CLASS B CERTIFICATION APPLICATION
UNDER PART15, SUBPART B

EUT : MULTIMEDIA KEYBOARD
MODEL : CKBM-001
FCC ID : NHMCKBM-001

SRT REPORT # T9F05-1

PREPARED FOR :

CRE TECHNOLOGY CORP. LTD.
7F., NO. 24, WU-GHUAN 7TH ROAD,
WU-KU INDUSTRIAL PARK,
TAIPEI, TAIWAN, R. O. C.

EMI TESTING REPORT

EUT : MULTIMEDIA KEYBOARD

MODEL : CKBM-001

FCC ID : NHMCKBM-001

PREPARED FOR :

CRE TECHNOLOGY CORP. LTD.
7F., NO. 24, WU-GHUAN 7TH ROAD,
WU-KU INDUSTRIAL PARK,
TAIPEI, TAIWAN, R.O.C.

PREPARED BY :

SPECTRUM RESEARCH & TESTING LABORATORY INC.
NO. 101-10, LING 8, SHAN-TONG LI CHUNG-LI CITY,
TAOYUAN, TAIWAN, R. O. C.
TEL : (03) 4987684 FAX : (03) 4986528

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1. TEST REPORT CERTIFICATION

APPLICANT : CRE TECHNOLOGY CORP. LTD.

ADDRESS : 7F., NO. 24, WU-GHUAN 7TH ROAD,
WU-KU INDUSTRIAL PARK,
TAIPEI, TAIWAN, R.O.C.

EUT DESCRIPTION : MULTIMEDIA KEYBOARD

(A) POWER SUPPLY : FROM PC

(B) MODEL : CKBM-001

(C) FCC ID : NHMCKBM-001

FINAL TEST DATE : 07/03/1999

MEASUREMENT PROCEDURE USED :

* PART 15 SUB PART B OF FCC RULES AND REGULATIONS (47 CFR PART 15)
* ANSI C63.4 - 1992

We hereby certify that :

The measurements contained in this report were made in accordance with the procedures indicated, and the energy emitted by the equipment was found to be within the limits applicable.

TESTING ENGINEER : K. W. DATE 7/3 99
Kiki Wu

SUPERVISOR : DATE 7/3 /99'
Jesse Ho

APPROVED BY : DATE 7/3/99'
Johnson Ho

2. TEST STATEMENT

2.1 TEST STATEMENT

1. This letter is to explain the test condition of this project. The EUT be tested as the following status.

2. The data was shown in this report reflects the worst – case data for the condition as listed above.
Please disregard any other oricessir (s) speed shown in this user manual.

3. EUT Conditions.

PC CPU : Intel Pentium 166 MHz **Clock chip : 66 MHz**

4. NVLAP logo is to be approved by management (it is according to NVLAP requirement if it need) before use.

2.2 DEPARTURE FROM DOCUMENT POLICIES, PROCEDURE OR SPECIFICATIONS, THE STATEMNT

A. Did have
Any departure from document policies & procedures or from specifications.
Yes _____, No ____√____ .
If yes, the description as below.

B. The certificate and report shall not be reproduced except in full, without the written approval of SRT laboratory.

C. The report must not be used by the client to claim product endorsement by NVLAP or any agency the government.

D. This product is a prototype product.

E. The effect that the results relate only to the items tested.

3. EUT MODIFICATIONS

The following accessories were added to the EUT during testing :

1. C4, C5 change to the value of 68 μF.
2. C8 change to the value of 33 pF.
3. The Vcc, Data, Clock, and SGnd line series a bead FBM-11-321611-151.
4. Move the Vcc line far away the data lines.

4. MODIFICATION LETTER

This section contains the following documents :

A. Letter of modifications.

佳落科技股份有限公司
CRE Technology Co., Ltd.
7F, No. 24 Wu-Chuan7th Road, Wu-Ku industrial Park, Taipei, Taiwan. R. O. C.
TEL: 886-2-22996090
FAX: 886-2-22995853 Http://www.cre.com.tw

Federal Communications Commission
Authorization and Evaluation Division
7435 Oakland Mills Road
Columbia, MD 21046

To whom it may concern :

This is to serve as proper notice that our company agrees to make all modifications to FCC ID : NHMCKBM-001 ——— as listed in section 3.0 of modification to submitted by Spectrum Research and Testing Laboratory, Inc.

Respectfully,

Bruce Lee
(Name, Surname)

Vice President
(Position/Title)

Effective Dates :

From June 14, 1999 to June 14, 2000

DATE : June 14, 1999

5. CONDUCTED POWER LINE TEST

5.1 TEST EQUIPMENT

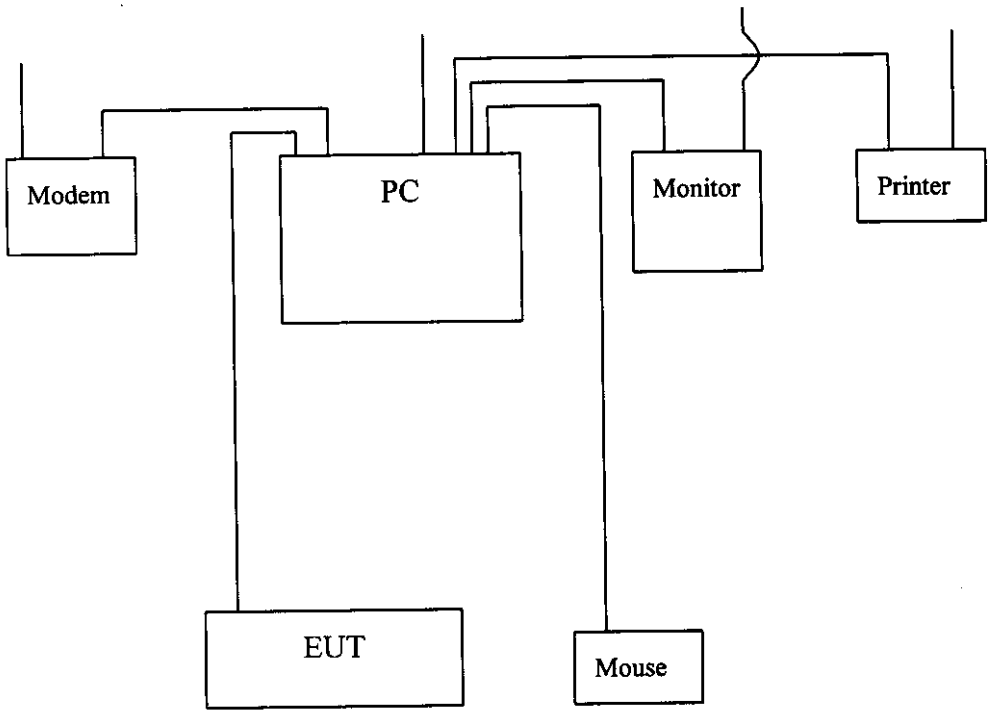
The following test equipment were used during the conducted power line test :

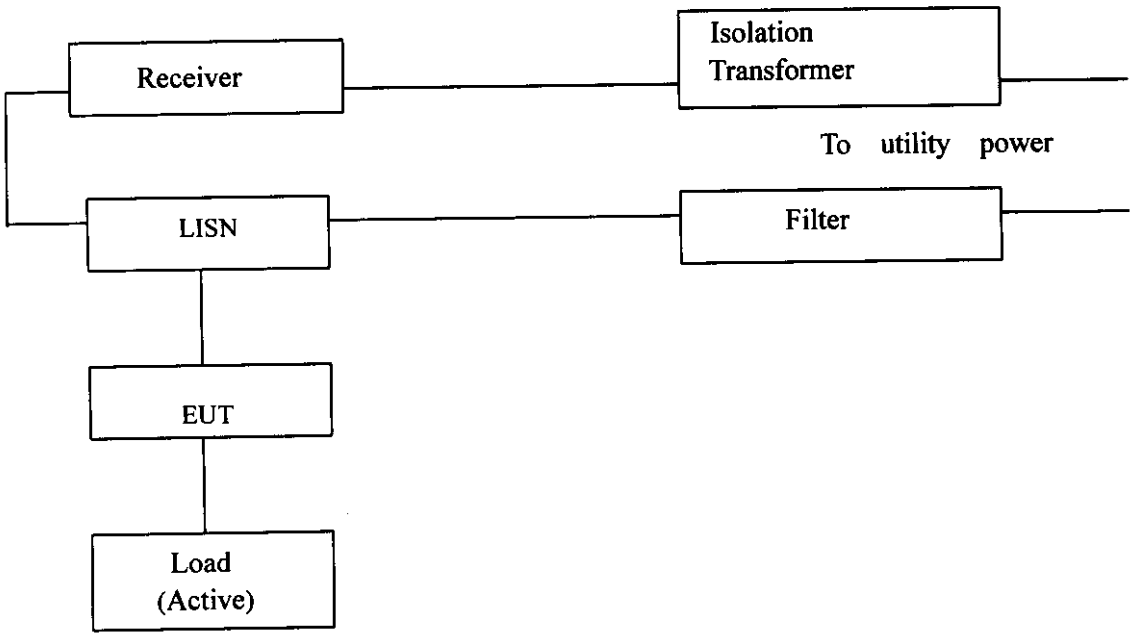
EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DATE OF CAL. & CAL. CENTER	DUE DATE	FINAL TEST
SPECTRUM ANALYZER	9 KHz TO 1 GHz	HP	8590L/ 3624A01317	AUGUST 1998 ETC	1Y	
EMI TEST RECEIVER	9 KHz TO 30 MHz	ROHDE & SCHWARZ	ESHS30/ 826003/008	AUGUST 1998 ETC	1Y	√
LISN	50 uH, 50 ohm	SOLAR ELECTRONICS	9252-50-R24-BNC/ 951315	AUGUST 1998 ETC	1Y	√
LISN	50uH, 50 ohm	SOLAR ELECTRONICS	9252-50-R24-BNC/ 951318	AUGUST 1998 ETC	1Y	√
SIGNAL GENERATOR	9 KHz TO 1080 MHz	ROHDE & SCHWARZ	SMY01/ 841104/019	APRIL 1999 ETC	1Y	√
POWER CONVERTER	0 TO 300 VAC VAC 47-500 Hz	AFC	AFC-1KW/ 850510	MARCH 1999 ETC	1Y	√

5.2 TEST PROCEDURE

The EUT was tested according to ANSI C63.4 - 1992. The frequency spectrum from 0.45 MHz to 30 MHz was investigated. The LISN used was 50 ohm / 50 uHenry as specified by section 5.1 of ANSI C63.4 - 1992. Cables and peripherals were moved to find the maximum emission levels for each frequency.

5.3 TEST SETUP





5.4 CONFIGURATION OF THE EUT

The EUT was configured according to ANSI C63.4 - 1992. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

A. EUT

DEVICE	MANUFACTURER	MODEL #	FCC ID / DoC
MULTIMEDIA KEYBOARD	CRE TECHNOLOGY CORP. LTD.	CKBM-001	NHMCKBM-001

B. INTERNAL DEVICES

DEVICE	MANUFACTURER	MODEL #	FCC ID / DoC
— NONE —			

C. PERIPHERALS

DEVICE	MANUFACTURER	MODEL # SERIAL #	FCC ID / DoC	CABLE
MONITOR	DTK	CCD-1401	HG7CDD-1401	1.8m unshielded power cord 1.2m shielded data cable (S1)
PRINTER	HP	2225C	DSI6XU2225	1.6m unshielded power cord 1.2m shielded data cable (S1)
MODEM	SMAR TEAM	1200AT	EF56A5 1200AT	1.6m unshielded power cord 1.2m shielded data cable (S1)
MOUSE	LOGITECH	M-S28-6MD	DZL210472	1.2m unshielded data cable
PC	HP	D3803A	B94VECTRA500T	1.8m unshielded power cord (S2)

- [redacted] :

(1). Cable - S1 : Single point shielding.
S2 : 360° shielding.
S3 : Double point shielding

(2). Cables - All 1m or greater in length - bundled according to regulations.

5.5 EUT OPERATING CONDITION

Operating condition is according to ANSI C63.4 - 1992.

1. EUT power on.
2. " H" pattern sent to the following peripherals :
   - monitor
   - printer
   - modem
3. PC CPU : Intel Pentium 166 MHz Clock Chip : 66 MHz

5.6 CONDUCTED POWER LINE EMISSION LIMITS

FREQUENCY RANGE (MHz)	CLASS A	CLASS B
0.45 - 1.705	1000 uV	250 uV
1.705 - 30	3000 uV	250 uV

: In the above table, the tighter limit applies at the band edges.

5.7 CONDUCTED POWER LINE TEST RESULTS

The frequency spectrum from 0.45 MHz to 30 MHz was investigated. All readinges are quasi – peak values with a resolution bandwidth of 9 KHz.

Temperature : 27 ℃ Humidity : 41 %RH

QUASI – PEAK

FREQUENCY (MHz)	LINE1 (uV)	LINE2 (uV)	LIMIT (uV)
0.45	26.9	68.4	250
0.82	*	11.1	250
0.91	10.1	*	250
1.83	*	15.7	250
2.18	*	12.2	250
3.15	26.6	*	250
5.17	83.2	*	250

[redacted] : (1). * = Measurement does not apply for this frequency
(2). Uncertainty in conducted emmission measured is <+/ -2dB
(3). Any departure from specification : N/A
(4). PC CPU : Intel Pentium 166 MHz Clock Chip : 66 MHz

SIGNED BY TESTING ENGINEER : Kik: W

6. RADIATED EMISSION TEST

6.1 TEST EQUIPMENT

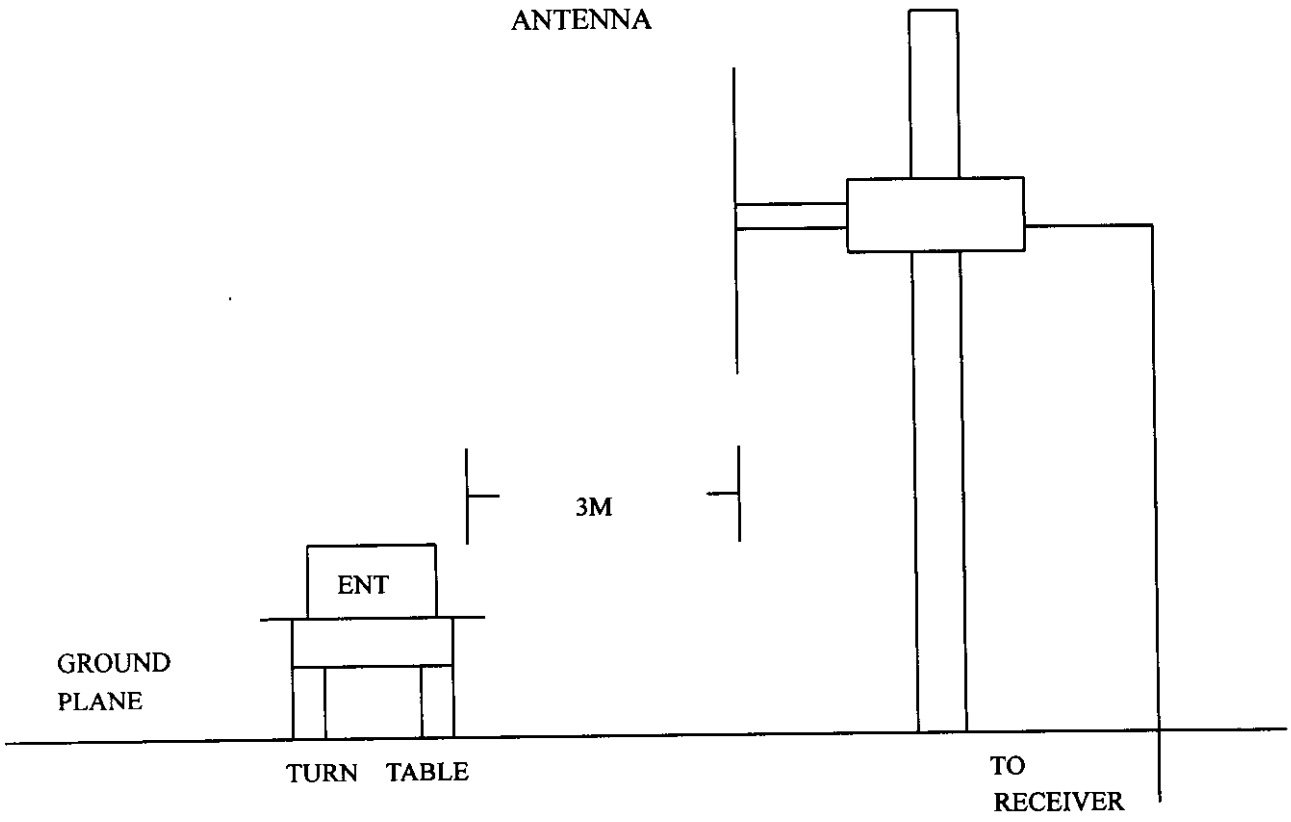
The following test equipments were used during the radiated emission test :

EQIPMENT / FACILITIES	SPECIFICA-TIONS	MANUFACTUR-ER	MODEL # / SERIAL #	DATE OF CAL. & CAL. CENTER	DUE DATE	FINAL TEST
RECEIVER	20 MHz TO 1000 MHz	R & S	ESVS30/ 841977/003	APRIL 1999 ETC	1Y	√
SPECTRUM ANALYZER	100 Hz TO 1500 MHz	HP	8568B/ 3019A05294	OCT. 1998 ETC	1Y	
SPECTRUM ANALYZER	9 KHz TO 22 GHz	HP	8593E/ 3322A00670	APRIL 1999 ETC	1Y	
SPECTRUM ANALYZER	100 Hz TO 1000 MHz	IFR	A-7550/ 2684/1248	JULY 1998 ETC	1Y	
SIGNAL GENERATOR	9 KHz TO 1080 MHz	ROHDE & SCHWARZ	SMY01/ 841104/019	APRIL 1999 ETC	1Y	√
DIPOLE ANTENNA	28 MHz TO 1000 MHz	EMCO	3121C/ 9003-534	MAR. 1999 SRT	1Y	
DIPOLE ANTENNA	28 MHz TO 1000 MHz	EMCO	3121C/ 9611-1239	SEP. 1998 SRT	1Y	
BI-LOG ANTENNA	26 MHz TO 2000 MHz	EMCO	3142/ 9608-1073	SEP. 1998 SRT	1Y	√
BI-LOG ANTENNA	26 MHz TO 1100 MHz	EMCO	3143/ 9509-1152	SEP. 1998 SRT	1Y	
PRE-AMPLIFIER	0.1 MHz TO 1300 MHz	HP	8447D/ 2944A08402	APRIL 1999 ETC	1Y	
PRE-AMPLIFIER	0.1 MHz TO 1300 MHz	HP	8447D/ 2944A06412	AUGUST 1998 ETC	1Y	
HORN ANTENNA	1 GHz TO 18 GHz	EMCO	3115/ 9012-3619	JAN. 1999 EMCO	1Y	

6.2 TEST PROCEDURE

(1).The EUT was tested according to ANSI C63.4 - 1992. The radiated test was performed at SRT lab's open site. this site is on file with the FCC laboratory division, reference 31040 / SIT.
(2).The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-1992.
(3).The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 KHz. All readings are above 1 GHz, peak values with a resolution bandwidth of 1 MHz. Measurements were made at 3 meters.
(4). The antenna high were varied from 1 m to 4 m high to find the maximum emission for each frequency.
(5). The antenna polarization : Vertical polarization and horizontal polarization.

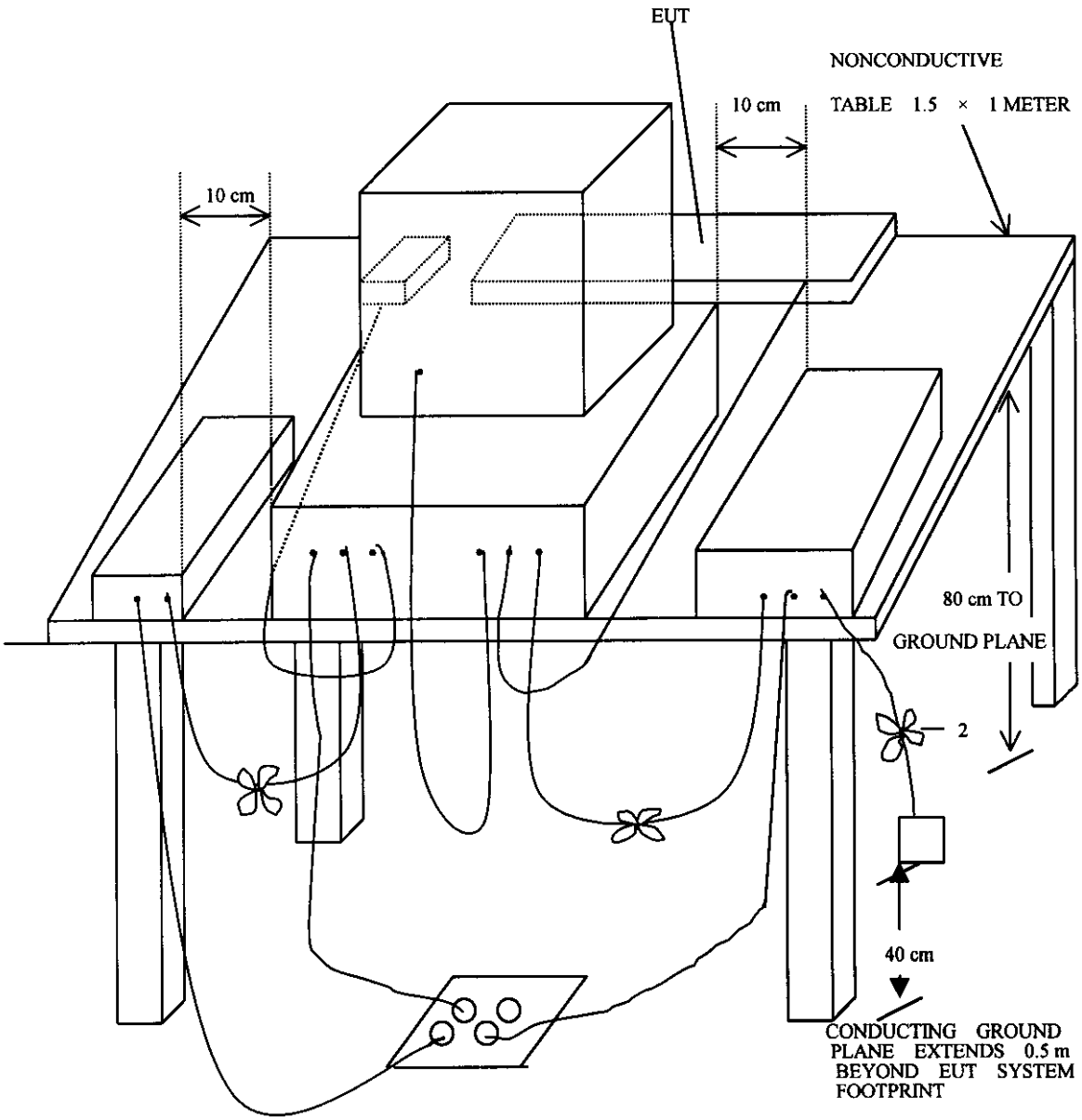
6.3 RADIATED TEST SET-UP



6.3 RADIATED TEST SET-UP

ANSI

ELECTRICAL AND ELECTRONIC EQUIIPMENT IN THE RANGE IN THE RANGE OF 9 KHz TO 40 GHz C63.4-1992



6.4 CONFIGURATION OF THE THE EUT

Same as section 4.4 of this report

6.5 EUT OPERATING CONDITION

Same as section 4.5 of this report.

6.6 RADIATED EMISSION LIMITS

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below :

CLASS B

FREQUENCY (MHz)	DISTANCE (m)	FIELS STRENGTH (uV/m)
30 - 88	3	100
88 - 216	3	150
216 - 960	3	200
ABOVE 960	3	500

CLASS B (OPEN CASE)

FREQUENCY (MHz)	DISTANCE (m)	FIELS STRENGTH (uV/m)
30 - 88	3	199.5
88 - 216	3	298.5
216 - 960	3	398.1

CLASS A

FREQUENCY (MHz)	DISTANCE (m)	FIELS STRENGTH (uV/m)
30 - 88	3	316.3
88 - 216	3	473.2
216 - 960	3	613.0
ABOVE 960	3	1000.0

NOTE : 1. In the emission tables above, the tighter limit applies at the band edges.

2. Distance refers to the distance between measuring instrument, antenna, and the closest point of any part of the device or system.

6.7 RADIATED EMISSION TEST RESULTS

The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 KHz. All readings are above 1GHz, peak values with a resolution bandwidth of 1 MHz. Measurements were made at 3 meters.

Temperature : 30 ℃ Humidity : 60 %RH

FREQ. (MHz)	FACTOR (dB)	ANT. FACTOR (dB/m)	READING (dBuV)		EMISSION (uV/m)		LIMITS (uV/m)
			HORIZ	VERT	HORIZ	VERT	
32.65	0.5	15.3	*	19.4	*	57.5	100
44.24	0.4	11.3	*	21.3	*	44.7	100
96.26	0.8	8.7	*	22.0	*	37.6	150
98.57	0.8	8.8	21.5	*	35.9	*	150
178.37	1.1	10.4	21.6	*	45.2	*	150
225.14	1.3	13.4	19.5	*	51.3	*	200
229.36	1.3	13.6	18.6	*	47.3	*	200
425.37	1.8	17.0	18.9	*	76.7	*	200
476.85	1.7	17.7	*	22.0	*	117.5	200

[redacted] : (1). *= Measurement does not apply for this frequency.
(2). Uncertainty in radiated emission measured is <+/-4dB
(3). Any departure from specification : N/A
(4). Factor will include cable loss and correction factor.
(5). Sample calculation
20 log (emission) uV/m = Factor (dB)+Ant. Factor(dB/m)+reading(dBuV)
(6). PC CPU : Intel Pentium 166 MHz Clock Chip : 66MHz

SIGNED BY TESTING ENGINEER : [redacted]