

TEST REPORT FOR FCC CERTIFICATION  
Class II Permissive Change  
On Behalf of  
LG Electronics USA  
FM Transmitter  
Model No. : GFT-41  
FCC ID : BEJFTGFT-41

Prepared for : LG Electronics USA  
2000 Millbrook Dr. Lincolnshire,  
IL 60069, United States

Prepared by : Audix Corporation  
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# TEST REPORT CERTIFICATION

## (Class II Permissive Change)

Applicant : LG Electronics USA  
 Manufacturer #1 : Kwang Sung Electronics Co., Ltd.  
 Manufacturer #2 : Kwang Sung Electronics H.K. Co., Ltd.  
 Factory : Shen Zhen Kwang Sung Electronics Co., Ltd.  
 EUT Description : FM Transmitter  
 FCC ID : BEJFTGFT-41  
 (A) MODEL NO. : GFT-41  
 (B) SERIAL NO. : N/A  
 (C) POWER SUPPLY : DC 1V ~ 1.5V

### Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C, July 2004  
 AND ANSI C63.4-2003  
 (FCC CFR 47 Part 15C, §15.203, §15.207, §15.209 and §15.239)

The device described above was tested by AUDIX CORPORATION. to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 subpart C limits both radiated and conducted emissions.

The measurement results are contained in this test report and AUDIX CORPORATION. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX CORPORATION.

Date of Test: Oct. 22 ~ 27, 2004

Prepared by:

Cherry Wang Nov. 05, 2004  
(Cherry Wang/Section Manager)

Test Engineer:

Allen Wang Nov. 05 '04  
(Allen Wang/Manager)

Approved & Authorized Signer:

Leon Liu Nov. 5 2004  
(Leon Liu/Senior Manager)

# 1. GENERAL INFORMATION

## 1.1. Description of Device (EUT)

|                             |   |                                                                                                                                                                                                                           |
|-----------------------------|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description                 | : | FM Transmitter<br>This equipment transmits wirelessly which connects music play equipments (MP3, CD) in the car or home. It replaces audio signal with FM frequency. The transmitted signal can be heard FM or Car Radio. |
| Model Number                | : | GFT-41                                                                                                                                                                                                                    |
| FCC ID                      | : | BEJFTGFT-41                                                                                                                                                                                                               |
| Applicant                   | : | LG Electronics USA<br>2000 Millbrook Dr. Lincolnshire,<br>IL 60069, United States                                                                                                                                         |
| Manufacturer #1             | : | Kwang Sung Electronics Co., Ltd.<br>R&D Center World Meridian Venture Center<br>#201, Digital Industrial Complex-2 60-24,<br>Gasam-Dong, Geumcheon-Gu, Seoul 153-801<br>Korea.                                            |
| Manufacturer #2             | : | Kwang Sung Electronics H.K. Co., Ltd.<br>Unit 8-9, 13/F, Wah Wai Ind. Centre, 38-40<br>Au Pui Wan St., Fo Tan, N.T., Hong Kong.                                                                                           |
| Factory                     | : | Shen Zhen Kwang Sung Electronics Co., Ltd.<br>Shi Tou Hill Industrial Zone, Zhuan Chuang<br>New Village Shi Yan Town, Bao An,<br>Shen Zhen, China.                                                                        |
| Transmitted Frequency Range | : | 88.2MHz~88.8MHz (FM)                                                                                                                                                                                                      |
| Channel Number              | : | 4 channels (interval of channel: 200kHz)                                                                                                                                                                                  |
| Supply Voltage              | : | DC 1V ~ 1.5V (AAA Size alkaline 1.5Vx1)                                                                                                                                                                                   |
| Current Drain               | : | 70mA                                                                                                                                                                                                                      |

|                           |   |                                                     |
|---------------------------|---|-----------------------------------------------------|
| Audio Input Cable         | : | Non-Shielded, Undetachable, 0.3m                    |
| FM Antenna                | : | Detachable, 0.2m                                    |
| Earphone                  | : | LG,<br>Cable: Non-Shielded, Undetachable, 0.9m+0.5m |
| Date of Receipt of Sample | : | Oct. 21, 2004                                       |
| Date of Test              | : | Oct. 22 ~ 27, 2004                                  |

**Remark:**

This EUT is a modification version with original FCC ID BEJFTGFT-41. The differences are:

- (1) to change the C27 Chip Capacitor from 102K(1000pF) into 331K(330pF).
- (2) to change the R2 & R3 Chip Resistors from 56K into 10K.
- (3) to change the R10 & R13 Chip Resistors from 8.2K into 10K.

The others transmitting frequency, PCB circuit & layout the same as original. The EUT is re-testing in radiated measurement and recorded test data in this report.

## 1.2. Tested Supporting System Details

### 1.2.1. MP3 PLAYER

|               |   |                     |
|---------------|---|---------------------|
| Model Number  | : | MF-FE429            |
| Serial Number | : | S/N                 |
| FCC ID        | : | By DoC              |
| Manufacturer  | : | LG Electronics Inc. |

## 1.3. Description of Test Facility

|                                   |   |                                                                                                                                                                                                              |
|-----------------------------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name of Firm                      | : | <b>Audix Corporation</b><br><b>Technical Division EMC Department</b><br>No. 53-11, Tin-Fu Tsun, Lin-Kou Hsiang,<br>Taipei Hsien 24443, Taiwan, R.O.C.                                                        |
| Test Location & Facility<br>(A/C) | : | <b>Semi-Anechoic Chamber</b><br>No. 53-11, Tin-Fu Tsun, Lin-Kou Hsiang,<br>Taipei Hsien 24443, Taiwan, R.O.C.<br><br>May. 16, 2003 File on<br>Federal Communication Commission<br>Registration Number: 90993 |
| NVLAP Lab. Code                   | : | 200077-0<br>(NVLAP is a NATA accredited body under Mutual Recognition Agreement)                                                                                                                             |

## 1.4. Measurement Uncertainty

| Test Item                        | Frequency Range | Uncertainty (dB)    |
|----------------------------------|-----------------|---------------------|
| Radiation Test<br>(Distance: 3m) | 30MHz~300MHz    | $\pm 2.91\text{dB}$ |
|                                  | 300MHz~1000MHz  | $\pm 2.74\text{dB}$ |

Remark : Uncertainty =  $k u_c(y)$

## **2. POWERLINE CONDUCTED EMISSION MEASUREMENT**

【The EUT only employ DC power for operation, no conductive emissions limits are required according to FCC Part 15 section §15.207(c)】

### 3. RADIATED EMISSION MEASUREMENT

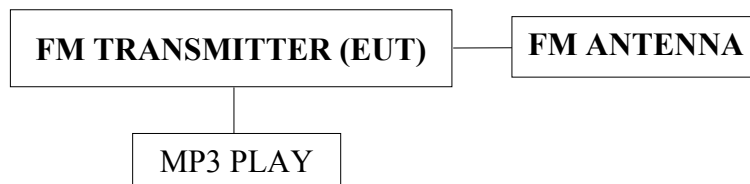
#### 3.1. Test Equipment

The following test equipment was used during the radiated emission measurement:

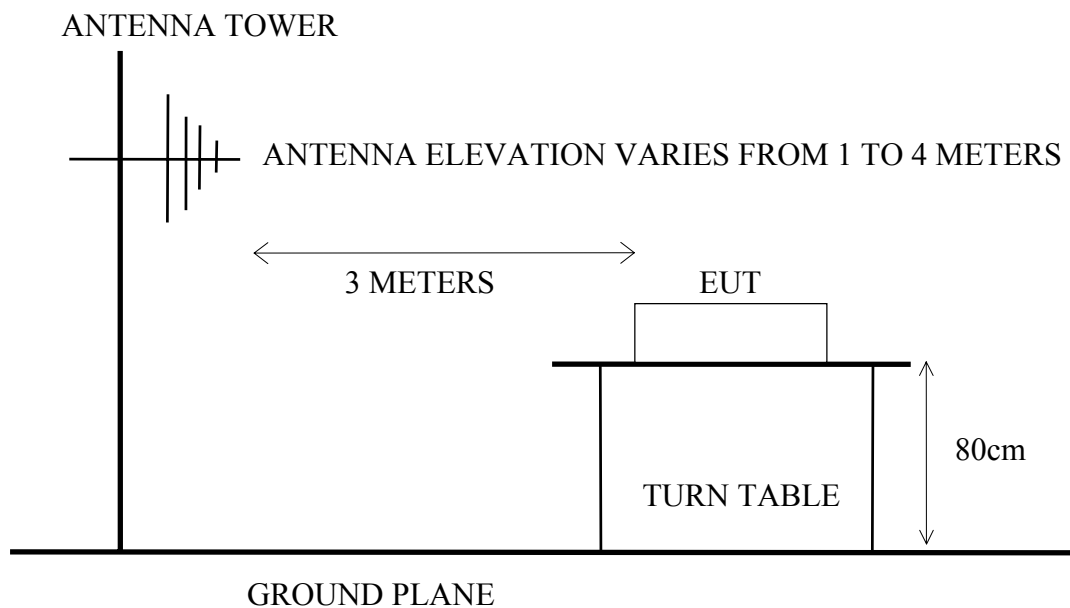
| Item | Type              | Manufacturer | Model No.   | Serial No. | Last Cal.   | Next Cal.   |
|------|-------------------|--------------|-------------|------------|-------------|-------------|
| 1.   | Spectrum Analyzer | HP           | 8593EM      | 3826A00248 | Oct.04, 04' | Oct.03, 05' |
| 2.   | Test Receiver     | R & S        | ESCS30      | 100265     | Oct.05, 04' | Oct.04, 05' |
| 3.   | Pre-Amplifier     | HP           | 8447D       | 2944A06305 | Mar.18, 04' | Mar.17, 05' |
| 4.   | Broadband Antenna | Schwarzbeck  | BBA 9106    | A3L        | Feb.21, 04' | Feb.20, 05' |
| 5.   | Broadband Antenna | Schwarzbeck  | UHALP9108-A | 0138       | Feb.21, 04' | Feb.20, 05' |

#### 3.2. Test Setup

##### 3.2.1. Block Diagram of connection between EUT and simulators



##### 3.2.2. Semi-Anechoic Chamber (3m) Setup Diagram



### 3.3. Radiation Limit (Comply with §15.239 & §15.209)

#### 3.3.1. §15.239 Radiated Emission Limits (Fundamental Frequency)

| FREQUENCY<br>MHz  | DISTANCE<br>Meters | FIELD STRENGTHS LIMITS |                             |
|-------------------|--------------------|------------------------|-----------------------------|
|                   |                    | μV/m                   | dBμV/m                      |
| Fundamental Freq. | 3                  | 250                    | 48.0 (Average)              |
|                   |                    | ---                    | 68.0 (Peak) <sup>*(2)</sup> |

Remark : (1) Emission level (dBμV/m) = 20 log Emission level (μV/m)

(2) The provision in section 15.35 for limiting peak emission apply.

#### 3.3.2. §15.209 Radiated Emission Limits (Spurious Frequency)

| FREQUENCY<br>MHz | DISTANCE<br>Meters | FIELD STRENGTHS LIMITS |        |
|------------------|--------------------|------------------------|--------|
|                  |                    | μV/m                   | dBμV/m |
| 30 ~ 88          | 3                  | 100                    | 40.0   |
| 88 ~ 216         | 3                  | 150                    | 43.5   |
| 216 ~ 960        | 3                  | 200                    | 46.0   |
| Above 960        | 3                  | 500                    | 54.0   |

Remark : (1) Emission level (dBμV/m) = 20 log Emission level (μV/m)

(2) The tighter limit applies at the edge between two frequency bands.

(3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

(4) The over 1GHz limit, FCC limit is used based on CFR 47 Part 15.35 (b) and 15.205(b) & Part 15.209(e).

### 3.4. EUT's Configuration during Compliance Measurement

The following equipment were installed on radiated measurement to meet the commission requirement and operating in a manner which tended to maximize its emission characteristics in a normal application.

#### 3.4.1. FM Transmitter (EUT)

|                       |   |                                            |
|-----------------------|---|--------------------------------------------|
| Model Number          | : | GFT-41                                     |
| Serial Number         | : | N/A                                        |
| FCC ID                | : | BEJFTGFT-41                                |
| Manufacturer          | : | Kwang Sung Electronics Co., Ltd.           |
| Factory               | : | Shen Zhen Kwang Sung Electronics Co., Ltd. |
| Transmitted Frequency | : | 88.2MHz~88.8MHz (FM)                       |
| FM Antenna            | : | Detachable, 0.2m                           |
| Audio Input Cable     | : | Non-Shielded, Undetachable, 0.3cm          |

#### 3.4.2. Supporting System

: As in Section 1.2.

### 3.5. Operating Condition of EUT

- 3.5.1. Setup the EUT and simulator as shown on 3.2.
- 3.5.2. Turned on the power of all equipment.
- 3.5.3. The EUT connected MP3 Player and turn the transmitting frequency to 88.2MHz 、 88.6MHz 、 88.8MHz during the testing.

### 3.6. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. The antenna moved up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna such as calibrated biconical and log- periodical antenna or horn antenna were used as a receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to FCC ANSI C63.4-2003 regulation.

The bandwidth of R & S test receiver ESCS 30 was set at 120kHz.

The frequency range from 30MHz to 1000MHz was checked. The all final readings of measurement were using the Peak or Average or Quasi-Peak detector.

EUT with the worst operating condition were measured within Semi-Anechoic Chamber and all the test results are listed in section 3.7. The details of test modes are as follows:

| Mode | Operating Condition of EUT                                            | Power Supply    |
|------|-----------------------------------------------------------------------|-----------------|
| 1.   | Transmitting FM Radio Frequency 88.2MHz w/FM Antenna, EUT set on Lie  | DC Battery 1.5V |
| 2.   | Transmitting FM Radio Frequency 88.2MHz w/FM Antenna, EUT set on Side |                 |
| 3.   | Transmitting FM Radio Frequency 88.2MHz w/FM Antenna EUT set on Stand |                 |
| 4.   | Transmitting FM Radio Frequency 88.6MHz w/FM Antenna, EUT set on Lie  |                 |
| 5.   | Transmitting FM Radio Frequency 88.8MHz w/FM Antenna, EUT set on Lie  |                 |

### 3.7. Radiated Emission Measurement Results

#### **PASSED.**

All the emissions not reported below are too low against the FCC Part 15 Subpart C official limits.

|                |                                                                           |               |      |
|----------------|---------------------------------------------------------------------------|---------------|------|
| Date of Test : | Oct. 26, 2004                                                             | Temperature : | 21°C |
| EUT :          | FM Transmitter                                                            | Humidity :    | 50%  |
| Test Mode 1 :  | EUT w/FM Antenna, Set On Lie<br>(Transmitting FM Radio Frequency 88.2MHz) |               |      |

| Frequency<br>MHz                     | Antenna<br>Factor<br>dB/m | Cable<br>Loss<br>dB | Reading<br>Horizontal<br>dBμV | Emission Level<br>Horizontal<br>dBμV/m | Limits<br>dBμV/m | Margin<br>dB |
|--------------------------------------|---------------------------|---------------------|-------------------------------|----------------------------------------|------------------|--------------|
| Fundamental Freq. (Average Value)    |                           |                     |                               |                                        |                  |              |
| 88.200                               | 15.57                     | 2.00                | 21.60                         | 39.17                                  | 48.00            | 8.83         |
| Fundamental Freq. (Peak Value)       |                           |                     |                               |                                        |                  |              |
| 88.200                               | 15.57                     | 2.00                | 24.71                         | 42.28                                  | 68.00            | 25.72        |
| Unwanted Emission (Quasi-Peak Value) |                           |                     |                               |                                        |                  |              |
| 176.400                              | 21.24                     | 2.90                | 14.66                         | 38.80                                  | 43.50            | 4.70         |
| 264.600                              | 24.62                     | 3.70                | 3.29                          | 31.61                                  | 46.00            | 14.39        |
| 352.800                              | 15.64                     | 4.30                | -0.69                         | 19.25                                  | 46.00            | 26.75        |
| 441.000                              | 17.59                     | 5.40                | 0.26                          | 23.25                                  | 46.00            | 22.75        |
| 529.200                              | 19.64                     | 7.00                | 0.73                          | 27.37                                  | 46.00            | 18.63        |
| 617.400                              | 21.33                     | 6.30                | -0.41                         | 27.21                                  | 46.00            | 18.79        |
| 687.660                              | 23.26                     | 6.50                | 0.73                          | 30.49                                  | 46.00            | 15.51        |
| 793.390                              | 23.98                     | 6.90                | 1.20                          | 32.08                                  | 46.00            | 13.92        |
| 967.990                              | 26.90                     | 7.69                | 0.56                          | 35.15                                  | 54.00            | 18.85        |

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Reading.  
 2. Measurement was up to 10<sup>th</sup> harmonics (from fundamental frequency), but the emissions level were too low against the official limit and not reported.

Date of Test : Oct. 26, 2004      Temperature : 21°C

EUT : FM Transmitter      Humidity : 50%

Test Mode 1 : EUT w/FM Antenna, Set On Lie  
(Transmitting FM Radio Frequency 88.2MHz)

| Frequency<br>MHz                     | Antenna<br>Factor<br>dB/m | Cable<br>Loss<br>dB | Reading<br>Vertical<br>dBμV | Emission Level<br>Vertical<br>dBμV/m | Limits<br>dBμV/m | Margin<br>dB |
|--------------------------------------|---------------------------|---------------------|-----------------------------|--------------------------------------|------------------|--------------|
| -----                                |                           |                     |                             |                                      |                  |              |
| Fundamental Freq. (Average Value)    |                           |                     |                             |                                      |                  |              |
| 88.200                               | 15.65                     | 2.00                | 16.61                       | 34.26                                | 48.00            | 13.74        |
| Fundamental Freq. (Peak Value)       |                           |                     |                             |                                      |                  |              |
| 88.200                               | 15.65                     | 2.00                | 18.69                       | 36.34                                | 68.00            | 31.66        |
| Unwanted Emission (Quasi-Peak Value) |                           |                     |                             |                                      |                  |              |
| 176.400                              | 20.84                     | 2.90                | 8.66                        | 32.40                                | 43.50            | 11.10        |
| 264.600                              | 25.20                     | 3.70                | -0.28                       | 28.62                                | 46.00            | 17.38        |
| 352.800                              | 15.82                     | 4.30                | 5.12                        | 25.24                                | 46.00            | 20.76        |
| 441.000                              | 17.40                     | 5.30                | -0.06                       | 22.63                                | 46.00            | 23.37        |
| 529.200                              | 20.65                     | 6.90                | -1.09                       | 26.47                                | 46.00            | 19.53        |
| 617.400                              | 21.26                     | 6.30                | -0.77                       | 26.79                                | 46.00            | 19.21        |
| 669.230                              | 22.76                     | 6.40                | 0.44                        | 29.60                                | 46.00            | 16.40        |
| 866.140                              | 25.35                     | 7.20                | 0.59                        | 33.14                                | 46.00            | 12.86        |
| 969.930                              | 26.88                     | 7.69                | -0.53                       | 34.04                                | 54.00            | 19.96        |
| -----                                |                           |                     |                             |                                      |                  |              |

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Reading.  
2. Measurement was up to 10<sup>th</sup> harmonics (from fundamental frequency), but the emissions level were too low against the official limit and not reported.

Date of Test : Oct. 26, 2004      Temperature : 21°C

EUT : FM Transmitter      Humidity : 50%

Test Mode 2 : EUT w/FM Antenna, Set On Side  
(Transmitting FM Radio Frequency 88.2MHz)

| Frequency<br>MHz                     | Antenna<br>Factor<br>dB/m | Cable<br>Loss<br>dB | Reading<br>Horizontal<br>dBμV | Emission Level<br>Horizontal<br>dBμV/m | Limits<br>dBμV/m | Margin<br>dB |
|--------------------------------------|---------------------------|---------------------|-------------------------------|----------------------------------------|------------------|--------------|
| -----                                |                           |                     |                               |                                        |                  |              |
| Fundamental Freq. (Average Value)    |                           |                     |                               |                                        |                  |              |
| 88.200                               | 15.57                     | 2.00                | 18.44                         | 36.01                                  | 48.00            | 11.99        |
| Fundamental Freq. (Peak Value)       |                           |                     |                               |                                        |                  |              |
| 88.200                               | 15.57                     | 2.00                | 21.13                         | 38.70                                  | 68.00            | 29.30        |
| Unwanted Emission (Quasi-Peak Value) |                           |                     |                               |                                        |                  |              |
| 176.400                              | 21.21                     | 2.90                | 11.39                         | 35.49                                  | 43.50            | 8.01         |
| 264.600                              | 24.62                     | 3.70                | 2.25                          | 30.57                                  | 46.00            | 15.43        |
| 352.800                              | 15.55                     | 4.30                | 8.18                          | 28.04                                  | 46.00            | 17.96        |
| 441.000                              | 17.59                     | 5.40                | -0.49                         | 22.50                                  | 46.00            | 23.50        |
| 529.200                              | 19.70                     | 6.93                | -0.36                         | 26.27                                  | 46.00            | 19.73        |
| 676.020                              | 22.89                     | 6.40                | 0.40                          | 29.68                                  | 46.00            | 16.32        |
| 873.900                              | 25.37                     | 7.30                | 0.48                          | 33.15                                  | 46.00            | 12.85        |
| 966.050                              | 26.89                     | 7.70                | 0.23                          | 34.83                                  | 54.00            | 19.17        |
| -----                                |                           |                     |                               |                                        |                  |              |

Remark : 1. Emission Level = Antenna Factor + Cable Loss + Reading.  
 2. Measurement was up to 10<sup>th</sup> harmonics (from fundamental frequency), but the emissions level were too low against the official limit and not reported.

Date of Test : Oct. 26, 2004      Temperature : 22°C

EUT : FM Transmitter      Humidity : 50%

Test Mode 2 : EUT w/FM Antenna, Set On Side  
(Transmitting FM Radio Frequency 88.2MHz)

| Frequency<br>MHz                     | Antenna<br>Factor<br>dB/m | Cable<br>Loss<br>dB | Reading<br>Vertical<br>dBμV | Emission Level<br>Vertical<br>dBμV/m | Limits<br>dBμV/m | Margin<br>dB |
|--------------------------------------|---------------------------|---------------------|-----------------------------|--------------------------------------|------------------|--------------|
| -----                                |                           |                     |                             |                                      |                  |              |
| Fundamental Freq. (Average Value)    |                           |                     |                             |                                      |                  |              |
| 88.200                               | 15.65                     | 2.00                | 14.52                       | 32.17                                | 48.00            | 15.83        |
| Fundamental Freq. (Peak Value)       |                           |                     |                             |                                      |                  |              |
| 88.200                               | 15.65                     | 2.00                | 16.66                       | 34.31                                | 68.00            | 33.69        |
| Unwanted Emission (Quasi-Peak Value) |                           |                     |                             |                                      |                  |              |
| 176.400                              | 20.66                     | 2.90                | 6.00                        | 29.56                                | 43.50            | 13.94        |
| 264.600                              | 25.96                     | 3.90                | 4.16                        | 34.02                                | 46.00            | 11.98        |
| 352.800                              | 15.86                     | 4.37                | -0.68                       | 19.55                                | 46.00            | 26.45        |
| 441.000                              | 17.40                     | 5.30                | -1.41                       | 21.28                                | 46.00            | 24.72        |
| 515.970                              | 20.86                     | 6.80                | 0.27                        | 27.92                                | 46.00            | 18.08        |
| 768.170                              | 24.98                     | 6.80                | 0.02                        | 31.81                                | 46.00            | 14.19        |
| 843.830                              | 26.62                     | 7.10                | -0.45                       | 33.27                                | 46.00            | 12.73        |
| 967.990                              | 26.97                     | 7.69                | 0.37                        | 35.03                                | 54.00            | 18.97        |

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Reading.  
2. Measurement was up to 10<sup>th</sup> harmonics (from fundamental frequency), but the emissions level were too low against the official limit and not reported.

Date of Test : Oct. 26, 2004      Temperature : 21°C

EUT : FM Transmitter      Humidity : 50%

Test Mode 3 : EUT w/FM Antenna, Set On Stand  
(Transmitting FM Radio Frequency 88.2MHz)

| Frequency<br>MHz                     | Antenna<br>Factor<br>dB/m | Cable<br>Loss<br>dB | Reading<br>Horizontal<br>dBμV | Emission Level<br>Horizontal<br>dBμV/m | Limits<br>dBμV/m | Margin<br>dB |
|--------------------------------------|---------------------------|---------------------|-------------------------------|----------------------------------------|------------------|--------------|
| -----                                |                           |                     |                               |                                        |                  |              |
| Fundamental Freq. (Average Value)    |                           |                     |                               |                                        |                  |              |
| 88.200                               | 15.57                     | 2.00                | 19.16                         | 36.73                                  | 48.00            | 11.27        |
| Fundamental Freq. (Peak Value)       |                           |                     |                               |                                        |                  |              |
| 88.200                               | 15.57                     | 2.00                | 22.12                         | 39.69                                  | 68.00            | 28.31        |
| Unwanted Emission (Quasi-Peak Value) |                           |                     |                               |                                        |                  |              |
| 176.400                              | 21.21                     | 2.90                | 11.08                         | 35.19                                  | 43.50            | 8.31         |
| 264.600                              | 24.62                     | 3.70                | 1.64                          | 29.96                                  | 46.00            | 16.04        |
| 352.800                              | 15.64                     | 4.30                | -1.01                         | 18.93                                  | 46.00            | 27.07        |
| 441.000                              | 17.59                     | 5.40                | -0.11                         | 22.88                                  | 46.00            | 23.12        |
| 569.320                              | 21.17                     | 6.50                | 0.54                          | 28.21                                  | 46.00            | 17.79        |
| 700.270                              | 23.46                     | 6.50                | -0.05                         | 29.91                                  | 46.00            | 16.09        |
| 810.850                              | 24.09                     | 7.00                | -0.18                         | 30.91                                  | 46.00            | 15.09        |
| 863.230                              | 26.09                     | 7.20                | -0.56                         | 32.73                                  | 46.00            | 13.27        |

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Reading.  
2. Measurement was up to 10<sup>th</sup> harmonics (from fundamental frequency), but the emissions level were too low against the official limit and not reported.

Date of Test : Oct. 26, 2004      Temperature : 21°C

EUT : FM Transmitter      Humidity : 50%

Test Mode 3 : EUT w/FM Antenna, Set On Stand  
(Transmitting FM Radio Frequency 88.2MHz)

| Frequency<br>MHz                     | Antenna<br>Factor<br>dB/m | Cable<br>Loss<br>dB | Reading<br>Vertical<br>dBμV | Emission Level<br>Vertical<br>dBμV/m | Limits<br>dBμV/m | Margin<br>dB |
|--------------------------------------|---------------------------|---------------------|-----------------------------|--------------------------------------|------------------|--------------|
| -----                                |                           |                     |                             |                                      |                  |              |
| Fundamental Freq. (Average Value)    |                           |                     |                             |                                      |                  |              |
| 88.200                               | 15.65                     | 2.00                | 16.96                       | 34.61                                | 48.00            | 13.39        |
| Fundamental Freq. (Peak Value)       |                           |                     |                             |                                      |                  |              |
| 88.200                               | 15.65                     | 2.00                | 19.29                       | 36.94                                | 68.00            | 31.06        |
| Unwanted Emission (Quasi-Peak Value) |                           |                     |                             |                                      |                  |              |
| 176.400                              | 20.66                     | 2.90                | 9.91                        | 33.47                                | 43.50            | 10.03        |
| 264.600                              | 26.04                     | 3.70                | 0.41                        | 30.15                                | 46.00            | 15.85        |
| 352.800                              | 15.76                     | 4.40                | -0.69                       | 19.47                                | 46.00            | 26.53        |
| 441.000                              | 17.40                     | 5.30                | -0.17                       | 22.52                                | 46.00            | 23.48        |
| 501.420                              | 19.91                     | 6.52                | 0.86                        | 27.29                                | 46.00            | 18.71        |
| 529.200                              | 20.22                     | 6.90                | -0.36                       | 26.77                                | 46.00            | 19.23        |
| 838.010                              | 26.57                     | 7.10                | -0.57                       | 33.10                                | 46.00            | 12.90        |
| 959.260                              | 27.16                     | 7.60                | 0.17                        | 34.93                                | 46.00            | 11.07        |

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Reading.  
2. Measurement was up to 10<sup>th</sup> harmonics (from fundamental frequency), but the emissions level were too low against the official limit and not reported.

Date of Test : Oct. 27, 2004      Temperature : 20°C

EUT : FM Transmitter      Humidity : 58%

Test Mode 4 : EUT w/FM Antenna, Set On Lie  
(Transmitting FM Radio Frequency 88.6MHz)

| Frequency<br>MHz                     | Antenna<br>Factor<br>dB/m | Cable<br>Loss<br>dB | Reading<br>Horizontal<br>dBμV | Emission Level<br>Horizontal<br>dBμV/m | Limits<br>dBμV/m | Margin<br>dB |
|--------------------------------------|---------------------------|---------------------|-------------------------------|----------------------------------------|------------------|--------------|
| -----                                |                           |                     |                               |                                        |                  |              |
| Fundamental Freq. (Average Value)    |                           |                     |                               |                                        |                  |              |
| 88.600                               | 15.57                     | 2.00                | 21.34                         | 38.91                                  | 48.00            | 9.09         |
| Fundamental Freq. (Peak Value)       |                           |                     |                               |                                        |                  |              |
| 88.600                               | 15.57                     | 2.00                | 24.37                         | 41.94                                  | 68.00            | 26.06        |
| Unwanted Emission (Quasi-Peak Value) |                           |                     |                               |                                        |                  |              |
| 177.200                              | 21.24                     | 2.90                | 12.66                         | 36.80                                  | 43.50            | 6.70         |
| 265.800                              | 24.74                     | 3.70                | 5.88                          | 34.32                                  | 46.00            | 11.68        |
| 354.400                              | 15.90                     | 4.40                | -0.65                         | 19.64                                  | 46.00            | 26.36        |
| 411.210                              | 17.15                     | 4.90                | 1.62                          | 23.67                                  | 46.00            | 22.33        |
| 443.000                              | 17.62                     | 5.33                | -0.37                         | 22.58                                  | 46.00            | 23.42        |
| 480.080                              | 18.68                     | 6.05                | 8.28                          | 33.01                                  | 46.00            | 12.99        |
| 850.620                              | 25.63                     | 7.10                | 0.77                          | 33.50                                  | 46.00            | 12.50        |
| 966.050                              | 26.89                     | 7.70                | 0.35                          | 34.95                                  | 54.00            | 19.05        |
| -----                                |                           |                     |                               |                                        |                  |              |

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Reading.  
 2. Measurement was up to 10<sup>th</sup> harmonics (from fundamental frequency), but the emissions level were too low against the official limit and not reported.

Date of Test : Oct. 27, 2004      Temperature : 20°C

EUT : FM Transmitter      Humidity : 58%

Test Mode 4 : EUT w/FM Antenna, Set On Lie  
(Transmitting FM Radio Frequency 88.6MHz)

| Frequency<br>MHz                     | Antenna<br>Factor<br>dB/m | Cable<br>Loss<br>dB | Reading<br>Vertical<br>dBμV | Emission Level<br>Vertical<br>dBμV/m | Limits<br>dBμV/m | Margin<br>dB |
|--------------------------------------|---------------------------|---------------------|-----------------------------|--------------------------------------|------------------|--------------|
| -----                                |                           |                     |                             |                                      |                  |              |
| Fundamental Freq. (Average Value)    |                           |                     |                             |                                      |                  |              |
| 88.600                               | 15.65                     | 2.00                | 14.84                       | 32.49                                | 48.00            | 15.51        |
| Fundamental Freq. (Peak Value)       |                           |                     |                             |                                      |                  |              |
| 88.600                               | 15.65                     | 2.00                | 17.44                       | 35.09                                | 68.00            | 32.91        |
| Unwanted Emission (Quasi-Peak Value) |                           |                     |                             |                                      |                  |              |
| 177.200                              | 20.84                     | 2.90                | 7.48                        | 31.21                                | 43.50            | 12.29        |
| 265.400                              | 25.94                     | 3.70                | 1.34                        | 30.98                                | 46.00            | 15.02        |
| 354.000                              | 15.86                     | 4.37                | 6.81                        | 27.04                                | 46.00            | 18.96        |
| 442.600                              | 17.46                     | 5.40                | 0.04                        | 22.90                                | 46.00            | 23.10        |
| 480.080                              | 18.94                     | 6.05                | 8.80                        | 33.78                                | 46.00            | 12.22        |
| 689.600                              | 23.46                     | 6.50                | 0.76                        | 30.73                                | 46.00            | 15.27        |
| 837.040                              | 26.47                     | 7.10                | -0.59                       | 32.98                                | 46.00            | 13.02        |
| 973.810                              | 26.71                     | 7.70                | 0.71                        | 35.12                                | 54.00            | 18.88        |
| -----                                |                           |                     |                             |                                      |                  |              |

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Reading.  
2. Measurement was up to 10<sup>th</sup> harmonics (from fundamental frequency), but the emissions level were too low against the official limit and not reported.

Date of Test : Oct. 27, 2004      Temperature : 20°C

EUT : FM Transmitter      Humidity : 58%

Test Mode 5 : EUT w/FM Antenna, Set On Lie  
(Transmitting FM Radio Frequency 88.8MHz)

| Frequency<br>MHz                     | Antenna<br>Factor<br>dB/m | Cable<br>Loss<br>dB | Reading<br>Horizontal<br>dBμV | Emission Level<br>Horizontal<br>dBμV/m | Limits<br>dBμV/m | Margin<br>dB |
|--------------------------------------|---------------------------|---------------------|-------------------------------|----------------------------------------|------------------|--------------|
| -----                                |                           |                     |                               |                                        |                  |              |
| Fundamental Freq. (Average Value)    |                           |                     |                               |                                        |                  |              |
| 88.800                               | 15.57                     | 2.00                | 20.71                         | 38.28                                  | 48.00            | 9.72         |
| Fundamental Freq. (Peak Value)       |                           |                     |                               |                                        |                  |              |
| 88.800                               | 15.57                     | 2.00                | 23.60                         | 41.17                                  | 68.00            | 26.83        |
| Unwanted Emission (Quasi-Peak Value) |                           |                     |                               |                                        |                  |              |
| 177.600                              | 21.28                     | 2.90                | 12.66                         | 36.84                                  | 43.50            | 6.66         |
| 240.490                              | 23.10                     | 3.40                | 4.86                          | 31.36                                  | 46.00            | 14.64        |
| 266.400                              | 24.74                     | 3.70                | 6.90                          | 35.34                                  | 46.00            | 10.66        |
| 355.200                              | 15.72                     | 4.40                | -0.72                         | 19.40                                  | 46.00            | 26.60        |
| 444.000                              | 17.59                     | 5.40                | -0.37                         | 22.62                                  | 46.00            | 23.38        |
| 480.080                              | 18.68                     | 6.05                | 8.92                          | 33.65                                  | 46.00            | 12.35        |
| 691.540                              | 23.22                     | 6.50                | 0.60                          | 30.31                                  | 46.00            | 15.69        |
| 980.600                              | 25.74                     | 7.70                | 0.80                          | 34.24                                  | 54.00            | 19.76        |
| -----                                |                           |                     |                               |                                        |                  |              |

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Reading.  
 2. Measurement was up to 10<sup>th</sup> harmonics (from fundamental frequency), but the emissions level were too low against the official limit and not reported.

Date of Test : Oct. 27, 2004      Temperature : 20°C

EUT : FM Transmitter      Humidity : 58%

Test Mode 5 : EUT w/FM Antenna, Set On Lie  
(Transmitting FM Radio Frequency 88.8MHz)

| Frequency<br>MHz                     | Antenna<br>Factor<br>dB/m | Cable<br>Loss<br>dB | Reading<br>Vertical<br>dBμV | Emission Level<br>Vertical<br>dBμV/m | Limits<br>dBμV/m | Margin<br>dB |
|--------------------------------------|---------------------------|---------------------|-----------------------------|--------------------------------------|------------------|--------------|
| -----                                |                           |                     |                             |                                      |                  |              |
| Fundamental Freq. (Average Value)    |                           |                     |                             |                                      |                  |              |
| 88.800                               | 15.65                     | 2.00                | 14.94                       | 32.59                                | 48.00            | 15.41        |
| Fundamental Freq. (Peak Value)       |                           |                     |                             |                                      |                  |              |
| 88.800                               | 15.65                     | 2.00                | 17.97                       | 35.62                                | 68.00            | 32.38        |
| Unwanted Emission (Quasi-Peak Value) |                           |                     |                             |                                      |                  |              |
| 177.600                              | 21.00                     | 2.90                | 8.17                        | 32.07                                | 43.50            | 11.43        |
| 233.700                              | 24.84                     | 3.38                | 0.35                        | 28.56                                | 46.00            | 17.44        |
| 266.400                              | 25.62                     | 3.70                | 1.22                        | 30.54                                | 46.00            | 15.46        |
| 355.200                              | 15.86                     | 4.37                | 5.66                        | 25.89                                | 46.00            | 20.11        |
| 444.000                              | 17.44                     | 5.40                | 0.64                        | 23.48                                | 46.00            | 22.52        |
| 480.080                              | 18.94                     | 6.05                | 5.90                        | 30.88                                | 46.00            | 15.12        |
| 689.600                              | 23.46                     | 6.50                | 0.90                        | 30.87                                | 46.00            | 15.13        |
| 873.900                              | 25.19                     | 7.30                | 1.00                        | 33.49                                | 46.00            | 12.51        |
| -----                                |                           |                     |                             |                                      |                  |              |

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Reading.  
2. Measurement was up to 10<sup>th</sup> harmonics (from fundamental frequency), but the emissions level were too low against the official limit and not reported.

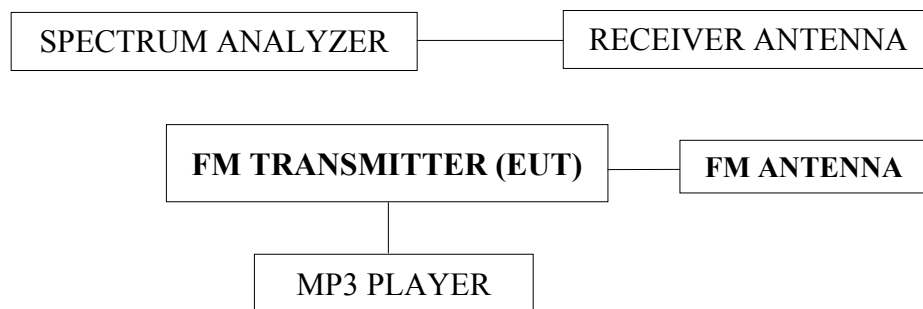
## 4. 26dB BANDWIDTH MEASUREMENT

### 4.1. Test Equipment

The following test equipment were used during the Emission Bandwidth Measurement:

| Item | Type              | Manufacturer | Model No. | Serial No. | Last Cal.   | Next Cal.   |
|------|-------------------|--------------|-----------|------------|-------------|-------------|
| 1.   | Spectrum Analyzer | Agilent      | E4446A    | US44300366 | Aug.27, 04' | Aug.26, 05' |

### 4.2. Block Diagram of Test Setup



### 4.3. Specification Limits (§15.239)

The 26dB bandwidth of fundamental emission from the intentional radiator shall be confined within a band 200kHz wide centered on the operating frequency. The 200kHz band shall lie wholly within the frequency range of 88.2-88.8MHz.

### 4.4. EUT's Configuration during Compliance Measurement

The configuration of EUT were same as section 3.4.

### 4.5. 26dB Bandwidth Measurement Results

**PASSED.** The graph of bandwidth measured is attached in next pages.  
(Remark: -26dB below the peak level to measure)

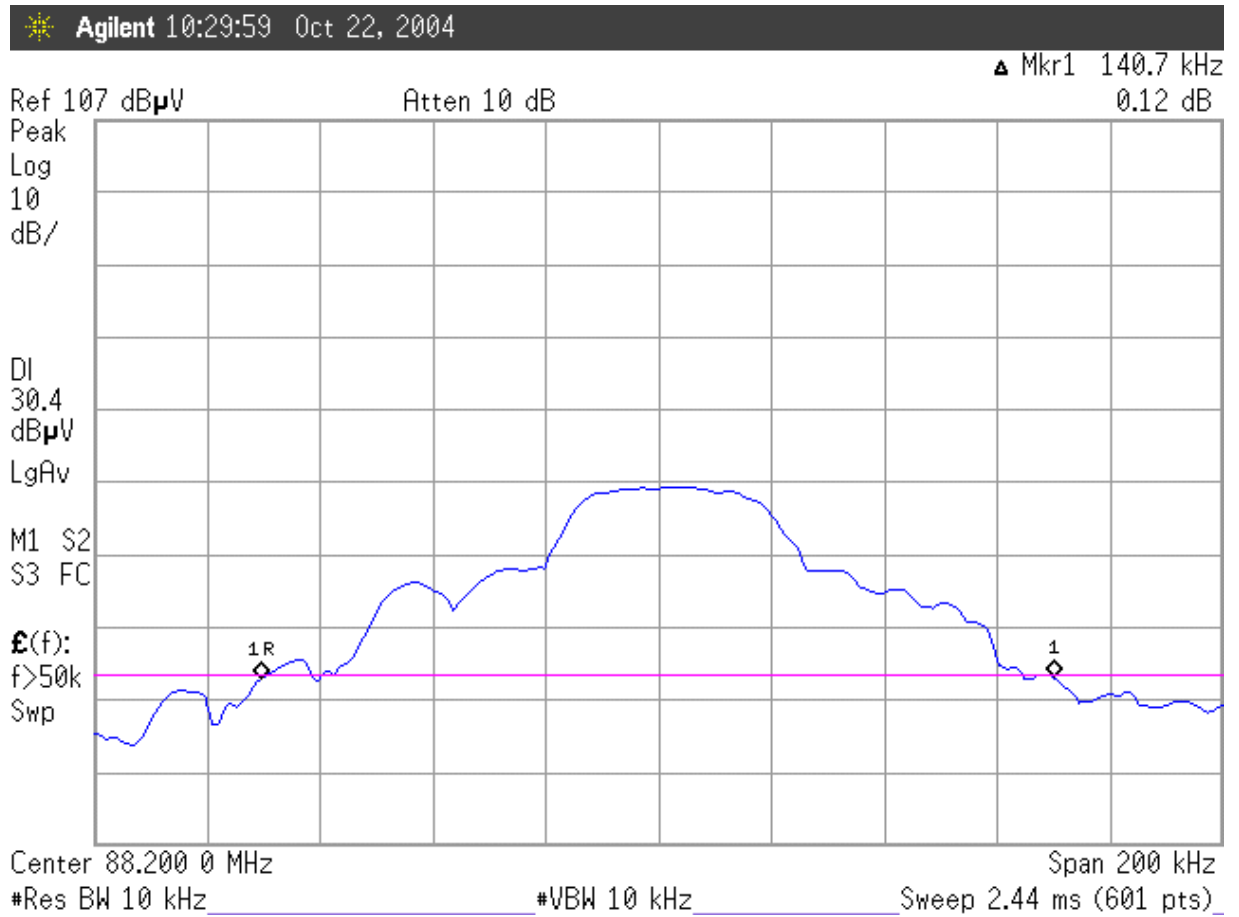
Date of Test : Oct. 22, 2004      Temperature : 23°C      Humidity : 51%

| Mode | Center Frequency | 26dB Bandwidth  | Limits |
|------|------------------|-----------------|--------|
| 1.   | 88.2000MHz       | <b>140.7kHz</b> | 200kHz |
| 2.   | 88.6000MHz       | <b>124.0kHz</b> | 200kHz |
| 3.   | 88.8000MHz       | <b>137.0kHz</b> | 200kHz |

Remark: The lowest frequency is 88.12965MHz and the highest frequency is 88.8685MHz.

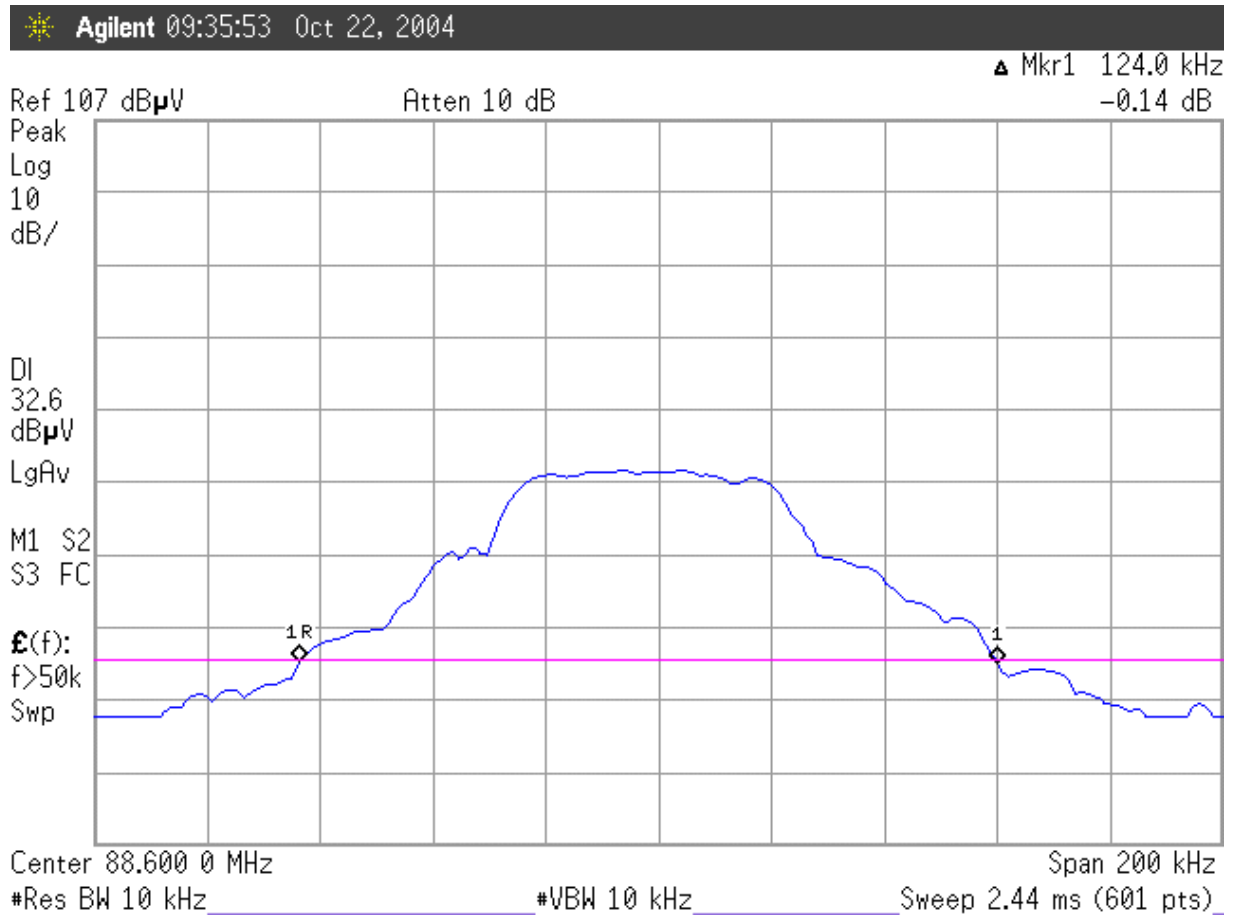
**(Graph of Bandwidth Measurement)**

Center Frequency 88.200MHz, 26dB Bandwidth: 140.7kHz



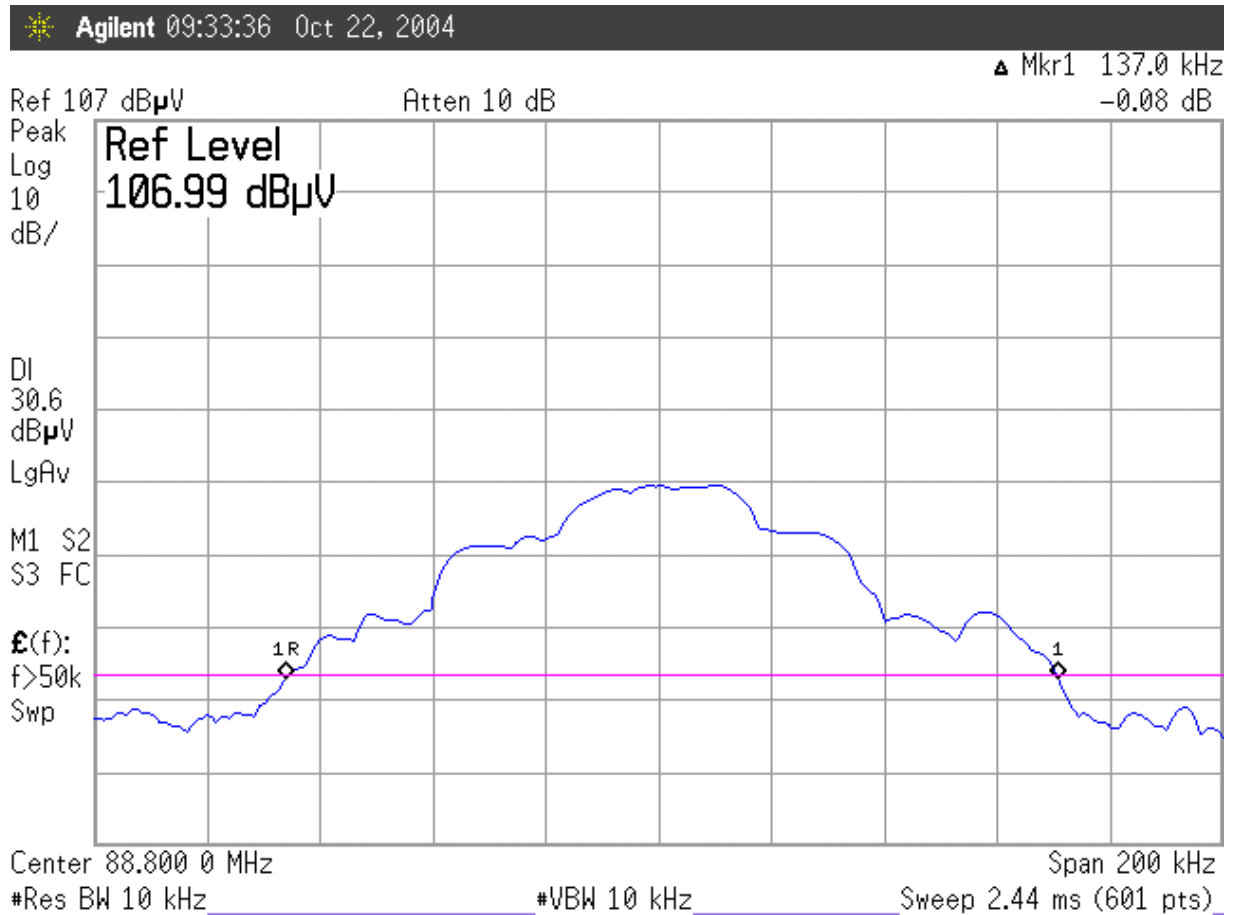
**(Graph of Bandwidth Measurement)**

Center Frequency 88.6000MHz, 26dB Bandwidth: 124.0kHz



**(Graph of Bandwidth Measurement)**

Center Frequency 88.8000MHz, 26dB Bandwidth: 137.0kHz



## **5. DEVIATION TO TEST SPECIFICATIONS**

**【NONE】**

## 6. PHOTOGRAPHS

### 6.1. Photos of Radiated Emission Measurement at Semi-Anechoic Chamber

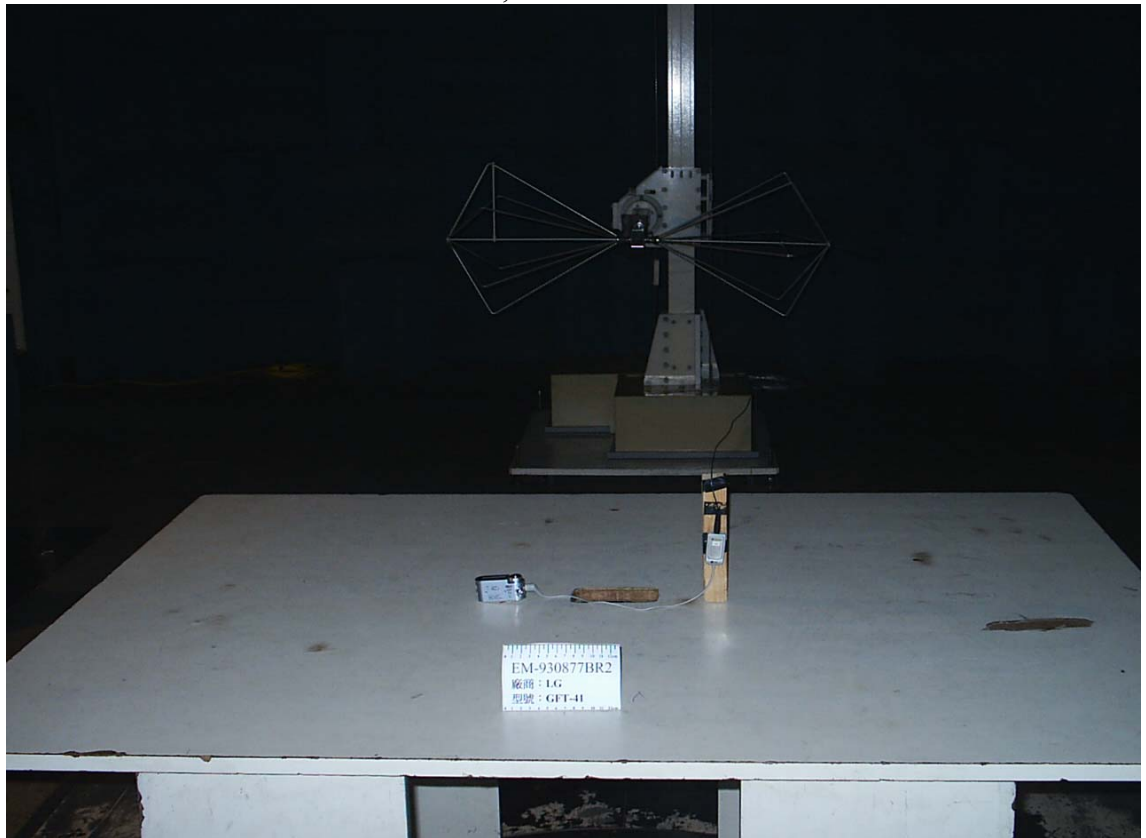
Test Mode: EUT w/FM Antenna, Set On Lie



Test Mode: EUT w/FM Antenna, Set On Side



Test Mode: EUT w/FM Antenna, Set On Stand



## 6.2. Photos of Bandwidth Measurement

