

## FCC PART 15C TEST REPORT FOR CERTIFICATION

On Behalf of

Planet Computers Limited

COSMO

COSMO COMMUNICATOR VE

FCC ID: 2A07Q-COSMOVE

Prepared for : Planet Computers Limited  
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Report Number : ACS-F19155  
Date of Test : Jul.19~Sep.04, 2019  
Date of Report : Nov.13, 2019

## TABLE OF CONTENTS

| Description                                                      | Page      |
|------------------------------------------------------------------|-----------|
| <b>1. SUMMARY OF STANDARDS AND RESULTS.....</b>                  | <b>5</b>  |
| 1.1. Description of Standards and Results .....                  | 5         |
| <b>2. GENERAL INFORMATION.....</b>                               | <b>6</b>  |
| 2.1. Description of Equipment Under Test .....                   | 6         |
| 2.2. Feature of Equipment Under Test.....                        | 7         |
| 2.3. Tested Supporting System Details .....                      | 9         |
| 2.4. Block Diagram of connection between EUT and simulators..... | 9         |
| 2.5. Test information .....                                      | 9         |
| 2.6. Test Facility .....                                         | 10        |
| 2.7. Measurement Uncertainty (95% confidence levels, k=2).....   | 10        |
| <b>3. POWER LINE CONDUCTED EMISSION TEST .....</b>               | <b>11</b> |
| 3.1. Test Equipments.....                                        | 11        |
| 3.2. Block Diagram of Test Setup.....                            | 11        |
| 3.3. Power Line Conducted Emission Test Limits.....              | 11        |
| 3.4. Configuration of EUT on Test .....                          | 11        |
| 3.5. Operating Condition of EUT.....                             | 12        |
| 3.6. Test Procedure .....                                        | 12        |
| 3.7. Power Line Conducted Emission Test Results .....            | 12        |
| <b>4. RADIATED EMISSION MEASUREMENT .....</b>                    | <b>15</b> |
| 4.1. Test Equipment .....                                        | 15        |
| 4.2. Block Diagram of Test Setup.....                            | 16        |
| 4.3. Radiated Emission Limit Standard: .....                     | 17        |
| 4.4. EUT Configuration on Test .....                             | 17        |
| 4.5. Operating Condition of EUT.....                             | 17        |
| 4.6. Test Procedure .....                                        | 17        |
| 4.7. Radiated Emission Test Results.....                         | 18        |
| <b>5. CONDUCTED SPURIOUS EMISSIONS.....</b>                      | <b>46</b> |
| 5.1. Test Equipment .....                                        | 46        |
| 5.2. Block Diagram of Test Setup.....                            | 46        |
| 5.3. Limit.....                                                  | 46        |
| 5.4. Test Procedure .....                                        | 46        |
| 5.5. Test result.....                                            | 46        |
| <b>6. 20 DB BANDWIDTH TEST.....</b>                              | <b>52</b> |
| 6.1. Test Equipment .....                                        | 52        |
| 6.2. Block Diagram of Test Setup.....                            | 52        |
| 6.3. Limit.....                                                  | 52        |
| 6.4. Test Procedure .....                                        | 52        |
| 6.5. Test Results.....                                           | 53        |
| <b>7. CARRIER FREQUENCY SEPARATION TEST.....</b>                 | <b>55</b> |
| 7.1. Test Equipment .....                                        | 55        |
| 7.2. Block Diagram of Test Setup.....                            | 55        |
| 7.3. Limit.....                                                  | 55        |
| 7.4. Test Procedure .....                                        | 55        |
| 7.5. Test Results.....                                           | 56        |
| <b>8. NUMBER OF HOPPING FREQUENCY TEST.....</b>                  | <b>57</b> |
| 8.1. Test Equipment .....                                        | 57        |

|            |                                              |           |
|------------|----------------------------------------------|-----------|
| 8.2.       | Block Diagram of Test Setup .....            | 57        |
| 8.3.       | Limit.....                                   | 57        |
| 8.4.       | Test Procedure .....                         | 57        |
| 8.5.       | Test Results.....                            | 58        |
| <b>9.</b>  | <b>DWELL TIME .....</b>                      | <b>59</b> |
| 9.1.       | Test Equipment .....                         | 59        |
| 9.2.       | Block Diagram of Test Setup.....             | 59        |
| 9.3.       | Limit.....                                   | 59        |
| 9.4.       | Test Procedure .....                         | 59        |
| 9.5.       | Test Results.....                            | 60        |
| <b>10.</b> | <b>MAXIMUM PEAK OUTPUT POWER TEST.....</b>   | <b>63</b> |
| 10.1.      | Test Equipment .....                         | 63        |
| 10.2.      | Limit.....                                   | 63        |
| 10.3.      | Test Procedure .....                         | 63        |
| 10.4.      | Test Results.....                            | 63        |
| <b>11.</b> | <b>BAND EDGE COMPLIANCE TEST .....</b>       | <b>64</b> |
| 11.1.      | Test Equipment .....                         | 64        |
| 11.2.      | Limit.....                                   | 64        |
| 11.3.      | Test Produce.....                            | 64        |
| 11.4.      | Test Results.....                            | 64        |
| <b>12.</b> | <b>ANTENNA REQUIREMENT.....</b>              | <b>73</b> |
| 12.1.      | Standard Applicable.....                     | 73        |
| 12.2.      | Antenna Connected Construction .....         | 73        |
| <b>13.</b> | <b>DEVIATION TO TEST SPECIFICATIONS.....</b> | <b>74</b> |

Appendix A. Photograph of Test

Appendix B. Photo of the EUT

**TEST REPORT CERTIFICATION**

Applicant : Planet Computers Limited  
Manufacturer : Planet Computers Limited  
Product : COSMO  
FCC ID : 2AO7Q-COSMOVE  
(A) Model No. : COSMO COMMUNICATOR VE  
(B) Test Voltage : AC 120V/60Hz

Tested for comply with:  
FCC CFR47 Part 15 Subpart C

Test procedure used:  
ANSI C63.10: 2013

The device described above is tested by AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. to confirm comply with all the FCC Part 15 Subpart C requirements. The test results are contained in this test report and AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. is assumed full responsibility for the accuracy and completeness of these tests. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements. This report contains data that are not covered by the NVLAP accreditation.

This Report is made under FCC Part 2.1074. No modifications were required during testing to bring this product into compliance.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX TECHNOLOGY (SHENZHEN) CO., LTD.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Date of Test : Jul.19~Sep.04, 2019 Report of date: Nov.13, 2019

Prepared by : Monica Liu Reviewed by : Sunny Lu  
Monica Liu / Assistant Sunny Lu / Deputy Manager

Approved & Authorized Signer :



## 1. SUMMARY OF STANDARDS AND RESULTS

### 1.1. Description of Standards and Results

The EUT has been tested according to the applicable standards as referenced below.

| EMISSION                           |                                                                                       |         |
|------------------------------------|---------------------------------------------------------------------------------------|---------|
| Description of Test Item           | Standard                                                                              | Results |
| Power Line Conducted Emission Test | FCC Part 15: 15.207<br>ANSI C63.10 2013                                               | PASS    |
| Radiated Emission Test             | FCC Part 15 15.209<br>FCC Part 15 15.205<br>FCC Part 15 15.247(d)<br>ANSI C63.10 2013 | PASS    |
| Conducted Spurious Emissions       | FCC Part 15: 15.247(d)<br>ANSI C63.10 2013                                            | PASS    |
| Carrier Frequency Separation Test  | FCC Part 15: 15.247(a)(1)<br>ANSI C63.10 2013                                         | PASS    |
| 20dB Bandwidth Test                | FCC Part 15: 15.215<br>ANSI C63.10 2013                                               | PASS    |
| Number Of Hopping Frequency Test   | FCC Part 15: 15.247(a)(1)(iii)<br>ANSI C63.10 2013                                    | PASS    |
| Dwell Time Test                    | FCC Part 15: 15.247(a)(1)(iii)<br>ANSI C63.10 2013                                    | PASS    |
| Maximum Peak Output Power Test     | FCC Part 15 15.247(b)(1)<br>ANSI C63.10 2013                                          | PASS    |
| Band Edge Compliance Test          | FCC Part 15 15.247(d)<br>ANSI C63.10 2013                                             | PASS    |

## 2. GENERAL INFORMATION

### 2.1. Description of Equipment Under Test

|                             |                                                                                                                                                                             |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Applicant                   | Planet Computers Limited<br>Suite #9, 56 Sloane Square, London, SW1W 8AX, United Kingdom                                                                                    |
| Manufacturer                | Planet Computers Limited<br>Suite #9, 56 Sloane Square, London, SW1W 8AX, United Kingdom                                                                                    |
| Factory                     | Shenzhen Eastaeon Technology Limited Company<br>4F, B block, Kingdee Software Park, 2 Keji South 12 Road, Nanshan District, Shenzhen                                        |
| Product                     | COSMO                                                                                                                                                                       |
| Model No.                   | COSMO COMMUNICATOR VE                                                                                                                                                       |
| FCC ID                      | 2AO7Q-COSMOVE                                                                                                                                                               |
| Power Adapter               | Manufacturer: SHENZHEN TIANYIN ELECTRONICS CO., LTD.<br>Model: TPA-10120125UU-MTK<br>Input: 100-240V~, 50/60Hz, 0.6A<br>Output: 5V, 2A / 7V, 1.67A / 9V, 1.67A / 12V, 1.25A |
| Rechargeable Li-ion Battery | Manufacturer: Shenzhen 3sun Electronics Co., Ltd.;<br>M/N: Gemini Standard Battery;<br>Rating Voltage: 3.85V;<br>Capacity: 4220mAh;<br>Charge Voltage: 4.4V.                |
| USB Cable                   | Shielded, Detachable, 0.8m                                                                                                                                                  |
| Sample Type                 | Prototype production                                                                                                                                                        |
| Date of Receipt             | Jul.12, 2019                                                                                                                                                                |
| Date of Test                | Jul.19~Sep.04, 2019                                                                                                                                                         |

## 2.2. Feature of Equipment Under Test

| Product Feature & Specification |                                                                                             |                                 |
|---------------------------------|---------------------------------------------------------------------------------------------|---------------------------------|
| Product                         | COSMO                                                                                       |                                 |
| Model No.                       | COSMO COMMUNICATOR VE                                                                       |                                 |
| Radio                           | IEEE802.11 a/b/g/n/ac; Bluetooth V3.0+EDR; Bluetooth V4.0; NFC                              |                                 |
| Power Source                    | <input checked="" type="checkbox"/> Commercial Power                                        | AC 100 ~ 240V, 0.6A             |
|                                 | <input checked="" type="checkbox"/> External Power Source                                   | DC 5/7/9/12V, 2/1.67/1.67/1.25A |
|                                 | <input checked="" type="checkbox"/> Lithium battery                                         | DC 3.85V, 4220mAh               |
|                                 | <input type="checkbox"/> UM battery                                                         | DC V                            |
| NFC                             |                                                                                             |                                 |
| Frequency Range                 | 13.56MHz                                                                                    |                                 |
| Type of Modulation              | ASK                                                                                         |                                 |
| Bluetooth                       |                                                                                             |                                 |
| Bluetooth Version               | V4.0 dual mode                                                                              |                                 |
| Frequency Range                 | 2402-2480MHz                                                                                |                                 |
| Type of Modulation              | GFSK, $\pi$ /4DQPSK, 8DPSK                                                                  |                                 |
| Data Rate                       | 1Mbps, 2Mbps, 3Mbps                                                                         |                                 |
| Quantity of Channels            | 79/40                                                                                       |                                 |
| Channel Separation              | 1MHz/2MHz                                                                                   |                                 |
| 2.4GHz Wi-Fi                    |                                                                                             |                                 |
| Support Modes                   | 802.11b/g/n20/n40                                                                           |                                 |
| Frequency Range                 | 2412-2462MHz                                                                                |                                 |
| Type of Modulation              | 802.11b(DSSS): CCK, QPSK, BPSK;<br>802.11g/n(OFDM): 64QAM,16QAM, QPSK, BPSK                 |                                 |
| Data Rate                       | 802.11b: 11/5.5/2/1 Mbps;<br>802.11g: 54/48/36/24/18/12/9/6 Mbps;<br>802.11n: up to 150Mbps |                                 |
| Channel Separation              | 5MHz                                                                                        |                                 |
| 5GHz Wi-Fi                      |                                                                                             |                                 |
| Support Modes                   | 802.11a/n20/n40/ac20/ac40/ac80                                                              |                                 |
| Frequency Range                 | 5180-5240MHz, 5260-5320MHz, 5500-5700MHz, 5745-5825MHz                                      |                                 |
| Type of Modulation              | 802.11a/ac/n (OFDM): QPSK, BPSK, 16QAM, 64QAM,256QAM                                        |                                 |
| Data Rate                       | 802.11a: 54/48/36/24/18/12/9/6 Mbps;<br>802.11n up to 150 Mbps;<br>802.11ac: up to 400Mbps  |                                 |
| Channel Separation              | 5MHz                                                                                        |                                 |
| Type of Product                 | Slave device without Radar detection                                                        |                                 |
| Transmit Power Control          | No Support                                                                                  |                                 |

**Antenna System****NFC**

|                   |             |
|-------------------|-------------|
| Type of Antenna   | FPC Antenna |
| Antenna number    | 1           |
| Antenna Peak Gain | 0dBi        |

**Bluetooth**

|                   |                  |
|-------------------|------------------|
| Type of Antenna   | MONOPOLE Antenna |
| Antenna number    | 1                |
| Antenna Peak Gain | -0.1dBi          |

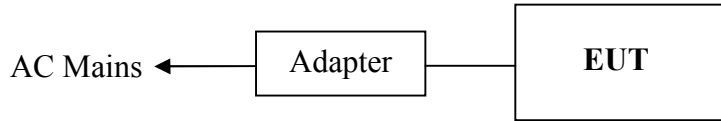
**Wi-Fi**

|                   |                                                                                                                                                                                                                                                 |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type of Antenna   | MONOPOLE Antenna                                                                                                                                                                                                                                |
| Antenna number    | 1                                                                                                                                                                                                                                               |
| Antenna Peak Gain | DTS Band (2400-2483.5MHz) Peak Gain: -0.1dBi<br>U-NII-1 Band(5150-5250MHz) Peak Gain: 0.6dBi<br>U-NII-2A Band(5250-5350MHz) Peak Gain: 0.6dBi<br>U-NII-2C Band(5470-5725MHz) Peak Gain: 0.4dBi<br>U-NII-3 Band (5725-5850MHz) Peak Gain: 0.3dBi |

### 2.3. Tested Supporting System Details

[None]

### 2.4. Block Diagram of connection between EUT and simulators



(EUT: COSMO)

### 2.5. Test information

A special software(The developer mode that comes with the device) was used to control EUT work in continuous TX mode

| Tested mode, Packet Type, peak output power information |             |                            |                            |
|---------------------------------------------------------|-------------|----------------------------|----------------------------|
| Mode                                                    | Packet Type | Output power(dBm)<br>P max | Output Power(dBm)<br>P low |
| GFSK                                                    | DH1         | 9.210                      | 7.817                      |
|                                                         | DH3         |                            |                            |
|                                                         | DH5         |                            |                            |
| $\pi/4$ DQPSK                                           | 2-DH1       | 6.475                      | 5.324                      |
|                                                         | 2-DH3       |                            |                            |
|                                                         | 2-DH5       |                            |                            |
| 8DPSK                                                   | 3-DH1       | 9.119                      | 6.902                      |
|                                                         | 3-DH3       |                            |                            |
|                                                         | 3-DH5       |                            |                            |

$\pi/4$ DQPSK mode has been verified to have the lowest power, so the final test were performed with GFSK and 8DPSK mode, the worse-case packet type were:

GFSK Mode: DH5

8DPSK Mode: 3DH5

| Item                |                              | Modulation | Data Rate | Test Channel |
|---------------------|------------------------------|------------|-----------|--------------|
| Radiated Test Case  | Radiated Band Edge           | GFSK       | 1Mbps     | 00/78        |
|                     |                              | 8-DPSK     | 3Mbps     | 00/78        |
|                     | Radiated Spurious Emission   | GFSK       | 1Mbps     | 00/39/78     |
|                     |                              | 8-DPSK     | 3Mbps     | 00/39/78     |
| Conducted Test Case | 20dB Bandwidth               | GFSK       | 1Mbps     | 00/39/78     |
|                     |                              | 8-DPSK     | 3Mbps     | 00/39/78     |
|                     | Carrier Frequency Separation | GFSK       | 1Mbps     | 39           |
|                     |                              | 8-DPSK     | 3Mbps     | 39           |
|                     | Time of Occupancy            | GFSK       | 1Mbps     | 39           |
|                     |                              | 8-DPSK     | 3Mbps     | 39           |
|                     | Number of Hopping Channels   | GFSK       | 1Mbps     | 39           |
|                     |                              | 8-DPSK     | 3Mbps     | 39           |
|                     | Maximum Peak Output Power    | GFSK       | 1Mbps     | 00/39/78     |
|                     |                              | 8-DPSK     | 3Mbps     | 00/39/78     |
|                     | Band Edges                   | GFSK       | 1Mbps     | 00/78        |
|                     |                              | 8-DPSK     | 3Mbps     | 00/78        |
|                     | Spurious Emission            | GFSK       | 1Mbps     | 00/39/78     |
|                     |                              | 8-DPSK     | 3Mbps     | 00/39/78     |

## 2.6. Test Facility

### Site Description

|              |                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name of Firm | : Audix Technology (Shenzhen) Co., Ltd.<br>No. 6, Kefeng Road, Science & Technology Park,<br>Nanshan District , Shenzhen, Guangdong, China                                                                                                                                                                                                                                               |
| EMC Lab.     | Certificated by Industry Canada<br>: Registration Number: IC 5183A-1<br>Valid Date: May.07, 2020<br><br>Certificated by DAkkS, Germany<br>: Registration No: D-PL-12151-01-00<br>Valid Date: Dec.07, 2021<br><br>Accredited by NVLAP, USA<br>: NVLAP Code: 200372-0<br>Valid Date: Mar.31, 2020<br><br>Certificated by FCC USA.<br>: Designation No.: CN5022<br>Valid Date: Mar.31, 2020 |

## 2.7. Measurement Uncertainty (95% confidence levels, k=2)

| Test Item                                                            | Uncertainty                       |
|----------------------------------------------------------------------|-----------------------------------|
| Uncertainty for Conduction emission test<br>in No. 1 Conduction      | 2.6dB(150KHz to 30MHz)            |
| Uncertainty for Radiation Emission test<br>in 3m chamber             | 3.6dB(30~200MHz, Polarization: H) |
|                                                                      | 4.0dB(30~200MHz, Polarization: V) |
|                                                                      | 3.6dB(200M~1GHz, Polarization: H) |
|                                                                      | 3.8dB(200M~1GHz, Polarization: V) |
| Uncertainty for Radiation Emission test<br>in 3m chamber(1GHz-25GHz) | 4.6dB(1~6GHz, Distance: 3m)       |
|                                                                      | 4.6dB(6~25GHz, Distance: 3m)      |
| Uncertainty for Radiated Spurious<br>Emission test in RF chamber     | 3.7dB(30MHz~1000MHz)              |
|                                                                      | 3.3dB(1~26.5GHz)                  |
| Uncertainty for Conduction Spurious<br>emission test                 | 2.0dB                             |
| Uncertainty for Output power test                                    | 0.8dB                             |
| Uncertainty for Bandwidth test                                       | 83kHz                             |
| Uncertainty for DC power test                                        | 0.1%                              |
| Uncertainty for test site temperature and<br>humidity                | 0.6℃                              |
|                                                                      | 3%                                |

Note: EMI uncertainty is evaluated by CISPR16-4-2.

The value of measurement uncertainty of EMI is less than  $U_{CISPR}$ .

The value is not calculated in the test results.

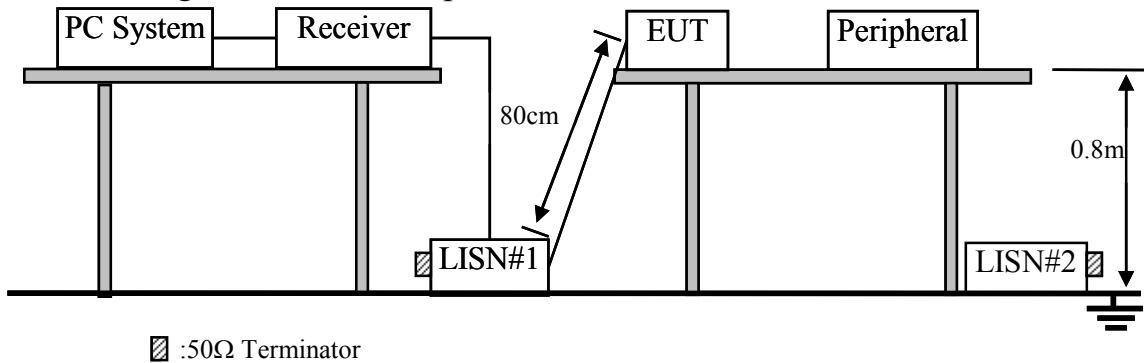
### 3. POWER LINE CONDUCTED EMISSION TEST

#### 3.1. Test Equipments

| Item | Equipment         | Manufacturer    | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|-------------------|-----------------|-----------|------------|-----------|---------------|
| 1.   | 1# Shielding Room | AUDIX           | N/A       | N/A        | May.17,18 | 3 Year        |
| 2.   | EMI Test Receiver | Rohde & Schwarz | ESCI      | 100842     | Apr.14,19 | 1 Year        |
| 3.   | L.I.S.N.#1        | Rohde & Schwarz | ENV216    | 102160     | Dec.01,18 | 1 Year        |
| 4.   | L.I.S.N.#2        | Kyoritsu        | K NW-403D | 8-1750-2   | Apr.18,19 | 1 Year        |
| 5.   | Terminator        | Hubersuhner     | 50Ω       | No.1       | Apr.14,19 | 1 Year        |
| 6.   | Terminator        | Hubersuhner     | 50Ω       | No.2       | Apr.14,19 | 1 Year        |
| 7.   | RF Cable          | Fujikura        | RG55/U    | No.1       | Apr.13,19 | 1 Year        |
| 8.   | Test Software     | AUDIX           | e3        | 6.100913a  | N/A       | N/A           |

Note: N/A means Not applicable.

#### 3.2. Block Diagram of Test Setup



#### 3.3. Power Line Conducted Emission Test Limits

| Frequency       | Maximum RF Line Voltage    |                         |
|-----------------|----------------------------|-------------------------|
|                 | Quasi-Peak Level<br>dB(μV) | Average Level<br>dB(μV) |
| 150kHz ~ 500kHz | 66 ~ 56*                   | 56 ~ 46*                |
| 500kHz ~ 5MHz   | 56                         | 46                      |
| 5MHz ~ 30MHz    | 60                         | 50                      |

Notes: 1. \* Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

#### 3.4. Configuration of EUT on Test

The following equipment are installed on Power Line Conducted Emission Test to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

##### 3.4.1. COSMO (EUT)

Model No. : COSMO COMMUNICATOR VE

Serial No. : N/A

##### 3.4.2. Support Equipment: As Tested Supporting System Details, in Section 2.2.

### 3.5.Operating Condition of EUT

- 3.5.1. Setup the EUT and simulator as shown as Section 3.2.
- 3.5.2. Turn on the power of all equipments.
- 3.5.3. PC run test software to control EUT work in Tx mode.

### 3.6.Test Procedure

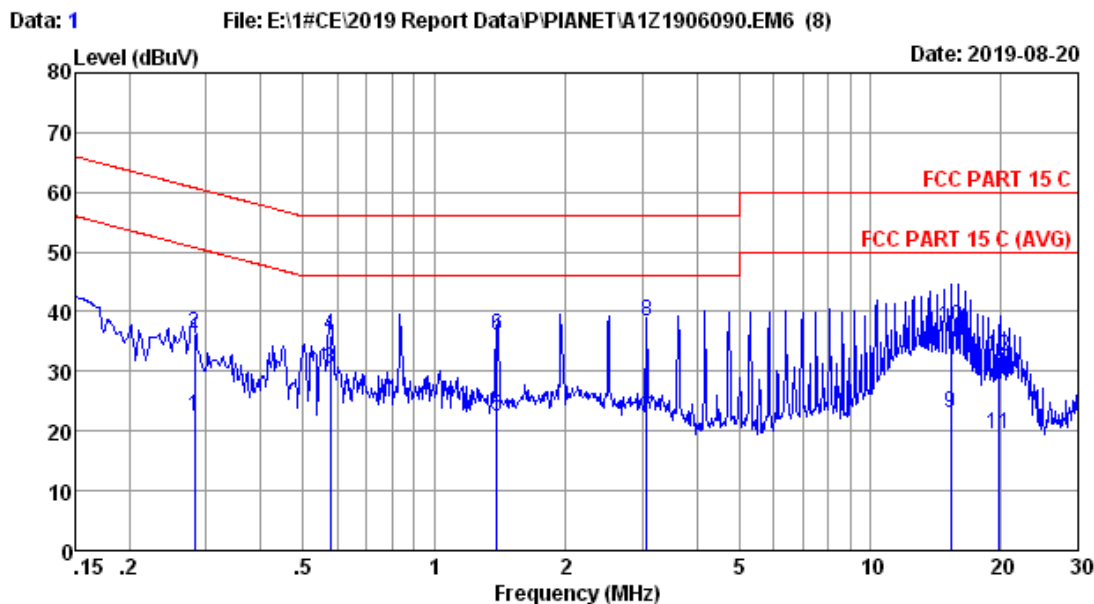
The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power Via AC unit connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#). This provides a 50 ohm coupling impedance for the EUT (Please refer the block diagram of the test setup and photographs). The AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Test.

The bandwidth of test receiver (R & S ESCI) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

### 3.7.Power Line Conducted Emission Test Results

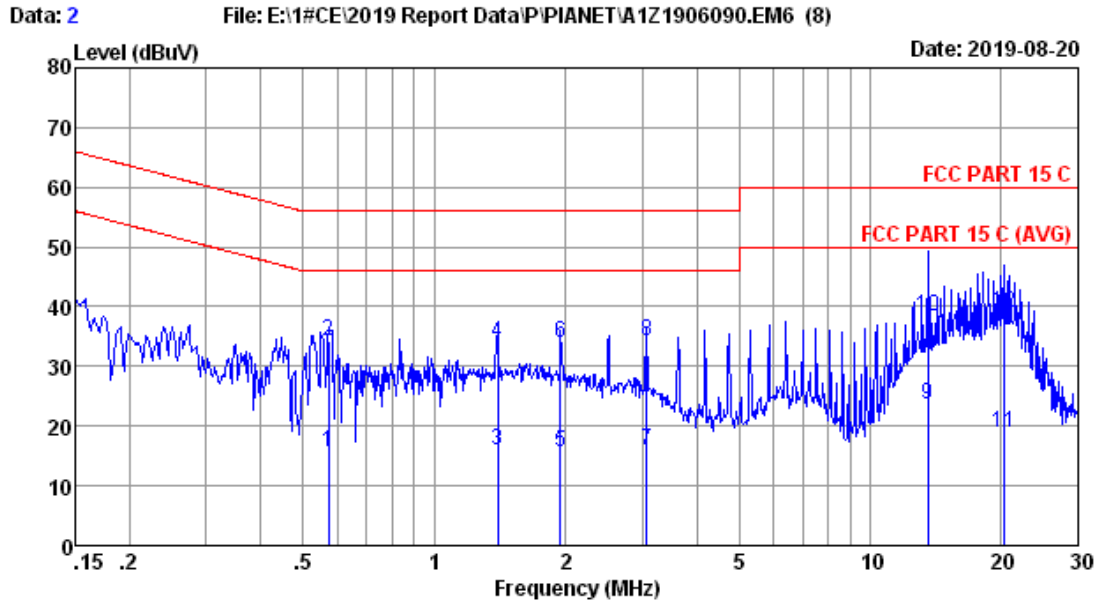
**PASS.** (All emissions not reported below are too low against the prescribed limits.)



Site no :1# Conduction Data No :1  
 Dis./Lisn :2018 ENV216-N LISN phase:  
 Limit :FCC PART 15 C  
 Env./Ins. :Temp:23.8°C Humi:55% Engineer :Evan  
 Power rating : AC 120V/60Hz  
 Test Mode : BT3.0

| No | Freq<br>(MHz) | LISN<br>Factor<br>(dB) | Cable<br>loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV) | Limits<br>(dBuV) | Margin<br>(dB) | Remark  |
|----|---------------|------------------------|-----------------------|-------------------|-----------------------------|------------------|----------------|---------|
| 1  | 0.282         | 9.40                   | 0.03                  | 13.10             | 22.53                       | 50.76            | 28.23          | Average |
| 2  | 0.282         | 9.40                   | 0.03                  | 27.00             | 36.43                       | 60.76            | 24.33          | QP      |
| 3  | 0.578         | 9.40                   | 0.02                  | 20.90             | 30.32                       | 46.00            | 15.68          | Average |
| 4  | 0.578         | 9.40                   | 0.02                  | 26.50             | 35.92                       | 56.00            | 20.08          | QP      |
| 5  | 1.394         | 9.40                   | 0.03                  | 12.90             | 22.33                       | 46.00            | 23.67          | Average |
| 6  | 1.394         | 9.40                   | 0.03                  | 26.50             | 35.93                       | 56.00            | 20.07          | QP      |
| 7  | 3.070         | 9.45                   | 0.05                  | 12.70             | 22.20                       | 46.00            | 23.80          | Average |
| 8  | 3.070         | 9.45                   | 0.05                  | 28.80             | 38.30                       | 56.00            | 17.70          | QP      |
| 9  | 15.330        | 9.61                   | 0.13                  | 13.39             | 23.13                       | 50.00            | 26.87          | Average |
| 10 | 15.330        | 9.61                   | 0.13                  | 27.89             | 37.63                       | 60.00            | 22.37          | QP      |
| 11 | 19.802        | 9.70                   | 0.15                  | 9.49              | 19.34                       | 50.00            | 30.66          | Average |
| 12 | 19.802        | 9.70                   | 0.15                  | 22.49             | 32.34                       | 60.00            | 27.66          | QP      |

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.  
 2.If the average limit is met when using a quasi-peak detector.  
 the EUT shall be deemed to meet both limits and measurement  
 with average detector is unnecessary.



Site no :1# Conduction Data No :2  
 Dis./Lisn :2018 ENV216-L LISN phase:  
 Limit :FCC PART 15 C  
 Env./Ins. :Temp:23.8°C Humi:55% Engineer :Evan  
 Power rating : AC 120V/60Hz  
 Test Mode : BT3.0

| No | Freq<br>(MHz) | LISN<br>Factor<br>(dB) | Cable<br>loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV) | Limits<br>(dBuV) | Margin<br>(dB) | Remark  |
|----|---------------|------------------------|-----------------------|-------------------|-----------------------------|------------------|----------------|---------|
| 1  | 0.573         | 9.40                   | 0.02                  | 6.29              | 15.71                       | 46.00            | 30.29          | Average |
| 2  | 0.573         | 9.40                   | 0.02                  | 24.82             | 34.24                       | 56.00            | 21.76          | QP      |
| 3  | 1.396         | 9.44                   | 0.03                  | 6.59              | 16.06                       | 46.00            | 29.94          | Average |
| 4  | 1.396         | 9.44                   | 0.03                  | 24.43             | 33.90                       | 56.00            | 22.10          | QP      |
| 5  | 1.949         | 9.49                   | 0.04                  | 6.23              | 15.76                       | 46.00            | 30.24          | Average |
| 6  | 1.949         | 9.49                   | 0.04                  | 24.40             | 33.93                       | 56.00            | 22.07          | QP      |
| 7  | 3.074         | 9.50                   | 0.05                  | 6.48              | 16.03                       | 46.00            | 29.97          | Average |
| 8  | 3.074         | 9.50                   | 0.05                  | 24.62             | 34.17                       | 56.00            | 21.83          | QP      |
| 9  | 13.562        | 9.57                   | 0.12                  | 13.80             | 23.49                       | 50.00            | 26.51          | Average |
| 10 | 13.562        | 9.57                   | 0.12                  | 28.60             | 38.29                       | 60.00            | 21.71          | QP      |
| 11 | 20.366        | 9.60                   | 0.15                  | 9.20              | 18.95                       | 50.00            | 31.05          | Average |
| 12 | 20.366        | 9.60                   | 0.15                  | 29.10             | 38.85                       | 60.00            | 21.15          | QP      |

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.  
 2.If the average limit is met when using a quasi-peak detector.  
 the EUT shall be deemed to meet both limits and measurement  
 with average detector is unnecessary.

## 4. RADIATED EMISSION MEASUREMENT

### 4.1. Test Equipment

Frequency range: 30~1000MHz

| Item | Equipment         | Manufacturer    | Model No.   | Serial No.      | Last Cal. | Cal. Interval |
|------|-------------------|-----------------|-------------|-----------------|-----------|---------------|
| 1.   | 3#Chamber(NSA)    | AUDIX           | N/A         | N/A             | May.10,19 | 1 Year        |
| 2.   | 3#Chamber(SE)     | AUDIX           | N/A         | N/A             | May.17,18 | 3 Year        |
| 3.   | Signal Analyzer   | Rohde & Schwarz | FSV30       | 104050          | Apr.14,19 | 1 Year        |
| 4.   | EMI Test Receiver | Rohde & Schwarz | ESR7        | 101547          | Apr.14,19 | 1 Year        |
| 5.   | Amplifier         | HP              | 8447D       | 2648A04738      | Apr.14,19 | 1 Year        |
| 6.   | Bi log Antenna    | TESEQ           | CBL6112D    | 35375           | Nov.21,18 | 1 Year        |
| 7.   | Loop Antenna      | Chase           | HLA6120     | 1062            | Apr.18,19 | 1 Year        |
| 8.   | NSA Cable         | HUBER+SUHNER    | CFD400NL-LW | No.3            | Dec.01,18 | 1 Year        |
| 9.   | Coaxial Switch    | Anritsu         | MP59B       | 6201397222      | Apr.14,19 | 1 Year        |
| 10.  | Test Software     | AUDIX           | e3          | 6.2009-5-21a(n) | N/A       | N/A           |

Note: N/A means Not applicable.

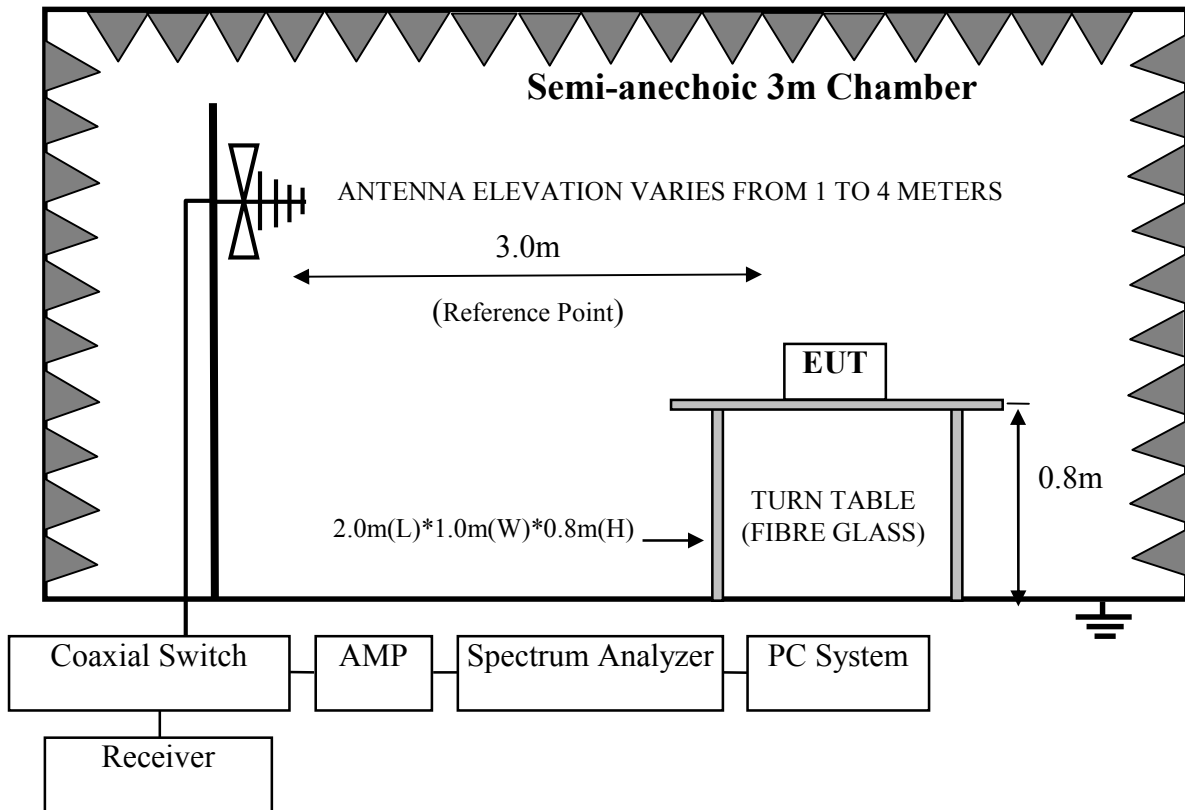
Frequency range: above 1000MHz

| Item | Equipment           | Manufacturer | Model No.             | Serial No.      | Last Cal. | Cal. Interval |
|------|---------------------|--------------|-----------------------|-----------------|-----------|---------------|
| 1.   | 3#Chamber(Svswr)    | AUDIX        | N/A                   | N/A             | Apr.18,19 | 1 Year        |
| 2.   | 3#Chamber(SE)       | AUDIX        | N/A                   | N/A             | May.17,18 | 3 Year        |
| 3.   | PXA Signal Analyzer | Agilent      | N9030A                | MY51380221      | Jun.30,19 | 1 Year        |
| 4.   | Horn Antenna        | ETS          | 3115                  | 9510-4580       | Dec.13,18 | 1 Year        |
| 5.   | Horn Antenna        | ETS          | 3116                  | 00060089        | Dec.13,18 | 1 Year        |
| 6.   | Amplifier           | HP           | 8449B                 | 3008A00863      | Apr.23,19 | 1 Year        |
| 7.   | Amplifier           | EMCI         | EMC184040SE           | 980507          | Jun.30,19 | 1 Year        |
| 8.   | RF Cable            | EMCI         | EMC102-KM-K<br>M-3500 | 170702          | May.13,19 | 1 Year        |
| 9.   | RF Cable            | N/A          | N/A                   | No.7            | Oct.14,18 | 1 Year        |
| 10.  | Test Software       | AUDIX        | e3                    | 6.2009-5-21a(n) | N/A       | N/A           |

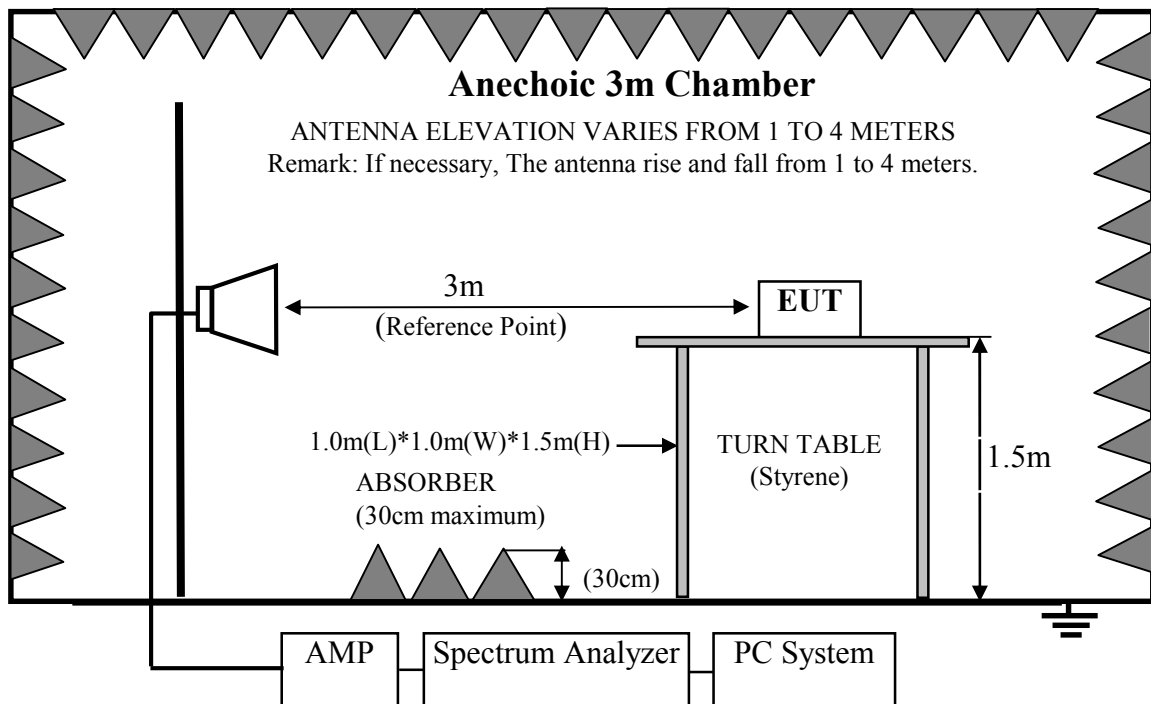
Note: N/A means Not applicable.

## 4.2. Block Diagram of Test Setup

For frequency range 30MHz-1000MHz



For frequency range 1GHz-25GHz



#### 4.3. Radiated Emission Limit Standard:

| FREQUENCY<br>MHz | DISTANCE<br>Meters | FIELD STRENGTHS LIMIT                                                                             |                                   |
|------------------|--------------------|---------------------------------------------------------------------------------------------------|-----------------------------------|
|                  |                    | $\mu\text{V/m}$                                                                                   | $\text{dB}(\mu\text{V})/\text{m}$ |
| 30 ~ 88          | 3                  | 100                                                                                               | 40.0                              |
| 88 ~ 216         | 3                  | 150                                                                                               | 43.5                              |
| 216 ~ 960        | 3                  | 200                                                                                               | 46.0                              |
| 960 ~ 1000       | 3                  | 500                                                                                               | 54.0                              |
| Above 1000MHz    | 3                  | 74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak)<br>54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average) |                                   |

- Remark :
- (1) Emission level  $\text{dB}\mu\text{V} = 20 \log$  Emission level  $\mu\text{V/m}$
  - (2) The smaller limit shall apply at the cross point between two frequency bands.
  - (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.
  - (4) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

#### 4.4. EUT Configuration on Test

The following equipment are installed on Radiated Emission Test to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

##### 4.4.1. COSMO (EUT)

Model No. : COSMO COMMUNICATOR VE  
Serial No. : N/A

#### 4.5. Operating Condition of EUT

- 4.5.1. Setup the EUT and simulator as shown as Section 4.2.
- 4.5.2. Turn on the power of all equipments.
- 4.5.3. Let EUT work in Tx mode.

#### 4.6. Test Procedure

##### Frequency below 30MHz:

The EUT setup on the turn table which has 0.8 m height to the ground. The turn table rotated 360 degrees and antenna fixed to 1 m to find the maximum emission level. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

EUT and its simulators are placed on a turn table, which is 0.8 meter high above ground for frequency 30MHz~1000MHz, 1.5 meter high above ground for frequency above 1GHz and put the absorbing with 2.4m(L)\*2.4m(W)\*0.3m(H) on the ground . The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it working in test mode, then test it. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna for frequency 30MHz~1000MHz, and the Horn antenna is used as receiving antenna for frequency above 1GHz. Both horizontal and vertical polarization of the antenna is set on Test. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.10-2013 on radiated emission Test.

This test was performed with EUT in X, Y, Z position, and the worse case was found when EUT in X position as the test photo indicated.

The bandwidth of the EMI test receiver (R&S ESR7) is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's RBW is set at 1MHz and VBW is set at 3MHz for peak emissions measurement above 1GHz

This device is pulse Modulated, a duty cycle factor was used to calculated average level based measured peak level.

The frequency range from 30MHz to 10th harmonic (25GHz) are checked. and no any emissions were found from 18GHz to 25 GHz, So the radiated emissions from 18GHz to 25GHz were not record.

#### 4.7.Radiated Emission Test Results

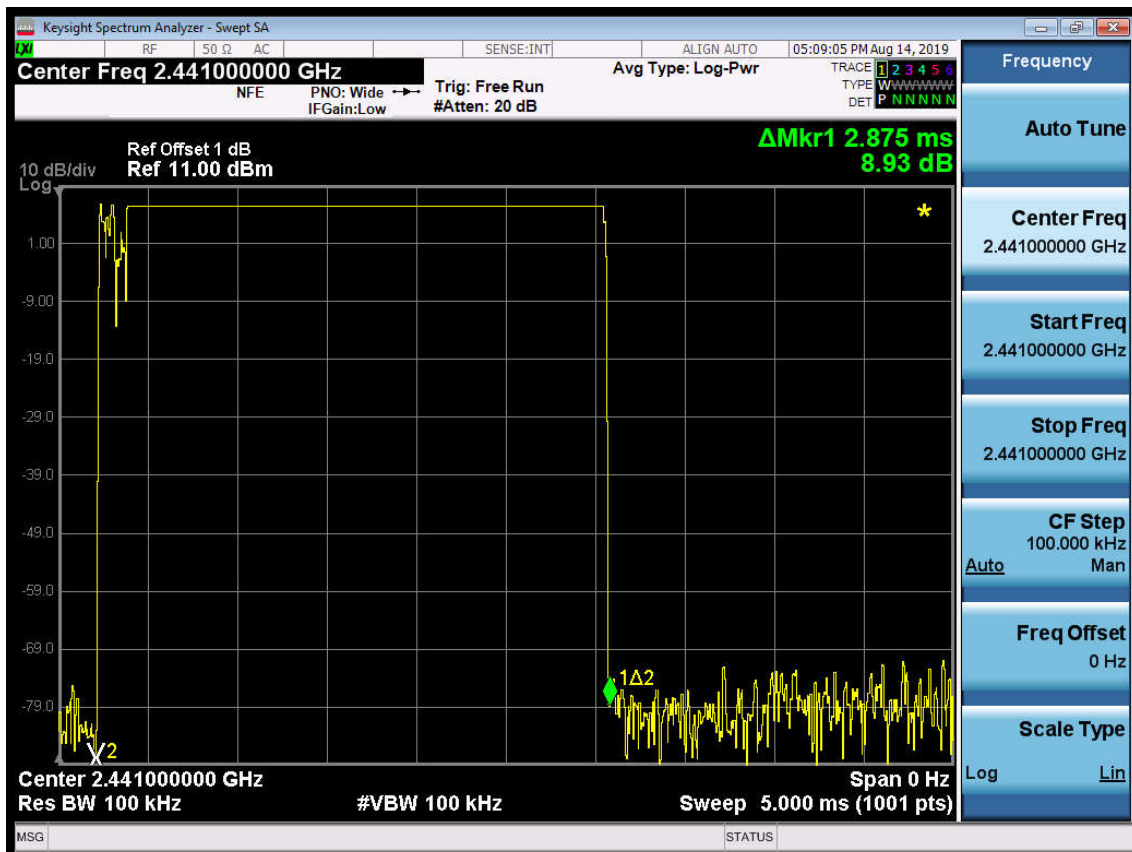
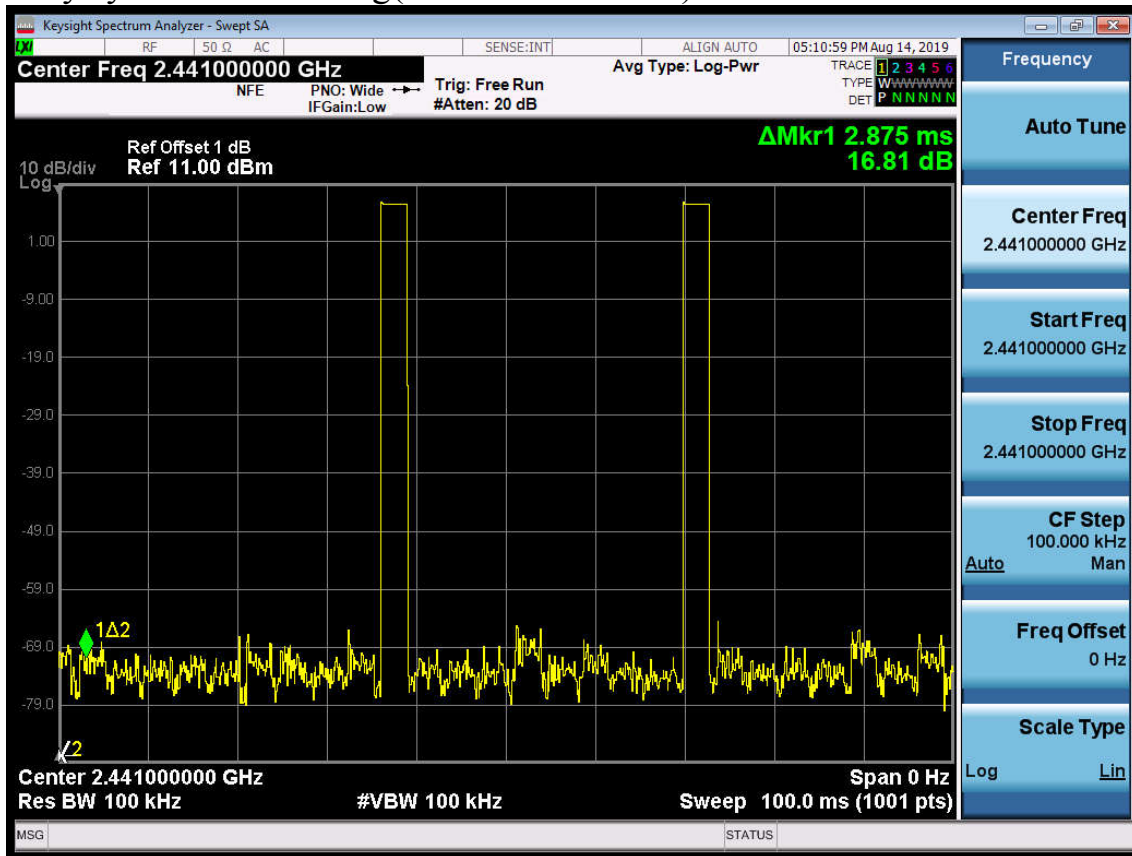
**PASS.**

All the emissions from 30MHz to 25GHz were comply with the 15.209 Limit.

Note 1: The duty cycle factor for calculate average level is -24.807dB, and average limit is 20dB below peak limit, so if peak measured level comply with average limit, the average level was deemed to comply with average limit.

Note 2: The emissions (9kHz~30MHz) is more than 20dB below the limit, so there is not reported.

Duty cycle factor =  $20\log(\text{Dwell time}/100\text{ms}) = -24.807\text{dB}$

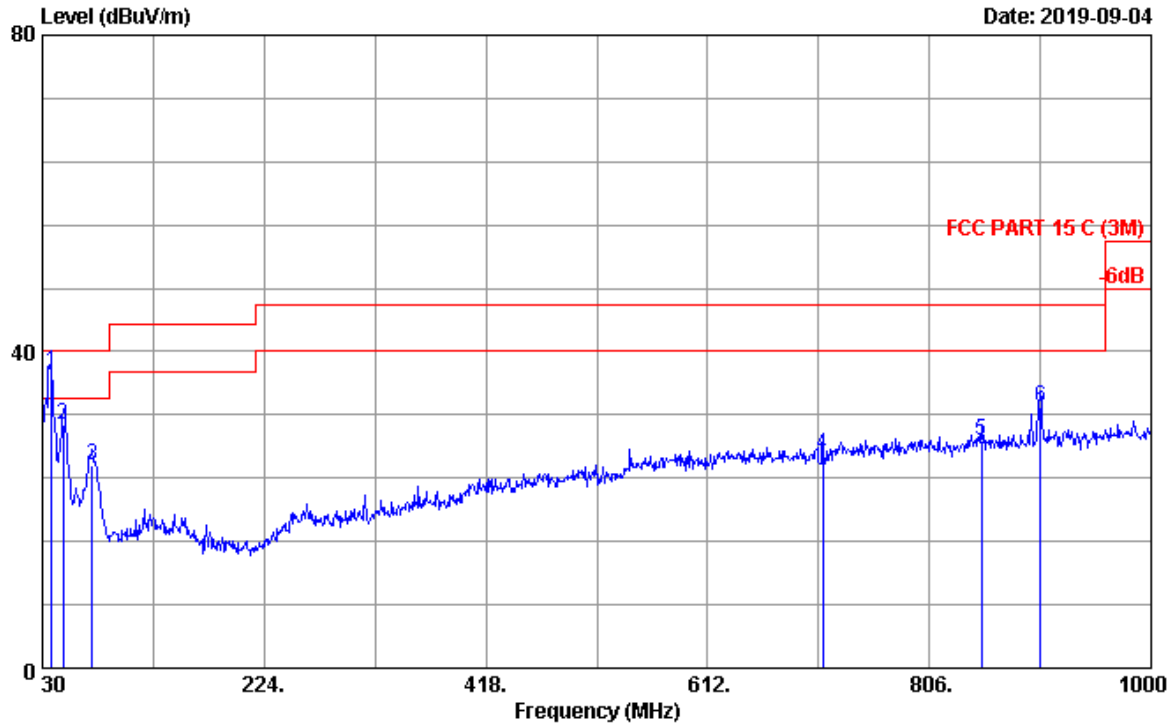


## Frequency: 30MHz~1GHz

Data: 1

File: E:\2019 Report Data\PIPlanet\A1Z1906090.EM6 (22)

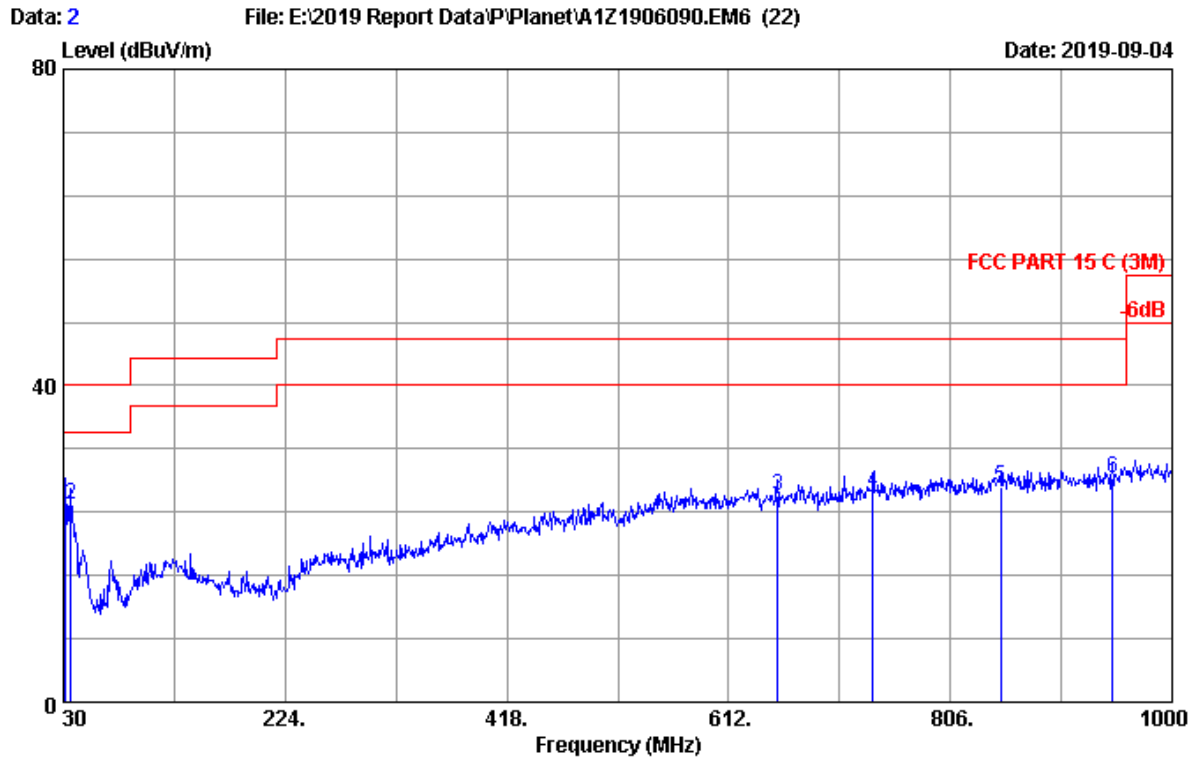
Date: 2019-09-04



Site no. : 3m Chamber Data no. : 1  
 Dis. / Ant. : 3m 2018 CBL6112D-35375 Ant. pol. : VERTICAL  
 Limit : FCC PART 15 C (3M)  
 Env. / Ins. : 23.4°C/54% Engineer : Hogen  
 Power rating : AC 120V/60Hz  
 Test Mode : BT3.0

| No. | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|----------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1   | 37.760         | 20.30                    | 0.58                  | 16.62             | 37.50                         | 40.00              | 2.50           | QP     |
| 2   | 48.430         | 15.80                    | 0.66                  | 14.21             | 30.67                         | 40.00              | 9.33           | QP     |
| 3   | 73.650         | 13.10                    | 0.83                  | 11.74             | 25.67                         | 40.00              | 14.33          | QP     |
| 4   | 712.880        | 25.16                    | 2.89                  | -0.99             | 27.06                         | 46.00              | 18.94          | QP     |
| 5   | 851.590        | 26.67                    | 3.22                  | -1.14             | 28.75                         | 46.00              | 17.25          | QP     |
| 6   | 903.000        | 26.70                    | 3.33                  | 2.96              | 32.99                         | 46.00              | 13.01          | QP     |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 2  
 Dis. / Ant. : 3m 2018 CBL6112D-35375 Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15 C (3M)  
 Env. / Ins. : 23.4°C/54% Engineer : Hogen  
 Power rating : AC 120V/60Hz  
 Test Mode : BT3.0

| No. | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission |  | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|----------------|--------------------------|-----------------------|-------------------|----------|--|--------------------|----------------|--------|
|     |                |                          |                       |                   | Level    |  |                    |                |        |
| 1   | 31.940         | 23.50                    | 0.54                  | 1.54              | 25.58    |  | 40.00              | 14.42          | QP     |
| 2   | 36.790         | 20.70                    | 0.58                  | 3.73              | 25.01    |  | 40.00              | 14.99          | QP     |
| 3   | 654.680        | 25.30                    | 2.75                  | -1.96             | 26.09    |  | 46.00              | 19.91          | QP     |
| 4   | 738.100        | 26.06                    | 2.96                  | -2.58             | 26.44    |  | 46.00              | 19.56          | QP     |
| 5   | 849.650        | 26.70                    | 3.22                  | -2.73             | 27.19    |  | 46.00              | 18.81          | QP     |
| 6   | 947.620        | 26.92                    | 3.47                  | -2.13             | 28.26    |  | 46.00              | 17.74          | QP     |

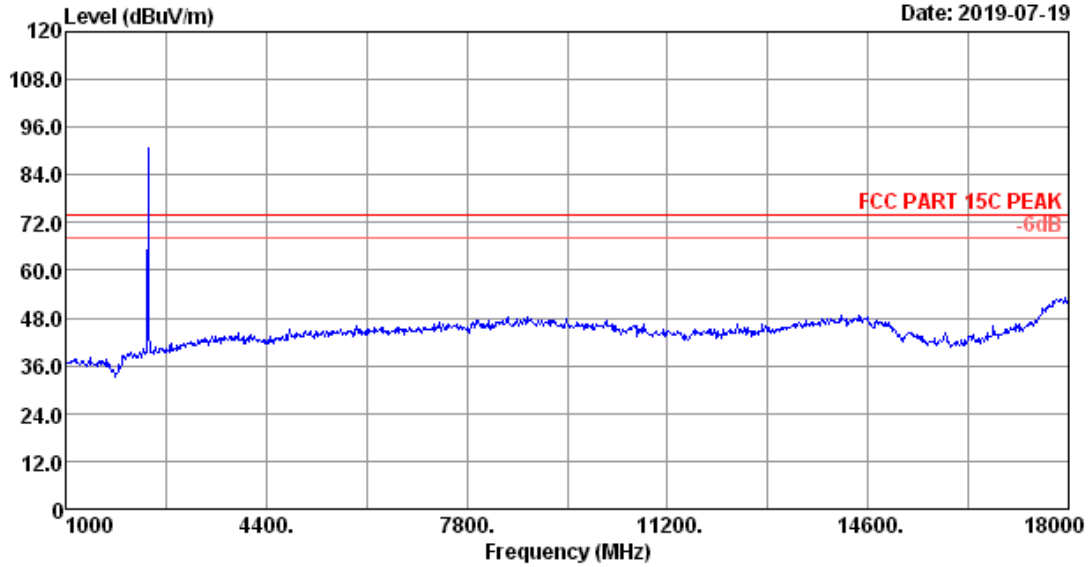
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
 2. The emission levels that are 20dB below the official limit are not reported.

## Frequency: 1GHz~18GHz

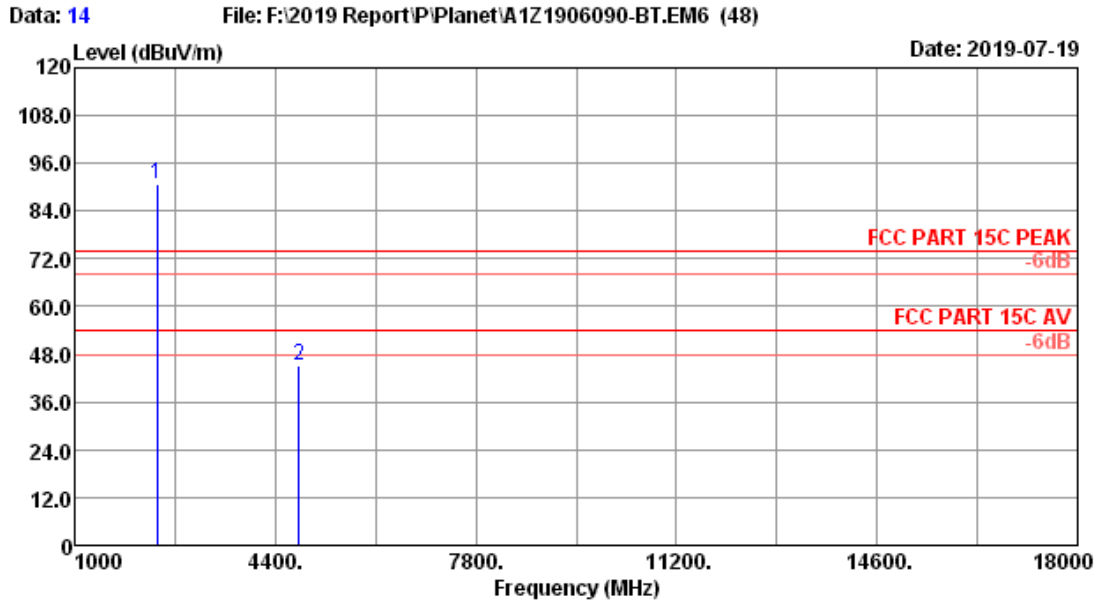
Data: 13

File: F:\2019 Report\Planet\A1Z1906090-BT.EM6 (48)

Date: 2019-07-19



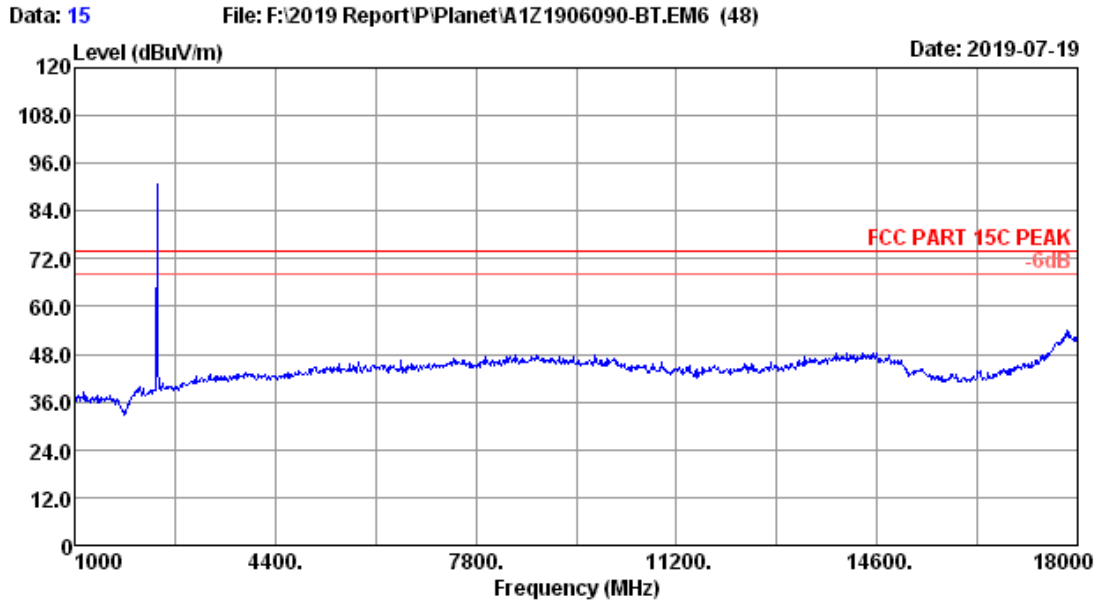
|              |                              |           |            |
|--------------|------------------------------|-----------|------------|
| Site no.     | : 3m Chamber                 | Data no.  | : 13       |
| Dis. / Ant.  | : 3m 2018 3115-4580          | Ant. pol. | : VERTICAL |
| Limit        | : FCC PART 15C PEAK          | Pre       | :          |
| Env. / Ins.  | : 23.4°C/52.9%               | Engineer  | : Garry    |
| Power rating | : AC120V/60Hz                |           |            |
| Test Mode    | : BT3.0 GFSK 2402MHz Tx Mode |           |            |



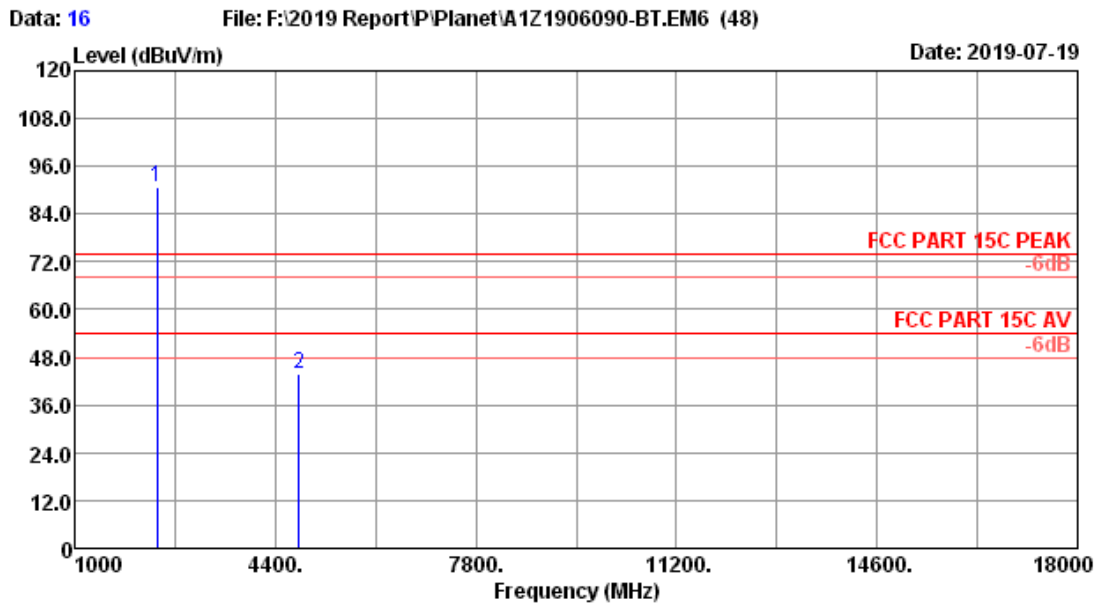
Site no. : 3m Chamber Data no. : 14  
 Dis. / Ant. : 3m 2018 3115-4580 Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK Pre :  
 Env. / Ins. : 23.4°C/52.9% Engineer : Garry  
 Power rating : AC120V/60Hz  
 Test Mode : BT3.0 GFSK 2402MHz Tx Mode

| No. | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | AMP<br>factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1   | 2402.00        | 27.71                    | 0.87                  | 35.04                 | 97.15             | 90.69                         | 74.00              | -16.69         | Peak   |
| 2   | 4804.00        | 32.10                    | 1.24                  | 34.36                 | 46.04             | 45.02                         | 74.00              | 28.98          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading  
 -Amp Factor  
 2. The emission levels that are 20dB below the official  
 limit are not reported.



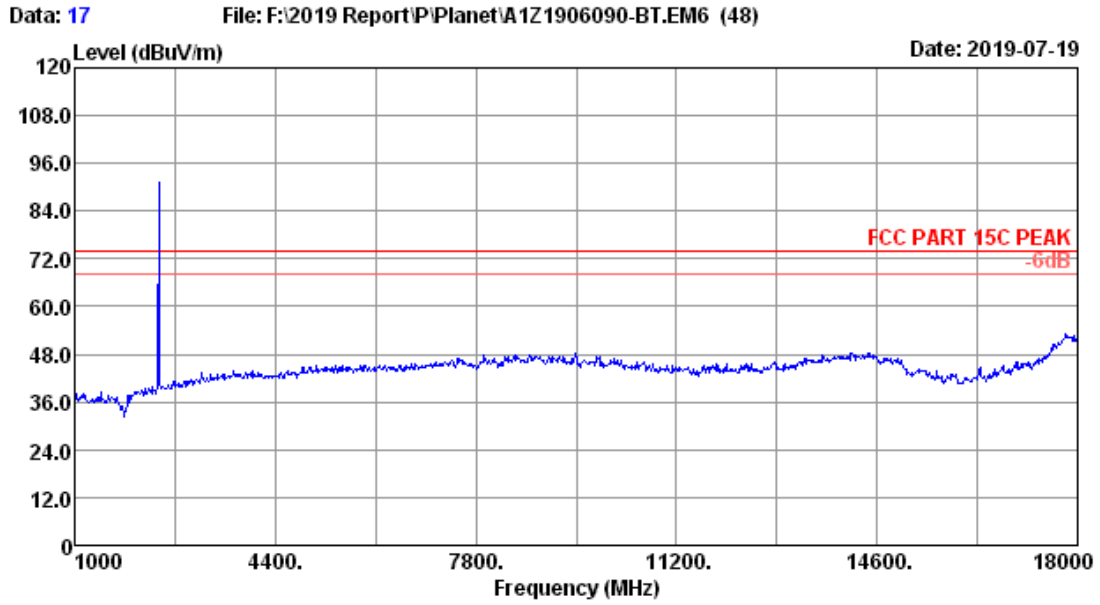
|              |                              |           |              |
|--------------|------------------------------|-----------|--------------|
| Site no.     | : 3m Chamber                 | Data no.  | : 15         |
| Dis. / Ant.  | : 3m 2018 3115-4580          | Ant. pol. | : HORIZONTAL |
| Limit        | : FCC PART 15C PEAK          | Pre       | :            |
| Env. / Ins.  | : 23.4°C/52.9%               | Engineer  | : Garry      |
| Power rating | : AC120V/60Hz                |           |              |
| Test Mode    | : BT3.0 GFSK 2402MHz Tx Mode |           |              |



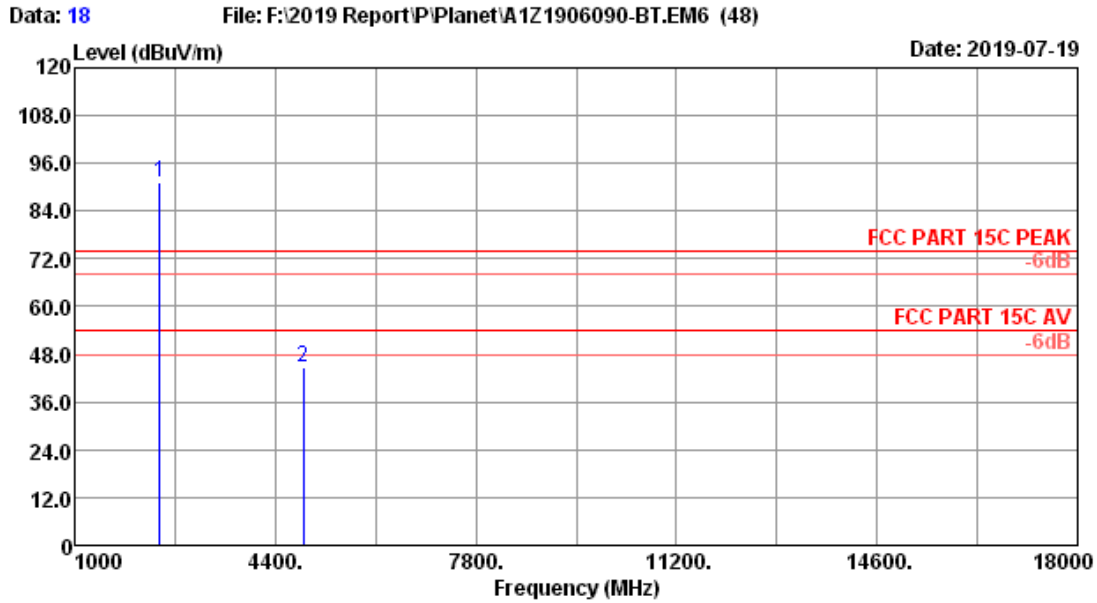
Site no. : 3m Chamber Data no. : 16  
 Dis. / Ant. : 3m 2018 3115-4580 Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK Pre :  
 Env. / Ins. : 23.4°C/52.9% Engineer : Garry  
 Power rating : AC120V/60Hz  
 Test Mode : BT3.0 GFSK 2402MHz Tx Mode

| No. | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | AMP<br>factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1   | 2402.00        | 27.71                    | 0.87                  | 35.04                 | 97.44             | 90.98                         | 74.00              | -16.98         | Peak   |
| 2   | 4804.00        | 32.10                    | 1.24                  | 34.36                 | 44.93             | 43.91                         | 74.00              | 30.09          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading  
 -Amp Factor  
 2. The emission levels that are 20dB below the official  
 limit are not reported.



|              |                              |           |            |
|--------------|------------------------------|-----------|------------|
| Site no.     | : 3m Chamber                 | Data no.  | : 17       |
| Dis. / Ant.  | : 3m 2018 3115-4580          | Ant. pol. | : VERTICAL |
| Limit        | : FCC PART 15C PEAK          | Pre       | :          |
| Env. / Ins.  | : 23.4°C/52.9%               | Engineer  | : Garry    |
| Power rating | : AC120V/60Hz                |           |            |
| Test Mode    | : BT3.0 GFSK 2441MHz Tx Mode |           |            |

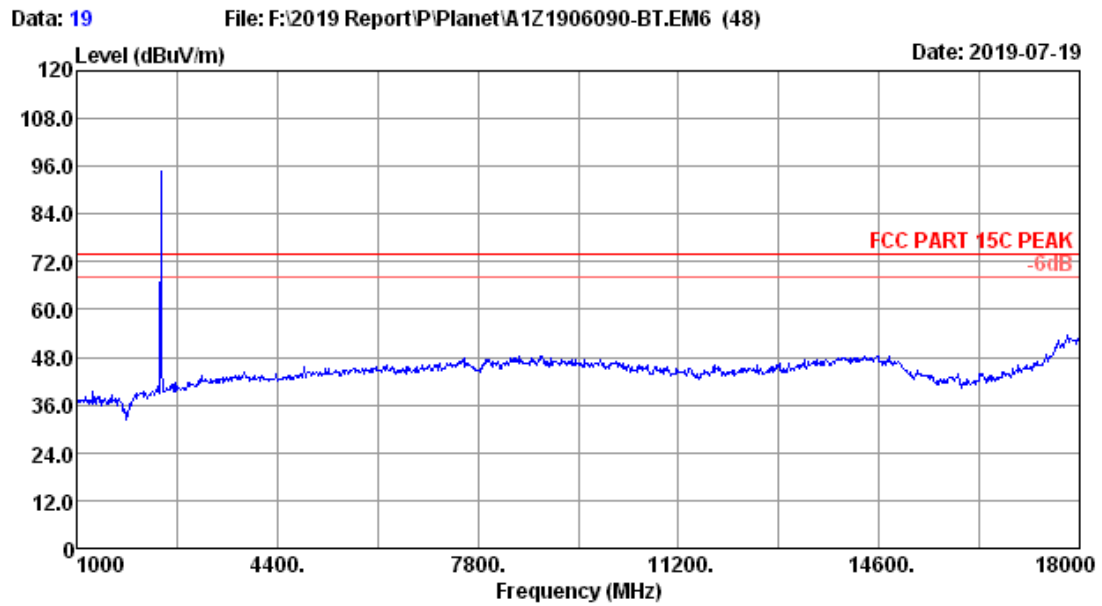


|              |                              |           |            |
|--------------|------------------------------|-----------|------------|
| Site no.     | : 3m Chamber                 | Data no.  | : 18       |
| Dis. / Ant.  | : 3m 2018 3115-4580          | Ant. pol. | : VERTICAL |
| Limit        | : FCC PART 15C PEAK          | Pre       | :          |
| Env. / Ins.  | : 23.4°C/52.9%               | Engineer  | : Garry    |
| Power rating | : AC120V/60Hz                |           |            |
| Test Mode    | : BT3.0 GFSK 2441MHz Tx Mode |           |            |

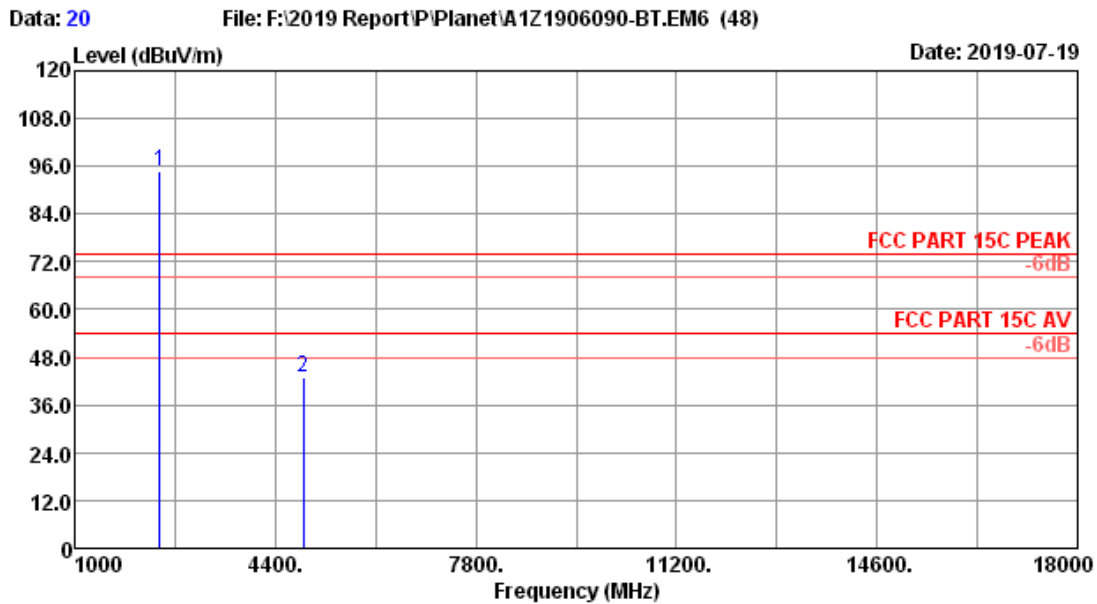
| No. | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | AMP<br>factor<br>(dB) | Reading<br>(dBuV) | Emission          |                    |                |        |
|-----|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------|--------------------|----------------|--------|
|     |                |                          |                       |                       |                   | Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
| 1   | 2441.00        | 27.87                    | 0.88                  | 35.02                 | 97.46             | 91.19             | 74.00              | -17.19         | Peak   |
| 2   | 4882.00        | 32.25                    | 1.25                  | 34.38                 | 45.55             | 44.67             | 74.00              | 29.33          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading  
-Amp Factor

2. The emission levels that are 20dB below the official limit are not reported.



|              |                              |           |              |
|--------------|------------------------------|-----------|--------------|
| Site no.     | : 3m Chamber                 | Data no.  | : 19         |
| Dis. / Ant.  | : 3m 2018 3115-4580          | Ant. pol. | : HORIZONTAL |
| Limit        | : FCC PART 15C PEAK          | Pre       | :            |
| Env. / Ins.  | : 23.4°C/52.9%               | Engineer  | : Garry      |
| Power rating | : AC120V/60Hz                |           |              |
| Test Mode    | : BT3.0 GFSK 2441MHz Tx Mode |           |              |

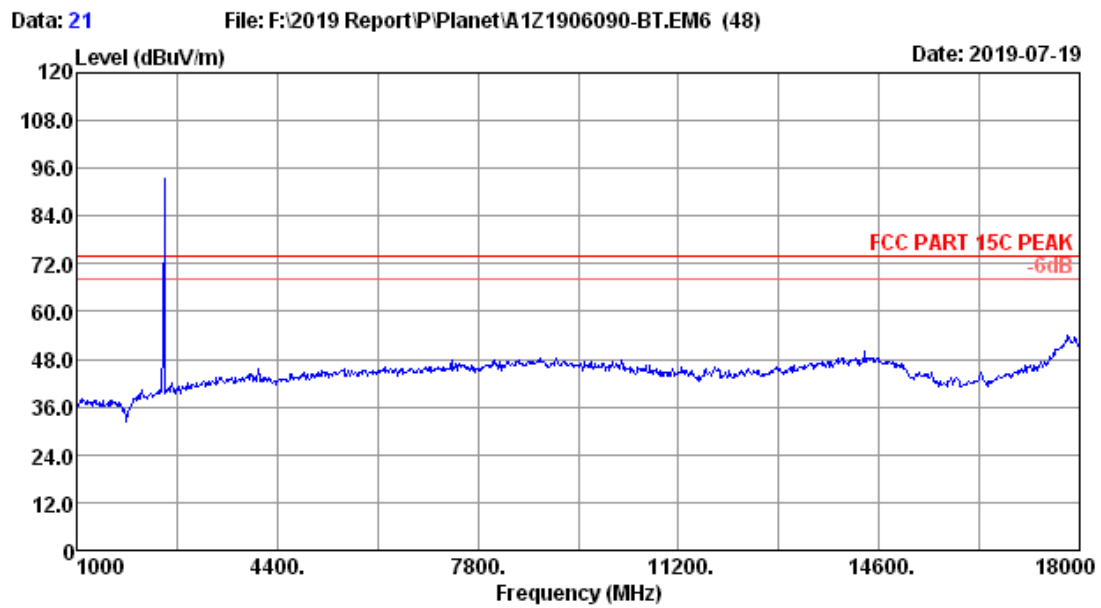


Site no. : 3m Chamber Data no. : 20  
 Dis. / Ant. : 3m 2018 3115-4580 Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK Pre :  
 Env. / Ins. : 23.4°C/52.9% Engineer : Garry  
 Power rating : AC120V/60Hz  
 Test Mode : BT3.0 GFSK 2441MHz Tx Mode

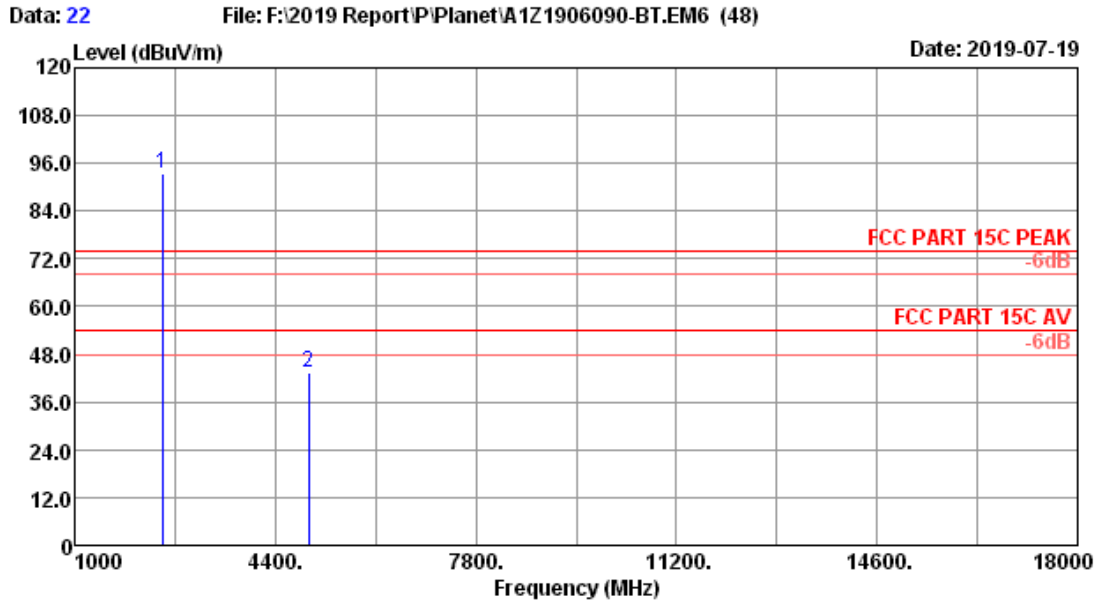
| No. | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | AMP<br>factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1   | 2441.00        | 27.87                    | 0.88                  | 35.02                 | 101.08            | 94.81                         | 74.00              | -20.81         | Peak   |
| 2   | 4882.00        | 32.25                    | 1.25                  | 34.38                 | 43.80             | 42.92                         | 74.00              | 31.08          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading  
 -Amp Factor  
 2. The emission levels that are 20dB below the official  
 limit are not reported.

| Frequency<br>(MHz) | Peak level<br>(dBuV/m) | Duty cycle factor<br>(dB) | AV level<br>(dBuV/m) | Limit(dBuV/m) | Conclusion |
|--------------------|------------------------|---------------------------|----------------------|---------------|------------|
| 2441.00            | 94.81                  | -24.807                   | 70.003               | 94            | Pass       |



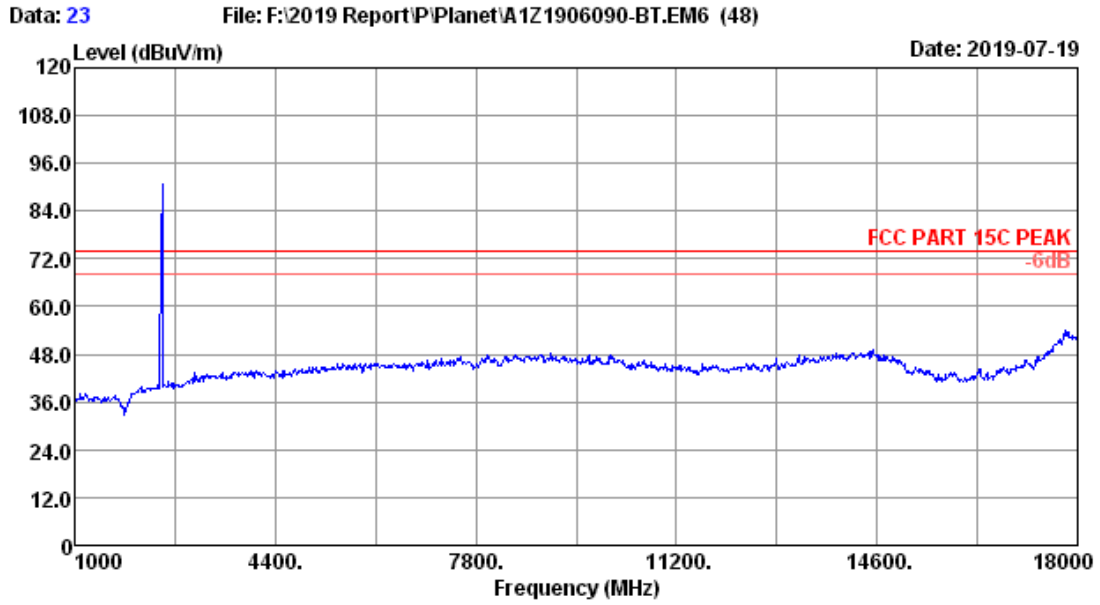
|              |                              |           |              |
|--------------|------------------------------|-----------|--------------|
| Site no.     | : 3m Chamber                 | Data no.  | : 21         |
| Dis. / Ant.  | : 3m 2018 3115-4580          | Ant. pol. | : HORIZONTAL |
| Limit        | : FCC PART 15C PEAK          | Pre       | :            |
| Env. / Ins.  | : 23.4°C/52.9%               | Engineer  | : Garry      |
| Power rating | : AC120V/60Hz                |           |              |
| Test Mode    | : BT3.0 GFSK 2480MHz Tx Mode |           |              |



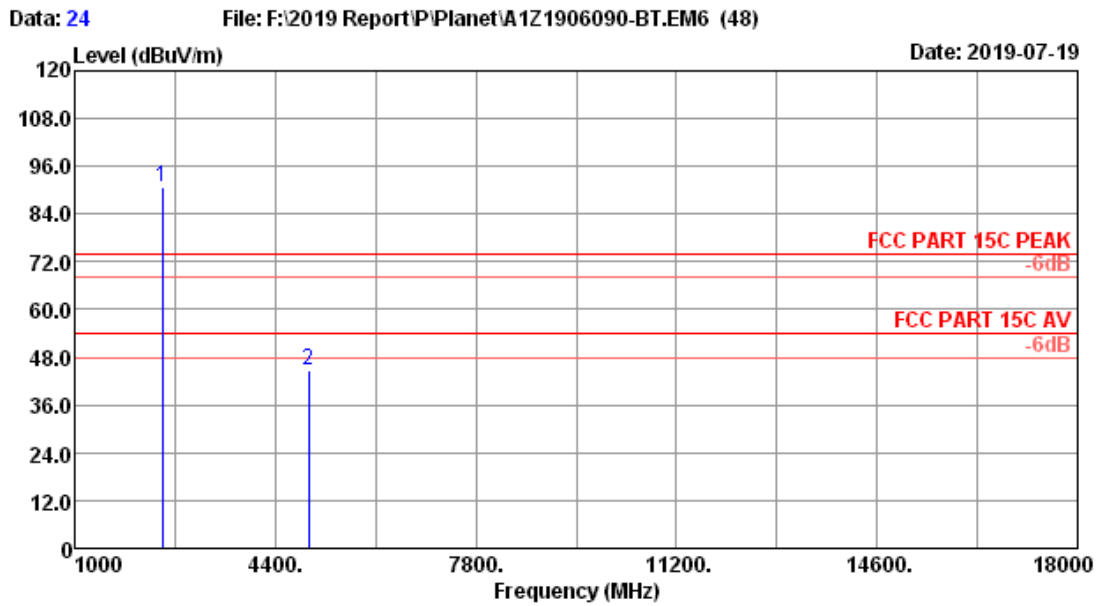
Site no. : 3m Chamber Data no. : 22  
 Dis. / Ant. : 3m 2018 3115-4580 Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK Pre :  
 Env. / Ins. : 23.4°C/52.9% Engineer : Garry  
 Power rating : AC120V/60Hz  
 Test Mode : BT3.0 GFSK 2480MHz Tx Mode

| No. | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | AMP<br>factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1   | 2480.00        | 27.98                    | 0.89                  | 35.01                 | 99.59             | 93.45                         | 74.00              | -19.45         | Peak   |
| 2   | 4960.00        | 32.43                    | 1.27                  | 34.39                 | 44.16             | 43.47                         | 74.00              | 30.53          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading  
 -Amp Factor  
 2. The emission levels that are 20dB below the official  
 limit are not reported.



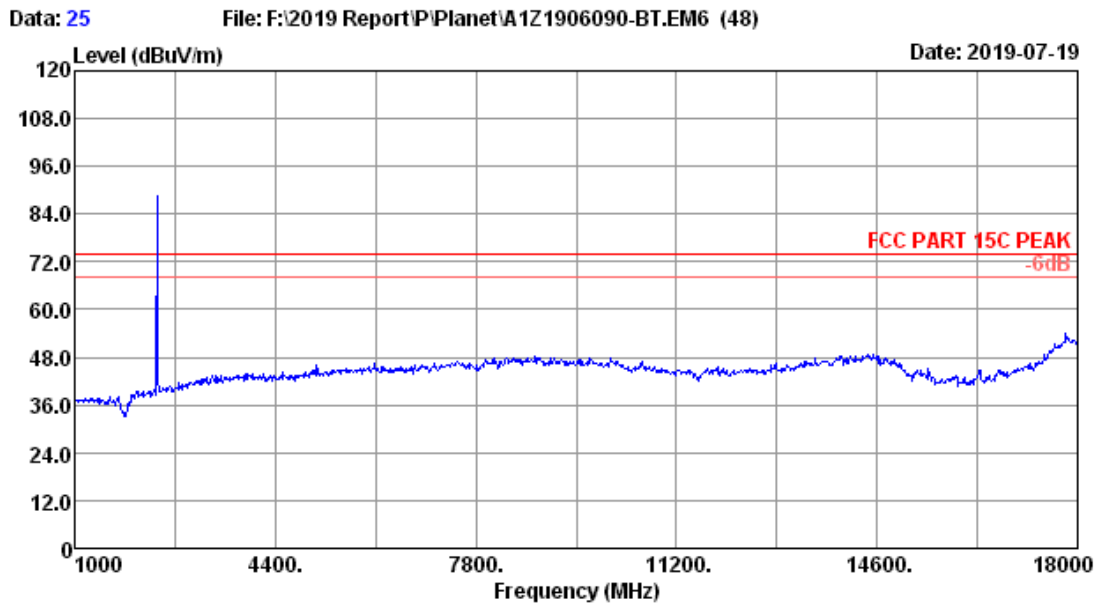
|              |                              |           |            |
|--------------|------------------------------|-----------|------------|
| Site no.     | : 3m Chamber                 | Data no.  | : 23       |
| Dis. / Ant.  | : 3m 2018 3115-4580          | Ant. pol. | : VERTICAL |
| Limit        | : FCC PART 15C PEAK          | Pre       | :          |
| Env. / Ins.  | : 23.4°C/52.9%               | Engineer  | : Garry    |
| Power rating | : AC120V/60Hz                |           |            |
| Test Mode    | : BT3.0 GFSK 2480MHz Tx Mode |           |            |



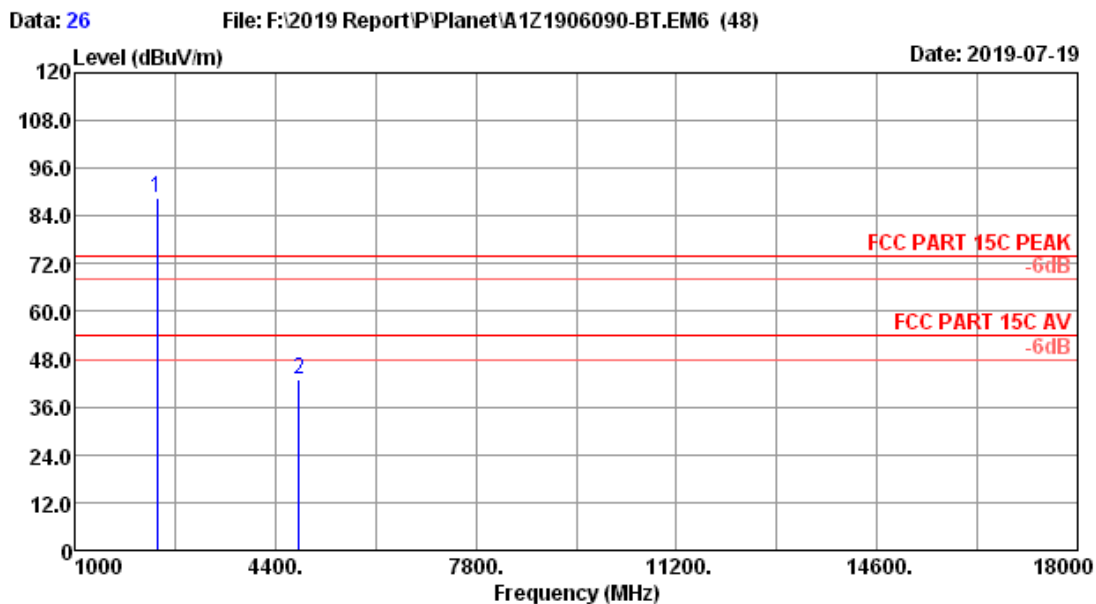
Site no. : 3m Chamber Data no. : 24  
 Dis. / Ant. : 3m 2018 3115-4580 Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK Pre :  
 Env. / Ins. : 23.4°C/52.9% Engineer : Garry  
 Power rating : AC120V/60Hz  
 Test Mode : BT3.0 GFSK 2480MHz Tx Mode

| No. | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | AMP<br>factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1   | 2480.00        | 27.98                    | 0.89                  | 35.01                 | 96.86             | 90.72                         | 74.00              | -16.72         | Peak   |
| 2   | 4960.00        | 32.43                    | 1.27                  | 34.39                 | 45.40             | 44.71                         | 74.00              | 29.29          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading  
 -Amp Factor  
 2. The emission levels that are 20dB below the official  
 limit are not reported.



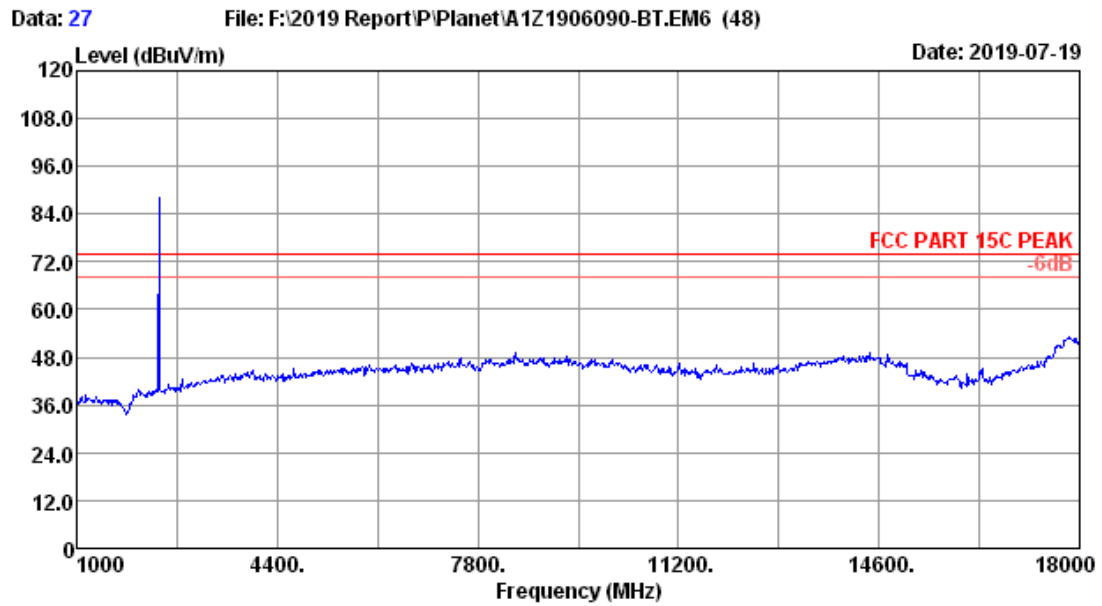
|              |                                |           |              |
|--------------|--------------------------------|-----------|--------------|
| Site no.     | : 3m Chamber                   | Data no.  | : 25         |
| Dis. / Ant.  | : 3m 2018 3115-4580            | Ant. pol. | : HORIZONTAL |
| Limit        | : FCC PART 15C PEAK            | Pre       | :            |
| Env. / Ins.  | : 23.4°C/52.9%                 | Engineer  | : Garry      |
| Power rating | : AC120V/60Hz                  |           |              |
| Test Mode    | : BT3.0 8-DPSK 2402MHz Tx Mode |           |              |



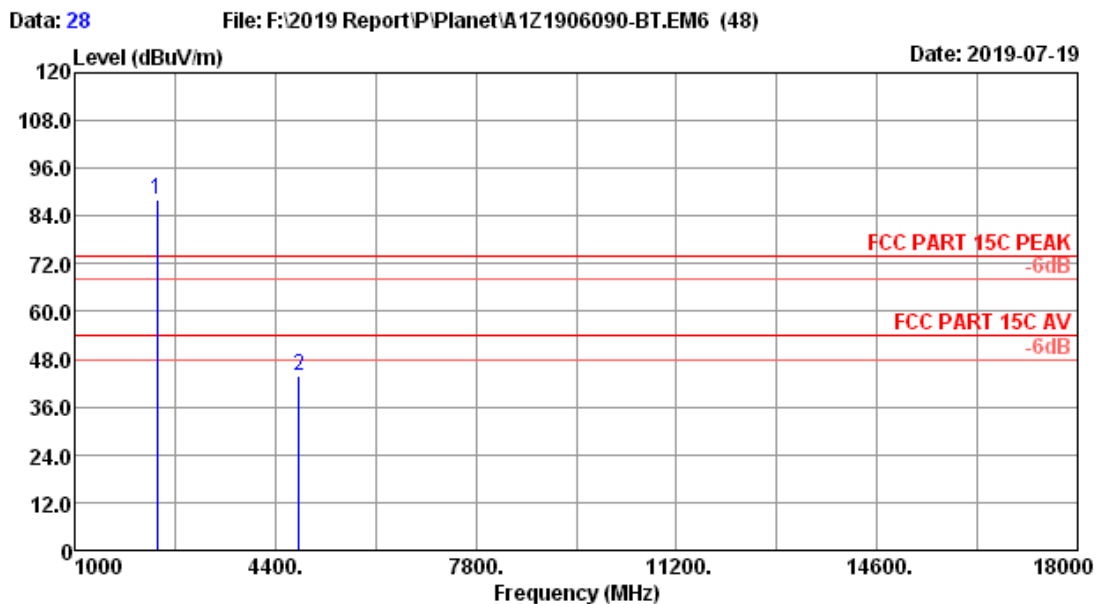
Site no. : 3m Chamber Data no. : 26  
 Dis. / Ant. : 3m 2018 3115-4580 Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK Pre :  
 Env. / Ins. : 23.4°C/52.9% Engineer : Garry  
 Power rating : AC120V/60Hz  
 Test Mode : BT3.0 8-DPSK 2402MHz Tx Mode

| No. | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | AMP<br>factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1   | 2402.00        | 27.71                    | 0.87                  | 35.04                 | 94.96             | 88.50                         | 74.00              | -14.50         | Peak   |
| 2   | 4804.00        | 32.10                    | 1.24                  | 34.36                 | 44.03             | 43.01                         | 74.00              | 30.99          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading  
 -Amp Factor  
 2. The emission levels that are 20dB below the official  
 limit are not reported.



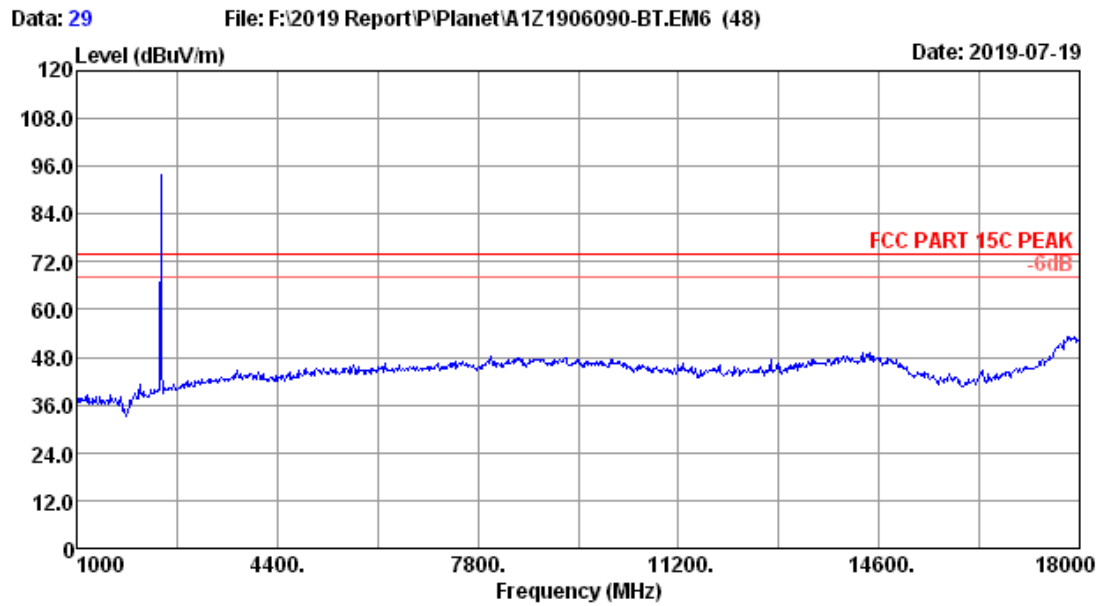
|              |                                |           |            |
|--------------|--------------------------------|-----------|------------|
| Site no.     | : 3m Chamber                   | Data no.  | : 27       |
| Dis. / Ant.  | : 3m 2018 3115-4580            | Ant. pol. | : VERTICAL |
| Limit        | : FCC PART 15C PEAK            | Pre       | :          |
| Env. / Ins.  | : 23.4°C/52.9%                 | Engineer  | : Garry    |
| Power rating | : AC120V/60Hz                  |           |            |
| Test Mode    | : BT3.0 8-DPSK 2402MHz Tx Mode |           |            |



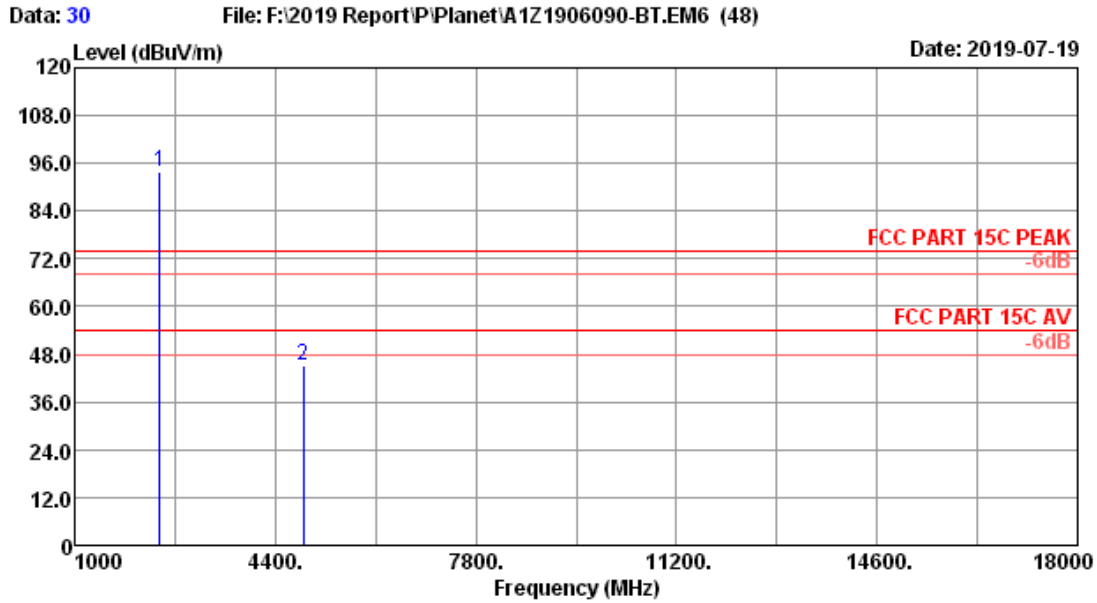
Site no. : 3m Chamber Data no. : 28  
 Dis. / Ant. : 3m 2018 3115-4580 Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK Pre :  
 Env. / Ins. : 23.4°C/52.9% Engineer : Garry  
 Power rating : AC120V/60Hz  
 Test Mode : BT3.0 8-DPSK 2402MHz Tx Mode

| No. | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | AMP<br>factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1   | 2402.00        | 27.71                    | 0.87                  | 35.04                 | 94.42             | 87.96                         | 74.00              | -13.96         | Peak   |
| 2   | 4804.00        | 32.10                    | 1.24                  | 34.36                 | 45.06             | 44.04                         | 74.00              | 29.96          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading  
 -Amp Factor  
 2. The emission levels that are 20dB below the official  
 limit are not reported.



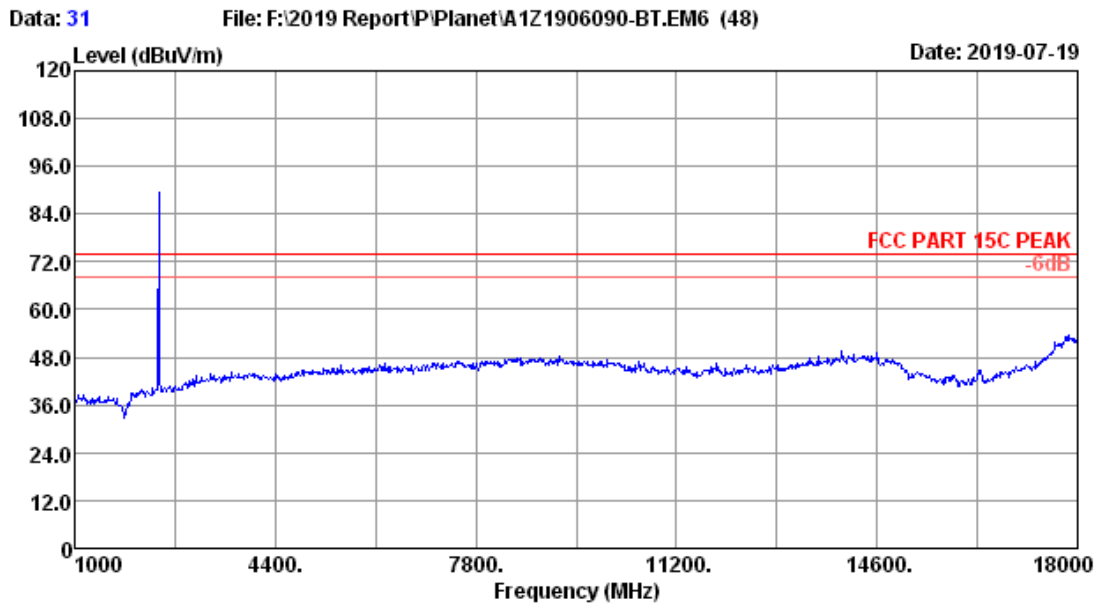
|              |                                |           |              |
|--------------|--------------------------------|-----------|--------------|
| Site no.     | : 3m Chamber                   | Data no.  | : 29         |
| Dis. / Ant.  | : 3m 2018 3115-4580            | Ant. pol. | : HORIZONTAL |
| Limit        | : FCC PART 15C PEAK            | Pre       | :            |
| Env. / Ins.  | : 23.4°C/52.9%                 | Engineer  | : Garry      |
| Power rating | : AC120V/60Hz                  |           |              |
| Test Mode    | : BT3.0 8-DPSK 2441MHz Tx Mode |           |              |



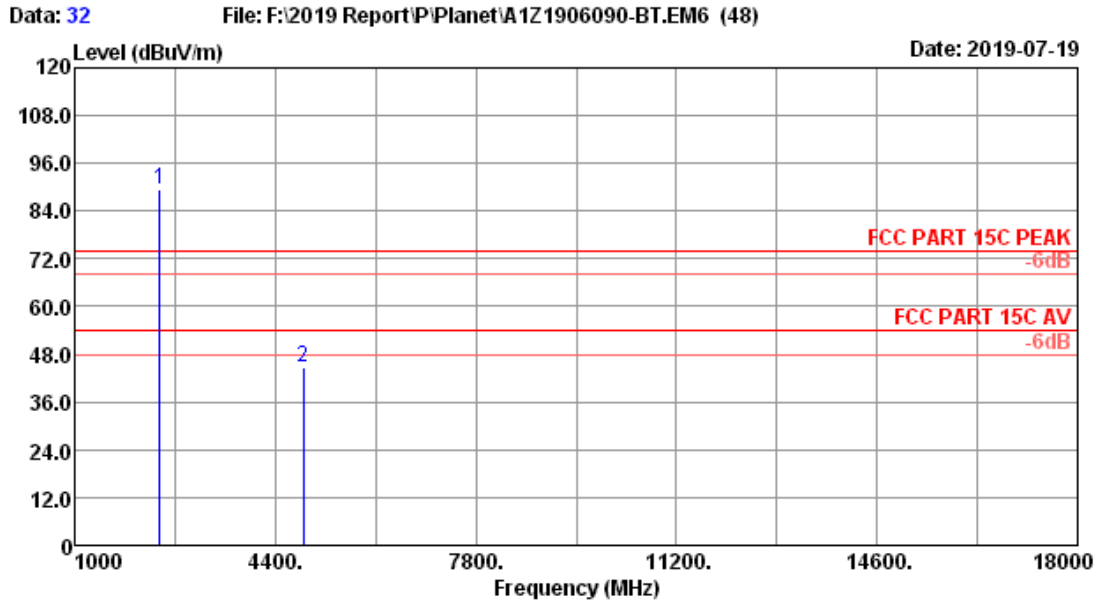
Site no. : 3m Chamber Data no. : 30  
 Dis. / Ant. : 3m 2018 3115-4580 Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK Pre :  
 Env. / Ins. : 23.4°C/52.9% Engineer : Garry  
 Power rating : AC120V/60Hz  
 Test Mode : BT3.0 8-DPSK 2441MHz Tx Mode

| No. | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | AMP<br>factor<br>(dB) | Reading<br>(dBuV) | Emission          |                    |                |        |
|-----|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------|--------------------|----------------|--------|
|     |                |                          |                       |                       |                   | Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
| 1   | 2441.00        | 27.87                    | 0.88                  | 35.02                 | 100.02            | 93.75             | 74.00              | -19.75         | Peak   |
| 2   | 4882.00        | 32.25                    | 1.25                  | 34.38                 | 45.87             | 44.99             | 74.00              | 29.01          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading  
 -Amp Factor  
 2. The emission levels that are 20dB below the official  
 limit are not reported.



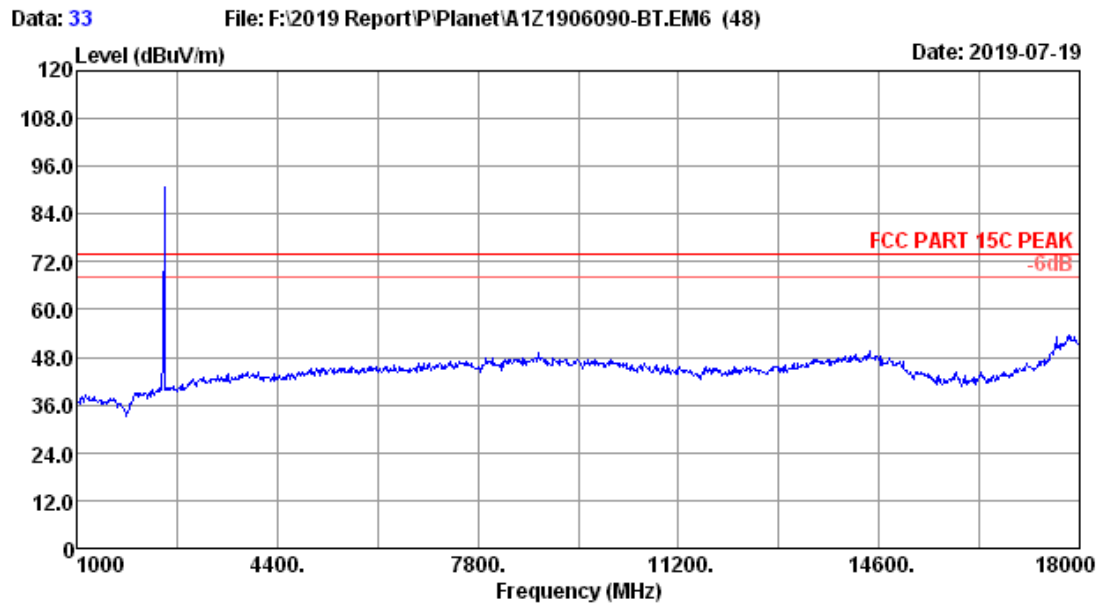
|              |                                |           |            |
|--------------|--------------------------------|-----------|------------|
| Site no.     | : 3m Chamber                   | Data no.  | : 31       |
| Dis. / Ant.  | : 3m 2018 3115-4580            | Ant. pol. | : VERTICAL |
| Limit        | : FCC PART 15C PEAK            | Pre       | :          |
| Env. / Ins.  | : 23.4°C/52.9%                 | Engineer  | : Garry    |
| Power rating | : AC120V/60Hz                  |           |            |
| Test Mode    | : BT3.0 8-DPSK 2441MHz Tx Mode |           |            |



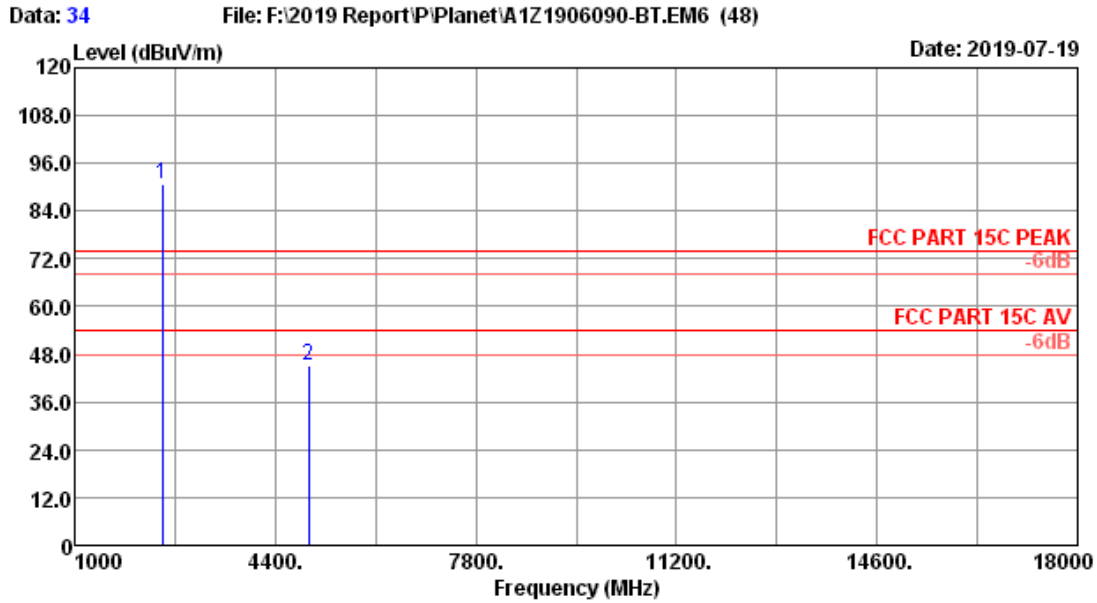
Site no. : 3m Chamber Data no. : 32  
 Dis. / Ant. : 3m 2018 3115-4580 Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK Pre :  
 Env. / Ins. : 23.4°C/52.9% Engineer : Garry  
 Power rating : AC120V/60Hz  
 Test Mode : BT3.0 8-DPSK 2441MHz Tx Mode

| No. | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | AMP<br>factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1   | 2441.00        | 27.87                    | 0.88                  | 35.02                 | 95.65             | 89.38                         | 74.00              | -15.38         | Peak   |
| 2   | 4882.00        | 32.25                    | 1.25                  | 34.38                 | 45.52             | 44.64                         | 74.00              | 29.36          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading  
 -Amp Factor  
 2. The emission levels that are 20dB below the official  
 limit are not reported.



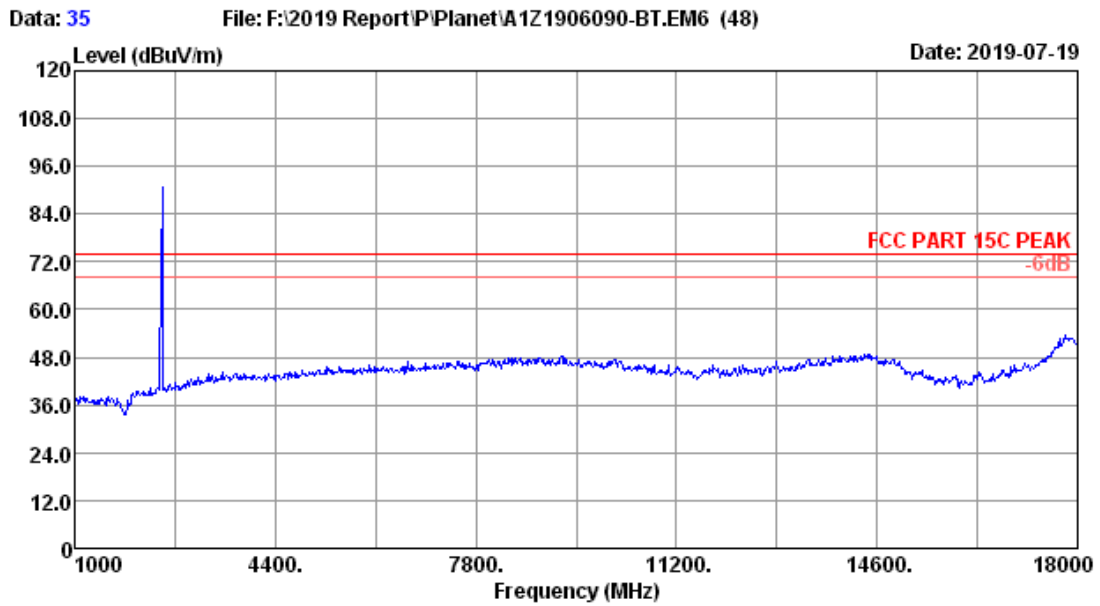
|              |                                |           |            |
|--------------|--------------------------------|-----------|------------|
| Site no.     | : 3m Chamber                   | Data no.  | : 33       |
| Dis. / Ant.  | : 3m 2018 3115-4580            | Ant. pol. | : VERTICAL |
| Limit        | : FCC PART 15C PEAK            | Pre       | :          |
| Env. / Ins.  | : 23.4°C/52.9%                 | Engineer  | : Garry    |
| Power rating | : AC120V/60Hz                  |           |            |
| Test Mode    | : BT3.0 8-DPSK 2480MHz Tx Mode |           |            |



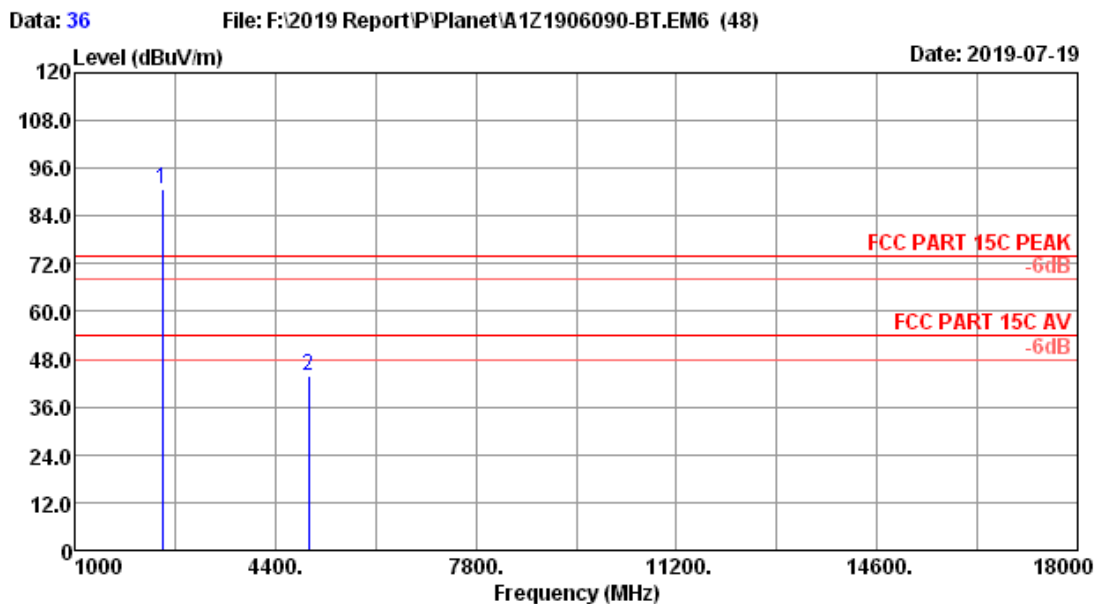
Site no. : 3m Chamber Data no. : 34  
 Dis. / Ant. : 3m 2018 3115-4580 Ant. pol. : VERTICAL  
 Limit : FCC PART 15C PEAK Pre :  
 Env. / Ins. : 23.4°C/52.9% Engineer : Garry  
 Power rating : AC120V/60Hz  
 Test Mode : BT3.0 8-DPSK 2480MHz Tx Mode

| No. | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | AMP<br>factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1   | 2480.00        | 27.98                    | 0.89                  | 35.01                 | 97.01             | 90.87                         | 74.00              | -16.87         | Peak   |
| 2   | 4960.00        | 32.43                    | 1.27                  | 34.39                 | 45.80             | 45.11                         | 74.00              | 28.89          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading  
 -Amp Factor  
 2. The emission levels that are 20dB below the official  
 limit are not reported.



|              |                                |           |              |
|--------------|--------------------------------|-----------|--------------|
| Site no.     | : 3m Chamber                   | Data no.  | : 35         |
| Dis. / Ant.  | : 3m 2018 3115-4580            | Ant. pol. | : HORIZONTAL |
| Limit        | : FCC PART 15C PEAK            | Pre       | :            |
| Env. / Ins.  | : 23.4°C/52.9%                 | Engineer  | : Garry      |
| Power rating | : AC120V/60Hz                  |           |              |
| Test Mode    | : BT3.0 8-DPSK 2480MHz Tx Mode |           |              |



Site no. : 3m Chamber Data no. : 36  
 Dis. / Ant. : 3m 2018 3115-4580 Ant. pol. : HORIZONTAL  
 Limit : FCC PART 15C PEAK Pre :  
 Env. / Ins. : 23.4°C/52.9% Engineer : Garry  
 Power rating : AC120V/60Hz  
 Test Mode : BT3.0 8-DPSK 2480MHz Tx Mode

| No. | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB/m) | Cable<br>Loss<br>(dB) | AMP<br>factor<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|----------------|--------------------------|-----------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1   | 2480.00        | 27.98                    | 0.89                  | 35.01                 | 96.98             | 90.84                         | 74.00              | -16.84         | Peak   |
| 2   | 4960.00        | 32.43                    | 1.27                  | 34.39                 | 44.31             | 43.62                         | 74.00              | 30.38          | Peak   |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading  
 -Amp Factor  
 2. The emission levels that are 20dB below the official  
 limit are not reported.

## 5. CONDUCTED SPURIOUS EMISSIONS

### 5.1. Test Equipment

| Item | Equipment           | Manufacturer | Model No.         | Serial No. | Last Cal. | Cal. Interval |
|------|---------------------|--------------|-------------------|------------|-----------|---------------|
| 1.   | PXA Signal Analyzer | Agilent      | N9030A            | MY51380221 | Jun.30,19 | 1 Year        |
| 2.   | Attenuator          | Agilent      | 8491B             | MY39262165 | Oct.14,18 | 1 Year        |
| 3.   | RF Cable            | EMCI         | EMC102-KM-KM 3500 | 170702     | May.13,19 | 1 Year        |

### 5.2. Block Diagram of Test Setup



### 5.3. Limit

In any 100kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

### 5.4. Test Procedure

Use the test method described in ANSI C63.10 clause 7.8.8:

The transmitter output was connected to a spectrum analyzer, The resolution bandwidth is set to 100 kHz, The video bandwidth is set to 300 kHz and measure all the emissions With peak detector.

Note: The cable loss and attenuator loss were offset into spectrum analyzer as an amplitude offset.

### 5.5. Test result

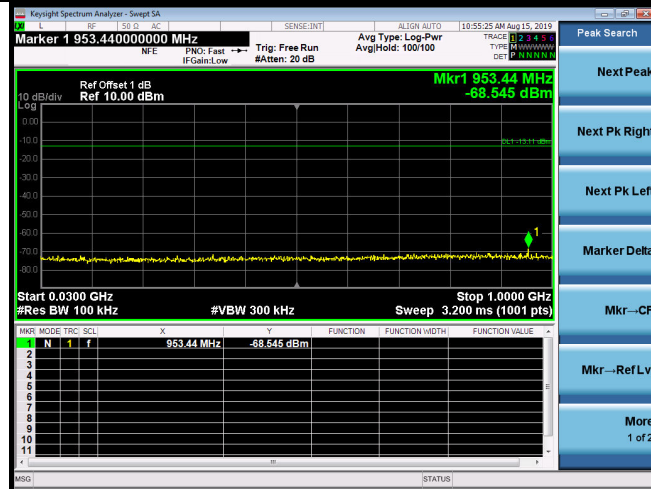
**PASS** (The testing data was attached in the next pages.)

|                            |                         |                          |
|----------------------------|-------------------------|--------------------------|
| EUT: COSMO                 |                         |                          |
| M/N: COSMO COMMUNICATOR VE |                         |                          |
| Test date: 2019-08-15      | Pressure: 102.1±1.0 kpa | Humidity: 51.1±3.0%      |
| Tested by: Garry           | Test site: RF site      | Temperature: 22.8±0.6 °C |

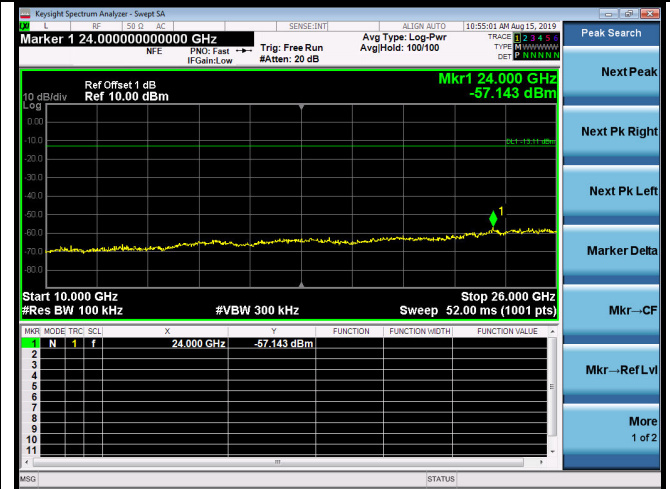
### Hopping off

#### GFSK

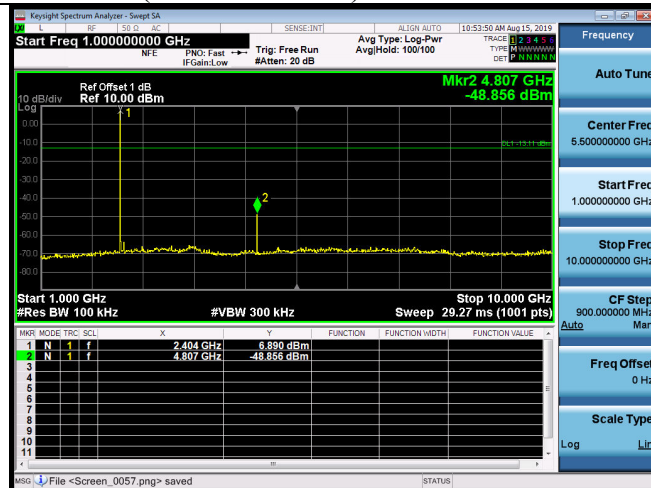
2402MHz(30MHz – 1GHz)



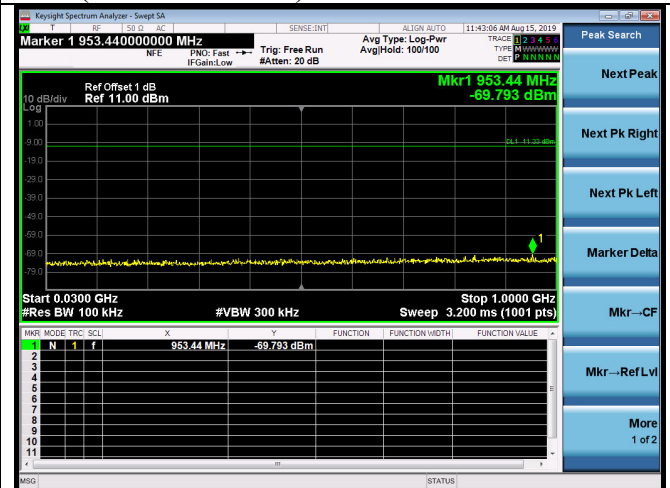
2402MHz(10GHz – 26GHz)



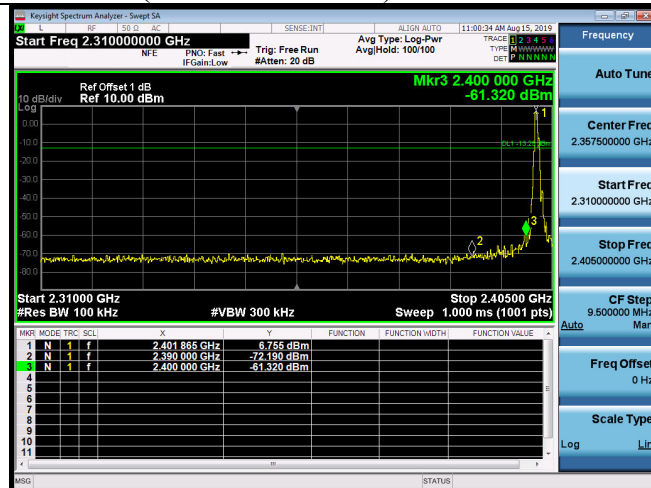
2402MHz(1GHz – 10GHz)



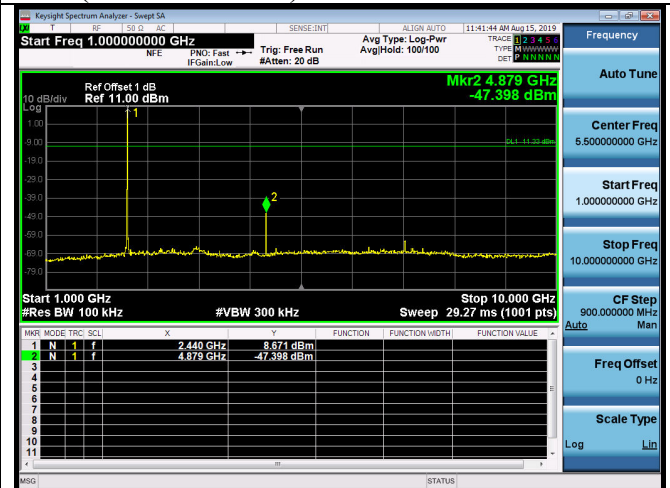
2441(30MHz – 1GHz)



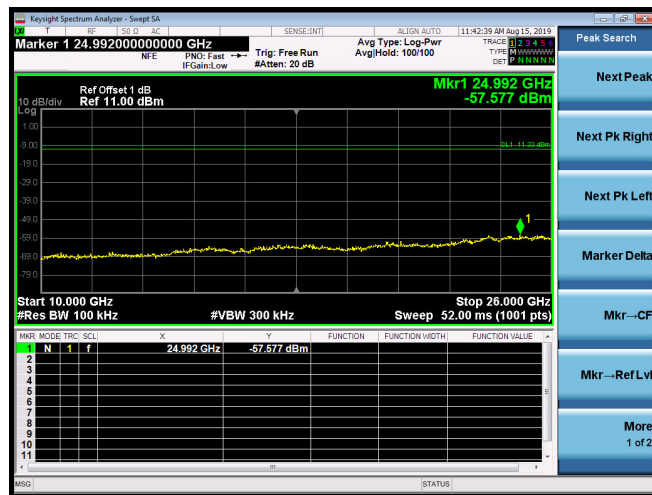
2402MHz(2.3GHz – 2.4GHz)



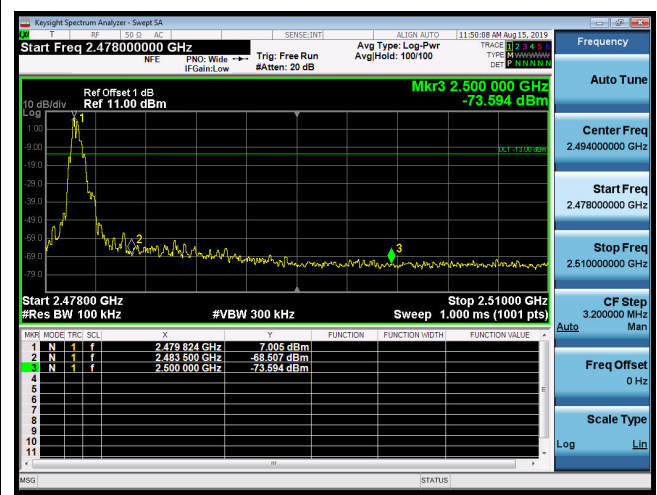
2441(1GHz – 10GHz)



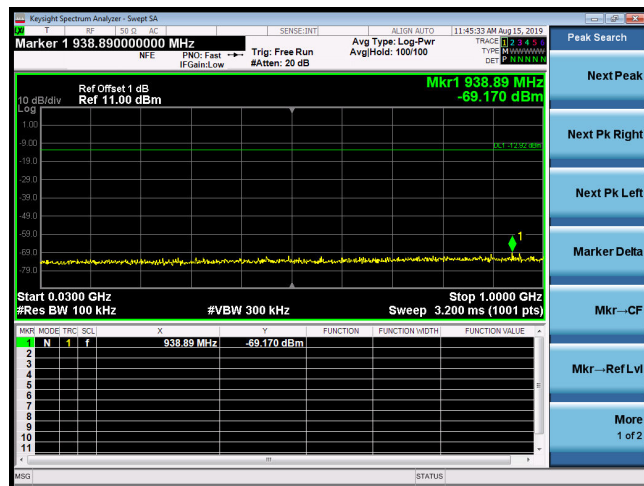
## 2441(10GHz – 26GHz)



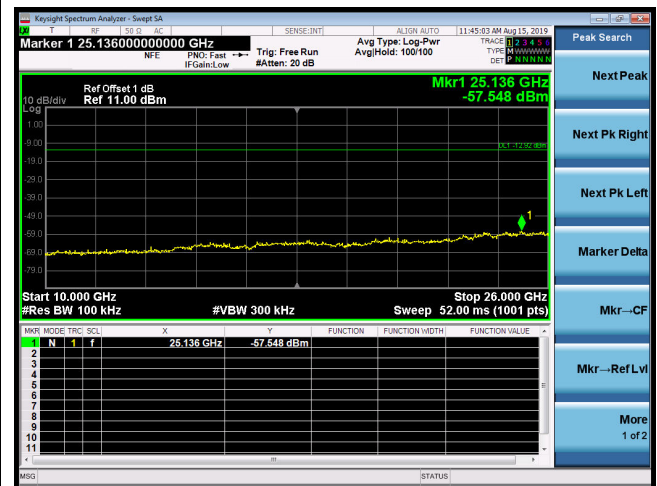
## 2480MHz(2.4GHz – 2.5GHz)



## 2480MHz(30MHz – 1GHz)

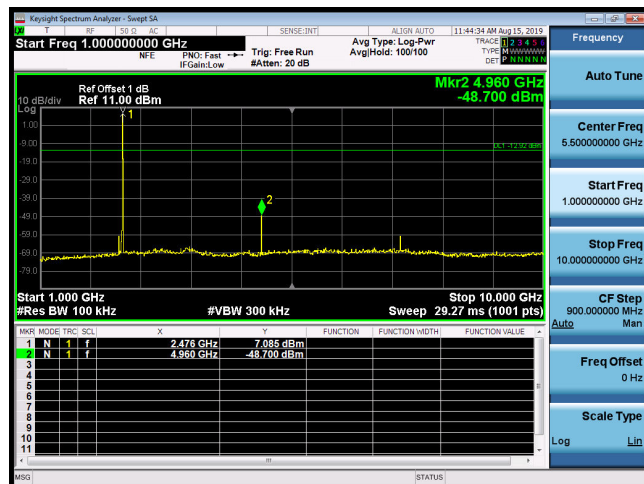


## 2480MHz(10GHz – 26GHz)

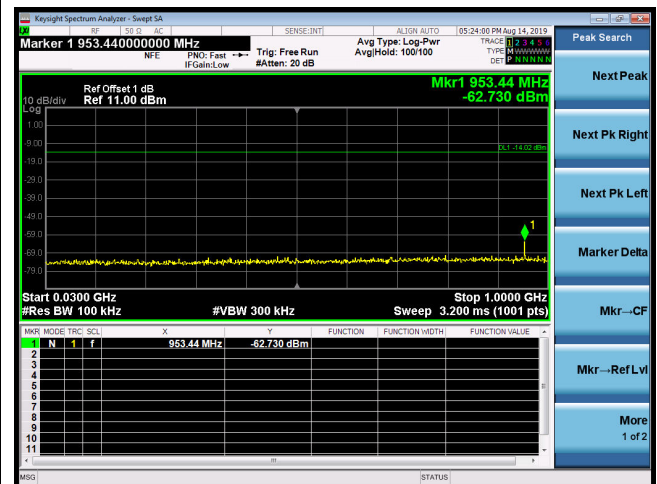


## 8-DPSK

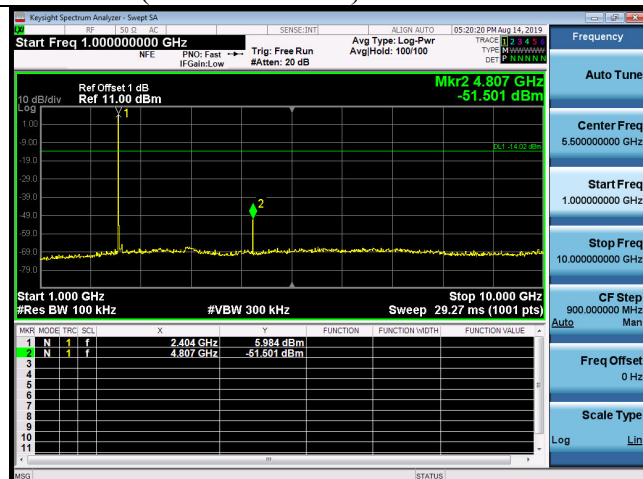
## 2480MHz(1GHz – 10GHz)



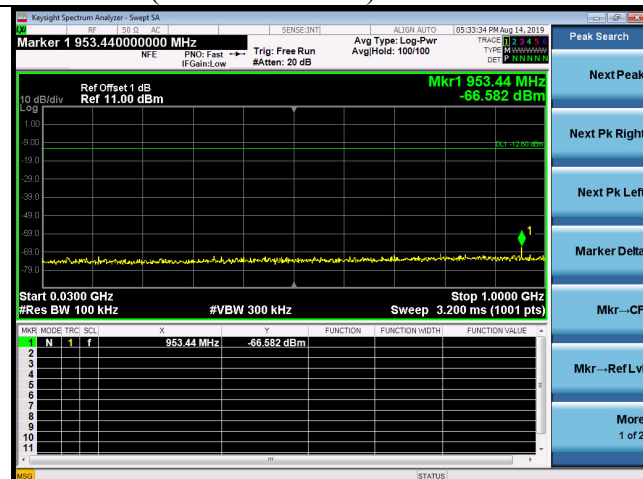
## 2402MHz(30MHz – 1GHz)



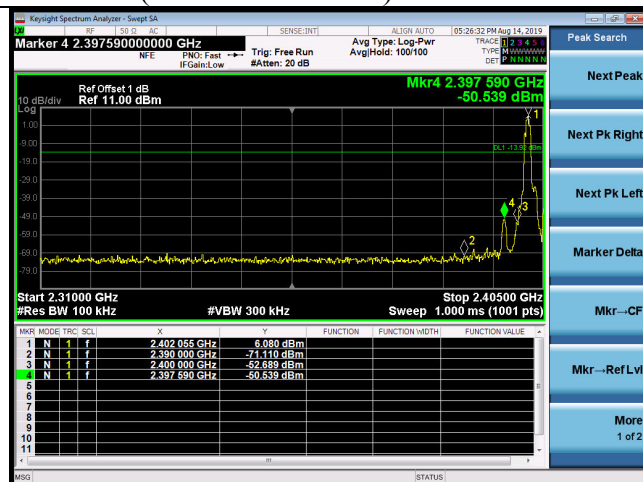
## 2402MHz(1GHz – 10GHz)



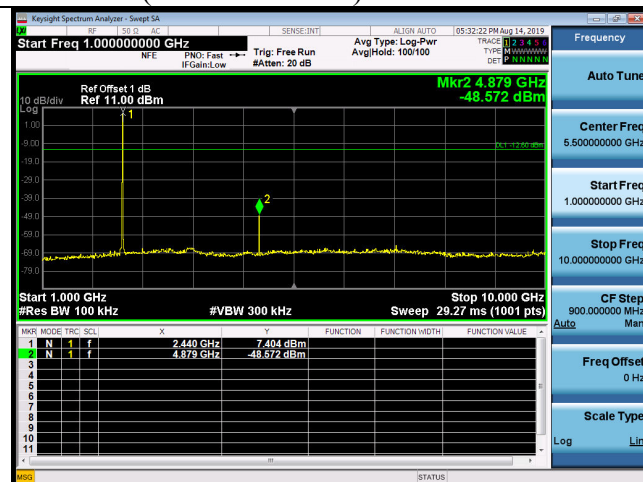
## 2441MHz(30MHz – 1GHz)



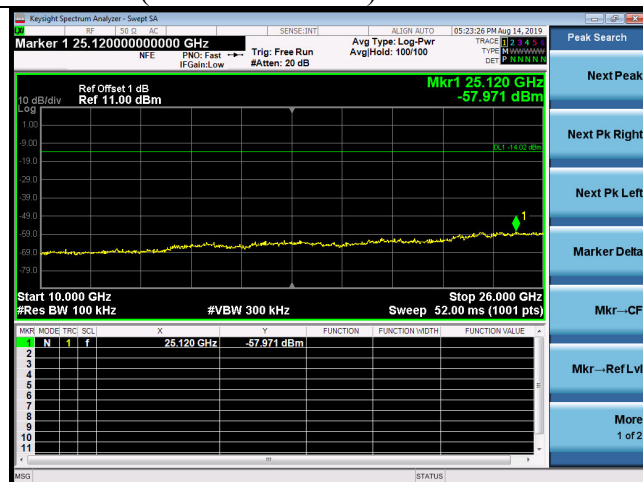
## 2402MHz(2.3GHz – 2.4GHz)



## 2441MHz(1GHz – 10GHz)



## 2402MHz(10GHz – 26GHz)



## 2441MHz(10GHz – 26GHz)

