



# FCC TEST REPORT

## FCC ID: 2A9V8-D1T

|                                                                                            |   |                      |
|--------------------------------------------------------------------------------------------|---|----------------------|
| Product                                                                                    | : | StarryHub ClickDrop  |
| Model Name                                                                                 | : | D1T、D1U              |
| Brand                                                                                      | : | CZUR                 |
| Report No.                                                                                 | : | PTC23021300802E-FC02 |
| Sample ID                                                                                  | : | PTC23021300802E-01#  |
| <b>Prepared for</b>                                                                        |   |                      |
| CZUR TECH CO., LTD                                                                         |   |                      |
| RM722, Block B, Podium of Buiding No. 12, Shenzhen Bay Eco-Technology Park Shenzhen, China |   |                      |
| <b>Prepared by</b>                                                                         |   |                      |
| Precise Testing & Certification Co., Ltd.                                                  |   |                      |
| Building 1, No. 6, Tongxin Road, Dongcheng Street, Dongguan, Guangdong, China              |   |                      |



## 1 TEST RESULT CERTIFICATION

Applicant's name : CZUR TECH CO., LTD  
Address : RM722, Block B, Podium of Buiding No. 12, Shenzhen Bay Eco-Technology Park Shenzhen, China  
Manufacture's name : CZUR TECH CO., LTD  
Address : RM722, Block B, Podium of Buiding No. 12, Shenzhen Bay Eco-Technology Park Shenzhen, China  
Product name : StarryHub ClickDrop  
Model name : D1T、D1U  
Standards : FCC CFR47 Part 15 Section 15.407  
Test procedure : ANSI C63.10:2013  
Test Date : Feb. 27, 2023 to Mar. 30, 2023  
Date of Issue : Apr. 09, 2023  
Test Result : Pass

This device described above has been tested by PTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of PTC, this document may be altered or revised by PTC, personal only, and shall be noted in the revision of the document.

Test Engineer:

A handwritten signature in black ink, appearing to read 'Simon Pu'.

Simon Pu / Engineer

Technical Manager:

A handwritten signature in black ink, appearing to read 'Ronnie Liu'.

Ronnie Liu / Manager



| <b>1</b> | <b>Contents</b>                                 | <b>Page</b> |
|----------|-------------------------------------------------|-------------|
| <b>1</b> | <b>TEST RESULT CERTIFICATION .....</b>          | <b>2</b>    |
| <b>1</b> | <b>CONTENTS PAGE .....</b>                      | <b>3</b>    |
|          | <b>TEST SUMMARY .....</b>                       | <b>5</b>    |
| 1.1      | TEST SITE .....                                 | 5           |
| <b>2</b> | <b>GENERAL INFORMATION .....</b>                | <b>6</b>    |
| 2.1      | GENERAL DESCRIPTION OF EUT .....                | 6           |
| 2.2      | DESCRIPTION OF TEST CONDITIONS .....            | 12          |
| <b>3</b> | <b>EQUIPMENTS LIST FOR ALL TEST ITEMS .....</b> | <b>13</b>   |
| 3.1      | MEASUREMENT UNCERTAINTY .....                   | 14          |
| 3.2      | DESCRIPTION OF SUPPORT UNITS .....              | 16          |
| <b>4</b> | <b>TEST RESULT .....</b>                        | <b>17</b>   |
| 4.1      | CONDUCTION EMISSIONS MEASUREMENT .....          | 17          |
| 4.1.1    | Applied procedures / Limit .....                | 17          |
| 4.1.3    | Test procedure .....                            | 18          |
| 4.1.4    | DEVIATION FROM TEST STANDARD .....              | 19          |
| 4.1.5    | TEST SETUP .....                                | 19          |
| 4.1.6    | Test results .....                              | 20          |
| 4.2      | RADIATED EMISSIONS MEASUREMENT .....            | 22          |
| 4.2.1    | Applied procedures / Limit .....                | 22          |
| 4.2.3    | Radiated Emissions Test Data .....              | 27          |
| 4.3      | RADIATED RESTRICTED BAND EDGE MEASUREMENT ..... | 43          |
| 4.3.1    | Applied procedures / Limit .....                | 43          |
| 4.3.2    | Test procedure .....                            | 43          |
| 4.3.3    | Deviation from standard .....                   | 44          |
| 4.3.4    | Test results .....                              | 45          |
| 4.4      | BANDWIDTH TEST .....                            | 49          |
| 4.4.1    | Applied procedures / Limit .....                | 49          |
| 4.4.2    | Test procedure .....                            | 49          |
| 4.4.3    | Deviation from standard .....                   | 51          |
| 4.4.4    | Test setup .....                                | 51          |
| 4.4.5    | Test results .....                              | 52          |
| 4.5      | PEAK POWER DENSITY .....                        | 66          |
| 4.5.1    | Applied procedures / Limit .....                | 66          |



|                                                                   |           |
|-------------------------------------------------------------------|-----------|
| 4.5.2 Test procedure .....                                        | 66        |
| 4.5.3 TEST SETUP .....                                            | 66        |
| 4.5.4 Deviation from standard .....                               | 66        |
| 4.5.5 Test results .....                                          | 67        |
| 4.6 MAXIMUM PEAK OUTPUT POWER .....                               | 72        |
| 4.6.1 Applied procedures / Limit .....                            | 72        |
| 4.6.2 Test procedure .....                                        | 72        |
| 4.6.3 Test Setup .....                                            | 73        |
| 4.6.4 Deviation from standard .....                               | 73        |
| 4.6.5 Test results .....                                          | 74        |
| 4.7 FREQUENCY STABILITY MEASUREMENT .....                         | 75        |
| 4.7.1 Applied procedures / Limit .....                            | 75        |
| 4.7.2 Test procedure .....                                        | 75        |
| 4.7.3 Deviation from standard .....                               | 75        |
| 4.7.4 Test setup .....                                            | 75        |
| 4.7.5 Test results .....                                          | 76        |
| 4.8 AUTOMATICALLY DISCONTINUE TRANSMISSION .....                  | 80        |
| 4.8.1 LIMIT OF AUTOMATICALLY DISCONTINUE TRANSMISSION .....       | 80        |
| 4.8.2 TEST RESULT OF AUTOMATICALLY DISCONTINUE TRANSMISSION ..... | 80        |
| 4.9 ANTENNA REQUIREMENT .....                                     | 80        |
| 4.9.1 STANDARD REQUIREMENT .....                                  | 80        |
| 4.9.2 EUT ANTENNA .....                                           | 80        |
| <b>5 PHOTOGRAPHS .....</b>                                        | <b>81</b> |
| 5.1 TEST SETUP .....                                              | 81        |
| 5.2 EUT CONSTRUCTIONAL DETAILS .....                              | 83        |



## Test Summary

| FCC Part15 (15.407)                                                                                                                                 |                                            |          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------|
| Test Item                                                                                                                                           | FCC standard                               | Judgment |
| AC Conducted Emission                                                                                                                               | 15.207                                     | PASS     |
| 26dB/6dB Bandwidth                                                                                                                                  | § 15.407 (a) (26 dB) / § 15.407 (e) (6 dB) | PASS     |
| Maximum Conducted Output Power                                                                                                                      | 15.407(a)                                  | PASS     |
| Radiated Emission And ( Unwanted Emissions) Measurement                                                                                             | 15.407(b)& 15.209                          | PASS     |
| Radiated Restricted Band Edge Measurement                                                                                                           | 15.407(b)& 15.205                          | PASS     |
| Power Spectral Density                                                                                                                              | 15.407(a)                                  | PASS     |
| Frequency Stability                                                                                                                                 | 15.407(g)                                  | PASS     |
| Automatically Discontinue Transmission                                                                                                              | 15.407(c)                                  | PASS     |
| Antenna Requirement                                                                                                                                 | 15.203                                     | PASS     |
| Note: Reference to the ANSI C63.10-2013, KDB 789033 D02v01r01, KDB 662911 D01v02r01.<br>" N/A " denotes test is not applicable in this Test Report. |                                            |          |

### 1.1 Test Site

Precise Testing & Certification Co., Ltd.

Address: Building 1, No.6 Tongxin Road, Dongcheng Street, Dongguan,China

FCC Registration Number: 790290

Designation Number: CN1219

A2LA Certificate No.: 4408.01

IC Registration Number: 12191A

CAB identifier: CN0080



## 2 General Information

### 2.1 General Description of EUT

|                      |                                                                          |
|----------------------|--------------------------------------------------------------------------|
| EUT Name:            | StarryHub ClickDrop                                                      |
| Model No.:           | D1T、D1U                                                                  |
| Operation frequency: | For 802.11a/n-HT20:<br>5745~5825MHz<br>For 802.11n-HT40:<br>5755~5795MHz |
| Modulation Type and  | 802.11a/n: OFDM                                                          |
| Antenna Type:        | Fpcb Antenna                                                             |
| Antenna Gain:        | 1.62 dBi                                                                 |
| Power Supply:        | DC5V                                                                     |
| Hardware Version:    | ES06T-C V1.1                                                             |
| Software Version:    | ES06T-C-CZ-V1.2                                                          |



---

**Channel List**

---

**Channel List for 802.11a/n-HT20**

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------|
| --      | --              | 149     | 5745            | 153     | 5765            | --      | --              |
| 157     | 5785            | 161     | 5805            | 165     | 5825            | --      | --              |

---

**Channel List for 802.11n-HT40**

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------|
| --      | --              | --      | --              | 151     | 5755            | 159     | 5795            |

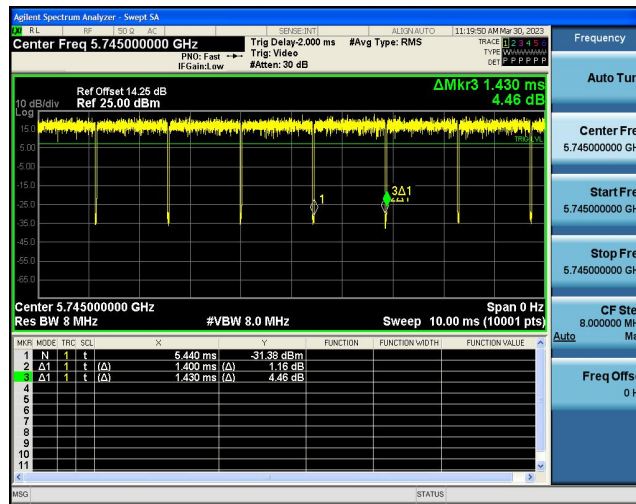
1. All the modulation modes were tested with DC 5v via adaptor,the EUT is stand alone.



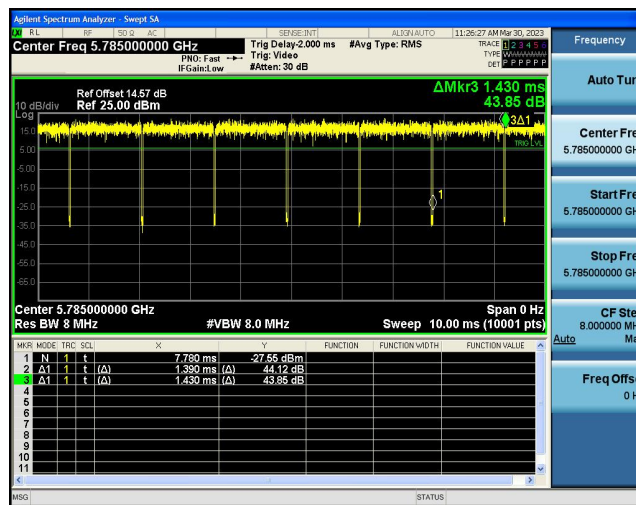
### Duty Cycle

| TestMode  | Antenna | Frequency[MHz] | Transmission Duration [ms] | Transmission Period [ms] | Duty Cycle [%] |
|-----------|---------|----------------|----------------------------|--------------------------|----------------|
| 11A       | Ant1    | 5745           | 1.40                       | 1.43                     | 97.90          |
| 11A       | Ant1    | 5785           | 1.39                       | 1.43                     | 97.20          |
| 11A       | Ant1    | 5825           | 1.39                       | 1.42                     | 97.89          |
| 11N20SISO | Ant1    | 5745           | 1.29                       | 1.33                     | 96.99          |
| 11N20SISO | Ant1    | 5785           | 1.30                       | 1.33                     | 97.74          |
| 11N20SISO | Ant1    | 5825           | 1.30                       | 1.34                     | 97.01          |
| 11N40SISO | Ant1    | 5755           | 0.65                       | 0.69                     | 94.20          |
| 11N40SISO | Ant1    | 5795           | 0.65                       | 0.69                     | 94.20          |

#### NTNV-11A-Ant1-5745-1.40-1.43

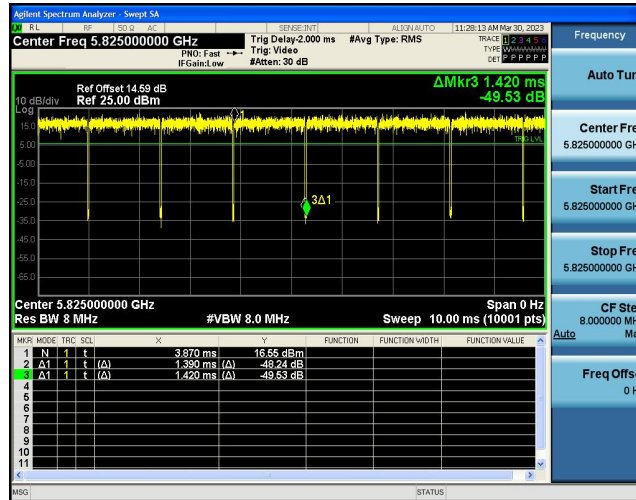


#### NTNV-11A-Ant1-5785-1.39-1.43

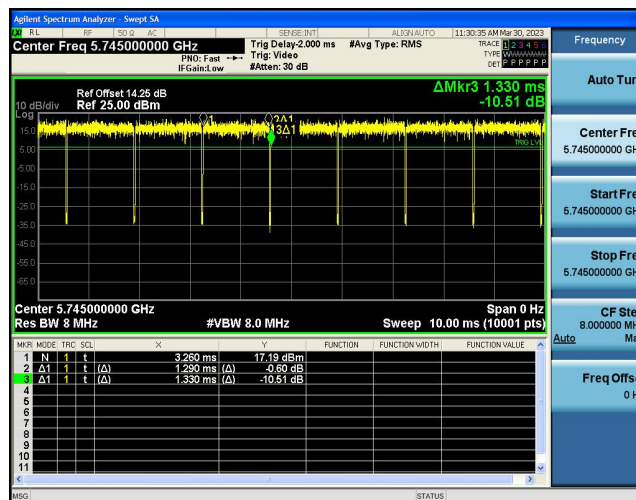




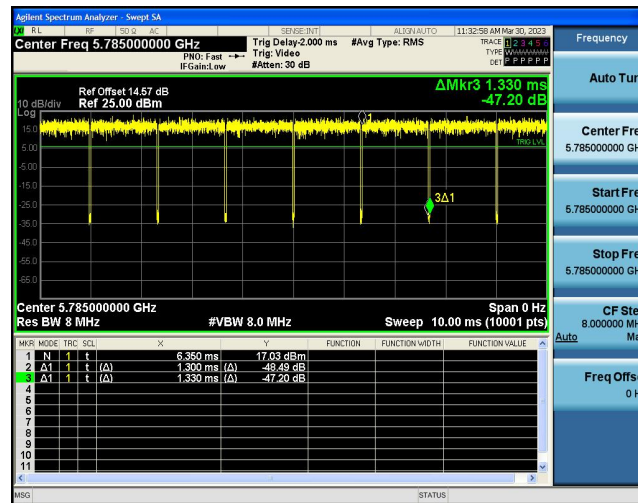
NTNV-11A-Ant1-5825-1.39-1.42



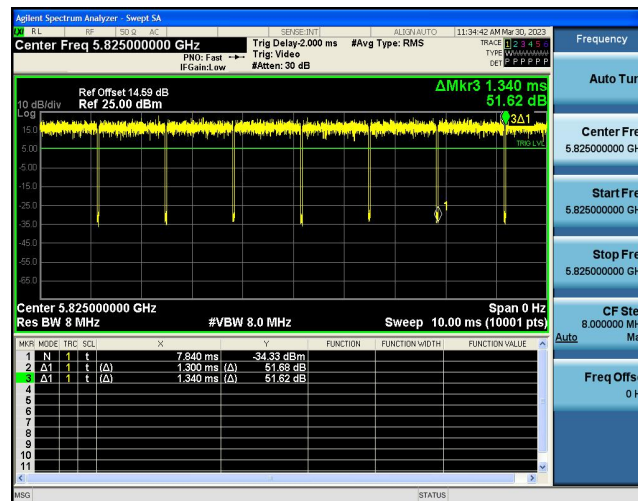
NTNV-11N20SISO-Ant1-5745-1.29-1.33



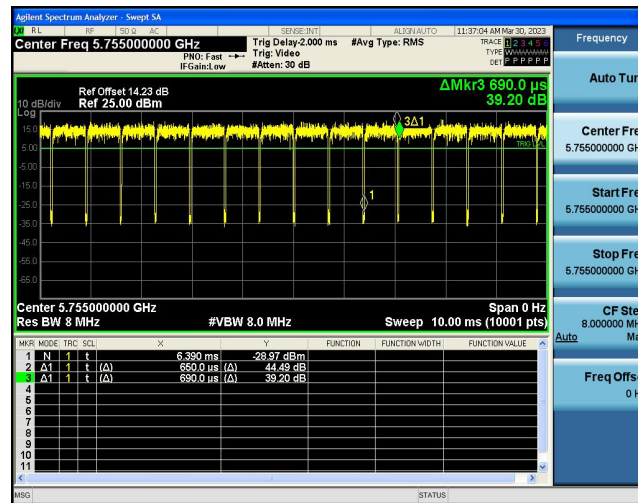
NTNV-11N20SISO-Ant1-5785-1.30-1.33



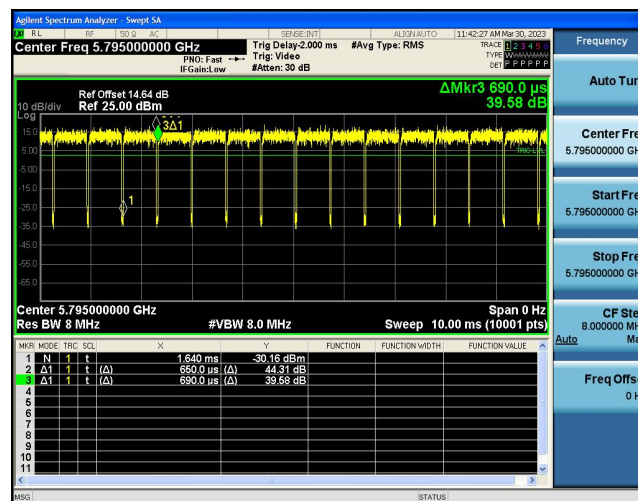
NTNV-11N20SISO-Ant1-5825-1.30-1.34



NTNV-11N40SISO-Ant1-5755-0.65-0.69

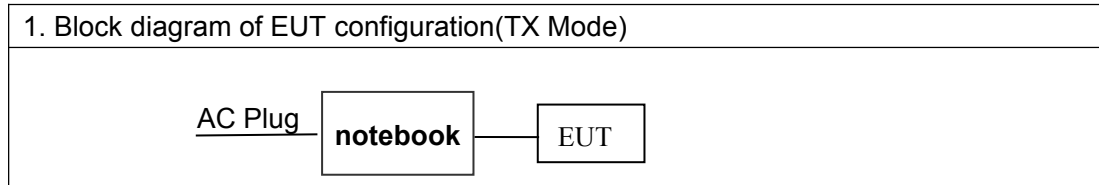


NTNV-11N40SISO-Ant1-5795-0.65-0.69



## 2.2 Description of Test conditions

- (1) EUT was tested in normal configuration (Please See following Block diagram)



- (2) E.U.T. test conditions:

15.31(e): For intentional radiators, measurements of the variation of the input power or the adiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominalrated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

- (3) Test frequencies:

According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and. If required reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

| Frequency range over which device operates | Number of frequencies | Location in the range of operation          |
|--------------------------------------------|-----------------------|---------------------------------------------|
| 1 MHz or less                              | 1                     | Middle                                      |
| 1 to 10 MHz                                | 2                     | 1 near top and 1 near bottom                |
| More than 10 MHz                           | 3                     | 1 near top, 1 near middle and 1 near bottom |

- (4) Frequency range of radiated measurements:

According to the 15.33, The test range will be up to the tenth harmonic of the highest fundamental frequency.

- (5) The EUT 's duty cycle is set to 100%

- (6) The measurements are performed at all Bit Rate of Transmitter, For all tests the worst-case was selected as the table below, the data of the worst-case is shown in the report.

|           |                                  |
|-----------|----------------------------------|
| Test Mode | Mode 1: Transmit by 802.11a      |
|           | Mode 2: Transmit by 802.11n-HT20 |
|           | Mode 3: Transmit by 802.11n-HT40 |
|           |                                  |
|           |                                  |
|           |                                  |



### 3 Equipments List for All Test Items

#### RF Conducted Test

| Name of Equipment      | Manufacturer  | Model    | Serial No. | Last calibration | Calibration Due | Calibration period |
|------------------------|---------------|----------|------------|------------------|-----------------|--------------------|
| MXA Signal Analyzer    | Agilent       | N9020A   | MY56070279 | Aug. 20, 2022    | Aug21,2023      | 1 year             |
| Coaxial Cable          | CDS           | 79254    | 46107086   | Aug. 20, 2022    | Aug21,2023      | 1 year             |
| Power Meter            | Anritsu       | ML2495A  | 0949003    | Aug. 20, 2022    | Aug21,2023      | 1 year             |
| Power Sensor           | Anritsu       | MA2411B  | 0917017    | Aug. 20, 2022    | Aug21,2023      | 1 year             |
| Spectrum Analyzer      | Rohde&Schwarz | FSVR40   | 101003     | Aug. 20, 2022    | Aug21,2023      | 1 year             |
| Temperature Chamber    | TERCHY        | MHG-800N | E21104     | Aug. 20, 2022    | Aug21,2023      | 1 year             |
| Temp. / Humidity Meter | Anymetre      | JR913    | N/A        | Aug. 20, 2022    | Aug21,2023      | 1 year             |
| DC Power Supply        | DAZHENG       | PS-605D  | 20018978   | Aug. 20, 2022    | Aug21,2023      | 1 year             |
| AC POWER SOURCE        | UMART         | HPA1010  | N/A        | Aug. 20, 2022    | Aug21,2023      | 1 year             |
| Scope                  | Tektronix     | TDS3032B | B014131    | Aug. 20, 2022    | Aug21,2023      | 1 year             |
| DC power               | eTOMENS       | eTM-1560 | --         | Aug. 20, 2022    | Aug21,2023      | 1 year             |

Remark: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

#### Radiated Emissions

| Name of Equipment            | Manufacturer  | Model     | Serial No. | Characteristics | Calibration Due |
|------------------------------|---------------|-----------|------------|-----------------|-----------------|
| EMI Test Receiver            | Rohde&Schwarz | ESCI      | 101417     | 9KHz-3GHz       | Aug21,2023      |
| Loop Antenna                 | Schwarzbeck   | FMZB 1519 | 012        | 9 KHz -30MHz    | Aug21,2023      |
| Bilog Antenna                | SCHWARZBECK   | VULB9160  | 9160-3355  | 25MHz-2GHz      | Aug21,2023      |
| Preamplifier (low frequency) | SCHWARZBECK   | BBV 9475  | 9745-0013  | 1MHz-1GHz       | Aug21,2023      |
| Cable                        | Schwarzbeck   | PLF-100   | 549489     | 9KHz-3GHz       | Aug21,2023      |



|                      |               |                 |            |              |            |
|----------------------|---------------|-----------------|------------|--------------|------------|
| Spectrum Analyzer    | Agilent       | E4407B          | MY45109572 | 9KHz-40GHz   | Aug21,2023 |
| Horn Antenna         | SCHWARZBECK   | 9120D           | 9120D-1246 | 1GHz-18GHz   | Aug21,2023 |
| High NOISE AMPLIFIER | ZHINAN        | ZN3380C         | 15002      | 10KHz-18GHz  | Aug21,2023 |
| Cable                | H+S           | CBL-26          | N/A        | 1GHz-26.5GHz | Aug21,2023 |
| Spectrum Analyzer    | Rohde&Schwarz | FSVR40          | 101003     | 10Hz-40GHz   | Aug21,2023 |
| Horn Antenna         | SCHWARZBECK   | BBHA9170        | 01066      | 15GHZ-40GHZ  | Aug21,2023 |
| Preamplifier         | SCHWARZBECK   | BBV-9721        | 81         | 18GHZ-40GHZ  | Aug21,2023 |
| Test S/W             | Tonscend      | JS32-RE/4.0.0.0 |            |              |            |

#### Conducted Emissions

| Name of Equipment        | Manufacturer  | Model           | Serial No. | Characteristics | Calibration Due |
|--------------------------|---------------|-----------------|------------|-----------------|-----------------|
| EMI Test Receiver        | Rohde&Schwarz | ESCI            | 101417     | 9KHz-3GHz       | Aug21,2023      |
| Artificial Mains Network | Rohde&Schwarz | BS ENV216       | 102453     | 9KHz-300MHz     | Aug21,2023      |
| Artificial Mains Network | Rohde&Schwarz | L2-16B          | 000WX31025 | 9KHz-300MHz     | Aug21,2023      |
| Test S/W                 | Tonscend      | JS32-CE/4.0.0.3 |            |                 |                 |

### 3.1 Measurement Uncertainty

| Parameter                         | Uncertainty              |
|-----------------------------------|--------------------------|
| RF output power, conducted        | ±1.0dB                   |
| Power Spectral Density, conducted | ±2.2dB                   |
| Radio Frequency                   | ± 1 x 10 <sup>-6</sup>   |
| Bandwidth                         | ± 1.5 x 10 <sup>-6</sup> |
| Time                              | ±2%                      |



|                                                                                                 |         |
|-------------------------------------------------------------------------------------------------|---------|
| Duty Cycle                                                                                      | ±2%     |
| Temperature                                                                                     | ±1°C    |
| Humidity                                                                                        | ±5%     |
| DC and low frequency voltages                                                                   | ±3%     |
| Conducted Emissions (150kHz~30MHz)                                                              | ±3.64dB |
| Radiated Emission(9KHz~30MHz)                                                                   | ±2.54dB |
| Radiated Emission(30MHz~1GHz)                                                                   | ±5.03dB |
| Radiated Emission(1GHz~25GHz)                                                                   | ±4.74dB |
| Radiated Emission(25GHz~40GHz)                                                                  | ±4.14dB |
| Remark: The coverage Factor (k=2), and measurement Uncertainty for a level of Confidence of 95% |         |



### 3.2 Description of Support Units

| Equipment | Model No. | Series No.       |
|-----------|-----------|------------------|
| Notebook  | NbDE-WDH9 | WCTPM22527002929 |

## 4 Test Result

### 4.1 Conduction Emissions Measurement

#### 4.1.1 Applied procedures / Limit

(Frequency Range 150KHz-30MHz)

| FREQUENCY<br>(MHz) | Quasi-peak<br>(dBuV) | Average<br>(dBuV) | Standard |
|--------------------|----------------------|-------------------|----------|
| 0.15 -0.5          | 66 - 56 *            | 56 - 46 *         | CISPR    |
| 0.50 -5.0          | 56.00                | 46.00             |          |
| 5.0 -30.0          | 60.00                | 50.00             |          |

|           |           |           |     |
|-----------|-----------|-----------|-----|
| 0.15 -0.5 | 66 - 56 * | 56 - 46 * | FCC |
| 0.50 -5.0 | 56.00     | 46.00     |     |
| 5.0 -30.0 | 60.00     | 50.00     |     |

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

| Receiver Parameters | Setting  |
|---------------------|----------|
| Attenuation         | 10 dB    |
| Start Frequency     | 0.15 MHz |
| Stop Frequency      | 30 MHz   |
| IF Bandwidth        | 9 kHz    |

#### 4.1.2 E.U.T. Operation

Operating Environment :

Temperature : 23.9 °C  
 Humidity : 51.4 % RH  
 Atmospheric Pressure : 101.21kPa



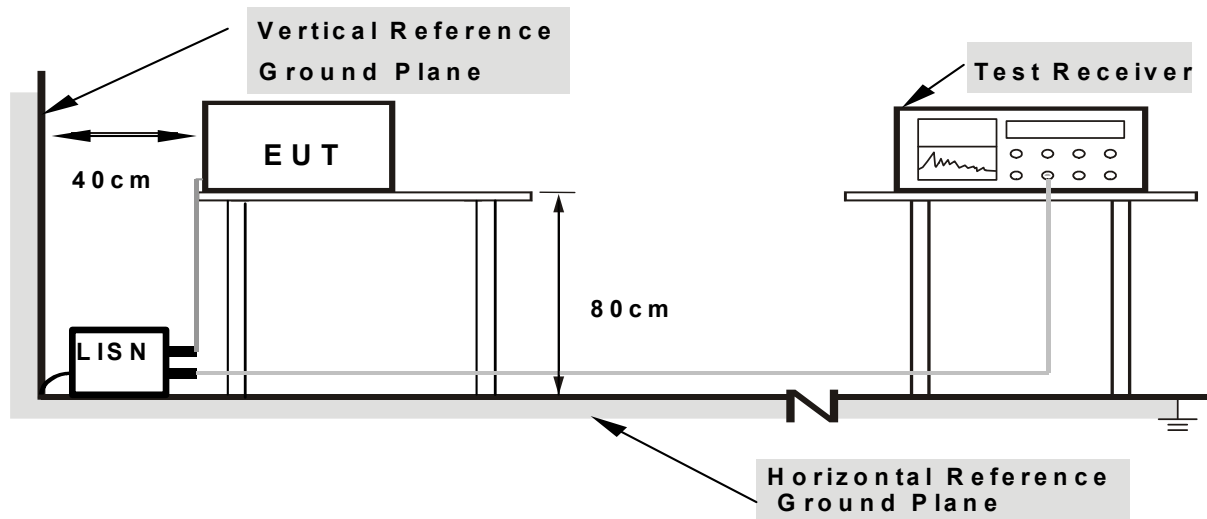
#### 4.1.3 Test procedure

- a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

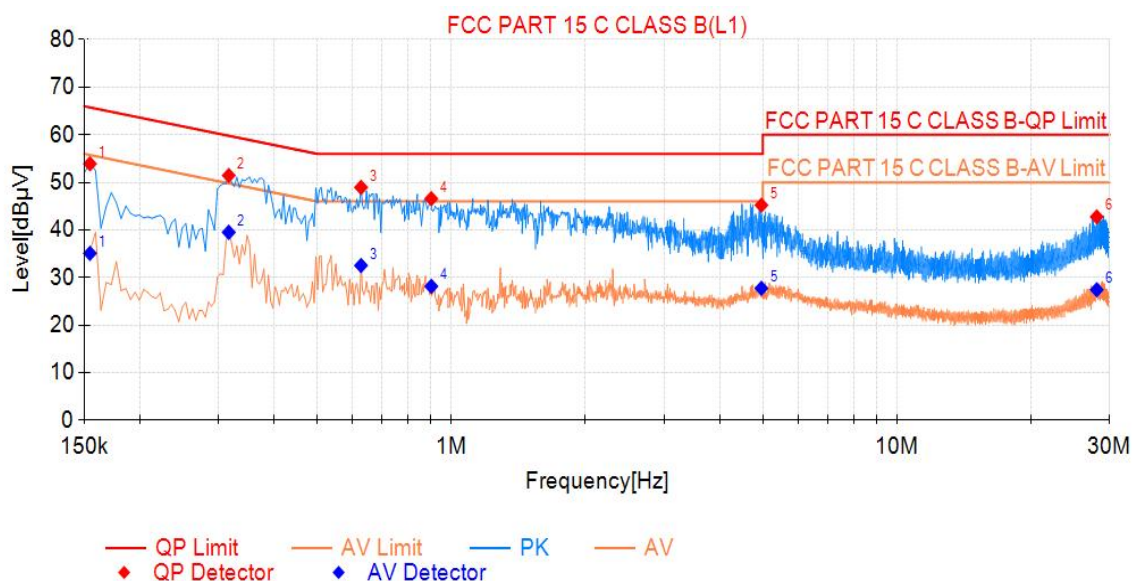
#### 4.1.5 TEST SETUP



- Note:** 1.Support units were connected to second LISN.  
 2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

#### 4.1.6 Test results

Line



Remark: Factor = LISN factor + Cable Loss + Pulse limiter factor.

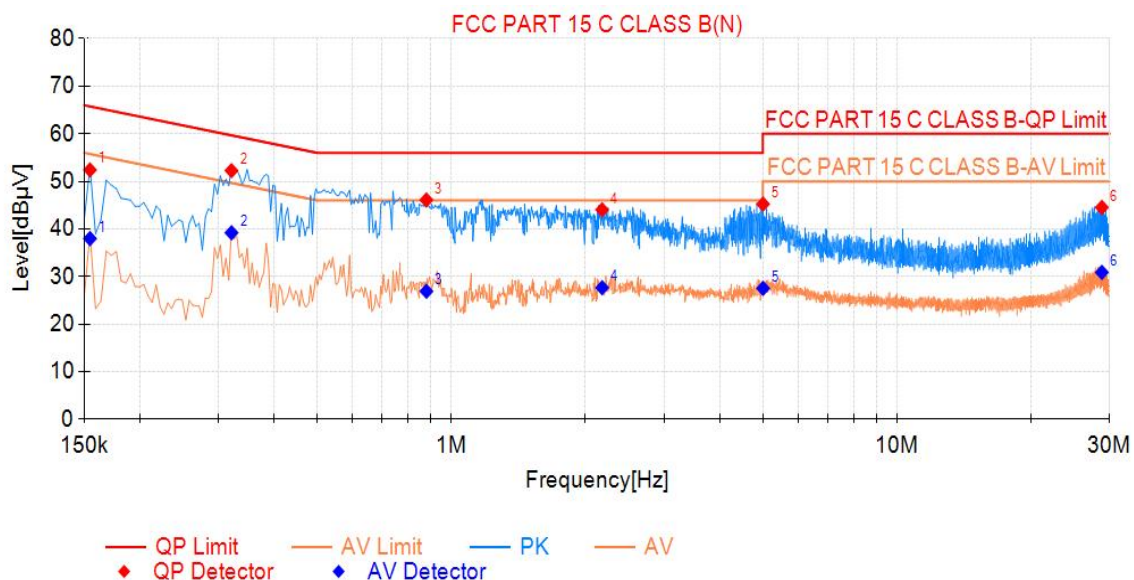
#### Final Data List

| NO. | Freq. [MHz] | QP Value [dBμV] | QP Limit [dBμV] | QP Margin [dB] | AV Value [dBμV] | AV Limit [dBμV] | AV Margin [dB] | Verdict |
|-----|-------------|-----------------|-----------------|----------------|-----------------|-----------------|----------------|---------|
| 1   | 0.155       | 53.91           | 65.75           | 11.84          | 35.10           | 55.75           | 20.65          | PASS    |
| 2   | 0.317       | 51.46           | 59.80           | 8.34           | 39.52           | 49.80           | 10.28          | PASS    |
| 3   | 0.627       | 48.95           | 56.00           | 7.05           | 32.54           | 46.00           | 13.46          | PASS    |
| 4   | 0.902       | 46.58           | 56.00           | 9.42           | 28.16           | 46.00           | 17.84          | PASS    |
| 5   | 4.965       | 45.22           | 56.00           | 10.78          | 27.76           | 46.00           | 18.24          | PASS    |
| 6   | 28.086      | 42.76           | 60.00           | 17.24          | 27.44           | 50.00           | 22.56          | PASS    |

Note: Emission Level = Reading + AMN Factor+Cable Loss

Over limited=Emission Level - Limit

Neatruue



Remark: Factor = LISN factor + Cable Loss + Pulse limiter factor.

### Final Data List

| NO. | Freq. [MHz] | QP Value [dBμV] | QP Limit [dBμV] | QP Margin [dB] | AV Value [dBμV] | AV Limit [dBμV] | AV Margin [dB] | Verdict |
|-----|-------------|-----------------|-----------------|----------------|-----------------|-----------------|----------------|---------|
| 1   | 0.155       | 52.41           | 65.75           | 13.34          | 37.98           | 55.75           | 17.77          | PASS    |
| 2   | 0.321       | 52.27           | 59.68           | 7.41           | 39.21           | 49.68           | 10.47          | PASS    |
| 3   | 0.879       | 46.10           | 56.00           | 9.90           | 26.92           | 46.00           | 19.08          | PASS    |
| 4   | 2.180       | 44.04           | 56.00           | 11.96          | 27.67           | 46.00           | 18.33          | PASS    |
| 5   | 5.006       | 45.23           | 60.00           | 14.77          | 27.53           | 50.00           | 22.47          | PASS    |
| 6   | 28.833      | 44.53           | 60.00           | 15.47          | 30.88           | 50.00           | 19.12          | PASS    |

Note: Emission Level = Reading + AMN Factor+Cable Loss  
Over limited=Emission Level - Limit



## 4.2 Radiated Emissions Measurement

### 4.2.1 Applied procedures / Limit

Test Requirement: FCC Part15 section 15.407

Limits:

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20 dB below the highest level of the desired power:

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

#### LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz at 3M)

| FREQUENCY (MHz) | PEAK (dBuV/m) | AVERAGE (dBuV/m) |
|-----------------|---------------|------------------|
| Above 1000      | 74            | 54               |

Notes:

- (1) The lower limit shall apply at the transition frequencies.
- (2) Emission level (dBuV/m) = 20 log Emission level (uV/m).
- (3) For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

Measurement Distance: 3m (Semi-Anechoic Chamber)

Frequency range: 9 kHz – 40 GHz for transmitting mode.

Test instrumentation resolution bandwidth  
9 kHz (9 kHz - 30 MHz), 120 kHz (30 MHz - 1000 MHz), 1 MHz (1000 MHz – 40 GHz)



Detector: For PK and QP value:  
RBW = 1 MHz for  $f \geq 1$  GHz, 100 kHz for  $f < 1$  GHz  
VBW  $\geq$  RBW  
Sweep = auto  
Detector function = peak  
Trace = max hold  
For AV value:  
RBW = 1 MHz for  $f \geq 1$  GHz,  
VBW = 10 Hz  
Sweep = auto  
Detector function = peak  
Trace = max hold

#### Test Procedure:

##### 1) 9 kHz to 30 MHz emissions:

For testing performed with the loop antenna, testing was performed in accordance to ANSI C63.10. The centre of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane.

##### 2) 30 MHz to 1 GHz emissions:

For testing performed with the bi-log type antenna, testing was performed in accordance to ANSI C63.10. The measurement is performed with the EUT rotated 360°, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

##### 3) 1 GHz to 40 GHz emissions:

Test site with RF absorbing material covering the ground plane that met the site validation criterion called out in CISPR 16-1-4:2007 was used to perform radiated emission test above 1 GHz.

For testing performed with the horn antenna, testing was performed in accordance to ANSI C63.10. The measurement is performed with the EUT rotated 360°, the antenna height scan between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

And according 15.35(a)

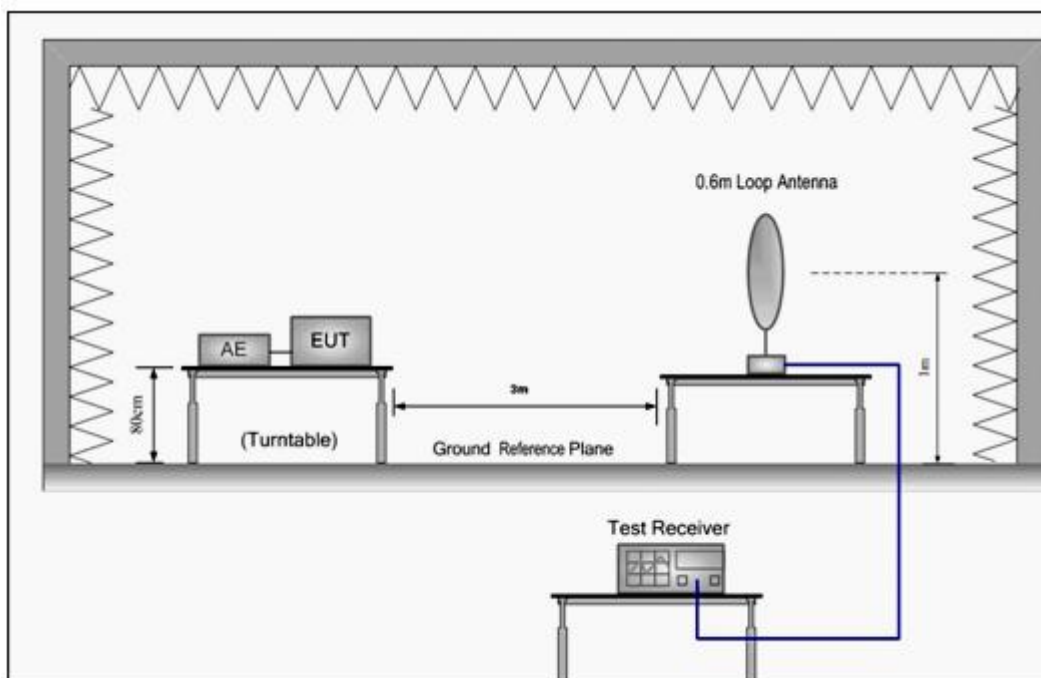
15.35(a) On any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths, unless otherwise specified. The specifications for the measuring instrument using the CISPR quasi-peak detector can be found in Publication 16 of the International Special Committee on Radio Interference (CISPR) of the International Electrotechnical Commission. As an alternative to CISPR quasi-peak measurements, the responsible party, at its option, may demonstrate compliance with the emission limits using measuring equipment employing a peak detector function, properly adjusted for such factors as pulse desensitization, as long as the same bandwidths as indicated for CISPR quasi-peak measurements are employed.

Note: For pulse modulated devices with a pulse-repetition frequency of 20 Hz or less and for which CISPR quasi-peak measurements are specified, compliance with the regulations shall be demonstrated using measuring equipment employing a peak detector function, properly adjusted for such factors as pulse desensitization, using the same measurement bandwidths that are indicated for CISPR quasi-peak measurements.

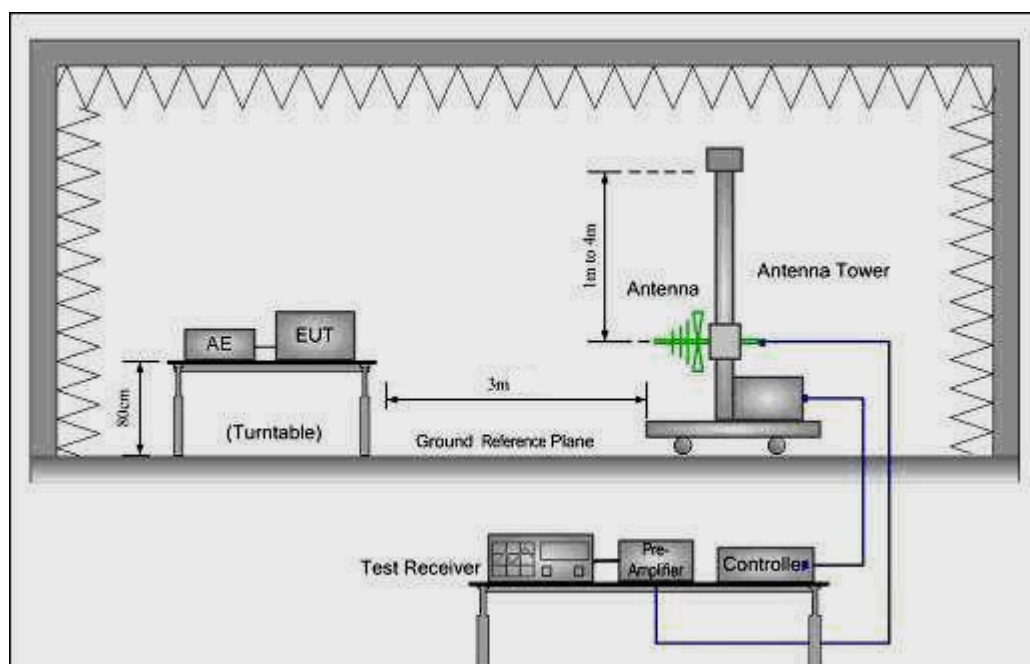
According to 15.35 (b) Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz. When average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, e.g., see §§ 15.250, 15.252, 15.255, and 15.509-15.519 of this part, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device, e.g., the total peak power level. Note that the use of a pulse desensitization correction factor may be needed to determine the total peak emission level. The instruction manual or application note for the measurement instrument should be consulted for determining pulse desensitization factors, as necessary.

### Test Configuration:

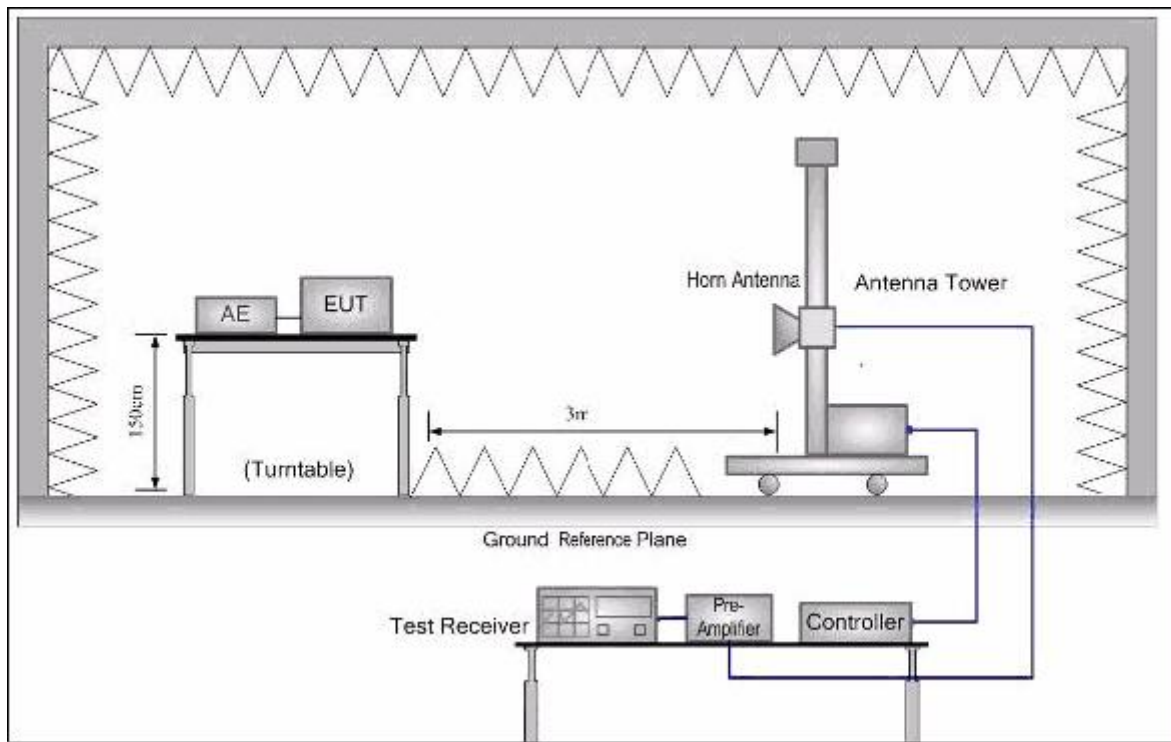
- 1) 9 kHz to 30 MHz emissions:



- 2) 30 MHz to 1 GHz emissions:



3) 1 GHz to 40 GHz emissions:



The field strength is calculated by adding the Antenna Factor, Cable Loss & Pre-amplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna, Factor + Cable Loss – Preamplifier Factor



#### **4.2.2 E.U.T. Operation**

Operating Environment :

|                      |   |           |
|----------------------|---|-----------|
| Temperature          | : | 23.9 °C   |
| Humidity             | : | 51.4 % RH |
| Atmospheric Pressure | : | 101.21kPa |

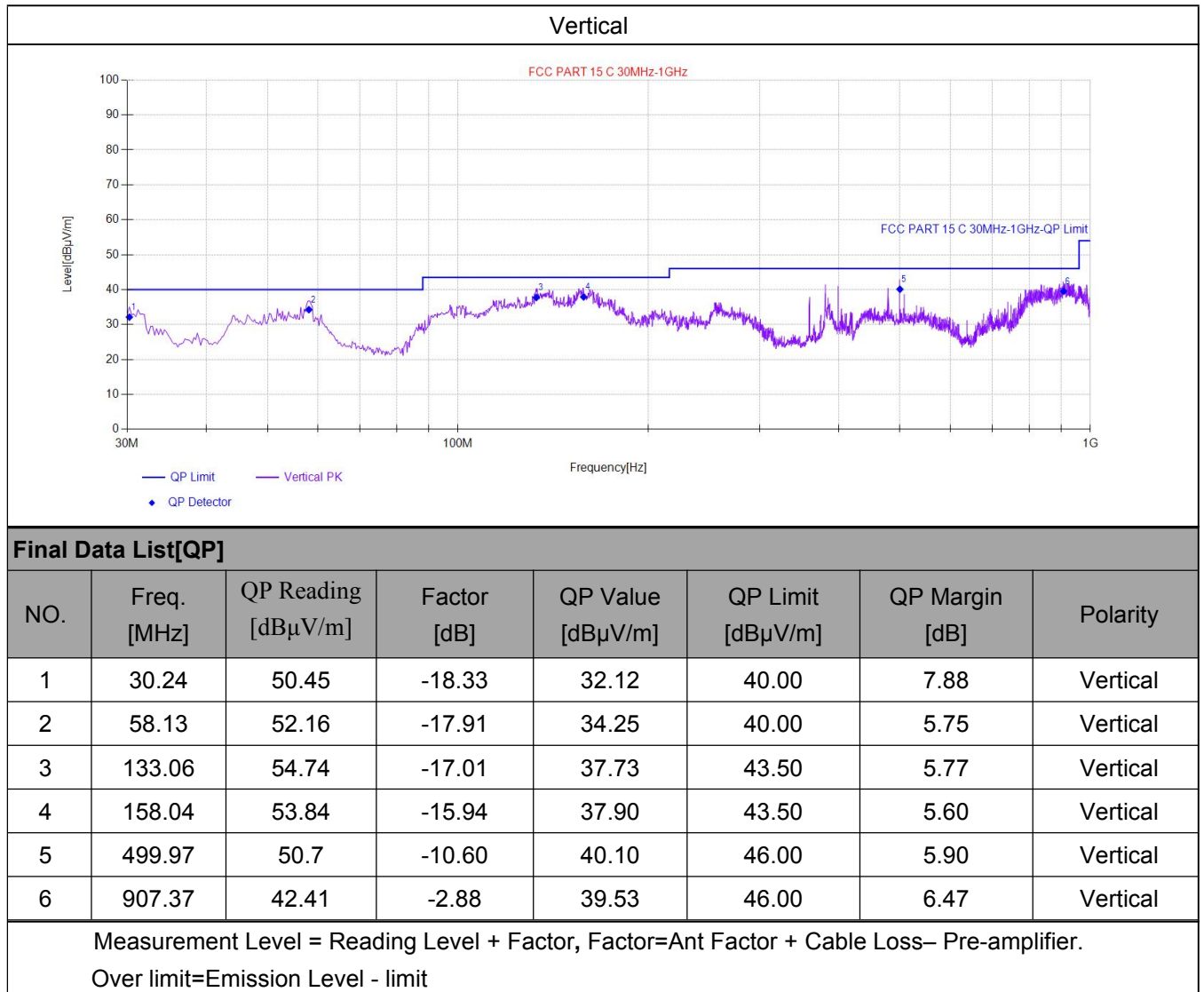
#### **4.2.3 Radiated Emissions Test Data**

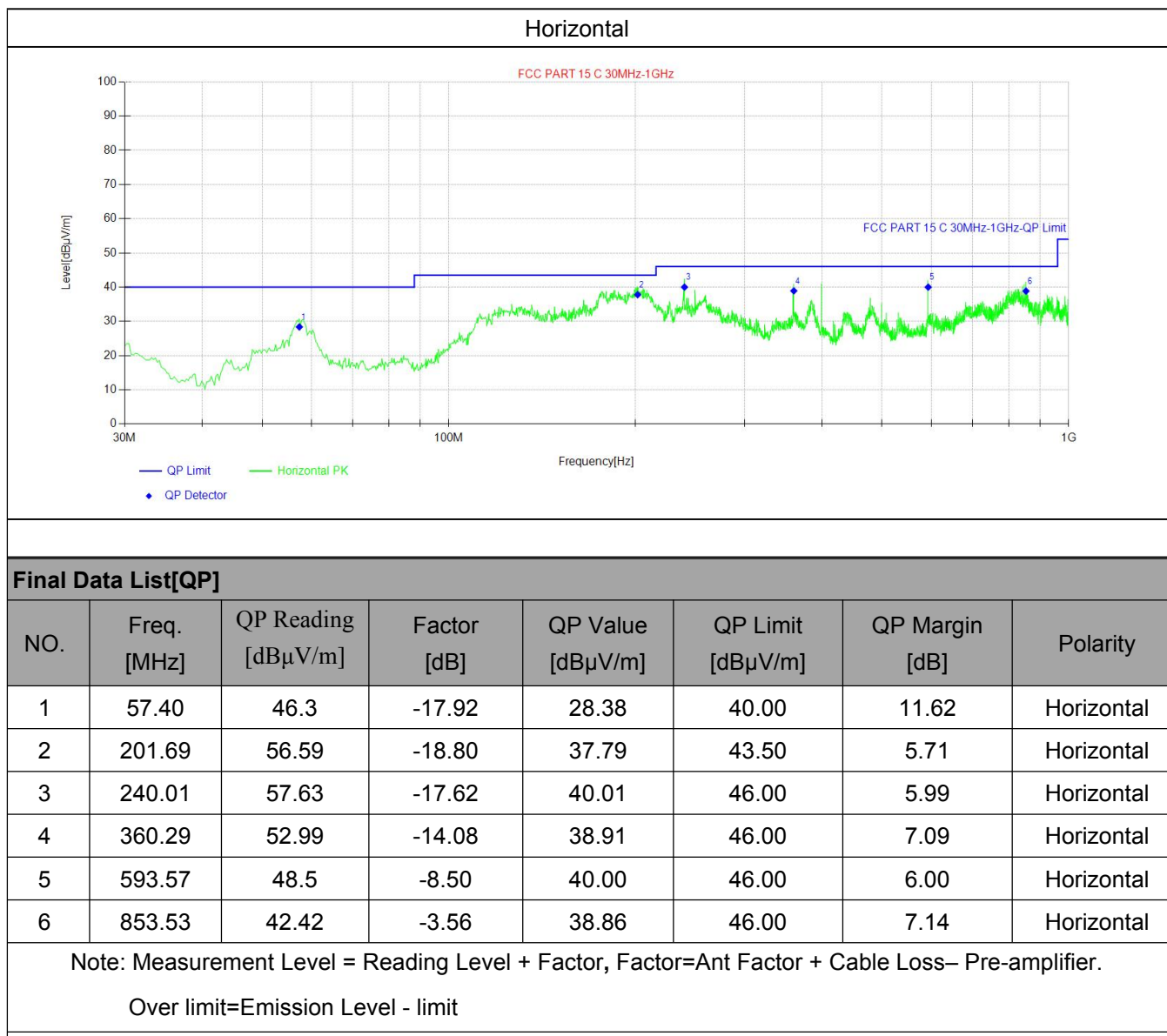
##### **9 kHz~30 MHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement**

The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.



### 30 MHz~1 GHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement







**1~40 GHz Field Strength of Fundamental & Field Strength of Unwanted Emissions.**

**Peak & Average Measurement.**

**Note:all model are tested and just worst case is record.**

|               |                                                                                                                                                                                   |                       |               |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|
| TX Mode:      | Ant1                                                                                                                                                                              | Measurement Distance: | 3 m           |
| Test channel: | 802.11a-5745 MHz                                                                                                                                                                  | Frequency Range:      | 1GHz to 40GHz |
| RBW/VBW:      | Spurious emission: 1MHz/3MHz for Peak, 1MHz/10Hz for Average.                                                                                                                     |                       |               |
| Remark:       | 1. Average measurement was not performed if peak level lower than average limit.<br>2. Other frequency was 20dB below limit line within 1-40GHz, there is not show in the report. |                       |               |

| Vertical        |                      |                     |                        |                |             |               |
|-----------------|----------------------|---------------------|------------------------|----------------|-------------|---------------|
| Frequency (MHz) | Reading Level (dBuV) | Correct Factor (dB) | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
| 11490.000       | 33.84                | 16.82               | 50.66                  | 74.00          | -23.34      | PEAK          |
| 11490.000       | 23.34                | 16.82               | 40.16                  | 54.00          | -13.84      | AV            |
| 17235.000       | 35.72                | 22.93               | 58.65                  | 74.00          | -15.35      | PEAK          |
| 17235.000       | 20.11                | 22.93               | 43.04                  | 54.00          | -10.94      | AV            |
| Horizontal      |                      |                     |                        |                |             |               |
| Frequency (MHz) | Reading Level (dBuV) | Correct Factor (dB) | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
| 11490.000       | 34.21                | 16.82               | 51.03                  | 74.00          | -22.97      | PEAK          |
| 11490.000       | 22.84                | 16.82               | 39.66                  | 54.00          | -14.34      | AV            |
| 17235.000       | 35.58                | 22.93               | 58.51                  | 74.00          | -15.49      | PEAK          |
| 17235.000       | 23.98                | 22.93               | 46.91                  | 54.00          | -7.09       | AV            |

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.

Average measurement was not performed if peak level lower than average limit.

No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.



|                 |                                                                                                                                                                                   |                       |                        |                |             |               |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------|----------------|-------------|---------------|
| TX Mode:        | Ant1                                                                                                                                                                              | Measurement Distance: | 3 m                    |                |             |               |
| Test channel:   | 802.11a-5785 MHz                                                                                                                                                                  | Frequency Range:      | 1GHz to 40GHz          |                |             |               |
| RBW/VBW:        | Spurious emission: 1MHz/3MHz for Peak, 1MHz/10Hz for Average.                                                                                                                     |                       |                        |                |             |               |
| Remark:         | 1. Average measurement was not performed if peak level lower than average limit.<br>2. Other frequency was 20dB below limit line within 1-40GHz, there is not show in the report. |                       |                        |                |             |               |
| Vertical        |                                                                                                                                                                                   |                       |                        |                |             |               |
| Frequency (MHz) | Reading Level (dBuV)                                                                                                                                                              | Correct Factor (dB)   | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
| 11570.000       | 34.10                                                                                                                                                                             | 16.71                 | 50.81                  | 74.00          | -23.19      | PEAK          |
| 11570.000       | 24.00                                                                                                                                                                             | 16.71                 | 40.71                  | 54.00          | -13.29      | AV            |
| 17355.000       | 36.79                                                                                                                                                                             | 24.37                 | 61.16                  | 74.00          | -12.84      | PEAK          |
| 17355.000       | 20.79                                                                                                                                                                             | 24.37                 | 45.16                  | 54.00          | -9.84       | AV            |
| Horizontal      |                                                                                                                                                                                   |                       |                        |                |             |               |
| Frequency (MHz) | Reading Level (dBuV)                                                                                                                                                              | Correct Factor (dB)   | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
| 11570.000       | 33.25                                                                                                                                                                             | 16.71                 | 49.96                  | 74.00          | -24.04      | PEAK          |
| 11570.000       | 24.03                                                                                                                                                                             | 16.71                 | 40.74                  | 54.00          | -13.26      | AV            |
| 17355.000       | 35.58                                                                                                                                                                             | 24.37                 | 59.95                  | 74.00          | -14.05      | PEAK          |
| 17355.000       | 18.99                                                                                                                                                                             | 24.37                 | 43.36                  | 54.00          | -9.64       | AV            |

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor.

Average measurement was not performed if peak level lower than average limit.

No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.



|                 |                                                                                                                                                                                   |                       |                        |                |             |               |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------|----------------|-------------|---------------|
| TX Mode:        | Ant1                                                                                                                                                                              | Measurement Distance: | 3 m                    |                |             |               |
| Test channel:   | 802.11a-5825 MHz                                                                                                                                                                  | Frequency Range:      | 1GHz to 40GHz          |                |             |               |
| RBW/VBW:        | Spurious emission: 1MHz/3MHz for Peak, 1MHz/10Hz for Average.                                                                                                                     |                       |                        |                |             |               |
| Remark:         | 1. Average measurement was not performed if peak level lower than average limit.<br>2. Other frequency was 20dB below limit line within 1-40GHz, there is not show in the report. |                       |                        |                |             |               |
| Vertical        |                                                                                                                                                                                   |                       |                        |                |             |               |
| Frequency (MHz) | Reading Level (dBuV)                                                                                                                                                              | Correct Factor (dB)   | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
| 11650.000       | 34.12                                                                                                                                                                             | 16.61                 | 50.73                  | 74.00          | -23.27      | PEAK          |
| 11650.000       | 25.32                                                                                                                                                                             | 16.61                 | 41.93                  | 54.00          | -12.07      | AV            |
| 17475.000       | 29.38                                                                                                                                                                             | 25.01                 | 54.39                  | 74.00          | -19.61      | PEAK          |
| 17475.000       | 19.44                                                                                                                                                                             | 25.01                 | 44.45                  | 54.00          | -9.55       | AV            |
| Horizontal      |                                                                                                                                                                                   |                       |                        |                |             |               |
| Frequency (MHz) | Reading Level (dBuV)                                                                                                                                                              | Correct Factor (dB)   | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
| 11650.000       | 35.72                                                                                                                                                                             | 16.61                 | 52.33                  | 74.00          | -21.67      | PEAK          |
| 11650.000       | 24.12                                                                                                                                                                             | 16.61                 | 40.73                  | 54.00          | -13.27      | AV            |
| 17475.000       | 28.82                                                                                                                                                                             | 25.01                 | 53.83                  | 74.00          | -20.17      | PEAK          |
| 17475.000       | 19.42                                                                                                                                                                             | 25.01                 | 44.43                  | 54.00          | -9.57       | AV            |

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor.

Average measurement was not performed if peak level lower than average limit.

No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.



|                 |                                                                                                                                                                                   |                     |                        |                       |               |               |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------------|-----------------------|---------------|---------------|
| TX Mode:        | Ant1                                                                                                                                                                              |                     |                        | Measurement Distance: | 3 m           |               |
| Test channel:   | 802.11n HT20-5745MHz                                                                                                                                                              |                     |                        | Frequency Range:      | 1GHz to 40GHz |               |
| RBW/VBW:        | Spurious emission: 1MHz/3MHz for Peak, 1MHz/10Hz for Average.                                                                                                                     |                     |                        |                       |               |               |
| Remark:         | 1. Average measurement was not performed if peak level lower than average limit.<br>2. Other frequency was 20dB below limit line within 1-40GHz, there is not show in the report. |                     |                        |                       |               |               |
| Vertical        |                                                                                                                                                                                   |                     |                        |                       |               |               |
| Frequency (MHz) | Reading Level (dBuV)                                                                                                                                                              | Correct Factor (dB) | Measure Level (dBuV/m) | Limit (dBuV/m)        | Margin (dB)   | Detector Type |
| 11490.000       | 34.95                                                                                                                                                                             | 16.82               | 51.77                  | 74.00                 | -22.23        | PEAK          |
| 11490.000       | 28.15                                                                                                                                                                             | 16.82               | 44.97                  | 54.00                 | -9.03         | AV            |
| 17235.000       | 29.91                                                                                                                                                                             | 22.93               | 52.84                  | 74.00                 | -21.16        | PEAK          |
| 17235.000       | 19.95                                                                                                                                                                             | 22.93               | 42.88                  | 54.00                 | -11.12        | AV            |
| Horizontal      |                                                                                                                                                                                   |                     |                        |                       |               |               |
| Frequency (MHz) | Reading Level (dBuV)                                                                                                                                                              | Correct Factor (dB) | Measure Level (dBuV/m) | Limit (dBuV/m)        | Margin (dB)   | Detector Type |
| 11570.000       | 35.83                                                                                                                                                                             | 16.71               | 52.54                  | 74.00                 | -21.46        | PEAK          |
| 11570.000       | 27.23                                                                                                                                                                             | 16.71               | 43.94                  | 54.00                 | -10.06        | AV            |
| 17235.000       | 28.42                                                                                                                                                                             | 22.93               | 51.35                  | 74.00                 | -22.65        | PEAK          |
| 17235.000       | 21.92                                                                                                                                                                             | 22.93               | 44.85                  | 54.00                 | -9.15         | AV            |

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor.

Average measurement was not performed if peak level lower than average limit.

No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.



|               |                                                                                                                                                                                   |                       |               |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|
| TX Mode:      | Ant1                                                                                                                                                                              | Measurement Distance: | 3 m           |
| Test channel: | 802.11n HT20-5785MHz                                                                                                                                                              | Frequency Range:      | 1GHz to 40GHz |
| RBW/VBW:      | Spurious emission: 1MHz/3MHz for Peak, 1MHz/10Hz for Average.                                                                                                                     |                       |               |
| Remark:       | 1. Average measurement was not performed if peak level lower than average limit.<br>2. Other frequency was 20dB below limit line within 1-40GHz, there is not show in the report. |                       |               |

| Vertical        |                      |                     |                        |                |             |               |
|-----------------|----------------------|---------------------|------------------------|----------------|-------------|---------------|
| Frequency (MHz) | Reading Level (dBuV) | Correct Factor (dB) | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
| 11570.000       | 35.39                | 16.71               | 52.10                  | 74.00          | -21.90      | PEAK          |
| 11570.000       | 27.74                | 16.71               | 44.45                  | 54.00          | -9.55       | AV            |
| 17355.000       | 28.72                | 24.37               | 53.09                  | 74.00          | -20.91      | PEAK          |
| 17355.000       | 20.58                | 24.37               | 44.95                  | 54.00          | -9.05       | AV            |
| Horizontal      |                      |                     |                        |                |             |               |
| Frequency (MHz) | Reading Level (dBuV) | Correct Factor (dB) | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
| 11570.000       | 36.12                | 16.71               | 52.83                  | 74.00          | -21.17      | PEAK          |
| 11570.000       | 26.74                | 16.71               | 43.45                  | 54.00          | -10.55      | AV            |
| 17355.000       | 29.48                | 24.37               | 53.85                  | 74.00          | -20.15      | PEAK          |
| 17355.000       | 19.58                | 24.37               | 43.95                  | 54.00          | -10.05      | AV            |

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor.

Average measurement was not performed if peak level lower than average limit.

No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.



|                 |                                                                                                                                                                                   |                       |                        |                |             |               |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------|----------------|-------------|---------------|
| TX Mode:        | Ant1                                                                                                                                                                              | Measurement Distance: | 3 m                    |                |             |               |
| Test channel:   | 802.11n HT20-5825MHz                                                                                                                                                              | Frequency Range:      | 1GHz to 40GHz          |                |             |               |
| RBW/VBW:        | Spurious emission: 1MHz/3MHz for Peak, 1MHz/10Hz for Average                                                                                                                      |                       |                        |                |             |               |
| Remark:         | 1. Average measurement was not performed if peak level lower than average limit.<br>2. Other frequency was 20dB below limit line within 1-40GHz, there is not show in the report. |                       |                        |                |             |               |
| Vertical        |                                                                                                                                                                                   |                       |                        |                |             |               |
| Frequency (MHz) | Reading Level (dBuV)                                                                                                                                                              | Correct Factor (dB)   | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
| 11650.000       | 33.56                                                                                                                                                                             | 16.61                 | 50.17                  | 74.00          | -23.83      | PEAK          |
| 11650.000       | 28.23                                                                                                                                                                             | 16.61                 | 44.04                  | 54.00          | -9.96       | AV            |
| 17475.000       | 29.71                                                                                                                                                                             | 25.01                 | 54.72                  | 74.00          | -19.28      | PEAK          |
| 17475.000       | 18.86                                                                                                                                                                             | 25.01                 | 43.87                  | 54.00          | -10.13      | AV            |
| Horizontal      |                                                                                                                                                                                   |                       |                        |                |             |               |
| Frequency (MHz) | Reading Level (dBuV)                                                                                                                                                              | Correct Factor (dB)   | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
| 11650.000       | 34.82                                                                                                                                                                             | 16.61                 | 51.43                  | 74.00          | -22.57      | PEAK          |
| 11650.000       | 28.21                                                                                                                                                                             | 16.61                 | 44.03                  | 54.00          | -9.97       | AV            |
| 17475.000       | 28.37                                                                                                                                                                             | 25.01                 | 53.38                  | 74.00          | -20.62      | PEAK          |
| 17475.000       | 18.36                                                                                                                                                                             | 25.01                 | 43.37                  | 54.00          | -10.63      | AV            |

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.

Average measurement was not performed if peak level lower than average limit.

No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.



|                    |                                                                                                                                                                                   |                           |                              |                       |                |               |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------------------|-----------------------|----------------|---------------|
| TX Mode:           | Ant1                                                                                                                                                                              |                           |                              | Measurement Distance: | 3 m            |               |
| Test channel:      | 802.11n HT40-5755MHz                                                                                                                                                              |                           |                              | Frequency Range:      | 1GHz to 40GHz  |               |
| RBW/VBW:           | Spurious emission: 1MHz/3MHz for Peak, 1MHz/10Hz for Average.                                                                                                                     |                           |                              |                       |                |               |
| Remark:            | 1. Average measurement was not performed if peak level lower than average limit.<br>2. Other frequency was 20dB below limit line within 1-40GHz, there is not show in the report. |                           |                              |                       |                |               |
| Vertical           |                                                                                                                                                                                   |                           |                              |                       |                |               |
| Frequency<br>(MHz) | Reading<br>Level<br>(dBuV)                                                                                                                                                        | Correct<br>Factor<br>(dB) | Measure<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m)     | Margin<br>(dB) | Detector Type |
| 11510.000          | 34.59                                                                                                                                                                             | 16.78                     | 51.37                        | 74.00                 | -22.63         | PEAK          |
| 11510.000          | 24.59                                                                                                                                                                             | 16.78                     | 41.37                        | 54.00                 | -12.63         | AV            |
| 17265.000          | 28.31                                                                                                                                                                             | 23.29                     | 51.60                        | 74.00                 | -22.40         | PEAK          |
| 17265.000          | 19.31                                                                                                                                                                             | 23.29                     | 42.60                        | 54.00                 | -11.40         | AV            |
| Horizontal         |                                                                                                                                                                                   |                           |                              |                       |                |               |
| Frequency<br>(MHz) | Reading<br>Level<br>(dBuV)                                                                                                                                                        | Correct<br>Factor<br>(dB) | Measure<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m)     | Margin<br>(dB) | Detector Type |
| 11510.000          | 35.12                                                                                                                                                                             | 16.78                     | 51.90                        | 74.00                 | -22.10         | PEAK          |
| 11510.000          | 25.19                                                                                                                                                                             | 16.78                     | 41.97                        | 54.00                 | -12.03         | AV            |
| 17265.000          | 29.43                                                                                                                                                                             | 23.29                     | 52.72                        | 74.00                 | -21.28         | PEAK          |
| 17265.000          | 19.51                                                                                                                                                                             | 23.29                     | 42.80                        | 54.00                 | -11.20         | AV            |

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor.

Average measurement was not performed if peak level lower than average limit.

No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.



|                 |                                                                                                                                                                                   |                     |                        |                       |               |               |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------------|-----------------------|---------------|---------------|
| TX Mode:        | Ant1                                                                                                                                                                              |                     |                        | Measurement Distance: | 3 m           |               |
| Test channel:   | 802.11n HT40-5795MHz                                                                                                                                                              |                     |                        | Frequency Range:      | 1GHz to 40GHz |               |
| RBW/VBW:        | Spurious emission: 1MHz/3MHz for Peak, 1MHz/10Hz for Average.                                                                                                                     |                     |                        |                       |               |               |
| Remark:         | 1. Average measurement was not performed if peak level lower than average limit.<br>2. Other frequency was 20dB below limit line within 1-40GHz, there is not show in the report. |                     |                        |                       |               |               |
| Vertical        |                                                                                                                                                                                   |                     |                        |                       |               |               |
| Frequency (MHz) | Reading Level (dBuV)                                                                                                                                                              | Correct Factor (dB) | Measure Level (dBuV/m) | Limit (dBuV/m)        | Margin (dB)   | Detector Type |
| 11590.000       | 36.31                                                                                                                                                                             | 16.69               | 53.00                  | 74.00                 | -21.00        | PEAK          |
| 11590.000       | 26.81                                                                                                                                                                             | 16.69               | 43.50                  | 54.00                 | -10.50        | AV            |
| 17385.000       | 31.40                                                                                                                                                                             | 24.73               | 56.13                  | 74.00                 | -17.87        | PEAK          |
| 17385.000       | 19.32                                                                                                                                                                             | 24.73               | 44.05                  | 54.00                 | -9.95         | AV            |
| Horizontal      |                                                                                                                                                                                   |                     |                        |                       |               |               |
| Frequency (MHz) | Reading Level (dBuV)                                                                                                                                                              | Correct Factor (dB) | Measure Level (dBuV/m) | Limit (dBuV/m)        | Margin (dB)   | Detector Type |
| 11590.000       | 34.87                                                                                                                                                                             | 16.69               | 51.56                  | 74.00                 | -22.44        | PEAK          |
| 11590.000       | 27.11                                                                                                                                                                             | 16.69               | 43.80                  | 54.00                 | -10.20        | AV            |
| 17385.000       | 28.20                                                                                                                                                                             | 24.73               | 52.93                  | 74.00                 | -21.07        | PEAK          |
| 17385.000       | 19.92                                                                                                                                                                             | 24.73               | 44.65                  | 54.00                 | -9.35         | AV            |

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.

Average measurement was not performed if peak level lower than average limit.

No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.



|                 |                                                                                                                                                                                   |                       |                        |                |             |               |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------|----------------|-------------|---------------|
| TX Mode:        | Ant1                                                                                                                                                                              | Measurement Distance: | 3 m                    |                |             |               |
| Test channel:   | 802.11ac HT20-5745MHz                                                                                                                                                             | Frequency Range:      | 1GHz to 40GHz          |                |             |               |
| RBW/VBW:        | Spurious emission: 1MHz/3MHz for Peak, 1MHz/10Hz for Average.                                                                                                                     |                       |                        |                |             |               |
| Remark:         | 1. Average measurement was not performed if peak level lower than average limit.<br>2. Other frequency was 20dB below limit line within 1-40GHz, there is not show in the report. |                       |                        |                |             |               |
| Vertical        |                                                                                                                                                                                   |                       |                        |                |             |               |
| Frequency (MHz) | Reading Level (dBuV)                                                                                                                                                              | Correct Factor (dB)   | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
| 11490.000       | 34.93                                                                                                                                                                             | 16.82                 | 51.75                  | 74.00          | -22.25      | PEAK          |
| 11490.000       | 27.30                                                                                                                                                                             | 16.82                 | 44.12                  | 54.00          | -9.88       | AV            |
| 17235.000       | 32.76                                                                                                                                                                             | 22.93                 | 55.69                  | 74.00          | -18.31      | PEAK          |
| 17235.000       | 20.96                                                                                                                                                                             | 22.93                 | 43.89                  | 54.00          | -10.11      | AV            |
| Horizontal      |                                                                                                                                                                                   |                       |                        |                |             |               |
| Frequency (MHz) | Reading Level (dBuV)                                                                                                                                                              | Correct Factor (dB)   | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
| 11490.000       | 36.17                                                                                                                                                                             | 16.82                 | 52.99                  | 74.00          | -21.01      | PEAK          |
| 11490.000       | 27.20                                                                                                                                                                             | 16.82                 | 44.02                  | 54.00          | -9.98       | AV            |
| 17235.000       | 28.22                                                                                                                                                                             | 22.93                 | 51.15                  | 74.00          | -22.85      | PEAK          |
| 17235.000       | 20.72                                                                                                                                                                             | 22.93                 | 43.65                  | 54.00          | -10.35      | AV            |

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.

Average measurement was not performed if peak level lower than average limit.

No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.



|                    |                                                                                                                                                                                   |                           |                              |                       |                |               |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------------------|-----------------------|----------------|---------------|
| TX Mode:           | Ant1                                                                                                                                                                              |                           |                              | Measurement Distance: | 3 m            |               |
| Test channel:      | 802.11ac HT20-5785MHz                                                                                                                                                             |                           |                              | Frequency Range:      | 1GHz to 40GHz  |               |
| RBW/VBW:           | Spurious emission: 1MHz/3MHz for Peak, 1MHz/10Hz for Average.                                                                                                                     |                           |                              |                       |                |               |
| Remark:            | 1. Average measurement was not performed if peak level lower than average limit.<br>2. Other frequency was 20dB below limit line within 1-40GHz, there is not show in the report. |                           |                              |                       |                |               |
| Vertical           |                                                                                                                                                                                   |                           |                              |                       |                |               |
| Frequency<br>(MHz) | Reading<br>Level<br>(dBuV)                                                                                                                                                        | Correct<br>Factor<br>(dB) | Measure<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m)     | Margin<br>(dB) | Detector Type |
| 11570.000          | 35.86                                                                                                                                                                             | 16.71                     | 52.57                        | 74.00                 | -21.43         | PEAK          |
| 11570.000          | 23.77                                                                                                                                                                             | 16.71                     | 40.48                        | 54.00                 | -13.52         | AV            |
| 17355.000          | 29.14                                                                                                                                                                             | 24.37                     | 53.51                        | 74.00                 | -20.49         | PEAK          |
| 17355.000          | 12.41                                                                                                                                                                             | 24.37                     | 36.78                        | 54.00                 | -17.22         | AV            |
| Horizontal         |                                                                                                                                                                                   |                           |                              |                       |                |               |
| Frequency<br>(MHz) | Reading<br>Level<br>(dBuV)                                                                                                                                                        | Correct<br>Factor<br>(dB) | Measure<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m)     | Margin<br>(dB) | Detector Type |
| 11570.000          | 34.27                                                                                                                                                                             | 16.71                     | 50.98                        | 74.00                 | -23.02         | PEAK          |
| 11570.000          | 24.27                                                                                                                                                                             | 16.71                     | 40.98                        | 54.00                 | -13.02         | AV            |
| 17355.000          | 28.66                                                                                                                                                                             | 24.37                     | 53.03                        | 74.00                 | -20.97         | PEAK          |
| 17355.000          | 11.59                                                                                                                                                                             | 24.37                     | 35.96                        | 54.00                 | -18.04         | AV            |

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.

Average measurement was not performed if peak level lower than average limit.

No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.



|                    |                                                                                                                                                                                   |                           |                              |                       |                |               |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------------------|-----------------------|----------------|---------------|
| TX Mode:           | Ant1                                                                                                                                                                              |                           |                              | Measurement Distance: | 3 m            |               |
| Test channel:      | 802.11ac HT20-5825MHz                                                                                                                                                             |                           |                              | Frequency Range:      | 1GHz to 40GHz  |               |
| RBW/VBW:           | Spurious emission: 1MHz/3MHz for Peak, 1MHz/10Hz for Average.                                                                                                                     |                           |                              |                       |                |               |
| Remark:            | 1. Average measurement was not performed if peak level lower than average limit.<br>2. Other frequency was 20dB below limit line within 1-40GHz, there is not show in the report. |                           |                              |                       |                |               |
| Vertical           |                                                                                                                                                                                   |                           |                              |                       |                |               |
| Frequency<br>(MHz) | Reading<br>Level<br>(dBuV)                                                                                                                                                        | Correct<br>Factor<br>(dB) | Measure<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m)     | Margin<br>(dB) | Detector Type |
| 11650.000          | 35.58                                                                                                                                                                             | 16.61                     | 52.19                        | 74.00                 | -21.81         | PEAK          |
| 11650.000          | 22.79                                                                                                                                                                             | 16.61                     | 39.40                        | 54.00                 | -14.60         | AV            |
| 17475.000          | 29.30                                                                                                                                                                             | 25.01                     | 54.31                        | 74.00                 | -19.69         | PEAK          |
| 17475.000          | 19.30                                                                                                                                                                             | 25.01                     | 44.71                        | 54.00                 | -9.29          | AV            |
| Horizontal         |                                                                                                                                                                                   |                           |                              |                       |                |               |
| Frequency<br>(MHz) | Reading<br>Level<br>(dBuV)                                                                                                                                                        | Correct<br>Factor<br>(dB) | Measure<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m)     | Margin<br>(dB) | Detector Type |
| 11650.000          | 33.29                                                                                                                                                                             | 16.61                     | 49.90                        | 74.00                 | -24.10         | PEAK          |
| 11650.000          | 23.29                                                                                                                                                                             | 16.61                     | 39.90                        | 54.00                 | -14.10         | AV            |
| 17475.000          | 28.76                                                                                                                                                                             | 25.01                     | 53.77                        | 74.00                 | -20.23         | PEAK          |
| 17475.000          | 18.93                                                                                                                                                                             | 25.01                     | 43.94                        | 54.00                 | -10.06         | AV            |

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.

Average measurement was not performed if peak level lower than average limit.

No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.



|                 |                                                                                                                                                                                   |                       |                        |                |             |               |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------|----------------|-------------|---------------|
| TX Mode:        | Ant1                                                                                                                                                                              | Measurement Distance: | 3 m                    |                |             |               |
| Test channel:   | 802.11ac HT40-5755MHz                                                                                                                                                             | Frequency Range:      | 1GHz to 40GHz          |                |             |               |
| RBW/VBW:        | Spurious emission: 1MHz/3MHz for Peak, 1MHz/10Hz for Average.                                                                                                                     |                       |                        |                |             |               |
| Remark:         | 1. Average measurement was not performed if peak level lower than average limit.<br>2. Other frequency was 20dB below limit line within 1-40GHz, there is not show in the report. |                       |                        |                |             |               |
| Vertical        |                                                                                                                                                                                   |                       |                        |                |             |               |
| Frequency (MHz) | Reading Level (dBuV)                                                                                                                                                              | Correct Factor (dB)   | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
| 11510.000       | 36.37                                                                                                                                                                             | 16.78                 | 53.15                  | 74.00          | -20.85      | PEAK          |
| 11510.000       | 26.15                                                                                                                                                                             | 16.78                 | 42.93                  | 54.00          | -11.07      | AV            |
| 17265.000       | 32.92                                                                                                                                                                             | 23.29                 | 56.21                  | 74.00          | -17.79      | PEAK          |
| 17265.000       | 21.20                                                                                                                                                                             | 23.29                 | 44.49                  | 54.00          | -19.51      | AV            |
| Horizontal      |                                                                                                                                                                                   |                       |                        |                |             |               |
| Frequency (MHz) | Reading Level (dBuV)                                                                                                                                                              | Correct Factor (dB)   | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
| 11510.000       | 34.85                                                                                                                                                                             | 16.78                 | 51.63                  | 74.00          | -22.37      | PEAK          |
| 11510.000       | 27.15                                                                                                                                                                             | 16.78                 | 43.93                  | 54.00          | -10.07      | AV            |
| 17265.000       | 31.20                                                                                                                                                                             | 23.29                 | 54.49                  | 74.00          | -19.51      | PEAK          |
| 17265.000       | 21.16                                                                                                                                                                             | 23.29                 | 44.45                  | 54.00          | -9.55       | AV            |

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.

Average measurement was not performed if peak level lower than average limit.

No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.



|                 |                                                                                                                                                                                   |                       |                        |                |             |               |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------|----------------|-------------|---------------|
| TX Mode:        | Ant1                                                                                                                                                                              | Measurement Distance: | 3 m                    |                |             |               |
| Test channel:   | 802.11ac HT40-5795MHz                                                                                                                                                             | Frequency Range:      | 1GHz to 40GHz          |                |             |               |
| RBW/VBW:        | Spurious emission: 1MHz/3MHz for Peak, 1MHz/10Hz for Average.                                                                                                                     |                       |                        |                |             |               |
| Remark:         | 1. Average measurement was not performed if peak level lower than average limit.<br>2. Other frequency was 20dB below limit line within 1-40GHz, there is not show in the report. |                       |                        |                |             |               |
| Vertical        |                                                                                                                                                                                   |                       |                        |                |             |               |
| Frequency (MHz) | Reading Level (dBuV)                                                                                                                                                              | Correct Factor (dB)   | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
| 11590.000       | 33.17                                                                                                                                                                             | 16.69                 | 49.86                  | 74.00          | -24.14      | PEAK          |
| 11590.000       | 25.80                                                                                                                                                                             | 16.69                 | 42.49                  | 54.00          | -11.51      | AV            |
| 17385.000       | 31.62                                                                                                                                                                             | 24.73                 | 56.35                  | 74.00          | -17.65      | PEAK          |
| 17385.000       | 20.02                                                                                                                                                                             | 24.73                 | 44.75                  | 54.00          | -9.25       | AV            |
| Horizontal      |                                                                                                                                                                                   |                       |                        |                |             |               |
| Frequency (MHz) | Reading Level (dBuV)                                                                                                                                                              | Correct Factor (dB)   | Measure Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector Type |
| 11590.000       | 34.80                                                                                                                                                                             | 16.69                 | 51.49                  | 74.00          | -22.51      | PEAK          |
| 11590.000       | 24.81                                                                                                                                                                             | 16.69                 | 41.50                  | 54.00          | -12.50      | AV            |
| 17385.000       | 30.35                                                                                                                                                                             | 24.73                 | 55.08                  | 74.00          | -18.92      | PEAK          |
| 17385.000       | 19.62                                                                                                                                                                             | 24.73                 | 44.35                  | 54.00          | -9.65       | AV            |

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.

Average measurement was not performed if peak level lower than average limit.

No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.

## 4.3 Radiated Restricted Band Edge Measurement

### 4.3.1 Applied procedures / Limit

*Undesirable emission limits.* Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.
- (4) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.
- (5) The provisions of §15.205 apply to intentional radiators operating under this section. (6) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

### 4.3.2 Test procedure

For Band edge

| Spectrum Parameter                    | Setting                                                |
|---------------------------------------|--------------------------------------------------------|
| Detector                              | Peak                                                   |
| Start/Stop Frequency                  | Lower Band Edge: 5150 MHz<br>Upper Band Edge: 5350 MHz |
| RB / VB (emission in restricted band) | 1000 KHz/3000 KHz                                      |
| Trace-Mode:                           | Max hold                                               |

For Band edge

| Spectrum Parameter                    | Setting                                                                |
|---------------------------------------|------------------------------------------------------------------------|
| Detector                              | Peak                                                                   |
| Start/Stop Frequency                  | Lower Band Edge: 5700 to 5725 MHz<br>Upper Band Edge: 5850 to 5870 MHz |
| RB / VB (emission in restricted band) | 1000 KHz/3000 KHz                                                      |
| Trace-Mode:                           | Max hold                                                               |



Test setup;



#### 4.3.3 Deviation from standard

No deviation.



#### 4.3.4 Test results

| TestMode  | Antenna | ChName | Frequenc<br>y[MHz] | Detector | Freq<br>[MHz] | Result<br>[dBm] | Limit<br>[dBm] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Verdict |
|-----------|---------|--------|--------------------|----------|---------------|-----------------|----------------|--------------------|-------------------|---------|
| 11A       | Ant1    | Low    | 5745               | Peak     | 5650.000      | -44.815         | ≤-27.00        | ---                | ---               | PASS    |
| 11A       | Ant1    | Low    | 5745               | Peak     | 5700.000      | -40.05          | ≤10.00         | ---                | ---               | PASS    |
| 11A       | Ant1    | Low    | 5745               | Peak     | 5720.000      | -30.05          | ≤15.60         | ---                | ---               | PASS    |
| 11A       | Ant1    | Low    | 5745               | Peak     | 5725.000      | -22.51          | ≤27.00         | - --               | - --              | PASS    |
| 11A       | Ant1    | High   | 5825               | Peak     | 5850.000      | -27.041         | ≤15.60         | ---                | ---               | PASS    |
| 11A       | Ant1    | High   | 5825               | Peak     | 5855.000      | -33.08          | ≤27.00         | ---                | ---               | PASS    |
| 11A       | Ant1    | High   | 5825               | Peak     | 5875.000      | -39.76          | ≤15.60         | ---                | ---               | PASS    |
| 11A       | Ant1    | High   | 5825               | Peak     | 5925.000      | -42.02          | ≤10.00         | - --               | - --              | PASS    |
| 11N20SISO | Ant1    | Low    | 5745               | Peak     | 5650.000      | -44.661         | ≤-27.00        | ---                | ---               | PASS    |
| 11N20SISO | Ant1    | Low    | 5745               | Peak     | 5700.000      | -42.18          | ≤10.00         | ---                | ---               | PASS    |
| 11N20SISO | Ant1    | Low    | 5745               | Peak     | 5720.000      | -29.31          | ≤15.60         | ---                | ---               | PASS    |
| 11N20SISO | Ant1    | Low    | 5745               | Peak     | 5725.000      | -24.65          | ≤27.00         | - --               | - --              | PASS    |
| 11N20SISO | Ant1    | High   | 5825               | Peak     | 5850.000      | -24.898         | ≤15.60         | ---                | ---               | PASS    |
| 11N20SISO | Ant1    | High   | 5825               | Peak     | 5855.000      | -34.2           | ≤27.00         | ---                | ---               | PASS    |
| 11N20SISO | Ant1    | High   | 5825               | Peak     | 5875.000      | -40.34          | ≤15.60         | ---                | ---               | PASS    |
| 11N20SISO | Ant1    | High   | 5825               | Peak     | 5925.000      | -43.52          | ≤10.00         | - --               | - --              | PASS    |
| 11N40SISO | Ant1    | Low    | 5755               | Peak     | 5650.000      | -44.226         | ≤-27.00        | ---                | ---               | PASS    |
| 11N40SISO | Ant1    | Low    | 5755               | Peak     | 5700.000      | -32.16          | ≤10.00         | ---                | ---               | PASS    |
| 11N40SISO | Ant1    | Low    | 5755               | Peak     | 5720.000      | -23.95          | ≤15.60         | ---                | ---               | PASS    |
| 11N40SISO | Ant1    | Low    | 5755               | Peak     | 5725.000      | -13.81          | ≤27.00         | - --               | - --              | PASS    |
| 11N40SISO | Ant1    | High   | 5795               | Peak     | 5850.000      | -35.967         | ≤15.60         | ---                | ---               | PASS    |
| 11N40SISO | Ant1    | High   | 5795               | Peak     | 5855.000      | -33.32          | ≤27.00         | ---                | ---               | PASS    |
| 11N40SISO | Ant1    | High   | 5795               | Peak     | 5875.000      | -44.11          | ≤15.60         | ---                | ---               | PASS    |
| 11N40SISO | Ant1    | High   | 5795               | Peak     | 5925.000      | -44.27          | ≤10.00         | - --               | - --              | PASS    |

**Note:**

1. The Antenna Gain is compensated in the graph.
2. For transmitters operating in 5150-5350 GHz band and 5470-5725 GHz band: The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.



11A-Ant1-Low-5745-Peak-5650.000



11A-Ant1-High-5825-Peak-5850.000



11N20SISO-Ant1-Low-5745-Peak-5650.000



11N20SISO-Ant1-High-5825-Peak-5850.000



11N40SISO-Ant1-Low-5755-Peak-5650.000



11N40SISO-Ant1-High-5795-Peak-5850.000





## 4.4 BANDWIDTH TEST

### 4.4.1 Applied procedures / Limit

The bandwidth at 26 dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum power control level, as defined in KDB 789033, at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26 dB bandwidth.

The 26 dB bandwidth is used to determine the conducted power limits.

There is no limit bandwidth for U-NII-1, U-NII-2-A and U-NII-2-C.

The minimum of 6dB Bandwidth measurement is 0.5 MHz for U-NII-3

### 4.4.2 Test procedure

#### 26 dB BANDWID PROCEDURES

- The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01
- Set RBW = approximately 1% of the emission bandwidth.
- Trace mode = max hold
- Detector = Peak
- Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%

#### 6 dB BANDWID PROCEDURES

- Set resolution bandwidth (RBW) = 100 kHz
- Set the video bandwidth (VBW)  $\geq 3 \times$  RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

#### 99% BANDWID PROCEDURES



1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW  $\geq 3 \cdot \text{RBW}$
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.



Report No.: PTC23021300802E-FC02

#### 4.4.3 Deviation from standard

No deviation.

#### 4.4.4 Test setup





#### 4.4.5 Test results

| TestMode  | Antenna | Frequency[MHz] | 26db EBW [MHz] | FL[MHz]  | FH[MHz]  | Limit[MHz] | Verdict |
|-----------|---------|----------------|----------------|----------|----------|------------|---------|
| 11A       | Ant1    | 5745           | 19.640         | 5735.160 | 5754.800 | ---        | ---     |
| 11A       | Ant1    | 5785           | 19.800         | 5775.040 | 5794.840 | ---        | ---     |
| 11A       | Ant1    | 5825           | 20.200         | 5814.760 | 5834.960 | ---        | ---     |
| 11N20SISO | Ant1    | 5745           | 23.000         | 5732.200 | 5755.200 | ---        | ---     |
| 11N20SISO | Ant1    | 5785           | 23.200         | 5773.760 | 5796.960 | ---        | ---     |
| 11N20SISO | Ant1    | 5825           | 23.000         | 5814.280 | 5837.280 | ---        | ---     |
| 11N40SISO | Ant1    | 5755           | 57.200         | 5722.360 | 5779.560 | ---        | ---     |
| 11N40SISO | Ant1    | 5795           | 49.200         | 5765.880 | 5815.080 | ---        | ---     |

11A-Ant1-5745



11A-Ant1-5785



11A-Ant1-5825



11N20SISO-Ant1-5745



11N20SISO-Ant1-5785



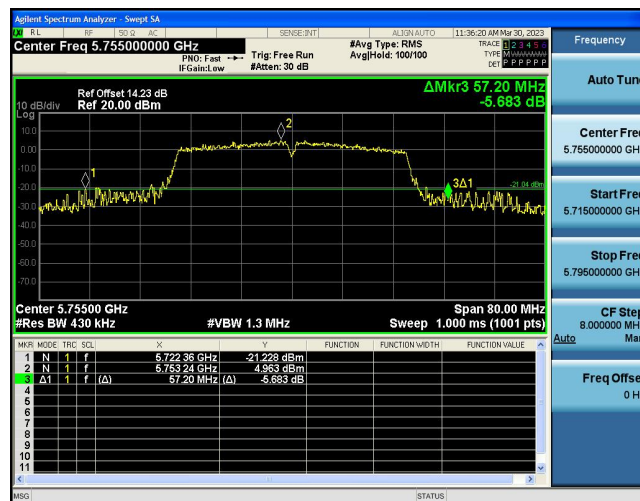
11N20SISO-Ant1-5825



Report No.: PTC23021300802E-FC02



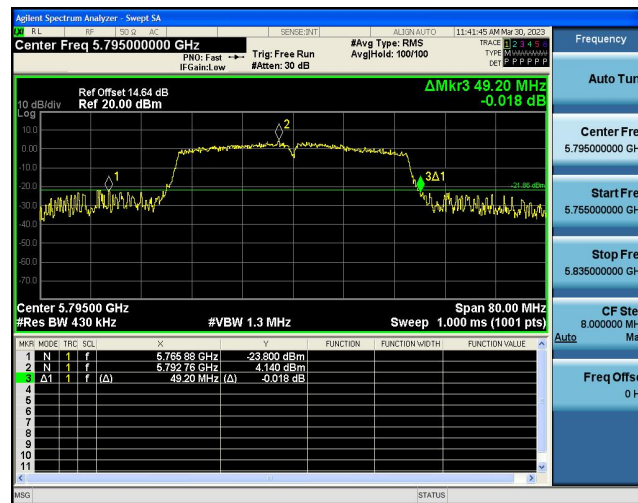
11N40SISO-Ant1-5755



11N40SISO-Ant1-5795



Report No.: PTC23021300802E-FC02

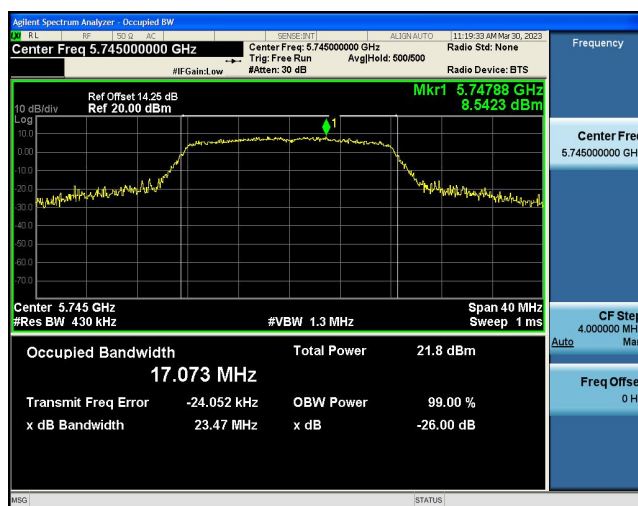




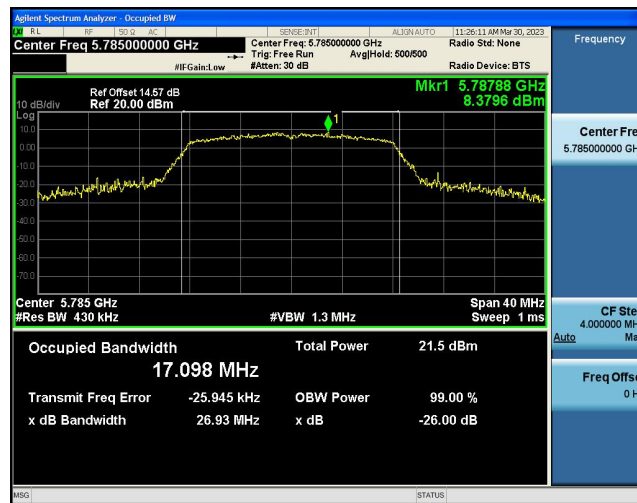
Occupied channel bandwidth

| TestMode  | Antenna | Frequency[MHz] | OCB [MHz] | FL[MHz]   | FH[MHz]   | Limit[MHz] | Verdict |
|-----------|---------|----------------|-----------|-----------|-----------|------------|---------|
| 11A       | Ant1    | 5745           | 17.073    | 5736.4395 | 5753.5125 | ---        | ---     |
| 11A       | Ant1    | 5785           | 17.098    | 5776.4251 | 5793.5231 | ---        | ---     |
| 11A       | Ant1    | 5825           | 17.020    | 5816.5235 | 5833.5435 | ---        | ---     |
| 11N20SISO | Ant1    | 5745           | 18.142    | 5735.9074 | 5754.0494 | ---        | ---     |
| 11N20SISO | Ant1    | 5785           | 18.031    | 5775.9685 | 5793.9995 | ---        | ---     |
| 11N20SISO | Ant1    | 5825           | 18.051    | 5816.0062 | 5834.0572 | ---        | ---     |
| 11N40SISO | Ant1    | 5755           | 36.642    | 5736.5262 | 5773.1682 | ---        | ---     |
| 11N40SISO | Ant1    | 5795           | 36.566    | 5776.5868 | 5813.1528 | ---        | ---     |

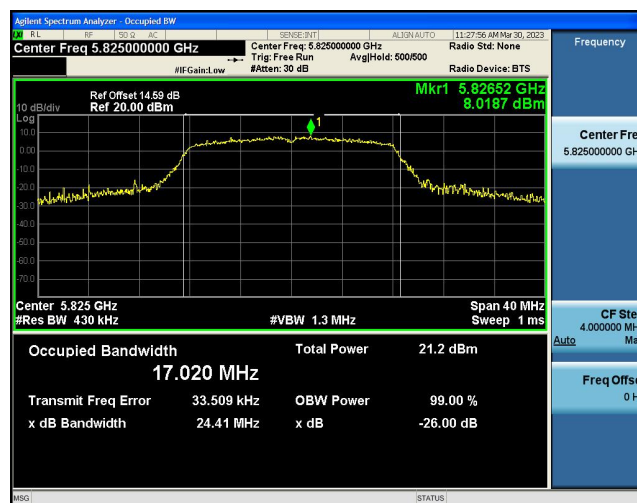
11A-Ant1-5745



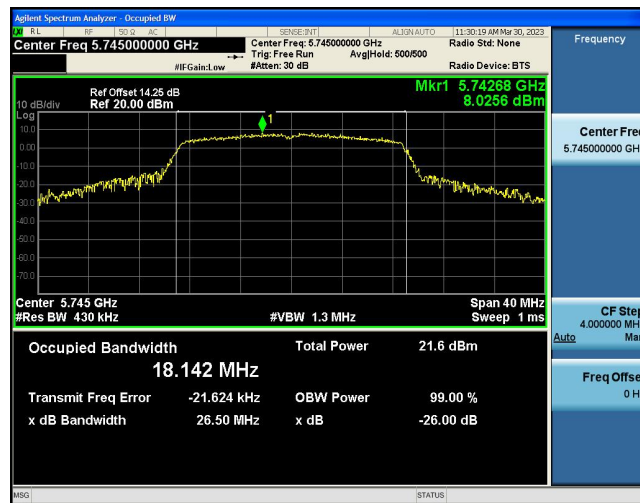
11A-Ant1-5785



11A-Ant1-5825



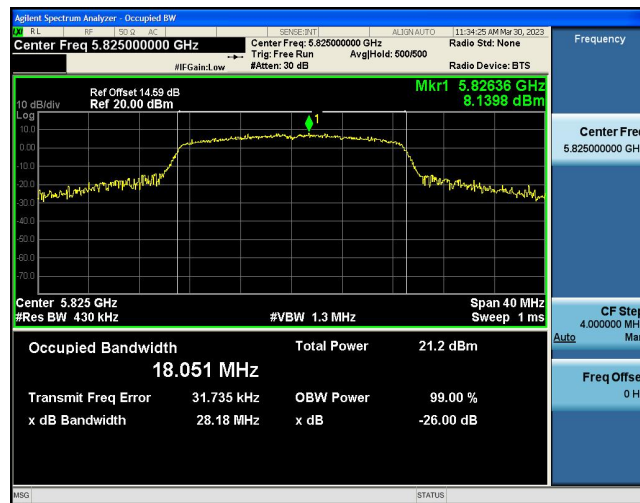
11N20SISO-Ant1-5745



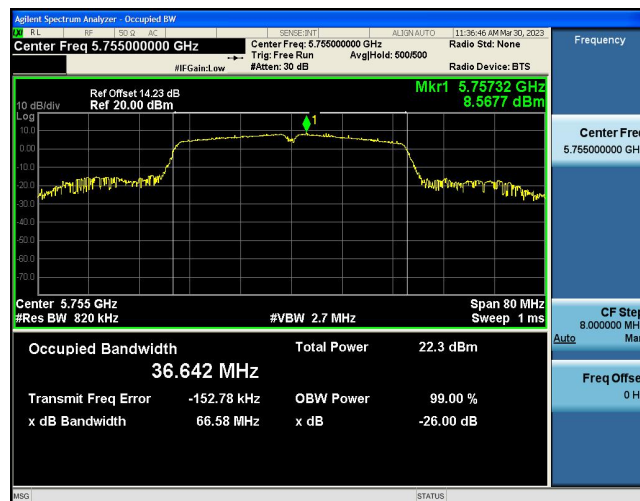
11N20SISO-Ant1-5785



11N20SISO-Ant1-5825



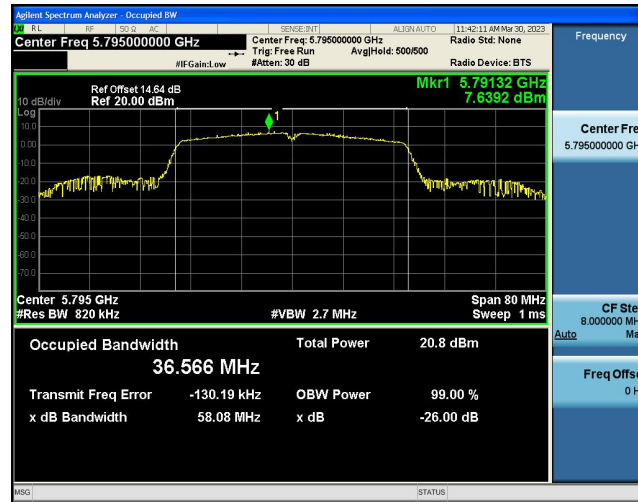
11N40SISO-Ant1-5755



11N40SISO-Ant1-5795



Report No.: PTC23021300802E-FC02



6dB bandwidth

| TestMode  | Antenna | Frequency[MHz] | 6db EBW [MHz] | FL[MHz]  | FH[MHz]  | Limit[MHz] | Verdict |
|-----------|---------|----------------|---------------|----------|----------|------------|---------|
| 11A       | Ant1    | 5745           | 15.080        | 5737.440 | 5752.520 | 0.5        | PASS    |
| 11A       | Ant1    | 5785           | 13.800        | 5777.480 | 5791.280 | 0.5        | PASS    |
| 11A       | Ant1    | 5825           | 14.440        | 5817.440 | 5831.880 | 0.5        | PASS    |
| 11N20SISO | Ant1    | 5745           | 15.240        | 5737.400 | 5752.640 | 0.5        | PASS    |
| 11N20SISO | Ant1    | 5785           | 15.040        | 5777.520 | 5792.560 | 0.5        | PASS    |
| 11N20SISO | Ant1    | 5825           | 14.200        | 5818.360 | 5832.560 | 0.5        | PASS    |
| 11N40SISO | Ant1    | 5755           | 33.840        | 5737.400 | 5771.240 | 0.5        | PASS    |
| 11N40SISO | Ant1    | 5795           | 35.040        | 5777.480 | 5812.520 | 0.5        | PASS    |

11A-Ant1-5745