

ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR LOW-POWER, NON-LICENSED TRANSMITTER

Test Report No. : OT-209-RWD-081

Reception No. : 2008003013

Applicant : LG Innotek Co., Ltd.

Address : 26, Hanamsandan 5beon-ro Gwangsan-gu, Gwangju, 506-731, South Korea

Manufacturer : LG Innotek Co., Ltd.

Address : 26, Hanamsandan 5beon-ro Gwangsan-gu, Gwangju, 506-731, South Korea

Type of Equipment : RF Module

FCC ID. : YZP-ATC5CPC001

Model Name : ATC5CPC001

Serial number : N/A

Total page of Report : 300 pages (including this page)

Date of Incoming : September 07, 2020

Date of issue : September 23, 2020

SUMMARY

The equipment complies with the regulation; *FCC PART 15 SUBPART E Section 15.407*

This test report only contains the result of a single test of the sample supplied for the examination.

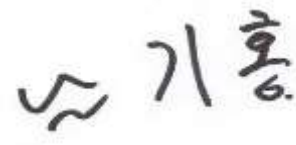
It is not a generally valid assessment of the features of the respective products of the mass-production.



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Revision History

| Rev. No. | Issue Report No. | Issued Date | Revisions | Section Affected |
|----------|------------------|--------------------|-----------------|------------------|
| 0 | OT-209-RWD-081 | September 23, 2020 | Initial Release | All |
| | | | | |
| | | | | |

1. VERIFICATION OF COMPLIANCE

Applicant : LG Innotek Co., Ltd.
 Address : 26, Hanamsandan 5beon-ro Gwangsan-gu, Gwangju, 506-731, South Korea
 Contact Person : Jeong Inchang / Chief Research Engineer
 Telephone No. : +82-10-2326-9972
 FCC ID : YZP-ATC5CPC001
 Model Name : ATC5CPC001
 Brand Name : LG Innotek Co., Ltd.
 Serial Number : N/A
 Date : September 23, 2020

| | |
|--|--|
| EQUIPMENT CLASS | Unlicensed National Information infrastructure(UNII) |
| E.U.T. DESCRIPTION | Modular Transmitter, RF Module |
| THIS REPORT CONCERNS | Original Grant |
| MEASUREMENT PROCEDURES | ANSI C63.10: 2013 |
| TYPE OF EQUIPMENT TESTED | Pre-Production |
| KIND OF EQUIPMENT AUTHORIZATION REQUESTED | Certification |
| EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S) | FCC PART 15 SUBPART E Section 15.407 789033 D02 General UNII Test Procedures New Rules v02r01 |
| Modifications on the Equipment to Achieve Compliance | None |
| Final Test was Conducted On | 3 m, Semi Anechoic Chamber |

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

2. TEST SUMMARY

2.1 Test items and results

| SECTION | TEST ITEMS | RESULTS |
|-------------------|---|----------------------|
| 15.407(a) | 26 dB Bandwidth | PASS |
| 15.407(a) | Maximum Conducted Output Power | Met the Limit / PASS |
| 15.407(a) | Peak Power Spectral Density | Met the Limit / PASS |
| 15.407(a) | Peak Excursion | Met the Limit / PASS |
| 15.407(g) | Frequency Stability | Met the Limit / PASS |
| 15.407(b) | Undesirable Emissions | Met the Limit / PASS |
| 15.205, 15.407(b) | General Field Strength Limits (Restricted Bands and Radiated Emission Limits) | Met the Limit / PASS |
| 15.207 | AC Conducted Emissions 150 kHz-30 MHz | N/A (See Note) |
| 15.407(h) | Dynamic frequency Selection | Met the Limit / PASS |

Note: This test is not performed because the EUT is operated by DC Power.

2.2 Additions, deviations, exclusions from standards

No additions, deviations or exclusions have been made from standard.

2.3 Related Submittal(s) / Grant(s)

Original submittal only

2.4 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in FCC PART 15 SUBPART E Section 15.407

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 a distance of 3 m from EUT to the antenna.

2.6 Test Facility

The Onetech Corp. has been designated to perform equipment testing in compliance with ISO/IEC 17025.

The Electromagnetic compatibility measurement facilities are located at 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea.

-. Site Filing:

VCCI (Voluntary Control Council for Interference) – Registration No. R-4112/ C-14617/ G-10666/ T-11842

ISED (Innovation, Science and Economic Development Canada) – Registration No. Site# 3736A-3

KOLAS (Korea Laboratory Accreditation Scheme) - Accreditation NO. KT085

FCC (Federal Communications Commission) - Accreditation No. KR0013

RRA (Radio Research Agency) – Designation No. KR0013

3. GENERAL INFORMATION

3.1 Product Description

The LG Innotek Co., Ltd., Model ATC5CPC001 (referred to as the EUT in this report) is a RF Module. The product specification described herein was obtained from product data sheet or user’s manual.

| | | |
|---|--|--|
| DEVICE TYPE | RF Module | |
| Temperature Range | -40 °C ~ 85 °C | |
| OPERATING FREQUENCY | Bluetooth LE | 2 402 MHz ~ 2 480 MHz |
| | Bluetooth | 2 402 MHz ~ 2 480 MHz |
| | WLAN 2.4 GHz | 2 412 MHz ~ 2 462 MHz (802.11b/g/n(HT20)) |
| | 5 150 MHz ~ 5 250 MHz Band | 5 180 MHz ~ 5 240 MHz (802.11a/n(HT20)/ac(VHT20)) |
| | | 5 190 MHz ~ 5 230 MHz (802.11n(HT40)/ac(VHT40)) |
| | | 5 210 MHz (802.11ac(VHT80)) |
| | 5 250 MHz ~ 5 350 MHz Band | 5 260 MHz ~ 5 320 MHz (802.11a/n(HT20)/ac(VHT20)) |
| | | 5 270 MHz ~ 5 310 MHz (802.11n(HT40)/ac(VHT40)) |
| | | 5 290 MHz (802.11ac(VHT80)) |
| | 5 470 MHz ~ 5 725 MHz Band | 5 500 MHz ~ 5 700 MHz (802.11a/n(HT20)/ac(VHT20)) |
| | | 5 510 MHz ~ 5 670 MHz (802.11n(HT40)/ac(VHT40)) |
| | | 5 530 MHz ~ 5 690 MHz (802.11ac(VHT80)) |
| | 5 725 MHz ~ 5 850 MHz Band | 5 745 MHz ~ 5 825 MHz (802.11a/n(HT20)/ac(VHT20)) |
| 5 755 MHz ~ 5 795 MHz (802.11n(HT40)/ac(VHT40)) | | |
| 5 775 MHz (802.11ac(VHT80)) | | |
| MODULATION TYPE | Bluetooth LE | GFSK for 1 Mbps |
| | Bluetooth | GFSK for 1Mbps, $\pi/4$ -DQPSK for 2Mbps, 8-DPSK for 3Mbps |
| | WLAN 2.4 GHz | 802.11b: DSSS Modulation(DBPSK/DQPSK/CCK) |
| | | 802.11g/n(HT20) OFDM Modulation(BPSK/QPSK/16QAM/64QAM) |
| WLAN 5 GHz | 802.11a/n(HT20)/n(HT40)/ac(VHT80): OFDM Modulation(BPSK/QPSK/16QAM/64QAM) | |

| | | | | |
|-------------------------------|---------------------------|-------------------------------|-------------------------|-------------------------|
| RF OUTPUT POWER | Bluetooth LE | 1 Mbps | 4.25 dBm | |
| | Bluetooth | 1 Mbps | 4.85 dBm | |
| | | 2 Mbps | 2.67 dBm | |
| | | 3 Mbps | 3.07 dBm | |
| | WLAN 2.4 GHz | Antenna 0 | 16.05 dBm(802.11b) | |
| | | | 16.48 dBm(802.11g) | |
| | | | 14.62 dBm(802.11n_HT20) | |
| | WLAN 2.4 GHz | Antenna 1 | 16.06 dBm(802.11b) | |
| | | | 18.22 dBm(802.11g) | |
| | | | 16.20 dBm(802.11n_HT20) | |
| | WLAN 2.4 GHz | Multiple Antenna | 18.29 dBm(802.11n_HT20) | |
| | | 5 150 MHz ~ 5 250 MHz Band | Antenna 0 | 17.28 dBm(802.11a) |
| | | | | 15.53 dBm(802.11n_HT20) |
| | 15.75 dBm(802.11n_HT40) | | | |
| | 15.03 dBm(802.11ac_VHT80) | | | |
| 5 150 MHz ~ 5 250 MHz Band | Antenna 1 | 15.47 dBm(802.11a) | | |
| | | 14.40 dBm(802.11n_HT20) | | |
| | | 13.82 dBm(802.11n_HT40) | | |
| | | 13.83 dBm(802.11ac_VHT80) | | |
| 5 150 MHz ~ 5 250 MHz Band | Multiple Antenna | 18.04 dBm(802.11n_HT20) | | |
| | | 17.87 dBm(802.11n_HT40) | | |
| | | 17.48 dBm(802.11ac_VHT80) | | |
| | | 17.48 dBm(802.11ac_VHT80) | | |
| 5 250 MHz ~ 5 350 MHz Band | Antenna 0 | 17.99 dBm(802.11a) | | |
| | | 16.87 dBm(802.11n_HT20) | | |
| | | 16.37 dBm(802.11n_HT40) | | |
| | | 16.12 dBm(802.11ac_VHT80) | | |
| 5 250 MHz ~ 5 350 MHz Band | Antenna 1 | 15.36 dBm(802.11a) | | |
| | | 14.18 dBm(802.11n_HT20) | | |
| | | 14.12 dBm(802.11n_HT40) | | |
| | | 14.13 dBm(802.11ac_VHT80) | | |
| 5 250 MHz ~ 5 350 MHz Band | Multiple Antenna | 18.66 dBm(802.11n_HT20) | | |
| | | 18.31 dBm(802.11n_HT40) | | |
| | | 18.25 dBm(802.11ac_VHT80) | | |
| | | 18.25 dBm(802.11ac_VHT80) | | |

| | | | |
|--------------------|-------------------------------|-------------------------------|---|
| RF OUTPUT POWER | 5 470 MHz ~ 5 725 MHz Band | Antenna 0 | 16.96 dBm(802.11a) 15.76 dBm(802.11n_HT20) 17.47 dBm(802.11n_HT40) 17.14 dBm(802.11ac_VHT80) |
| | | Antenna 0_Straddle | 14.04 dBm(802.11a) 12.84 dBm(802.11n_HT20) 15.23 dBm(802.11n_HT40) 15.09 dBm(802.11ac_VHT80) |
| | | Antenna 1 | 16.39 dBm(802.11a) 15.41 dBm(802.11n_HT20) 15.85 dBm(802.11n_HT40) 15.55 dBm(802.11ac_VHT80) |
| | | Antenna 1_Straddle | 14.74 dBm(802.11a) 13.52 dBm(802.11n_HT20) 14.19 dBm(802.11n_HT40) 14.34 dBm(802.11ac_VHT80) |
| | | Multiple Antenna | 18.58 dBm(802.11n_HT20) 19.73 dBm(802.11n_HT40) 19.44 dBm(802.11ac_VHT80) |
| | | Multiple Antenna _Straddle | 16.23 dBm(802.11n_HT20) 17.76 dBm(802.11n_HT40) 17.75 dBm(802.11ac_VHT80) |

| | | | |
|--------------------|-------------------------------|-------------------------------|---|
| RF OUTPUT POWER | 5 725 MHz ~ 5 850 MHz Band | Antenna 0 | 15.67 dBm(802.11a) 14.59 dBm(802.11n_HT20) 15.34 dBm(802.11n_HT40) 14.72 dBm(802.11ac_VHT80) |
| | | Antenna 0_Straddle | 6.57 dBm(802.11a) 5.97 dBm(802.11n_HT20) 2.88 dBm(802.11n_HT40) -0.70 dBm(802.11ac_VHT80) |
| | | Antenna 1 | 15.88 dBm(802.11a) 14.57 dBm(802.11n_HT20) 14.40 dBm(802.11n_HT40) 13.83 dBm(802.11ac_VHT80) |
| | | Antenna 1_Straddle | 7.26 dBm(802.11a) 6.69 dBm(802.11n_HT20) 2.22 dBm(802.11n_HT40) -1.34 dBm(802.11ac_VHT80) |
| | | Multiple Antenna | 17.57 dBm(802.11n_HT20) 17.92 dBm(802.11n_HT40) 17.31 dBm(802.11ac_VHT80) |
| | | Multiple Antenna _Straddle | 9.33 dBm(802.11n_HT20) 5.59 dBm(802.11n_HT40) 2.01 dBm(802.11ac_VHT80) |

| ANTENNA TYPE | PCB Antenna | | | |
|--------------|---|------------------|-----------|--|
| ANTENNA GAIN | Bluetooth LE | 1.49 dBi | | |
| | Bluetooth | 1.49 dBi | | |
| | WLAN 2.4 GHz | Antenna 0 | 1.49 dBi | |
| | | Antenna 1 | 0.14 dBi | |
| | | Multiple Antenna | 3.88 dBi | |
| | 5 150 MHz ~ 5 250 MHz Band | Antenna 0 | -2.10 dBi | |
| | | Antenna 1 | -6.66 dBi | |
| | | Multiple Antenna | -0.80 dBi | |
| | 5 250 MHz ~ 5 350 MHz Band | Antenna 0 | -2.10 dBi | |
| | | Antenna 1 | -6.66 dBi | |
| | | Multiple Antenna | -0.80 dBi | |
| | 5 470 MHz ~ 5 725 MHz Band | Antenna 0 | -2.82 dBi | |
| | | Antenna 1 | -6.82 dBi | |
| | | Multiple Antenna | -1.36 dBi | |
| | 5 725 MHz ~ 5 850 MHz Band | Antenna 0 | -2.61 dBi | |
| | | Antenna 1 | -7.60 dBi | |
| | | Multiple Antenna | -1.41 dBi | |
| | List of each Osc. or crystal Freq.(Freq. >= 1 MHz) | | 37.4 MHz | |

3.2 Alternative type(s)/model(s); also covered by this test report.

-. None

4. EUT MODIFICATIONS

-. None

5. SYSTEM TEST CONFIGURATION

5.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

| DEVICE TYPE | MANUFACTURER | MODEL/PART NUMBER | FCC ID |
|-------------|----------------------|-----------------------|--------|
| Main Board | LG Innotek Co., Ltd. | RBHP-B216C_RDK_Rev0.2 | N/A |

5.2 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested:

| Model | Manufacturer | Description | Connected to |
|--------------------------------------|--|-----------------|--------------|
| ATC5CPC001 | LG Innotek Co., Ltd. | RF Module (EUT) | |
| HP Probook | HP | Notebook PC | EUT |
| PPP009L-E | LIE-ON TECHNOLOGY (CHANGZHOU)CO.,LTD. | AC Adapter | |
| RBHX-Q20XX_Carrier_Interface_Rev.0.2 | LG Inntek Co., LTD. | Interface Board | EUT |
| PWS-3003D | Protek | DC Power Supply | EUT |

5.3 Mode of operation during the test

For the testing, software used to control the EUT for staying in continuous transmitting mode is programmed.

-. Channel List (5 150 MHz ~ 5 250 MHz Band)

| 802.11a / n_HT20 / ac_VHT20 | | 802.11n_HT40 / ac_VHT40 | | 802.11ac_VHT80 | |
|-----------------------------|----------------|-------------------------|----------------|----------------|----------------|
| Channel | Frequency[MHz] | Channel | Frequency[MHz] | Channel | Frequency[MHz] |
| 36 | 5 180.00 | 38 | 5 190.00 | 42 | 5 210.00 |
| 40 | 5 200.00 | 46 | 5 230.00 | | |
| 44 | 5 220.00 | | | | |
| 48 | 5 240.00 | | | | |

-. Channel List (5 250 MHz ~ 5 350 MHz Band)

| 802.11a / n_HT20 / ac_VHT20 | | 802.11n_HT40 / ac_VHT40 | | 802.11ac_VHT80 | |
|-----------------------------|----------------|-------------------------|----------------|----------------|----------------|
| Channel | Frequency[MHz] | Channel | Frequency[MHz] | Channel | Frequency[MHz] |
| 52 | 5 260.00 | 54 | 5 270.00 | 58 | 5 290.00 |
| 56 | 5 280.00 | 62 | 5 310.00 | | |
| 60 | 5 300.00 | | | | |
| 64 | 5 320.00 | | | | |

-. Channel List (5 470 MHz ~ 5 725 MHz Band)

| 802.11a / n_HT20 / ac_VHT20 | | 802.11n_HT40 / ac_VHT40 | | 802.11ac_VHT80 | |
|-----------------------------|----------------|-------------------------|----------------|----------------|----------------|
| Channel | Frequency[MHz] | Channel | Frequency[MHz] | Channel | Frequency[MHz] |
| 100 | 5 500.00 | 102 | 5 510.00 | 106 | 5 530.00 |
| 104 | 5 520.00 | 110 | 5 550.00 | 138 | 5 690.00 |
| 108 | 5 540.00 | 118 | 5 590.00 | | |
| 112 | 5 560.00 | 126 | 5 630.00 | | |
| 116 | 5 580.00 | 134 | 5 670.00 | | |
| 120 | 5 600.00 | | | | |
| 124 | 5 620.00 | | | | |
| 128 | 5 640.00 | | | | |
| 132 | 5 660.00 | | | | |
| 136 | 5 680.00 | | | | |
| 140 | 5 700.00 | | | | |

-. Channel List (5 725 MHz ~ 5 850 MHz Band)

| 802.11a / n_HT20 / ac_VHT20 | | 802.11n_HT40 / ac_VHT40 | | 802.11ac_VHT80 | |
|-----------------------------|----------------|-------------------------|----------------|----------------|----------------|
| Channel | Frequency[MHz] | Channel | Frequency[MHz] | Channel | Frequency[MHz] |
| 149 | 5 745.00 | 151 | 5 755.00 | 155 | 5 775.00 |
| 153 | 5 765.00 | 159 | 5 795.00 | | |
| 157 | 5 785.00 | | | | |
| 161 | 5 805.00 | | | | |
| 165 | 5 825.00 | | | | |

UNII 1

| Modulation | DATA RATE | OUTPUT POWER[dBm] | |
|------------------------------|------------|-------------------|-----------|
| | | Antenna 0 | Antenna 1 |
| 802.11 a (Middle Channel) | 6 Mbps | 16.96 | 15.08 |
| | 9 Mbps | 16.73 | 14.87 |
| | 12 Mbps | 16.48 | 14.69 |
| | 18 Mbps | 16.15 | 14.52 |
| | 24 Mbps | 15.79 | 14.34 |
| | 36 Mbps | 15.52 | 14.15 |
| | 48 Mbps | 15.20 | 13.88 |
| | 54 Mbps | 15.08 | 13.69 |
| HT 20 (Middle Channel) | 6.5 Mbps | 14.86 | 13.68 |
| | 13 Mbps | 14.58 | 13.52 |
| | 19.5 Mbps | 14.39 | 13.39 |
| | 26 Mbps | 13.97 | 13.24 |
| | 39 Mbps | 13.62 | 13.09 |
| | 52 Mbps | 13.38 | 12.89 |
| | 58.5 Mbps | 13.15 | 12.74 |
| | 65 Mbps | 13.02 | 12.59 |
| HT 40 (Low Channel) | 13.5 Mbps | 14.64 | 12.71 |
| | 27 Mbps | 14.20 | 12.58 |
| | 40.5 Mbps | 14.08 | 12.34 |
| | 54 Mbps | 13.76 | 12.18 |
| | 81 Mbps | 13.51 | 11.87 |
| | 108 Mbps | 13.39 | 11.76 |
| | 121.5 Mbps | 13.21 | 11.54 |
| | 135 Mbps | 13.08 | 11.32 |

| | | | |
|---------------------------|------------|-------|-------|
| VHT80 (Middle Channel) | 29.3 Mbps | 13.15 | 11.96 |
| | 58.5 Mbps | 13.02 | 11.88 |
| | 87.8 Mbps | 12.89 | 11.73 |
| | 117 Mbps | 12.73 | 11.54 |
| | 175.5 Mbps | 12.54 | 11.39 |
| | 234 Mbps | 12.36 | 11.26 |
| | 263.3 Mbps | 12.17 | 11.18 |
| | 292.5 Mbps | 11.88 | 11.09 |

- The worse case data rate for each modulation is determined 6 Mbps(Ant.0/Ant.1) for IEEE 802.11a, 6.5 Mbps(Ant.0/Ant.1) for HT20, 13.5 Mbps(Ant.0/Ant.1) for HT40, 29.3 Mbps(Ant.0/Ant.1) for VHT80.
- To get a maximum emission levels from the EUT, the EUT was moved throughout the XY, XZ, and YZ planes and the worst case is “XY” axis.

UNII 2A

| Modulation | DATA RATE | OUTPUT POWER[dBm] | |
|------------------------------|------------|-------------------|-----------|
| | | Antenna 0 | Antenna 1 |
| 802.11 a (Middle Channel) | 6 Mbps | 17.57 | 14.67 |
| | 9 Mbps | 17.39 | 14.54 |
| | 12 Mbps | 17.24 | 14.39 |
| | 18 Mbps | 17.03 | 14.17 |
| | 24 Mbps | 16.89 | 13.96 |
| | 36 Mbps | 16.72 | 13.78 |
| | 48 Mbps | 16.54 | 13.54 |
| | 54 Mbps | 16.38 | 13.28 |
| HT 20 (Middle Channel) | 6.5 Mbps | 16.28 | 13.19 |
| | 13 Mbps | 16.02 | 12.97 |
| | 19.5 Mbps | 15.89 | 12.64 |
| | 26 Mbps | 15.74 | 12.55 |
| | 39 Mbps | 15.56 | 12.37 |
| | 52 Mbps | 15.33 | 12.29 |
| | 58.5 Mbps | 15.21 | 12.05 |
| | 65 Mbps | 15.03 | 11.87 |
| HT 40 (Low Channel) | 13.5 Mbps | 15.26 | 12.75 |
| | 27 Mbps | 15.11 | 12.63 |
| | 40.5 Mbps | 14.99 | 12.48 |
| | 54 Mbps | 14.76 | 12.29 |
| | 81 Mbps | 14.58 | 12.20 |
| | 108 Mbps | 14.34 | 12.04 |
| | 121.5 Mbps | 14.23 | 11.89 |
| | 135 Mbps | 14.05 | 11.67 |

| | | | |
|---------------------------|------------|-------|-------|
| VHT80 (Middle Channel) | 29.3 Mbps | 14.25 | 12.25 |
| | 58.5 Mbps | 14.02 | 12.06 |
| | 87.8 Mbps | 13.86 | 11.89 |
| | 117 Mbps | 13.65 | 11.64 |
| | 175.5 Mbps | 13.52 | 11.53 |
| | 234 Mbps | 13.39 | 11.37 |
| | 263.3 Mbps | 13.21 | 11.18 |
| | 292.5 Mbps | 13.08 | 11.02 |

- The worse case data rate for each modulation is determined 6 Mbps(Ant.0/Ant.1) for IEEE 802.11a, 6.5 Mbps(Ant.0/Ant.1) for HT20, 13.5 Mbps(Ant.0/Ant.1) for HT40, 29.3 Mbps(Ant.0/Ant.1) for VHT80.
- To get a maximum emission levels from the EUT, the EUT was moved throughout the XY, XZ, and YZ planes and the worst case is “XY” axis.

UNII 2C

| Modulation | DATA RATE | OUTPUT POWER[dBm] | |
|------------------------------|------------|-------------------|-----------|
| | | Antenna 0 | Antenna 1 |
| 802.11 a (Middle Channel) | 6 Mbps | 16.44 | 16.10 |
| | 9 Mbps | 16.32 | 15.96 |
| | 12 Mbps | 16.19 | 15.78 |
| | 18 Mbps | 15.94 | 15.70 |
| | 24 Mbps | 15.78 | 15.49 |
| | 36 Mbps | 15.64 | 15.28 |
| | 48 Mbps | 15.49 | 15.13 |
| | 54 Mbps | 15.22 | 14.97 |
| HT 20 (Middle Channel) | 6.5 Mbps | 14.99 | 14.76 |
| | 13 Mbps | 14.83 | 14.56 |
| | 19.5 Mbps | 14.68 | 14.33 |
| | 26 Mbps | 14.59 | 14.18 |
| | 39 Mbps | 14.37 | 14.03 |
| | 52 Mbps | 14.20 | 13.97 |
| | 58.5 Mbps | 14.08 | 13.74 |
| | 65 Mbps | 14.03 | 13.63 |
| HT 40 (Middle Channel) | 13.5 Mbps | 16.33 | 14.74 |
| | 27 Mbps | 16.20 | 14.56 |
| | 40.5 Mbps | 16.04 | 14.39 |
| | 54 Mbps | 15.89 | 14.18 |
| | 81 Mbps | 15.73 | 14.05 |
| | 108 Mbps | 15.54 | 13.87 |
| | 121.5 Mbps | 15.39 | 13.65 |
| | 135 Mbps | 15.12 | 13.42 |

| | | | |
|------------------------|------------|-------|-------|
| VHT80 (Low Channel) | 29.3 Mbps | 15.27 | 13.66 |
| | 58.5 Mbps | 15.19 | 13.40 |
| | 87.8 Mbps | 15.02 | 13.29 |
| | 117 Mbps | 14.83 | 13.16 |
| | 175.5 Mbps | 14.69 | 12.97 |
| | 234 Mbps | 14.62 | 12.68 |
| | 263.3 Mbps | 14.48 | 12.49 |
| | 292.5 Mbps | 14.25 | 12.35 |

- The worse case data rate for each modulation is determined 6 Mbps(Ant.0/Ant.1) for IEEE 802.11a, 6.5 Mbps(Ant.0/Ant.1) for HT20, 13.5 Mbps(Ant.0/Ant.1) for HT40, 29.3 Mbps(Ant.0/Ant.1) for VHT80.
- To get a maximum emission levels from the EUT, the EUT was moved throughout the XY, XZ, and YZ planes and the worst case is “XY” axis.

UNII 3

| Modulation | DATA RATE | OUTPUT POWER[dBm] | |
|------------------------------|------------|-------------------|-----------|
| | | Antenna 0 | Antenna 1 |
| 802.11 a (Middle Channel) | 6 Mbps | 15.33 | 15.30 |
| | 9 Mbps | 15.28 | 15.15 |
| | 12 Mbps | 15.17 | 15.04 |
| | 18 Mbps | 15.05 | 14.93 |
| | 24 Mbps | 14.89 | 14.77 |
| | 36 Mbps | 14.73 | 14.56 |
| | 48 Mbps | 14.52 | 14.39 |
| | 54 Mbps | 14.39 | 14.25 |
| HT 20 (Middle Channel) | 6.5 Mbps | 13.82 | 13.73 |
| | 13 Mbps | 13.66 | 13.56 |
| | 19.5 Mbps | 13.54 | 13.49 |
| | 26 Mbps | 13.38 | 13.38 |
| | 39 Mbps | 13.17 | 13.21 |
| | 52 Mbps | 13.05 | 13.10 |
| | 58.5 Mbps | 12.87 | 12.99 |
| | 65 Mbps | 12.68 | 12.83 |
| HT 40 (Low Channel) | 13.5 Mbps | 14.26 | 13.29 |
| | 27 Mbps | 14.05 | 13.10 |
| | 40.5 Mbps | 13.97 | 13.02 |
| | 54 Mbps | 13.74 | 12.94 |
| | 81 Mbps | 13.58 | 12.78 |
| | 108 Mbps | 13.39 | 12.64 |
| | 121.5 Mbps | 13.30 | 12.50 |
| | 135 Mbps | 13.17 | 12.36 |

| | | | |
|---------------------------|------------|-------|-------|
| VHT80 (Middle Channel) | 29.3 Mbps | 12.84 | 11.94 |
| | 58.5 Mbps | 12.66 | 11.89 |
| | 87.8 Mbps | 12.53 | 11.76 |
| | 117 Mbps | 12.39 | 11.54 |
| | 175.5 Mbps | 12.14 | 11.39 |
| | 234 Mbps | 12.03 | 11.18 |
| | 263.3 Mbps | 11.87 | 11.05 |
| | 292.5 Mbps | 11.64 | 11.96 |

- The worse case data rate for each modulation is determined 6 Mbps(Ant.0/Ant.1) for IEEE 802.11a, 6.5 Mbps(Ant.0/Ant.1) for HT20, 13.5 Mbps(Ant.0/Ant.1) for HT40, 29.3 Mbps(Ant.0/Ant.1) for VHT80.
- To get a maximum emission levels from the EUT, the EUT was moved throughout the XY, XZ, and YZ planes and the worst case is “XY” axis.

- . Duty Cycle

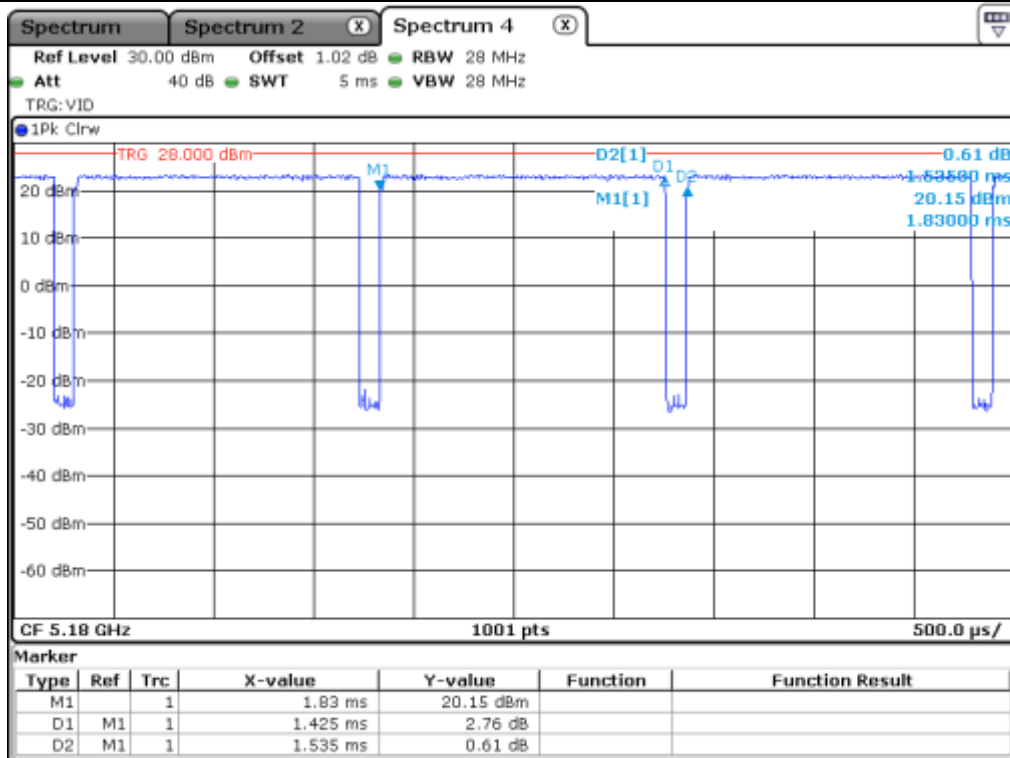
| | Band | Mode | Tx On Time [ms] | Tx Off Time [ms] | Duty Cycle [%] | Correction Factor [dB] |
|-----------|---------|---------------|----------------------|-----------------------|---------------------|--------------------------------|
| Antenna 0 | UNII 1 | 802.11 a | 1.43 | 0.11 | 92.86 | 0.32 |
| | | 802.11 HT 20 | 0.69 | 0.10 | 87.34 | 0.59 |
| | | 802.11 HT 40 | 0.35 | 0.10 | 77.53 | 1.11 |
| | | 802.11 VHT 80 | 0.19 | 0.10 | 64.83 | 1.88 |
| | UNII 2A | 802.11 a | 1.43 | 0.10 | 93.46 | 0.29 |
| | | 802.11 HT 20 | 0.69 | 0.10 | 87.34 | 0.59 |
| | | 802.11 HT 40 | 0.35 | 0.10 | 77.53 | 1.11 |
| | | 802.11 VHT 80 | 0.19 | 0.10 | 65.05 | 1.87 |
| | UNII 2C | 802.11 a | 1.43 | 0.10 | 93.46 | 0.29 |
| | | 802.11 HT 20 | 0.69 | 0.10 | 87.34 | 0.59 |
| | | 802.11 HT 40 | 0.35 | 0.10 | 77.88 | 1.09 |
| | | 802.11 VHT 80 | 0.19 | 0.10 | 65.05 | 1.87 |
| | UNII 3 | 802.11 a | 1.43 | 0.10 | 93.46 | 0.29 |
| | | 802.11 HT 20 | 0.68 | 0.11 | 86.08 | 0.65 |
| | | 802.11 HT 40 | 0.35 | 0.10 | 77.97 | 1.08 |
| | | 802.11 VHT 80 | 0.18 | 0.10 | 64.83 | 1.88 |

| | | | | | | |
|-----------|---------|---------------|------|------|-------|------|
| Antenna 1 | UNII 1 | 802.11 a | 1.41 | 0.12 | 92.16 | 0.35 |
| | | 802.11 HT 20 | 0.67 | 0.12 | 84.81 | 0.72 |
| | | 802.11 HT 40 | 0.35 | 0.10 | 77.92 | 1.08 |
| | | 802.11 VHT 80 | 0.19 | 0.10 | 65.05 | 1.87 |
| | UNII 2A | 802.11 a | 1.43 | 0.11 | 92.86 | 0.32 |
| | | 802.11 HT 20 | 0.68 | 0.11 | 86.08 | 0.65 |
| | | 802.11 HT 40 | 0.35 | 0.10 | 77.53 | 1.11 |
| | | 802.11 VHT 80 | 0.19 | 0.10 | 64.83 | 1.88 |
| | UNII 2C | 802.11 a | 1.43 | 0.10 | 93.46 | 0.29 |
| | | 802.11 HT 20 | 0.68 | 0.11 | 86.08 | 0.65 |
| | | 802.11 HT 40 | 0.35 | 0.10 | 77.53 | 1.11 |
| | | 802.11 VHT 80 | 0.19 | 0.10 | 64.71 | 1.89 |
| | UNII 3 | 802.11 a | 1.43 | 0.11 | 93.14 | 0.31 |
| | | 802.11 HT 20 | 0.68 | 0.10 | 87.18 | 0.60 |
| | | 802.11 HT 40 | 0.35 | 0.10 | 77.53 | 1.11 |
| | | 802.11 VHT 80 | 0.19 | 0.10 | 64.71 | 1.89 |

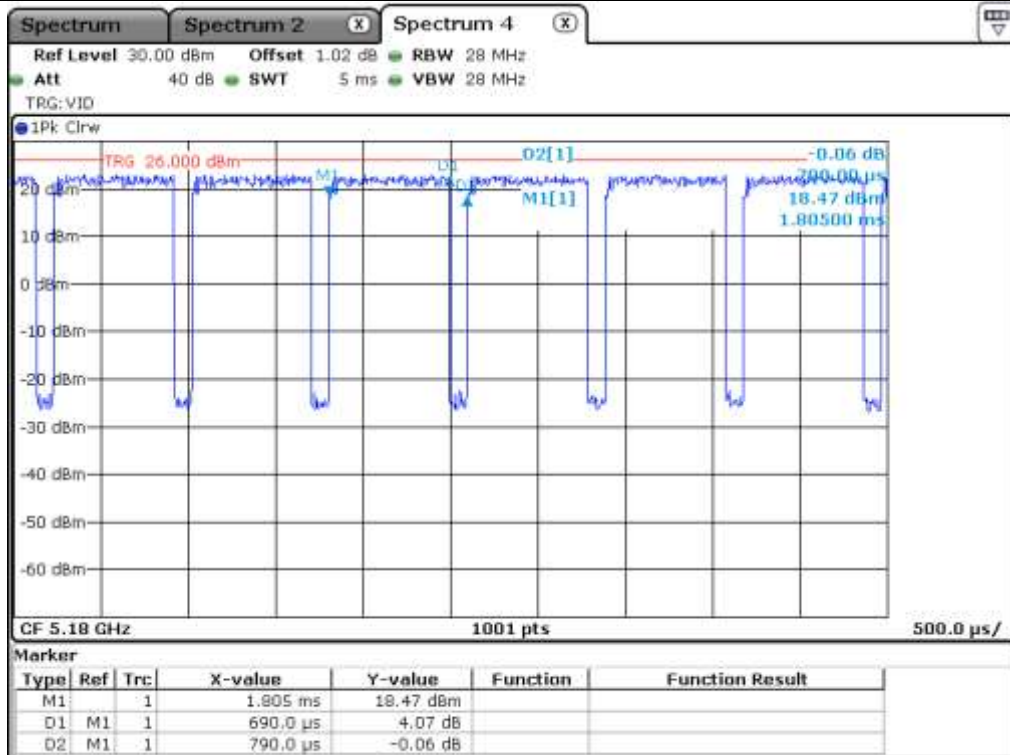
Note – Duty Cycle : (Tx On Time / (Tx On Time + Tx Off Time)) * 100

Correction Factor : 10 * Log(1 / (Duty Cycle / 100))

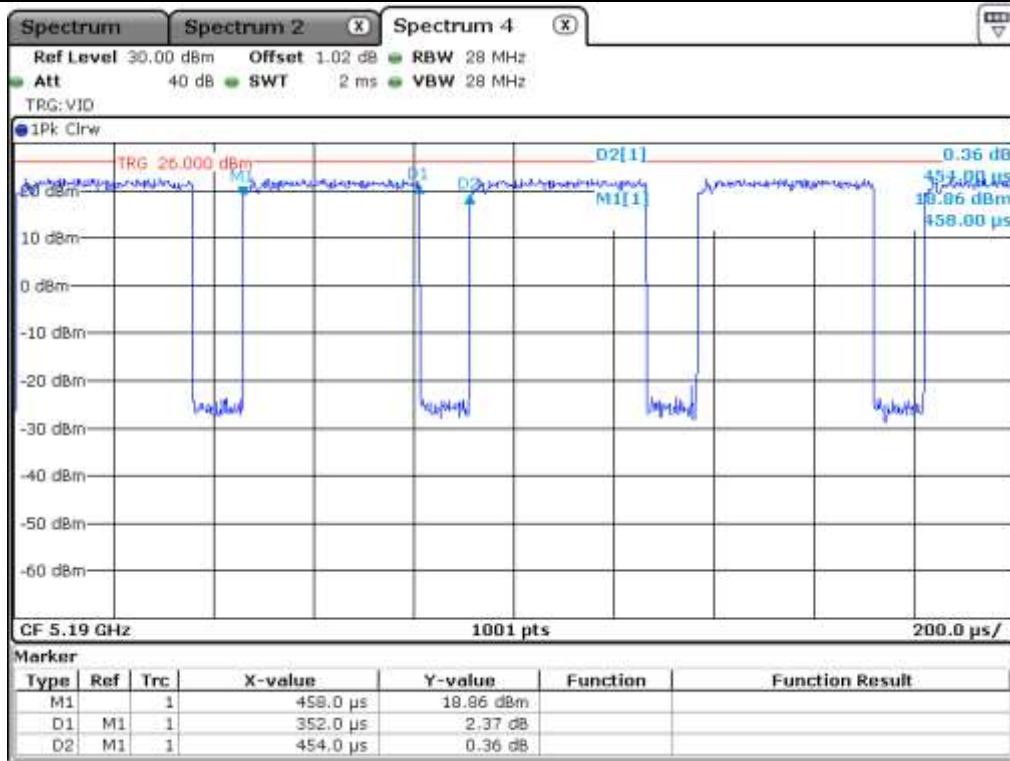
- Test Plot



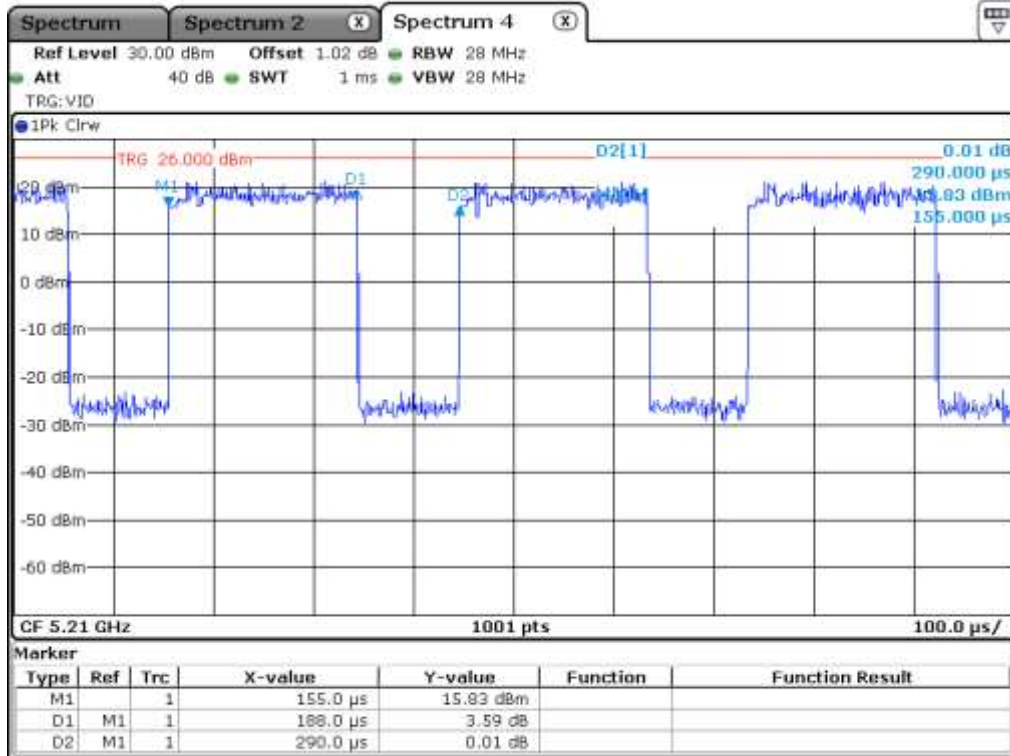
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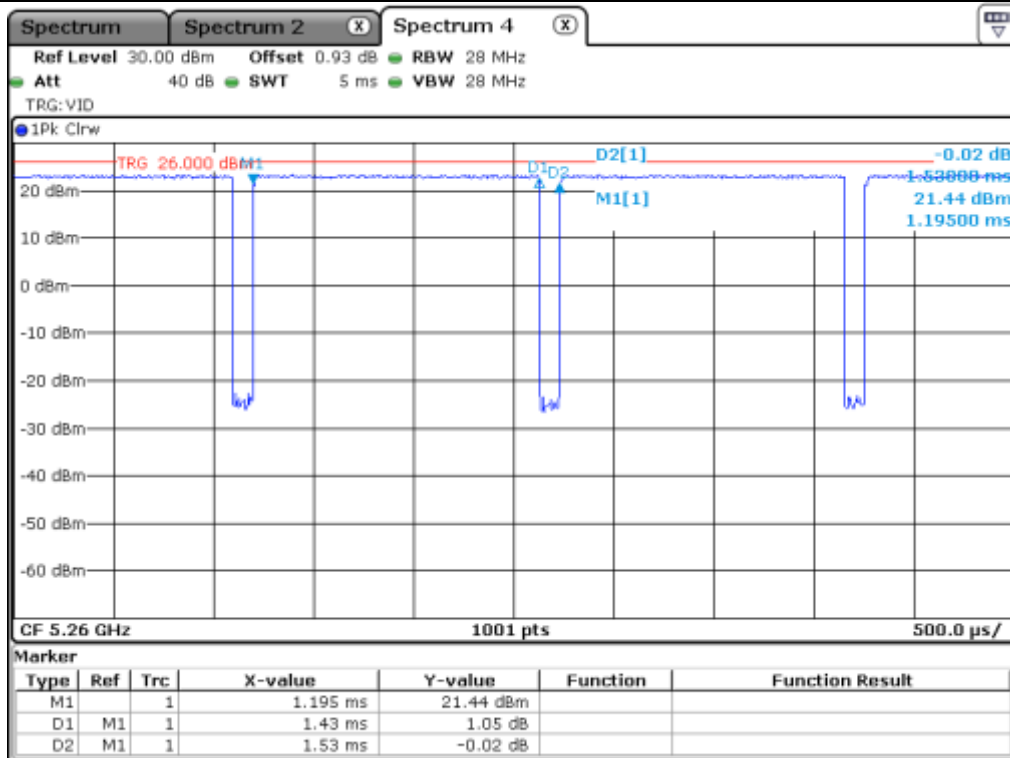
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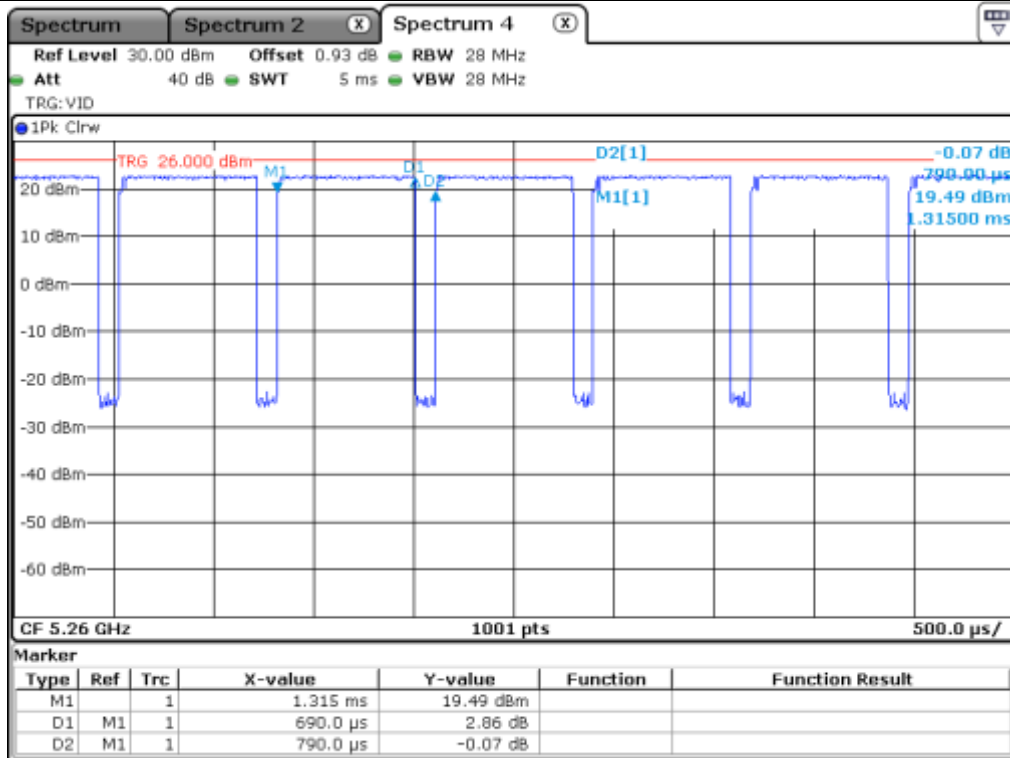
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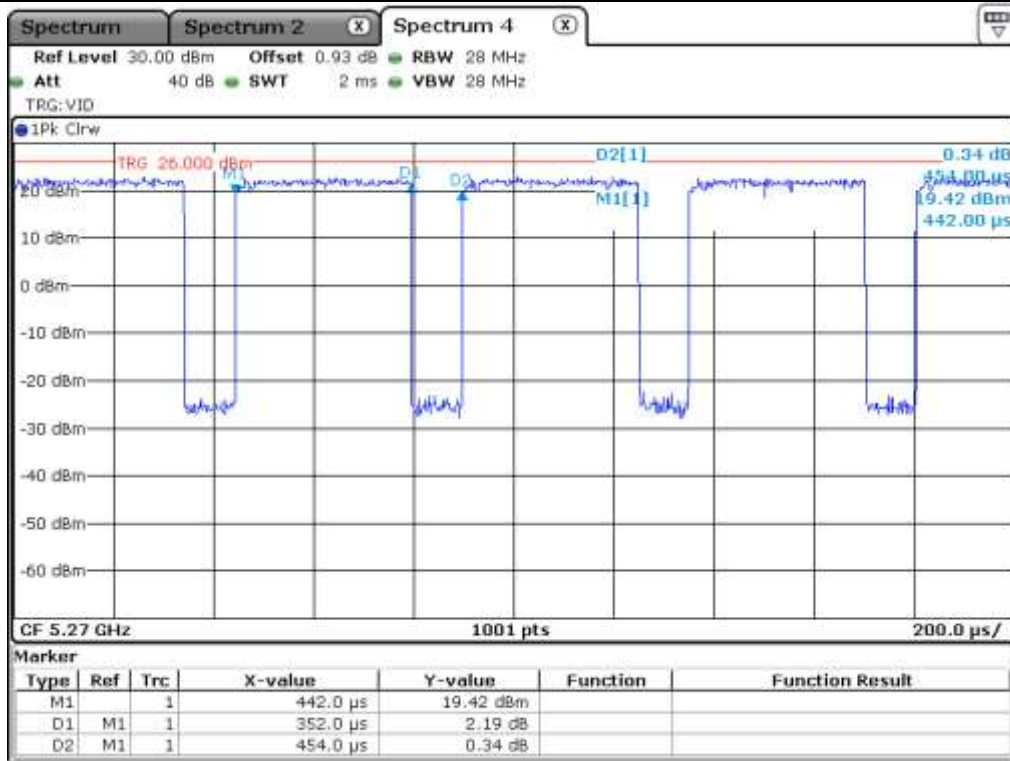
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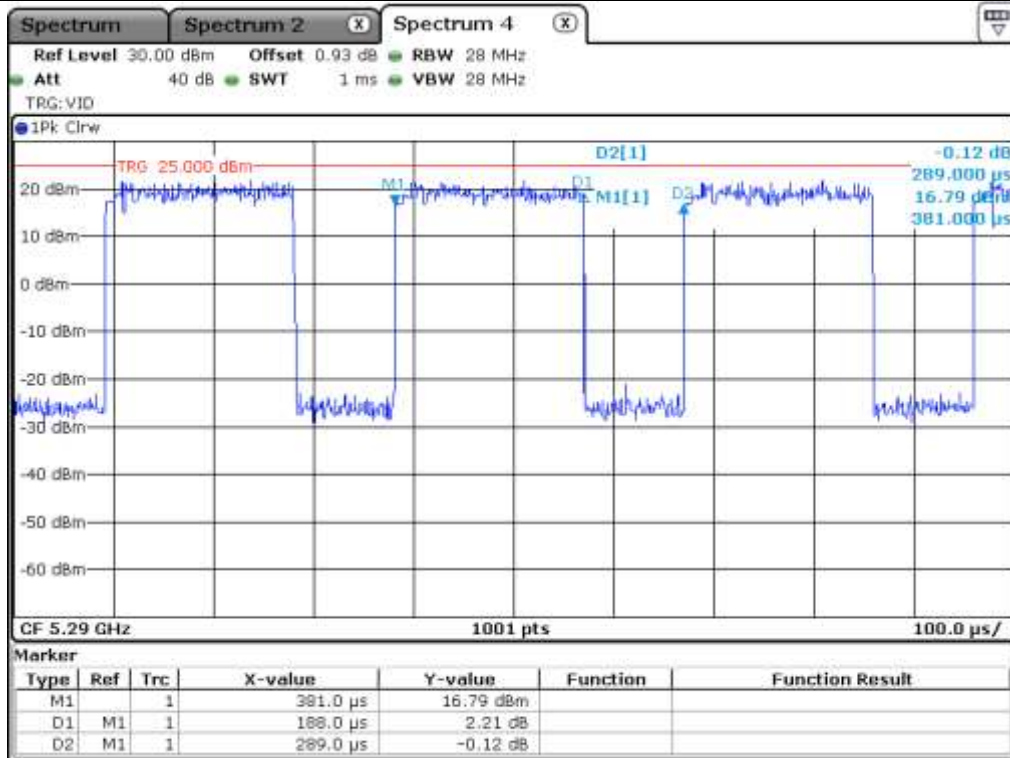
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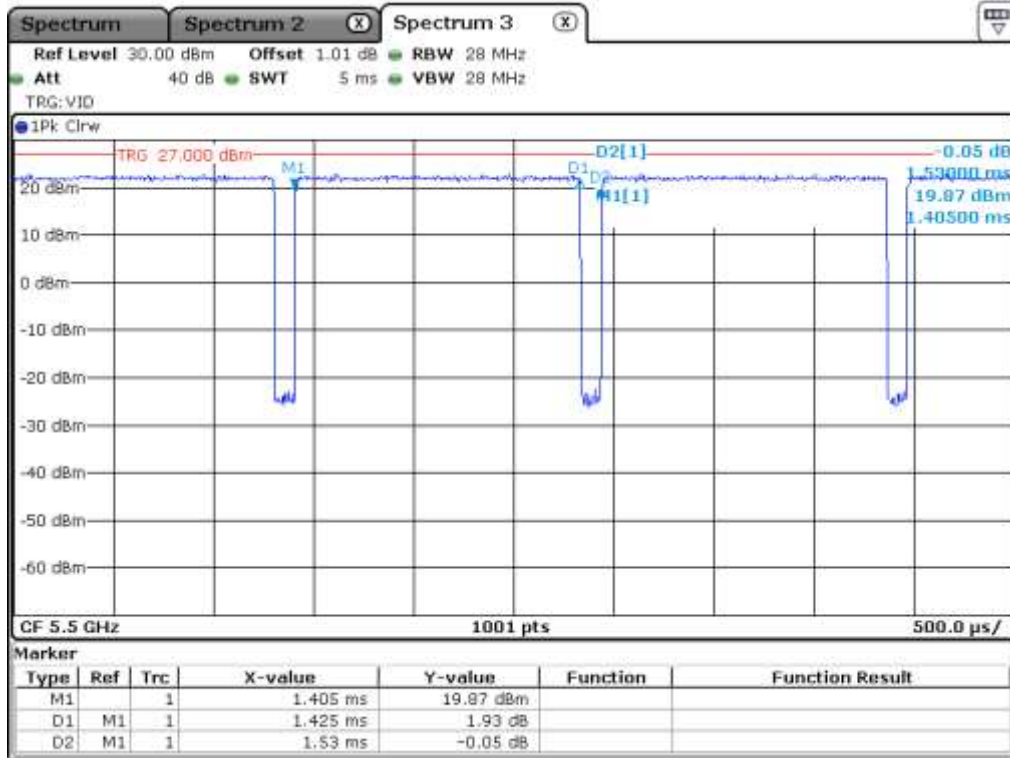
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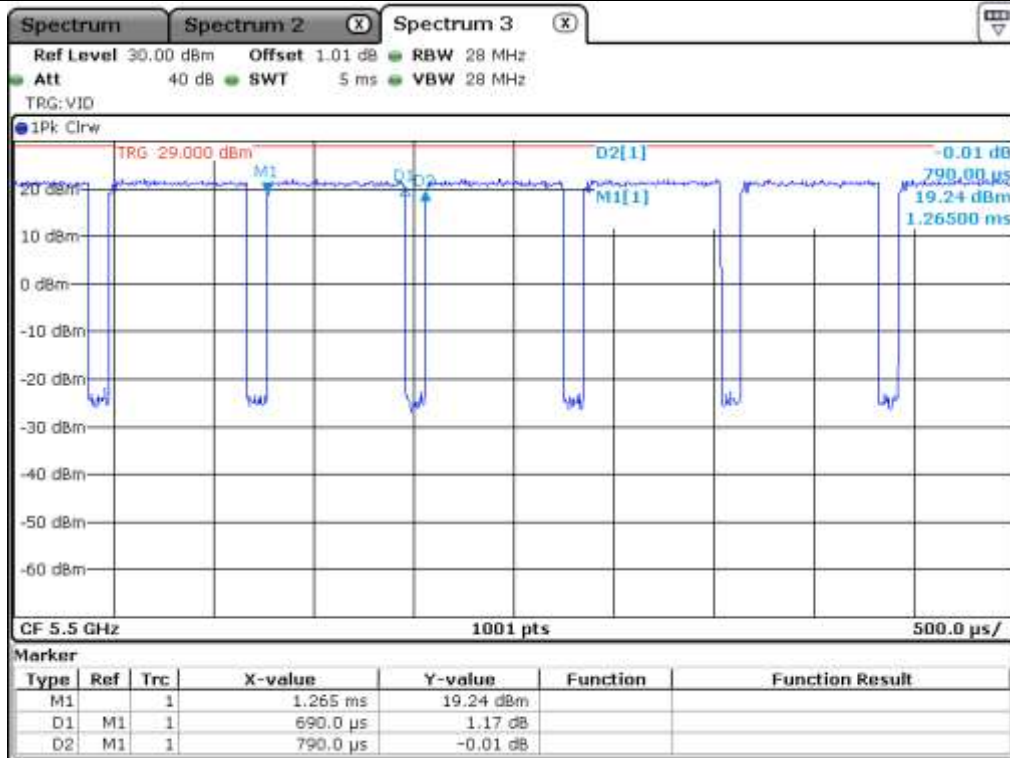
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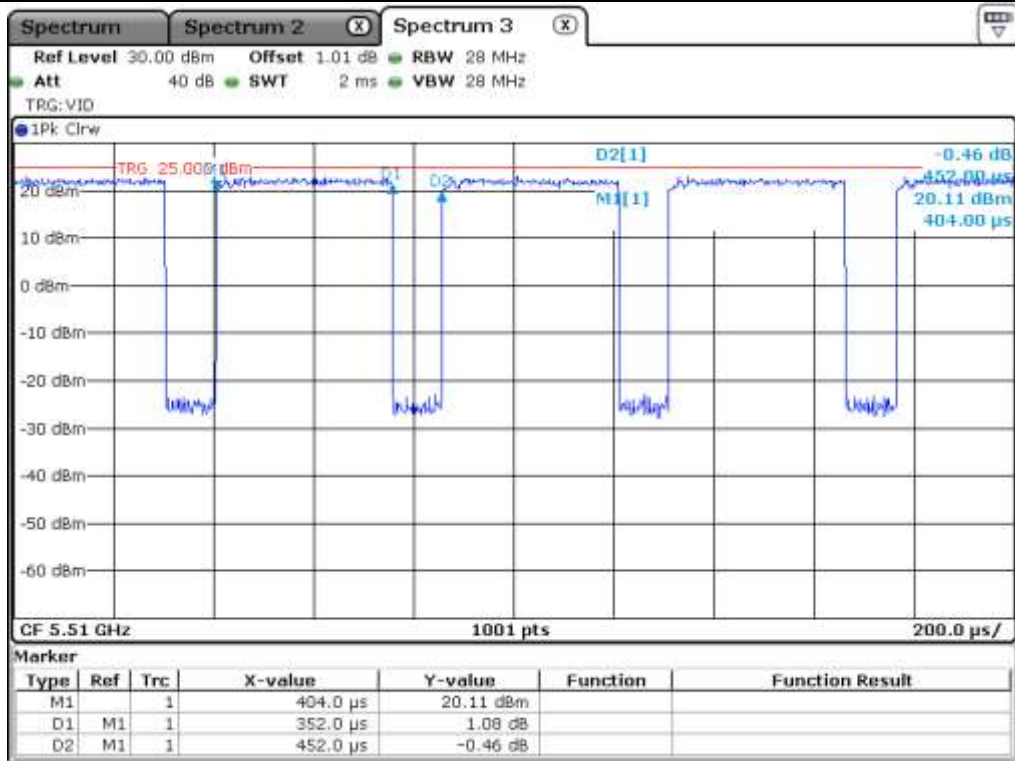
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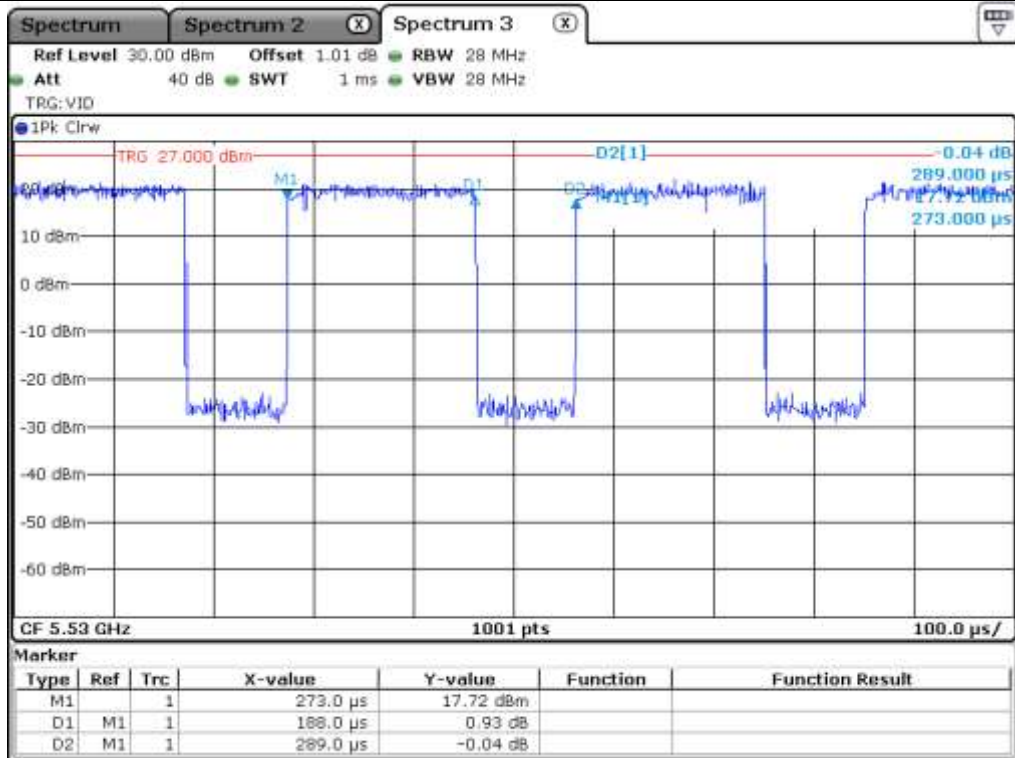
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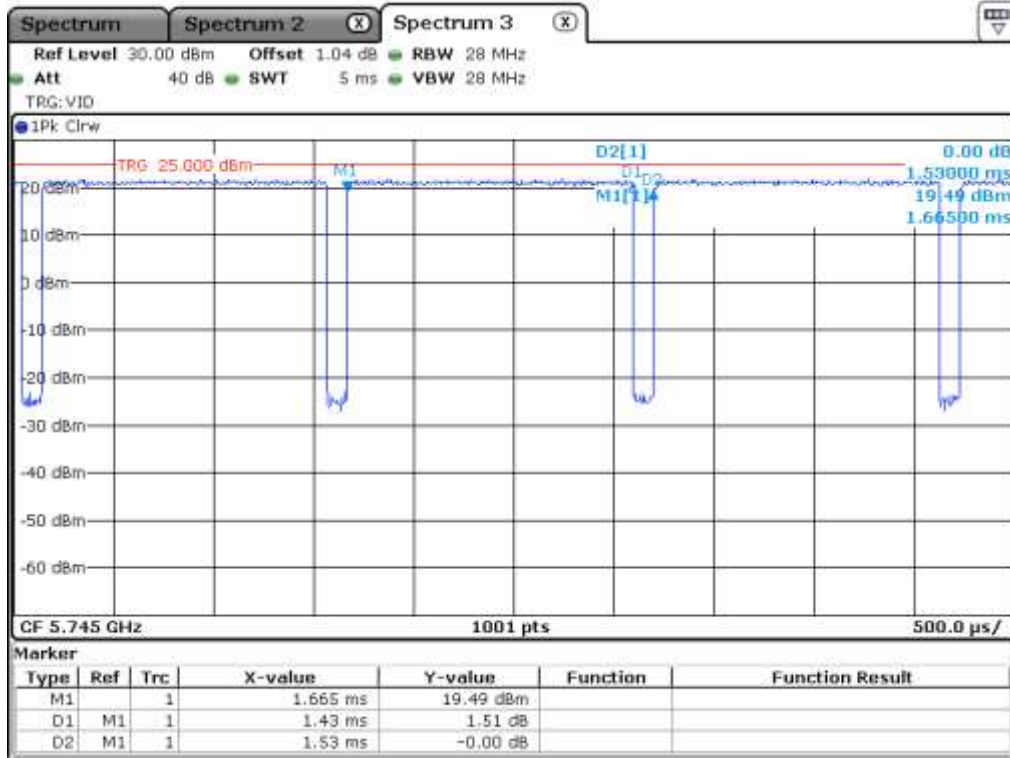
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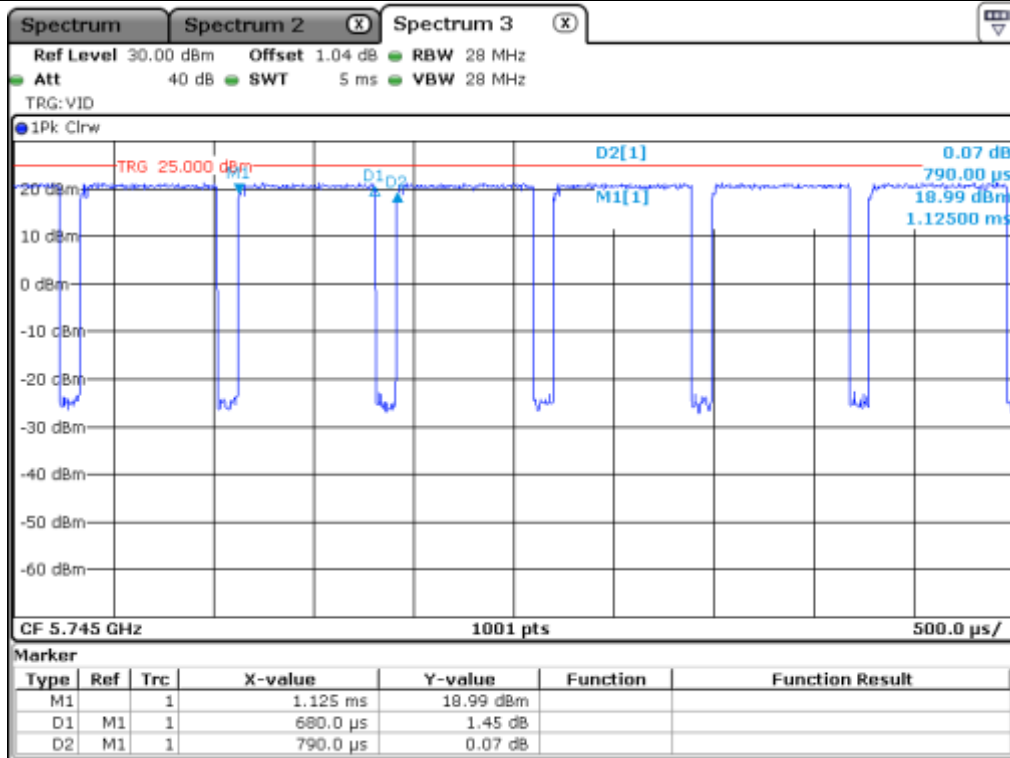
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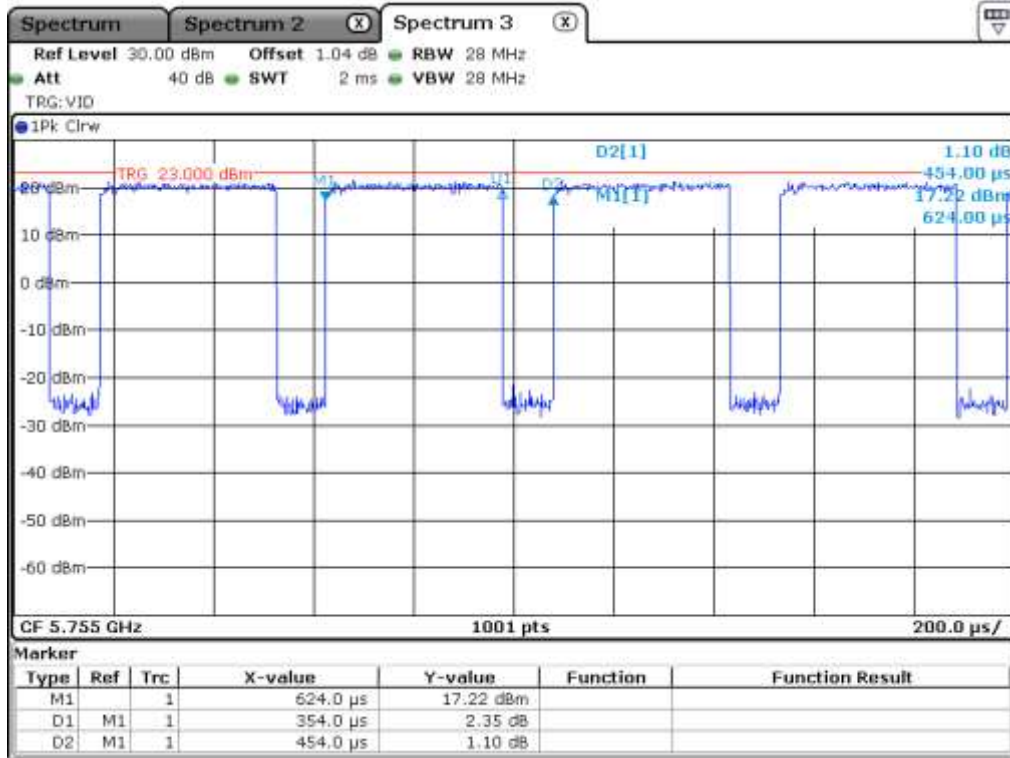
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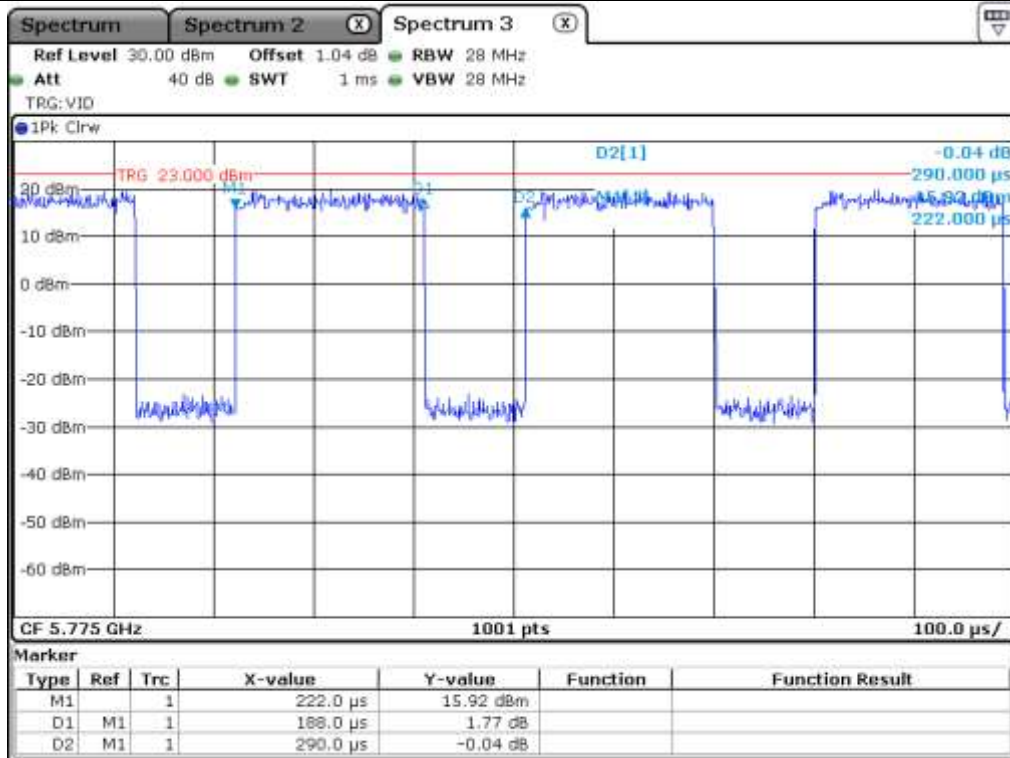
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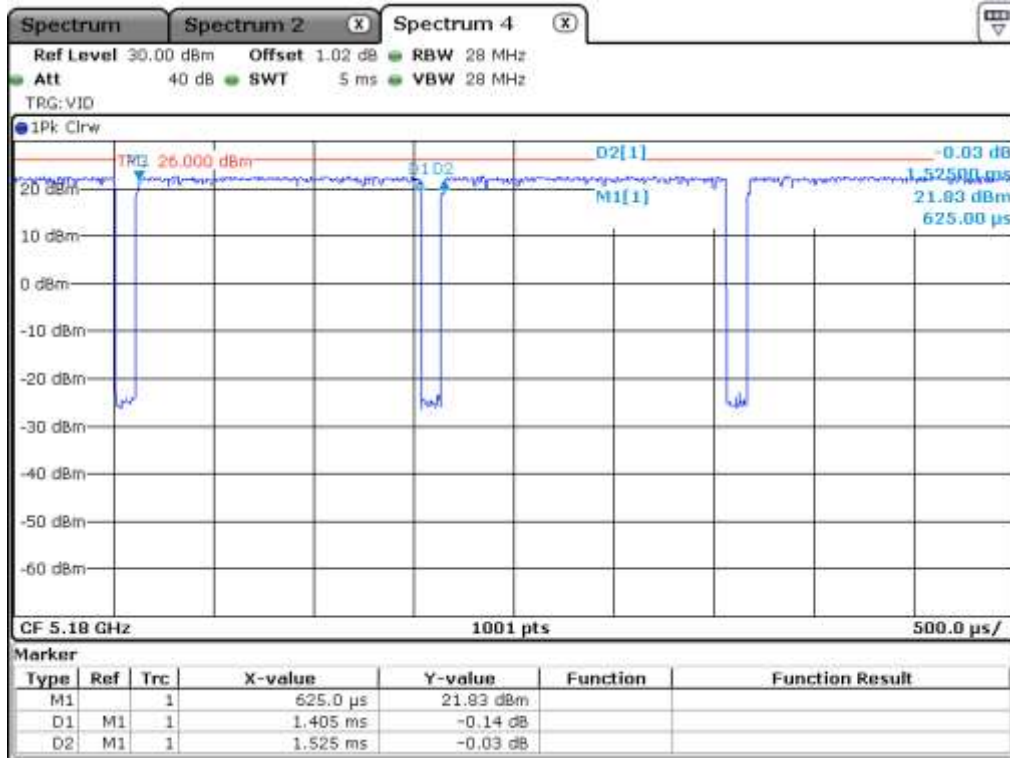
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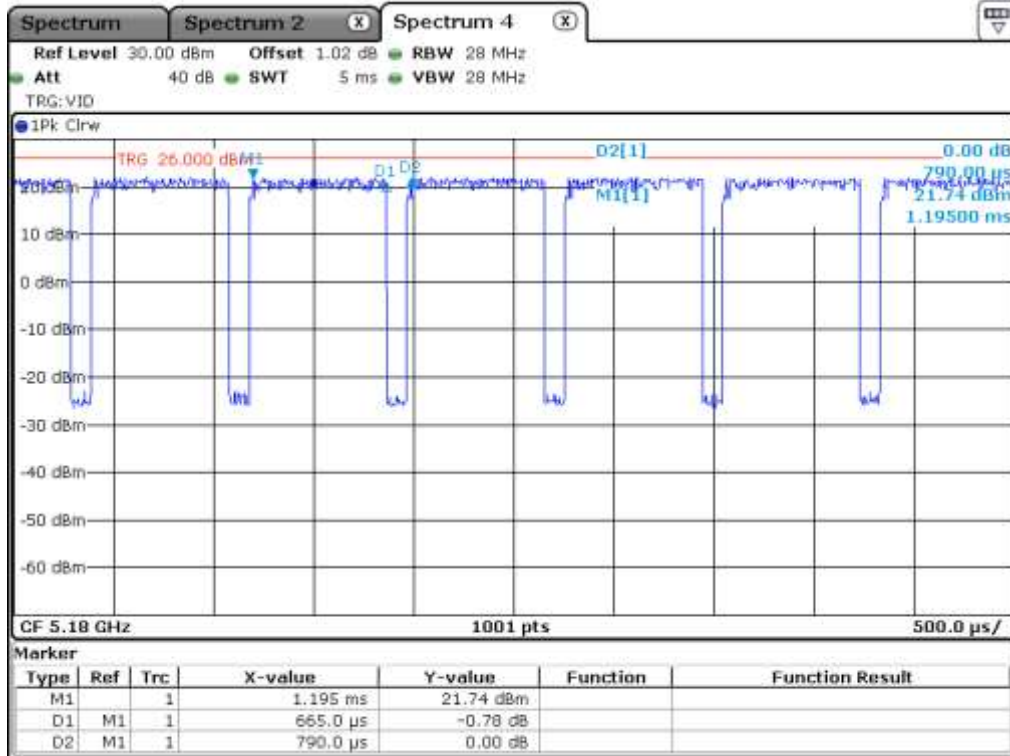
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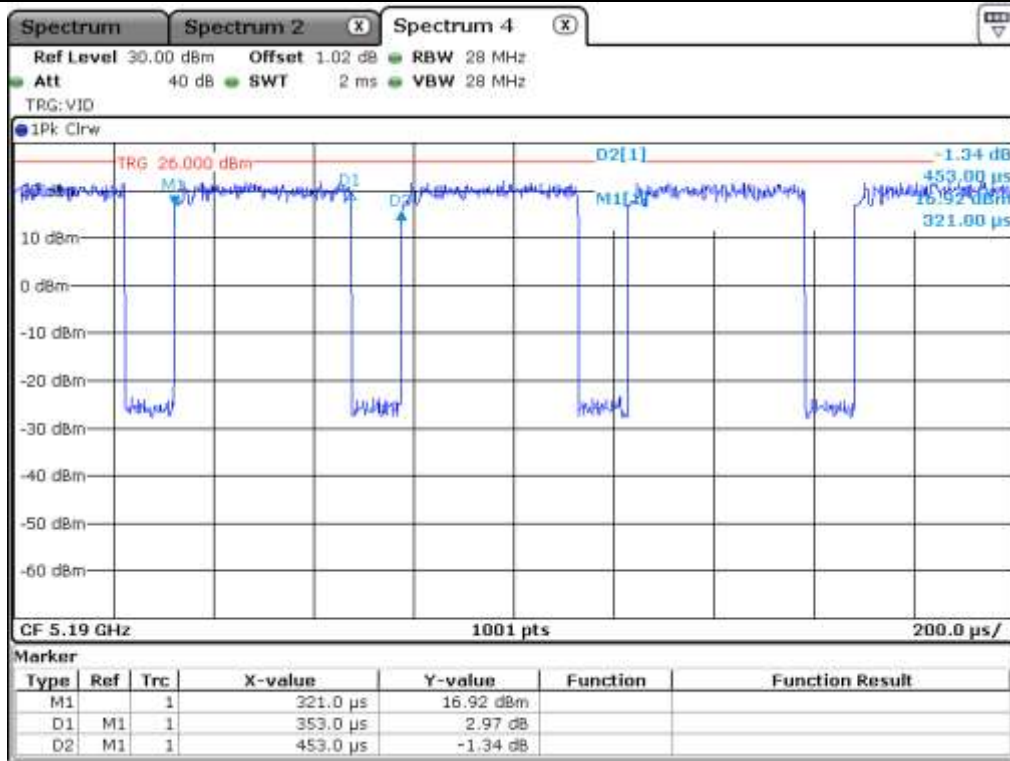
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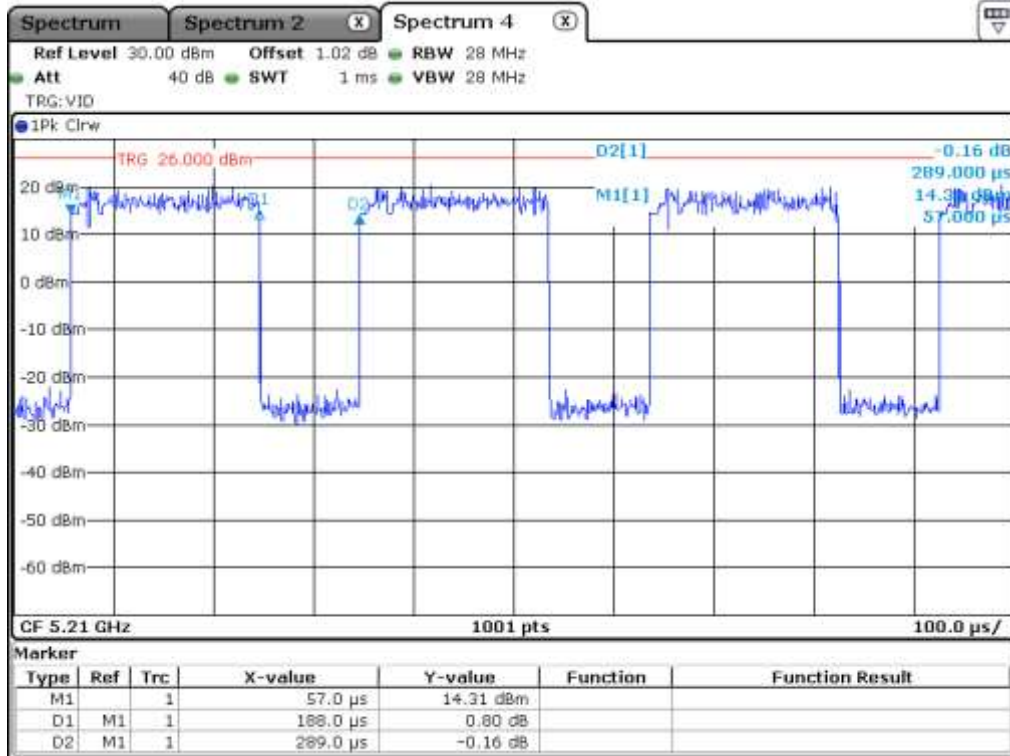
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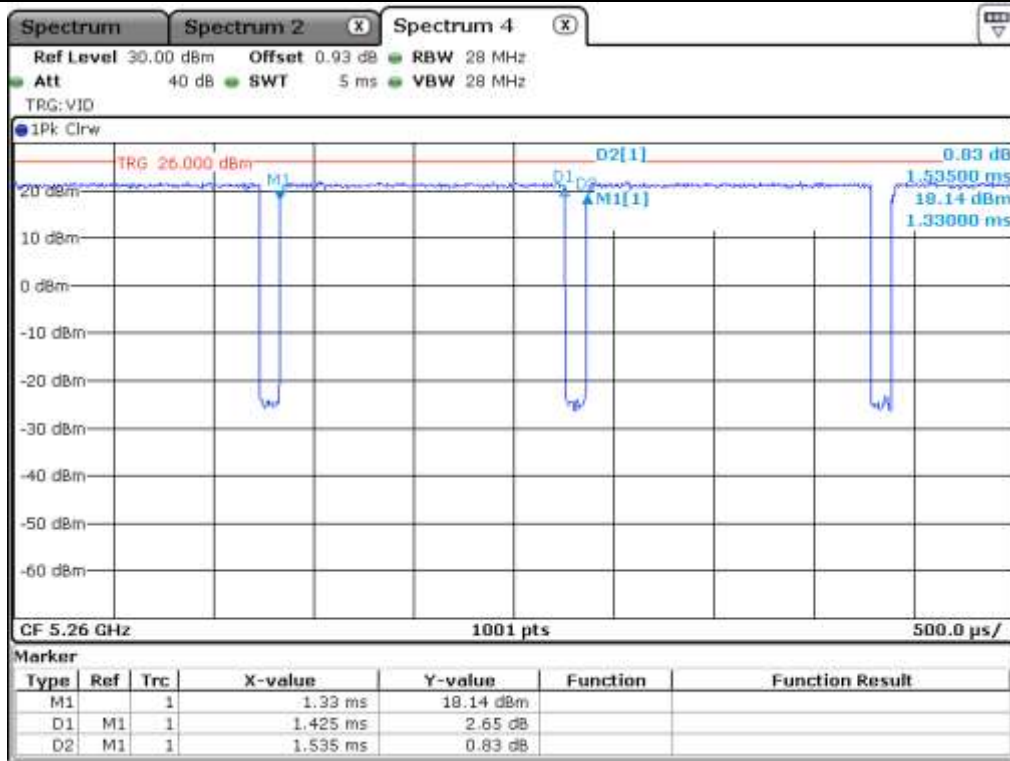
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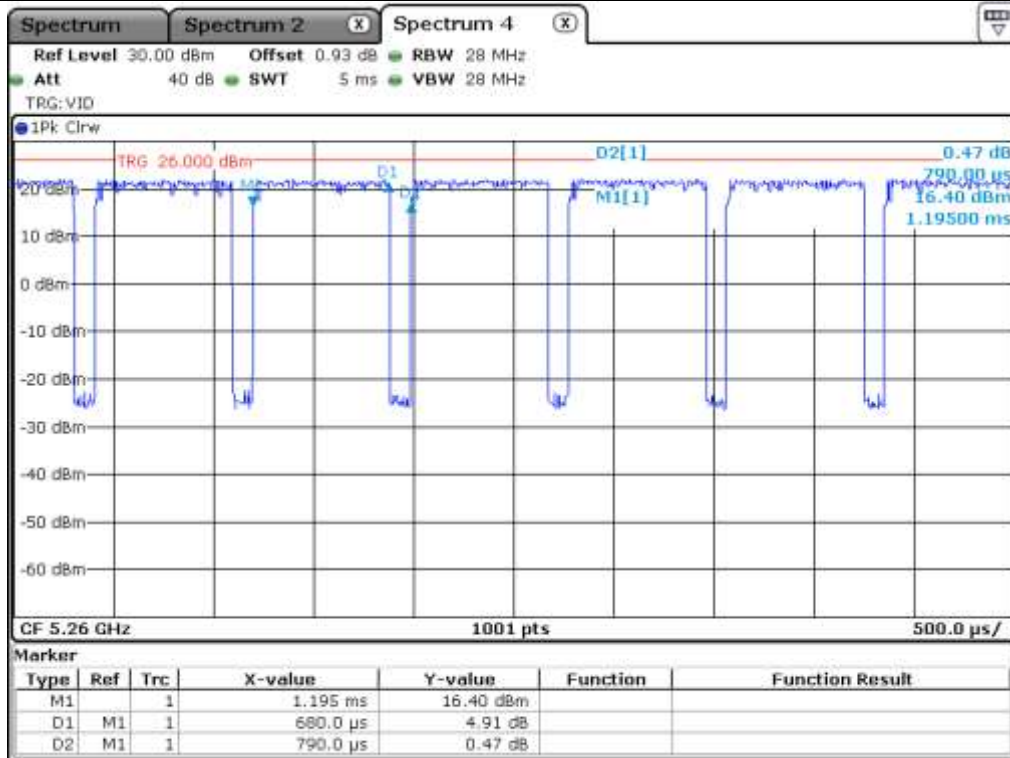
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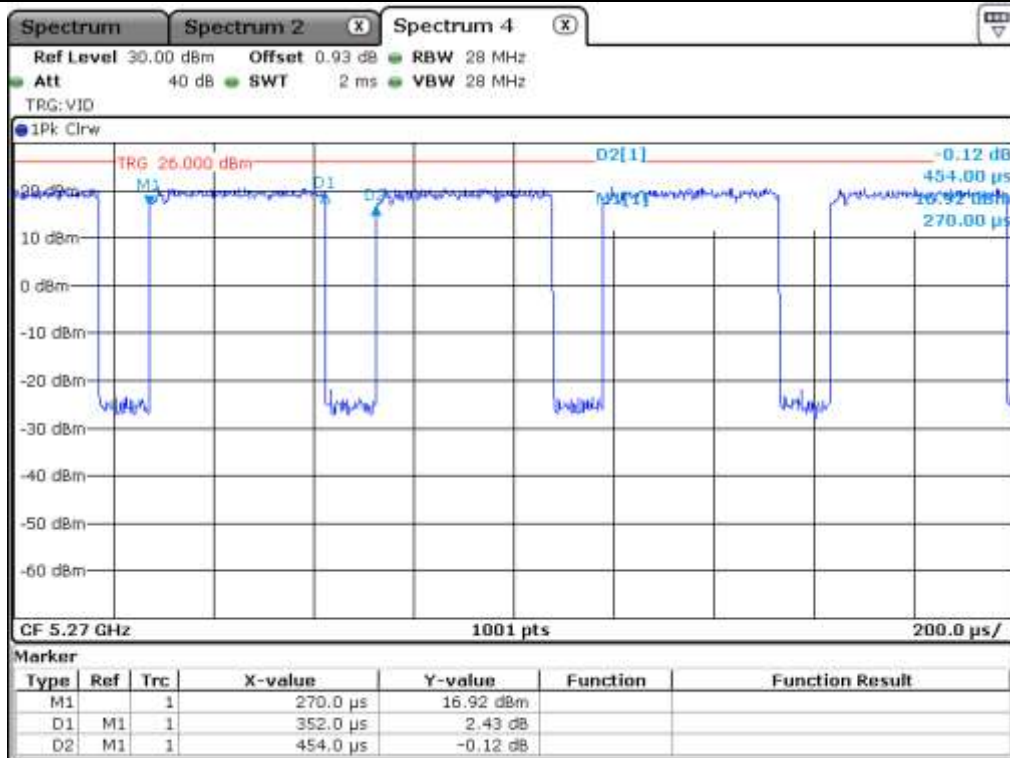
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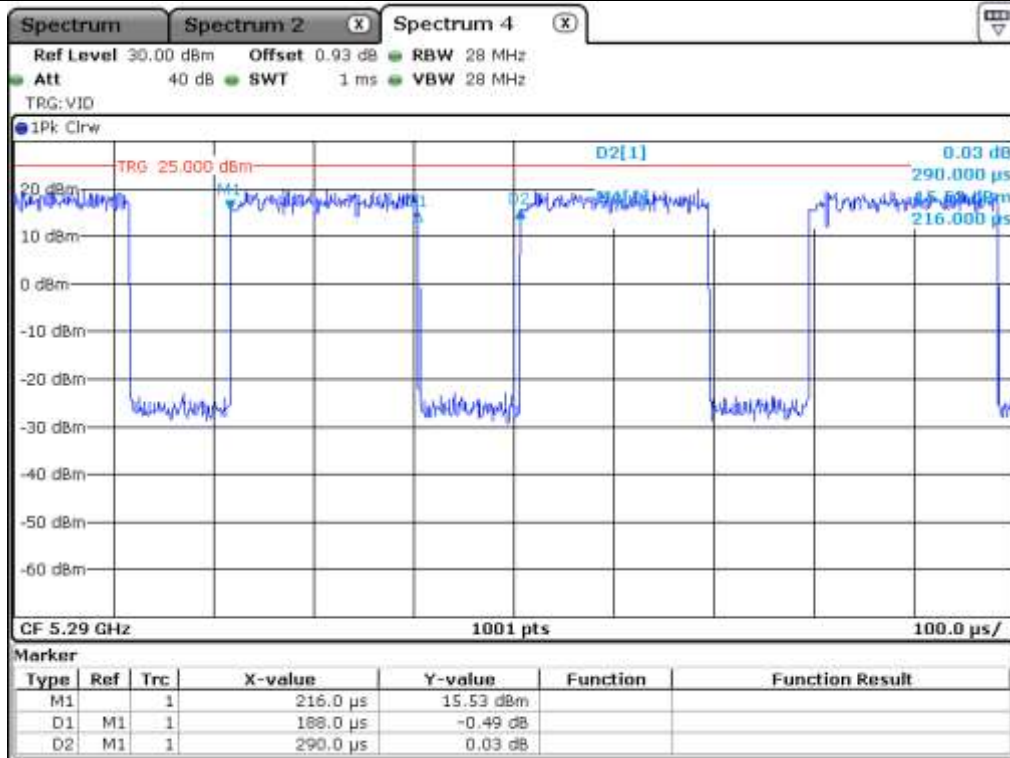
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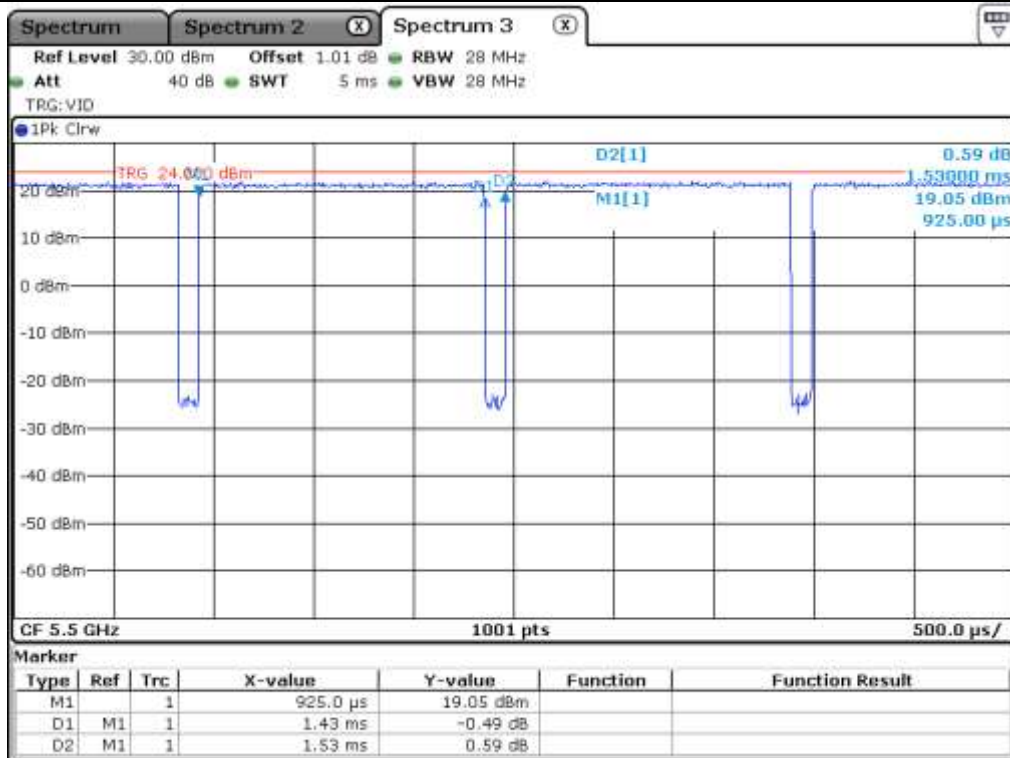
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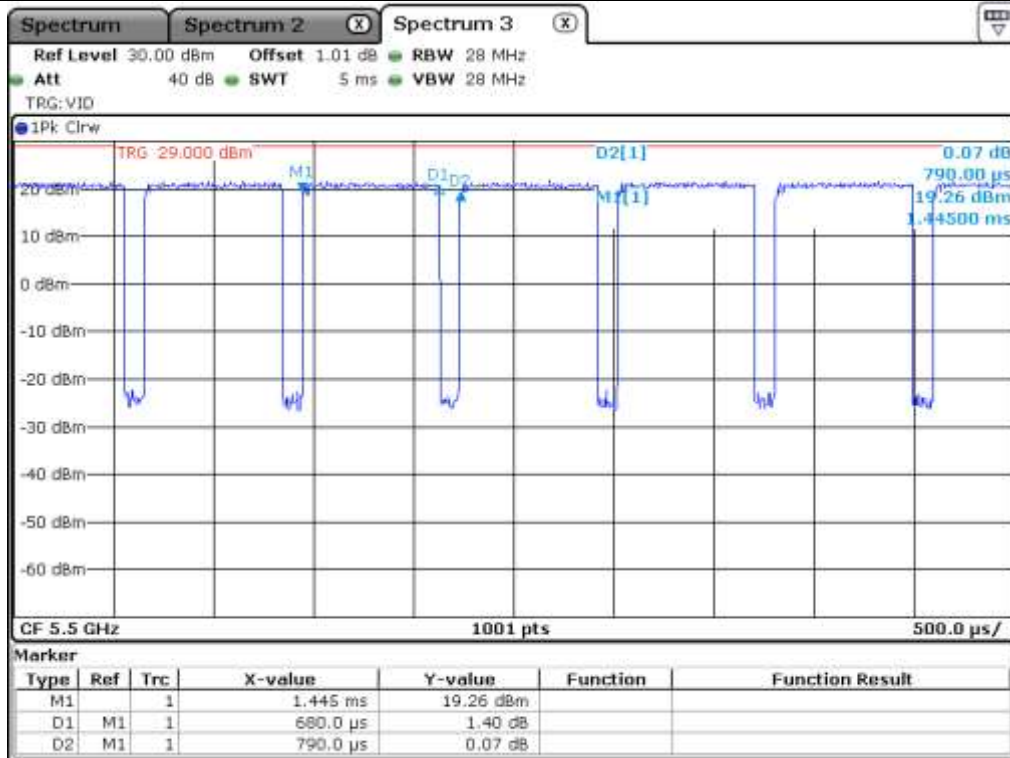
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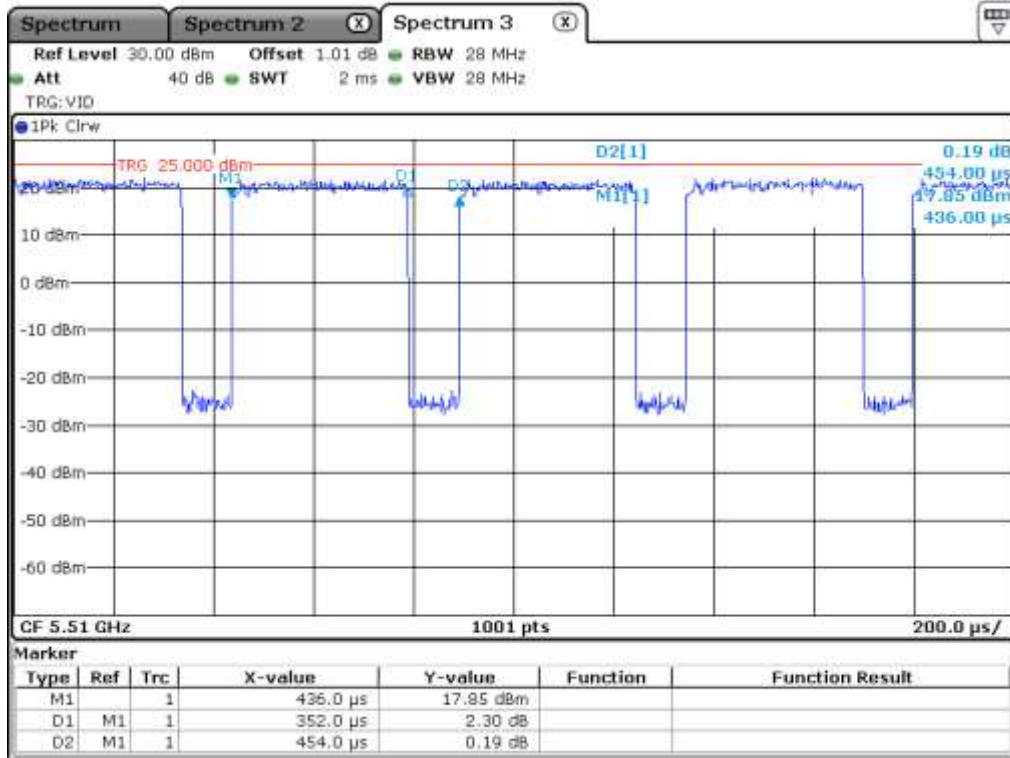
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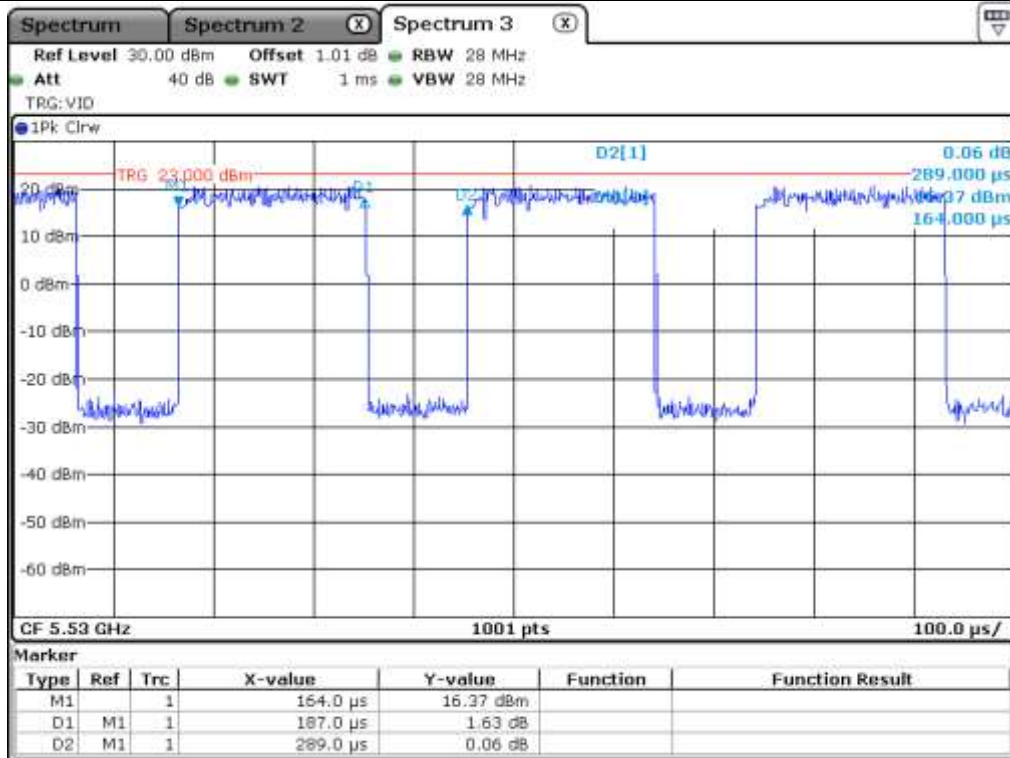
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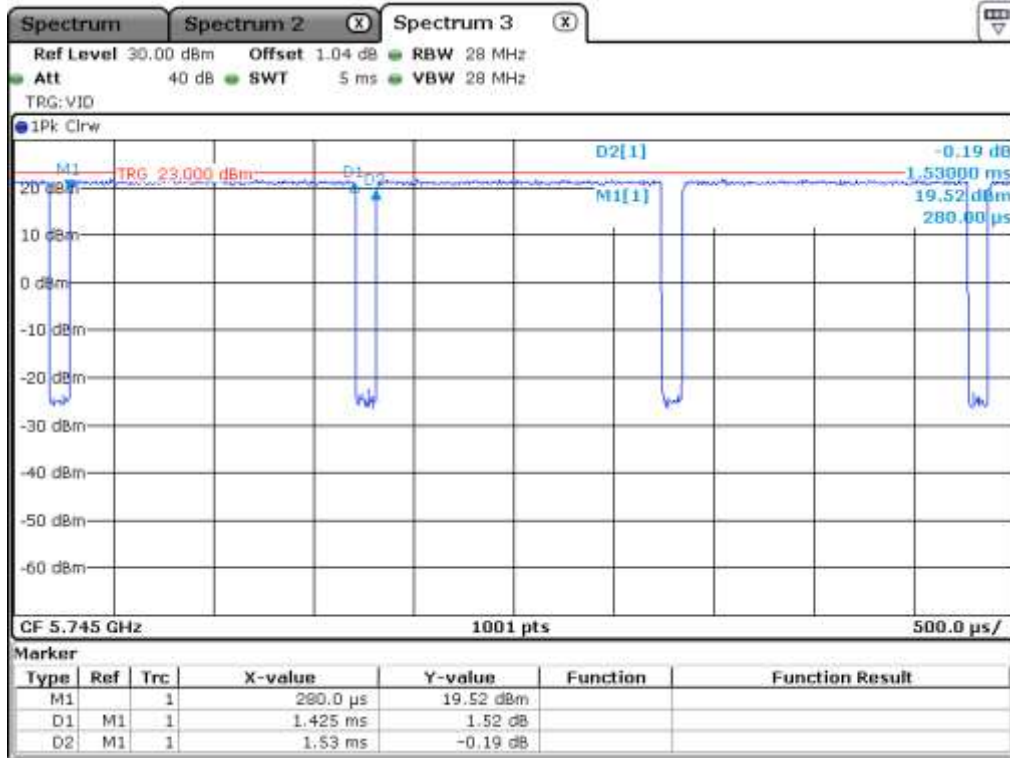
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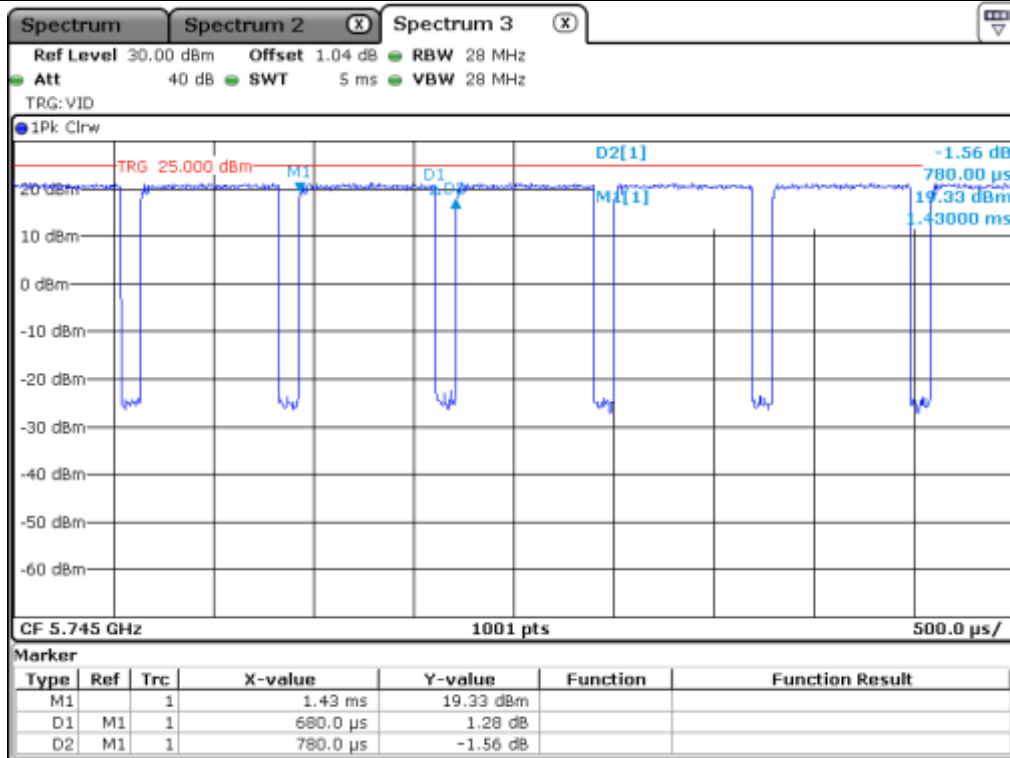
UNII 2C_802.11 HT40_Antenna 1



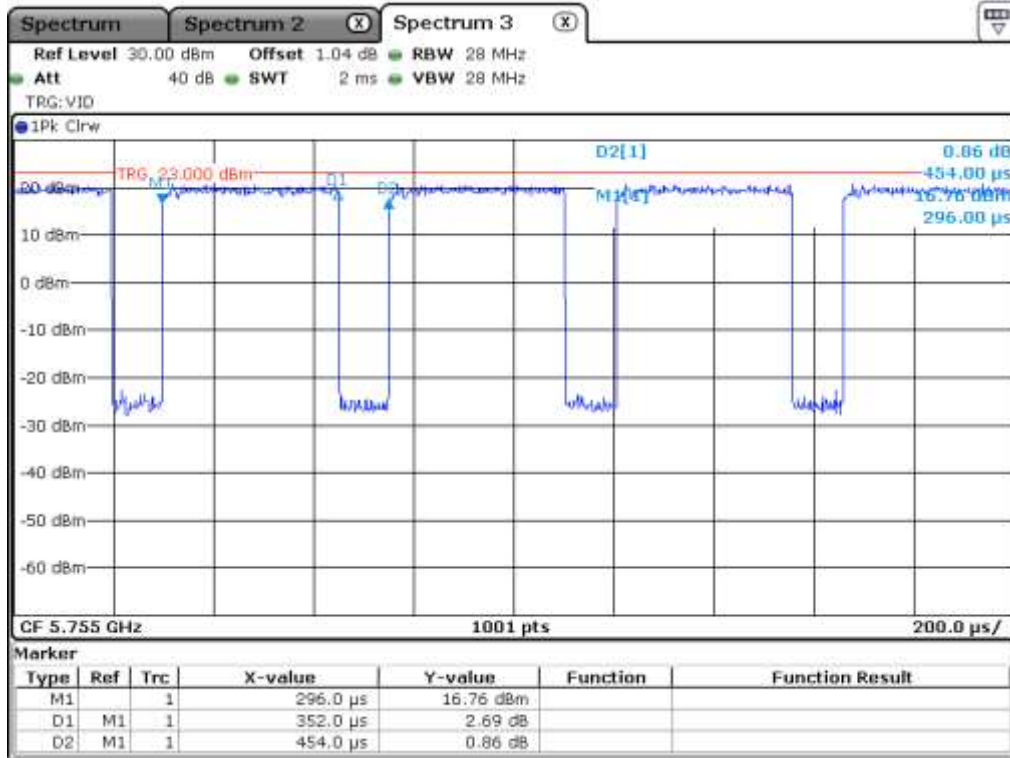
UNII 2C_802.11 VHT 80_Antenna 1



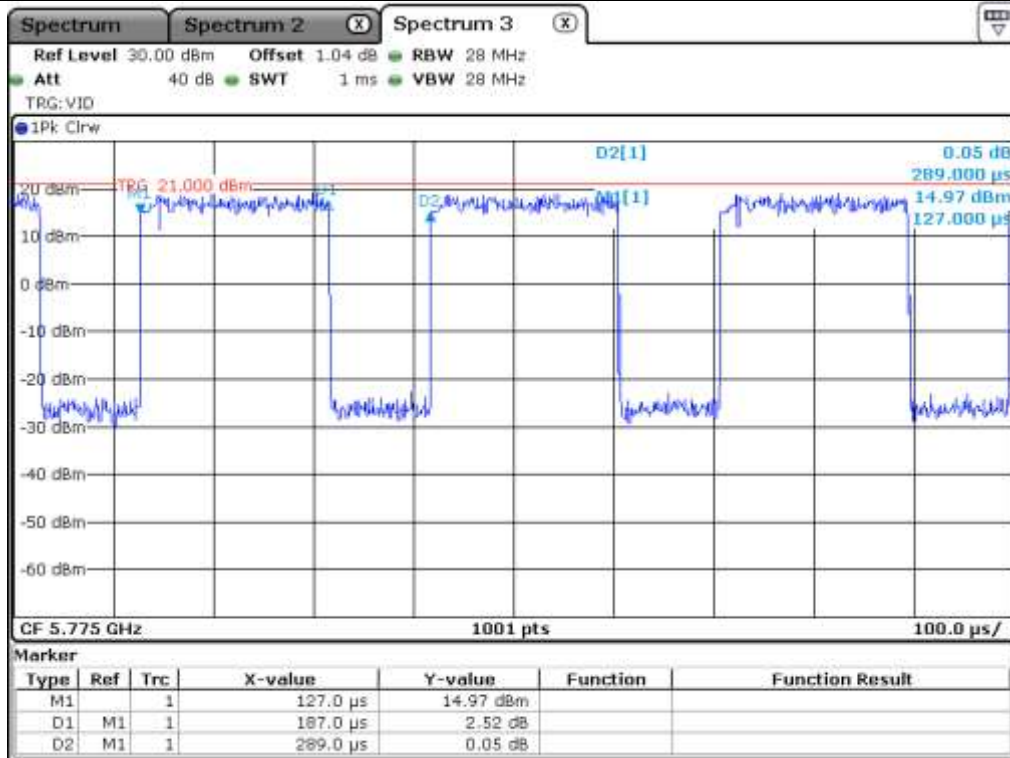
UNII 3_802.11 a_Antenna 1



UNII 3_802.11 HT 20_Antenna 1



UNII 3_802.11 HT40_Antenna 1



UNII 3_802.11 VHT 80_Antenna 1

5.4 Configuration of Test System

Line Conducted Test: It is not need to test this requirement, because the EUT shall be operated by DC Power.

Radiated Emission Test: Preliminary radiated emissions test were conducted using the procedure in ANSI C63.10: 2013 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 meter Semi Anechoic Chamber.

The turntable was rotated through 360 degrees and the EUT was tested by positioned three orthogonal planes to obtain the highest reading on the field strength meter. Once maximum reading was determined, the search antenna was raised and lowered in both vertical and horizontal polarization.

5.5 Antenna Requirement

For intentional device, according to section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna Construction:

The antenna of the EUT is a PCB Antenna on the main board in the EUT, The manufacturer has designed a structure that connects to the antenna using a unique coupling connector of the MCX type. So no consideration of replacement by the user.

6. PRELIMINARY TEST

6.1 AC Power line Conducted Emissions Tests

During Preliminary Test, the following operating mode was investigated.

| Operation Mode | The Worse operating condition (Please check one only) |
|--|---|
| It is not need to test this requirement, because the power of the EUT is supplied by DC Power. | |

6.2 General Radiated Emissions Tests

During Preliminary Test, the following operating mode was investigated.

| Operation Mode | The Worse operating condition (Please check one only) |
|-------------------|---|
| Transmitting Mode | X |

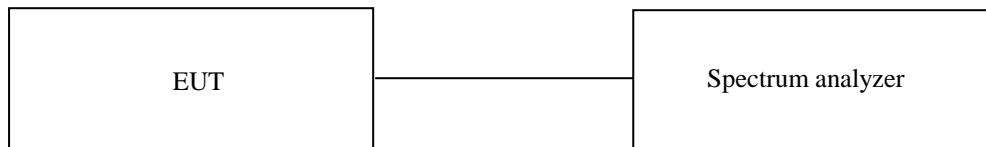
7. MINIMUM 26 dB BANDWIDTH

7.1 Operating environment

Temperature : 23 °C
Relative humidity : 45 % R.H.

7.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 1 % to 5 % of the OBW, and peak detection was used. The 26 dB bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 26 dB.



7.3 Test Date

September 07, 2020 ~ September 11, 2020

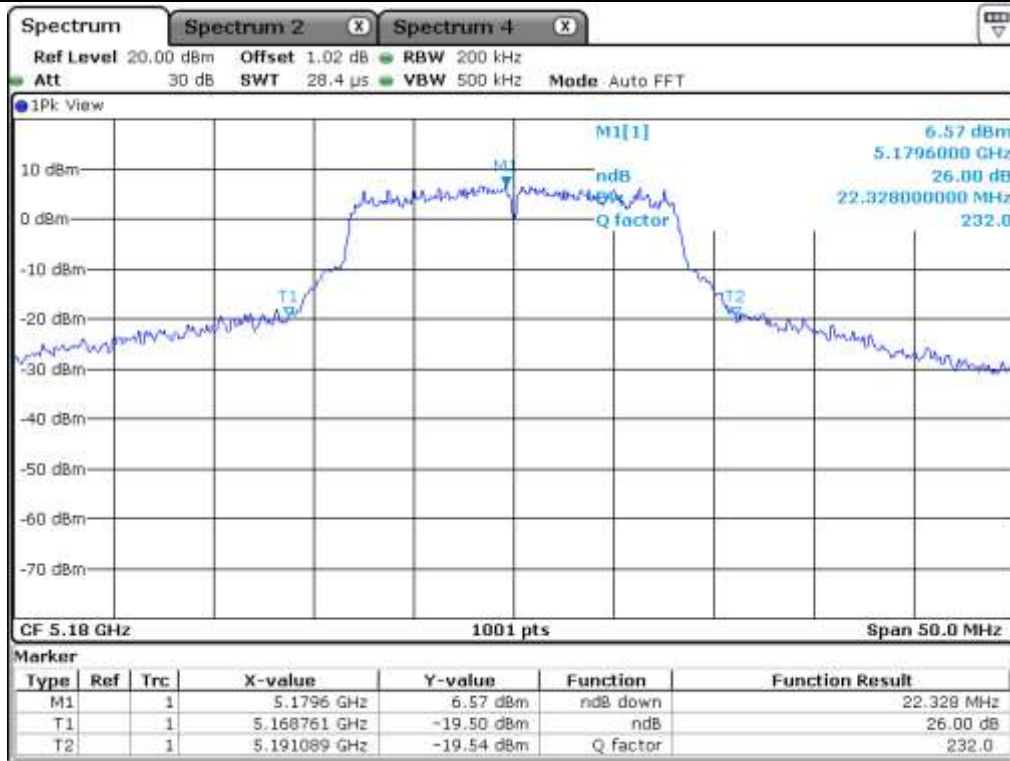
7.4 Test data for 802.11a RLAN Mode

7.4.1 Test data for Antenna 0

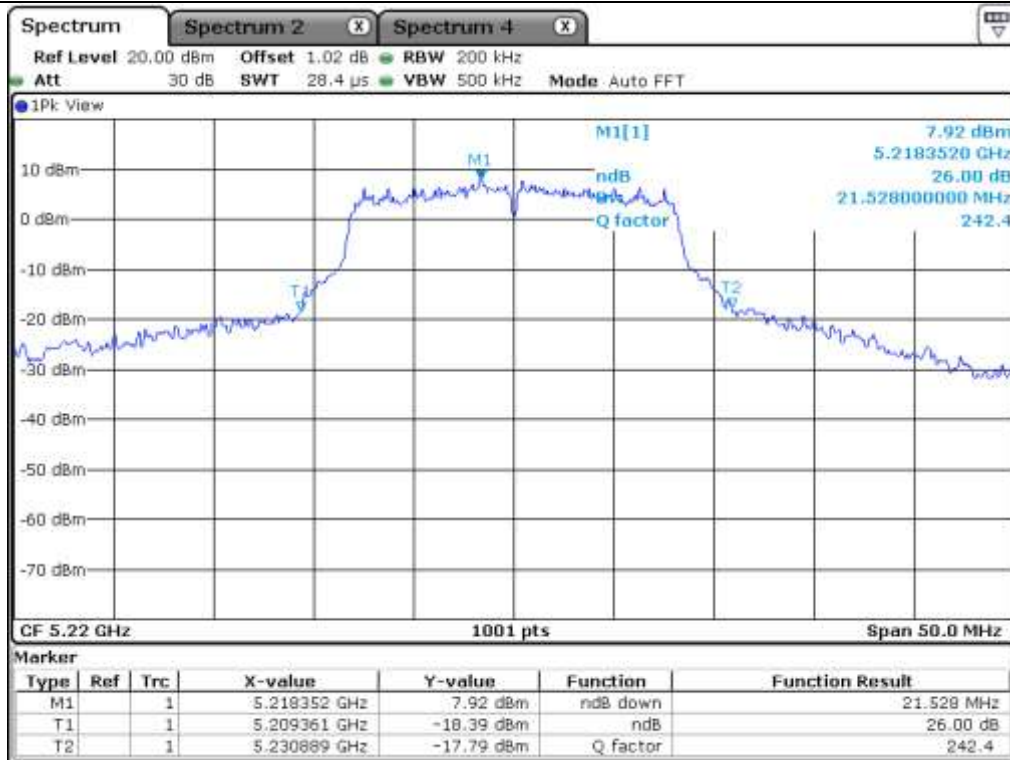
-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | 26 dB Bandwidth (MHz) |
|--------------------------|---------|--------------------|--------------------------|
| 5 150 ~ 5 250 | Low | 5 180.00 | 22.33 |
| | Middle | 5 220.00 | 21.53 |
| | High | 5 240.00 | 21.78 |
| 5 250 ~ 5 350 | Low | 5 260.00 | 19.78 |
| | Middle | 5 300.00 | 21.63 |
| | High | 5 320.00 | 21.63 |
| 5 470 ~ 5 725 | Low | 5 500.00 | 19.93 |
| | Middle | 5 580.00 | 21.68 |
| | High | 5 700.00 | 21.13 |
| 5 725 ~ 5 850 | Low | 5 745.00 | 21.98 |
| | Middle | 5 785.00 | 21.98 |
| | High | 5 825.00 | 21.78 |

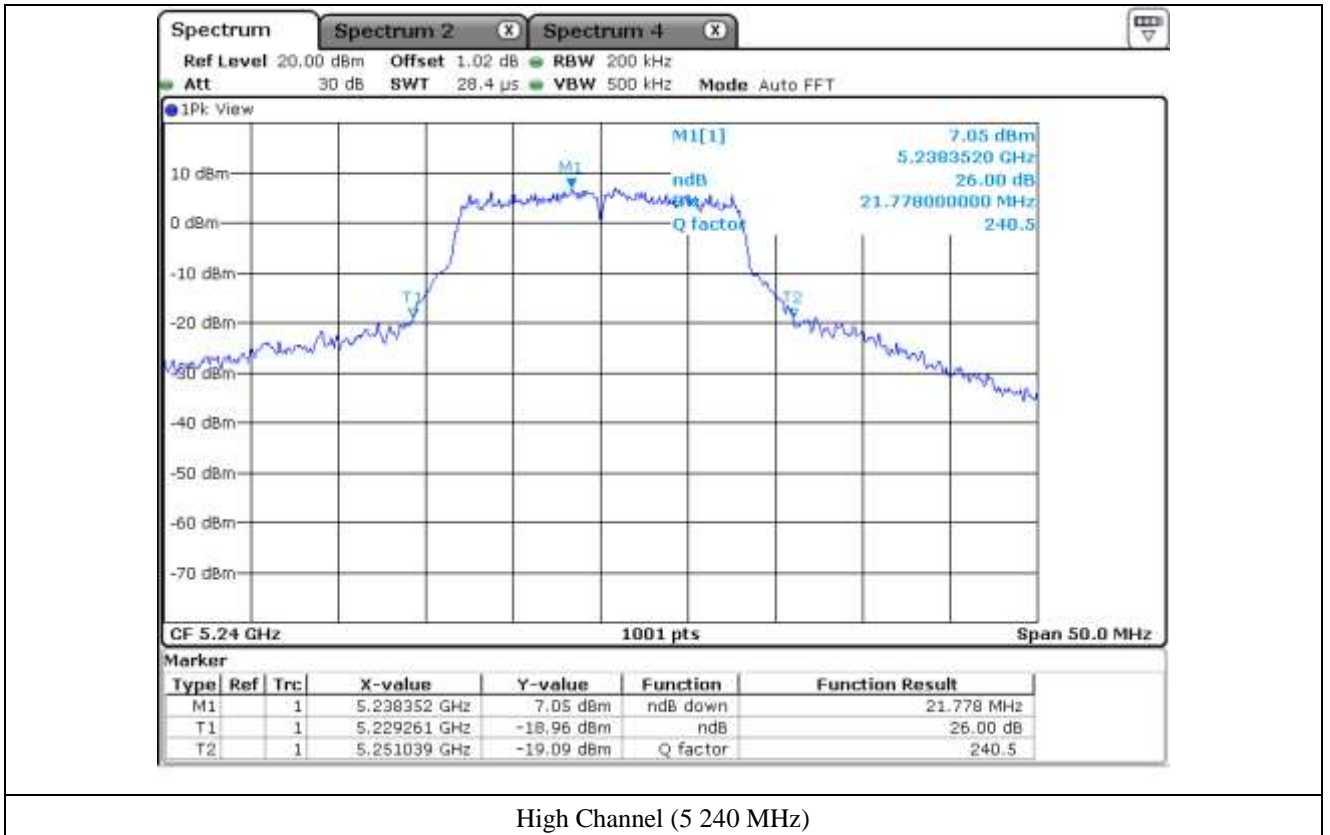
Remark: See next page for measurement data.



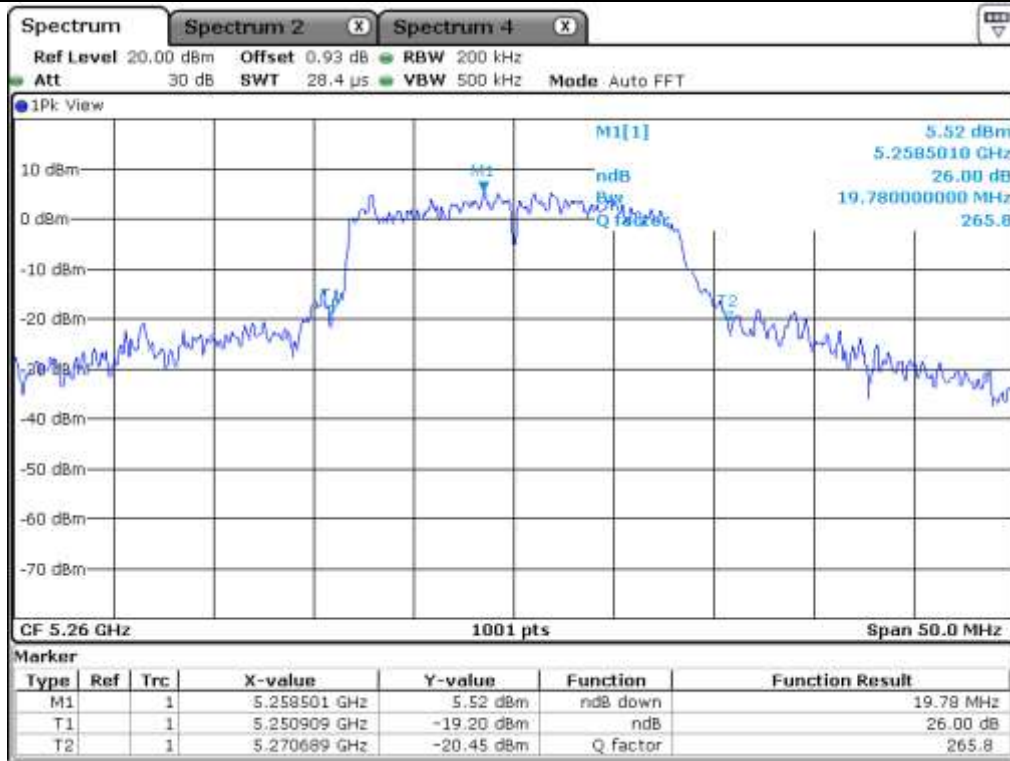
Low Channel (5 180 MHz)



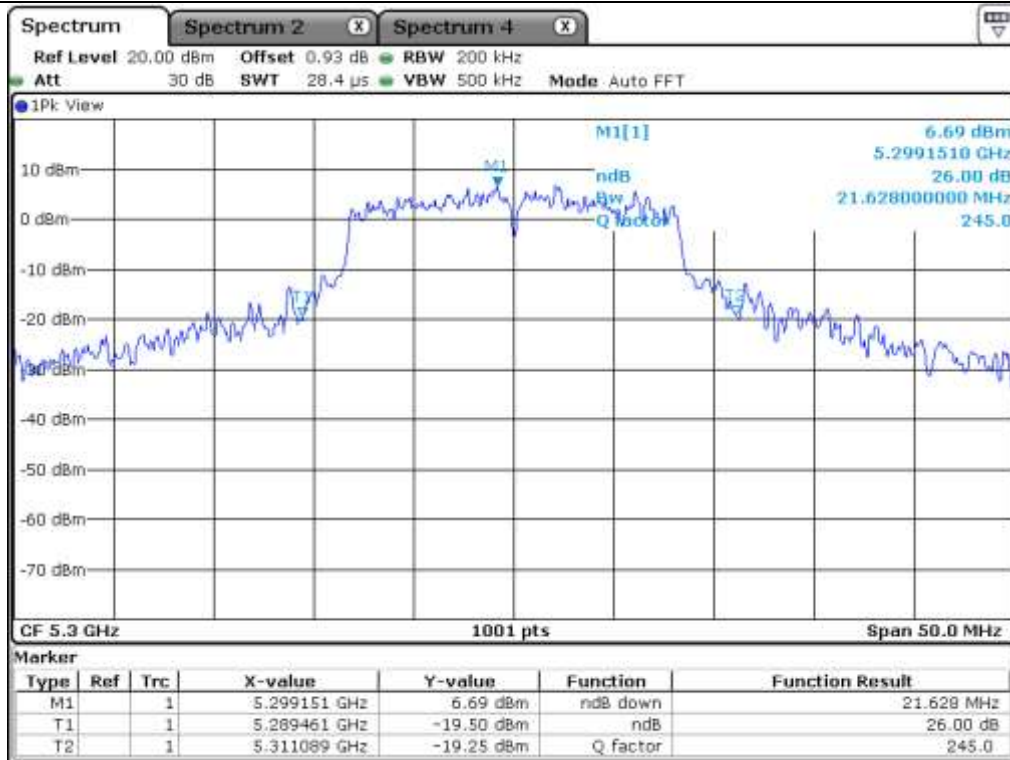
Middle Channel (5 220 MHz)



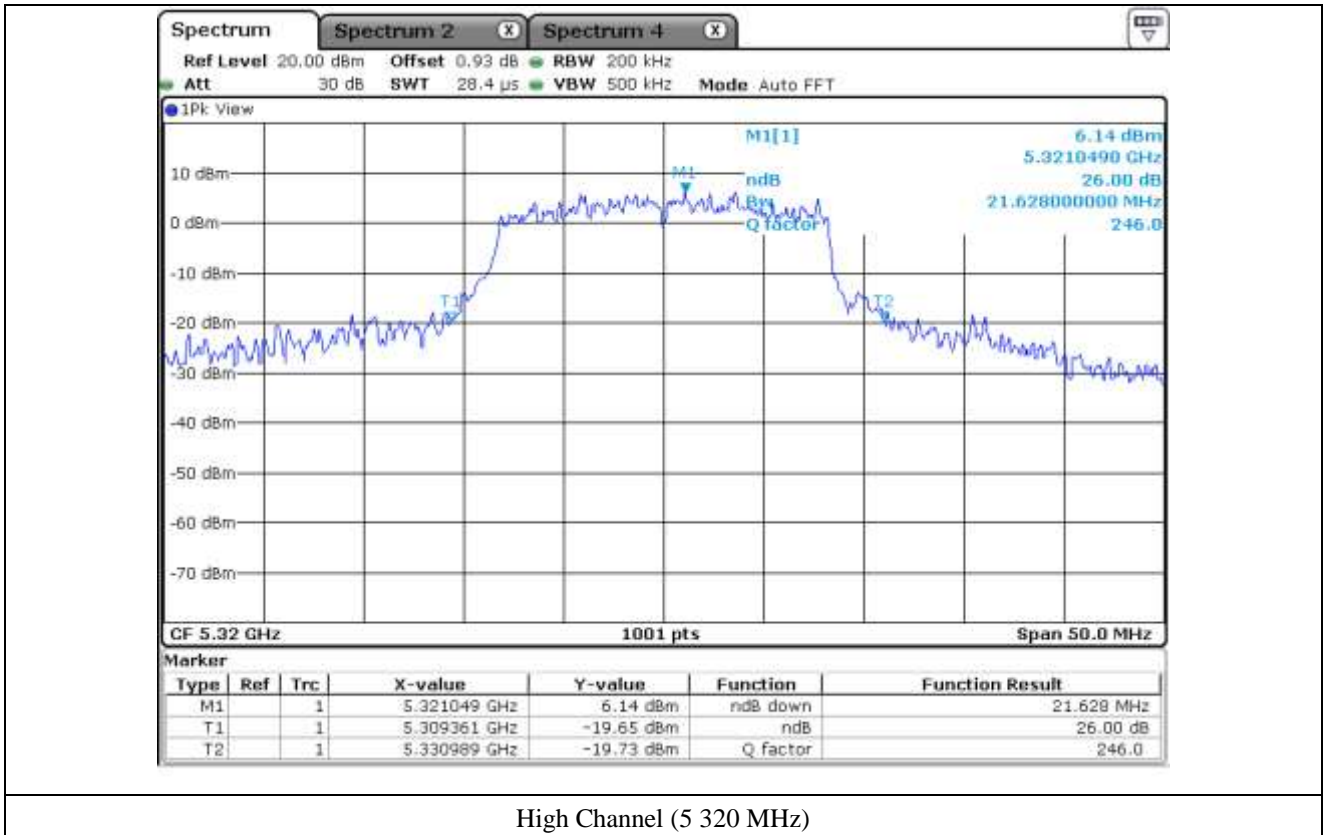
High Channel (5 240 MHz)

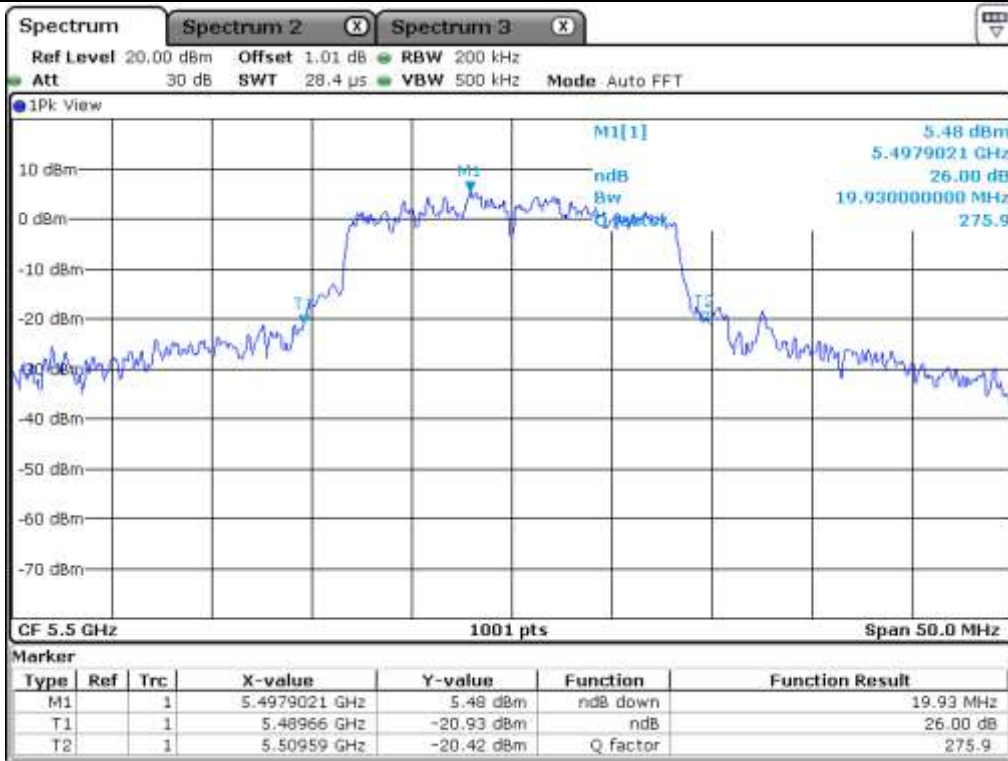


Low Channel (5 260 MHz)

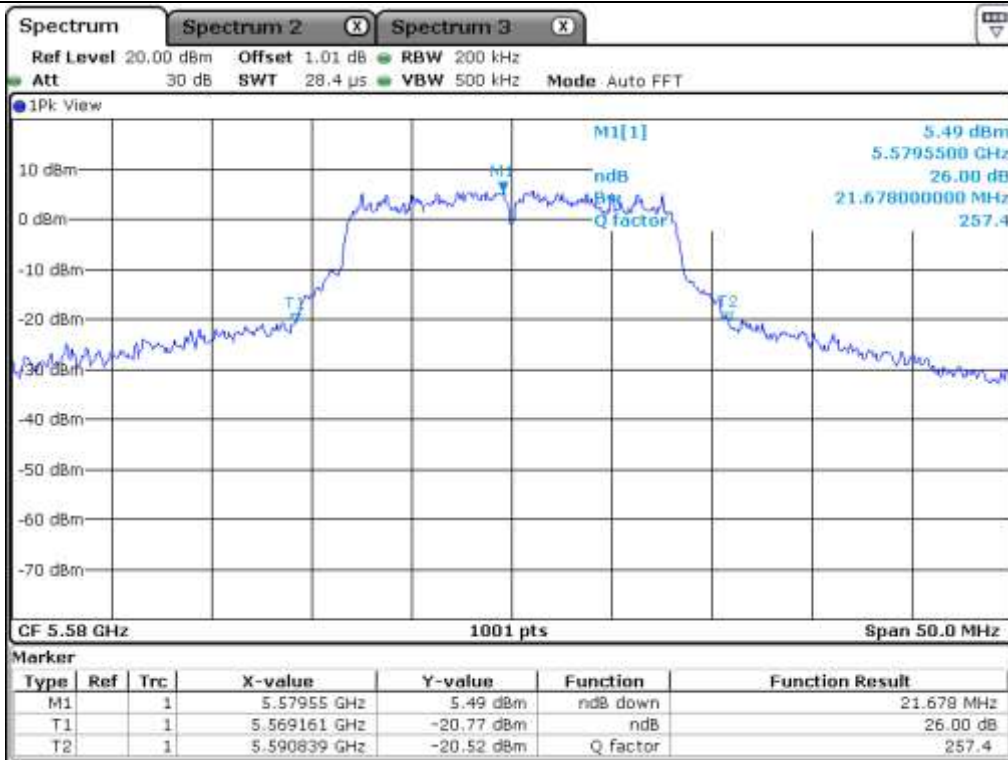


Middle Channel (5 300 MHz)

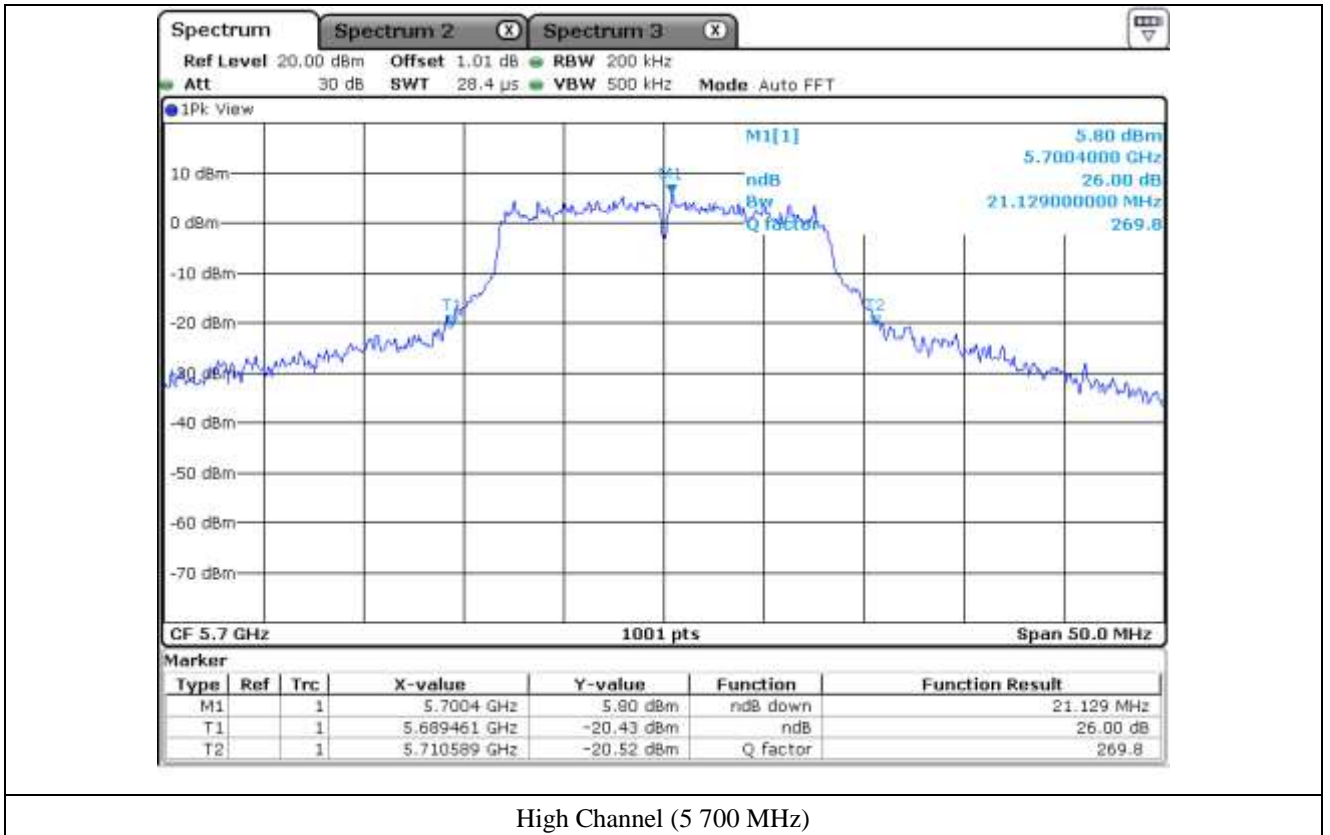




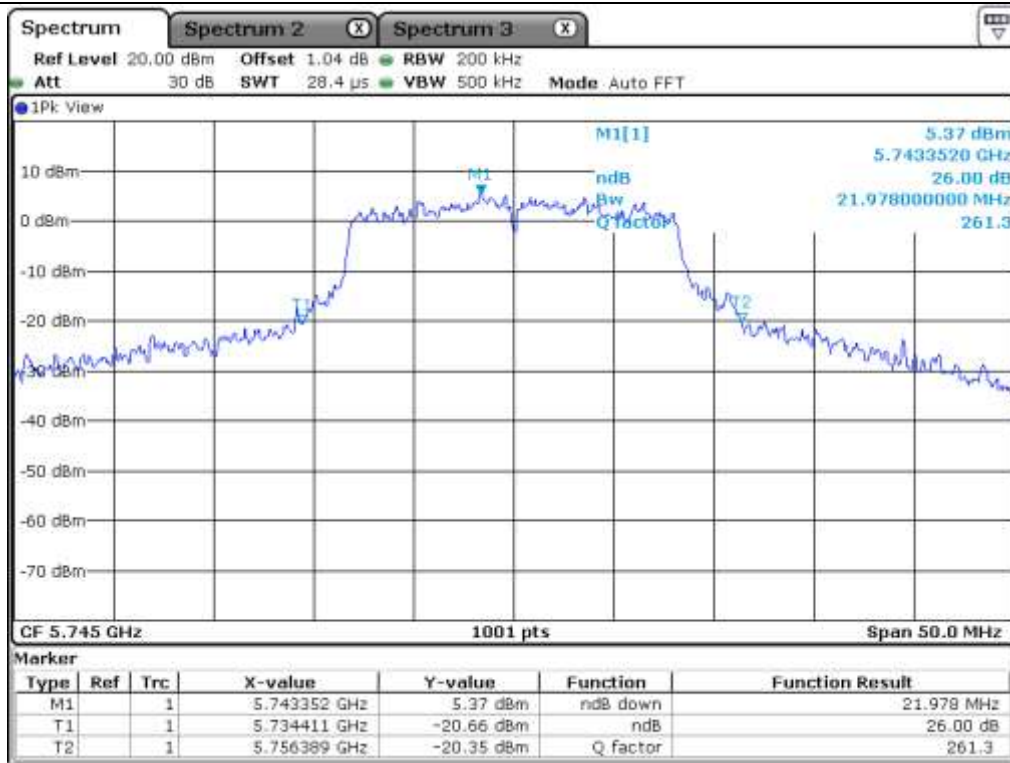
Low Channel (5 500 MHz)



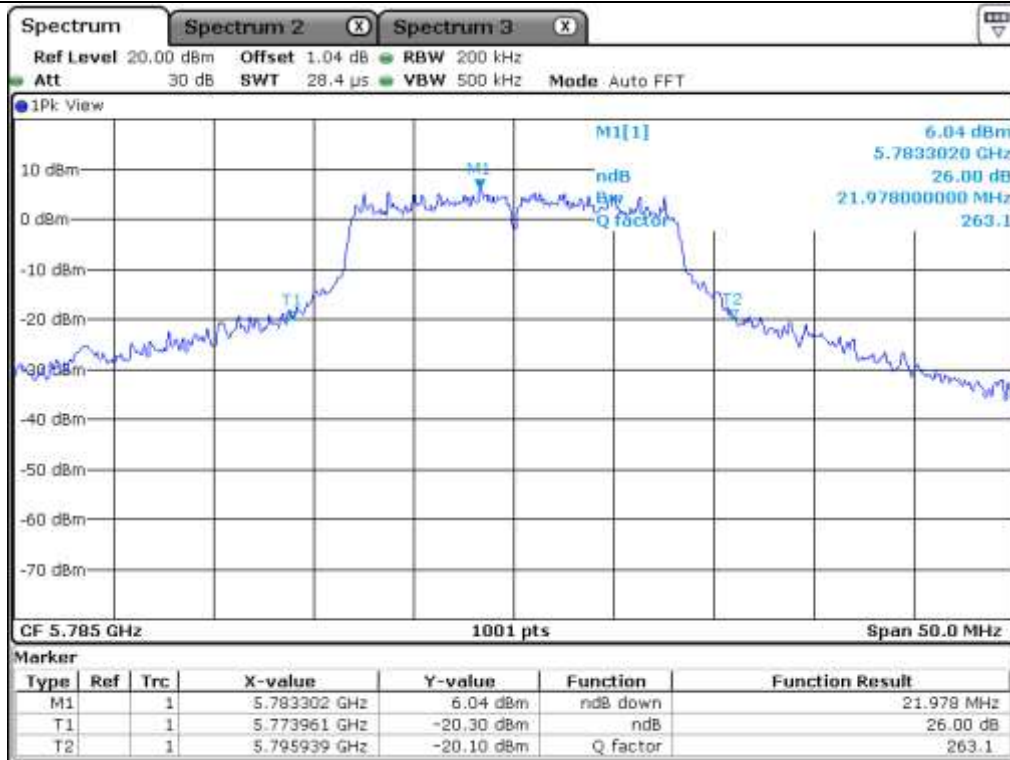
Middle Channel (5 580 MHz)



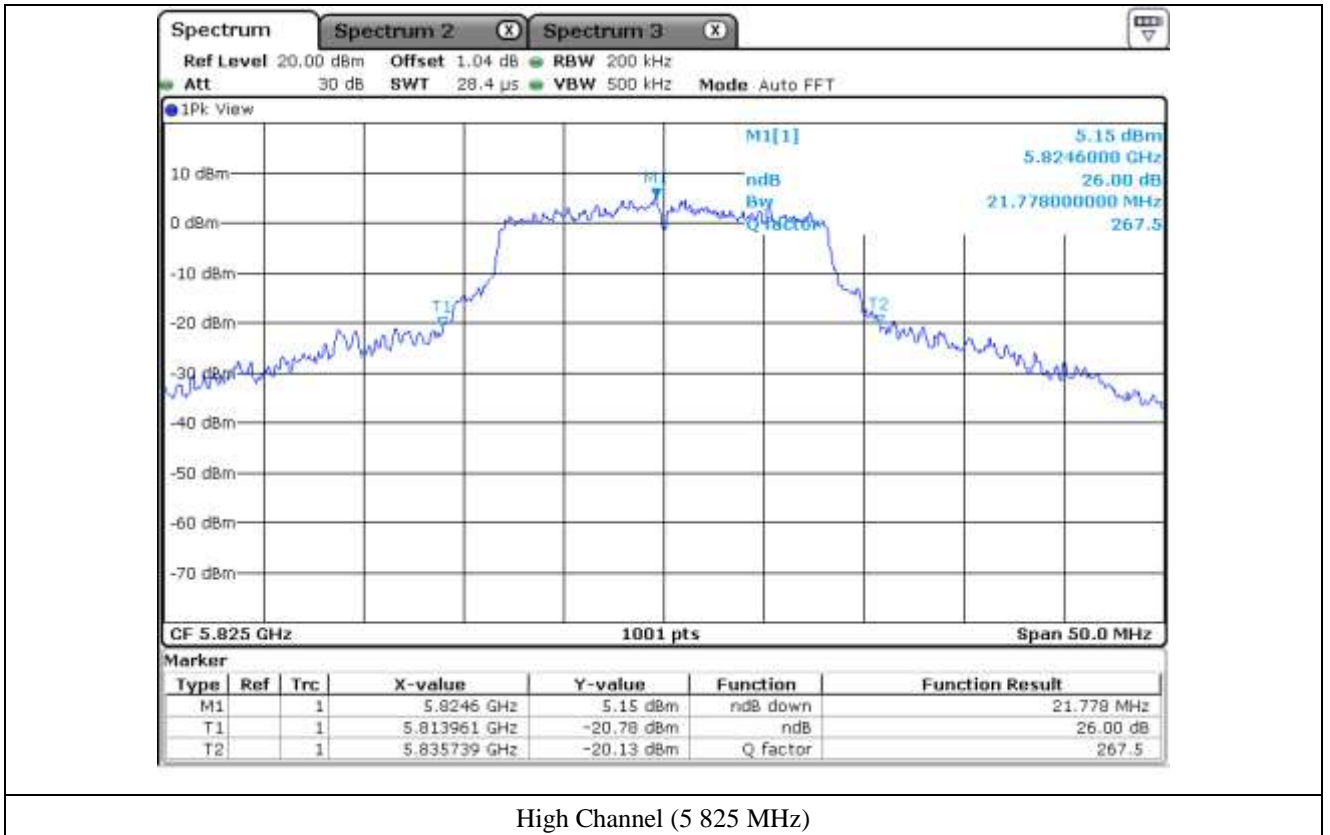
High Channel (5 700 MHz)



Low Channel (5.745 MHz)



Middle Channel (5.785 MHz)

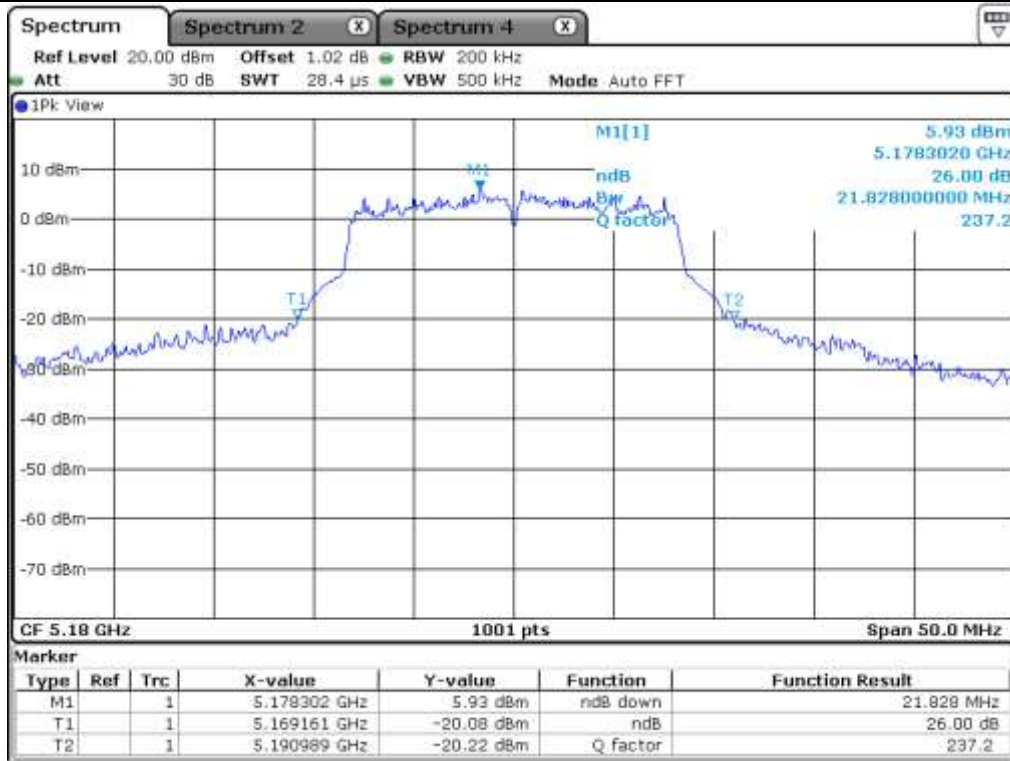


7.4.2 Test data for Antenna 1

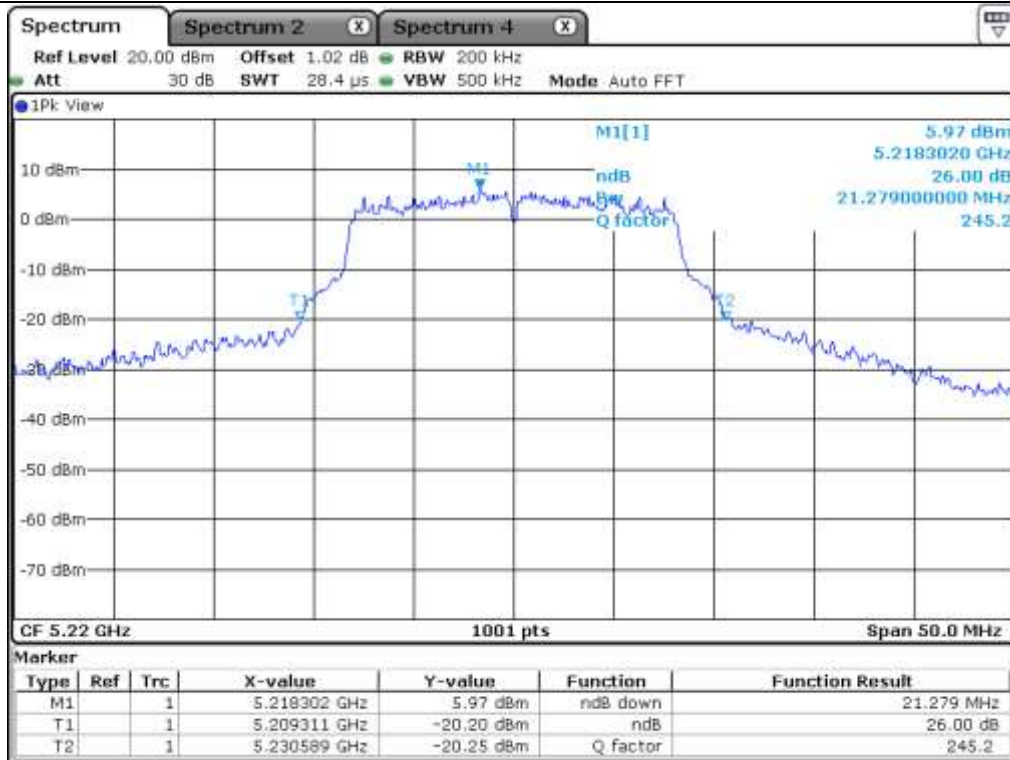
-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | 26 dB Bandwidth (MHz) |
|--------------------------|---------|--------------------|--------------------------|
| 5 150 ~ 5 250 | Low | 5 180.00 | 21.83 |
| | Middle | 5 220.00 | 21.28 |
| | High | 5 240.00 | 21.48 |
| 5 250 ~ 5 350 | Low | 5 260.00 | 20.18 |
| | Middle | 5 300.00 | 21.08 |
| | High | 5 320.00 | 21.33 |
| 5 470 ~ 5 725 | Low | 5 500.00 | 19.03 |
| | Middle | 5 580.00 | 20.73 |
| | High | 5 700.00 | 21.13 |
| 5 725 ~ 5 850 | Low | 5 745.00 | 22.08 |
| | Middle | 5 785.00 | 21.98 |
| | High | 5 825.00 | 21.48 |

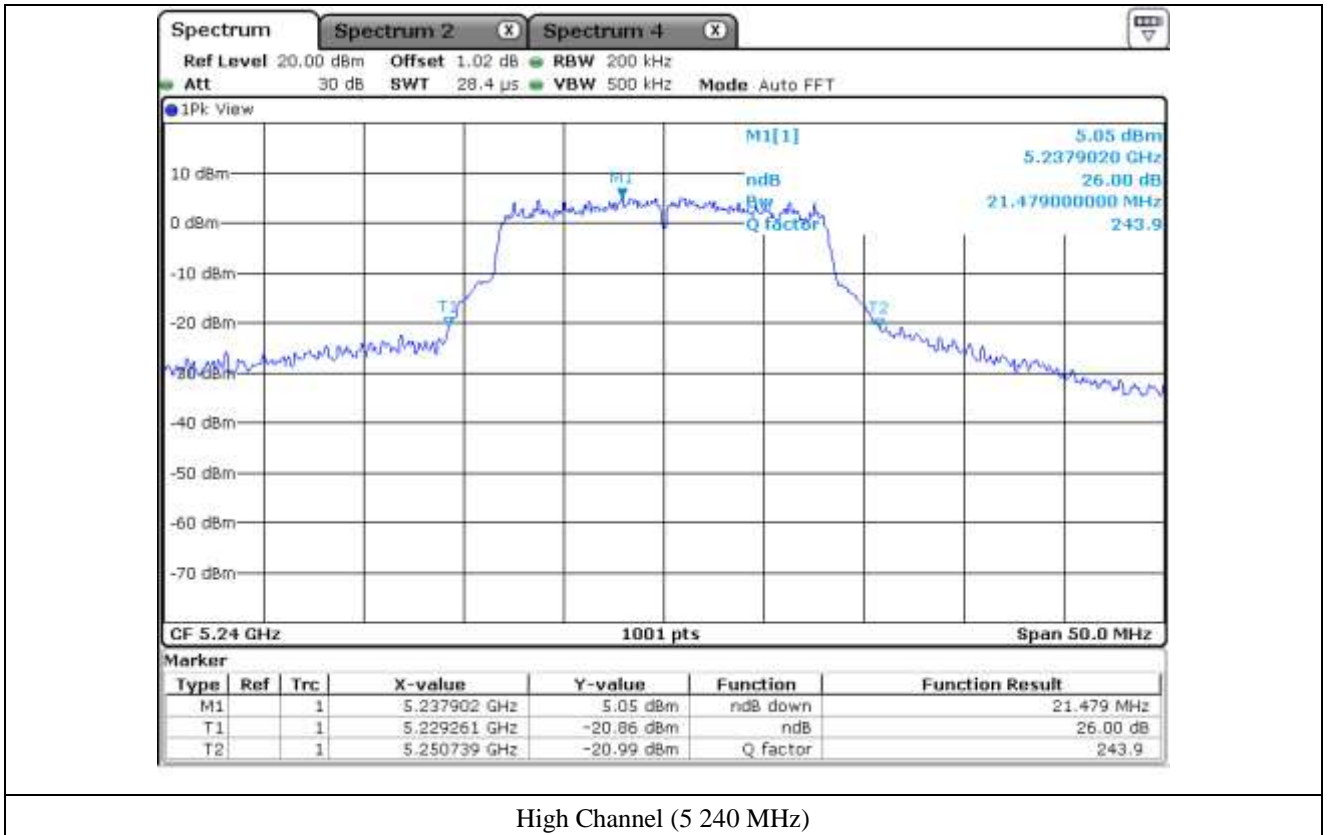
Remark: See next page for measurement data.

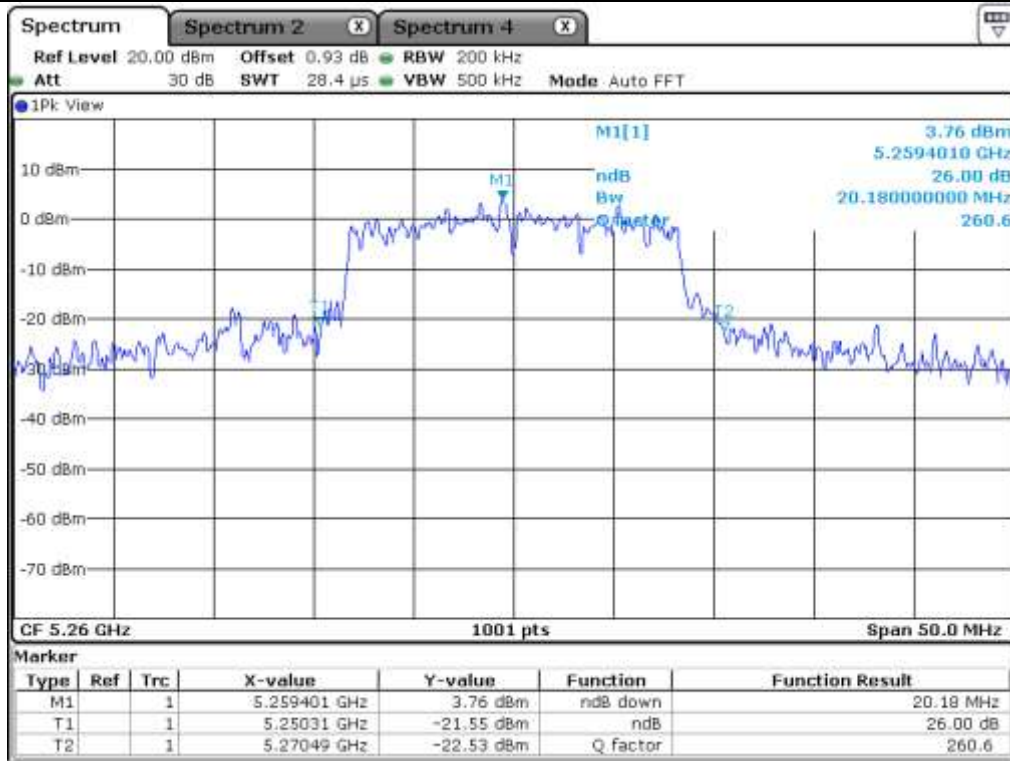


Low Channel (5 180 MHz)

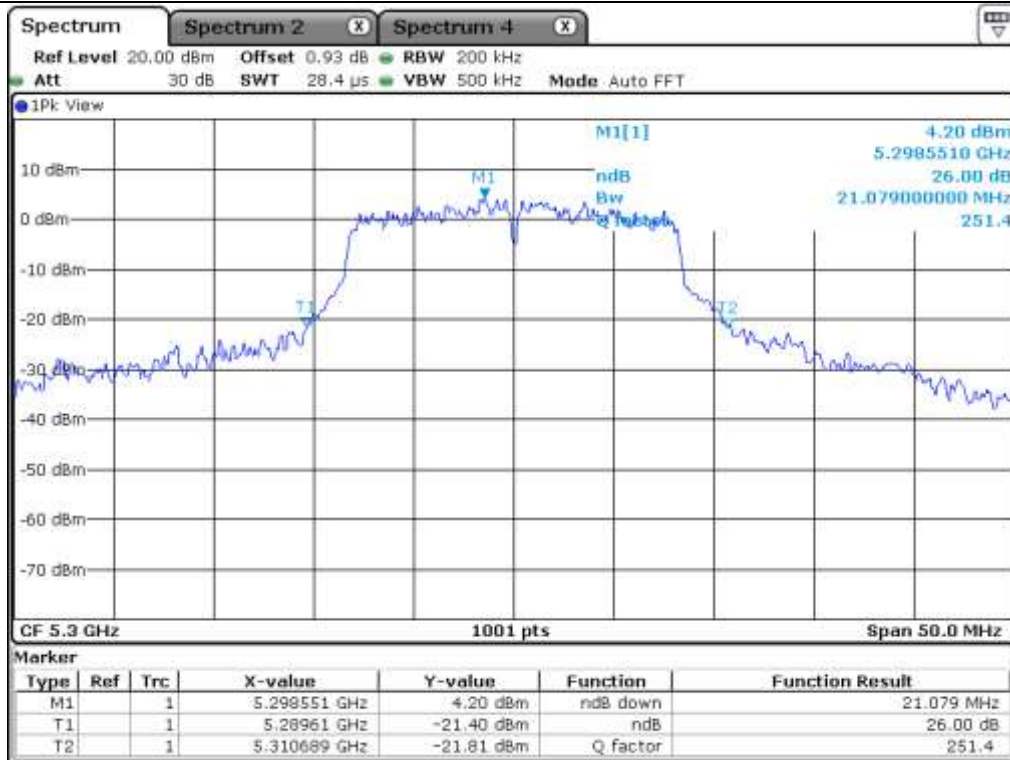


Middle Channel (5 220 MHz)

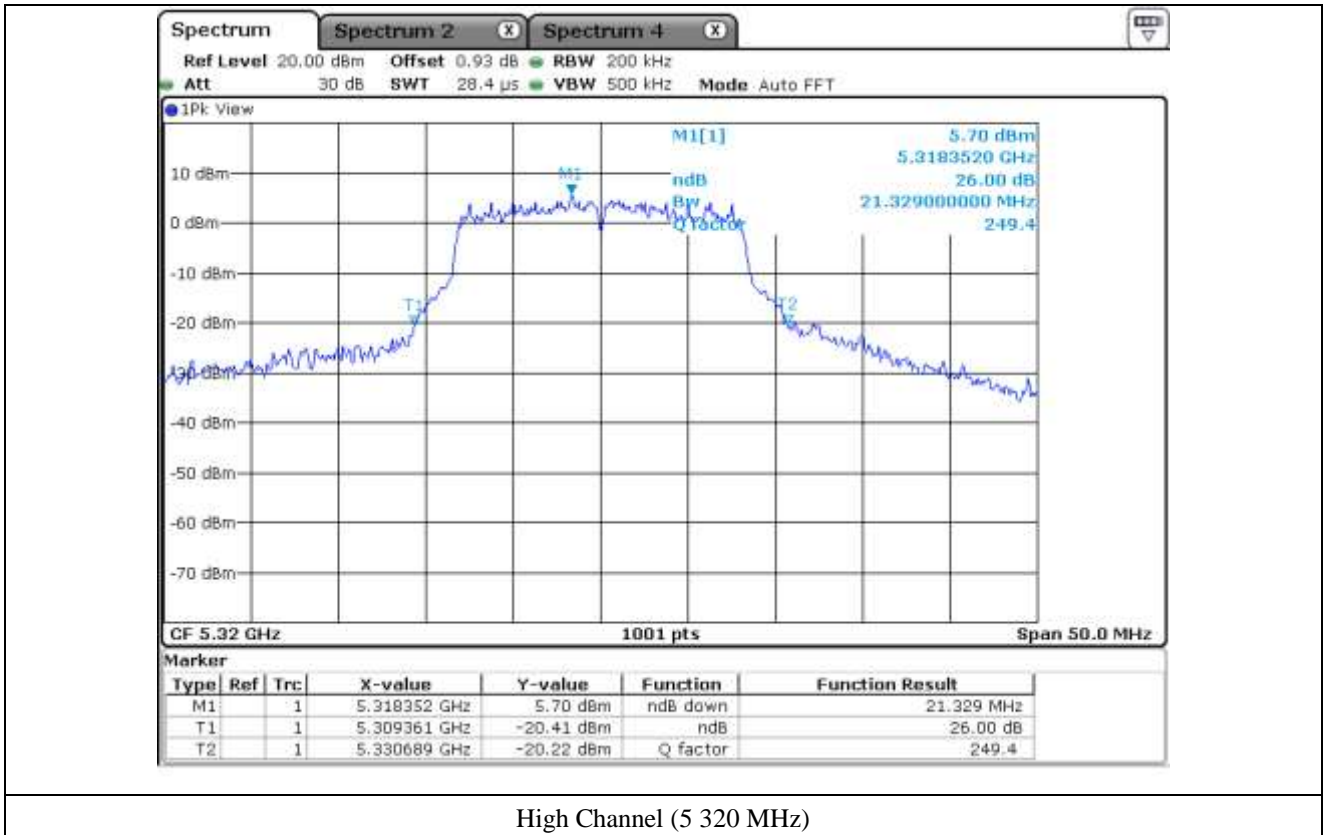


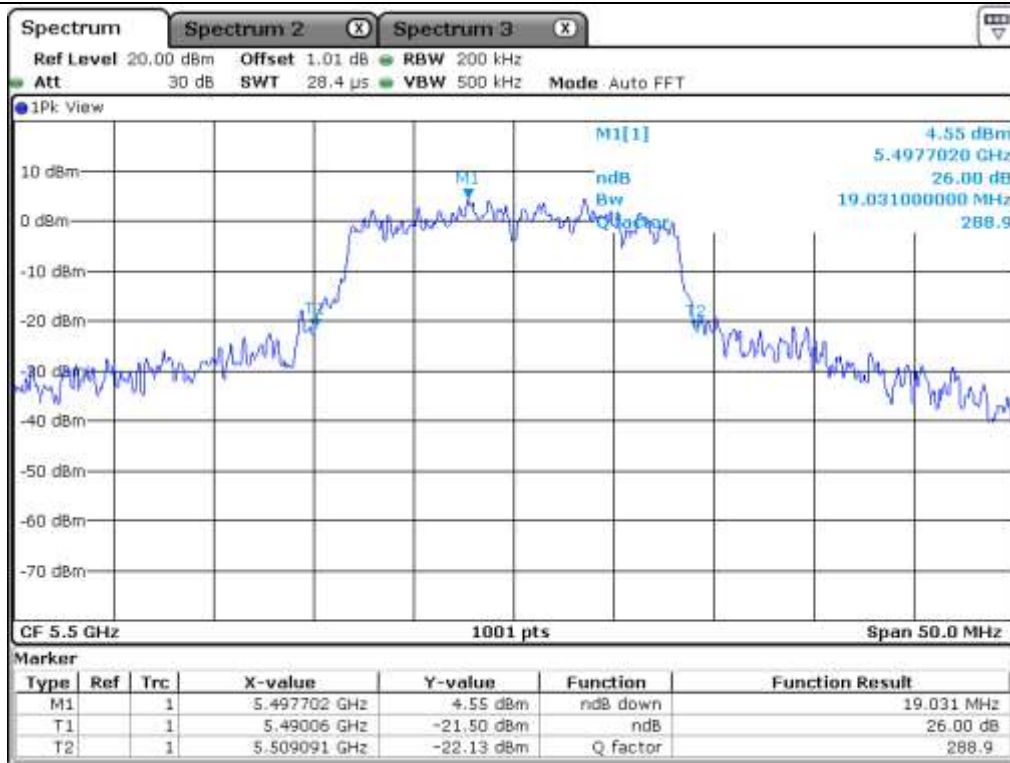


Low Channel (5 260 MHz)

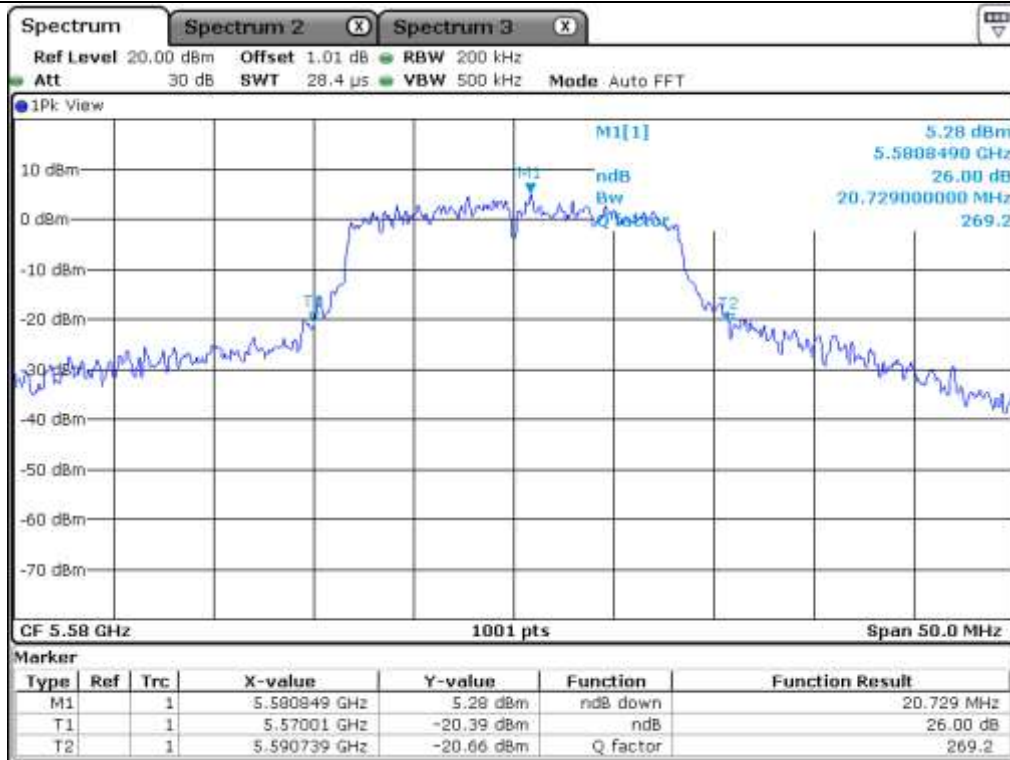


Middle Channel (5 300 MHz)

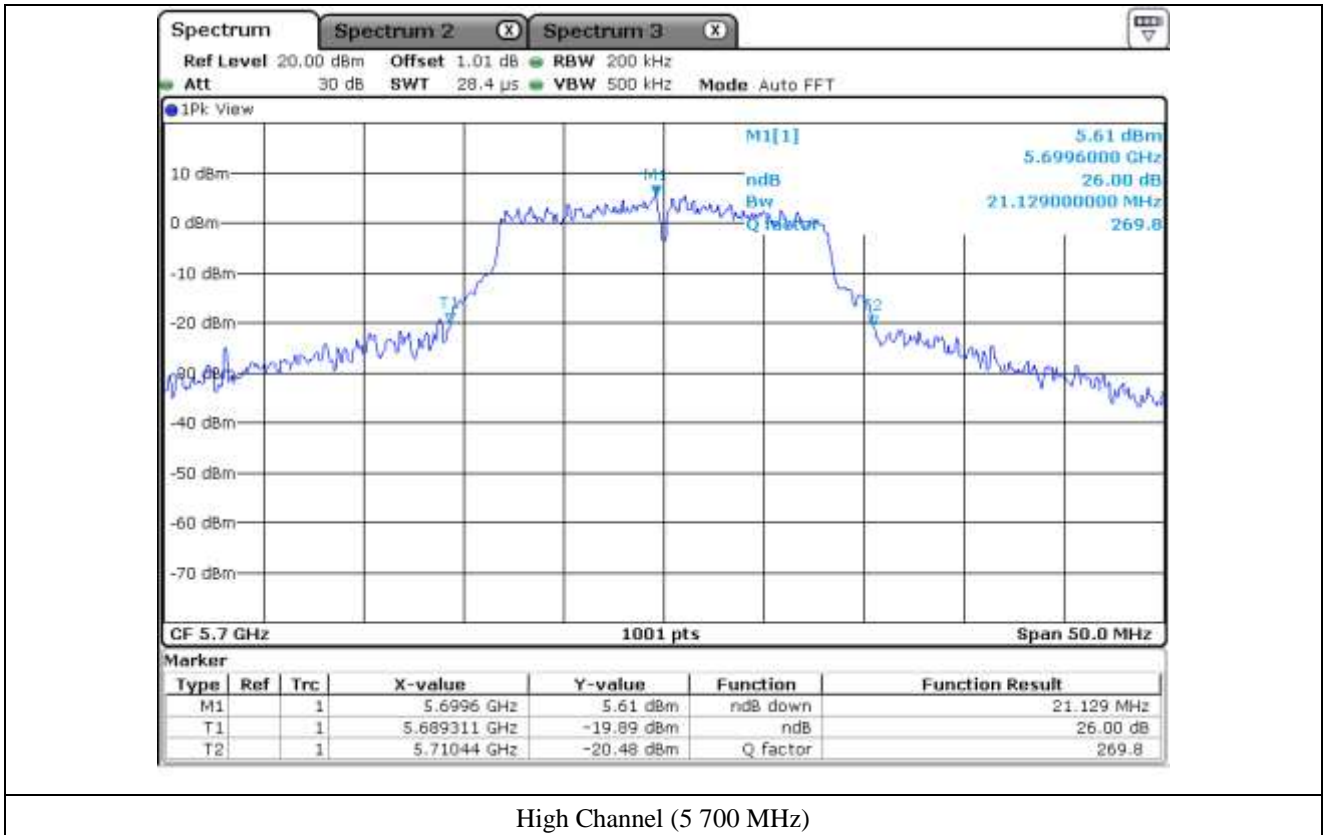


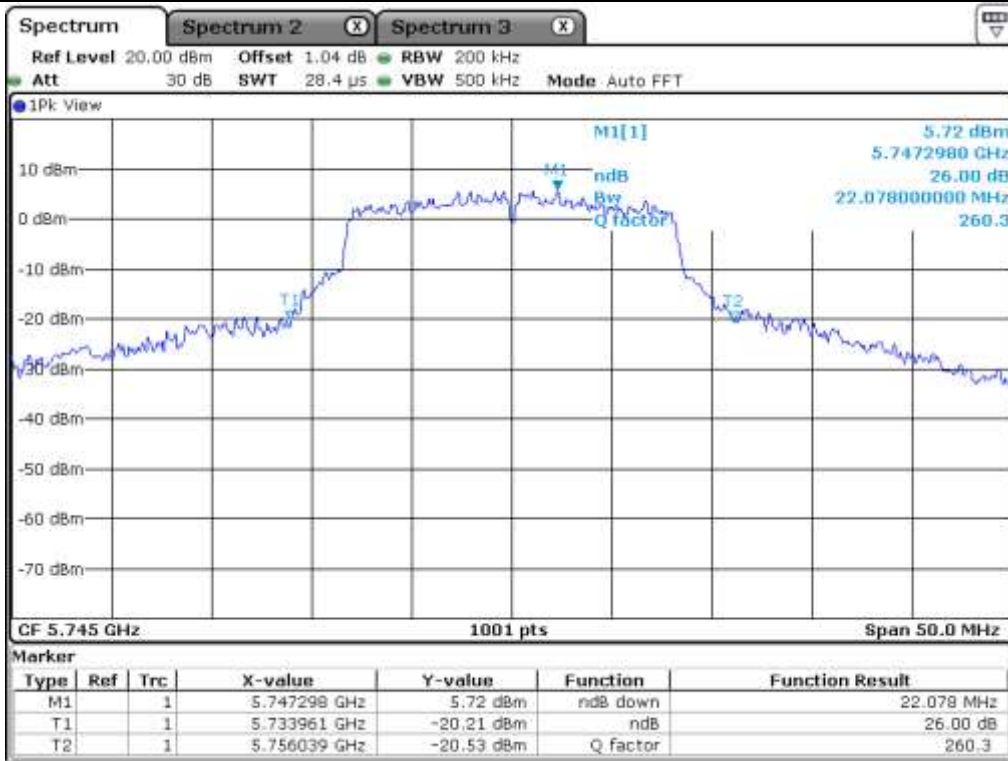


Low Channel (5 500 MHz)

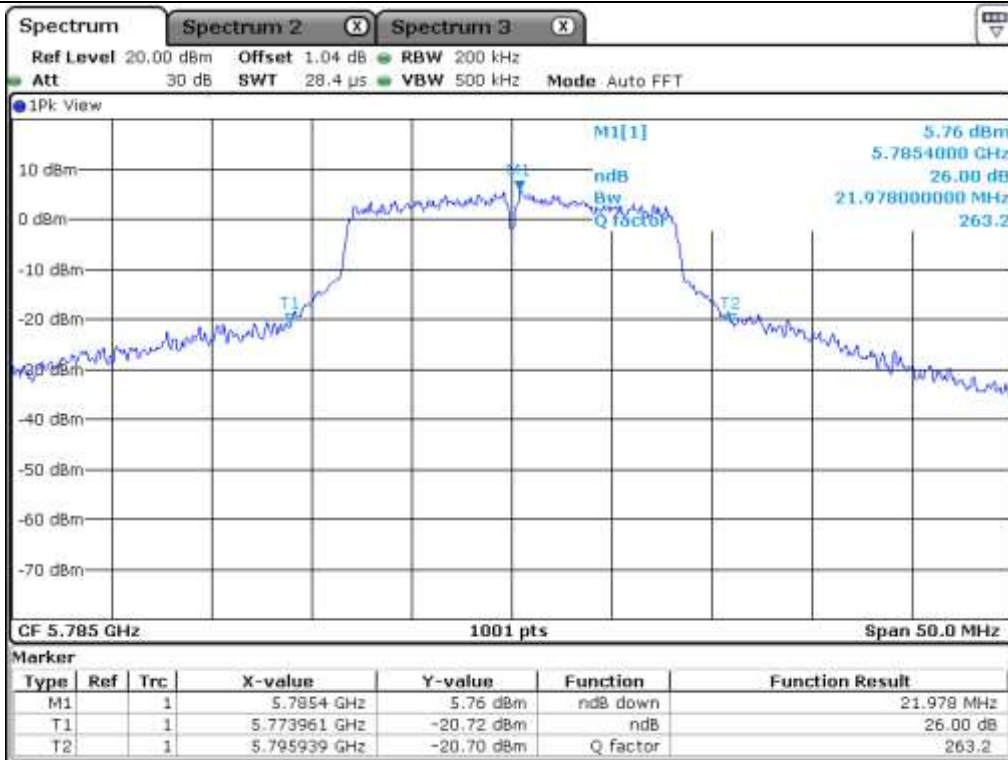


Middle Channel (5 580 MHz)

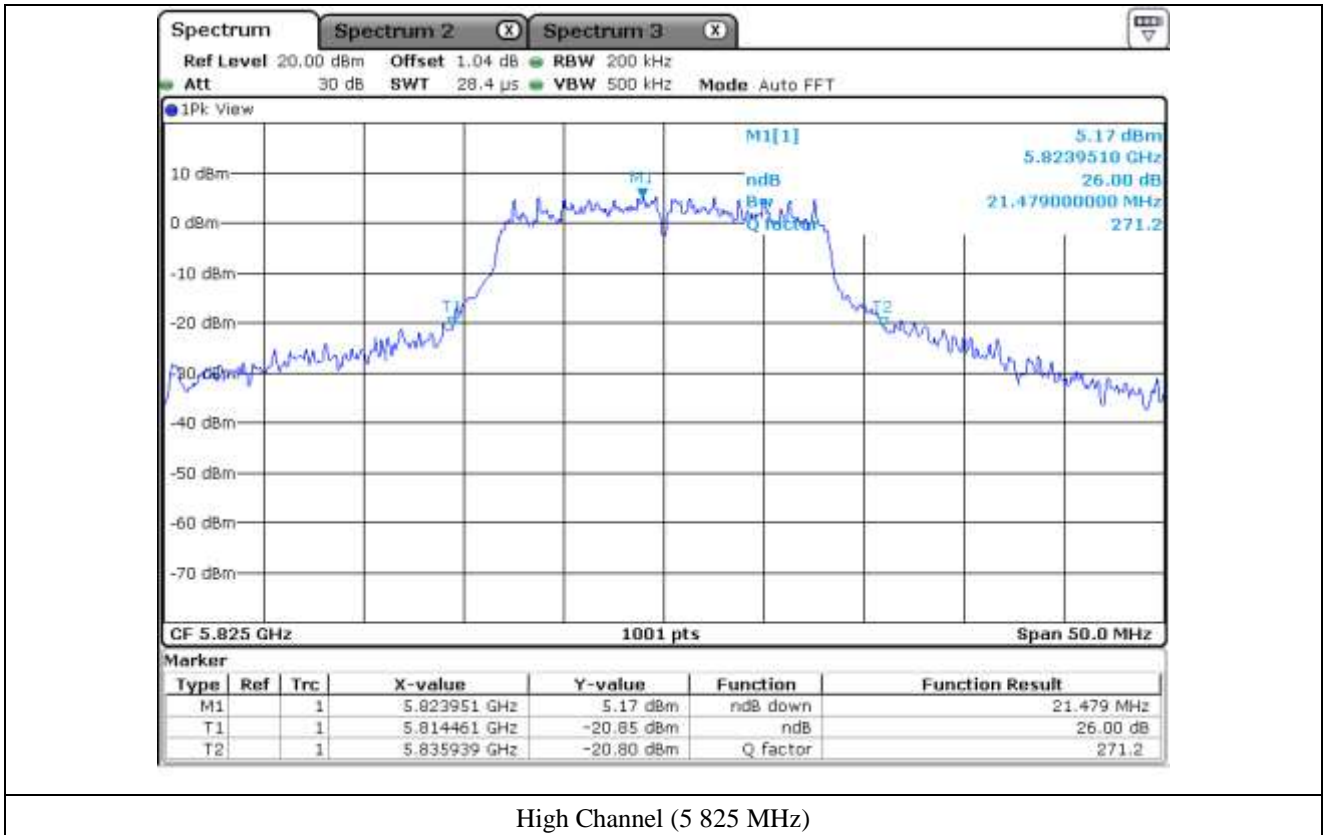




Low Channel (5.745 MHz)



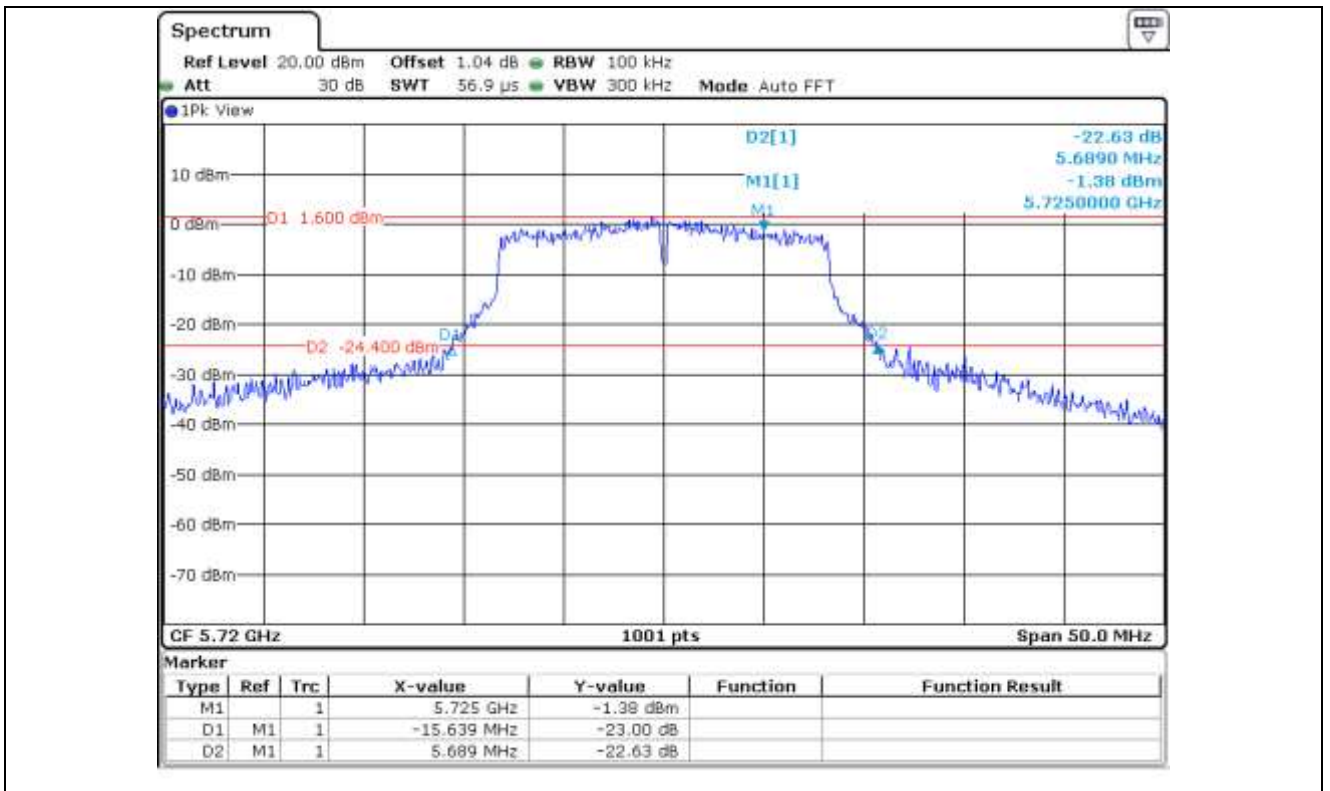
Middle Channel (5.785 MHz)



7.4.3 Test data for Straddle Channel_Antenna 0

-. Test Result : Pass

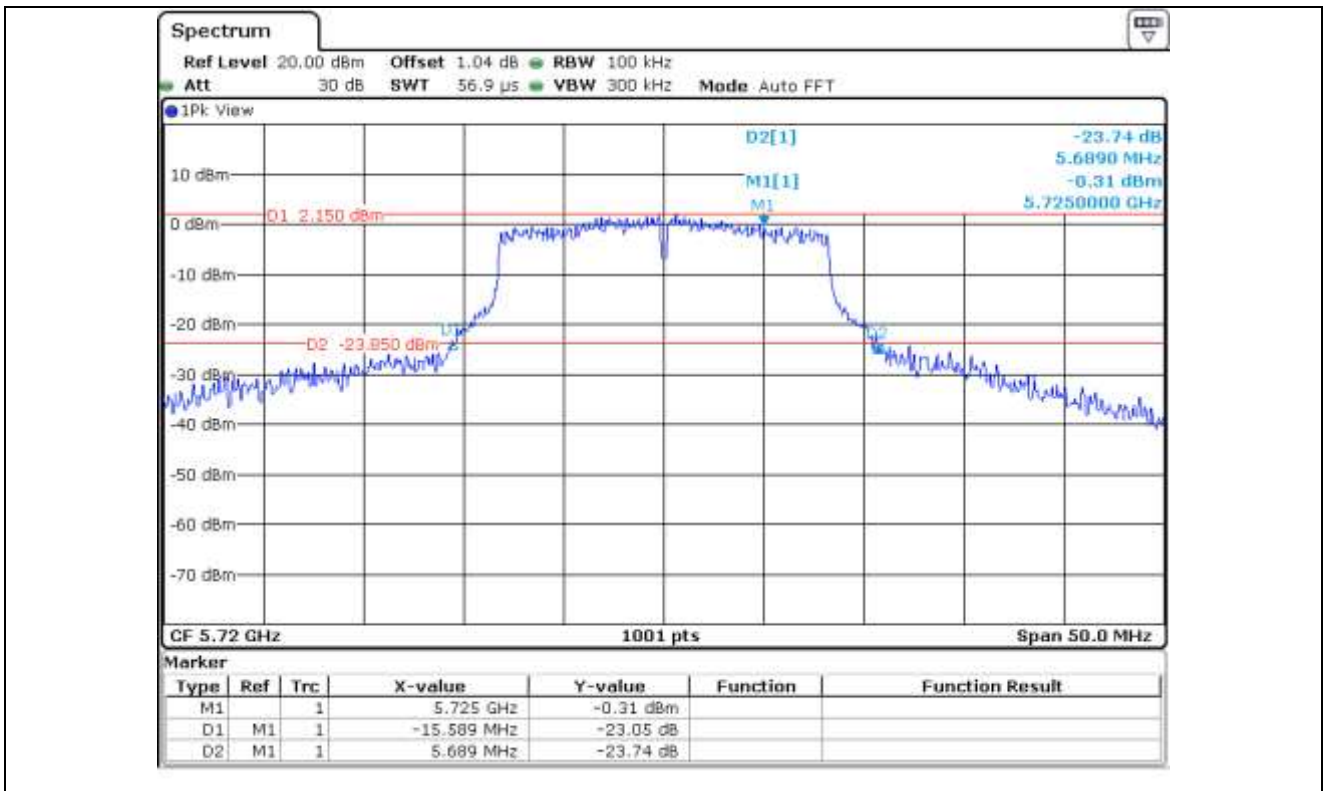
| FREQUENCY RANGE (MHz) | FREQUENCY (MHz) | 26 dB Bandwidth (MHz) |
|-----------------------|-----------------|-----------------------|
| 5 470 ~ 5 725 | 5 720.00 | 15.64 |
| 5 725 ~ 5 850 | 5 720.00 | 5.69 |



7.4.4 Test data for Straddle Channel_Antenna 1

-. Test Result : Pass

| FREQUENCY RANGE (MHz) | FREQUENCY (MHz) | 26 dB Bandwidth (MHz) |
|-----------------------|-----------------|-----------------------|
| 5 470 ~ 5 725 | 5 720.00 | 15.59 |
| 5 725 ~ 5 850 | 5 720.00 | 5.69 |



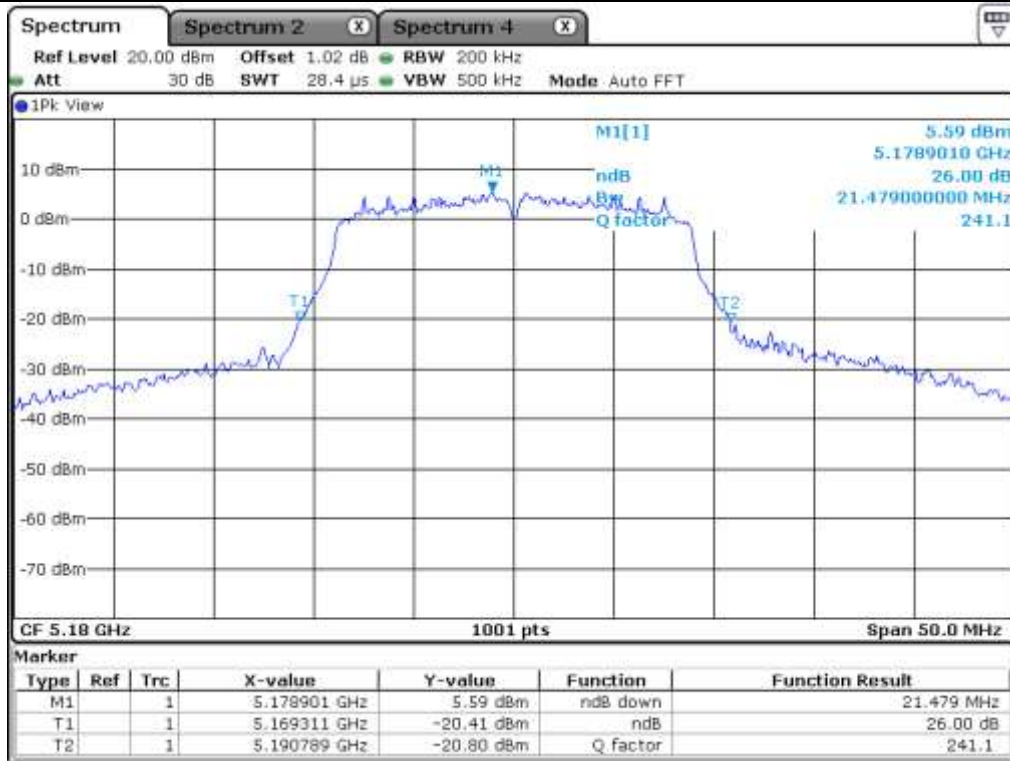
7.5 Test data for 802.11n_HT20 RLAN Mode

7.5.1 Test data for Antenna 0

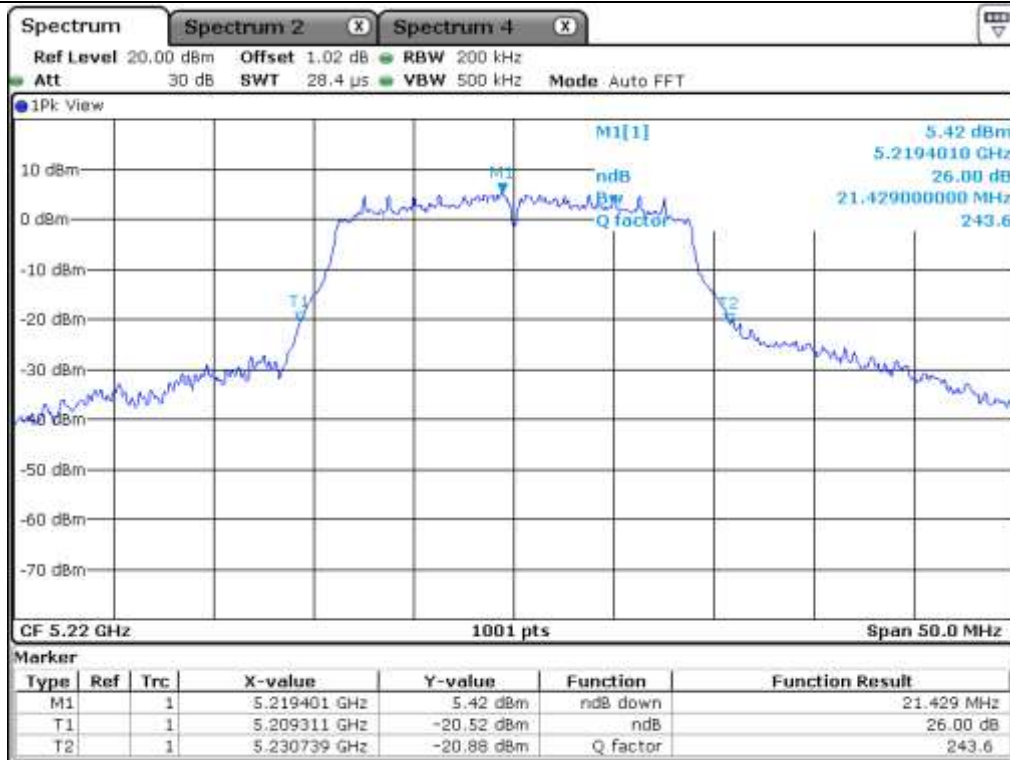
-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | 26 dB Bandwidth (MHz) |
|--------------------------|---------|--------------------|--------------------------|
| 5 150 ~ 5 250 | Low | 5 180.00 | 21.48 |
| | Middle | 5 220.00 | 21.43 |
| | High | 5 240.00 | 21.53 |
| 5 250 ~ 5 350 | Low | 5 260.00 | 21.73 |
| | Middle | 5 300.00 | 21.78 |
| | High | 5 320.00 | 21.63 |
| 5 470 ~ 5 725 | Low | 5 500.00 | 21.08 |
| | Middle | 5 580.00 | 21.53 |
| | High | 5 700.00 | 21.28 |
| 5 725 ~ 5 850 | Low | 5 745.00 | 21.58 |
| | Middle | 5 785.00 | 21.68 |
| | High | 5 825.00 | 21.78 |

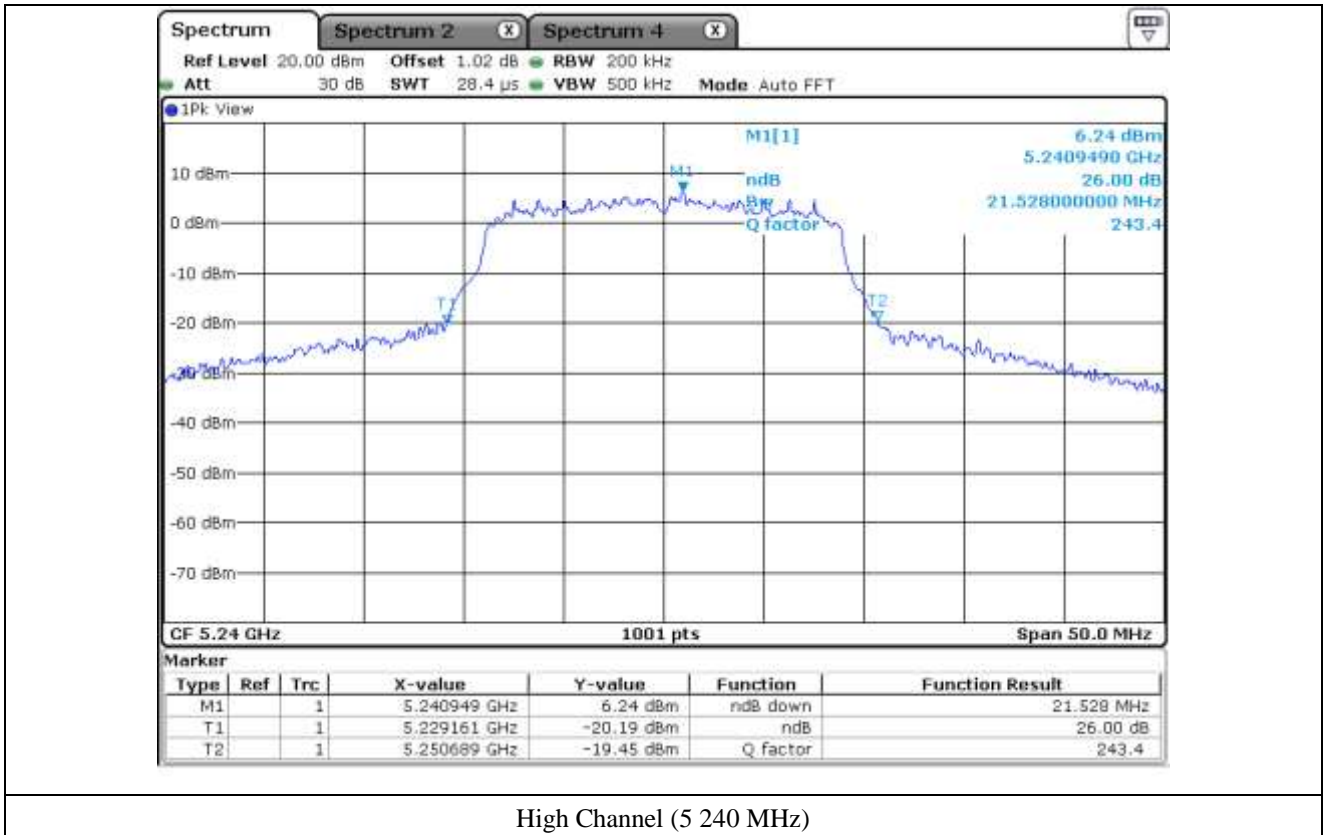
Remark: See next page for measurement data.

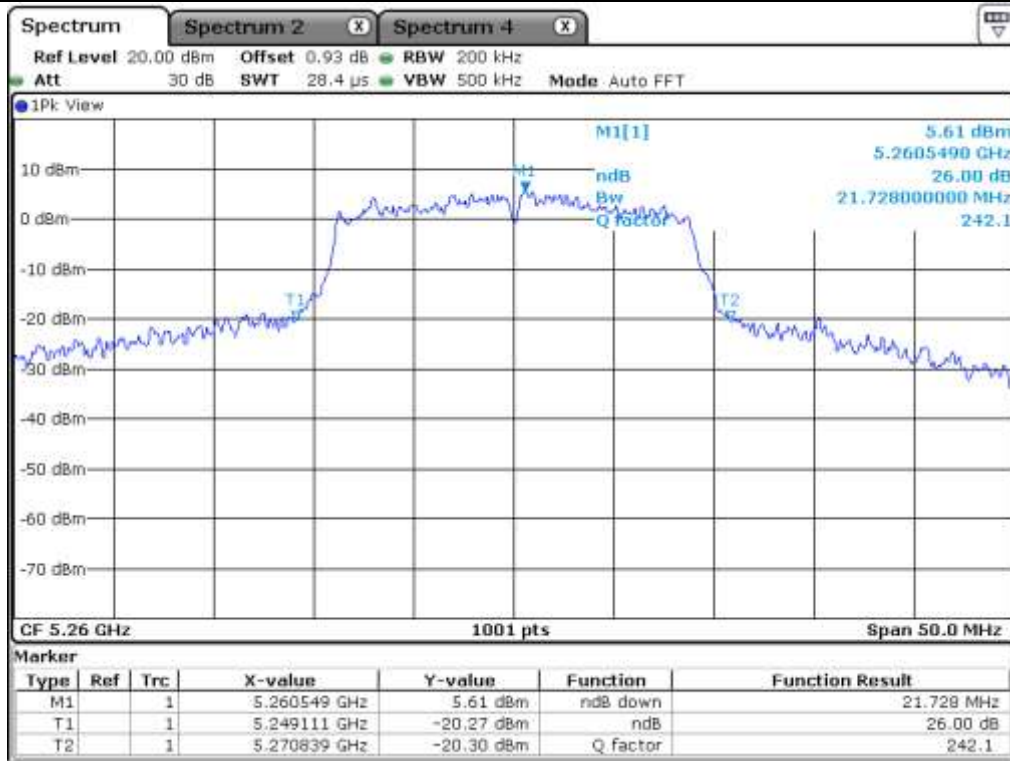


Low Channel (5 180 MHz)

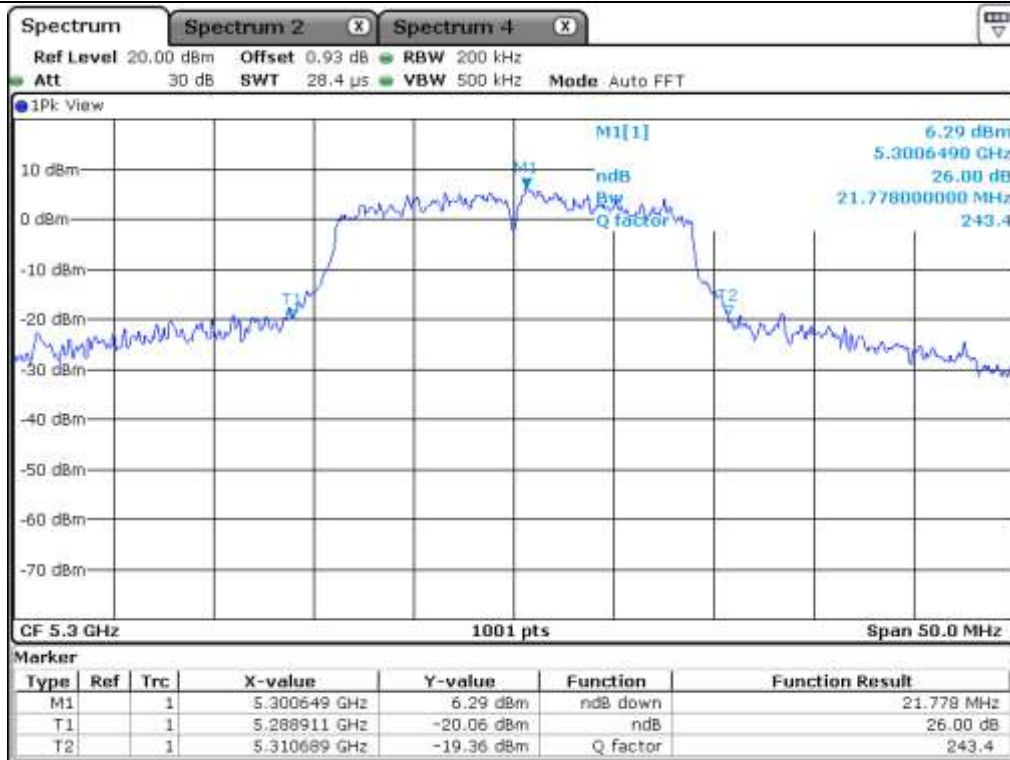


Middle Channel (5 220 MHz)

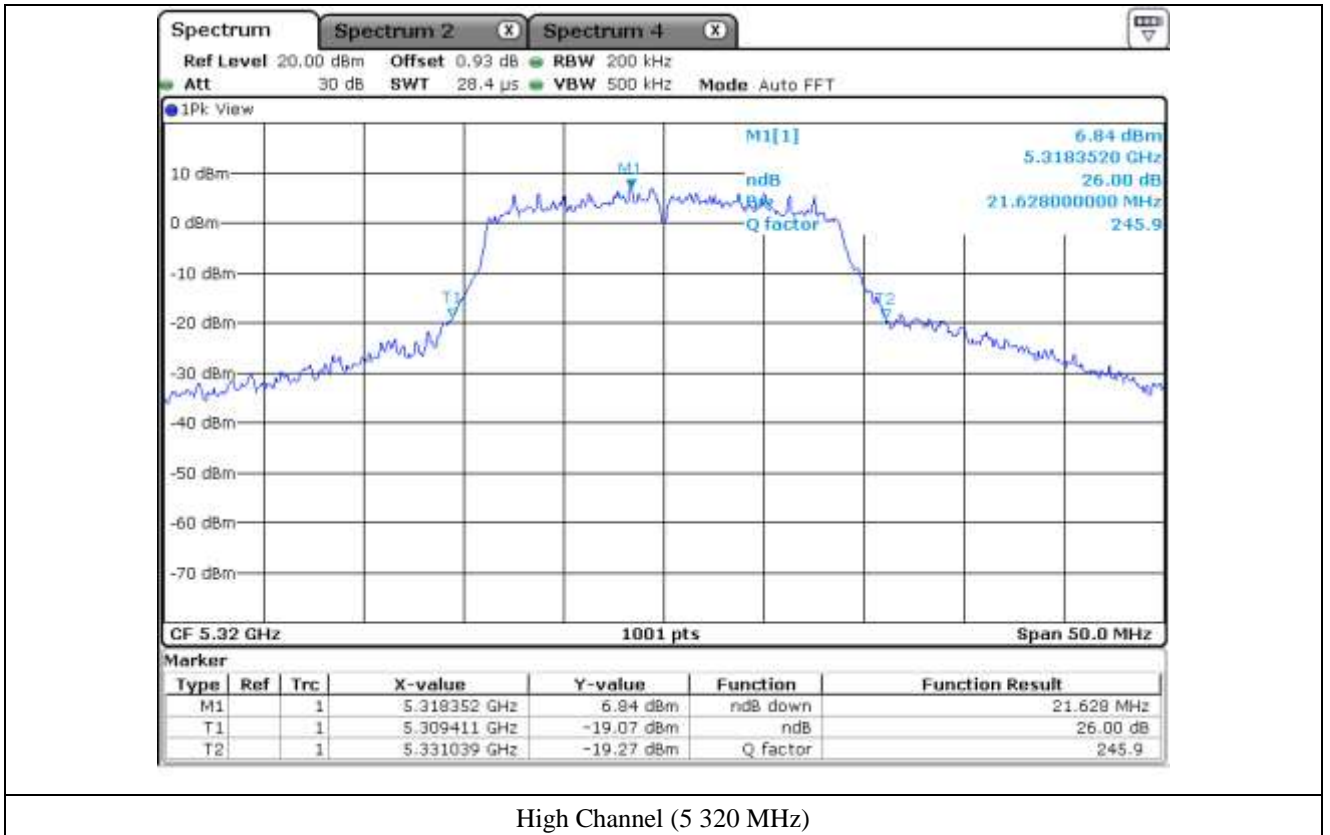




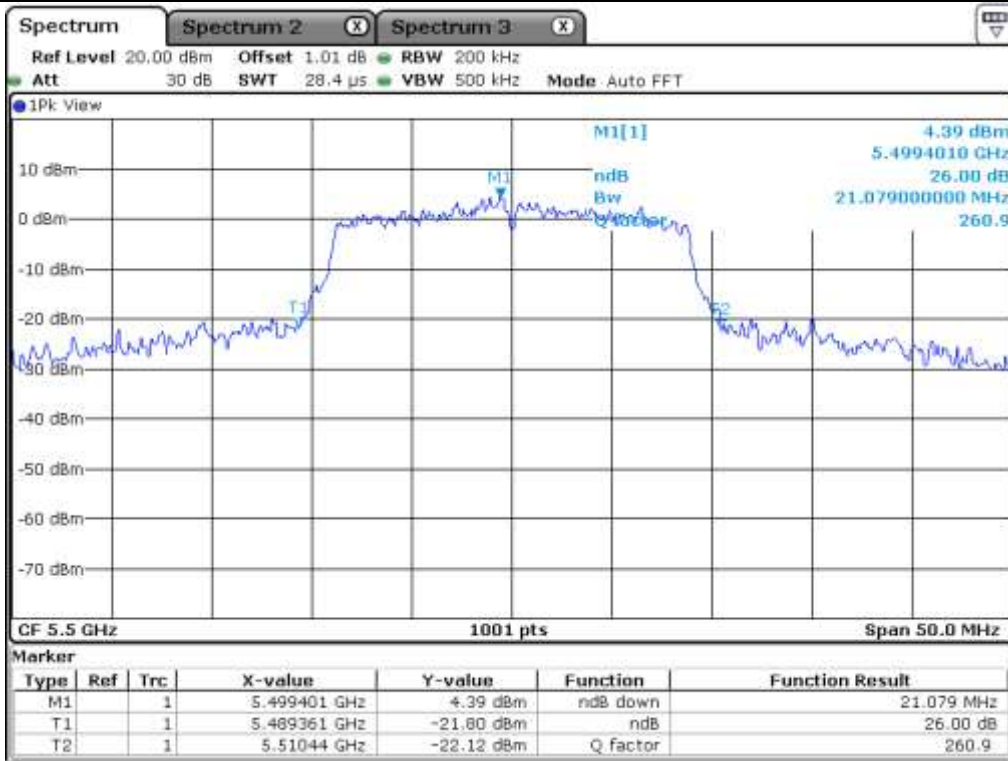
Low Channel (5 260 MHz)



Middle Channel (5 300 MHz)



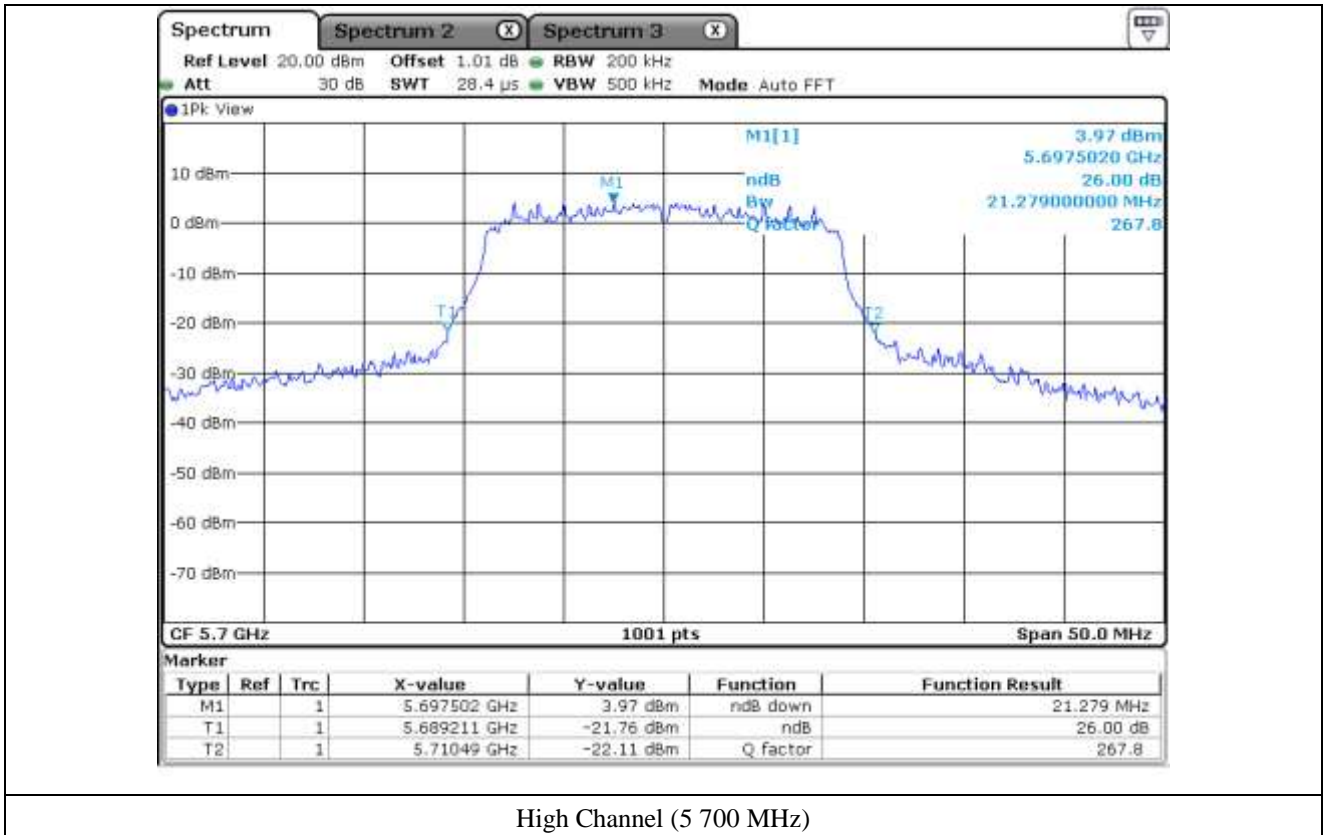
High Channel (5 320 MHz)

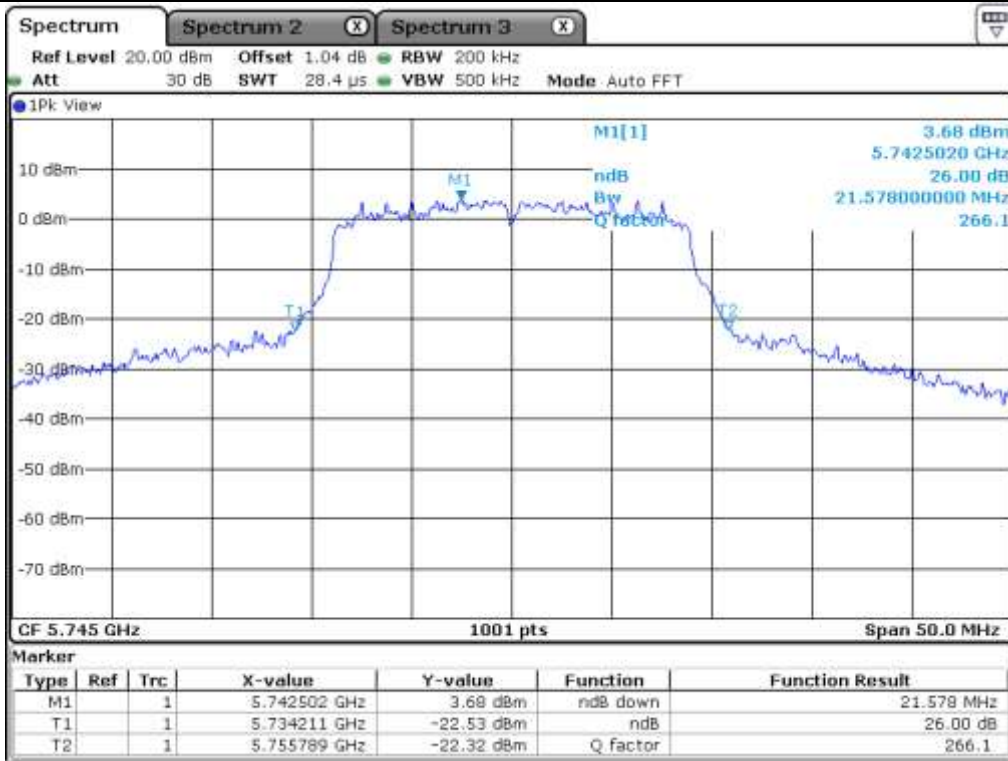


Low Channel (5 500 MHz)

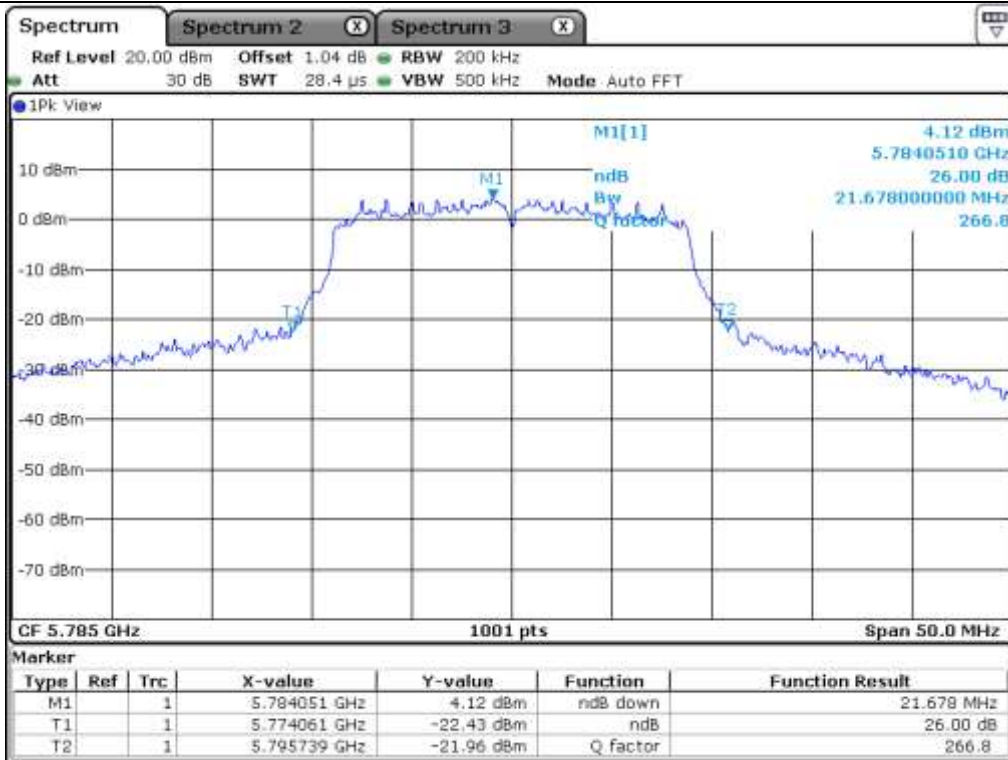


Middle Channel (5 580 MHz)

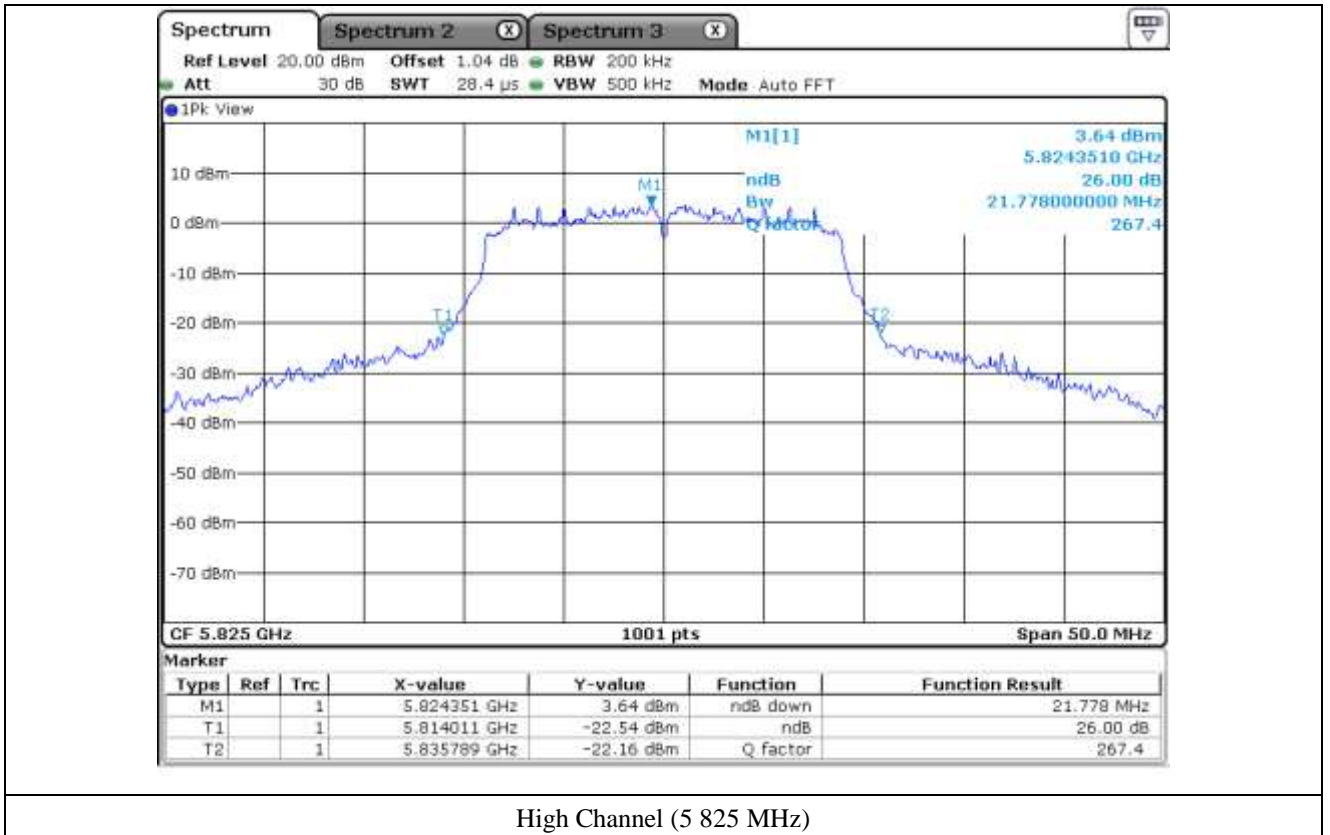




Low Channel (5 745 MHz)



Middle Channel (5 785 MHz)

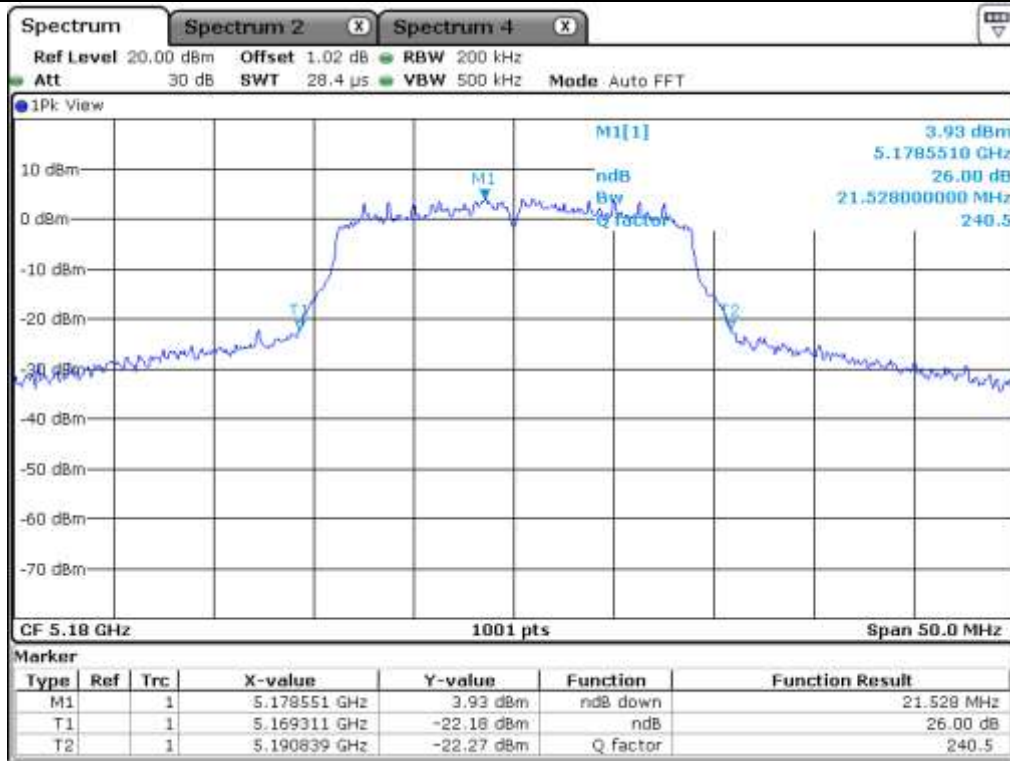


7.5.2 Test data for Antenna 1

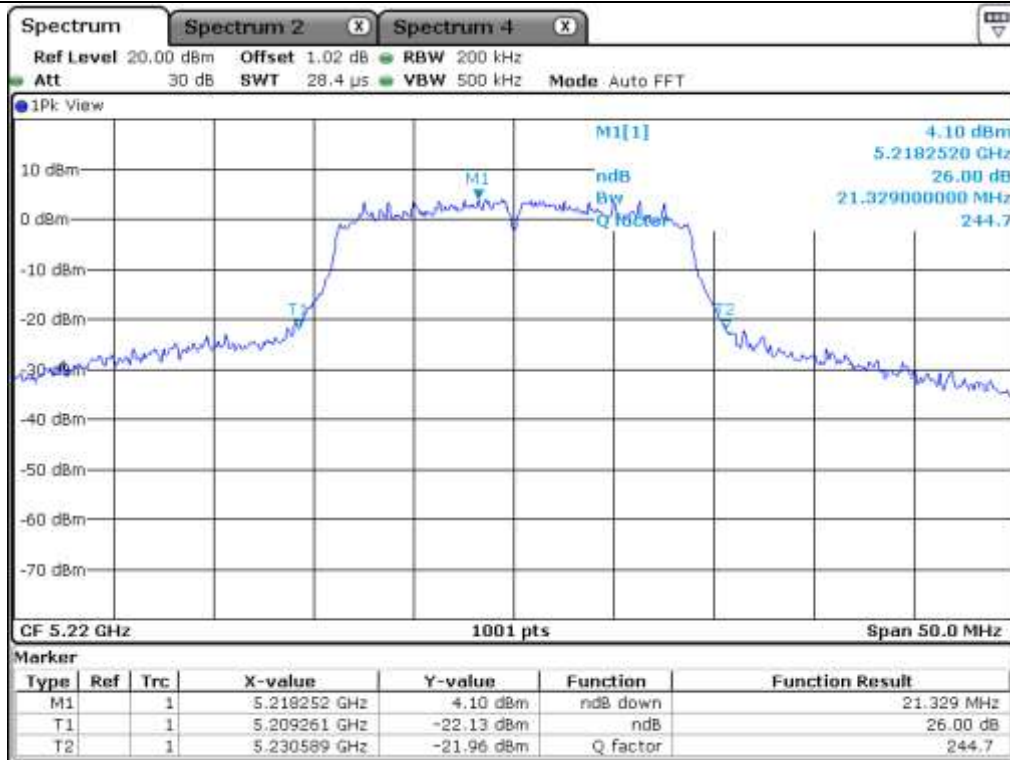
-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | 26 dB Bandwidth (MHz) |
|--------------------------|---------|--------------------|--------------------------|
| 5 150 ~ 5 250 | Low | 5 180.00 | 21.53 |
| | Middle | 5 220.00 | 21.33 |
| | High | 5 240.00 | 21.68 |
| 5 250 ~ 5 350 | Low | 5 260.00 | 21.78 |
| | Middle | 5 300.00 | 21.63 |
| | High | 5 320.00 | 21.33 |
| 5 470 ~ 5 725 | Low | 5 500.00 | 20.98 |
| | Middle | 5 580.00 | 21.93 |
| | High | 5 700.00 | 21.78 |
| 5 725 ~ 5 850 | Low | 5 745.00 | 21.68 |
| | Middle | 5 785.00 | 21.53 |
| | High | 5 825.00 | 21.78 |

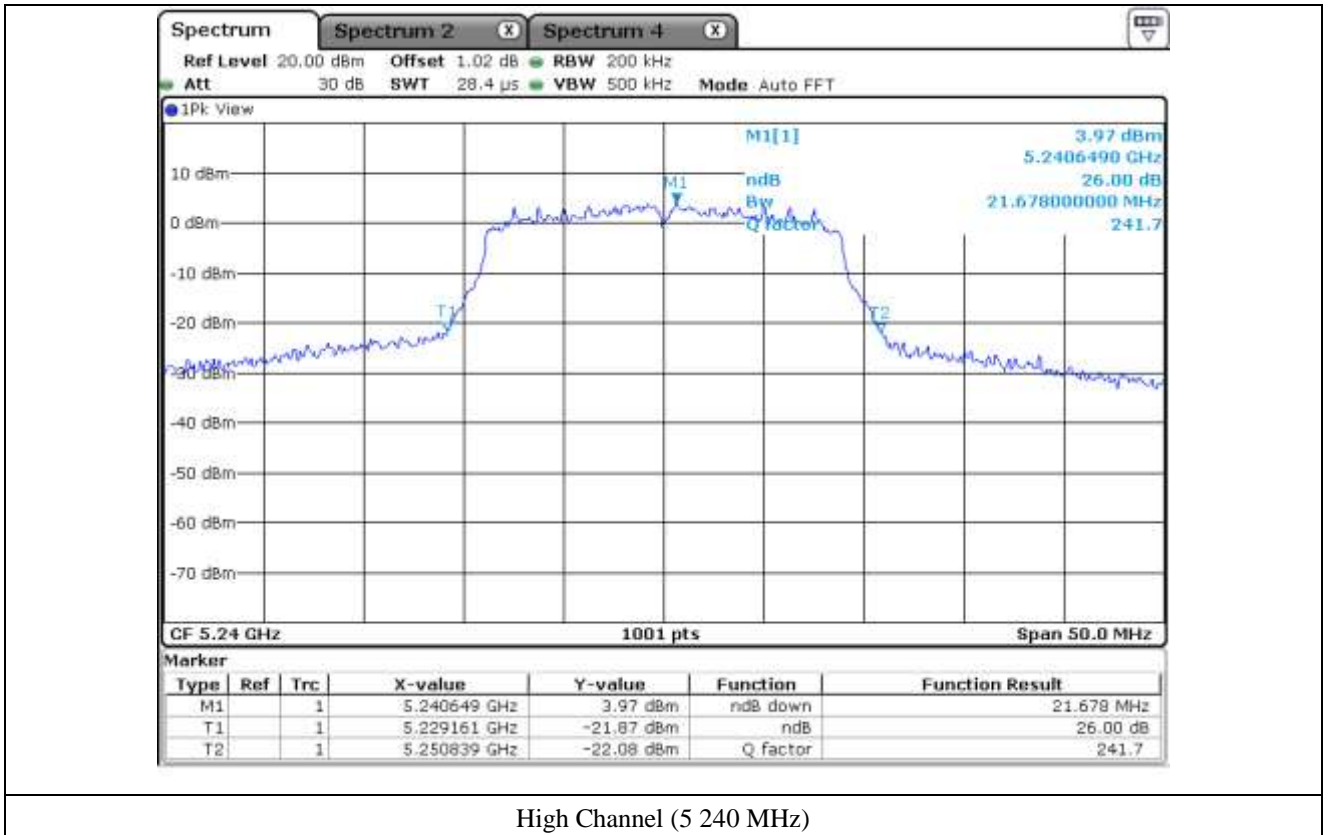
Remark: See next page for measurement data.



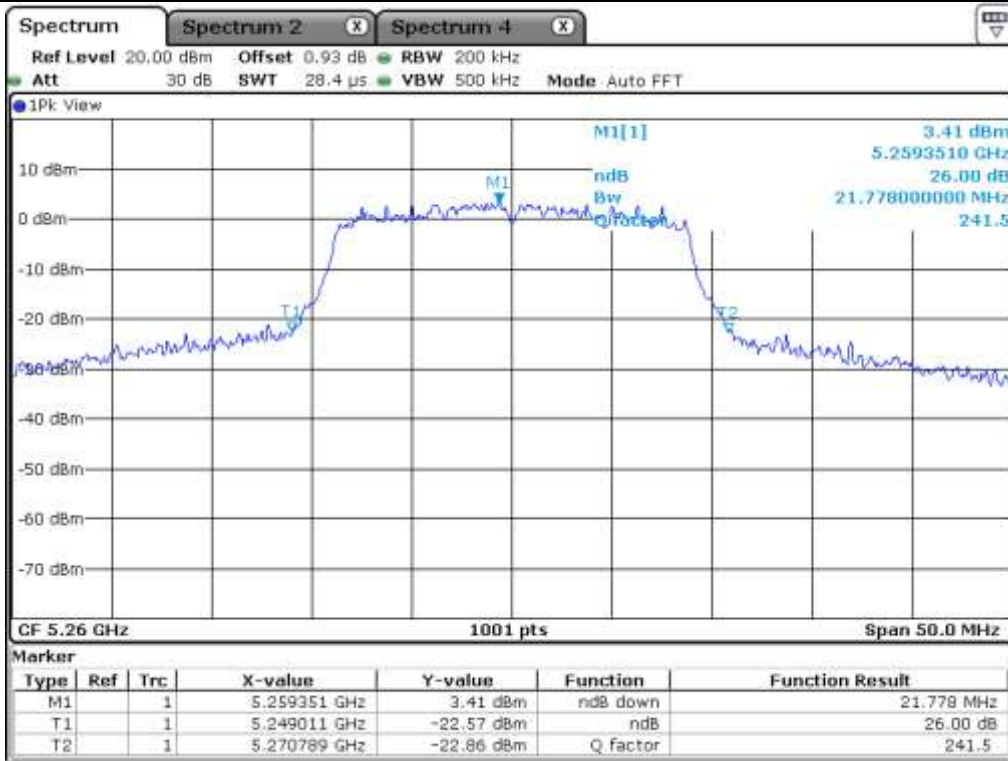
Low Channel (5 180 MHz)



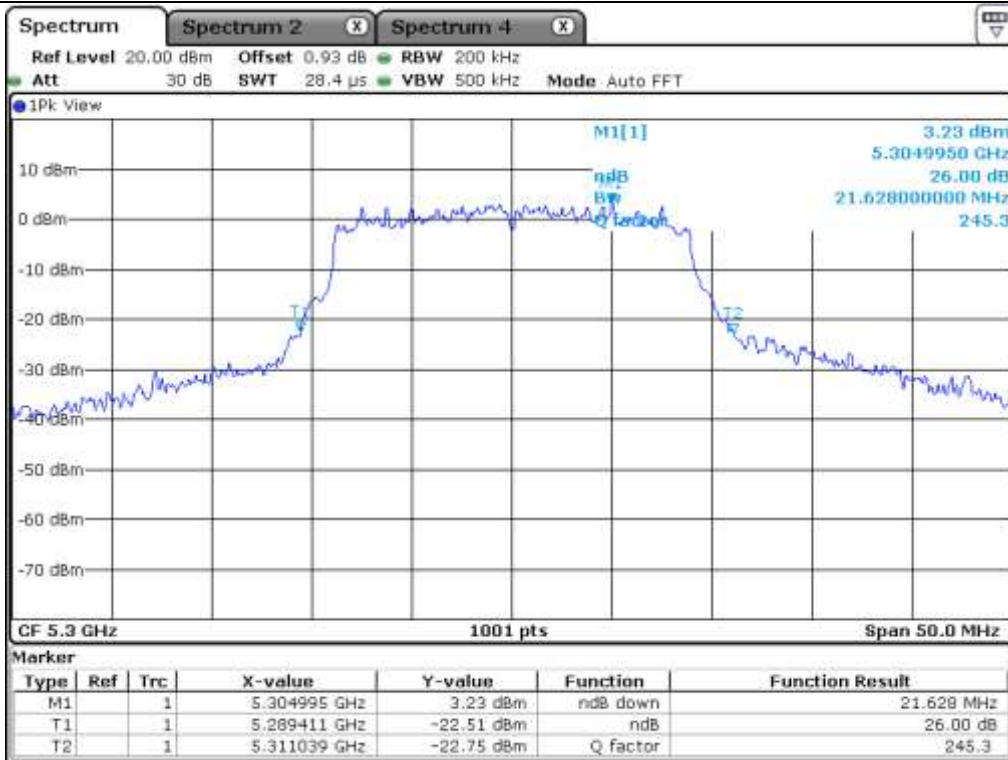
Middle Channel (5 220 MHz)



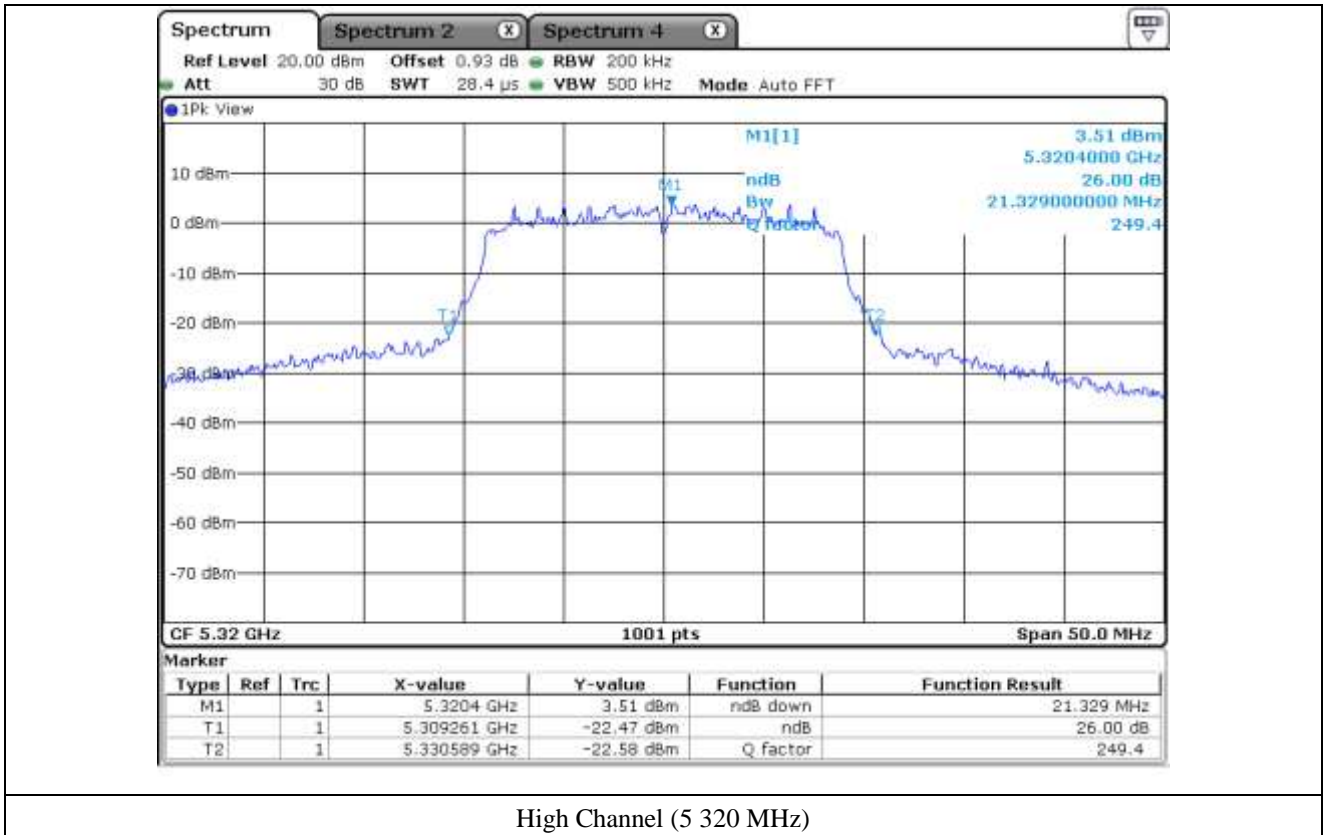
High Channel (5 240 MHz)

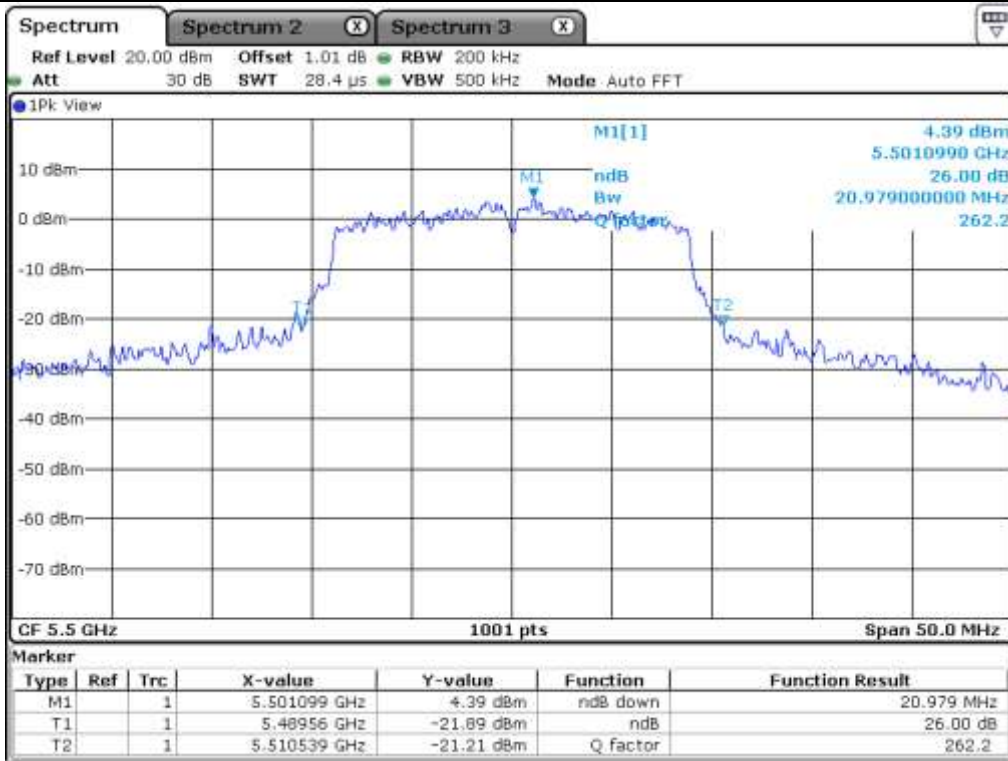


Low Channel (5 260 MHz)

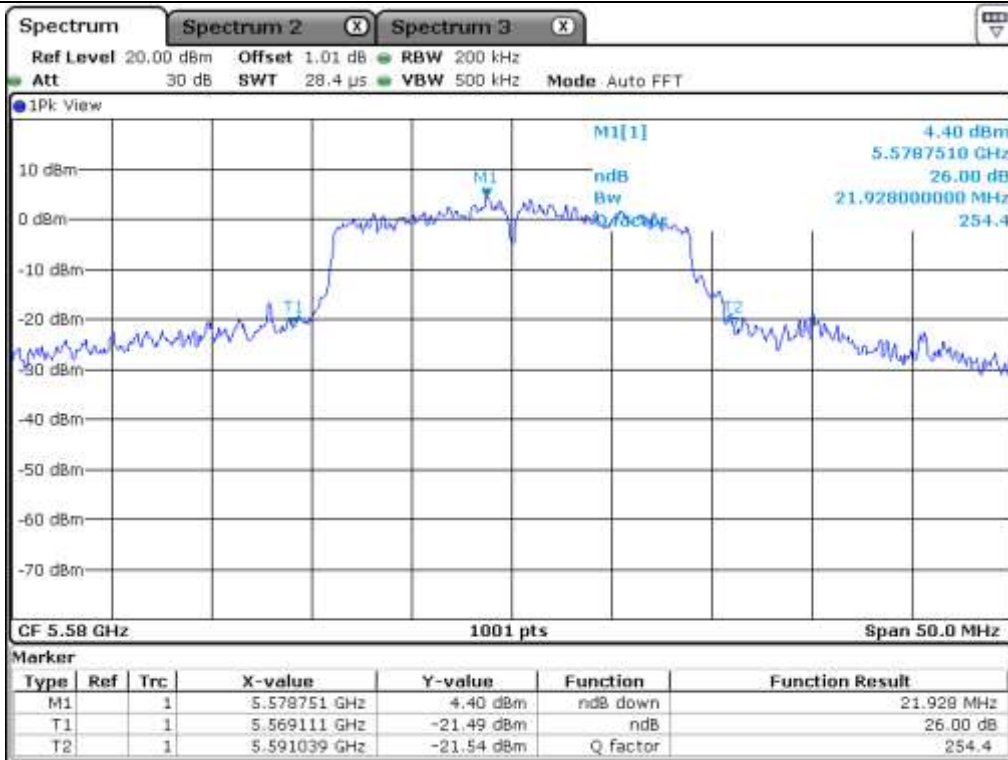


Middle Channel (5 300 MHz)

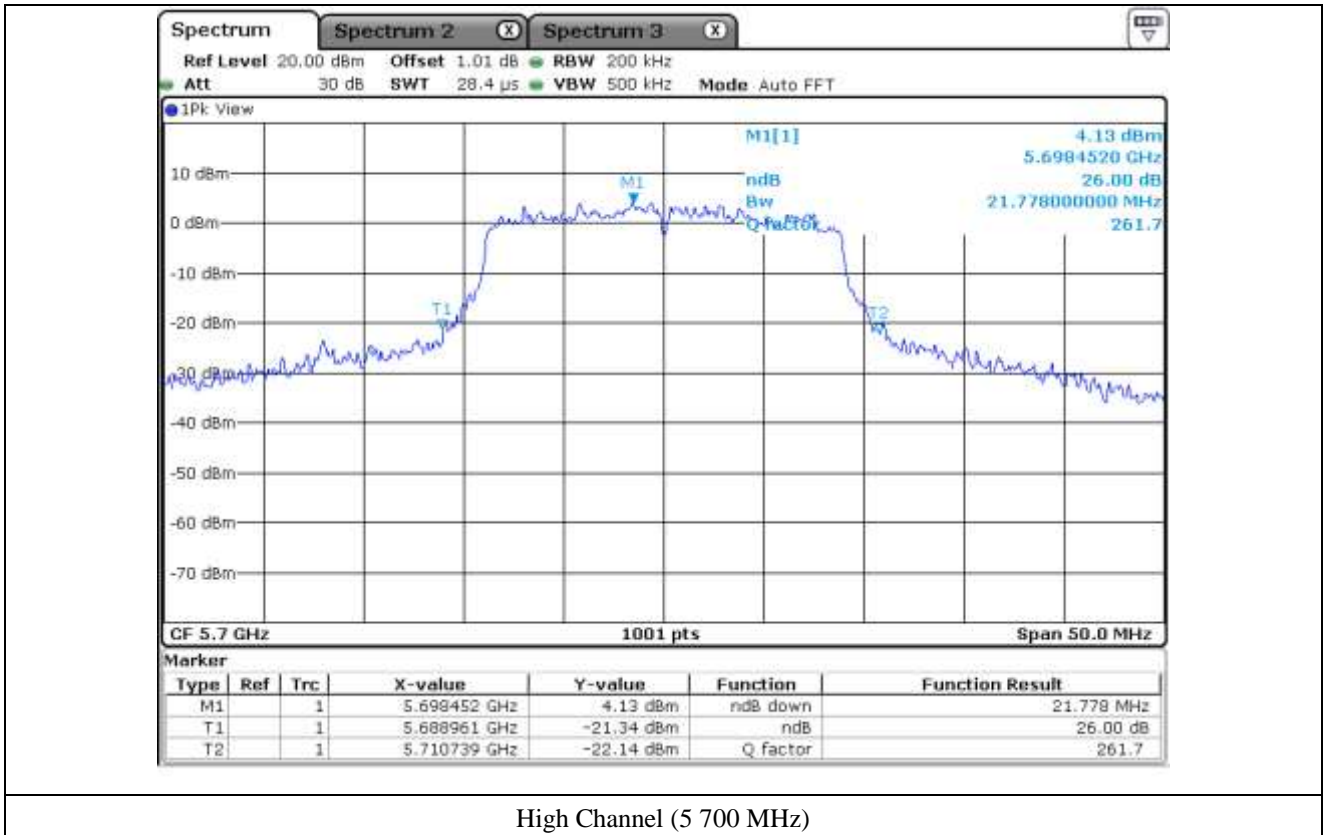


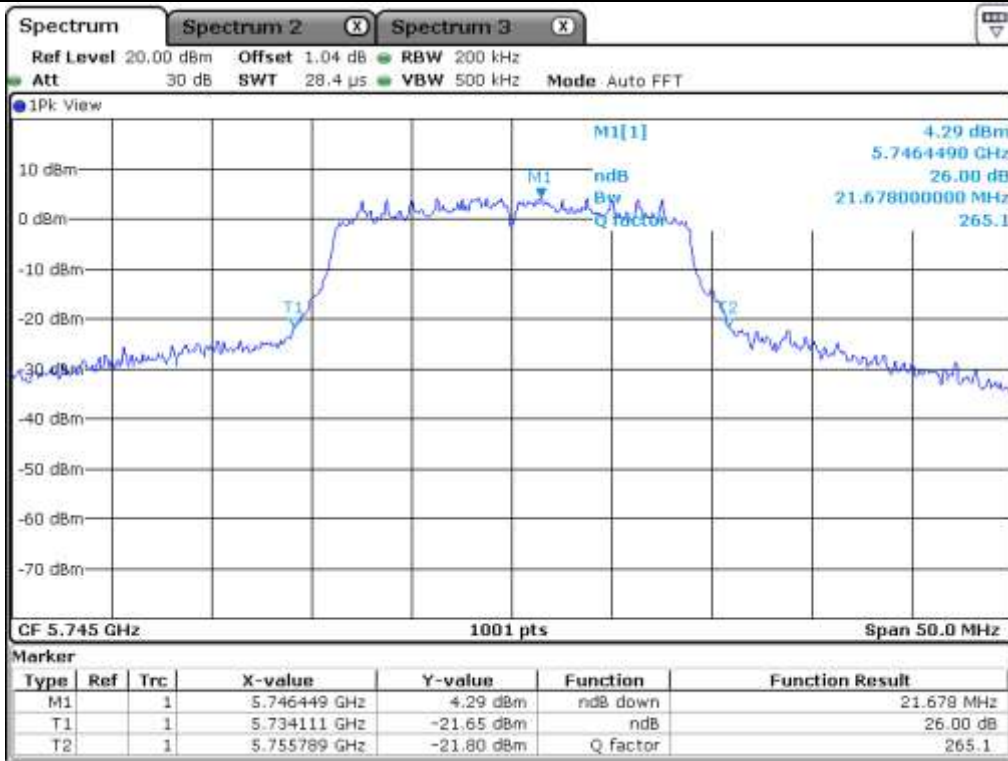


Low Channel (5 500 MHz)

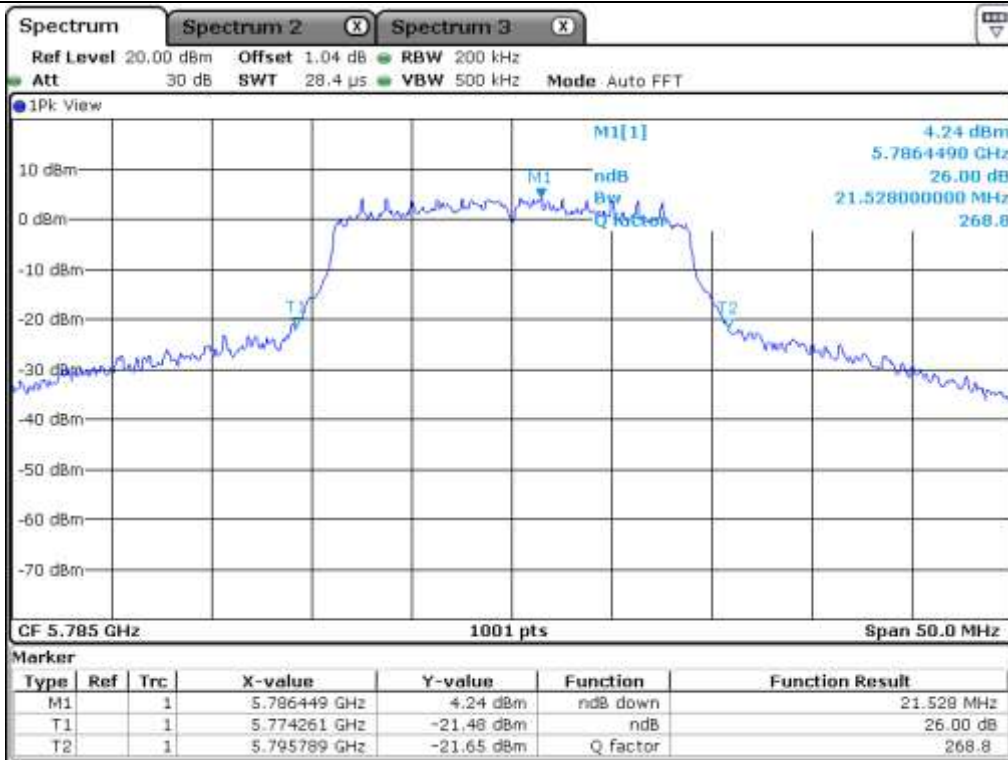


Middle Channel (5 580 MHz)

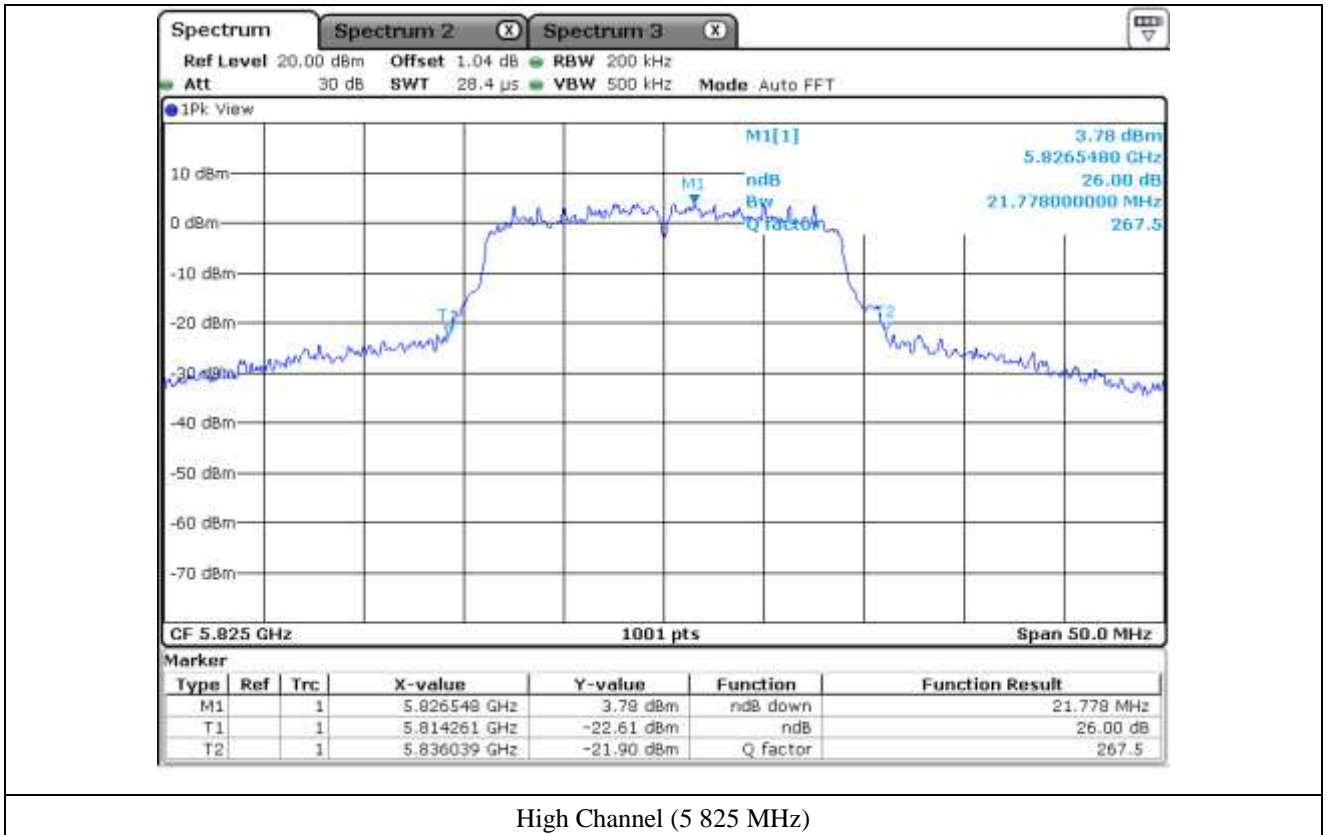




Low Channel (5.745 MHz)



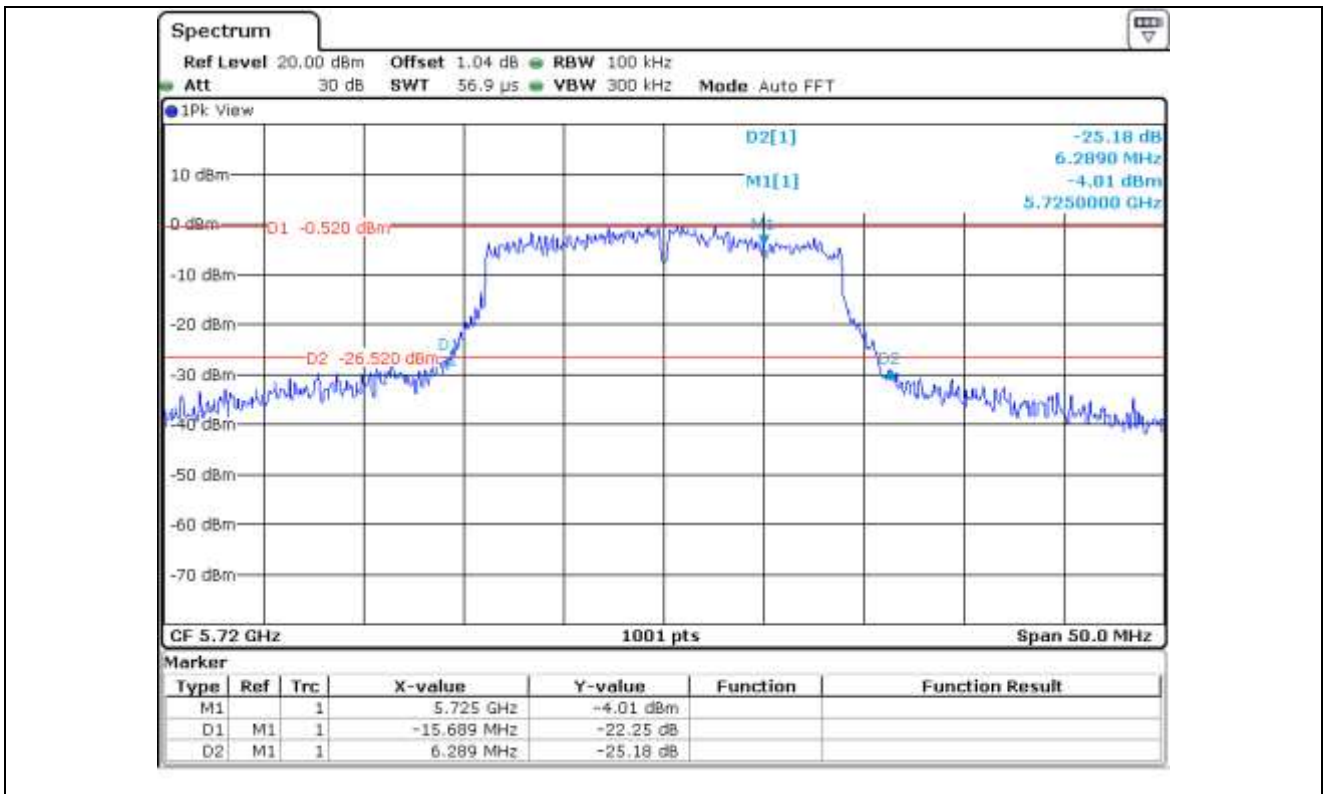
Middle Channel (5.785 MHz)



7.4.3 Test data for Straddle Channel_Antenna 0

-. Test Result : Pass

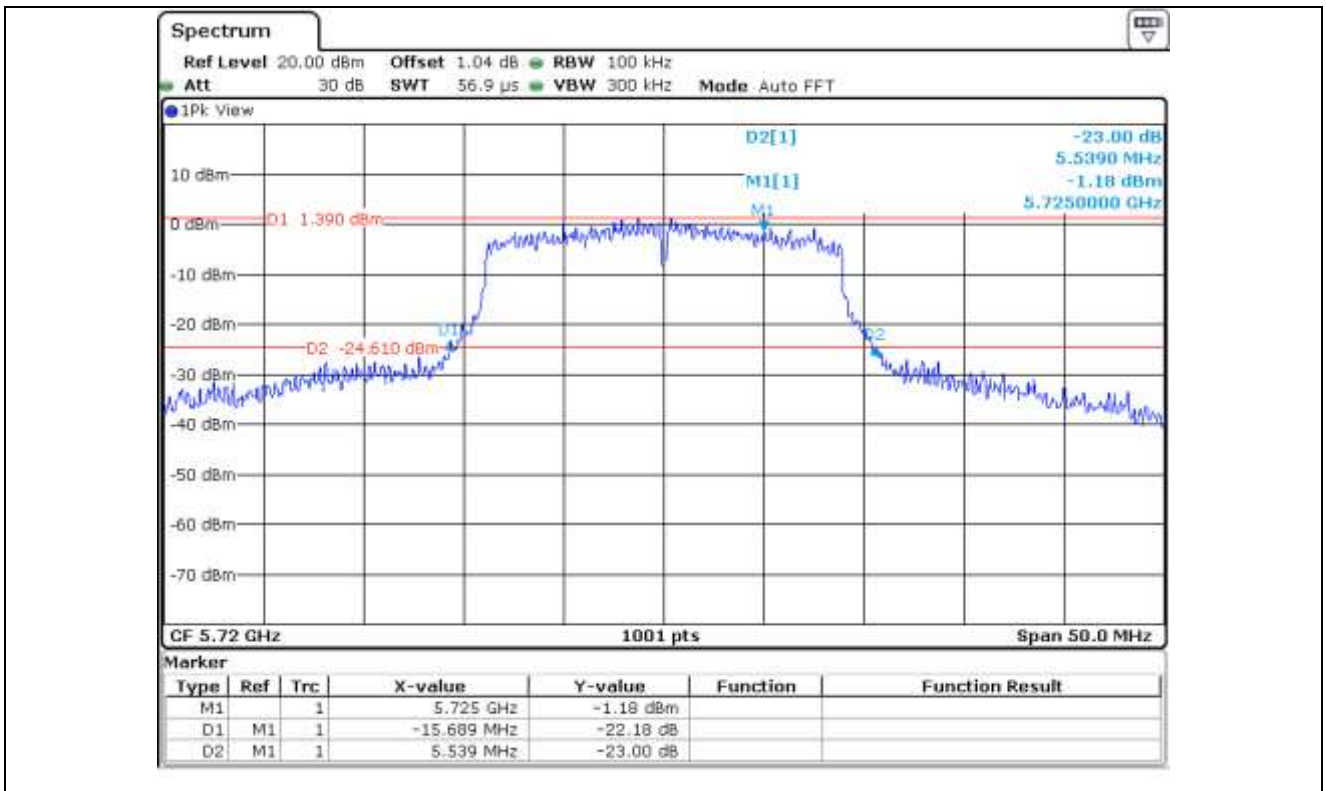
| FREQUENCY RANGE (MHz) | FREQUENCY (MHz) | 26 dB Bandwidth (MHz) |
|-----------------------|-----------------|-----------------------|
| 5 470 ~ 5 725 | 5 720.00 | 15.69 |
| 5 725 ~ 5 850 | 5 720.00 | 6.29 |



7.4.4 Test data for Straddle Channel_Antenna 1

-. Test Result : Pass

| FREQUENCY RANGE (MHz) | FREQUENCY (MHz) | 26 dB Bandwidth (MHz) |
|-----------------------|-----------------|-----------------------|
| 5 470 ~ 5 725 | 5 720.00 | 15.69 |
| 5 725 ~ 5 850 | 5 720.00 | 5.54 |



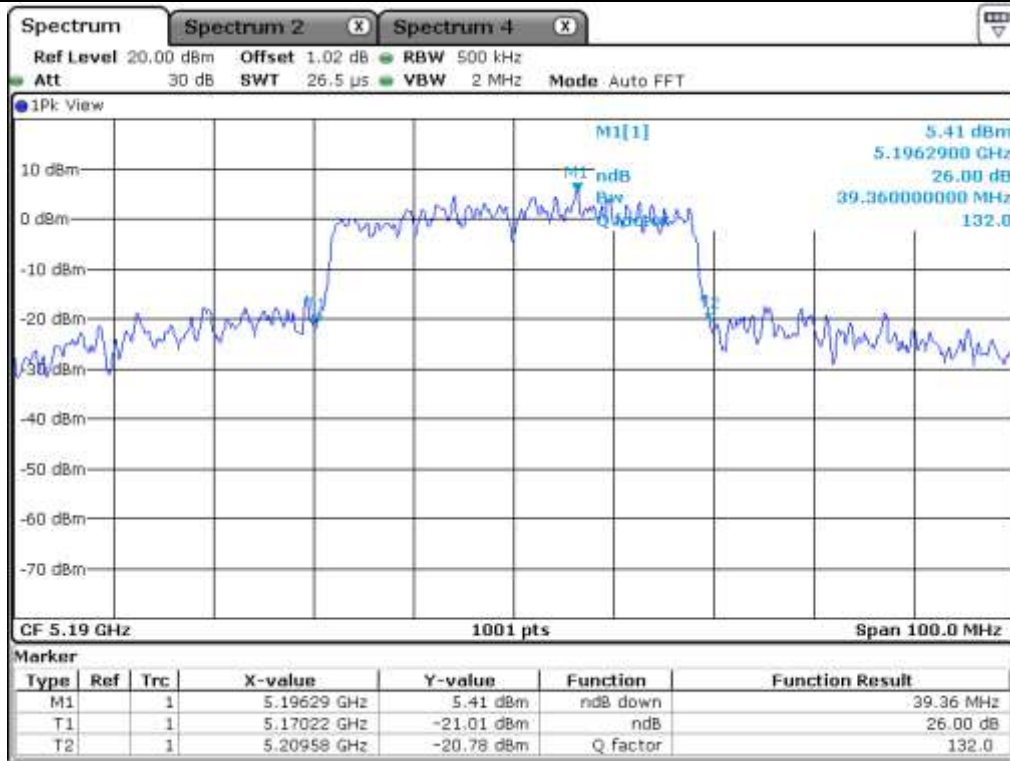
7.6 Test data for 802.11n_HT40 RLAN Mode

7.6.1 Test data for Antenna 0

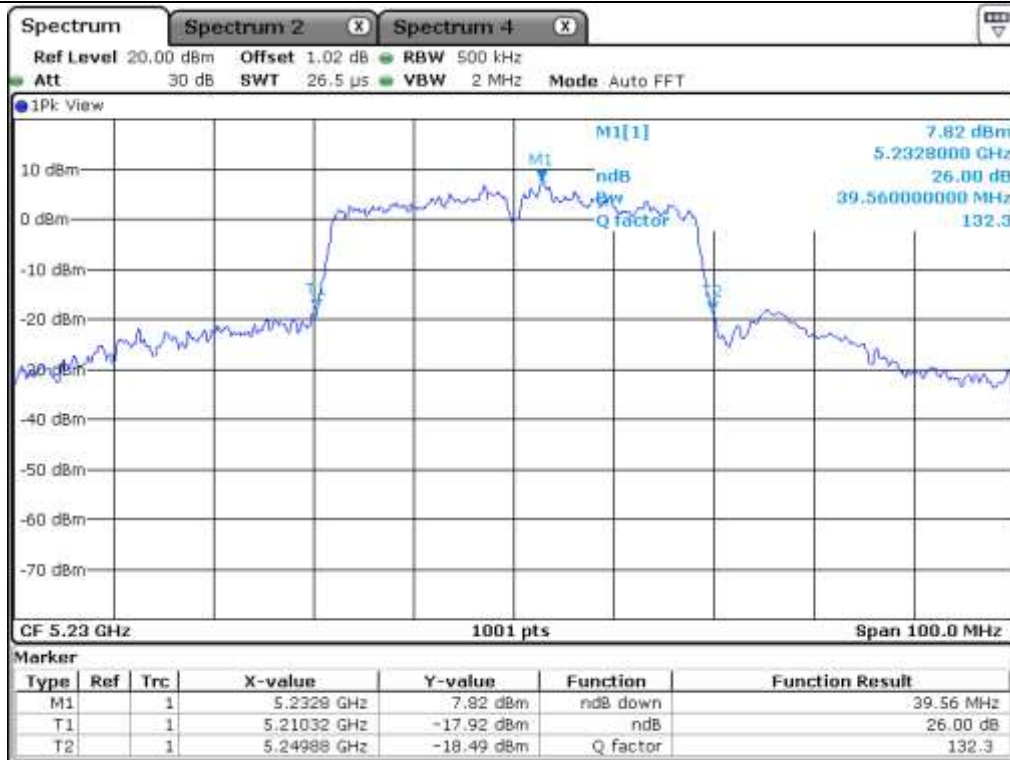
-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | 26 dB Bandwidth (MHz) |
|--------------------------|---------|--------------------|--------------------------|
| 5 150 ~ 5 250 | Low | 5 190.00 | 39.36 |
| | High | 5 230.00 | 39.56 |
| 5 250 ~ 5 350 | Low | 5 270.00 | 40.16 |
| | High | 5 310.00 | 39.46 |
| 5 470 ~ 5 725 | Low | 5 510.00 | 41.16 |
| | Middle | 5 550.00 | 41.06 |
| | High | 5 670.00 | 39.86 |
| 5 725 ~ 5 850 | Low | 5 755.00 | 39.76 |
| | High | 5 795.00 | 39.16 |

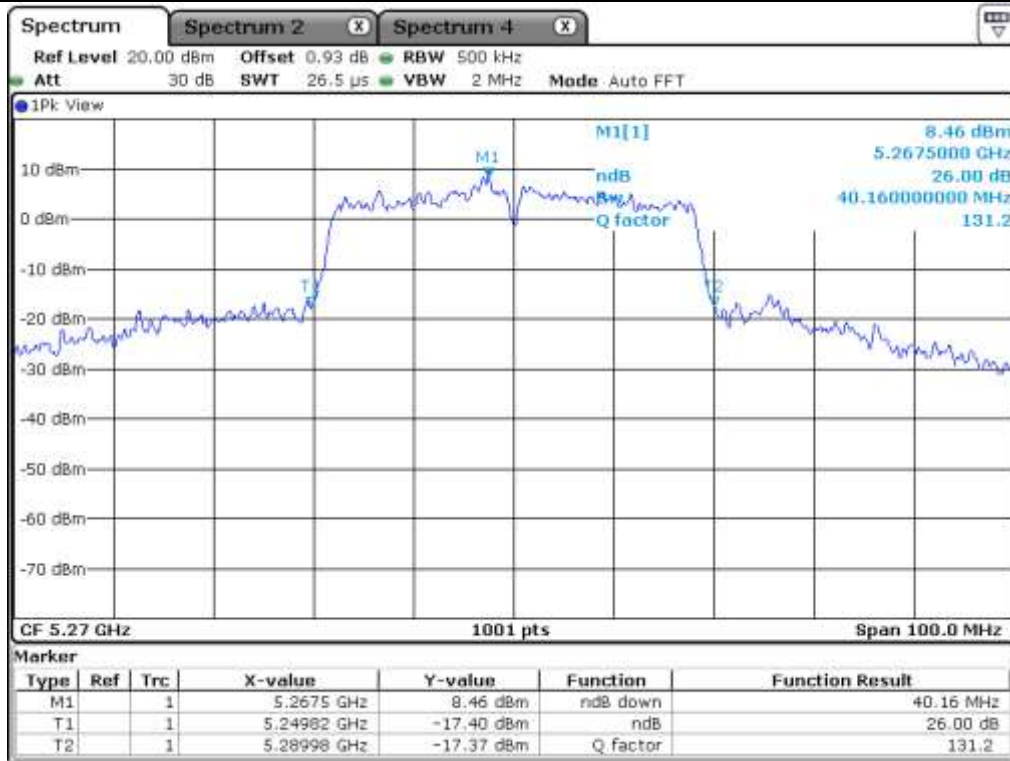
Remark: See next page for measurement data.



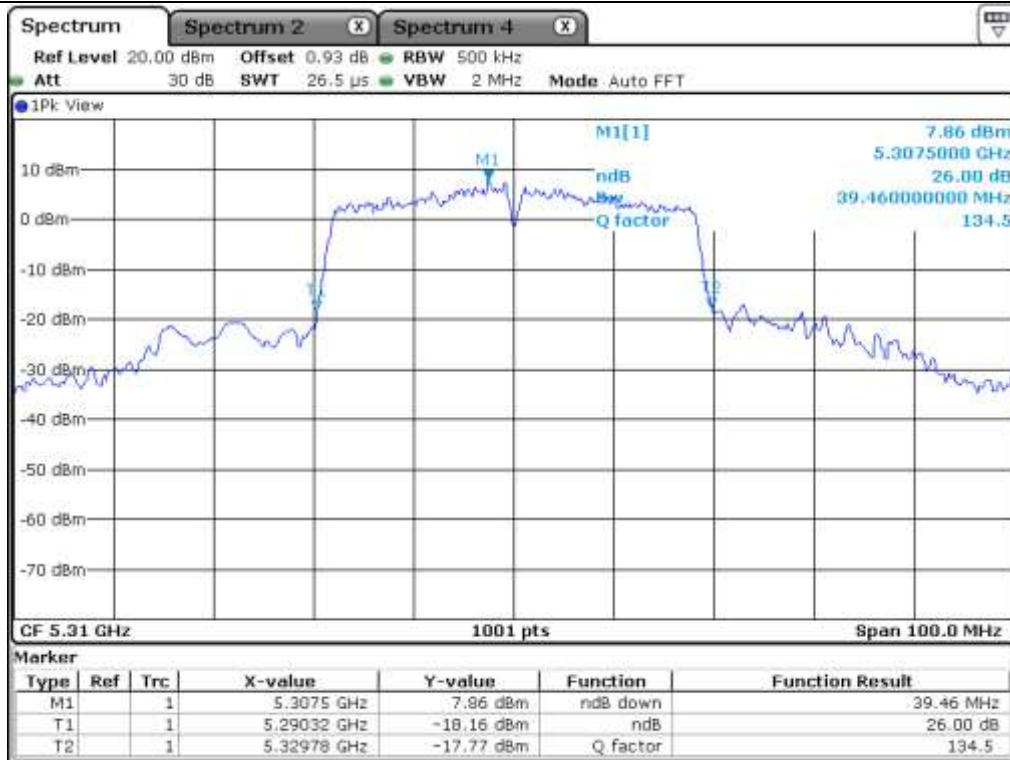
Low Channel (5 190 MHz)



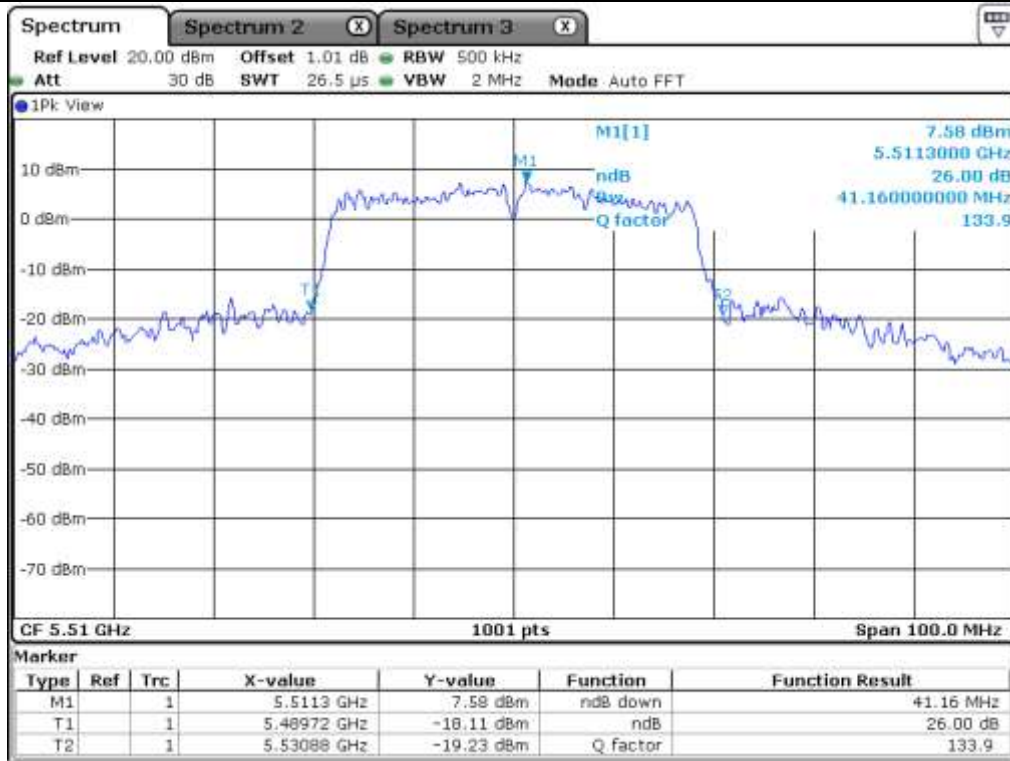
High Channel (5 230 MHz)



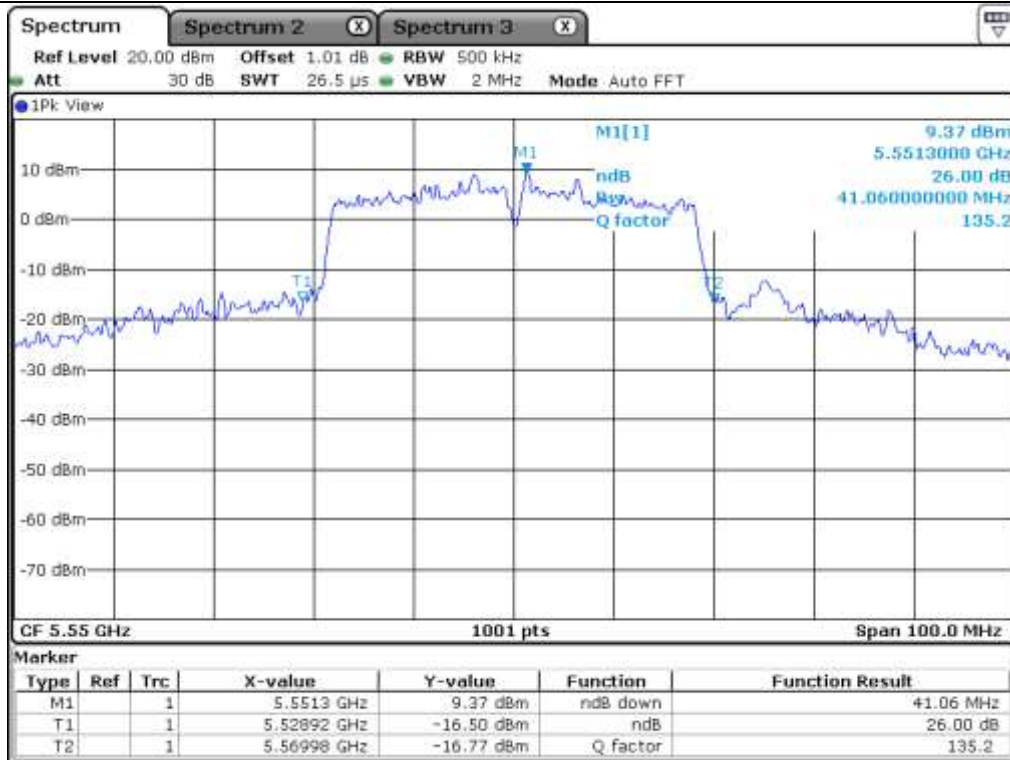
Low Channel (5 270 MHz)



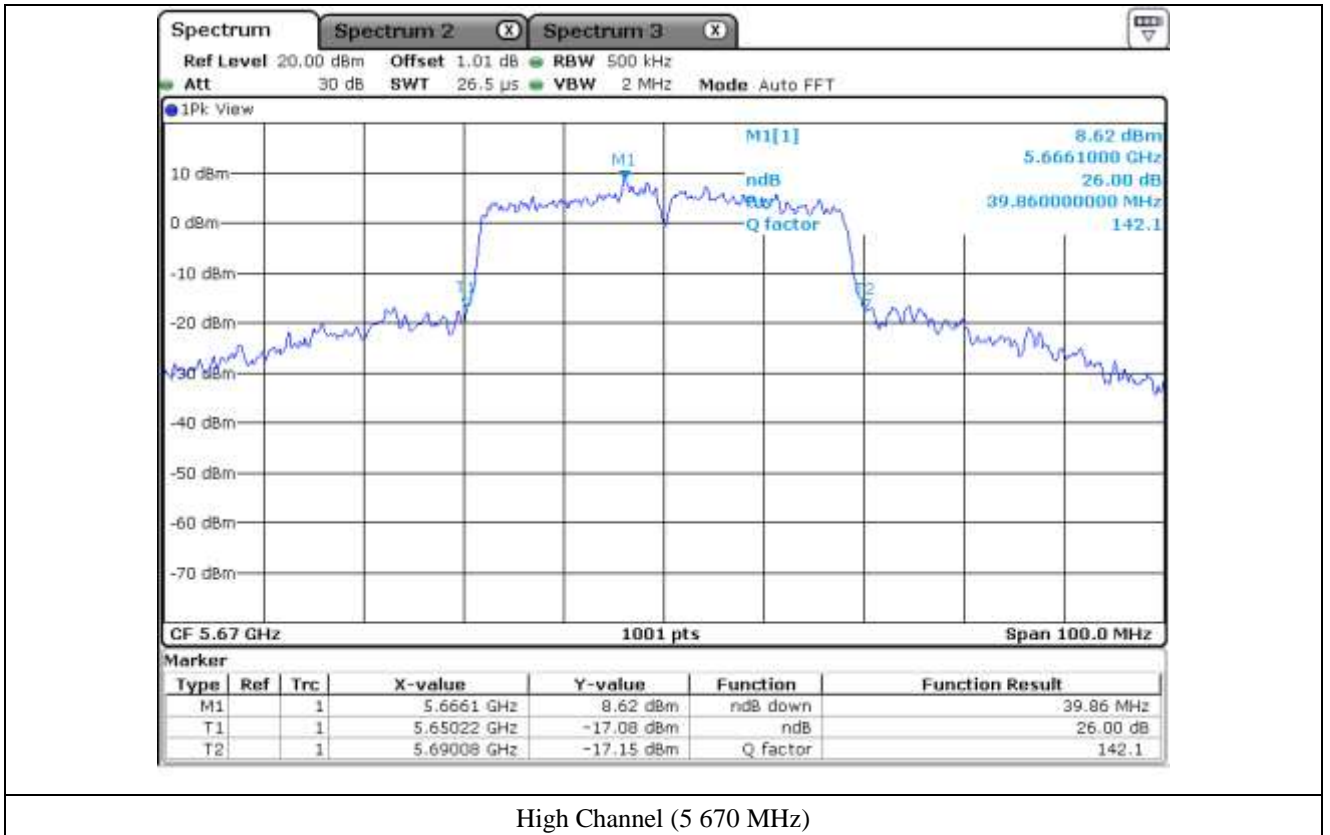
High Channel (5 310 MHz)

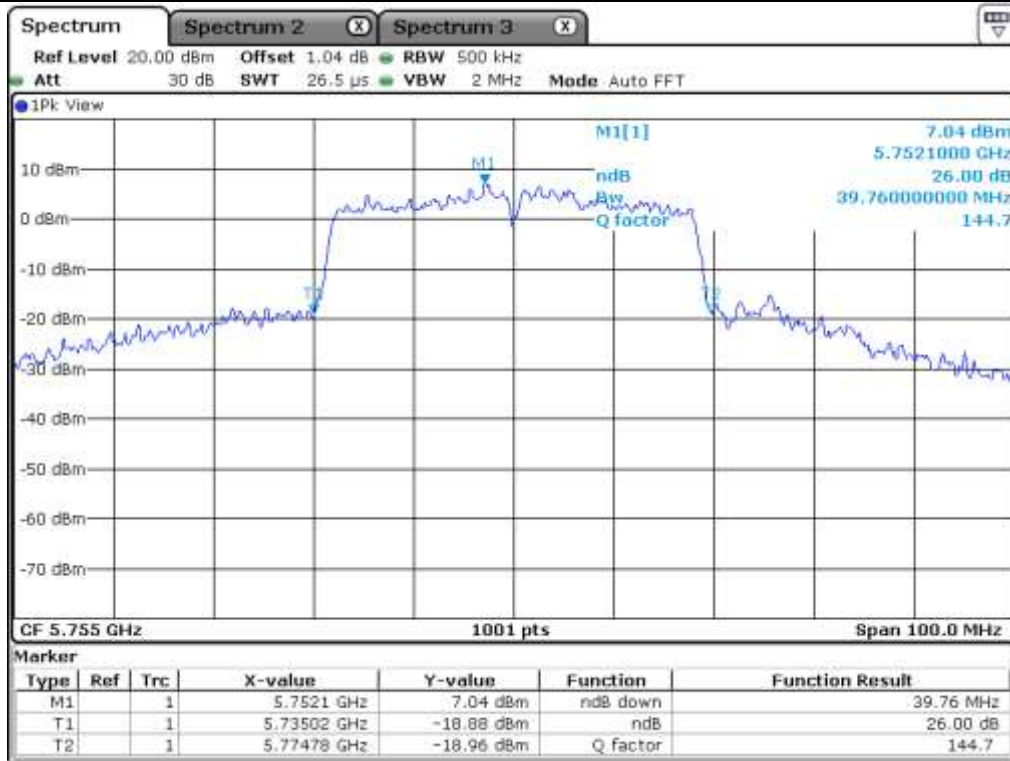


Low Channel (5.510 MHz)

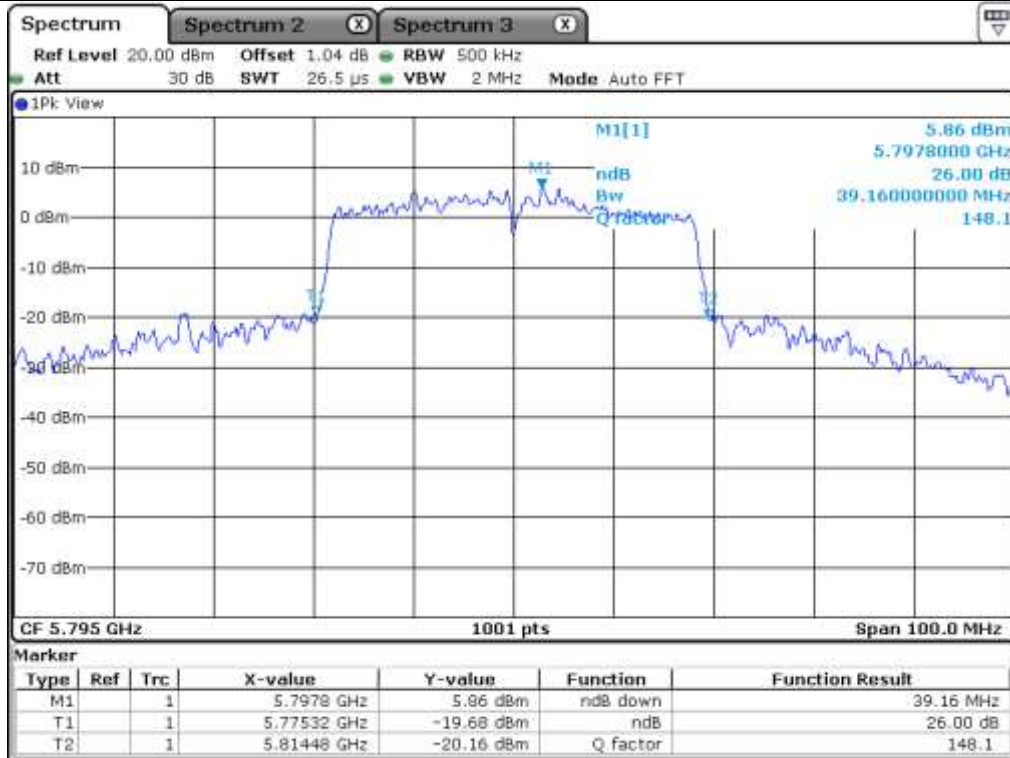


Middle Channel (5.550 MHz)





Low Channel (5 755 MHz)



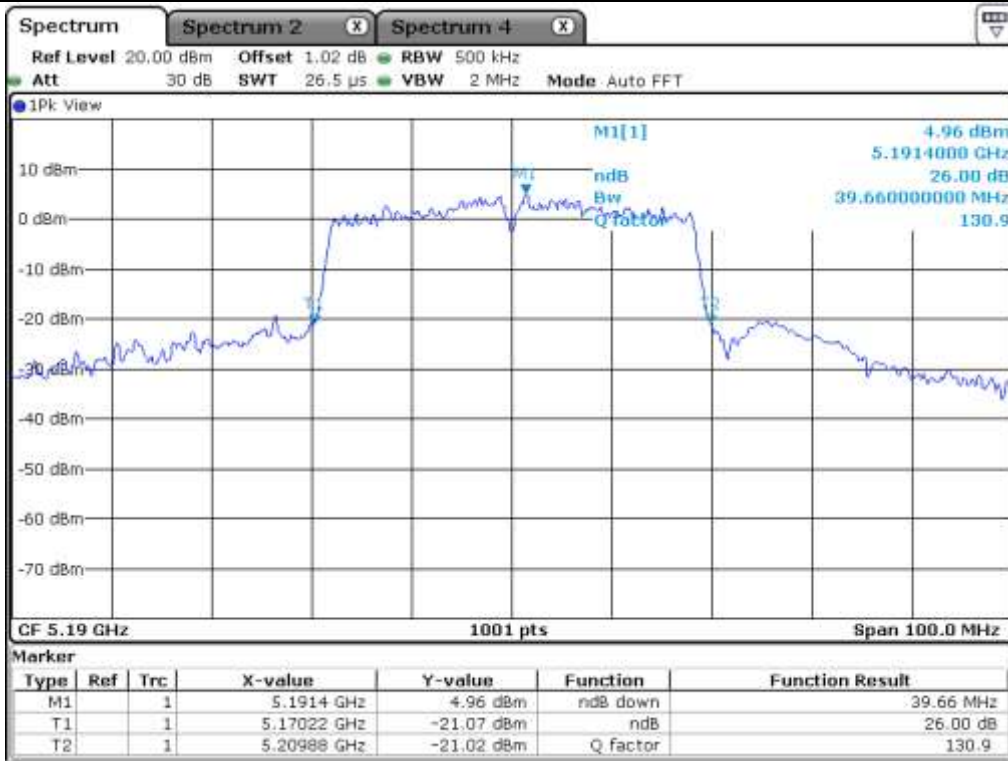
High Channel (5 795 MHz)

7.6.2 Test data for Antenna 1

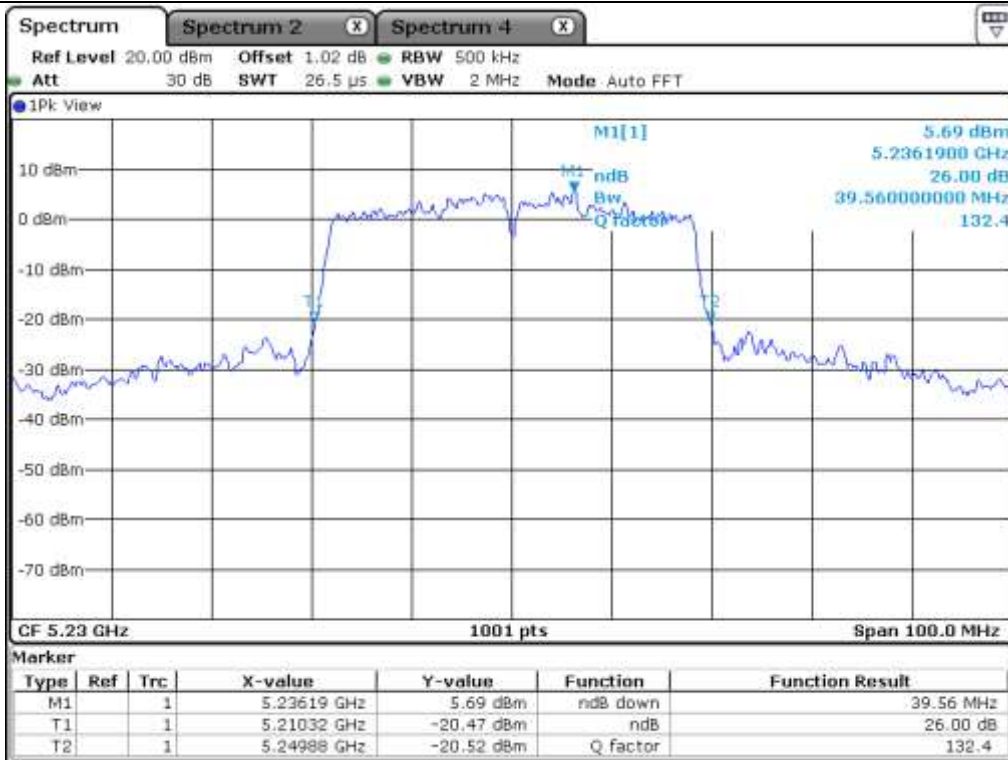
-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | 26 dB Bandwidth (MHz) |
|--------------------------|---------|--------------------|--------------------------|
| 5 150 ~ 5 250 | Low | 5 190.00 | 39.66 |
| | High | 5 230.00 | 39.56 |
| 5 250 ~ 5 350 | Low | 5 270.00 | 40.16 |
| | High | 5 310.00 | 39.76 |
| 5 470 ~ 5 725 | Low | 5 510.00 | 41.06 |
| | Middle | 5 550.00 | 40.46 |
| | High | 5 670.00 | 40.36 |
| 5 725 ~ 5 850 | Low | 5 755.00 | 39.66 |
| | High | 5 795.00 | 39.56 |

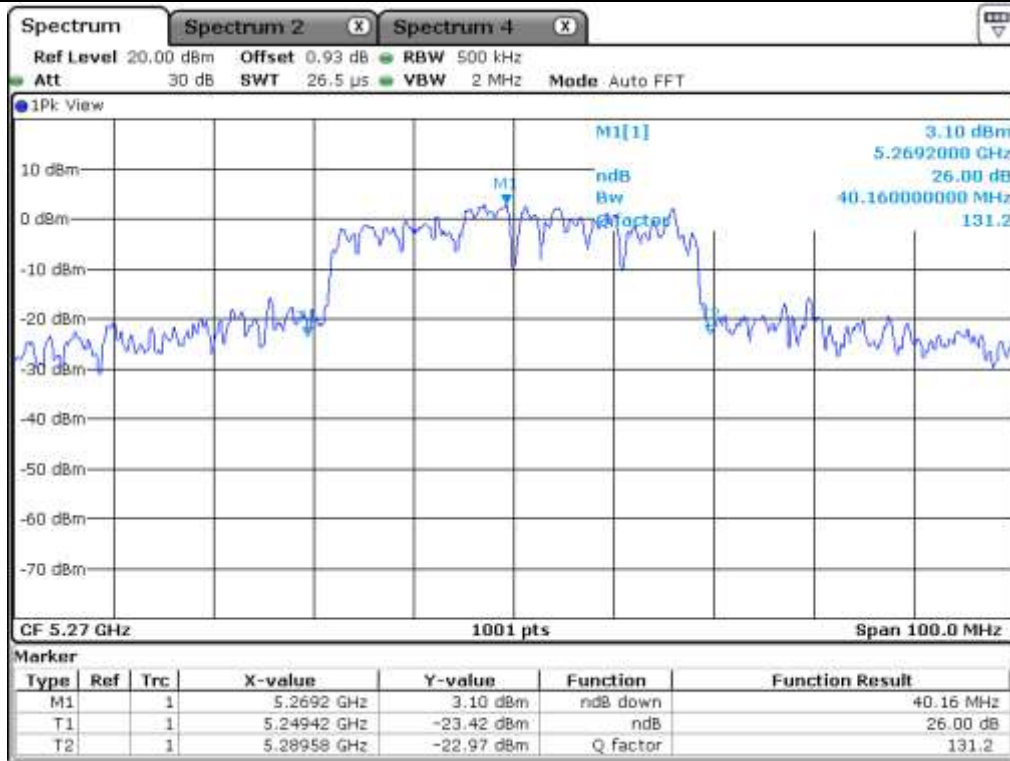
Remark: See next page for measurement data.



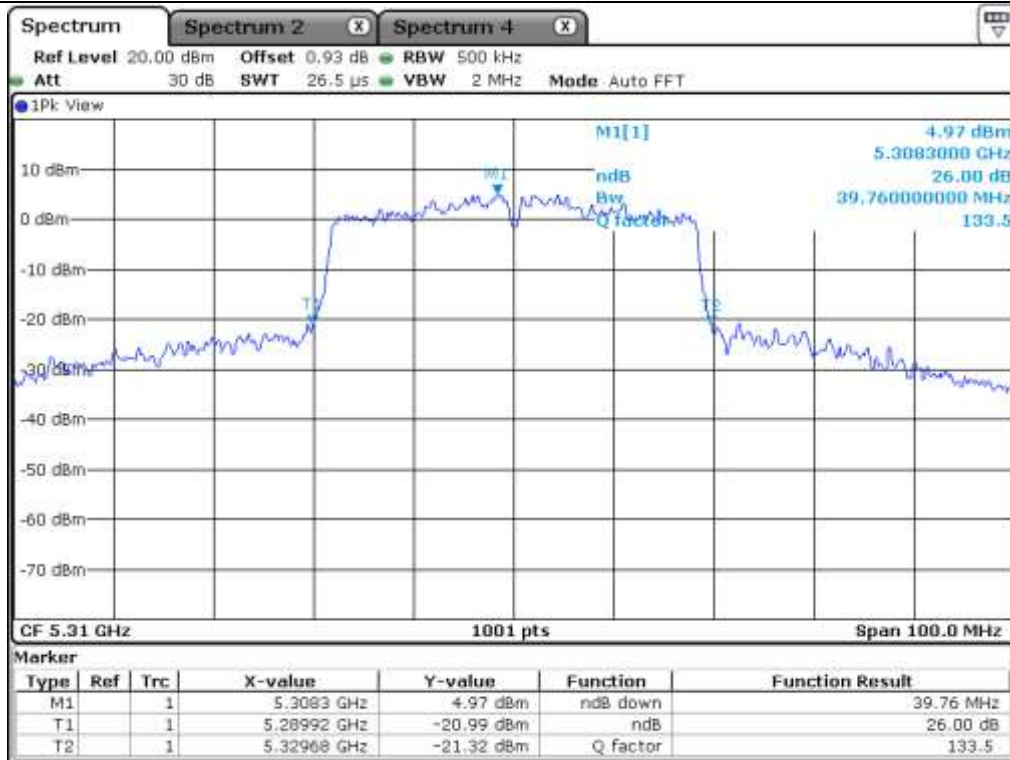
Low Channel (5 190 MHz)



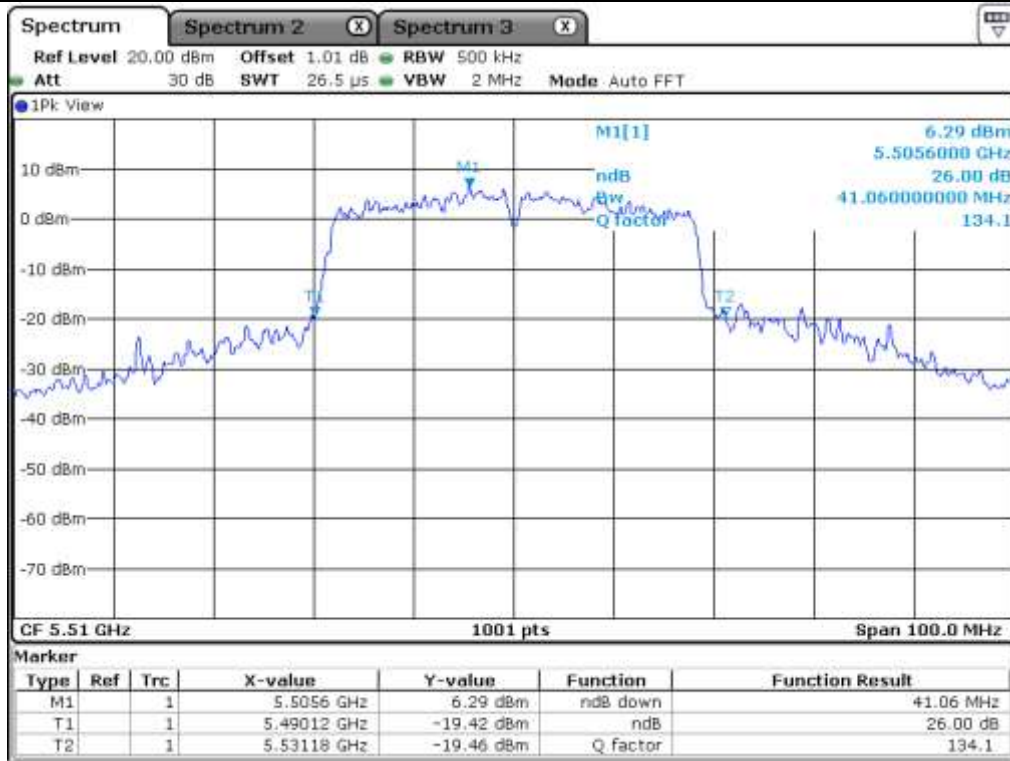
High Channel (5 230 MHz)



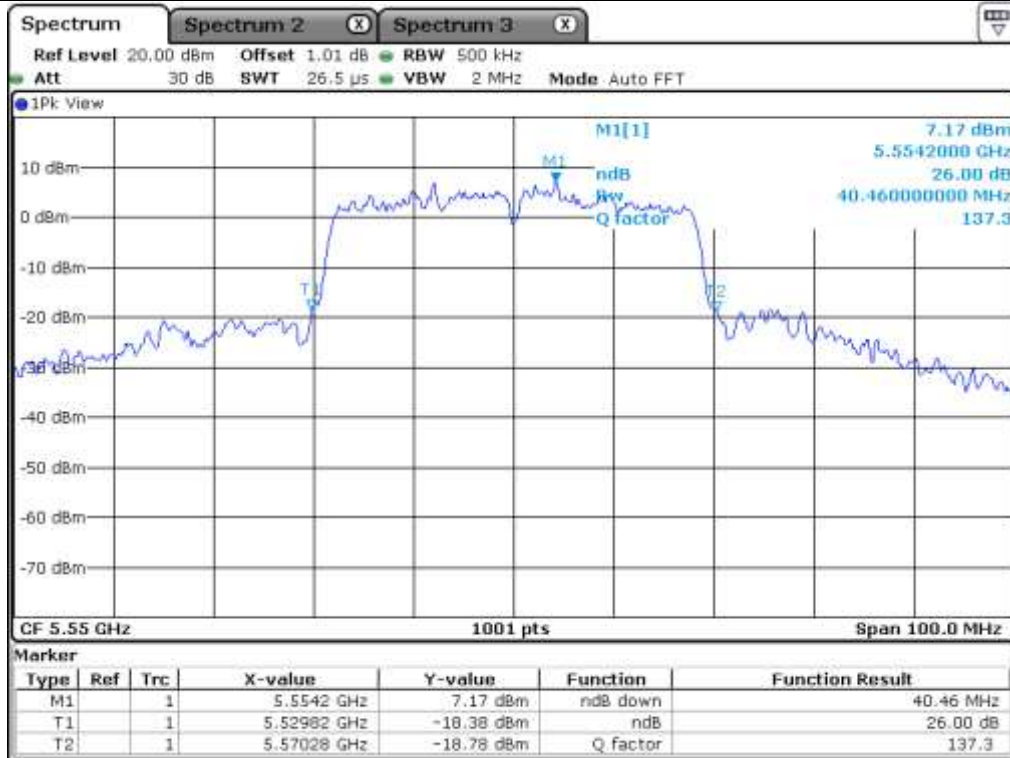
Low Channel (5 270 MHz)



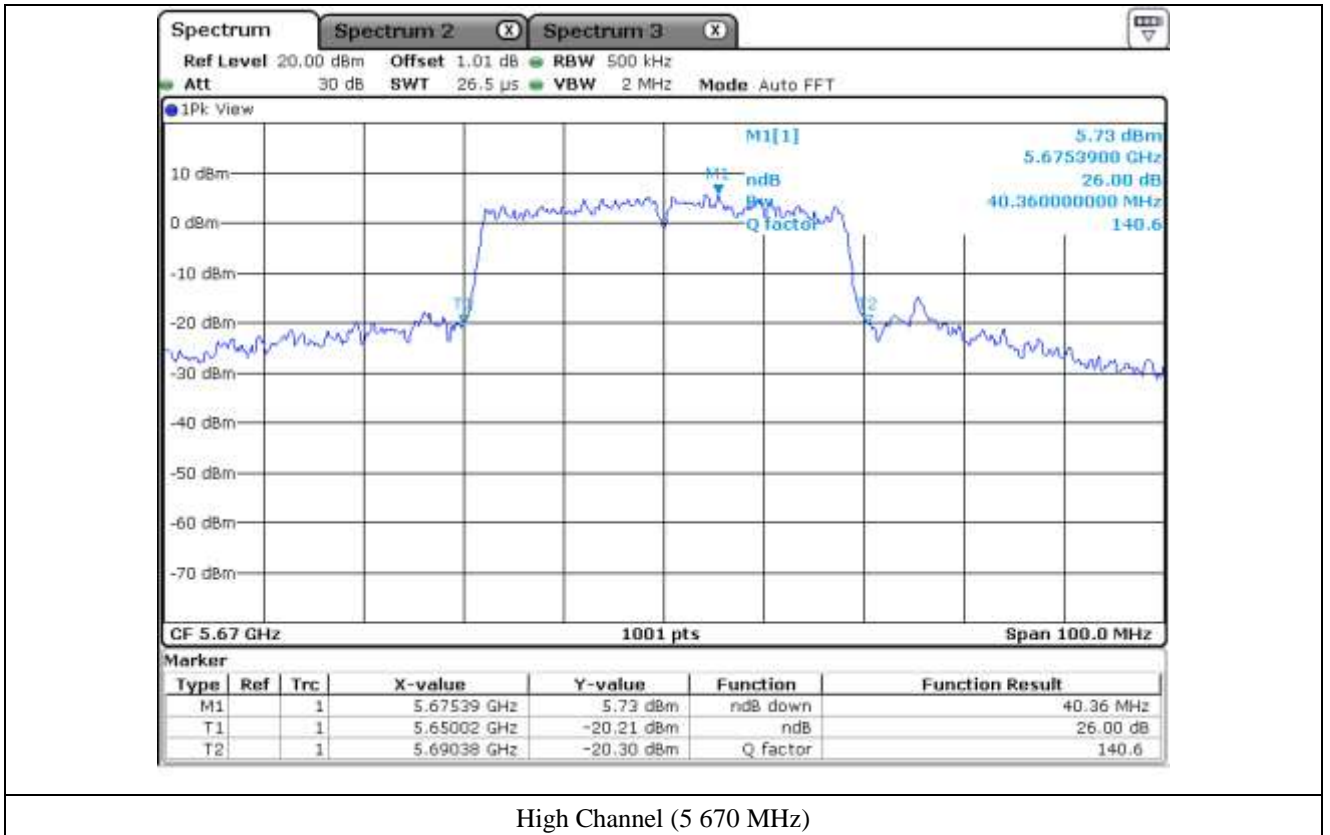
High Channel (5 310 MHz)

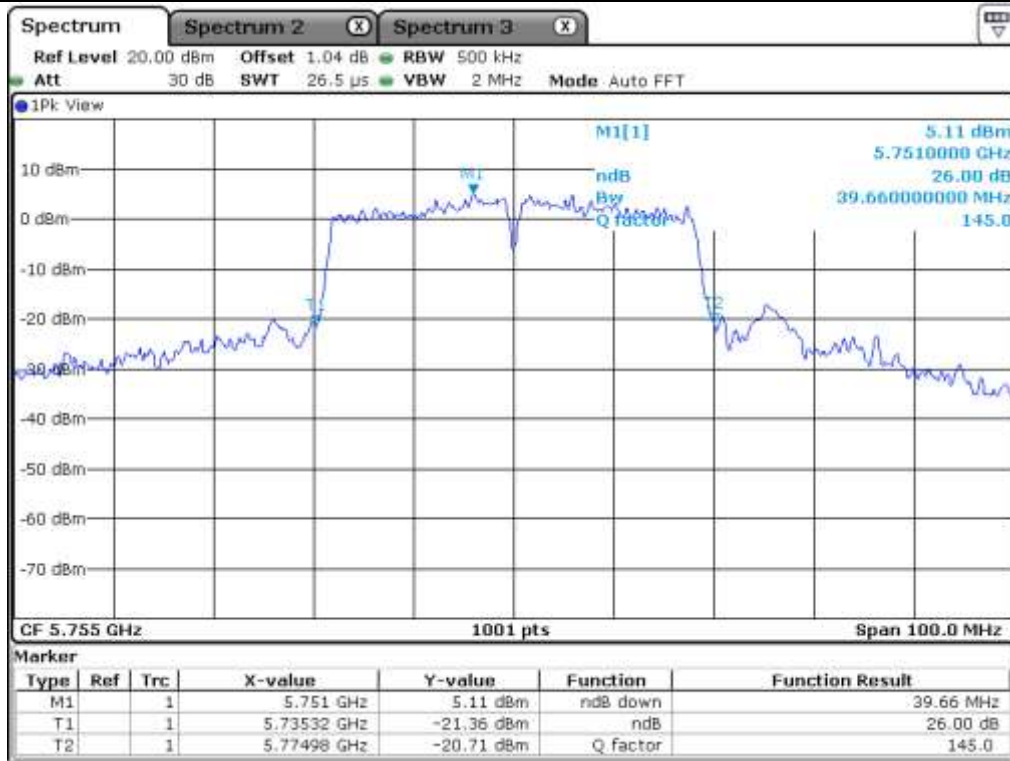


Low Channel (5 510 MHz)

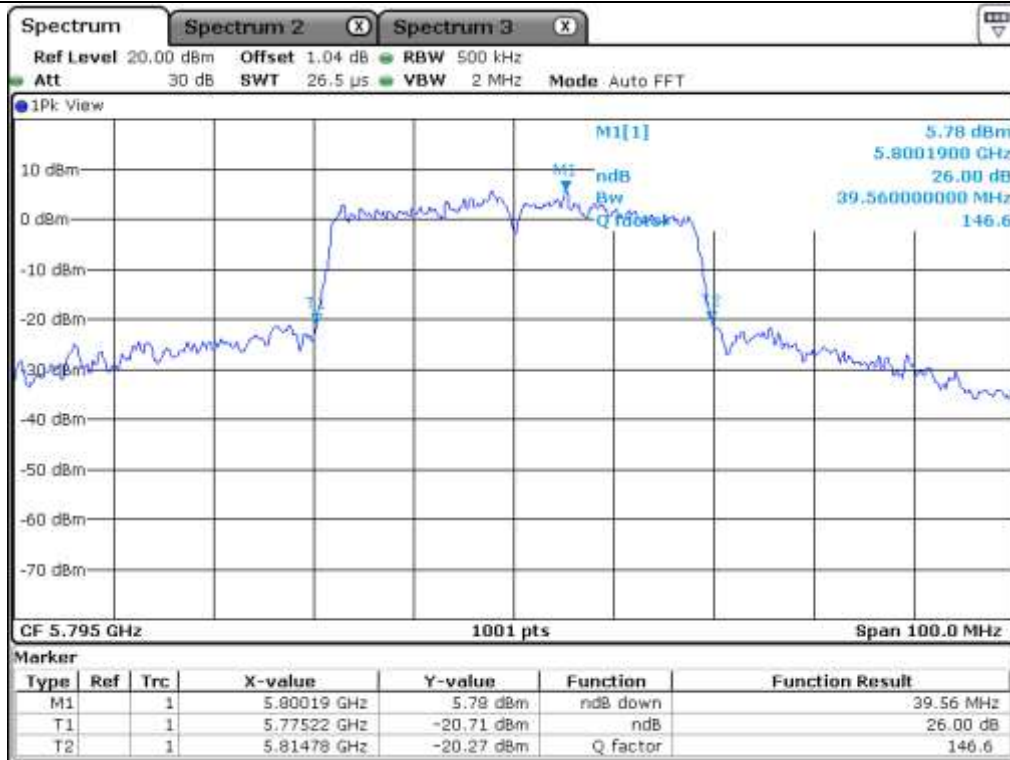


Middle Channel (5 550 MHz)





Low Channel (5 755 MHz)

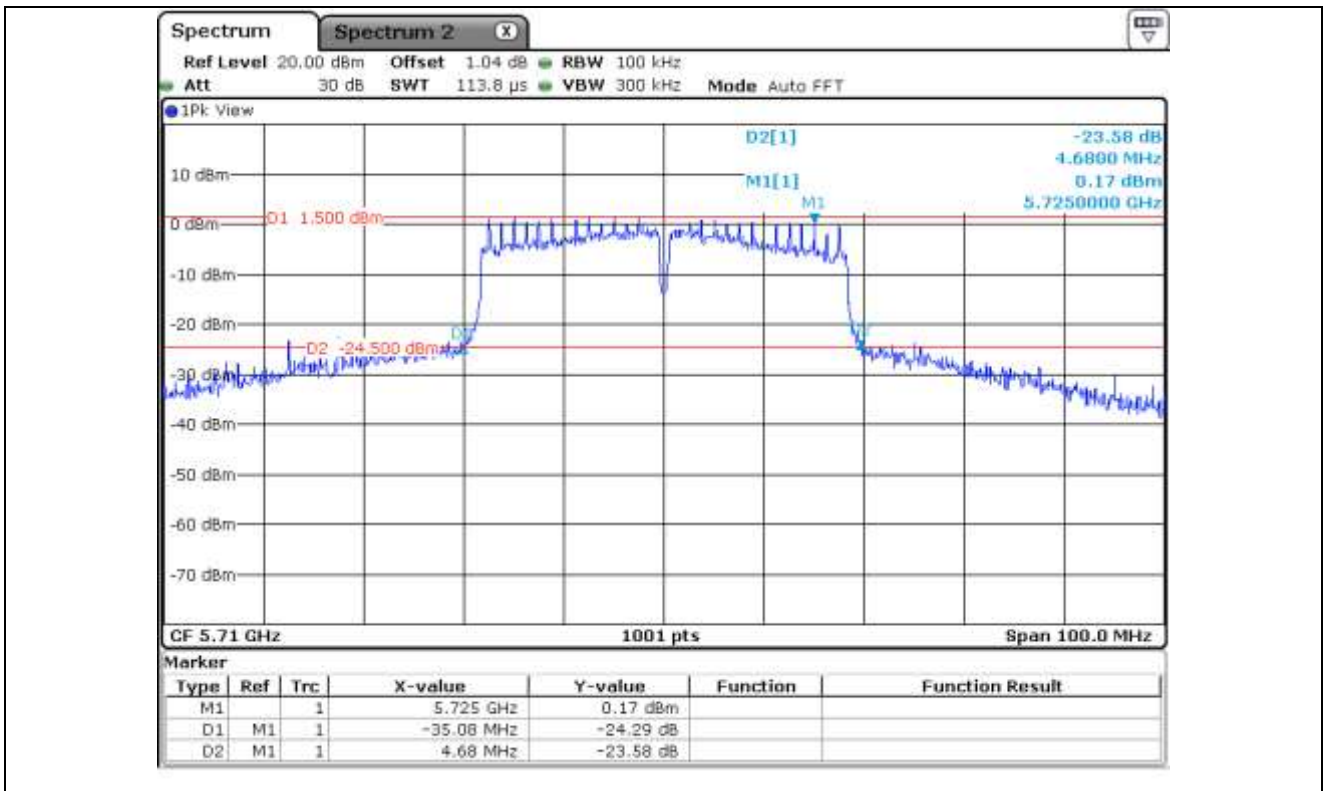


High Channel (5 795 MHz)

7.6.3 Test data for Straddle Channel_Antenna 0

-. Test Result : Pass

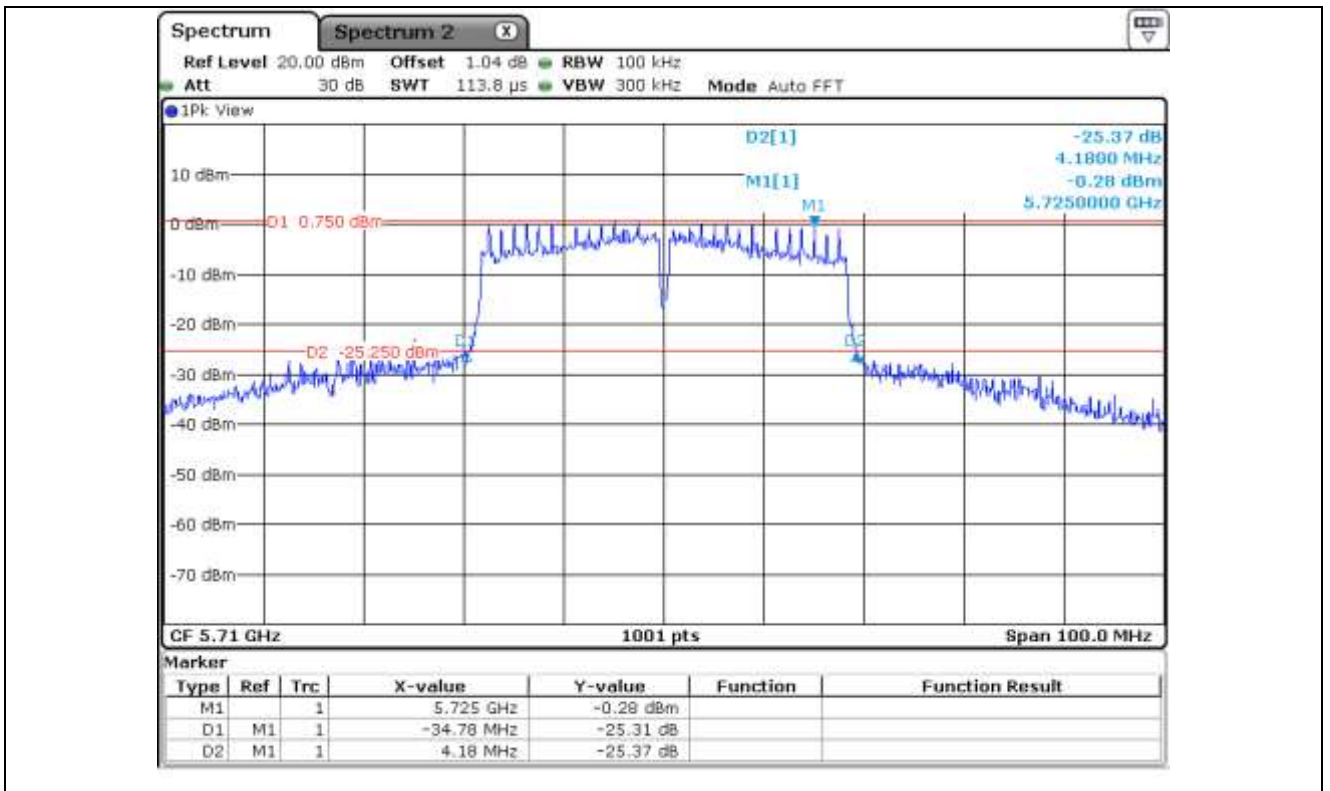
| FREQUENCY RANGE (MHz) | FREQUENCY (MHz) | 26 dB Bandwidth (MHz) |
|-----------------------|-----------------|-----------------------|
| 5 470 ~ 5 725 | 5 710.00 | 35.08 |
| 5 725 ~ 5 850 | 5 710.00 | 4.68 |



7.6.4 Test data for Straddle Channel_Antenna 1

-. Test Result : Pass

| FREQUENCY RANGE (MHz) | FREQUENCY (MHz) | 26 dB Bandwidth (MHz) |
|-----------------------|-----------------|-----------------------|
| 5 470 ~ 5 725 | 5 710.00 | 34.78 |
| 5 725 ~ 5 850 | 5 710.00 | 4.18 |

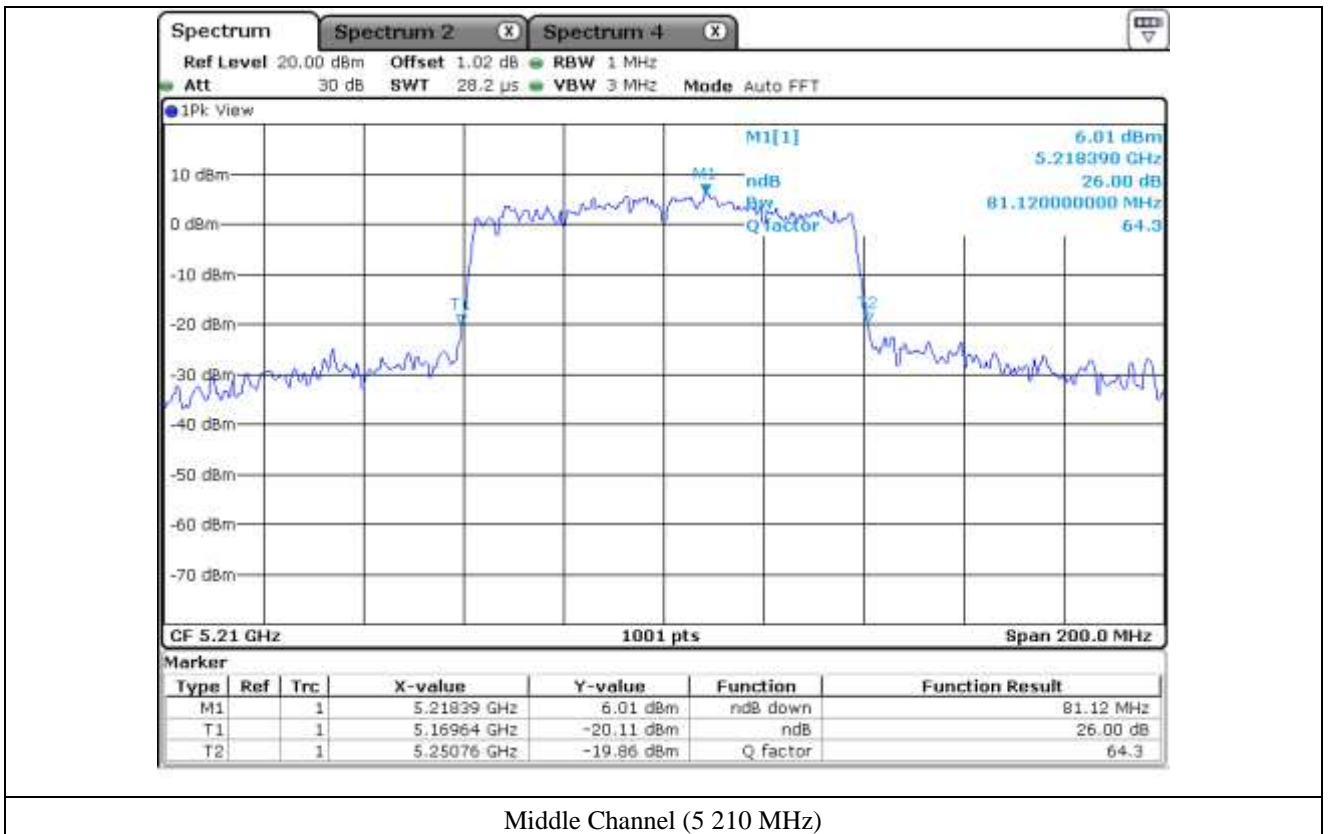


7.7 Test data for 802.11ac_VHT80 RLAN Mode

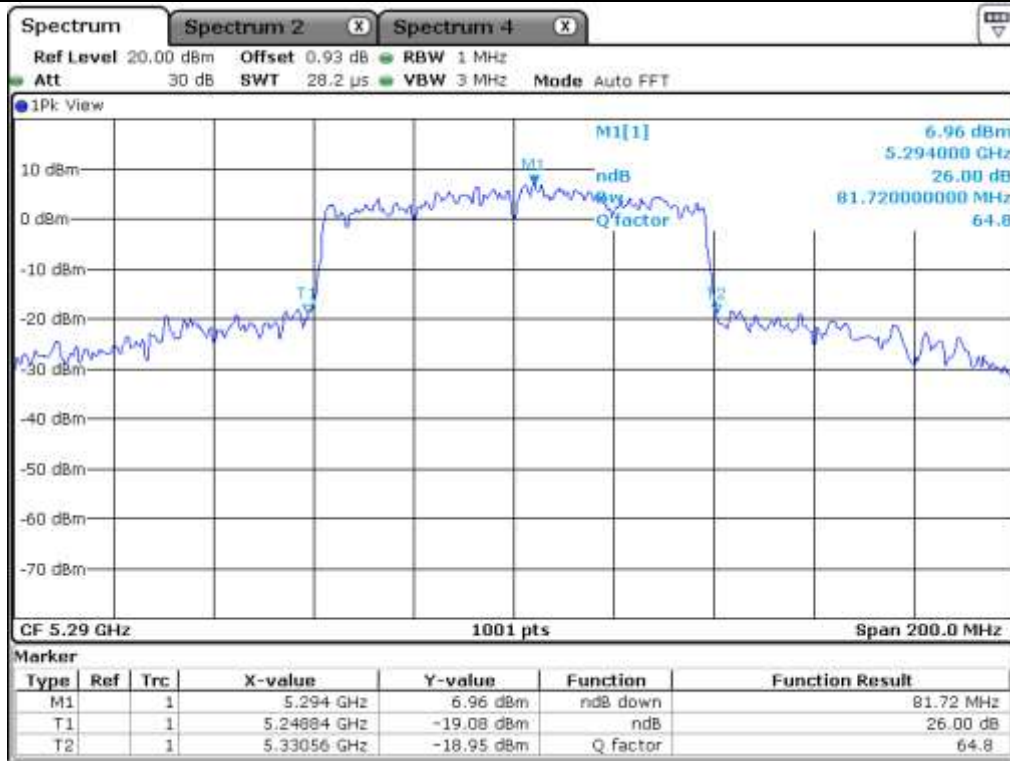
7.7.1 Test data for Antenna 0

-. Test Result : Pass

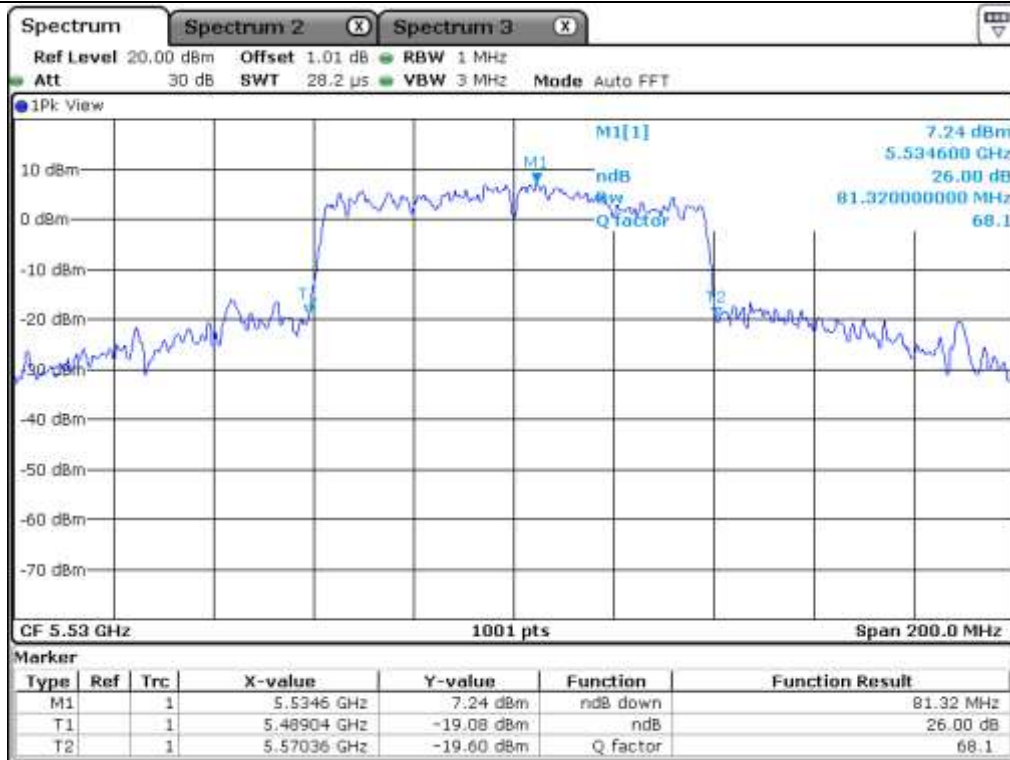
| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | 26 dB Bandwidth (MHz) |
|-----------------------|---------|-----------------|-----------------------|
| 5 150 ~ 5 250 | Middle | 5 210.00 | 81.12 |
| 5 250 ~ 5 350 | Middle | 5 290.00 | 81.72 |
| 5 470 ~ 5 725 | Low | 5 530.00 | 81.32 |
| | High | 5 690.00 | 81.32 |
| 5 725 ~ 5 850 | Middle | 5 775.00 | 81.12 |



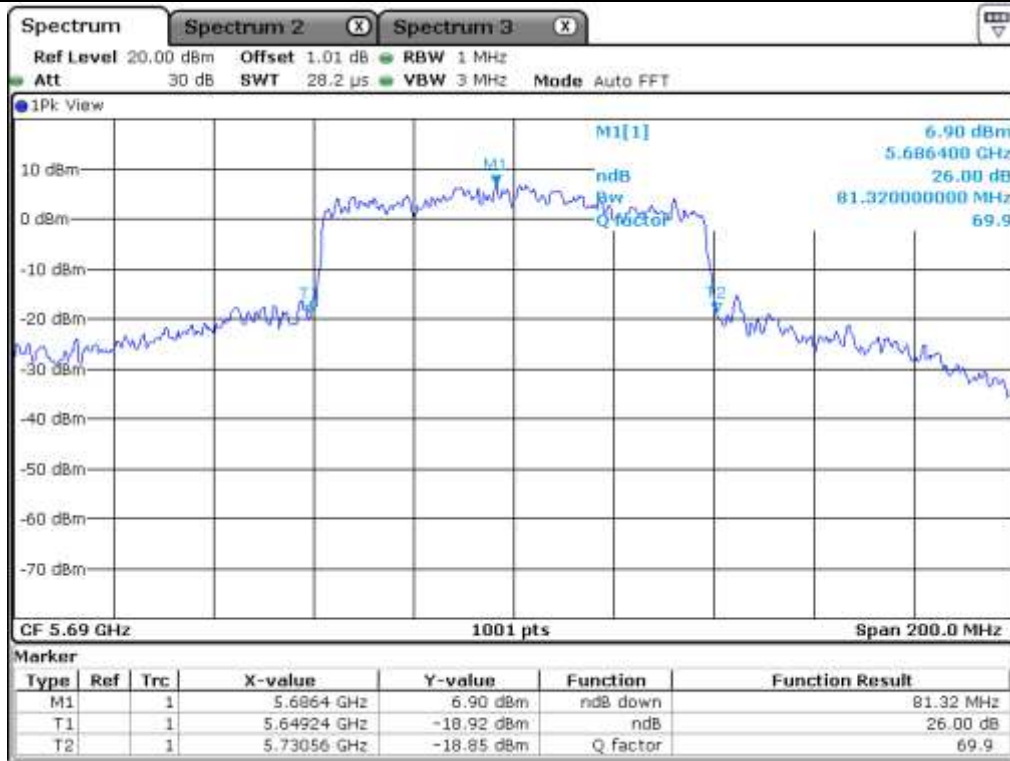
Middle Channel (5 210 MHz)



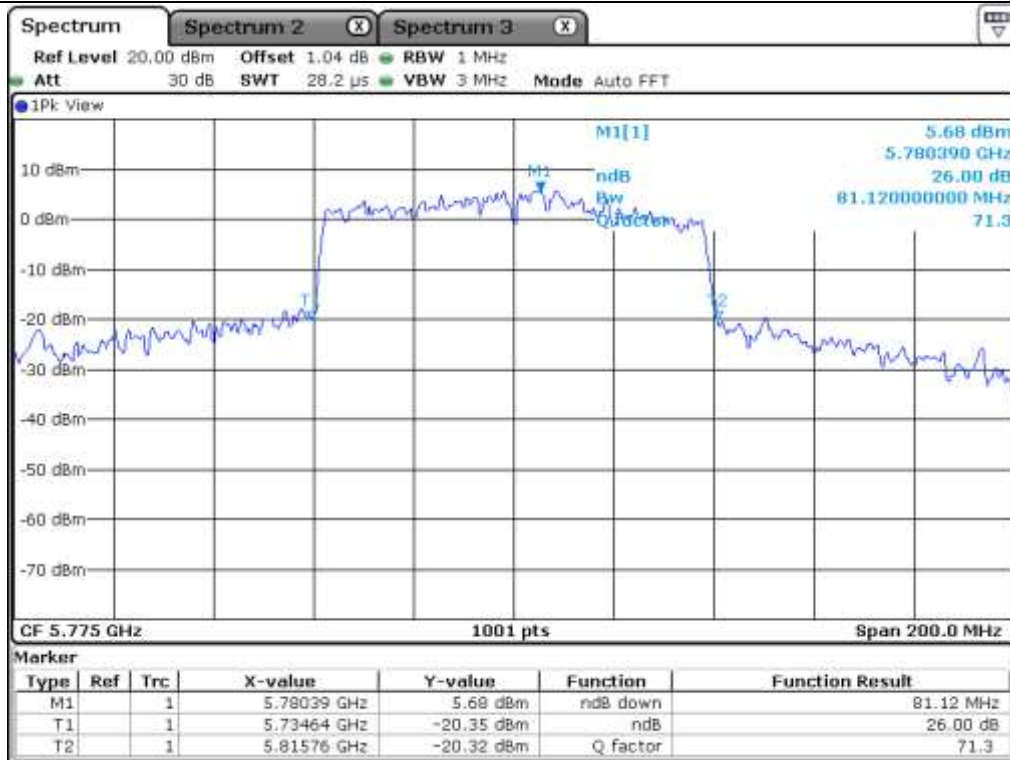
Middle Channel (5 290 MHz)



Low Channel (5 530 MHz)



High Channel (5 690 MHz)



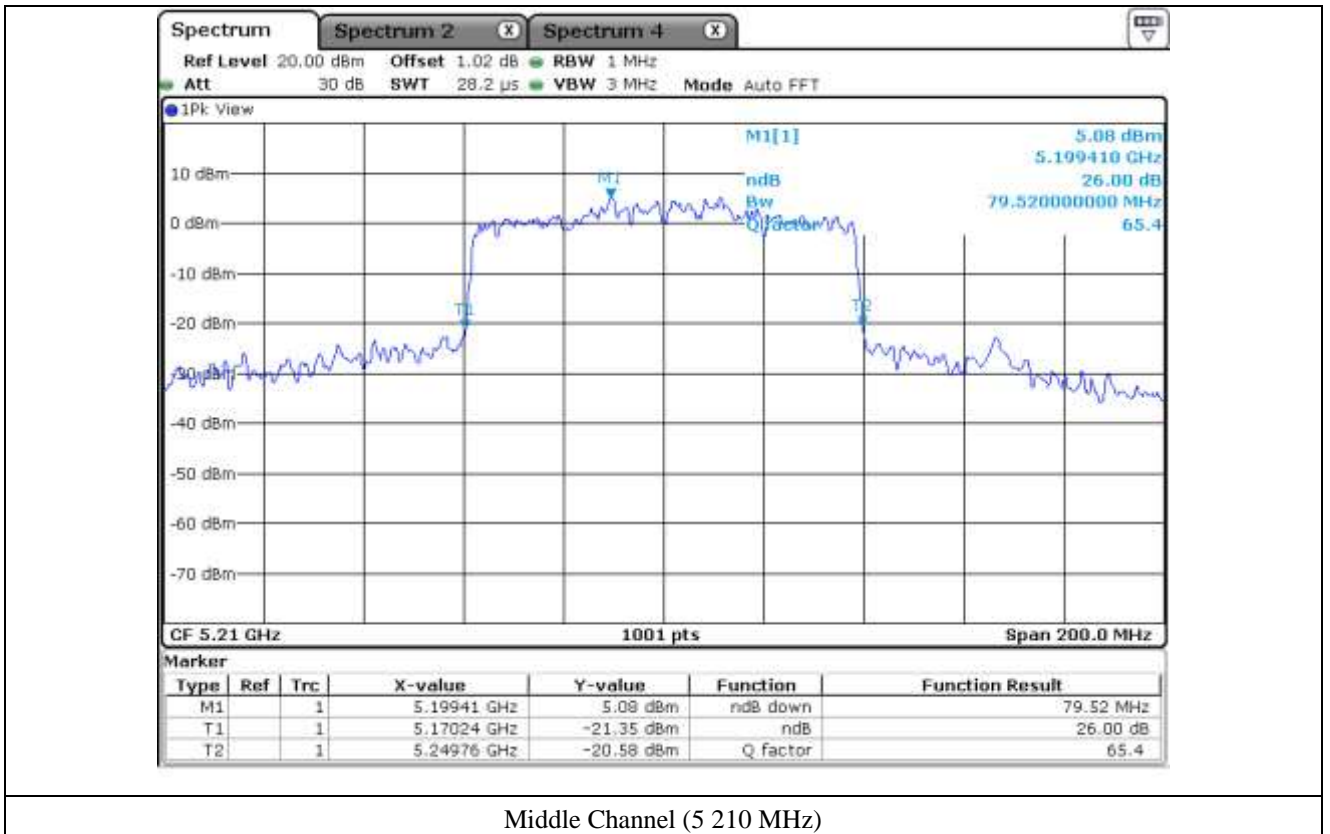
Middle Channel (5 775 MHz)

7.7.2 Test data for Antenna 1

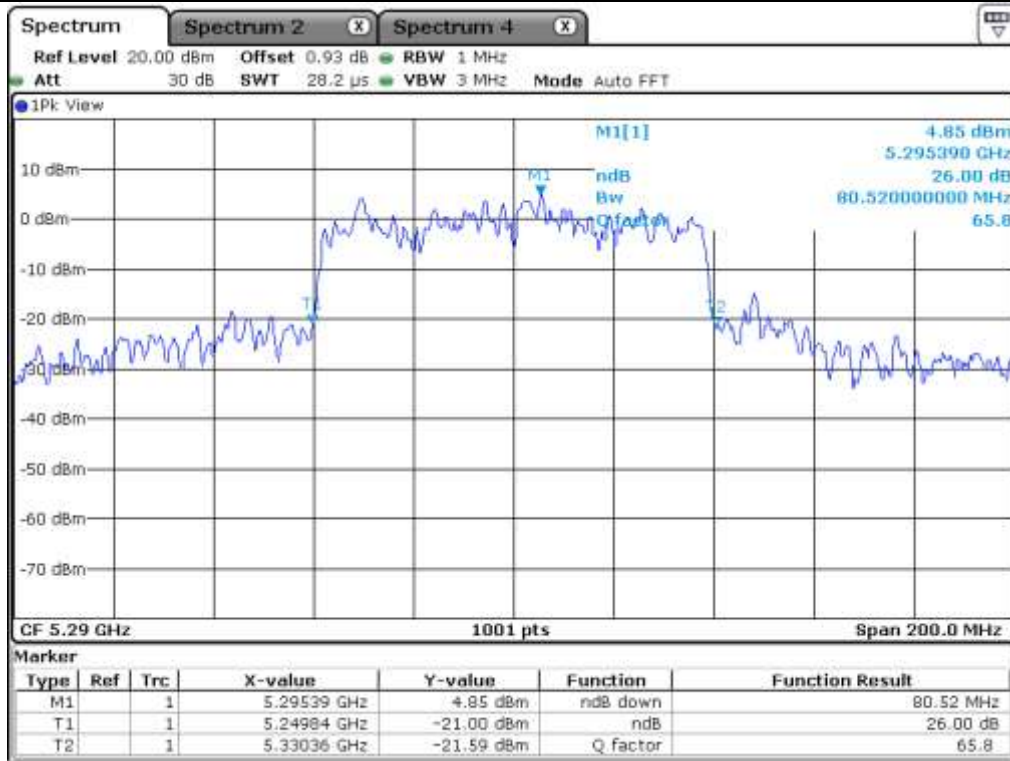
-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | 26 dB Bandwidth (MHz) |
|-----------------------|---------|-----------------|-----------------------|
| 5 150 ~ 5 250 | Middle | 5 210.00 | 79.52 |
| 5 250 ~ 5 350 | Middle | 5 290.00 | 80.52 |
| 5 470 ~ 5 725 | Low | 5 530.00 | 82.12 |
| | High | 5 690.00 | 80.92 |
| 5 725 ~ 5 850 | Middle | 5 775.00 | 80.32 |

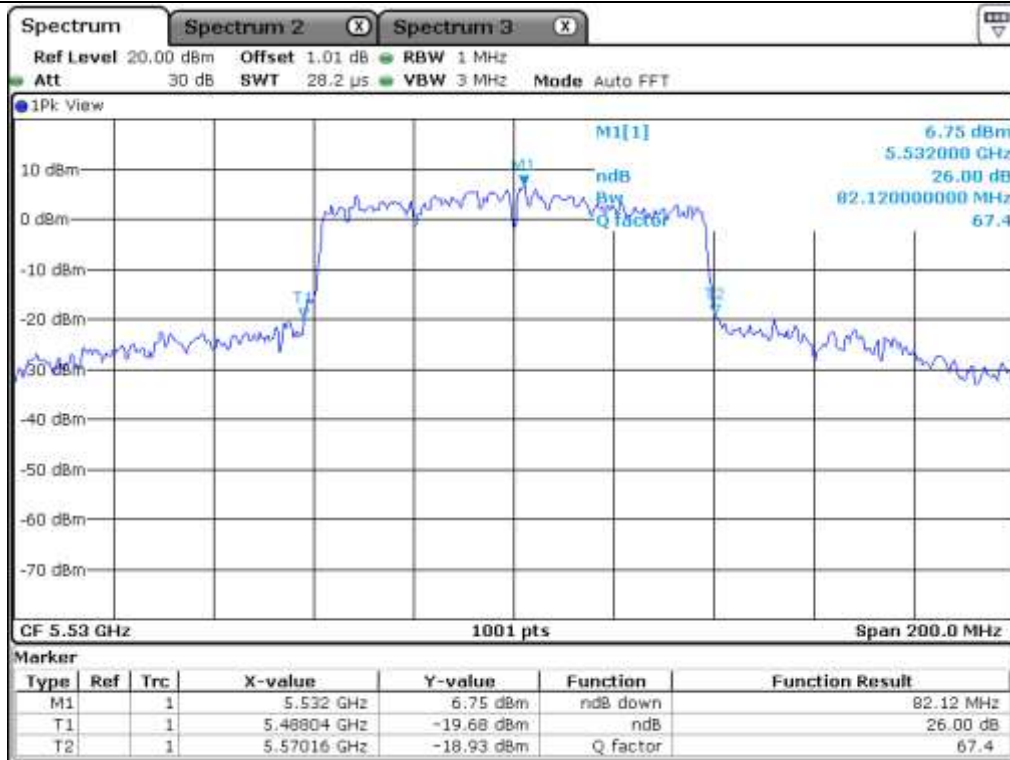
Remark: See next page for measurement data.



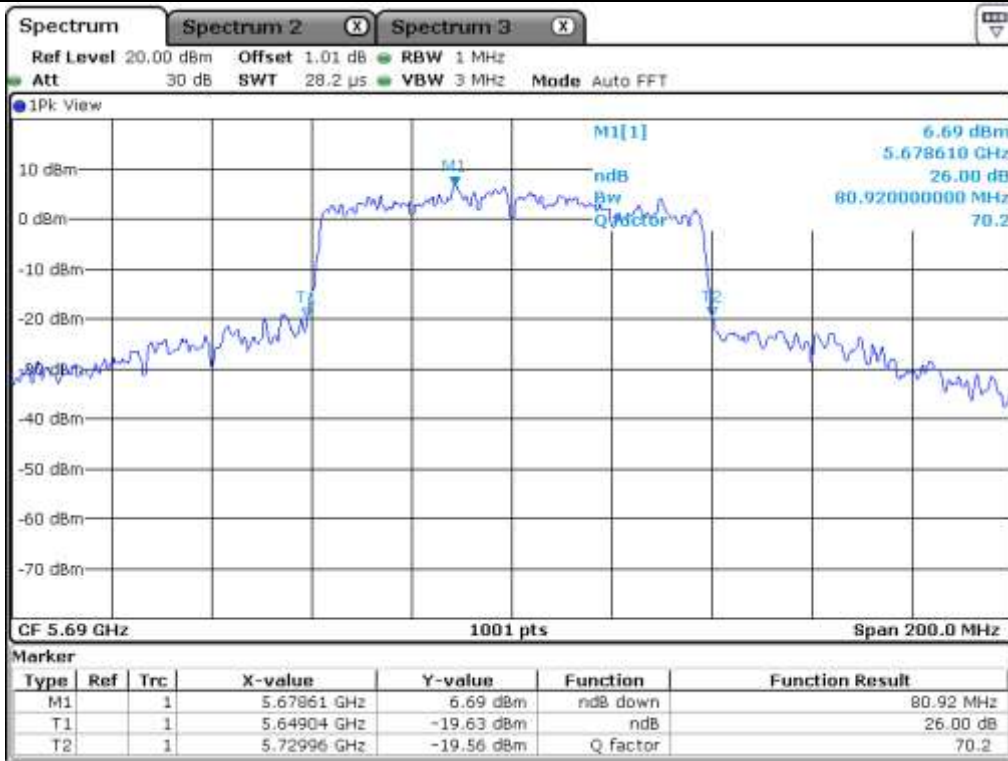
Middle Channel (5 210 MHz)



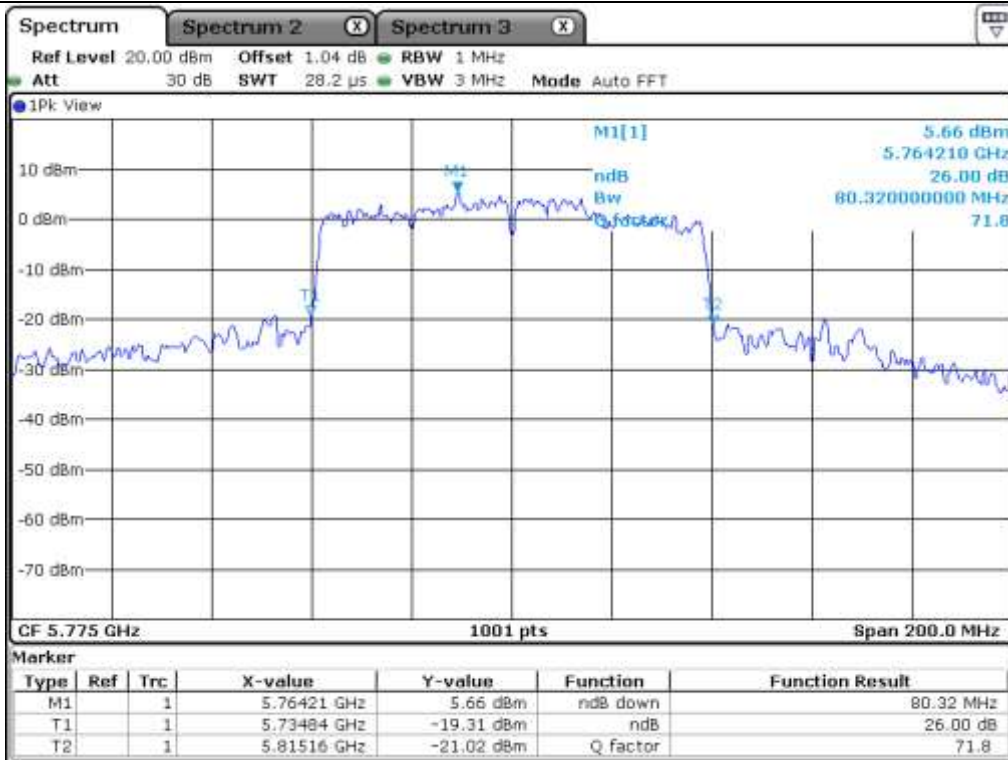
Middle Channel (5 290 MHz)



Low Channel (5 530 MHz)



High Channel (5 690 MHz)

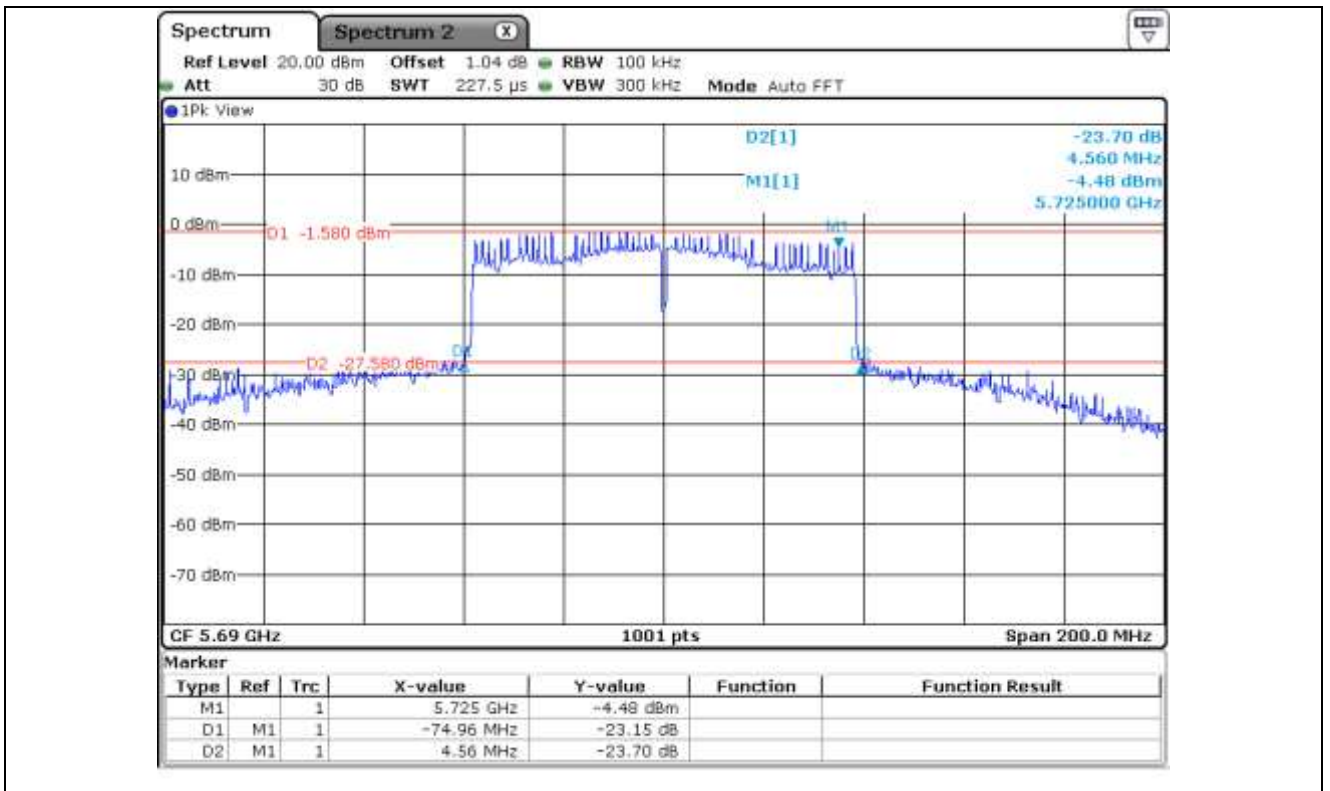


Middle Channel (5 775 MHz)

7.7.3 Test data for Straddle Channel_Antenna 0

-. Test Result : Pass

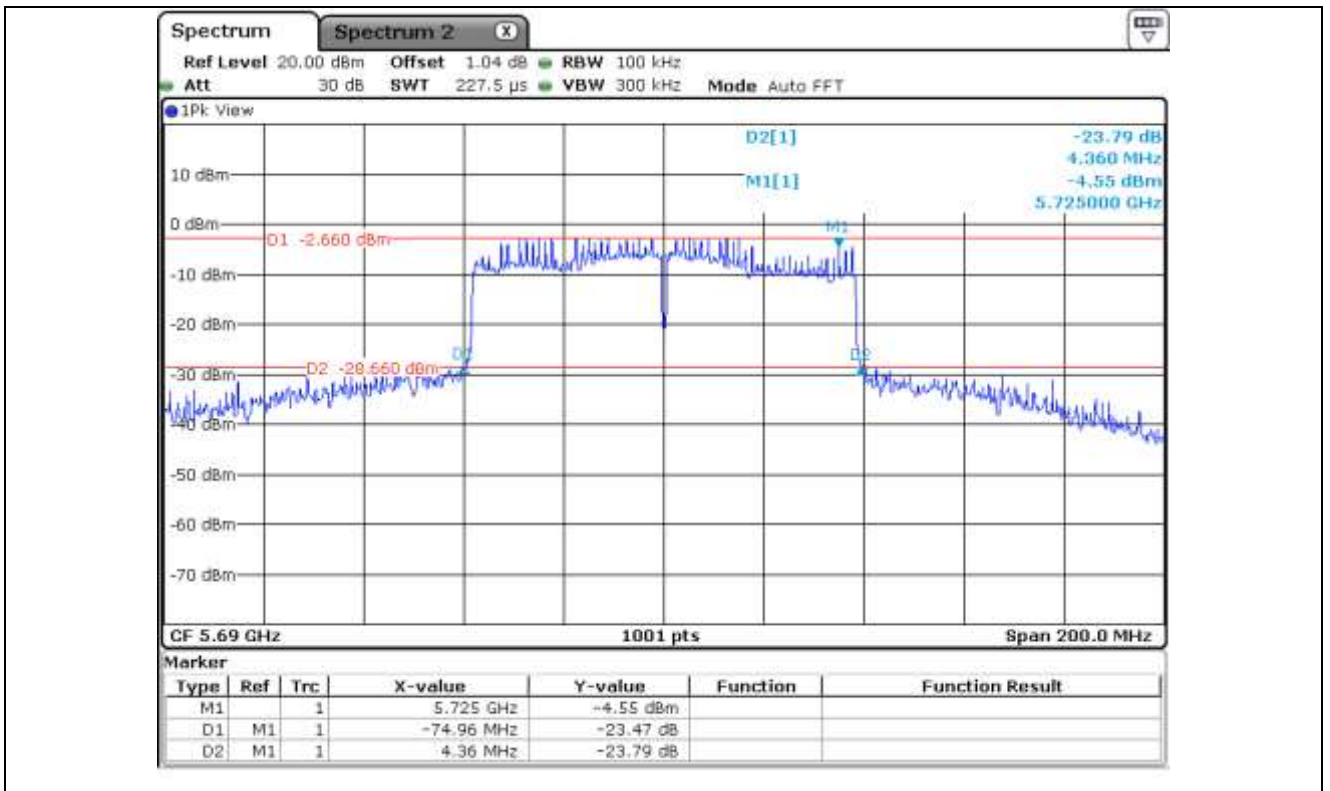
| FREQUENCY RANGE (MHz) | FREQUENCY (MHz) | 26 dB Bandwidth (MHz) |
|-----------------------|-----------------|-----------------------|
| 5 470 ~ 5 725 | 5 690.00 | 74.96 |
| 5 725 ~ 5 850 | 5 690.00 | 4.56 |



7.7.4 Test data for Straddle Channel_Antenna 1

-. Test Result : Pass

| FREQUENCY RANGE (MHz) | FREQUENCY (MHz) | 26 dB Bandwidth (MHz) |
|-----------------------|-----------------|-----------------------|
| 5 470 ~ 5 725 | 5 690.00 | 74.96 |
| 5 725 ~ 5 850 | 5 690.00 | 4.36 |



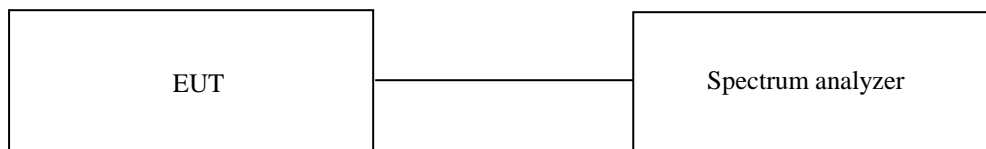
8. 6 dB BANDWIDTH

8.1 Operating environment

Temperature : 23 °C
 Relative humidity : 45 % R.H.

8.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz, and peak detection was used. The 6 dB bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 6 dB.



8.3 Test Date

September 07, 2020 ~ September 11, 2020

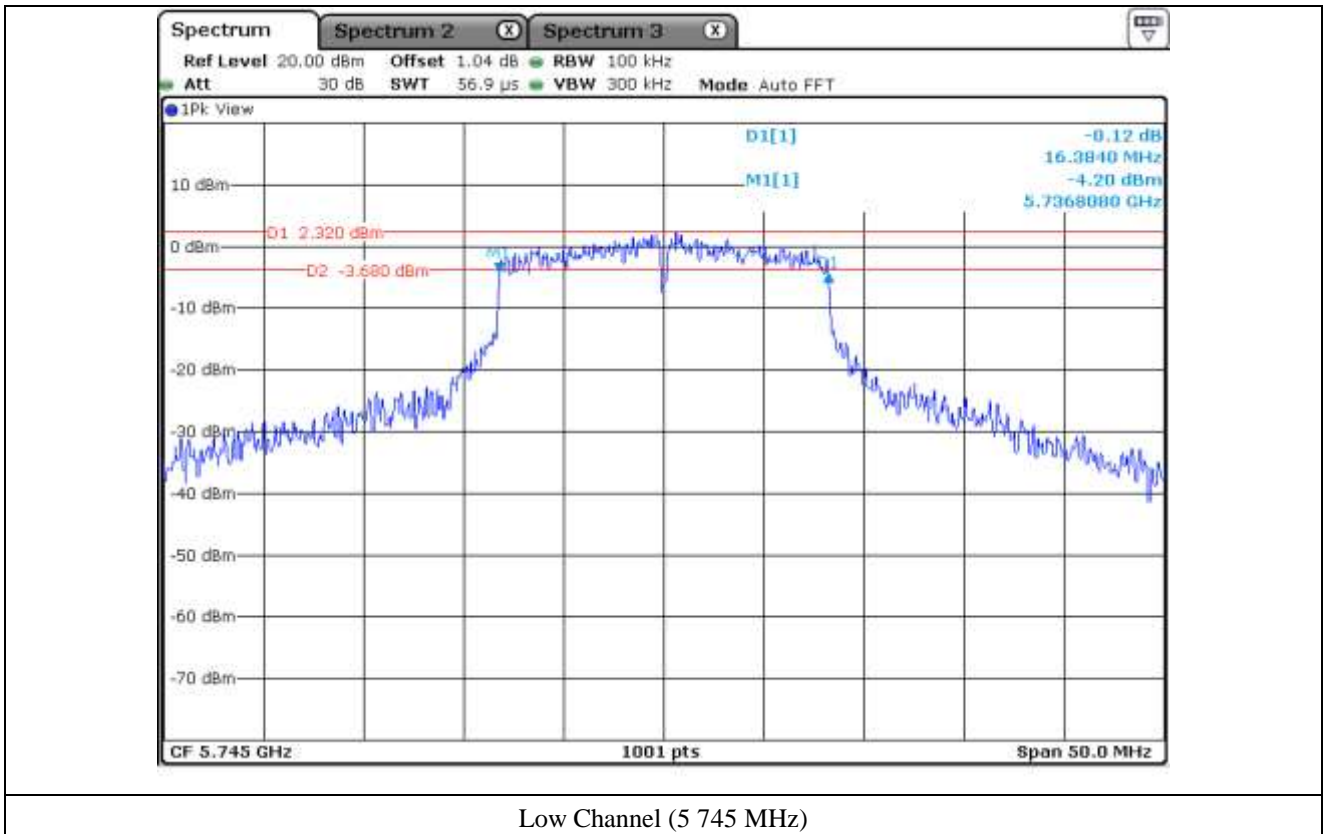
8.4 Test data for 802.11a RLAN Mode

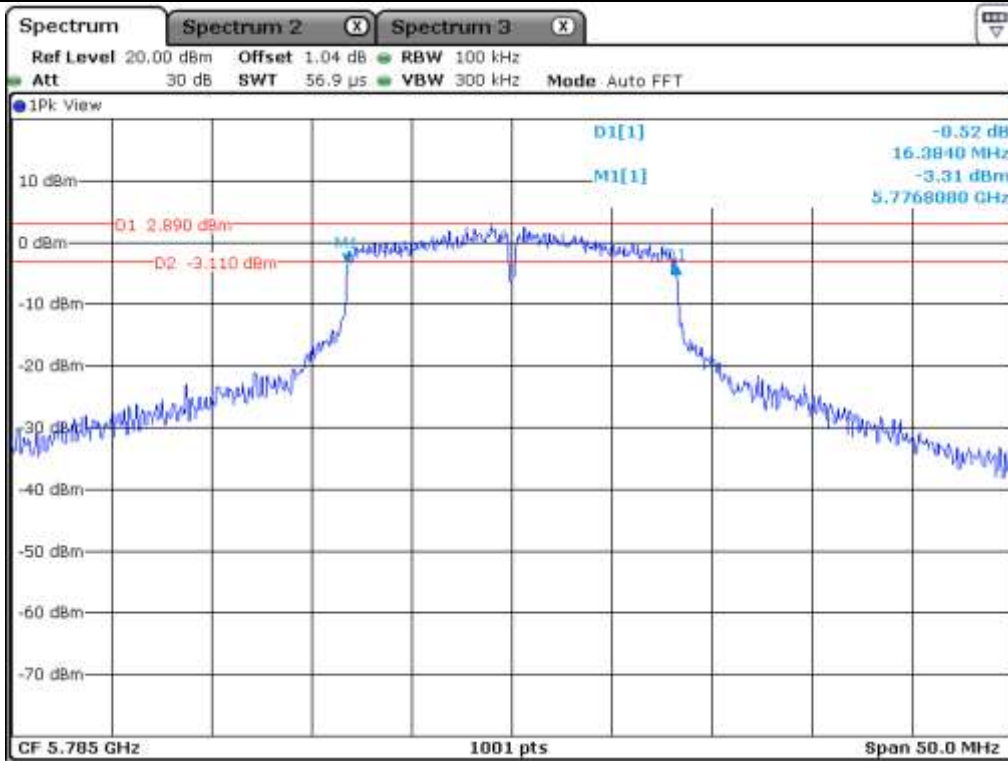
8.4.1 Test data for Antenna 0

-. Test Result : Pass

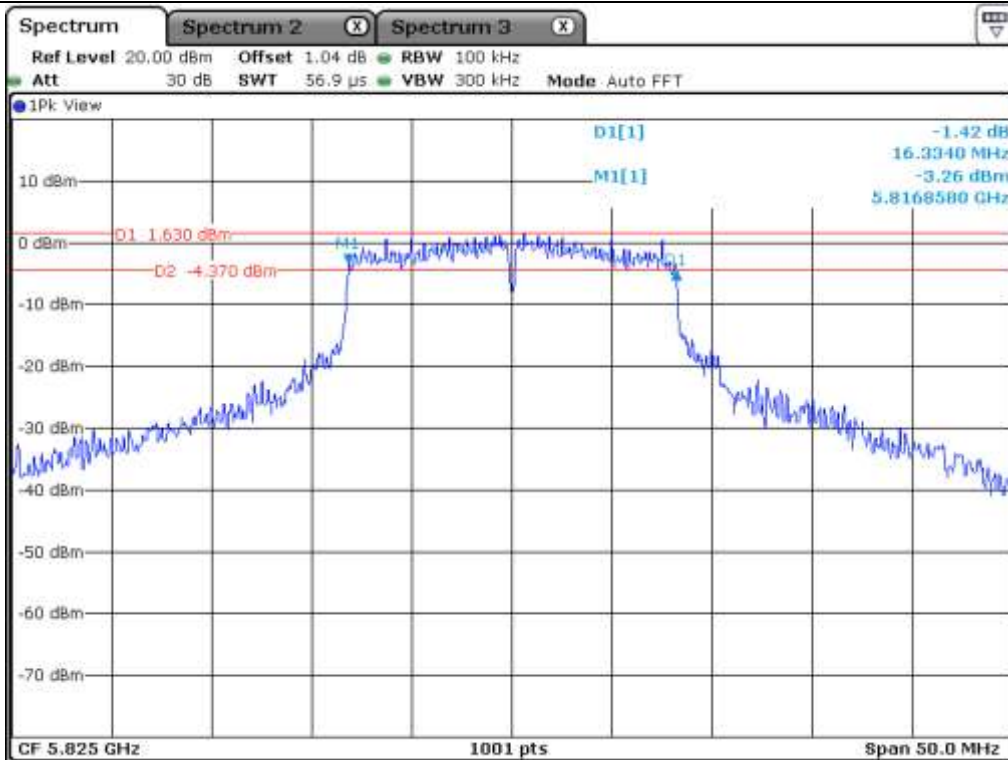
| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | 6 dB Bandwidth (MHz) |
|--------------------------|---------|--------------------|-------------------------|
| 5 725 ~ 5 850 | Low | 5 745.00 | 16.38 |
| | Middle | 5 785.00 | 16.38 |
| | High | 5 825.00 | 16.33 |

Remark: See next page for measurement data.





Middle Channel (5.785 MHz)



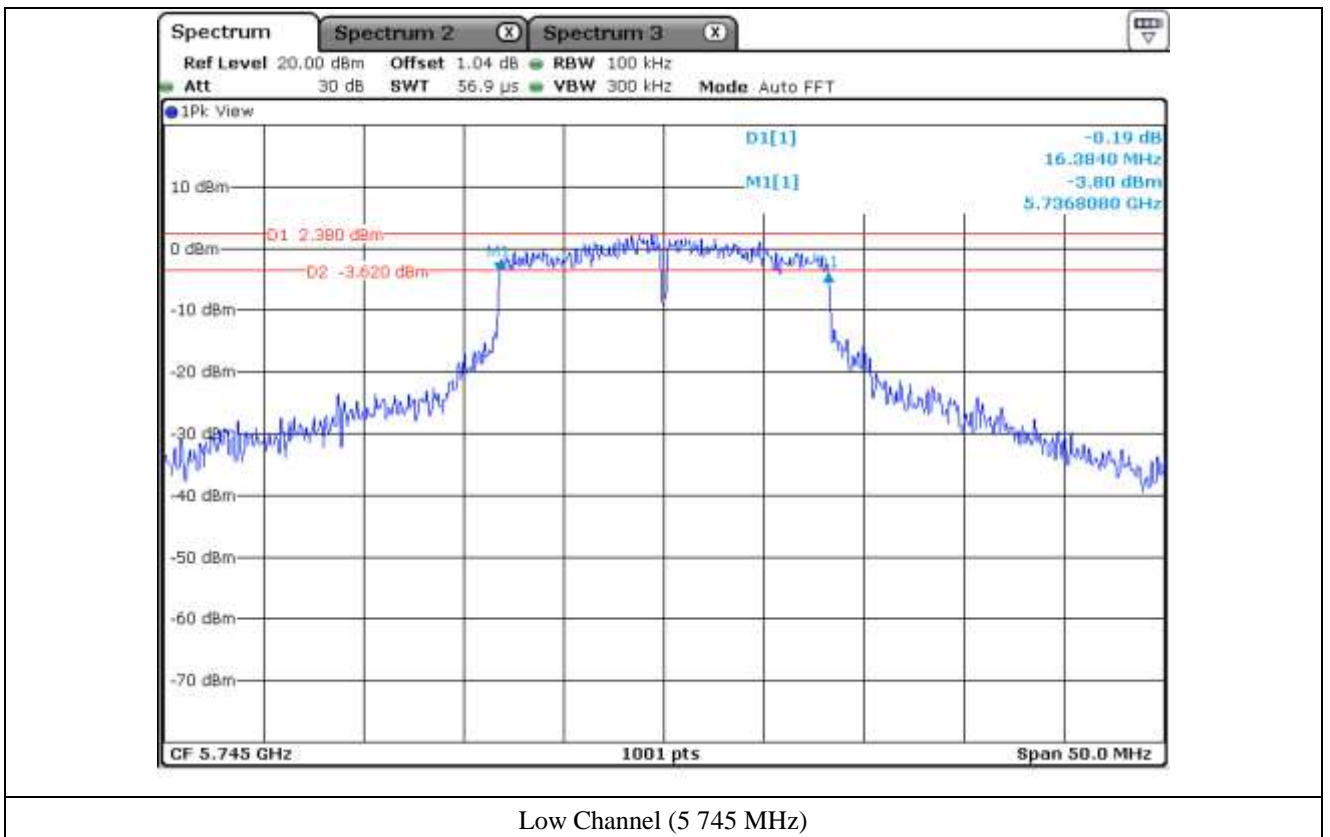
High Channel (5.825 MHz)

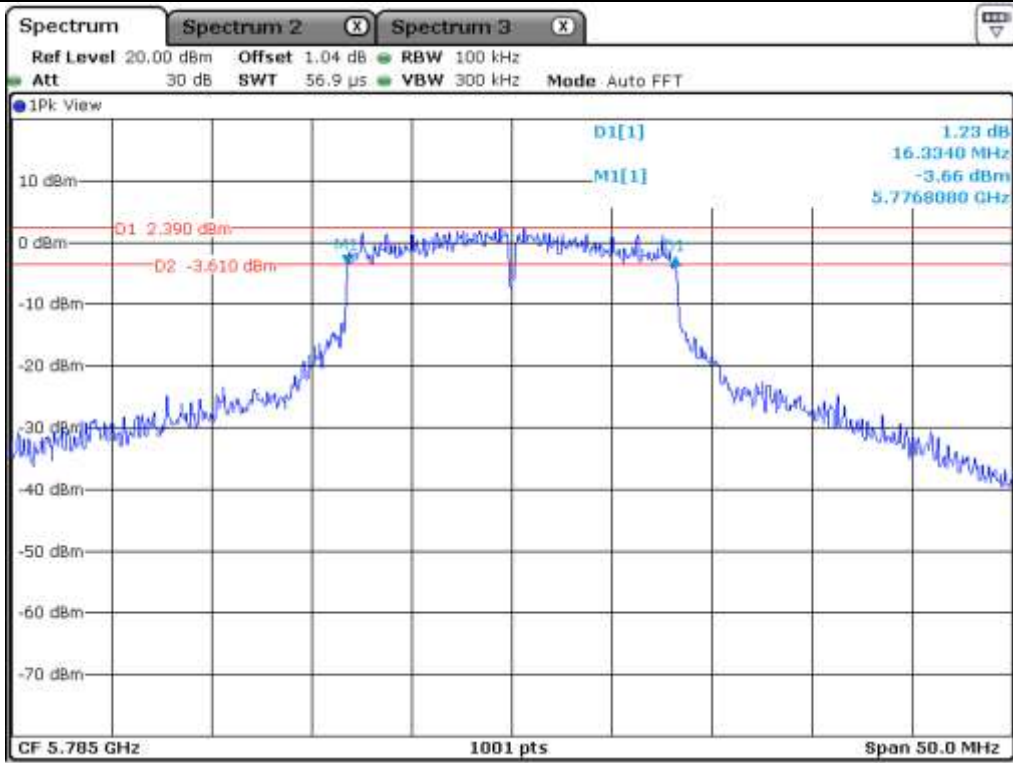
8.4.2 Test data for Antenna 1

- Test Result : Pass

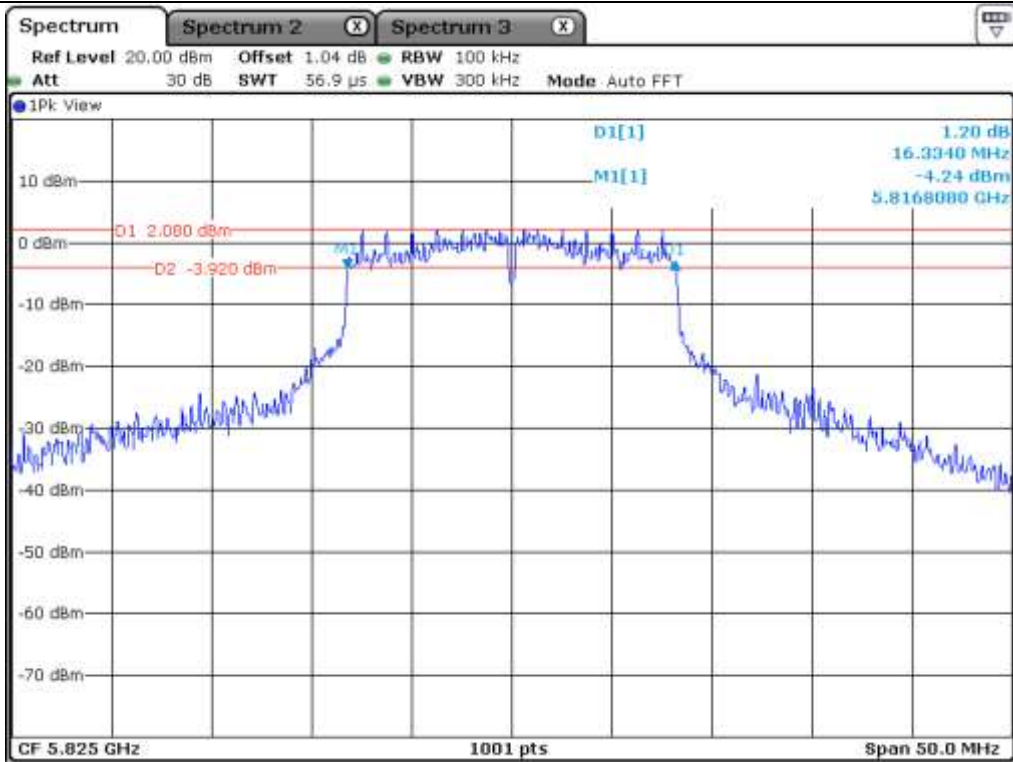
| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | 6 dB Bandwidth (MHz) |
|--------------------------|---------|--------------------|-------------------------|
| 5 725 ~ 5 850 | Low | 5 745.00 | 16.38 |
| | Middle | 5 785.00 | 16.33 |
| | High | 5 825.00 | 16.33 |

Remark: See next page for measurement data.





Middle Channel (5.785 MHz)



High Channel (5.825 MHz)

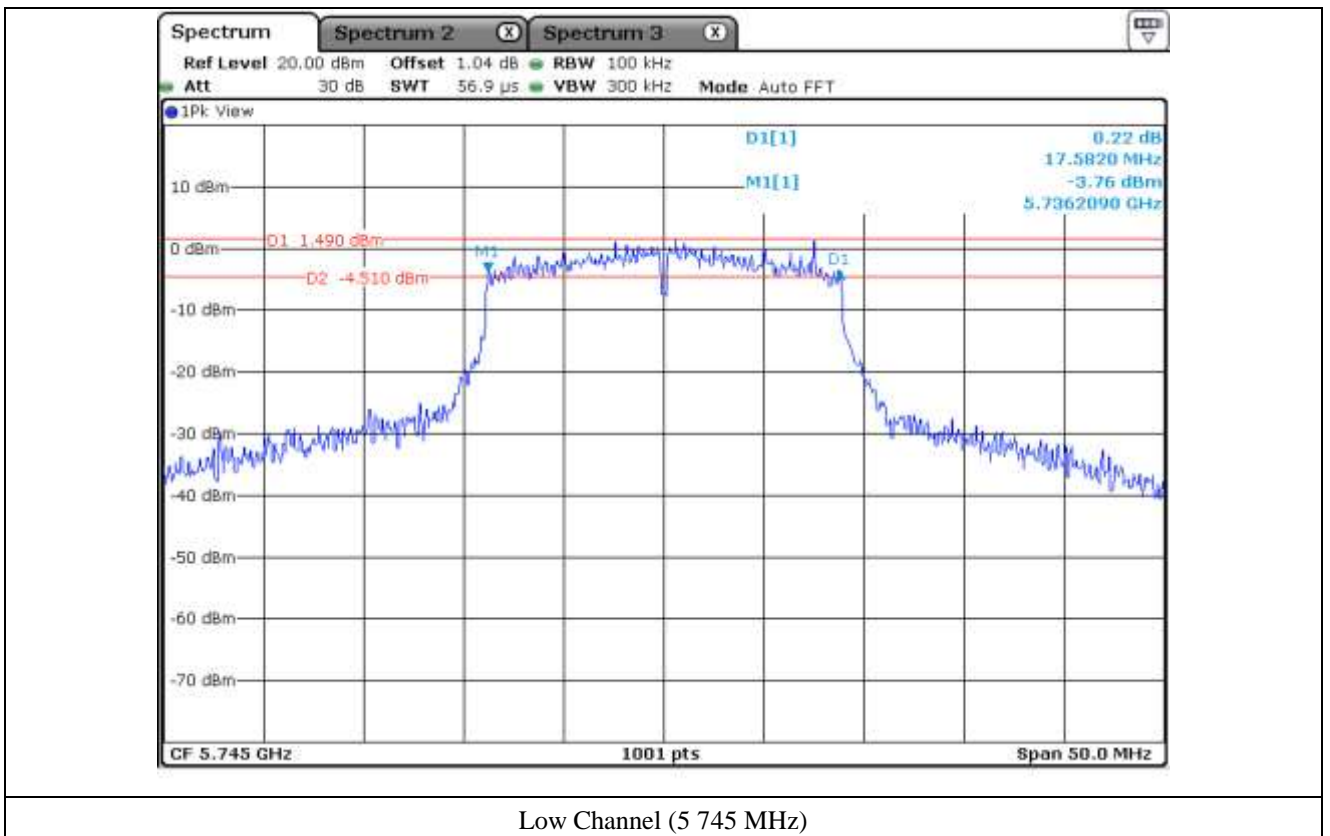
8.5 Test data for 802.11n_HT20 RLAN Mode

8.5.1 Test data for Antenna 0

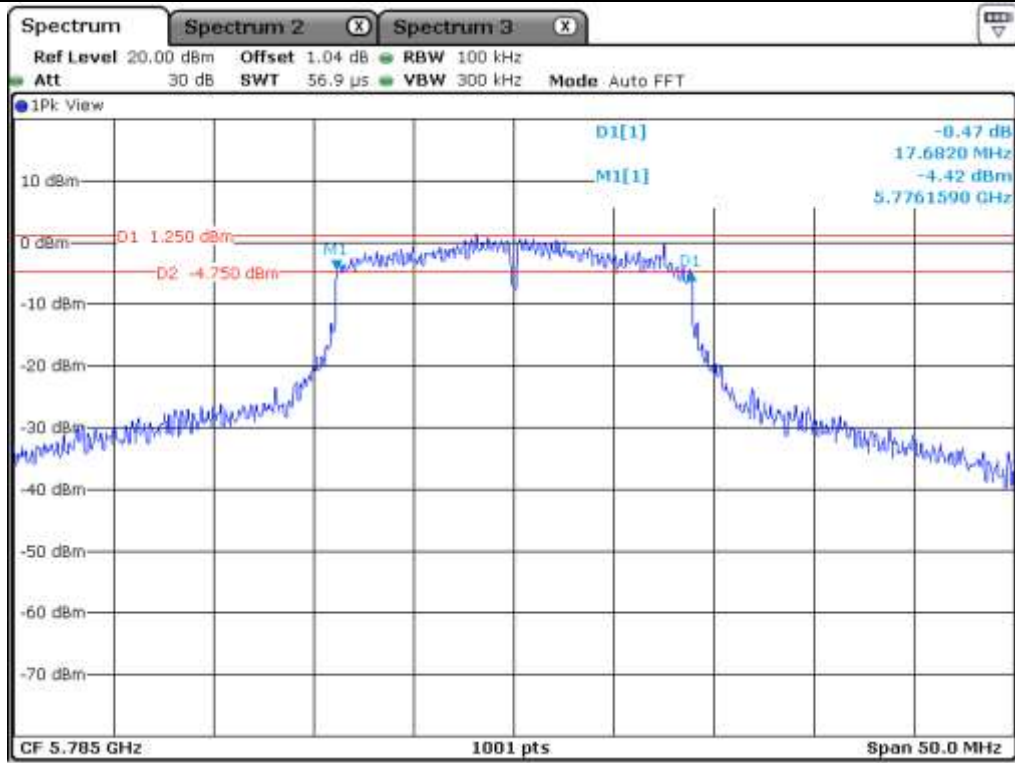
-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | 6 dB Bandwidth (MHz) |
|--------------------------|---------|--------------------|-------------------------|
| 5 725 ~ 5 850 | Low | 5 745.00 | 17.58 |
| | Middle | 5 785.00 | 17.68 |
| | High | 5 825.00 | 17.63 |

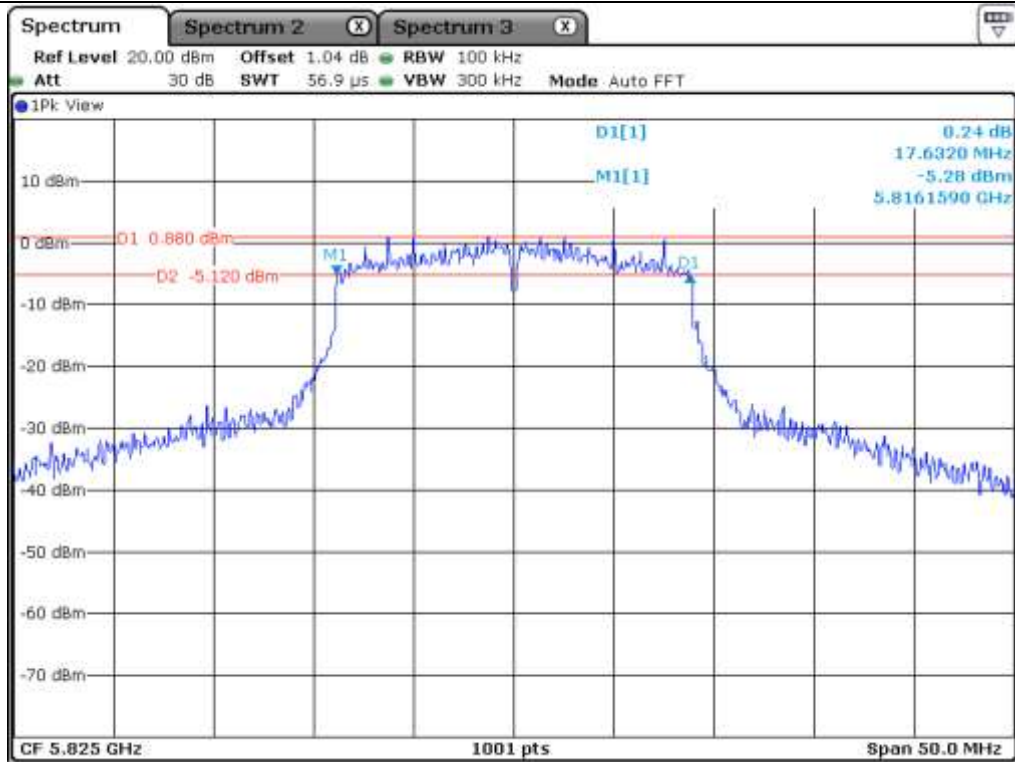
Remark: See next page for measurement data.



Low Channel (5 745 MHz)



Middle Channel (5.785 MHz)



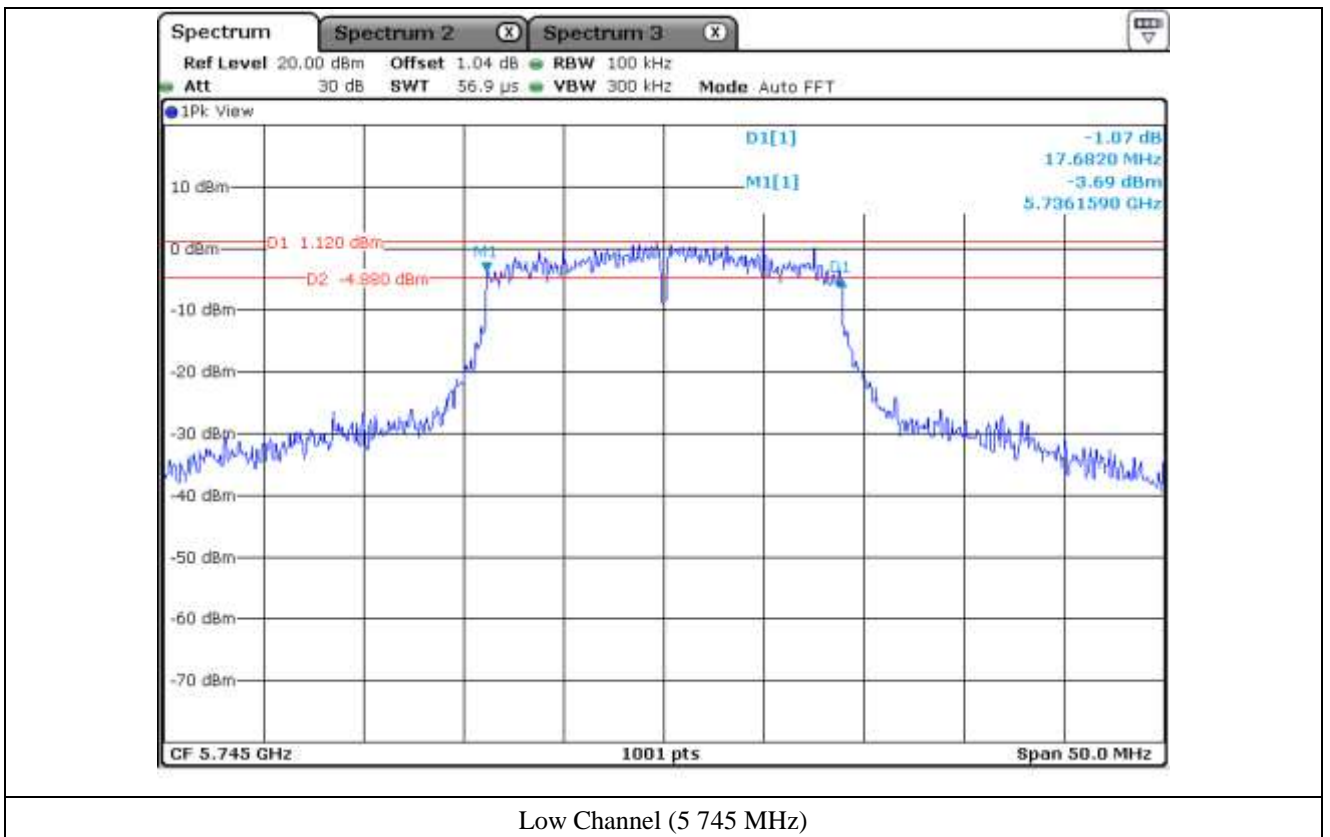
High Channel (5.825 MHz)

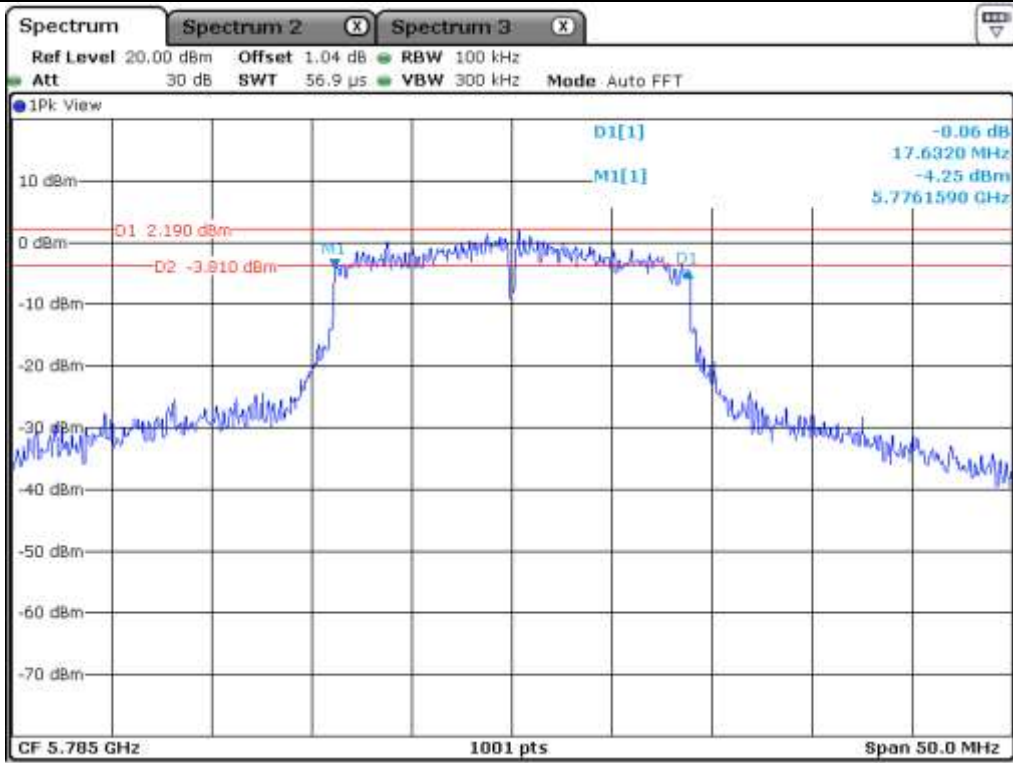
8.5.2 Test data for Antenna 1

-. Test Result : Pass

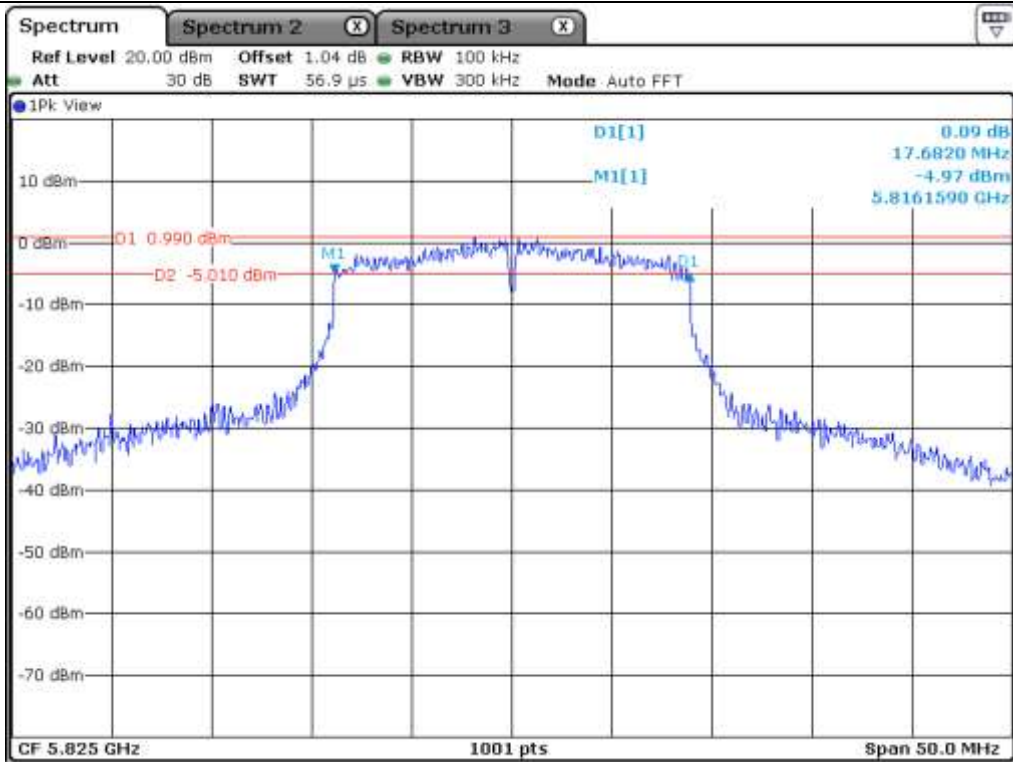
| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | 6 dB Bandwidth (MHz) |
|--------------------------|---------|--------------------|-------------------------|
| 5 725 ~ 5 850 | Low | 5 745.00 | 17.68 |
| | Middle | 5 785.00 | 17.63 |
| | High | 5 825.00 | 17.68 |

Remark: See next page for measurement data.





Middle Channel (5.785 MHz)



High Channel (5.825 MHz)

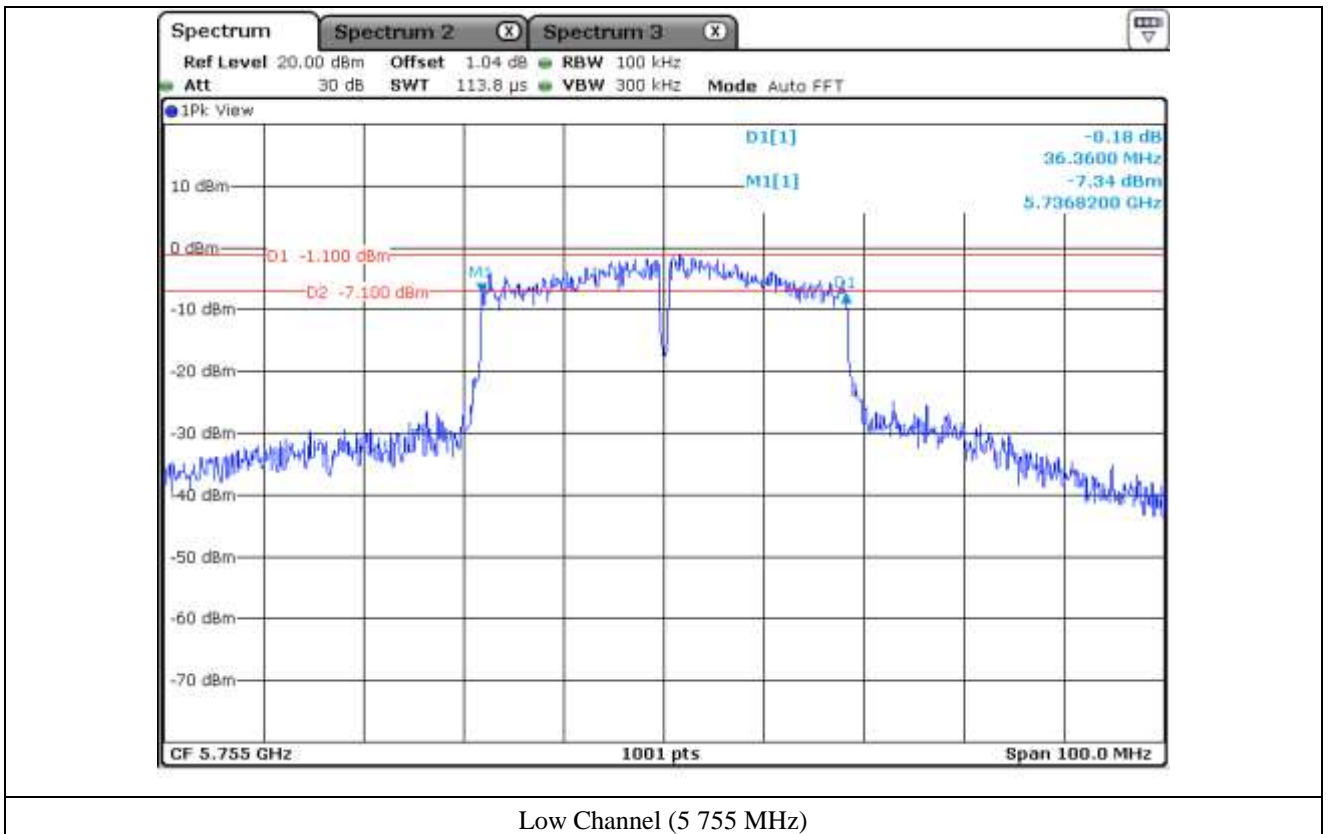
8.6 Test data for 802.11n_HT40 RLAN Mode

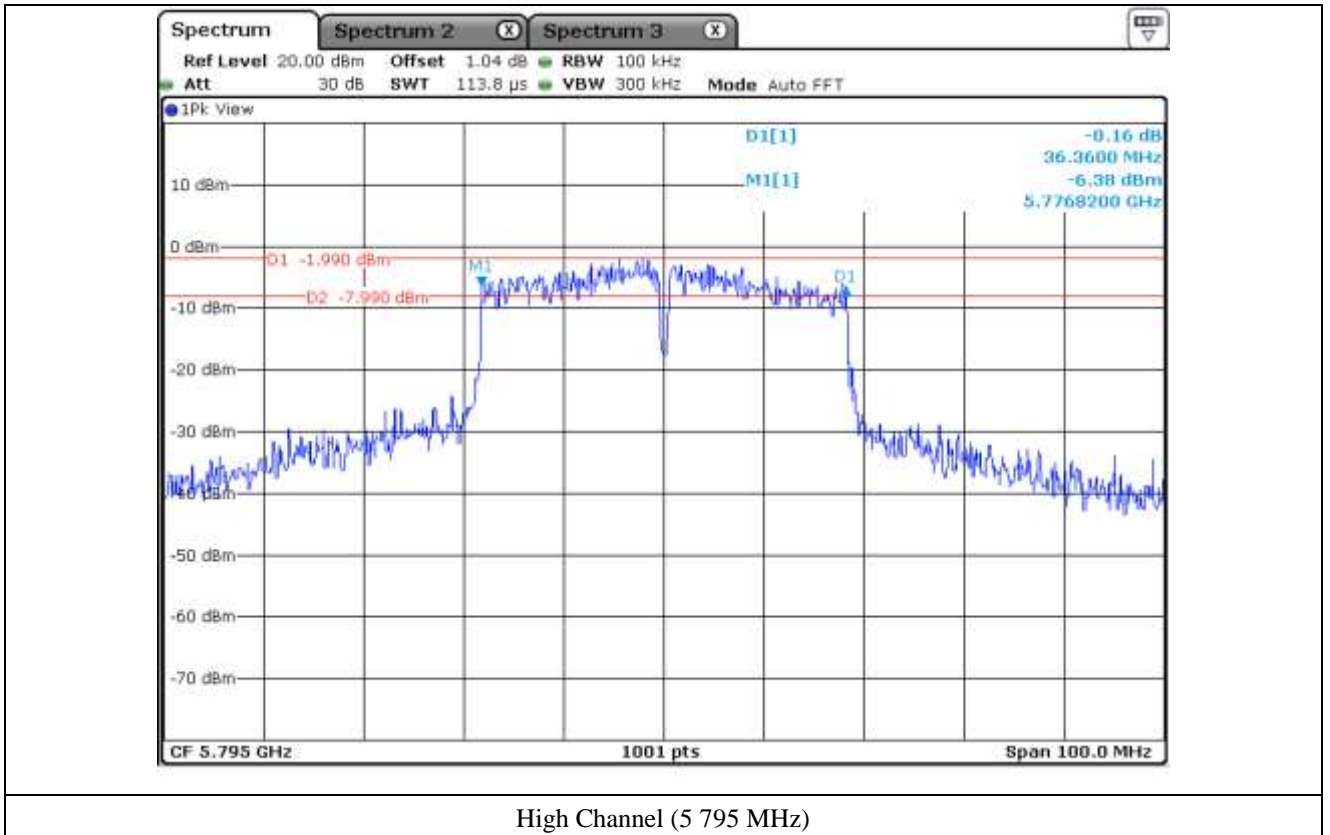
8.6.1 Test data for Antenna 0

-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | 6 dB Bandwidth (MHz) |
|--------------------------|---------|--------------------|-------------------------|
| 5 725 ~ 5 850 | Low | 5 755.00 | 36.36 |
| | High | 5 795.00 | 36.36 |

Remark: See next page for measurement data.





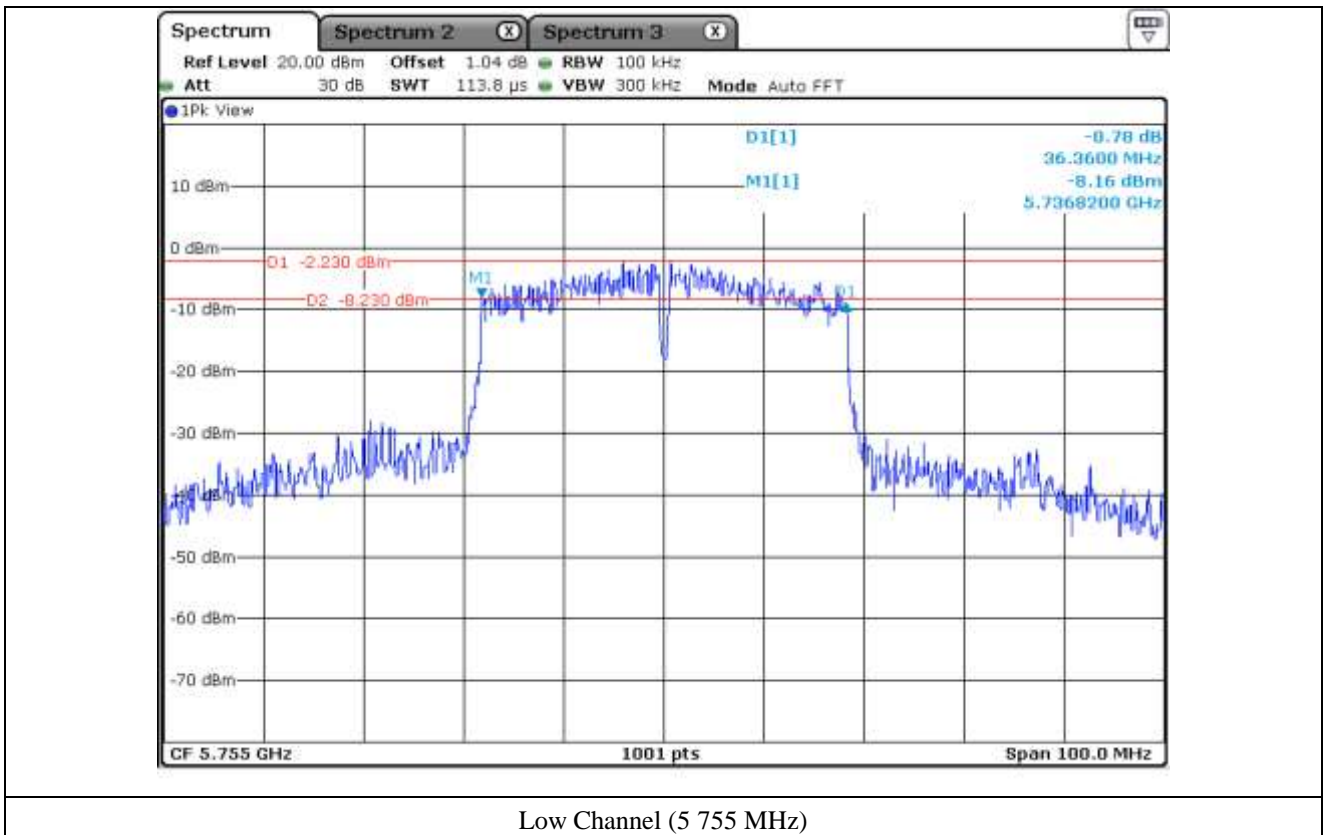
High Channel (5 795 MHz)

8.6.2 Test data for Antenna 1

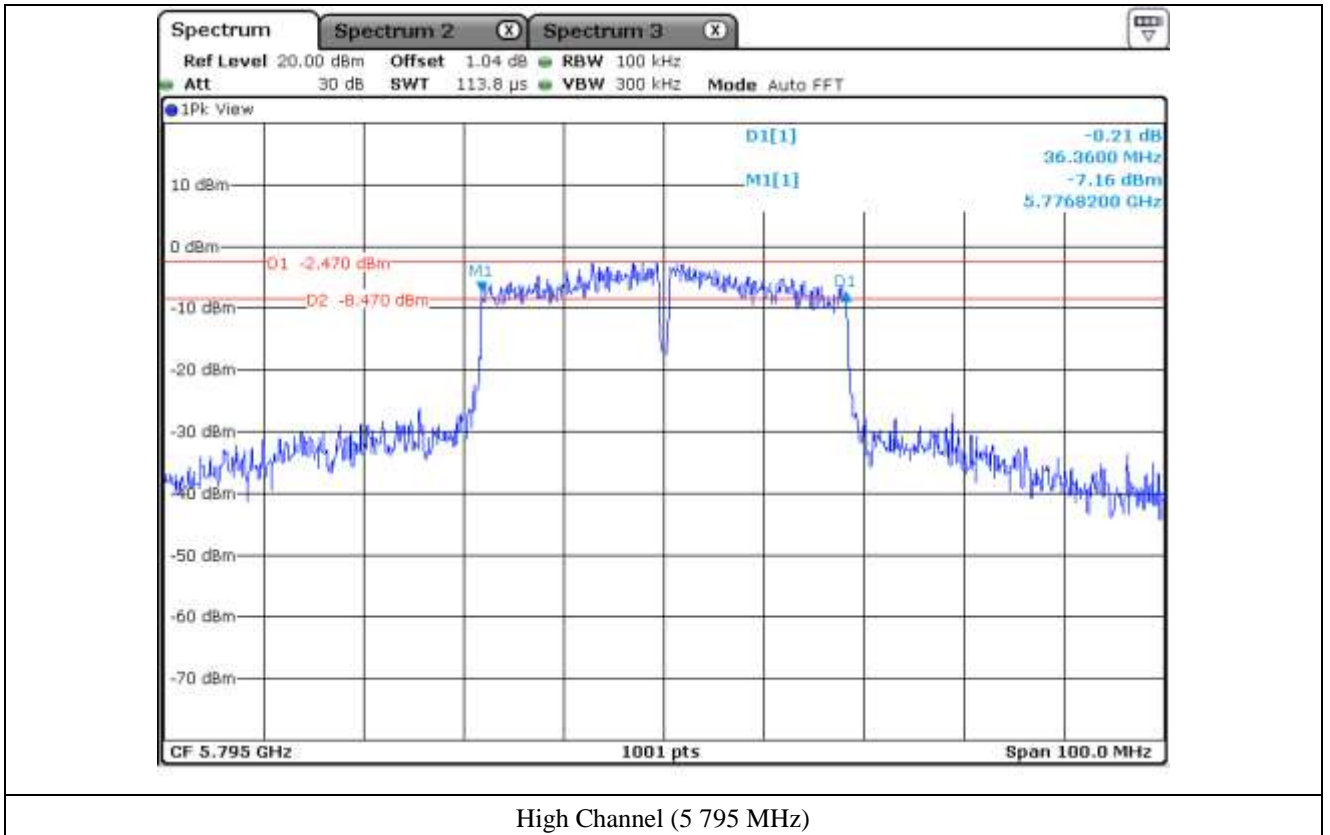
-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | 6 dB Bandwidth (MHz) |
|--------------------------|---------|--------------------|-------------------------|
| 5 725 ~ 5 850 | Low | 5 755.00 | 36.36 |
| | High | 5 795.00 | 36.36 |

Remark: See next page for measurement data.



Low Channel (5 755 MHz)



High Channel (5 795 MHz)

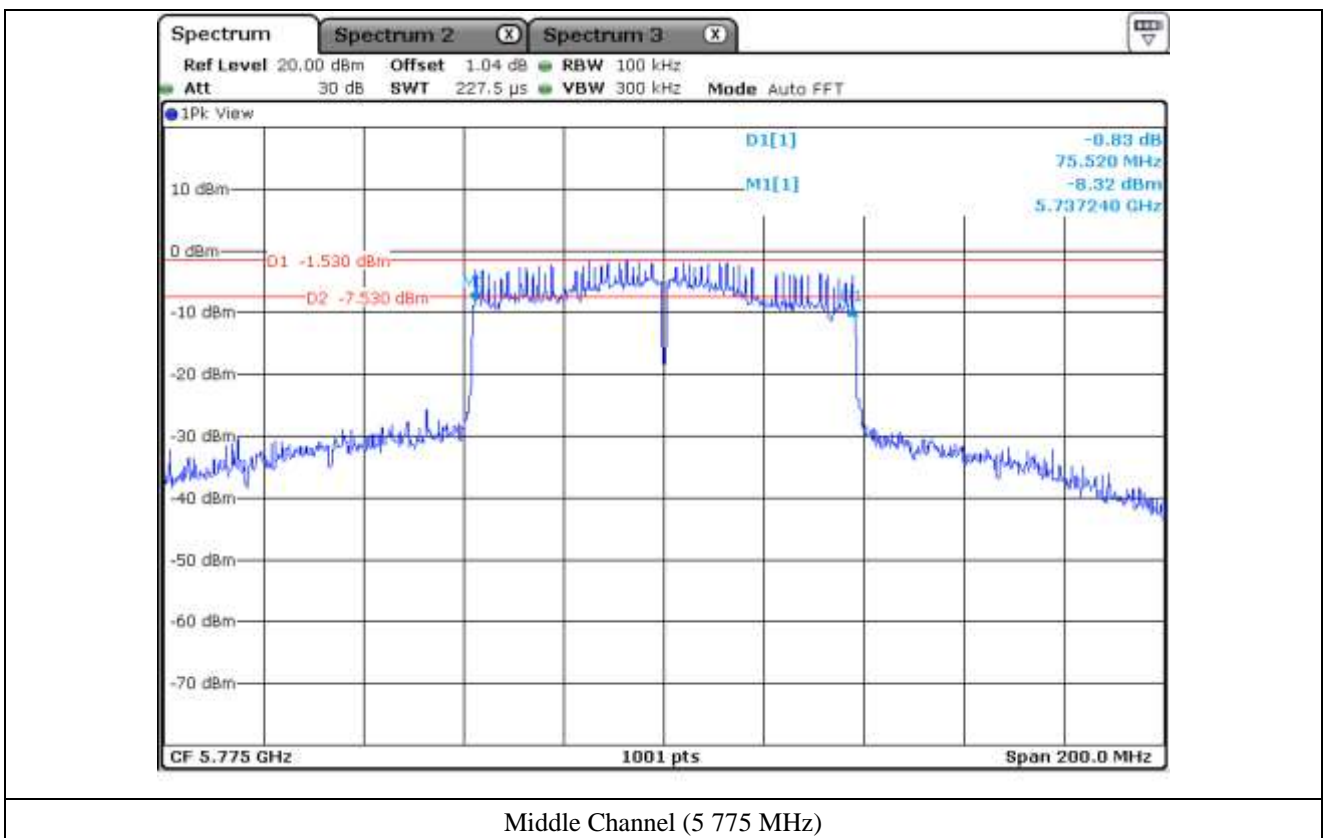
8.7 Test data for 802.11ac_VHT80 RLAN Mode

8.7.1 Test data for Antenna 0

-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | 6 dB Bandwidth (MHz) |
|--------------------------|---------|--------------------|-------------------------|
| 5 725 ~ 5 850 | Middle | 5 775.00 | 75.52 |

Remark: See next page for measurement data.



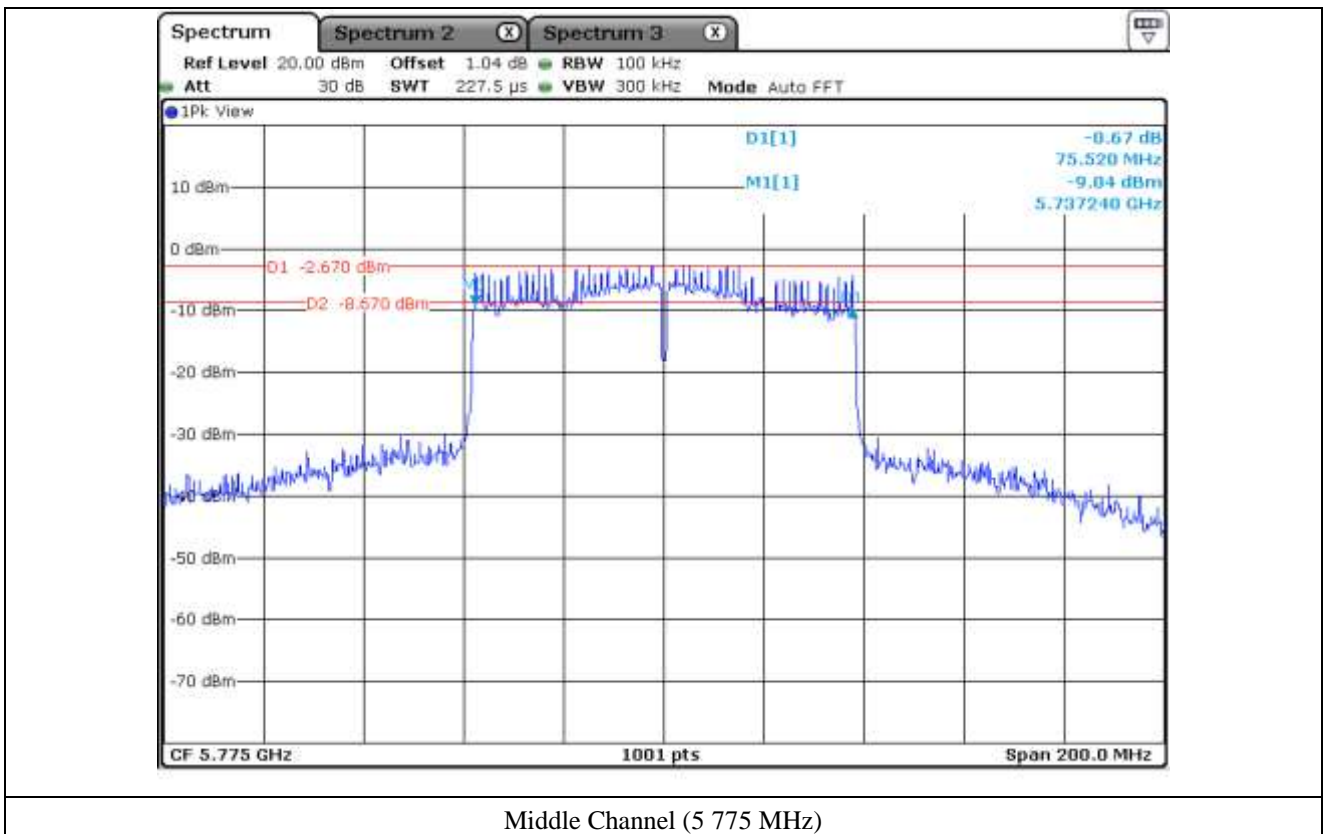
Middle Channel (5 775 MHz)

8.7.2 Test data for Antenna 1

- Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | 6 dB Bandwidth (MHz) |
|--------------------------|---------|--------------------|-------------------------|
| 5 725 ~ 5 850 | Middle | 5 775.00 | 75.52 |

Remark: See next page for measurement data.



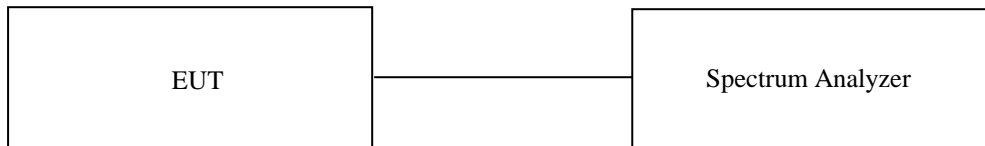
9. MAXIMUM CONDUCTED (AVERAGE) OUTPUT POWER

9.1 Operating environment

Temperature : 23 °C
 Relative humidity : 45 % R.H.

9.2 Test set-up

The maximum peak output power was measured with the spectrum analyzer connected to the antenna output of the EUT. The spectrum analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99 % bandwidth. The EUT was operating in transmit mode at the appropriate center frequency.



9.3 Test Date

September 07, 2020 ~ September 11, 2020

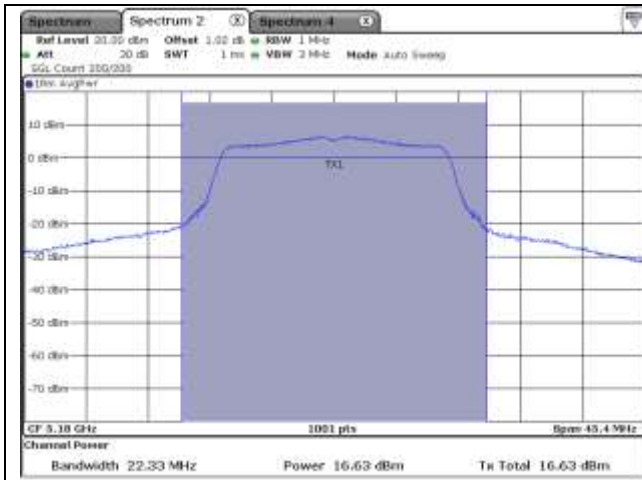
9.4 Test data for 802.11a RLAN Mode

9.4.1 Test data for Antenna 0

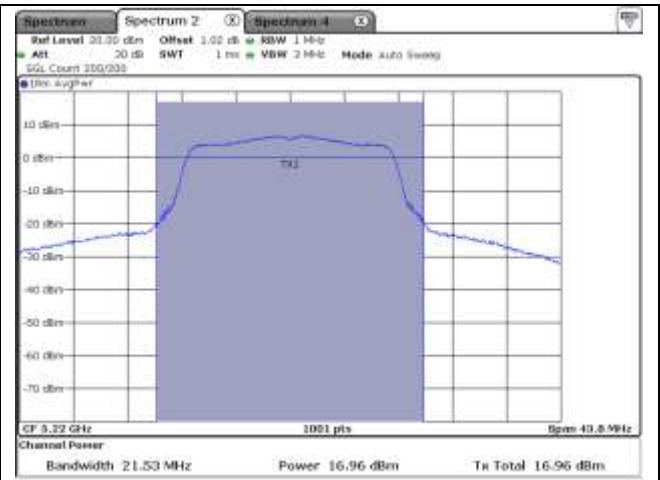
-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|---------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 150 ~ 5 250 | Low | 5 180.00 | 16.63 | 0.32 | 16.95 | 23.97 | 7.02 |
| | Middle | 5 220.00 | 16.96 | 0.32 | 17.28 | 23.97 | 6.69 |
| | High | 5 240.00 | 16.76 | 0.32 | 17.08 | 23.97 | 6.89 |
| 5 250 ~ 5 350 | Low | 5 260.00 | 17.61 | 0.29 | 17.90 | 23.97 | 6.07 |
| | Middle | 5 300.00 | 17.57 | 0.29 | 17.86 | 23.97 | 6.11 |
| | High | 5 320.00 | 17.70 | 0.29 | 17.99 | 23.97 | 5.98 |
| 5 470 ~ 5 725 | Low | 5 500.00 | 16.67 | 0.29 | 16.96 | 23.97 | 7.01 |
| | Middle | 5 580.00 | 16.44 | 0.29 | 16.73 | 23.97 | 7.24 |
| | High | 5 700.00 | 15.67 | 0.29 | 15.96 | 23.97 | 8.01 |
| 5 725 ~ 5 850 | Low | 5 745.00 | 15.38 | 0.29 | 15.67 | 30.00 | 14.33 |
| | Middle | 5 785.00 | 15.33 | 0.29 | 15.62 | 30.00 | 14.38 |
| | High | 5 825.00 | 14.88 | 0.29 | 15.17 | 30.00 | 14.83 |

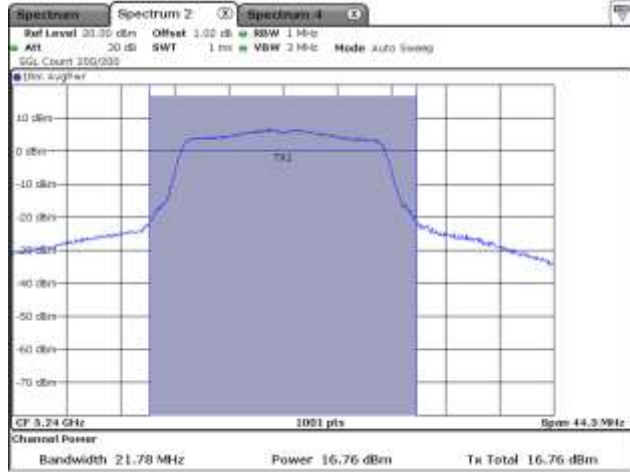
Remark : Margin = Limit – Result(Measured Value + Correction Factor)



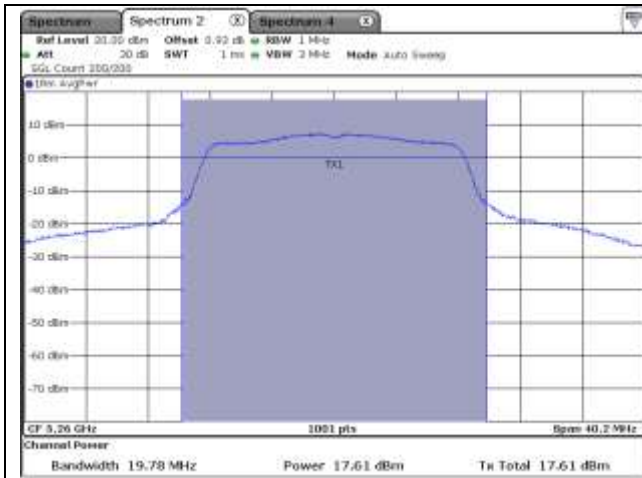
U-NII-1 (5 180 MHz)



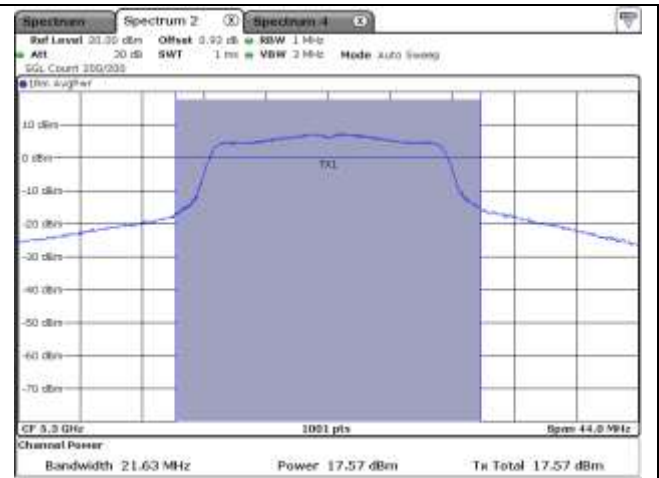
U-NII-1 (5 220 MHz)



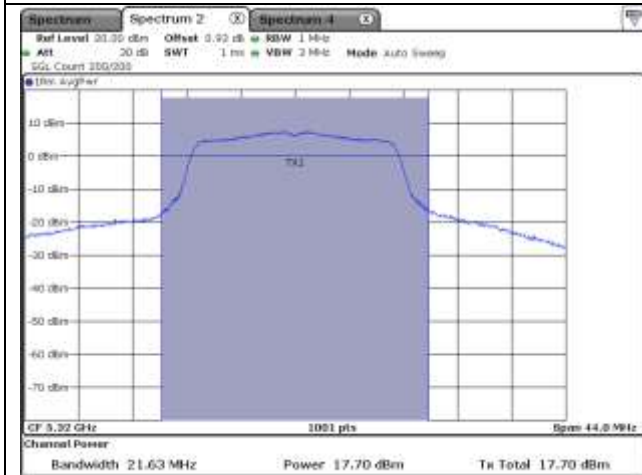
U-NII-1 (5 240 MHz)



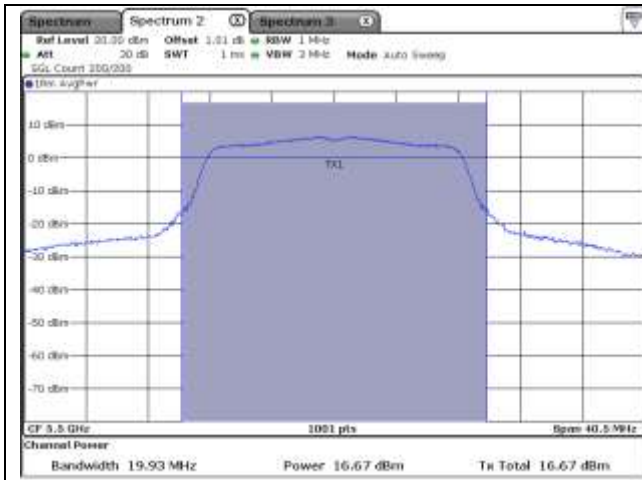
U-NII-2A (5 260 MHz)



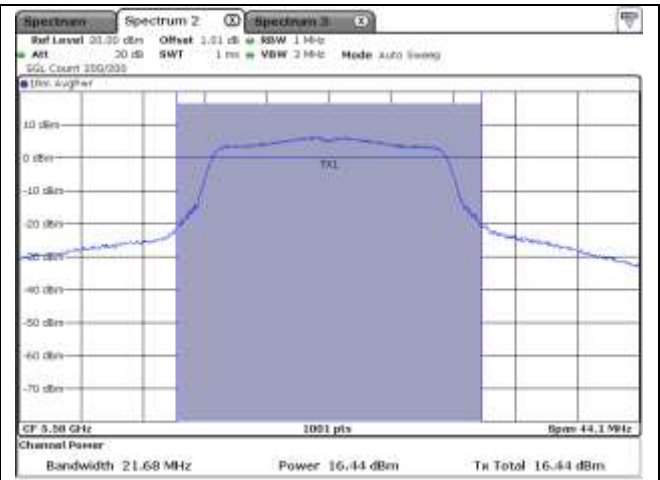
U-NII-2A (5 300 MHz)



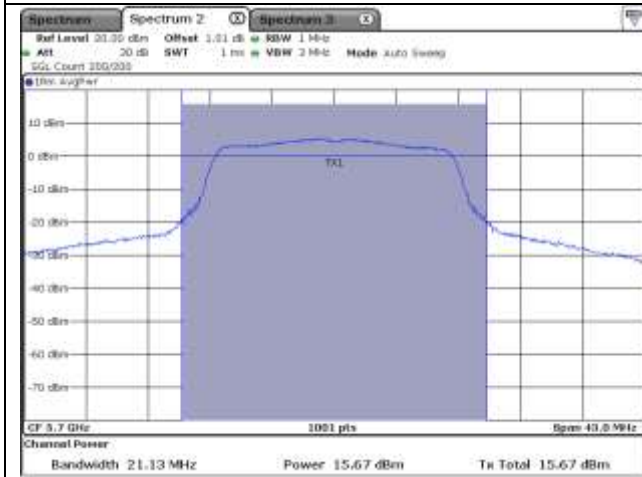
U-NII-2A (5 320 MHz)



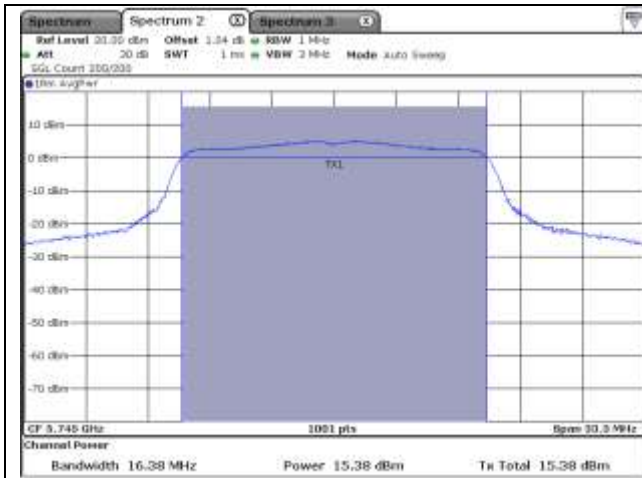
U-NII-2C (5 500 MHz)



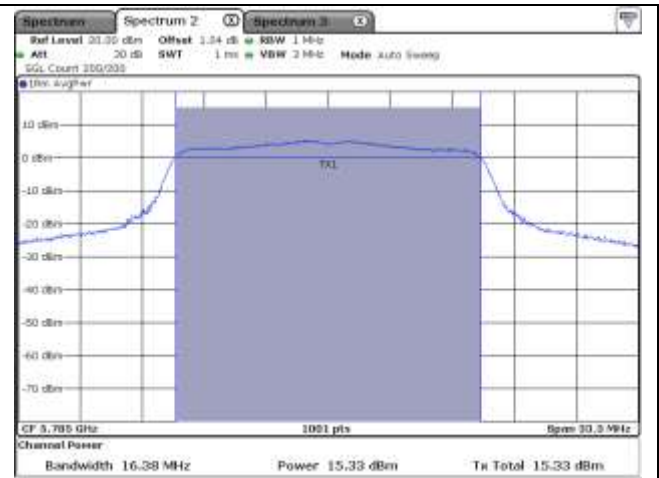
U-NII-2C (5 580 MHz)



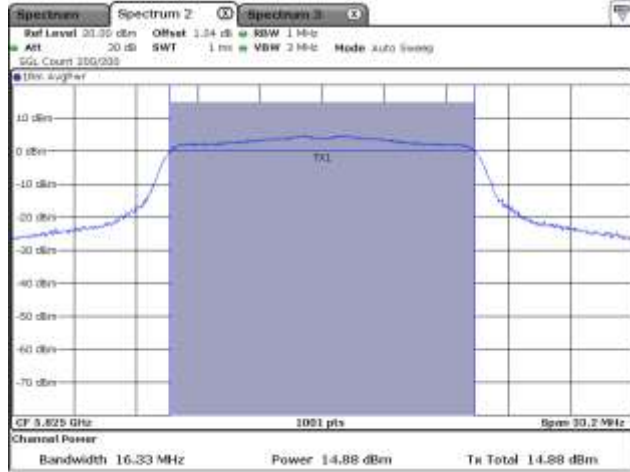
U-NII-2C (5 700 MHz)



U-NII-3 (5 745 MHz)



U-NII-3 (5 785 MHz)



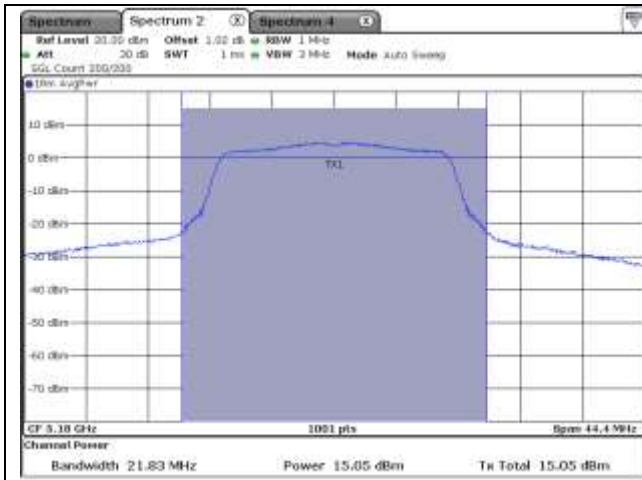
U-NII-3 (5 825 MHz)

9.4.2 Test data for Antenna 1

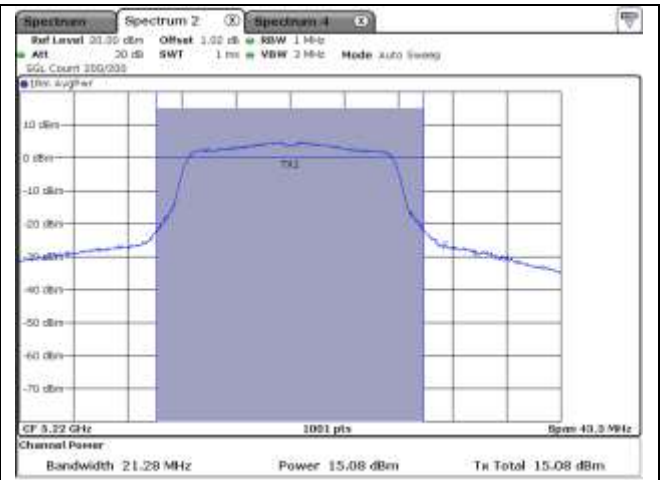
-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|---------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 150 ~ 5 250 | Low | 5 180.00 | 15.05 | 0.35 | 15.40 | 23.97 | 8.92 |
| | Middle | 5 220.00 | 15.08 | 0.35 | 15.43 | 23.97 | 8.89 |
| | High | 5 240.00 | 15.12 | 0.35 | 15.47 | 23.97 | 8.85 |
| 5 250 ~ 5 350 | Low | 5 260.00 | 14.73 | 0.32 | 15.05 | 23.97 | 9.24 |
| | Middle | 5 300.00 | 14.67 | 0.32 | 14.99 | 23.97 | 9.30 |
| | High | 5 320.00 | 15.04 | 0.32 | 15.36 | 23.97 | 8.93 |
| 5 470 ~ 5 725 | Low | 5 500.00 | 15.98 | 0.29 | 16.27 | 23.97 | 7.99 |
| | Middle | 5 580.00 | 16.10 | 0.29 | 16.39 | 23.97 | 7.87 |
| | High | 5 700.00 | 16.10 | 0.29 | 16.39 | 23.97 | 7.87 |
| 5 725 ~ 5 850 | Low | 5 745.00 | 15.57 | 0.31 | 15.88 | 30.00 | 14.43 |
| | Middle | 5 785.00 | 15.30 | 0.31 | 15.61 | 30.00 | 14.70 |
| | High | 5 825.00 | 15.18 | 0.31 | 15.49 | 30.00 | 14.82 |

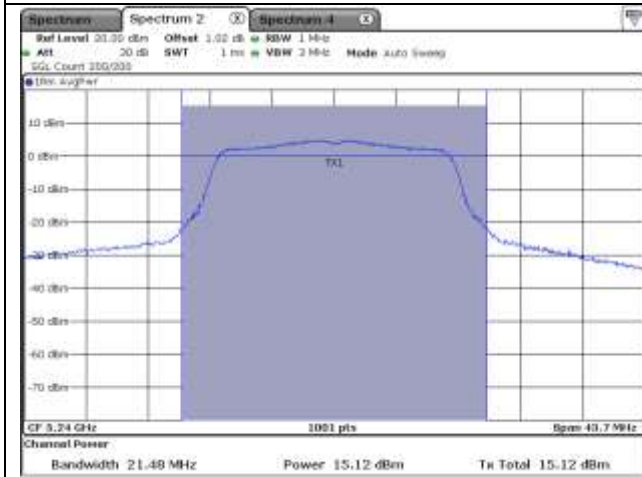
Remark : Margin = Limit – Result(Measured Value + Correction Factor)



U-NII-1 (5 180 MHz)

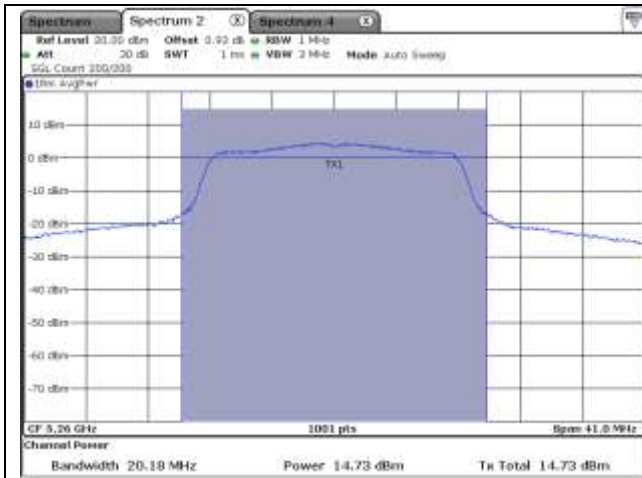


U-NII-1 (5 220 MHz)

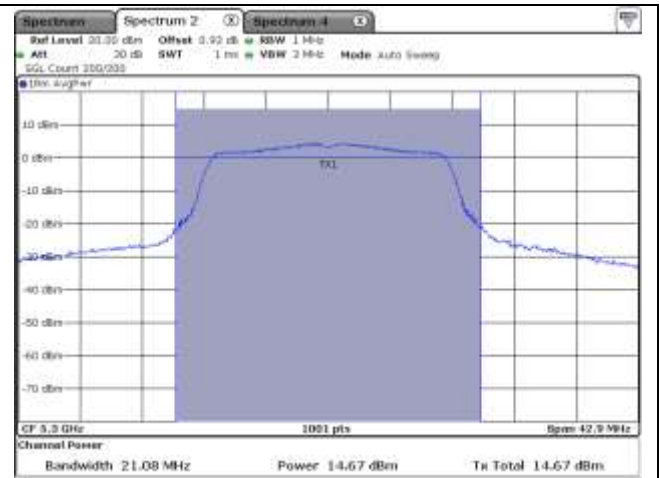


U-NII-1 (5 240 MHz)

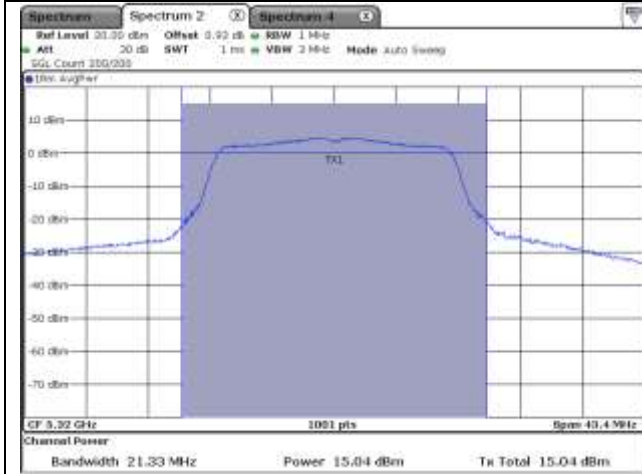




U-NII-2A (5 260 MHz)

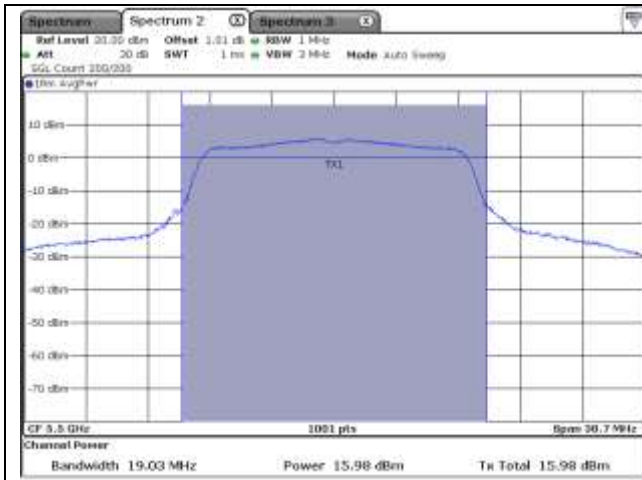


U-NII-2A (5 300 MHz)

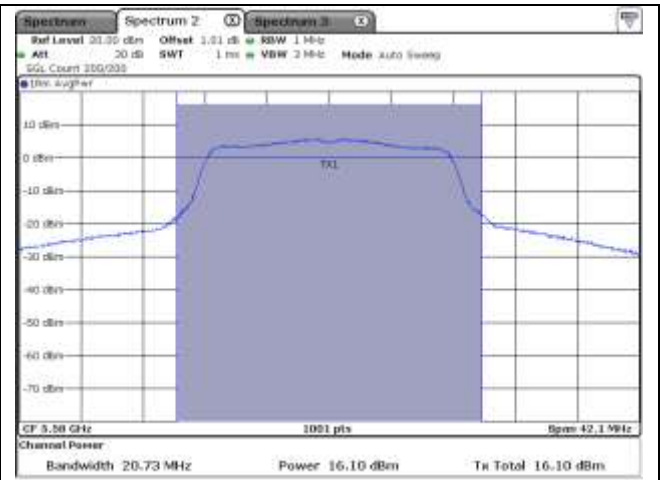


U-NII-2A (5 320 MHz)

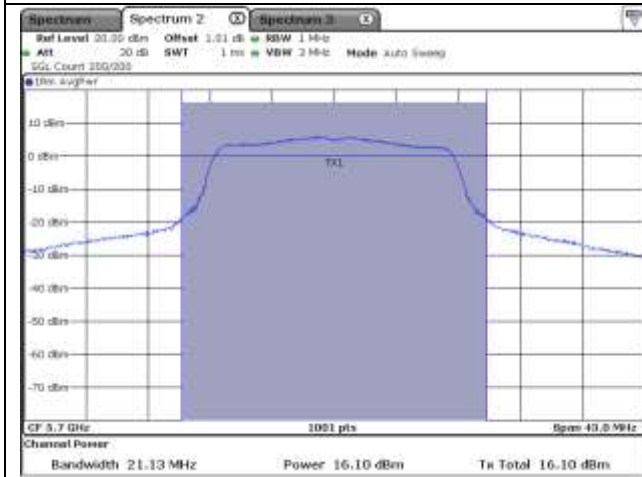




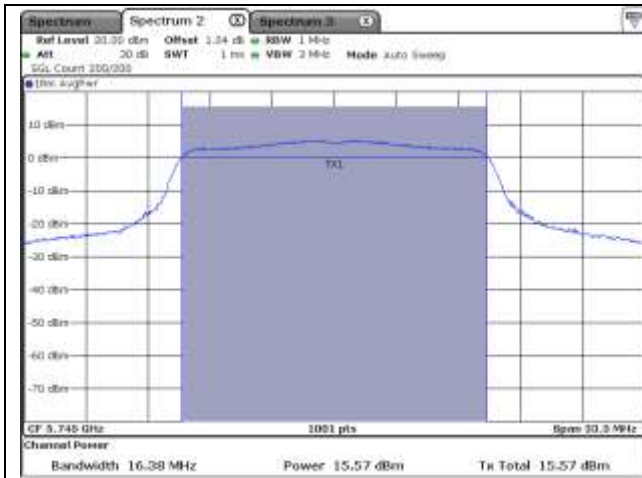
U-NII-2C (5 500 MHz)



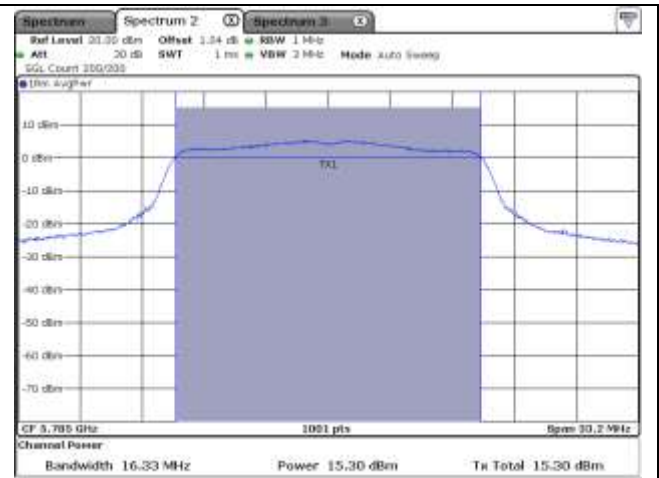
U-NII-2C (5 580 MHz)



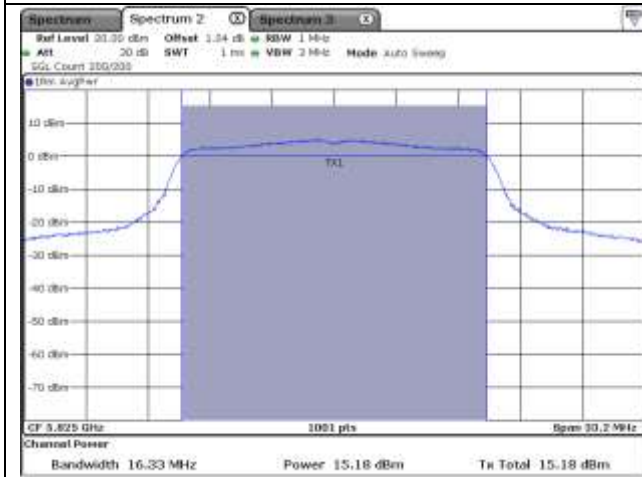
U-NII-2C (5 700 MHz)



U-NII-3 (5 745 MHz)



U-NII-3 (5 785 MHz)



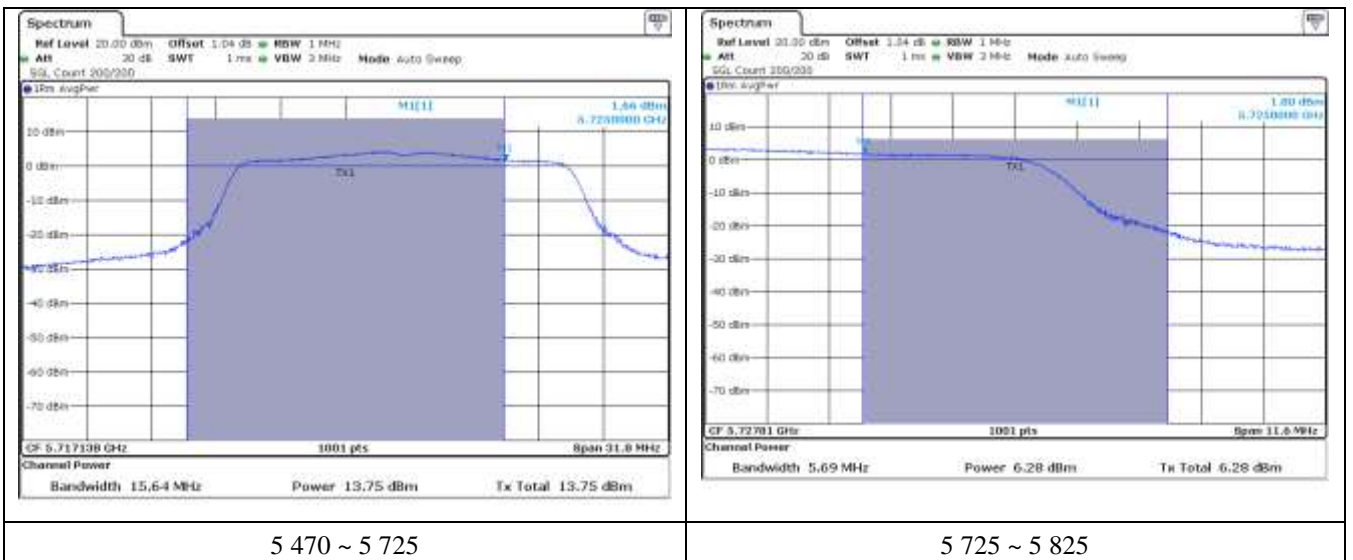
U-NII-3 (5 825 MHz)

9.4.4 Test data for Straddle Channel_Antenna 0

-. Test Result : Pass

| FREQUENCY RANGE (MHz) | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 470 ~ 5 725 | 5 720.00 | 13.75 | 0.29 | 14.04 | 23.97 | 9.93 |
| 5 725 ~ 5 825 | 5 720.00 | 6.28 | 0.29 | 6.57 | 30.00 | 23.43 |

Remark : Margin = Limit – Result(Measured Value + Correction Factor)

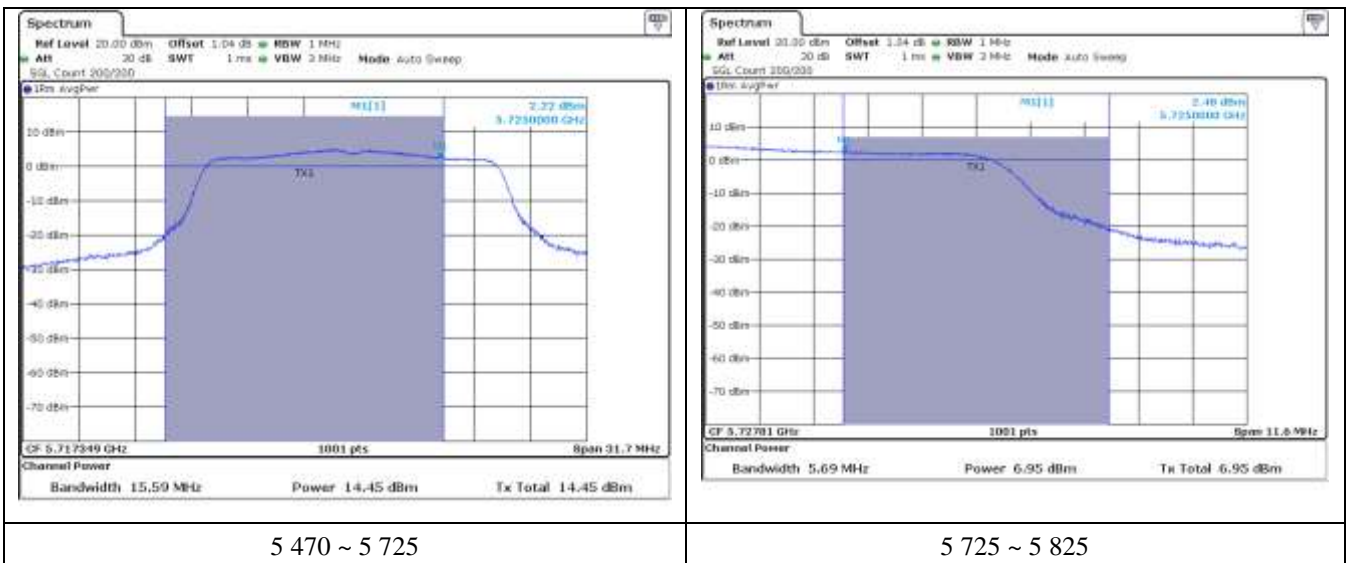


9.4.5 Test data for Straddle Channel_Antenna 1

-. Test Result : Pass

| FREQUENCY RANGE (MHz) | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 470 ~ 5 725 | 5 720.00 | 14.45 | 0.29 | 14.74 | 23.97 | 9.23 |
| 5 725 ~ 5 825 | 5 720.00 | 6.95 | 0.31 | 7.26 | 30.00 | 22.74 |

Remark : Margin = Limit – Result(Measured Value + Correction Factor)



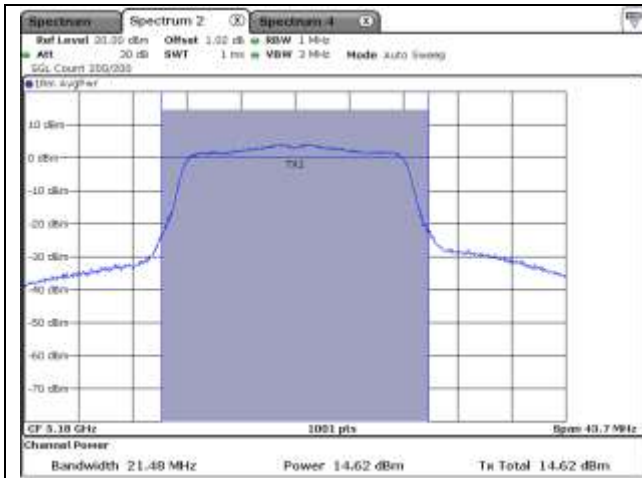
9.5 Test data for 802.11n_HT20 RLAN Mode

9.5.1 Test data for Antenna 0

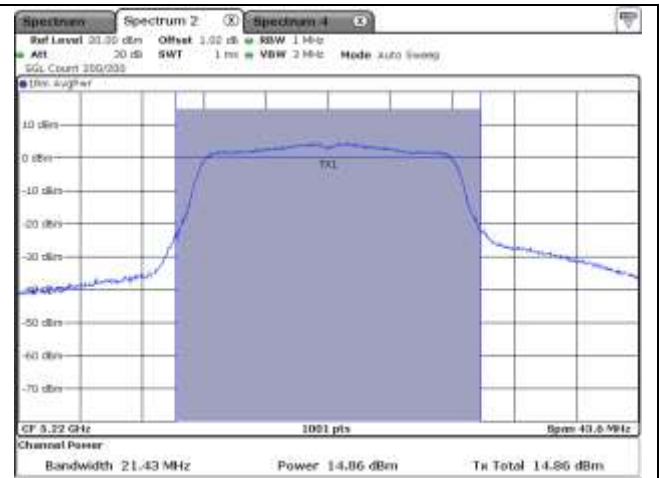
-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|---------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 150 ~ 5 250 | Low | 5 180.00 | 14.62 | 0.59 | 15.21 | 23.97 | 8.76 |
| | Middle | 5 220.00 | 14.86 | 0.59 | 15.45 | 23.97 | 8.52 |
| | High | 5 240.00 | 14.94 | 0.59 | 15.53 | 23.97 | 8.44 |
| 5 250 ~ 5 350 | Low | 5 260.00 | 16.06 | 0.59 | 16.65 | 23.97 | 7.32 |
| | Middle | 5 300.00 | 16.28 | 0.59 | 16.87 | 23.97 | 7.10 |
| | High | 5 320.00 | 15.88 | 0.59 | 16.47 | 23.97 | 7.50 |
| 5 470 ~ 5 725 | Low | 5 500.00 | 15.17 | 0.59 | 15.76 | 23.97 | 8.21 |
| | Middle | 5 580.00 | 14.99 | 0.59 | 15.58 | 23.97 | 8.39 |
| | High | 5 700.00 | 14.33 | 0.59 | 14.92 | 23.97 | 9.05 |
| 5 725 ~ 5 850 | Low | 5 745.00 | 13.94 | 0.65 | 14.59 | 30.00 | 15.41 |
| | Middle | 5 785.00 | 13.82 | 0.65 | 14.47 | 30.00 | 15.53 |
| | High | 5 825.00 | 13.42 | 0.65 | 14.07 | 30.00 | 15.93 |

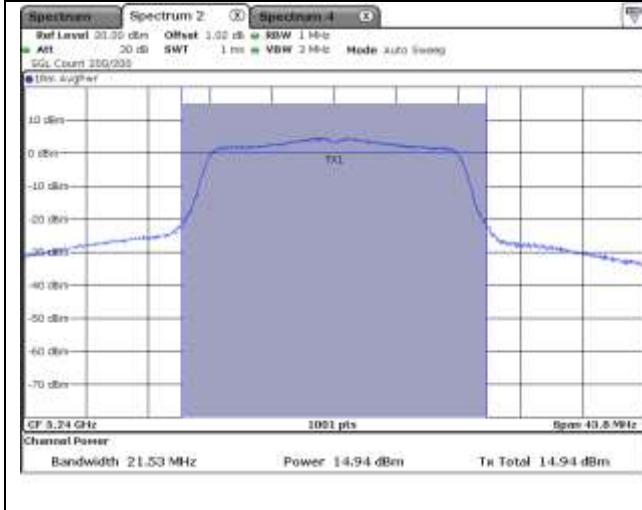
Remark : Margin = Limit – Result(Measured Value + Correction Factor)



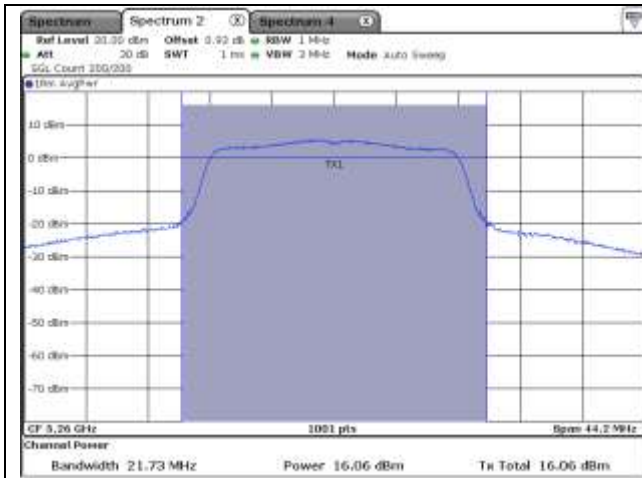
U-NII-1 (5 180 MHz)



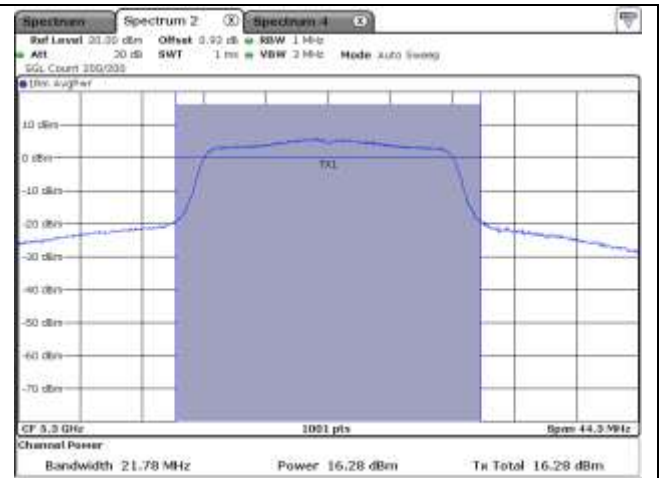
U-NII-1 (5 220 MHz)



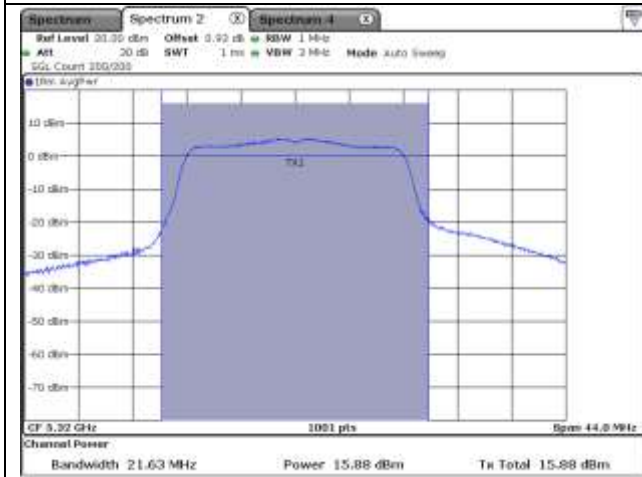
U-NII-1 (5 240 MHz)



U-NII-2A (5 260 MHz)

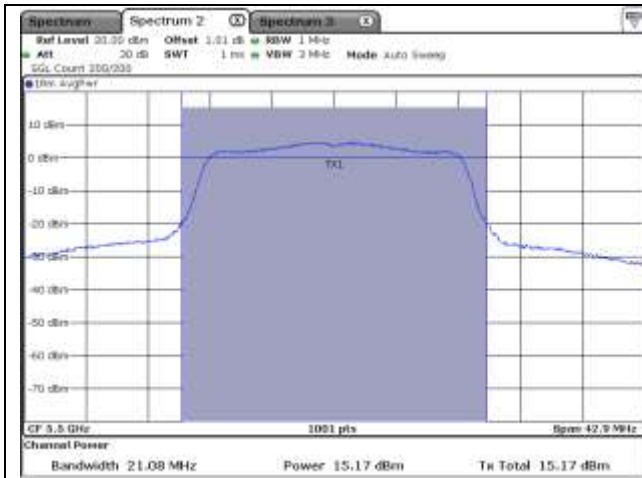


U-NII-2A (5 300 MHz)

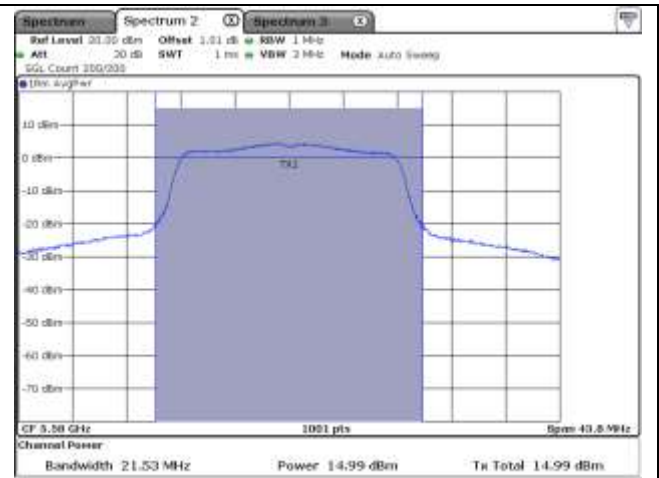


U-NII-2A (5 320 MHz)

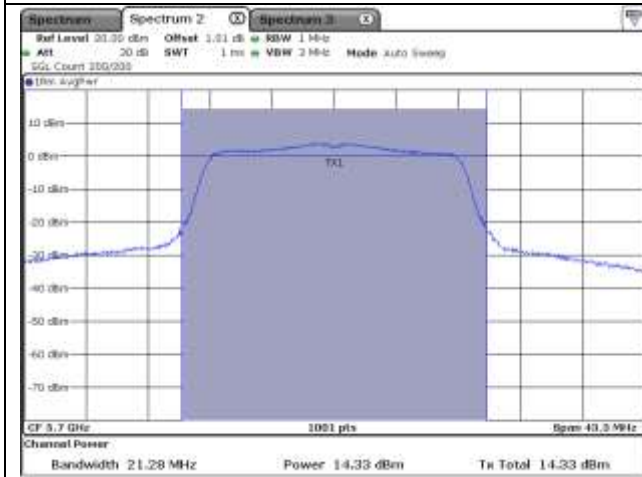




U-NII-2C (5 500 MHz)

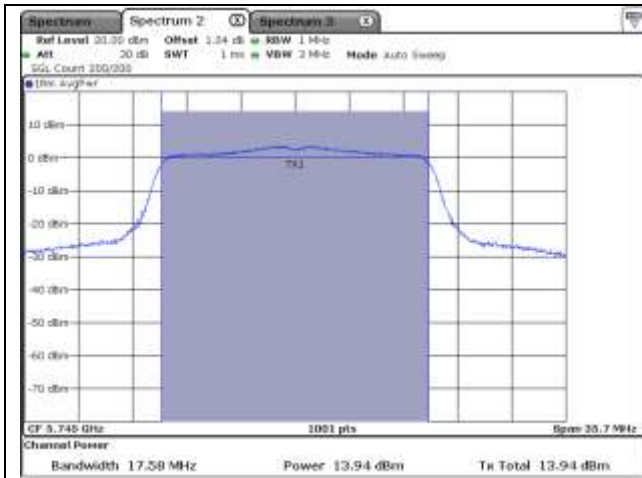


U-NII-2C (5 580 MHz)

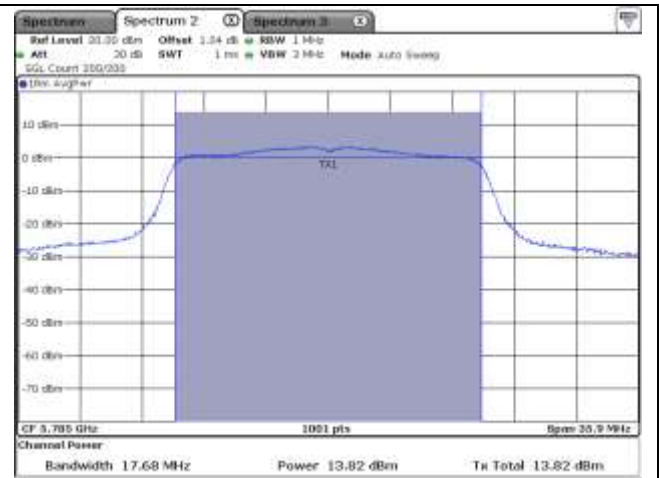


U-NII-2C (5 700 MHz)

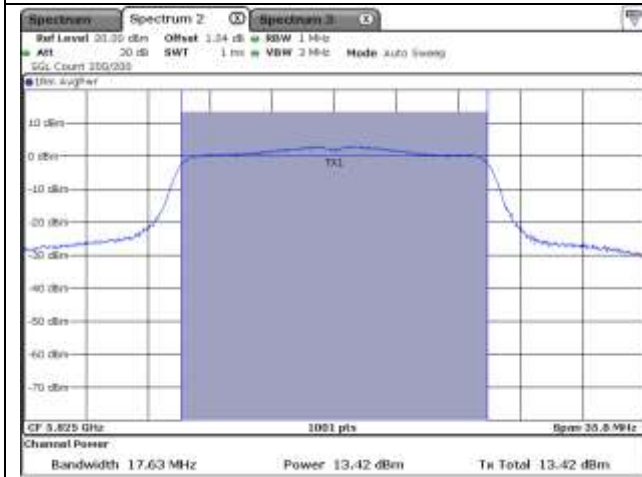




U-NII-3 (5 745 MHz)



U-NII-3 (5 785 MHz)



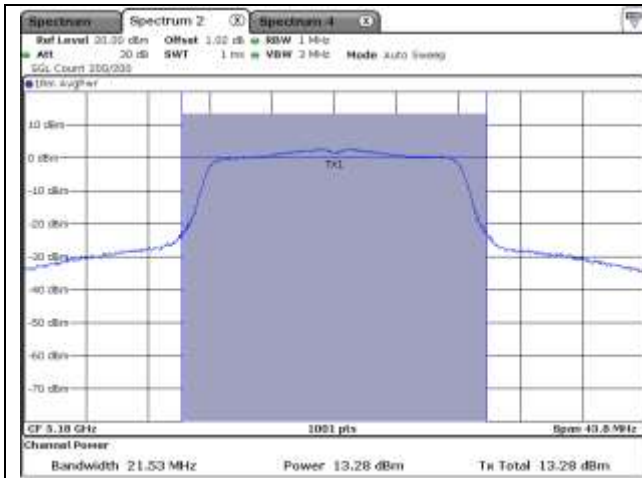
U-NII-3 (5 825 MHz)

9.5.2 Test data for Antenna 1

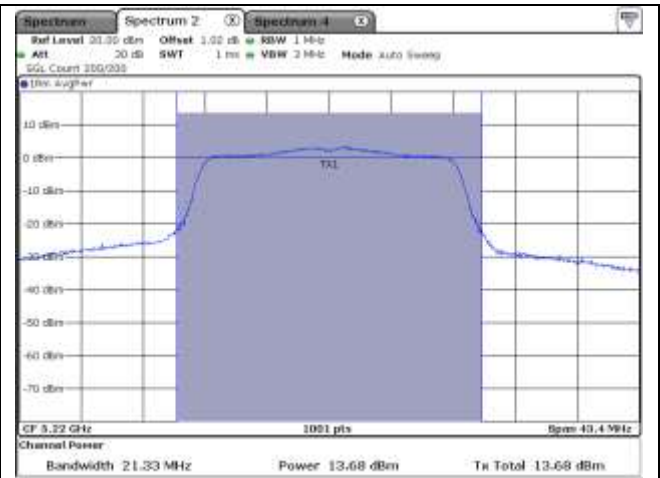
-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|---------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 150 ~ 5 250 | Low | 5 180.00 | 13.28 | 0.72 | 14.00 | 23.97 | 9.97 |
| | Middle | 5 220.00 | 13.68 | 0.72 | 14.40 | 23.97 | 9.57 |
| | High | 5 240.00 | 13.47 | 0.72 | 14.19 | 23.97 | 9.78 |
| 5 250 ~ 5 350 | Low | 5 260.00 | 13.40 | 0.65 | 14.05 | 23.97 | 9.92 |
| | Middle | 5 300.00 | 13.19 | 0.65 | 13.84 | 23.97 | 10.13 |
| | High | 5 320.00 | 13.53 | 0.65 | 14.18 | 23.97 | 9.79 |
| 5 470 ~ 5 725 | Low | 5 500.00 | 14.66 | 0.65 | 15.31 | 23.97 | 8.66 |
| | Middle | 5 580.00 | 14.76 | 0.65 | 15.41 | 23.97 | 8.56 |
| | High | 5 700.00 | 14.74 | 0.65 | 15.39 | 23.97 | 8.58 |
| 5 725 ~ 5 850 | Low | 5 745.00 | 13.97 | 0.60 | 14.57 | 30.00 | 15.43 |
| | Middle | 5 785.00 | 13.73 | 0.60 | 14.33 | 30.00 | 15.67 |
| | High | 5 825.00 | 13.49 | 0.60 | 14.09 | 30.00 | 15.91 |

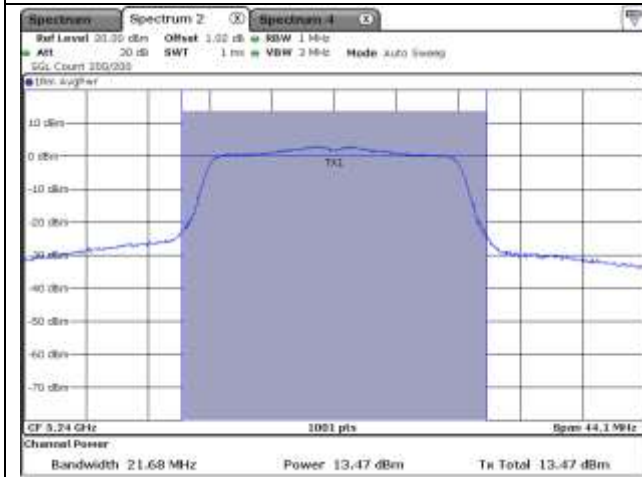
Remark : Margin = Limit – Result(Measured Value + Correction Factor)



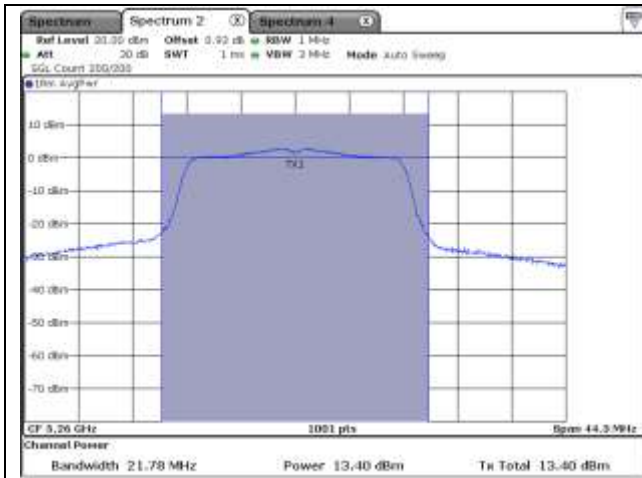
U-NII-1 (5 180 MHz)



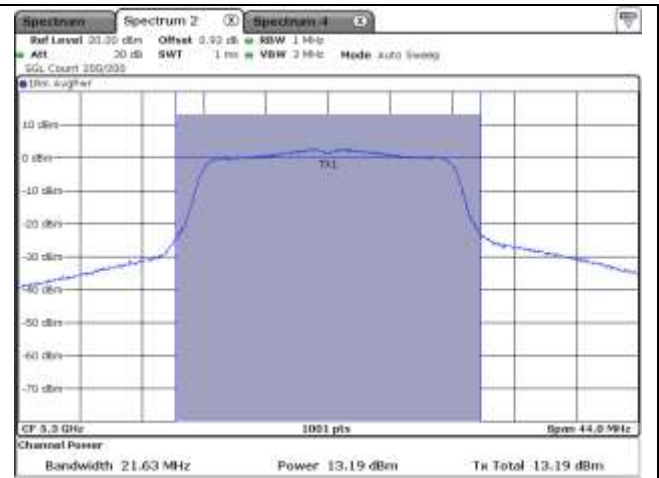
U-NII-1 (5 220 MHz)



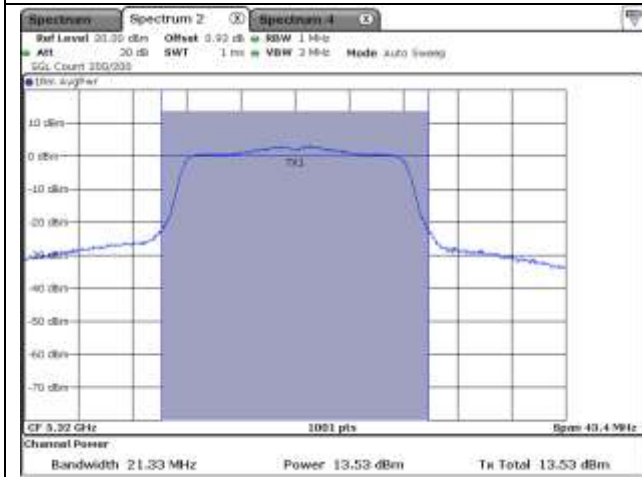
U-NII-1 (5 240 MHz)



U-NII-2A (5 260 MHz)

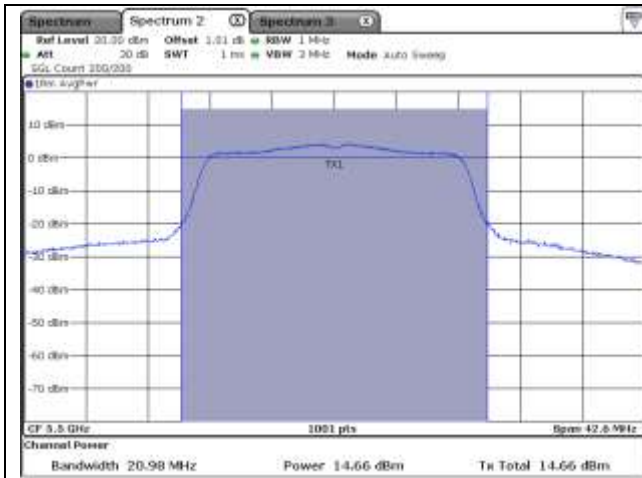


U-NII-2A (5 300 MHz)

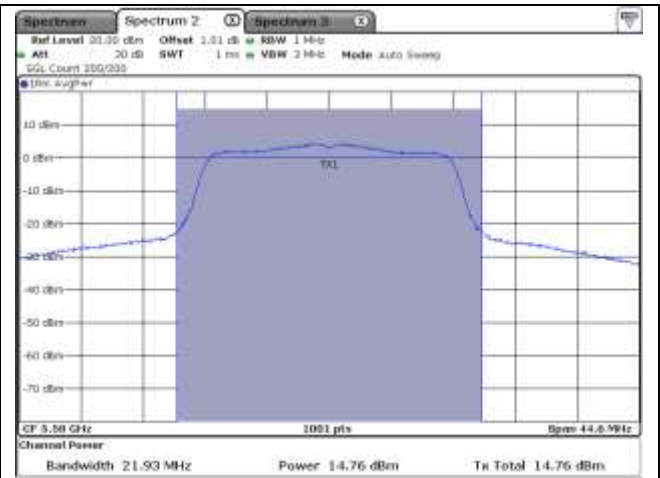


U-NII-2A (5 320 MHz)

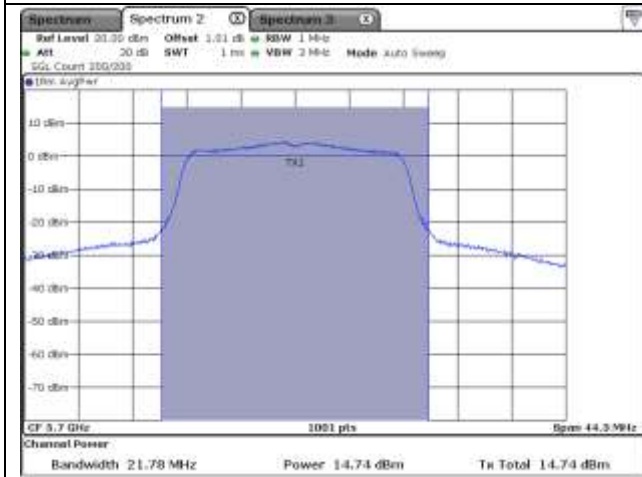




U-NII-2C (5 500 MHz)

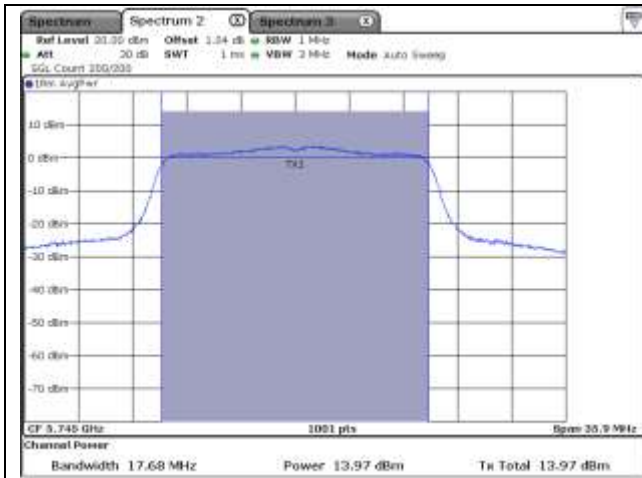


U-NII-2C (5 580 MHz)

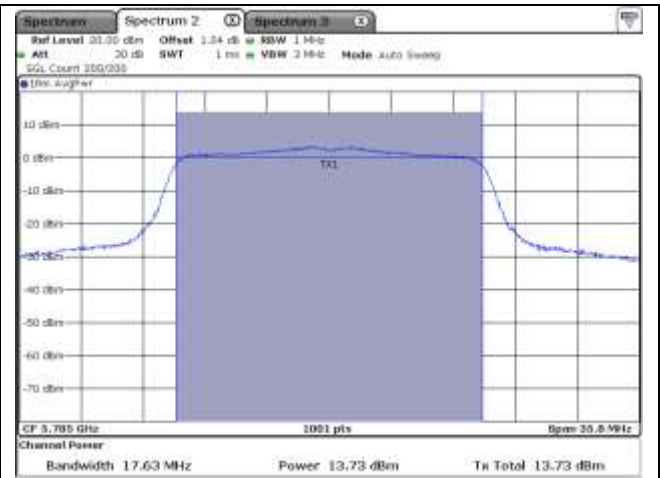


U-NII-2C (5 700 MHz)

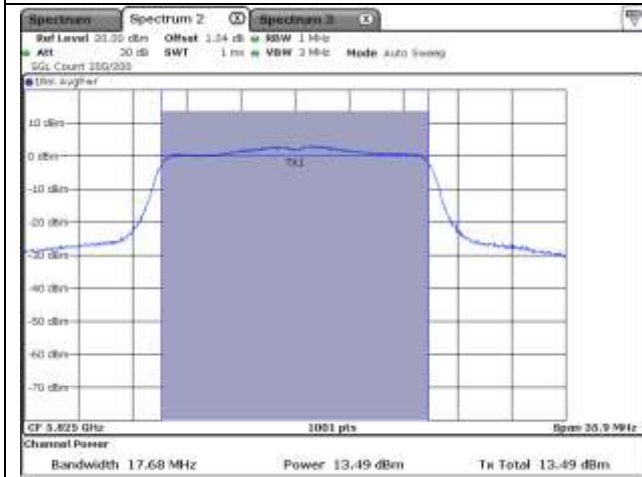




U-NII-3 (5 745 MHz)



U-NII-3 (5 785 MHz)



U-NII-3 (5 825 MHz)



9.5.3 Test data for Multiple Transmit

-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|---------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 150 ~ 5 250 | Low | 5 180.00 | 17.01 | 0.72 | 17.73 | 23.97 | 6.24 |
| | Middle | 5 220.00 | 17.32 | 0.72 | 18.04 | 23.97 | 5.93 |
| | High | 5 240.00 | 17.28 | 0.72 | 18.00 | 23.97 | 5.97 |
| 5 250 ~ 5 350 | Low | 5 260.00 | 17.94 | 0.65 | 18.59 | 23.97 | 5.38 |
| | Middle | 5 300.00 | 18.01 | 0.65 | 18.66 | 23.97 | 5.31 |
| | High | 5 320.00 | 17.87 | 0.65 | 18.52 | 23.97 | 5.45 |
| 5 470 ~ 5 725 | Low | 5 500.00 | 17.93 | 0.65 | 18.58 | 23.97 | 5.39 |
| | Middle | 5 580.00 | 17.89 | 0.65 | 18.54 | 23.97 | 5.43 |
| | High | 5 700.00 | 17.55 | 0.65 | 18.20 | 23.97 | 5.77 |
| 5 725 ~ 5 850 | Low | 5 745.00 | 16.97 | 0.60 | 17.57 | 30.00 | 12.43 |
| | Middle | 5 785.00 | 16.79 | 0.60 | 17.39 | 30.00 | 12.61 |
| | High | 5 825.00 | 16.47 | 0.60 | 17.07 | 30.00 | 12.93 |

Remark : Margin = Limit – Result(Measured Value + Correction Factor)

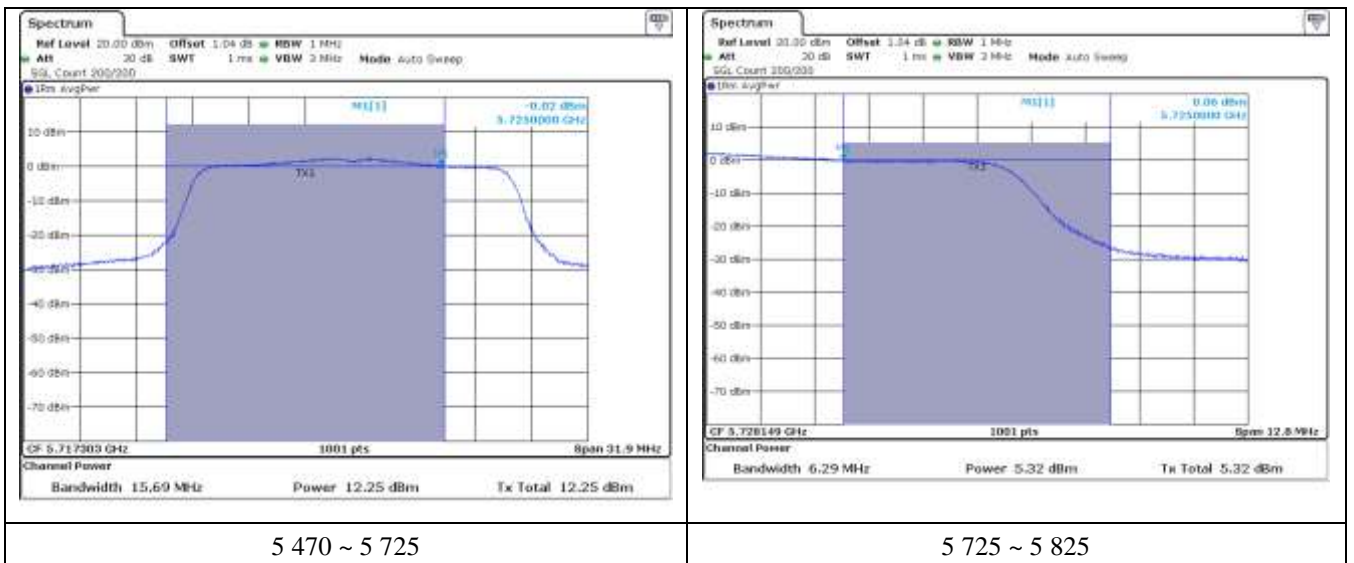
Remark 2: Calculated Output Power= $10\log (10^{(\text{Antenna0 Output Power}/10)} + 10^{(\text{Antenna1 Output Power}/10)})$

9.5.4 Test data for Straddle Channel_Antenna 0

- Test Result : Pass

| FREQUENCY RANGE (MHz) | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 470 ~ 5 725 | 5 720.00 | 12.25 | 0.59 | 12.84 | 23.97 | 11.13 |
| 5 725 ~ 5 825 | 5 720.00 | 5.32 | 0.65 | 5.97 | 30.00 | 24.03 |

Remark : Margin = Limit – Result(Measured Value + Correction Factor)

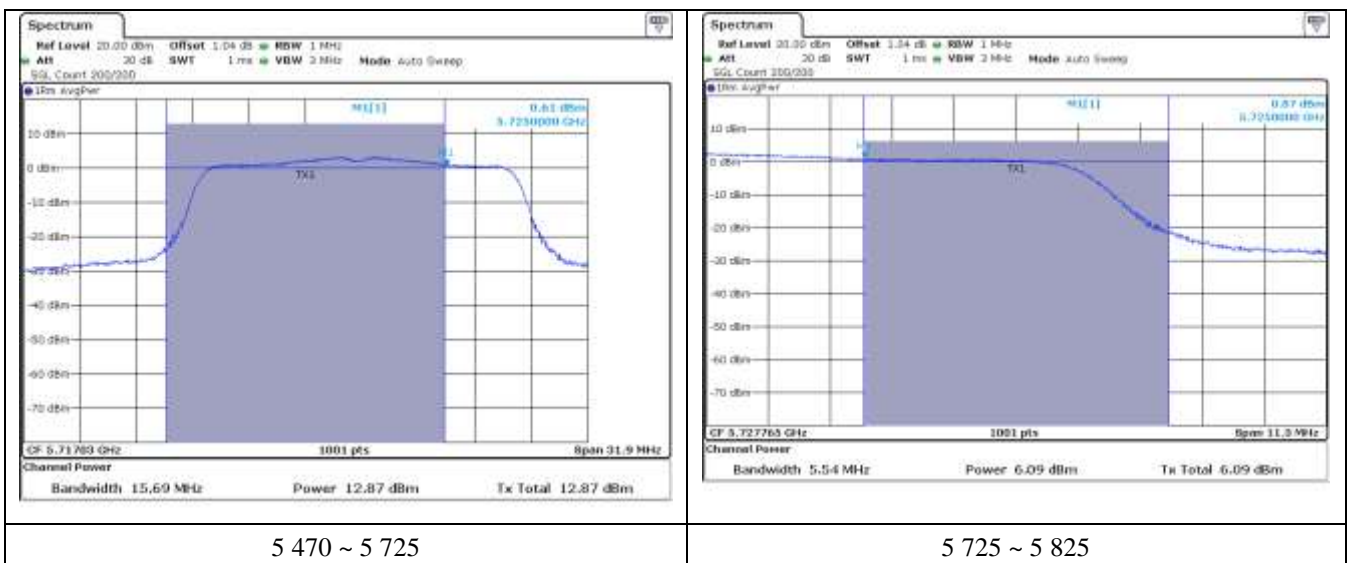


9.5.5 Test data for Straddle Channel_Antenna 1

-. Test Result : Pass

| FREQUENCY RANGE (MHz) | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 470 ~ 5 725 | 5 720.00 | 12.87 | 0.65 | 13.52 | 23.97 | 10.45 |
| 5 725 ~ 5 825 | 5 720.00 | 6.09 | 0.60 | 6.69 | 30.00 | 23.31 |

Remark : Margin = Limit – Result(Measured Value + Correction Factor)



9.5.6 Test data for Straddle Channel_Multiple Transmit

-. Test Result : Pass

| FREQUENCY RANGE (MHz) | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 470 ~ 5 725 | 5 720.00 | 15.58 | 0.65 | 16.23 | 23.97 | 7.74 |
| 5 725 ~ 5 825 | 5 720.00 | 8.73 | 0.60 | 9.33 | 30.00 | 20.67 |

Remark 1 : Margin = Limit – Result(Measured Value + Correction Factor)

Remark 2 : Calculated Output Power= $10\log (10^{(\text{Antenna1 Output Power}/10)}+10^{(\text{Antenna2 Output Power}/10)})$

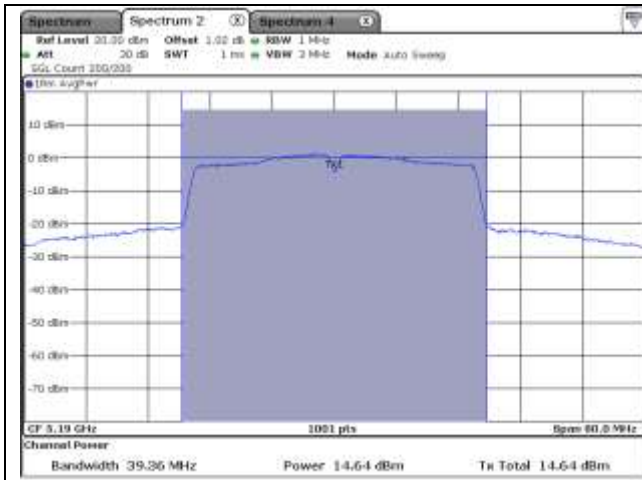
9.6 Test data for 802.11n_HT40 RLAN Mode

9.6.1 Test data for Antenna 0

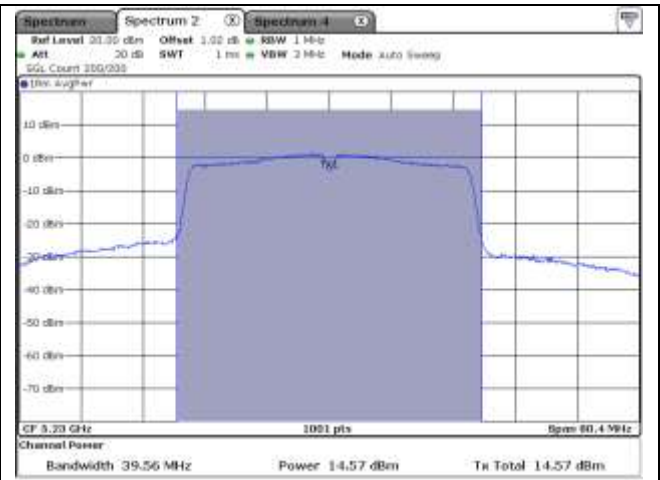
-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|---------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 150 ~ 5 250 | Low | 5 190.00 | 14.64 | 1.11 | 15.75 | 23.97 | 8.22 |
| | High | 5 230.00 | 14.57 | 1.11 | 15.68 | 23.97 | 8.29 |
| 5 250 ~ 5 350 | Low | 5 270.00 | 15.26 | 1.11 | 16.37 | 23.97 | 7.60 |
| | High | 5 310.00 | 15.12 | 1.11 | 16.23 | 23.97 | 7.74 |
| 5 470 ~ 5 725 | Low | 5 510.00 | 1.09 | 17.47 | 23.97 | 6.50 | 16.38 |
| | Middle | 5 550.00 | 1.09 | 17.42 | 23.97 | 6.55 | 16.33 |
| | High | 5 670.00 | 1.09 | 17.00 | 23.97 | 6.97 | 15.91 |
| 5 725 ~ 5 850 | Low | 5 755.00 | 14.26 | 1.08 | 15.34 | 30.00 | 14.66 |
| | High | 5 795.00 | 14.04 | 1.08 | 15.12 | 30.00 | 14.88 |

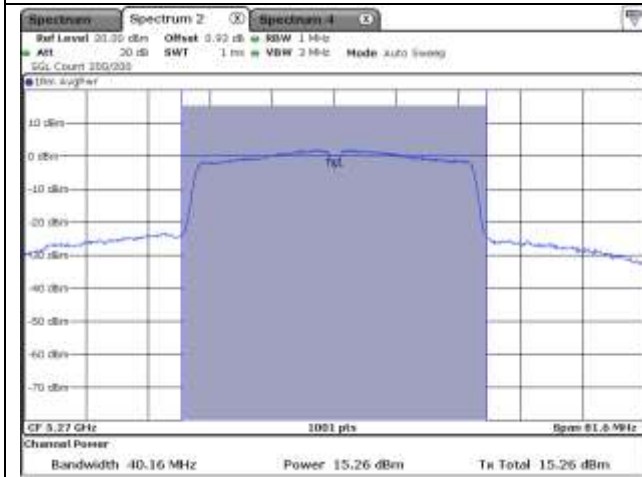
Remark : Margin = Limit – Result(Measured Value + Correction Factor)



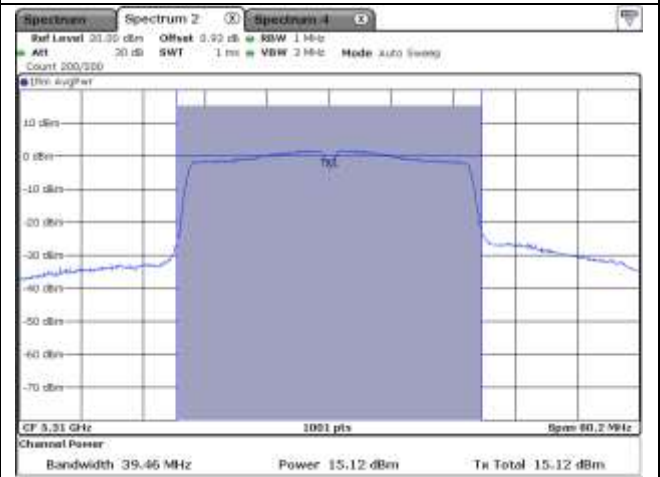
U-NII-1 (5 190 MHz)



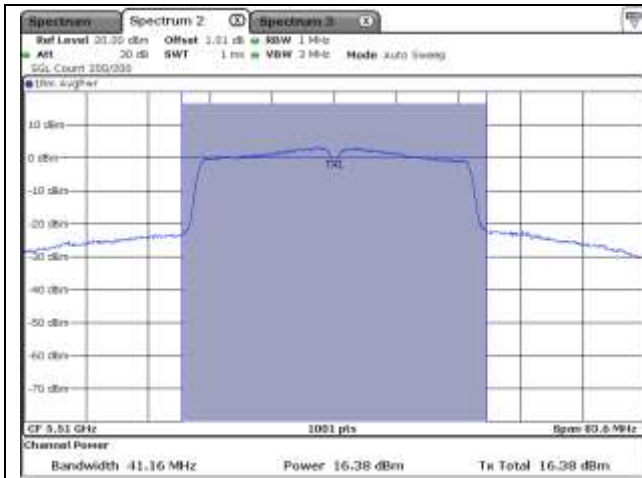
U-NII-1 (5 230 MHz)



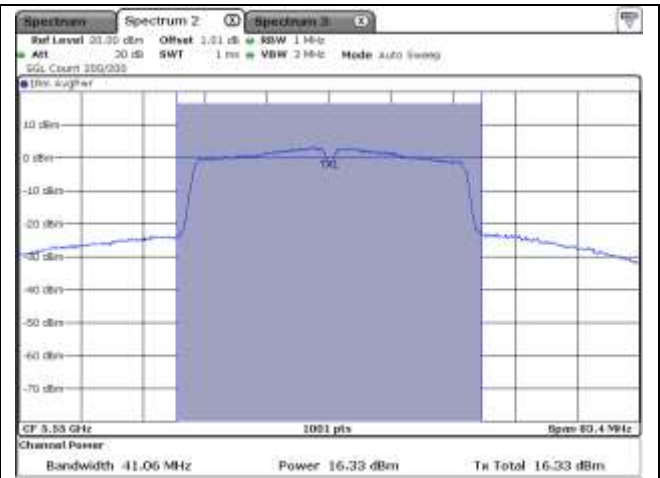
U-NII-2A (5 270 MHz)



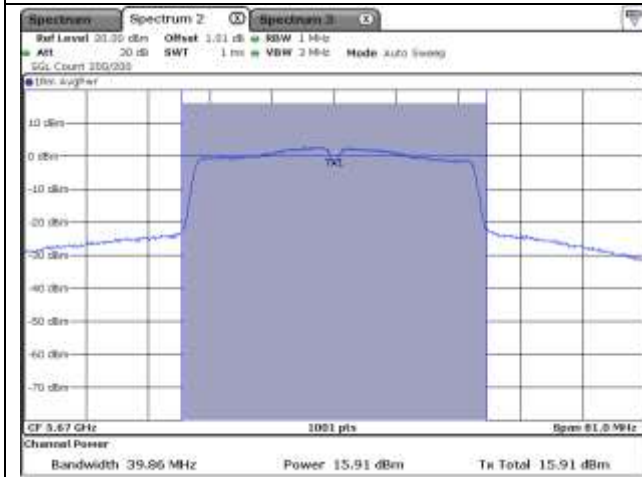
U-NII-2A (5 310 MHz)



U-NII-2C (5 510 MHz)

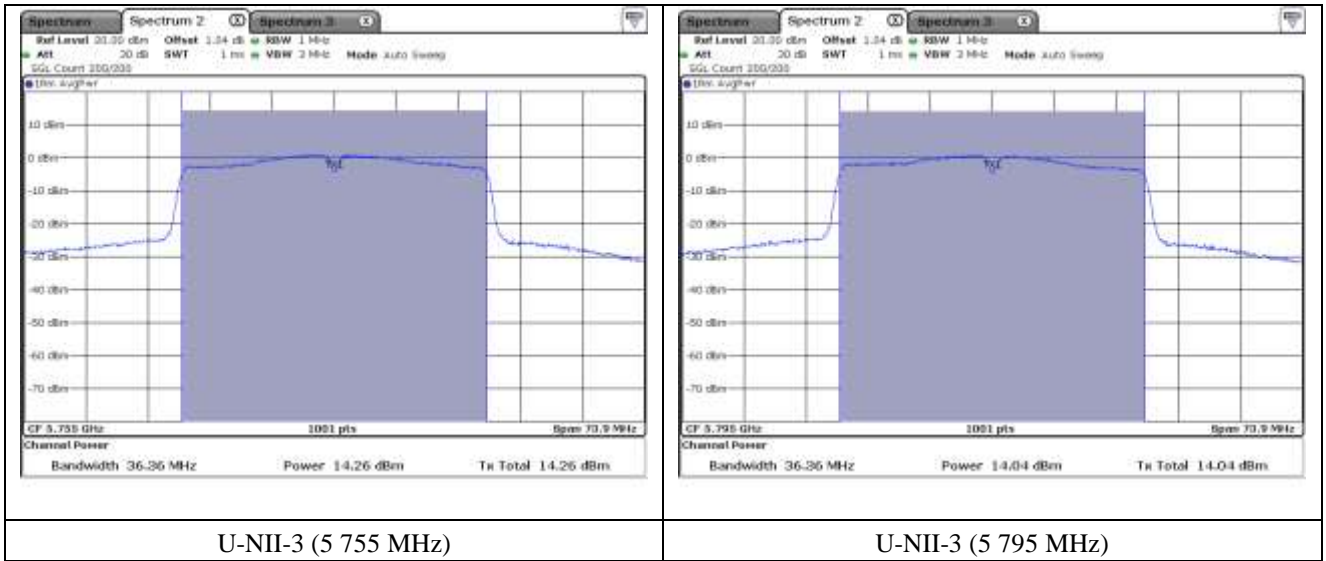


U-NII-2C (5 550 MHz)



U-NII-2C (5 670 MHz)



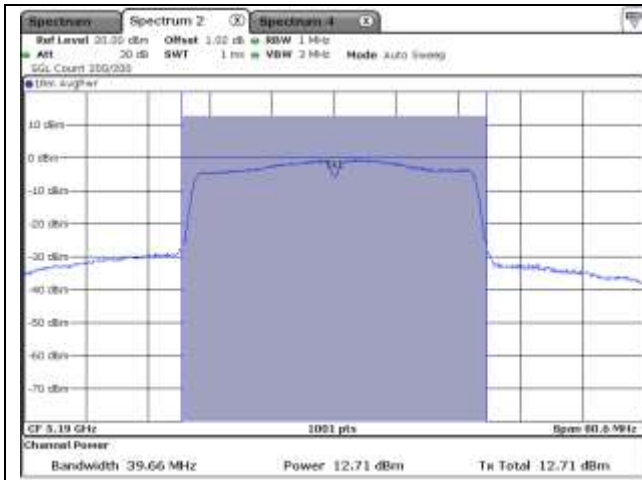


9.6.2 Test data for Antenna 1

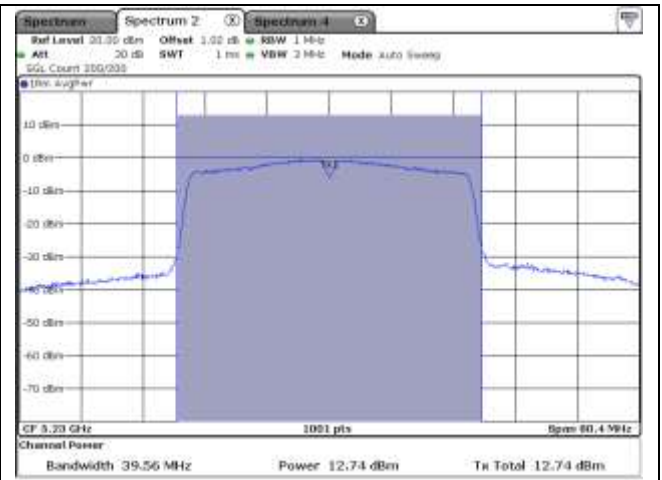
-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|---------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 150 ~ 5 250 | Low | 5 190.00 | 12.71 | 1.08 | 13.79 | 23.97 | 10.18 |
| | High | 5 230.00 | 12.74 | 1.08 | 13.82 | 23.97 | 10.15 |
| 5 250 ~ 5 350 | Low | 5 270.00 | 12.75 | 1.11 | 13.86 | 23.97 | 10.11 |
| | High | 5 310.00 | 13.01 | 1.11 | 14.12 | 23.97 | 9.85 |
| 5 470 ~ 5 725 | Low | 5 510.00 | 14.29 | 1.11 | 15.40 | 23.97 | 8.57 |
| | Middle | 5 550.00 | 14.74 | 1.11 | 15.85 | 23.97 | 8.12 |
| | High | 5 670.00 | 14.61 | 1.11 | 15.72 | 23.97 | 8.25 |
| 5 725 ~ 5 850 | Low | 5 755.00 | 13.29 | 1.11 | 14.40 | 30.00 | 15.60 |
| | High | 5 795.00 | 13.12 | 1.11 | 14.23 | 30.00 | 15.77 |

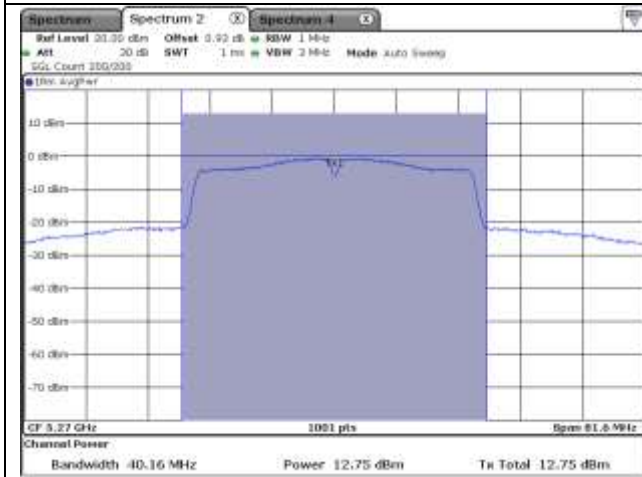
Remark : Margin = Limit – Result(Measured Value + Correction Factor)



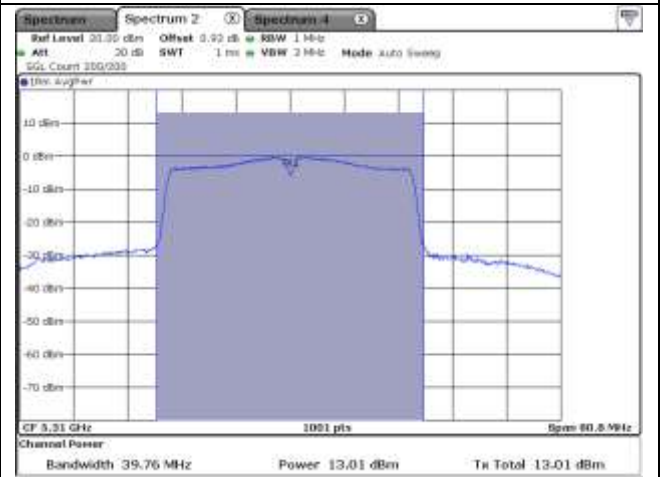
U-NII-1 (5 190 MHz)



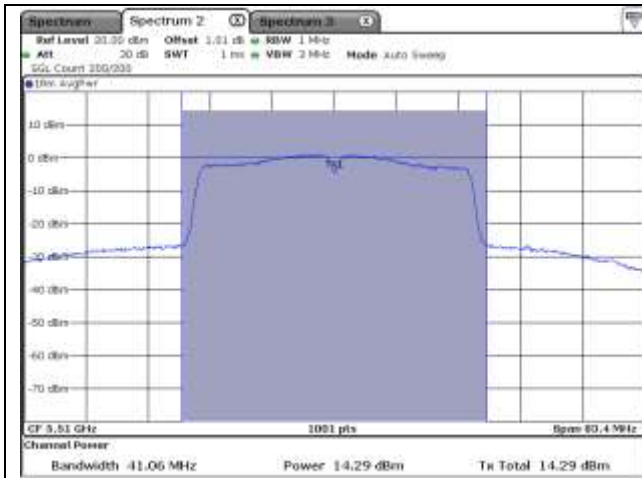
U-NII-1 (5 230 MHz)



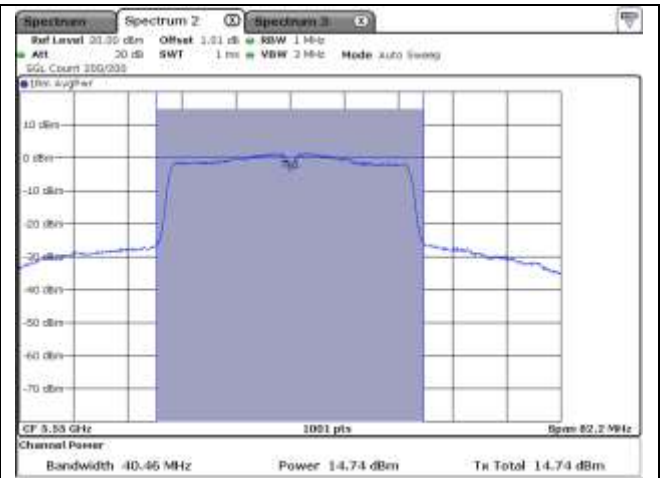
U-NII-2A (5 270 MHz)



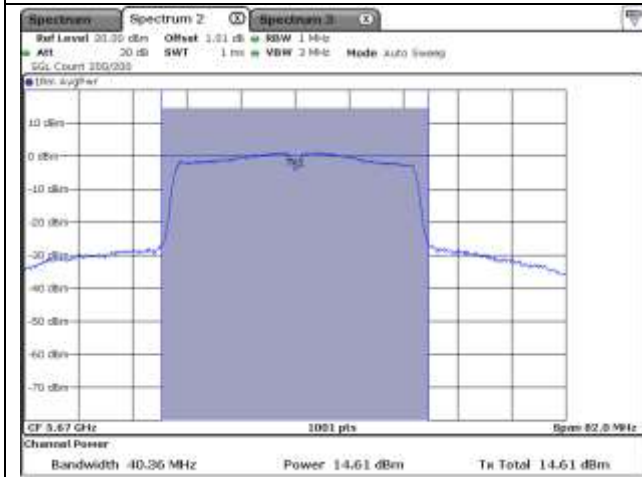
U-NII-2A (5 310 MHz)



U-NII-2C (5 510 MHz)

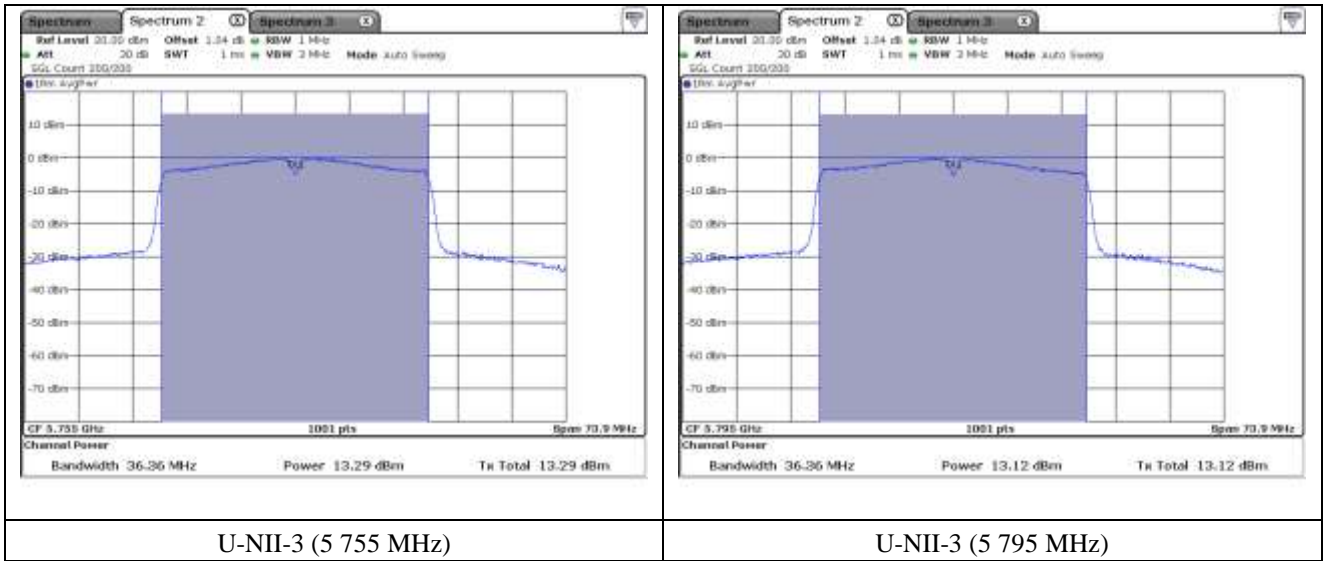


U-NII-2C (5 550 MHz)



U-NII-2C (5 670 MHz)





9.6.3 Test data for Multiple Transmit

-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|---------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 150 ~ 5 250 | Low | 5 190.00 | 16.79 | 1.08 | 17.87 | 23.97 | 6.10 |
| | High | 5 230.00 | 16.76 | 1.08 | 17.84 | 23.97 | 6.13 |
| 5 250 ~ 5 350 | Low | 5 270.00 | 17.19 | 1.11 | 18.30 | 23.97 | 5.67 |
| | High | 5 310.00 | 17.20 | 1.11 | 18.31 | 23.97 | 5.66 |
| 5 470 ~ 5 725 | Low | 5 510.00 | 18.47 | 1.11 | 19.58 | 23.97 | 4.39 |
| | Middle | 5 550.00 | 18.62 | 1.11 | 19.73 | 23.97 | 4.24 |
| | High | 5 670.00 | 18.32 | 1.11 | 19.43 | 23.97 | 4.54 |
| 5 725 ~ 5 850 | Low | 5 755.00 | 16.81 | 1.11 | 17.92 | 30.00 | 12.08 |
| | High | 5 795.00 | 16.61 | 1.11 | 17.72 | 30.00 | 12.28 |

Remark 1 : Margin = Limit – Result(Measured Value + Correction Factor)

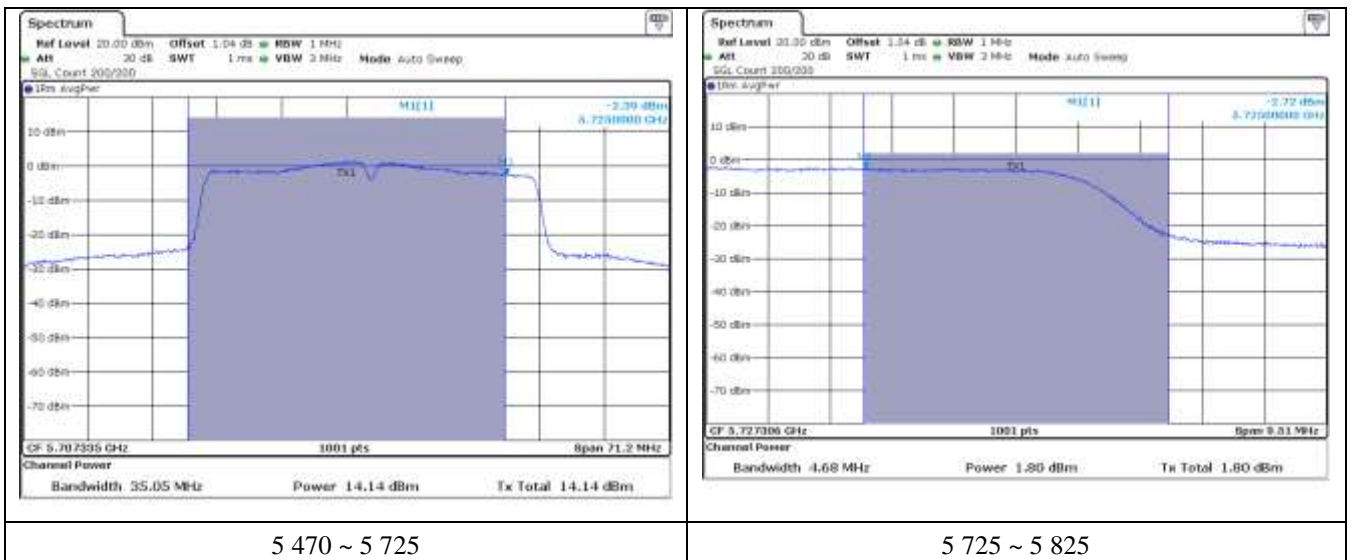
Remark 2: Calculated Output Power= $10\log(10^{(\text{Antenna0 Output Power}/10)} + 10^{(\text{Antenna1 Output Power}/10)})$

9.6.4 Test data for Straddle Channel_Antenna 0

- Test Result : Pass

| FREQUENCY RANGE (MHz) | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 470 ~ 5 725 | 5 710.00 | 14.14 | 1.09 | 15.23 | 23.97 | 8.74 |
| 5 725 ~ 5 825 | 5 710.00 | 1.80 | 1.08 | 2.88 | 30.00 | 27.12 |

Remark : Margin = Limit – Result(Measured Value + Correction Factor)

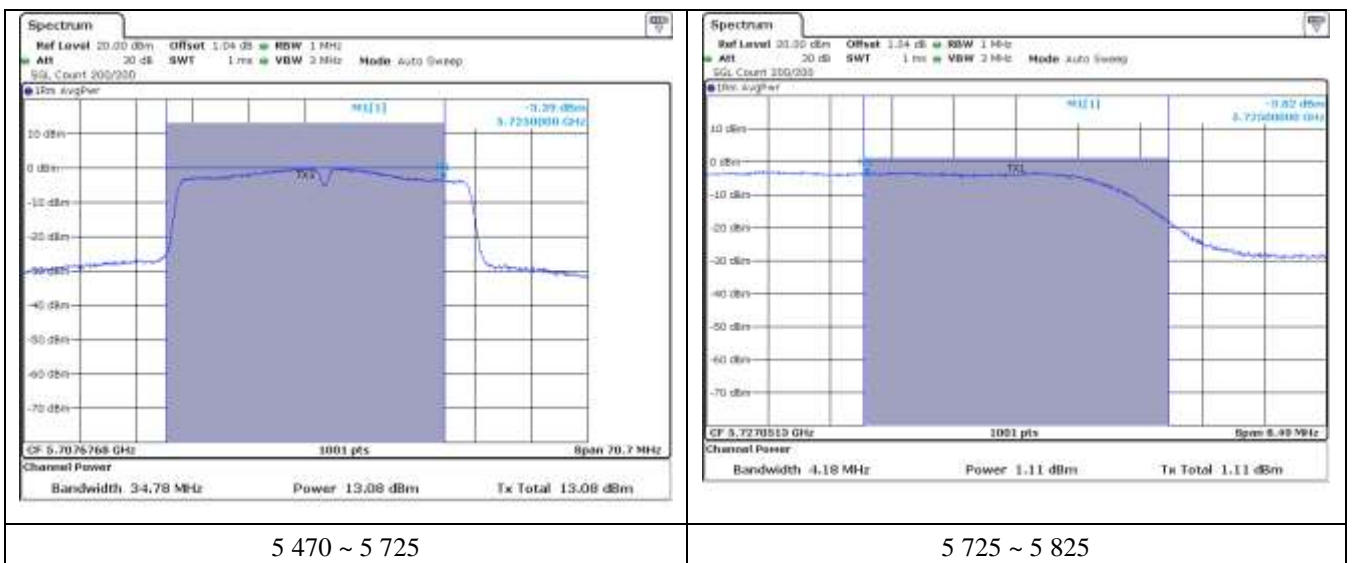


9.6.5 Test data for Straddle Channel_Antenna 1

-. Test Result : Pass

| FREQUENCY RANGE (MHz) | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 470 ~ 5 725 | 5 710.00 | 13.08 | 1.11 | 14.19 | 23.97 | 9.78 |
| 5 725 ~ 5 825 | 5 710.00 | 1.11 | 1.11 | 2.22 | 30.00 | 27.78 |

Remark : Margin = Limit – Result(Measured Value + Correction Factor)



9.6.6 Test data for Straddle Channel_Multiple Transmit

-. Test Result : Pass

| FREQUENCY RANGE (MHz) | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 470 ~ 5 725 | 5 720.00 | 16.65 | 1.11 | 17.76 | 23.97 | 6.21 |
| 5 725 ~ 5 825 | 5 720.00 | 4.48 | 1.11 | 5.59 | 30.00 | 24.41 |

Remark 1 : Margin = Limit – Result(Measured Value + Correction Factor)

Remark 2 : Calculated Output Power= $10\log (10^{(\text{Antenna1 Output Power}/10)}+10^{(\text{Antenna2 Output Power}/10)})$

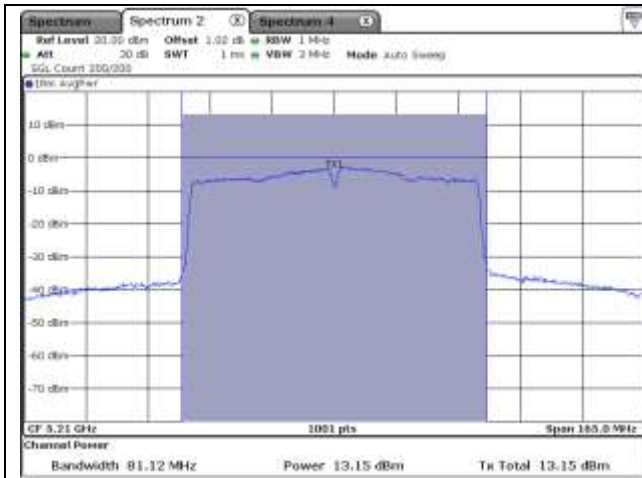
9.7 Test data for 802.11ac_HT80 RLAN Mode

9.7.1 Test data for Antenna 0

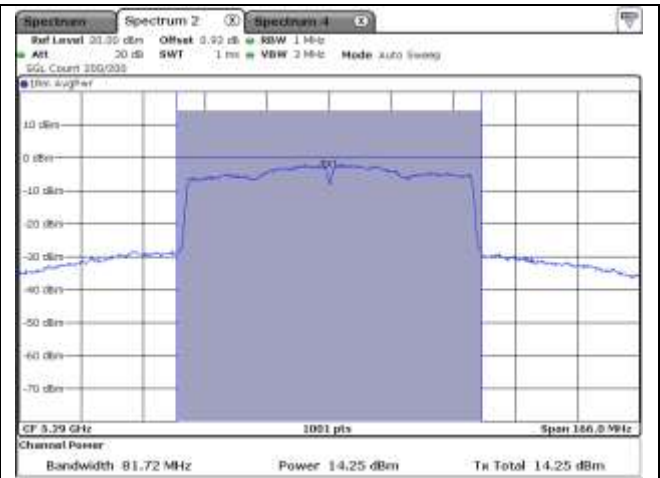
-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|---------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 150 ~ 5 250 | Middle | 5 210.00 | 13.15 | 1.88 | 15.03 | 23.97 | 8.94 |
| 5 250 ~ 5 350 | Middle | 5 290.00 | 14.25 | 1.87 | 16.12 | 23.97 | 7.85 |
| 5 470 ~ 5 725 | Low | 5 530.00 | 15.27 | 1.87 | 17.14 | 23.97 | 6.83 |
| | High | 5 690.00 | 14.36 | 1.87 | 16.23 | 23.97 | 7.74 |
| 5 725 ~ 5 850 | Middle | 5 775.00 | 12.84 | 1.88 | 14.72 | 30.00 | 15.28 |

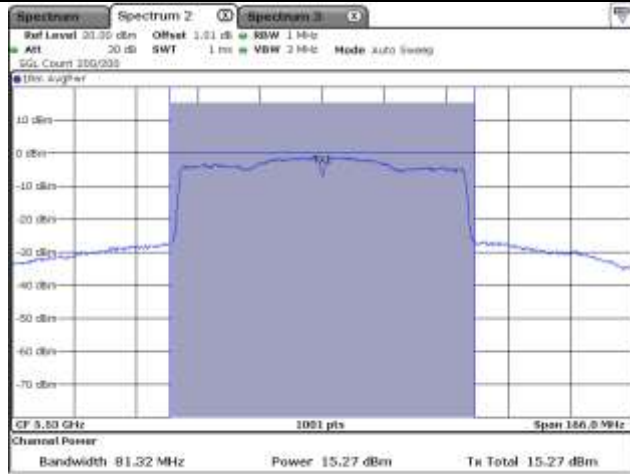
Remark : Margin = Limit – Result(Measured Value + Correction Factor)



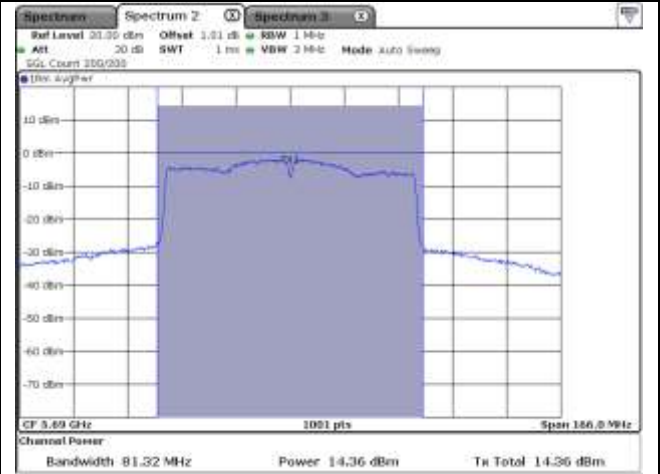
U-NII-1 (5 210 MHz)



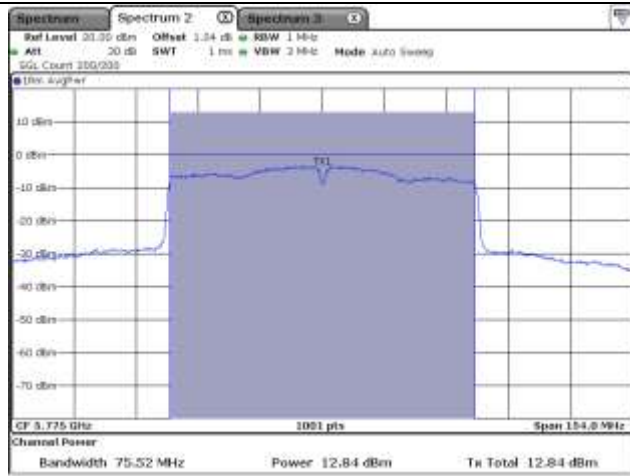
U-NII-2A (5 290 MHz)



U-NII-2C (5 530 MHz)



U-NII-2C (5 690 MHz)



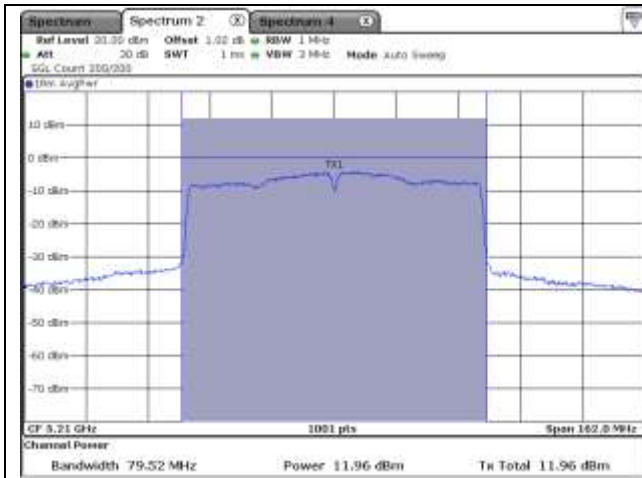
U-NII-3 (5 775 MHz)

9.7.2 Test data for Antenna 1

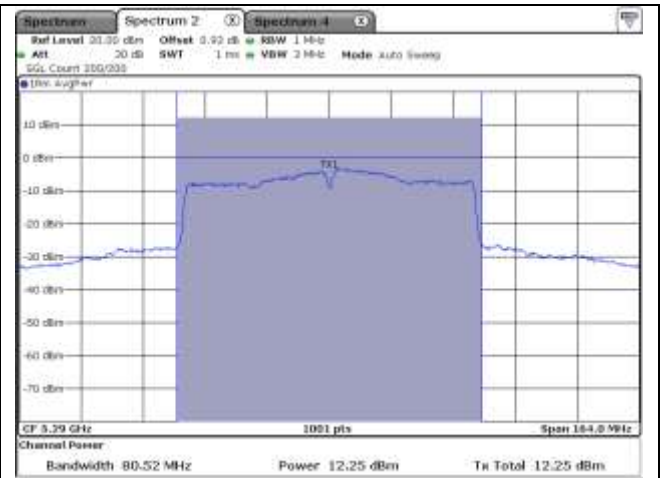
-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|---------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 150 ~ 5 250 | Middle | 5 210.00 | 11.96 | 1.87 | 13.83 | 23.97 | 10.14 |
| 5 250 ~ 5 350 | Middle | 5 290.00 | 12.25 | 1.88 | 14.13 | 23.97 | 9.84 |
| 5 470 ~ 5 725 | Low | 5 530.00 | 13.66 | 1.89 | 15.55 | 23.97 | 8.42 |
| | High | 5 690.00 | 13.51 | 1.89 | 15.40 | 23.97 | 8.57 |
| 5 725 ~ 5 850 | Middle | 5 775.00 | 11.94 | 1.89 | 13.83 | 30.00 | 16.17 |

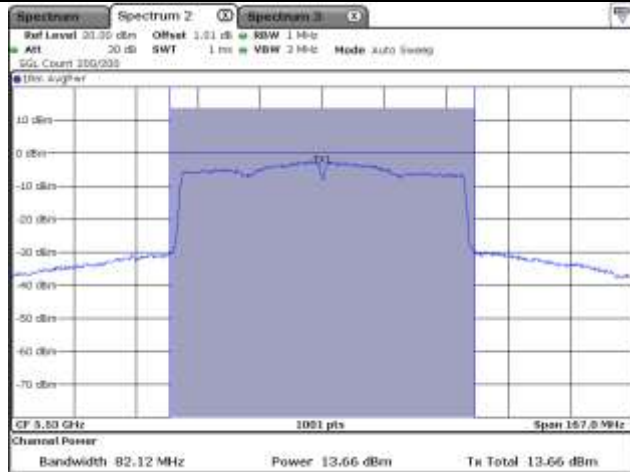
Remark : Margin = Limit – Result(Measured Value + Correction Factor)



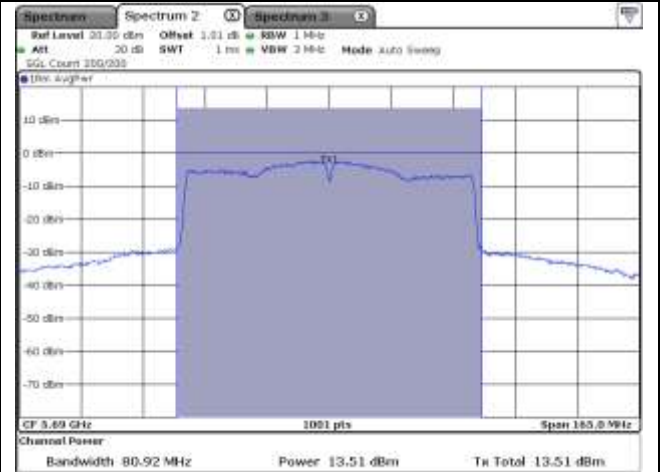
U-NII-1 (5 210 MHz)



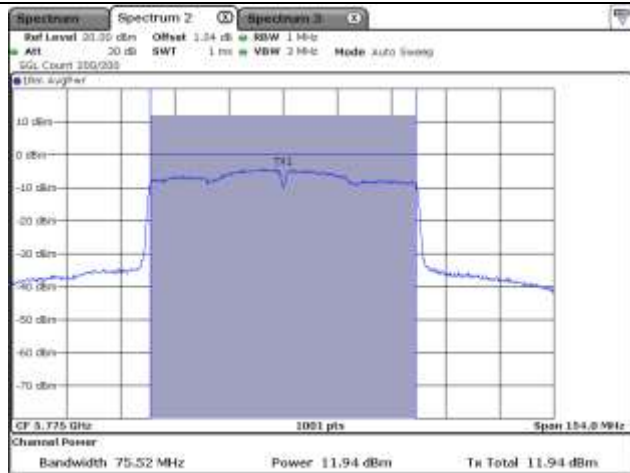
U-NII-2A (5 290 MHz)



U-NII-2C (5 530 MHz)



U-NII-2C (5 690 MHz)



U-NII-3 (5 775 MHz)

9.7.3 Test data for Multiple Transmit

-. Test Result : Pass

| FREQUENCY RANGE (MHz) | CHANNEL | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|---------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 150 ~ 5 250 | Middle | 5 210.00 | 15.61 | 1.87 | 17.48 | 23.97 | 6.49 |
| 5 250 ~ 5 350 | Middle | 5 290.00 | 16.37 | 1.88 | 18.25 | 23.97 | 5.72 |
| 5 470 ~ 5 725 | Low | 5 530.00 | 17.55 | 1.89 | 19.44 | 23.97 | 4.53 |
| | High | 5 690.00 | 16.97 | 1.89 | 18.86 | 23.97 | 5.11 |
| 5 725 ~ 5 850 | Middle | 5 775.00 | 15.42 | 1.89 | 17.31 | 30.00 | 12.69 |

Remark 1 : Margin = Limit – Result(Measured Value + Correction Factor)

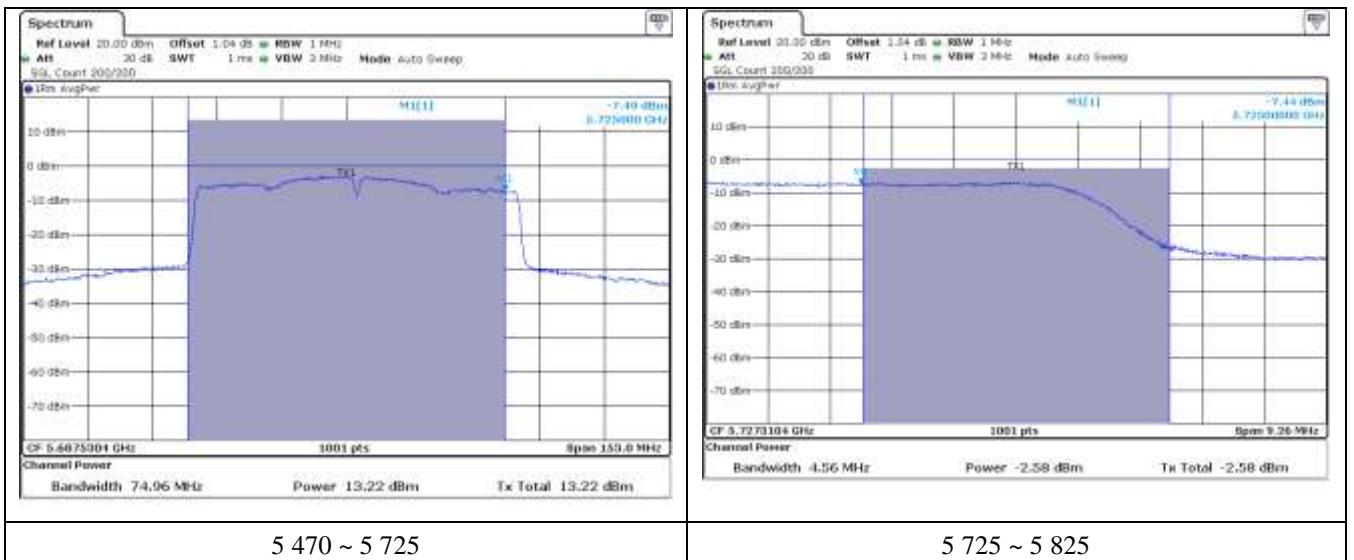
Remark 2: Calculated Output Power= $10\log (10^{(\text{Antenna0 Output Power}/10)} + 10^{(\text{Antenna1 Output Power}/10)})$

9.7.4 Test data for Straddle Channel_Antenna 0

- Test Result : Pass

| FREQUENCY RANGE (MHz) | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 470 ~ 5 725 | 5 690.00 | 13.22 | 1.87 | 15.09 | 23.97 | 8.88 |
| 5 725 ~ 5 825 | 5 690.00 | -2.58 | 1.88 | -0.70 | 30.00 | 30.70 |

Remark : Margin = Limit – Result(Measured Value + Correction Factor)

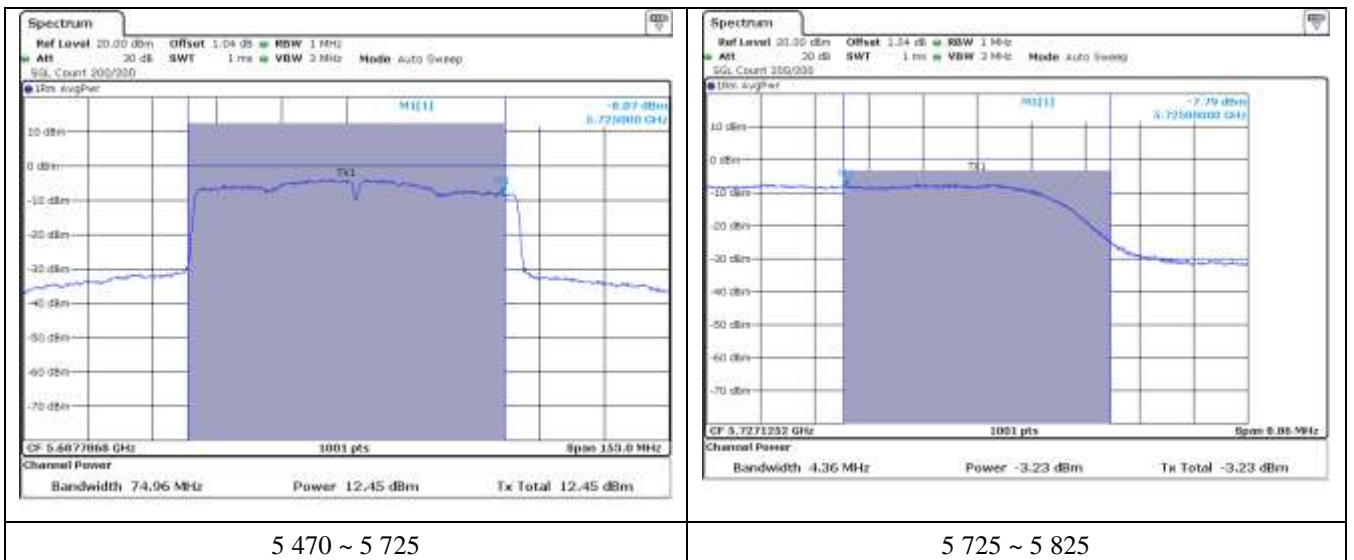


9.7.5 Test data for Straddle Channel_Antenna 1

- Test Result : Pass

| FREQUENCY RANGE (MHz) | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 470 ~ 5 725 | 5 690.00 | 12.45 | 1.89 | 14.34 | 23.97 | 9.63 |
| 5 725 ~ 5 825 | 5 690.00 | -3.23 | 1.89 | -1.34 | 30.00 | 31.34 |

Remark : Margin = Limit – Result(Measured Value + Correction Factor)



9.7.6 Test data for Straddle Channel_Multiple Transmit

-. Test Result : Pass

| FREQUENCY RANGE (MHz) | FREQUENCY (MHz) | MEASURED VALUE (dBm) | Correction Factor (dB) | Result (dBm) | LIMIT (dBm) | MARGIN (dB) |
|-----------------------|-----------------|----------------------|------------------------|--------------|-------------|-------------|
| 5 470 ~ 5 725 | 5 690.00 | 15.86 | 1.89 | 17.75 | 23.97 | 6.22 |
| 5 725 ~ 5 825 | 5 690.00 | 0.12 | 1.89 | 2.01 | 30.00 | 27.99 |

Remark 1 : Margin = Limit – Result(Measured Value + Correction Factor)

Remark 2 : Calculated Output Power= $10\log (10^{(\text{Antenna1 Output Power}/10)}+10^{(\text{Antenna2 Output Power}/10)})$