



EMISSION TEST REPORT

Test report file No. : **02-IST-125/FB** Date of issue : July. 01, 2002

Model / Type No. : C3224

Kind of product : PDA (Portable Digital Assistant)

Brand name : WOO YOUNG

Applicant : WOO YOUNG Telecom CO., Ltd.

Manufacturer : WOO YOUNG Telecom CO., Ltd.

License holder : WOO YOUNG Telecom CO., Ltd.

Address : 222-1, Suwolam-ri, Seotan-myeon, Pyeongtaek, Gyeonggi-do, Korea

Test result according to the regulation(s)

☒ Positive ☐ Negative

at page 3.

This test report without appendix consists of 19 pages.

It is not allowed to copy this report even partly without the allowance of the Test Laboratory.

This equipment is complied with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-1992.

DIRECTORY

A) Documentation.		Page
Directory		<u>2</u>
Test regulations		<u>3</u>
Information of Test Regulation		<u>3</u>
Equipment under Test		<u>4 ~ 5</u>
Test Conditions		<u>6 ~ 7</u>
Test Result		<u>8</u>
Test-setup		<u>9 ~ 10</u>
Summary		<u>19</u>
B) Test Data.		
Conducted emissions (Mains)	: 450 kHz - 30 MHz	<u>11 ~ 16</u>
Radiated emissions	: 30 MHz – 1 GHz	<u>17 ~ 18</u>
C) Appendix		

TEST REGULATIONS

The tests were performed according to the following regulations ;

- - FCC Part 15, Subpart B (Unintentional Radiators, Class B)

Information of Test Laboratory

IST EMC Lab.

San 21-8 Goan-Ri, Baekam-Myun, Yongin-Si, Kyunggi-Do, Korea

International - Tel : 82-31 - 333 - 4093. Fax : 82-31 - 333 - 4094.

Domestic - Tel : 031 - 333 - 4093. Fax : 031 - 333 - 4094.

EQUIPMENT UNDER TEST

Equipment Description :

PROCESSOR :	INTEL strongARM(SA1110)206MHz 32BIT RISC PROCESSOR
DISPLAY :	3.8 INCH TFT LCD reflective type CCFL frontlit 240 * 320 resolution, 65,536 color, touch panel
OS :	EMBEDDED LINUX
MEMORY :	32MB flash ROM 32MB SDRAM
INTERFACE	USB(SLAVE MODE) IRDA
EXPANSION SLOT :	COMPACT FLASH TYPE I/II
CONTORLS :	4-WAY DIRECTIONAL KEYS 1 POWER 1 JOG SHUTTLE(PUSH LEVER) 1 MENU 1 SYSTEM RESET 1 VOICE MEMO
INDICATOR :	POWER STATUS OPERATION
ACCESSORIES :	STEREO EAR PHONE AC/DC ATAPTOR STYLUS PEN HARDWARE SUPPORT MP3 PLAYER DIGITALIZED FM STEREO RADIO
OTHERS :	INTERNAL SPEAKER INTERNAL MICROPHONE ADAPTOR JACK/STEREO JACK HARDWARE SUPPORT MP3 PLAYER
BATTERY :	1050mAh RECHAGABLE LI-ION BATTERY
DIMENSION :	82*132*16.4 (mm)
WEIGHT :	APPROX. 168g

EUT Type :

- ☒ Table-Top.
☐ Floor-Standing.
☐ Table-Top and Floor-Standing(Combination).

Operation – mode of the E.U.T. :

The equipment under test was operated during the measurement under following conditions :

- ☐ Standby.
☒ Operational Condition : Download files from PC to EUT
 MP3 Play mode

Configuration of the equipment under test :

Following peripheral devices and interface cables were connected during the measurement :

Equipment	Type	Brand	Serial No.	FCC Compliance Information
Laptop PC	CM2080	COMPAQ	5Y07FHR6FA54	Doc
Monitor	523X	Daewoo	GC96712365	C5F7NFCMC523X
Printer	A0302384	Northern	26633S60168	DSI6XU2225C-L

Connecting Interface Cables :

- Unshielded power cable : 1.8m
- Unshielded USB cable : 1.3m
- Shielded monitor's signal cable : 1.5 m
- Shielded printer's signal cable : 1.8 m
- Earphone cable : 1.2m

TEST CONDITIONS

The **measurement of the conducted emissions (Interference voltage)** was performed in a shielded room.

Test location :

☒ Shielded room. No.1

☐ Compact chamber 2

Used testing instruments :

Name	Type	Manufacturer	Calibration. Date	Serial Number
ESH 3	Test Receiver	Rohde & Schwarz	Jun. 16, 2001	861742/015
3725/2	LISN	EMCO	Jul. 13, 2001	9102-1788
3825/2	LISN	EMCO	Jul. 13, 2001	9103-1788
ESH 3-Z2	Pulse Limiter	Rohde & Schwarz	Jul. 13, 2001	357.8810.52

Test - accessories :

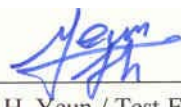
Type	Manufacturer
Aneroid Barometer	Sato
Hygrometer	Sato

Measurement Procedures :

Conducted emissions measurements were made in accordance with ANSI C-63.4-1992, "Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The measurement were performed over the frequency range of 0.45 MHz to 30MHz using a 50Ω/ 50uH LISN as the input transducer to an EMI/Field Intensity Meter. The measurements were made with the detector set for "Peak" amplitude within an IF bandwidth of 10 kHz or for "quasi-peak" within a bandwidth of 9 kHz.

All used test-instruments as well as the test-accessories are calibrated regularly.

Test engineer :



J. H. Yeun / Test Engineer
IST EMC Lab.

The **measurement of the radiated emissions (Electric field)** in the frequency range from 30 MHz to 1 GHz was performed in horizontal and vertical antenna polarization at a open-site which meet the site attenuation requirement of ANSI C63.4-1992 and a test distance of :

Location : ☐ Open Site No. 1 ☒ Open Site No. 2 ☐ Open Site No. 3
 Distance : ☒ 3 meters ☐ 10 meters

Used testing instruments :

Name	Type	Manufacturer	Calibration. Date	Serial Number
ESVP	Test Receiver	Rohde & Schwarz	June. 12, 2002	860688/011
VULB 9160	Antenna	Schwarzbeck	June. 07, 2002	3047

Test - accessories :

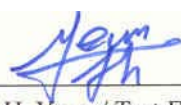
Type	Manufacturer
Aneroid Barometer	Sato
Hygrometer	Sato

Measurement procedures

Radiated measurements were in accordance with ANSI C63.4-1992 “Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz”. The measurements were performed over the frequency range of 30MHz to 1 GHz using antenna as the input transducer to a EMI/Field Intensity Meter. The measurements were made with the detector set for “quasi-peak” within a bandwidth of 120 kHz.

All used test-instruments as well as the test-accessories are calibrated regularly.

Test engineer :



J. H. Yeun / Test Engineer
 IST EMC Lab.

TEST RESULT

Conducted emissions : 450 kHz - 30 MHz

The requirements are.

☒ KEPT ☐ NOT KEPT

Min. limit margin :

Files Download mode 4.1 dB at 1.0476 MHz

MP3 Play mode 9.6 dB at 1.6312 MHz

Remarks : See test-graph to be attached at pages 11 ~ 16.

Radiated emissions (electric field) 30 MHz - 1000 MHz

The requirements are.

☒ KEPT ☐ NOT KEPT

Min. limit margin :

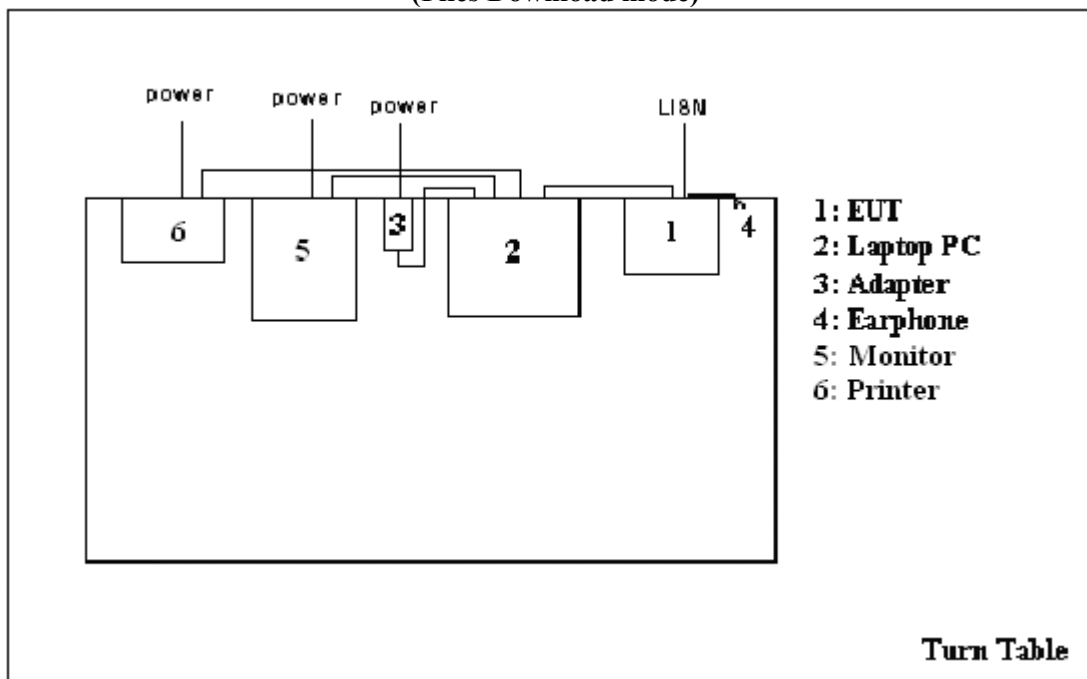
Files Download mode 9.7 dB at 352.1 MHz

MP3 Play mode 15.0 dB at 206.5 MHz

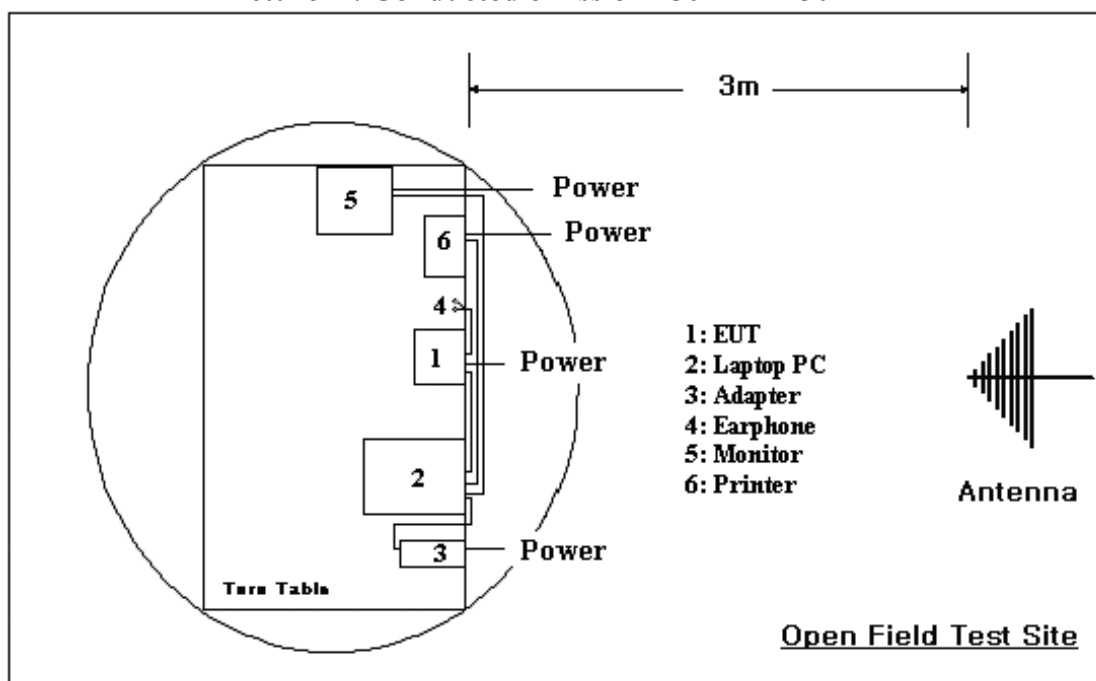
Remarks : See test-data at page 17 ~ 18.

TEST SETUP (Drawings)

(Files Download mode)



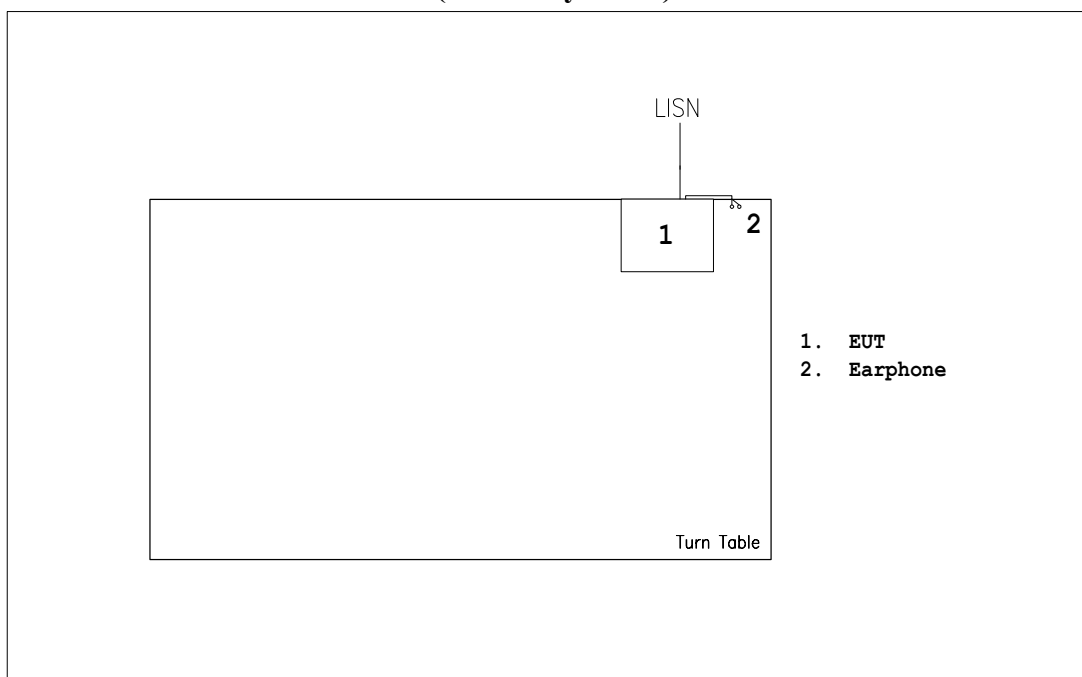
Picture 1 : Conducted emission 450 kHz ~ 30 MHz



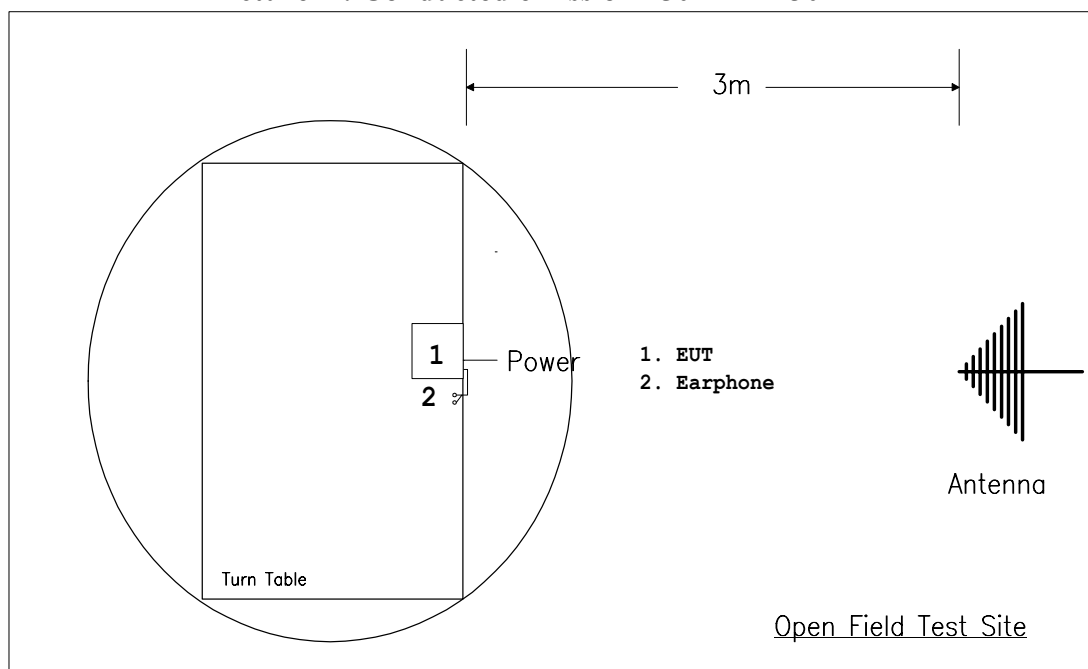
Picture 2 : Radiated emission 30 MHz ~ 1000 MHz

TEST SETUP (Drawings)

(MP3 Play mode)



Picture 1 : Conducted emission 450 kHz ~ 30 MHz



Picture 2 : Radiated emission 30 MHz ~ 1000 MHz

Conducted Emission Test Data

Type : C3224
 Manufacturer : WOORYOUNG Telecom Co., Ltd.
 Operation mode : Files Download mode
 Date : June. 29, 2002.

Frequency [MHz]	Reading [dB V]	Insertion loss [dB]	Phase (L1/N)	Result [dB V]	Limit [dB V]	Margin [dB]
0.5625	34.8	0.8	L1	35.6	48.0	12.4
0.6681	37.4	0.8		38.2	48.0	9.8
1.0476	43.7	0.8		44.5	48.0	3.5
1.2170	43.1	0.8		43.9	48.0	4.1
1.5326	36.1	0.8		36.9	48.0	11.1
0.6130	36.7	0.8	N	37.5	48.0	10.5
0.9189	41.0	0.8		41.8	48.0	6.2
1.2280	43.1	0.8		43.9	48.0	4.1
1.9224	35.4	0.8		36.2	48.0	11.8
3.1371	33.0	0.8		33.8	48.0	14.2
Cable loss are less than 0.1 dB						

*L1 : Live Line

**N : Neutral Line

*** Please refer to data graphs at page 13 ~ 14

Conducted Emission Test Data

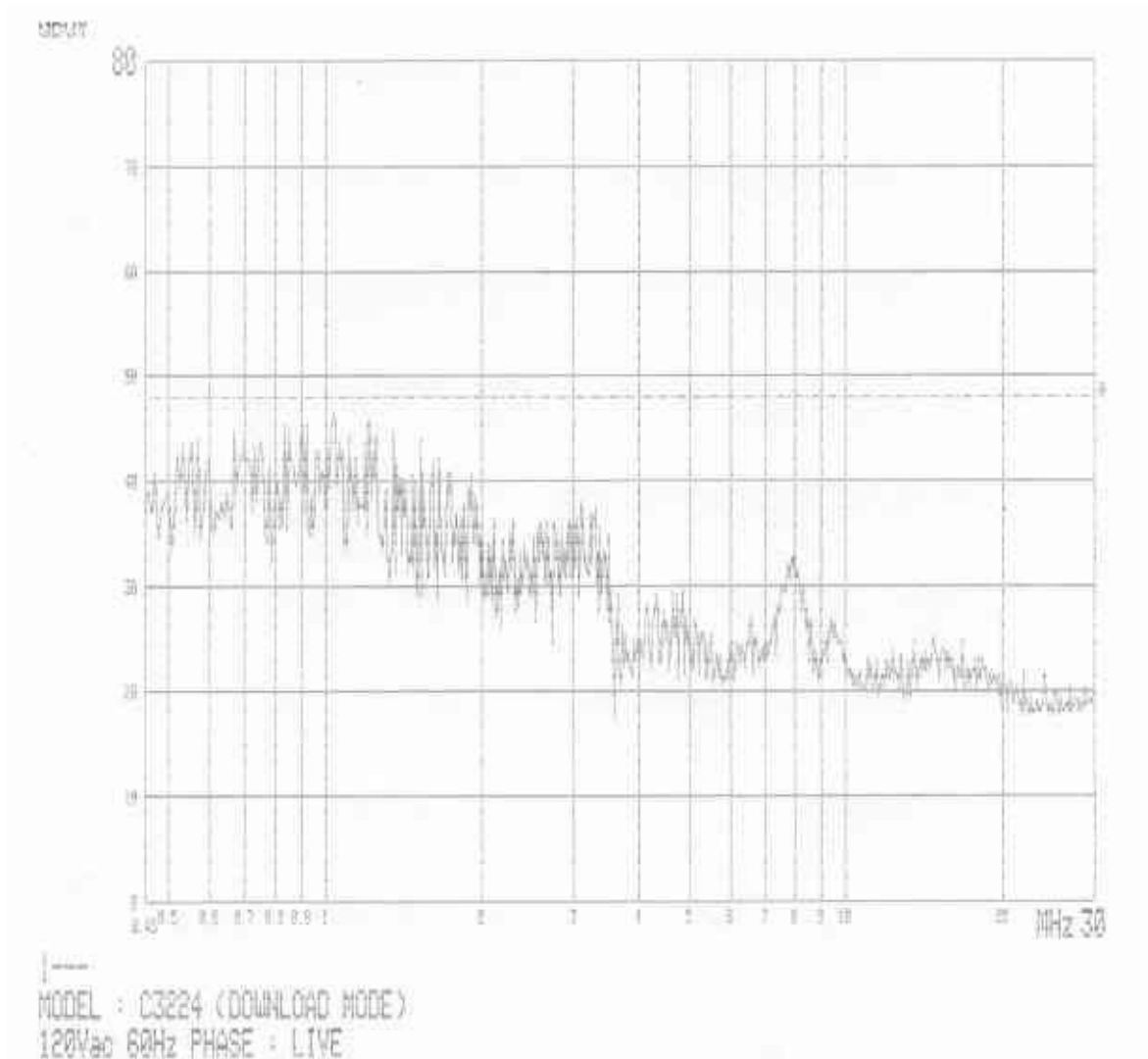
Type : C3224
 Manufacturer : WOORYOUNG Telecom Co., Ltd.
 Operation mode : MP3 Play mode
 Date : May 17, 2002.

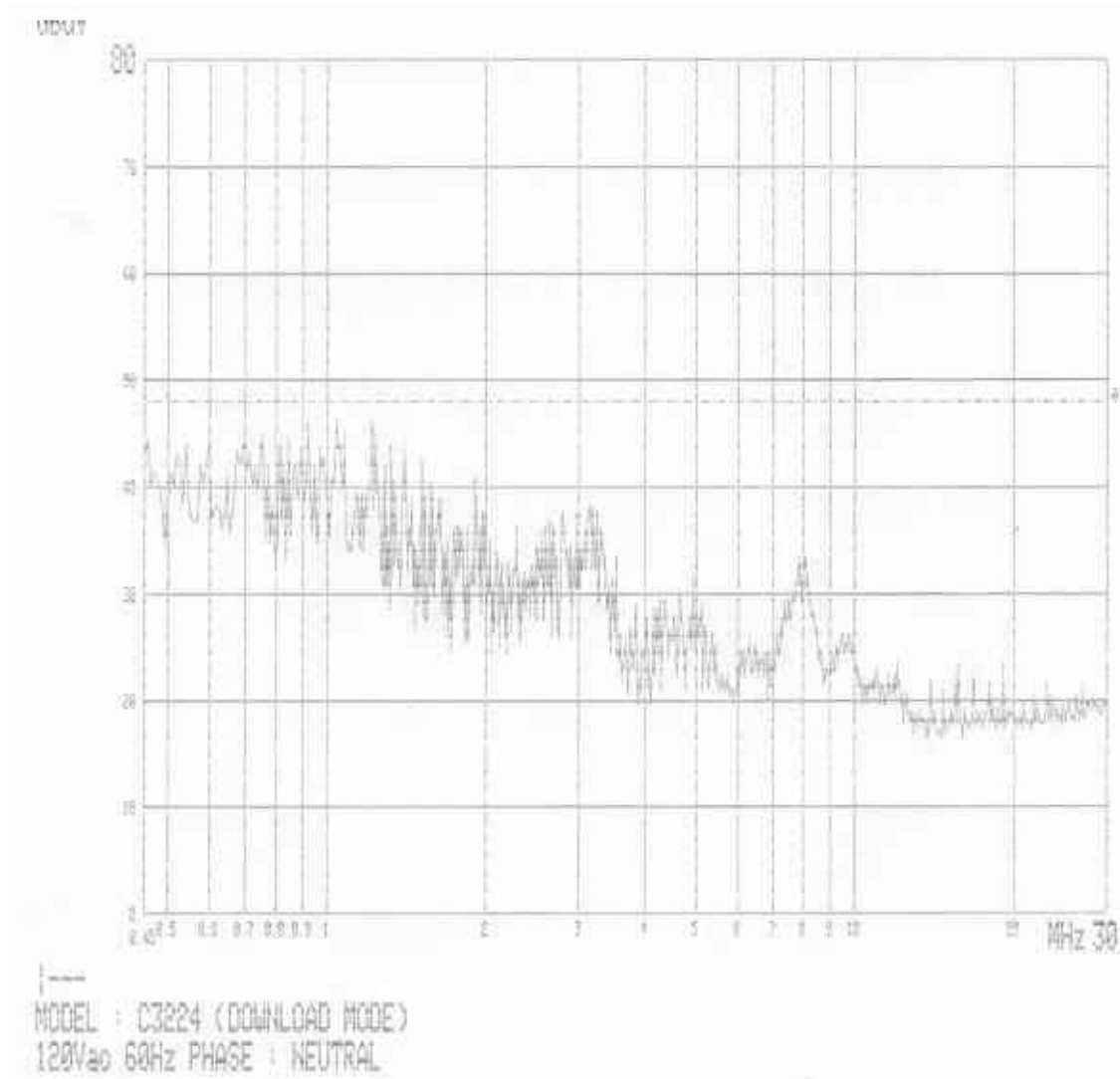
Frequency [MHz]	Reading [dB V]	Insertion loss [dB]	Phase (L1/N)	Result [dB V]	Limit [dB V]	Margin [dB]
0.4690	36.1	0.8	L1	36.9	48.0	11.1
1.2116	37.1	0.8		37.9	48.0	10.1
1.5575	34.7	0.8		35.5	48.0	12.5
1.7198	35.3	0.8		36.1	48.0	11.9
3.1230	32.0	0.8		32.8	48.0	15.2
3.3013	31.1	0.8		31.9	48.0	16.1
0.6840	37.2	0.8	N	38.0	48.0	10.0
0.8564	37.3	0.8		38.1	48.0	9.9
1.6312	37.6	0.8		38.4	48.0	9.6
1.2493	33.5	0.8		34.3	48.0	13.7
1.4009	30.4	0.8		31.2	48.0	16.8
2.1297	31.0	0.8		31.8	48.0	16.2
Cable loss are less than 0.1 dB						

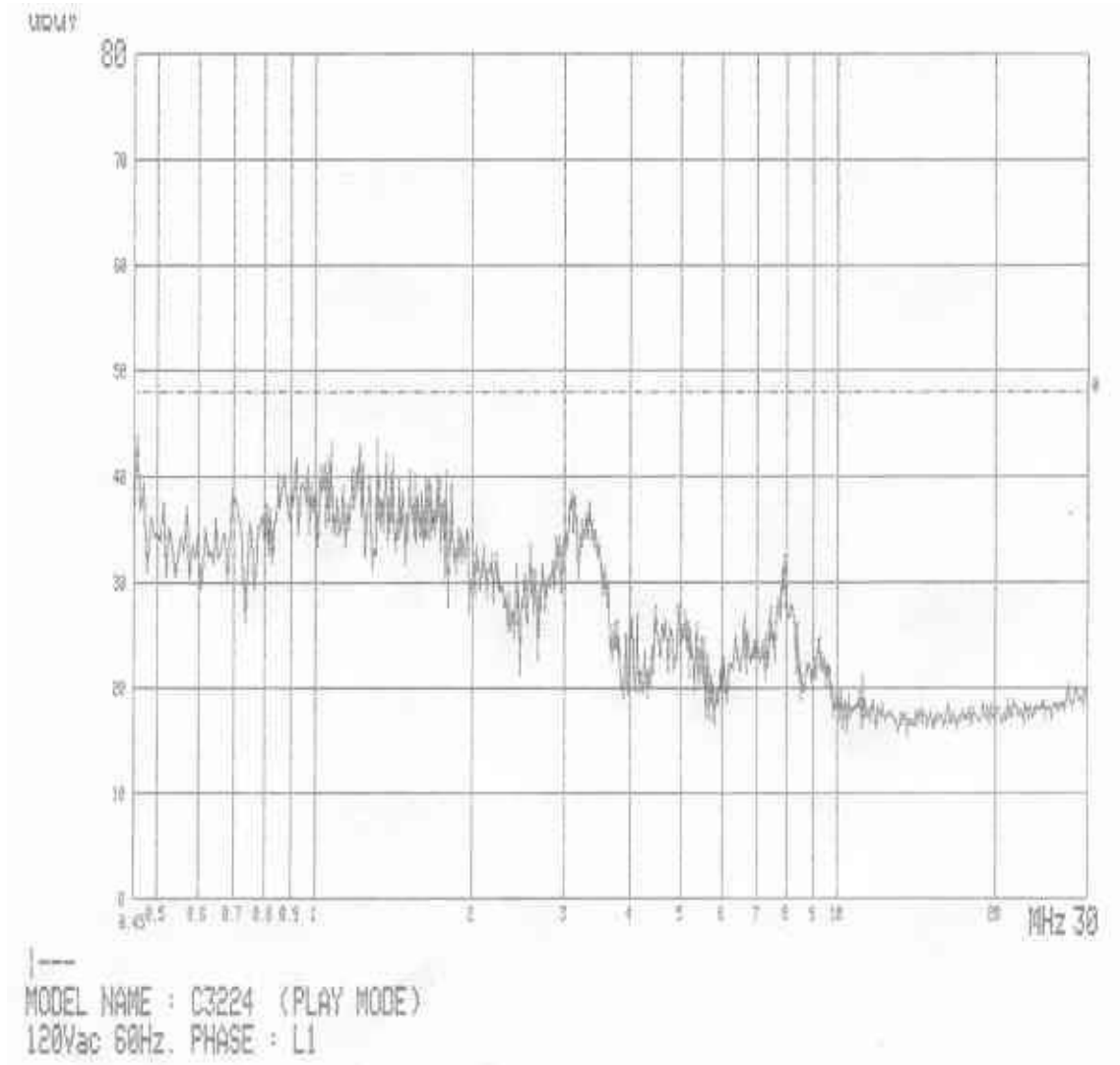
*L1 : Live Line

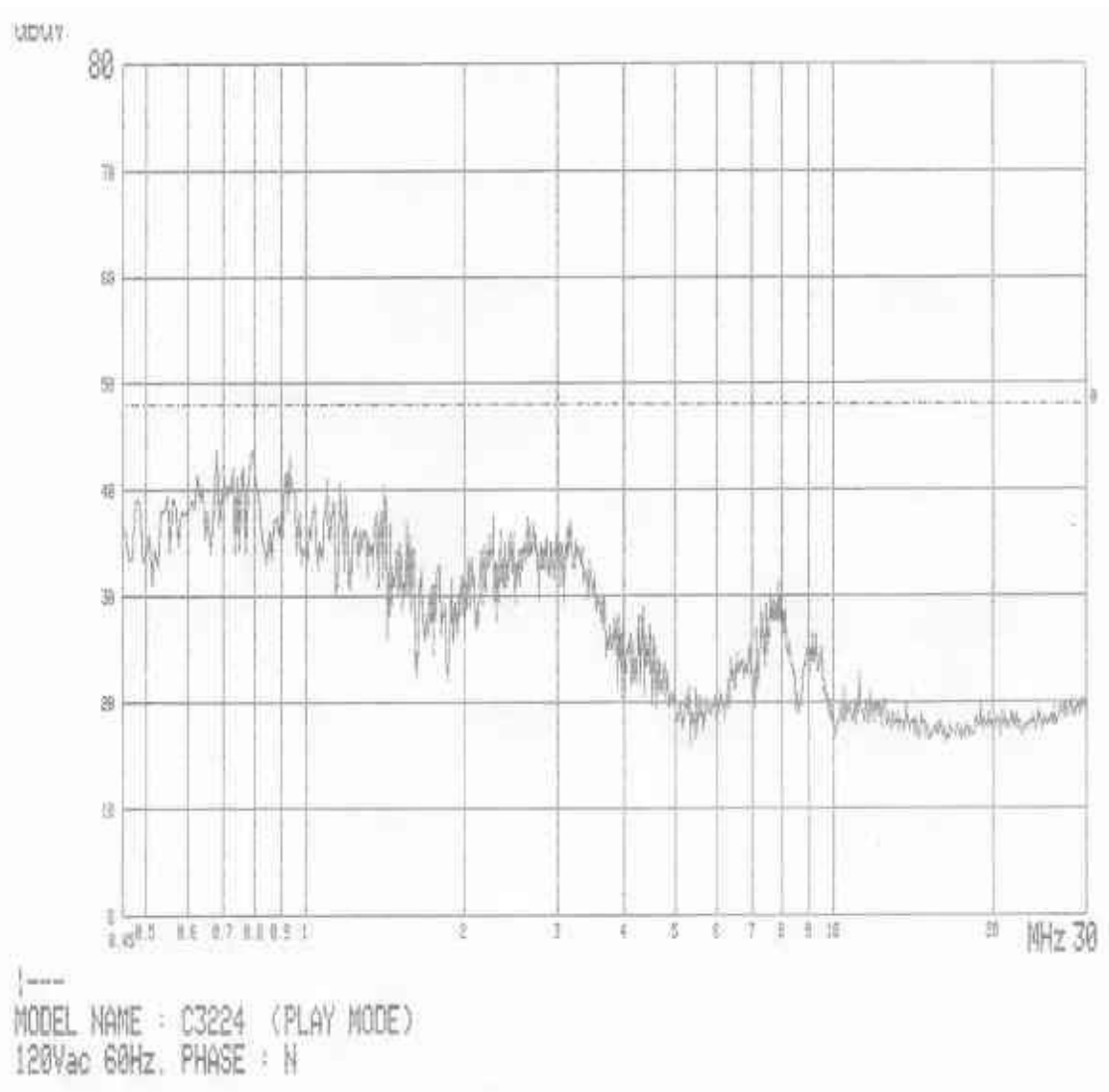
**N : Neutral Line

*** Please refer to data graphs at page 15 ~ 16









Radiation Test Data

Type : C3224
 Manufacturer : WOORYOUNG Telecom Co., Ltd.
 Operation mode : Files Download mode
 Test distance : 3 m
 Antenna : VULB9160
 Date : June. 29, 2002.

Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Height [cm]	Polar [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
154.7	15.4	12.8	2.9	35	132	V	31.1	43.5	12.4
185.5	16.1	10.3	3.3	32	100	V	29.7	43.5	13.8
196.2	17.4	9.6	3.3	324	400	H	30.3	43.5	13.2
206.3	18.2	9.2	3.4	41	110	V	30.8	43.5	12.7
216.4	18.3	9.5	3.5	327	151	V	31.3	46.0	14.7
298.7	11.1	12.4	4.4	324	100	V	27.9	46.0	18.1
309.1	15.3	12.5	4.4	32	100	V	32.2	46.0	13.8
340.2	15.7	13.4	4.7	327	379	H	33.8	46.0	12.2
352.1	17.9	13.6	4.8	320	371	H	36.3	46.0	9.7
361.7	12.8	13.8	4.9	121	365	H	31.5	46.0	14.5
423.1	11.2	15.3	5.4	149	105	V	31.9	46.0	14.1
485.1	15.2	16.5	5.9	47	102	V	37.6	46.0	8.4
526.7	12.7	17.1	6.2	134	102	V	36.0	46.0	10.0

Radiation Test Data

Type : C3224
 Manufacturer : WOORYOUNG Telecom Co., Ltd.
 Operation mode : MP3 Play mode.
 Test distance : 3 m
 Antenna : VULB9160
 Date : June. 29, 2002.

Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Height [cm]	Polar [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
84.1	11.8	8.0	2.1	37	100	V	21.9	40.0	18.1
134.2	10.2	12.1	2.8	32	100	V	25.1	43.5	18.4
141.9	8.9	12.3	2.8	159	131	V	24.0	43.5	19.5
206.5	15.9	9.2	3.4	31	101	V	28.5	43.5	15.0
216.6	12.9	9.5	3.5	34	105	V	25.9	46.0	20.1
248.1	8.2	10.8	3.9	21	392	H	22.9	46.0	23.1
257.8	8.9	11.1	3.9	67	102	V	23.9	46.0	22.1
311.8	7.2	12.5	4.4	59	105	V	24.1	46.0	21.9
341.2	13.6	13.4	4.7	368	101	V	31.7	46.0	14.3
462.1	7.8	16.1	5.7	173	354	H	29.6	46.0	16.4

SUMMARY

GENERAL REMARKS :

The equipment is not modified anything, mechanical or circuit to improve EMI status during a measurement and complied the regulation "Part 15 subpart B Class B of CFR 47"

FINAL JUDGMENT :

The requirements according to the technical regulations are

☒ Kept ☐ Not kept

The equipment under test does

☒ Fulfill the general approval requirements mentioned on page 3.
☐ Not fulfill the general approval requirements mentioned on page 3.

Begin of testing : May 17, 2002

End of testing : June. 29, 2002

Reviewed by :



Joon H. Lee, EMC Manager
IST EMC Lab.

Approved by :



G. Chung, Chief of EMC Lab.