



# FCC RADIO TEST REPORT

**FCC ID** : MSQI005D  
**Equipment** : ASUS Phone(Mobile Phone)  
**Brand Name** : ASUS  
**Model Name** : ASUS\_I005D  
ASUS\_I005DC  
**Standard** : FCC Part 15 Subpart C §15.247

The product was received on Nov. 02, 2020 and testing was started from Nov. 17, 2020 and completed on Jan. 05, 2021. We, SPORTON INTERNATIONAL INC., EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

*Louis Wu*

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**Reviewed by: Louis Wu**

**SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory**  
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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## History of this test report

| Report No. | Version | Description             | Issued Date   |
|------------|---------|-------------------------|---------------|
| FR082114A  | 01      | Initial issue of report | Feb. 04, 2021 |
|            |         |                         |               |
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|            |         |                         |               |

## Summary of Test Result

| Report Clause | Ref Std. Clause    | Test Items                                         | Result (PASS/FAIL) | Remark                             |
|---------------|--------------------|----------------------------------------------------|--------------------|------------------------------------|
| 3.1           | 15.247(a)(1)       | Number of Channels                                 | Pass               | -                                  |
| 3.2           | 15.247(a)(1)       | Hopping Channel Separation                         | Pass               | -                                  |
| 3.3           | 15.247(a)(1)       | Dwell Time of Each Channel                         | Pass               | -                                  |
| 3.4           | 15.247(a)(1)       | 20dB Bandwidth                                     | Pass               | -                                  |
| 3.4           | 2.1049             | 99% Occupied Bandwidth                             | Reporting only     | -                                  |
| 3.5           | 15.247(b)(1)       | Peak Output Power                                  | Pass               | -                                  |
| 3.6           | 15.247(d)          | Conducted Band Edges                               | Pass               | -                                  |
| 3.7           | 15.247(d)          | Conducted Spurious Emission                        | Pass               | -                                  |
| 3.8           | 15.247(d)          | Radiated Band Edges and Radiated Spurious Emission | Pass               | Under limit 6.50 dB at 903.970 MHz |
| 3.9           | 15.207             | AC Conducted Emission                              | Pass               | Under limit 4.92 dB at 0.152 MHz   |
| 3.10          | 15.203 & 15.247(b) | Antenna Requirement                                | Pass               | -                                  |

**Declaration of Conformity:**

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

**Comments and Explanations:**

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

**Reviewed by: Wii Chang**

**Report Producer: Amy Chen**

# 1 General Description

## 1.1 Applicant

1. ASUSTeK COMPUTER INC.  
1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan

## 1.2 Manufacturer

1. Guangdong Enok Communication Co., Ltd.  
No. 137, 139, Lixiang Road., Songmushan Village, Dalang Town, Dongguan City, Guangdong Province, China
2. PT. SAT NUSAPERSADA TBK  
JALAN PELITA VI. NO. 99, BATAM, 29443, INDONESIA

## 1.3 Product Feature of Equipment Under Test

GSM/WCDMA/LTE/5G NR, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n/ac/ax, Wi-Fi 5GHz 802.11a/n/ac/ax, NFC, and GNSS.

| Product Specification subjective to this standard |                                                                                                                                                                                                                                                                         |                                                         |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| Sample 1                                          | Model Name: ASUS_I005D                                                                                                                                                                                                                                                  |                                                         |
| Sample 2                                          | Model Name: ASUS_I005DC                                                                                                                                                                                                                                                 |                                                         |
| Antenna Type                                      | WWAN: PIFA Antenna<br>WLAN<br><Ant. 4>: PIFA Antenna<br><Ant. 5>: PIFA Antenna<br><Ant. 6>: PIFA Antenna<br>Bluetooth<br><Ant. 4>: PIFA Antenna<br><Ant. 5>: PIFA Antenna<br><Ant. 6>: PIFA Antenna<br>GPS / Glonass / BDS / Galileo: PIFA Antenna<br>NFC: Loop Antenna |                                                         |
| Antenna information                               |                                                                                                                                                                                                                                                                         |                                                         |
| 2400 MHz ~ 2483.5 MHz                             | Peak Gain (dBi)                                                                                                                                                                                                                                                         | Ant. 4: -0.5 dBi<br>Ant. 5: -0.8 dBi<br>Ant. 6: 2.7 dBi |

**Remark:** The above EUT's information was declared by manufacturer. Please refer to Comments and Explanations in report summary.

| Sample Information                               |                                            |                                                       |
|--------------------------------------------------|--------------------------------------------|-------------------------------------------------------|
| Model Name                                       | ASUS_I005D                                 | ASUS_I005DC                                           |
| SKU                                              | SKU1                                       | SKU2                                                  |
|                                                  | UE2S3                                      | UE2S2                                                 |
| High-end or Entry level<br>(Back cover CN or WW) | High-end WW<br>(Etching + Black)<br>PMOLED | High-end CN<br>(Etching + Black)<br>Light guide plate |
| PCB Manufacturer                                 | COMPEQ                                     | COMPEQ                                                |
| Front Camera<br>24M<br>(Brand/Model name)        | TRIPLEWIN/CASF0-000A                       | LUXVISIONS/0BFO01P3                                   |
| Rear CAM 64M+13M<br>(Brand/Model name)           | PRIMAX/50-704JHASC8                        | PRIMAX/50-704JHASC8                                   |
| Rear CAM 8M<br>(Brand/Model name)                | TSPRECISION/O5F9323 VERA1                  | TSPRECISION/O5F9323 VERA1                             |
| BATT<br>(Brand/Model name)                       | SCUD/C21P2001                              | SCUD/C21P2001                                         |
| CPU<br>(Brand/Model name)                        | QUALCOMM/<br>SM-8350-1-MPSP1393-TR-00-0-AB | QUALCOMM/<br>SM-8350-1-MPSP1393-TR-00-0-AB            |
| DDR                                              | 12G                                        | 12G                                                   |
| Brand/Model name                                 | Micron/MT62F1536M64D8CH-031WT:A            | Micron/MT62F1536M64D8CH-031WT:A                       |
| UFS                                              | 512G                                       | 256G                                                  |
| Brand/Model name                                 | Micron/MTFC512GARATAM-WT                   | Samsung/KLUEG8UHDC-B0E1                               |

## 1.4 Modification of EUT

No modifications are made to the EUT during all test items.

## 1.5 Testing Location

|                           |                                                                                                                       |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Test Site</b>          | SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory                                                   |
| <b>Test Site Location</b> | No.52, Huaya 1st Rd., Guishan Dist.,<br>Taoyuan City, Taiwan (R.O.C.)<br>TEL: +886-3-327-3456<br>FAX: +886-3-328-4978 |
| <b>Test Site No.</b>      | <b>Sporton Site No.</b><br>TH05-HY, CO05-HY                                                                           |

**Note:** The test site complies with ANSI C63.4 2014 requirement.

|                           |                                                                                                                                           |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Test Site</b>          | SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory                                                                       |
| <b>Test Site Location</b> | No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist.,<br>Taoyuan City, Taiwan (R.O.C.)<br>TEL: +886-3-327-0868<br>FAX: +886-3-327-0855 |
| <b>Test Site No.</b>      | <b>Sporton Site No.</b><br>03CH15-HY                                                                                                      |

**Note:** The test site complies with ANSI C63.4 2014 requirement.

FCC designation No.: TW1190 and TW0007

## 1.6 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v05r02
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01
- ♦ ANSI C63.10-2013

### Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. The TAF code is not including all the FCC KDB listed without accreditation.
3. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

## 2 Test Configuration of Equipment Under Test

### 2.1 Carrier Frequency Channel

| Frequency Band  | Channel | Freq.<br>(MHz) | Channel | Freq.<br>(MHz) | Channel | Freq.<br>(MHz) |
|-----------------|---------|----------------|---------|----------------|---------|----------------|
| 2400-2483.5 MHz | 0       | 2402           | 27      | 2429           | 54      | 2456           |
|                 | 1       | 2403           | 28      | 2430           | 55      | 2457           |
|                 | 2       | 2404           | 29      | 2431           | 56      | 2458           |
|                 | 3       | 2405           | 30      | 2432           | 57      | 2459           |
|                 | 4       | 2406           | 31      | 2433           | 58      | 2460           |
|                 | 5       | 2407           | 32      | 2434           | 59      | 2461           |
|                 | 6       | 2408           | 33      | 2435           | 60      | 2462           |
|                 | 7       | 2409           | 34      | 2436           | 61      | 2463           |
|                 | 8       | 2410           | 35      | 2437           | 62      | 2464           |
|                 | 9       | 2411           | 36      | 2438           | 63      | 2465           |
|                 | 10      | 2412           | 37      | 2439           | 64      | 2466           |
|                 | 11      | 2413           | 38      | 2440           | 65      | 2467           |
|                 | 12      | 2414           | 39      | 2441           | 66      | 2468           |
|                 | 13      | 2415           | 40      | 2442           | 67      | 2469           |
|                 | 14      | 2416           | 41      | 2443           | 68      | 2470           |
|                 | 15      | 2417           | 42      | 2444           | 69      | 2471           |
|                 | 16      | 2418           | 43      | 2445           | 70      | 2472           |
|                 | 17      | 2419           | 44      | 2446           | 71      | 2473           |
|                 | 18      | 2420           | 45      | 2447           | 72      | 2474           |
|                 | 19      | 2421           | 46      | 2448           | 73      | 2475           |
|                 | 20      | 2422           | 47      | 2449           | 74      | 2476           |
|                 | 21      | 2423           | 48      | 2450           | 75      | 2477           |
|                 | 22      | 2424           | 49      | 2451           | 76      | 2478           |
|                 | 23      | 2425           | 50      | 2452           | 77      | 2479           |
|                 | 24      | 2426           | 51      | 2453           | 78      | 2480           |
|                 | 25      | 2427           | 52      | 2454           | -       | -              |
|                 | 26      | 2428           | 53      | 2455           | -       | -              |

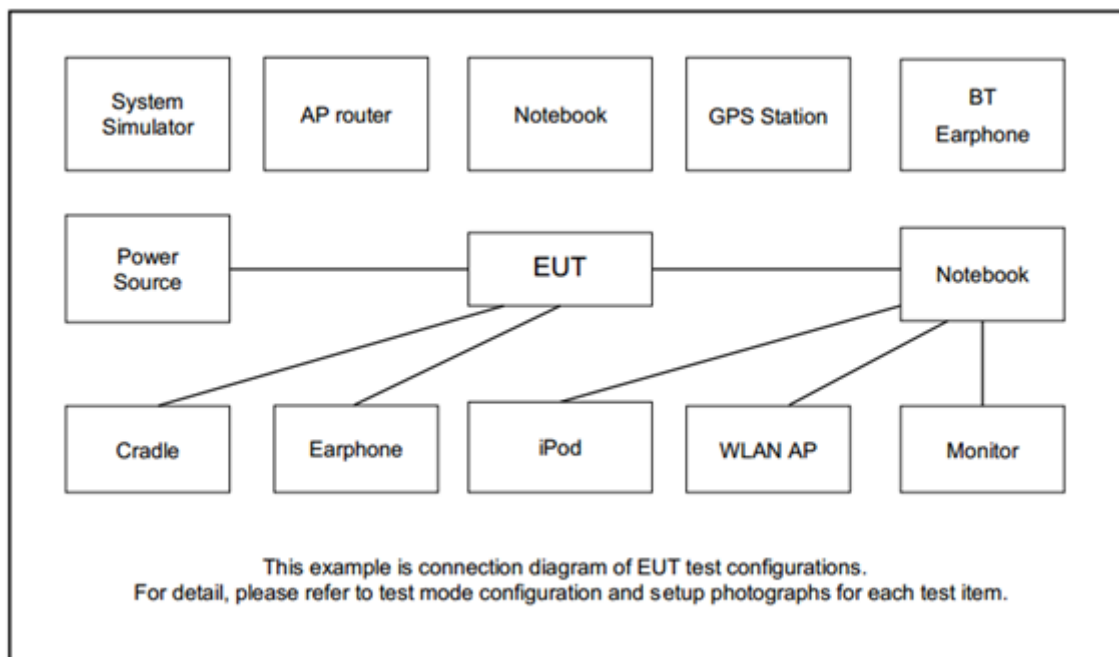
## 2.2 Test Mode

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Normal Mode: X plane for Ant. 4 and Ant. 5; Camera Mode: Z plane for Ant. 6) were recorded in this report, and the worst mode of radiated spurious emissions is Bluetooth 1Mbps mode, and recorded in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

The following summary table is showing all test modes to demonstrate in compliance with the standard.

| Summary table of Test Cases                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                        |                                    |                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------|
| Test Item                                                                                                                                                                                                                                                                                                                                  | Data Rate / Modulation                                                                                                                                                                 |                                    |                            |
| Conducted Test Cases                                                                                                                                                                                                                                                                                                                       | Bluetooth BR 1Mbps GFSK                                                                                                                                                                | Bluetooth EDR 2Mbps $\pi/4$ -DQPSK | Bluetooth EDR 3Mbps 8-DPSK |
|                                                                                                                                                                                                                                                                                                                                            | Mode 1: CH00_2402 MHz                                                                                                                                                                  | Mode 4: CH00_2402 MHz              | Mode 7: CH00_2402 MHz      |
|                                                                                                                                                                                                                                                                                                                                            | Mode 2: CH39_2441 MHz                                                                                                                                                                  | Mode 5: CH39_2441 MHz              | Mode 8: CH39_2441 MHz      |
|                                                                                                                                                                                                                                                                                                                                            | Mode 3: CH78_2480 MHz                                                                                                                                                                  | Mode 6: CH78_2480 MHz              | Mode 9: CH78_2480 MHz      |
| Radiated Test Cases                                                                                                                                                                                                                                                                                                                        | Bluetooth BR 1Mbps GFSK                                                                                                                                                                |                                    |                            |
|                                                                                                                                                                                                                                                                                                                                            | Mode 1: CH00_2402 MHz                                                                                                                                                                  |                                    |                            |
|                                                                                                                                                                                                                                                                                                                                            | Mode 2: CH39_2441 MHz                                                                                                                                                                  |                                    |                            |
|                                                                                                                                                                                                                                                                                                                                            | Mode 3: CH78_2480 MHz                                                                                                                                                                  |                                    |                            |
| AC Conducted Emission                                                                                                                                                                                                                                                                                                                      | Mode 1 : GSM850 Idle + Bluetooth Link + WLAN (2.4GHz) Link + Camera (Front) + NFC On + USB Cable 1 (Bottom USB Port) (Charging from Adapter) + X mode + Aura sync + SIM 1 for Sample 1 |                                    |                            |
| Remark:                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                        |                                    |                            |
| 1. For radiated test cases, the worst mode data rate 1Mbps was reported only since the highest RF output power in the preliminary tests. The conducted spurious emissions and conducted band edge measurement for other data rates were not worse than 1Mbps, and no other significantly frequencies found in conducted spurious emission. |                                                                                                                                                                                        |                                    |                            |
| 2. The worst case of conducted emission is mode 1; only the test data of it was reported.                                                                                                                                                                                                                                                  |                                                                                                                                                                                        |                                    |                            |
| 3. For Radiated Test Cases, the tests were performed with USB Cable 1 and Sample 1.                                                                                                                                                                                                                                                        |                                                                                                                                                                                        |                                    |                            |

## 2.3 Connection Diagram of Test System



## 2.4 Support Unit used in test configuration and system

| Item | Equipment              | Brand Name    | Model Name    | FCC ID      | Data Cable | Power Cord                                           |
|------|------------------------|---------------|---------------|-------------|------------|------------------------------------------------------|
| 1.   | System Simulator       | Anritsu       | MT8820C       | N/A         | N/A        | Unshielded, 1.8 m                                    |
| 2.   | Bluetooth Earphone     | Sony Ericsson | MW600         | PY7DDA-2029 | N/A        | N/A                                                  |
| 3.   | WLAN AP                | ASUS          | RT-AC66U      | MSQ-RTAC66U | N/A        | Unshielded, 1.8 m                                    |
| 4.   | Notebook               | Dell          | Latitude 3400 | FCC DoC     | N/A        | AC I/P: Unshielded, 1.2 m<br>DC O/P: Shielded, 1.8 m |
| 5.   | Bluetooth Base Station | R&S           | CBT32         | N/A         | N/A        | Unshielded, 1.8 m                                    |
| 6.   | Earphone               | ASUS          | EA009B        | N/A         | N/A        | N/A                                                  |



## 2.5 EUT Operation Test Setup

The RF test items, utility "QRCT V4.0.00175.0" was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to contact with base station to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

## 2.6 Measurement Results Explanation Example

**For all conducted test items:**

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

*Offset = RF cable loss + attenuator factor.*

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 4.2 + 10 = 14.2 \text{ (dB)}\end{aligned}$$

### 3 Test Result

#### 3.1 Number of Channel Measurement

##### 3.1.1 Limits of Number of Hopping Frequency

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

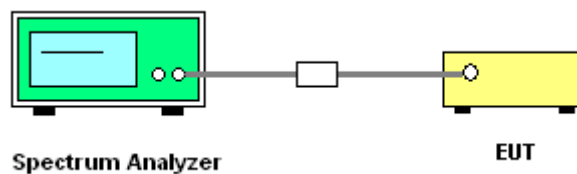
##### 3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

##### 3.1.3 Test Procedure

1. The testing follows ANSI C63.10-2013 clause 7.8.3.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Enable the EUT hopping function.
5. Use the following spectrum analyzer settings: Span = the frequency band of operation;  
RBW = 300kHz; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold.
6. The number of hopping frequency used is defined as the number of total channel.
7. Record the measurement data derived from spectrum analyzer.

##### 3.1.4 Test Setup



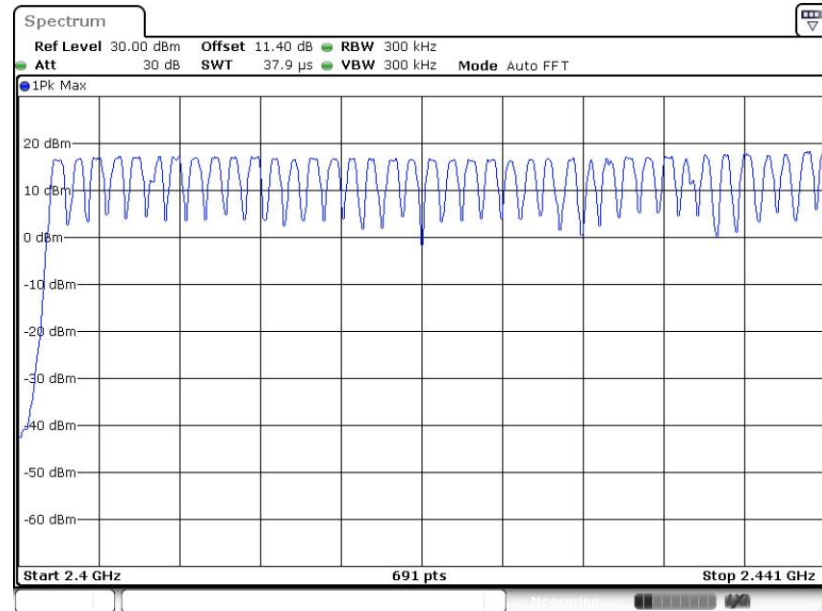


### 3.1.5 Test Result of Number of Hopping Frequency

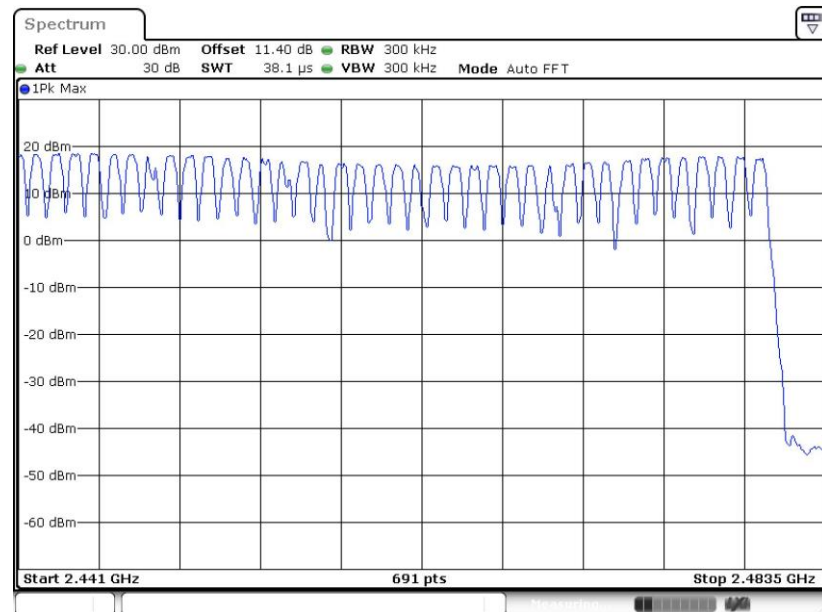
Please refer to Appendix A.

<Normal Mode with Ant. 4>

Number of Hopping Channel Plot on Channel 00 - 78



Date: 30.DEC.2020 00:47:19

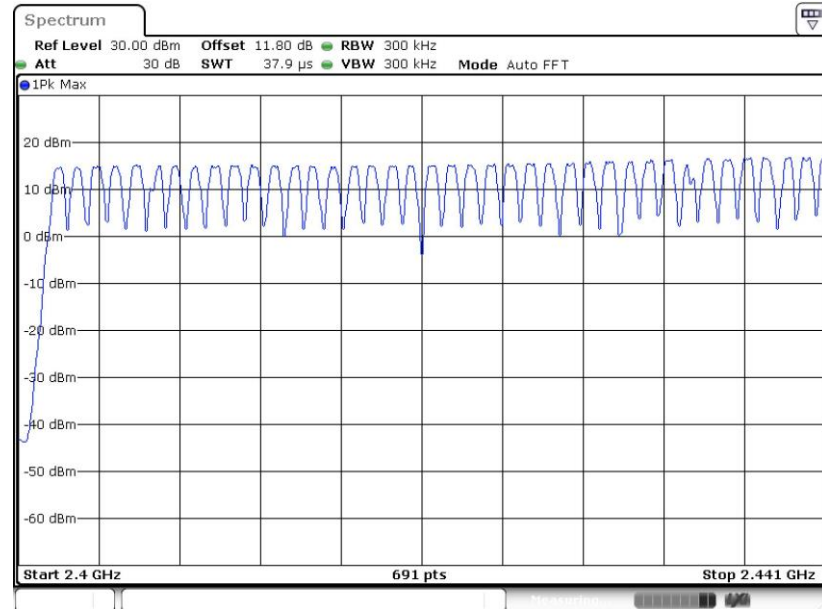


Date: 30.DEC.2020 00:47:36

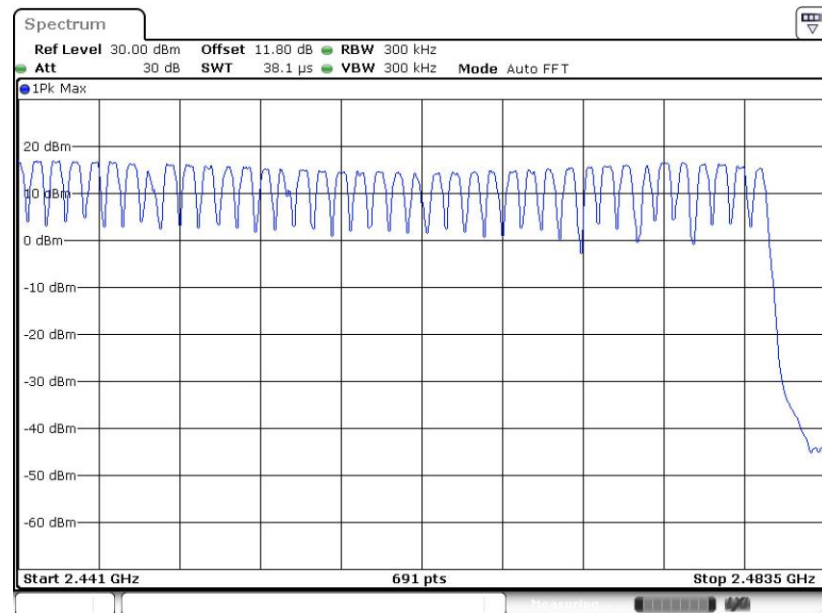


<Normal Mode with Ant. 5>

Number of Hopping Channel Plot on Channel 00 - 78



Date: 5.JAN.2021 00:29:49

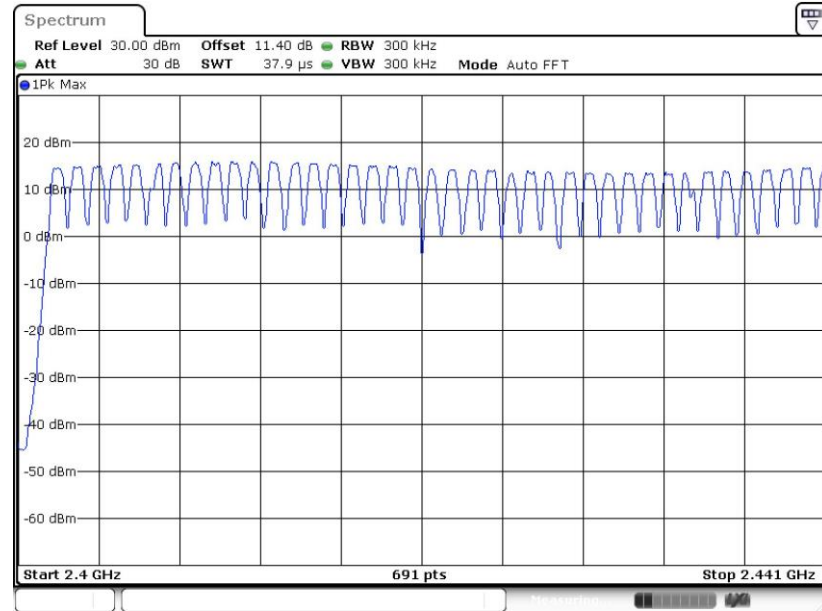


Date: 5.JAN.2021 00:30:07

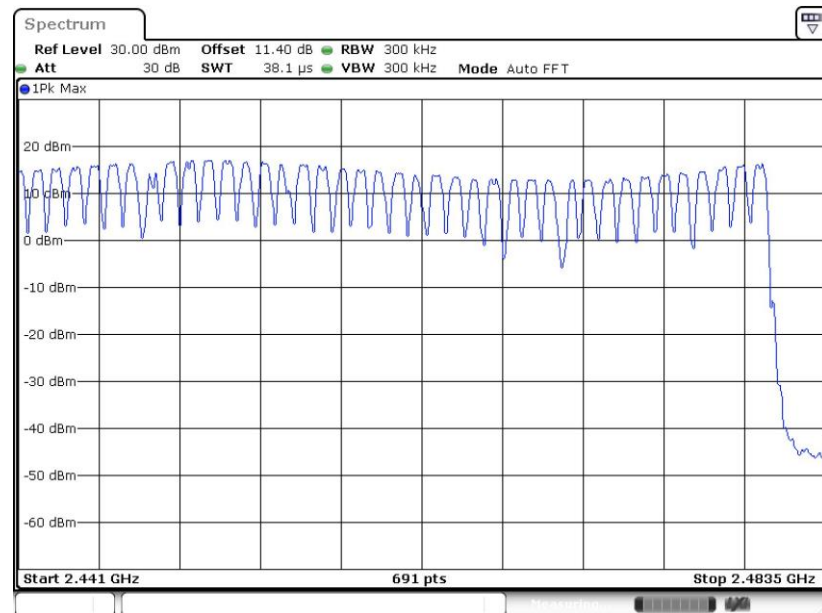


<Camera Mode with Ant. 6>

Number of Hopping Channel Plot on Channel 00 - 78



Date: 30.DEC.2020 20:08:06



Date: 30.DEC.2020 20:08:22

## 3.2 Hopping Channel Separation Measurement

### 3.2.1 Limit of Hopping Channel Separation

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

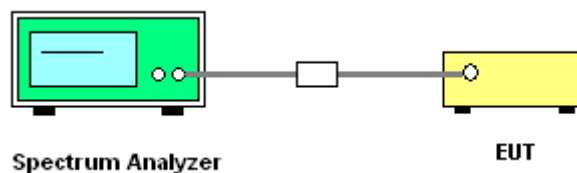
### 3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

### 3.2.3 Test Procedures

1. The testing follows ANSI C63.10-2013 clause 7.8.2.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Enable the EUT hopping function.
5. Use the following spectrum analyzer settings:  
Span = wide enough to capture the peaks of two adjacent channels;  
RBW = 300kHz; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold.
6. Measure and record the results in the test report.

### 3.2.4 Test Setup



### 3.2.5 Test Result of Hopping Channel Separation

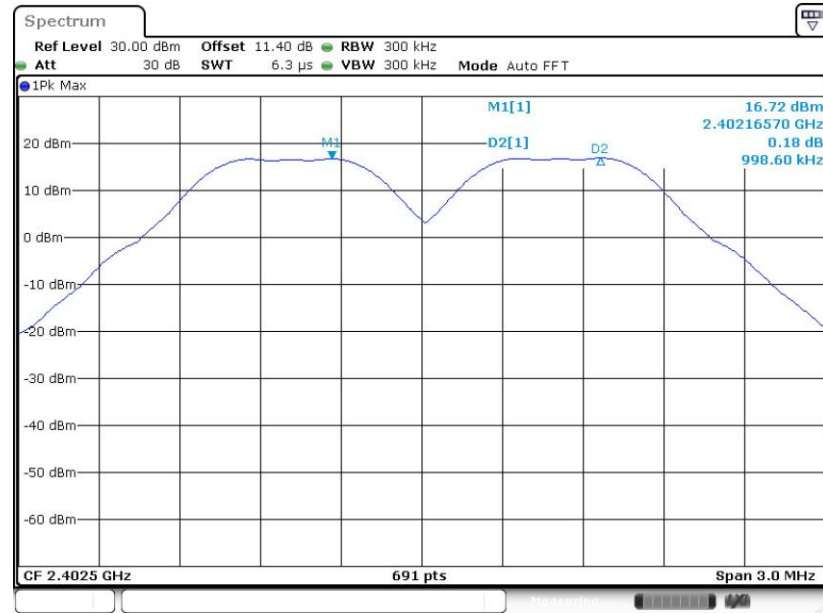
Please refer to Appendix A.



&lt;Normal Mode with Ant. 4&gt;

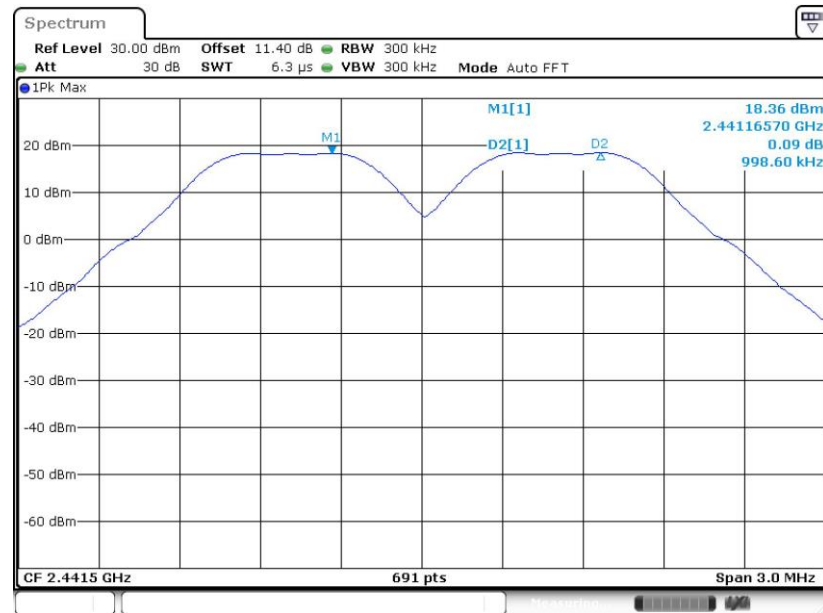
&lt;1Mbps&gt;

Channel Separation Plot on Channel 00 - 01



Date: 29.DECEMBER 2020 23:48:07

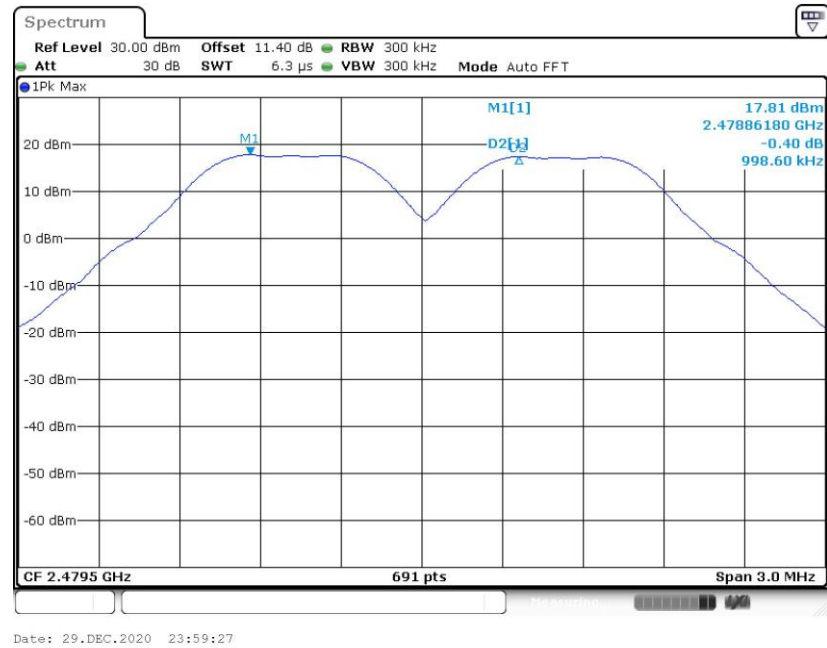
Channel Separation Plot on Channel 39 - 40



Date: 29.DECEMBER 2020 23:51:27



Channel Separation Plot on Channel 77 - 78



<2Mbps>

Channel Separation Plot on Channel 00 - 01





Channel Separation Plot on Channel 39 - 40



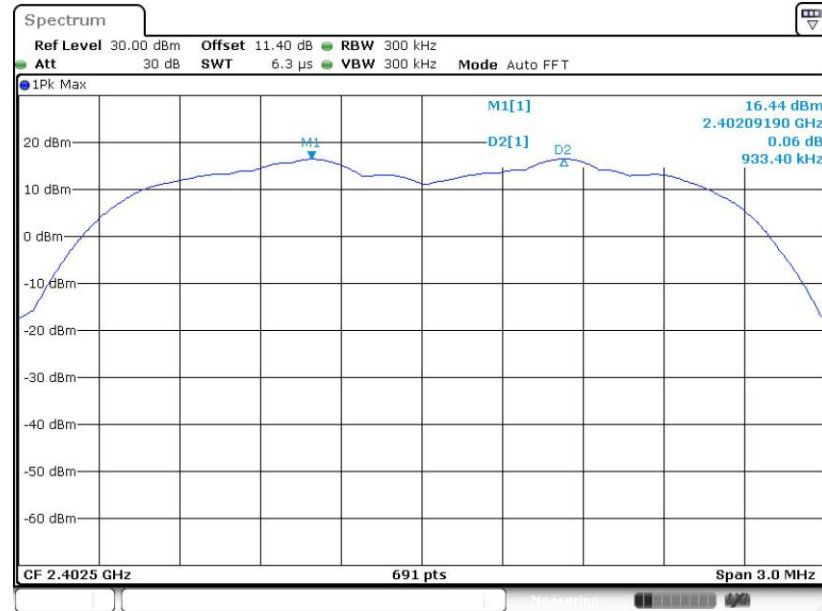
Channel Separation Plot on Channel 77 - 78





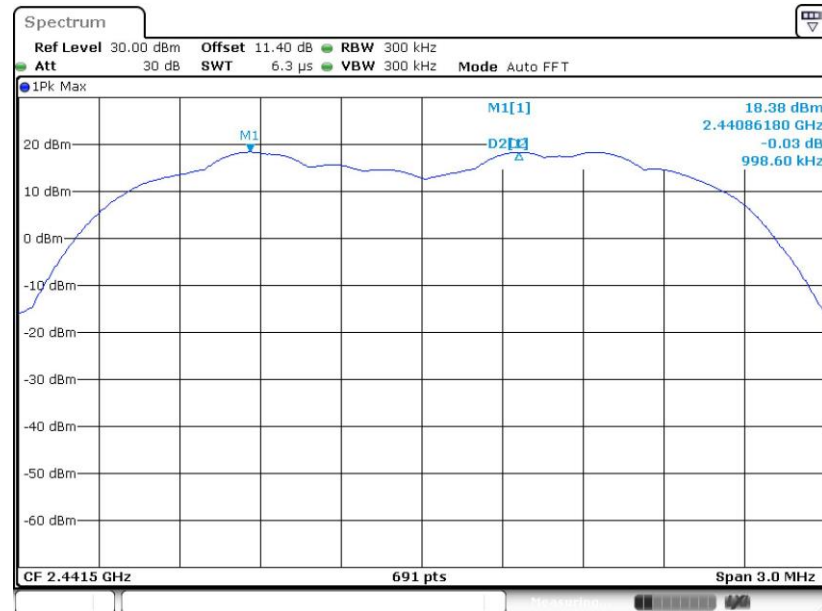
&lt;3Mbps&gt;

## Channel Separation Plot on Channel 00 - 01



Date: 30.DEC.2020 00:23:54

## Channel Separation Plot on Channel 39 - 40



Date: 30.DEC.2020 00:28:20



Channel Separation Plot on Channel 77 - 78

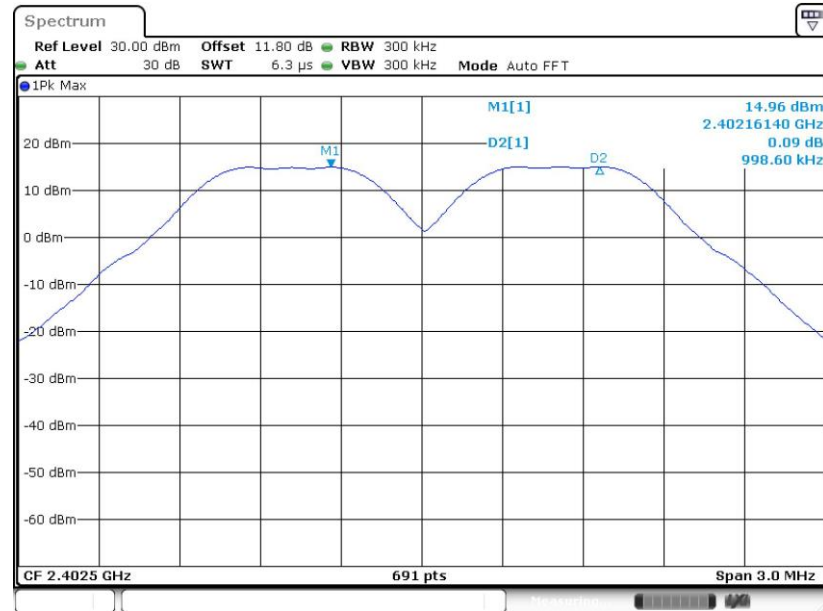




<Normal Mode with Ant. 5>

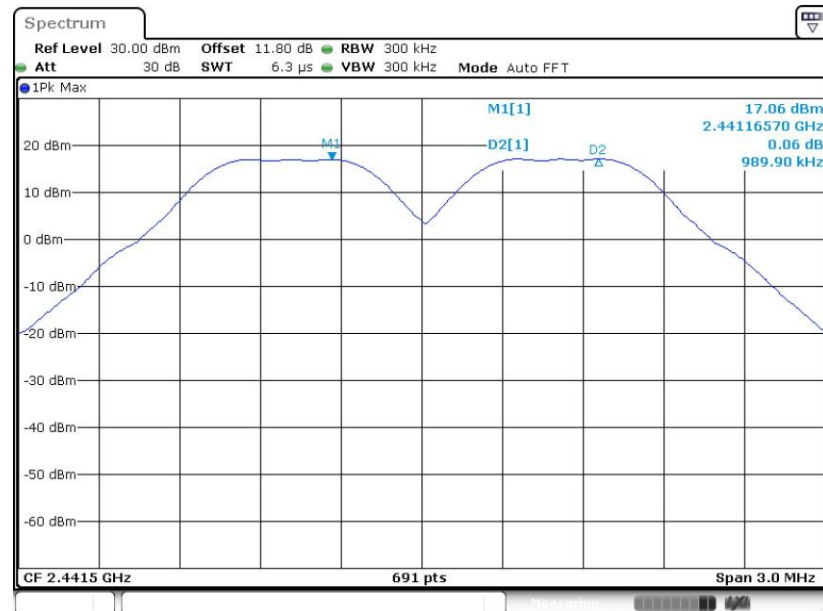
<1Mbps>

Channel Separation Plot on Channel 00 - 01



Date: 5.JAN.2021 00:37:20

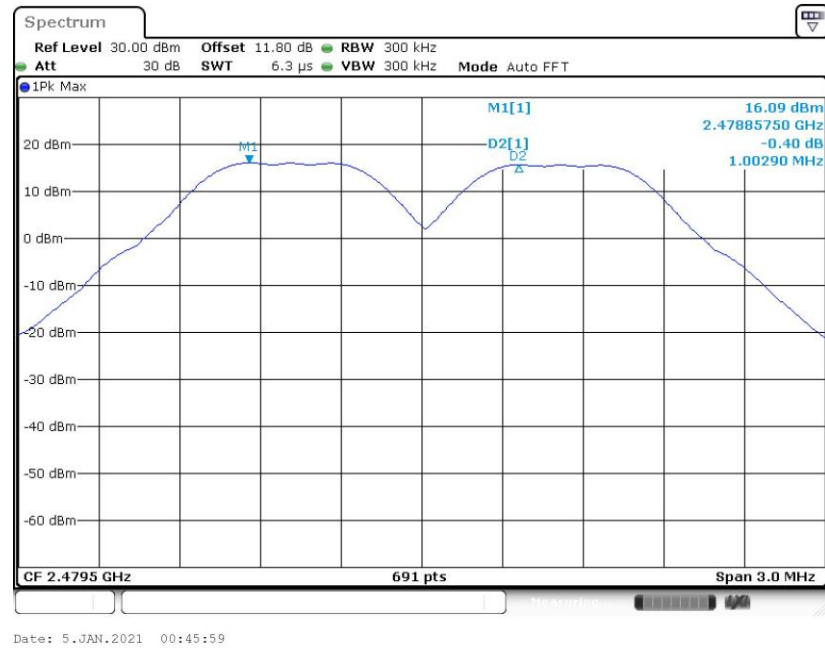
Channel Separation Plot on Channel 39 - 40



Date: 5.JAN.2021 00:41:23

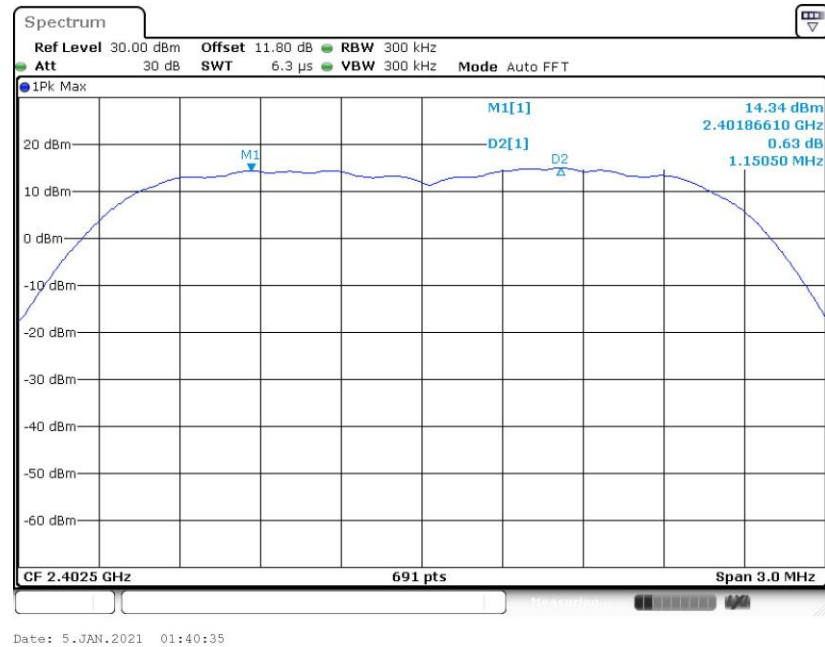


Channel Separation Plot on Channel 77 - 78



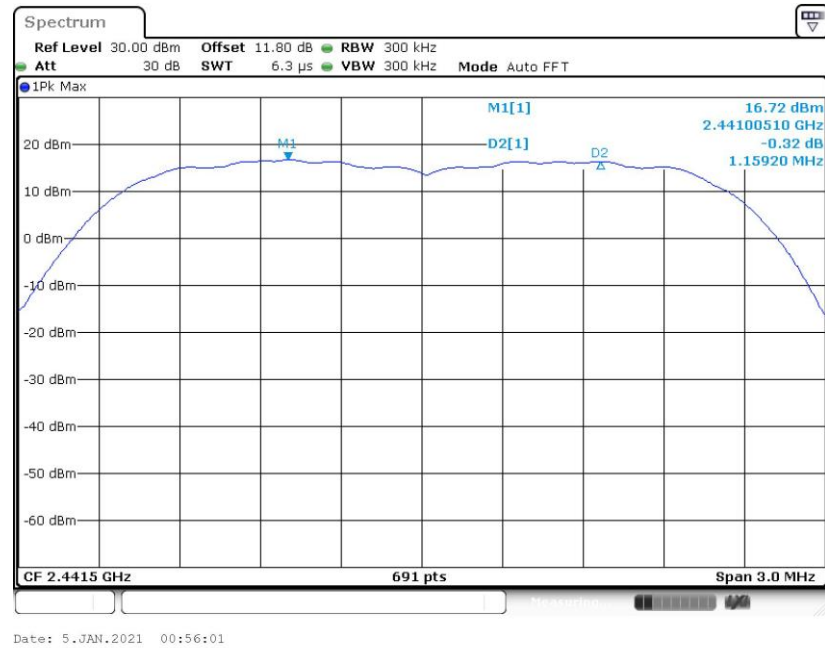
<2Mbps>

Channel Separation Plot on Channel 00 - 01

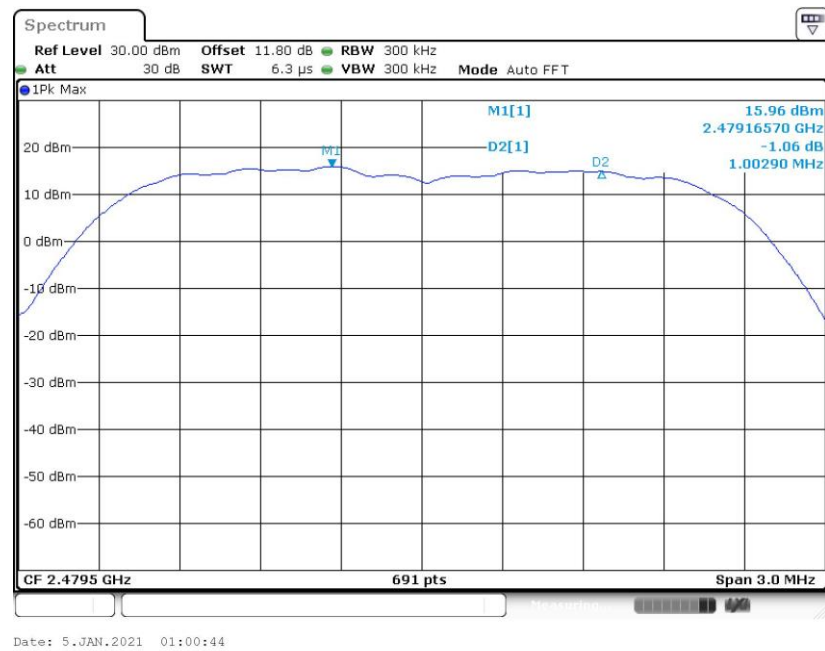




Channel Separation Plot on Channel 39 - 40



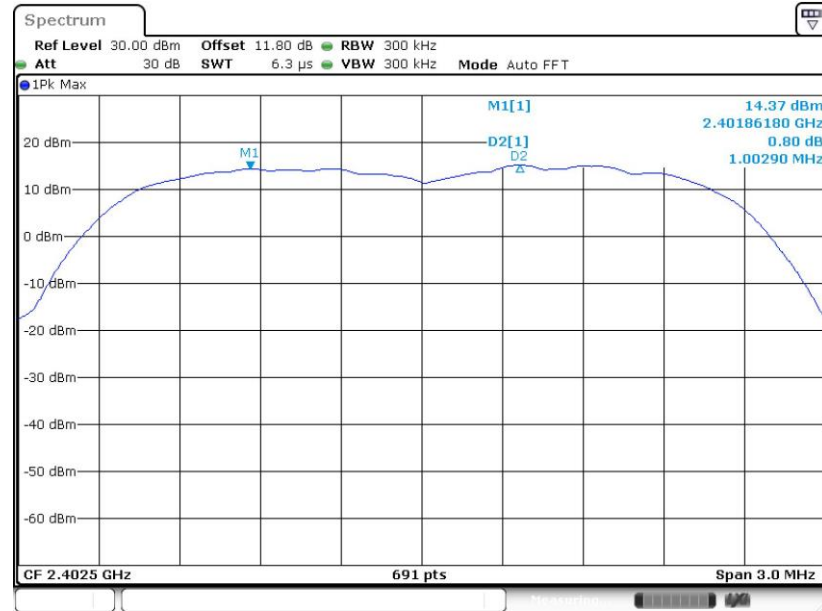
Channel Separation Plot on Channel 77 - 78



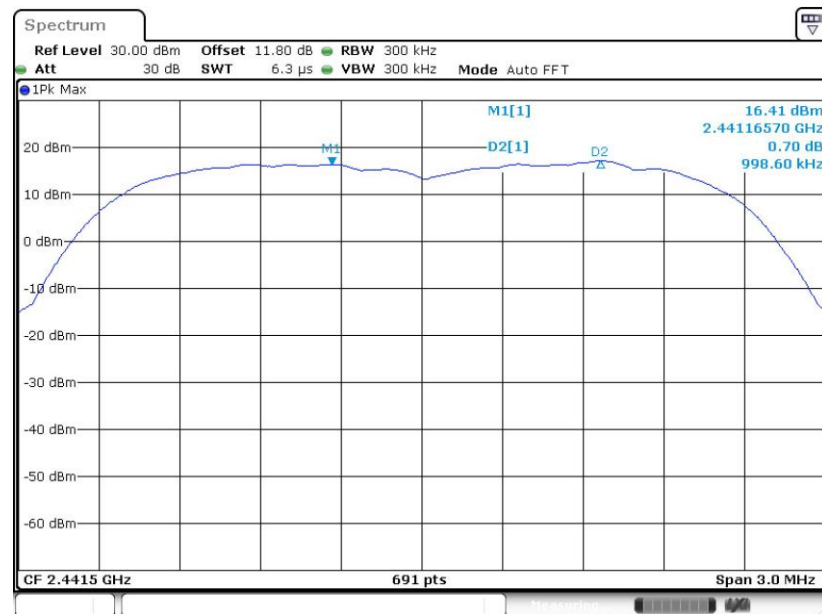


&lt;3Mbps&gt;

## Channel Separation Plot on Channel 00 - 01

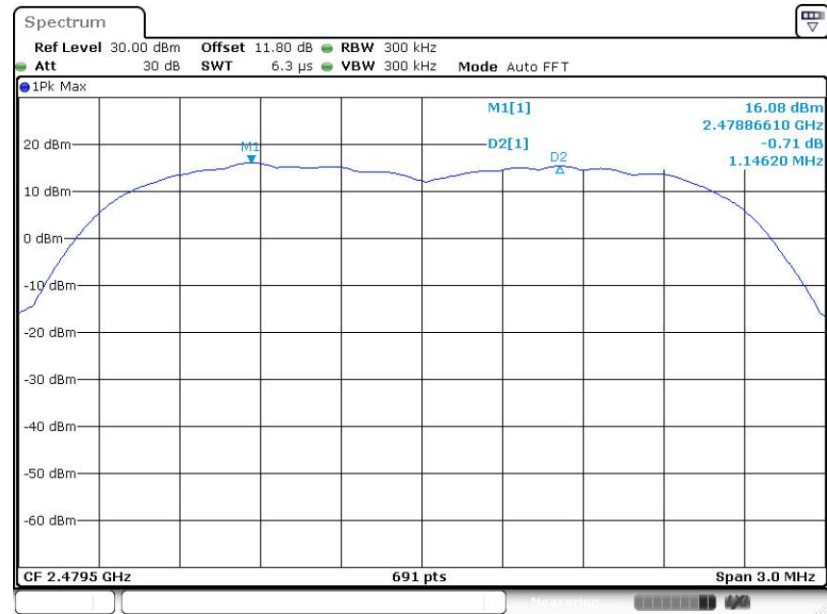


## Channel Separation Plot on Channel 39 - 40





Channel Separation Plot on Channel 77 - 78

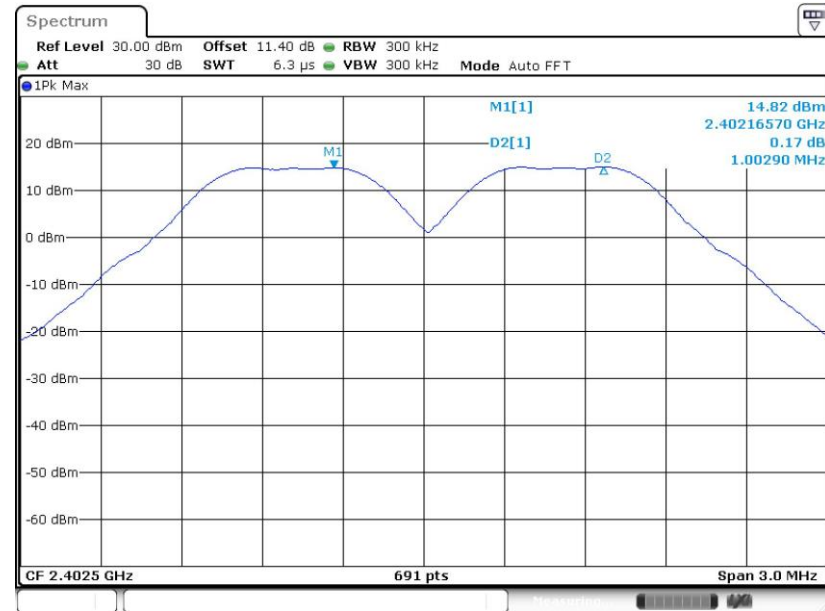


Date: 5.JAN.2021 01:18:41

<Camera Mode with Ant. 6>

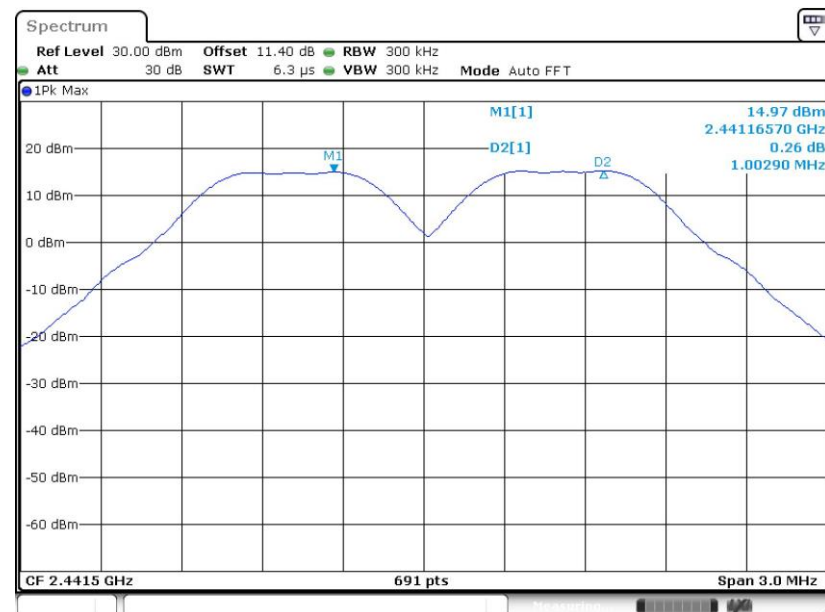
<1Mbps>

Channel Separation Plot on Channel 00 - 01



Date: 30.DECEMBER.2020 20:21:57

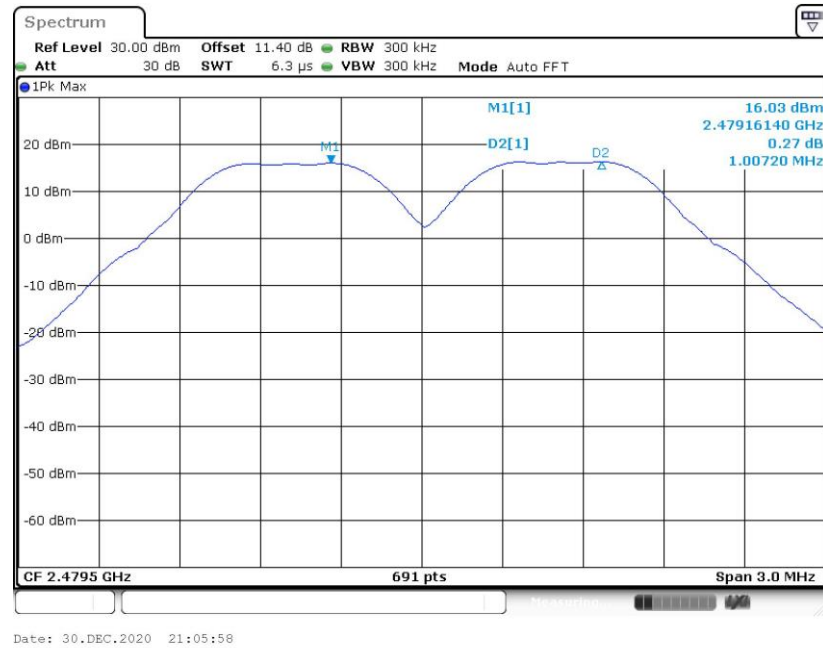
Channel Separation Plot on Channel 39 - 40



Date: 30.DECEMBER.2020 20:59:00

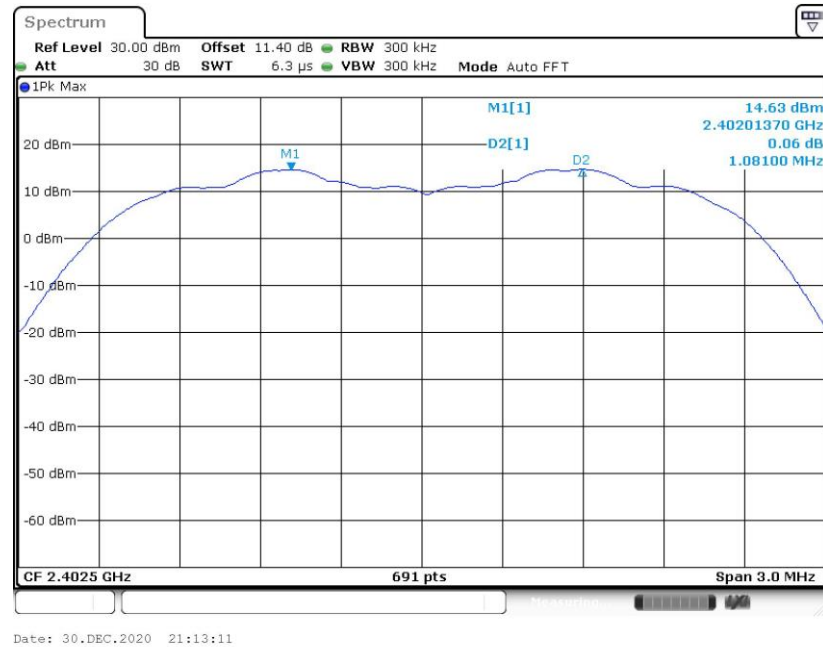


Channel Separation Plot on Channel 77 - 78



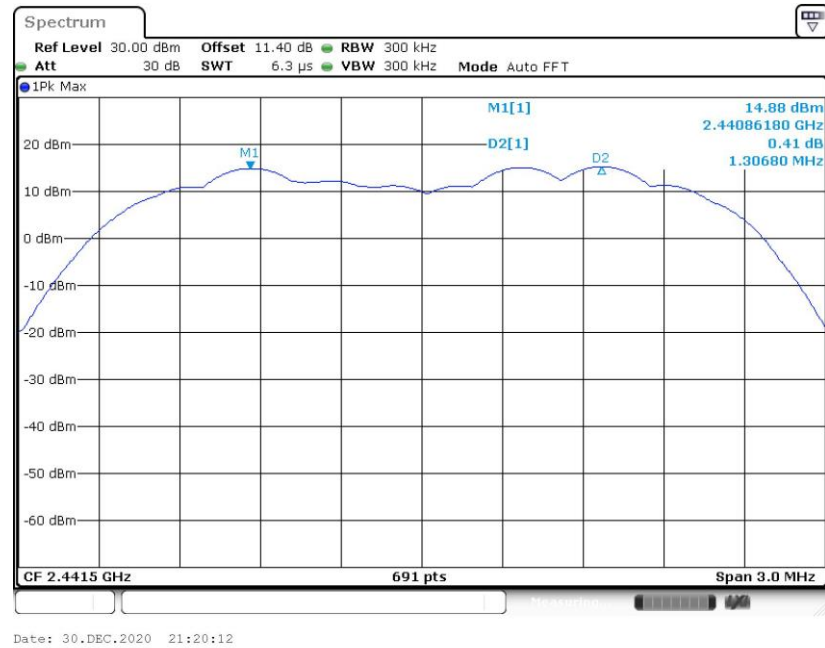
<2Mbps>

Channel Separation Plot on Channel 00 - 01

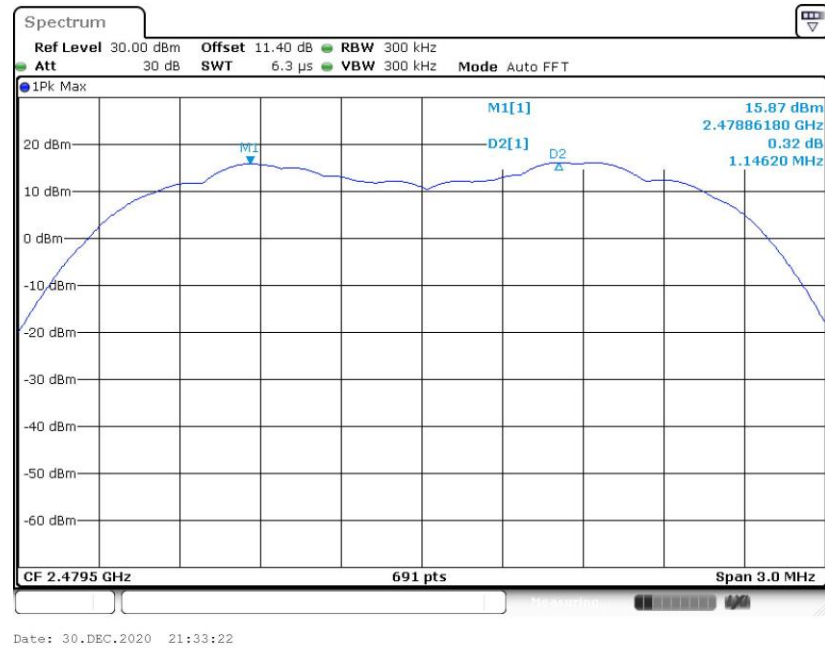




Channel Separation Plot on Channel 39 - 40



Channel Separation Plot on Channel 77 - 78





**Spectrum**

Ref Level 30.00 dBm Offset 11.40 dB RBW 300 kHz  
Att 30 dB SWT 6.3  $\mu$ s VBW 300 kHz Mode Auto FFT

1Pk Max

M1[1] 14.74 dBm  
2.40186180 GHz  
-0.10 dBm  
1.15480 MHz

M1  
D2

CF 2.4025 GHz 691 pts Span 3.0 MHz

Date: 30.DEC.2020 21:59:05

**Spectrum**

Ref Level 30.00 dBm Offset 11.40 dB RBW 300 kHz  
Att 30 dB SWT 6.3  $\mu$ s VBW 300 kHz Mode Auto FFT

1Pk Max

20 dBm  
10 dBm  
0 dBm  
-10 dBm  
-20 dBm  
-30 dBm  
-40 dBm  
-50 dBm  
-60 dBm

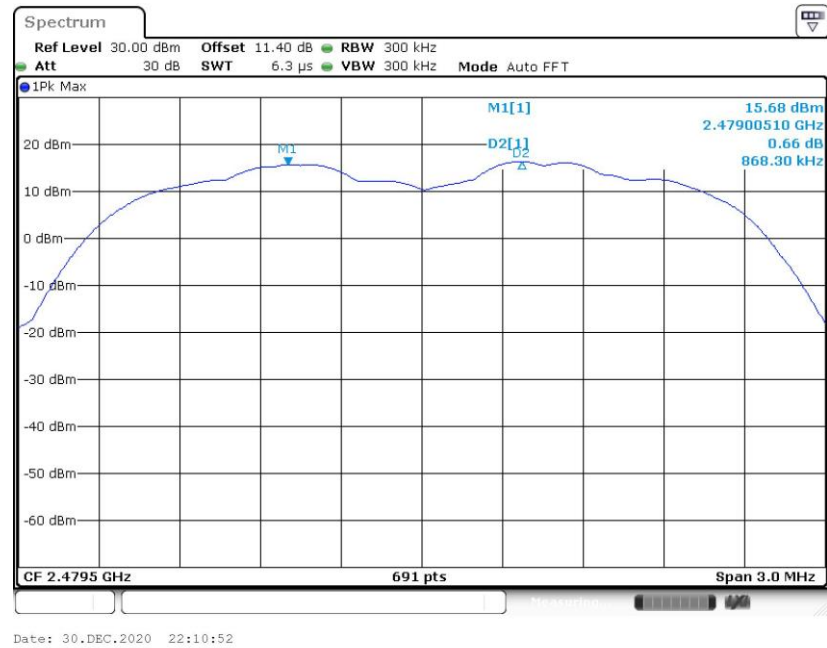
M1[1] 14.53 dBm  
D2[1] 924.70 kHz

CF 2.4415 GHz 691 pts Span 3.0 MHz

Date: 30.DEC.2020 22:05:04



Channel Separation Plot on Channel 77 - 78



### 3.3 Dwell Time Measurement

#### 3.3.1 Limit of Dwell Time

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

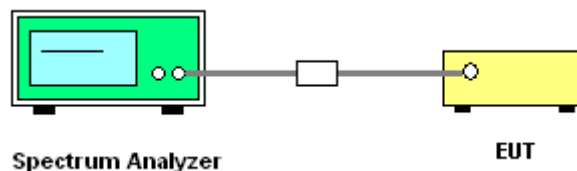
#### 3.3.2 Measuring Instruments

See list of measuring equipment of this test report.

#### 3.3.3 Test Procedures

1. The testing follows ANSI C63.10-2013 clause 7.8.4.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Enable the EUT hopping function.
5. Use the following spectrum analyzer settings: Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW  $\geq$  RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold.
6. Measure and record the results in the test report.

#### 3.3.4 Test Setup



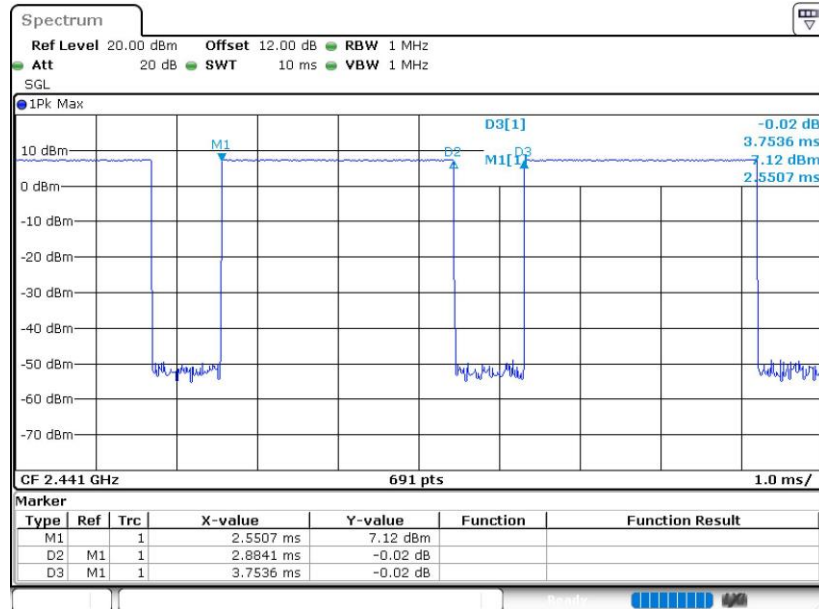
#### 3.3.5 Test Result of Dwell Time

Please refer to Appendix A.



## &lt;Normal Mode with Ant. 4&gt;

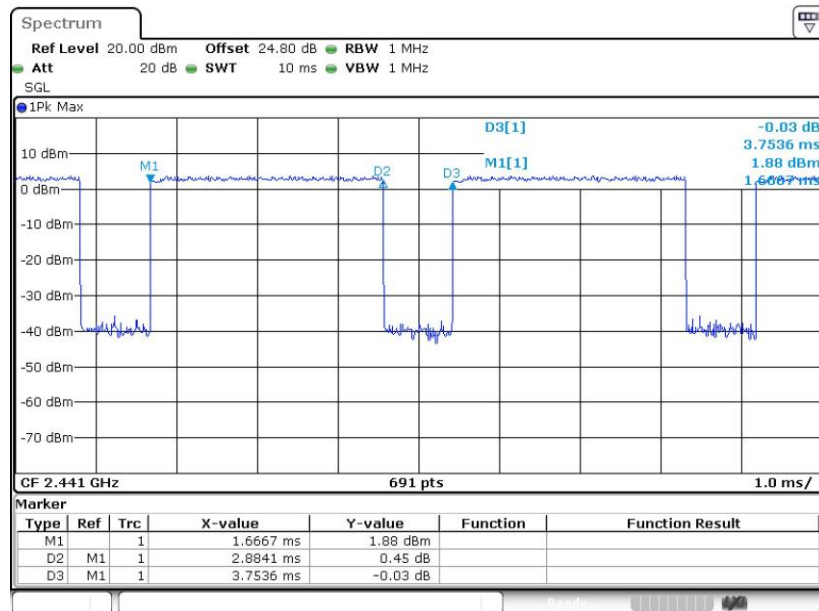
## Package Transfer Time Plot



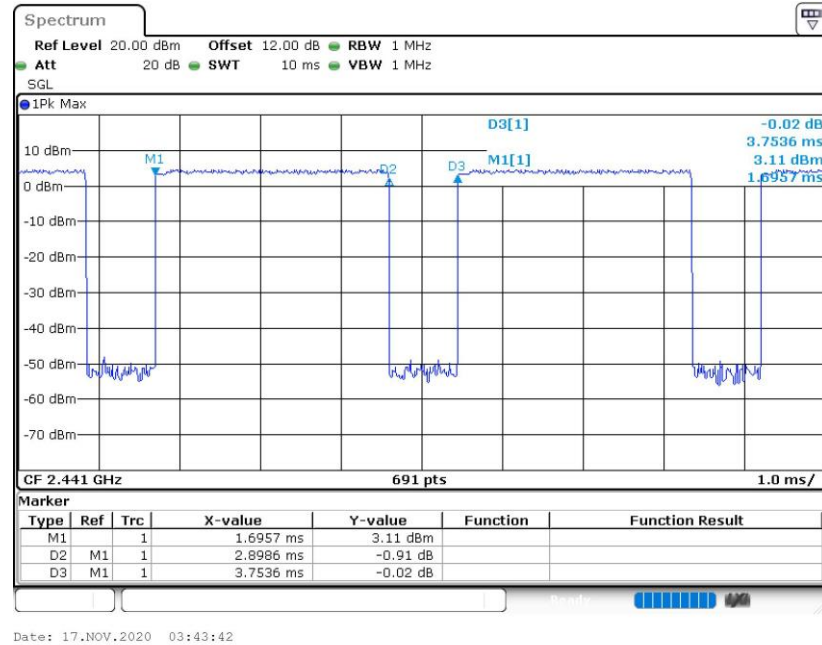
Date: 17.NOV.2020 04:20:07

## &lt;Normal Mode with Ant. 5&gt;

## Package Transfer Time Plot



Date: 23.NOV.2020 19:38:57

**<Camera Mode with Ant. 6>**
**Package Transfer Time Plot**

**Remark:**

1. In normal mode, hopping rate is 1600 hops/s with 6 slots in 79 hopping channels. With channel hopping rate (1600 / 6 / 79) in Occupancy Time Limit (0.4 x 79) (s), Hops Over Occupancy Time comes to (1600 / 6 / 79) x (0.4 x 79) = 106.67 hops.
2. In AFH mode, hopping rate is 800 hops/s with 6 slots in 20 hopping channels. With channel hopping rate (800 / 6 / 20) in Occupancy Time Limit (0.4 x 20) (s), Hops Over Occupancy Time comes to (800 / 6 / 20) x (0.4 x 20) = 53.33 hops.
3. Dwell Time(s) = Hops Over Occupancy Time (hops) x Package Transfer Time

### 3.4 20dB and 99% Bandwidth Measurement

#### 3.4.1 Limit of 20dB and 99% Bandwidth

Reporting only

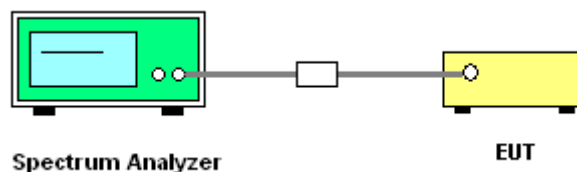
#### 3.4.2 Measuring Instruments

See list of measuring equipment of this test report.

#### 3.4.3 Test Procedures

1. The testing follows ANSI C63.10-2013 clause 6.9.2 and 6.9.3.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Use the following spectrum analyzer settings for 20dB Bandwidth measurement.  
Span = approximately 2 to 5 times the 20 dB bandwidth, centered on a hopping channel;  
RBW  $\geq$  1% of the 20 dB bandwidth; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak;  
Trace = max hold.
5. Use the following spectrum analyzer settings for 99 % Bandwidth measurement.  
Span = approximately 1.5 to 5 times the 99% bandwidth, centered on a hopping channel;  
RBW  $\geq$  1-5% of the 99% bandwidth; VBW  $\geq$  3 \* RBW; Sweep = auto; Detector function = peak;  
Trace = max hold.
6. Measure and record the results in the test report.

#### 3.4.4 Test Setup



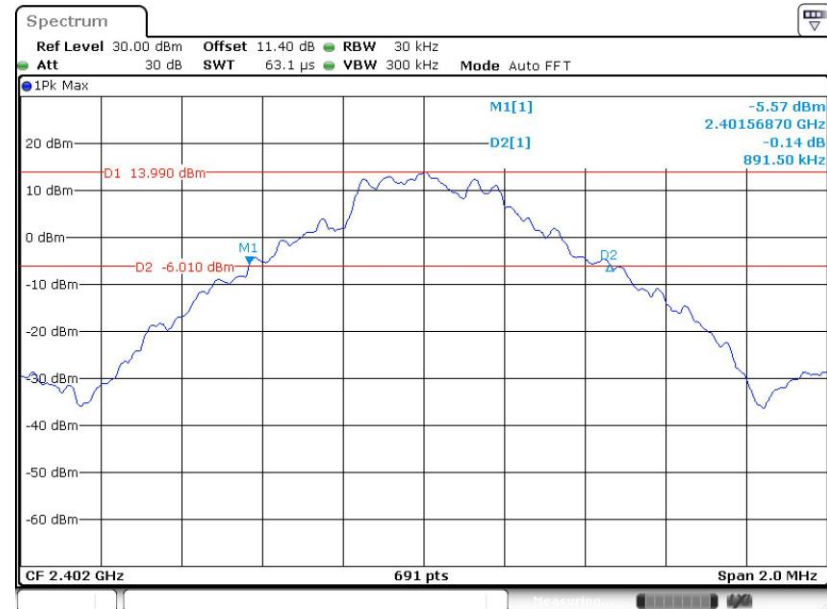
#### 3.4.5 Test Result of 20dB Bandwidth

Please refer to Appendix A.

<Normal Mode with Ant. 4>

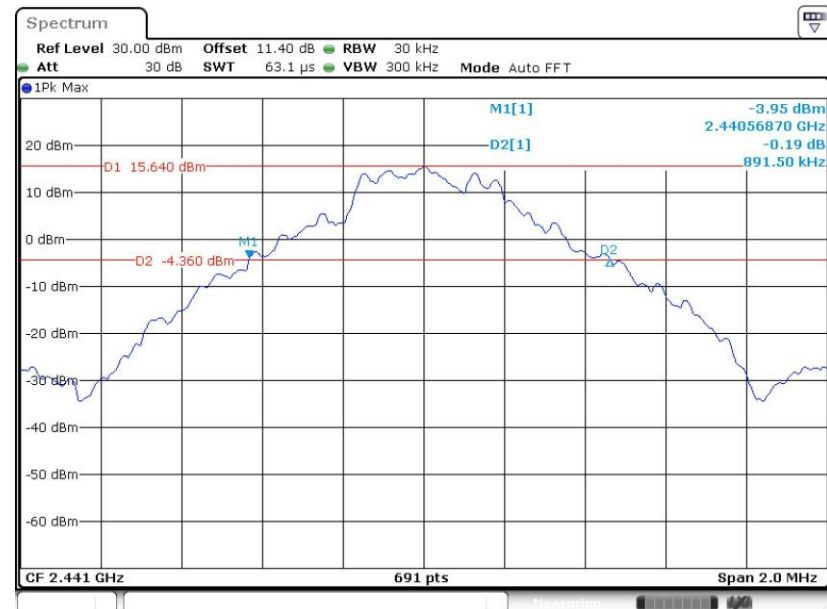
<1Mbps>

20 dB Bandwidth Plot on Channel 00



Date: 29.DECEMBER 2020 23:45:00

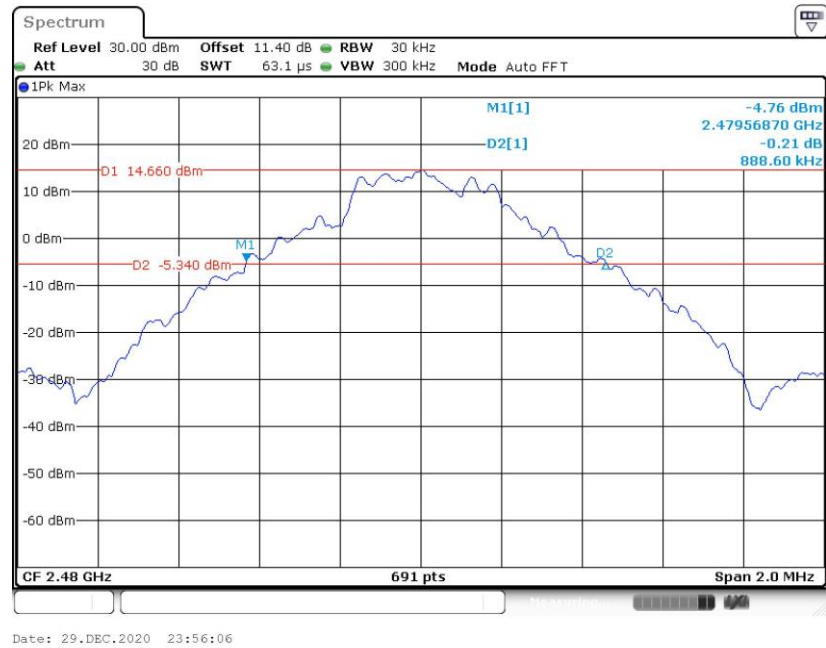
20 dB Bandwidth Plot on Channel 39



Date: 29.DECEMBER 2020 23:49:03

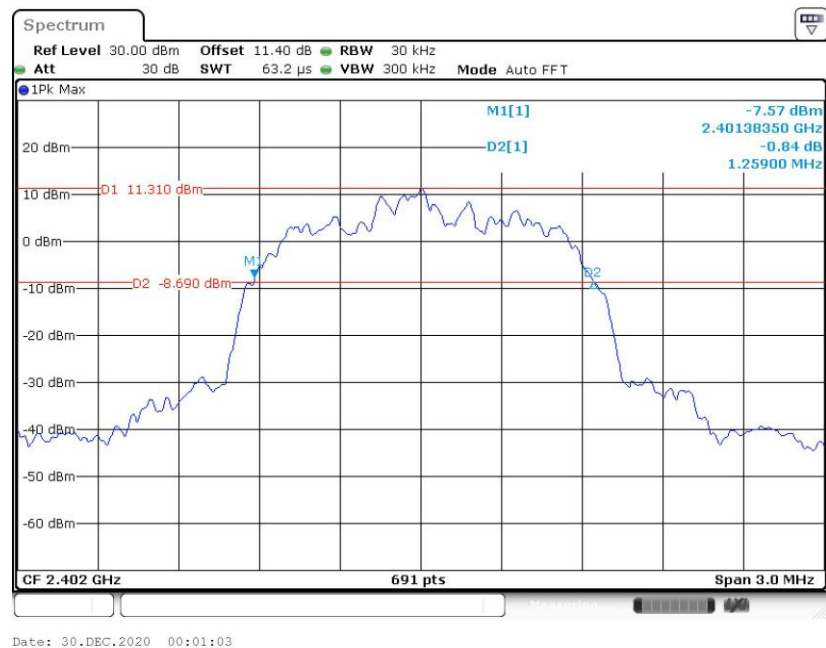


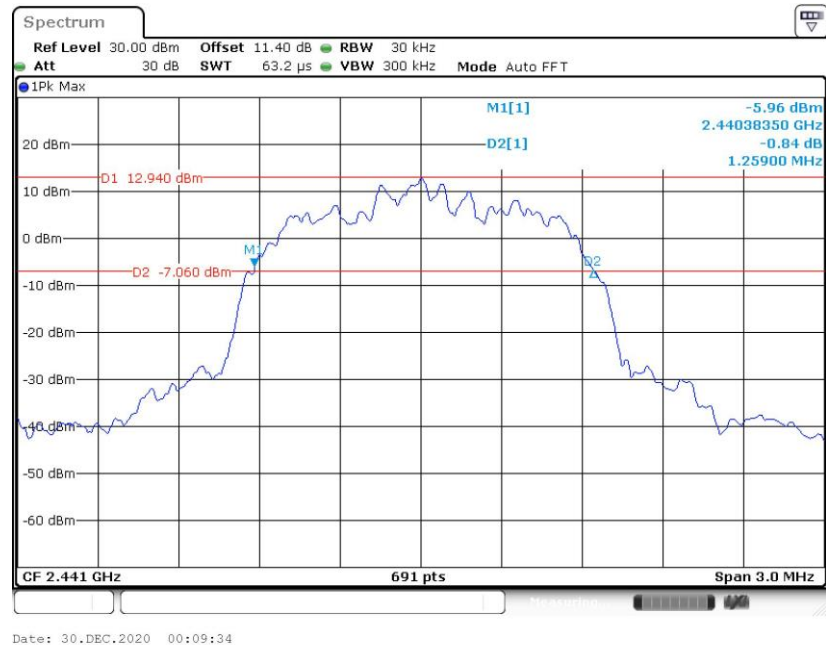
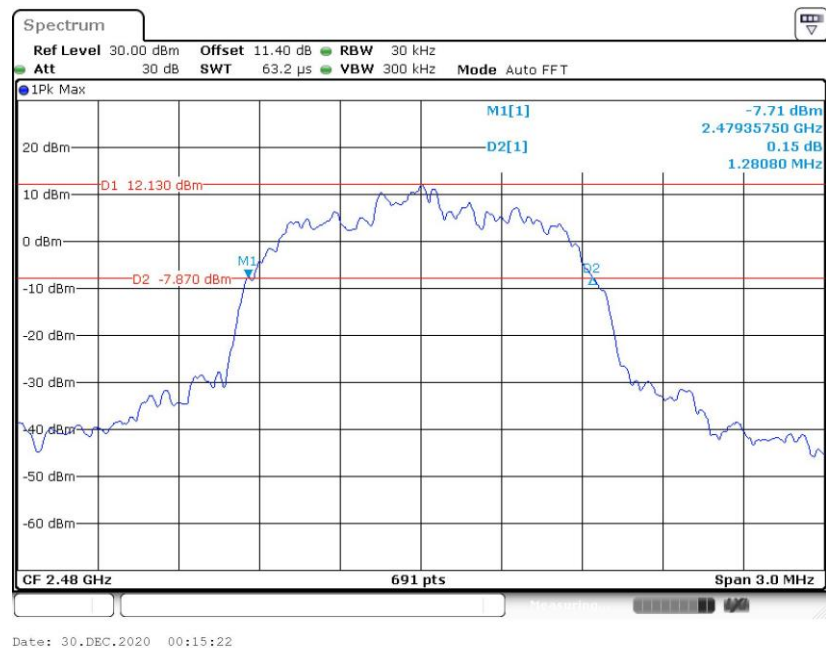
## 20 dB Bandwidth Plot on Channel 78



## &lt;2Mbps&gt;

## 20 dB Bandwidth Plot on Channel 00



**20 dB Bandwidth Plot on Channel 39****20 dB Bandwidth Plot on Channel 78**



&lt;3Mbps&gt;

## 20 dB Bandwidth Plot on Channel 00



Date: 30.DECEMBER 2020 00:25:06

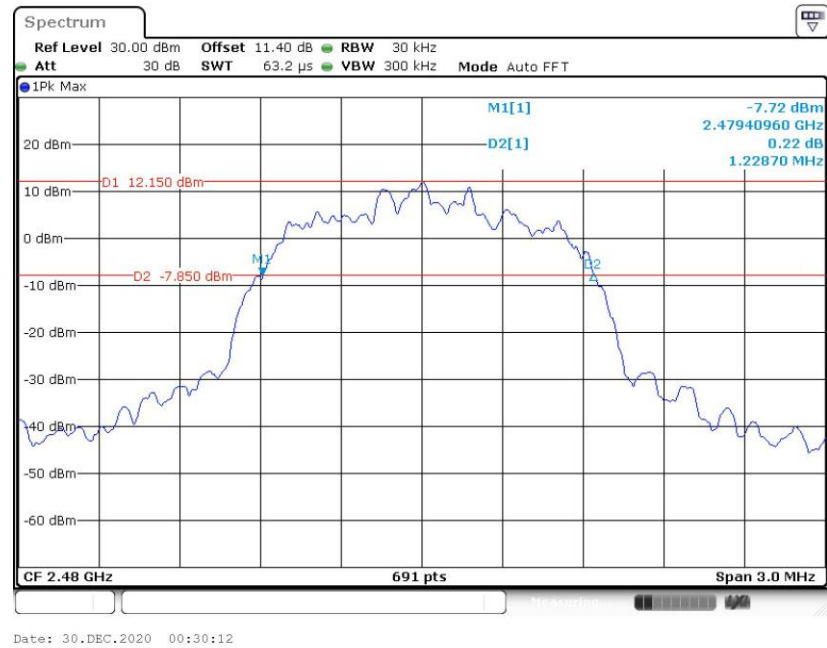
## 20 dB Bandwidth Plot on Channel 39



Date: 30.DECEMBER 2020 00:29:15



20 dB Bandwidth Plot on Channel 78

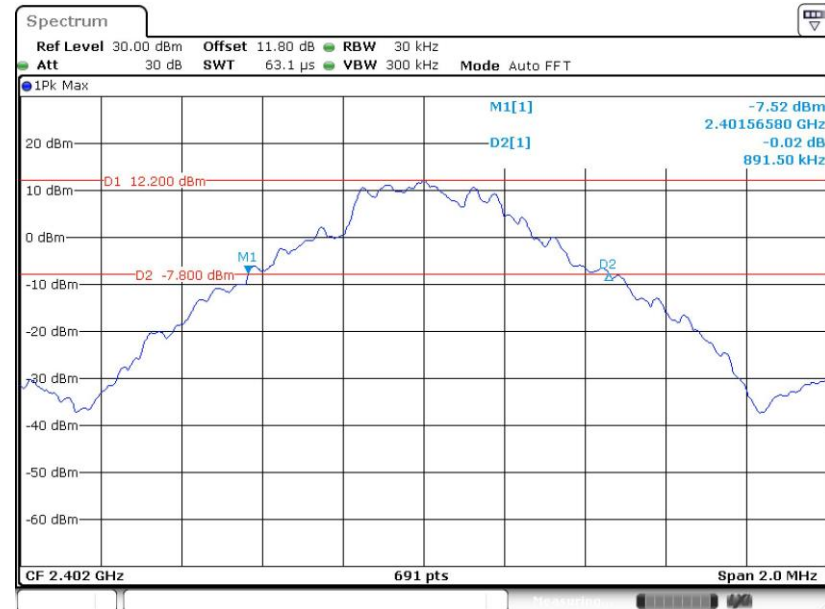




&lt;Normal Mode with Ant. 5&gt;

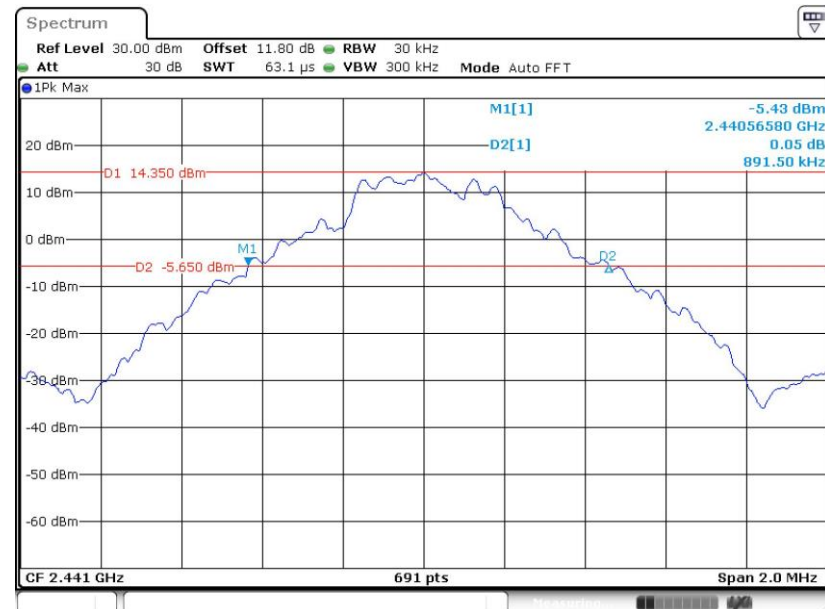
&lt;1Mbps&gt;

20 dB Bandwidth Plot on Channel 00

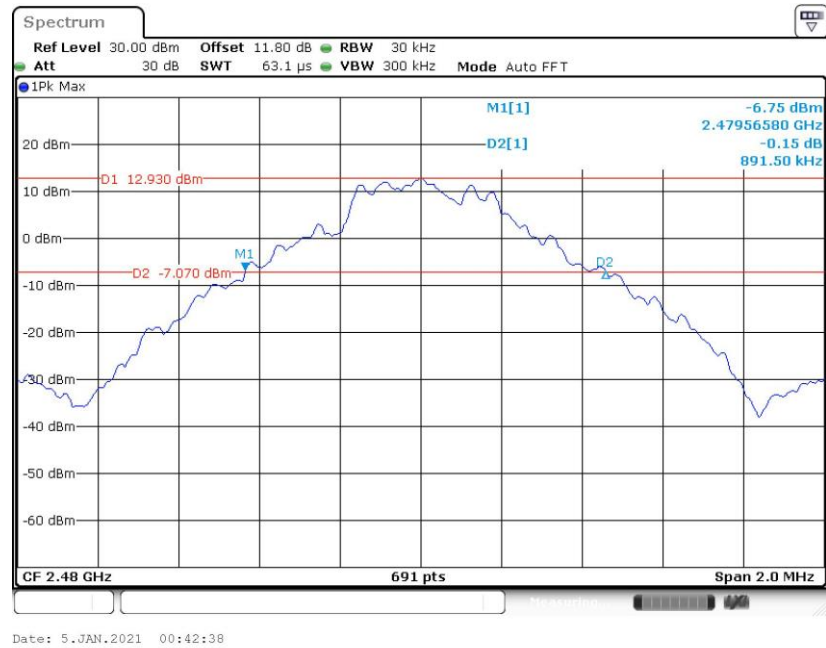
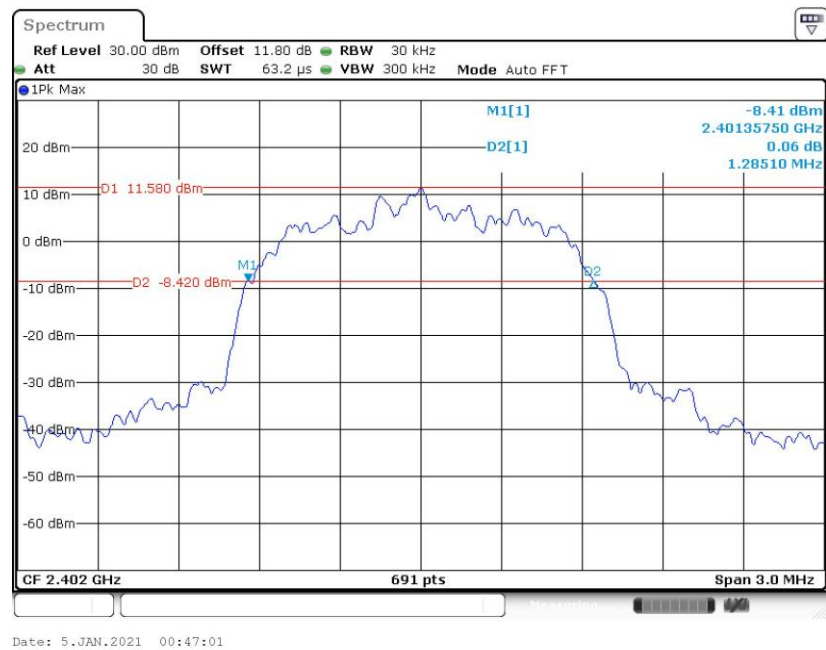


Date: 5.JAN.2021 00:34:10

20 dB Bandwidth Plot on Channel 39

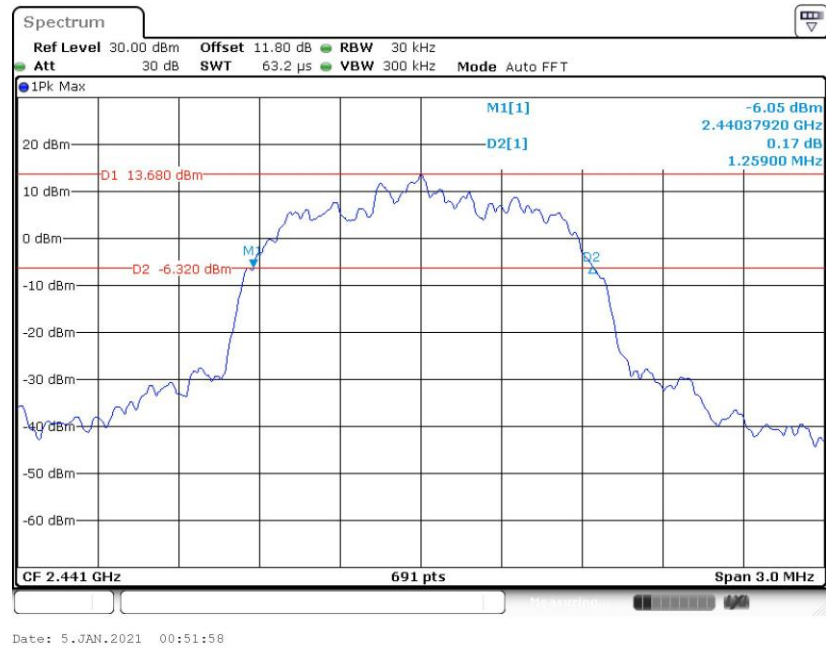


Date: 5.JAN.2021 00:38:57

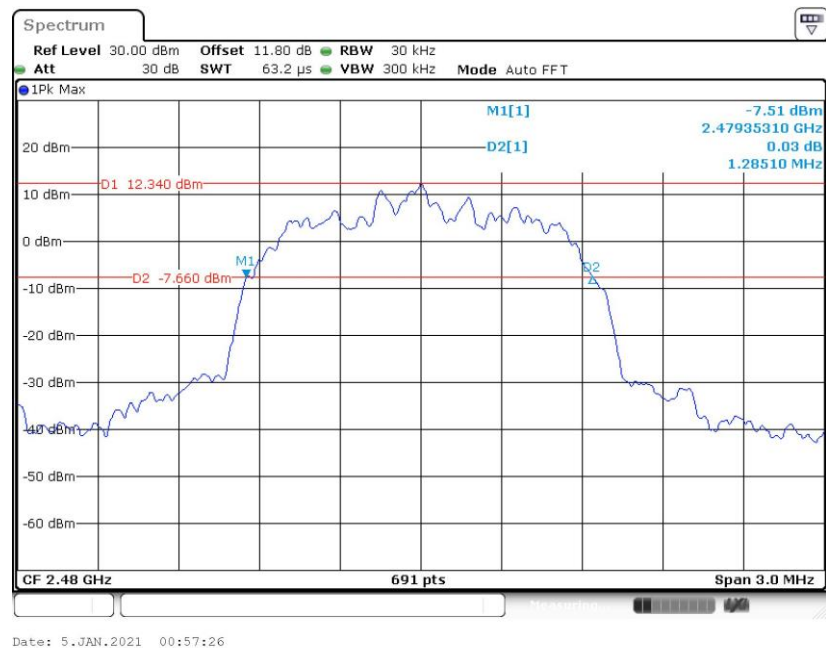
**20 dB Bandwidth Plot on Channel 78****<2Mbps>****20 dB Bandwidth Plot on Channel 00**



## 20 dB Bandwidth Plot on Channel 39



## 20 dB Bandwidth Plot on Channel 78





&lt;3Mbps&gt;

## 20 dB Bandwidth Plot on Channel 00



Date: 5.JAN.2021 01:02:01

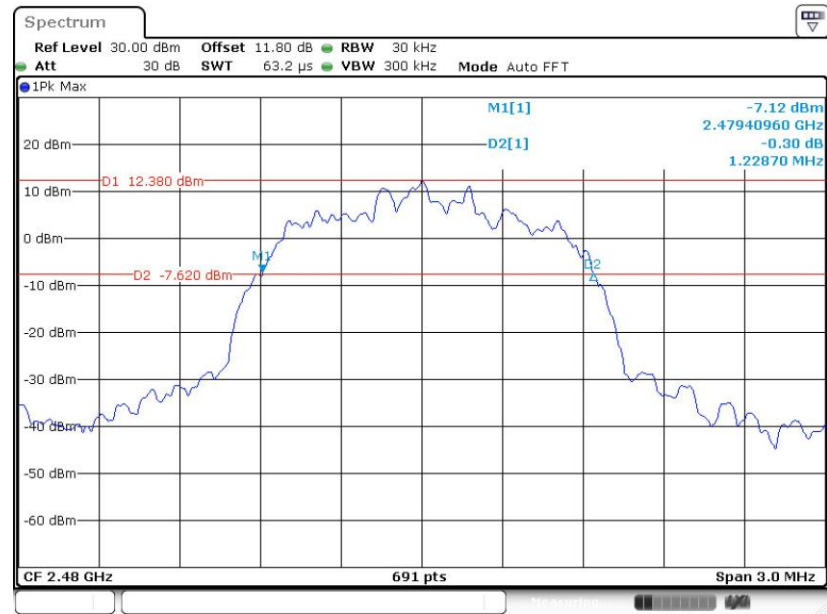
## 20 dB Bandwidth Plot on Channel 39



Date: 5.JAN.2021 01:08:27



20 dB Bandwidth Plot on Channel 78

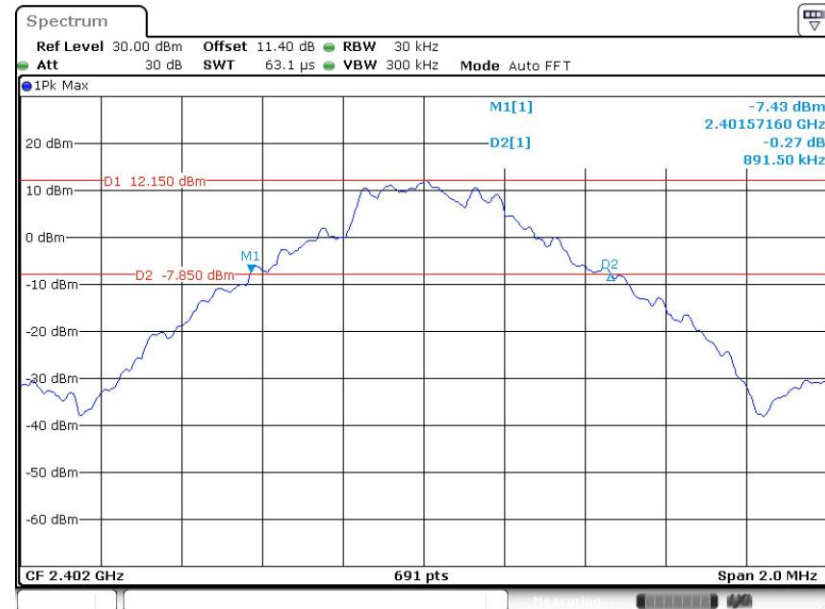


Date: 5.JAN.2021 01:12:13

<Camera Mode with Ant. 6>

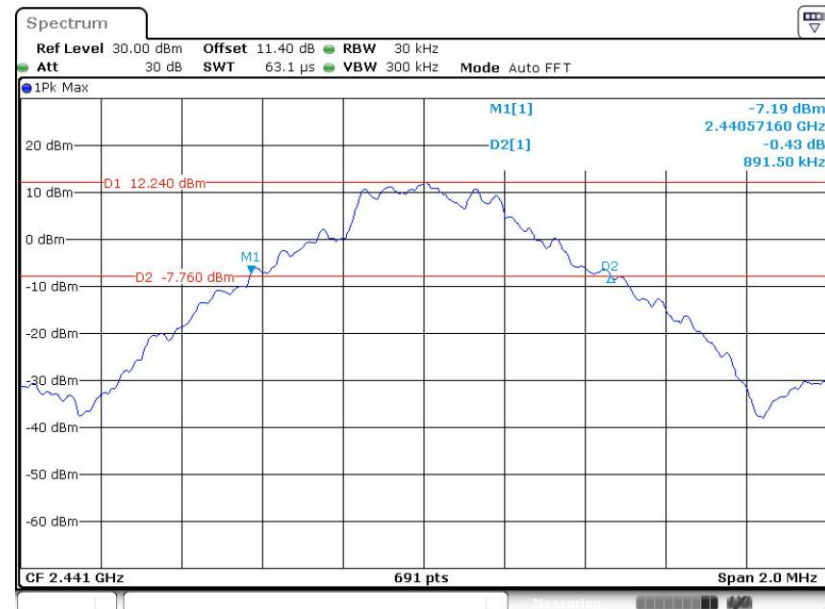
<1Mbps>

20 dB Bandwidth Plot on Channel 00

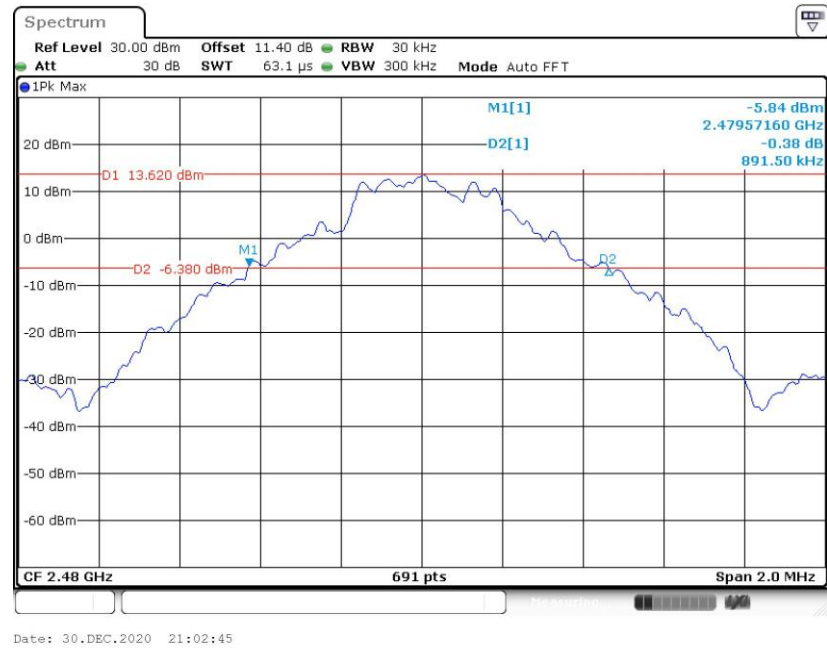
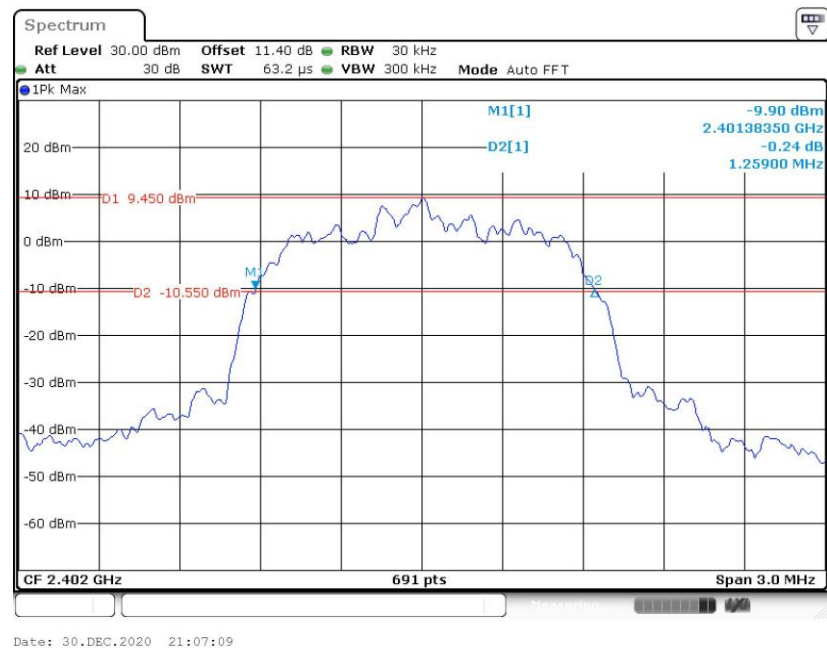


Date: 30.DEC.2020 20:15:45

20 dB Bandwidth Plot on Channel 39

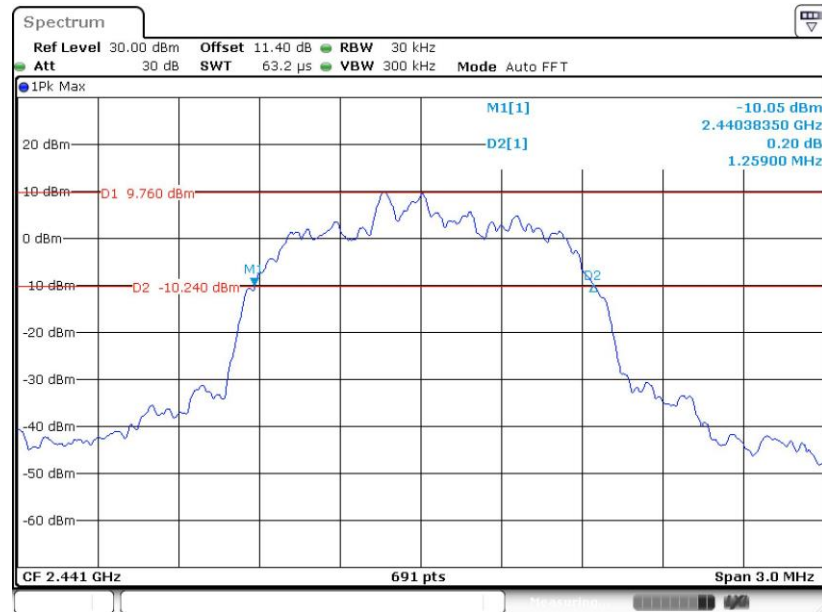


Date: 30.DEC.2020 21:00:15

**20 dB Bandwidth Plot on Channel 78****<2Mbps>****20 dB Bandwidth Plot on Channel 00**

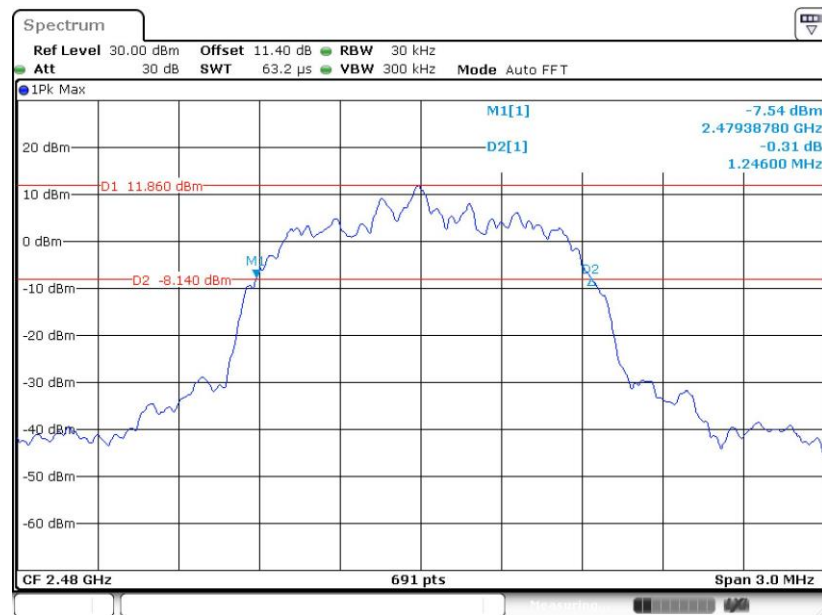


### 20 dB Bandwidth Plot on Channel 39



Date: 30.DEC.2020 21:16:23

### 20 dB Bandwidth Plot on Channel 78



Date: 30.DEC.2020 21:21:34



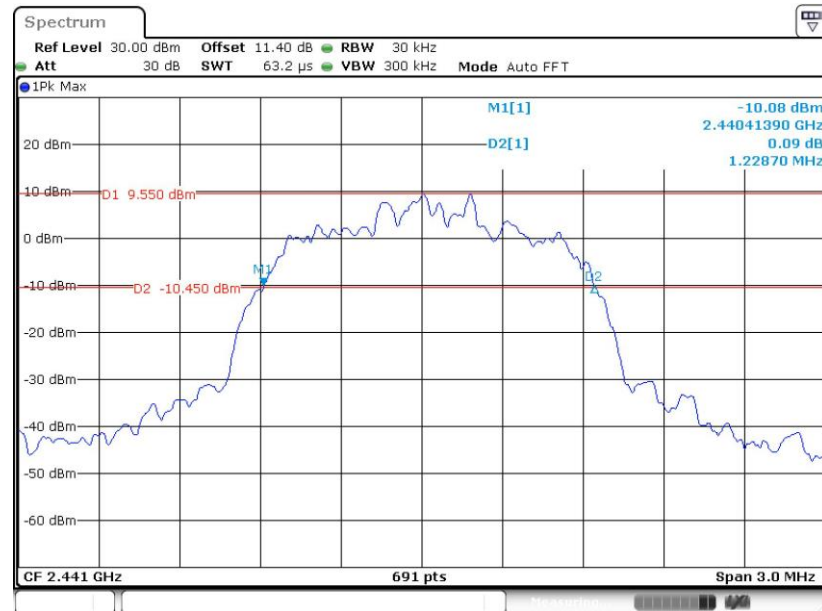
&lt;3Mbps&gt;

## 20 dB Bandwidth Plot on Channel 00



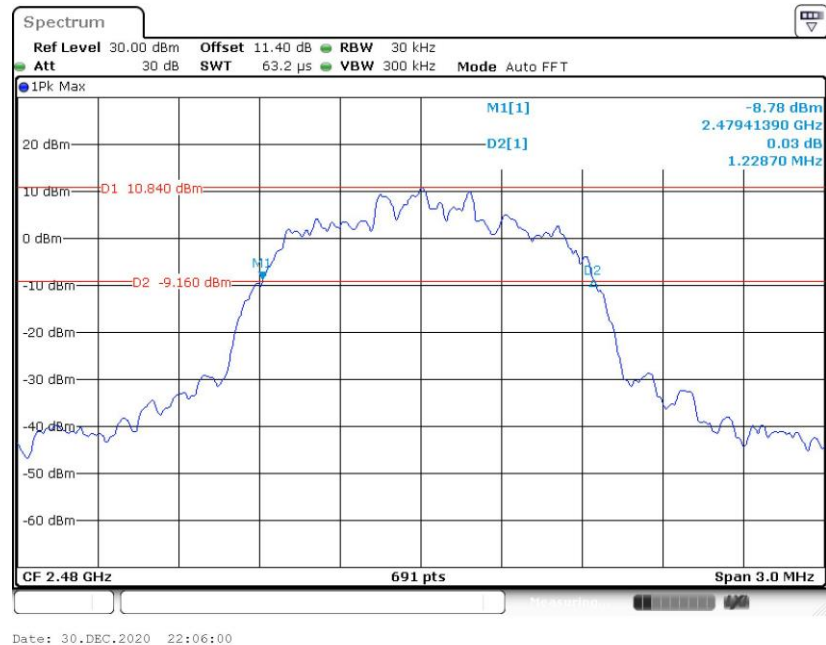
Date: 30.DEC.2020 21:34:30

## 20 dB Bandwidth Plot on Channel 39



Date: 30.DEC.2020 21:59:59

### 20 dB Bandwidth Plot on Channel 78





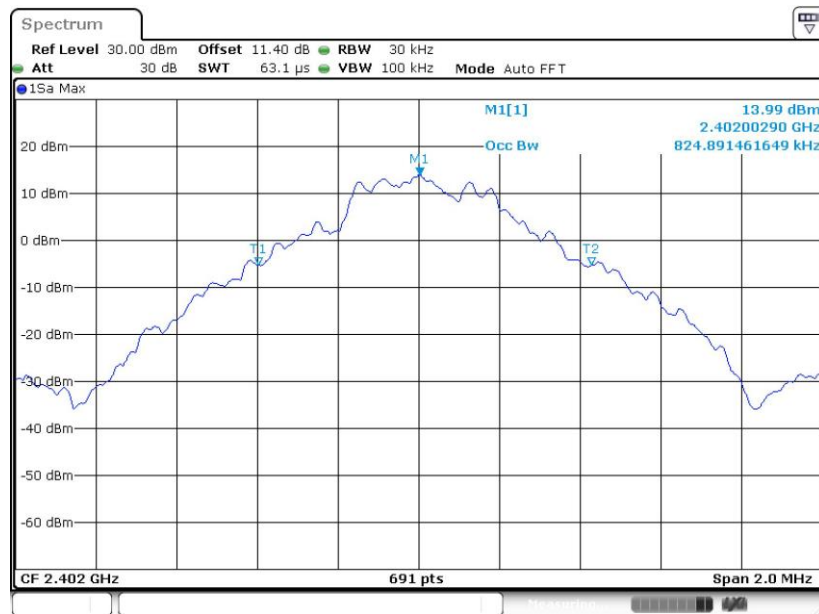
### 3.4.6 Test Result of 99% Occupied Bandwidth

Please refer to Appendix A.

<Normal Mode with Ant. 4>

<1Mbps>

99% Occupied Bandwidth Plot on Channel 00



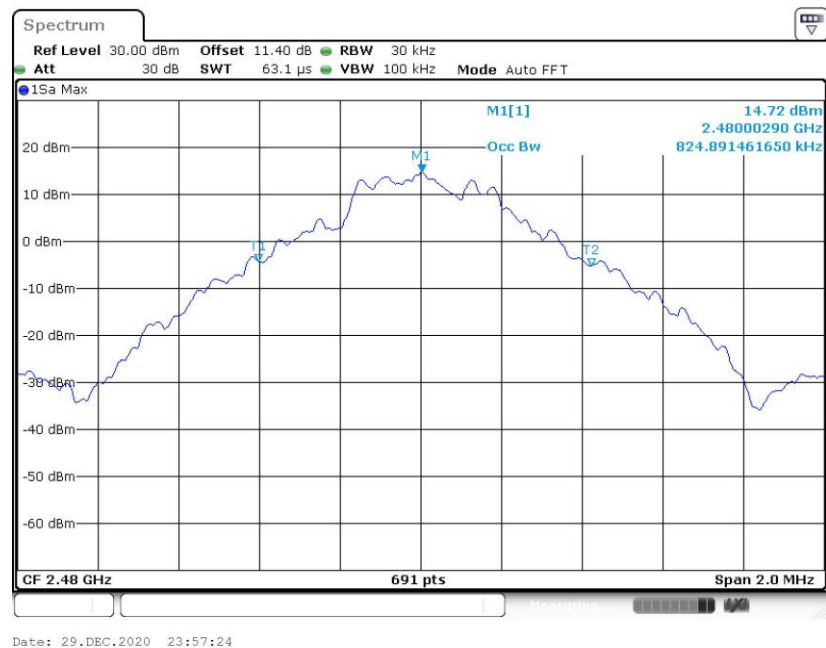
Date: 29.DEC.2020 23:46:00



## 99% Occupied Bandwidth Plot on Channel 39



## 99% Occupied Bandwidth Plot on Channel 78



<2Mbps>

### 99% Occupied Bandwidth Plot on Channel 00



Date: 30.DEC.2020 00:02:46

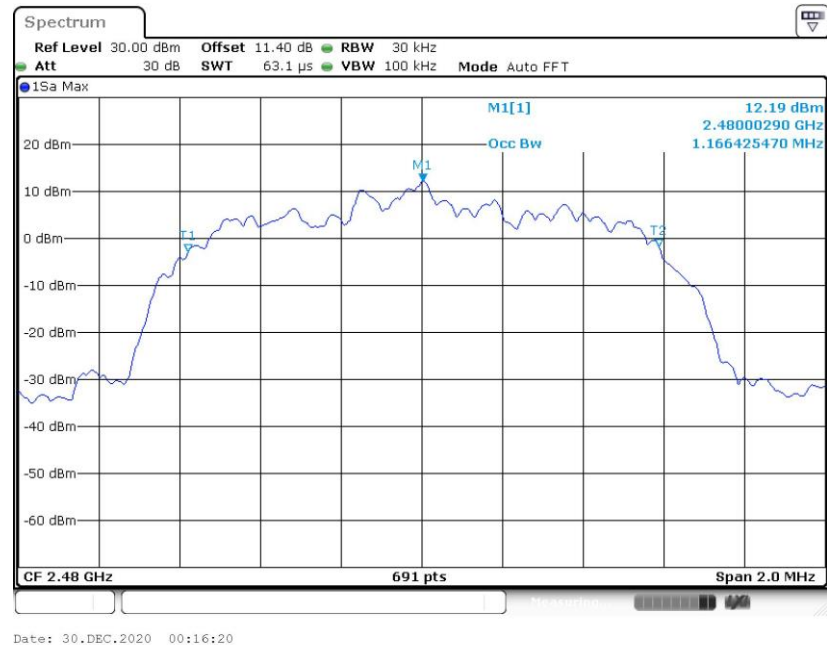
### 99% Occupied Bandwidth Plot on Channel 39



Date: 30.DEC.2020 00:10:29



99% Occupied Bandwidth Plot on Channel 78



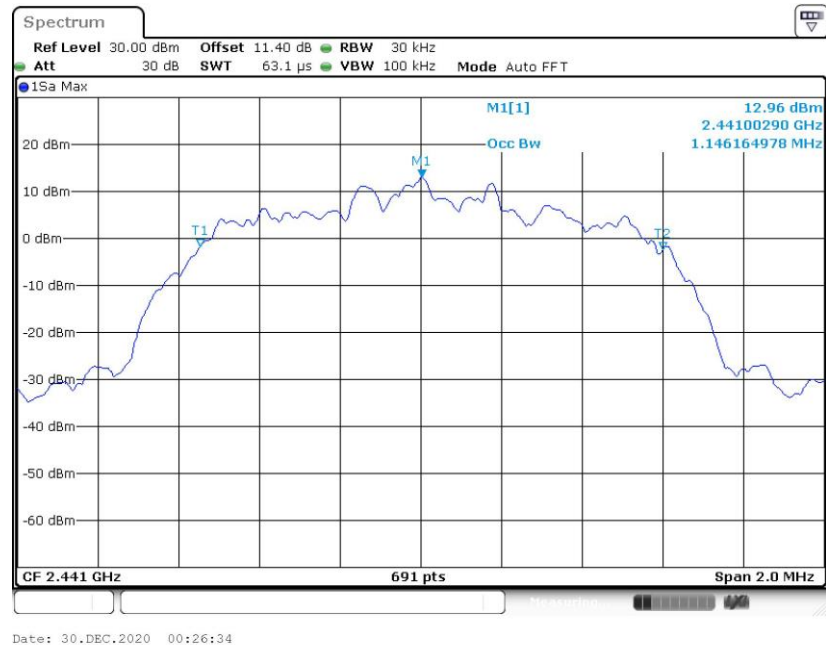
<3Mbps>

99% Occupied Bandwidth Plot on Channel 00





### 99% Occupied Bandwidth Plot on Channel 39



### 99% Occupied Bandwidth Plot on Channel 78

