# FCC Test Report

Report No.: AGC08326170101FE06

| | | |
|---|---|---|
| **FCC ID** | : | 2AKZSM-1200S |
| **APPLICATION PURPOSE** | : | Class II Permissive Change |
| **PRODUCT DESIGNATION** | : | Wireless USB Adapter |
| **BRAND NAME** | : | N/A |
| **MODEL NAME** | : | M-1200M |
| **CLIENT** | : | Shenzhen Xunman Technology Co., Ltd. |
| **DATE OF ISSUE** | : | Feb. 08, 2017 |
| **STANDARD(S)**<br>**TEST PROCEDURE(S)** | : | FCC Part 15.407<br>KDB 789033 D02 |
| **REPORT VERSION** | : | V1.0 |

*A*ttestation of *G*lobal *C*ompliance (Shenzhen) Co., Ltd

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## Report Revise Record

| Report Version | Revise Time | Issued Date | Valid Version | Notes |
|---|---|---|---|---|
| V1.0 | / | Feb. 08, 2017 | Valid | Class II Permissive Change |

Note: The report of the model (M-1200M) is based-on the project -No.AGC08326161101FE06, which was named after (M-1200S), with some changed the model name and increased by two external antenna; The relevant test data is update into this new report.

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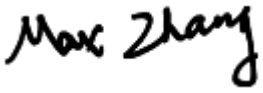
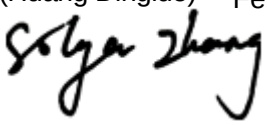
## 1. VERIFICATION OF CONFORMITY

| | |
|---|---|
| **Applicant** | Shenzhen Xunman Technology Co., Ltd. |
| **Address** | 2/F., #3 Building, New Development Zone, Baishixia, Fuyong St., Baoan Dist., Shenzhen, China |
| **Manufacturer** | Shenzhen Xunman Technology Co., Ltd. |
| **Address** | 2/F., #3 Building, New Development Zone, Baishixia, Fuyong St., Baoan Dist., Shenzhen, China |
| **Product Designation** | Wireless USB Adapter |
| **Brand Name** | N/A |
| **Test Model** | M-1200M |
| **Date of test** | Jan. 16, 2017~Feb. 07, 2017 |
| **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 requirement of FCC Part 15 Rules requirement.

Tested by 
Max Zhang(Zhang Yi) Feb. 07, 2017

Reviewed by 
Rock Huang(Huang Dinglue) Feb. 08, 2017

Approved by 
Solger Zhang(Zhang Hongyi) Feb. 08, 2017
Authorized Officer

# 2. GENERAL INFORMATION

## 2.1. PRODUCT DESCRIPTION

The EUT is designed as “client”. It is designed by way of utilizing the OFDM technology to achieve the system operation.

A major technical description of EUT is described as following

| | |
|---|---|
| **Operation Frequency** | 5150 GHz～5250GHz;5725 GHz～5825GHz |
| **Output Power** | IEEE 802.11a20:10.54dBm IEEE 802.11n(40):10.08dBm;<br>IEEE802.11n(20):12.70dBm IEEE802.11ac(20):12.47dBm<br>IEEE802.11ac(40):10.51dBm EEE802.11ac(80):8.28dBm |
| **Modulation** | BPSK, QPSK, 16QAM, 64QAM, 128QAM, 256QAM,OFDM |
| **Number of channels** | 15 |
| **Hardware Version** | V1.0 |
| **Software Version** | V1.0 |
| **Antenna Designation** | External Antenna |
| **Number of transmit chain** | 2 |
| **Antenna Gain** | 5dBi |
| **Power Supply** | DC 5V |

## 2.2. TABLE OF CARRIER FREQUENCYS

| Frequency Band | Channel Number | Frequency | Frequency Band | Channel Number | Frequency |
|---|---|---|---|---|---|
| 5150 GHz～5250GHz | 36 | 5180 MHz | 5725 GHz～5850GHz | 149 | 5745 MHz |
| | 38 | 5190 MHz | | 151 | 5755 MHz |
| | 40 | 5200 MHz | | 153 | 5765 MHz |
| | 42 | 5210 MHz | | 155 | 5775MHz |
| | 44 | 5220 MHz | | 157 | 5785 MHz |
| | 46 | 5230 MHz | | 159 | 5795 MHz |
| | 48 | 5240 MHz | | 161 | 5805 MHz |
| | | | | 165 | 5825MHz |

Note: For 20MHZ bandwidth system use Channel 36,40,44,48,149,153,157,161,165; For 40MHZ bandwidth system use Channel 38,46,151,159; For 80MHZ bandwidth system use Channel 42,155

## 2.3. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2AKZSM-1200S** filing to comply with the FCC Part 15 requirements.

## 2.4. 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.
Others testing (listed at item 5.3) was performed according to the procedures in FCC Part 15.407 rules KDB 789033

## 2.5. SPECIAL ACCESSORIES

Refer to section 5.2.

## 2.6. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

## 3. MEASUREMENT UNCERTAINTY

Conducted measurement: +/- 3.18dB
Radiated measurement: +/- 3.91dB

## 4. DESCRIPTION OF TEST MODES

| Mode | Available channel | Tested channel | Modulation | Date rate(Mbps) |
|---|---|---|---|---|
| 802.11a/n20/ac20 | 36,40,44,48,149,153,157,161,165 | 36,48, 149, 165 | OFDM | 6/6.5 |
| 802.11n40/ac40 | 38,46,151,159 | 38,46, 151,159 | OFDM | 13.5 |
| 802.11ac80 | 42,155 | 42,155 | OFDM | 13.5 |

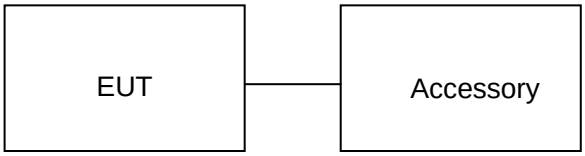
**Note:**

1. The EUT has been set to operate continuously on tested channel 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. 11a: SISO Mode; 11nHT20/11nHT40/11acVHT20/11acVHT40/11acVHT80: MIMO Mode.

# 5. SYSTEM TEST CONFIGURATION

## 5.1. CONFIGURATION OF EUT SYSTEM

**Configure:**




## 5.2. EQUIPMENT USED IN EUT SYSTEM

| Item | Equipment | Model No. | ID or Specification | Remark |
|---|---|---|---|---|
| 1 | Wireless USB Adapter | M-1200M | N/A | EUT |
| 2 | External Antenna | 1200M-5AN | N/A | EUT |

## 5.3. SUMMARY OF TEST RESULTS

| FCC RULES | DESCRIPTION OF TEST | RESULT |
|---|---|---|
| §15.407 | 6dB Bandwidth | Compliant |
| §15.407 | Maximum conducted output power | Compliant |
| §15.407 | Conducted Spurious Emission | Compliant |
| §15.407 | Maximum Conducted Output Power Density | Compliant |
| §15.209 | Radiated Emission | Compliant |
| §15.407 | Band Edges | Compliant |
| §15.207 | Line Conduction Emission | Compliant |

## 6. TEST FACILITY

| | |
|---|---|
| **Site** | Dongguan Precise Testing Service Co., Ltd. |
| **Location** | Building D, Baoding Technology Park,Guangming Road2, Dongcheng District, Dongguan, Guangdong, China. |
| **FCC Registration No.** | 371540 |
| **Description** | The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2014. |

**ALL TEST EQUIPMENT LIST**

| Radiated Emission Test Site | | | | | |
|---|---|---|---|---|---|
| **Name of Equipment** | **Manufacturer** | **Model Number** | **Serial Number** | **Last Calibration** | **Due Calibration** |
| EMI Test Receiver | Rohde & Schwarz | ESCI | 101417 | July 4, 2016 | July 3, 2017 |
| Trilog Broadband Antenna (25M-1GHz) | SCHWARZBECK | VULB9160 | 9160-3355 | July 4, 2016 | July 3, 2017 |
| Signal Amplifier | SCHWARZBECK | BBV 9475 | 9745-0013 | July 4, 2016 | July 3, 2017 |
| RF Cable | SCHWARZBECK | AK9515E | 96221 | July 4, 2016 | July 3, 2017 |
| 3m Anechoic Chamber | CHENGYU | 966 | PTS-001 | June 6, 2016 | June 5, 2017 |
| MULTI-DEVICE Positioning Controller | Max-Full | MF-7802 | MF780208339 | N/A | N/A |
| Active loop antenna (9K-30MHz) | Schwarzbeck | FMZB1519 | 1519-038 | June 6, 2016 | June 5, 2017 |
| Spectrum analyzer | Agilent | E4407B | MY46185649 | June 6, 2016 | June 5, 2017 |
| Power Sensor | Agilent | U2021XA | MY55050474 | June 6, 2016 | June 5, 2017 |
| Horn Antenna (1G-18GHz) | SCHWARZBECK | BBHA9120D | 9120D-1246 | June 6, 2016 | June 5, 2017 |
| Horn Ant (18G-40GHz) | Schwarzbeck | BBHA 9170 | 9170-181 | June 6, 2016 | June 5, 2017 |

| Conducted Emission Test Site | | | | | |
|---|---|---|---|---|---|
| **Name of Equipment** | **Manufacturer** | **Model Number** | **Serial Number** | **Last Calibration** | **Due Calibration** |
| EMI Test Receiver | - Rohde & Schwarz | ESCI | 101417 | July 4, 2016 | July 3, 2017 |
| Artificial Mains Network | Narda | L2-16B | 000WX31025 | July 8, 2016 | July 7, 2017 |
| Artificial Mains Network (AUX) | Narda | L2-16B | 000WX31026 | July 8, 2016 | July 7, 2017 |
| RF Cable | SCHWARZBECK | AK9515E | 96222 | July 4, 2016 | July 3, 2017 |
| Shielded Room | CHENGYU | 843 | PTS-002 | June 6,2016 | June 5,2017 |

# 7. MAXIMUM CONDUCTED OUTPUT POWER

## 7.1. MEASUREMENT PROCEDURE

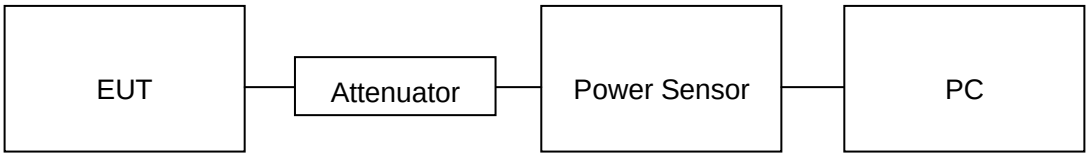
For average power test:

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 KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

## 7.2. TEST SET-UP

**AVERAGE POWER SETUP**



### 7.3. LIMITS AND MEASUREMENT RESULT

| LIMITS AND MEASUREMENT RESULT FOR 802.11A20 MODULATION | | | | |
|---|---|---|---|---|
| **Frequency (MHz)** | **Average Power Chain 0(dBm)** | **Average Power Chain 1(dBm)** | **Applicable Limits (dBm)** | **Pass or Fail** |
| 5180 | 10.35 | 9.86 | 20 | Pass |
| 5240 | 10.54 | 9.99 | 20 | Pass |
| 5745 | 8.23 | 7.95 | 26 | Pass |
| 5825 | 8.86 | 8.25 | 26 | Pass |

| LIMITS AND MEASUREMENT RESULT FOR 802.11N20 MODULATION | | | | | |
|---|---|---|---|---|---|
| **Frequency (MHz)** | **Average Power Chain 0(dBm)** | **Average Power Chain 1(dBm)** | **Average Power Total(dBm)** | **Applicable Limits (dBm)** | **Pass or Fail** |
| 5180 | 9.75 | 9.62 | 12.70 | 20 | Pass |
| 5240 | 9.35 | 8.89 | 12.14 | 20 | Pass |
| 5745 | 8.64 | 8.47 | 11.57 | 26 | Pass |
| 5825 | 8.94 | 8.42 | 11.70 | 26 | Pass |

| LIMITS AND MEASUREMENT RESULT FOR 802.11N40 MODULATION | | | | | |
|---|---|---|---|---|---|
| **Frequency (MHz)** | **Average Power Chain 0(dBm)** | **Average Power Chain 1(dBm)** | **Average Power Total(dBm)** | **Applicable Limits (dBm)** | **Pass or Fail** |
| 5190 | 7.14 | 6.94 | 10.05 | 20 | Pass |
| 5230 | 7.28 | 6.85 | 10.08 | 20 | Pass |
| 5755 | 6.31 | 5.95 | 9.14 | 26 | Pass |
| 5795 | 6.25 | 5.98 | 9.13 | 26 | Pass |

| LIMITS AND MEASUREMENT RESULT FOR 802.11AC20 MODULATION | | | | | |
|---|---|---|---|---|---|
| **Frequency (MHz)** | **Average Power Chain 0(dBm)** | **Average Power Chain 1(dBm)** | **Average Power Total(dBm)** | **Applicable Limits (dBm)** | **Pass or Fail** |
| 5180 | 9.68 | 9.22 | 12.47 | 20 | Pass |
| 5240 | 8.88 | 8.37 | 11.64 | 20 | Pass |
| 5745 | 8.76 | 8.55 | 11.67 | 26 | Pass |
| 5825 | 8.69 | 8.51 | 11.61 | 26 | Pass |

| LIMITS AND MEASUREMENT RESULT FOR 802.11AC40 MODULATION | | | | | |
|---|---|---|---|---|---|
| **Frequency (MHz)** | **Average Power Chain 0(dBm)** | **Average Power Chain 1(dBm)** | **Average Power Total(dBm)** | **Applicable Limits (dBm)** | **Pass or Fail** |
| 5190 | 7.75 | 7.24 | 10.51 | 20 | Pass |
| 5230 | 7.61 | 7.15 | 10.40 | 20 | Pass |
| 5755 | 6.42 | 6.11 | 9.28 | 26 | Pass |
| 5795 | 6.32 | 5.88 | 9.12 | 26 | Pass |

| LIMITS AND MEASUREMENT RESULT FOR 802.11AC80 MODULATION | | | | | |
|---|---|---|---|---|---|
| **Frequency (MHz)** | **Average Power Chain 0(dBm)** | **Average Power Chain 1(dBm)** | **Average Power Total(dBm)** | **Applicable Limits (dBm)** | **Pass or Fail** |
| 5210 | 5.42 | 5.12 | 8.28 | 20 | Pass |
| 5775 | 4.62 | 4.09 | 7.37 | 26 | Pass |

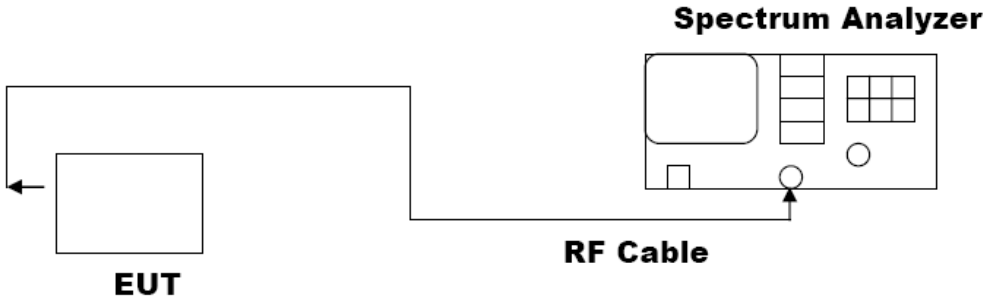
# 8. 6dB BANDWIDTH

## 8.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on operation frequency individually.
3. Set RBW = 100kHz.
4. Set the VBW ≥3*RBW. Detector = Peak. Trace mode = max hold.
5. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.

**Note:** The EUT was tested according to KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

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



### 8.3. LIMITS AND MEASUREMENT RESULTS

| LIMITS AND MEASUREMENT RESULT FOR 802.11A20 MODULATION | | | |
|---|---|---|---|
| Applicable Limits | Applicable Limits | | |
| | Test Data (MHz) | | Criteria |
| >500KHZ | 5745MHz | 16.36 | PASS |
| | 5825MHz | 16.38 | PASS |

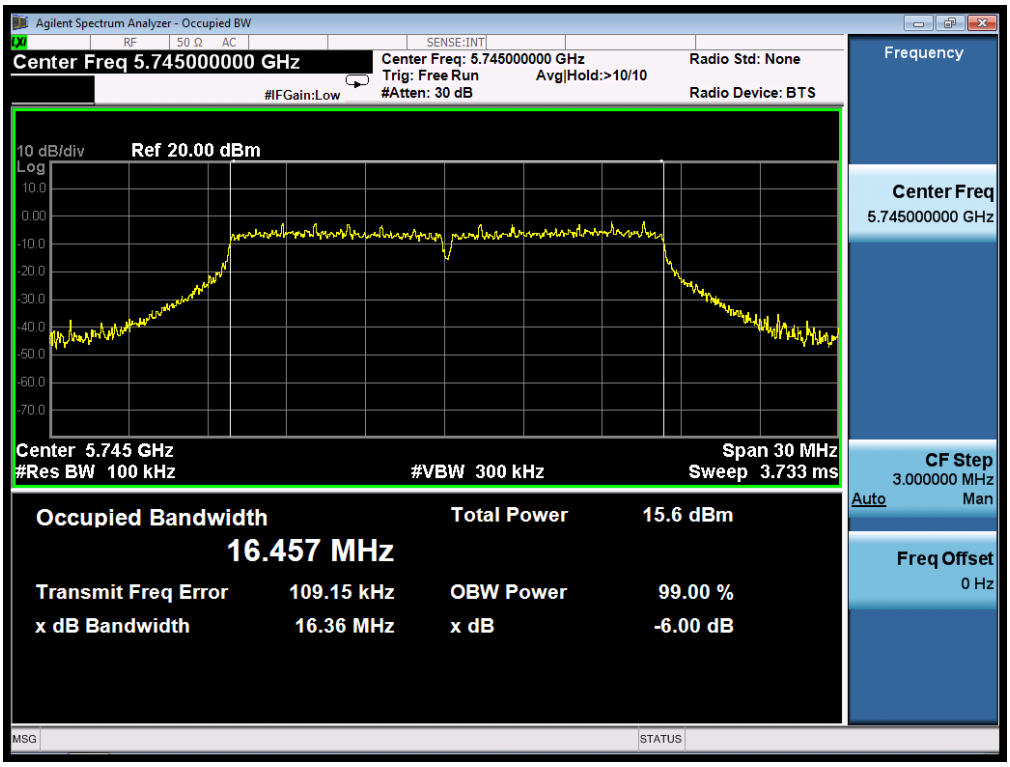
| LIMITS AND MEASUREMENT RESULT FOR 802.11N20/40 MODULATION | | | |
|---|---|---|---|
| Applicable Limits | Applicable Limits | | |
| | Test Data (MHz) | | Criteria |
| >500KHZ | 5745MHz | 17.59 | PASS |
| | 5825MHz | 17.54 | PASS |
| | 5755MHz | 36.12 | PASS |
| | 5795MHz | 36.33 | PASS |

| LIMITS AND MEASUREMENT RESULT FOR 802.11AC20/40/80 MODULATION | | | |
|---|---|---|---|
| Applicable Limits | Applicable Limits | | |
| | Test Data (MHz) | | Criteria |
| >500KHZ | 5745MHz | 17.55 | PASS |
| | 5825MHz | 17.55 | PASS |
| | 5755MHz | 36.31 | PASS |
| | 5795MHz | 36.32 | PASS |
| | 5775MHz | 75.11 | PASS |

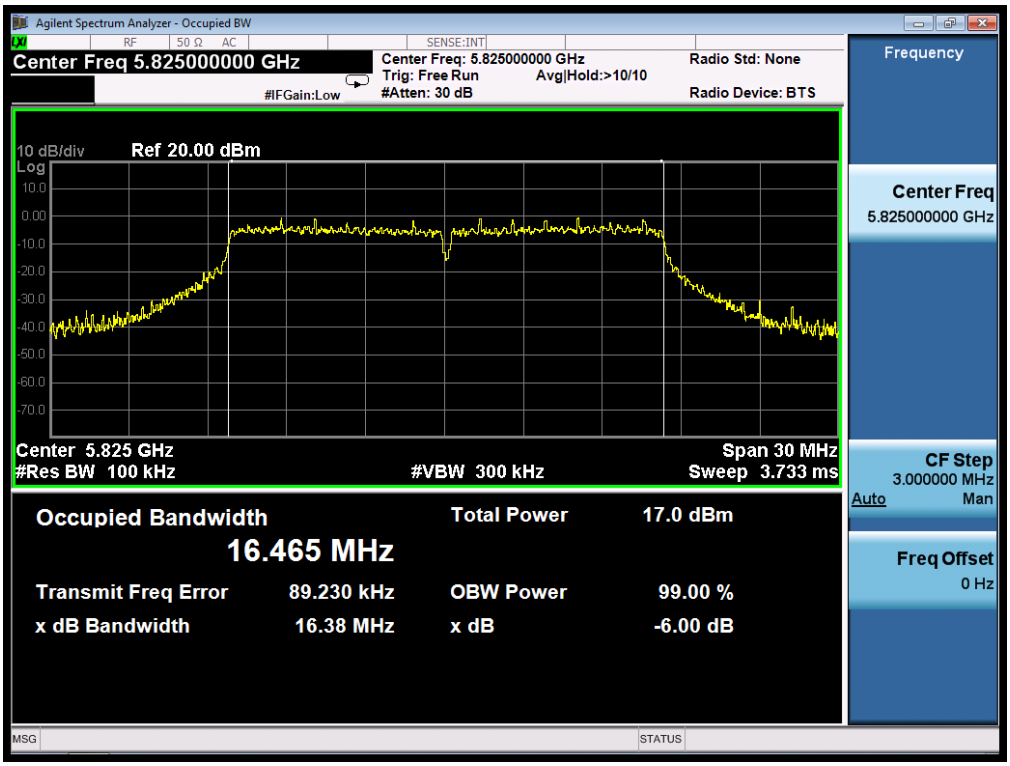
Note: Above is the worst mode data.

## 802.11a20 TEST RESULT

TEST PLOT OF BANDWIDTH FOR 5745MHz

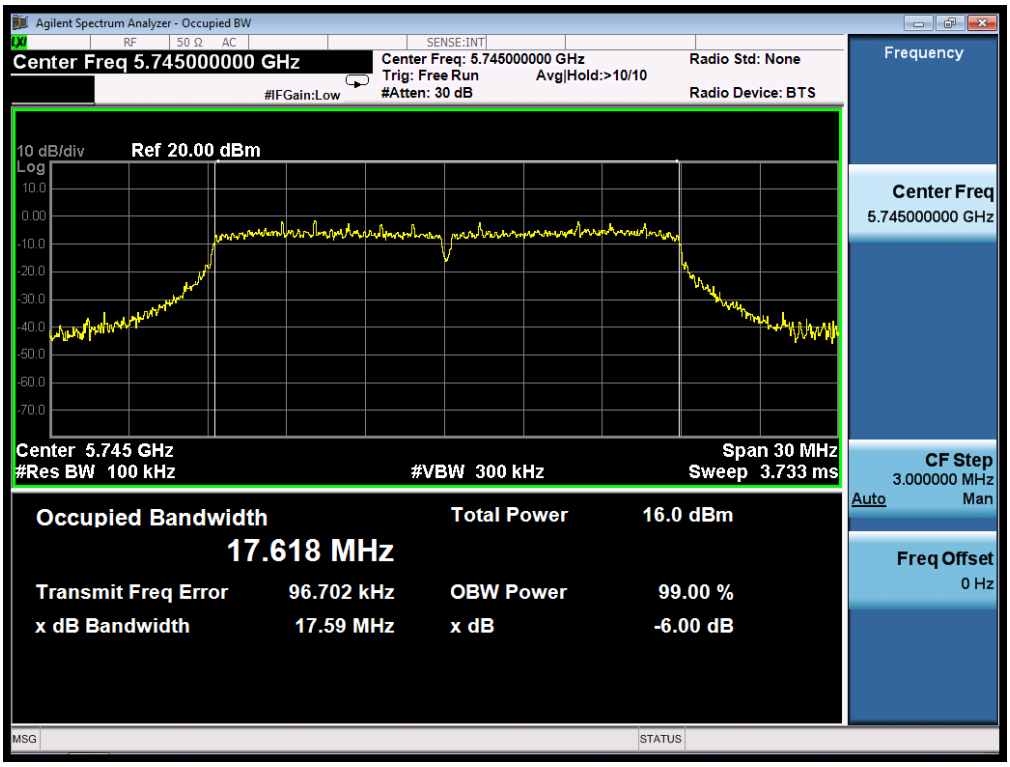



TEST PLOT OF BANDWIDTH FOR 5825MHz

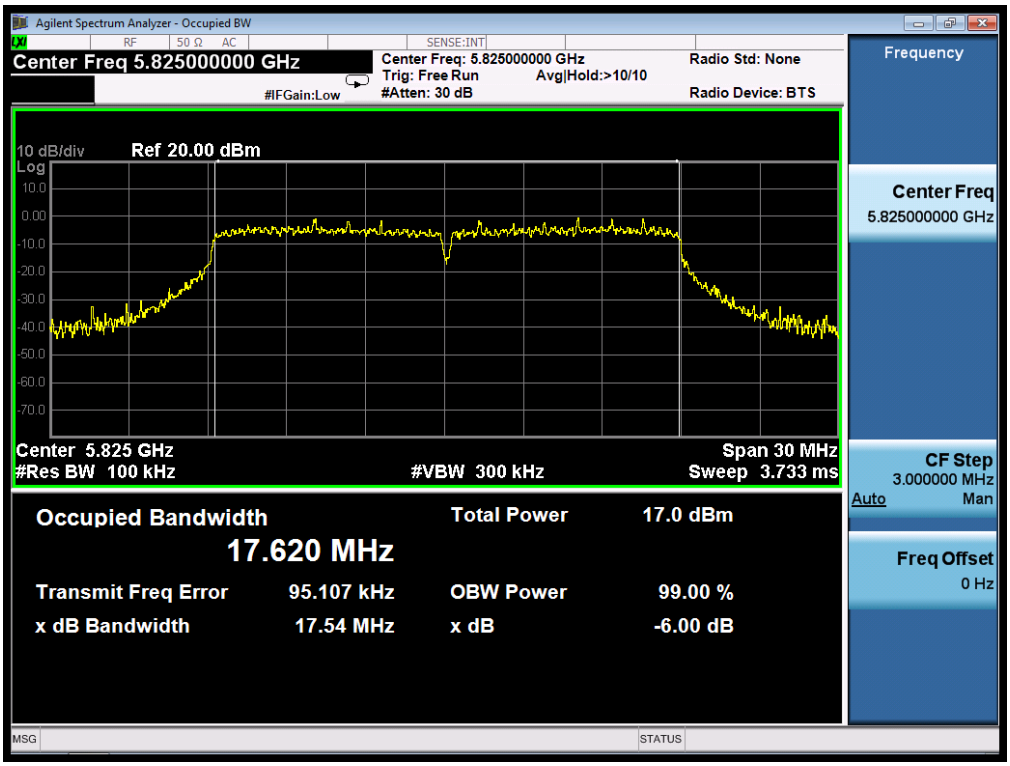


## 802.11n20 TEST RESULT

TEST PLOT OF BANDWIDTH FOR 5745MHz

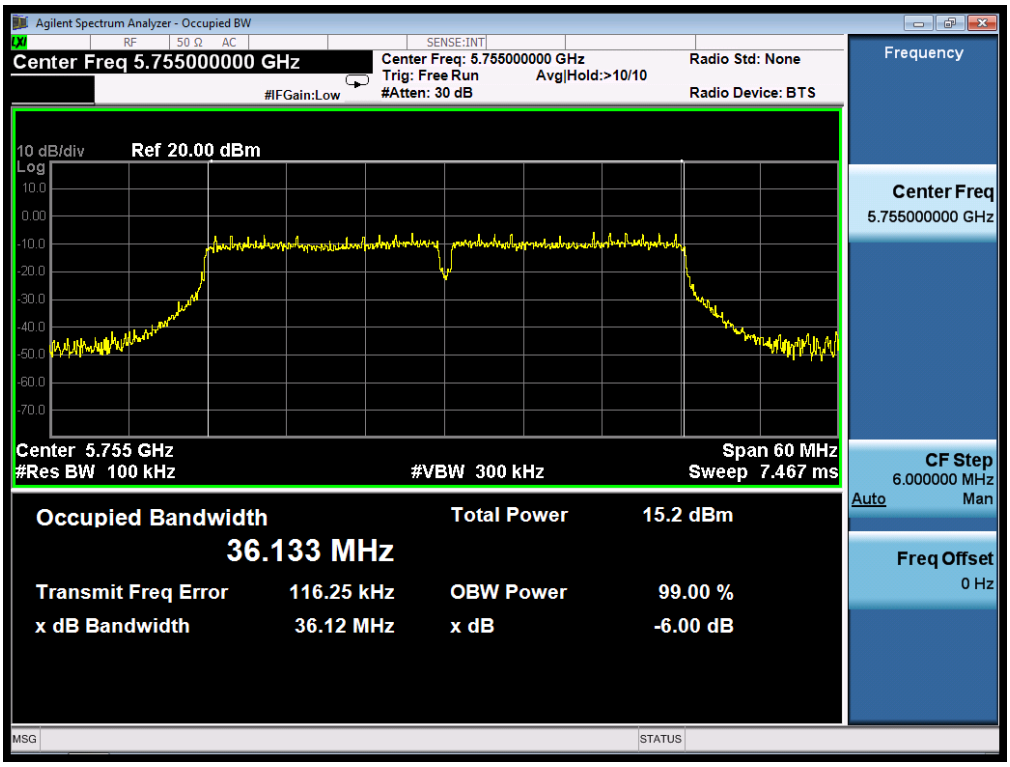



TEST PLOT OF BANDWIDTH FOR 5825MHz

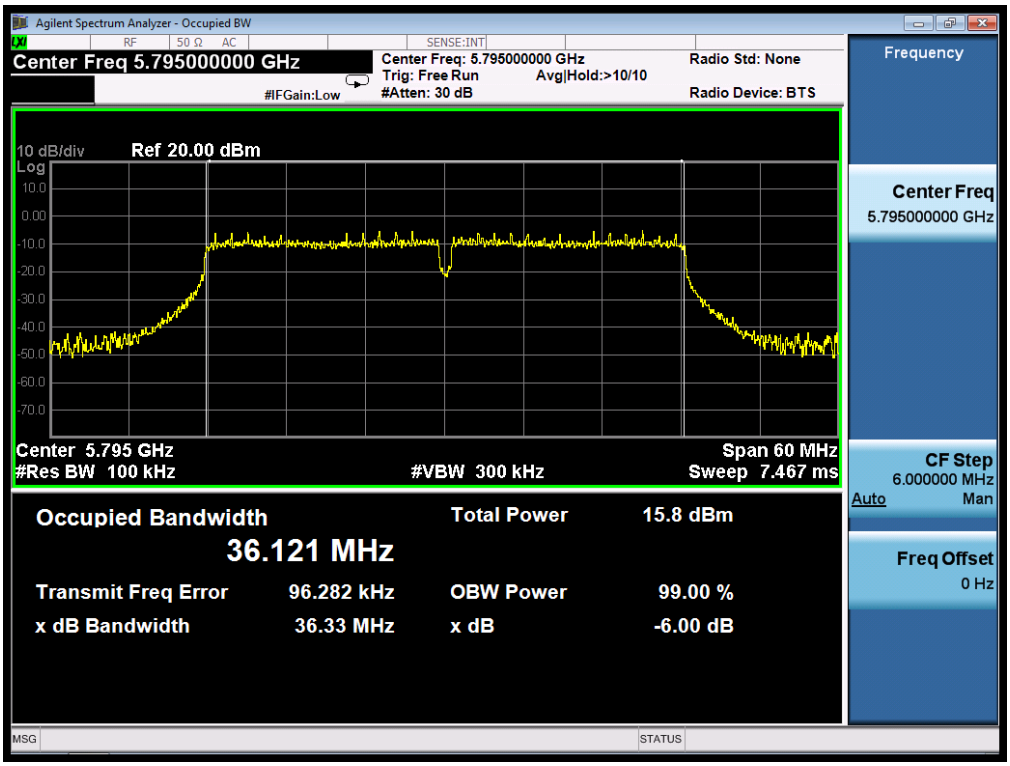


## 802.11n40 TEST RESULT

TEST PLOT OF BANDWIDTH FOR 5755MHz

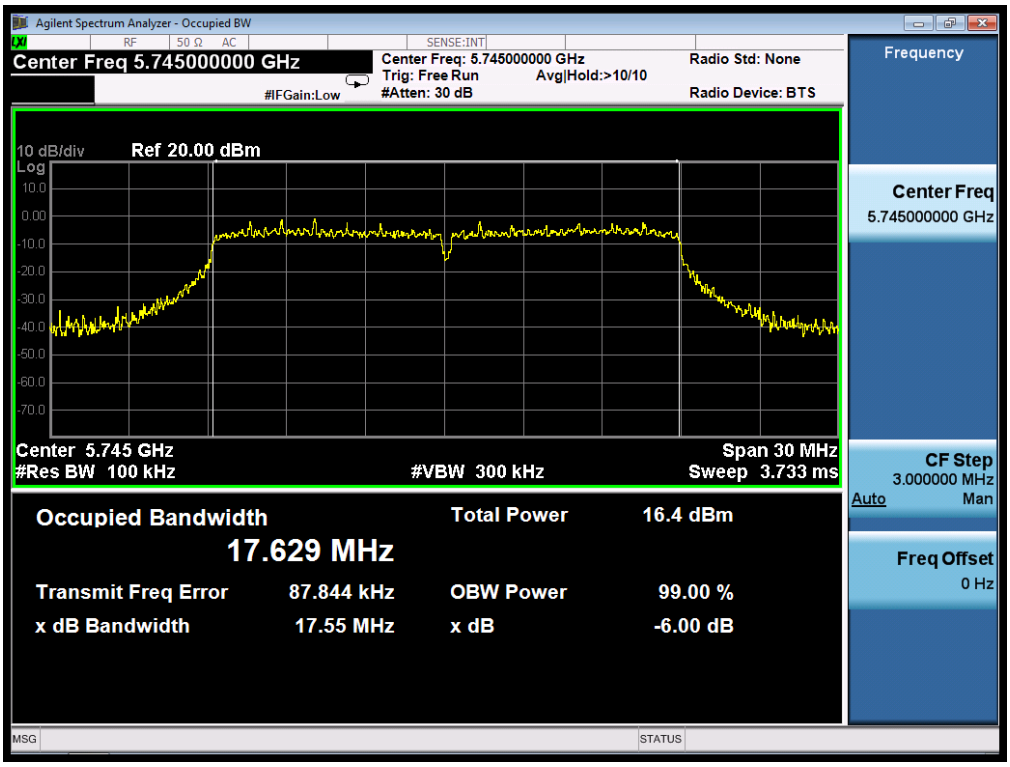



TEST PLOT OF BANDWIDTH FOR 5795MHz

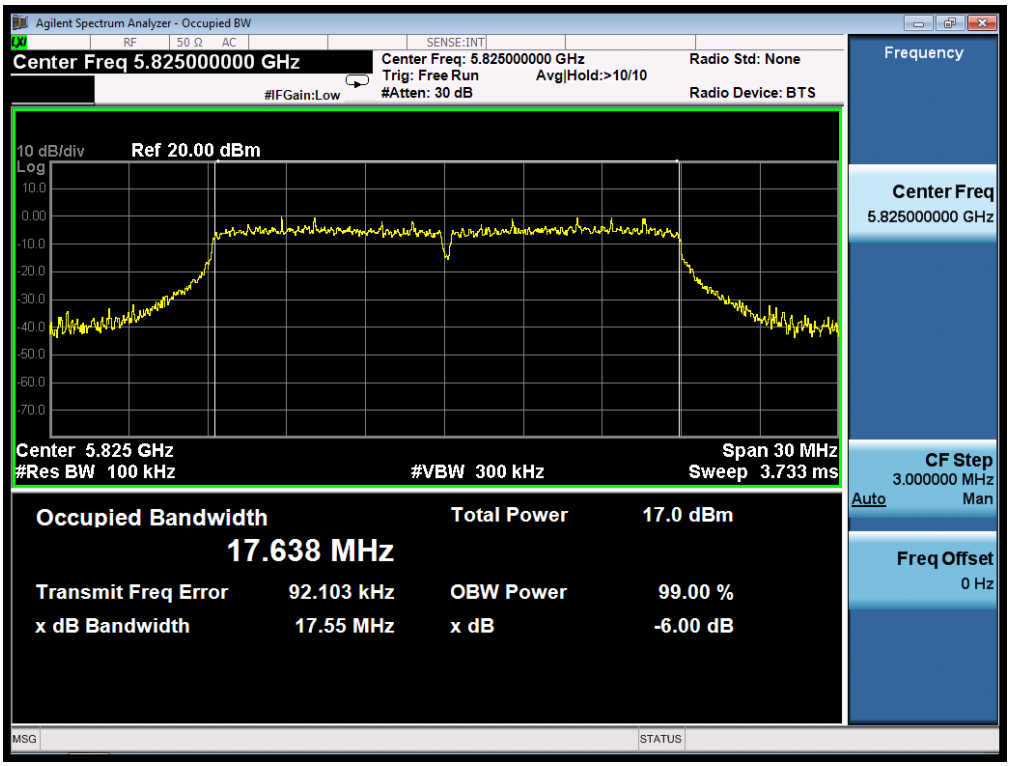


## 802.11ac20 TEST RESULT

TEST PLOT OF BANDWIDTH FOR 5745MHz

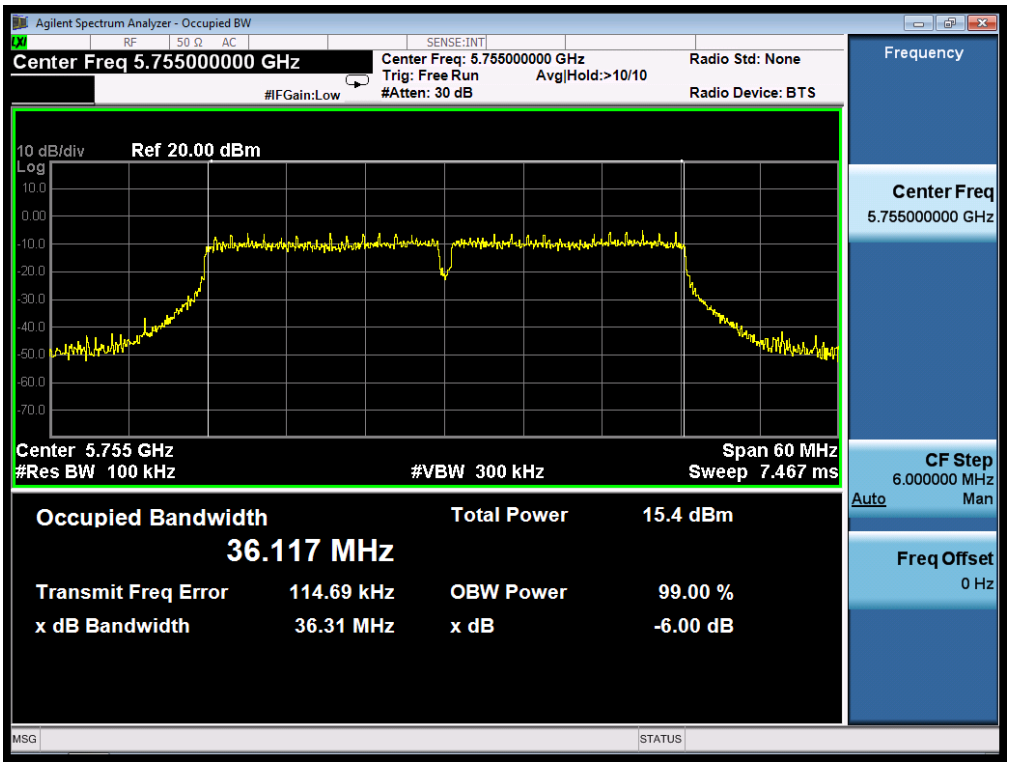



TEST PLOT OF BANDWIDTH FOR 5825MHz

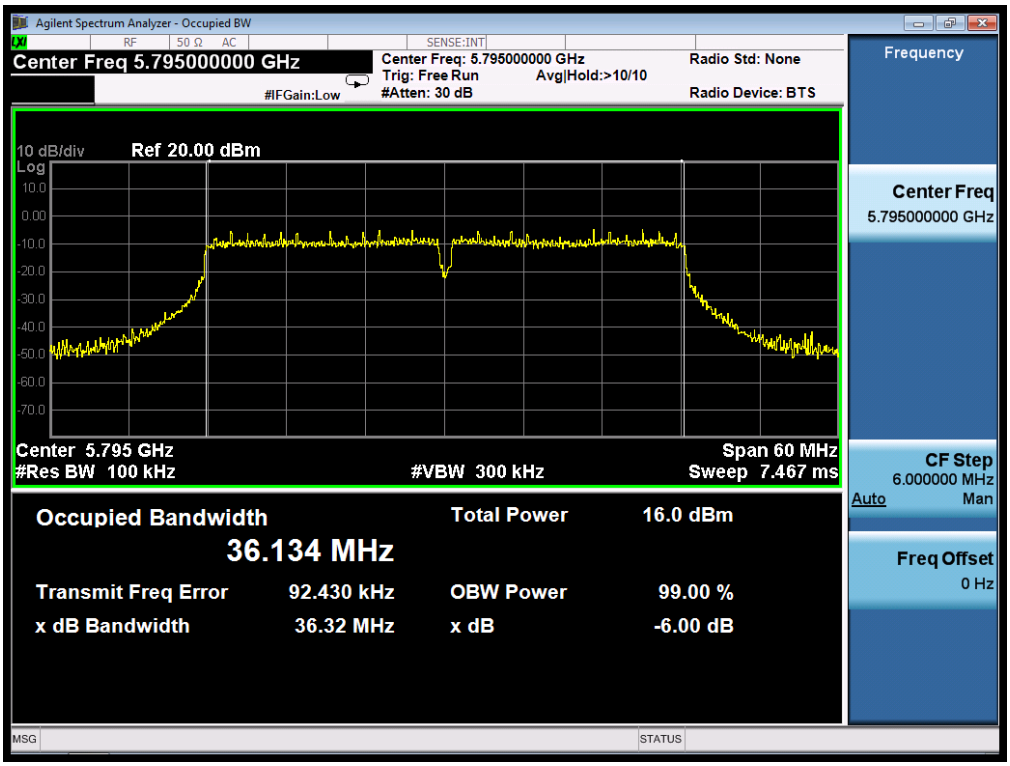


## 802.11ac40 TEST RESULT

TEST PLOT OF BANDWIDTH FOR 5755MHz

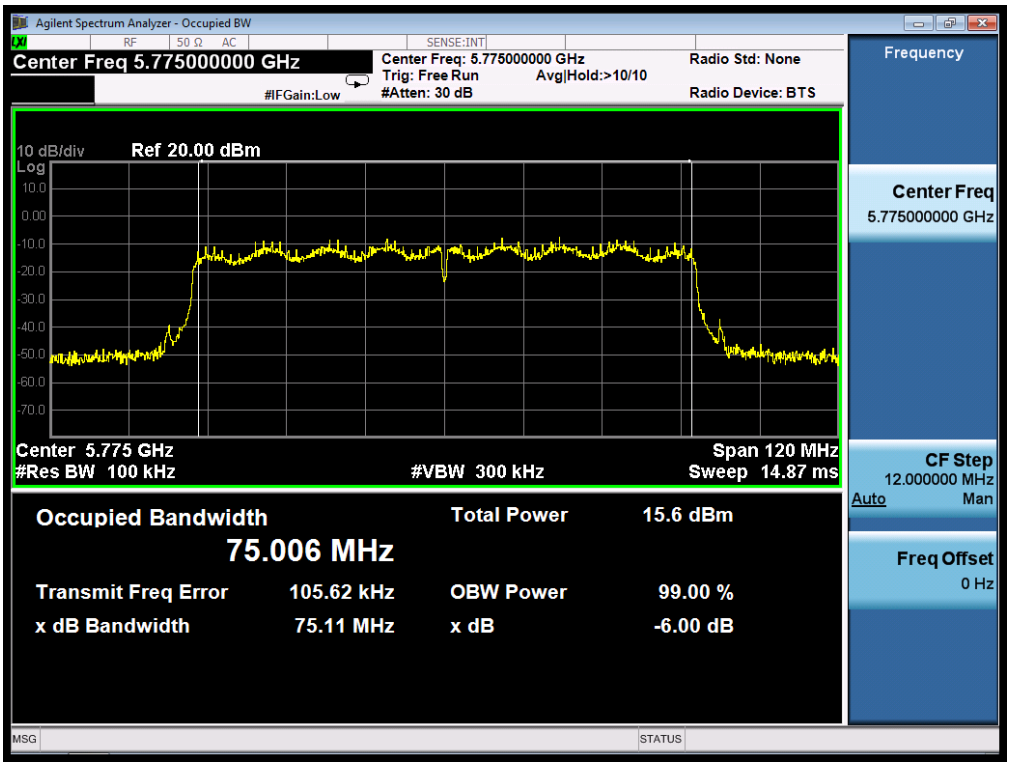



TEST PLOT OF BANDWIDTH FOR 5795MHz



## 802.11ac80 TEST RESULT

TEST PLOT OF BANDWIDTH FOR 5775MHz



# 9. MAXIMUM CONDUCTED OUTPUT PEAK POWER SPECTRAL DENSITY

## 9.1 MEASUREMENT PROCEDURE

Refer to KDB 789033 section F

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

Refer To Section 8.2.

## 9.3 MEASUREMENT EQUIPMENT USED

Refer To Section 6.

## 9.4 LIMITS AND MEASUREMENT RESULT

| LIMITS AND MEASUREMENT RESULT FOR 802.11A20 MODULATION | | | | | |
|---|---|---|---|---|---|
| BAND 1 | | | | | |
| BW | Frequency (MHz) | Power density Chain 0 (dBm/MHz) | Power density Chain 1 (dBm/MHz) | Applicable Limits (dBm) | Pass or Fail |
| 20MHz | 5180 | 1.02 | 0.82 | 11 | Pass |
| 40MHz | 5240 | 1.25 | 0.87 | 11 | Pass |
| BAND 4 | | | | | |
| BW | Frequency (MHz) | Power density Chain 0 (dBm/500kHz) | Power density Chain 1 (dBm/500kHz) | Applicable Limits (dBm) | Pass or Fail |
| 20MHz | 5745 | 0.86 | 0.64 | 30 | Pass |
| 40MHz | 5825 | 0.74 | 0.34 | 30 | Pass |

| LIMITS AND MEASUREMENT RESULT FOR 802.11N20/40 MODULATION | | | | | | |
|---|---|---|---|---|---|---|
| BAND 1 | | | | | | |
| BW | Frequency (MHz) | Power density Chain 0 (dBm/MHz) | Power density Chain 1 (dBm/MHz) | Power density Total (dBm/MHz) | Applicable Limits (dBm) | Pass or Fail |
| 20MHz | 5180 | -1.41 | -1.12 | 1.75 | 11 | Pass |
| | 5240 | -1.35 | -1.05 | 1.81 | 11 | Pass |
| 40MHz | 5190 | -4.58 | -5.05 | -1.80 | 11 | Pass |
| | 5230 | -4.61 | -5.11 | -1.84 | 11 | Pass |

| BAND 4 | | | | | | |
|---|---|---|---|---|---|---|
| **BW** | **Frequency (MHz)** | **Power density Chain 0 (dBm/500kHz)** | **Power density Chain 1 (dBm/500kHz)** | **Power density Total (dBm/500kHz)** | **Applicable Limits (dBm)** | **Pass or Fail** |
| 20MHz | 5745 | -3.34 | -3.10 | -0.21 | 30 | Pass |
| | 5825 | -3.64 | -3.21 | -0.41 | 30 | Pass |
| 40MHz | 5755 | -7.21 | -7.18 | -4.18 | 30 | Pass |
| | 5795 | -7.31 | -7.15 | -4.22 | 30 | Pass |

| LIMITS AND MEASUREMENT RESULT FOR 802.11AC20/40/80 MODULATION | | | | | | |
|---|---|---|---|---|---|---|
| BAND 1 | | | | | | |
| **BW** | **Frequency (MHz)** | **Power density Chain 0 (dBm/MHz)** | **Power density Chain 1 (dBm/MHz)** | **Power density Total (dBm/MHz)** | **Applicable Limits (dBm)** | **Pass or Fail** |
| 20MHz | 5180 | -2.34 | -2.76 | 0.47 | 11 | Pass |
| | 5240 | -2.25 | -2.85 | 0.47 | 11 | Pass |
| 40MHz | 5190 | -5.34 | -5.78 | -2.54 | 11 | Pass |
| | 5230 | -5.15 | -5.84 | -2.47 | 11 | Pass |
| 80MHz | 5210 | -8.35 | -8.12 | -5.22 | 11 | Pass |
| BAND 4 | | | | | | |
| **BW** | **Frequency (MHz)** | **Power density Chain 0 (dBm/500kHz)** | **Power density Chain 1 (dBm/500kHz)** | **Power density Total (dBm/500kHz)** | **Applicable Limits (dBm)** | **Pass or Fail** |
| 20MHz | 5745 | -3.87 | -4.41 | -1.12 | 30 | Pass |
| | 5825 | -3.73 | -4.25 | -0.97 | 30 | Pass |
| 40MHz | 5755 | -7.87 | -8.17 | -5.01 | 30 | Pass |
| | 5795 | -7.91 | -8.31 | -5.10 | 30 | Pass |
| 80MHz | 5775 | -9.15 | -9.42 | -6.27 | 30 | Pass |

# 10. CONDUCTED SPURIOUS EMISSION

## 10.1. 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 KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

## 10.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The same as described in section 8.2.

## 10.3. MEASUREMENT EQUIPMENT USED

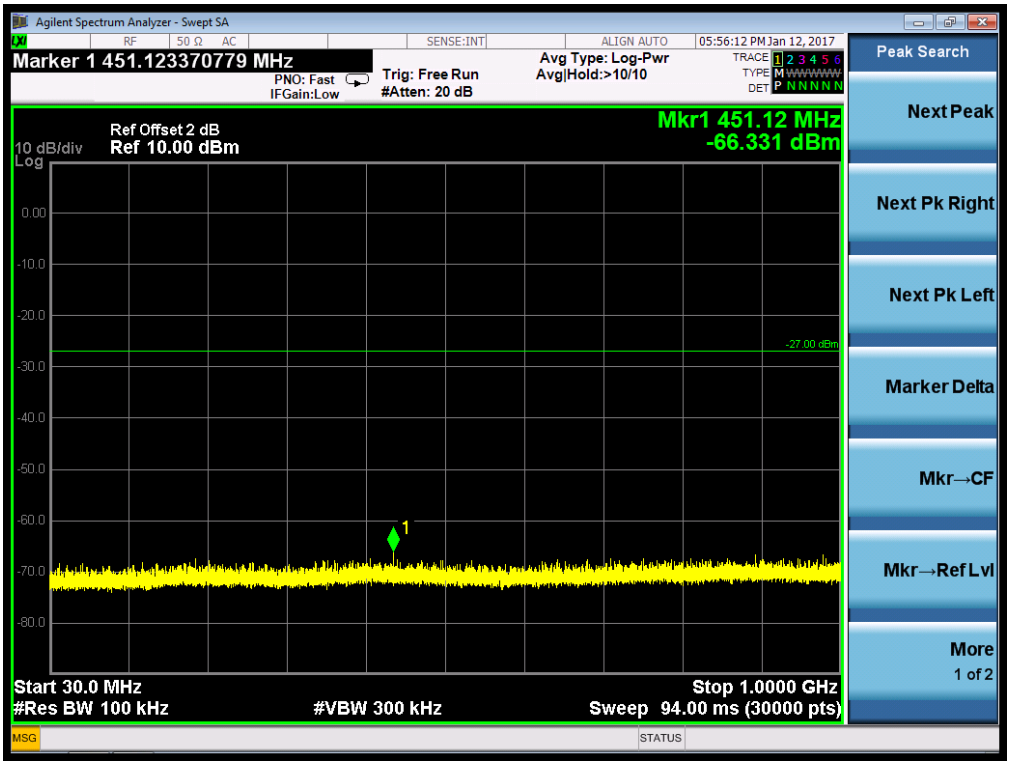
The same as described in section 6.

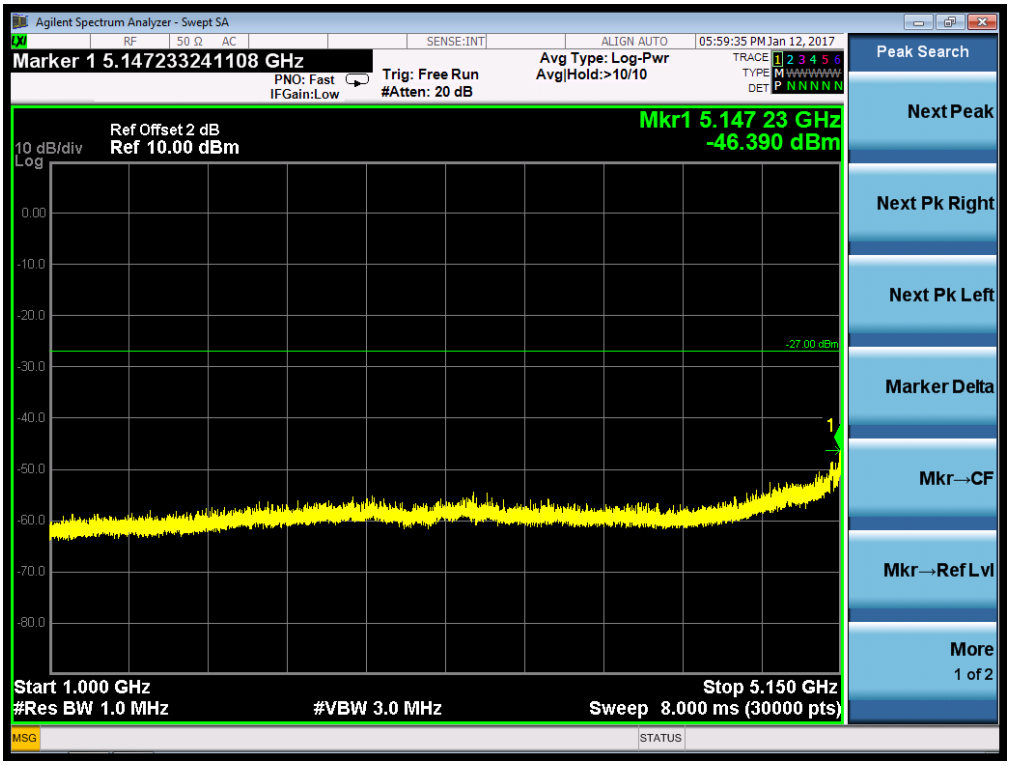
## 10.4. LIMITS AND MEASUREMENT RESULT

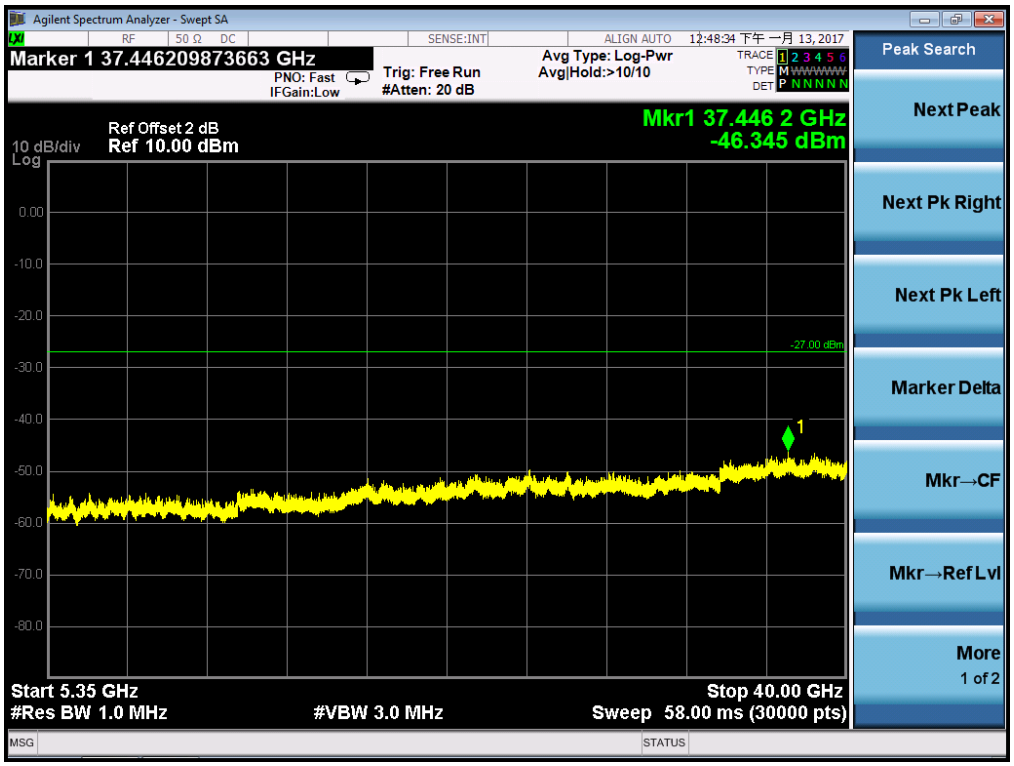
| LIMITS AND MEASUREMENT RESULT | | |
|---|---|---|
| **Applicable Limits** | **Measurement Result** | |
| | **Test channel** | **Criteria** |
| 27dBm | 5150MHz-5250MHz | PASS |
| 17dBm within 5715-5725MHz and 5850-5860MHz<br>27dBm outside 5715-5860MHz | 5725MHz-5825MHz | PASS |

**FOR 802.11A20 MODULATION**

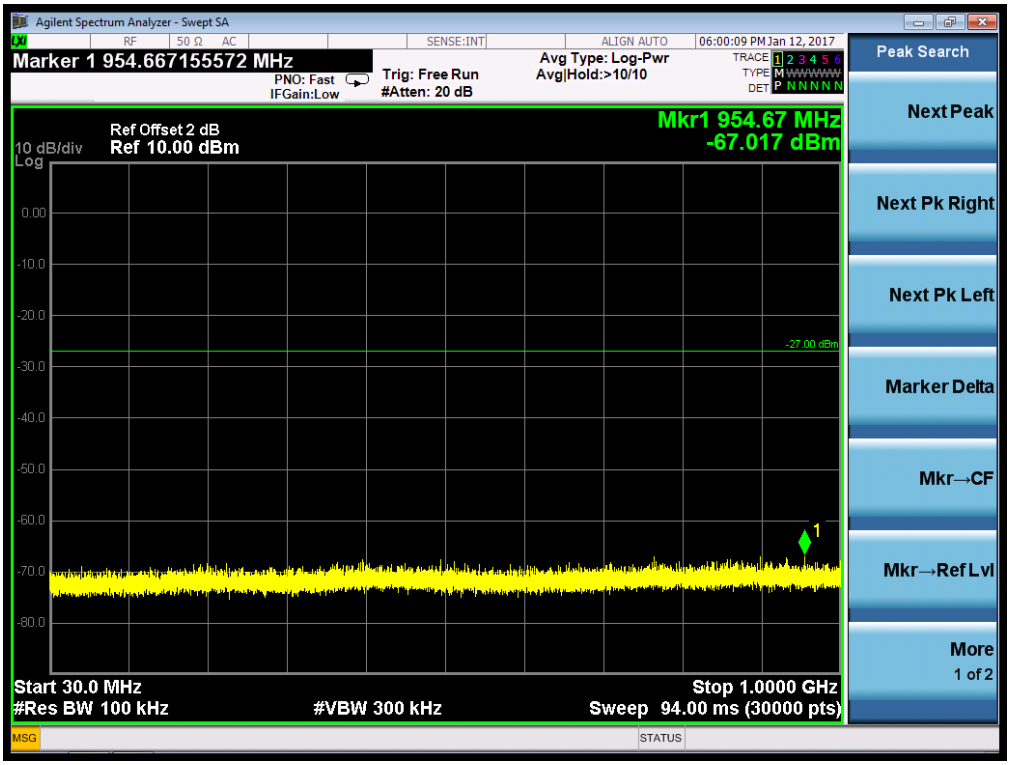
TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5180MHz

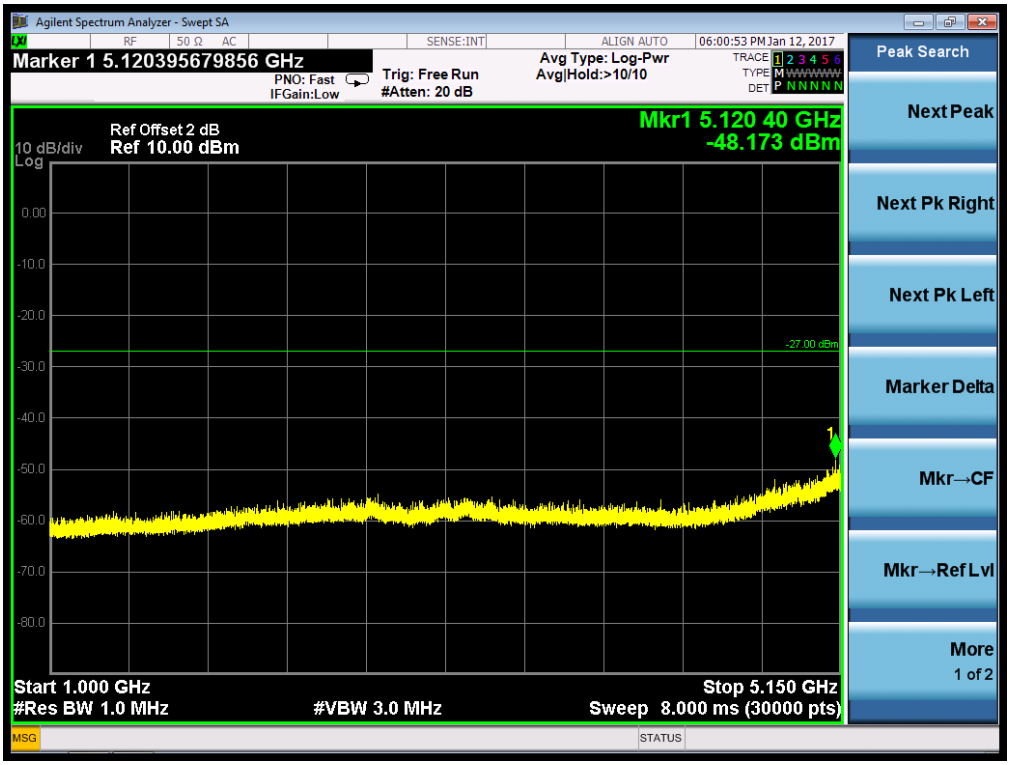


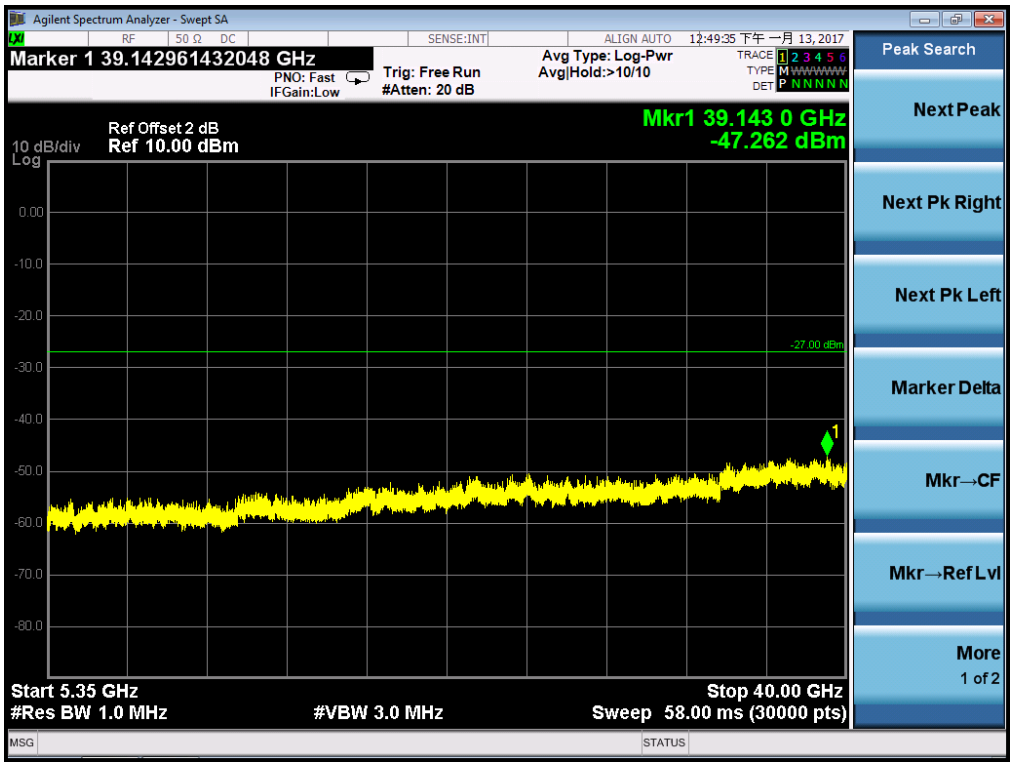





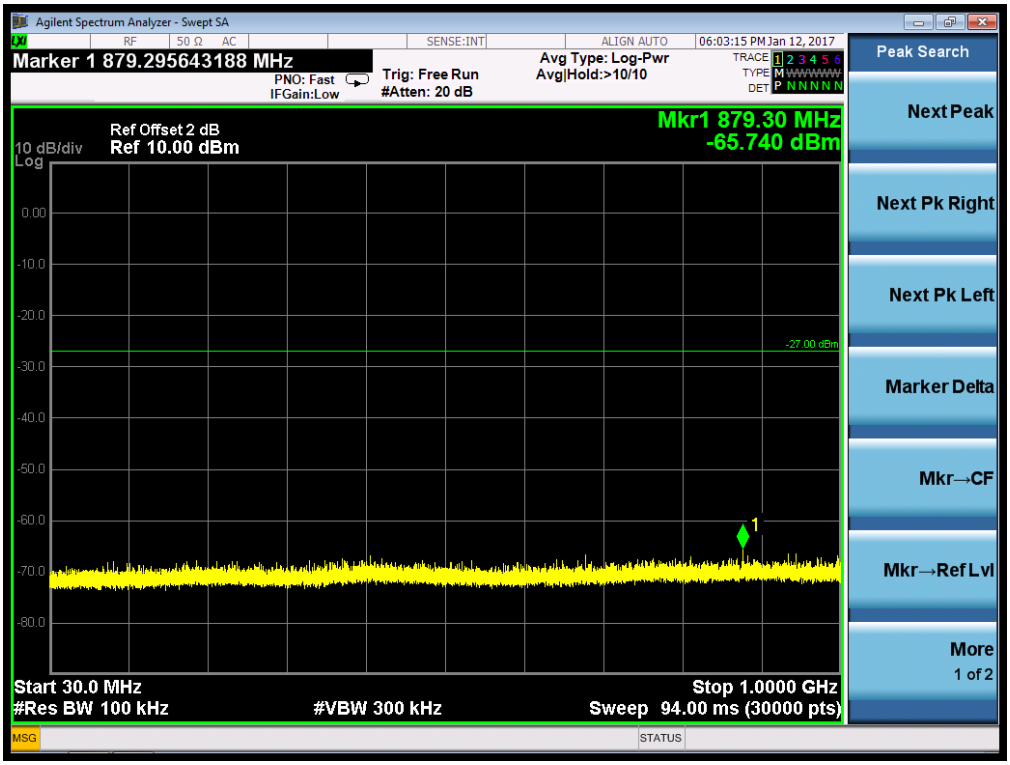

TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5240MHz

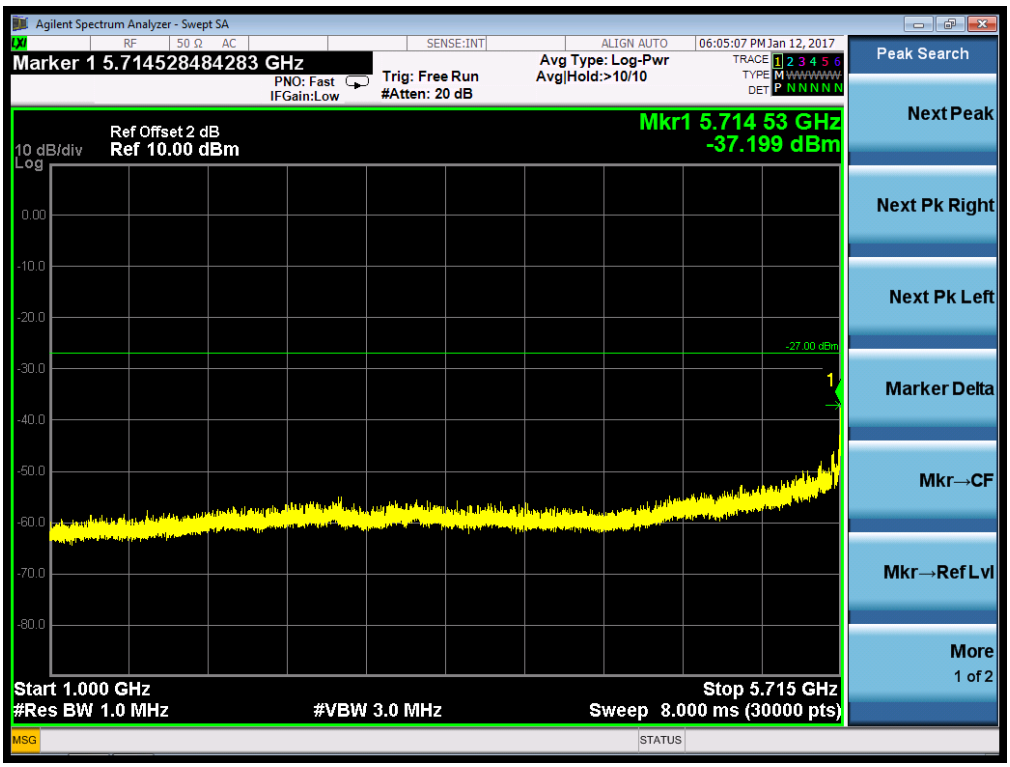


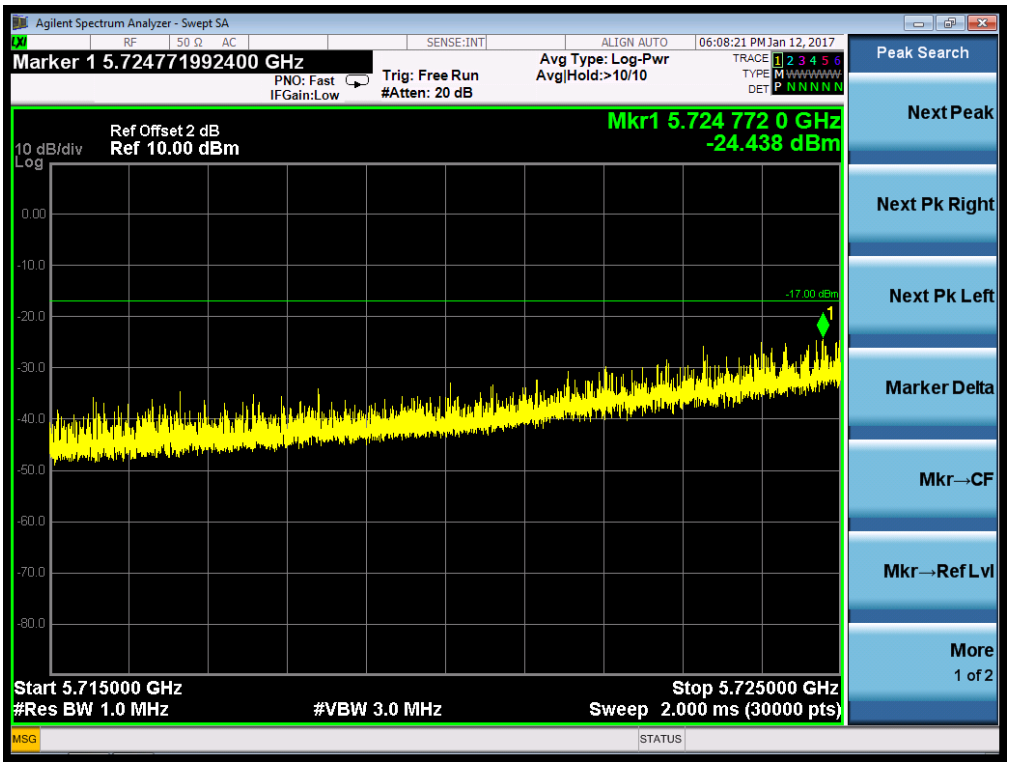

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
06:00:53 PM Jan 12, 2017
Marker 1 5.120395679856 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Ref Offset 2 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 5.120 40 GHz
-48.173 dBm
0.00
-10.0
-20.0
-27.00 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.150 GHz
Sweep 8.000 ms (30000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

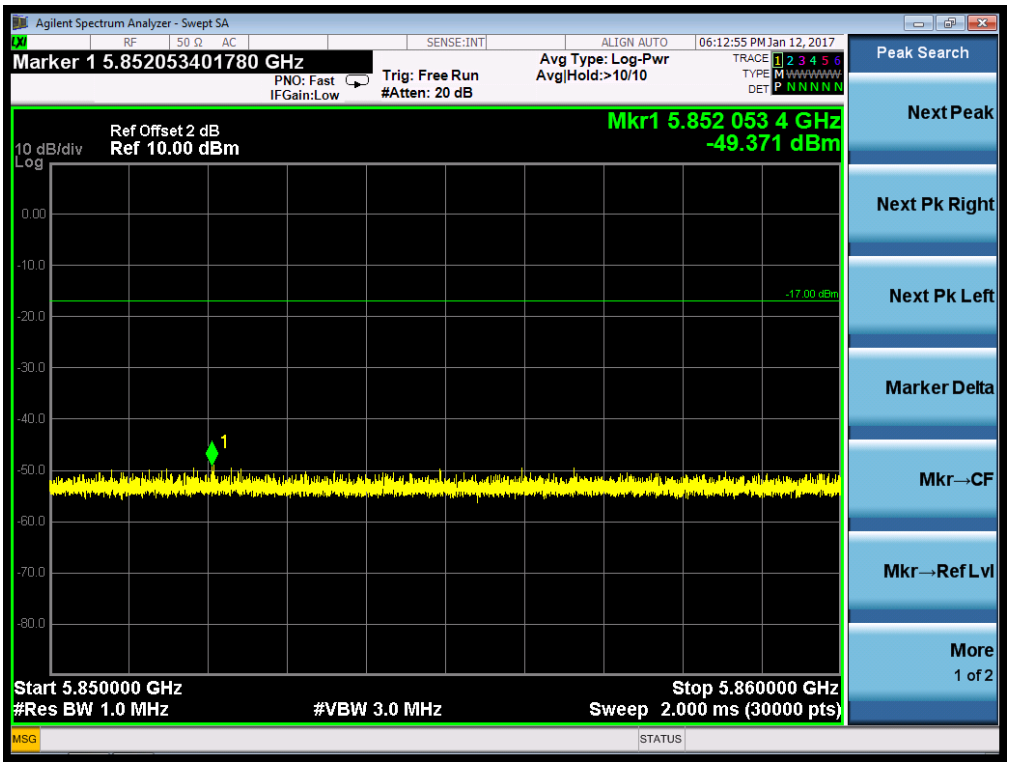

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
12:49:35 下午 一月 13, 2017
Marker 1 39.142961432048 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Ref Offset 2 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 39.143 0 GHz
-47.262 dBm
0.00
-10.0
-20.0
-27.00 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Start 5.35 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 40.00 GHz
Sweep 58.00 ms (30000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

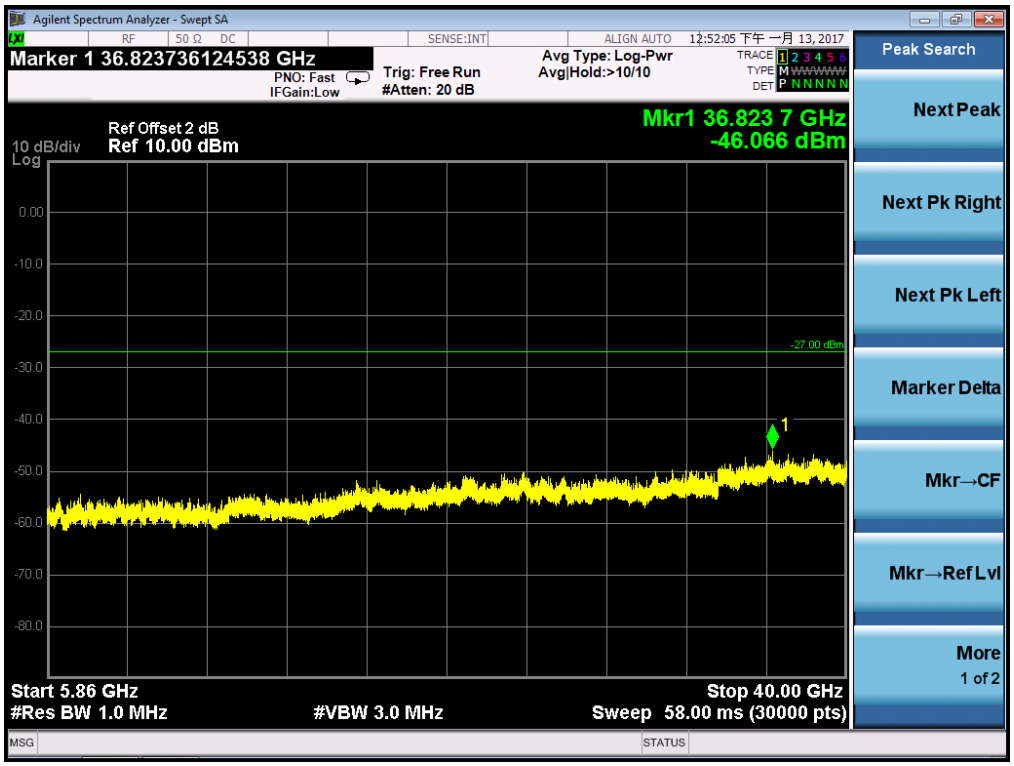
TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5745MHz



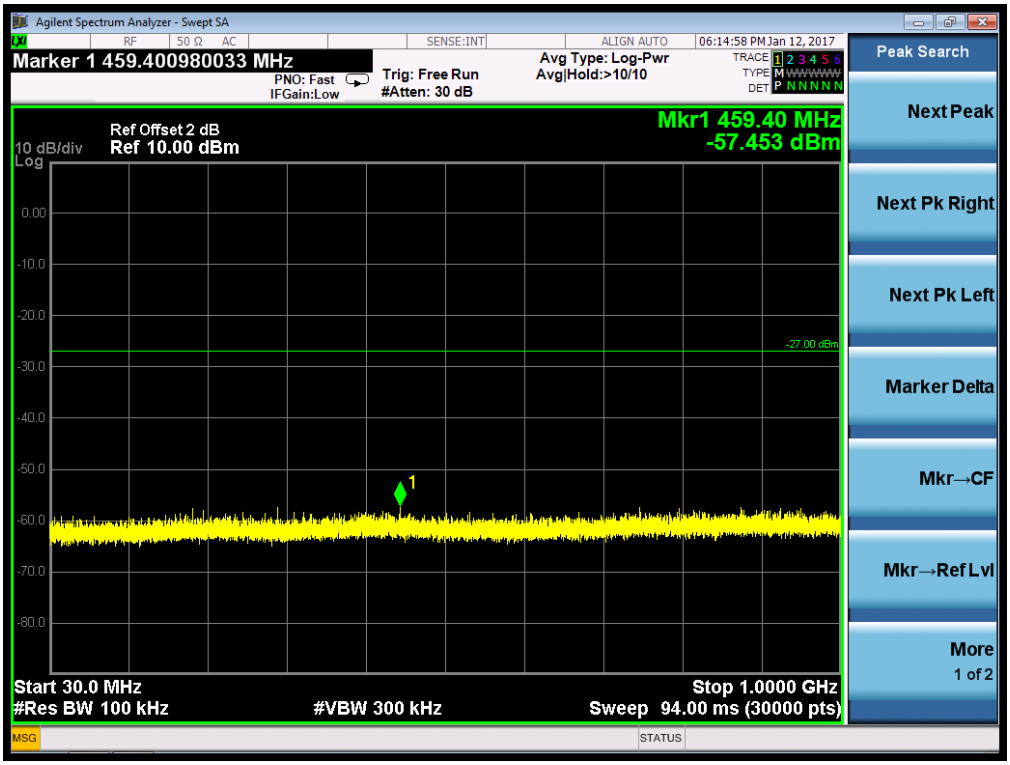



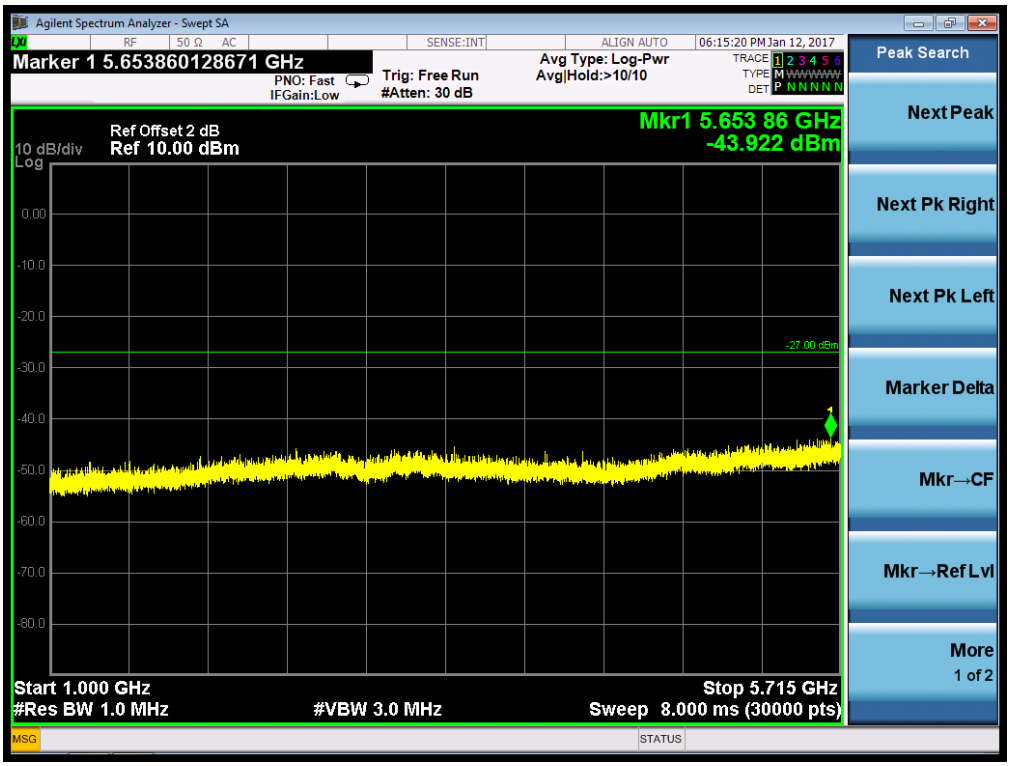

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
06:08:21 PM Jan 12, 2017
Marker 1 5.724771992400 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Ref Offset 2 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 5.724 772 0 GHz
-24.438 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-17.00 dBm
1
Start 5.715000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.725000 GHz
Sweep 2.000 ms (30000 pts)
MSG
STATUS

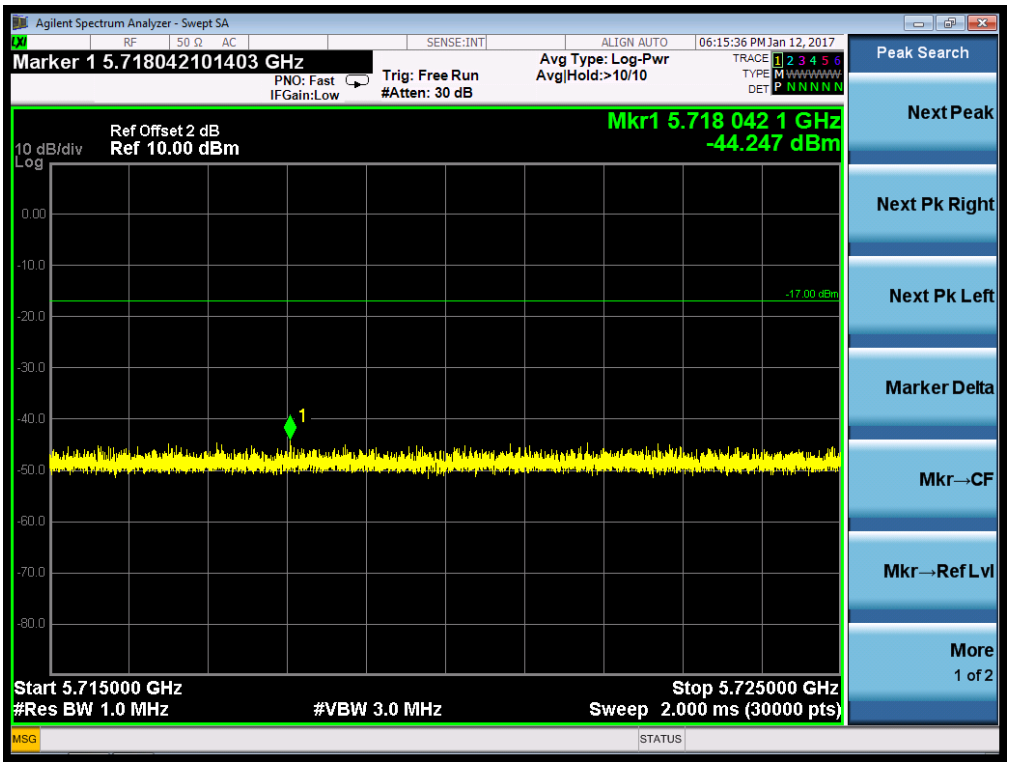

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
06:12:55 PM Jan 12, 2017
Marker 1 5.852053401780 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Ref Offset 2 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 5.852 053 4 GHz
-49.371 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-17.00 dBm
1
Start 5.850000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.860000 GHz
Sweep 2.000 ms (30000 pts)
MSG
STATUS

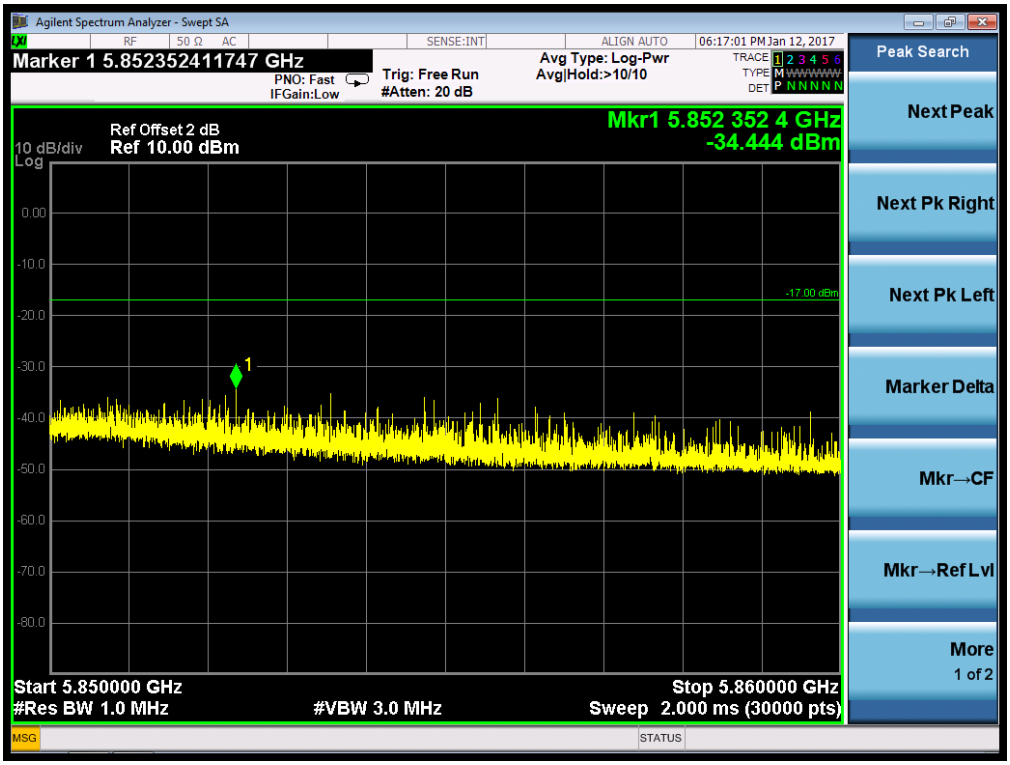


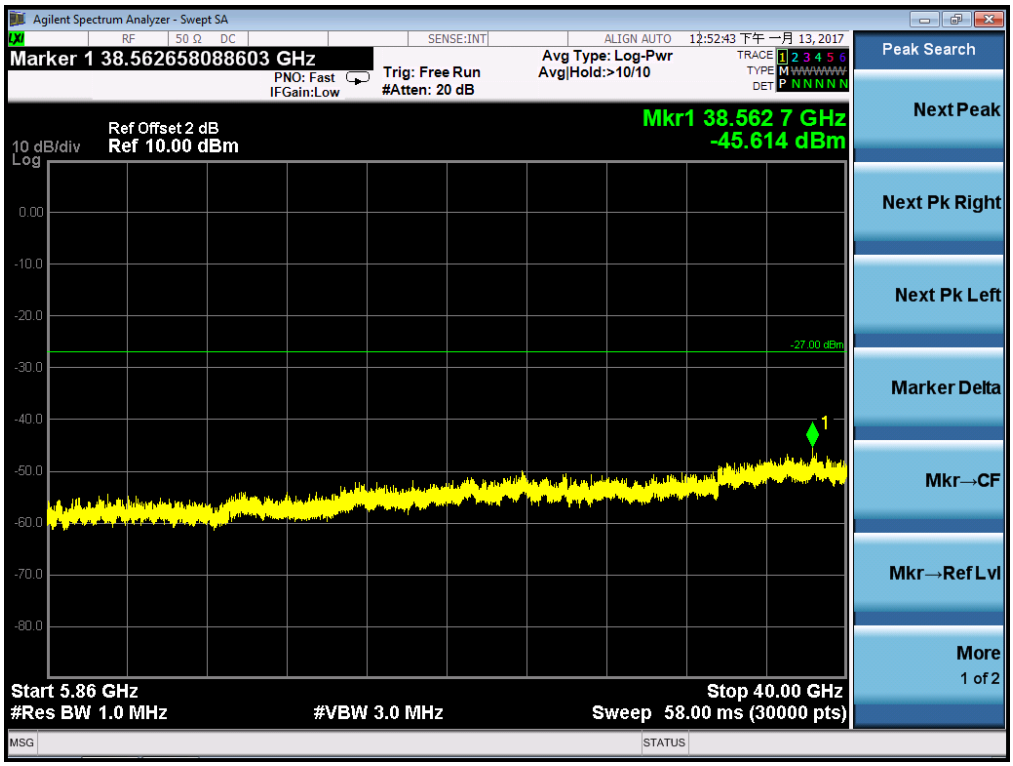

TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5825MHz




Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
06:15:20 PM Jan 12, 2017
Marker 1 5.653860128671 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Ref Offset 2 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 5.653 86 GHz
-43.922 dBm
0.00
-10.0
-20.0
-27.00 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.715 GHz
Sweep 8.000 ms (30000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

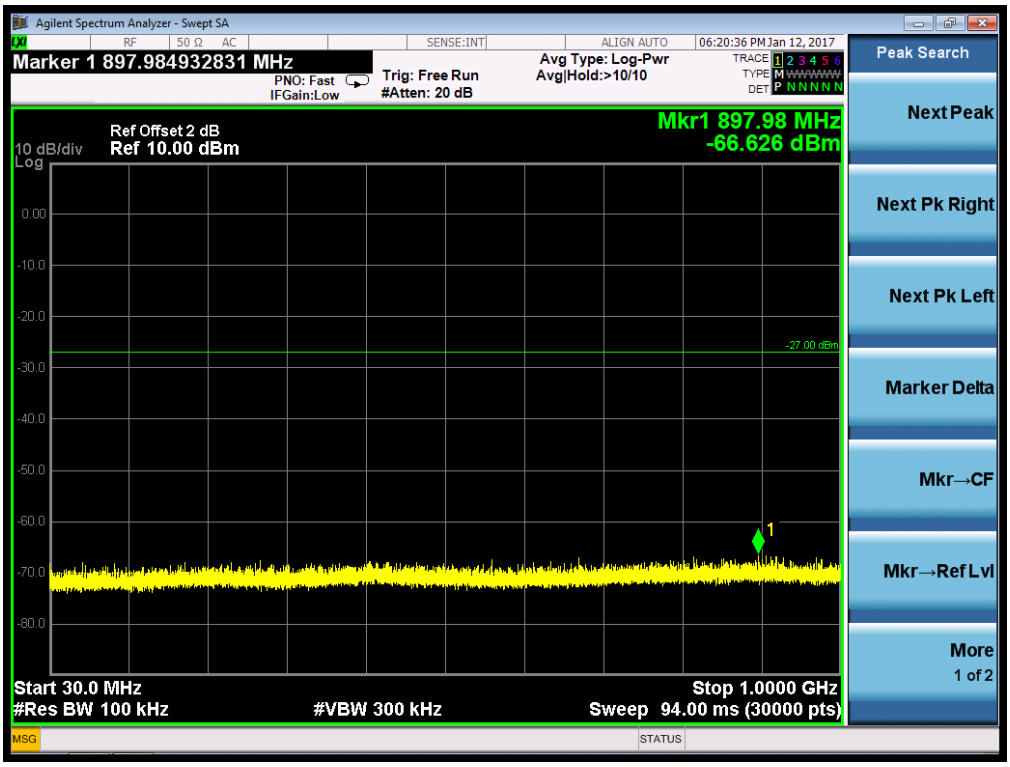

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
06:15:36 PM Jan 12, 2017
Marker 1 5.718042101403 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Ref Offset 2 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 5.718 042 1 GHz
-44.247 dBm
0.00
-10.0
-17.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Start 5.715000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.725000 GHz
Sweep 2.000 ms (30000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

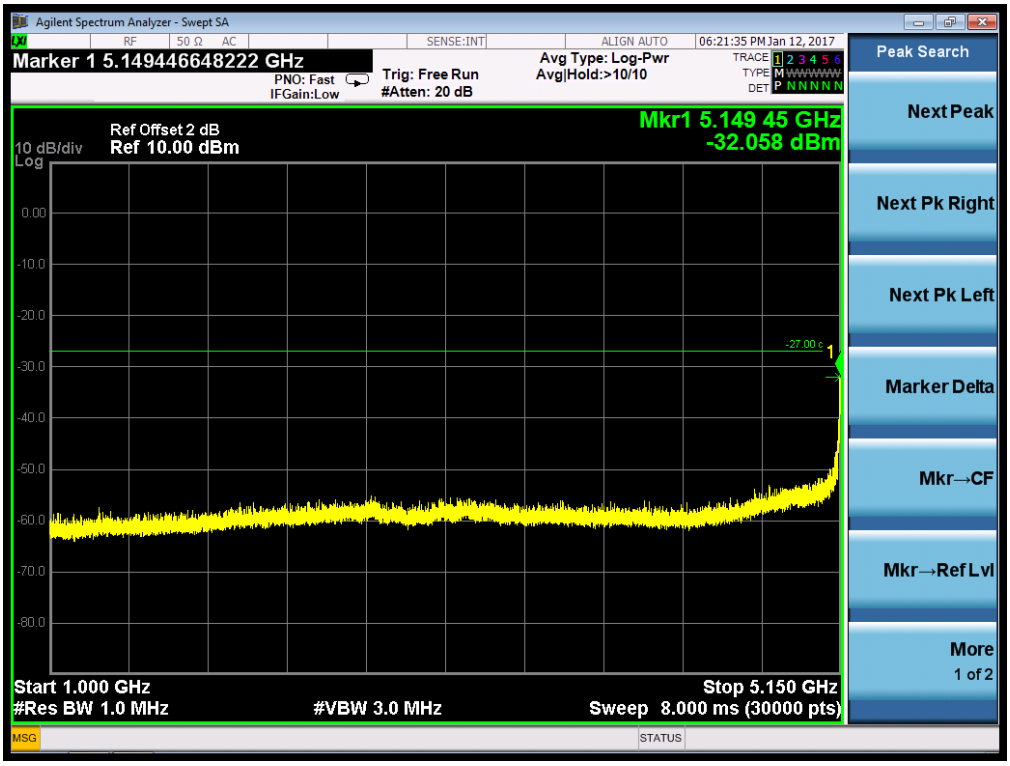

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
06:17:01 PM Jan 12, 2017
Marker 1 5.852352411747 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Ref Offset 2 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 5.852 352 4 GHz
-34.444 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-17.00 dBm
1
Start 5.850000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.860000 GHz
Sweep 2.000 ms (30000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

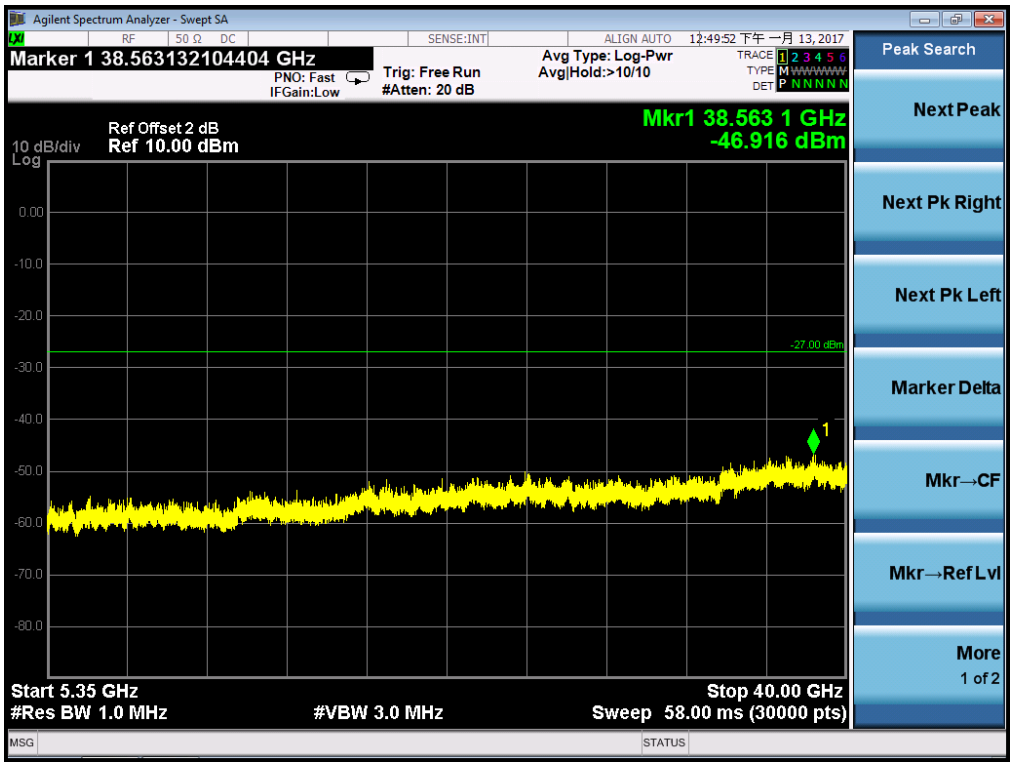

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
12:52:43 下午 一月 13, 2017
Marker 1 38.562658088603 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Ref Offset 2 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 38.562 7 GHz
-45.614 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-27.00 dBm
1
Start 5.86 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 40.00 GHz
Sweep 58.00 ms (30000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

**FOR 802.11N40 MODULATION**

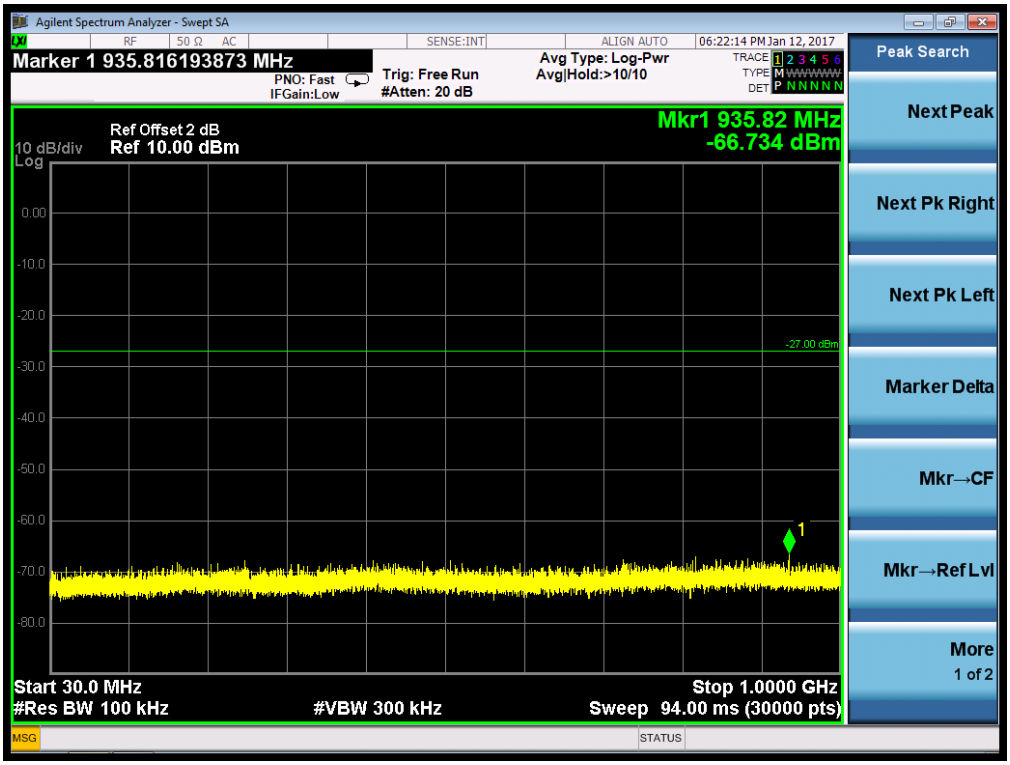
TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5190MHz

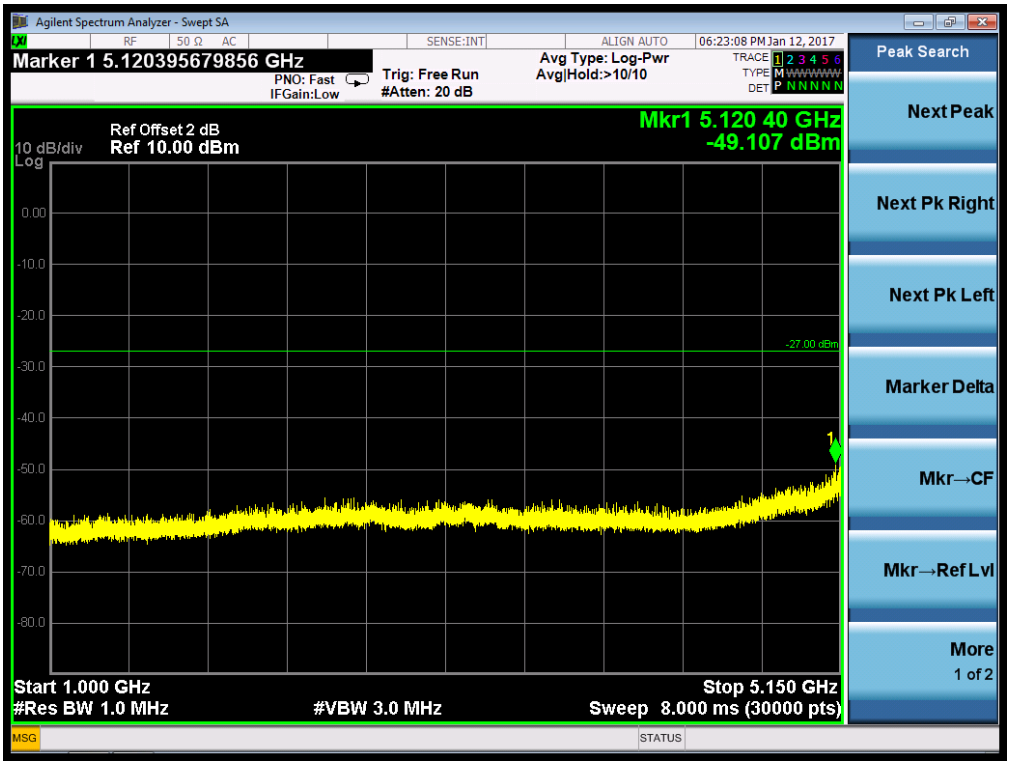


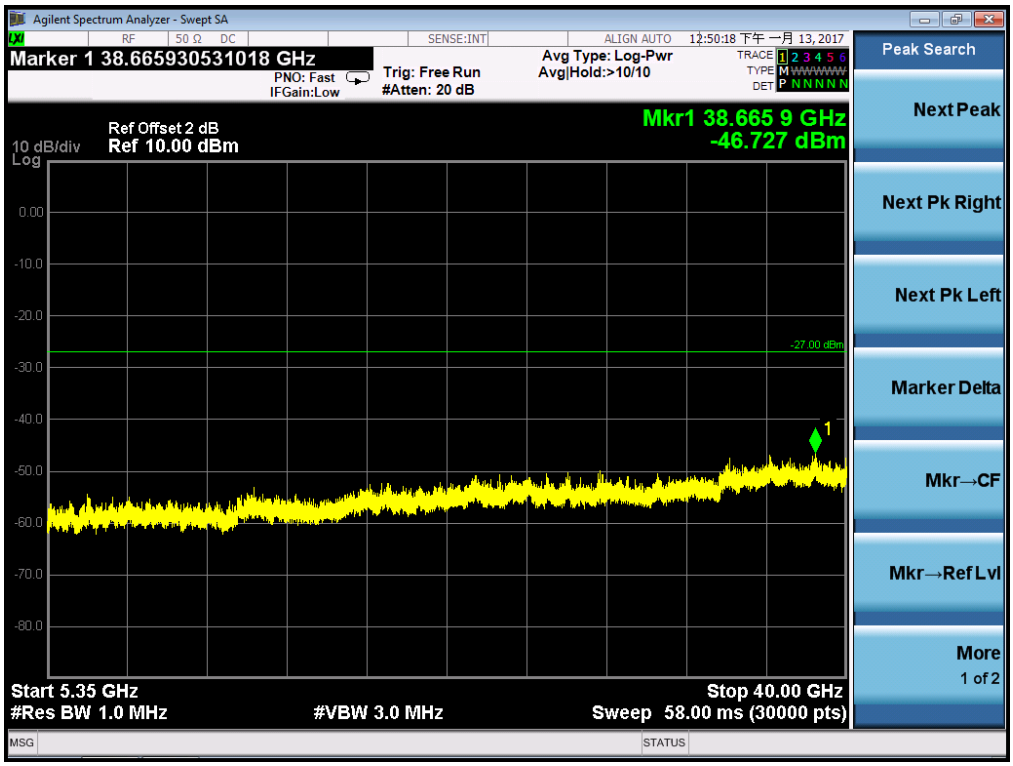





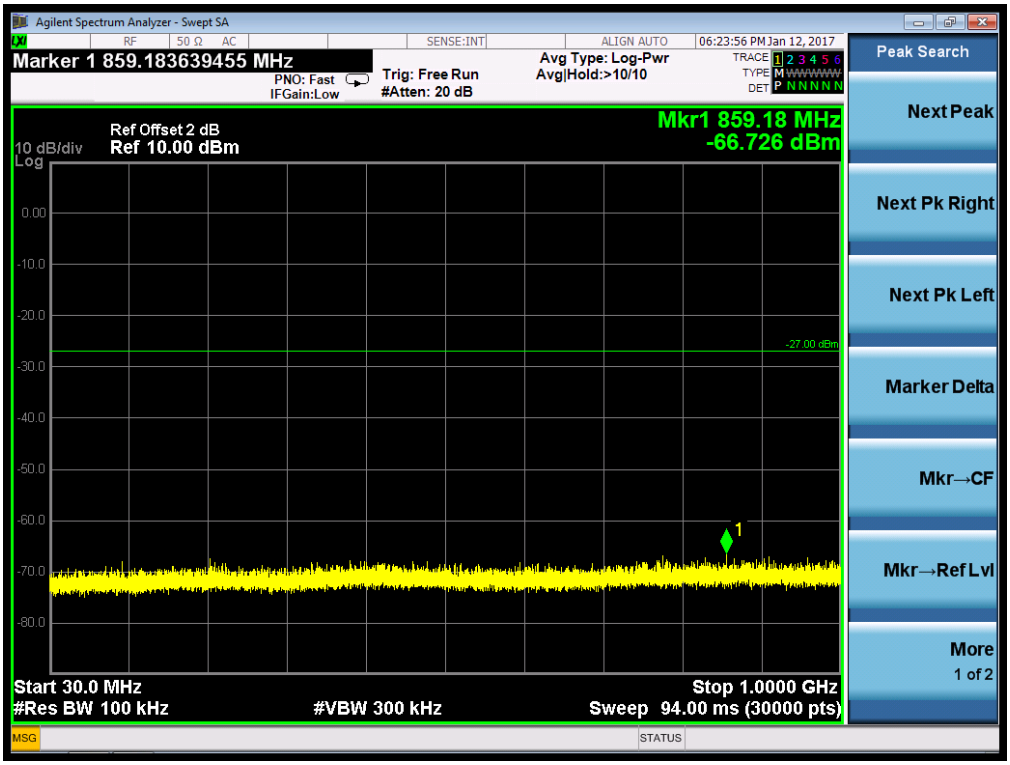

TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5230MHz

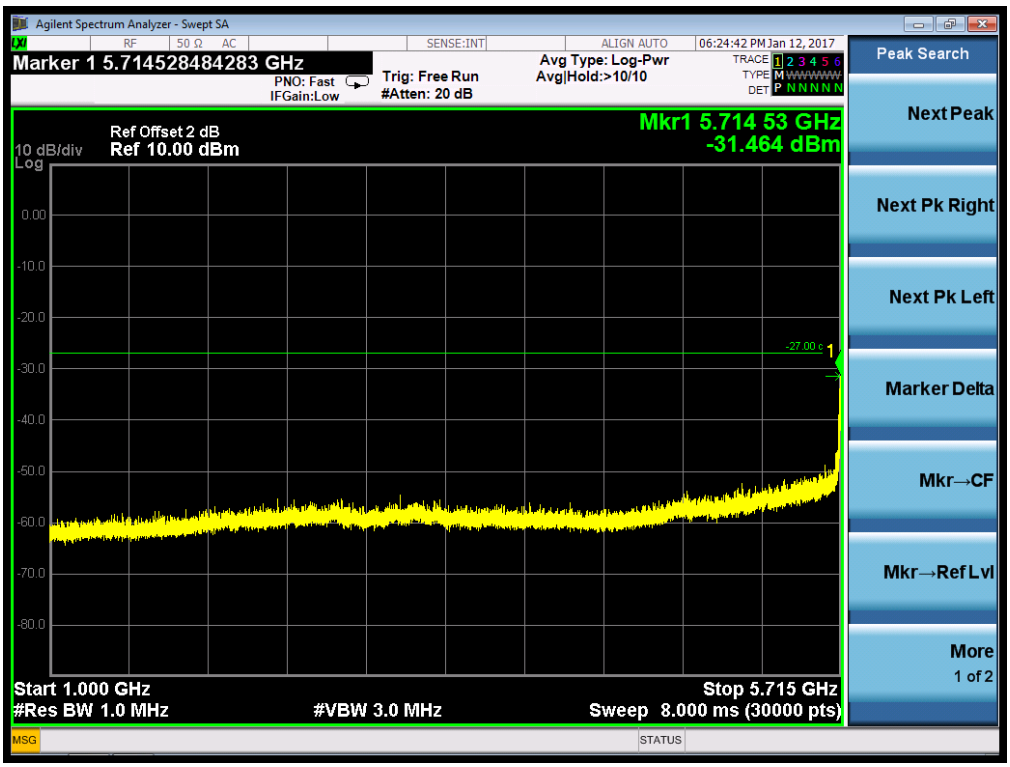


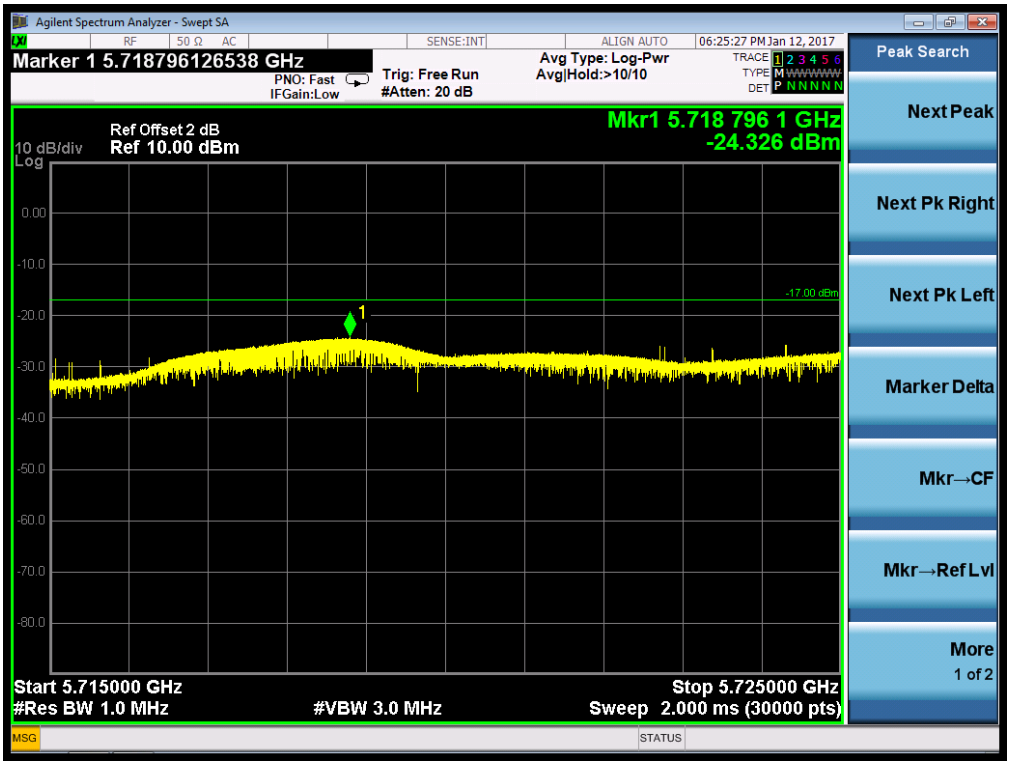

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
06:23:08 PM Jan 12, 2017
Marker 1 5.120395679856 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Ref Offset 2 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 5.120 40 GHz
-49.107 dBm
0.00
-10.0
-20.0
-27.00 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.150 GHz
Sweep 8.000 ms (30000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

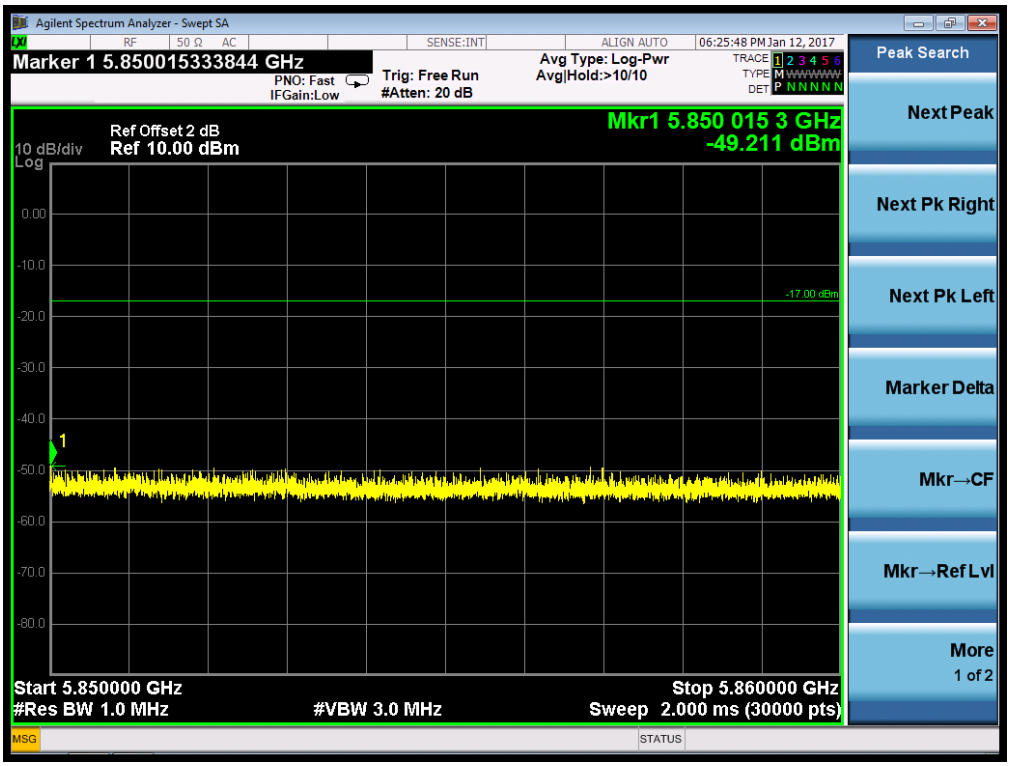

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
12:50:18 下午 一月 13, 2017
Marker 1 38.665930531018 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Ref Offset 2 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 38.665 9 GHz
-46.727 dBm
0.00
-10.0
-20.0
-27.00 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
Start 5.35 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 40.00 GHz
Sweep 58.00 ms (30000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

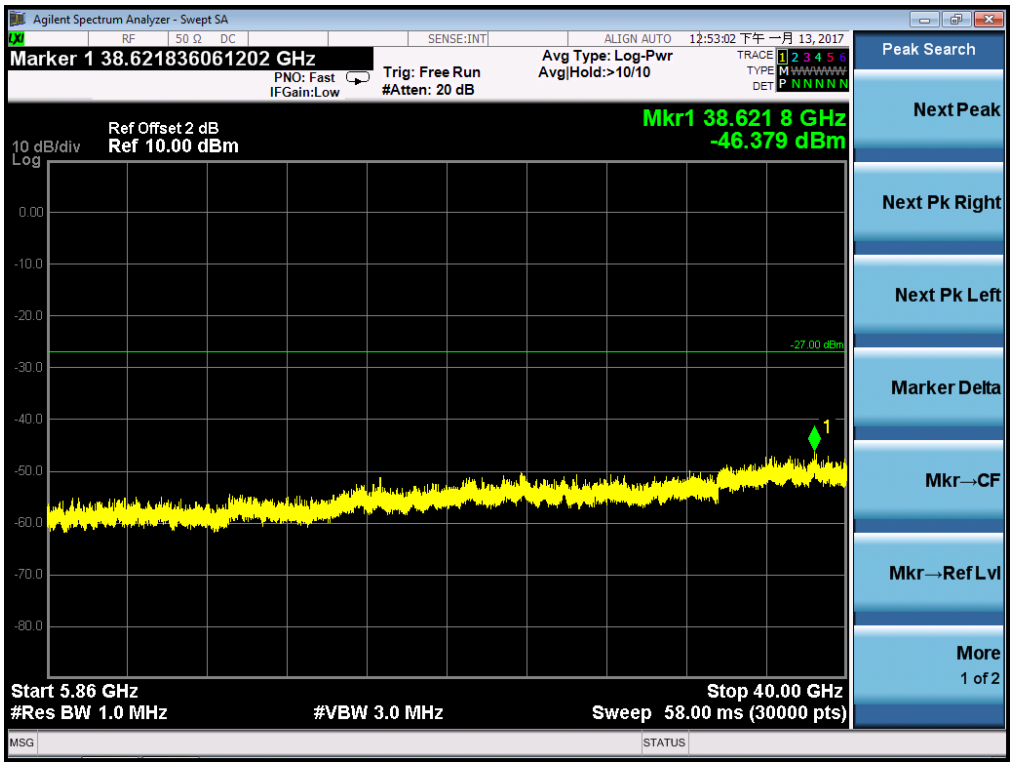
TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5755MHz



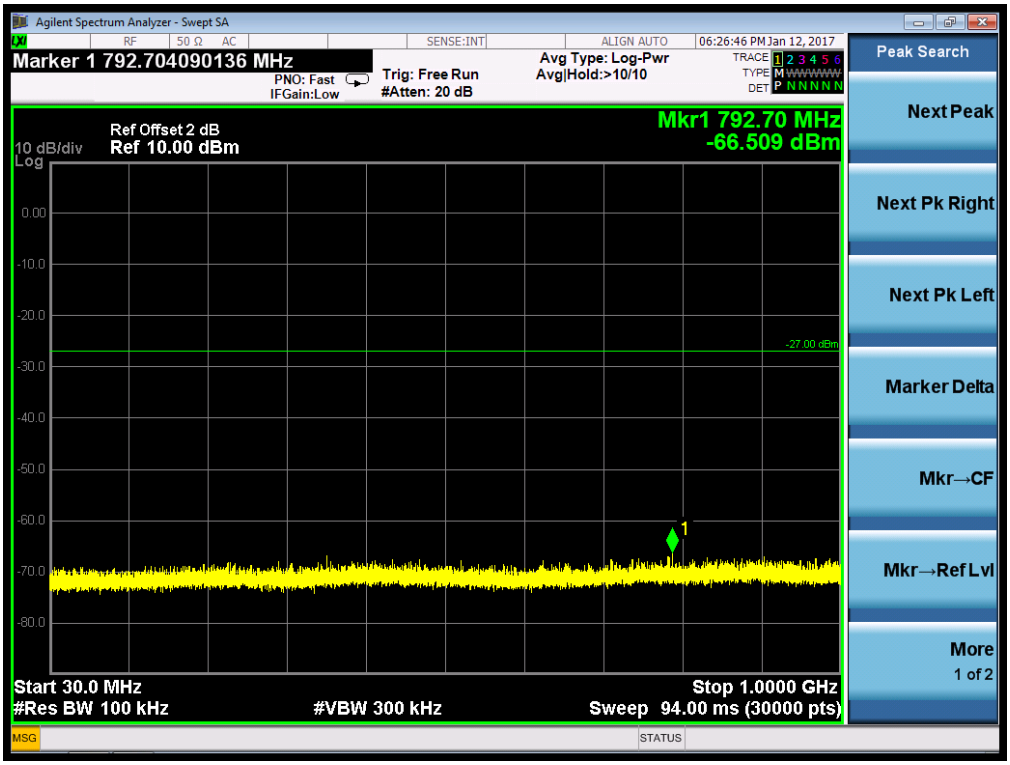



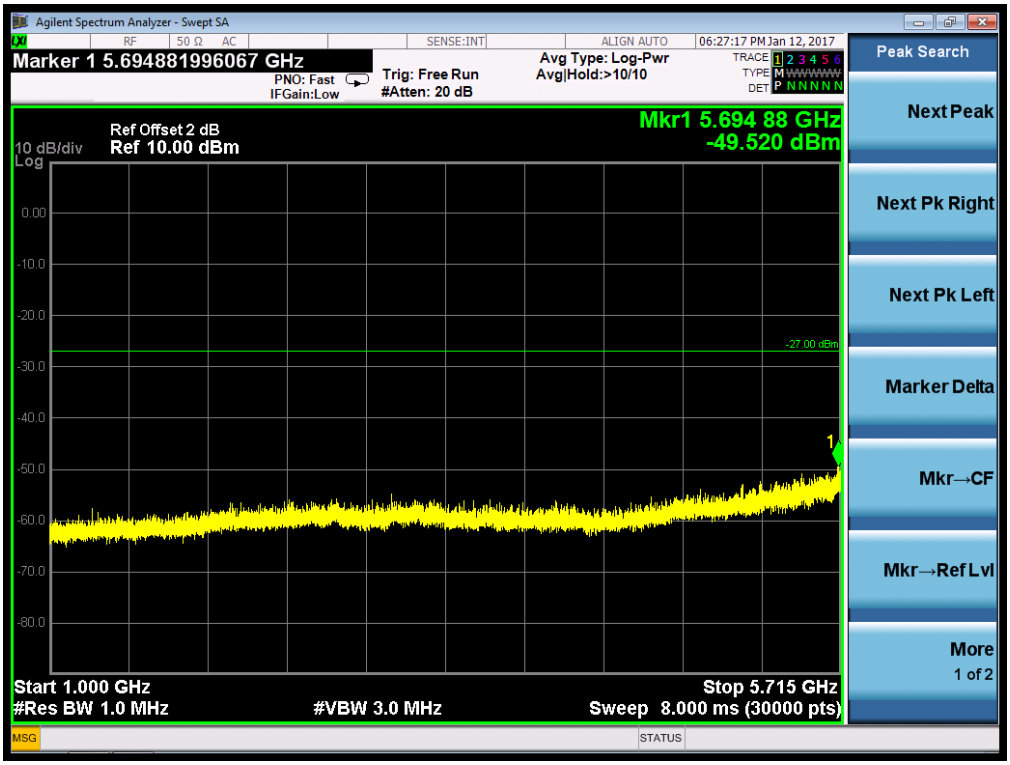

Agilent Spectrum Analyzer - Swept SA
Marker 1 5.718796126538 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>10/10
06:25:27 PM Jan 12, 2017
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Mkr1 5.718 796 1 GHz
-24.326 dBm
-17.00 dBm
Start 5.715000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.725000 GHz
Sweep 2.000 ms (30000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

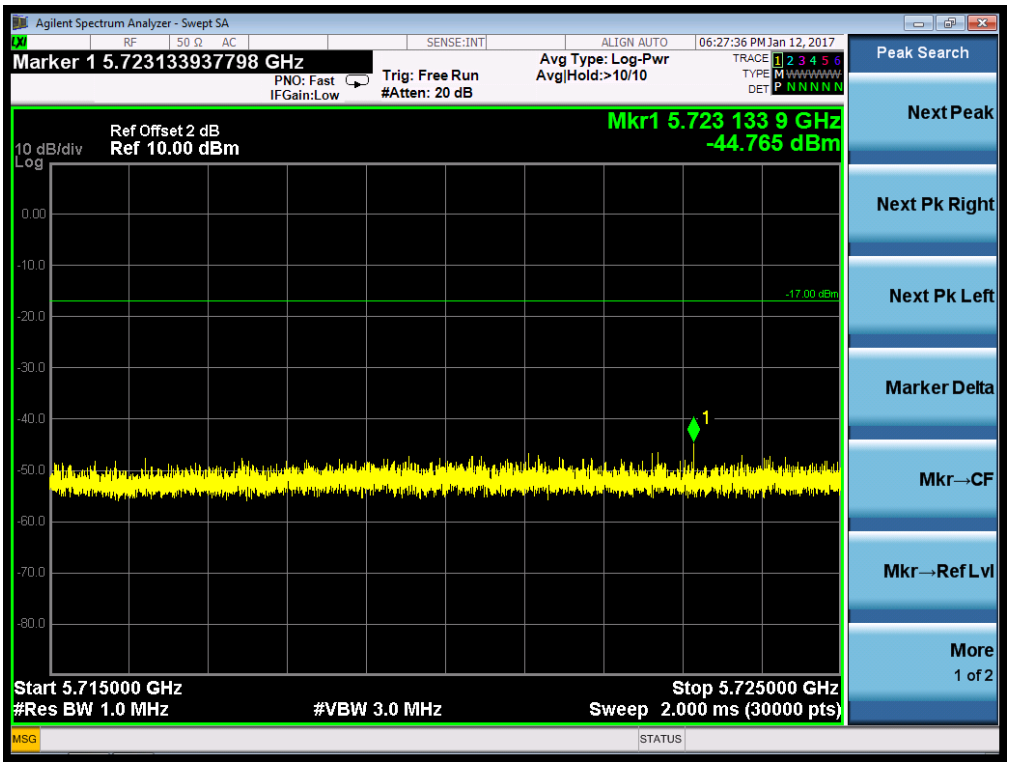

Agilent Spectrum Analyzer - Swept SA
Marker 1 5.850015333844 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>10/10
06:25:48 PM Jan 12, 2017
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Mkr1 5.850 015 3 GHz
-49.211 dBm
-17.00 dBm
Start 5.850000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.860000 GHz
Sweep 2.000 ms (30000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

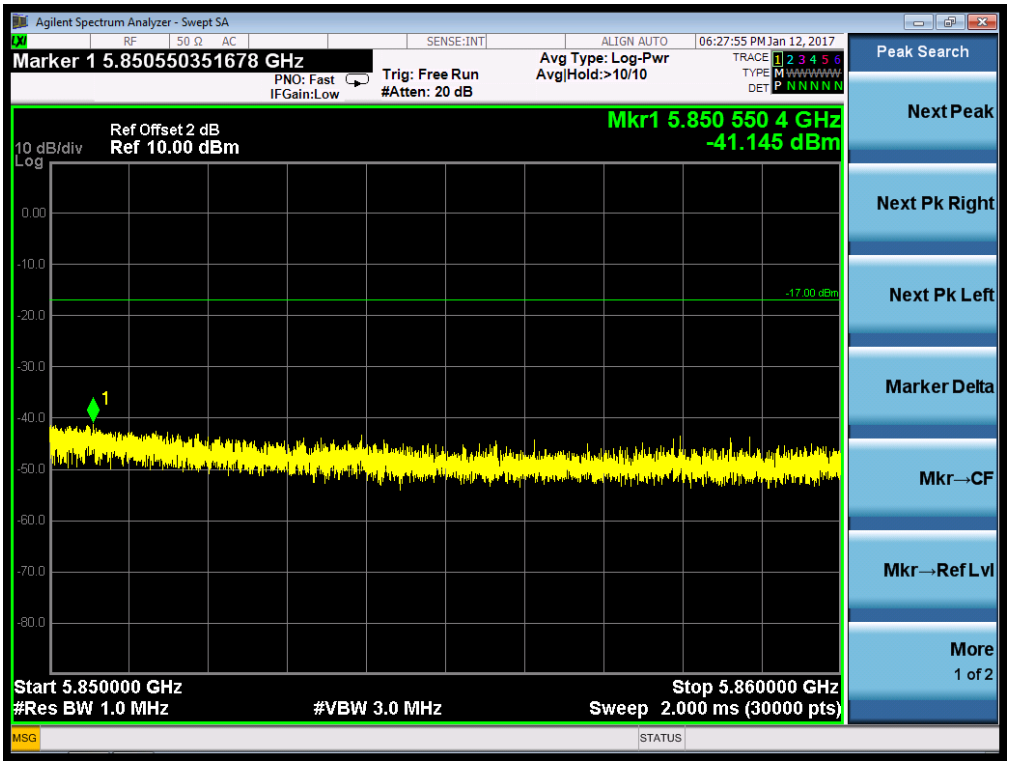


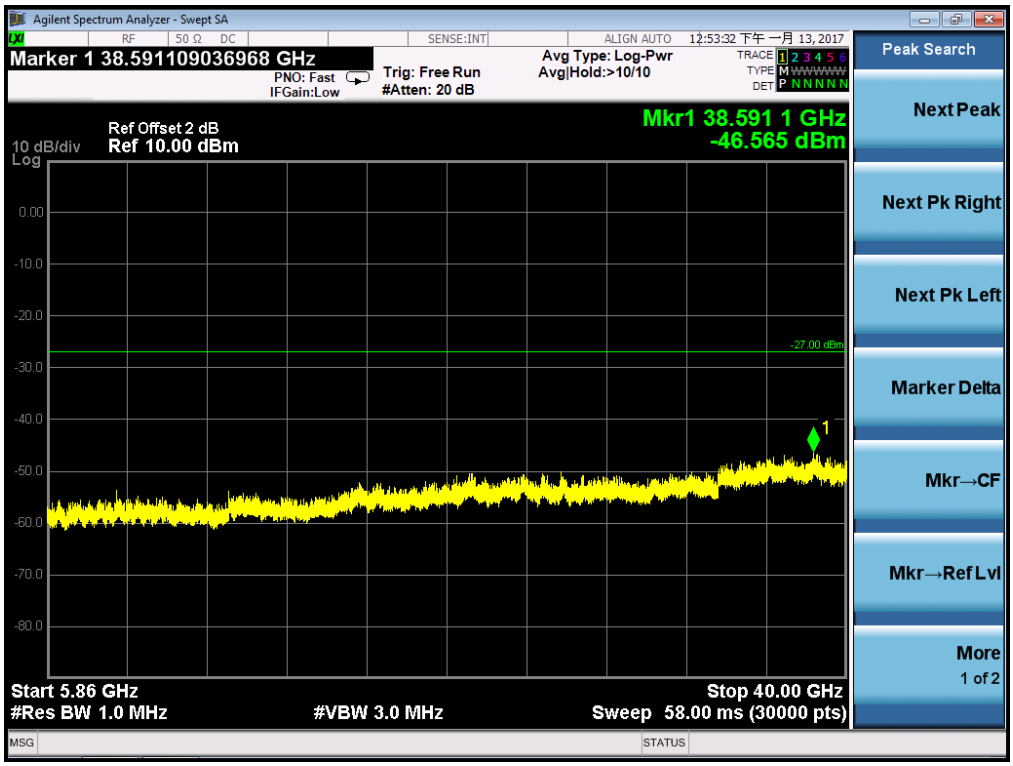

TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5795M




Agilent Spectrum Analyzer - Swept SA
Marker 1 5.694881996067 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>10/10
06:27:17 PM Jan 12, 2017
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Mkr1 5.694 88 GHz
-49.520 dBm
-27.00 dBm
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.715 GHz
Sweep 8.000 ms (30000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

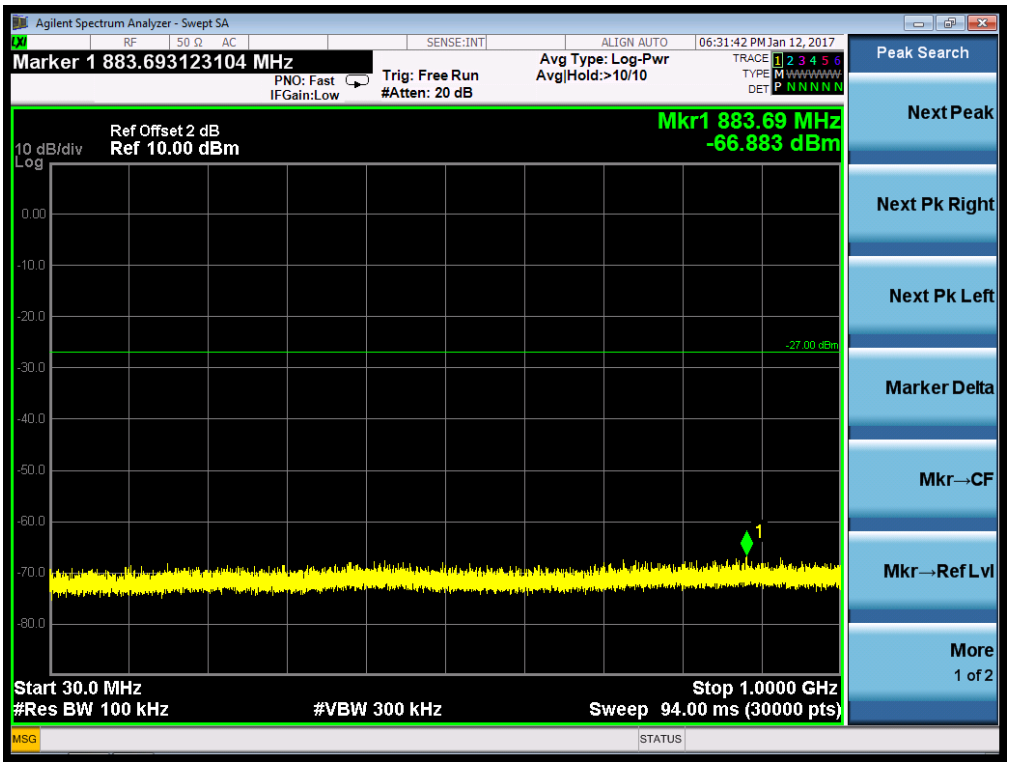

Agilent Spectrum Analyzer - Swept SA
Marker 1 5.723133937798 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>10/10
06:27:36 PM Jan 12, 2017
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Mkr1 5.723 133 9 GHz
-44.765 dBm
-17.00 dBm
Start 5.715000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.725000 GHz
Sweep 2.000 ms (30000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

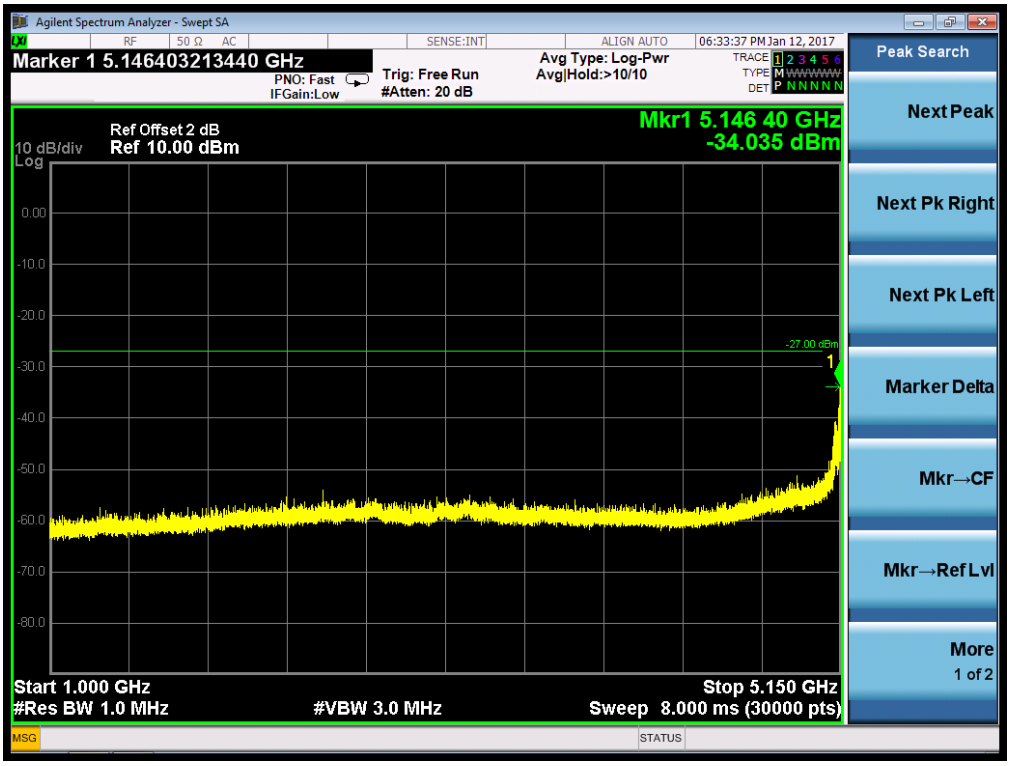

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
06:27:55 PM Jan 12, 2017
Marker 1 5.850550351678 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Ref Offset 2 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 5.850 550 4 GHz
-41.145 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-17.00 dBm
1
Start 5.850000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.860000 GHz
Sweep 2.000 ms (30000 pts)
MSG
STATUS
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

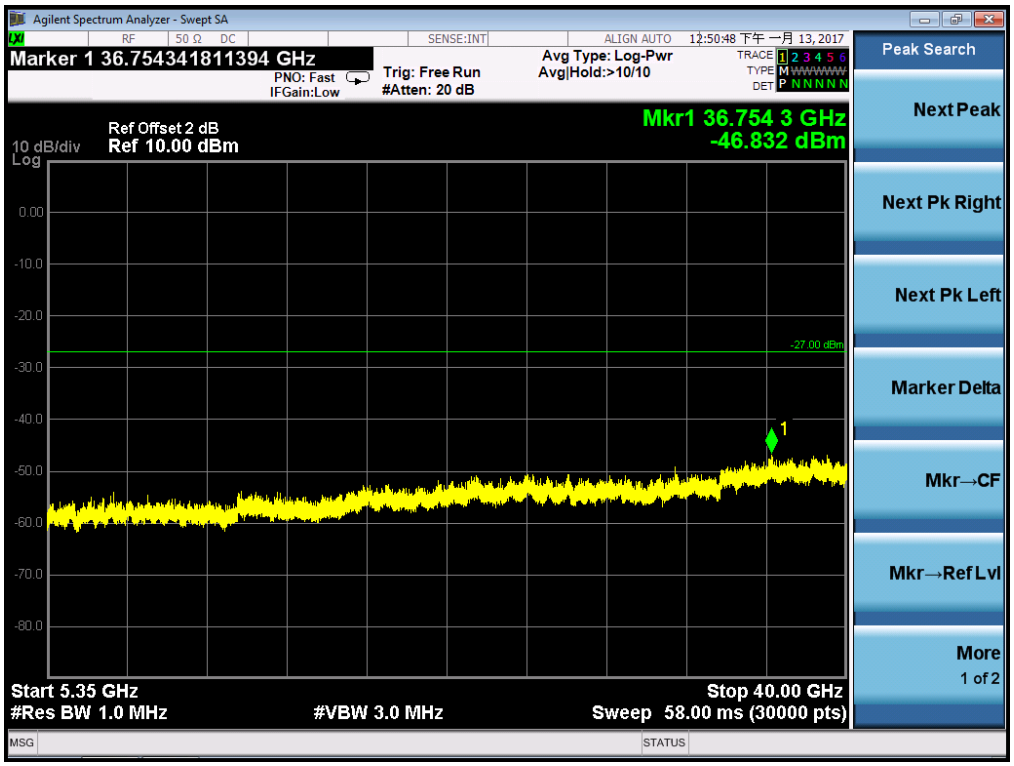

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
12:53:32 下午 一月 13, 2017
Marker 1 38.591109036968 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Ref Offset 2 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 38.591 1 GHz
-46.565 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-27.00 dBm
1
Start 5.86 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 40.00 GHz
Sweep 58.00 ms (30000 pts)
MSG
STATUS
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

**FOR 802.11AC80 MODULATION**

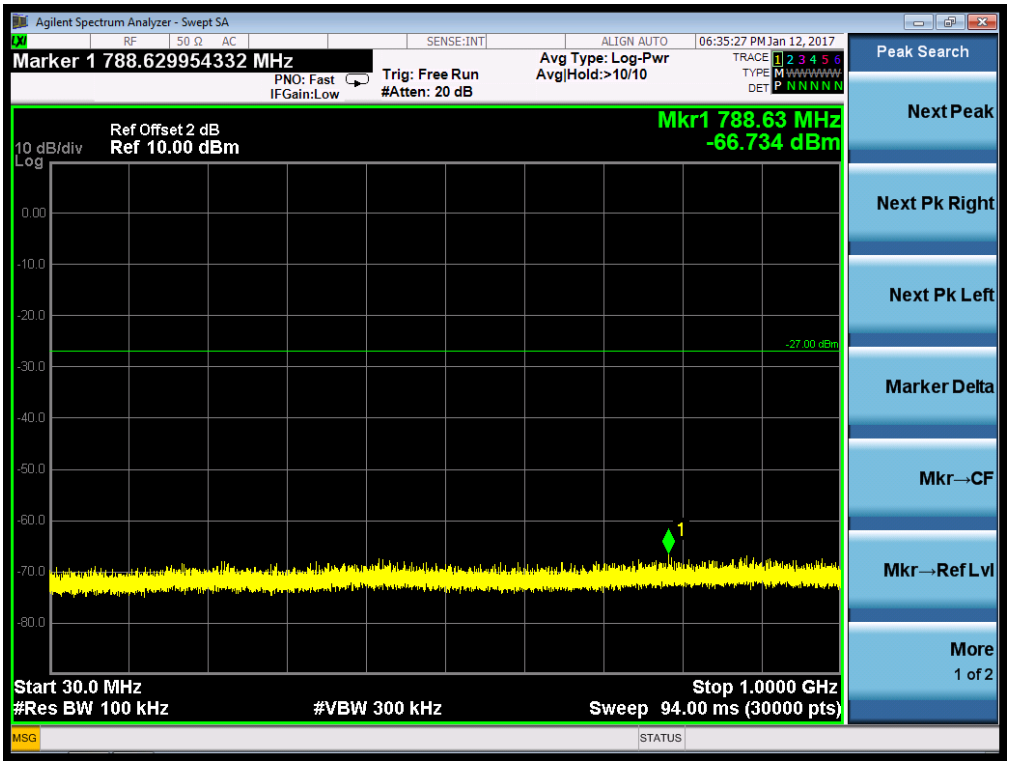
TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5210MHz

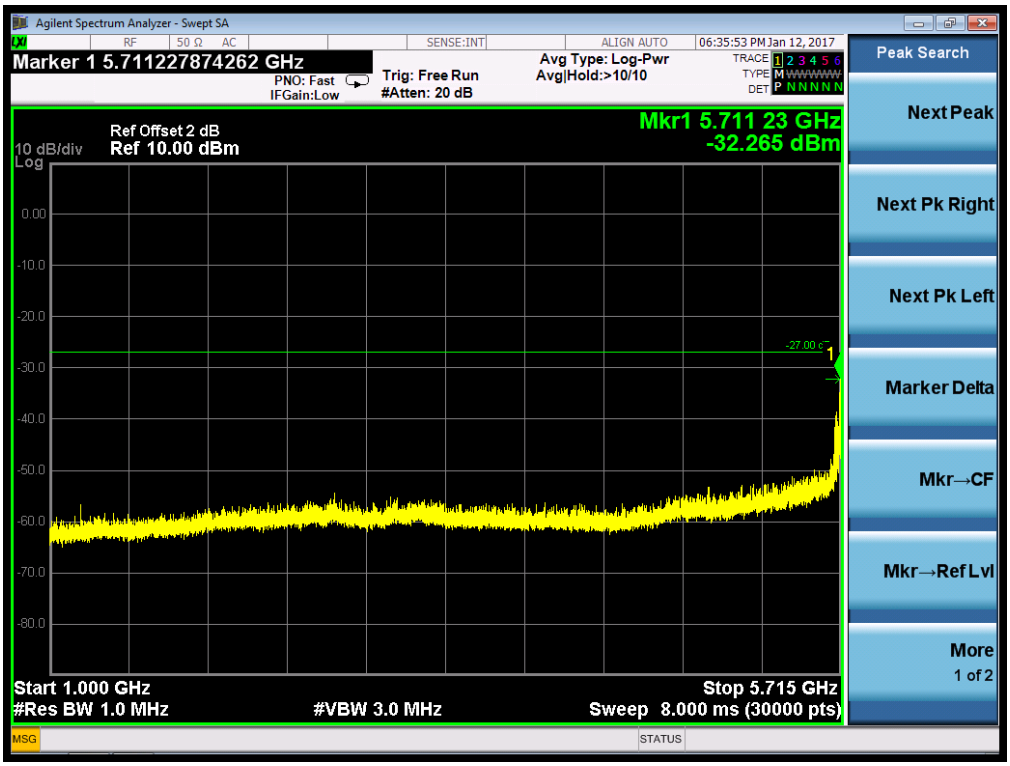


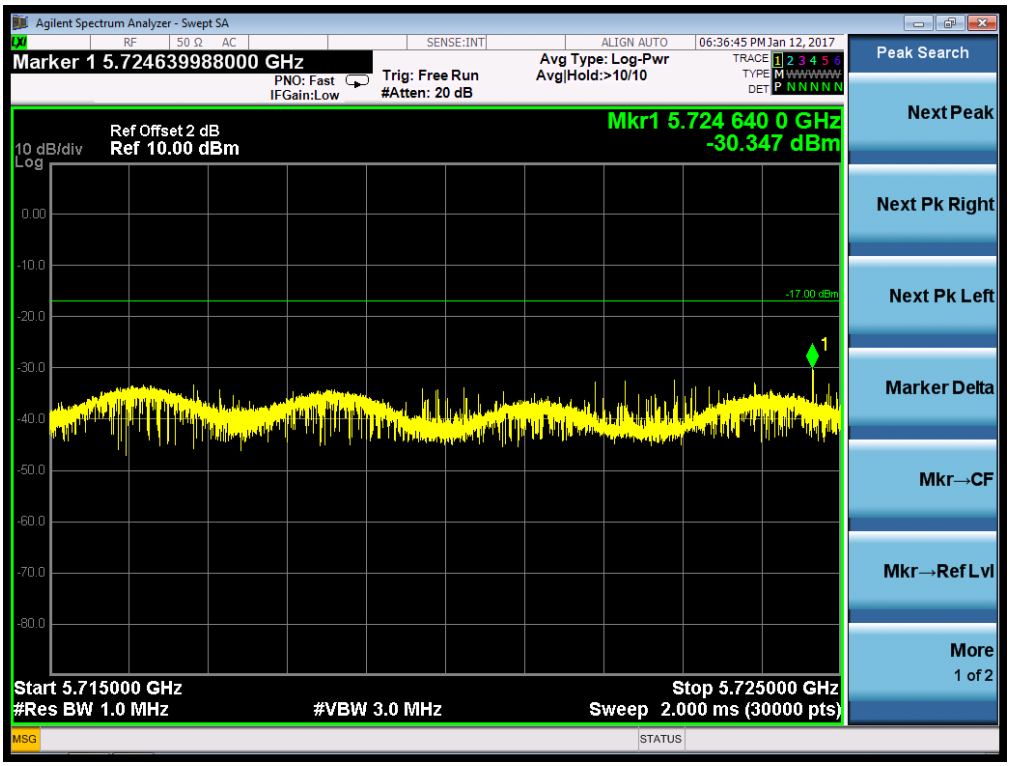



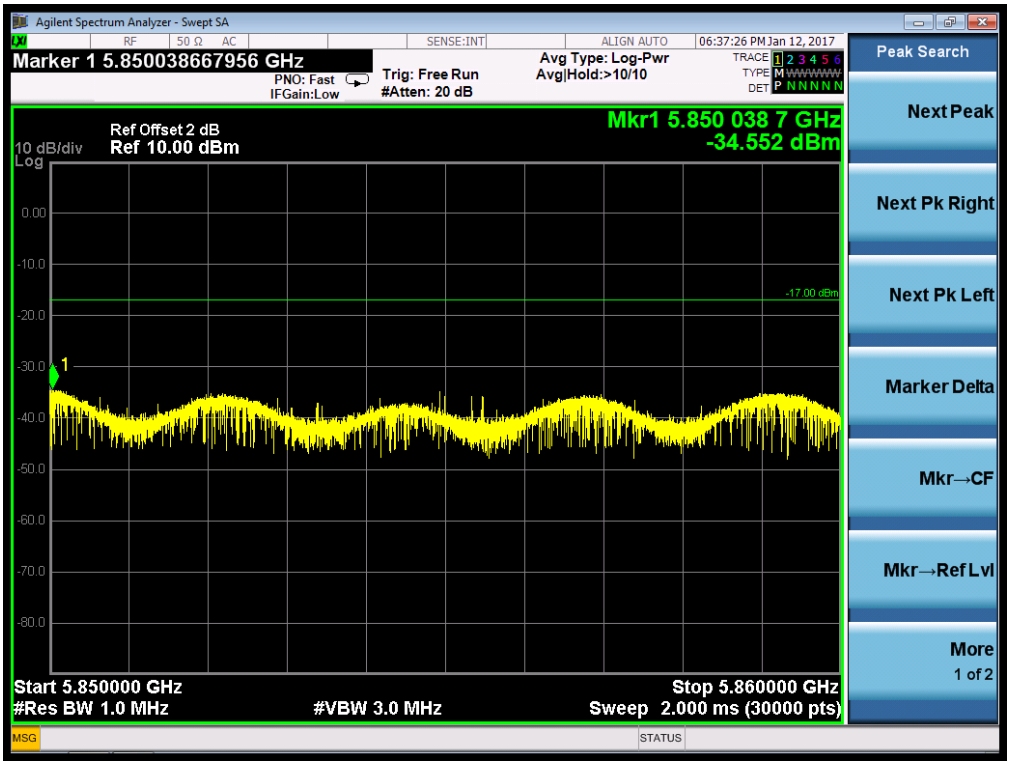


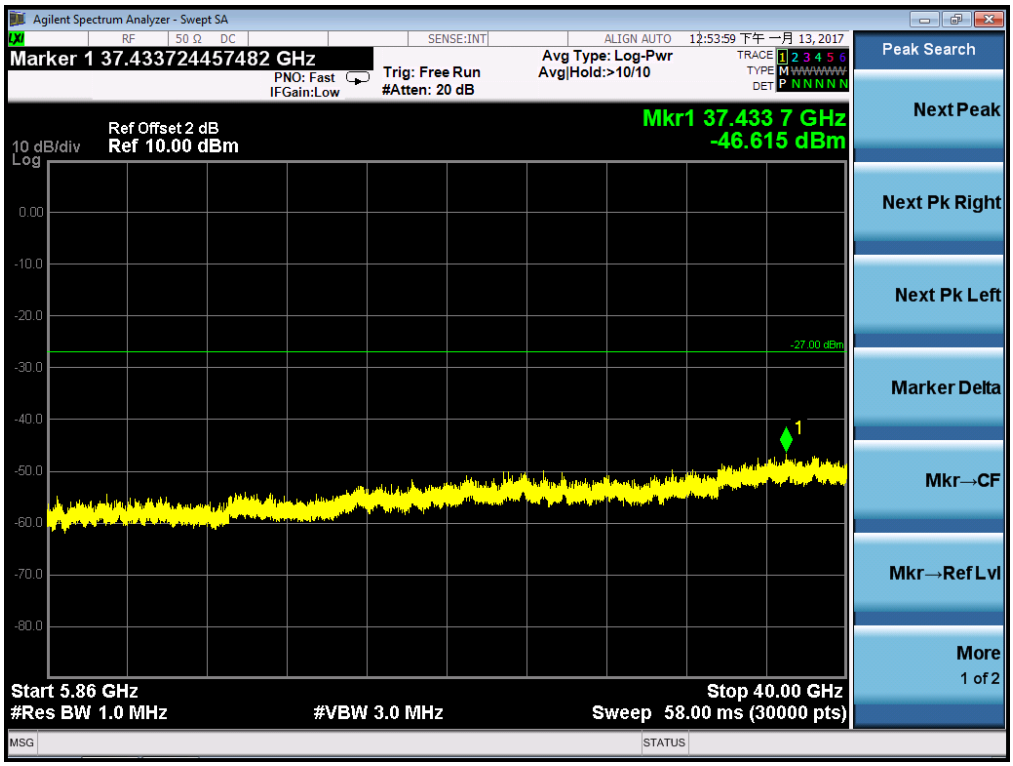

TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5775MHz




Agilent Spectrum Analyzer - Swept SA
Marker 1 5.711227874262 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>10/10
06:35:53 PM Jan 12, 2017
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Mkr1 5.711 23 GHz
-32.265 dBm
-27.00 dBm
Start 1.000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.715 GHz
Sweep 8.000 ms (30000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Agilent Spectrum Analyzer - Swept SA
Marker 1 5.724639988000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>10/10
06:36:45 PM Jan 12, 2017
Ref Offset 2 dB
10 dB/div
Ref 10.00 dBm
Mkr1 5.724 640 0 GHz
-30.347 dBm
-17.00 dBm
Start 5.715000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.725000 GHz
Sweep 2.000 ms (30000 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
06:37:26 PM Jan 12, 2017
Marker 1 5.850038667956 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Ref Offset 2 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 5.850 038 7 GHz
-34.552 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-17.00 dBm
1
Start 5.850000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 5.860000 GHz
Sweep 2.000 ms (30000 pts)
MSG
STATUS
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Agilent Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
12:53:59 下午 一月 13, 2017
Marker 1 37.433724457482 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>10/10
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Ref Offset 2 dB
10 dB/div
Log
Ref 10.00 dBm
Mkr1 37.433 7 GHz
-46.615 dBm
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-27.00 dBm
1
Start 5.86 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 40.00 GHz
Sweep 58.00 ms (30000 pts)
MSG
STATUS
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

Note: All the 20MHz bandwidth modulation had been tested, the 802.11a20 was the worst case and record in his test report. All the 40MHz bandwidth modulation had been tested, the 802.11N40 was the worst case and record in his test report.

Two transmit chains had been tested, the chain 0 was the worst case and record in the test report.

## 11. RADIATED EMISSION

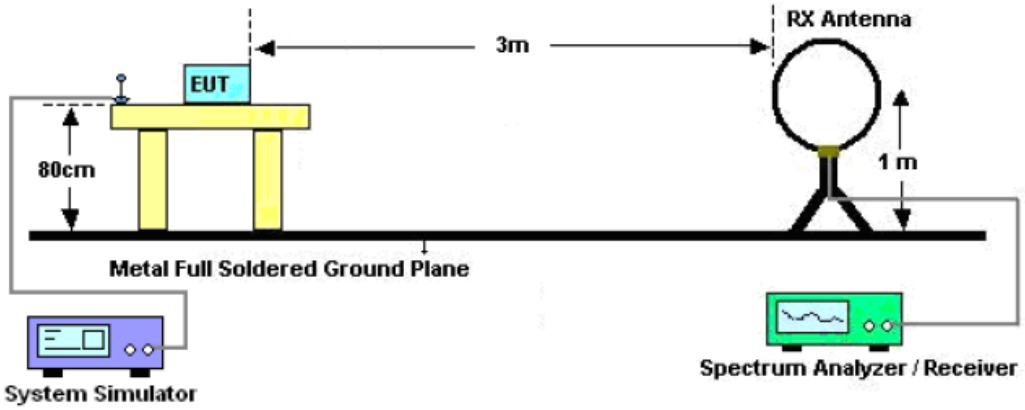
### 11.1. MEASUREMENT PROCEDURE

1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

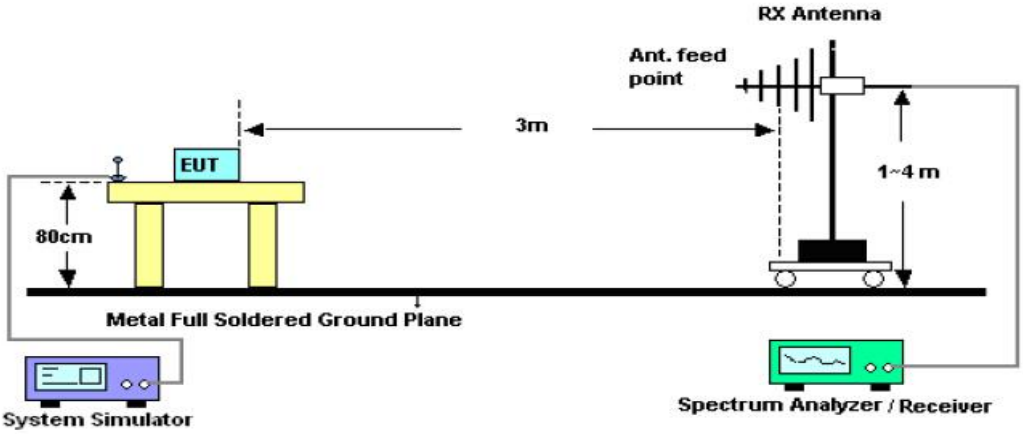
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

**11.2. TEST SETUP**

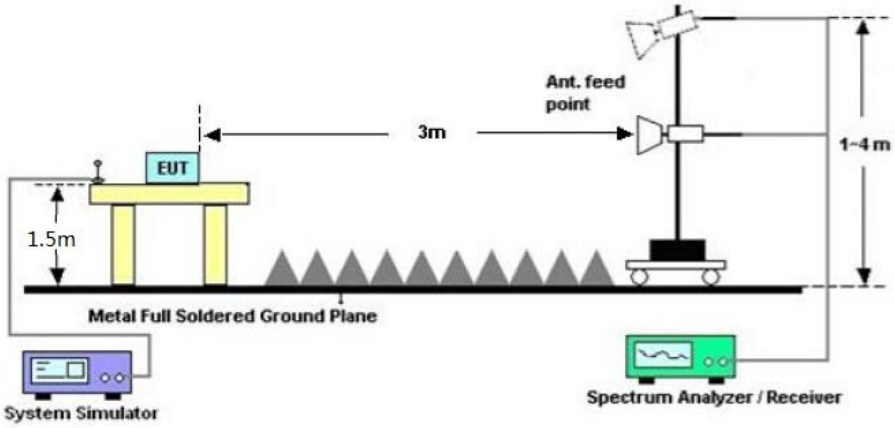
Radiated Emission Test-Setup Frequency Below 30MHz




RADIATED EMISSION TEST SETUP 30MHz-1000MHz




RADIATED EMISSION TEST SETUP ABOVE 1000MHz


Ant. feed
point
3m
1~4 m
EUT
1.5m
Metal Full Soldered Ground Plane
System Simulator
Spectrum Analyzer / Receiver

## 11.3. LIMITS AND MEASUREMENT RESULT

15.209(a) Limit in the below table has to be followed

| Frequencies (MHz) | Field Strength (micorvolts/meter) | Measurement Distance (meters) |
|---|---|---|
| 0.009~0.490 | 2400/F(KHz) | 300 |
| 0.490~1.705 | 24000/F(KHz) | 30 |
| 1.705~30.0 | 30 | 30 |
| 30~88 | 100 | 3 |
| 88~216 | 150 | 3 |
| 216~960 | 200 | 3 |
| Above 960 | 500 | 3 |

Note: All modes were tested For restricted band radiated emission,
the test records reported below are the worst result compared to other modes.

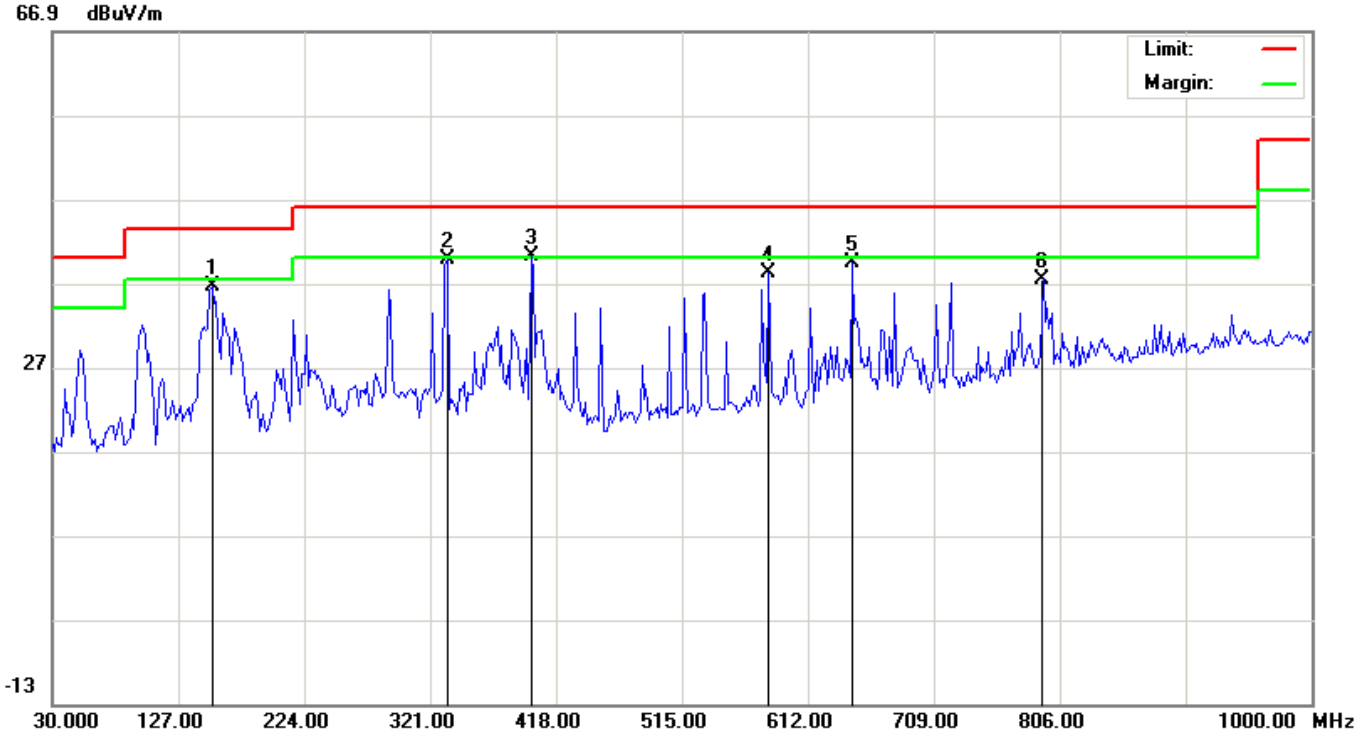
## 11.4. TEST RESULT

**RADIATED EMISSION BELOW 30MHZ**

No emission found between lowest internal used/generated frequencies to 30MHz.

## RADIATED EMISSION BELOW 1GHZ

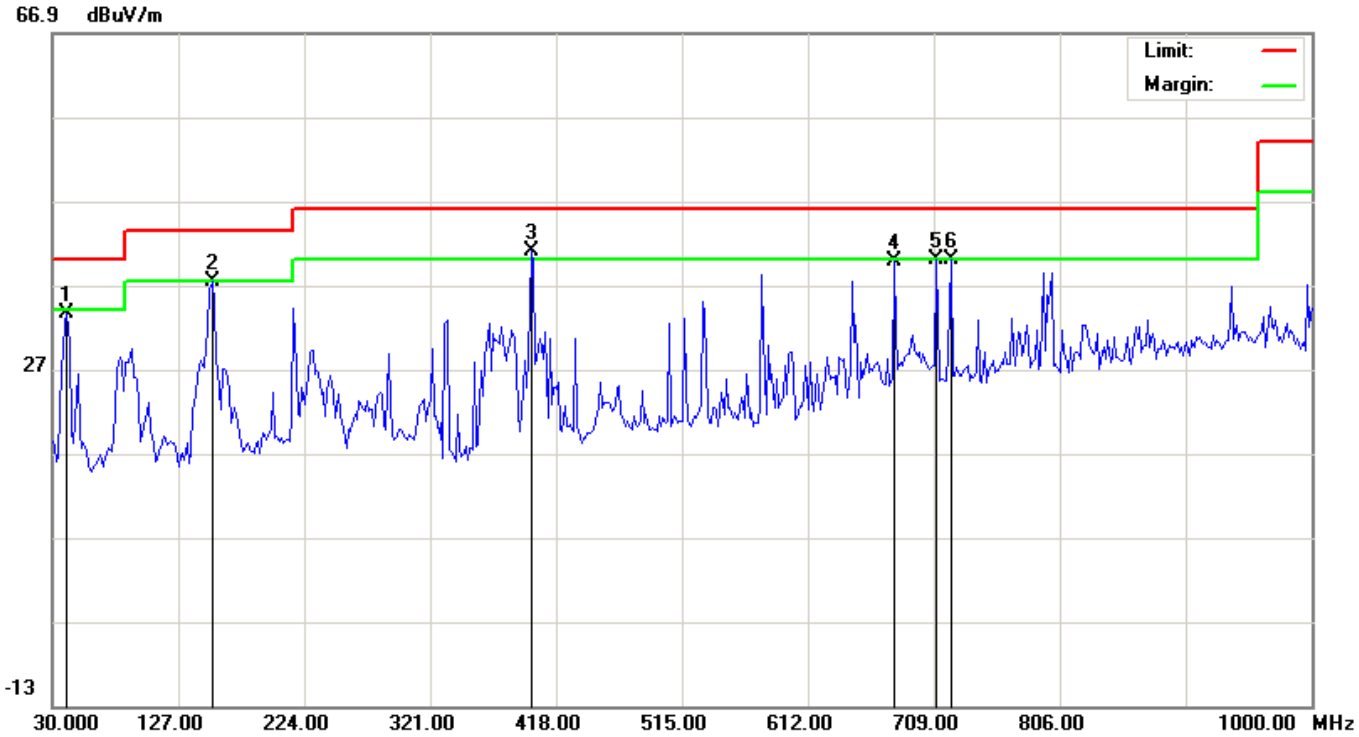
| EUT | Wireless USB Adapter | Model Name | M-1200M |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11a20 5180MHz | Antenna | Horizontal |




| No. | Mk | Freq. | Reading | Factor | Measurement | Limit | Over | Detector | Antenna Height | Table Degree | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | cm | degree | |
| 1 | | 152.8667 | 24.47 | 12.07 | 36.54 | 43.50 | -6.96 | peak | | | |
| 2 | | 333.9333 | 22.08 | 17.67 | 39.75 | 46.00 | -6.25 | peak | | | |
| 3 | * | 398.6000 | 21.06 | 19.06 | 40.12 | 46.00 | -5.88 | peak | | | |
| 4 | | 581.2833 | 14.99 | 23.26 | 38.25 | 46.00 | -7.75 | peak | | | |
| 5 | | 645.9500 | 15.51 | 23.84 | 39.35 | 46.00 | -6.65 | peak | | | |
| 6 | | 793.0666 | 10.28 | 27.22 | 37.50 | 46.00 | -8.50 | peak | | | |

**RESULT: PASS**

| EUT | Wireless USB Adapter | Model Name | M-1200M |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11a20 5180MHz | Antenna | Vertical |




| No. | Mk | Freq. | Reading | Factor | Measurement | Limit | Over | Detector | Antenna Height | Table Degree | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | cm | degree | |
| 1 | | 41.3167 | 24.78 | 8.81 | 33.59 | 40.00 | -6.41 | peak | | | |
| 2 | | 152.8667 | 22.16 | 15.28 | 37.44 | 43.50 | -6.06 | peak | | | |
| 3 | * | 398.6000 | 22.01 | 19.06 | 41.07 | 46.00 | -4.93 | peak | | | |
| 4 | | 678.2833 | 15.11 | 24.61 | 39.72 | 46.00 | -6.28 | peak | | | |
| 5 | | 710.6167 | 14.46 | 25.50 | 39.96 | 46.00 | -6.04 | peak | | | |
| 6 | | 721.9333 | 14.18 | 25.82 | 40.00 | 46.00 | -6.00 | peak | | | |

**RESULT: PASS**

**Note:** All test channels had been tested. The 802.11a20 at 5180MHz is the worst case and recorded in the test report.

Factor = Antenna Factor + Cable loss - Amplifier gain, Margin= Limit-Level.

The “Factor” value can be calculated automatically by software of measurement system.

## RADIATED EMISSION ABOVE 1GHZ

| | | | |
|---|---|---|---|
| **EUT** | Wireless USB Adapter | **Model Name** | M-1200M |
| **Temperature** | 25°C | **Relative Humidity** | 55.4% |
| **Pressure** | 960hPa | **Test Voltage** | Normal Voltage |
| **Test Mode** | 802.11a20 5180MHz | **Antenna** | Horizontal/Vertical |

RADIATED EMISSION ABOVE 1GHZ–Horizontal

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Value Type |
|---|---|---|---|---|---|---|
| 10360.120 | 43.51 | 9.14 | 52.65 | 74 | -21.35 | peak |
| 10360.120 | 35.34 | 9.14 | 44.48 | 54 | -9.52 | AVG |
| 15540.180 | 40.86 | 10.22 | 51.08 | 74 | -22.92 | peak |
| 15540.180 | 34.54 | 10.22 | 44.76 | 54 | -9.24 | AVG |
| Remark: | | | | | | |
| Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

RADIATED EMISSION ABOVE 1GHZ–Vertical

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Value Type |
|---|---|---|---|---|---|---|
| 10360.120 | 41.53 | 9.14 | 50.67 | 74 | -23.33 | peak |
| 10360.120 | 35.49 | 9.14 | 44.63 | 54 | -9.37 | AVG |
| 15540.180 | 39.14 | 10.22 | 49.36 | 74 | -24.64 | peak |
| 15540.180 | 35.62 | 10.22 | 45.84 | 54 | -8.16 | AVG |
| Remark: | | | | | | |
| Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

| **EUT** | Wireless USB Adapter | **Model Name** | M-1200M |
|---|---|---|---|
| **Temperature** | 25°C | **Relative Humidity** | 55.4% |
| **Pressure** | 960hPa | **Test Voltage** | Normal Voltage |
| **Test Mode** | 802.11a20 5240MHz | **Antenna** | Horizontal/Vertical |

RADIATED EMISSION ABOVE 1GHZ–Horizontal

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Value Type |
|---|---|---|---|---|---|---|
| 10480.120 | 43.42 | 9.27 | 52.69 | 74 | -21.31 | peak |
| 10480.120 | 35.25 | 9.27 | 44.52 | 54 | -9.48 | AVG |
| 15720.180 | 39.35 | 10.38 | 49.73 | 74 | -24.27 | peak |
| 15720.180 | 34.68 | 10.38 | 45.06 | 54 | -8.94 | AVG |
| Remark: | | | | | | |
| Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

RADIATED EMISSION ABOVE 1GHZ–Vertical

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Value Type |
|---|---|---|---|---|---|---|
| 10480.120 | 42.15 | 9.27 | 51.42 | 74 | -22.58 | peak |
| 10480.120 | 36.26 | 9.27 | 45.53 | 54 | -8.47 | AVG |
| 15720.180 | 41.81 | 10.38 | 52.19 | 74 | -21.81 | peak |
| 15720.180 | 33.08 | 10.38 | 43.46 | 54 | -10.54 | AVG |
| Remark: | | | | | | |
| Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

| EUT | Wireless USB Adapter | Model Name | M-1200M |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11a20 5745MHz | Antenna | Horizontal/Vertical |

RADIATED EMISSION ABOVE 1GHZ–Horizontal

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Value Type |
|---|---|---|---|---|---|---|
| 11490.120 | 43.48 | 9.42 | 52.9 | 74 | -21.1 | peak |
| 11490.120 | 34.51 | 9.42 | 43.93 | 54 | -10.07 | AVG |
| 17235.180 | 41.63 | 10.51 | 52.14 | 74 | -21.86 | peak |
| 17235.180 | 35.41 | 10.51 | 45.92 | 54 | -8.08 | AVG |
| Remark: | | | | | | |
| Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

RADIATED EMISSION ABOVE 1GHZ–Vertical

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Value Type |
|---|---|---|---|---|---|---|
| 11490.120 | 41.35 | 9.42 | 50.77 | 74 | -23.23 | peak |
| 11490.120 | 34.85 | 9.42 | 44.27 | 54 | -9.73 | AVG |
| 17235.180 | 40.86 | 10.51 | 51.37 | 74 | -22.63 | peak |
| 17235.180 | 33.41 | 10.51 | 43.92 | 54 | -10.08 | AVG |
| Remark: | | | | | | |
| Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

| **EUT** | Wireless USB Adapter | **Model Name** | M-1200M |
|---|---|---|---|
| **Temperature** | 25°C | **Relative Humidity** | 55.4% |
| **Pressure** | 960hPa | **Test Voltage** | Normal Voltage |
| **Test Mode** | 802.11a20 5825MHz | **Antenna** | Horizontal/Vertical |

RADIATED EMISSION ABOVE 1GHZ–Horizontal

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Value Type |
|---|---|---|---|---|---|---|
| 11650.120 | 42.18 | 9.62 | 51.8 | 74 | -22.2 | peak |
| 11650.120 | 33.67 | 9.62 | 43.29 | 54 | -10.71 | AVG |
| 17475.180 | 39.31 | 10.75 | 50.06 | 74 | -23.94 | peak |
| 17475.180 | 32.16 | 10.75 | 42.91 | 54 | -11.09 | AVG |
| Remark: | | | | | | |
| Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

RADIATED EMISSION ABOVE 1GHZ–Vertical

| Frequency (MHz) | Meter Reading (dBμV) | Factor (dB) | Emission Level (dBμV/m) | Limits (dBμV/m) | Margin (dB) | Value Type |
|---|---|---|---|---|---|---|
| 11650.120 | 41.28 | 9.62 | 50.9 | 74 | -23.1 | peak |
| 11650.120 | 35.47 | 9.62 | 45.09 | 54 | -8.91 | AVG |
| 17475.180 | 40.68 | 10.75 | 51.43 | 74 | -22.57 | peak |
| 17475.180 | 32.47 | 10.75 | 43.22 | 54 | -10.78 | AVG |
| Remark: | | | | | | |
| Factor = Antenna Factor + Cable Loss – Pre-amplifier. | | | | | | |

**Note:** All the case had been tested. The 802.11a modulation is the worst case and recorded in the test report. Other frequencies radiation emission from 1GHz to 40GHz at least have 20dB margin and not recorded in the test report.

Factor = Antenna Factor + Cable loss - Amplifier gain, Margin= Limit-Level.

The “Factor” value can be calculated automatically by software of measurement system.

# 12. BAND EDGE EMISSION

## 12.1. MEASUREMENT PROCEDURE

1. The EUT operates at transmitting mode. The operate channel is tested to verify the largest transmission and spurious emissions power at the continuous transmission mode.

2. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission: (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

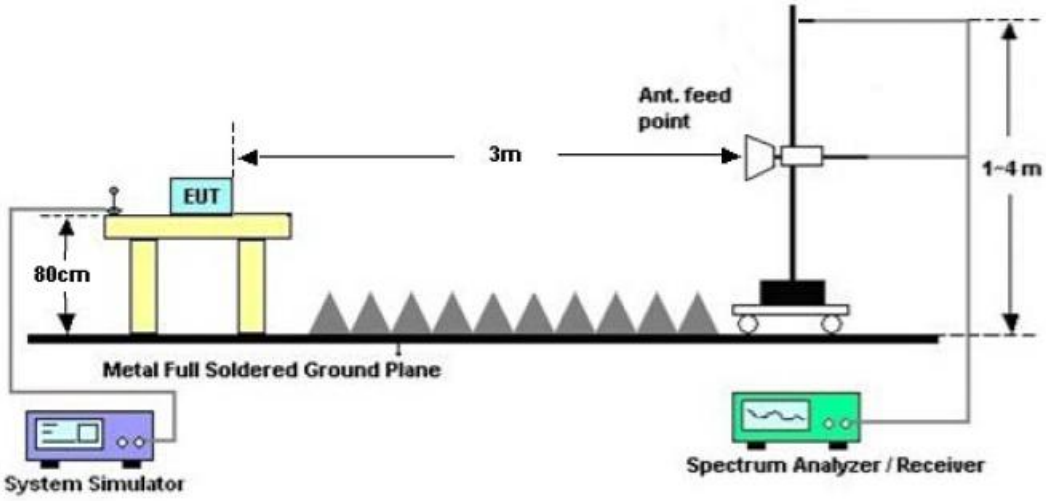
(b) AVERAGE: RBW=1MHz ; VBW=1/on time(1KHz) / Sweep=AUTO

3. Other procedures refer to clause 11.2.

**Note**:

1. Factor=Antenna Factor + Cable loss - Amplifier gain. Field Strength=Factor + Reading level
2. The factor had been edited in the “Input Correction” of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB(μV) to represent the Amplitude. Use the F dB(μV/m) to represent the Field Strength. So A=F.
3. Only the data of band edge emission at the restricted band 4.5GHz-5.15GHz record in the report. Other restricted band 5.35GHz-5.46GHz and 7.25GHz-7.77GHz were considered as ambient noise. No recording in the test report.

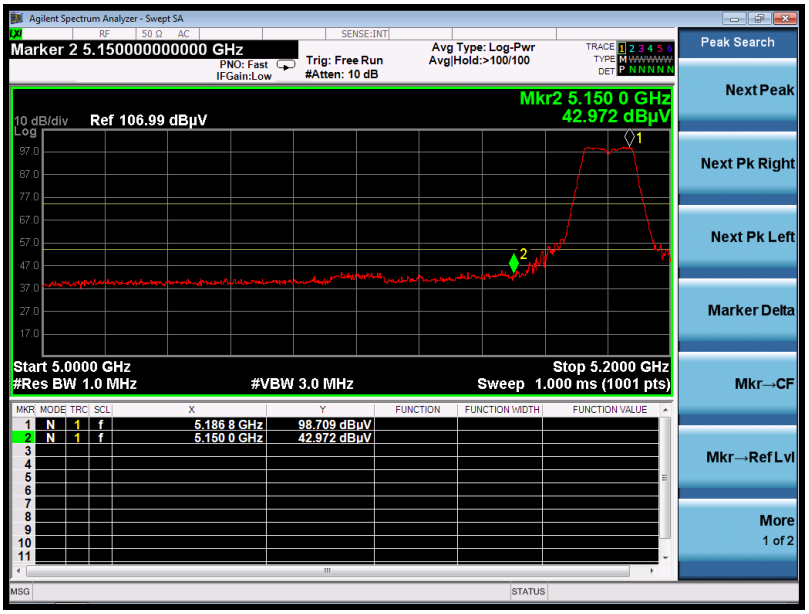
## 12.2. TEST SET-UP



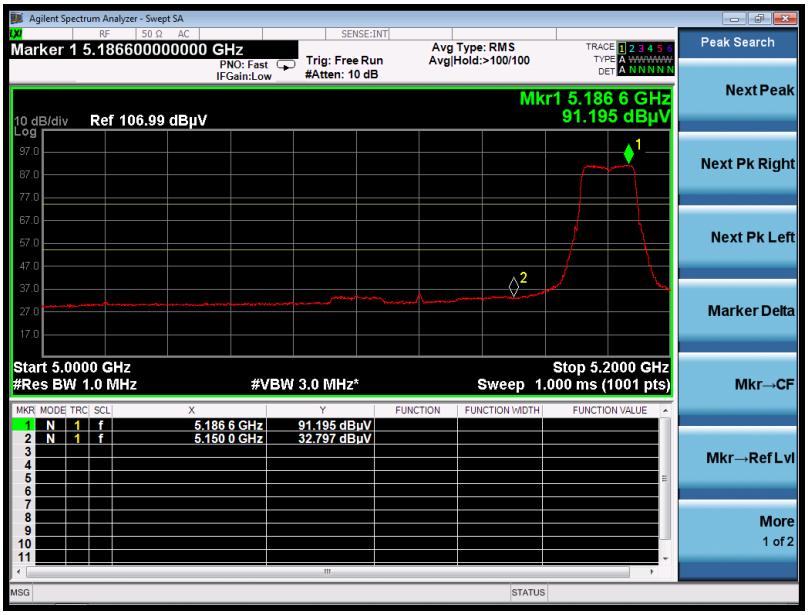
### 12.3. TEST RESULT

| EUT | Wireless USB Adapter | Model Name | M-1200M |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11a20 5180MHz | Antenna | Horizontal |

PK Value

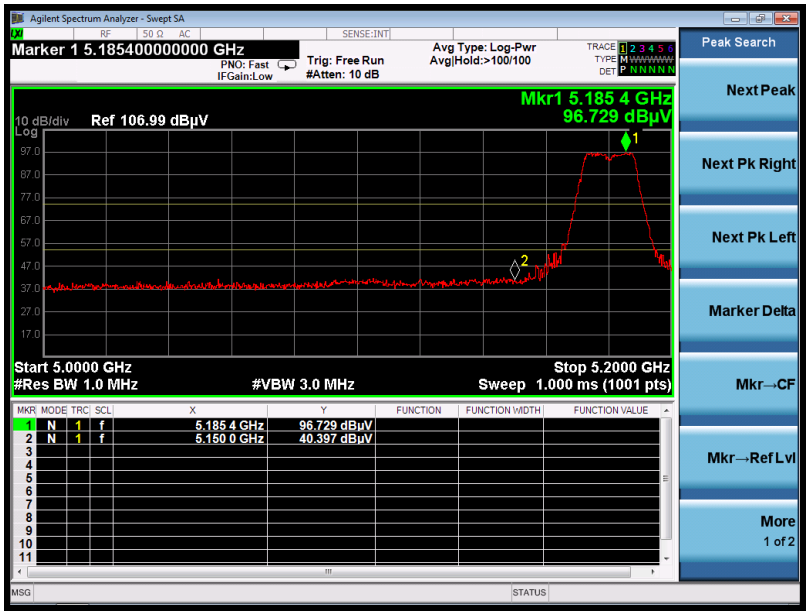



AV Value

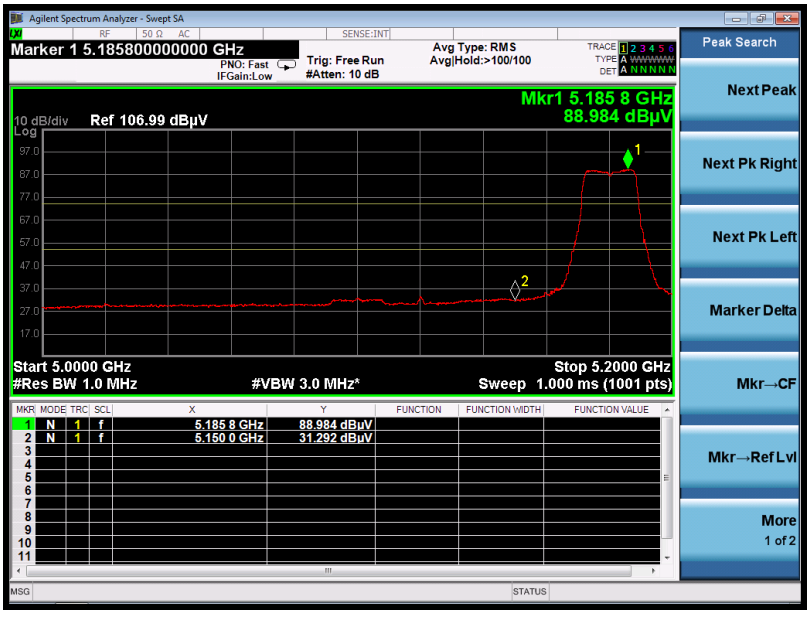


| EUT | Wireless USB Adapter | Model Name | M-1200M |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11a20 5180MHz | Antenna | Vertical |

PK Value

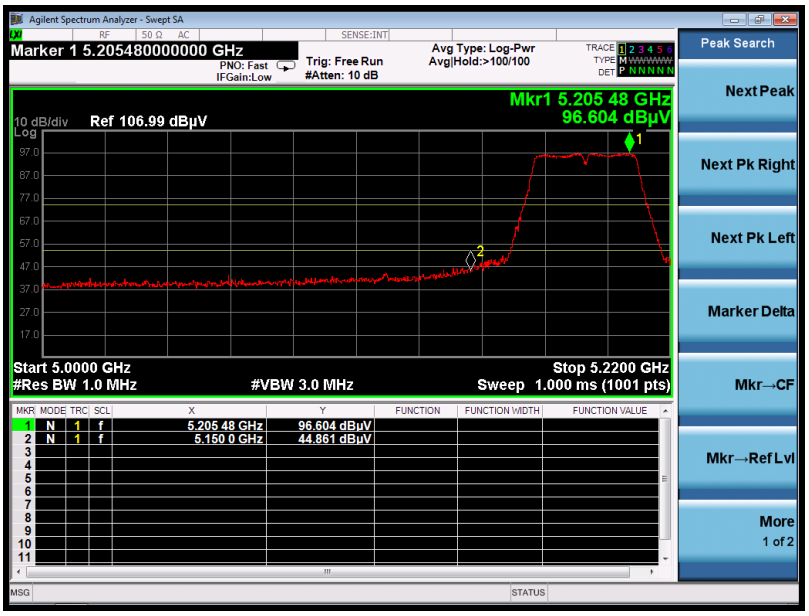



AV Value

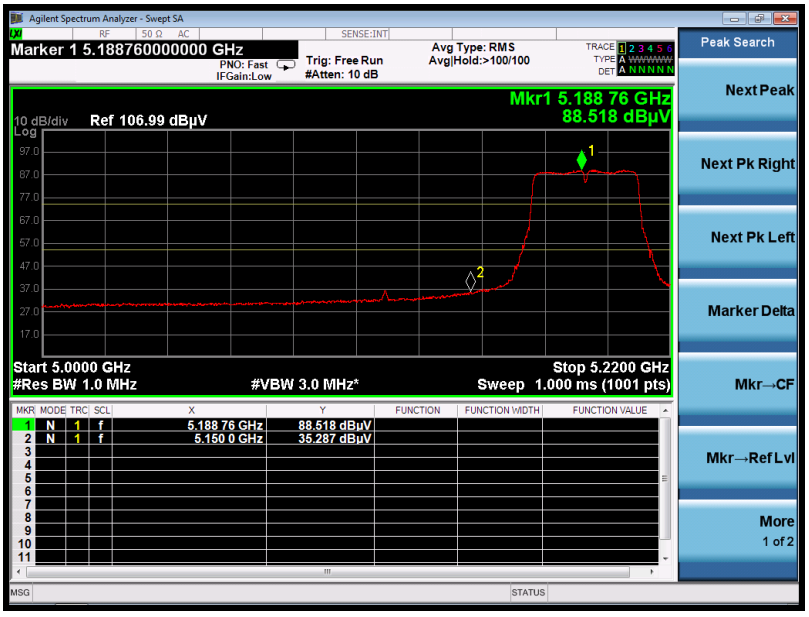


| EUT | Wireless USB Adapter | Model Name | M-1200M |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11n40 5190MHz | Antenna | Horizontal |

PK Value

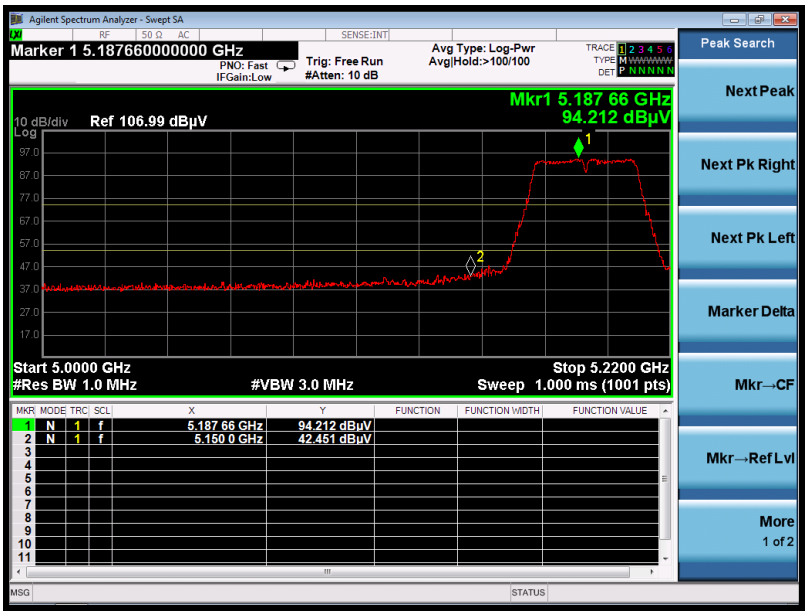



AV Value

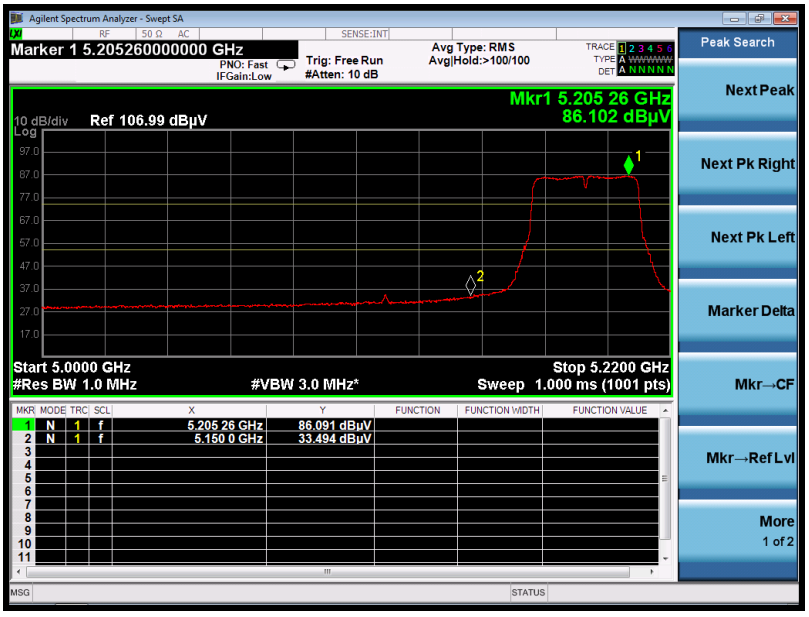


| EUT | Wireless USB Adapter | Model Name | M-1200M |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11n40 5190MHz | Antenna | Vertical |

PK Value

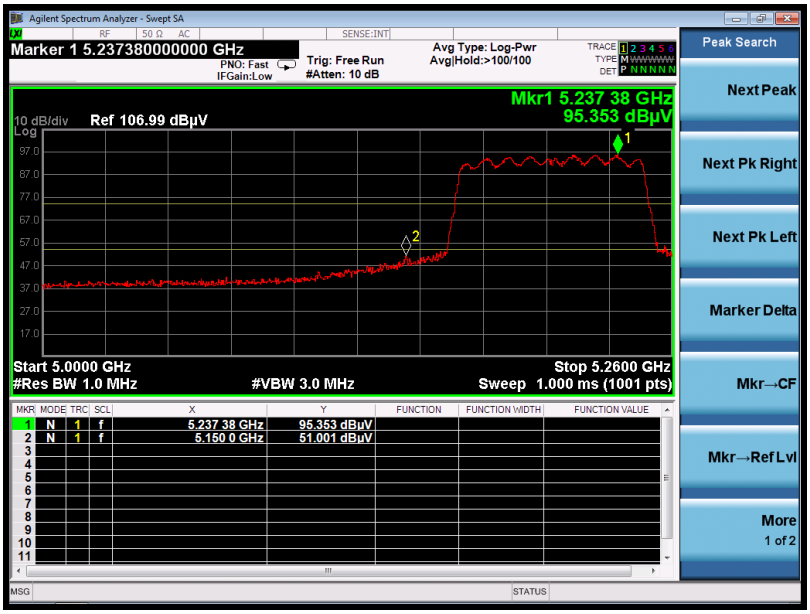



AV Value

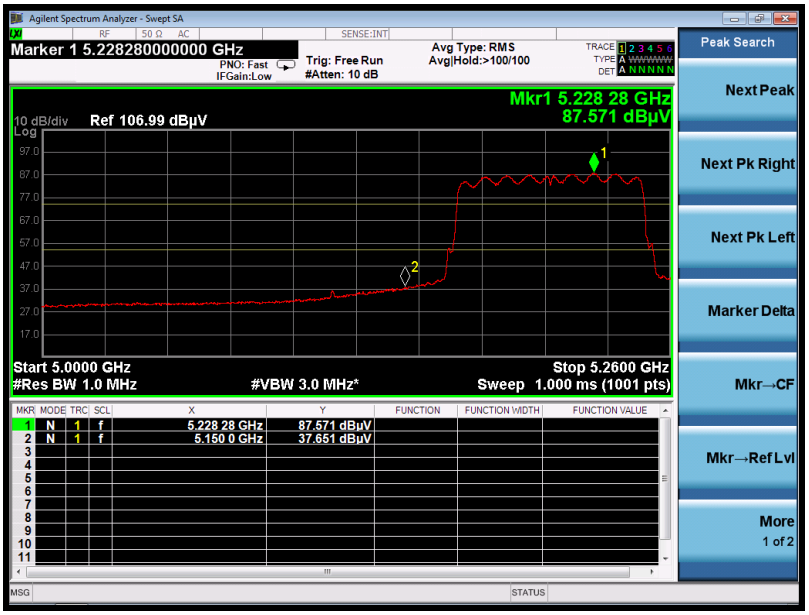


| EUT | Wireless USB Adapter | Model Name | M-1200M |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11ac80 5210MHz | Antenna | Horizontal |

PK Value

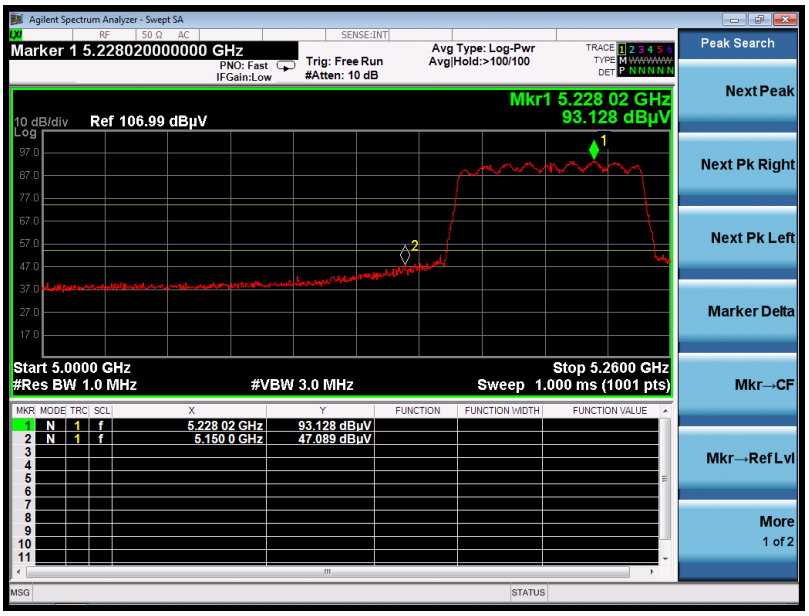



AV Value

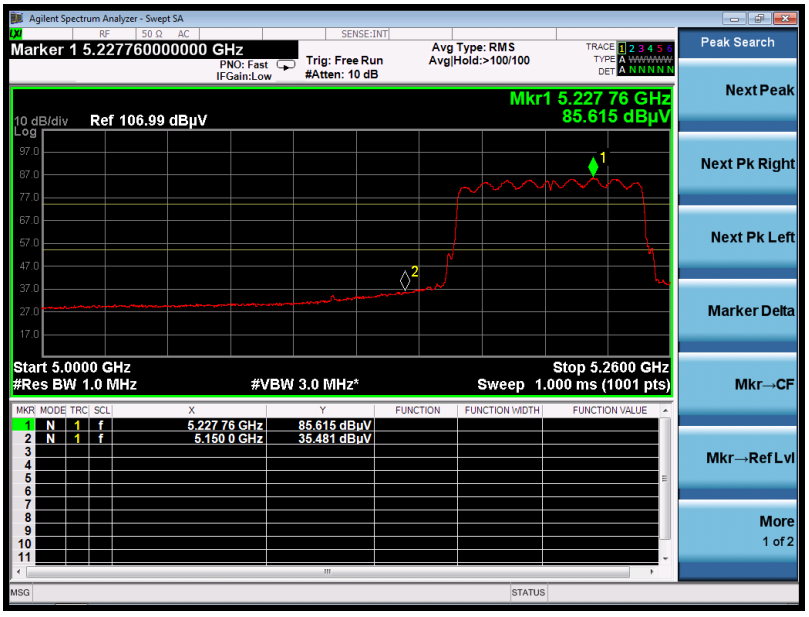


| EUT | Wireless USB Adapter | Model Name | M-1200M |
|---|---|---|---|
| Temperature | 25°C | Relative Humidity | 55.4% |
| Pressure | 960hPa | Test Voltage | Normal Voltage |
| Test Mode | 802.11ac80 5210MHz | Antenna | Vertical |

PK Value




AV Value




**RESULT: PASS**

Note: All the 20MHz bandwidth modulation had been tested, the 802.11a20 was the worst case and record in his test report. All the 40MHz bandwidth modulation had been tested, the 802.11N40 was the worst case and record in his test report.

# 13. FCC LINE CONDUCTED EMISSION TEST

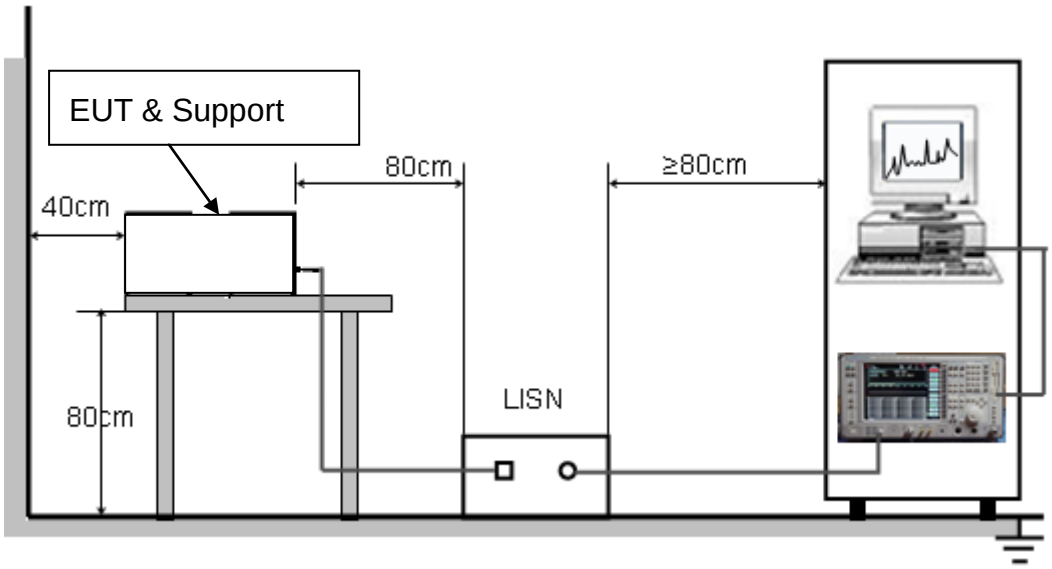
## 13.1. LIMITS OF LINE CONDUCTED EMISSION TEST

| Frequency | Maximum RF Line Voltage | |
|---|---|---|
| | Q.P.( dBuV) | Average( dBuV) |
| 150kHz~500kHz | 66-56 | 56-46 |
| 500kHz~5MHz | 56 | 46 |
| 5MHz~30MHz | 60 | 50 |

Note:

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50MHz.

## 13.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



### 13.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. All support equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received charging voltage by adapter which received 120V/60Hzpower by a LISN.
6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

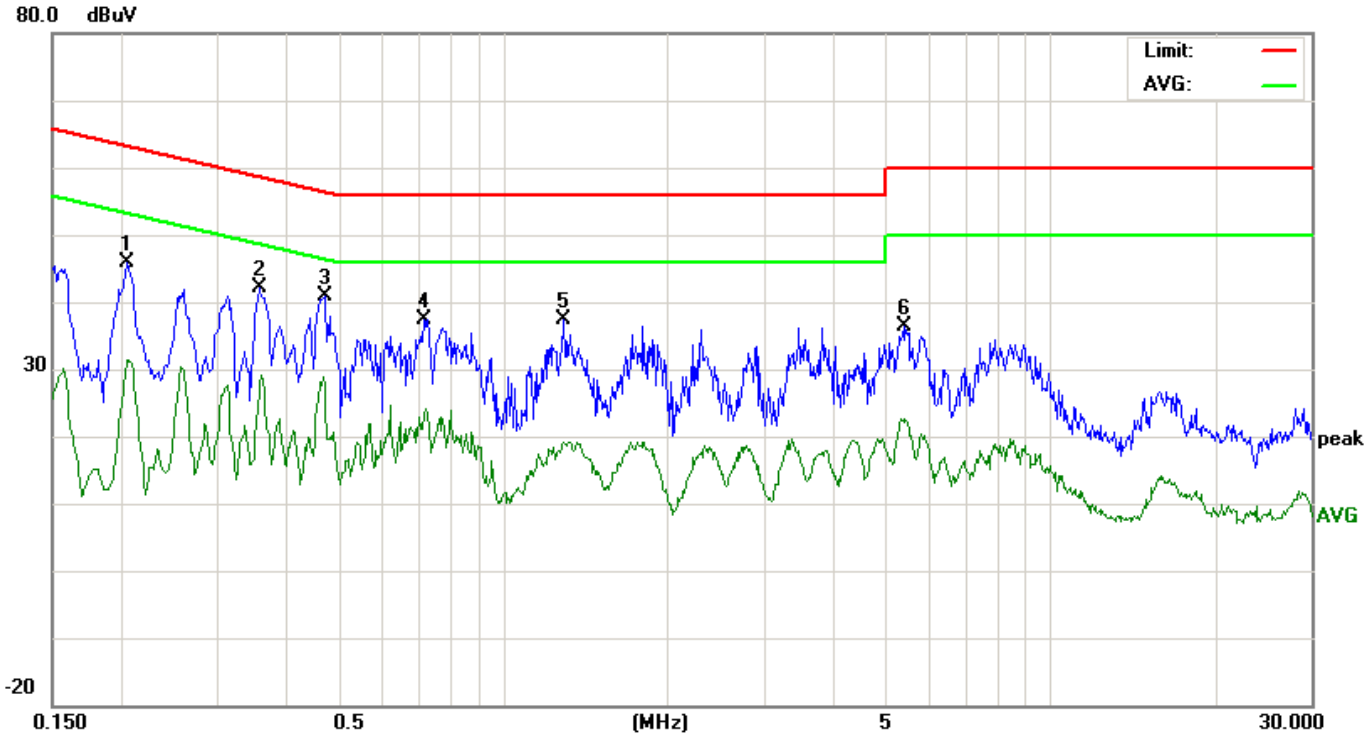
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

### 12.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.

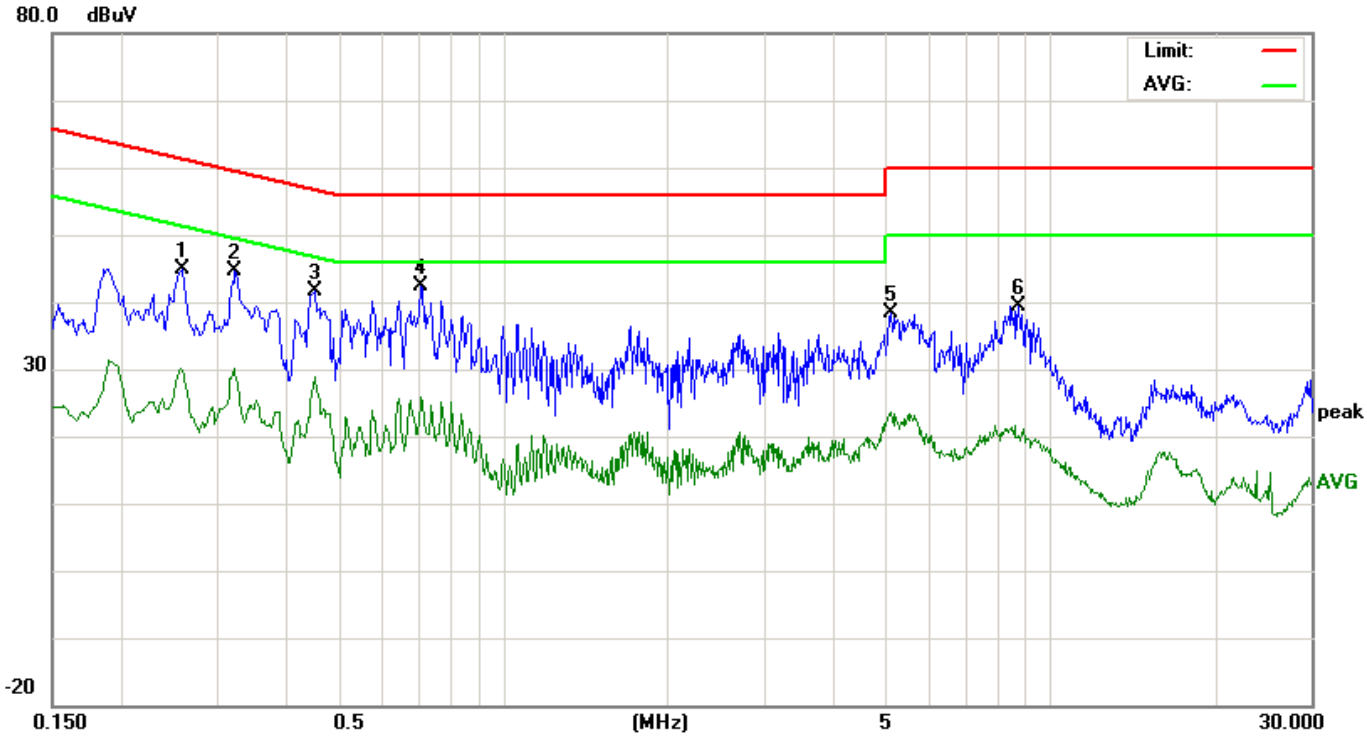
## 13.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

LINE CONDUCTED EMISSION TEST-L




| No. | Freq. (MHz) | Reading_Level (dBuV) | | | Correct Factor | Measurement (dBuV) | | | Limit (dBuV) | | Margin (dB) | | P/F | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Peak | QP | AVG | dB | Peak | QP | AVG | QP | AVG | QP | AVG | | |
| 1 | 0.2058 | 35.68 | | 21.09 | 10.22 | 45.90 | | 31.31 | 63.37 | 53.37 | -17.47 | -22.06 | P | |
| 2 | 0.3578 | 31.73 | | 16.20 | 10.31 | 42.04 | | 26.51 | 58.78 | 48.78 | -16.74 | -22.27 | P | |
| 3 | 0.4711 | 30.52 | | 17.17 | 10.38 | 40.90 | | 27.55 | 56.49 | 46.49 | -15.59 | -18.94 | P | |
| 4 | 0.7177 | 27.11 | | 12.75 | 10.34 | 37.45 | | 23.09 | 56.00 | 46.00 | -18.55 | -22.91 | P | |
| 5 | 1.2900 | 27.08 | | 8.68 | 10.38 | 37.46 | | 19.06 | 56.00 | 46.00 | -18.54 | -26.94 | P | |
| 6 | 5.4058 | 26.06 | | 12.35 | 10.25 | 36.31 | | 22.60 | 60.00 | 50.00 | -23.69 | -27.40 | P | |

LINE CONDUCTED EMISSION TEST-N



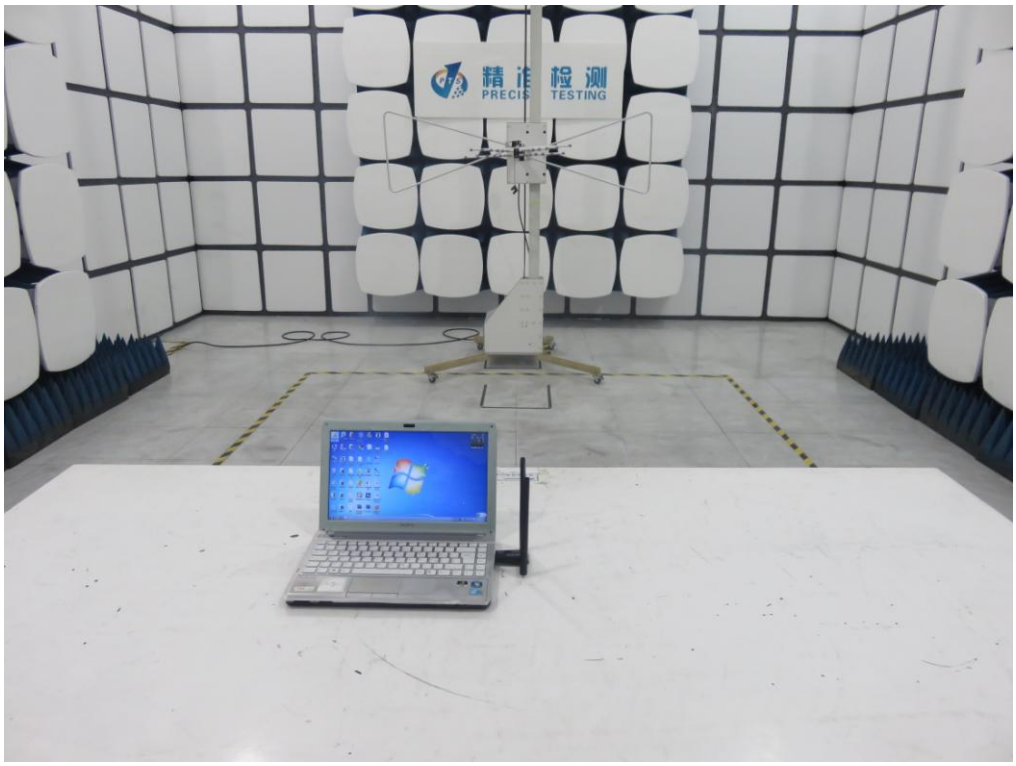

| No. | Freq. (MHz) | Reading_Level (dBuV) | | | Correct Factor | Measurement (dBuV) | | | Limit (dBuV) | | Margin (dB) | | P/F | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Peak | QP | AVG | dB | Peak | QP | AVG | QP | AVG | QP | AVG | | |
| 1 | 0.2589 | 34.68 | | 19.50 | 10.27 | 44.95 | | 29.77 | 61.46 | 51.46 | -16.51 | -21.69 | P | |
| 2 | 0.3234 | 34.36 | | 19.26 | 10.30 | 44.66 | | 29.56 | 59.62 | 49.62 | -14.96 | -20.06 | P | |
| 3 | 0.4515 | 31.33 | | 17.99 | 10.37 | 41.70 | | 28.36 | 56.85 | 46.85 | -15.15 | -18.49 | P | |
| 4 | 0.7100 | 32.00 | | 15.50 | 10.34 | 42.34 | | 25.84 | 56.00 | 46.00 | -13.66 | -20.16 | P | |
| 5 | 5.1299 | 28.24 | | 13.34 | 10.24 | 38.48 | | 23.58 | 60.00 | 50.00 | -21.52 | -26.42 | P | |
| 6 | 8.7499 | 29.15 | | 9.90 | 10.27 | 39.42 | | 20.17 | 60.00 | 50.00 | -20.58 | -29.83 | P | |

**RESULT: PASS**

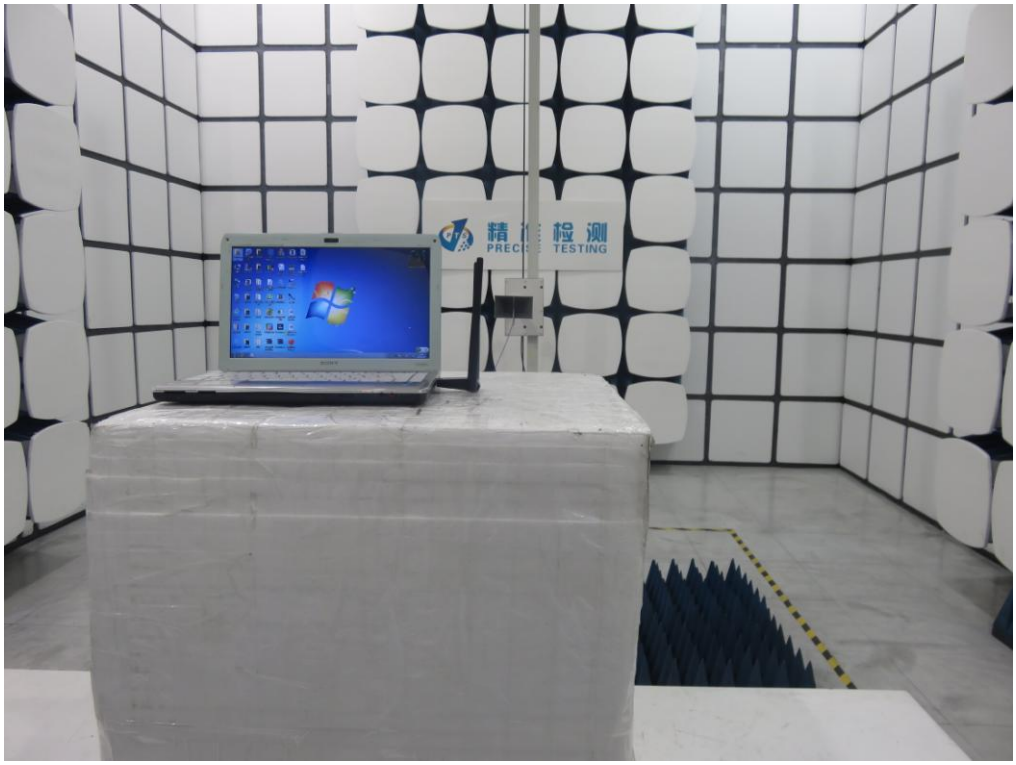
# APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC LINE CONDUCTED EMISSION TEST SETUP

FCC RADIATED EMISSION TEST SETUP BELOW 1GHZ



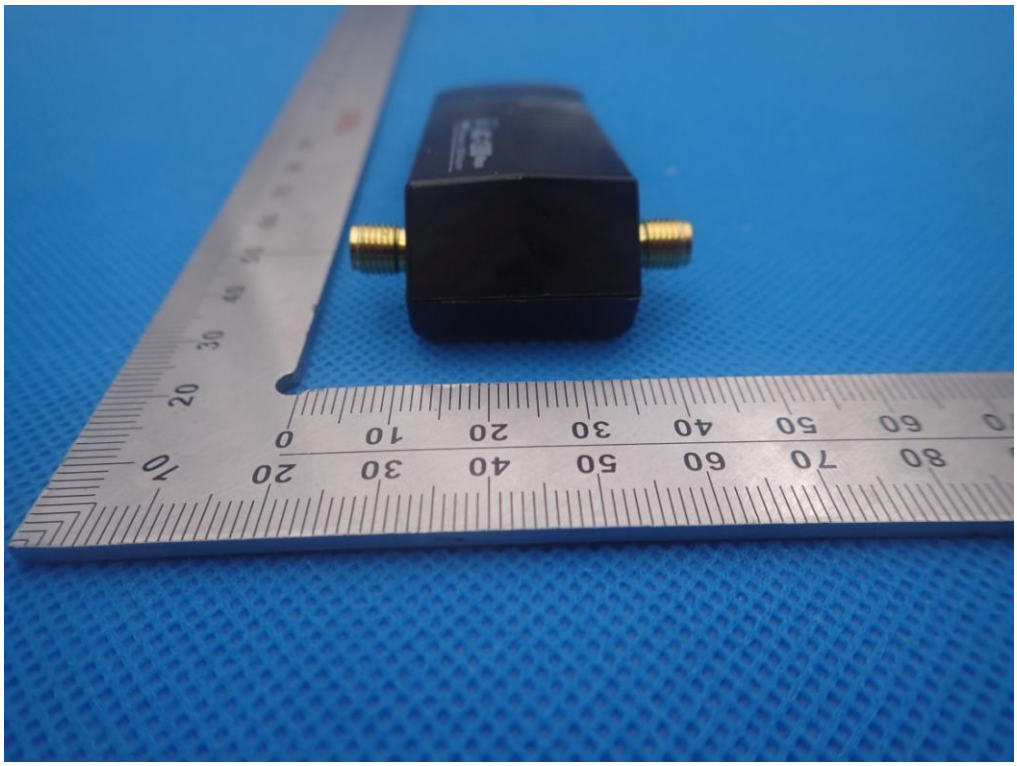
FCC RADIATED EMISSION TEST SETUP ABOVE 1GHZ



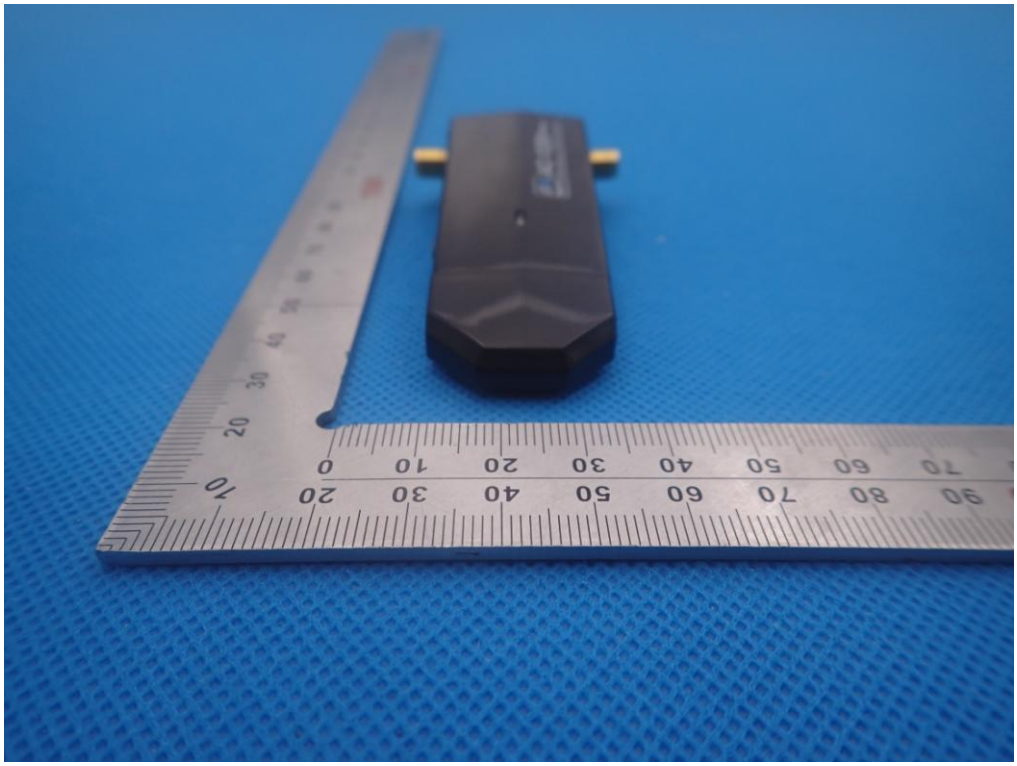
# APPENDIX B: PHOTOGRAPHS OF EUT

ALL VIEW OF EUT

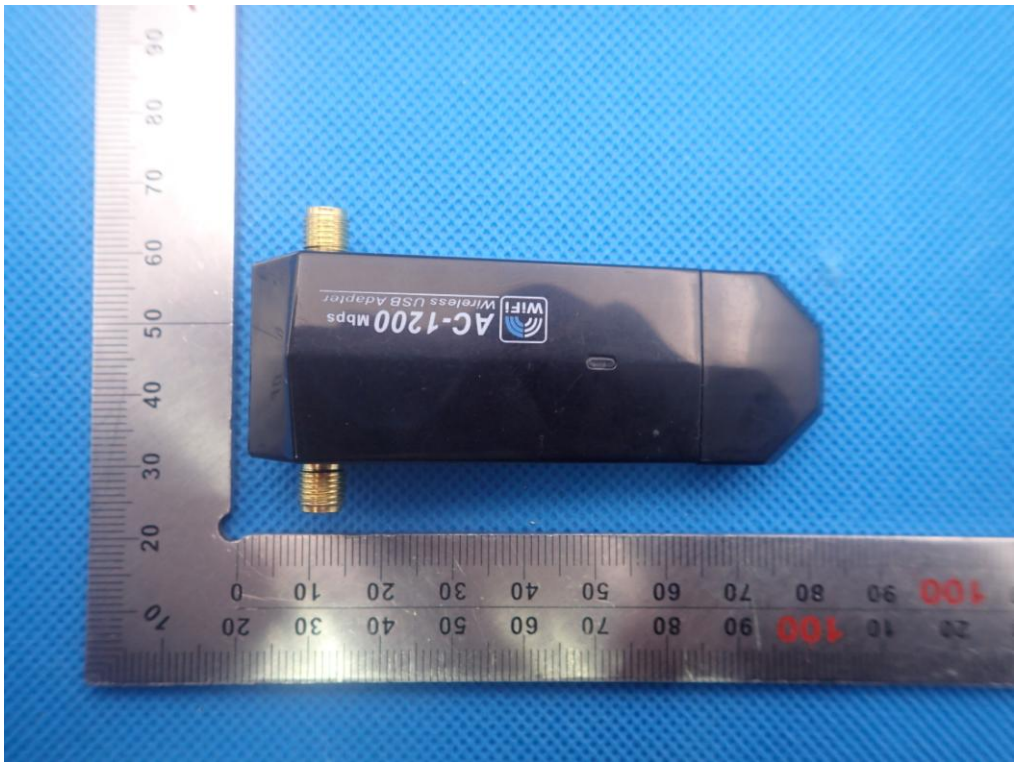
TOP VIEW OF EUT



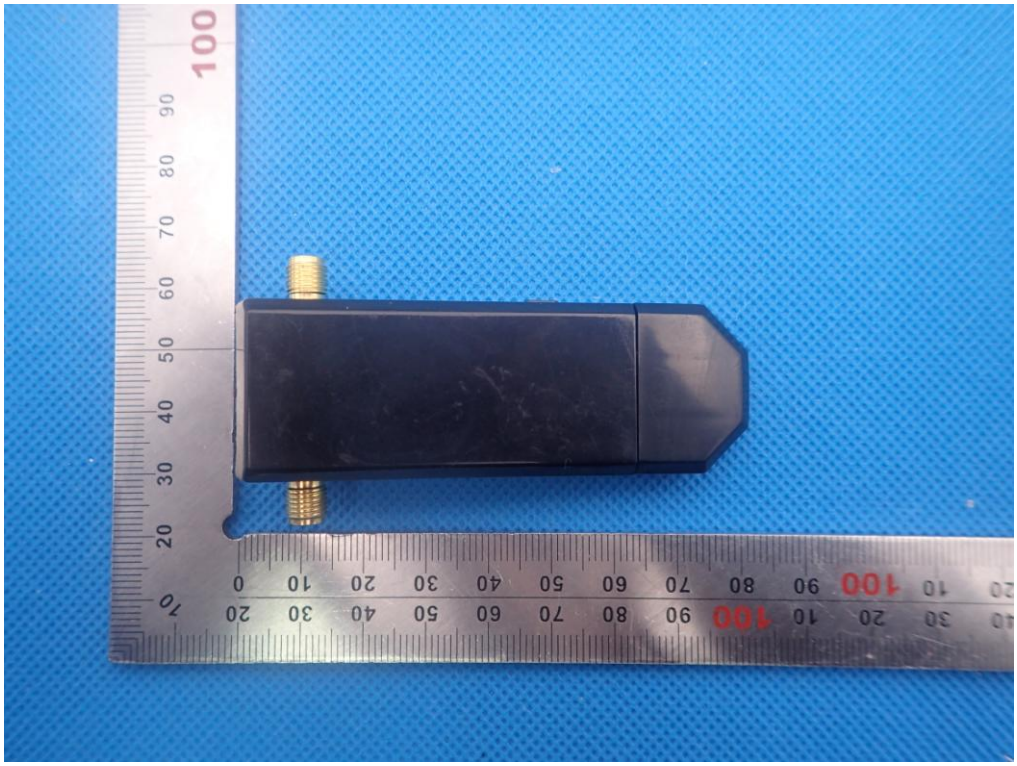
BOTTOM VIEW OF EUT



FRONT VIEW OF EUT

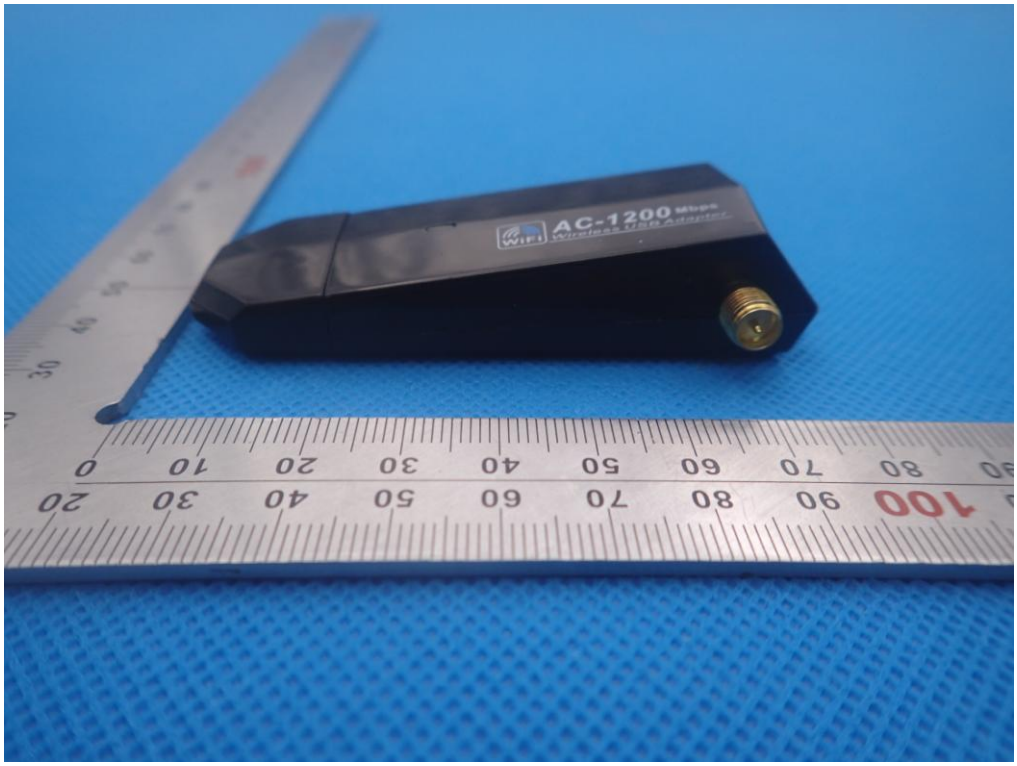


BACK VIEW OF EUT

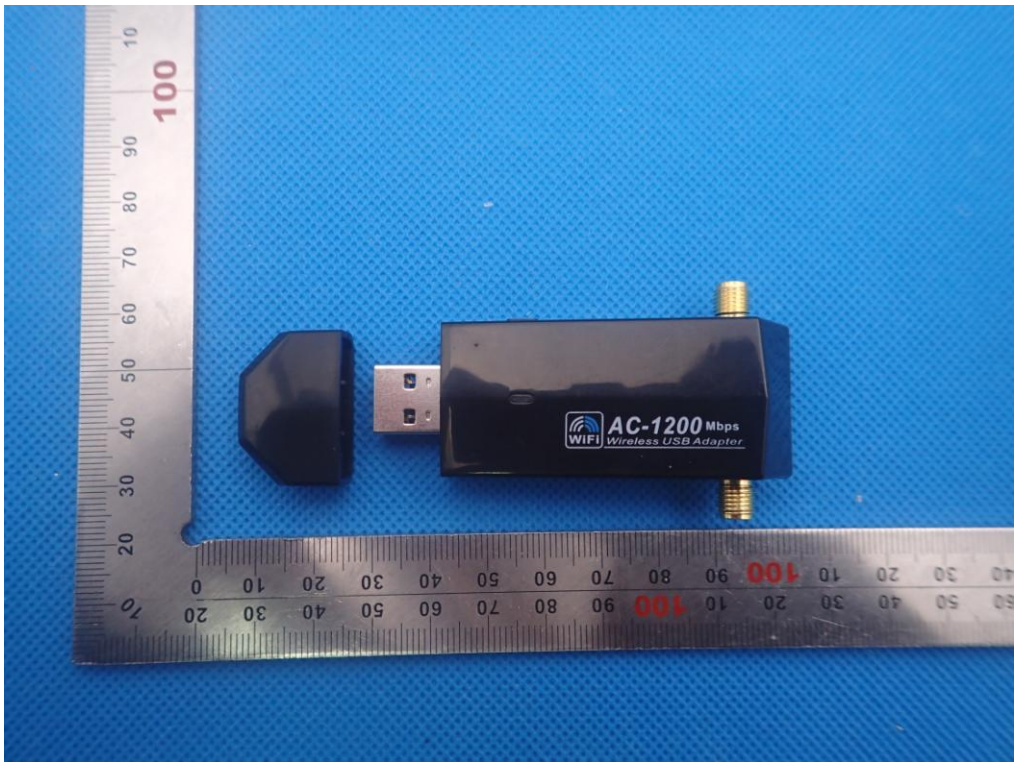


LEFT VIEW OF EUT

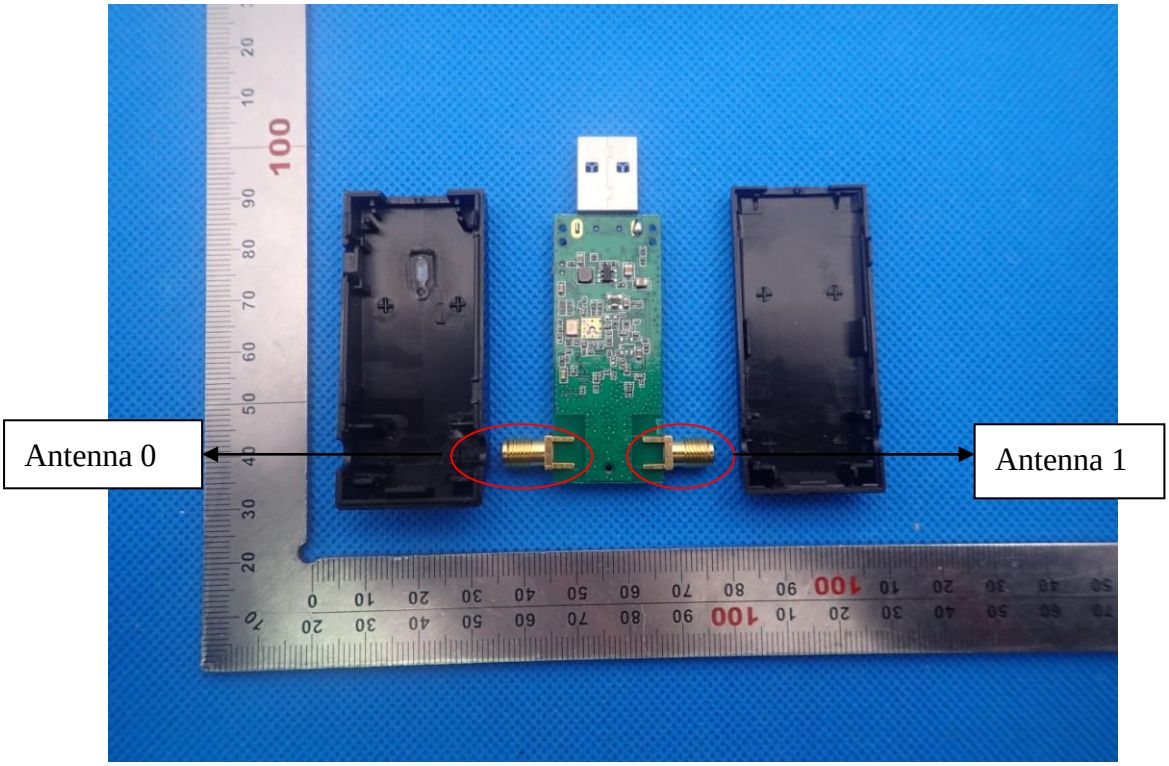
RIGHT VIEW OF EUT



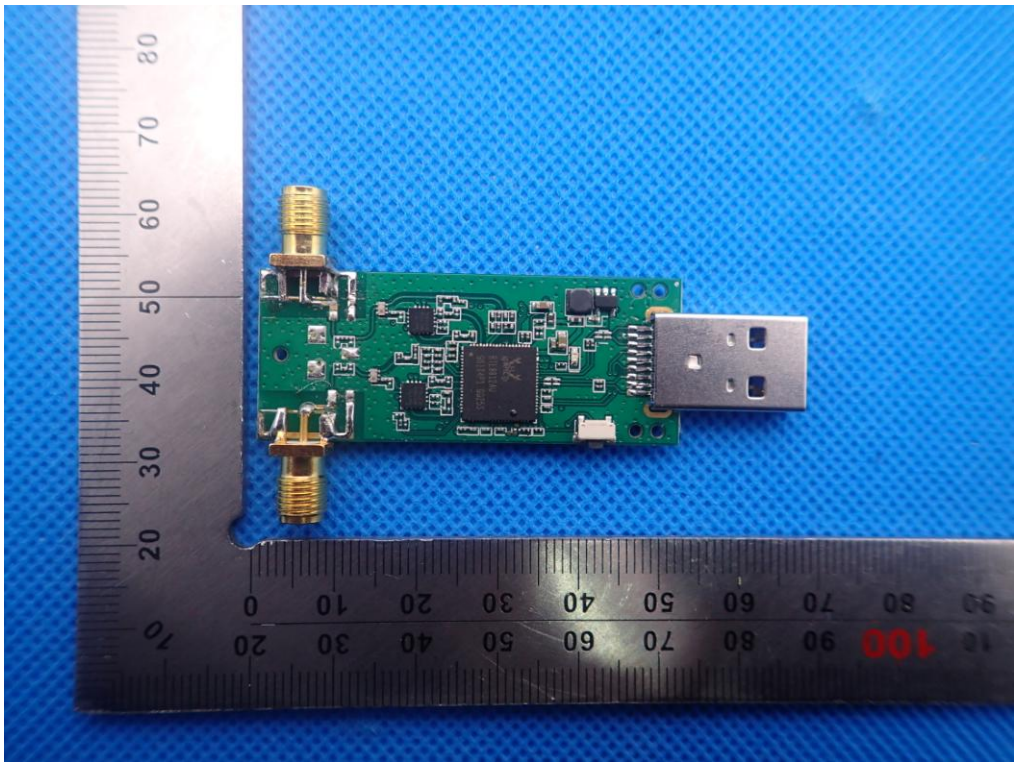

OPEN VIEW OF EUT-1



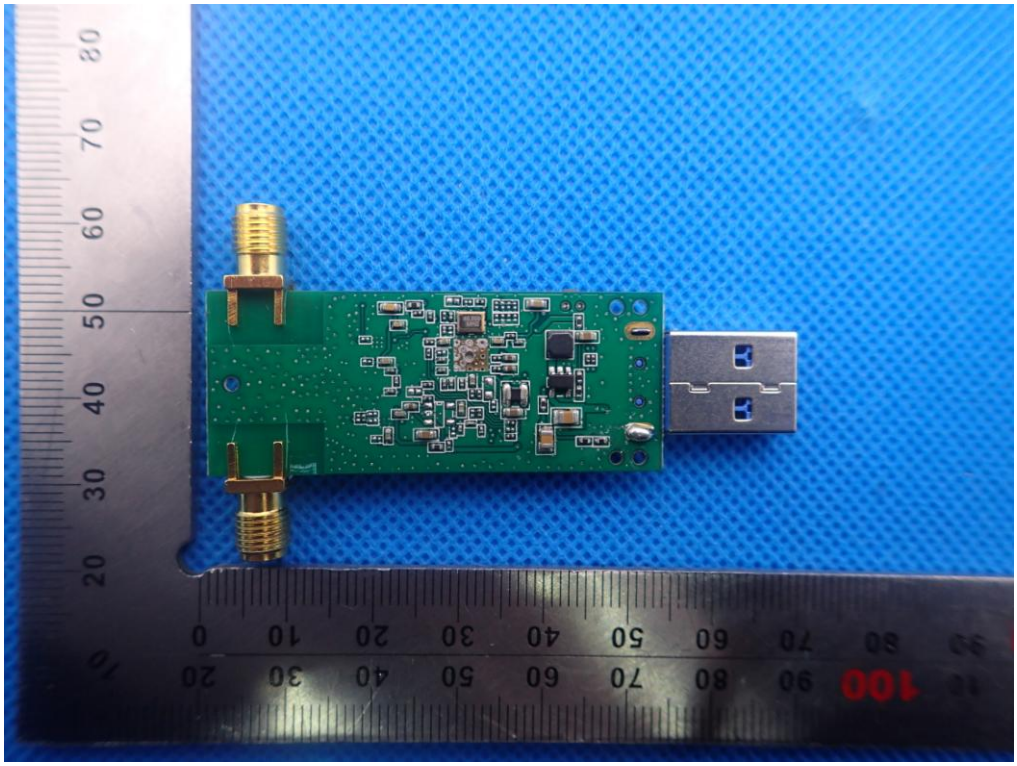
OPEN VIEW OF EUT-2




INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



**----END OF REPORT----**