TEST REPORT

of

FCC Part 15 Subpart E §15.407
RSS-247 Issue 1, RSS-Gen Issue 4

FCC ID / IC Certification: A3LSIP007AFS00 / 649E-SIP007AFS00

Equipment Under Test	:	ARTIK-0710
Model Name	:	SIP007AFS00
Applicant	:	Samsung Electronics Co., Ltd.
Manufacturer	:	Samsung Electronics Co., Ltd.
Date of Receipt	:	2016.06.01
Date of Test(s)	:	2016.06.14 ~ 2016.08.11
Date of Issue	:	2016.08.12

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

Tested By:	**Jungmin Yang**	**Date:**	**2016.08.12**
Technical Manager:	**Alvin Kim**	**Date:**	**2016.08.12**

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Table of contents

1. General information ---------- 3

2. Transmitter radiated spurious emissions ---------- 7

3. 99 % Bandwidth & 26 dB Bandwidth ---------- 78

4. 6 dB Bandwidth ---------- 121

5. Maximum Conducted Output Power ---------- 129

6. Peak Power Spectral Density ---------- 141

7. AC Power Line Conducted Emission ---------- 167

8. Antenna Requirement ---------- 171

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1. General information

1.1. Testing laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)
- Wireless Div. 2FL, 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807

All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at http://www.sgs.com/en/Terms-and-Conditions.aspx.

Telephone : +82 31 688 0901
FAX : +82 31 688 0921

1.2. Details of applicant

Applicant : Samsung Electronics Co., Ltd.
Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 17113 Republic of Korea
Contact Person : Lee, Jae-Hyuk
Phone No. : +82 10 8848 6628

1.3. Description of EUT

Kind of Product	ARTIK-0710
Model Name	SIP007AFS00
Power Supply	DC 4.2 V
Frequency Range	2 402 ㎒ ~ 2 480 ㎒ (Bluetooth, Bluetooth Low Energy), 2 405 ㎒ ~ 2 475 ㎒ (Zigbee), 2 412 ㎒ ~ 2 462 ㎒ (11b/g/n_HT20), 5 745 ㎒ ~ 5 825 ㎒ (Band 3: 11a/n_HT20, 11ac_VHT20), 5 755 ㎒ ~ 5 795 ㎒ (Band 3: 11n_HT40, 11ac_VHT40), 5 775 ㎒ (Band 3: 11ac_VHT80), 5 180 ㎒ ~ 5 240 ㎒ (Band 1: 11a/n_HT20, 11ac_VHT20), 5 190 ㎒ ~ 5 230 ㎒ (Band 1: 11n_HT40, 11ac_VHT40), 5 210 ㎒ (Band 1: 11ac_VHT80), 5 260 ㎒ ~ 5 320 ㎒ (Band 2A: 11a/n_HT20, 11ac_VHT20), 5 270 ㎒ ~ 5 310 ㎒ (Band 2A: 11n_HT40, 11ac_VHT40), 5 290 ㎒ (Band 2A: 11ac_VHT80), 5 500 ㎒ ~ 5 720 ㎒ (Band 2C: 11a/n_HT20, 11ac_VHT20), 5 510 ㎒ ~ 5 710 ㎒ (Band 2C: 11n_HT40, 11ac_VHT40), 5 530 ㎒ ~ 5 690 ㎒ (Band 2C: 11ac_VHT80)
Modulation Technique	DSSS, OFDM, GFSK, π/4DQPSK, 8DPSK
Number of Channels	79 channel (Bluetooth), 40 channel (Bluetooth Low Energy), 15 channel (Zigbee), 11 channel (11b/g/n_HT20), 5 channel (Band 3: 11a/n_HT20, 11ac_VHT20), 2 channel (Band 3: 11n_HT40, 11ac_VHT40), 1 channel (Band 3: 11ac_VHT80), 4 channel (Band 1: 11a/n_HT20, 11ac_VHT20), 2 channel (Band 1: 11n_HT40, 11ac_VHT40), 1 channel (Band 1: 11ac_VHT80), 4 channel (Band 2A: 11a/n_HT20, 11ac_VHT20), 2 channel (Band 2A: 11n_HT40, 11ac_VHT40), 1 channel (Band 2A: 11ac_VHT80), 9 channel (Band 2C: 11a/n_HT20, 11ac_VHT20), 4 channel (Band 2C: 11n_HT40, 11ac_VHT40), 2 channel (Band 2C: 11ac_VHT80)
Antenna Type	Dipole antenna
Antenna Gain	2 400 ㎒ ~ 2 483.5 ㎒: 1.10 ㏈i, 5 150 ㎒ ~ 5 350 ㎒: 0.91 ㏈i, 5 470 ㎒ ~ 5 725 ㎒: 0.69 ㏈i, 5 725 ㎒ ~ 5 850 ㎒: -1.52 ㏈i
H/W Version	0710-1.0
S/W Version	0710GC0F-41F-01Q0

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1.4. Declaration by the manufacturer

- The EUT is a slave without radar detection and TPC.
- EUT is not supported TDWR(5.6-5.65 ㎓) band.
- The 5 150 ㎒ - 5 350 ㎒ band of device use indoor in canada only.

1.5. Test equipment list

Equipment	Manufacturer	Model	S/N	Cal Date	Cal Interval	Cal Due.
Signal Generator	Agilent	E8257D	MY51501169	Jul. 07, 2016	Annual	Jul. 07, 2017
Signal Generator	R&S	SMBV100A	255834	Jun. 22, 2016	Annual	Jun. 22, 2017
Spectrum Analyzer	R&S	FSV30	100768	Mar. 30, 2016	Annual	Mar. 30, 2017
Spectrum Analyzer	Agilent	N9030A	MY51350132	Sep. 24, 2015	Annual	Sep. 24, 2016
Power Meter	Anritsu	ML2495A	1223004	Jun. 10, 2016	Annual	Jun. 10, 2017
Power Sensor	Anritsu	MA2411B	1207272	Jun. 10, 2016	Annual	Jun. 10, 2017
Attenuator	AEROFLEX / INMET	18N-20 ㏈	2	Feb. 29, 2016	Annual	Feb. 29, 2017
Low Pass Filter	Mini-Circuits	NLP-1200+	V 8979400903-2	Feb. 29, 2016	Annual	Feb. 29, 2017
High Pass Filter	Wainwright Instrument GmbH	WHNX6.0/18G-10SS	51	Jun. 18, 2016	Annual	Jun. 18, 2017
High Pass Filter	Wainwright Instrument GmbH	WHK7.5/26.5G-6SS	11	Jun. 03, 2016	Annual	Jun. 03, 2017
DC Power Supply	Agilent	U8002A	MY50060028	Mar. 21, 2016	Annual	Mar. 21, 2017
Preamplifier	H.P.	8447F	2944A03909	Aug. 27, 2015	Annual	Aug. 27, 2016
Preamplifier	R&S	SCU-18	10117	Apr. 07, 2016	Annual	Apr. 07, 2017
Preamplifier	MITEQ Inc.	JS44-18004000-35-8P	1546891	May 12, 2016	Annual	May 12, 2017
Loop Antenna	R&S	HFH2-Z2	100118	Jun. 04, 2015	Biennial	Jun. 04, 2017
Bilog Antenna	Schwarzbeck Mess-Elektronik	VULB9163	396	Jun. 18, 2015	Biennial	Jun. 18, 2017
Horn Antenna	R&S	HF906	100608	Oct. 16, 2014	Biennial	Oct. 16, 2016
Horn Antenna	Schwarzbeck Mess-Elektronik	BBHA9170	BBHA9170223	Sep. 01, 2014	Biennial	Sep. 01, 2016
Antenna Master	INN-CO	MM4000	N/A	N.C.R.	N/A	N.C.R.
Turn Table	INN-CO	DS 1200 S	N/A	N.C.R.	N/A	N.C.R.
Test Receiver	R&S	ESU26	100109	Mar. 07, 2016	Annual	Mar. 07, 2017
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.
Test Receiver	R&S	ESCI 7	100911	Dec. 22, 2015	Annual	Dec. 22, 2016
Two-Line V-Network	R&S	ENV216	100190	Dec. 21, 2015	Annual	Dec. 21, 2016
Shield Room	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 Part 15 Subpart E, RSS-247 Issue 1, RSS-Gen Issue 4			
Section		Test Item	Result
15.205(a) 15.209(a) 15.407(b)(1) 15.407(b)(2) 15.407(b)(3) 15.407(b)(4)	RSS-Gen Issue 4 8.9 RSS-247 Issue 1 6.2.1 (2) RSS-247 Issue 1 6.2.2 (2) RSS-247 Issue 1 6.2.3 (2) RSS-247 Issue 1 6.2.4 (2)	Transmitter radiated spurious emissions	Complied
15.407(a)	RSS-Gen Issue 4 6.6	99 % Bandwidth	Complied
15.407(e)	RSS-247 Issue 1 6.2.4 (1)	6 dB Bandwidth	Complied
15.407(a)(1) 15.407(a)(2) 15.407(a)(3)	RSS-247 Issue 1 6.2.1 (1) RSS-247 Issue 1 6.2.2 (1) RSS-247 Issue 1 6.2.3 (1) RSS-247 Issue 1 6.2.4 (1)	Maximum Conducted Output Power	Complied
15.407(a)(1) 15.407(a)(2) 15.407(a)(3)	RSS-247 Issue 1 6.2.1 (1) RSS-247 Issue 1 6.2.2 (1) RSS-247 Issue 1 6.2.3 (1) RSS-247 Issue 1 6.2.4 (1)	Peak Power Spectral Density	Complied
15.207	RSS-Gen Issue 4 8.8	AC Power Line Conducted Emissions	Complied

1.7. Test Procedure(s)

The measurement procedures described in the American National Standard of Procedure for Compliance Testing of unlicensed Wireless Devices (ANSI C63.10-2013) and the guidance provided in KDB 789033_v01r02 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 (dBμV/m) = Measured level (dBμV) + Antenna factor (dB) + Cable loss (dB) - Amplifier gain (dB)

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1.9. Test report revision

Revision	Report number	Date of Issue	Description
0	F690501/RF-RTL010229	2016.08.12	Initial

1.10. Duty Cycle of EUT

Regarding to KDB789033 v01r02, B, the maximum duty cycles of all modes were investigated and set the spectrum analyzer as below
Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value, Set VBW ≥ RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100.

Mode	Data Rate (Mbps)	Mode	Data Rate (Mbps)	Mode	Data Rate (Mbps)	Mode	Data Rate (Mbps)
11a	**6**	**11n_HT20**	**MCS0**	**11n_HT40**	**MCS0**	**11ac_VHT80**	**MCS0**
Duty Cycle (%)	0.98	Duty Cycle (%)	0.98	Duty Cycle (%)	0.97	Duty Cycle (%)	0.93
Correction factor (dB)	0.09	Correction factor (dB)	0.09	Correction factor (dB)	0.13	Correction factor (dB)	0.32

Remark:

1. As measured duty cycles of EUT, all of mode and data rate keep constant period and are converted to log scale (power averaging) to compensate correction factor to result of average test items.
2. Duty cycle (%) = (Tx on time / Tx on + off time) x 100
3. Correction factor (dB) = 10 log (1 / Duty cycle)

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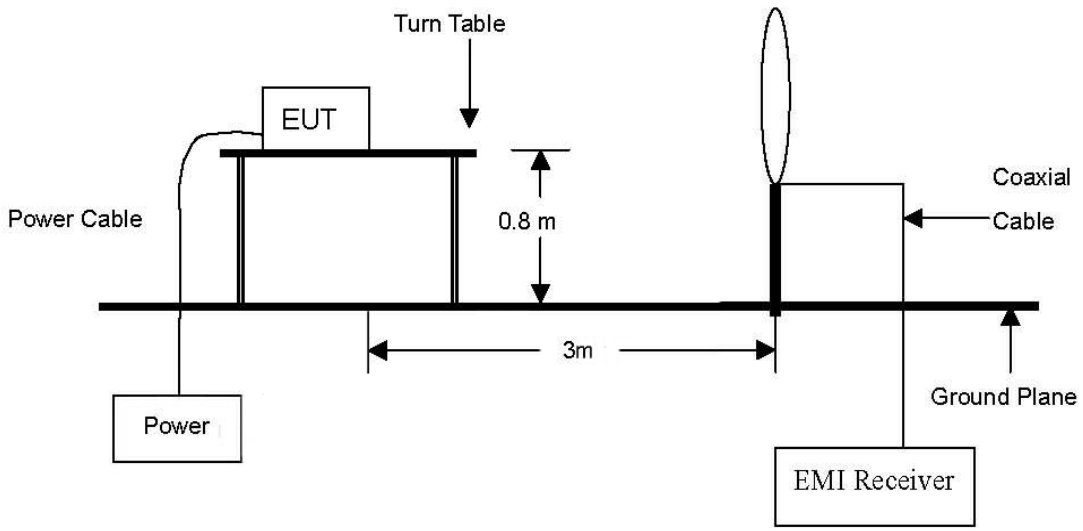
2. Transmitter Radiated Spurious Emissions

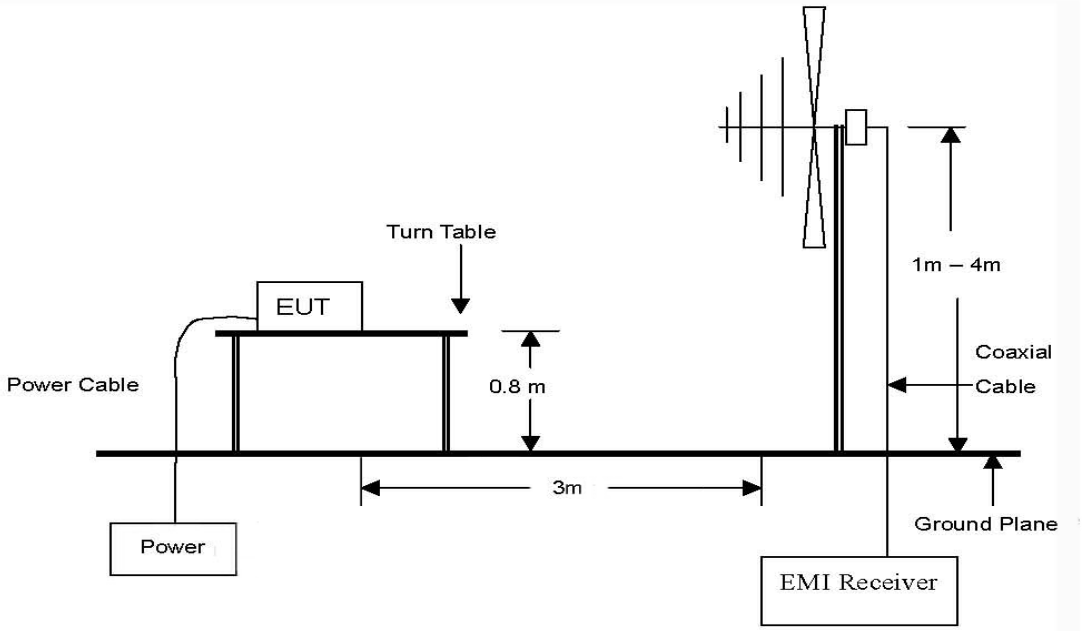
2.1. Test setup

2.1.1. Transmitter Radiated Spurious Emissions

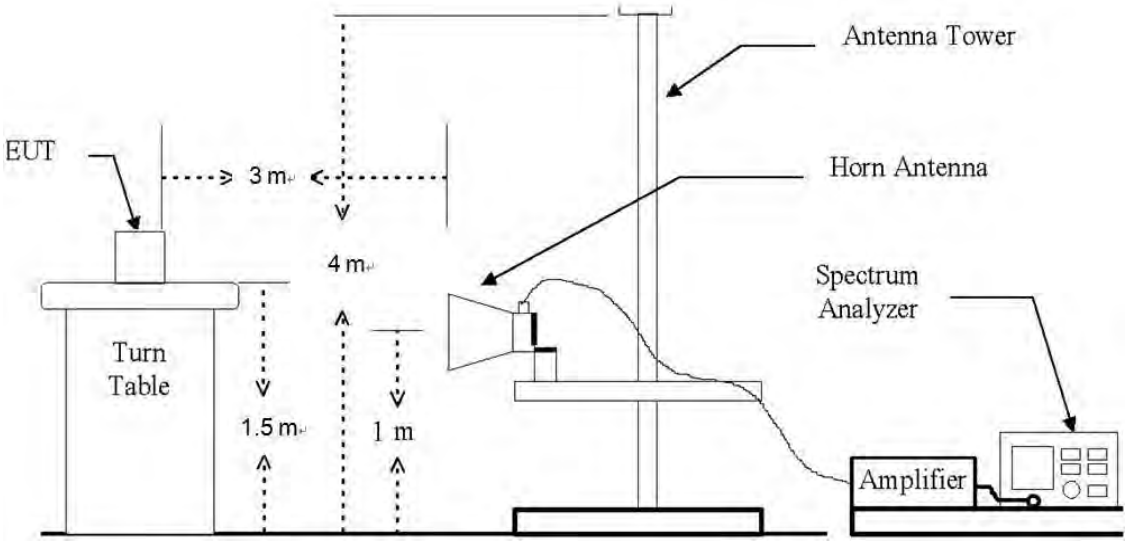
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 ㎑ to 30 ㎒ Emissions.



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



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



2.2. Limit

FCC

For transmitters operating in the 5.15-5.25 ㎓ band: all emissions outside of the 5.15-5.35 ㎓ band shall not exceed an EIRP of -27 ㏈m/㎒.

For transmitters operating in the 5.25-5.35 ㎓ band: all emissions outside of the 5.15-5.35 ㎓ band shall not exceed an EIRP of -27 ㏈m/㎒.

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

For transmitters operating in the 5.725-5.85 ㎓ band: all emissions shall be limited to a level of -27 ㏈m/㎒ at 75 ㎒ or more above or below the band edge increasing linearly to 10 ㏈m/㎒ at 20 ㎒ above or below the band edge, and from 25 ㎒ above or below the band edge increasing linearly to a level of 15.6 ㏈m/㎒ at 5 ㎒ above or below the band edge, and from 5 ㎒ above or below the band edge increasing linearly to a level of 27 ㏈m/㎒ at the band edge.

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 (㎒)	Distance (Meters)	Field Strength (dBμV/m)	Field Strength (μV/m)
0.009 - 0.490	300	20 log (2 400/F(㎑))	2 400/F(㎑)
0.490 - 1.705	30	20 log (24 000/F(㎑))	24 000/F(㎑)
1.705 - 30.0	30	29.54	30
30 - 88	3	40.0	100**
88 - 216	3	43.5	150**
216 - 960	3	46.0	200**
Above 960	3	54.0	500

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 ㎒, 76-88 ㎒, 174-216 ㎒ or 470-806 ㎒. However, operation within these frequency bands is permitted under other sections of this part, e.g., §15.231 and §15.241.

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IC

(1) Frequency Band 5 150-5 250 ㎒

For transmitters operating in the band 5 150-5 250 ㎒, all emissions outside the band 5 150-5 350 ㎒ shall not exceed -27 ㏈m/㎒ e.i.r.p. However, any unwanted emissions that fall into the band 5 250-5 350 ㎒ must be 26 ㏈ c, when measured using a resolution bandwidth between 1 and 5 % of the occupied bandwidth, above 5.25 ㎓. Otherwise, the transmission is considered as intentional and the devices shall implement dynamic frequency selection (DFS) and transmitter power control (TPC) as per the requirements for the band 5 250-5 350 ㎒.

(2) Band 5 250 - 5 350 ㎒

i) For devices with both operating frequencies and channel bandwidths contained within the band 5 250-5 350 ㎒, the device shall comply with the following:

a. All emissions outside the band 5 250-5 350 ㎒ shall not exceed -27 ㏈m/㎒ e.i.r.p. if the equipment is intended for outdoor use; or

b. All emissions outside the band 5 150-5 350 ㎒ shall not exceed -27 ㏈m/㎒ e.i.r.p. and any emissions within the band 5 150-5 250 ㎒ shall meet the power spectral density limits of Section 6.2.1. The device shall be labelled “for indoor use only.”

ii) For devices with operating frequencies in the band 5 250-5 350 ㎒ but having a channel bandwidth that overlaps the band 5 150-5 250 ㎒, the devices’ unwanted emission shall not exceed -27 ㏈m/㎒ e.i.r.p. outside the band 5 150-5 350 ㎒ and its power shall comply with the spectral power density for operation within the band 5 150-5 250 ㎒. The device shall be labelled “for indoor use only.”

(3) Bands 5 470 - 5 600 ㎒ and 5 650 - 5 725 ㎒

Emissions outside the band 5 470-5 725 ㎒ shall not exceed -27 ㏈m/㎒ e.i.r.p.

(4) Frequency Band 5 725-5 825 ㎒

For the band 5 725-5 850 ㎒, emissions at frequencies from the band edges to 10 ㎒ above or below the band edges shall not exceed -17 ㏈m/㎒ e.i.r.p.

For emissions at frequencies more than 10 ㎒ above or below the band edges, the emissions power shall not exceed -27 ㏈m/㎒.

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According to RSS-Gen Issue 4 8.9, Except when the requirements applicable to a given device state otherwise, the emissions from licence-exempt transmitters shall comply with the field strength limit shown in Table 4 or Table 5 below. Additionally, the level of any transmitter emission shall not exceed the level of the transmitter's fundamental emission.

Table 4- General Field Strength Limits for Licence-Exempt Transmitters at Frequencies Above 30 ㎒

Frequency (㎒)	Distance (Meters)	Field Strength (㎶/m)
30 - 88	3	100
88 - 216	3	150
216 - 960	3	200
Above 960*	3	500

* Unless otherwise specified, for all frequencies greater than 1 ㎓, the radiated emission limits for licence-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a linear average detector function having a minimum resolution bandwidth of 1 ㎒. If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for such factors as pulse desensitization to ensure the peak emission is less than 20 ㏈ above the average limit.

Note: Transmitting devices are not permitted in restricted frequency bands unless stated otherwise in the specific RSS.

Table 5- General Field Strength Limits for Licence-Exempt Transmitters at Frequencies Below 30 ㎒

Frequency (㎒)	Electric Field Strength (㎶/m)	Magnetic Field Strength (㎶/m)	Distance (Meters)
9 - 490 ㎑	2,400/F (F in ㎑)	2,400/377F (F in ㎑)	300
490 - 1,705 ㎑	24,000/F (F in ㎑)	24,000/377F (F in ㎑)	30
1.705 - 30 ㎒	30	N/A	30

Note: The emission limits for the bands 9-90 ㎑ and 110-490 ㎑ are based on measurements employing a linear average detector. Transmitting devices are not permitted in restricted frequency bands unless stated otherwise in the relevant RSS.

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2.3. Test procedures

Radiated spurious emissions from the EUT were measured according to the dictates in section G of KDB 789033_v01r02 and ANSI C63.10-2013.

2.3.1. Test Procedures for emission below 30 ㎒

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. Then antenna is a loop antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement.
3. For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading.
4. The test-receiver system was set to average or quasi peak detect function and Specified Bandwidth with Maximum Hold Mode.

Note;
Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 meter open field test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 937606.

2.3.2. Test Procedures for emission from above 30 ㎒

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 below 1 ㎓ and 1.5 meters above the ground at a 3 meter anechoic chamber test site above 1 ㎓. The table was rotated 360 degrees to determine the position of the highest radiation.
2. During performing radiated emission below 1 ㎓, 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 ㎓, the EUT was set 3 meter away from the interference-receiving antenna.
3. The antenna is a bi-log antenna, a horn 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 ㏈ 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 ㏈ margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

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NOTE;

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

- The measurements for below 1 ㎓ refer to section II.G.4.
  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 ㎓ II.G.5.
  Peak emission levels are measured by setting the analyzer as follows:
  Set to RBW = 1 ㎒, VBW ≥ 3 ㎒, Detector = Peak, Sweep time = auto, Trace mode= Max hold

- The measurements for above 1 ㎓ II.G.6.
Average emission levels are measured by setting the analyzer as follows:
Set to RBW = 1 ㎒, VBW ≥ 3 ㎒, Detector = power averaging (rms), Averaging type = power averaging (rms), Sweep time = auto, Perform a trace average of at least 100 traces If the transmission is continuous, 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. For example, with 50% duty cycle, at least 200 traces shall be averaged.

If tests are performed with the EUT transmitting at a duty cycle less than 98%, a correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:

- If power averaging (rms) mode was used in step (iv) above, the correction factor is 10 log (1/x), where x is the duty cycle. For example, if the transmit duty cycle was 50%, then 3 dB must be added to the measured emission levels.

- If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning on and off with the transmit cycle, no duty cycle correction is required for that emission.

- To get a maximum emission level from the EUT, the EUT is manipulated through three orthogonal planes (X, Y, Z). Worst orthogonal plan of EUT is **Z – axis** during radiation test.

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2.4. Test result

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

2.4.1. Radiated Spurious Emission below 1 000 ㎒

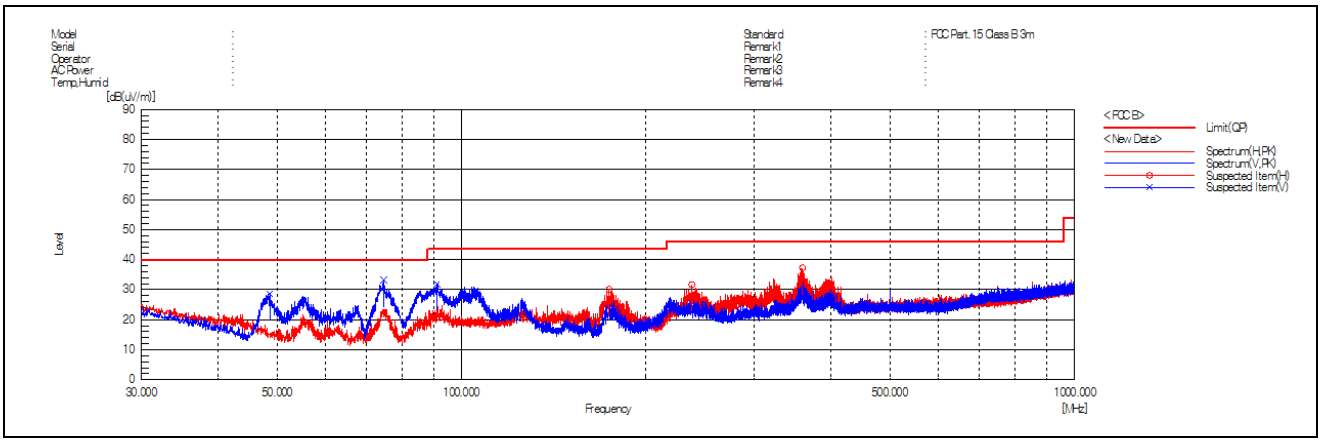
The frequency spectrum from 9 ㎑ to 1 000 ㎒ was investigated. All reading values are peak values.

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP + CL (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
48.63	46.10	Peak	V	9.51	-27.00	28.61	40.00	11.39
74.62	51.40	Peak	V	8.67	-26.72	33.35	40.00	6.65
91.07	47.90	Peak	V	10.77	-26.60	32.07	43.50	11.43
174.01	44.80	Peak	H	11.34	-25.86	30.28	43.50	13.22
237.54	44.30	Peak	H	12.86	-25.34	31.82	46.00	14.18
359.92	47.00	Peak	H	15.82	-25.07	37.75	46.00	8.25
Above 400.00	Not detected	-	-	-	-	-	-	-

Remark:

1. Spurious emissions for all channels and modes were investigated and almost the same below 1 ㎓.
2. Reported spurious emissions are in **11a (Band 1) / 6Mbps / Low channel** as worst case among other modes.
3. Radiated spurious emission measurement as below.
   (Actual = Reading + AF + AMP + CL)
4. According to §15.31(o), emission levels are not report much lower than the limits by over 20 ㏈.

Test plot



2.4.2. Radiated Spurious Emission above 1 000 ㎒

802.11a (Band 1)_6 Mbps

A. Low channel (5 180 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*4 500.00	18.06	Peak	V	31.84	6.48	-	56.38	74.00	17.62
*4 500.00	7.76	Average	V	31.84	6.48	-	46.08	54.00	7.92
*5 149.34	20.70	Peak	V	33.38	7.87	-	61.95	74.00	12.05
*5 147.15	9.00	Average	V	33.38	7.86	-	50.24	54.00	3.76
*5 150.00	20.76	Peak	V	33.38	7.87	-	62.01	74.00	11.99
*5 150.00	9.16	Average	V	33.38	7.87	-	50.41	54.00	3.59

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 357.10	37.17	Peak	H	37.67	-24.39	-	50.45	68.23	17.78
Above 10 400.00	Not detected	-	-	-	-	-	-	-	-

B. Middle channel (5 200 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 398.45	37.22	Peak	H	37.69	-25.03	-	49.88	68.23	18.35
Above 10 400.00	Not detected	-	-	-	-	-	-	-	-

C. High channel (5 240 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 480.62	36.91	Peak	H	37.73	-24.93	-	49.71	68.23	18.52
Above 10 500.00	Not detected	-	-	-	-	-	-	-	-

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802.11a (Band 2A)_6 Mbps

A. Low channel (5 260 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 518.39	37.23	Peak	H	37.75	-24.92	-	50.06	68.23	18.17
Above 10 600.00	Not detected	-	-	-	-	-	-	-	-

B. Middle channel (5 280 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 563.33	37.54	Peak	H	37.78	-24.96	-	50.36	68.23	17.87
Above 10 600.00	Not detected	-	-	-	-	-	-	-	-

C. High channel (5 320 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*5 350.00	17.59	Peak	V	33.66	7.94	-	59.19	74.00	14.81
*5 350.00	7.61	Average	V	33.66	7.94	-	49.21	54.00	4.79
*5 411.98	18.69	Peak	V	33.74	8.69	-	61.12	74.00	12.88
*5 351.50	8.21	Average	V	33.66	7.97	-	49.84	54.00	4.16
*5 460.00	15.99	Peak	V	33.81	8.10	-	57.90	74.00	16.10
*5 460.00	7.18	Average	V	33.81	8.10	-	49.09	54.00	4.91

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*10 639.15	37.45	Peak	H	37.83	-25.37	-	49.91	74.00	24.09
*10 638.84	26.23	Average	H	37.83	-25.36	-	38.70	54.00	15.30
Above 10 700.00	Not detected	-	-	-	-	-	-	-	-

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802.11a (Band 2C)_6 Mbps

A. Low channel (5 500 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*5 350.00	16.79	Peak	V	33.66	7.94	-	58.39	74.00	15.61
*5 350.00	7.23	Average	V	33.66	7.94	-	48.83	54.00	5.17
*5 457.80	19.34	Peak	V	33.80	8.09	-	61.23	74.00	12.77
*5 459.40	7.98	Average	V	33.80	8.10	-	49.88	54.00	4.12
*5 460.00	17.83	Peak	V	33.81	8.10	-	59.74	74.00	14.26
*5 460.00	7.66	Average	V	33.81	8.10	-	49.57	54.00	4.43

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*10 997.88	36.48	Peak	H	38.08	-26.24	-	48.32	74.00	25.68
*11 001.67	25.29	Average	H	38.08	-26.23	-	37.14	54.00	16.86
Above 11 100.00	Not detected	-	-	-	-	-	-	-	-

B. Middle channel (5 580 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 162.26	36.70	Peak	H	38.20	-25.67	-	49.23	74.00	24.77
*11 159.34	26.15	Average	H	38.20	-25.67	-	38.68	54.00	15.32
Above 11 200.00	Not detected	-	-	-	-	-	-	-	-

C. High channel (5 720 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 442.79	37.91	Peak	H	38.41	-25.38	-	50.94	74.00	23.06
*11 441.65	25.86	Average	H	38.41	-25.38	-	38.89	54.00	15.11
Above 11 500.00	Not detected	-	-	-	-	-	-	-	-

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802.11a (Band 3)_6 Mbps

A. Low channel (5 745 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 648.82	19.60	Peak	V	34.10	8.53	-	62.23	68.23	6.00

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 489.40	35.96	Peak	H	38.44	-25.42	-	48.98	74.00	25.02
*11 487.50	25.41	Average	H	38.44	-25.42	-	38.43	54.00	15.57
Above 11 500.00	Not detected	-	-	-	-	-	-	-	-

B. Middle channel (5 785 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 566.55	35.82	Peak	H	38.43	-24.99	-	49.26	74.00	24.74
*11 569.81	24.82	Average	H	38.43	-24.96	-	38.29	54.00	15.71
Above 11 600.00	Not detected	-	-	-	-	-	-	-	-

C. High channel (5 825 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 935.10	19.12	Peak	V	34.57	9.18	-	62.87	68.23	5.36

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 649.83	36.94	Peak	H	38.41	-24.92	-	50.43	74.00	23.57
*11 648.68	25.79	Average	H	38.41	-24.92	-	39.28	54.00	14.72
Above 11 700.00	Not detected	-	-	-	-	-	-	-	-

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802.11n_HT20 (Band 1)_MCS0

A. Low channel (5 180 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*4 500.00	17.00	Peak	V	31.84	6.48	-	55.32	74.00	18.68
*4 500.00	8.32	Average	V	31.84	6.48	-	46.64	54.00	7.36
*4 629.58	19.94	Peak	V	32.19	7.01	-	59.14	74.00	14.86
*5 144.23	9.34	Average	V	33.38	7.84	-	50.56	54.00	3.44
*5 150.00	18.98	Peak	V	33.38	7.87	-	60.23	74.00	13.77
*5 150.00	8.68	Average	V	33.38	7.87	-	49.93	54.00	4.07

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 359.02	36.52	Peak	H	37.67	-24.42	-	49.77	68.23	18.46
Above 10 400.00	Not detected	-	-	-	-	-	-	-	-

B. Middle channel (5 200 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 402.81	37.66	Peak	H	37.69	-25.05	-	50.30	68.23	17.93
Above 10 500.00	Not detected	-	-	-	-	-	-	-	-

C. High channel (5 240 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 478.71	37.32	Peak	H	37.73	-24.93	-	50.12	68.23	18.11
Above 10 500.00	Not detected	-	-	-	-	-	-	-	-

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802.11n_HT20 (Band 2A)_MCS0

A. Low channel (5 260 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 516.56	36.82	Peak	H	37.75	-24.91	-	49.66	68.23	18.57
Above 10 600.00	Not detected	-	-	-	-	-	-	-	-

B. Middle channel (5 280 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 560.71	36.67	Peak	H	37.78	-24.95	-	49.50	68.23	18.73
Above 10 600.00	Not detected	-	-	-	-	-	-	-	-

C. High channel (5 320 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*5 350.00	16.45	Peak	V	33.66	7.94	-	58.05	74.00	15.95
*5 350.00	8.05	Average	V	33.66	7.94	-	49.65	54.00	4.35
*5 365.00	19.05	Peak	V	33.68	8.22	-	60.95	74.00	13.05
*5 355.10	8.37	Average	V	33.66	8.04	-	50.07	54.00	3.93
*5 460.00	16.65	Peak	V	33.81	8.10	-	58.56	74.00	15.44
*5 460.00	7.41	Average	V	33.81	8.10	-	49.32	54.00	4.68

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*10 639.57	37.21	Peak	H	37.83	-25.37	-	49.67	74.00	24.33
*10 638.08	26.69	Average	H	37.83	-25.35	-	39.17	54.00	14.83
Above 10 700.00	Not detected	-	-	-	-	-	-	-	-

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802.11n_HT20 (Band 2C)_MCS0

A. Low channel (5 500 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*5 350.00	16.90	Peak	V	33.66	7.94	-	58.50	74.00	15.50
*5 350.00	7.37	Average	V	33.66	7.94	-	48.97	54.00	5.03
*5 458.80	19.27	Peak	V	33.80	8.09	-	61.16	74.00	12.84
*5 459.40	7.86	Average	V	33.80	8.10	-	49.76	54.00	4.24
*5 460.00	18.58	Peak	V	33.81	8.10	-	60.49	74.00	13.51
*5 460.00	7.65	Average	V	33.81	8.10	-	49.56	54.00	4.44

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*10 999.90	36.60	Peak	H	38.08	-26.24	-	48.44	74.00	25.56
*10 999.70	25.24	Average	H	38.08	-26.24	-	37.08	54.00	16.92
Above 11 000.00	Not detected	-	-	-	-	-	-	-	-

B. Middle channel (5 580 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 159.47	36.86	Peak	H	38.20	-25.67	-	49.39	74.00	24.61
*11 158.21	26.14	Average	H	38.20	-25.66	-	38.68	54.00	15.32
Above 11 200.00	Not detected	-	-	-	-	-	-	-	-

C. High channel (5 720 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 442.23	36.71	Peak	H	38.41	-25.38	-	49.74	74.00	24.26
*11 441.18	25.85	Average	H	38.41	-25.38	-	38.88	54.00	15.12
Above 11 500.00	Not detected	-	-	-	-	-	-	-	-

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802.11n_HT20 (Band 3)_MCS0

A. Low channel (5 745 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 637.80	19.95	Peak	V	34.09	8.51	-	62.55	68.23	5.68

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 491.91	35.94	Peak	H	38.44	-25.42	-	48.96	74.00	25.04
*11 489.28	24.93	Average	H	38.44	-25.43	-	37.94	54.00	16.06
Above 11 500.00	Not detected	-	-	-	-	-	-	-	-

B. Middle channel (5 785 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 567.03	36.03	Peak	H	38.43	-24.98	-	49.48	74.00	24.52
*11 568.50	24.81	Average	H	38.43	-24.97	-	38.27	54.00	15.73
Above 11 600.00	Not detected	-	-	-	-	-	-	-	-

C. High channel (5 825 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 922.35	19.27	Peak	V	34.55	9.23	-	63.05	70.19	7.14
5 928.65	19.53	Peak	V	34.56	9.21	-	63.30	68.23	4.93

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 647.74	37.16	Peak	H	38.41	-24.91	-	50.66	74.00	23.34
*11 648.79	25.72	Average	H	38.41	-24.92	-	39.21	54.00	14.79
Above 11 700.00	Not detected	-	-	-	-	-	-	-	-

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802.11n_HT40 (Band 1)_MCS0

A. Low channel (5 190 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*4 500.00	20.21	Peak	V	31.84	6.48	-	58.53	74.00	15.47
*4 500.00	8.36	Average	V	31.84	6.48	0.13	46.81	54.00	7.19
*5 149.30	22.59	Peak	V	33.38	7.87	-	63.84	74.00	10.16
*5 149.30	11.11	Average	V	33.38	7.87	0.13	52.49	54.00	1.51
*5 150.00	22.58	Peak	V	33.38	7.87	-	63.83	74.00	10.17
*5 150.00	11.05	Average	V	33.38	7.87	0.13	52.43	54.00	1.57

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 382.13	37.33	Peak	H	37.68	-24.77	-	50.24	68.23	17.99
Above 10 400.00	Not detected	-	-	-	-	-	-	-	-

B. High channel (5 230 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 457.11	38.08	Peak	H	37.72	-24.96	-	50.84	68.23	17.39
Above 10 500.00	Not detected	-	-	-	-	-	-	-	-

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802. 11n_HT40 (Band 2A)_MCS0

A. Low channel (5 270 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 542.44	37.56	Peak	H	37.77	-24.93	-	50.40	68.23	17.83
Above 10 600.00	Not detected	-	-	-	-	-	-	-	-

B. High channel (5 310 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*5 350.00	17.28	Peak	V	33.66	7.94	-	58.88	74.00	15.12
*5 350.00	8.22	Average	V	33.66	7.94	0.13	49.95	54.00	4.05
*5 402.15	19.66	Peak	V	33.73	8.85	-	62.24	74.00	11.76
*5 356.93	8.23	Average	V	33.67	8.07	0.13	50.10	54.00	3.90
*5 460.00	17.82	Peak	V	33.81	8.10	-	59.73	74.00	14.27
*5 460.00	7.27	Average	V	33.81	8.10	0.13	49.31	54.00	4.69

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*10 622.45	37.27	Peak	H	37.82	-25.20	-	49.89	74.00	24.11
*10 622.18	26.05	Average	H	37.82	-25.20	0.13	38.80	54.00	15.20
Above 10 700.00	Not detected	-	-	-	-	-	-	-	-

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802. 11n_HT40 (Band 2C)_MCS0

A. Low channel (5 510 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*5 350.00	16.58	Peak	V	33.66	7.94	-	58.18	74.00	15.82
*5 350.00	7.89	Average	V	33.66	7.94	0.13	49.62	54.00	4.38
*5 458.99	19.86	Peak	V	33.80	8.10	-	61.76	74.00	12.24
*5 458.57	9.48	Average	V	33.80	8.09	0.13	51.50	54.00	2.50
*5 460.00	18.71	Peak	V	33.81	8.10	-	60.62	74.00	13.38
*5 460.00	9.33	Average	V	33.81	8.10	0.13	51.37	54.00	2.63

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 017.47	36.61	Peak	H	38.09	-26.10	-	48.60	74.00	25.40
*11 021.95	25.99	Average	H	38.10	-26.07	0.13	38.15	54.00	15.85
Above 11 100.00	Not detected	-	-	-	-	-	-	-	-

B. Middle channel (5 550 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 101.38	36.71	Peak	H	38.16	-25.45	-	49.42	74.00	24.58
*11 100.83	25.49	Average	H	38.15	-25.44	0.13	38.33	54.00	15.67
Above 11 200.00	Not detected	-	-	-	-	-	-	-	-

C. High channel (5 710 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 418.21	36.22	Peak	H	38.39	-25.36	-	49.25	74.00	24.75
*11 422.03	25.70	Average	H	38.39	-25.37	0.13	38.85	54.00	15.15
Above 11 500.00	Not detected	-	-	-	-	-	-	-	-

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802.11n_HT40 (Band 3)_MCS0

A. Low channel (5 755 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 621.41	18.91	Peak	V	34.06	8.47	-	61.44	68.23	6.79

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 513.25	36.54	Peak	H	38.45	-25.34	-	49.65	74.00	24.35
*11 510.44	25.17	Average	H	38.45	-25.36	0.13	38.39	54.00	15.61
Above 11 600.00	Not detected	-	-	-	-	-	-	-	-

B. High channel (5 795 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 924.33	18.97	Peak	V	34.56	9.22	-	62.75	68.72	5.97
5 937.83	19.48	Peak	V	34.58	9.17	-	63.23	68.23	5.00

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 591.22	35.48	Peak	H	38.42	-24.82	-	49.08	74.00	24.92
*11 593.27	24.40	Average	H	38.42	-24.81	0.13	38.14	54.00	15.86
Above 11 600.00	Not detected	-	-	-	-	-	-	-	-

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802.11ac_VHT80 (Band 1)_MCS0

A. Middle channel (5 210 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*4 500.00	18.03	Peak	V	31.84	6.48	-	56.35	74.00	17.65
*4 500.00	8.20	Average	V	31.84	6.48	0.32	46.84	54.00	7.16
*5 147.68	19.25	Peak	V	33.38	7.86	-	60.49	74.00	13.51
*5 143.12	10.00	Average	V	33.37	7.84	0.32	51.53	54.00	2.47
*5 150.00	18.33	Peak	V	33.38	7.87	-	59.58	74.00	14.42
*5 150.00	9.52	Average	V	33.38	7.87	0.32	51.09	54.00	2.91

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 419.69	36.91	Peak	H	37.70	-25.02	-	49.59	68.23	18.64
Above 10 500.00	Not detected	-	-	-	-	-	-	-	-

802.11ac_VHT80 (Band 2A)_MCS0

A. Middle channel (5 290 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*5 350.00	18.01	Peak	V	33.66	7.94	-	59.61	74.00	14.39
*5 350.00	7.85	Average	V	33.66	7.94	0.32	49.77	54.00	4.23
*5 352.86	19.48	Peak	V	33.66	7.99	-	61.13	74.00	12.87
*5 352.86	8.74	Average	V	33.66	7.99	0.32	50.71	54.00	3.29
*5 460.00	16.85	Peak	V	33.81	8.10	-	58.76	74.00	15.24
*5 460.00	7.41	Average	V	33.81	8.10	0.32	49.64	54.00	4.36

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 582.41	36.91	Peak	H	37.80	-24.97	-	49.74	68.23	18.49
Above 10 600.00	Not detected	-	-	-	-	-	-	-	-

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802.11ac_VHT80 (Band 2C)_MCS0

A. Low channel (5 530 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*5 350.00	17.84	Peak	V	33.66	7.94	-	59.44	74.00	14.56
*5 350.00	7.26	Average	V	33.66	7.94	0.32	49.18	54.00	4.82
*5 454.92	21.30	Peak	V	33.80	8.08	-	63.18	74.00	10.82
*5 457.45	10.23	Average	V	33.80	8.09	0.32	52.44	54.00	1.56
*5 460.00	19.13	Peak	V	33.81	8.10	-	61.04	74.00	12.96
*5 460.00	10.06	Average	V	33.81	8.10	0.32	52.29	54.00	1.71

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 060.16	36.90	Peak	H	38.12	-25.76	-	49.26	74.00	24.74
*11 059.92	26.21	Average	H	38.12	-25.76	0.32	38.89	54.00	15.11
Above 11 100.00	Not detected	-	-	-	-	-	-	-	-

B. High channel (5 690 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 382.57	36.46	Peak	H	38.36	-25.24	-	49.58	74.00	24.42
*11 381.06	25.54	Average	H	38.36	-25.24	0.32	38.98	54.00	15.02
Above 11 400.00	Not detected	-	-	-	-	-	-	-	-

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802.11ac_VHT80 (Band 3)_MCS0

A. Middle channel (5 775 ㎒)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dB㎶)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
5 630.40	18.68	Peak	V	34.07	8.49	-	61.24	68.23	6.99
5 923.50	19.88	Peak	V	34.55	9.23	-	63.66	69.34	5.68
5 931.60	19.03	Peak	V	34.57	9.19	-	62.79	68.23	5.44

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (㎒)	Reading (dB㎶)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Duty (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
*11 549.80	36.20	Peak	H	38.44	-25.10	-	49.54	74.00	24.46
*11 547.84	25.72	Average	H	38.44	-25.11	0.32	39.37	54.00	14.63
Above 11 600.00	Not detected	-	-	-	-	-	-	-	-

Remark:

1. "*" means the restricted band.
2. Radiated emissions measured in frequency above 1 000 ㎒ were made with an instrument using Peak / average detector mode if frequency was in restricted band. Otherwise the frequency was out of restricted band, only peak detector should be used.
3. Band edge measurement.
   (Actual = Reading + AF + CL + Duty cycle)
4. Radiated spurious emission measurement.
   (Actual = Reading + AF + AMP + CL + Duty cycle)
5. If frequency was out of restricted band, the calculation method for peak limit is same as below.
   68.23 dB㎶/m = EIRP - 20 log(d) + 104.77 = -27 - 20 log (3) + 104.77
6. In case of the emissions within ±75 ㎒ from band edge of band 3, limit should be adjusted to emission mask of 15.407(4)(i).
7. According to § 15.31(o), Emission levels are not reported much lower than the limits by over 20 dB.

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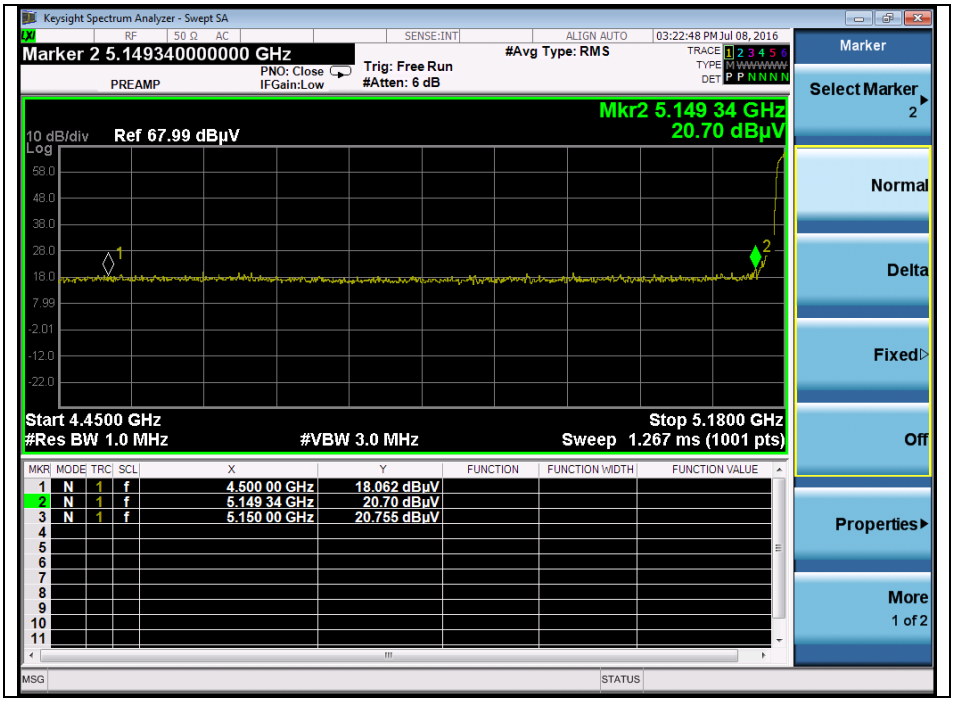
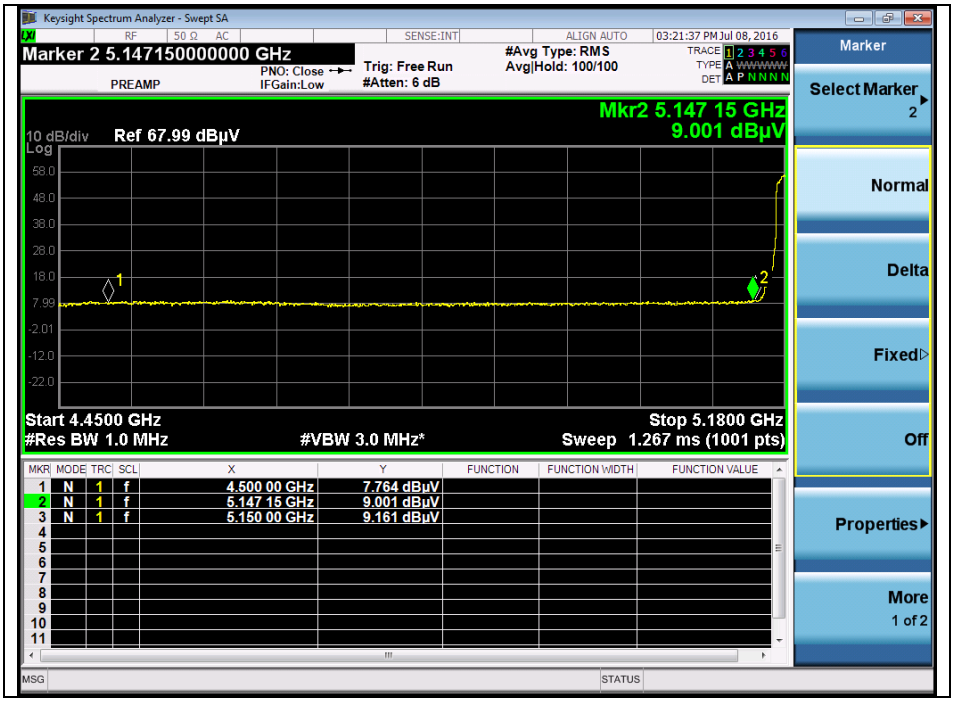
Plots of Spurious Emission

OFDM : 802.11a(6 Mbps)

Low channel band edge (Peak) - Band 1



Low channel band edge (Average) - Band 1



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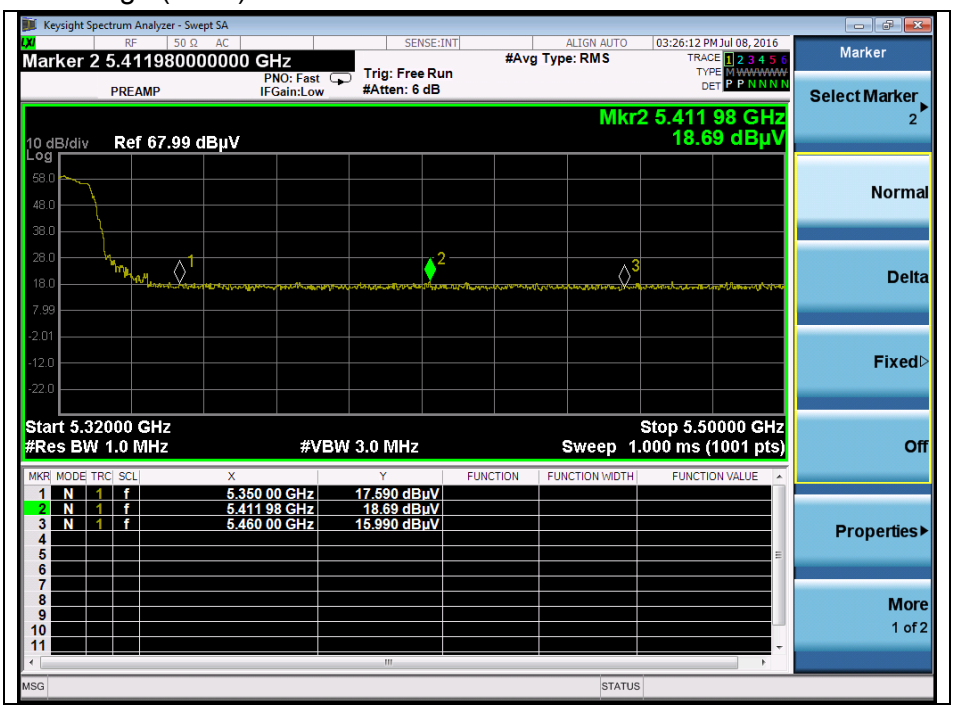
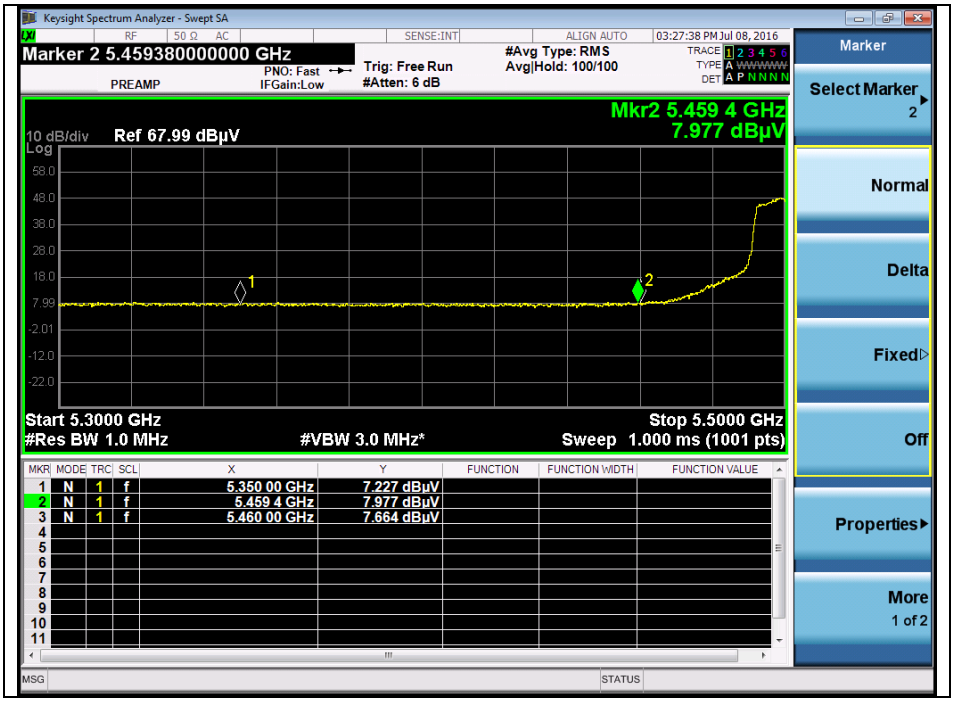
High channel band edge (Peak) - Band 2A



High channel band edge (Average) - Band 2A

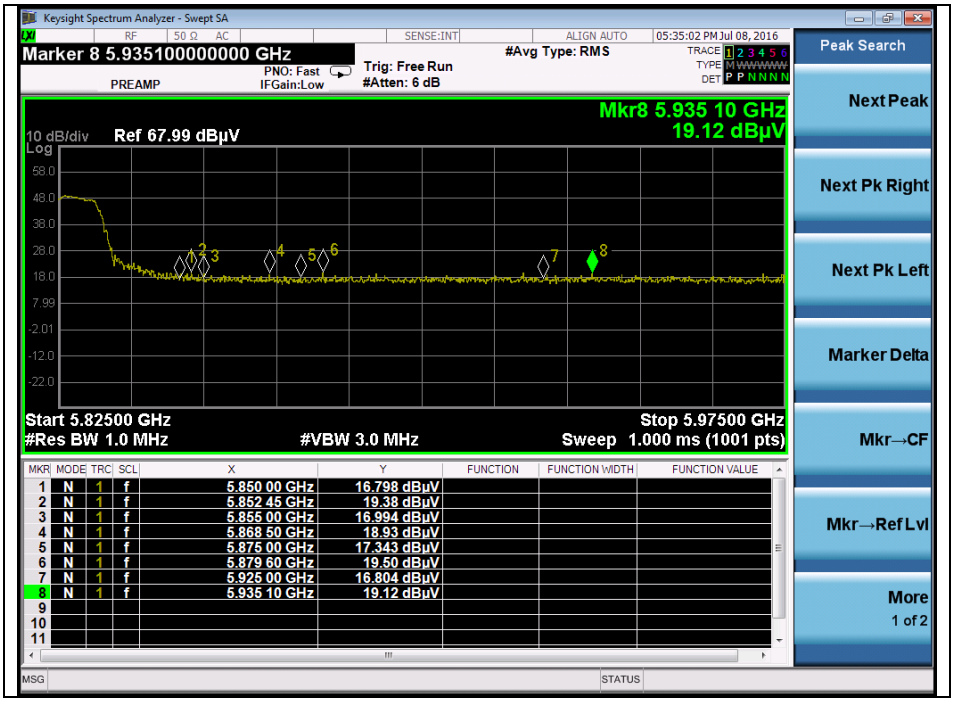
Low channel band edge (Peak) - Band 2C

Low channel band edge (Average) - Band 2C



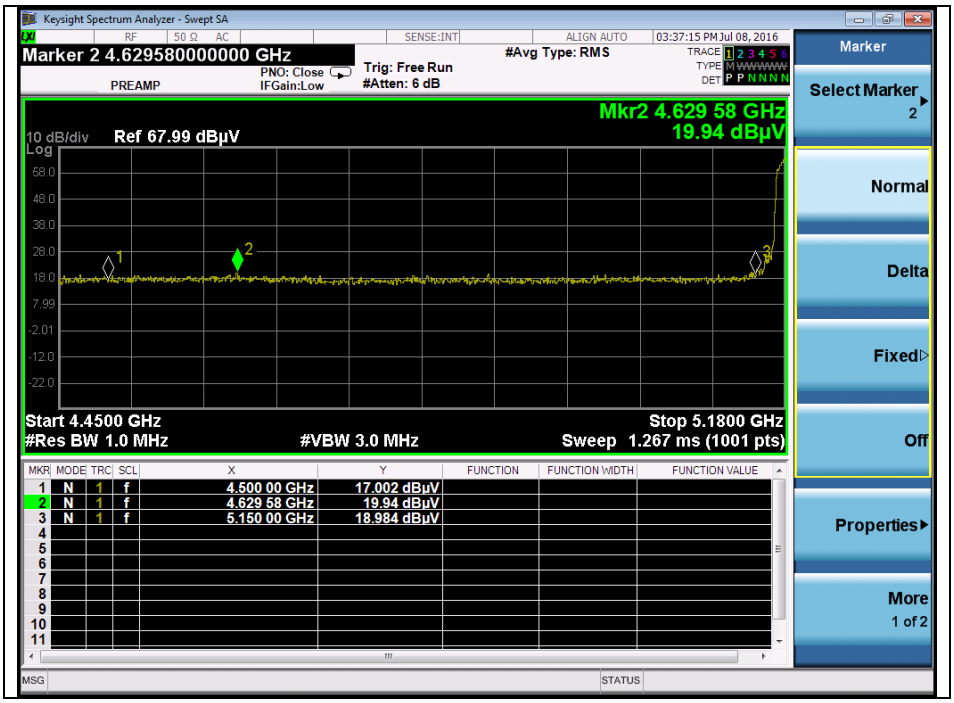
Low channel band edge (Peak) - Band 3

High channel band edge (Peak) - Band 3

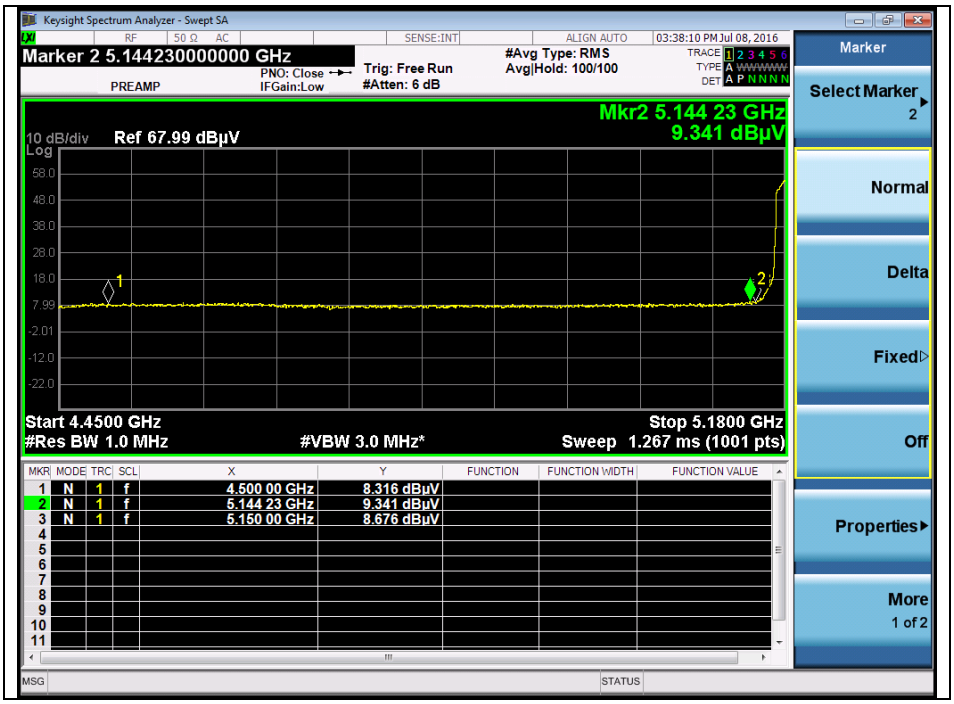


OFDM : 802.11n_HT20(MCS0)

Low channel band edge (Peak) - Band 1



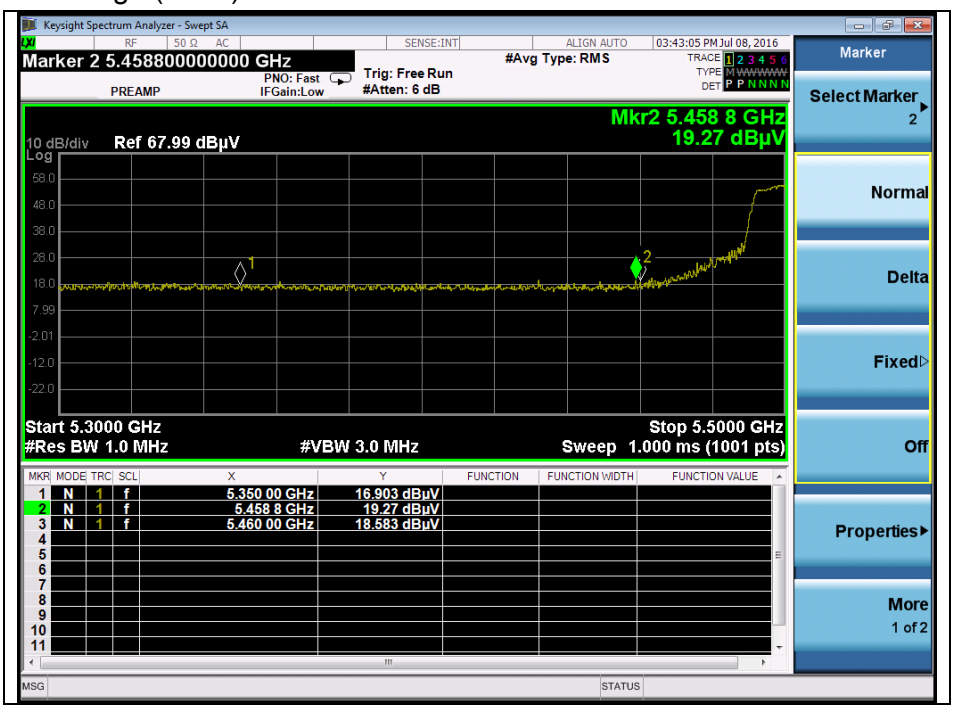
Low channel band edge (Average) - Band 1



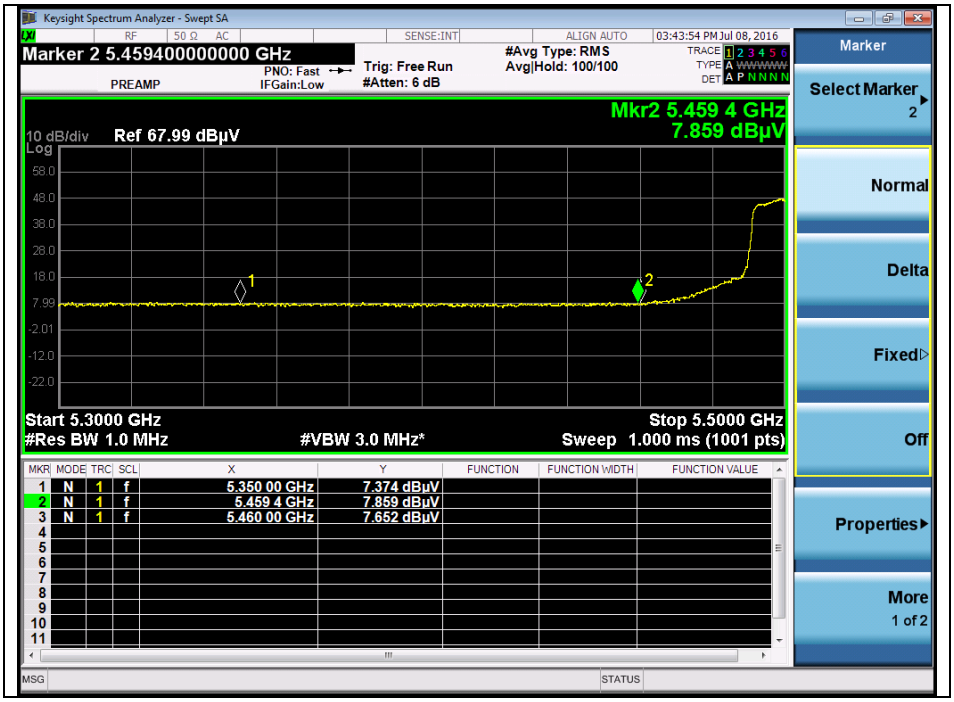
High channel band edge (Peak) - Band 2A

High channel band edge (Average) - Band 2A

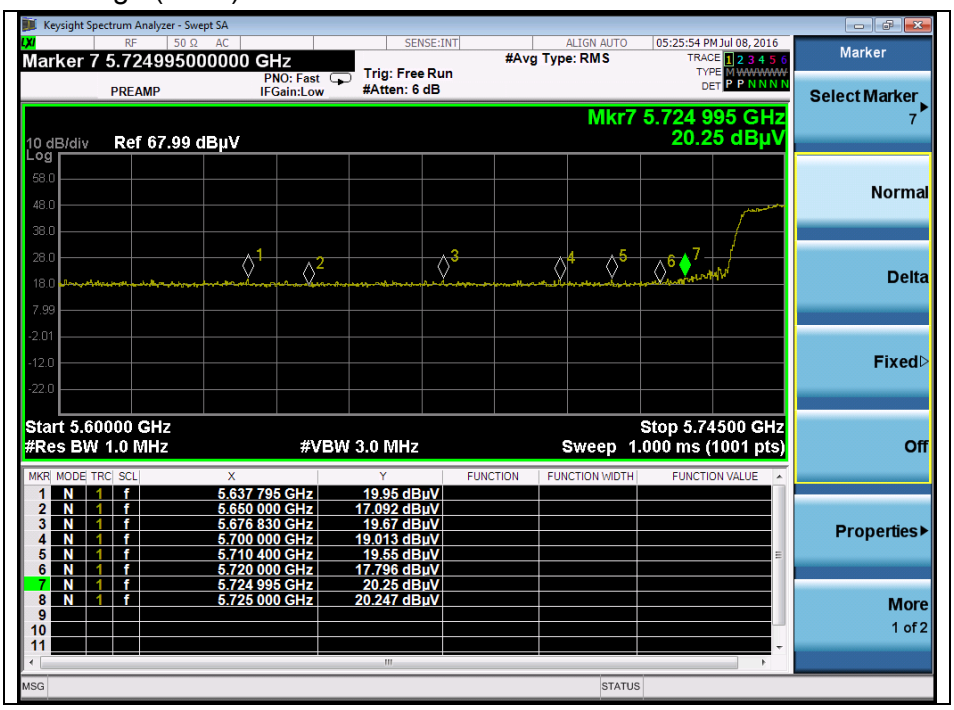
Low channel band edge (Peak) - Band 2C



Low channel band edge (Average) - Band 2C



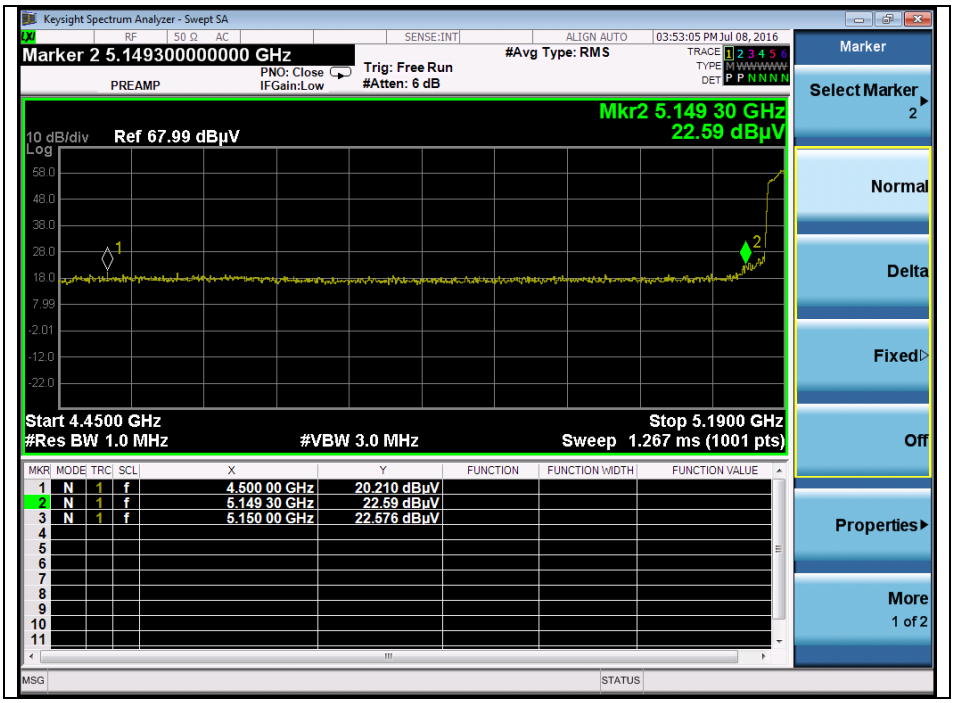
Low channel band edge (Peak) - Band 3



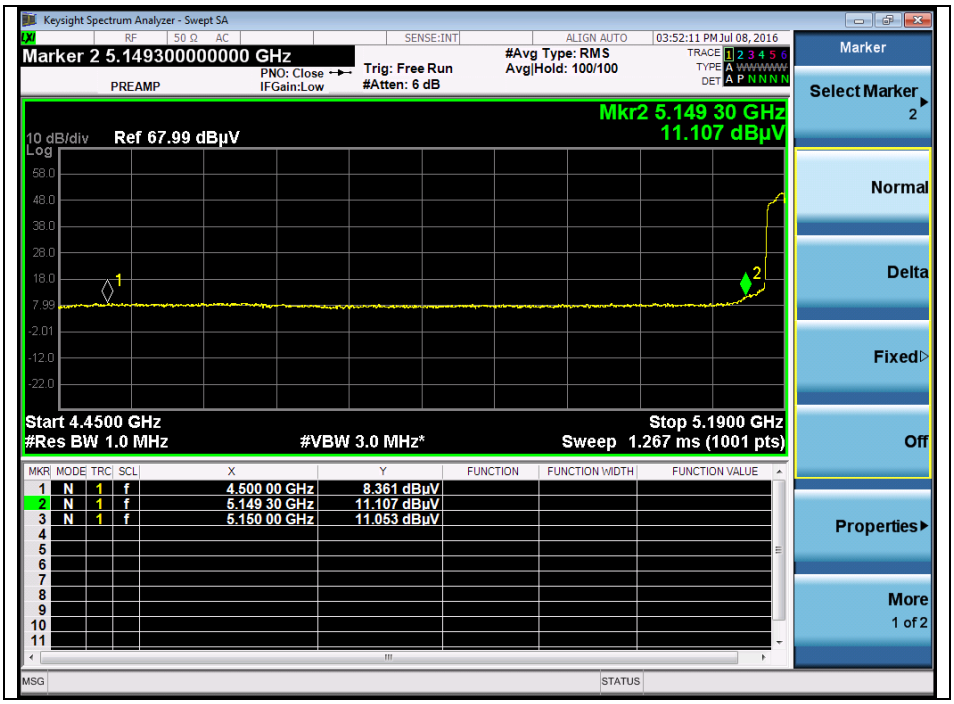
High channel band edge (Peak) - Band 3

OFDM : 802.11n_HT40(MCS0)

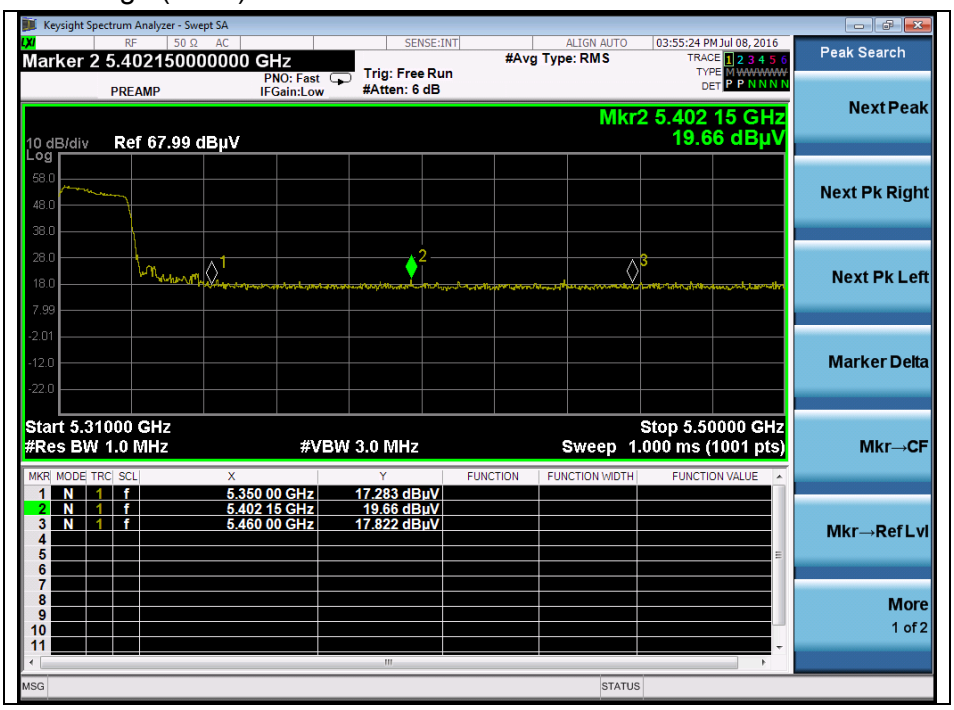
Low channel band edge (Peak) - Band 1



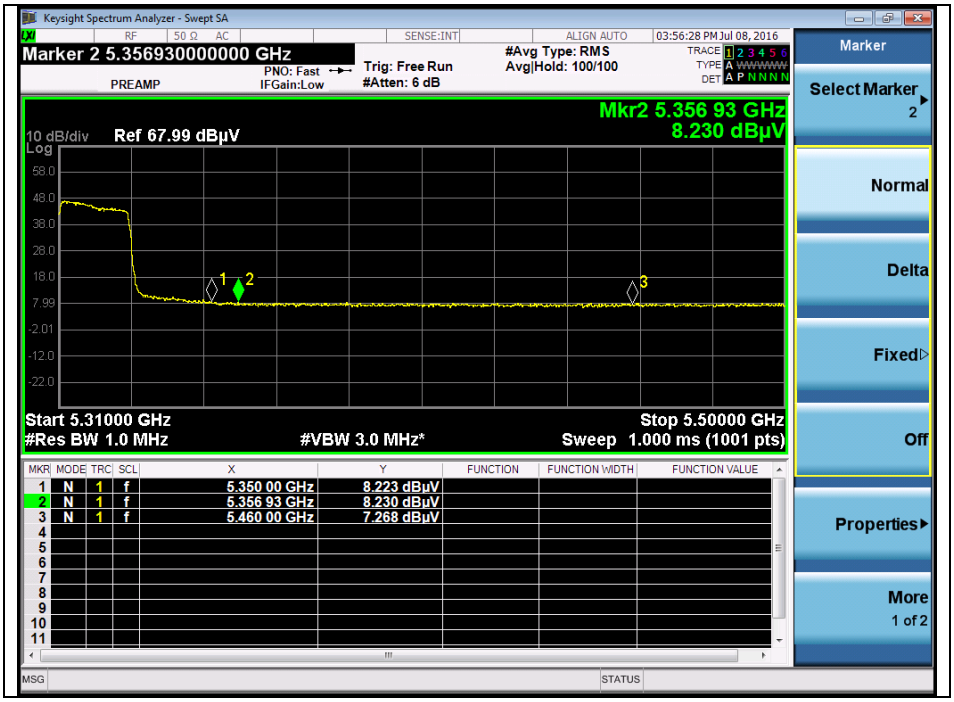
Low channel band edge (Average) - Band 1



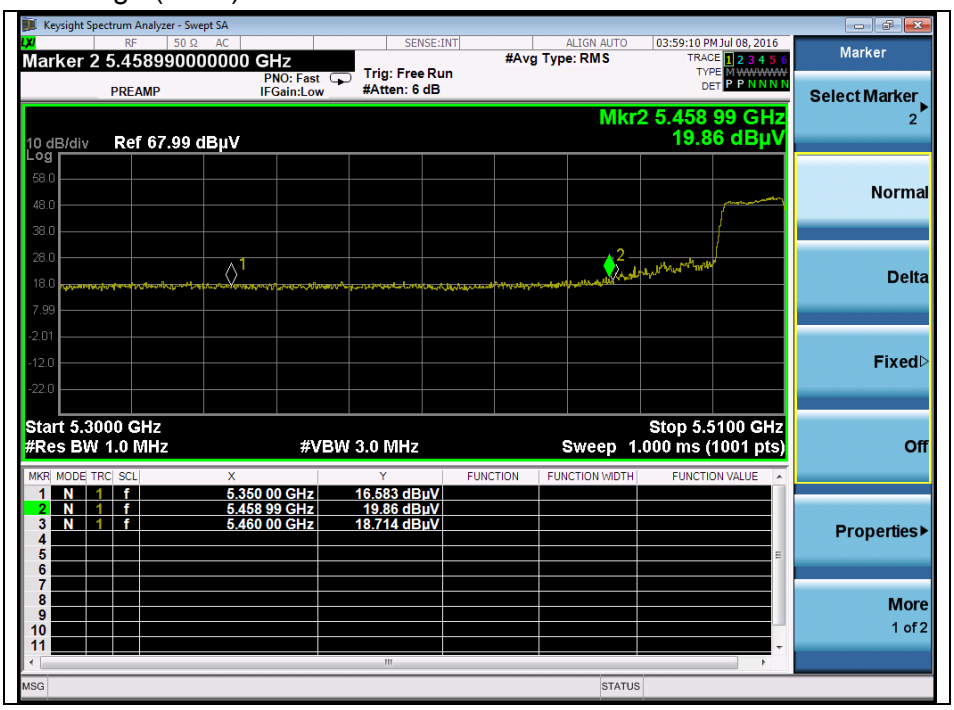
High channel band edge (Peak) - Band 2A



High channel band edge (Average) - Band 2A

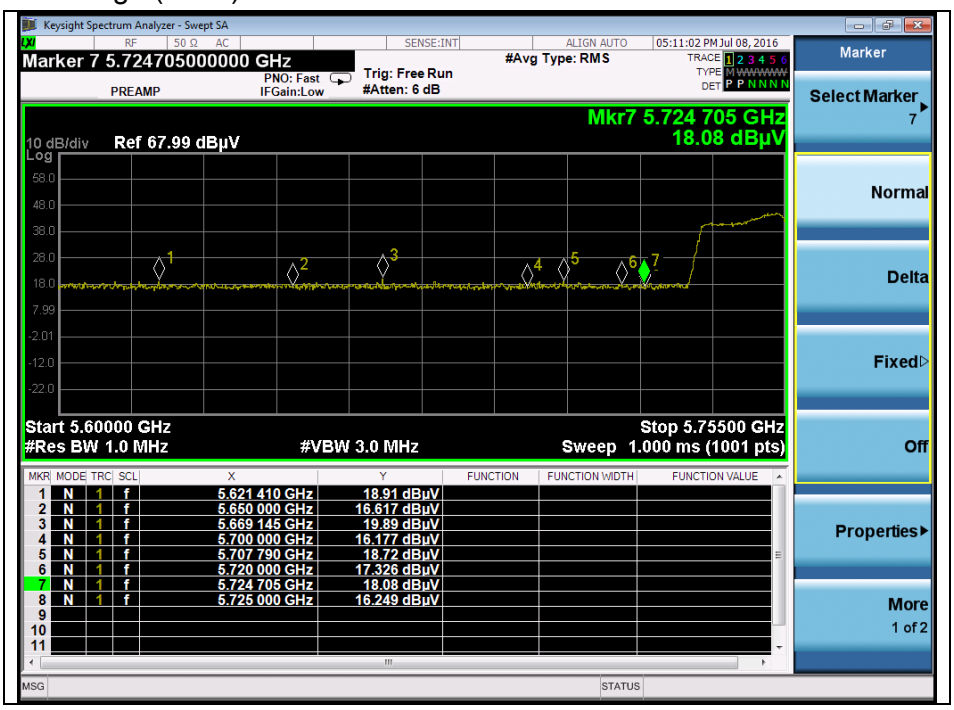


Low channel band edge (Peak) - Band 2C

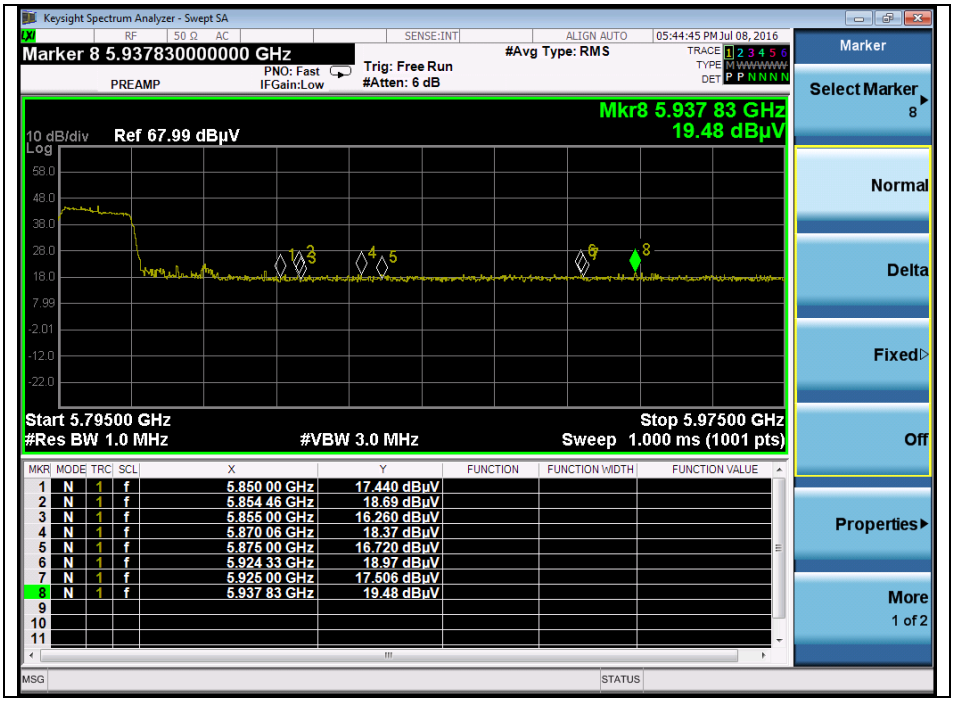


Low channel band edge (Average) - Band 2C

Low channel band edge (Peak) - Band 3

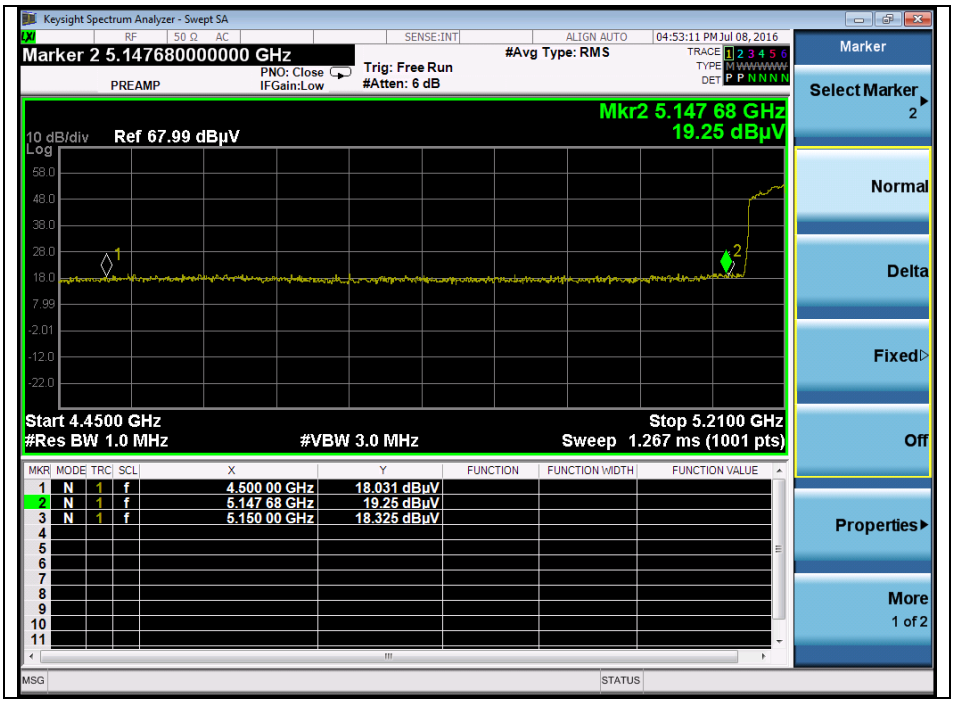


High channel band edge (Peak) - Band 3

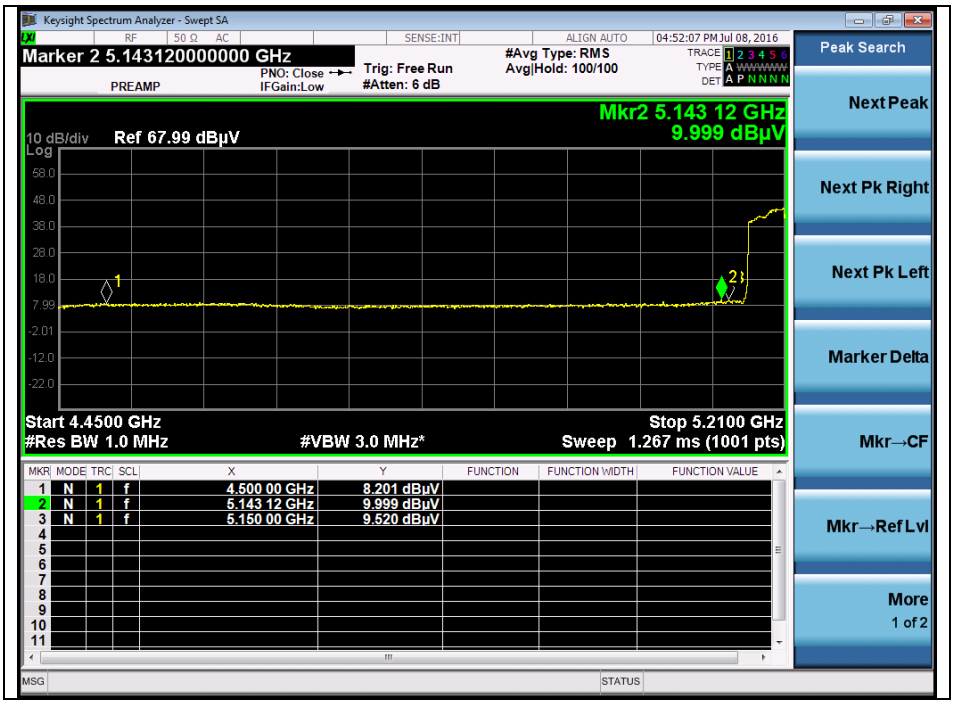


OFDM : 802.11ac_VHT80(MCS0)

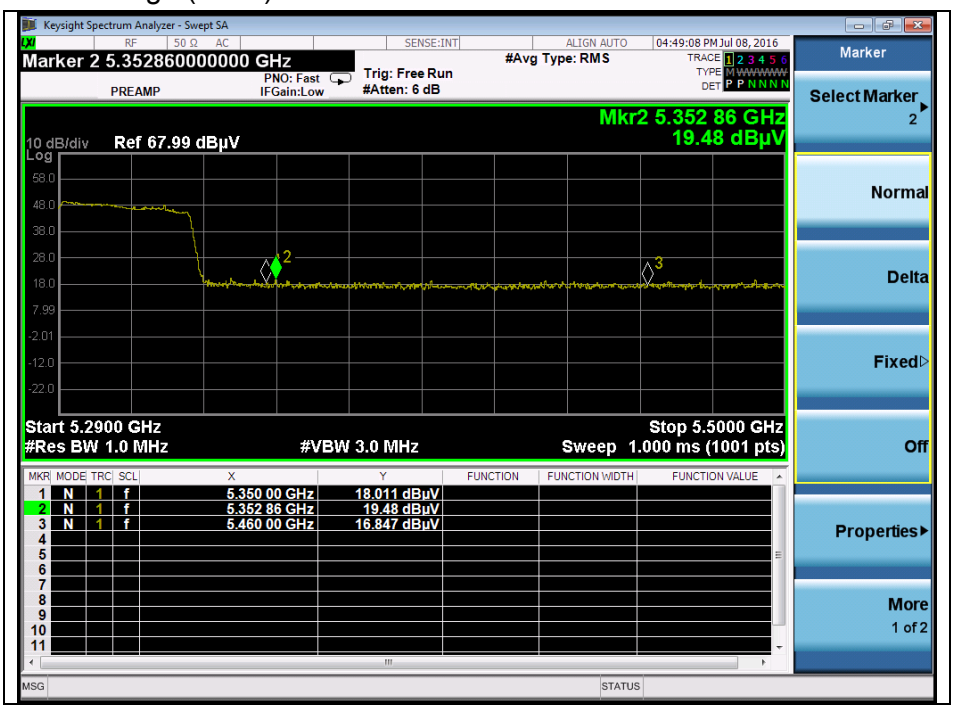
Middle channel band edge (Peak) - Band 1



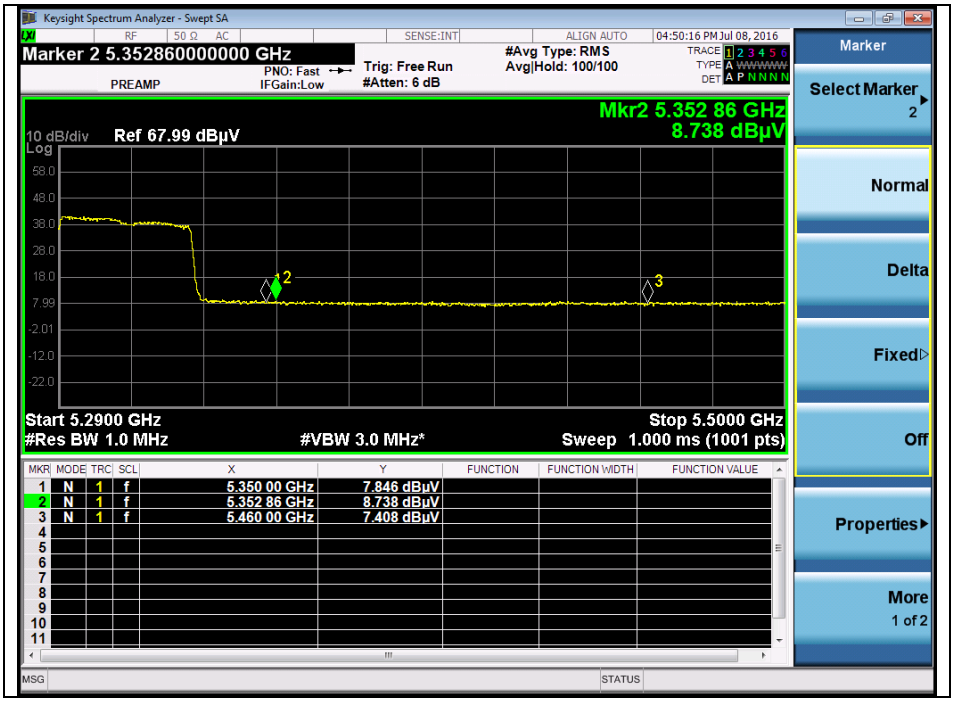
Middle channel band edge (Average) - Band 1



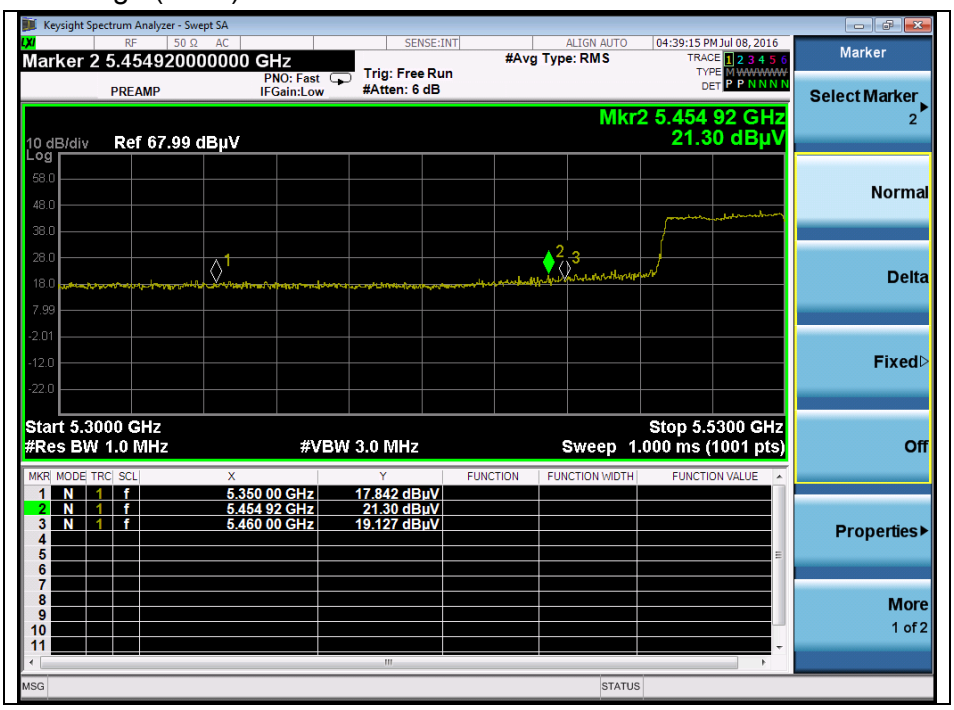
Middle channel band edge (Peak) - Band 2A



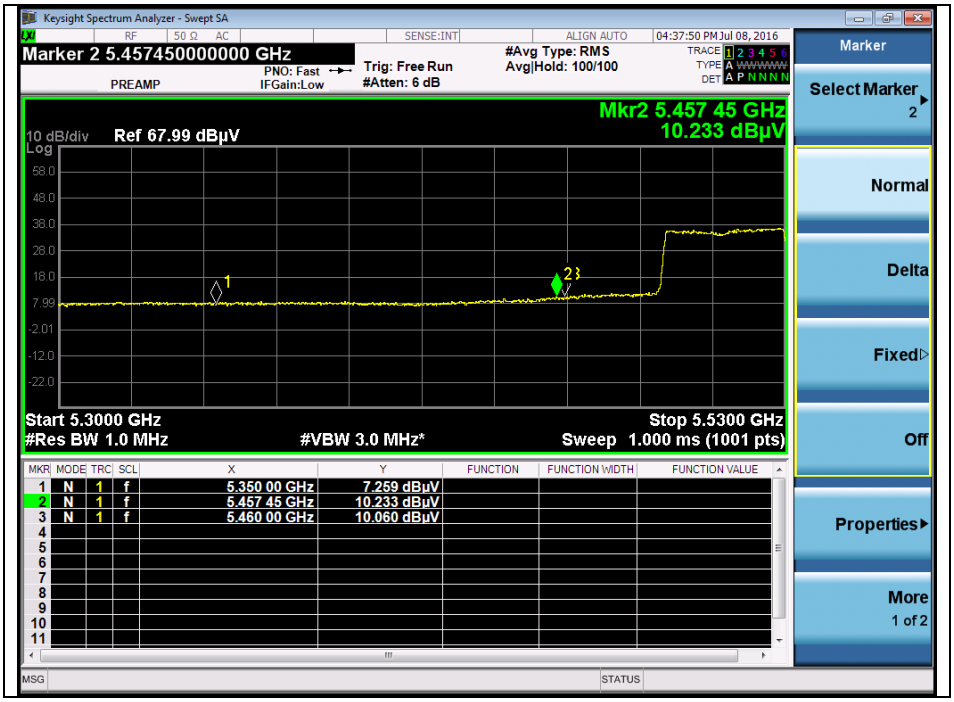
Middle channel band edge (Average) - Band 2A



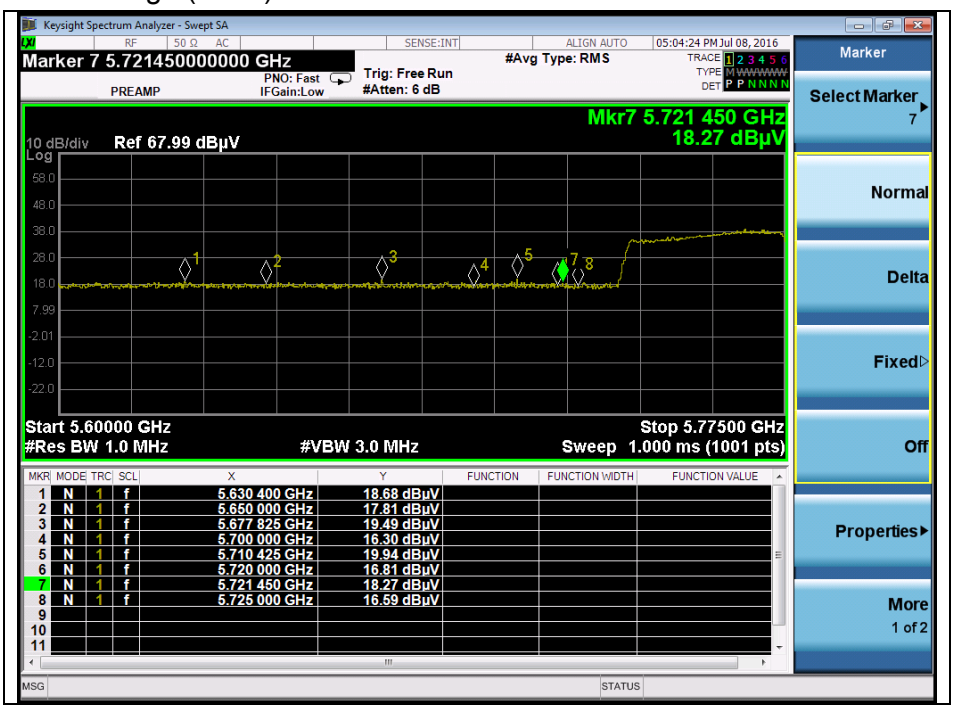
Low channel band edge (Peak) - Band 2C



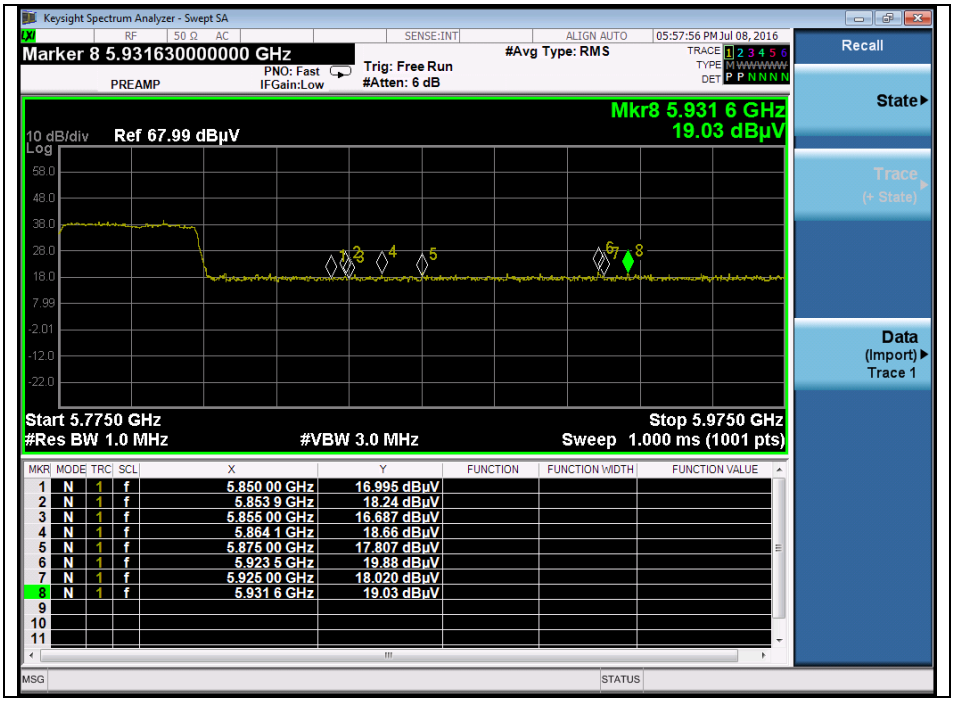
Low channel band edge (Average) - Band 2C



Middle channel band edge (Peak) - Band 3



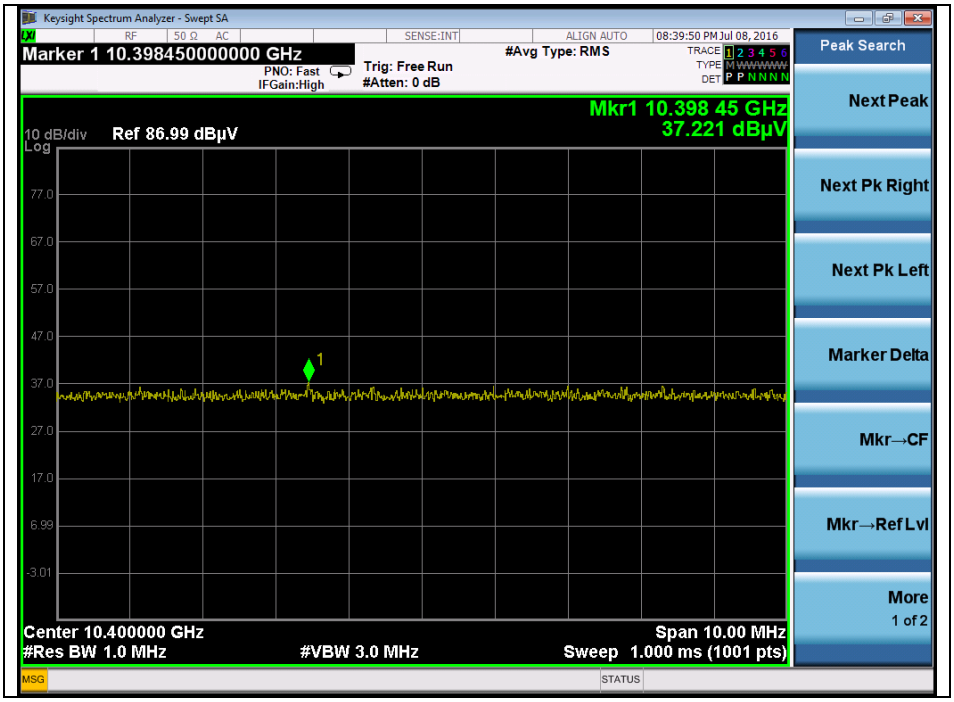
Middle channel band edge (Peak) - Band 3



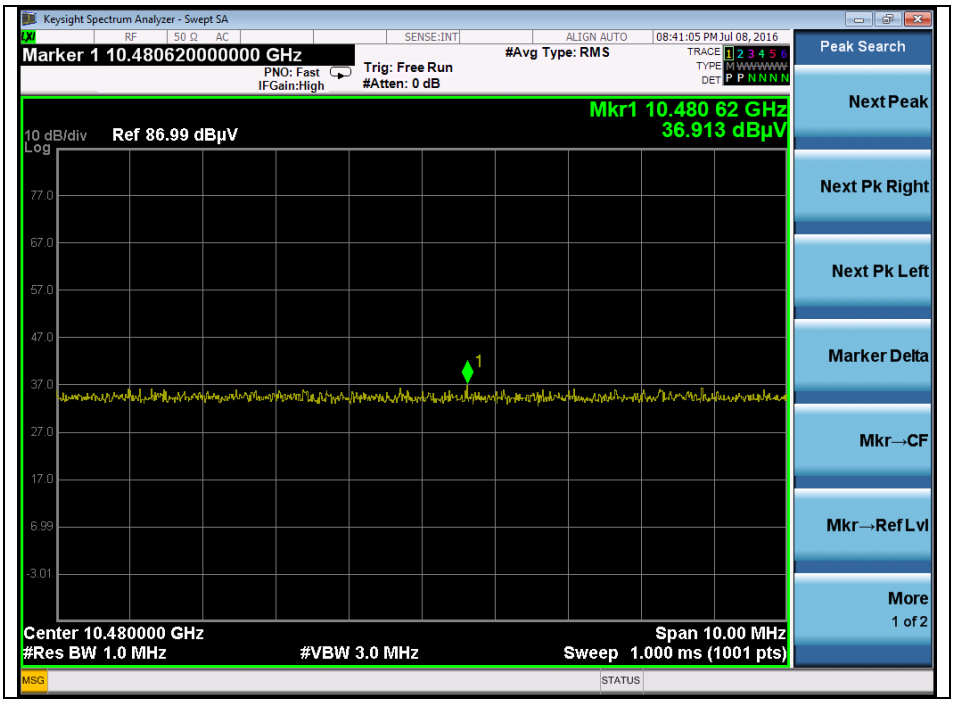
OFDM : 802.11a(6 Mbps)

Low channel 2nd harmonic (Peak) - Band 1

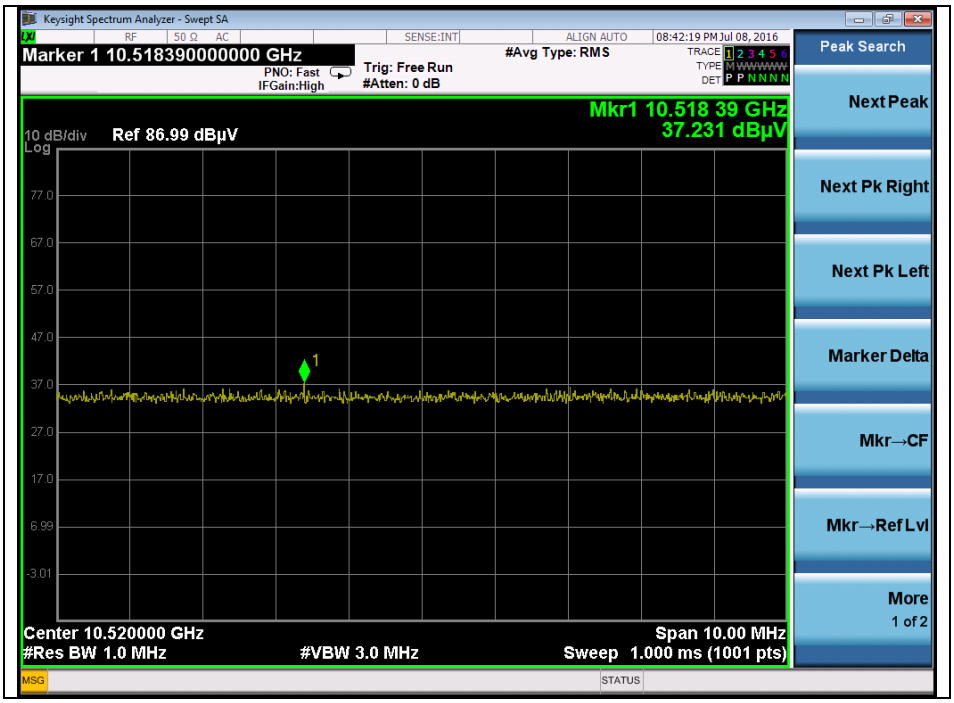
Middle channel 2nd harmonic (Peak) - Band 1



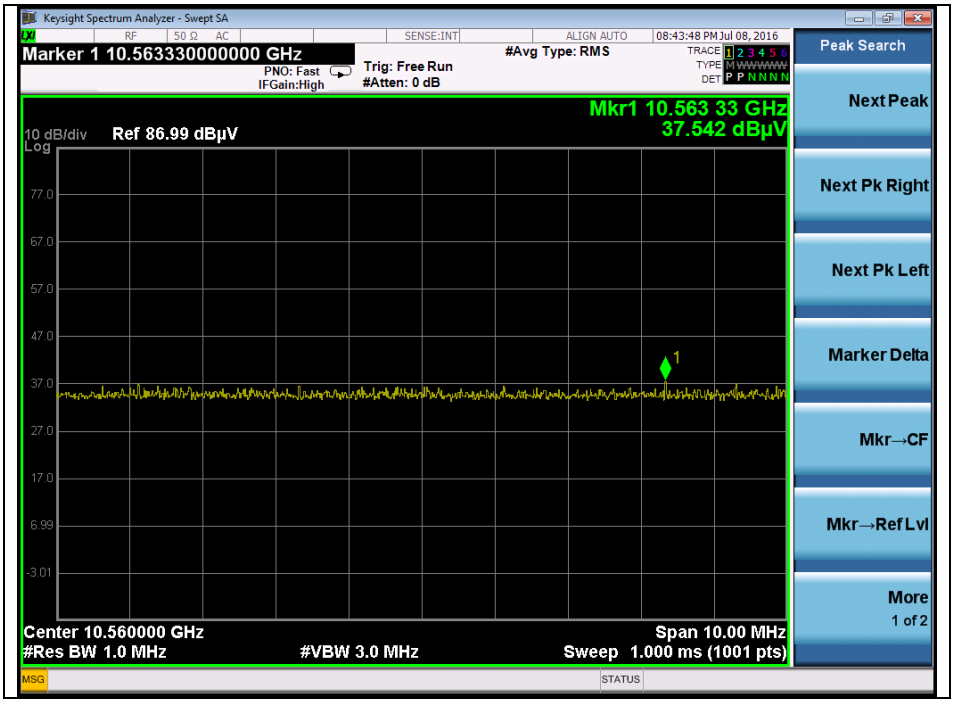
High channel 2nd harmonic (Peak) - Band 1



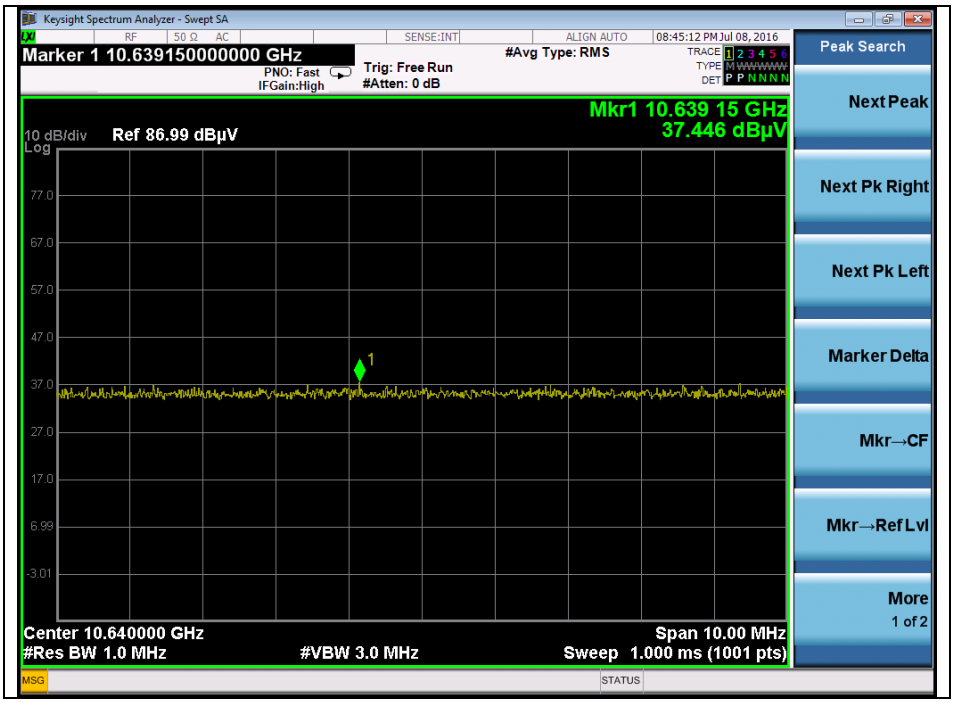
Low channel 2nd harmonic (Peak) - Band 2A



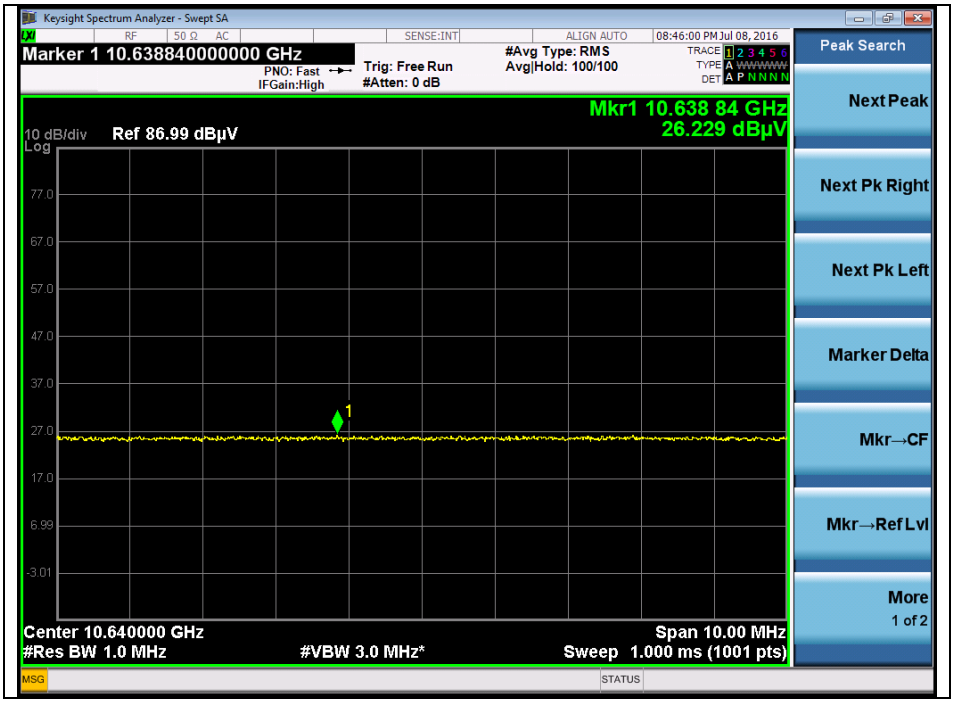
Middle channel 2nd harmonic (Peak) - Band 2A



High channel 2nd harmonic (Peak) - Band 2A

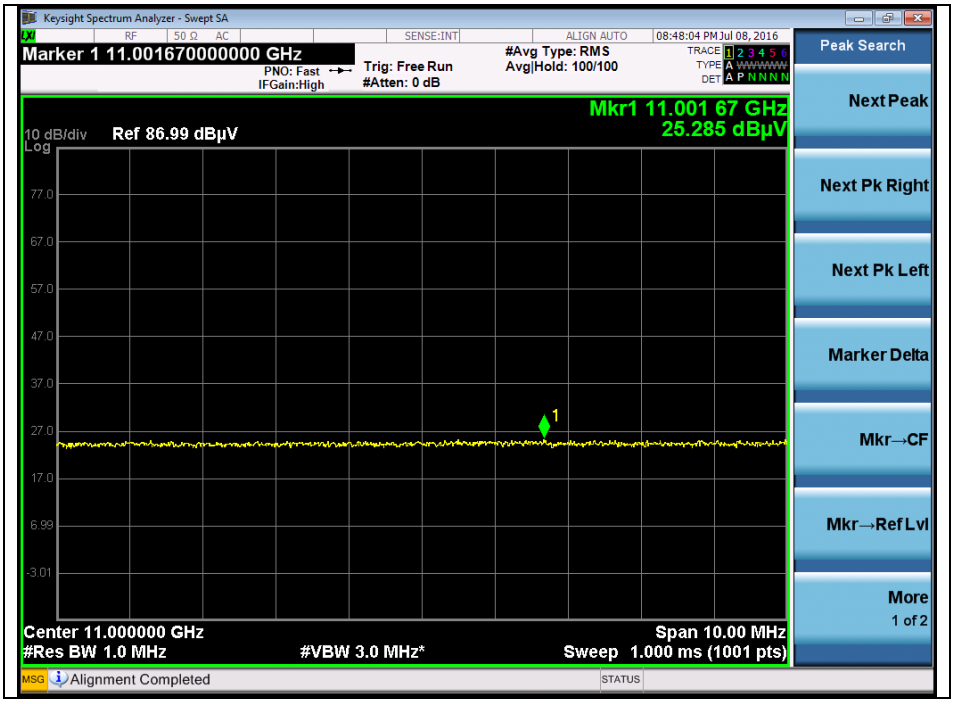


High channel 2nd harmonic (Average) - Band 2A

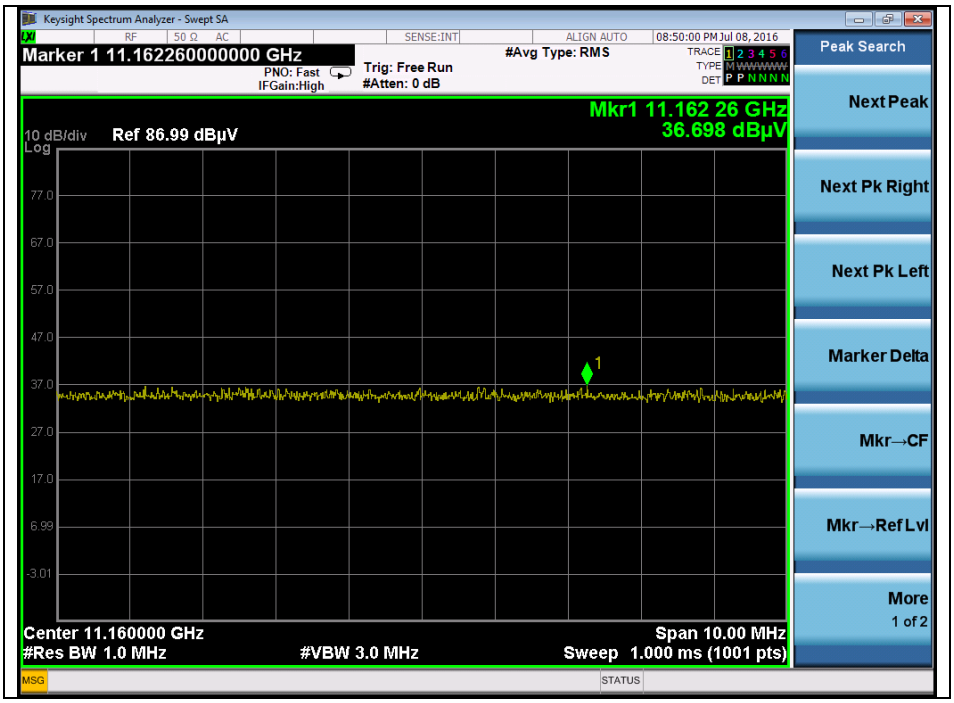


Low channel 2nd harmonic (Peak) - Band 2C

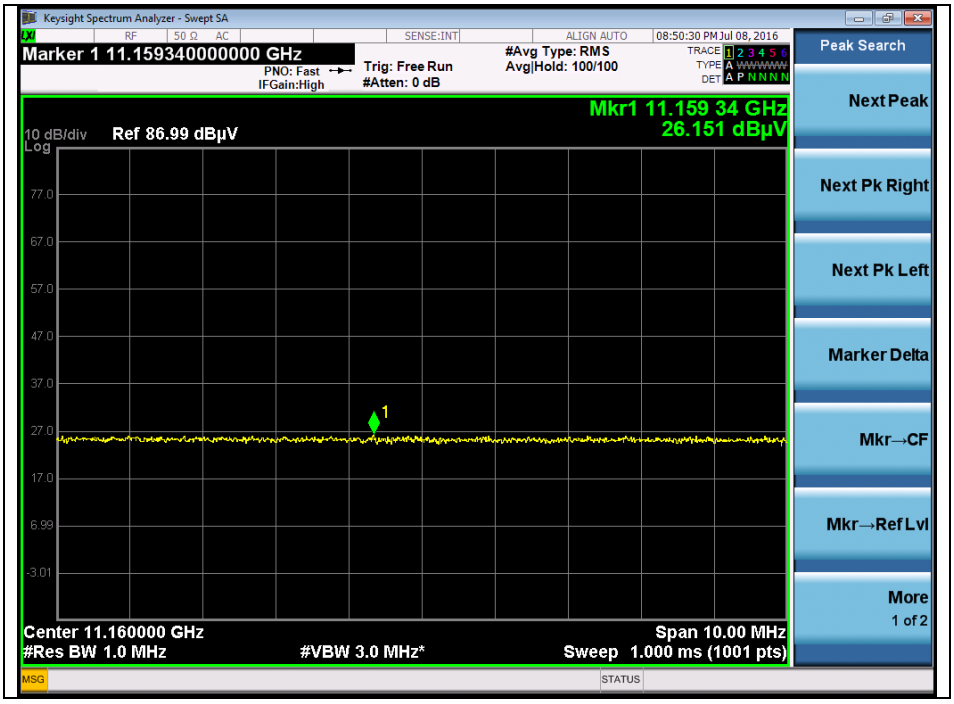
Low channel 2nd harmonic (Average) - Band 2C



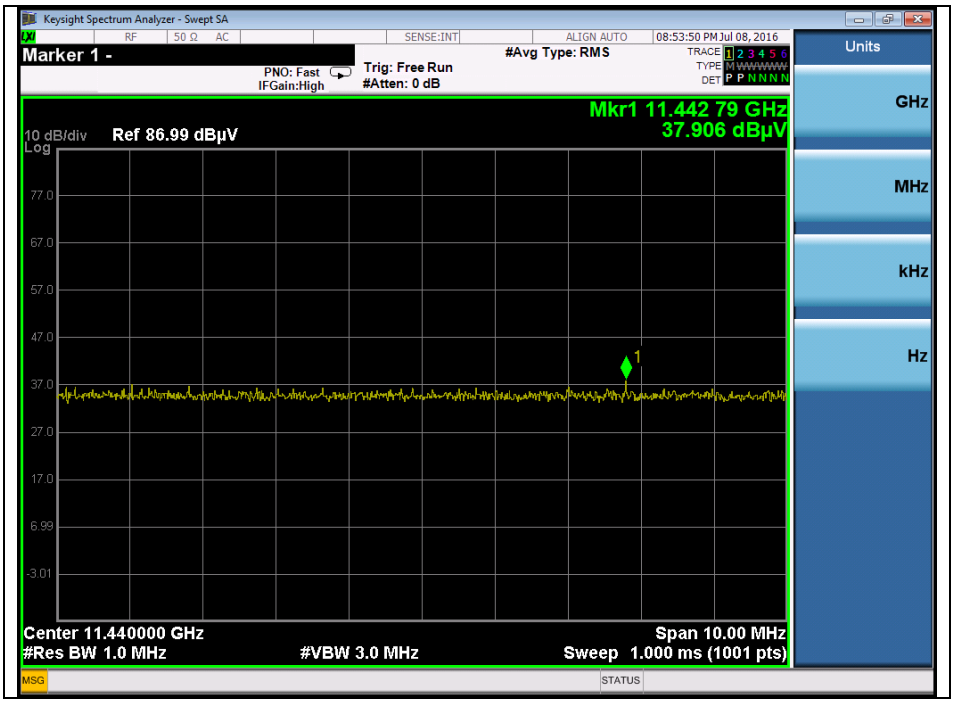
Middle channel 2nd harmonic (Peak) - Band 2C



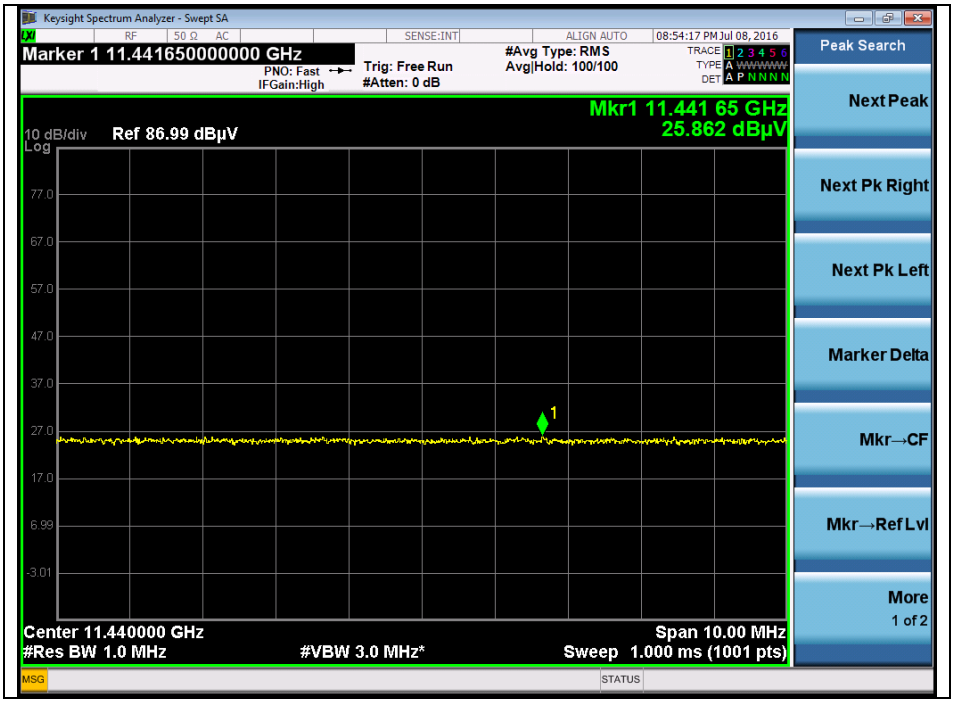
Middle channel 2nd harmonic (Average) - Band 2C



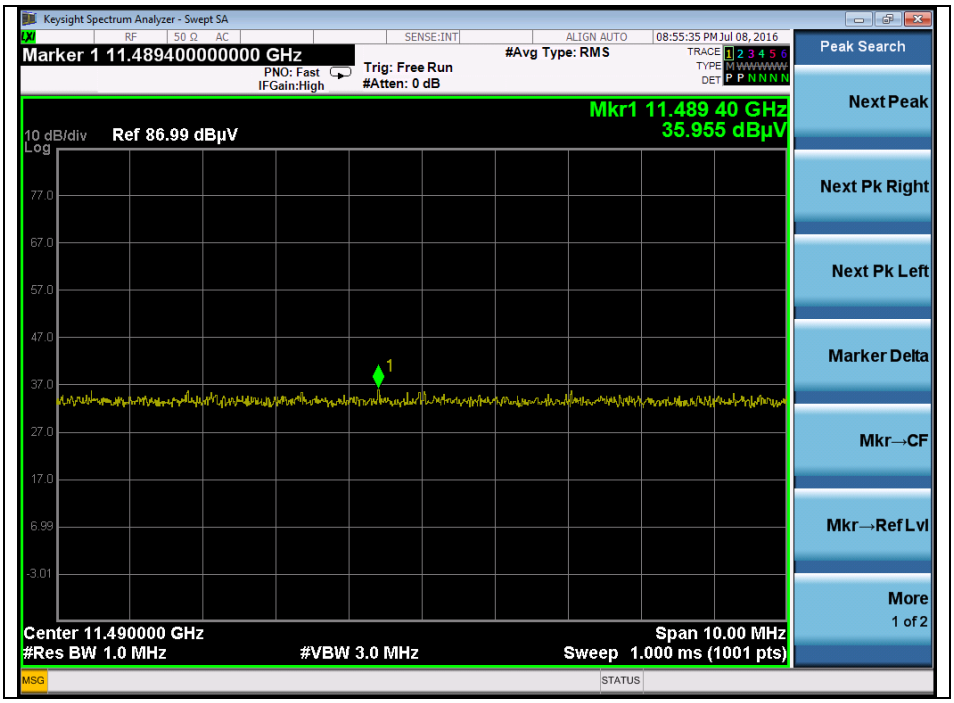
High channel 2nd harmonic (Peak) - Band 2C



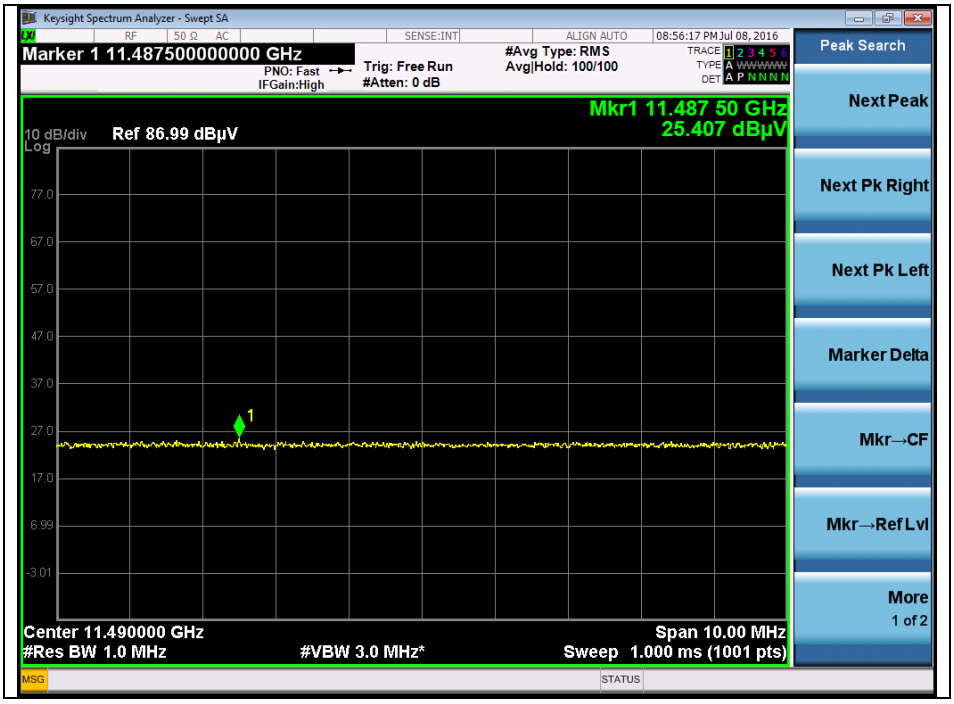
High channel 2nd harmonic (Average) - Band 2C



Low channel 2nd harmonic (Peak) - Band 3

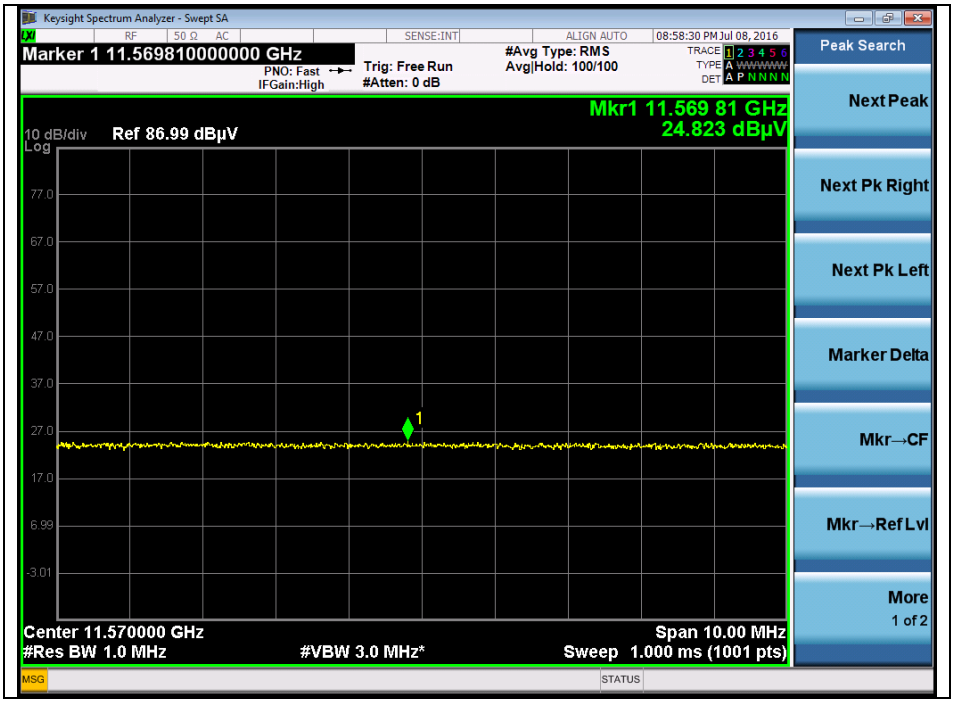


Low channel 2nd harmonic (Average) - Band 3

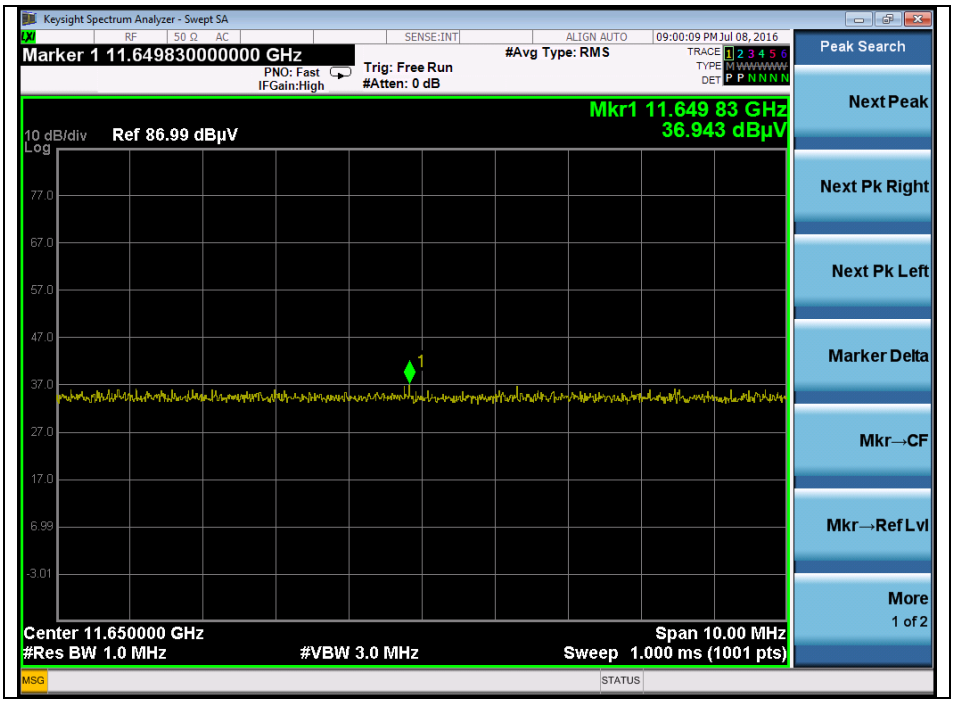


Middle channel 2nd harmonic (Peak) - Band 3

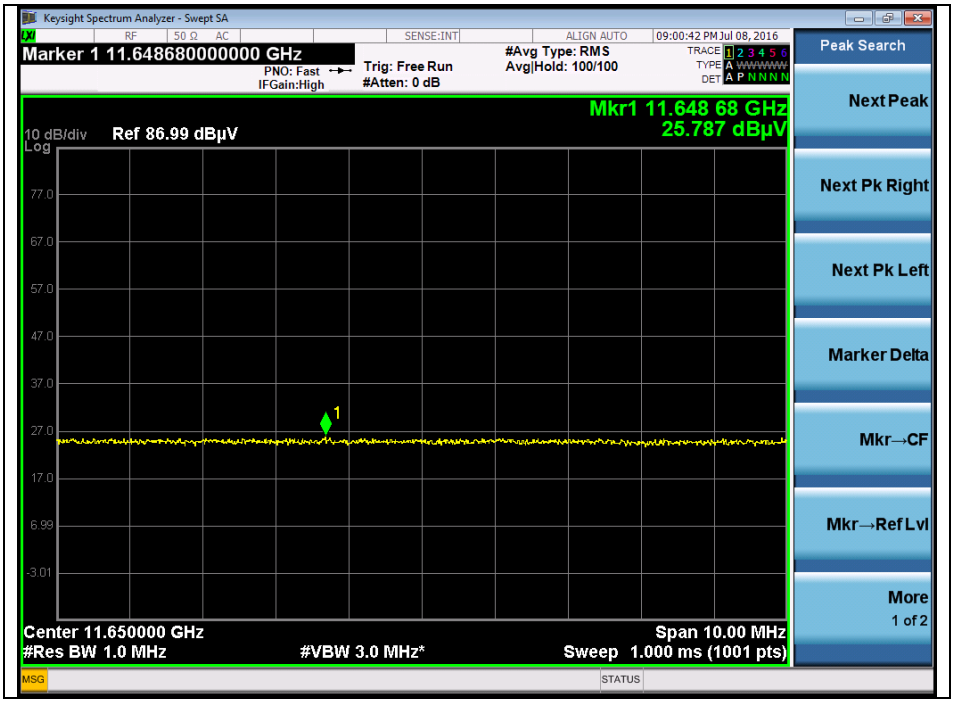
Middle channel 2nd harmonic (Average) - Band 3



High channel 2nd harmonic (Peak) - Band 3

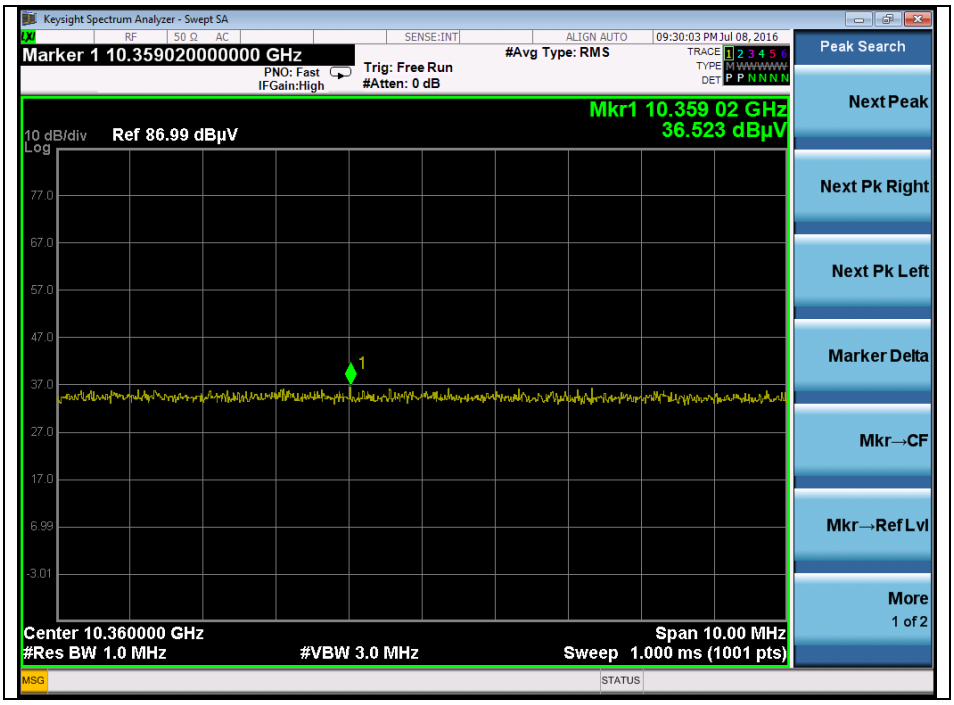


High channel 2nd harmonic (Average) - Band 3

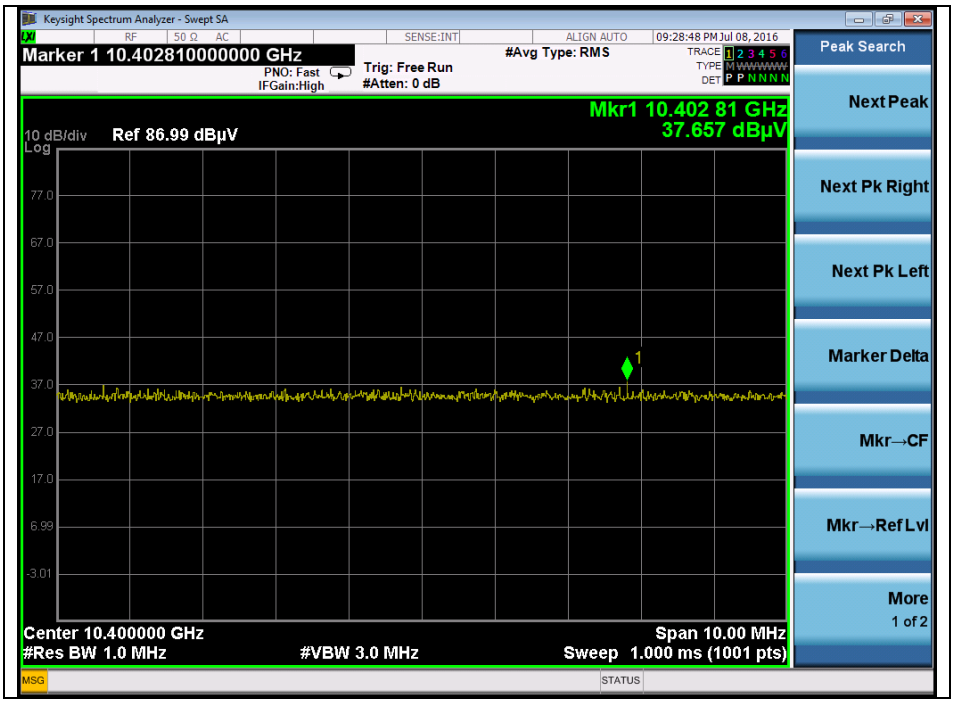


OFDM : 802.11n_HT20(MCS0)

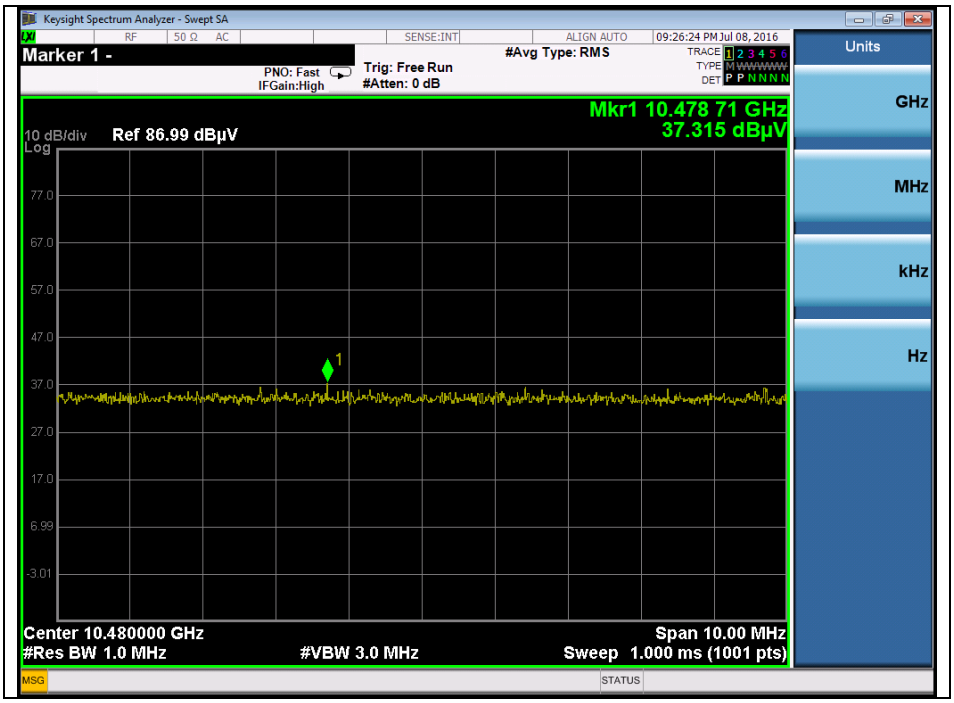
Low channel 2nd harmonic (Peak) - Band 1



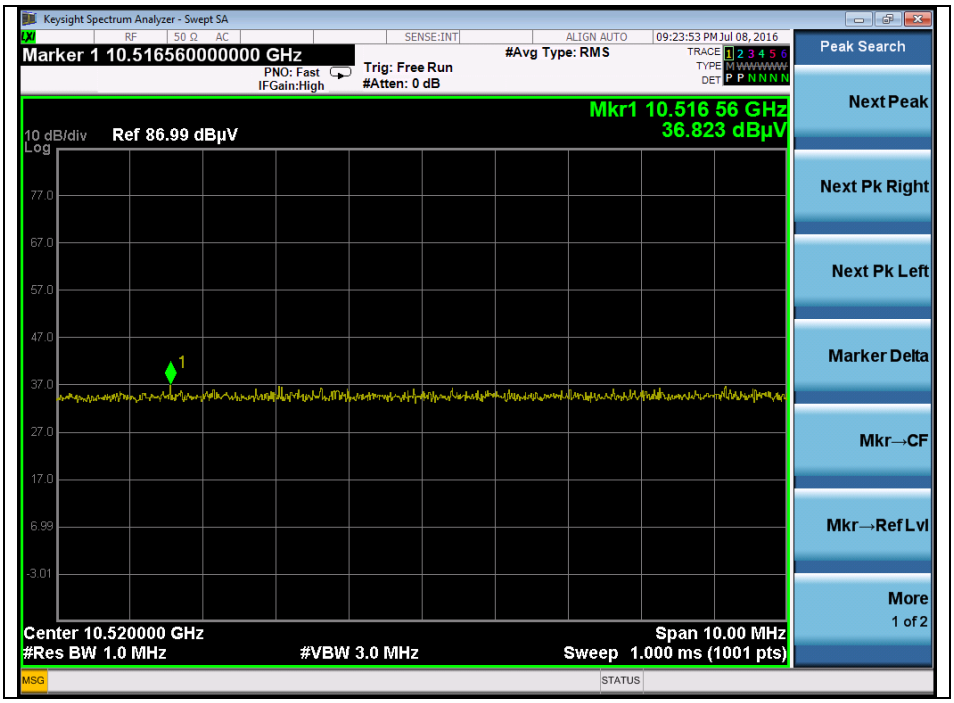
Middle channel 2nd harmonic (Peak) - Band 1



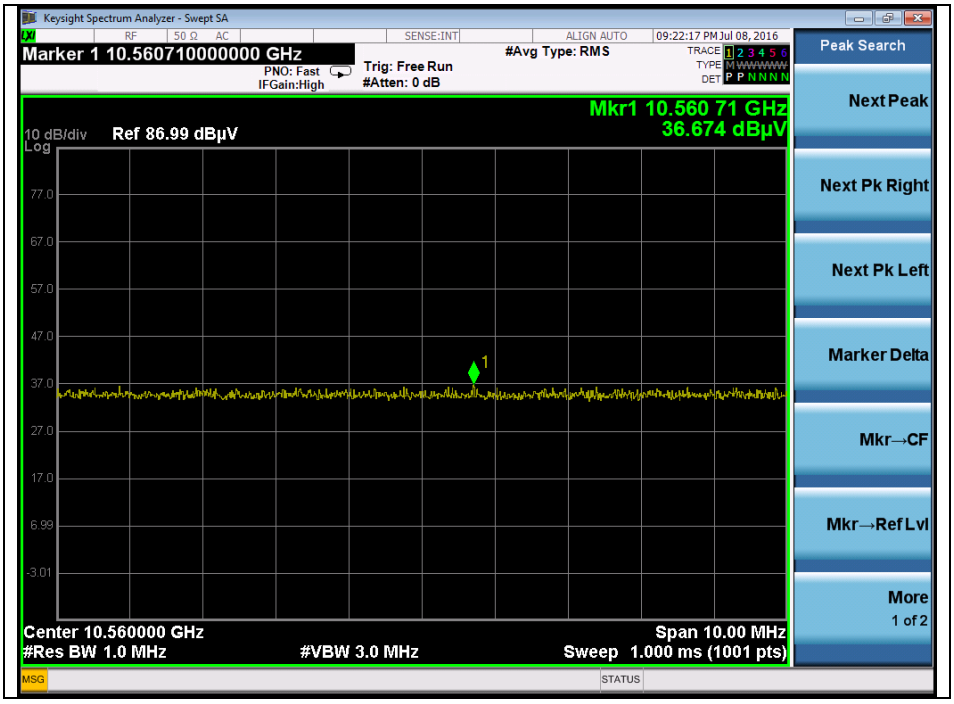
High channel 2nd harmonic (Peak) - Band 1



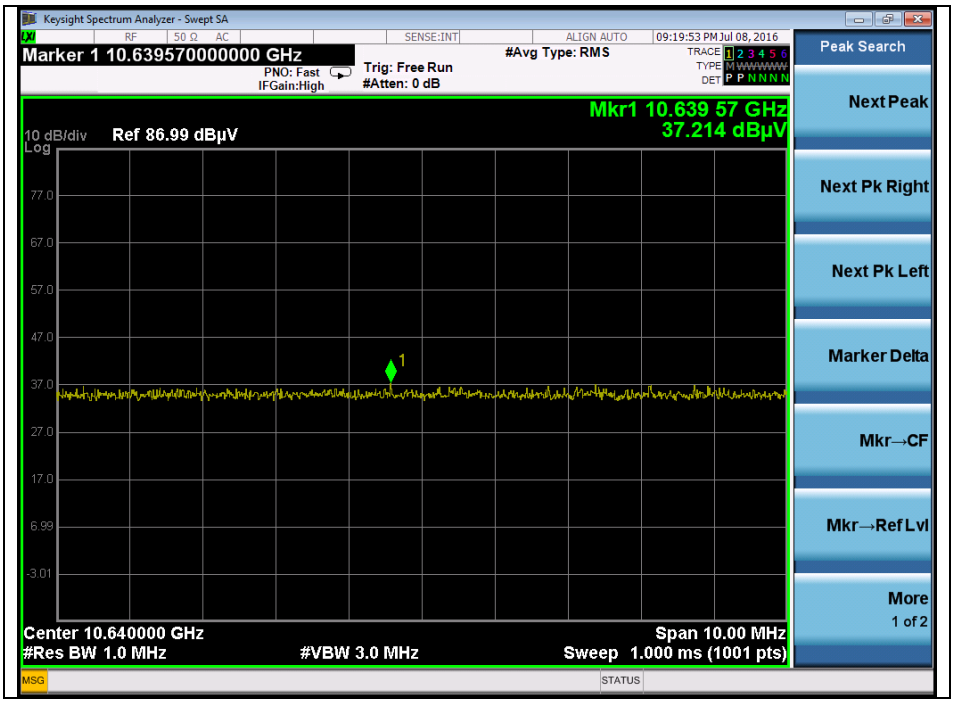
Low channel 2nd harmonic (Peak) - Band 2A



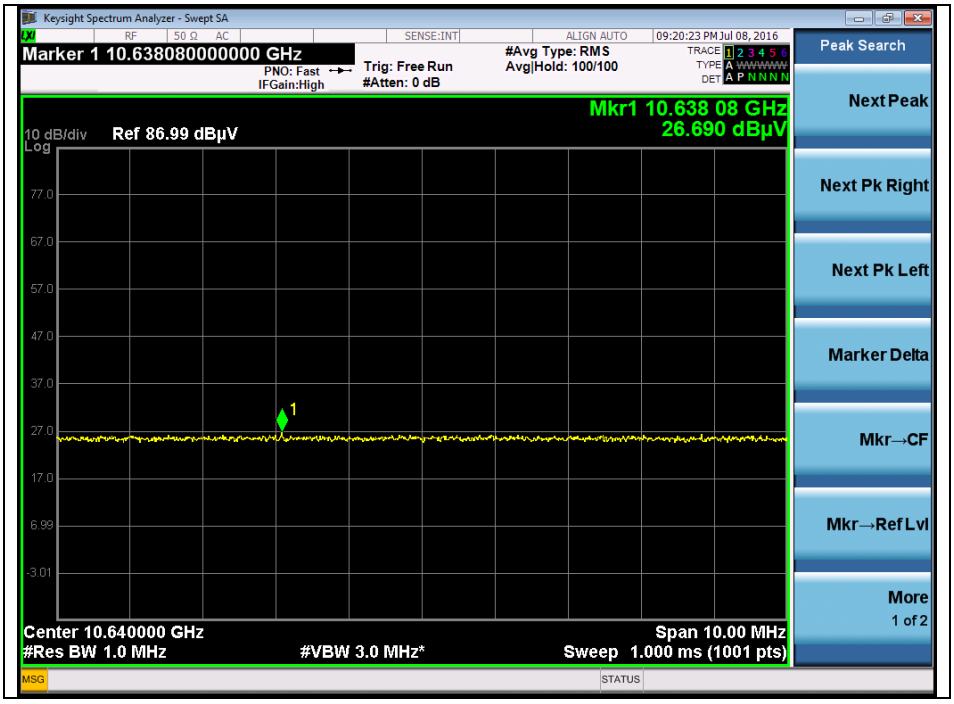
Middle channel 2nd harmonic (Peak) - Band 2A



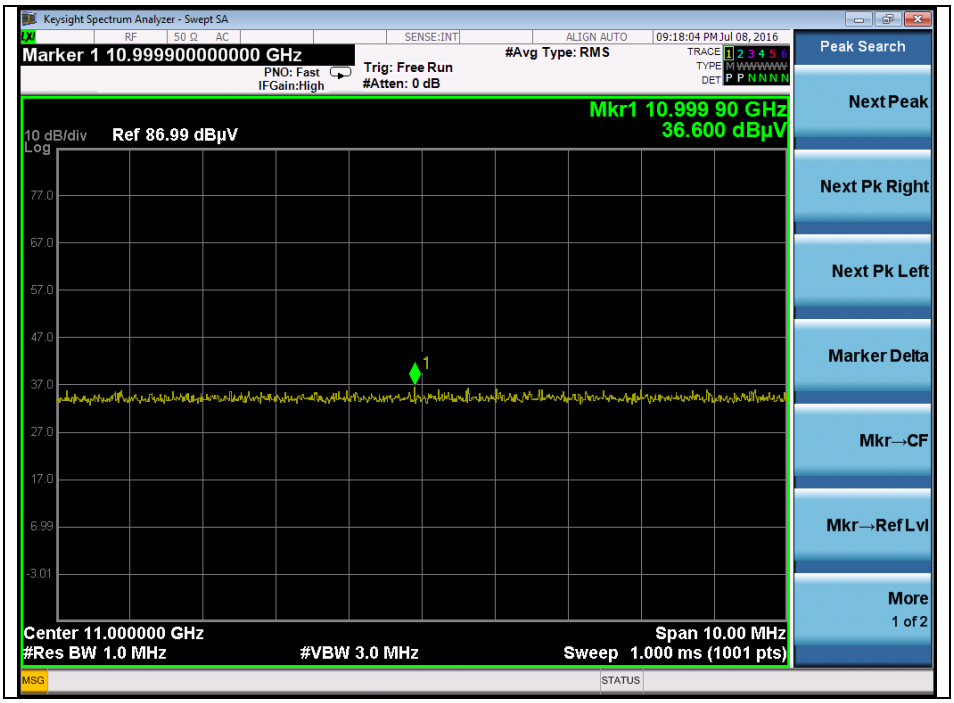
High channel 2nd harmonic (Peak) - Band 2A



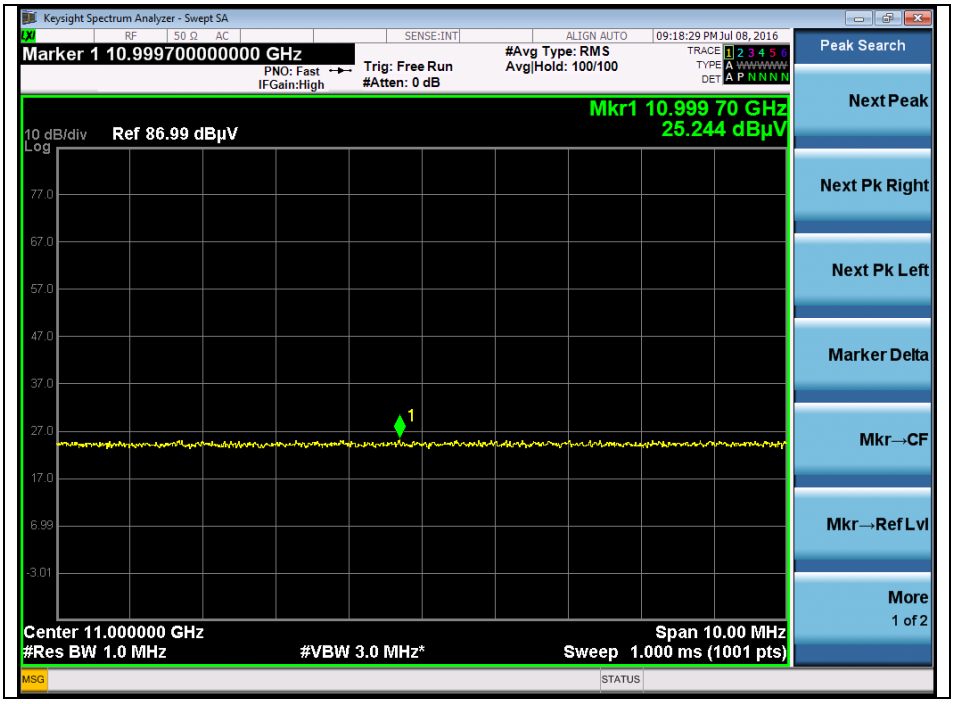
High channel 2nd harmonic (Average) - Band 2A



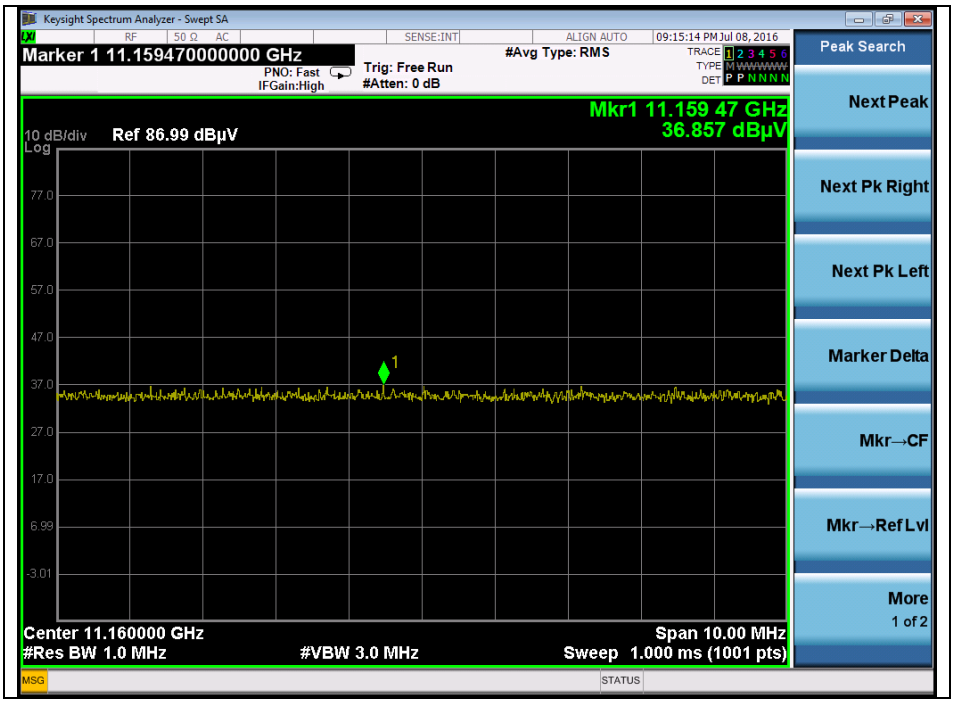
Low channel 2nd harmonic (Peak) - Band 2C



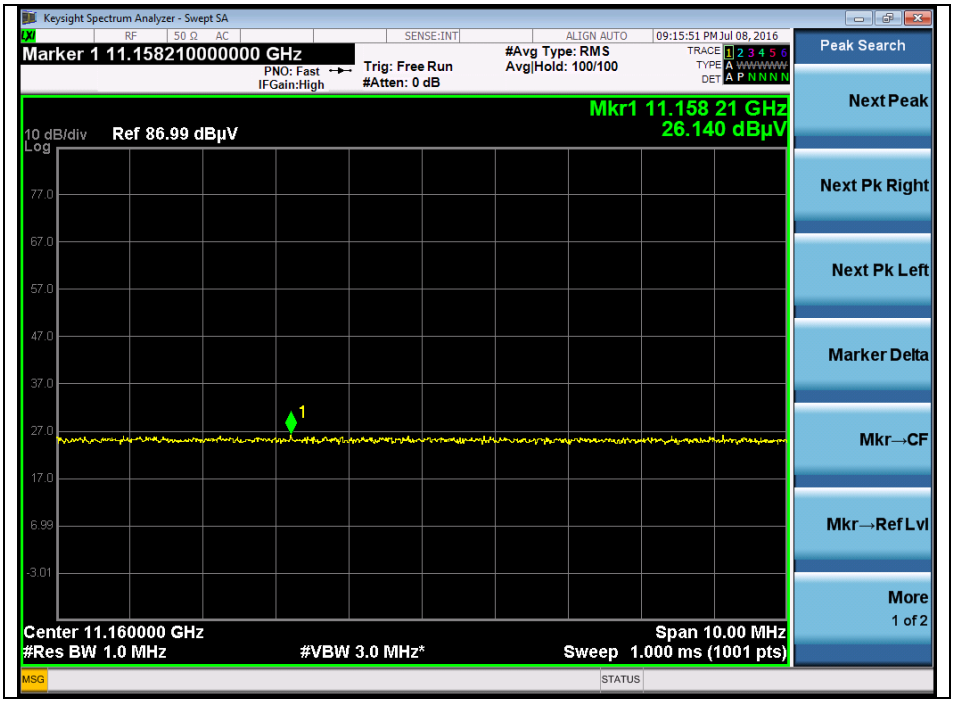
Low channel 2nd harmonic (Average) - Band 2C



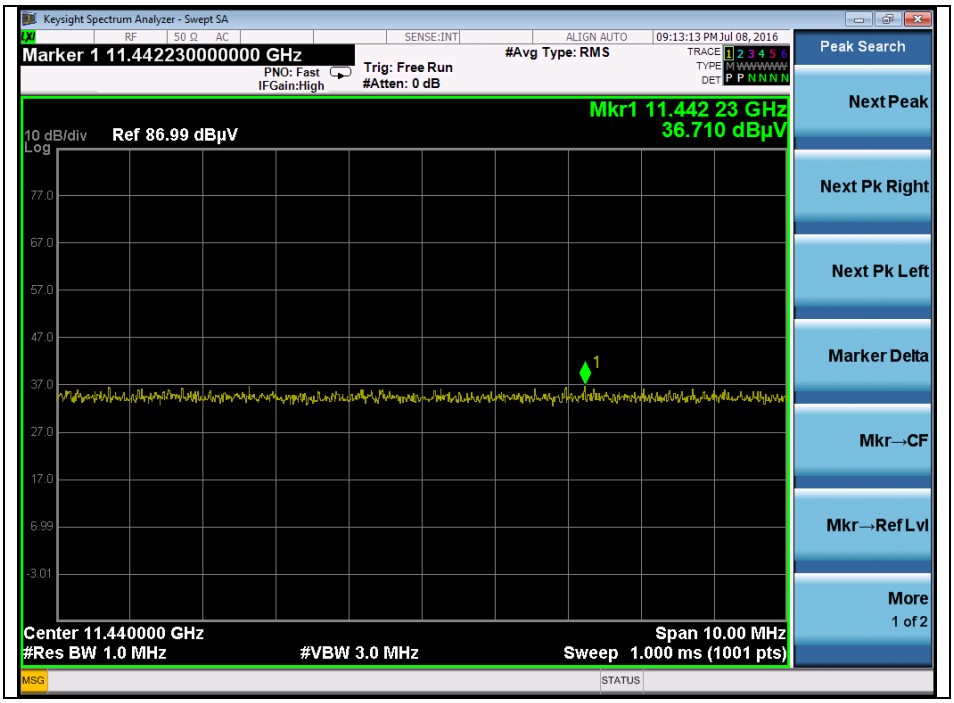
Middle channel 2nd harmonic (Peak) - Band 2C



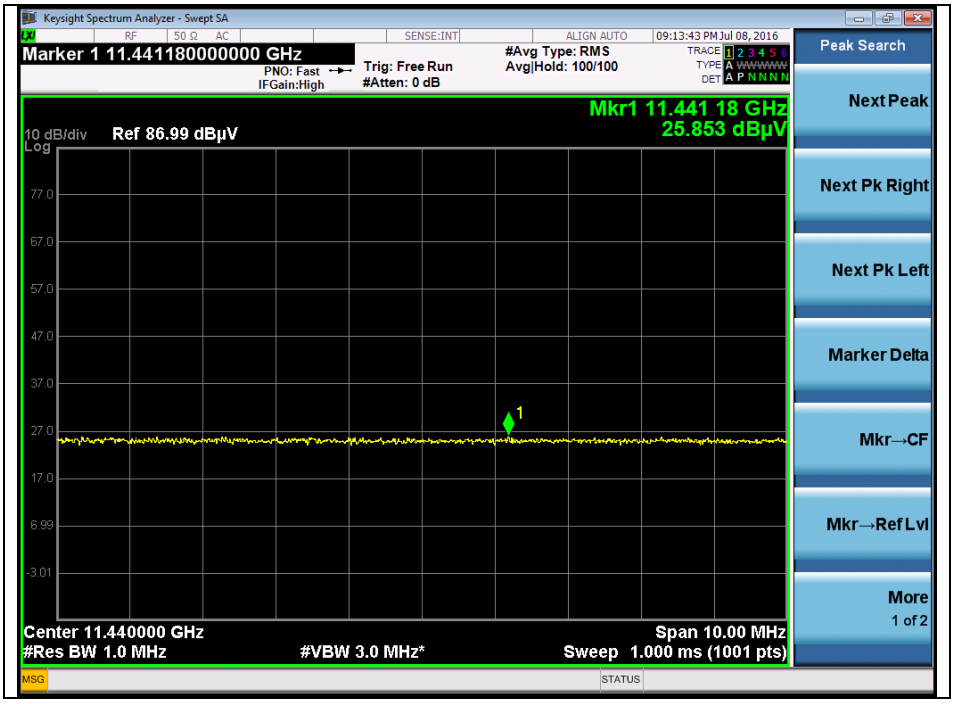
Middle channel 2nd harmonic (Average) - Band 2C



High channel 2nd harmonic (Peak) - Band 2C

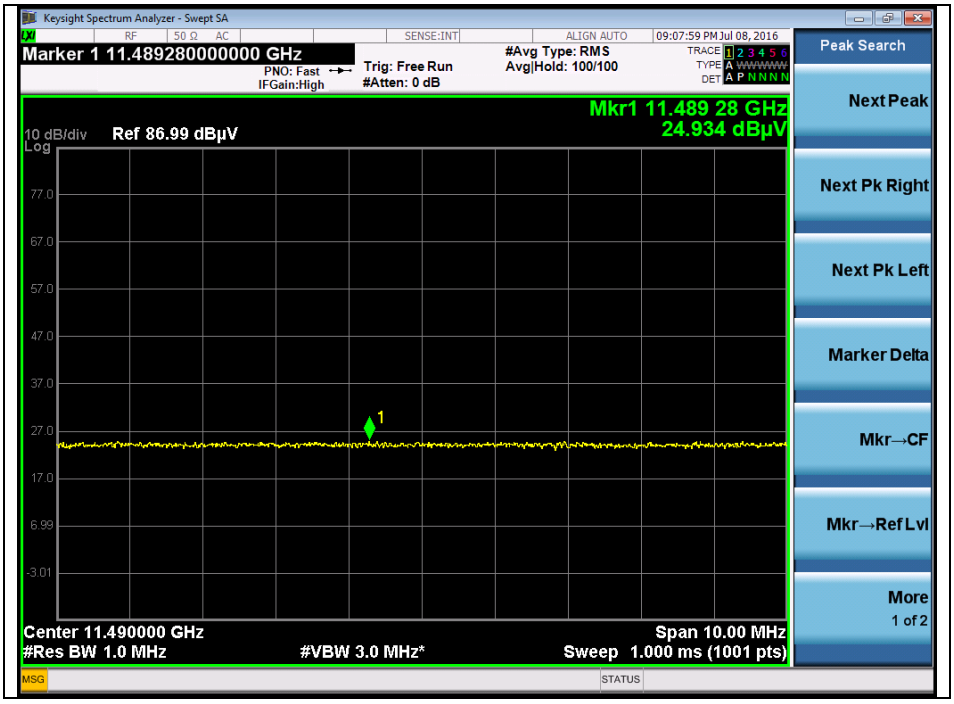


High channel 2nd harmonic (Average) - Band 2C



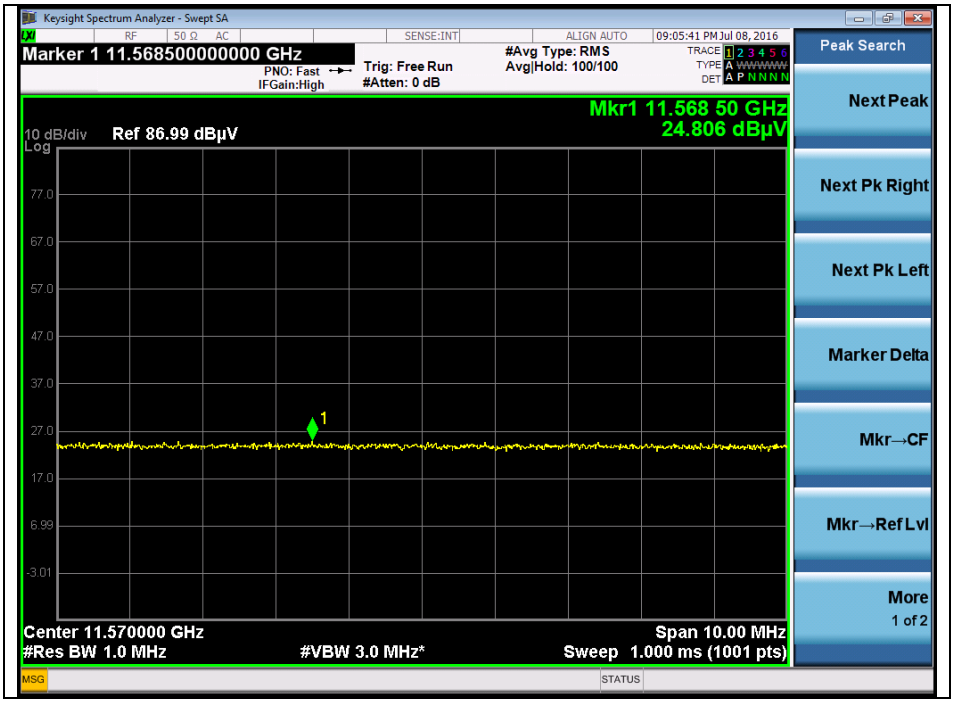
Low channel 2nd harmonic (Peak) - Band 3

Low channel 2nd harmonic (Average) - Band 3

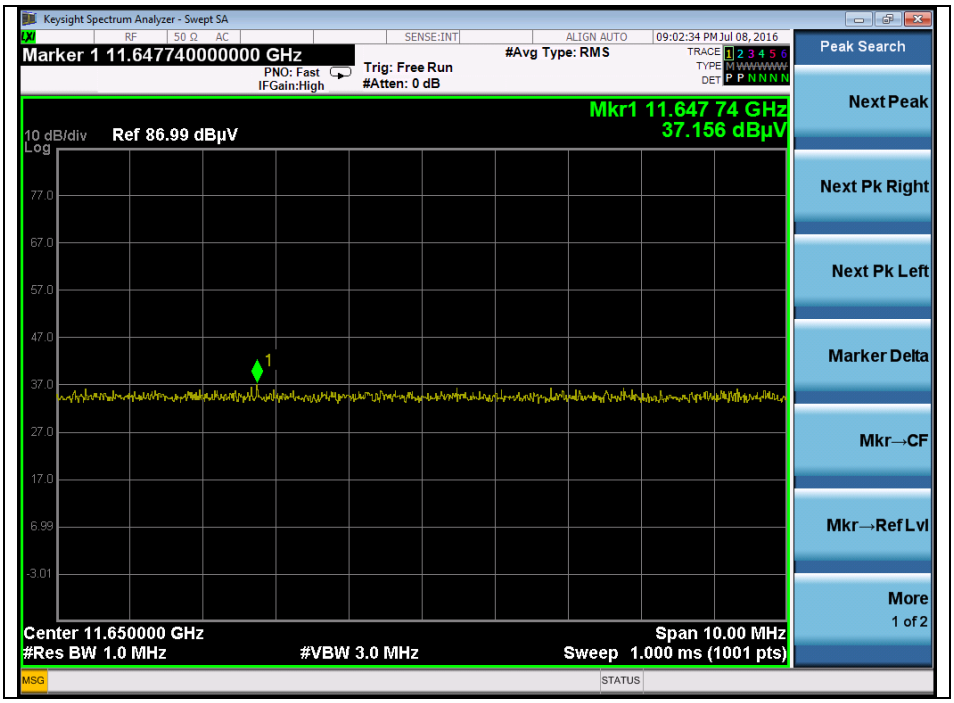


Middle channel 2nd harmonic (Peak) - Band 3

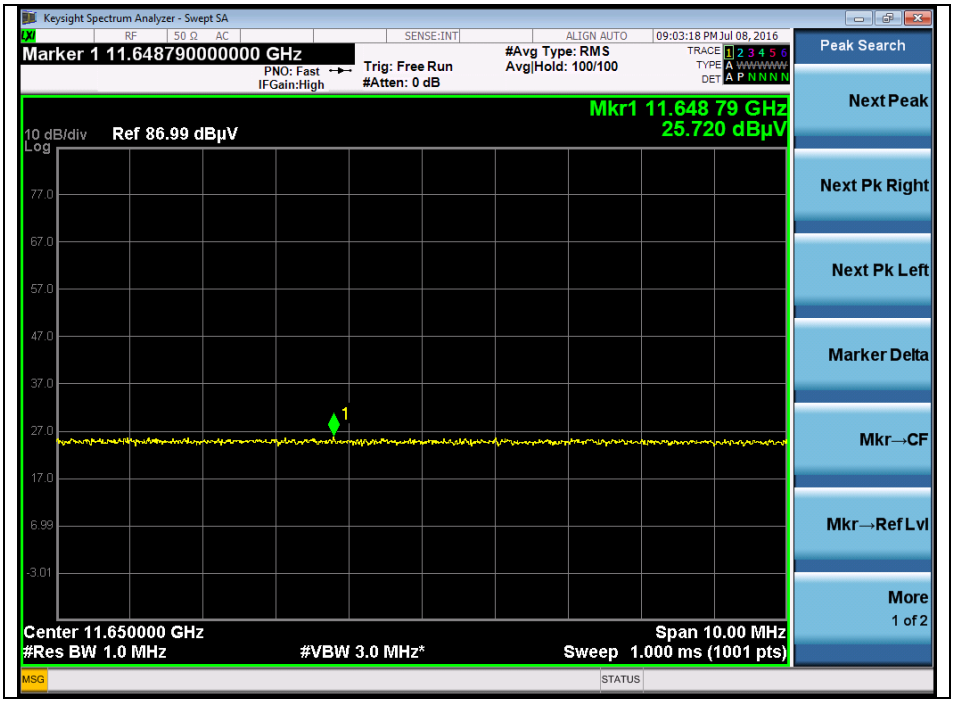
Middle channel 2nd harmonic (Average) - Band 3



High channel 2nd harmonic (Peak) - Band 3

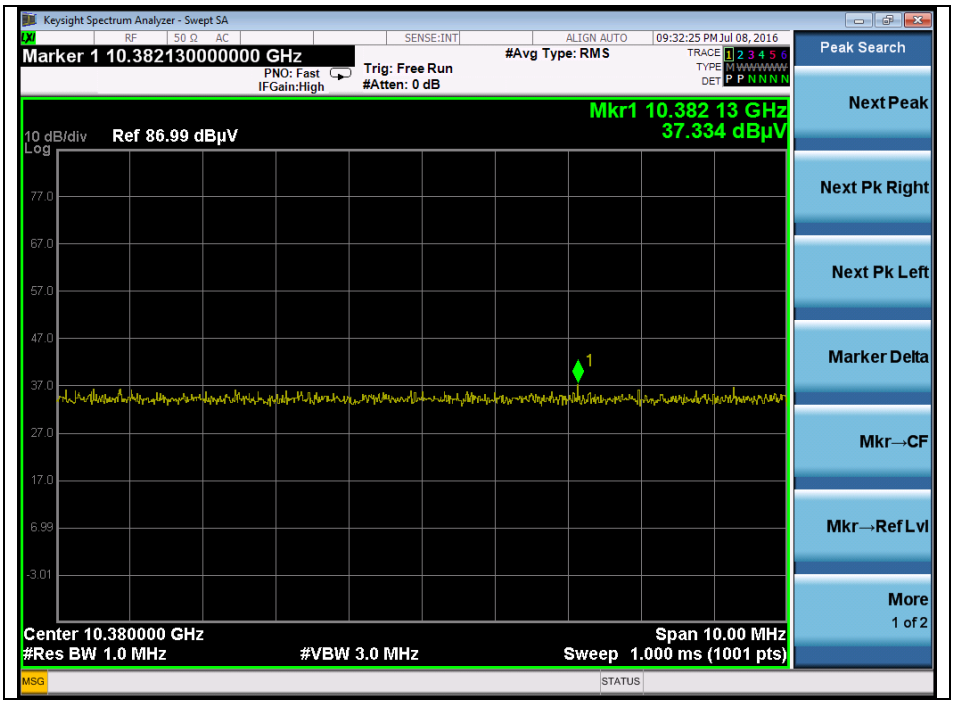


High channel 2nd harmonic (Average) - Band 3

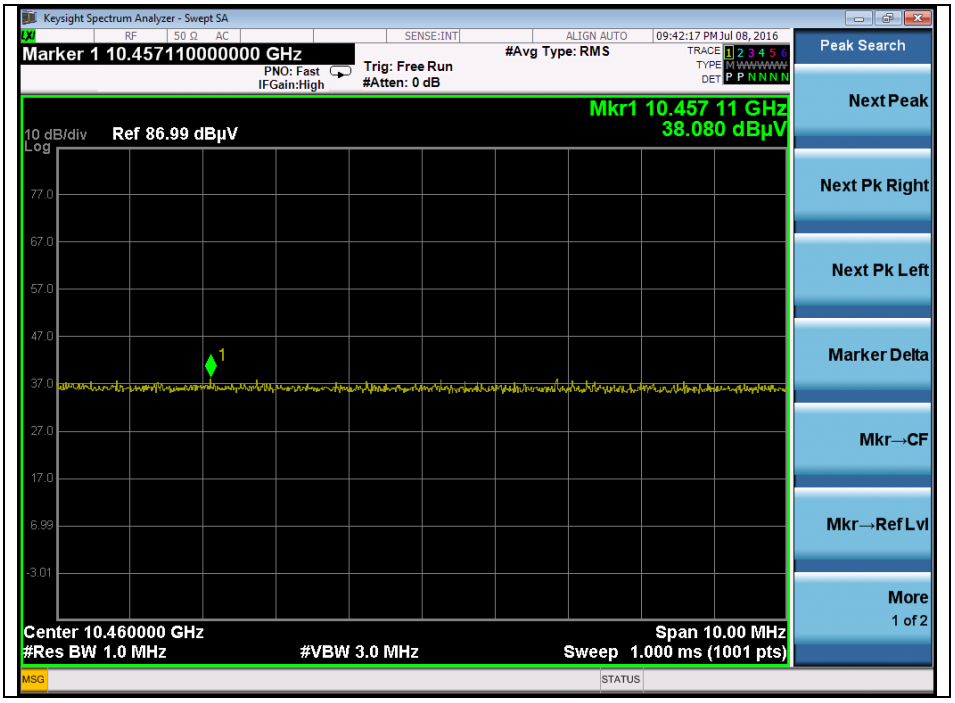


OFDM : 802.11n_HT40(MCS0)

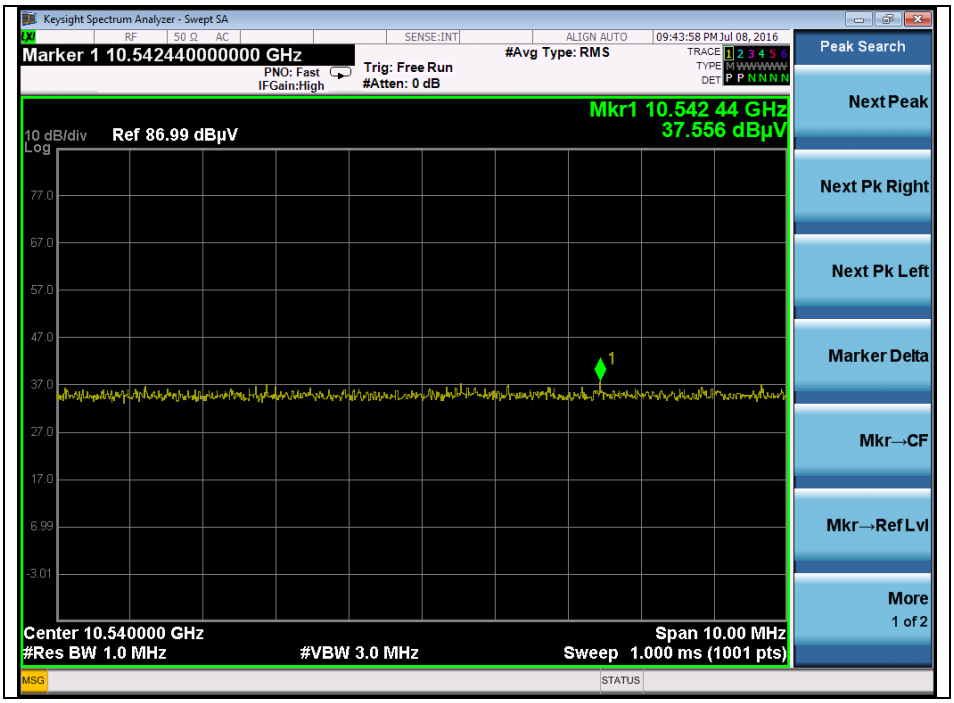
Low channel 2nd harmonic (Peak) - Band 1



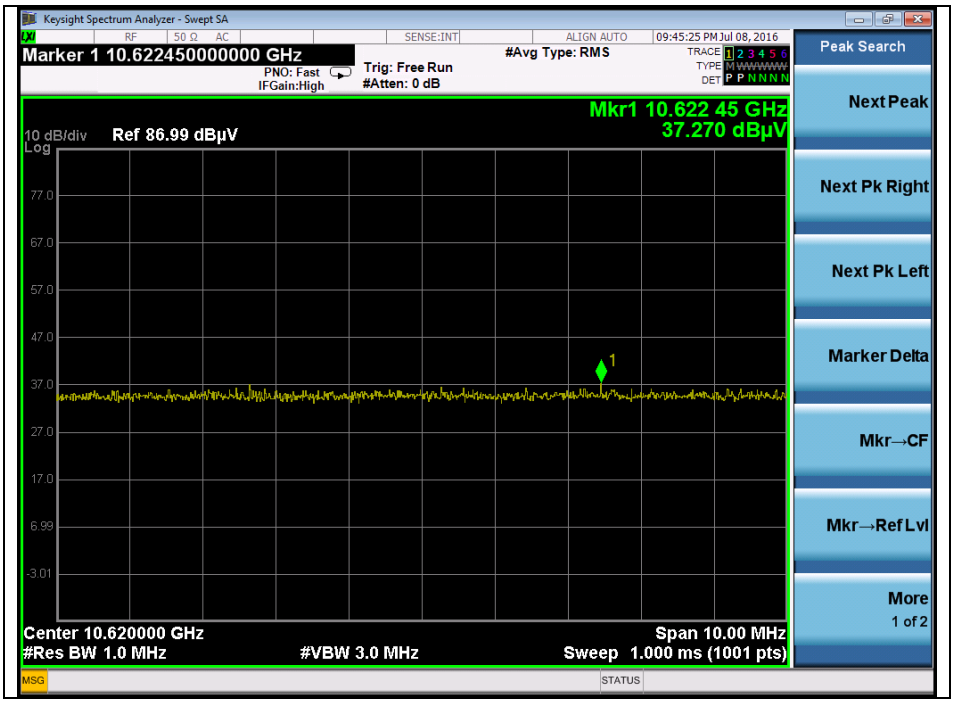
High channel 2nd harmonic (Peak) - Band 1



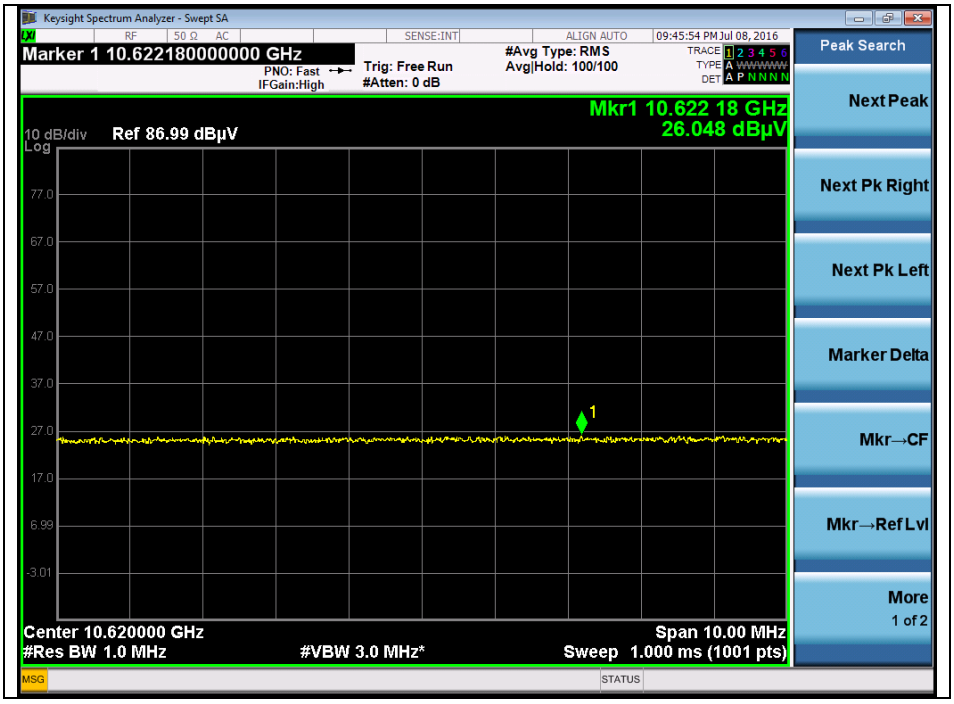
Low channel 2nd harmonic (Peak) - Band 2A



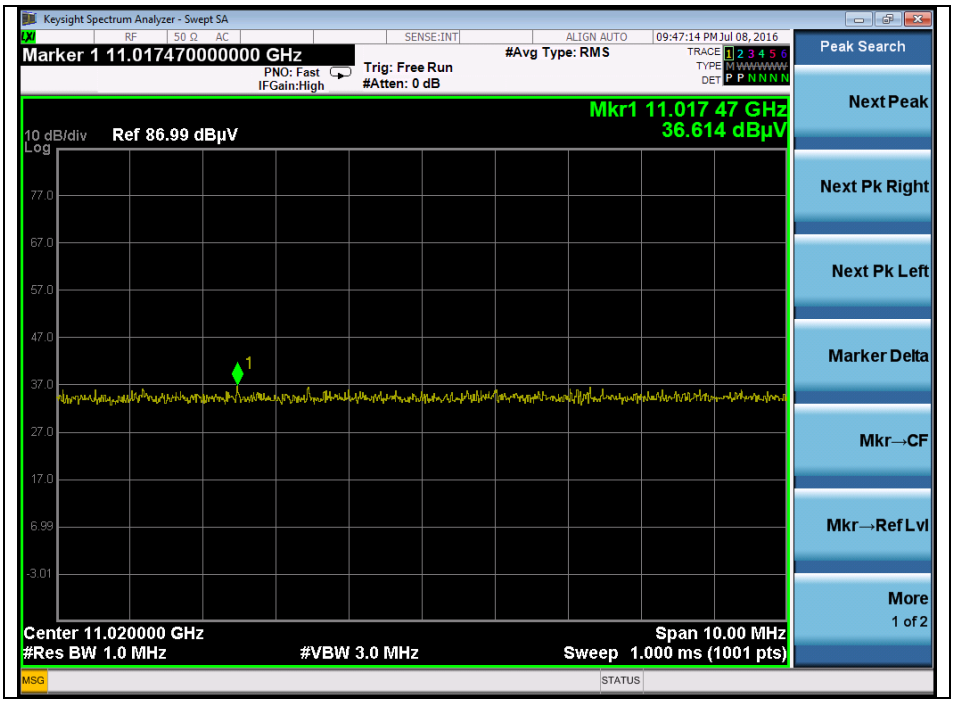
High channel 2nd harmonic (Peak) - Band 2A



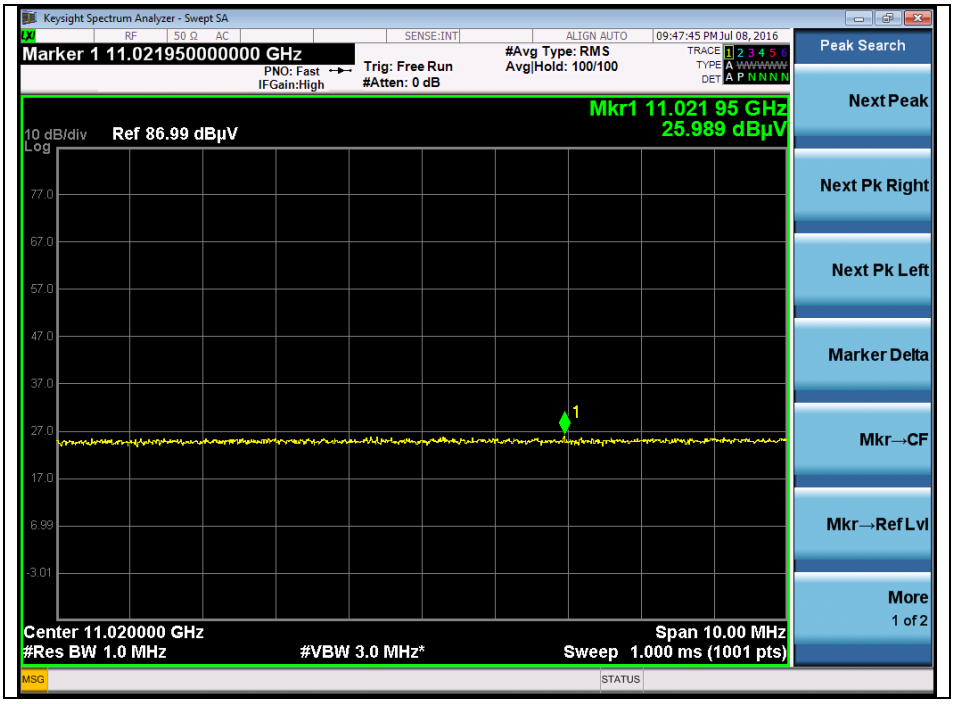
High channel 2nd harmonic (Average) - Band 2A



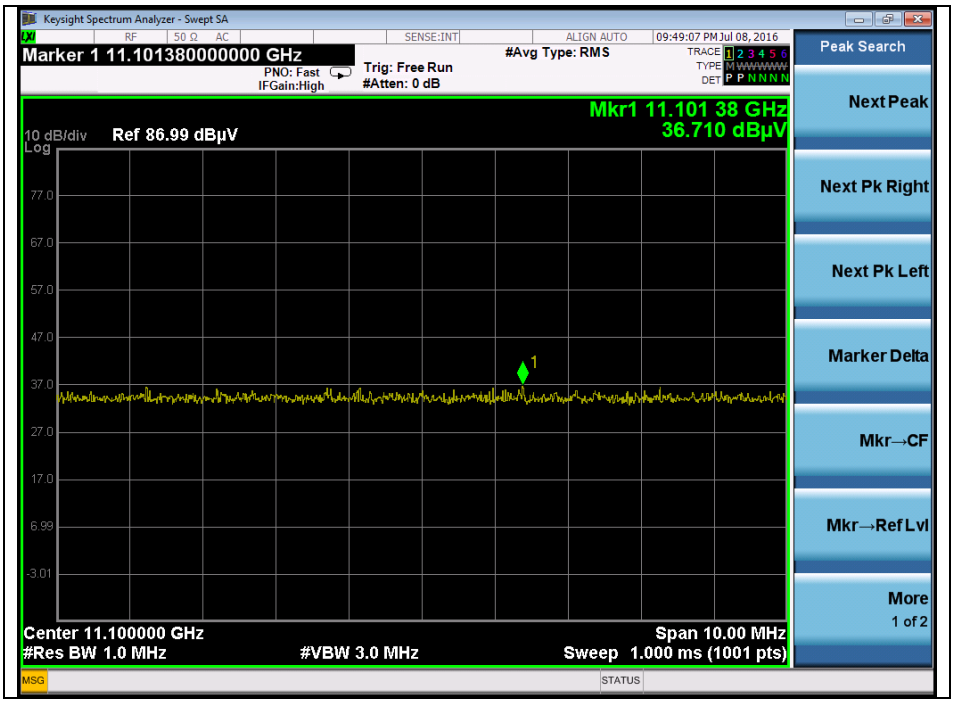
Low channel 2nd harmonic (Peak) - Band 2C



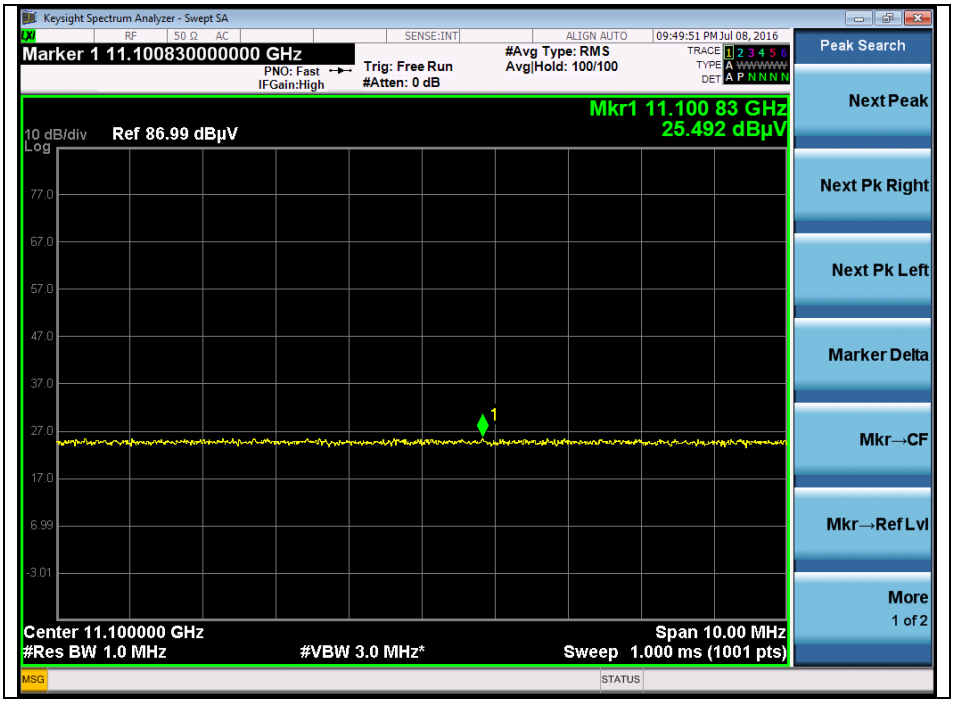
Low channel 2nd harmonic (Average) - Band 2C



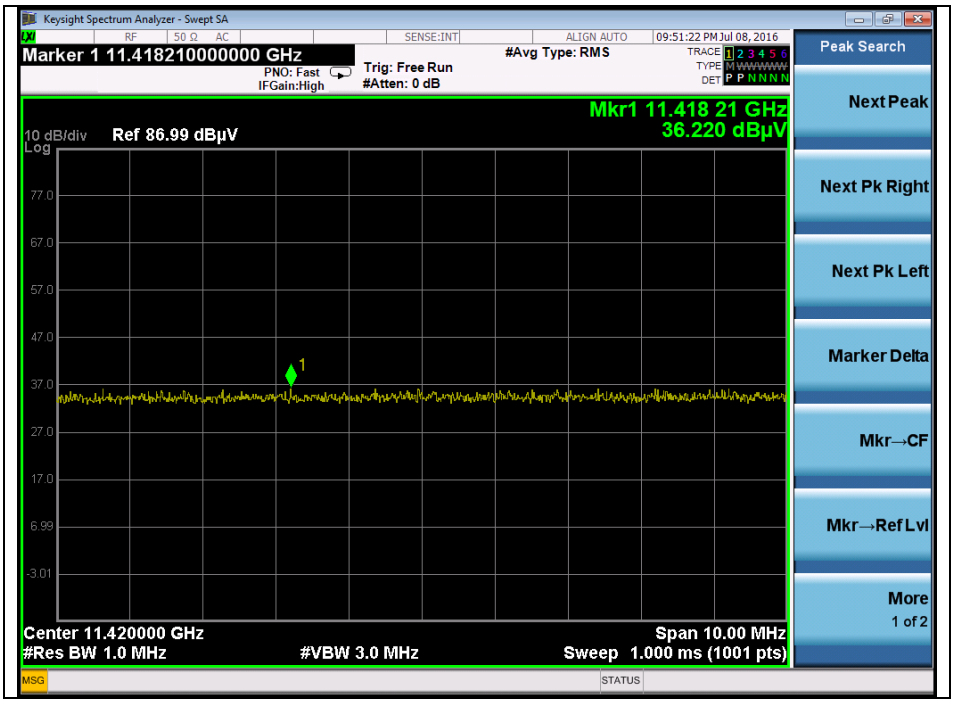
Middle channel 2nd harmonic (Peak) - Band 2C



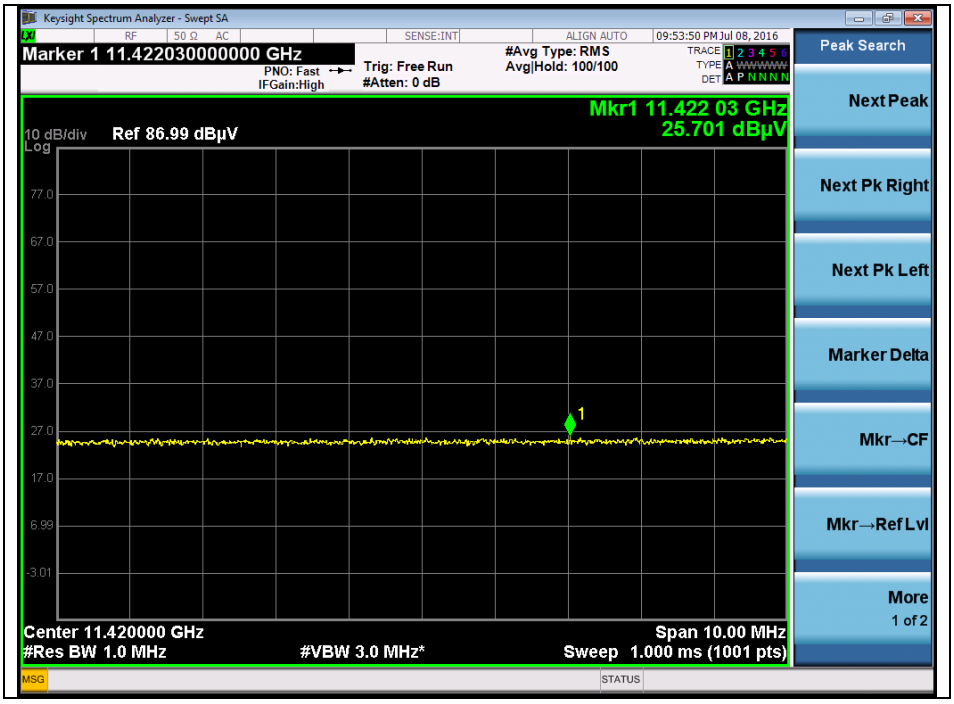
Middle channel 2nd harmonic (Average) - Band 2C



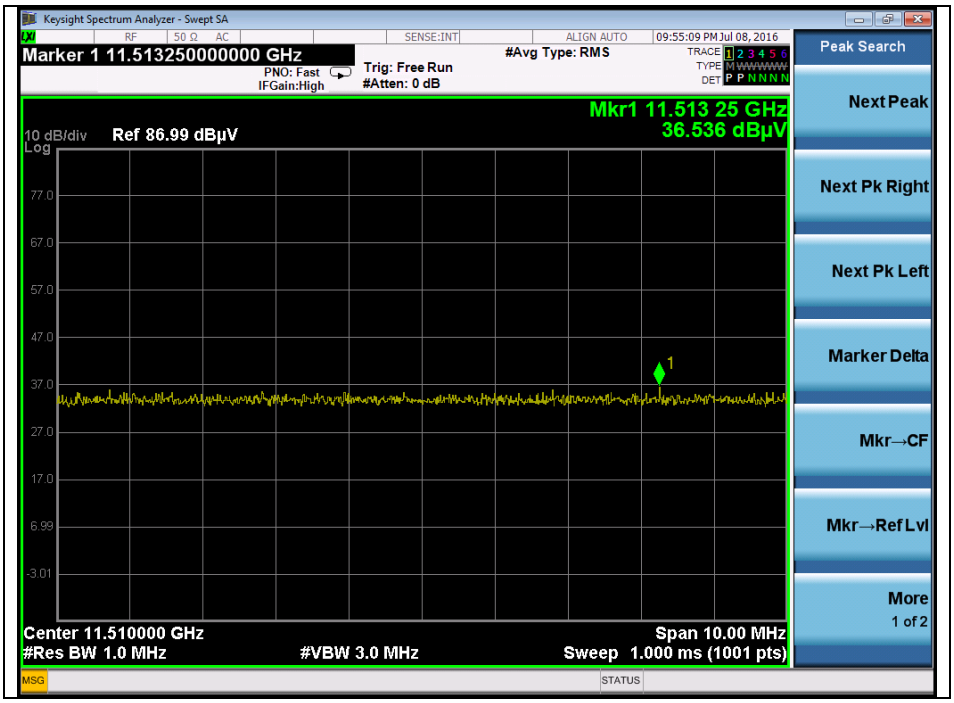
High channel 2nd harmonic (Peak) - Band 2C



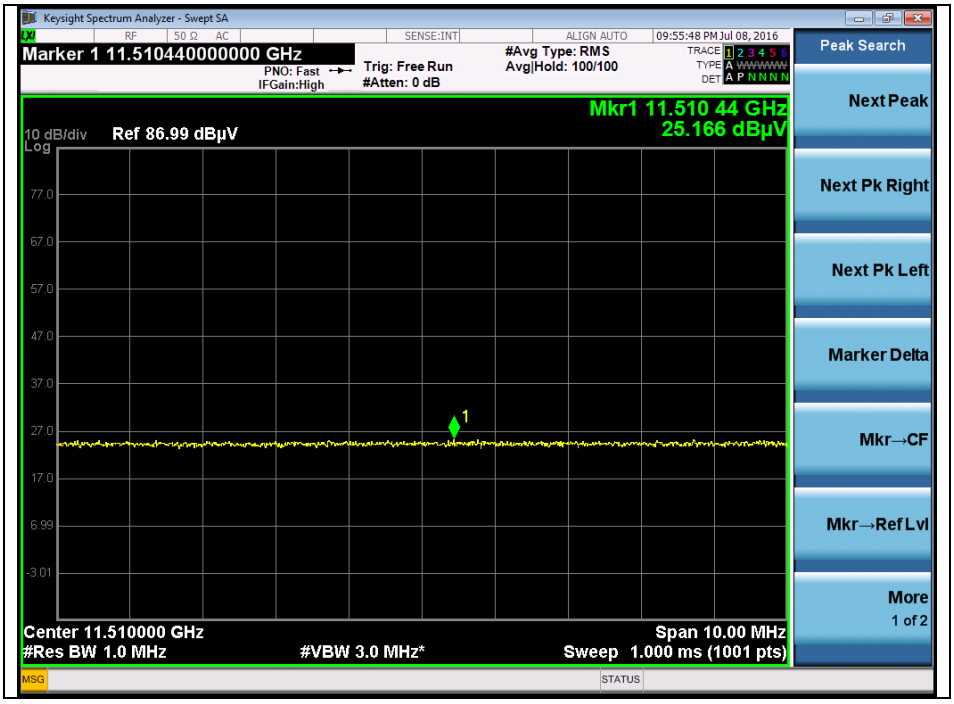
High channel 2nd harmonic (Average) - Band 2C



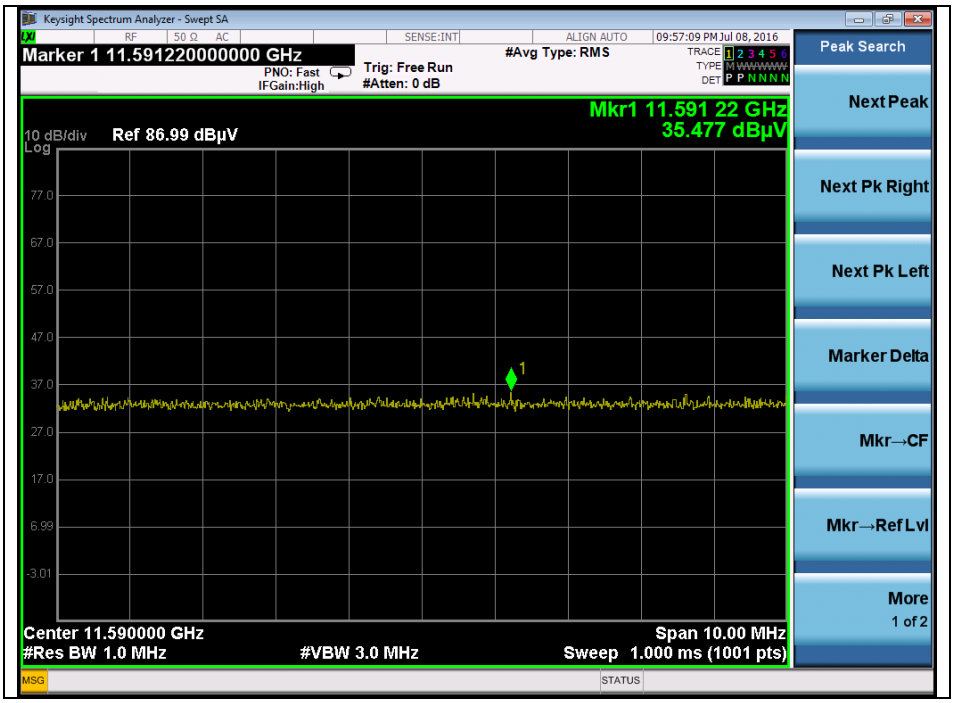
Low channel 2nd harmonic (Peak) - Band 3



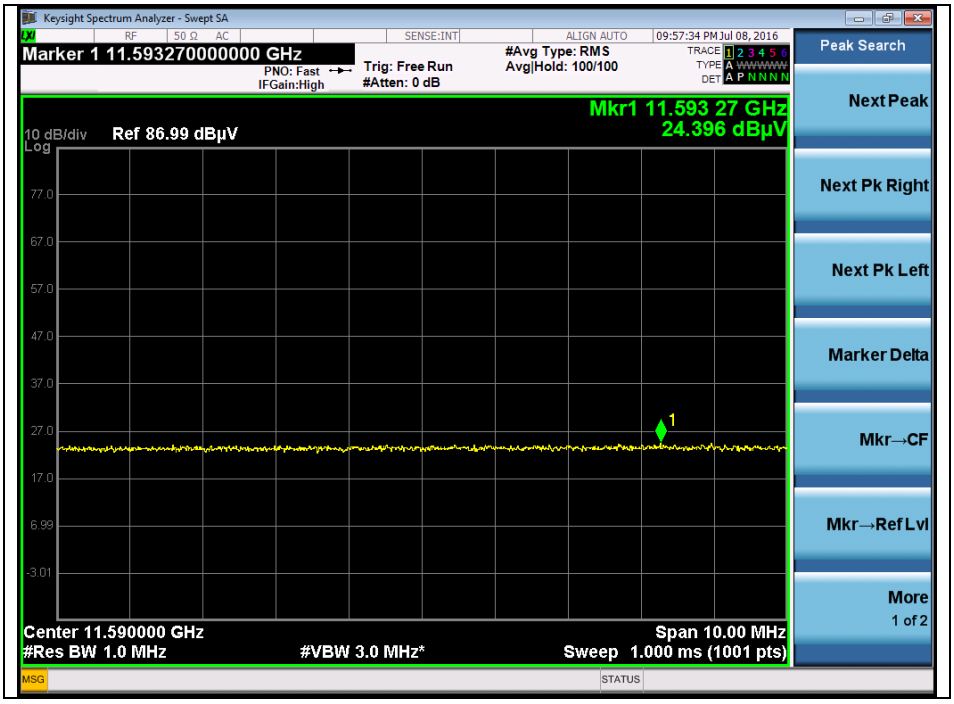
Low channel 2nd harmonic (Average) - Band 3



High channel 2nd harmonic (Peak) - Band 3

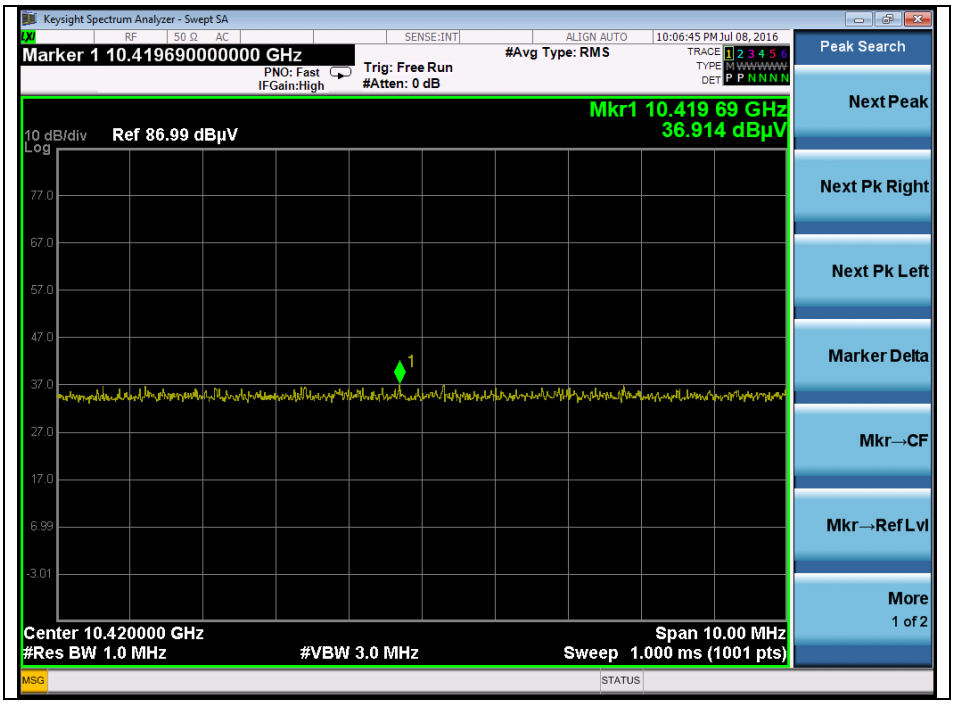


High channel 2nd harmonic (Average) - Band 3

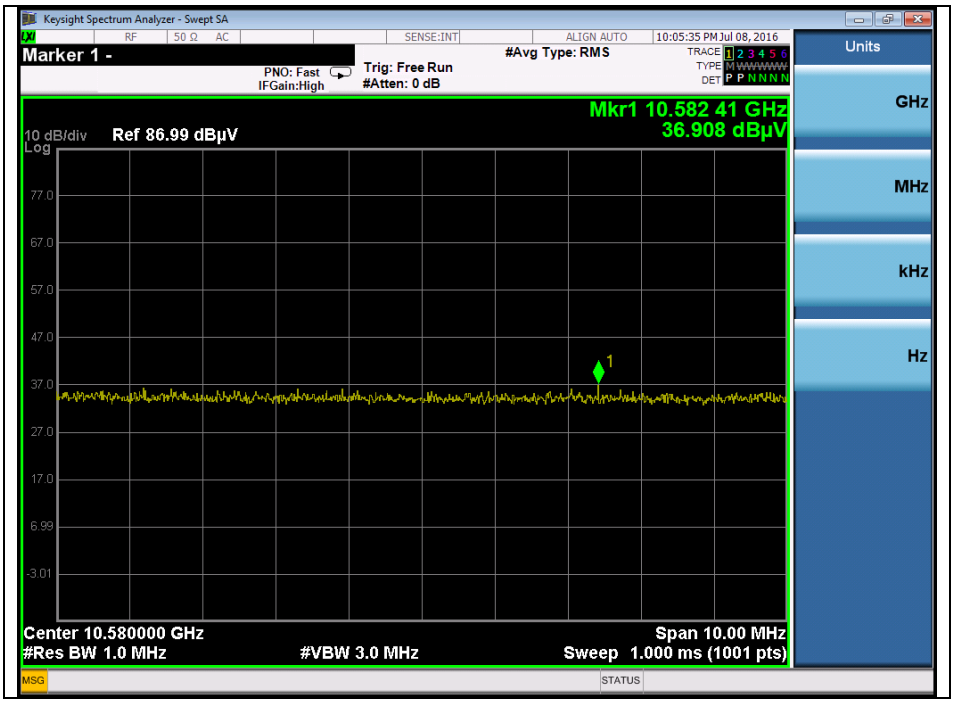


OFDM : 802.11ac_VHT80(MCS0)

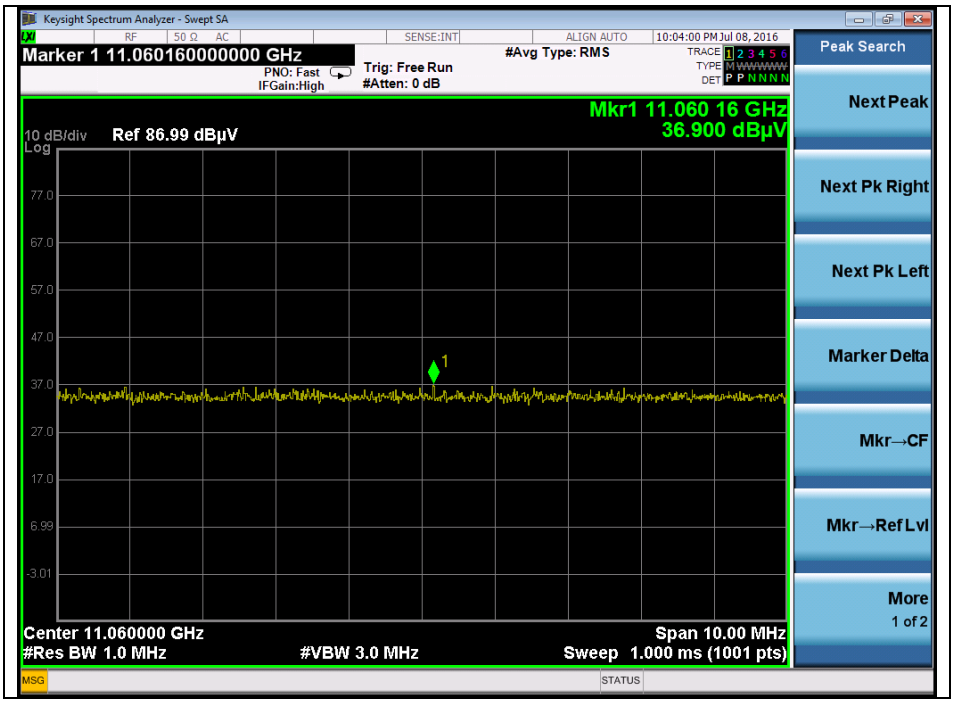
Middle channel 2nd harmonic (Peak) - Band 1



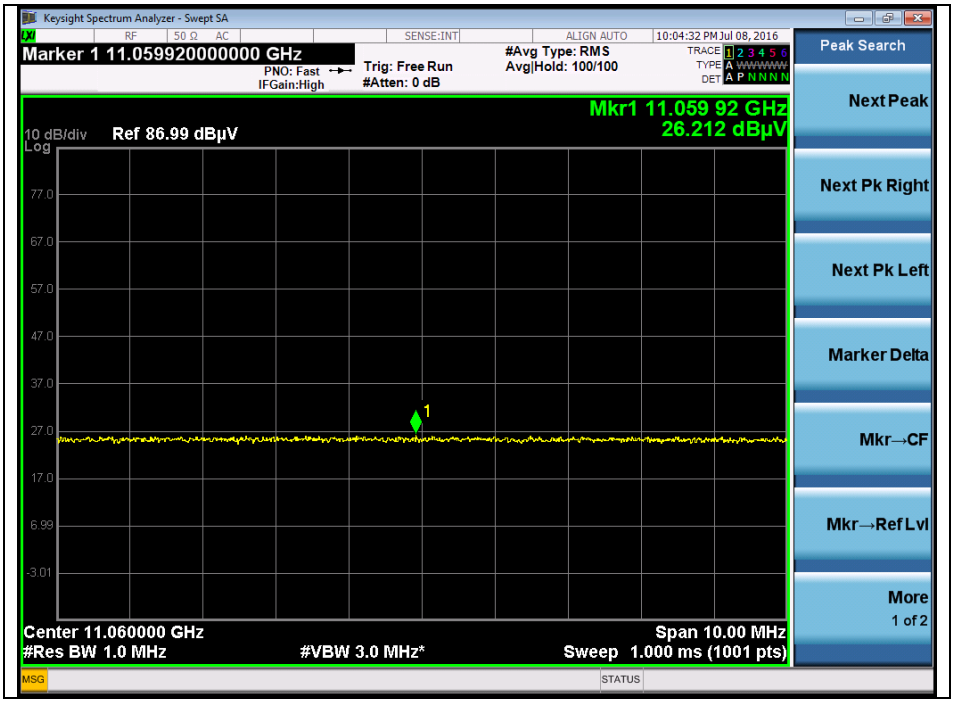
Middle channel 2nd harmonic (Peak) - Band 2A



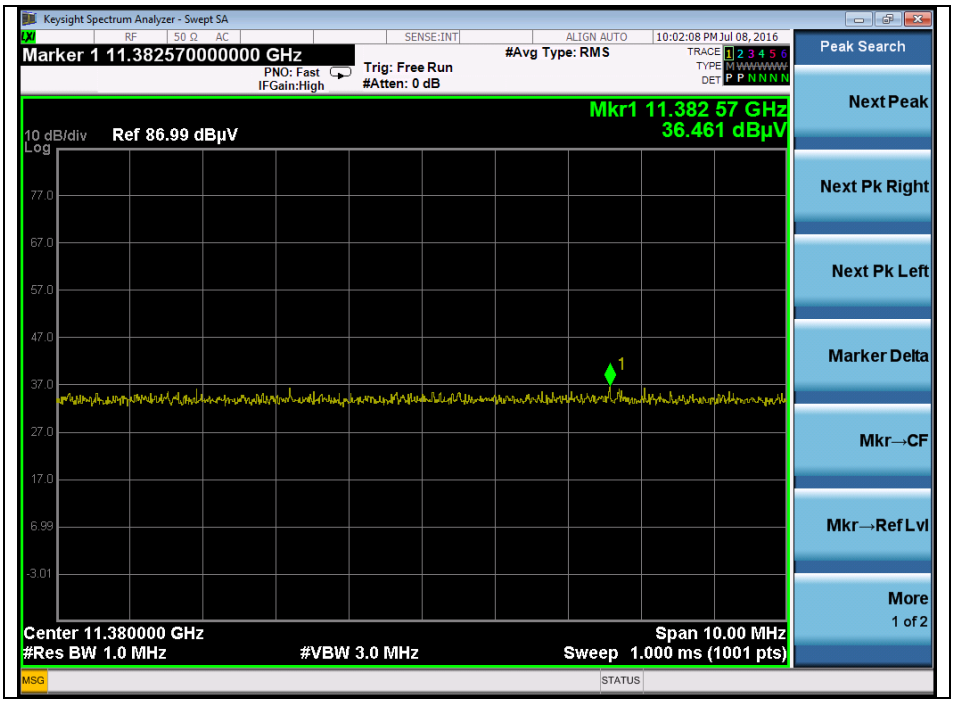
Low channel 2nd harmonic (Peak) - Band 2C



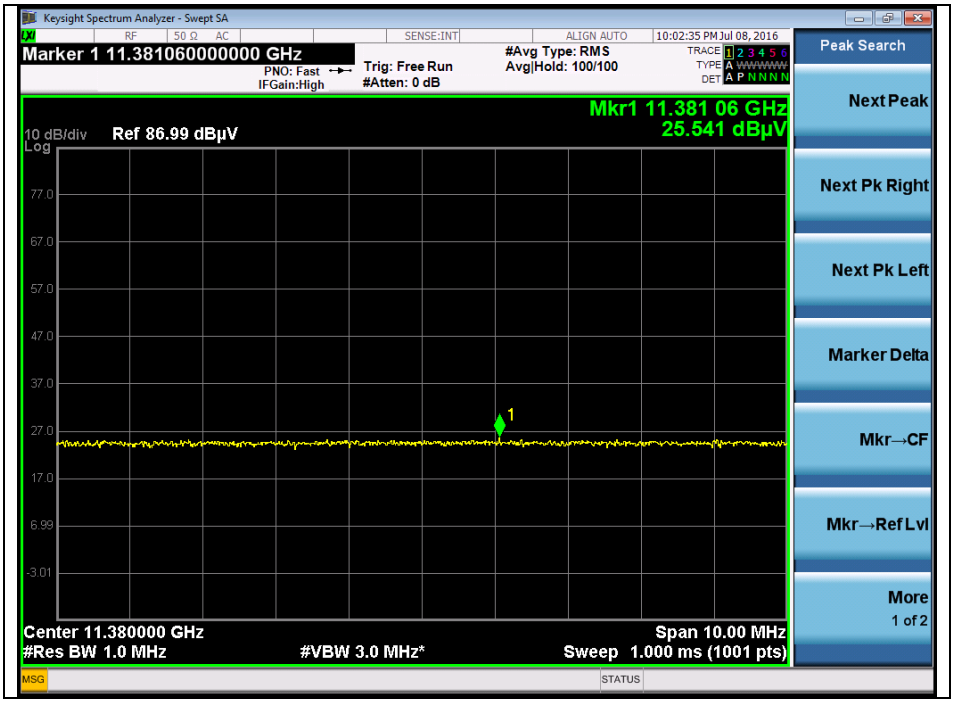
Low channel 2nd harmonic (Average) - Band 2C



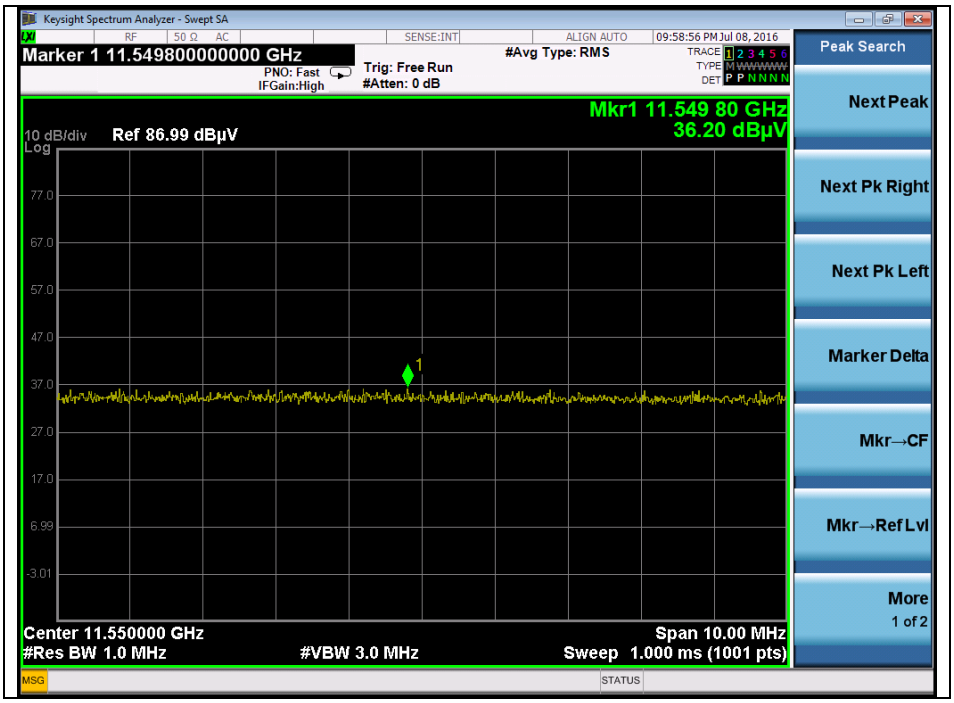
High channel 2nd harmonic (Peak) - Band 2C



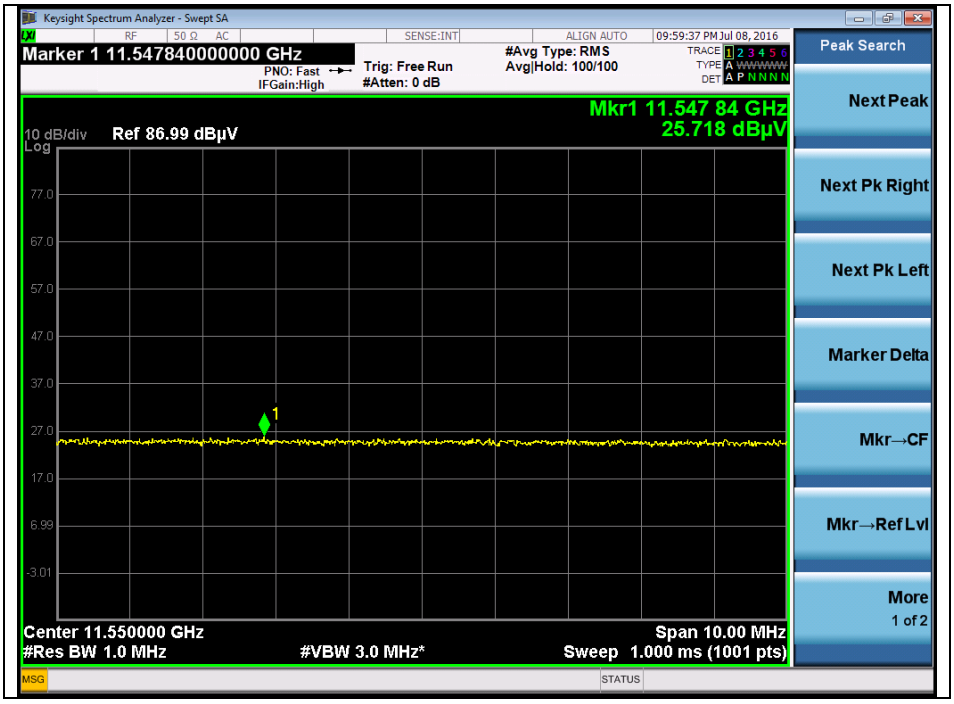
High channel 2nd harmonic (Average) - Band 2C



Middle channel 2nd harmonic (Peak) - Band 3

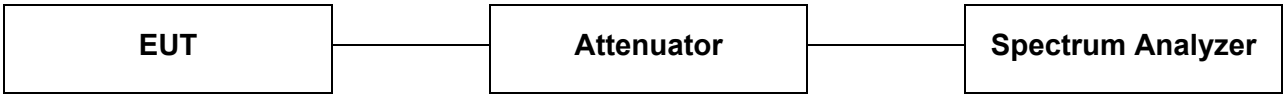


Middle channel 2nd harmonic (Average) - Band 3



3. 99 % Bandwidth & 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.

3.3.1. 99 % Bandwidth

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
The resolution bandwidth (RBW) shall be in the range of 1 % to 5 % of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3 x RBW. Detector = sampling, Trace mode = max hold.
The trace data points are recovered and are directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency).
This frequency is then recorded.

3.3.2. 26 dB Bandwidth

1. This measurement settings are specified in section C.1 of KDB 789033_D02 v01r02.
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 %.

Remark;
In case of band crossing channels 138, 142 and 144, the measurement is complied with section D of KDB 644545_D03 v01.

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3.4. Test result

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

Mode	Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	99 % Bandwidth (㎒)	26 ㏈ Bandwidth (㎒)
11a	U-NII 1	5 180	36	6	17.077	21.187
		5 200	40	6	17.077	21.418
		5 240	48	6	17.077	21.360
	U-NII 2A	5 260	52	6	17.077	21.447
		5 280	56	6	17.135	21.360
		5 320	64	6	17.135	21.418
	U-NII 2C	5 500	100	6	17.192	21.360
		5 580	116	6	17.135	21.245
		5 700	140	6	17.192	21.360
	U-NII 3	5 745	149	6	17.192	21.650
		5 785	157	6	17.192	21.708
		5 825	165	6	17.192	22.171

Mode	Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	99 % Bandwidth (㎒)	26 ㏈ Bandwidth (㎒)
11n_HT20	U-NII 1	5 180	36	MCS0	18.119	21.534
		5 200	40	MCS0	18.177	21.534
		5 240	48	MCS0	18.177	21.650
	U-NII 2A	5 260	52	MCS0	18.177	21.476
		5 280	56	MCS0	18.177	21.766
		5 320	64	MCS0	18.119	21.823
	U-NII 2C	5 500	100	MCS0	18.177	21.650
		5 580	116	MCS0	18.177	21.476
		5 700	140	MCS0	18.177	21.592
	U-NII 3	5 745	149	MCS0	18.177	21.823
		5 785	157	MCS0	18.292	21.766
		5 825	165	MCS0	18.234	21.476

Mode	Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	99 % Bandwidth (㎒)	26 ㏈ Bandwidth (㎒)
11n_HT40	U-NII 1	5 190	38	MCS0	36.700	40.450
		5 230	46	MCS0	36.700	40.410
	U-NII 2A	5 270	54	MCS0	36.585	40.460
		5 310	62	MCS0	36.700	40.520
	U-NII 2C	5 510	102	MCS0	36.700	40.170
		5 550	110	MCS0	36.585	40.410
		5 670	134	MCS0	36.700	40.290
	U-NII 3	5 755	151	MCS0	36.700	40.060
		5 795	159	MCS0	36.700	40.520

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Mode	Band	Frequency (㎒)	Ch.	Data Rate (Mbps)	99 % Bandwidth (㎒)	26 ㏈ Bandwidth (㎒)
11ac_VHT80	U-NII 1	5 210	42	MCS0	75.716	82.320
	U-NII 2A	5 290	58	MCS0	75.948	83.130
	U-NII 2C	5 530	106	MCS0	75.716	82.660
		5 690	138	MCS0	75.716	82.200
	U-NII 3	5 775	155	MCS0	75.485	82.170

Band	Mode	Frequency (㎒)	Ch.	Data Rate (Mbps)	26 ㏈ Bandwidth (㎒)
U-NII 2C (Band-crossing channel)	11a	5 720	144	6	15.593
	11n_HT20	5 720	144	MCS0	15.709
	11n_HT40	5 710	142	MCS0	34.800
	11ac_VHT80	5 690	138	MCS0	75.980

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