

FCC 15B Test Report

FCC ID: 2AEMC-BM1

Original Grant

Report No. : TB-FCC143961
Applicant : BIOMEDIS TECHNOLOGIES CO.,LIMITED
Equipment Under Test (EUT)
EUT Name : Device for generating modulated signals BIOMEDIS M
Model No. : BM1
Serial No. : N/A
Brand Name : N/A
Receipt Date : 2015-04-22
Test Date : 2015-04-22 to 2015-04-24
Issue Date : 2015-04-28
Standards : FCC Part 15: 2014, Subpart B, Class B
Test Method : ANSI C63.4-2014
Conclusions : **PASS**

In the configuration tested, the EUT complied with the standards specified above,

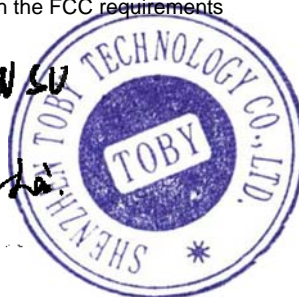
The EUT technically complies with the FCC requirements

Test/Witness Engineer

: *Ivan Su*

Approved& Authorized

: *Regina*



This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

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1. General Information about EUT

1.1 Client Information

| | | |
|---------------------|---|---|
| Applicant | : | BIOMEDIS TECHNOLOGIES CO.,LIMITED |
| Address | : | UNIT E223, 3/F WING TAT COMM BLDG 97 BONHAM STRAND EAST SHEUNG WAN HONG KONG |
| Manufacturer | : | BIOMEDIS TECHNOLOGIES CO.,LIMITED |
| Address | : | UNIT E223, 3/F WING TAT COMM BLDG 97 BONHAM STRAND EAST SHEUNG WAN HONG KONG |

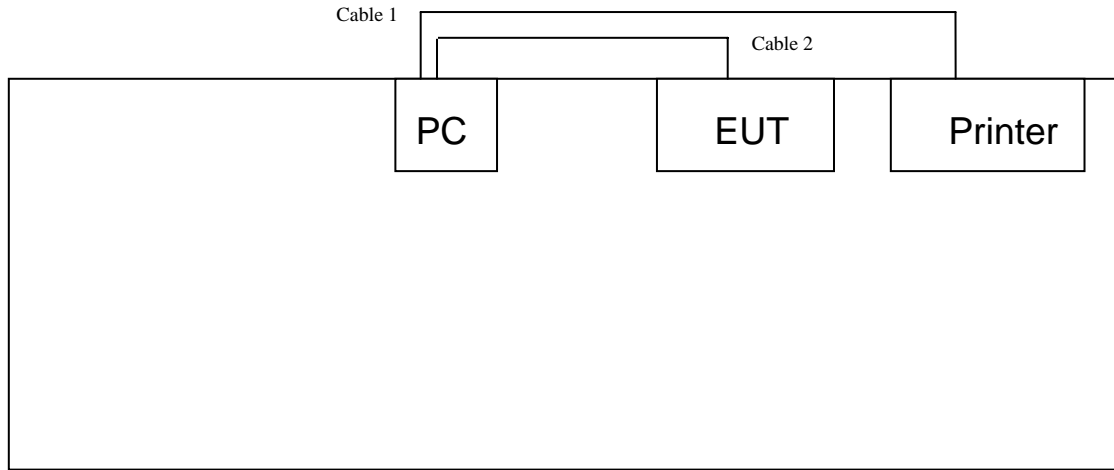
1.2 General Description of EUT (Equipment Under Test)

| | | |
|-------------------------|---|--|
| EUT Name | : | Device for generating modulated signals BIOMEDIS M |
| Brand Name | : | N/A |
| Model No. | : | BM1 |
| Model difference | : | N/A |
| Power Supply | : | DC Voltage supplied from PC System by USB Cable. DC power by Li-ion battery |
| Power Rating | : | USB DC 5V DC 3.7V by 300 mAh Li-ion Battery. |

Note:

- (1) The EUT with a USB port, can communicate with PC by USB Cable. The EUT considered as an ITE/Computing Device.
- (2) For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

1.3 Block Diagram Showing the Configuration of System Tested



1.4 Description of Support Units

| Equipment Information | | | | |
|-----------------------|---------------|--------------|--------------|----------|
| Name | Model | DOC/FCC ID | Manufacturer | Used “√” |
| LCD Monitor | E170Sc | DOC | DELL | √ |
| PC | OPTIPLEX380 | DOC | DELL | √ |
| Keyboard | L100 | DOC | DELL | √ |
| Mouse | M-UARDEL7 | DOC | DELL | √ |
| Printer | HP1505n | DOC | HP | √ |
| Cable Information | | | | |
| Number | Shielded Type | Ferrite Core | Length | Note |
| Cable 1 | YES | YES | 2.0 M | |
| Cable 2 | YES | YES | 0.5M | |

1.5 Description of Test Mode

| Mode | Description |
|--------|-------------------------------|
| Mode 1 | USB Charging and Loading Data |
| Mode 2 | Normal Playing |

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of the EUT operation mode, and the maximum emission levels of the conducted and radiated emissions are compared to the FCC Part 15 Subpart B (Class B) limits.

1.6 Measurement Uncertainty

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 %.

| Test Item | Parameters | Expanded Uncertainty (U_{Lab}) |
|--------------------|--------------------------------------|------------------------------------|
| Conducted Emission | Level Accuracy: 9kHz~150kHz | ± 3.42 dB |
| | 150kHz to 30MHz | ± 3.42 dB |
| Radiated Emission | Level Accuracy: 9kHz to 30 MHz | ± 4.60 dB |
| Radiated Emission | Level Accuracy: 30MHz to 1000 MHz | ± 4.40 dB |
| Radiated Emission | Level Accuracy: Above 1000MHz | ± 4.20 dB |

1.7 Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

FCC List No.: (811562)

The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number is 811562.

IC Registration No.: (11950A-1)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.

May 22, 2014 certificated by TUV Rheinland(China) Co., Ltd. with TUV certificate No.: UA 50282953 0001 and report No.: 17026822 002. The certificate is valid until the next scheduled audit or up to 18 months, at the discretion of TUV Rhineland.

2. Test Summary

| FCC Part15, Subpart B | | | | |
|-----------------------|-----------------|---|---------|----------|
| Section | Test Method | Test Item | Limit | Judgment |
| 15.109 | ANSI C63.4:2014 | Radiated Emission (30M~1GHz) | Class B | PASS |
| 15.107 | ANSI C63.4:2014 | Conducted Emission (150KHz to 30MHz) | Class B | PASS |

Note: N/A is an abbreviation for Not Applicable.

3. Test Equipment

| Conducted Emission Test | | | | | |
|-------------------------|----------------------------------|-------------|------------|---------------|---------------|
| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Due Date |
| EMI Test Receiver | Rohde & Schwarz | ESCI | 100321 | Aug. 08, 2014 | Aug. 07, 2015 |
| RF Switching Unit | Compliance Direction Systems Inc | RSU-A4 | 34403 | Aug. 08, 2014 | Aug. 07, 2015 |
| AMN | SCHWARZBECK | NNBL 8226-2 | 8226-2/164 | Aug. 08, 2014 | Aug. 07, 2015 |
| LISN | Rohde & Schwarz | ENV216 | 101131 | Aug. 08, 2014 | Aug. 07, 2015 |
| Radiation Emission Test | | | | | |
| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Due Date |
| Spectrum Analyzer | Agilent | E4407B | MY45106456 | Aug. 08, 2014 | Aug.07, 2015 |
| Spectrum Analyzer | Rohde & Schwarz | FSP30 | DE25181 | Aug. 08, 2014 | Aug.07, 2015 |
| EMI Test Receiver | Rohde & Schwarz | ESCI | 101165 | Aug. 08, 2014 | Aug.07, 2015 |
| Bilog Antenna | ETS-LINDGREN | 3142E | 00117537 | Mar. 06, 2015 | Mar.05, 2016 |
| Horn Antenna | ETS-LINDGREN | 3117 | 00143207 | Mar. 06, 2015 | Mar.05, 2016 |
| Pre-amplifier | HP | 11909A | 185903 | Mar. 06, 2015 | Mar.05, 2016 |
| Pre-amplifier | HP | 8447B | 3008A00849 | Mar. 06, 2015 | Mar.05, 2016 |
| Cable | HUBER+SUHNER | 100 | SUCOFLEX | Mar. 06, 2015 | Mar.05, 2016 |
| Signal Generator | Rohde & Schwarz | SML03 | IKW682-054 | Feb. 10, 2015 | Feb.09, 2016 |
| Positioning Controller | ETS-LINDGREN | 2090 | N/A | N/A | N/A |

4. Conducted Emission Test

4.1 Test Standard and Limit

4.1.1 Test Standard
FCC Part 15.107

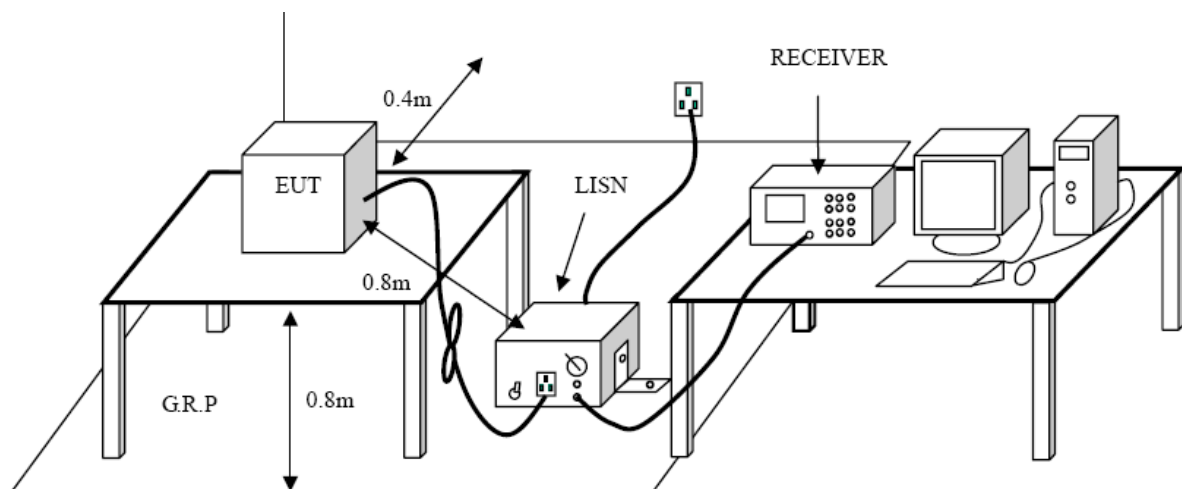
4.1.2 Test Limit

Conducted Emission Test Limit

| Frequency (MHz) | Conducted Limit (dBuV) | |
|--------------------|------------------------|---------------|
| | Quasi-peak Level | Average Level |
| 0.15~0.5 | 66 ~ 56 * | 56 ~ 46 * |
| 0.5~5.0 | 56.00 | 46.00 |
| 5.0~30.0 | 60.00 | 50.00 |

Notes: (1) *Decreasing linearly with logarithm of the frequency.
(2) The lower limit shall apply at the transition frequencies.

4.2 Test Setup



4.3 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.

The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

For the actual test configuration, please refer to the EUT test Photos.

4.4 EUT Operating Mode

(1) Setup the EUT and peripherals refer to the description of test mode.

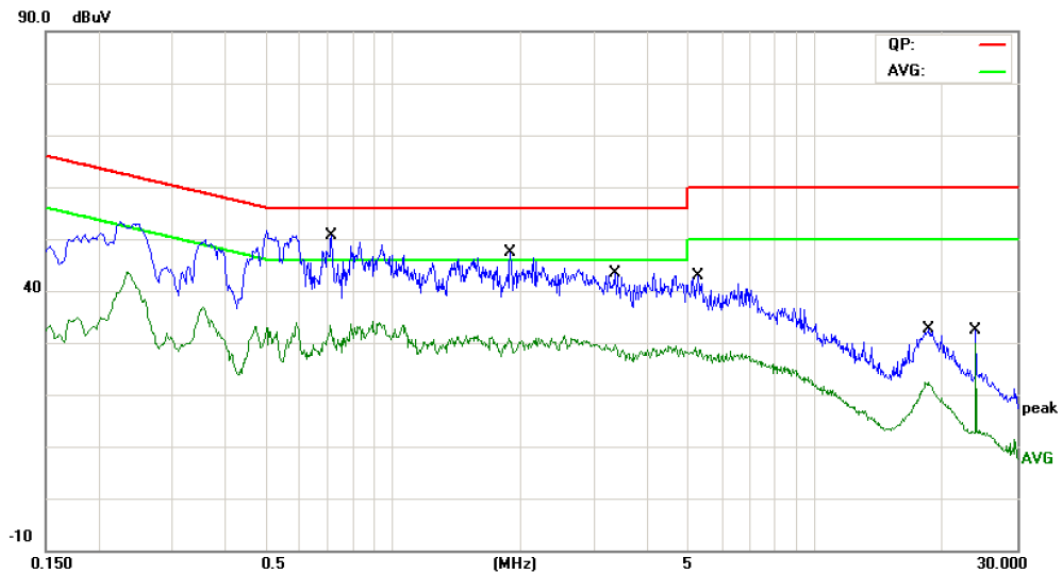
4.5 Deviation

The test is no deviation from the standard.

4.5 Test Data

Please see the next page.

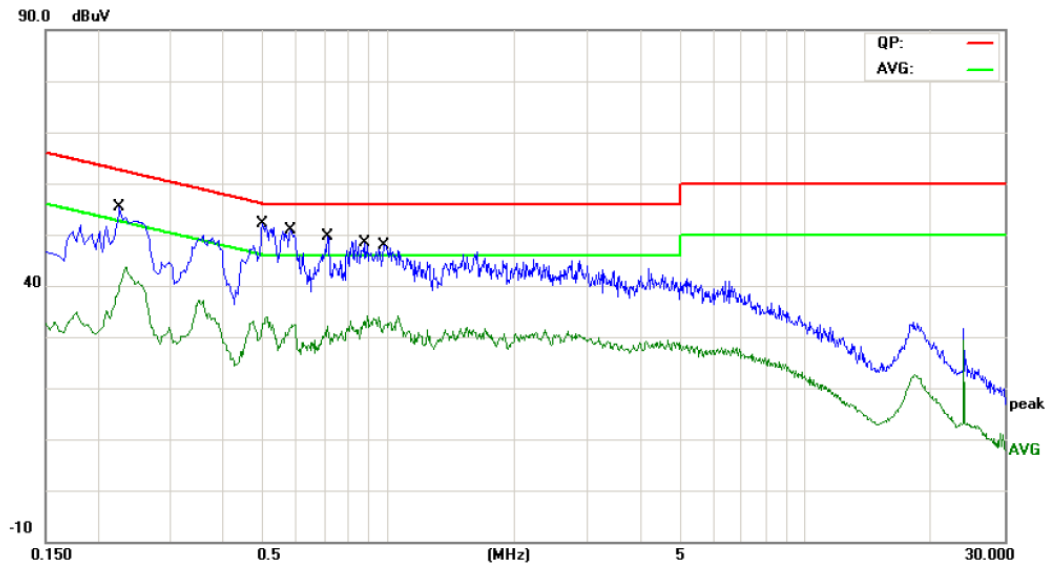
| | | | |
|----------------------|--|---------------------------|-----|
| EUT: | Device for generating modulated signals BIOMEDIS M | Model Name : | BM1 |
| Temperature: | 25 °C | Relative Humidity: | 55% |
| Test Voltage: | AC 120V/60Hz | | |
| Terminal: | Line | | |
| Test Mode: | Mode 1 | | |
| Remark: | Only worse case is reported | | |



| No. | Mk. | Freq. | Reading Level | Correct Factor | Measurement | Limit | Over | |
|-----|-----|---------|---------------|----------------|-------------|-------|--------|----------|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector |
| 1 | * | 0.7140 | 35.30 | 10.12 | 45.42 | 56.00 | -10.58 | QP |
| 2 | | 0.7140 | 21.61 | 10.12 | 31.73 | 46.00 | -14.27 | AVG |
| 3 | | 1.8900 | 28.49 | 10.06 | 38.55 | 56.00 | -17.45 | QP |
| 4 | | 1.8900 | 19.59 | 10.06 | 29.65 | 46.00 | -16.35 | AVG |
| 5 | | 3.3500 | 25.95 | 10.02 | 35.97 | 56.00 | -20.03 | QP |
| 6 | | 3.3500 | 19.02 | 10.02 | 29.04 | 46.00 | -16.96 | AVG |
| 7 | | 5.2500 | 23.87 | 9.97 | 33.84 | 60.00 | -26.16 | QP |
| 8 | | 5.2500 | 17.08 | 9.97 | 27.05 | 50.00 | -22.95 | AVG |
| 9 | | 18.5419 | 16.49 | 10.19 | 26.68 | 60.00 | -33.32 | QP |
| 10 | | 18.5419 | 11.27 | 10.19 | 21.46 | 50.00 | -28.54 | AVG |
| 11 | | 24.0020 | 20.53 | 10.16 | 30.69 | 60.00 | -29.31 | QP |
| 12 | | 24.0020 | 19.70 | 10.16 | 29.86 | 50.00 | -20.14 | AVG |

Emission Level= Read Level+ Correct Factor

| | | | |
|---------------|--|--------------------|-----|
| EUT: | Device for generating modulated signals BIOMEDIS M | Model Name : | BM1 |
| Temperature: | 25 °C | Relative Humidity: | 55% |
| Test Voltage: | AC 120V/60Hz | | |
| Terminal: | Neutral | | |
| Test Mode: | Mode 1 | | |
| Remark: | Only worse case is reported | | |



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV | Limit dBuV | Over dB | Detector |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|
| 1 | | 0.2260 | 38.98 | 10.11 | 49.09 | 62.59 | -13.50 | QP |
| 2 | | 0.2260 | 29.79 | 10.11 | 39.90 | 52.59 | -12.69 | AVG |
| 3 | * | 0.4980 | 37.73 | 10.02 | 47.75 | 56.03 | -8.28 | QP |
| 4 | | 0.4980 | 21.50 | 10.02 | 31.52 | 46.03 | -14.51 | AVG |
| 5 | | 0.5860 | 37.37 | 10.02 | 47.39 | 56.00 | -8.61 | QP |
| 6 | | 0.5860 | 22.41 | 10.02 | 32.43 | 46.00 | -13.57 | AVG |
| 7 | | 0.7140 | 34.85 | 10.03 | 44.88 | 56.00 | -11.12 | QP |
| 8 | | 0.7140 | 21.27 | 10.03 | 31.30 | 46.00 | -14.70 | AVG |
| 9 | | 0.8740 | 33.88 | 10.10 | 43.98 | 56.00 | -12.02 | QP |
| 10 | | 0.8740 | 22.62 | 10.10 | 32.72 | 46.00 | -13.28 | AVG |
| 11 | | 0.9700 | 30.65 | 10.15 | 40.80 | 56.00 | -15.20 | QP |
| 12 | | 0.9700 | 20.83 | 10.15 | 30.98 | 46.00 | -15.02 | AVG |

Emission Level= Read Level+ Correct Factor

5. Radiated Emission Test

5.1 Test Standard and Limit

- 5.1.1 Test Standard
FCC Part 15.109
- 5.1.2 Test Limit

Radiated Emission Limit

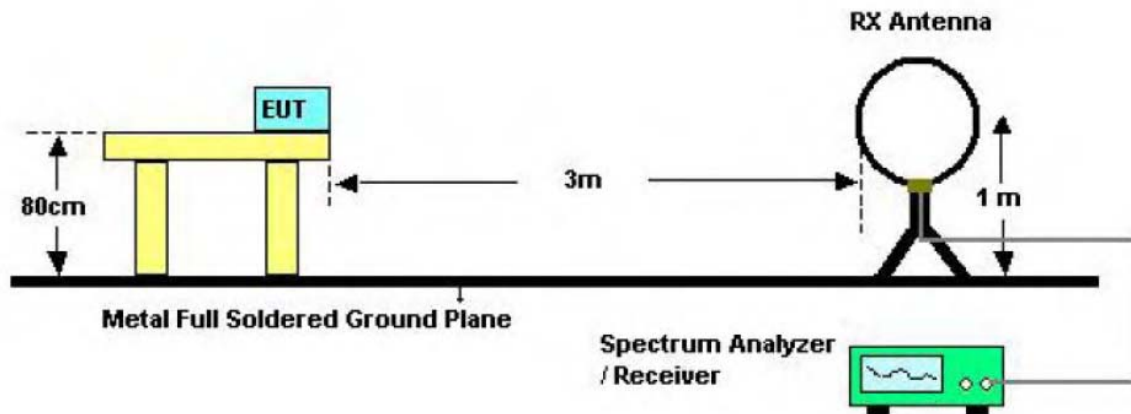
| Frequency (MHz) | Field Strength (dBuV/m) | Measurement Distance (meters) |
|---|-------------------------|-------------------------------|
| 30~88 | 40 | 3 |
| 88~216 | 43.5 | 3 |
| 216~960 | 46 | 3 |
| Above 960 | 54 | 3 |
| Note: Emission Level(dBuV/m)=20log Emission Level(uV/m) | | |

For unintentional radiators (FCC Part 15, section 15.33(1)):

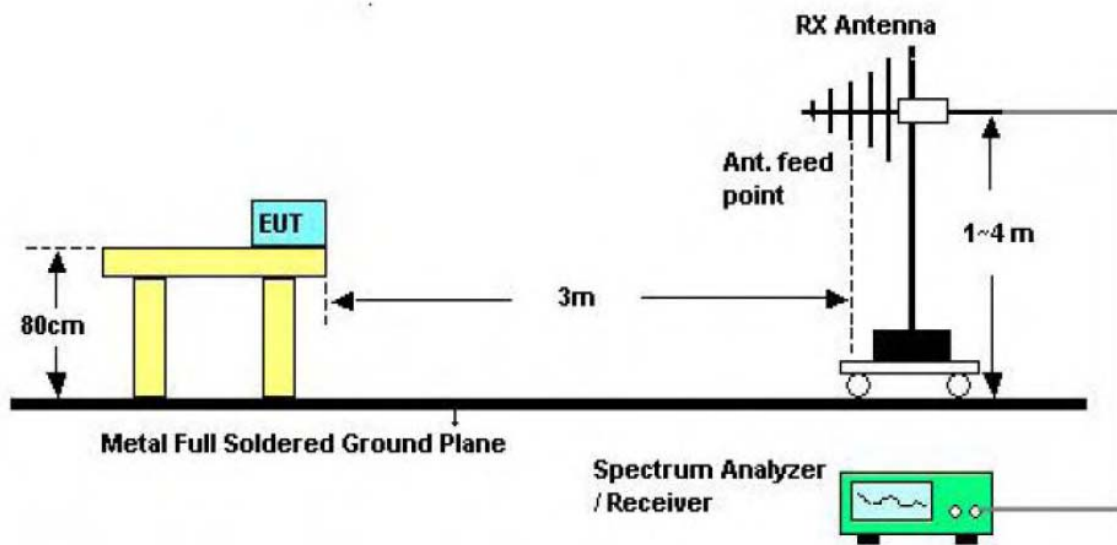
Except as otherwise indicated in paragraphs (b)(2) or (b)(3), for an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

| Highest frequency generated or used in the device or on which the device operates or tunes (MHz) | Upper frequency of measurement range (MHz) |
|--|---|
| Below 1.705 | 30 |
| 1.705~108 | 1000 |
| 108~500 | 2000 |
| 500~1000 | 5000 |
| Above 1000 | 5 th harmonic of the highest frequency or 40 GHz, whichever is lower |

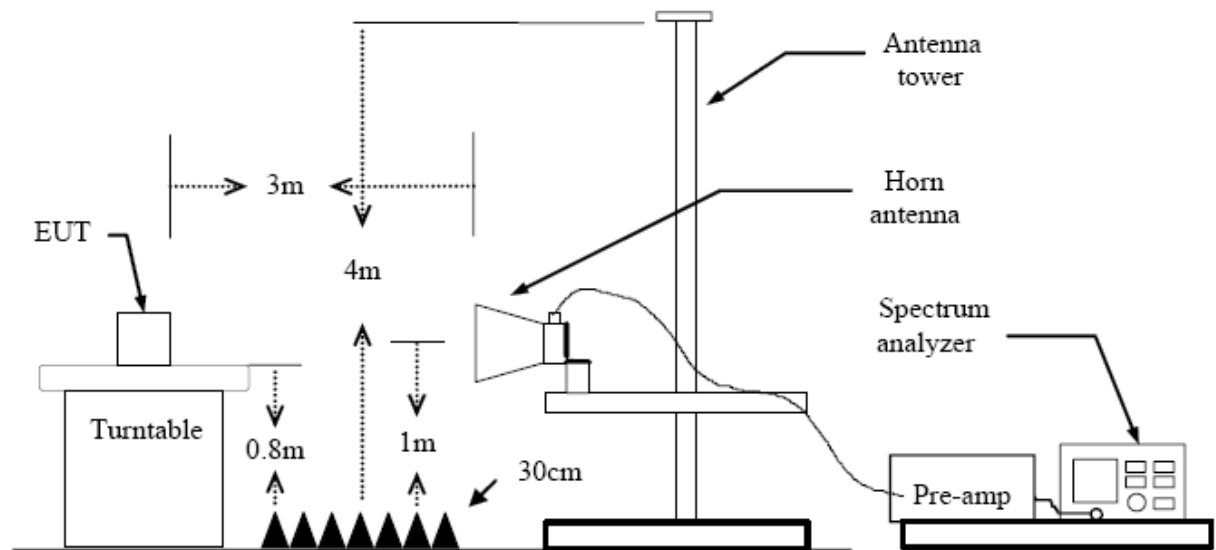
5.2 Test Setup



Bellow 30MHz Test Setup



30MHz to 1000MHz Test Setup



Above 1GHz Test Setup

5.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 0.8m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.

5.4 EUT Operating Condition

(1) Setup the EUT and peripherals refer to the description of test mode.

5.5 Deviation

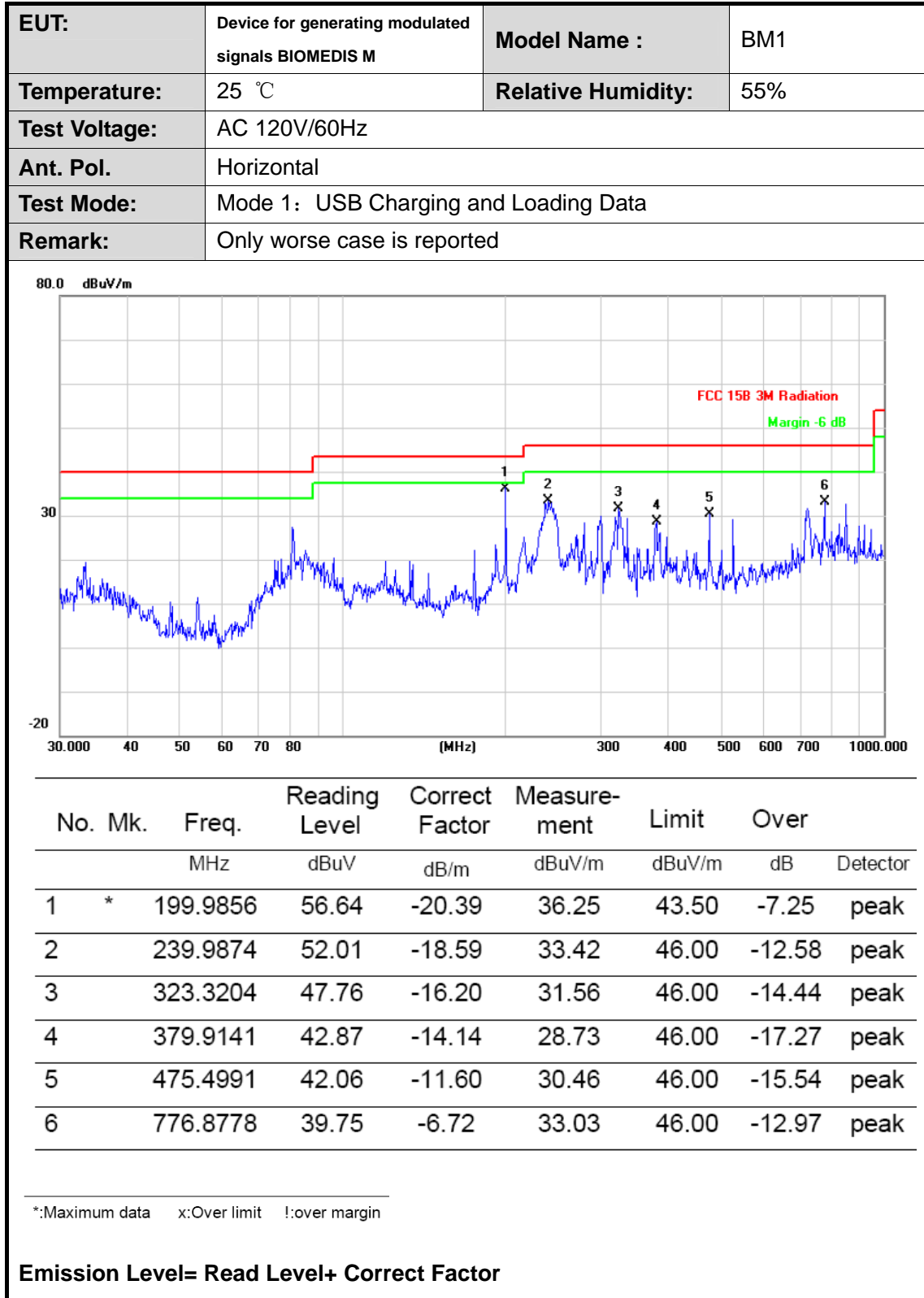
The test is no deviation from the standard.

5.6 Test Data

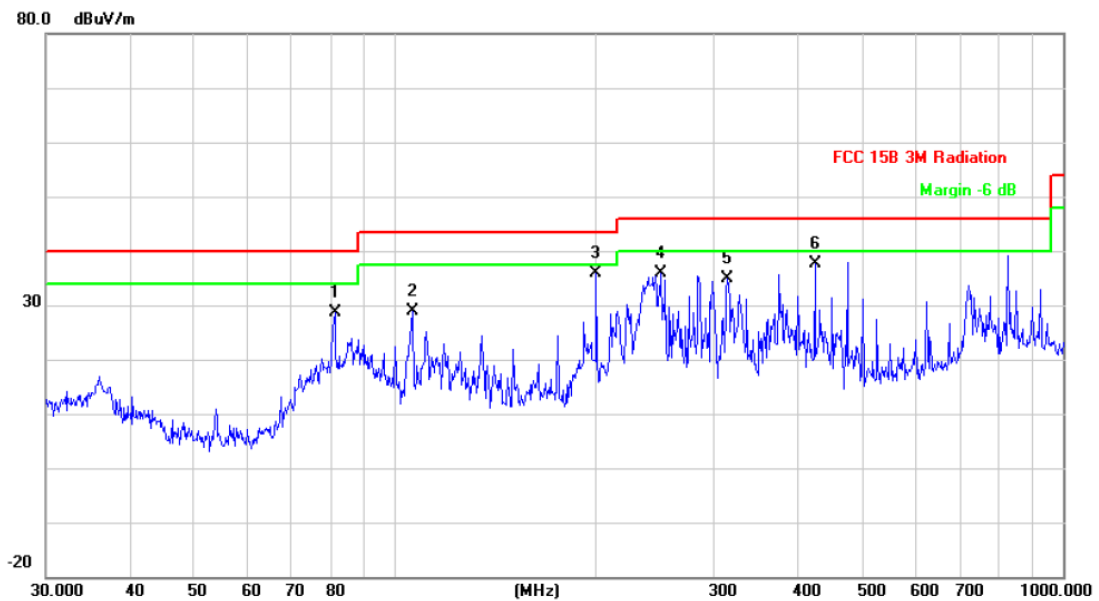
Remark: The Highest frequency of the device operates or tunes below 108MHz, so no requirement for test the emission frequency of above 1GHz.

Test data please refer the following pages.

(1) Bellow 1GHz



| | | | |
|----------------------|--|---------------------------|-----|
| EUT: | Device for generating modulated signals BIOMEDIS M | Model Name : | BM1 |
| Temperature: | 25 °C | Relative Humidity: | 55% |
| Test Voltage: | AC 120V/60Hz | | |
| Ant. Pol. | Vertical | | |
| Test Mode: | Mode 1: USB Charging and Loading Data | | |
| Remark: | Only worse case is reported | | |

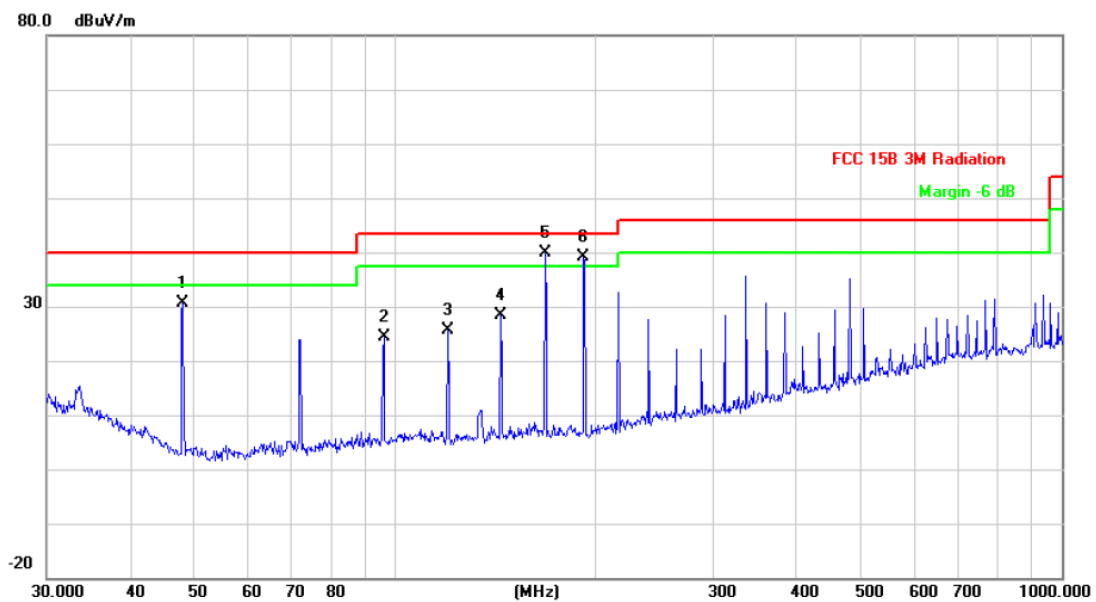


| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB/m | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector |
|-----|-----|--------------|--------------------------|---------------------------|----------------------------|-----------------|------------|----------|
| 1 | | 81.2117 | 51.84 | -23.21 | 28.63 | 40.00 | -11.37 | peak |
| 2 | | 106.0126 | 50.73 | -21.85 | 28.88 | 43.50 | -14.62 | peak |
| 3 | * | 199.9856 | 56.19 | -20.39 | 35.80 | 43.50 | -7.70 | peak |
| 4 | | 250.3012 | 54.10 | -18.11 | 35.99 | 46.00 | -10.01 | peak |
| 5 | | 314.3765 | 51.51 | -16.54 | 34.97 | 46.00 | -11.03 | peak |
| 6 | | 425.0280 | 50.60 | -12.92 | 37.68 | 46.00 | -8.32 | peak |

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

| | | | |
|----------------------|--|---------------------------|-----|
| EUT: | Device for generating modulated signals BIOMEDIS M | Model Name : | BM1 |
| Temperature: | 25 °C | Relative Humidity: | 55% |
| Test Voltage: | DC 12V | | |
| Ant. Pol. | Horizontal | | |
| Test Mode: | Mode 2: Normal Playing Mode | | |
| Remark: | Only worse case is reported | | |

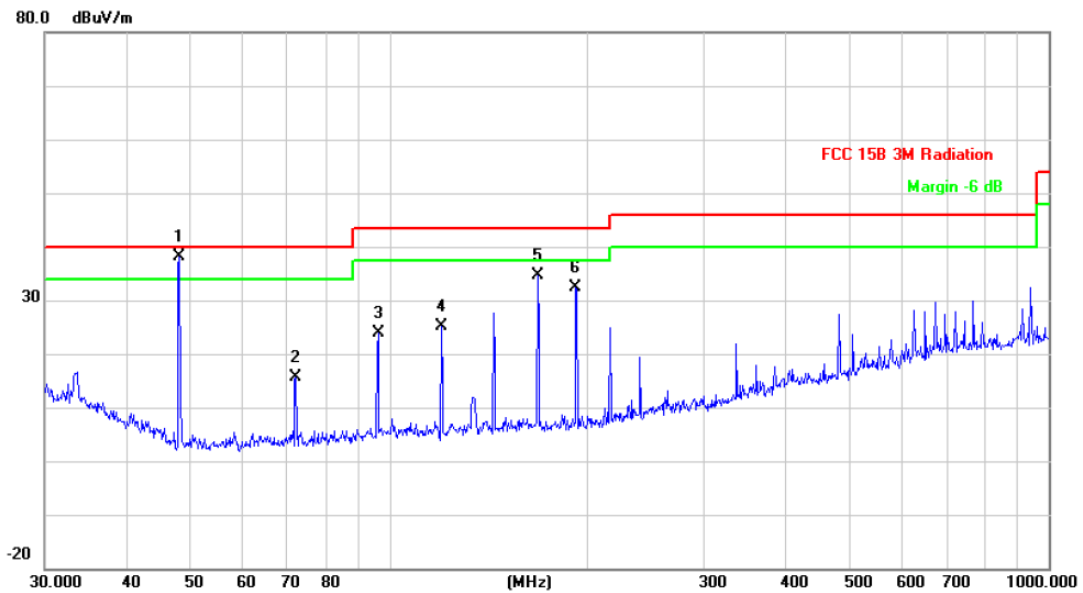


| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|-----|-----|----------|---------------|----------------|--------------|--------|--------|----------|
| | | MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | Detector |
| 1 | | 47.9940 | 54.14 | -23.54 | 30.60 | 40.00 | -9.40 | peak |
| 2 | | 96.0986 | 46.48 | -22.16 | 24.32 | 43.50 | -19.18 | peak |
| 3 | | 119.8556 | 48.23 | -22.50 | 25.73 | 43.50 | -17.77 | peak |
| 4 | | 143.8295 | 50.15 | -21.67 | 28.48 | 43.50 | -15.02 | peak |
| 5 | * | 167.8243 | 60.89 | -21.04 | 39.85 | 43.50 | -3.65 | peak |
| 6 | ! | 191.7450 | 60.02 | -20.81 | 39.21 | 43.50 | -4.29 | peak |

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor

| | | | |
|----------------------|--|---------------------------|-----|
| EUT: | Device for generating modulated signals BIOMEDIS M | Model Name : | BM1 |
| Temperature: | 25 °C | Relative Humidity: | 55% |
| Test Voltage: | DC 12V | | |
| Ant. Pol. | Vertical | | |
| Test Mode: | Mode 2: Normal Playing Mode | | |
| Remark: | Only worse case is reported | | |



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB/m | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector |
|-----|-----|--------------|--------------------------|---------------------------|----------------------------|-----------------|------------|----------|
| 1 | * | 47.9940 | 61.63 | -23.54 | 38.09 | 40.00 | -1.91 | peak |
| 2 | | 72.0843 | 39.08 | -23.54 | 15.54 | 40.00 | -24.46 | peak |
| 3 | | 96.0986 | 46.07 | -22.16 | 23.91 | 43.50 | -19.59 | peak |
| 4 | | 119.8556 | 47.60 | -22.50 | 25.10 | 43.50 | -18.40 | peak |
| 5 | | 167.8243 | 55.75 | -21.04 | 34.71 | 43.50 | -8.79 | peak |
| 6 | | 191.7450 | 53.24 | -20.81 | 32.43 | 43.50 | -11.07 | peak |

*:Maximum data x:Over limit !:over margin

Emission Level= Read Level+ Correct Factor