

Test Report

for

Electromagnetic Interference

of

E.U.T.: Baby Monitor

Trade Name: Graco

Model Number: 2745

Prepared for

GRACO CHILDREN'S PRODUCTS INC.

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Prepared by

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Certification of Compliance

Applicant : GRACO CHILDREN'S PRODUCTS INC.

Manufacturer : HONOR TONE LTD.

EUT Description : Baby Monitor

Model No. : 2745

Serial No. : N/A

Tested Power Supply : 120Vac

Date of Final Test : Feb. 09, 2002

Measurement Procedures and Standards Used :

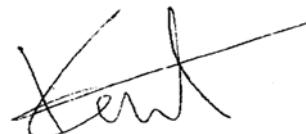
CFR 47, Part 15, Subpart C

ANSI C63.4: 1992

The device described above was tested by Interocean EMC Technology Corporation to determine the maximum emission levels emanated from the device and severity levels of the device endure and its performance criterion. The measurement results are contained in this test report and Interocean EMC Technology Corp assumes full responsibility for the accuracy and completeness of these measurements. This report shows the EUT is technically compliant with the Part 15 subpart C and ANSI C63.4 official requirements. This report applies to the above sample only and shall not be reproduced in part without written approval of Interocean EMC Technology Corporation.

Report Issued: 2002-2-10

Approved:



Kent J.K. Hsu

1 General Information

1.1 Description of Equipment Under Test

Equipment Under Test : Baby Monitor

Model Number : 2745

Serial Number : N/A

Type of Sample Tested : Proto-type, Pre-production, Mass Production

Applicant : GRACO CHILDREN'S PRODUCTS INC.
51 SOUTH PINE STREET, P.O. BOX 100, ELVERSON PA 19520 USA

Manufacturer : HONOR TONE LTD
Tung Mun Industrial Zone, Dan Shui Zhen, Dongguan, Hui Yang Hsien,
Guangdong 516211, China

Power Supply : AC/DC Adapter, GRACO, M/N: U090010D12
Input: 120Vac, 60Hz, 6.5W
Output: 9Vdc, 100mA, Cable: Non-Shielded, Un-detachable, 1.86m

Data Cable : N/A

Date of Receipt of Sample : JAN. 10, 2002

Date of Test : FEB 1~ FEB 09, 2002

Description of E.U.T. : The EUT is nursery unit of baby monitor. It is for transmits the baby's sound to the parent unit.
The operating frequency band is 49.82 MHz to 49.90 MHz. It has two main versions operating at difference frequency band.
Version 1: Channel A: 49.830 MHz, Channel B: 49.860 MHz
Version 2: Channel X: 49.845 MHz, Channel B: 49.875 MHz

1.2 Test Facility

Site Description : OATS 1 OATS 2

Name of Firm : Intercean EMC Technology Corp.

Site Location : No.5-2, Lin 1, Tin-Fu Tsun, Lin-Kou Hsiang, Taipei County, Taiwan, R.O.C.

Site Filing :

- Federal Communication Commissions – USA
Registration No.: 96399
- Voluntary Control Council for Interference by Information Technology Equipment (VCCI) – Japan
Registration No. (Conducted Room): C-1094
Registration No. (OATS 1): R-1040
Registration No. (OATS 2): R-1041

Site Accreditation :

- Bureau of Standards and Metrology and Inspection (BSMI) – Taiwan, R.O.C.
Accreditation No.:
SL2-IN-E-0026 for CNS13438 / CISPR22
SL2-A1-E-0026 for CNS13783-1 / CISPR14
- National Voluntary Laboratory Accreditation Program (NVLAP) - USA
Lab Code: 200458-0
- NEMKO
ELA 181

1.2.1 Test Methodology

Both conducted and Radiated Emission Measurement was performed according to the procedures in ANSI C63.4-1992 and Part 15 subpart C. Radiated Emission Measurement was performed at 3 meters distance from antenna to EUT.

1.2.2 Measurement Uncertainty

The uncertainty is calculated in accordance with NAMAS document NIS 81.

Conducted Uncertainty $U_c = \pm 2.96\text{dB}$.

Radiated Uncertainty $U_c = \pm 3.67\text{dB}$.

2 Power Line Conducted Emission Measurement

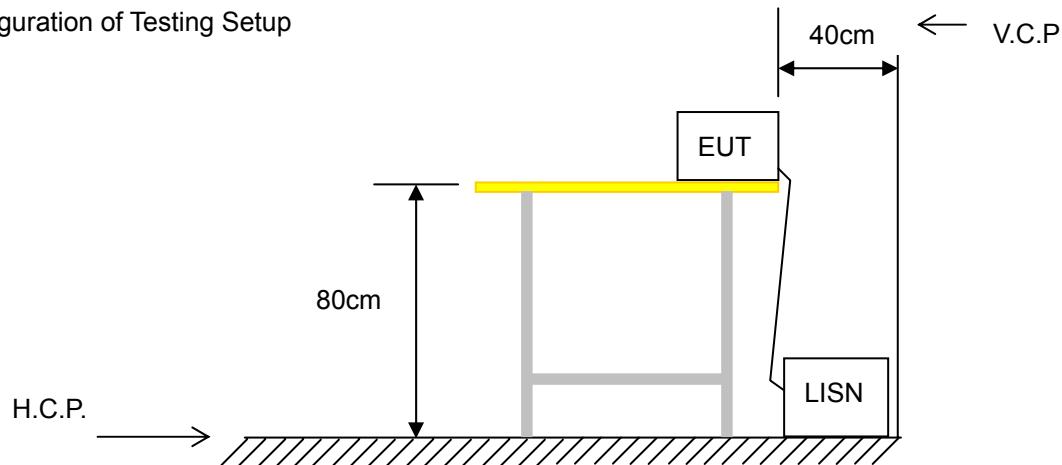
2.1 Instrument

Instrument	Manufacturer	Model	Serial No.	Last Calibration
EMI Test Receiver	Rohde & Schwarz	ESCS 30	830245/027	2001/08/21
L.I.S.N.	Schwarzbeck	NNLK8121	8121417	2001/08/13
L.I.S.N.	Rohde & Schwarz	ESH3-Z5	829996/016	2001/06/28
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	830836/026	2001/07/20
RF Cable	IETC	CBL04	N/A	2001/10/20

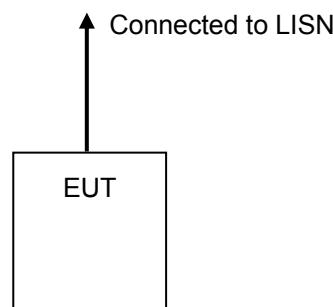
Note: All instrument upon which need to calibrated are with calibration period of 1 year.

2.2 Block Diagram of Test Configuration

Configuration of Testing Setup



Configuration of EUT Setup



2.3 Conducted Limit

FCC Part 15

Frequency (MHz)	<input checked="" type="checkbox"/> Class B	
	uV	dBuV
0.45 ~ 1.705	250	48
1.705 ~ 30	250	48

2.4 Instrument configuration

- 2.4.1 The EMI test receiver frequency range set from 450 KHz to 30 MHz.
- 2.4.2 The EMI test receiver bandwidth set at 9 kHz.
- 2.4.3 The EMI test receiver detector set as Quasi-Peak (Q.P.).

2.5 Measured Mode

- 2.5.1 The test mode for final as following:
Mode 1: Power on (Channel A)

2.6 Configuration of Measurement

- 2.6.1 The EUT was place on a non-conductive table whose total height equaled 80cm and vertical conducting plane located 40cm to the rear of the EUT.
- 2.6.2 The EUT was connected to the main power through Line Impedance Stabilization Networks (LISN). This setup provided a 50ohm/50 μ H coupling impedance for the measuring equipment. The auxiliary equipment was also connected to the main power through a LISN that provided a 50ohm/50 μ H coupling impedance with 50ohm termination. (Refer to the block diagram of the test setup and photographs.)
- 2.6.3 The conducted disturbance was measured between the phase lead and the reference ground, and between the neutral lead and reference ground. The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.
- 2.6.4 The identification of the frequency of highest disturbance with respect to the limit was found by investigating disturbances at a number of significant frequencies. The probable frequency of maximum disturbance had been found and that the associated cable and EUT configuration and mode of operation had been identified.

2.7 Configuration of EUT

- 2.7.1 Setup the EUT and simulators as shown section 2.2.
- 2.7.2 Turn on the power of all equipment.

2.8 Test Result

PASS

The final tests data is shown on following page.

Power Line Conducted Test Data

Date of Tested	:	2002-02-05	Power Line	:	Line
Temperature	:	21°C	Humidity	:	53%
Tested Mode	:	Power on (Channel A)			

Remark :

1. All readings are Quasi-Peak values.
2. Factor = Insertion Loss + Cable Loss
3. “*” Means emission level un-detectable.
4. “--” Means do not need detect.

Power Line Conducted Test Data

Date of Tested	: 2002-02-05	Power Line	: Neutral
Temperature	: 21°C	Humidity	: 53%
Tested Mode	: Power on (Channel A)		

Remark :

1. All readings are Quasi-Peak values.
2. Factor = Insertion Loss + Cable Loss
3. “*” Means emission level un-detectable.
4. “--” Means do not need detect.

3 Radiated Emission Measurement

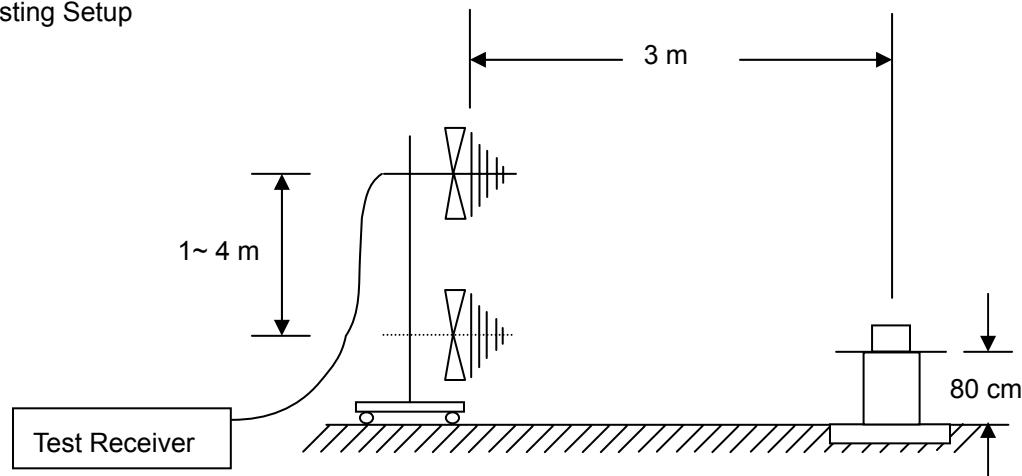
3.1 Instrument (OATS 2)

Instrument	Manufacturer	Model	Serial No.	Last Calibration
EMI Test Receiver	Rohde & Schwarz	ESI 07	830154/002	2001/07/28
Bi-Log Antenna	Schaffner	CBL6112B	2610	2001/06/28
Pre-Amplifier	Schaffner	CPA9231A	3351	2001/10/17
RF Cable	IETC	CBL01	N/A	2001/09/15
Horn Antenna	Com-Power	AH-118	10081	2001/05/15
Pre-Amplifier	Agilent Technologies	8449B	3008A01434	2001/08/20
RF Cable	Insulated Wire	NPS-2251-7880-NPR	CBL06	2001/08/20

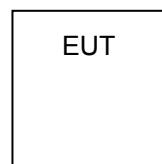
Note: All instrument upon which need to calibrated are with calibration period of 1 year.

3.2 Block Diagram of Test Configuration

Configuration of Testing Setup



Configuration of EUT Setup



3.3 Radiated Limit

FCC Part 15 (30~1000 MHz, Section 15.209)

Frequency (MHz)	(3m) Q.P. Detected	
	Field Strength (uV/m)	Quasi-Peak (dBuV/m)
30 ~ 88	100	40.00
88 ~ 216	150	43.52
216 ~ 960	200	46.02
960 above	500	53.98

FCC Part 15 (Section 15.235)

Frequency (MHz)	Fundamental (AV. Detected)		Others Fundamental attenuated 26 dB or follow 15.209 whichever permits the higher emission levels
	uv/m	dBuV/m	
49.82~49.90	10,000	80.00	

3.4 Instrument configuration

- 3.4.1 The EMI test receiver frequency range set from 30 MHz to 1000 MHz.
- 3.4.2 The EMI test receiver bandwidth set at 120 kHz.
- 3.4.3 The EMI test receiver detector set as Quasi-Peak (Q.P.) and Average (AV.).
- 3.4.4 The Spectrum frequency range set to fundamental and harmonics.

3.5 Measured Mode

- 3.5.1 The test mode for final as following:
Mode 1: Power on (Channel A)

3.6 Configuration of Measurement

- 3.6.1 The EUT was place on a non-conductive table whose total height equaled 80cm. The turntable can rotate 360 degree to determine the position of the maximum emission level.
- 3.6.2 The EUT was set 3 meters away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level.
- 3.6.3 The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.
- 3.6.4 The identification of the frequency of highest emission with respect to the limit was found by investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.

3.7 Configuration of EUT

- 3.7.1 Setup the EUT and simulators as shown section 3.2.
- 3.7.2 Turn on the power of all equipment.

3.8 Test Result

PASS.

The final tests data is shown on following page.

Radiated Emission Measurement Data

Date of Tested : 2002-2-5 Polarization : Horizontal
Temperature : 25°C Humidity : 54%
Tested Mode : Power On (Channel A)

Remark :

- 1 All readings are Quasi-Peak values.
- 2 "+" Means Fundamental Frequency.
- 3 "*" Means Average Value.
- 4 Factor = Antenna Factor + Cable Loss – Pre-amplifier

Radiated Emission Measurement Data

Date of Tested	: 2002-2-5	Polarization	: Vertical
Temperature	: 25°C	Humidity	: 54%
Tested Mode	: Power On (Channel A)		

Remark :

- 1 All readings are Quasi-Peak values.
- 2 "+" Means Fundamental Frequency.
- 3 "*" Means Average Value.
- 4 Factor = Antenna Factor + Cable Loss – Pre-amplifier

4 Frequency Measurements

4.1 Instrument

Instrument	Manufacturer	Model	Serial No.	Last Calibration
EMI Test Receiver	Rohde & Schwarz	ESI 07	830154/002	2001/07/28
Temperature Chamber	KATO	SSE-27CRT	OFB-710	2002/01/23

Note: All instrument upon which need to calibrated are with calibration period of 1 year.

4.2 Measurement Operating Frequency

- 4.2.1 Test Condition: Temperature: 25°C.
- 4.2.2 The EUT supplied with 120Vac.
- 4.2.3 The EUT frequency ranges did not over 1MHz, so operate on channel A frequency (49.830MHz) in during test.
- 4.2.4 Turn the EUT on and measure the EUT operating frequency at the start-up, and two, five, and ten minutes after startup.
- 4.2.5 Result:

Timing	49.830 MHz
Start-Up	49.828
2 min.	49.828
5 min.	49.827
10 min.	49.829

4.3 Measurement Frequency Stability vs. Temperature

- 4.3.1 Set the environmental temperature test chamber to temperature of 20°C.
- 4.3.2 The EUT supplied with 120Vac.
- 4.3.3 The EUT frequency ranges did not over 1MHz, so operate on channel A frequency (49.830MHz) in during test.
- 4.3.4 Turn the environmental temperature test chamber on and wait the temperature of the chamber to stabilize.
- 4.3.5 While maintaining a constant temperature inside the environmental chamber, turn the EUT on and measure the EUT operating frequency at the start-up, and two, five, and ten minutes after startup.
- 4.3.6 Result:

Timing	49.830 MHz
Start-Up	49.829
2 min.	49.828
5 min.	49.827
10 min.	49.828

4.4 Measurement Frequency Stability vs. Voltage

- 4.4.1 Set the environmental temperature test chamber to temperature of 20°C.
- 4.4.2 The EUT supplied with 102 & 138Vac.

4.4.3 The EUT frequency ranges did not over 1MHz, so operate on channel A frequency (49.830MHz) in during test.

4.4.4 Turn the environmental temperature test chamber on and wait the temperature of the chamber to stabilize.

4.4.5 While maintaining a constant temperature inside the environmental chamber, turn the EUT on and measure the EUT operating frequency at the start-up, and two, five, and ten minutes after startup.

4.4.6 Result:

Timing	49.830 MHz	
	102Vac	138Vac
Start-Up	49.829	49.830
2 min.	49.827	49.828
5 min.	49.828	49.829
10 min.	49.828	49.827

5 Occupied Bandwidth Measurements

5.1 Instrument

Instrument	Manufacturer	Model	Serial No.	Last Calibration
EMI Test Receiver	Rohde & Schwarz	ESI 07	830154/002	2001/07/28

Note: All instrument upon which need to calibrated are with calibration period of 1 year.

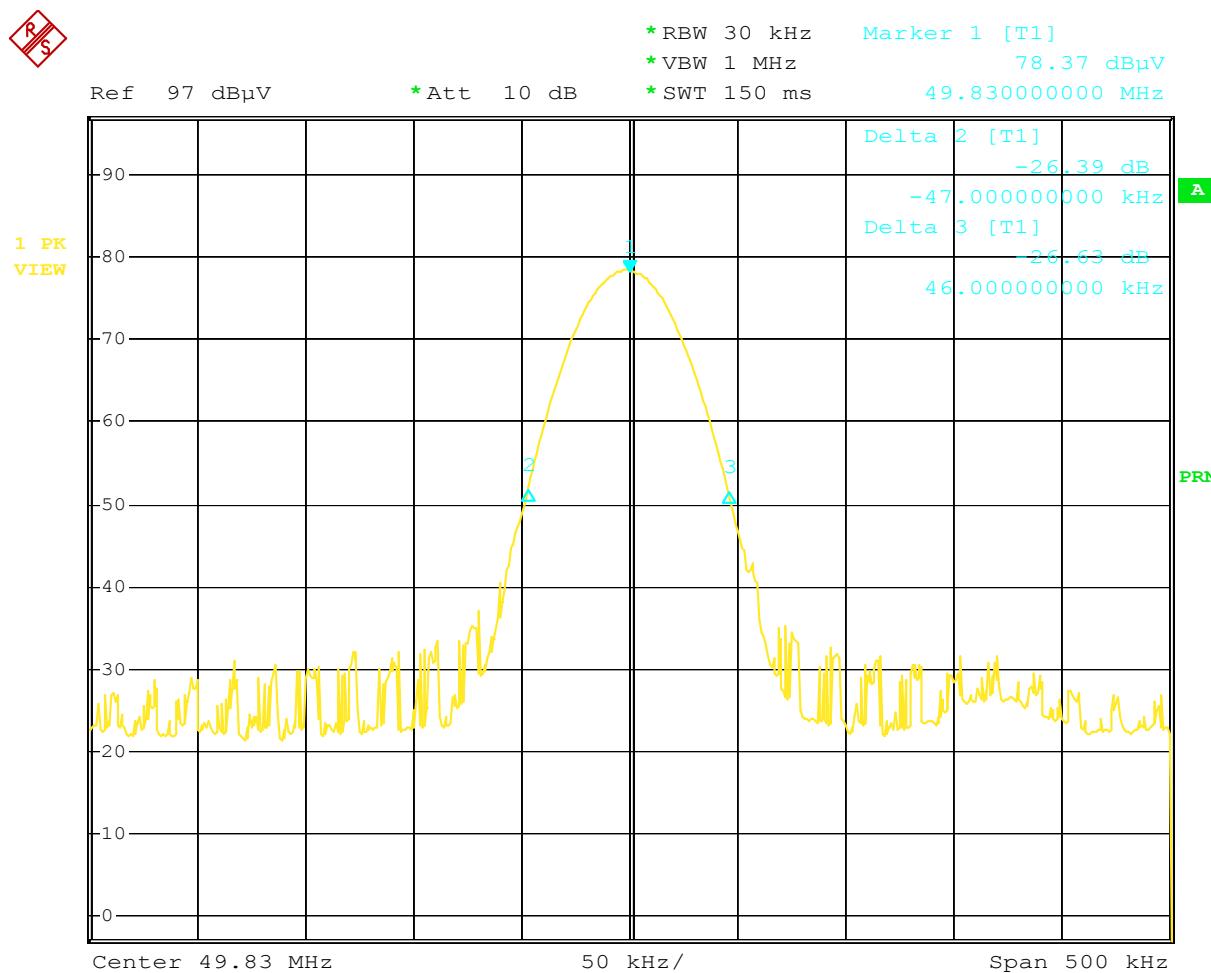
5.2 Instrument configuration

5.2.1 The EMI test receiver resolution bandwidth set at 30 kHz.

5.3 Result

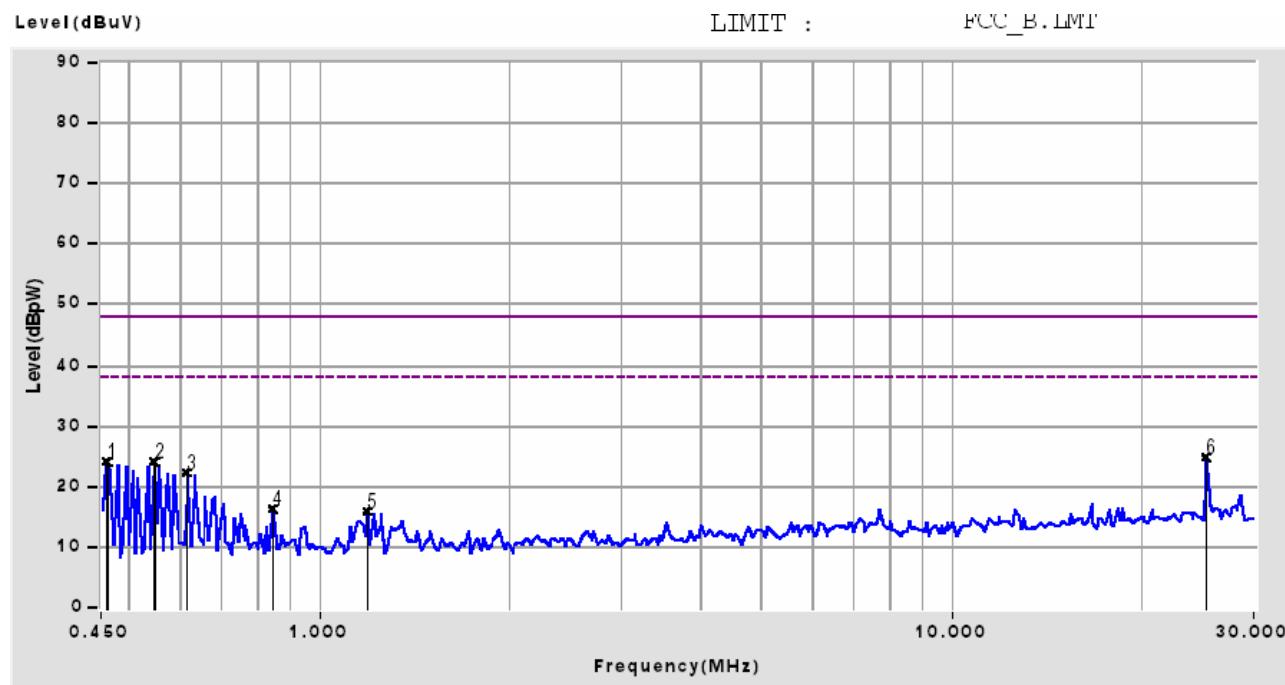
5.3.1 Channel A

Frequency: 49.830 MHz, Occupied Bandwidth: 93 kHz

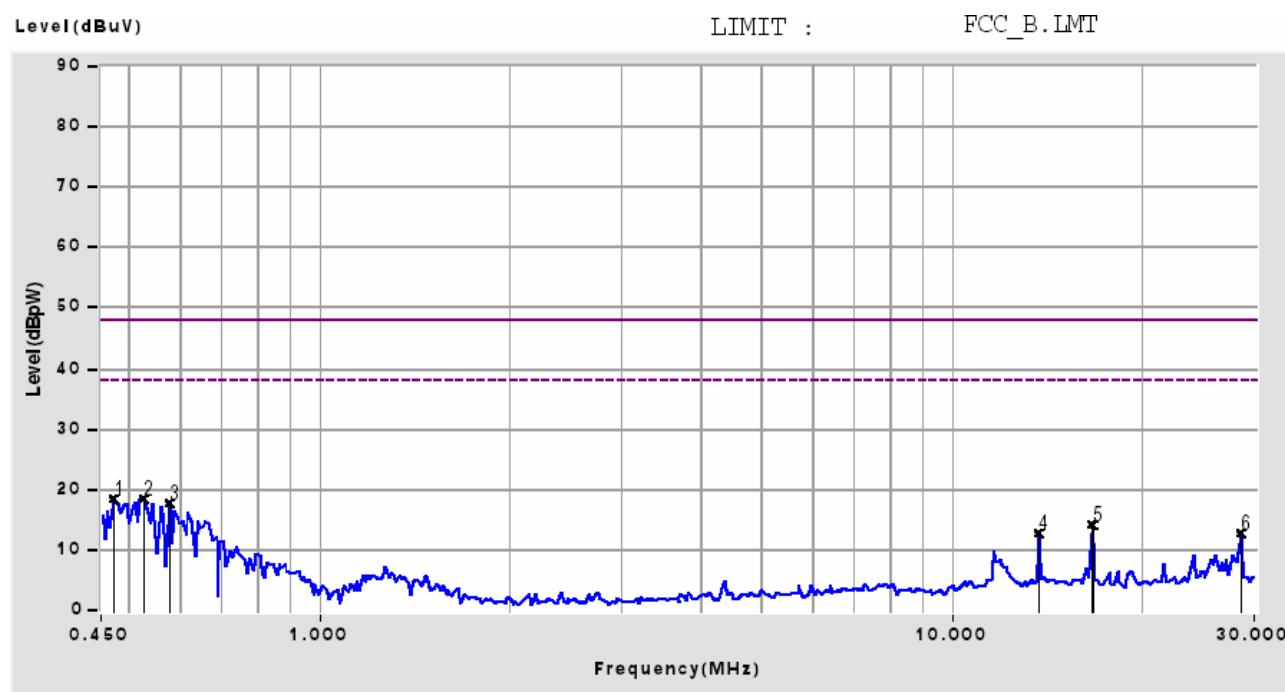


Date: 26.FEB.2002 12:39:14

Appendix 1 – Power Line Conducted Test Data

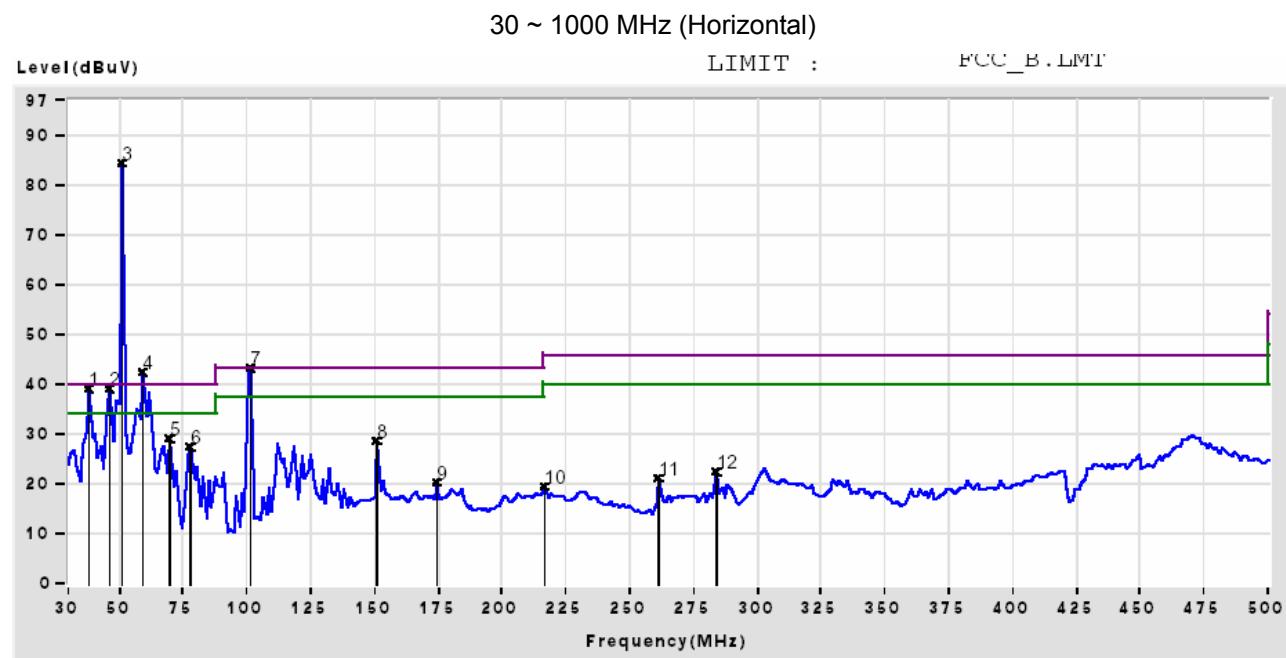
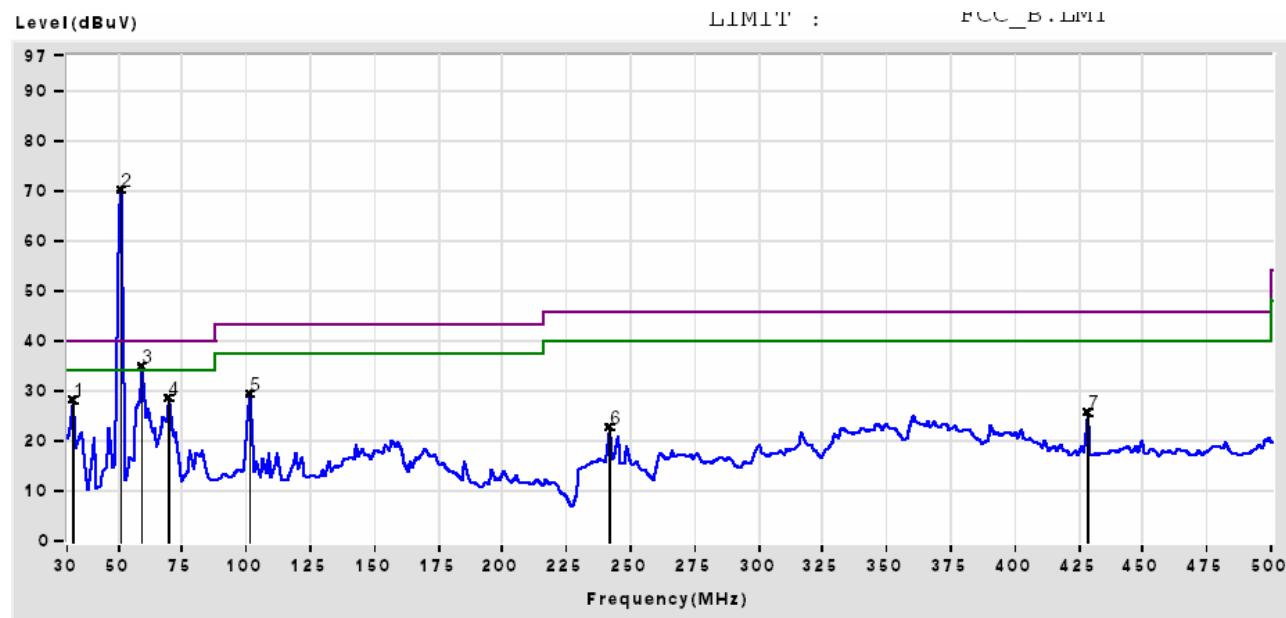


Line



Neutral

Appendix 2 – Radiated Emission Test Data



30 ~ 1000 MHz (Vertical)