



**CFR 47 FCC PART 15 SUBPART C**

**TEST REPORT**

*For*

**Rock Force 1/10 SCALE AWD OFF-ROAD VEHICLE**

**MODEL NUMBER: VL-6228, NV-6065, GV-6282**

**FCC ID: 2ASK3VL-6228RW**

**REPORT NUMBER: 4790053047.1-2**

**ISSUE DATE: September 17, 2021**

*Prepared for*

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

*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](http://www.ul.com)**

Revision History

| Rev. | Issue Date | Revisions     | Revised By |
|------|------------|---------------|------------|
| V0   | 09/17/2021 | Initial Issue |            |



| Summary of Test Results                                                                                                                                                                                                                                                                                                                                                                 |                                              |                                                                |                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------------|----------------------------|
| Clause                                                                                                                                                                                                                                                                                                                                                                                  | Test Items                                   | FCC Rules                                                      | Test Results               |
| 1                                                                                                                                                                                                                                                                                                                                                                                       | 20dB Bandwidth                               | CFR 47 FCC §15.215 (c)                                         | Pass                       |
| 2                                                                                                                                                                                                                                                                                                                                                                                       | Radiated Emission                            | CFR 47 FCC §15.249 (a)(d)(e)<br>CFR 47 FCC §15.205 and §15.209 | Pass                       |
| 3                                                                                                                                                                                                                                                                                                                                                                                       | Conducted Emission Test<br>for AC Power Port | FCC Part 15.207                                                | Not Applicable<br>(Note 3) |
| 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 &lt;Pass&gt; according to &lt; CFR 47 FCC PART 15 SUBPART C &gt; when &lt;Accuracy Method&gt; decision rule is applied.</p> <p>Note 3: The EUT was power by battery but can't be charged.</p> |                                              |                                                                |                            |



---

## TABLE OF CONTENTS

|                                                                            |           |
|----------------------------------------------------------------------------|-----------|
| <b>1. ATTESTATION OF TEST RESULTS .....</b>                                | <b>5</b>  |
| <b>2. TEST METHODOLOGY .....</b>                                           | <b>6</b>  |
| <b>3. FACILITIES AND ACCREDITATION .....</b>                               | <b>6</b>  |
| <b>4. CALIBRATION AND UNCERTAINTY .....</b>                                | <b>7</b>  |
| 4.1. MEASURING INSTRUMENT CALIBRATION .....                                | 7         |
| 4.2. MEASUREMENT UNCERTAINTY .....                                         | 7         |
| <b>5. EQUIPMENT UNDER TEST .....</b>                                       | <b>8</b>  |
| 5.1. DESCRIPTION OF EUT .....                                              | 8         |
| 5.2. MAXIMUM FIELD STRENGTH .....                                          | 8         |
| 5.3. CHANNEL LIST .....                                                    | 8         |
| 5.4. DESCRIPTION OF AVAILABLE ANTENNAS .....                               | 10        |
| 5.5. TEST CHANNEL CONFIGURATION .....                                      | 10        |
| 5.6. THE WORSE CASE POWER SETTING PARAMETER .....                          | 10        |
| 5.7. TEST ENVIRONMENT .....                                                | 10        |
| 5.8. DESCRIPTION OF TEST SETUP .....                                       | 11        |
| 5.9. MEASURING INSTRUMENT AND SOFTWARE USED .....                          | 12        |
| <b>6. ANTENNA PORT TEST RESULTS .....</b>                                  | <b>13</b> |
| 6.1. ON TIME AND DUTY CYCLE .....                                          | 13        |
| 6.2. 20 dB BANDWIDTH OCCUPIED BANDWIDTH .....                              | 16        |
| <b>7. RADIATED TEST RESULTS .....</b>                                      | <b>19</b> |
| 7.1. LIMITS AND PROCEDURE .....                                            | 19        |
| 7.2. RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS<br>25 |           |
| 7.3. SPURIOUS EMISSIONS (1 ~ 3 GHz) .....                                  | 31        |
| 7.4. SPURIOUS EMISSIONS (3 ~ 18 GHz) .....                                 | 37        |
| 7.5. SPURIOUS EMISSIONS (18 ~ 26 GHz) .....                                | 43        |
| 7.6. SPURIOUS EMISSIONS BELOW 30 MHz .....                                 | 45        |
| 7.7. SPURIOUS EMISSIONS BELOW 1 GHz AND ABOVE 30 MHz .....                 | 48        |
| <b>8. ANTENNA REQUIREMENTS .....</b>                                       | <b>50</b> |



## 1. ATTESTATION OF TEST RESULTS

### Applicant Information

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

### Manufacturer Information

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

### EUT Information

EUT Name: Rock Force 1/10 SCALE AWD OFF-ROAD VEHICLE  
Model: VL-6228  
Serial Model: NV-6065, GV-6282  
Model Difference: Please refer to clause 5.1. Description of EUT  
Sample Received Date: August 6, 2021  
Sample Status: Normal  
Sample ID: 4124028  
Date of Tested: August 6, 2021~ September 15, 2021

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

Prepared By:

Jacky Jiang  
Project Engineer

Checked By:

Shawn Wen  
Laboratory Leader

Approved By:

Stephen Guo  
Laboratory 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><b>A2LA (Certificate No.: 4102.01)</b><br/>UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA.</p> <p><b>FCC (FCC Designation No.: CN1187)</b><br/>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><b>ISED (Company No.: 21320)</b><br/>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><b>VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011)</b><br/>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.</p> <p>Facility Name:<br/>Chamber D, the VCCI registration No. is G-20019 and R-20004<br/>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, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China
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.
3. For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30MHz 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                   |
| Radiation Emission test (include Fundamental emission)<br>(9 kHz ~ 30 MHz)                                                                    | 2.2 dB                    |
| Radiation Emission test (include Fundamental emission)<br>(30 MHz ~ 1 GHz)                                                                    | 4.00 dB                   |
| Radiation Emission test<br>(1 GHz ~ 26 GHz) (include Fundamental emission)                                                                    | 5.78 dB (1 GHz ~ 18 GHz)  |
|                                                                                                                                               | 5.23 dB (18 GHz ~ 26 GHz) |
| 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            | Rock Force 1/10 SCALE AWD OFF-ROAD VEHICLE                                                                                                                                                                  |                     |
| EUT Description     | The device under test (EUT) is toy car with a 2.4GHz transceiver                                                                                                                                            |                     |
| Model               | VL-6228                                                                                                                                                                                                     |                     |
| Serial Model        | NV-6065, GV-6282                                                                                                                                                                                            |                     |
| Model Difference    | Their electrical circuit design, layout, components used and internal wiring are identical, only the color and model name is different. We select "VL-6228" as the representative model for compliance test |                     |
| Product Description | Operation Frequency                                                                                                                                                                                         | 2405 MHz ~ 2475 MHz |
|                     | Modulation Type                                                                                                                                                                                             | GFSK                |
| Battery             | DC 7.4V                                                                                                                                                                                                     |                     |

### 5.2. MAXIMUM FIELD STRENGTH

| Frequency (MHz) | Channel Number | Max Peak field strength (dBμV/m) |
|-----------------|----------------|----------------------------------|
| 2445            | 41[71]         | 97.72                            |

### 5.3. CHANNEL LIST

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|
| 1       | 2405            | 32      | 2436            |
| 2       | 2406            | 33      | 2437            |
| 3       | 2407            | 34      | 2438            |
| 4       | 2408            | 35      | 2439            |
| 5       | 2409            | 36      | 2440            |
| 6       | 2410            | 37      | 2441            |
| 7       | 2411            | 38      | 2442            |
| 8       | 2412            | 39      | 2443            |
| 9       | 2413            | 40      | 2444            |
| 10      | 2414            | 41      | 2445            |
| 11      | 2415            | 42      | 2446            |
| 12      | 2416            | 43      | 2447            |
| 13      | 2417            | 44      | 2448            |
| 14      | 2418            | 45      | 2449            |
| 15      | 2419            | 46      | 2450            |
| 16      | 2420            | 47      | 2451            |



|    |      |    |      |
|----|------|----|------|
| 17 | 2421 | 48 | 2452 |
| 18 | 2422 | 49 | 2453 |
| 19 | 2423 | 50 | 2454 |
| 20 | 2424 | 51 | 2455 |
| 21 | 2425 | 52 | 2456 |
| 22 | 2426 | 53 | 2457 |
| 23 | 2427 | 54 | 2458 |
| 24 | 2428 | 55 | 2459 |
| 25 | 2429 | 56 | 2460 |
| 26 | 2430 | 57 | 2461 |
| 27 | 2431 | 58 | 2462 |
| 28 | 2432 | 59 | 2463 |
| 29 | 2433 | 60 | 2464 |
| 30 | 2434 | 61 | 2465 |
| 31 | 2435 | 62 | 2466 |
| 63 | 2467 | 70 | 2474 |
| 64 | 2468 | 71 | 2475 |
| 65 | 2469 |    |      |
| 66 | 2470 |    |      |
| 67 | 2471 |    |      |
| 68 | 2472 |    |      |
| 69 | 2473 |    |      |

**5.4. DESCRIPTION OF AVAILABLE ANTENNAS**

| Ant. | Frequency (MHz) | Antenna Type     | Antenna Gain (dBi) |
|------|-----------------|------------------|--------------------|
| 1    | 2405 ~ 2475     | integral antenna | 0                  |

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

**5.5. TEST CHANNEL CONFIGURATION**

| Test Mode | Test Channel       | Frequency                    |
|-----------|--------------------|------------------------------|
| GFSK      | CH 1, CH 41, CH 71 | 2405 MHz, 2445 MHz, 2475 MHz |

**5.6. THE WORSE CASE POWER SETTING PARAMETER**

| The Worse Case Power Setting Parameter under 2405 MHz ~ 2475 MHz Band |                         |              |         |         |
|-----------------------------------------------------------------------|-------------------------|--------------|---------|---------|
| Test Software Version                                                 |                         | /            |         |         |
| Modulation Type                                                       | Transmit Antenna Number | Test Channel |         |         |
|                                                                       |                         | CH 1         | CH 36   | CH 71   |
| GFSK                                                                  | 1                       | Default      | Default | Default |

**5.7. TEST ENVIRONMENT**

| Environment Parameter | Selected Values During Tests |            |
|-----------------------|------------------------------|------------|
| Relative Humidity     | 55 ~ 65 %                    |            |
| Atmospheric Pressure: | 1025 Pa                      |            |
| Temperature           | TN                           | 22 ~ 28 °C |
| Voltage:              | VL                           | /          |
|                       | VN                           | DC 7.4V    |
|                       | VH                           | /          |

Note: VL= Lower Extreme Test Voltage

VN= Nominal Voltage

VH= Upper Extreme Test Voltage

TN= Normal Temperature



## 5.8. 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 |
|----------|------|----------------|------------|-----------------|---------|
| /        | /    | /              | /          | /               | /       |

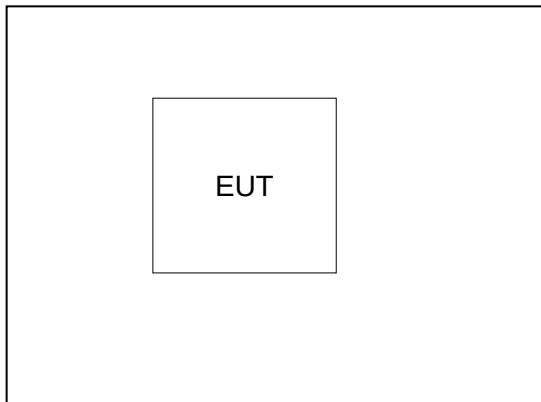
### ACCESSORY

| Item | Equipment | Mfr/Brand | Model/Type No. | Specification | Series No. |
|------|-----------|-----------|----------------|---------------|------------|
| /    | /         | /         | /              | /             | /          |

### TEST SETUP

The EUT have the engineer mode inside.

### SETUP DIAGRAM FOR TEST



Note: New battery was used during all tests.

**5.9. MEASURING INSTRUMENT AND SOFTWARE USED**

| Radiated Emissions                  |                                        |               |                                     |               |               |               |
|-------------------------------------|----------------------------------------|---------------|-------------------------------------|---------------|---------------|---------------|
| Instrument                          |                                        |               |                                     |               |               |               |
| Used                                | Equipment                              | Manufacturer  | Model No.                           | Serial No.    | Last Cal.     | Next Cal.     |
| <input checked="" type="checkbox"/> | MXE EMI Receiver                       | KESIGHT       | N9038A                              | MY56400036    | Nov. 12, 2020 | Nov. 11, 2021 |
| <input checked="" type="checkbox"/> | Hybrid Log Periodic Antenna            | TDK           | HLP-3003C                           | 130960        | Aug. 02, 2021 | Aug. 01, 2023 |
| <input checked="" type="checkbox"/> | Preamplifier                           | HP            | 8447D                               | 2944A09099    | Nov. 12, 2020 | Nov. 11, 2021 |
| <input checked="" type="checkbox"/> | EMI Measurement Receiver               | R&S           | ESR26                               | 101377        | Nov. 12, 2020 | Nov. 11, 2021 |
| <input checked="" type="checkbox"/> | Horn Antenna                           | TDK           | HRN-0118                            | 130939        | Aug. 02, 2021 | Aug. 01, 2023 |
| <input checked="" type="checkbox"/> | Preamplifier                           | TDK           | PA-02-0118                          | TRS-305-00067 | Nov. 20, 2020 | Nov. 19, 2021 |
| <input checked="" type="checkbox"/> | Horn Antenna                           | Schwarzbeck   | BBHA9170                            | #691          | Jul. 20, 2021 | Jul. 19, 2023 |
| <input checked="" type="checkbox"/> | Preamplifier                           | TDK           | PA-02-2                             | TRS-307-00003 | Nov. 12, 2020 | Nov. 11, 2021 |
| <input checked="" type="checkbox"/> | Preamplifier                           | TDK           | PA-02-3                             | TRS-308-00002 | Nov. 12, 2020 | Nov. 11, 2021 |
| <input checked="" type="checkbox"/> | Loop antenna                           | Schwarzbeck   | 1519B                               | 00008         | Jan.17, 2019  | Jan.17,2022   |
| <input checked="" type="checkbox"/> | Preamplifier                           | TDK           | PA-02-001-3000                      | TRS-302-00050 | Nov. 12, 2020 | Nov. 11, 2021 |
| <input checked="" type="checkbox"/> | Preamplifier                           | Mini-Circuits | ZX60-83LN-S+                        | SUP01201941   | Nov. 20, 2020 | Nov. 19, 2021 |
| <input checked="" type="checkbox"/> | High Pass Filter                       | Wi            | WHKX10-2700-3000-18000-40SS         | 23            | Nov. 12, 2020 | Nov. 11, 2021 |
| <input checked="" type="checkbox"/> | Band Reject Filter                     | Wainwright    | WRCJV8-2350-2400-2483.5-2533.5-40SS | 4             | Nov. 12, 2020 | Nov. 11, 2021 |
| <input checked="" type="checkbox"/> | Signal Analyzer                        | R&S           | FSV40                               | 101118        | Nov.20, 2020  | Nov.19, 2021  |
| Software                            |                                        |               |                                     |               |               |               |
| Used                                | Description                            |               | Manufacturer                        | Name          | Version       |               |
| <input checked="" type="checkbox"/> | Test Software for Radiated disturbance |               | Farad                               | EZ-EMC        | Ver. UL-3A1   |               |



## 6. ANTENNA PORT TEST RESULTS

### 6.1. ON TIME AND DUTY CYCLE

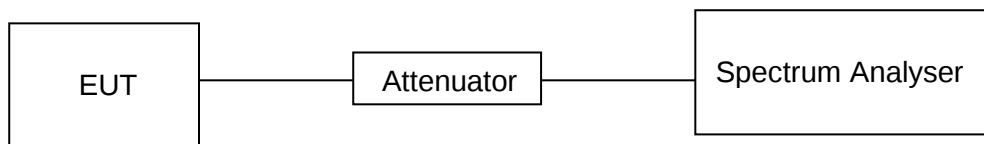
#### LIMITS

None; for reporting purposes only

#### PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method

#### TEST SETUP



#### TEST ENVIRONMENT

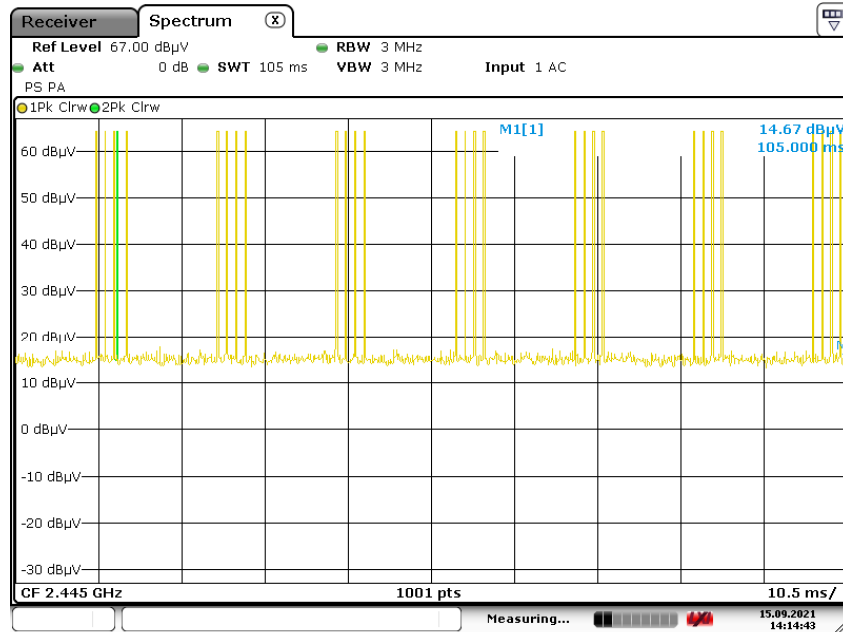
|                     |         |                   |         |
|---------------------|---------|-------------------|---------|
| Temperature         | 24.3 °C | Relative Humidity | 61 %    |
| Atmosphere Pressure | 101 kPa | Test Voltage      | DC 7.4V |

#### RESULTS

| Mode | On Time<br>(msec) | Period<br>(msec) | Duty Cycle<br>x<br>(Linear) | Duty Cycle<br>(%) | Duty Cycle<br>Correction Factor<br>(db) |
|------|-------------------|------------------|-----------------------------|-------------------|-----------------------------------------|
| GFSK | 4.851             | 100              | 0.04851                     | 4.62              | -26.28                                  |

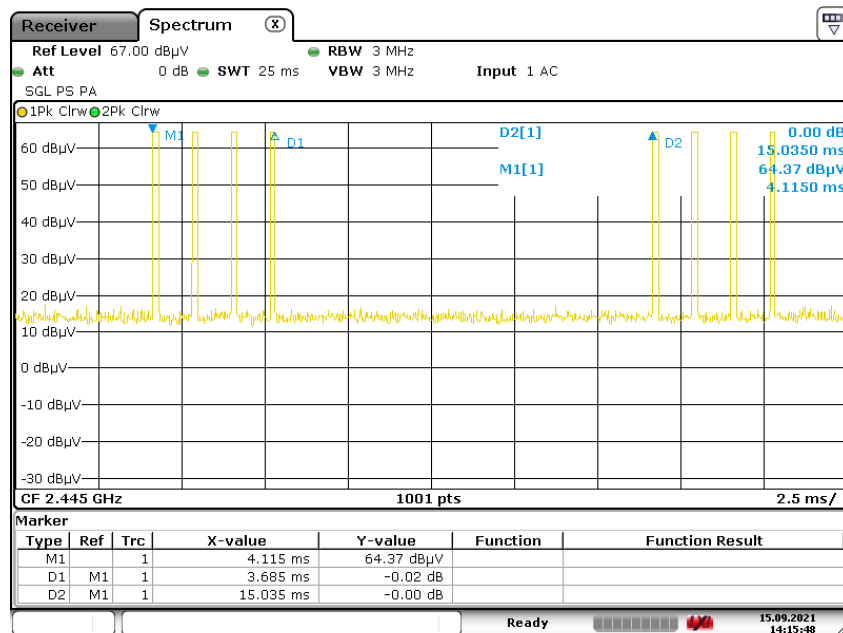
Note: Duty Cycle Correction Factor=20log(x).  
Where: x is Duty Cycle

### ON TIME AND DUTY CYCLE MID CH PLOT



Date: 15.SEP.2021 14:14:43

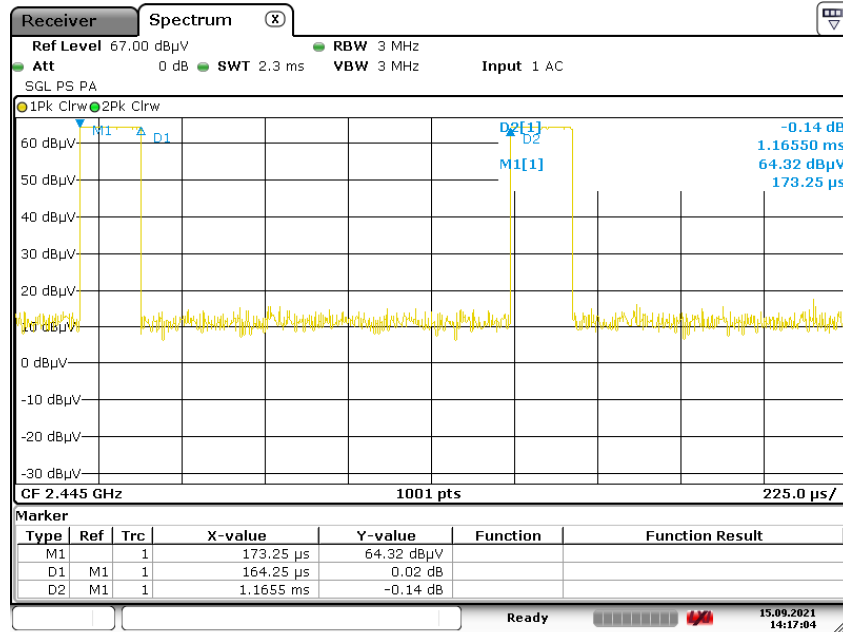
### ON TIME AND DUTY CYCLE MID CH PLOT-2



Date: 15.SEP.2021 14:15:49



## ON TIME AND DUTY CYCLE MID CH PLOT-3



Date: 15.SEP.2021 14:17:04

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

## 6.2. 20 dB BANDWIDTH OCCUPIED BANDWIDTH

### LIMITS

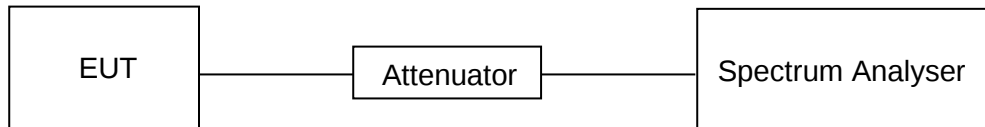
| CFR 47 FCC Part15 (15.249) Subpart C |                |                             |                       |
|--------------------------------------|----------------|-----------------------------|-----------------------|
| Section                              | Test Item      | Limit                       | Frequency Range (MHz) |
| CFR 47 FCC §15.215 (c)               | 20dB Bandwidth | for reporting purposes only | 2400-2483.5           |

### TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

|                  |                                                |
|------------------|------------------------------------------------|
| 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                                    |

### TEST SETUP



### TEST ENVIRONMENT

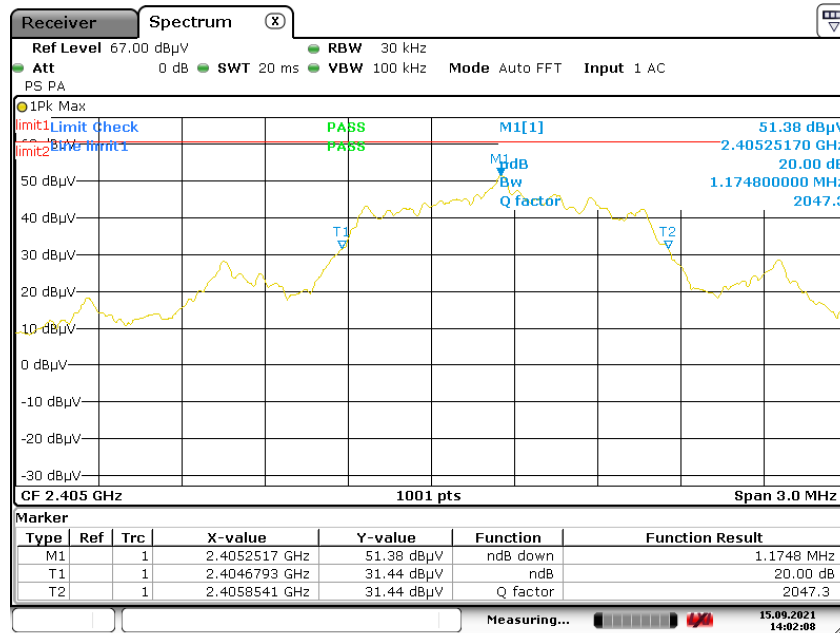
|                     |         |                   |         |
|---------------------|---------|-------------------|---------|
| Temperature         | 24.3 °C | Relative Humidity | 61 %    |
| Atmosphere Pressure | 101 kPa | Test Voltage      | DC 7.4V |

### RESULTS

| Frequency (MHz) | 20dB bandwidth (MHz) | Result |
|-----------------|----------------------|--------|
| 2405            | 1.1748               | PASS   |



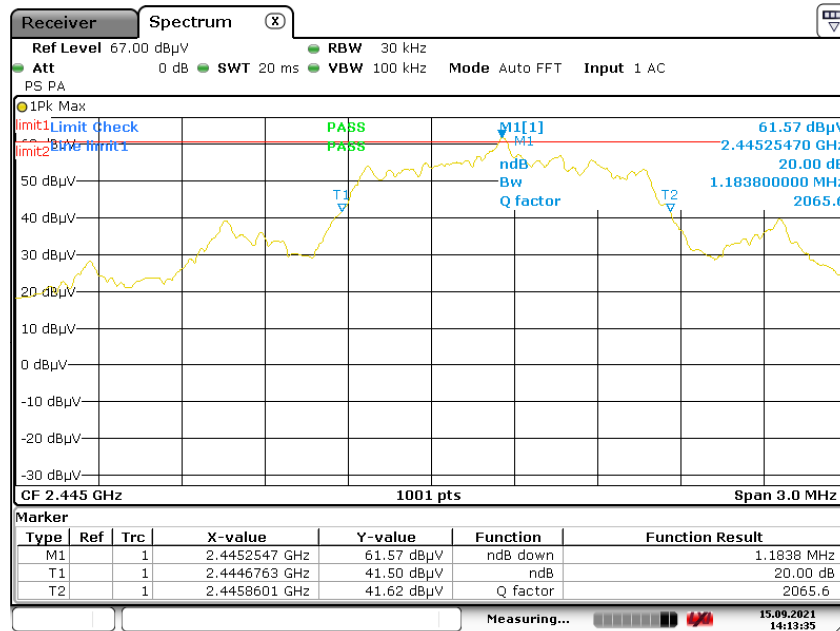
## 20 dB BANDWIDTH LOW CH



Date: 15.SEP.2021 14:02:08

| Frequency (MHz) | 20dB bandwidth (MHz) | Result |
|-----------------|----------------------|--------|
| 2445            | 1.1838               | PASS   |

## 20 dB BANDWIDTH MID CH

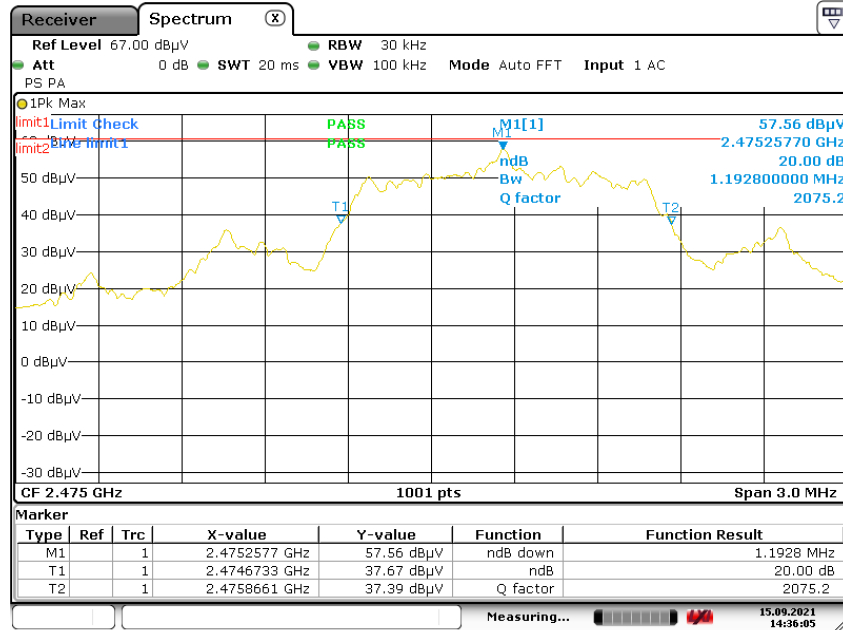


Date: 15.SEP.2021 14:13:36



| Frequency (MHz) | 20dB bandwidth (MHz) | Result |
|-----------------|----------------------|--------|
| 2475            | 1.1928               | PASS   |

## 20 dB BANDWIDTH HIG CH



Date: 15.SEP.2021 14:36:05



## 7. RADIATED TEST RESULTS

### 7.1. LIMITS AND PROCEDURE

#### 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<br>(94dBuV/m)         | 500 uV/m<br>(54dBuV/m)      | 3            |
| 2400 – 2483.5                                                                                    | 50 mV/m<br>(94dBuV/m)         | 500 uV/m<br>(54dBuV/m)      | 3            |
| 5725 – 5875                                                                                      | 50 mV/m<br>(94dBuV/m)         | 500 uV/m<br>(54dBuV/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 30MHz |                                   |                               |
|-----------------------------------------------------------------------------|-----------------------------------|-------------------------------|
| 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                            |

FCC Restricted bands of operation:



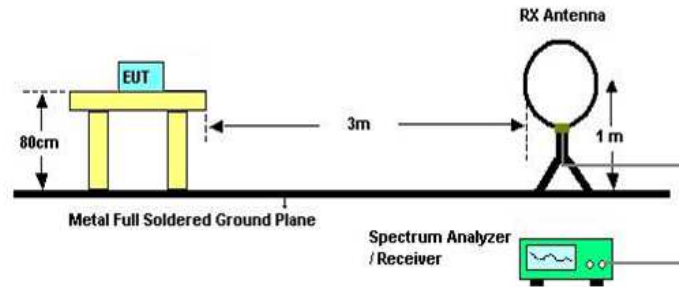
| MHz                      | MHz                 | MHz           | GHz              |
|--------------------------|---------------------|---------------|------------------|
| 0.090-0.110              | 16.42-16.423        | 399.9-410     | 4.5-5.15         |
| <sup>1</sup> 0.495-0.505 | 16.69475-16.69525   | 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     | ( <sup>2</sup> ) |
| 13.36-13.41              |                     |               |                  |

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

<sup>2</sup>Above 38.6c

## TEST SETUP AND PROCEDURE

Below 30MHz

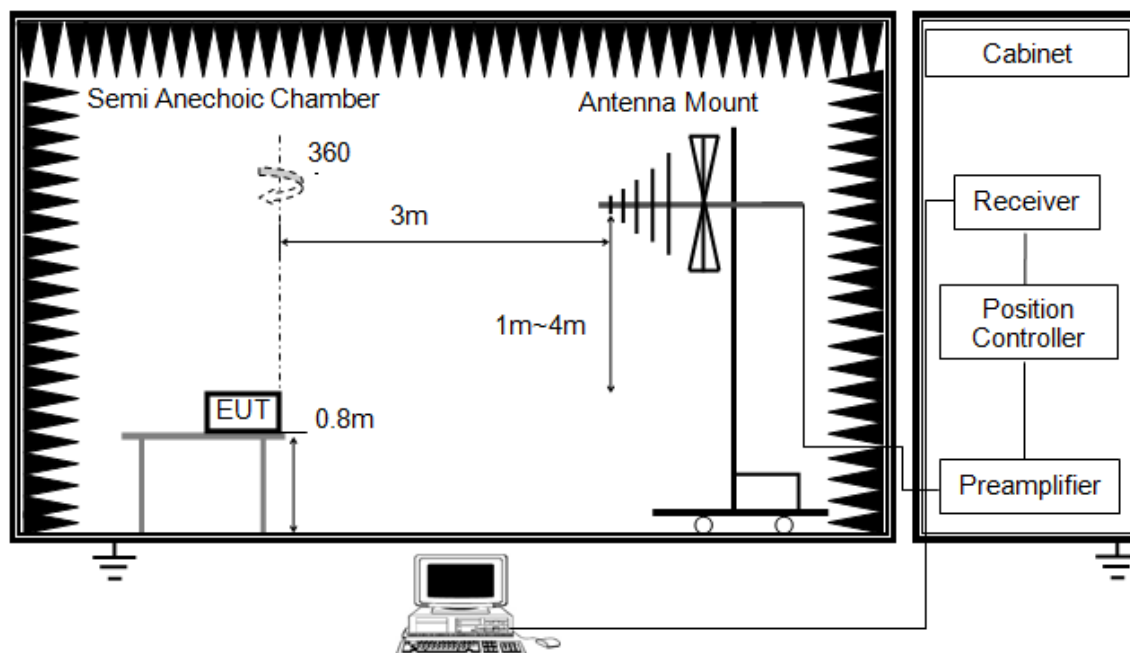


The setting of the spectrum analyser

|          |                                                                  |
|----------|------------------------------------------------------------------|
| 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                                                             |
| Detector | Peak/QP/ Average                                                 |
| Trace    | Max hold                                                         |

1. The testing follows the guidelines in ANSI C63.10-2013.
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 30 m 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 377  $\Omega$ . 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

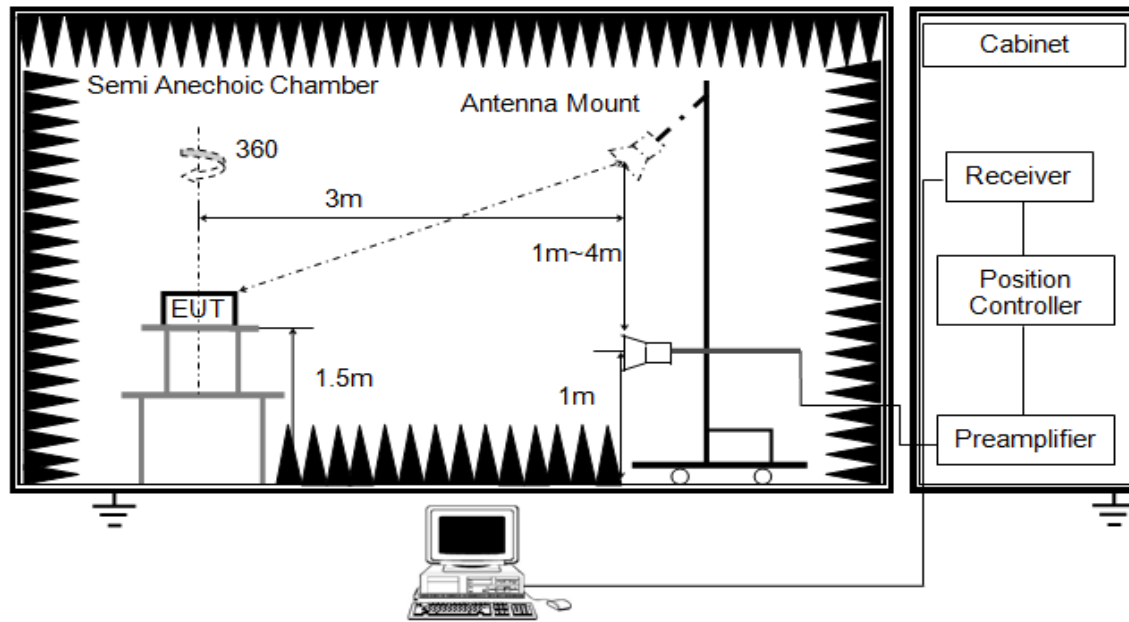


The setting of the spectrum analyser

|          |          |
|----------|----------|
| 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.
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 80cm 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. 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

Above 1 GHz



The setting of the spectrum analyser. (For Bandedge and Field strength)

|          |                                              |
|----------|----------------------------------------------|
| RBW      | $\geq$ OBW (3MHz)                            |
| VBW      | PEAK: $\geq 3 \times$ RBW<br>AVG: see note 5 |
| Sweep    | Auto                                         |
| Detector | Peak                                         |
| Trace    | Max hold                                     |

The setting of the spectrum analyser. (For Spurious emissions)

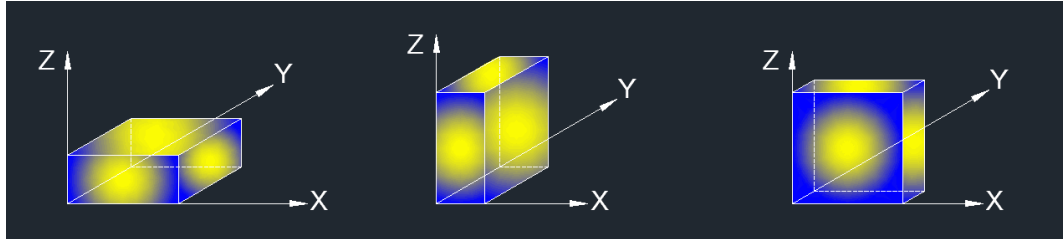
|          |                               |
|----------|-------------------------------|
| RBW      | 1MHz                          |
| VBW      | PEAK: 3MHz<br>AVG: see note 5 |
| Sweep    | Auto                          |
| Detector | Peak                          |
| Trace    | Max hold                      |

1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then tune the antenna tower (1.5 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter or band reject 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 150cm 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 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 6.1. ON TIME AND DUTY CYCLE.

6. For measurements Bandedge above 1 GHz, the resolution bandwidth is set to 3 MHz, then the video bandwidth is set to  $\geq 3 \times \text{RBW}$  for peak measurements. This test results are worse than using 1MHz resolution bandwidth, so if the result is pass, the test is considered to meet the standard requirements.

X axis, Y axis, Z axis positions:



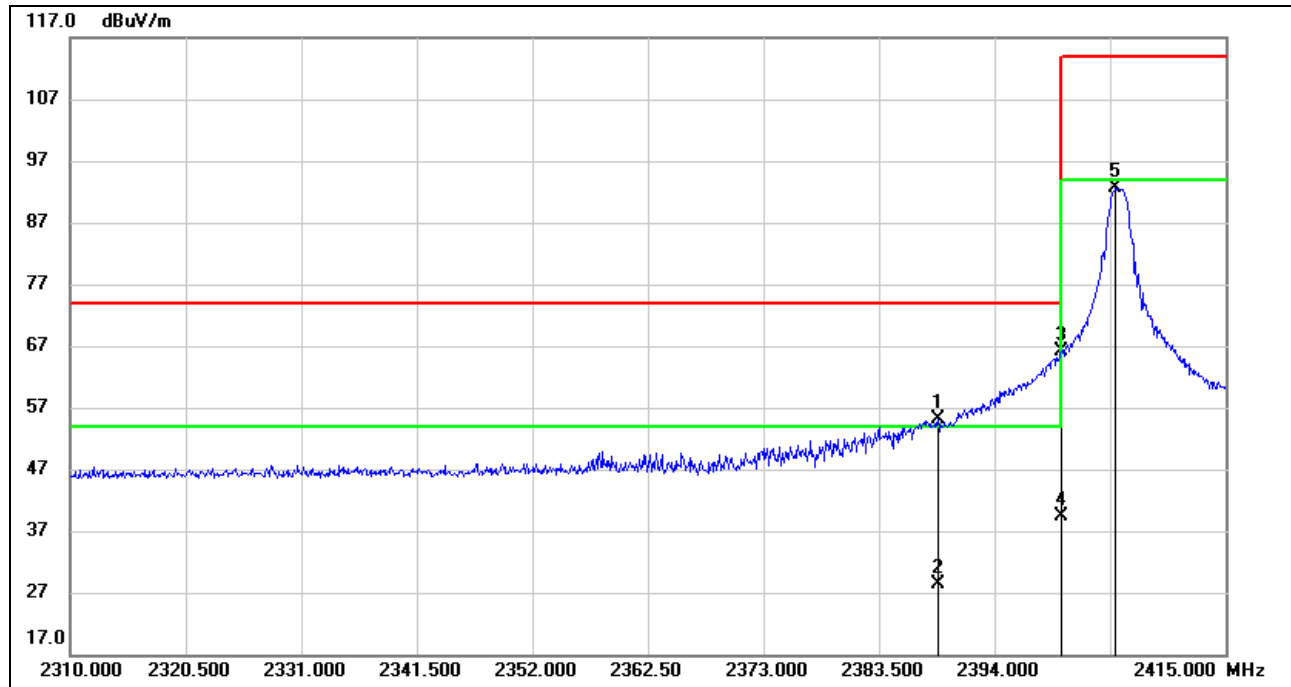
Note: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

## TEST ENVIRONMENT

|                     |         |                   |         |
|---------------------|---------|-------------------|---------|
| Temperature         | 24.3 °C | Relative Humidity | 61 %    |
| Atmosphere Pressure | 101 kPa | Test Voltage      | DC 7.4V |

## 7.2. RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS

### RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS (LOW CHANNEL, HORIZONTAL)



| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1   | 2388.855           | 21.88             | 33.34             | 55.22              | 74.00             | -18.78         | peak   |
| 2   | 2388.855           | /                 | /                 | 28.94              | 54.00             | -25.06         | AVG    |
| 3   | 2400.000           | 32.80             | 33.43             | 66.23              | 74.00             | -7.77          | peak   |
| 4   | 2400.000           | /                 | /                 | 39.95              | 54.00             | -14.05         | AVG    |
| 5   | 2405.025           | 59.10             | 33.45             | 92.55              | 114.00            | -21.45         | peak   |

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

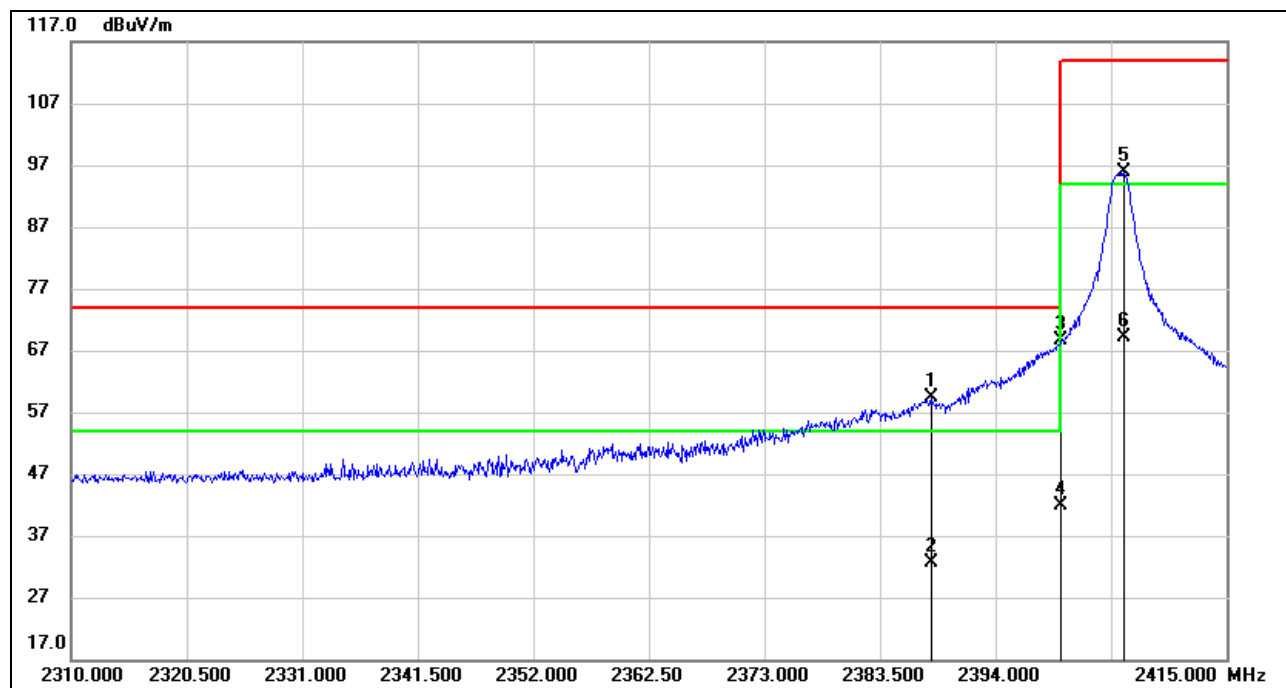
### 3. Peak: Peak detector.

4.  $\text{AVG Result} = \text{Peak Result} + \text{Duty Correction Factor}$ .

5. For the Duty Cycle and Correction Factor, please refer to clause 6.1.

6. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

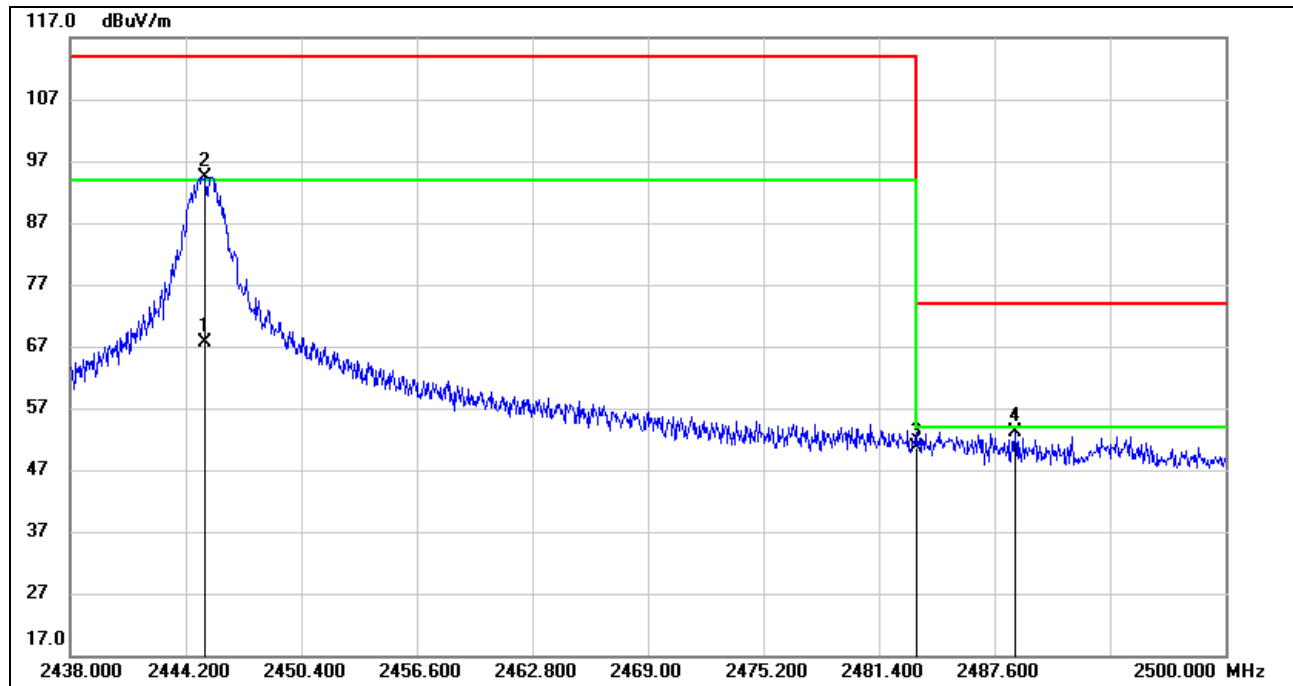
# **RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS (LOW CHANNEL, VERTICAL)**



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1   | 2388.120        | 26.03          | 33.34          | 59.37           | 74.00          | -14.63      | peak   |
| 2   | 2388.120        | /              | /              | 33.09           | 54.00          | -20.91      | AVG    |
| 3   | 2400.000        | 35.10          | 33.43          | 68.53           | 74.00          | -5.47       | peak   |
| 4   | 2400.000        | /              | /              | 42.25           | 54.00          | -11.75      | AVG    |
| 5   | 2405.655        | 62.33          | 33.45          | 95.78           | 114.00         | -18.22      | peak   |
| 6   | 2405.655        | /              | /              | 69.50           | 94.00          | -24.50      | AVG    |

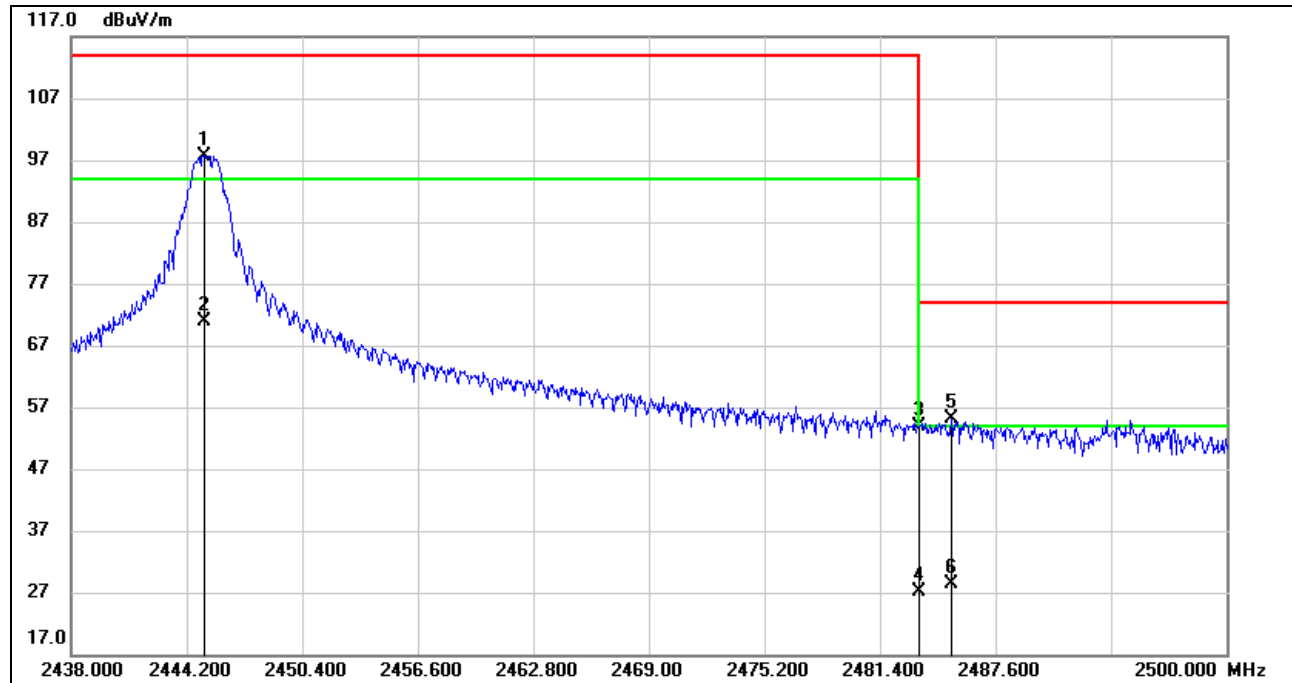
Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. AVG Result=Peak Result + Duty Correction Factor.  
5. For the Duty Cycle and Correction Factor, please refer to clause 6.1.  
6. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

### FIELD STRENGTH OF INTENTIONAL EMISSIONS (MIDDLE CHANNEL, HORIZONTAL)



| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1   | 2445.192           | /                 | /                 | 68.22              | 94.00             | -25.78         | AVG    |
| 2   | 2445.192           | 60.92             | 33.58             | 94.50              | 114.00            | -19.50         | peak   |
| 3   | 2483.500           | 17.01             | 33.71             | 50.72              | 74.00             | -23.28         | peak   |
| 4   | 2488.716           | 19.39             | 33.72             | 53.11              | 74.00             | -20.89         | peak   |

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. AVG Result=Peak Result + Duty Correction Factor.  
5. For the Duty Cycle and Correction Factor, please refer to clause 6.1.  
6. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

**FIELD STRENGTH OF INTENTIONAL EMISSIONS (MIDDLE CHANNEL, VERTICAL)**

| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1   | 2445.130           | 64.14             | 33.58             | 97.72              | 114.00            | -16.28         | peak   |
| 2   | 2445.130           | /                 | /                 | 71.44              | 94.00             | -22.56         | AVG    |
| 3   | 2483.500           | 20.13             | 33.71             | 53.84              | 74.00             | -20.16         | peak   |
| 4   | 2483.500           | /                 | /                 | 27.56              | 54.00             | -26.44         | AVG    |
| 5   | 2485.244           | 21.37             | 33.71             | 55.08              | 74.00             | -18.92         | peak   |
| 6   | 2485.244           | /                 | /                 | 28.80              | 54.00             | -25.20         | AVG    |

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

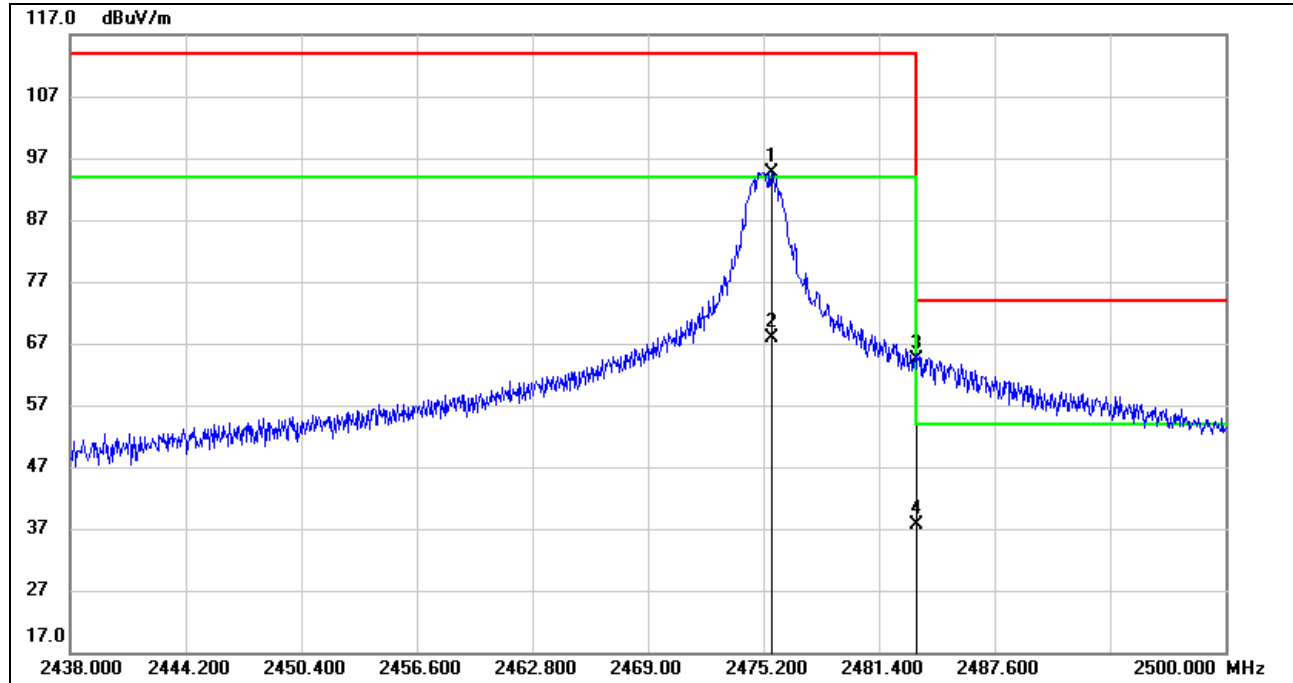
3. Peak: Peak detector.

4. AVG Result=Peak Result + Duty Correction Factor.

5. For the Duty Cycle and Correction Factor, please refer to clause 6.1.

6. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

**RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS (HIGH CHANNEL, HORIZONTAL)**

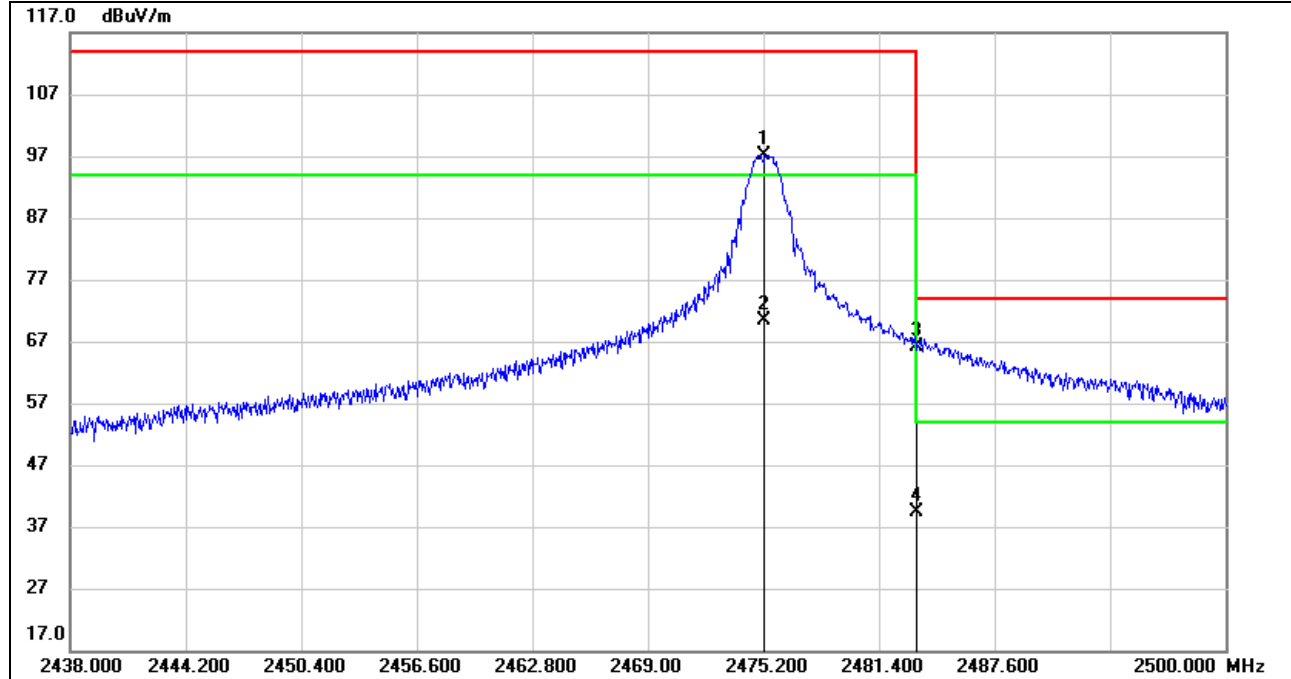


| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1   | 2475.634           | 60.93             | 33.68             | 94.61              | 114.00            | -19.39         | peak   |
| 2   | 2475.634           | /                 | /                 | 68.33              | 94.00             | -25.67         | AVG    |
| 3   | 2483.500           | 30.63             | 33.71             | 64.34              | 74.00             | -9.66          | peak   |
| 4   | 2483.500           | /                 | /                 | 38.06              | 54.00             | -15.94         | AVG    |

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. AVG Result=Peak Result + Duty Correction Factor.  
5. For the Duty Cycle and Correction Factor, please refer to clause 6.1.  
6. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



**RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS (HIGH CHANNEL, VERTICAL)**

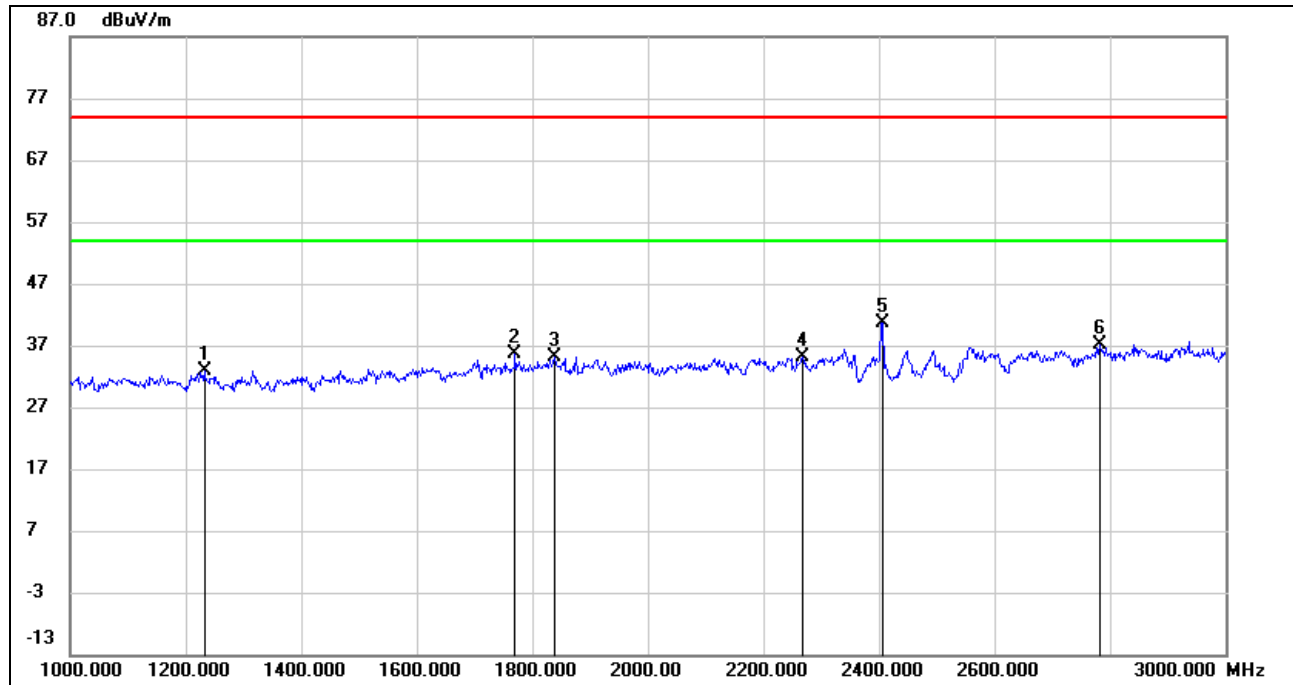


| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1   | 2475.262        | 63.43          | 33.68          | 97.11           | 114.00         | -16.89      | peak   |
| 2   | 2475.262        | /              | /              | 70.83           | 94.00          | -23.17      | AVG    |
| 3   | 2483.500        | 32.39          | 33.71          | 66.10           | 74.00          | -7.90       | peak   |
| 4   | 2483.500        | /              | /              | 39.82           | 54.00          | -14.18      | AVG    |

Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. AVG Result=Peak Result + Duty Correction Factor.  
5. For the Duty Cycle and Correction Factor, please refer to clause 6.1.  
6. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

### 7.3. SPURIOUS EMISSIONS (1 ~ 3 GHz)

#### HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1   | 1233.000           | 45.86             | -12.95            | 32.91              | 74.00             | -41.09         | peak   |
| 2   | 1770.000           | 45.82             | -10.27            | 35.55              | 74.00             | -38.45         | peak   |
| 3   | 1838.000           | 45.24             | -10.08            | 35.16              | 74.00             | -38.84         | peak   |
| 4   | 2269.000           | 43.95             | -8.83             | 35.12              | 74.00             | -38.88         | peak   |
| 5   | 2406.000           | 49.09             | -8.39             | 40.70              | 74.00             | -33.30         | peak   |
| 6   | 2782.000           | 43.70             | -6.68             | 37.02              | 74.00             | -36.98         | peak   |

Note: 1. Peak Result = Reading Level + Correct Factor.

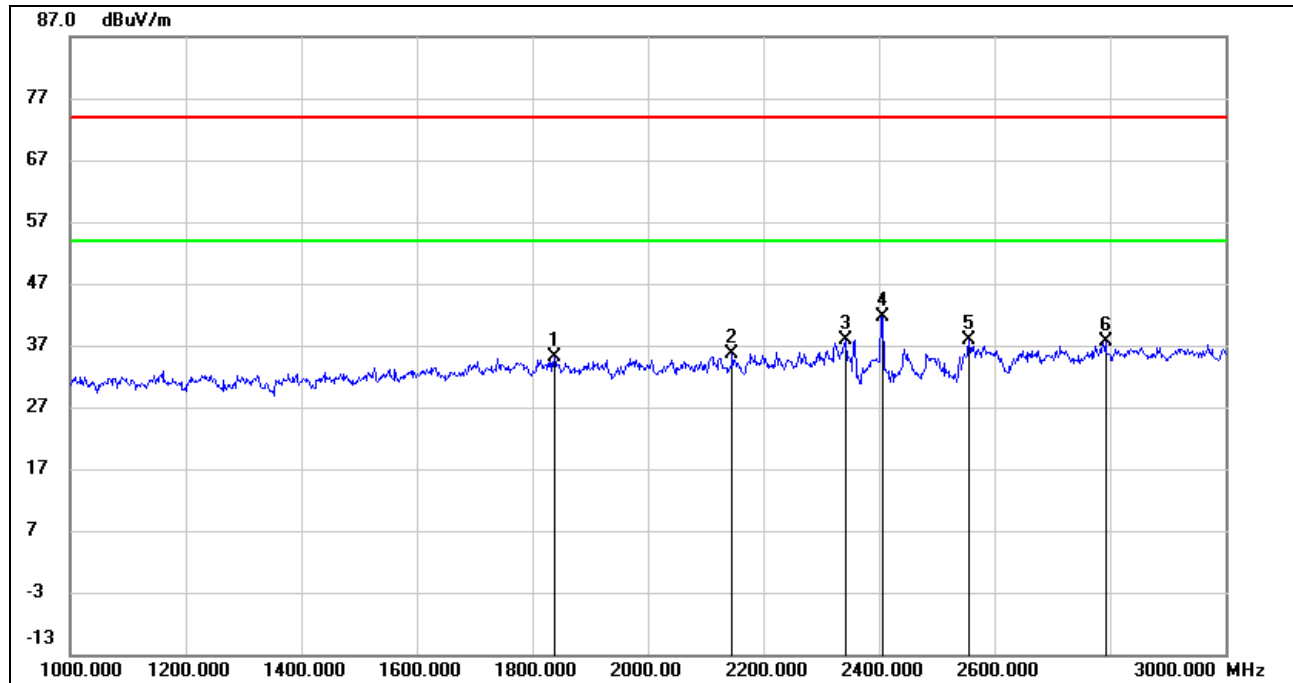
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for Band reject filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

### HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1   | 1839.000           | 45.19             | -10.08            | 35.11              | 74.00             | -38.89         | peak   |
| 2   | 2146.000           | 45.07             | -9.36             | 35.71              | 74.00             | -38.29         | peak   |
| 3   | 2342.000           | 46.58             | -8.58             | 38.00              | 74.00             | -36.00         | peak   |
| 4   | 2406.000           | 50.11             | -8.39             | 41.72              | 74.00             | -32.28         | peak   |
| 5   | 2557.000           | 46.02             | -8.02             | 38.00              | 74.00             | -36.00         | peak   |
| 6   | 2793.000           | 44.11             | -6.60             | 37.51              | 74.00             | -36.49         | peak   |

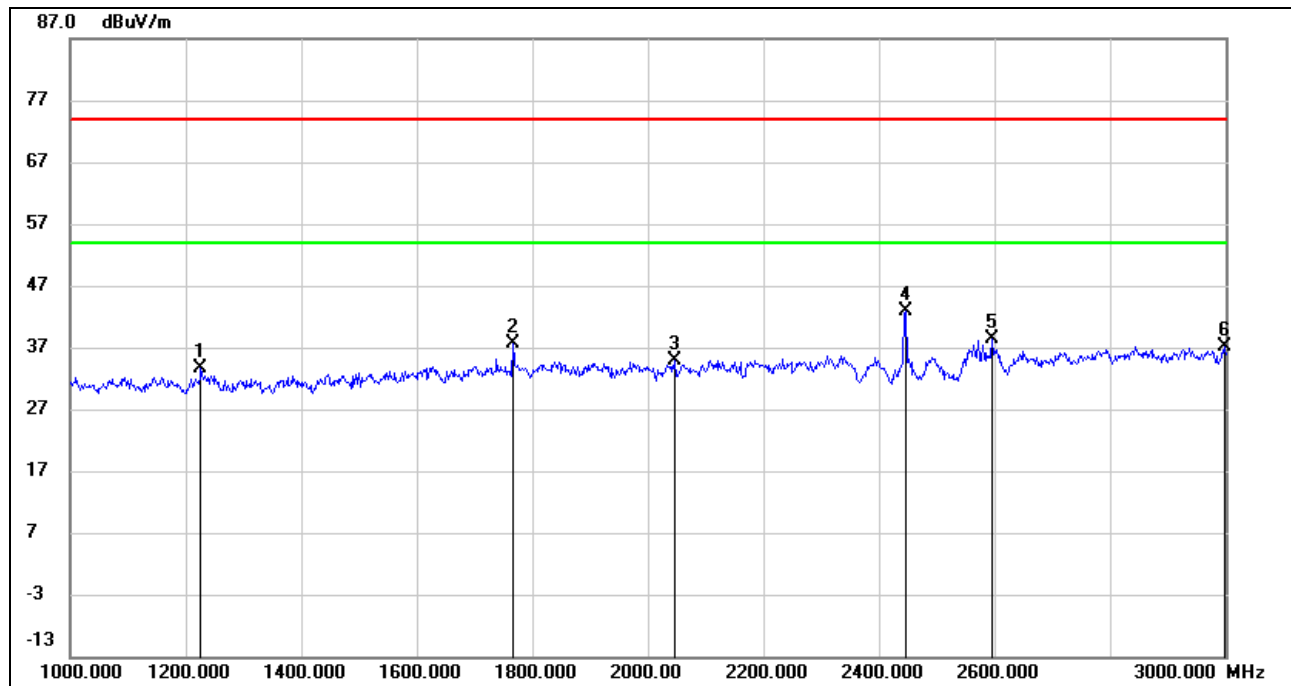
Note: 1. Peak Result = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for Band reject filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)**

| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1   | 1226.000           | 46.54             | -12.95            | 33.59              | 74.00             | -40.41         | peak   |
| 2   | 1767.000           | 47.94             | -10.30            | 37.64              | 74.00             | -36.36         | peak   |
| 3   | 2046.000           | 44.93             | -9.93             | 35.00              | 74.00             | -39.00         | peak   |
| 4   | 2446.000           | 51.16             | -8.32             | 42.84              | 74.00             | -31.16         | peak   |
| 5   | 2596.000           | 46.31             | -7.88             | 38.43              | 74.00             | -35.57         | peak   |
| 6   | 2998.000           | 42.66             | -5.60             | 37.06              | 74.00             | -36.94         | peak   |

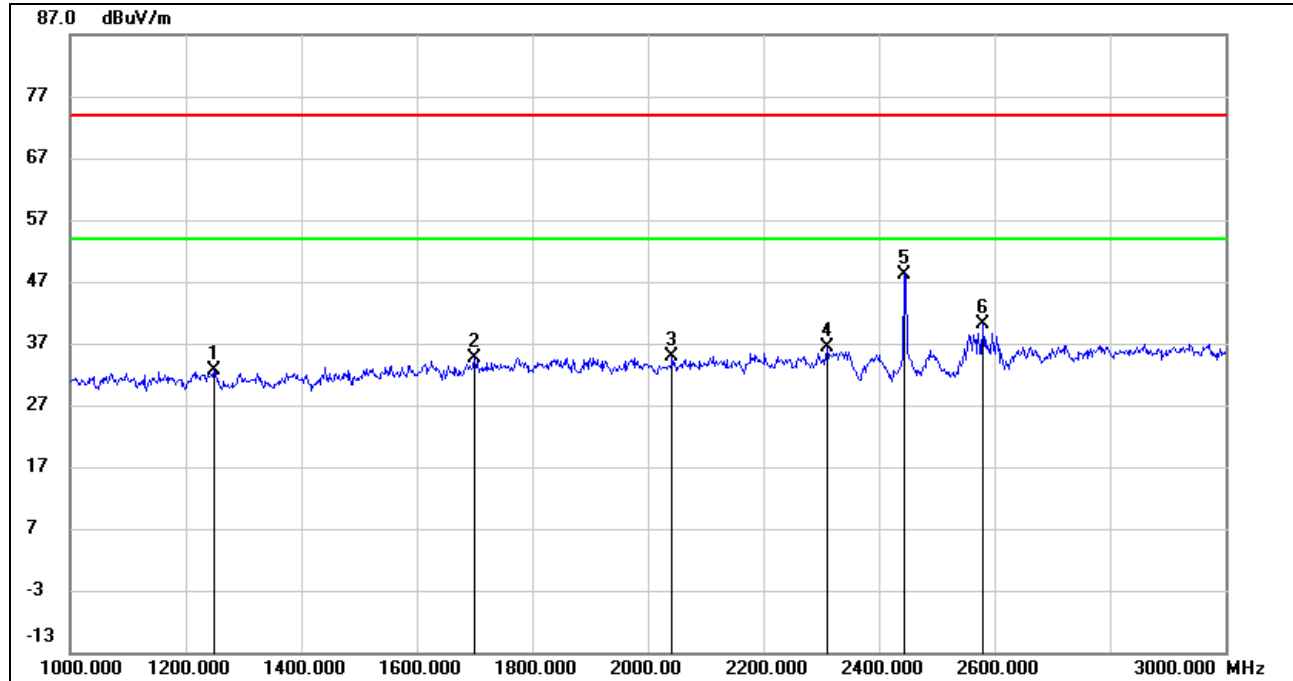
Note: 1. Peak Result = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for Band reject filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)**

| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1   | 1248.000           | 45.43             | -12.92            | 32.51              | 74.00             | -41.49         | peak   |
| 2   | 1701.000           | 45.37             | -10.80            | 34.57              | 74.00             | -39.43         | peak   |
| 3   | 2043.000           | 44.72             | -9.94             | 34.78              | 74.00             | -39.22         | peak   |
| 4   | 2310.000           | 45.04             | -8.69             | 36.35              | 74.00             | -37.65         | peak   |
| 5   | 2445.000           | 56.53             | -8.31             | 48.22              | 74.00             | -25.78         | peak   |
| 6   | 2580.000           | 48.16             | -7.93             | 40.23              | 74.00             | -33.77         | peak   |

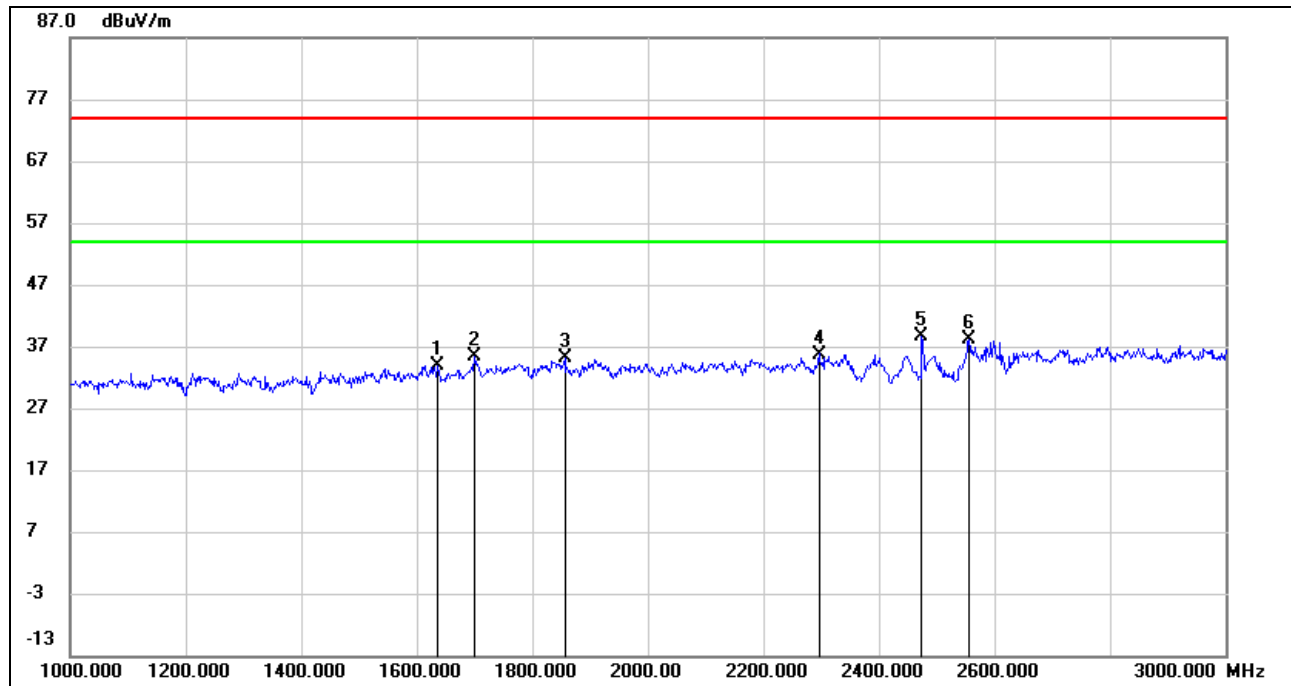
Note: 1. Peak Result = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for Band reject filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)**

| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1   | 1636.000           | 45.10             | -11.28            | 33.82              | 74.00             | -40.18         | peak   |
| 2   | 1700.000           | 46.17             | -10.80            | 35.37              | 74.00             | -38.63         | peak   |
| 3   | 1856.000           | 45.16             | -10.09            | 35.07              | 74.00             | -38.93         | peak   |
| 4   | 2297.000           | 44.48             | -8.73             | 35.75              | 74.00             | -38.25         | peak   |
| 5   | 2475.000           | 46.98             | -8.26             | 38.72              | 74.00             | -35.28         | peak   |
| 6   | 2556.000           | 46.20             | -8.03             | 38.17              | 74.00             | -35.83         | peak   |

Note: 1. Peak Result = Reading Level + Correct Factor.

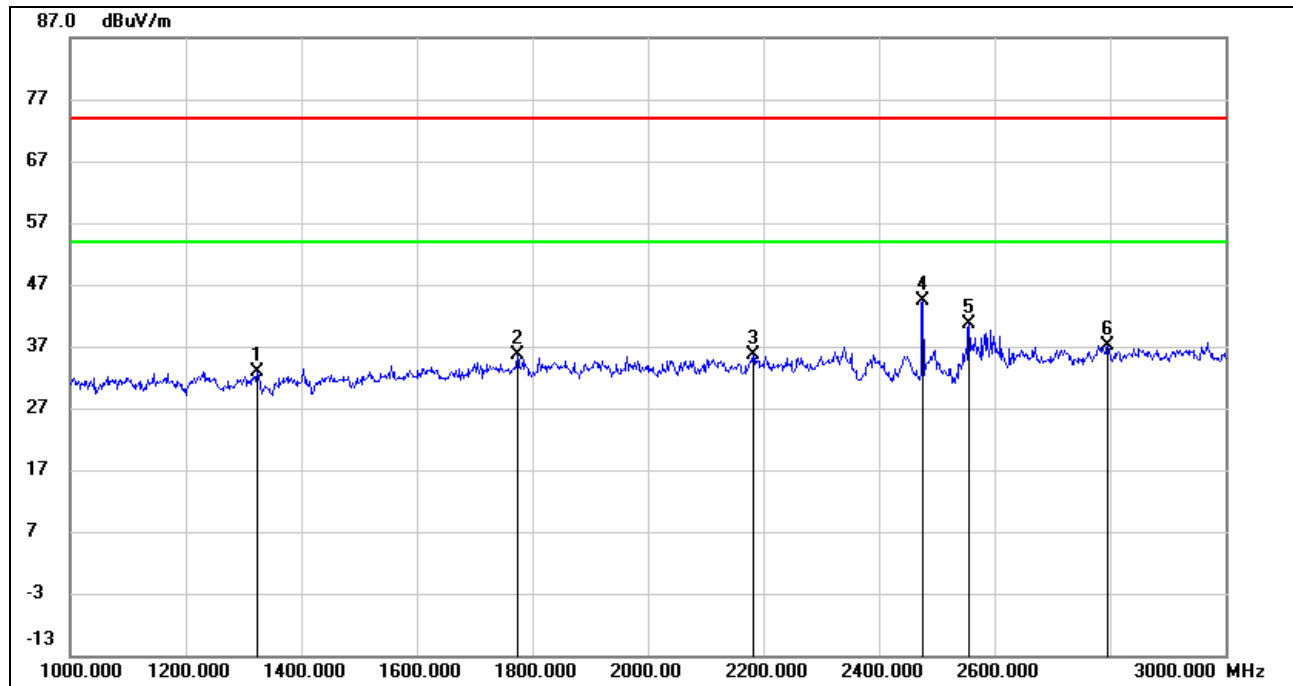
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in then spurious frequency bands and the authorized banding was not corrected for Band reject filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

### HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1   | 1325.000           | 45.76             | -12.82            | 32.94              | 74.00             | -41.06         | peak   |
| 2   | 1774.000           | 45.76             | -10.24            | 35.52              | 74.00             | -38.48         | peak   |
| 3   | 2183.000           | 44.76             | -9.14             | 35.62              | 74.00             | -38.38         | peak   |
| 4   | 2476.000           | 52.59             | -8.26             | 44.33              | 74.00             | -29.67         | peak   |
| 5   | 2556.000           | 48.73             | -8.03             | 40.70              | 74.00             | -33.30         | peak   |
| 6   | 2797.000           | 43.82             | -6.57             | 37.25              | 74.00             | -36.75         | peak   |

Note: 1. Peak Result = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

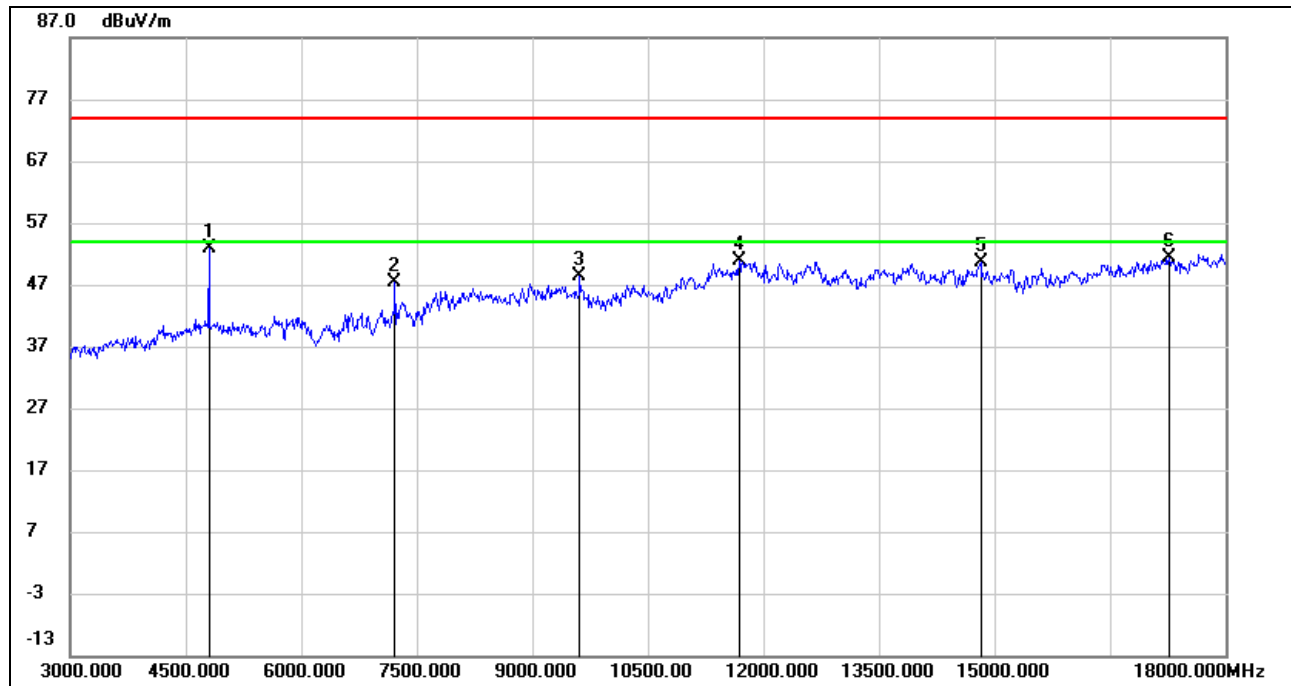
3. Peak: Peak detector.

4. Filter losses were only considered in then spurious frequency bands and the authorized banding was not corrected for Band reject filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

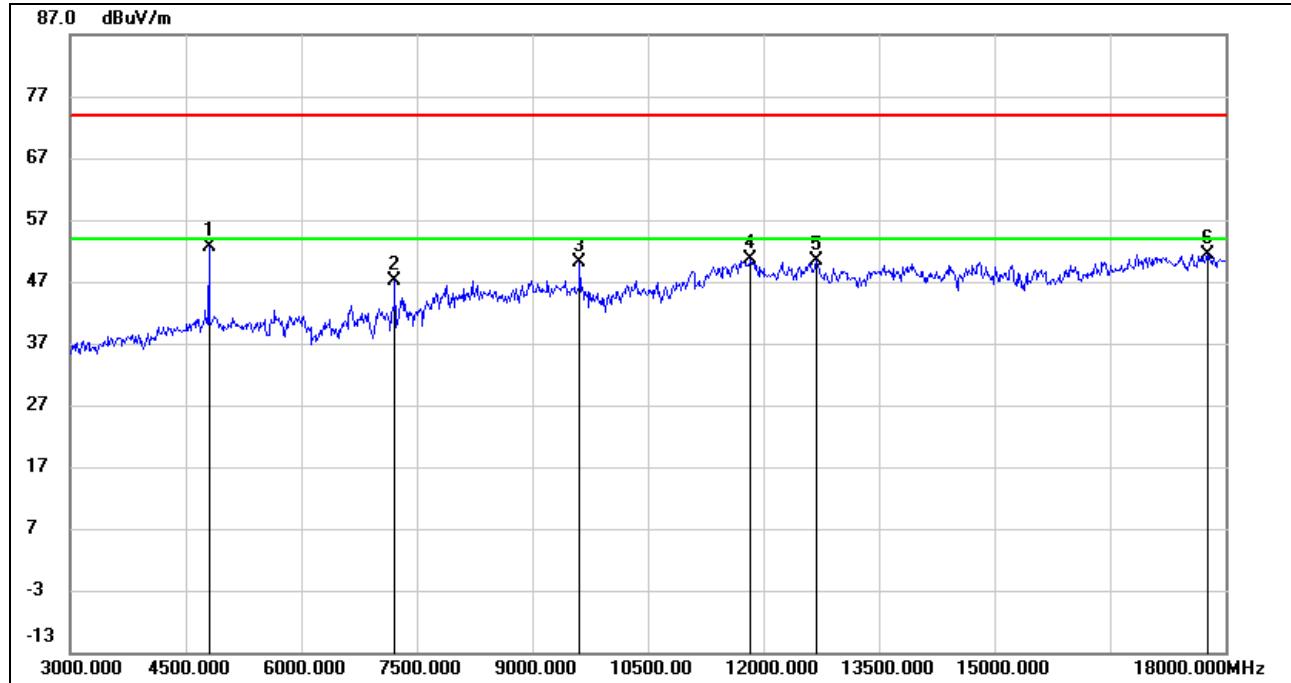
## 7.4. SPURIOUS EMISSIONS (3 ~ 18 GHz)

### HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1   | 4807.500        | 52.33          | 0.60           | 52.93           | 74.00          | -21.07      | peak   |
| 2   | 7215.000        | 40.34          | 7.03           | 47.37           | 74.00          | -26.63      | peak   |
| 3   | 9622.500        | 37.94          | 10.41          | 48.35           | 74.00          | -25.65      | peak   |
| 4   | 11692.500       | 35.88          | 15.02          | 50.90           | 74.00          | -23.10      | peak   |
| 5   | 14820.000       | 33.91          | 16.81          | 50.72           | 74.00          | -23.28      | peak   |
| 6   | 17265.000       | 30.34          | 20.94          | 51.28           | 74.00          | -22.72      | peak   |

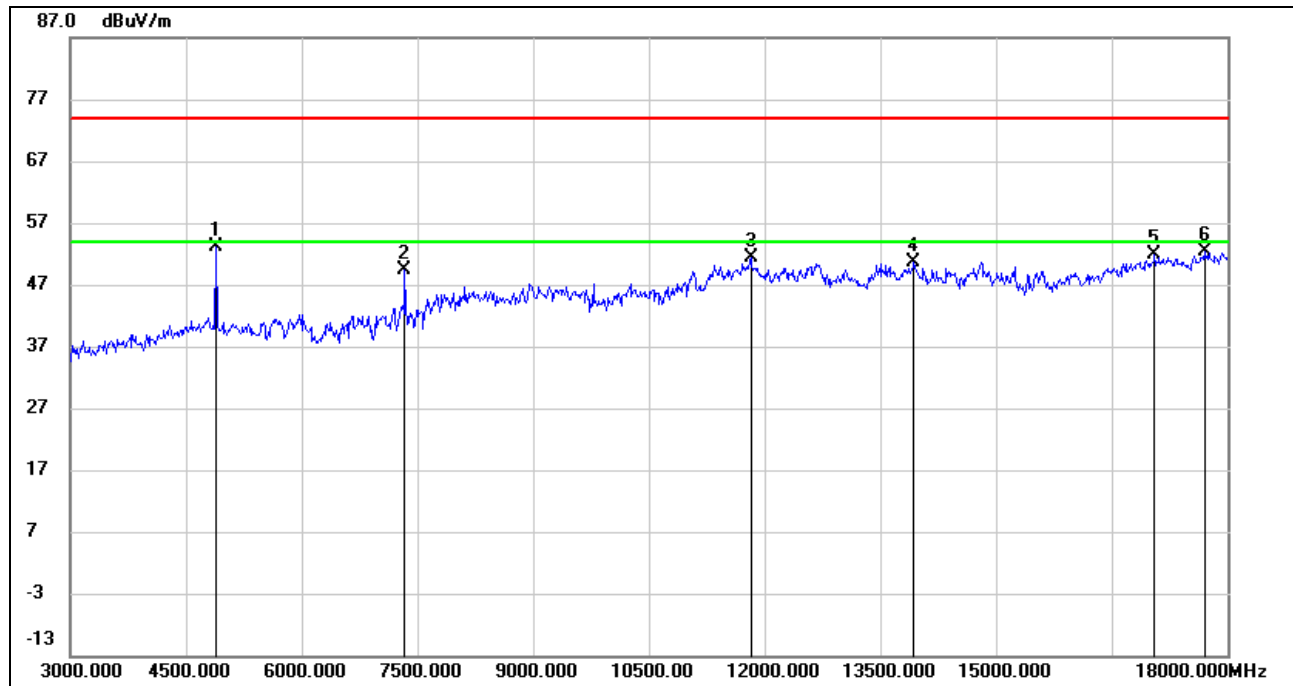
- Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. AVG Result=Peak Result + Duty Cycle Correction Factor.  
5. For the Duty Cycle and Correction Factor, please refer to clause 6.1.  
6. The High Pass filter loss factor already add into the correct factor.  
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)**

| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1   | 4807.500           | 52.04             | 0.60              | 52.64              | 74.00             | -21.36         | peak   |
| 2   | 7215.000           | 40.06             | 7.03              | 47.09              | 74.00             | -26.91         | peak   |
| 3   | 9622.500           | 39.79             | 10.41             | 50.20              | 74.00             | -23.80         | peak   |
| 4   | 11842.500          | 35.10             | 15.55             | 50.65              | 74.00             | -23.35         | peak   |
| 5   | 12690.000          | 34.89             | 15.45             | 50.34              | 74.00             | -23.66         | peak   |
| 6   | 17760.000          | 28.99             | 22.41             | 51.40              | 74.00             | -22.60         | peak   |

- Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. The High Pass filter loss factor already add into the correct factor.  
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

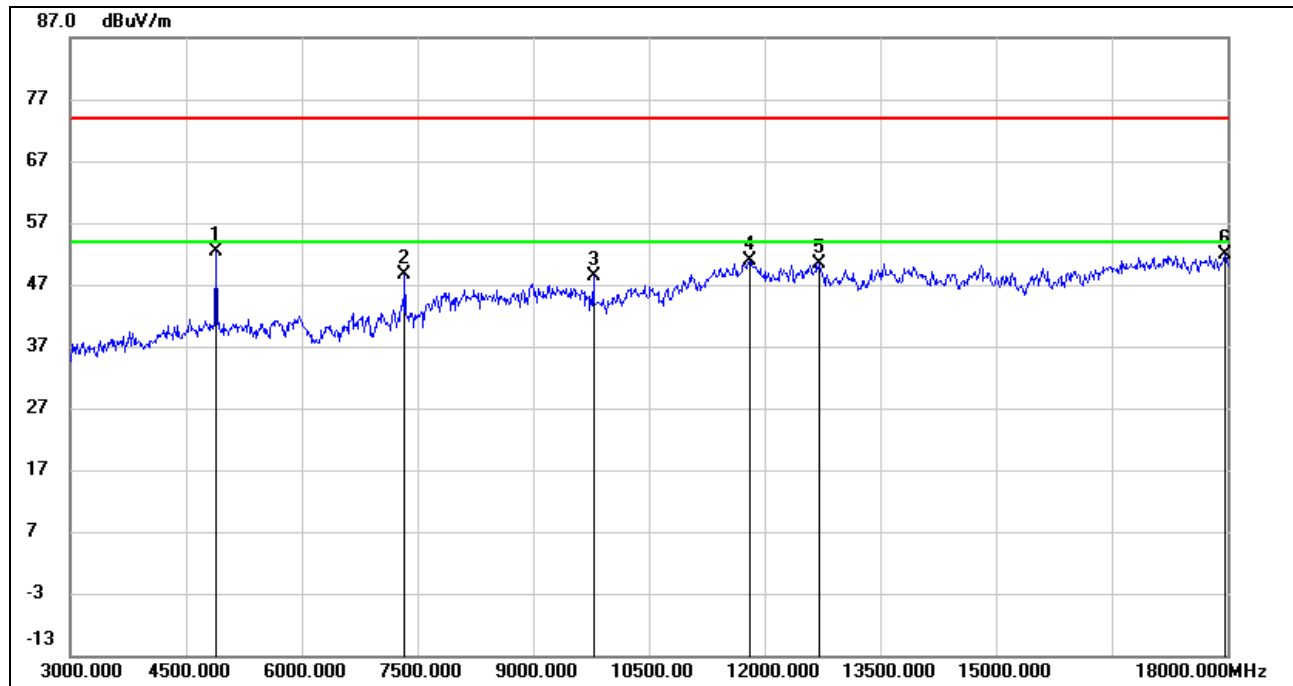
### HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1   | 4890.000           | 52.50             | 0.73              | 53.23              | 74.00             | -20.77         | peak   |
| 2   | 7335.000           | 41.99             | 7.49              | 49.48              | 74.00             | -24.52         | peak   |
| 3   | 11827.500          | 35.73             | 15.57             | 51.30              | 74.00             | -22.70         | peak   |
| 4   | 13942.500          | 33.86             | 16.89             | 50.75              | 74.00             | -23.25         | peak   |
| 5   | 17062.500          | 31.45             | 20.48             | 51.93              | 74.00             | -22.07         | peak   |
| 6   | 17707.500          | 30.47             | 21.99             | 52.46              | 74.00             | -21.54         | peak   |

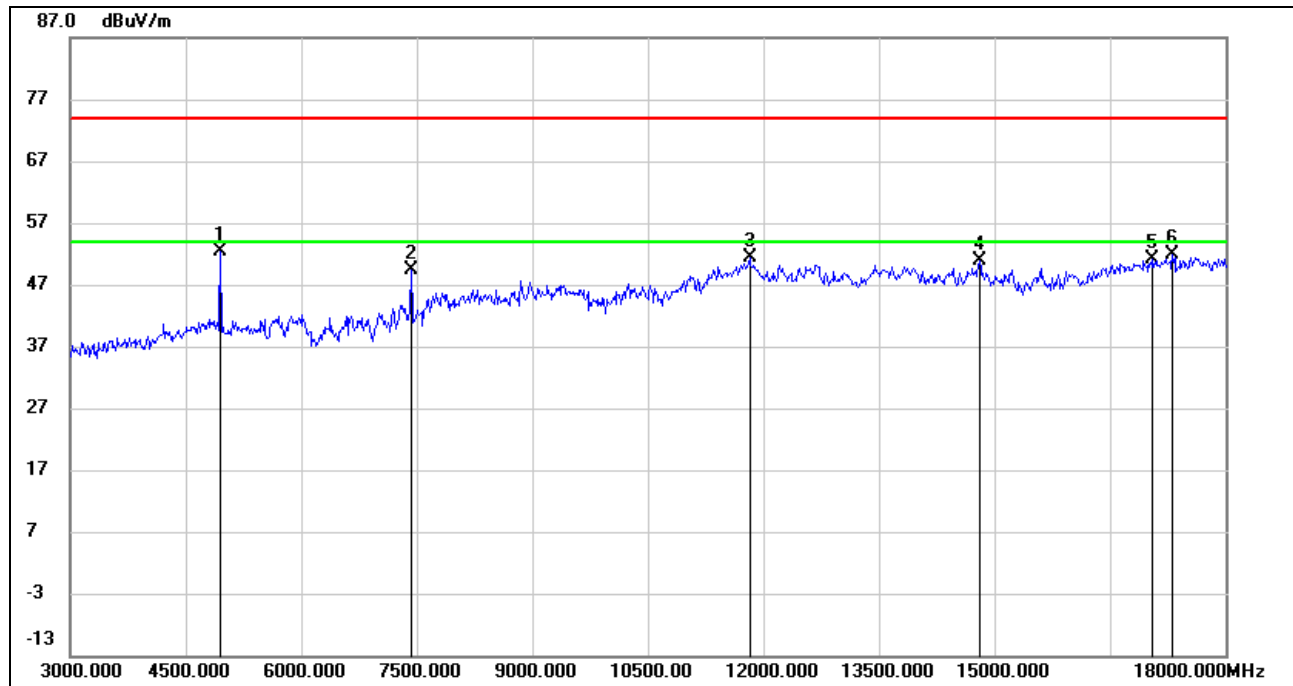
- Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. AVG Result=Peak Result + Duty Cycle Correction Factor.  
5. For the Duty Cycle and Correction Factor, please refer to clause 6.1.  
6. The High Pass filter loss factor already add into the correct factor.  
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

### HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)



| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1   | 4890.000           | 51.67             | 0.73              | 52.40              | 74.00             | -21.60         | peak   |
| 2   | 7335.000           | 41.21             | 7.49              | 48.70              | 74.00             | -25.30         | peak   |
| 3   | 9780.000           | 38.46             | 10.01             | 48.47              | 74.00             | -25.53         | peak   |
| 4   | 11812.500          | 35.28             | 15.59             | 50.87              | 74.00             | -23.13         | peak   |
| 5   | 12705.000          | 34.96             | 15.48             | 50.44              | 74.00             | -23.56         | peak   |
| 6   | 17977.500          | 29.19             | 22.68             | 51.87              | 74.00             | -22.13         | peak   |

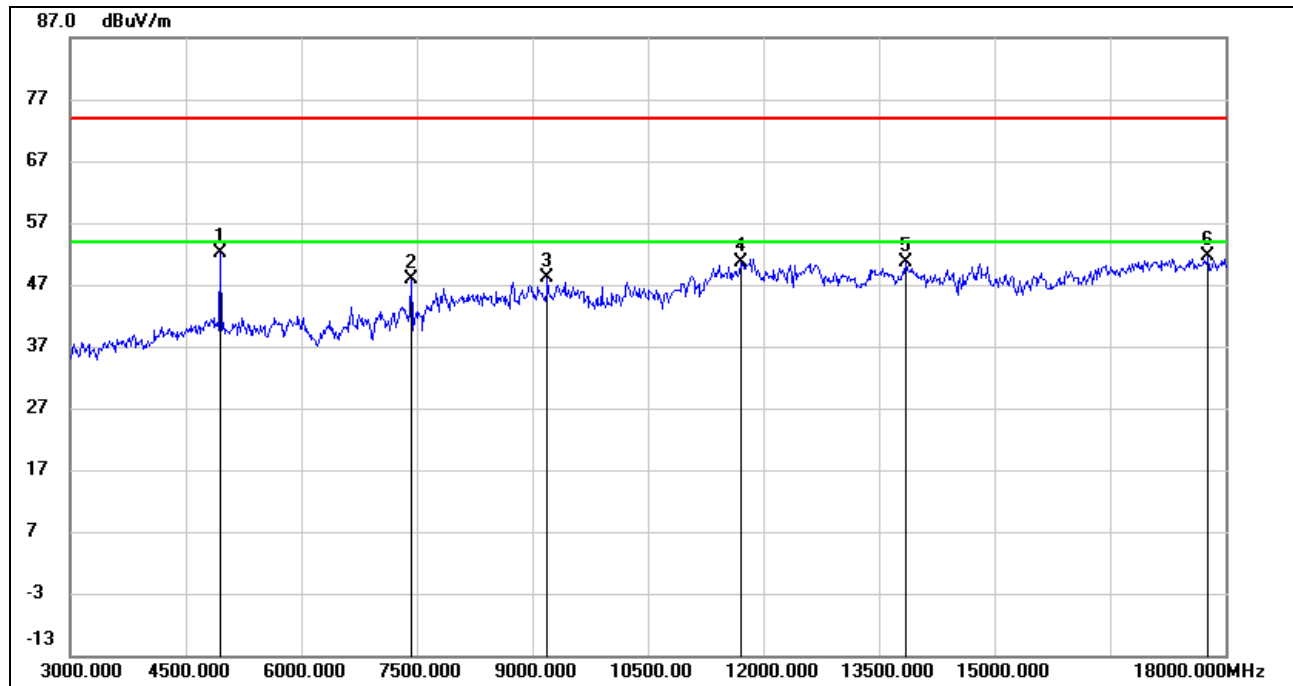
- Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. The High Pass filter loss factor already add into the correct factor.  
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)**

| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1   | 4950.000           | 51.59             | 0.82              | 52.41              | 74.00             | -21.59         | peak   |
| 2   | 7425.000           | 41.69             | 7.70              | 49.39              | 74.00             | -24.61         | peak   |
| 3   | 11820.000          | 35.76             | 15.58             | 51.34              | 74.00             | -22.66         | peak   |
| 4   | 14805.000          | 33.97             | 16.80             | 50.77              | 74.00             | -23.23         | peak   |
| 5   | 17055.000          | 30.71             | 20.45             | 51.16              | 74.00             | -22.84         | peak   |
| 6   | 17310.000          | 31.12             | 20.88             | 52.00              | 74.00             | -22.00         | peak   |

- Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. AVG Result=Peak Result + Duty Cycle Correction Factor.  
5. For the Duty Cycle and Correction Factor, please refer to clause 6.1.  
6. The High Pass filter loss factor already add into the correct factor.  
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.

### HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



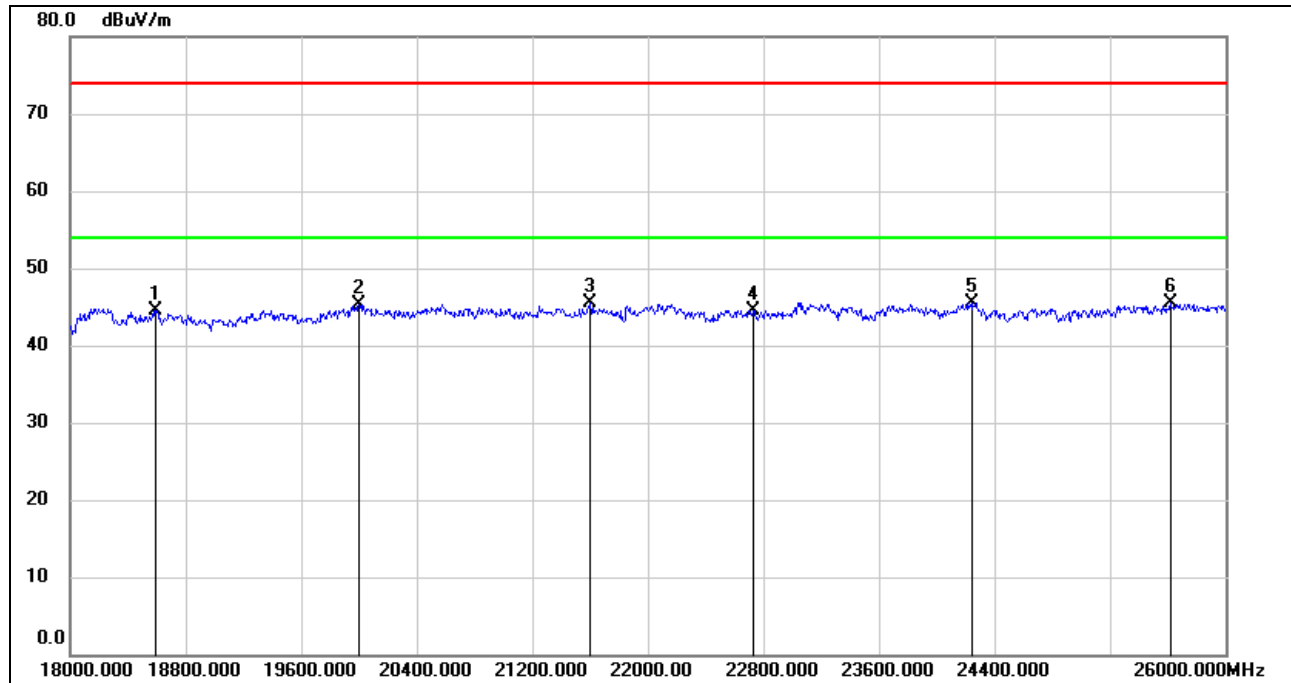
| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1   | 4950.000           | 51.29             | 0.82              | 52.11              | 74.00             | -21.89         | peak   |
| 2   | 7425.000           | 40.11             | 7.70              | 47.81              | 74.00             | -26.19         | peak   |
| 3   | 9195.000           | 38.93             | 9.32              | 48.25              | 74.00             | -25.75         | peak   |
| 4   | 11715.000          | 35.47             | 15.15             | 50.62              | 74.00             | -23.38         | peak   |
| 5   | 13852.500          | 33.79             | 16.93             | 50.72              | 74.00             | -23.28         | peak   |
| 6   | 17775.000          | 29.08             | 22.53             | 51.61              | 74.00             | -22.39         | peak   |

- Note:
1. Measurement = Reading Level + Correct Factor.
  2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
  3. Peak: Peak detector.
  4. AVG Result=Peak Result + Duty Cycle Correction Factor.
  5. For the Duty Cycle and Correction Factor, please refer to clause 6.1.
  6. The High Pass filter loss factor already add into the correct factor.
  7. Proper operation of the transmitter prior to adding the filter to the measurement chain.



## 7.5. SPURIOUS EMISSIONS (18 ~ 26 GHz)

### HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



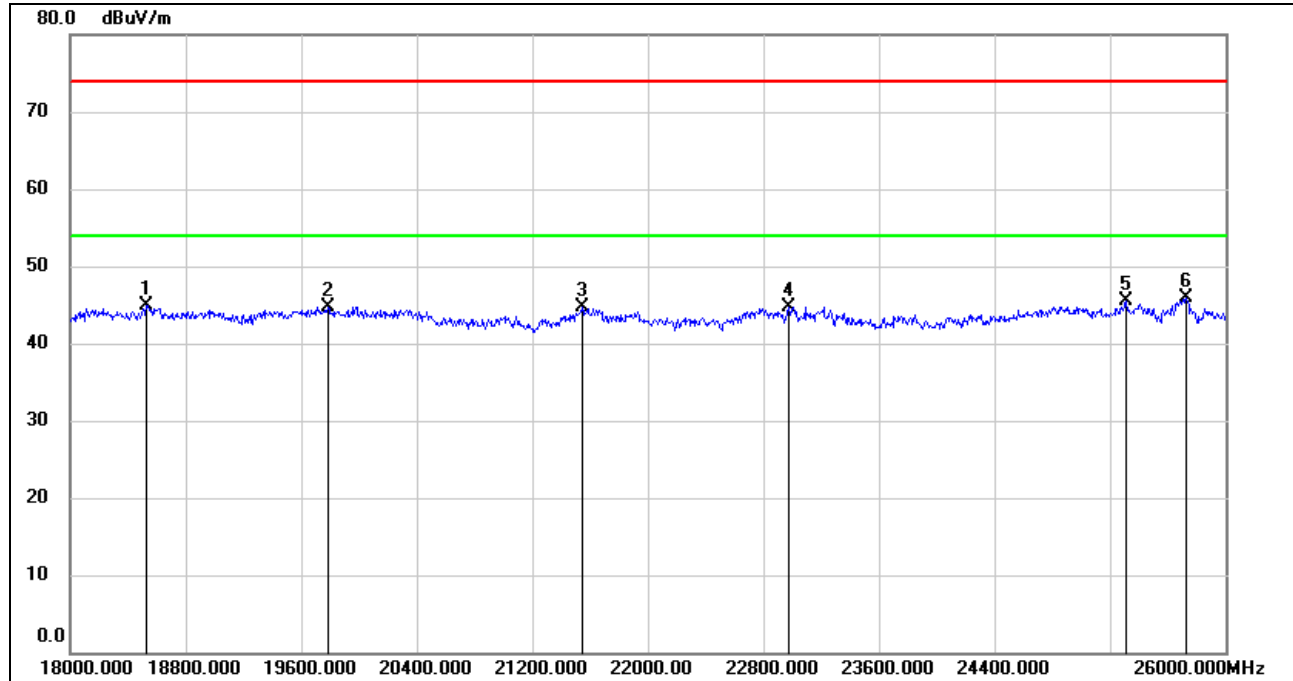
| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1   | 18592.000          | 49.75             | -5.31             | 44.44              | 74.00             | -29.56         | peak   |
| 2   | 20000.000          | 50.81             | -5.45             | 45.36              | 74.00             | -28.64         | peak   |
| 3   | 21600.000          | 50.02             | -4.54             | 45.48              | 74.00             | -28.52         | peak   |
| 4   | 22728.000          | 48.27             | -3.71             | 44.56              | 74.00             | -29.44         | peak   |
| 5   | 24248.000          | 48.32             | -2.83             | 45.49              | 74.00             | -28.51         | peak   |
| 6   | 25616.000          | 46.68             | -1.24             | 45.44              | 74.00             | -28.56         | peak   |

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

**HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION,  
VERTICAL)**



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1   | 18528.000       | 50.11          | -5.26          | 44.85           | 74.00          | -29.15      | peak   |
| 2   | 19784.000       | 50.07          | -5.28          | 44.79           | 74.00          | -29.21      | peak   |
| 3   | 21544.000       | 49.26          | -4.63          | 44.63           | 74.00          | -29.37      | peak   |
| 4   | 22976.000       | 48.26          | -3.46          | 44.80           | 74.00          | -29.20      | peak   |
| 5   | 25312.000       | 47.20          | -1.70          | 45.50           | 74.00          | -28.50      | peak   |
| 6   | 25728.000       | 46.61          | -0.72          | 45.89           | 74.00          | -28.11      | peak   |

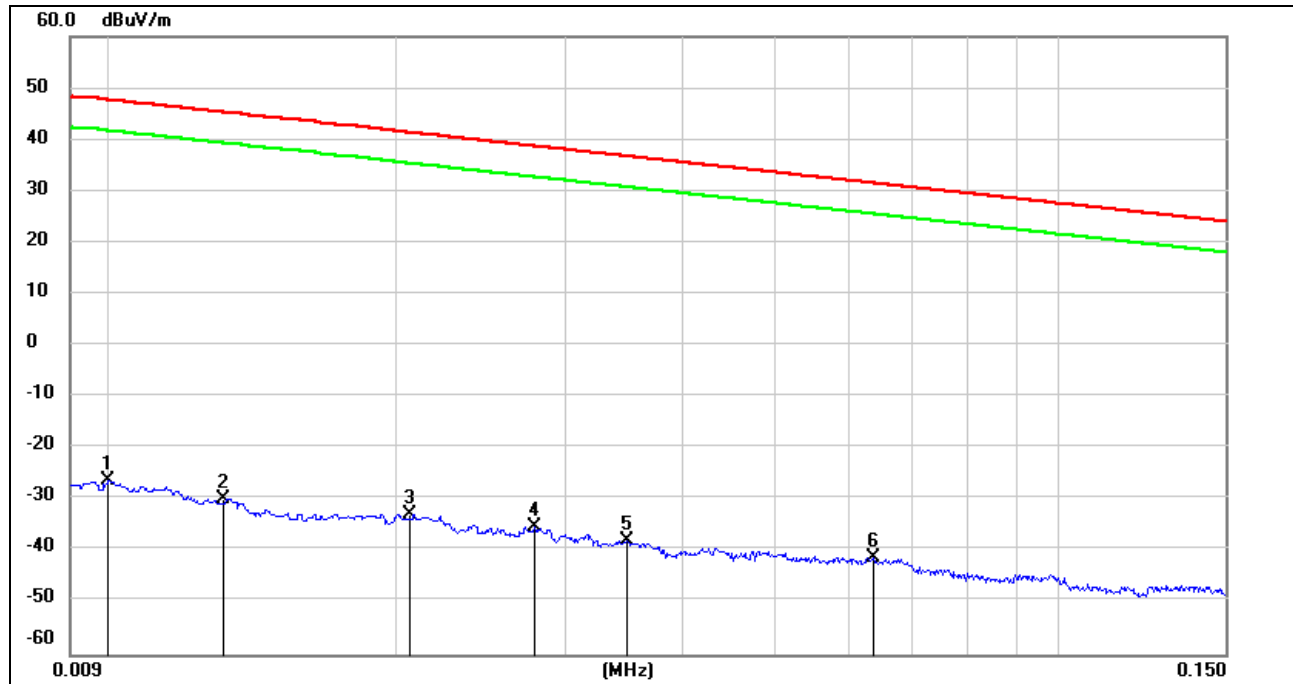
Note: 1. Measurement = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.

Note: All test modes had been tested, only the worst data record in the report.

## 7.6. SPURIOUS EMISSIONS BELOW 30 MHz

### SPURIOUS EMISSIONS (HIGH CHANNEL, LOOP ANTENNA FACE ON TO THE EUT, WORST-CASE CONFIGURATION)

9 kHz ~ 150 kHz

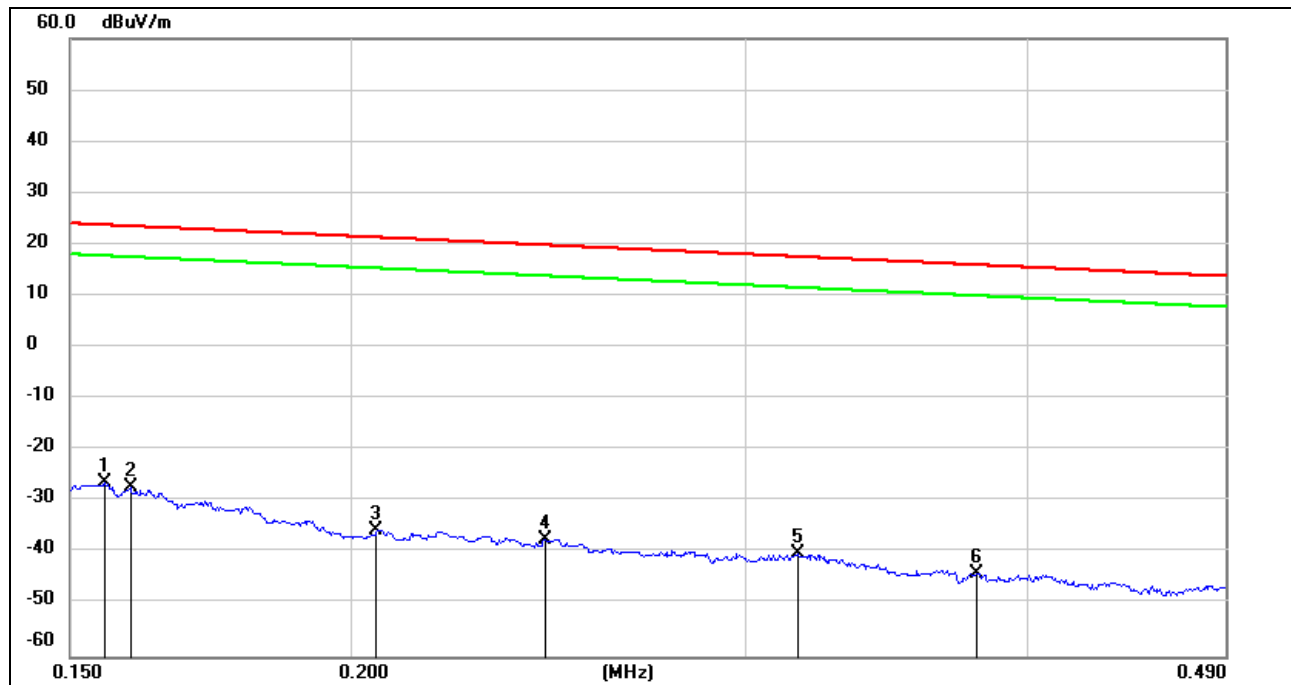


| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1   | 0.0100             | 75.22             | -101.40           | -26.18             | 47.60             | -73.78         | peak   |
| 2   | 0.0131             | 71.47             | -101.38           | -29.91             | 45.25             | -75.16         | peak   |
| 3   | 0.0206             | 68.42             | -101.35           | -32.93             | 41.32             | -74.25         | peak   |
| 4   | 0.0279             | 66.17             | -101.38           | -35.21             | 38.69             | -73.90         | peak   |
| 5   | 0.0349             | 63.53             | -101.41           | -37.88             | 36.75             | -74.63         | peak   |
| 6   | 0.0636             | 60.31             | -101.54           | -41.23             | 31.53             | -72.76         | peak   |

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV 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.

150 kHz ~ 490 kHz

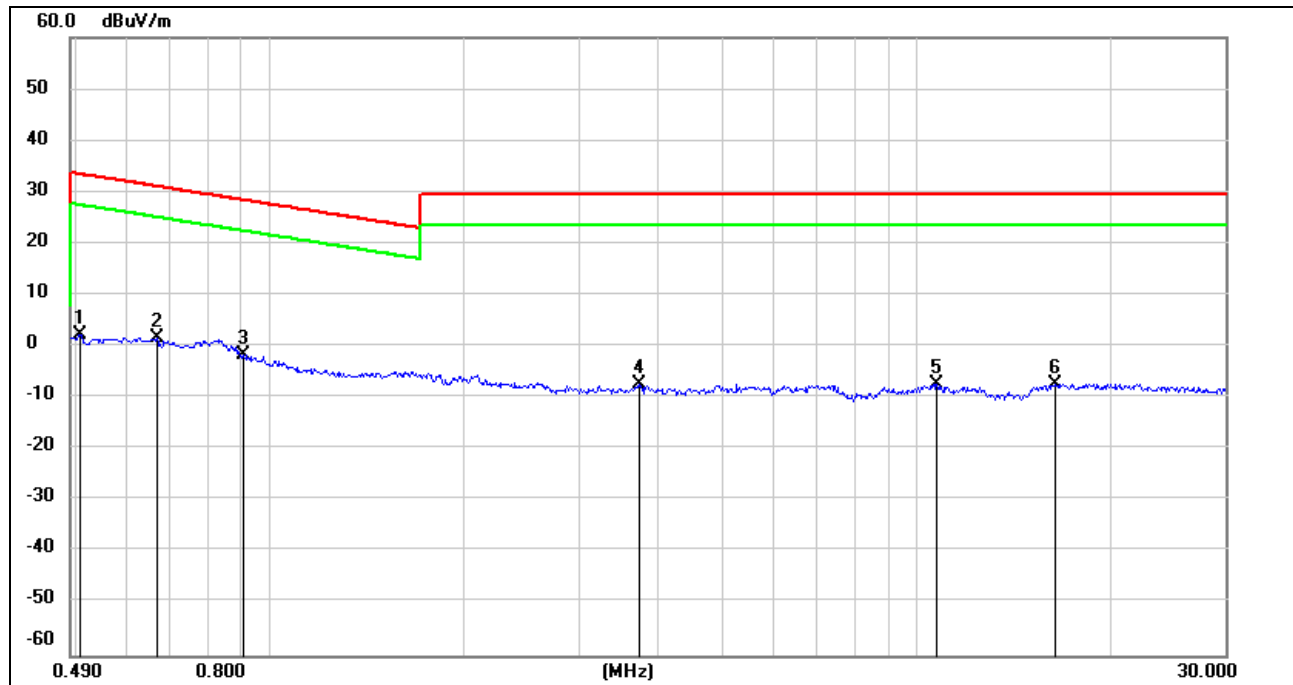
| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1   | 0.1554          | 75.27          | -101.65        | -26.38          | 23.77          | -50.15      | peak   |
| 2   | 0.1595          | 74.36          | -101.65        | -27.29          | 23.55          | -50.84      | peak   |
| 3   | 0.2053          | 66.29          | -101.73        | -35.44          | 21.35          | -56.79      | peak   |
| 4   | 0.2442          | 64.53          | -101.79        | -37.26          | 19.85          | -57.11      | peak   |
| 5   | 0.3163          | 61.70          | -101.87        | -40.17          | 17.60          | -57.77      | peak   |
| 6   | 0.3800          | 58.02          | -101.94        | -43.92          | 16.01          | -59.93      | peak   |

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV 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.

### 490 kHz ~ 30 MHz



| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1   | 0.5080             | 64.35             | -62.07            | 2.28               | 33.49             | -31.21         | peak   |
| 2   | 0.6671             | 63.75             | -62.10            | 1.65               | 31.12             | -29.47         | peak   |
| 3   | 0.9082             | 60.65             | -62.21            | -1.56              | 28.44             | -30.00         | peak   |
| 4   | 3.7100             | 54.20             | -61.41            | -7.21              | 29.54             | -36.75         | peak   |
| 5   | 10.7299            | 53.48             | -60.83            | -7.35              | 29.54             | -36.89         | peak   |
| 6   | 16.3959            | 53.67             | -60.96            | -7.29              | 29.54             | -36.83         | peak   |

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

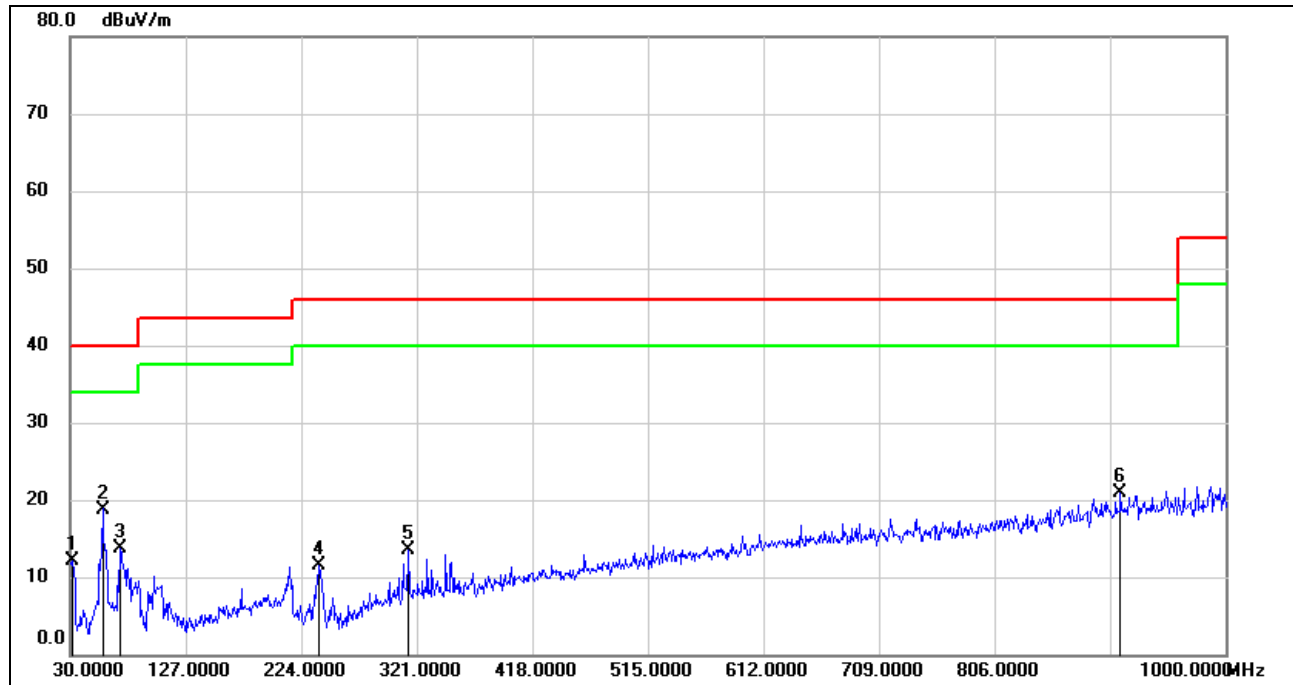
3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.

Note: All test modes had been tested, only the worst data record in the report.



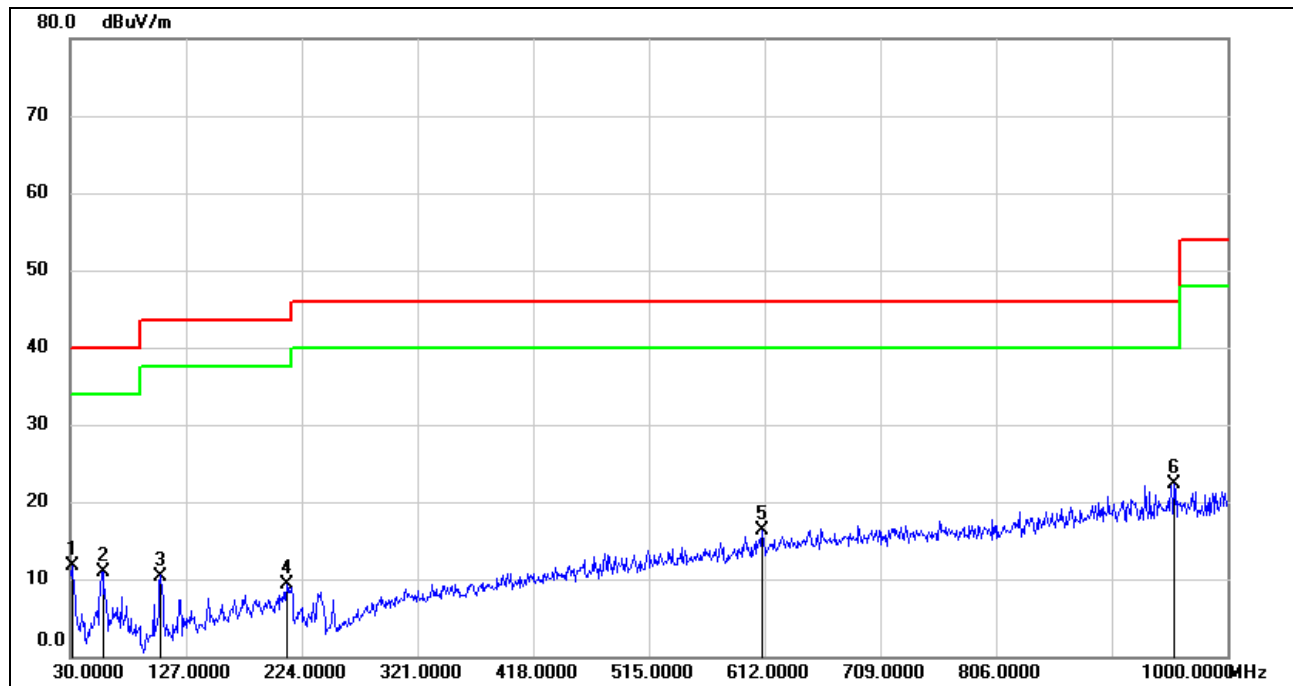
## 7.7. SPURIOUS EMISSIONS BELOW 1 GHz AND ABOVE 30 MHz

### SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1   | 31.9400            | 31.27             | -19.13            | 12.14              | 40.00             | -27.86         | QP     |
| 2   | 57.1600            | 39.38             | -20.58            | 18.80              | 40.00             | -21.20         | QP     |
| 3   | 71.7100            | 34.37             | -20.70            | 13.67              | 40.00             | -26.33         | QP     |
| 4   | 238.5500           | 30.59             | -19.10            | 11.49              | 46.00             | -34.51         | QP     |
| 5   | 314.2100           | 28.56             | -14.96            | 13.60              | 46.00             | -32.40         | QP     |
| 6   | 911.7300           | 25.77             | -4.93             | 20.84              | 46.00             | -25.16         | QP     |

- Note: 1. Result Level = Read Level + Correct Factor.  
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.  
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

**SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)**

| No. | Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1   | 31.9400            | 30.90             | -19.13            | 11.77              | 40.00             | -28.23         | QP     |
| 2   | 57.1600            | 31.50             | -20.58            | 10.92              | 40.00             | -29.08         | QP     |
| 3   | 105.6600           | 31.10             | -20.70            | 10.40              | 43.50             | -33.10         | QP     |
| 4   | 211.3900           | 26.73             | -17.40            | 9.33               | 43.50             | -34.17         | QP     |
| 5   | 610.0600           | 25.67             | -9.40             | 16.27              | 46.00             | -29.73         | QP     |
| 6   | 955.3800           | 26.68             | -4.47             | 22.21              | 46.00             | -23.79         | QP     |

Note: 1. Result Level = Read Level + Correct Factor.

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto

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



## 8. ANTENNA REQUIREMENTS

### 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.

Please refer to FCC §15.247(b)(4)

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### RESULTS

Complies

---

**END OF REPORT**