

FCC Test Report

Report No.: AGC02031180101FE05

FCC ID : 2AG94-C-8068
APPLICATION PURPOSE : Original Equipment
PRODUCT DESIGNATION : WIFI Module
BRAND NAME : C-CHIP
MODEL NAME : C-8068
CLIENT : Shenzhenshi Xinzhongxin Technology Co., Ltd
DATE OF ISSUE : May 04, 2018
STANDARD(S) : FCC Part 15.247
TEST PROCEDURE(S)
REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

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Report Revise Record

| Report Version | Revise Time | Issued Date | Valid Version | Notes |
|----------------|-------------|--------------|---------------|-----------------|
| V1.0 | / | May 04, 2018 | Valid | Initial Release |

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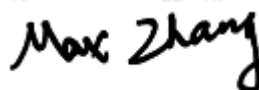
1. VERIFICATION OF CONFORMITY

| | |
|---------------------------------|---|
| Applicant | Shenzhen Xinzhongxin Technology Co., Ltd |
| Address | Block A3, Dong Huan Industrial Zone, Nanpu Road, Shajin Street, Baoan District, Shenzhen, China |
| Manufacturer | Shenzhen Xinzhongxin Technology Co., Ltd |
| Address | Block A3, Dong Huan Industrial Zone, Nanpu Road, Shajin Street, Baoan District, Shenzhen, China |
| Product Designation | WIFI Module |
| Brand Name | C-CHIP |
| Test Model | C-8068 |
| Date of test | Feb. 05, 2018 to May 04, 2018 |
| Deviation | None |
| Condition of Test Sample | Normal |
| Test Result | Pass |
| Report Template | AGCRT-US-BGN/RF |

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15.247.

Tested By



Max Zhang(Zhang Yi)

May 04, 2018

Reviewed By



Bart Xie(Xie Xiaobin)

May 04, 2018

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2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

The EUT is designed as "WIFI Module". It is designed by way of utilizing the DSSS and OFDM technology to achieve the system operation.

A major technical description of EUT is described as following

| | |
|----------------------------|--|
| Operation Frequency | 2.412 GHz~2.462GHz |
| Output Power | IEEE 802.11b:11.59dBm; IEEE 802.11g:10.61dBm; IEEE 802.11n(20):10.66dBm; IEEE 802.11n(40):9.59dBm |
| Modulation | DSSS(DBPSK/DQPSK/CCK);OFDM(BPSK/QPSK/16-QAM/64-QAM) |
| Number of channels | 11 |
| Hardware Version | V1.1 |
| Software Version | V1.1 |
| Antenna Designation | PCB Antenna |
| Antenna Gain | 0dBi |
| Power Supply | DC 3.3V |

2.2. TABLE OF CARRIER FREQUENCIES

| Frequency Band | Channel Number | Frequency |
|----------------|----------------|-----------|
| 2400~2472MHZ | 1 | 2412 MHZ |
| | 2 | 2417 MHZ |
| | 3 | 2422 MHZ |
| | 4 | 2427 MHZ |
| | 5 | 2432 MHZ |
| | 6 | 2437 MHZ |
| | 7 | 2442 MHZ |
| | 8 | 2447 MHZ |
| | 9 | 2452 MHZ |
| | 10 | 2457 MHZ |
| | 11 | 2462 MHZ |

Note: For 20MHZ bandwidth system use Channel 1 to Channel 11, For 40MHZ bandwidth system use Channel 3 to Channel 9

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2.3. IEEE 802.11N MODULATION SCHEME

| MCS Index | Nss | Modulation | R | NBPSC | NCBPS | | NDBPS | | Data rate(Mbps) | |
|-----------|-----|------------|-----|-------|-------|-------|-------|-------|-----------------|---------|
| | | | | | 20MHz | 40MHz | 20MHz | 40MHz | 800nsGI | 800nsGI |
| 0 | 1 | BPSK | 1/2 | 1 | 52 | 108 | 26 | 54 | 6.5 | 13.5 |
| 1 | 1 | QPSK | 1/2 | 2 | 104 | 216 | 52 | 108 | 13.0 | 27.0 |
| 2 | 1 | QPSK | 3/4 | 2 | 104 | 216 | 78 | 162 | 19.5 | 40.5 |
| 3 | 1 | 16-QAM | 1/2 | 4 | 208 | 432 | 104 | 216 | 26.0 | 54.0 |
| 4 | 1 | 16-QAM | 3/4 | 4 | 208 | 432 | 156 | 324 | 39.0 | 81.0 |
| 5 | 1 | 64-QAM | 2/3 | 6 | 312 | 648 | 208 | 432 | 52.0 | 108.0 |
| 6 | 1 | 64-QAM | 3/4 | 6 | 312 | 648 | 234 | 489 | 58.5 | 121.5 |
| 7 | 1 | 64-QAM | 5/6 | 6 | 312 | 648 | 260 | 540 | 65.0 | 135.0 |

| Symbol | Explanation |
|--------|---|
| NSS | Number of spatial streams |
| R | Code rate |
| NBPSC | Number of coded bits per single carrier |
| NCBPS | Number of coded bits per symbol |
| NDBPS | Number of data bits per symbol |
| GI | Guard interval |

2.4. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2AG94-C-8068** filing to comply with the FCC Part 15 requirements.

2.5. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2013). Radiated testing was performed at an antenna to EUT distance 3 meters.

2.6. SPECIAL ACCESSORIES

Refer to section 5.2.

2.7. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

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3. MEASUREMENT UNCERTAINTY

Conducted measurement: +/- 3.18dB

Radiated measurement: +/- 3.91dB

4. DESCRIPTION OF TEST MODES

| NO. | TEST MODE DESCRIPTION |
|-----|-----------------------|
| 1 | Low channel TX |
| 2 | Middle channel TX |
| 3 | High channel TX |
| 4 | Normal operating |

Note:
 Transmit by 802.11b with Data rate (1/2/5.5/11)
 Transmit by 802.11g with Data rate (6/9/12/18/24/36/48/54)
 Transmit by 802.11n (20MHz) with Data rate (6.5/13/19.5/26/39/52/58.5/65)
 Transmit by 802.11n (40MHz) with Data rate (13.5/27/40.5/54/81/108/121.5/135)

Note:

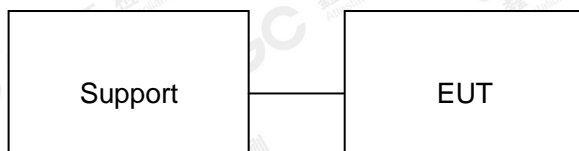
1. The EUT has been set to operate continuously on the lowest, middle and highest operation frequency Individually, and the eut is operating at its maximum duty cycle>or equal 98%
2. All modes under which configure applicable have been tested and the worst mode test data recording in the test report, if no other mode data.
3. For Radiated Emission, 3axis were chosen for testing for each applicable mode.

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5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Configure 1:



5.2. EQUIPMENT USED IN EUT SYSTEM

Support equipment

| Item | Equipment | manufacturer | Model | Remark |
|------|-------------------|--------------|-------------|---------|
| 1 | PC | DELL | Vostro 2421 | Support |
| 2 | Serial-port board | N/A | FT232 | Support |

5.3. SUMMARY OF TEST RESULTS

| FCC RULES | DESCRIPTION OF TEST | RESULT |
|-----------|---|-----------|
| §15.247 | Output Power | Compliant |
| §15.247 | 6 dB Bandwidth | Compliant |
| §15.247 | Conducted Spurious Emission | Compliant |
| §15.247 | Maximum Conducted Output Power SPECTRAL Density | Compliant |
| §15.209 | Radiated Emission | Compliant |
| §15.247 | Band Edges | Compliant |
| §15.207 | Line Conduction Emission | Compliant |

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6. TEST FACILITY

| | |
|---------------------------|--|
| Test Site | Attestation of Global Compliance (Shenzhen) Co., Ltd |
| Location | 1-2F., Bldg.2, No.1-4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Bao'an District B112-B113, Bldg.12, Baoan Bldg Materials Center, No.1 of Xixiang Inner Ring Road, Baoan District, Shenzhen 518012 |
| NVLAP LAB CODE | 600153-0 |
| Designation Number | CN5028 |
| Description | Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by National Voluntary Laboratory Accreditation program, NVLAP Code 600153-0 |

TEST EQUIPMENT OF CONDUCTED EMISSION TEST

| Equipment | Manufacturer | Model | S/N | Cal. Date | Cal. Due |
|---------------|--------------|---------|--------|--------------|--------------|
| TEST RECEIVER | R&S | ESPI | 101206 | Jun.20, 2017 | Jun.19, 2018 |
| LISN | R&S | ESH2-Z5 | 100086 | Aug.21, 2017 | Aug.20, 2018 |

TEST EQUIPMENT OF RADIATED EMISSION TEST

| Equipment | Manufacturer | Model | S/N | Cal. Date | Cal. Due |
|--------------------------------|--------------|-------------|------------|--------------|--------------|
| TEST RECEIVER | R&S | ESCI | 10096 | Jun.20, 2017 | Jun.19, 2018 |
| EXA Signal Analyzer | Aglient | N9010A | MY53470504 | Dec.08, 2017 | Dec.07, 2018 |
| Power sensor | Aglient | U2021XA | MY54110007 | Sep.21, 2017 | Sep.20, 2018 |
| Horn antenna | SCHWARZBECK | BBHA 9170 | #768 | Sep.20, 2017 | Sep.19, 2018 |
| preamplifier | ChengYi | EMC184045SE | 980508 | Sep.15, 2017 | Sep.14, 2018 |
| Active loop antenna (9K-30MHz) | SCHWARZBECK | FMZB1519 | 1519-038 | Sep.28, 2017 | Sep.27, 2018 |
| Double-Ridged Waveguide Horn | ETS LINDGREN | 3117 | 00034609 | May.18, 2017 | May.17, 2019 |
| Broadband Preamplifier | SCHWARZBECK | BBV 9718 | 9718-205 | Jun.20, 2017 | Jun.19, 2018 |
| ANTENNA | SCHWARZBECK | VULB9168 | D69250 | Sep.28, 2017 | Sep.27, 2018 |

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7. OUTPUT POWER

7.1. MEASUREMENT PROCEDURE

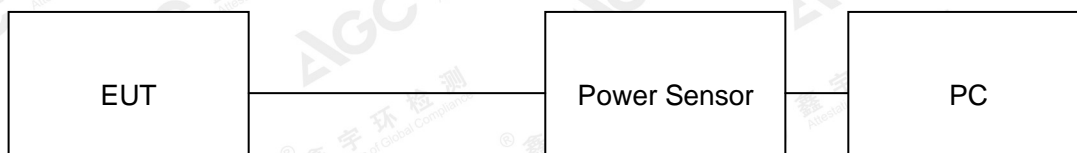
For average power test:

1. Connect EUT RF output port to power sensor through an RF attenuator.
2. Connect the power sensor to the PC.
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Record the maximum power from the software.

Note : The EUT was tested according to ANSI C63.10 (2013) for compliance to FCC 47CFR 15.247 requirements.

7.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

AVERAGE POWER SETUP



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7.3. LIMITS AND MEASUREMENT RESULT

| | |
|------------------|--------------------------|
| TEST ITEM | OUTPUT POWER |
| TEST MODE | 802.11b with data rate 1 |

| Frequency (GHz) | Average Power (dBm) | Applicable Limits (dBm) | Pass or Fail |
|-----------------|---------------------|-------------------------|--------------|
| 2.412 | 11.59 | 30 | Pass |
| 2.437 | 11.41 | 30 | Pass |
| 2.462 | 11.27 | 30 | Pass |

| | |
|------------------|--------------------------|
| TEST ITEM | OUTPUT POWER |
| TEST MODE | 802.11g with data rate 6 |

| Frequency (GHz) | Average Power (dBm) | Applicable Limits (dBm) | Pass or Fail |
|-----------------|---------------------|-------------------------|--------------|
| 2.412 | 10.34 | 30 | Pass |
| 2.437 | 10.58 | 30 | Pass |
| 2.462 | 10.61 | 30 | Pass |

| | |
|------------------|-------------------------------|
| TEST ITEM | OUTPUT POWER |
| TEST MODE | 802.11n 20 with data rate 6.5 |

| Frequency (GHz) | Average Power (dBm) | Applicable Limits (dBm) | Pass or Fail |
|-----------------|---------------------|-------------------------|--------------|
| 2.412 | 10.24 | 30 | Pass |
| 2.437 | 10.41 | 30 | Pass |
| 2.462 | 10.66 | 30 | Pass |

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| | |
|-----------|--------------------------------|
| TEST ITEM | OUTPUT POWER |
| TEST MODE | 802.11n 40 with data rate 13.5 |

| Frequency (GHz) | Average Power (dBm) | Applicable Limits (dBm) | Pass or Fail |
|-----------------|---------------------|-------------------------|--------------|
| 2.422 | 9.59 | 30 | Pass |
| 2.437 | 9.43 | 30 | Pass |
| 2.452 | 9.52 | 30 | Pass |

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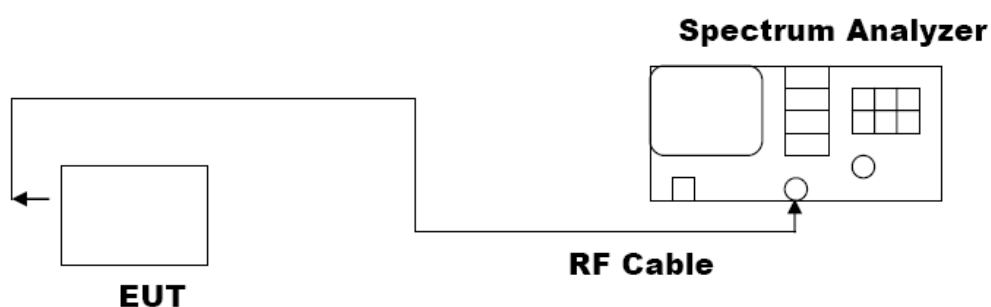
8. 6 DB BANDWIDTH

8.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 100 KHz, VBW $\geq 3 \times$ RBW.
4. Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to ANSI C63.10 (2013) for compliance to FCC 47CFR 15.247 requirements.

8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



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8.3. LIMITS AND MEASUREMENT RESULTS

| | |
|------------------|---------------------------|
| TEST ITEM | 6DB BANDWIDTH |
| TEST MODE | 802.11b with data rate 11 |

| LIMITS AND MEASUREMENT RESULT | | | |
|-------------------------------|-------------------|--------|----------|
| Applicable Limits | Applicable Limits | | |
| | channel | MHz | Criteria |
| >500KHZ | Low Channel | 9.551 | PASS |
| | Middle Channel | 9.089 | PASS |
| | High Channel | 10.030 | PASS |

| | |
|------------------|---------------------------|
| TEST ITEM | 6DB BANDWIDTH |
| TEST MODE | 802.11g with data rate 54 |

| LIMITS AND MEASUREMENT RESULT | | | |
|-------------------------------|-------------------|-------|----------|
| Applicable Limits | Applicable Limits | | |
| | channel | MHz | Criteria |
| >500KHZ | Low Channel | 15.13 | PASS |
| | Middle Channel | 15.13 | PASS |
| | High Channel | 15.31 | PASS |

| | |
|------------------|------------------------------|
| TEST ITEM | 6DB BANDWIDTH |
| TEST MODE | 802.11n 20 with data rate 65 |

| LIMITS AND MEASUREMENT RESULT | | | |
|-------------------------------|-------------------|-------|----------|
| Applicable Limits | Applicable Limits | | |
| | channel | MHz | Criteria |
| >500KHZ | Low Channel | 15.13 | PASS |
| | Middle Channel | 15.13 | PASS |
| | High Channel | 15.13 | PASS |

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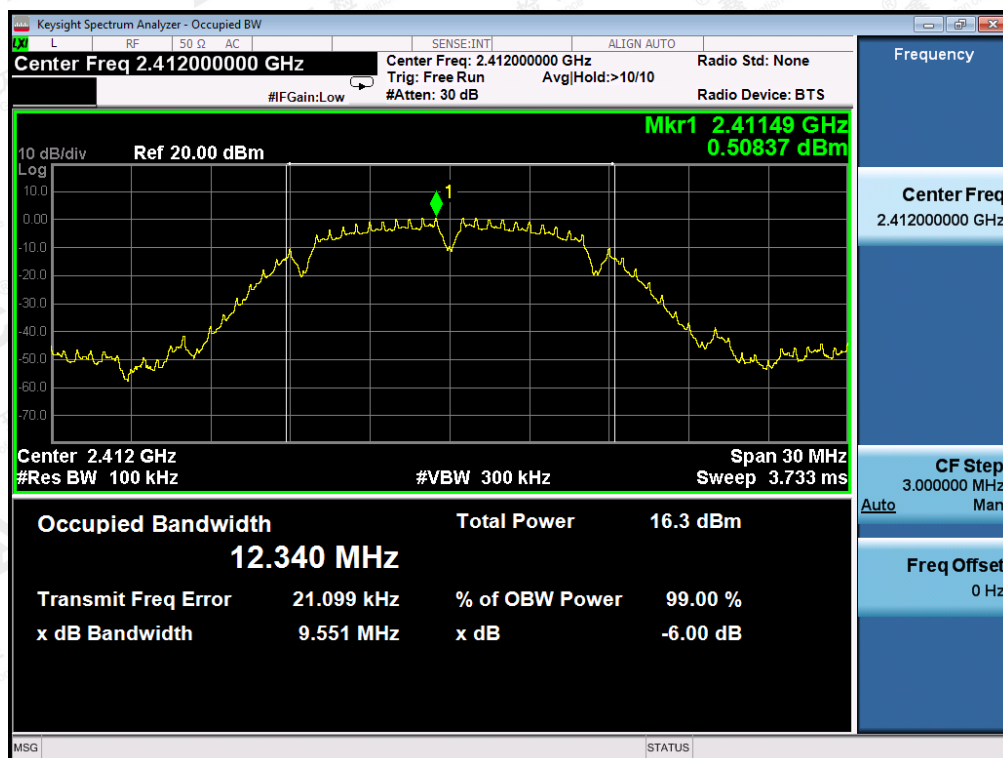
| | |
|------------------|-------------------------------|
| TEST ITEM | 6DB BANDWIDTH |
| TEST MODE | 802.11n 40 with data rate 135 |

| LIMITS AND MEASUREMENT RESULT | | | |
|-------------------------------|-------------------|-------|----------|
| Applicable Limits | Applicable Limits | | |
| | channel | MHz | Criteria |
| >500KHZ | Low Channel | 35.17 | PASS |
| | Middle Channel | 35.16 | PASS |
| | High Channel | 35.15 | PASS |

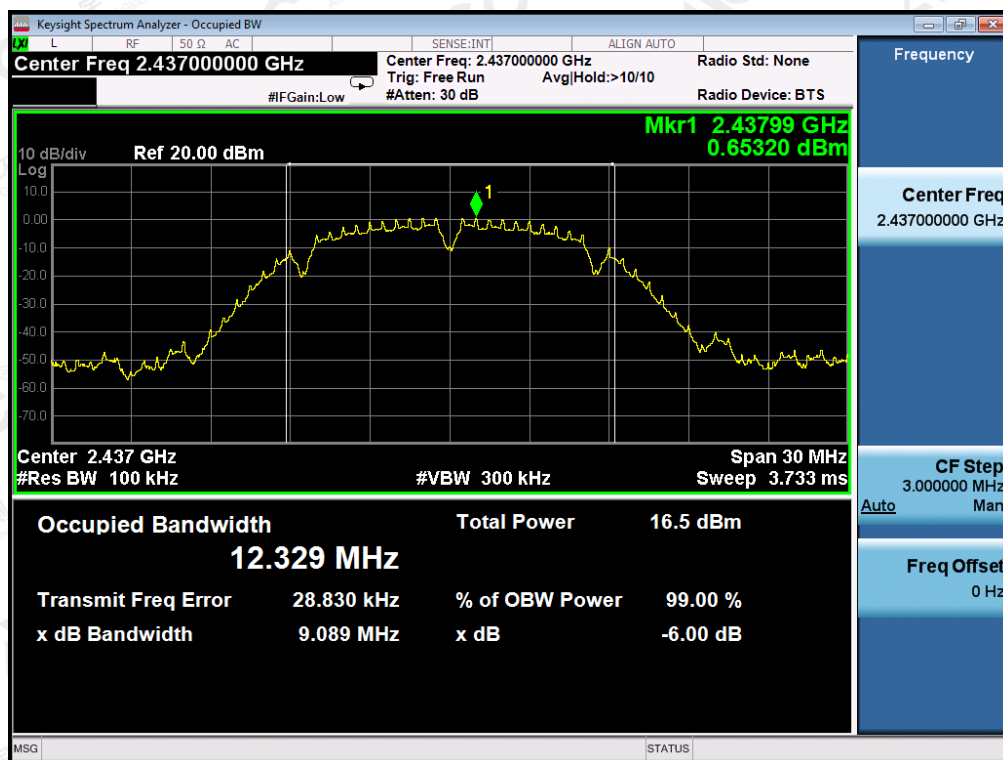
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802.11b TEST RESULT

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



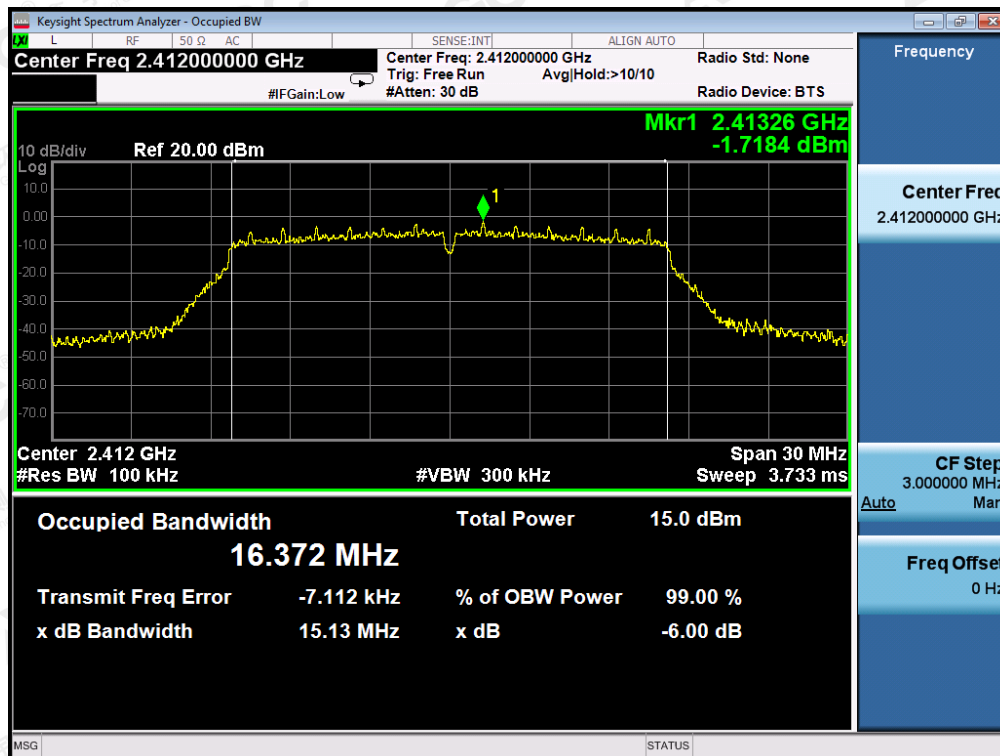
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TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



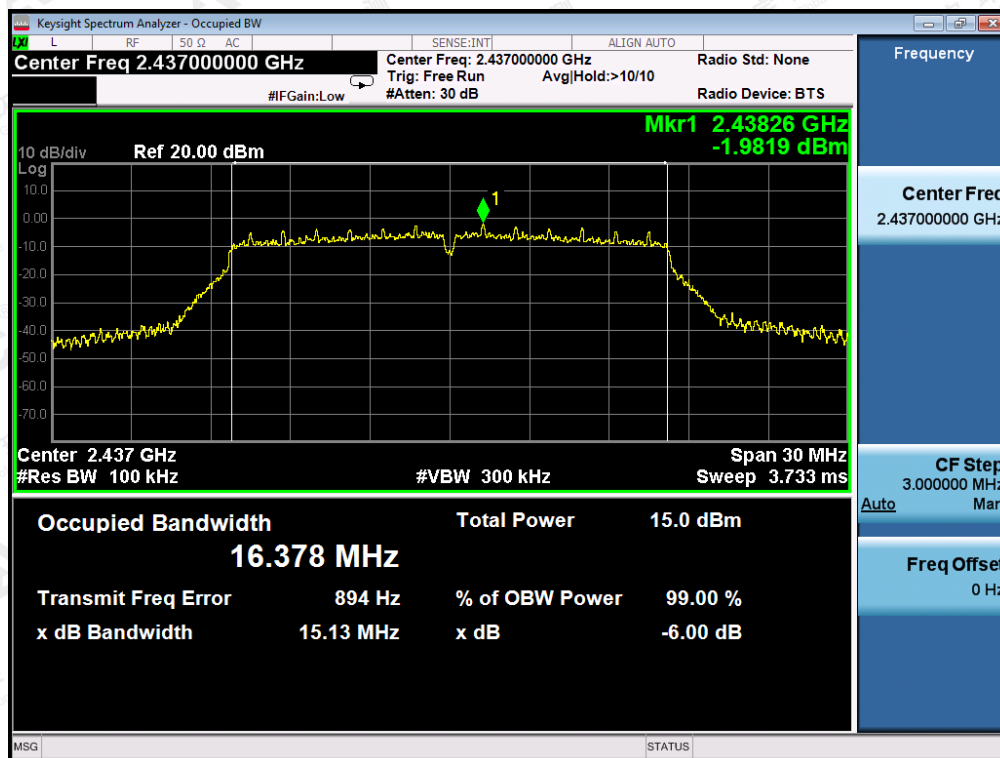
802.11g TEST RESULT

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

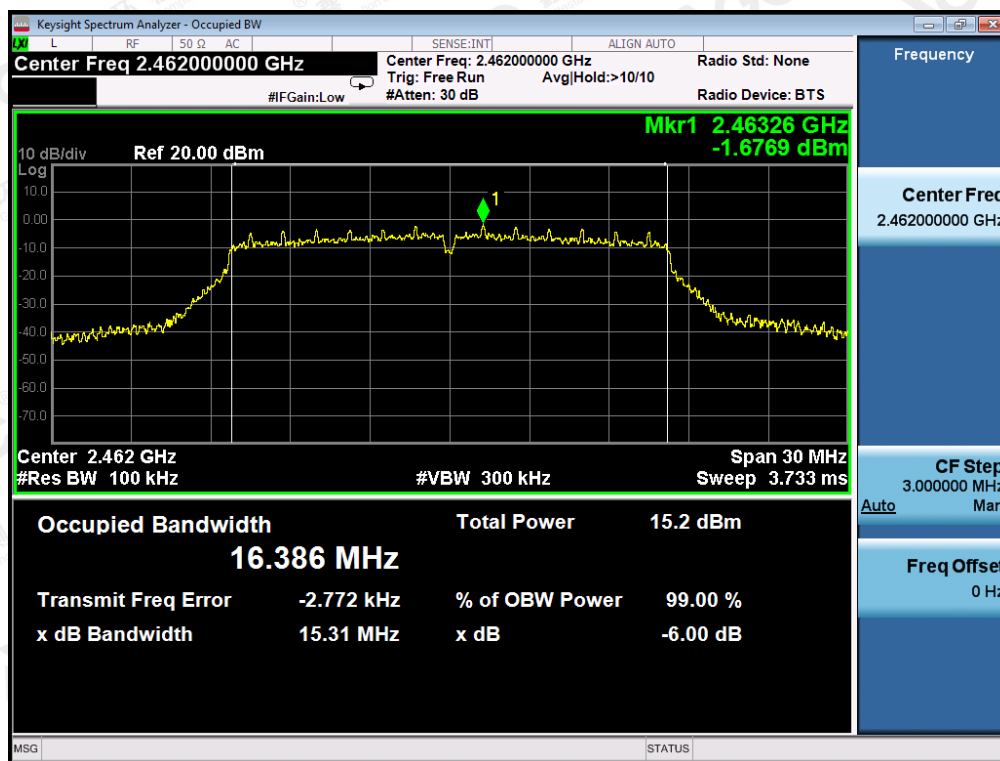


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TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



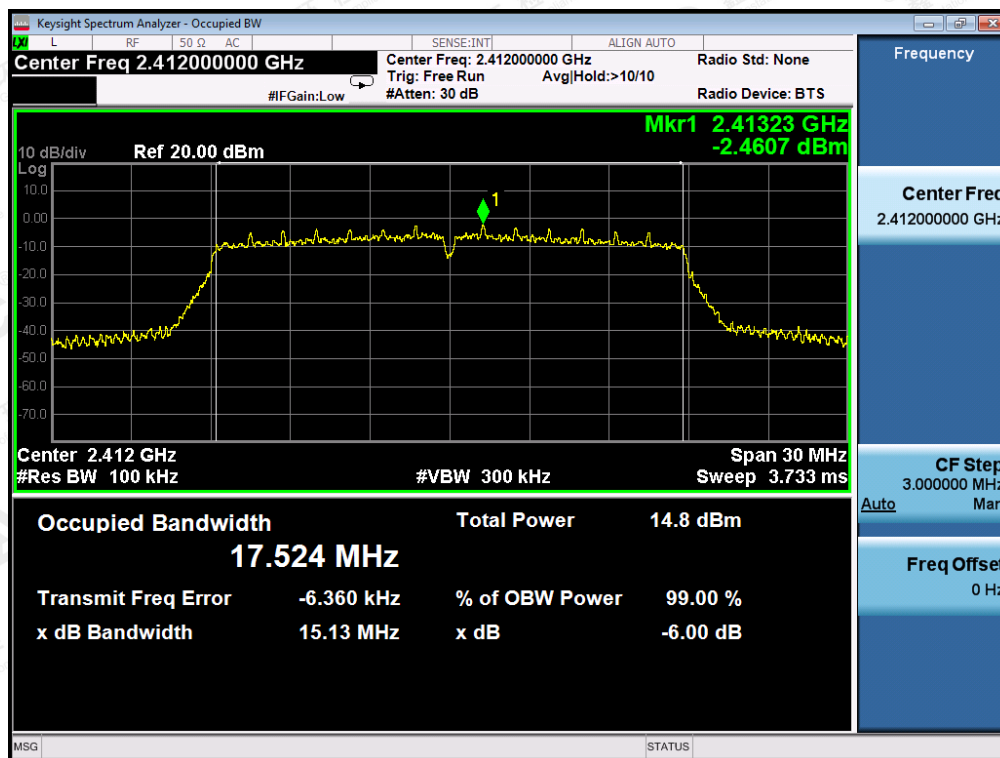
TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



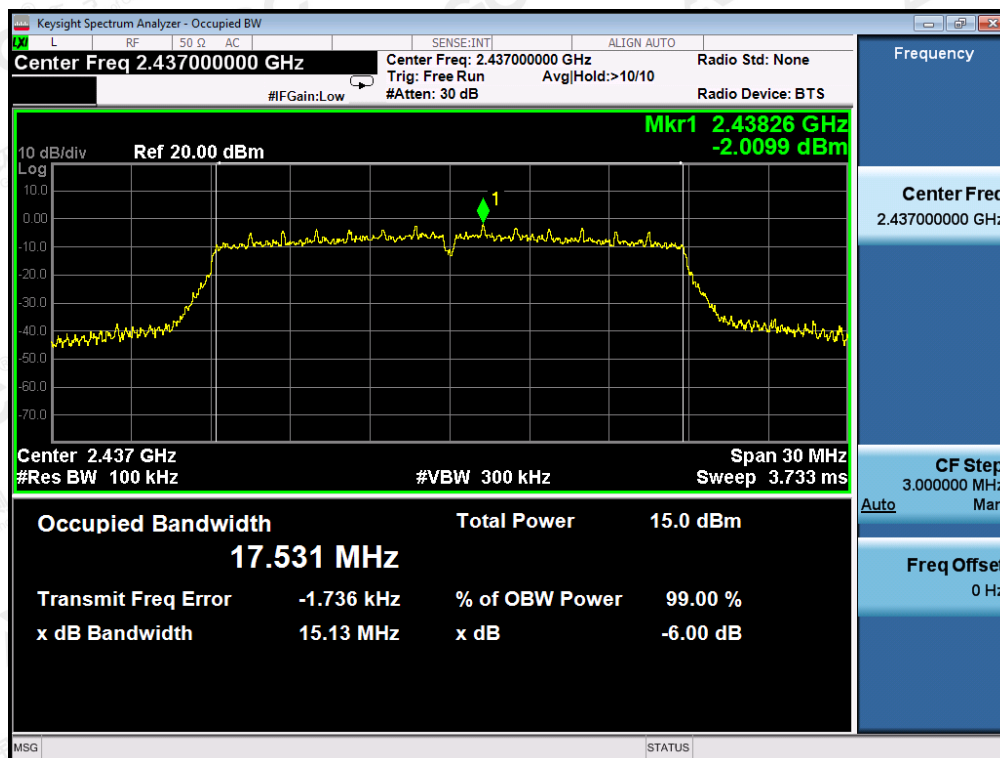
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802.11n (20) TEST RESULT

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

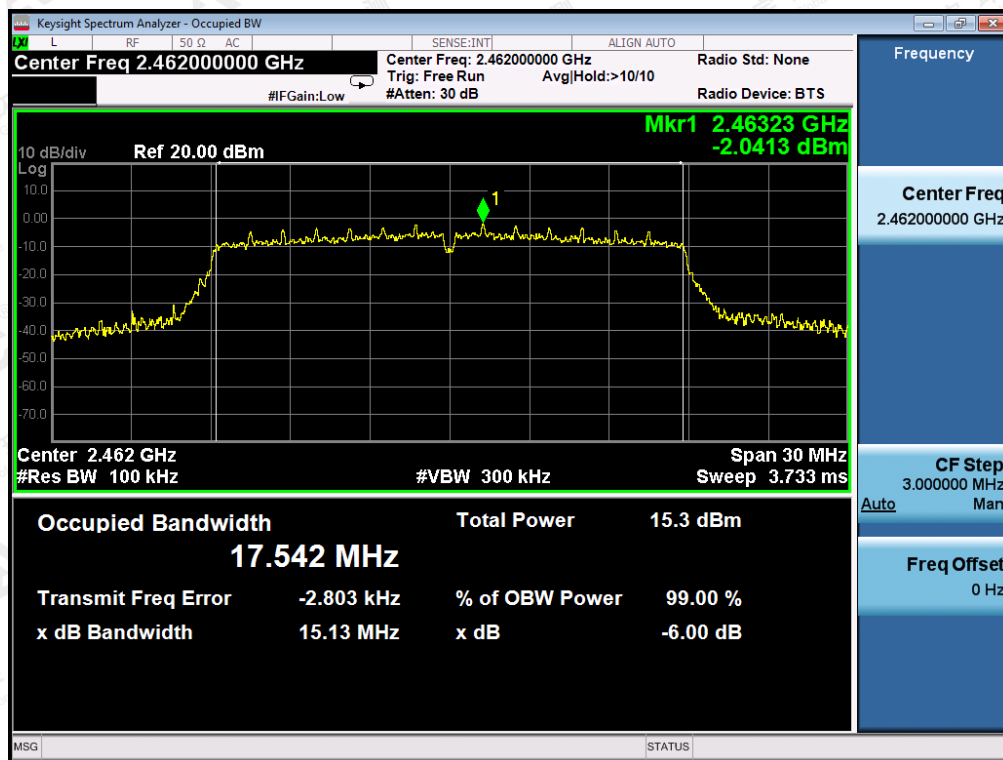


TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



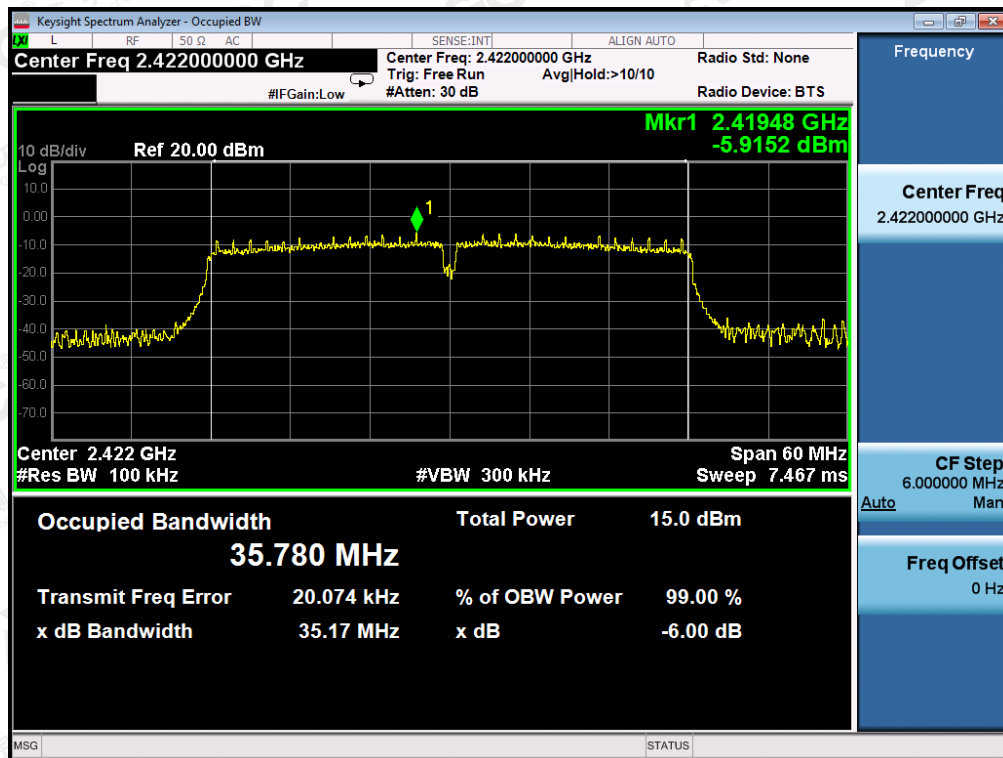
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TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



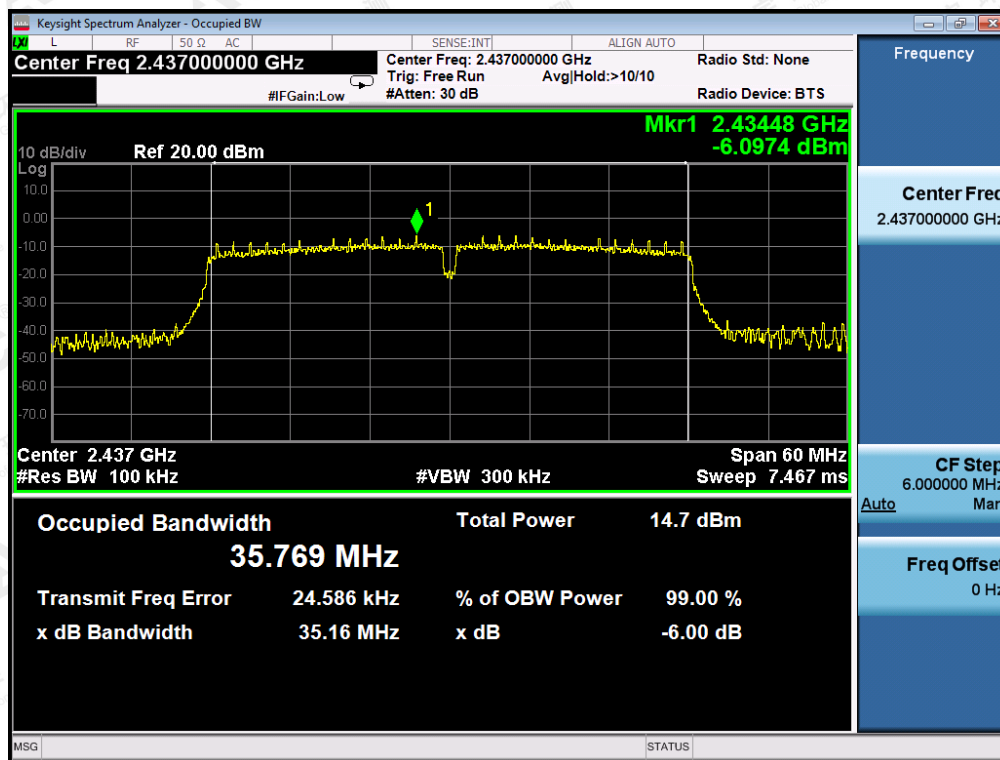
802.11n (40) TEST RESULT

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

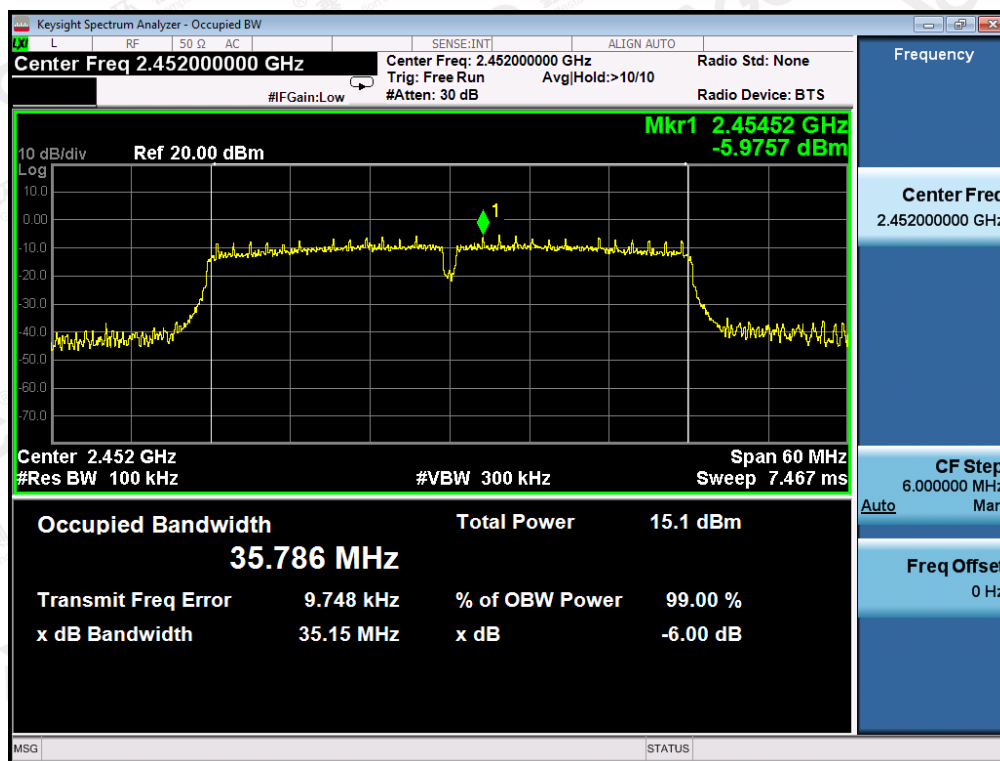


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TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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9. CONDUCTED SPURIOUS EMISSION

9.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to ANSI C63.10 (2013) for compliance to FCC 47CFR 15.247 requirements. Owing to satisfy the requirements of the number of measurement points, we set the RBW=1MHz, VBW > RBW, scan up through 10th harmonic, and consider the tested results as the worst case, if the tested results conform to the requirement, we can deem that the real tested results(set the RBW=100KHz, VBW > RBW) are conform to the requirement.

9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The same as described in section 8.2.

9.3. MEASUREMENT EQUIPMENT USED

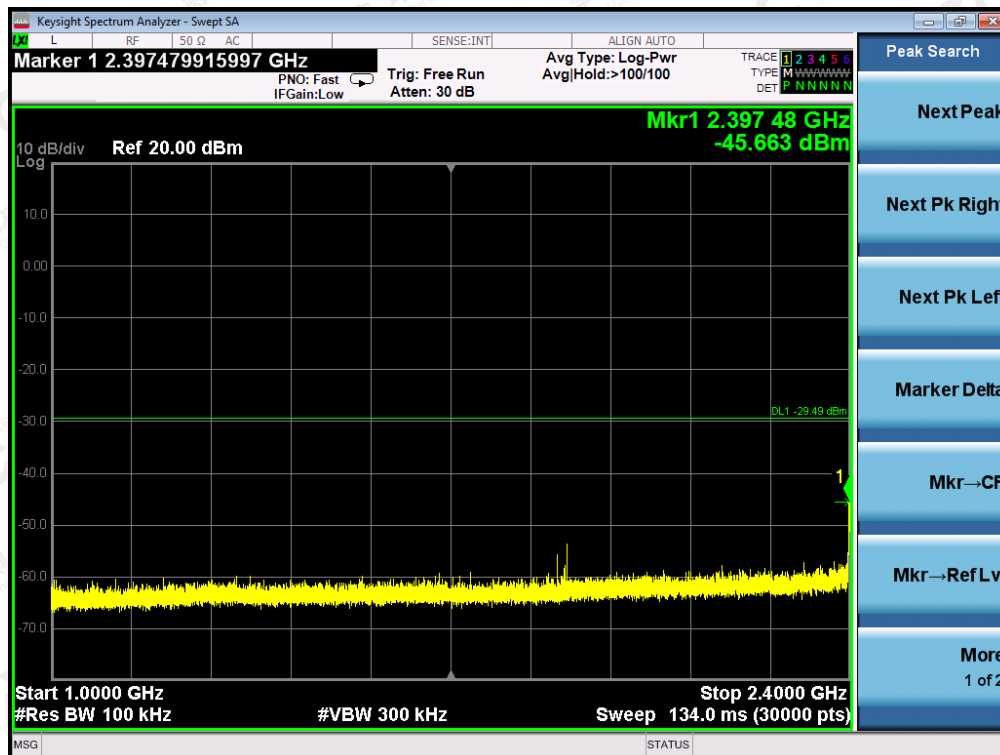
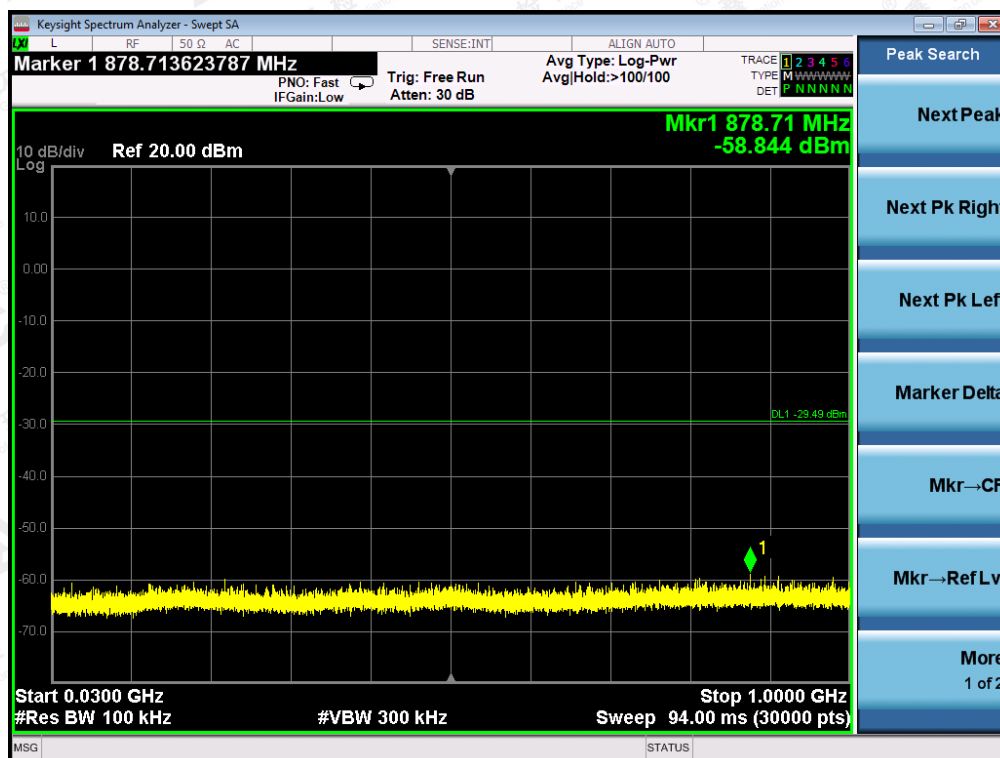
The same as described in section 6.

9.4. LIMITS AND MEASUREMENT RESULT

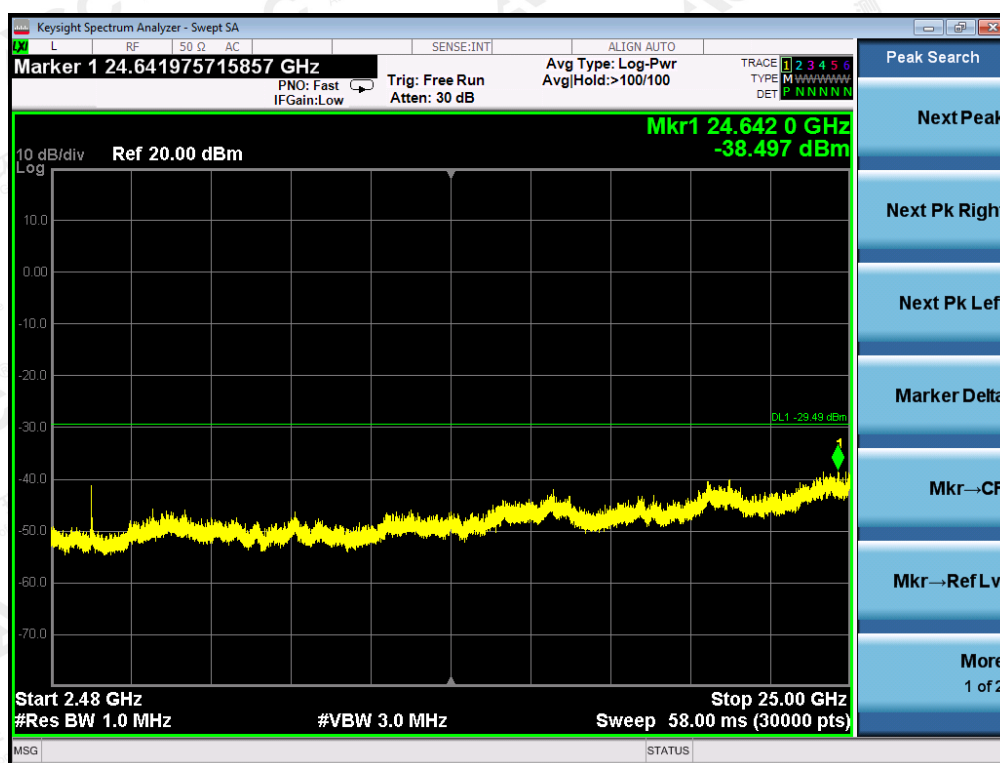
| LIMITS AND MEASUREMENT RESULT | | |
|---|--|----------|
| Applicable Limits | Measurement Result | |
| | Test Data | Criteria |
| In any 100 KHz Bandwidth Outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produce by the intentional radiator shall be at least 30 dB below that in 100KHz bandwidth within the band that contains the highest level of the desired power. In addition, radiation emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in§15.209(a)) | At least -30dBc than the limit Specified on the BOTTOM Channel | PASS |
| | At least -30dBc than the limit Specified on the TOP Channel | PASS |

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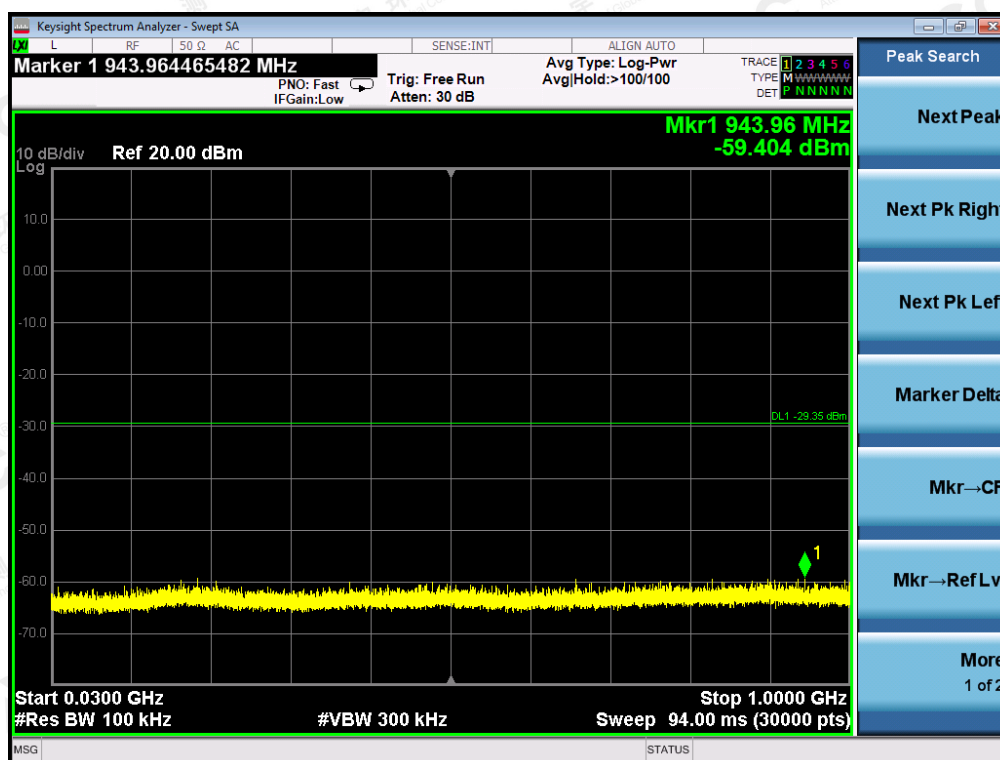
TEST PLOTS OF 802.11b OUT OF BAND EMISSIONS MODULATION IN LOW CHANNEL



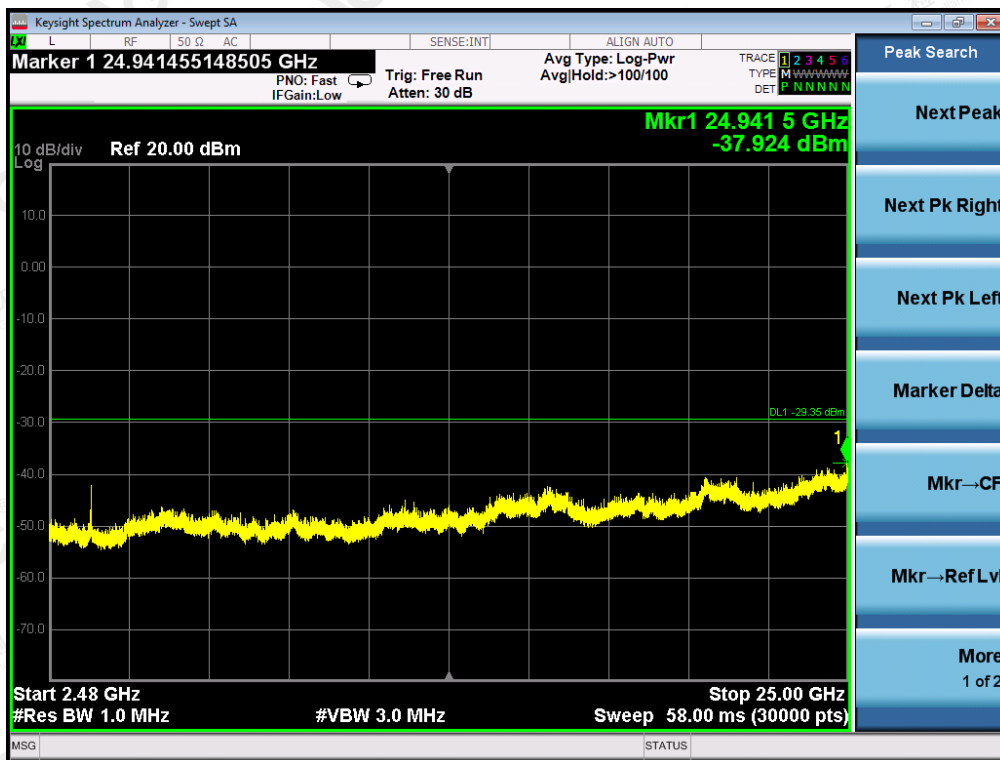
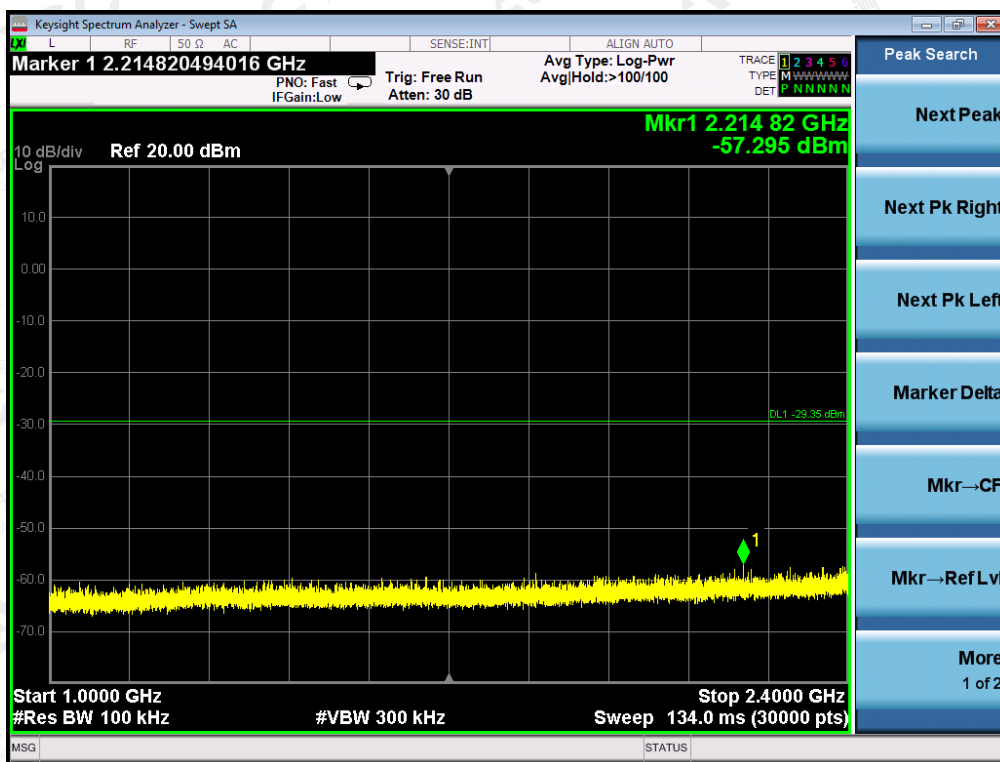
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TEST PLOTS OF 802.11b OUT OF BAND EMISSIONS
MODULATION IN MIDDLE CHANNEL



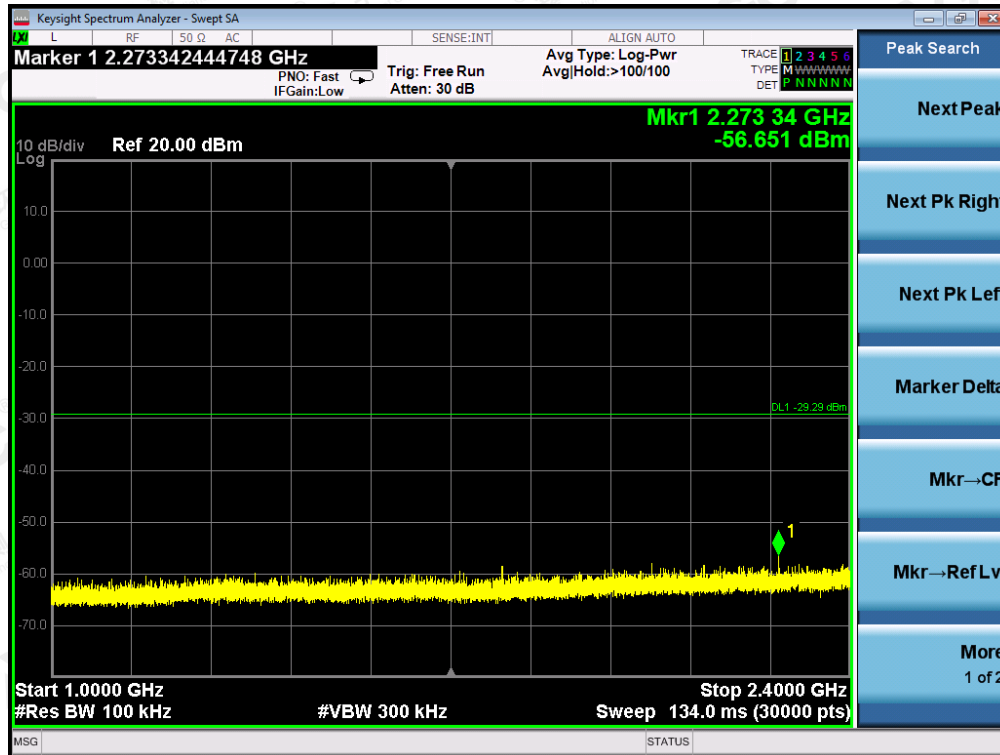
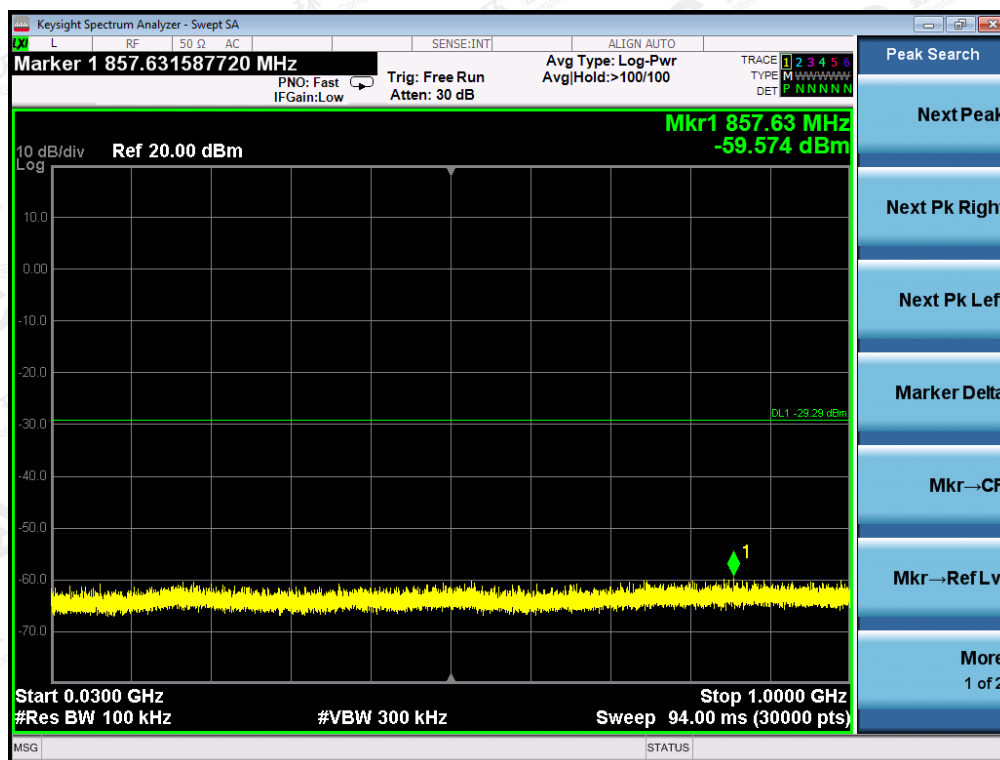
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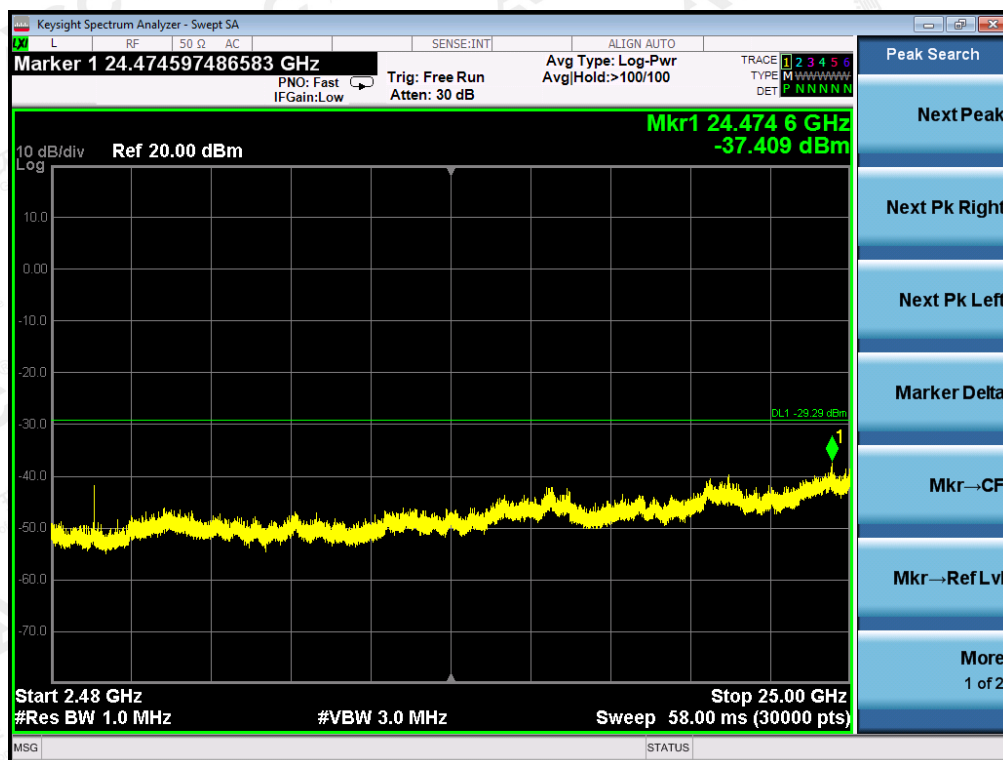
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Add: 2/F. , Building 2, No.1-4,Chaxi Sanwei Technical Industrial Park,Gushu, Xixiang, Baoan District, Shenzhen, Guangdong China

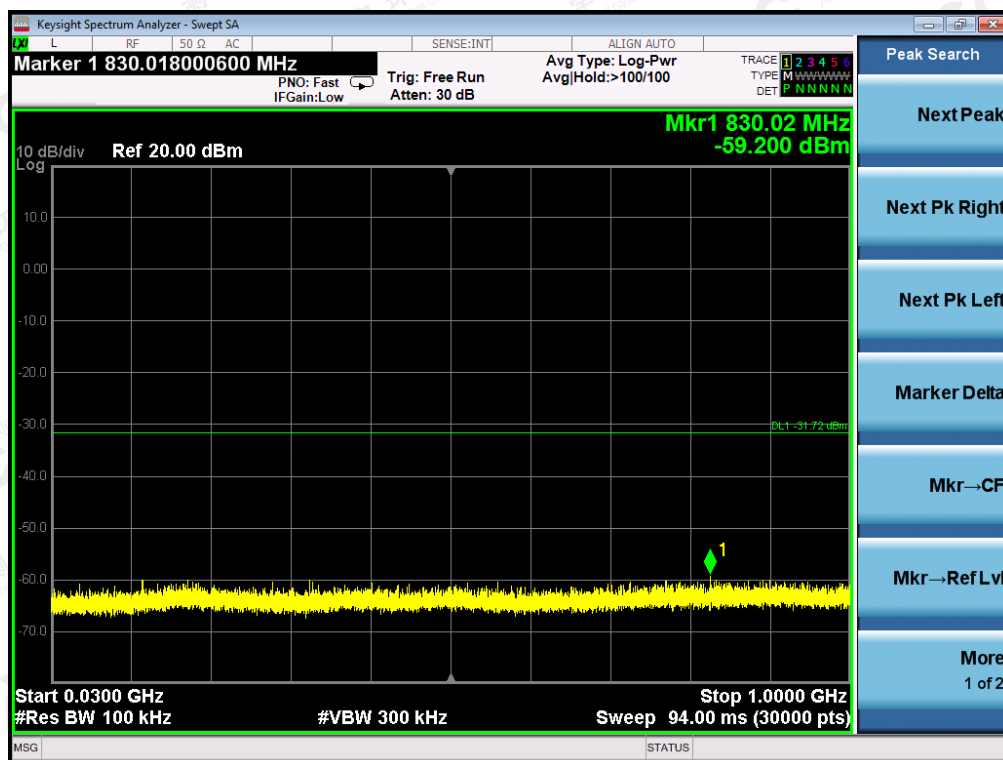
TEST PLOTS OF 802.11b OUT OF BAND EMISSIONS MODULATION IN HIGH CHANNEL



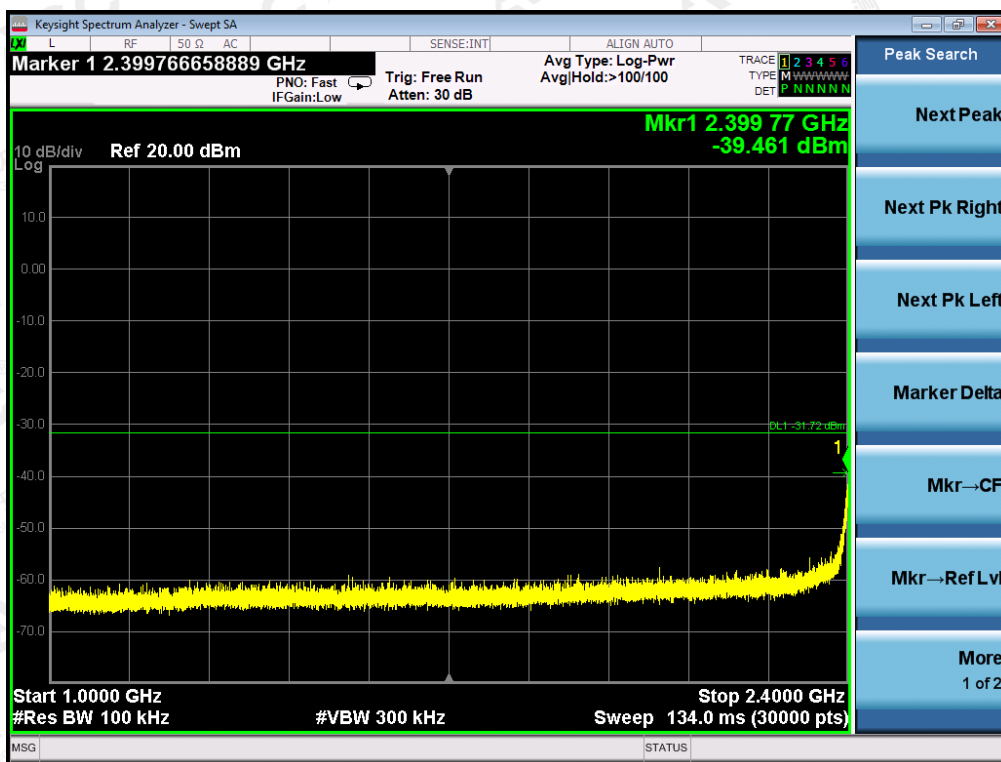
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TEST PLOTS OF 802.11g OUT OF BAND EMISSIONS
MODULATION IN LOW CHANNEL

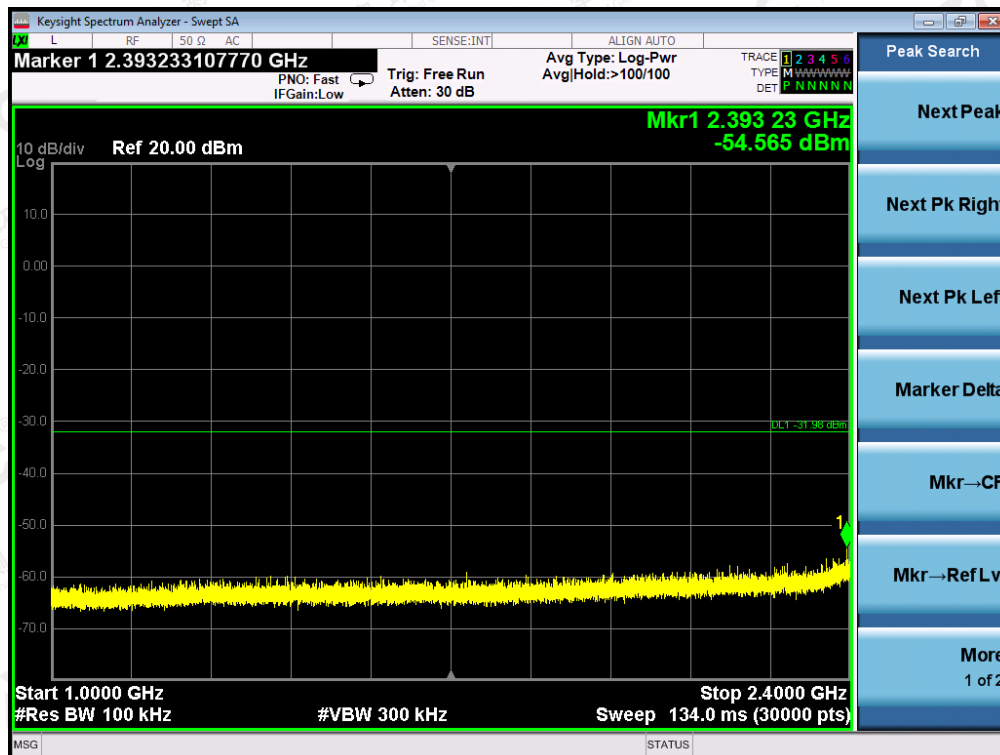
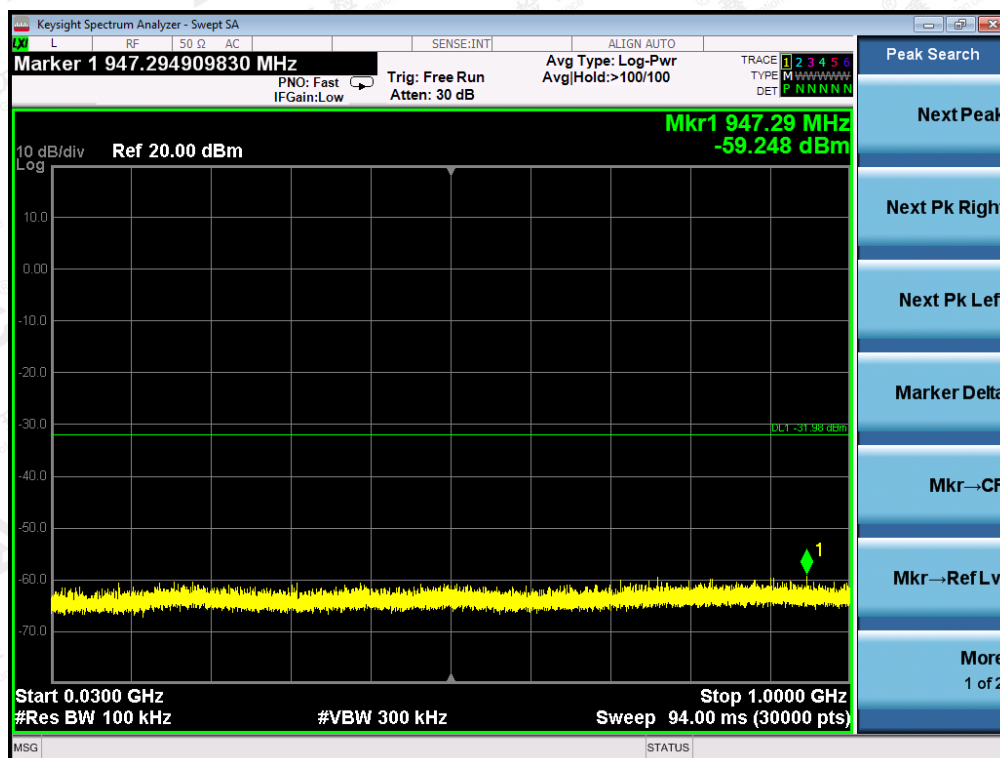


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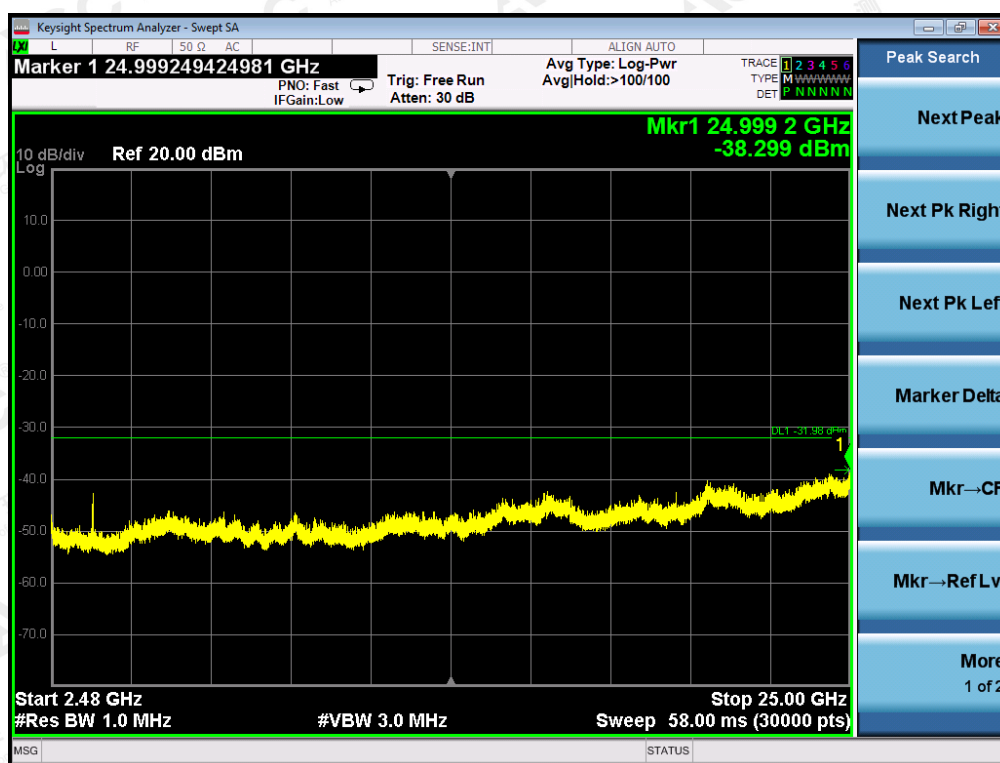


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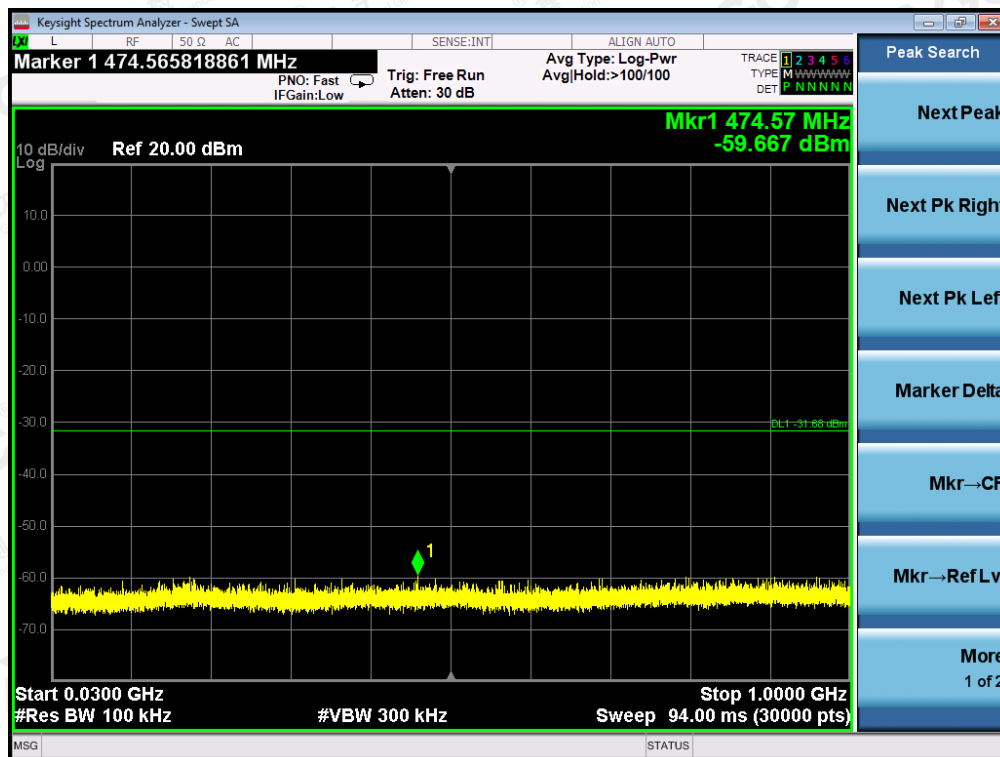
TEST PLOT OF 802.11g OUT OF BAND EMISSIONS MODULATION IN MIDDLE CHANNEL



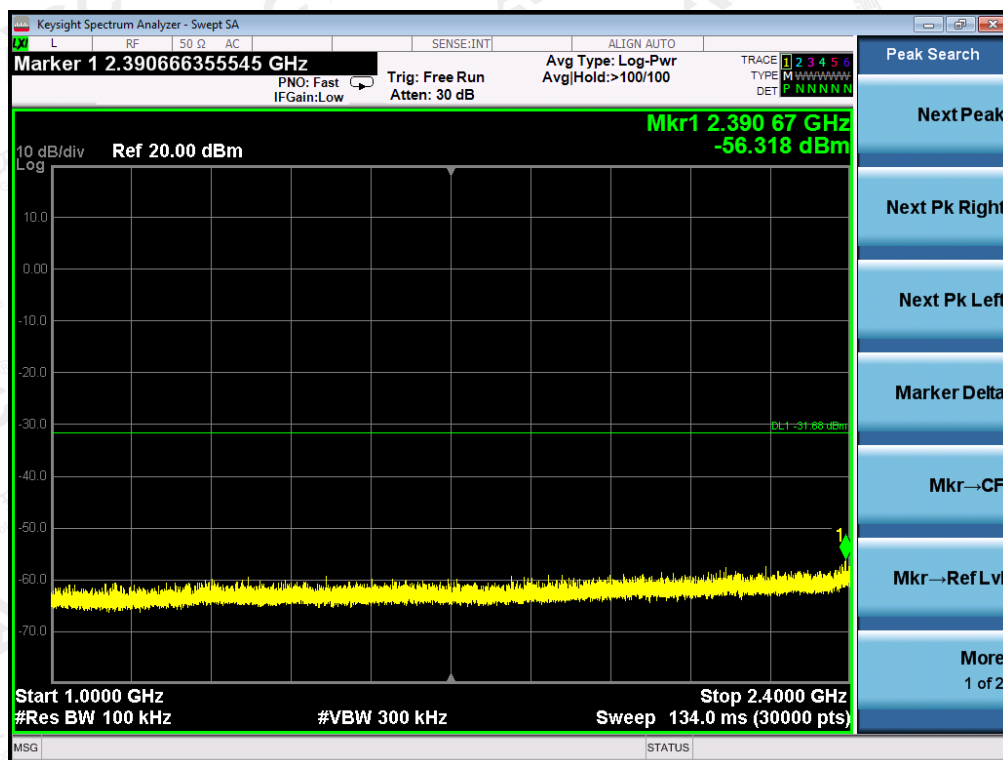
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TEST PLOTS OF 802.11g OUT OF BAND EMISSIONS
MODULATION IN HIGH CHANNEL

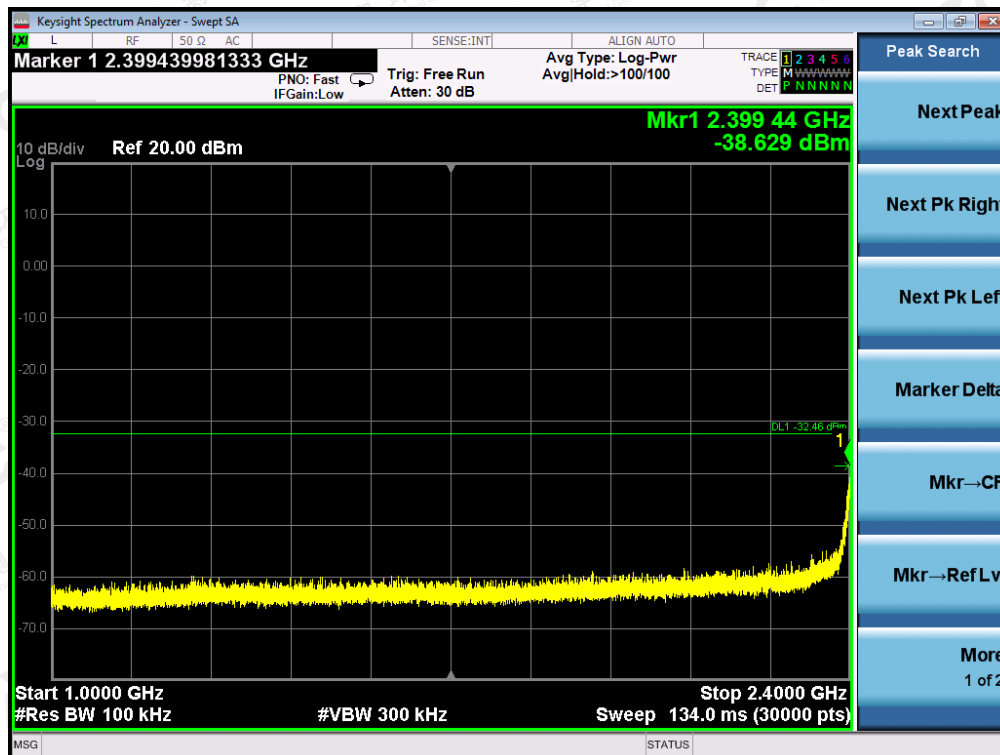
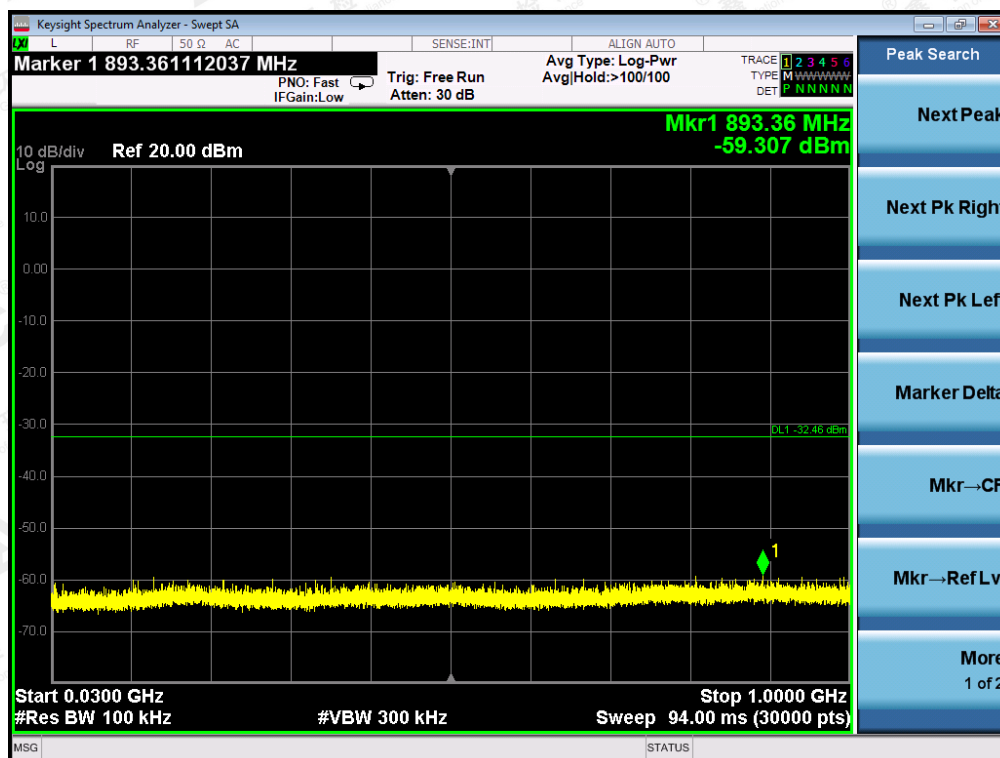


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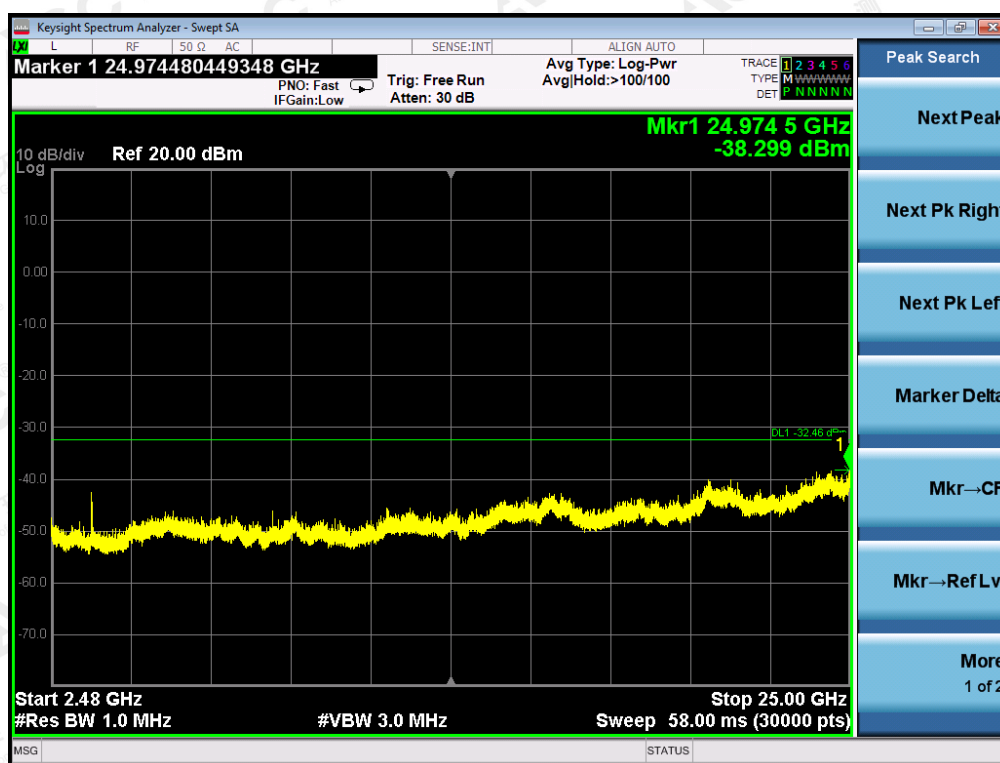


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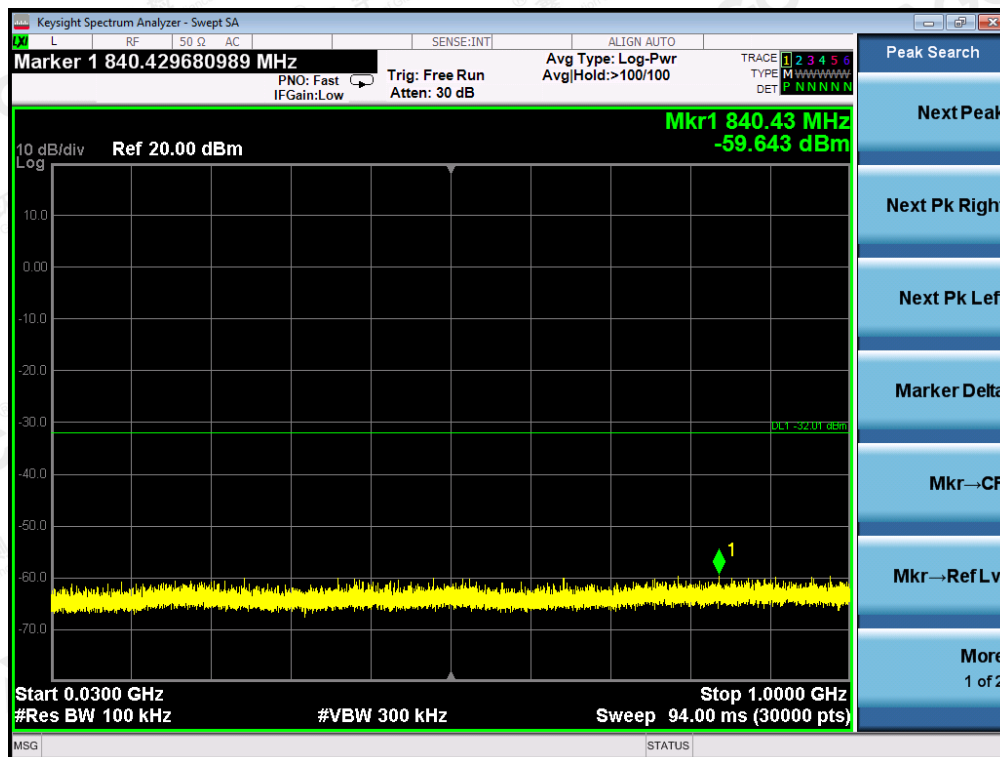
TEST PLOTS OF 802.11n20 OUT OF BAND EMISSIONS MODULATION IN LOW CHANNEL



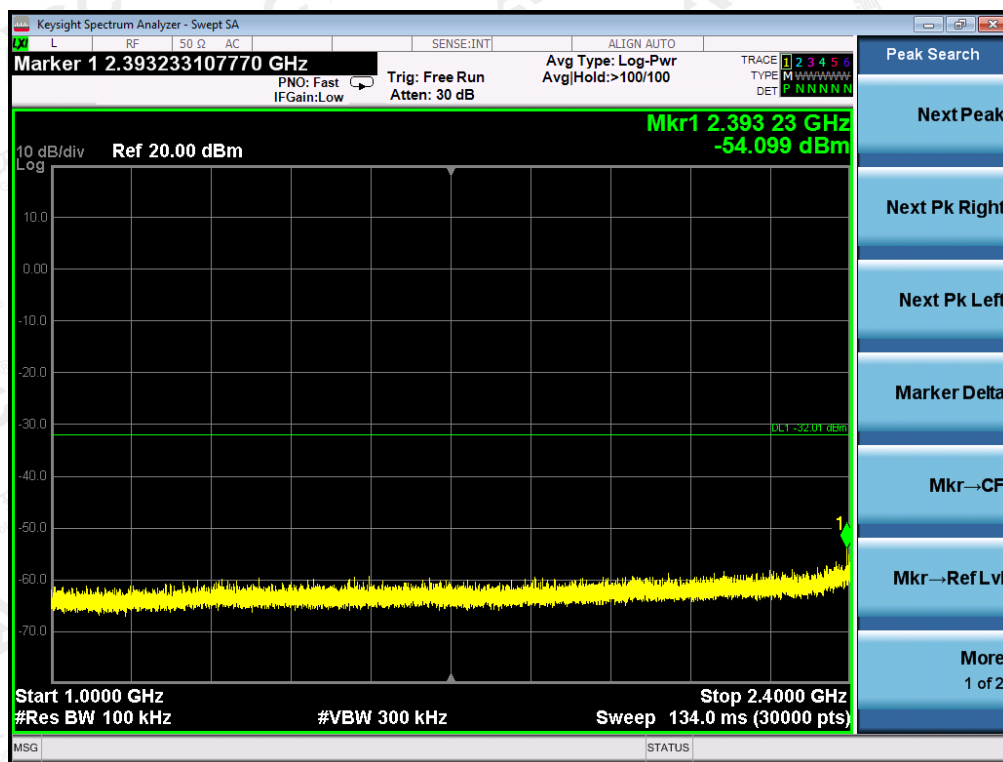
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TEST PLOTS OF 802.11n20 OUT OF BAND EMISSIONS
MODULATION IN MIDDLE CHANNEL

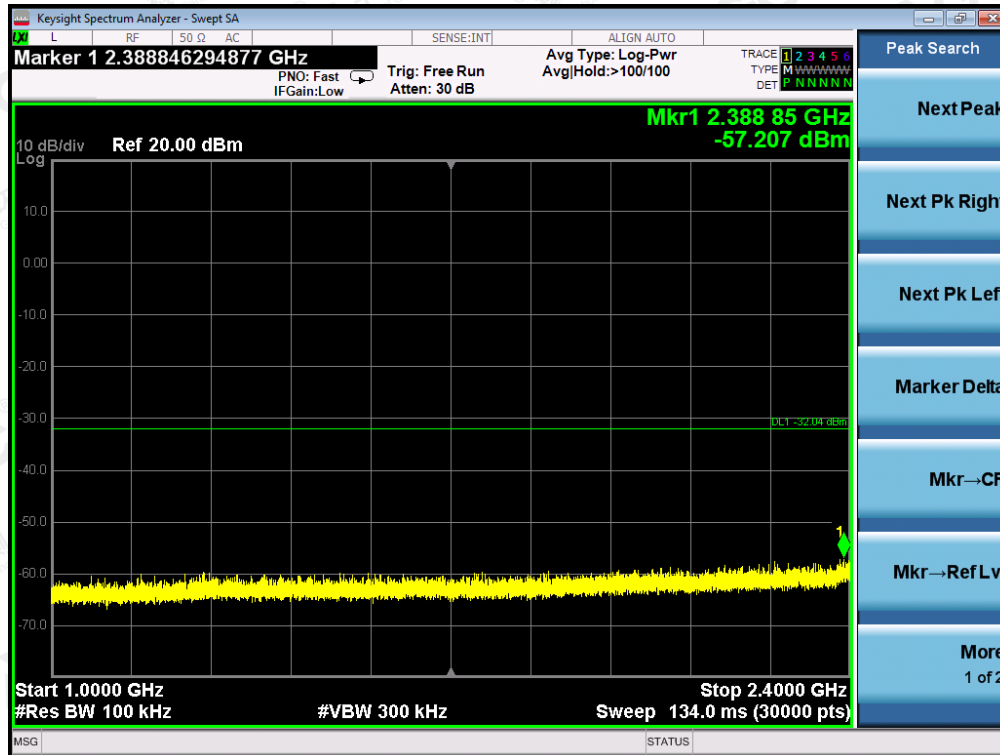
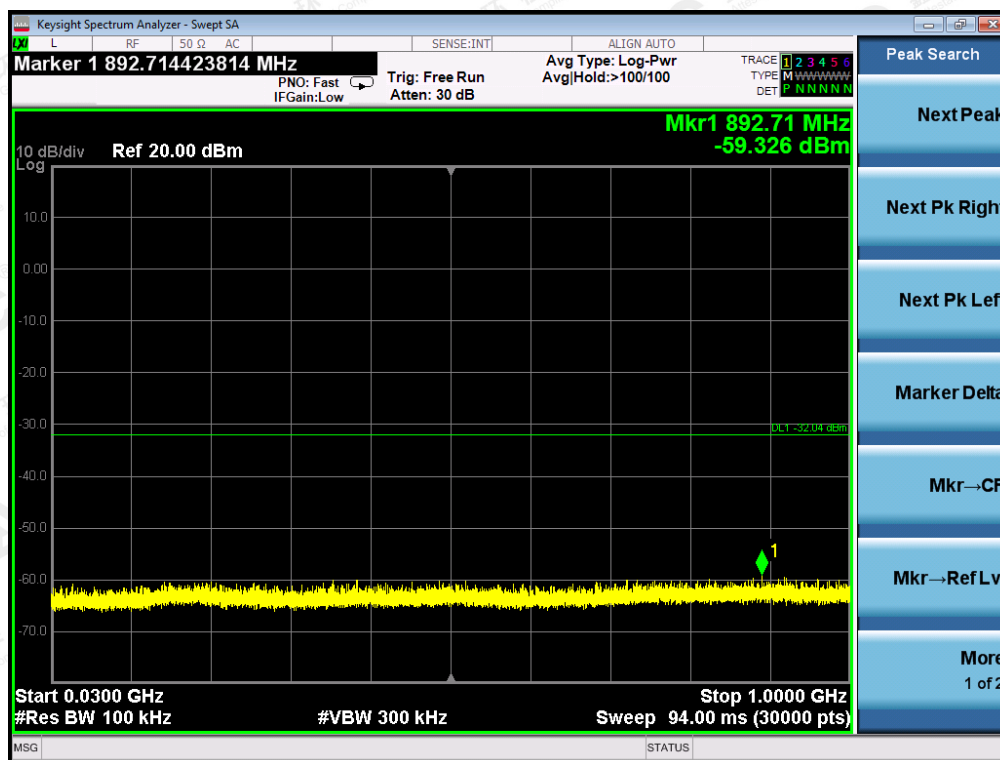


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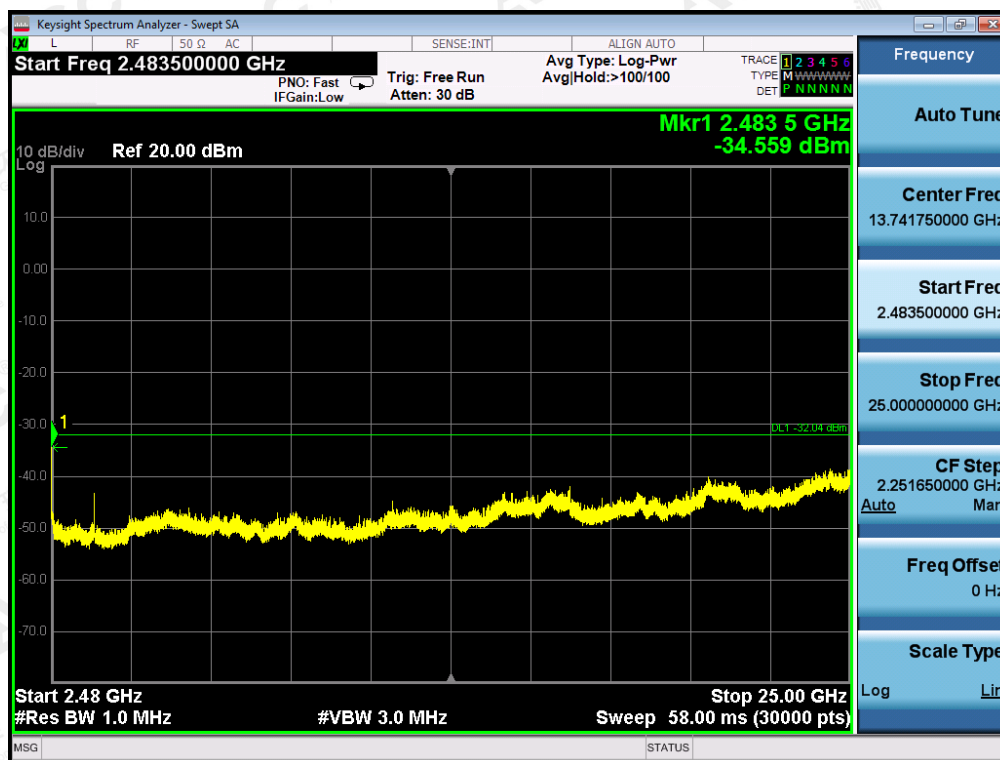


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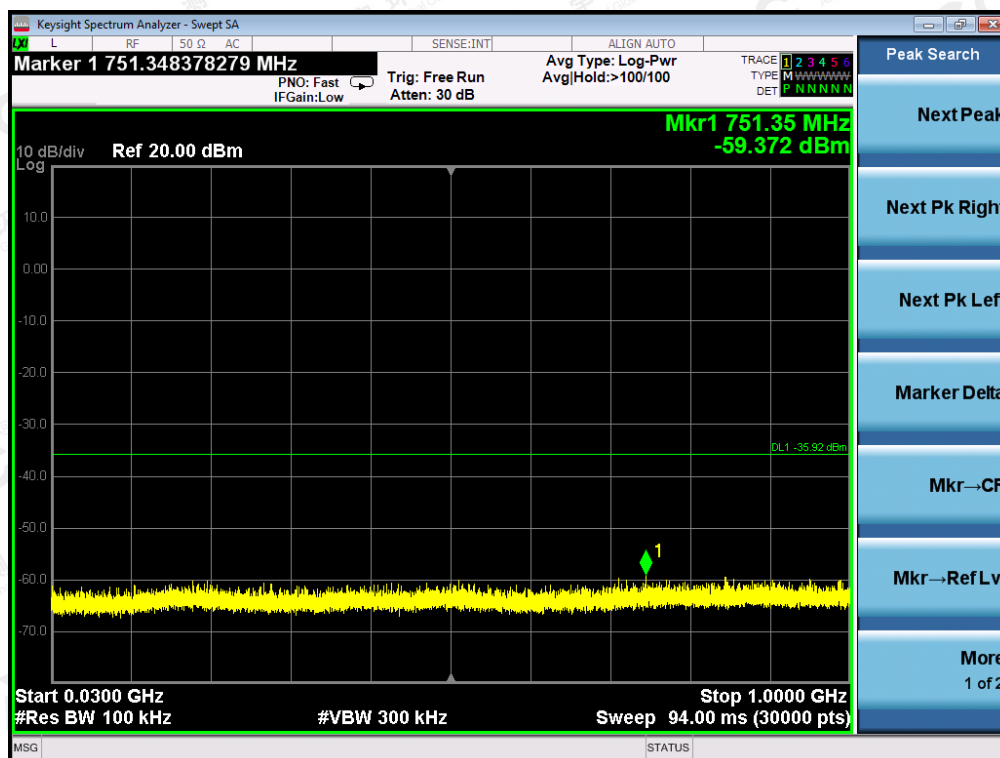
TEST PLOTS OF 802.11n20 OUT OF BAND EMISSIONS MODULATION IN HIGH CHANNEL



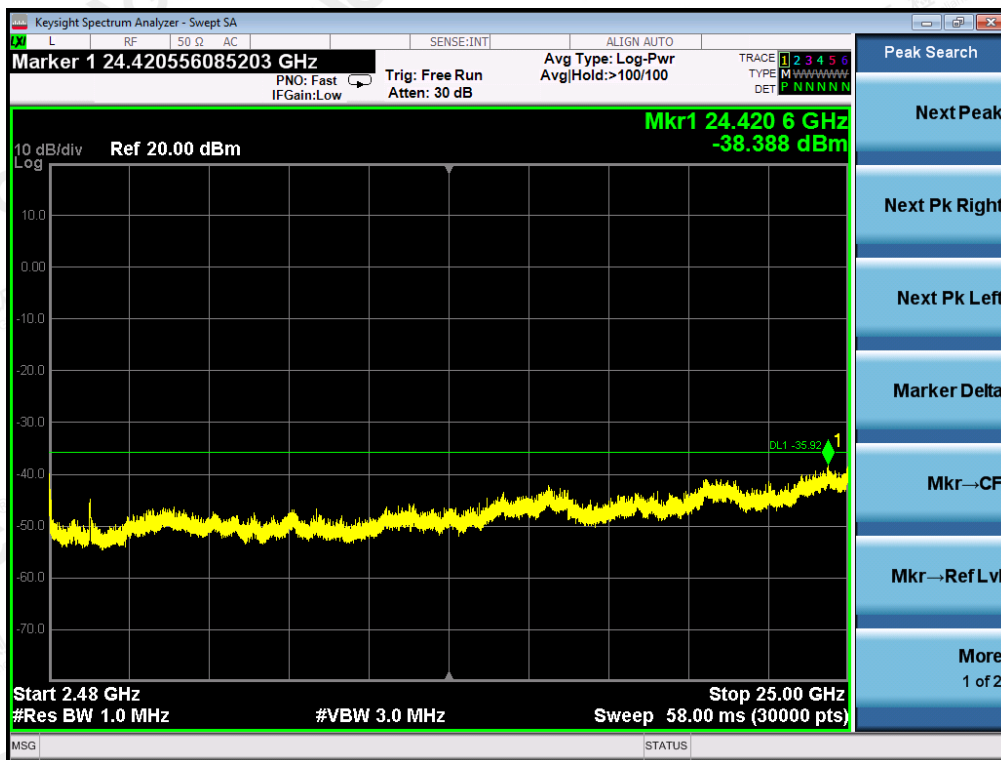
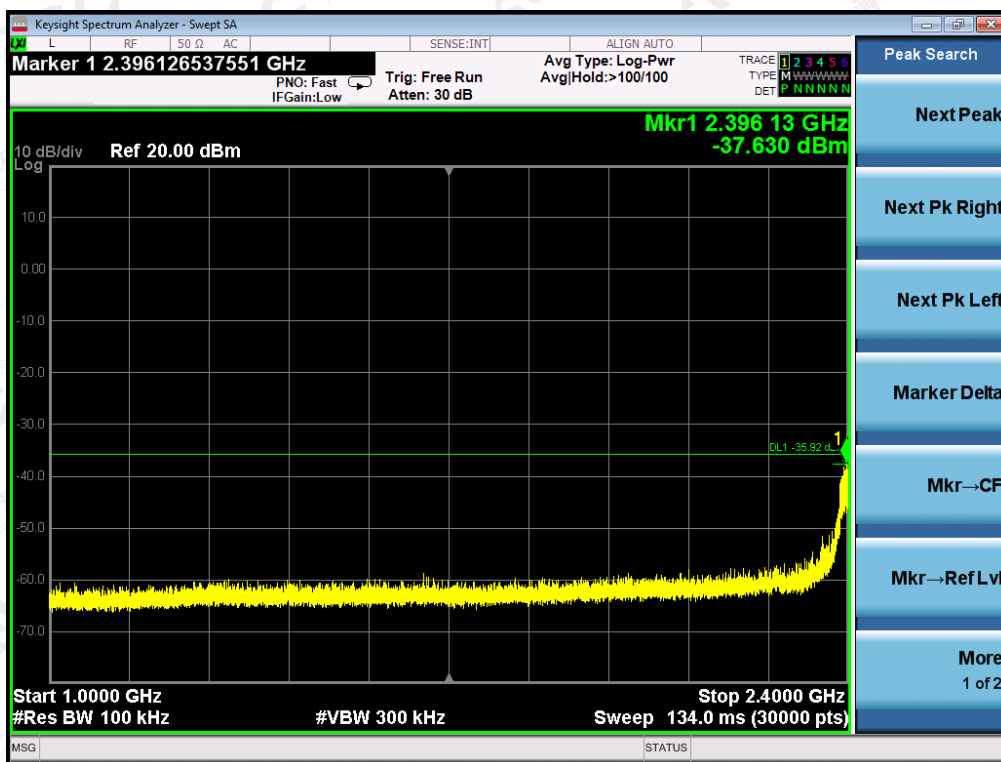
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TEST PLOTS OF 802.11n40 OUT OF BAND EMISSIONS
MODULATION IN LOW CHANNEL



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