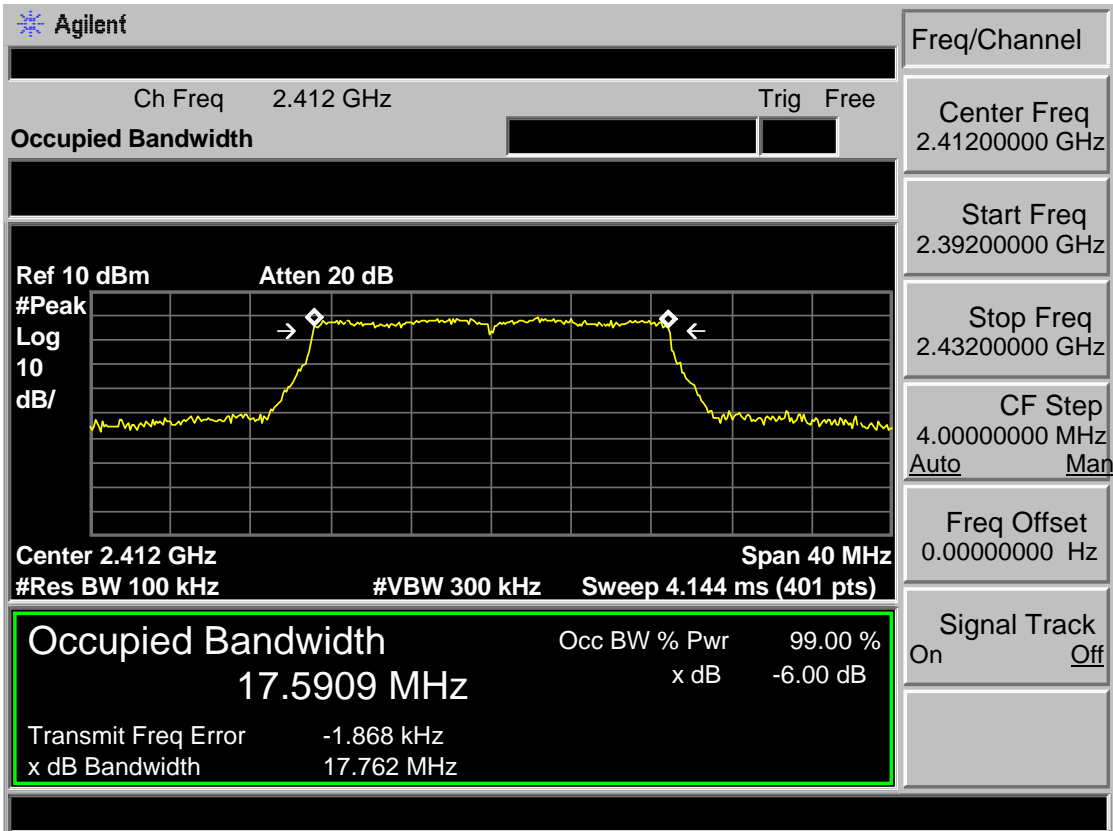
Ref 10 dBm Atten 20 dB

#Peak
Log
10
dB/

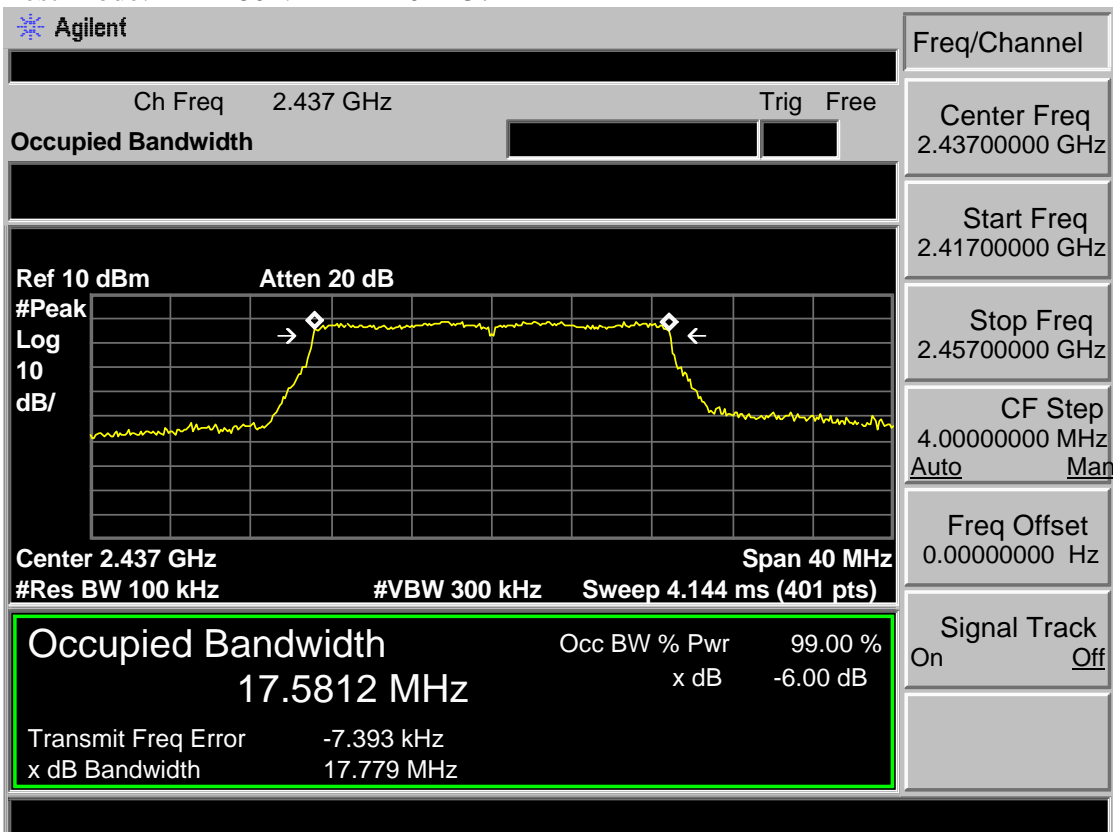
Center 2.462 GHz Span 40 MHz
#Res BW 100 kHz #VBW 300 kHz Sweep 4.144 ms (401 pts)

Occupied Bandwidth	Occ BW % Pwr	99.00 %
16.4343 MHz	x dB	-6.00 dB
Transmit Freq Error	-14.377 kHz	
x dB Bandwidth	16.604 MHz	

Test Mode: IEEE 802.11n HT20 2412MHz



Test Mode: IEEE 802.11n HT20 2437MHz



Test Mode: IEEE 802.11n HT20 2462MHz

Agilent

Freq/Channel	
Center Freq	2.46200000 GHz
Start Freq	2.44200000 GHz
Stop Freq	2.48200000 GHz
CF Step	4.00000000 MHz
Auto	Man
Freq Offset	0.00000000 Hz
Signal Track	On <u>Off</u>

Ch Freq	2.462 GHz	Trig	Free
Occupied Bandwidth			

Ref 10 dBm

Atten 20 dB

Center 2.462 GHz

Span 40 MHz

#Res BW 100 kHz

#VBW 300 kHz

Sweep 4.144 ms (401 pts)

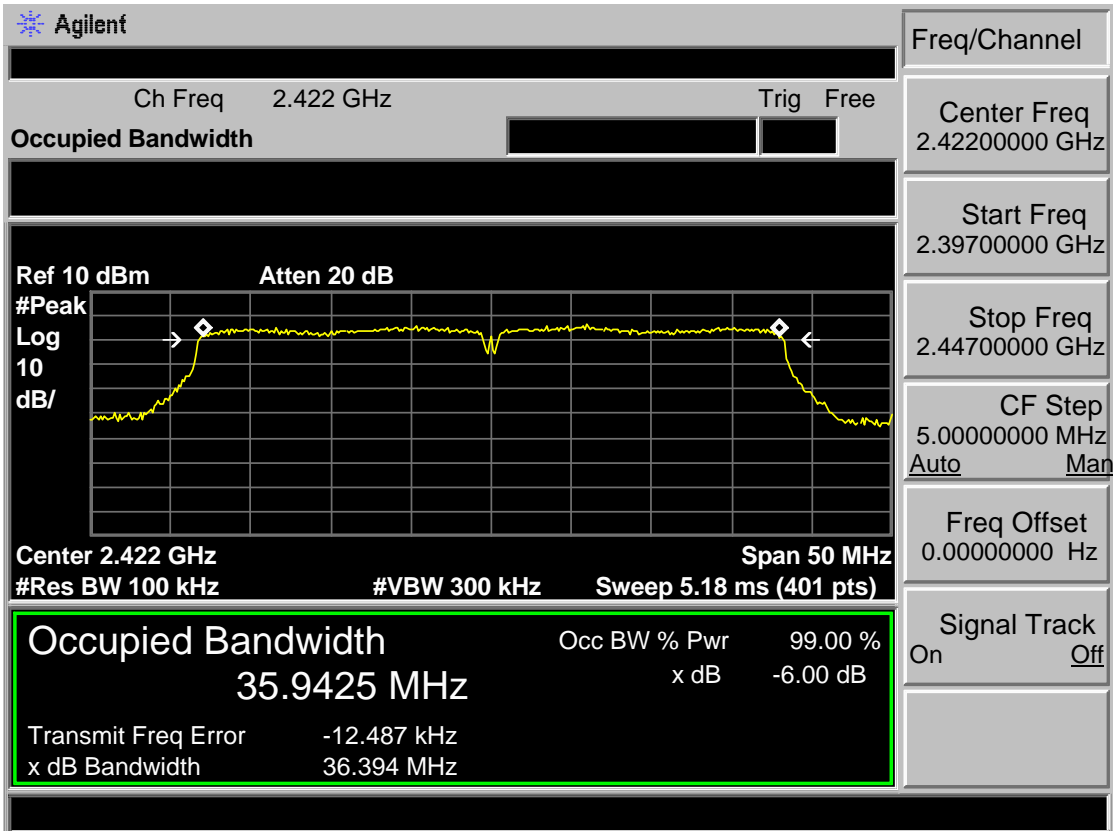
Occupied Bandwidth	Occ BW % Pwr	99.00 %
17.5831 MHz	x dB	-6.00 dB
Transmit Freq Error	-11.336 kHz	
x dB Bandwidth	17.773 MHz	

EST Technology Co., Ltd

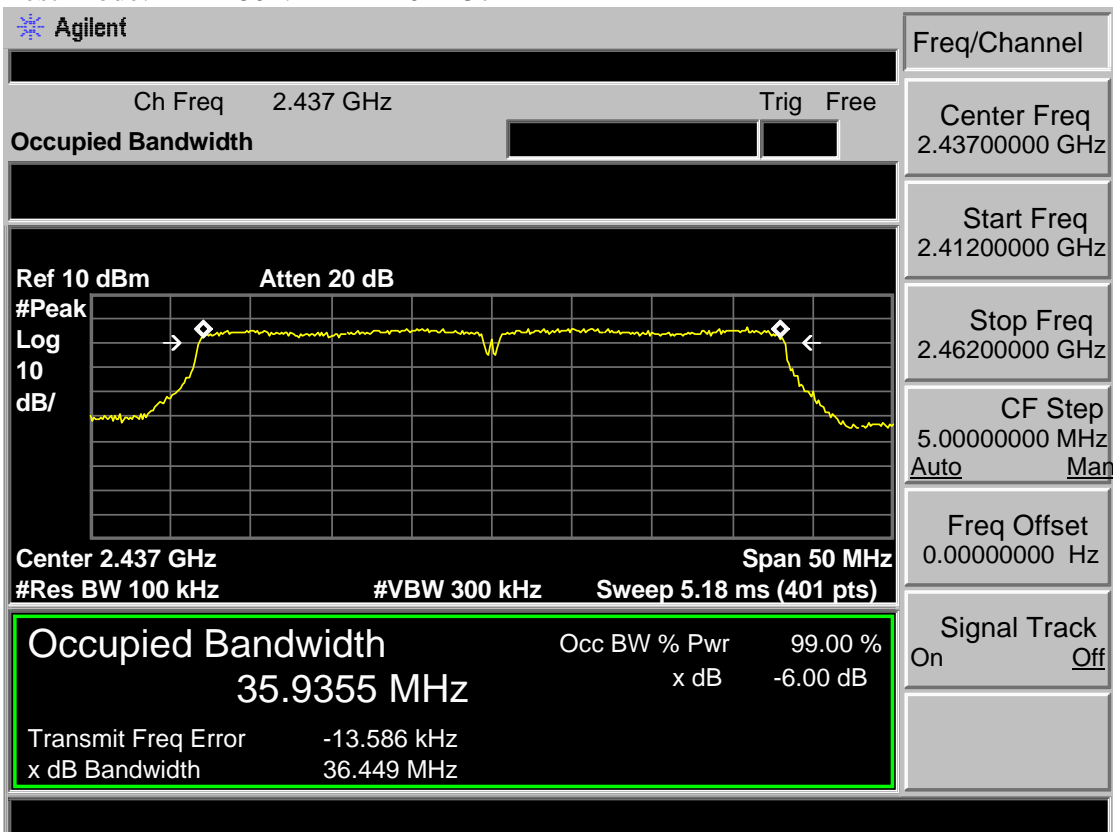
Report No. ESTE-R1707003

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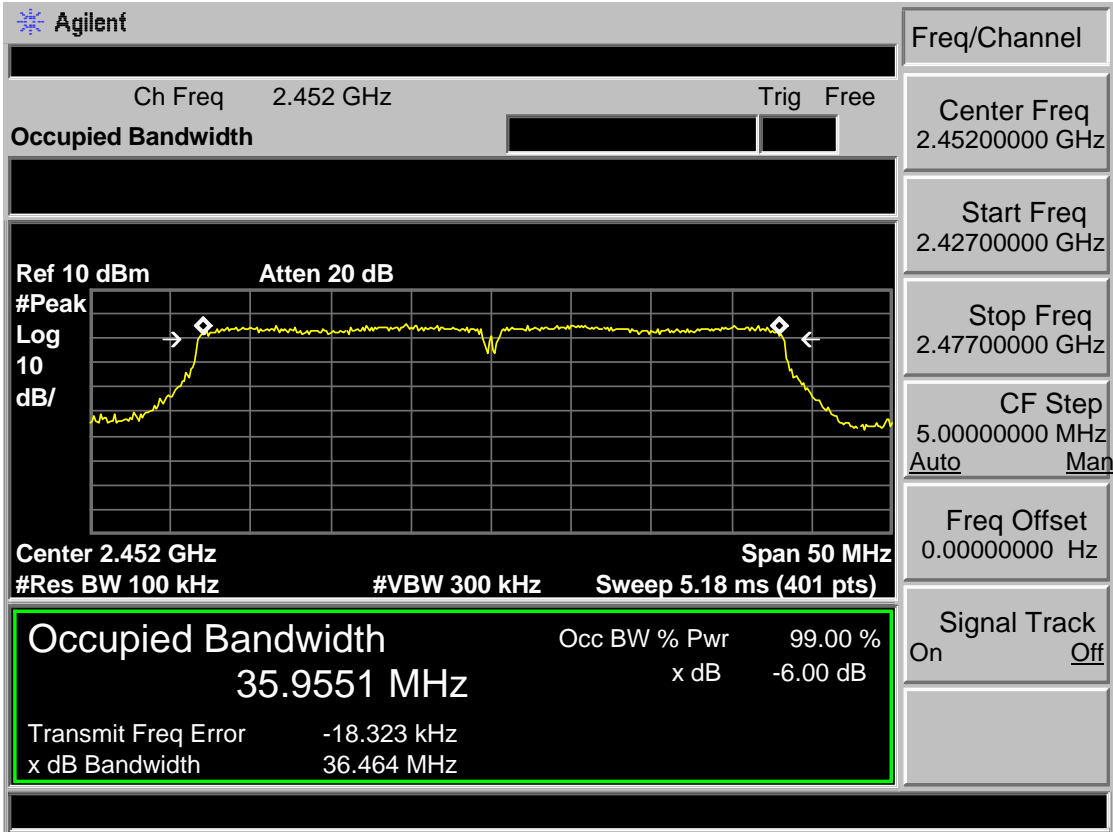
Test Mode: IEEE 802.11n HT40 2422MHz



Test Mode: IEEE 802.11n HT40 2437MHz



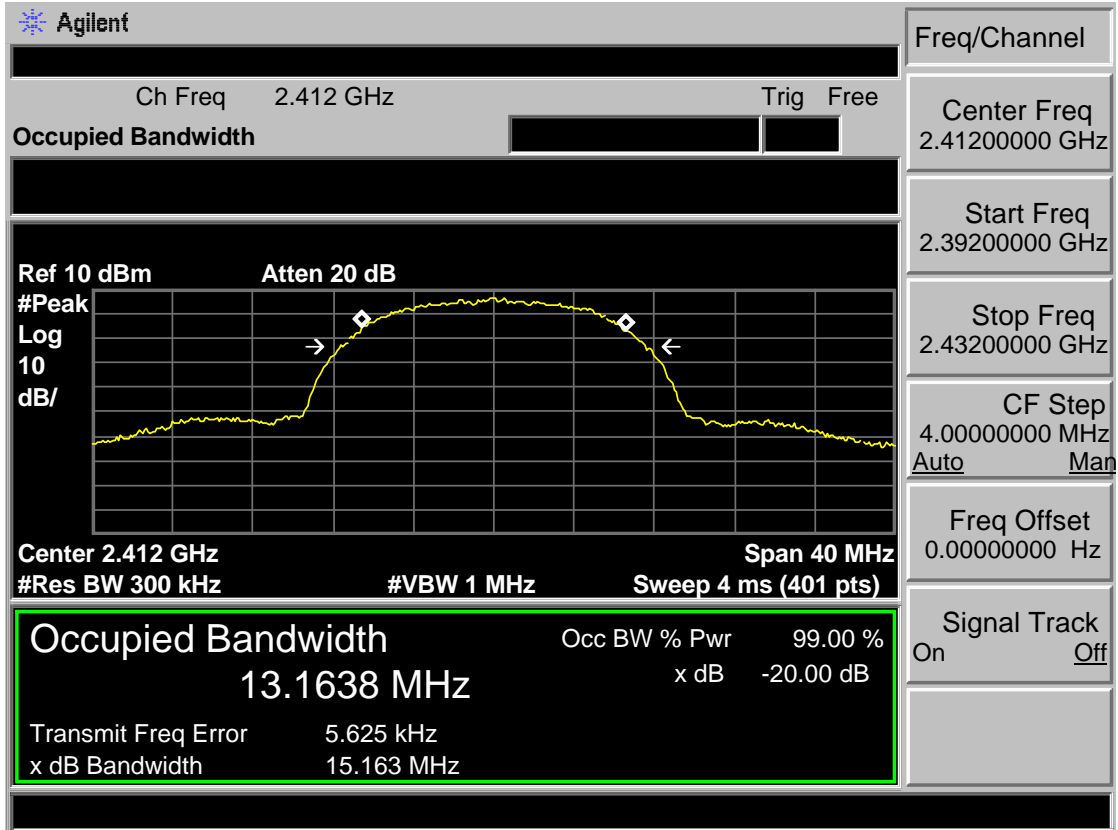
Test Mode: IEEE 802.11n HT40 2452MHz



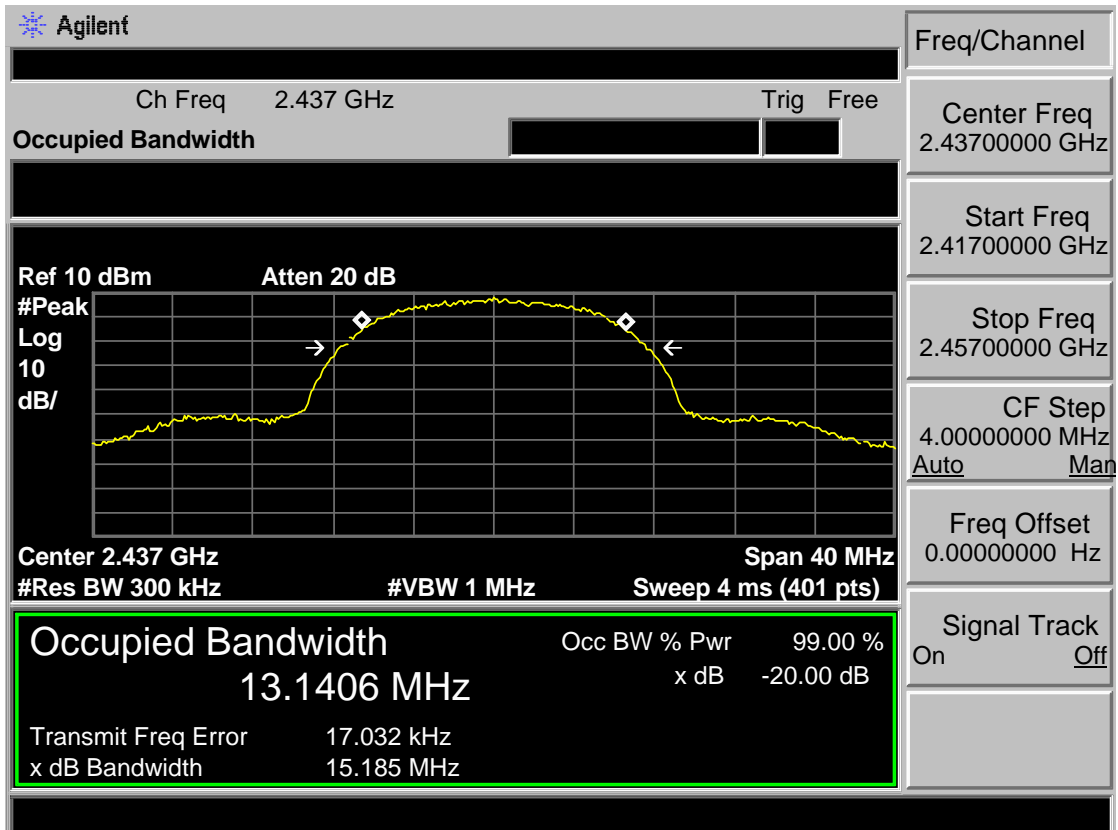
6.6 20dB Test Data

Antenna 0

Test Mode: IEEE 802.11b 2412MHz



Test Mode: IEEE 802.11b 2437MHz



Test Mode: IEEE 802.11b 2462MHz

Agilent

Freq/Channel

Ch Freq 2.462 GHz
Trig Free

Occupied Bandwidth

Center 2.462 GHz
Span 40 MHz

#Res BW 300 kHz
#VBW 1 MHz
Sweep 4 ms (401 pts)

Occupied Bandwidth	Occ BW % Pwr	99.00 %
13.1315 MHz	x dB	-20.00 dB
Transmit Freq Error	20.558 kHz	
x dB Bandwidth	15.200 MHz	

Start Freq
2.44200000 GHz

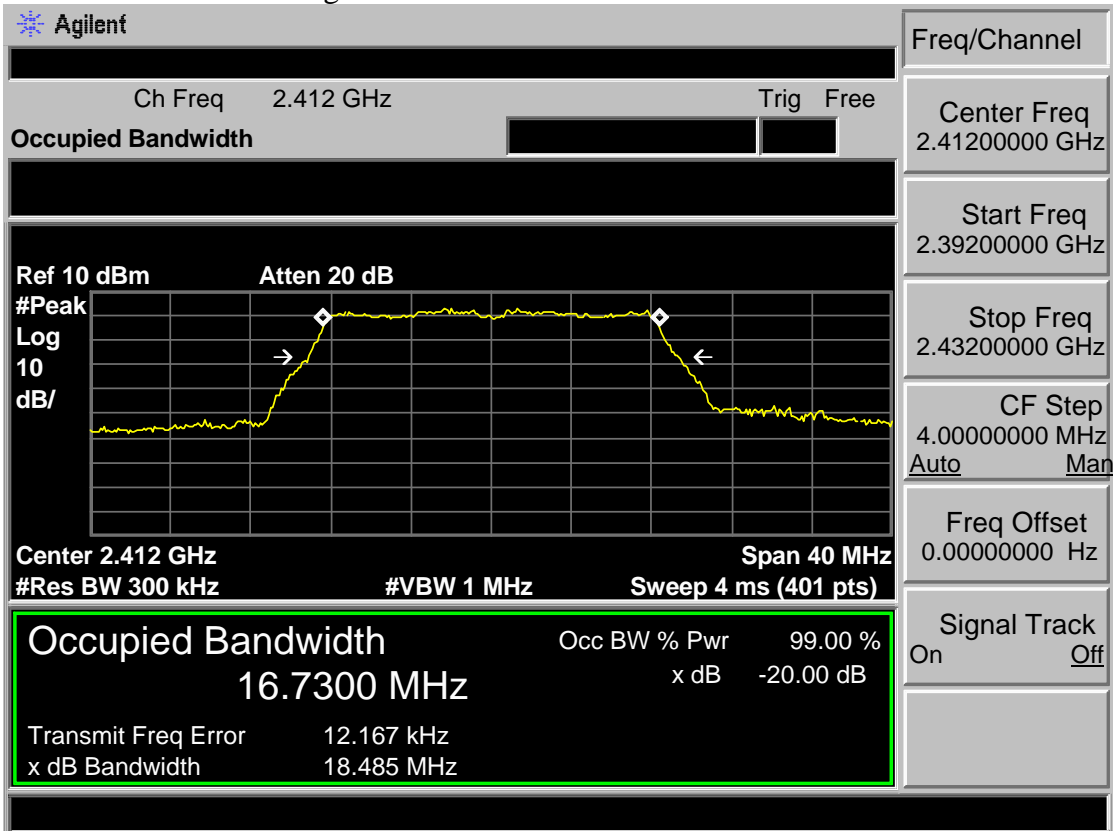
Stop Freq
2.48200000 GHz

CF Step
4.00000000 MHz
Auto Man

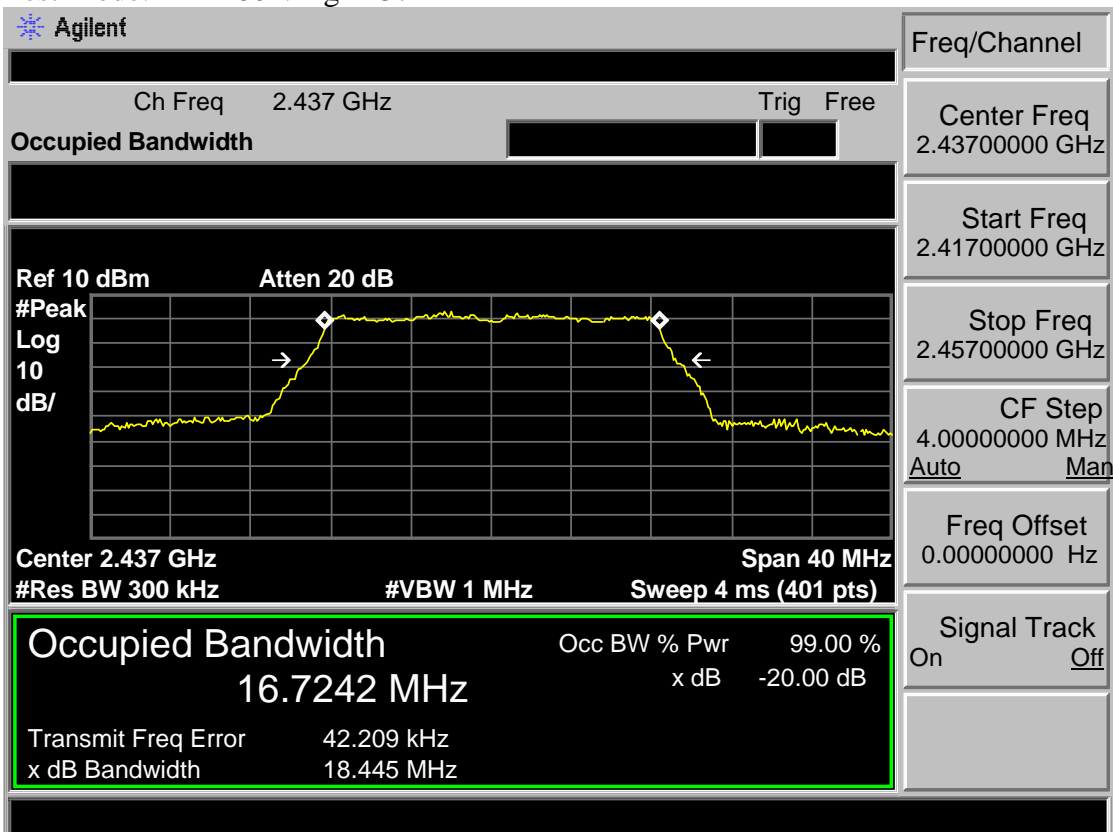
Freq Offset
0.00000000 Hz

Signal Track
On Off

Test Mode: IEEE 802.11g 2412MHz



Test Mode: IEEE 802.11g 2437MHz



Test Mode: IEEE 802.11g 2462MHz

Agilent

Ch Freq 2.462 GHz Trig Free

Occupied Bandwidth

Ref 10 dBm Atten 20 dB

#Peak Log 10 dB/

Center 2.462 GHz Span 40 MHz

#Res BW 300 kHz #VBW 1 MHz Sweep 4 ms (401 pts)

Occupied Bandwidth Occ BW % Pwr 99.00 %

16.7125 MHz x dB -20.00 dB

Transmit Freq Error 19.429 kHz

x dB Bandwidth 18.451 MHz

Freq/Channel

Center Freq 2.46200000 GHz

Start Freq 2.44200000 GHz

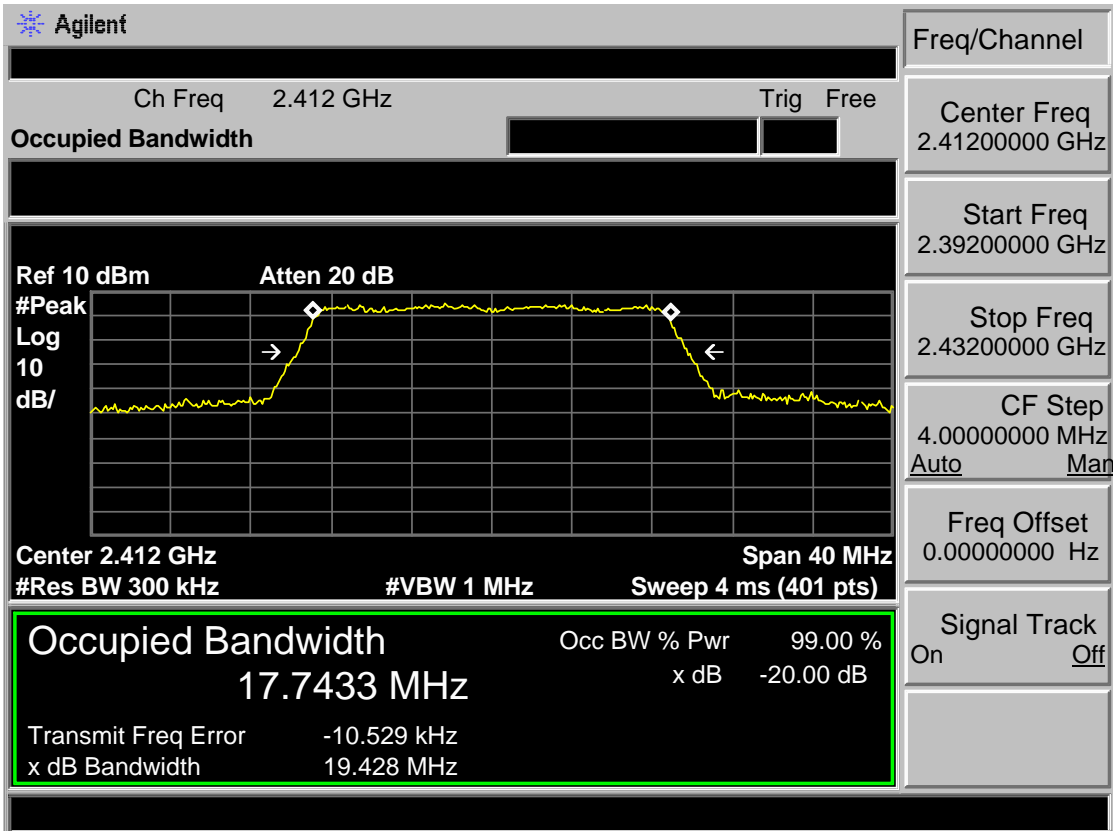
Stop Freq 2.48200000 GHz

CF Step 4.00000000 MHz
Auto Man

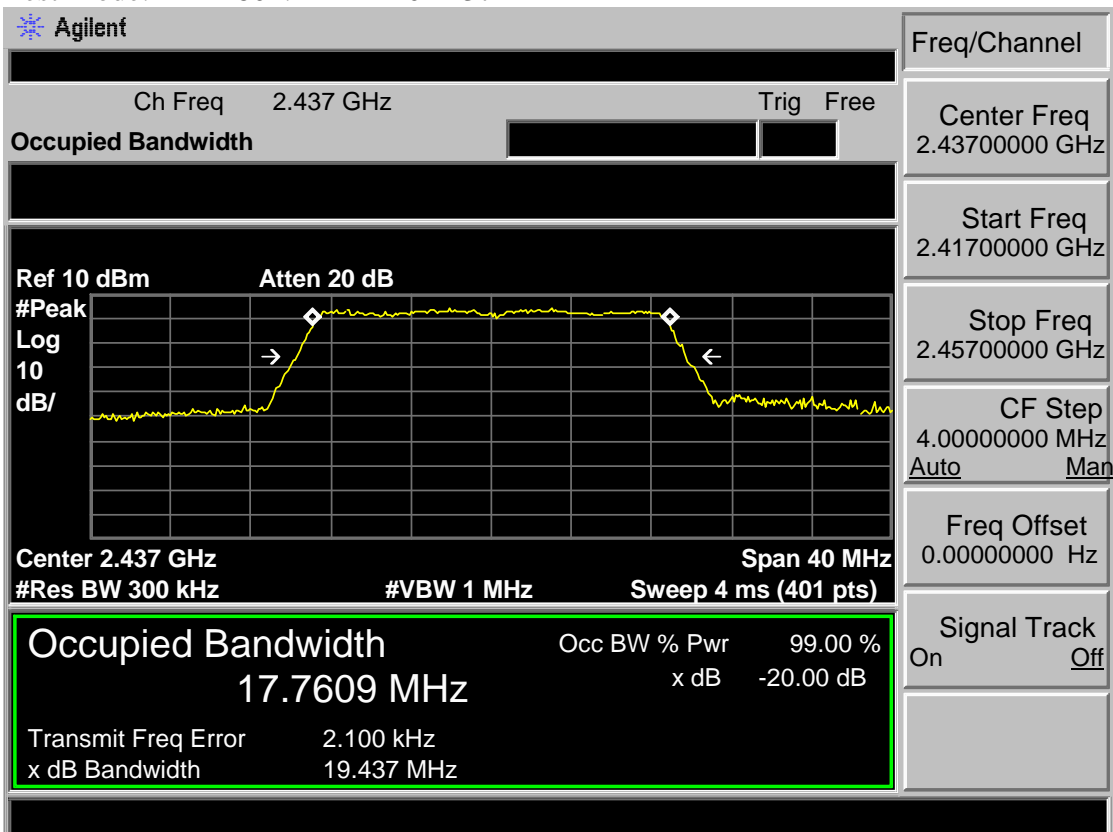
Freq Offset 0.00000000 Hz

Signal Track On Off

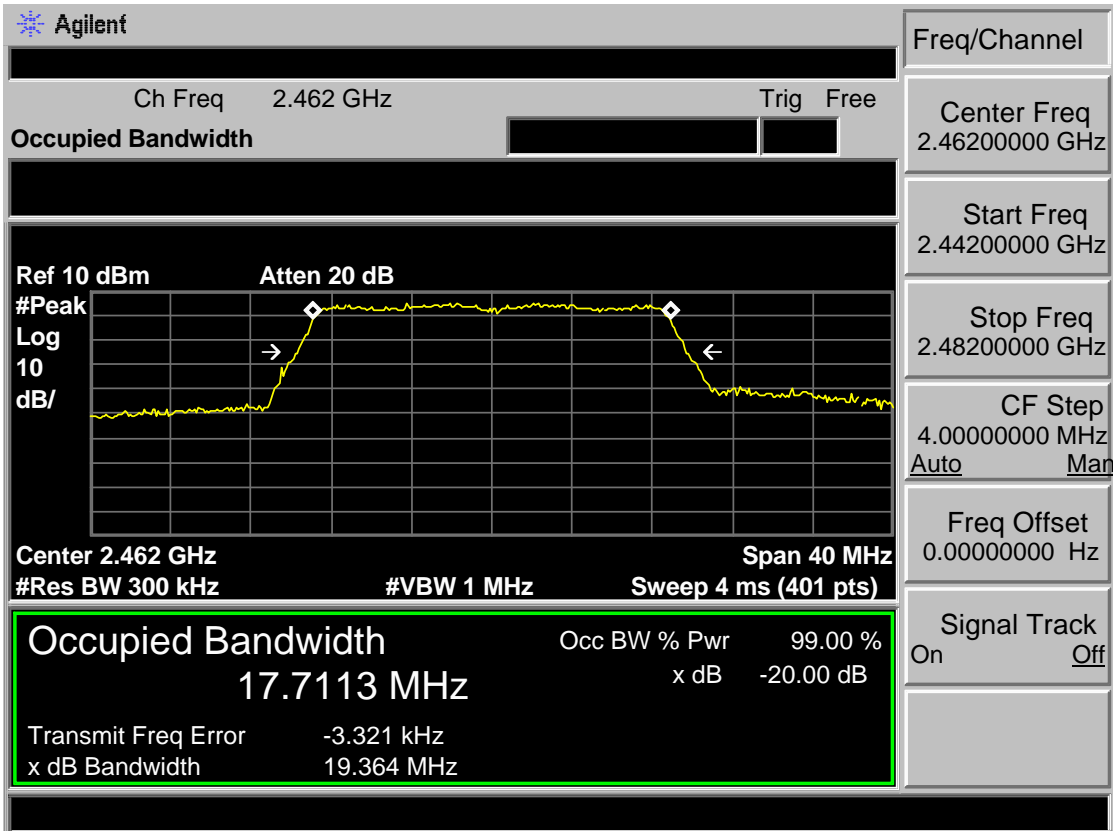
Test Mode: IEEE 802.11n HT20 2412MHz



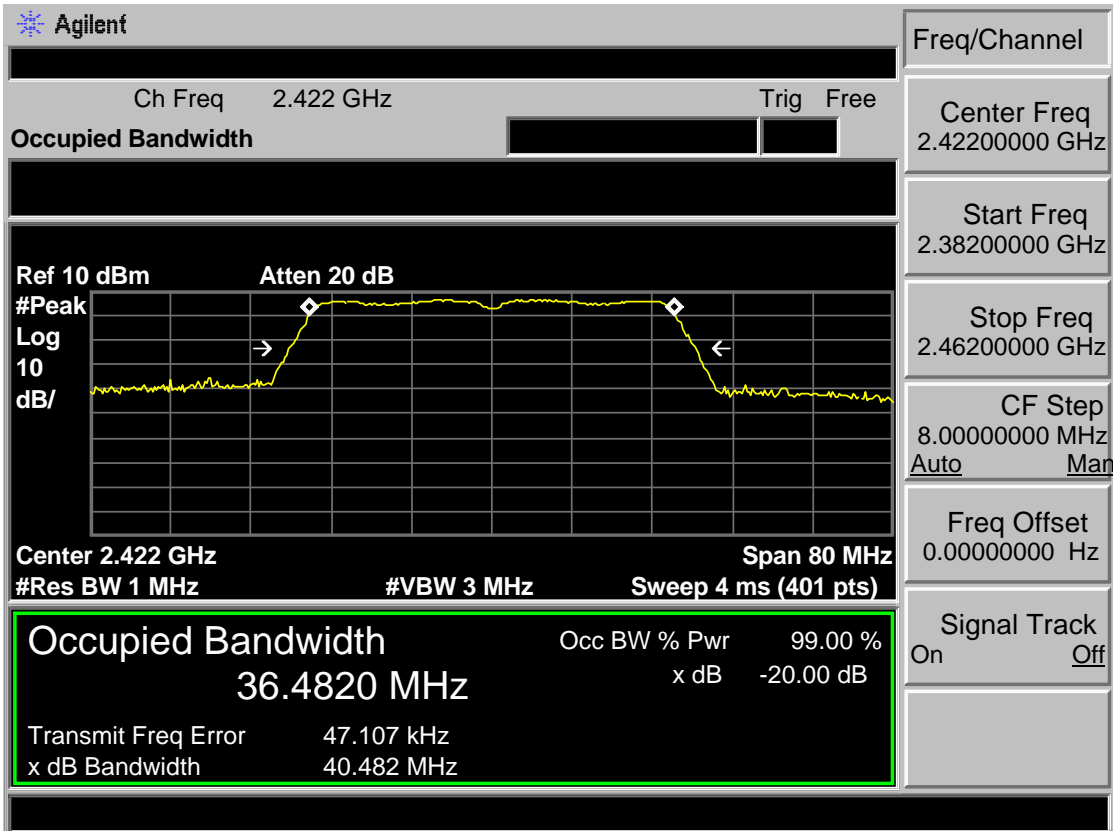
Test Mode: IEEE 802.11n HT20 2437MHz



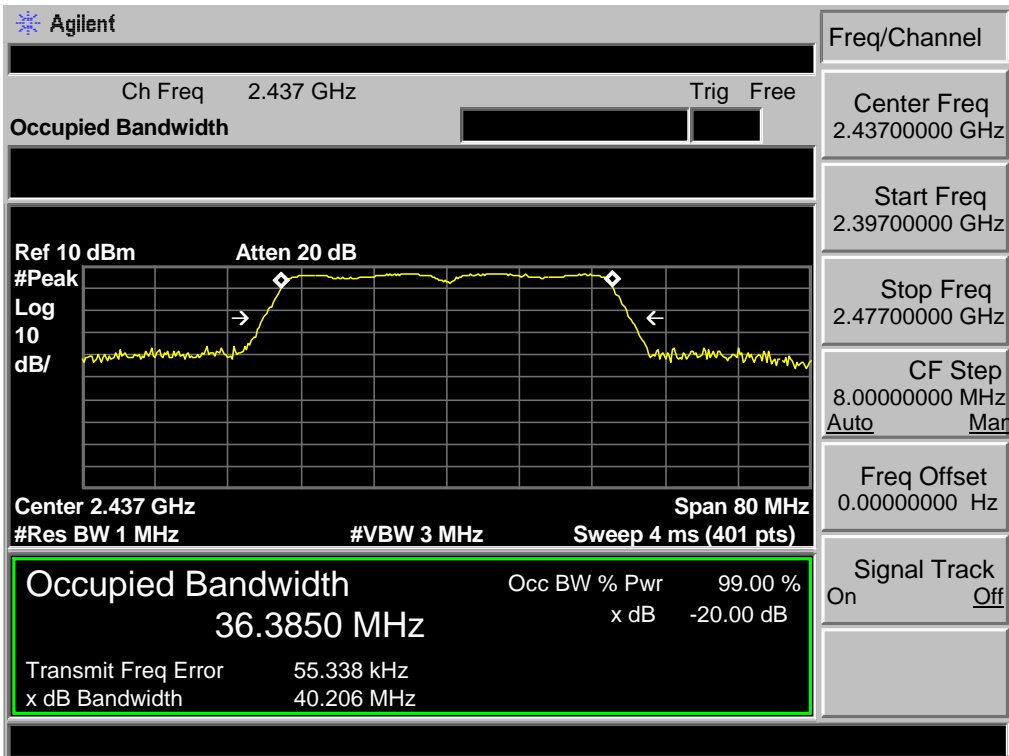
Test Mode: IEEE 802.11n HT20 2462MHz



Test Mode: IEEE 802.11n HT40 2422MHz



Test Mode: IEEE 802.11n HT40 2437MHz



Test Mode: IEEE 802.11n HT40 2452MHz

Agilent

Freq/Channel

Ch Freq 2.452 GHz
Trig Free

Occupied Bandwidth

Ref 10 dBm Atten 20 dB

#Peak
Log
10
dB/

Center Freq
2.45200000 GHz

Start Freq
2.41200000 GHz

Stop Freq
2.49200000 GHz

CF Step
8.00000000 MHz
Auto Man

Freq Offset
0.00000000 Hz

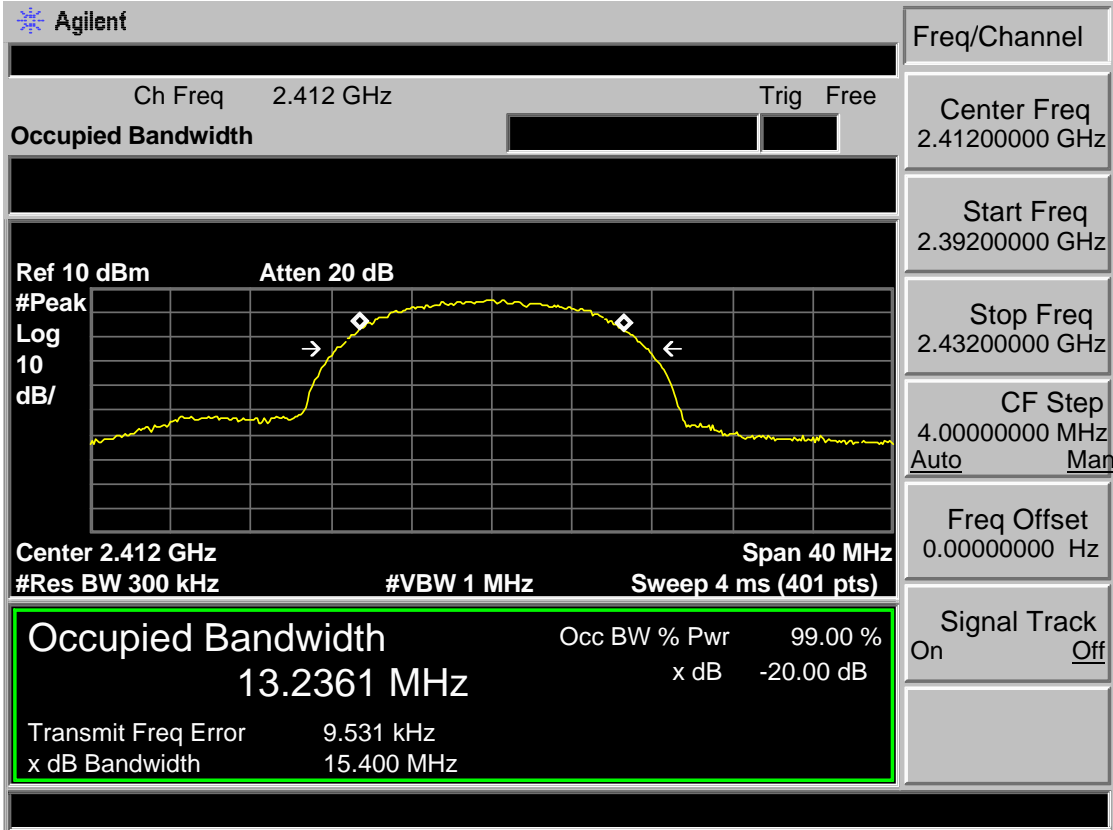
Signal Track
On Off

Center 2.452 GHz
Span 80 MHz

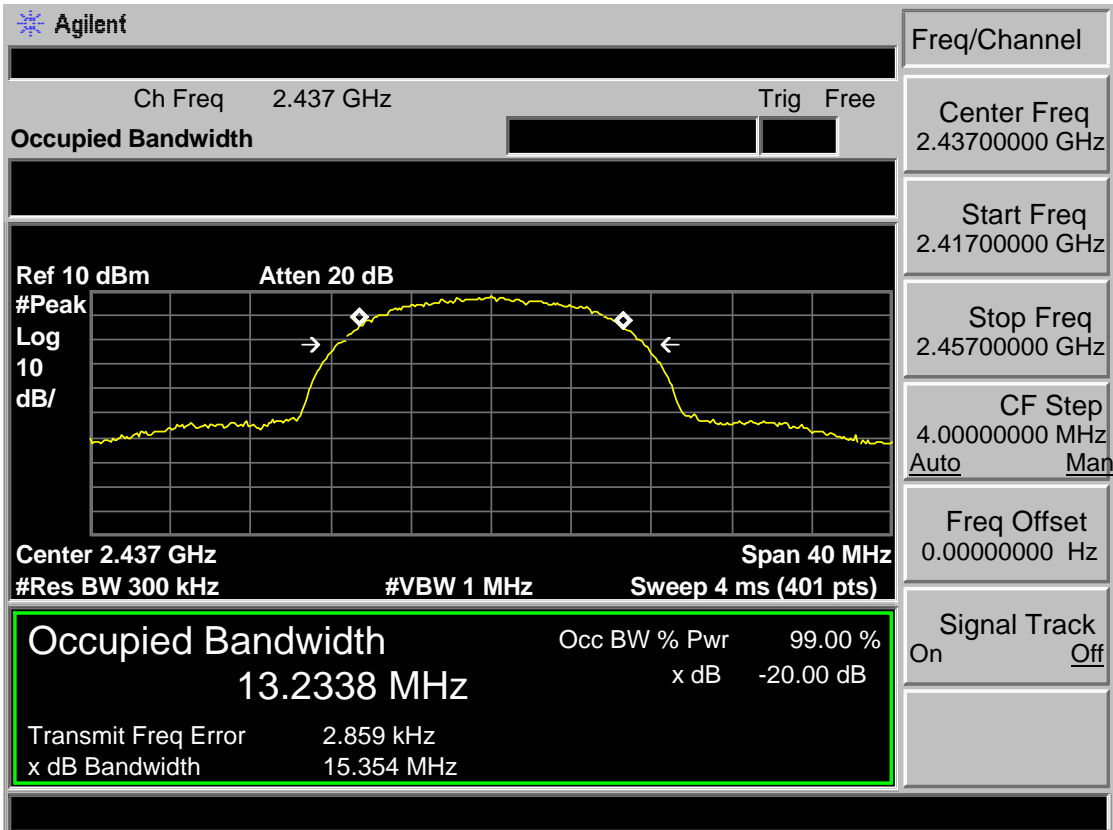
#Res BW 1 MHz
#VBW 3 MHz
Sweep 4 ms (401 pts)

Occupied Bandwidth	Occ BW % Pwr	99.00 %
36.4015 MHz	x dB	-20.00 dB
Transmit Freq Error	38.818 kHz	
x dB Bandwidth	40.396 MHz	

Antenna 1
 Test Mode: IEEE 802.11b 2412MHz



Test Mode: IEEE 802.11b 2437MHz



Test Mode: IEEE 802.11b 2462MHz

Agilent

Freq/Channel
 Center Freq 2.46200000 GHz
 Start Freq 2.44200000 GHz
 Stop Freq 2.48200000 GHz
 CF Step 4.00000000 MHz
 Auto Man
 Freq Offset 0.00000000 Hz
 Signal Track On Off

Ch Freq 2.462 GHz Trig Free

Occupied Bandwidth

Ref 10 dBm Atten 20 dB

Center 2.462 GHz Span 40 MHz

#Res BW 300 kHz #VBW 1 MHz Sweep 4 ms (401 pts)

Occupied Bandwidth Occ BW % Pwr 99.00 %

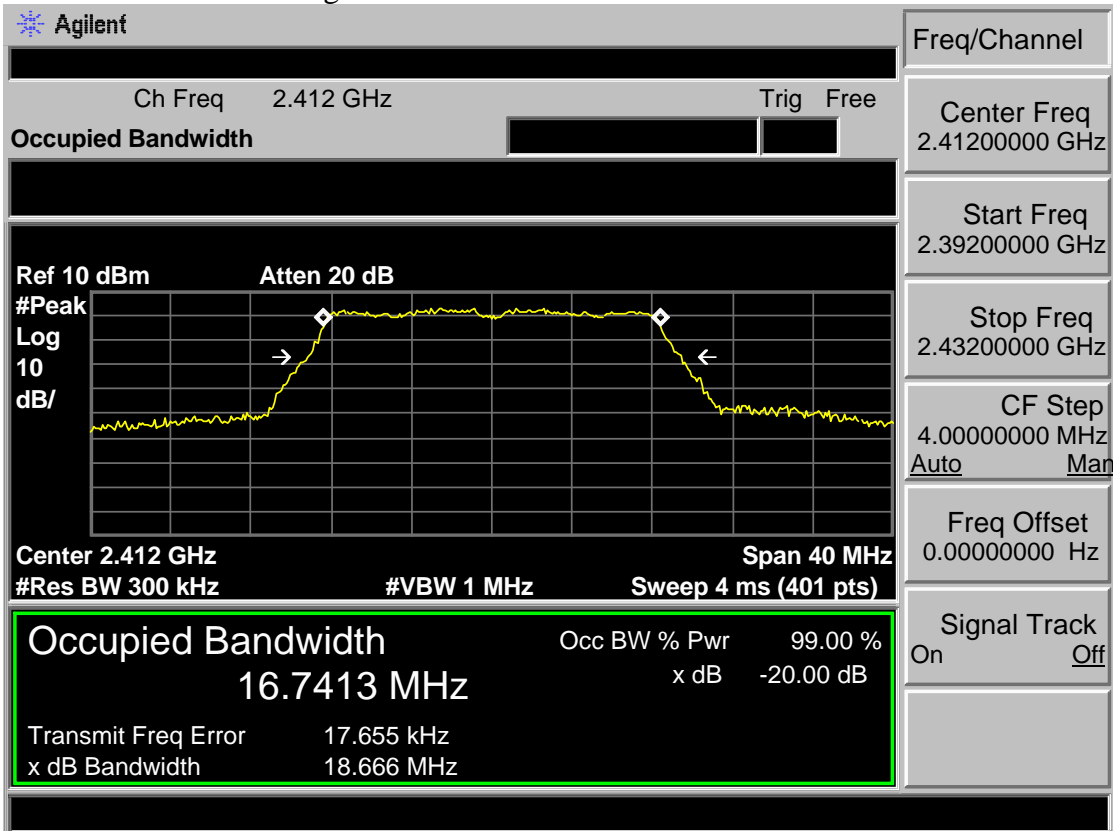
13.2240 MHz

x dB -20.00 dB

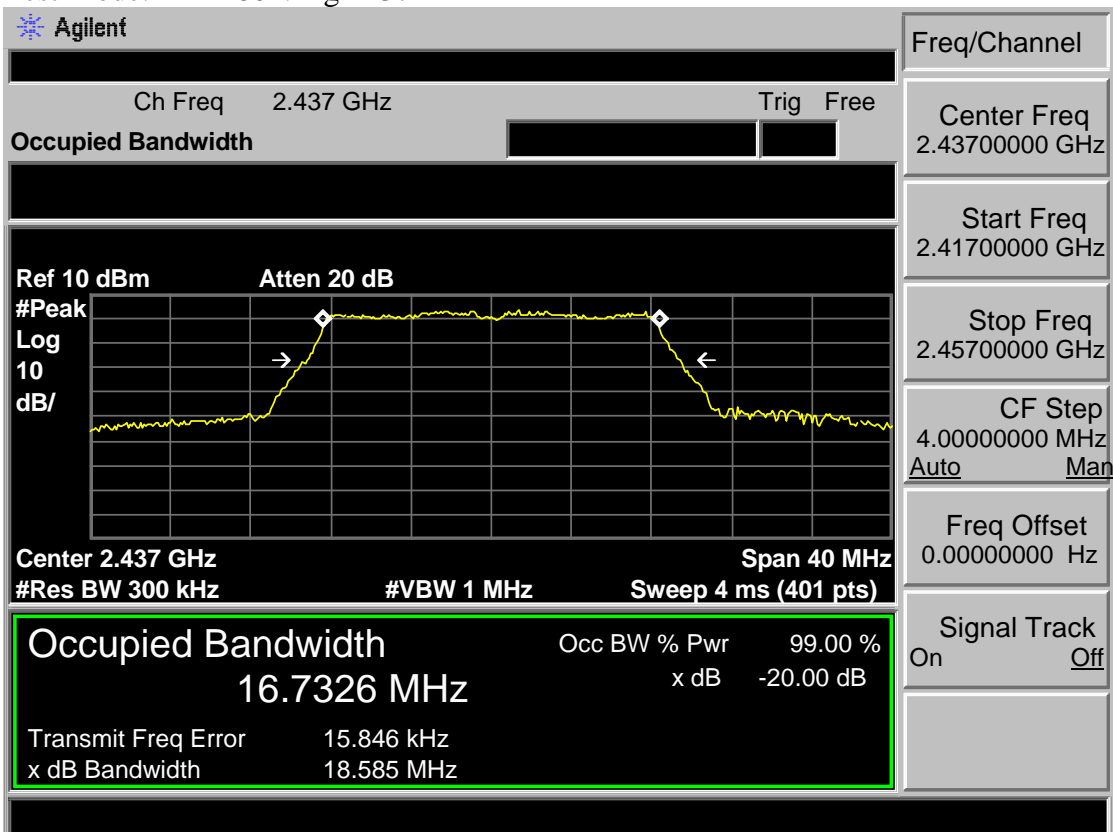
Transmit Freq Error 2.428 kHz

x dB Bandwidth 15.376 MHz

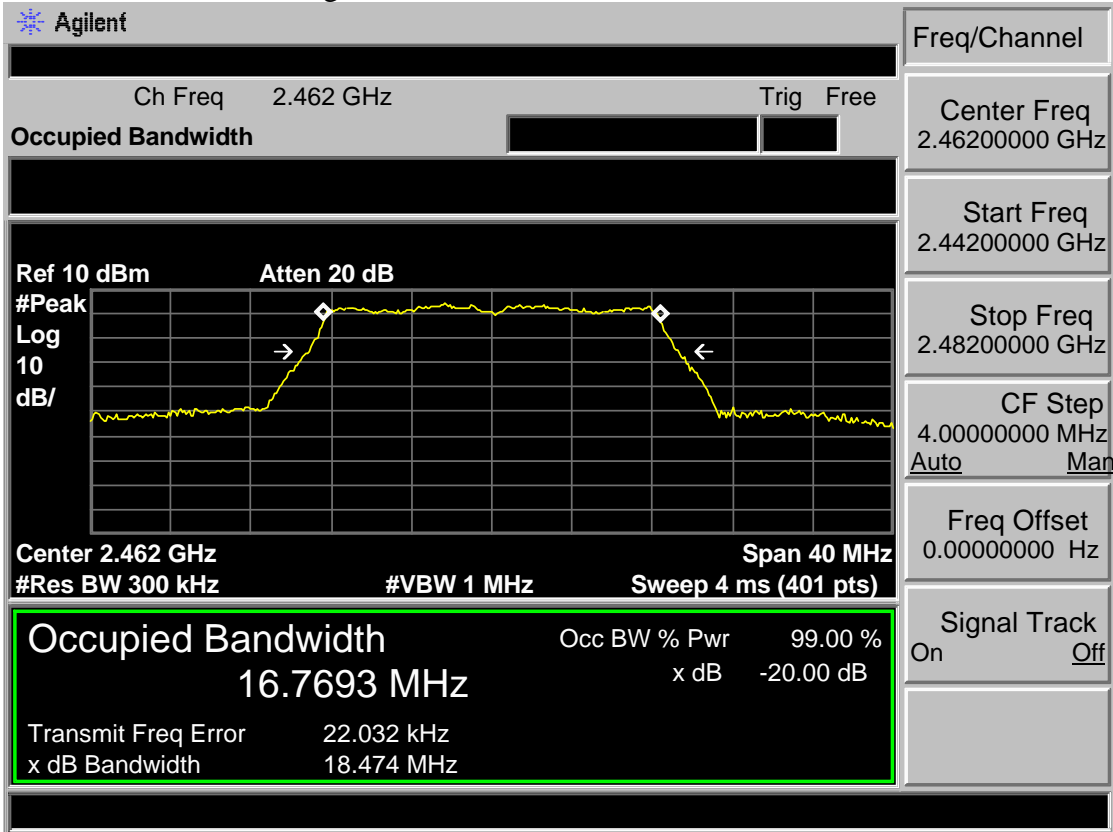
Test Mode: IEEE 802.11g 2412MHz



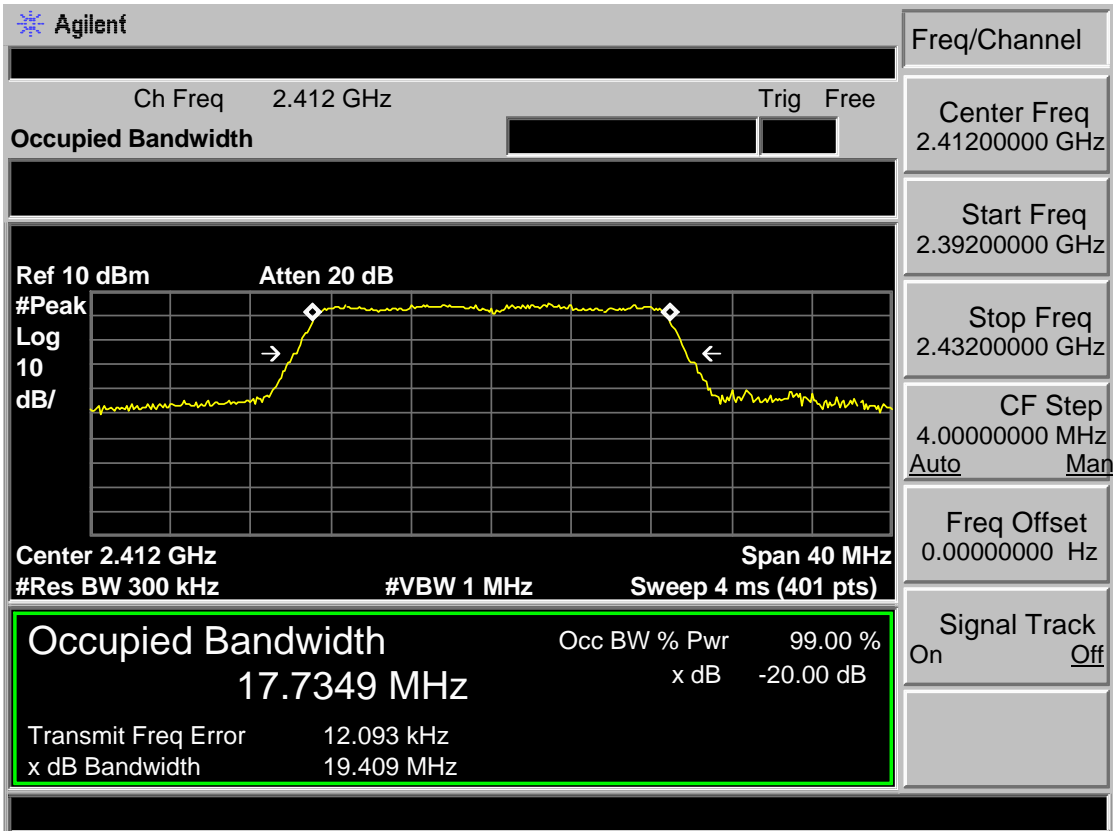
Test Mode: IEEE 802.11g 2437MHz



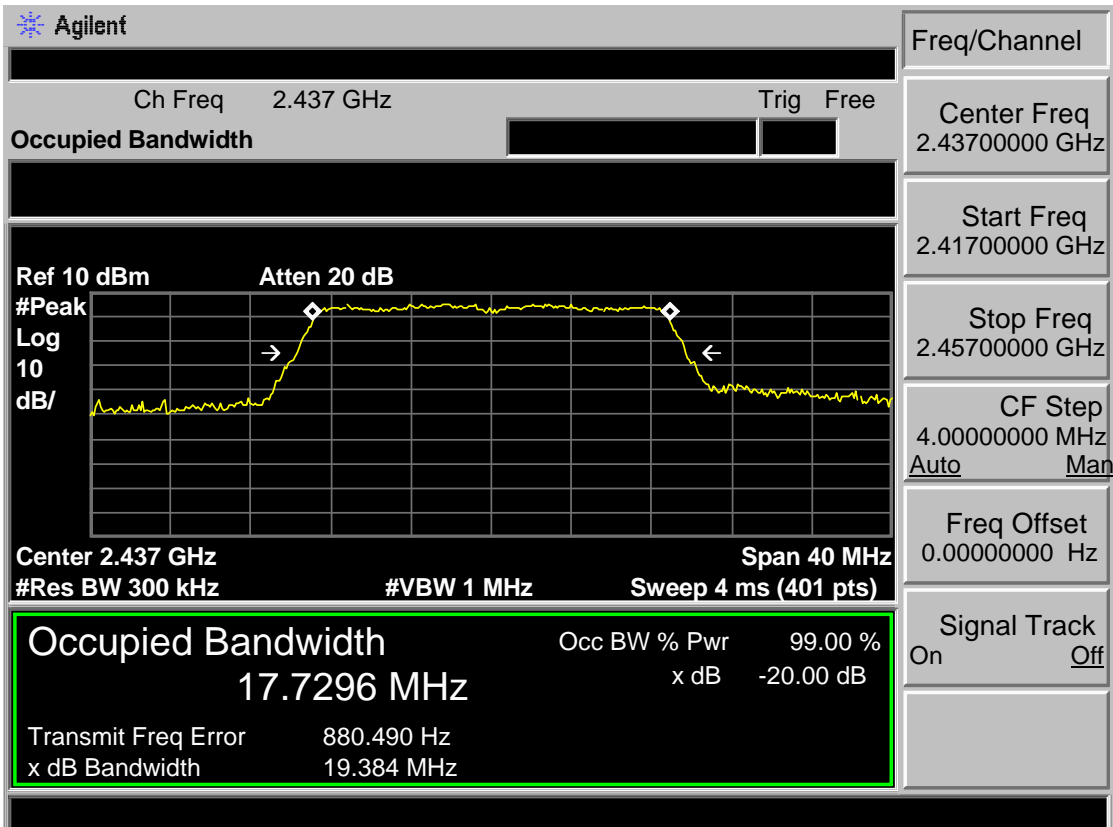
Test Mode: IEEE 802.11g 2462MHz



Test Mode: IEEE 802.11n HT20 2412MHz



Test Mode: IEEE 802.11n HT20 2437MHz



Test Mode: IEEE 802.11n HT20 2462MHz

Agilent

Ch Freq 2.462 GHz Trig Free

Occupied Bandwidth

Center 2.462 GHz Span 40 MHz

#Res BW 300 kHz #VBW 1 MHz Sweep 4 ms (401 pts)

Freq/Channel

Center Freq 2.46200000 GHz

Start Freq 2.44200000 GHz

Stop Freq 2.48200000 GHz

CF Step 4.00000000 MHz
Auto Man

Freq Offset 0.00000000 Hz

Signal Track On Off

Occupied Bandwidth Occ BW % Pwr 99.00 %

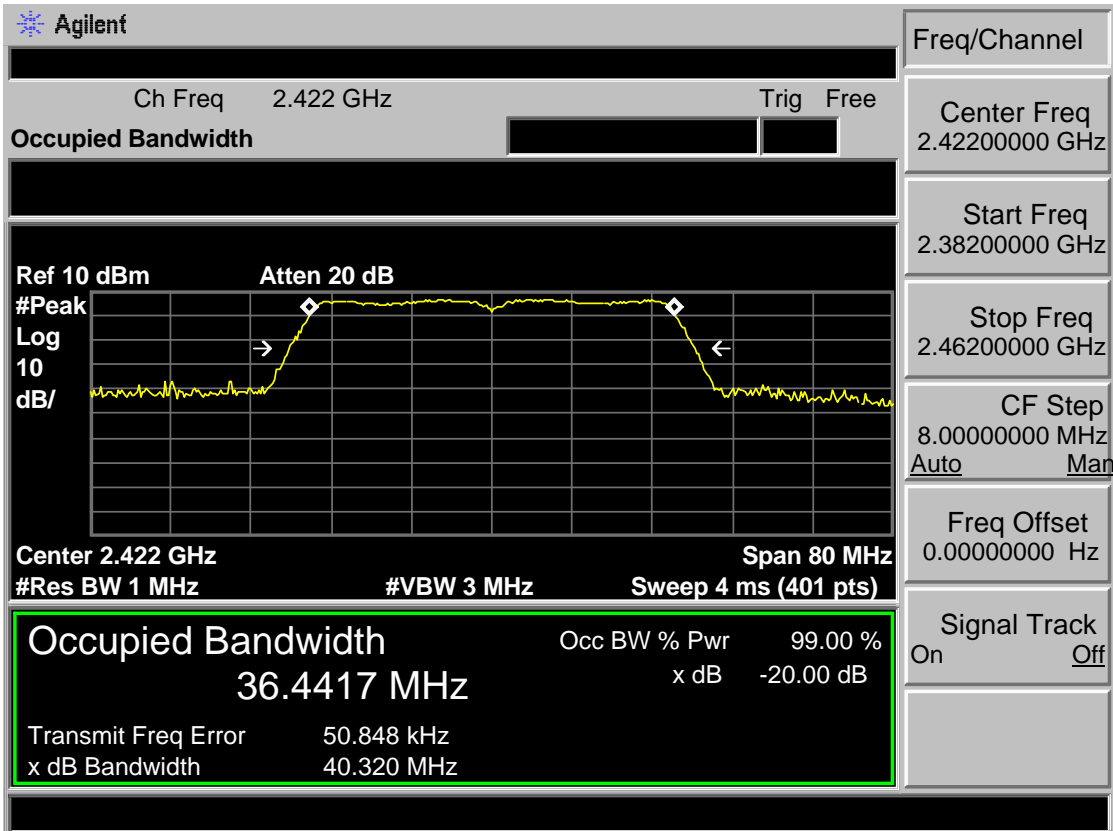
17.7414 MHz

x dB -20.00 dB

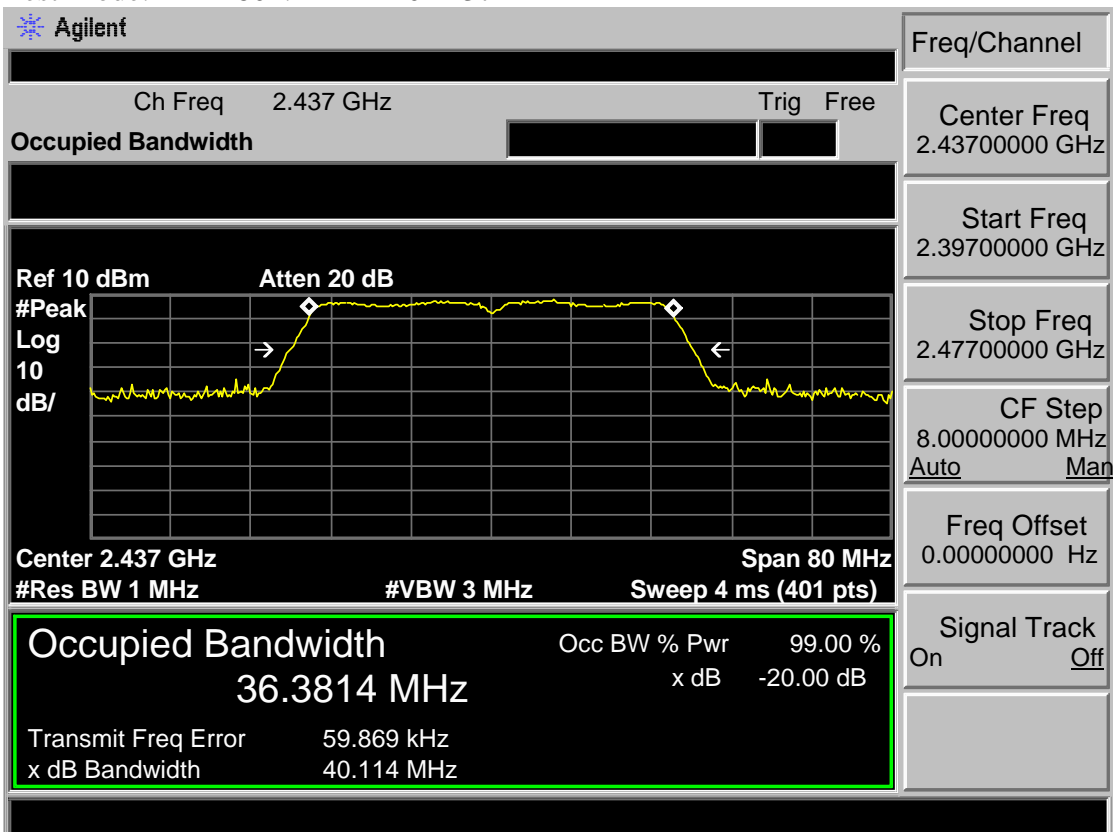
Transmit Freq Error -674.087 Hz

x dB Bandwidth 19.446 MHz

Test Mode: IEEE 802.11n HT40 2422MHz



Test Mode: IEEE 802.11n HT40 2437MHz



Test Mode: IEEE 802.11n HT40 2452MHz

Agilent

Freq/Channel

Ch Freq 2.452 GHz
Occupied Bandwidth

Trig Free

Center Freq
 2.45200000 GHz

Ref 10 dBm
 #Peak
 Log
 10
 dB/

Atten 20 dB

Start Freq
 2.41200000 GHz

Stop Freq
 2.49200000 GHz

CF Step
 8.00000000 MHz
 Auto Man

Center 2.452 GHz
 #Res BW 1 MHz

#VBW 3 MHz

Span 80 MHz
 Sweep 4 ms (401 pts)

Freq Offset
 0.00000000 Hz

Occupied Bandwidth
36.4334 MHz

Occ BW % Pwr 99.00 %
 x dB -20.00 dB

Transmit Freq Error 53.558 kHz
 x dB Bandwidth 40.385 MHz

Signal Track
 On Off

7 OUTPUT POWER TEST

7.1 Limit

For systems using digital modulation in the 2400—2483.5MHz, The Peak out put Power shall not exceed 1W(30dBm)

7.2 Test Procedure

- 1, The transmitter output (antenna port) was connected to the spectrum analyzer. Connect EUT antenna terminal to the spectrum analyzer with a low loss SMA cable.
- 2, Follow the test procedure as described in KDB 558074
 - (1)Set span to at least 1.5 times the OBW.
 - (2)Set RBW = 1-5% of the OBW, not to exceed 1 MHz.
 - (3)Set VBW $\geq 3 \times$ RBW.
 - (4)Number of points in sweep $\geq 2 \times$ span / RBW. (This gives bin-to-bin spacing \leq RBW/2, so that narrowband signals are not lost between frequency bins.)
 - (4)Sweep time = auto.
 - (5)Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
 - (6)If transmit duty cycle $< 98 \%$, use a sweep trigger with the level set to enable triggering only on full power pulses. The transmitter shall operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle $\geq 98 \%$, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run”.
 - (7)Trace average at least 100 traces in power averaging (i.e., RMS) mode.
 - (8)Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

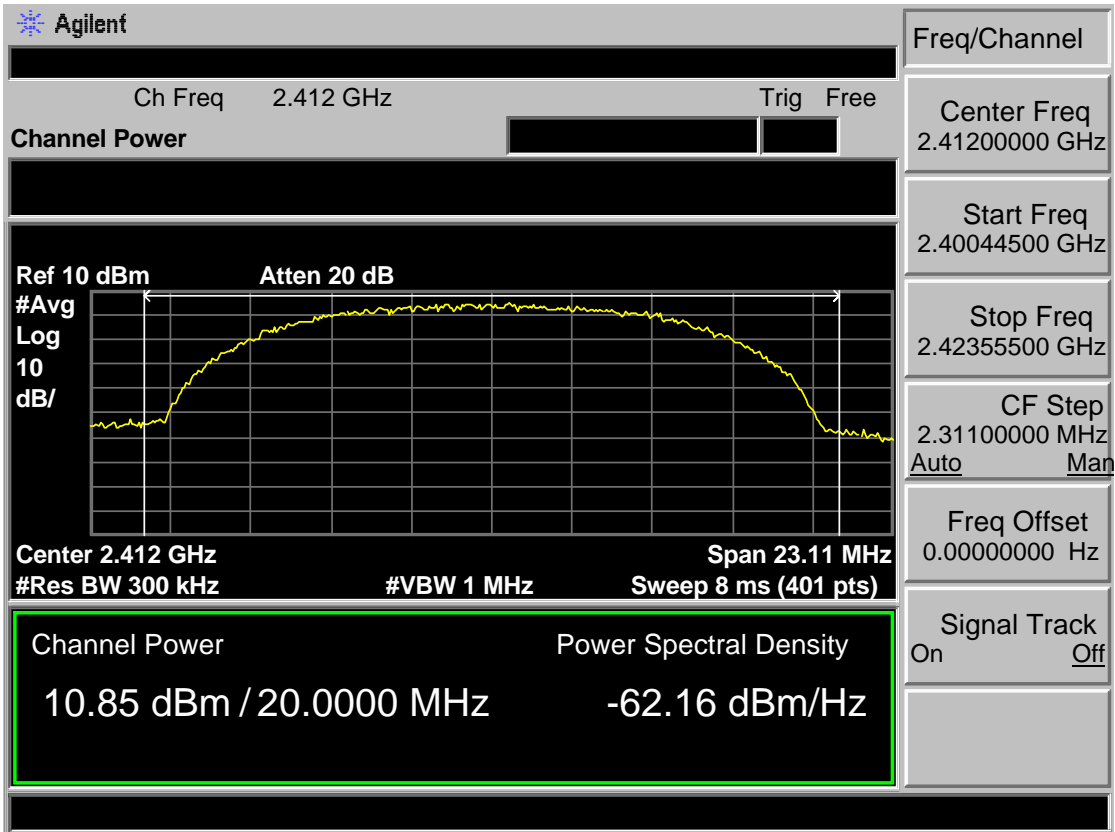
7.3 Test Result

EUT: Wireless Speaker					
M/N: Beoplay M3					
Test date: 2017-05-25		Test site: 3m Chamber		Tested by: Tony Tang	
Pass					
Test Mode	CH	Conducted Power (dBm)			Limit (dBm)
		Ant 0	Ant 1	Total	
IEEE 802.11 b	CH1	10.85	12.16	/	30
	CH6	12.98	11.83	/	30
	CH11	13.36	12.18	/	30
IEEE 802.11 g	CH1	9.49	8.67	/	30
	CH6	10.16	8.15	/	30
	CH11	10.25	9.54	/	30
IEEE 802.11 n HT 20	CH1	12.51	12.22	15.38	30
	CH6	12.63	12.40	15.53	30
	CH11	13.12	12.07	15.64	30
IEEE 802.11 n HT 40	CH1	10.70	10.56	13.64	30
	CH4	11.42	10.60	14.04	30
	CH7	11.50	10.17	13.90	30
Conclusion : PASS					

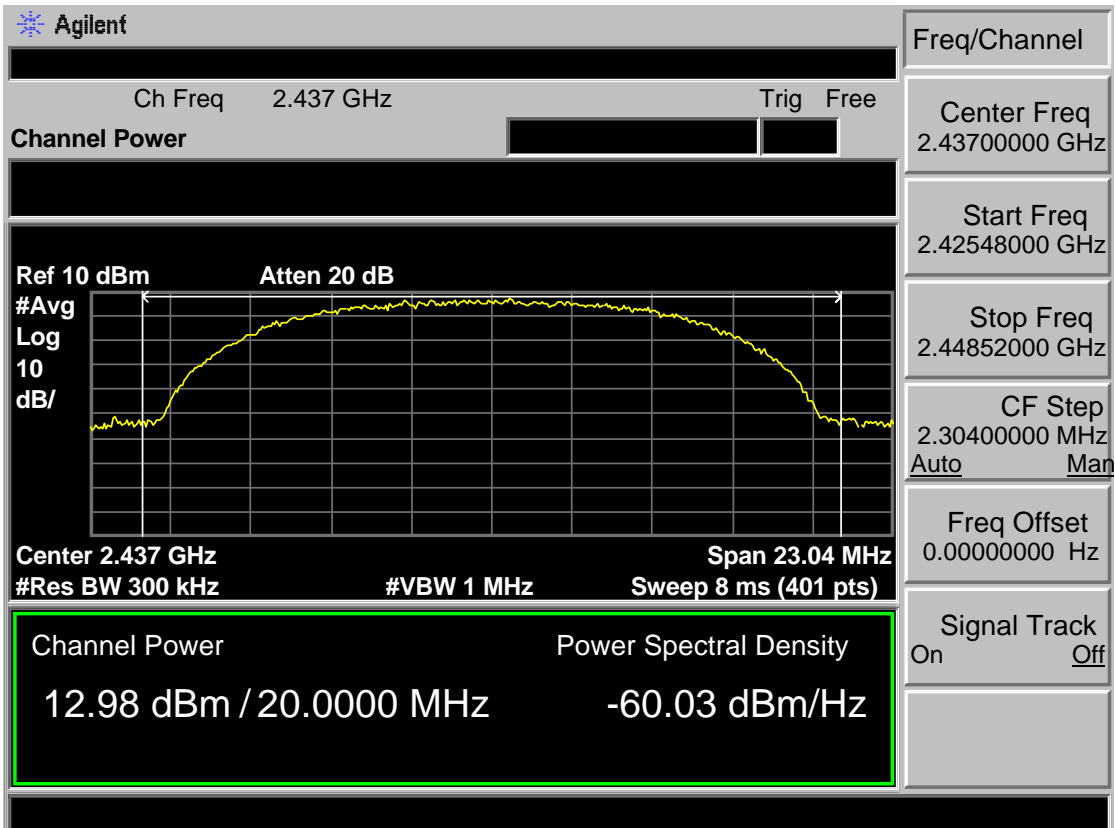
7.4 Test Data

Antenna 0

Test Mode: IEEE 802.11b 2412MHz



Test Mode: IEEE 802.11b 2437MHz



Test Mode: IEEE 802.11b 2462MHz

Agilent

Freq/Channel	
Center Freq	2.46200000 GHz
Start Freq	2.45046500 GHz
Stop Freq	2.47353500 GHz
CF Step	2.30700000 MHz
Auto	Man
Freq Offset	0.00000000 Hz
Signal Track	On <u>Off</u>

Ch Freq	2.462 GHz	Trig	Free
Channel Power			

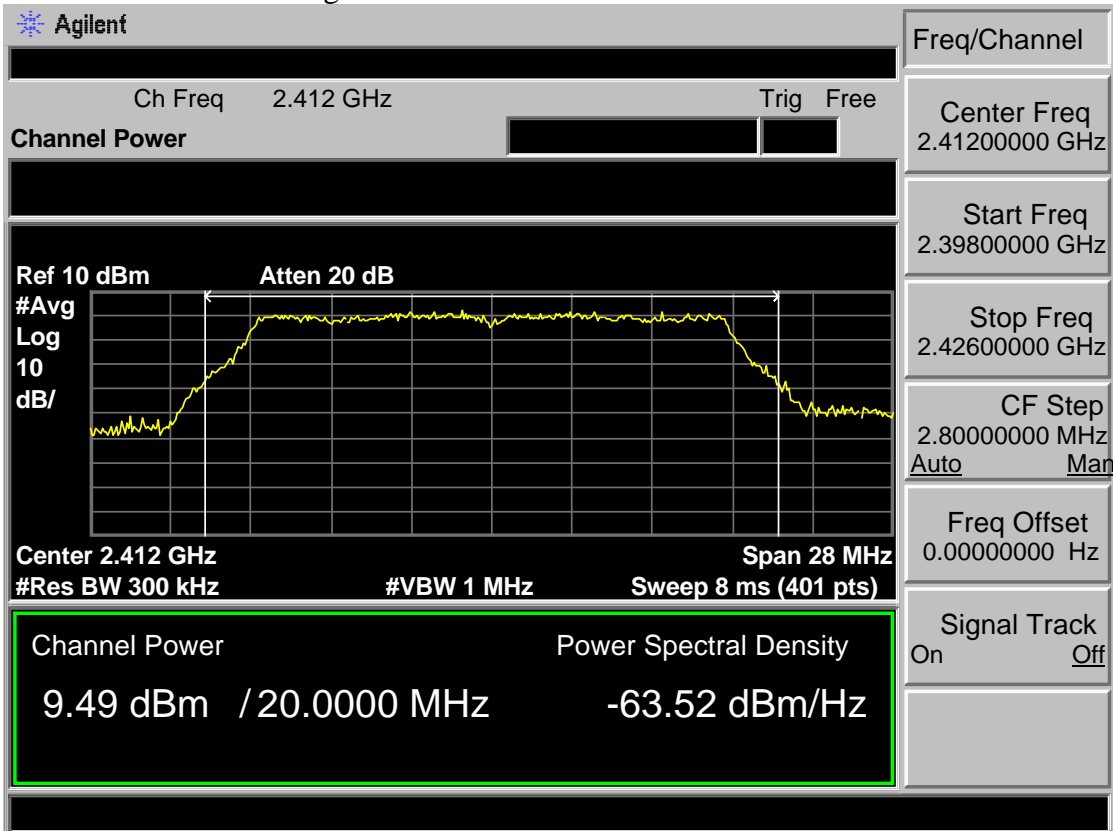
Ref 10 dBm Atten 20 dB

#Avg 10
Log 10
dB/

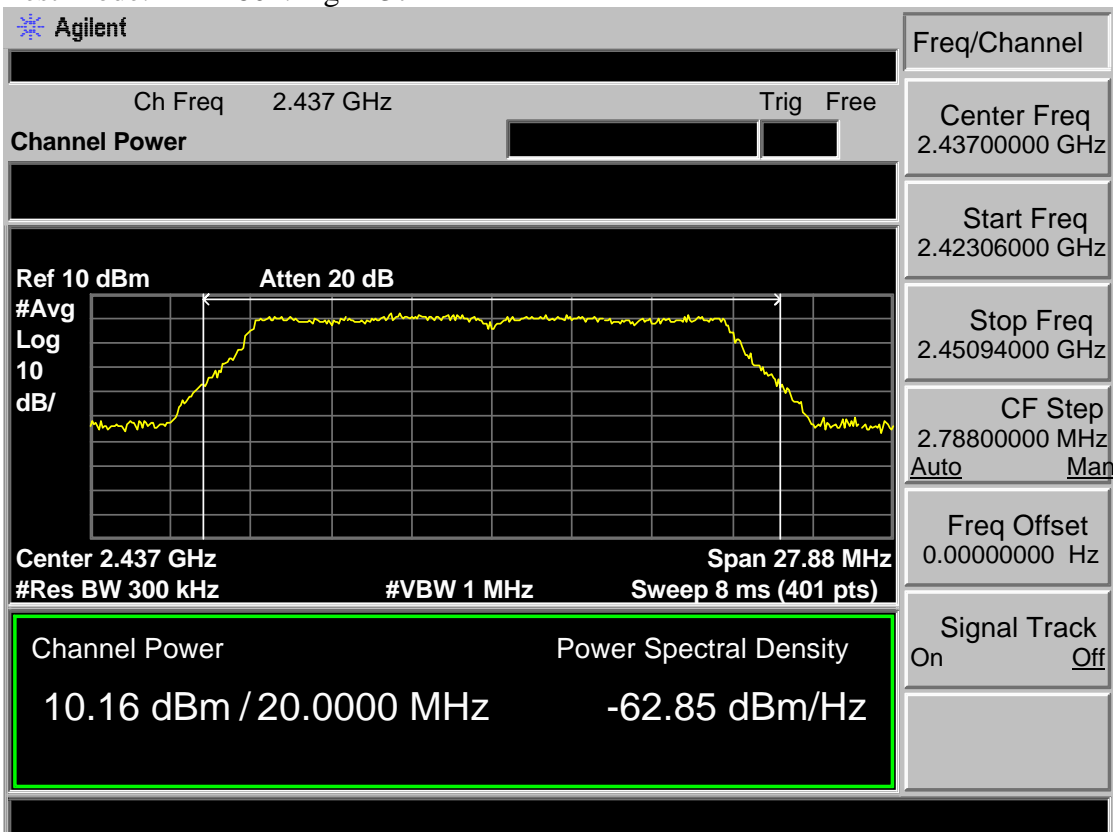
Center 2.462 GHz Span 23.07 MHz
#Res BW 300 kHz #VBW 1 MHz Sweep 8 ms (401 pts)

Channel Power	Power Spectral Density
13.36 dBm / 20.0000 MHz	-59.65 dBm/Hz

Test Mode: IEEE 802.11g 2412MHz



Test Mode: IEEE 802.11g 2437MHz



Test Mode: IEEE 802.11g 2462MHz

Agilent

Freq/Channel

Ch Freq 2.462 GHz
Channel Power

Trig Free

Center Freq 2.4620000 GHz

Start Freq 2.44814000 GHz

Stop Freq 2.47586000 GHz

CF Step 2.77200000 MHz
 Auto Man

Freq Offset 0.00000000 Hz

Signal Track
 On Off

Ref 10 dBm Atten 20 dB

#Avg 10
Log
dB/

Center 2.462 GHz Span 27.72 MHz

#Res BW 300 kHz #VBW 1 MHz Sweep 8 ms (401 pts)

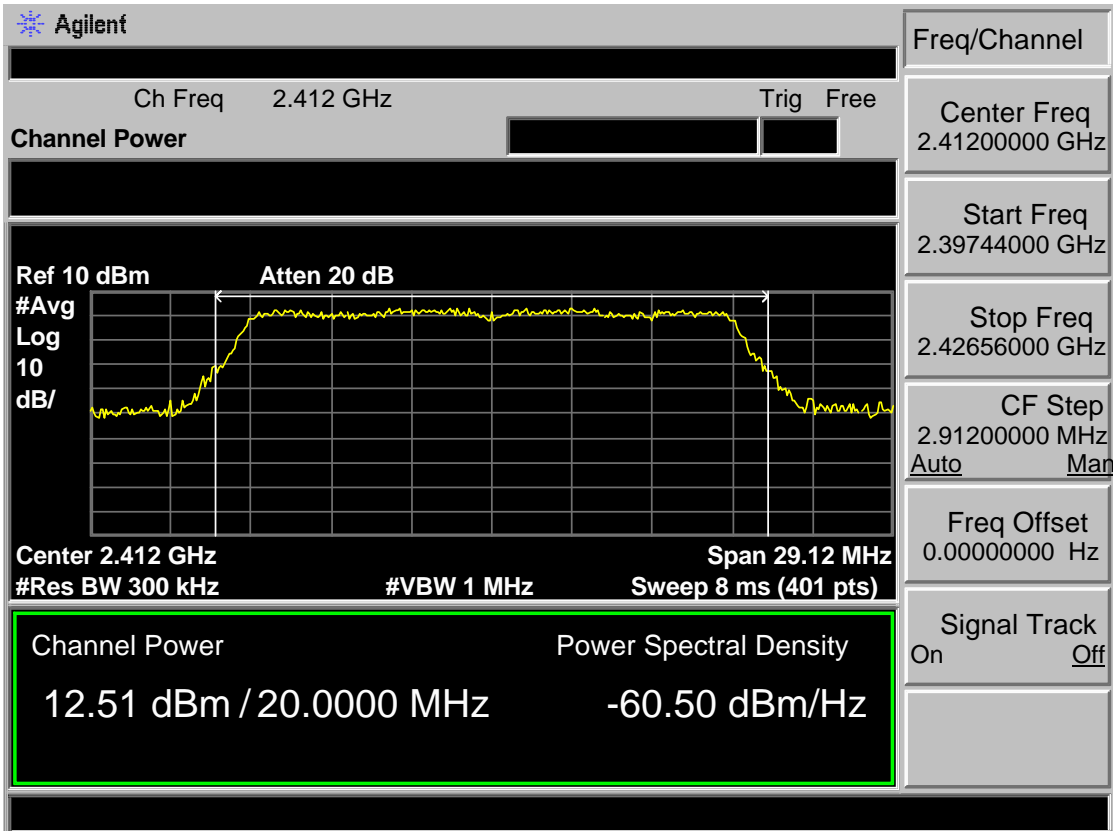
Channel Power

10.25 dBm / 20.0000 MHz

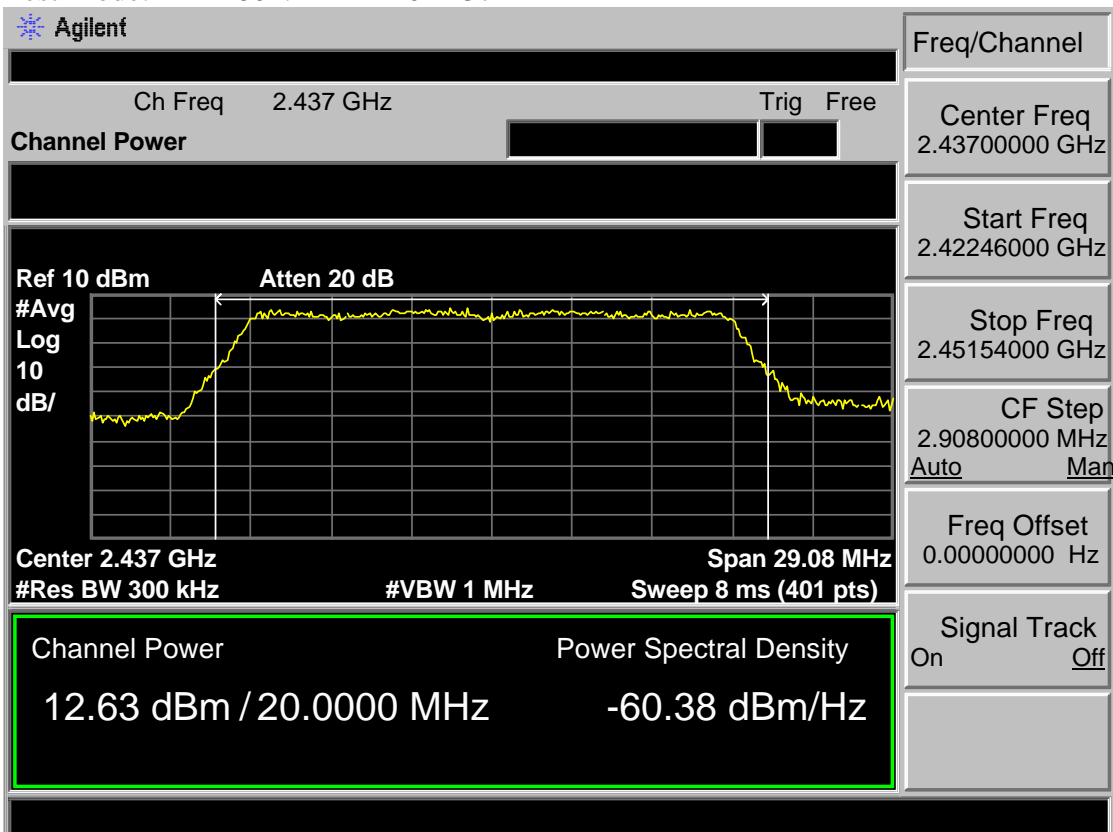
Power Spectral Density

-62.76 dBm/Hz

Test Mode: IEEE 802.11n HT20 2412MHz



Test Mode: IEEE 802.11n HT20 2437MHz



Test Mode: IEEE 802.11n HT20 2462MHz

Agilent

Freq/Channel
 Center Freq
2.46200000 GHz
 Start Freq
2.44741500 GHz
 Stop Freq
2.47658500 GHz
 CF Step
2.91700000 MHz
Auto Man
 Freq Offset
0.00000000 Hz
 Signal Track
On Off

Ch Freq 2.462 GHz
 Trig Free

Channel Power

Ref 10 dBm
 #Avg
Log
10
dB/

Atten 20 dB

Center 2.462 GHz
 #Res BW 300 kHz

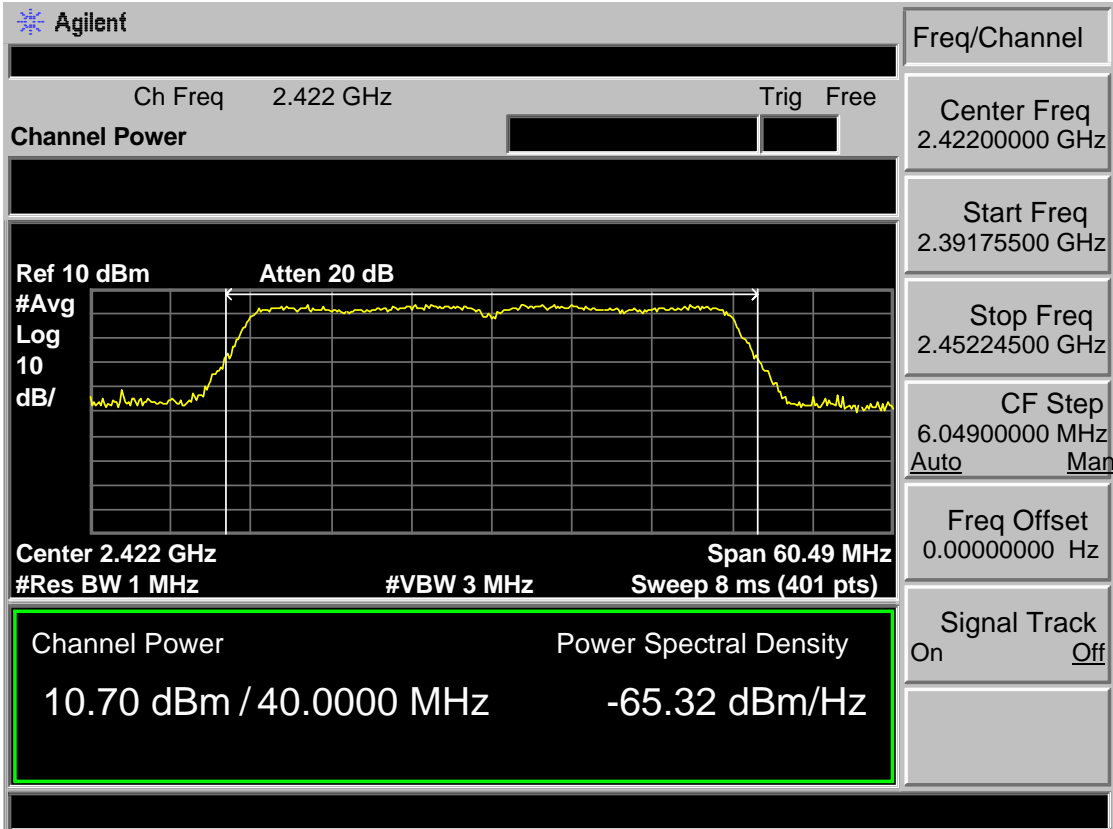
#VBW 1 MHz

Span 29.17 MHz
 Sweep 8 ms (401 pts)

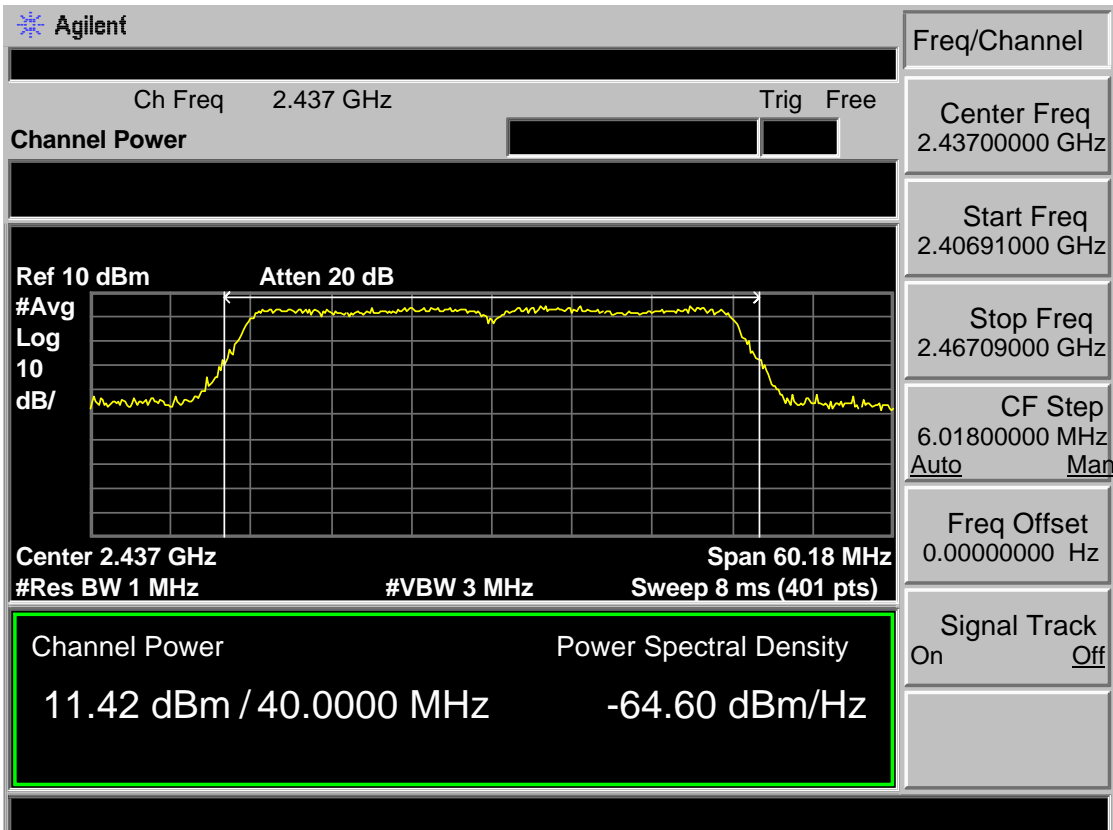
Channel Power
 13.12 dBm / 20.0000 MHz

Power Spectral Density
 -59.89 dBm/Hz


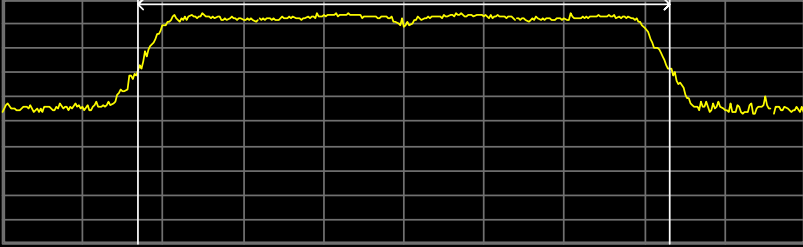
Test Mode: IEEE 802.11n HT40 2422MHz



Test Mode: IEEE 802.11n HT40 2437MHz

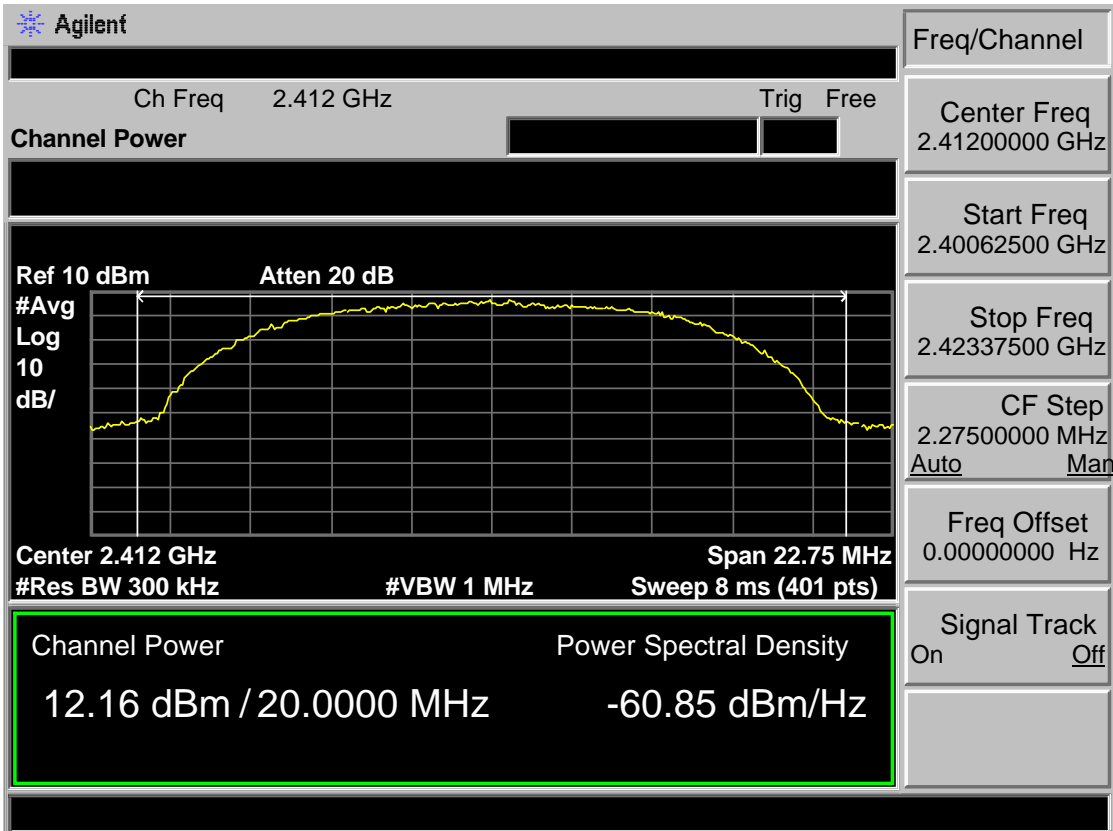


Test Mode: IEEE 802.11n HT40 2452MHz

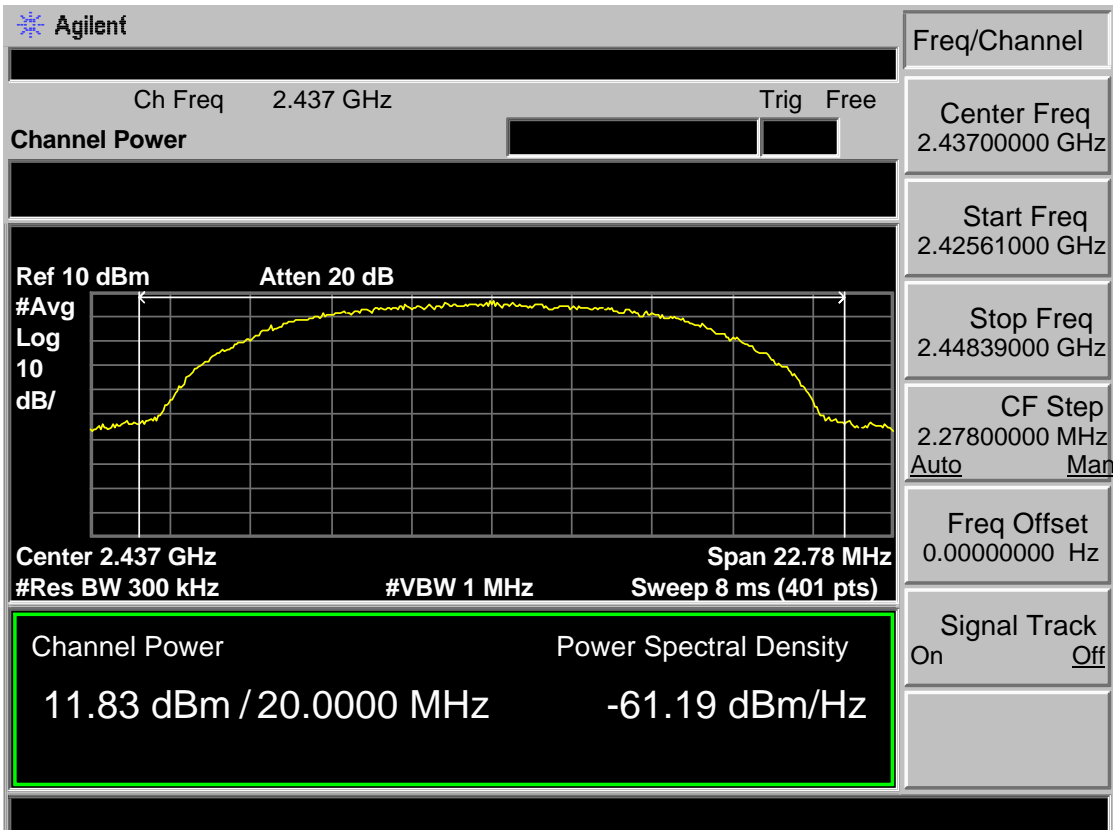
		Freq/Channel	
Ch Freq 2.452 GHz		Trig Free	
Channel Power		Center Freq 2.45200000 GHz	
Ref 10 dBm		Start Freq 2.42171000 GHz	
Atten 20 dB		Stop Freq 2.48229000 GHz	
#Avg 10 Log dB/		CF Step 6.05800000 MHz Auto Man	
		Freq Offset 0.00000000 Hz	
Center 2.452 GHz		Span 60.58 MHz	
#Res BW 1 MHz		#VBW 3 MHz Sweep 8 ms (401 pts)	
Channel Power		Power Spectral Density	
11.50 dBm / 40.0000 MHz		-64.52 dBm/Hz	
		Signal Track On Off	

Antenna 1

Test Mode: IEEE 802.11b 2412MHz



Test Mode: IEEE 802.11b 2437MHz



Test Mode: IEEE 802.11b 2462MHz

Agilent

Freq/Channel

Ch Freq 2.462 GHz

Trig Free

Channel Power

Center Freq
2.46200000 GHz

Ref 10 dBm Atten 20 dB

#Avg 10
Log
dB/

Start Freq
2.45059500 GHz

Center 2.462 GHz Span 22.81 MHz

#Res BW 300 kHz #VBW 1 MHz Sweep 8 ms (401 pts)

Stop Freq
2.47340500 GHz

Channel Power **Power Spectral Density**

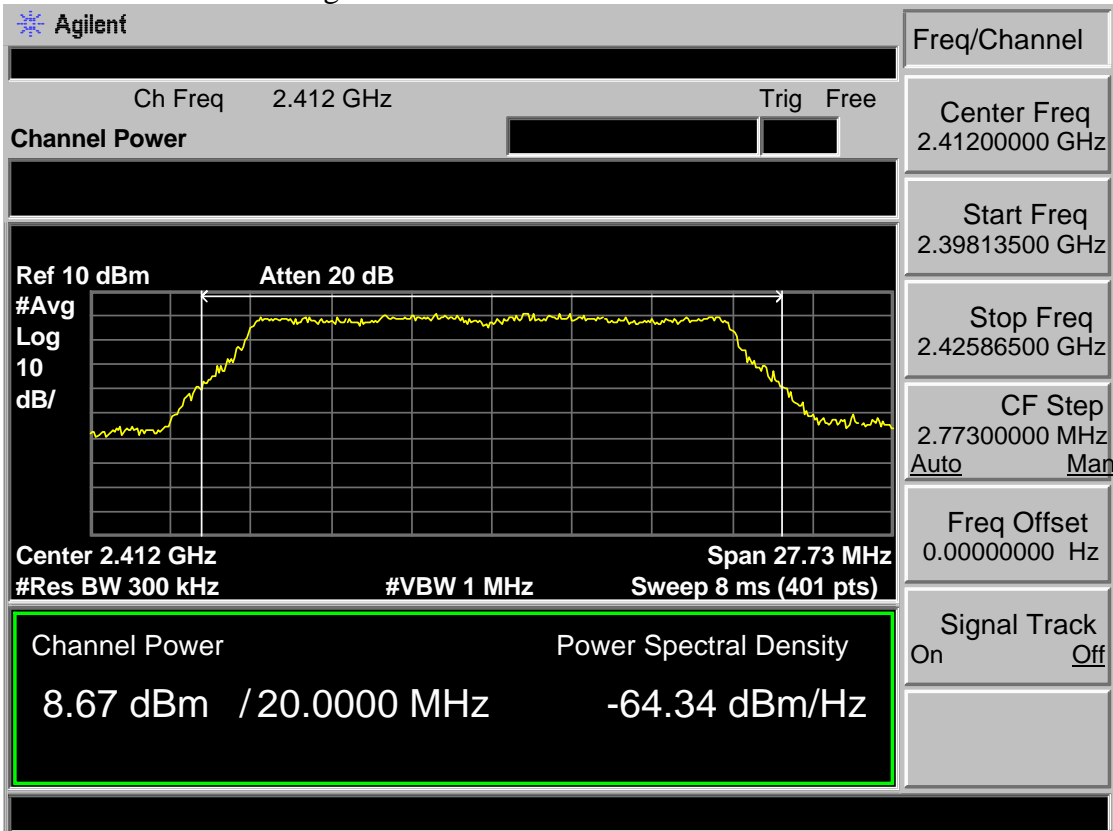
12.18 dBm / 20.0000 MHz -60.83 dBm/Hz

CF Step
2.28100000 MHz
Auto Man

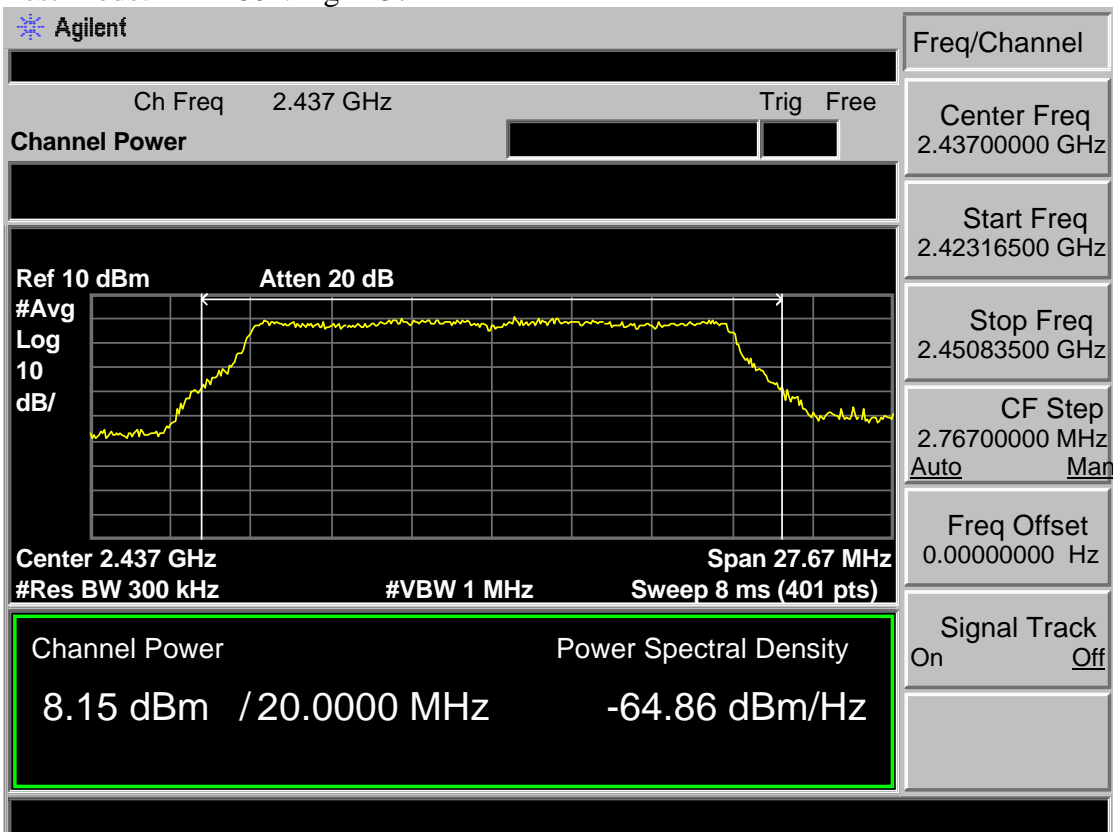
Signal Track
On Off

Freq Offset
0.00000000 Hz

Test Mode: IEEE 802.11g 2412MHz



Test Mode: IEEE 802.11g 2437MHz



Test Mode: IEEE 802.11g 2462MHz

Agilent

Freq/Channel

Ch Freq 2.462 GHz

Trig Free

Channel Power

Center Freq
2.46200000 GHz

Ref 10 dBm

Atten 20 dB

#Avg 10
Log
dB/

Center 2.462 GHz

Span 27.68 MHz

#Res BW 300 kHz

#VBW 1 MHz

Sweep 8 ms (401 pts)

Channel Power

Power Spectral Density

9.54 dBm / 20.0000 MHz

-63.52 dBm/Hz

Center Freq

Start Freq

2.46200000 GHz

2.44816000 GHz

Stop Freq

CF Step

2.47584000 GHz

2.76800000 MHz

Auto

Man

Freq Offset

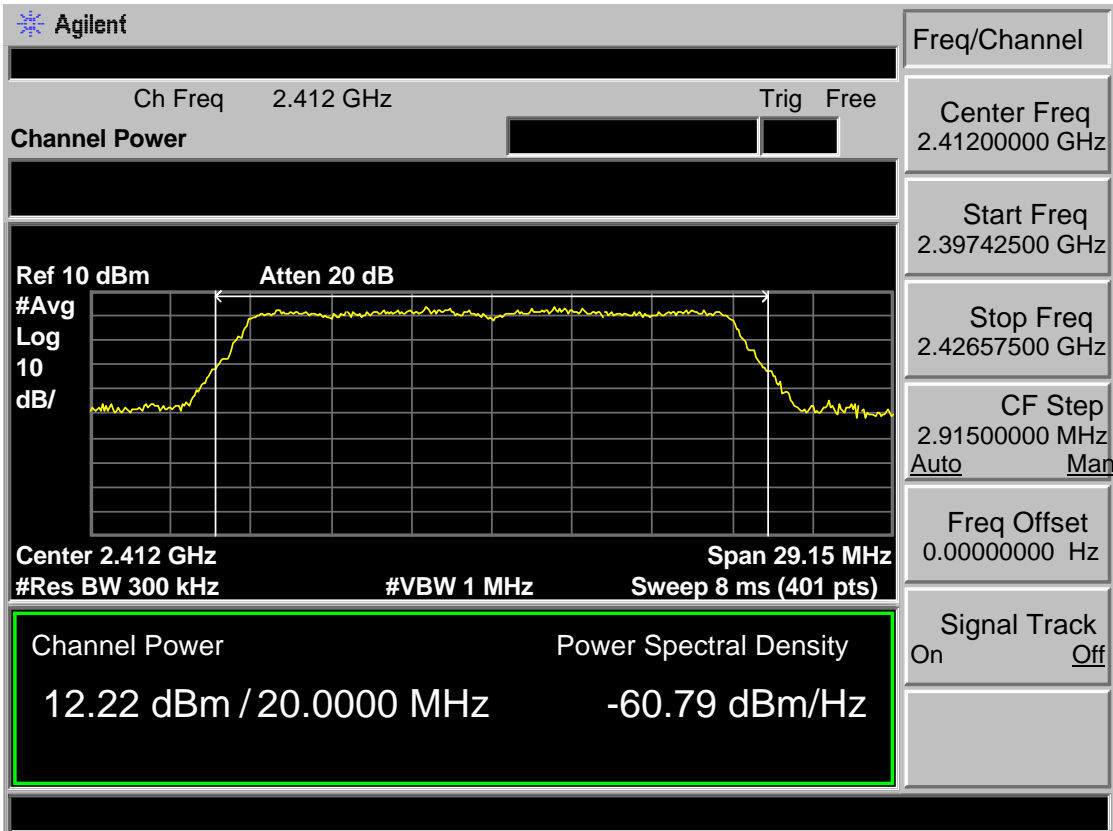
0.00000000 Hz

Signal Track

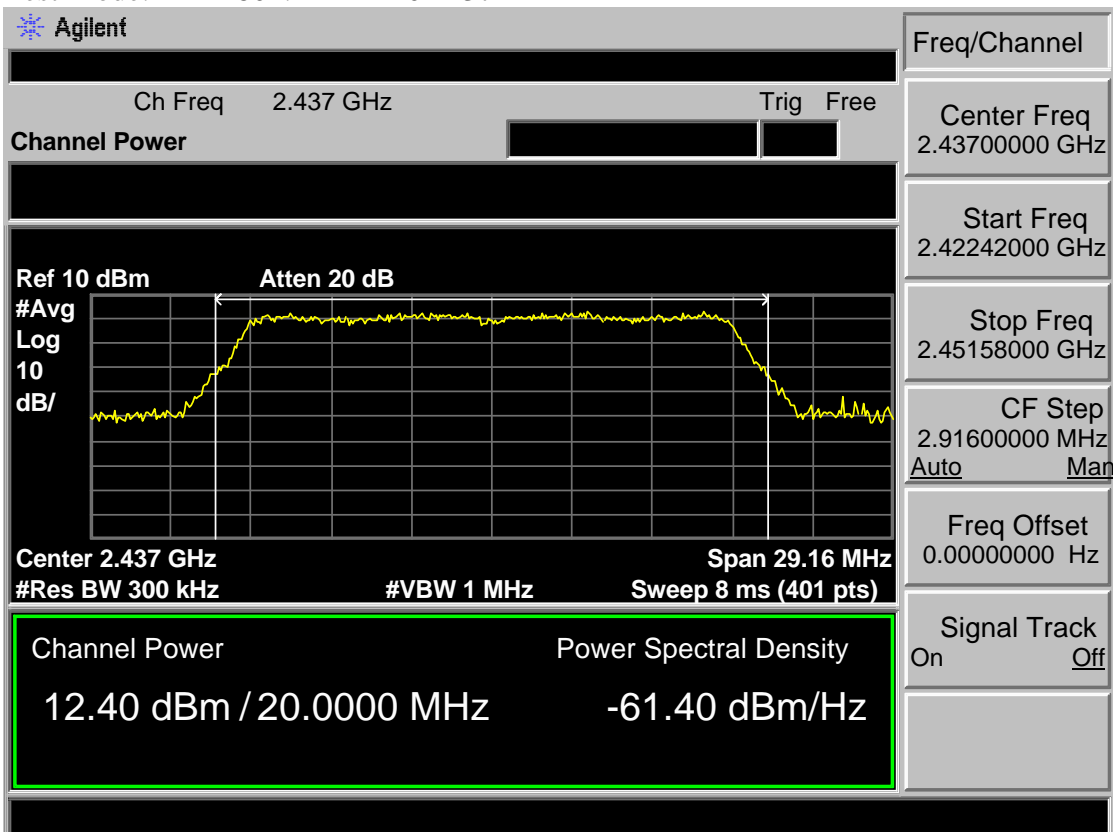
On

Off

Test Mode: IEEE 802.11n HT20 2412MHz



Test Mode: IEEE 802.11n HT20 2437MHz




Test Mode: IEEE 802.11n HT20 2462MHz

Agilent

Freq/Channel	
Center Freq	2.46200000 GHz
Start Freq	2.44747500 GHz
Stop Freq	2.47652500 GHz
CF Step	2.90500000 MHz
Auto	Man
Freq Offset	0.00000000 Hz
Signal Track	On <u>Off</u>

Ch Freq	2.462 GHz	Trig	Free
Channel Power			

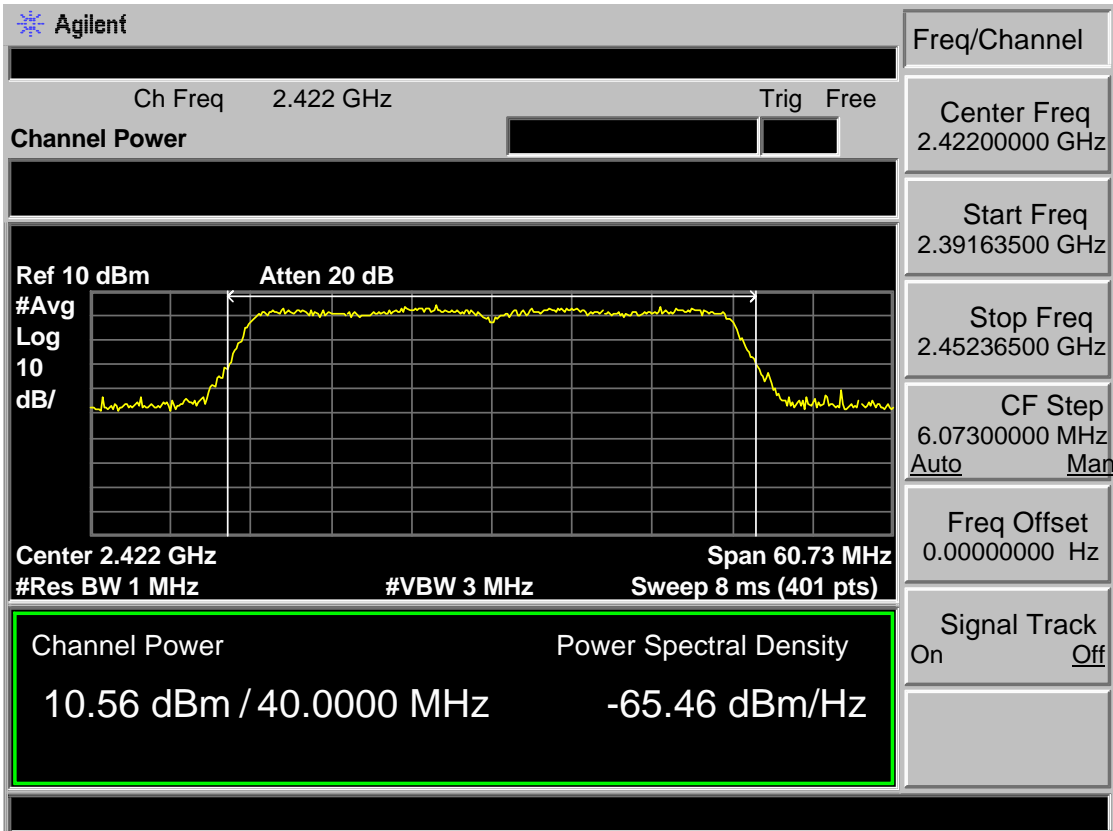
Ref 10 dBm	Atten 20 dB	
#Avg		
Log		
10		
dB/		



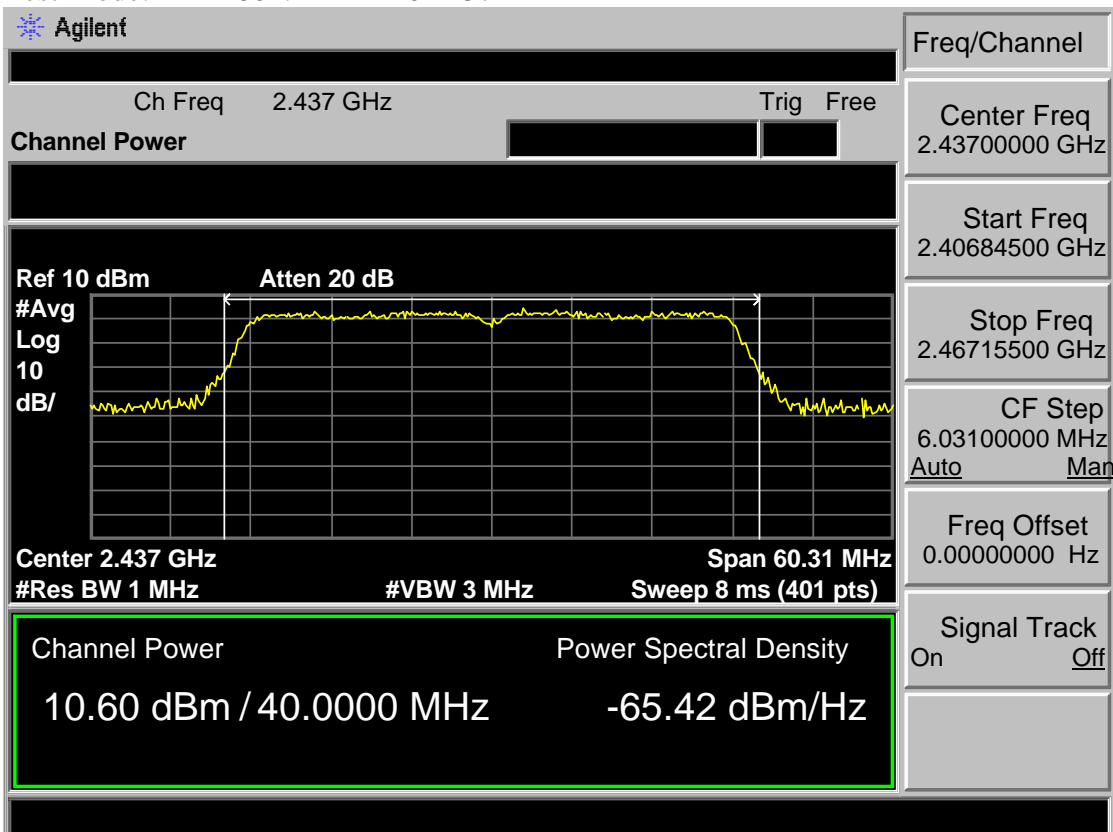
Center 2.462 GHz	Span 29.05 MHz
#Res BW 300 kHz	#VBW 1 MHz
	Sweep 8 ms (401 pts)

Channel Power	Power Spectral Density
12.07 dBm / 20.0000 MHz	-60.94 dBm/Hz

Test Mode: IEEE 802.11n HT40 2422MHz



Test Mode: IEEE 802.11n HT40 2437MHz



Test Mode: IEEE 802.11n HT40 2452MHz

Agilent

Freq/Channel

Ch Freq 2.452 GHz
Channel Power

Trig Free

Center Freq
2.45200000 GHz

Start Freq
2.42170000 GHz

Stop Freq
2.48230000 GHz

CF Step
6.06000000 MHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

Ref 10 dBm
 #Avg 10
 Log
 dB/

Atten 20 dB

Center 2.452 GHz
 #Res BW 1 MHz

#VBW 3 MHz

Span 60.6 MHz
 Sweep 8 ms (401 pts)

Channel Power	Power Spectral Density
10.17 dBm / 40.0000 MHz	-65.85 dBm/Hz

8 POWER SPECTRAL DENSITY TEST

8.1 Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

8.2 Test Procedure

- 1, The transmitter output (antenna port) was connected to the spectrum analyzer. Connect EUT antenna terminal to the spectrum analyzer with a low loss SMA cable.

- 2, Follow the test procedure as described in KDB 558074
 - (1). Set analyzer center frequency to DTS channel center frequency.
 - (2). Set the span to 1.5 times the DTS bandwidth.
 - (3). Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
 - (4). Set the VBW $\geq 3 \text{ RBW}$.
 - (5). Detector = peak.
 - (6). Sweep time = auto couple.
 - (7). Trace mode = max hold.
 - (8). Allow trace to fully stabilize.
 - (9). Use the peak marker function to determine the maximum amplitude level.
 - (10). If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

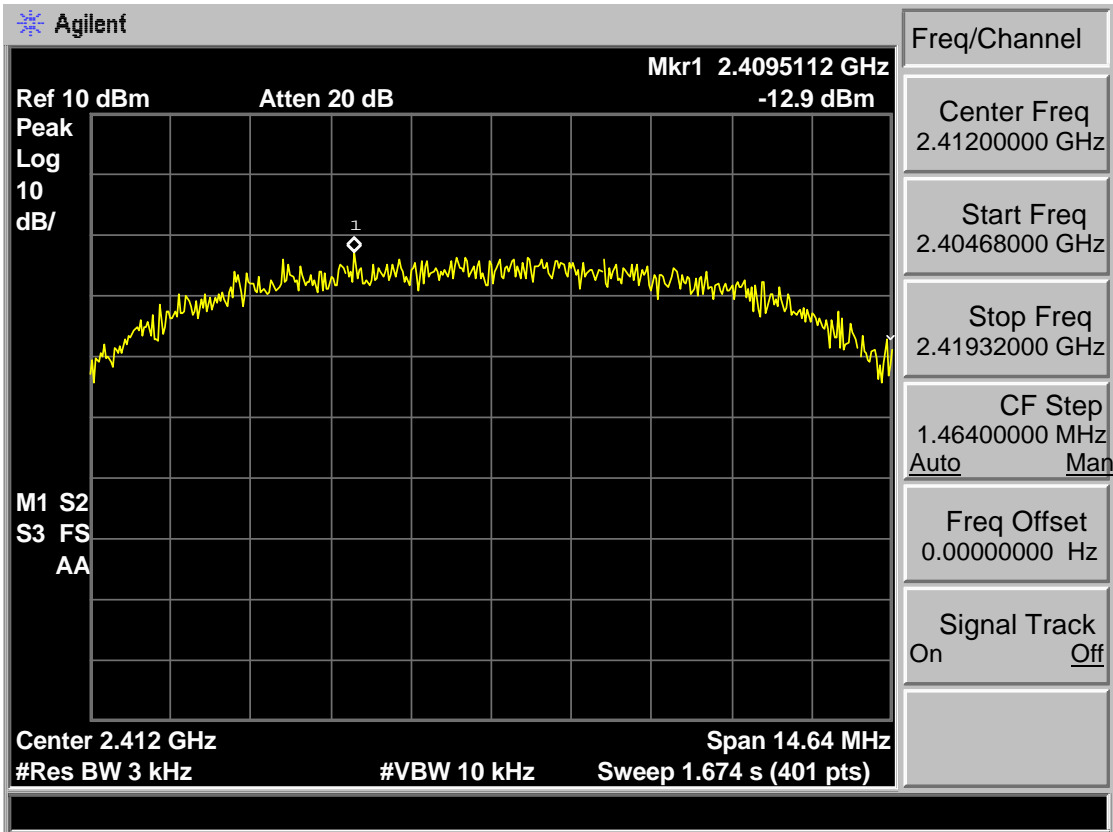
8.3 Test Result

EUT: Wireless Speaker					
M/N: Beoplay M3					
Test date: 2017-05-25		Test site: 3m Chamber			Tested by: Tony Tang
Pass					
Test Mode	CH	Power density (dBm/3kHz)			Limit (dBm/3kHz)
		Ant 0	Ant 1	Total	
IEEE 802.11 b	CH1	-12.90	-11.87	/	8
	CH6	-10.74	-11.91	/	8
	CH11	-10.53	-11.85	/	8
IEEE 802.11 g	CH1	-13.27	-11.47	/	8
	CH6	-13.28	-11.89	/	8
	CH11	-13.05	-11.43	/	8
IEEE 802.11 n HT 20	CH1	-11.47	-12.18	-8.80	8
	CH6	-10.67	-11.45	-8.03	8
	CH11	-11.06	-11.04	-8.04	8
IEEE 802.11 n HT 40	CH1	-13.92	-11.84	-9.75	8
	CH4	-14.42	-11.99	-10.03	8
	CH7	-14.24	-12.26	-10.13	8
Conclusion : PASS					

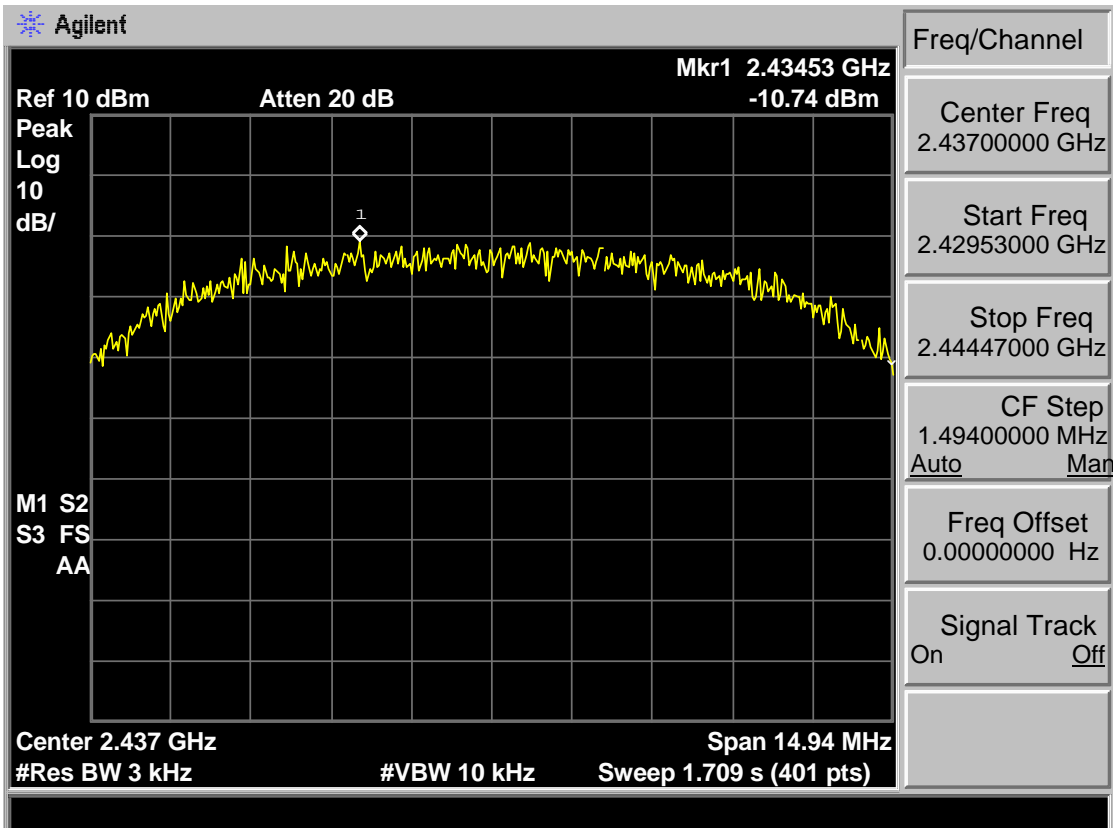
8.4 Test Data

Antenna 0

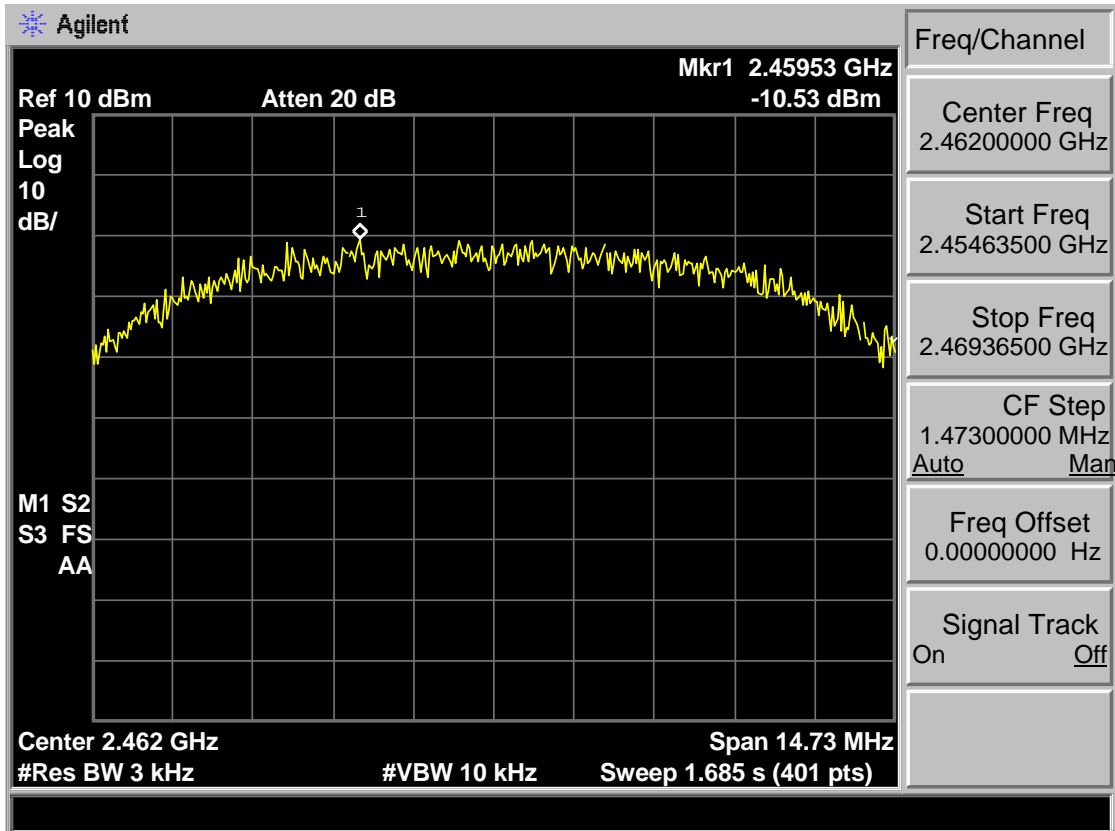
Test Mode: IEEE 802.11b 2412MHz



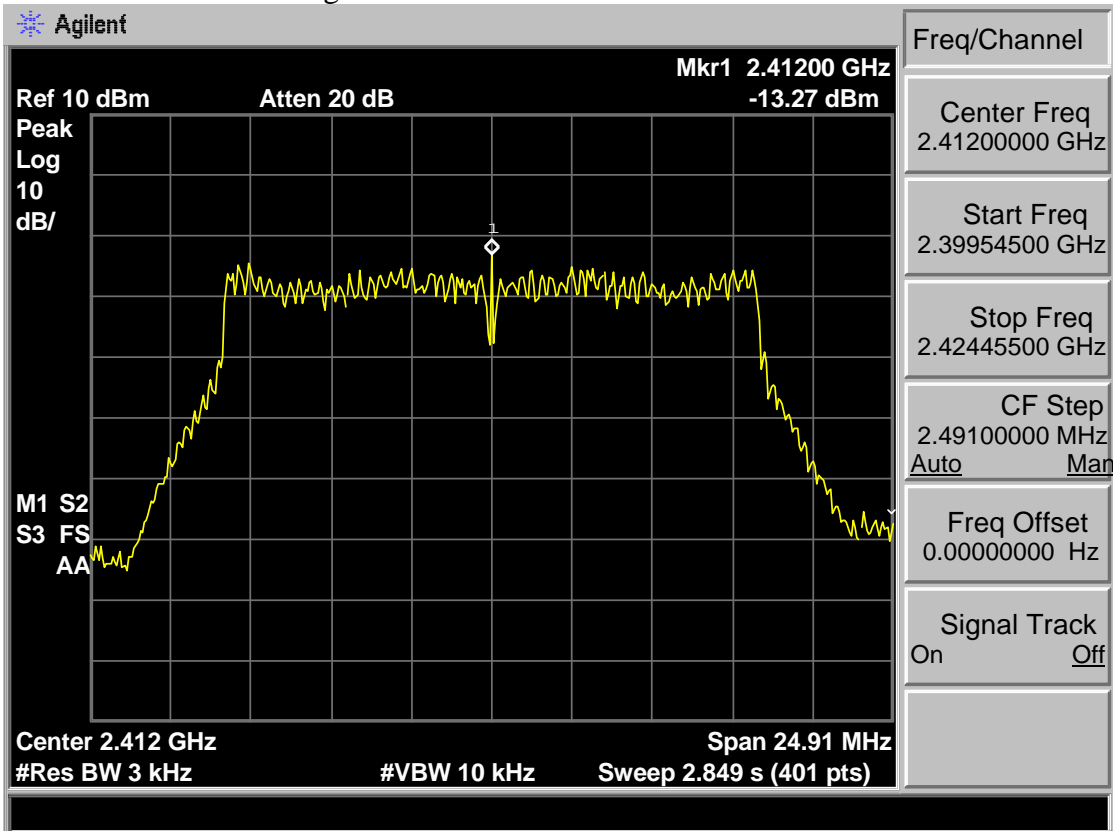
Test Mode: IEEE 802.11b 2437MHz



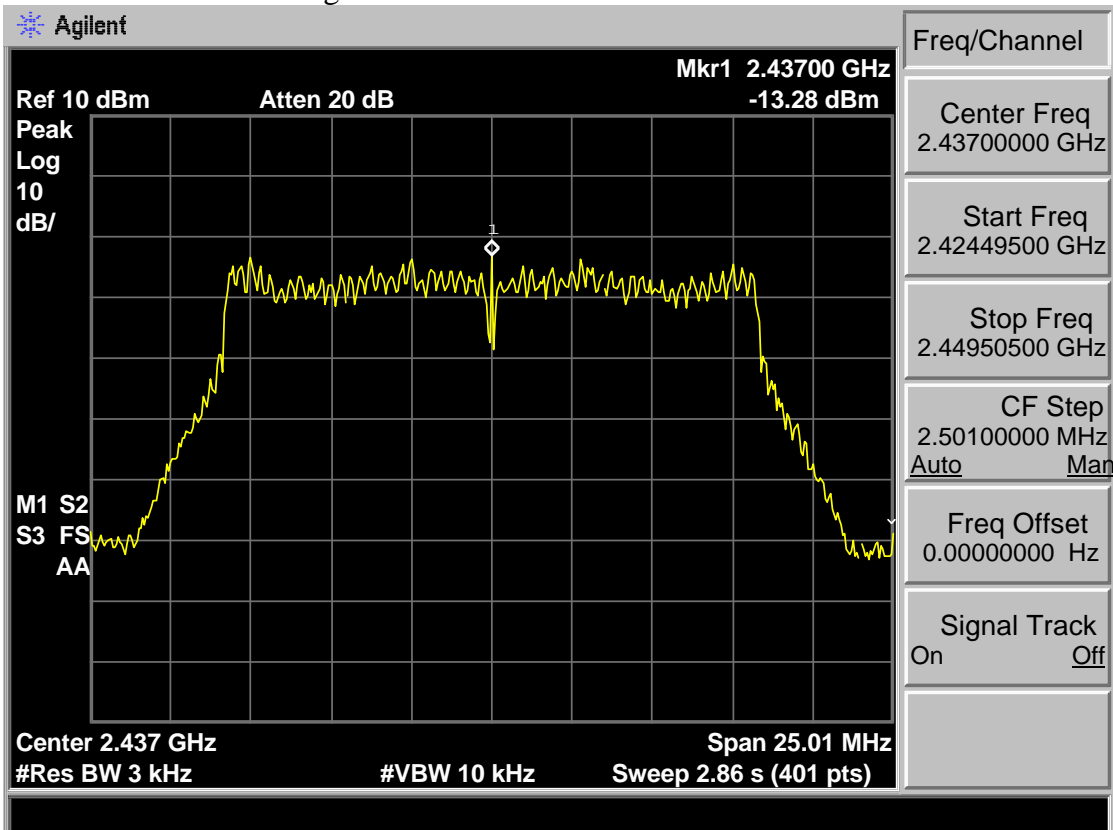
Test Mode: IEEE 802.11b 2462MHz



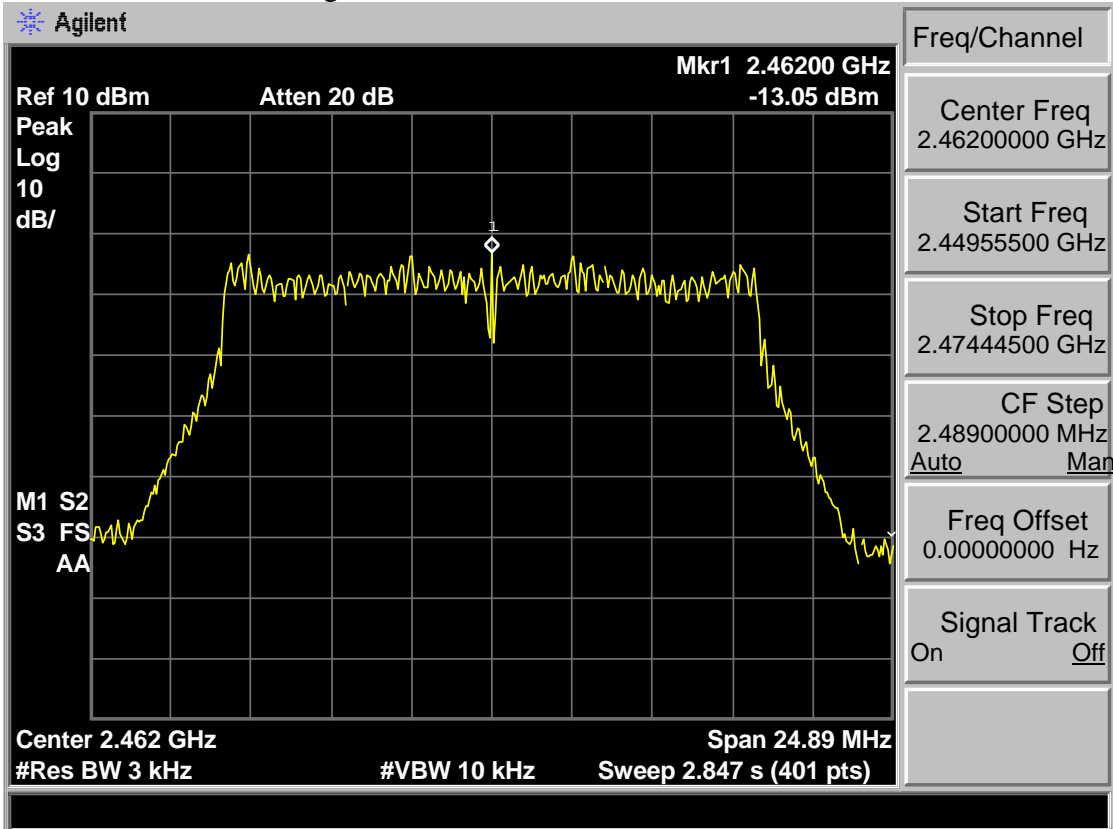
Test Mode: IEEE 802.11g 2412MHz



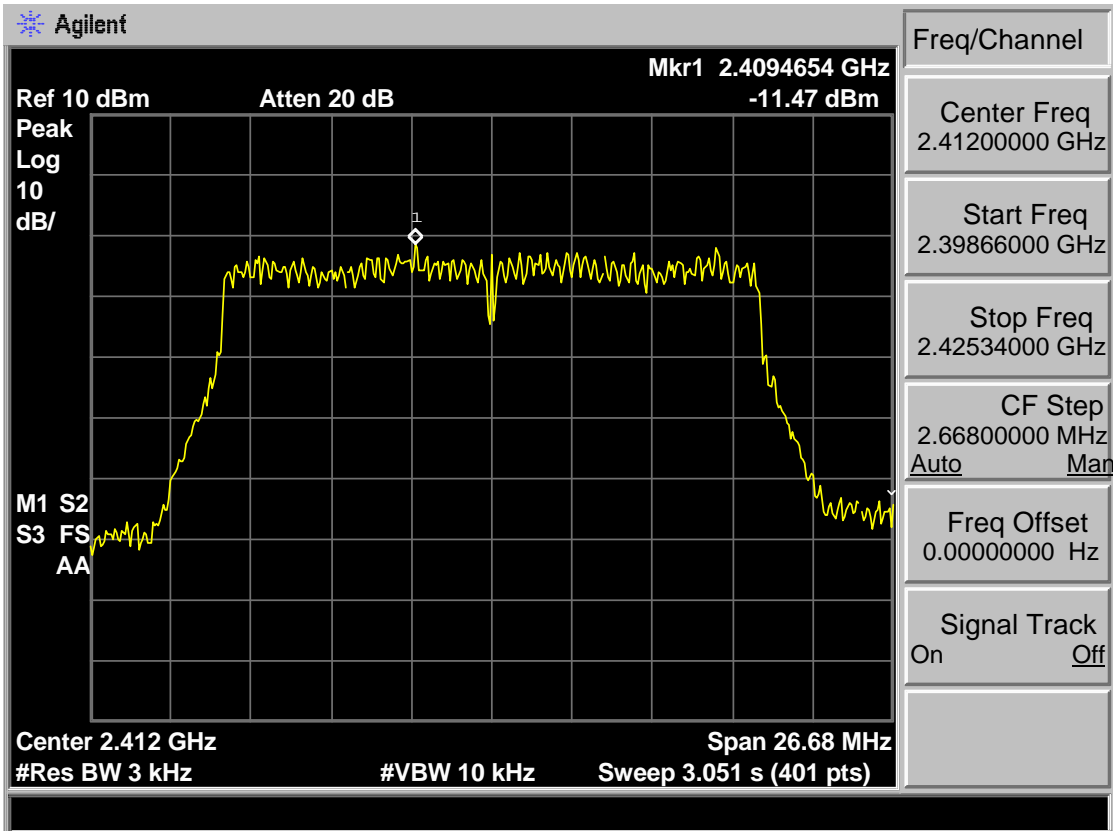
Test Mode: IEEE 802.11g 2437MHz



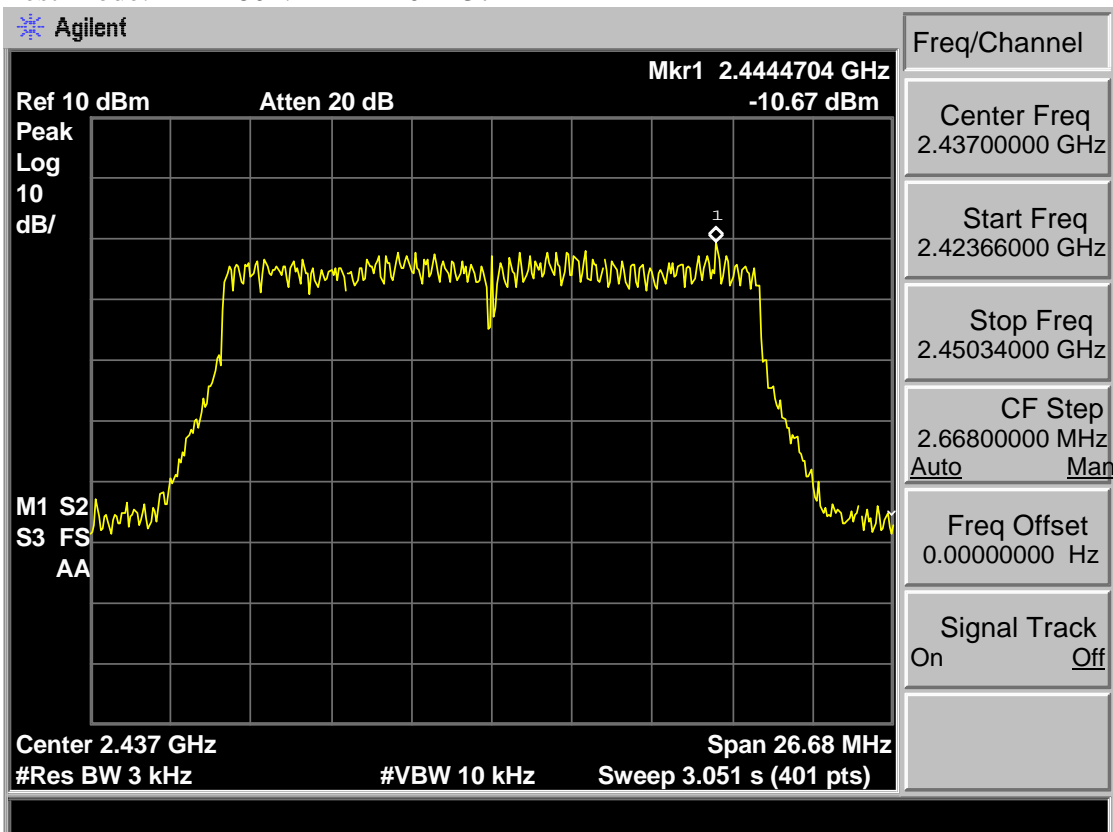
Test Mode: IEEE 802.11g 2462MHz



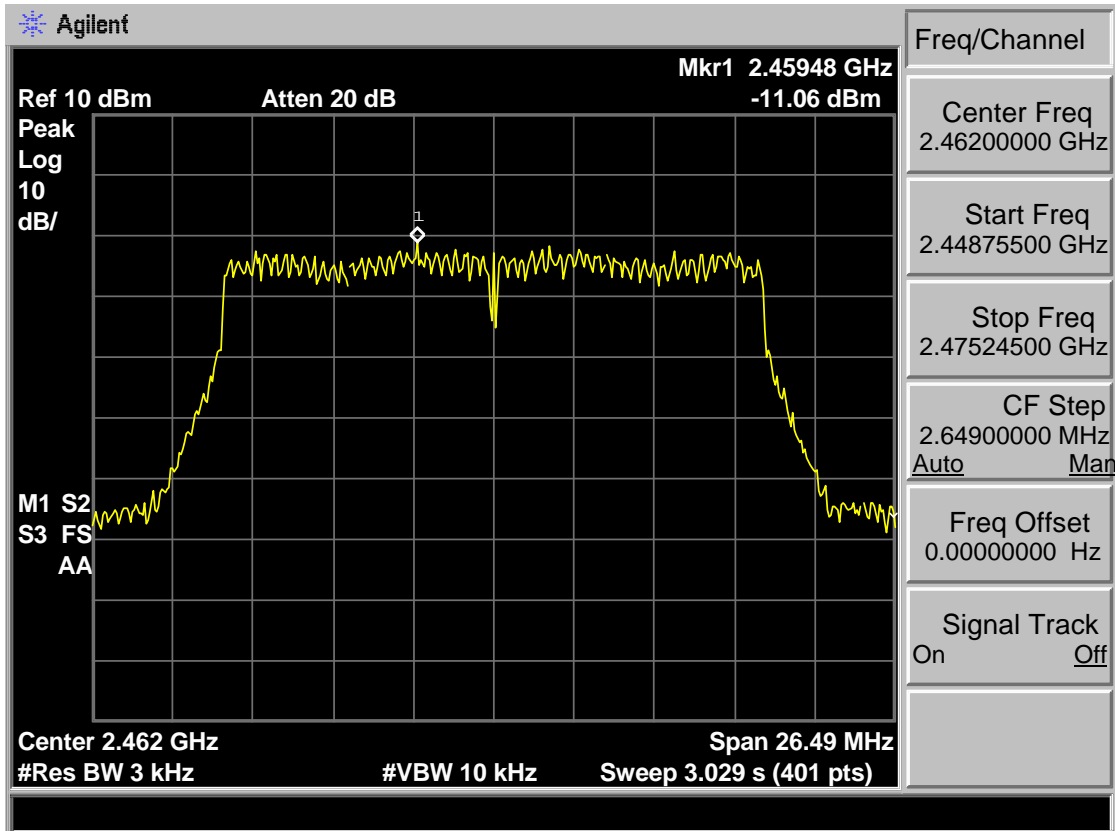
Test Mode: IEEE 802.11n HT20 2412MHz



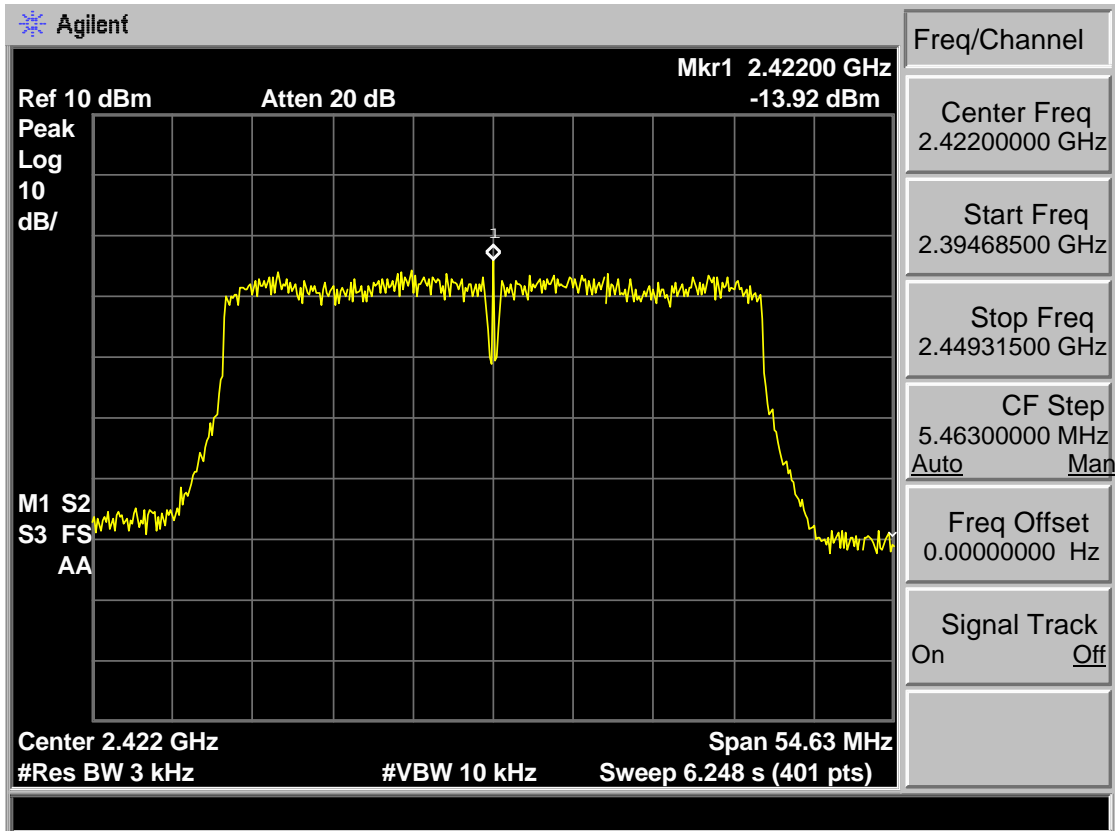
Test Mode: IEEE 802.11n HT20 2437MHz



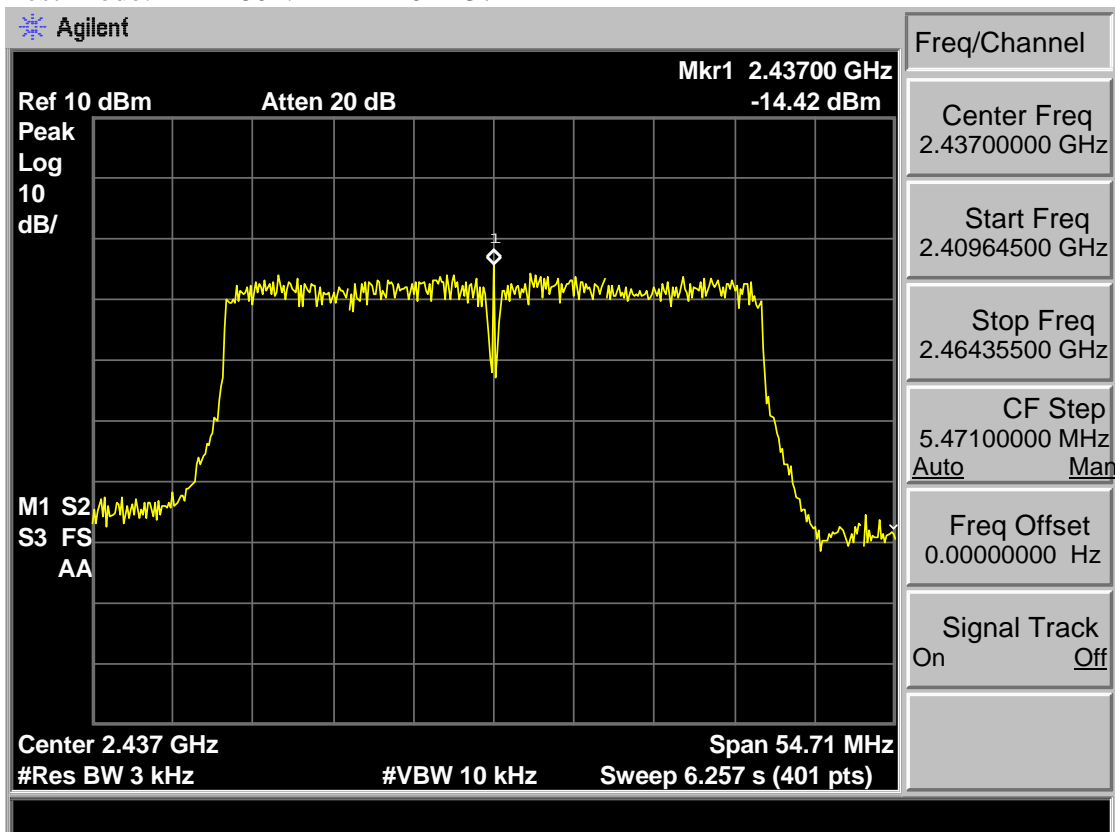
Test Mode: IEEE 802.11n HT20 2462MHz



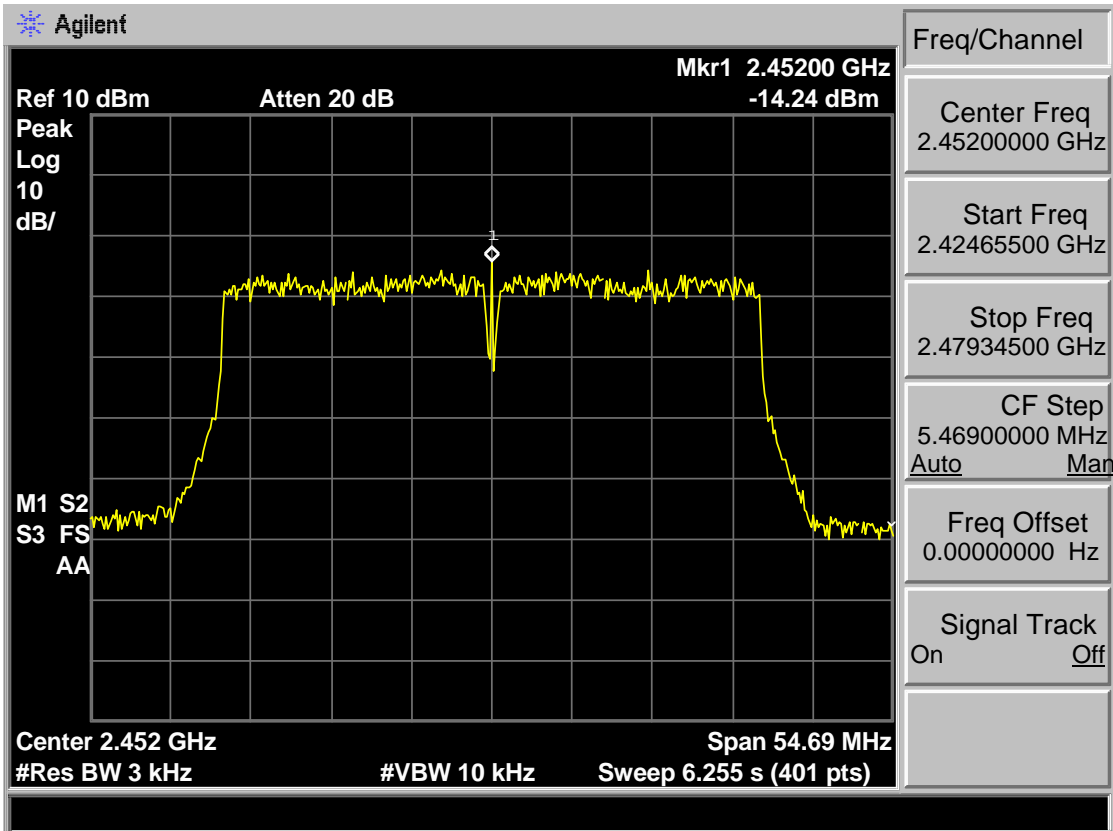
Test Mode: IEEE 802.11n HT40 2422MHz



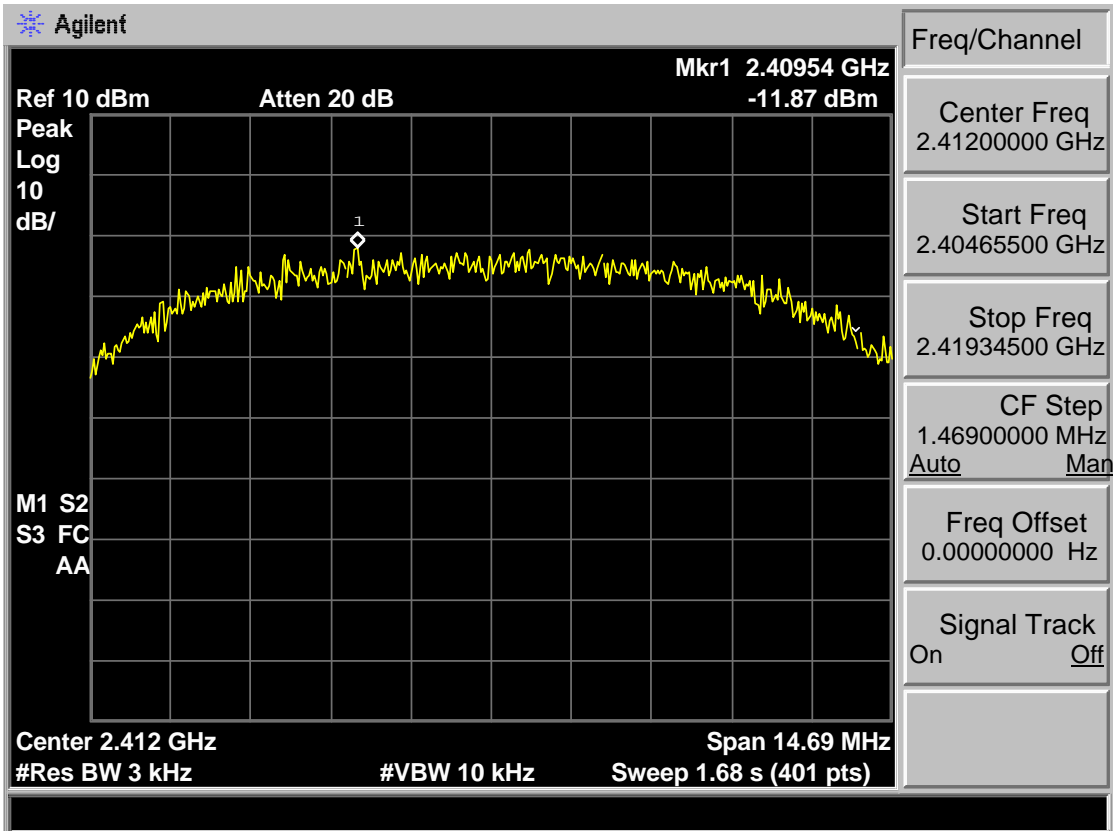
Test Mode: IEEE 802.11n HT40 2437MHz



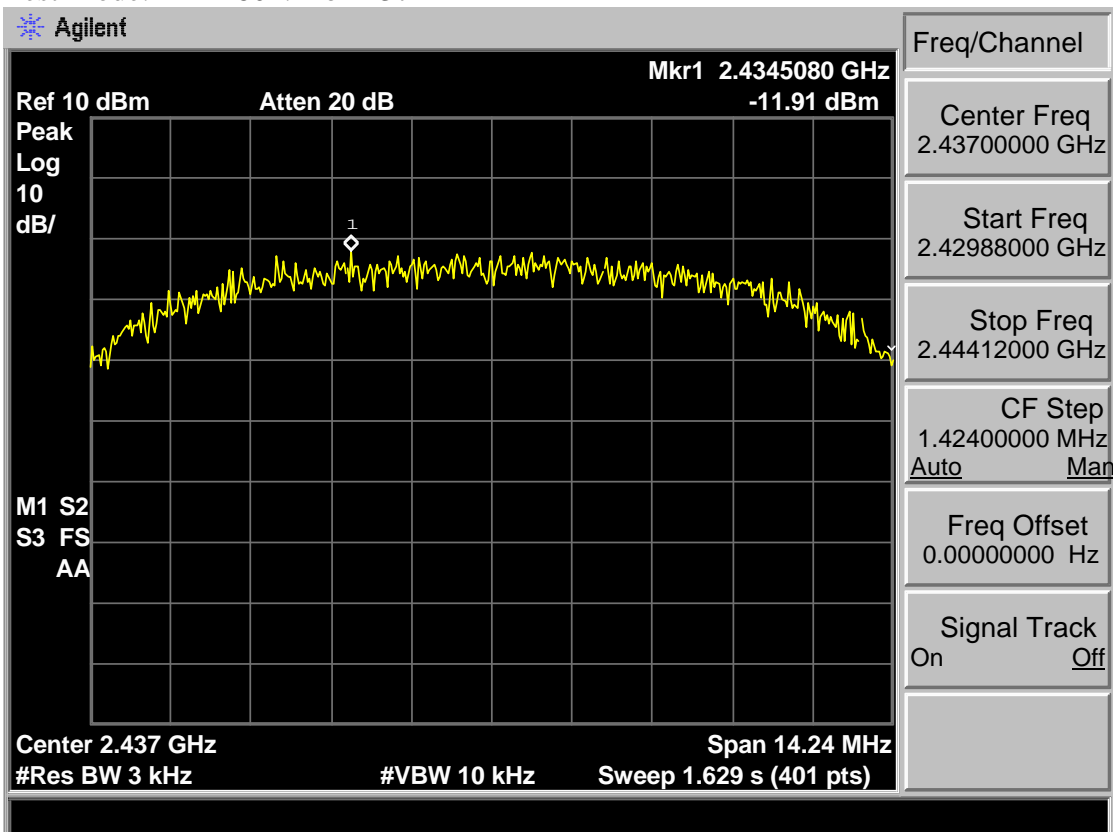
Test Mode: IEEE 802.11n HT40 2452MHz



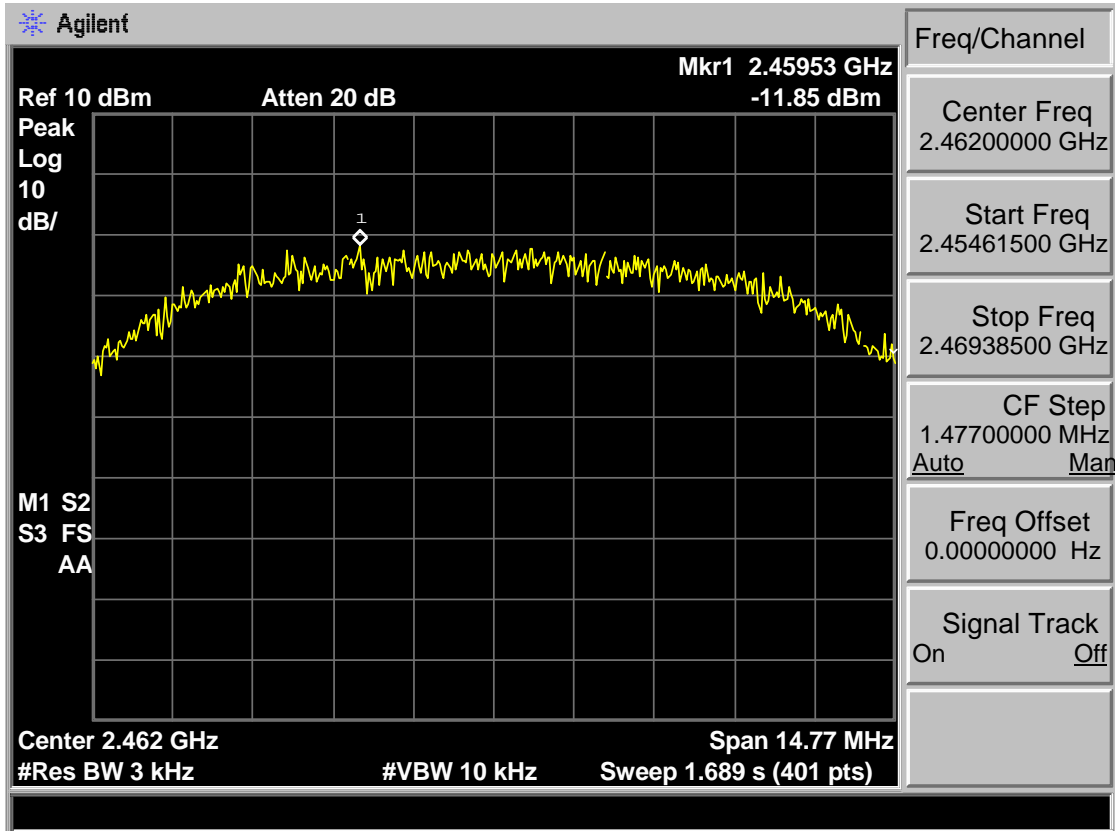
Antenna 1
 Test Mode: IEEE 802.11b 2412MHz



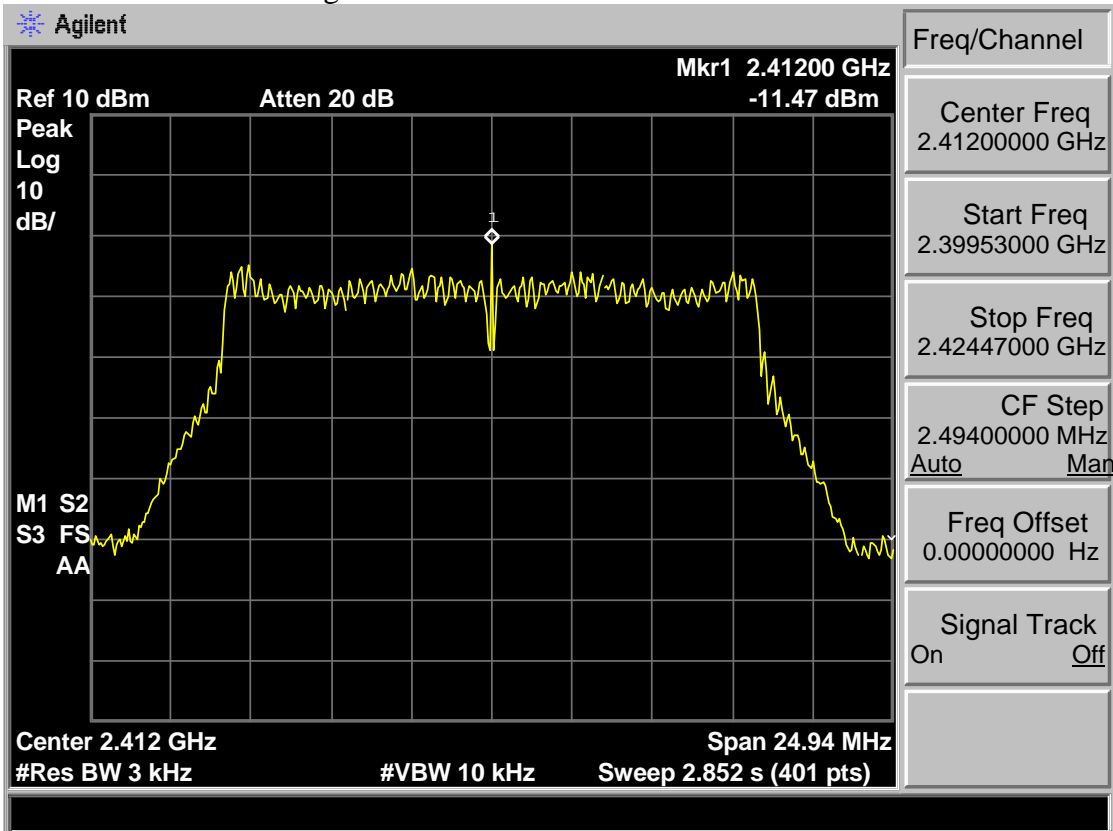
Test Mode: IEEE 802.11b 2437MHz



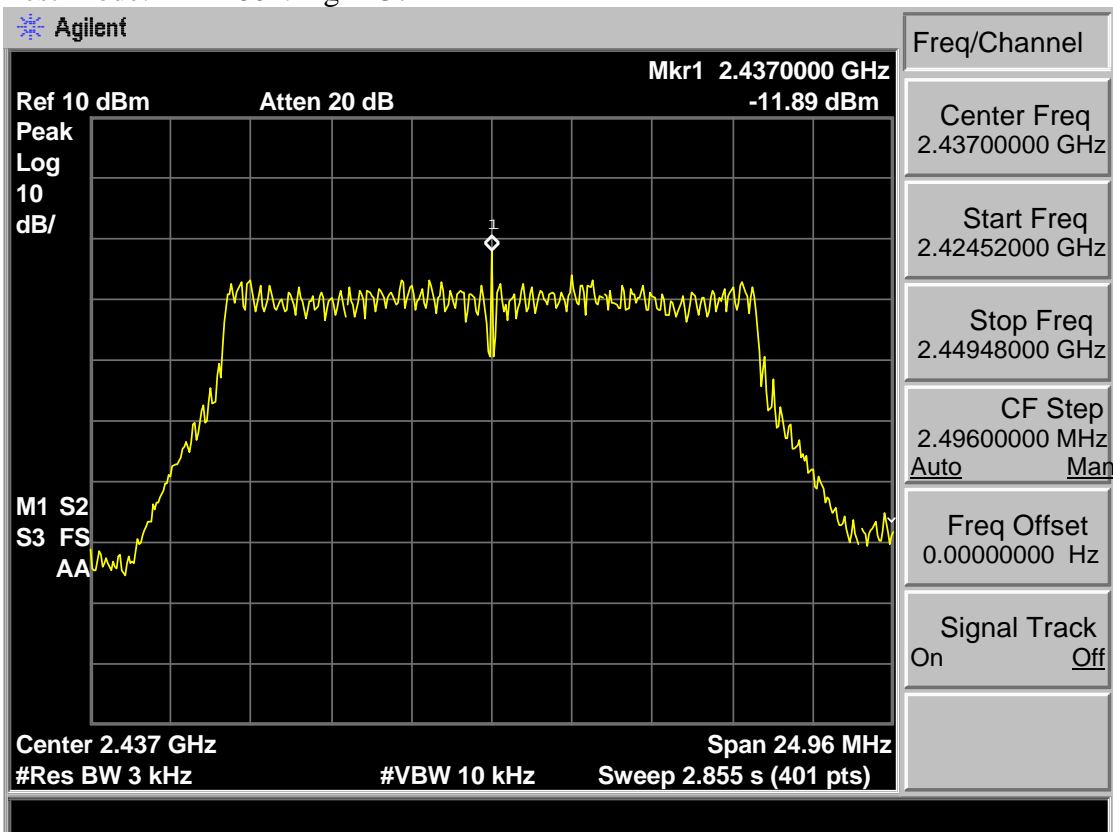
Test Mode: IEEE 802.11b 2462MHz



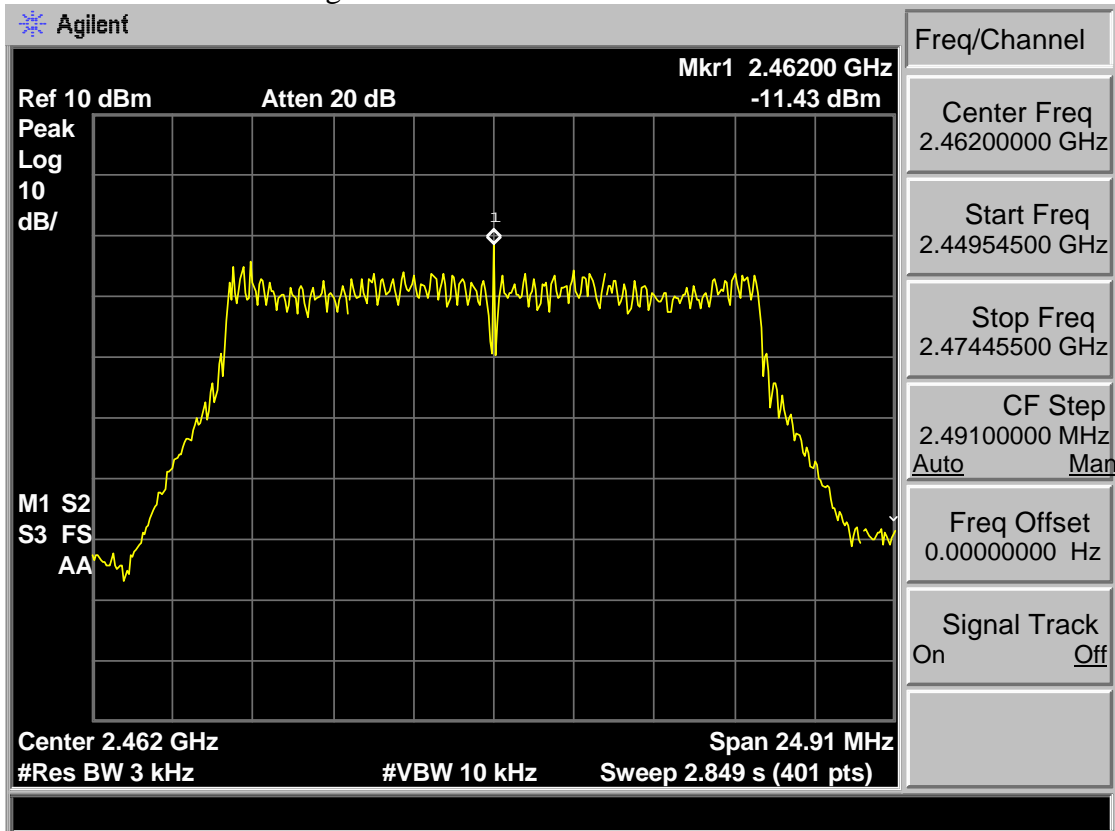
Test Mode: IEEE 802.11g 2412MHz



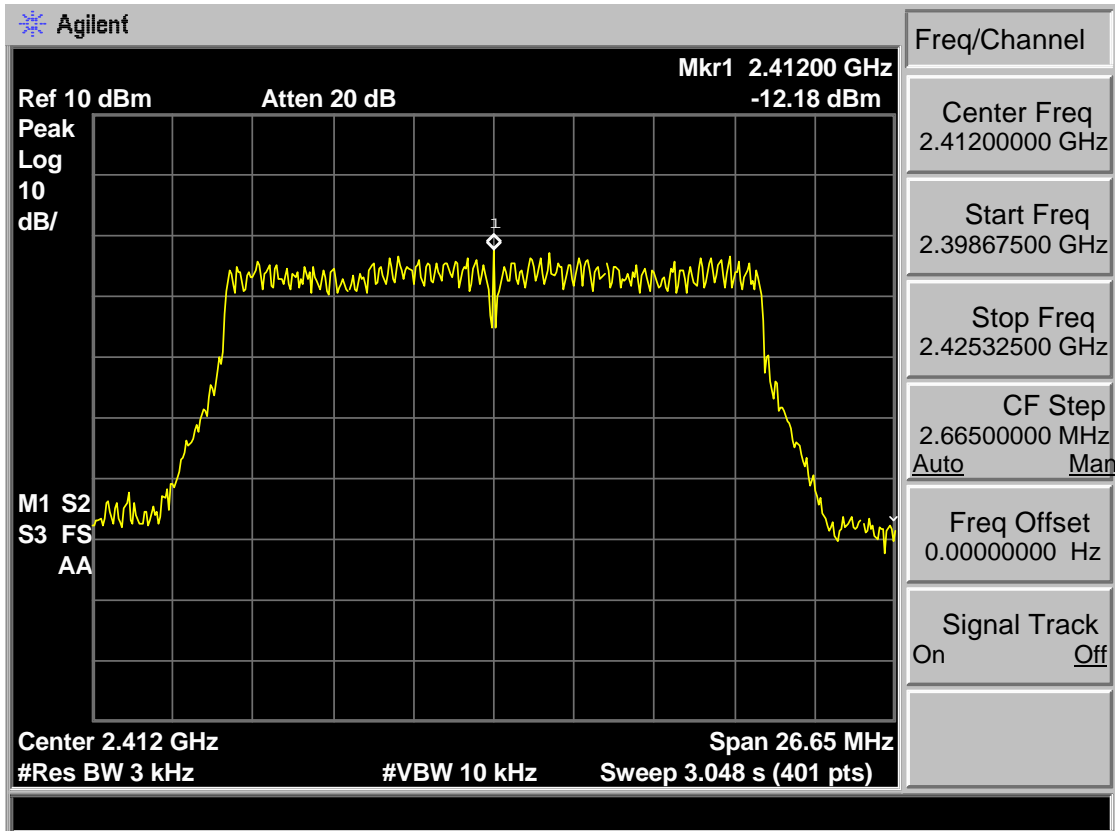
Test Mode: IEEE 802.11g 2437MHz



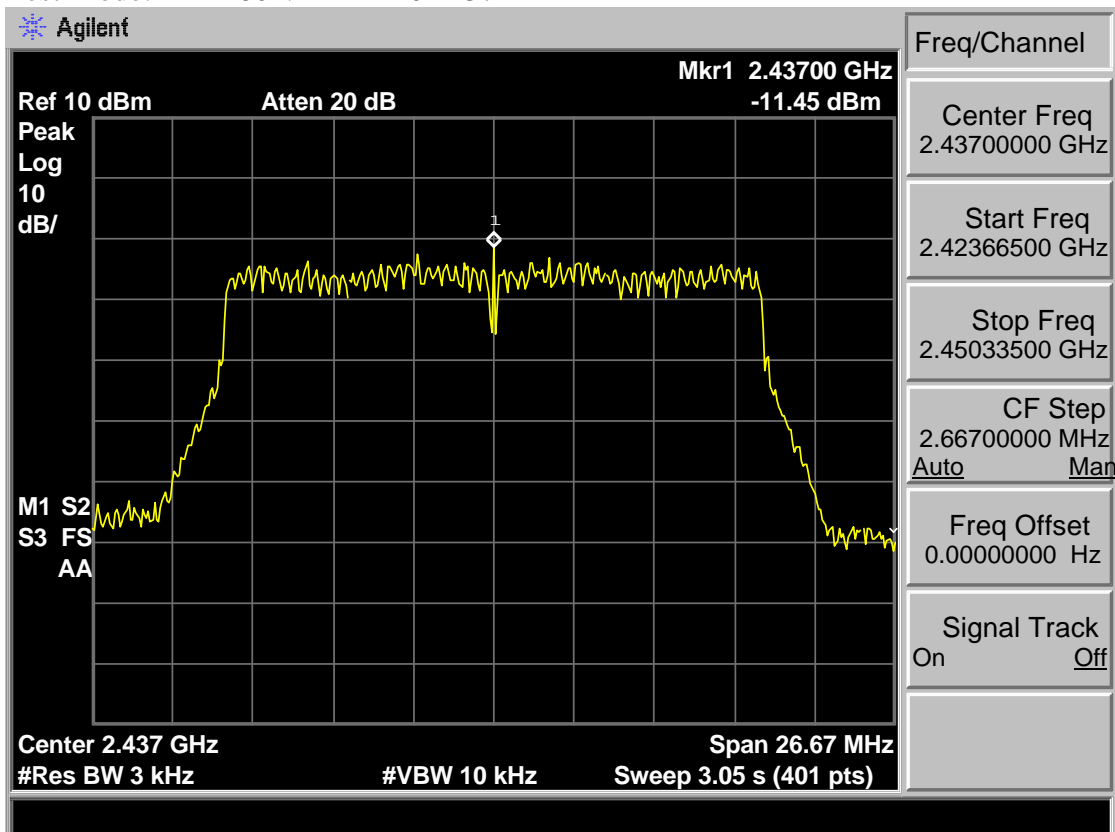
Test Mode: IEEE 802.11g 2462MHz



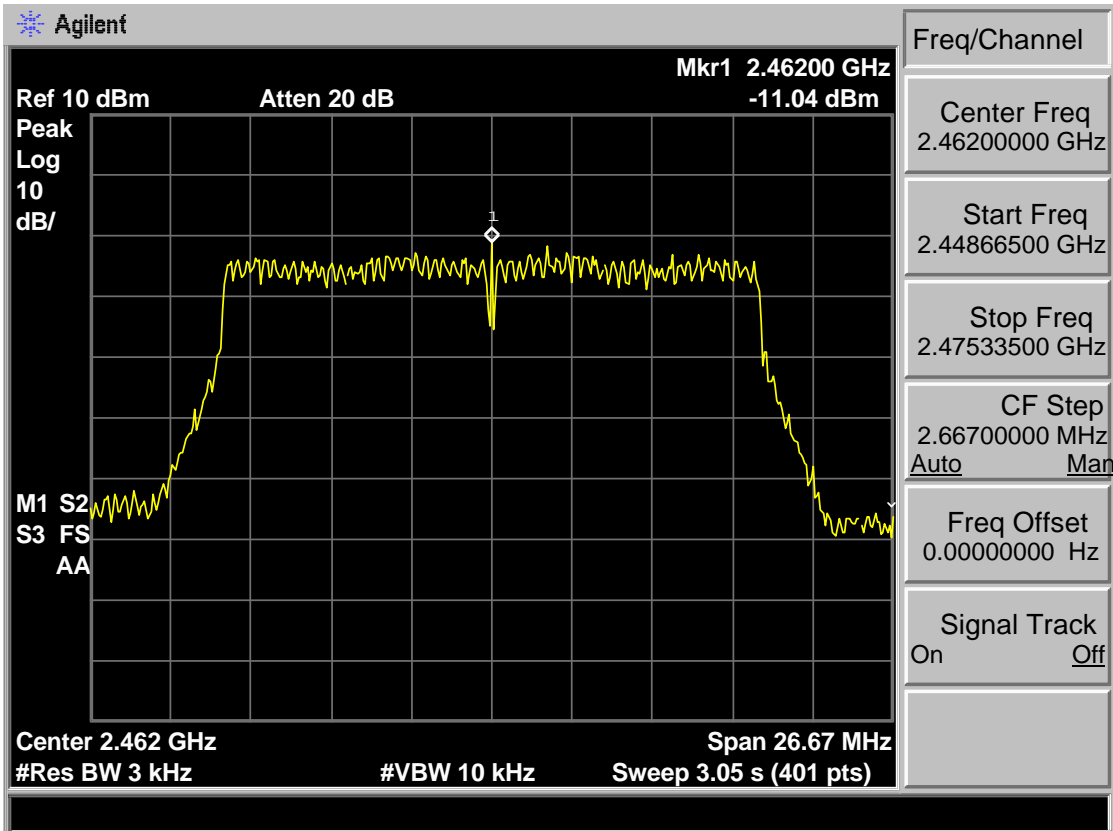
Test Mode: IEEE 802.11n HT20 2412MHz



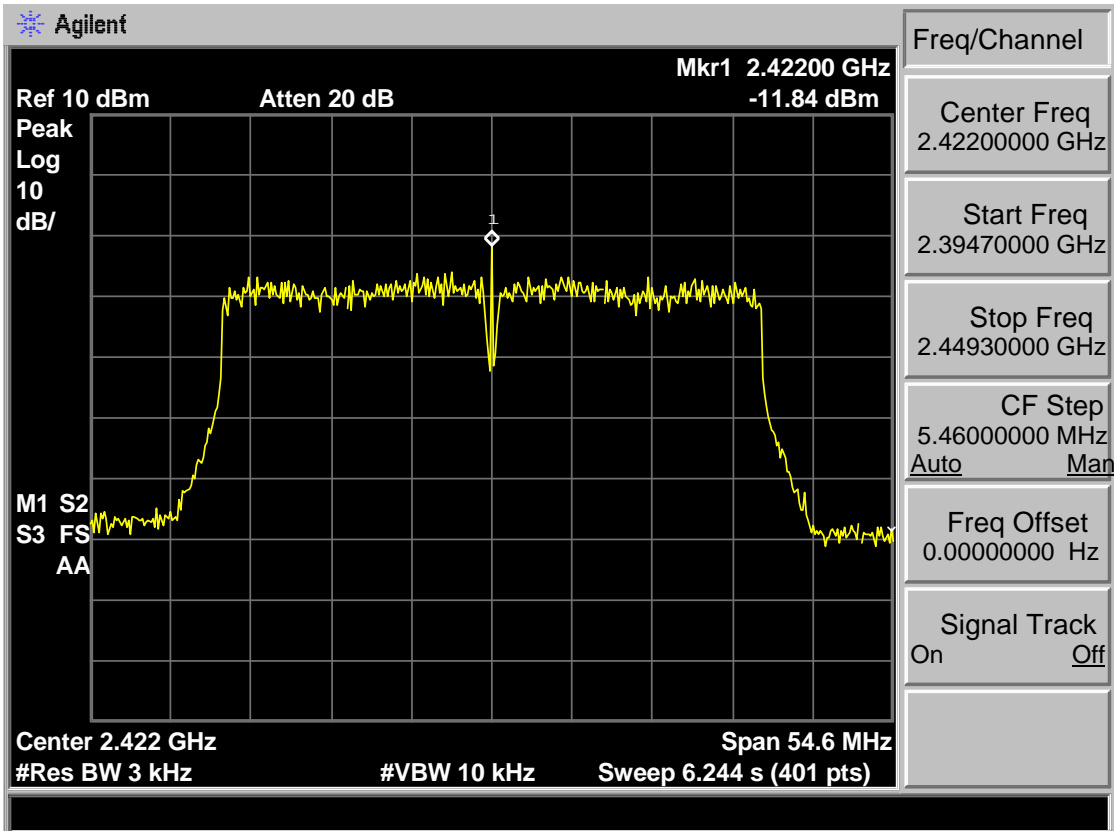
Test Mode: IEEE 802.11n HT20 2437MHz



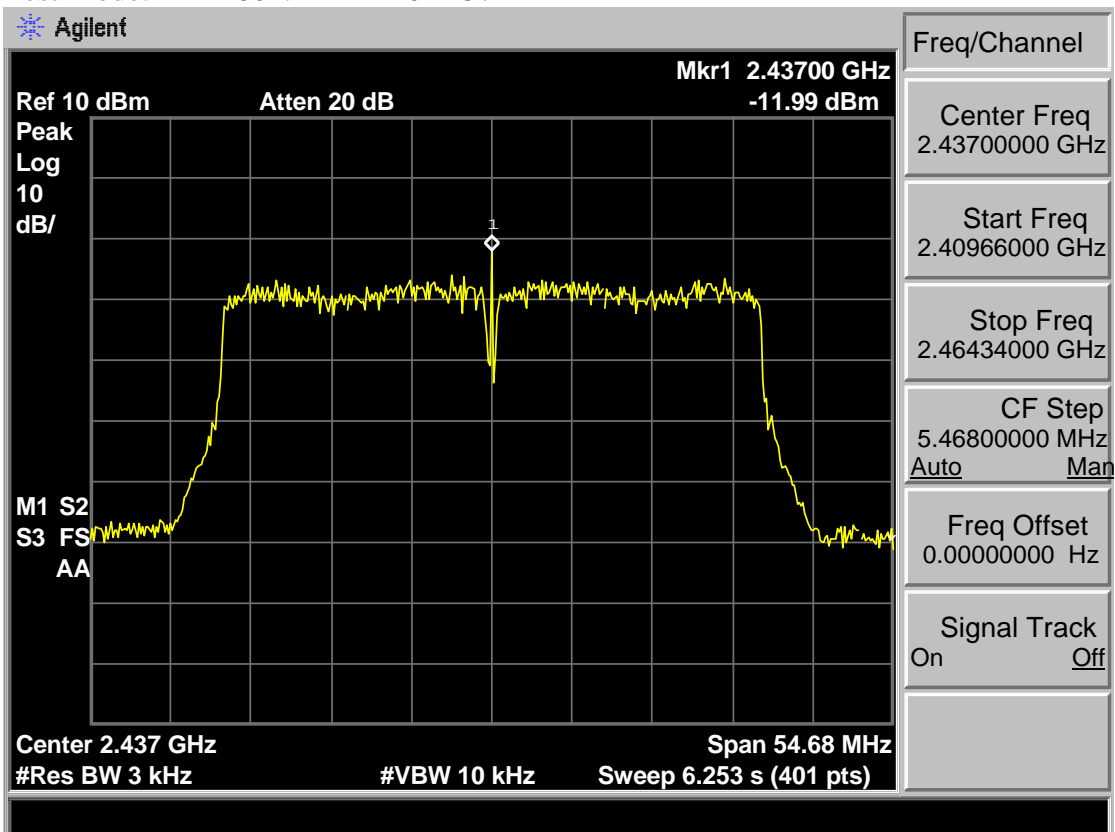
Test Mode: IEEE 802.11n HT20 2462MHz



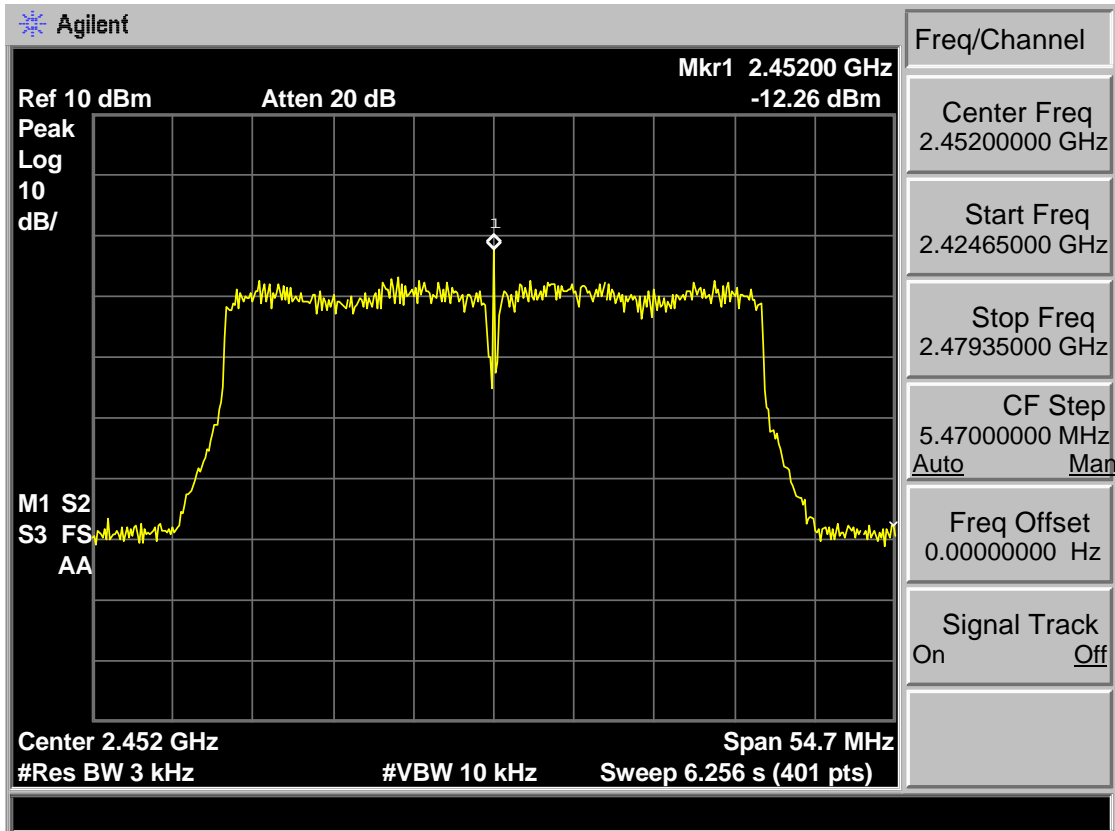
Test Mode: IEEE 802.11n HT40 2422MHz



Test Mode: IEEE 802.11n HT40 2437MHz



Test Mode: IEEE 802.11n HT40 2452MHz



9 ANTENNA REQUIREMENTS

9.1 Limit

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

9.2 Result

The antennas used for this product are Integrated PCB antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only -1.16 dBi in 2.4G band and 4.67dBi in 5G Band.