SUPPLEMENTARY: FCC ID JVP56W10

APPLICATION FOR CERTIFICATION
On Behalf of
BENQ Corporation

GPRS with Wireless LAN PC Card

Model : 56W10 (W10)

Brand：BenQ

Prepared for : BENQ Corporation
157, Shan-Ying Road, Gueishan,
Taoyuan 333, Taiwan, R.O.C.

Prepared by : Audix Corporation
No. 53-11, Tin-Fu Tsun, Lin-Kou,
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File Number	:	EM-G920336
Report Number	:	TTEMC-F92213
Date of Test	:	Apr. 10 ~ Nov. 11, 2003
Date of Report	:	Nov. 20, 2003

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TEST REPORT CERTIFICATION

Applicant	:	BENQ Corporation
Manufacturer #1	:	BENQ Corporation
Manufacturer #2	:	BENQ Electronics (Suzhou) Co. Ltd.
EUT Description	:	GPRS with Wireless LAN PC Card
		(A) PRODUCT NAME. : 56W10
		(B) MODEL NO. : 56W10 (W10)
		(C) SERIAL NO. : N/A
		(D) POWER SUPPLY : DC 5V (via Notebook)

Measurement Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART C, MAY 2002
AND ANSI C63.4/1992
(FCC CFR 47 Part 15C, §15.207 , §15.209 and §15.247)

The device described above was tested by Audix Corporation to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 subpart C limits both radiated and conducted emissions.

The measurement results are contained in this test report and Audix Corporation is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Corporation.

Date of Test : Apr. 10 ~ Nov. 11, 2003

Prepared by : Monica Chang Nov. 20, 2003
(Monica Chang/Assistant)

Test Engineer : Ben Cheng Nov. 20, 2003
(Ben Cheng/Assistant Manager)

Approve & Authorized Signer : Leon Liu Nov. 20 2003
(Leon Liu/Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	GPRS with Wireless LAN PC Card
Product Name	:	56W10
Model Number	:	56W10 (W10)
Applicant	:	BENQ Corporation 157, Shan-Ying Road, Gueishan, Taoyuan 333, Taiwan, R.O.C.
Manufacturer #1	:	BENQ Corporation 157, Shan-Ying Road, Gueishan, Taoyuan 333, Taiwan.
Manufacturer #2	:	BENQ Electronics (Suzhou) Co. Ltd. No. 169, Zhujiang Road, New District, Suzhou, Jiangsu, P.R., China
Radio Technology	:	DSSS
Fundamental Range	:	2412MHz ~ 2462MHz
Number of Channel	:	11

Channel	Frequency	Channel	Frequency
1	2412 MHz	8	2447 MHz
2	2417 MHz	9	2452 MHz
3	2422 MHz	10	2457 MHz
4	2427 MHz	11	2462 MHz
5	2432 MHz		
6	2437 MHz		
7	2442 MHz		

Bandwidth of Each Channel	:	5MHz
Transfer Rate	:	1/2/5.5/11Mbps

Power Supply	:	DC 5V (Via Notebook)
Antenna Gain	:	1.3dBi
Date of Receipt of Sample	:	Apr. 10, 2003
Date of Test	:	Apr. 10 ~ Nov. 11, 2003

Remark:

Antenna requirement: This EUT's transmitter antenna is design in soldered to a printed circuit board, comply with §15.203 and inform to user that any change and modify is prohibited.

1.2. Tested Supporting System Details

1.2.1. NOTEBOOK PC

Model Number	:	L1400 Series
Serial Number	:	2309620042
FCC ID	:	By DoC
BSMI ID	:	41015024
Brand	:	ASUS
EUT	:	**BENQ Corporation, M/N 56W10 (W10)**
Adapter	:	Delta, M/N ADP-50SB, S/N K0W0203008390 BSMI ID 3882A525 Non-Shielded, Undetachable, 1.8m
Power Cord	:	Non-Shielded, Detachable, 1.8m

1.2.2. PRINTER

Model Number	:	KX-P2135
Serial Number	:	8DMCN02139
FCC ID	:	ACJ5Z6KX-P2135
BSMI ID	:	3872A371
Manufacturer	:	Matsushita
Data Cable	:	Shielded, Detachable, 1.2m
Power Cord	:	Non-Shielded, Detachable, 1.8m

1.2.3. USB KEYBOARD

Model Number	:	KU-8933
Serial Number	:	8H17800115
FCC ID	:	By DoC
Manufacturer	:	Chicony Electronics Co., Ltd.
Data Cable	:	Shielded, Undetachable, 1.8m

1.2.4.USB MOUSE

Model Number	:	MINI 801 USB
Serial Number	:	CE2300400429
FCC ID	:	By DoC
BSMI ID	:	3892B623
Manufacturer	:	Lemel
Data Cable	:	Shielded, Undetachable, 1.0m

1.2.5.HANDSFREE

Model Number	:	SQ-10911-12
Manufacturer	:	Phihong
Data Cable	:	Non-shielded, Detachable, 1.2m

1.3.Description of Test Facility

Semi-Anechoic Chamber Description	:	May 16, 2000 Re-file on Federal Communication Commission Registration Number: 90993
Name of Firm	:	Audix Corporation
Site Location #1	:	No. 53-11, Tin-Fu Tsun, Lin-Kou, Taipei Hsien, Taiwan, R.O.C.
Site Location #2	:	No. 67-4, Tin-Fu Tsun, Lin-Kou, Taipei Hsien, Taiwan, R.O.C.
NVLAP Lab Code	:	200077-0

1.4.Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Conduction Test	150kHz~30MHz	±2.66dB
Radiation Test (Distance: 3m)	30MHz~300MHz	+4.26dB / –4.22dB
	300MHz~1000MHz	+5.28dB / –4.0dB

Remark：Uncertainty = $ku_c(y)$

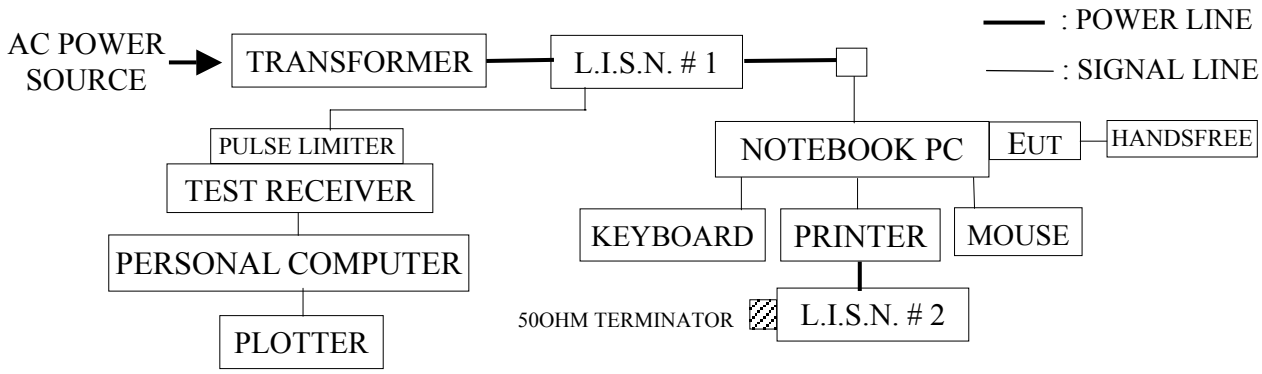
2. CONDUCTED EMISSION TEST

2.1.Test Equipment

The following test equipment was used during the conducted emission measurement：

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	Rohde & Schwarz	ESH3	893044/015	Jul. 08, 02’	Jul. 07, 03’
2.	L.I.S.N. # 1	Kyoritsu	KNW-407	8-881-13	Apr. 25, 02’	Apr. 24, 03’
3.	L.I.S.N. # 2	Kyoritsu	KNW-407	8-855-9	Apr. 25, 02’	Apr. 24, 03’
4.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	002	Aug. 21, 02’	Aug. 20, 03’

2.2.Block Diagram of Test Setup



EUT : GPRS WITH WIRELESS LAN PC CARD

2.3.Conducted Emission Limits (§15.207)

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level	Average Level
150KHz ~ 500KHz	66 ~ 56 dBμV	56 ~ 46 dBμV
500KHz ~ 5MHz	56 dBμV	46 dBμV
5MHz ~ 30MHz	60 dBμV	50 dBμV

2.4. Operating Condition of EUT

2.4.1. Setup the EUT and simulator as shown on 2.2.

2.4.2. Turned on the power of all equipment.

2.4.3. The software (test program: ZD Config) was used to enable the EUT to transmit and receive data at different channel frequency individually.

2.5. Test Procedure

The Notebook PC's power cord was connected to the power mains through a line impedance stabilization network (L.I.S.N. #1) and the other peripheral devices power cord were connected to the power mains through a line impedance stabilization network (L.I.S.N. #2) This provided a 50 ohm coupling impedance for the measuring equipment. (Please refer to the block diagram of the test setup and photographs.) Both sides of A.C. line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed according to FCC ANSI C63.4-1992 on conducted measurement.

The bandwidth of R&S Test Receiver ESH3 was set at 10kHz.

The frequency range from 150KHz to 30MHz was checked.

The Channel 1, 7 & 11 were done on conducted test, then selected the worst case (Channel 1) to read the Q.P. & Average value, all the test results are attached in section 2.6.

2.6. Test Results

PASSED. All emissions not reported below are too low against the prescribed limits.

Date of Test： Apr. 10, 2003 Temperature： 21℃

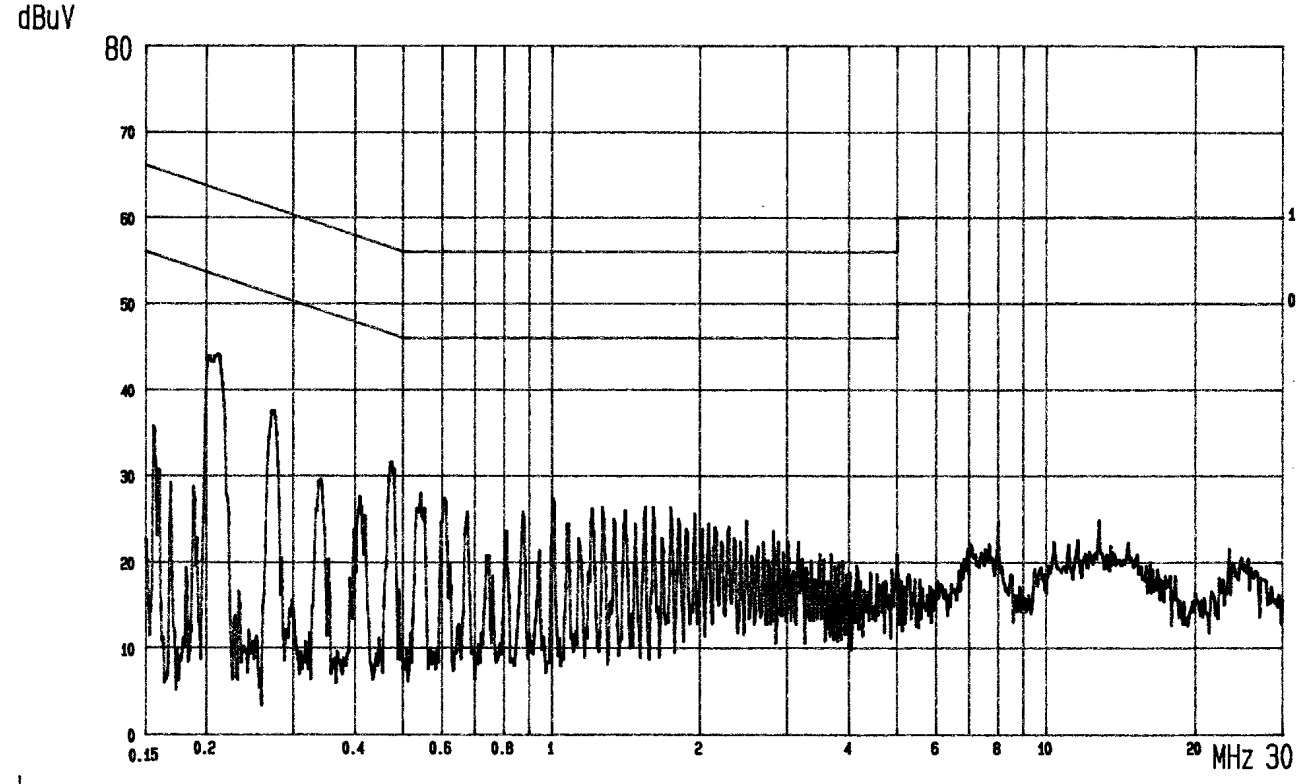
EUT ： GPRS with Wireless LAN PC Card Humidity： 68%

Test Mode： Channel 1, Testing Voltage: AC 120V/60Hz

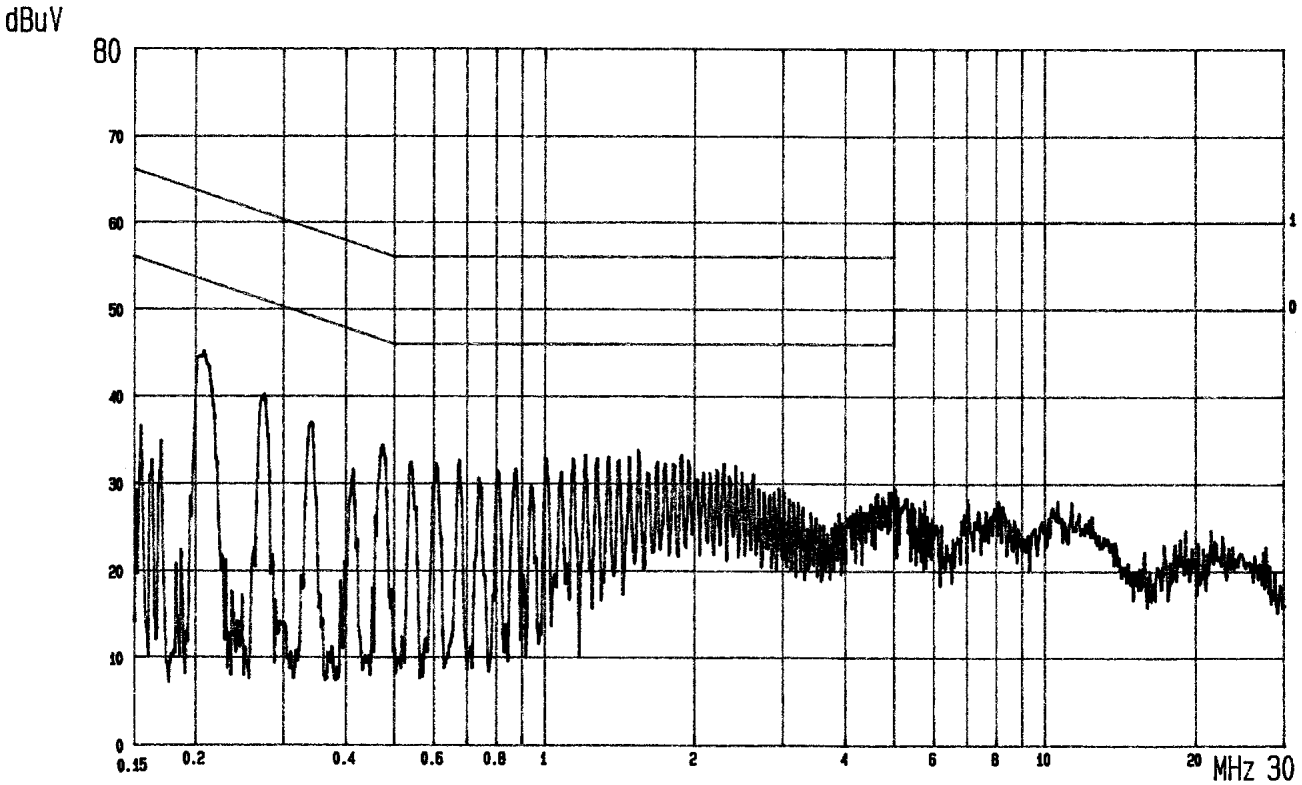
Frequency	Factor	Reading (dBμV)		Measurement (dBμV)		Limits (dBμV)		Margin dB	
		Neutral							
(MHz)	dB	Q.P.	Average	Q.P.	Average	Q.P.	Average	Q.P.	Average
0.2098	0.4	42.7	*	43.1	*	63.2	53.2	20.1	*
0.2718	0.4	35.9	*	36.3	*	61.0	51.0	24.7	*
0.3379	0.4	27.6	*	28.0	*	59.2	49.2	31.2	*
0.4727	0.5	29.8	*	30.3	*	56.4	46.4	26.1	*
0.6016	0.5	26.4	*	26.9	*	56.0	46.0	29.1	*
1.0043	0.5	27.4	*	27.9	*	56.0	46.0	28.1	*

Frequency	Factor	Reading (dBμV)		Measurement (dBμV)		Limits (dBμV)		Margin dB	
		Line							
(MHz)	dB	Q.P.	Average	Q.P.	Average	Q.P.	Average	Q.P.	Average
0.2085	0.4	43.7	*	44.1	*	63.2	53.2	19.1	*
0.2718	0.4	35.4	*	35.8	*	61.0	51.0	25.2	*
0.3399	0.4	34.8	*	35.2	*	59.2	49.2	24.0	*
0.4727	0.5	32.9	*	33.4	*	56.4	46.4	23.0	*
0.6735	0.5	30.4	*	30.9	*	56.0	46.0	25.1	*
1.0043	0.5	31.5	*	32.0	*	56.0	46.0	24.0	*

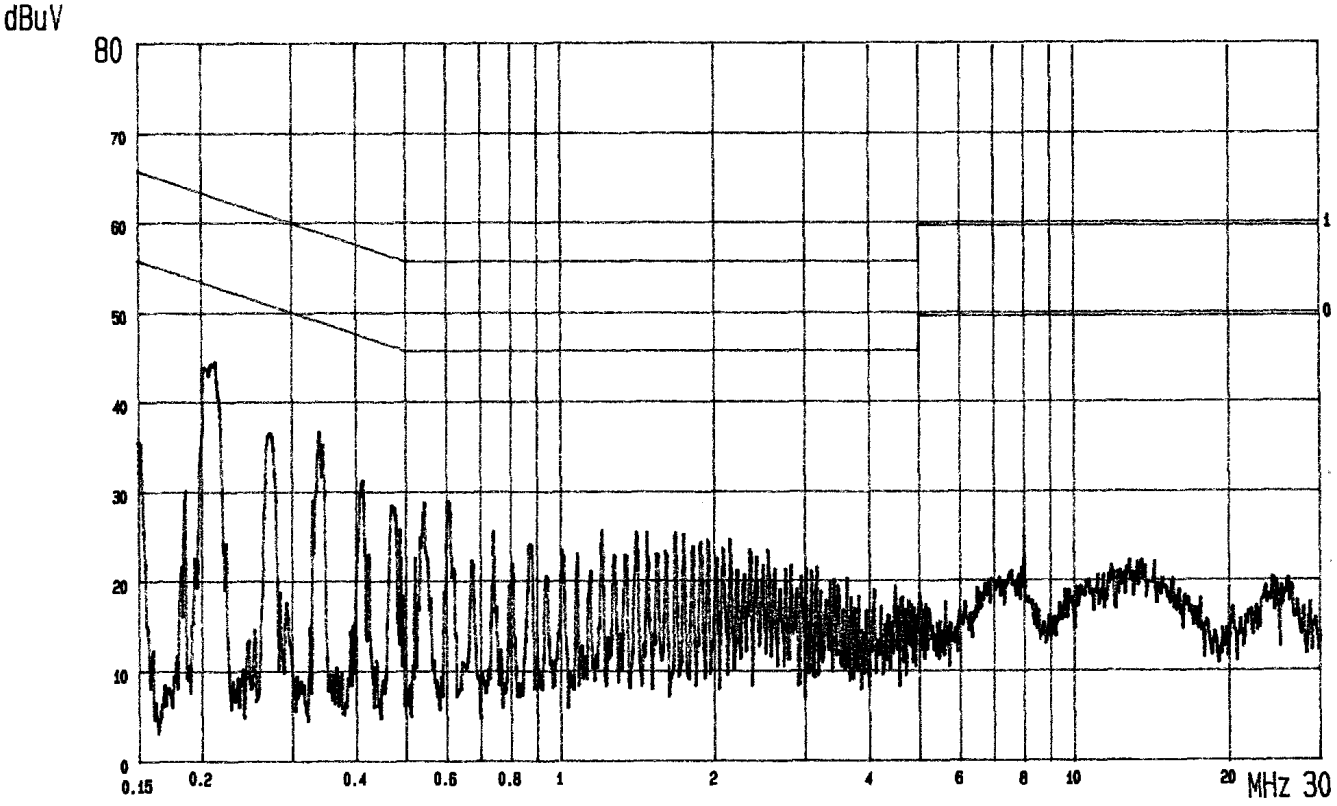
Remark： 1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss
3. Measurement = Factor + Reading
4. "*" Above Q.P. values have met both limits, it's not necessary to measure with average detector.



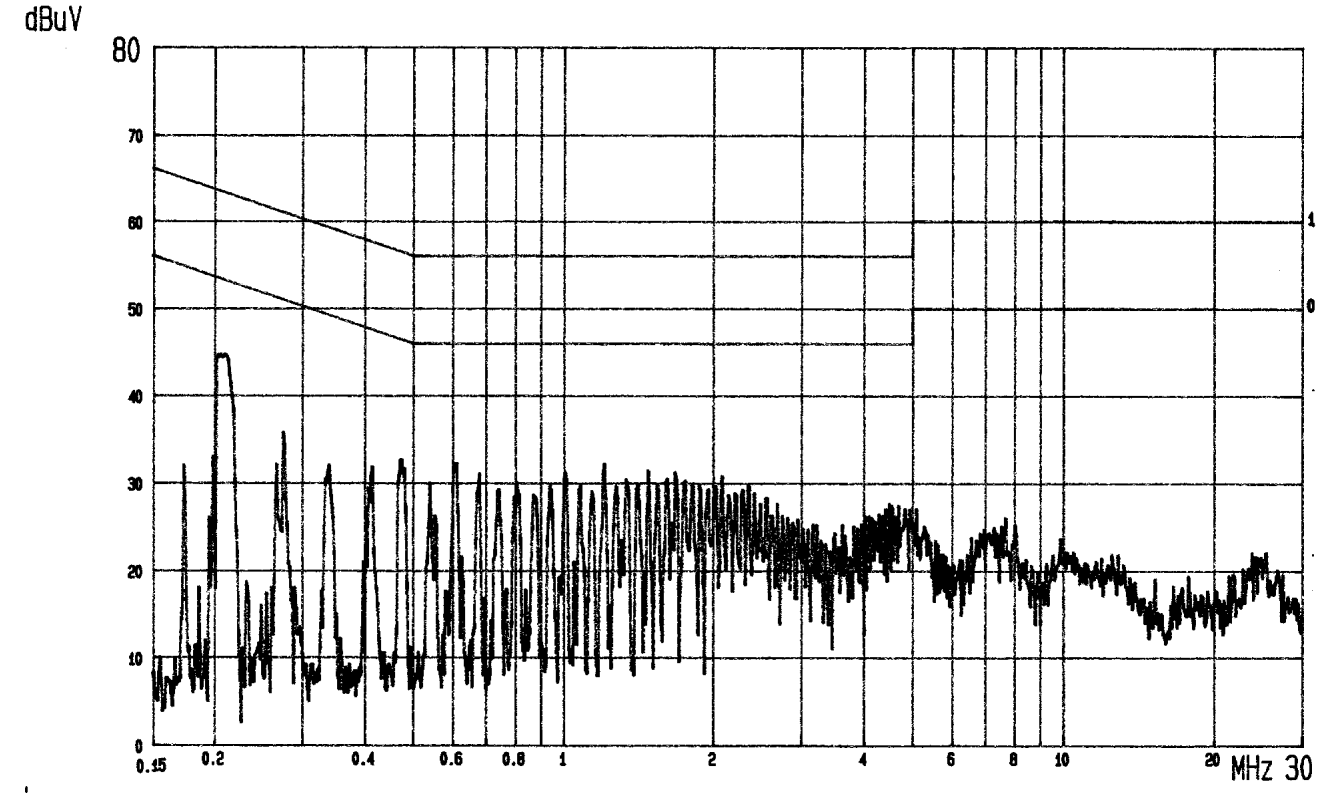
BENQ EUT: GPRS WITH WIRELESS LAN PC CARD M/N: 56W10 120V/60Hz PAGE: 01
LINE: Va MEMO: CH: 1 (TX/RX) (PEAK VALUE) AUDIX



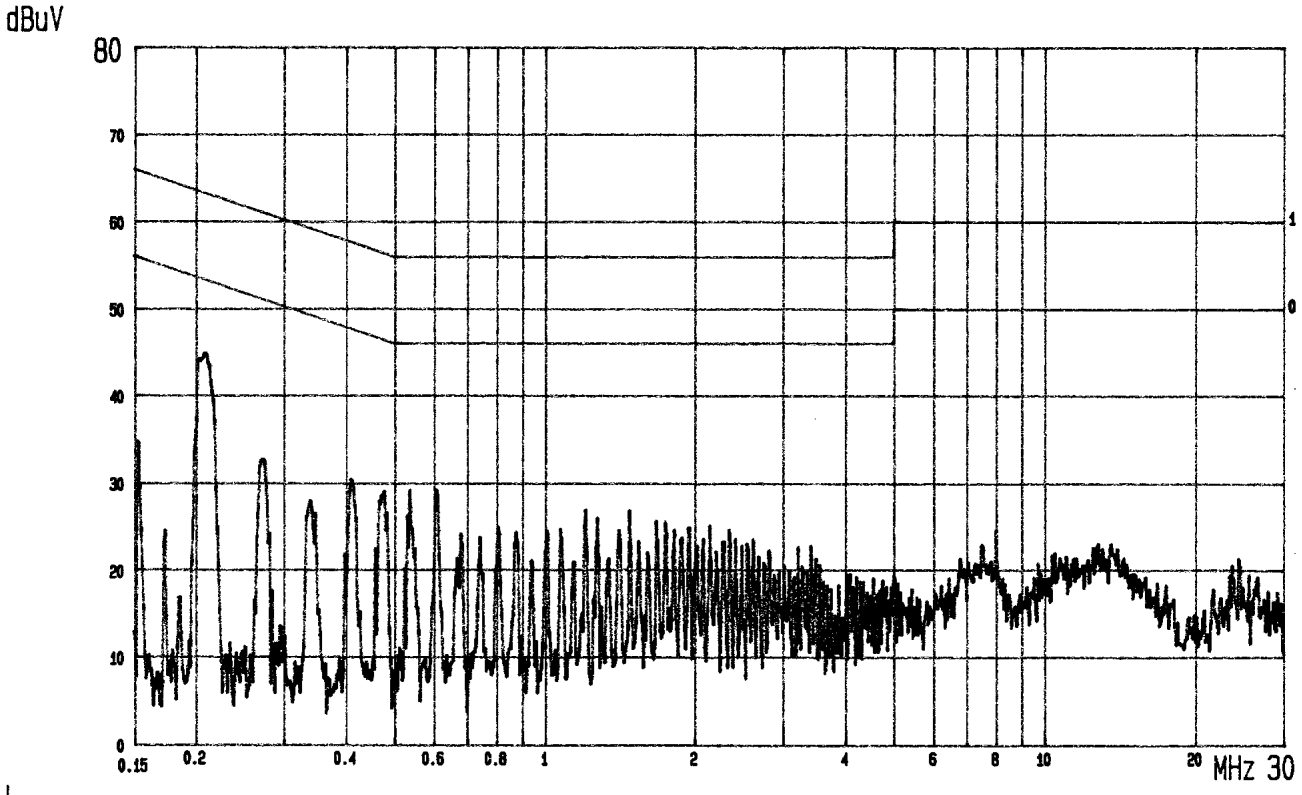
BENQ EUT: GPRS WITH WIRELESS LAN PC CARD M/N: 56W10 120V/60Hz PAGE: 02
LINE: Vb MEMO: CH: 1 (TX/RX) (PEAK VALUE) AUDIX



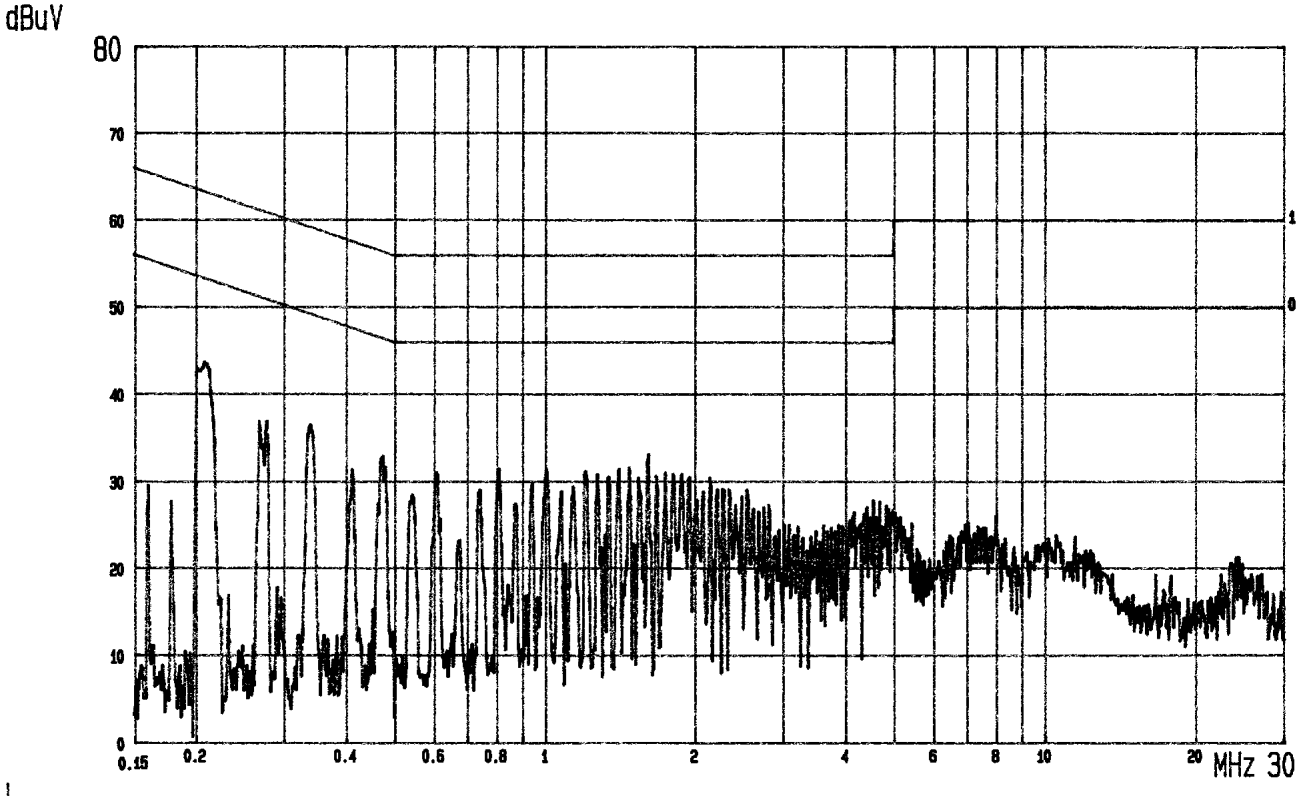
BENQ EUT: GPRS WITH WIRELESS LAN PC CARD M/N: 56W10 120V/60Hz PAGE: 01
LINE: Va MEMO: CH: 7 (TX/RX) (PEAK VALUE) AUDIX



BENQ EUT: GPRS WITH WIRELESS LAN PC CARD M/N: 56W10 120V/60Hz PAGE: 02
LINE: Vb MEMO: CH: 7 (TX/RX) (PEAK VALUE) AUDIX



BENQ EUT: GPRS WITH WIRELESS LAN PC CARD M/N: 56W10 120V/60Hz PAGE: 01
LINE: Va MEMO: CH: 11 (TX/RX) (PEAK VALUE) AUDIX



BENQ EUT: GPRS WITH WIRELESS LAN PC CARD M/N: 56W10 120V/60Hz PAGE: 02
LINE: Vb MEMO: CH: 11 (TX/RX) (PEAK VALUE) AUDIX

3. RADIATED EMISSION MEASUREMENT

3.1.Test Equipment

The following test equipment was used during the radiated emission measurement：

3.1.1.1.For 30MHz~1000MHz Frequency (at Semi-Anechoic Chamber)

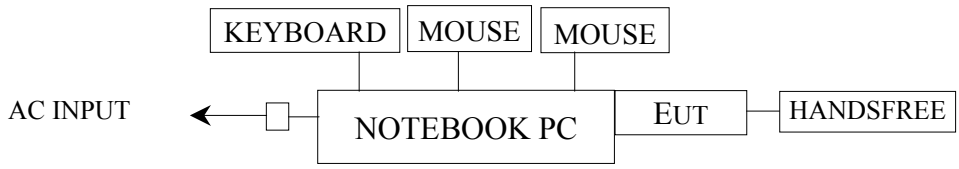
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8593EM	3826A00248	Sep. 24, 03’	Sep. 23, 04’
2.	Test Receiver	R&S	ESVP	893202/001	Jul. 09, 03’	Jul. 08, 04’
3.	Pre-Amplifier	HP	8447D	2944A06305	Mar. 13, 03’	Mar. 12, 04’
4.	Broadband Antenna	Schwarzbeck	BBA 9106	A3L	Feb. 23, 03‘	Feb. 22, 04‘
5.	Broadband Antenna	Schwarzbeck	UHALP9108-A	0138	Feb. 23, 03‘	Feb. 22, 04‘

3.1.1.2.For Above 1GHz frequency (at Semi-Anechoic Chamber)

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8564EC	3946A00249	Aug. 27, 03’	Aug. 26. 04’
2.	Amplifier	HP	8449B	3008A00529	Jan. 04, 03’	Jan. 03, 04’
3.	Horn Antenna	EMCO	3115	9112-3775	Apr. 21, 03’	Apr. 20, 04’
4.	Horn Antenna	EMCO	3116	2653	Oct. 28, 03’	Oct. 27, 04’

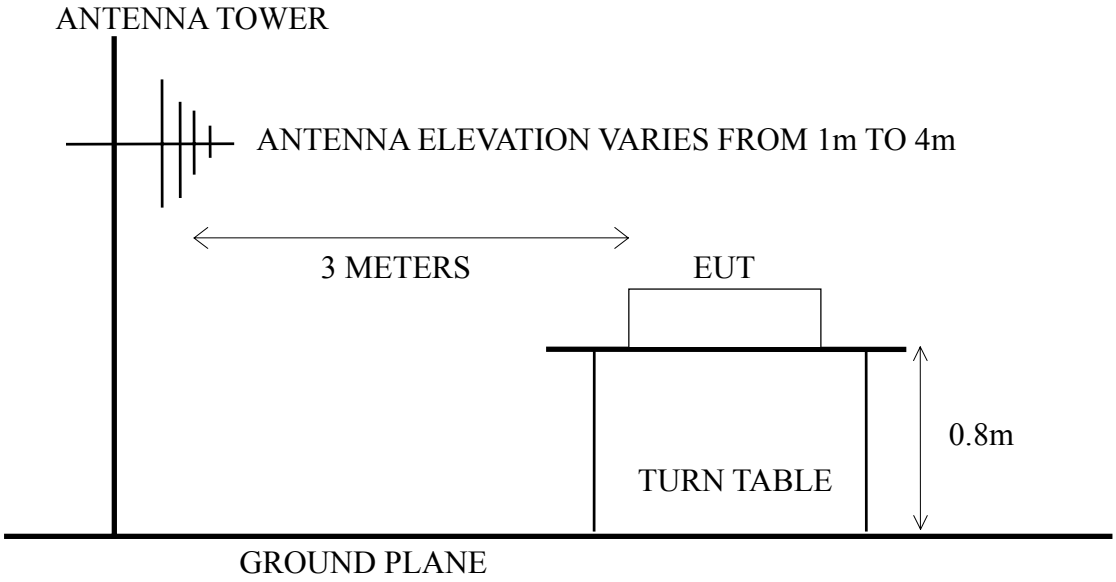
3.2.Test Setup

3.2.1.Block Diagram of connection between EUT and simulators



EUT : GPRS WITH WIRELESS LAN PC CARD

3.2.2.Semi-Anechoic Chamber (3m) Setup Diagram



3.3.Radiated Emission Limits (§15.209)

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMITS	
		μV/m	dBμV/m
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0
Above 1000	3	74.0 dBμV/m (Peak) 54.0 dBμV/m (Average)	

Remark： (1) Emission level (dBμV/m) = 20 log Emission level (μV/m)
(2) The tighter limit applies at the edge between two frequency bands.
(3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3.4.Operating Condition of EUT

Same as conducted measurement which is listed in Section 2.4.

3.5. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. The antenna moved up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna such as calibrated biconical and log- periodical antenna or horn antenna were used as a receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to FCC ANSI C63.4-1992 regulation.

The bandwidth of the R&S Test Receiver ESVP was set at 120kHz.

The bandwidth of the HP Spectrum Analyzer 8564EC was set at 1MHz.

The Channel 1, 7 & 11 were done on radiated test for 30MHz ~ 1GHz, , all the test results are attached in section 3.6.1. The Channel 1, 7 & 11 were done on radiated test for above 1GHz, all the test results are listed in section 3.6.2.

3.6. Test Results

PASSED. All the emissions not reported below are too low against the official limits.

3.6.1. 30MHz to 1000MHz frequency.

Date of Test： Oct. 30, 2003 Temperature： 23℃

EUT： GPRS with Wireless LAN PC Card Humidity： 65%

Test Mode： Channel 1, Testing Voltage: AC 120V/60Hz

Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Limits dBμV/m	Margin dB
133.410	19.50	2.40	13.83	35.73	43.50	7.77
233.040	23.98	3.30	7.66	34.94	46.00	11.06
297.840	26.78	3.98	1.77	32.53	46.00	13.47
366.500	16.70	4.50	17.89	39.09	46.00	6.91
393.800	16.90	4.70	13.29	34.89	46.00	11.11
917.400	23.10	7.40	5.29	35.79	46.00	10.21

Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB
74.280	13.58	1.80	13.09	28.47	40.00	11.53
133.680	18.80	2.40	8.14	29.34	43.50	14.16
393.100	16.34	4.70	15.07	36.11	46.00	9.89
432.300	16.60	5.20	11.62	33.42	46.00	12.58
584.900	19.72	6.40	4.39	30.51	46.00	15.49
917.400	23.22	7.40	5.70	36.32	46.00	9.68

Remark： 1. All readings are Quasi-Peak values.
2. Emission Level= Antenna Factor + Cable Loss + Meter Reading.

Date of Test：	Oct. 30, 2003	Temperature：	23℃
EUT：	GPRS with Wireless LAN PC Card	Humidity：	65%
Test Mode：	Channel 7, Testing Voltage: AC 120V/60Hz		

Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Limits dBμV/m	Margin dB
133.680	19.50	2.40	11.58	33.48	43.50	10.02
297.840	26.78	3.98	5.94	36.70	46.00	9.30
367.200	16.70	4.42	15.45	36.57	46.00	9.43
397.300	16.84	4.79	14.22	35.85	46.00	10.15
432.300	17.20	5.20	14.32	36.72	46.00	9.28
911.100	23.10	7.40	4.51	35.01	46.00	10.99

Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB
83.190	14.25	1.90	9.36	25.51	40.00	14.49
133.680	18.80	2.40	9.88	31.08	43.50	12.42
210.090	22.96	3.16	4.48	30.60	43.50	12.90
339.900	14.62	4.29	11.42	30.33	46.00	15.67
392.400	16.36	4.70	17.21	38.27	46.00	7.73
432.300	16.60	5.20	8.74	30.54	46.00	15.46

Remark： 1. All readings are Quasi-Peak values.
2. Emission Level= Antenna Factor + Cable Loss + Meter Reading.

Date of Test：	Oct. 30, 2003	Temperature：	23℃
EUT：	GPRS with Wireless LAN PC Card	Humidity：	65%
Test Mode：	Channel 11, Testing Voltage: AC 120V/60Hz		

Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Limits dBμV/m	Margin dB
133.410	19.50	2.40	11.59	33.49	43.50	10.01
297.300	26.70	4.00	1.82	32.52	46.00	13.48
367.900	16.70	4.46	17.24	38.40	46.00	7.60
393.800	16.90	4.70	15.31	36.91	46.00	9.09
432.300	17.20	5.20	12.42	34.82	46.00	11.18
917.400	23.10	7.40	4.80	35.30	46.00	10.70

Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB
74.280	13.58	1.80	12.49	27.87	40.00	12.13
133.680	18.80	2.40	8.71	29.91	43.50	13.59
392.400	16.36	4.70	14.83	35.89	46.00	10.11
460.300	17.00	5.70	12.14	34.84	46.00	11.16
584.900	19.72	6.40	4.29	30.41	46.00	15.59
917.400	23.22	7.40	7.04	37.66	46.00	8.34

Remark： 1. All readings are Quasi-Peak values.
2. Emission Level= Antenna Factor + Cable Loss + Meter Reading.

3.6.2.Above 1GHz frequency

Date of Test： Apr. 16, 2003 Temperature： 22℃

EUT： GPRS with Wireless LAN PC Card Humidity： 68%

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Limits dBμV/m	Margin dB
Channel l : TX: 2412MHz, RX: 2038MHz							
Peak	4824.581	33.61	9.14	2.97	45.72	74.00	28.28
	7236.870	36.75	11.25	2.04	50.04	74.00	23.96
Average	4824.581	33.61	9.14	-9.46	33.29	54.00	20.71
	7236.870	36.75	11.25	-13.24	34.76	54.00	19.24
Channel 7 : TX: 2442MHz, RX: 2068MHz							
Peak	4884.717	33.78	9.15	2.19	45.12	74.00	28.88
	7326.790	37.00	11.44	2.99	51.43	74.00	22.57
Average	4884.717	33.78	9.15	-9.62	33.31	54.00	20.69
	7326.790	37.00	11.44	-9.02	39.42	54.00	14.58

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. Measurement for TX/RX was up to 10th harmonics, but the emissions level were too low against the official limit and not report.
3. Test Voltage: AC 120V/60Hz

Date of Test： Oct. 30, 2003 Temperature： 23℃

EUT： GPRS with Wireless LAN PC Card Humidity： 65%

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBμV	Emission Level Horizontal dBμV/m	Limits dBμV/m	Margin dB
Channel 1l : TX: 2462MHz, RX: 2088MHz							
Peak	4935.800	33.92	9.13	0.20	43.25	74.00	30.75
	7387.500	37.10	11.51	3.49	52.10	74.00	21.90
Average	4935.800	33.92	9.13	-6.28	36.77	54.00	17.23
	7387.500	37.10	11.51	-2.41	46.20	54.00	7.80

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
4. Measurement for TX/RX was up to 10th harmonics, but the emissions level were too low against the official limit and not report.
5. Test Voltage: AC 120V/60Hz

Date of Test： Apr. 16, 2003 Temperature： 22℃

EUT： GPRS with Wireless LAN PC Card Humidity： 68%

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB
Channel l : TX: 2412MHz, RX: 2038MHz							
Peak	4824.581	33.61	9.14	6.10	48.85	74.00	25.15
	7236.870	36.75	11.25	3.08	51.08	74.00	22.92
Average	4824.581	33.61	9.14	-6.86	35.89	54.00	18.11
	7236.870	36.75	11.25	-9.37	38.63	54.00	15.37
Channel 7 : TX: 2442MHz, RX: 2068MHz							
Peak	4884.717	33.78	9.15	5.23	48.16	74.00	25.84
	7326.790	37.00	11.44	2.16	50.60	74.00	23.40
Average	4884.717	33.78	9.15	-8.38	34.55	54.00	19.45
	7326.790	37.00	11.44	-8.66	39.78	54.00	14.22

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. Measurement for TX/RX was up to 10th harmonics, but the emissions level were too low against the official limit and not report.
3. Test Voltage: AC 120V/60Hz

Date of Test： Oct. 30, 2003 Temperature： 23℃

EUT： GPRS with Wireless LAN PC Card Humidity： 65%

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBμV	Emission Level Vertical dBμV/m	Limits dBμV/m	Margin dB
Channel 1l : TX: 2462MHz, RX: 2088MHz							
Peak	4930.158	33.92	9.13	1.56	44.61	74.00	29.39
	7387.500	37.10	11.51	0.59	49.20	74.00	24.80
Average	4930.158	33.92	9.13	-4.88	38.17	54.00	15.83
	7387.500	37.10	11.51	-6.53	42.08	54.00	11.92

Remark ： 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. Measurement for TX/RX was up to 10th harmonics, but the emissions level were too low against the official limit and not report.
3. Test Voltage: AC 120V/60Hz

4. 6dB BANDWIDTH MEASUREMENT

4.1.Test Equipment

The following test equipment was used during the Emission Bandwidth test：

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8564EC	3946A00249	Aug. 27, 03’	Aug. 26. 04’

4.2.Block Diagram of Test Setup

EUT : GPRS WITH WIRELESS LAN PC CARD

4.3.Specification Limits (§15.247(a)(2))

The minimum 6dB bandwidth shall be at least 500kHz.

4.4.Operating Condition of EUT

The software (ZD Config) was used to enable the EUT to transmit and receive data at different channel frequency individually.

4.5.Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with 100kHz RBW and 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

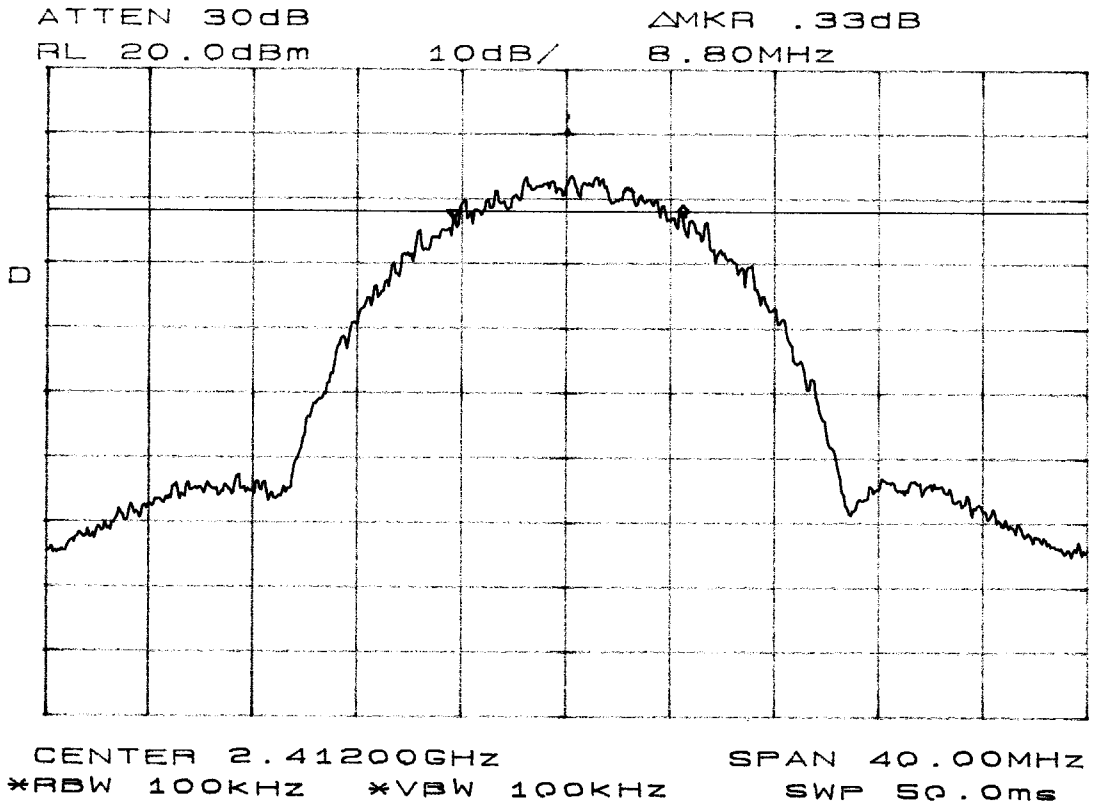
4.6.Test Results

PASSED. The testing data was attached in the next pages.

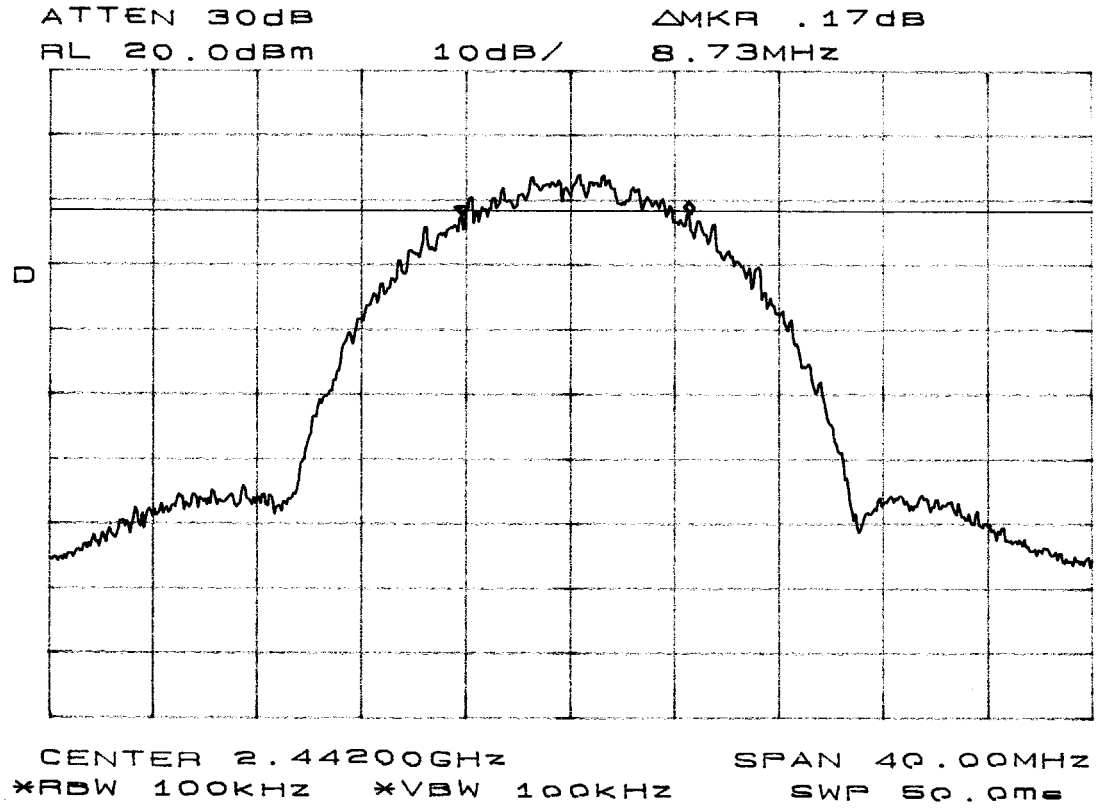
(Test Date : Oct. 30, 2003 Temperature : 23℃ Humidity : 64 %)

Channel	Frequency	**6dB Bandwidth**
1	2412MHz	**8.80MHz**
7	2442MHz	**8.73MHz**
11	2462MHz	**9.13MHz**

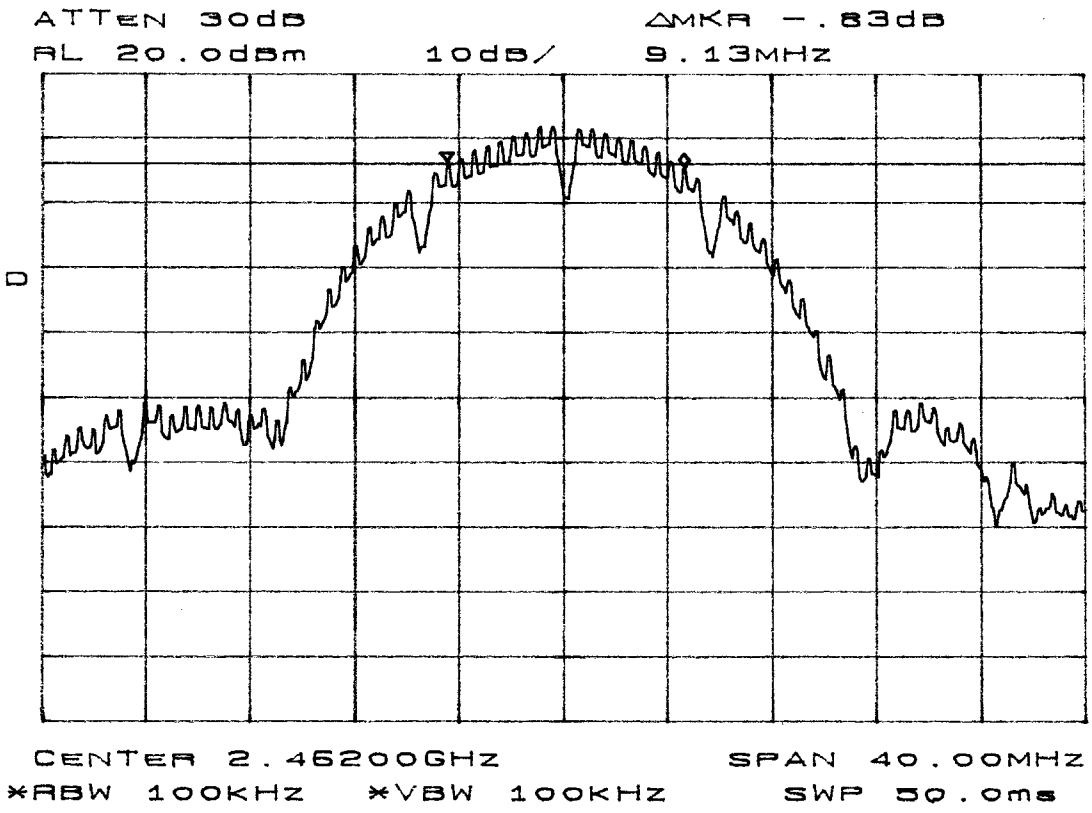
Channel : 1



Channel : 7



Channel : 11


ATTEN 30dB
ΔMKR -.83dB
RL 20.0dBm
10dB/
9.13MHz
D
CENTER 2.46200GHz
SPAN 40.00MHz
*RBW 100KHz
*VBW 100KHz
SWP 50.0ms

5. MAXIMUM PEAK OUTPUT POWER MEASUREMENT

5.1.Test Equipment

The following test equipment was used during the Emission Bandwidth test：

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Power Meter	Anritsu	ML2488A	3946A00249	Nov. 03, 03’	Nov. 02, 04’
2.	Power Sensor	Anritsu	MA2491A	030541	Nov. 03, 03’	Nov. 02, 04’
3.	Attenuator	Anritsu	41KC-10	N/A	N/A	N/A

5.2.Block Diagram of Test Setup

EUT : GPRS WITH WIRELESS LAN PC CARD

5.3.Specification Limits (§15.247(b)-(3))

The Limits of maximum Peak Output Power for digital modulation in 2400-2483.5MHz is : 1Watt. (30dBm)

5.4.Operating Condition of EUT

The software (ZD Config) was used to enable the EUT to transmit and receive data at different channel frequency individually.

5.5.Test Procedure

The transmitter output was connected to the power meter that was designed to detect peak value automatically.

5.6. Test Results

PASSED. The testing data was attached in the next pages.

(Test Date : Nov. 11, 2003 Temperature : 21℃ Humidity : 64 %)

Channel	Frequency	**Peak Output Power**	Limit
1	2412MHz	**23.45dBm**	30dBm
7	2442MHz	**22.56dBm**	30dBm
11	2462MHz	**22.85dBm**	30dBm

6. BAND EDGES MEASUREMENT

6.1. Test Equipment

The following test equipment was used during the Emission Bandwidth test：

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8564EC	3946A00249	Aug. 27, 03’	Aug. 26. 04’

6.2. Block Diagram of Test Setup

EUT : GPRS WITH WIRELESS LAN PC CARD

6.3. Specification Limits (§15.247(c))

The highest level should be at least 20 dB below that in the 100kHz bandwidth.

6.4. Operating Condition of EUT

The software (ZD Config) was used to enable the EUT to transmit and receive data at different channel frequency individually.

6.5. Test Procedure

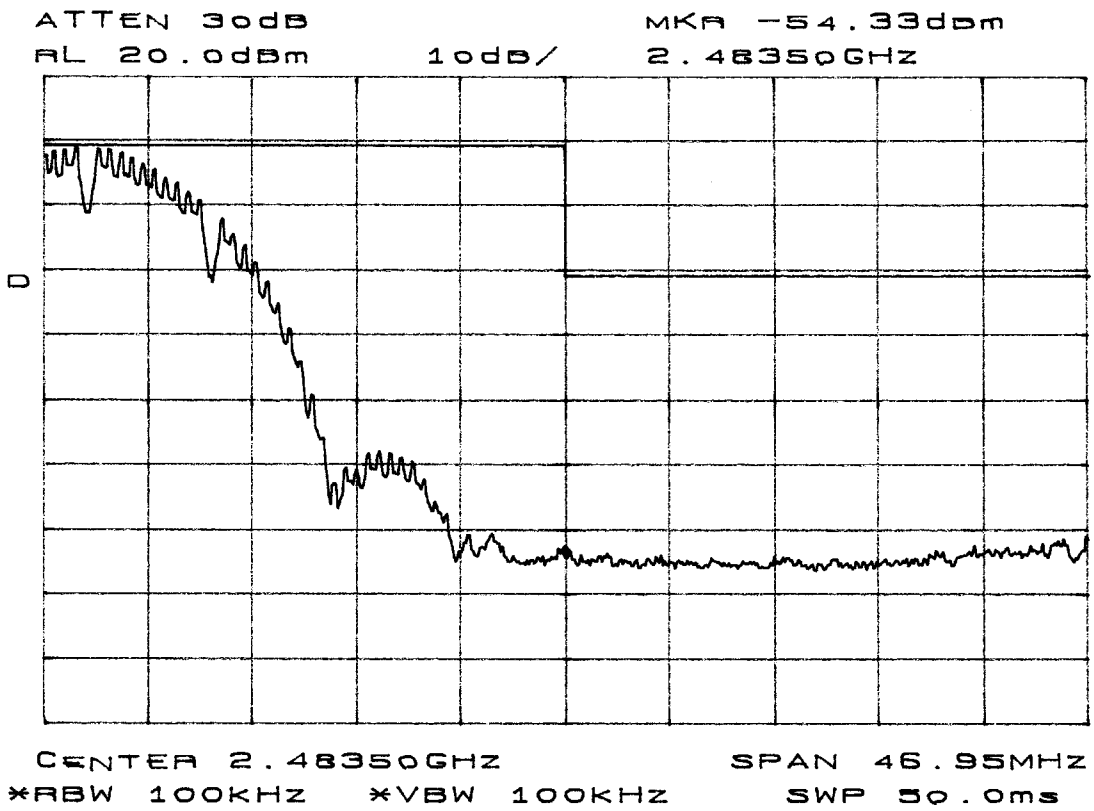
The transmitter output was connected to the spectrum analyzer. Set both RBW and VBW of spectrum analyzer to 100kHz with suitable frequency span including 100kHz bandwidth from band edge.

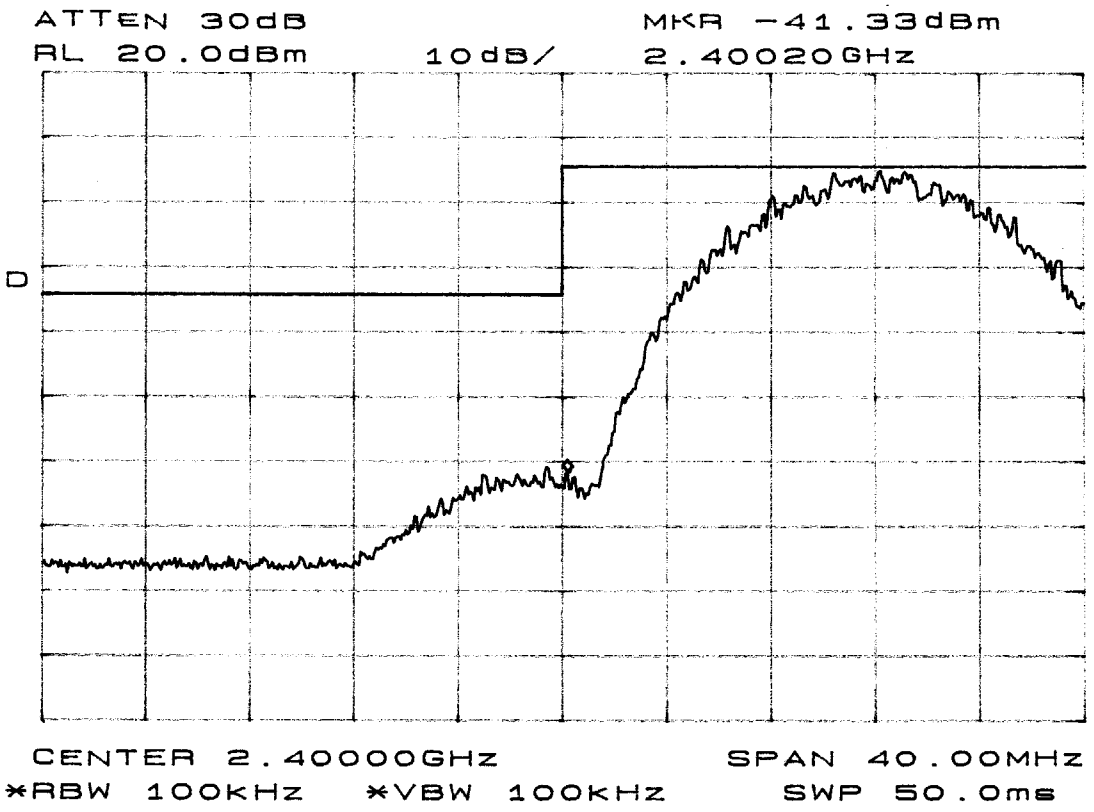
6.6. Test Results

PASSED. The testing data was attached in the next pages.

(Test Date : Oct. 30, 2003 Temperature : 23℃ Humidity : 64 %)

1. Below Band edge: The highest emission level is – 54.33dBm on 2.48350GHz。
2. Upper Band edge : The highest emission level is – 41.33dBm on 2.40020GHz。


ATTEN 30dB
MKR -54.33dBm
RL 20.0dBm
10dB/
2.48350GHz
D
CENTER 2.48350GHz
SPAN 46.95MHz
*RBW 100KHz
*VBW 100KHz
SWP 50.0ms


ATTEN 30dB
MKR -41.33dBm
RL 20.0dBm
10dB/
2.40020GHz
D
CENTER 2.40000GHz
SPAN 40.00MHz
*RBW 100KHz
*VBW 100KHz
SWP 50.0ms

7. POWER SPECTRAL DESITY MEASUREMENT

7.1. Test Equipment

The following test equipment was used during the Emission Bandwidth test：

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8564EC	3946A00249	Aug. 27, 03’	Aug. 26. 04’

7.2. Block Diagram of Test Setup

EUT : GPRS WITH WIRELESS LAN PC CARD

7.3. Specification Limits (§15.247(d))

The peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band.

7.4. Operating Condition of EUT

The software (ZD Config) was used to enable the EUT to transmit and receive data at different channel frequency individually.

7.5. Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz.

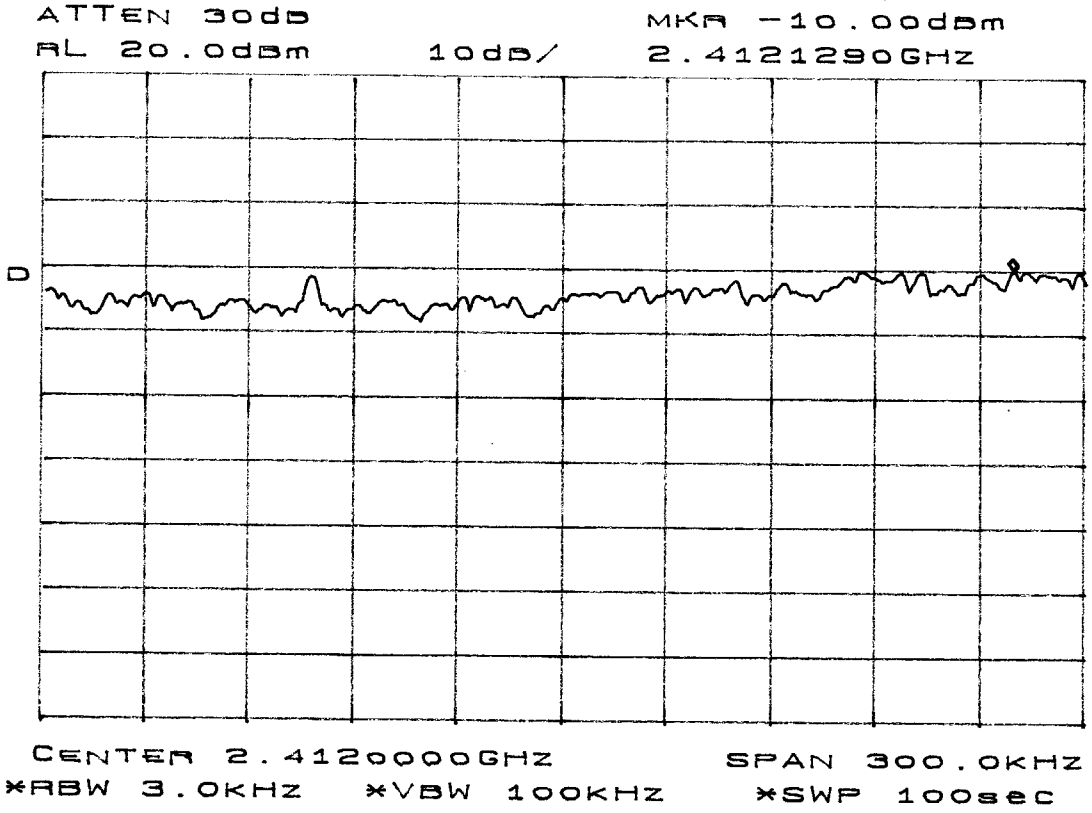
7.6. Test Results

PASSED. The testing data was attached in the next pages.

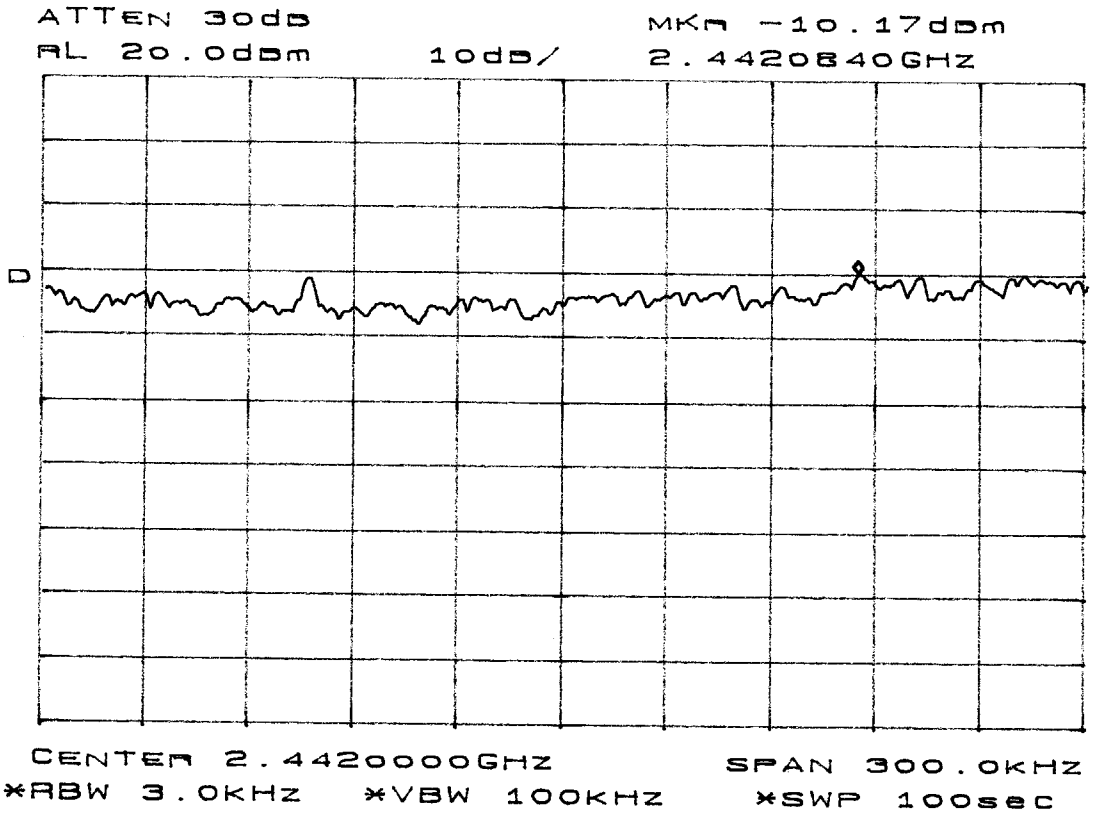
(Test Date : Oct. 30, 2003 Temperature : 23℃ Humidity : 64 %)

Channel	Frequency	**Power Spectral Density**	Limit
1	2412MHz	**-10.00dBm**	8dBm
7	2442MHz	**-10.17dBm**	8dBm
11	2462MHz	**-11.00dBm**	8dBm

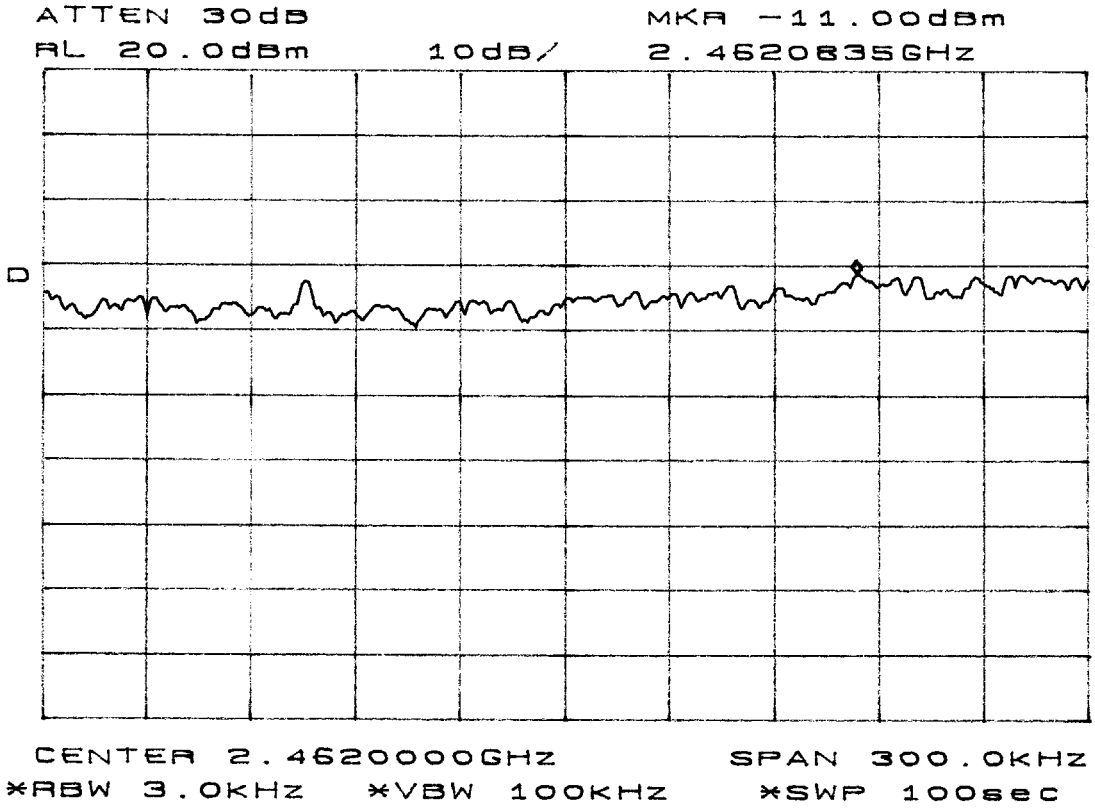
Channel : 1



Channel : 7



Channel : 11


ATTEN 30dB
MKR -11.00dBm
RL 20.0dBm
10dB/
2.4620835GHz
D
CENTER 2.4620000GHz
SPAN 300.0KHz
*RBW 3.0KHz
*VBW 100KHz
*SWP 100sec

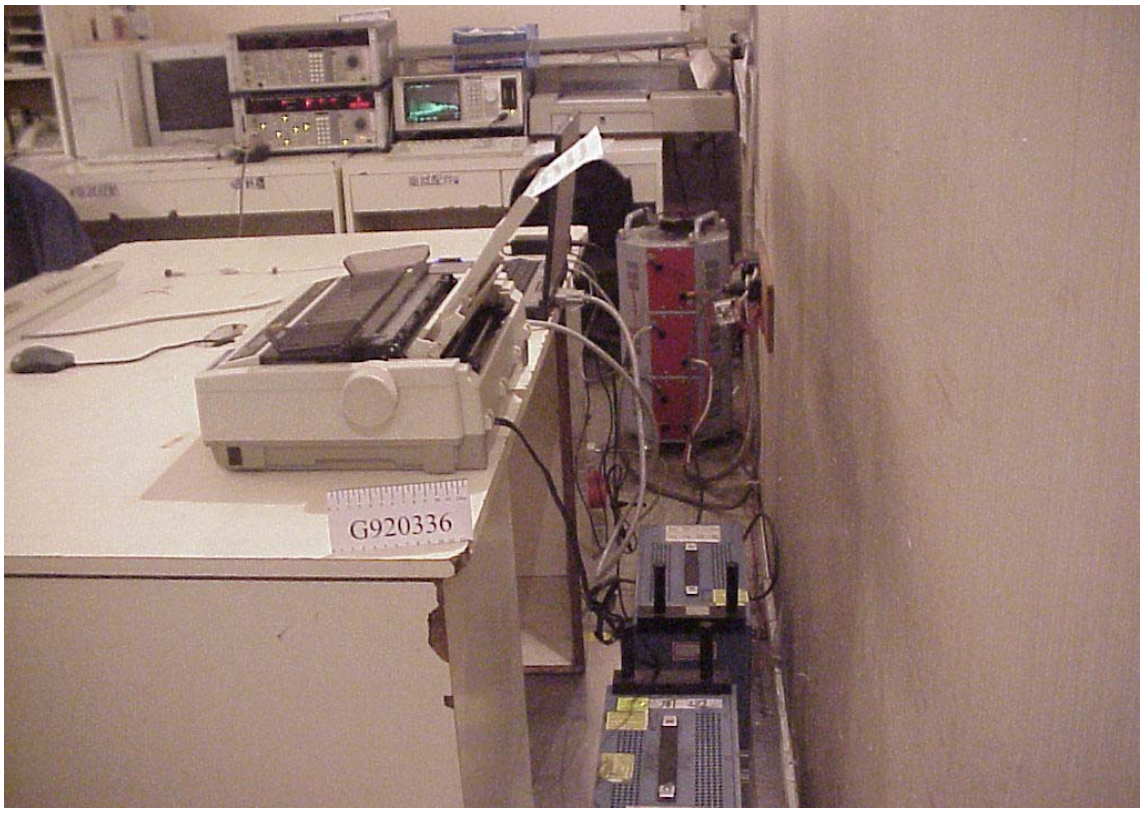
8. DEVIATION TO TEST SPECIFICATIONS

【NONE】

9. PHOTOGRAPHS

9.1.Photos of Conducted Emission Measurement

FRONT VIEW OF CONDUCTED TEST

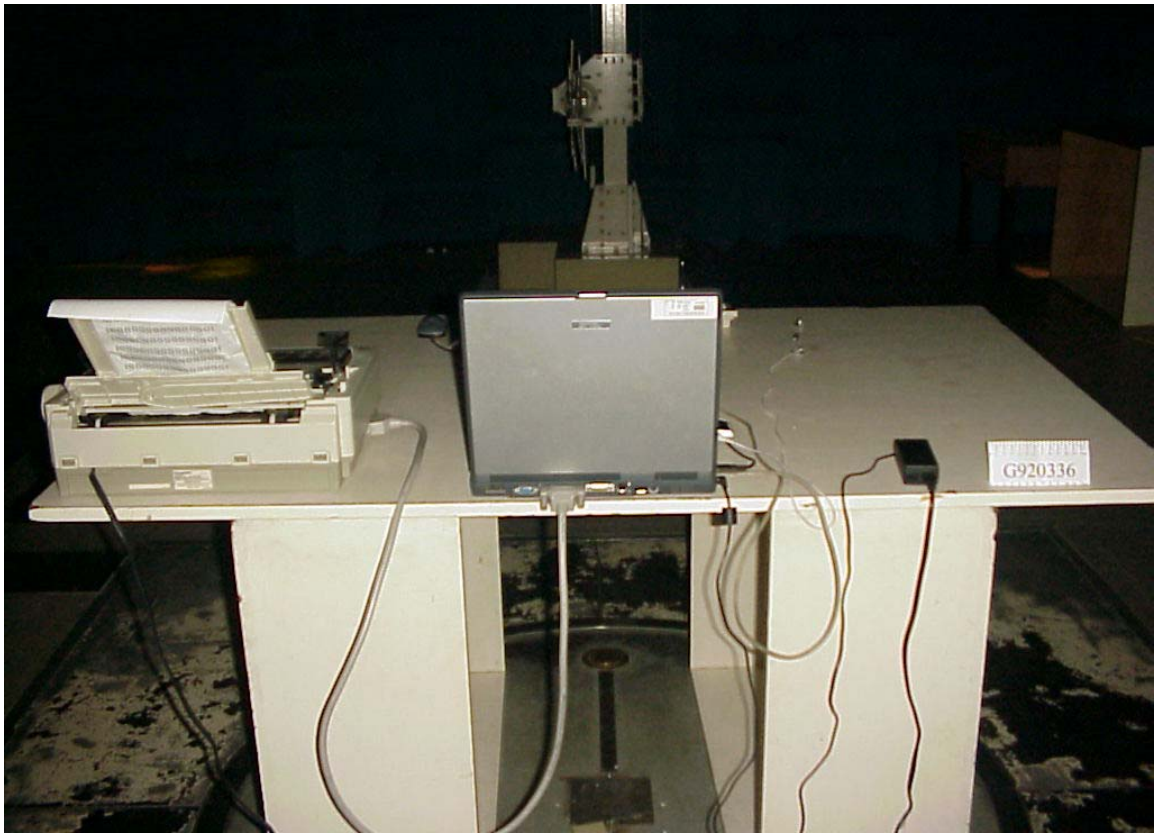


BACK VIEW OF CONDUCTED TEST

9.2.Photos of Radiated Measurement at Semi-Anechoic Chamber

9.2.1.30MHz to 1GHz frequency

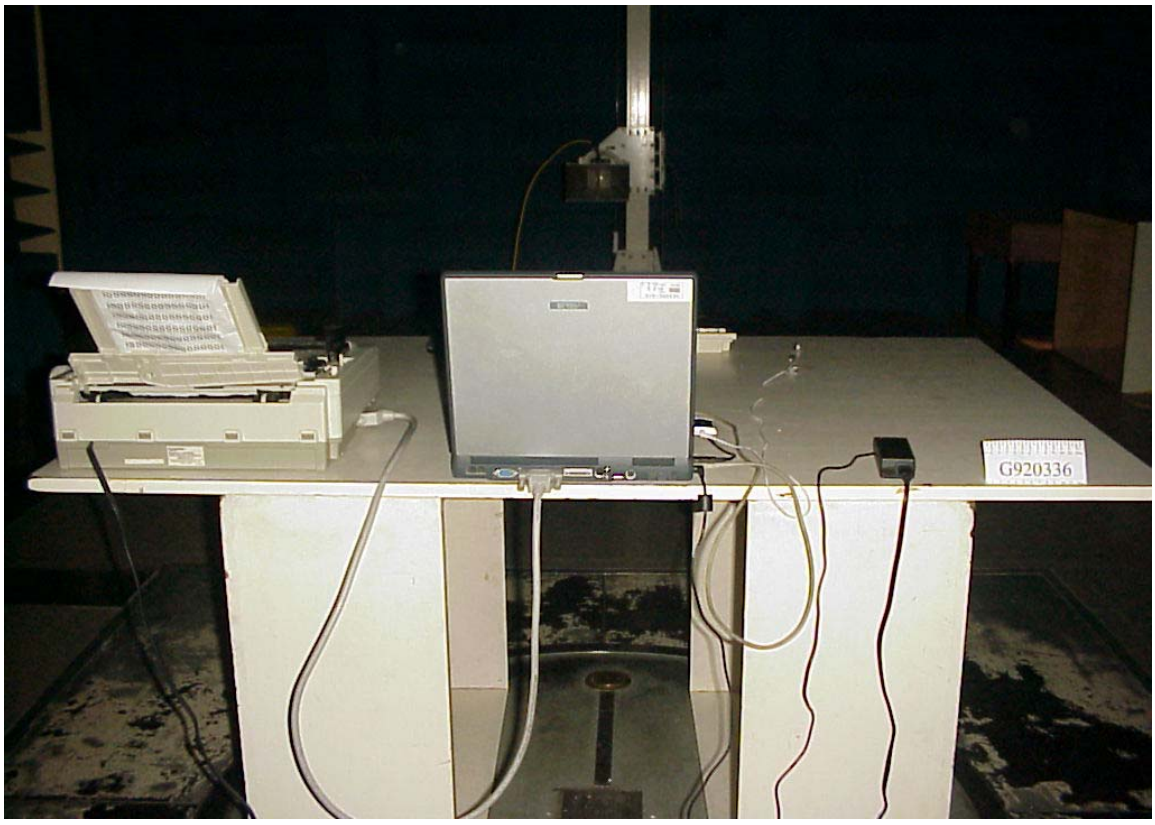
FRONT VIEW OF RADIATED TEST



BACK VIEW OF RADIATED TEST

9.2.2.Above 1GHz frequency

FRONT VIEW OF RADIATED TEST



BACK VIEW OF RADIATED TEST

9.3.Photos of Measurement for Section 4, 6 ~ 7