

FCC Radio Test Report

FCC ID: 2AIJ8-CTR003C

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

Project No. : 1702C004
Equipment : Specified Low Power Radio Station Device
Model Name : CTR-003C, CTR-003
Applicant : Cathay Tri-Tech., Inc
Address : 3-24-5, Shinyokohama Kohoku-ku, Yokohama
222-0033, Japan

Date of Receipt : Feb. 04, 2017
Date of Test : Feb. 04, 2017 ~ Apr. 25, 2017
Issued Date : Apr. 25, 2017
Tested by : BTL Inc.

Testing Engineer : Shawn Xiao
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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 | 10 |
| 3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED | 10 |
| 3.4 DESCRIPTION OF SUPPORT UNITS | 10 |
| 4 . EMC EMISSION TEST | 11 |
| 4.1 CONDUCTED EMISSION MEASUREMENT | 11 |
| 4.1.1 POWER LINE CONDUCTED EMISSION | 11 |
| 4.1.2 TEST PROCEDURE | 11 |
| 4.1.3 DEVIATION FROM TEST STANDARD | 11 |
| 4.1.4 TEST SETUP | 12 |
| 4.1.5 EUT OPERATING CONDITIONS | 12 |
| 4.1.6 EUT TEST CONDITIONS | 12 |
| 4.1.7 TEST RESULTS | 12 |
| 4.2 RADIATED EMISSION MEASUREMENT | 13 |
| 4.2.1 RADIATED EMISSION LIMITS | 13 |
| 4.2.2 TEST PROCEDURE | 14 |
| 4.2.3 DEVIATION FROM TEST STANDARD | 14 |
| 4.2.4 TEST SETUP | 15 |
| 4.2.5 EUT OPERATING CONDITIONS | 16 |
| 4.2.6 EUT TEST CONDITIONS | 16 |
| 4.2.7 TEST RESULTS (BELOW 30MHz) | 16 |
| 4.2.8 TEST RESULTS (30 TO 1000 MHz) | 16 |
| 4.2.9 TEST RESULTS (ABOVE 1000 MHz) | 16 |
| 5 . BANDWIDTH TEST | 17 |
| 5.1 TEST PROCEDURE | 17 |
| 5.2 DEVIATION FROM STANDARD | 17 |
| 5.3 TEST SETUP | 17 |
| 5.4 EUT OPERATION CONDITIONS | 17 |
| 5.5 EUT TEST CONDITIONS | 17 |
| 5.6 TEST RESULTS | 17 |
| 6 . MEASUREMENT INSTRUMENTS LIST AND SETTING | 18 |
| 7 . EUT TEST PHOTO | 20 |

| Table of Contents | Page |
|--|-------------|
| ATTACHMENT A - CONDUCTED EMISSION | 24 |
| ATTACHMENT B -RADIATED EMISSION (9KHZ to 30MHZ) | 27 |
| ATTACHMENT C -RADIATED EMISSION (30MHZ TO 1000MHZ) | 32 |
| ATTACHMENT D -RADIATED EMISSION (ABOVE 1000MHZ) | 39 |
| ATTACHMENT E - BANDWIDTH | 52 |

REPORT ISSUED HISTORY

| Issued No. | Description | Issued Date |
|---------------------|-----------------|---------------|
| BTL-FCCP-1-1702C004 | Original Issue. | Apr. 25, 2017 |

1. CERTIFICATION

Equipment : Specified Low Power Radio Station Device
Brand Name : Cathay Tri-Tech.,Inc
Model Name : CTR-003C, CTR-003
Applicant : Cathay Tri-Tech., Inc
Manufacturer : Cathay Tri-Tech.,Inc
Address : 3-24-5,Shinyokohama Kohoku-ku,Yokohama 222-0033,Japan
Factory : SHENZHEN LONGTECH ELECTRONICS CO.,LTD
Address : Zhengfeng Industrial Area,No.148, donghuan Road,huangpu Village ,Shajing Town, Baoan District,Shenzhen ,PRC
Date of Test : Feb. 04, 2017 ~ Apr. 25, 2017
Test Sample : Engineering Sample
Standard(s) : FCC Part15, Subpart C(15.249)/ ANSI C63.10-2013

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-1-1702C004) 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 | |
| - | Bandwidth | 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 at the location of No.3,Jinshagang 1st Road, Shixia, DalangTown,Dongguan, Guangdong, China.

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 BTL measurement uncertainty is less than the CISPR 16-4-2 U_{cisp} requirement.

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) |
|-----------|--------|-----------------------------|------------|
| DG-C02 | CISPR | 150 KHz ~ 30MHz | 2.32 |

B. Radiated Measurement :

| 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 | 3.82 |
| | | 30MHz ~ 200MHz | H | 3.78 |
| | | 200MHz ~ 1,000MHz | V | 4.10 |
| | | 200MHz ~ 1,000MHz | H | 4.06 |
| | | 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 | Specified Low Power Radio Station Device | | |
| Brand Name | Cathay Tri-Tech.,Inc | | |
| Model Name | CTR-003C, CTR-003 | | |
| Model Difference | Only differ in model name. | | |
| Product Description | Operation Frequency | 916-923 MHz | |
| | Modulation Technology | GFSK | |
| | Data rate | 9600bps | |
| | Field Strength | 93.51dBuV/m | |
| PowerSource | DC voltage supplied form AC/DC adapter. Model: A122-0502000ID | | |
| Power Rating | I/P:100-240V~50/60Hz 0.4A O/P:5V === 2000mA | | |

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) |
|---------|-----------------|---------|-----------------|
| 00 | 916.00 | 20 | 920.00 |
| 01 | 916.20 | 21 | 920.20 |
| 02 | 916.40 | 22 | 920.40 |
| 03 | 916.60 | 23 | 920.60 |
| 04 | 916.80 | 24 | 920.80 |
| 05 | 917.00 | 25 | 921.00 |
| 06 | 917.20 | 26 | 921.20 |
| 07 | 917.40 | 27 | 921.40 |
| 08 | 917.60 | 28 | 921.60 |
| 09 | 917.80 | 29 | 921.80 |
| 10 | 918.00 | 30 | 922.00 |
| 11 | 918.20 | 31 | 922.20 |
| 12 | 918.40 | 32 | 922.40 |
| 13 | 918.60 | 33 | 922.60 |
| 14 | 918.80 | 34 | 922.80 |
| 15 | 919.00 | 35 | 923.00 |
| 16 | 919.20 | | |
| 17 | 919.40 | | |
| 18 | 919.60 | | |
| 19 | 919.80 | | |

Table for Filed Antenna:

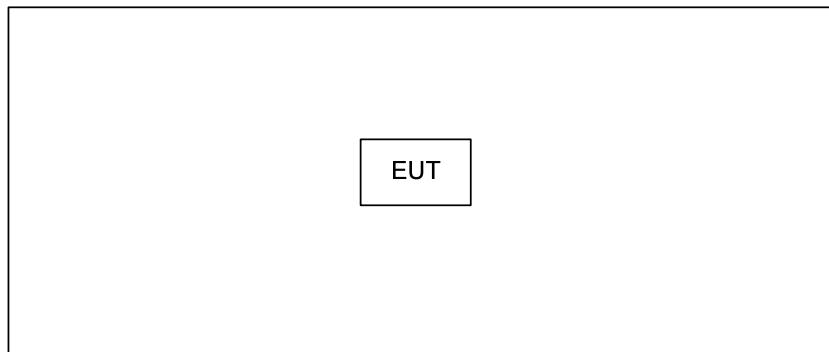
| 3. | Ant. | Manufacturer | Model Name | Antenna Type | Connector | Gain (dBi) |
|----|------|--------------|------------|--------------|-----------|------------|
| | 1 | N/A | N/A | Externel | N/A | 2 |

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 Mode |
| Final Test Mode | Description |
| Mode 1 | TX Mode |

3.3 BLOCKDIAGRAMSHOWINGTHECONFIGURATIONOFSYSTEMTESTED



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. |
|------|-----------|-----------|----------------|--------|------------|
| - | - | - | - | - | - |

| Item | Shielded Type | Ferrite Core | Length | Note |
|------|---------------|--------------|--------|------|
| - | - | - | - | - |

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 |

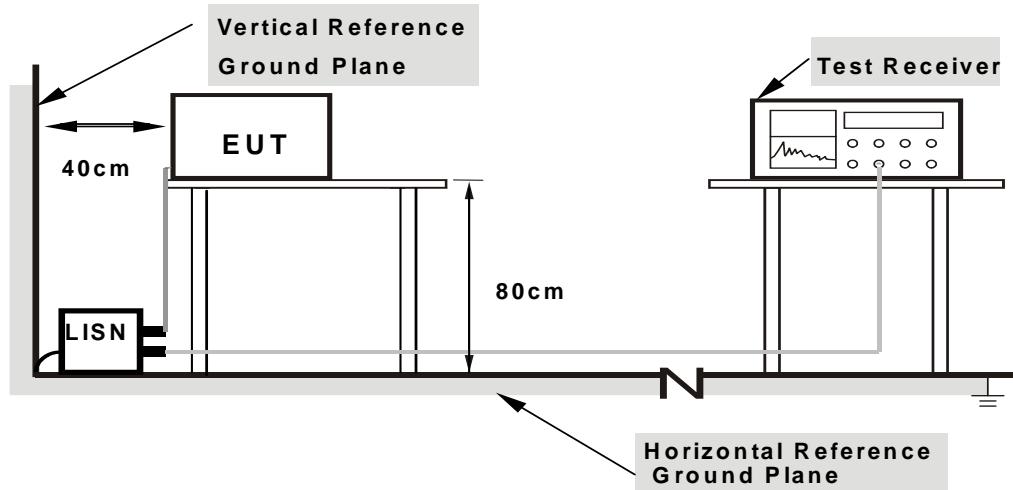
4.1.2 TESTPROCEDURE

- 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 groundplane 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 TESTSETUP



Note:

1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm 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: 23°C

Relative Humidity: 60%

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 54dB_{UV}/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 (dB_{UV}/m)=20log Emission level (uV/m).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.209)

| FREQUENCY (MHz) | (dB _{UV} /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 (dB_{UV}/m)=20log Emission level (uV/m).

| | |
|--------------------|-----------------------|
| 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 TESTPROCEDURE

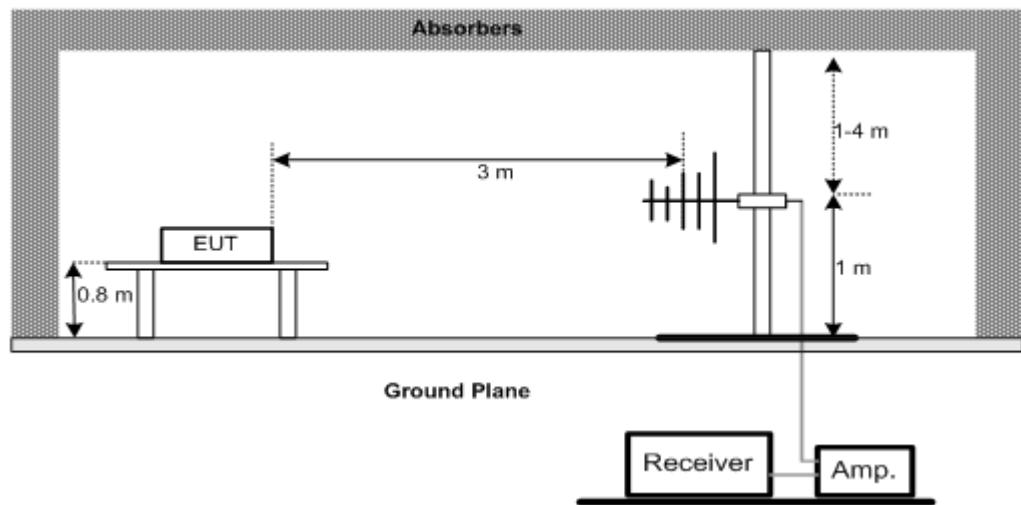
- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The measuring distance 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 1GHz)
- c. The height of the equipment or of the substitution antenna shall be 0.8 m 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 1GHz.
- 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 1GHz)
- 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 1GHz)
- i. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.2.3DEVIATIONFROMTESTSTANDARD

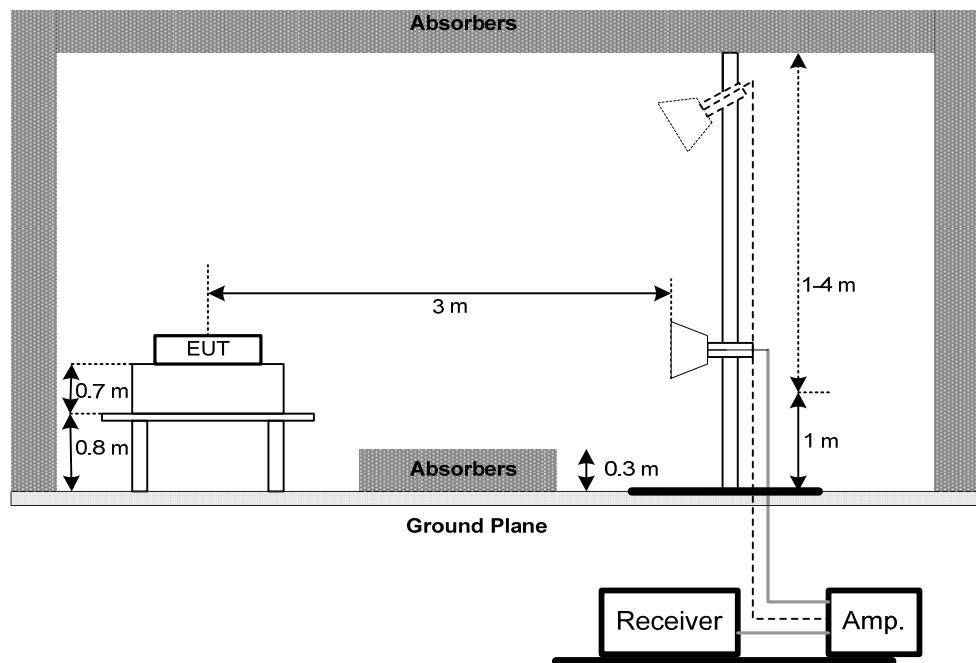
No deviation

4.2.4 TESTSETUP

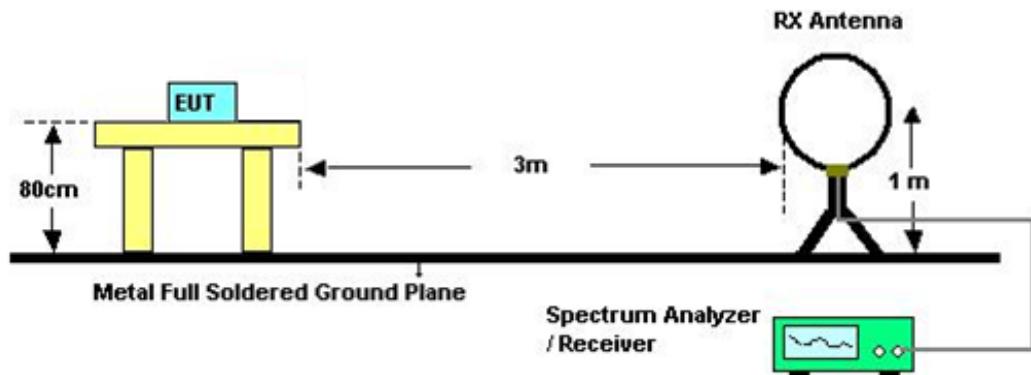
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(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 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

4.2.6 EUT TEST CONDITIONS

Temperature: 24°C

Relative Humidity: 52%

Test Voltage: DC 4.5V

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 (30 TO 1000 MHz)

Please refer to the Attachment C

4.2.9 TEST RESULTS(ABOVE1000 MHz)

Please refer to the Attachment D

Remark:

- (1) EUT Orthogonal Axis:
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (2) 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

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= 3kHz, VBW=3kHz, 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 4.1.5 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 4.5V

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 | 50Ω Terminator | SHX | TF2-3G-A | 8122901 | Mar. 26, 2018 |
| 2 | TWO-LINE V-NETWORK | R&S | ENV216 | 100526 | Mar. 26, 2018 |
| 3 | EMI Test Receiver | R&S | ESR3 | 101862 | Sep. 04, 2017 |
| 4 | Artificial-Mains Network | SCHWARZBECK | NSLK 8127 | 8127685 | Sep. 04, 2017 |
| 5 | Cable | N/A | RG400 12m | N/A | Mar. 09, 2018 |
| 6 | Measurement Software | Farad | EZ-EMC Ver.NB-03A1-01 | N/A | N/A |

| Radiated Emission Measurement | | | | | |
|-------------------------------|-------------------------------------|----------------|----------------------------|---------------|------------------|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Antenna | Schwarbeck | VULB9160 | 9160-3232 | Mar. 26, 2018 |
| 2 | Amplifier | HP | 8447D | 2944A09673 | Oct. 20, 2017 |
| 3 | Receiver | Agilent | N9038A | MY52130039 | Sep. 04, 2017 |
| 4 | Cable | emci | LMR-400(30MHz-1GHz)(8m+5m) | N/A | Jun. 27, 2017 |
| 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 |
| 8 | Amplifier | Agilent | 8449B | 3008A02274 | Mar. 09, 2018 |
| 9 | Receiver | Agilent | N9038A | MY52130039 | Sep. 04, 2017 |
| 10 | Antenna | EM | EM-6876-1 | 230 | Jul. 08, 2017 |
| 11 | Controller | CT | SC100 | N/A | N/A |
| 12 | Controller | MF | MF-7802 | MF780208416 | N/A |
| 13 | Cable | emci | EMC104-SM-SM-12000(12m) | N/A | Jul. 06, 2017 |
| 14 | Broad-Band Horn Antenna | Schwarzbeck | BBHA 9170 | 9170319 | Apr. 23, 2017 |
| 15 | Spectrum Analyzer | R&S | FSP40 | 100185 | Sep. 04, 2017 |
| 16 | Microwave Preamplifier With Adaptor | EMC INSTRUMENT | EMC2654045 | 980039 & HA01 | Mar. 26, 2018 |
| 17 | Measurement Software | Farad | EZ-EMC Ver.NB-03A1-01 | N/A | N/A |

| Bandwidth | | | | | |
|------------------|-------------------|--------------|----------|------------|------------------|
| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
| 1 | Spectrum Analyzer | R&S | FSP40 | 100185 | Sep. 04, 2017 |

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

7.EUT TEST PHOTO**Conducted Measurement Photos**

Radiated Measurement Photos

9KHz to 30MHz



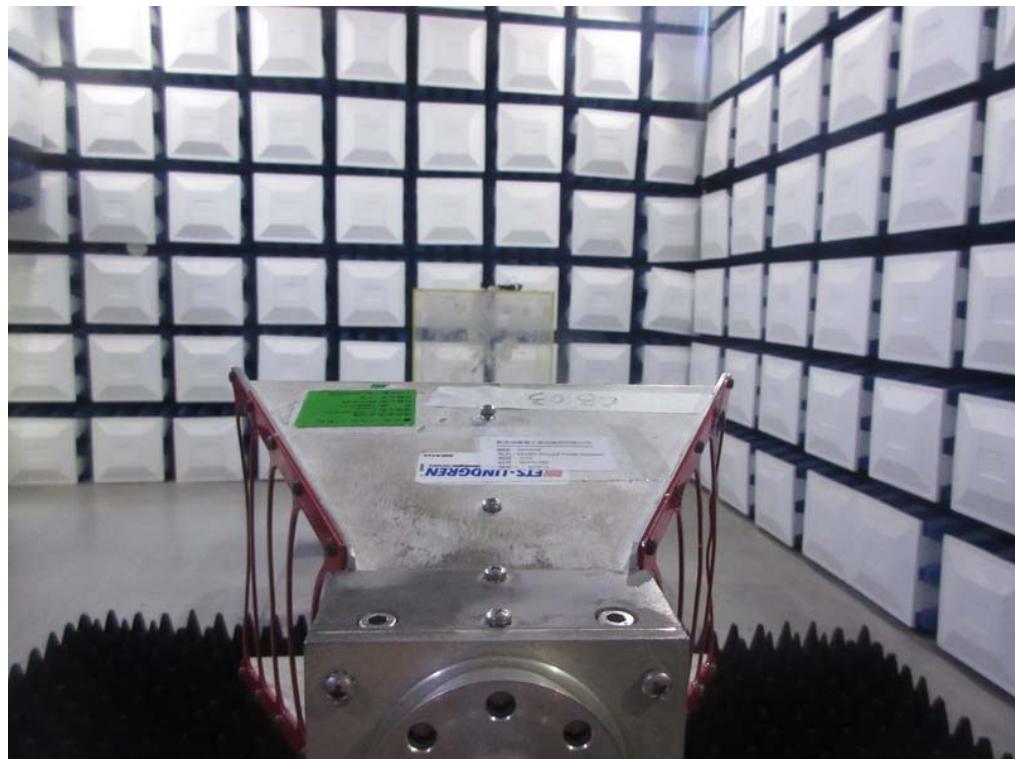
Radiated Measurement Photos

30MHz to 1000MHz



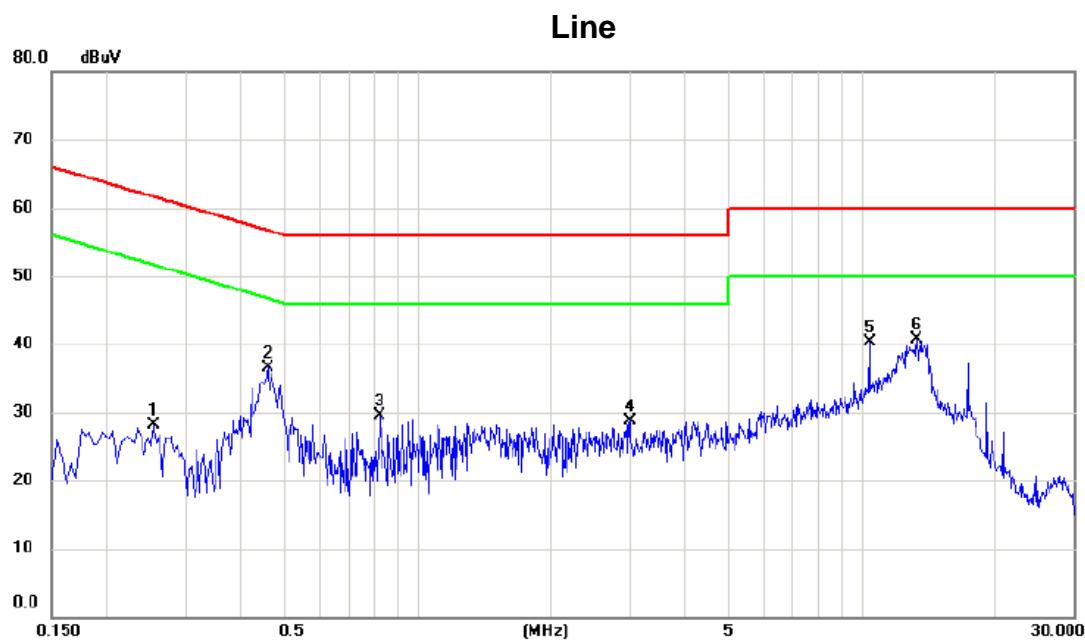
Radiated Measurement Photos

Above 1000MHz



ATTACHMENT A - CONDUCTED EMISSION

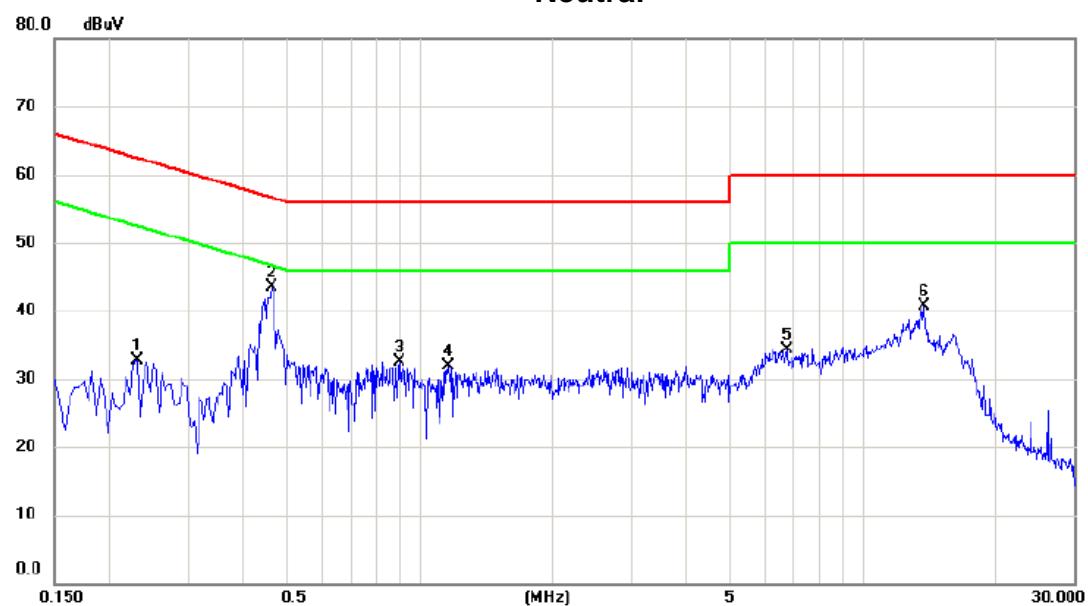
Test Mode: TX MODE



| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit | Margin | Detector | Comment |
|-----|-----|---------|---------|---------|----------|-------|--------|----------|---------|
| | | | Level | Factor | ment | | | | |
| | | MHz | dBuV | dB | dBuV | dB | | | |
| 1 | | 0.2540 | 18.51 | 9.53 | 28.04 | 61.63 | -33.59 | peak | |
| 2 | | 0.4580 | 27.00 | 9.60 | 36.60 | 56.73 | -20.13 | peak | |
| 3 | | 0.8180 | 19.75 | 9.75 | 29.50 | 56.00 | -26.50 | peak | |
| 4 | | 3.0020 | 18.52 | 10.09 | 28.61 | 56.00 | -27.39 | peak | |
| 5 | | 10.4460 | 30.05 | 10.22 | 40.27 | 60.00 | -19.73 | peak | |
| 6 | * | 13.3100 | 30.42 | 10.31 | 40.73 | 60.00 | -19.27 | peak | |

Test Mode: TX MODE

Neutral

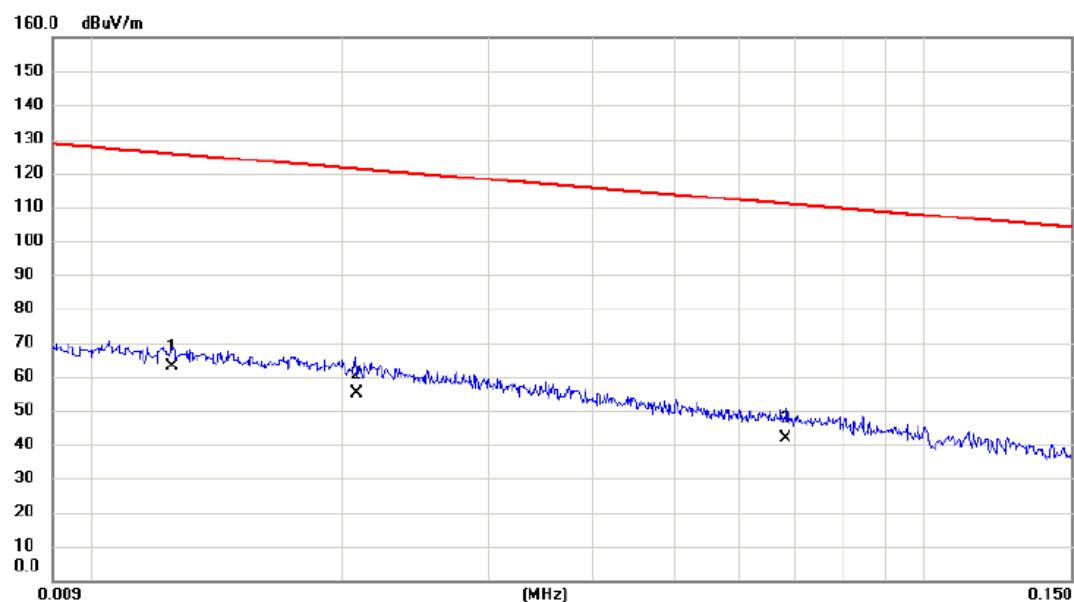


| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure- ment | Limit | Margin | | |
|-----|-----|---------|---------------|----------------|------------------|-------|--------|----------|---------|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | | 0.2300 | 23.22 | 9.53 | 32.75 | 62.45 | -29.70 | peak | |
| 2 | * | 0.4620 | 33.98 | 9.44 | 43.42 | 56.66 | -13.24 | peak | |
| 3 | | 0.9020 | 22.89 | 9.66 | 32.55 | 56.00 | -23.45 | peak | |
| 4 | | 1.1620 | 22.21 | 9.66 | 31.87 | 56.00 | -24.13 | peak | |
| 5 | | 6.7100 | 24.38 | 9.95 | 34.33 | 60.00 | -25.67 | peak | |
| 6 | | 13.7380 | 30.27 | 10.35 | 40.62 | 60.00 | -19.38 | peak | |

ATTACHMENTB -RADIATED EMISSION (9KHZ to 30MHZ)

Test Mode: TX Mode

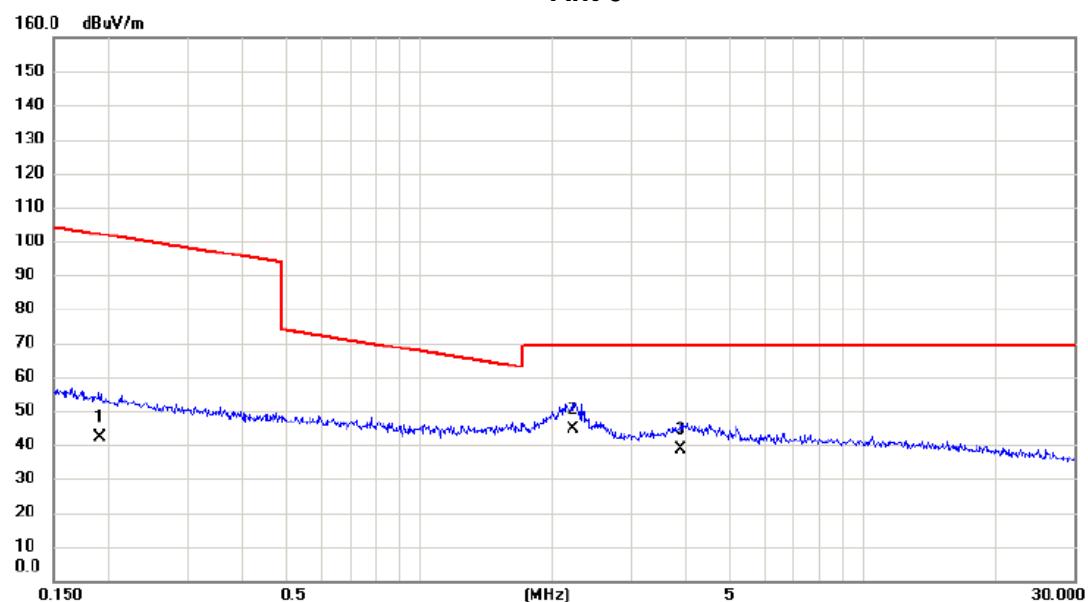
Ant 0°



| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure- ment | Limit | Margin | | |
|-----|-----|--------|---------------|----------------|------------------|--------|--------|----------|---------|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | * | 0.0125 | 39.18 | 23.97 | 63.15 | 125.67 | -62.52 | AVG | |
| 2 | | 0.0208 | 31.41 | 23.42 | 54.83 | 121.24 | -66.41 | AVG | |
| 3 | | 0.0682 | 22.16 | 19.61 | 41.77 | 110.93 | -69.16 | AVG | |

Test Mode: TX Mode

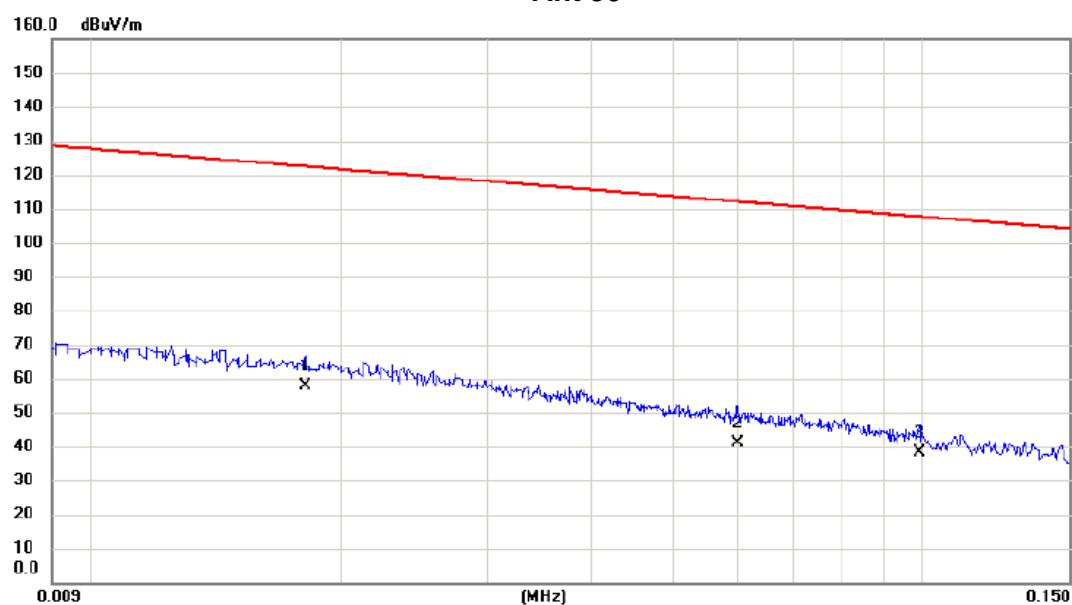
Ant 0°



| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit | Margin | |
|-----|-----|--------|---------|---------|----------|--------|----------|---------|
| | | | Level | Factor | ment | | | |
| | | MHz | dBuV | dB | dBuV/m | dB | Detector | Comment |
| 1 | | 0.1894 | 23.70 | 18.70 | 42.40 | 102.06 | -59.66 | AVG |
| 2 | * | 2.2132 | 27.13 | 17.63 | 44.76 | 69.54 | -24.78 | QP |
| 3 | | 3.8808 | 20.24 | 18.50 | 38.74 | 69.54 | -30.80 | QP |

Test Mode: TX Mode

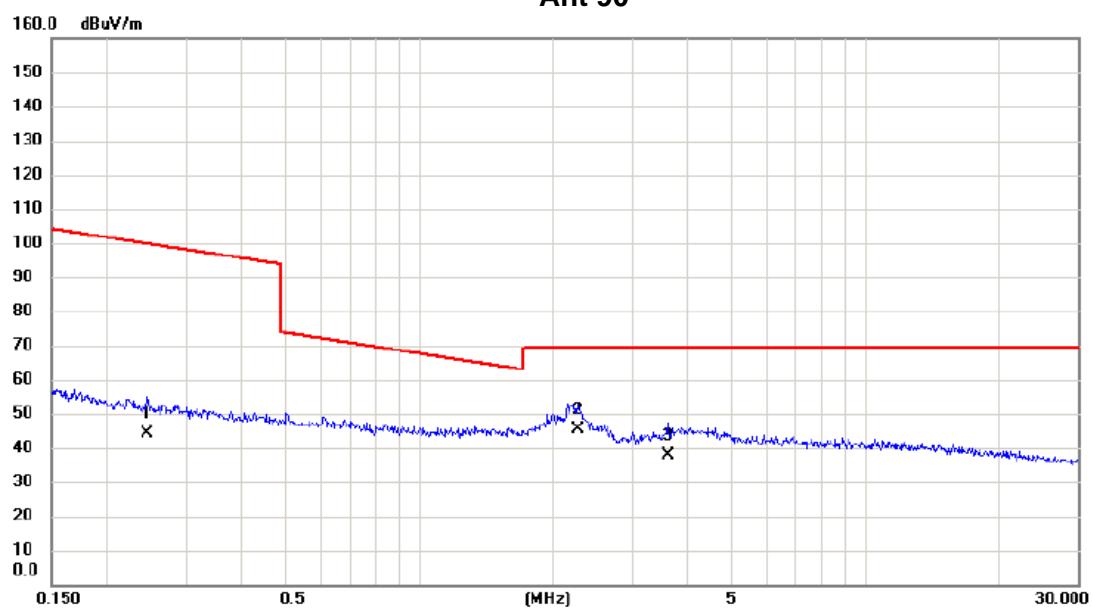
Ant 90°



| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure- ment | Limit | Margin | | |
|-----|-----|--------|---------------|----------------|------------------|--------|--------|----------|---------|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | * | 0.0181 | 34.02 | 23.63 | 57.65 | 122.45 | -64.80 | AVG | |
| 2 | | 0.0600 | 21.14 | 19.71 | 40.85 | 112.04 | -71.19 | AVG | |
| 3 | | 0.0990 | 19.54 | 18.47 | 38.01 | 107.69 | -69.68 | AVG | |

Test Mode: TX Mode

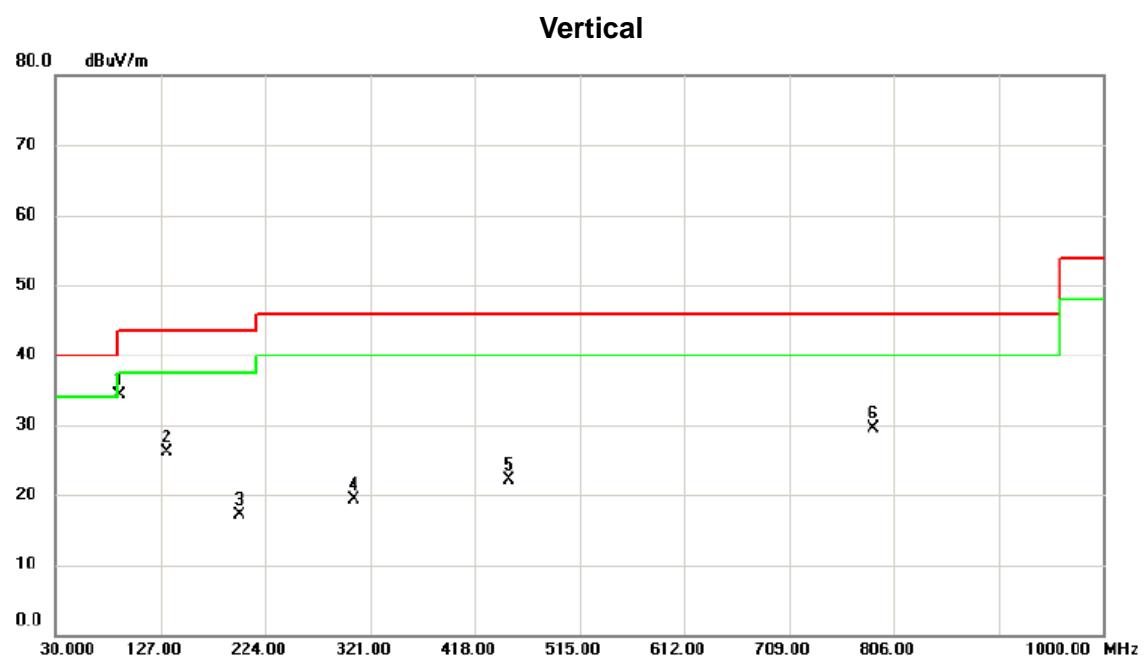
Ant 90°



| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure- ment | Limit | Margin | | |
|-----|-----|--------|---------------|----------------|------------------|--------|--------|----------|---------|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | Comment |
| 1 | | 0.2455 | 25.39 | 18.65 | 44.04 | 99.80 | -55.76 | AVG | |
| 2 | * | 2.2726 | 27.92 | 17.56 | 45.48 | 69.54 | -24.06 | QP | |
| 3 | | 3.6034 | 19.95 | 17.92 | 37.87 | 69.54 | -31.67 | QP | |

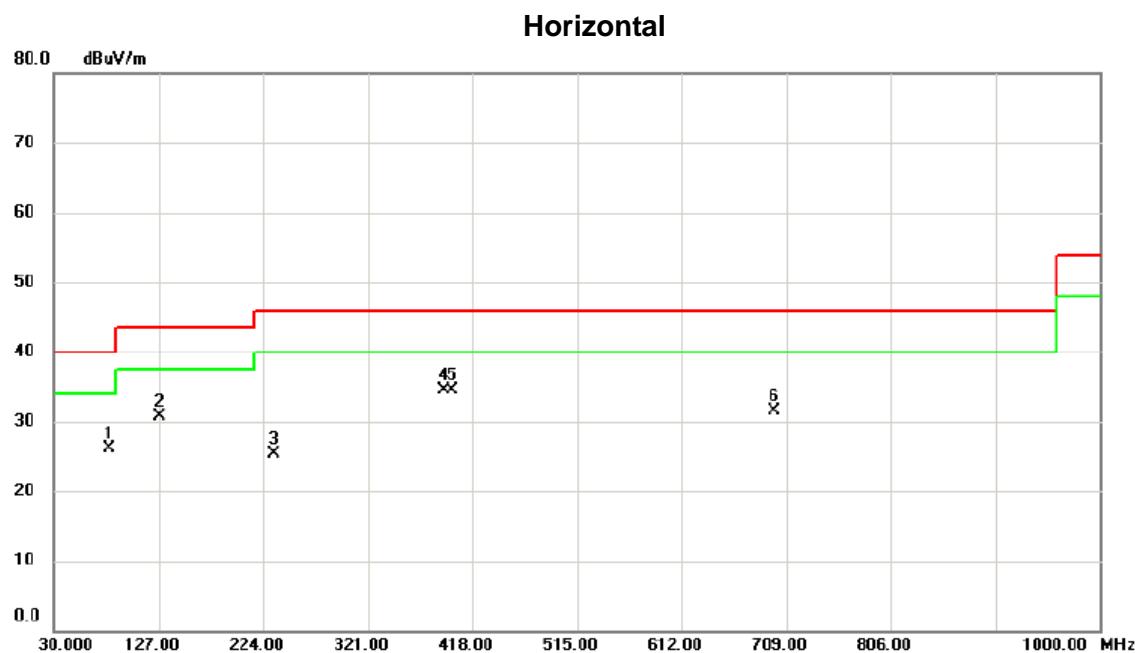
ATTACHMENTC -RADIATED EMISSION (30MHZ TO 1000MHZ)

Test Mode: TX Mode_916MHz



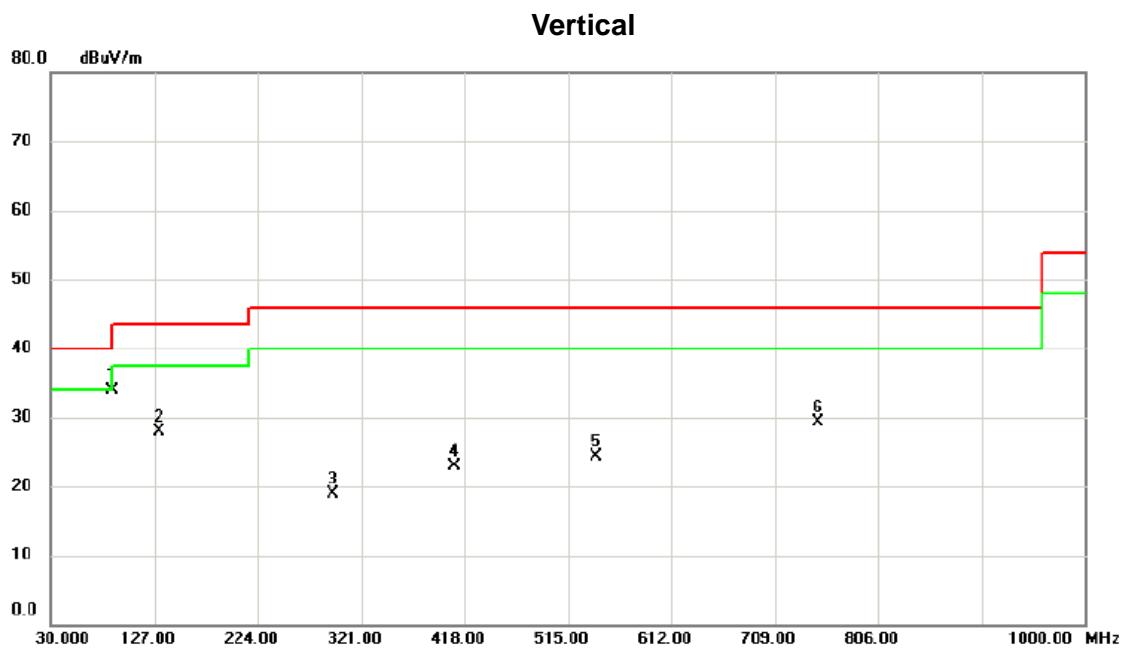
| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure- ment | Limit | Margin | |
|-----|-----|---------|---------------|----------------|------------------|-------|----------|---------|
| | | MHz | dBuV | dB | dBuV/m | dB | Detector | Comment |
| 1 | * | 88.200 | 51.78 | -17.43 | 34.35 | 43.50 | -9.15 | peak |
| 2 | | 132.820 | 38.85 | -12.75 | 26.10 | 43.50 | -17.40 | peak |
| 3 | | 199.750 | 31.45 | -14.41 | 17.04 | 43.50 | -26.46 | peak |
| 4 | | 305.480 | 29.54 | -10.28 | 19.26 | 46.00 | -26.74 | peak |
| 5 | | 450.010 | 30.05 | -8.00 | 22.05 | 46.00 | -23.95 | peak |
| 6 | | 787.570 | 29.72 | -0.29 | 29.43 | 46.00 | -16.57 | peak |

Test Mode: TX Mode_916MHz



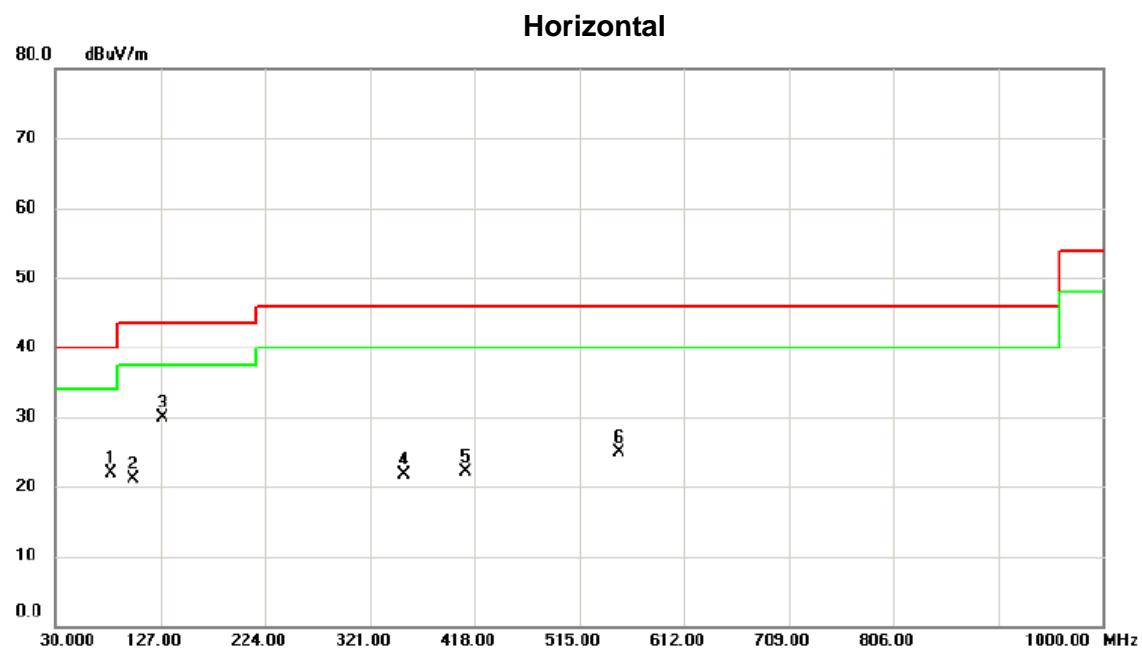
| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit | Margin | Comment |
|-----|-----|---------|---------|---------|----------|-------|----------|---------|
| | | | Level | Factor | ment | | | |
| | | MHz | dBuV | dB | dBuV/m | dB | Detector | |
| 1 | | 81.410 | 42.52 | -16.42 | 26.10 | 40.00 | -13.90 | peak |
| 2 | | 127.970 | 43.21 | -12.58 | 30.63 | 43.50 | -12.87 | peak |
| 3 | | 233.700 | 38.85 | -13.51 | 25.34 | 46.00 | -20.66 | peak |
| 4 | | 390.840 | 42.94 | -8.41 | 34.53 | 46.00 | -11.47 | peak |
| 5 * | | 399.570 | 42.41 | -7.81 | 34.60 | 46.00 | -11.40 | peak |
| 6 | | 698.330 | 33.64 | -2.17 | 31.47 | 46.00 | -14.53 | peak |

Test Mode: TX Mode_919.6MHz



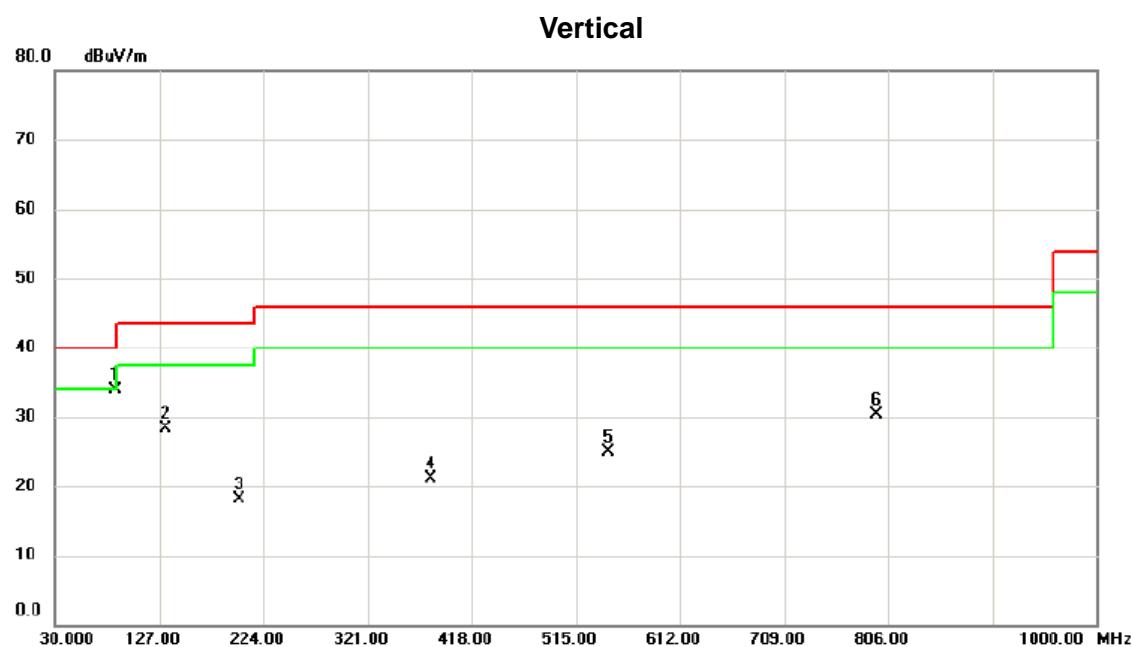
| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit | Margin | Detector | Comment |
|-----|-----|---------|---------|---------|----------|--------|--------|----------|---------|
| | | | Level | Factor | ment | | | | |
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | | |
| 1 * | | 87.230 | 51.36 | -17.42 | 33.94 | 40.00 | -6.06 | peak | |
| 2 | | 131.850 | 40.56 | -12.61 | 27.95 | 43.50 | -15.55 | peak | |
| 3 | | 294.810 | 29.55 | -10.72 | 18.83 | 46.00 | -27.17 | peak | |
| 4 | | 408.300 | 30.64 | -7.81 | 22.83 | 46.00 | -23.17 | peak | |
| 5 | | 541.190 | 29.68 | -5.46 | 24.22 | 46.00 | -21.78 | peak | |
| 6 | | 749.740 | 31.34 | -1.97 | 29.37 | 46.00 | -16.63 | peak | |

Test Mode: TX Mode_919.6MHz



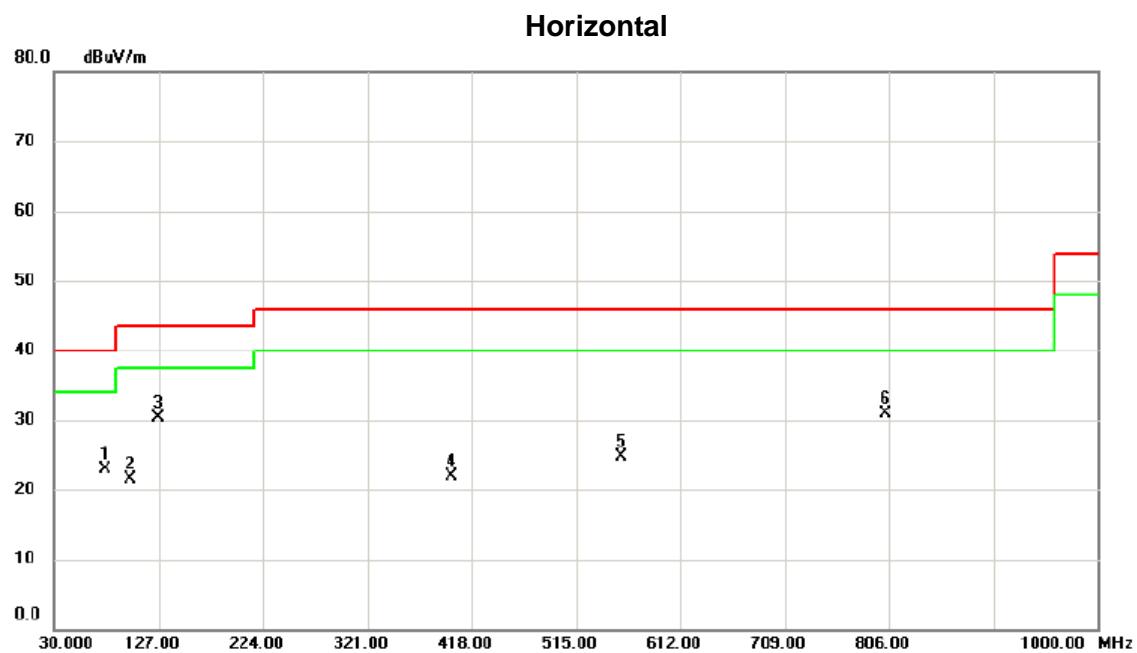
| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit | Margin | Comment |
|-----|-----|---------|---------|---------|----------|-------|----------|---------|
| | | | Level | Factor | ment | | | |
| | | MHz | dBuV | dB | dBuV/m | dB | Detector | |
| 1 | | 81.410 | 38.25 | -16.42 | 21.83 | 40.00 | -18.17 | peak |
| 2 | | 101.780 | 36.36 | -15.32 | 21.04 | 43.50 | -22.46 | peak |
| 3 * | | 128.940 | 42.28 | -12.47 | 29.81 | 43.50 | -13.69 | peak |
| 4 | | 353.010 | 32.63 | -11.02 | 21.61 | 46.00 | -24.39 | peak |
| 5 | | 409.270 | 29.92 | -7.83 | 22.09 | 46.00 | -23.91 | peak |
| 6 | | 551.860 | 29.60 | -4.63 | 24.97 | 46.00 | -21.03 | peak |

Test Mode: TX Mode_923MHz



| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit | Margin | Detector | Comment |
|-----|-----|---------|---------|---------|----------|--------|--------|----------|---------|
| | | | Level | Factor | ment | | | | |
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | | |
| 1 * | | 86.260 | 51.32 | -17.42 | 33.90 | 40.00 | -6.10 | peak | |
| 2 | | 132.820 | 41.12 | -12.75 | 28.37 | 43.50 | -15.13 | peak | |
| 3 | | 200.720 | 32.49 | -14.45 | 18.04 | 43.50 | -25.46 | peak | |
| 4 | | 379.200 | 30.31 | -9.21 | 21.10 | 46.00 | -24.90 | peak | |
| 5 | | 545.070 | 29.85 | -5.04 | 24.81 | 46.00 | -21.19 | peak | |
| 6 | | 795.330 | 30.17 | 0.05 | 30.22 | 46.00 | -15.78 | peak | |

Test Mode: TX Mode_923MHz

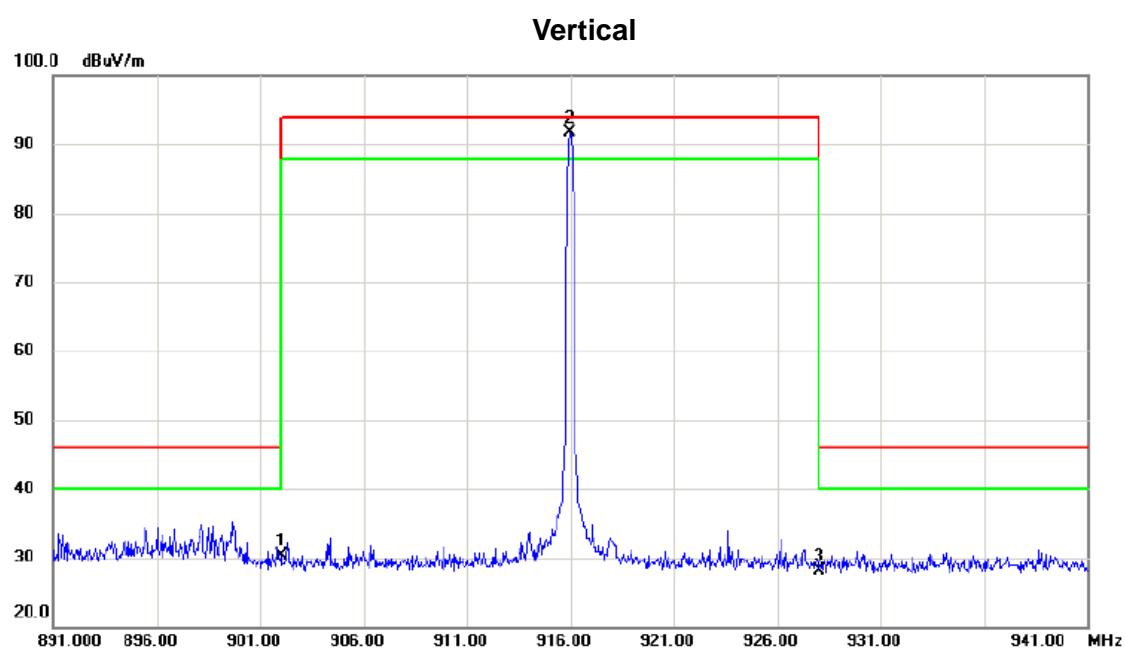


| No. | Mk. | Freq. | Reading | Correct Factor | Measure- ment | Limit | Margin | Detector | Comment |
|-----|-----|---------|---------|----------------|------------------|--------|--------|----------|---------|
| | | | Level | | | | | | |
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | | |
| 1 | | 77.530 | 39.18 | -16.31 | 22.87 | 40.00 | -17.13 | peak | |
| 2 | | 100.810 | 36.95 | -15.39 | 21.56 | 43.50 | -21.94 | peak | |
| 3 * | | 126.030 | 43.17 | -12.80 | 30.37 | 43.50 | -13.13 | peak | |
| 4 | | 399.570 | 29.67 | -7.81 | 21.86 | 46.00 | -24.14 | peak | |
| 5 | | 557.680 | 29.67 | -4.92 | 24.75 | 46.00 | -21.25 | peak | |
| 6 | | 803.090 | 30.68 | 0.17 | 30.85 | 46.00 | -15.15 | peak | |

ATTACHMENTD -RADIATED EMISSION (ABOVE 1000MHZ)

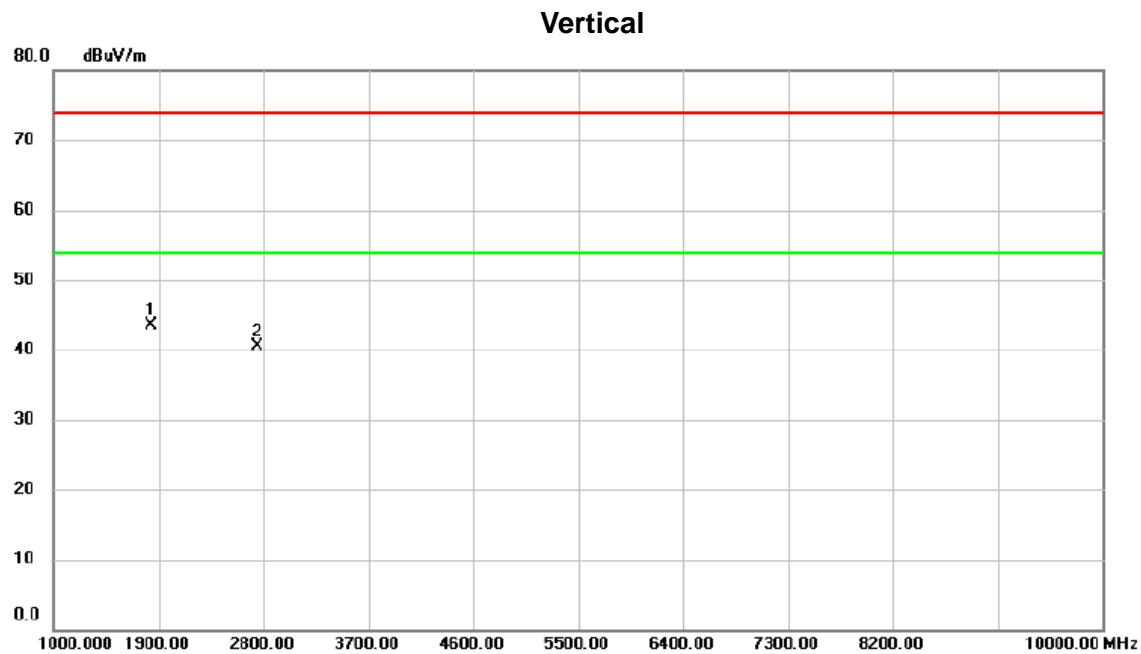
Orthogonal Axis : X

Test Mode : TX Mode _916MHz



| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit | Margin | |
|-----|-----|---------|---------|---------|----------|-------|----------|---------|
| | | | Level | Factor | ment | | | |
| | | MHz | dBuV | dB | dBuV/m | dB | Detector | Comment |
| 1 | | 902.000 | 27.67 | 2.64 | 30.31 | 46.00 | -15.69 | peak |
| 2 * | | 915.950 | 89.09 | 2.58 | 91.67 | 94.00 | -2.33 | peak |
| 3 | | 928.000 | 25.61 | 2.52 | 28.13 | 46.00 | -17.87 | peak |

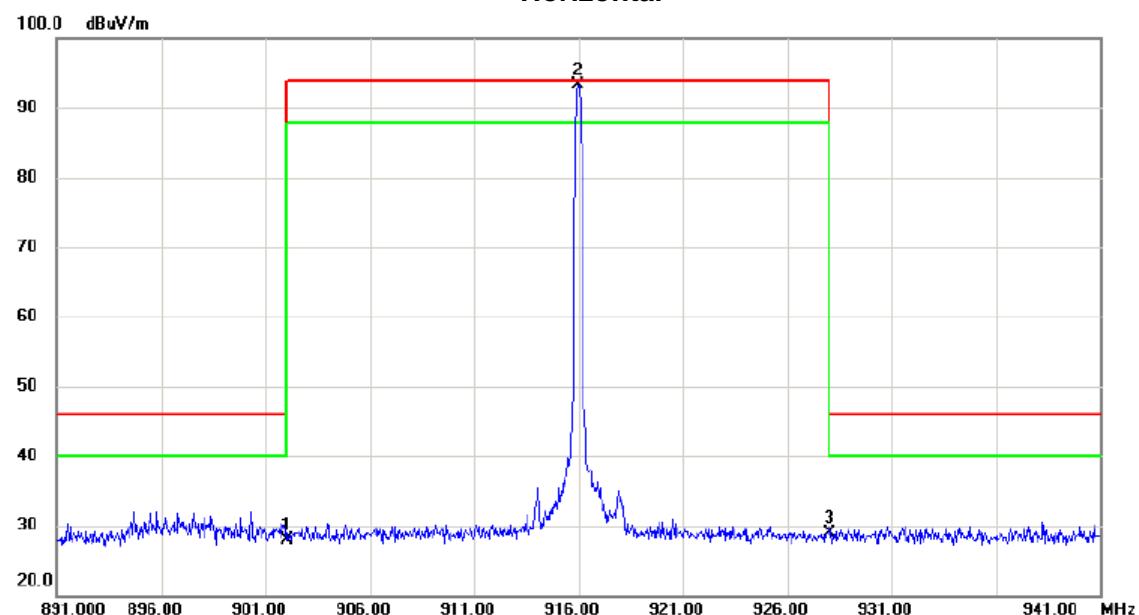
| | |
|-------------------|----------------|
| Orthogonal Axis : | X |
| Test Mode : | TX Mode_916MHz |



| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit | Margin | Detector | Comment |
|-----|-----|----------|---------|---------|----------|--------|--------|----------|---------|
| | | | Level | Factor | ment | | | | |
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | | |
| 1 * | | 1831.970 | 47.73 | -4.13 | 43.60 | 74.00 | -30.40 | peak | |
| 2 | | 2747.965 | 40.12 | 0.42 | 40.54 | 74.00 | -33.46 | peak | |

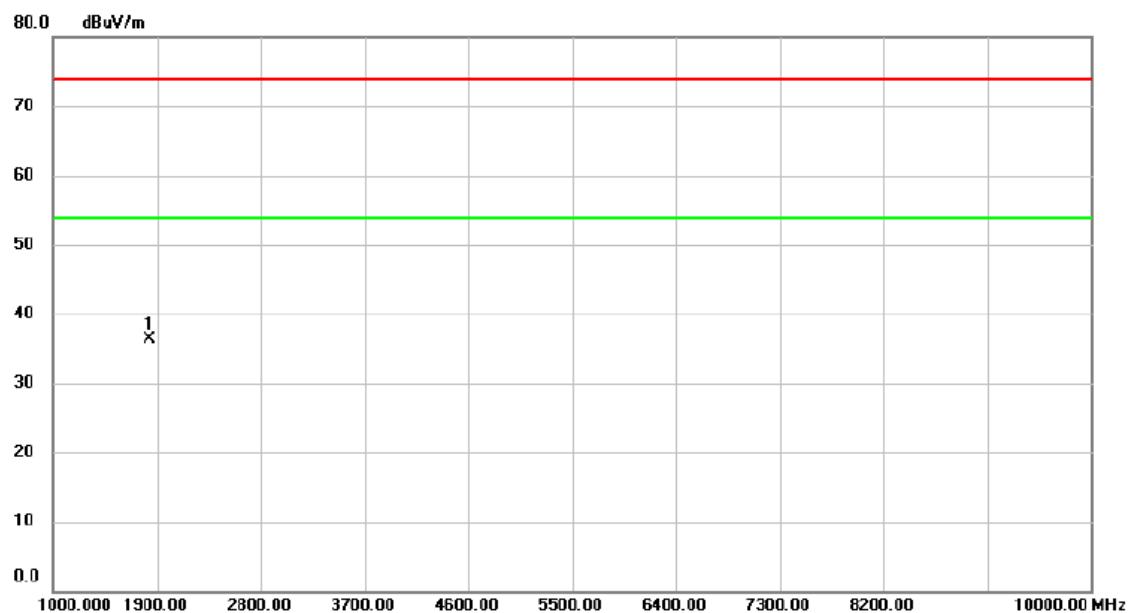
Orthogonal Axis : X

Test Mode : TX Mode_916MHz

Horizontal

| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit | Margin | Detector | Comment |
|-----|-----|---------|---------|---------|----------|-------|--------|----------|---------|
| | | | Level | Factor | ment | | | | |
| | | MHz | dBuV | dB | dBuV/m | dB | | | |
| 1 | | 902.000 | 25.18 | 2.64 | 27.82 | 46.00 | -18.18 | peak | |
| 2 * | | 915.950 | 90.82 | 2.58 | 93.40 | 94.00 | -0.60 | peak | |
| 3 | | 928.000 | 26.42 | 2.52 | 28.94 | 46.00 | -17.06 | peak | |

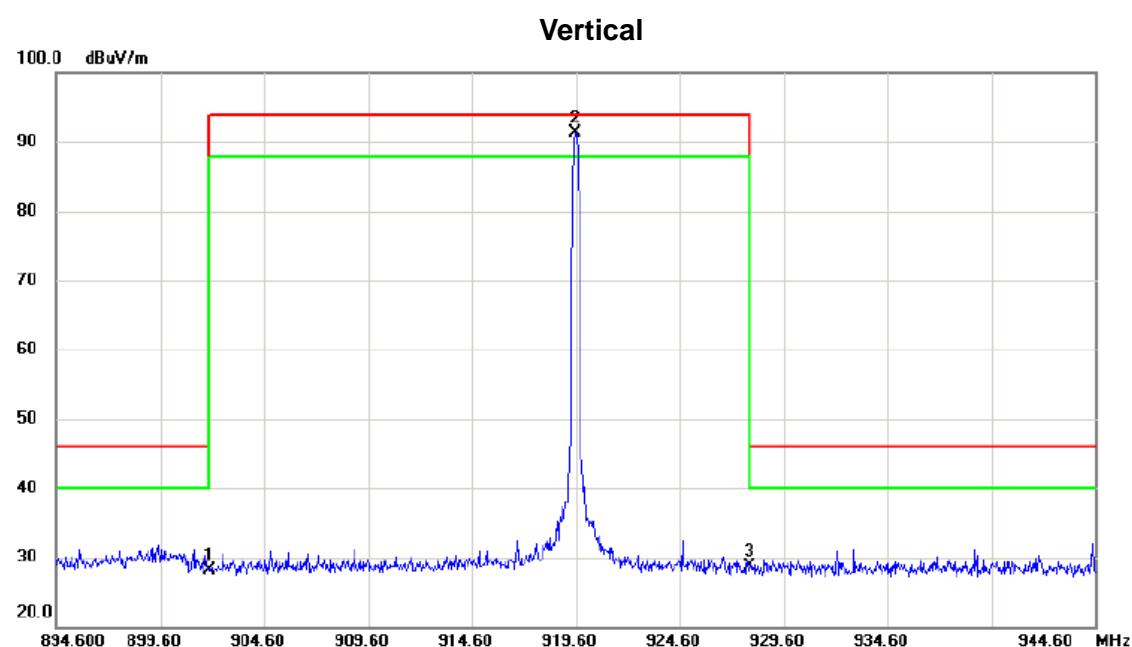
| | |
|-------------------|----------------|
| Orthogonal Axis : | X |
| Test Mode : | TX Mode_916MHz |

Horizontal

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure- ment | Limit | Margin | |
|-----|-----|----------|---------------|----------------|------------------|--------|--------|------------------|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector Comment |
| 1 | * | 1831.944 | 40.52 | -4.13 | 36.39 | 74.00 | -37.61 | peak |

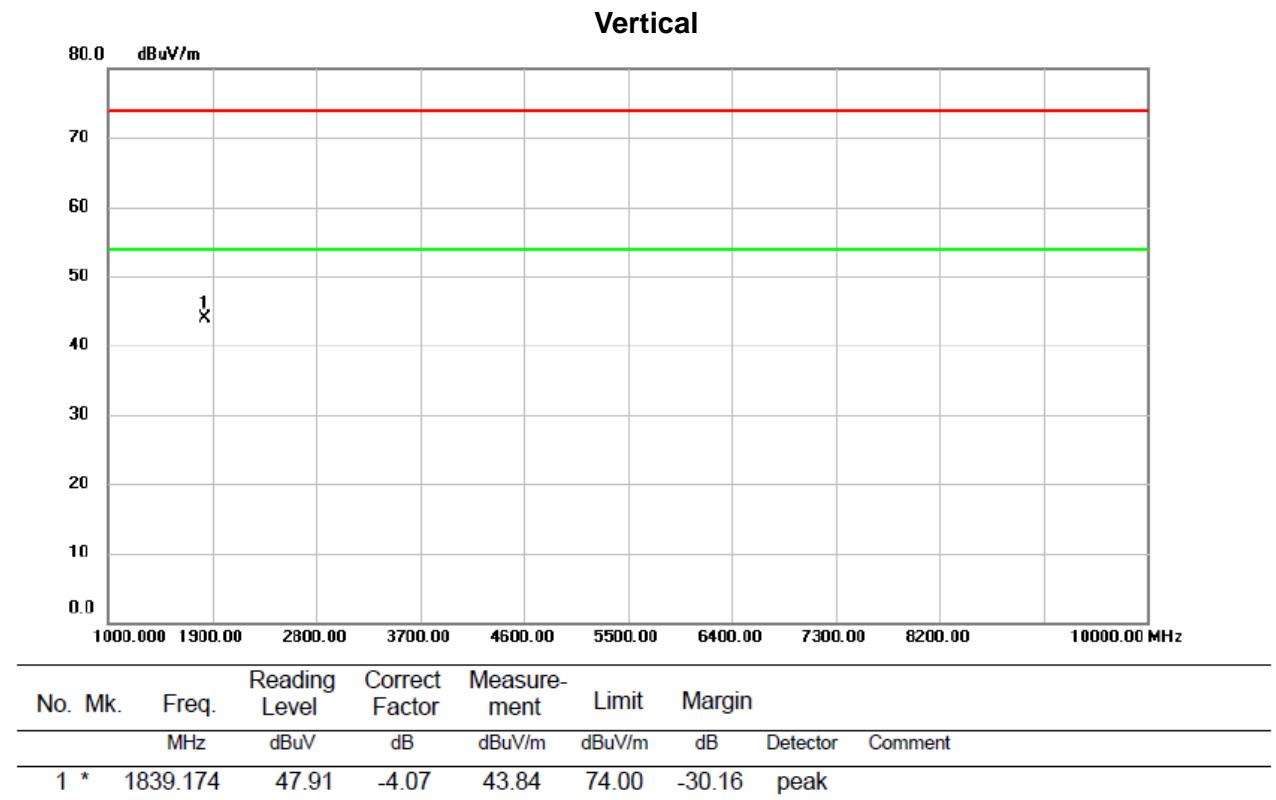
Orthogonal Axis : X

Test Mode : TX Mode _919.6MHz



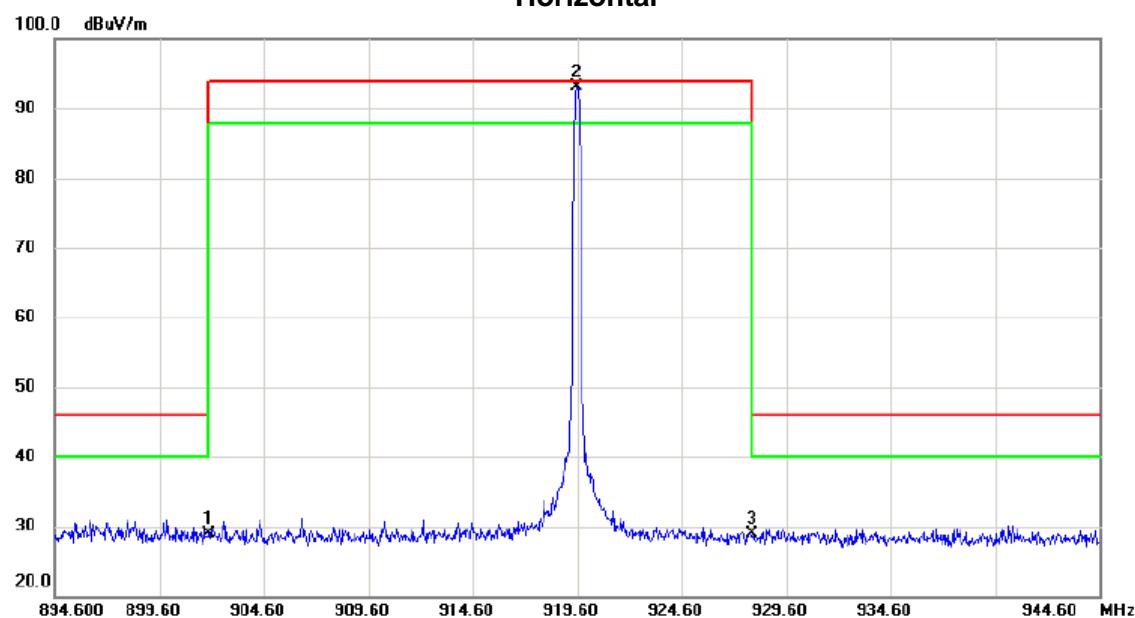
| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit | Margin | |
|-----|-----|---------|---------|---------|----------|-------|----------|---------|
| | | | Level | Factor | ment | | | |
| | | MHz | dBuV | dB | dBuV/m | dB | Detector | Comment |
| 1 | | 902.000 | 25.49 | 2.64 | 28.13 | 46.00 | -17.87 | peak |
| 2 * | | 919.550 | 88.76 | 2.57 | 91.33 | 94.00 | -2.67 | peak |
| 3 | | 928.000 | 26.09 | 2.52 | 28.61 | 46.00 | -17.39 | peak |

| | |
|-------------------|------------------|
| Orthogonal Axis : | X |
| Test Mode : | TX Mode_919.6MHz |



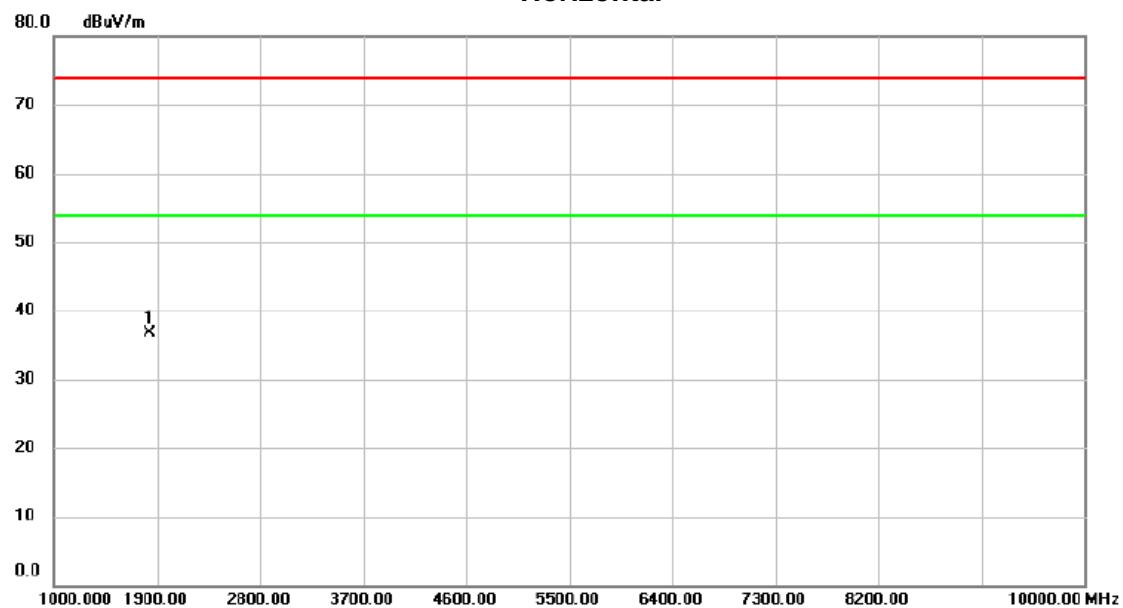
Orthogonal Axis : X

Test Mode : TX Mode_919.6MHz

Horizontal

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure- ment | Limit | Margin | |
|-----|-----|---------|---------------|----------------|------------------|-------|----------|---------|
| | | MHz | dBuV | dB | dBuV/m | dB | Detector | Comment |
| 1 | | 902.000 | 26.26 | 2.64 | 28.90 | 46.00 | -17.10 | peak |
| 2 * | | 919.550 | 90.58 | 2.57 | 93.15 | 94.00 | -0.85 | peak |
| 3 | | 928.000 | 26.40 | 2.52 | 28.92 | 46.00 | -17.08 | peak |

| | |
|-------------------|------------------|
| Orthogonal Axis : | X |
| Test Mode : | TX Mode_919.6MHz |

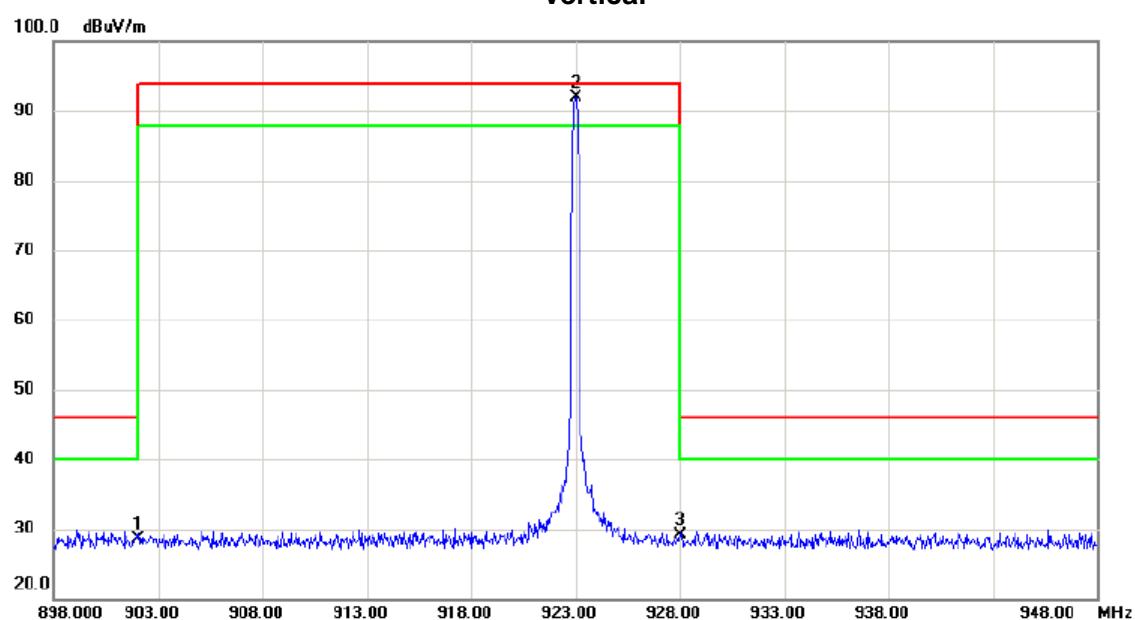
Horizontal

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure- ment | Limit | Margin | |
|-----|-----|----------|---------------|----------------|------------------|-------|----------|---------|
| | | MHz | dBuV | dB | dBuV/m | dB | Detector | Comment |
| 1 | * | 1839.200 | 40.85 | -4.07 | 36.78 | 74.00 | -37.22 | peak |

Orthogonal Axis : X

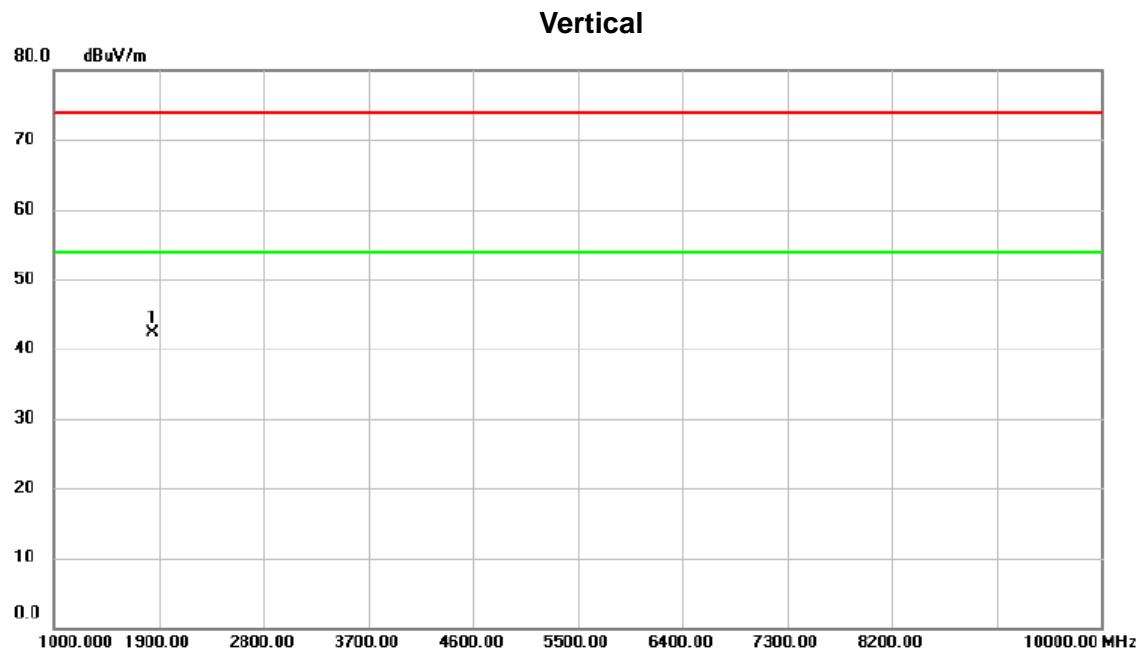
Test Mode : TX Mode _923MHz

Vertical



| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit | Margin | |
|-----|-----|---------|---------|---------|----------|-------|----------|---------|
| | | | Level | Factor | ment | | | |
| | | MHz | dBuV | dB | dBuV/m | dB | Detector | Comment |
| 1 | | 902.000 | 25.95 | 2.64 | 28.59 | 46.00 | -17.41 | peak |
| 2 * | | 923.000 | 89.36 | 2.55 | 91.91 | 94.00 | -2.09 | peak |
| 3 | | 928.000 | 26.54 | 2.52 | 29.06 | 46.00 | -16.94 | peak |

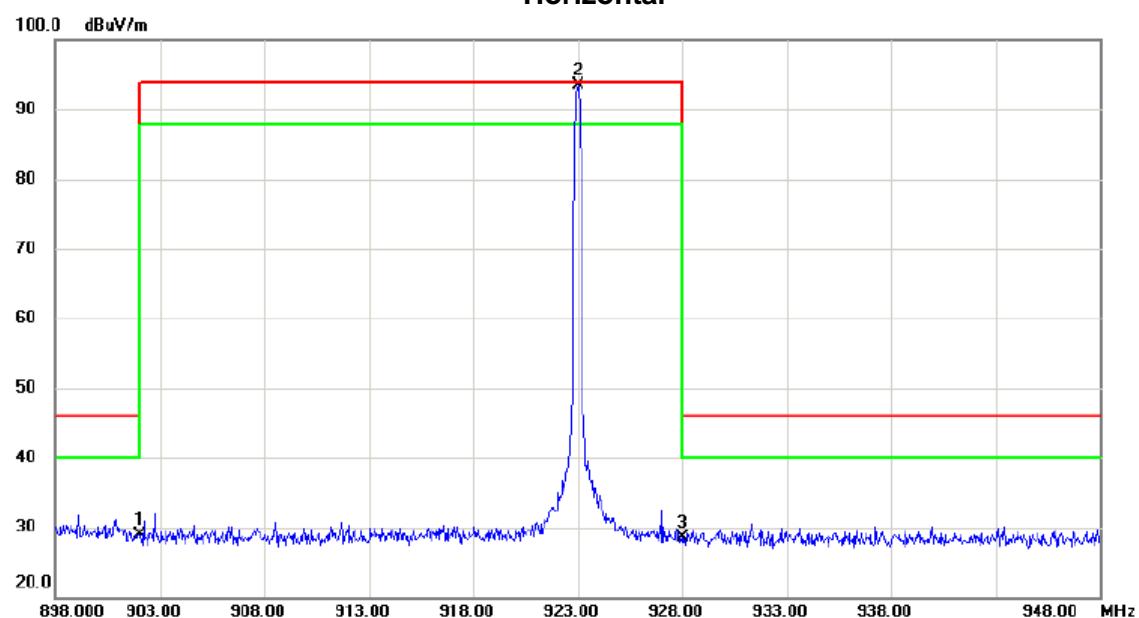
| | |
|-------------------|----------------|
| Orthogonal Axis : | X |
| Test Mode : | TX Mode_923MHz |



| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure- ment | Limit | Margin | |
|-----|-----|----------|---------------|----------------|------------------|-------|----------|---------|
| | | MHz | dBuV | dB | dBuV/m | dB | Detector | Comment |
| 1 | * | 1845.898 | 46.28 | -4.01 | 42.27 | 74.00 | -31.73 | peak |

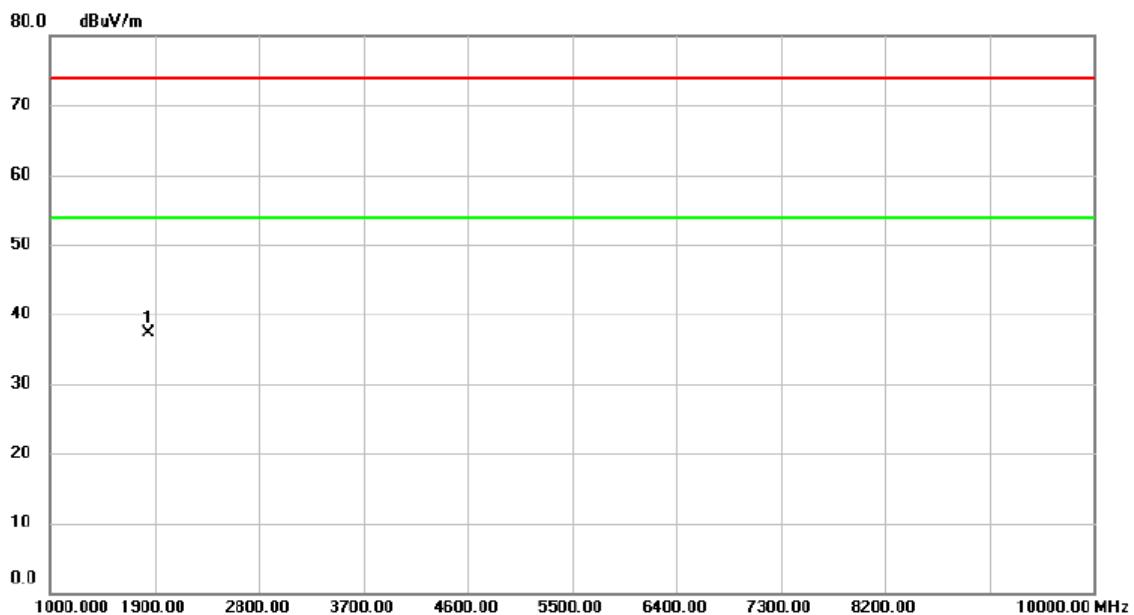
Orthogonal Axis : X

Test Mode : TX Mode_923MHz

Horizontal

| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit | Margin | Detector | Comment |
|-----|-----|---------|---------|---------|----------|-------|--------|----------|---------|
| | | | Level | Factor | ment | | | | |
| | | MHz | dBuV | dB | dBuV/m | dB | | | |
| 1 | | 902.000 | 26.26 | 2.64 | 28.90 | 46.00 | -17.10 | peak | |
| 2 * | | 923.000 | 90.96 | 2.55 | 93.51 | 94.00 | -0.49 | peak | |
| 3 | | 928.000 | 25.90 | 2.52 | 28.42 | 46.00 | -17.58 | peak | |

| | |
|-------------------|----------------|
| Orthogonal Axis : | X |
| Test Mode : | TX Mode_923MHz |

Horizontal

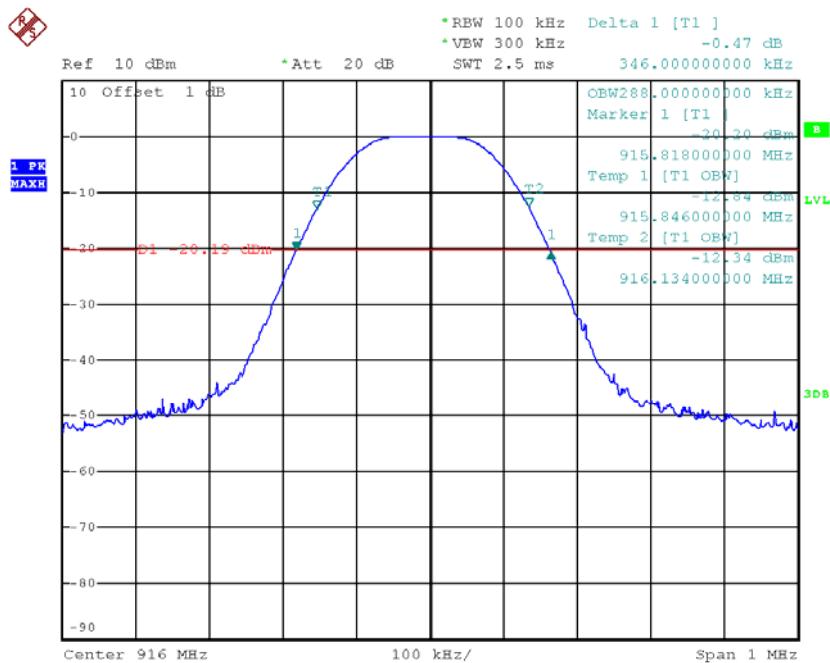
| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure- ment | Limit | Margin | |
|-----|-----|----------|---------------|----------------|------------------|-------|----------|---------|
| | | MHz | dBuV | dB | dBuV/m | dB | Detector | Comment |
| 1 | * | 1845.960 | 41.28 | -4.01 | 37.27 | 74.00 | -36.73 | peak |

ATTACHMENTE - BANDWIDTH

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

| Frequency (MHz) | 20dB Bandwidth (MHz) | 99% Occupied BW (MHz) |
|--------------------|-------------------------|--------------------------|
| 916 | 0.346 | 0.288 |

TX Mode

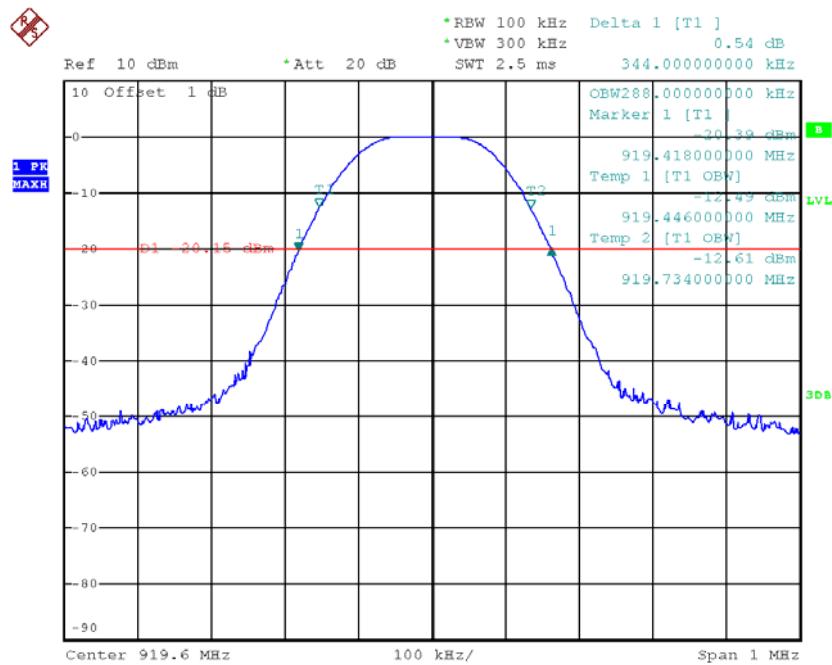


Date: 25.APR.2017 09:05:35

Test Mode : TX Mode

| Frequency (MHz) | 20dB Bandwidth (MHz) | 99% Occupied BW (MHz) |
|-----------------|----------------------|-----------------------|
| 919.6 | 0.344 | 0.288 |

TX Mode

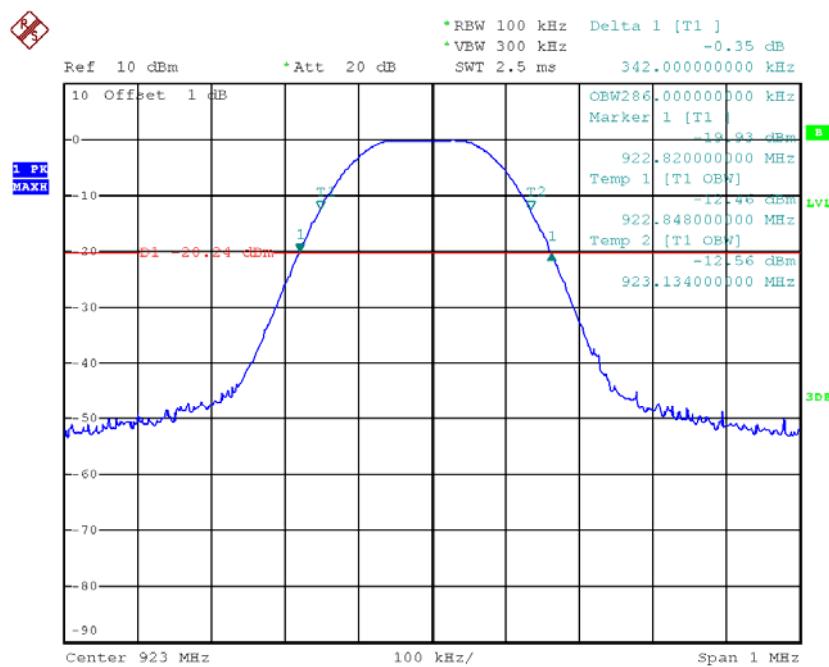


Date: 25.APR.2017 09:06:55

Test Mode : TX Mode

| Frequency (MHz) | 20dB Bandwidth (MHz) | 99% Occupied BW (MHz) |
|-----------------|----------------------|-----------------------|
| 923 | 0.342 | 0.286 |

TX Mode



Date: 25.APR.2017 09:07:48