

TEST REPORT FOR CERTIFICATION

On Behalf of

Jow Tong Technology Co., Ltd.

Multi-Player

Model No. : ST-28

FCC ID : QPRST28

Prepared for : Jow Tong Technology Co., Ltd.
46, Lane 337, Chung Cheng Rd., Yung Kang,
Tainan Hsien 710, Taiwan, R.O.C.

Prepared by : Audix Corporation
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No. 53-11, Tin-Fu Tsun, Lin-Kou,
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TEST REPORT CERTIFICATION

Applicant : Jow Tong Technology Co., Ltd.

Manufacturer : Jow Tong Technology Co., Ltd.

EUT Description : Multi-Player

FCC ID : QPRST28

(A) MODEL NO. : ST-28

(B) SERIAL NO. : N/A

(C) POWER SUPPLY : DC +5V/1A

Measurement Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART B & C, DEC. 2003
AND FCC / ANSI C63.4-2001

(Transmitter Unit with FCC CFR 47 Part 15C, §15.203, §15.207, §15.209 and §15.239)
(Computing Peripheral with FCC CFR 47 Part 15B, §15.107 and §15.109)

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 & B limits both radiated and conducted emissions, and FCC Part 15 subpart C requirements.

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 and requirement.

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: Apr. 01 ~ 26, 2004

Prepared by: Cherry Wang May 04, 2004
(Cherry Wang/Assistant Manager)

Test Engineer: Ben Cheng May. 05. 2004
(Ben Cheng/Assistant Manager)

Approved & Authorized Signer: Leon Liu May. 5 2004
(Leon Liu/Assistant General Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	Multi-Player This device is with a FM transmitter module and with USB desktop link the PC to transmit or store the data to/from the USB storage device, and through the cradle holder & saver charger to transmit music signal that can accept by Car radio FM band.
Model Number	:	ST-28
FCC ID	:	QPRST28
Applicant	:	Jow Tong Technology Co., Ltd. 46, Lane 337, Chung Cheng Rd., Yung Kang, Tainan Hsien 710, Taiwan, R.O.C.
Manufacturer	:	Jow Tong Technology Co., Ltd. 46, Lane 337, Chung Cheng Rd., Yung Kang, Tainan Hsien 710, Taiwan, R.O.C.
Fundamental Frequency	:	Output FM Frequency Range: 88.1MHz~107.9MHz
Radio Frequency Adjustment	:	0.2MHz / Per Step.
Input Voltage	:	DC +5V/1A (Max.)
Accessories are as follows:		
1. Desktop (USB Docking)	:	Jow Tong DC 100~240V, 5V/1A
2. Travel Charger	:	Jow Tong Input: AC 100~240V Output: DC 5V, 1A DC Cord: Non-Shielded, Undetachable, 1.3m Added a ferrite core
3. USB Cable (Link to PC)	:	Shielded, Detachable, 1.2m Bonded a ferrite core

4. Earphone	:	Non-Shielded, 1.0m Added a ferrite core
5. Power Bank	:	Jow Tong AC 100~240V, DC 5V/1A
6. Desktop Speaker	:	Jow Tong AC 100~240V, DC 12V/1A AC Adapter: Model: WP121000DV Input: 120VAC 60Hz Output: 12VDC 1000mA DC Cord: Non-Shielded, Undetachable, 1.6m Added a ferrite core
7. Saver Charge for Car	:	Jow Tong 13.5V
8. Cradle Holder for Car	:	Jow Tong Vehicle 16V~24V
Date of Receipt of Sample	:	Apr. 01, 2004
Date of Test	:	Apr. 01 ~ 26, 2004

Remark:

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

1.2. Tested Supporting System Details

1.2.1. USB FLASH MEMORY STICK (128MB)

Model Number	:	N/A
Serial Number	:	N/A
Supporter	:	Jow Tong

1.2.2. DC POWER SUPPLY (DC 12V, FOR RADIATED MEASUREMENT)

Model Number	:	3303A
Serial Number	:	N/A
Manufacturer	:	Topward
Power Wire (to EUT)	:	Non-Shielded, Detachable, 0.8m *2
Power Cord	:	Non-Shielded, Detachable, 1.8m

1.2.3. NOTEBOOK PC

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

1.2.4. 15" LCD MONITOR

Model Number	:	D5063
Serial Number	:	CN206A6568
FCC ID	:	By DoC
BSMI ID	:	R33037
Manufacturer	:	Top Victory Electronics (Fujian) Co., Ltd.
Data Cable (D-Sub)	:	Shielded, Detachable, 1.8m Bonded two ferrite cores
AC Adapter	:	Delta, M/N ADP-40TB BSMI ID 3892D142 Cord: Shielded, Undetachable, 1.8m Bonded a ferrite core
Power Cord	:	Non-Shielded, Detachable, 1.8m

1.2.5. DOT MATRIX PRINTER

Model Number	:	KX-P2135
Serial Number	:	8DMCNC02116
FCC ID	:	ACJ5Z6KX-P2135
BSMI ID	:	3872A371
Manufacturer	:	Matsushita (Brand: Panasonic)
Data Cable	:	Shielded, Detachable, 1.5m
Power Cord	:	Non-Shielded, Undetachable, 1.8m

1.2.6. USB MOUSE

Model Number	:	MINI 801 USB
Serial Number	:	CE2300400743
FCC ID	:	By DoC
BSMI ID	:	3892B623
Manufacturer	:	GENIUS (Brand: LEMEL)
Data Cable	:	Shielded, Undetachable, 1.0m

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)

DAR-Registration No. : DAT-P-145/03-01

1.4. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Conduction Test	150kHz~30MHz	±2.66dB
Radiation Test (Distance: 3m)	30MHz~300MHz	+4.26dB / -4.22dB
	300MHz~1000MHz	+5.28dB / -4.0dB

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

2. POWERLINE CONDUCTED EMISSION MEASUREMENT

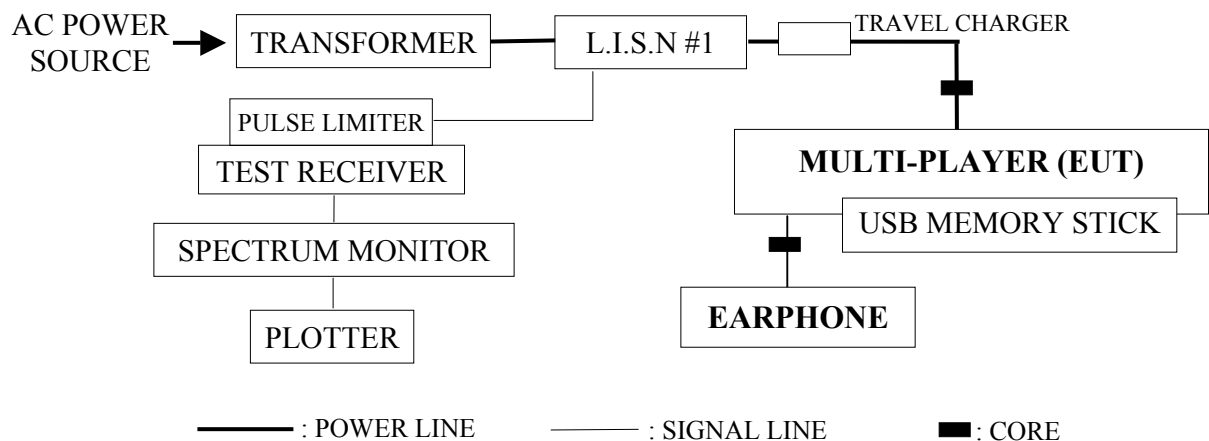
2.1. Test Equipment

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

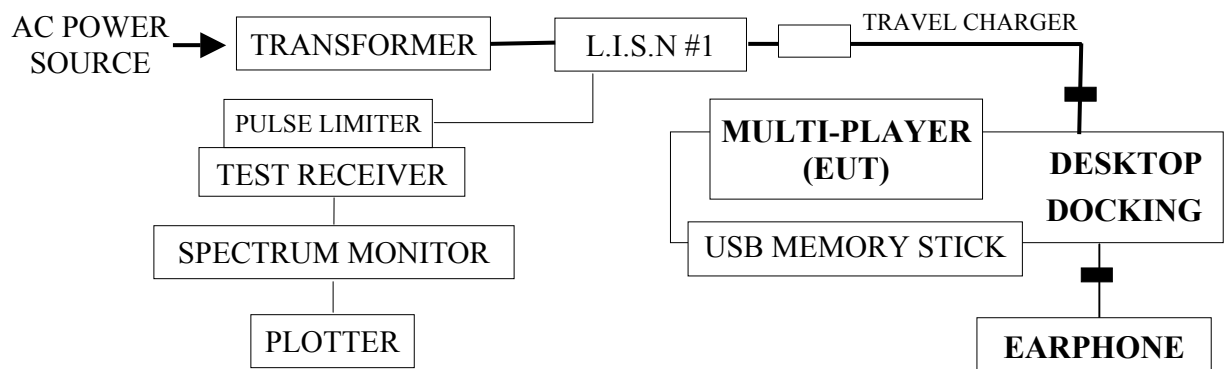
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Monitor	R & S	EZM-B2	860935/018	N/A	N/A
2.	Test Receiver	R & S	ESH3	893044/015	Jul. 05, 03'	Jul. 04, 04'
3.	L.I.S.N. #1	Kyoritsu	KNW-407	8-1539-3	Nov.15, 03'	Nov.14, 04'
4.	L.I.S.N. #2	Kyoritsu	KNW-407	8-1539-2	Nov.15, 03'	Nov.14, 04'
5.	Pulse Limiter	R & S	ESH3-Z2	003	Jun. 18, 03'	Jun. 17, 04'

2.2. Block Diagram of Test Setup

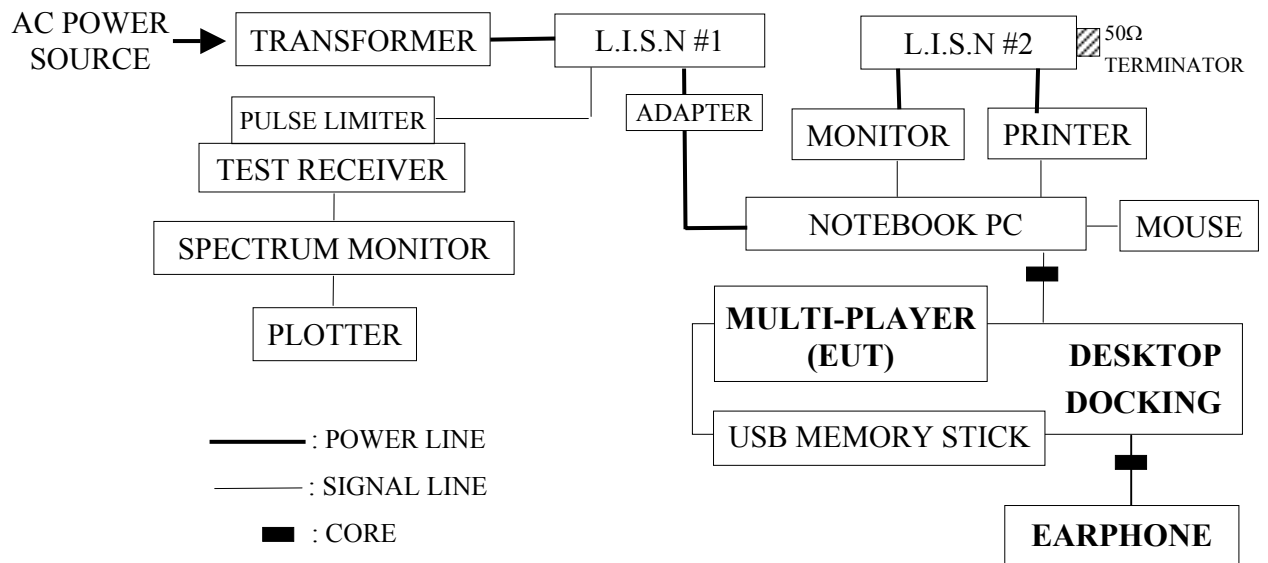
2.2.1. EUT on Stand-Alone, Power with Travel Charger



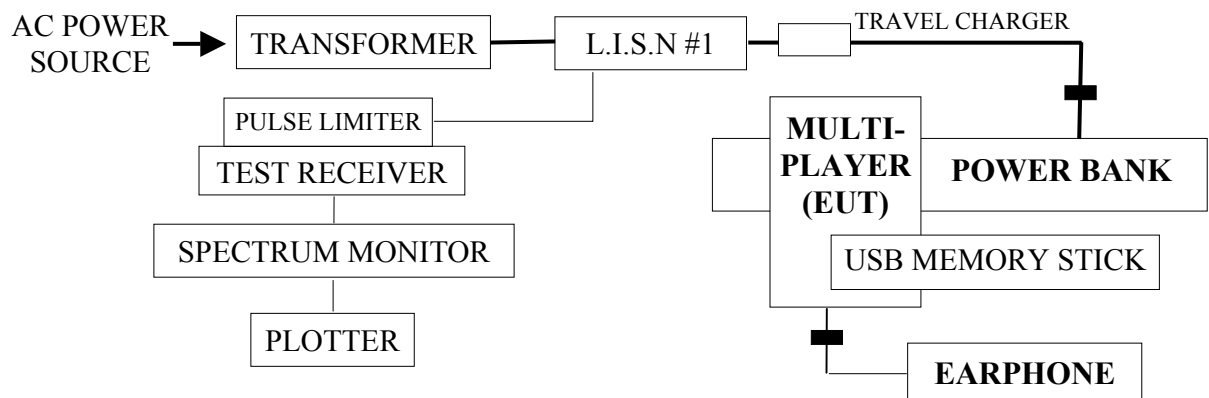
2.2.2. EUT with Desktop, Power with Travel Charger of Desktop



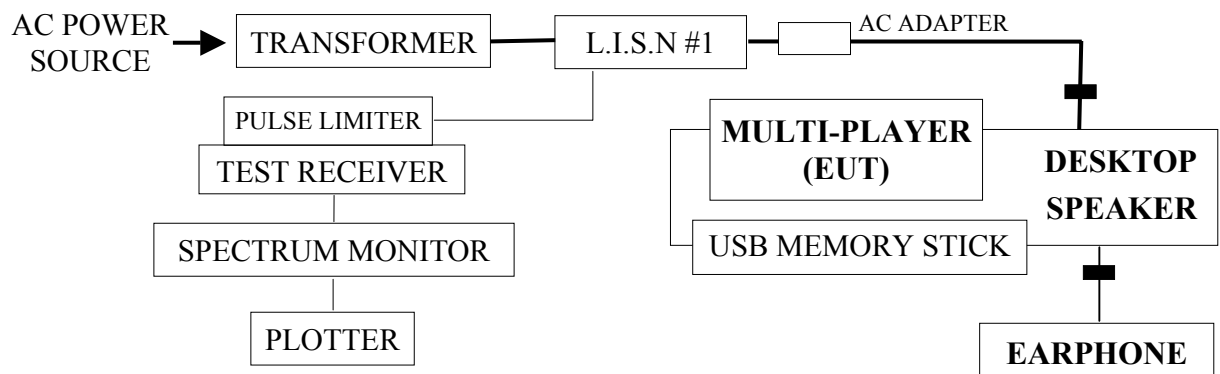
2.2.3. EUT with Desktop and Link to PC, Power with USB Port from PC



2.2.4. EUT with Power Bank, Power with Travel Charger of Power Bank



2.2.5. EUT with Desktop Speaker, Power with AC Adapter of Desktop Speaker



2.3. Conducted Limits (§15.207, §15.107 Class B)

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

- Remark:
1. * Decreases with the logarithm of the frequency.
 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 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. Multi-Player (EUT)

- | | | |
|-----------------------------|---|---|
| Model Number | : | ST-28 |
| Serial Number | : | N/A |
| FCC ID | : | QPRST28 |
| Manufacturer | : | Jow Tong Technology Co., Ltd. |
| Accessories are as follows: | | |
| 1. Desktop (USB Docking) | : | Jow Tong
DC 100~240V, 5V/1A |
| 2. Travel Charger | : | Jow Tong
Input: AC 100~240V
Output: DC 5V, 1A
DC Cord: Non-Shielded, Undetachable, 1.3m
Added a ferrite core |
| 3. USB Cable (link to PC) | : | Shielded, Detachable, 1.2m
Bonded a ferrite core |
| 4. Earphone | : | Non-Shielded, 1.0m
Added a ferrite core |
| 5. Power Bank | : | Jow Tong
AC 100~240V, DC 5V/1A |
| 6. Desktop Speaker | : | Jow Tong
AC 100~240V, DC 12V/1A
AC Adapter:
Model: WP121000DV
Input: 120VAC 60Hz
Output: 12VDC 1000mA
DC Cord: Non-Shielded, Undetachable, 1.6m
Added a ferrite core |

- 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. For EUT on Stand-Alone Mode: The EUT with USB flash memory stick and set the FM radio frequency on 88.1MHz to transmit the music to the earphone during all testing.
- 2.5.4. For EUT with Desktop Mode: Setup EUT to the Desktop and install the USB flash memory stick on USB slit of Desktop, Set the FM radio frequency on 88.1MHz to transmit the music to the earphone during all testing.
- 2.5.5. For EUT with Desktop and Link PC Mode: Setup EUT to the Desktop and install the USB flash memory stick on USB slit of Desktop, then the Desktop with USB cable linked to PC and the power from notebook PC, the Notebook PC was download music file from USB flash memory stick and upload music file into USB flash memory stick during all testing.
- 2.5.6. For EUT with Power Bank Mode: Setup EUT to the Power Bank and install the USB flash memory stick on USB slit of EUT, Set the FM radio frequency on 88.1MHz to transmit the music to the earphone during all testing.
- 2.5.7. For EUT with Desktop Speaker Mode: Setup EUT to the Desktop Speaker and install the USB flash memory stick on USB slit of Desktop Speaker, Set the FM radio frequency on 88.1MHz to transmit the music to the earphone during all testing.
- 2.5.8. The other peripheral devices were drove and operated in turn during all testing.

2.6. Test Procedure

The EUT was put on table which was above the ground by 80cm and it's power adapter (or Notebook'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 ESH3 was set at 10kHz.

The frequency range from 150kHz to 30MHz was checked using a peak detector.

EUT with the following test modes were performed during conducted voltage measurement, and to read the Q.P. & Average values. All the test results are listed in section 2.7. The details of test modes are as follows:

Mode	Operating Condition of EUT	Power Supply
1.	EUT on Stand-Alone, Transmitting FM Radio Frequency 88.1MHz	Via Travel Charger
2.	EUT with Desktop, Transmitting FM Radio Frequency 88.1MHz	Via Travel Charger of Desktop
3.	EUT with Desktop and Link PC, Upload/Download Music File	Via AC Adapter of Notebook PC
4.	EUT with Power Bank, Transmitting FM Radio Frequency 88.1MHz	Via Travel Charger of Power Bank
5.	EUT with Desktop Speaker, Transmitting FM Radio Frequency 88.1MHz	Via AC Adapter of Desktop Speaker

2.7. Conducted Emission Measurement Results

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

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

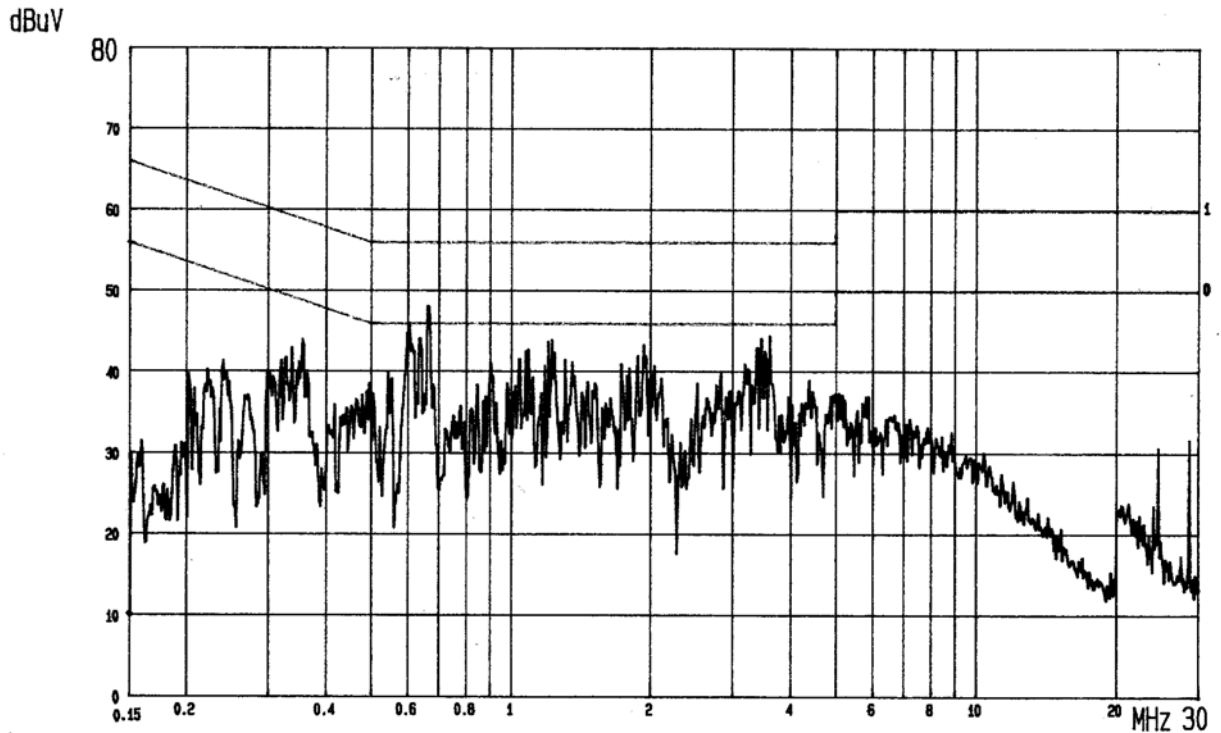
EUT : Multi-Player Humidity : 79%

Test Mode 1 : EUT on Stand-Alone, Transmitting FM Radio Frequency 88.1MHz

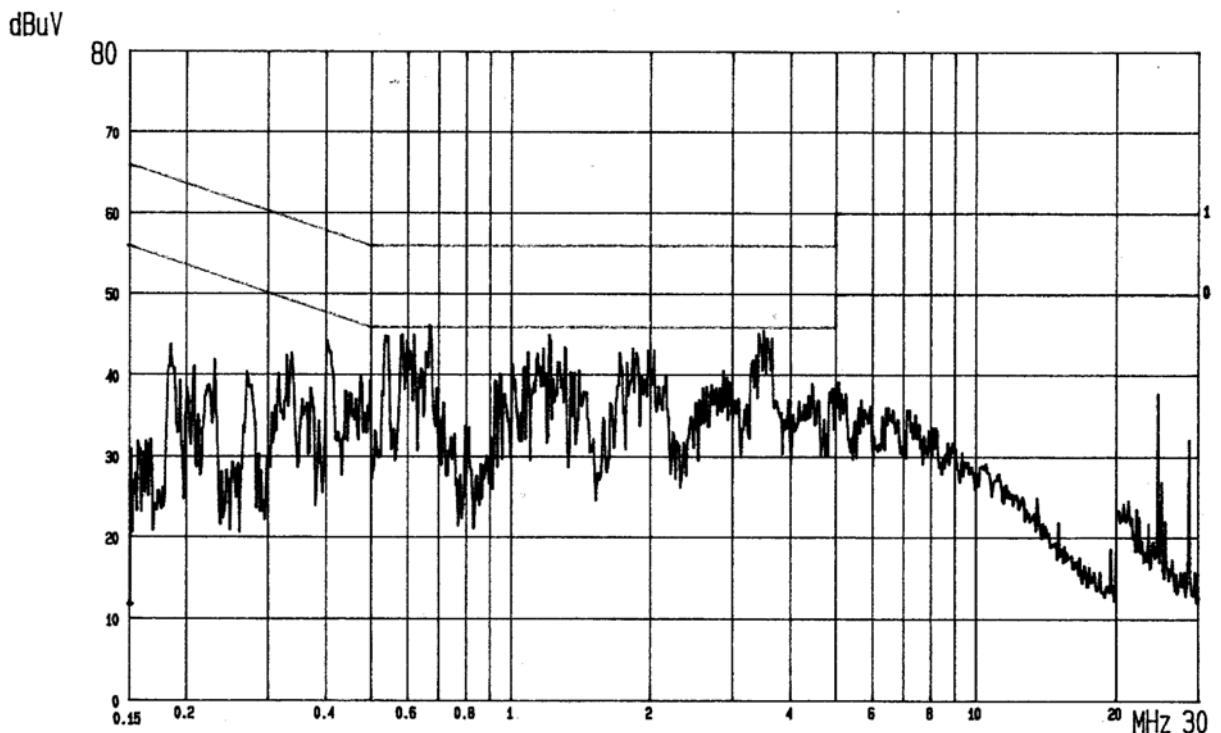
Frequency (MHz)	Factor dB	Reading (dBμV)		Measurement (dBμV)		Limits (dBμV)		Margin dB	
		Phase Line (VA)							
		Q.P.	Average	Q.P.	Average	Q.P.	Average	Q.P.	Average
0.2388	0.4	38.4	*	38.8	*	62.1	52.1	23.3	*
0.3542	0.4	41.0	*	41.4	*	58.8	48.8	17.4	*
0.6018	0.5	43.1	*	43.6	*	56.0	46.0	12.4	*
0.6573	0.5	45.2	36.7	45.7	37.2	56.0	46.0	10.3	8.8
1.2197	0.5	41.3	*	41.8	*	56.0	46.0	14.2	*
1.9172	0.5	40.5	*	41.0	*	56.0	46.0	15.0	*
3.5822	0.5	41.6	*	42.1	*	56.0	46.0	13.9	*
28.6199	1.1	28.8	*	29.9	*	60.0	50.0	30.1	*

Frequency (MHz)	Factor dB	Reading (dBμV)		Measurement (dBμV)		Limits (dBμV)		Margin dB	
		Phase Neutral (VB)							
		Q.P.	Average	Q.P.	Average	Q.P.	Average	Q.P.	Average
0.1843	0.4	40.8	*	41.2	*	64.3	54.3	23.1	*
0.4009	0.5	41.2	*	41.7	*	57.8	47.8	16.1	*
0.6651	0.5	43.2	34.3	43.7	34.8	56.0	46.0	12.3	11.2
1.2054	0.5	42.0	*	42.5	*	56.0	46.0	13.5	*
1.8202	0.5	40.4	*	40.9	*	56.0	46.0	15.1	*
3.4783	0.5	42.6	*	43.1	*	56.0	46.0	12.9	*
24.5579	1.1	34.8	*	35.9	*	60.0	50.0	24.1	*

- Remark :
1. All readings are Quasi-Peak and Average values.
 2. Measurement = Factor (Insertion Loss + Cable Loss) + Reading.
 3. Margin = Limits – Measurement.
 4. The “*” means above Q.P. values have met both limits, they are not necessary to measure with average detector.
 5. The worst emission was detected at 0.6573MHz with corrected signal level of 37.2dBμV (limit is 46.0dBμV) when the VA side of the EUT's power was connected to L.I.S.N.



LINE: L1

EUT: Multi-Player M/N: ST-28
MEMO: EUT+Earphone+Travel Charger120V/60Hz PAGE: 01
(PEAK VALUE) AUDIX

LINE: N

EUT: Multi-Player M/N: ST-28
MEMO: EUT+Earphone+Travel Charger120V/60Hz PAGE: 02
(PEAK VALUE) AUDIX

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

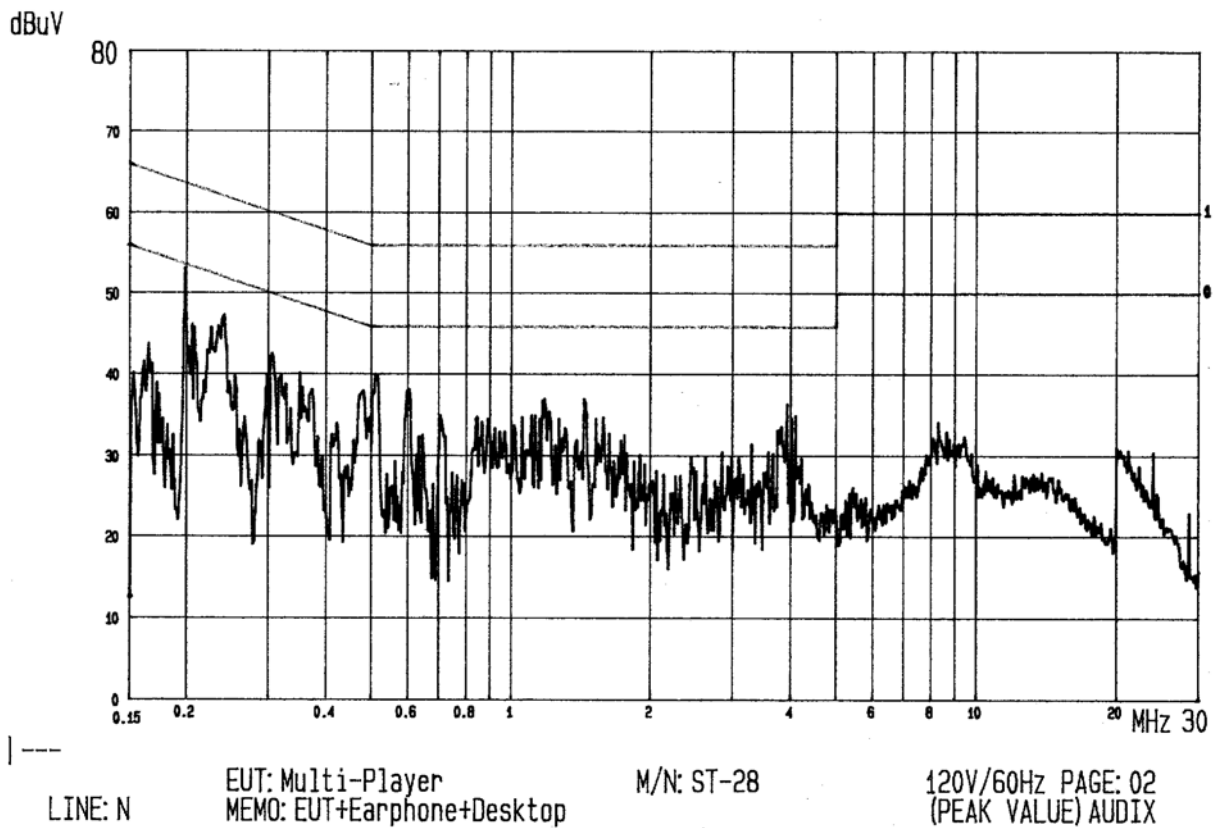
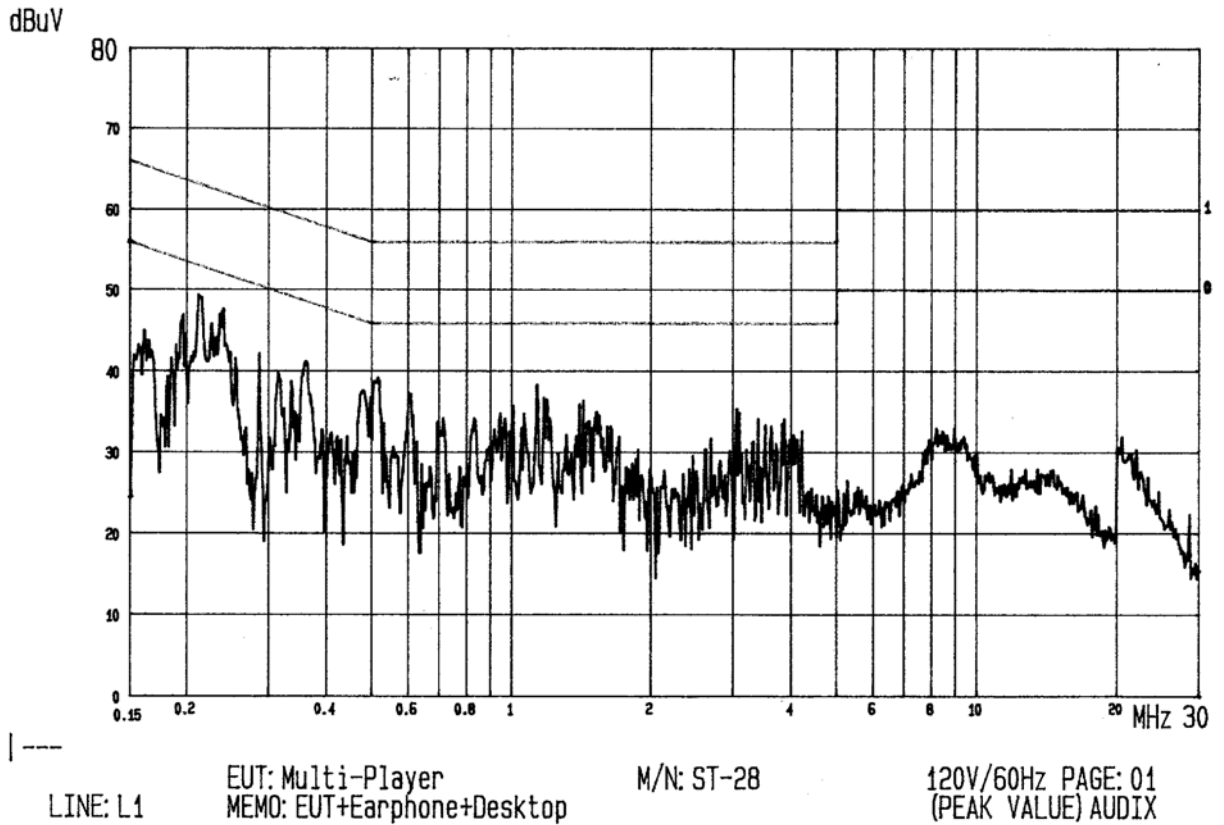
EUT : Multi-Player Humidity : 79%

Test Mode 2 : EUT with Desktop, Transmitting FM Radio Frequency 88.1MHz

Frequency (MHz)	Factor dB	Reading (dBμV)		Measurement (dBμV)		Limits		Margin	
		Phase Line (VA)				(dBμV)		dB	
		Q.P.	Average	Q.P.	Average	Q.P.	Average	Q.P.	Average
0.2110	0.4	46.4	*	46.8	*	63.1	53.1	16.3	*
0.2388	0.4	44.8	*	45.2	*	62.1	52.1	16.9	*
0.3606	0.4	38.2	*	38.6	*	58.7	48.7	20.1	*
1.1298	0.5	35.4	*	35.9	*	56.0	46.0	20.1	*
3.0378	0.5	32.4	*	32.9	*	56.0	46.0	23.1	*
20.4614	1.1	29.0	*	30.1	*	60.0	50.0	29.9	*

Frequency (MHz)	Factor dB	Reading (dBμV)		Measurement (dBμV)		Limits		Margin	
		Phase Neutral (VB)				(dBμV)		dB	
		Q.P.	Average	Q.P.	Average	Q.P.	Average	Q.P.	Average
0.1978	0.4	49.8	40.1	50.2	40.5	63.7	53.7	13.5	13.2
0.2402	0.4	43.4	*	43.8	*	62.0	52.0	18.2	*
0.5133	0.5	36.5	*	37.0	*	56.0	46.0	19.0	*
1.4299	0.5	34.0	*	34.5	*	56.0	46.0	21.5	*
3.9129	0.5	33.4	*	33.9	*	56.0	46.0	22.1	*
23.9862	1.1	27.1	*	28.2	*	60.0	50.0	31.8	*

- Remark :
1. All readings are Quasi-Peak and Average values.
 2. Measurement = Factor (Insertion Loss + Cable Loss) + Reading.
 3. Margin = Limits – Measurement.
 4. The “*” means above Q.P. values have met both limits, they are not necessary to measure with average detector.
 5. The worst emission was detected at 0.1978MHz with corrected signal level of 40.5dBμV (limit is 53.7dBμV) when the VB side of the Desktop’s power was connected to L.I.S.N.



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

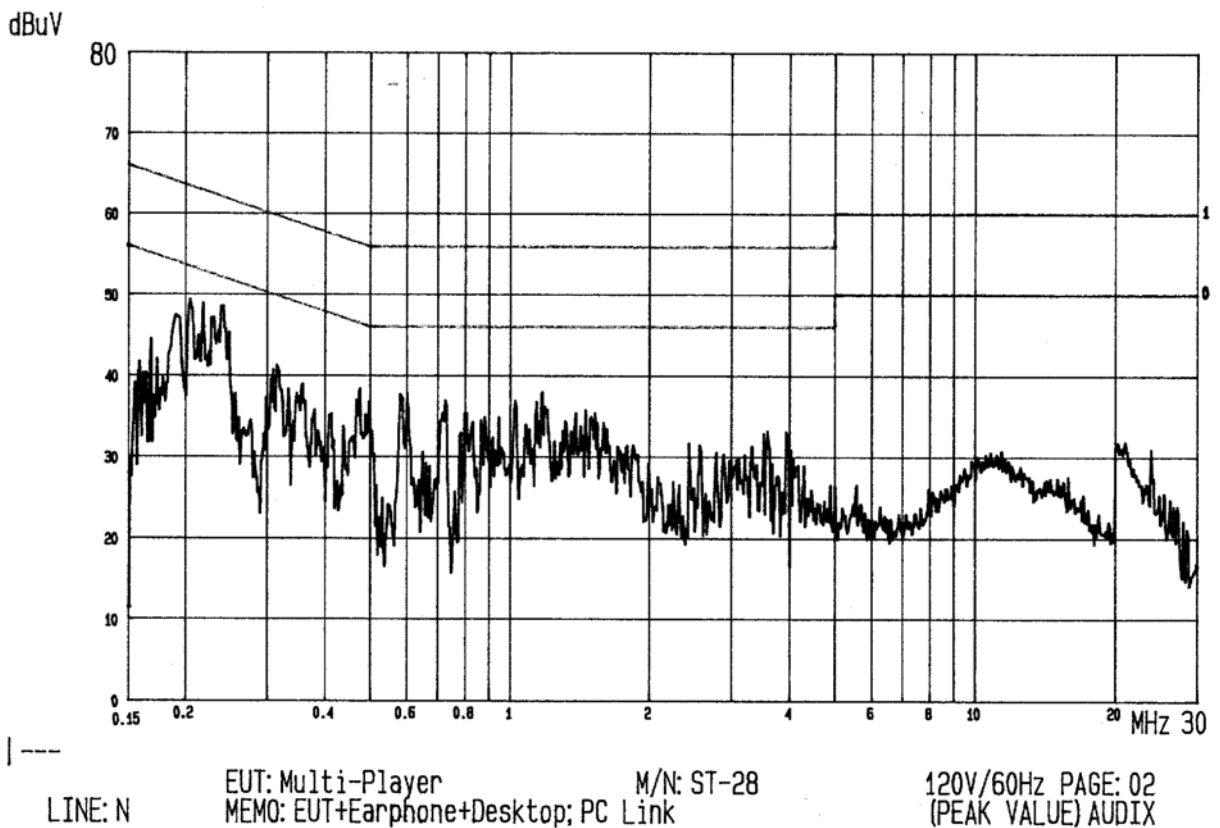
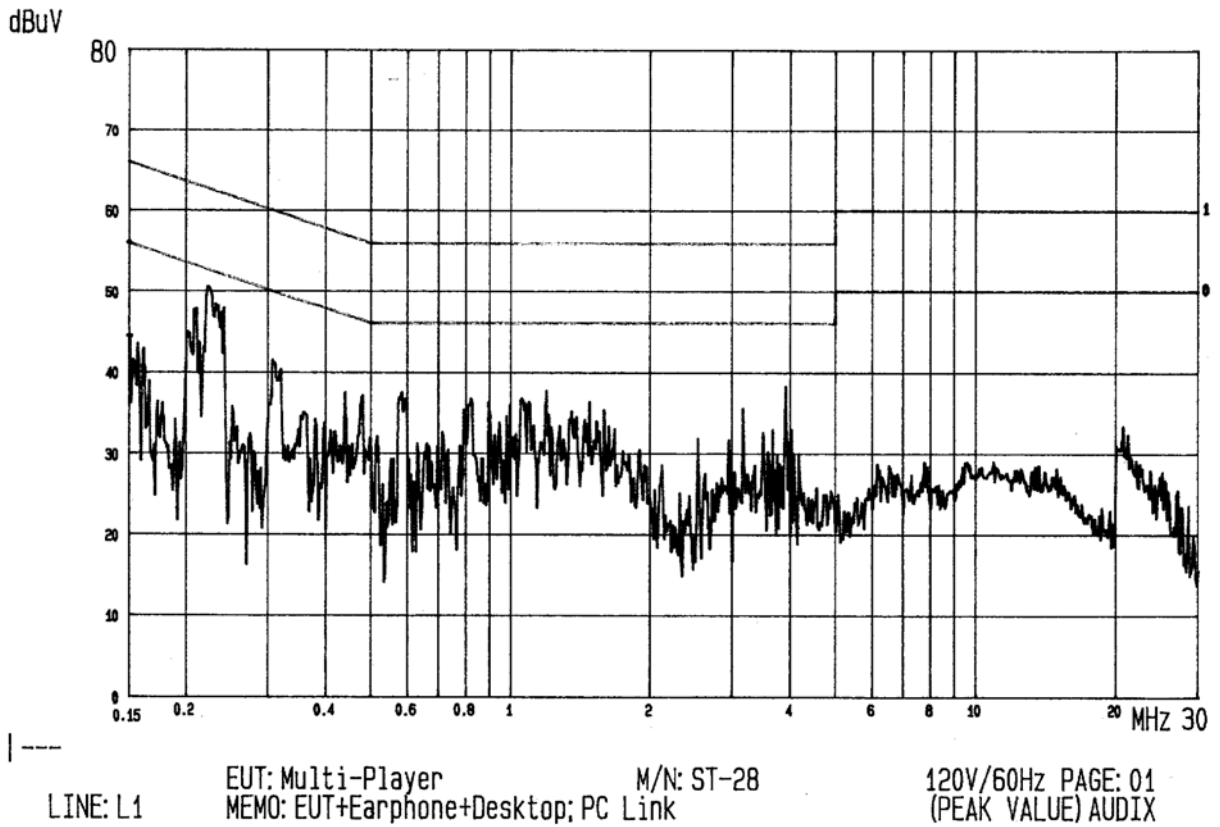
EUT : Multi-Player Humidity : 79%

Test Mode 3 : EUT with Desktop and Link PC, Upload/Download Music File

Frequency (MHz)	Factor dB	Reading (dBμV)		Measurement (dBμV)		Limits		Margin	
		Phase Line (VA)				(dBμV)		dB	
		Q.P.	Average	Q.P.	Average	Q.P.	Average	Q.P.	Average
0.2225	0.4	47.2	*	47.6	*	62.7	52.7	15.1	*
0.3058	0.4	48.6	*	49.0	*	60.1	50.1	11.1	*
0.5809	0.5	34.3	*	34.8	*	56.0	46.0	21.2	*
1.1913	0.5	34.8	*	35.3	*	56.0	46.0	20.7	*
3.8899	0.5	35.4	*	35.9	*	56.0	46.0	20.1	*
20.7038	1.1	30.4	*	31.5	*	60.0	50.0	28.5	*

Frequency (MHz)	Factor dB	Reading (dBμV)		Measurement (dBμV)		Limits		Margin	
		Phase Neutral (VB)				(dBμV)		dB	
		Q.P.	Average	Q.P.	Average	Q.P.	Average	Q.P.	Average
0.2037	0.4	46.4	*	46.8	*	63.4	53.4	16.6	*
0.4022	0.5	45.6	*	46.1	*	57.8	47.8	11.7	*
0.4727	0.5	35.4	*	40.4	*	56.4	46.4	16.0	*
1.1705	0.4	35.0	*	35.4	*	56.0	46.0	20.6	*
3.9129	0.5	30.2	*	30.7	*	56.0	46.0	25.3	*
20.9490	1.1	29.0	*	30.1	*	60.0	50.0	29.9	*

- Remark :
1. All readings are Quasi-Peak and Average values.
 2. Measurement = Factor (Insertion Loss + Cable Loss) + Reading.
 3. Margin = Limits – Measurement.
 4. The “*” means above Q.P. values have met both limits, they are not necessary to measure with average detector.
 5. The worst emission was detected at 0.3058MHz with corrected signal level of 49.0dBμV (limit is 60.10dBμV) when the VA side of the Notebook PC's power was connected to L.I.S.N.



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

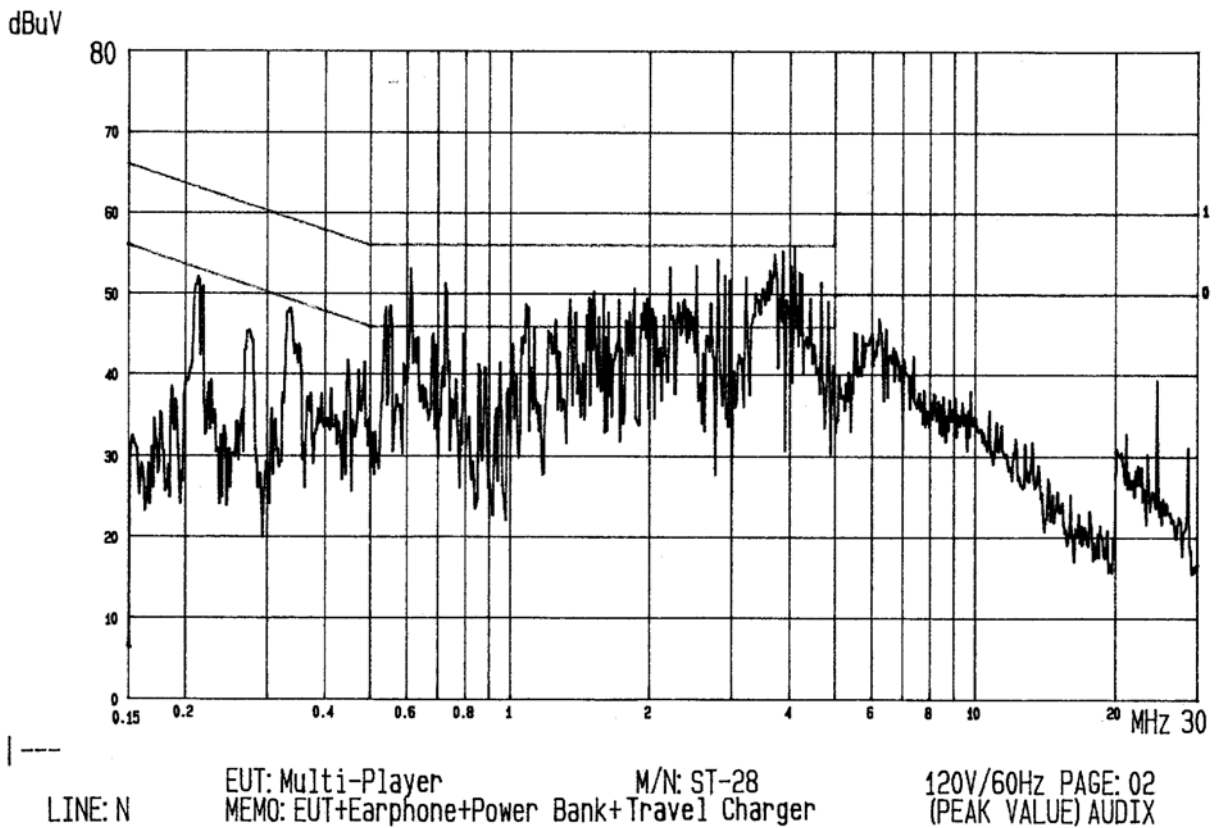
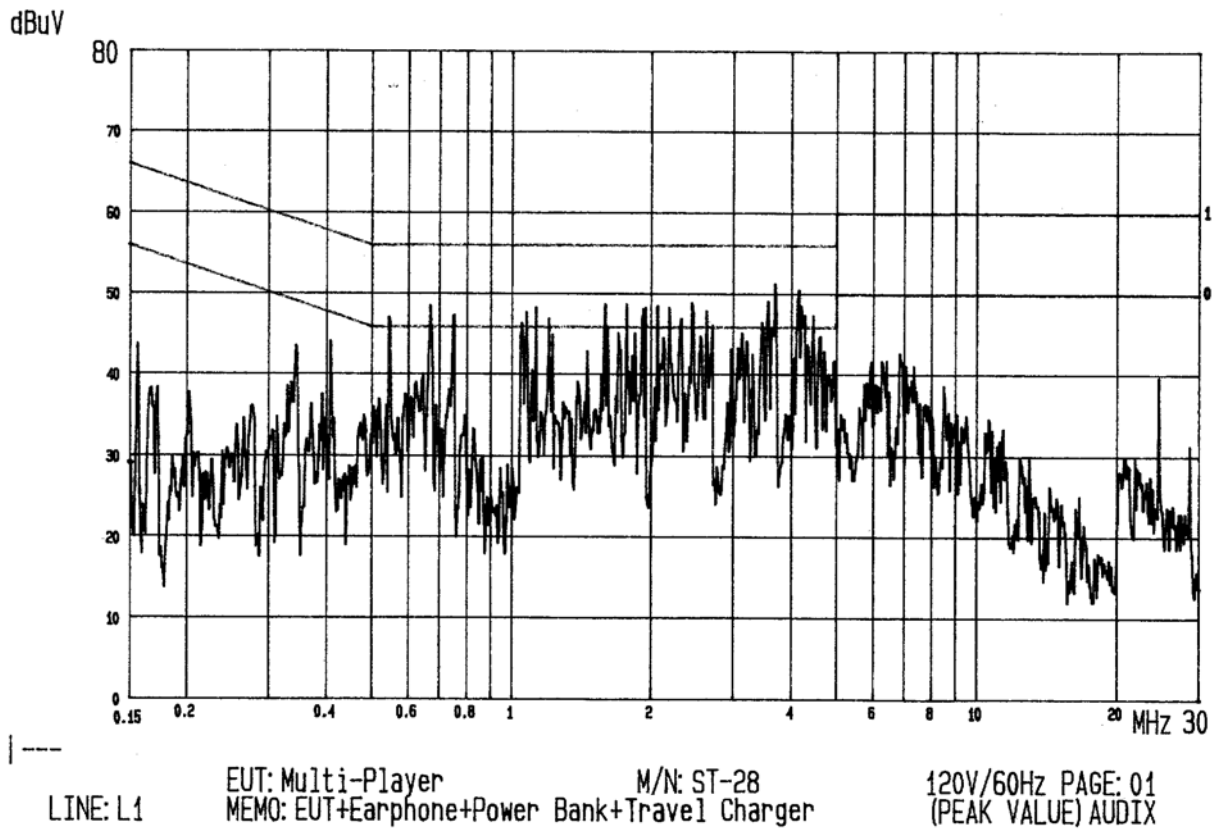
EUT : Multi-Player Humidity : 79%

Test Mode 4 : EUT with Power Bank, Transmitting FM Radio Frequency 88.1MHz

Frequency (MHz)	Factor dB	Reading (dBμV)		Measurement (dBμV)		Limits (dBμV)		Margin dB	
		Phase Line (VA)							
		Q.P.	Average	Q.P.	Average	Q.P.	Average	Q.P.	Average
0.1553	0.4	40.2	*	40.6	*	65.7	55.7	25.1	*
0.5413	0.5	44.2	35.4	44.7	35.9	56.0	46.0	11.3	10.1
0.6651	0.5	45.6	36.1	46.1	36.6	56.0	46.0	9.9	9.4
1.1232	0.5	45.4	35.7	45.9	36.2	56.0	46.0	10.1	9.8
1.5804	0.5	45.8	35.9	46.3	36.4	56.0	46.0	9.7	9.6
2.0476	0.5	45.6	35.7	46.1	36.2	56.0	46.0	9.9	9.8
2.4289	0.5	46.0	36.5	46.5	37.0	56.0	46.0	9.5	9.0
3.6675	0.5	48.4	39.6	48.9	40.1	56.0	46.0	7.1	5.9
4.1258	0.8	47.6	38.5	48.4	39.3	56.0	46.0	7.6	6.7
24.5579	1.1	35.8	*	36.9	*	60.0	50.0	23.1	*

Frequency (MHz)	Factor dB	Reading (dBμV)		Measurement (dBμV)		Limits (dBμV)		Margin dB	
		Phase Neutral (VB)							
		Q.P.	Average	Q.P.	Average	Q.P.	Average	Q.P.	Average
0.2122	0.4	49.1	39.2	49.5	39.6	63.1	53.1	13.6	13.5
0.5509	0.5	45.3	36.4	45.8	36.9	56.0	46.0	10.2	9.1
0.6089	0.5	50.2	40.7	50.7	41.2	56.0	46.0	5.3	4.8
0.7223	0.5	48.4	39.6	48.9	40.1	56.0	46.0	7.1	5.9
1.50777	0.5	47.4	38.3	47.9	38.8	56.0	46.0	8.1	7.2
2.5014	0.5	50.5	40.4	51.0	40.9	56.0	46.0	5.0	5.1
2.7810	0.5	51.4	42.1	51.9	42.6	56.0	46.0	4.1	3.4
3.8444	0.5	52.4	43.6	52.9	44.1	56.0	46.0	3.1	1.9
4.0775	0.8	53.0	44.2	53.8	45.0	56.0	46.0	2.2	1.0
24.5579	1.1	36.2	*	37.3	*	60.0	50.0	22.7	*

- Remark :
1. All readings are Quasi-Peak and Average values.
 2. Measurement = Factor (Insertion Loss + Cable Loss) + Reading.
 3. Margin = Limits – Measurement.
 4. The “*” means above Q.P. values have met both limits, they are not necessary to measure with average detector.
 5. The worst emission was detected at 4.0775MHz with corrected signal level of 45.0dBμV (limit is 46.0dBμV) when the VB side of the Power Bank’s power was connected to L.I.S.N.



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

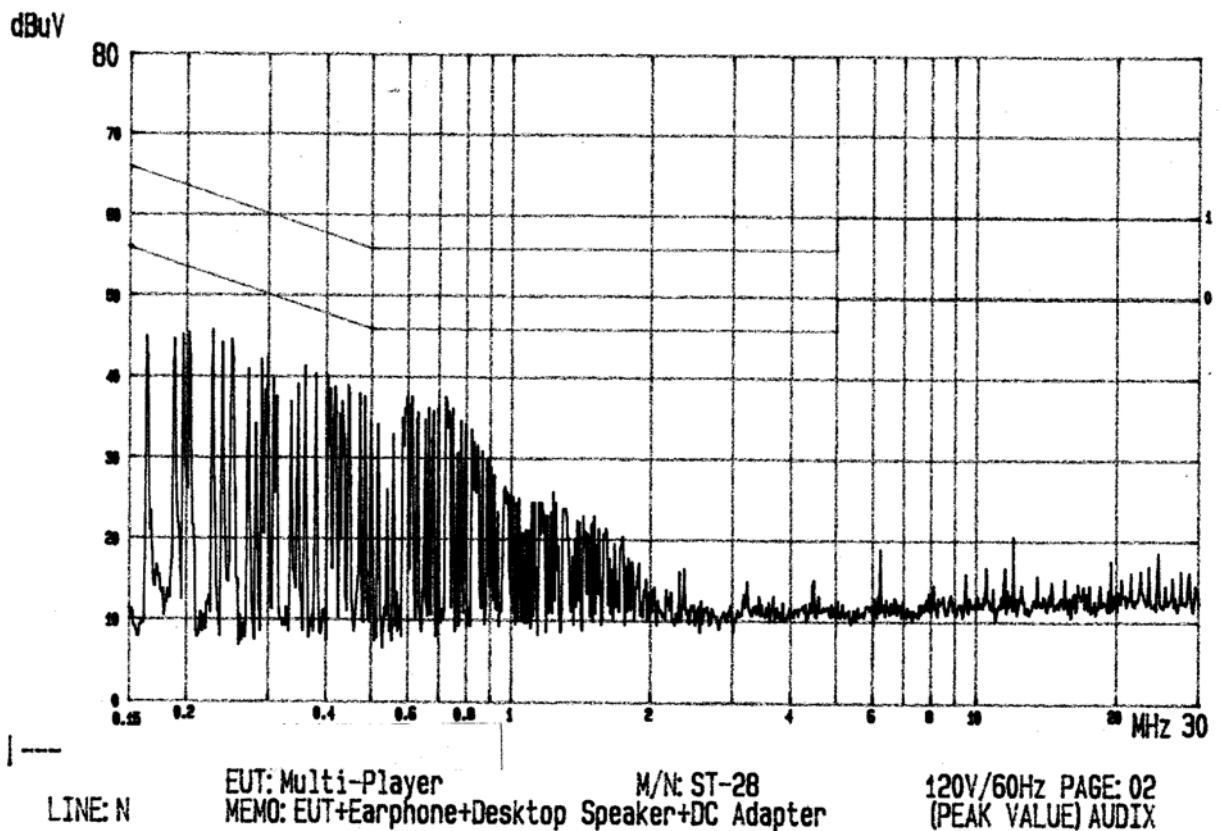
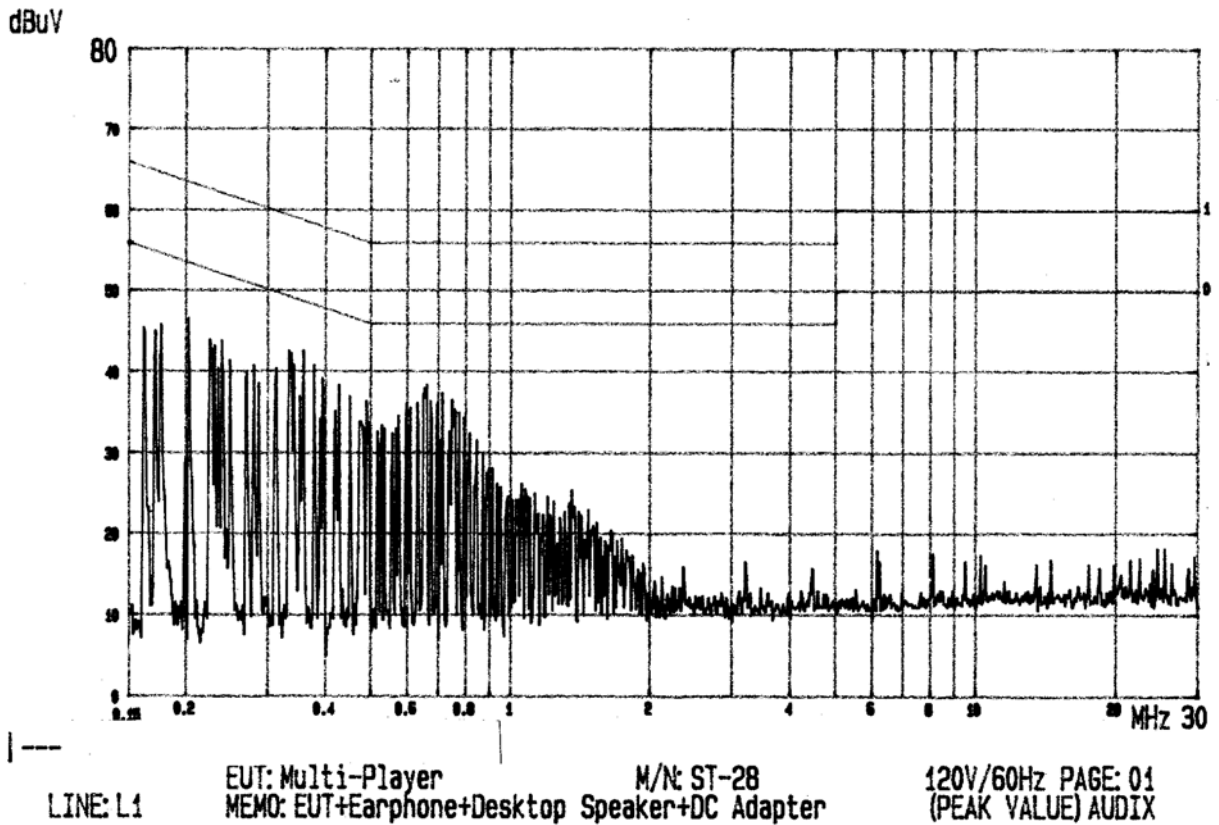
EUT : Multi-Player Humidity : 79%

Test Mode 5 : EUT with Desktop Speaker, Transmitting FM Radio Frequency 88.1MHz

Frequency (MHz)	Factor dB	Reading (dBμV)		Measurement (dBμV)		Limits		Margin	
		Phase Line (VA)				(dBμV)		dB	
		Q.P.	Average	Q.P.	Average	Q.P.	Average	Q.P.	Average
0.1609	0.4	45.1	*	45.5	*	65.4	55.4	19.9	*
0.2013	0.4	42.9	*	43.3	*	63.5	53.5	20.2	*
0.3320	0.4	39.2	*	39.6	*	59.4	49.4	19.8	*
0.3563	0.4	38.7	*	39.1	*	58.8	48.8	19.7	*
1.3481	0.5	22.4	*	22.9	*	56.0	46.0	33.1	*
6.1268	0.8	15.0	*	15.8	*	60.0	50.0	44.2	*

Frequency (MHz)	Factor dB	Reading (dBμV)		Measurement (dBμV)		Limits		Margin	
		Phase Neutral (VB)				(dBμV)		dB	
		Q.P.	Average	Q.P.	Average	Q.P.	Average	Q.P.	Average
0.1628	0.4	41.6	*	42.0	*	65.3	55.3	23.3	*
0.2013	0.4	41.7	*	42.1	*	63.5	53.5	21.4	*
0.2264	0.4	41.9	*	42.3	*	62.5	52.5	20.2	*
0.3584	0.4	38.7	*	39.1	*	58.7	48.7	19.6	*
0.7180	0.5	34.6	*	35.1	*	56.0	46.0	20.9	*
11.9749	0.9	17.6	*	18.5	*	60.0	50.0	41.5	*

- Remark :
1. All readings are Quasi-Peak and Average values.
 2. Measurement = Factor (Insertion Loss + Cable Loss) + Reading.
 3. Margin = Limits – Measurement.
 4. The “*” means above Q.P. values have met both limits, they are not necessary to measure with average detector.
 5. The worst emission was detected at 0.3584MHz with corrected signal level of 39.1dBμV (limit is 48.7dBμV) when the VB side of the Desktop Speaker’s power adapter was connected to L.I.S.N.



3. RADIATED EMISSION MEASUREMENT

3.1. Test Equipment

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

3.1.1. For 30MHz~1000MHz Frequency (at Semi-Anechoic Chamber)

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8593EM	3826A00248	Sep.24, 03'	Sep.23, 04'
2.	Pre-Amplifier	HP	8447D	2944A06305	Mar.12, 04'	Mar.11, 05'
3.	Broadband Antenna	Schwarzbeck	BBA 9106	A3L	Feb.21, 04'	Feb.20, 05'
4.	Broadband Antenna	Schwarzbeck	UHALP9108-A	0138	Feb.21, 04'	Feb.20, 05'

3.1.2. For 1GHz~2GHz frequency (at Semi-Anechoic Chamber)

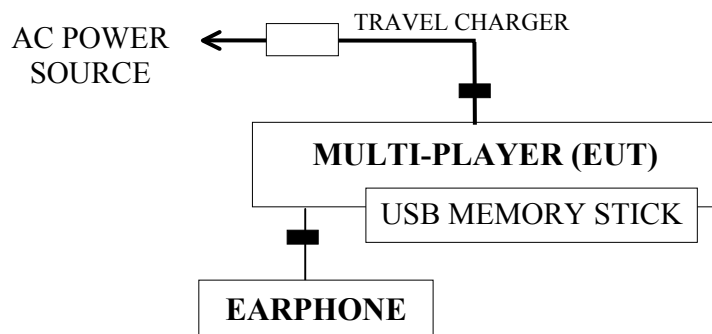
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8593EM	3826A00248	Sep.24, 03'	Sep.23, 04'
2.	Pre-Amplifier	HP	8449B	3008A01284	Jul. 02, 03'	Jul. 01, 04'
3.	Horn Antenna	EMCO	3115	9112-3775	Apr. 21, 03'	Apr.20, 04'

3.2. Test Setup

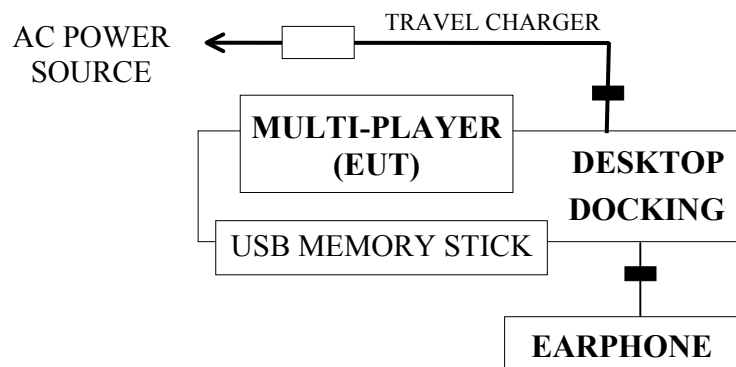
3.2.1. Block Diagram of connection between EUT and simulators

—— : POWER LINE ——— : SIGNAL LINE ■ : CORE

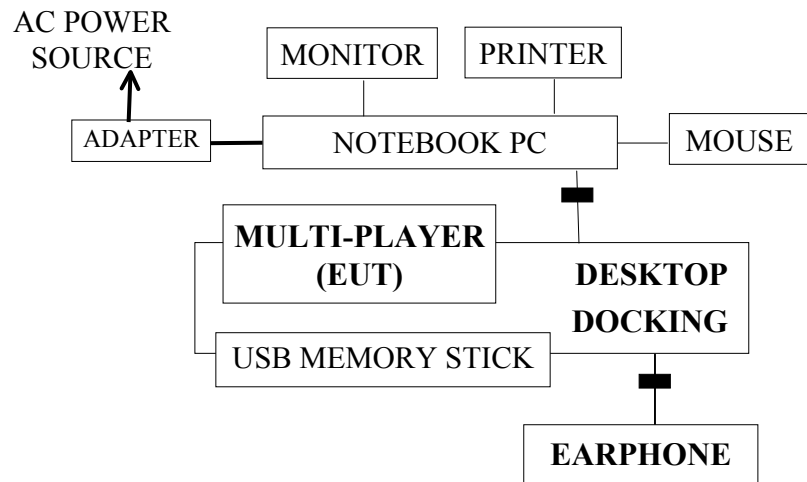
3.2.1.1. EUT on Stand-Alone, Power with Travel Charger



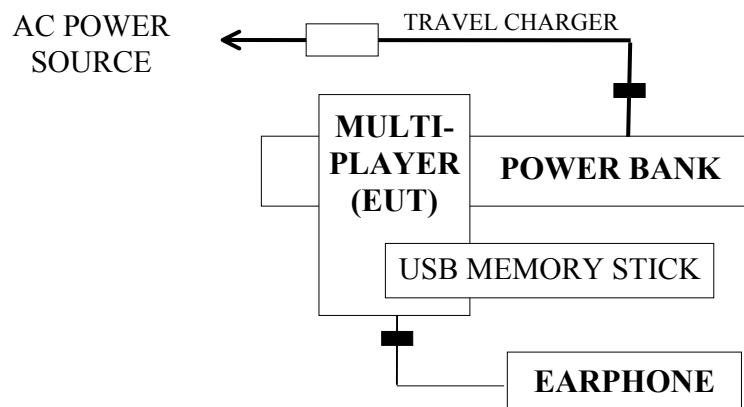
3.2.1.2. EUT with Desktop, Power with Travel Charger of Desktop



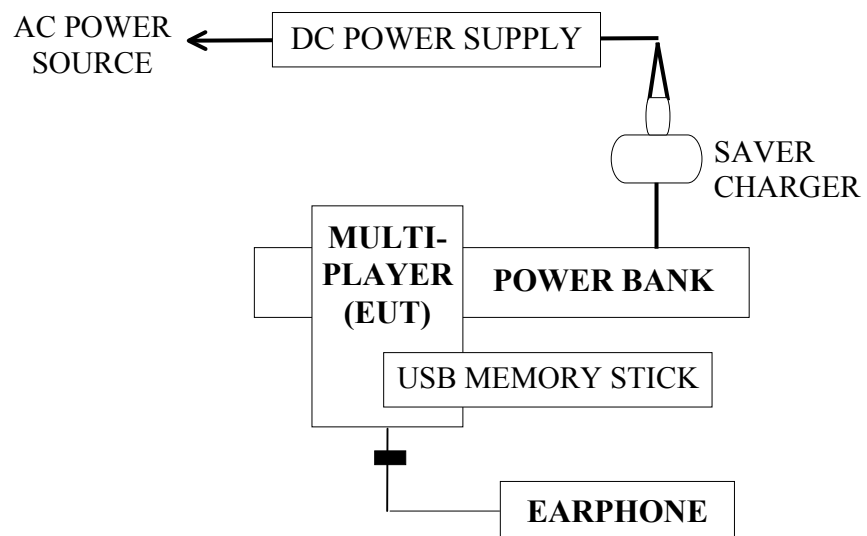
3.2.1.3. EUT with Desktop and Link to PC, Power with USB Port from PC



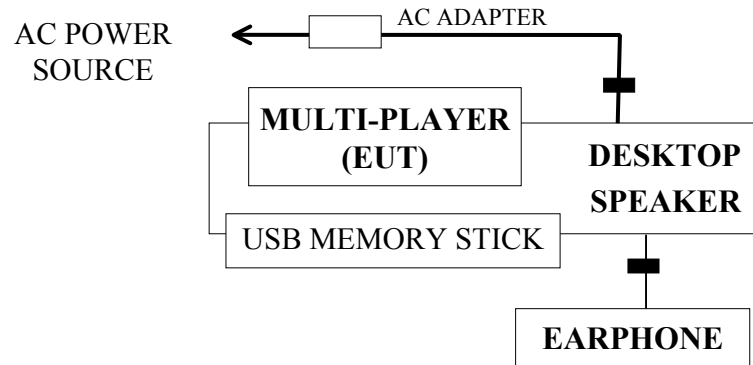
3.2.1.4. EUT with Power Bank, Power with Travel Charger of Power Bank



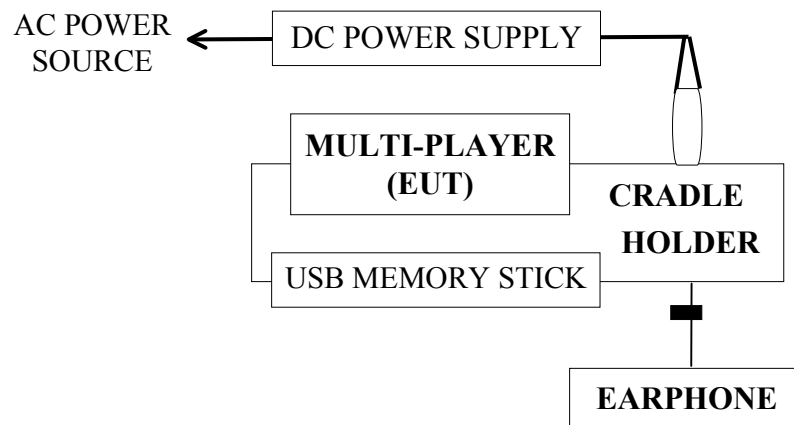
3.2.1.5. EUT with Power Bank, Power with Saver Charger from DC Power



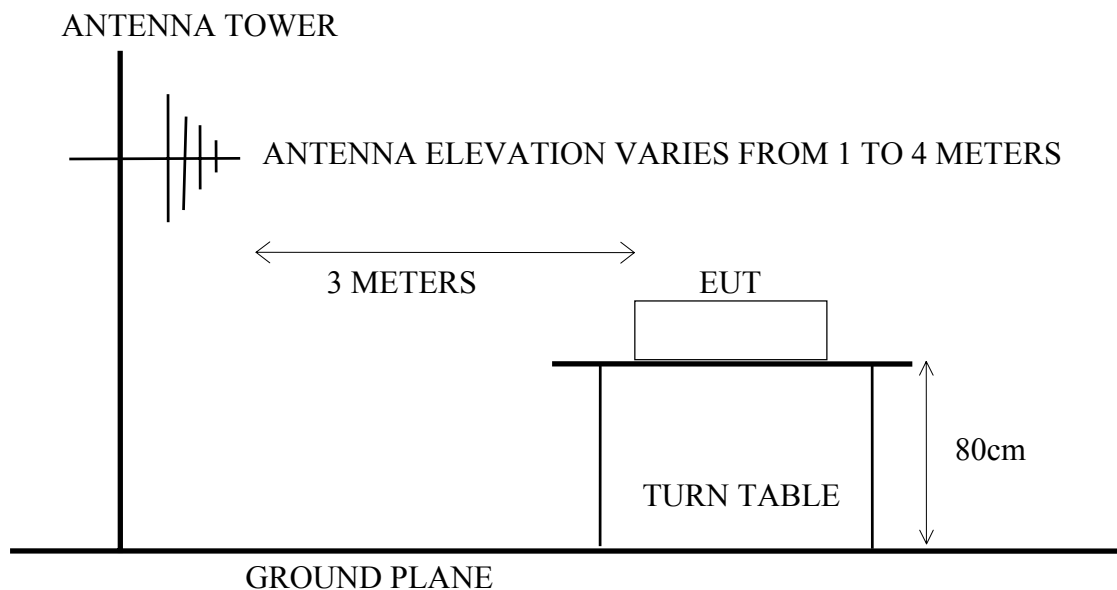
3.2.1.6. EUT with Desktop Speaker, Power with AC Adapter of Desktop Speaker



3.2.1.7. EUT with Cradle Holder, Power with Holder from DC Power



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



3.3. Radiation Limit (Comply with §15.239、§15.209、§15.109 Class B)

3.3.1. §15.239 Radiated Emission Limits (Fundamental Frequency)

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMITS	
		μV/m	dBμV/m
Fundamental Freq.	3	250	48.0 (Average)
		---	68.0 (Peak) ^{*(2)}

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 & §15.109 Class B Radiated Emission Limits (Spurious Frequency)

FREQUENCY MHz	DISTANCE 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
1000 ~ 2000	3	---	54 (Average) ^{*(4)}
1000 ~ 2000	3	---	74 (Peak) ^{*(4)}

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. Multi-Player (EUT)

Model Number : ST-28

Serial Number : N/A

FCC ID : QPRST28

Manufacturer : Jow Tong Technology Co., Ltd.

Accessories are as follows:

1. Desktop (USB Docking) : Jow Tong
DC 100~240V, 5V/1A

2. Travel Charger : Jow Tong
Input: AC 100~240V
Output: DC 5V, 1A
DC Cord: Non-Shielded, Undetachable, 1.3m
Added a ferrite core

- 3. USB Cable (link to PC) : Shielded, Detachable, 1.2m
Bonded a ferrite core
- 4. Earphone : Non-Shielded, 1.0m
Added a ferrite core
- 5. Power Bank : Jow Tong
AC 100~240V, DC 5V/1A
- 6. Desktop Speaker : Jow Tong
AC 100~240V, DC 12V/1A
AC Adapter:
Model: WP121000DV
Input: 120VAC 60Hz
Output: 12VDC 1000mA
DC Cord: Non-Shielded, Undetachable, 1.6m
Added a ferrite core
- 7. Saver Charge for Car : Jow Tong
13.5V
- 8. Cradle Holder for Car : Jow Tong
Vehicle 16V~24V
- 3.4.2. Supporting System : As in Section 1.2.

3.5. Operating Condition of EUT

- 3.5.1. Turned on the power of all equipment.
- 3.5.2. For EUT on Stand-Alone Mode: Setup the EUT and simulator as shown on section 3.2.1.1. The EUT with USB flash memory stick and set the FM radio frequency on 88.1MHz、98.1MHz、107.9MHz to transmit the music to the earphone during all testing.
- 3.5.3. For EUT with Desktop mode and EUT with Desktop and Link PC mode (Transmitting): Setup the EUT and simulator as shown on sections 3.2.1.2 & 3.2.1.3. The operating condition of EUT was same as conducted measurement, which is listed in section 2.5.4.
- 3.5.4. For EUT with Desktop and Link PC Mode (Upload/Download): Setup the EUT and simulator as shown on section 3.2.1.3. The operating condition of EUT was same as conducted measurement, which is listed in section 2.5.5.
- 3.5.5. For EUT with Power Bank mode and EUT with Desktop Speaker mode: Setup the EUT and simulator as shown on sections 3.2.1.4 & 3.2.1.5 & 3.2.1.6. The operating condition of EUT was same as conducted measurement, which are listed in sections 2.5.6 ~ 2.5.7
- 3.5.6. For EUT with Cradle Holder Mode: Setup the EUT and simulator as shown on section 3.2.1.7. Setup EUT to the Cradle Holder and install the USB flash memory stick on USB slit of Cradle Holder, Set the FM radio frequency on 88.1MHz to transmit the music to the earphone during all testing.
- 3.5.7. The other peripheral devices were drove 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 test receiver was set at 120kHz for frequency range 30MHz to 1000MHz and resolution bandwidth of spectrum analyzer was set at 1MHz for frequency range 1GHz to 2GHz.

The frequency range from 30MHz to 2GHz (up to 10th harmonics from fundamental frequency) was checked.

EUT with the following test modes 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.	EUT on Stand-Alone, Transmitting FM Radio Frequency 88.1MHz	Via Travel Charger
2.	EUT on Stand-Alone, Transmitting FM Radio Frequency 98.1MHz	
3.	EUT on Stand-Alone, Transmitting FM Radio Frequency 107.9MHz	
4.	EUT with Desktop, Transmitting FM Radio Frequency 88.1MHz	Via Travel Charger of Desktop
5.	EUT with Desktop and Link PC, Transmitting FM Radio Frequency 88.1MHz	Via AC Adapter of Notebook PC
6.	EUT with Desktop and Link PC, Upload/Download Music File	
7.	EUT with Power Bank, Transmitting FM Radio Frequency 88.1MHz	Via Travel Charger of Power Bank
8.	EUT with Power Bank, Transmitting FM Radio Frequency 88.1MHz	Via Sever Charger of DC Power Supply
9.	EUT with Desktop Speaker, Transmitting FM Radio Frequency 88.1MHz	Via AC Adapter of Desktop Speaker
10.	EUT with Cradle Holder, Transmitting FM Radio Frequency 88.1MHz	Via Cradle Holder of DC Power Supply

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 B & C official limits.

Date of Test :	Apr. 01, 2004	Temperature :	21°C
EUT :	Multi-Player	Humidity :	71%
Test Mode 1 :	EUT on Stand-Alone, Transmitting FM Radio Frequency 88.1MHz (Power Supply Via Travel Charger)		

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)						
88.100	15.42	2.00	21.42	38.84	48.00	9.16
Fundamental Freq. (Peak Value)						
88.100	15.42	2.00	26.39	43.81	68.00	24.19
Spurious Freq. (Quasi-Peak Value)						
158.040	20.74	2.70	11.91	35.35	43.50	8.15
176.200	21.21	2.90	2.24	26.35	43.50	17.15
264.300	24.62	3.70	0.20	28.52	46.00	17.48
352.400	15.55	4.30	8.88	28.73	46.00	17.27
440.500	17.60	5.30	11.04	33.94	46.00	12.06
515.970	19.98	6.80	9.30	36.08	46.00	9.92
528.600	19.69	6.90	2.94	29.53	46.00	16.47
600.360	21.31	6.30	10.06	37.68	46.00	8.32
616.700	21.31	6.30	3.17	30.78	46.00	15.22
672.140	22.85	6.40	7.25	36.50	46.00	9.50
704.800	23.56	6.60	-4.57	25.59	46.00	20.41
792.900	23.95	6.90	-5.11	25.74	46.00	20.26
881.000	25.34	7.30	-5.76	26.88	46.00	19.12

- 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 : Apr. 01, 2004 Temperature : 21°C
 EUT : Multi-Player Humidity : 71%
 Test Mode 1 : EUT on Stand-Alone, Transmitting FM Radio Frequency 88.1MHz
(Power Supply Via Travel Charger)

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)						
88.100	15.46	2.00	20.20	37.66	48.00	10.34
Fundamental Freq. (Peak Value)						
88.100	15.46	2.00	25.10	42.56	68.00	25.44
Spurious Freq. (Quasi-Peak Value)						
58.130	13.79	1.60	19.47	34.86	40.00	5.14
165.800	20.87	2.70	10.64	34.22	43.50	9.28
176.200	20.66	2.90	2.21	25.77	43.50	17.73
264.300	25.20	3.70	-2.57	26.33	46.00	19.67
352.400	15.78	4.30	4.27	24.34	46.00	21.66
360.770	15.94	4.43	13.86	34.22	46.00	11.78
440.500	17.38	5.30	6.35	29.03	46.00	16.97
528.600	20.22	6.90	3.54	30.67	46.00	15.33
616.700	21.29	6.30	-3.26	24.33	46.00	21.67
704.800	22.25	6.60	-3.53	25.32	46.00	20.68
792.900	25.42	6.90	-5.85	26.46	46.00	19.54
881.000	25.34	7.30	-5.61	27.03	46.00	18.97

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 : Apr. 01, 2004 Temperature : 21°C
 EUT : Multi-Player Humidity : 71%
 Test Mode 2 : EUT on Stand-Alone, Transmitting FM Radio Frequency 98.1MHz
(Power Supply Via Travel Charger)

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)						
98.100	16.84	2.10	19.20	38.14	48.00	9.86
Fundamental Freq. (Peak Value)						
98.100	16.84	2.10	23.12	42.06	68.00	25.94
Spurious Freq. (Quasi-Peak Value)						
196.200	21.85	3.00	7.23	32.07	43.50	11.43
294.300	26.33	3.96	-0.12	30.17	46.00	15.83
358.830	16.02	4.40	15.64	36.06	46.00	9.94
392.400	17.54	4.70	-1.13	21.11	46.00	24.89
490.500	18.58	6.30	9.69	34.57	46.00	11.43
588.600	21.02	6.30	2.43	29.75	46.00	16.26
600.360	21.31	6.30	9.65	37.27	46.00	8.73
686.700	23.18	6.50	-3.40	26.29	46.00	19.71
719.670	22.30	6.60	5.97	34.87	46.00	11.13
784.800	23.87	6.90	-4.87	25.90	46.00	20.10
882.900	25.28	7.30	-5.41	27.18	46.00	18.82
981.000	25.74	7.70	-5.42	28.02	54.00	25.98

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 : Apr. 01, 2004 Temperature : 21°C
 EUT : Multi-Player Humidity : 71%
 Test Mode 2 : EUT on Stand-Alone, Transmitting FM Radio Frequency 98.1MHz
(Power Supply Via Travel Charger)

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)						
98.100	17.54	2.10	17.23	36.87	48.00	11.13
Fundamental Freq. (Peak Value)						
98.100	17.54	2.10	22.00	41.64	68.00	26.36
Spurious Freq. (Quasi-Peak Value)						
58.130	13.79	1.60	19.18	34.57	40.00	5.43
172.590	20.30	2.80	11.42	34.52	43.50	8.98
196.200	22.50	3.00	-1.00	24.50	43.50	19.00
294.300	26.47	3.96	-2.50	27.92	46.00	18.08
348.160	15.67	4.31	14.48	34.45	46.00	11.55
392.400	17.73	4.70	-0.84	21.59	46.00	24.41
490.500	18.53	6.30	0.89	25.72	46.00	20.28
588.600	21.52	6.30	-1.38	26.44	46.00	19.57
686.700	23.55	6.50	-1.19	28.87	46.00	17.13
784.800	25.40	6.90	-6.88	25.43	46.00	20.57
882.900	25.42	7.30	-6.66	26.06	46.00	19.94
981.000	26.26	7.70	-5.27	28.69	54.00	25.31

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 : Apr. 01, 2004 Temperature : 21°C

EUT : Multi-Player Humidity : 71%

Test Mode 3 : EUT on Stand-Alone, Transmitting FM Radio Frequency
107.9MHz (Power Supply Via Travel Charger)

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)						
107.900	17.87	2.20	17.65	37.72	48.00	10.28
Fundamental Freq. (Peak Value)						
107.900	17.87	2.20	21.54	41.61	68.00	26.39
Spurious Freq. (Quasi-Peak Value)						
157.070	20.70	2.70	10.50	33.90	43.50	9.60
172.590	21.04	2.80	10.60	34.44	43.50	9.06
215.800	21.86	3.20	6.79	31.86	43.50	11.64
323.700	15.10	4.14	17.10	36.34	46.00	9.66
358.830	16.02	4.40	14.75	35.17	46.00	10.83
431.600	17.27	5.20	5.62	28.09	46.00	17.91
462.620	17.99	5.70	11.62	35.31	46.00	10.69
539.500	19.34	7.10	-0.91	25.53	46.00	20.47
600.360	21.31	6.30	9.63	37.24	46.00	8.76
647.400	21.29	6.30	1.82	29.41	46.00	16.59
755.300	23.58	6.70	-2.14	28.13	46.00	17.87
863.200	26.09	7.20	-5.74	27.55	46.00	18.45
971.100	26.81	7.70	-6.20	28.32	54.00	25.68

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 : Apr. 01, 2004 Temperature : 21°C
 EUT : Multi-Player Humidity : 71%
 Test Mode 3 : EUT on Stand-Alone, Transmitting FM Radio Frequency
107.9MHz (Power Supply Via Travel Charger)

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)						
107.900	17.80	2.20	16.19	36.19	48.00	11.81
Fundamental Freq. (Peak Value)						
107.900	17.80	2.20	20.77	40.77	68.00	27.23
Spurious Freq. (Quasi-Peak Value)						
58.130	13.79	1.60	19.08	34.47	40.00	5.53
163.860	20.58	2.70	10.05	33.33	43.50	10.17
215.800	22.37	3.20	-0.90	24.68	43.50	18.82
323.700	15.54	4.14	5.19	24.87	46.00	21.13
431.600	17.16	5.20	1.22	23.58	46.00	22.42
539.500	20.31	7.10	-3.33	24.08	46.00	21.92
647.400	21.69	6.30	4.55	32.54	46.00	13.46
755.300	24.74	6.70	-4.94	26.50	46.00	19.50
863.200	25.46	7.20	-6.05	26.60	46.00	19.40
971.100	26.84	7.70	-4.56	29.99	54.00	24.01

- 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 : Apr. 01, 2004 Temperature : 21°C

EUT : Multi-Player Humidity : 71%

Test Mode 4 : EUT with Desktop, Transmitting FM Radio Frequency 88.1MHz
(Power Supply with Desktop Via Travel Charger)

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)						
88.100	15.42	2.00	20.77	38.19	48.00	9.81
Fundamental Freq. (Peak Value)						
88.100	15.42	2.00	22.88	40.30	68.00	27.70
Spurious Freq. (Quasi-Peak Value)						
172.590	21.04	2.80	12.61	36.45	43.50	7.05
176.200	21.21	2.90	6.65	30.76	43.50	12.74
264.300	24.62	3.70	0.52	28.84	46.00	17.16
352.400	15.55	4.30	6.61	26.46	46.00	19.54
440.500	17.60	5.30	0.97	23.87	46.00	22.13
481.050	18.74	6.10	11.85	36.69	46.00	9.31
528.600	19.69	6.90	-0.94	25.65	46.00	20.35
616.700	21.31	6.30	-1.62	25.99	46.00	20.01
689.600	23.25	6.50	7.39	37.15	46.00	8.85
704.800	23.56	6.60	-3.86	26.30	46.00	19.70
792.900	23.95	6.90	-4.08	26.77	46.00	19.23
881.000	25.34	7.30	-4.94	27.70	46.00	18.30
959.260	26.38	7.60	0.04	34.02	46.00	11.98

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 : Apr. 01, 2004 Temperature : 21°C

EUT : Multi-Player Humidity : 71%

Test Mode 4 : EUT with Desktop, Transmitting FM Radio Frequency 88.1MHz
(Power Supply with Desktop Via Travel Charger)

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)						
88.100	15.46	2.00	20.30	37.76	48.00	10.24
Fundamental Freq. (Peak Value)						
88.100	15.46	2.00	24.45	41.91	68.00	26.09
Spurious Freq. (Quasi-Peak Value)						
58.130	13.79	1.60	18.27	33.66	40.00	6.34
151.250	21.87	2.60	12.13	36.60	43.50	6.90
176.200	20.66	2.90	4.57	28.13	43.50	15.37
264.300	25.20	3.70	-1.26	27.64	46.00	18.36
352.400	15.78	4.30	-0.15	19.92	46.00	26.08
440.500	17.38	5.30	0.78	23.46	46.00	22.55
528.600	20.22	6.90	3.27	30.40	46.00	15.60
600.360	21.65	6.30	9.24	37.20	46.00	8.80
616.700	21.29	6.30	-1.36	26.22	46.00	19.78
704.800	22.25	6.60	1.24	30.09	46.00	15.91
792.900	25.42	6.90	-4.05	28.26	46.00	17.74
881.000	25.34	7.30	-5.05	27.59	46.00	18.41
959.260	27.16	7.60	2.28	37.04	46.00	8.96

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 : Apr. 01, 2004 Temperature : 21°C

EUT : Multi-Player Humidity : 71%

Test Mode 5 : EUT with Desktop and Link PC, Transmitting FM Radio Frequency 88.1MHz (Power Supply with Notebook PC Via AC Adapter)

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)						
88.100	15.42	2.00	20.70	38.12	48.00	9.88
Fundamental Freq. (Peak Value)						
88.100	15.42	2.00	24.46	41.88	68.00	26.12
Spurious Freq. (Quasi-Peak Value)						
152.220	20.80	2.60	11.97	35.37	43.50	8.13
176.200	21.60	2.90	4.37	28.87	43.50	14.63
264.300	24.97	3.67	-0.02	28.62	46.00	17.38
352.400	16.02	4.30	12.40	32.72	46.00	13.28
410.240	16.60	4.90	15.37	36.87	46.00	9.13
440.500	17.30	5.30	5.11	27.71	46.00	18.29
528.600	18.60	6.90	4.18	29.68	46.00	16.32
547.010	18.63	6.97	10.74	36.34	46.00	9.66
616.700	19.59	6.30	1.42	27.31	46.00	18.69
704.800	21.39	6.60	-2.96	25.03	46.00	20.97
768.170	22.10	3.00	10.92	36.02	43.50	7.48
792.900	22.00	6.90	-1.49	27.41	46.00	18.59
881.000	22.78	7.30	-2.24	27.84	46.00	18.16

- 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 : Apr. 01, 2004 Temperature : 21°C
 EUT : Multi-Player Humidity : 71%
 Test Mode 5 : EUT with Desktop and Link PC, Transmitting FM Radio Frequency
88.1MHz (Power Supply with Notebook PC Via AC Adapter)

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)						
88.100	15.46	2.00	21.80	39.26	48.00	8.74
Fundamental Freq. (Peak Value)						
88.100	15.46	2.00	26.00	43.46	68.00	24.54
Spurious Freq. (Quasi-Peak Value)						
158.040	21.19	2.70	10.28	34.17	43.50	9.33
176.200	20.26	2.90	2.06	25.22	43.50	18.28
264.300	25.20	3.67	-1.29	27.58	46.00	18.42
352.400	15.40	4.30	10.69	30.39	46.00	15.61
440.500	16.62	5.30	6.66	28.59	46.00	17.42
469.410	17.20	5.80	15.20	38.20	46.00	7.80
528.600	18.60	6.90	4.76	30.26	46.00	15.74
558.650	19.70	6.70	11.34	37.74	46.00	8.26
616.700	19.90	6.30	7.48	33.68	46.00	12.32
654.680	20.70	6.40	9.49	36.59	46.00	9.41
704.800	21.05	6.60	-0.82	26.83	46.00	19.17
792.900	21.70	6.90	-1.93	26.67	46.00	19.33
881.000	22.00	7.30	-2.34	26.96	46.00	19.04

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 : Apr. 01, 2004 Temperature : 21°C
 EUT : Multi-Player Humidity : 71%
 Test Mode 6 : EUT with Desktop and Link PC, Upload/Download Music File
 (Power Supply with Notebook PC Via AC Adapter)

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

Spurious Freq. (Quasi-Peak Value)						
36.790	21.30	1.20	7.00	29.50	40.00	10.50
133.790	19.57	2.40	10.73	32.70	43.50	10.80
213.330	22.54	3.10	7.51	33.15	43.50	10.35
262.800	24.90	3.60	4.03	32.53	46.00	13.47
400.540	16.85	4.80	16.52	38.17	46.00	7.83
526.640	18.40	6.90	4.66	29.96	46.00	16.04
666.320	20.60	6.40	6.27	33.27	46.00	12.73
702.210	21.18	6.50	6.80	34.48	46.00	11.52
795.330	22.06	6.90	2.48	31.44	46.00	14.56
924.340	23.24	7.40	3.12	33.76	46.00	12.24

-
- 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 : Apr. 01, 2004 Temperature : 21°C

EUT : Multi-Player Humidity : 71%

Test Mode 6 : EUT with Desktop and Link PC, Upload/Download Music File
(Power Supply with Notebook PC Via AC Adapter)

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

Spurious Freq. (Quasi-Peak Value)						
40.670	20.12	1.20	10.50	31.82	40.00	8.18
133.790	18.95	2.40	7.74	29.09	43.50	14.41
202.660	22.90	3.10	3.71	29.71	43.50	13.79
292.870	26.90	3.90	-0.07	30.73	46.00	15.27
352.040	15.40	4.30	13.24	32.94	46.00	13.06
400.540	16.45	4.80	18.37	39.62	46.00	6.38
526.640	18.50	6.90	5.62	31.02	46.00	14.98
665.350	20.90	6.40	7.47	34.77	46.00	11.23
702.210	21.07	6.50	6.24	33.81	46.00	12.19
798.240	21.60	6.90	0.47	28.97	46.00	17.03
928.220	22.90	7.50	3.22	33.62	46.00	12.38

- 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 : Apr. 01, 2004 Temperature : 21°C

EUT : Multi-Player Humidity : 71%

Test Mode 7 : EUT with Power Bank, Transmitting FM Radio Frequency
88.1MHz (Power with Power Bank Via Travel Charger)

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)						
88.100	15.42	2.00	21.58	39.00	48.00	9.00
Fundamental Freq. (Peak Value)						
88.100	15.42	2.00	26.13	43.55	68.00	24.45
Spurious Freq. (Quasi-Peak Value)						
176.200	21.60	2.90	1.23	25.73	43.50	17.77
264.300	24.97	3.67	4.11	32.75	46.00	13.25
352.400	16.02	4.30	0.66	20.98	46.00	25.02
440.500	17.30	5.30	3.24	25.84	46.00	20.17
445.160	17.39	5.40	14.13	36.92	46.00	9.08
528.600	18.60	6.90	4.72	30.22	46.00	15.78
600.360	19.50	6.30	11.25	37.05	46.00	8.95
616.700	19.59	6.30	2.81	28.70	46.00	17.30
704.800	21.39	6.60	-1.02	26.97	46.00	19.03
719.670	21.30	6.60	8.01	35.91	46.00	10.09
792.900	22.00	6.90	-1.74	27.16	46.00	18.84
881.000	22.78	7.30	-2.32	27.76	46.00	18.24
959.260	23.10	7.60	4.07	34.77	46.00	11.23

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 : Apr. 01, 2004 Temperature : 21°C

EUT : Multi-Player Humidity : 71%

Test Mode 7 : EUT with Power Bank, Transmitting FM Radio Frequency
88.1MHz (Power with Power Bank Via Travel Charger)

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)						
88.100	15.46	2.00	19.20	36.66	48.00	11.34
Fundamental Freq. (Peak Value)						
88.100	15.46	2.00	23.28	40.74	68.00	27.26
Spurious Freq. (Quasi-Peak Value)						
36.790	20.80	1.20	10.42	32.42	40.00	7.58
176.200	20.26	2.90	0.24	23.40	43.50	20.10
264.300	25.20	3.67	-1.39	27.48	46.00	18.52
352.400	15.40	4.30	-2.54	17.16	46.00	28.84
440.500	16.62	5.30	0.07	21.99	46.00	24.01
528.600	18.60	6.90	1.55	27.05	46.00	18.95
600.360	20.40	6.30	7.85	34.55	46.00	11.45
616.700	19.90	6.30	1.21	27.41	46.00	18.59
704.800	21.05	6.60	-2.28	25.37	46.00	20.63
792.900	21.70	6.90	-2.49	26.11	46.00	19.89
881.000	22.00	7.30	-1.88	27.42	46.00	18.58
959.260	23.90	7.60	2.00	33.50	46.00	12.50

- 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 : Apr. 01, 2004 Temperature : 21°C

EUT : Multi-Player Humidity : 71%

Test Mode 8 : EUT with Power Bank, Transmitting FM Radio Frequency 88.1MHz
(Power with Power Bank Via Saver Charger from DC Power Supply)

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)						
88.100	15.42	2.00	20.57	37.99	48.00	10.01
Fundamental Freq. (Peak Value)						
88.100	15.42	2.00	26.56	43.98	68.00	24.02
Spurious Freq. (Quasi-Peak Value)						
143.490	20.27	2.50	10.83	33.61	43.50	9.89
176.200	21.21	2.90	3.98	28.09	43.50	15.41
216.240	21.86	3.20	9.32	34.38	46.00	11.62
243.400	23.29	3.40	8.74	35.43	46.00	10.57
264.300	24.62	3.70	0.86	29.18	46.00	16.82
352.400	15.55	4.30	0.87	20.72	46.00	25.28
440.500	17.60	5.30	3.67	26.57	46.00	19.43
528.600	19.69	6.90	3.76	30.35	46.00	15.65
600.360	21.31	6.30	7.94	35.56	46.00	10.44
616.700	21.31	6.30	-0.16	27.45	46.00	18.55
704.800	23.56	6.60	-5.04	25.12	46.00	20.88
792.900	23.95	6.90	-4.27	26.58	46.00	19.42
881.000	25.34	7.30	-5.16	27.48	46.00	18.52

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 : Apr. 01, 2004 Temperature : 21°C
 EUT : Multi-Player Humidity : 71%
 Test Mode 8 : EUT with Power Bank, Transmitting FM Radio Frequency 88.1MHz
 (Power with Power Bank Via Saver Charger from DC Power Supply)

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)						
88.100	15.46	2.00	19.88	37.34	48.00	10.56
Fundamental Freq. (Peak Value)						
88.100	15.46	2.00	24.00	41.46	68.00	26.54
Spurious Freq. (Quasi-Peak Value)						
35.820	21.79	1.20	7.90	30.89	40.00	9.11
176.200	20.66	2.90	-0.34	23.22	43.50	20.28
264.300	25.20	3.70	-1.96	26.94	46.00	19.06
352.400	15.78	4.30	-2.56	17.51	46.00	28.49
440.500	17.38	5.30	-0.85	21.83	46.00	24.17
528.600	20.22	6.90	1.05	28.18	46.00	17.82
600.360	21.65	6.30	8.31	36.27	46.00	9.73
616.700	21.29	6.30	-2.07	25.52	46.00	20.48
704.800	22.25	6.60	-2.53	26.32	46.00	19.68
792.900	25.42	6.90	-5.38	26.94	46.00	19.06
881.000	25.34	7.30	-5.91	26.74	46.00	19.26
959.260	27.16	7.60	-1.79	32.96	46.00	13.04

- 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 : Apr. 01, 2004 Temperature : 21°C
 EUT : Multi-Player Humidity : 71%
 Test Mode 9 : EUT with Desktop Speaker, Transmitting FM Radio Frequency
 88.1MHz (Power Supply with Desktop Speaker Via AC Adapter)

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)						
88.100	15.42	2.00	20.87	38.29	48.00	9.71
Fundamental Freq. (Peak Value)						
88.100	15.42	2.00	24.80	42.22	68.00	25.78
Spurious Freq. (Quasi-Peak Value)						
58.130	13.43	1.60	17.51	32.54	40.00	7.46
115.360	18.69	2.30	14.00	34.98	43.50	8.52
172.590	21.04	2.80	12.61	36.45	43.50	7.05
176.200	21.21	2.90	7.82	31.93	43.50	11.57
264.300	24.62	3.70	1.46	29.78	46.00	16.22
275.410	25.25	3.70	5.94	34.89	46.00	11.11
352.400	15.55	4.30	2.92	22.77	46.00	23.23
440.500	17.60	5.30	1.17	24.07	46.00	21.93
528.600	19.69	6.90	1.17	27.76	46.00	18.24
616.700	21.31	6.30	-3.06	24.55	46.00	21.45
704.800	23.56	6.60	-3.41	26.75	46.00	19.25
792.900	23.95	6.90	-3.10	27.75	46.00	18.25
881.000	25.34	7.30	-4.59	28.05	46.00	17.95

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 : Apr. 01, 2004 Temperature : 21°C
 EUT : Multi-Player Humidity : 71%
 Test Mode 9 : EUT with Desktop Speaker, Transmitting FM Radio Frequency 88.1MHz (Power Supply with Desktop Speaker Via AC Adapter)

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)						
88.100	15.46	2.00	21.90	39.36	48.00	8.64
Fundamental Freq. (Peak Value)						
88.100	15.46	2.00	25.11	42.57	68.00	25.43
Spurious Freq. (Quasi-Peak Value)						
30.970	23.39	1.10	6.58	31.08	40.00	8.92
58.130	13.79	1.60	18.59	33.98	40.00	6.02
176.200	20.66	2.90	0.91	24.47	43.50	19.03
264.300	25.20	3.70	-2.03	26.87	46.00	19.13
352.400	15.78	4.30	-1.54	18.53	46.00	27.47
440.500	17.38	5.30	8.49	31.17	46.00	14.83
528.600	20.22	6.90	10.73	37.86	46.00	8.14
616.700	21.29	6.30	1.36	28.94	46.00	17.06
704.800	22.25	6.60	7.69	36.54	46.00	9.46
792.900	25.42	6.90	-0.24	32.07	46.00	13.93
850.620	26.34	7.10	4.33	37.77	46.00	8.23
881.000	25.34	7.30	-5.54	27.10	46.00	18.90
969.100	26.94	7.60	-0.92	33.62	54.00	20.38

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 : Apr. 01, 2004 Temperature : 21°C

EUT : Multi-Player Humidity : 71%

Test Mode 10 : EUT with Cradle Holder, Transmitting FM Radio Frequency
88.1MHz (Power Supply with Cradle Holder from DC Power)

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)						
88.100	15.42	2.00	21.90	39.32	48.00	8.68
Fundamental Freq. (Peak Value)						
88.100	15.42	2.00	25.63	43.05	68.00	24.95
Spurious Freq. (Quasi-Peak Value)						
58.130	14.18	1.60	19.40	35.18	40.00	4.82
172.590	21.50	2.80	11.44	35.74	43.50	7.76
176.200	21.60	2.90	6.87	31.37	43.50	12.13
264.300	24.97	3.67	3.22	31.86	46.00	14.14
301.600	14.77	3.90	17.99	36.66	46.00	9.34
352.400	16.02	4.30	4.93	25.25	46.00	20.75
440.500	17.30	5.30	2.36	24.96	46.00	21.05
528.600	18.60	6.90	4.41	29.91	46.00	16.09
541.190	18.80	7.01	11.81	37.62	46.00	8.38
616.700	19.59	6.30	-2.08	23.81	46.00	22.19
704.800	21.39	6.60	-2.45	25.54	46.00	20.46
792.900	22.00	6.90	-2.16	26.74	46.00	19.26
881.000	22.78	7.30	-2.01	28.07	46.00	17.93

- 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 : Apr. 01, 2004 Temperature : 21°C
 EUT : Multi-Player Humidity : 71%
 Test Mode 10 : EUT with Cradle Holder, Transmitting FM Radio Frequency
 88.1MHz (Power Supply with Cradle Holder from DC Power)

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)						
88.100	15.46	2.00	20.80	38.26	48.00	9.74
Fundamental Freq. (Peak Value)						
88.100	15.46	2.00	26.88	44.34	68.00	23.66
Spurious Freq. (Quasi-Peak Value)						
58.130	15.26	1.60	18.27	35.13	40.00	4.87
150.280	20.64	2.60	13.90	37.14	43.50	6.36
176.200	20.26	2.90	3.85	27.01	43.50	16.49
204.600	23.20	3.10	10.54	36.84	43.50	6.66
264.300	25.20	3.67	3.15	32.02	46.00	13.98
352.400	15.40	4.30	-0.79	18.91	46.00	27.09
440.500	16.62	5.30	1.84	23.76	46.00	22.24
528.600	18.60	6.90	11.34	36.84	46.00	9.16
616.700	19.90	6.30	-1.76	24.44	46.00	21.56
704.800	21.05	6.60	0.81	28.46	46.00	17.54
792.900	21.70	6.90	-2.06	26.54	46.00	19.46
881.000	22.00	7.30	-1.30	28.00	46.00	18.00
959.260	23.90	7.60	4.31	35.81	46.00	10.19

- 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.

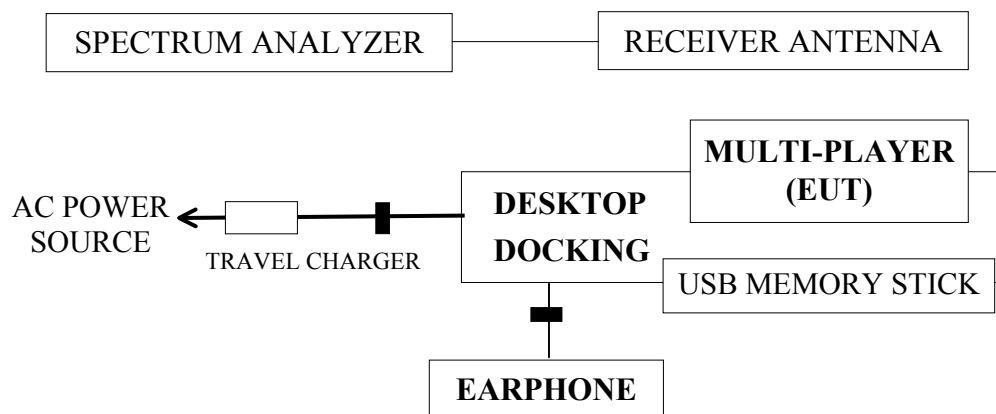
4. 26dB BANDWIDTH MEASUREMENT

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 88-108MHz.

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.

Date of Test: Apr. 19, 2004

Temperature : 22°C

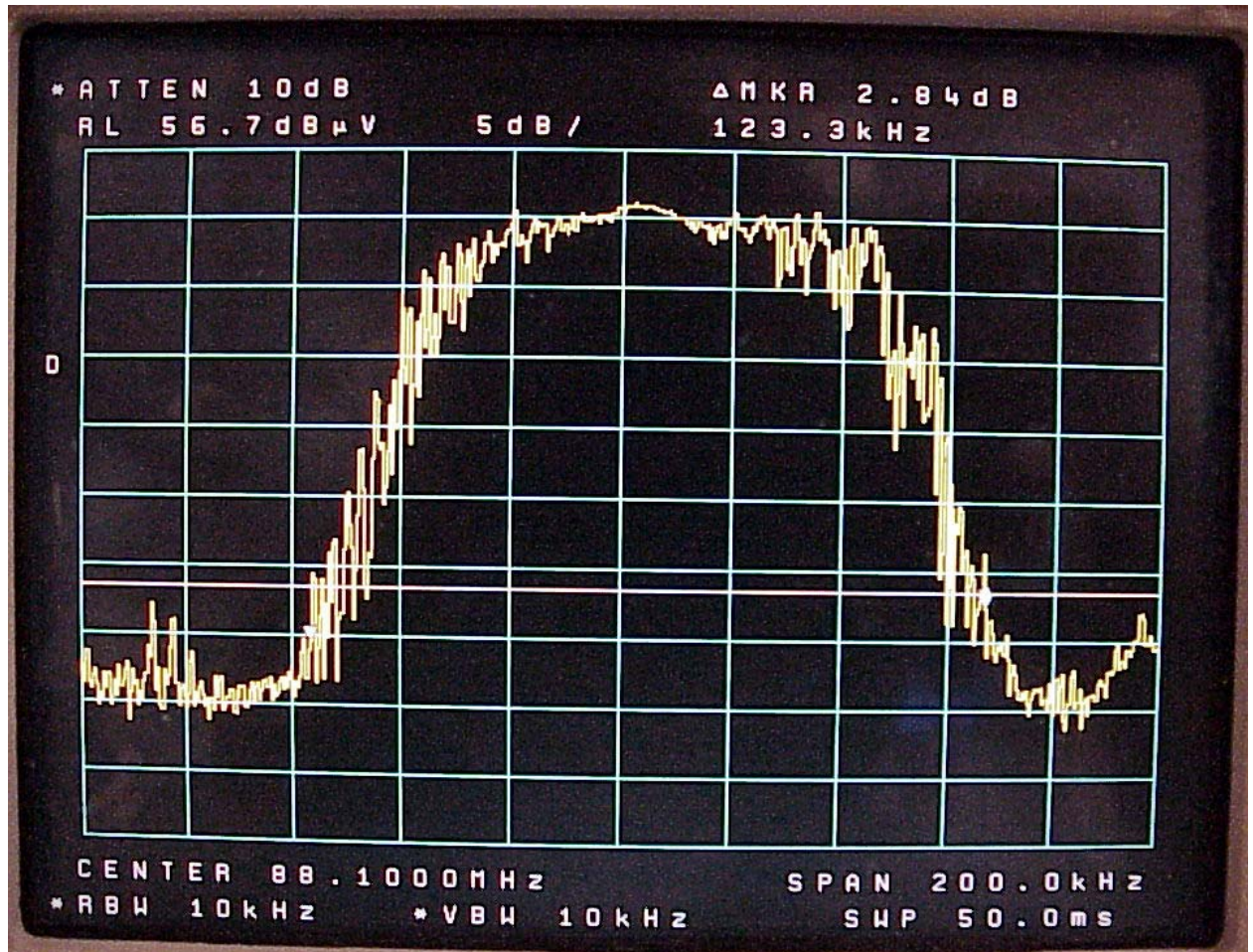
Humidity : 56%

Mode	Center Frequency	26dB Bandwidth	Limits
1.	88.1000MHz	123.3kHz	200kHz
2.	98.1000MHz	135.3kHz	200kHz
3.	107.9053MHz	79.3kHz	200kHz

Remark: The lowest frequency is 88.038MHz and the highest frequency is 107.945MHz.

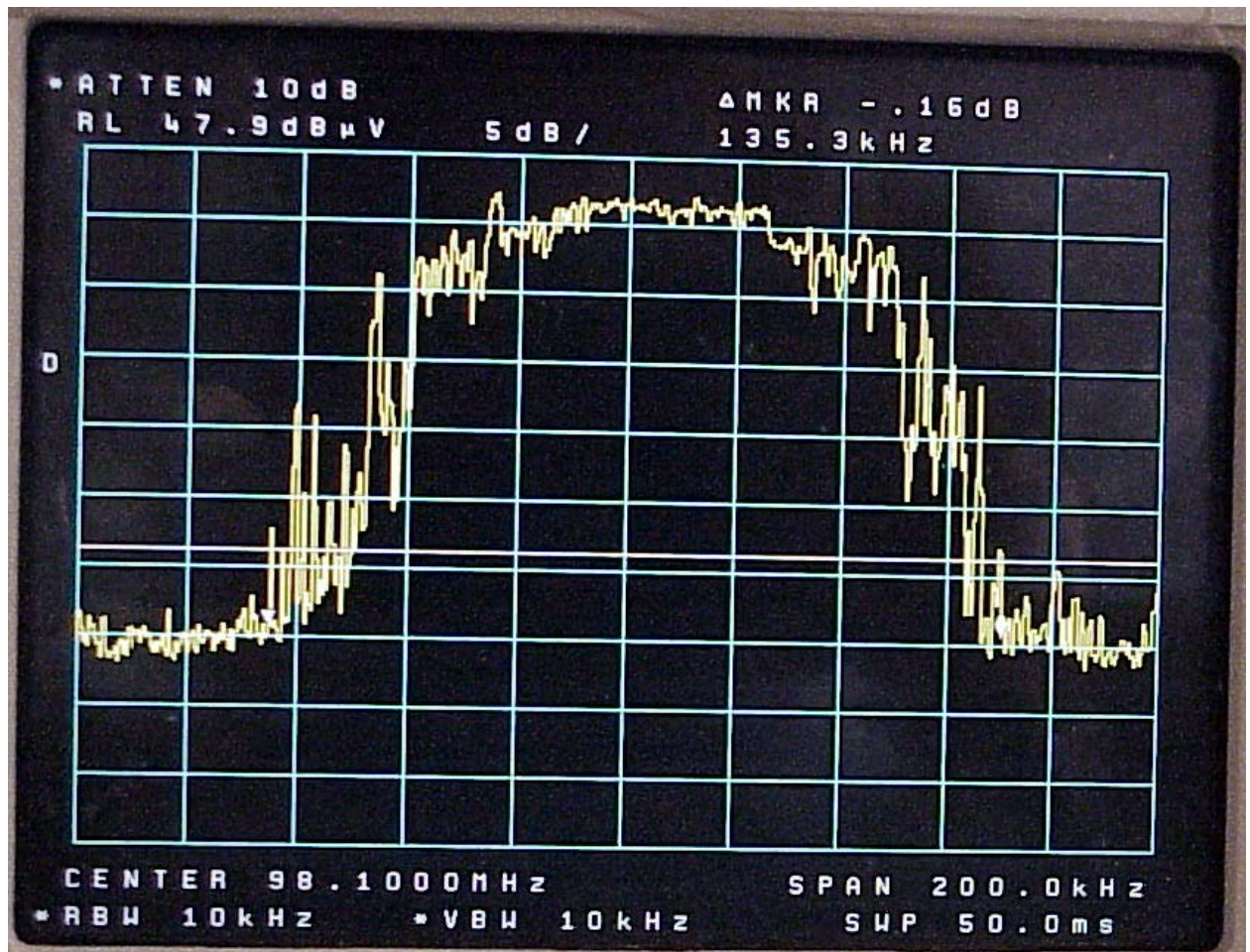
(Graph of Bandwidth Measurement)

Center Frequency 88.1000MHz, 26dB Bandwidth: 123.3kHz



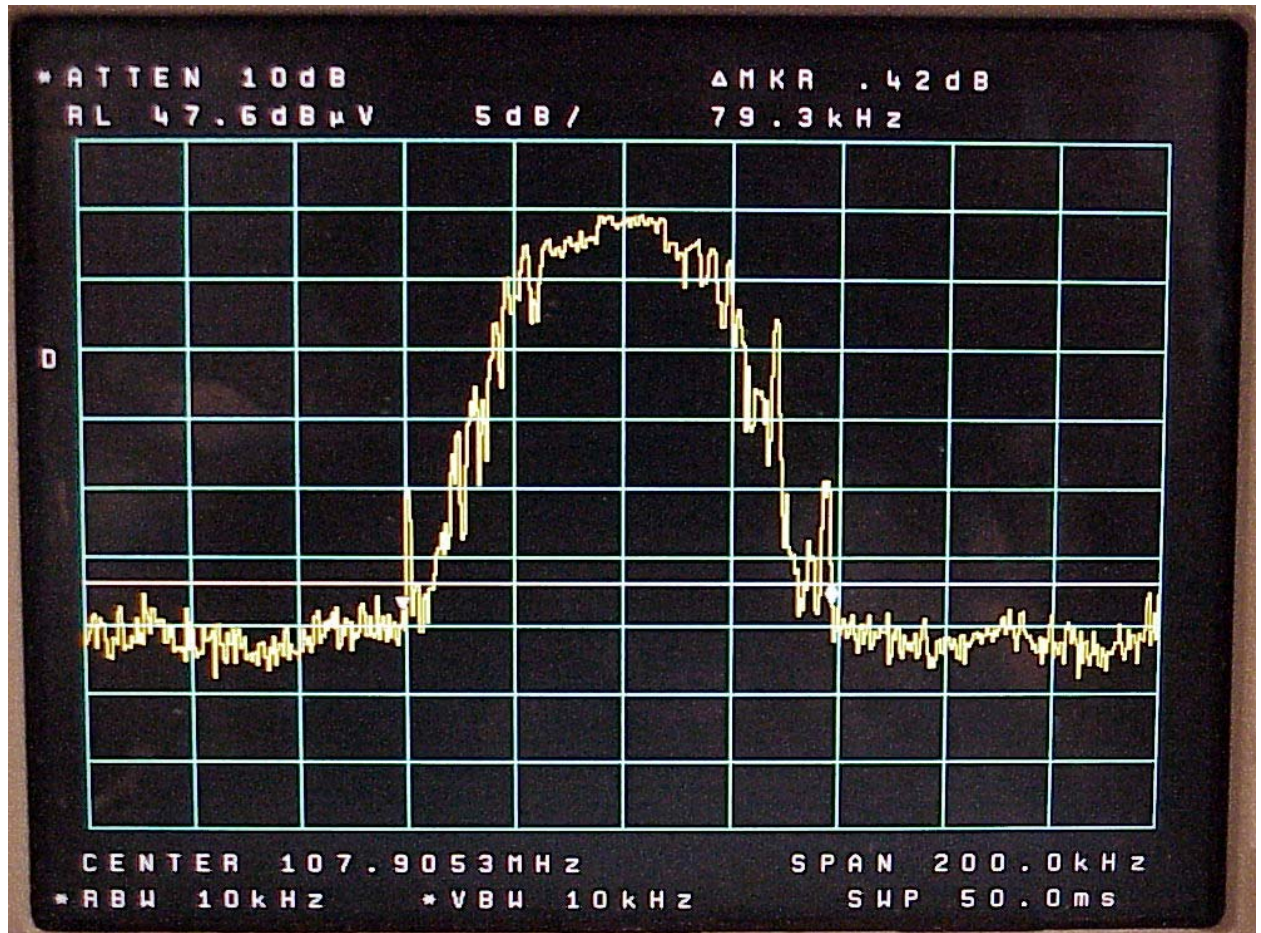
(Graph of Bandwidth Measurement)

Center Frequency 98.1000MHz, 26dB Bandwidth: 135.3kHz



(Graph of Bandwidth Measurement)

Center Frequency 107.9053MHz, 26dB Bandwidth: 79.3kHz



5. MODIFICATIONS TO EUT

1. The USB cable was shielded and bonded a ferrite core.
2. Added a ferrite core on the line of earphone with 2 turns.
3. Added a ferrite core on the dc output power cable of travel charger with 2 turns.
4. Added a ferrite core on the dc output power cable of ac adapter with 2 turns. (This AC Adapter is connect to power socket of Desktop Speaker)

6. DEVIATION TO TEST SPECIFICATIONS

【NONE】