EMI TEST REPORT

Test report no. : ERI-FCC-0126

Type of equipment : MP3 PLAYER

Model no. : CA-1000

Applicant. : CM Tech 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 : PASS

This equipment has been tested to comply with the requirements of FCC rules and regulations part 15 subpart B unitentional 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. 7. 2 – 7.3 **Issued date: 2002. 7. 4**

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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1. Client information

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Manufacturer	: CM Tech Co., Ltd.
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2. Laboratory information

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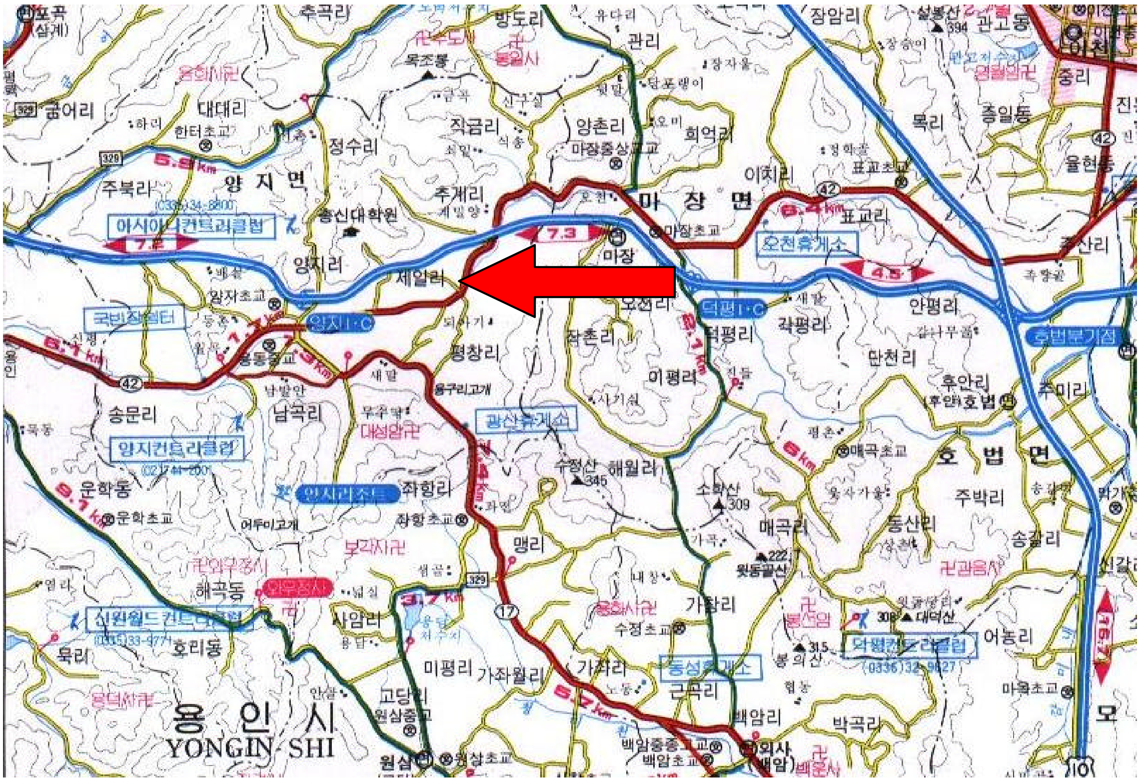
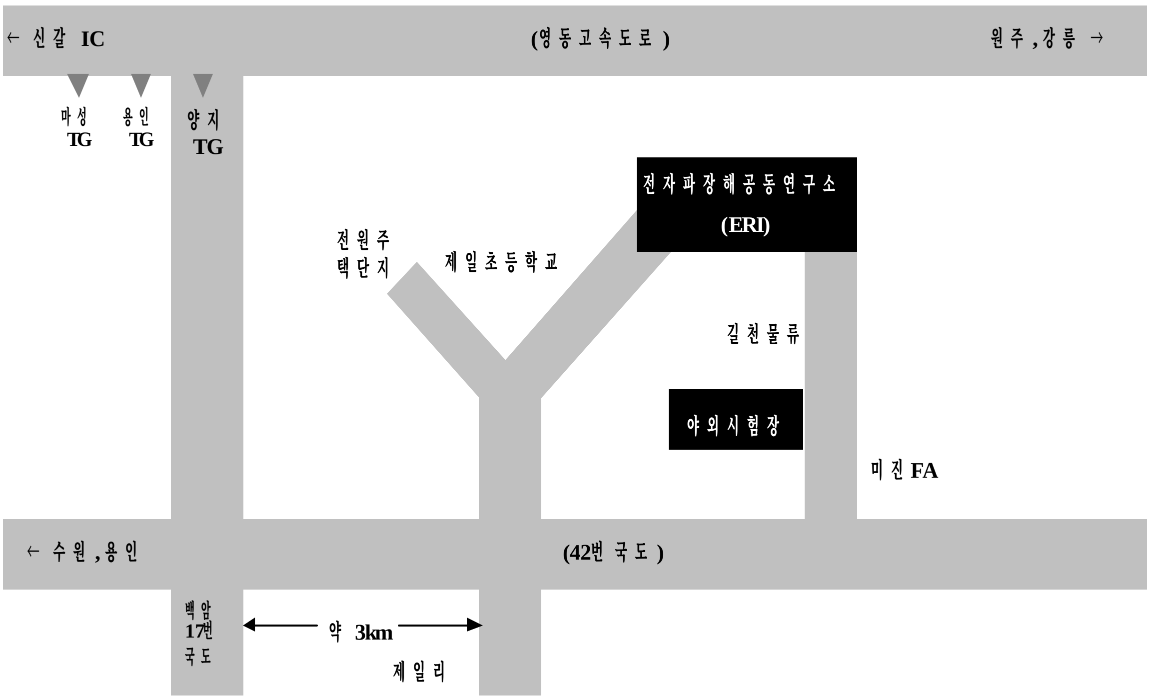
All of the test facilities of ERI were accredited by KOLAS(ATS) / MIC of Korea, FCC.

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 :	19° C	45%	991hPa
Shielded room :	23° C	54 %	992hPa

3.2 Measurement uncertainty

All measurements involve certain levels of uncertainties, specially 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

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. :	CA-1000
Serial number :	N/A
Electric rating :	DC 1.5V
General description :	This EUT(Equipment under test) is the MP3 PLAYER.

4.2 Peripherals

Description	Manufacturer	Model / Part #	Serial number
PC	Commaeul	Emachines/j	50010 804 00808
Earphone	N/A	N/A	N/A
Monitor	Samsung electronics. Co., Ltd.	CDP15S	P041H8WKA17397
Printer	HP	C64247A	CN13V1B1SZ
Mouse	Microsoft	63618-OEM	X05-53748
Keyboard	TriGem computer Co., Ltd.	Power keyboard TRI-270	108018373
Earphone	N/A	N/A	N/A
Mic	N/A	N/A	N/A

4.3 Used cables

Cable type	Shield	Length (meters)	Connector	Connection point 1	Connection point 2
Earphone	No	1.0	P-jack	EUT	-
USB	Yes	1.0	Usb	PC	-

4.4 Operating conditions

Operating : data download mode

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	2003. 3. 25	x
L.I.S.N.	ESH3-Z5	827246/008	R&S	2003. 3. 12	x
	ESH3-Z5	831887/018	R&S	2003. 3. 12	
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

Frequency Range [MHz]	Tested Freq. [MHz]	LISN Pol.	Meter Reading[A] QP [dBuV]	Meter Reading[A] AV [dBuV]	Loss [B] [dB]	Results [A] + [B] QP [dBuV]	Results [A] + [B] AV [dBuV]	Limits QP [dBuV]	Limits AV [dBuV]
	0.165	N	50.40	47.50	0.20	50.60	47.70	65.20	55.20
0.15 - 0.5(MHz)	0.204	N	48.80	44.80	1.20	50.00	46.00	63.40	53.40
	0.339	N	47.90	46.50	2.20	50.10	48.70	59.20	49.20
	0.405	N	44.10	42.60	3.20	47.30	45.80	57.80	47.80
	0.657	N	40.90	36.90	0.18	41.08	37.08	56.00	46.00
	1.146	N	44.20	34.40	0.19	44.39	34.59	56.00	46.00
	1.689	N	40.00	35.20	0.21	40.21	35.41	56.00	46.00
0.5-5(MHz)	1.959	N	43.80	36.30	0.22	44.02	36.52	56.00	46.00
	5.740	H	38.10	33.90	0.46	38.56	34.36	60.00	50.00
	7.900	H	39.40	31.30	0.56	39.96	31.86	60.00	50.00
	10.330	H	41.70	32.90	0.65	42.35	33.55	60.00	50.00
5-30 (MHz)	11.140	H	41.40	35.80	0.81	42.21	36.61	60.00	50.00
	17.690	H	40.20	37.40	1.10	41.30	38.50	60.00	50.00

5.1.5 Result

PASS

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 chamber 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	Serial no.	Makers	Next cal.date	Used
Test Receiver	ESMI	R&S	826210/007	2003.03.08	
	ESCS30	R&S	830986/015	2003.03.18.	x
Biconical Antenna	VHA9103	Schwarzbeck	1950	2003.04.17	x
Log-Periodic Antenna	UHALP9108-A1	Schwarzbeck	0393	2003.04.17	x
Antenna Mast	MA240	HD	N/A	-	x
Turn Table	DT430S	HD	N/A	-	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

Tested frequency	Reading [A]	ANT	Antenna factor [B]	Cable loss [C]	Result [A+B+C]	Limit [D]	Margin [D]-[A+B]
(MHz)	(dBuV/m)	Pol.	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)
153.56	15.40	H	14.99	2.40	32.79	43.50	10.71
163.98	14.80	H	15.59	2.50	32.89	43.50	10.61
175.14	14.10	H	15.90	2.50	32.50	43.50	11.00
201.25	13.40	H	16.29	2.80	32.49	43.50	11.01
289.46	11.70	H	18.45	3.50	33.65	46.00	12.35
295.25	11.50	H	19.13	3.40	34.03	46.00	11.97
394.74	15.90	H	14.31	3.80	34.01	46.00	11.99
452.26	14.60	V	16.64	4.20	35.44	46.00	10.56
492.25	14.50	H	16.64	4.20	35.34	46.00	10.66
550.28	13.80	V	18.16	5.00	36.96	46.00	9.04
688.45	11.40	V	19.50	5.20	36.10	46.00	9.90
685.50	10.80	H	19.50	5.20	35.50	46.00	10.50
872.21	7.20	H	21.51	6.10	34.81	46.00	11.19

* Receiving Antenna Mode : *Horizontal, Vertical*
* 3m chamber
* <5 : mean less than 5dB

5.2.5 Result

PASS

6. TEST PHOTOGRAPHS

Conducted emission

Radiated emission

EUT (front)

EUT (rear)

EUT (inner)