# FCC Radio Test Report

## FCC ID: 2AP9V-ML03010

**This report concerns: Original Grant**

| | | |
|---|---|---|
| **Project No.** | : | 1812C033A |
| **Equipment** | : | Bluetooth Speaker |
| **Test Model** | : | AeroFrame HD |
| **Series Model** | : | N/A |
| **Applicant** | : | Music Life Limited |
| **Address** | : | Unit 2105-09, 21/F, FTLife Tower, 18 Sheung Yuet Road, Kowloon Bay, Kowloon, Hong Kong, China |

| | | |
|---|---|---|
| **Date of Receipt** | : | Apr. 04, 2019 |
| **Date of Test** | : | Apr. 11, 2019 ~ Jul. 17, 2019 |
| **Issued Date** | : | Sep. 06, 2019 |
| **Tested by** | : | BTL Inc. |

**Testing Engineer** : Rose. Liu

(Rose Liu)

**Technical Manager** : Steven Lu

(Steven Lu)

**Authorized Signatory** : Ethan Ma

(Ethan Ma)


**BTL INC.**

No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

TEL: +86-769-8318-3000 FAX: +86-769-8319-6000


Certificate #5123.02

## Declaration

**BTL** represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

**BTL**'s reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, A2LA, or any agency of the U.S. Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

**BTL**'s laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

**BTL** is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

## Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.
Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

Table of Contents Page


REPORT ISSUED HISTORY 6

1 . GENERAL SUMMARY 7

2 . SUMMARY OF TEST RESULTS 8

2.1 TEST FACILITY 9

2.2 MEASUREMENT UNCERTAINTY 9

3 . GENERAL INFORMATION 10

3.1 GENERAL DESCRIPTION OF EUT 10

3.2 DESCRIPTION OF TEST MODES 12

3.3 PARAMETERS OF TEST SOFTWARE 13

3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED 14

3.5 SUPPORT UNITS 14

4 . AC POWER LINE CONDUCTED EMISSIONS TEST 15

4.1 LIMIT 15

4.2 TEST PROCEDURE 15

4.3 DEVIATION FROM TEST STANDARD 15

4.4 TEST SETUP 16

4.5 EUT OPERATING CONDITIONS 16

4.6 EUT TEST CONDITIONS 16

4.7 TEST RESULTS 16

5 . RADIATED EMISSION TEST 17

5.1 LIMIT 17

5.2 TEST PROCEDURE 18

5.3 DEVIATION FROM TEST STANDARD 18

5.4 TEST SETUP 19

5.5 EUT OPERATING CONDITIONS 20

5.6 EUT TEST CONDITIONS 20

5.7 TEST RESULTS - 9 KHZ TO 30 MHZ 20

5.8 TEST RESULTS - 30 MHZ TO 1000 MHZ 20

5.9 TEST RESULTS - ABOVE 1000 MHZ 20

6 . NUMBER OF HOPPING FREQUENCY 21

6.1 LIMIT 21

6.2 TEST PROCEDURE 21

6.3 DEVIATION FROM STANDARD 21

Table of Contents Page

6.4 TEST SETUP 21
6.5 EUT OPERATION CONDITIONS 21
6.6 EUT TEST CONDITIONS 21
6.7 TEST RESULTS 21
7 . AVERAGE TIME OF OCCUPANCY 22
7.1 LIMIT 22
7.2 TEST PROCEDURE 22
7.3 DEVIATION FROM STANDARD 22
7.4 TEST SETUP 22
7.5 EUT OPERATION CONDITIONS 22
7.6 EUT TEST CONDITIONS 22
7.7 TEST RESULTS 22
8 . HOPPING CHANNEL SEPARATION MEASUREMENT 23
8.1 LIMIT 23
8.2 TEST PROCEDURE 23
8.3 DEVIATION FROM STANDARD 23
8.4 TEST SETUP 23
8.5 EUT OPERATION CONDITIONS 23
8.6 EUT TEST CONDITIONS 23
8.7 TEST RESULTS 23
9 . BANDWIDTH TEST 24
9.1 LIMIT 24
9.2 TEST PROCEDURE 24
9.3 DEVIATION FROM STANDARD 24
9.4 TEST SETUP 24
9.5 EUT OPERATION CONDITIONS 24
9.6 EUT TEST CONDITIONS 24
9.7 TEST RESULTS 24
10 . MAXIMUM PEAK OUTPUT POWER 25
10.1 LIMIT 25
10.2 TEST PROCEDURE 25
10.3 DEVIATION FROM STANDARD 25
10.4 TEST SETUP 25
10.5 EUT OPERATION CONDITIONS 25

Table of Contents | Page


10.6 EUT TEST CONDITIONS 25
10.7 TEST RESULTS 25
11 . CONDUCTED SPURIOUS EMISSION 26
11.1 LIMIT 26
11.2 TEST PROCEDURE 26
11.3 DEVIATION FROM STANDARD 26
11.4 TEST SETUP 26
11.5 EUT OPERATION CONDITIONS 26
11.6 EUT TEST CONDITIONS 26
11.7 TEST RESULTS 26
12 . MEASUREMENT INSTRUMENTS LIST 27
13 . EUT TEST PHOTO 29
APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS 33
APPENDIX B - RADIATED EMISSION - 9 KHZ-30 MHZ 36
APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ 41
APPENDIX D - RADIATED EMISSION - ABOVE 1000 MHZ 44
APPENDIX E - NUMBER OF HOPPING FREQUENCY 69
APPENDIX F - AVERAGE TIME OF OCCUPANCY 71
APPENDIX G - HOPPING CHANNEL SEPARATION MEASUREMENT 76
APPENDIX H - BANDWIDTH 78
APPENDIX I - MAXIMUM PEAK OUTPUT POWER 80
APPENDIX J - CONDUCTED SPURIOUS EMISSION 82

## REPORT ISSUED HISTORY

| Report Version | Description | Issued Date |
|---|---|---|
| R00 | Original Issue. | Aug. 29, 2019 |
| R01 | Modified the comments of TCB. | Sep. 04, 2019 |
| R02 | Updated the antenna gain which does not affect the test results. | Sep. 06, 2019 |

## 1. GENERAL SUMMARY

| | | |
|---|---|---|
| Equipment | : | Bluetooth Speaker |
| Brand Name | : | AeroSystem |
| Test Model | : | AeroFrame HD |
| Series Model | : | N/A |
| Applicant | : | Music Life Limited |
| Manufacturer | : | Music Life Limited |
| Address | : | Unit 2105-09, 21/F, FTLife Tower, 18 Sheung Yuet Road, Kowloon Bay, Kowloon, Hong Kong, China |
| Factory | : | EVERBRIGHT AUDIO (SHENZHEN) COMPANY LIMITED |
| Address | : | No. 19, Fareast Industry Area, Hsin Ho, Fu Yung, Bao'an District, Shenzhen City, Guangdong Province, P.R. China |
| Date of Test | : | Apr. 11, 2019 ~ Jul. 17, 2019 |
| Test Sample | : | Engineering Sample No.: D190403472 |
| Standard(s) | : | FCC Part15, Subpart C (15.247)<br>ANSI C63.10-2013<br>KDB 558074 D01 15.247 Meas Guidance V05r02 |

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-1-1812C033A) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of A2LA according to the ISO/IEC 17025 quality assessment standard and technical standard(s).

**Test results included in this report are only for the Bluetooth EDR part.**

## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

| FCC Part15, Subpart C (15.247) | | | | |
|---|---|---|---|---|
| **Standard(s) Section** | **Test Item** | **Test Result** | **Judgment** | **Remark** |
| 15.207 | AC Power Line Conducted Emissions | APPENDIX A | PASS | ------ |
| 15.247(d)<br>15.205(a)<br>15.209(a) | Radiated Emission | APPENDIX B<br>APPENDIX C<br>APPENDIX D | PASS | ------ |
| 15.247(a)(1)(iii) | Number of Hopping Frequency | APPENDIX E | PASS | ------ |
| 15.247(a)(1)(iii) | Average Time Of Occupancy | APPENDIX F | PASS | ------ |
| 15.247(a)(1) | Hopping Channel Separation | APPENDIX G | PASS | ------ |
| 15.247(a)(1) | Bandwidth | APPENDIX H | PASS | ------ |
| 15.247(a)(1) | Maximum Peak Output Power | APPENDIX I | PASS | ------ |
| 15.247(d) | Conducted Spurious Emission | APPENDIX J | PASS | ------ |
| 15.203 | Antenna Requirement | ------ | PASS | Note(2) |

Note:

(1) “N/A” denotes test is not applicable in this test report

(2) The device what use a permanently attached antenna were considered sufficient to comply with the provisions of 15.203.

## 2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China
BTL's Test Firm Registration Number for FCC: 357015
BTL's Designation Number for FCC: CN1240

## 2.2 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))
The BTL measurement uncertainty as below table:

A. AC power line conducted emissions test:

| Test Site | Method | Measurement Frequency Range | U, (dB) |
|---|---|---|---|
| DG-C02 | CISPR | 150 kHz ~ 30 MHz | 2.32 |

B. Radiated emissions test:

| Test Site | Method | Measurement Frequency Range | Ant. H / V | U, (dB) |
|---|---|---|---|---|
| DG-CB03 | CISPR | 9KHz ~ 30MHz | V | 3.79 |
| | | 9KHz ~ 30MHz | H | 3.57 |
| | | 30MHz ~ 200MHz | V | 4.88 |
| | | 30MHz ~ 200MHz | H | 4.14 |
| | | 200MHz ~ 1,000MHz | V | 4.62 |
| | | 200MHz ~ 1,000MHz | H | 4.80 |
| | | 1GHz ~ 6GHz | - | 4.58 |
| | | 6GHz ~ 18GHz | - | 5.18 |
| | | 18 ~ 26.5 GHz | - | 3.80 |
| | | 26.5 ~ 40 GHz | - | 4.30 |

C. Other Measurement:

| Test Item | Uncertainty |
|---|---|
| Conducted Spurious Emission | 2.67 dB |
| Hopping Channel Separation | 53.46 MHz |
| Output Power | 0.95 dB |
| Number of Hopping Frequency | 53.46 MHz |
| Temperature | 0.08 °C |
| Humidity | 1.5% |

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

# 3. GENERAL INFORMATION

## 3.1 GENERAL DESCRIPTION OF EUT

| | |
|---|---|
| Equipment | Bluetooth Speaker |
| Brand Name | AeroSystem |
| Test Model | AeroFrame HD |
| Series Model | N/A |
| Model Difference(s) | N/A |
| Hardware Version | Ver I |
| Software Version | Ver 2.1 |
| Power Source | DC voltage supplied from AC/DC adapter.<br>Model: DYS902-240300W |
| Power Rating | I/P: 100-240V ~50/60Hz 1.5A MAX O/P: 24.0V ⎓ 3.0A |
| Operation Frequency | 2402 MHz ~ 2480 MHz |
| Modulation Technology | GFSK, π/4-DQPSK, 8-DPSK |
| Bit Rate of Transmitter | 1/2/3Mbps |
| Max. Peak Output Power | 3.90 dBm (0.0025 W) For 1Mbps<br>3.86 dBm (0.0024 W) For 3Mbps |

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|---|---|
| 00 | 2402 | 27 | 2429 | 54 | 2456 |
| 01 | 2403 | 28 | 2430 | 55 | 2457 |
| 02 | 2404 | 29 | 2431 | 56 | 2458 |
| 03 | 2405 | 30 | 2432 | 57 | 2459 |
| 04 | 2406 | 31 | 2433 | 58 | 2460 |
| 05 | 2407 | 32 | 2434 | 59 | 2461 |
| 06 | 2408 | 33 | 2435 | 60 | 2462 |
| 07 | 2409 | 34 | 2436 | 61 | 2463 |
| 08 | 2410 | 35 | 2437 | 62 | 2464 |
| 09 | 2411 | 36 | 2438 | 63 | 2465 |
| 10 | 2412 | 37 | 2439 | 64 | 2466 |
| 11 | 2413 | 38 | 2440 | 65 | 2467 |
| 12 | 2414 | 39 | 2441 | 66 | 2468 |
| 13 | 2415 | 40 | 2442 | 67 | 2469 |
| 14 | 2416 | 41 | 2443 | 68 | 2470 |
| 15 | 2417 | 42 | 2444 | 69 | 2471 |
| 16 | 2418 | 43 | 2445 | 70 | 2472 |
| 17 | 2419 | 44 | 2446 | 71 | 2473 |
| 18 | 2420 | 45 | 2447 | 72 | 2474 |
| 19 | 2421 | 46 | 2448 | 73 | 2475 |
| 20 | 2422 | 47 | 2449 | 74 | 2476 |
| 21 | 2423 | 48 | 2450 | 75 | 2477 |
| 22 | 2424 | 49 | 2451 | 76 | 2478 |
| 23 | 2425 | 50 | 2452 | 77 | 2479 |
| 24 | 2426 | 51 | 2453 | 78 | 2480 |
| 25 | 2427 | 52 | 2454 | | |
| 26 | 2428 | 53 | 2455 | | |

3. Table for Filed Antenna:

| Ant. | Brand | Model Name | Antenna Type | Connector | Gain(dBi) |
|---|---|---|---|---|---|
| 1 | | FM-S1428-L=100 | PCB | N/A | 2.49 |

## 3.2 DESCRIPTION OF TEST MODES

The test system was pre-tested based on the consideration of all possible combinations of EUT operation mode.

| Pretest Mode | Description |
|---|---|
| Mode 1 | TX Mode **NOTE (1)** |
| Mode 2 | TX Mode Channel 78 _1Mbps |

Following mode(s) was (were) found to be the worst case(s) and selected for the final test.

| **AC power line conducted emissions test** | |
|---|---|
| Final Test Mode | Description |
| Mode 2 | TX Mode Channel 78 _1Mbps |

| **Radiated emissions test - Below 1GHz** | |
|---|---|
| Final Test Mode | Description |
| Mode 2 | TX Mode Channel 78 _1Mbps |

| **Radiated emissions test - Above 1GHz** | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | TX Mode **NOTE (1)** |

| **Conducted test** | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | TX Mode **NOTE (1)** |

Note:

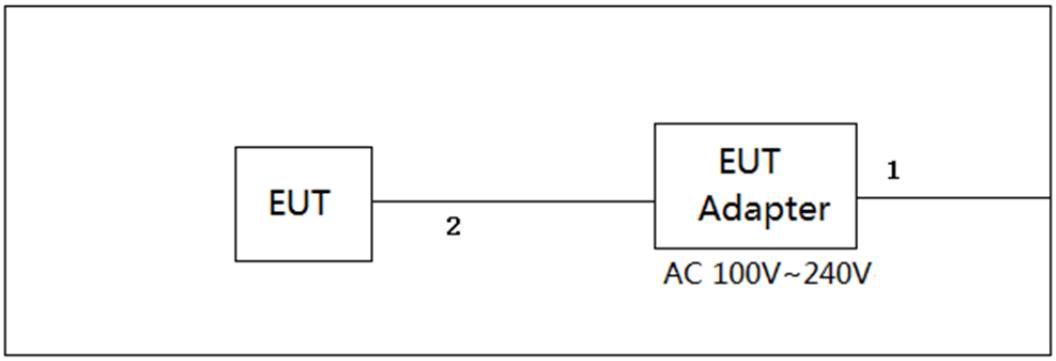
(1) The measurements are performed at the high, middle, low available channels.
(2) The measurements for Hopping Channel Separation, Bandwidth and Maximum Output Power were tested during 1Mbps, 2Mbps and 3Mbps, the worst case are 1Mbps and 3Mbps, only worst case was documented.
(3) For radiated emission above 1 GHz test, 1GHz~26.5GHz have been pre-tested and in this report only recorded the worst case. The remaining spurious points are all below the limit value of 20dB.

### 3.3 PARAMETERS OF TEST SOFTWARE

During testing, channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

| Test Software | Bluetest3_2.6.4 | | |
|---|---|---|---|
| Frequency (MHz) | 2402 | 2441 | 2480 |
| Parameters(1Mbps) | 255/10 | 200/0 | 200/4 |
| Parameters(3Mbps) | 255/30 | 255/20 | 255/20 |

### 3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED




### 3.5 SUPPORT UNITS

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

| Item | Cable Type | Shielded Type | Ferrite Core | Length |
|---|---|---|---|---|
| 1 | AC Cable | NO | NO | 3.0m |
| 2 | DC Cable | NO | NO | 1.4m |

# 4. AC POWER LINE CONDUCTED EMISSIONS TEST

## 4.1 LIMIT

| Frequency of Emission (MHz) | Limit (dBμV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15 - 0.50 | 66 to 56* | 56 to 46* |
| 0.50 - 5.0 | 56 | 46 |
| 5.0 - 30.0 | 60 | 50 |

Note:

(1) The tighter limit applies at the band edges.
(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

| Receiver Parameters | Setting |
|---|---|
| Attenuation | 10 dB |
| Start Frequency | 0.15 MHz |
| Stop Frequency | 30 MHz |
| IF Bandwidth | 9 kHz |

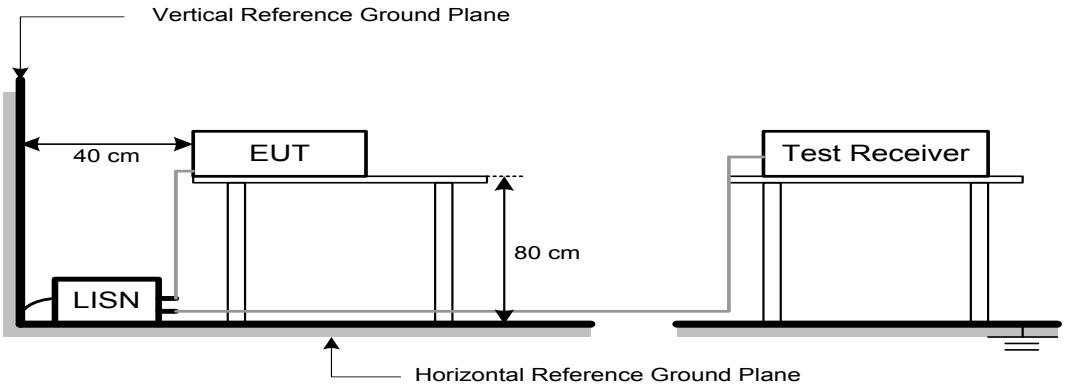
## 4.2 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

## 4.3 DEVIATION FROM TEST STANDARD

No deviation

## 4.4 TEST SETUP




## 4.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical function (as a customer would normally use it), EUT was programmed to be in continuously transmitting data or hopping on mode.

## 4.6 EUT TEST CONDITIONS

Temperature: 25°C Relative Humidity: 53% Test Voltage: AC 120V/60Hz

## 4.7 TEST RESULTS

Please refer to the APPENDIX A.

Remark:

(1) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform in this case, a "*" marked in AVG Mode column of Interference Voltage Measured.

(2) Measuring frequency range from 150 kHz to 30 MHz.

# 5. RADIATED EMISSION TEST

## 5.1 LIMIT

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.
LIMITS OF RADIATED EMISSION MEASUREMENT (9 kHz-1000 MHz)

| Frequency (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|---|---|---|
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30.0 | 30 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000 MHz)

| Frequency (MHz) | (dBuV/m at 3 m) | |
|---|---|---|
| | Peak | Average |
| Above 1000 | 74 | 54 |

Note:

(1) The limit for radiated test was performed according to FCC PART 15C.
(2) The tighter limit applies at the band edges.
(3) Emission level (dBuV/m)=20log Emission level (uV/m).
(4) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
Margin Level = Measurement Value - Limit Value

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start Frequency | 1000 MHz |
| Stop Frequency | 10th carrier harmonic |
| RBW / VBW<br>(Emission in restricted band) | RBW 1 MHz VBW 3 MHz peak detector for Pk value<br>RMS detector for AV value |

| Receiver Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start ~ Stop Frequency | 9 kHz~90 kHz for PK/AVG detector |
| Start ~ Stop Frequency | 90 kHz~110 kHz for QP detector |
| Start ~ Stop Frequency | 110 kHz~490 kHz for PK/AVG detector |
| Start ~ Stop Frequency | 490 kHz~30 MHz for QP detector |
| Start ~ Stop Frequency | 30 MHz~1000 MHz for QP detector |

## 5.2 TEST PROCEDURE

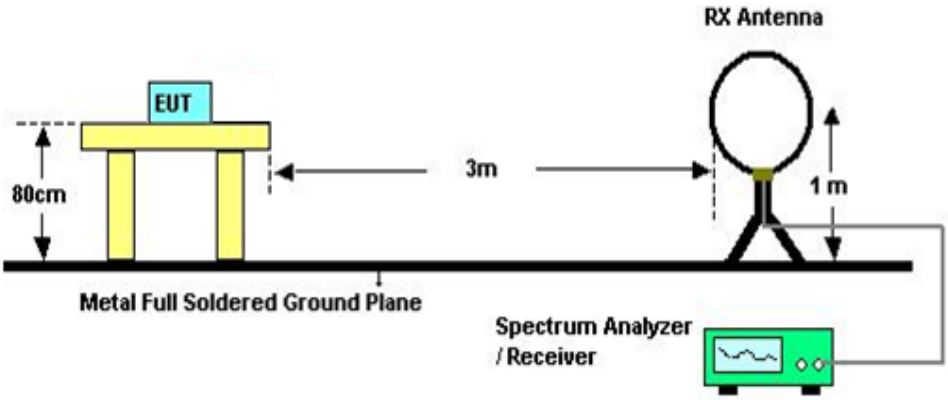
a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1 GHz)
b. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1 GHz)
c. The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.
f. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
g. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn‘t perform. (below 1 GHz)
h. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn‘t perform. (above 1 GHz)
i. For the actual test configuration, please refer to the related Item –EUT Test Photos.

## 5.3 DEVIATION FROM TEST STANDARD

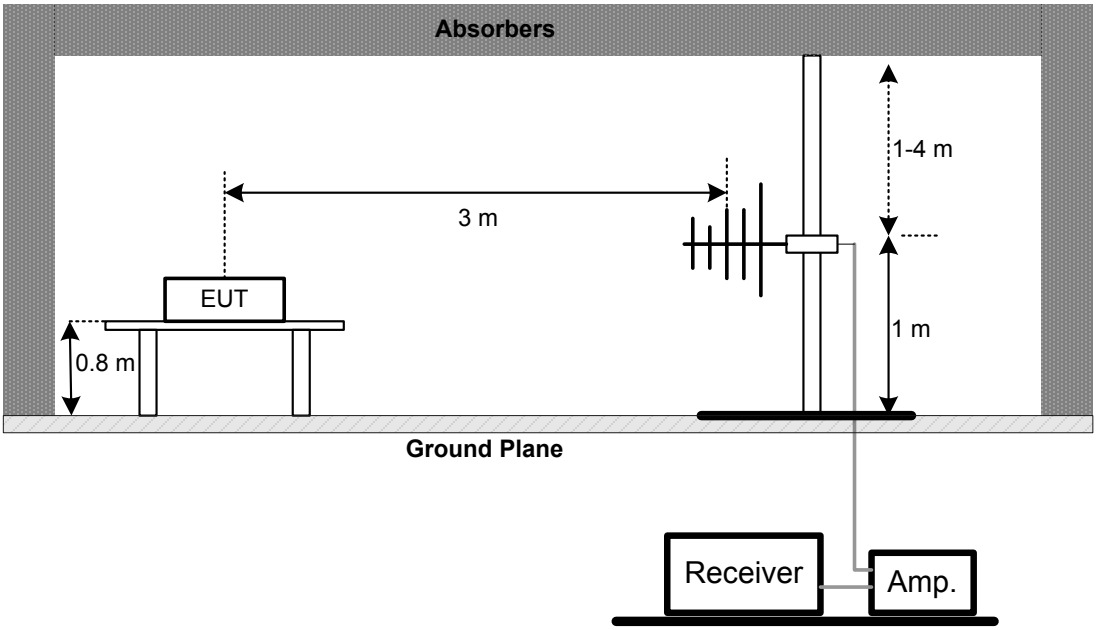
No deviation

## 5.4 TEST SETUP

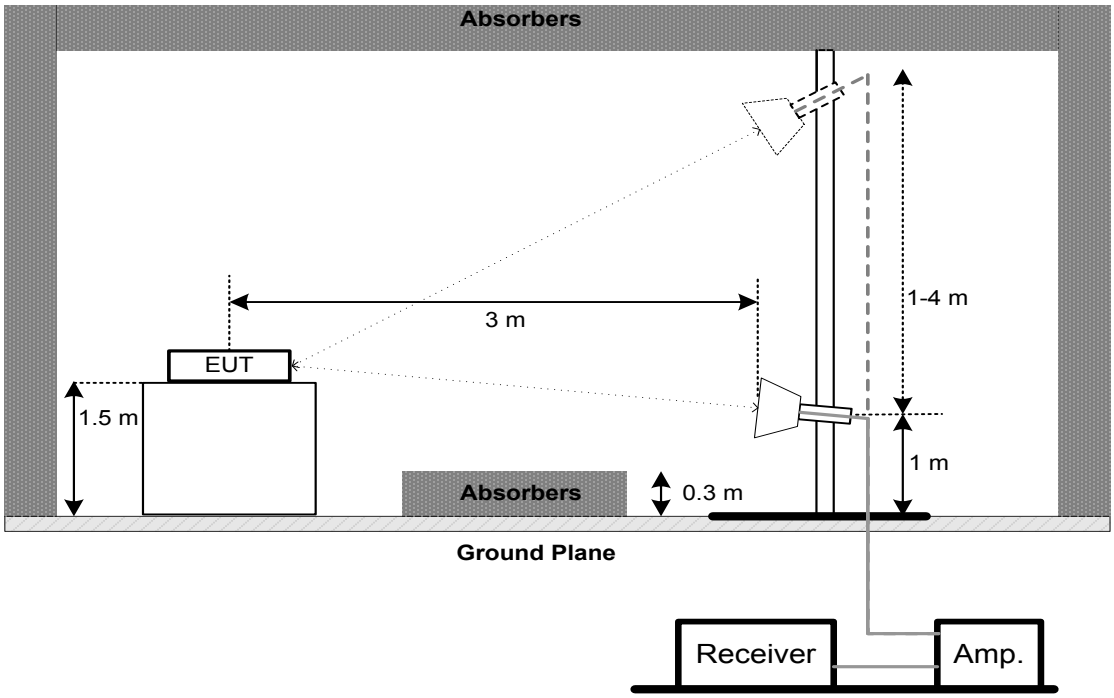
**9 kHz-30 MHz**




**30 MHz to 1 GHz**



**Above 1 GHz**




## 5.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

## 5.6 EUT TEST CONDITIONS

Temperature: 24°C Relative Humidity: 68% Test Voltage: AC 120V/60Hz

## 5.7 TEST RESULTS - 9 kHz TO 30 MHz

Please refer to the APPENDIX B

Remark:

(1) Distance extrapolation factor = 40 log (specific distance / test distance) (dB).
(2) Limit line = specific limits (dBuV) + distance extrapolation factor.

## 5.8 TEST RESULTS - 30 MHz TO 1000 MHz

Please refer to the APPENDIX C.

## 5.9 TEST RESULTS - ABOVE 1000 MHz

Please refer to the APPENDIX D.

Remark:

(1) No limit: This is fundamental signal, the judgment is not applicable.
For fundamental signal judgment was referred to Peak output test.

# 6. NUMBER OF HOPPING FREQUENCY

## 6.1 LIMIT

| FCC Part15, Subpart C (15.247) | |
|---|---|
| Section | Test Item |
| 15.247(a)(1)(iii) | Number of Hopping Frequency |

| Spectrum Parameters | Setting |
|---|---|
| Attenuation | Auto |
| Span Frequency | > Operating Frequency Range |
| RBW | 100 kHz |
| VBW | 100 kHz |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |

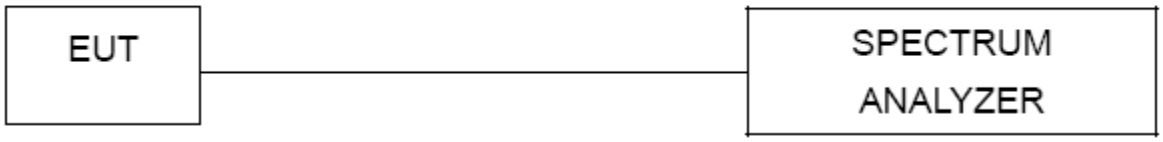
## 6.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. Spectrum Setting: RBW=100 kHz, VBW=100 kHz, Sweep time = Auto.

## 6.3 DEVIATION FROM STANDARD

No deviation.

## 6.4 TEST SETUP




## 6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.5 unless otherwise a special operating condition is specified in the follows during the testing.

## 6.6 EUT TEST CONDITIONS

Temperature: 25.2°C  Relative Humidity: 54%  Test Voltage: AC 120V/60Hz

## 6.7 TEST RESULTS

Please refer to the APPENDIX E

# 7. AVERAGE TIME OF OCCUPANCY

## 7.1 LIMIT

| FCC Part15, Subpart C (15.247) | | |
|---|---|---|
| Section | Test Item | Limit |
| 15.247(a)(1)(iii) | Average Time of Occupancy | 0.4sec |

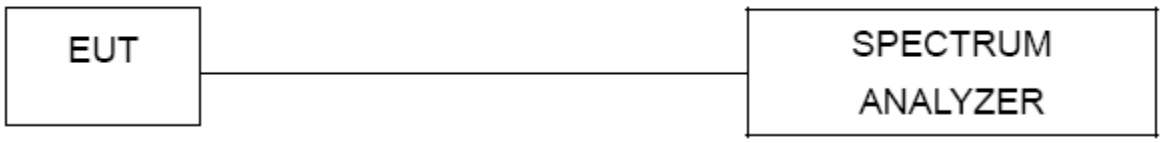
## 7.2 TEST PROCEDURE

a. The transmitter output (antenna port) was connected to the spectrum analyzer
b. Set RBW of spectrum analyzer to 1 MHz and VBW to 1 MHz
c. Use a video trigger with the trigger level set to enable triggering only on full pulses
d. Sweep Time is more than once pulse time
e. Set the center frequency on any frequency would be measure and set the frequency span to zero span
f. Measure the maximum time duration of one single pulse
g. Set the EUT for DH1, DH3 and DH5 packet transmitting
h. Measure the maximum time duration of one single pulse
i. DH1 Packet permit maximum 1600 / 79 /2 = 10.12 hops per second in each channel (1 time slot TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times 10.12 x 31.6 = 320 within 31.6 seconds
j. DH3 Packet permit maximum 1600 / 79 / 4 = 5.06 hops per second in each channel (3 time slots TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times 5.06 x 31.6 = 160 within 31.6 seconds
k. DH5 Packet permit maximum 1600/ 79 / 6 = 3.37 hops per second in each channel (5 time slots TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times 3.37 x 31.6 = 106.6 within 31.6 seconds

## 7.3 DEVIATION FROM STANDARD

No deviation.

## 7.4 TEST SETUP




## 7.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.5 unless otherwise a special operating condition is specified in the follows during the testing.

## 7.6 EUT TEST CONDITIONS

Temperature: 25.2°C Relative Humidity: 54% Test Voltage: AC 120V/60Hz

## 7.7 TEST RESULTS

Please refer to the APPENDIX F

## 8. HOPPING CHANNEL SEPARATION MEASUREMENT

### 8.1 LIMIT

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Span Frequency | > Measurement Bandwidth or Channel Separation |
| RBW | 30 kHz |
| VBW | 100 kHz |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |

### 8.2 TEST PROCEDURE

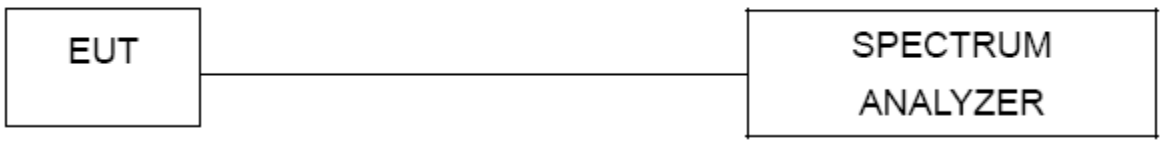
a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.

b. Span = wide enough to capture the peaks of two adjacent channels
Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span
Video (or Average) Bandwidth (VBW) ≥ RBW
Sweep = Auto
Detector function = Peak
Trace = Max Hold

### 8.3 DEVIATION FROM STANDARD

No deviation.

### 8.4 TEST SETUP




### 8.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.5 unless otherwise a special operating condition is specified in the follows during the testing.

### 8.6 EUT TEST CONDITIONS

Temperature: 25.2°C  Relative Humidity: 54%  Test Voltage: AC 120V/60Hz

### 8.7 TEST RESULTS

Please refer to the APPENDIX G

# 9. BANDWIDTH TEST

## 9.1 LIMIT

| FCC Part15, Subpart C (15.247) | |
|---|---|
| Section | Test Item |
| 15.247(a)(1) | Bandwidth |

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Span Frequency | > Measurement Bandwidth |
| RBW | 30 kHz |
| VBW | 100 kHz |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |

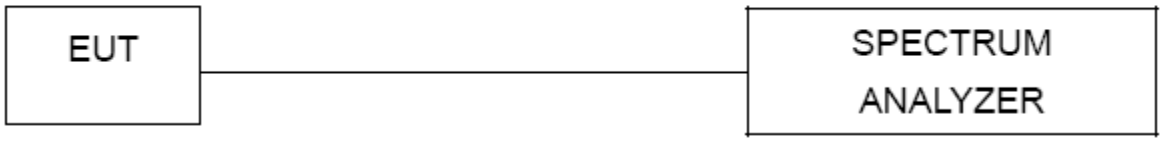
## 9.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. Spectrum Setting: RBW= 30 kHz, VBW=100 kHz, Sweep Time = Auto.

## 9.3 DEVIATION FROM STANDARD

No deviation.

## 9.4 TEST SETUP




## 9.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.5 unless otherwise a special operating condition is specified in the follows during the testing.

## 9.6 EUT TEST CONDITIONS

Temperature: 25.2°C  Relative Humidity: 54%  Test Voltage: AC 120V/60Hz

## 9.7 TEST RESULTS

Please refer to the APPENDIX H

## 10. MAXIMUM PEAK OUTPUT POWER

### 10.1 LIMIT

| FCC Part15 , Subpart C (15.247) | | |
|---|---|---|
| Section | Test Item | Limit |
| 15.247(a)(1) | Maximum Peak Output Power | 0.125 Watt or 21 dBm |

Note: Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB band width of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

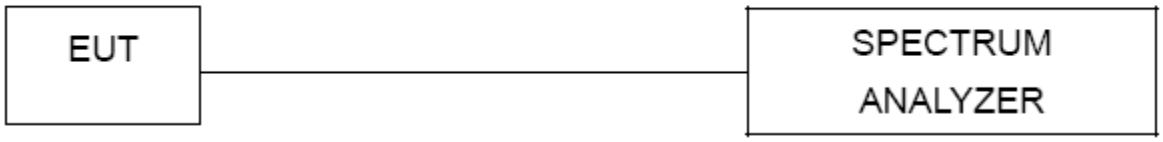
### 10.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. Spectrum Setting: RBW= 1 MHz/3 MHz, VBW= 1 MHz/3 MHz, Sweep time = Auto.

### 10.3 DEVIATION FROM STANDARD

No deviation.

### 10.4 TEST SETUP




### 10.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.5 unless otherwise a special operating condition is specified in the follows during the testing.

### 10.6 EUT TEST CONDITIONS

Temperature: 25.2°C Relative Humidity: 54% Test Voltage: AC 120V/60Hz

### 10.7 TEST RESULTS

Please refer to the APPENDIX I

# 11. CONDUCTED SPURIOUS EMISSION

## 11.1 LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak Output Power limits. If the transmitter complies with the Output Power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required.

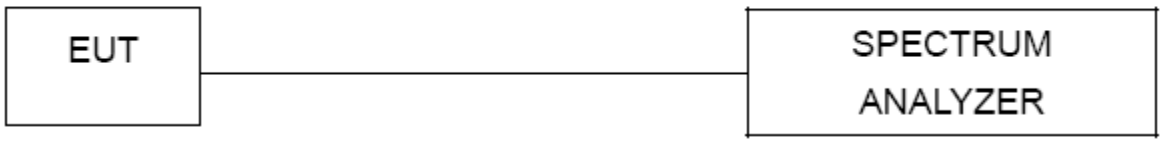
## 11.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. Spectrum Setting: RBW= 100 kHz, VBW=100 kHz, Sweep time = Auto.

## 11.3 DEVIATION FROM STANDARD

No deviation.

## 11.4 TEST SETUP




## 11.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.5 unless otherwise a special operating condition is specified in the follows during the testing.

## 11.6 EUT TEST CONDITIONS

Temperature: 25.2°C  Relative Humidity: 54%  Test Voltage: AC 120V/60Hz

## 11.7 TEST RESULTS

Please refer to the APPENDIX J

## 12. MEASUREMENT INSTRUMENTS LIST

| AC Power Line Conducted Emissions | | | | | |
|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | EMI Test Receiver | R&S | ESCI | 100382 | Mar. 10, 2020 |
| 2 | LISN | EMCO | 3816/2 | 52765 | Mar. 10, 2020 |
| 3 | 50ohm Terminator | SHX | TF5-3 | 15041305 | Mar. 10, 2020 |
| 4 | Artificial-Mains Network | SCHWARZBECK | NSLK 8127 | 8127685 | Mar. 10, 2020 |
| 5 | TRANSIENT LIMITER | EM | EM-7600 | 772 | Mar. 10, 2020 |
| 6 | Measurement Software | Farad | EZ-EMC Ver.NB-03A1-01 | N/A | N/A |
| 7 | Cable | N/A | RG223 | 12m | Mar. 12, 2020 |

| Radiated Emissions - 9 kHz to 30 MHz | | | | | |
|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Loop Antenna | EM | EM-6876-1 | 230 | Jan. 15, 2020 |
| 2 | Cable | N/A | RG 213/U | C-102 | May 31, 2020 |
| 3 | EMI Test Receiver | R&S | ESCI | 100895 | Mar. 10, 2020 |
| 4 | Measurement Software | Farad | EZ-EMC Ver.NB-03A1-01 | N/A | N/A |

| Radiated Emissions - 30 MHz to 1 GHz | | | | | |
|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Antenna | Schwarzbeck | VULB9160 | 9160-3232 | Mar. 09, 2020 |
| 2 | Amplifier | HP | 8447D | 2944A09673 | Aug. 11, 2019 |
| 3 | Receiver | Agilent | N9038A | MY52130039 | Aug. 11, 2019 |
| 4 | Cable | emci | LMR-400(30MHz-1GHz)(8m+5m) | N/A | May 24, 2020 |
| 5 | Controller | CT | SC100 | N/A | N/A |
| 6 | Controller | MF | MF-7802 | MF780208416 | N/A |
| 7 | Measurement Software | Farad | EZ-EMC Ver.NB-03A1-01 | N/A | N/A |

| Radiated Emissions - Above 1 GHz | | | | | |
|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Double Ridged Guide Antenna | ETS | 3115 | 75789 | Mar. 09, 2020 |
| 2 | Broad-Band Horn Antenna | Schwarzbeck | BBHA 9170 | 9170319 | Jun. 23, 2020 |
| 3 | Amplifier | Agilent | 8449B | 3008A02333 | Mar. 10, 2020 |
| 4 | Microwave Preamplifier With Adaptor | EMC INSTRUMENT | EMC2654045 | 980039 & HA01 | Mar. 10, 2020 |
| 5 | Receiver | Agilent | N9038A | MY52130039 | Aug. 11, 2019 |
| 6 | Controller | CT | SC100 | N/A | N/A |
| 7 | Controller | MF | MF-7802 | MF780208416 | N/A |
| 8 | Cable | mitron | B10-01-01-12M | 18072744 | Jul. 30, 2019 |
| 9 | Measurement Software | Farad | EZ-EMC Ver.NB-03A1-01 | N/A | N/A |

| Number of Hopping Frequency | | | | | |
|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Spectrum Analyzer | R&S | FSP40 | 100185 | Aug. 11, 2019 |

| Average Time of Occupancy | | | | | |
|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Spectrum Analyzer | R&S | FSP40 | 100185 | Aug. 11, 2019 |

| Hopping Channel Separation Measurement | | | | | |
|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Spectrum Analyzer | R&S | FSP40 | 100185 | Aug. 11, 2019 |

| Bandwidth | | | | | |
|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Spectrum Analyzer | R&S | FSP40 | 100185 | Aug. 11, 2019 |

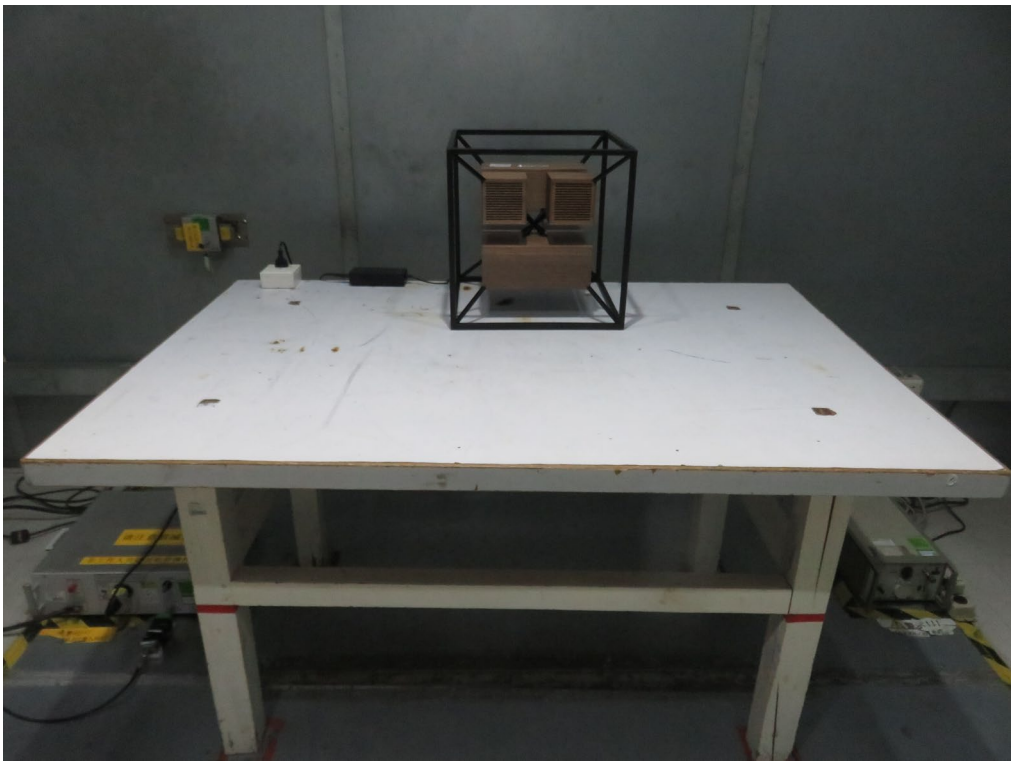
| Maximum Output Power | | | | | |
|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Spectrum Analyzer | R&S | FSP40 | 100185 | Aug. 11, 2019 |

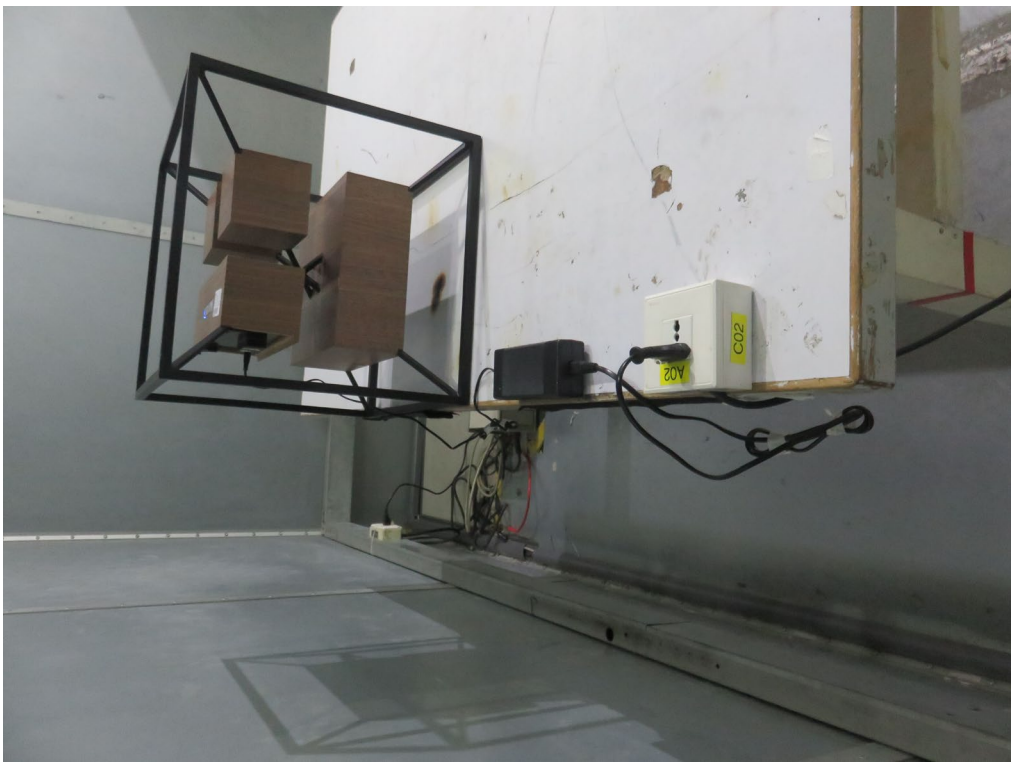
| Antenna Conducted Spurious Emission | | | | | |
|---|---|---|---|---|---|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Spectrum Analyzer | R&S | FSP40 | 100185 | Aug. 11, 2019 |

Remark "N/A" denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

## 13. EUT TEST PHOTO

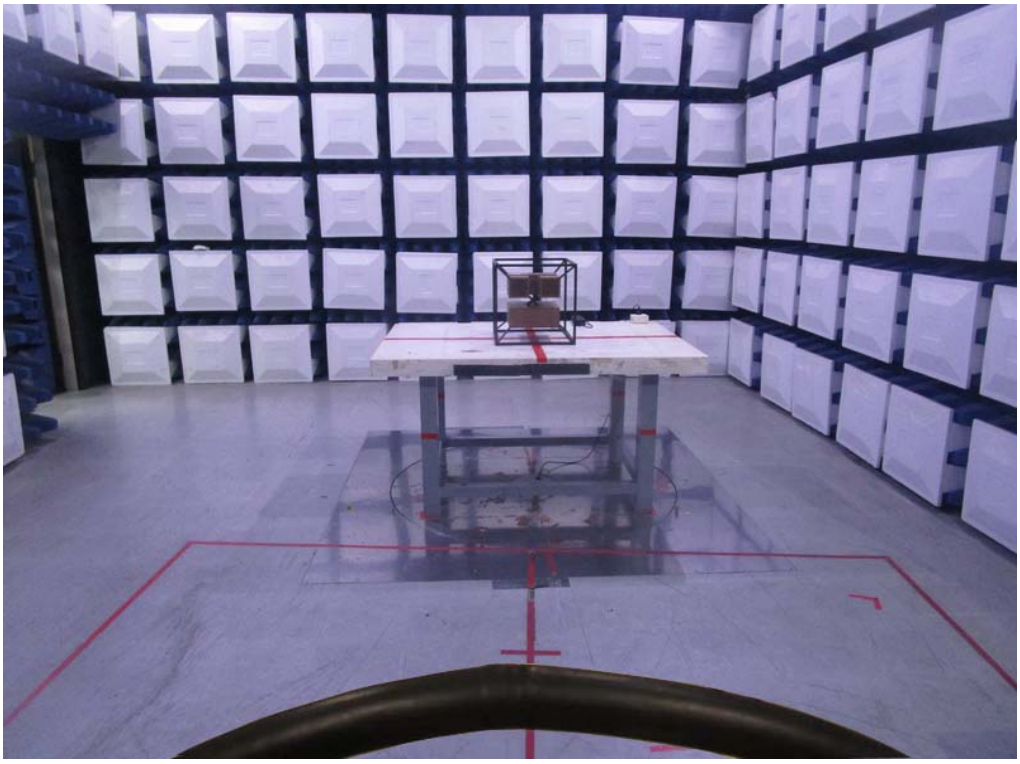
**AC Power Line Conducted Emissions Test Photos**





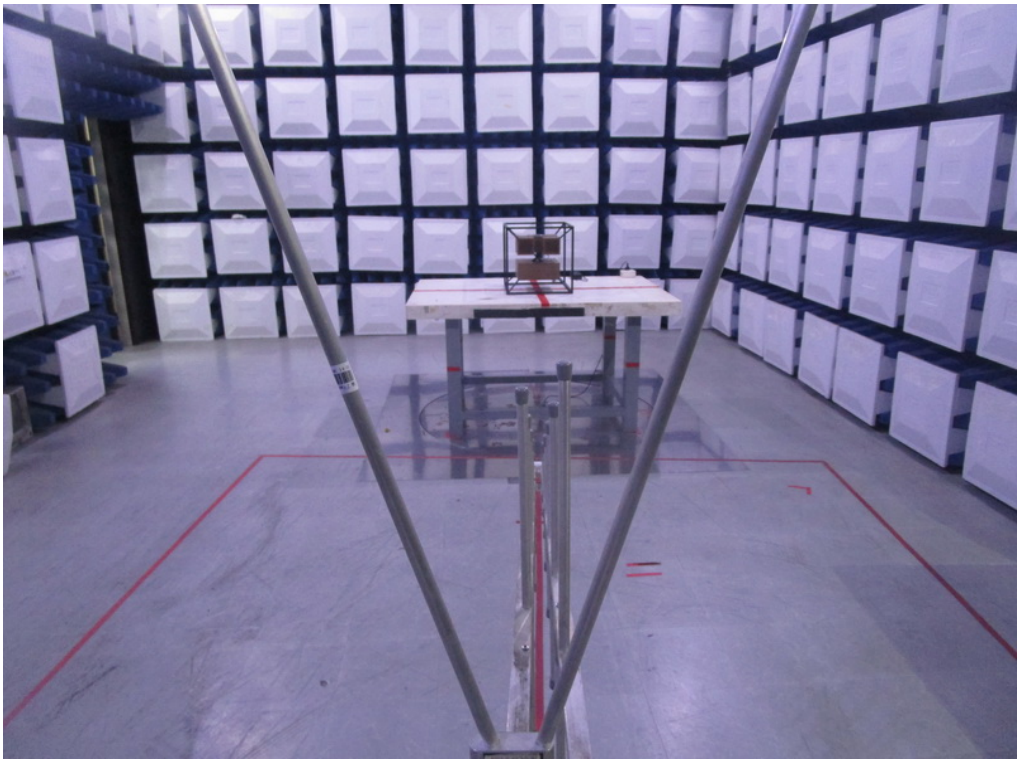
## Radiated Emissions Test Photos

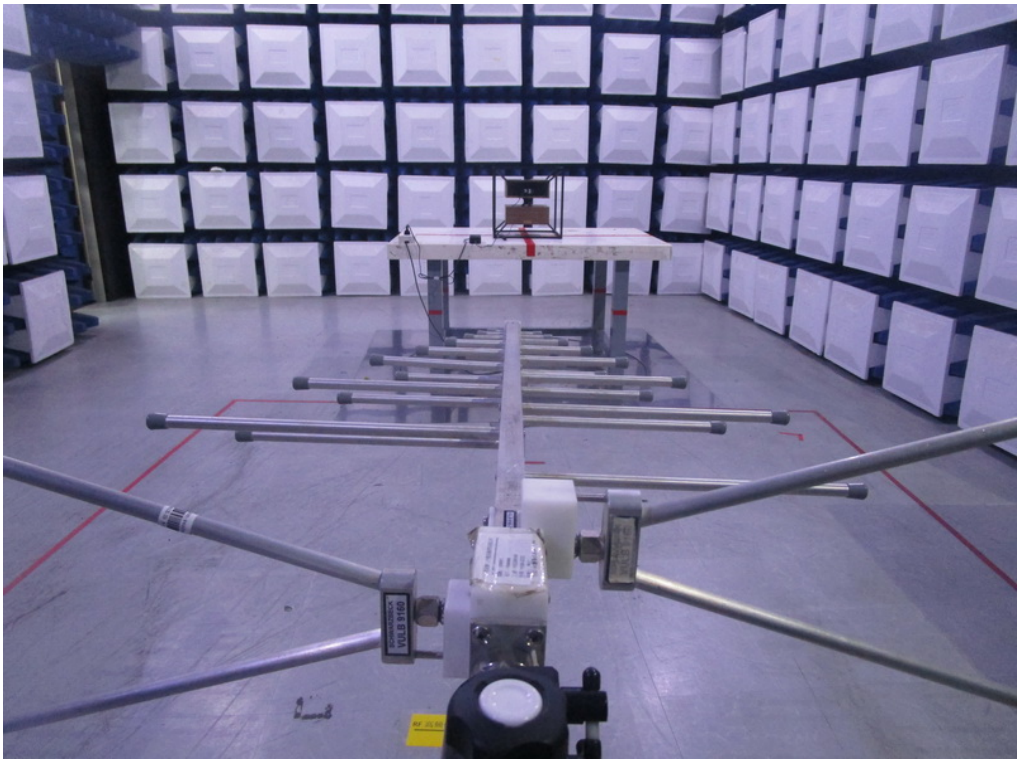
### 9 kHz to 30 MHz



## Radiated Emissions Test Photos

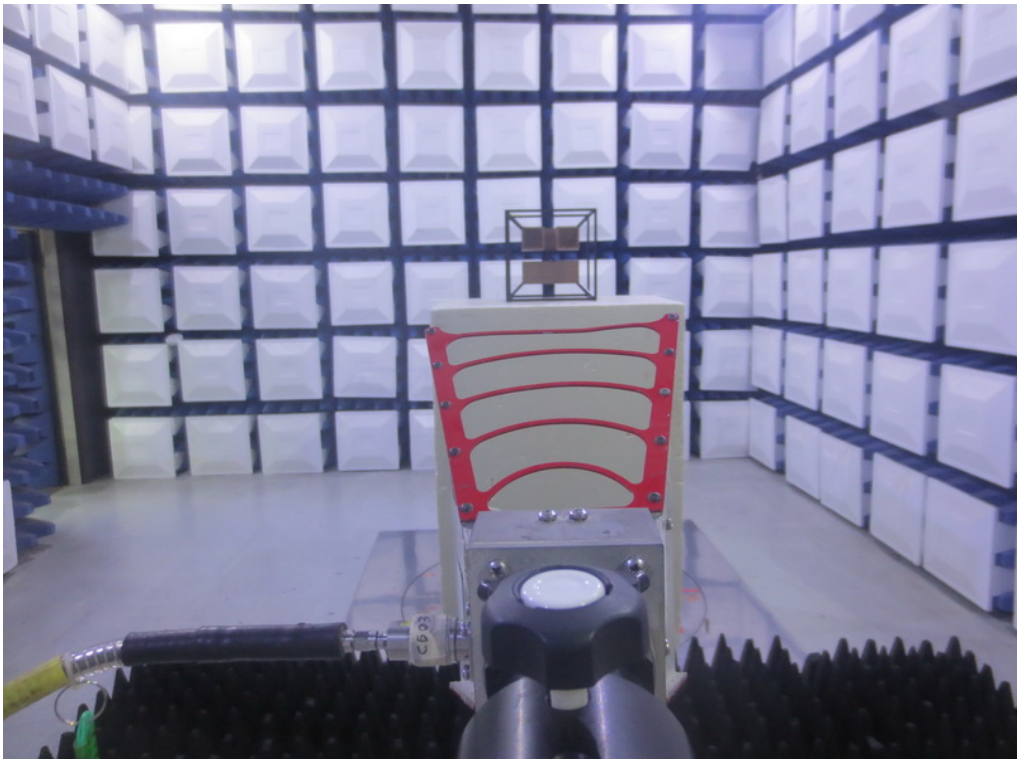
## 30 MHz to 1000 MHz

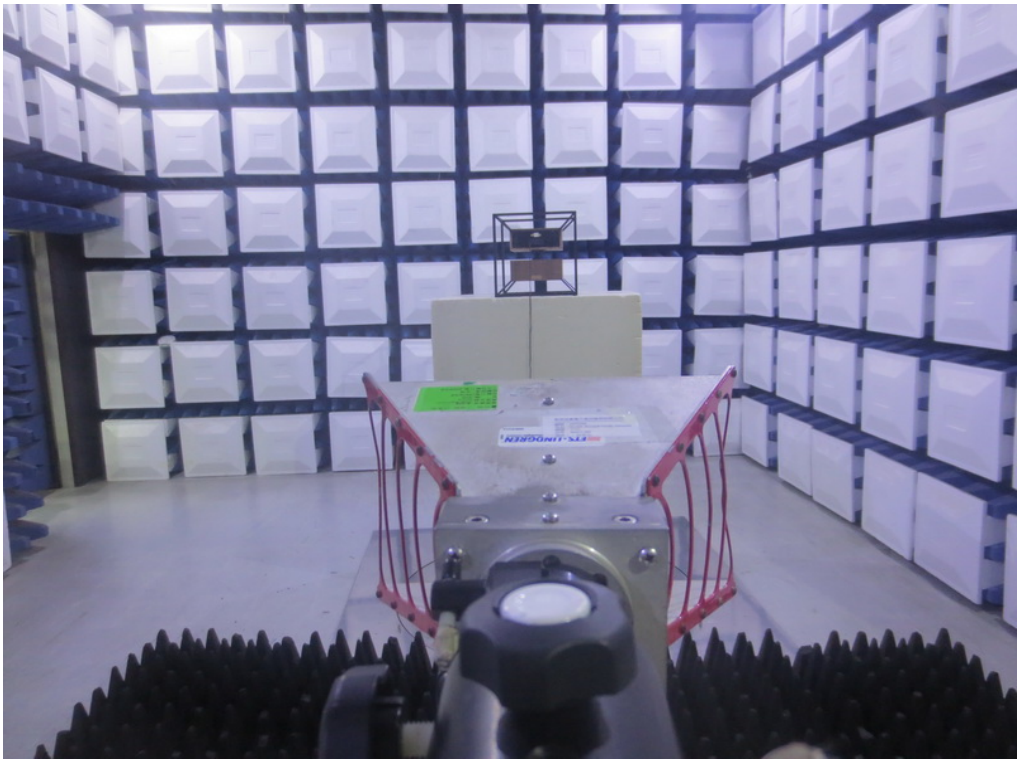




**Radiated Emissions Test Photos**

**Above 1 GHz**

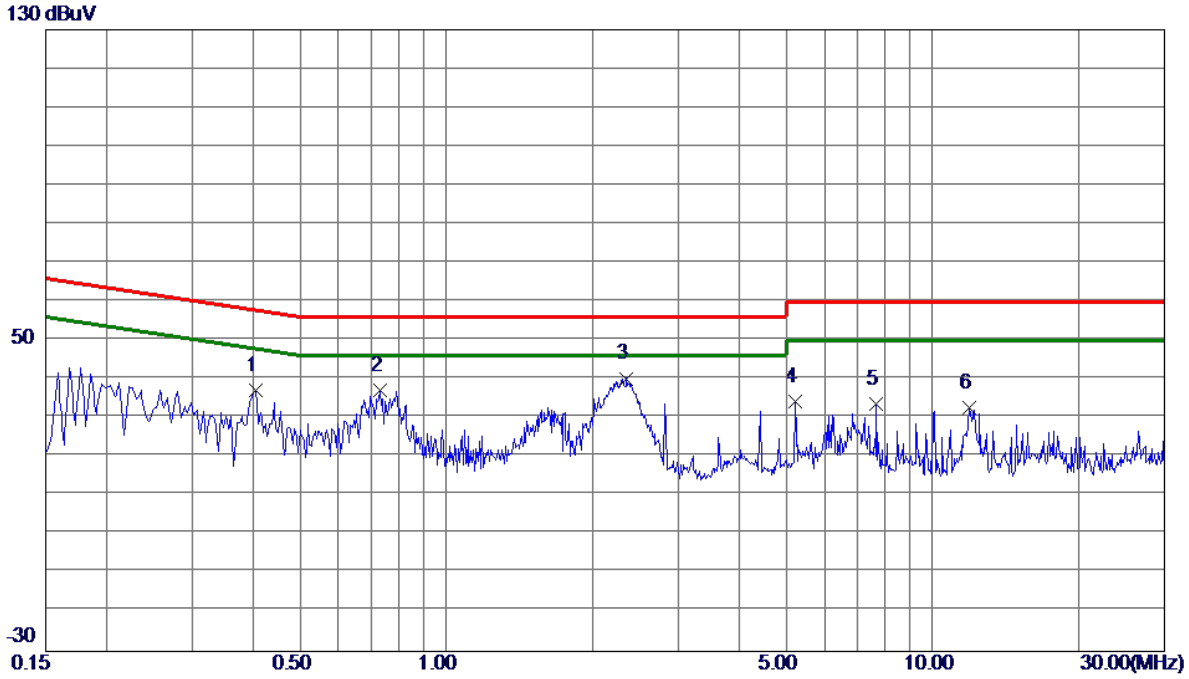




# APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS

| Test Mode: | TX Mode Channel 78 _1Mbps |
|---|---|

## Line

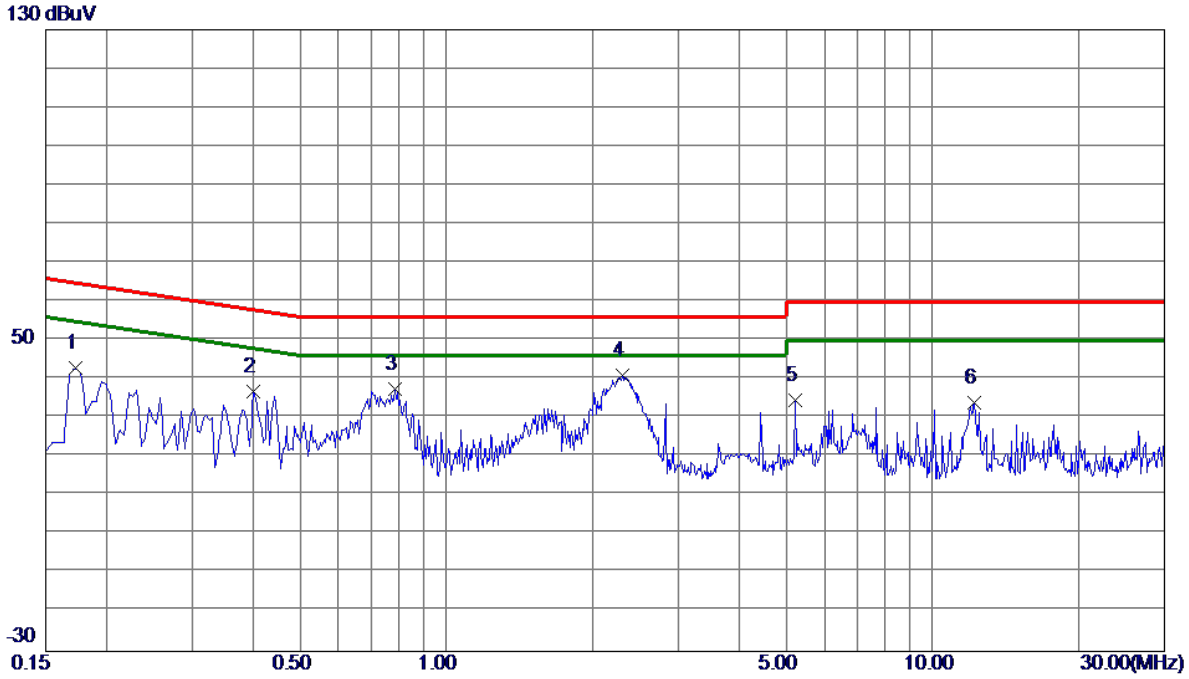



| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | 0.4065 | 26.84 | 10.49 | 37.33 | 57.72 | -20.39 | Peak | |
| 2 | 0.7304 | 26.82 | 10.52 | 37.34 | 56.00 | -18.66 | Peak | |
| 3 * | 2.3460 | 29.58 | 10.66 | 40.24 | 56.00 | -15.76 | Peak | |
| 4 | 5.2350 | 23.62 | 10.79 | 34.41 | 60.00 | -25.59 | Peak | |
| 5 | 7.6605 | 22.77 | 10.88 | 33.65 | 60.00 | -26.35 | Peak | |
| 6 | 11.8905 | 21.88 | 10.96 | 32.84 | 60.00 | -27.16 | Peak | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX Mode Channel 78 _1Mbps |
|---|---|

**Neutral**



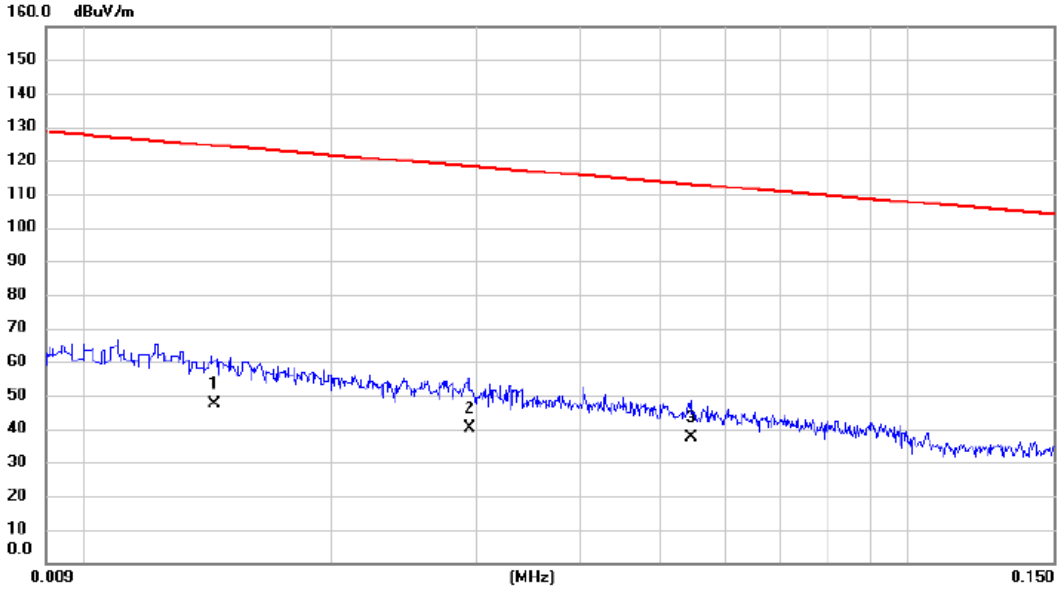

| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | 0.1725 | 32.47 | 10.44 | 42.91 | 64.84 | -21.93 | Peak | |
| 2 | 0.4020 | 26.49 | 10.47 | 36.96 | 57.81 | -20.85 | Peak | |
| 3 | 0.7845 | 27.06 | 10.50 | 37.56 | 56.00 | -18.44 | Peak | |
| 4 * | 2.3010 | 30.31 | 10.62 | 40.93 | 56.00 | -15.07 | Peak | |
| 5 | 5.2350 | 23.85 | 10.76 | 34.61 | 60.00 | -25.39 | Peak | |
| 6 | 12.1965 | 23.17 | 10.94 | 34.11 | 60.00 | -25.89 | Peak | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

# APPENDIX B - RADIATED EMISSION - 9 KHZ-30 MHZ

| Test Mode: | TX Mode Channel 78 _1Mbps |
|---|---|

**Ant 0°**

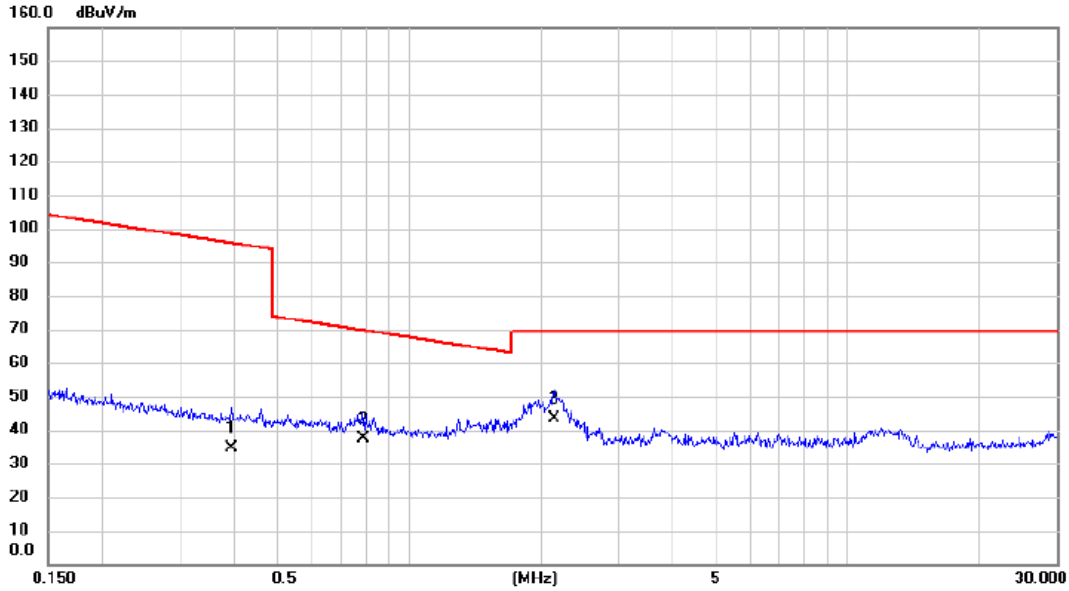



| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 0.0144 | 31.90 | 15.50 | 47.40 | 124.44 | -77.04 | AVG | |
| 2 | | 0.0294 | 26.50 | 13.85 | 40.35 | 118.24 | -77.89 | AVG | |
| 3 | * | 0.0546 | 23.70 | 13.86 | 37.56 | 112.86 | -75.30 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX Mode Channel 78 _1Mbps |
|---|---|

**Ant 0°**

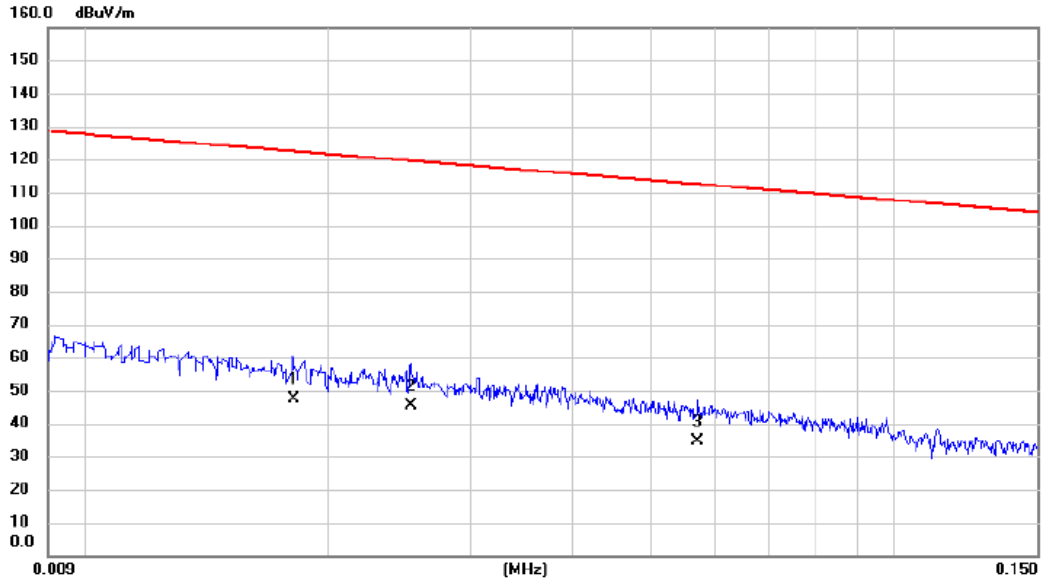



| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 0.3933 | 21.30 | 13.32 | 34.62 | 95.71 | -61.09 | AVG | |
| 2 | | 0.7835 | 24.80 | 12.57 | 37.37 | 69.72 | -32.35 | QP | |
| 3 | * | 2.1440 | 31.60 | 11.73 | 43.33 | 69.54 | -26.21 | QP | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX Mode Channel 78 _1Mbps |
|---|---|

**Ant 90°**

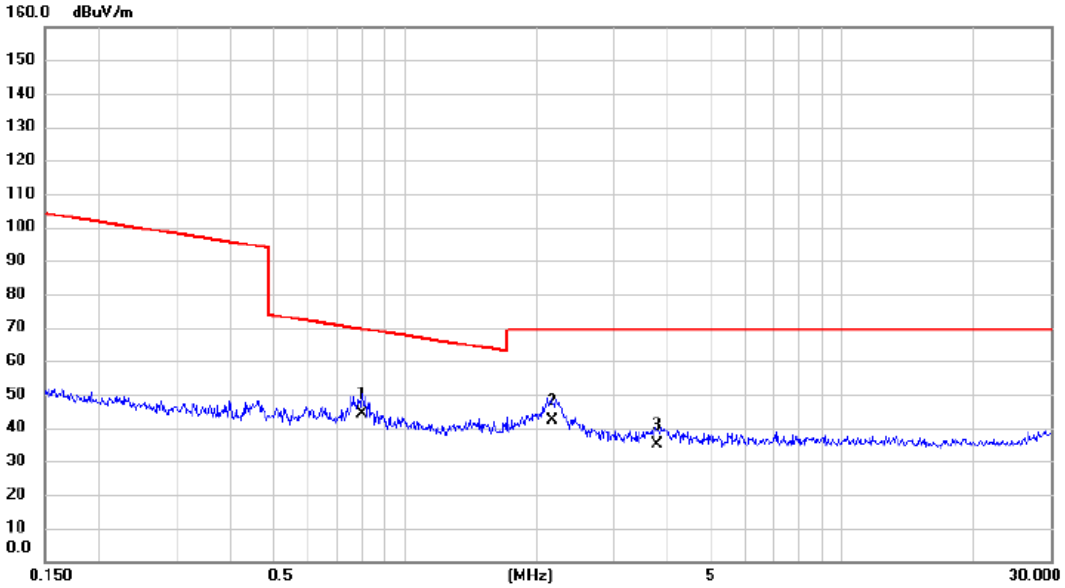



| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 0.0181 | 32.90 | 14.39 | 47.29 | 122.45 | -75.16 | AVG | |
| 2 | * | 0.0253 | 31.40 | 13.84 | 45.24 | 119.54 | -74.30 | AVG | |
| 3 | | 0.0571 | 20.90 | 13.82 | 34.72 | 112.47 | -77.75 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX Mode Channel 78 _1Mbps |
|---|---|

**Ant 90°**



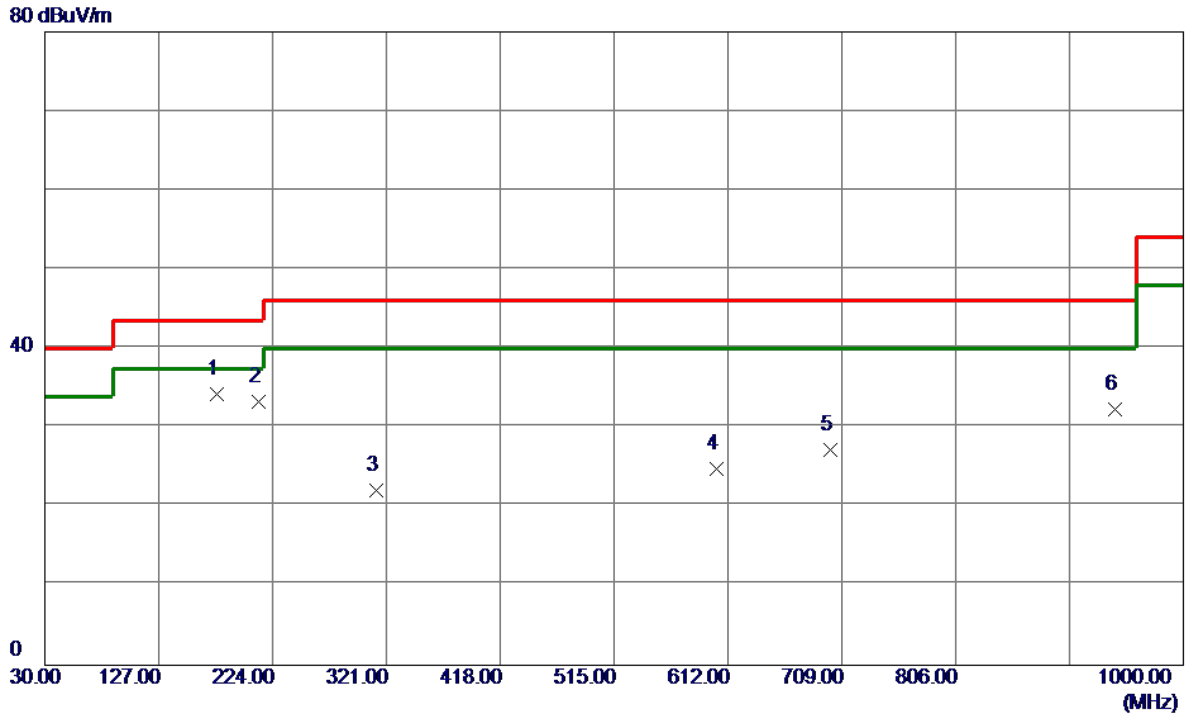

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | * | 0.7960 | 31.60 | 12.56 | 44.16 | 69.59 | -25.43 | QP | |
| 2 | | 2.1668 | 30.30 | 11.72 | 42.02 | 69.54 | -27.52 | QP | |
| 3 | | 3.7594 | 23.80 | 11.01 | 34.81 | 69.54 | -34.73 | QP | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

# APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ

| Test Mode: | TX Mode Channel 78 _1Mbps |
|---|---|

**Vertical**

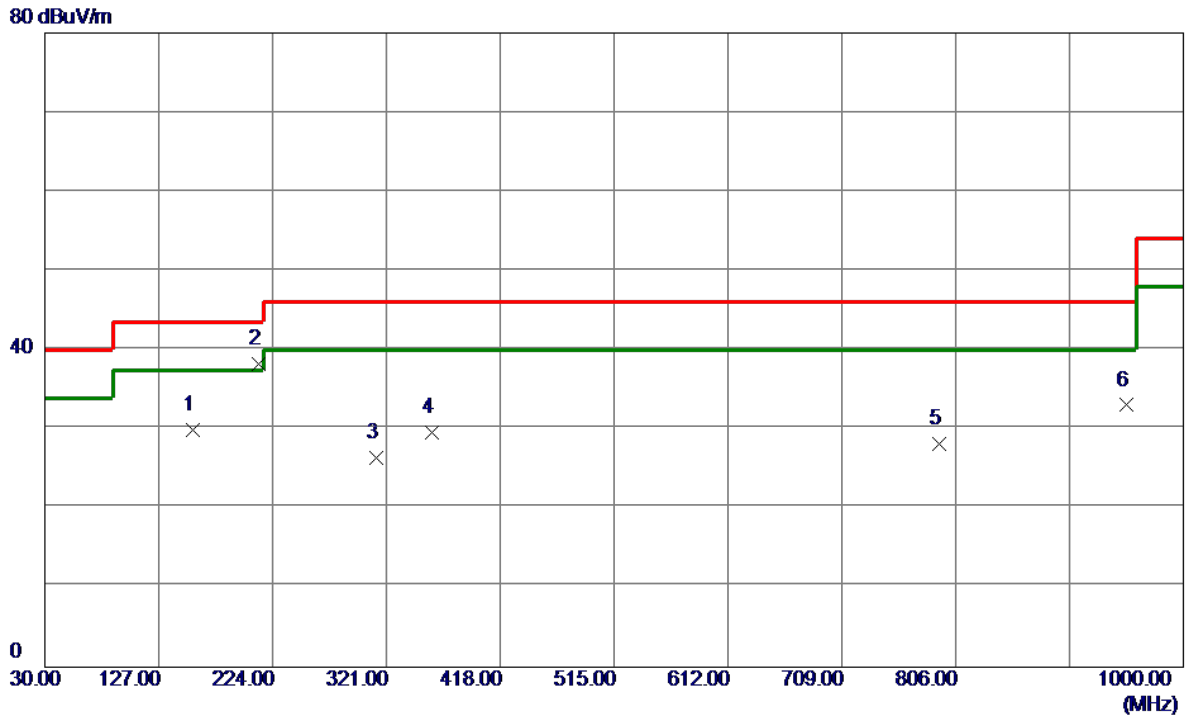



| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 * | 176.4700 | 46.47 | -12.24 | 34.23 | 43.50 | -9.27 | Peak | |
| 2 | 212.3600 | 48.36 | -15.14 | 33.22 | 43.50 | -10.28 | Peak | |
| 3 | 312.2700 | 32.66 | -10.54 | 22.12 | 46.00 | -23.88 | Peak | |
| 4 | 602.3000 | 31.13 | -6.25 | 24.88 | 46.00 | -21.12 | Peak | |
| 5 | 699.3000 | 30.00 | -2.78 | 27.22 | 46.00 | -18.78 | Peak | |
| 6 | 941.8000 | 31.26 | 1.08 | 32.34 | 46.00 | -13.66 | Peak | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX Mode Channel 78 _1Mbps |
|---|---|

**Horizontal**



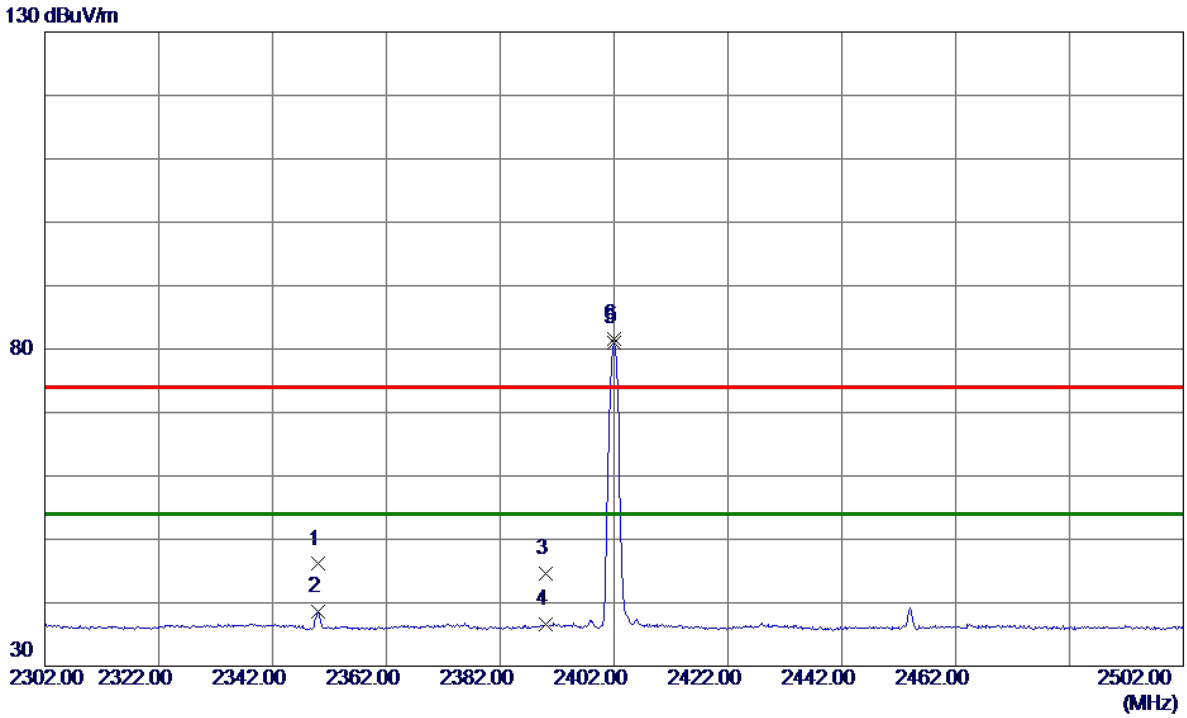

| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 156.1000 | 40.92 | -10.95 | 29.97 | 43.50 | -13.53 | Peak | |
| 2 * | 212.3600 | 53.31 | -15.14 | 38.17 | 43.50 | -5.33 | Peak | |
| 3 | 312.2700 | 36.96 | -10.54 | 26.42 | 46.00 | -19.58 | Peak | |
| 4 | 359.8000 | 40.36 | -10.74 | 29.62 | 46.00 | -16.38 | Peak | |
| 5 | 792.4200 | 29.73 | -1.50 | 28.23 | 46.00 | -17.77 | Peak | |
| 6 | 951.5000 | 31.67 | 1.37 | 33.04 | 46.00 | -12.96 | Peak | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

# APPENDIX D - RADIATED EMISSION - ABOVE 1000 MHZ

| Test Mode: | TX 2402 MHz _CH00_1Mbps |
|---|---|

**Vertical**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 2349.9000 | 39.52 | 6.58 | 46.10 | 74.00 | -27.90 | Peak | |
| 2 | 2349.9000 | 32.08 | 6.58 | 38.66 | 54.00 | -15.34 | AVG | |
| 3 | 2390.0000 | 38.06 | 6.53 | 44.59 | 74.00 | -29.41 | Peak | |
| 4 | 2390.0000 | 30.02 | 6.53 | 36.55 | 54.00 | -17.45 | AVG | |
| 5 * | 2401.9000 | 74.56 | 6.52 | 81.08 | 54.00 | 27.08 | AVG | No Limit |
| 6 | 2402.1000 | 75.02 | 6.52 | 81.54 | 74.00 | 7.54 | Peak | No Limit |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2402 MHz _CH00_1Mbps |
|---|---|

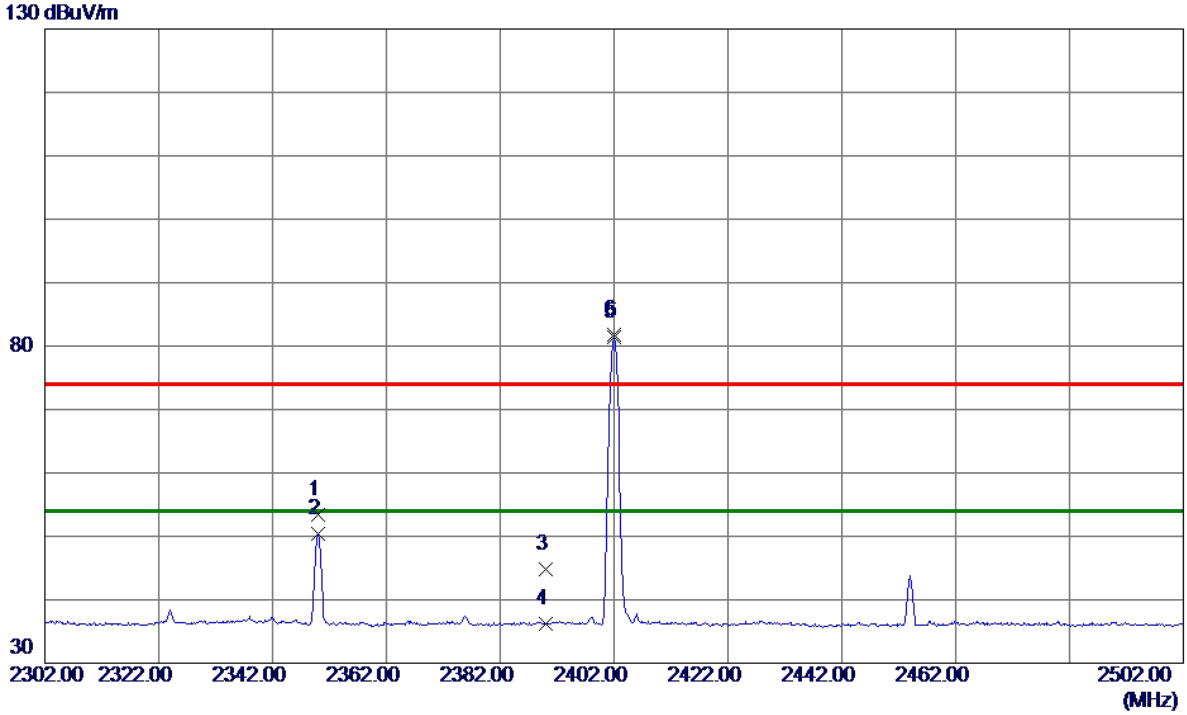
**Vertical**

| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 * | 4803.9080 | 40.90 | 4.19 | 45.09 | 54.00 | -8.91 | AVG | |
| 2 | 4804.1760 | 45.63 | 4.19 | 49.82 | 74.00 | -24.18 | Peak | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2402 MHz _CH00_1Mbps |
|---|---|

**Horizontal**

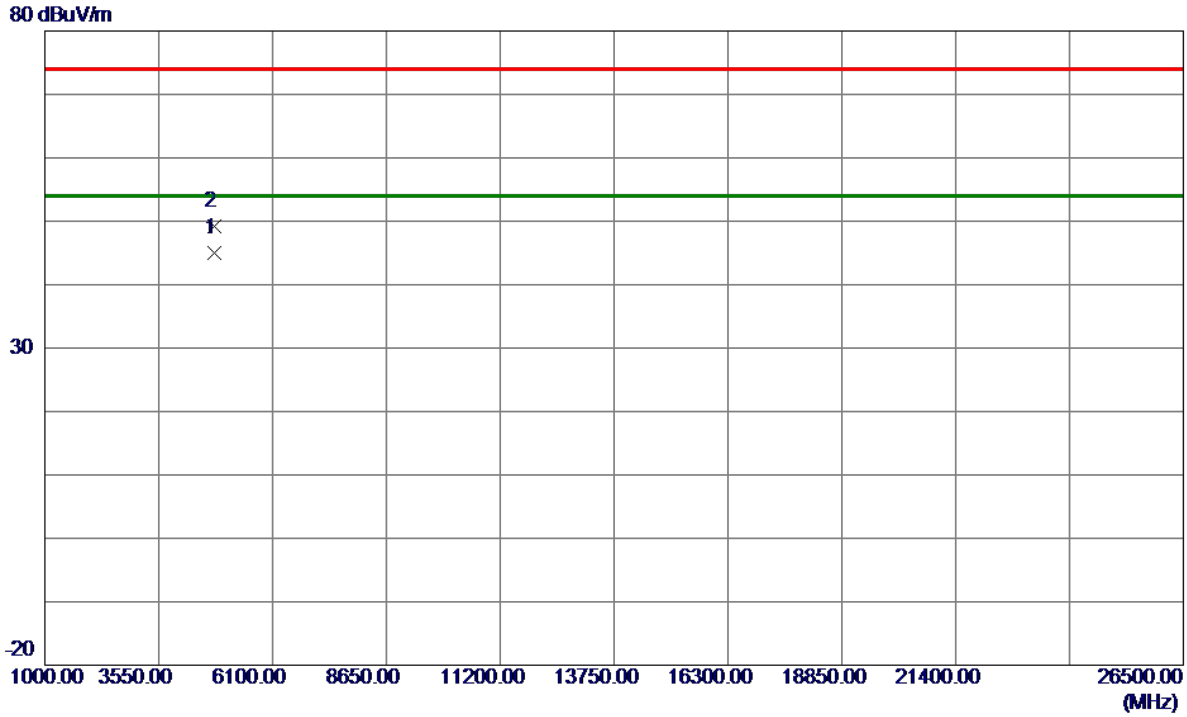



| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 2349.9000 | 46.91 | 6.58 | 53.49 | 74.00 | -20.51 | Peak | |
| 2 | 2349.9000 | 43.90 | 6.58 | 50.48 | 54.00 | -3.52 | AVG | |
| 3 | 2390.0000 | 38.32 | 6.53 | 44.85 | 74.00 | -29.15 | Peak | |
| 4 | 2390.0000 | 29.67 | 6.53 | 36.20 | 54.00 | -17.80 | AVG | |
| 5 * | 2401.9000 | 74.95 | 6.52 | 81.47 | 54.00 | 27.47 | AVG | No Limit |
| 6 | 2402.1000 | 75.36 | 6.52 | 81.88 | 74.00 | 7.88 | Peak | No Limit |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2402 MHz _CH00_1Mbps |
|---|---|

**Horizontal**

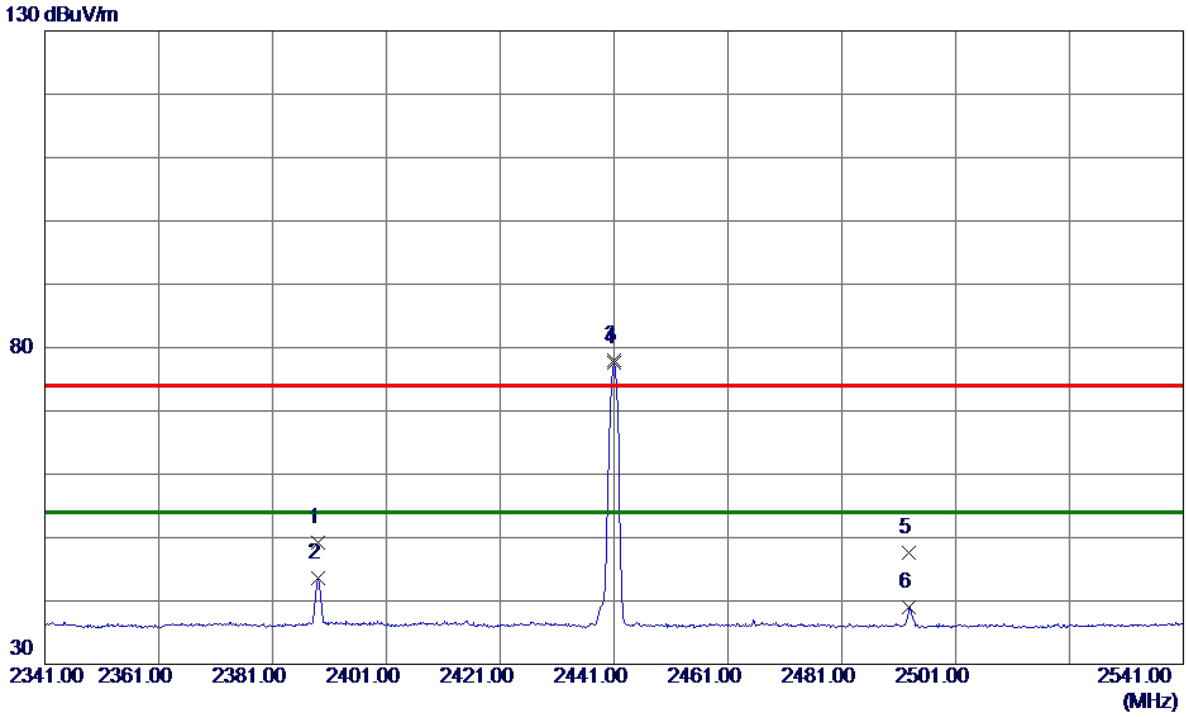



| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 * | 4803.8760 | 40.72 | 4.19 | 44.91 | 54.00 | -9.09 | AVG | |
| 2 | 4804.0360 | 45.09 | 4.19 | 49.28 | 74.00 | -24.72 | Peak | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2441 MHz _CH39_1Mbps |
|---|---|

**Vertical**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 2388.9000 | 42.62 | 6.53 | 49.15 | 74.00 | -24.85 | Peak | |
| 2 | 2388.9000 | 37.02 | 6.53 | 43.55 | 54.00 | -10.45 | AVG | |
| 3 | 2440.9000 | 71.58 | 6.47 | 78.05 | 74.00 | 4.05 | Peak | No Limit |
| 4 * | 2440.9000 | 71.08 | 6.47 | 77.55 | 54.00 | 23.55 | AVG | No Limit |
| 5 | 2492.8000 | 41.10 | 6.41 | 47.51 | 74.00 | -26.49 | Peak | |
| 6 | 2492.8000 | 32.53 | 6.41 | 38.94 | 54.00 | -15.06 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2441 MHz _CH39_1Mbps |
|---|---|

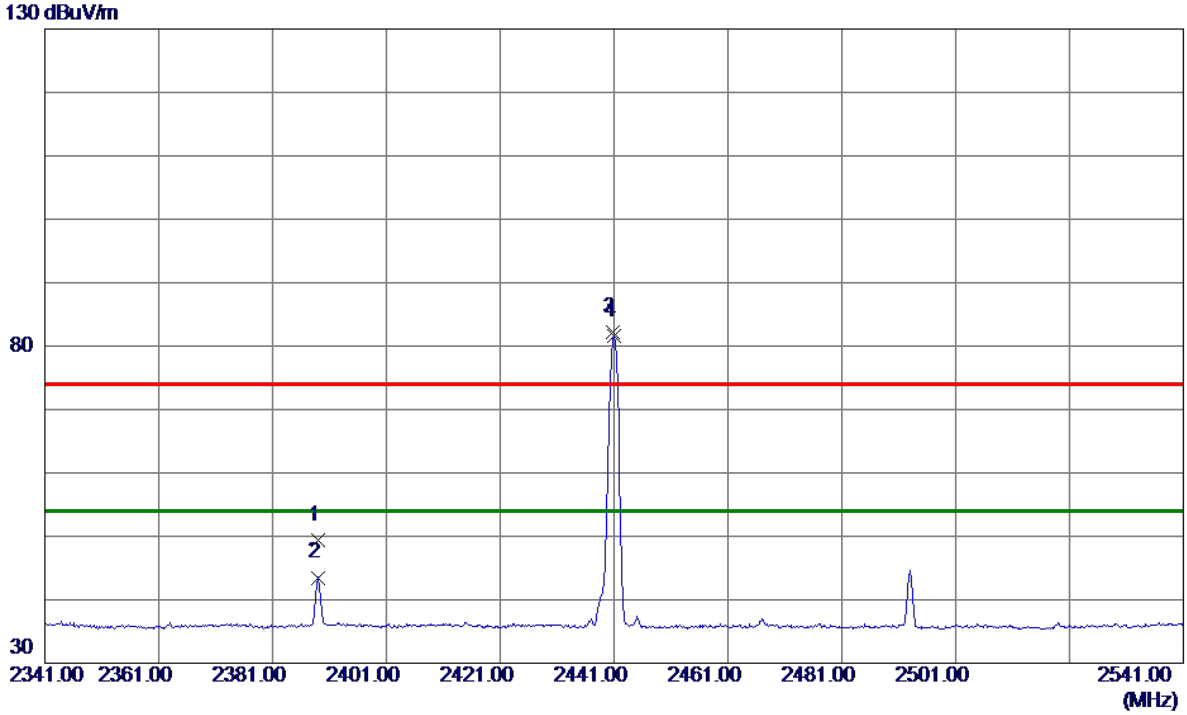
**Vertical**

| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 4881.8940 | 41.84 | 4.35 | 46.19 | 74.00 | -27.81 | Peak | |
| 2 * | 4881.9000 | 35.28 | 4.35 | 39.63 | 54.00 | -14.37 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2441 MHz _CH39_1Mbps |
|---|---|

**Horizontal**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 2388.9000 | 42.81 | 6.53 | 49.34 | 74.00 | -24.66 | Peak | |
| 2 | 2388.9000 | 36.97 | 6.53 | 43.50 | 54.00 | -10.50 | AVG | |
| 3 | 2440.8000 | 75.64 | 6.47 | 82.11 | 74.00 | 8.11 | Peak | No Limit |
| 4 * | 2440.9000 | 75.20 | 6.47 | 81.67 | 54.00 | 27.67 | AVG | No Limit |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2441 MHz _CH39_1Mbps |
|---|---|

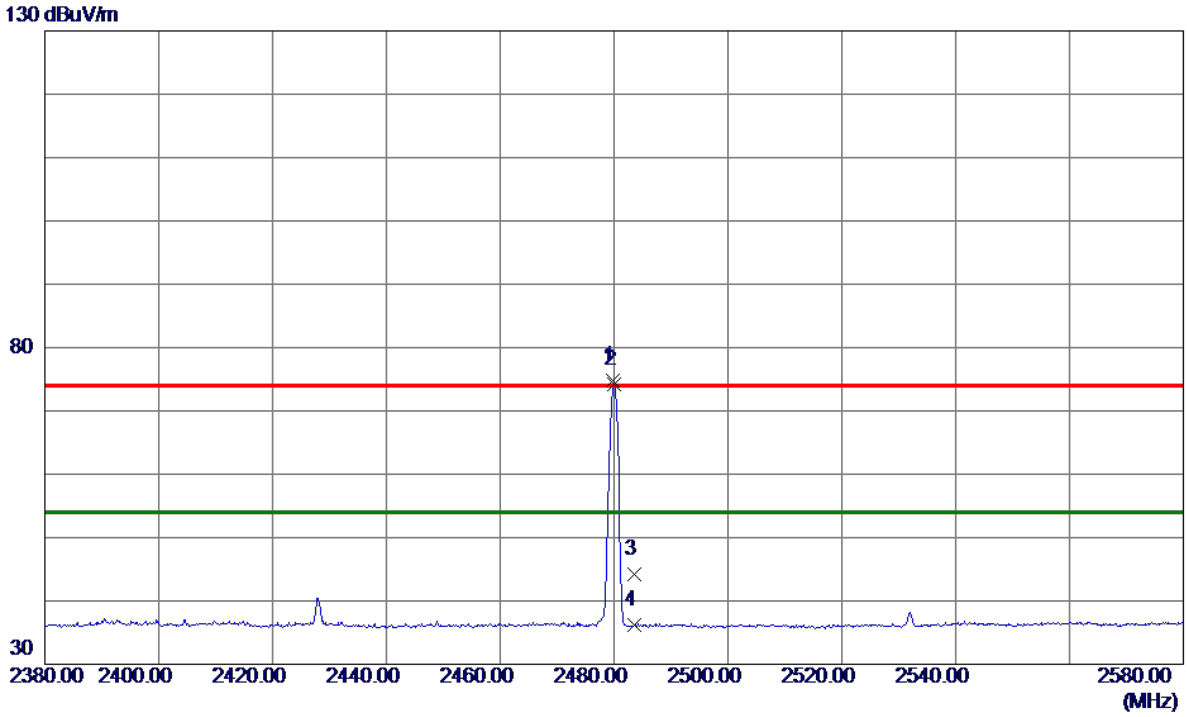
**Horizontal**

| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 4881.8400 | 40.86 | 4.35 | 45.21 | 74.00 | -28.79 | Peak | |
| 2 * | 4881.8700 | 33.42 | 4.35 | 37.77 | 54.00 | -16.23 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2480 MHz _CH78_1Mbps |
|---|---|

**Vertical**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 2479.8000 | 68.37 | 6.43 | 74.80 | 74.00 | 0.80 | Peak | No Limit |
| 2 * | 2480.0000 | 67.78 | 6.43 | 74.21 | 54.00 | 20.21 | AVG | No Limit |
| 3 | 2483.5000 | 37.74 | 6.42 | 44.16 | 74.00 | -29.84 | Peak | |
| 4 | 2483.5000 | 29.77 | 6.42 | 36.19 | 54.00 | -17.81 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2480 MHz _CH78_1Mbps |
|---|---|

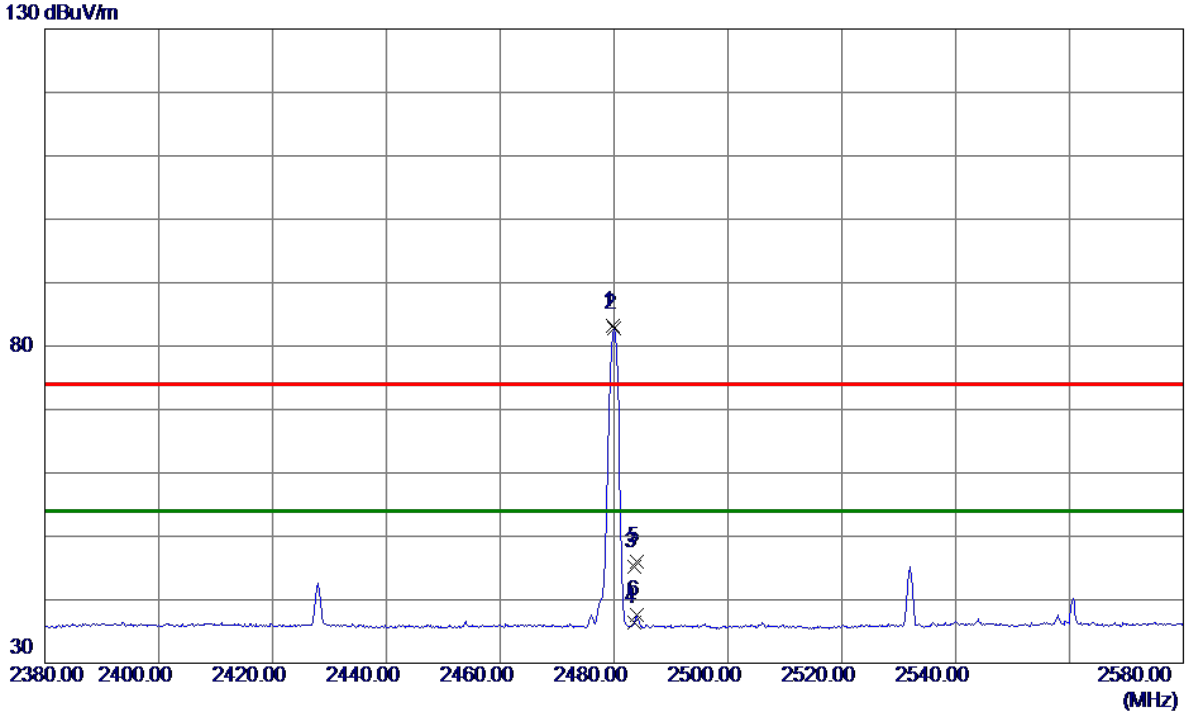
**Vertical**

| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 4959.5740 | 41.90 | 4.52 | 46.42 | 74.00 | -27.58 | Peak | |
| 2 * | 4959.8920 | 34.85 | 4.52 | 39.37 | 54.00 | -14.63 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2480 MHz _CH78_1Mbps |
|---|---|

**Horizontal**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 2479.8000 | 76.80 | 6.43 | 83.23 | 74.00 | 9.23 | Peak | No Limit |
| 2 * | 2479.9000 | 76.33 | 6.43 | 82.76 | 54.00 | 28.76 | AVG | No Limit |
| 3 | 2483.5000 | 38.71 | 6.42 | 45.13 | 74.00 | -28.87 | Peak | |
| 4 | 2483.5000 | 30.03 | 6.42 | 36.45 | 54.00 | -17.55 | AVG | |
| 5 | 2483.9000 | 39.66 | 6.42 | 46.08 | 74.00 | -27.92 | Peak | |
| 6 | 2483.9000 | 31.12 | 6.42 | 37.54 | 54.00 | -16.46 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2480 MHz _CH78_1Mbps |
|---|---|

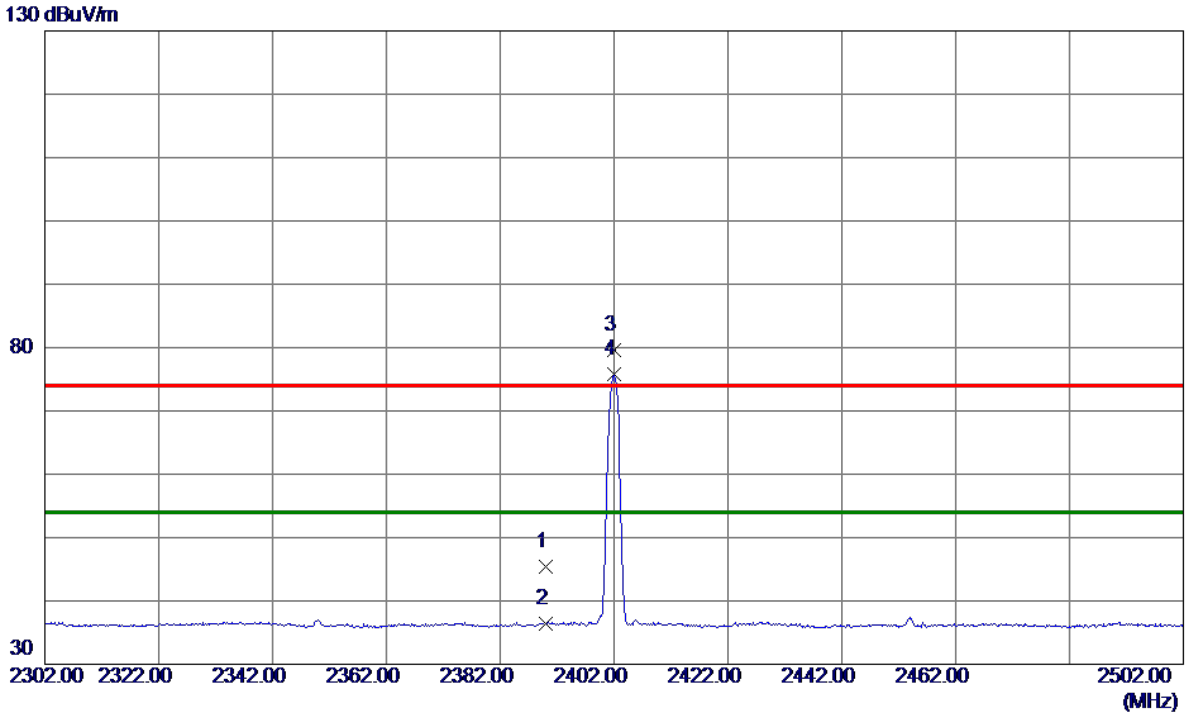
**Horizontal**

| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 4959.4120 | 41.26 | 4.52 | 45.78 | 74.00 | -28.22 | Peak | |
| 2 * | 4959.7599 | 33.35 | 4.52 | 37.87 | 54.00 | -16.13 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2402 MHz _CH00_3Mbps |
|---|---|

**Vertical**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 2390.0000 | 38.95 | 6.53 | 45.48 | 74.00 | -28.52 | Peak | |
| 2 | 2390.0000 | 29.84 | 6.53 | 36.37 | 54.00 | -17.63 | AVG | |
| 3 | 2401.9000 | 73.01 | 6.52 | 79.53 | 74.00 | 5.53 | Peak | No Limit |
| 4 * | 2401.9000 | 69.19 | 6.52 | 75.71 | 54.00 | 21.71 | AVG | No Limit |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2402 MHz _CH00_3Mbps |
|---|---|

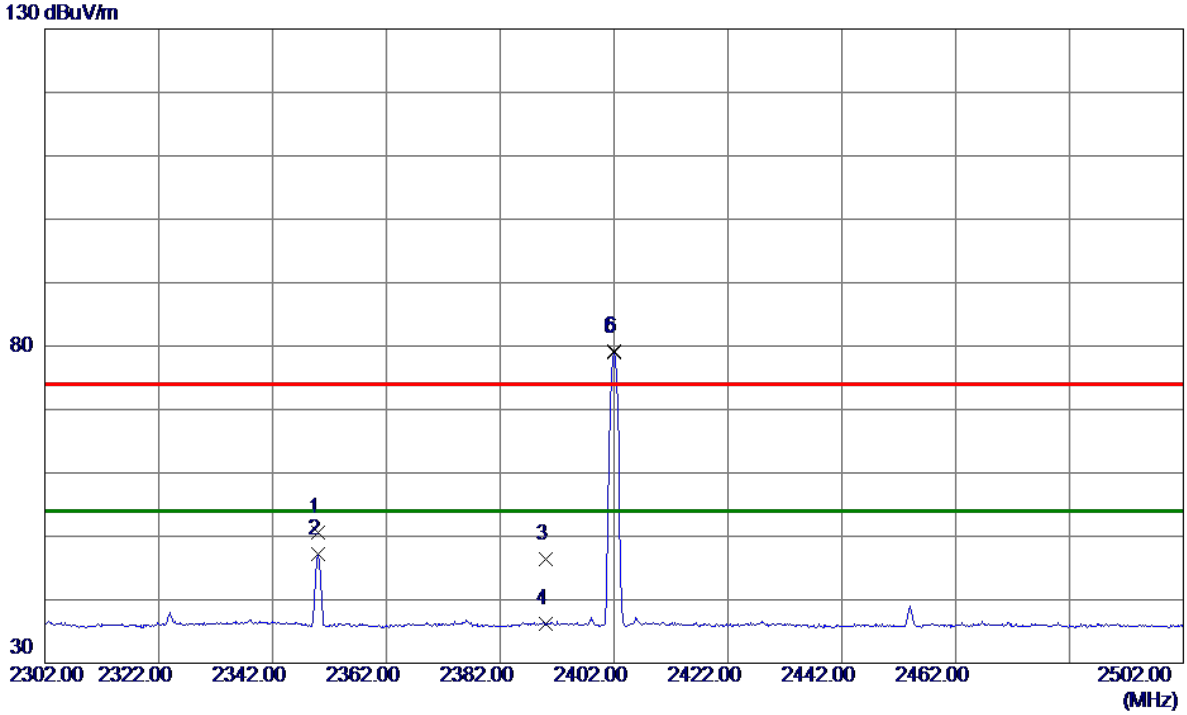
**Vertical**

| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 * | 4803.7940 | 40.09 | 4.19 | 44.28 | 54.00 | -9.72 | AVG | |
| 2 | 4803.9200 | 47.29 | 4.19 | 51.48 | 74.00 | -22.52 | Peak | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2402 MHz _CH00_3Mbps |
|---|---|

**Horizontal**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 2349.9000 | 44.08 | 6.58 | 50.66 | 74.00 | -23.34 | Peak | |
| 2 | 2349.9000 | 40.59 | 6.58 | 47.17 | 54.00 | -6.83 | AVG | |
| 3 | 2390.0000 | 39.88 | 6.53 | 46.41 | 74.00 | -27.59 | Peak | |
| 4 | 2390.0000 | 29.64 | 6.53 | 36.17 | 54.00 | -17.83 | AVG | |
| 5 * | 2401.9000 | 72.56 | 6.52 | 79.08 | 54.00 | 25.08 | AVG | No Limit |
| 6 | 2402.0000 | 72.59 | 6.52 | 79.11 | 74.00 | 5.11 | Peak | No Limit |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2402 MHz _CH00_3Mbps |
|---|---|

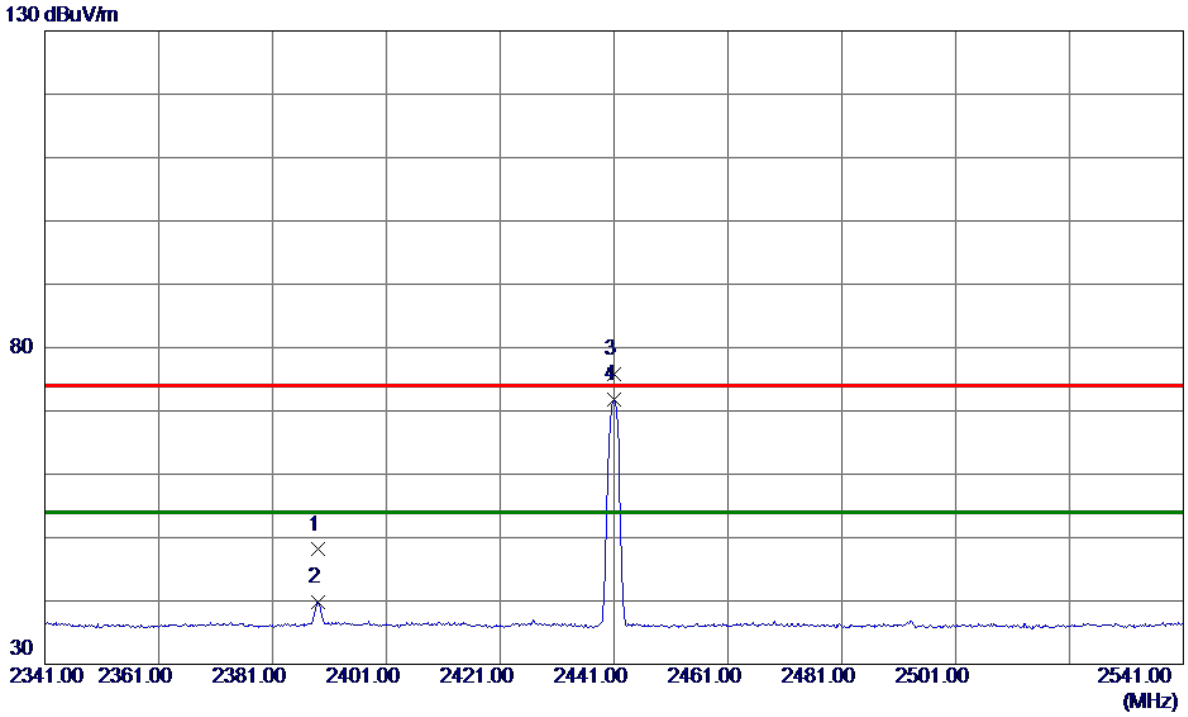
**Horizontal**

| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 4803.5160 | 44.01 | 4.19 | 48.20 | 74.00 | -25.80 | Peak | |
| 2 * | 4803.8360 | 35.98 | 4.19 | 40.17 | 54.00 | -13.83 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2441 MHz _CH39_3Mbps |
|---|---|

**Vertical**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 2388.9000 | 41.57 | 6.53 | 48.10 | 74.00 | -25.90 | Peak | |
| 2 | 2388.9000 | 33.20 | 6.53 | 39.73 | 54.00 | -14.27 | AVG | |
| 3 | 2440.9000 | 69.36 | 6.47 | 75.83 | 74.00 | 1.83 | Peak | No Limit |
| 4 * | 2440.9000 | 65.32 | 6.47 | 71.79 | 54.00 | 17.79 | AVG | No Limit |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2441 MHz _CH39_3Mbps |
|---|---|

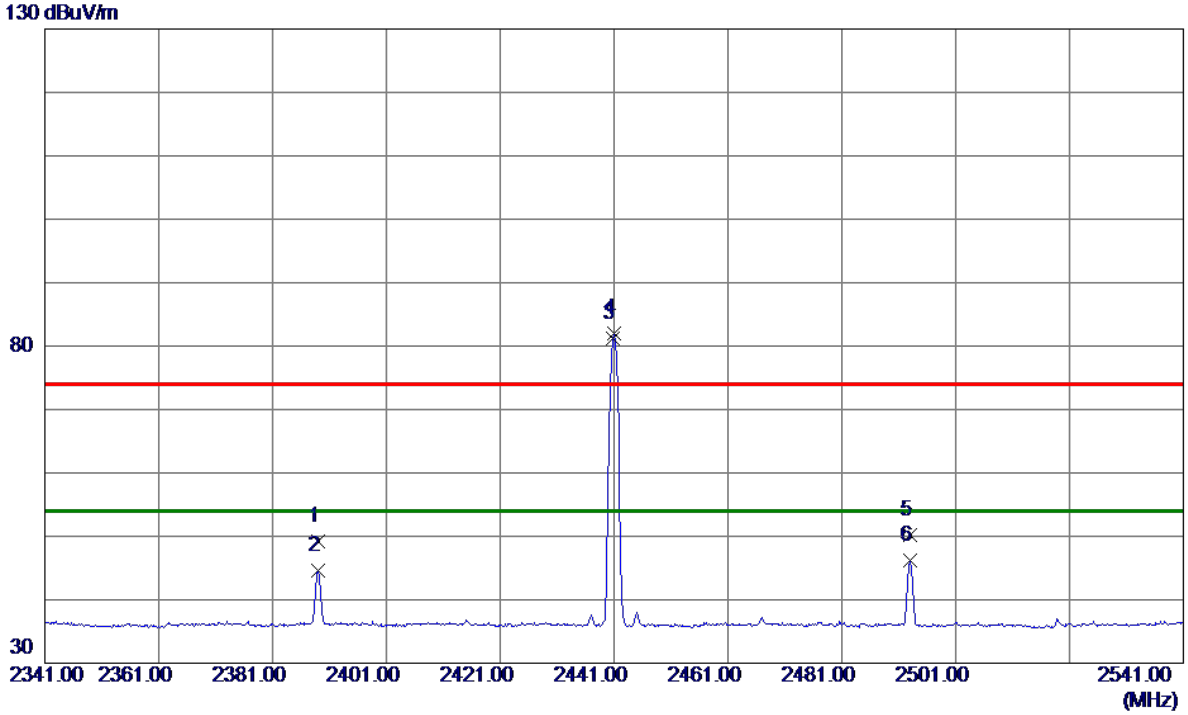
**Vertical**

| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 4881.6800 | 43.77 | 4.35 | 48.12 | 74.00 | -25.88 | Peak | |
| 2 * | 4881.7320 | 35.20 | 4.35 | 39.55 | 54.00 | -14.45 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2441 MHz _CH39_3Mbps |
|---|---|

**Horizontal**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 2388.9000 | 42.67 | 6.53 | 49.20 | 74.00 | -24.80 | Peak | |
| 2 | 2388.9000 | 38.09 | 6.53 | 44.62 | 54.00 | -9.38 | AVG | |
| 3 * | 2440.7330 | 74.79 | 6.47 | 81.26 | 54.00 | 27.26 | AVG | No Limit |
| 4 | 2441.0000 | 75.49 | 6.47 | 81.96 | 74.00 | 7.96 | Peak | No Limit |
| 5 | 2492.9000 | 43.79 | 6.41 | 50.20 | 74.00 | -23.80 | Peak | |
| 6 | 2492.9000 | 39.71 | 6.41 | 46.12 | 54.00 | -7.88 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2441 MHz _CH39_3Mbps |
|---|---|

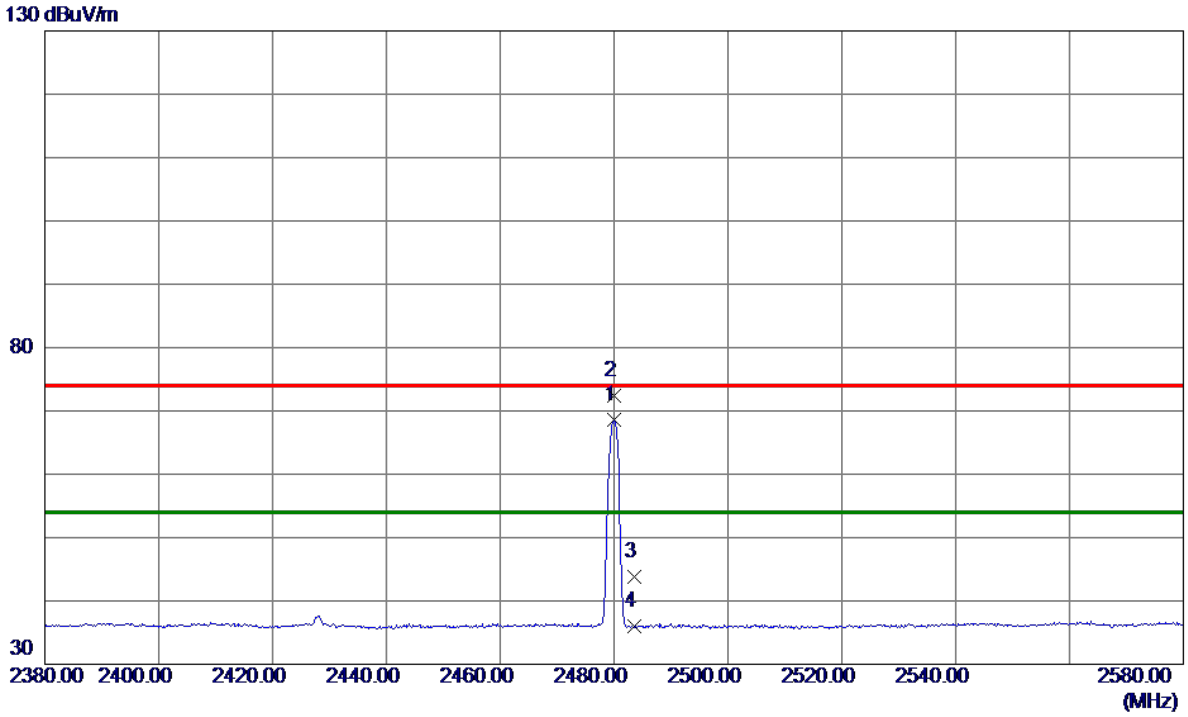
**Horizontal**

| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 4881.7360 | 41.46 | 4.35 | 45.81 | 74.00 | -28.19 | Peak | |
| 2 * | 4881.8680 | 32.82 | 4.35 | 37.17 | 54.00 | -16.83 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2480 MHz _CH78_3Mbps |
|---|---|

**Vertical**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 * | 2479.9000 | 62.22 | 6.43 | 68.65 | 54.00 | 14.65 | AVG | No Limit |
| 2 | 2480.1000 | 66.02 | 6.43 | 72.45 | 74.00 | -1.55 | Peak | No Limit |
| 3 | 2483.5000 | 37.45 | 6.42 | 43.87 | 74.00 | -30.13 | Peak | |
| 4 | 2483.5000 | 29.67 | 6.42 | 36.09 | 54.00 | -17.91 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2480 MHz _CH78_3Mbps |
|---|---|

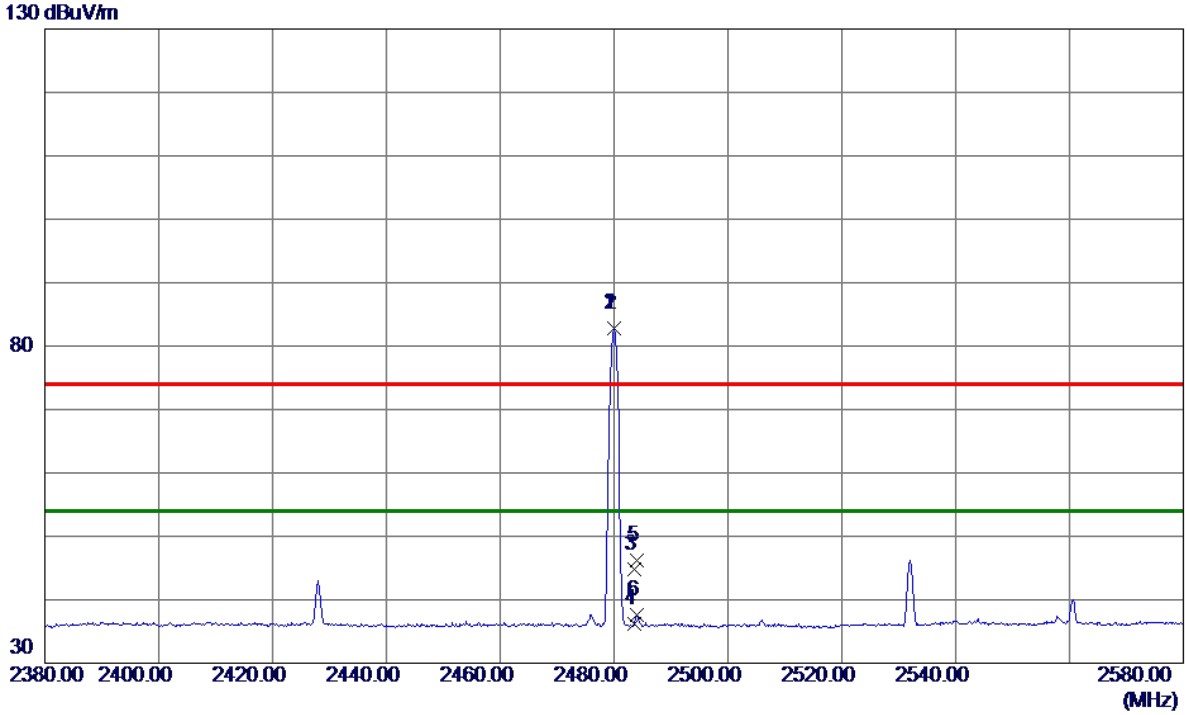
**Vertical**

| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 4959.4840 | 47.58 | 4.52 | 52.10 | 74.00 | -21.90 | Peak | |
| 2 * | 4959.7700 | 40.93 | 4.52 | 45.45 | 54.00 | -8.55 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2480 MHz _CH78_3Mbps |
|---|---|

**Horizontal**




| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 * | 2479.9000 | 76.37 | 6.43 | 82.80 | 54.00 | 28.80 | AVG | No Limit |
| 2 | 2480.0000 | 76.39 | 6.43 | 82.82 | 74.00 | 8.82 | Peak | No Limit |
| 3 | 2483.5000 | 38.39 | 6.42 | 44.81 | 74.00 | -29.19 | Peak | |
| 4 | 2483.5000 | 29.86 | 6.42 | 36.28 | 54.00 | -17.72 | AVG | |
| 5 | 2484.0000 | 39.85 | 6.42 | 46.27 | 74.00 | -27.73 | Peak | |
| 6 | 2484.0000 | 31.12 | 6.42 | 37.54 | 54.00 | -16.46 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

| Test Mode: | TX 2480 MHz _CH78_3Mbps |
|---|---|

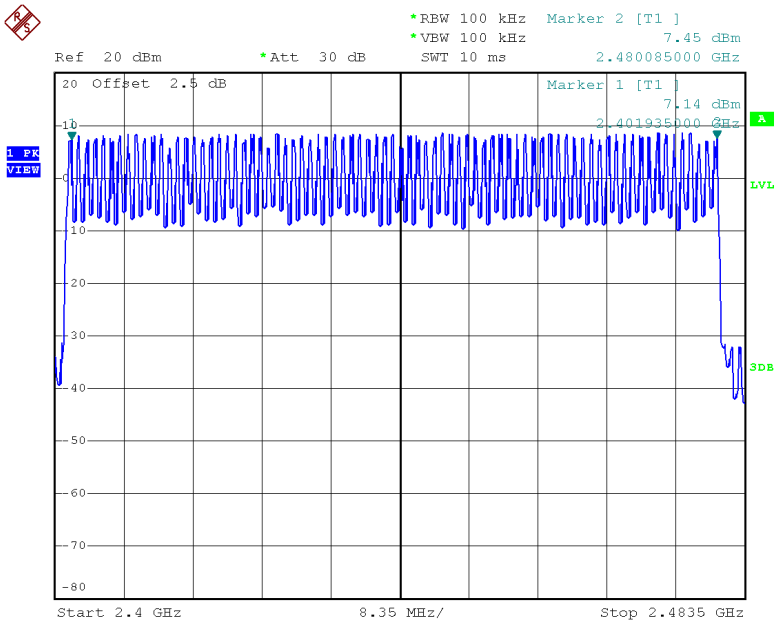
**Horizontal**

| No. | Freq. | Reading Level | Correct Factor | Measure ment | Limit | Margin | | |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | 4959.6740 | 46.23 | 4.52 | 50.75 | 74.00 | -23.25 | Peak | |
| 2 * | 4959.9000 | 39.49 | 4.52 | 44.01 | 54.00 | -9.99 | AVG | |

REMARKS:
(1) Measurement Value = Reading Level + Correct Factor.
(2) Margin Level = Measurement Value - Limit Value.

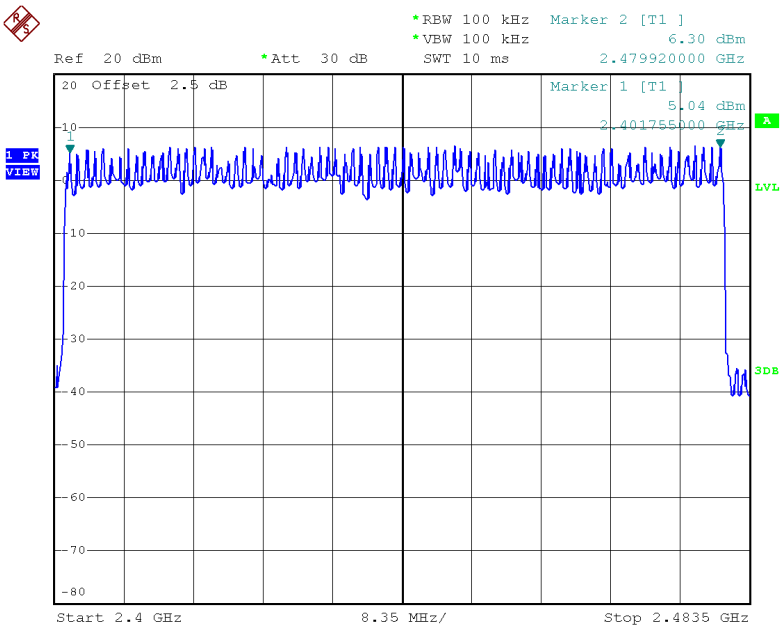
# APPENDIX E - NUMBER OF HOPPING FREQUENCY

| Test Mode | Hopping Mode_1Mbps |
|---|---|
| Number of Hopping Frequency | 79 |




Date: 15.MAY.2019 11:34:57

| Test Mode | Hopping Mode_3Mbps |
|---|---|
| Number of Hopping Frequency | 79 |



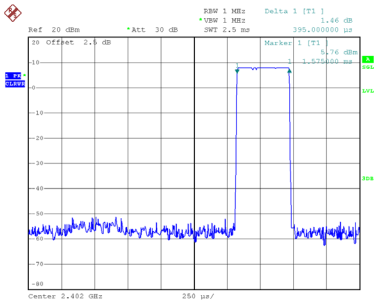

Date: 15.MAY.2019 12:02:26

# APPENDIX F - AVERAGE TIME OF OCCUPANCY

| Test Mode: | TX Mode_1Mbps |
|---|---|

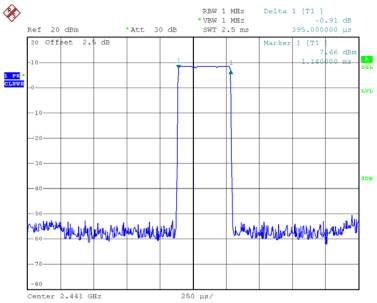
| Data Packet | Frequency (MHz) | Pulse Duration (ms) | Dwell Time (s) | Limits (s) | Test Result |
|---|---|---|---|---|---|
| DH1 | 2402 | 0.3950 | 0.1264 | 0.4000 | Pass |
| DH3 | 2402 | 1.6400 | 0.2624 | 0.4000 | Pass |
| DH5 | 2402 | 2.9200 | 0.3115 | 0.4000 | Pass |
| DH1 | 2441 | 0.3950 | 0.1264 | 0.4000 | Pass |
| DH3 | 2441 | 1.6600 | 0.2656 | 0.4000 | Pass |
| DH5 | 2441 | 2.8800 | 0.3072 | 0.4000 | Pass |
| DH1 | 2480 | 0.4000 | 0.1280 | 0.4000 | Pass |
| DH3 | 2480 | 1.6600 | 0.2656 | 0.4000 | Pass |
| DH5 | 2480 | 2.9200 | 0.3115 | 0.4000 | Pass |

## CH00-DH1



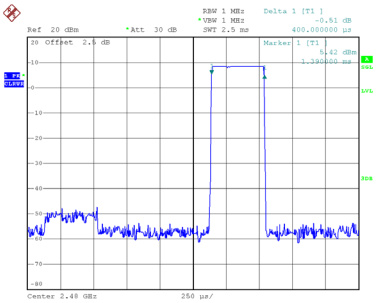

Date: 15.MAY.2019 11:41:06

## CH39-DH1



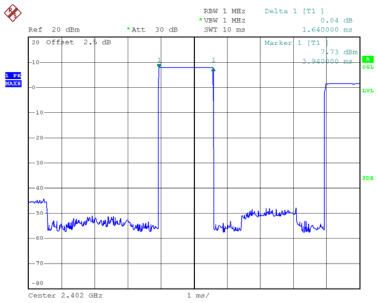

Date: 15.MAY.2019 11:43:18

## CH78-DH1



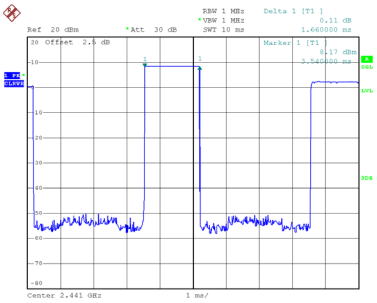

Date: 15.MAY.2019 11:41:22

## CH00-DH3



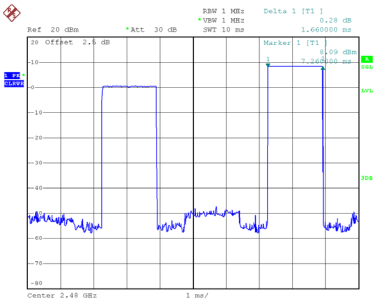

Date: 15.MAY.2019 11:37:16

## CH39-DH3



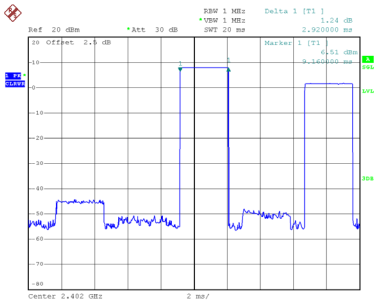

Date: 15.MAY.2019 11:37:23

## CH78-DH3



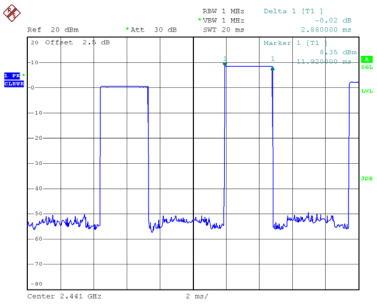

Date: 15.MAY.2019 11:37:30

## CH00-DH5



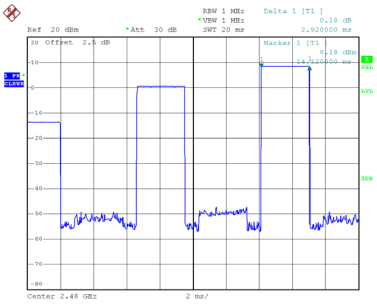

Date: 15.MAY.2019 11:39:30

## CH39-DH5




Date: 15.MAY.2019 11:39:35

## CH78-DH5

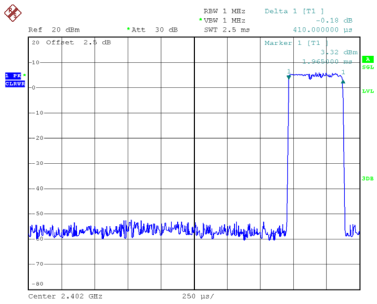



Date: 15.MAY.2019 11:40:35

| Test Mode: | TX Mode_3Mbps |
|---|---|

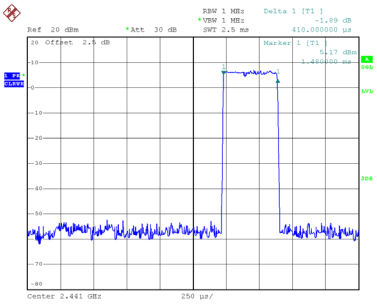
| Data Packet | Frequency | Pulse Duration(ms) | Dwell Time(s) | Limits(s) | Test Result |
|---|---|---|---|---|---|
| 3DH1 | 2402 | 0.4100 | 0.1312 | 0.4000 | Pass |
| 3DH3 | 2402 | 1.6600 | 0.2656 | 0.4000 | Pass |
| 3DH5 | 2402 | 2.9200 | 0.3115 | 0.4000 | Pass |
| 3DH1 | 2441 | 0.4100 | 0.1312 | 0.4000 | Pass |
| 3DH3 | 2441 | 1.6600 | 0.2656 | 0.4000 | Pass |
| 3DH5 | 2441 | 2.8800 | 0.3072 | 0.4000 | Pass |
| 3DH1 | 2480 | 0.4100 | 0.1312 | 0.4000 | Pass |
| 3DH3 | 2480 | 1.6600 | 0.2656 | 0.4000 | Pass |
| 3DH5 | 2480 | 2.9200 | 0.3115 | 0.4000 | Pass |

## CH00-3DH1



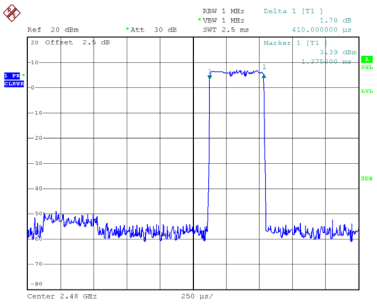

Date: 15.MAY.2019 12:10:33

## CH39-3DH1



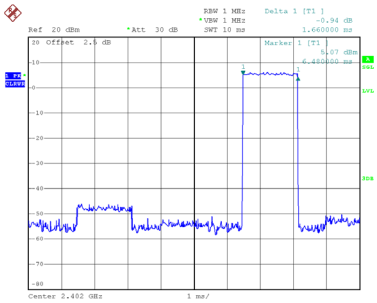

Date: 15.MAY.2019 11:57:12

## CH78-3DH1



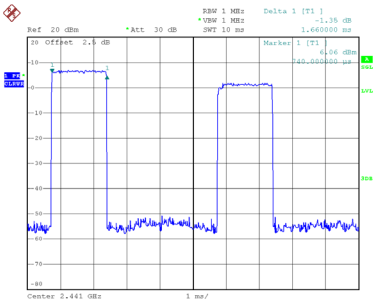

Date: 15.MAY.2019 11:57:16

## CH00-3DH3



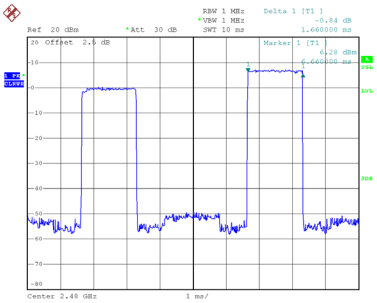

Date: 15.MAY.2019 12:11:12

## CH39-3DH3



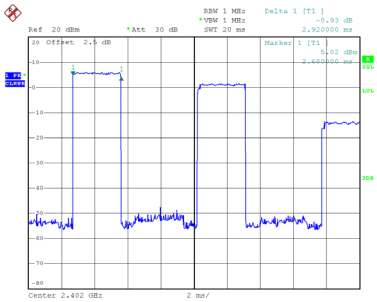

Date: 15.MAY.2019 12:04:32

## CH78-3DH3



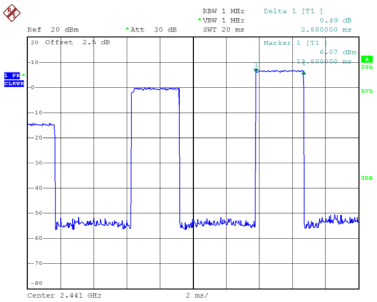

Date: 15.MAY.2019 12:11:18

## CH00-3DH5



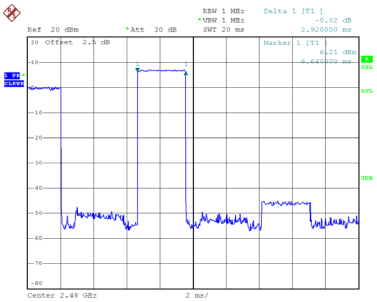

Date: 15.MAY.2019 12:05:31

## CH39-3DH5




Date: 15.MAY.2019 12:09:15

## CH78-3DH5



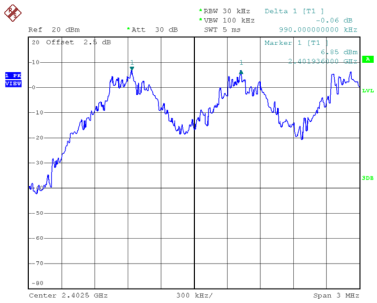

Date: 15.MAY.2019 12:10:06

# APPENDIX G - HOPPING CHANNEL SEPARATION MEASUREMENT

| Test Mode: | Hopping on _1Mbps |
|---|---|

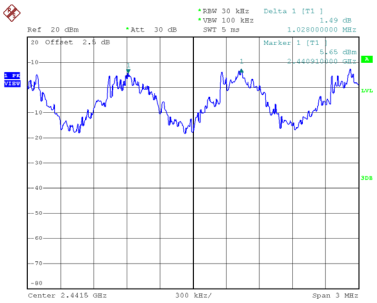
| Channel | Frequency (MHz) | Channel Separation (MHz) | 2/3 of 20 dB Bandwidth (MHz) | Test Result |
|---|---|---|---|---|
| 00 | 2402 | 0.990 | 0.559 | Pass |
| 39 | 2441 | 1.028 | 0.573 | Pass |
| 78 | 2480 | 0.984 | 0.561 | Pass |

**CH00**



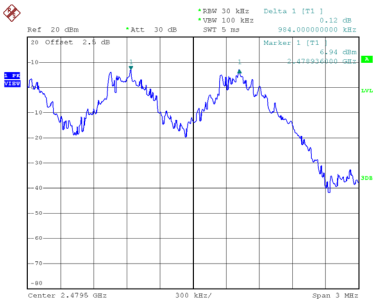
Date: 15.MAY.2019 11:30:55

**CH39**



Date: 15.MAY.2019 11:32:03

**CH78**

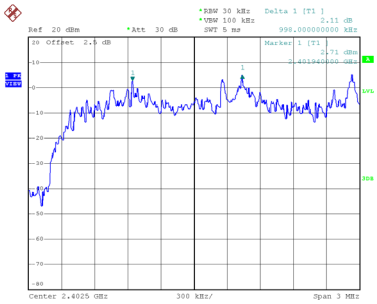


Date: 15.MAY.2019 11:33:08

| Test Mode: | Hopping on _3Mbps |
|---|---|

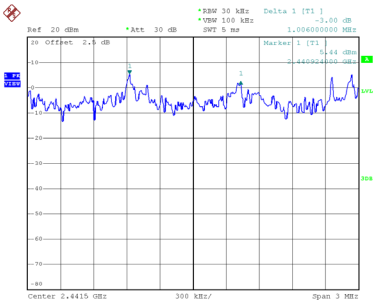
| Channel | Frequency (MHz) | Channel Separation (MHz) | 2/3 of 20 dB Bandwidth (MHz) | Test Result |
|---|---|---|---|---|
| 00 | 2402 | 0.998 | 0.811 | Pass |
| 39 | 2441 | 1.006 | 0.849 | Pass |
| 78 | 2480 | 0.996 | 0.829 | Pass |

**CH00**



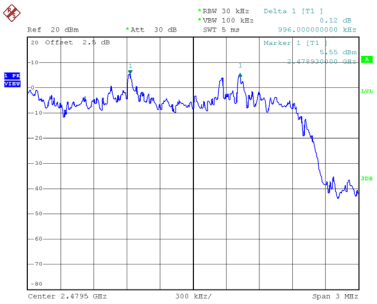
Date: 15.MAY.2019 11:58:25

**CH39**



Date: 15.MAY.2019 11:59:33

**CH78**



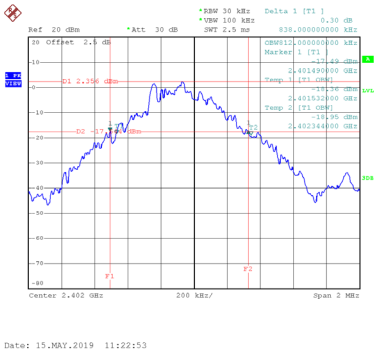
Date: 15.MAY.2019 12:00:38

# APPENDIX H - BANDWIDTH

| Test Mode: | TX Mode _1Mbps |
|---|---|

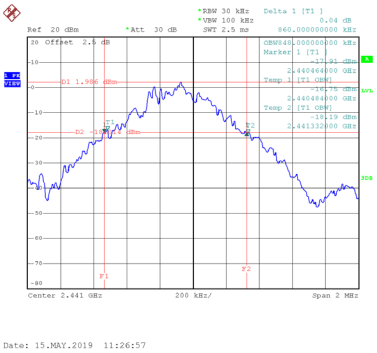
| Channel | Frequency (MHz) | 20 dB Bandwidth (MHz) | 99 % Emission Bandwidth (MHz) |
|---|---|---|---|
| 00 | 2402 | 0.838 | 0.812 |
| 39 | 2441 | 0.860 | 0.848 |
| 78 | 2480 | 0.842 | 0.816 |

**CH00**



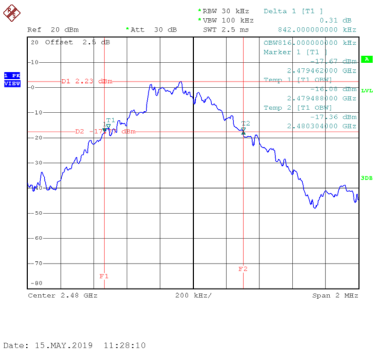
Date: 15.MAY.2019 11:22:53

**CH39**



Date: 15.MAY.2019 11:26:57

**CH78**

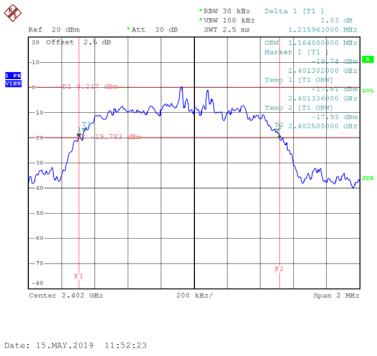


Date: 15.MAY.2019 11:28:10

| Test Mode: | TX Mode _3Mbps |
|---|---|

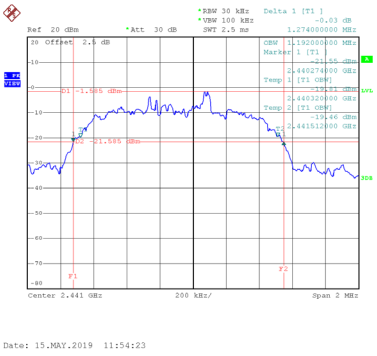
| Channel | Frequency (MHz) | 20 dB Bandwidth (MHz) | 99 % Emission Bandwidth (MHz) |
|---|---|---|---|
| 00 | 2402 | 1.216 | 1.164 |
| 39 | 2441 | 1.274 | 1.192 |
| 78 | 2480 | 1.244 | 1.180 |

**CH00**



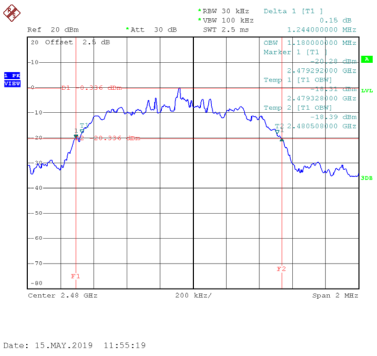
Date: 15.MAY.2019 11:52:23

**CH39**



Date: 15.MAY.2019 11:54:23

**CH78**



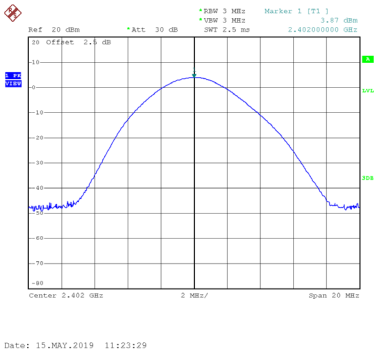
Date: 15.MAY.2019 11:55:19

# APPENDIX I - MAXIMUM PEAK OUTPUT POWER

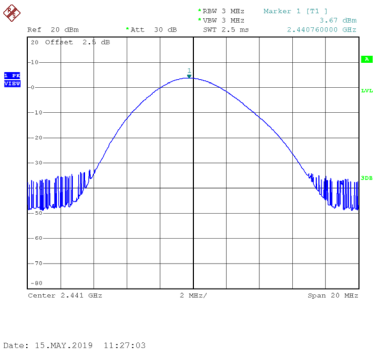
| Test Mode: | TX Mode _1Mbps |
|---|---|

| Channel | Frequency (MHz) | Peak Output Power (dBm) | Peak Output Power (W) | Max. Limit (dBm) | Max. Limit (W) | Test Result |
|---|---|---|---|---|---|---|
| 00 | 2402 | 3.87 | 0.0024 | 21.00 | 0.125 | Pass |
| 39 | 2441 | 3.67 | 0.0023 | 21.00 | 0.125 | Pass |
| 78 | 2480 | 3.90 | 0.0025 | 21.00 | 0.125 | Pass |

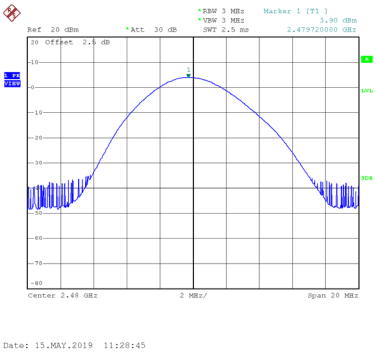
**CH00**




**CH39**



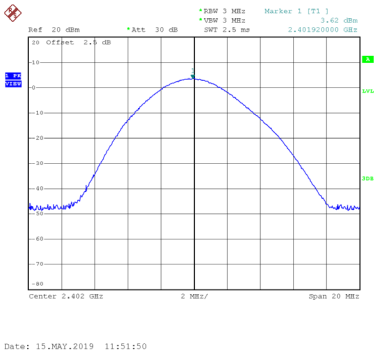

**CH78**



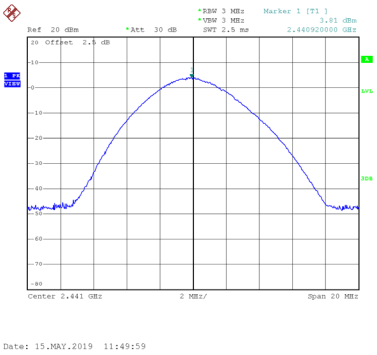

| Test Mode: | TX Mode _3Mbps |
|---|---|

| Channel | Frequency (MHz) | Peak Output Power (dBm) | Peak Output Power (W) | Max. Limit (dBm) | Max. Limit (W) | Test Result |
|---|---|---|---|---|---|---|
| 00 | 2402 | 3.62 | 0.0023 | 21.00 | 0.125 | Pass |
| 39 | 2441 | 3.81 | 0.0024 | 21.00 | 0.125 | Pass |
| 78 | 2480 | 3.86 | 0.0024 | 21.00 | 0.125 | Pass |

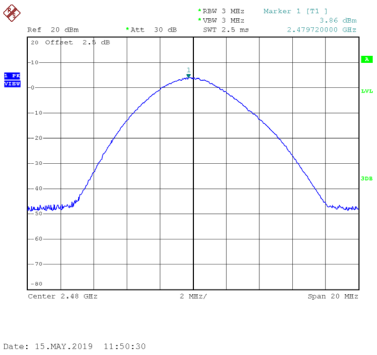
**CH00**




**CH39**



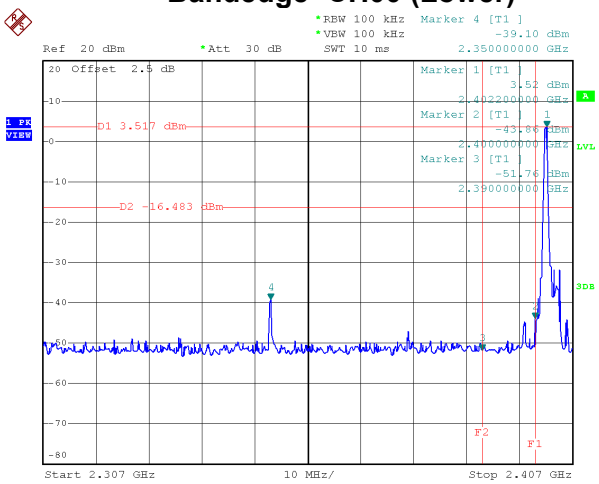

**CH78**



# APPENDIX J - CONDUCTED SPURIOUS EMISSION

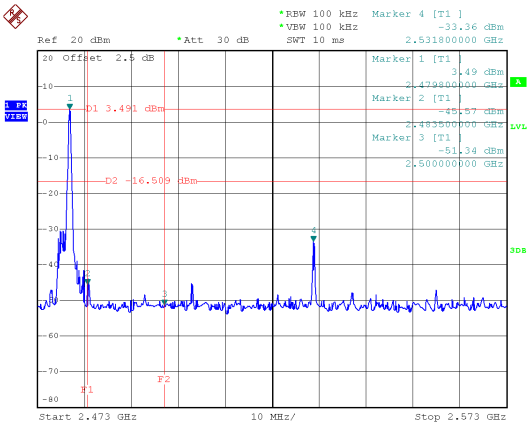
## Test Mode : TX Mode _1Mbps

### Bandedge- CH00 (Lower)



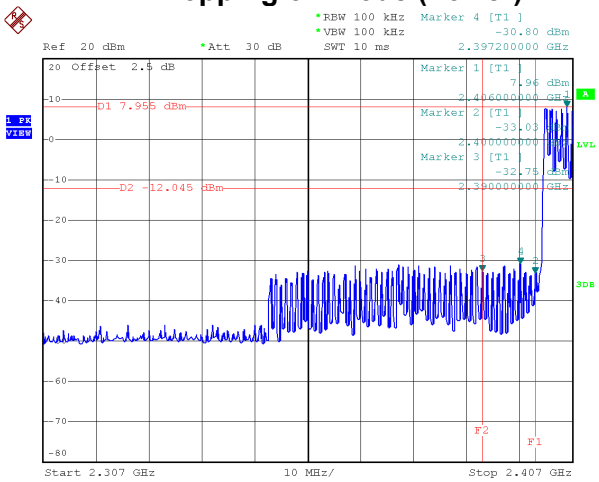

Date: 15.MAY.2019 11:22:23

### Bandedge CH78 (Upper)



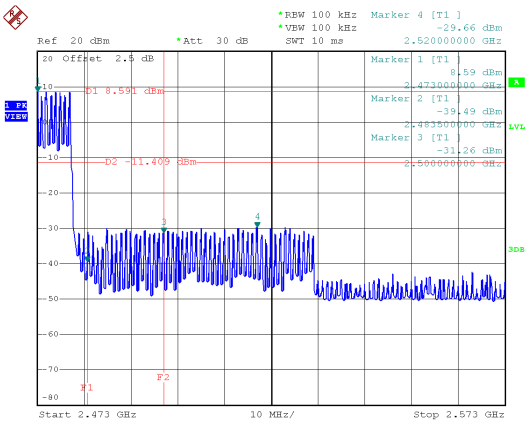

Date: 15.MAY.2019 11:27:41

### Hopping on mode (Lower)



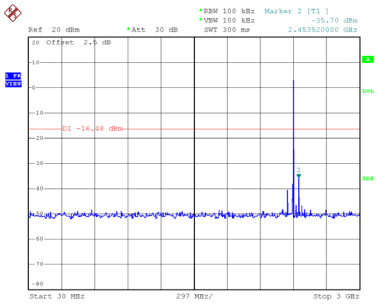

Date: 15.MAY.2019 12:19:53

### Hopping on mode (Upper)

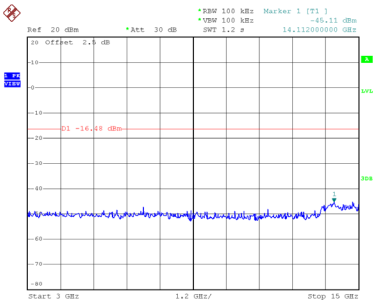



Date: 15.MAY.2019 12:21:02

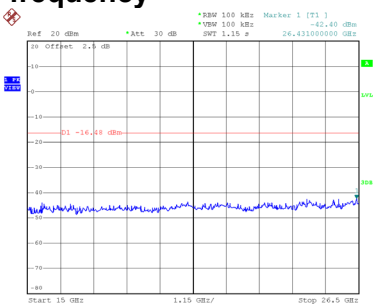
## CH00 – 10th Harmonic of the fundamental frequency




Date: 15.MAY.2019 11:23:07

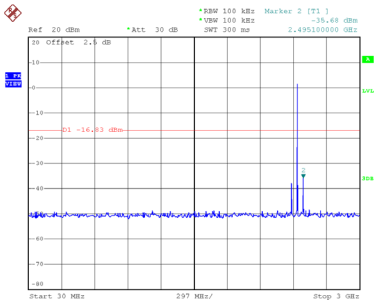



Date: 15.MAY.2019 11:23:15

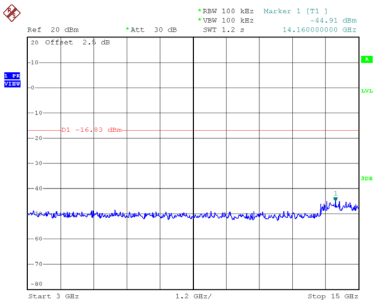



Date: 15.MAY.2019 11:23:23

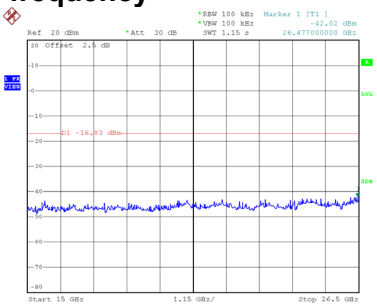
## CH39 – 10th Harmonic of the fundamental frequency




Date: 15.MAY.2019 11:26:12

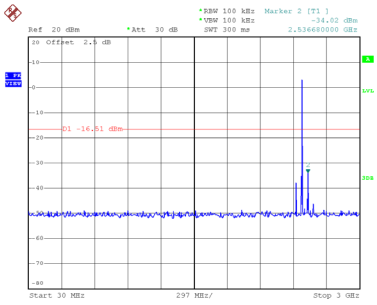



Date: 15.MAY.2019 11:26:20

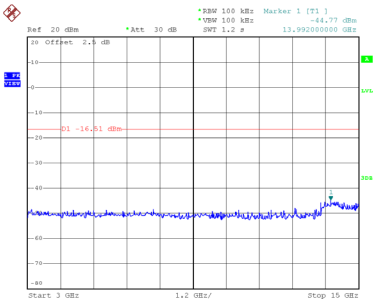



Date: 15.MAY.2019 11:26:29

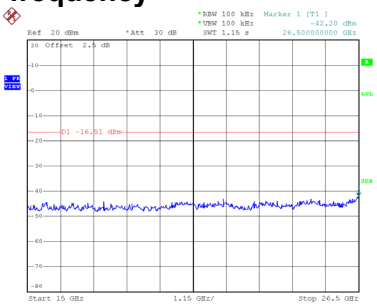
## CH78 – 10th Harmonic of the fundamental frequency




Date: 15.MAY.2019 11:28:23



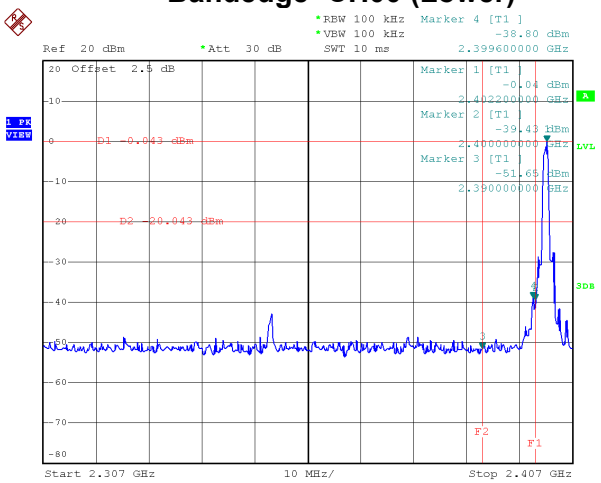

Date: 15.MAY.2019 11:28:31




Date: 15.MAY.2019 11:28:39

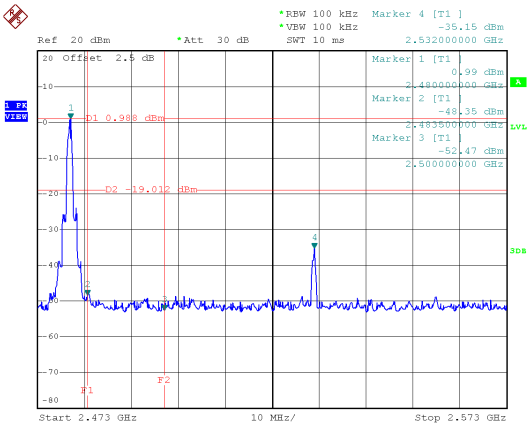
## Test Mode : TX Mode _3Mbps

### Bandedge- CH00 (Lower)



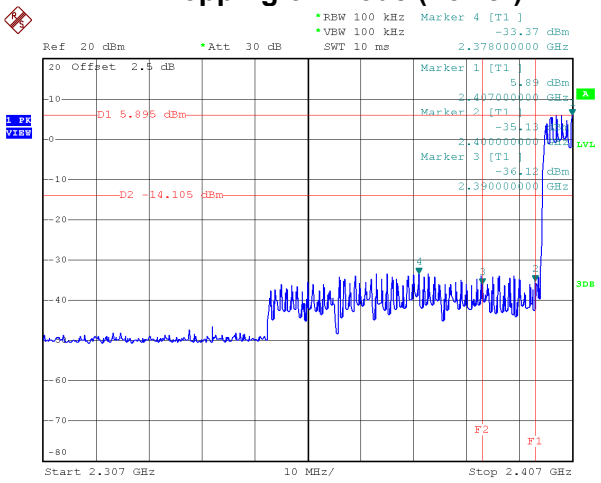

Date: 15.MAY.2019 11:51:59

### Bandedge CH78 (Upper)



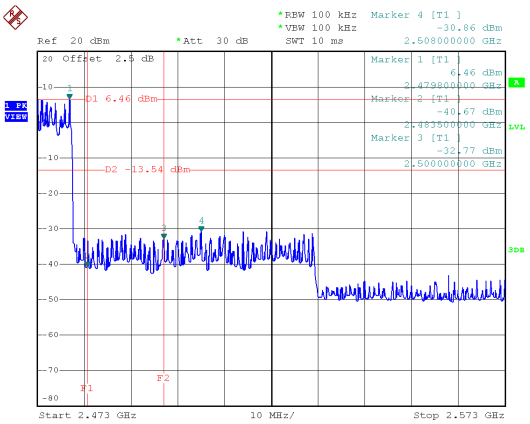

Date: 15.MAY.2019 11:54:58

### Hopping on mode (Lower)



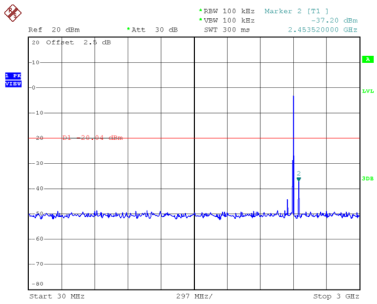

Date: 15.MAY.2019 12:16:38

### Hopping on mode (Upper)

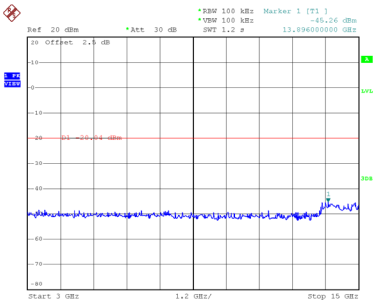



Date: 15.MAY.2019 12:17:45

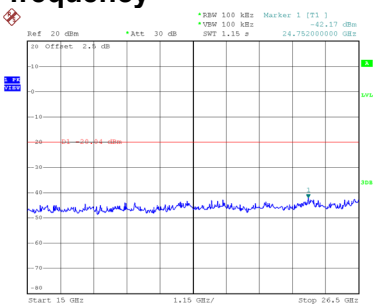
## CH00 – 10th Harmonic of the fundamental frequency




Date: 15.MAY.2019 11:52:36

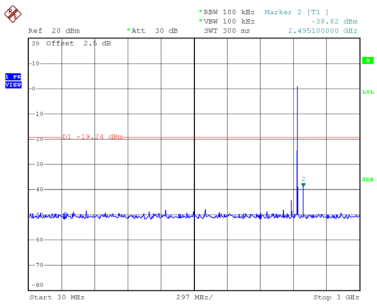



Date: 15.MAY.2019 11:52:44

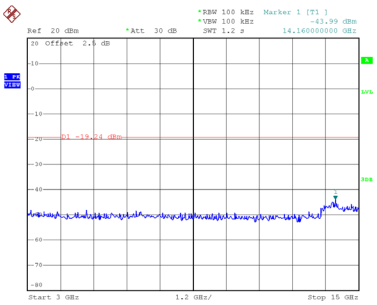



Date: 15.MAY.2019 11:52:52

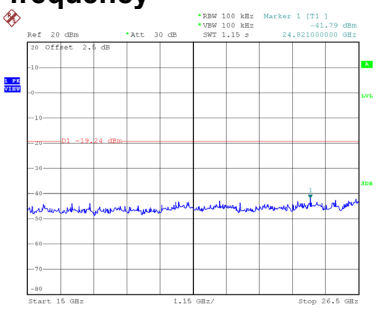
## CH39 – 10th Harmonic of the fundamental frequency




Date: 15.MAY.2019 11:53:46

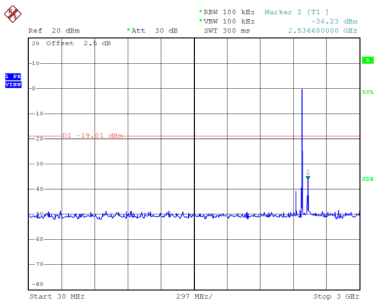



Date: 15.MAY.2019 11:53:54

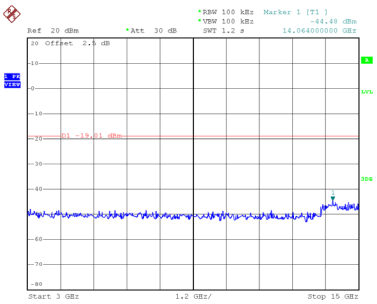



Date: 15.MAY.2019 11:54:02

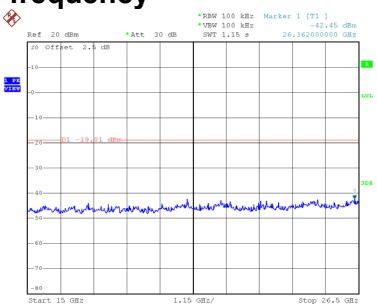
## CH78 – 10th Harmonic of the fundamental frequency




Date: 15.MAY.2019 11:55:32




Date: 15.MAY.2019 11:55:41




Date: 15.MAY.2019 11:55:49

**End of Test Report**