EMI TEST REPORT

Test report no. : ERI-FCC-0136

Type of equipment : MP3 Player

Model no. : iFP-180T

Applicant. : ReignCom Co., Ltd.

Test standards : FCC Part15 Subpart B (Class B)

Test Procedure and Items :

- AC Power line Conducted Emissions Measurement : ANSI C63.4-1992
- Radiated Emissions Measurement : ANSI C63.4-1992

Test result : Complied

This equipment has been tested to comply with the requirements of FCC Rules and Regulations Part 15 Subpart B Unintentional Radiators.
The results in this report apply only to the sample tested.
This test report shall not be reproduced except in full, Without the written approval of ERI Laboratory.

Date of test: 2002. 8. 8 9 **Issued date: 2002. 8. 9**

Tested by : GWEON, HUR **Approved by:** SANG-KYU, LEE

This laboratory is registered by KOLAS, KOREA.

This test report have been performed in accordance with Its terms of registration.

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Contents

1. Client information

Applicant	: ReignCom Co., Ltd.
Address	: 8F Posgen VentureTower, 1586-7 Seocho-dong, Seocho- gu, Seoul, Korea
Telephone Number	: +81-2-3019-1723
Facsimile Number	: +81-2-3019-1746
Contact person	: Mun, Hyo Jae

Manufacturer	: ReignCom Co., Ltd.
Address	: 8F Posgen VentureTower, 1586-7 Seocho-dong, Seocho-gu, Seoul, Korea
Telephone Number	: +81-2-3019-1723
Facsimile Number	: +81-2-3019-1746

2. Laboratory information

Address

The open area test site and EMC facilities are used for these testing.
This facility was accredited by KOLAS, EK of Korea, MIC, FCC.

EMC RESEARCH INSTITUTE .
66-6, JEIL-RI, YANGJI-MYUN, YOUNGIN-CITY, KYUNGGI-DO, KOREA

Telephone Number : 82- 31- 336- 1186
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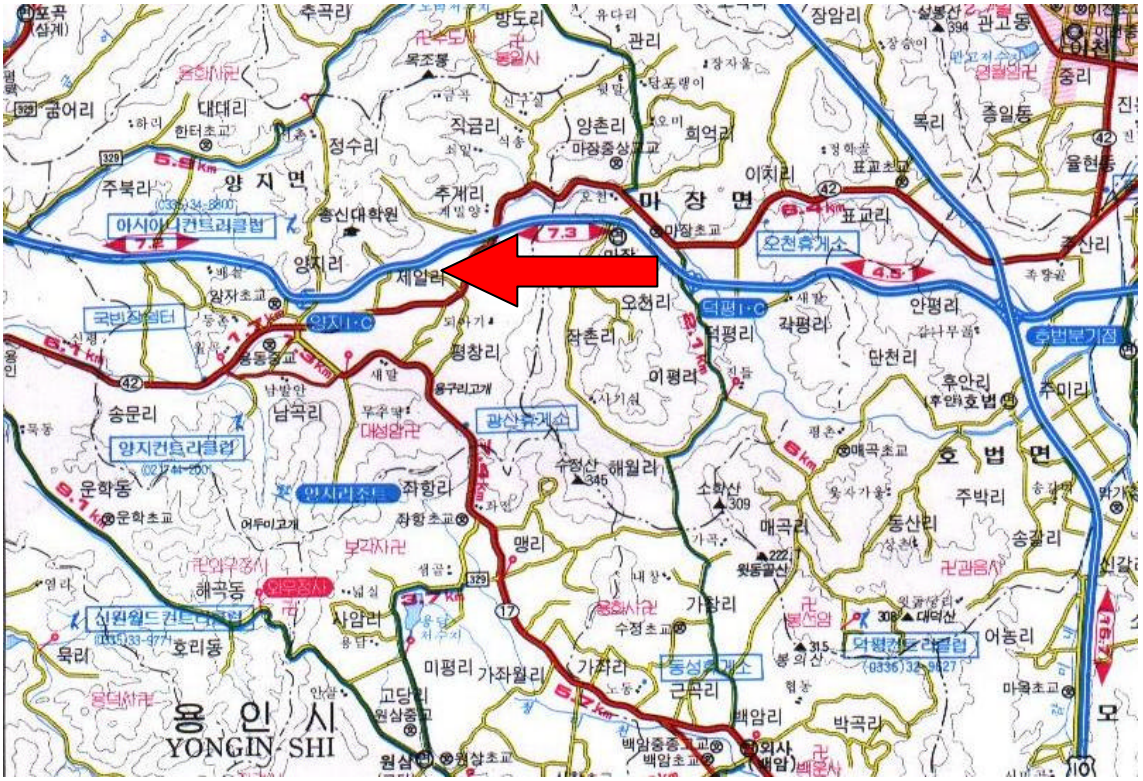
KOLAS No. : 111
EK : J
MIC : KR0030
FCC Filing No. : 302567

MAP



3. TEST SYSTEM CONFIGURATION

3.1 Operation environment

	Temperature	Humidity	Pressure
10m Chamber :	21.0 ° C	52 %	-
Shielded room :	24.0 ° C	58 %	998hPa

3.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, specfially in field of EMC.
The factors contributing to uncertainties are test receiver, Cable loss, antenna factor calibration, Antenna directivity, antenna factor variation with height, antenna phase center variation, antenna Frequency interpolation, measurement distance variation, site imperfection, mismatch, and system repeatability.

Based on NIS 80,81, The measurement uncertainty level with a 95% confidence level were applied.

3.3 Sample calculation

Conducted emission

The field strength is calculated by adding the LISN factor, cable loss from the measured reading.
The sample calculation is as follows :

FS = MR + LF + CL
MR = Meter Reading
LF = LISN Factor
CL = Cable Loss

If MR is 30dB, LISN Factor 1dB, CL 1dB
The result (MR) is
30 + 1 + 1 = 32dBuV

Radiated emission

The field strength is calculated by adding the antenna Factor, cable loss and, Antenna pad subtracting the amplifier gain from the measured reading.
The sample calculation is as follows :

FS = MR + AF + CL + AT-AG

MR = Meter Reading
AF = Antenna Factor
CL = Cable Loss
AT = Antenna Pad
AG=Amplifier Gain

If MR is 30dB, AF 12dB, CL 5dB, AP 10dB, AG 35dB
The result (MR) is

30 + 12 + 5 + 10 –35 = 22dBuV/m

4. Description of e.u.t.

4.1 Product description

Type of Product :	MP3 PLAYER
Model No. :	iFP-180T
Serial Number :	N/A
Electrical Ratings :	DC 1.5V
General Description :	This EUT(Equipment Under Test) is the MP3 player.

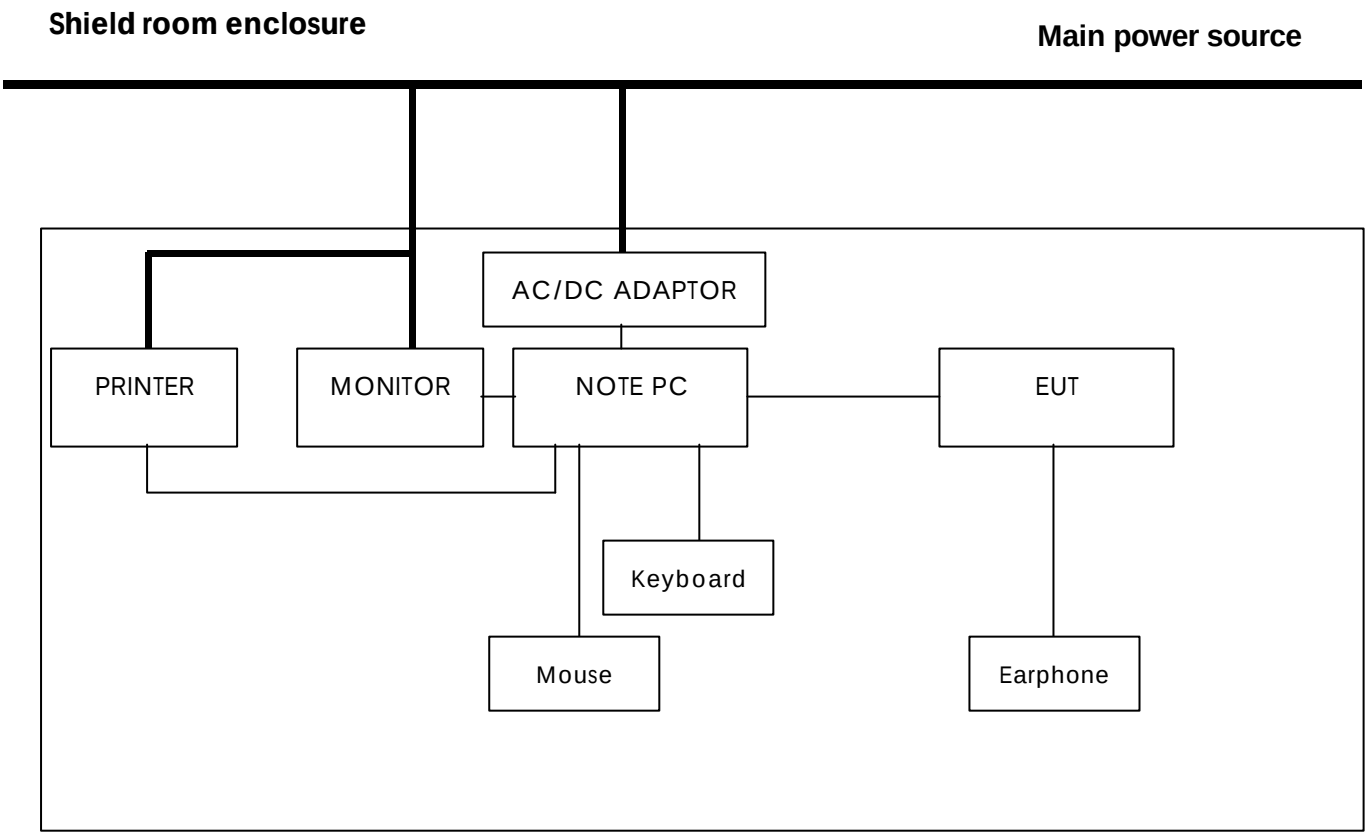
4.2 Peripherals

Description	Manufacturer	Model / Part #	Serial Number
Note PC	Fujitsu	LIFE BOOK E-6585	R1300287
AC/DC adaptor	Sanken electronic Co., Ltd.	SEA60N2-16.OA	01261909B
Monitor	Samsung electronics Co., Ltd.	55E	N/A
Printer	HP	C6427A	CN13V1B1SZ
Keyboard	Samsung electro-machanics Co., Ltd.	SEM-DT35	14379394
Mouse	N/A	MOSXUB	N/A
Earphone	N/A	N/A	N/A

4.3 Used cables

Cable Type	Shield	Length (meters)	Ferrite	Connector	Connection Point 1	Connection Point 2
Earphone	No	1.0	YES	P-jack	Earphone	-
USB	Yes	1.0	YES	USB	NOTE PC	-

4.4 E.U.T Test configuration



4.5 Operating conditions

Operating : upload, download mode & play mode

- The system was configured in typical fashion (as a customer would normally use it) for testing.
- The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to typical use.

5. TEST RESULTS

5.1 Conducted emission

5.1.1 Measurement procedure

Mains

The measurements were performed in a shielded room.
EUT was placed on a non-metallic table height of 0.8m above the reference ground plane.
The rear of tabletop was located 0.4m to the vertical conducted plane.
All other surfaces of tabletop was at least 0.8m from any other grounded conducting surface.
I/O cables and AC cables that were connected to the peripherals were bundled in center.
They were folded back and forth forming a bundle 0.3m to 0.4m long and were hanged at a 0.4m height to the ground plane.
Each EUT power lead, except ground (safety) lead, were individually connected through a LISN to input power source.
Both lines of power cord, hot and neutral, were measured.

5.1.2 Used equipment

Equipment	Model	Serial No.	Makers	Next Cal.Date	Used
Test receiver	ESCS30	100022	R&S	03. 3. 25	x
L.I.S.N.	ESH3-Z5	827246/008	R&S	03. 3. 12	x
	ESH3-Z5	831887/018	R&S	03. 3. 12	x
Shield room	8 × 6 × 3.3m/H	-	Daehan shield Engineering	-	x

5.1.3 Measurement uncertainty

Conducted emission measurement : ± 2.4 (K=2)

5.1.4 Test data(up&download mode)

Frequency Range	Tested Freq.	LISN Pol.	Meter Reading		Limits	
			QP	AV	QP	AV
[MHz]	[MHz]		[dBuV]		[dBuV]	
0.15 - 0.5(MHz)	0.150	H	37.8	19.2	66.0	56.0
	0.189	H	49.8	22.4	64.1	54.1
	0.255	H	41.8	36.1	61.5	51.5
	0.381	H	40.4	33.8	58.1	48.1
	0.498	N	39.3	25.0	56.1	46.1
0.5-5 (MHz)	0.852	N	35.6	24.8	56.0	46.0
	1.137	H	37.4	27.9	56.0	46.0
	1.491	N	36.8	27.0	56.0	46.0
	1.779	N	38.9	29.4	56.0	46.0
	2.424	N	37.4	29.0	56.0	46.0
5-30 (MHz)	5.700	N	32.1	21.9	60.0	50.0
	7.340	N	30.3	21.3	60.0	50.0
	15.460	H	30.4	22.8	60.0	50.0

5.1.5 Result

Complied

5.2 Radiated emission

5.2.1 Measurement procedure

A pretest was performed at 3m distance in an semi-anechoic chamber for searching correct frequency.
The final test was done at a 10m open area test site with a quasi-peak detector.
EUT was placed on a non-metallic table height of 0.8m above the reference ground plane.
Cables connected to EUT were fixed to cause maximum emission.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization.
The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

5.2.2 Used equipment

Equipment	Model No.	Serial No.	Makers	Next Cal Date	Used
Test receiver	ESMI	826210/007	R&S	03. 3. 8	
	ESCS30	830986/015	R&S	03. 3.18	x
Biconnical antenna	VHA9103	1950	Schwarzbeck	03. 4. 17	x
Log-Periodic antenna	UHALP9108-A1	0393	Schwarzbeck	03. 4. 17	x
Antenna Mast	MA240	N/A	HD	-	x
Turn Table	DT430S	N/A	HD	-	x
Test site	10m chamber	-	Daetong	-	
	3m chamber	-	Daetong	-	x

5.2.3 Measurement uncertainty

Radiated Emission measurement

30-300MHz +3.96dB / -4.04dB
300-1000MHz +3.04dB / -3.00dB

5.2.4 Test Data(up&download mode)

Frequency Range [MHz]	Tested Frequency [MHz]	ANT Pol.	Meter Reading [A] [dBuV/m]	Total Loss [B] [dB]	Results [A+B] [dBuV/m]	Margine	Limits [dBuV/m]
30 - 88	51.60	V	16.2	13.00	29.20	10.80	**40**
	84.00	V	17.1	9.50	26.60	13.40	
88-216	99.50	H	23.6	11.22	34.82	8.78	**43.5**
	130.60	H	16.5	16.06	32.56	11.04	
	188.60	H	13.6	18.90	32.50	11.10	
	199.40	H	17.6	19.05	36.65	6.95	
216-960	245.30	H	12.2	20.20	32.40	13.60	**46.0**
	298.70	H	12.4	22.53	34.93	11.07	
	321.00	H	17.6	17.29	34.89	11.11	
	465.00	H	14.3	20.84	35.14	10.86	
	500.00	H	16.8	21.64	38.44	7.56	
960-above							**54.0**

5.2.5 Test data(play mode)

Frequency Range [MHz]	Tested Frequency [MHz]	ANT Pol.	Meter Reading [A] [dBuV/m]	Total Loss [B] [dB]	Results [A+B] [dBuV/m]	Margine	Limits [dBuV/m]
30 - 88							**40**
88-216	112.60	H	3.1	13.69	16.79	26.81	**43.5**
	207.50	H	3.5	19.09	22.59	21.01	
	209.60	H	2.1	19.09	21.19	22.41	
216-960	364.10	H	1.9	18.11	20.01	25.99	**46.0**
	623.80	H	2.6	24.08	26.68	19.32	
960-above							**54.0**

5.2.5 Test Data(FM tuner mode)

T.	Tested	Meter Reading		Total	Results		Margin		Limits
Frequency	Frequency	[dBuV/m]		Loss	[dBuV/m]		[dBuV/m]		
		[A]		[B]	[A+B]		[C]-[A+B]		[C]
[MHz]	[MHz]	H	V		H	V	H	V	[dBuV/m]
87.5	98.2	3.2	-	11.9	15.1	-	28.4	-	43.5
	196.4	8.6	-	17.8	26.4	-	17.1	-	43.5
	294.6	2.4	-	24.3	26.7	-	19.3	-	46.0
	392.8	-	-	21.4	-	-	-	-	46.0
	491.0	-	-	23.9	-	-	-	-	46.0
	589.2	-	-	26.2	-	-	-	-	46.0
	687.4	-	-	28.7	-	-	-	-	46.0
	785.6	-	-	30.0	-	-	-	-	46.0
	883.8	-	-	31.9	-	-	-	-	46.0
	982.0	-	-	33.1	-	-	-	-	54.0
98.0	108.7	4.1	3.4	12.7	16.8	16.1	26.7	27.4	43.5
	217.4	10.2	6.7	18.9	29.1	25.6	17.0	20.5	46.0
	326.1	-	-	18.9	-	-	-	-	46.0
	434.8	-	-	22.4	-	-	-	-	46.0
	543.5	-	-	25.2	-	-	-	-	46.0
	652.2	-	-	27.5	-	-	-	-	46.0
	760.9	-	-	29.7	-	-	-	-	46.0
	869.6	-	-	31.8	-	-	-	-	46.0
	978.3	-	-	33.0	-	-	-	-	54.0
108.0	118.7	7.9	-	13.7	21.6	-	21.9	-	43.5
	237.4	4.2	-	19.0	23.2	-	22.8	-	46.0
	356.1	-	-	20.1	-		-	-	46.0
	474.8	-	-	23.4	-	-	-	-	46.0
	593.5	-	-	26.3	-	-	-	-	46.0
	712.2	-	-	29.1	-	-	-	-	46.0
	830.9	-	-	30.6	-	-	-	-	46.0
	949.6	-	-	32.1	-	-	-	-	46.0

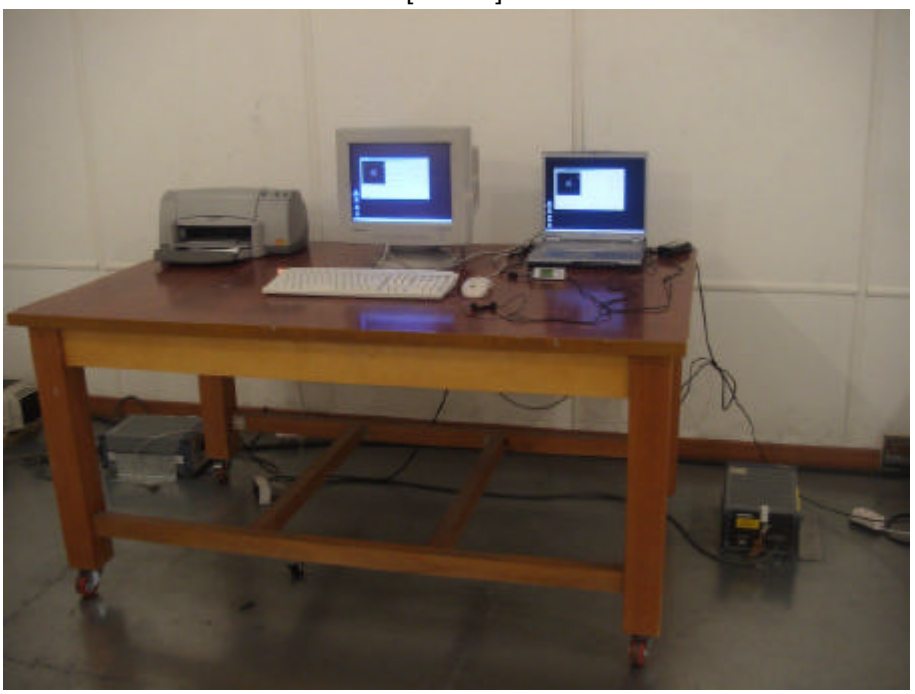
5.2.6 Result

Complied

6. TEST PHOTOGRAPHS

Conducted emission

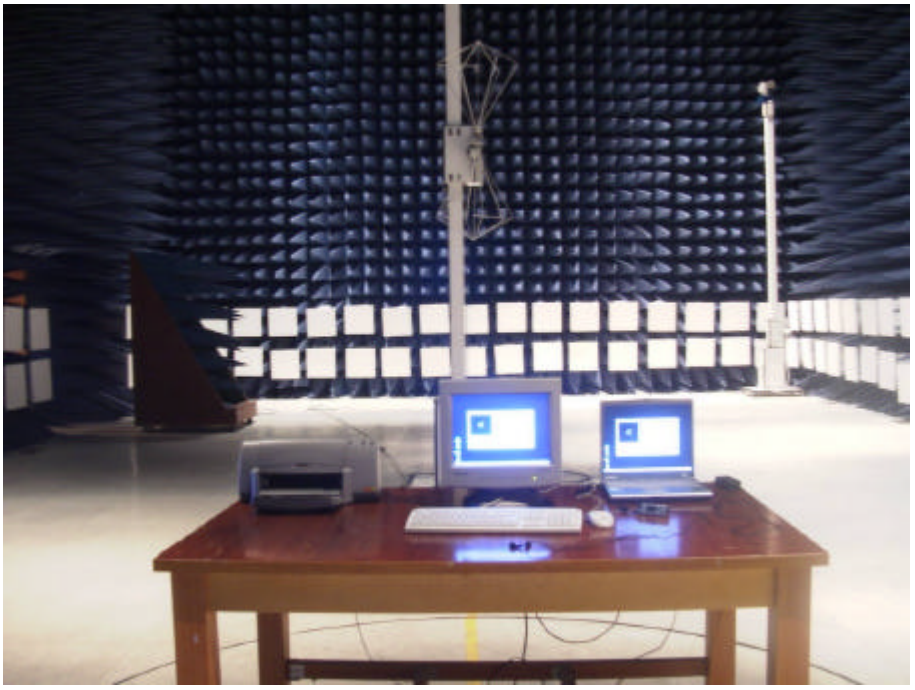
[FRONT]



[REAR]

Radiated emission

[FRONT]



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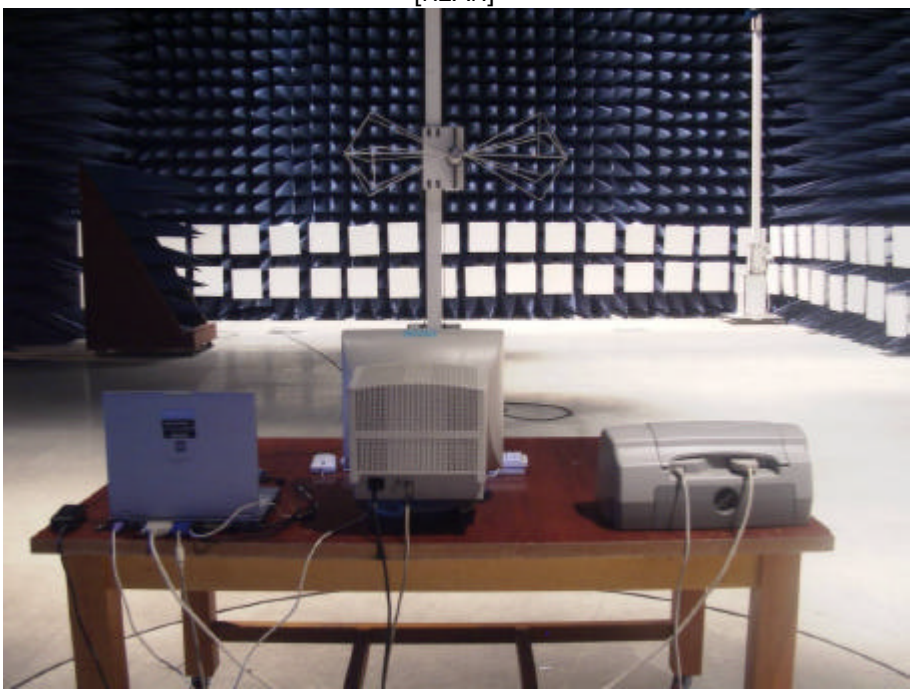


EUT(equipment under test)

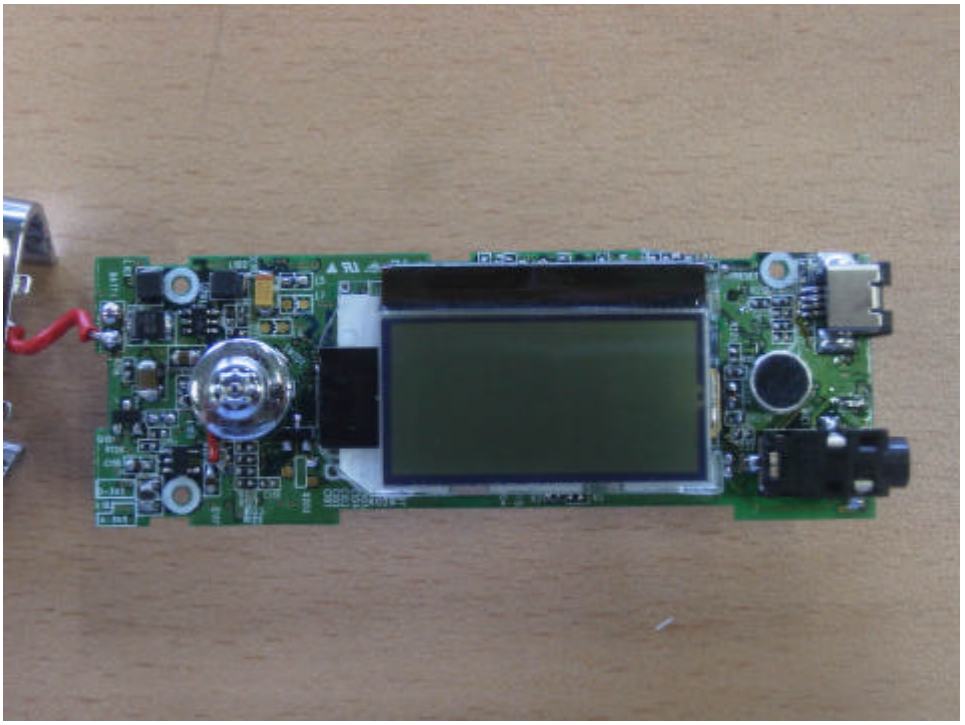
[EUT FRONT]

[EUT REAR]

[EUT INNER]

EUT MAINBOARD

[FRONT]



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