11. UNDESIRABLE EMISSION - RADIATED MEASUREMENT

11.1 Standard Applicable

(1) For transmitters operating in the 5.15-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27dBm / MHz.

(2) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

(3) The provisions of §15.205 apply to intentional radiators operating under this section.

§15.205- RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	([2])
13.36 - 13.41	322 - 335.4		

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.209- RADIATED EMISSION LIMITS: GENERAL REQUIREMENTS

FCC PART 15.209

MEASURING DISTANCE OF 3 METER		
FREQUENCY RANGE (MHz)	**FIELD STRENGTH (Microvolts/m)**	**FIELD STRENGTH (dBuV/m)**
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

11.2 EUT Setup

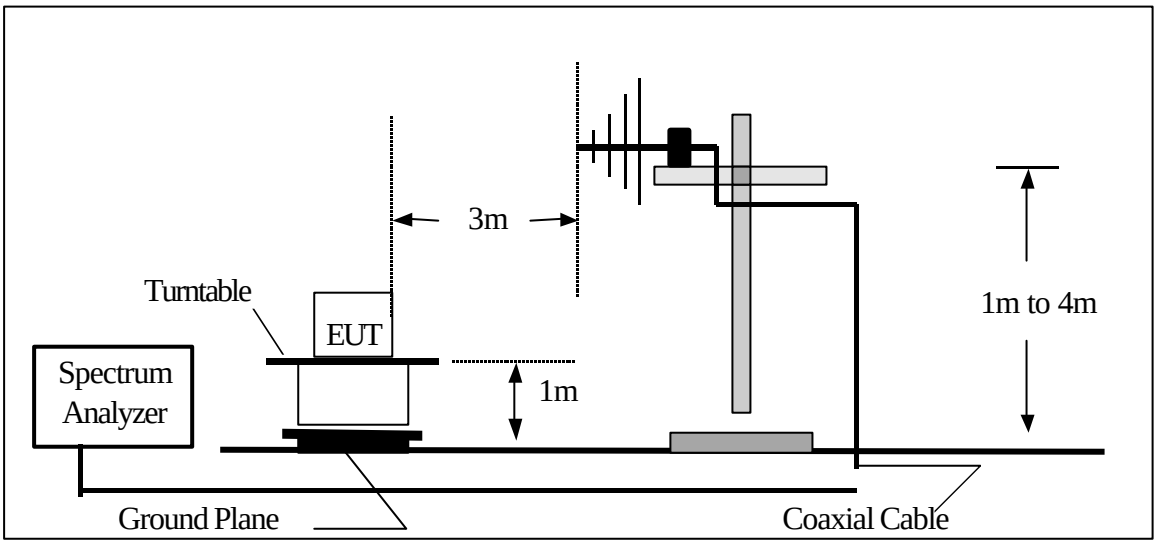
1. The radiated emission tests were performed in the 3 meter open-test site, using the setup in accordance with the ANSI C63.4-2000.
2. The EUT was plug-in the host Notebook via PCMCIA port. The host Notebook system was placed on the center of the back edge on the test table. The peripherals like printer, K/B, and mouse were placed on the side of the host Notebook system. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The keyboard was placed directly in the front of the Notebook, flushed with the front tabletop. The mouse was placed next to the Keyboard, flushed with the back of keyboard.
4. The spacing between the peripherals was 10 centimeters.
5. External I/O cables were draped along the edge of the test table and bundle when necessary.
6. The host Notebook system was connected with 110Vac/60Hz power source.

11.3 Measurement Procedure

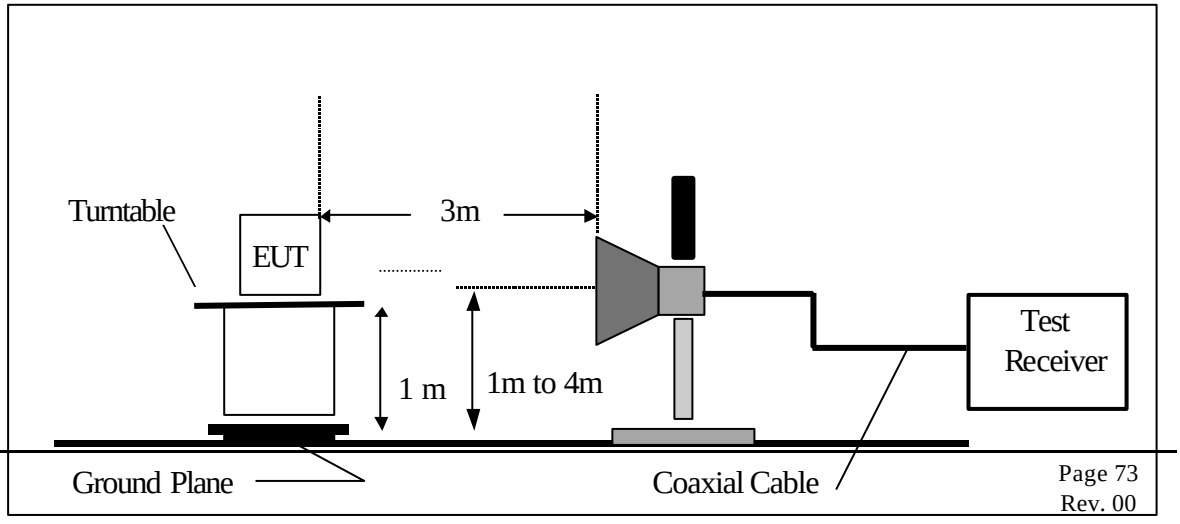
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until all frequency measured were complete.

11.4 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



11.5 Measurement Equipment Used:

Open Area Test Site # 3					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	ADVANTEST	R3261A	N/A	03/18/2003	03/17/2004
Spectrum Analyzer	Advantest	R3182	110600647	11/16/2002	11/15/2003
Spectrum Analyzer	ROHDE & SCHWARZ	FSP30	100112	06/29/2002	06/28/2003
EMI Test Receiver	R&S	ESVS20	838804/004	01/04/2003	01/03/2004
Pre-Amplifier	HP	8447D	2944A09173	03/03/2003	03/02/2004
Bi-log Antenna	SCHWAZBECK	VULB9163	145	07/06/2002	07/05/2003
Turn Table	EMCO	2081-1.21	9709-1885	N.C.R	N.C.R
Antenna Tower	EMCO	2075-2	9707-2060	N.C.R	N.C.R
Controller	EMCO	2090	9709-1256	N.C.R	N.C.R
RF Switch	ANRITSU	MP59B	M53867	N.C.R	N.C.R
Site NSA	C&C	N/A	N/A	11/17/2002	11/16/2003
Horn antenna	Schwarzbeck	BBHA 9120	D210	2/23/2003	2/22/2004
Horn antenna	EMCO	3116	2487	11/11/2002	11/10/2003
Pre-Amplifier	HP	8449B	3008B00965	10/01/2002	10/02/2003

Factor Calculation

The Factor is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

F=AF + CL - AG

Where F = Factor	CL = Cable Attenuation Factor (Cable Loss)
AF = Antenna Factor	AG = Amplifier Gain

11.6 Measurement Result

Refer to attach tabular data sheets.

NOTE:

The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 100kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode:	TX Mode	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	Robin
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	IBM		

Frequency (MHz)	Ant. Pol. (H/V)	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV)	Limit(3m) (dBuV/m)	Margin (dB)
133.0500	V	PK	42.84	-18.21	24.63	43.5	-18.87
220.8000	V	PK	52.00	-14.9	37.10	46.0	-8.90
232.9500	V	PK	51.50	-14.67	36.83	46.0	-9.17
266.2500	V	PK	47.00	-13.27	33.73	46.0	-12.27
399.1667	V	PK	43.00	-9.97	33.03	46.0	-9.97
531.0000	V	PK	37.00	-7.93	29.07	46.0	-7.93
665.1667	V	PK	37.50	-6.17	31.33	46.0	-6.17
928.8333	V	PK	39.67	-3.33	36.34	46.0	-3.33
133.0500	H	PK	41.50	-18.21	23.29	43.5	-20.21
221.2500	H	PK	49.00	-14.89	34.11	46.0	-11.89
227.1000	H	PK	49.17	-14.82	34.35	46.0	-11.65
265.8000	H	PK	46.84	-13.27	33.57	46.0	-12.43
336.1667	H	PK	40.67	-11.58	29.09	46.0	-16.91
399.1667	H	PK	40.67	-9.97	30.70	46.0	-15.30
431.8333	H	PK	39.00	-10.07	28.93	46.0	-17.07
640.6667	H	PK	35.00	-6.47	28.53	46.0	-17.47
930.0000	H	PK	34.84	-3.31	31.53	46.0	-14.47

Remark：

(1) Measuring frequencies from 30 MHz to the 1GHz。

(2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.

(3) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

(5) Emission level = Reading value + Factor

Operation Mode:	TX Mode	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	TOSHIBA		

Frequency (MHz)	Ant. Pol. (H/V)	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV)	Limit(3m) (dBuV/m)	Margin (dB)
32.2500	V	PK	24.50	-1.01	23.50	40.0	-16.50
133.5000	V	PK	37.67	-18.24	19.43	43.5	-24.07
203.7000	V	PK	40.00	-15.42	24.58	43.5	-18.92
217.2000	V	PK	42.17	-14.98	27.19	46.0	-18.81
300.0000	V	PK	42.50	-12.42	30.08	46.0	-15.92
336.1667	V	PK	43.67	-11.58	32.09	46.0	-13.91
366.5000	V	PK	47.17	-10.98	36.28	46.0	-9.72
528.6667	V	PK	36.17	-7.97	28.20	46.0	-17.80
665.1667	V	PK	37.67	-6.17	31.50	46.0	-14.50
788.8333	V	PK	37.00	-4.72	32.28	46.0	-13.72
32.2500	H	PK	25.34	-1.01	24.34	40.0	-15.66
86.2500	H	PK	35.84	-18.90	16.94	40.0	-23.06
114.6000	H	PK	38.67	-18.85	19.82	43.5	-23.68
133.0500	H	PK	45.34	-18.21	27.13	43.5	-16.37
135.7500	H	PK	46.50	-18.37	28.13	43.5	-15.37
232.9500	H	PK	40.67	-14.67	26.00	46.0	-20.00
292.3500	H	PK	41.67	-12.80	28.87	46.0	-17.13
366.5000	H	PK	51.00	-10.89	40.11	46.0	-5.89
399.1667	H	PK	41.17	-9.97	31.20	46.0	-14.80
528.6667	H	PK	38.17	-7.97	30.20	46.0	-15.80
596.3333	H	PK	39.50	-7.10	32.40	46.0	-13.60
788.8333	H	PK	36.17	-4.72	31.45	46.0	-14.55

Remark：

(1) Measuring frequencies from 30 MHz to the 1GHz。

(2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.

(3) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

(5) Emission level = Reading value + Factor

Operation Mode:	TX Mode	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	BENQ		

Frequency (MHz)	Ant. Pol. (H/V)	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV)	Limit(3m) (dBuV/m)	Margin (dB)
32.7000	V	PK	24.34	-1.18	23.16	40.0	-16.84
99.3000	V	PK	41.50	-18.26	23.24	43.5	-20.26
210.9000	V	PK	40.84	-15.15	25.69	43.5	-17.81
233.4000	V	PK	41.34	-14.65	26.69	46.0	-19.31
400.3333	V	PK	44.34	-9.95	34.39	46.0	-11.61
434.1667	V	PK	45.17	-9.97	35.20	46.0	-10.80
500.6667	V	PK	40.50	-8.19	32.31	46.0	-13.69
556.6667	V	PK	45.34	-7.66	37.68	46.0	-8.32
667.5000	V	PK	45.00	-6.16	38.84	46.0	-7.16
933.5000	V	PK	40.00	-3.23	36.77	46.0	-9.23
33.1500	H	PK	24.50	-1.35	23.15	40.0	-16.85
211.3500	H	PK	44.50	-15.13	29.37	43.5	-14.13
233.4000	H	PK	43.17	-14.65	28.52	46.0	-17.48
264.0000	H	PK	42.17	-13.27	28.90	46.0	-17.10
434.1667	H	PK	41.17	-9.97	31.20	46.0	-14.80
466.8333	H	PK	41.84	-8.80	33.04	46.0	-12.96
500.6667	H	PK	48.50	-8.19	40.31	46.0	-5.69
552.0000	H	PK	40.34	-7.64	32.70	46.0	-13.30
667.5000	H	PK	38.67	-6.16	32.51	46.0	-13.49
734.0000	H	PK	38.67	-5.29	33.38	46.0	-12.62
933.5000	H	PK	36.84	-3.23	33.61	46.0	-12.39

Remark：

(1) Measuring frequencies from 30 MHz to the 1GHz。

(2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.

(3) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(4) The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz.

(5) Emission level = Reading value + Factor

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX Low Mode	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	IBM		

Frequency (MHz)	Cable loss (dB)	Ant. Fact. (dB/m)	Pre-amp. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dBuV/m)	
					PK	AV	PK	AV	PK	AV	PK	AV
5148.20	1.34	37.16	31.86	V	53.3	42.9	49.3	38.9	74.0	54.0	-24.7	-15.1
10366.00	1.92	37.24	39.68	V	49.0	37.0	53.3	41.4	88.2	68.2	-34.9	-26.8
15540.00	2.23	37.71	38.00	V	52.3	40.6	54.8	43.2	74.0	54.0	-19.2	-10.8
5148.00	1.34	37.16	31.86	H	51.0	40.9	47.0	36.9	74.0	54.0	-27.0	-17.1
10357.80	1.91	37.25	39.66	H	50.7	38.8	55.1	43.1	88.2	68.2	-33.1	-25.1
15538.80	2.23	37.70	38.03	H	50.4	38.7	53.0	41.2	74.0	54.0	-21.0	-12.8

Remark：

(1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Emission.

(4) Spectrum Peak Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

(5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX Mid Mode	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	IBM		

Frequency (MHz)	Cable loss (dB)	Ant. Fact (dB/m)	Pre-amp. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dBuV/m)	
					PK	AV	PK	AV	PK	AV	PK	AV
10477.80	1.98	37.12	39.85	V	48.6	38.2	53.3	42.9	88.2	68.2	-34.9	-25.3
15721.60	2.20	37.84	37.57	V	50.7	39.8	52.7	41.7	74.0	54.0	-21.3	-12.3
10479.40	1.98	37.12	39.85	H	47.7	37.2	52.4	41.9	88.2	68.2	-35.8	-26.3
15720.00	2.20	37.84	37.57	H	49.4	37.7	51.3	39.6	74.0	54.0	-22.7	-14.4

Remark：

(1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Emission.

(4) Spectrum Peak Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

(5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX Mid (5260MHz)Mode	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	IBM		

Frequency (MHz)	Cable loss (dB)	Ant. Fact (dB/m)	Pre-amp. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dBuV/m)	
					PK	AV	PK	AV	PK	AV	PK	AV
10521.80	2.00	37.07	39.93	V	52.3	39.9	57.1	44.8	88.2	68.2	-31.1	-23.4
15777.00	2.20	37.87	37.45	V	57.3	45.6	59.1	47.4	74.0	54.0	-14.9	-6.6
10518.00	2.00	37.08	39.91	H	49.1	37.7	53.9	42.5	88.2	68.2	-34.3	-25.7
15787.80	2.20	37.88	37.43	H	52.6	40.9	54.4	42.6	74.0	54.0	-19.6	-11.4

Remark：

(1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Emission.

(4) Spectrum Peak Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

(5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX High Mode	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	IBM		

Frequency (MHz)	Cable loss (dB)	Ant. Fact (dB/m)	Pre-amp. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dBuV/m)	
					PK	AV	PK	AV	PK	AV	PK	AV
5352.00	1.45	37.18	31.94	V	64.5	50.0	60.7	46.2	74.0	54.0	-13.3	-7.8
10640.60	2.00	36.94	40.10	V	51.1	40.1	56.3	45.3	74.0	54.0	-17.7	-8.7
15961.80	2.17	38.01	37.00	V	55.2	43.3	56.3	44.4	74.0	54.0	-17.7	-9.6
5352.20	1.45	37.18	31.94	H	60.3	47.1	56.5	43.3	74.0	54.0	-17.5	-10.7
10637.40	2.00	36.95	40.08	H	47.9	37.6	53.0	42.7	74.0	54.0	-21.0	-11.3
15958.80	2.18	38.00	37.02	H	53.7	42.1	54.9	43.3	74.0	54.0	-19.1	-10.7

Remark：

(1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Emission.

(4) Spectrum Peak Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

(5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX Low Mode(Turbo Mode)	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	IBM		

Frequency (MHz)	Cable loss (dB)	Ant. Fact (dB/m)	Pre-amp. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dBuV/m)	
					PK	AV	PK	AV	PK	AV	PK	AV
5150.00	1.34	37.16	31.86	V	51.8	38.3	47.9	34.3	74.0	54.0	-26.1	-19.7
10417.20	1.95	37.19	39.76	V	48.4	37.8	52.9	42.3	88.2	68.2	-35.3	-25.9
15630.40	2.21	37.77	37.79	V	50.7	39.8	53.0	42.0	74.0	54.0	-21.0	-12.0
5150.00	1.34	37.16	31.86	H	51.5	38.2	47.6	34.3	74.0	54.0	-26.4	-19.7
10421.20	1.95	37.17	39.77	H	47.2	36.7	51.7	41.2	88.2	68.2	-36.5	-27.0
15626.80	2.22	37.77	37.81	H	50.0	38.3	52.3	40.5	74.0	54.0	-21.7	-13.5

Remark：

(1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Emission.

(4) Spectrum Peak Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

(5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX Mid Mode(Turbo Mode)	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	IBM		

Frequency (MHz)	Cable loss (dB)	Ant. Fact (dB/m)	Pre-amp. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dBuV/m)	
					PK	AV	PK	AV	PK	AV	PK	AV
10511.20	2.00	37.08	39.91	V	46.3	36.0	51.2	40.9	88.2	68.2	-37.0	-27.3
15744.40	2.20	37.85	37.52	V	50.2	39.2	52.1	41.1	74.0	54.0	-21.9	-12.9
10498.00	1.99	37.10	39.88	H	48.1	35.5	52.9	40.3	88.2	68.2	-35.3	-27.9
15756.80	2.20	37.86	37.50	H	48.1	37.7	50.0	39.6	74.0	54.0	-24.0	-14.4

Remark：

(1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Emission.

(4) Spectrum Peak Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

(5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX High Mode(Turbo Mode)	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	IBM		

Frequency (MHz)	Cable loss (dB)	Ant. Fact (dB/m)	Pre-amp. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dBuV/m)	
					PK	AV	PK	AV	PK	AV	PK	AV
5350.00	1.45	37.18	31.94	V	59.8	46.6	56.0	42.8	74.0	54.0	-18.0	-11.2
10564.00	2.00	37.03	39.98	V	49.4	37.7	54.3	42.6	88.2	68.2	-33.9	-25.6
15870.00	2.19	37.95	37.21	V	53.0	42.2	54.4	43.7	74.0	54.0	-19.6	-10.3
5350.00	1.45	37.18	31.94	H	58.6	44.7	54.8	40.9	74.0	54.0	-19.2	-13.1
10577.60	2.00	37.02	40.00	H	47.6	36.9	52.6	41.9	88.2	68.2	-35.6	-26.3
15877.60	2.19	37.95	37.21	H	51.6	40.1	53.0	41.6	74.0	54.0	-21.0	-12.4

Remark：

(1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Emission.

(4) Spectrum Peak Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

(5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX Low Mode	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	TOSHIBA		

Frequency (MHz)	Cable loss (dB)	Ant. Fact (dB/m)	Pre-amp. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dBuV/m)	
					PK	AV	PK	AV	PK	AV	PK	AV
5148.00	1.34	37.16	31.86	V	54.9	42.6	50.9	38.6	74.0	54.0	-23.1	-15.4
5152.60	1.34	37.16	31.86	V	55.1	43.2	51.2	39.3	74.0	54.0	-22.8	-14.7
5212.80	1.37	37.17	31.88	V	55.3	42.5	51.3	38.6	74.0	54.0	-22.7	-15.4
5216.20	1.37	37.17	31.88	V	52.7	41.7	48.8	37.8	74.0	54.0	-25.2	-16.2
10360.00	1.92	37.24	39.68	V	49.3	37.4	53.7	41.8	88.2	68.2	-34.5	-26.4
15540.40	2.23	37.71	38.00	V	52.6	40.5	55.1	43.1	74.0	54.0	-18.9	-10.9
5148.00	1.34	37.16	31.86	H	51.9	38.9	47.9	34.9	74.0	54.0	-26.1	-19.1
5211.60	1.37	37.17	31.88	H	51.4	37.9	47.4	34.0	74.0	54.0	-26.6	-20.0
10358.00	1.91	37.25	39.66	H	46.7	35.5	51.1	39.8	88.2	68.2	-37.1	-28.4
15542.00	2.23	37.71	38.00	H	49.7	38.0	52.3	40.5	74.0	54.0	-21.7	-13.5

Remark：

(1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Emission.

(4) Spectrum Peak Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

(5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX Mid Mode	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	TOSHIBA		

Frequency (MHz)	Cable loss (dB)	Ant. Fact (dB/m)	Pre-amp. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dBuV/m)	
					PK	AV	PK	AV	PK	AV	PK	AV
5207.20	1.37	37.16	31.88	V	57.0	42.1	53.0	38.2	74.0	54.0	-21.0	-15.8
5272.00	1.41	37.17	31.91	V	56.7	42.8	52.8	39.0	74.0	54.0	-21.2	-15.0
5280.20	1.41	37.17	31.91	V	51.2	41.3	47.4	37.5	74.0	54.0	-26.6	-16.5
10480.40	1.99	37.11	39.87	V	48.8	37.3	53.5	42.1	88.2	68.2	-34.7	-26.1
15718.00	2.20	37.83	37.60	V	50.1	38.8	52.1	40.8	74.0	54.0	-21.9	-13.2
15725.40	2.20	37.84	37.57	V	50.1	38.7	52.0	40.6	74.0	54.0	-22.0	-13.4
5207.60	1.37	37.16	31.88	H	53.0	36.7	49.1	32.8	74.0	54.0	-24.9	-21.2
5271.80	1.41	37.17	31.91	H	53.1	38.0	49.3	34.1	74.0	54.0	-24.7	-19.9
10480.60	1.99	37.11	39.87	H	47.2	36.2	51.9	40.9	88.2	68.2	-36.3	-27.3
15726.20	2.20	37.84	37.57	H	49.2	37.6	51.1	39.6	74.0	54.0	-22.9	-14.4

Remark：

(1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Emission.

(4) Spectrum Peak Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms. Spectrum AV Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

(5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX Mid Mode	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	TOSHIBA		

Frequency (MHz)	Cable loss (dB)	Ant. Fact (dB/m)	Pre-amp. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dBuV/m)	
					PK	AV	PK	AV	PK	AV	PK	AV
5227.20	1.38	37.17	31.89	V	68.9	50.9	65.0	47.0	74.0	54.0	-9.0	-7.0
5292.20	1.42	37.17	31.92	V	63.7	49.9	59.9	46.0	74.0	54.0	-14.1	-8.0
10518.60	2.00	37.08	39.91	V	50.1	38.7	54.9	43.5	88.2	68.2	-33.3	-24.7
15788.00	2.20	37.88	37.43	V	56.6	43.5	58.4	45.2	74.0	54.0	-15.6	-8.8
5228.40	1.38	37.17	31.89	H	64.9	45.0	61.0	41.1	74.0	54.0	-13.0	-12.9
5292.00	1.42	37.17	31.92	H	62.3	45.0	58.5	41.2	74.0	54.0	-15.5	-12.8
10520.40	2.00	37.07	39.93	H	47.8	36.6	52.7	41.4	88.2	68.2	-35.5	-26.8
15780.80	2.20	37.88	37.43	H	53.3	42.0	55.0	43.8	74.0	54.0	-19.0	-10.2

Remark：

(1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Emission.

(4) Spectrum Peak Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

(5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX High Mode	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	TOSHIBA		

Frequency (MHz)	Cable loss (dB)	Ant. Fact (dB/m)	Pre-amp. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dBuV/m)	
					PK	AV	PK	AV	PK	AV	PK	AV
5286.40	1.41	37.17	31.91	V	63.2	48.3	59.4	44.5	74.0	54.0	-14.6	-9.5
5351.40	1.45	37.18	31.94	V	66.4	49.6	62.6	45.8	74.0	54.0	-11.4	-8.2
10641.40	2.00	36.94	40.10	V	49.1	37.8	54.2	43.0	74.0	54.0	-19.8	-11.0
15965.20	2.17	38.01	37.00	V	56.8	44.3	57.9	45.4	74.0	54.0	-16.1	-8.6
5288.00	1.41	37.17	31.91	H	60.9	44.5	57.1	40.7	74.0	54.0	-16.9	-13.3
5352.80	1.45	37.18	31.94	H	60.1	43.9	56.3	40.1	74.0	54.0	-17.7	-13.9
10641.20	2.00	36.94	40.10	H	45.8	35.0	51.0	40.1	74.0	54.0	-23.0	-13.9
15960.80	2.17	38.01	37.00	H	53.3	41.8	54.5	42.9	74.0	54.0	-19.5	-11.1

Remark：

(1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Emission.

(4) Spectrum Peak Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

(5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX Low Mode(Turbo Mode)	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	TOSHIBA		

Frequency (MHz)	Cable loss (dB)	Ant. Fact (dB/m)	Pre-amp. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dBuV/m)	
					PK	AV	PK	AV	PK	AV	PK	AV
5150.00	1.34	37.16	31.86	V	55.2	41.1	51.3	37.1	74.0	54.0	-22.7	-16.9
10417.30	1.95	37.19	39.76	V	46.4	36.7	50.9	41.2	88.2	68.2	-37.3	-27.0
15630.90	2.21	37.77	37.79	V	48.3	38.5	50.5	40.7	74.0	54.0	-23.5	-13.3
5150.00	1.34	37.16	31.86	H	49.3	37.0	45.3	33.1	74.0	54.0	-28.7	-20.9
10422.70	1.95	37.17	39.77	H	47.4	35.8	51.9	40.3	88.2	68.2	-36.3	-27.9
15630.90	2.21	37.77	37.79	H	48.3	36.8	50.6	39.1	74.0	54.0	-23.4	-14.9

Remark：

(1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Emission.

(4) Spectrum Peak Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

(5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX Mid Mode(Turbo Mode)	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	TOSHIBA		

Frequency (MHz)	Cable loss (dB)	Ant. Fact (dB/m)	Pre-amp. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dBuV/m)	
					PK	AV	PK	AV	PK	AV	PK	AV
10503.00	2.00	37.09	39.90	V	46.8	36.6	51.6	41.4	88.2	68.2	-36.6	-26.8
15749.70	2.20	37.85	37.52	V	48.5	38.0	50.3	39.9	74.0	54.0	-23.7	-14.1
10500.60	2.00	37.09	39.90	H	44.5	34.1	49.3	38.9	74.0	54.0	-24.7	-15.1
15749.70	2.20	37.85	37.52	H	47.9	37.0	49.8	38.9	74.0	54.0	-24.2	-15.1

Remark：

(1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Emission.

(4) Spectrum Peak Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

(5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX High Mode(Turbo Mode)	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	TOSHIBA		

Frequency (MHz)	Cable loss (dB)	Ant. Fact (dB/m)	Pre-amp. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dBuV/m)	
					PK	AV	PK	AV	PK	AV	PK	AV
5350.00	1.45	37.18	31.94	V	63.5	46.9	59.7	43.1	74.0	54.0	-14.3	-10.9
10577.90	2.00	37.02	40.00	V	47.3	36.3	52.3	41.2	88.2	68.2	-35.9	-27.0
15873.60	2.19	37.95	37.21	V	53.2	42.0	54.6	43.5	74.0	54.0	-19.4	-10.5
5230.90	1.38	37.17	31.89	H	61.7	43.0	57.8	39.1	74.0	54.0	-16.2	-14.9
5350.00	1.45	37.18	31.94	H	55.7	40.4	51.9	36.6	74.0	54.0	-22.1	-17.4
10569.50	2.00	37.03	39.98	H	46.5	35.1	51.5	40.0	88.2	68.2	-36.7	-28.2
15869.70	2.19	37.94	37.24	H	50.7	40.1	52.2	41.6	74.0	54.0	-21.8	-12.4

Remark：

(1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Emission.

(4) Spectrum Peak Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

(5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX Low Mode	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	BENQ		

Frequency (MHz)	Cable loss (dB)	Ant. Fact (dB/m)	Pre-amp. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dBuV/m)	
					PK	AV	PK	AV	PK	AV	PK	AV
5148.20	1.34	37.16	31.86	V	54.5	42.2	50.5	38.2	74.0	54.0	-23.5	-15.8
5152.10	1.34	37.16	31.86	V	55.0	43.0	51.0	39.0	74.0	54.0	-23.0	-15.0
5212.30	1.37	37.17	31.88	V	55.0	42.1	51.1	38.2	74.0	54.0	-22.9	-15.8
5216.00	1.37	37.17	31.88	V	52.3	41.2	48.4	37.3	74.0	54.0	-25.6	-16.7
10360.10	1.92	37.24	39.68	V	49.1	37.1	53.5	41.5	88.2	68.2	-34.7	-26.7
15540.20	2.23	37.71	38.00	V	52.2	40.2	54.7	42.7	74.0	54.0	-19.3	-11.3
5148.10	1.34	37.16	31.86	H	51.3	38.3	47.3	34.3	74.0	54.0	-26.7	-19.7
5211.10	1.37	37.17	31.88	H	51.0	37.3	47.1	33.4	74.0	54.0	-26.9	-20.6
10357.90	1.91	37.25	39.66	H	46.3	35.2	50.6	39.5	88.2	68.2	-37.6	-28.7
15542.10	2.23	37.71	38.00	H	49.3	38.1	51.8	40.6	74.0	54.0	-22.2	-13.4

Remark：

(1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Emission.

(4) Spectrum Peak Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

(5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX Mid Mode	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	BENQ		

Frequency (MHz)	Cable loss (dB)	Ant. Fact (dB/m)	Pre-amp. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dBuV/m)	
					PK	AV	PK	AV	PK	AV	PK	AV
5207.00	1.37	37.16	31.88	V	56.7	42.1	52.8	38.2	74.0	54.0	-21.2	-15.8
5272.10	1.41	37.17	31.91	V	56.2	42.1	52.3	38.2	74.0	54.0	-21.7	-15.8
5280.10	1.41	37.17	31.91	V	51.1	41.1	47.2	37.2	74.0	54.0	-26.8	-16.8
10477.30	1.98	37.12	39.85	V	49.1	37.1	53.8	41.8	88.2	68.2	-34.4	-26.4
10480.10	1.99	37.11	39.87	V	48.3	37.0	53.0	41.7	74.0	54.0	-21.0	-12.3
15718.10	2.20	37.83	37.60	V	50.0	38.3	52.0	40.3	74.0	54.0	-22.0	-13.7
5207.60	1.37	37.16	31.88	H	53.2	36.2	49.3	32.3	74.0	54.0	-24.7	-21.7
5271.90	1.41	37.17	31.91	H	53.0	37.8	49.1	33.9	74.0	54.0	-24.9	-20.1
10480.20	1.99	37.11	39.87	H	47.0	36.0	51.7	40.7	88.2	68.2	-36.5	-27.5
15726.10	2.20	37.84	37.57	H	49.1	37.5	51.0	39.4	74.0	54.0	-23.0	-14.6

Remark：

(1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Emission.

(4) Spectrum Peak Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms. Spectrum AV Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

(5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX Mid Mode	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	BENQ		

Frequency (MHz)	Cable loss (dB)	Ant. Fact (dB/m)	Pre-amp. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dBuV/m)	
					PK	AV	PK	AV	PK	AV	PK	AV
5227.00	1.38	37.17	31.89	V	68.6	50.6	64.7	46.7	74.0	54.0	-9.3	-7.3
5292.10	1.42	37.17	31.92	V	63.4	49.5	59.6	45.7	74.0	54.0	-14.4	-8.3
10518.20	2.00	37.08	39.91	V	50.0	38.1	54.8	42.9	88.2	68.2	-33.4	-25.3
15788.10	2.20	37.88	37.43	V	56.2	43.1	57.9	44.8	74.0	54.0	-16.1	-9.2
5228.40	1.38	37.17	31.89	H	64.9	45.0	61.0	41.1	74.0	54.0	-13.0	-12.9
5292.10	1.42	37.17	31.92	H	62.1	45.0	58.3	41.2	74.0	54.0	-15.7	-12.8
10520.40	2.00	37.07	39.93	H	47.8	36.6	52.7	41.4	88.2	68.2	-35.5	-26.8
15780.80	2.20	37.88	37.43	H	53.3	42.0	55.0	43.8	74.0	54.0	-19.0	-10.2

Remark：

(1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Emission.

(4) Spectrum Peak Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

(5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX High Mode	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	BENQ		

Frequency (MHz)	Cable loss (dB)	Ant. Fact (dB/m)	Pre-amp. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dBuV/m)	
					PK	AV	PK	AV	PK	AV	PK	AV
5286.10	1.41	37.17	31.91	V	63.0	48.1	59.1	44.2	74.0	54.0	-14.9	-9.8
5351.10	1.45	37.18	31.94	V	66.1	49.3	62.3	45.5	74.0	54.0	-11.7	-8.5
10641.20	2.00	36.94	40.10	V	49.0	37.7	54.2	42.9	74.0	54.0	-19.8	-11.1
15965.10	2.17	38.01	37.00	V	56.5	44.1	57.7	45.3	74.0	54.0	-16.3	-8.7
5288.10	1.41	37.17	31.91	H	60.3	44.0	56.4	40.1	74.0	54.0	-17.6	-13.9
5352.70	1.45	37.18	31.94	H	60.0	43.8	56.2	40.0	74.0	54.0	-17.8	-14.0
10641.10	2.00	36.94	40.10	H	45.6	34.9	50.8	40.1	74.0	54.0	-23.2	-13.9
15960.70	2.17	38.01	37.00	H	53.1	41.6	54.3	42.8	74.0	54.0	-19.7	-11.2

Remark：

(1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Emission.

(4) Spectrum Peak Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

(5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX Low Mode(Turbo Mode)	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	BENQ		

Frequency (MHz)	Cable loss (dB)	Ant. Fact (dB/m)	Pre-amp. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dBuV/m)	
					PK	AV	PK	AV	PK	AV	PK	AV
5150.10	1.34	37.16	31.86	V	55.0	41.0	51.0	37.0	74.0	54.0	-23.0	-17.0
10417.10	1.95	37.19	39.76	V	46.2	36.5	50.7	41.0	88.2	68.2	-37.5	-27.2
15630.90	2.21	37.77	37.79	V	48.3	38.2	50.5	40.4	74.0	54.0	-23.5	-13.6
5150.10	1.34	37.16	31.86	H	49.1	36.8	45.1	32.8	74.0	54.0	-28.9	-21.2
10422.50	1.95	37.17	39.77	H	47.1	35.2	51.7	39.8	88.2	68.2	-36.5	-28.4
15630.70	2.21	37.77	37.79	H	48.1	36.4	50.3	38.6	74.0	54.0	-23.7	-15.4

Remark：

(1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Emission.

(4) Spectrum Peak Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

(5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX Mid Mode(Turbo Mode)	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	BENQ		

Frequency (MHz)	Cable loss (dB)	Ant. Fact (dB/m)	Pre-amp. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dBuV/m)	
					PK	AV	PK	AV	PK	AV	PK	AV
10502.90	2.00	37.09	39.90	V	46.3	36.3	51.1	41.1	88.2	68.2	-37.1	-27.1
15749.50	2.20	37.85	37.52	V	48.5	38.0	50.3	39.9	74.0	54.0	-23.7	-14.1
10500.20	2.00	37.09	39.90	H	44.3	34.0	49.1	38.8	74.0	54.0	-24.9	-15.2
15749.20	2.20	37.85	37.52	H	47.1	36.7	49.0	38.6	74.0	54.0	-25.0	-15.4

Remark：

(1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Emission.

(4) Spectrum Peak Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

(5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode:	TX High Mode(Turbo Mode)	Test Date :	Mar. 07 2003
Temperature :	23 ℃	Test By:	James
Humidity :	58 %	Pol:	Ver./Hor
Test Host:	BENQ		

Frequency (MHz)	Cable loss (dB)	Ant. Fact (dB/m)	Pre-amp. (dB)	Ant. Pol. (H/V)	Reading (dBuV)		Emission (dBuV/m)		Limit Line (dBuV/m)		Margin (dBuV/m)	
					PK	AV	PK	AV	PK	AV	PK	AV
5350.10	1.45	37.18	31.94	V	63.2	46.6	59.4	42.8	74.0	54.0	-14.6	-11.2
10577.80	2.00	37.02	40.00	V	47.2	36.1	52.2	41.1	88.2	68.2	-36.0	-27.1
15873.20	2.19	37.95	37.21	V	53.1	41.8	54.6	43.3	74.0	54.0	-19.4	-10.7
5230.70	1.38	37.17	31.89	H	61.7	43.0	57.8	39.1	74.0	54.0	-16.2	-14.9
5350.10	1.45	37.18	31.94	H	55.7	40.4	51.9	36.6	74.0	54.0	-22.1	-17.4
10569.20	2.00	37.03	39.98	H	46.5	35.1	51.5	40.0	88.2	68.2	-36.7	-28.2

Remark：

(1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

(2) Datas of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(3) Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Emission.

(4) Spectrum Peak Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 40GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

(5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

12. TRANSMISSION IN THE ABSENCE OF DATA

12.1 Standard Applicable

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signalling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

12.2 Result:

No non-compliance noted:

Refer to the theory of operation.

13. FREQUENCY STABILITY

13.1 Standard Applicable

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

13.2 Result:

No non-compliance noted:

Referring to the theory of operation, the crystal used to set the frequency has a temperature coefficient of +/- 20 ppm. For a transmitter fundamental frequency of 5.35 GHz, this corresponds to +/- 107 kHz.

During band edge testing, it is determined that the smallest margin (along the frequency axis) to the band edge occurred at the upper band edge in the Turbo mode, using average detection, with the antenna vertically polarized. In this configuration, with the transmitter set to the highest channel, the envelope of the modulation sideband intercepted the 54 dBuV/m limit at 5,347.3 MHz. Adding the maximum peak-to-peak deviation due to the crystal (0.214 MHz) yields 5,347.514 MHz, which remains within the authorized band of 5,150 to 5,350 MHz.

At the lower band edge, the smallest margin (along the frequency axis) occurred in the Base mode, using average detection, with the antenna vertically polarized. In this configuration, with the transmitter set to the lowest channel, the envelope of the modulation sideband intercepted the 54 dBuV/m limit at 5,154 MHz. Subtracting the maximum peak-to-peak deviation due to the crystal (0.214 MHz) yields 5,153.786 MHz, which remains within the authorized band of 5,150 to 5,350 MHz.

14. ANTENNA REQUIREMENT

14.1 Standard Applicable

According to §15.407(d), Any U-NII device that operates in the 5.15-5.25 GHz band shall use a transmitting antenna that is an integral part of the device.

14.2 Antenna Connected Construction

The directional gins of antenna used for transmitting is 1.5 dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see Antenna Specification for more details.

15. RF Exposure

15.1 Standard Applicable

According to § 15.407(f) and § 1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

15.2 Measurement Result:

The SAR test was attached.

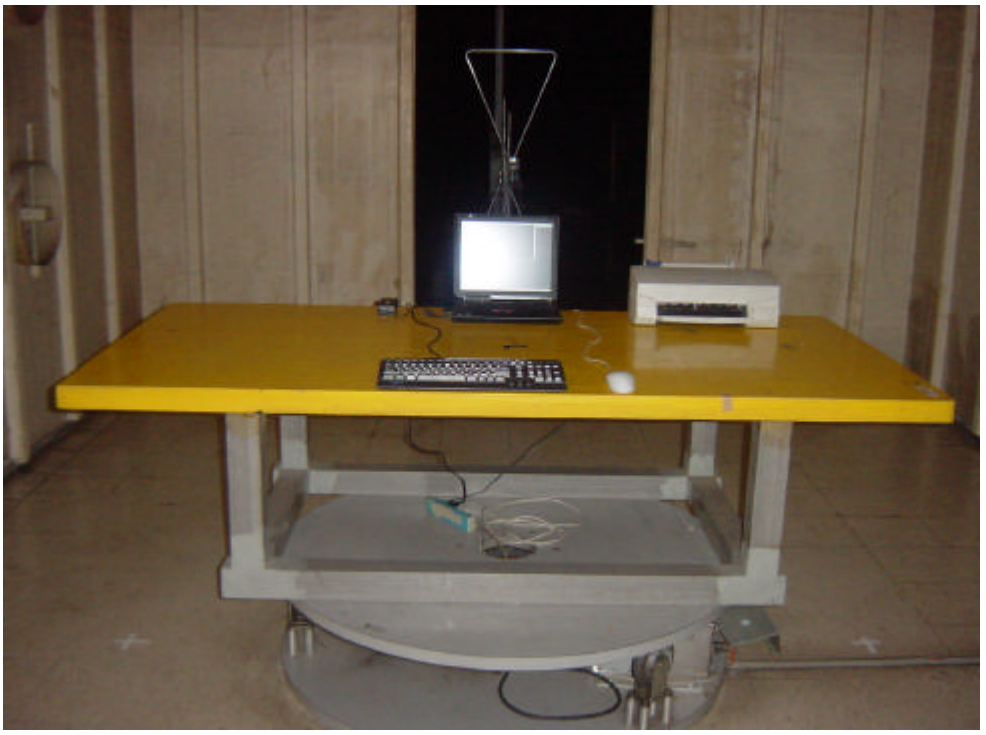
16. TERMS OF ABRIVATION

ACP	Adjecent Channel Power
ANSI	Americal National Standard Institute
Ant.	Antenna
AV.	Average detection
B	26dB down emission bandwidth
CAL.	Calibration
Correct.	Correction
dBc	dB relative to fundamental frequency level
dBi	Gain in decibels relative to an isotropic antenna
EUT	Equipment Under Test
FREQ.	Frequency
Hor.	Horizontal direction
IEEE	Institute of Electral and Electronic Engineer
LISN	Line Impedance Stabilization Network
MFR	Manufacturer
NSA	Normalized Site Attenuation
OFDM	Orthogonal Frequency Division Multiplexing
PK	Peak detection
PIFA	Printed Invert-F Antenna
Pol.	Polarization
PPSD	Peak Power Spectral Density
Pre-amp.	Pre-amplifier
Q.P.	Quasi-peak detection
RBW	Resolution bandwidth
SAR	Specific Absorption Rate
SRA	Spectrum analyzer
U-NII	Unlicense National Information Infrastructure
VBW	Video bandwidth
Vert.	Vertical direction

APPENDIX 1

PHOTOGRPHS OF SET UP

Radiated Emission Set up Photos

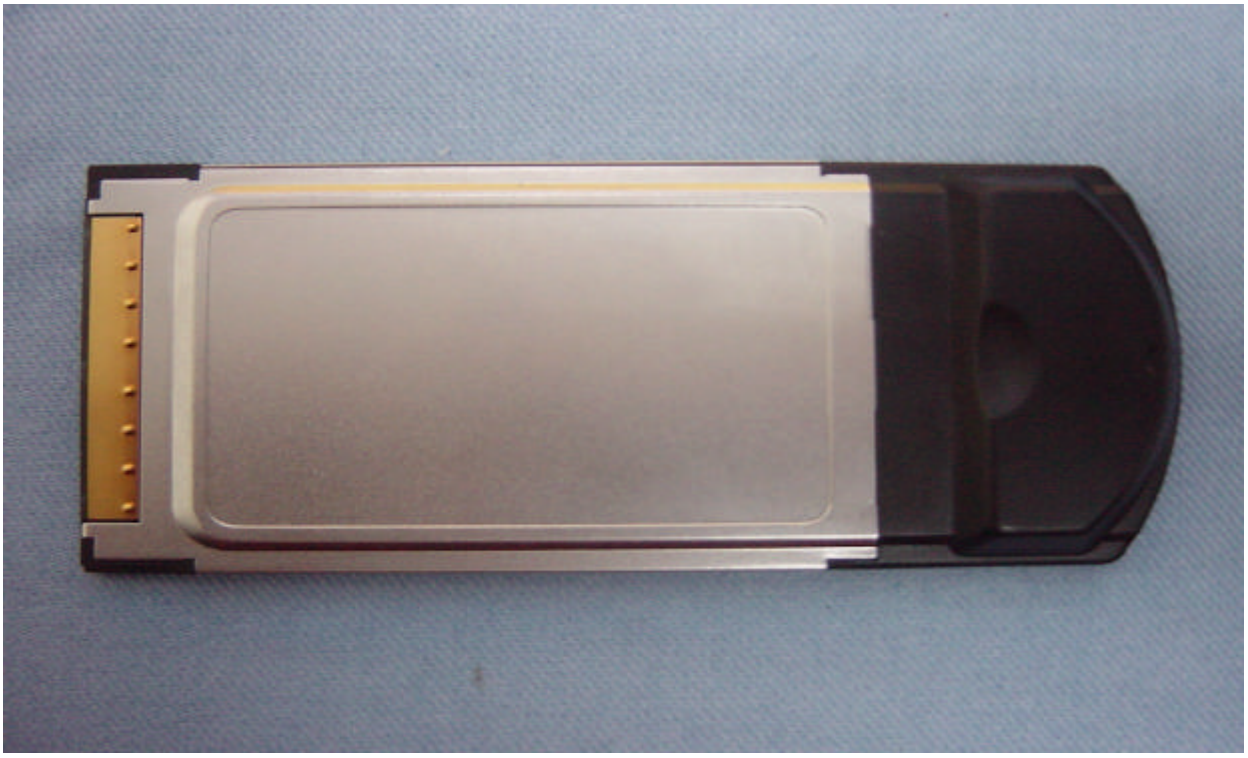


Conducted Emission Set Up Photos

APPENDIX 2

PHOTOGRPHS OF EUT

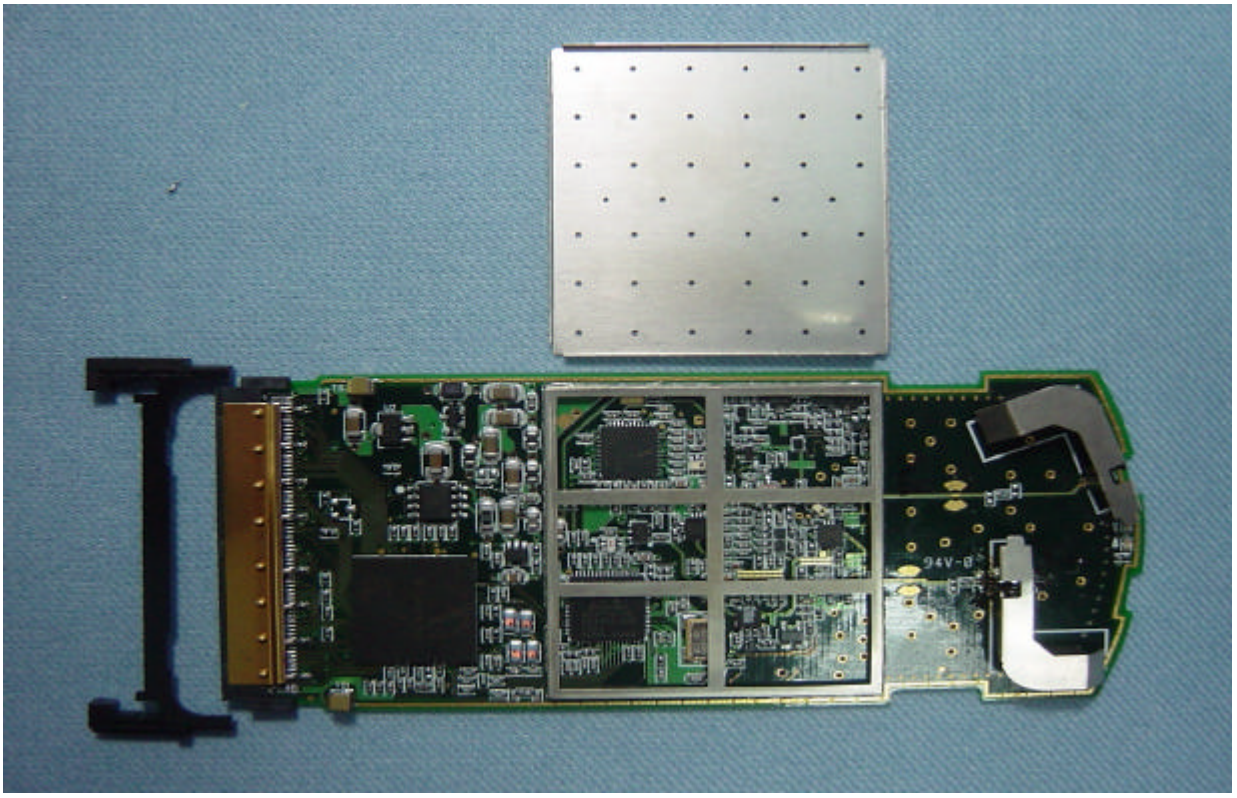
Front View of EUT



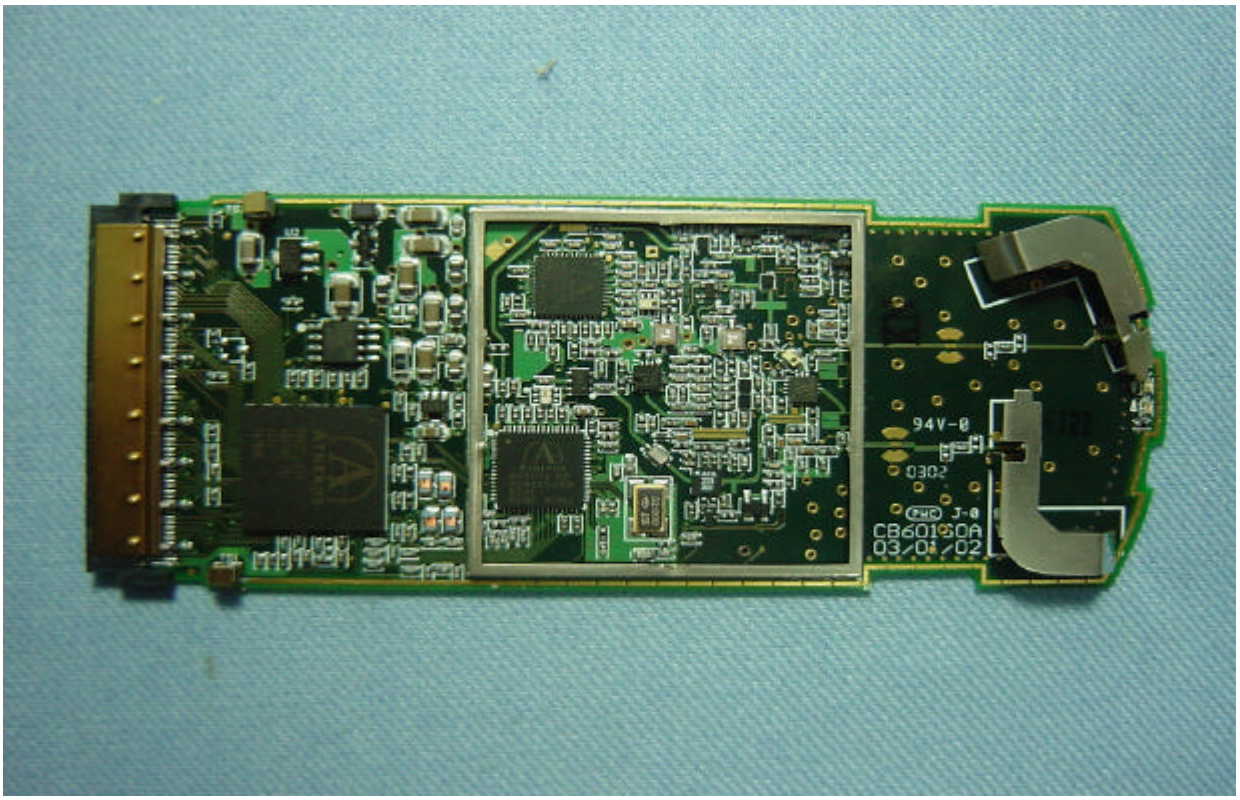
Back View of EUT

Dissolution View of EUT

Dissolution View of EUT



Internal PCB View of EUT



Internal PCB View of EUT