

# FCC Radio Test Report

## FCC ID: UZZTSXB237

**This report concerns: Original Grant**

**Project No.** : 1907C167  
**Equipment** : Desktop Audio System  
**Brand Name** :  **YAMAHA**  
**Test Model** : TSX-B237  
**Series Model** : N/A  
**S/N** : Z003209UW for AC Power Line Conducted Emissions test,  
Z003289UW for Radiated Emissions test.  
**Applicant** : Beautiful Enterprise Co., Ltd.  
**Address** : 27th Floor, Beautiful Group Tower, 77 Connaught Road  
Central, Hong Kong  
**Manufacturer** : Beautiful Enterprise Co., Ltd.  
**Address** : 27th Floor, Beautiful Group Tower, 77 Connaught Road  
Central, Hong Kong  
**Factory** : Shenzhen Synchron Electronics Co., Ltd.  
**Address** : No.9 Mei Li Road, Xia Mei Lin, Fu Tian Area, Shenzhen,  
Guangdong, P.R. China.  
**Date of Receipt** : Jul. 23, 2019  
**Date of Test** : Aug. 01, 2019 ~ Oct. 28, 2019  
**Issued Date** : Nov. 14, 2019  
**Report Version** : R00  
**Test Sample** : Engineering Sample No.: DG1908028  
**Standard(s)** : FCC Part15, Subpart C (15.209)  
ANSI C63.10-2013

The above equipment has been tested and found compliance with the requirement of  
the relative standards by BTL Inc.

*Vincent. Tan*

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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 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.

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**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.

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**REPORT ISSUED HISTORY**

| Report Version | Description     | Issued Date   |
|----------------|-----------------|---------------|
| R00            | Original Issue. | Nov. 14, 2019 |

## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

| <b>FCC Part15, Subpart C (15.209)</b> |                                   |                    |                 |               |
|---------------------------------------|-----------------------------------|--------------------|-----------------|---------------|
| <b>Standard(s)<br/>Section</b>        | <b>Test Item</b>                  | <b>Test Result</b> | <b>Judgment</b> | <b>Remark</b> |
| 15.207                                | AC Power Line Conducted Emissions | APPENDIX A         | PASS            | -----         |
| 15.209(a)                             | Radiated Emissions                | APPENDIX B         | PASS            | -----         |

NOTE:

(1) "N/A" denotes test is not applicable to this device.

## 1.1 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

## 1.2 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 Measurement:

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

B. Radiated emissions Measurement:

| Test Site | Method | Measurement Frequency Range | Ant. H / V | U, (dB) |
|-----------|--------|-----------------------------|------------|---------|
|           |        | 9kHz ~ 30MHz                | V          |         |
| DG-CB03   | CISPR  | 9kHz ~ 30MHz                | H          | 3.57    |

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

## 1.3 TEST ENVIRONMENT CONDITIONS

| Test Item                         | Temperature | Humidity | Test Voltage | Tested By      |
|-----------------------------------|-------------|----------|--------------|----------------|
| AC Power Line Conducted Emissions | 25°C        | 53%      | AC 120V/60Hz | Robin Zhuang   |
| Radiated Emissions                | 25°C        | 60%      | AC 120V/60Hz | Laughing Zhang |

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

|                     |   |
|---------------------|---|
| Equipment           | Desktop Audio System  |
| Brand Name          |  <b>YAMAHA</b> |
| Test Model          | TSX-B237  |
| Series Model        | N/A   |
| Model Difference(s) | N/A   |
| S/N                 | Z003209UW for AC Power Line Conducted Emissions test,<br>Z003289UW for Radiated Emissions test. |
| Power Source        | AC Mains.   |
| Power Rating        | AC 120V~60Hz  |
| Operation Frequency | 120kHz~130kHz   |

Note:

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

#### 2. Channel List:

| Test Channel | Test Frequency |
|--------------|----------------|
| CH01         | 127.759kHz     |

## 2.2 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     |

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

| <b>AC power line conducted emissions test</b> |             |
|---|-------------|
| Final Test Mode                               | Description |
| Mode 1  | TX Mode     |

| <b>Radiated emissions test</b> |             |
|--------------------------------|-------------|
| Final Test Mode                | Description |
| Mode 1                         | TX Mode     |

Remark: The EUT has the maximum average output power when the support unit is in low power and being charged by EUT.

**2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED****2.4 SUPPORT UNITS**

| Item | Equipment    | Brand   | Model No. | Series No. |
|------|--------------|---------|-----------|------------|
| A    | Mobile phone | SAMSUNG | GALAXY S9 | N/A        |

| Item | Cable Type | Shielded Type | Ferrite Core | Length |
|------|------------|---------------|--------------|--------|
| 1    | AC Cable   | NO            | NO           | 1.5m   |

### 3. AC POWER LINE CONDUCTED EMISSIONS TEST

#### 3.1 LIMIT

| Frequency of Emission (MHz) | Limit (dB $\mu$ V) |           |
|-----------------------------|--------------------|-----------|
|                             | 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.

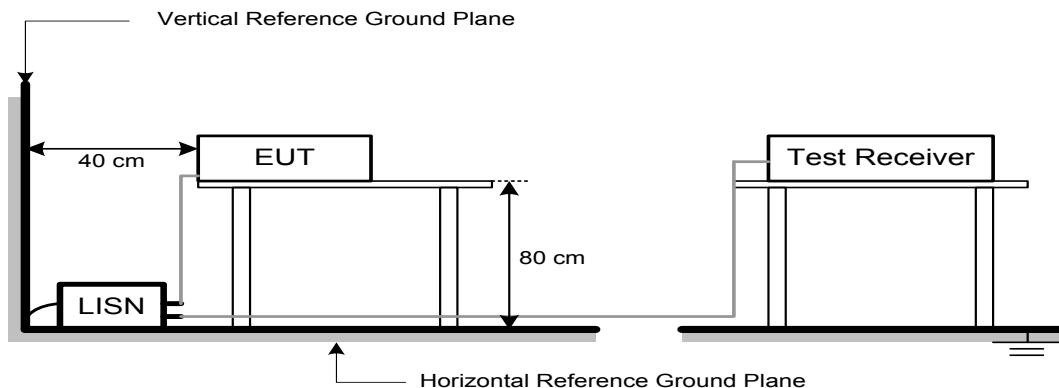
#### 3.2 TEST PROCEDURE

- 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.

#### 3.3 DEVIATION FROM TEST STANDARD

No deviation

### 3.4 TEST SETUP



### 3.5 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.

### 3.6 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.

## 4. RADIATED EMISSION TEST

### 4.1 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<br>(MHz) | Field Strength<br>(microvolts/meter) | Measurement Distance<br>(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                                |

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).

### 4.2 TEST PROCEDURE

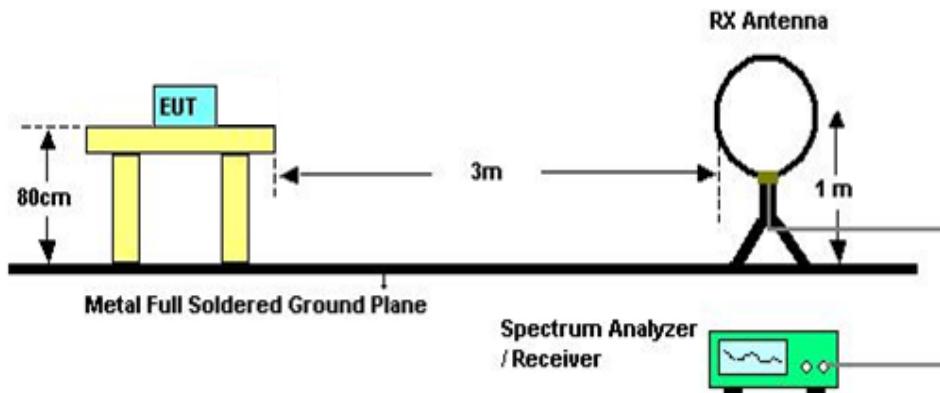
- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1 GHz)
- b. The height of the 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.
- c. 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).
- d. 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.
- e. 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)
- f. 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

**9 kHz-30 MHz**



#### 4.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 4.6 TEST RESULT - 9 kHz TO 30 MHz

Please refer to the APPENDIX B

Remark:

- (1) Distance extrapolation factor =  $40 \log (\text{specific distance} / \text{test distance})$  (dB).
- (2) Limit line = specific limits (dBuV) + distance extrapolation factor.

**5. MEASUREMENT INSTRUMENTS LIST**

| <b>AC Power Line Conducted Emissions</b> |                         |              |                          |            |                  |
|--|-------------------------|--------------|--------------------------|------------|------------------|
| 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  | TWO-LINE<br>V-NETWORK   | R&S          | ENV216                   | 101447     | May. 19, 2020    |
| 4  | 50Ω Terminator          | SHX          | TF5-3                    | 15041305   | Mar. 10, 2020    |
| 5  | Measurement<br>Software | Farad        | EZ-EMC<br>Ver.NB-03A1-01 | N/A        | N/A              |
| 6  | Cable                   | N/A          | RG223                    | 12m        | Mar. 12, 2020    |

| <b>Radiated Emissions - 9 kHz to 30 MHz</b> |                         |              |                          |            |                  |
|---|-------------------------|--------------|--------------------------|------------|------------------|
| 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<br>Software | Farad        | EZ-EMC<br>Ver.NB-03A1-01 | N/A        | N/A              |

Remark: "N/A" denotes no model name, serial no. or calibration specified.

"\*" calibration period of equipment list is three year.

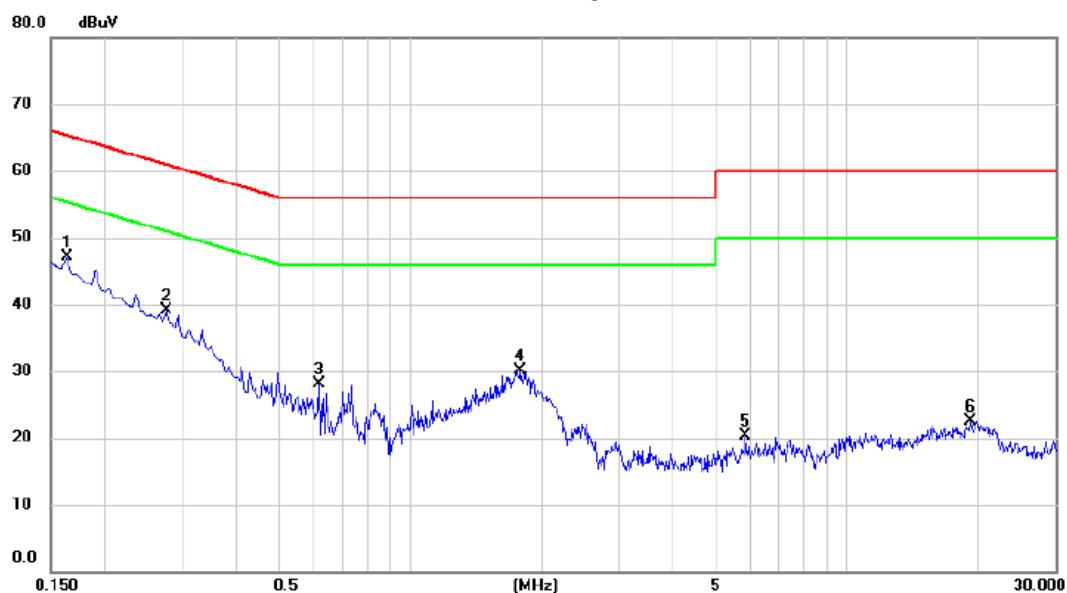
Except \* item, all calibration period of equipment list is one year.

**6. EUT TEST PHOTO****AC Power Line Conducted Emissions Test Photos**

**Radiated Measurement Photos****9 kHz to 30 MHz**

## APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS

Test Mode: TX Mode

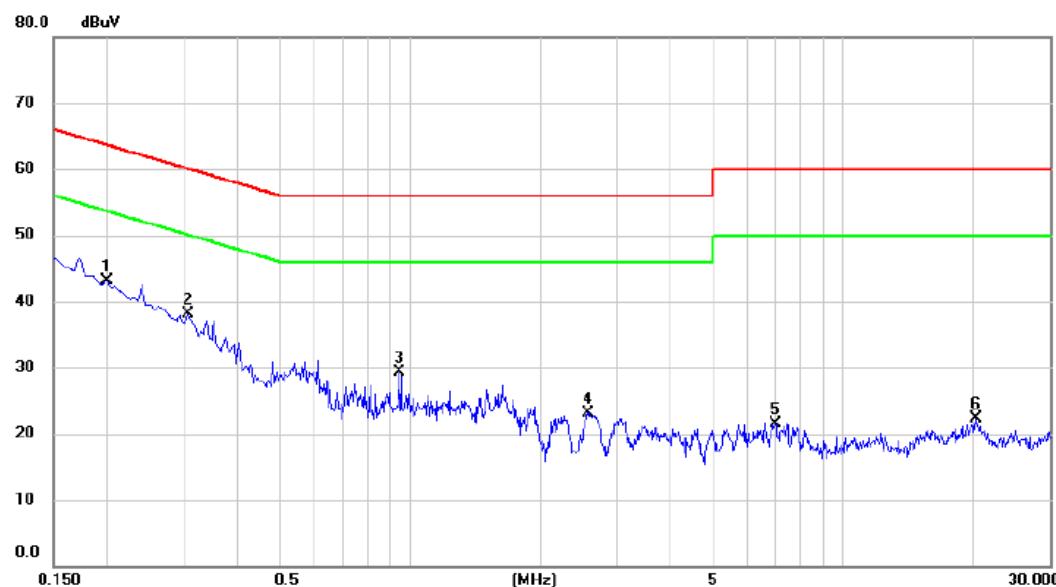
**Line**

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dB | Margin<br>Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|-------------|--------------------|---------|
| 1   | *   | 0.1635       | 37.19                    | 9.82                    | 47.01                    | 65.28       | -18.27             | peak    |
| 2   |     | 0.2760       | 29.22                    | 9.84                    | 39.06                    | 60.94       | -21.88             | peak    |
| 3   |     | 0.6180       | 18.20                    | 9.89                    | 28.09                    | 56.00       | -27.91             | peak    |
| 4   |     | 1.7880       | 20.03                    | 9.99                    | 30.02                    | 56.00       | -25.98             | peak    |
| 5   |     | 5.8425       | 10.07                    | 10.25                   | 20.32                    | 60.00       | -39.68             | peak    |
| 6   |     | 19.1805      | 11.47                    | 11.11                   | 22.58                    | 60.00       | -37.42             | peak    |

**REMARKS:**

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

Test Mode: TX Mode

**Neutral**

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Margin<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|--------------|----------|---------|
| 1   | *   | 0.1995       | 33.26                    | 9.90                    | 43.16                    | 63.63         | -20.47       | peak     |         |
| 2   |     | 0.3075       | 28.20                    | 9.95                    | 38.15                    | 60.04         | -21.89       | peak     |         |
| 3   |     | 0.9420       | 19.25                    | 10.11                   | 29.36                    | 56.00         | -26.64       | peak     |         |
| 4   |     | 2.5710       | 12.85                    | 10.22                   | 23.07                    | 56.00         | -32.93       | peak     |         |
| 5   |     | 6.9585       | 10.99                    | 10.59                   | 21.58                    | 60.00         | -38.42       | peak     |         |
| 6   |     | 20.2470      | 10.79                    | 11.48                   | 22.27                    | 60.00         | -37.73       | peak     |         |

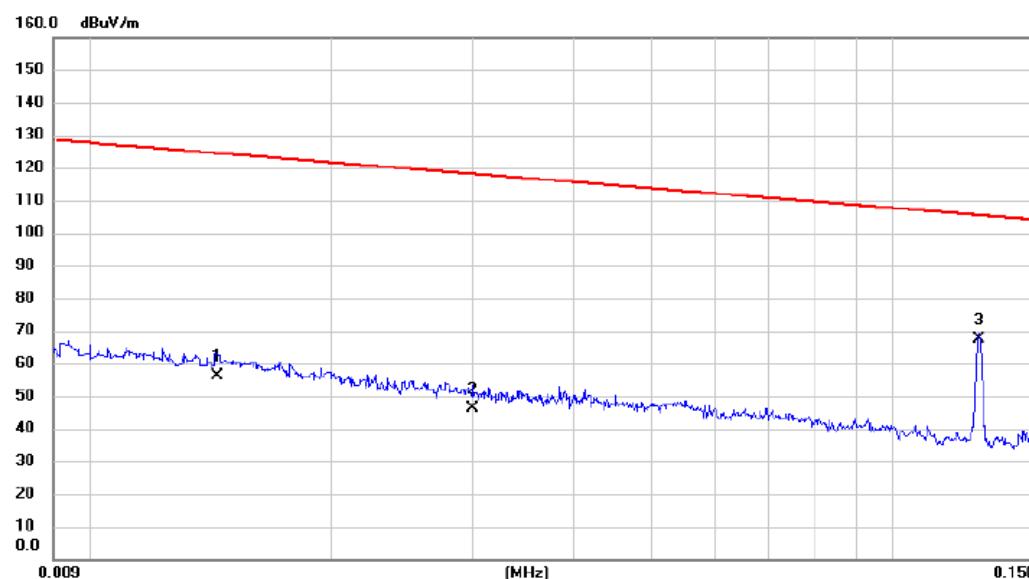
**REMARKS:**

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

**APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ**

Test Mode: TX Mode

Ant 0°

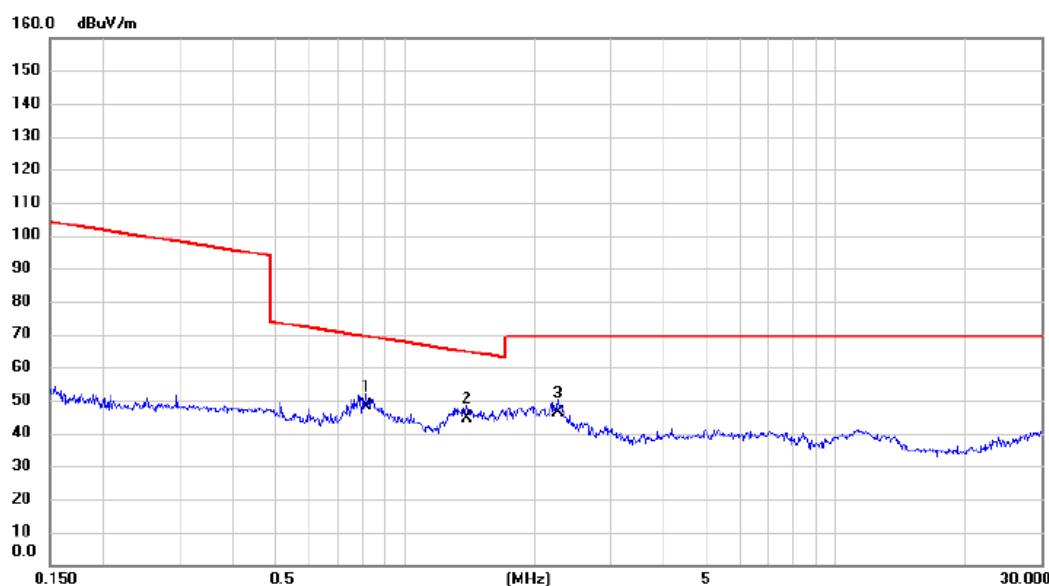


| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit  | Margin   | Comment |
|-----|-----|-------|---------|---------|----------|--------|----------|---------|
|     |     |       | Level   | Factor  | ment     |        |          |         |
|     |     | MHz   | dBuV    | dB      | dBuV/m   | dB     | Detector |         |
| 1   |     | 0.014 | 40.54   | 15.50   | 56.04    | 124.44 | -68.40   | AVG     |
| 2   |     | 0.030 | 32.48   | 13.85   | 46.33    | 118.06 | -71.73   | AVG     |
| 3 * |     | 0.128 | 53.83   | 13.55   | 67.38    | 105.46 | -38.08   | AVG     |

## REMARKS:

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

Test Mode: TX Mode

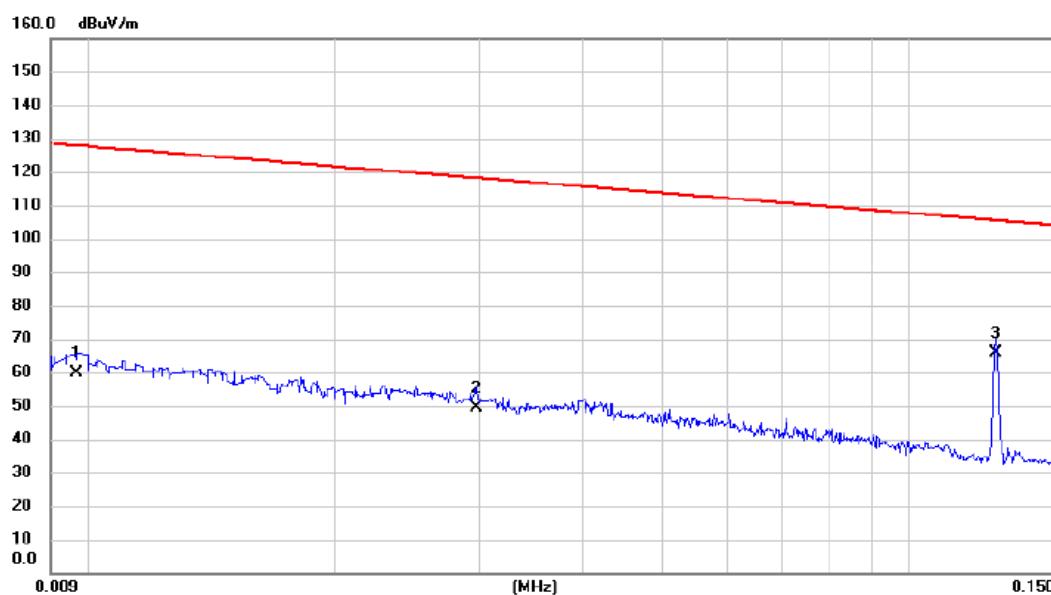
**Ant 0°**

| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit | Margin   |         |
|-----|-----|-------|---------|---------|----------|-------|----------|---------|
|     |     |       | Level   | Factor  | ment     |       |          |         |
|     |     | MHz   | dBuV    | dB      | dBuV/m   | dB    | Detector | Comment |
| 1   |     | 0.813 | 35.70   | 12.56   | 48.26    | 69.40 | -21.14   | QP      |
| 2 * |     | 1.396 | 32.48   | 12.23   | 44.71    | 64.71 | -20.00   | QP      |
| 3   |     | 2.272 | 34.59   | 11.66   | 46.25    | 69.54 | -23.29   | QP      |

**REMARKS:**

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

Test Mode: TX Mode

**Ant 90°**

| No. | Mk. | Freq. | Reading | Correct | Measure- | Limit  | Margin | Detector | Comment |
|-----|-----|-------|---------|---------|----------|--------|--------|----------|---------|
|     |     |       | Level   | Factor  | ment     |        |        |          |         |
|     |     | MHz   | dBuV    | dB      | dBuV/m   | dB     |        |          |         |
| 1   |     | 0.010 | 42.92   | 16.97   | 59.89    | 127.87 | -67.98 | AVG      |         |
| 2   |     | 0.030 | 35.75   | 13.85   | 49.60    | 118.15 | -68.55 | AVG      |         |
| 3 * |     | 0.127 | 52.45   | 13.55   | 66.00    | 105.50 | -39.50 | AVG      |         |

**REMARKS:**

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

Test Mode: TX Mode

**Ant 90°**

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dB | Margin<br>Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-------------|--------------------|---------|
| 1   |     | 0.813        | 35.94                    | 12.56                   | 48.50                      | 69.40       | -20.90             | QP      |
| 2   | *   | 1.396        | 32.15                    | 12.23                   | 44.38                      | 64.71       | -20.33             | QP      |
| 3   |     | 2.213        | 33.87                    | 11.69                   | 45.56                      | 69.54       | -23.98             | QP      |

**REMARKS:**

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

**End of Test Report**