

TEST REPORT

of

FCC Part 15 Subpart E §15.407

FCC ID : A3LEICN10

Equipment Under Test : IP Camera
Model Name : EI-CN10
Serial No. : N/A
Applicant : SAMSUNG ELECTRONICS CO., LTD.
Manufacturer : SAMSUNG ELECTRONICS CO., LTD.
Date of Test(s) : 2013.05.30 ~ 2013.07.05
Date of Issue : 2013.07.08

In the configuration tested, the EUT complied with the standards specified above.

Tested By:



Date

2013.07.08

Harim Lee

Approved By:



Date

2013.07.08

Feel Jeong

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1. General information

1.1 Testing laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

- Wireless Div. 3FL, 18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea 435-040

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1.2 Details of applicant

Applicant : SAMSUNG ELECTRONICS CO., LTD.

Address : 19-29, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 443-742 Rep. of Korea

Contact Person : Park, Min-Ho

Phone No. : +82 10 7145 7838

1.3. Description of EUT

Kind of Product	IP Camera
Model Name	EI-CN10
Serial Number	N/A
Power Supply	DC 5.0 V
Frequency Range	2 402 MHz ~ 2 480 MHz (BT), 2 412 MHz ~ 2 462 MHz (11b/g/n_HT20), 5 745 MHz ~ 5 825 MHz (11a/n_HT20), 5 755 MHz ~ 5 795 MHz (11n_HT40), 5 180 MHz ~ 5 240 MHz (11a/n_HT20 – Non DFS), 5 190 MHz ~ 5 230 MHz (11n_HT40 – Non DFS), 5 260 MHz ~ 5 320 MHz (11a/n_HT20 – DFS), 5 270 MHz ~ 5 310 MHz (11n_HT40 – DFS), 5 500 MHz ~ 5 700 MHz (11a/n_HT20 – DFS), 5 510 MHz ~ 5 670 MHz (11n_HT40 – DFS)
Modulation Technique	GFSK, π /4DQPSK, 8DPSK, DSSS, OFDM
Number of Channels	11 channel (11b/g/n_HT20), 5 channel (11a/n_HT20), 2 channel (11n_HT40), 4 channel (11a/n_HT20-Non DFS), 2 channel (11n_HT40-Non DFS), 15 channel (11a/n_HT20-DFS), 7 channel (11n_HT40-DFS), 79 channel (BT)
Antenna Type	Internal type(SISO)
Antenna Gain	2 402 MHz ~ 2 480 MHz, 2 412 MHz ~ 2 462 MHz: 0.35 dB i, 5 180 MHz ~ 5 320 MHz: -0.35 dB i, 5 500 MHz ~ 5 700 MHz: -0.14 dB i, 5 745 MHz ~ 5 825 MHz: 0.87 dB i

1.4. Declaration by the manufacturer

- EUT is SLAVE without DFS and TPC.

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1.5. Test equipment list

Equipment	Manufacturer	Model	S/N	Cal Date	Cal Interval	Cal Due.
Signal Generator	R&S	SMR40	100272	Aug. 23, 2012	Annual	Aug. 23, 2013
Spectrum Analyzer	R&S	FSV30	100768	Mar. 28, 2013	Annual	Mar. 28, 2014
Spectrum Analyzer	Agilent	N9030A	US51350132	Oct. 30, 2012	Annual	Oct. 30, 2013
Attenuator	AEROFLEX	89-20-12	408	May 28, 2013	Annual	May 28, 2014
Tunable Notch Filter	Wainwright	WRCJV5100/5850-20/50-8SSK	4	Jul. 12, 2012	Annual	Jul. 12, 2013
High Pass Filter	Wainwright	WHK7.5/26.5G-6SS	11	Jun. 08, 2013	Annual	Jun. 08, 2014
Low Pass Filter	Mini circuits	NLP-1200+	V8979400903-2	Mar. 30, 2013	Annual	Mar. 30, 2014
Power meter	Anritsu	ML2495A	1223004	Jun. 13, 2013	Annual	Jun. 13, 2014
Power Sensor	Anritsu	MA2411B	1207272	Jun. 13, 2013	Annual	Jun. 13, 2014
DC Power Supply	Agilent	U8002A	MY50060028	Mar. 28, 2013	Annual	Mar. 28, 2014
Preamplifier	H.P.	8447F	2944A03909	Jun. 28, 2013	Annual	Jun. 28, 2014
Preamplifier	R&S	SCU 18	10117	Jan. 14, 2013	Annual	Jan. 14, 2014
Preamplifier	MITEQ Inc.	JS44-18004000-35-8P	1546891	Jun. 13, 2013	Annual	Jun. 13, 2014
Test Receiver	R&S	ESU26	100109	Feb. 28, 2013	Annual	Feb. 28, 2014
Bilog Antenna	SCHWARZBECK MESSELEKTRONIK	VULB9163	390	Apr. 12, 2012	Biennial	Apr. 12, 2014
Horn Antenna	R&S	HF906	100326	Nov. 23, 2011	Biennial	Nov. 23, 2013
Horn Antenna	SCHWARZBECK MESSELEKTRONIK	BBHA9170	BBHA9170431	May 15, 2012	Biennial	May 15, 2014
Antenna Master	INN-CO	MM4000	N/A	N.C.R.	N/A	N.C.R.
Turn Table	INN-CO	DS 1200S	N/A	N.C.R.	N/A	N.C.R.
Anechoic Chamber	SY Corporation	L × W × H (9.6 m × 6.4 m × 6.6 m)	N/A	N.C.R.	N/A	N.C.R.
EMI Test Receiver	R&S	ESHSI0	863365/018	Jun. 27, 2013	Annual	Jun. 27, 2014
Two-Line V-Network	R&S	ENV216	100190	Jan. 04, 2013	Annual	Jan. 04, 2014
Anechoic Chamber	SY Corporation	L × W × H (6.5 m × 3.5 m × 3.5 m)	N/A	N.C.R.	N/A	N.C.R.

► Support equipment

Description	Manufacturer	Model	Serial Number / FCC ID
N/A	-	-	-

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1.6. Summary of test result

The EUT has been tested according to the following specifications:

APPLIED STANDARD:FCC Part15 subpart E		
Section in FCC 15	Test Item	Result
15.205(a) 15.209(a) 15.407(b)(1) 15.407(b)(2) 15.407(b)(3)	Transmitter radiated spurious emissions and Conducted spurious emission	Complied
15.407(a)(1) 15.407(a)(2)	Output power	Complied
15.407(a)(1) 15.407(a)(2)	Peak power spectral density	Complied
15.407(a)(6)	Peak excursion	Complied
15.207	Transmitter AC power line Conducted emission	Complied

1.7. Test Procedure(s)

The measurement procedures described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (ANSI C63.4-2003) and the guidance provided in KDB 789033 were used in the measurement of the DUT.

1.8. Sample calculation

Where relevant, the following sample calculation is provided:

1.8.1. Conducted test

offset value (dB) = Attenuator (dB) + Cable loss (dB)

1.8.2. Radiation test

Field strength level (dB μ V/m) = Measured level (dB μ V) + Antenna factor (dB) + Cable loss (dB) - amplifier (dB)

1.9. Test report revision

Revision	Report number	Description
0	F690501/RF-RTL006728	Initial

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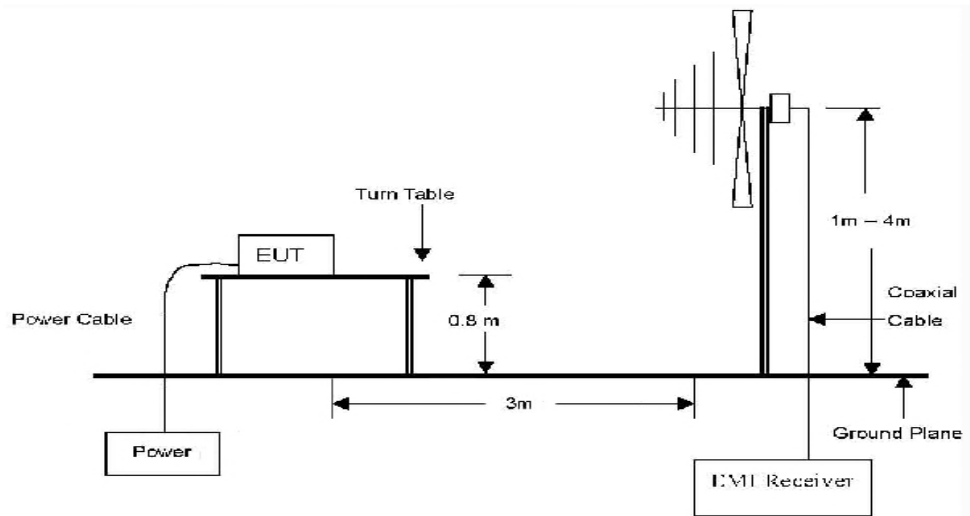
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2. Transmitter radiated spurious emissions and conducted spurious emission

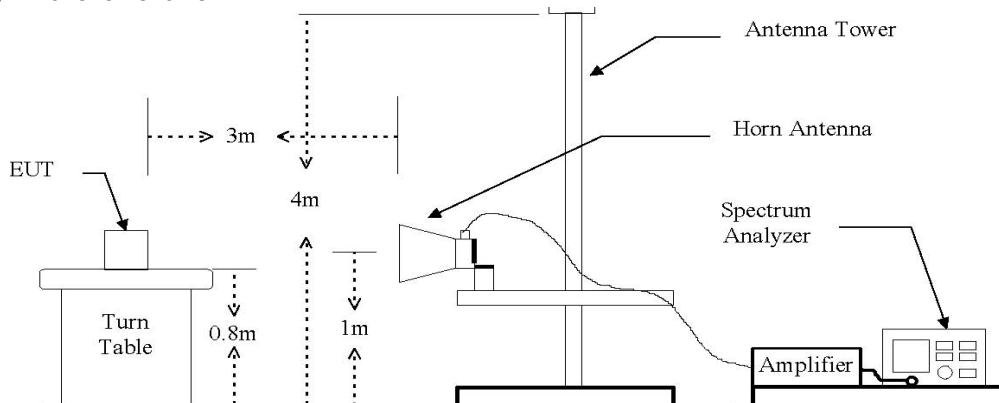
2.1. Test setup

2.1.1. Transmitter radiated spurious emissions

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission. The spurious emissions were investigated from 1 GHz to the 10th harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.



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2.1.2. Conducted spurious emissions



2.2. Limit

15.407(b)(1) For transmitters operating in the 5.15 ~ 5.25 GHz band: all emissions outside of the 5.15 ~ 5.35 GHz band shall not exceed an EIRP of -27 m/MHz.

15.407(b)(2) For transmitters operating in the 5.25 ~ 5.35 GHz band: all emissions outside of the 5.15 ~ 5.35 GHz band shall not exceed an EIRP of -27 dB m/MHz. Devices operating in the 5.25 ~ 5.35 GHz band that generate emissions in the 5.15 ~ 5.25 GHz band must meet all applicable technical requirements for operation in the 5.15 ~ 5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dB m/MHz in the 5.15 ~ 5.25 GHz band.

15.407(b)(3) For transmitters operating in the 5.47 ~ 5.725 GHz band: all emissions outside of the 5.47 ~ 5.725 GHz band shall not exceed an EIRP of -27 dB m/MHz.

According to § 15.209(a), Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

Frequency (MHz)	Distance (Meters)	Field Strength (dBμV/m)	Field Strength (μV/m)
30 - 88	3	40.0	100
88 – 216	3	43.5	150
216 – 960	3	46.0	200
Above 960	3	54.0	500

2.3. Test procedures

Conducted and Radiated emissions from the EUT were measured according to the dictates in section H of KDB 789033.

All data rates and modes were investigated for conducted spurious emissions. The emissions of the configuration that produced the worst case emissions are reported in this section.

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2.3.1. Test procedures for radiated spurious emissions

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
2. During performing radiated emission below 1 GHz, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1 GHz, the EUT was set 3 meter away from the interference-receiving antenna.
3. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE;

- The measurements for below 1 GHz

Compliance shall be demonstrated using CISPR quasi-peak detection; however, peak detection is permitted as an alternative to quasi-peak detection.

- The measurements for above 1 GHz

Peak emission levels are measured by setting the analyzer as follows:

Set to RBW = 1 MHz, VBW ≥ 3 MHz, Detector = Peak, Sweep time = auto, Trace mode= Max hold.

Average emission levels are measured by setting the analyzer as follows:

Set to RBW = 1 MHz, VBW ≥ 3 MHz, Detector = RMS, Averaging type = power(i.e., RMS), Sweep time = auto, Trace mode= trace average of at least 100 traces. If the transmission is not continuous, the number of traces shall be increased by a factor of 1/x, where x is the duty cycle.

If duty cycle < 98 percent, a correction factor shall be added to the measurement results.

- Power averaging(RMS) mode was used above, the correction factor is $10 \log(1/x)$, where x is the duty cycle.

To get a maximum emission level from the EUT, the EUT is manipulated through three orthogonal planes.

2.3.2. Test procedures for conducted spurious emissions

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Peak emission levels are measured by setting the analyzer as follows: RBW = 1 MHz, VBW ≥ 3 MHz, Detector = Peak, Sweep time = auto, Trace hold = max hold.

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2.4. Test result

Ambient temperature : $(24 \pm 2) ^\circ\text{C}$
 Relative humidity : 49 % R.H.

2.4.1. Spurious radiated emission (Worst case configuration_11n_HT40 mode, MCS0)

The frequency spectrum from 30 MHz to 1 000 MHz was investigated. Emission levels are not reported much lower than the limits by over 30 dB. All reading values are peak values.

Radiated emissions			Ant	Correction factors		Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	Amp gain+CL (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
53.8	38.4	Peak	V	13.5	-26.6	25.3	40.0	14.7
59.4	38.0	Peak	V	12.9	-26.5	24.4	40.0	15.6
91.5	44.1	Peak	V	10.5	-26.2	28.4	43.5	15.1
264.0	39.2	Peak	H	12.6	-24.7	27.1	46.0	18.9
312.0	41.9	Peak	H	12.8	-24.6	30.1	46.0	15.9
Above 400.0	Not Detected	-	-	-	-	-	-	-

Remark:

1. All spurious emission at channels are almost the same below 1 GHz, So that the Middle channel was chose at representative in final test.
2. Actual = Reading + AF + AMP + CL

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2.4.2. Spurious radiated emission for above 1 GHz

802.11a (Non-DFS) _6 Mbps

A. Low Channel (5 180 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*5 150.00	15.55	Peak	H	33.43	11.17	-	60.15	74.00	13.85
*5 150.00	5.09	Average	H	33.43	11.17	0.32	50.01	54.00	3.99
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 360.04	35.83	Peak	H	37.58	-29.06	-	44.35	68.23	23.88
Above 10 400.00	Not Detected	-	-	-	-	-	-	-	-

B. Middle Channel (5 220 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 439.41	35.66	Peak	H	37.67	-29.99	-	43.34	68.23	24.89
Above 10 500.00	Not Detected	-	-	-	-	-	-	-	-

C. High Channel (5 240 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 480.71	35.84	Peak	H	37.61	-30.20	-	43.25	68.23	24.98
Above 10 500.00	Not Detected	-	-	-	-	-	-	-	-

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802.11a (DFS) _6 Mbps

A. Low Channel (5 260 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 520.24	35.35	Peak	H	37.52	-30.03	-	42.84	68.23	25.39
Above 10 600.00	Not Detected	-	-	-	-	-	-	-	-

B. Middle Channel (5 300 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*10 600.49	35.34	Peak	H	37.63	-28.95	-	44.02	74.00	29.98
*10 600.49	25.34	Average	H	37.63	-28.95	0.32	34.34	54.00	19.66
Above 10 700.00	Not Detected	-	-	-	-	-	-	-	-

C. High Channel (5 320 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*5 350.00	15.66	Peak	H	33.75	11.25	-	60.66	74.00	13.34
*5 350.00	4.40	Average	H	33.75	11.25	0.32	49.72	54.00	4.28
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*10 639.97	35.74	Peak	H	37.67	-29.38	-	44.03	74.00	29.97
*10 639.97	25.62	Average	H	37.67	-29.38	0.32	34.23	54.00	19.77
Above 10 700.00	Not Detected	-	-	-	-	-	-	-	-

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802.11a (DFS) _6 Mbps

A. Low Channel (5 500 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*5 460.00	15.02	Peak	H	34.29	11.75	-	61.06	74.00	12.94
*5 460.00	4.41	Average	H	34.29	11.75	0.32	50.77	54.00	3.23
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*11 000.26	36.75	Peak	H	38.09	-26.98	-	47.86	74.00	26.14
*11 000.26	25.90	Average	H	38.09	-26.98	0.32	37.33	54.00	16.67
Above 11 100.00	Not Detected	-	-	-	-	-	-	-	-

B. Middle Channel (5 580 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*11 160.12	35.55	Peak	H	37.94	-26.32	-	47.17	74.00	26.83
*11 160.12	25.36	Average	H	37.94	-26.32	0.32	37.30	54.00	16.70
Above 11 200.00	Not Detected	-	-	-	-	-	-	-	-

C. High Channel (5 700 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*11 400.05	37.08	Peak	H	37.92	-25.19	-	49.81	74.00	24.19
*11 400.05	28.42	Average	H	37.92	-25.19	0.32	41.47	54.00	12.53
Above 11 500.00	Not Detected	-	-	-	-	-	-	-	-

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802.11n_HT20 (Non-DFS) _MCS0

A. Low Channel (5 180 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*5 150.00	15.11	Peak	H	33.43	11.17	-	59.71	74.00	14.29
*5 150.00	4.73	Average	H	33.43	11.17	0.35	49.68	54.00	4.32
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 359.57	35.93	Peak	H	37.58	-29.06	-	44.45	68.23	23.78
Above 10 400.00	Not Detected	-	-	-	-	-	-	-	-

B. Middle Channel (5 220 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 440.02	35.56	Peak	H	37.67	-29.99	-	43.24	68.23	24.99
Above 10 500.00	Not Detected	-	-	-	-	-	-	-	-

C. High Channel (5 240 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 480.26	35.82	Peak	H	37.61	-30.20	-	43.23	68.23	25.00
Above 10 500.00	Not Detected	-	-	-	-	-	-	-	-

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802.11n_HT20 (DFS) _MCS0

A. Low Channel (5 260 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 519.94	35.73	Peak	H	37.52	-30.03	-	43.22	68.23	25.01
Above 10 600.00	Not Detected	-	-	-	-	-	-	-	-

B. Middle Channel (5 300 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*10 600.11	36.34	Peak	H	37.63	-28.94	-	45.03	74.00	28.97
*10 600.11	25.14	Average	H	37.63	-28.94	0.35	34.18	54.00	19.82
Above 10 700.00	Not Detected	-	-	-	-	-	-	-	-

C. High Channel (5 320 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*5 350.00	14.91	Peak	H	33.75	11.25	-	59.91	74.00	14.09
*5 350.00	4.39	Average	H	33.75	11.25	0.35	49.74	54.00	4.26
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*10 639.98	36.04	Peak	H	37.67	-29.38	-	44.33	74.00	29.67
*10 639.98	25.21	Average	H	37.67	-29.38	0.35	33.85	54.00	20.15
Above 10 700.00	Not Detected	-	-	-	-	-	-	-	-

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802.11n_HT20 (DFS) _MCS0

A. Low Channel (5 500 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*5 460.00	15.08	Peak	H	34.29	11.75	-	61.12	74.00	12.88
*5 460.00	4.33	Average	H	34.29	11.75	0.35	50.72	54.00	3.28
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*10 999.91	35.78	Peak	H	38.09	-27.08	-	46.79	74.00	27.21
*10 999.91	25.83	Average	H	38.09	-27.08	0.35	37.19	54.00	16.81
Above 11 100.00	Not Detected	-	-	-	-	-	-	-	-

B. Middle Channel (5 580 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*11 159.96	35.60	Peak	H	37.94	-26.32	-	47.22	74.00	26.78
*11 159.96	24.86	Average	H	37.94	-26.32	0.35	36.83	54.00	17.17
Above 11 200.00	Not Detected	-	-	-	-	-	-	-	-

C. High Channel (5 700 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*11 400.17	36.72	Peak	H	37.92	-25.19	-	49.45	74.00	24.56
*11 400.17	28.30	Average	H	37.92	-25.19	0.35	41.38	54.00	12.62
Above 11 400.00	Not Detected	-	-	-	-	-	-	-	-

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802.11n-HT40 (Non-DFS) _MCS0

A. Low Channel (5 190 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*5 150.00	15.67	Peak	H	33.43	11.17	-	60.27	74.00	13.73
*5 150.00	4.70	Average	H	33.43	11.17	0.60	49.90	54.00	4.10
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 379.93	34.62	Peak	H	37.54	-29.42	-	42.74	68.23	25.49
Above 10 400.00	Not Detected	-	-	-	-	-	-	-	-

B. Middle Channel (5 230 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 460.95	35.12	Peak	H	37.62	-30.09	-	42.65	68.23	25.58
Above 10 500.00	Not Detected	-	-	-	-	-	-	-	-

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802. 11n-HT40 (DFS)_MCS0

A. Low Channel (5 270 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 540.37	35.65	Peak	H	37.54	-29.76	-	43.43	68.23	24.80
Above 10 600.00	Not Detected	-	-	-	-		-	-	-

B. High Channel (5 310 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*5 350.00	15.46	Peak	H	33.75	11.25	-	60.46	74.00	13.54
*5 350.00	4.52	Average	H	33.75	11.25	0.60	50.12	54.00	3.88
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*10 620.44	35.33	Peak	H	37.71	-29.16	-	43.88	74.00	30.12
*10 620.44	24.54	Average	H	37.71	-29.16	0.60	33.69	54.00	20.31
Above 10 400.00	Not Detected	-	-	-	-		-	-	-

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802. 11n-HT40 (DFS)_MCS0

A. Low Channel (5 510 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*5 460.00	15.24	Peak	H	34.29	11.75	-	61.28	74.00	12.72
*5 460.00	4.31	Average	H	34.29	11.75	0.60	50.95	54.00	3.05
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*11 020.32	35.49	Peak	H	38.15	-26.91	-	46.73	74.00	27.27
*11 020.32	24.80	Average	H	38.15	-26.91	0.60	36.64	54.00	17.36
Above 11 100.00	Not Detected	-	-	-	-	-	-	-	-

B. Middle Channel (5 550 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*11 099.93	35.39	Peak	H	38.01	-26.59	-	46.81	74.00	27.19
*11 099.93	25.10	Average	H	38.01	-26.59	0.60	37.12	54.00	16.88
Above 11 200.00	Not Detected	-	-	-	-	-	-	-	-

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C. High Channel (5 670 MHz)

Radiated Emissions			Ant	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp +CL (dB)	Duty factor (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*11 340.12	37.02	Peak	H	38.11	-25.68	-	49.45	74.00	24.55
*11 340.12	27.19	Average	H	38.11	-25.68	0.60	40.22	54.00	13.78
Above 11 400.00	Not Detected	-	-	-	-	-	-	-	-

Remark:

1. "*" means the restricted band.
2. Radiated emissions measured in frequency above 1 000 MHz were made with an instrument using Peak / average detector mode if frequency was in restricted band. Otherwise the frequency was in outside of restricted band, only peak detector should be used.
3. Average test would be performed if the peak result was greater than the average limit and frequency was in the restricted band.
4. If frequency was outside of restricted band, the calculation method for peak limit is same as below:
 $68.23 \text{ dB}\mu\text{V/m} = \text{EIRP} - 20 \log(d) + 104.77 = -27 - 20 \log(3) + 104.77$
 *distance: 3 m, *EIRP: -27 dB m/MHz
5. Actual = Reading + AF + AMP + CL + Duty factor
6. Duty factor = $10 \cdot \log(1/x)$, x = duty cycle

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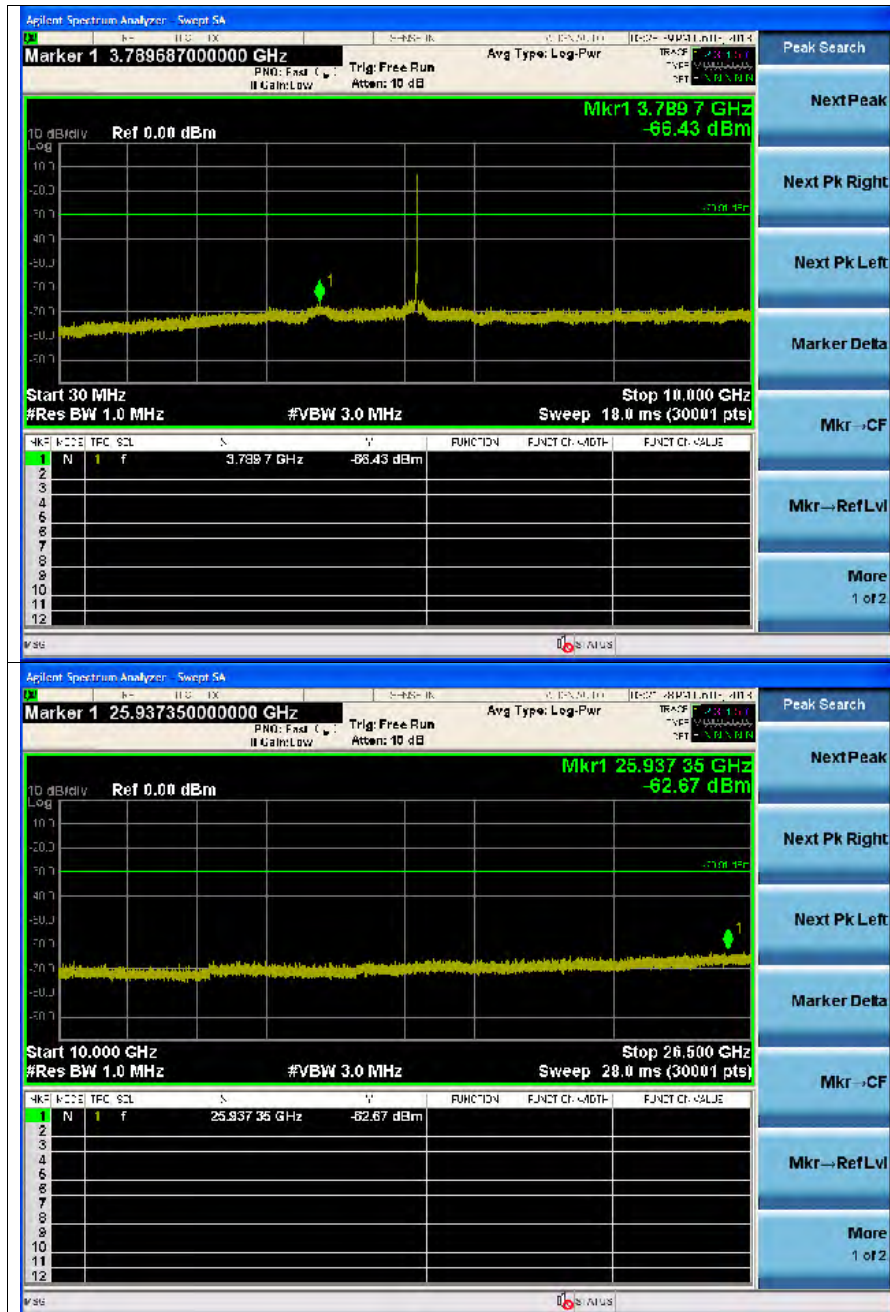
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2.4.3. Spurious RF Conducted Emissions: Plot of Spurious RF Conducted Emission

Antenna gain is -0.14 dB i, So the EIRP limit is -29.00 dB m/Hz

802.11a (Non-DFS)_6 Mbps

5 180 MHz

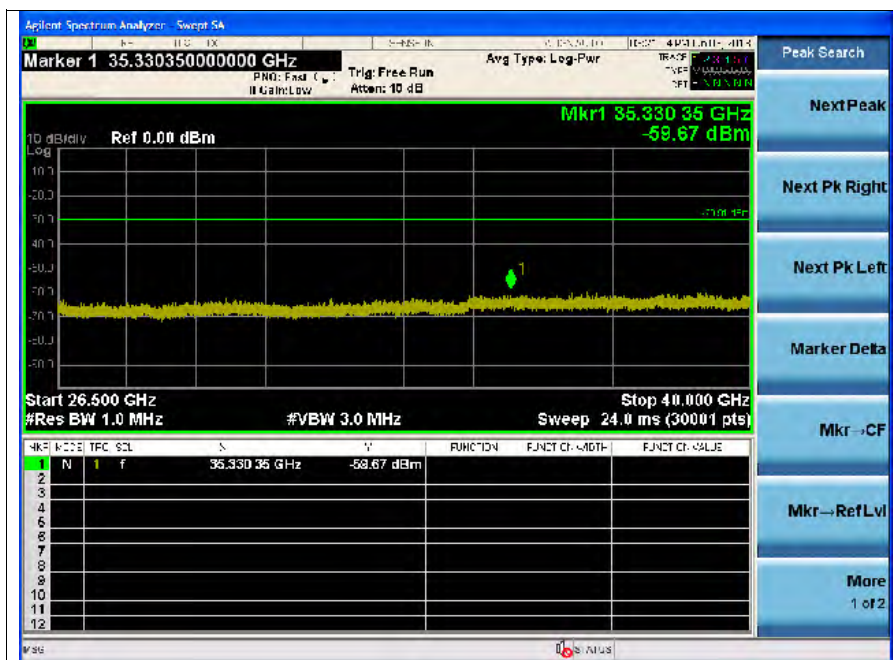


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Note:

Offset (dB) = Attenuator(dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 789.70	Noise floor	-	-
25 937.35	Noise floor	-	-
35 330.35	Noise floor	-	-

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5 220 MHz

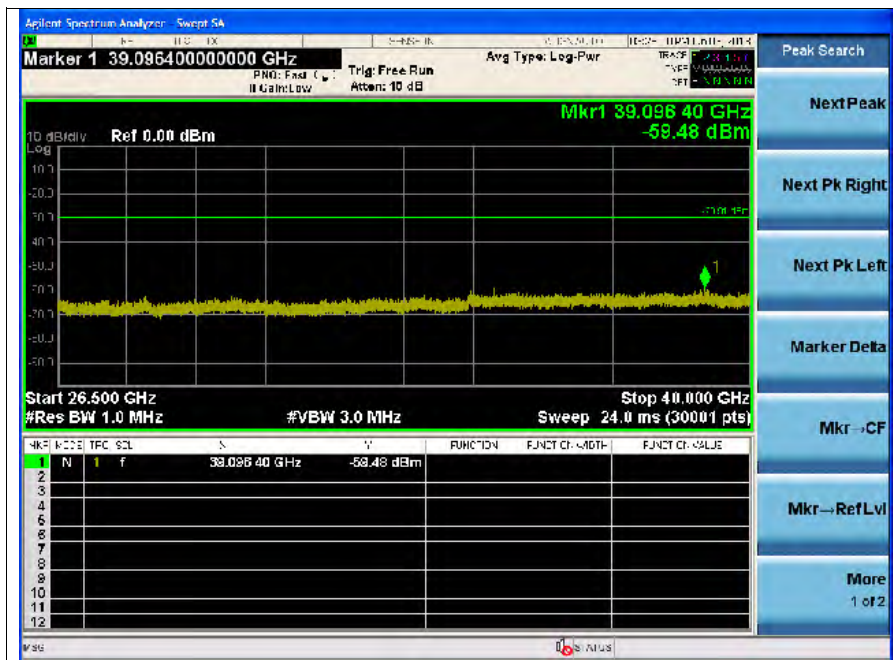


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Note:

Offset (dB) = Attenuator(dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 875.40	Noise floor	-	-
24 555.20	Noise floor	-	-
39 096.40	Noise floor	-	-

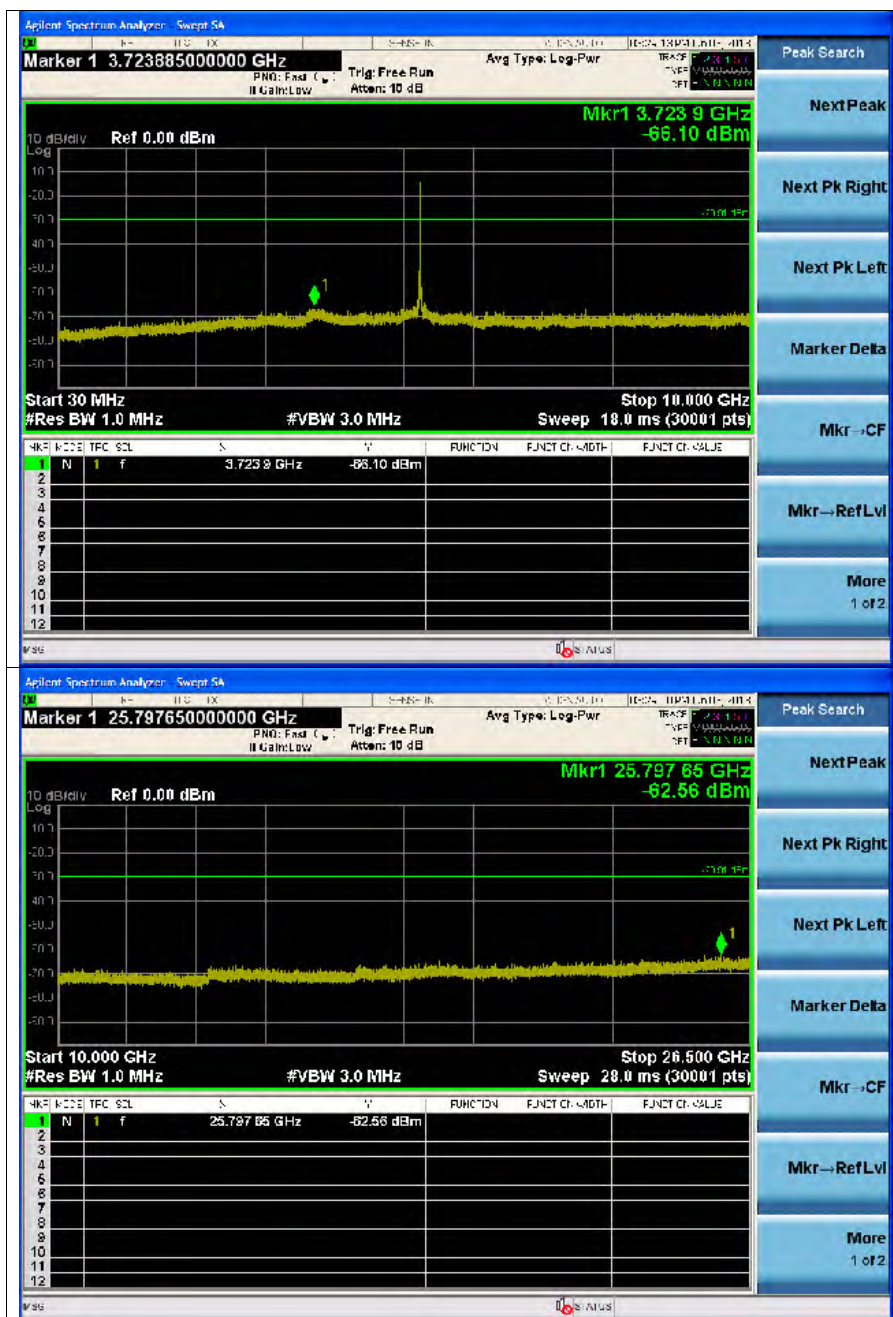
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5 240 MHz

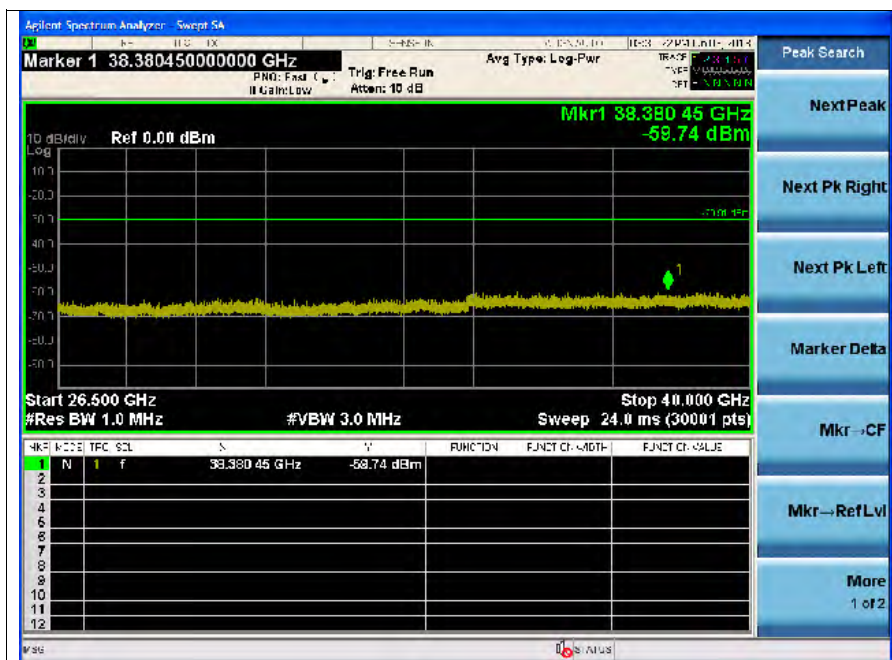


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Note:

Offset (dB) = Attenuator(dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 723.90	Noise floor	-	-
25 797.65	Noise floor	-	-
38 380.45	Noise floor	-	-

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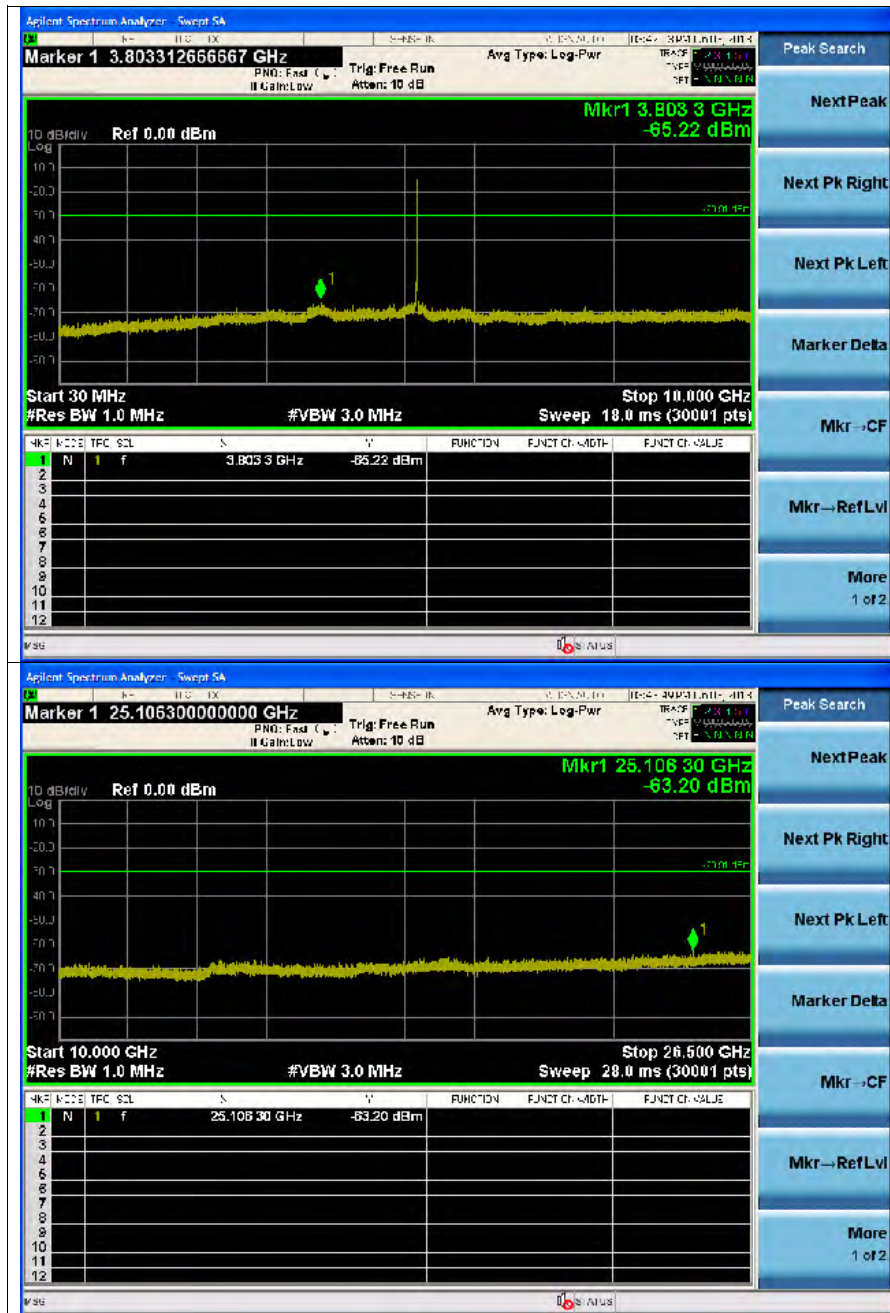
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802.11n-HT20 (Non-DFS)_MCS0

5 180 MHz

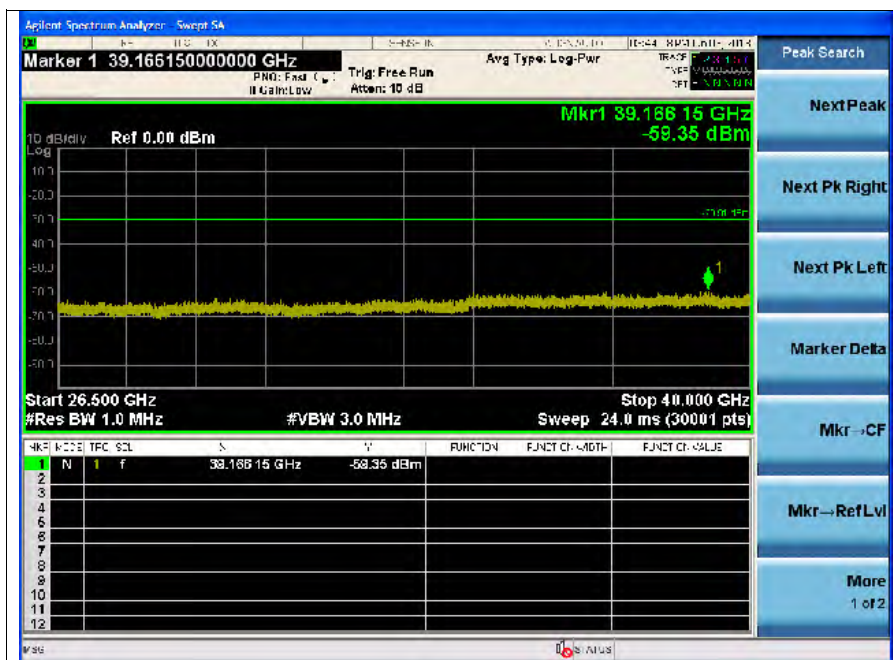


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Note:

Offset (dB) = Attenuator(dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 803.30	Noise floor	-	-
25 106.30	Noise floor	-	-
39 166.15	Noise floor	-	-

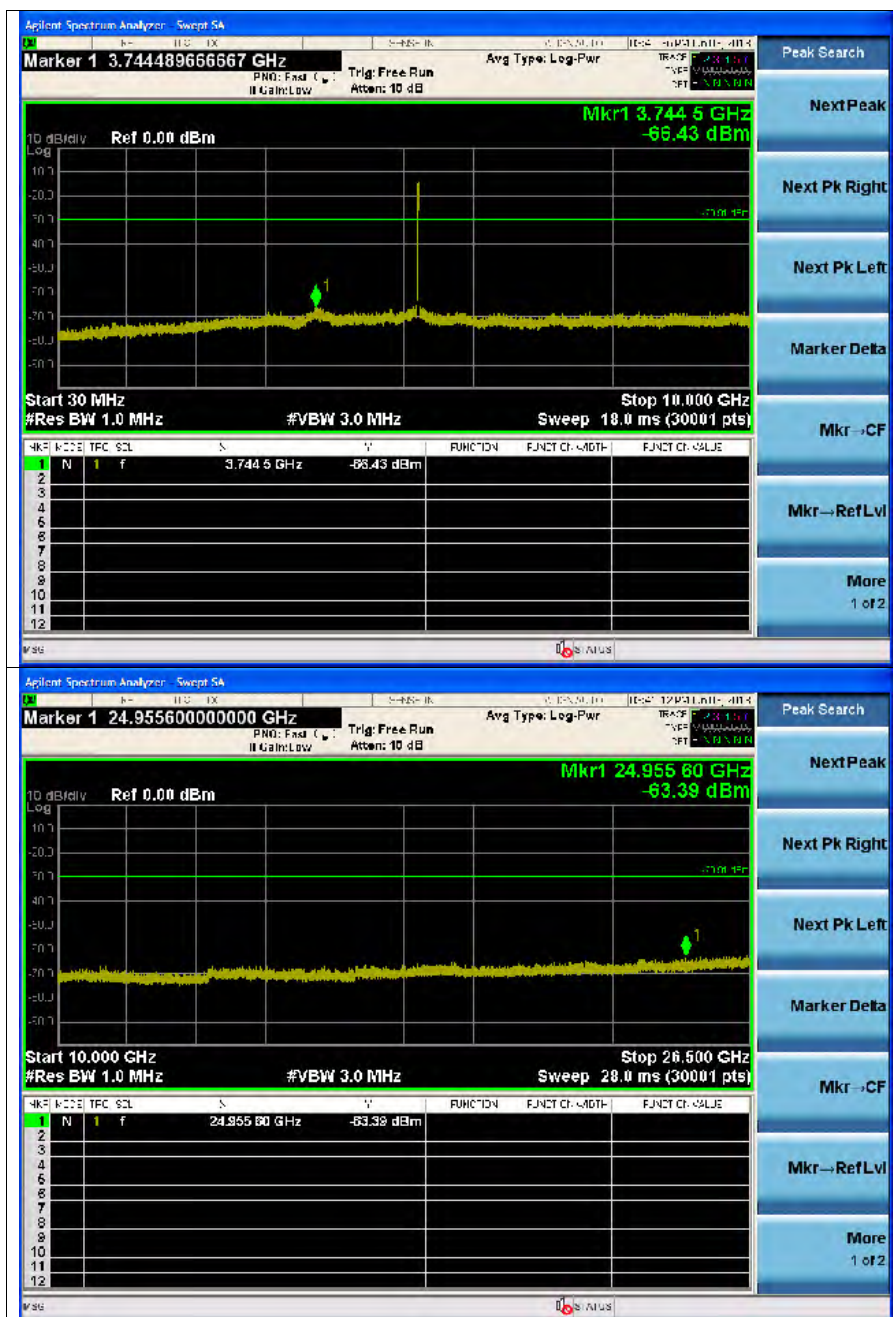
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5 220 MHz

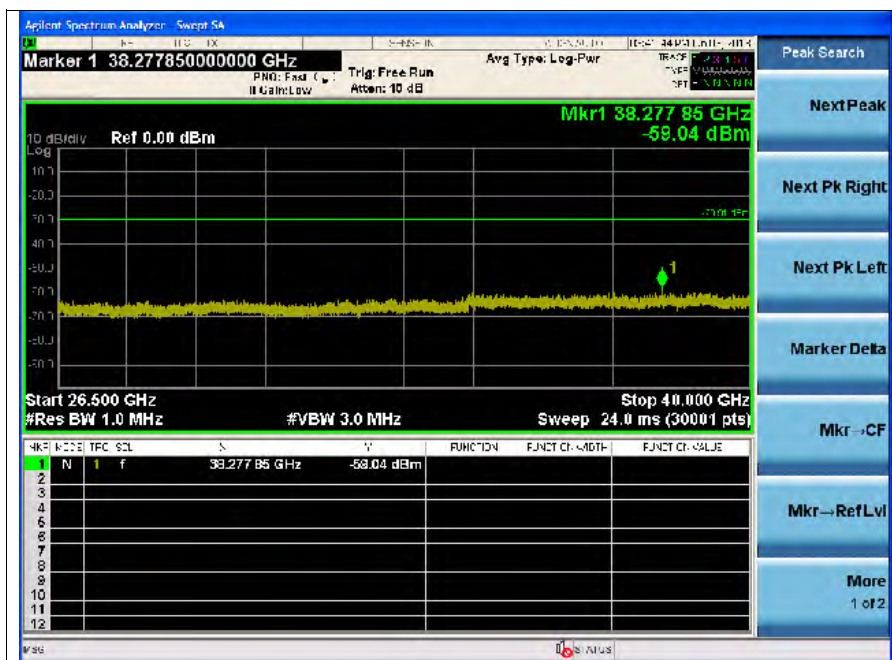


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Note:

Offset (dB) = Attenuator(dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 744.50	Noise floor	-	-
24 955.60	Noise floor	-	-
38 277.85	Noise floor	-	-

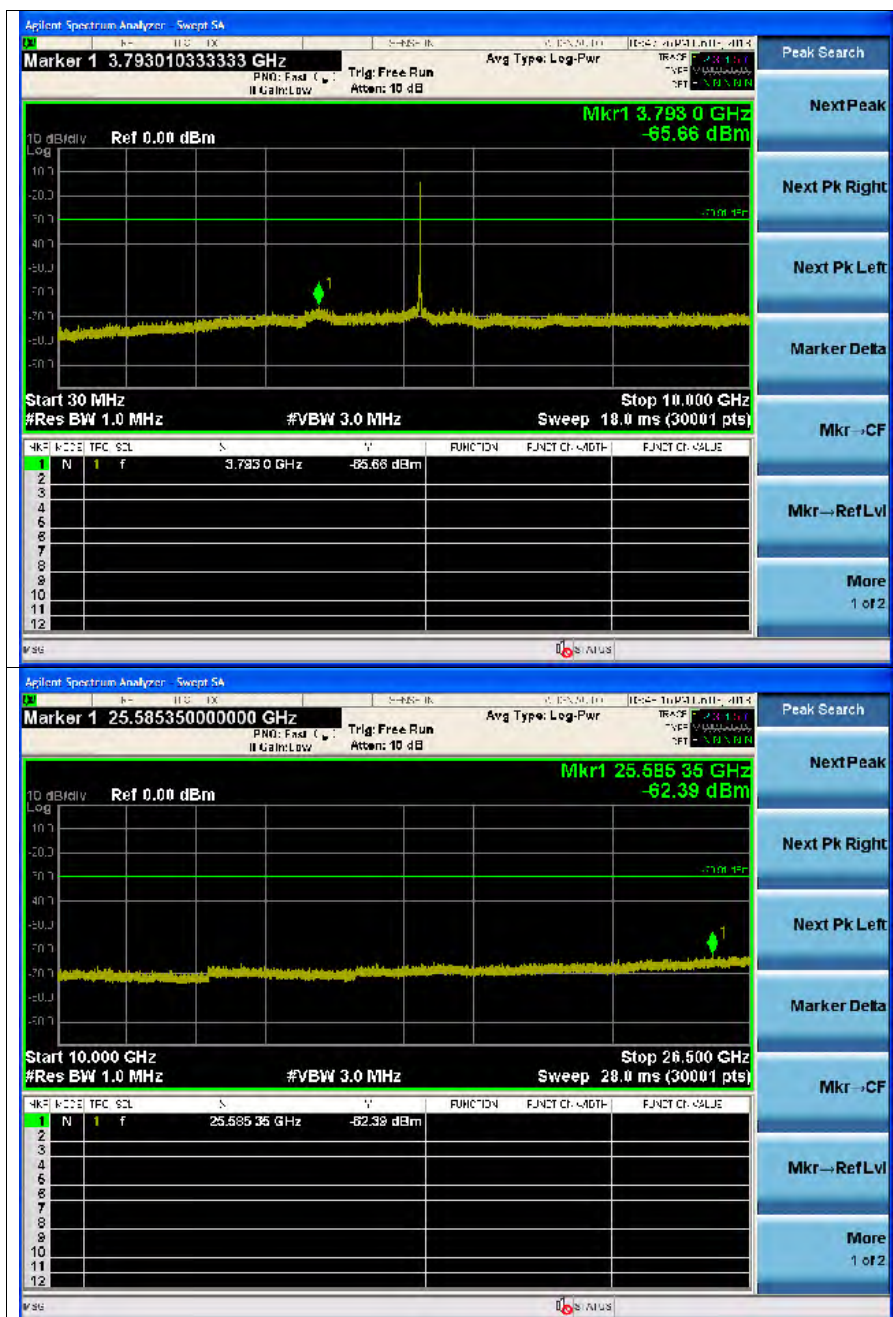
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5 240 MHz

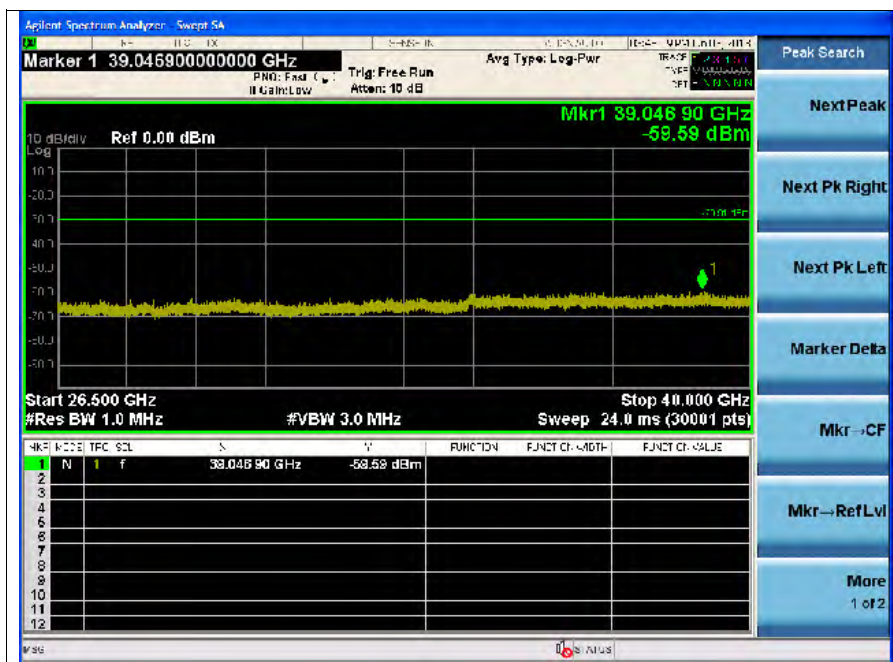


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Note:

Offset (dB) = Attenuator (dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 793.00	Noise floor	-	-
25 585.35	Noise floor	-	-
39 046.90	Noise floor	-	-

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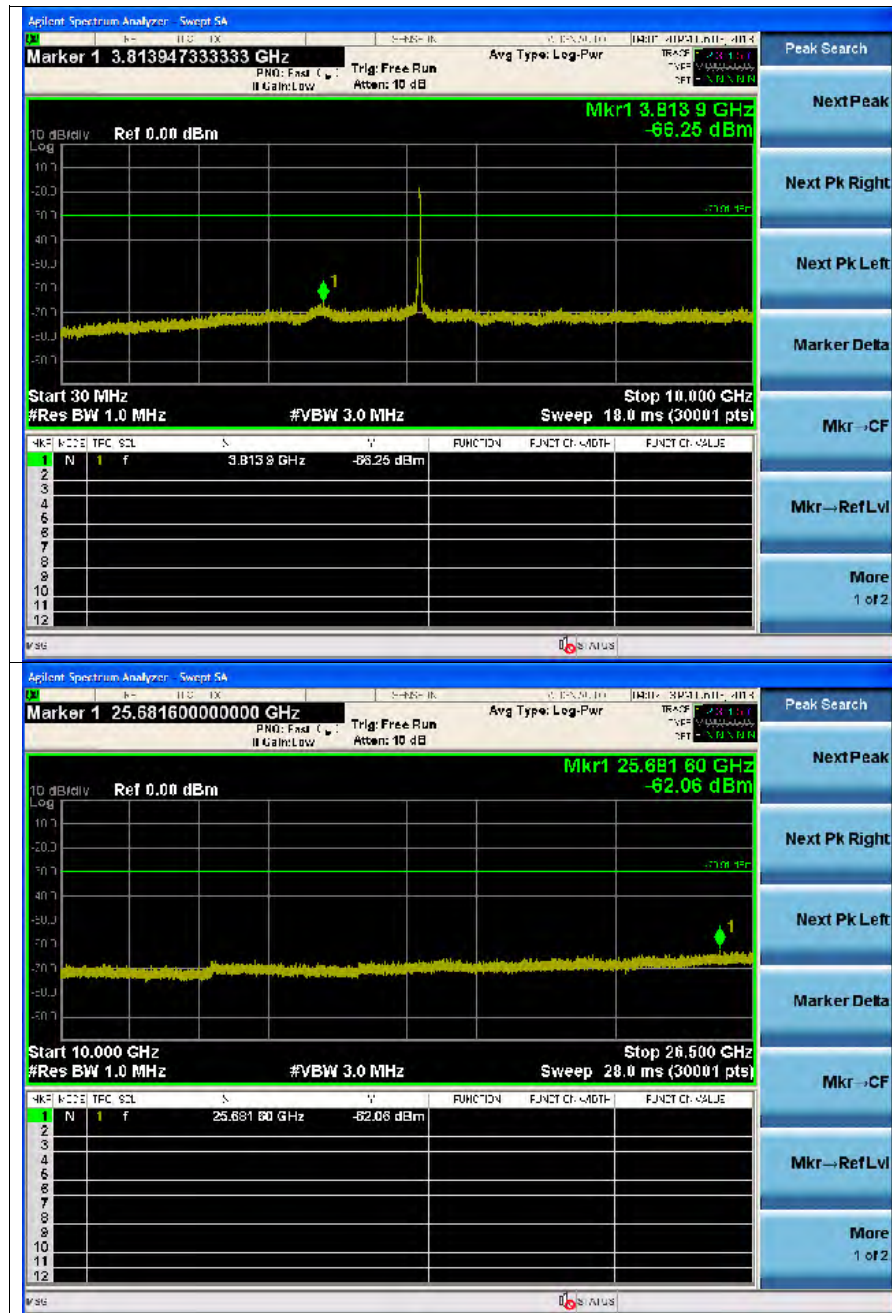
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802.11n-HT40 (Non-DFS)_MCS0

5 190 MHz

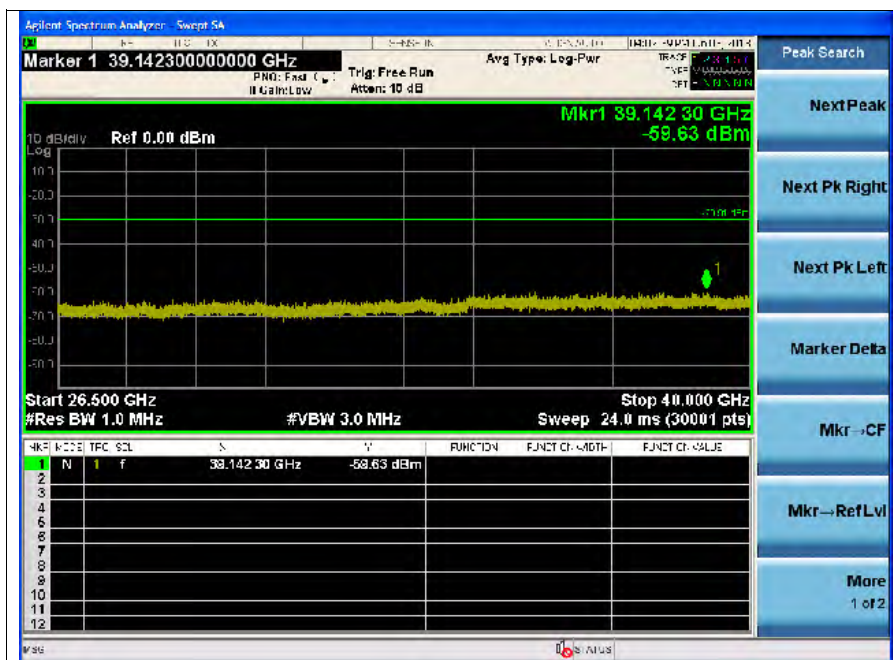


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Note:

Offset (dB) = Attenuator(dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 813.90	Noise floor	-	-
25 681.60	Noise floor	-	-
39 142.30	Noise floor	-	-

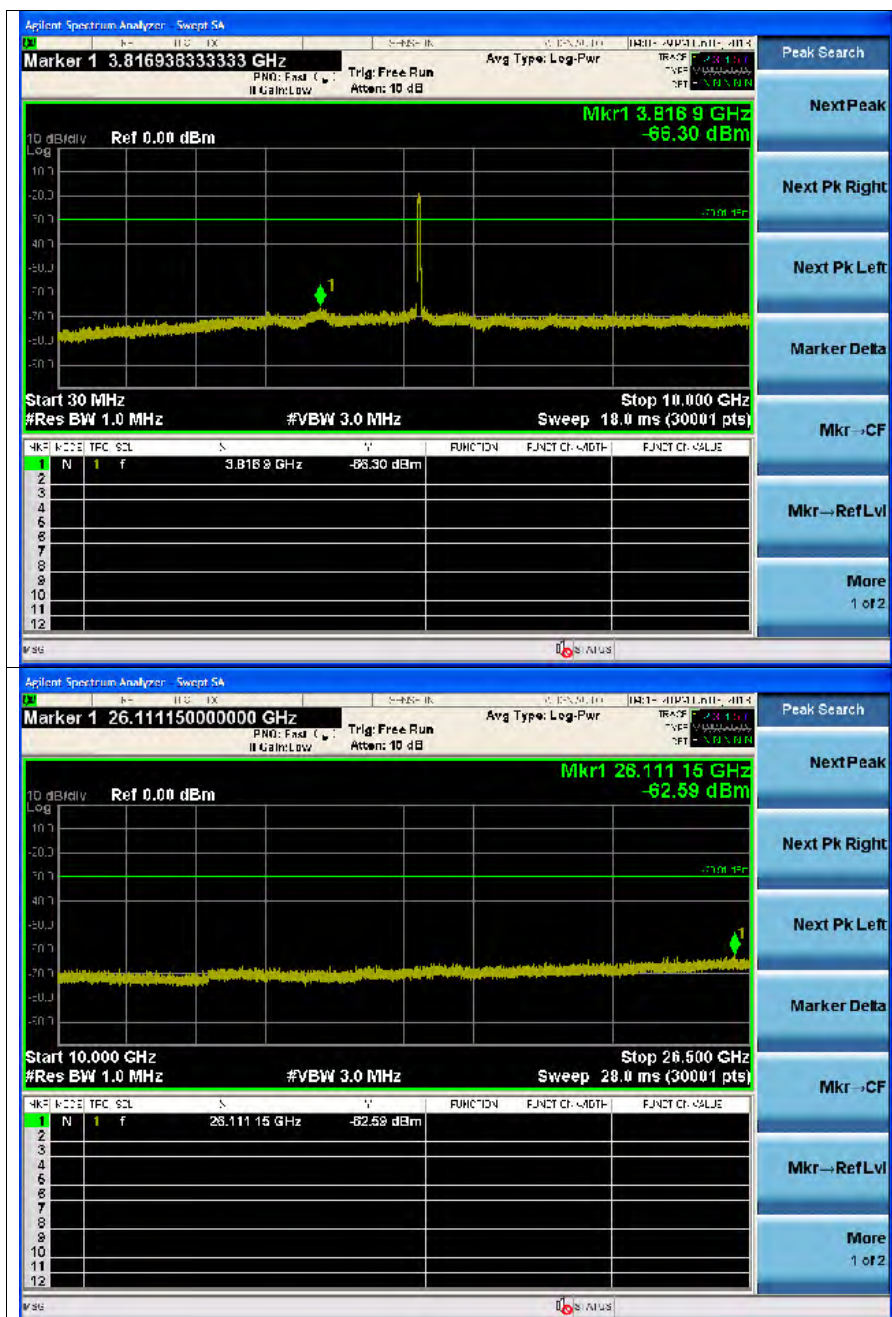
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5 230 MHz

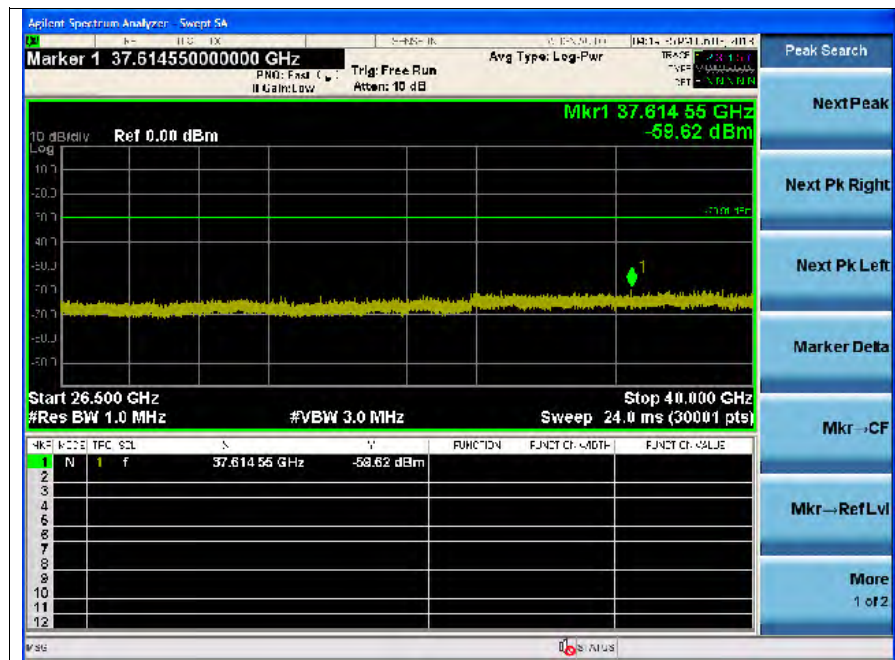


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Note:

Offset (dB) = Attenuator(dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 816.90	Noise floor	-	-
26 111.15	Noise floor	-	-
37 614.55	Noise floor	-	-

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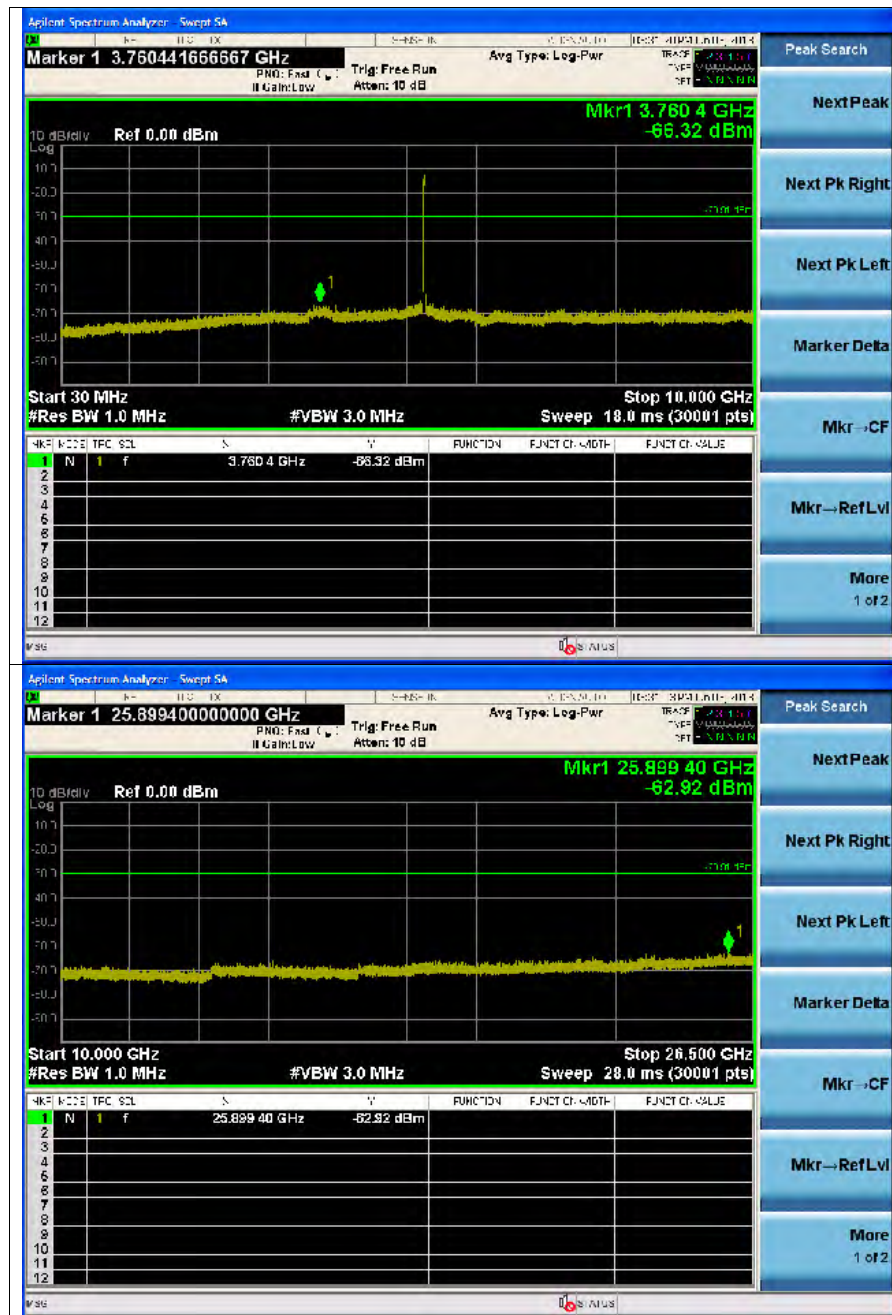
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802.11a (DFS)_6 Mbps

5 260 MHz

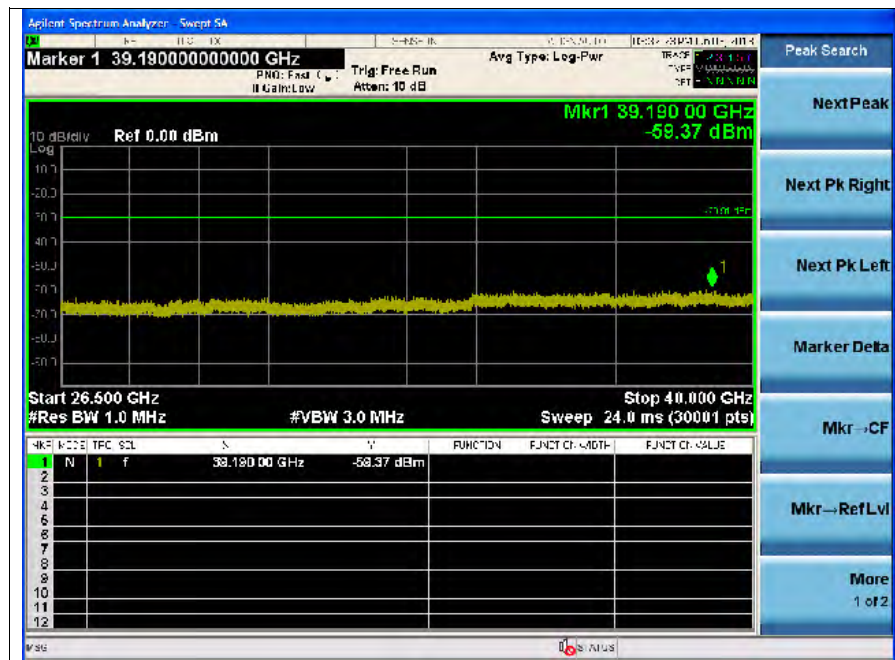


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Note:

Offset (dB) = Attenuator(dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 760.40	Noise floor	-	-
25 899.40	Noise floor	-	-
39 190.00	Noise floor	-	-

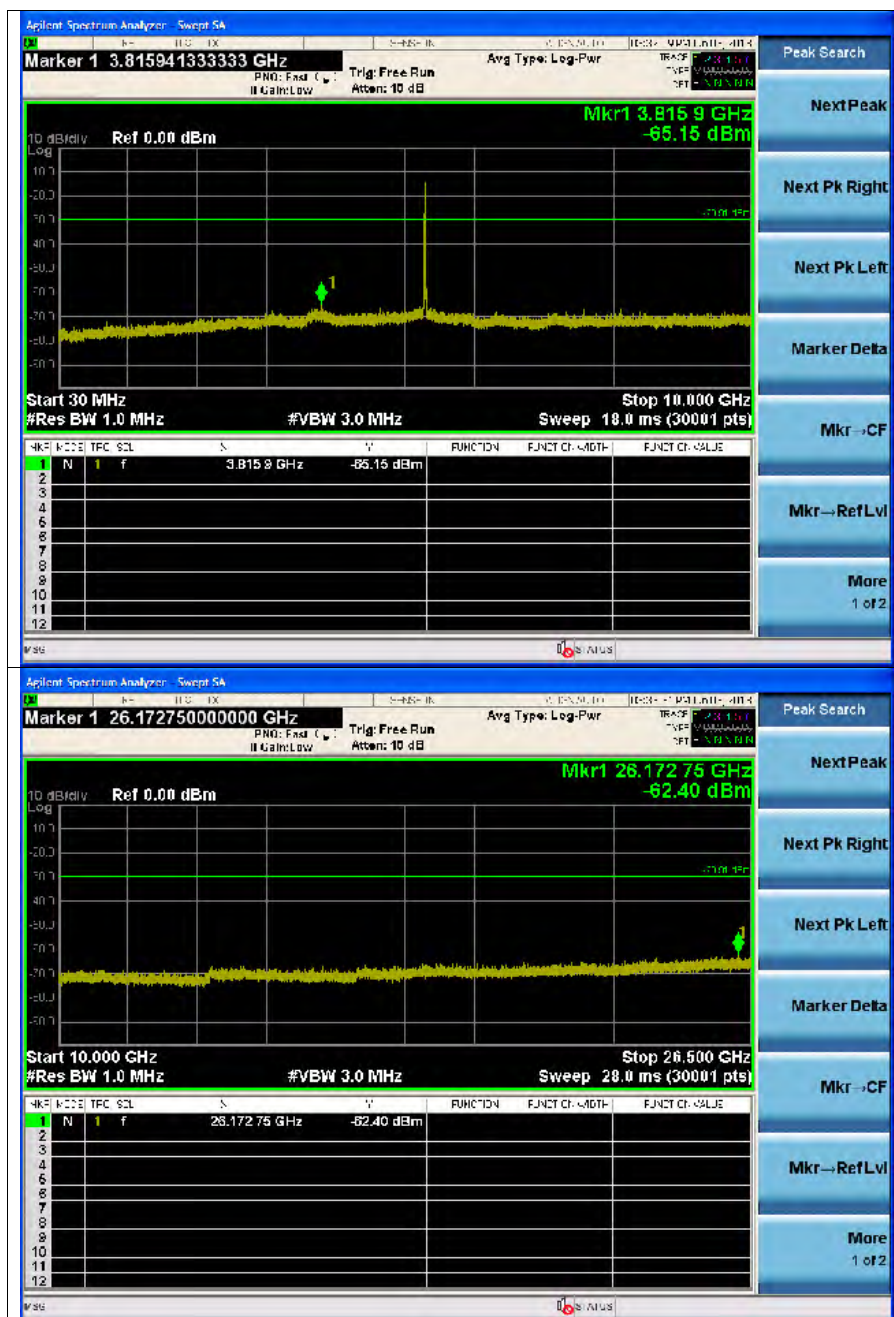
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5 300 MHz

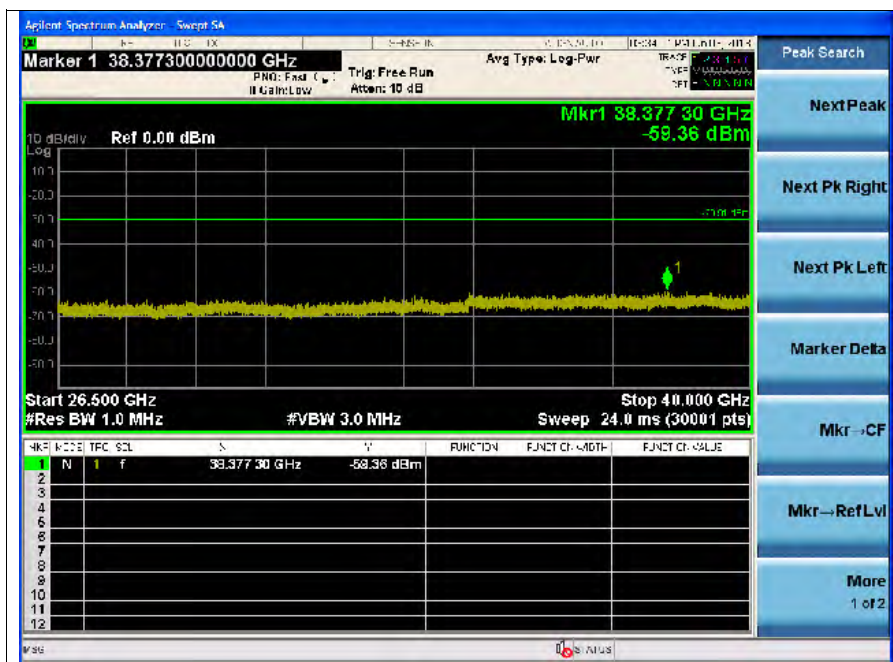


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Note:

Offset (dB) = Attenuator(dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 815.90	Noise floor	-	-
26 172.75	Noise floor	-	-
38 377.30	Noise floor	-	-

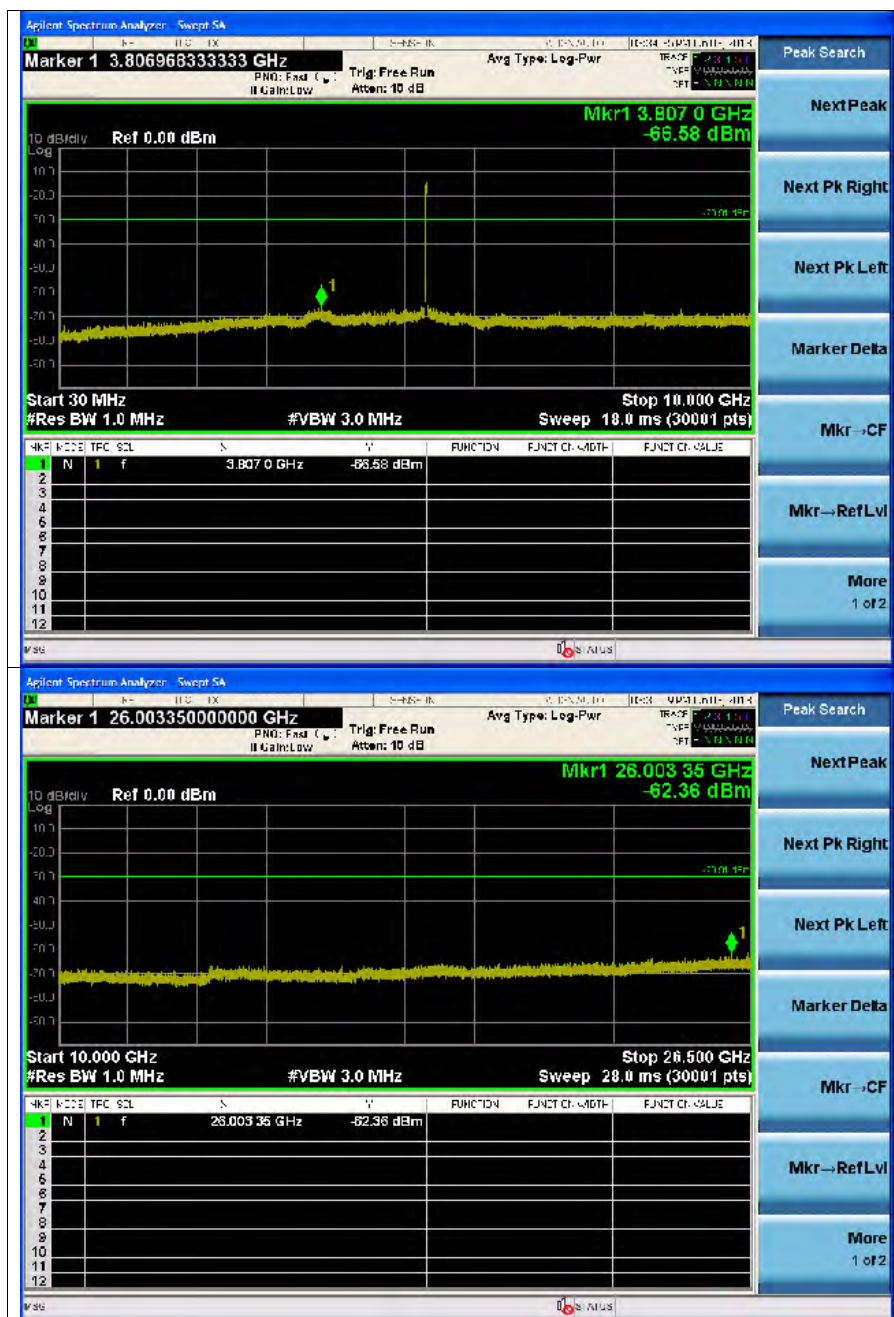
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5 320 MHz

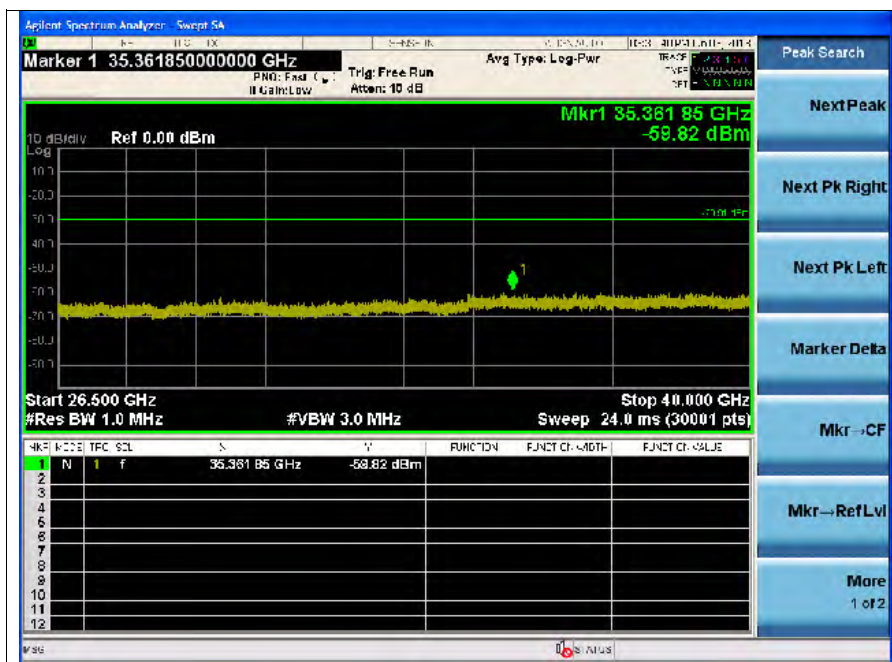


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Note:

Offset (dB) = Attenuator(dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 807.00	Noise floor	-	-
26 003.35	Noise floor	-	-
35 361.85	Noise floor	-	-

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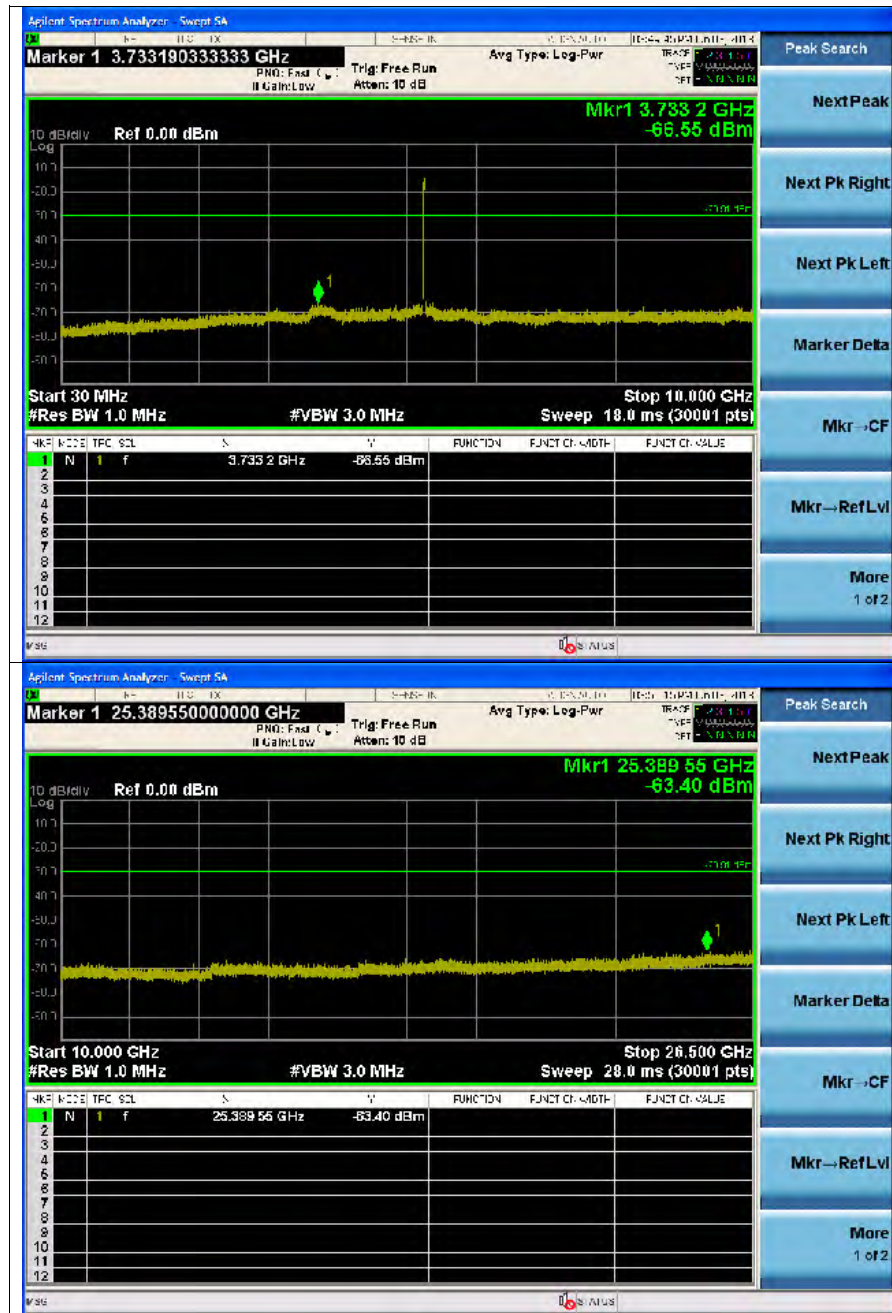
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802.11n-HT20 (DFS)_MCS0

5 260 MHz

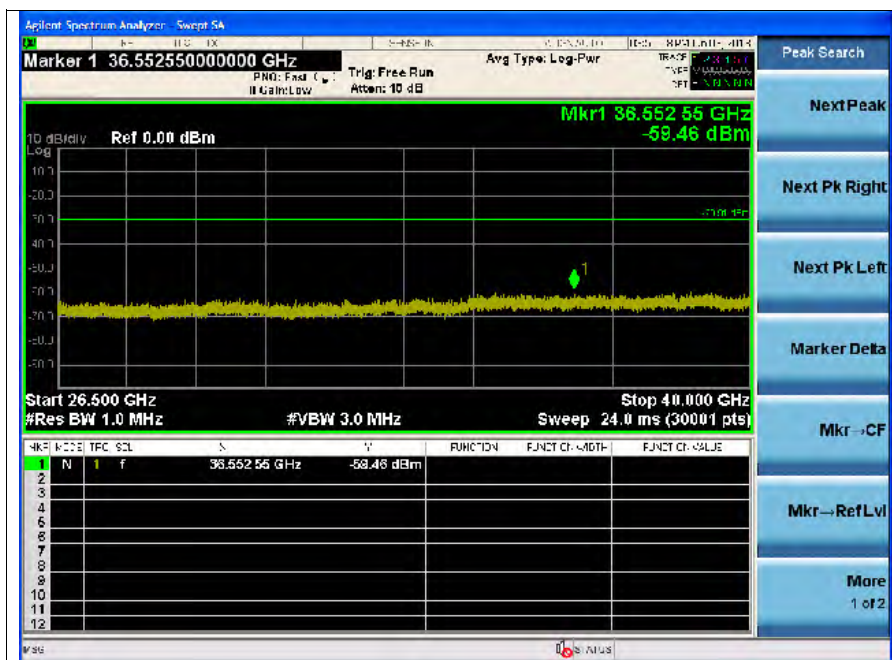


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Note:

Offset (dB) = Attenuator(dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 733.20	Noise floor	-	-
25 389.55	Noise floor	-	-
36 552.55	Noise floor	-	-

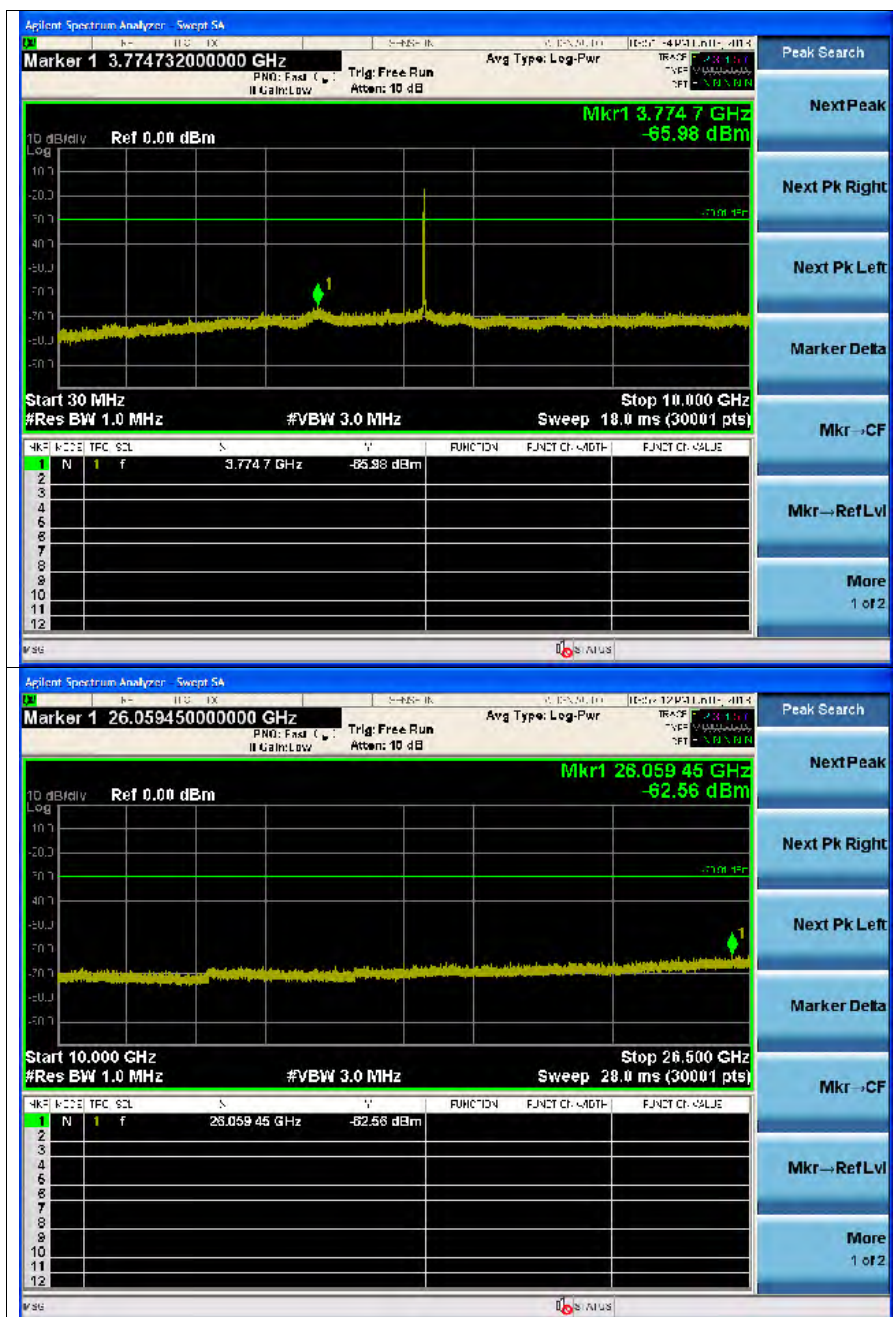
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5 300 MHz

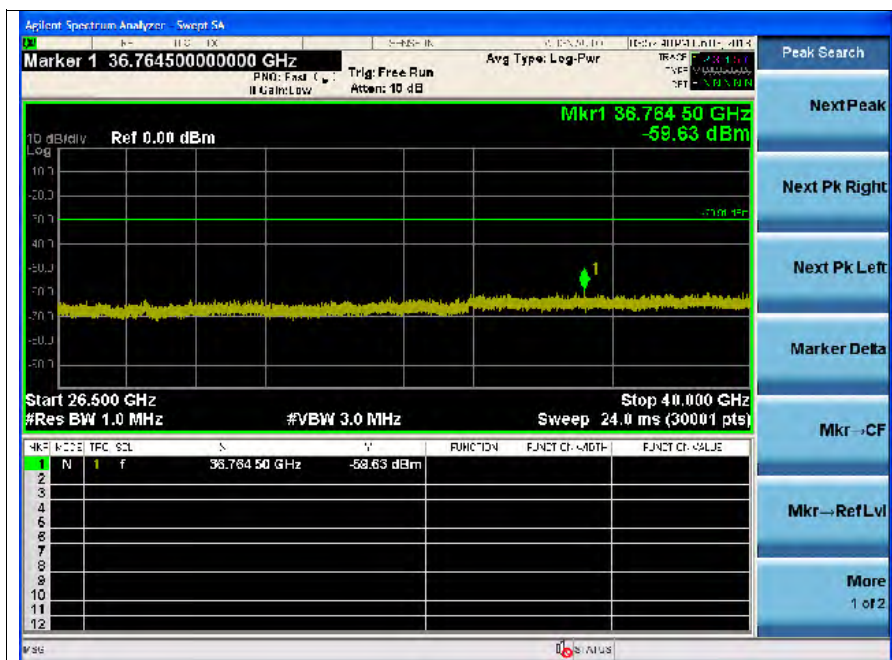


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Note:

Offset (dB) = Attenuator(dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 774.70	Noise floor	-	-
26 059.45	Noise floor	-	-
36 764.50	Noise floor	-	-

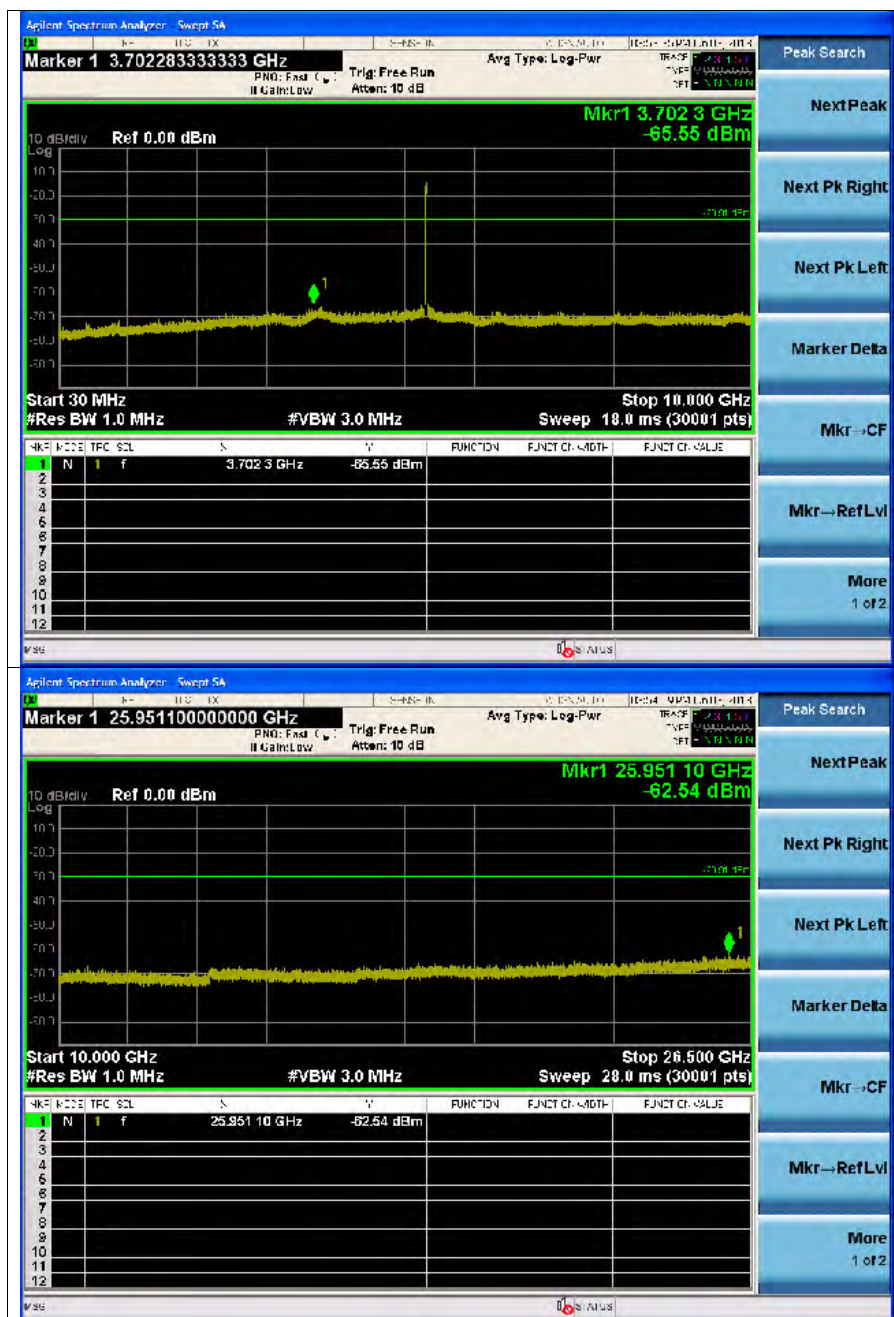
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5 320 MHz

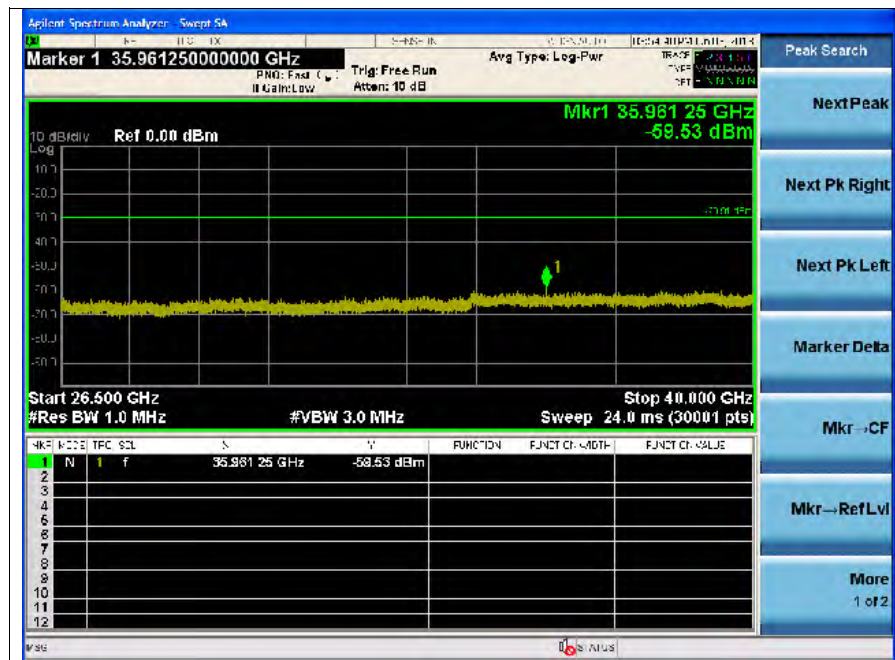


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Note:

Offset (dB) = Attenuator (dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 702.30	Noise floor	-	-
25 951.10	Noise floor	-	-
35 961.25	Noise floor	-	-

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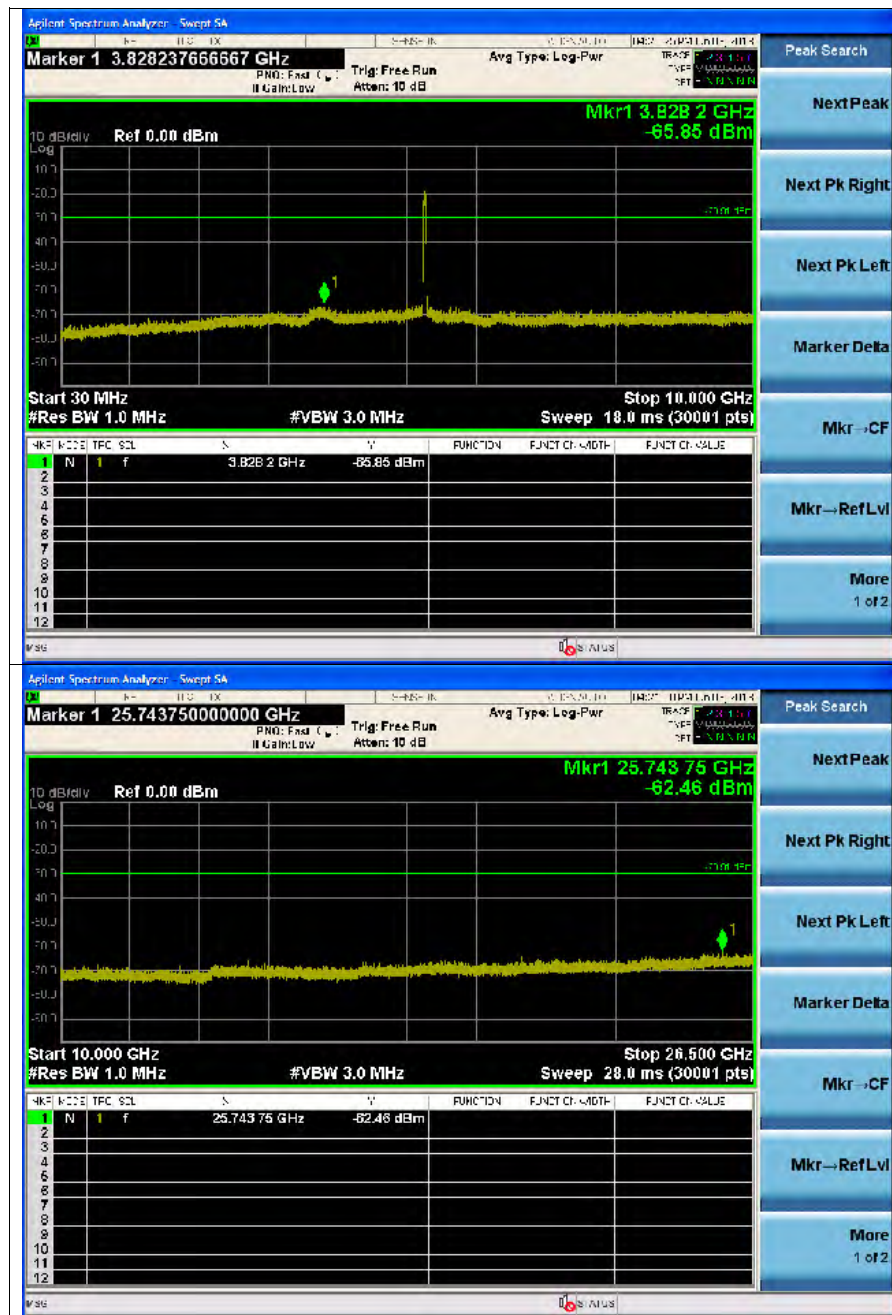
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802.11n-HT40 (DFS)_MCS0

5 270 MHz

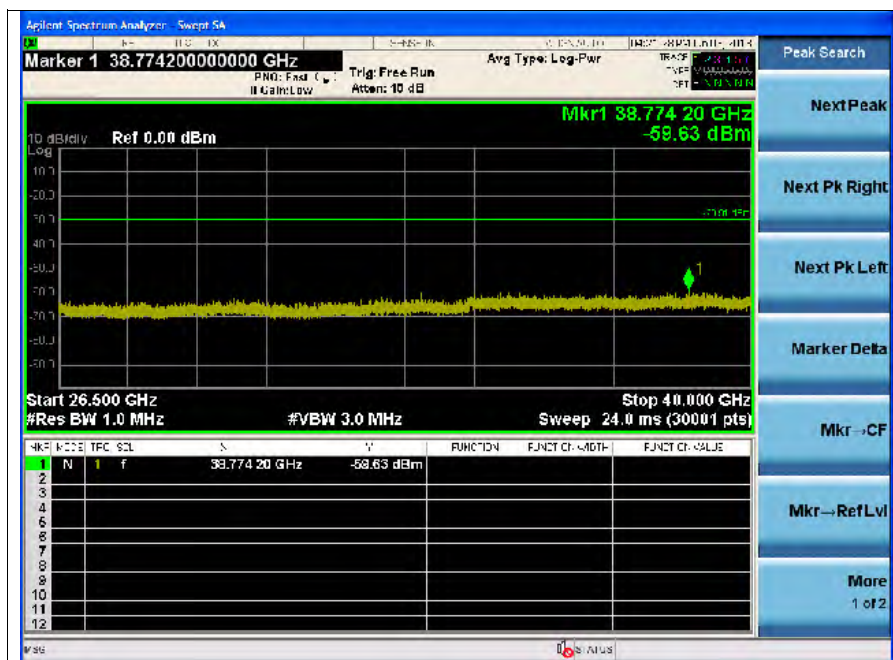


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Note:

Offset (dB) = Attenuator(dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 828.20	Noise floor	-	-
25 743.75	Noise floor	-	-
38 774.20	Noise floor	-	-

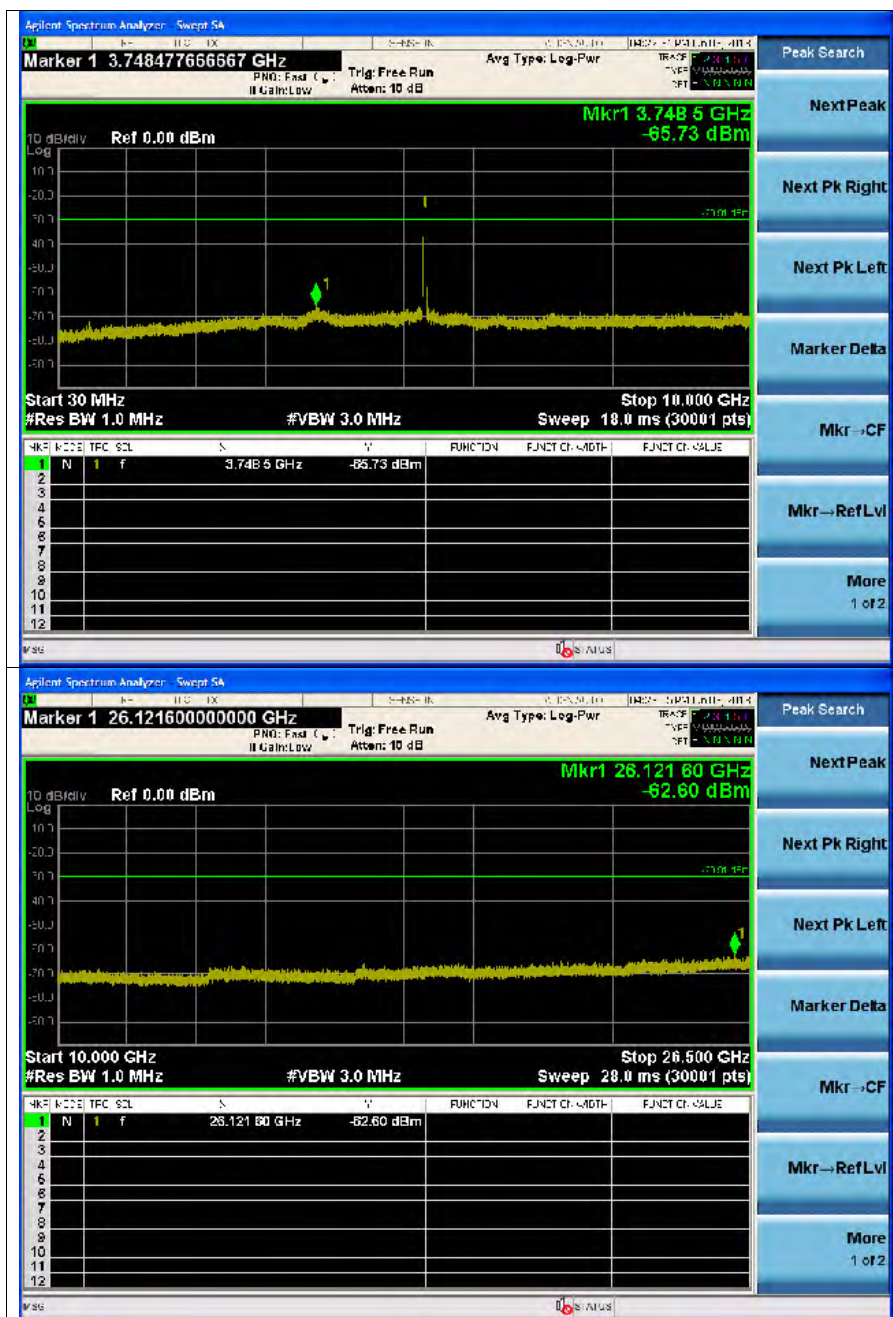
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5 310 MHz

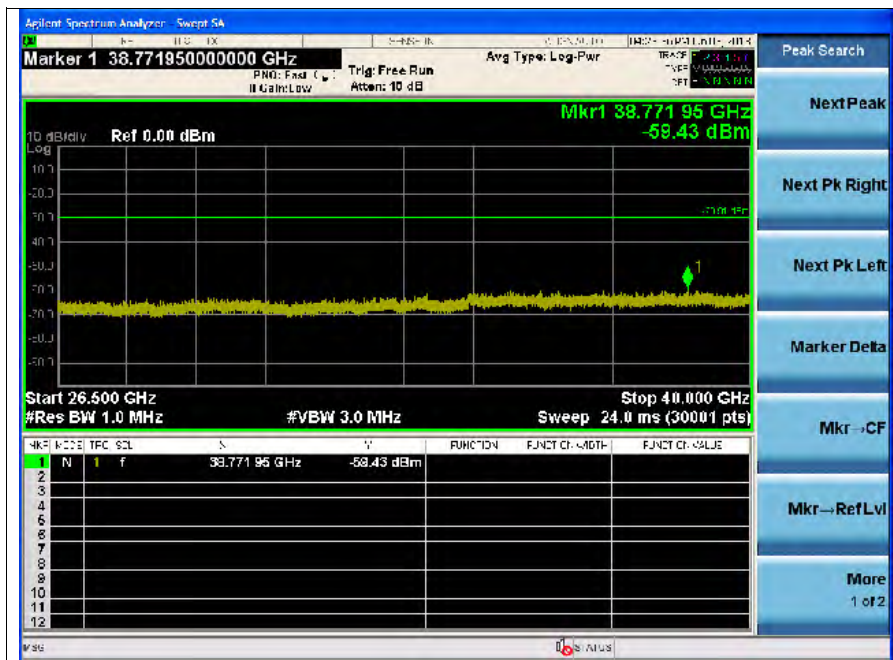


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Note:

Offset (dB) = Attenuator(dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 748.50	Noise floor	-	-
26 121.60	Noise floor	-	-
38 771.95	Noise floor	-	-

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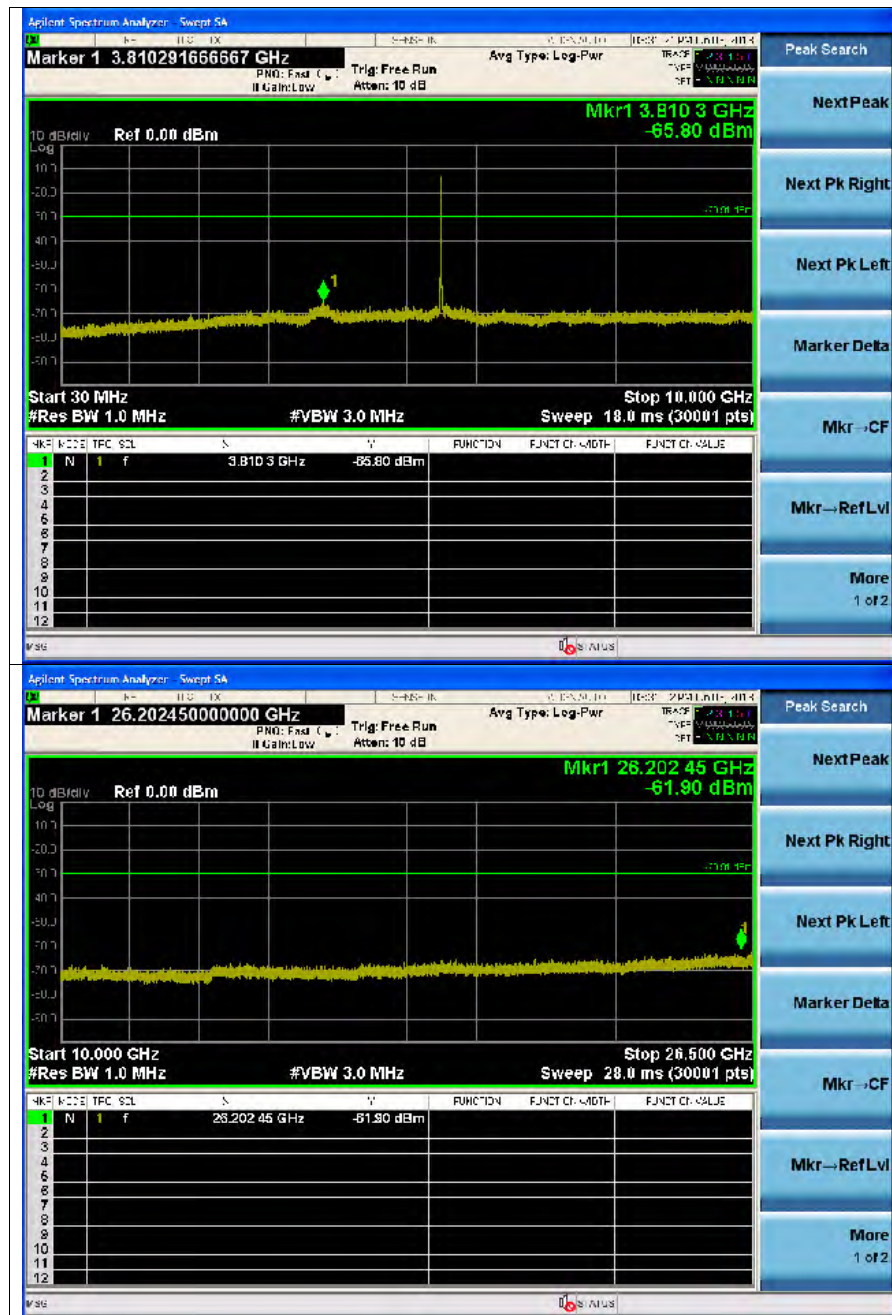
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802.11a (DFS)_6 Mbps

5 500 MHz

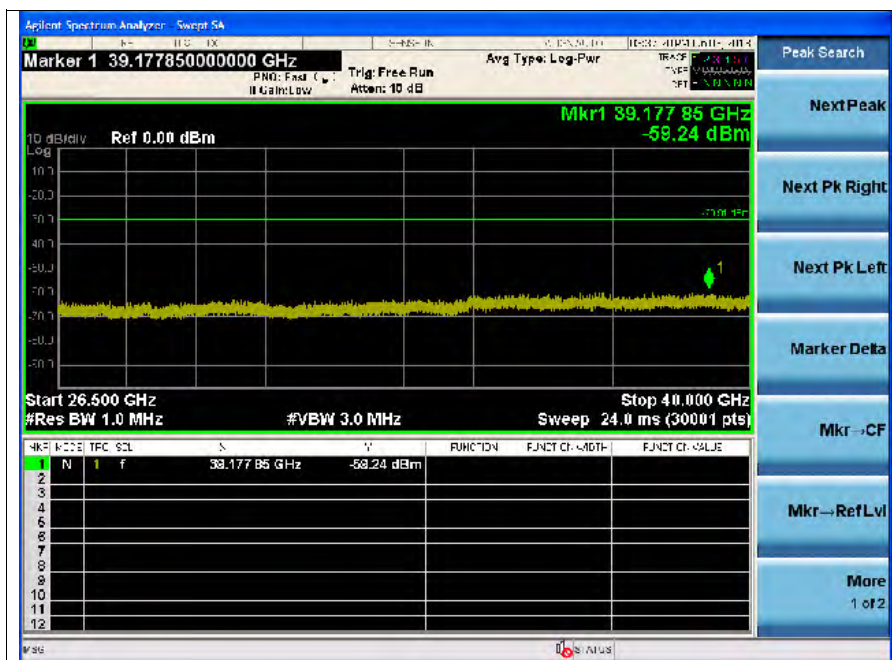


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Note:

Offset (dB) = Attenuator (dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 810.30	Noise floor	-	-
26 202.45	Noise floor	-	-
39 177.85	Noise floor	-	-

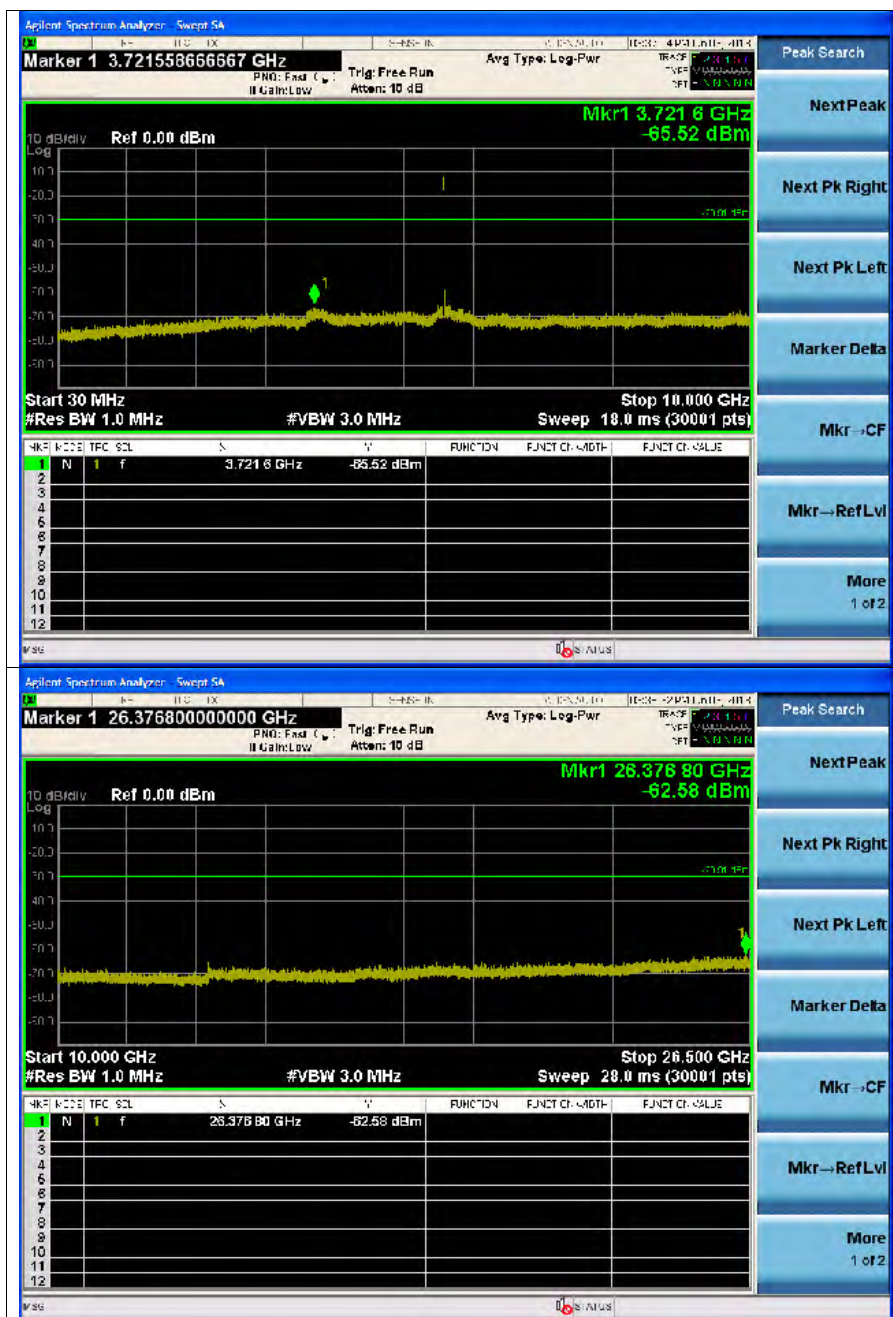
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5 580 MHz

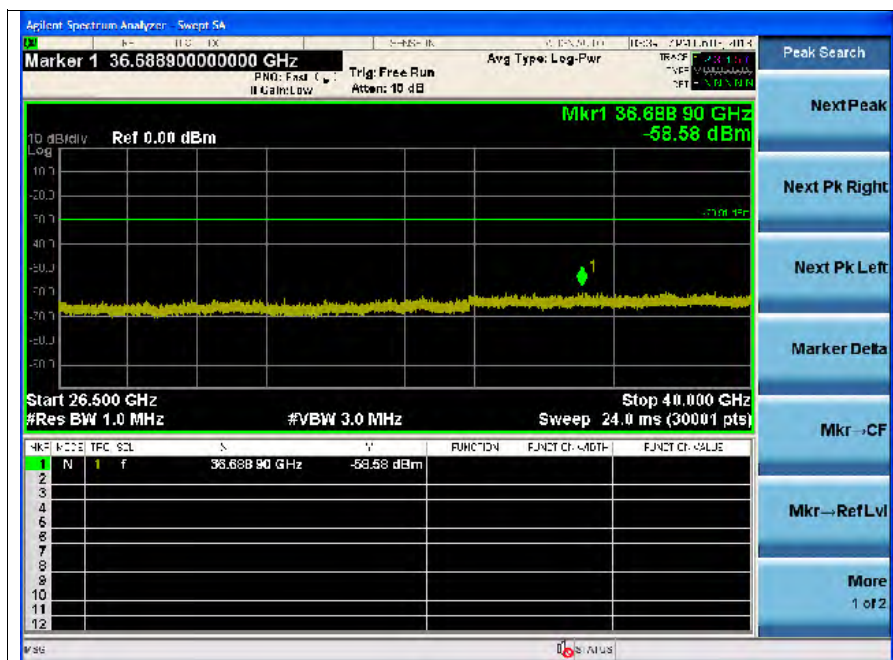


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Note:

Offset (dB) = Attenuator(dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 721.60	Noise floor	-	-
26 376.80	Noise floor	-	-
36 688.90	Noise floor	-	-

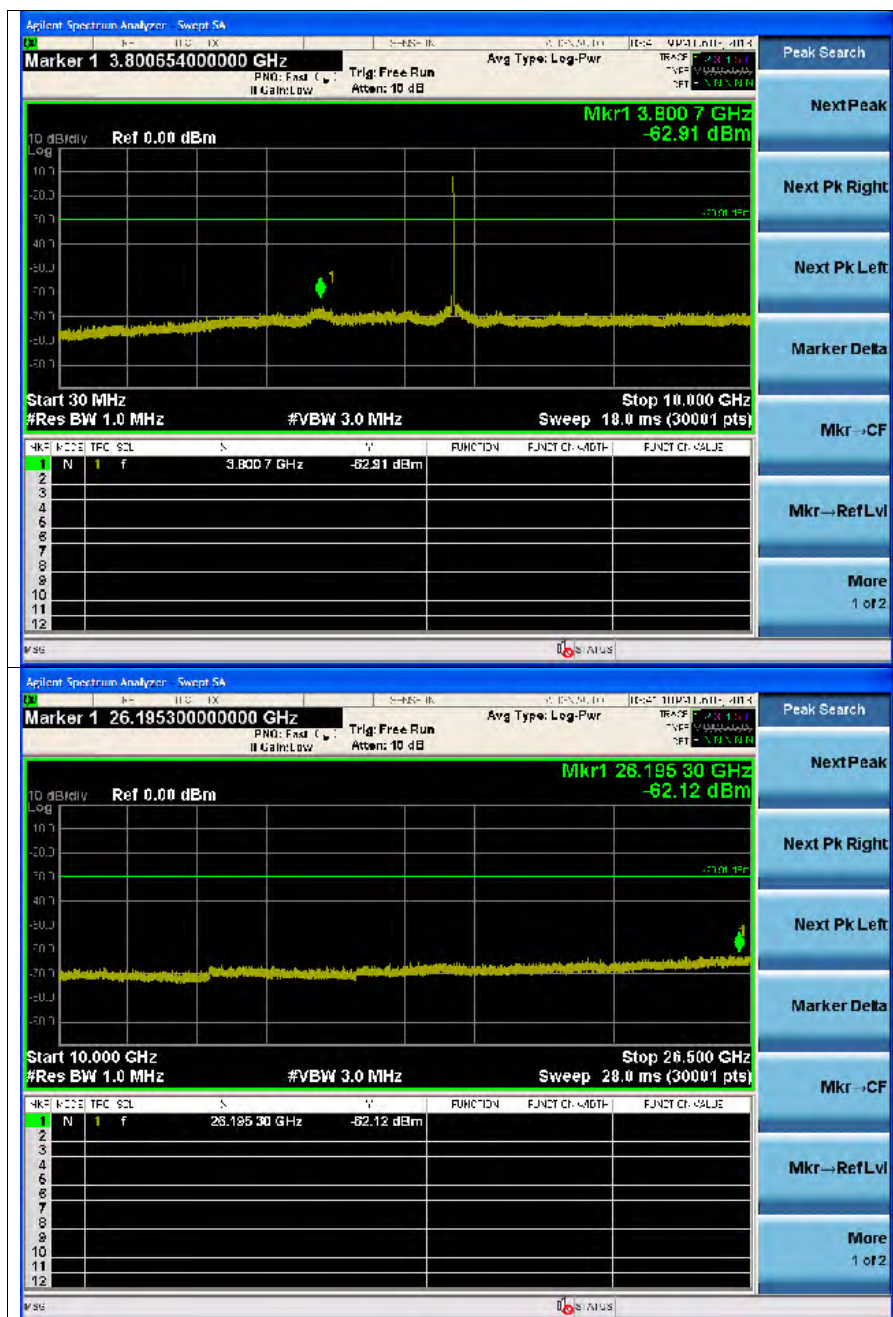
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5 700 MHz

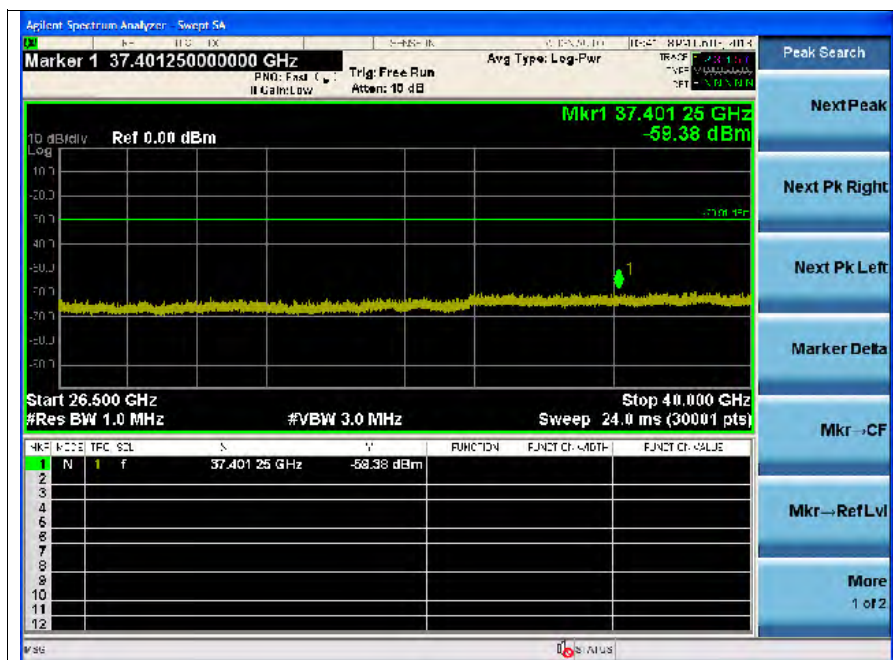


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Note:

Offset (dB) = Attenuator(dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 800.70	Noise floor	-	-
26 195.30	Noise floor	-	-
37 401.25	Noise floor	-	-

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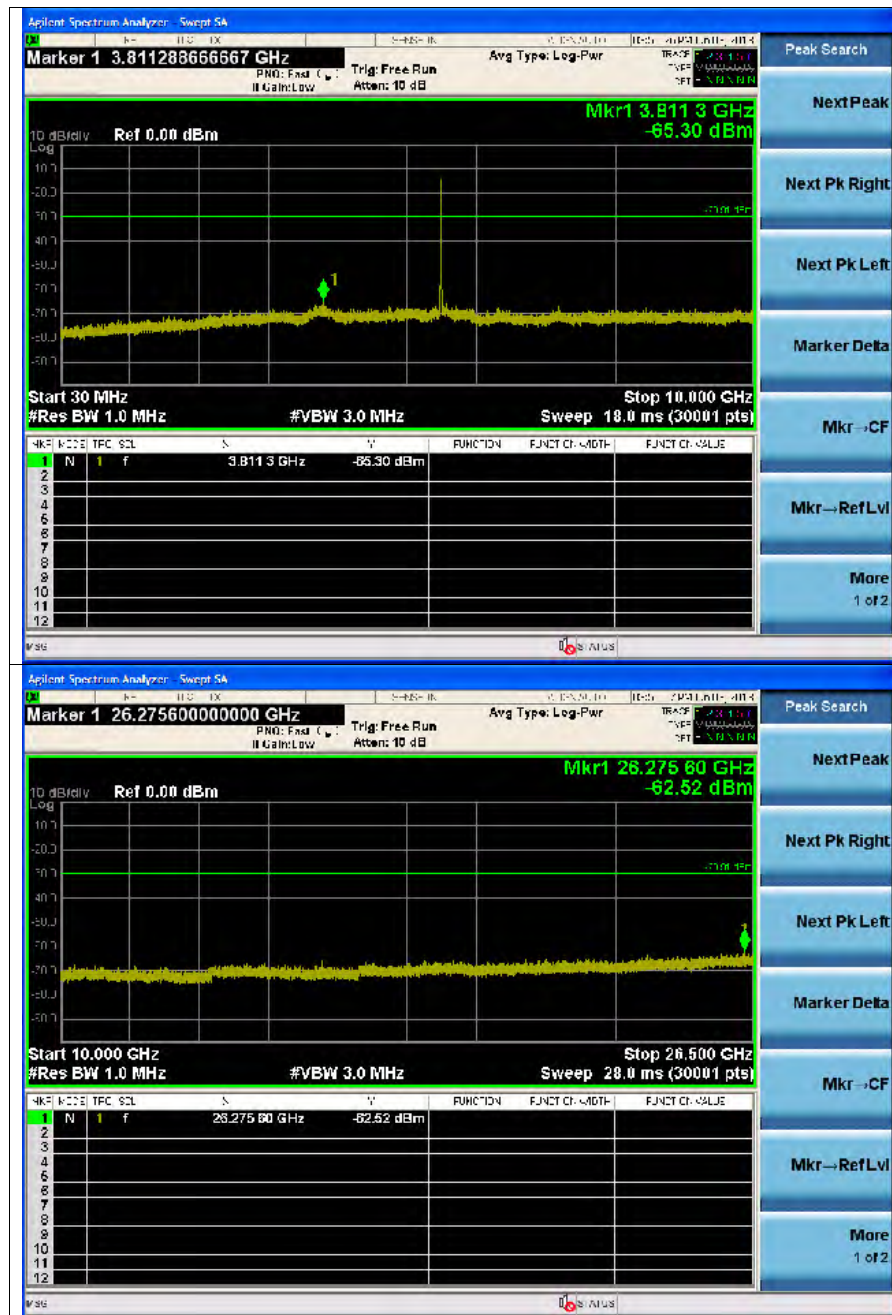
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802.11n-HT20 (DFS)_MCS0

5 500 MHz

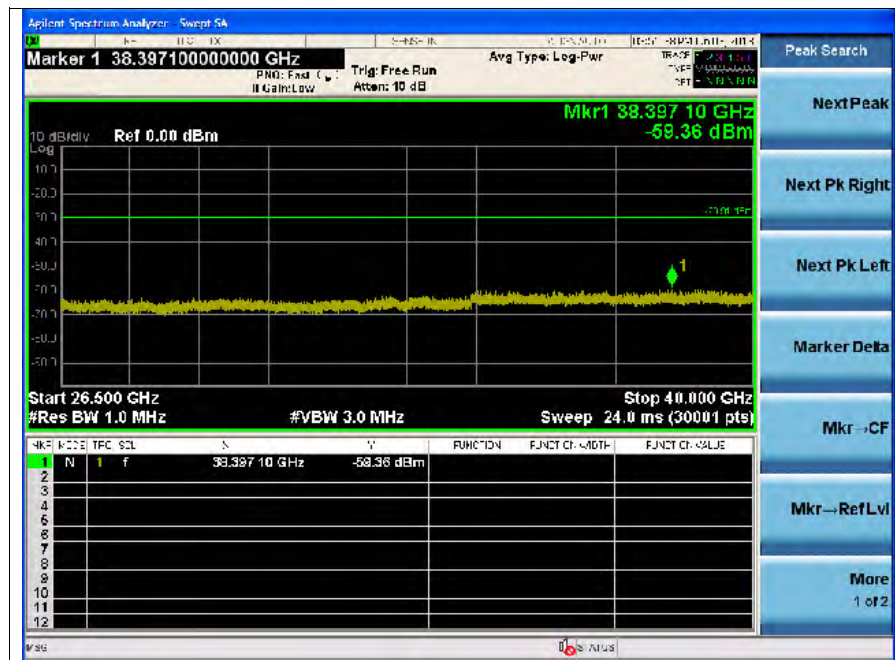


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Note:

Offset (dB) = Attenuator(dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 811.30	Noise floor	-	-
26 275.60	Noise floor	-	-
38 397.10	Noise floor	-	-

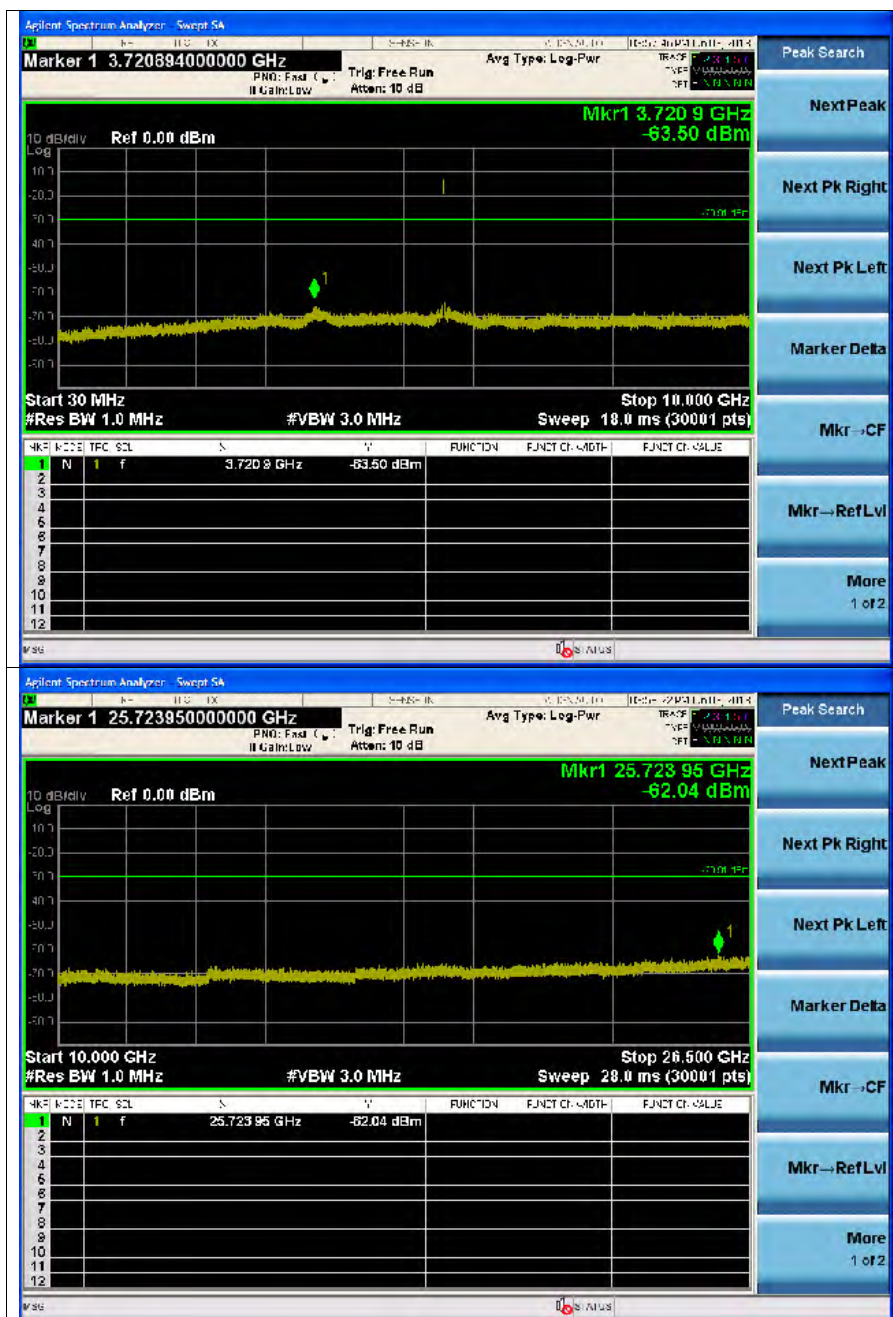
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5 580 MHz

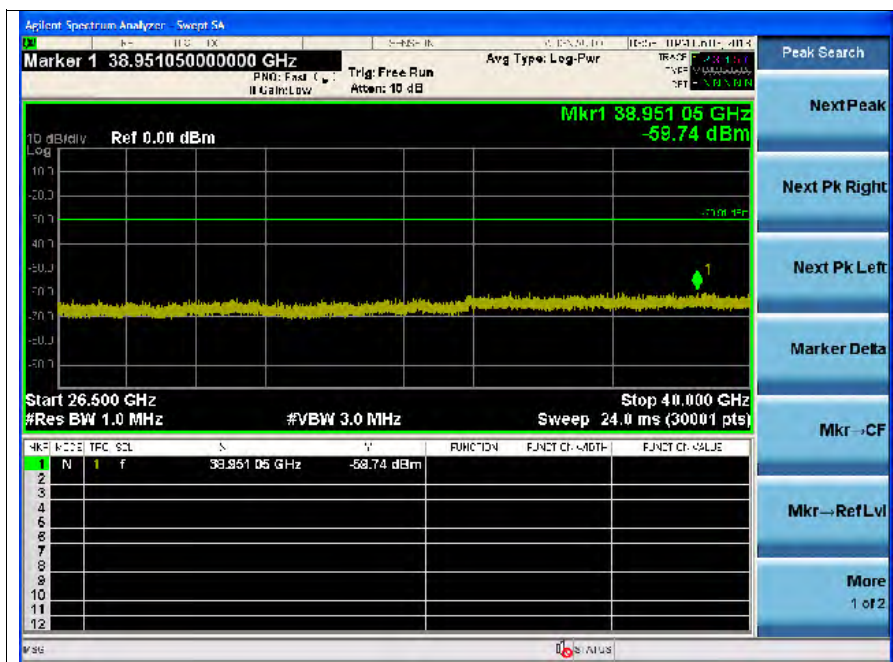


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Note:

Offset (dB) = Attenuator(dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 720.90	Noise floor	-	-
25 723.95	Noise floor	-	-
38 951.05	Noise floor	-	-

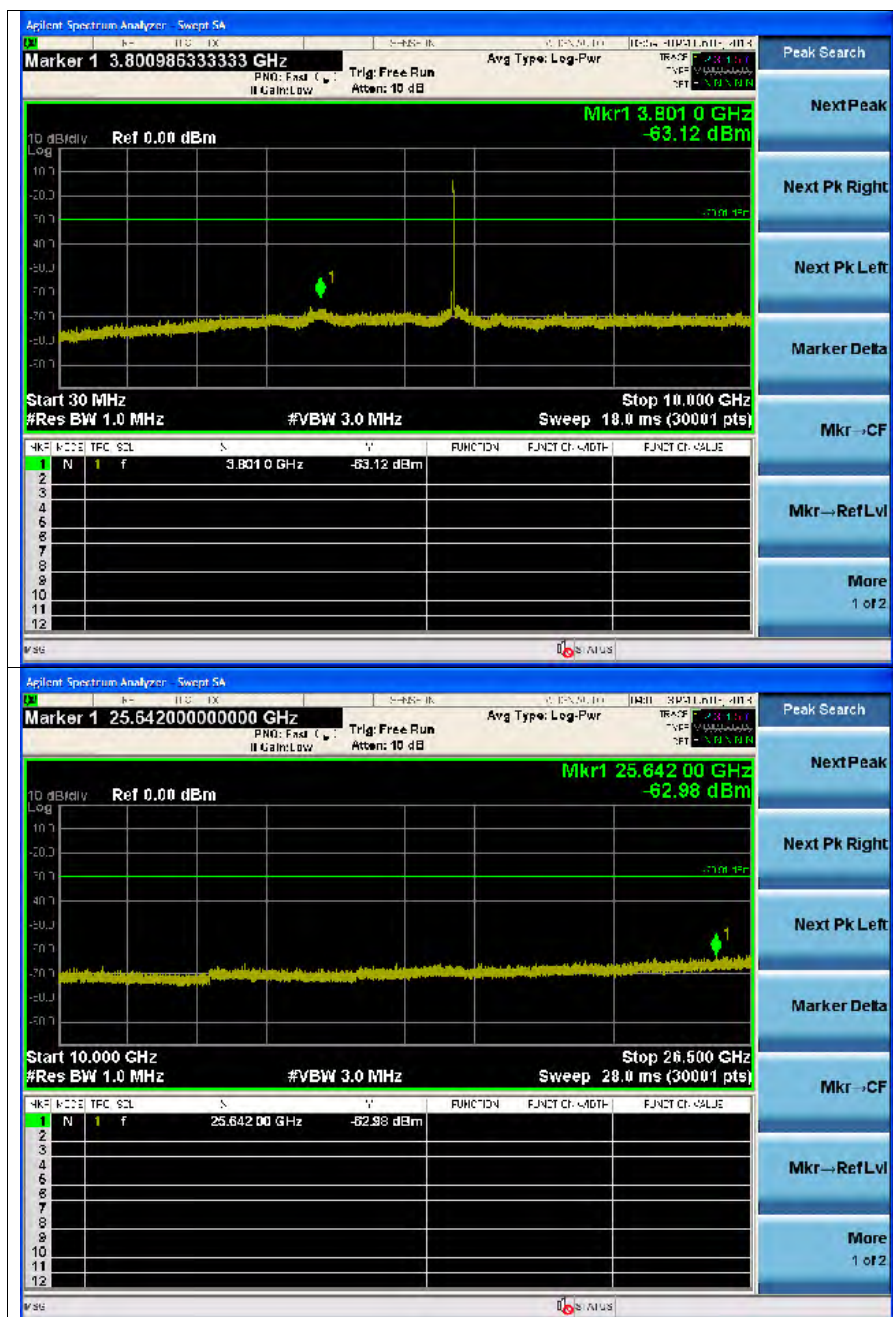
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5 700 MHz

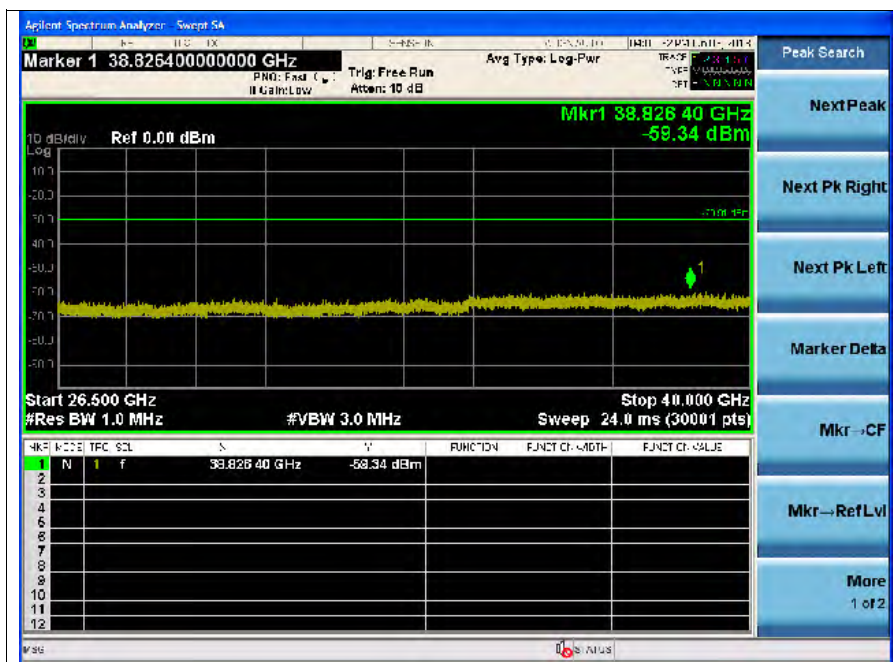


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Note:

Offset (dB) = Attenuator(dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 801.00	Noise floor	-	-
25 642.00	Noise floor	-	-
38 826.40	Noise floor	-	-

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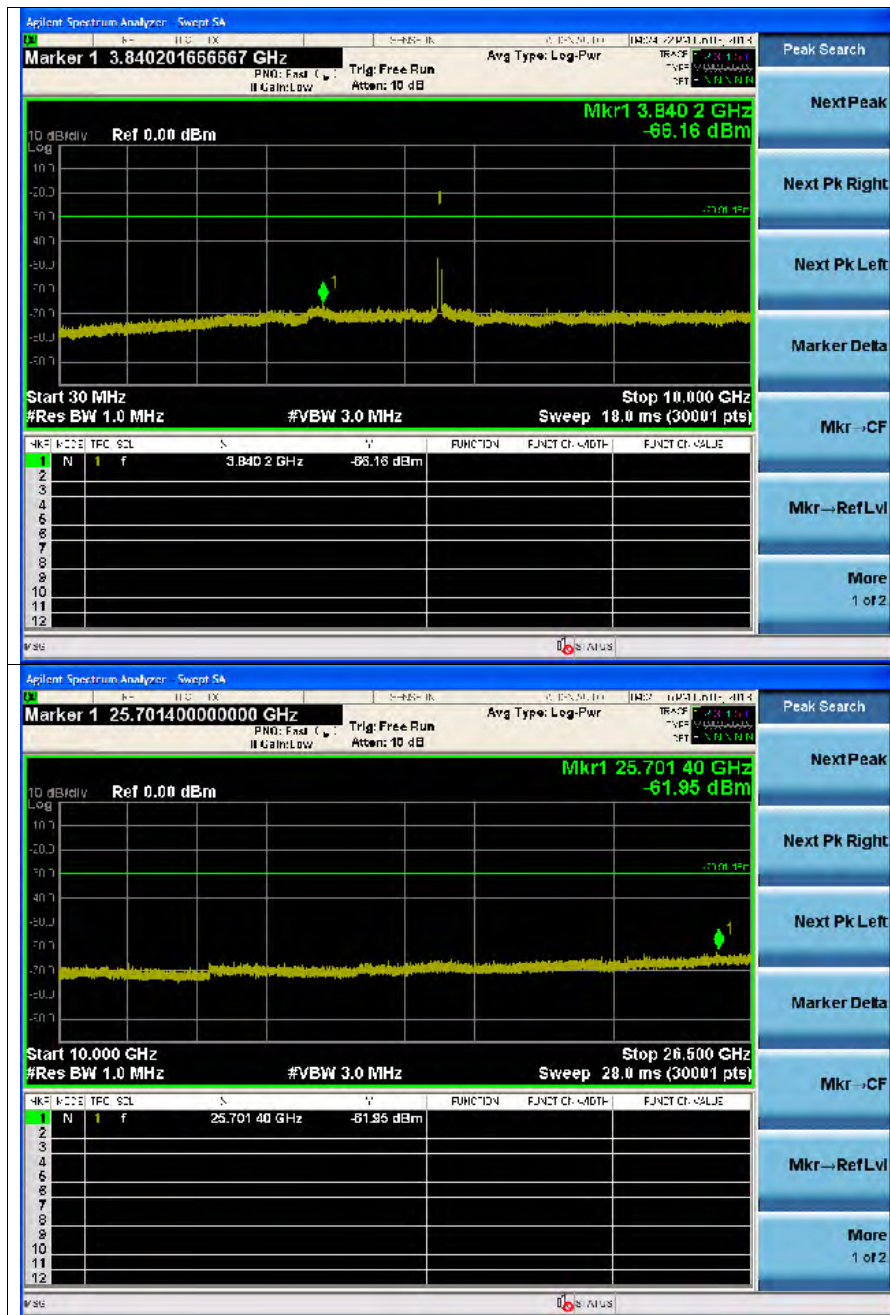
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802.11n-HT40 (DFS)_MCS0

5 510 MHz

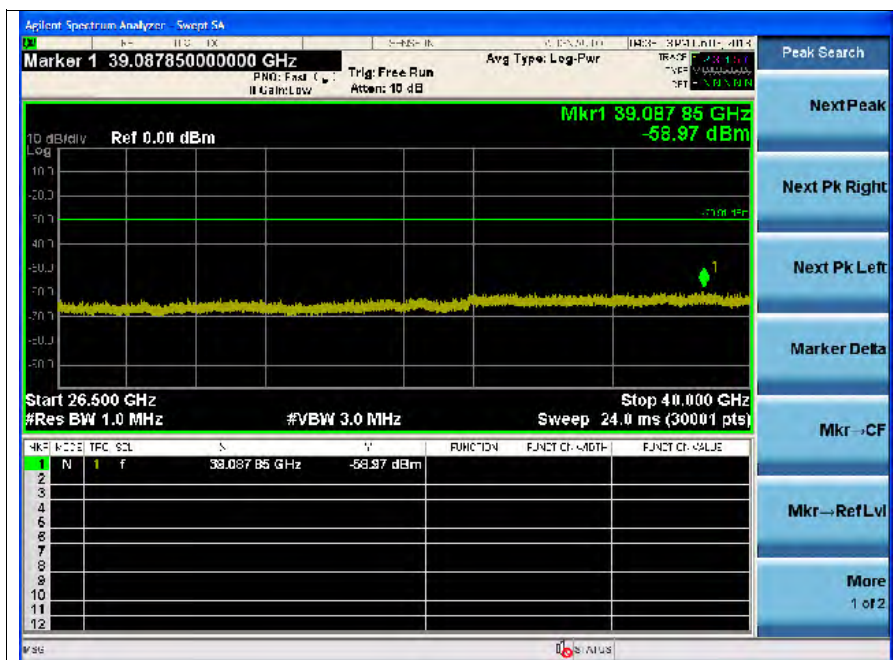


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Note:

Offset (dB) = Attenuator(dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 840.20	Noise floor	-	-
25 701.40	Noise floor	-	-
39 087.85	Noise floor	-	-

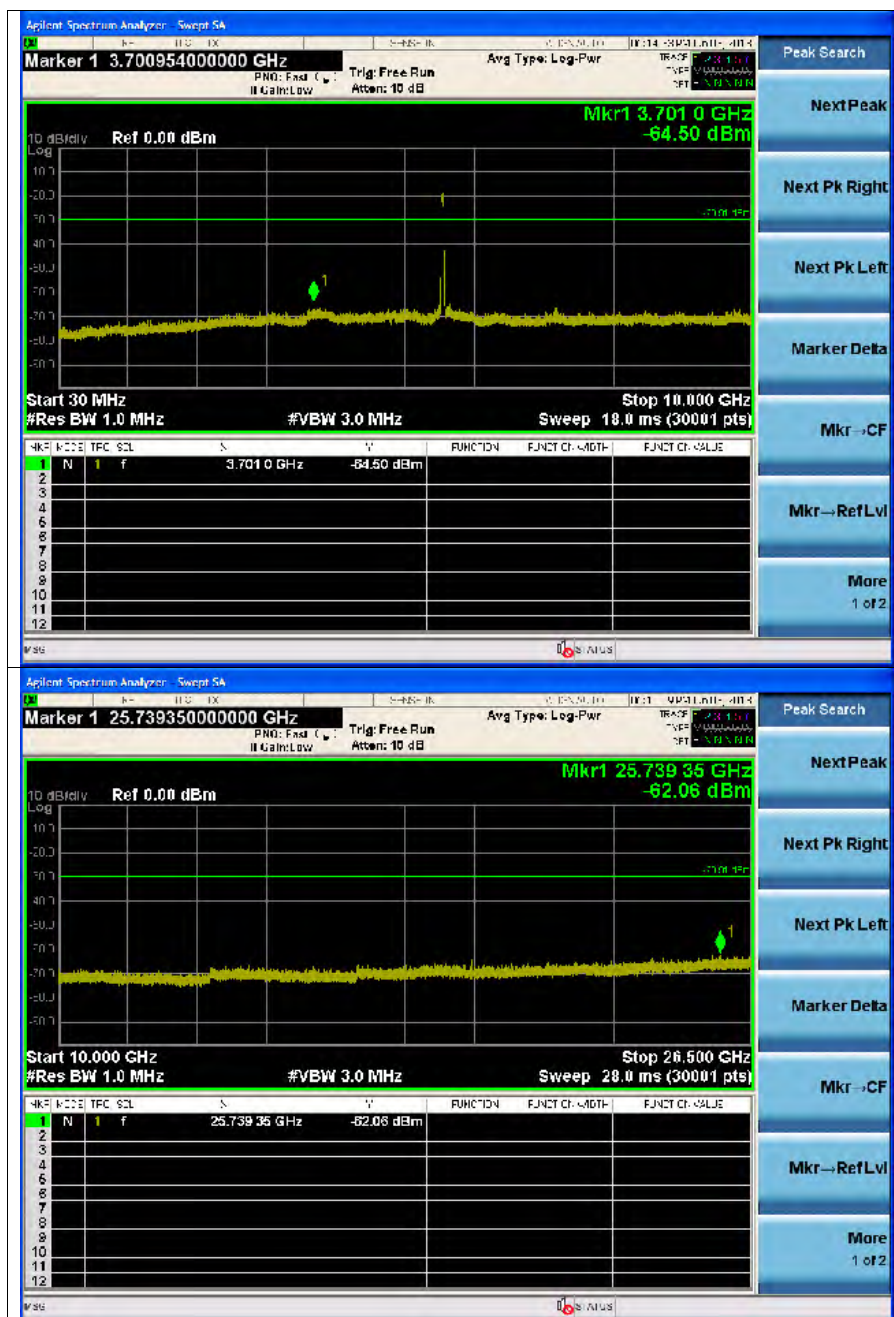
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5 550 MHz

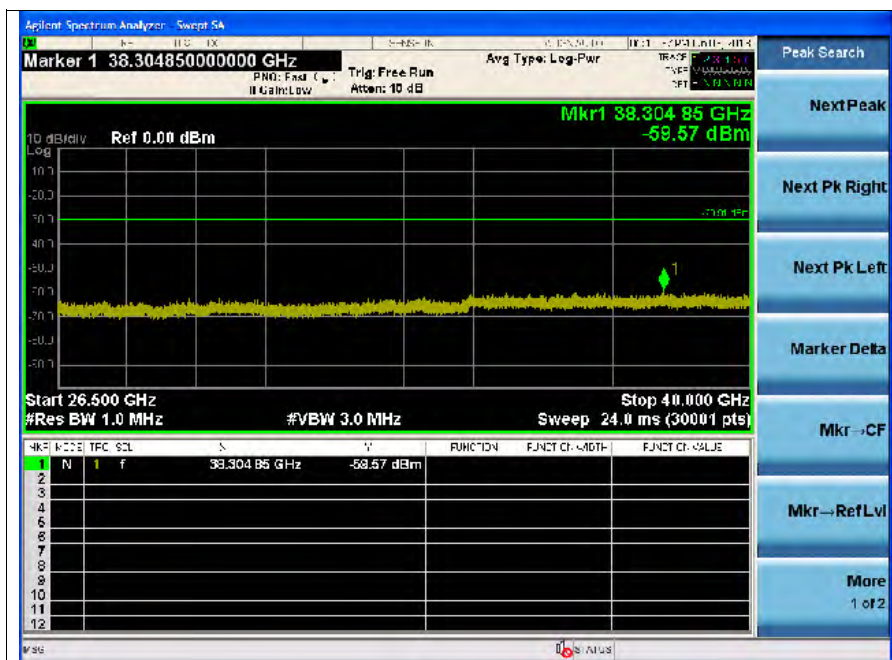


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Note:

Offset (dB) = Attenuator(dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 701.00	Noise floor	-	-
25 739.35	Noise floor	-	-
38 304.85	Noise floor	-	-

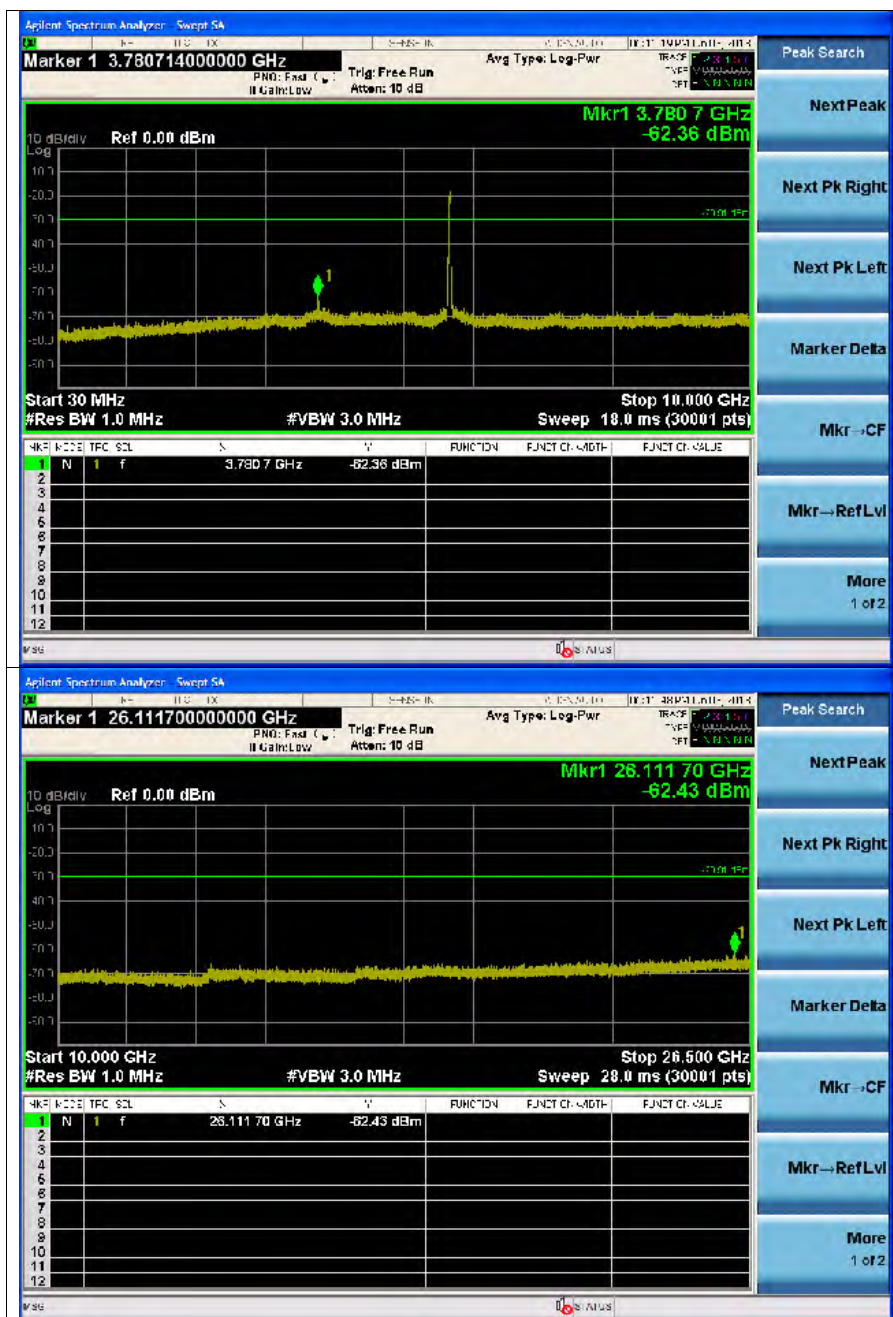
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5 670 MHz

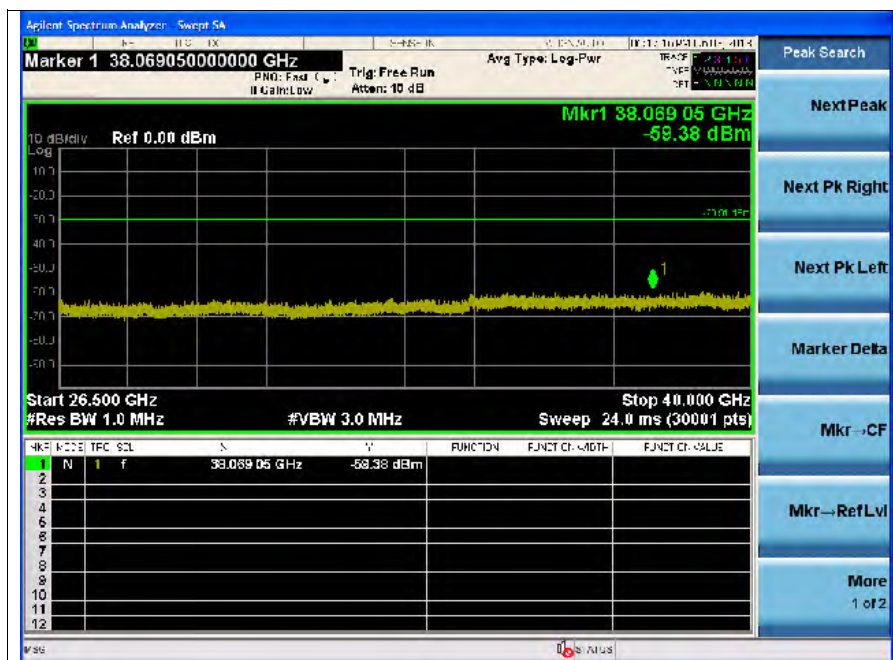


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Note:

Offset (dB) = Attenuator (dB) + Cable loss (dB)

Result (dB m) = Spurious offset (dB) + Reading values (dB m)

Frequency (MHz)	Reading values (dB m)	Spurious offset (dB)	Result (dB m)
3 780.70	Noise floor	-	-
26 111.70	Noise floor	-	-
38 069.05	Noise floor	-	-

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3. 26 dB bandwidth

3.1. Test setup



3.2. Limit

None; for reporting purpose only

3.3. Test procedure

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.

1. This measurement settings are specified in section C of KDB 789033.
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak
5. Trace mode = max hold.
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %

Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

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3.4. Test result

Ambient temperature : (24 ± 2) °C
Relative humidity : 49 % R.H.

Mode: 11a

Operating mode	Data Rate (Mbps)	Frequency (MHz)	26 dB bandwidth (MHz)
Non - DFS	6	5 180	18.64
	6	5 220	18.71
	6	5 240	18.59
DFS	6	5 260	18.63
	6	5 300	18.59
	6	5 320	18.73
DFS	6	5 500	18.50
	6	5 580	18.86
	6	5 700	18.57

Mode: 11n_HT20

Operating mode	Data Rate (Mbps)	Frequency (MHz)	26 dB bandwidth (MHz)
Non - DFS	MCS0	5 180	18.98
	MCS0	5 220	18.99
	MCS0	5 240	19.03
DFS	MCS0	5 260	18.94
	MCS0	5 300	19.06
	MCS0	5 320	19.05
DFS	MCS0	5 500	18.98
	MCS0	5 580	18.96
	MCS0	5 700	19.01

Mode: 11n_HT40

Operating mode	Data Rate (Mbps)	Frequency (MHz)	26 dB bandwidth (MHz)
Non - DFS	MCS0	5 190	43.36
	MCS0	5 230	43.75
DFS	MCS0	5 270	42.62
	MCS0	5 310	42.12
	MCS0	5 510	43.28
DFS	MCS0	5 550	43.51
	MCS0	5 670	42.48

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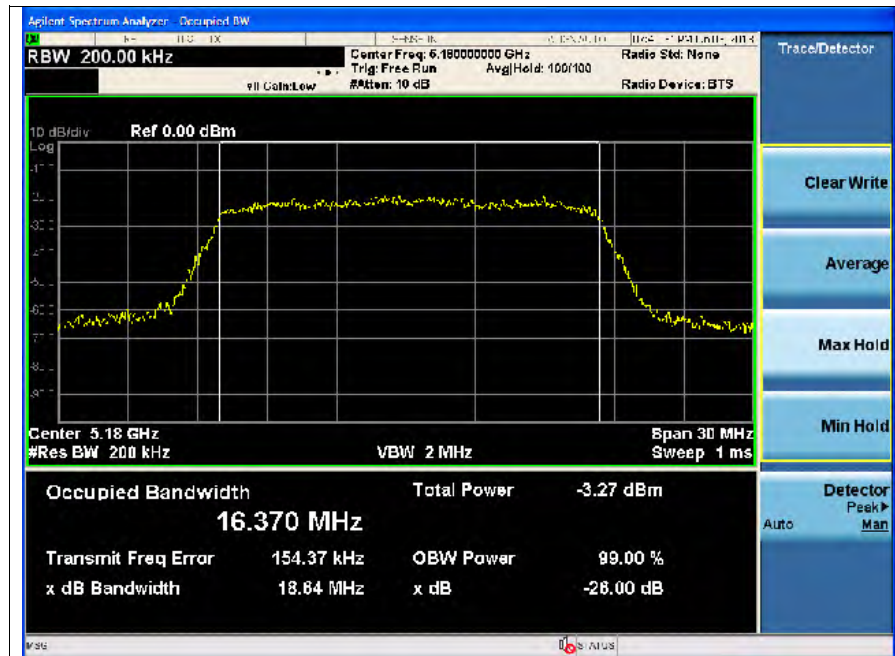
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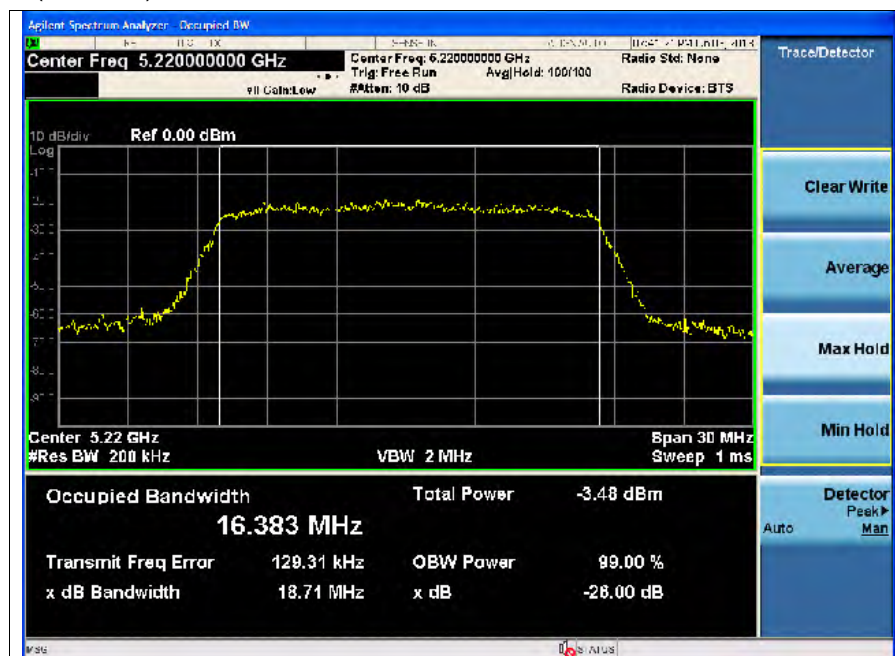
26 dB Bandwidth

802.11a (Non-DFS)

Low Channel (5 180 MHz)



Middle Channel (5 220 MHz)



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High Channel (5 240 MHz)



802.11a (DFS)

Low Channel (5 260 MHz)



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Middle Channel (5 300 MHz)



High Channel (5 320 MHz)



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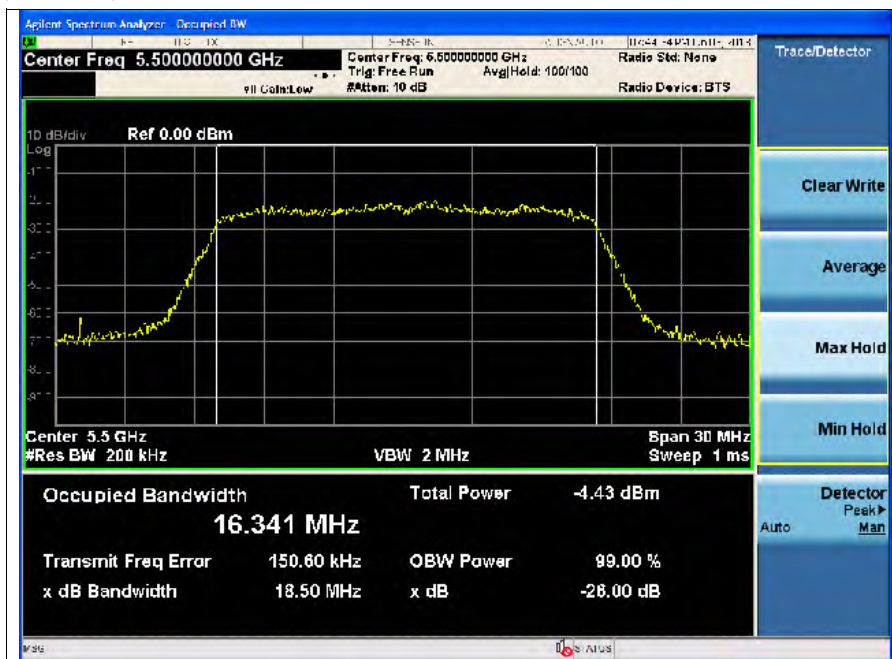
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802.11a (DFS)

Low Channel (5 500 MHz)



Middle Channel (5 580 MHz)



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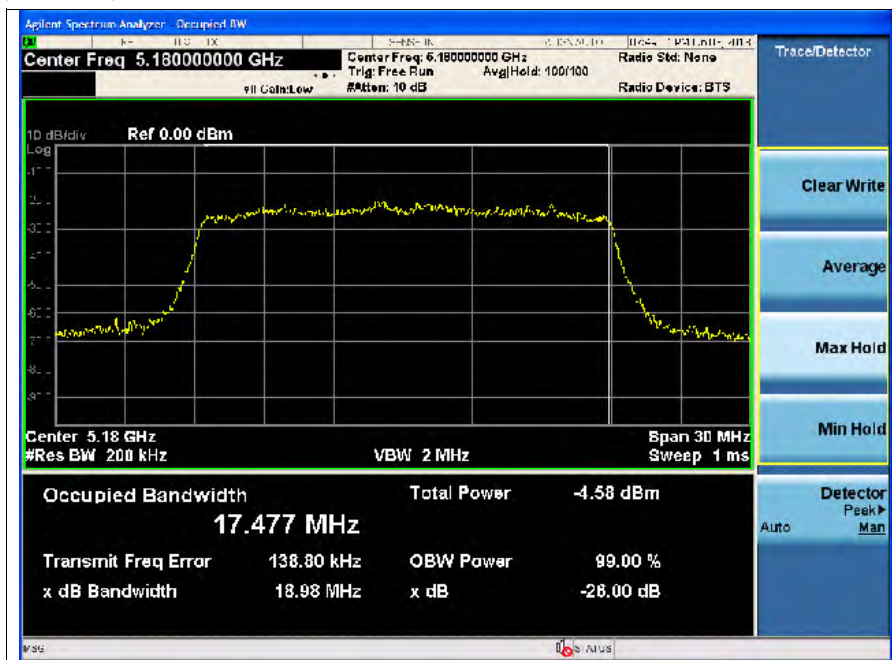
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High Channel (5 700 MHz)



802.11n-HT20 (Non-DFS)

Low Channel (5 180 MHz)



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Middle Channel (5 220 MHz)



High Channel (5 240 MHz)



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802.11n-HT20 (DFS)

Low Channel (5 260 MHz)



Middle Channel (5 300 MHz)



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