

TEST REPORT FOR CERTIFICATION

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
Technical Division EMC Department
No. 53-11, Tin-Fu Tsun, Lin-Kou,
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File Number : EM930877B
Report Number : EM-F930147
Date of Test : Jul. 30 ~ Aug. 02, 2004
Date of Report : Aug. 03, 2004

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TEST REPORT CERTIFICATION

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, APR. 2004
 AND ANSI C63.4-2001
 (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: Jul. 30 ~ Aug. 02, 2004

Prepared by: Cherry Wang Aug. 03, 2004
 (Cherry Wang/Assistant Manager)

Test Engineer: Ben Cheng Aug. 03, 2004
 (Ben Cheng/Assistant Manager)

Approved & Authorized Signer: Leon Liu Aug. 3 2004
 (Leon Liu/Senior Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	FM Transmitter 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 2000 Millbrook Dr. Lincolnshire, IL 60069, United States
Manufacturer #1	:	Kwang Sung Electronics Co., Ltd. R&D Center World Meridian Venture Center #201, Digital Industrial Complex-2 60-24, Gasam-Dong, Geumcheon-Gu, Seoul 153-801 Korea.
Manufacturer #2	:	Kwang Sung Electronics H.K. Co., Ltd. Unit 8-9, 13/F, Wah Wai Ind. Centre, 38-40 Au Pui Wan St., Fo Tan, N.T., Hong Kong.
Factory	:	Shen Zhen Kwang Sung Electronics Co., Ltd. Shi Tou Hill Industrial Zone, Zhuan Chuang New Village Shi Yan Town, Bao An, 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, Cable: Non-Shielded, Undetachable, 0.9m+0.5m
Date of Receipt of Sample	:	Jul. 27, 2004
Date of Test	:	Jul. 30 ~ Aug. 02, 2004

Remark:

Antenna requirement: This EUT's transmitter antenna is a kind of wire ANT, comply with §15.203 and inform to user that any change and modify is prohibited.

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.
USB Cable	:	Shielded, Detachable, 1.0m Bonded two ferrite cores
Audio Cable	:	Non-Shielded, Detachable, 1.2m

1.2.2. NOTEBOOK PC

Model Number	:	PP2130
Serial Number	:	5Y32KSQZ40ME
FCC ID	:	By DoC
BSMI ID Number	:	3912A556
Brand	:	Compaq Computer Corporation
Manufacturer	:	LG Electronics Ltd.
AC Adapter	:	Compaq, M/N PPP009L (LITE-ON, M/N PA-1650-02C) Cord: Non-Shielded, Undetachable, 1.8m
Power Cord	:	Non-Shielded, Detachable, 1.8m

1.2.3. WALKMAN

Model Number	:	RQ-P35LT-K
Serial Number	:	HA08697
Manufacturer	:	Panasonic

1.3. Description of Test Facility

Name of Firm : **Audix Corporation**
Technical Division EMC Department
 No. 53-11, Tin-Fu Tsun, Lin-Kou Hsiang,
 Taipei Hsien 24443, Taiwan, R.O.C.

Test Location & Facility (C2/AC) : **No.2 Shielded Room**
 No. 53-11, Tin-Fu Tsun, Lin-Kou Hsiang,
 Taipei Hsien 24443, Taiwan, R.O.C.

Semi-Anechoic Chamber
 No. 53-11, Tin-Fu Tsun, Lin-Kou Hsiang,
 Taipei Hsien 24443, Taiwan, R.O.C.

May. 16, 2003 File on
 Federal Communication Commission
 Registration Number: 90993

NVLAP Lab. Code : 200077-0
 (NVLAP is a NATA accredited body under Mutual Recognition Agreement)

1.4. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB), (V/m)
Conduction Test	150kHz~30MHz	± 1.73dB
Radiation Test (Distance: 3m)	30MHz~300MHz	± 2.91dB
	300MHz~1000MHz	± 2.74dB

Remark : Uncertainty = $k_{uc}(y)$

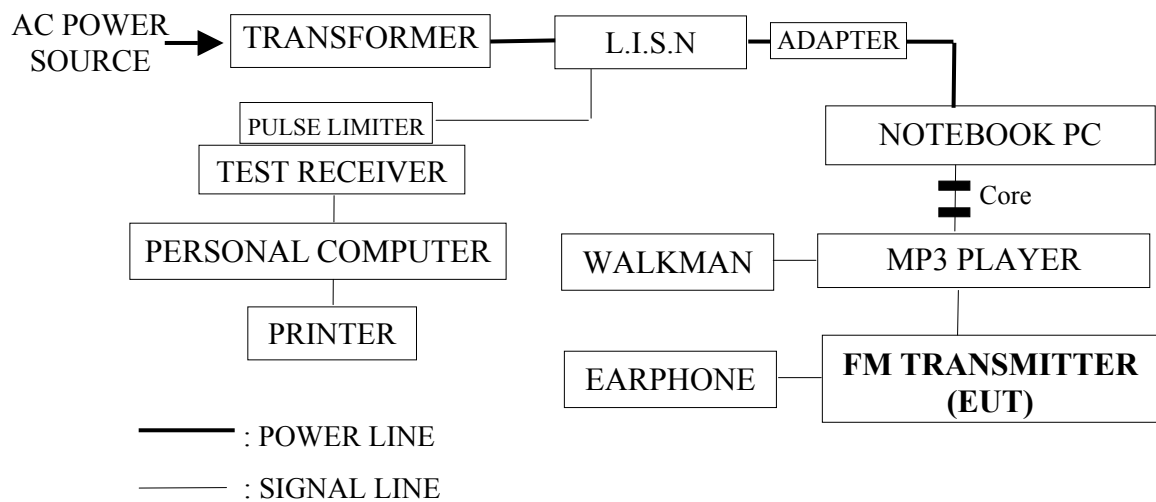
2. POWERLINE CONDUCTED EMISSION MEASUREMENT

2.1. Test Equipment

The following test equipment are used during the power line conducted tests :

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCS 30	100265	Sep. 22, 03'	Sep. 21, 04'
2.	L.I.S.N.	Kyoritsu	KNW-407	8-881-13	Apr. 20, 04'	Apr. 19, 05'
3.	Pulse Limiter	R & S	ESH3-Z2	001	Apr. 28, 04'	Apr. 27, 05'

2.2. Block Diagram of Test Setup



2.3. Conducted Limits (Comply with §15.207)

Frequency	Maximum RF Line Voltage (dBμV)	
	Quasi-Peak Level	Average Level
150kHz ~ 500kHz	66 ~ 56 *	56 ~ 46 *
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

- Remark:
- * Decreases with the logarithm of the frequency.
 - If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary.

2.4. EUT's Configuration during Compliance Measurement

The following equipment was 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.

2.4.1. FM Transmitter (EUT)

Model Number	:	GFT-41
Serial Number	:	N/A
FCC ID	:	BEJFTGFT-41
Manufacturer	:	Kwang Sung Electronics Co., Ltd.
Audio Input Cable	:	Non-Shielded, Undetachable, 0.3m
FM Antenna	:	Detachable, 0.2m
Earphone	:	LG, Cable: Non-Shielded, Undetachable, 0.9m+0.5m

2.4.2. Supporting System : As in Section 1.2.

2.5. Operating Condition of EUT

2.5.1. Setup the EUT and simulator as shown on 2.2.

2.5.2. Turned on the power of all equipment.

2.5.3. The EUT connected to MP3 Player with audio cable, the MP3 Player linked to notebook pc through USB cable, MP3 download music file from notebook pc during all testing.

2.5.4. The other peripheral devices were driven and operated in turn during all testing.

2.6. Test Procedure

The EUT connected to MP3 Player and put on table which was above the ground by 80cm and the Notebook PC's power adapter was connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provided a 50 ohm coupling impedance for the measuring equipment.

Both sides of A.C. line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to FCC ANSI C63.4-2001 on conducted measurement.

The bandwidth of R&S Test Receiver ESCS 30 was set at 9kHz.

The frequency range from 150kHz to 30MHz was checked and using the Peak detector.

The all reading of measurement was with the Quasi-Peak detector and Average detector. (Remark: If the Average limit is met when using a Quasi-Peak detector, the Average detector is unnecessary)

2.7. Test Results

PASSED. Please refer to the following pages.

(All the emissions not reported below are too low against the prescribed limits.)

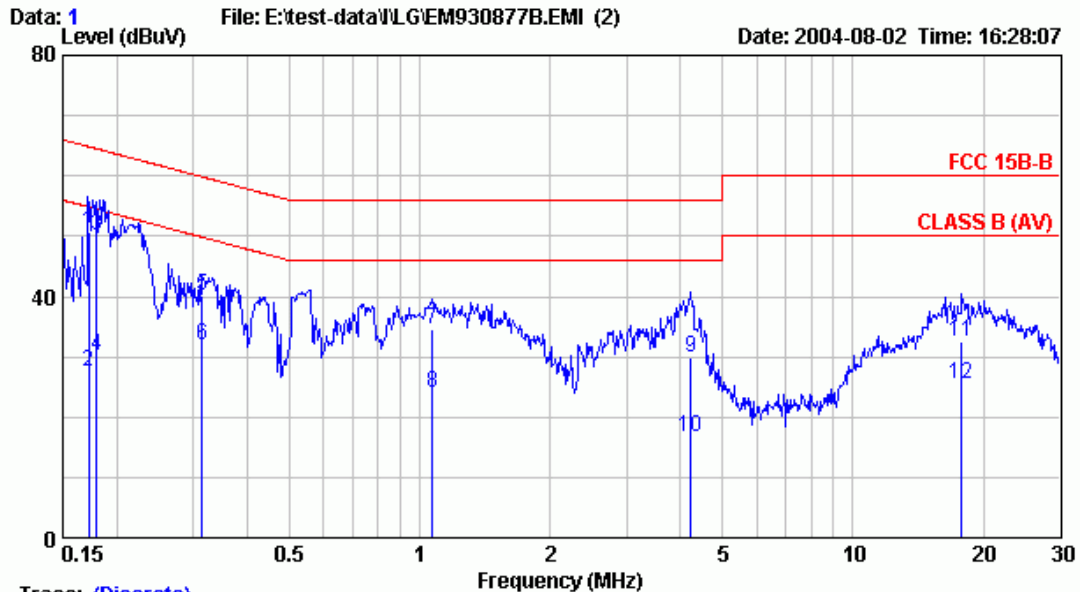
The EUT connected to MP3 Player and through Notebook PC with 120V/60Hz supplying voltage were done during conducted measurement and all the test results are listed in next pages.

(Test Date: Aug. 02, 2004, Temperature: 24°C , Humidity: 59%)

Reference Test Data No.: #1 (Line) & #2 (Neutral).



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Trace: (Discrete)

Site : No.2 Shielded room Data : 1

Condition : ESH2-Z5 Phase : LINE

Limit : FCC 15B-B

Env. / Ins. : 24°C, 59% / ESCS 30 Engineer: Cater Chou

EUT : FM Transmitter M/N:GFT-41

Power Rating : 120Vac/60Hz

Test Mode : PC LINK

		LISN	Cable		Emission				
Freq.	Factor	Loss	Reading	Level	Limits	Margin	Remark		
(MHz)	(dB)	(dB)	(dB μ V)	(dB μ V)	(dB μ V)	(dB)			
1	0.172	0.10	0.25	50.30	50.65	64.84	14.19	QP	@
2	0.172	0.10	0.25	27.08	27.43	54.84	27.41	AVERAGE	
3	0.180	0.10	0.25	49.70	50.05	64.50	14.45	QP	@
4	0.180	0.10	0.25	29.86	30.21	54.50	24.29	AVERAGE	
5	0.315	0.10	0.30	39.67	40.07	59.84	19.77	QP	
6	0.315	0.10	0.30	31.40	31.80	49.84	18.04	AVERAGE	
7	1.070	0.20	0.40	34.10	34.70	56.00	21.30	QP	
8	1.070	0.20	0.40	23.50	24.10	46.00	21.90	AVERAGE	
9	4.220	0.21	0.42	29.41	30.03	56.00	25.97	QP	
10	4.220	0.21	0.42	16.20	16.82	46.00	29.18	AVERAGE	
11	17.850	0.58	0.70	31.22	32.50	60.00	27.50	QP	
12	17.850	0.58	0.70	24.31	25.59	50.00	24.41	AVERAGE	

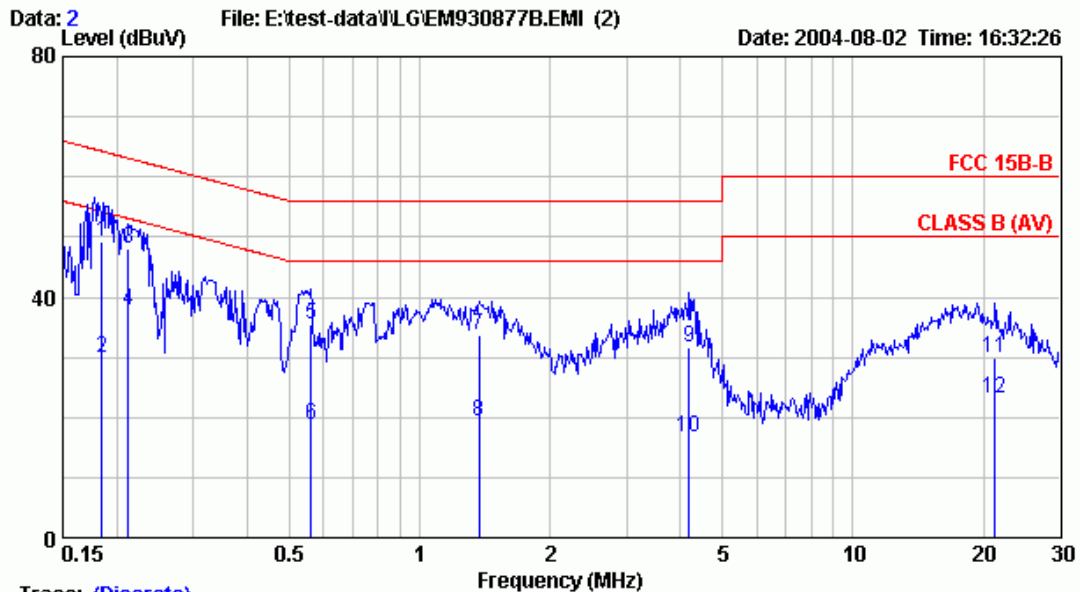
Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.

2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

3. The worst emission was detected at 0.172MHz with corrected signal level of 50.65dB μ V (limit is 64.84dB μ V) when the Line Phase of the Notebook PC's power adapter was connected to LISN.



AUDIX Corp. EMC Laboratory
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Trace: (Discrete)

Site : No.2 Shielded room Data : 2
Condition : ESH2-Z5 Phase : NEUTRAL
Limit : FCC 15B-B
Env. / Ins. : 24°C, 59% / ESCS 30 Engineer: Cater Chou
EUT : FM Transmitter M/N: GFT-41
Power Rating : 120Vac/60Hz
Test Mode : PC LINK

		LISN	Cable		Emission				
Freq.	Factor	Loss	Reading	Level	Limits	Margin	Remark		
(MHz)	(dB)	(dB)	(dB μ V)	(dB μ V)	(dB μ V)	(dB)			
1	0.184	0.10	0.25	48.83	49.18	64.29	15.11	QP	@
2	0.184	0.10	0.25	29.55	29.90	54.29	24.39	AVERAGE	
3	0.213	0.10	0.27	47.58	47.95	63.10	15.15	QP	
4	0.213	0.10	0.27	37.47	37.84	53.10	15.26	AVERAGE	
5	0.561	0.14	0.35	34.93	35.42	56.00	20.58	QP	
6	0.561	0.14	0.35	18.31	18.80	46.00	27.20	AVERAGE	
7	1.370	0.20	0.40	33.16	33.76	56.00	22.24	QP	
8	1.370	0.20	0.40	18.71	19.31	46.00	26.69	AVERAGE	
9	4.180	0.21	0.41	30.97	31.59	56.00	24.41	QP	
10	4.180	0.21	0.41	16.20	16.82	46.00	29.18	AVERAGE	
11	21.260	0.50	0.70	28.74	29.94	60.00	30.06	QP	
12	21.260	0.50	0.70	21.89	23.09	50.00	26.91	AVERAGE	

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.

2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

3. The worst emission was detected at 0.184MHz with corrected signal level of 49.18dB μ V (limit is 64.29dB μ V) when the Neutral Phase of the Notebook PC's power adapter was connected to LISN.

3. RADIATED EMISSION MEASUREMENT

3.1. Test Equipment

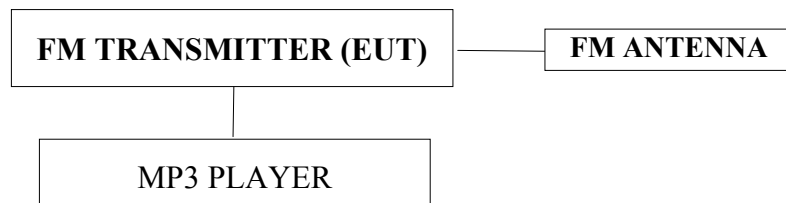
The following test equipment was used during the radiated emission measurement:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8593EM	3826A00248	Sep.24, 03'	Sep.23, 04'
2.	Test Receiver	Rohde & Schwarz	ESCS30	100265	Sep. 22, 03'	Sep. 21, 04'
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'

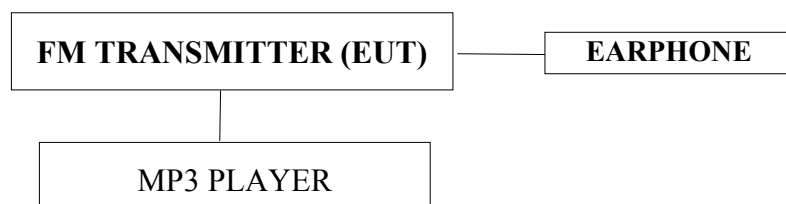
3.2. Test Setup

3.2.1. Block Diagram of connection between EUT and simulators

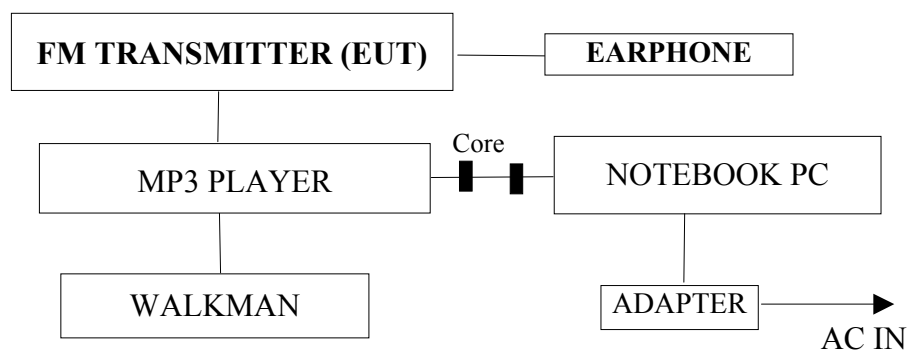
3.2.1.1. Transmitting Mode w/FM ANT (FM 88.2MHz, 88.4MHz, 88.8MHz)



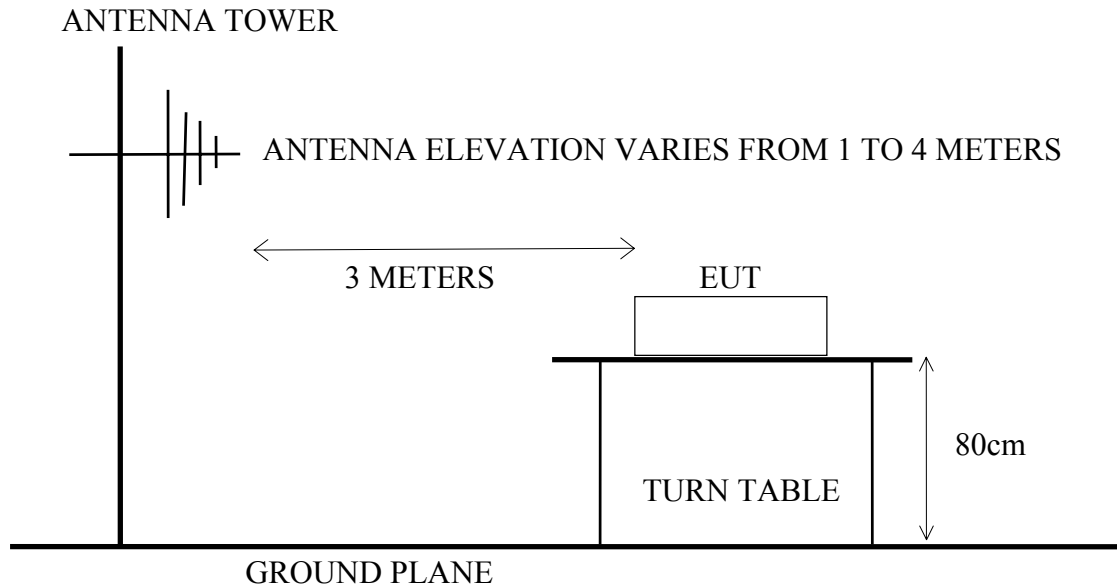
3.2.1.2. Transmitting Mode w/Earphone (FM 88.8MHz)



3.2.1.3. MP3 Player Link PC Mode (MP3 Download)



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 MHz	DISTANCE Meters	FIELD STRENGTHS LIMITS	
		$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
Fundamental Freq.	3	250	48.0 (Average)
		---	68.0 (Peak) ^{*(2)}

Remark : (1) Emission level ($\text{dB}\mu\text{V/m}$) = 20 log Emission level ($\mu\text{V/m}$)
 (2) The provision in section 15.35 for limiting peak emission apply.

3.3.2. §15.209 Radiated Emission Limits (Spurious Frequency)

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMITS	
		$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
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 ($\text{dB}\mu\text{V/m}$) = 20 log Emission level ($\mu\text{V/m}$)
 (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.
Transmitted Frequency	:	88.2MHz~88.8MHz (FM)
Audio Input Cable	:	Non-Shielded, Undetachable, 0.3cm
FM Antenna	:	Detachable, 0.2m
Earphone	:	LG, Cable: Non-Shielded, Undetachable, 0.9m+0.5m

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 set the transmitting frequency tune in to 88.2MHz 、 88.4MHz 、 88.8MHz to measure field strength.
- 3.5.4. The EUT connected to MP3 Player with audio cable, the MP3 Player linked to notebook pc through USB cable, MP3 download music file from notebook pc during all testing.
- 3.5.5. The other peripheral devices were driven and operated in turn during all 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 C63.4-2001 regulation.

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

The frequency range from 30MHz to 1000MHz was checked.

EUT with the worst operating conduction 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 88.4MHz w/FM Antenna, EUT set on Lie	
5.	Transmitting FM Radio Frequency 88.8MHz w/FM Antenna, EUT set on Lie	
6.	Transmitting FM Radio Frequency 88.8MHz w/Earphone, EUT set on Lie	DC Battery 1.5V
7.	EUT connected to MP3 Player, MP3 Player Link PC Mode (MP3 Download)	AC 120V/60Hz Via Adapter of PC

3.7. Radiated Emission Noise Measurement Results

PASSED. Please refer to the following pages.

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

Date of Test : Aug. 02, 2004 Temperature : 21°C

EUT : FM Transmitter Humidity : 64%

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

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Reading Horizontal dB μ V	Emission Level Horizontal dB μ V/m	Limits dB μ V/m	Margin dB

Fundamental Freq. (Average Value)						
88.201	15.57	2.00	22.67	40.24	48.00	7.76
Fundamental Freq. (Peak Value)						
88.201	15.57	2.00	24.65	42.22	68.00	25.78
Spurious Freq. (Quasi-Peak Value)						
176.400	21.24	2.90	2.34	26.48	43.50	17.02
264.600	24.62	3.70	3.52	31.84	46.00	14.16
352.800	15.61	4.30	7.64	27.55	46.00	18.45
441.009	17.63	5.30	-0.04	22.89	46.00	23.11
632.370	20.95	6.40	2.71	30.06	46.00	15.94
658.560	22.21	6.40	2.55	31.16	46.00	14.84
865.170	26.00	7.20	-0.03	33.17	46.00	12.83
963.140	26.63	7.60	-0.03	34.20	54.00	19.80

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

Date of Test : Aug. 02, 2004 Temperature : 21°C

EUT : FM Transmitter Humidity : 64%

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

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB

Fundamental Freq. (Average Value)						
88.201	15.65	2.00	16.31	33.96	48.00	14.04
Fundamental Freq. (Peak Value)						
88.201	15.65	2.00	18.58	36.23	68.00	31.77
Spurious Freq. (Quasi-Peak Value)						
176.400	21.40	2.90	0.40	24.70	43.50	18.80
199.750	22.86	3.00	1.31	27.17	43.50	16.33
264.600	25.27	3.67	0.79	29.73	46.00	16.27
441.000	17.08	4.90	0.80	22.78	46.00	23.22
521.790	20.65	6.90	3.01	30.56	46.00	15.44
634.310	21.13	6.30	1.05	28.48	46.00	17.52
687.660	23.56	6.50	-0.06	30.00	46.00	16.00
835.100	26.32	7.10	-2.40	31.02	46.00	14.98

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

Date of Test : Aug. 02, 2004 Temperature : 21°C

EUT : FM Transmitter Humidity : 64%

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

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Limits dBμV/m	Margin dB

Fundamental Freq. (Average Value)						
88.201	15.57	2.00	20.47	38.04	48.00	9.96
Fundamental Freq. (Peak Value)						
88.201	15.57	2.00	22.68	40.25	68.00	27.75
Spurious Freq. (Quasi-Peak Value)						
176.402	21.24	2.90	2.47	26.61	43.50	16.89
264.602	24.62	3.70	3.93	32.25	46.00	13.75
352.801	15.64	4.30	6.05	25.99	46.00	20.01
441.002	17.62	5.33	0.07	23.02	46.00	22.98
616.850	21.31	6.30	3.51	31.12	46.00	14.88
656.620	22.09	6.40	2.91	31.41	46.00	14.59
863.230	26.09	7.20	-0.53	32.76	46.00	13.24
966.050	26.89	7.70	-0.35	34.25	54.00	19.75

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

Date of Test : Aug. 02, 2004 Temperature : 21°C

EUT : FM Transmitter Humidity : 64%

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

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB

Fundamental Freq. (Average Value)						
88.201	15.65	2.00	16.30	33.95	48.00	14.05
Fundamental Freq. (Peak Value)						
88.201	15.65	2.00	18.74	36.39	68.00	31.61
Spurious Freq. (Quasi-Peak Value)						
176.400	21.40	2.90	0.98	25.28	43.50	18.22
197.810	22.65	3.00	2.28	27.94	43.50	15.56
287.050	26.27	3.80	0.38	30.45	46.00	15.55
397.630	17.67	4.80	-0.38	22.09	46.00	23.91
521.790	20.65	6.90	-0.01	27.54	46.00	18.46
639.160	21.22	6.28	0.25	27.75	46.00	18.25
787.570	25.44	6.90	-0.65	31.69	46.00	14.31
845.770	26.61	7.10	-2.66	31.06	46.00	14.94

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

Date of Test : Aug. 02, 2004 Temperature : 21°C

EUT : FM Transmitter Humidity : 64%

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

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Limits dBμV/m	Margin dB

Fundamental Freq. (Average Value)						
88.201	15.57	2.00	18.66	36.23	48.00	11.77
Fundamental Freq. (Peak Value)						
88.201	15.57	2.00	20.99	38.56	68.00	29.44
Spurious Freq. (Quasi-Peak Value)						
176.400	21.24	2.90	2.78	26.92	43.50	16.58
264.601	24.62	3.70	3.91	32.23	46.00	13.77
352.800	15.64	4.30	3.83	23.77	46.00	22.23
441.001	17.63	5.30	-0.51	22.42	46.00	23.58
619.760	21.35	6.20	1.91	29.46	46.00	16.54
698.330	23.36	6.50	1.07	30.93	46.00	15.07
863.230	26.09	7.20	-1.23	32.05	46.00	13.95
954.410	26.15	7.60	0.11	33.86	46.00	12.14

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

Date of Test : Aug. 02, 2004 Temperature : 21°C

EUT : FM Transmitter Humidity : 64%

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

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB

Fundamental Freq. (Average Value)						
88.201	15.65	2.00	14.77	32.42	48.00	15.58
Fundamental Freq. (Peak Value)						
88.201	15.65	2.00	17.78	35.43	68.00	32.57
Spurious Freq. (Quasi-Peak Value)						
131.850	18.94	2.40	4.67	26.01	43.50	17.49
247.280	24.78	3.50	0.73	29.01	46.00	16.99
353.980	15.84	4.30	3.76	23.91	46.00	22.09
474.260	19.11	5.85	0.27	25.23	46.00	20.77
676.990	23.38	6.40	-0.09	29.70	46.00	16.30
840.920	26.62	7.10	-3.63	30.09	46.00	15.91
943.740	26.96	7.50	-3.78	30.68	46.00	15.32
959.260	27.16	7.60	-3.72	31.04	46.00	14.96

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

Date of Test : Aug. 02, 2004 Temperature : 21°C

EUT : FM Transmitter Humidity : 64%

Test Mode 4 : EUT w/FM Antenna, Set On Lie
(Transmitting FM Radio Frequency 88.4MHz)

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Limits dBμV/m	Margin dB

Fundamental Freq. (Average Value)						
88.401	15.57	2.00	21.08	38.65	48.00	9.35
Fundamental Freq. (Peak Value)						
88.401	15.57	2.00	23.62	41.19	68.00	26.81
Spurious Freq. (Quasi-Peak Value)						
176.800	21.24	2.90	2.75	26.89	43.50	16.61
265.200	24.67	3.70	3.51	31.88	46.00	14.12
353.600	15.64	4.30	7.55	27.49	46.00	18.51
453.890	17.70	5.50	1.56	24.76	46.00	21.25
539.250	19.34	7.10	1.65	28.10	46.00	17.90
808.910	24.13	7.00	0.59	31.72	46.00	14.28
867.110	25.92	7.20	-0.27	32.84	46.00	13.16
964.110	26.80	7.60	1.99	36.39	54.00	17.61

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

Date of Test : Aug. 02, 2004 Temperature : 21°C

EUT : FM Transmitter Humidity : 64%

Test Mode 4 : EUT w/FM Antenna, Set On Lie
(Transmitting FM Radio Frequency 88.4MHz)

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB

Fundamental Freq. (Average Value)						
88.401	15.65	2.00	17.01	34.66	48.00	13.34
Fundamental Freq. (Peak Value)						
88.401	15.65	2.00	19.72	37.37	68.00	30.63
Spurious Freq. (Quasi-Peak Value)						
176.800	21.28	2.90	0.62	24.80	43.50	18.70
278.320	25.94	3.80	0.56	30.30	46.00	15.70
513.060	20.92	6.80	0.36	28.08	46.00	17.92
674.080	23.16	6.40	-0.14	29.42	46.00	16.58
781.750	25.37	6.90	-0.33	31.94	46.00	14.06
842.860	26.62	7.10	-1.25	32.46	46.00	13.54
887.480	25.68	7.30	-0.09	32.89	46.00	13.11
948.590	27.09	7.50	-1.93	32.65	46.00	13.35

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

Date of Test : Aug. 02, 2004 Temperature : 21°C

EUT : FM Transmitter Humidity : 64%

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

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Limits dBμV/m	Margin dB

Fundamental Freq. (Average Value)						
88.801	15.57	2.00	21.39	38.96	48.00	9.04
Fundamental Freq. (Peak Value)						
88.801	15.57	2.00	23.73	41.30	68.00	26.70
Spurious Freq. (Quasi-Peak Value)						
177.600	21.28	2.90	2.47	26.65	43.50	16.85
266.401	24.74	3.70	2.90	31.34	46.00	14.66
355.202	15.69	4.37	9.26	29.32	46.00	16.68
455.830	17.75	5.50	0.63	23.88	46.00	22.12
669.230	22.82	6.40	1.88	31.10	46.00	14.90
761.380	23.68	6.70	0.17	30.55	46.00	15.45
858.380	25.98	7.20	-0.84	32.33	46.00	13.67
967.990	26.90	7.69	-0.51	34.08	54.00	19.92

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

Date of Test : Aug. 02, 2004 Temperature : 21°C

EUT : FM Transmitter Humidity : 64%

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

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB

Fundamental Freq. (Average Value)						
88.801	15.65	2.00	16.91	34.56	48.00	13.44
Fundamental Freq. (Peak Value)						
88.801	15.65	2.00	18.95	36.60	68.00	31.40
Spurious Freq. (Quasi-Peak Value)						
142.520	20.58	2.50	3.79	26.86	43.50	16.64
206.540	22.09	3.10	3.94	29.12	43.50	14.38
479.110	18.96	6.00	-0.21	24.75	46.00	21.25
551.860	21.66	6.80	-0.26	28.21	46.00	17.79
676.990	23.38	6.40	-0.67	29.12	46.00	16.88
750.710	24.50	6.70	0.42	31.62	46.00	14.38
891.360	25.79	7.30	-0.41	32.69	46.00	13.31
957.320	27.16	7.60	-2.23	32.52	46.00	13.48

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

Date of Test : Aug. 02, 2004 Temperature : 21°C

EUT : FM Transmitter Humidity : 64%

Test Mode 6 : EUT w/Earphone, Set On Lie
(Transmitting FM Radio Frequency 88.8MHz)

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Limits dBμV/m	Margin dB

Fundamental Freq. (Average Value)						
88.801	15.57	2.00	27.73	45.30	48.00	2.70
Fundamental Freq. (Peak Value)						
88.801	15.57	2.00	30.00	47.57	68.00	20.43
Spurious Freq. (Quasi-Peak Value)						
177.601	21.28	2.90	7.70	31.88	43.50	11.62
266.400	24.74	3.70	3.71	32.15	46.00	13.85
375.320	17.15	4.60	-0.17	21.57	46.00	24.43
519.850	19.99	6.90	-0.37	26.52	46.00	19.48
704.150	23.56	6.60	0.12	30.28	46.00	15.72
777.870	24.18	6.80	-0.03	30.96	46.00	15.04
861.290	26.09	7.20	-0.29	33.00	46.00	13.00
966.050	26.89	7.70	-0.19	34.41	54.00	19.59

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

Date of Test : Aug. 02, 2004 Temperature : 21°C

EUT : FM Transmitter Humidity : 64%

Test Mode 6 : EUT w/Earphone, Set On Lie
(Transmitting FM Radio Frequency 88.8MHz)

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB

Fundamental Freq. (Average Value)						
88.801	15.65	2.00	20.01	37.66	48.00	10.34
Fundamental Freq. (Peak Value)						
88.801	15.65	2.00	22.75	40.40	68.00	27.60
Spurious Freq. (Quasi-Peak Value)						
177.601	21.00	2.90	3.43	27.33	43.50	16.17
266.402	25.62	3.70	0.06	29.38	46.00	16.62
398.600	17.65	4.80	-0.42	22.03	46.00	23.97
602.300	21.68	6.30	2.07	30.05	46.00	15.95
680.870	23.52	6.47	1.90	31.89	46.00	14.11
848.680	26.54	7.10	-0.21	33.43	46.00	12.57
906.880	25.75	7.40	0.18	33.33	46.00	12.67
964.110	27.10	7.60	-0.22	34.48	54.00	19.52

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

Date of Test : Jul. 30, 2004 Temperature : 20°C

EUT : FM Transmitter Humidity : 51%

Test Mode 7 : EUT connected to MP3 Player, MP3 Player Link PC Mode (MP3 Download)

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Limits dBμV/m	Margin dB
133.790	19.23	2.40	9.37	31.00	43.50	12.50
269.590	25.91	3.70	3.83	33.43	46.00	12.57
294.810	26.43	3.99	3.95	34.37	46.00	11.63
352.040	15.78	4.30	12.91	32.99	46.00	13.01
399.570	17.61	4.80	10.34	32.75	46.00	13.25
530.520	20.19	6.90	6.00	33.09	46.00	12.91
667.290	22.62	6.40	9.79	38.81	46.00	7.19
802.120	24.71	6.90	12.47	44.08	46.00	1.92
935.980	26.53	7.50	10.62	44.65	46.00	1.35
998.060	26.27	7.80	5.28	39.35	54.00	14.65

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.
 3. The all reading are Quasi-Peak value.

Date of Test : Jul. 30, 2004 Temperature : 20°C

EUT : FM Transmitter Humidity : 51%

Test Mode 7 : EUT connected to MP3 Player, MP3 Player Link PC Mode
(MP3 Download)

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB
133.790	19.89	2.40	6.97	29.27	43.50	14.23
158.040	20.74	2.70	7.25	30.69	43.50	12.81
272.500	25.10	3.70	8.96	37.76	46.00	8.24
352.040	15.55	4.30	11.66	31.52	46.00	14.48
399.570	17.69	4.80	10.98	33.46	46.00	12.54
602.300	21.37	6.30	4.78	32.45	46.00	13.55
667.290	22.80	6.40	9.87	39.07	46.00	6.93
704.150	23.56	6.60	10.77	40.93	46.00	5.07
802.120	24.17	6.90	8.88	39.95	46.00	6.05
935.010	25.42	7.50	8.06	40.99	46.00	5.01

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.
 3. The all reading are Quasi-Peak value.

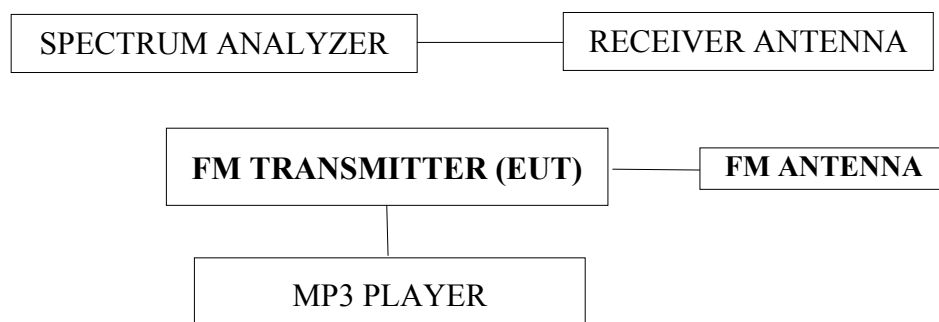
4. 26dB BANDWIDTH MEASUREMENT

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	HP	8564EC	3946A00249	Aug.28, 03'	Aug.27. 04'

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 88.1-88.8MHz.

4.4. EUT's Configuration during Compliance Measurement

The configuration of EUT were same as section 2.4.

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)

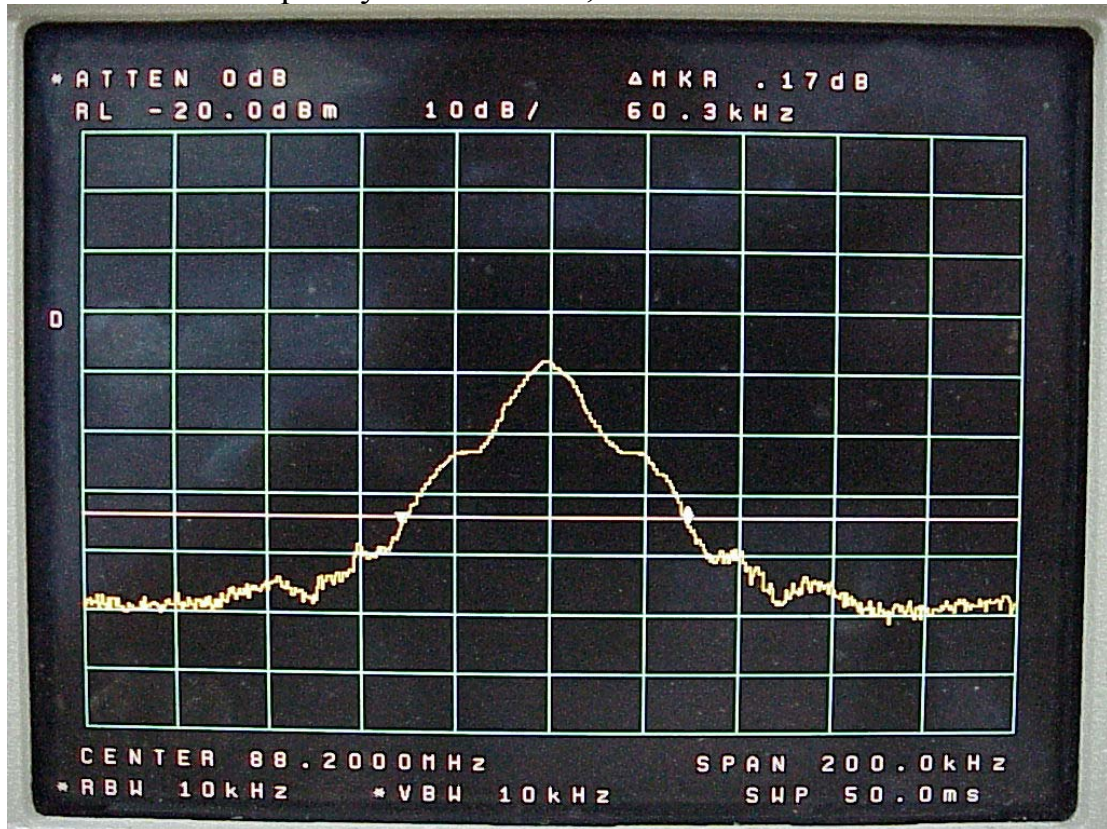
Date of Test: Aug. 02, 2004 Temperature : 22°C Humidity : 60%

Mode	Center Frequency	26dB Bandwidth	Limits
1.	88.2000MHz	60.3kHz	200kHz
2.	88.4000MHz	63.7kHz	200kHz
3.	88.8000MHz	59.0kHz	200kHz

Remark: The lowest frequency is 88.1698MHz and the highest frequency is 88.8295MHz.

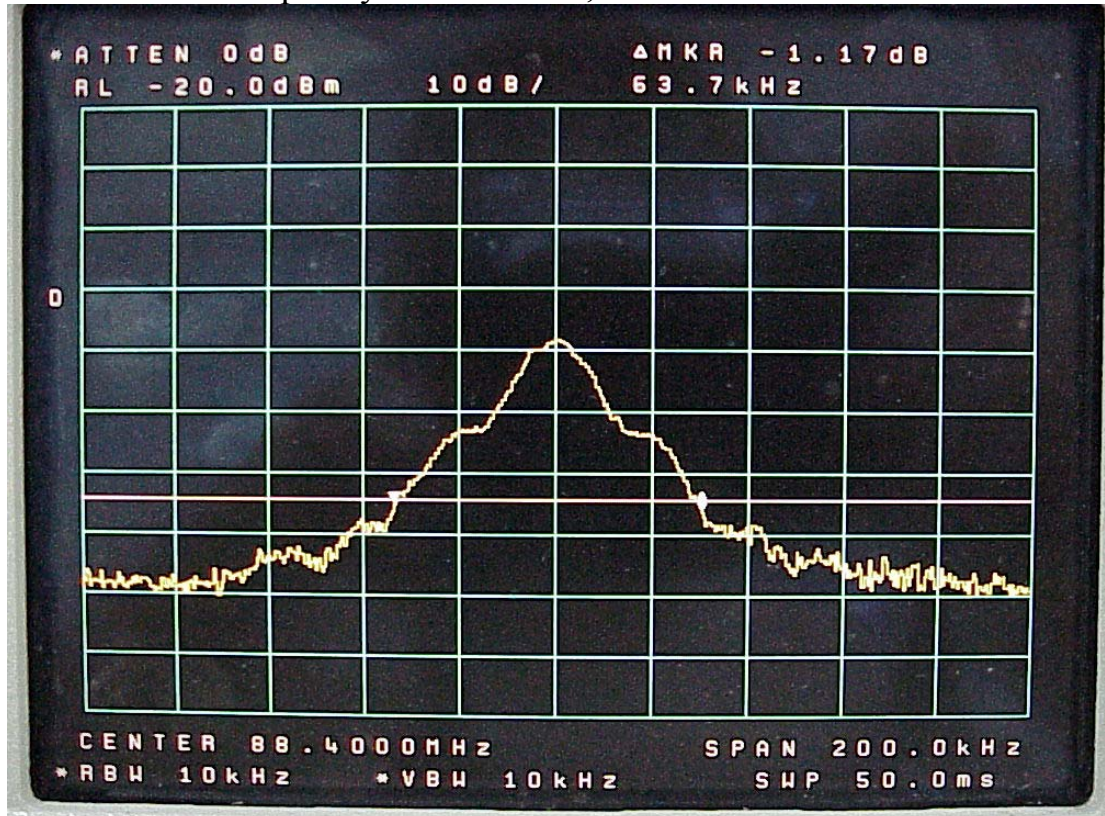
(Graph of Bandwidth Measurement)

Center Frequency 88.2000MHz, 26dB Bandwidth: 60.3kHz



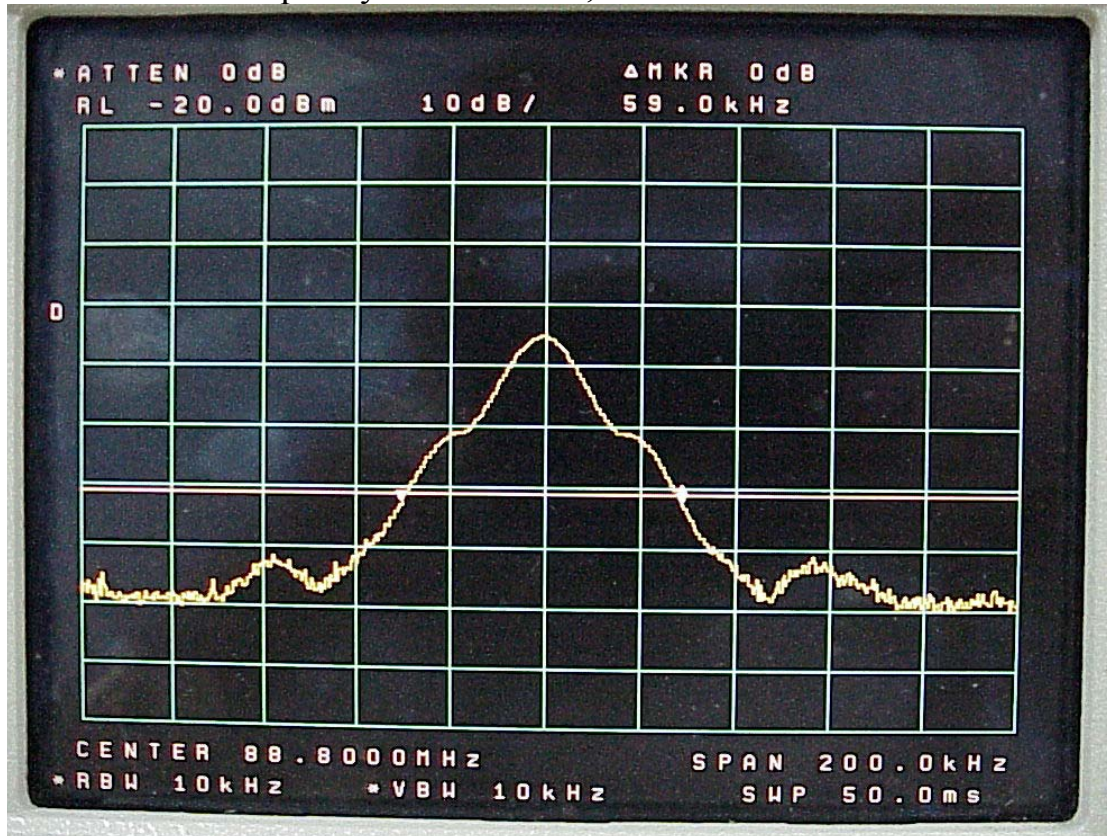
(Graph of Bandwidth Measurement)

Center Frequency 88.4000MHz, 26dB Bandwidth: 63.7kHz



(Graph of Bandwidth Measurement)

Center Frequency 88.8000MHz, 26dB Bandwidth: 59.0kHz



5. DEVIATION TO TEST SPECIFICATIONS

【NONE】