

FCC Radio Test Report

FCC ID: RWO-RC30012301

This report concerns (check one): Original Grant Class II Change

Project No. : 1407C253
Equipment : LASER GAMING MOUSE
Model Name : RC30-012301
Applicant : Razer Inc.
Address : 2035 Corte Del Nogal, Suite 101. Carlsbad California
92011. USA

Date of Receipt : Jul. 31, 2014
Date of Test : Jul. 31, 2014~ Aug. 19, 2014
Issued Date : Aug. 20, 2014
Tested by : BTL Inc.

Testing Engineer : David Mao
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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 the standards traceable to National Measurement Laboratory (**NML**) of **R.O.C.**, or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

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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.

| Table of Contents | Page |
|--|-------------|
| 1 . CERTIFICATION | 6 |
| 2 . SUMMARY OF TEST RESULTS | 7 |
| 2.1 TEST FACILITY | 8 |
| 2.2 MEASUREMENT UNCERTAINTY | 8 |
| 3 . GENERAL INFORMATION | 9 |
| 3.1 GENERAL DESCRIPTION OF EUT | 9 |
| 3.2 DESCRIPTION OF TEST MODES | 11 |
| 3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED | 12 |
| 3.4 DESCRIPTION OF SUPPORT UNITS | 13 |
| 4 . EMC EMISSION TEST | 14 |
| 4.1 CONDUCTED EMISSION MEASUREMENT | 14 |
| 4.1.1 POWER LINE CONDUCTED EMISSION | 14 |
| 4.1.2 TEST PROCEDURE | 14 |
| 4.1.3 DEVIATION FROM TEST STANDARD | 14 |
| 4.1.4 TEST SETUP | 15 |
| 4.1.5 EUT OPERATING CONDITIONS | 15 |
| 4.1.6 EUT TEST CONDITIONS | 15 |
| 4.1.7 TEST RESULTS | 15 |
| 4.2 RADIATED EMISSION MEASUREMENT | 16 |
| 4.2.1 RADIATED EMISSION LIMITS | 16 |
| 4.2.2 TEST PROCEDURE | 17 |
| 4.2.3 DEVIATION FROM TEST STANDARD | 17 |
| 4.2.4 TEST SETUP | 18 |
| 4.2.5 EUT OPERATING CONDITIONS | 19 |
| 4.2.6 EUT TEST CONDITIONS | 19 |
| 4.2.7 TEST RESULTS (BELOW 30MHz) | 19 |
| 4.2.8 TEST RESULTS (BETWEEN 30 – 1000 MHz) | 19 |
| 4.2.9 TEST RESULTS (ABOVE 1000 MHz) | 20 |
| 5 . BANDWIDTH TEST | 21 |
| 5.1 TEST PROCEDURE | 21 |
| 5.2 DEVIATION FROM STANDARD | 21 |
| 5.3 TEST SETUP | 21 |
| 5.4 EUT OPERATION CONDITIONS | 21 |
| 5.5 EUT TEST CONDITIONS | 21 |
| 5.6 TEST RESULTS | 21 |
| 6 . MEASUREMENT INSTRUMENTS LIST AND SETTING | 22 |
| ATTACHMENT A - CONDUCTED EMISSION | 23 |

Table of Contents

Page

| | |
|---|----|
| ATTACHMENT B - RADIATED EMISSION (9KHZ to 30MHZ) | 26 |
| ATTACHMENT C - RADIATED EMISSION (30MHZ TO 1000MHZ) | 28 |
| ATTACHMENT D - RADIATED EMISSION (ABOVE 1000MHZ) | 35 |
| ATTACHMENT E - BANDWIDTH | 48 |

REPORT ISSUED HISTORY

| Issued No. | Description | Issued Date |
|---------------------|-----------------|---------------|
| BTL-FCCP-1-1407C253 | Original Issue. | Aug. 20, 2014 |

1. CERTIFICATION

Equipment : LASER GAMING MOUSE
Brand Name : RAZER
Model Name : RC30-012301
Applicant : Razer Inc.
Manufacturer : Razer (Asia-Pacific) Pte Ltd
Address : 514 Chai Chee Lane #07-01 ~ 06 Singapore 469029
Factory : RAZER TECHNOLOGY AND DEVELOPMENT (SHENZHEN) CO., LTD
Address : East Wing, 3rd Floor, Block 2, Phase 1 of Vision Shenzhen Business Park
Keji South Road, Hi-Tech Industrial Park, Shenzhen 518057, China
Date of Test : Jul. 31, 2014~ Aug. 19, 2014
Test Sample : Engineering Sample
Standard(s) : FCC Part15, Subpart C(15.249)/ ANSI C63.4-2009
RSS-GEN Issue 3, Dec 2010

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-1-1407C253) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

| FCC Part15, Subpart C (15.249) | | | |
|--------------------------------|----------------------------|----------|--------|
| StandardSection | Test Item | Judgment | Remark |
| 15.207 | Conducted Emission | PASS | |
| 15.209 15.249 | Radiated Spurious Emission | PASS | |

NOTE:

(1) "N/A" denotes test is not applicable in this test report.

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **DG-C02/DG-CB03** at the location of No.3,Jinshagang 1st Road, ShiXia, Dalang Town,Dong Guan, China.523792

BTL's test firm number for FCC: 319330

2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

A. Conducted Measurement :

| Test Site | Method | Measurement Frequency Range | U , (dB) | NOTE |
|-----------|--------|-----------------------------|----------|------|
| DG-C02 | CISPR | 150 KHz ~ 30MHz | 3.4 | |

B. Radiated Measurement :

| Test Site | Method | Measurement Frequency Range | Ant. H / V | U,(dB) | NOTE |
|-----------|--------|-----------------------------|------------|--------|------|
| DG-CB03 | CISPR | 9KHz~30MHz | V | 3.79 | |
| | | 9KHz~30MHz | H | 3.57 | |
| | | 30MHz ~ 200MHz | V | 3.82 | |
| | | 30MHz ~ 200MHz | H | 3.60 | |
| | | 200MHz ~ 1,000MHz | V | 3.86 | |
| | | 200MHz ~ 1,000MHz | H | 3.94 | |
| | | 1GHz~18GHz | V | 3.12 | |
| | | 1GHz~18GHz | H | 3.68 | |
| | | 18GHz~40GHz | V | 4.15 | |
| | | 18GHz~40GHz | H | 4.14 | |

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

| | | |
|------------------------|--|---------------------|
| Equipment | LASER GAMING MOUSE | |
| Brand Name | RAZER | |
| Model Name | RC30-012301 | |
| Model Difference | N/A | |
| Product Description | Operation Frequency | 2402~2480 MHz |
| | Modulation Technology | GFSK(1Mbps) |
| | Data rate | |
| | Field Strength | 66.78dBuV/m(AV Max) |
| Power Source | 1# Supplier from in-built battery 2# Supplier from USB Port | |
| Power Rating | 1# DC 3.7V 1500mAh 2# DC 5V 500mA | |
| Connecting I/O Port(s) | Please refer to the User's Manual | |

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) |
| 01 | 2402 | 28 | 2429 | 55 | 2456 |
| 02 | 2403 | 29 | 2430 | 56 | 2457 |
| 03 | 2404 | 30 | 2431 | 57 | 2458 |
| 04 | 2405 | 31 | 2432 | 58 | 2459 |
| 05 | 2406 | 32 | 2433 | 59 | 2460 |
| 06 | 2407 | 33 | 2434 | 60 | 2461 |
| 07 | 2408 | 34 | 2435 | 61 | 2462 |
| 08 | 2409 | 35 | 2436 | 62 | 2463 |
| 09 | 2410 | 36 | 2437 | 63 | 2464 |
| 10 | 2411 | 37 | 2438 | 64 | 2465 |
| 11 | 2412 | 38 | 2439 | 65 | 2466 |
| 12 | 2413 | 39 | 2440 | 66 | 2467 |
| 13 | 2414 | 40 | 2441 | 67 | 2468 |
| 14 | 2415 | 41 | 2442 | 68 | 2469 |
| 15 | 2416 | 42 | 2443 | 69 | 2470 |
| 16 | 2417 | 43 | 2444 | 70 | 2471 |
| 17 | 2418 | 44 | 2445 | 71 | 2472 |
| 18 | 2419 | 45 | 2446 | 72 | 2473 |
| 19 | 2420 | 46 | 2447 | 73 | 2474 |
| 20 | 2421 | 47 | 2448 | 74 | 2475 |
| 21 | 2422 | 48 | 2449 | 75 | 2476 |
| 22 | 2423 | 49 | 2450 | 76 | 2477 |
| 23 | 2424 | 50 | 2451 | 77 | 2478 |
| 24 | 2425 | 51 | 2452 | 78 | 2479 |
| 25 | 2426 | 52 | 2453 | 79 | 2480 |
| 26 | 2427 | 53 | 2454 | | |
| 27 | 2428 | 54 | 2455 | | |

3. Table for Filed Antenna

| Ant. | Manufacturer | Model Name | Antenna Type | Connector | Gain (dBi) |
|------|------------------------------|------------|--------------|-----------|------------|
| 1 | GainForce Technology Co.,Ltd | AT3216 | Internal | N/A | 0.5 |

3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

| Pretest Mode | Description |
|--------------|-------------------|
| Mode 1 | TX Low Channel |
| Mode 2 | TX Middle Channel |
| Mode 3 | TX High Channel |

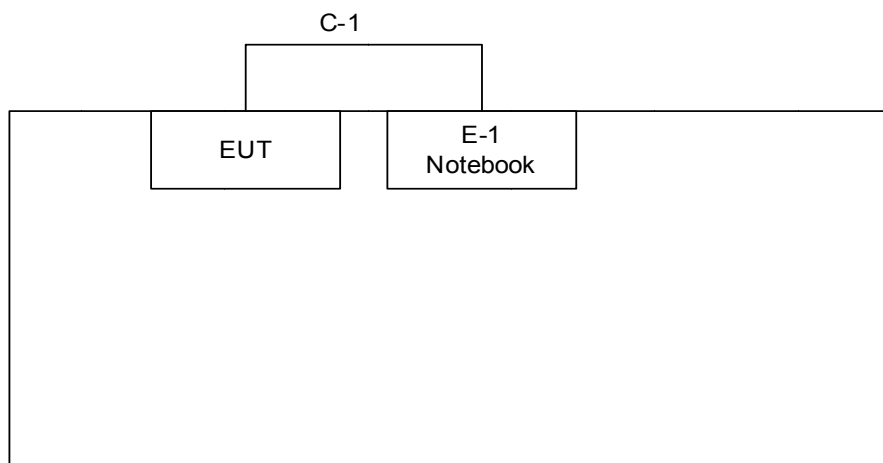
| For Radiated Test | |
|-------------------|-------------------|
| Final Test Mode | Description |
| Mode 1 | TX Low Channel |
| Mode 2 | TX Middle Channel |
| Mode 3 | TX High Channel |

Note:

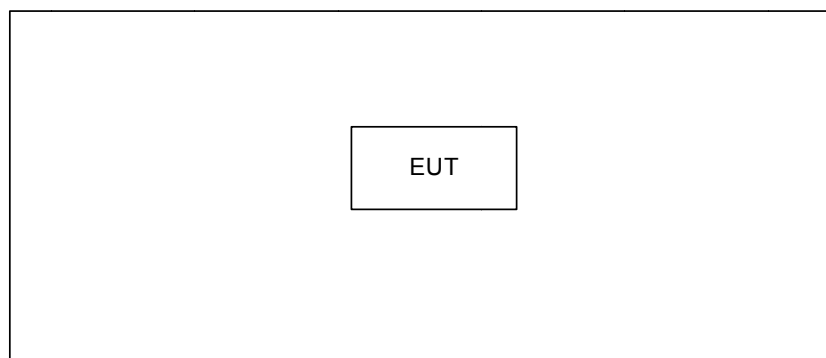
(1) The measurements are performed at the high, middle, low available channels.

3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted TX Mode:



Radiated TX Mode:



3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment | Mfr/Brand | Model/Type No. | FCC ID | Series No. | Note |
|------|-----------|-----------|------------------|--------|------------|------|
| E-1 | Notebook | DELL | INSPIRON 1420 | NA | NA | - |

| Item | Shielded Type | Ferrite Core | Length | Note |
|------|---------------|--------------|--------|-----------|
| C-1 | NO | NO | 1.5M | USB Cable |

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 POWER LINE CONDUCTED EMISSION (FREQUENCY RANGE 150KHZ-30MHZ)

| Frequency of Emission (MHz) | Conducted Limit (dB μ V) | |
|-----------------------------|------------------------------|-----------|
| | Quasi-peak | Average |
| 0.15 -0.5 | 66 to 56* | 56 to 46* |
| 0.50 -5.0 | 56 | 46 |
| 5.0 -30.0 | 60 | 50 |

Note:

- (1) The limit of " * " decreases with the logarithm of the frequency

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 |

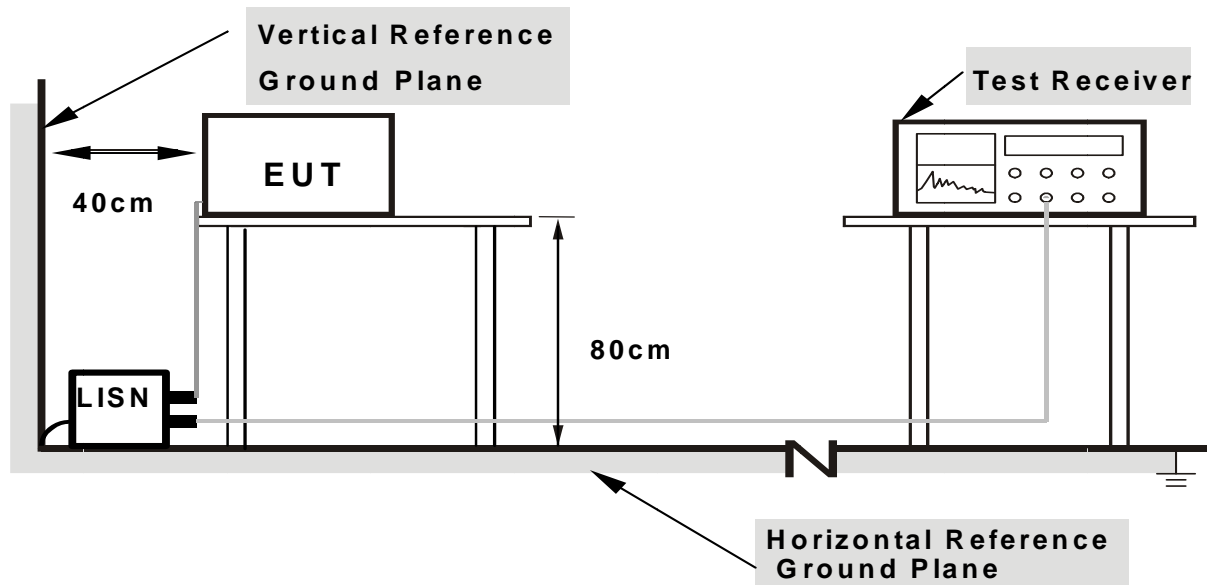
4.1.2 TEST PROCEDURE

- 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 equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- 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.
- 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.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.1.3 DEVIATION FROM TEST STANDARD

No deviation

4.1.4 TEST SETUP



- Note:**
1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

4.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

The EUT was programmed to be in continuously transmitting mode.

4.1.6 EUT TEST CONDITIONS

Temperature: 25°C

Relative Humidity: 55%

Test Voltage: AC 120V/60Hz

4.1.7 TEST RESULTS

Please refer to the Attachment 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 150KHz to 30MHz.

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS (FCC 15.209)

| Frequencies (MHz) | Field Strength (micorvolts/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 |
| 960~1000 | 500 | 3 |

Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.209)

| FREQUENCY (MHz) | (dBuV/m) (at 3m) | |
|-----------------|------------------|---------|
| | PEAK | AVERAGE |
| Above 1000 | 74 | 54 |

Notes:

- (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).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC Part 15.249)

| FCC Part15 (15.249) , Subpart C | |
|--|-----------------------|
| Limit | Frequency Range (MHz) |
| Field strength of fundamental 50000 μ V/m (94 dB μ V/m) @ 3 m | 2400-2483.5 |
| Field strength of harmonics 500 μ V/m (54 dB μ V/m) @ 3 m | Above 2483.5 |

| Spectrum Parameter | Setting |
|--------------------|-----------------------|
| Attenuation | Auto |
| Start Frequency | 1000 MHz |
| Stop Frequency | 10th carrier harmonic |

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

4.2.2 TEST PROCEDURE

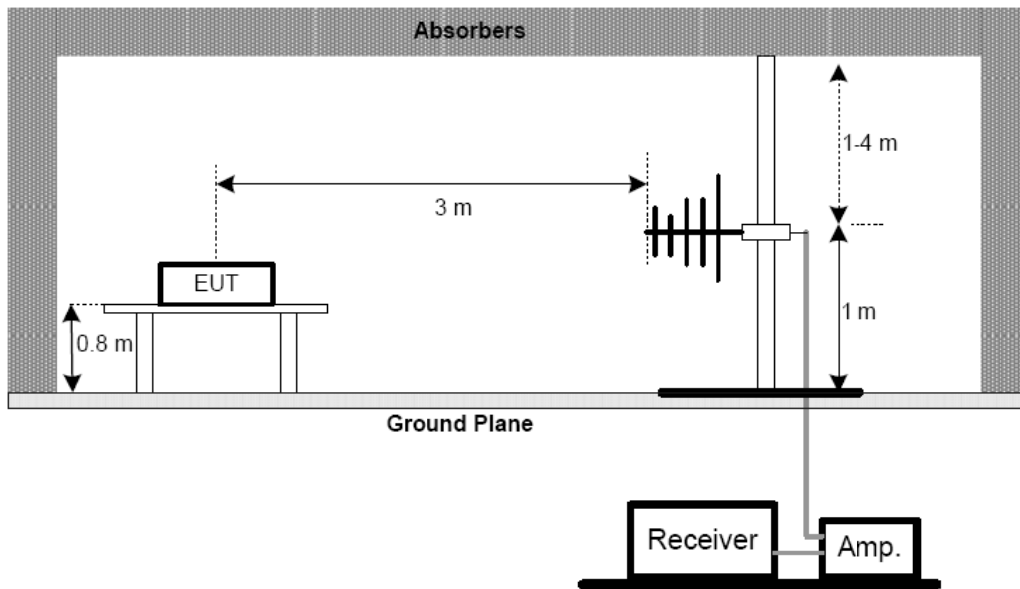
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; 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. 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 AV detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.2.3 DEVIATION FROM TEST STANDARD

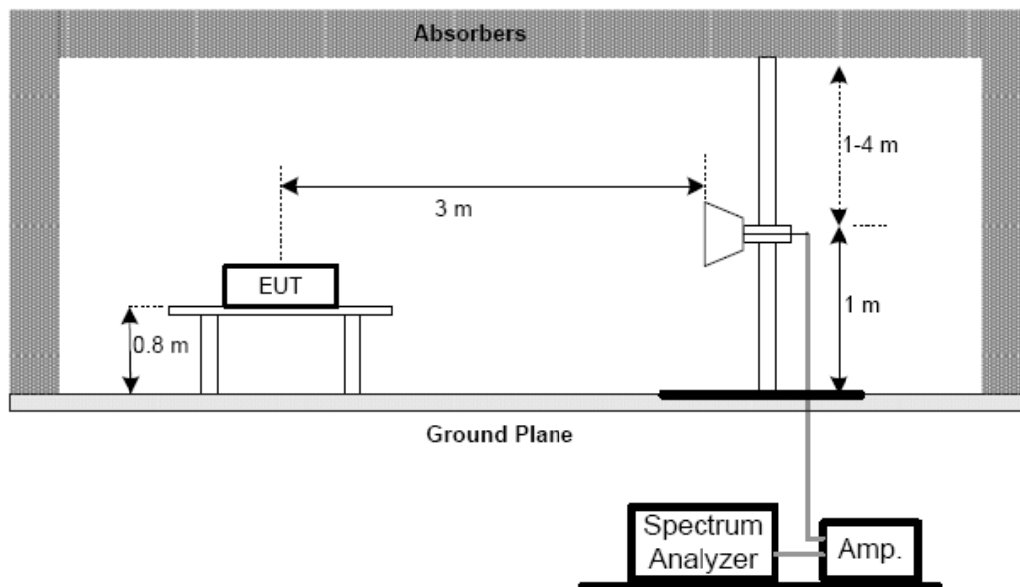
No deviation

4.2.4 TEST SETUP

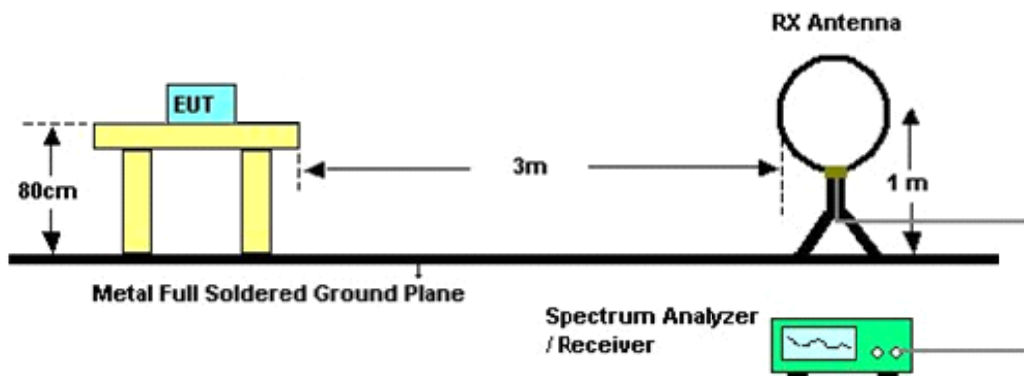
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



(C) For radiated emissions below 30MHz



4.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

4.2.6 EUT TEST CONDITIONS

Temperature: 25°C

Relative Humidity: 55%

Test Voltage: DC 3.7V

4.2.7 TEST RESULTS (BELOW 30MHz)

Please refer to the Attachment B.

Remark

- (1) The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.
- (2) Distance extrapolation factor = $40 \log(\text{specific distance} / \text{test distance})$ (dB);.
- (3) Limit line = specific limits (dBuV) + distance extrapolation factor..

4.2.8 TEST RESULTS (BETWEEN 30 – 1000 MHz)

Please refer to the Attachment C

Remark :

- (1) 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.
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission .

4.2.9 TEST RESULTS (ABOVE 1000 MHz)

Please refer to the Attachment D

Remark :

- (1) 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.
- (2) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (3) Data of measurement within this frequency range shown “ * ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (5) EUT Orthogonal Axis :
“X” - denotes Laid on Table ; “Y” - denotes Vertical Stand ; “Z” - denotes Side Stand
- (6) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna
- (7) The average value of fundamental frequency is:
Average = Peak value + 20log(Duty cycle) ,Final AV=PK-19.49

5. BANDWIDTH TEST

5.1 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= 100KHz, VBW=100KHz, Sweep time = Auto.

5.2 DEVIATION FROM STANDARD

No deviation.

5.3 TEST SETUP



5.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

5.5 EUT TEST CONDITIONS

Temperature: 25°C
Relative Humidity: 55%
Test Voltage: DC 3.7V

5.6 TEST RESULTS

Please refer to the Attachment E

6. MEASUREMENT INSTRUMENTS LIST AND SETTING

| Conducted Emission Measurement | | | | | |
|---------------------------------------|-------------------|--------------|----------|------------|------------------|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | LISN | EMCO | 3816/2 | 00052765 | Mar. 29, 2015 |
| 2 | LISN | R&S | ENV216 | 101447 | Mar. 29, 2015 |
| 3 | Test Cable | N/A | C_17 | N/A | Mar. 14, 2015 |
| 4 | EMI TEST RECEIVER | R&S | ESCS30 | 833364/017 | Mar. 29, 2015 |
| 5 | 50Ω Terminator | SHX | TF2-3G-A | 08122902 | Mar. 29, 2015 |

| Radiated Emission Measurement | | | | | |
|--------------------------------------|-------------------------|--------------|-----------|------------|------------------|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Antenna | Schwarbeck | VULB9160 | 9160-3232 | Mar. 29, 2015 |
| 2 | Amplifier | HP | 8447D | 2944A09673 | Mar. 29, 2015 |
| 3 | Test Receiver | R&S | ESCI | 100382 | Mar. 29, 2015 |
| 4 | Test Cable | N/A | C-01_CB03 | N/A | Jul. 01, 2015 |
| 5 | Antenna | ETS | 3115 | 00075789 | Mar. 29, 2015 |
| 6 | Amplifier | Agilent | 8449B | 3008A02274 | Mar. 29, 2015 |
| 7 | Spectrum | Agilent | E4408B | US39240143 | Nov. 09, 2014 |
| 8 | Test Cable | HUBER+SUHNER | C-45 | N/A | Jan. 14, 2015 |
| 9 | Controller | CT | SC100 | N/A | N/A |
| 10 | Horn Antenna | EMCO | 3115 | 9605-4803 | Mar. 29, 2015 |
| 11 | Active Loop Antenna | R&S | HFH2-Z2 | 830749/020 | Mar. 29, 2015 |
| 12 | Broad-Band Horn Antenna | Schwarzbeck | BBHA 9170 | 9170319 | Oct. 22, 2014 |

| Bandwidth | | | | | |
|------------------|-------------------|--------------|----------|------------|------------------|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Spectrum Analyzer | R&S | FSP 40 | 100185 | Nov. 11, 2014 |

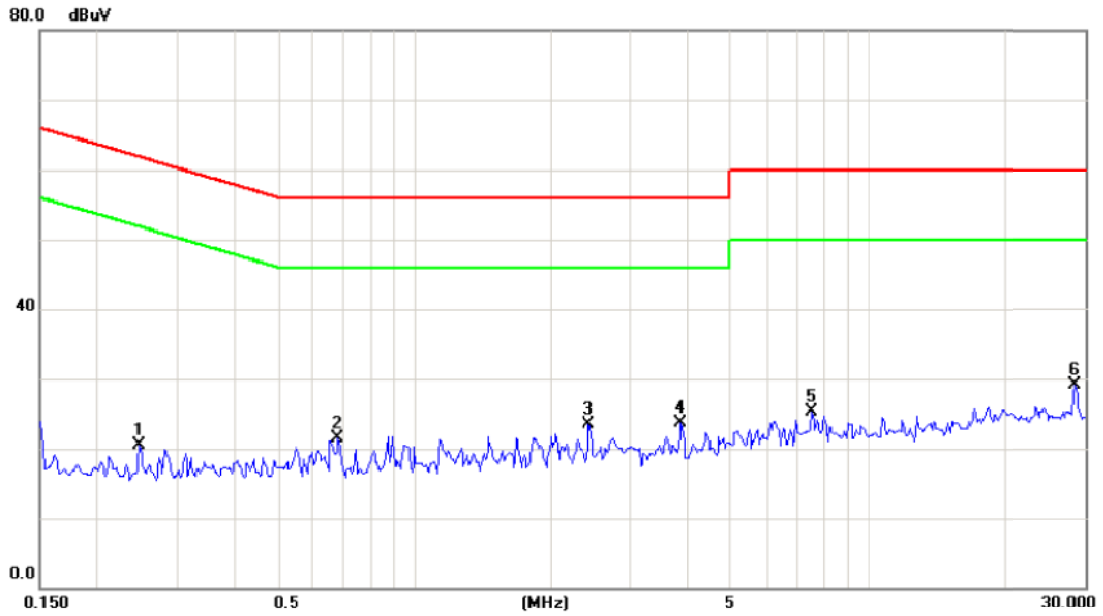
| Antenna Conducted Spurious Emission | | | | | |
|--|-------------------|--------------|----------|------------|------------------|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Spectrum Analyzer | R&S | FSP 40 | 100185 | Nov. 11, 2014 |

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

ATTACHMENT A - CONDUCTED EMISSION

Test Mode: TX Mode

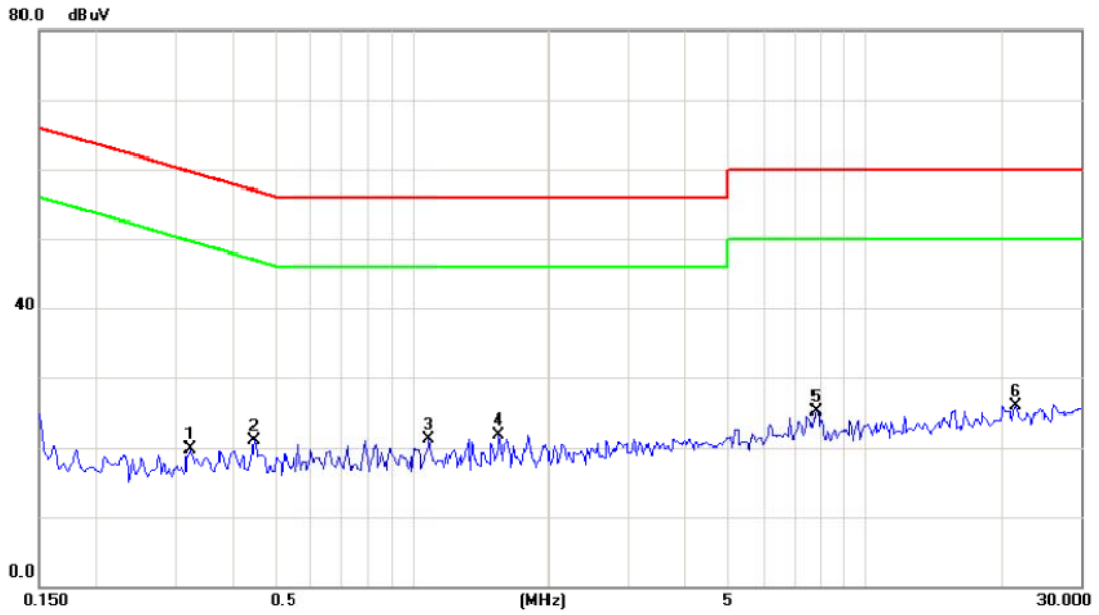
Line



| No. Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measurement dBuV | Limit dBuV | Over dB | Detector | Comment |
|---------|-----------|--------------------|-------------------|------------------|------------|---------|----------|---------|
| 1 | 0.2477 | 10.93 | 9.56 | 20.49 | 61.83 | -41.34 | peak | |
| 2 | 0.6813 | 11.95 | 9.63 | 21.58 | 56.00 | -34.42 | peak | |
| 3 | 2.4312 | 13.78 | 9.73 | 23.51 | 56.00 | -32.49 | peak | |
| 4 | 3.8711 | 13.82 | 9.81 | 23.63 | 56.00 | -32.37 | peak | |
| 5 | 7.5040 | 15.21 | 10.00 | 25.21 | 60.00 | -34.79 | peak | |
| 6 * | 28.5703 | 18.21 | 10.85 | 29.06 | 60.00 | -30.94 | peak | |

Test Mode: TX Mode

Neutral



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV | Limit dBuV | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1 | | 0.3220 | 9.99 | 9.62 | 19.61 | 59.66 | -40.05 | peak | |
| 2 | | 0.4470 | 11.24 | 9.63 | 20.87 | 56.93 | -36.06 | peak | |
| 3 | | 1.0836 | 11.33 | 9.68 | 21.01 | 56.00 | -34.99 | peak | |
| 4 | | 1.5523 | 12.05 | 9.71 | 21.76 | 56.00 | -34.24 | peak | |
| 5 | | 7.8360 | 15.05 | 9.99 | 25.04 | 60.00 | -34.96 | peak | |
| 6 | * | 21.6328 | 15.42 | 10.56 | 25.98 | 60.00 | -34.02 | peak | |

ATTACHMENT B - RADIATED EMISSION (9KHZ to 30MHZ)

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

| Freq. (MHz) | Ant. 0°/90° | Reading(RA) (dBuV) | Corr.Factor(CF) (dB) | Measured(FS) (dBuV/m) | Limits(QP) (dBuV/m) | Margin (dB) | Note |
|----------------|----------------|-----------------------|-------------------------|--------------------------|------------------------|----------------|------|
| 0.0146 | 0° | 14.16 | 24.64 | 38.80 | 104.32 | -65.52 | AVG |
| 0.0146 | 0° | 15.03 | 24.64 | 39.67 | 124.32 | -84.65 | PEAK |
| 0.0293 | 0° | 8.50 | 23.71 | 32.21 | 98.27 | -66.06 | AVG |
| 0.0293 | 0° | 9.41 | 23.71 | 33.12 | 118.27 | -85.15 | PEAK |
| 0.0353 | 0° | 4.85 | 23.33 | 28.18 | 96.65 | -68.47 | AVG |
| 0.0353 | 0° | 5.65 | 23.33 | 28.98 | 116.65 | -87.67 | PEAK |
| 0.0382 | 0° | 2.54 | 23.15 | 25.69 | 95.96 | -70.28 | AVG |
| 0.0382 | 0° | 3.81 | 23.15 | 26.96 | 115.96 | -89.01 | PEAK |
| 2.0471 | 0° | 27.64 | 19.47 | 47.11 | 69.54 | -22.43 | QP |
| 3.3056 | 0° | 22.38 | 18.93 | 41.31 | 69.54 | -28.23 | QP |

| Freq. (MHz) | Ant. 0°/90° | Reading(RA) (dBuV) | Corr.Factor(CF) (dB) | Measured(FS) (dBuV/m) | Limits(QP) (dBuV/m) | Margin (dB) | Note |
|----------------|----------------|-----------------------|-------------------------|--------------------------|------------------------|----------------|------|
| 0.0132 | 90° | 13.54 | 24.30 | 37.84 | 125.19 | -87.35 | AVG |
| 0.0132 | 90° | 14.68 | 24.30 | 38.98 | 145.19 | -106.21 | PEAK |
| 0.0284 | 90° | 7.58 | 23.77 | 31.35 | 118.54 | -87.19 | AVG |
| 0.0284 | 90° | 8.98 | 23.77 | 32.75 | 138.54 | -105.79 | PEAK |
| 0.0337 | 90° | 4.41 | 23.43 | 27.84 | 117.05 | -89.21 | AVG |
| 0.0337 | 90° | 5.74 | 23.43 | 29.17 | 137.05 | -107.88 | PEAK |
| 0.0476 | 90° | 2.28 | 22.55 | 24.83 | 114.05 | -89.22 | AVG |
| 0.0476 | 90° | 4.16 | 22.55 | 26.71 | 134.05 | -107.34 | PEAK |
| 2.0380 | 90° | 28.17 | 19.48 | 47.65 | 69.54 | -21.89 | QP |
| 3.1068 | 90° | 20.85 | 18.91 | 39.76 | 69.54 | -29.78 | QP |

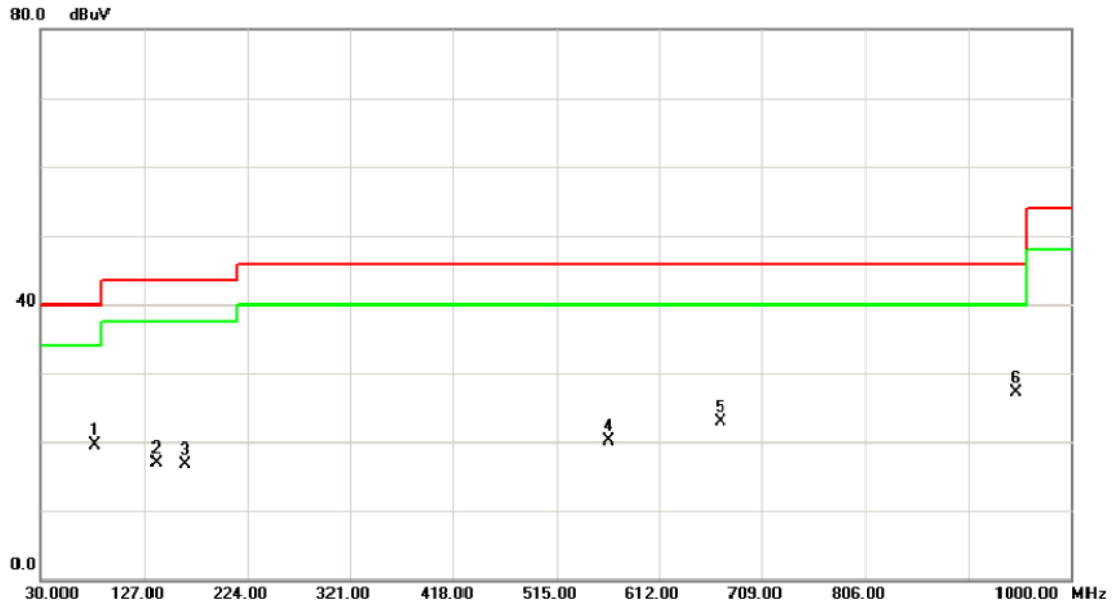
Remark:

- (1) The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.
- (2) Distance extrapolation factor = 40 log (specific distance / test distance) (dB);
- (3) Limit line = specific limits (dBuV) + distance extrapolation factor.

ATTACHMENT C - RADIATED EMISSION (30MHZ TO 1000MHZ)

Test Mode: TX Low Channel

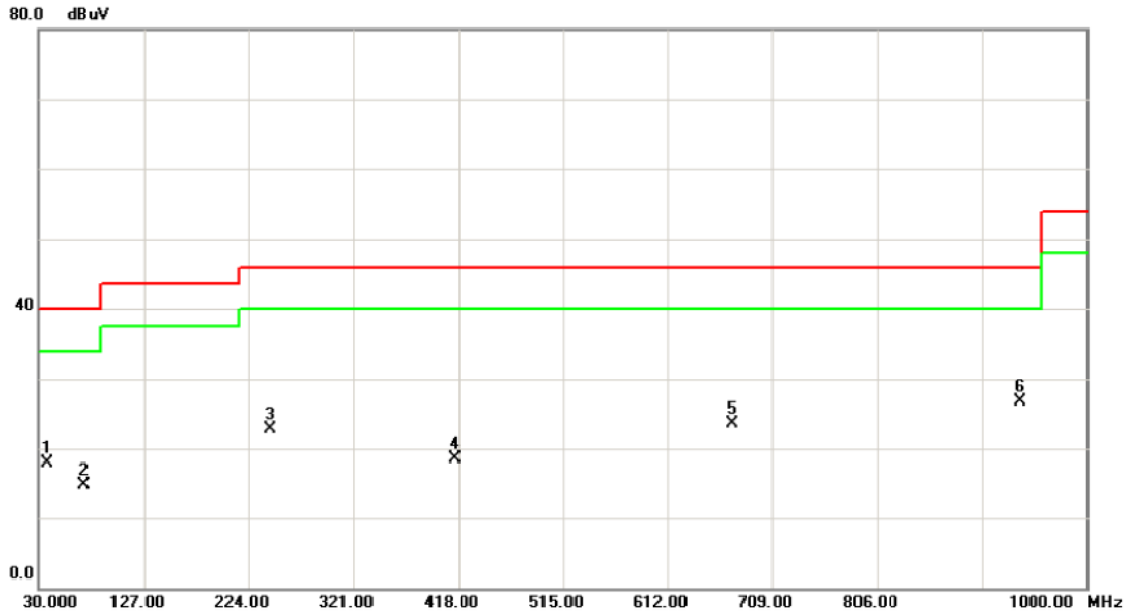
Vertical



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV | Limit dBuV | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1 | | 81.4100 | 36.81 | -17.23 | 19.58 | 40.00 | -20.42 | peak | |
| 2 | | 138.6400 | 30.06 | -13.15 | 16.91 | 43.50 | -26.59 | peak | |
| 3 | | 165.8000 | 29.92 | -13.22 | 16.70 | 43.50 | -26.80 | peak | |
| 4 | | 564.4700 | 27.96 | -7.93 | 20.03 | 46.00 | -25.97 | peak | |
| 5 | | 670.2000 | 27.91 | -5.06 | 22.85 | 46.00 | -23.15 | peak | |
| 6 | * | 948.5900 | 27.41 | -0.25 | 27.16 | 46.00 | -18.84 | peak | |

Test Mode: TX Low Channel

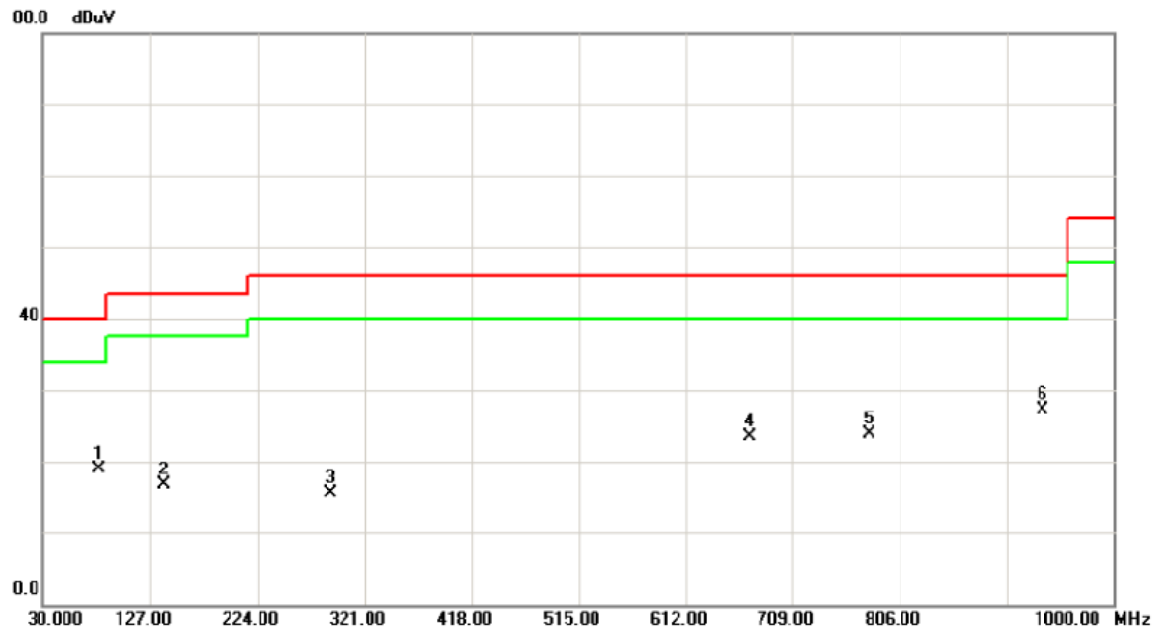
Horizontal



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV | Limit dBuV | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1 | | 37.7600 | 32.37 | -14.38 | 17.99 | 40.00 | -22.01 | peak | |
| 2 | | 71.7100 | 31.13 | -16.38 | 14.75 | 40.00 | -25.25 | peak | |
| 3 | | 243.4000 | 36.76 | -14.03 | 22.73 | 46.00 | -23.27 | peak | |
| 4 | | 414.1200 | 27.77 | -9.27 | 18.50 | 46.00 | -27.50 | peak | |
| 5 | | 672.1400 | 28.47 | -5.06 | 23.41 | 46.00 | -22.59 | peak | |
| 6 | * | 938.8900 | 27.29 | -0.50 | 26.79 | 46.00 | -19.21 | peak | |

Test Mode: TX Middle Channel

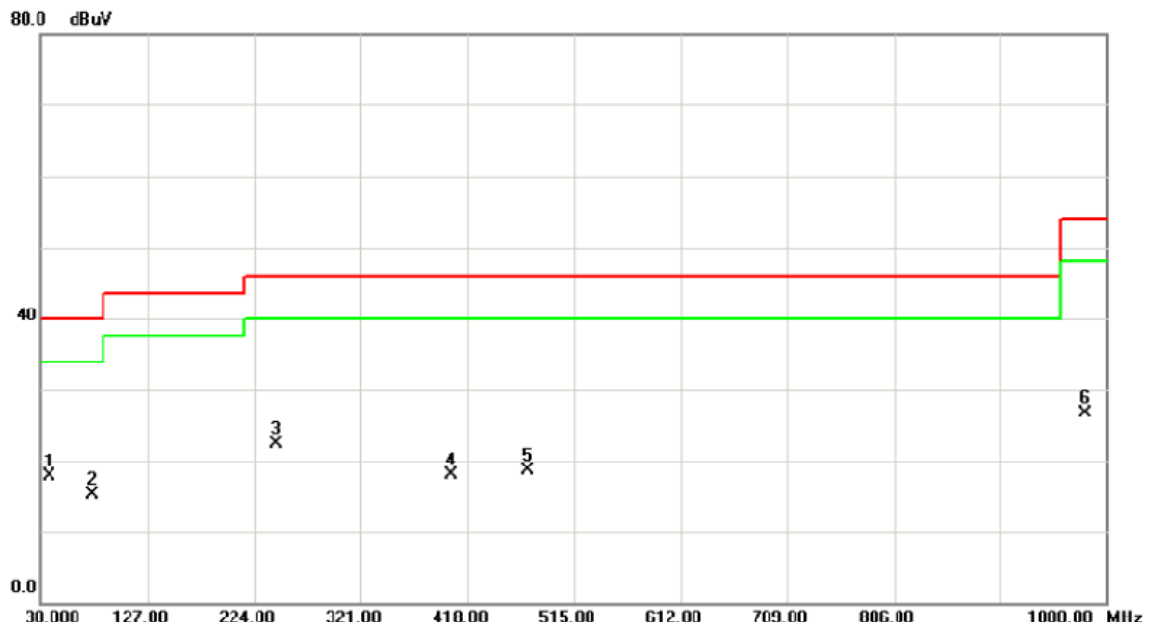
Vertical



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV | Limit dBuV | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1 | | 81.4100 | 36.11 | -17.23 | 18.88 | 40.00 | -21.12 | peak | |
| 2 | | 138.6400 | 29.77 | -13.15 | 16.62 | 43.50 | -26.88 | peak | |
| 3 | | 289.9600 | 26.62 | -11.18 | 15.44 | 46.00 | -30.56 | peak | |
| 4 | | 669.2300 | 28.55 | -5.06 | 23.49 | 46.00 | -22.51 | peak | |
| 5 | | 777.8700 | 27.58 | -3.66 | 23.92 | 46.00 | -22.08 | peak | |
| 6 | * | 935.9800 | 27.79 | -0.58 | 27.21 | 46.00 | -18.79 | peak | |

Test Mode: TX Middle Channel

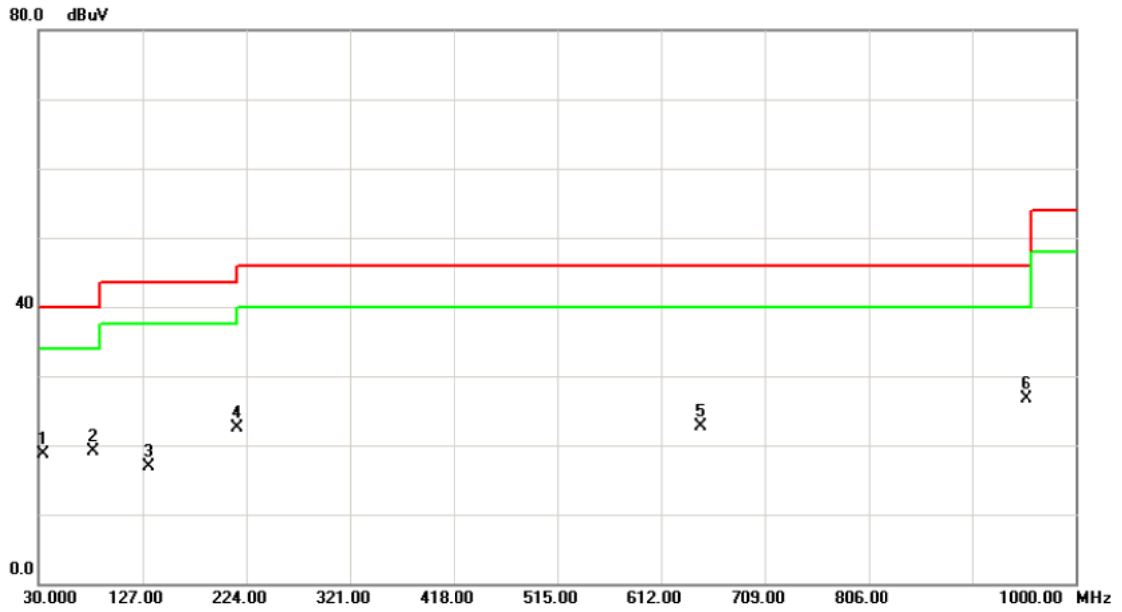
Horizontal



| No | Mk | Freq MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV | Limit dBuV | Over dB | Detector | Comment |
|----|----|-------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1 | * | 37.7600 | 32.16 | -14.38 | 17.78 | 10.00 | -22.22 | peak | |
| 2 | | 77.5300 | 31.95 | -16.87 | 15.08 | 40.00 | -24.92 | peak | |
| 3 | | 243.4000 | 36.38 | -14.03 | 22.35 | 40.00 | -23.65 | peak | |
| 4 | | 402.4800 | 27.30 | -9.48 | 17.82 | 46.00 | -28.18 | peak | |
| 5 | | 473.2900 | 28.02 | -9.50 | 18.52 | 46.00 | -27.48 | peak | |
| 6 | | 980.6000 | 27.08 | 0.33 | 26.75 | 54.00 | 27.25 | peak | |

Test Mode: TX High Channel

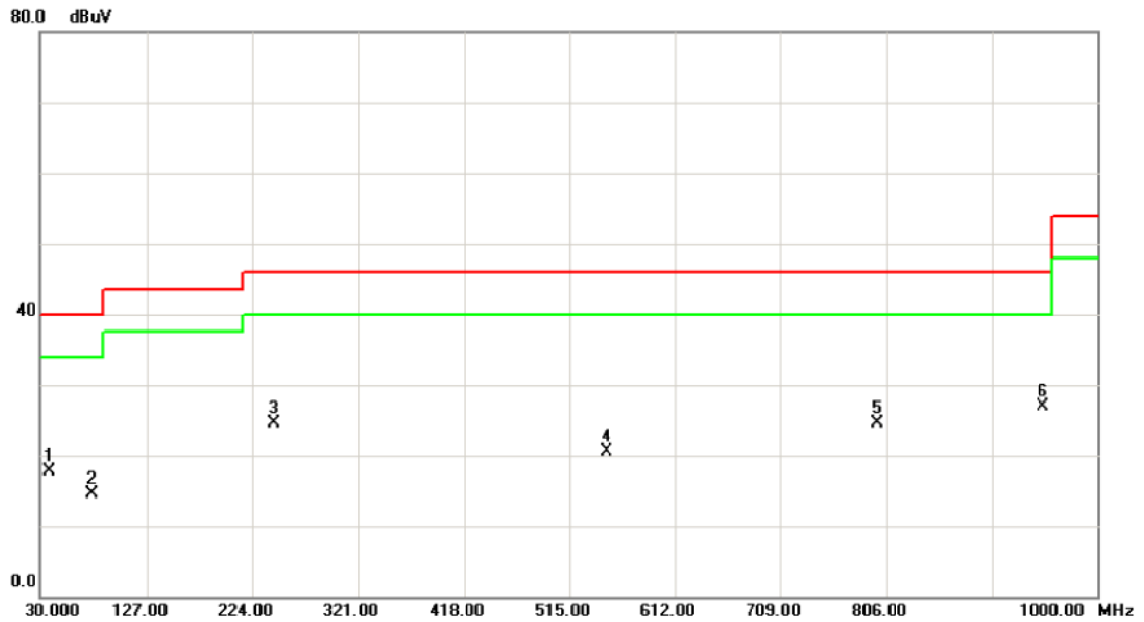
Vertical



| No. Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measurement dBuV | Limit dBuV | Over dB | Detector | Comment |
|---------|-----------|--------------------|-------------------|------------------|------------|---------|----------|---------|
| 1 | 34.8500 | 33.50 | -14.75 | 18.75 | 40.00 | -21.25 | peak | |
| 2 | 81.4100 | 36.36 | -17.23 | 19.13 | 40.00 | -20.87 | peak | |
| 3 | 132.8200 | 30.03 | -13.09 | 16.94 | 43.50 | -26.56 | peak | |
| 4 | 215.2700 | 37.58 | -15.13 | 22.45 | 43.50 | -21.05 | peak | |
| 5 | 648.8600 | 27.86 | -5.21 | 22.65 | 46.00 | -23.35 | peak | |
| 6 * | 953.4400 | 26.86 | -0.23 | 26.63 | 46.00 | -19.37 | peak | |

Test Mode: TX High Channel

Horizontal

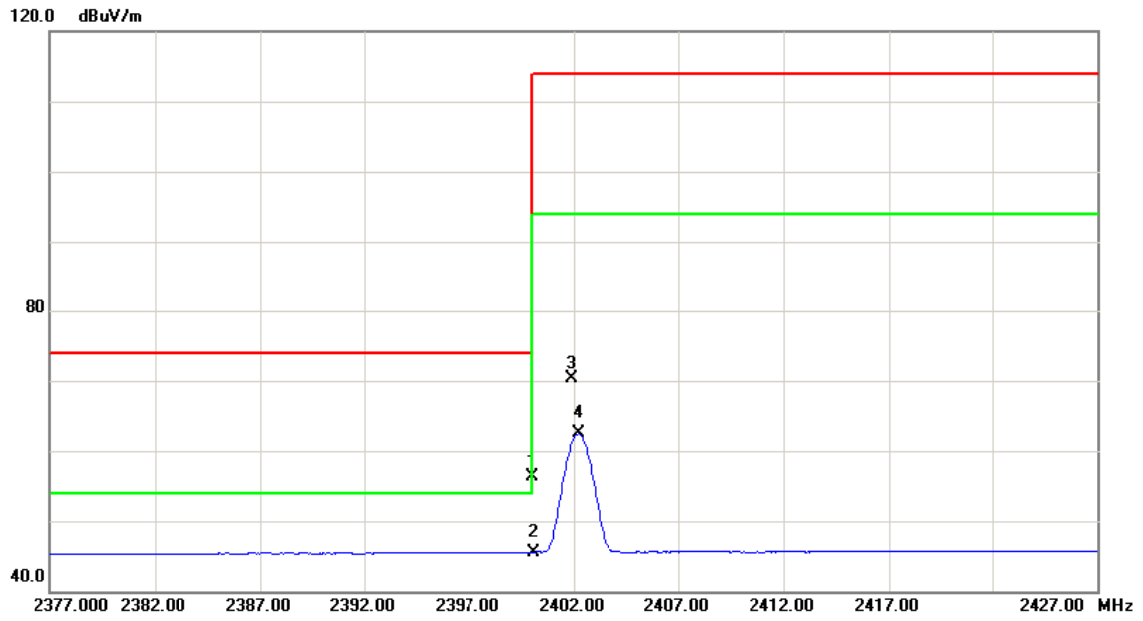


| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV | Limit dBuV | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1 | | 37.7600 | 32.16 | -14.38 | 17.78 | 40.00 | -22.22 | peak | |
| 2 | | 77.5300 | 31.45 | -16.87 | 14.58 | 40.00 | -25.42 | peak | |
| 3 | | 243.4000 | 38.49 | -14.03 | 24.46 | 46.00 | -21.54 | peak | |
| 4 | | 548.9500 | 28.41 | -7.99 | 20.42 | 46.00 | -25.58 | peak | |
| 5 | | 797.2700 | 27.52 | -2.99 | 24.53 | 46.00 | -21.47 | peak | |
| 6 | * | 949.5600 | 27.17 | -0.22 | 26.95 | 46.00 | -19.05 | peak | |

ATTACHMENT D - RADIATED EMISSION (ABOVE 1000MHZ)

| | |
|-------------------|----------------|
| Orthogonal Axis : | X |
| Test Mode : | TX Low Channel |

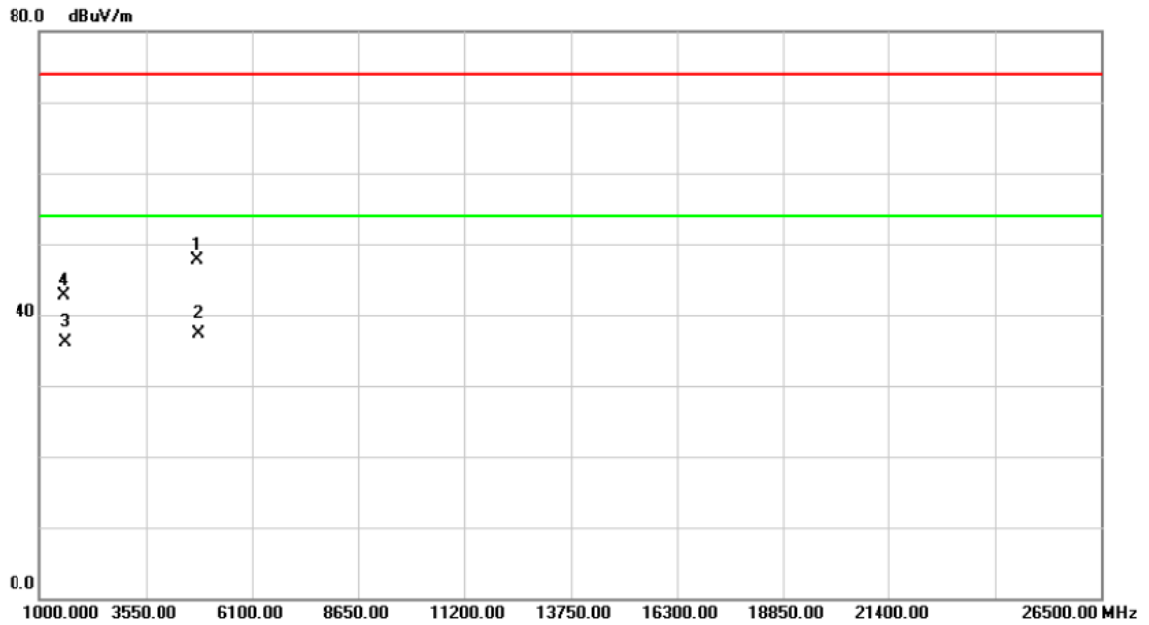
Vertical



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1 | | 2400.000 | 24.34 | 31.89 | 56.23 | 74.00 | -17.77 | peak | |
| 2 | * | 2400.000 | 13.68 | 31.89 | 45.57 | 54.00 | -8.43 | AVG | |
| 3 | | 2401.900 | 38.33 | 31.89 | 70.22 | 114.0 | -43.78 | peak | |
| 4 | | 2402.250 | 30.52 | 31.89 | 62.41 | 94.00 | -31.59 | AVG | |

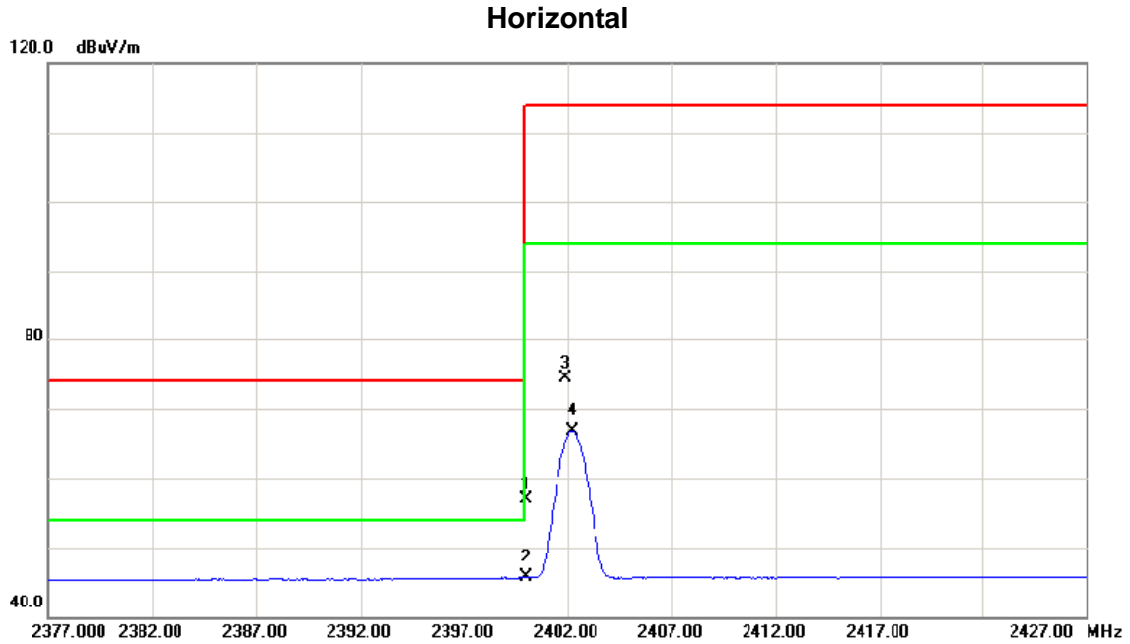
| | |
|-------------------|----------------|
| Orthogonal Axis : | X |
| Test Mode : | TX Low Channel |

Vertical



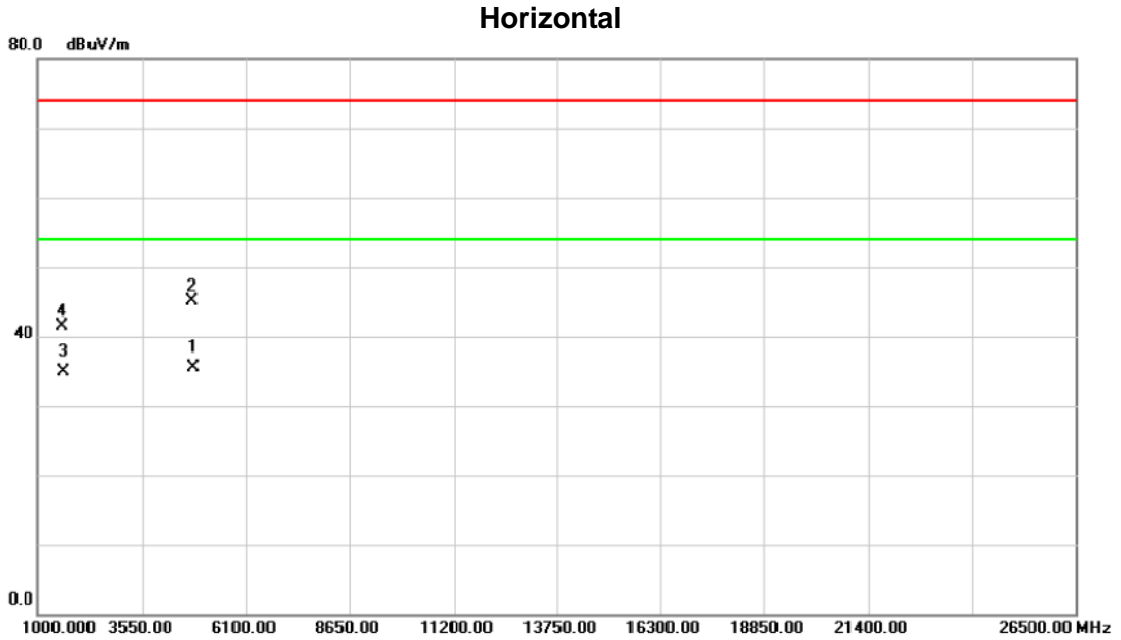
| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1 | | 4803.940 | 44.22 | 3.58 | 47.80 | 74.00 | -26.20 | peak | |
| 2 | * | 4803.960 | 33.74 | 3.58 | 37.32 | 54.00 | -16.68 | AVG | |
| 3 | | 1600.820 | 41.22 | -5.18 | 36.04 | 54.00 | -17.96 | AVG | |
| 4 | | 1600.880 | 47.92 | -5.18 | 42.74 | 74.00 | -31.26 | peak | |

| | |
|-------------------|----------------|
| Orthogonal Axis : | X |
| Test Mode : | TX Low Channel |



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1 | | 2400.000 | 24.95 | 31.89 | 56.84 | 74.00 | -17.16 | peak | |
| 2 | * | 2400.000 | 13.75 | 31.89 | 45.64 | 54.00 | -8.36 | AVG | |
| 3 | | 2401.900 | 42.34 | 31.89 | 74.23 | 114.0 | -39.77 | peak | |
| 4 | | 2402.200 | 31.89 | 31.89 | 66.78 | 91.00 | -27.22 | AVG | |

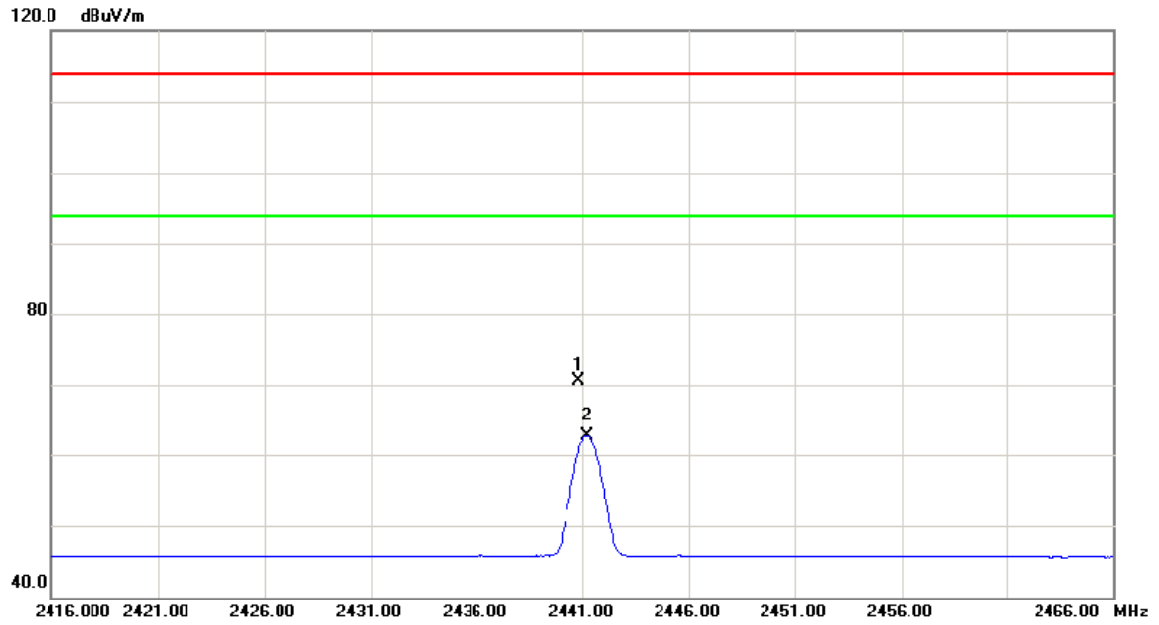
| | |
|-------------------|----------------|
| Orthogonal Axis : | X |
| Test Mode : | TX Low Channel |



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1 | * | 4803.940 | 31.99 | 3.58 | 35.57 | 54.00 | -18.43 | AVG | |
| 2 | | 4803.970 | 41.54 | 3.58 | 45.12 | 74.00 | -28.88 | peak | |
| 3 | | 1600.800 | 40.16 | -5.18 | 34.98 | 54.00 | -19.02 | AVG | |
| 4 | | 1600.850 | 46.68 | -5.18 | 41.50 | 74.00 | -32.50 | peak | |

| | |
|-------------------|-------------------|
| Orthogonal Axis : | X |
| Test Mode : | TX Middle Channel |

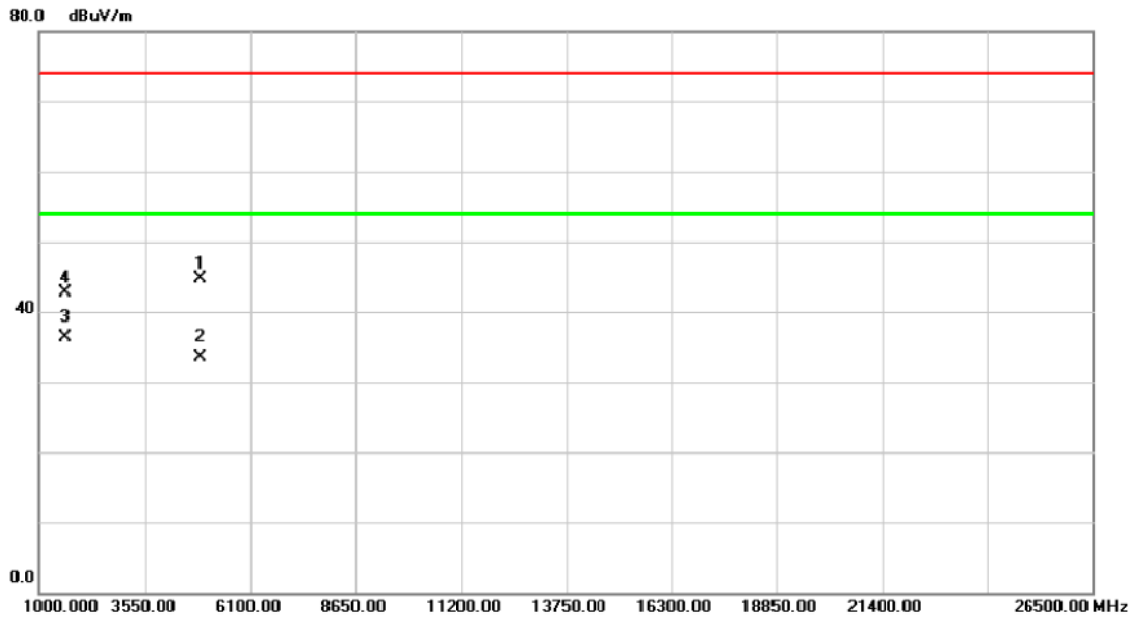
Vertical



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1 | | 2440.800 | 38.51 | 31.95 | 70.46 | 114.0 | -43.54 | peak | |
| 2 | * | 2441.200 | 30.84 | 31.95 | 62.79 | 94.00 | -31.21 | AVG | |

| | |
|-------------------|-------------------|
| Orthogonal Axis : | X |
| Test Mode : | TX Middle Channel |

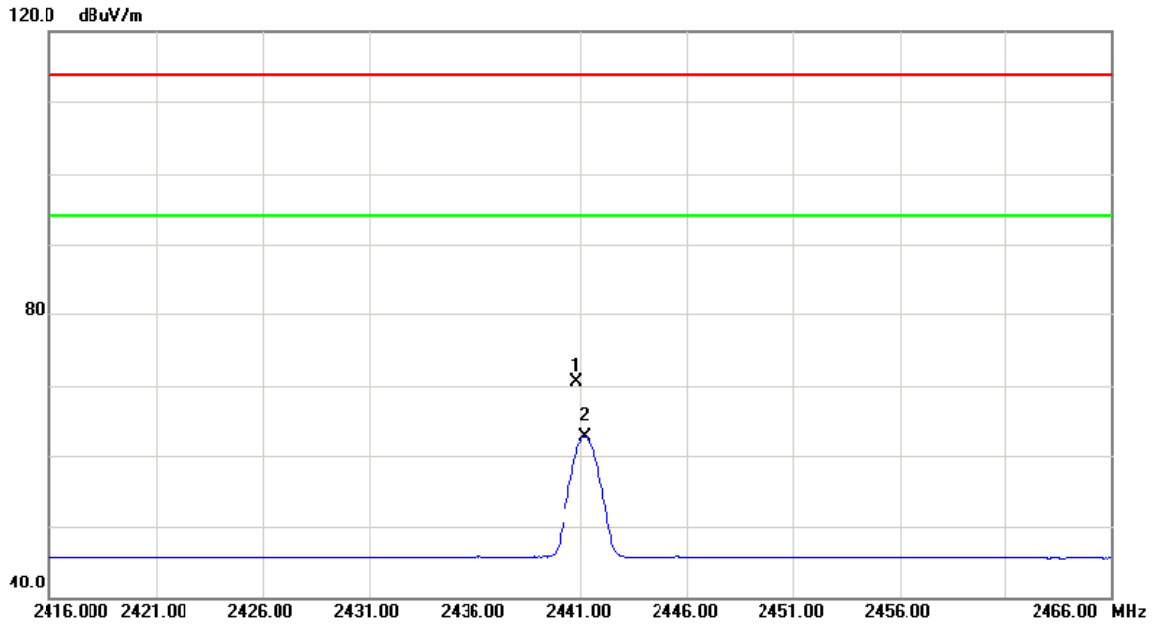
Vertical



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1 | | 4881.600 | 40.98 | 3.73 | 44.71 | 74.00 | -29.29 | peak | |
| 2 | | 4881.950 | 29.71 | 3.73 | 33.44 | 54.00 | -20.56 | AVG | |
| 3 | * | 1626.820 | 41.32 | -5.03 | 36.29 | 54.00 | -17.71 | AVG | |
| 4 | | 1626.790 | 47.81 | -5.03 | 42.78 | 74.00 | -31.22 | peak | |

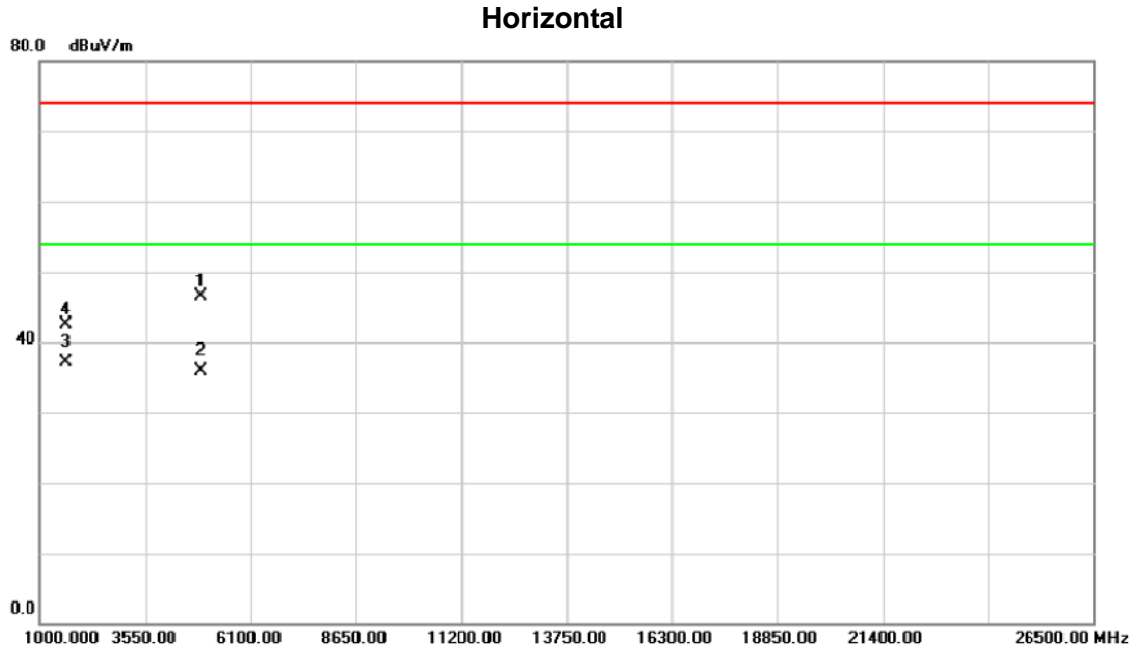
| | |
|-------------------|-------------------|
| Orthogonal Axis : | X |
| Test Mode : | TX Middle Channel |

Horizontal



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1 | | 2440.800 | 38.51 | 31.95 | 70.46 | 114.0 | -43.54 | peak | |
| 2 | * | 2441.200 | 30.84 | 31.95 | 62.79 | 94.00 | -31.21 | AVG | |

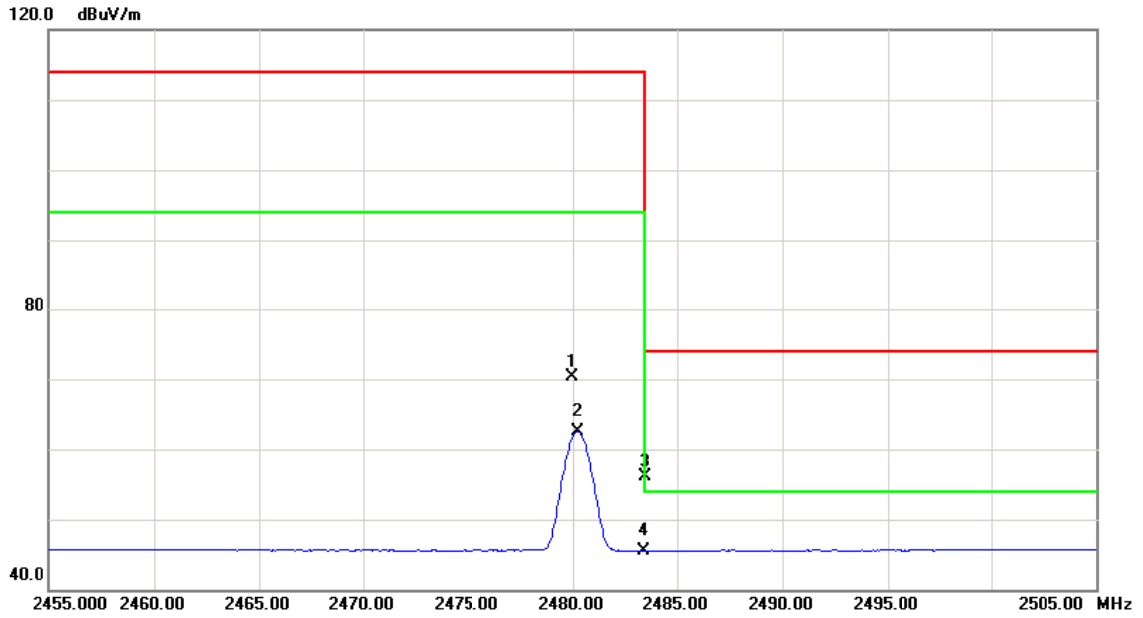
| | |
|-------------------|-------------------|
| Orthogonal Axis : | X |
| Test Mode : | TX Middle Channel |



| No. Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|---------|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1 | 4881.890 | 42.78 | 3.73 | 46.51 | 74.00 | -27.49 | peak | |
| 2 | 4881.970 | 32.26 | 3.73 | 35.99 | 54.00 | -18.01 | AVG | |
| 3 * | 1626.815 | 42.08 | -5.03 | 37.05 | 54.00 | -16.95 | AVG | |
| 4 | 1626.715 | 47.51 | -5.03 | 42.48 | 74.00 | -31.52 | peak | |

| | |
|-------------------|-----------------|
| Orthogonal Axis : | X |
| Test Mode : | TX High Channel |

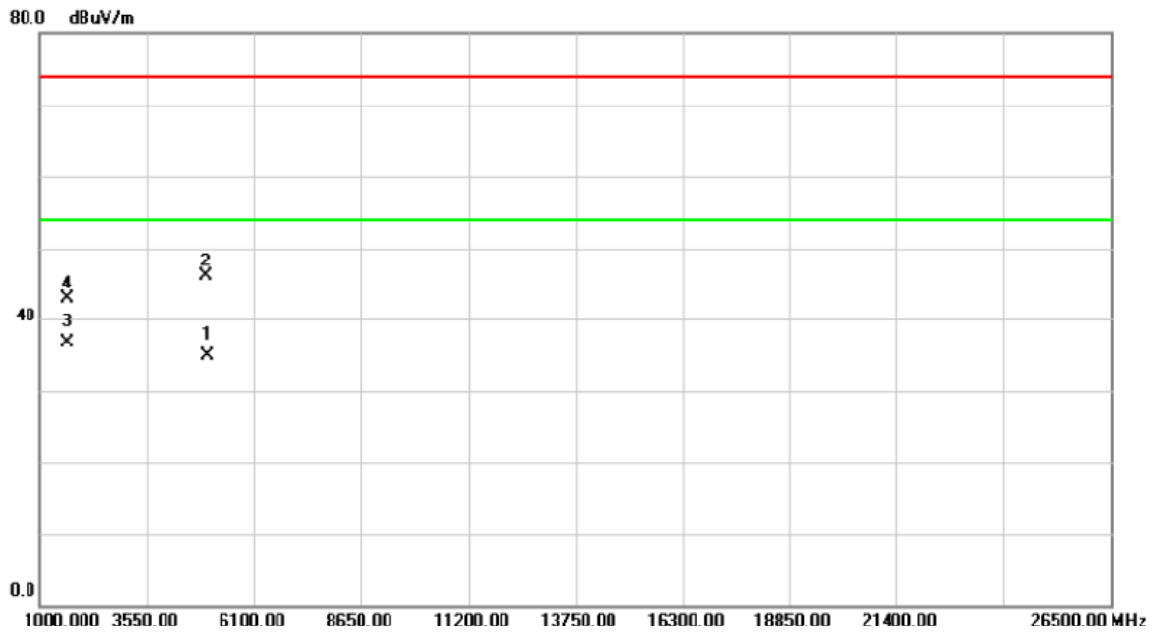
Vertical



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1 | | 2479.950 | 38.31 | 32.00 | 70.31 | 114.0 | -43.69 | peak | |
| 2 | | 2480.200 | 30.55 | 32.00 | 62.55 | 94.00 | -31.45 | AVG | |
| 3 | | 2483.500 | 24.00 | 32.01 | 56.01 | 74.00 | -17.99 | peak | |
| 4 | * | 2483.500 | 13.53 | 32.01 | 45.54 | 54.00 | -8.46 | AVG | |

| | |
|-------------------|-----------------|
| Orthogonal Axis : | X |
| Test Mode : | TX High Channel |

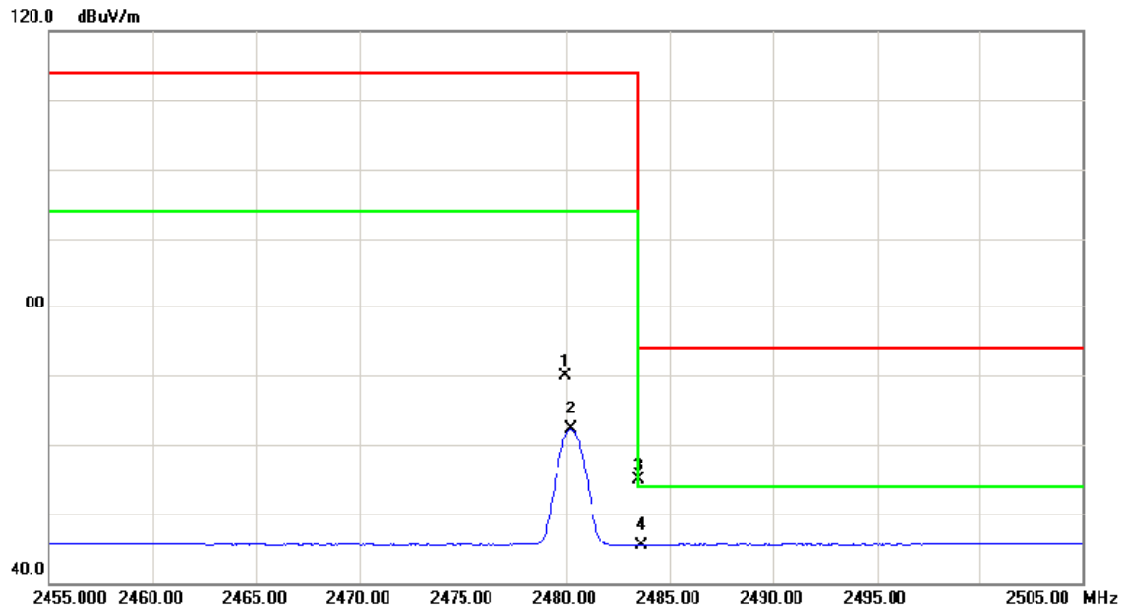
Vertical



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1 | | 4960.010 | 31.02 | 3.83 | 34.90 | 54.00 | -19.10 | AVG | |
| 2 | | 4960.170 | 42.23 | 3.83 | 46.11 | 74.00 | -27.89 | peak | |
| 3 | * | 1652.815 | 41.55 | -4.88 | 36.67 | 54.00 | -17.33 | AVG | |
| 4 | | 1652.960 | 47.79 | -4.88 | 42.91 | 74.00 | -31.09 | peak | |

| | |
|-------------------|-----------------|
| Orthogonal Axis : | X |
| Test Mode : | TX High Channel |

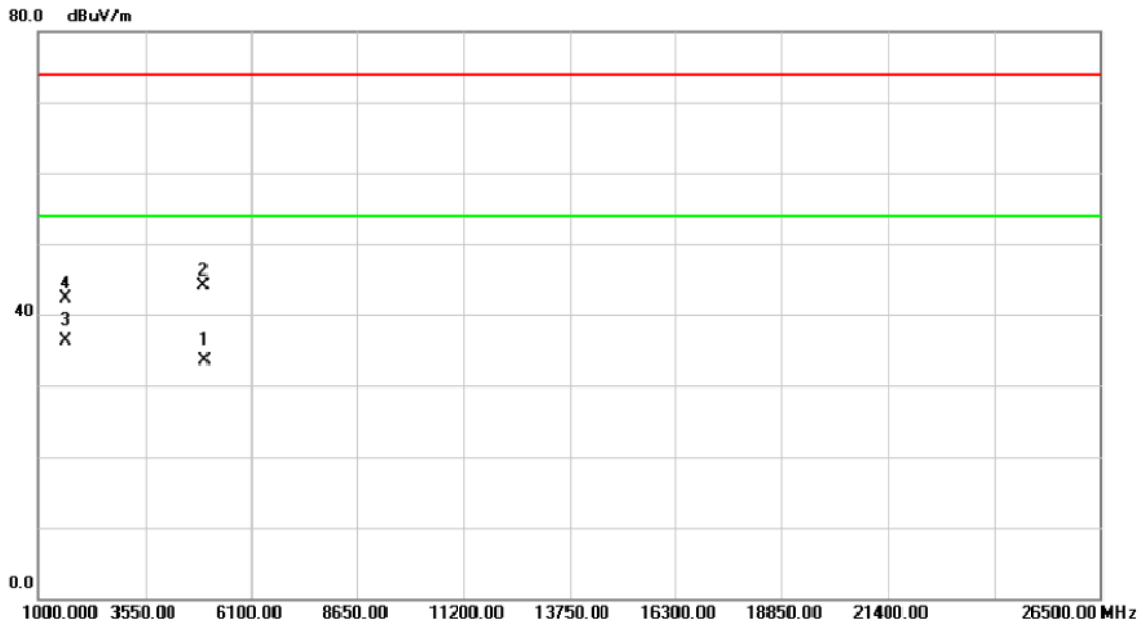
Horizontal



| No. Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measurement dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|---------|-----------|--------------------|-------------------|--------------------|--------------|---------|----------|---------|
| 1 | 2479.950 | 37.99 | 32.00 | 69.99 | 114.0 | -44.01 | peak | |
| 2 | 2480.250 | 30.25 | 32.00 | 62.25 | 94.00 | -31.75 | AVG | |
| 3 | 2483.500 | 22.97 | 32.01 | 54.98 | 74.00 | -19.02 | peak | |
| 4 * | 2483.500 | 13.51 | 32.01 | 45.52 | 54.00 | -8.48 | AVG | |

| | |
|-------------------|-----------------|
| Orthogonal Axis : | X |
| Test Mode : | TX High Channel |

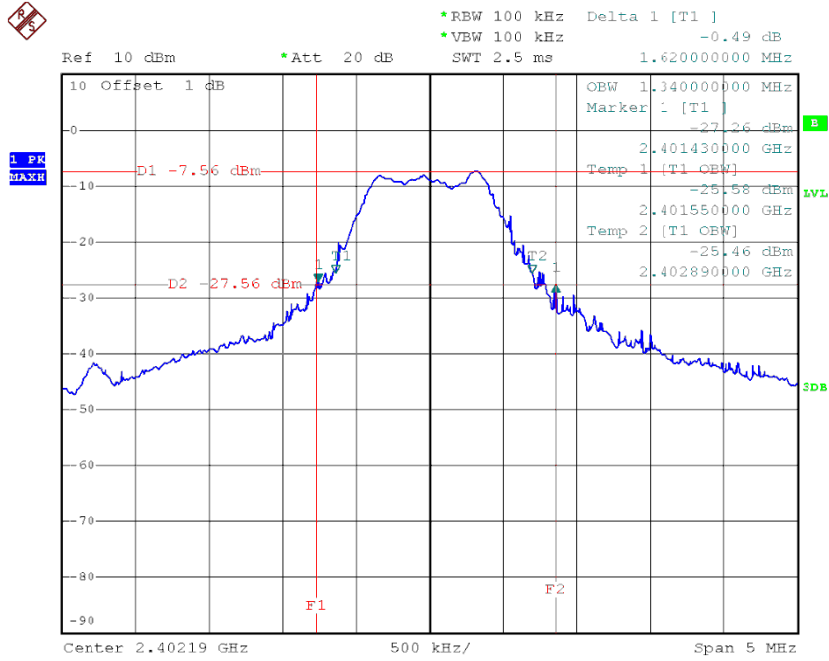
Horizontal



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1 | | 4959.870 | 29.55 | 3.88 | 33.43 | 54.00 | -20.57 | AVG | |
| 2 | | 4959.960 | 40.28 | 3.88 | 44.16 | 74.00 | -29.84 | peak | |
| 3 | * | 1652.820 | 41.11 | -4.88 | 36.23 | 54.00 | -17.77 | AVG | |
| 4 | | 1652.750 | 47.16 | -4.88 | 42.28 | 74.00 | -31.72 | peak | |

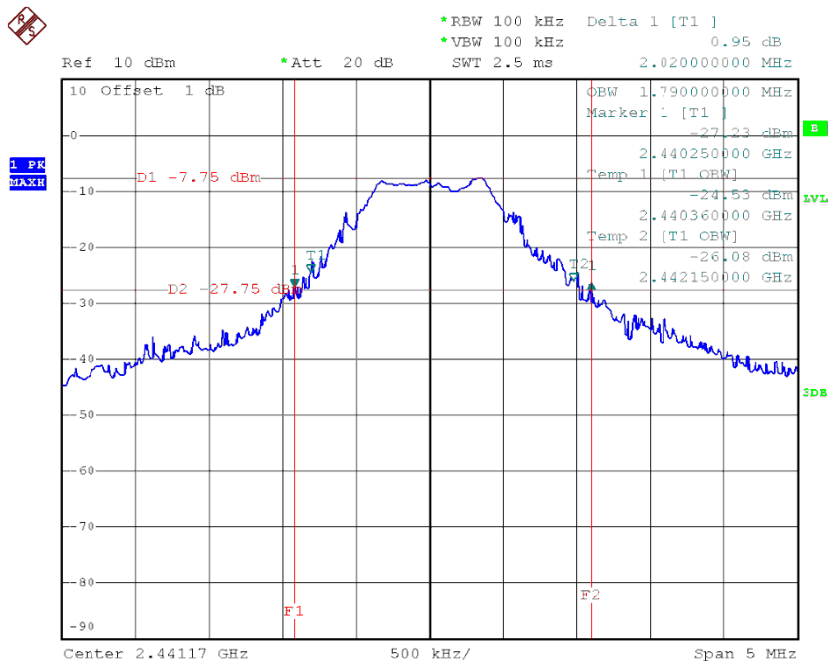
ATTACHMENT E - BANDWIDTH

TX Low Channel



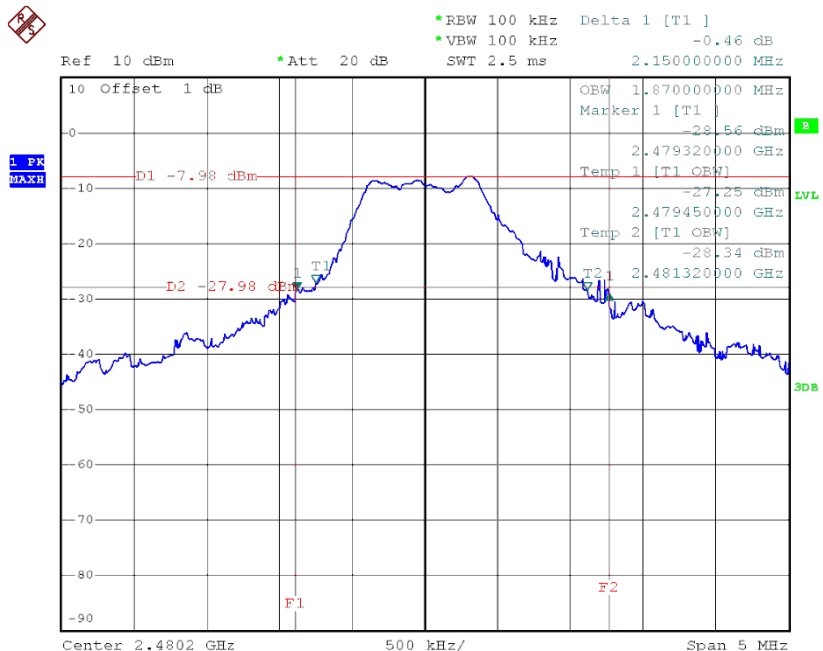
Date: 11.AUG.2014 19:36:03

TX Middle Channel



Date: 11.AUG.2014 19:40:25

TX High Channel



Date: 11.AUG.2014 19:43:50