# CFR 47 FCC PART 15 SUBPART C

# TEST REPORT

*For*

**SHIFT24/Power Craze 2.0 High Speed Buggy**

**MODEL NUMBER: CT-6176/1422642/VL-6036/VL-6037/VL-6038**

**FCC ID: 2ASK3CT-6176R**

**REPORT NUMBER: 4789461925-6**

**ISSUE DATE: May 22, 2020**

*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*

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Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| V0 | 05/22/2020 | Initial Issue | |

| Summary of Test Results | | | |
|---|---|---|---|
| Clause | Test Items | FCC/ISED Rules | Test Results |
| 1 | 20dB Bandwidth and 99% Occupied Bandwidth | CFR 47 FCC §15.215 (c)<br>ISED RSS-Gen Clause 6.7 | 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 For AC Power Port | FCC Part 15.207 | Pass |
| 4 | Antenna Requirement | CFR 47 FCC §15.203 | Pass |
| Note 1: This test report is only published to and used by the applicant, and it is not for evidence purpose in China.<br>Note 2: The measurement result for the sample received is <Pass> according to < CFR 47 FCC PART 15 SUBPART C, ISED RSS-210 Issue 10 and ISED RSS-GEN Issue 5 > when <Accuracy Method> decision rule is applied. | | | |

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# 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**

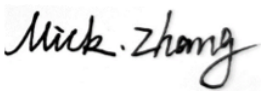
| | |
|---|---|
| Company Name: | AMAX INDUSTRIAL GROUP CHINA CO.,LTD |
| Address: | OFFICE NO.3 10/F WITTY COMMERCIAL BUILDING 1A-1L TUNG CHOI STREET MONGKOK KOWLOON HONG KONG |

**EUT Information**

| | |
|---|---|
| EUT Name: | SHIFT24/Power Craze 2.0 High Speed Buggy |
| Model: | CT-6176 |
| Series Model: | 1422642/VL-6036/VL-6037/VL-6038 |
| Model difference: | All the same except for the model name and color. |
| Sample Received Date: | April 30, 2020 |
| Sample Status: | Normal |
| Date of Tested: | April 30, 2020~ May 22, 2020 |

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

Prepared By:



Mick Zhang
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 | **A2LA (Certificate No.: 4102.01)**<br>UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA.<br>**FCC (FCC Designation No.: CN1187)**<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.<br>**ISED (Company No.: 21320)**<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.<br>**VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011)**<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.<br>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 |

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 | 3.62dB |
| Radiation Emission test (include Fundamental emission) (9KHz-30MHz) | 2.2dB |
| Radiation Emission test (include Fundamental emission) (30MHz-1GHz) | 4.00dB |
| Radiation Emission test (1GHz to 26GHz) (include Fundamental emission) | 5.78dB (1GHz-18GHz) |
| | 5.23dB (18GHz-26GHz) |
| 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 | SHIFT24/Power Craze 2.0 High Speed Buggy | |
| EUT Description | The EUT is a wireless remote Car | |
| Model | CT-6176 | |
| Series Model | 1422642/VL-6036/VL-6037/VL-6038 | |
| Model difference | All the same except for the model name and color. | |
| Product Description | Operation Frequency | 2407 MHz ~ 2479 MHz |
| | Modulation Type | GFSK |
| Battery | DC 3.7V | |

## 5.2. MAXIMUM FIELD STRENGTH

| Frequency (MHz) | Channel Number | Max Peak field strength (dBµV/m) |
|---|---|---|
| 2479 | 3[3] | 83.95 |

## 5.3. CHANNEL LIST

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|
| 1 | 2407 | 3 | 2467 |
| 2 | 2443 | 4 | 2479 |

## 5.4. DESCRIPTION OF AVAILABLE ANTENNAS

| Ant. | Frequency (MHz) | Antenna Type | Antenna Gain (dBi) |
|---|---|---|---|
| 1 | 2407~ 2479 | Wire Antenna | 0 |

| Test Mode | Transmit and Receive Mode | Description |
|---|---|---|
| GFSK | ☒1TX, 1RX | Antenna 1 can be used as transmitting/receiving antenna. |

## 5.5. TEST CHANNEL CONFIGURATION

| Test Mode | Test Channel | Frequency |
|---|---|---|
| GFSK | CH 1(Low Channel), CH 2(MID Channel), CH 4(High Channel) | 2407MHz, 2443MHz, 2479MHz |

## 5.6. THE WORSE CASE POWER SETTING PARAMETER

| The Worse Case Power Setting Parameter under 2407 MHz ~ 2479 MHz Band | | | | |
|---|---|---|---|---|
| Test Software Version | | / | | |
| Modulation Type | Transmit Antenna Number | Test Channel | | |
| | | CH1 | CH2 | CH4 |
| GFSK | 1 | Default | Default | Default |

## 5.7. TEST ENVIRONMENT

| Environment Parameter | Selected Values During Tests | |
|---|---|---|
| Relative Humidity | 55 ~ 65% | |
| Atmospheric Pressure: | 1025Pa | |
| Temperature | TN | 22 ~ 28°C |
| Voltage: | VL | / |
| | VN | DC 3.7V |
| | 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 |
|---|---|---|---|---|---|
| 1 | USB-DC cable | / | / | 0.6 | / |

Note: The USB-DC cable is provided by the customer.

**ACCESSORY**

| Item | Equipment | Mfr/Brand | Model/Type No. | Specification | Series No. |
|---|---|---|---|---|---|
| 1 | Adapter | SAMSUNG | ETA0U83CBC | 5Vdc,1A | DW2G720OS/A |

**TEST SETUP**

The EUT have the engineer mode inside.

**SETUP DIAGRAM FOR TEST**

EUT

Note: New battery was used during all tests.

## 5.9. MEASURING INSTRUMENT AND SOFTWARE USED

| Conducted Emissions | | | | | |
|---|---|---|---|---|---|
| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Due Date |
| EMI Test Receiver | R&S | ESR3 | 101961 | Dec. 5, 2019 | Dec. 5, 2020 |
| Two-Line V-Network | R&S | ENV216 | 101983 | Dec. 5, 2019 | Dec. 5, 2020 |
| Software | | | | | |
| Description | | | Manufacturer | Name | Version |
| Test Software for Conducted Emissions | | | Farad | EZ-EMC | Ver. UL-3A1 |

| Radiated Emissions | | | | | | |
|---|---|---|---|---|---|---|
| Instrument | | | | | | |
| Used | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
| ☑ | MXE EMI Receiver | KESIGHT | N9038A | MY56400036 | Dec. 6, 2019 | Dec. 6, 2020 |
| ☑ | Hybrid Log Periodic Antenna | TDK | HLP-3003C | 130959 | Sept.17, 2018 | Sept.17,2021 |
| ☑ | Preamplifier | HP | 8447D | 2944A09099 | Dec. 5, 2019 | Dec. 5, 2020 |
| ☑ | EMI Measurement Receiver | R&S | ESR26 | 101377 | Dec. 05, 2019 | Dec.05, 2020 |
| ☑ | Horn Antenna | TDK | HRN-0118 | 130939 | Sept. 17, 2018 | Sept.17,2021 |
| ☑ | Preamplifier | TDK | PA-02-0118 | TRS-305-00067 | Dec. 05, 2019 | Dec.05, 2020 |
| ☑ | Loop antenna | Schwarzbeck | 1519B | 00008 | Jan.17, 2019 | Jan.17, 2022 |
| ☑ | Preamplifier | TDK | PA-02-001-3000 | TRS-302-00050 | Dec. 05, 2019 | Dec.05, 2020 |
| ☑ | High Gain Horn Antenna | Schwarzbeck | BBHA-9170 | 691 | Aug.11,2018 | Aug.11,2021 |
| ☑ | Preamplifier | TDK | PA-02-2 | TRS-307-00003 | Dec. 05, 2019 | Dec.05, 2020 |
| Software | | | | | | |
| Used | Description | | Manufacturer | Name | | Version |
| ☑ | Test Software for Radiated disturbance | | Farad | EZ-EMC | | Ver. UL-3A1 |

| Other instruments | | | | | | |
|---|---|---|---|---|---|---|
| Used | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
| ☑ | High Pass Filter | Wi | WHKX10-2700-3000-18000-40SS | 23 | Dec. 05, 2019 | Dec.05, 2020 |
| ☑ | Band Reject Filter | Wainwright | WRCJV8-2350-2400-2483.5-2533.5-40SS | 4 | Dec. 05, 2019 | Dec.05, 2020 |

# 6. ANTENNA PORT TEST RESULTS

## 6.1. ON TIME AND DUTY CYCLE

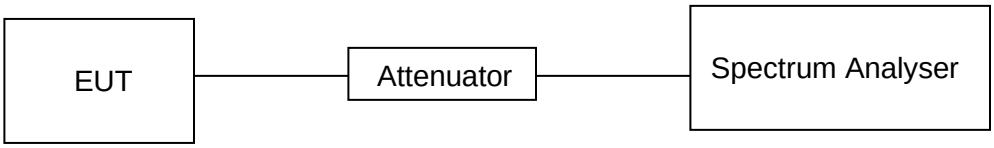
**LIMITS**

None; for reporting purposes only

**PROCEDURE**

KDB 558074 Zero-Span Spectrum Analyzer Method

**TEST SETUP**




**TEST ENVIRONMENT**

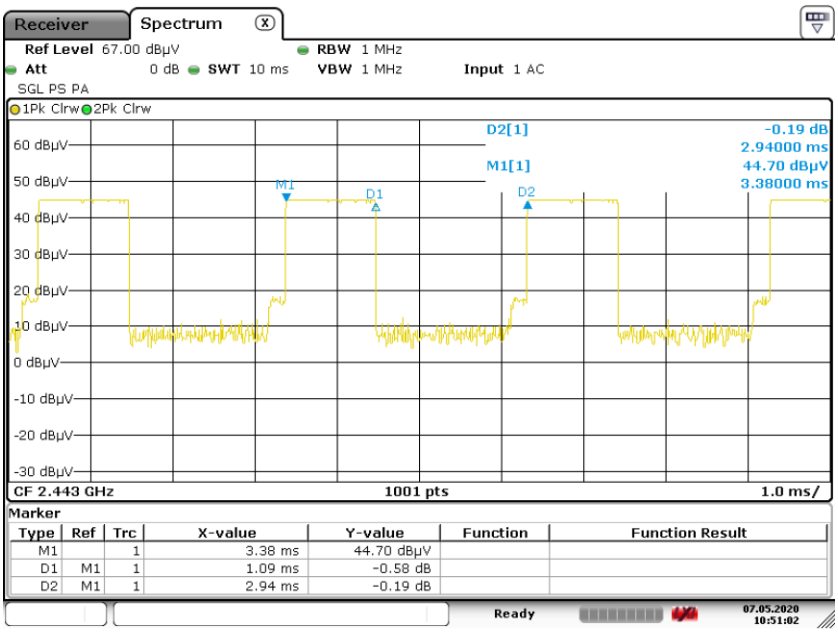
| | | | |
|---|---|---|---|
| Temperature | 22.8°C | Relative Humidity | 56% |
| Atmosphere Pressure | 101kPa | Test Voltage | DC 3.7V |

**RESULTS**

| Mode | On Time (msec) | Period (msec) | Duty Cycle x (Linear) | Duty Cycle (%) | Duty Cycle Correction Factor (db) |
|---|---|---|---|---|---|
| GFSK | 38.15 | 100 | 0.3815 | 38.15 | -8.37 |

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

## ON TIME AND DUTY CYCLE MID CH PLOT

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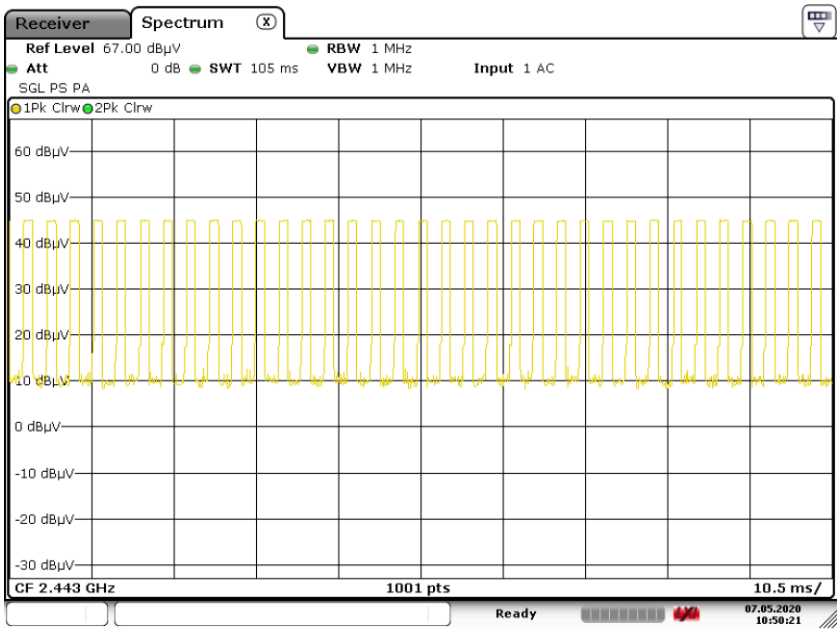
## ON TIME AND DUTY CYCLE MID CH PLOT-2

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

## 6.2. 20 dB BANDWIDTH AND 99% OCCUPIED BANDWIDTH

**LIMITS**

| CFR 47 FCC Part15 (15.249) Subpart C<br>RSS-Gen Issue 5 | | | |
|---|---|---|---|
| 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 |

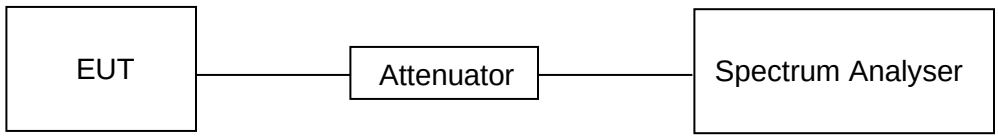
**TEST PROCEDURE**

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 |

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 6 dB/99% relative to the maximum level measured in the fundamental emission.

**TEST SETUP**



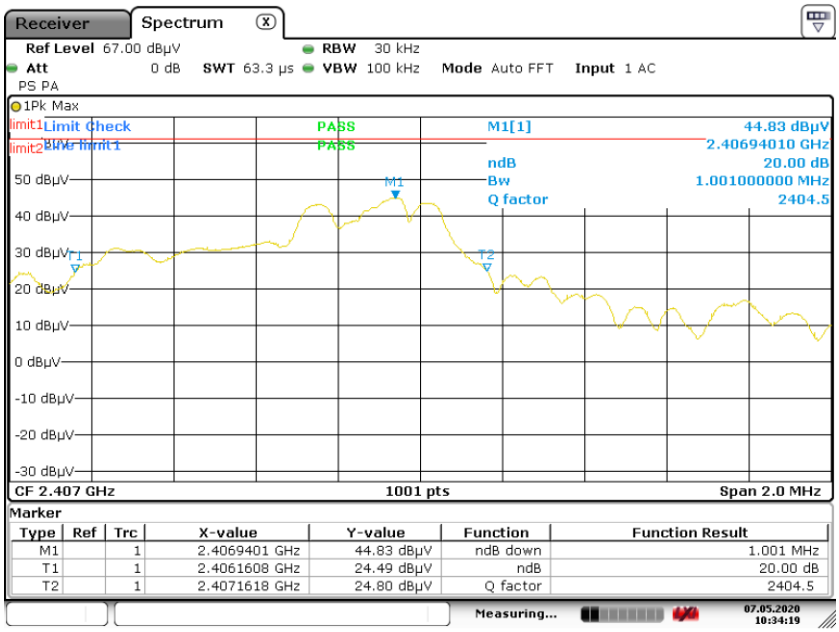

**TEST ENVIRONMENT**

| | | | |
|---|---|---|---|
| Temperature | 22.8°C | Relative Humidity | 56% |
| Atmosphere Pressure | 101kPa | Test Voltage | DC 3.7V |

**RESULTS**

| Frequency (MHz) | 20dB bandwidth (MHz) | 99% bandwidth (MHz) | Result |
|---|---|---|---|
| 2407 | 1.0010 | 1.0749 | PASS |

20 dB BANDWIDTH LOW CH

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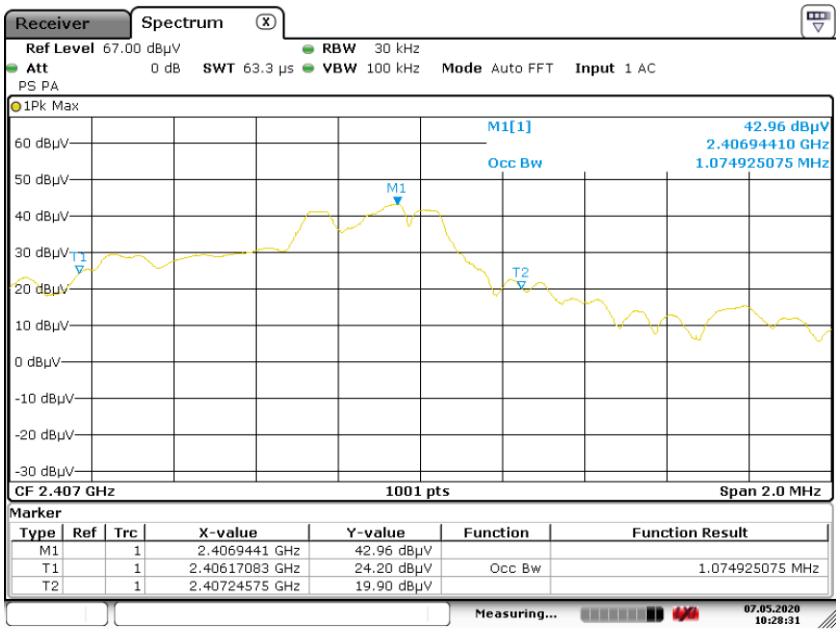
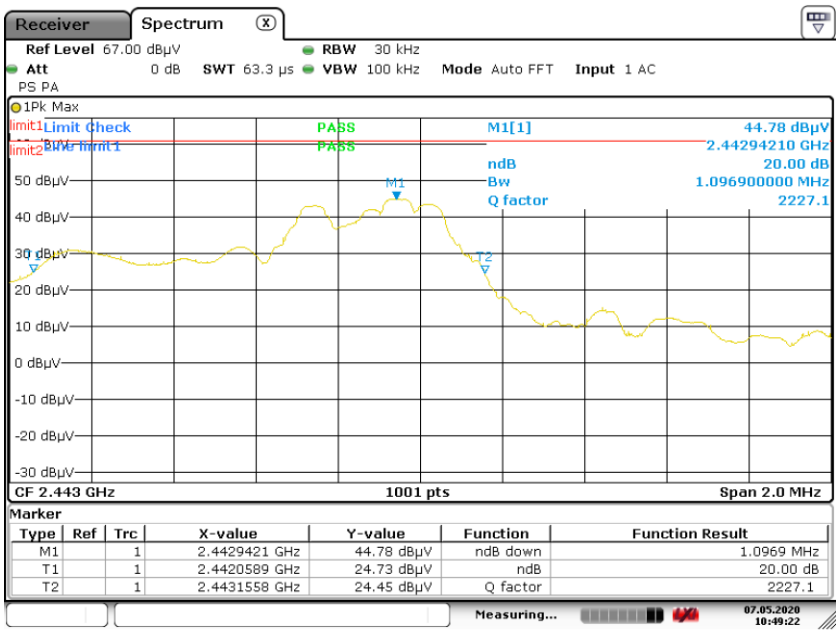
99% OCCUPIED BANDWIDTH LOW CH




Date: 7.MAY.2020 10:28:31

| Frequency (MHz) | 20dB bandwidth (MHz) | 99% bandwidth (MHz) | Result |
|---|---|---|---|
| 2443 | 1.0969 | 1.0210 | PASS |

20 dB BANDWIDTH MID CH

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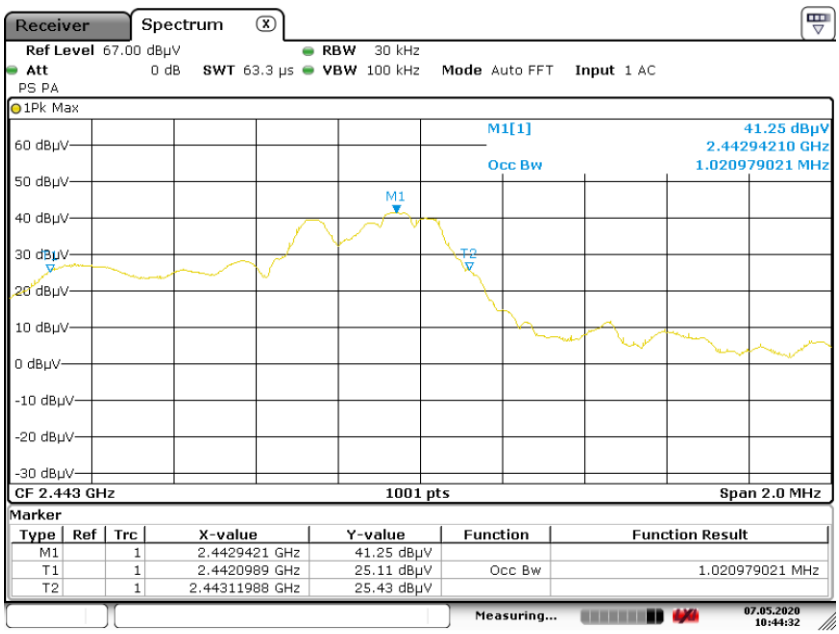
99% OCCUPIED BANDWIDTH MID CH

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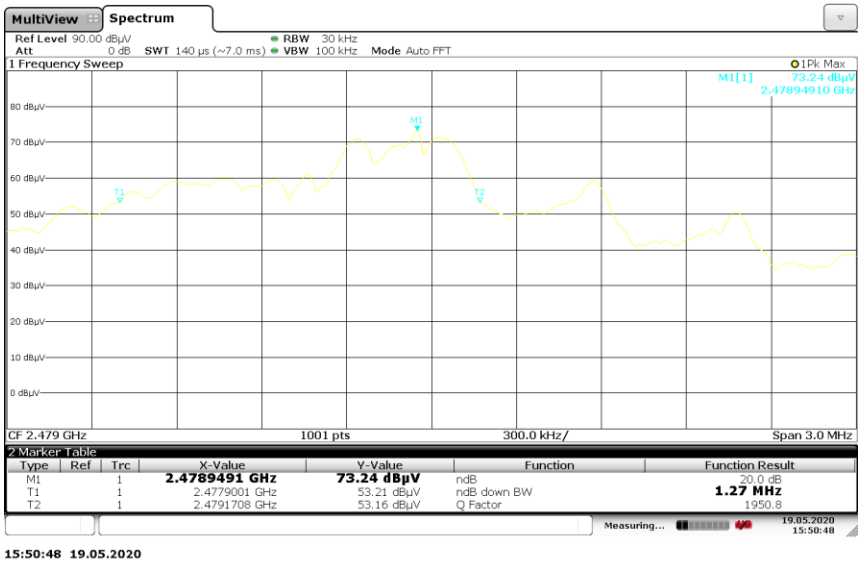
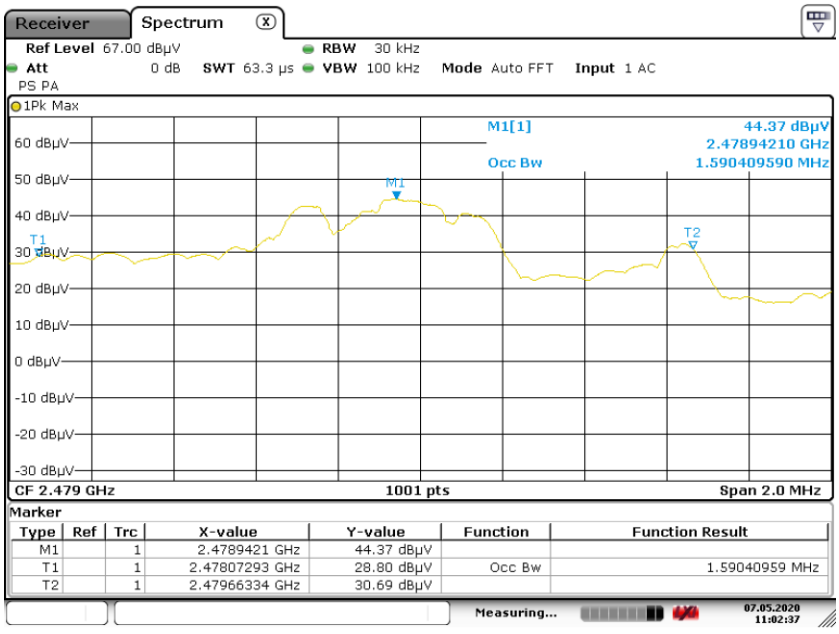
| Frequency (MHz) | 20dB bandwidth (MHz) | 99% bandwidth (MHz) | Result |
|---|---|---|---|
| 2479 | 1.27 | 1.5904 | PASS |

20 dB BANDWIDTH HIG CH




15:50:48 19.05.2020

99% OCCUPIED BANDWIDTH HIG CH

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# 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)

ISED RSS-210 Issue 10 Annex B B.10

RSS-GEN Clause 8.9

| 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 (94dBuV/m) | 500 uV/m (54dBuV/m) | 3 |
| 2400 – 2483.5 | 50 mV/m (94dBuV/m) | 500 uV/m (54dBuV/m) | 3 |
| 5725 – 5875 | 50 mV/m (94dBuV/m) | 500 uV/m (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 |

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.

IC 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.

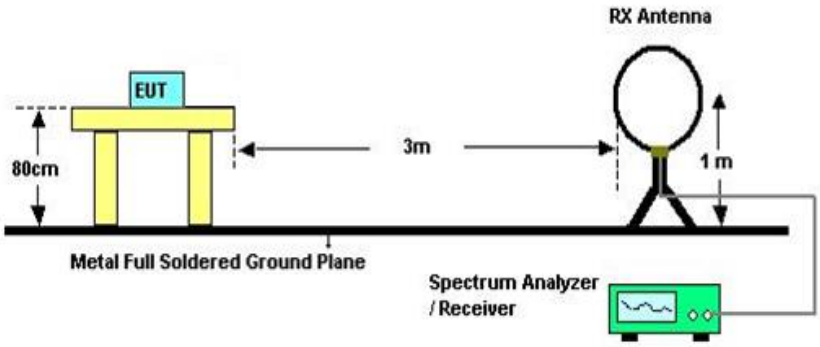
FCC Restricted bands of operation:

| 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: [1]Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2]Above 38.6c

**TEST SETUP AND PROCEDURE**

Below 30MHz




The setting of the spectrum analyser

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

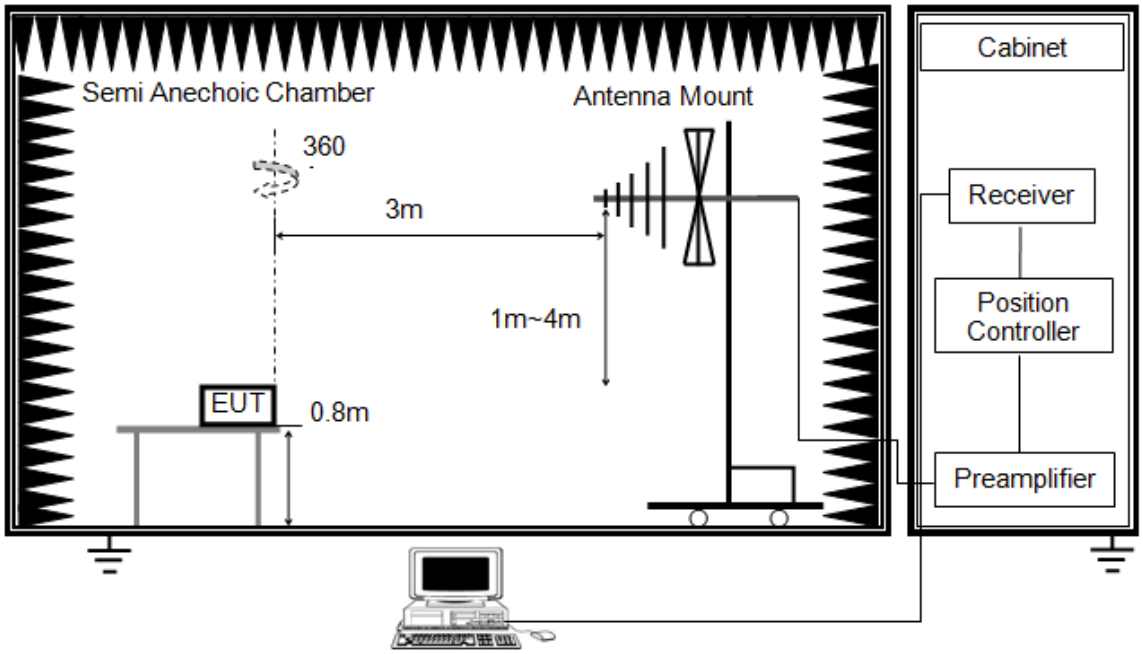
3. The EUT was placed on a turntable with 80cm meter above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1m 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 1000MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

6. Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30m open field site. Therefore, the sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

Below 1G




The setting of the spectrum analyser

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

1. The testing follows the guidelines in ANSI C63.10-2013.

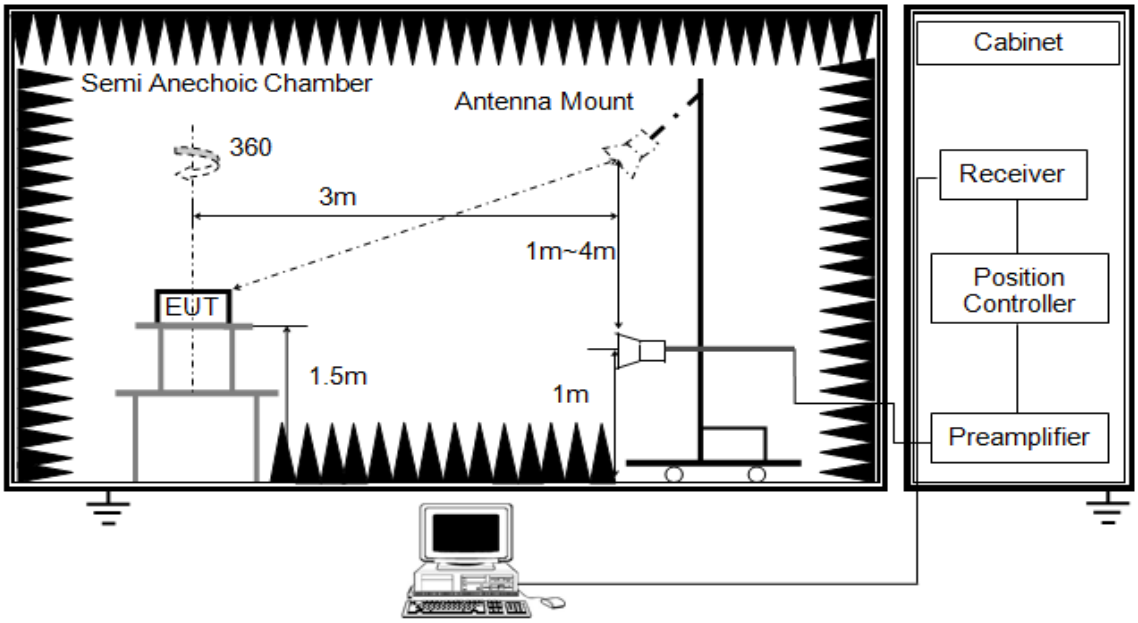
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations 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 1G




The setting of the spectrum analyser

| | |
|---|---|
| RBW | 1M |
| VBW | PEAK: 3M<br>AVG: see note 6 |
| Sweep | Auto |
| Detector | Peak |
| Trace | Max hold |

1. The testing follows the guidelines in ANSI C63.10-2013.

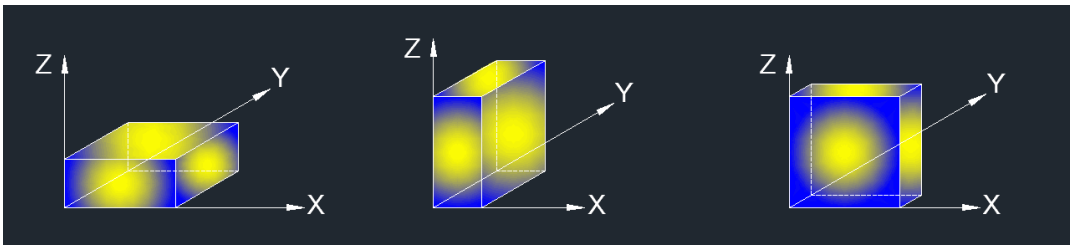
2. The EUT was arranged to its worst case and then tune the antenna tower (1.5 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter or band reject filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 1.5m 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.

X axis, Y axis, Z axis positions:



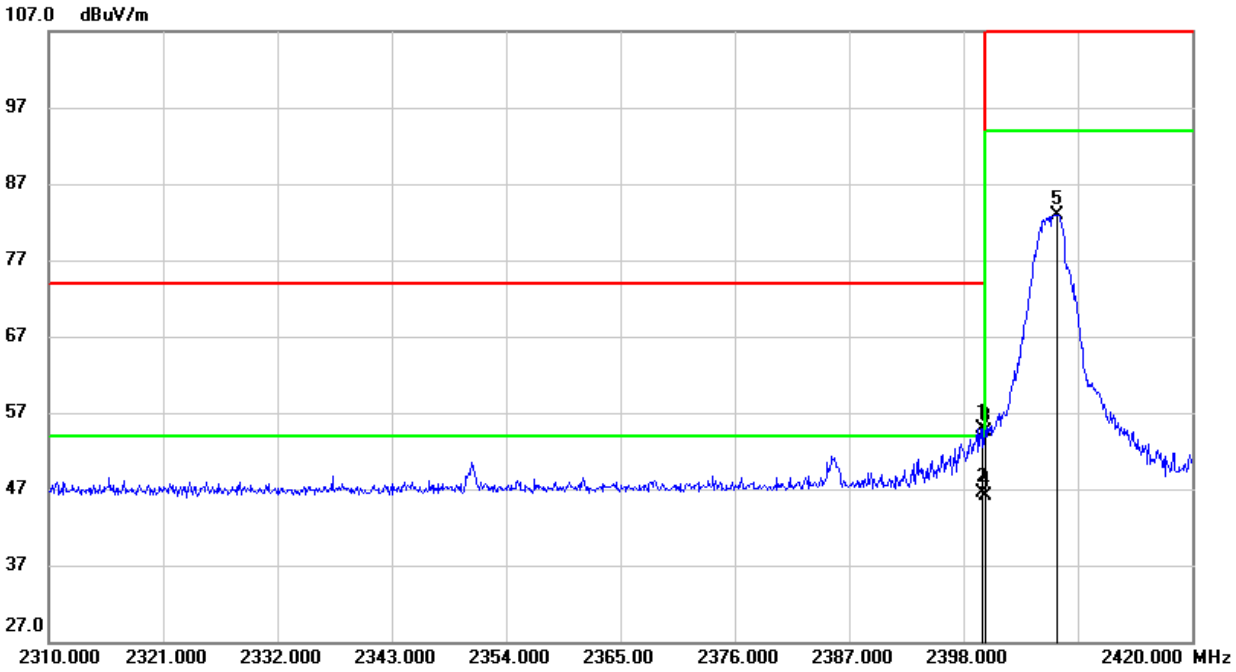

Note 1: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

**TEST ENVIRONMENT**

| | | | |
|---|---|---|---|
| Temperature | 23.6°C | Relative Humidity | 60% |
| Atmosphere Pressure | 101kPa | Test Voltage | DC 3.7V |

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

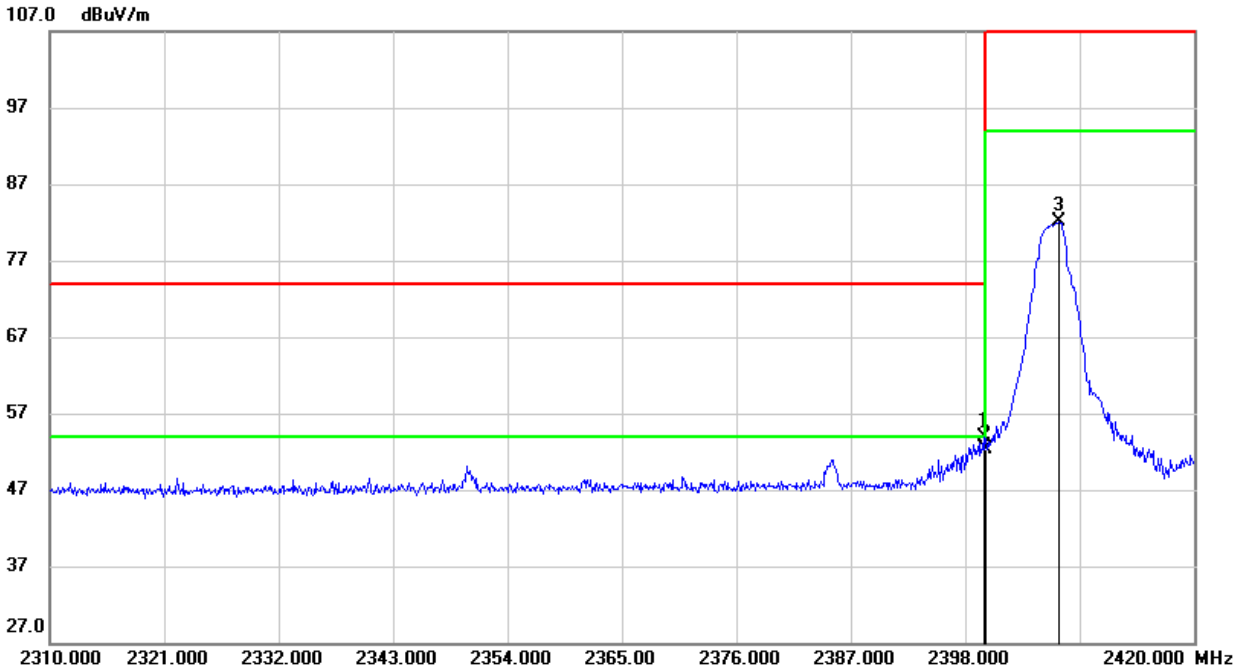
**RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS (LOW CHANNEL, HORIZONTAL)**




| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 2399.870 | 21.94 | 32.98 | 54.92 | 74.00 | -19.08 | peak |
| 2 | 2399.870 | 13.57 | 32.98 | 46.55 | 54.00 | -7.45 | AVG |
| 3 | 2400.000 | 21.48 | 32.98 | 54.46 | 74.00 | -19.54 | peak |
| 4 | 2400.000 | 13.11 | 32.98 | 46.09 | 54.00 | -7.91 | AVG |
| 5 | 2407.020 | 49.90 | 33.03 | 82.93 | 114.00 | -31.07 | 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.

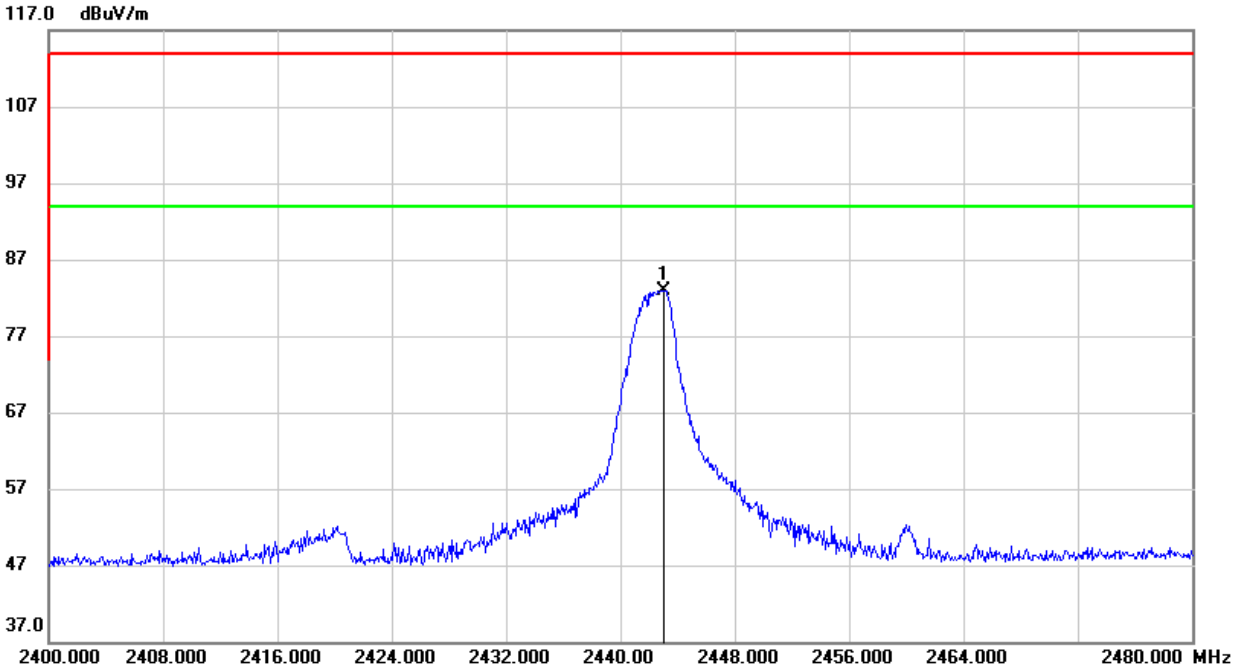
**RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS (LOW CHANNEL, VERTICAL)**




| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 2399.760 | 21.00 | 32.98 | 53.98 | 74.00 | -20.02 | peak |
| 2 | 2400.000 | 19.38 | 32.98 | 52.36 | 74.00 | -21.64 | peak |
| 3 | 2407.020 | 49.00 | 33.03 | 82.03 | 114.00 | -31.97 | 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. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

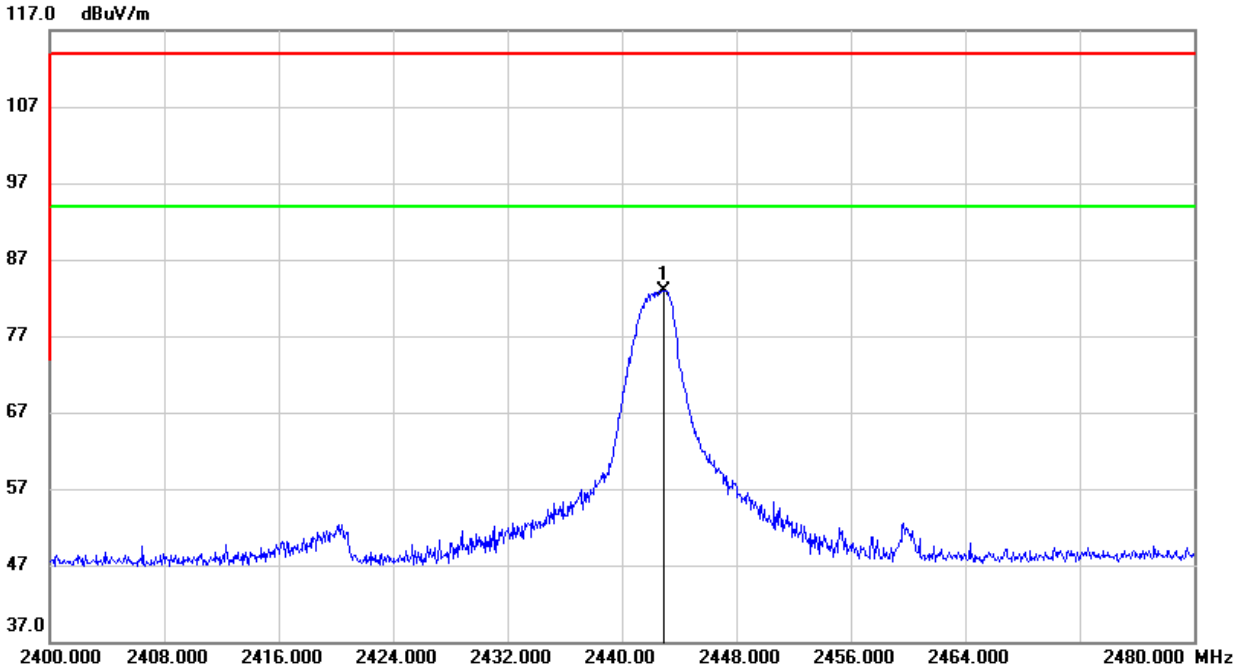
## FIELD STRENGTH OF INTENTIONAL EMISSIONS (MIDDLE CHANNEL, HORIZONTAL)




| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 2443.040 | 49.70 | 33.29 | 82.99 | 114.00 | -31.01 | 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. Only the worst emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

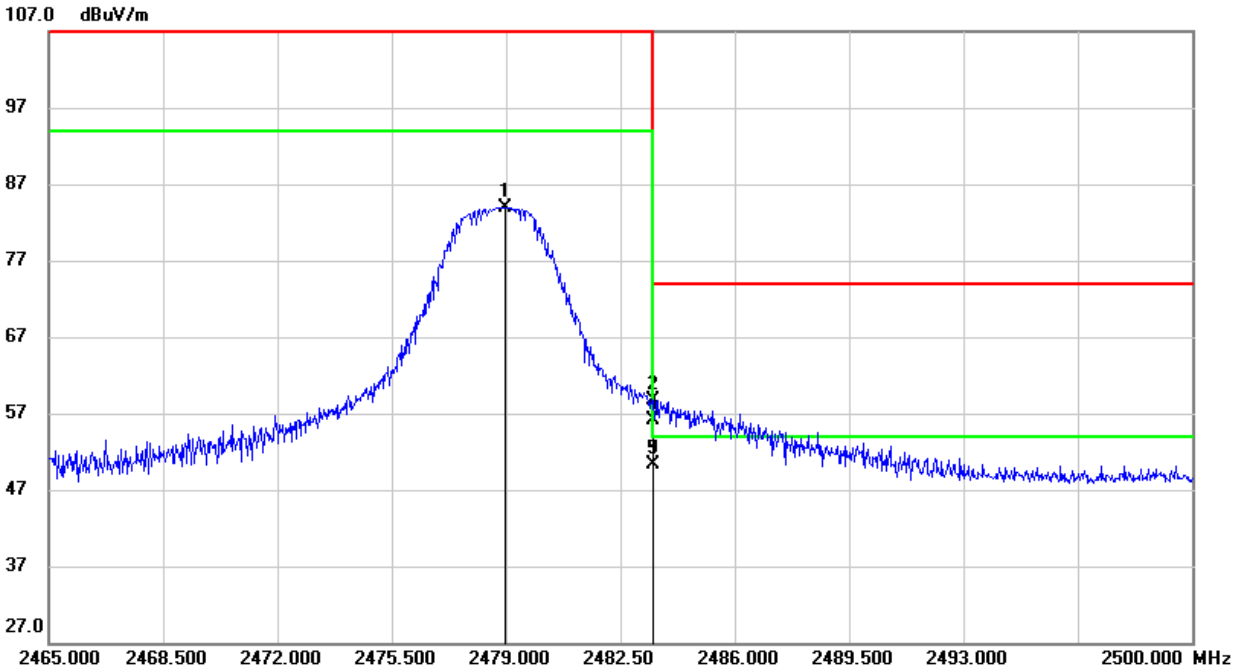
## FIELD STRENGTH OF INTENTIONAL EMISSIONS (MIDDLE CHANNEL, VERTICAL)




| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 2442.960 | 49.69 | 33.29 | 82.98 | 114.00 | -31.02 | 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. Only the worst emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

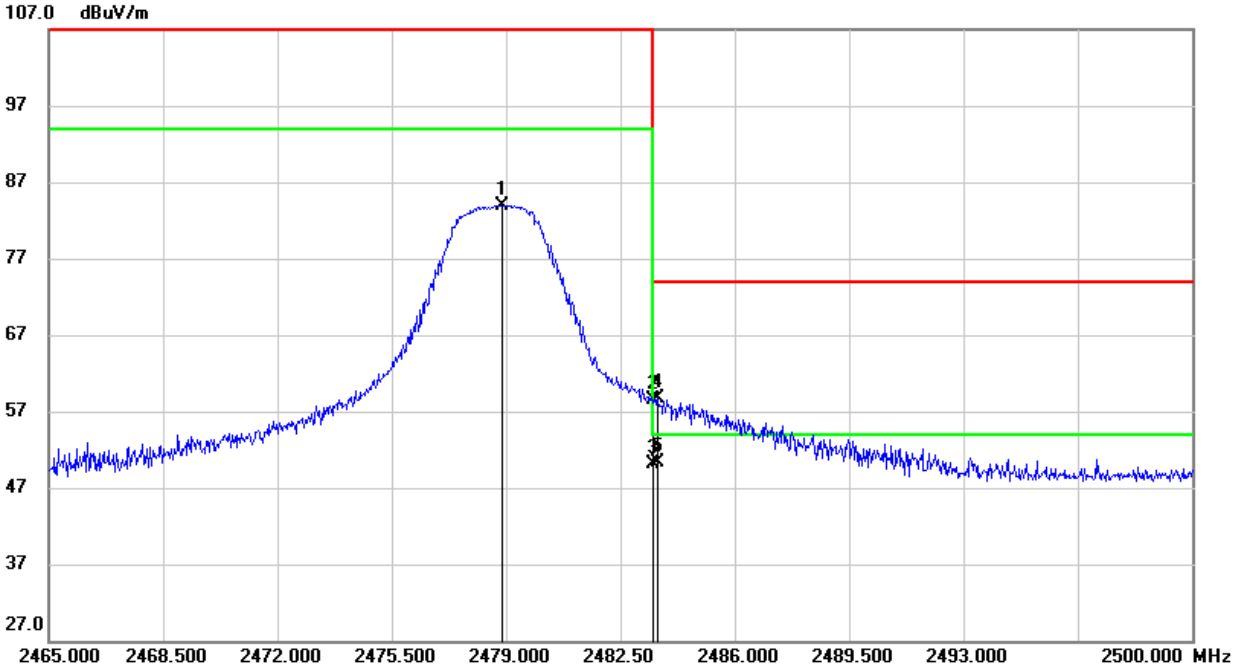
**RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS (HIGH CHANNEL, HORIZONTAL)**




| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 2478.965 | 50.35 | 33.55 | 83.90 | 114.00 | -30.10 | peak |
| 2 | 2483.500 | 25.22 | 33.58 | 58.80 | 74.00 | -15.20 | peak |
| 3 | 2483.500 | 16.85 | 33.58 | 50.43 | 54.00 | -3.57 | AVG |
| 4 | 2483.515 | 22.62 | 33.58 | 56.20 | 74.00 | -17.80 | peak |
| 5 | 2483.515 | 14.25 | 33.58 | 47.83 | 54.00 | -6.17 | 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)**

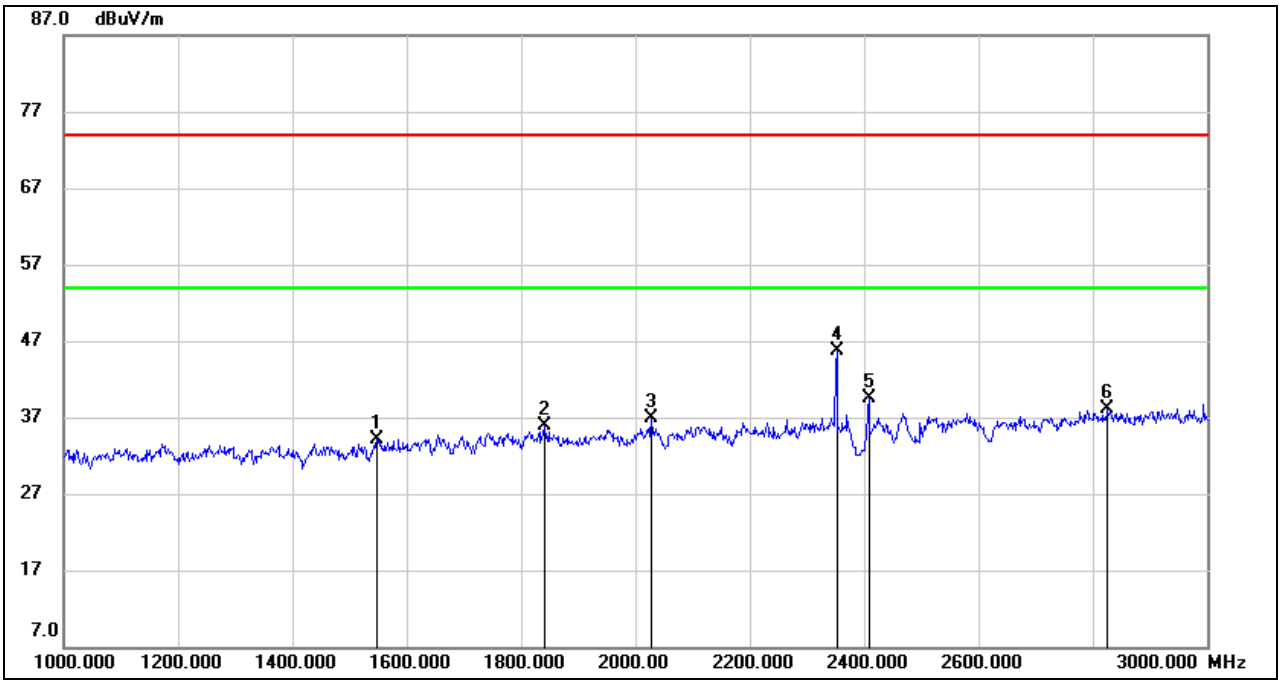



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 2478.895 | 50.40 | 33.55 | 83.95 | 114.00 | -30.05 | peak |
| 2 | 2483.500 | 24.87 | 33.58 | 58.45 | 74.00 | -15.55 | peak |
| 3 | 2483.500 | 16.50 | 33.58 | 50.08 | 54.00 | -3.92 | AVG |
| 4 | 2483.620 | 25.06 | 33.58 | 58.64 | 74.00 | -15.36 | peak |
| 5 | 2483.620 | 16.69 | 33.58 | 50.27 | 54.00 | -3.73 | 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 (1~3GHz)

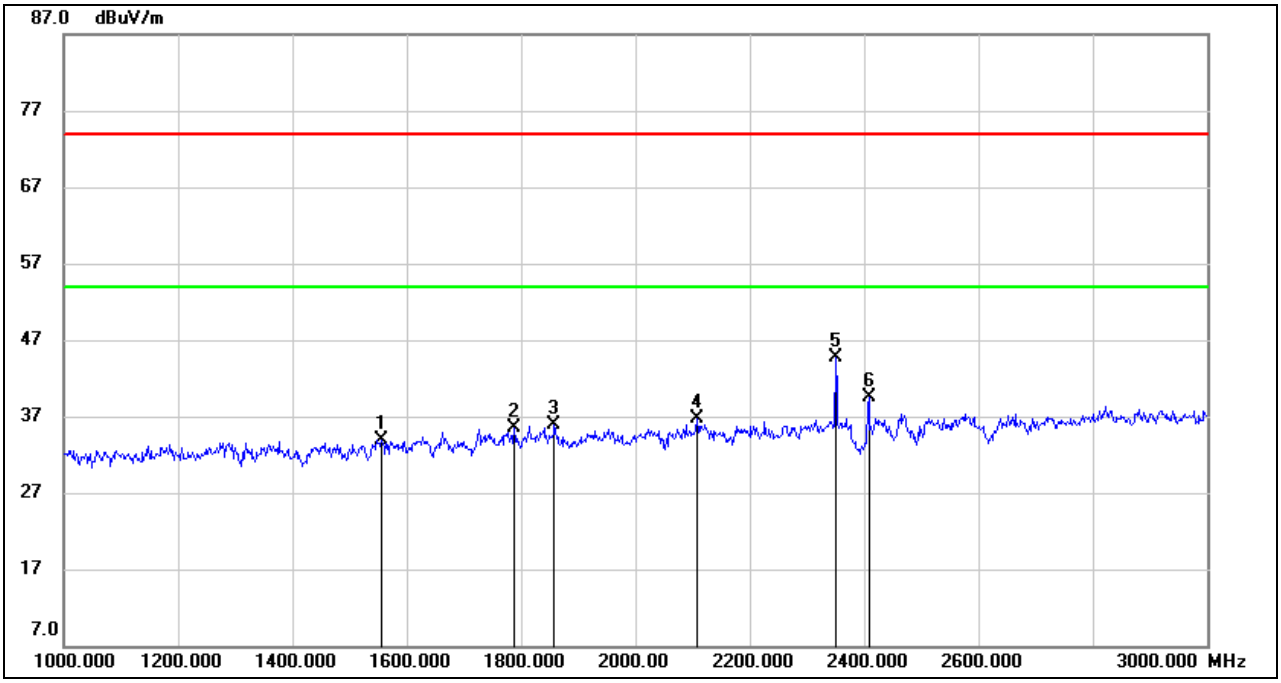
**HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)**




| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 1548.000 | 45.88 | -11.82 | 34.06 | 74.00 | -39.94 | peak |
| 2 | 1840.000 | 45.89 | -9.93 | 35.96 | 74.00 | -38.04 | peak |
| 3 | 2028.000 | 46.53 | -9.64 | 36.89 | 74.00 | -37.11 | peak |
| 4 | 2352.000 | 53.81 | -8.02 | 45.79 | 74.00 | -28.21 | peak |
| 5 | 2407.000 | 47.37 | -7.81 | 39.56 | / | / | fundamental |
| 6 | 2826.000 | 43.93 | -5.92 | 38.01 | 74.00 | -35.99 | 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.

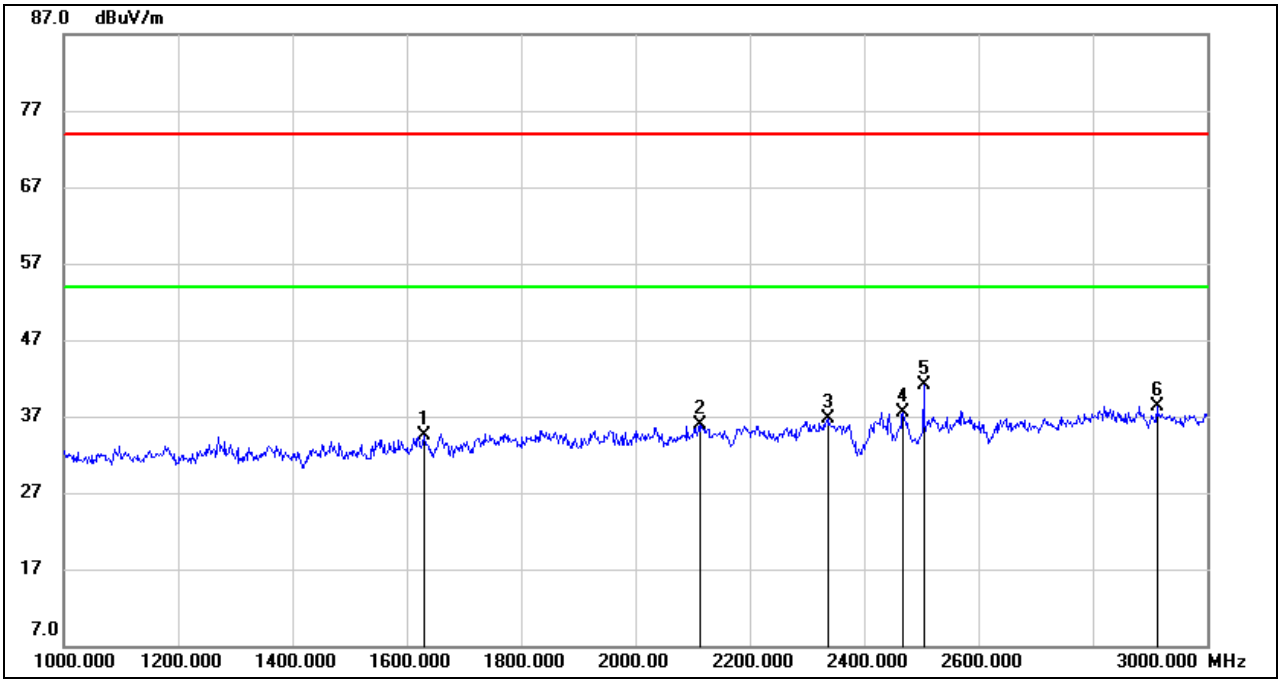
## HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)




| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 1556.000 | 45.74 | -11.76 | 33.98 | 74.00 | -40.02 | peak |
| 2 | 1788.000 | 45.50 | -10.04 | 35.46 | 74.00 | -38.54 | peak |
| 3 | 1858.000 | 45.83 | -9.93 | 35.90 | 74.00 | -38.10 | peak |
| 4 | 2108.000 | 45.73 | -9.12 | 36.61 | 74.00 | -37.39 | peak |
| 5 | 2350.000 | 52.68 | -8.02 | 44.66 | 74.00 | -29.34 | peak |
| 6 | 2407.000 | 47.22 | -7.81 | 39.41 | / | / | fundamental |

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.

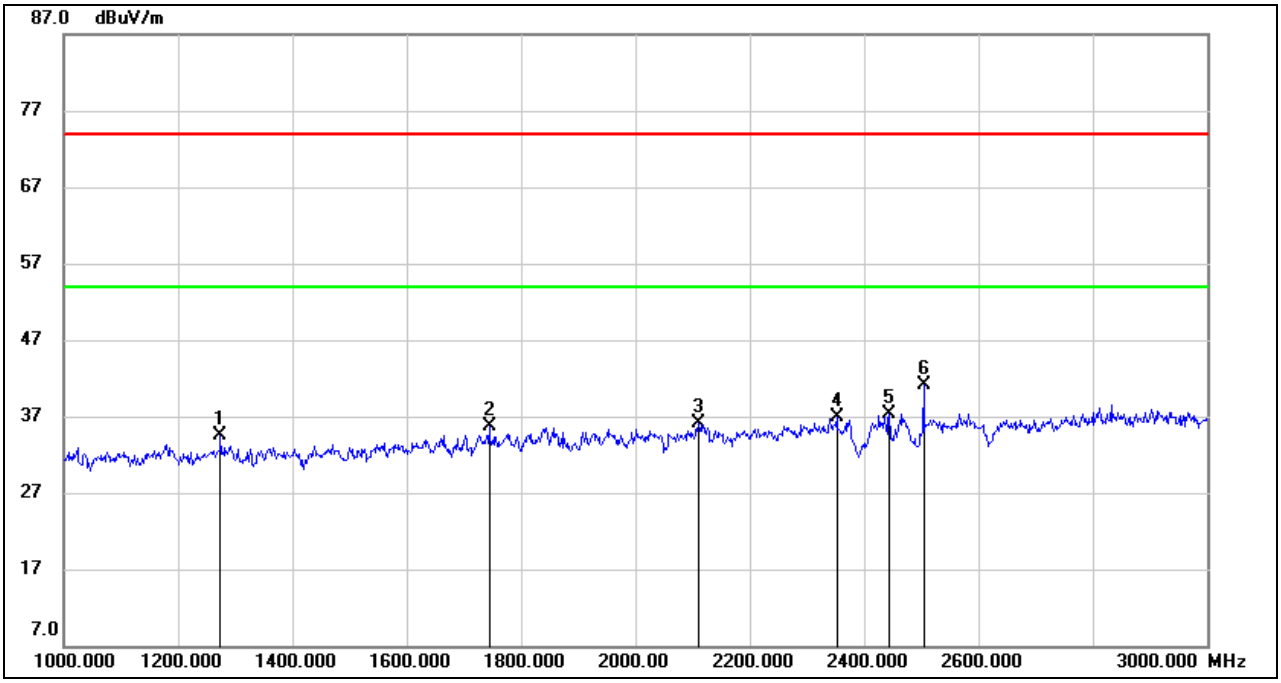
## HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)




| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 1630.000 | 45.69 | -11.25 | 34.44 | 74.00 | -39.56 | peak |
| 2 | 2112.000 | 44.96 | -9.10 | 35.86 | 74.00 | -38.14 | peak |
| 3 | 2338.000 | 44.73 | -8.06 | 36.67 | 74.00 | -37.33 | peak |
| 4 | 2468.000 | 44.92 | -7.39 | 37.53 | 74.00 | -36.47 | peak |
| 5 | 2504.000 | 48.35 | -7.19 | 41.16 | 74.00 | -32.84 | peak |
| 6 | 2912.000 | 43.85 | -5.50 | 38.35 | 74.00 | -35.65 | 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.

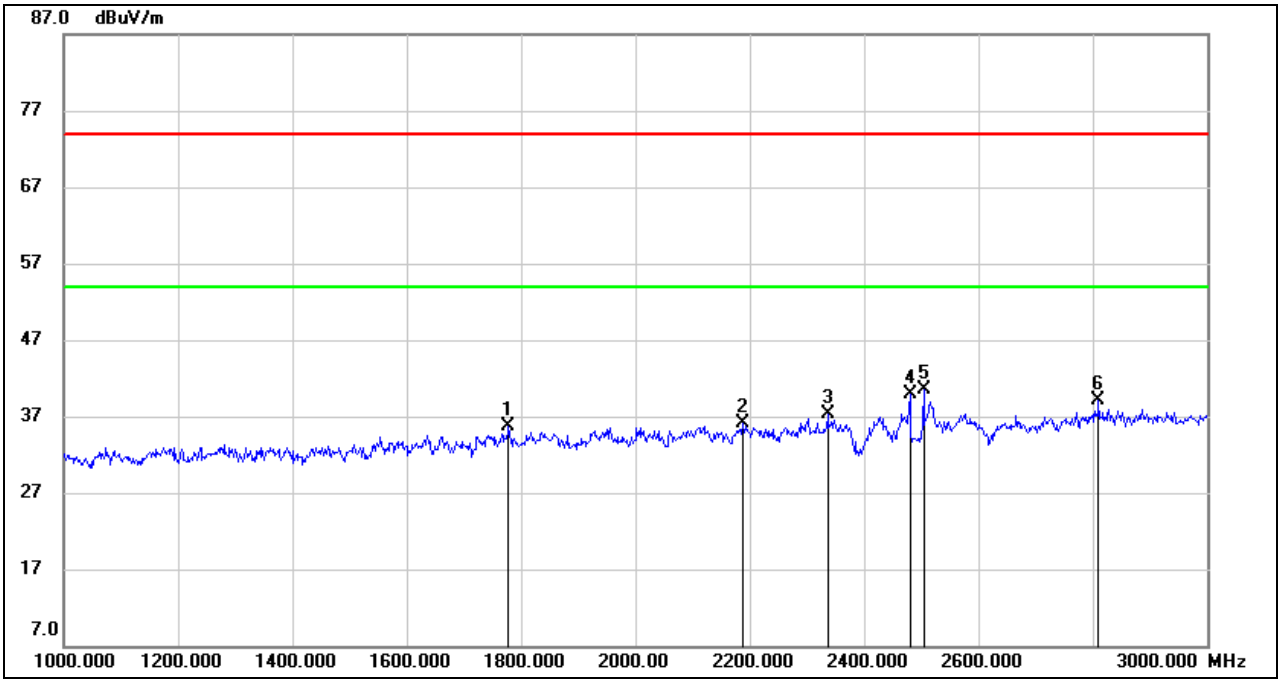
## HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)




| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 1274.000 | 46.98 | -12.43 | 34.55 | 74.00 | -39.45 | peak |
| 2 | 1744.000 | 46.13 | -10.46 | 35.67 | 74.00 | -38.33 | peak |
| 3 | 2110.000 | 45.18 | -9.10 | 36.08 | 74.00 | -37.92 | peak |
| 4 | 2352.000 | 44.96 | -8.02 | 36.94 | 74.00 | -37.06 | peak |
| 5 | 2443.000 | 44.92 | -7.56 | 37.36 | / | / | fundamental |
| 6 | 2504.000 | 48.38 | -7.19 | 41.19 | 74.00 | -32.81 | 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.

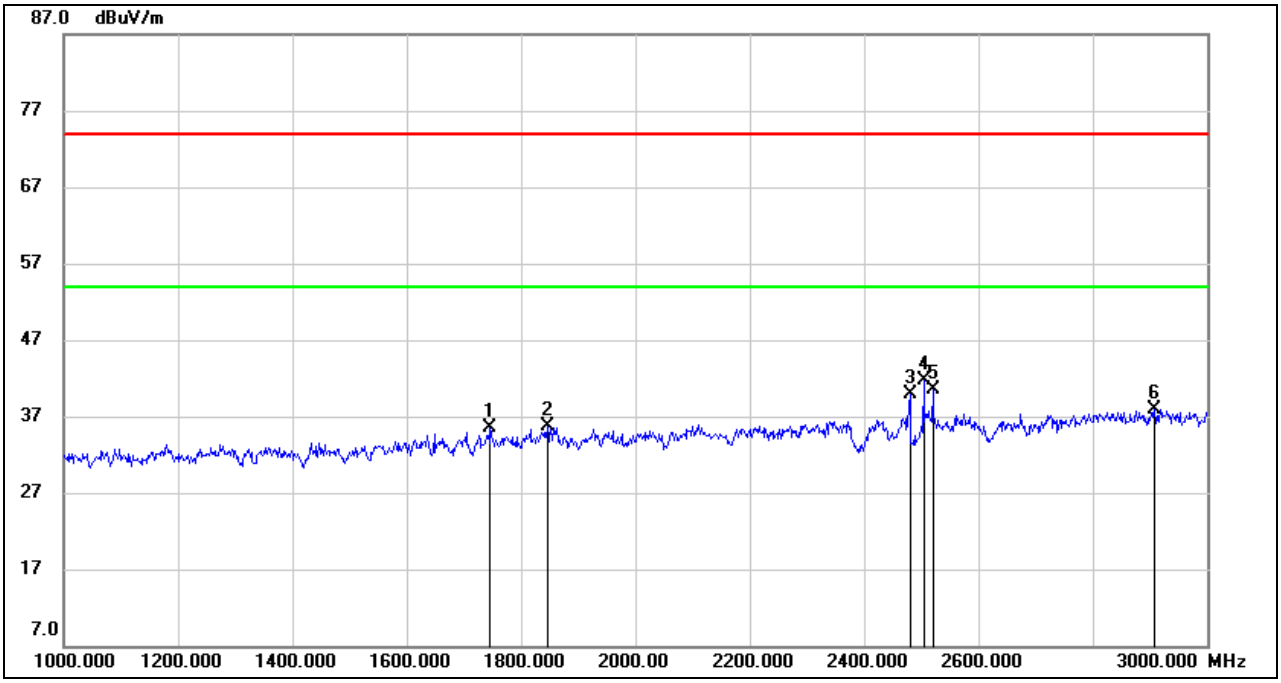
## HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)




| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 1778.000 | 45.83 | -10.13 | 35.70 | 74.00 | -38.30 | peak |
| 2 | 2188.000 | 44.77 | -8.72 | 36.05 | 74.00 | -37.95 | peak |
| 3 | 2336.000 | 45.36 | -8.07 | 37.29 | 74.00 | -36.71 | peak |
| 4 | 2479.000 | 47.26 | -7.32 | 39.94 | / | / | fundamental |
| 5 | 2504.000 | 47.64 | -7.19 | 40.45 | 74.00 | -33.55 | peak |
| 6 | 2810.000 | 45.01 | -6.00 | 39.01 | 74.00 | -34.99 | 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, VERTICAL)

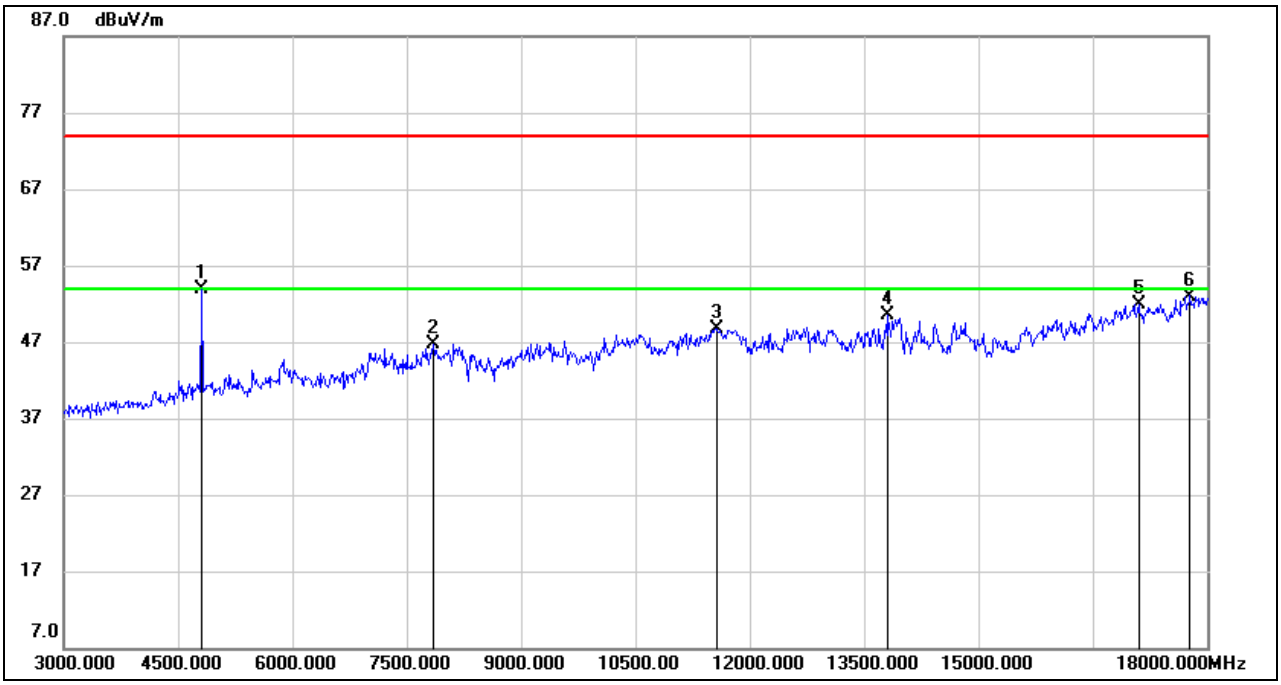



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 1746.000 | 45.89 | -10.45 | 35.44 | 74.00 | -38.56 | peak |
| 2 | 1846.000 | 45.70 | -9.93 | 35.77 | 74.00 | -38.23 | peak |
| 3 | 2479.000 | 47.14 | -7.32 | 39.82 | / | / | fundamental |
| 4 | 2504.000 | 48.93 | -7.19 | 41.74 | 74.00 | -32.26 | peak |
| 5 | 2520.000 | 47.72 | -7.27 | 40.45 | 74.00 | -33.55 | peak |
| 6 | 2908.000 | 43.41 | -5.51 | 37.90 | 74.00 | -36.10 | 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.

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

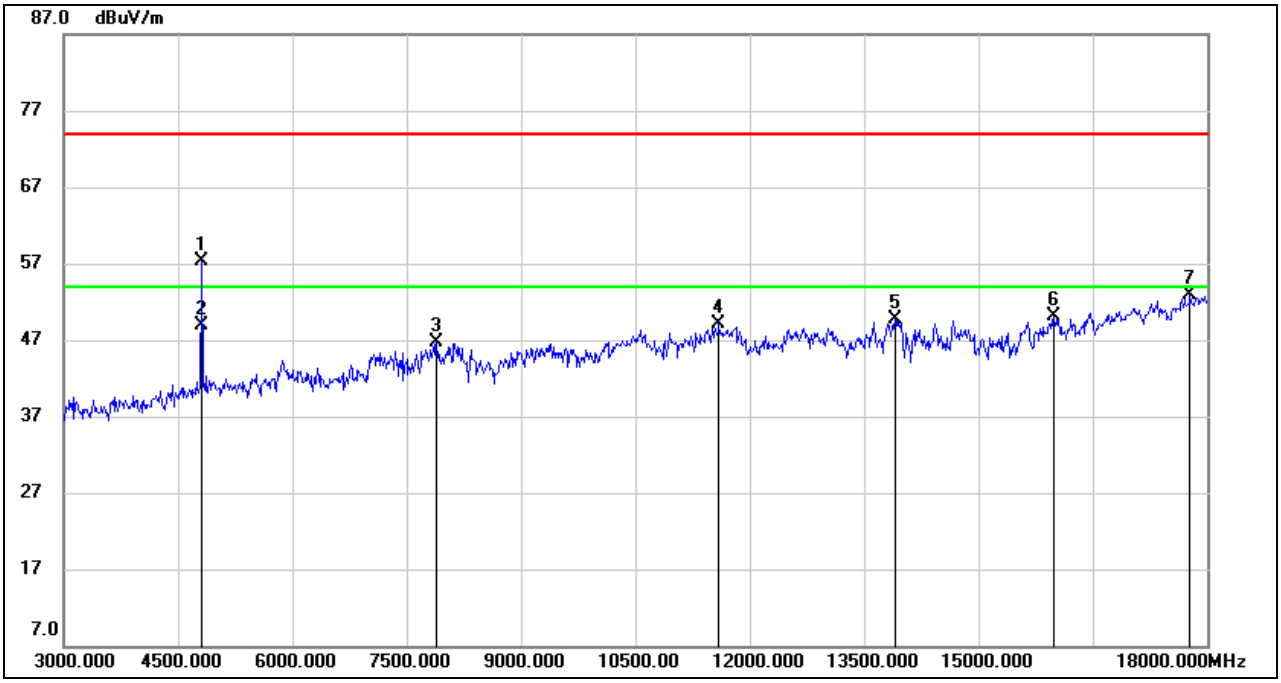
**HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)**




| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 4814.000 | 53.42 | 0.51 | 53.93 | 74.00 | -20.07 | peak |
| 2 | 7845.000 | 39.10 | 7.62 | 46.72 | 74.00 | -27.28 | peak |
| 3 | 11565.000 | 35.45 | 13.26 | 48.71 | 74.00 | -25.29 | peak |
| 4 | 13800.000 | 33.34 | 17.10 | 50.44 | 74.00 | -23.56 | peak |
| 5 | 17100.000 | 31.18 | 20.64 | 51.82 | 74.00 | -22.18 | peak |
| 6 | 17775.000 | 29.91 | 23.09 | 53.00 | 74.00 | -21.00 | 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. 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.

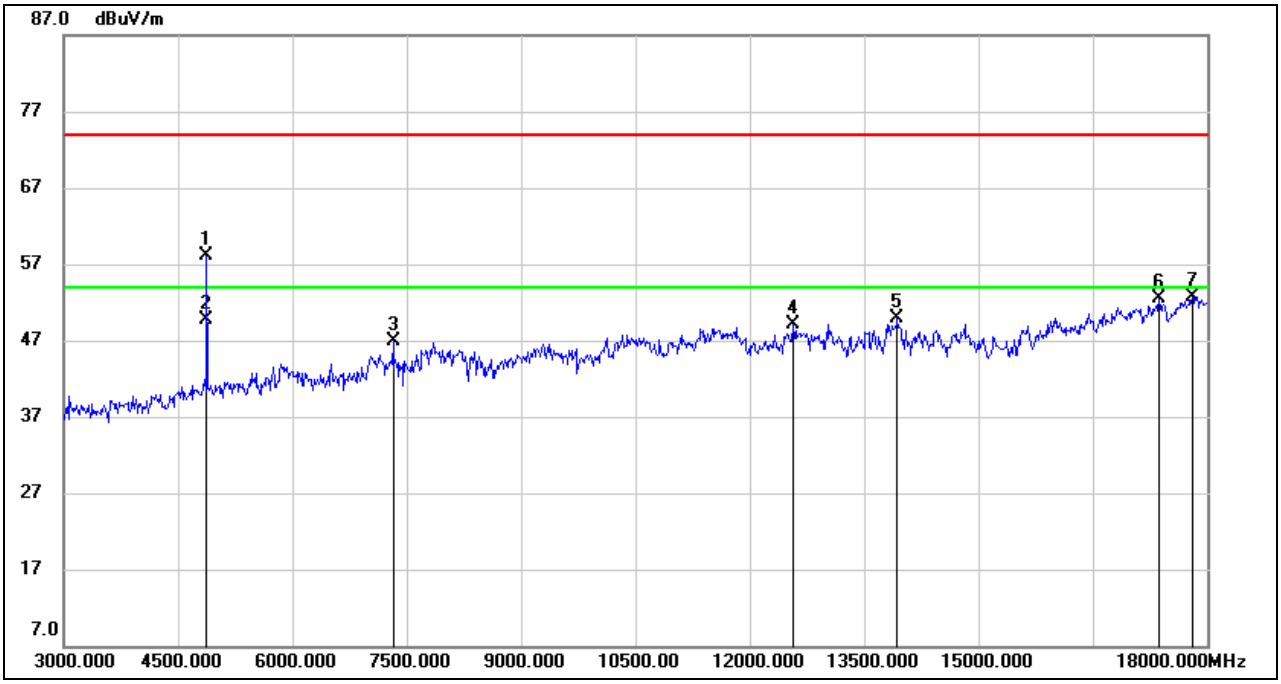
## HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)




| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 4814.000 | 56.84 | 0.51 | 57.35 | 74.00 | -16.65 | peak |
| 2 | 4814.000 | 48.47 | 0.51 | 48.98 | 54.00 | -5.02 | AVG |
| 3 | 7890.000 | 39.39 | 7.30 | 46.69 | 74.00 | -27.31 | peak |
| 4 | 11595.000 | 35.89 | 13.19 | 49.08 | 74.00 | -24.92 | peak |
| 5 | 13905.000 | 33.56 | 16.20 | 49.76 | 74.00 | -24.24 | peak |
| 6 | 15990.000 | 32.41 | 17.68 | 50.09 | 74.00 | -23.91 | peak |
| 7 | 17775.000 | 29.74 | 23.09 | 52.83 | 74.00 | -21.17 | 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.

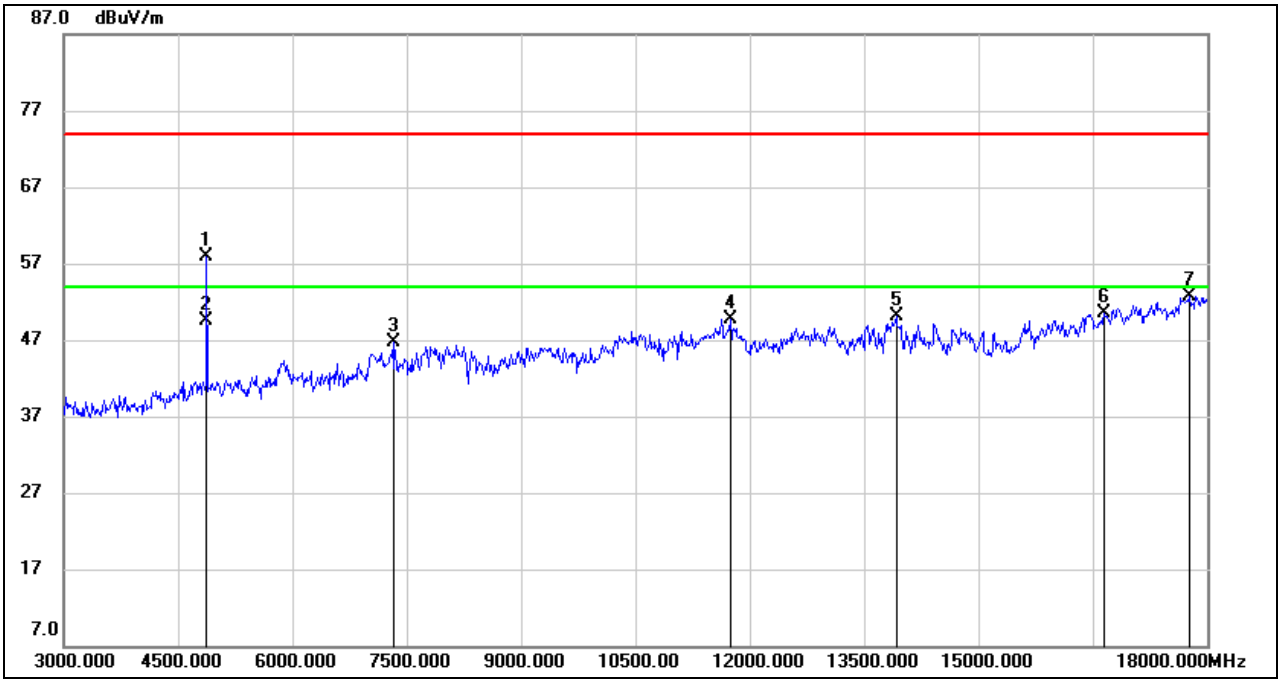
## HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)




| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 4886.000 | 57.31 | 0.81 | 58.12 | 74.00 | -15.88 | peak |
| 2 | 4886.000 | 48.94 | 0.81 | 49.75 | 54.00 | -4.25 | AVG |
| 3 | 7320.000 | 40.69 | 6.14 | 46.83 | 74.00 | -27.17 | peak |
| 4 | 12570.000 | 34.96 | 14.17 | 49.13 | 74.00 | -24.87 | peak |
| 5 | 13935.000 | 33.75 | 16.15 | 49.90 | 74.00 | -24.10 | peak |
| 6 | 17370.000 | 31.04 | 21.52 | 52.56 | 74.00 | -21.44 | peak |
| 7 | 17805.000 | 29.49 | 23.31 | 52.80 | 74.00 | -21.20 | 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.

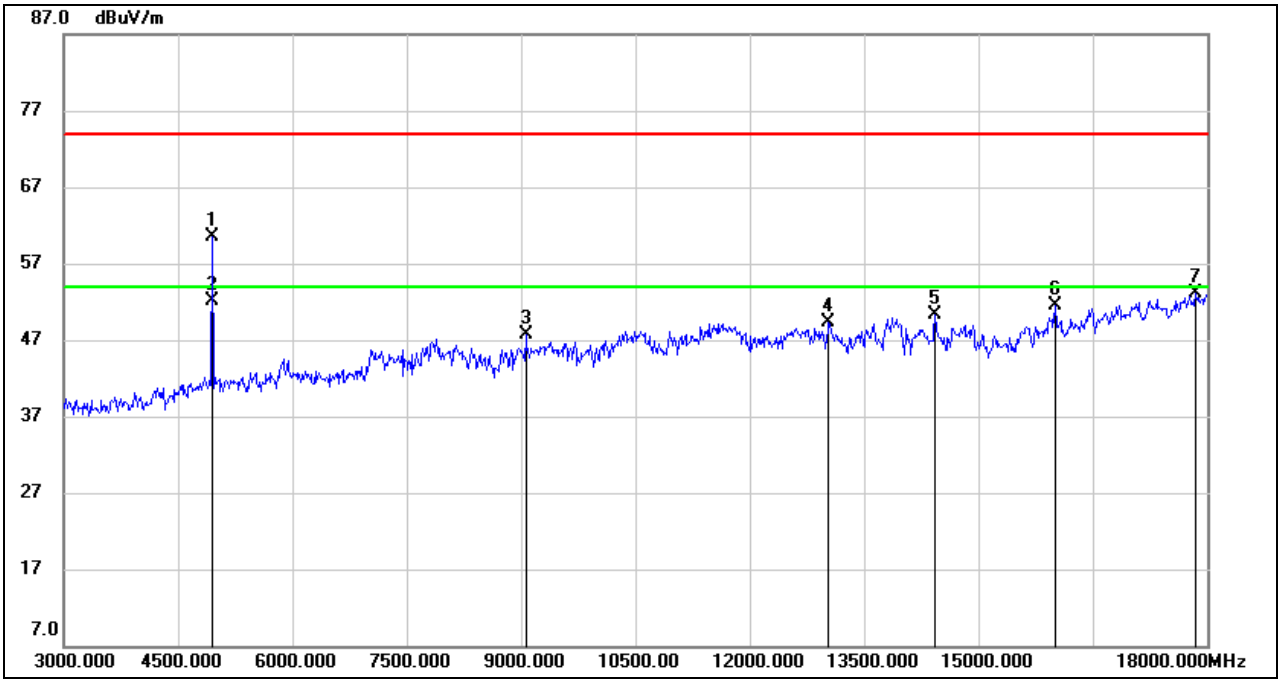
## HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)




| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 4886.000 | 57.02 | 0.81 | 57.83 | 74.00 | -16.17 | peak |
| 2 | 4886.000 | 48.65 | 0.81 | 49.46 | 54.00 | -4.54 | AVG |
| 3 | 7320.000 | 40.65 | 6.14 | 46.79 | 74.00 | -27.21 | peak |
| 4 | 11745.000 | 36.63 | 13.05 | 49.68 | 74.00 | -24.32 | peak |
| 5 | 13920.000 | 33.99 | 16.17 | 50.16 | 74.00 | -23.84 | peak |
| 6 | 16650.000 | 30.74 | 19.70 | 50.44 | 74.00 | -23.56 | peak |
| 7 | 17775.000 | 29.57 | 23.09 | 52.66 | 74.00 | -21.34 | 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.

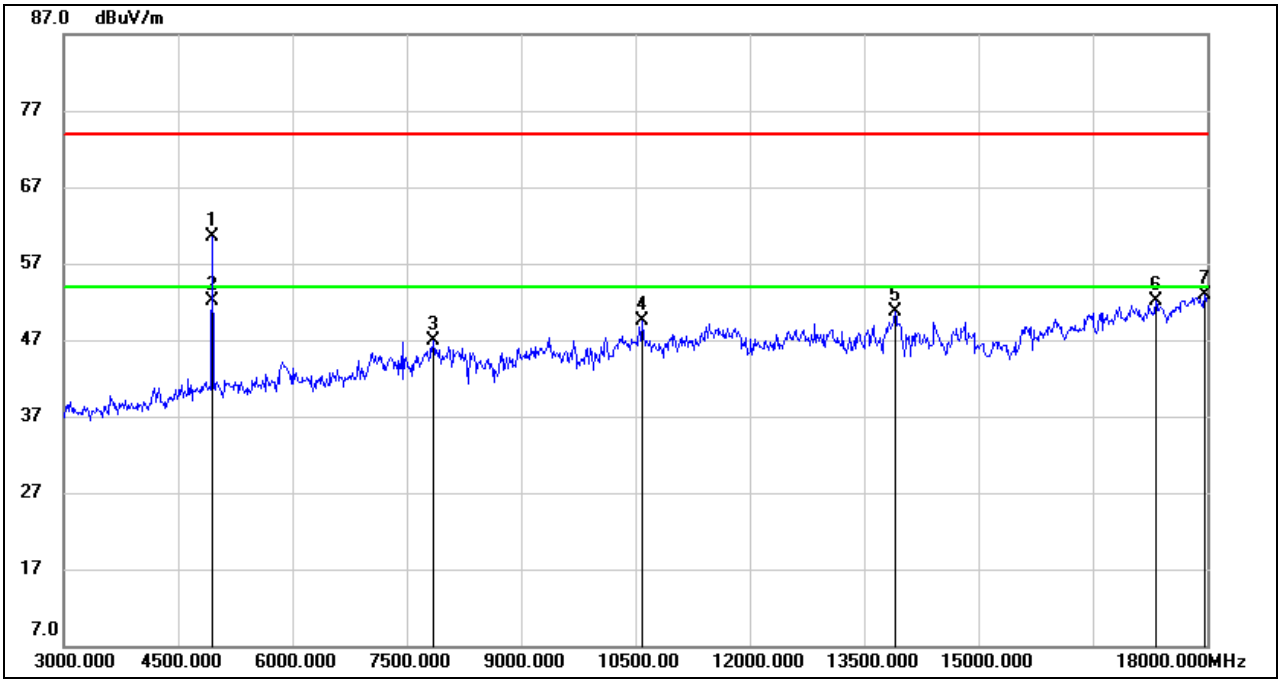
## HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)




| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 4958.000 | 59.24 | 1.17 | 60.41 | 74.00 | -13.59 | peak |
| 2 | 4958.000 | 50.87 | 1.17 | 52.04 | 54.00 | -1.96 | AVG |
| 3 | 9060.000 | 38.33 | 9.28 | 47.61 | 74.00 | -26.39 | peak |
| 4 | 13035.000 | 34.25 | 15.03 | 49.28 | 74.00 | -24.72 | peak |
| 5 | 14430.000 | 33.96 | 16.35 | 50.31 | 74.00 | -23.69 | peak |
| 6 | 16005.000 | 33.74 | 17.71 | 51.45 | 74.00 | -22.55 | peak |
| 7 | 17850.000 | 29.73 | 23.32 | 53.05 | 74.00 | -20.95 | 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)

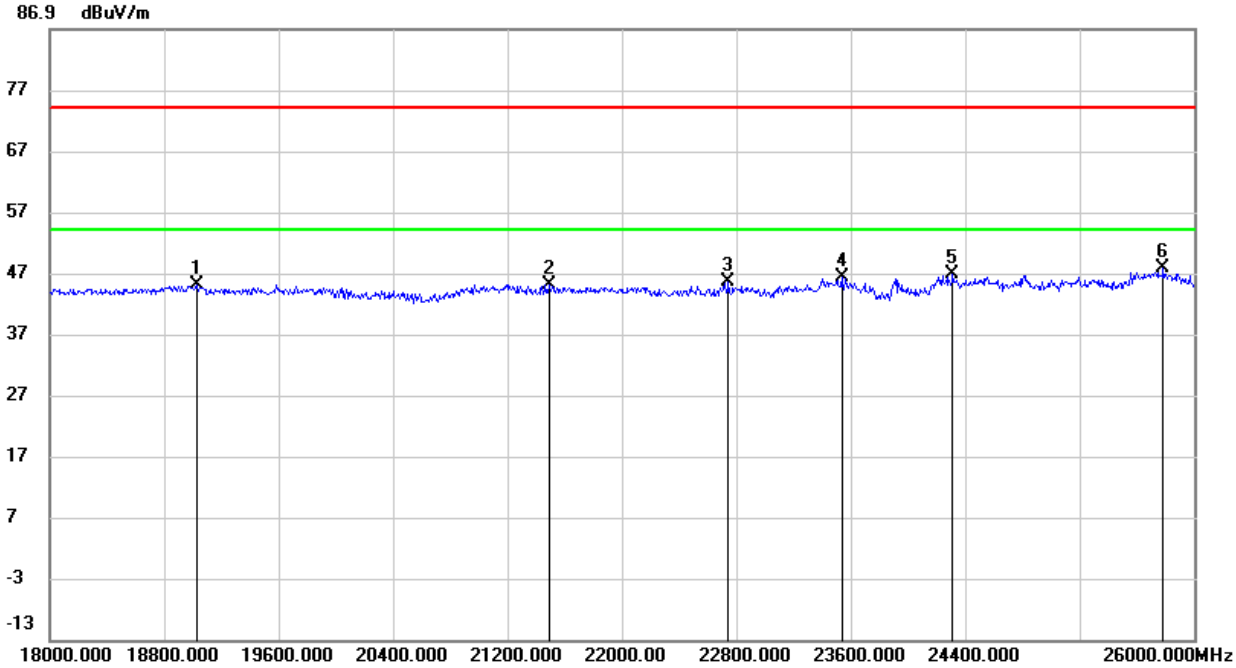



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 4958.000 | 59.38 | 1.17 | 60.55 | 74.00 | -13.45 | peak |
| 2 | 4958.000 | 51.01 | 1.17 | 52.18 | 54.00 | -1.82 | AVG |
| 3 | 7845.000 | 39.27 | 7.62 | 46.89 | 74.00 | -27.11 | peak |
| 4 | 10590.000 | 37.69 | 11.88 | 49.57 | 74.00 | -24.43 | peak |
| 5 | 13905.000 | 34.48 | 16.20 | 50.68 | 74.00 | -23.32 | peak |
| 6 | 17325.000 | 30.38 | 21.67 | 52.05 | 74.00 | -21.95 | peak |
| 7 | 17970.000 | 29.46 | 23.42 | 52.88 | 74.00 | -21.12 | 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 (18~26GHz)

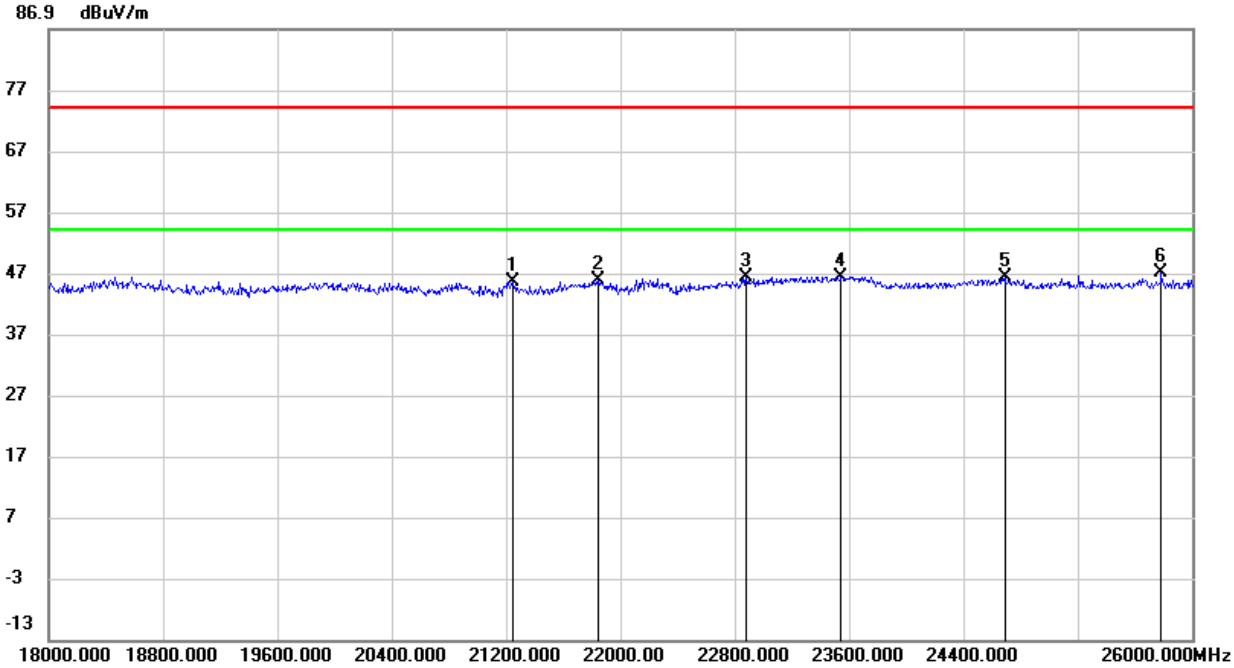
**HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)**




| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 19024.000 | 49.99 | -4.91 | 45.08 | 74.00 | -28.92 | peak |
| 2 | 21488.000 | 50.85 | -5.76 | 45.09 | 74.00 | -28.91 | peak |
| 3 | 22744.000 | 51.18 | -5.74 | 45.44 | 74.00 | -28.56 | peak |
| 4 | 23536.000 | 50.96 | -4.74 | 46.22 | 74.00 | -27.78 | peak |
| 5 | 24312.000 | 50.10 | -3.35 | 46.75 | 74.00 | -27.25 | peak |
| 6 | 25784.000 | 49.23 | -1.49 | 47.74 | 74.00 | -26.26 | 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 | 21248.000 | 50.98 | -5.51 | 45.47 | 74.00 | -28.53 | peak |
| 2 | 21848.000 | 51.76 | -5.95 | 45.81 | 74.00 | -28.19 | peak |
| 3 | 22880.000 | 51.92 | -5.67 | 46.25 | 74.00 | -27.75 | peak |
| 4 | 23544.000 | 51.13 | -4.73 | 46.40 | 74.00 | -27.60 | peak |
| 5 | 24688.000 | 48.39 | -2.11 | 46.28 | 74.00 | -27.72 | peak |
| 6 | 25784.000 | 48.58 | -1.49 | 47.09 | 74.00 | -26.91 | peak |

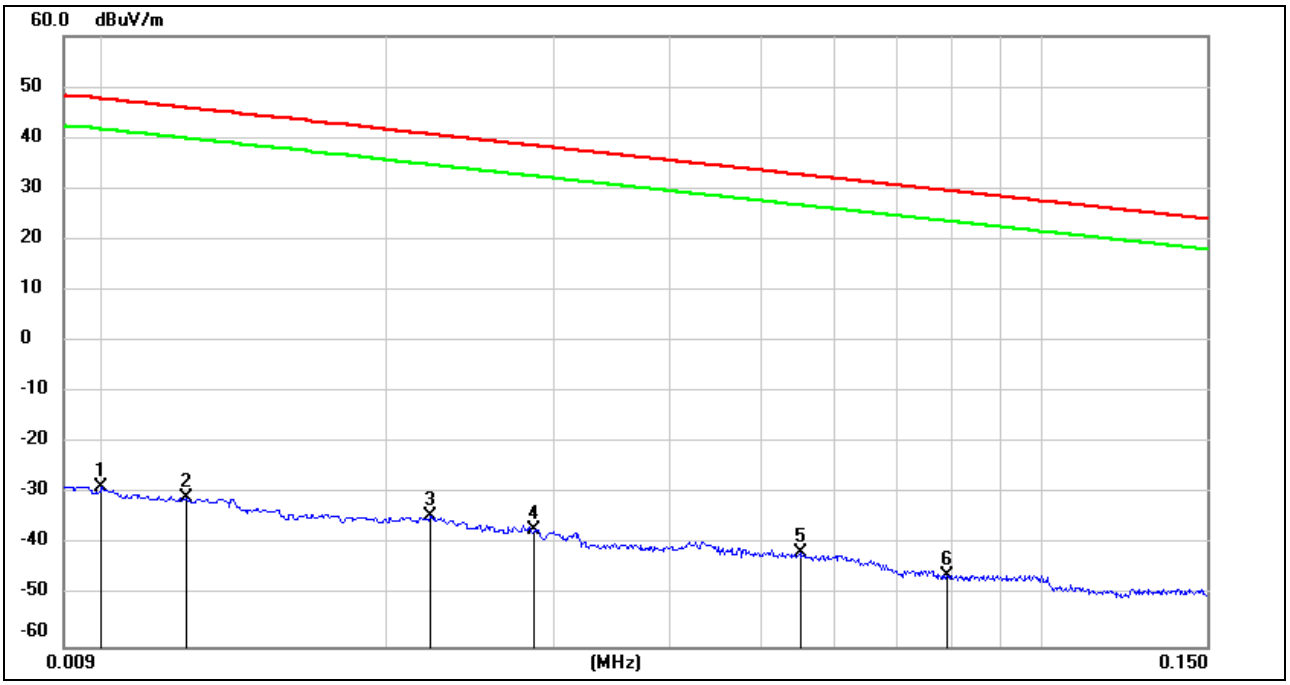
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.

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

## 7.6. SPURIOUS EMISSIONS BELOW 30MHz

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

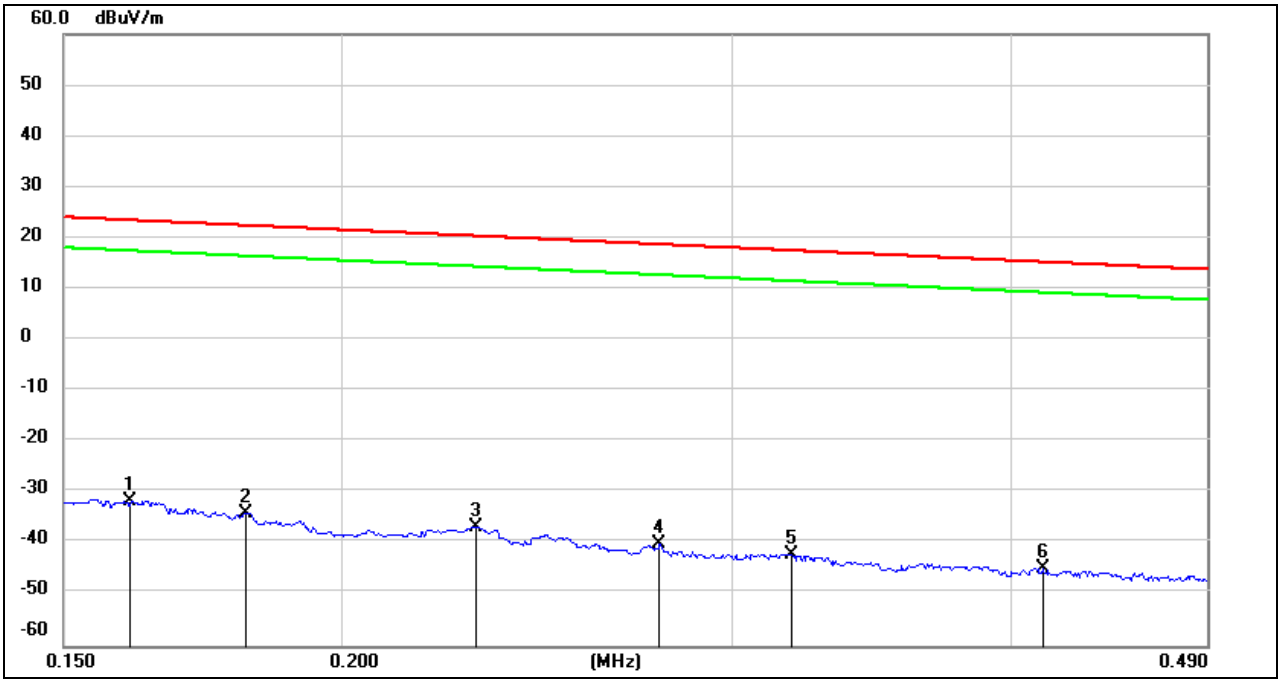
**9kHz~ 150kHz**




| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | FCC Result (dBuV/m) | FCC Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 0.0100 | 72.72 | -101.40 | -28.68 | 47.60 | -76.28 | peak |
| 2 | 0.0122 | 70.50 | -101.39 | -30.89 | 45.87 | -76.76 | peak |
| 3 | 0.0222 | 66.86 | -101.35 | -34.49 | 40.67 | -75.16 | peak |
| 4 | 0.0286 | 64.46 | -101.38 | -36.92 | 38.47 | -75.39 | peak |
| 5 | 0.0551 | 59.95 | -101.50 | -41.55 | 32.78 | -74.33 | peak |
| 6 | 0.0791 | 55.71 | -101.63 | -45.92 | 29.64 | -75.56 | 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.

**150kHz ~ 490kHz**



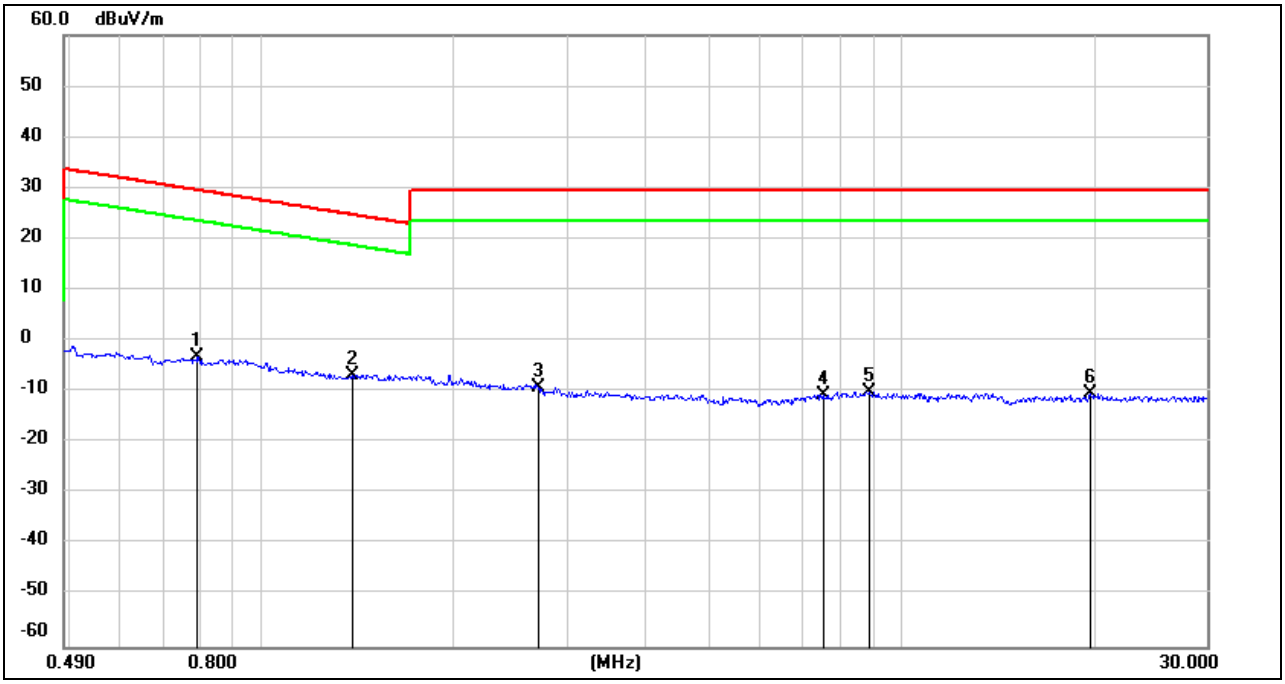

| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | FCC Result (dBuV/m) | FCC Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 0.1607 | 70.04 | -101.65 | -31.61 | 23.48 | -55.09 | peak |
| 2 | 0.1811 | 67.55 | -101.68 | -34.13 | 22.45 | -56.58 | peak |
| 3 | 0.2298 | 65.05 | -101.77 | -36.72 | 20.37 | -57.09 | peak |
| 4 | 0.2782 | 61.79 | -101.83 | -40.04 | 18.71 | -58.75 | peak |
| 5 | 0.3190 | 59.79 | -101.88 | -42.09 | 17.53 | -59.62 | peak |
| 6 | 0.4132 | 57.05 | -101.98 | -44.93 | 15.28 | -60.21 | 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.

**490kHz ~ 30MHz**



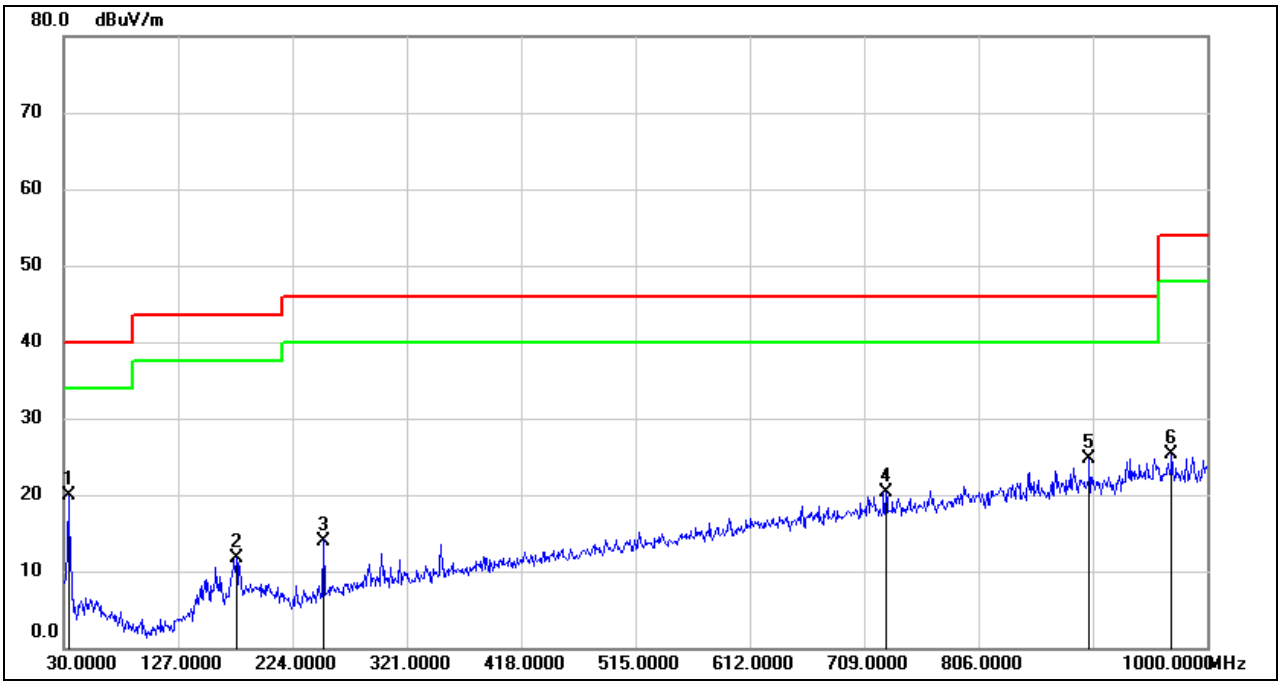

| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | FCC Result (dBuV/m) | FCC Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 0.7929 | 59.02 | -62.14 | -3.12 | 29.62 | -32.74 | peak |
| 2 | 1.3812 | 55.47 | -62.10 | -6.63 | 24.80 | -31.43 | peak |
| 3 | 2.7033 | 52.40 | -61.65 | -9.25 | 29.54 | -38.79 | peak |
| 4 | 7.5429 | 50.58 | -61.14 | -10.56 | 29.54 | -40.10 | peak |
| 5 | 8.9001 | 50.91 | -60.95 | -10.04 | 29.54 | -39.58 | peak |
| 6 | 19.7895 | 50.42 | -60.84 | -10.42 | 29.54 | -39.96 | 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 1GHz AND ABOVE 30MHz

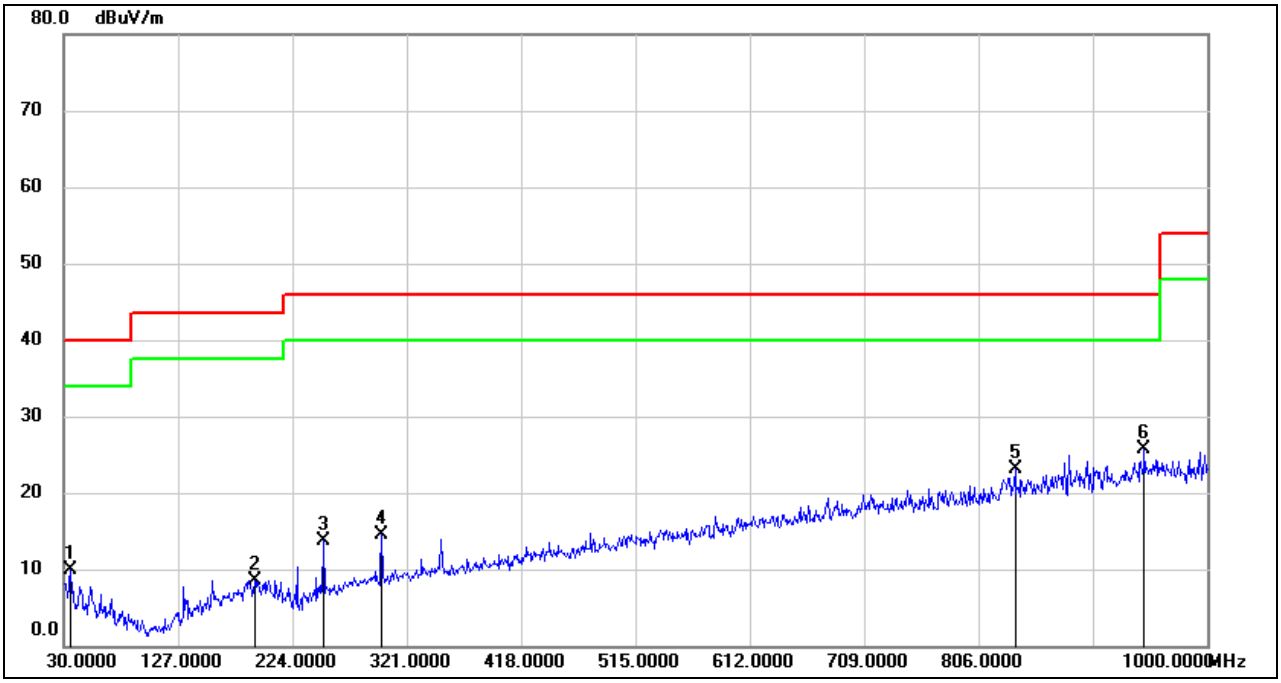
## SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)




| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 33.8800 | 37.30 | -17.33 | 19.97 | 40.00 | -20.03 | QP |
| 2 | 176.4700 | 28.56 | -16.77 | 11.79 | 43.50 | -31.71 | QP |
| 3 | 250.1900 | 30.34 | -16.34 | 14.00 | 46.00 | -32.00 | QP |
| 4 | 727.4300 | 26.91 | -6.57 | 20.34 | 46.00 | -25.66 | QP |
| 5 | 900.0900 | 28.98 | -4.25 | 24.73 | 46.00 | -21.27 | QP |
| 6 | 969.9300 | 28.69 | -3.35 | 25.34 | 54.00 | -28.66 | 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 (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 35.8200 | 27.37 | -17.56 | 9.81 | 40.00 | -30.19 | QP |
| 2 | 191.9900 | 24.70 | -16.10 | 8.60 | 43.50 | -34.90 | QP |
| 3 | 250.1900 | 29.96 | -16.34 | 13.62 | 46.00 | -32.38 | QP |
| 4 | 299.6600 | 28.83 | -14.39 | 14.44 | 46.00 | -31.56 | QP |
| 5 | 837.0400 | 28.01 | -4.94 | 23.07 | 46.00 | -22.93 | QP |
| 6 | 946.6500 | 29.15 | -3.51 | 25.64 | 46.00 | -20.36 | 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 test modes had been tested, only the worst data record in the report.

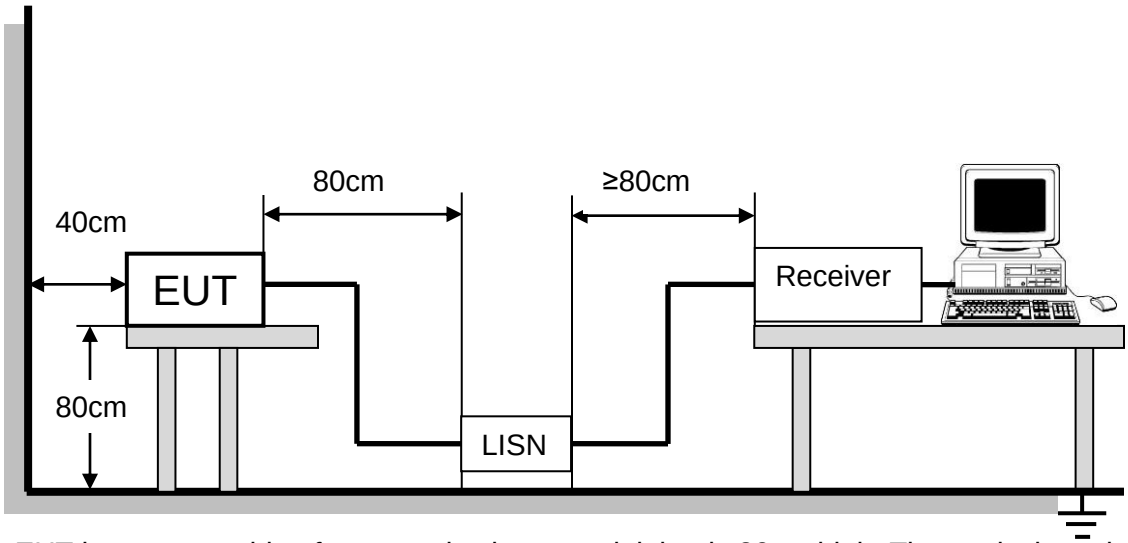
# 8. AC POWER LINE CONDUCTED EMISSIONS

**LIMITS**

Please refer to CFR 47 FCC §15.207 (a) and ISED RSS-Gen Clause 8.8

| 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 SETUP AND PROCEDURE**




The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm 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 30MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9kHz.

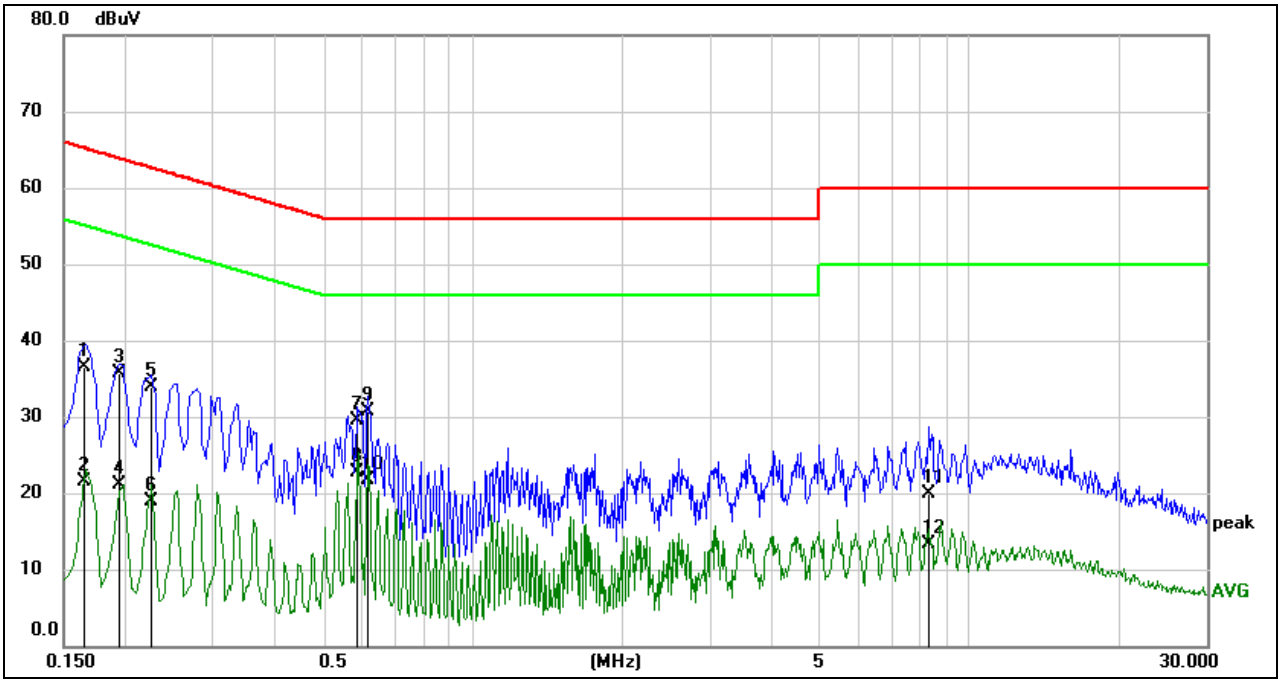
The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

**TEST ENVIRONMENT**

| | | | |
|---|---|---|---|
| Temperature | 26°C | Relative Humidity | 58% |
| Atmosphere Pressure | 101kPa | | |

**TEST RESULTS**

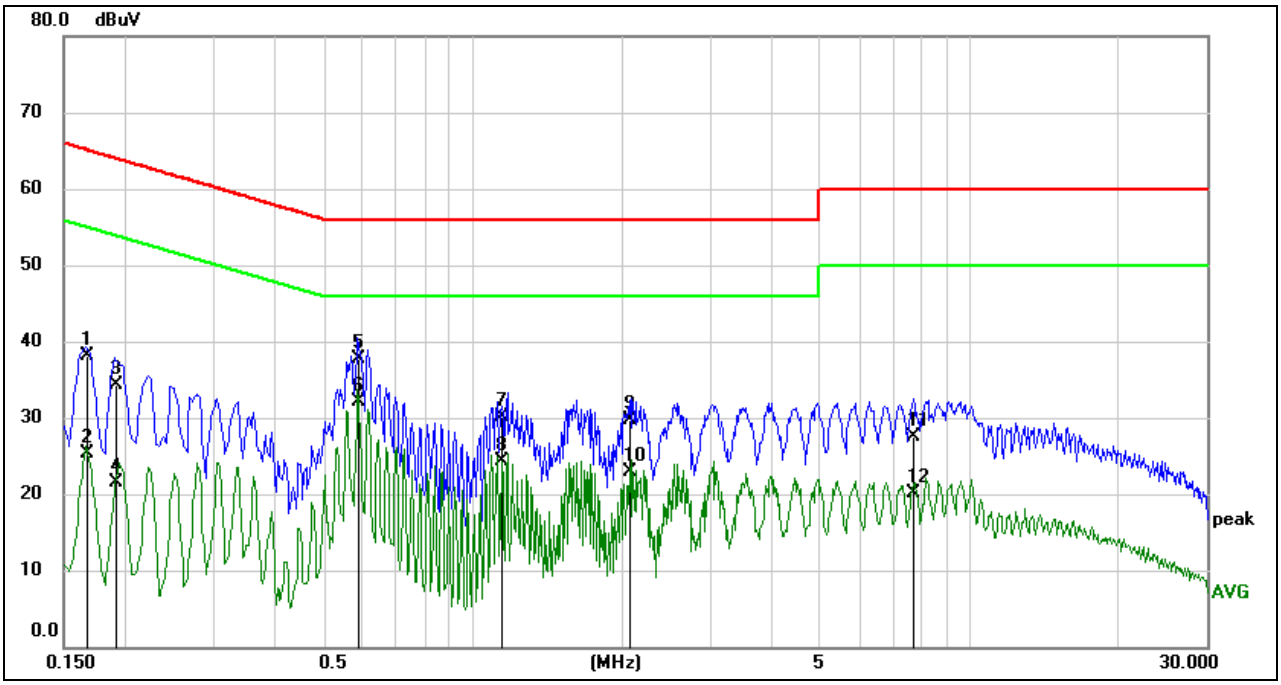
| Conducted Emissions | | | |
|---|---|---|---|
| Test Mode: | Charging | Phase: | Line |
| Test Voltage: | AC 120V_60Hz | | |




| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 0.1643 | 26.96 | 9.61 | 36.57 | 65.24 | -28.67 | QP |
| 2 | 0.1643 | 11.90 | 9.61 | 21.51 | 55.24 | -33.73 | AVG |
| 3 | 0.1952 | 26.19 | 9.60 | 35.79 | 63.81 | -28.02 | QP |
| 4 | 0.1952 | 11.53 | 9.60 | 21.13 | 53.81 | -32.68 | AVG |
| 5 | 0.2244 | 24.31 | 9.60 | 33.91 | 62.65 | -28.74 | QP |
| 6 | 0.2244 | 9.23 | 9.60 | 18.83 | 52.65 | -33.82 | AVG |
| 7 | 0.5897 | 19.97 | 9.60 | 29.57 | 56.00 | -26.43 | QP |
| 8 | 0.5897 | 13.11 | 9.60 | 22.71 | 46.00 | -23.29 | AVG |
| 9 | 0.6146 | 21.10 | 9.60 | 30.70 | 56.00 | -25.30 | QP |
| 10 | 0.6146 | 12.12 | 9.60 | 21.72 | 46.00 | -24.28 | AVG |
| 11 | 8.2990 | 10.10 | 9.72 | 19.82 | 60.00 | -40.18 | QP |
| 12 | 8.2990 | 3.53 | 9.72 | 13.25 | 50.00 | -36.75 | AVG |

Note: 1. Result = Reading +Correct (Insertion Loss + Cable Loss + Attenuator Factor)
2. Margin = Result - Limit

| Conducted Emissions | | | |
|---|---|---|---|
| Test Mode: | Charging | Phase: | Neutral |
| Test Voltage: | AC 120V_60Hz | | |




| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 0.1681 | 28.41 | 9.60 | 38.01 | 65.05 | -27.04 | QP |
| 2 | 0.1681 | 15.70 | 9.60 | 25.30 | 55.05 | -29.75 | AVG |
| 3 | 0.1915 | 24.67 | 9.60 | 34.27 | 63.97 | -29.70 | QP |
| 4 | 0.1915 | 11.83 | 9.60 | 21.43 | 53.97 | -32.54 | AVG |
| 5 | 0.5902 | 28.17 | 9.60 | 37.77 | 56.00 | -18.23 | QP |
| 6 | 0.5902 | 22.49 | 9.60 | 32.09 | 46.00 | -13.91 | AVG |
| 7 | 1.1462 | 20.43 | 9.61 | 30.04 | 56.00 | -25.96 | QP |
| 8 | 1.1462 | 14.70 | 9.61 | 24.31 | 46.00 | -21.69 | AVG |
| 9 | 2.0706 | 20.05 | 9.63 | 29.68 | 56.00 | -26.32 | QP |
| 10 | 2.0706 | 13.25 | 9.63 | 22.88 | 46.00 | -23.12 | AVG |
| 11 | 7.7326 | 17.85 | 9.72 | 27.57 | 60.00 | -32.43 | QP |
| 12 | 7.7326 | 10.31 | 9.72 | 20.03 | 50.00 | -29.97 | AVG |

Note: 1. Result = Reading +Correct (Insertion Loss + Cable Loss + Attenuator Factor)
2. Margin = Result - Limit

# 9. 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

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**END OF REPORT**