



CFR 47 FCC PART 15 SUBPART C

TEST REPORT

For

Grrrumball

**MODEL NUMBER: US858330, EU858330, YW858330, US858330B, EU858330B,
YW858330B**

FCC ID: 2AIRP8580026

REPORT NUMBER: 4788940157.1-7

ISSUE DATE: April 17, 2019

Prepared for

**ALPHA GROUP CO., LTD.
AULDEYIND. AREA, WENGUAN
RD.(CENTRAL),CHENGHAI, SHANTOU,GUANGDONG, 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, People's Republic of China**

**Tel: +86 769 22038881
Fax: +86 769 33244054
Website: www.ul.com**



Revision History

| Rev. | Issue Date | Revisions | Revised By |
|------|------------|---------------|------------|
| V0 | 04/17/2019 | Initial Issue | |



| Summary of Test Results | | | |
|-------------------------|---|--|--------------|
| Clause | Test Items | FCC Rules | Test Results |
| 1 | 20dB Bandwidth and 99% Occupied Bandwidth | CFR 47 FCC 15.249(d) | Pass |
| 2 | Radiated emission | CFR 47 FCC §15.249 (a)(d)(e) CFR 47 FCC §15.205 and §15.209 | Pass |
| 3 | Antenna Requirement | FCC Part 15.203 | Pass |



TABLE OF CONTENTS

| | |
|--|-----------|
| 1. ATTESTATION OF TEST RESULTS | 5 |
| 2. TEST METHODOLOGY | 6 |
| 3. FACILITIES AND ACCREDITATION | 6 |
| 4. CALIBRATION AND UNCERTAINTY | 7 |
| 4.1. MEASURING INSTRUMENT CALIBRATION | 7 |
| 4.2. MEASUREMENT UNCERTAINTY..... | 7 |
| 5. EQUIPMENT UNDER TEST | 8 |
| 5.1. DESCRIPTION OF EUT | 8 |
| 5.2. MAXIMUM OUTPUT POWER..... | 8 |
| 5.3. CHANNEL LIST | 8 |
| 5.4. DESCRIPTION OF AVAILABLE ANTENNAS | 8 |
| 5.5. TEST CHANNEL CONFIGURATION..... | 9 |
| 5.6. THE WORSE CASE POWER SETTING PARAMETER..... | 9 |
| 5.7. TEST ENVIRONMENT | 9 |
| 5.8. DESCRIPTION OF TEST SETUP..... | 10 |
| 5.9. MEASURING INSTRUMENT AND SOFTWARE USED..... | 11 |
| 6. ANTENNA PORT TEST RESULTS..... | 12 |
| 6.1. ON TIME AND DUTY CYCLE..... | 12 |
| 6.2. 20 dB BANDWIDTH AND 99% OCCUPIED BANDWIDTH | 14 |
| 7. RADIATED TEST RESULTS..... | 18 |
| 7.1. LIMITS AND PROCEDURE | 18 |
| 7.2. RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS 24 | |
| 7.3. SPURIOUS EMISSIONS (1~3GHz) | 30 |
| 7.4. SPURIOUS EMISSIONS (3~18GHz) | 36 |
| 7.5. SPURIOUS EMISSIONS (18~26GHz) | 42 |
| 7.6. SPURIOUS EMISSIONS BELOW 30M..... | 44 |
| 7.7. SPURIOUS EMISSIONS BELOW 1 GHz..... | 50 |
| 8. ANTENNA REQUIREMENTS..... | 52 |



1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: ALPHA GROUP CO., LTD.
Address: AULDEYIND. AREA, WENGUAN RD.(CENTRAL),CHENGHAI,
SHANTOU,GUANGDONG, CHINA

Manufacturer Information

Company Name: ALPHA GROUP CO., LTD.
Address: AULDEYIND. AREA, WENGUAN RD.(CENTRAL),CHENGHAI,
SHANTOU,GUANGDONG, CHINA

EUT Description

EUT Name: Grrrumball
Model: US858330, EU858330, YW858330, US858330B, EU858330B,
YW858330B
Model Difference: All the same except for the model name.
Brand Name: /
Sample ID: 2170638
Sample Status: Normal
Sample Received Date: March 26, 2019
Date of Tested: March 26, 2019 ~ April 17, 2019

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

Prepared By:

Denny Huang
Engineer Project Associate

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 C63.10-2014.

3. FACILITIES AND ACCREDITATION

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

Note:

1. All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, 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-18Gz) |
| | 5.23dB (18GHz-26Gz) |
| 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 | Grrrumball | |
| EUT Description | The EUT is a wireless remote controlled toy. | |
| Model | US858330 | |
| Series Model | EU858330, YW858330, US858330B, EU858330B, YW858330B | |
| Model Difference | All the same except for the model name. | |
| Product Description | Operation Frequency | 2410 MHz ~ 2475 MHz |
| | Modulation Type | GFSK |
| Battery | DC 6V | |

5.2. MAXIMUM OUTPUT POWER

| Frequency Range (MHz) | Number of Transmit Chains (NTX) | Frequency (MHz) | Channel Number | Max Power (dBμV/m) |
|-----------------------|---------------------------------|-----------------|----------------|--------------------|
| 2410 ~ 2475 | 1 | 2475 | 27[27] | 91.59 |

5.3. CHANNEL LIST

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------|
| 1 | 2410 | 8 | 2424 | 15 | 2441 | 22 | 2465 |
| 2 | 2412 | 9 | 2426 | 16 | 2443 | 23 | 2467 |
| 3 | 2414 | 10 | 2431 | 17 | 2445 | 24 | 2469 |
| 4 | 2416 | 11 | 2433 | 18 | 2447 | 25 | 2471 |
| 5 | 2418 | 12 | 2435 | 19 | 2459 | 26 | 2473 |
| 6 | 2420 | 13 | 2437 | 20 | 2461 | 27 | 2475 |
| 7 | 2422 | 14 | 2439 | 21 | 2463 | / | / |

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

| Ant. | Frequency (MHz) | Antenna Type | Antenna Gain (dBi) |
|------|-----------------|--------------|--------------------|
| 1 | 2410 ~ 2475 | Wire Antenna | 2.5 |

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



5.5. TEST CHANNEL CONFIGURATION

| Test Mode | Test Channel | Frequency |
|-----------|--------------------|---------------------------|
| GFSK | CH 1, CH 17, CH 27 | 2410MHz, 2445MHz, 2475MHz |

5.6. THE WORSE CASE POWER SETTING PARAMETER

| The Worse Case Power Setting Parameter under 2402 ~ 2483.5MHz Band | | | | |
|--|-------------------------|--------------|---------|---------|
| Test Software | | / | | |
| Modulation Type | Transmit Antenna Number | Test Channel | | |
| | | CH 1 | CH 17 | CH 27 |
| 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 | N/A |
| | VN | DC 6V |
| | VH | N/A |

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 |
|------|-----------|------------|------------|-----|
| 1 | / | / | / | / |

I/O CABLES

| Cable No | Port | Connector Type | Cable Type | Cable Length(m) | Remarks |
|----------|------|----------------|------------|-----------------|---------|
| 1 | / | / | / | / | / |

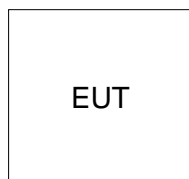
ACCESSORY

| Item | Accessory | Brand Name | Model Name | Description |
|------|-----------|------------|------------|-------------|
| 1 | / | / | / | / |

TEST SETUP

The EUT have the engineering mode inside.

SETUP DIAGRAM FOR TEST



Note: New battery was used during all tests.

**5.9. MEASURING INSTRUMENT AND SOFTWARE USED**

| Conducted Emissions | | | | | | |
|-------------------------------------|---|--------------|---|-------------------|-----------------|-------------|
| Instrument | | | | | | |
| Used | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
| <input checked="" type="checkbox"/> | EMI Test Receiver | R&S | ESR3 | 101961 | Dec.10,2018 | Dec.10,2019 |
| <input checked="" type="checkbox"/> | Two-Line V- Network | R&S | ENV216 | 101983 | Dec.10,2018 | Dec.10,2019 |
| <input checked="" type="checkbox"/> | Artificial Mains Networks | Schwarzbeck | NSLK 8126 | 8126465 | Dec.10,2018 | Dec.10,2019 |
| Software | | | | | | |
| Used | Description | | Manufacturer | Name | | Version |
| <input checked="" type="checkbox"/> | Test Software for Conducted disturbance | | Farad | EZ-EMC | | Ver. UL-3A1 |
| Radiated Emissions | | | | | | |
| Instrument | | | | | | |
| Used | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
| <input checked="" type="checkbox"/> | MXE EMI Receiver | KESIGHT | N9038A | MY56400036 | Dec.10,2018 | Dec.10,2019 |
| <input checked="" type="checkbox"/> | Hybrid Log Periodic Antenna | TDK | HLP-3003C | 130960 | Sep.17,2018 | Sep.17,2021 |
| <input checked="" type="checkbox"/> | Preamplifier | HP | 8447D | 2944A09099 | Dec.10,2018 | Dec.10,2019 |
| <input checked="" type="checkbox"/> | EMI Measurement Receiver | R&S | ESR26 | 101377 | Dec.10,2018 | Dec.10,2019 |
| <input checked="" type="checkbox"/> | Horn Antenna | TDK | HRN-0118 | 130939 | Sep.17,2018 | Sep.17,2021 |
| <input checked="" type="checkbox"/> | High Gain Horn Antenna | Schwarzbeck | BBHA-9170 | 691 | Aug.18,2018 | Aug.18,2021 |
| <input checked="" type="checkbox"/> | Preamplifier | TDK | PA-02-0118 | TRS-305- 00066 | Dec.10,2018 | Dec.10,2019 |
| <input checked="" type="checkbox"/> | Preamplifier | TDK | PA-02-2 | TRS-307- 00003 | Dec.10,2018 | Dec.10,2019 |
| <input checked="" type="checkbox"/> | Loop antenna | Schwarzbeck | 1519B | 00008 | Jan.17, 2019 | Jan.17,2022 |
| Software | | | | | | |
| Used | Description | | Manufacturer | Name | | Version |
| <input checked="" type="checkbox"/> | Test Software for Radiated disturbance | | Farad | EZ-EMC | | Ver. UL-3A1 |
| Other instruments | | | | | | |
| Used | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
| <input checked="" type="checkbox"/> | Spectrum Analyzer | Keysight | N9030A | MY55410512 | Dec.10,2018 | Dec.10,2019 |
| <input checked="" type="checkbox"/> | Band Reject Filter | Wainwright | WRCJV8- 2350-2400- 2483.5- 2533.5-40SS | 4 | Dec.10,2018 | Dec.10,2019 |
| <input checked="" type="checkbox"/> | High Pass Filter | Wi | WHKX10- 2700-3000- 18000-40SS | 23 | Dec.10,2018 | Dec.10,2019 |



6. ANTENNA PORT TEST RESULTS

6.1. ON TIME AND DUTY CYCLE

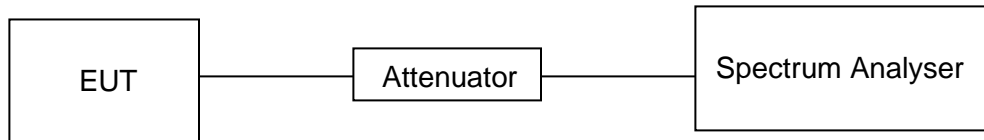
LIMITS

None; for reporting purposes only

PROCEDURE

ANSI C63.10-2014 Zero-Span Spectrum Analyzer Method

TEST SETUP



RESULTS

| Mode | On Time (msec) | Period (msec) | Duty Cycle x (Linear) | Duty Cycle (%) | Duty Cycle Correction Factor (dB) | 1/T Minimum VBW (KHz) | Final setting For VBW (KHz) |
|------|----------------|---------------|-----------------------|----------------|-----------------------------------|-----------------------|-----------------------------|
| GFSK | 0.640 | 5.07 | 0.126 | 12.62 | 9.00 | 1.563 | 2 |

Note:

Duty Cycle Correction Factor= $10\log(1/x)$.

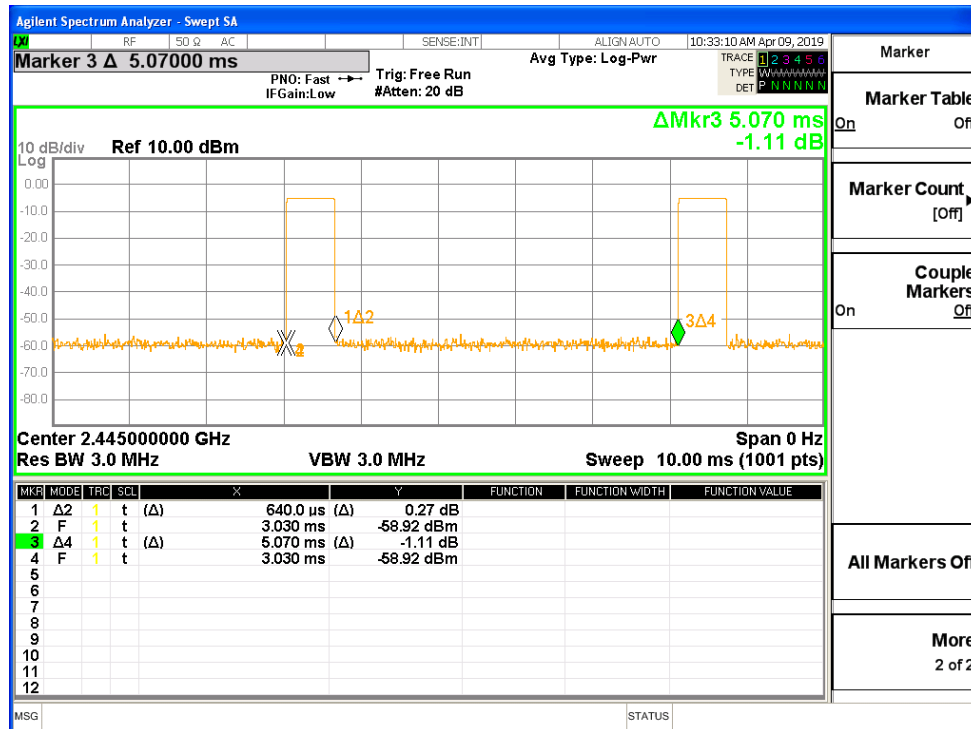
Where: x is Duty Cycle(Linear)

Where: T is On Time (transmit duration)

If that calculated VBW is not available on the analyzer then the next higher value should be used.



ON TIME AND DUTY CYCLE PLOT





6.2. 20 dB BANDWIDTH AND 99% OCCUPIED BANDWIDTH

LIMITS

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

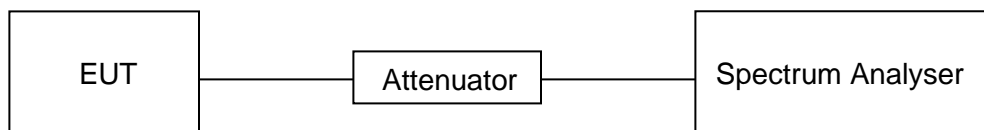
TEST PROCEDURE

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

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

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

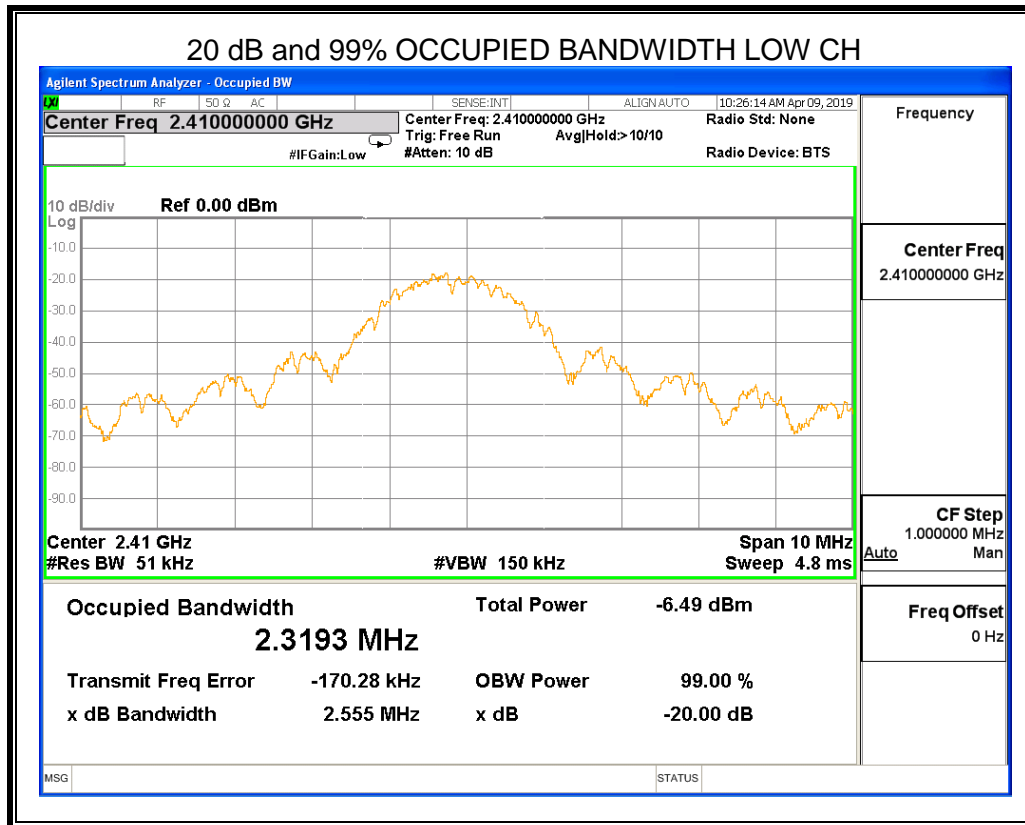
TEST SETUP





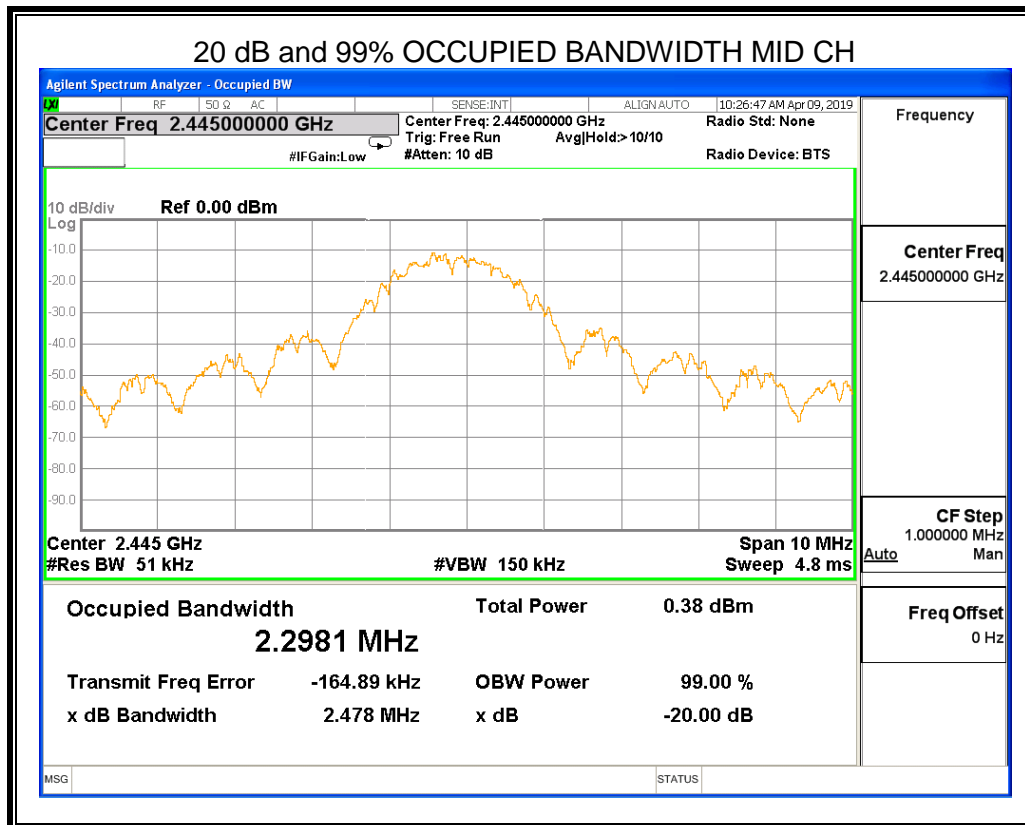
RESULTS

| Frequency (MHz) | 20dB bandwidth (MHz) | 99% bandwidth (MHz) | Result |
|-----------------|----------------------|---------------------|--------|
| 2410 | 2.555 | 2.3193 | PASS |



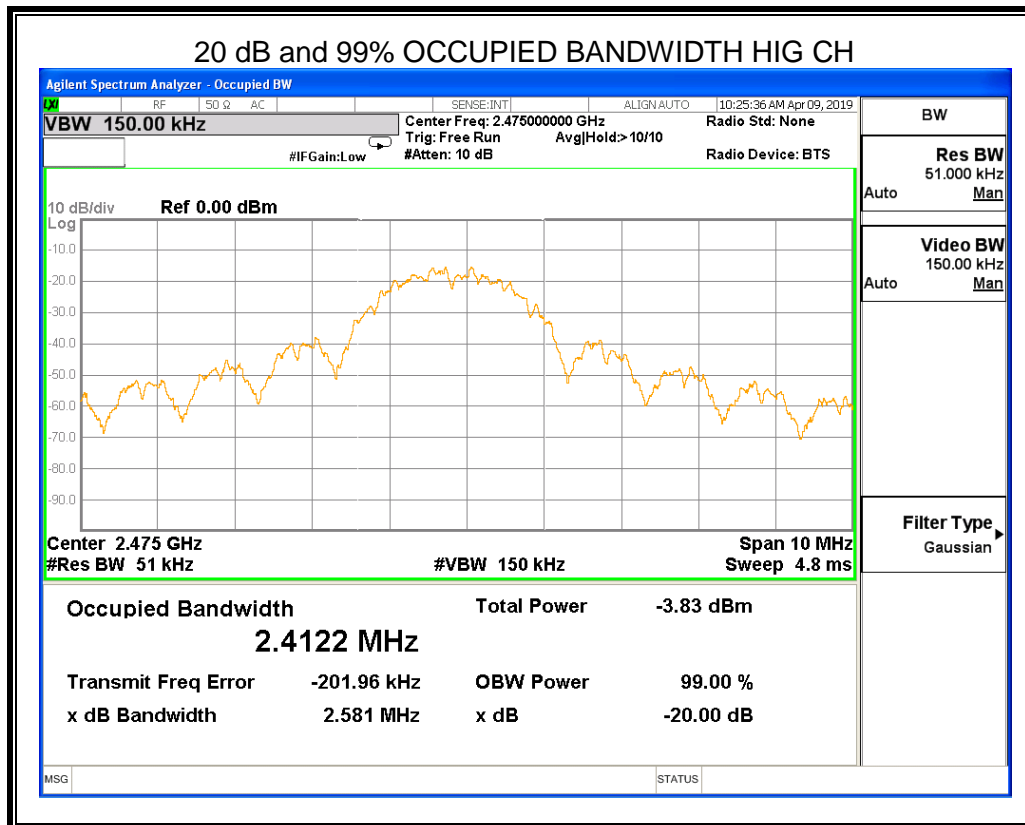


| Frequency (MHz) | 20dB bandwidth (MHz) | 99% bandwidth (MHz) | Result |
|-----------------|----------------------|---------------------|--------|
| 2445 | 2.478 | 2.2981 | PASS |





| Frequency (MHz) | 20dB bandwidth (MHz) | 99% bandwidth (MHz) | Result |
|-----------------|----------------------|---------------------|--------|
| 2475 | 2.581 | 2.4122 | PASS |





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)(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 (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 |

| 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:

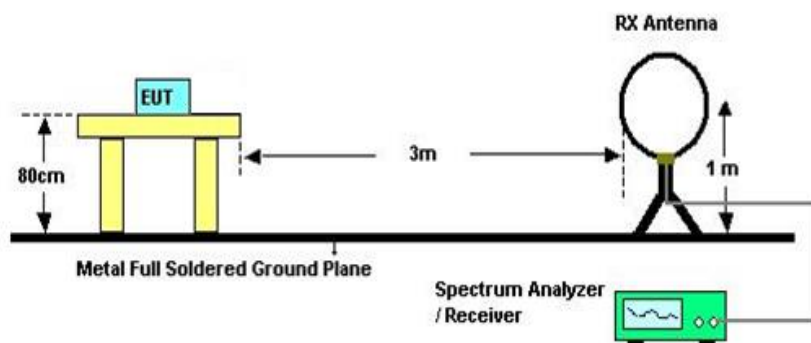
| MHz | MHz | MHz | GHz |
|--------------------------|---------------------|---------------|------------------|
| 0.090-0.110 | 16.42-16.423 | 399.9-410 | 4.5-5.15 |
| ¹ 0.495-0.505 | 16.69475-16.69525 | 608-614 | 5.35-5.46 |
| 2.1735-2.1905 | 16.80425-16.80475 | 960-1240 | 7.25-7.75 |
| 4.125-4.128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

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

²Above 38.6c

TEST SETUP AND PROCEDURE

Below 30MHz

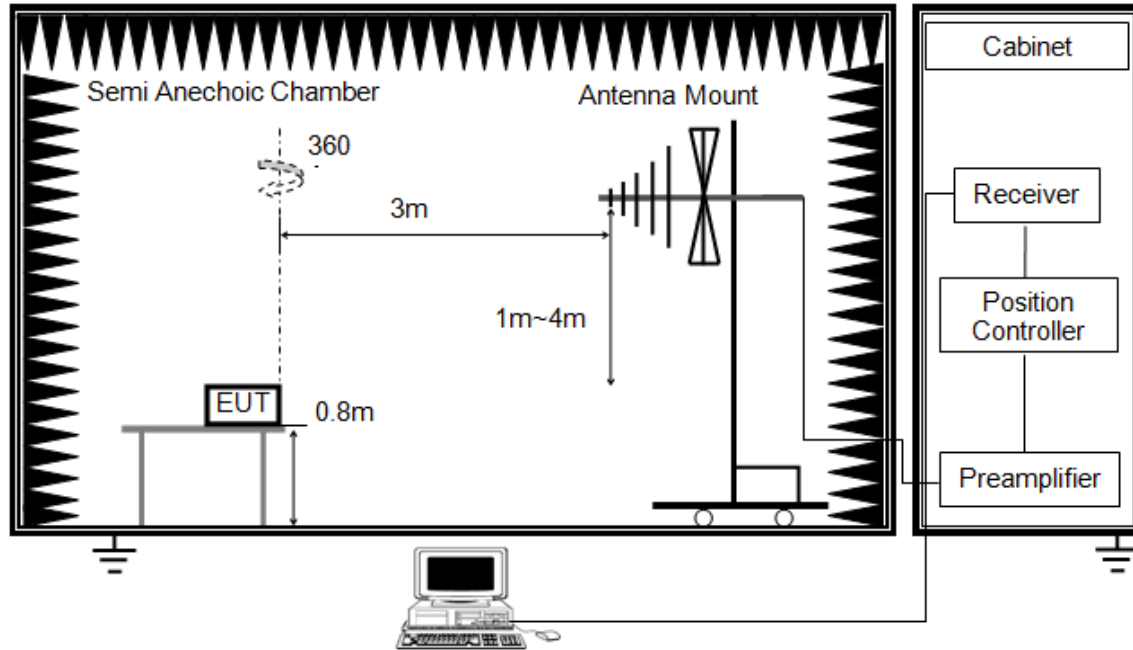


The setting of the spectrum analyser

| | |
|----------|--|
| 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 and vertical 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 variable 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 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30m open field site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

Below 1G

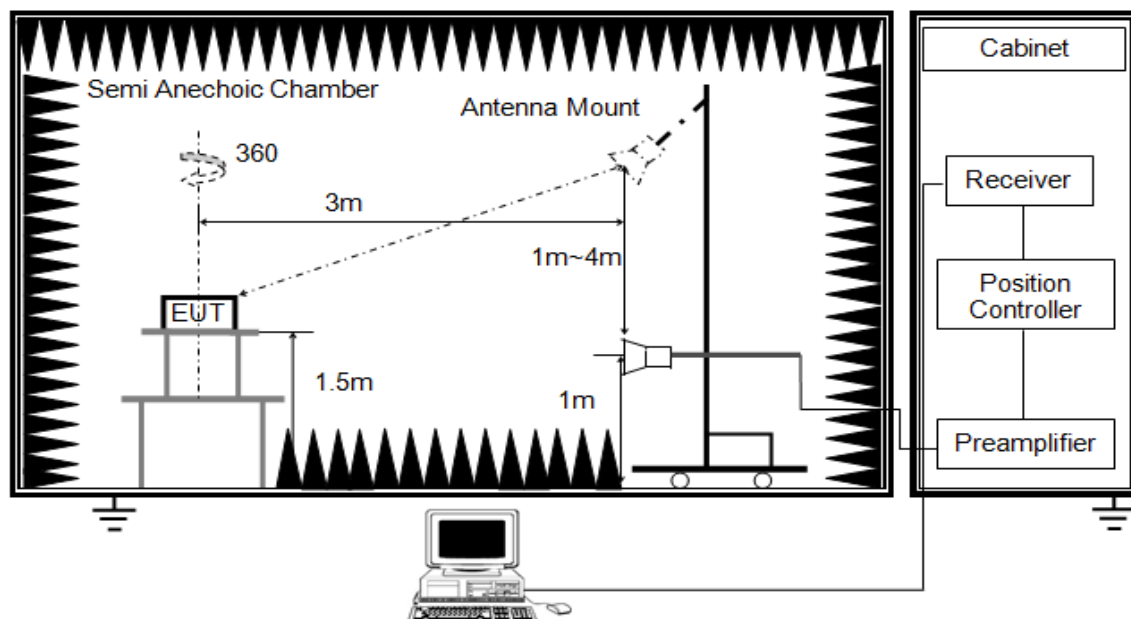


The setting of the spectrum analyser

| | |
|----------|----------|
| 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. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

Above 1G

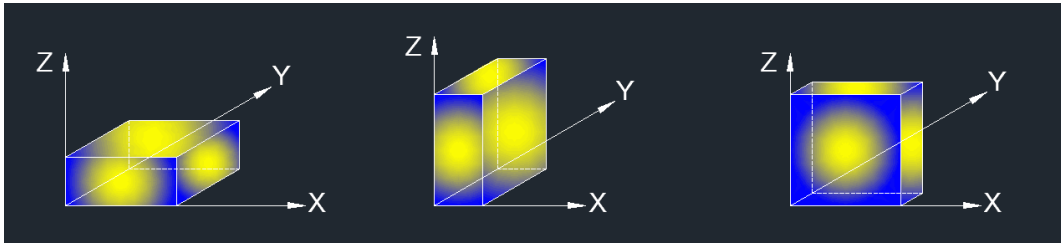


The setting of the spectrum analyser

| | |
|----------|-----------------------------|
| RBW | 1M |
| VBW | PEAK: 3M 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 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. For measurement above 1GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.
6. For average power measurement, set the detector to AVG, while maintaining all of the other instrument settings, if the duty cycle of the EUT is less than 98%, the Duty Cycle Correction Factor shall be added to the measured emission levels. 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:

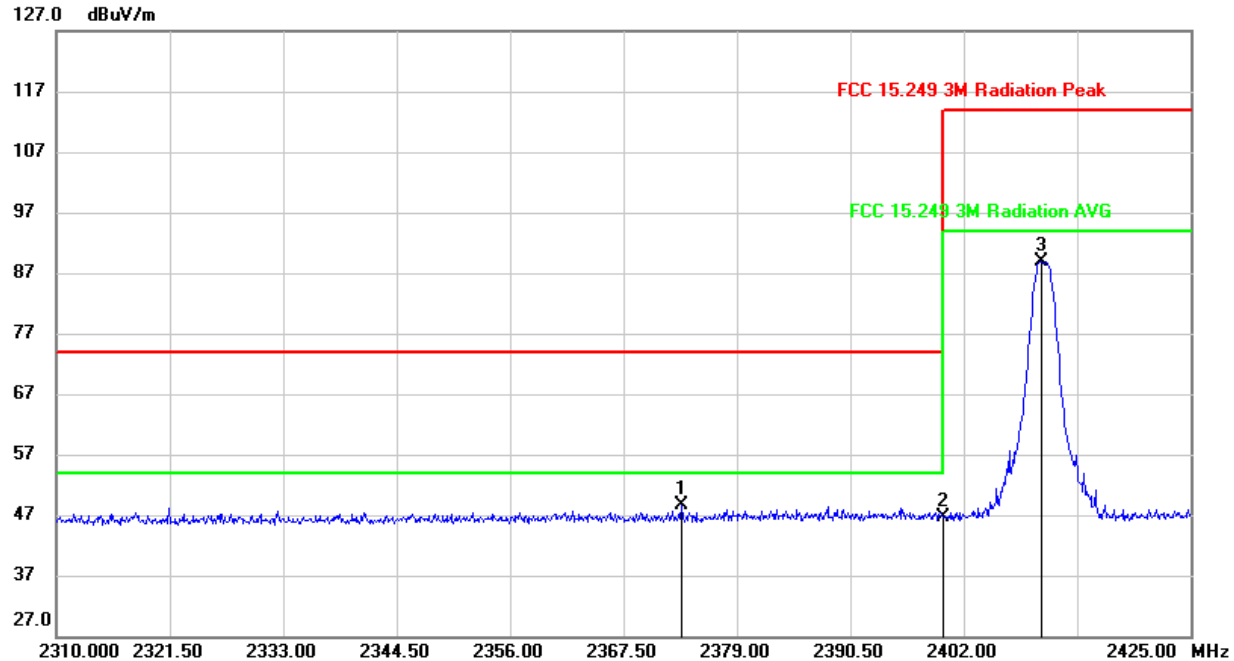


Note 1: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.



7.2. RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS

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

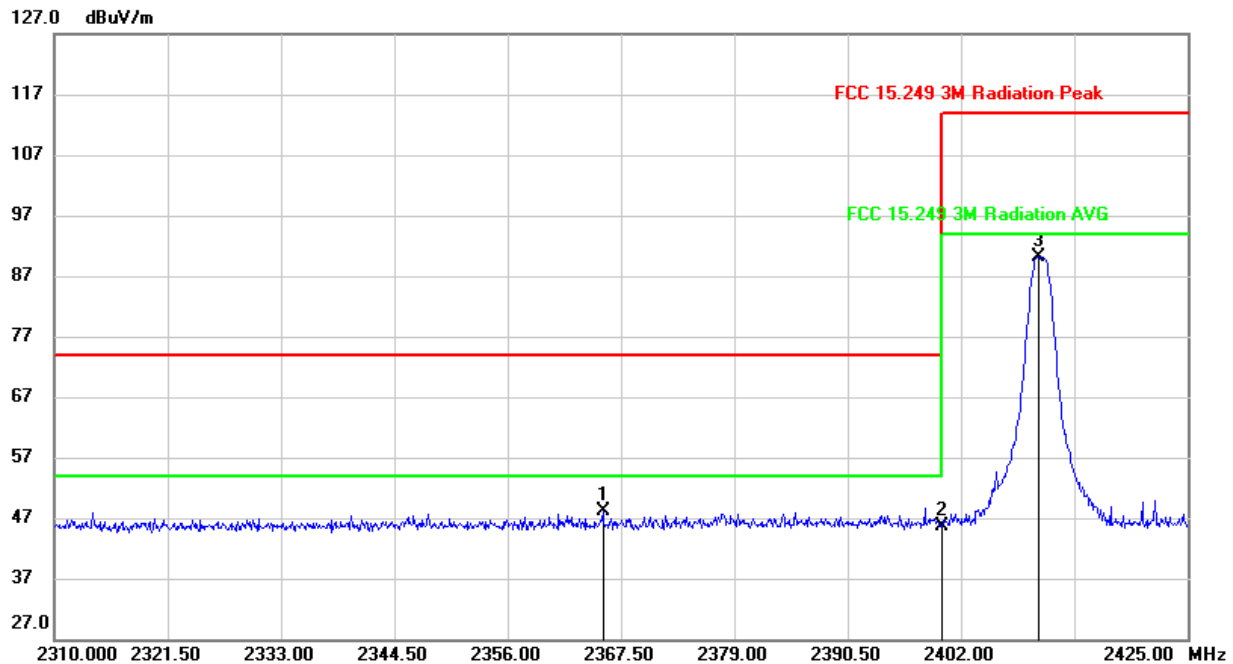


| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1 | 2373.365 | 15.64 | 32.89 | 48.53 | 74.00 | -25.47 | peak |
| 2 | 2400.000 | 13.61 | 32.98 | 46.59 | 74.00 | -27.41 | peak |
| 3 | 2409.820 | 55.78 | 33.05 | 88.83 | 114.00 | -25.17 | 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. 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)

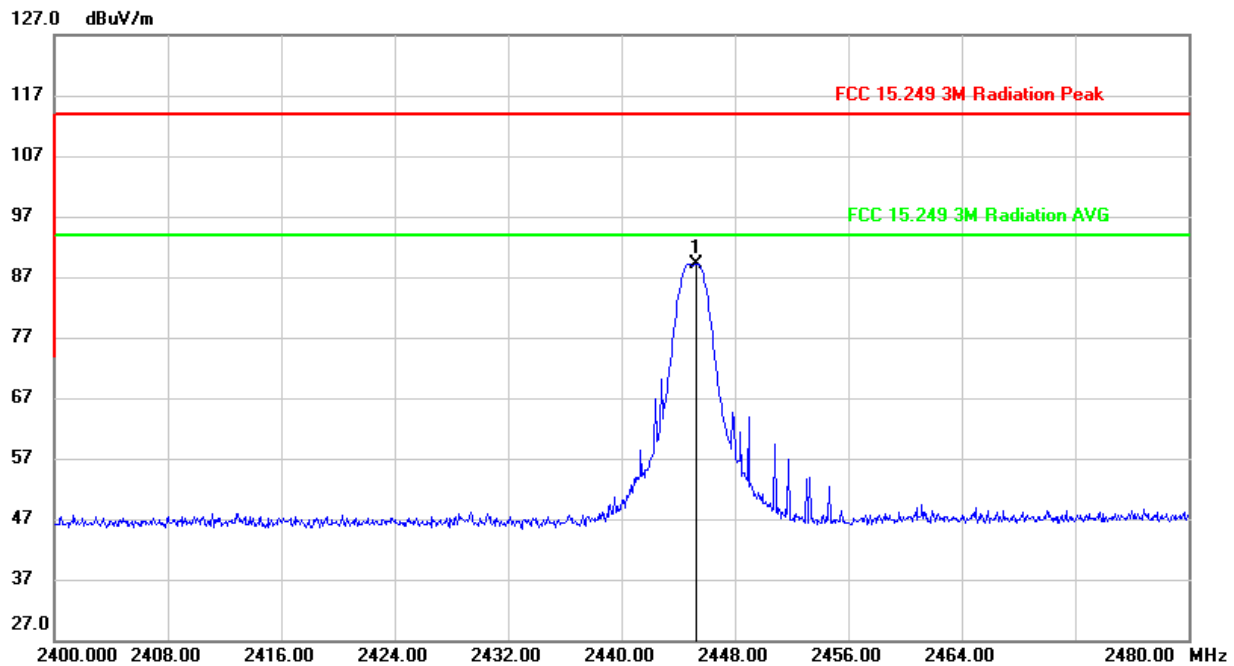


| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1 | 2365.660 | 15.29 | 32.86 | 48.15 | 74.00 | -25.85 | peak |
| 2 | 2400.000 | 12.76 | 32.98 | 45.74 | 74.00 | -28.26 | peak |
| 3 | 2409.820 | 57.06 | 33.05 | 90.11 | 114.00 | -23.89 | 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. 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)

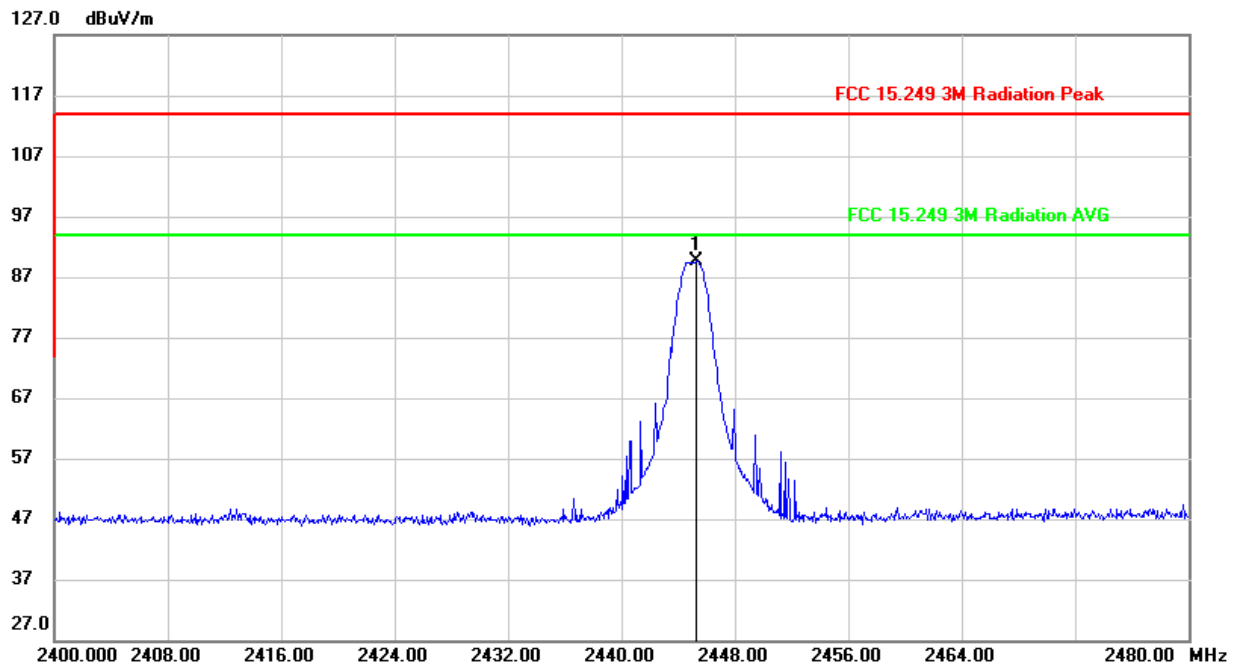


| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1 | 2445.280 | 55.87 | 33.30 | 89.17 | 114.00 | -24.83 | 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, VERTICAL)

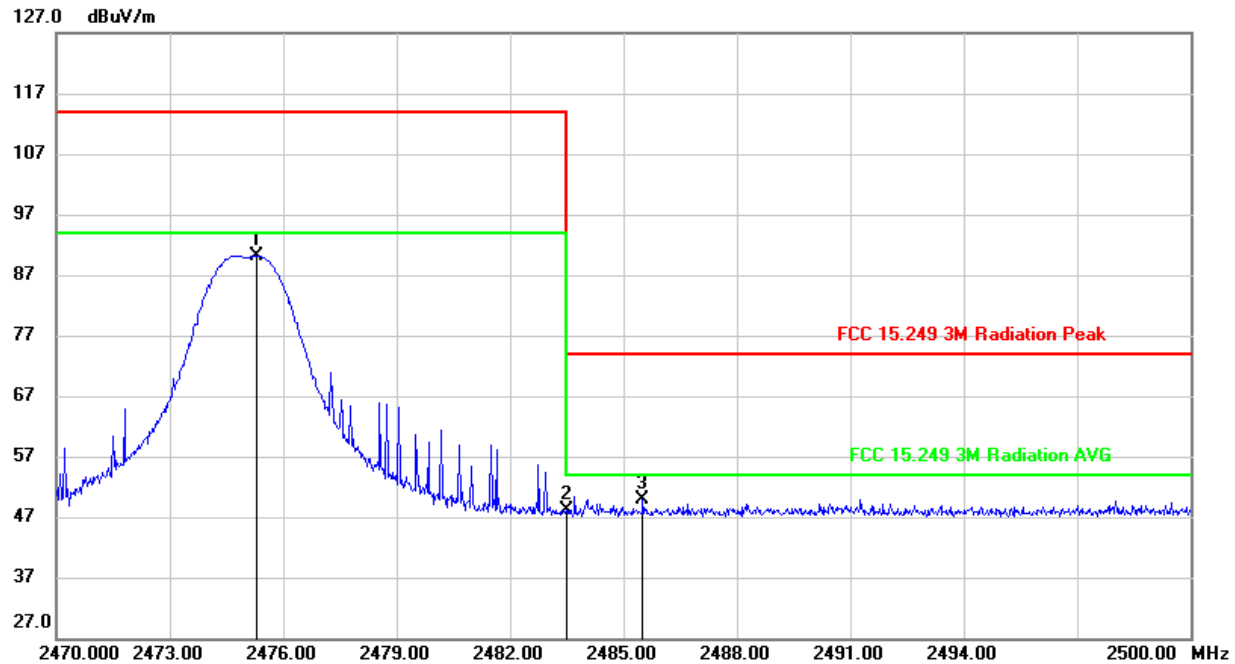


| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1 | 2445.280 | 56.24 | 33.30 | 89.54 | 114.00 | -24.46 | 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.



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

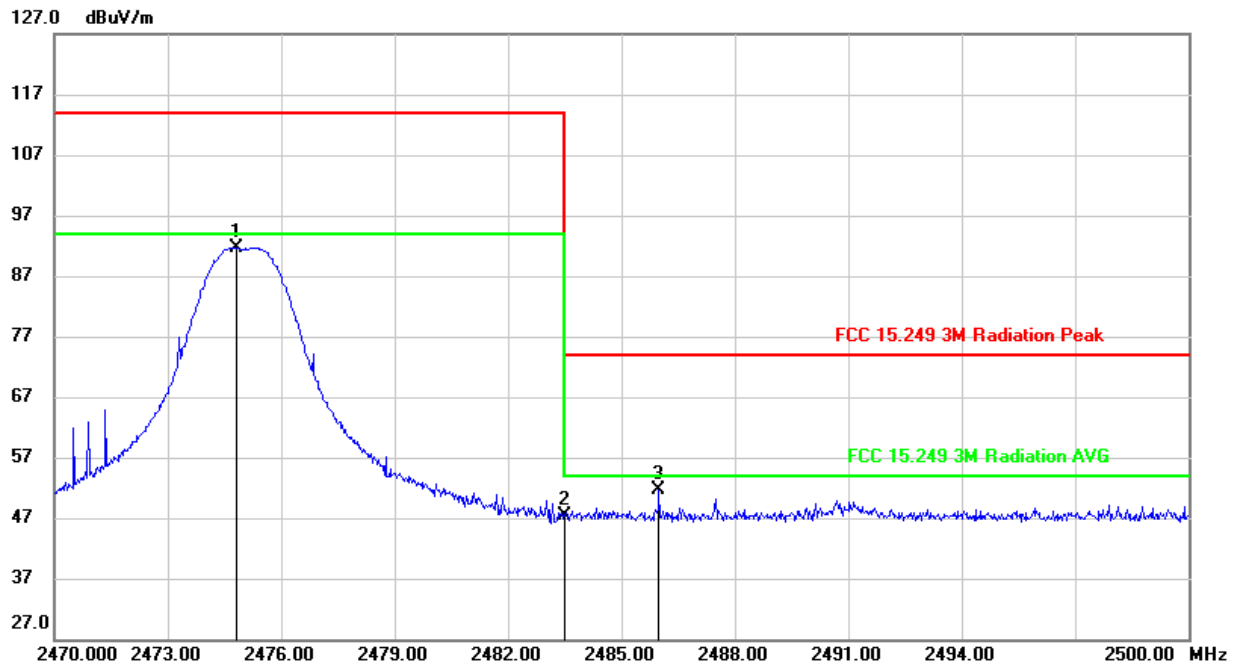


| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 2475.280 | 56.60 | 33.53 | 90.13 | 114.00 | -23.87 | peak |
| 2 | 2483.500 | 14.48 | 33.58 | 48.06 | 74.00 | -25.94 | peak |
| 3 | 2485.510 | 16.35 | 33.59 | 49.94 | 74.00 | -24.06 | 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.



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



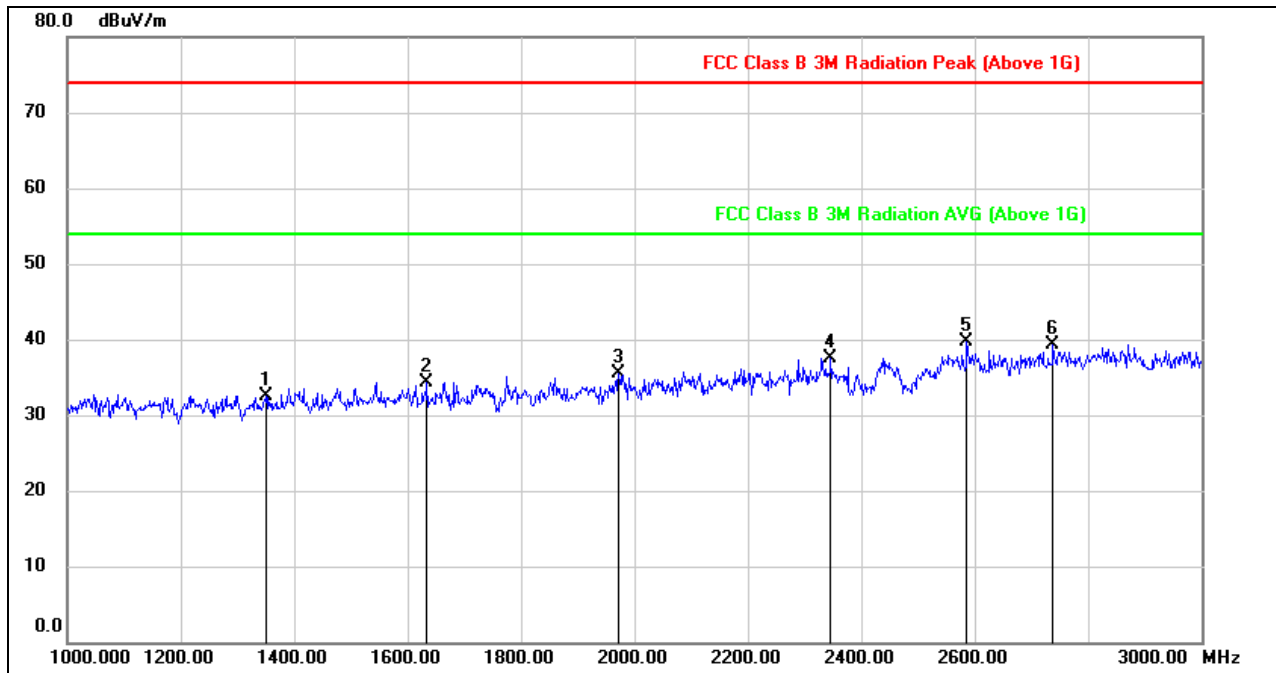
| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 2474.800 | 58.08 | 33.51 | 91.59 | 114.00 | -22.41 | peak |
| 2 | 2483.500 | 13.81 | 33.58 | 47.39 | 74.00 | -26.61 | peak |
| 3 | 2485.990 | 18.05 | 33.59 | 51.64 | 74.00 | -22.36 | 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.



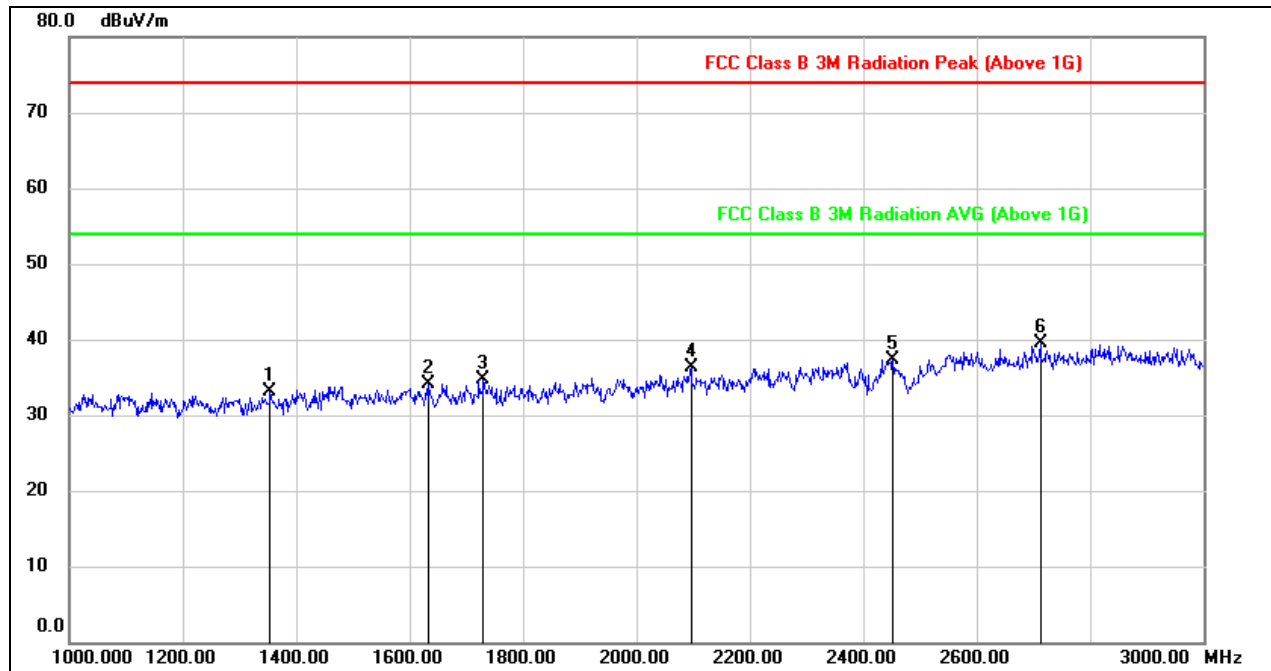
7.3. SPURIOUS EMISSIONS (1~3GHz)

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 | 1350.000 | 44.05 | -11.56 | 32.49 | 74.00 | -41.51 | peak |
| 2 | 1634.000 | 44.94 | -10.64 | 34.30 | 74.00 | -39.70 | peak |
| 3 | 1972.000 | 45.19 | -9.65 | 35.54 | 74.00 | -38.46 | peak |
| 4 | 2346.000 | 44.85 | -7.32 | 37.53 | 74.00 | -36.47 | peak |
| 5 | 2586.000 | 46.36 | -6.73 | 39.63 | 74.00 | -34.37 | peak |
| 6 | 2738.000 | 45.86 | -6.57 | 39.29 | 74.00 | -34.71 | 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 BRF 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 | 1354.000 | 44.65 | -11.60 | 33.05 | 74.00 | -40.95 | peak |
| 2 | 1634.000 | 44.82 | -10.64 | 34.18 | 74.00 | -39.82 | peak |
| 3 | 1730.000 | 45.12 | -10.32 | 34.80 | 74.00 | -39.20 | peak |
| 4 | 2096.000 | 44.60 | -8.38 | 36.22 | 74.00 | -37.78 | peak |
| 5 | 2452.000 | 43.96 | -6.71 | 37.25 | 74.00 | -36.75 | peak |
| 6 | 2712.000 | 46.62 | -7.16 | 39.46 | 74.00 | -34.54 | peak |

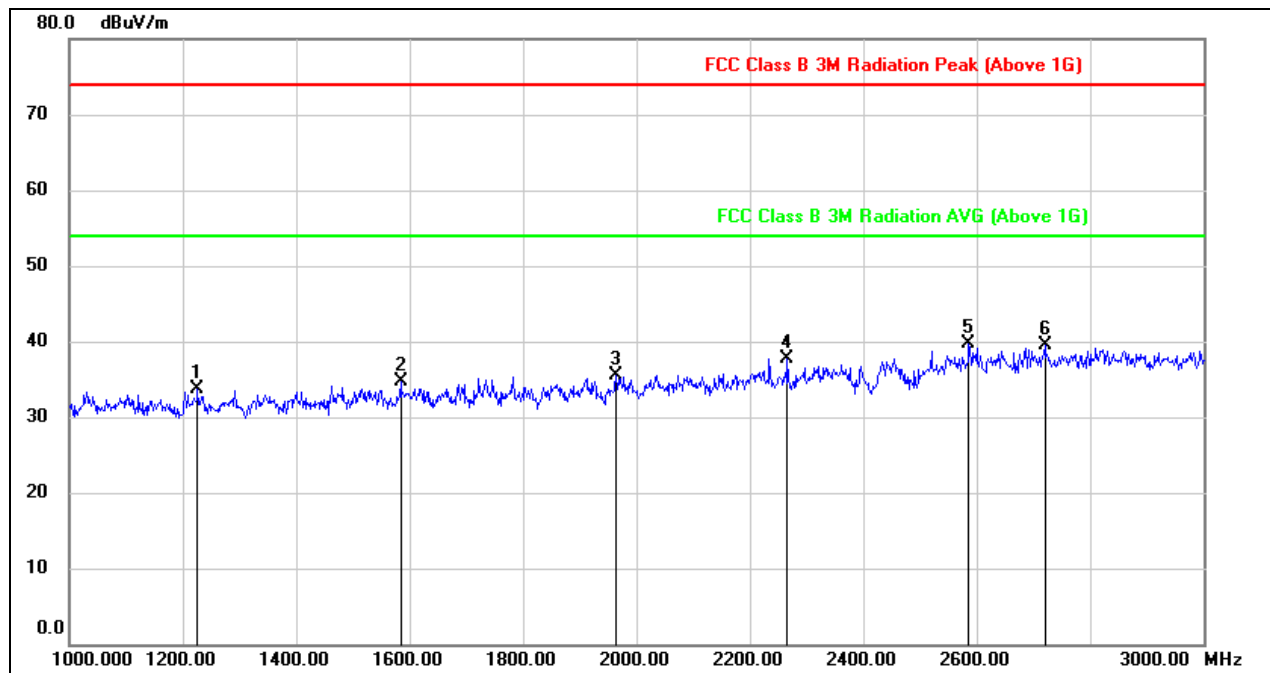
Note: 1. Peak Result = Reading Level + Correct Factor.

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

3. Peak: Peak detector.

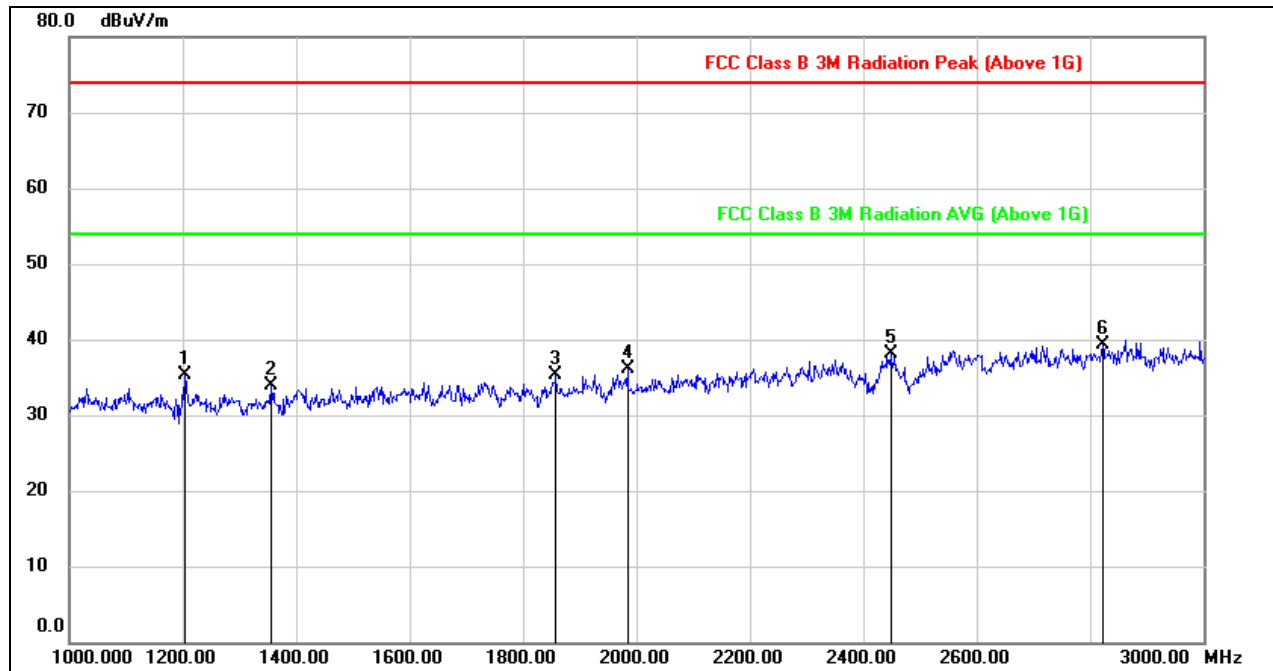
4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for BRF losses.

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 | 1226.000 | 45.83 | -12.11 | 33.72 | 74.00 | -40.28 | peak |
| 2 | 1584.000 | 45.49 | -10.77 | 34.72 | 74.00 | -39.28 | peak |
| 3 | 1964.000 | 45.06 | -9.61 | 35.45 | 74.00 | -38.55 | peak |
| 4 | 2266.000 | 45.44 | -7.82 | 37.62 | 74.00 | -36.38 | peak |
| 5 | 2586.000 | 46.46 | -6.73 | 39.73 | 74.00 | -34.27 | peak |
| 6 | 2720.000 | 46.55 | -6.97 | 39.58 | 74.00 | -34.42 | 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 BRF 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 | 1204.000 | 47.77 | -12.39 | 35.38 | 74.00 | -38.62 | peak |
| 2 | 1356.000 | 45.60 | -11.61 | 33.99 | 74.00 | -40.01 | peak |
| 3 | 1858.000 | 44.66 | -9.35 | 35.31 | 74.00 | -38.69 | peak |
| 4 | 1984.000 | 45.77 | -9.70 | 36.07 | 74.00 | -37.93 | peak |
| 5 | 2448.000 | 44.76 | -6.73 | 38.03 | 74.00 | -35.97 | peak |
| 6 | 2822.000 | 44.53 | -5.18 | 39.35 | 74.00 | -34.65 | peak |

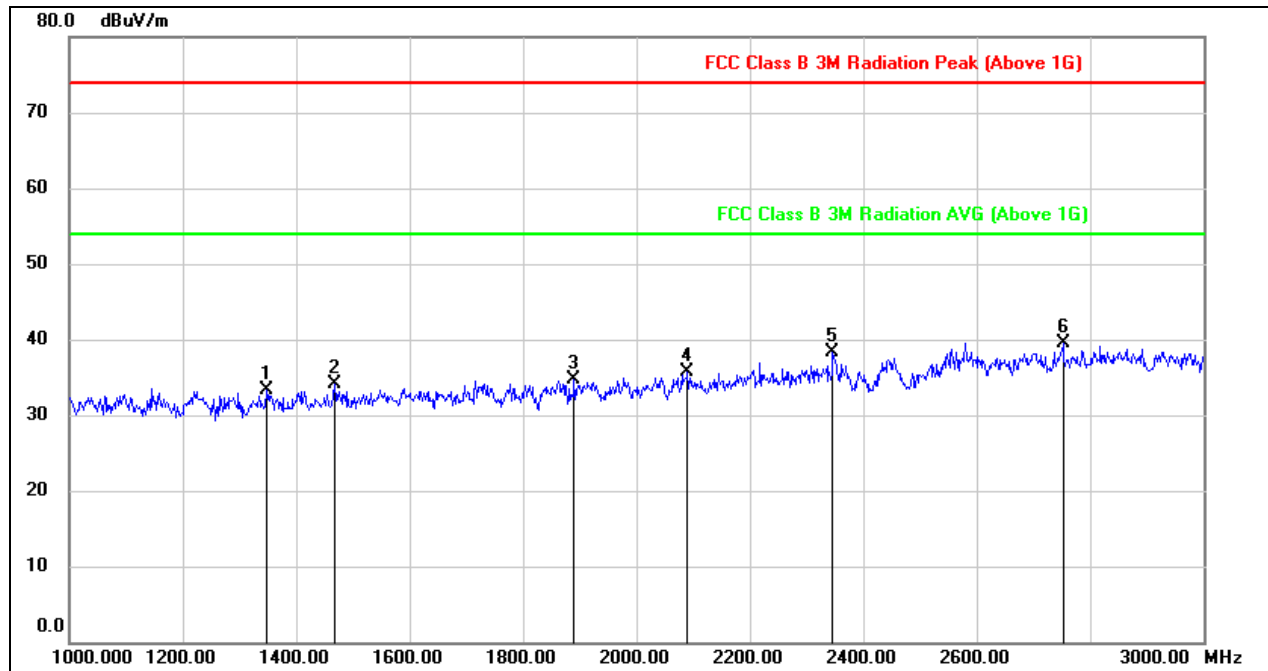
Note: 1. Peak Result = Reading Level + Correct Factor.

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 the spurious frequency bands and the authorized band was not corrected for BRF 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 | 1348.000 | 44.85 | -11.54 | 33.31 | 74.00 | -40.69 | peak |
| 2 | 1468.000 | 45.76 | -11.71 | 34.05 | 74.00 | -39.95 | peak |
| 3 | 1890.000 | 44.00 | -9.31 | 34.69 | 74.00 | -39.31 | peak |
| 4 | 2090.000 | 44.22 | -8.46 | 35.76 | 74.00 | -38.24 | peak |
| 5 | 2346.000 | 45.67 | -7.32 | 38.35 | 74.00 | -35.65 | peak |
| 6 | 2752.000 | 45.78 | -6.26 | 39.52 | 74.00 | -34.48 | peak |

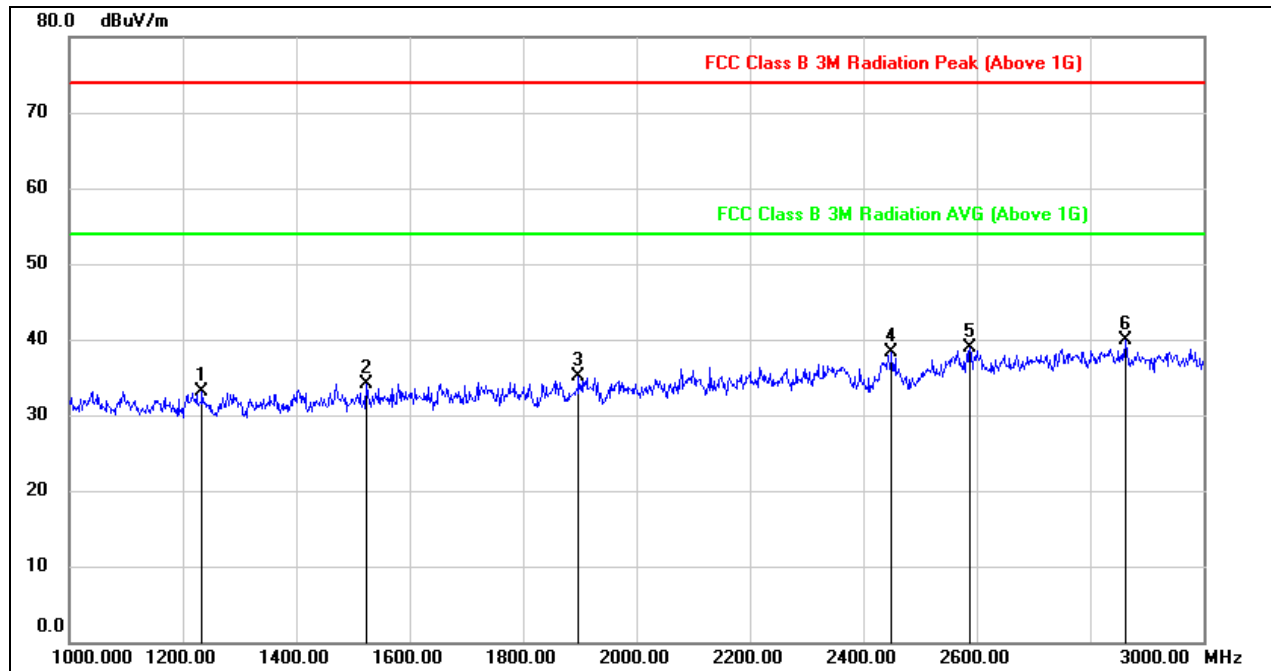
Note: 1. Peak Result = Reading Level + Correct Factor.

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 BRF 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 | 1234.000 | 45.19 | -12.02 | 33.17 | 74.00 | -40.83 | peak |
| 2 | 1524.000 | 45.52 | -11.36 | 34.16 | 74.00 | -39.84 | peak |
| 3 | 1898.000 | 44.31 | -9.30 | 35.01 | 74.00 | -38.99 | peak |
| 4 | 2450.000 | 45.04 | -6.72 | 38.32 | 74.00 | -35.68 | peak |
| 5 | 2588.000 | 45.60 | -6.74 | 38.86 | 74.00 | -35.14 | peak |
| 6 | 2862.000 | 45.05 | -5.17 | 39.88 | 74.00 | -34.12 | 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.

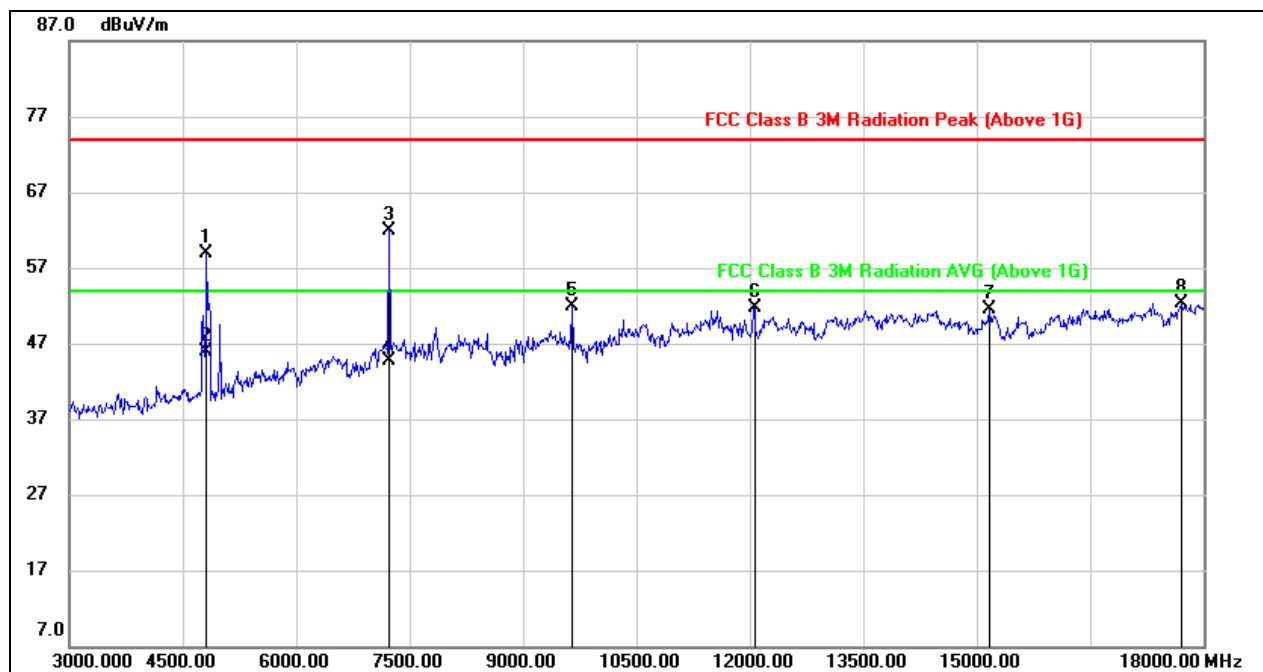
4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for BRF losses.

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)

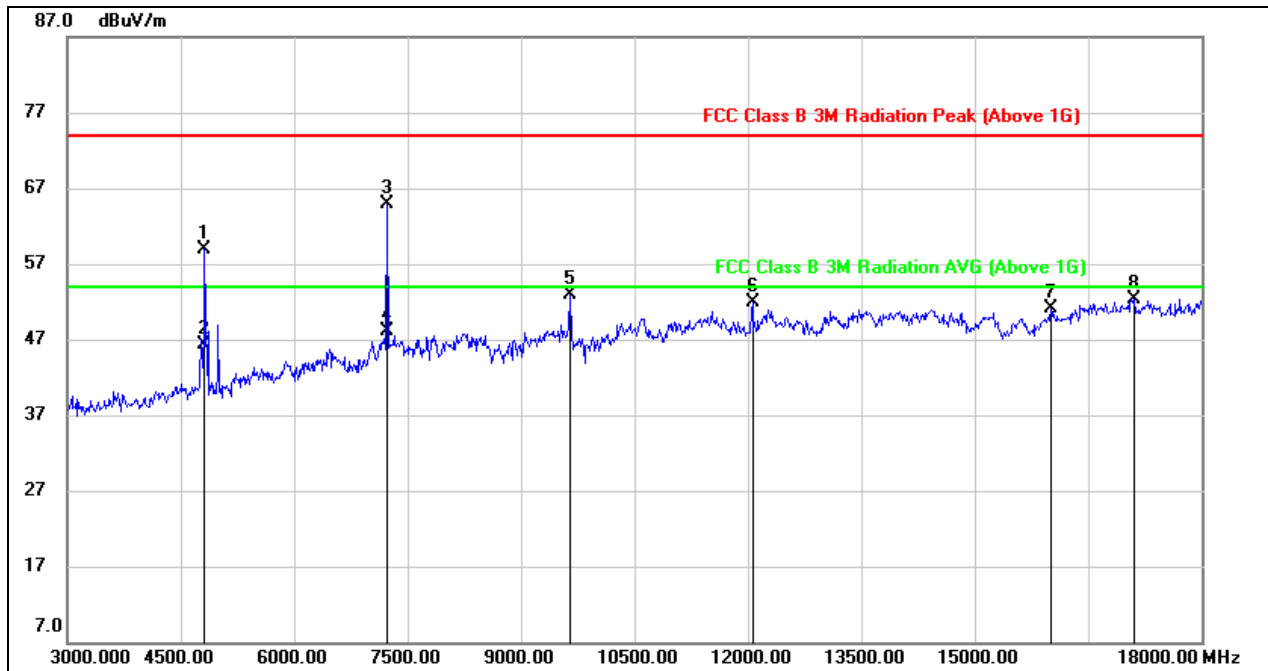


| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 4820.000 | 59.11 | -0.21 | 58.90 | 74.00 | -15.10 | peak |
| 2 | 4820.035 | 46.19 | -0.21 | 45.98 | 54.00 | -8.02 | AVG |
| 3 | 7230.000 | 55.04 | 6.96 | 62.00 | 74.00 | -12.00 | peak |
| 4 | 7230.000 | 37.66 | 6.96 | 44.62 | 54.00 | -9.38 | AVG |
| 5 | 9645.000 | 41.82 | 10.03 | 51.85 | 74.00 | -22.15 | peak |
| 6 | 12060.000 | 37.53 | 14.26 | 51.79 | 74.00 | -22.21 | peak |
| 7 | 15165.000 | 35.97 | 15.54 | 51.51 | 74.00 | -22.49 | peak |
| 8 | 17715.000 | 29.97 | 22.39 | 52.36 | 74.00 | -21.64 | 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. AVG: $VBW=1/Ton$ where: ton is transmit duration.
 5. For transmit duration, 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)

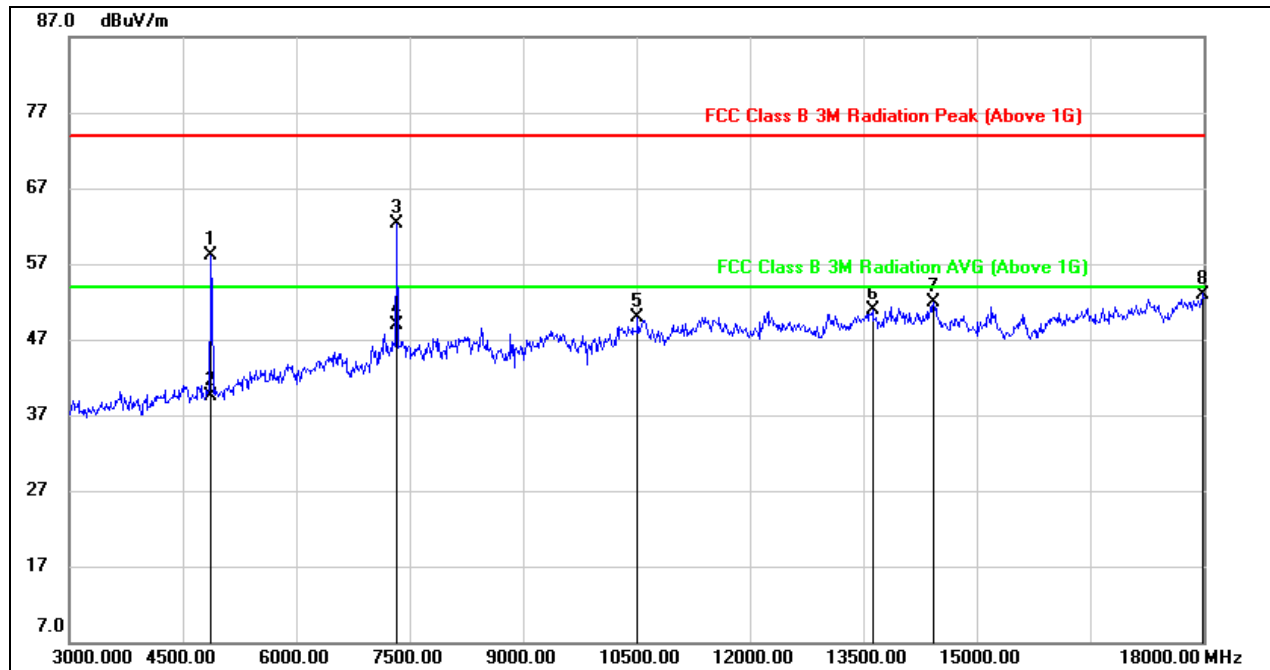


| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1 | 4815.000 | 59.15 | -0.23 | 58.92 | 74.00 | -15.08 | peak |
| 2 | 4820.115 | 46.56 | -0.21 | 46.35 | 54.00 | -7.65 | AVG |
| 3 | 7230.000 | 58.02 | 6.96 | 64.98 | 74.00 | -9.02 | peak |
| 4 | 7230.180 | 41.19 | 6.96 | 48.15 | 54.00 | -5.85 | AVG |
| 5 | 9645.000 | 42.91 | 10.03 | 52.94 | 74.00 | -21.06 | peak |
| 6 | 12060.000 | 37.61 | 14.26 | 51.87 | 74.00 | -22.13 | peak |
| 7 | 16005.000 | 33.84 | 17.20 | 51.04 | 74.00 | -22.96 | peak |
| 8 | 17115.000 | 31.59 | 20.81 | 52.40 | 74.00 | -21.60 | 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. AVG: VBW=1/Ton where: ton is transmit duration.
5. For transmit duration, 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.

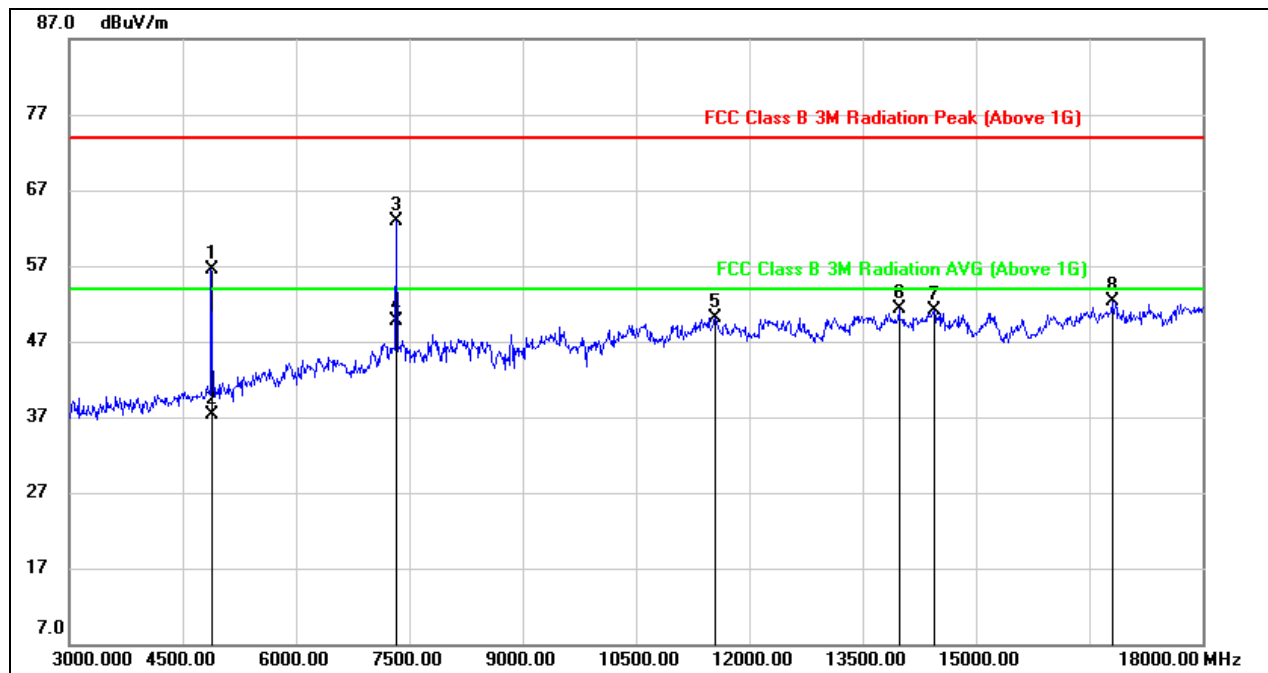


HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1 | 4875.599 | 58.16 | -0.12 | 58.04 | 74.00 | -15.96 | peak |
| 2 | 4875.599 | 39.66 | -0.12 | 39.54 | 54.00 | -14.46 | AVG |
| 3 | 7335.060 | 55.06 | 7.26 | 62.32 | 74.00 | -11.68 | peak |
| 4 | 7335.060 | 41.59 | 7.26 | 48.85 | 54.00 | -5.15 | AVG |
| 5 | 10515.000 | 38.05 | 11.89 | 49.94 | 74.00 | -24.06 | peak |
| 6 | 13620.000 | 34.83 | 16.04 | 50.87 | 74.00 | -23.13 | peak |
| 7 | 14430.000 | 35.52 | 16.39 | 51.91 | 74.00 | -22.09 | peak |
| 8 | 17985.000 | 29.75 | 23.25 | 53.00 | 74.00 | -21.00 | 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. AVG: VBW=1/Ton where: ton is transmit duration.
5. For transmit duration, 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.

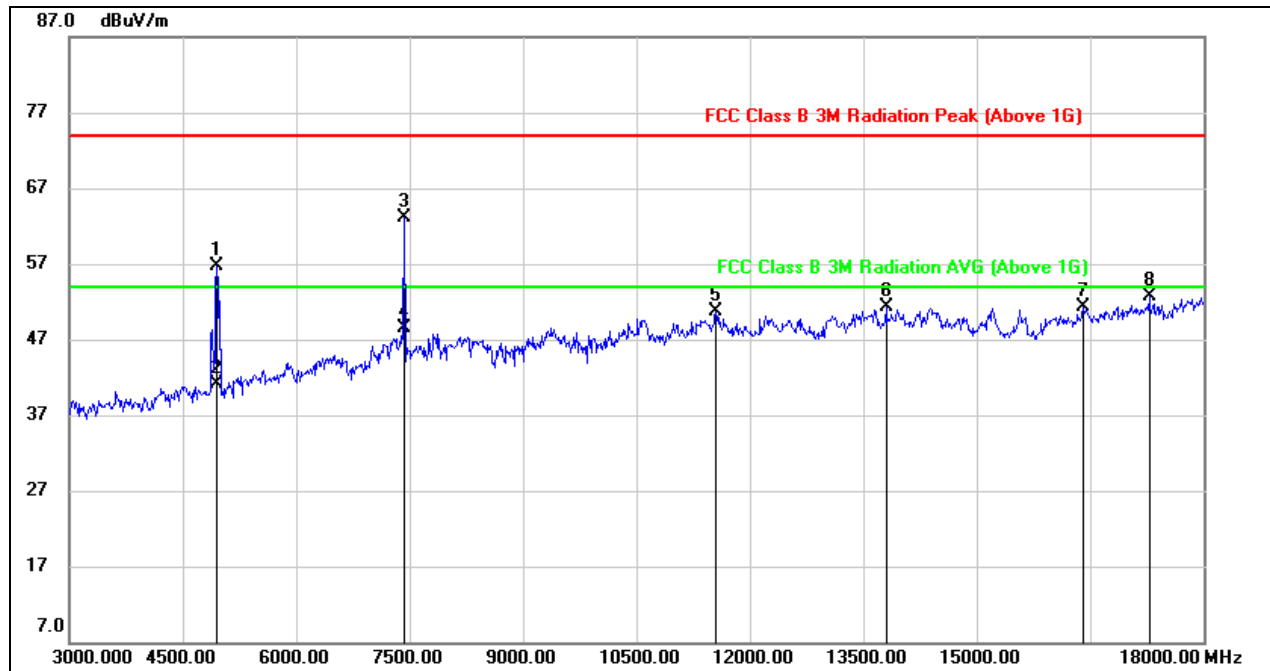
**HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)**

| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1 | 4890.105 | 56.58 | -0.10 | 56.48 | 74.00 | -17.52 | peak |
| 2 | 4890.105 | 37.38 | -0.10 | 37.28 | 54.00 | -16.72 | AVG |
| 3 | 7335.015 | 55.73 | 7.26 | 62.99 | 74.00 | -11.01 | peak |
| 4 | 7335.015 | 42.39 | 7.26 | 49.65 | 54.00 | -4.35 | AVG |
| 5 | 11550.000 | 35.93 | 14.13 | 50.06 | 74.00 | -23.94 | peak |
| 6 | 13980.000 | 34.90 | 16.32 | 51.22 | 74.00 | -22.78 | peak |
| 7 | 14445.000 | 34.70 | 16.37 | 51.07 | 74.00 | -22.93 | peak |
| 8 | 16800.000 | 32.44 | 19.91 | 52.35 | 74.00 | -21.65 | 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. AVG: $VBW=1/Ton$ where: ton is transmit duration.
5. For transmit duration, 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.

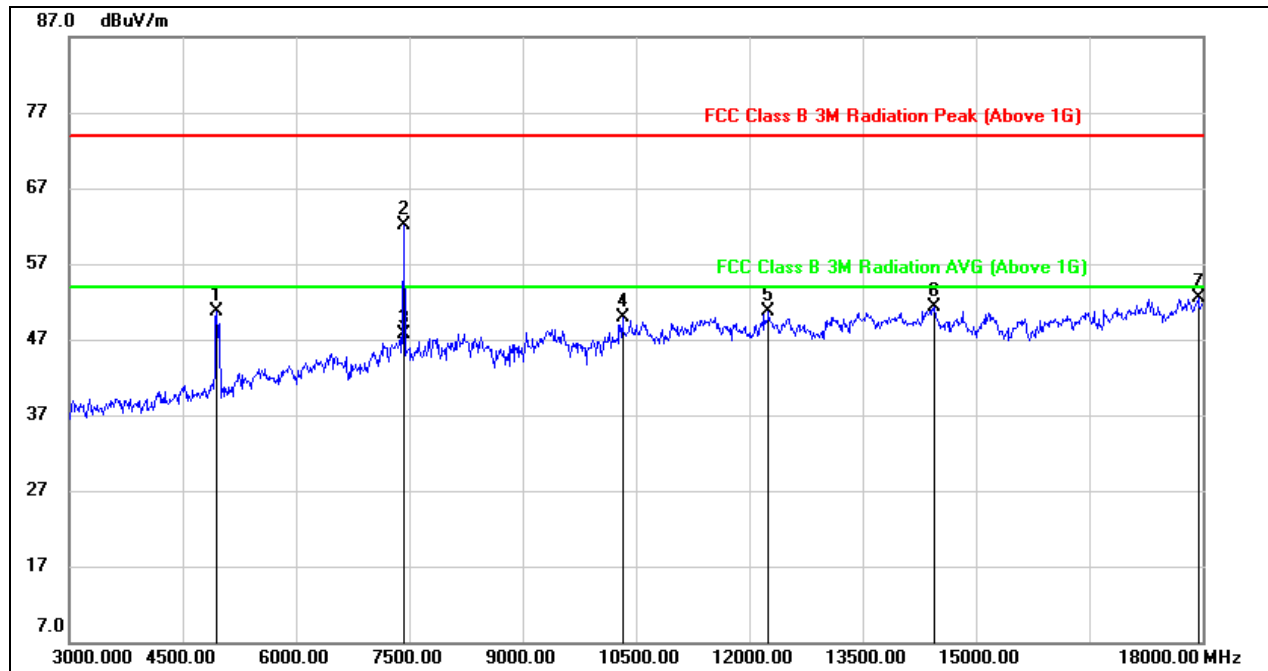


HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1 | 4948.541 | 56.50 | 0.19 | 56.69 | 74.00 | -17.31 | peak |
| 2 | 4948.541 | 41.01 | 0.19 | 41.20 | 54.00 | -12.80 | AVG |
| 3 | 7425.080 | 55.73 | 7.42 | 63.15 | 74.00 | -10.85 | peak |
| 4 | 7425.080 | 40.99 | 7.42 | 48.41 | 54.00 | -5.59 | AVG |
| 5 | 11550.000 | 36.49 | 14.13 | 50.62 | 74.00 | -23.38 | peak |
| 6 | 13800.000 | 34.56 | 16.81 | 51.37 | 74.00 | -22.63 | peak |
| 7 | 16410.000 | 32.66 | 18.61 | 51.27 | 74.00 | -22.73 | peak |
| 8 | 17280.000 | 30.95 | 21.72 | 52.67 | 74.00 | -21.33 | 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. AVG: VBW=1/Ton where: ton is transmit duration.
5. For transmit duration, 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)**

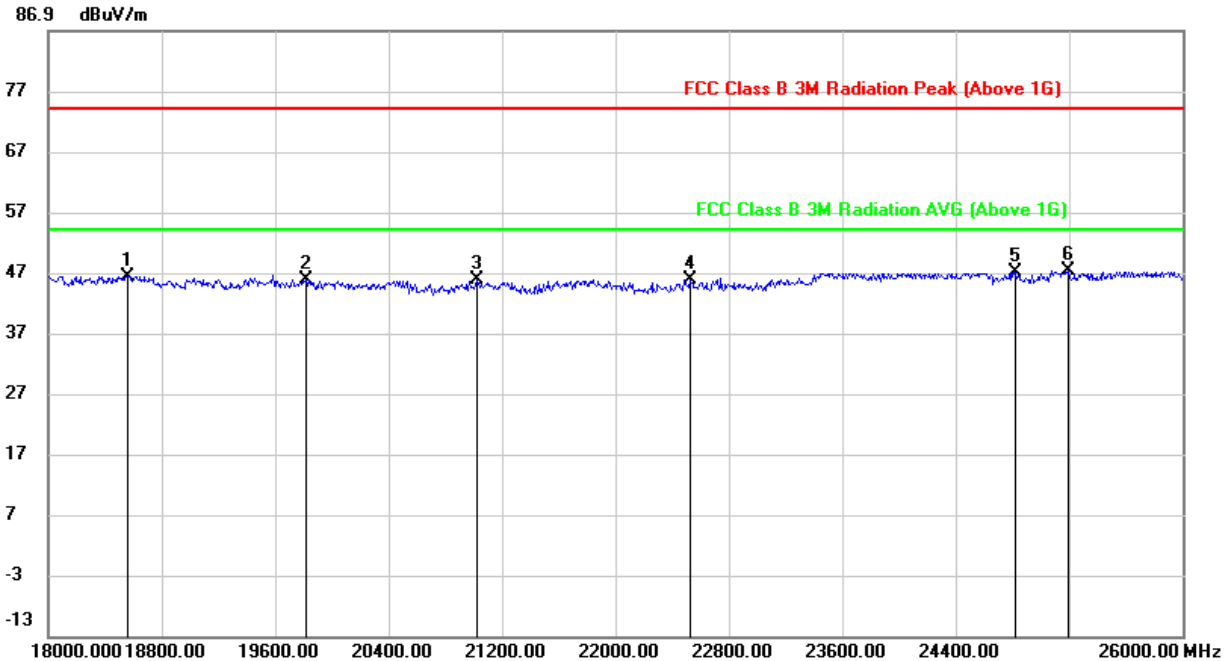
| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1 | 4950.000 | 50.61 | 0.19 | 50.80 | 74.00 | -23.20 | peak |
| 2 | 7425.000 | 54.61 | 7.42 | 62.03 | 74.00 | -11.97 | peak |
| 3 | 7425.100 | 40.24 | 7.42 | 47.66 | 54.00 | -6.34 | AVG |
| 4 | 10320.000 | 38.35 | 11.58 | 49.93 | 74.00 | -24.07 | peak |
| 5 | 12255.000 | 36.38 | 14.32 | 50.70 | 74.00 | -23.30 | peak |
| 6 | 14445.000 | 34.97 | 16.37 | 51.34 | 74.00 | -22.66 | peak |
| 7 | 17940.000 | 29.35 | 23.21 | 52.56 | 74.00 | -21.44 | 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. AVG: VBW=1/Ton where: ton is transmit duration.
5. For transmit duration, 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)

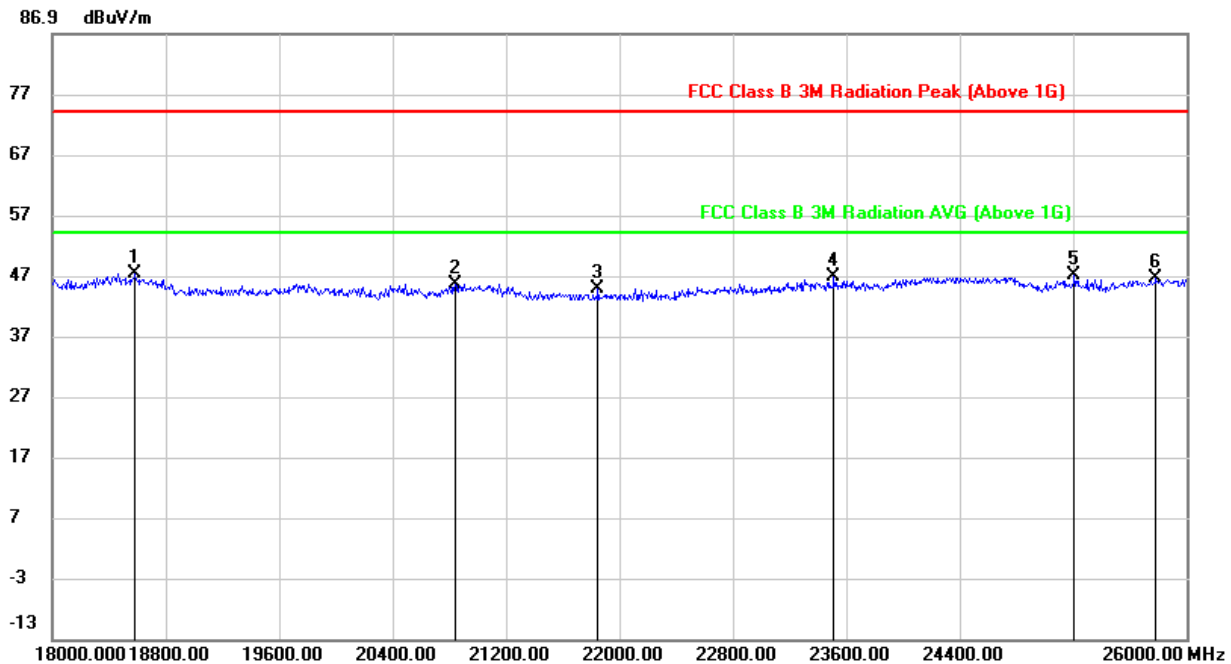


| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 18560.000 | 50.87 | -4.49 | 46.38 | 74.00 | -27.62 | peak |
| 2 | 19816.000 | 50.13 | -4.34 | 45.79 | 74.00 | -28.21 | peak |
| 3 | 21024.000 | 51.12 | -5.30 | 45.82 | 74.00 | -28.18 | peak |
| 4 | 22528.000 | 51.66 | -5.79 | 45.87 | 74.00 | -28.13 | peak |
| 5 | 24824.000 | 48.77 | -1.69 | 47.08 | 74.00 | -26.92 | peak |
| 6 | 25192.000 | 48.49 | -1.16 | 47.33 | 74.00 | -26.67 | 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 | 18584.000 | 51.69 | -4.53 | 47.16 | 74.00 | -26.84 | peak |
| 2 | 20840.000 | 50.77 | -5.18 | 45.59 | 74.00 | -28.41 | peak |
| 3 | 21848.000 | 50.76 | -5.95 | 44.81 | 74.00 | -29.19 | peak |
| 4 | 23512.000 | 51.51 | -4.76 | 46.75 | 74.00 | -27.25 | peak |
| 5 | 25208.000 | 48.13 | -1.16 | 46.97 | 74.00 | -27.03 | peak |
| 6 | 25784.000 | 48.08 | -1.49 | 46.59 | 74.00 | -27.41 | 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.

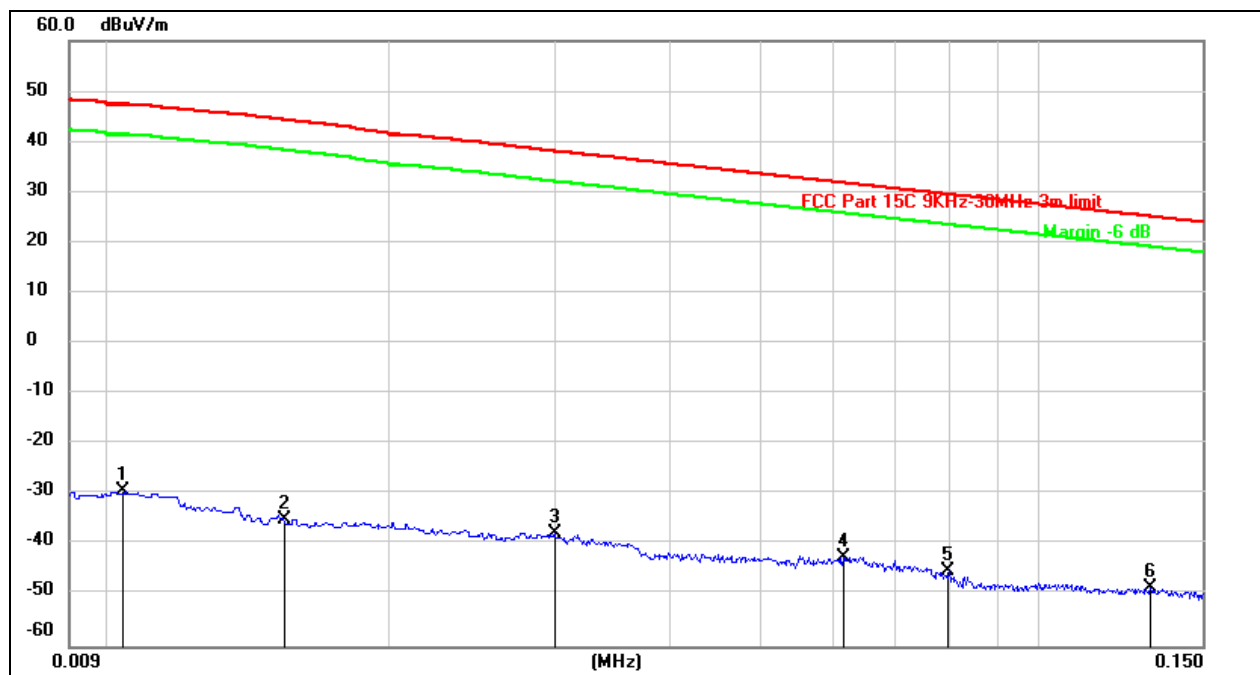
Note: All test mode has been tested, only the worst data record in the report.



7.6. SPURIOUS EMISSIONS BELOW 30M

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

9kHz~ 150kHz

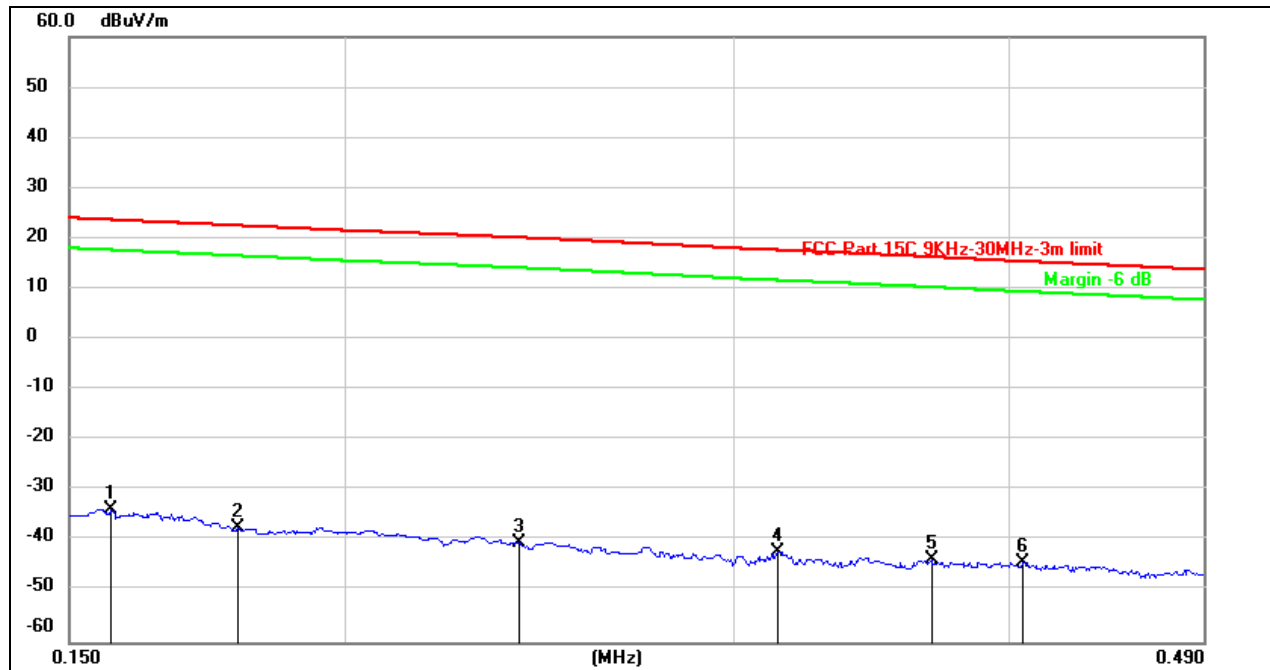


| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|----------------|-----------------|----------------|-------------|--------|
| 1 | 0.0103 | 72.14 | -101.40 | -29.26 | 47.42 | -76.68 | peak |
| 2 | 0.0154 | 66.44 | -101.37 | -34.93 | 44.35 | -79.28 | peak |
| 3 | 0.0300 | 63.68 | -101.39 | -37.71 | 38.06 | -75.77 | peak |
| 4 | 0.0616 | 59.13 | -101.53 | -42.40 | 31.83 | -74.23 | peak |
| 5 | 0.0796 | 56.53 | -101.63 | -45.10 | 29.59 | -74.69 | peak |
| 6 | 0.1318 | 53.23 | -101.69 | -48.46 | 25.21 | -73.67 | peak |

Note: 1. Measurement = Reading Level + Correct Factor.
2. All the modes had been tested, but only the worst data were recorded in the report.
3. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.



150kHz ~ 490kHz

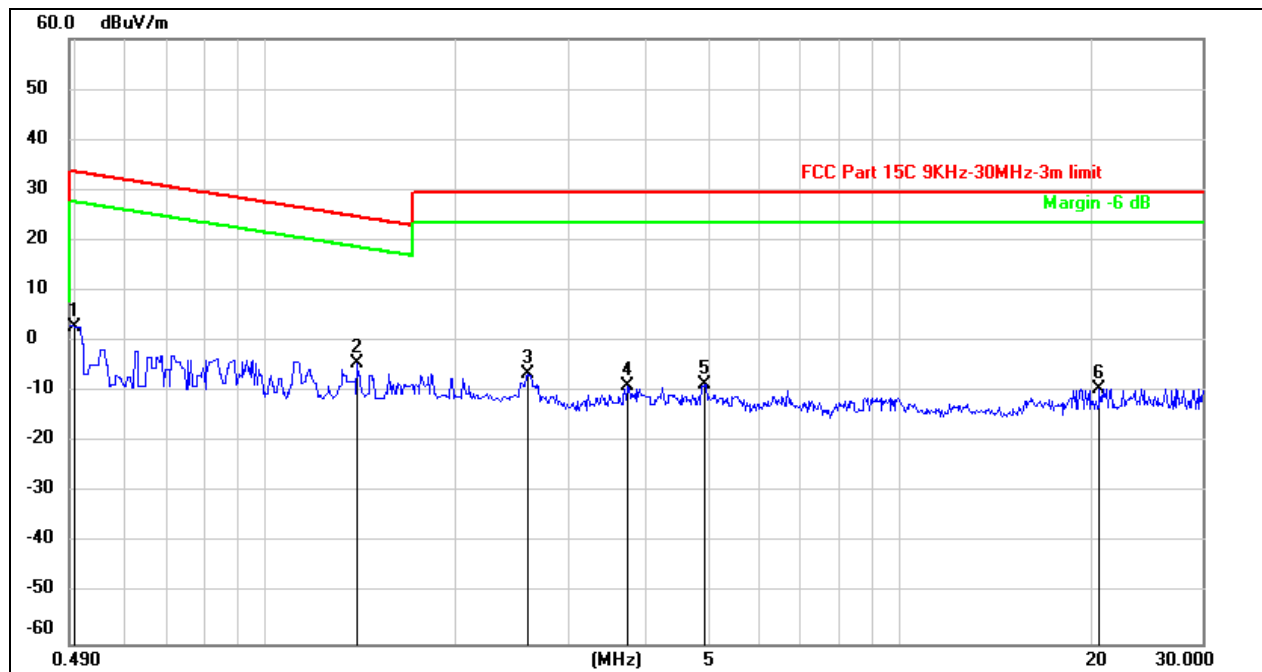


| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1 | 0.1565 | 68.03 | -101.65 | -33.62 | 23.72 | -57.34 | peak |
| 2 | 0.1789 | 64.32 | -101.68 | -37.36 | 22.55 | -59.91 | peak |
| 3 | 0.2398 | 61.51 | -101.78 | -40.27 | 20.18 | -60.45 | peak |
| 4 | 0.3144 | 59.68 | -101.87 | -42.19 | 17.70 | -59.89 | peak |
| 5 | 0.3689 | 58.13 | -101.93 | -43.80 | 16.34 | -60.14 | peak |
| 6 | 0.4060 | 57.65 | -101.96 | -44.31 | 15.44 | -59.75 | peak |

Note: 1. Measurement = Reading Level + Correct Factor.
2. All the modes had been tested, but only the worst data were recorded in the report.
3. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.



490kHz ~ 30MHz



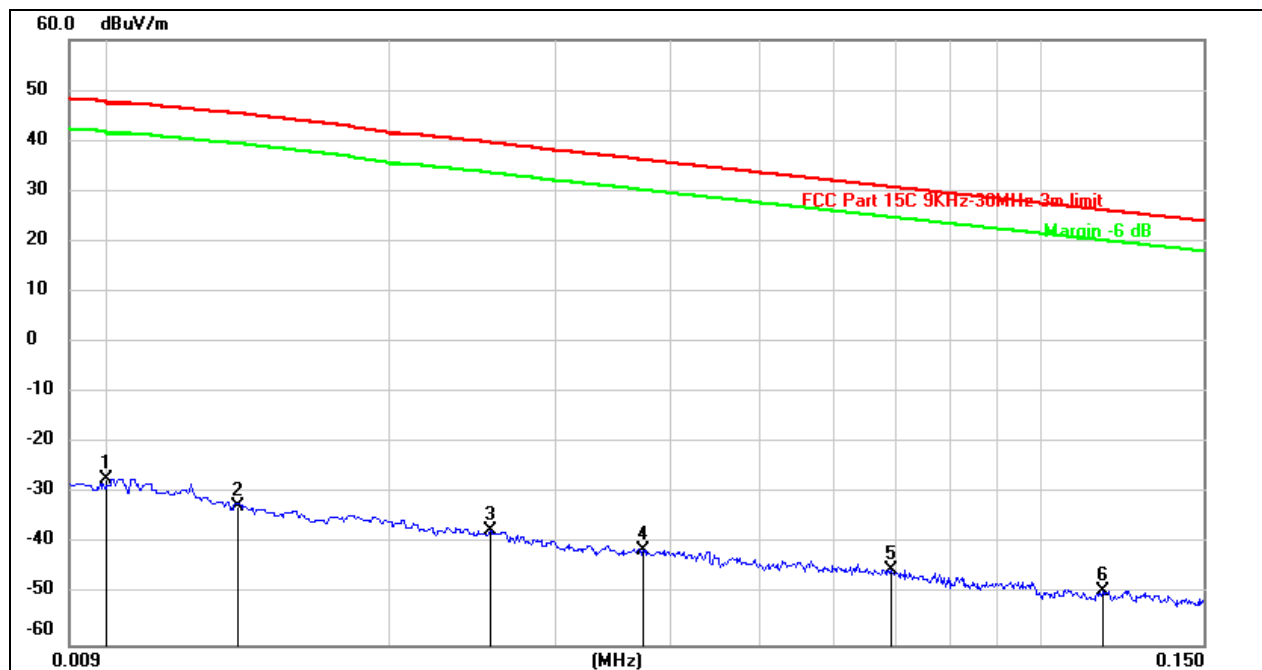
| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1 | 0.5000 | 65.02 | -62.07 | 2.95 | 33.64 | -30.69 | peak |
| 2 | 1.3931 | 57.68 | -62.09 | -4.41 | 24.72 | -29.13 | peak |
| 3 | 2.5935 | 55.11 | -61.68 | -6.57 | 29.54 | -36.11 | peak |
| 4 | 3.7100 | 52.70 | -61.41 | -8.71 | 29.54 | -38.25 | peak |
| 5 | 4.9165 | 52.88 | -61.48 | -8.60 | 29.54 | -38.14 | peak |
| 6 | 20.6748 | 51.31 | -60.79 | -9.48 | 29.54 | -39.02 | peak |

Note: 1. Measurement = Reading Level + Correct Factor.
2. All the modes had been tested, but only the worst data were recorded in the report.
3. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.



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

9kHz~ 150kHz

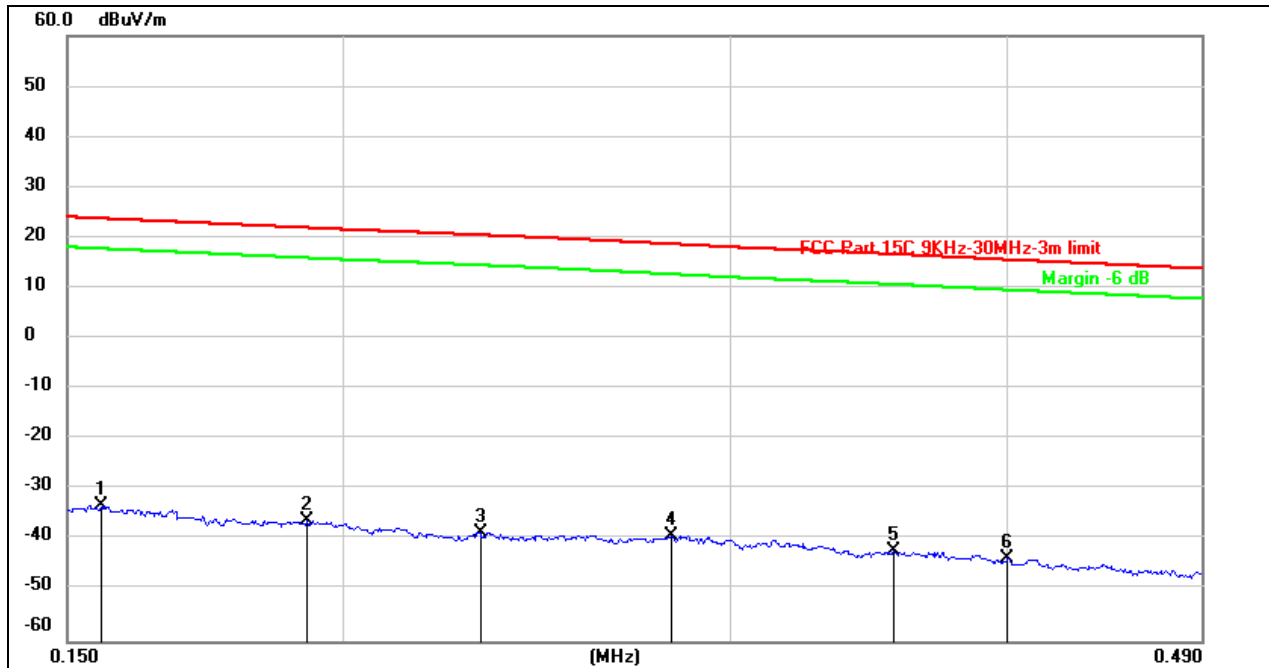


| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1 | 0.0100 | 74.18 | -101.40 | -27.22 | 47.60 | -74.82 | peak |
| 2 | 0.0137 | 68.76 | -101.38 | -32.62 | 45.37 | -77.99 | peak |
| 3 | 0.0256 | 63.91 | -101.37 | -37.46 | 39.61 | -77.07 | peak |
| 4 | 0.0374 | 60.20 | -101.42 | -41.22 | 36.21 | -77.43 | peak |
| 5 | 0.0690 | 56.54 | -101.56 | -45.02 | 30.83 | -75.85 | peak |
| 6 | 0.1170 | 52.50 | -101.74 | -49.24 | 26.25 | -75.49 | peak |

Note: 1. Measurement = Reading Level + Correct Factor.
2. All the modes had been tested, but only the worst data were recorded in the report.
3. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.



150kHz ~ 490kHz

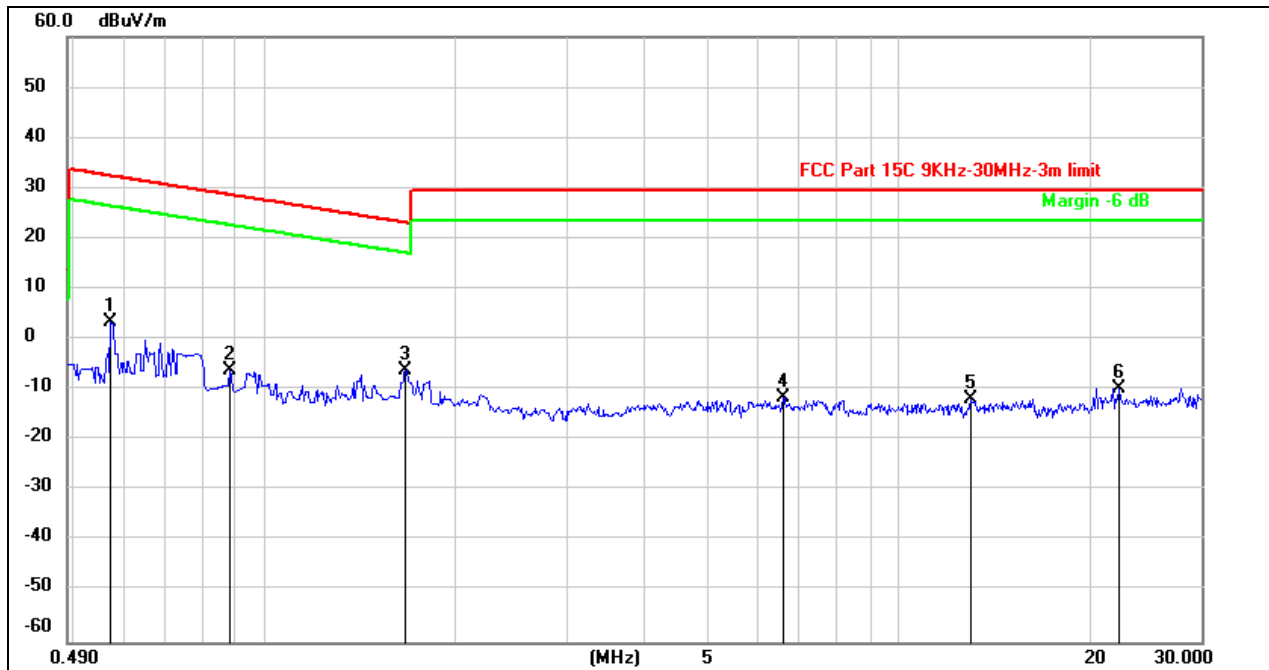


| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1 | 0.1556 | 68.52 | -101.65 | -33.13 | 23.77 | -56.90 | peak |
| 2 | 0.1927 | 65.48 | -101.70 | -36.22 | 21.91 | -58.13 | peak |
| 3 | 0.2308 | 63.25 | -101.77 | -38.52 | 20.50 | -59.02 | peak |
| 4 | 0.2816 | 62.67 | -101.83 | -39.16 | 18.71 | -57.87 | peak |
| 5 | 0.3553 | 59.72 | -101.91 | -42.19 | 16.68 | -58.87 | peak |
| 6 | 0.4006 | 58.18 | -101.96 | -43.78 | 15.55 | -59.33 | peak |

Note: 1. Measurement = Reading Level + Correct Factor.
2. All the modes had been tested, but only the worst data were recorded in the report.
3. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.



490kHz ~ 30MHz



| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|--------------------|-------------------|-------------------|--------------------|-------------------|----------------|--------|
| 1 | 0.5725 | 65.53 | -62.07 | 3.46 | 32.48 | -29.02 | peak |
| 2 | 0.8820 | 56.09 | -62.19 | -6.10 | 28.70 | -34.80 | peak |
| 3 | 1.6704 | 55.72 | -61.97 | -6.25 | 23.15 | -29.40 | peak |
| 4 | 6.5986 | 49.62 | -61.27 | -11.65 | 29.54 | -41.19 | peak |
| 5 | 13.0318 | 49.05 | -60.93 | -11.88 | 29.54 | -41.42 | peak |
| 6 | 22.2974 | 50.90 | -60.66 | -9.76 | 29.54 | -39.30 | peak |

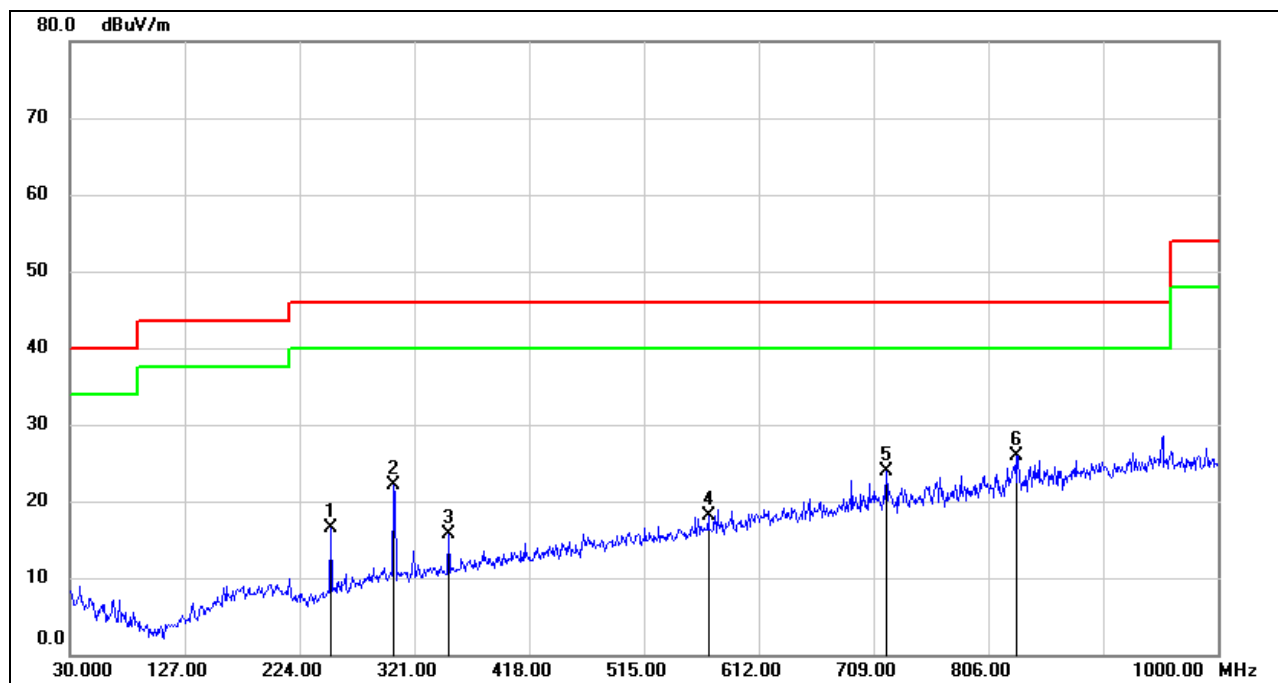
Note: 1. Measurement = Reading Level + Correct Factor.
2. All the modes had been tested, but only the worst data were recorded in the report.
3. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

Note: All test mode has been tested, only the worst data record in the report.



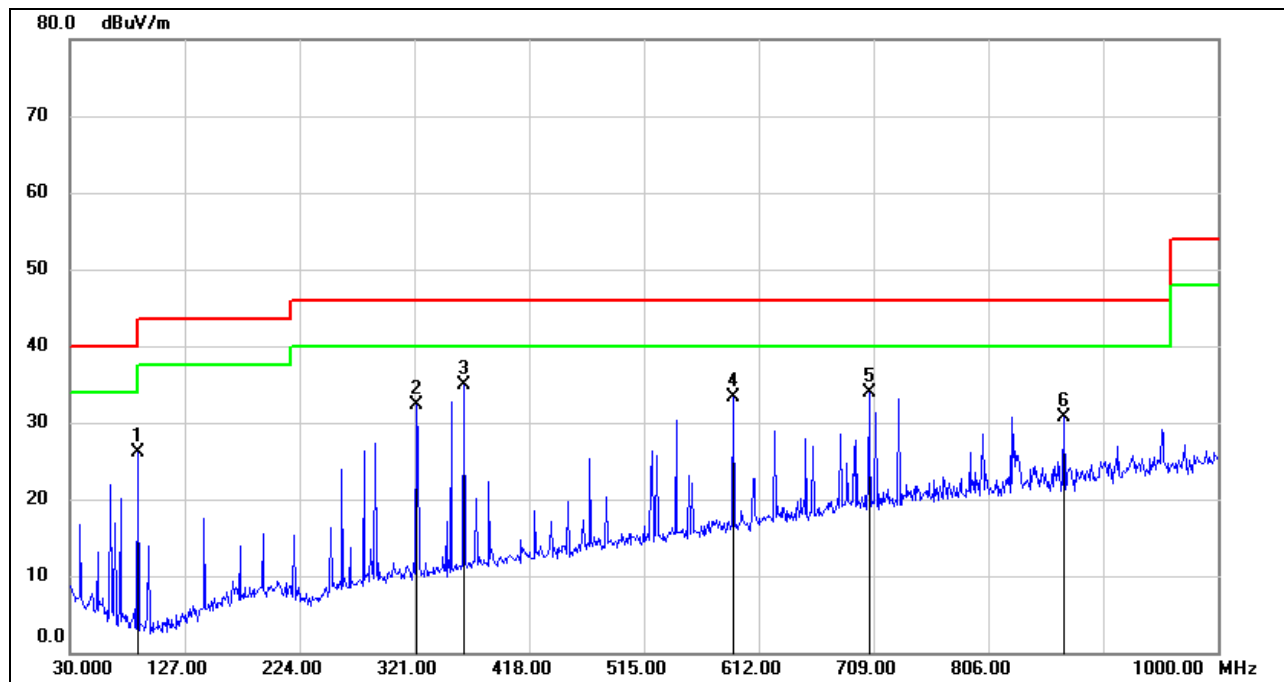
7.7. SPURIOUS EMISSIONS BELOW 1 GHz

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 | 250.1900 | 32.65 | -16.12 | 16.53 | 46.00 | -29.47 | QP |
| 2 | 303.5400 | 35.98 | -13.82 | 22.16 | 46.00 | -23.84 | QP |
| 3 | 350.1000 | 28.82 | -13.16 | 15.66 | 46.00 | -30.34 | QP |
| 4 | 569.3200 | 27.17 | -9.01 | 18.16 | 46.00 | -27.84 | QP |
| 5 | 719.6700 | 30.03 | -6.09 | 23.94 | 46.00 | -22.06 | QP |
| 6 | 829.2800 | 30.80 | -4.87 | 25.93 | 46.00 | -20.07 | 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 | 87.2300 | 47.07 | -21.00 | 26.07 | 40.00 | -13.93 | QP |
| 2 | 322.9400 | 45.84 | -13.60 | 32.24 | 46.00 | -13.76 | QP |
| 3 | 362.7100 | 47.88 | -12.98 | 34.90 | 46.00 | -11.10 | QP |
| 4 | 590.6599 | 41.91 | -8.64 | 33.27 | 46.00 | -12.73 | QP |
| 5 | 705.1200 | 40.36 | -6.47 | 33.89 | 46.00 | -12.11 | QP |
| 6 | 870.0200 | 35.20 | -4.46 | 30.74 | 46.00 | -15.26 | 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 mode has been tested, only the worst data record 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