

CFR 47 FCC PART 15 SUBPART C

TEST REPORT

For

Starriders Autonomous RC Drone

MODEL NUMBER: 2092086, OA-6487, NV-6474

REPORT NUMBER: 4790848339-RF-1

FCC ID: 2ASK3NV-6474T

ISSUE DATE: May 11, 2023

Prepared for

**AMAX INDUSTRIAL GROUP CHINA CO.,LTD
OFFICE NO.3 10/F WITTY COMMERCIAL BUILDING 1A-1L TUNG CHOI STREET
MONGKOK KOWLOON HONG KONG**

Prepared by

UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch

Building 10, Innovation Technology Park, No. 1, Li Bin Road, Song Shan Lake Hi-Tech Development Zone Dongguan, 523808, People's Republic of China

Tel: +86 769 22038881

Fax: +86 769 33244054

Website: www.ul.com

Revision History

| Rev. | Issue Date | Revisions | Revised By |
|------|--------------|---------------|------------|
| V0 | May 11, 2023 | Initial Issue | |

| Summary of Test Results | | | |
|---|---|--|--------------|
| Clause | Test Items | FCC Rules | Test Results |
| 1 | 20dB Bandwidth and 99% Occupied Bandwidth | CFR 47 FCC §15.215 € | Pass |
| 2 | Radiated Emission | CFR 47 FCC §15.249 (a)(d)€ CFR 47 FCC §15.205 and §15.209 | Pass |
| 3 | Conducted Emission Test for AC Power Port | CFR 47 FCC §15.207 | Pass |
| 4 | Antenna Requirement | CFR 47 FCC §15.203 | Pass |
| <p>Note 1: This test report is only published to and used by the applicant, and it is not for evidence purpose in China.</p> <p>Note 2: The measurement result for the sample received is <Pass> according to < CFR 47 FCC PART 15 SUBPART C > when <Accuracy Method> decision rule is applied.</p> | | | |

CONTENTS

| | |
|---|-----------|
| 1. ATTESTATION OF TEST RESULTS | 5 |
| 2. TEST METHODOLOGY | 6 |
| 3. FACILITIES AND ACCREDITATION | 6 |
| 4. CALIBRATION AND UNCERTAINTY | 7 |
| 4.1. <i>MEASURING INSTRUMENT CALIBRATION</i> | <i>7</i> |
| 4.2. <i>MEASUREMENT UNCERTAINTY</i> | <i>7</i> |
| 5. EQUIPMENT UNDER TEST | 8 |
| 5.1. <i>DESCRIPTION OF EUT</i> | <i>8</i> |
| 5.2. <i>CHANNEL LIST</i> | <i>8</i> |
| 5.3. <i>MAXIMUM FIELD STRENGTH</i> | <i>8</i> |
| 5.4. <i>TEST CHANNEL CONFIGURATION</i> | <i>8</i> |
| 5.5. <i>THE WORSE CASE POWER SETTING PARAMETER</i> | <i>9</i> |
| 5.6. <i>DESCRIPTION OF AVAILABLE ANTENNAS</i> | <i>9</i> |
| 5.7. <i>DESCRIPTION OF TEST SETUP</i> | <i>10</i> |
| 6. MEASURING EQUIPMENT AND SOFTWARE USED | 11 |
| 7. ANTENNA PORT TEST RESULTS | 12 |
| 7.1. <i>20DB BANDWIDTH AND 99% OCCUPIED BANDWIDTH</i> | <i>12</i> |
| 7.2. <i>DUTY CYCLE</i> | <i>19</i> |
| 8. RADIATED TEST RESULTS | 21 |
| 8.1. <i>RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS</i> | <i>31</i> |
| 8.2. <i>SPURIOUS EMISSIONS (1 GHZ ~ 3 GHZ)</i> | <i>34</i> |
| 8.3. <i>SPURIOUS EMISSIONS (3 GHZ ~ 18 GHZ)</i> | <i>40</i> |
| 8.4. <i>SPURIOUS EMISSIONS (9 KHZ ~ 30 MHZ)</i> | <i>46</i> |
| 8.5. <i>SPURIOUS EMISSIONS (30 MHZ ~ 1 GHZ)</i> | <i>49</i> |
| 8.6. <i>SPURIOUS EMISSIONS (18 GHZ ~ 26 GHZ)</i> | <i>51</i> |
| 9. AC POWER LINE CONDUCTED EMISSION | 53 |
| 10. ANTENNA REQUIREMENT | 56 |

1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: AMAX INDUSTRIAL GROUP CHINA CO.,LTD
Address: OFFICE NO.3 10/F WITTY COMMERCIAL BUILDING 1A-1L
TUNG CHOI STREET MONGKOK KOWLOON HONG KONG

Manufacturer Information

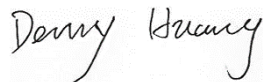
Company Name: AMAX INDUSTRIAL GROUP CHINA CO.,LTD
Address: OFFICE NO.3 10/F WITTY COMMERCIAL BUILDING 1A-1L
TUNG CHOI STREET MONGKOK KOWLOON HONG KONG

EUT Information

EUT Name: Starriders Autonomous RC Drone
Model: 2092086, OA-6487, NV-6474
Model Difference: All the same except for the model name.
Sample Received Date: May 4, 2023
Sample Status: Normal
Sample ID: 6063661
Date of Tested: May 4, 2023 to May 11, 2023

| APPLICABLE STANDARDS | |
|------------------------------|--------------|
| STANDARD | TEST RESULTS |
| CFR 47 FCC PART 15 SUBPART C | PASS |

Prepared By:



Denny Huang

Senior Project Engineer

Checked By:



Kebo Zhang

Senior Project Engineer

Approved By:



Stephen Guo

Operations Manager

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with KDB 414788 D01 Radiated Test Site v01r01, FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013.

3. FACILITIES AND ACCREDITATION

| | |
|---------------------------|--|
| Accreditation Certificate | <p>A2LA (Certificate No.: 4102.01) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA.</p> <p>FCC (FCC Designation No.: CN1187) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules</p> <p>ISED (Company No.: 21320) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320 and the test lab Conformity Assessment Body Identifier (CABID) is CN0046.</p> <p>VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B, the VCCI registration No. is C-20012 and T-20011</p> |
|---------------------------|--|

Note 1:

All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, No. 1, Li Bin Road, Song Shan Lake Hi-Tech Development Zone Dongguan, 523808, People's Republic of China.

Note 2:

The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

Note 3:

For below 30 MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30 MHz had been correlated to measurements performed on an OFS.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| Test Item | Uncertainty |
|---|---------------------------|
| Conduction emission | 3.62 dB |
| Radiated Emission (Included Fundamental Emission) (9 kHz ~ 30 MHz) | 2.2 dB |
| Radiated Emission (Included Fundamental Emission) (30 MHz ~ 1 GHz) | 4.00 dB |
| Radiated Emission (Included Fundamental Emission) (1 GHz to 26 GHz) | 5.78 dB (1 GHz ~ 18 GHz) |
| | 5.23 dB (18 GHz ~ 26 GHz) |
| Duty Cycle | ±0.028% |
| 20 dB Bandwidth and 99% Occupied Bandwidth | ±0.0196% |
| Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2. | |

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

| | | |
|---------------------|---|---------------------|
| EUT Name | Starriders Autonomous RC Drone | |
| EUT description | The EUT is a controller for Starriders Autonomous RC Drone (FCC ID: 2ASK3NV-6474R). | |
| Model | 2092086, OA-6487, NV-6474 | |
| Model Difference | All the same except for the model name. | |
| Product Description | Operation Frequency | 2429 MHz ~ 2453 MHz |
| | Modulation Type | GFSK |
| Battery | DC 3.7 V | |

5.2. CHANNEL LIST

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------|
| 1 | 2429 | 8 | 2436 | 15 | 2443 | 22 | 2450 |
| 2 | 2430 | 9 | 2437 | 16 | 2444 | 23 | 2451 |
| 3 | 2431 | 10 | 2438 | 17 | 2445 | 24 | 2452 |
| 4 | 2432 | 11 | 2439 | 18 | 2446 | 25 | 2453 |
| 5 | 2433 | 12 | 2440 | 19 | 2447 | / | / |
| 6 | 2434 | 13 | 2441 | 20 | 2448 | / | / |
| 7 | 2435 | 14 | 2442 | 21 | 2449 | / | / |

5.3. MAXIMUM FIELD STRENGTH

| Test Mode | Frequency (MHz) | Channel Number | Maximum Peak field strength (dBμV/m) |
|-----------|-----------------|----------------|--------------------------------------|
| GFSK | 2429 ~ 2453 | 1-25[25] | 87.49 |

5.4. TEST CHANNEL CONFIGURATION

| Test Mode | Test Channel | Frequency |
|-----------|--|------------------------------|
| GFSK | CH 1(Low Channel), CH 13(MID Channel), CH 25(High Channel) | 2429 MHz, 2441 MHz, 2453 MHz |

5.5. THE WORSE CASE POWER SETTING PARAMETER

| The Worse Case Power Setting Parameter under 2429 MHz ~ 2453 MHz Band | | | | |
|---|-------------------------|--------------|---------|---------|
| Test Software Version | | / | | |
| Modulation Type | Transmit Antenna Number | Test Channel | | |
| | | CH 1 | CH 13 | CH 25 |
| GFSK | 1 | Default | Default | Default |

5.6. DESCRIPTION OF AVAILABLE ANTENNAS

| Antenna | Frequency (MHz) | Antenna Type | Maximum Antenna Gain (dBi) |
|---------|-----------------|--------------|----------------------------|
| 1 | 2429 ~ 2453 | Wire Antenna | 0.8 |

| Test Mode | Transmit and Receive Mode | Description |
|-----------|---|--|
| GFSK | <input checked="" type="checkbox"/> 1TX | Antenna 1 can be used as transmitting/receiving antenna. |

Note: The value of the antenna gain was declared by customer.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

| Item | Equipment | Brand Name | Model Name | P/N |
|------|-----------|------------|------------|-----|
| / | / | / | / | / |

I/O CABLES

| Cable No | Port | Connector Type | Cable Type | Cable Length(m) | Remarks |
|----------|------|----------------|------------|-----------------|---------|
| 1 | DC | USB | Unshielded | 0.4 | / |

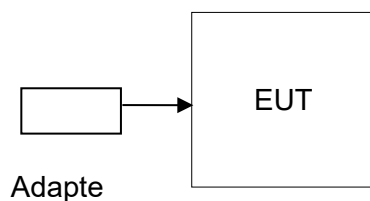
ACCESSORY

| Item | Equipment | Mfr/Brand | Model/Type No. | Specification | Series No. |
|------|-----------|-----------|----------------|---|------------|
| 1 | Adapter | / | MDY-11-EX | Input: AC 100-240 V, 50/60 Hz, 0.7 A Output: DC 5 V, 3 A | / |

TEST SETUP

The EUT have the engineer mode inside.

SETUP DIAGRAM FOR TEST



Note: With and without adapter mode had been tested, but only the worst data was recorded in the report.

6. MEASURING EQUIPMENT AND SOFTWARE USED

| Conducted Emissions | | | | | |
|---------------------------------------|--------------|-----------|--------------|--------------|--------------|
| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Due Date |
| EMI Test Receiver | R&S | ESR3 | 101961 | Oct.17, 2022 | Oct.16, 2023 |
| Two-Line V-Network | R&S | ENV216 | 101983 | Oct.17, 2022 | Oct.16, 2023 |
| Software | | | | | |
| Description | | | Manufacturer | Name | Version |
| Test Software for Conducted Emissions | | | Farad | EZ-EMC | Ver. UL-3A1 |

| Radiated Emissions | | | | | |
|--------------------------------------|---------------|-------------------------------------|---------------|---------------|---------------|
| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Due Date |
| MXE EMI Receiver | KESIGHT | N9038A | MY56400036 | Oct.17, 2022 | Oct.16, 2023 |
| Hybrid Log Periodic Antenna | TDK | HLP-3003C | 130959 | Aug.02, 2021 | Aug.01, 2024 |
| Preamplifier | HP | 8447D | 2944A09099 | Oct.17, 2022 | Oct.16, 2023 |
| EMI Measurement Receiver | R&S | ESR26 | 101377 | Oct.17, 2022 | Oct.16, 2023 |
| Horn Antenna | TDK | HRN-0118 | 130940 | July 20, 2021 | July 19, 2024 |
| Preamplifier | TDK | PA-02-0118 | TRS-305-00067 | Oct.17, 2022 | Oct.16, 2023 |
| Horn Antenna | Schwarzbeck | BBHA9170 | 697 | July 20, 2021 | July 19, 2024 |
| Preamplifier | TDK | PA-02-2 | TRS-307-00003 | Oct.17, 2022 | Oct.16, 2023 |
| Preamplifier | TDK | PA-02-3 | TRS-308-00002 | Oct.17, 2022 | Oct.16, 2023 |
| Loop antenna | Schwarzbeck | 1519B | 00008 | Dec.14, 2021 | Dec.13, 2024 |
| Preamplifier | TDK | PA-02-001-3000 | TRS-302-00050 | Oct.17, 2022 | Oct.16, 2023 |
| Preamplifier | Mini-Circuits | ZX60-83LN-S+ | SUP01202035 | Oct.17, 2022 | Oct.16, 2023 |
| High Pass Filter | Wi | WHKX10-2700-3000-18000-40SS | 23 | / | / |
| Band Reject Filter | Wainwright | WRCJV8-2350-2400-2483.5-2533.5-40SS | 4 | / | / |
| Software | | | | | |
| Description | | | Manufacturer | Name | Version |
| Test Software for Radiated Emissions | | | Farad | EZ-EMC | Ver. UL-3A1 |

7. ANTENNA PORT TEST RESULTS

7.1. 20DB BANDWIDTH AND 99% OCCUPIED BANDWIDTH

LIMITS

| CFR 47 FCC Part15 (15.249) Subpart C | | | |
|--------------------------------------|------------------------|------------------------------|-----------------------|
| Section | Test Item | Limit | Frequency Range (MHz) |
| CFR 47 FCC §15.215 (c) | 20dB Bandwidth | for reporting purposes only | 2400-2483.5 |
| ISED RSS-Gen Clause 6.7 Issue 5 | 99% Occupied Bandwidth | For reporting purposes only. | 2400-2483.5 |

TEST PROCEDURE

| | |
|------------------|--|
| Center Frequency | The center frequency of the channel under test |
| Detector | Peak |
| RBW | 1% to 5% of the occupied bandwidth |
| VBW | approximately 3×RBW |
| Trace | Max hold |
| Sweep | Auto couple |

Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB/99% relative to the maximum level measured in the fundamental emission.

TEST SETUP

Refer to clause 8 radiated test.

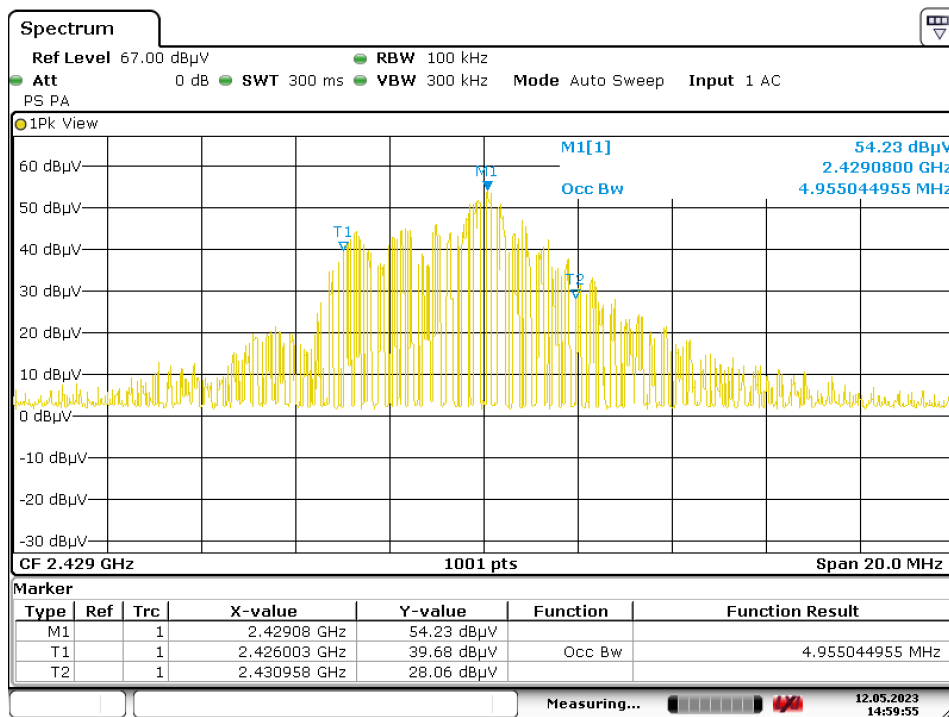
TEST ENVIRONMENT

| | | | |
|---------------------|---------|-------------------|----------|
| Temperature | 25.2 °C | Relative Humidity | 54 % |
| Atmosphere Pressure | 101 kPa | Test Voltage | DC 3.7 V |

TEST RESULTS

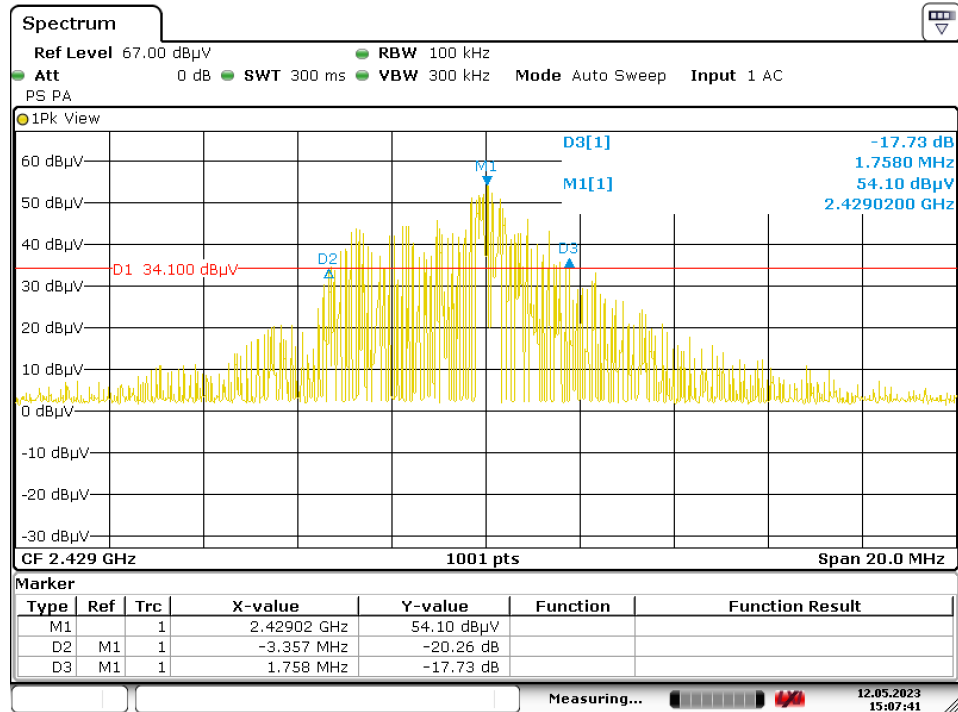
| Frequency (MHz) | 99% Bandwidth (MHz) | 20dB Bandwidth (MHz) | Result |
|-----------------|---------------------|----------------------|--------|
| 2429 | 4.955 | 5.115 | PASS |

99% OCCUPIED BANDWIDTH LOW CH



Date: 12.MAY.2023 14:59:55

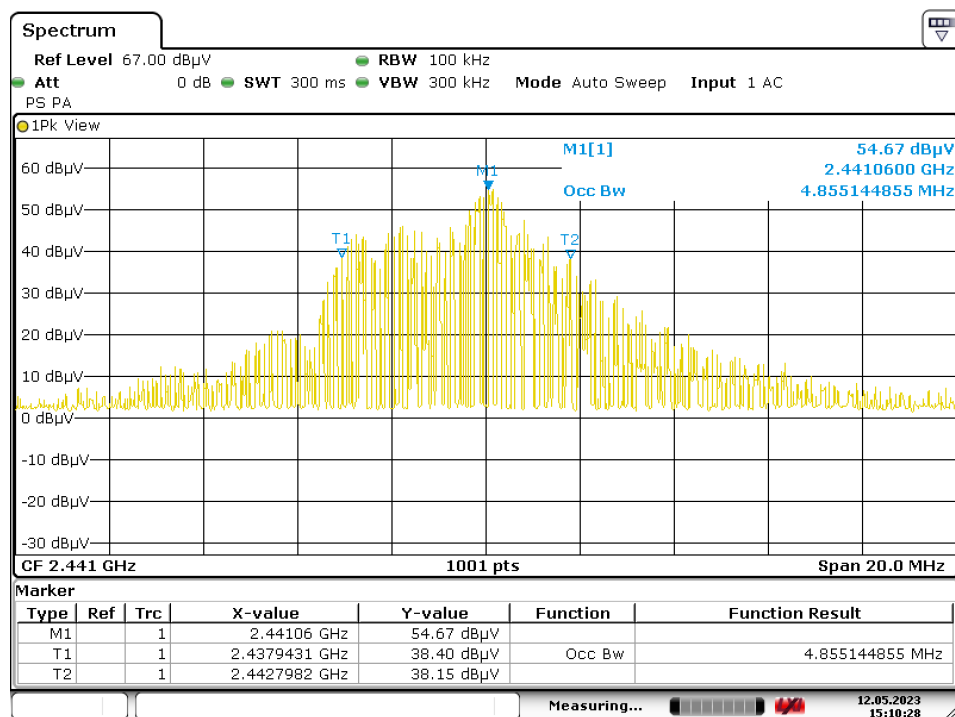
20 dB BANDWIDTH AND LOW CH



Date: 12 MAY 2023 15:07:41

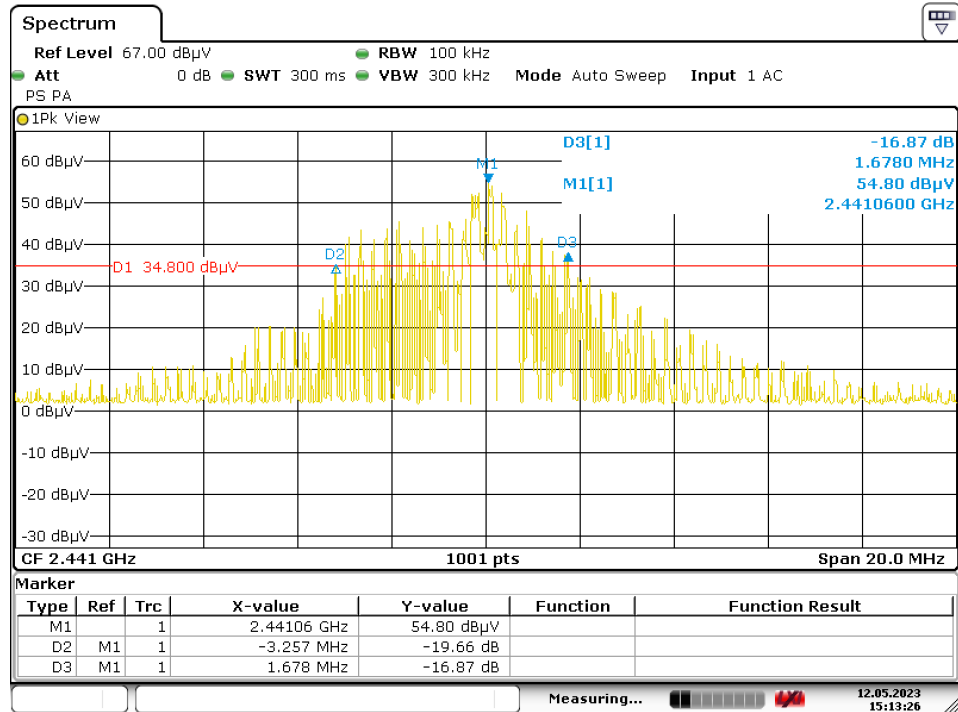
| Frequency (MHz) | 99% Bandwidth (MHz) | 20dB Bandwidth (MHz) | Result |
|-----------------|---------------------|----------------------|--------|
| 2441 | 4.855 | 4.935 | PASS |

99% OCCUPIED BANDWIDTH MID CH



Date: 12.MAY.2023 15:10:28

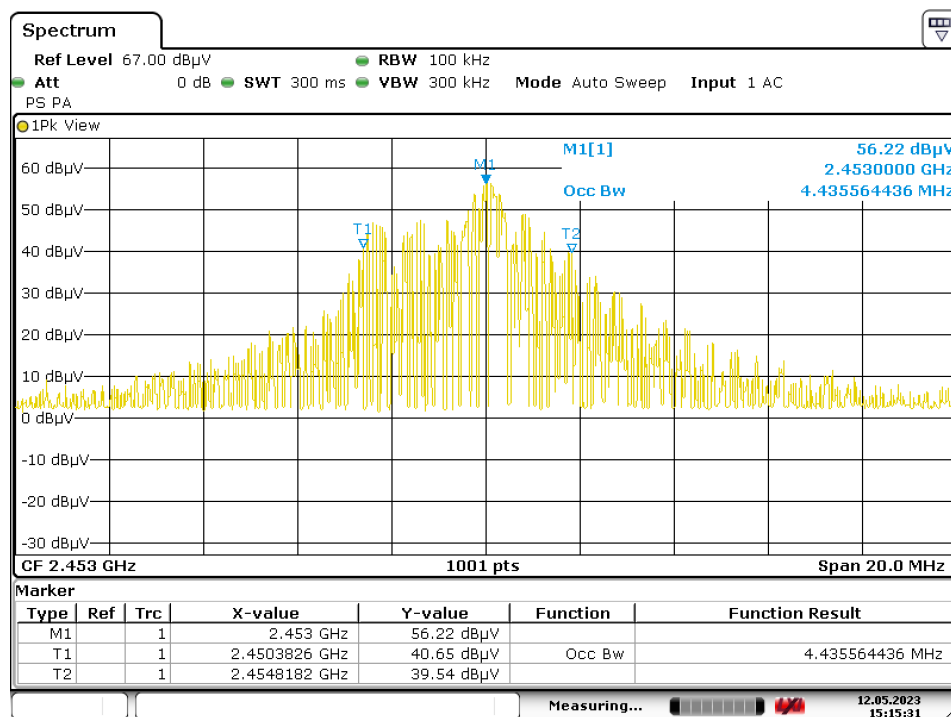
20 dB BANDWIDTH AND MID CH



Date: 12 MAY 2023 15:13:27

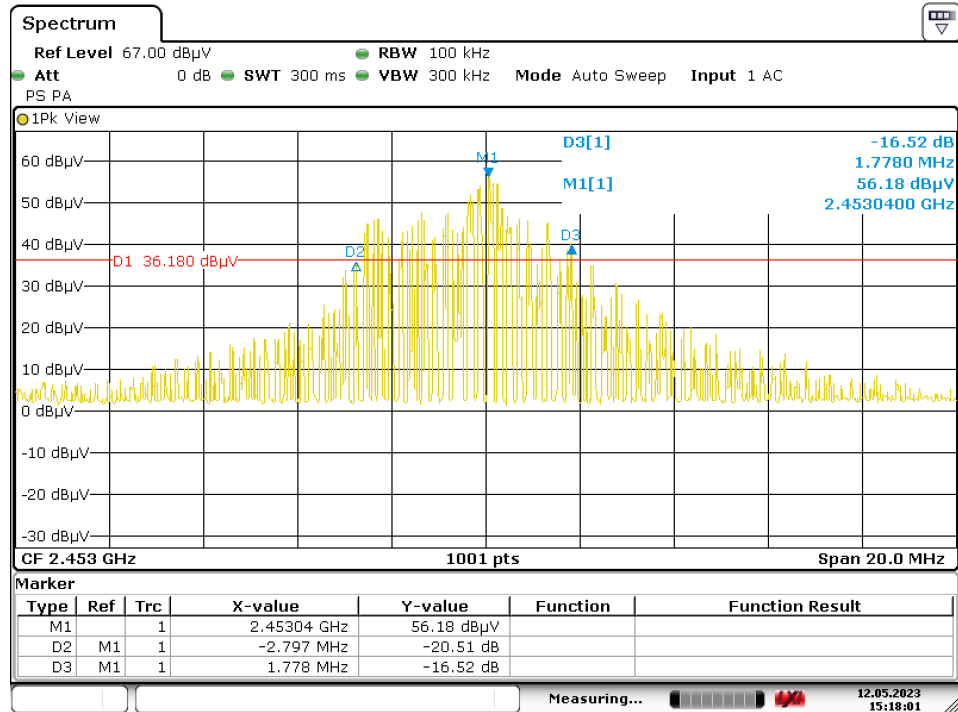
| Frequency (MHz) | 99% Bandwidth (MHz) | 20dB Bandwidth (MHz) | Result |
|-----------------|---------------------|----------------------|--------|
| 2453 | 4.436 | 4.575 | PASS |

99% OCCUPIED BANDWIDTH MID CH



Date: 12.MAY.2023 15:15:31

20 dB BANDWIDTH AND MID CH



Date: 12 MAY 2023 15:18:02

7.2. DUTY CYCLE

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Refer to ANSI C63.10-2013 clause 11.6 Zero – Span Spectrum Analyzer method.

TEST SETUP

Refer to clause 8 radiated test.

TEST ENVIRONMENT

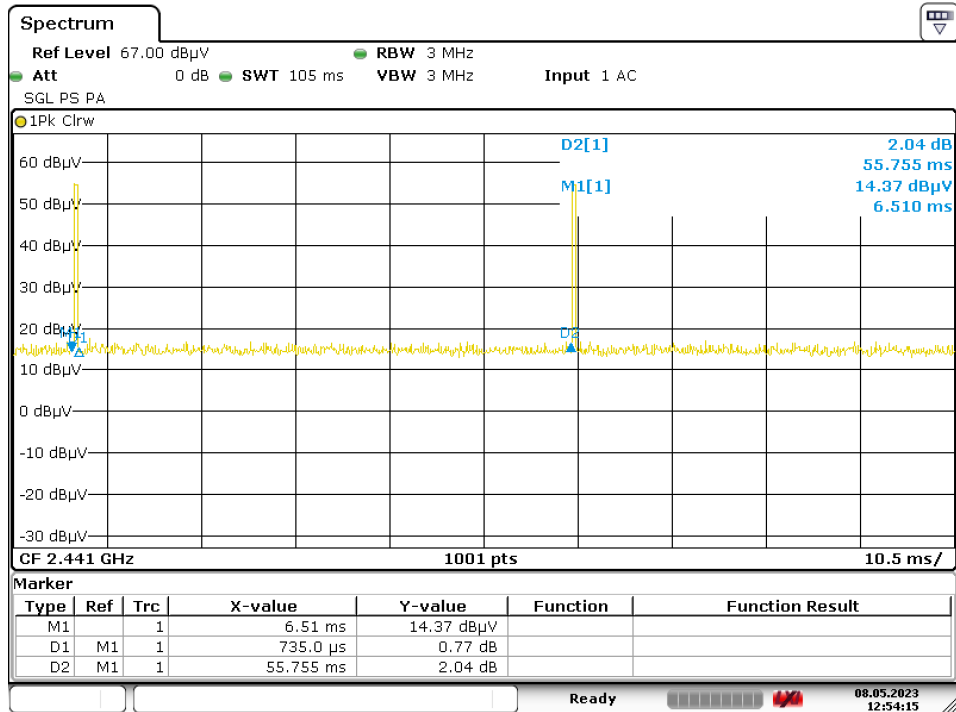
| | | | |
|---------------------|---------|-------------------|----------|
| Temperature | 25.2 °C | Relative Humidity | 54 % |
| Atmosphere Pressure | 101 kPa | Test Voltage | DC 3.7 V |

TEST RESULTS

| Mode | On Time (msec) | Period (msec) | Duty Cycle x (Linear) | Duty Cycle (%) | Duty Cycle Correction Factor (db) |
|------|-------------------|------------------|-----------------------------|-------------------|---|
| GFSK | 1.47 | 100 | 0.0147 | 1.47 | -36.65 |

Note: Duty Cycle Correction Factor= $20\log(x)$.
Where: x is Duty Cycle

ON TIME AND DUTY CYCLE MID CH PLOT-1



Date: 8 MAY.2023 12:54:16

Note: All the modes had been tested, but only the worst duty cycle recorded in the report.

8. RADIATED TEST RESULTS

LIMITS

CFR 47 FCC §15.205 and §15.209

CFR 47 FCC §15.249 (a)(d)(c)(e)

| The field strength of emissions from intentional radiators operated within these frequency bands | | | |
|--|-------------------------------|-----------------------------|--------------|
| Frequency (MHz) | Field strength of Fundamental | Field strength of Harmonics | Distance (m) |
| 902 - 928 | 50 mV/m (94 dBuV/m) | 500 uV/m (54 dBuV/m) | 3 |
| 2400 – 2483.5 | 50 mV/m (94 dBuV/m) | 500 uV/m (54 dBuV/m) | 3 |
| 5725 – 5875 | 50 mV/m (94 dBuV/m) | 500 uV/m (54 dBuV/m) | 3 |

| Emissions radiated outside of the specified frequency bands above 30MHz | | | |
|---|------------------------------------|--------------------------------------|---------|
| Frequency Range (MHz) | Field Strength Limit (uV/m) at 3 m | Field Strength Limit (dBuV/m) at 3 m | |
| | | Quasi-Peak | |
| 30 - 88 | 100 | 40 | |
| 88 - 216 | 150 | 43.5 | |
| 216 - 960 | 200 | 46 | |
| Above 960 | 500 | 54 | |
| Above 1000 | 500 | Peak | Average |
| | | 74 | 54 |

| FCC Emissions radiated outside of the specified frequency bands below 30 MHz | | |
|--|-----------------------------------|-------------------------------|
| Frequency (MHz) | Field strength (microvolts/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 |

ISED General field strength limits at frequencies below 30 MHz

| Table 6 – General field strength limits at frequencies below 30 MHz | | |
|---|--|--------------------------|
| Frequency | Magnetic field strength (H-Field) (µA/m) | Measurement distance (m) |
| 9 - 490 kHz ^{Note 1} | 6.37/F (F in kHz) | 300 |
| 490 - 1705 kHz | 63.7/F (F in kHz) | 30 |
| 1.705 - 30 MHz | 0.08 | 30 |

Note 1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

ISED Restricted bands please refer to ISED RSS-GEN Clause 8.10

| Table 7 – Restricted frequency bands ^{Note 1} | | |
|--|-----------------------|---------------|
| MHz | MHz | GHz |
| 0.090 - 0.110 | 149.9 - 150.05 | 9.0 - 9.2 |
| 0.495 - 0.505 | 156.52475 - 156.52525 | 9.3 - 9.5 |
| 2.1735 - 2.1905 | 156.7 - 156.9 | 10.6 - 12.7 |
| 3.020 - 3.026 | 162.0125 - 167.17 | 13.25 - 13.4 |
| 4.125 - 4.128 | 167.72 - 173.2 | 14.47 - 14.5 |
| 4.17725 - 4.17775 | 240 - 285 | 15.35 - 16.2 |
| 4.20725 - 4.20775 | 322 - 335.4 | 17.7 - 21.4 |
| 5.677 - 5.683 | 399.9 - 410 | 22.01 - 23.12 |
| 6.215 - 6.218 | 608 - 614 | 23.6 - 24.0 |
| 6.26775 - 6.26825 | 960 - 1427 | 31.2 - 31.8 |
| 6.31175 - 6.31225 | 1435 - 1626.5 | 36.43 - 36.5 |
| 8.291 - 8.294 | 1645.5 - 1646.5 | Above 38.6 |
| 8.362 - 8.366 | 1660 - 1710 | |
| 8.37625 - 8.38675 | 1718.8 - 1722.2 | |
| 8.41425 - 8.41475 | 2200 - 2300 | |
| 12.29 - 12.293 | 2310 - 2390 | |
| 12.51975 - 12.52025 | 2483.5 - 2500 | |
| 12.57675 - 12.57725 | 2655 - 2900 | |
| 13.36 - 13.41 | 3260 - 3267 | |
| 16.42 - 16.423 | 3332 - 3339 | |
| 16.69475 - 16.69525 | 3345.8 - 3358 | |
| 16.80425 - 16.80475 | 3500 - 4400 | |
| 25.5 - 25.67 | 4500 - 5150 | |
| 37.5 - 38.25 | 5350 - 5460 | |
| 73 - 74.6 | 7250 - 7750 | |
| 74.8 - 75.2 | 8025 - 8500 | |
| 108 - 138 | | |

Note 1: Certain frequency bands listed in table 7 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

FCC Restricted bands of operation:

| MHz | MHz | MHz | GHz |
|--------------------------|---------------------|---------------|------------------|
| 0.090-0.110 | 16.42-16.423 | 399.9-410 | 4.5-5.15 |
| ¹ 0.495-0.505 | 16.69475-16.69525 | 608-614 | 5.35-5.46 |
| 2.1735-2.1905 | 16.80425-16.80475 | 960-1240 | 7.25-7.75 |
| 4.125-4.128 | 25.5-25.67 | 1300-1427 | 8.025-8.5 |
| 4.17725-4.17775 | 37.5-38.25 | 1435-1626.5 | 9.0-9.2 |
| 4.20725-4.20775 | 73-74.6 | 1645.5-1646.5 | 9.3-9.5 |
| 6.215-6.218 | 74.8-75.2 | 1660-1710 | 10.6-12.7 |
| 6.26775-6.26825 | 108-121.94 | 1718.8-1722.2 | 13.25-13.4 |
| 6.31175-6.31225 | 123-138 | 2200-2300 | 14.47-14.5 |
| 8.291-8.294 | 149.9-150.05 | 2310-2390 | 15.35-16.2 |
| 8.362-8.366 | 156.52475-156.52525 | 2483.5-2500 | 17.7-21.4 |
| 8.37625-8.38675 | 156.7-156.9 | 2690-2900 | 22.01-23.12 |
| 8.41425-8.41475 | 162.0125-167.17 | 3260-3267 | 23.6-24.0 |
| 12.29-12.293 | 167.72-173.2 | 3332-3339 | 31.2-31.8 |
| 12.51975-12.52025 | 240-285 | 3345.8-3358 | 36.43-36.5 |
| 12.57675-12.57725 | 322-335.4 | 3600-4400 | (²) |
| 13.36-13.41 | | | |

Note: ¹Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

²Above 38.6c

TEST PROCEDURE

Below 30 MHz

The setting of the spectrum analyzer

| | |
|-------|--|
| RBW | 200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz) |
| VBW | 200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz) |
| Sweep | Auto |

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.4.
2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80 cm above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1 m height antenna tower.
5. The radiated emission limits 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.
6. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak and average detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak and average detector and reported.
7. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30m open field site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field site based on KDB 414788.
8. The limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377Ω. For example, the measurement frequency X KHz resulted in a level of Y dBuV/m, which is equivalent to $Y-51.5 = Z$ dBuA/m, which has the same margin, W dB, to the corresponding RSS-GEN Table 6 limit as it has to be 15.209(a) limit.

Below 1 GHz and above 30 MHz

The setting of the spectrum analyzer

| | |
|----------|----------|
| RBW | 120 kHz |
| VBW | 300 kHz |
| Sweep | Auto |
| Detector | Peak/QP |
| Trace | Max hold |

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.5.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80 cm above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement below 1 GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

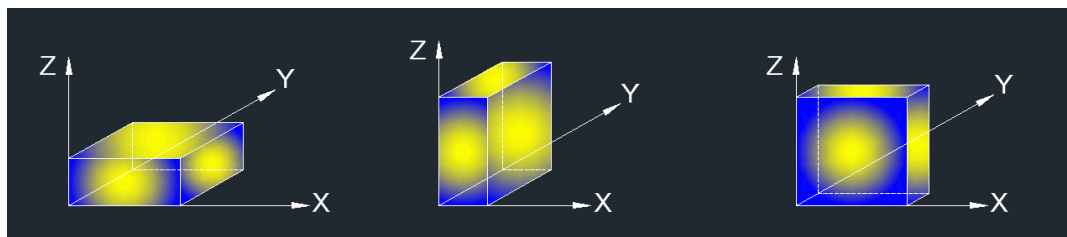
Above 1 GHz

The setting of the spectrum analyzer

| | |
|----------|--------------------------------|
| RBW | 1 MHz |
| VBW | PEAK: 3 MHz AVG: see note 6 |
| Sweep | Auto |
| Detector | Peak |
| Trace | Max hold |

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.6.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 1.5 m above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement above 1 GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.
6. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements. Where necessary, average emission are determined by applying the Duty Cycle Correction Factor to the peak measurements. For the Duty Cycle and Correction Factor please refer to clause 7.2. ON TIME AND DUTY CYCLE.

X axis, Y axis, Z axis positions:



Note: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

For Restricted Bandedge and field strength of intentional emission:

Note:

1. Measurement = Reading Level + Correct Factor.
2. If the peak values are less than the average limit of 54 dBuV/m, the average result is deemed to comply with average limit.
3. Peak: Peak detector.
4. AVG Result=Peak Result + Duty Cycle Correction Factor.
5. For the transmitting duration, please refer to clause 7.2.
6. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.
7. Both horizontal and vertical have been tested, only the worst data was recorded in the report.
8. All modes, channels and antennas have been tested, only the worst data was recorded in the report.

For Radiate Spurious emission (9 kHz ~ 30 MHz):

Note:

1. Measurement = Reading Level + Correct Factor.
2. If the peak values are less than the QP limit, the QP result is deemed to comply with QP limit.
3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.
4. All modes, channels and antennas have been tested, only the worst data was recorded in the report.

For Radiate Spurious Emission (30 MHz ~ 1 GHz):

Note:

1. Result Level = Read Level + Correct Factor.
2. If the peak values are less than the QP limit, the QP result is deemed to comply with QP limit.
3. All modes, channels and antennas have been tested, only the worst data was recorded in the report.

For Radiate Spurious Emission (1 GHz ~ 3 GHz):

1. Measurement = Reading Level + Correct Factor.
2. If the peak values are less than the average limit of 54 dBuV/m, the average result is deemed to comply with average limit.
3. Peak: Peak detector.
4. AVG Result=Peak Result + Duty Cycle Correction Factor.
5. For the transmitting duration, please refer to clause 7.2.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band reject filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. All modes, channels and antennas have been tested, only the worst data was recorded in the report.

For Radiate Spurious Emission (3 GHz ~ 18 GHz):

Note:

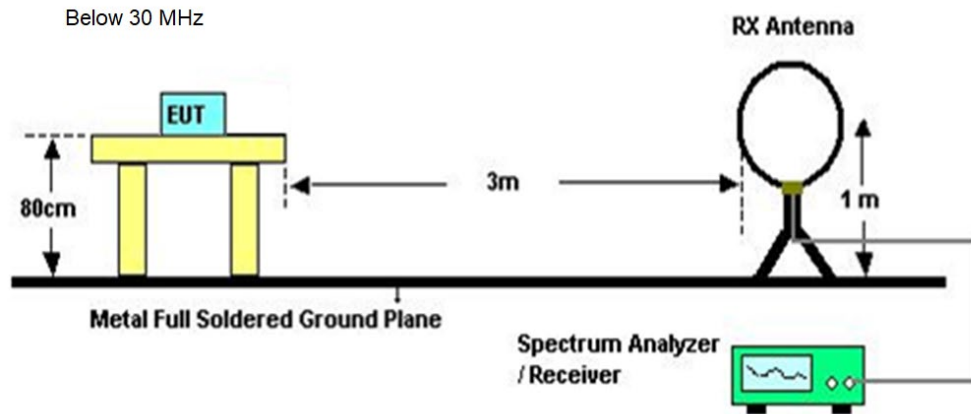
1. Peak Result = Reading Level + Correct Factor.
2. If the peak values are less than the average limit of 54 dBuV/m, the average result is deemed to comply with average limit.
3. Peak: Peak detector.
4. AVG Result=Peak Result + Duty Cycle Correction Factor.
5. For the transmitting duration, please refer to clause 7.2.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. All modes, channels and antennas have been tested, only the worst data was recorded in the report.

For Radiate Spurious emission (18 GHz ~ 26 GHz):

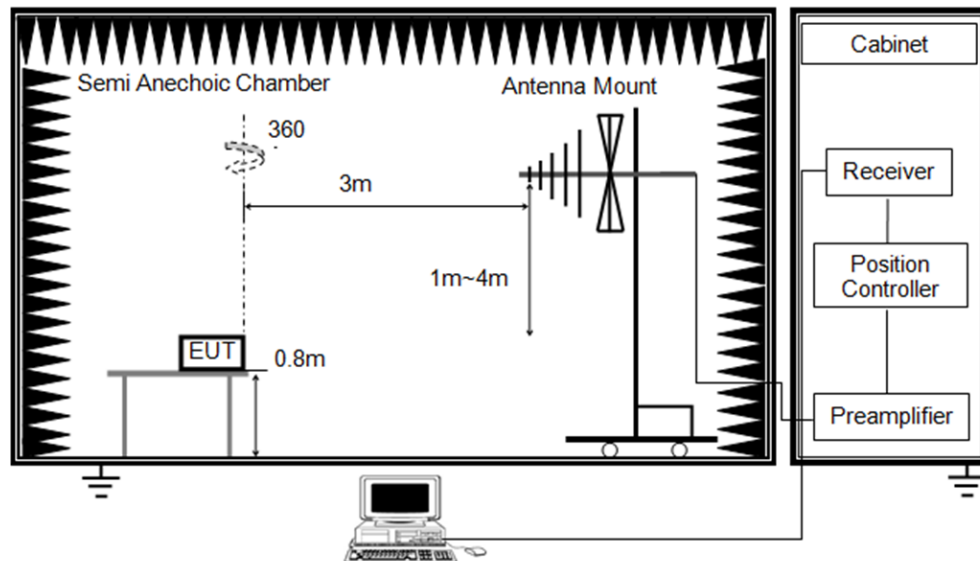
Note:

1. Measurement = Reading Level + Correct Factor.
2. If the peak values are less than the average limit of 54 dBuV/m, the average result is deemed to comply with average limit.
3. Peak: Peak detector.
4. All modes, channels and antennas have been tested, only the worst data was recorded in the report.

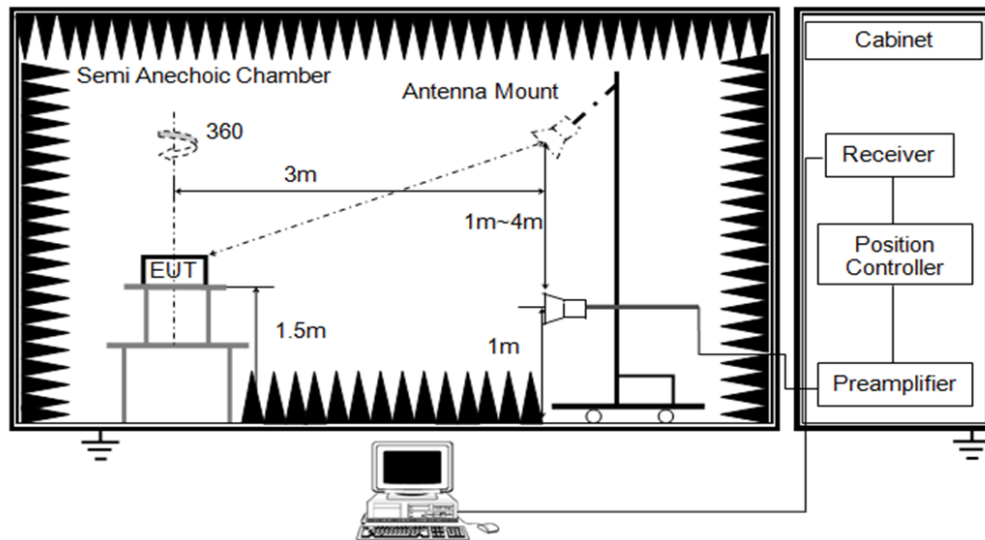
TEST SETUP



Below 1 GHz and above 30 MHz



Above 1 GHz



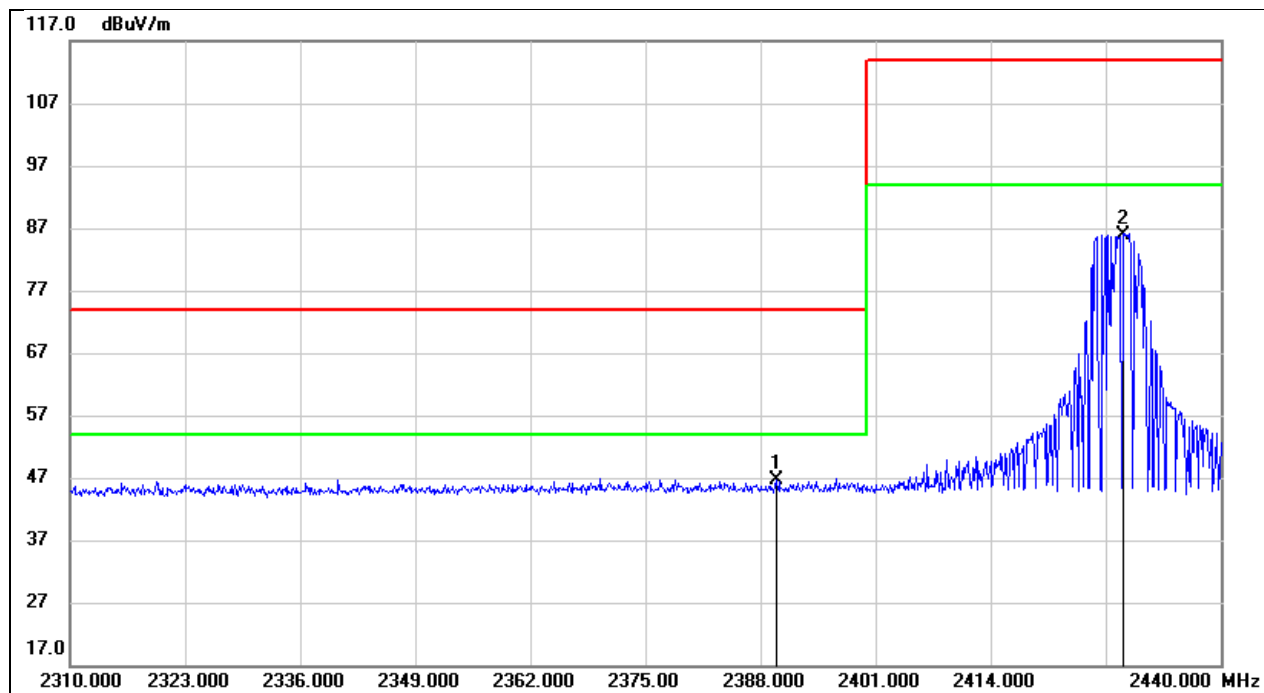
TEST ENVIRONMENT

| | | | |
|---------------------|---------|-------------------|----------|
| Temperature | 22.7 °C | Relative Humidity | 60 % |
| Atmosphere Pressure | 101 kPa | Test Voltage | DC 3.7 V |

TEST RESULTS

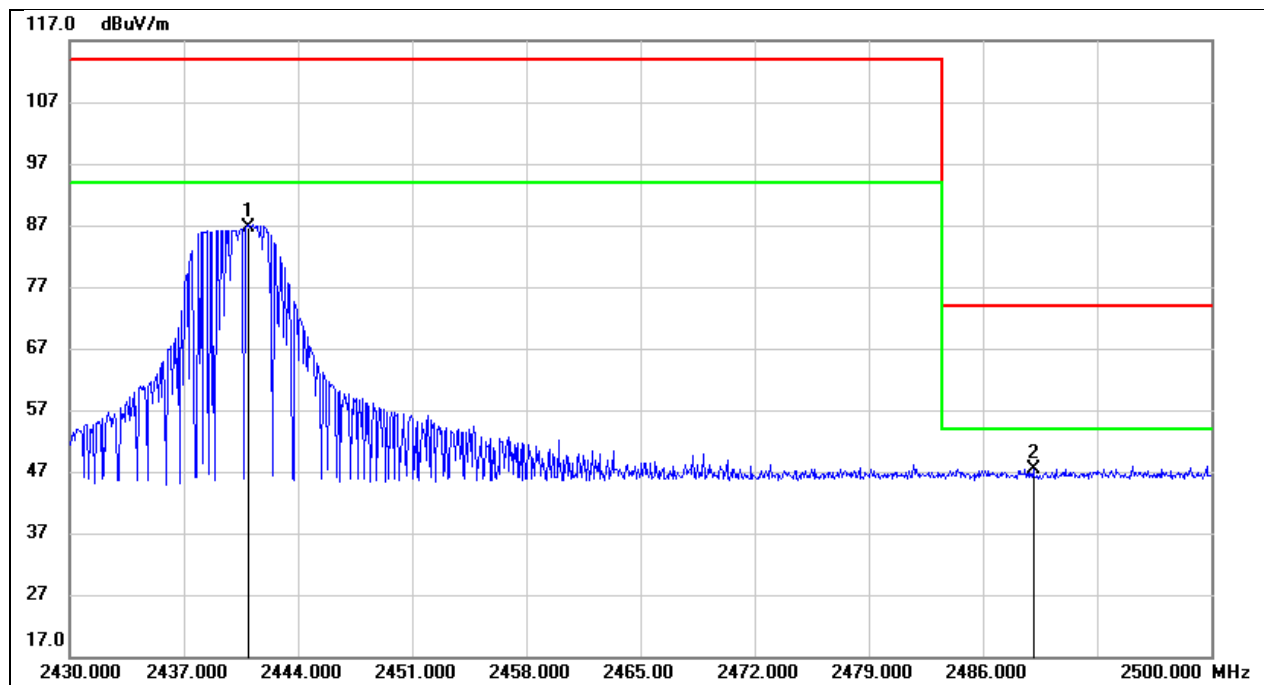
8.1. RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS

| | | | |
|------------|-----------|---------------|----------|
| Test Mode: | GFSK Peak | Channel: | 2429 MHz |
| Polarity: | Vertical | Test Voltage: | DC 3.7 V |



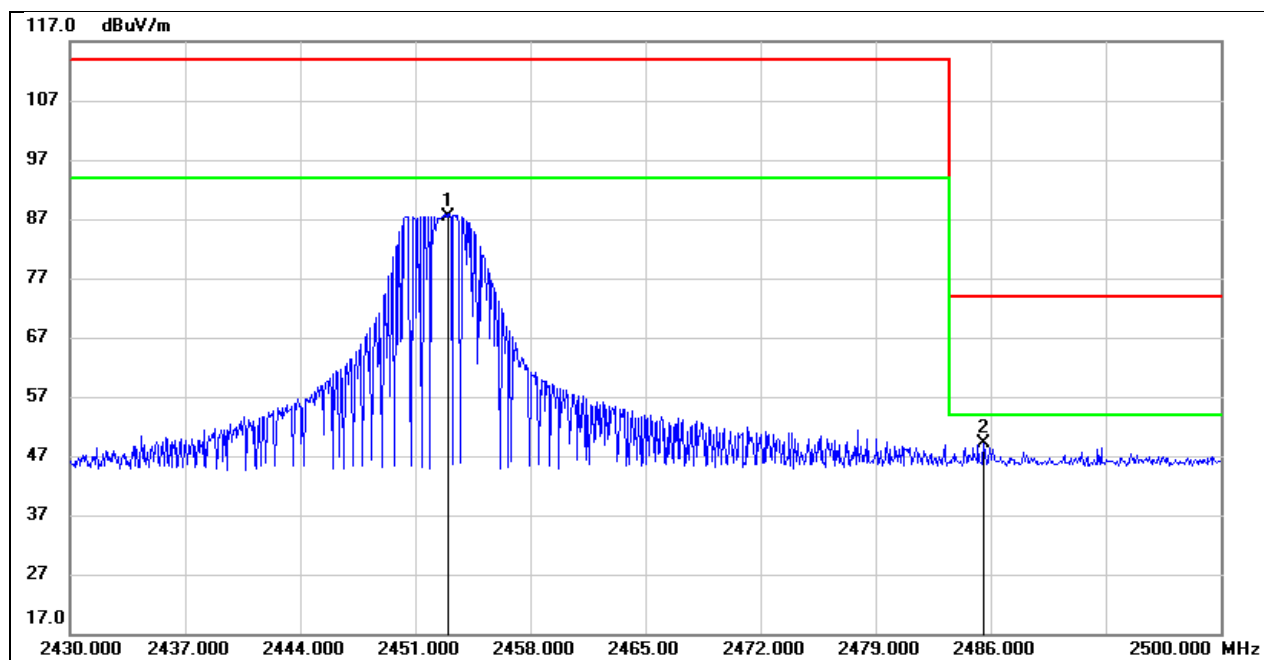
| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|-------------|
| 1 | 2389.820 | 14.36 | 32.16 | 46.52 | 74.00 | -27.48 | peak |
| 2 | 2429.000 | 53.52 | 32.28 | 85.80 | 114.00 | -28.20 | Fundamental |

| | | | |
|------------|-----------|---------------|----------|
| Test Mode: | GFSK Peak | Channel: | 2441 MHz |
| Polarity: | Vertical | Test Voltage: | DC 3.7 V |



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|-------------|
| 1 | 2441.000 | 54.30 | 32.32 | 86.62 | 114.00 | -27.38 | Fundamental |
| 2 | 2489.080 | 14.99 | 32.46 | 47.45 | 74.00 | -26.55 | peak |

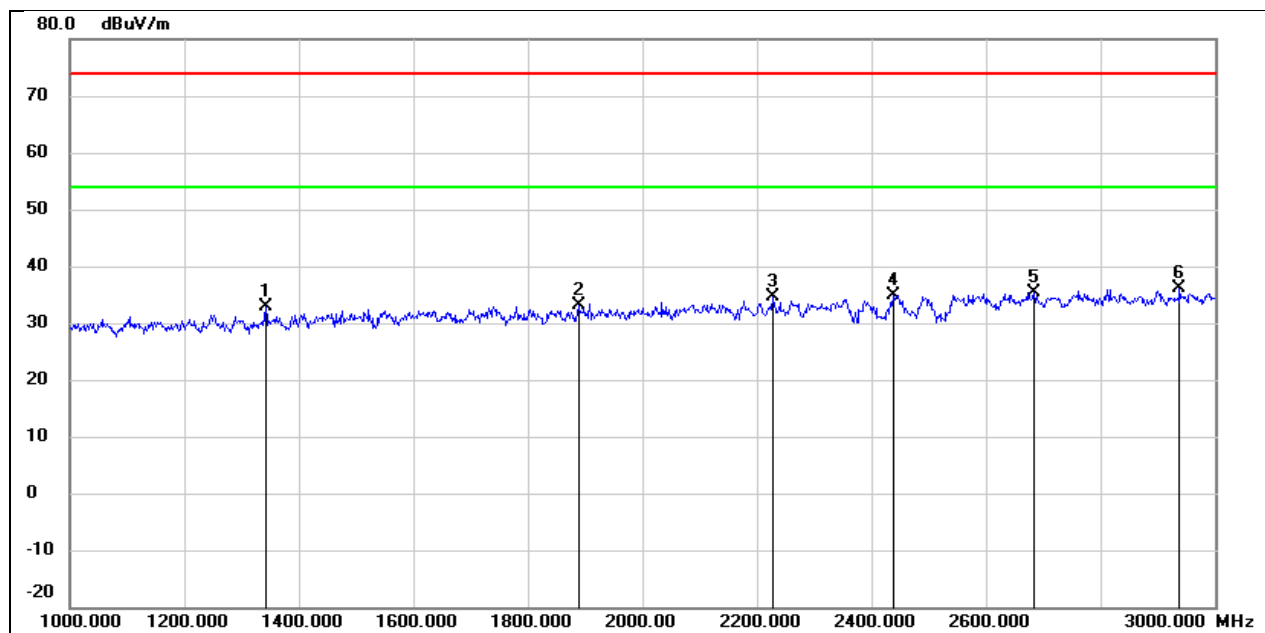
| | | | |
|------------|-----------|---------------|----------|
| Test Mode: | GFSK Peak | Channel: | 2453 MHz |
| Polarity: | Vertical | Test Voltage: | DC 3.7 V |



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|-------------|
| 1 | 2453.000 | 55.14 | 32.35 | 87.49 | 114.00 | -26.51 | Fundamental |
| 2 | 2485.580 | 16.68 | 32.44 | 49.12 | 74.00 | -24.88 | peak |

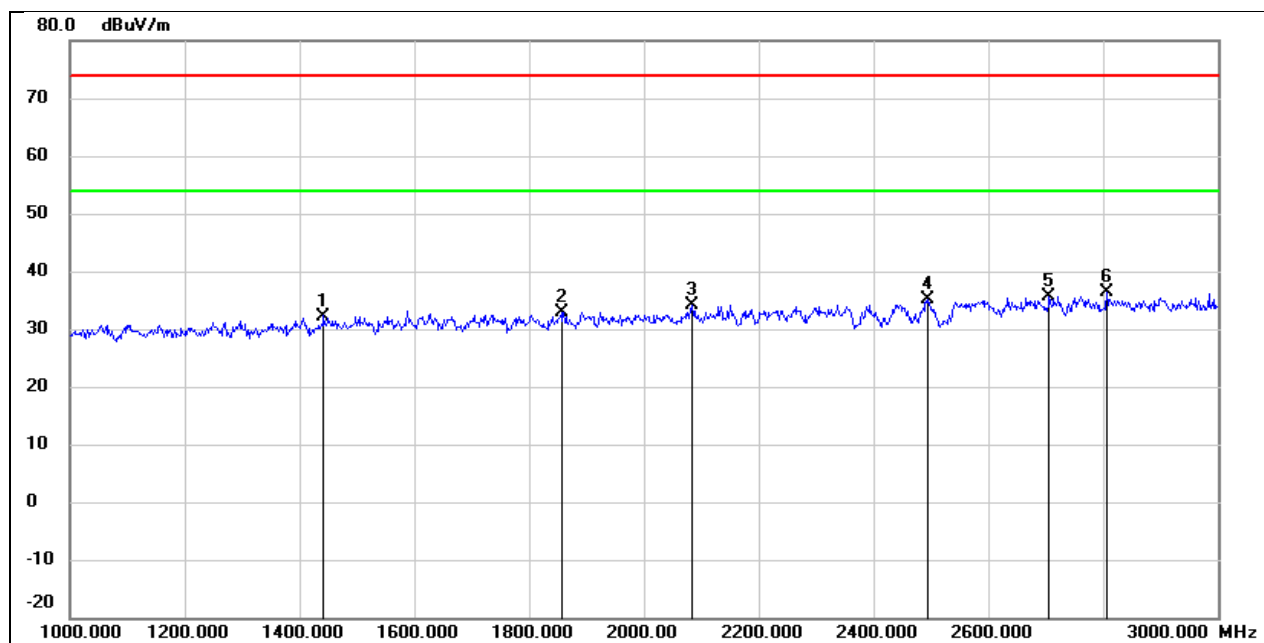
8.2. SPURIOUS EMISSIONS (1 GHZ ~ 3 GHZ)

| | | | |
|------------|------------|---------------|----------|
| Test Mode: | GFSK | Channel: | 2429 MHz |
| Polarity: | Horizontal | Test Voltage: | DC 3.7 V |



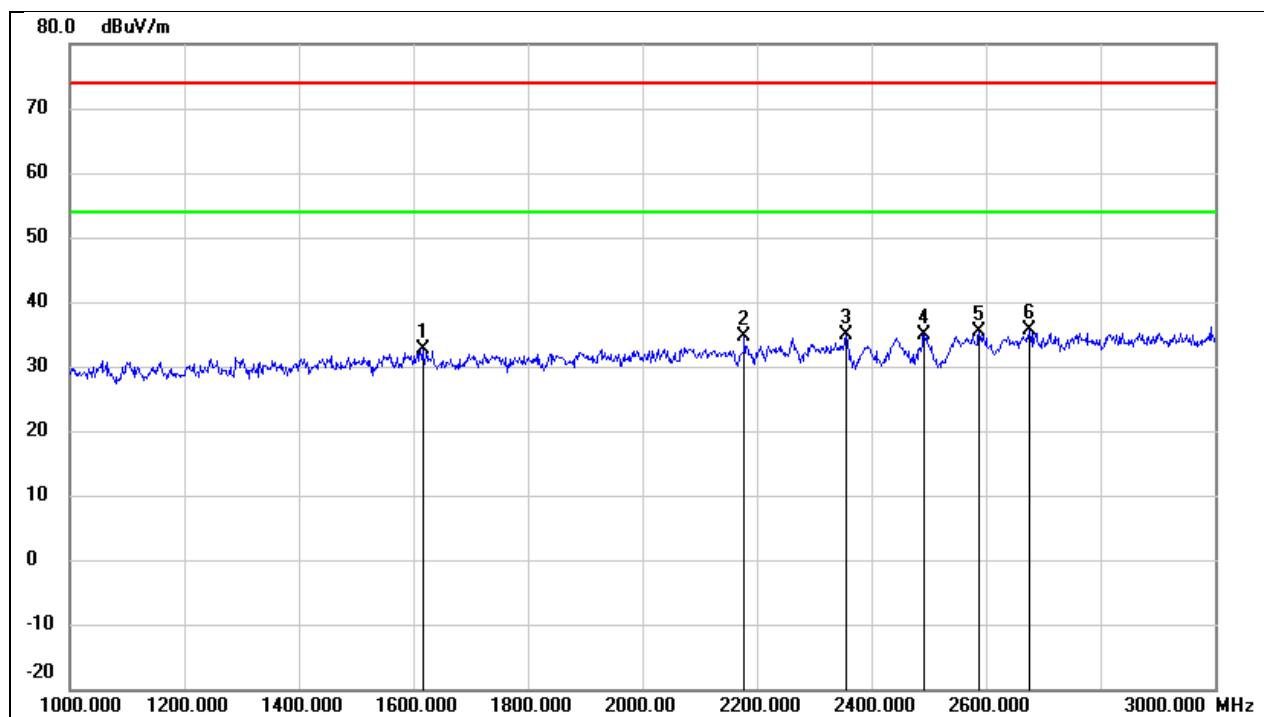
| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 1342.000 | 46.27 | -13.45 | 32.82 | 74.00 | -41.18 | peak |
| 2 | 1888.000 | 44.55 | -11.43 | 33.12 | 74.00 | -40.88 | peak |
| 3 | 2228.000 | 44.42 | -9.89 | 34.53 | 74.00 | -39.47 | peak |
| 4 | 2438.000 | 43.79 | -8.80 | 34.99 | 74.00 | -39.01 | peak |
| 5 | 2684.000 | 43.34 | -7.93 | 35.41 | 74.00 | -38.59 | peak |
| 6 | 2938.000 | 43.17 | -7.16 | 36.01 | 74.00 | -37.99 | peak |

| | | | |
|------------|----------|---------------|----------|
| Test Mode: | GFSK | Channel: | 2429 MHz |
| Polarity: | Vertical | Test Voltage: | DC 3.7 V |



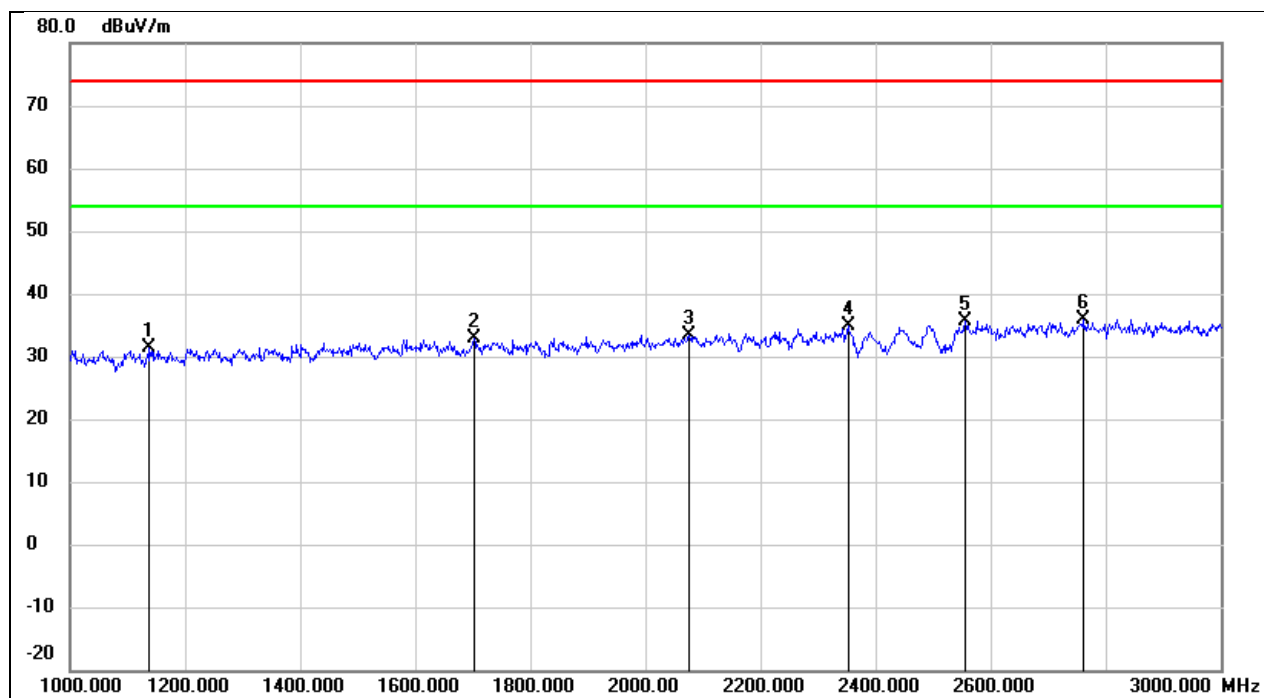
| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 1442.000 | 45.23 | -12.98 | 32.25 | 74.00 | -41.75 | peak |
| 2 | 1856.000 | 44.46 | -11.54 | 32.92 | 74.00 | -41.08 | peak |
| 3 | 2084.000 | 44.65 | -10.63 | 34.02 | 74.00 | -39.98 | peak |
| 4 | 2494.000 | 43.69 | -8.52 | 35.17 | 74.00 | -38.83 | peak |
| 5 | 2706.000 | 43.50 | -7.87 | 35.63 | 74.00 | -38.37 | peak |
| 6 | 2806.000 | 43.93 | -7.57 | 36.36 | 74.00 | -37.64 | peak |

| | | | |
|------------|------------|---------------|----------|
| Test Mode: | GFSK | Channel: | 2441 MHz |
| Polarity: | Horizontal | Test Voltage: | DC 3.7 V |



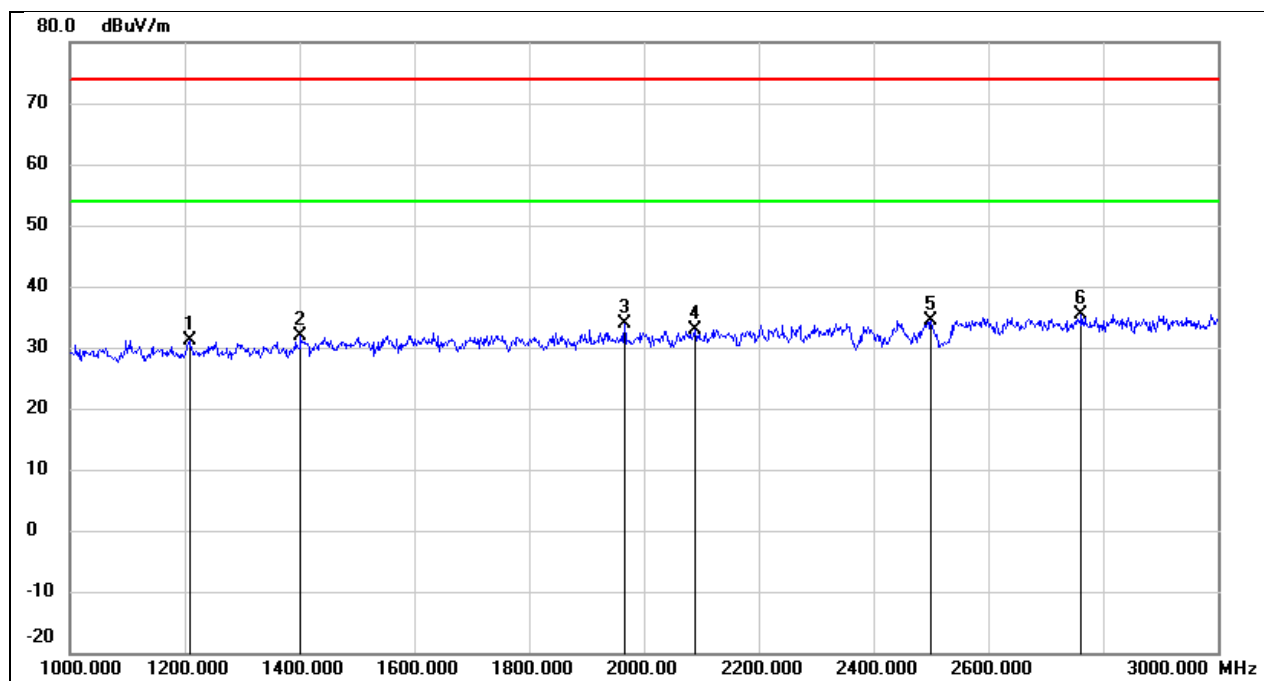
| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1 | 1616.000 | 44.85 | -12.33 | 32.52 | 74.00 | -41.48 | peak |
| 2 | 2178.000 | 44.83 | -10.15 | 34.68 | 74.00 | -39.32 | peak |
| 3 | 2356.000 | 44.06 | -9.22 | 34.84 | 74.00 | -39.16 | peak |
| 4 | 2492.000 | 43.43 | -8.53 | 34.90 | 74.00 | -39.10 | peak |
| 5 | 2588.000 | 43.51 | -8.22 | 35.29 | 74.00 | -38.71 | peak |
| 6 | 2676.000 | 43.49 | -7.96 | 35.53 | 74.00 | -38.47 | peak |

| | | | |
|------------|----------|---------------|----------|
| Test Mode: | GFSK | Channel: | 2441 MHz |
| Polarity: | Vertical | Test Voltage: | DC 3.7 V |



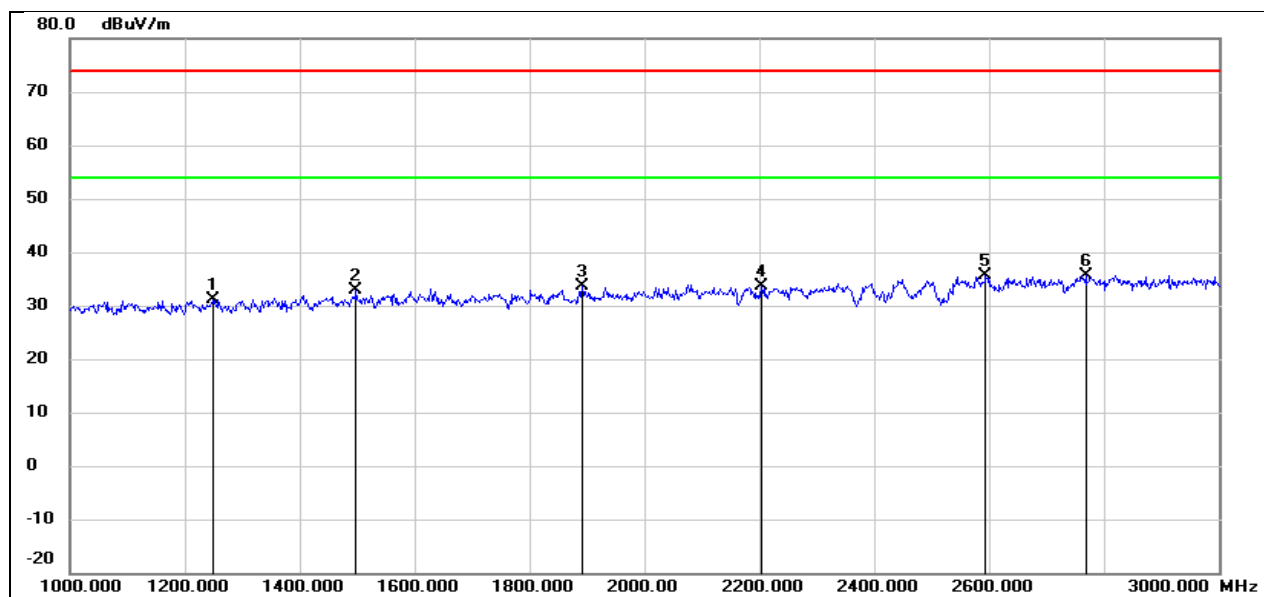
| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 1138.000 | 45.88 | -14.39 | 31.49 | 74.00 | -42.51 | peak |
| 2 | 1702.000 | 44.85 | -12.05 | 32.80 | 74.00 | -41.20 | peak |
| 3 | 2076.000 | 44.12 | -10.67 | 33.45 | 74.00 | -40.55 | peak |
| 4 | 2352.000 | 44.06 | -9.24 | 34.82 | 74.00 | -39.18 | peak |
| 5 | 2556.000 | 43.91 | -8.32 | 35.59 | 74.00 | -38.41 | peak |
| 6 | 2762.000 | 43.48 | -7.70 | 35.78 | 74.00 | -38.22 | peak |

| | | | |
|------------|------------|---------------|----------|
| Test Mode: | GFSK | Channel: | 2453 MHz |
| Polarity: | Horizontal | Test Voltage: | DC 3.7 V |



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 1208.000 | 45.24 | -14.06 | 31.18 | 74.00 | -42.82 | peak |
| 2 | 1402.000 | 45.11 | -13.16 | 31.95 | 74.00 | -42.05 | peak |
| 3 | 1966.000 | 44.93 | -11.17 | 33.76 | 74.00 | -40.24 | peak |
| 4 | 2090.000 | 43.51 | -10.60 | 32.91 | 74.00 | -41.09 | peak |
| 5 | 2500.000 | 42.80 | -8.49 | 34.31 | 74.00 | -39.69 | peak |
| 6 | 2762.000 | 43.05 | -7.70 | 35.35 | 74.00 | -38.65 | peak |

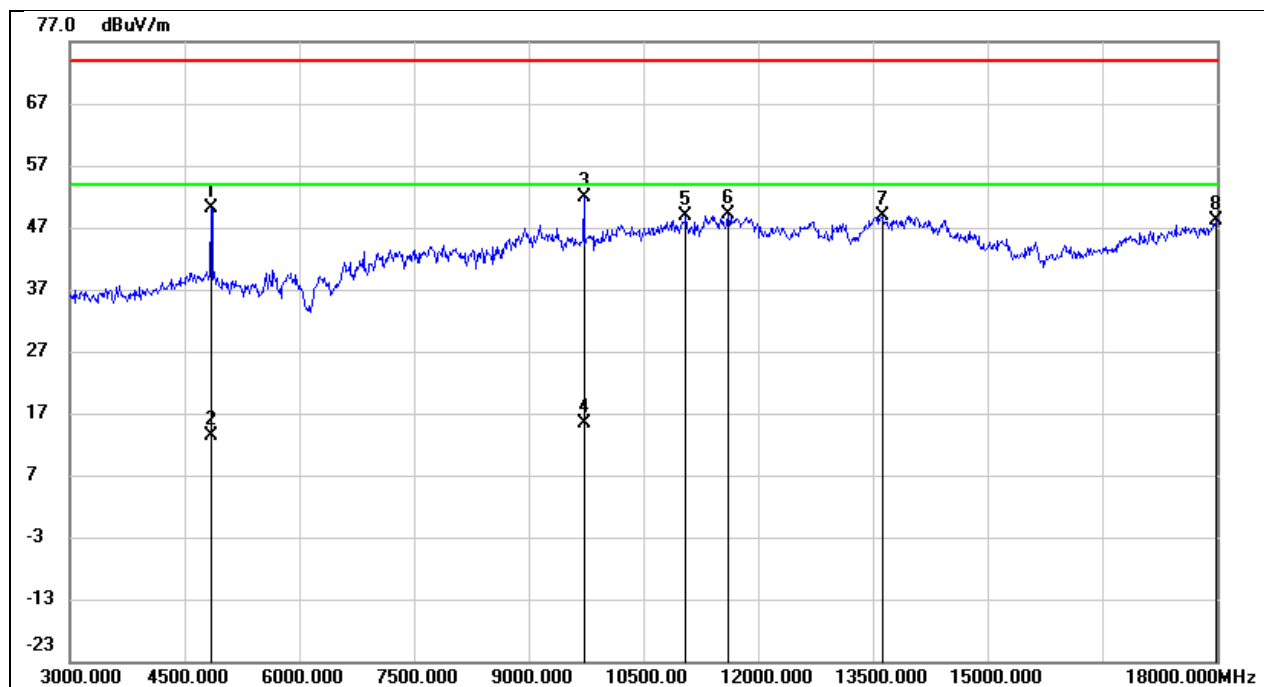
| | | | |
|------------|----------|---------------|----------|
| Test Mode: | GFSK | Channel: | 2453 MHz |
| Polarity: | Vertical | Test Voltage: | DC 3.7 V |



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 1248.000 | 45.12 | -13.88 | 31.24 | 74.00 | -42.76 | peak |
| 2 | 1498.000 | 45.57 | -12.72 | 32.85 | 74.00 | -41.15 | peak |
| 3 | 1892.000 | 45.11 | -11.42 | 33.69 | 74.00 | -40.31 | peak |
| 4 | 2204.000 | 43.55 | -10.01 | 33.54 | 74.00 | -40.46 | peak |
| 5 | 2594.000 | 43.77 | -8.20 | 35.57 | 74.00 | -38.43 | peak |
| 6 | 2768.000 | 43.33 | -7.68 | 35.65 | 74.00 | -38.35 | peak |

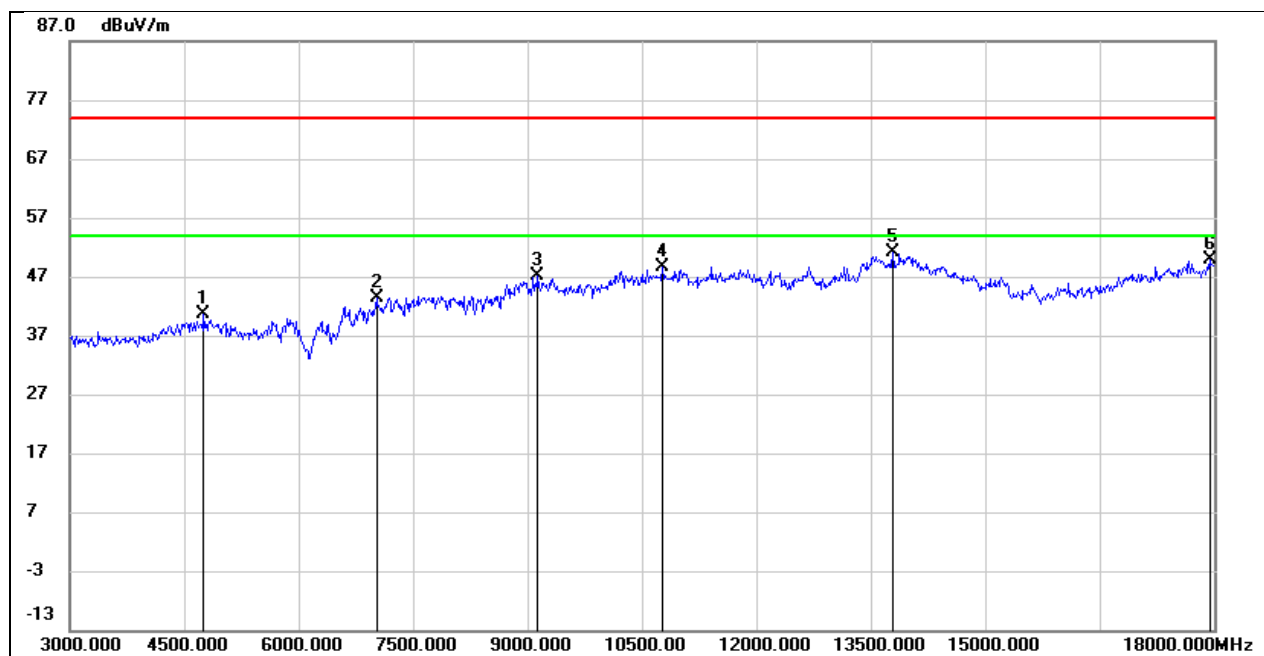
8.3. SPURIOUS EMISSIONS (3 GHZ ~ 18 GHZ)

| | | | |
|------------|------------|---------------|----------|
| Test Mode: | GFSK | Channel: | 2429 MHz |
| Polarity: | Horizontal | Test Voltage: | DC 3.7 V |



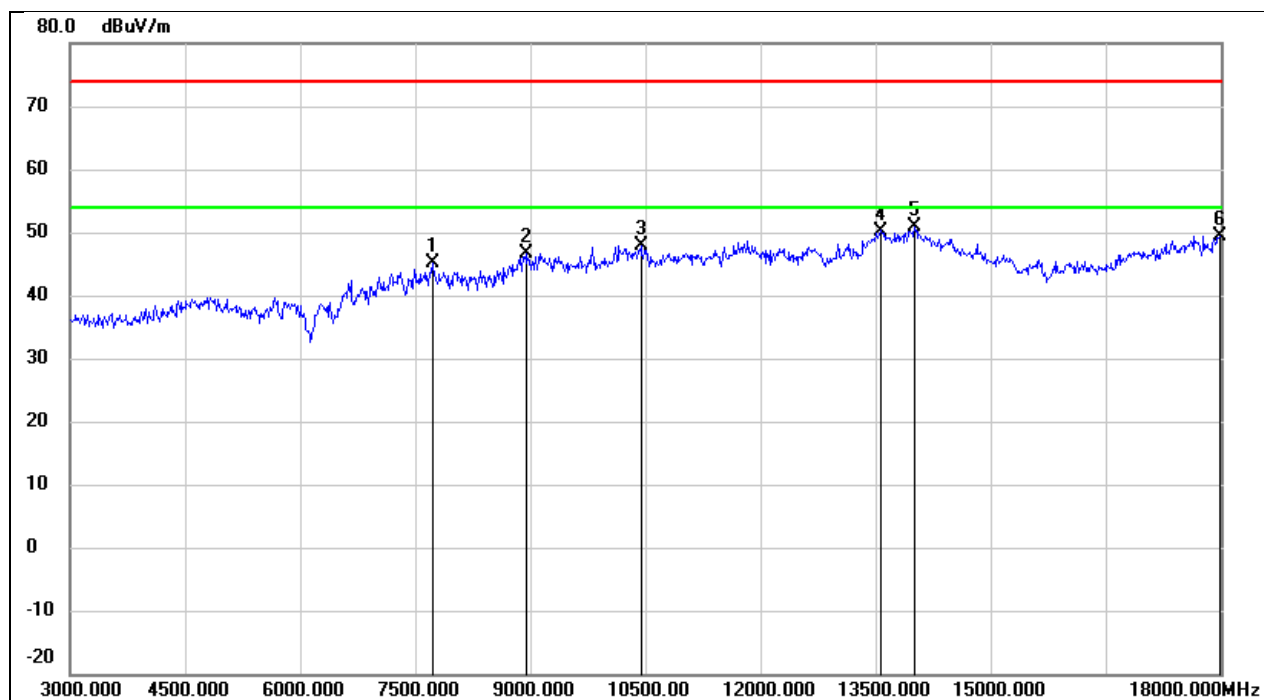
| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 4845.000 | 50.17 | -0.15 | 50.02 | 74.00 | -23.98 | peak |
| 2 | 4845.000 | / | / | 13.37 | 54.00 | -40.63 | AVG |
| 3 | 9720.000 | 40.60 | 11.27 | 51.87 | 74.00 | -22.13 | peak |
| 4 | 9720.000 | / | / | 15.22 | 54.00 | -38.78 | AVG |
| 5 | 11055.000 | 33.91 | 14.96 | 48.87 | 74.00 | -25.13 | peak |
| 6 | 11610.000 | 32.12 | 16.90 | 49.02 | 74.00 | -24.98 | peak |
| 7 | 13620.000 | 27.73 | 21.15 | 48.88 | 74.00 | -25.12 | peak |
| 8 | 17985.000 | 22.51 | 25.60 | 48.11 | 74.00 | -25.89 | peak |

| | | | |
|------------|----------|---------------|----------|
| Test Mode: | GFSK | Channel: | 2429 MHz |
| Polarity: | Vertical | Test Voltage: | DC 3.7 V |



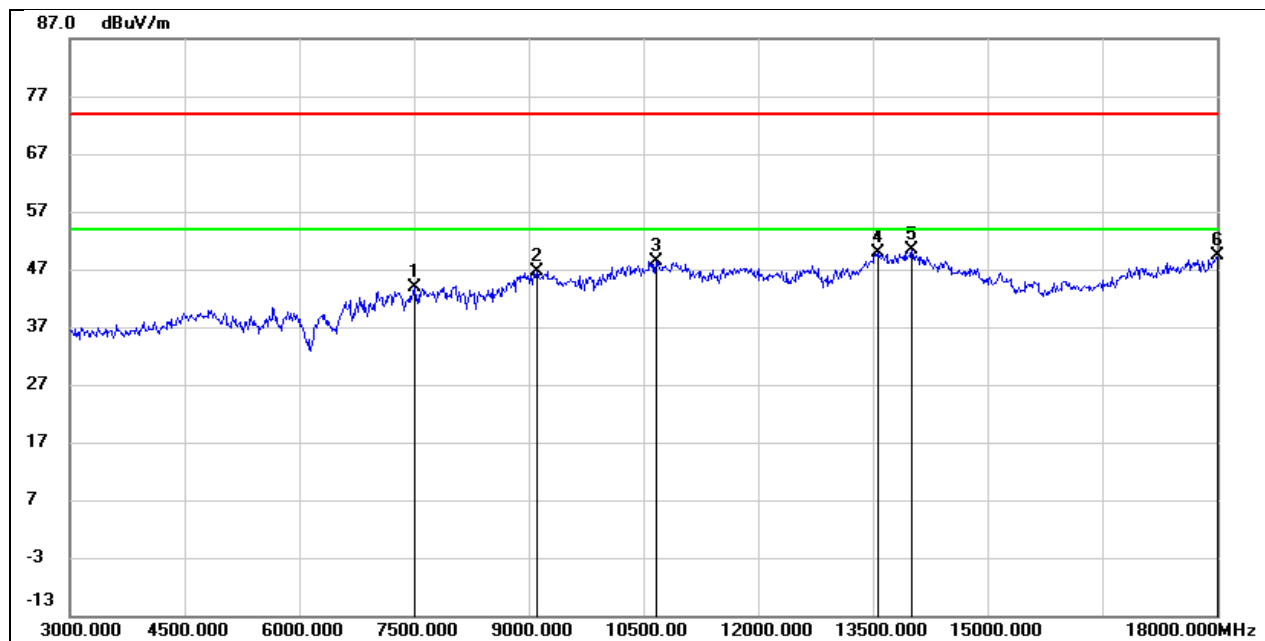
| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 4755.000 | 41.09 | -0.48 | 40.61 | 74.00 | -33.39 | peak |
| 2 | 7020.000 | 36.69 | 6.67 | 43.36 | 74.00 | -30.64 | peak |
| 3 | 9135.000 | 36.48 | 10.55 | 47.03 | 74.00 | -26.97 | peak |
| 4 | 10770.000 | 34.70 | 13.95 | 48.65 | 74.00 | -25.35 | peak |
| 5 | 13785.000 | 29.54 | 21.51 | 51.05 | 74.00 | -22.95 | peak |
| 6 | 17940.000 | 24.48 | 25.34 | 49.82 | 74.00 | -24.18 | peak |

| | | | |
|------------|------------|---------------|----------|
| Test Mode: | GFSK | Channel: | 2441 MHz |
| Polarity: | Horizontal | Test Voltage: | DC 3.7 V |



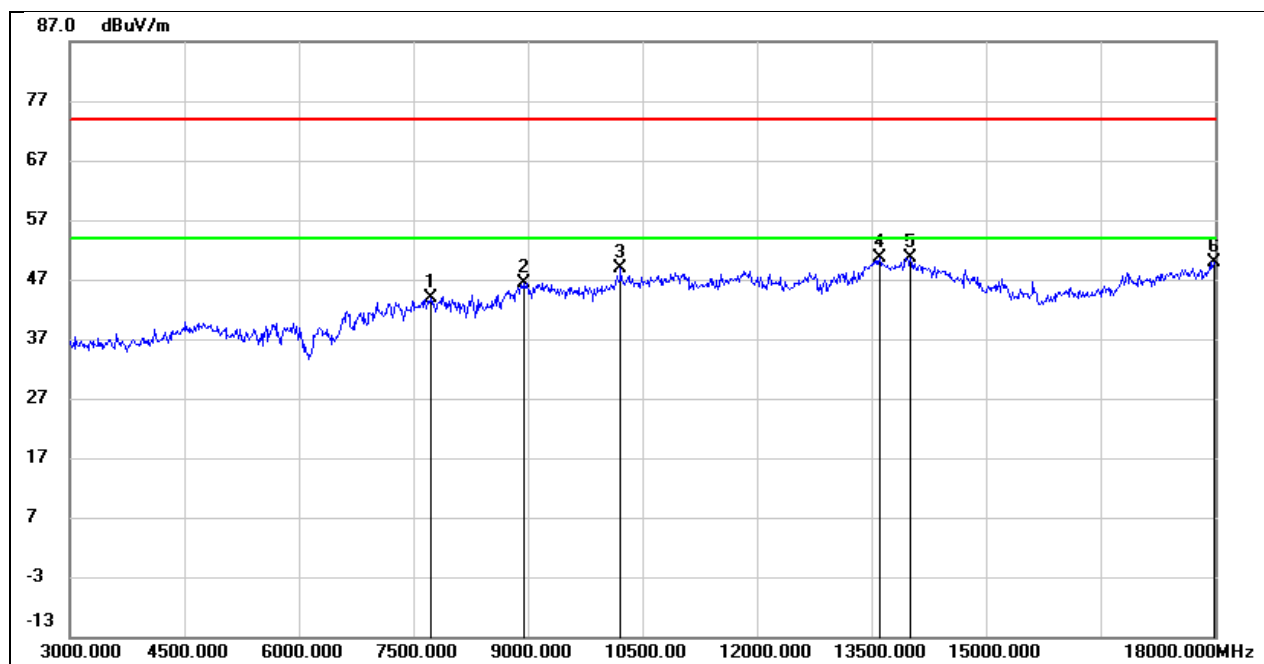
| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 7725.000 | 38.78 | 6.32 | 45.10 | 74.00 | -28.90 | peak |
| 2 | 8940.000 | 36.66 | 10.04 | 46.70 | 74.00 | -27.30 | peak |
| 3 | 10440.000 | 35.07 | 12.87 | 47.94 | 74.00 | -26.06 | peak |
| 4 | 13560.000 | 29.21 | 21.04 | 50.25 | 74.00 | -23.75 | peak |
| 5 | 14010.000 | 28.88 | 21.93 | 50.81 | 74.00 | -23.19 | peak |
| 6 | 17985.000 | 23.89 | 25.60 | 49.49 | 74.00 | -24.51 | peak |

| | | | |
|------------|----------|---------------|----------|
| Test Mode: | GFSK | Channel: | 2441 MHz |
| Polarity: | Vertical | Test Voltage: | DC 3.7 V |



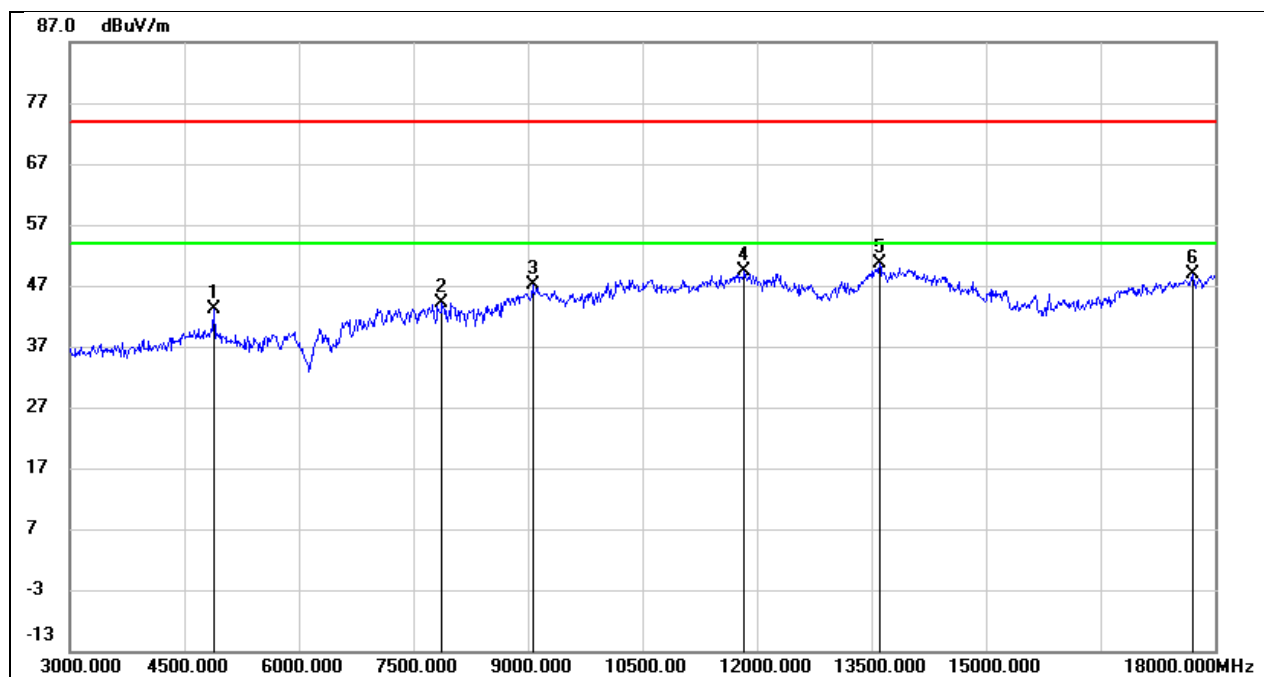
| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 7500.000 | 37.50 | 6.33 | 43.83 | 74.00 | -30.17 | peak |
| 2 | 9105.000 | 36.13 | 10.53 | 46.66 | 74.00 | -27.34 | peak |
| 3 | 10665.000 | 34.87 | 13.58 | 48.45 | 74.00 | -25.55 | peak |
| 4 | 13575.000 | 28.87 | 21.06 | 49.93 | 74.00 | -24.07 | peak |
| 5 | 14010.000 | 28.40 | 21.93 | 50.33 | 74.00 | -23.67 | peak |
| 6 | 18000.000 | 23.58 | 25.69 | 49.27 | 74.00 | -24.73 | peak |

| | | | |
|------------|------------|---------------|----------|
| Test Mode: | GFSK | Channel: | 2453 MHz |
| Polarity: | Horizontal | Test Voltage: | DC 3.7 V |



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 7725.000 | 37.64 | 6.32 | 43.96 | 74.00 | -30.04 | peak |
| 2 | 8940.000 | 36.39 | 10.04 | 46.43 | 74.00 | -27.57 | peak |
| 3 | 10215.000 | 36.51 | 12.43 | 48.94 | 74.00 | -25.06 | peak |
| 4 | 13605.000 | 29.55 | 21.12 | 50.67 | 74.00 | -23.33 | peak |
| 5 | 14010.000 | 28.79 | 21.93 | 50.72 | 74.00 | -23.28 | peak |
| 6 | 17985.000 | 24.16 | 25.60 | 49.76 | 74.00 | -24.24 | peak |

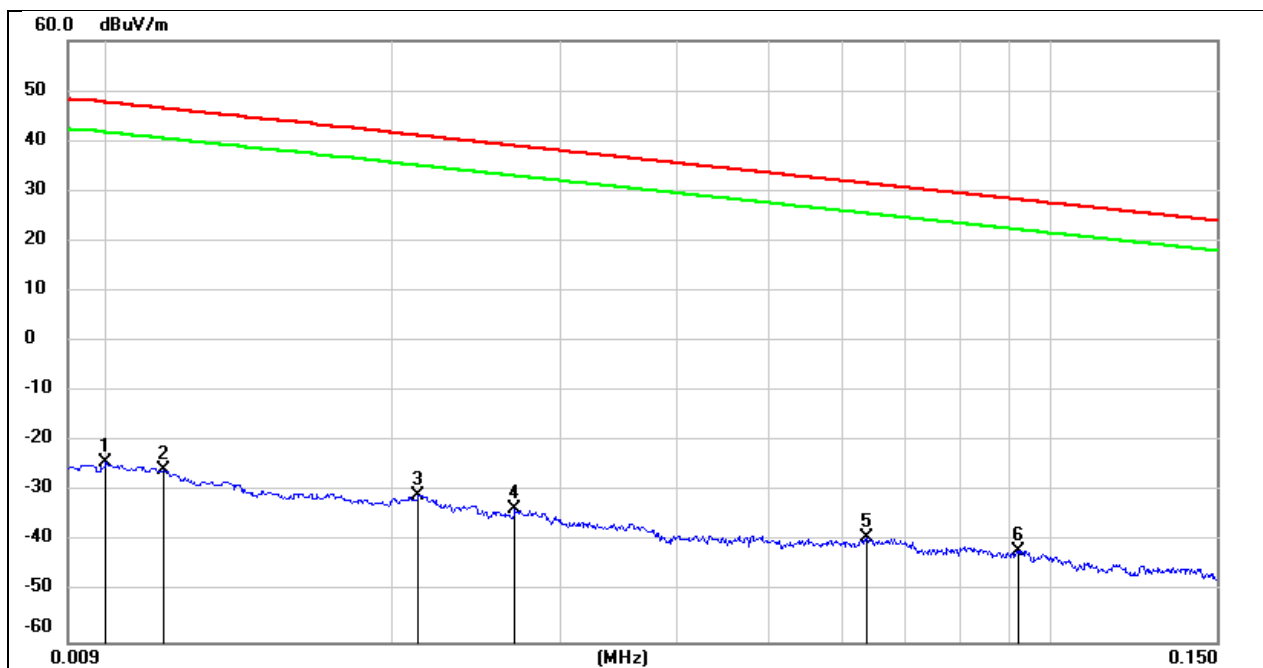
| | | | |
|------------|----------|---------------|----------|
| Test Mode: | GFSK | Channel: | 2453 MHz |
| Polarity: | Vertical | Test Voltage: | DC 3.7 V |



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 4890.000 | 43.11 | 0.03 | 43.14 | 74.00 | -30.86 | peak |
| 2 | 7875.000 | 37.86 | 6.31 | 44.17 | 74.00 | -29.83 | peak |
| 3 | 9060.000 | 36.61 | 10.51 | 47.12 | 74.00 | -26.88 | peak |
| 4 | 11835.000 | 31.86 | 17.51 | 49.37 | 74.00 | -24.63 | peak |
| 5 | 13605.000 | 29.44 | 21.12 | 50.56 | 74.00 | -23.44 | peak |
| 6 | 17700.000 | 24.90 | 23.91 | 48.81 | 74.00 | -25.19 | peak |

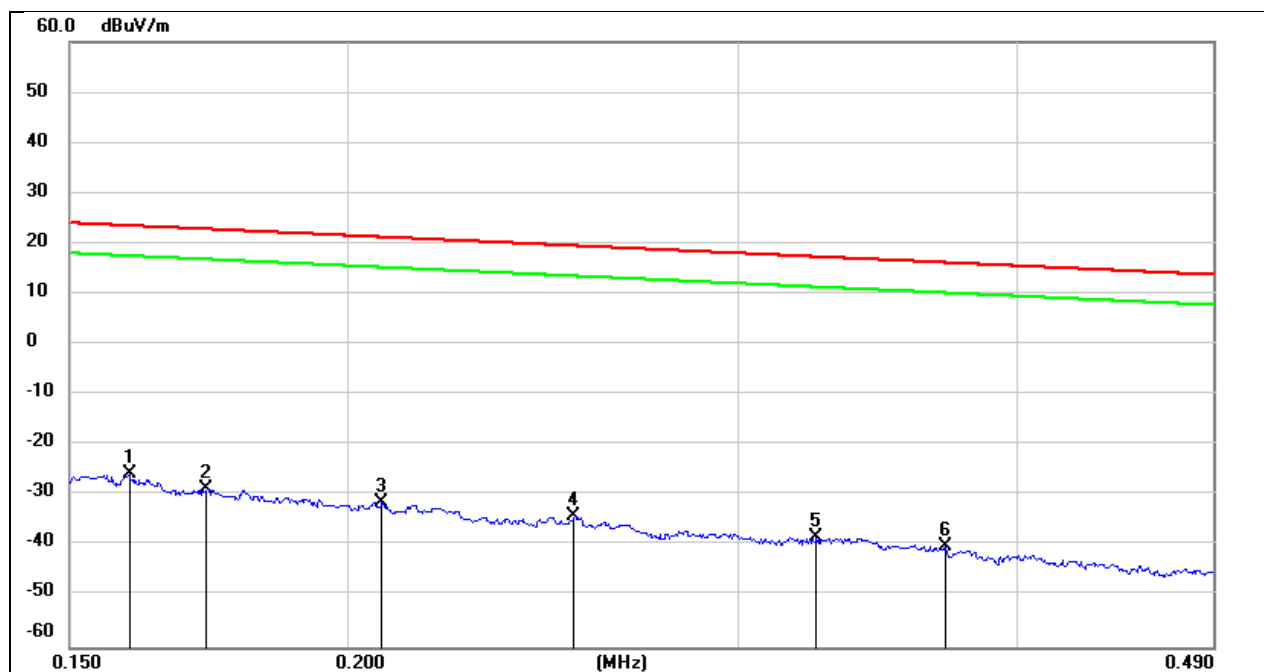
8.4. SPURIOUS EMISSIONS (9 KHZ ~ 30 MHZ)

| | | | |
|------------|---------------------------------|--------------|----------|
| Test Mode: | GFSK | Channel: | 2453 MHz |
| Polarity: | Loop Antenna Face On To The EUT | Test Voltage | DC 3.7 V |



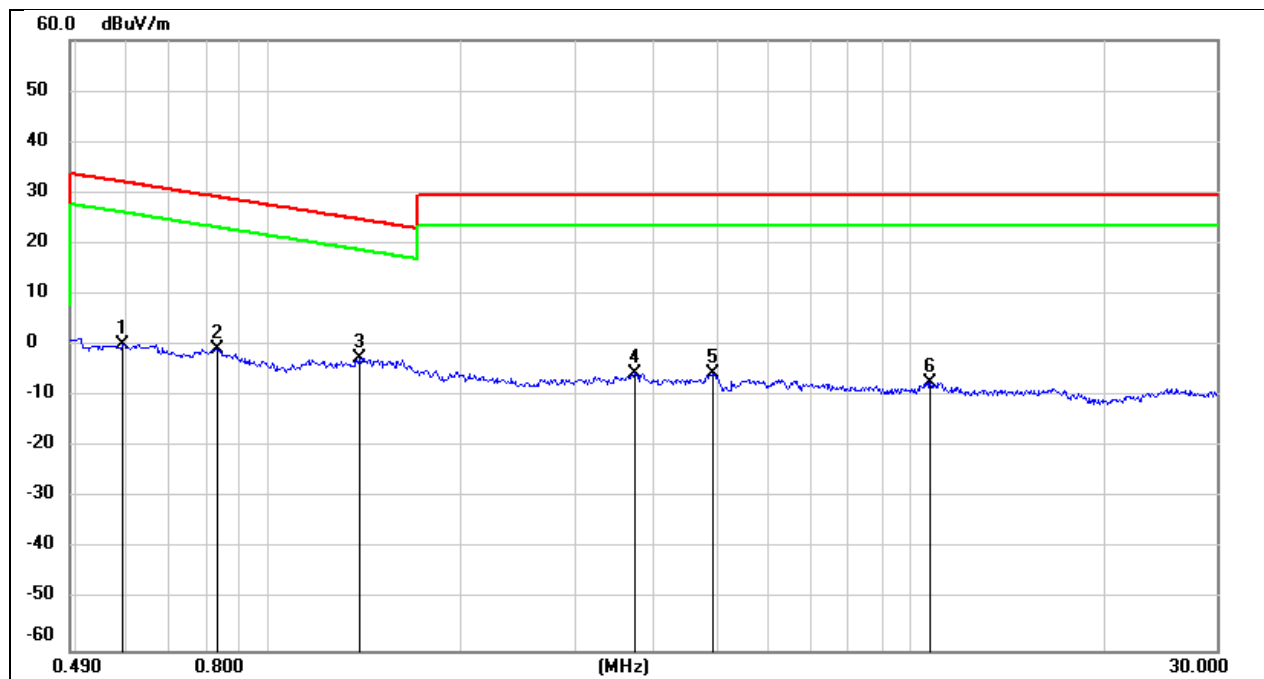
| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 0.0100 | 77.22 | -101.40 | -24.18 | 47.60 | -71.78 | peak |
| 2 | 0.0114 | 75.88 | -101.40 | -25.52 | 46.46 | -71.98 | peak |
| 3 | 0.0212 | 70.54 | -101.35 | -30.81 | 41.07 | -71.88 | peak |
| 4 | 0.0269 | 67.85 | -101.38 | -33.53 | 39.01 | -72.54 | peak |
| 5 | 0.0636 | 62.31 | -101.54 | -39.23 | 31.53 | -70.76 | peak |
| 6 | 0.0922 | 60.01 | -101.74 | -41.73 | 28.31 | -70.04 | peak |

| | | | |
|------------|---------------------------------|--------------|----------|
| Test Mode: | GFSK | Channel: | 2453 MHz |
| Polarity: | Loop Antenna Face On To The EUT | Test Voltage | DC 3.7 V |



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 0.1595 | 75.86 | -101.65 | -25.79 | 23.55 | -49.34 | peak |
| 2 | 0.1728 | 72.99 | -101.67 | -28.68 | 22.86 | -51.54 | peak |
| 3 | 0.2071 | 70.38 | -101.73 | -31.35 | 21.28 | -52.63 | peak |
| 4 | 0.2530 | 67.64 | -101.80 | -34.16 | 19.54 | -53.70 | peak |
| 5 | 0.3251 | 63.71 | -101.88 | -38.17 | 17.36 | -55.53 | peak |
| 6 | 0.3714 | 61.78 | -101.93 | -40.15 | 16.20 | -56.35 | peak |

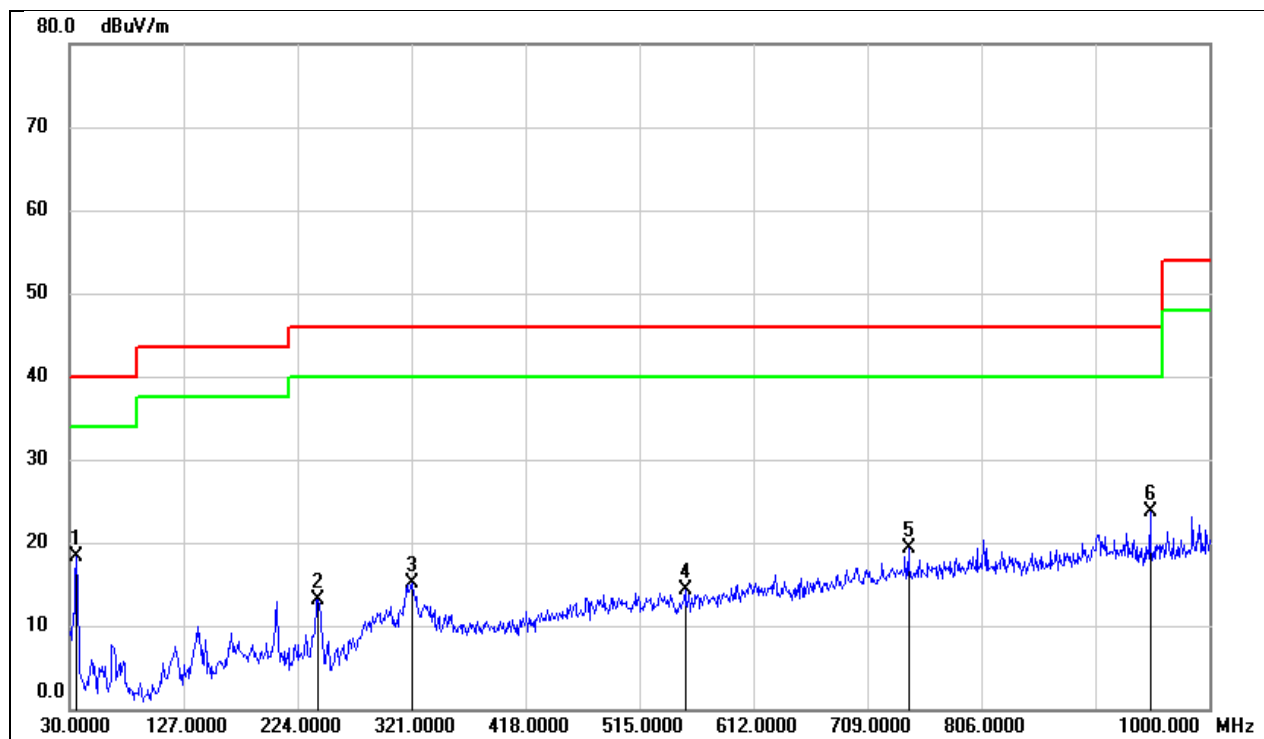
| | | | |
|------------|---------------------------------|--------------|----------|
| Test Mode: | GFSK | Channel: | 2453 MHz |
| Polarity: | Loop Antenna Face On To The EUT | Test Voltage | DC 3.7 V |



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 0.5917 | 62.24 | -62.08 | 0.16 | 32.16 | -32.00 | peak |
| 2 | 0.8296 | 61.44 | -62.17 | -0.73 | 29.23 | -29.96 | peak |
| 3 | 1.3810 | 59.47 | -62.10 | -2.63 | 24.80 | -27.43 | peak |
| 4 | 3.7360 | 55.83 | -61.40 | -5.57 | 29.54 | -35.11 | peak |
| 5 | 4.9165 | 55.88 | -61.48 | -5.60 | 29.54 | -35.14 | peak |
| 6 | 10.7299 | 53.48 | -60.83 | -7.35 | 29.54 | -36.89 | peak |

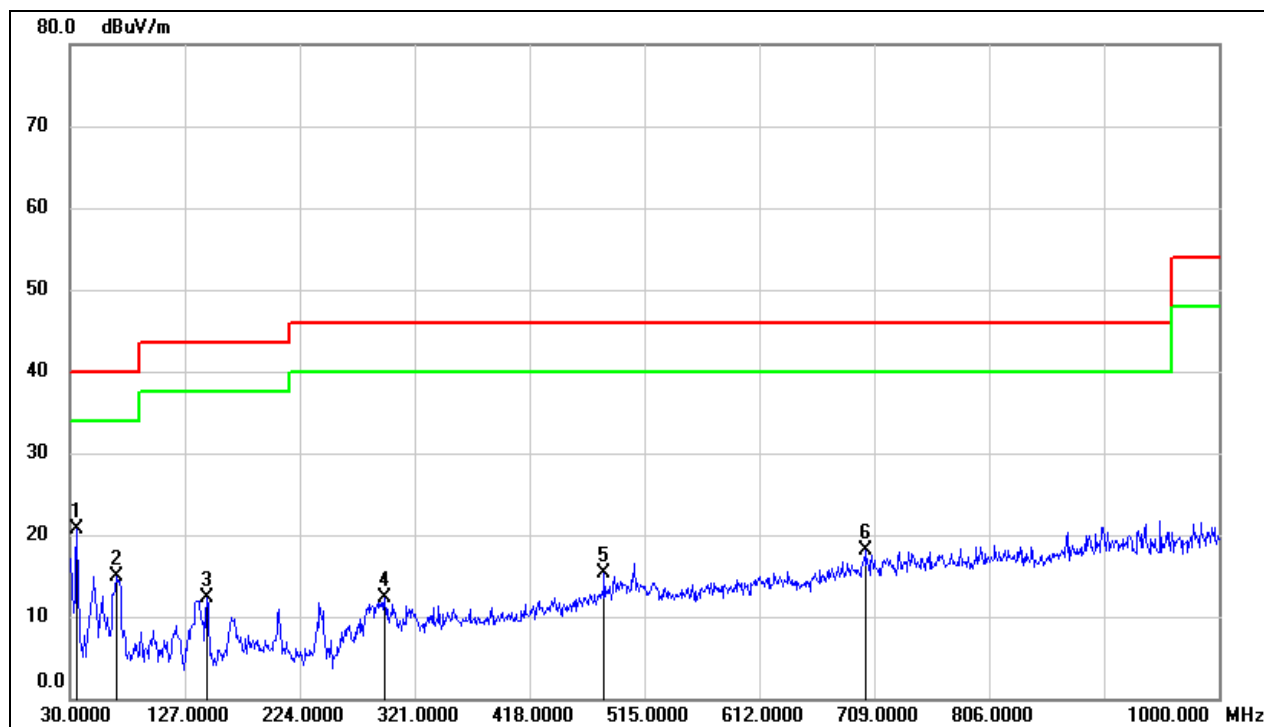
8.5. SPURIOUS EMISSIONS (30 MHz ~ 1 GHz)

| | | | |
|------------|------------|---------------|----------|
| Test Mode: | GFSK | Channel: | 2453 MHz |
| Polarity: | Horizontal | Test Voltage: | DC 3.7 V |



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 35.8200 | 37.51 | -19.15 | 18.36 | 40.00 | -21.64 | QP |
| 2 | 241.4600 | 31.69 | -18.50 | 13.19 | 46.00 | -32.81 | QP |
| 3 | 321.0000 | 29.36 | -14.21 | 15.15 | 46.00 | -30.85 | QP |
| 4 | 553.8000 | 24.71 | -10.45 | 14.26 | 46.00 | -31.74 | QP |
| 5 | 743.9200 | 26.56 | -7.17 | 19.39 | 46.00 | -26.61 | QP |
| 6 | 949.5600 | 28.29 | -4.66 | 23.63 | 46.00 | -22.37 | QP |

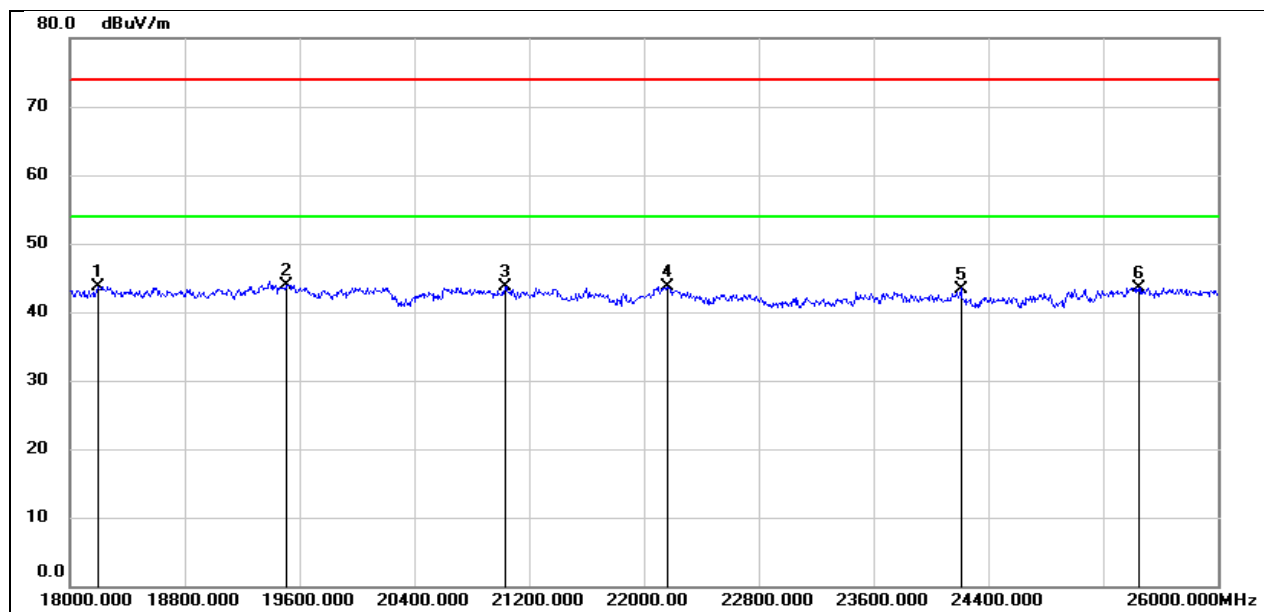
| | | | |
|------------|----------|---------------|----------|
| Test Mode: | GFSK | Channel: | 2453 MHz |
| Polarity: | Vertical | Test Voltage: | DC 3.7 V |



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1 | 35.8200 | 39.78 | -19.15 | 20.63 | 40.00 | -19.37 | QP |
| 2 | 68.8000 | 35.63 | -20.71 | 14.92 | 40.00 | -25.08 | QP |
| 3 | 145.4299 | 30.95 | -18.60 | 12.35 | 43.50 | -31.15 | QP |
| 4 | 295.7800 | 27.83 | -15.54 | 12.29 | 46.00 | -33.71 | QP |
| 5 | 481.0500 | 26.35 | -11.03 | 15.32 | 46.00 | -30.68 | QP |
| 6 | 702.2100 | 26.00 | -7.89 | 18.11 | 46.00 | -27.89 | QP |

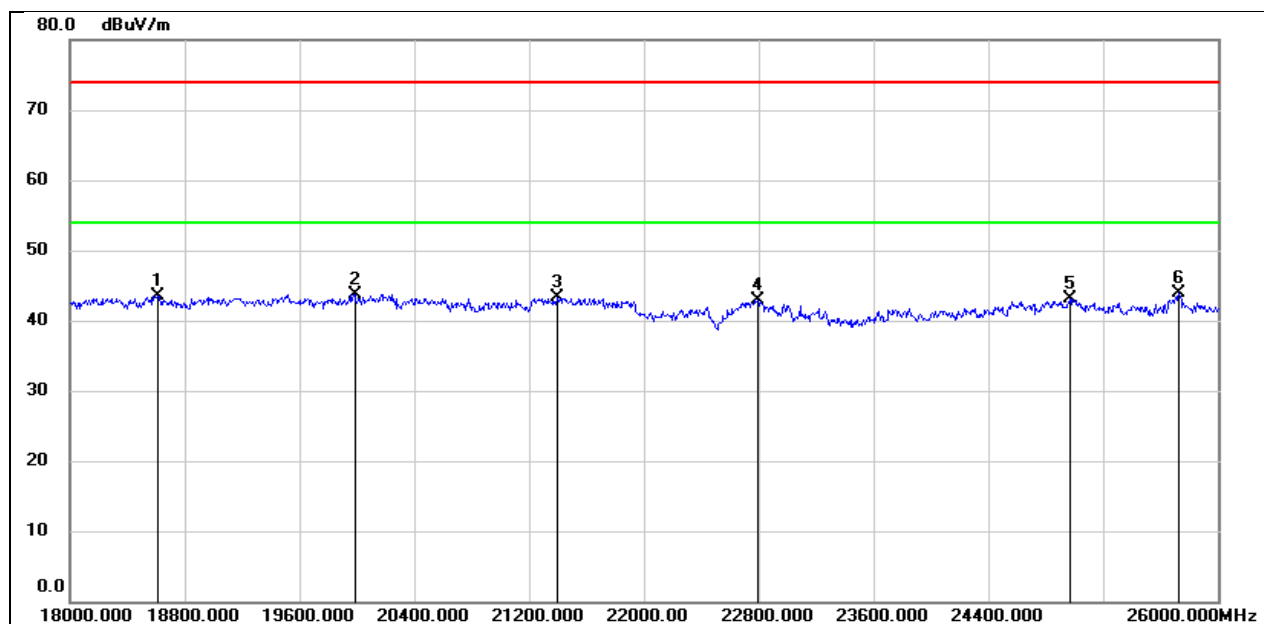
8.6. SPURIOUS EMISSIONS (18 GHZ ~ 26 GHZ)

| | | | |
|------------|------------|---------------|----------|
| Test Mode: | GFSK | Channel: | 2453 MHz |
| Polarity: | Horizontal | Test Voltage: | DC 3.7 V |



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 18200.000 | 49.29 | -5.52 | 43.77 | 74.00 | -30.23 | peak |
| 2 | 19504.000 | 49.47 | -5.54 | 43.93 | 74.00 | -30.07 | peak |
| 3 | 21032.000 | 48.65 | -4.87 | 43.78 | 74.00 | -30.22 | peak |
| 4 | 22160.000 | 48.08 | -4.31 | 43.77 | 74.00 | -30.23 | peak |
| 5 | 24208.000 | 46.21 | -2.81 | 43.40 | 74.00 | -30.60 | peak |
| 6 | 25448.000 | 45.33 | -1.76 | 43.57 | 74.00 | -30.43 | peak |

| | | | |
|------------|----------|---------------|----------|
| Test Mode: | GFSK | Channel: | 2453 MHz |
| Polarity: | Vertical | Test Voltage: | DC 3.7 V |



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 18616.000 | 48.89 | -5.34 | 43.55 | 74.00 | -30.45 | peak |
| 2 | 19984.000 | 49.21 | -5.44 | 43.77 | 74.00 | -30.23 | peak |
| 3 | 21400.000 | 48.04 | -4.72 | 43.32 | 74.00 | -30.68 | peak |
| 4 | 22792.000 | 46.61 | -3.65 | 42.96 | 74.00 | -31.04 | peak |
| 5 | 24968.000 | 45.26 | -2.14 | 43.12 | 74.00 | -30.88 | peak |
| 6 | 25728.000 | 44.61 | -0.72 | 43.89 | 74.00 | -30.11 | peak |

9. AC POWER LINE CONDUCTED EMISSION

LIMITS

Please refer to CFR 47 FCC §15.207 (a)

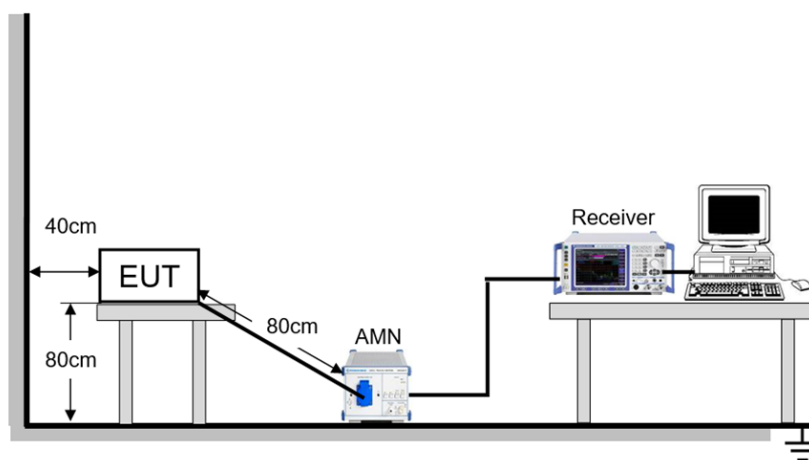
| FREQUENCY (MHz) | Quasi-peak | Average |
|-----------------|------------|-----------|
| 0.15 -0.5 | 66 - 56 * | 56 - 46 * |
| 0.50 -5.0 | 56.00 | 46.00 |
| 5.0 -30.0 | 60.00 | 50.00 |

TEST PROCEDURE

The EUT is put on a table of non-conducting material that is 80 cm high. The vertical conducting wall of shielding is located 40 cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10-2013. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9 kHz.

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

TEST SETUP

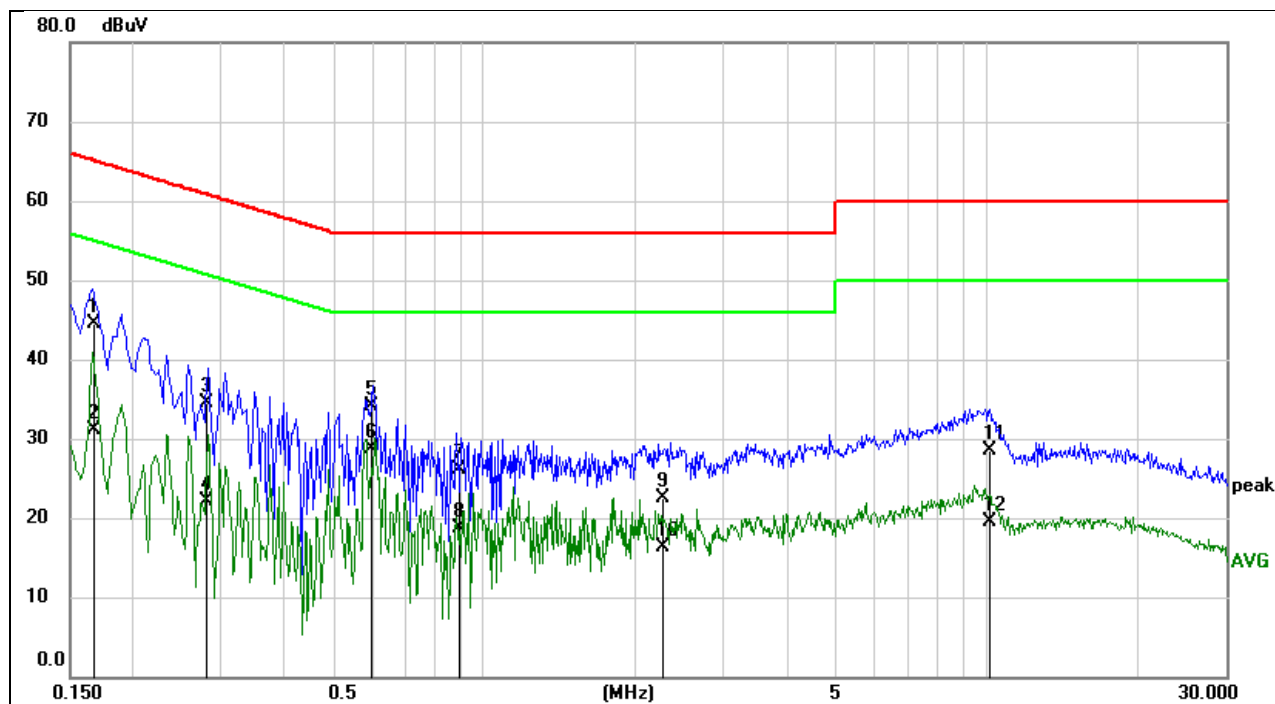


TEST ENVIRONMENT

| | | | |
|---------------------|---------|-------------------|-----------------|
| Temperature | 25.1 °C | Relative Humidity | 52% |
| Atmosphere Pressure | 101 kPa | Test Voltage | AC 120 V, 60 Hz |

TEST RESULTS

| | | | |
|------------|------|--------------|-----------------|
| Test Mode: | GFSK | Channel: | 2453 MHz |
| Line: | L1 | Test Voltage | AC 120 V, 60 Hz |

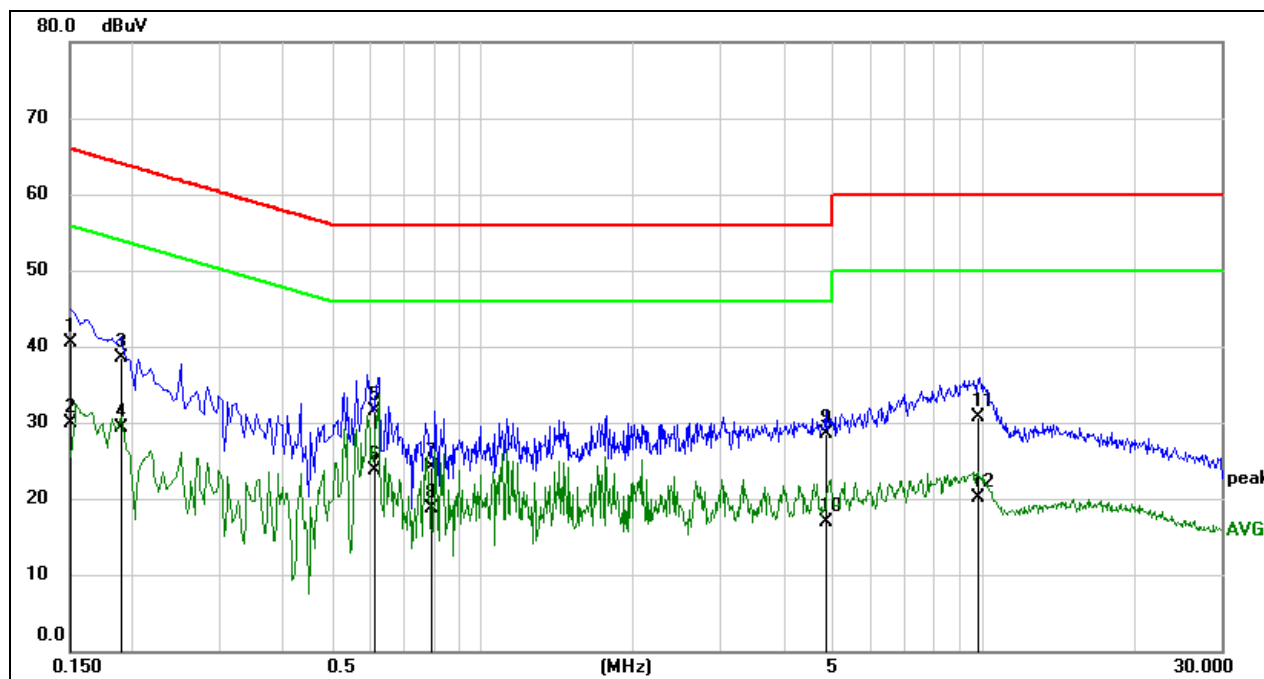


| No. | Frequency (MHz) | Reading (dBμV) | Correct (dB) | Result (dBμV) | Limit (dBμV) | Margin (dB) | Remark |
|-----|--------------------|-------------------|-----------------|------------------|-----------------|----------------|--------|
| 1 | 0.1669 | 34.83 | 9.59 | 44.42 | 65.11 | -20.69 | QP |
| 2 | 0.1669 | 21.56 | 9.59 | 31.15 | 55.11 | -23.96 | AVG |
| 3 | 0.2794 | 24.97 | 9.59 | 34.56 | 60.83 | -26.27 | QP |
| 4 | 0.2794 | 12.58 | 9.59 | 22.17 | 50.83 | -28.66 | AVG |
| 5 | 0.5972 | 24.52 | 9.60 | 34.12 | 56.00 | -21.88 | QP |
| 6 | 0.5972 | 19.17 | 9.60 | 28.77 | 46.00 | -17.23 | AVG |
| 7 | 0.8942 | 16.52 | 9.60 | 26.12 | 56.00 | -29.88 | QP |
| 8 | 0.8942 | 9.17 | 9.60 | 18.77 | 46.00 | -27.23 | AVG |
| 9 | 2.2724 | 12.89 | 9.64 | 22.53 | 56.00 | -33.47 | QP |
| 10 | 2.2724 | 6.71 | 9.64 | 16.35 | 46.00 | -29.65 | AVG |
| 11 | 10.1733 | 18.76 | 9.72 | 28.48 | 60.00 | -31.52 | QP |
| 12 | 10.1733 | 9.70 | 9.72 | 19.42 | 50.00 | -30.58 | AVG |

Note:

1. Result = Reading + Correct Factor.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz ~ 150 kHz), 9 kHz (150 kHz ~ 30 MHz).
4. Step size: 80 Hz (0.009 MHz ~ 0.15 MHz), 4 kHz (0.15 MHz ~ 30 MHz), Scan time: auto.

| | | | |
|------------|------|--------------|-----------------|
| Test Mode: | GFSK | Channel: | 2453 MHz |
| Line: | N | Test Voltage | AC 120 V, 60 Hz |



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|-----|-----------------|----------------|--------------|---------------|--------------|-------------|--------|
| 1 | 0.1504 | 30.82 | 9.59 | 40.41 | 65.98 | -25.57 | QP |
| 2 | 0.1504 | 20.41 | 9.59 | 30.00 | 55.98 | -25.98 | AVG |
| 3 | 0.1889 | 28.93 | 9.59 | 38.52 | 64.08 | -25.56 | QP |
| 4 | 0.1889 | 19.62 | 9.59 | 29.21 | 54.08 | -24.87 | AVG |
| 5 | 0.6070 | 21.83 | 9.60 | 31.43 | 56.00 | -24.57 | QP |
| 6 | 0.6070 | 14.18 | 9.60 | 23.78 | 46.00 | -22.22 | AVG |
| 7 | 0.7937 | 14.51 | 9.60 | 24.11 | 56.00 | -31.89 | QP |
| 8 | 0.7937 | 9.17 | 9.60 | 18.77 | 46.00 | -27.23 | AVG |
| 9 | 4.8940 | 18.79 | 9.71 | 28.50 | 56.00 | -27.50 | QP |
| 10 | 4.8940 | 7.12 | 9.71 | 16.83 | 46.00 | -29.17 | AVG |
| 11 | 9.8266 | 21.07 | 9.72 | 30.79 | 60.00 | -29.21 | QP |
| 12 | 9.8266 | 10.46 | 9.72 | 20.18 | 50.00 | -29.82 | AVG |

Note:

1. Result = Reading + Correct Factor.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz ~ 150 kHz), 9 kHz (150 kHz ~ 30 MHz).
4. Step size: 80 Hz (0.009 MHz ~ 0.15 MHz), 4 kHz (0.15 MHz ~ 30 MHz), Scan time: auto.

Note: All the modes have been tested, only the worst data was recorded in the report.

10. ANTENNA REQUIREMENT

APPLICABLE REQUIREMENTS

Please refer to FCC §15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

RESULTS

Complies

END OF REPORT