

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
INTENTIONAL RADIATOR CERTIFICATION TO
FCC PART 15 SUBPART C REQUIREMENT**

OF

802.11a/g mini PCI Card

Model No.: BCM94309MP

Trade Name: Quanta

FCC ID: HFS-BCM94309MP

Report No: B30624201-RP

Issue Date: July 8, 2003

Outlook Express.Ink *Prepared for*

**Quanta Computer Company Ltd.
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Prepared by

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VERIFICATION OF COMPLIANCE

Applicant: Quanta Computer Company Ltd.
No. 188, Wen Hwa 2nd Rd., Kuei Shan Hsiang,
Taoyuan Hsien, Taiwan, R.O.C.

Product Description: 802.11a/g mini PCI Card

Model No.: BCM94309MP

Serial Number: N/A

File Number: B30624201-RP

Date of test: June 30 ~ July 7, 2003

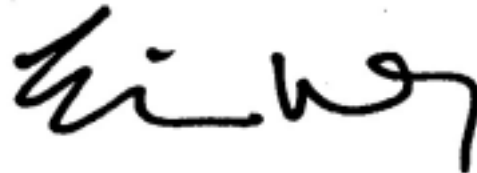
We hereby certify that:

The above equipment was tested by C&C Laboratory Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (1992) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.247

The test results of this report relate only to the tested sample identified in this report.

Approved By

Reviewed By



Jonson Lee / Director
C&C Laboratory Co., Ltd.

Eric Wong / Section Manager
C&C Laboratory Co., Ltd.

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1. GENERAL INFORMATION

1.1 Product Description

The Quanta Computer Company Ltd., Model: BCM94309MP (referred to as the EUT in this report) is 802.11a/g mini PCI Card.

Notebook		Antenna		Panel
Trade Name	Model No.	Trade Name	Model No.	
Gateway	450ROG	Fonconn	OA2	14.1"
Gateway	450ROG	Fonconn	OA2	15"
Gateway	M305CRV	Fonconn	OA5L	14.1"
Gateway	M305CRV	Fonconn	OA5L	15"
Gateway	M350WVN	Fonconn	OA6L	14.1"
Gateway	M350WVN	Fonconn	OA6L	15"
Gateway	600YG2	Quanta	YA1A	15"
Gateway	600YG2	Quanta	YA1A	15.7"
Gateway	600PIR	Fonconn	PA1	15.4"
Gateway	600PIR	Fonconn	PA1	17"
Gateway	600PIR	Hannstar	PA-1	15.4"
Gateway	600PIR	Hannstar	PA-1	17"

A major technical descriptions of EUT is described as following:

A). Operation Frequency:

2400~2483.5 IEEE802.11g				5.15 – 5.35 IEEE802.11a	
1	2412	7	2442	1	5180
2	2417	8	2447	2	5200
3	2422	9	2452	3	5220
4	2427	10	2457	4	5240
5	2432	11	2462	5	5260
6	2437			6	5280
				7	5300
				8	5320

B). Transmit Power: 14dBm (Peak)

C). Modulation type: OFDM (OFDM – Orthogonal Frequency Division Multiplexing)

D). Transition Speed: up to 54Mbps

E). Antenna Designation: 1. PIFA Antenna; Non-User Replaceable (Fixed), two provided.
one for Tx, another for Rx.
2. Metal Antenna; Non-User Replaceable (Fixed), two provided.
one for Tx, another for Rx.

F). Power Supply: from Notebook system



1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: HFS-BCM94309MP filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

1.3 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4 (1992). Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the address of C&C Laboratory, Co., Ltd. No. 81-1, 210 Lane, Pa-de 2nd Road, Lu-Chu Hsiang, Taoyuan, Taiwan, R.O.C.. The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 1992 and CISPR 22/EN 55022 requirements.

1.5 Special Accessories

Not available for this EUT intended for grant.

1.6 Equipment Modifications

Not available for this EUT intended for grant.

2. SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4-1992. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak detector mode.

2.3.2 Radiated Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4-1992.

2.4 Configuration of Tested System

Fig. 2-1 Configuration of Tested System

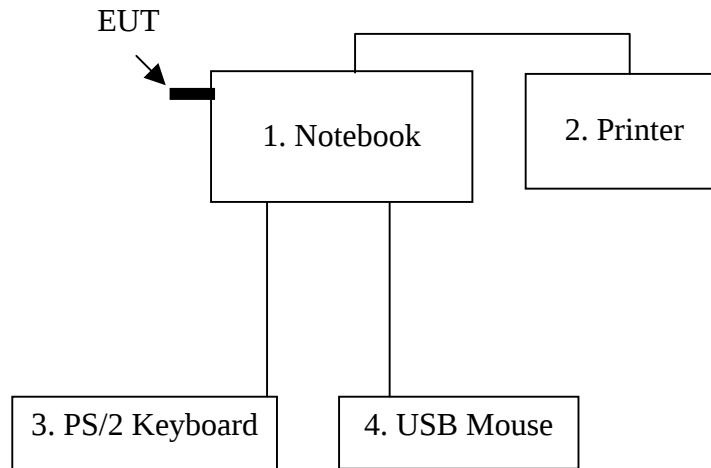


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	FCC ID	Series No.	Data Cable	Power Cord
1.	Notebook	Compaq	PP2150	DoC	N/A	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m
2.	Printer	EPSON	EPSON STYLUS C20SX	N/A	DW4E130542	Shielded, 1.8m	Unshielded, 1.8m
3.	PS/2 Keyboard	Compaq	SK-2800C	GYUR79SK	B1C790BCPJ73JQ	Shielded, 1.8m	N/A
4.	USB Mouse	Logitech	M-BB48	FCC DoC	LZE92250259	Shielded, 1.8m	N/A

3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.205	Restrict Band Emission	Compliant
§15.209(a) (f)	Spurious Emission	Compliant
§15.207(a)	AC Power Port Conducted Emission	Compliant
§15.247(a)(2)	6dB Bandwidth	Compliant
§15.247(b)	Peak Output Power	Compliant
§15.247(c)	100 KHz Bandwidth Of Frequency Band Edges	Compliant
§15.247(d)	Power Density	Compliant
§15.203	Antenna Requirement	Compliant
§1.1310 and §2.1093	RF exposures	Compliant

4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

IEEE802.11g: Base mode of frequency band 2.4GHz – 2.4835GHz Channel 1(2412MHz)、7(2442MHz) and 11(2462MHz) with 54Mbps data rate (the worst case) are chosen for full testing.

5. SPURIOUS EMISSION TEST

5.1 Standard Applicable

According to §15.247(c), all other emissions outside these bands shall not exceed the general radiated emission limits specified in §15.209(a). And according to §15.33(a)(1), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

5.2 EUT Setup

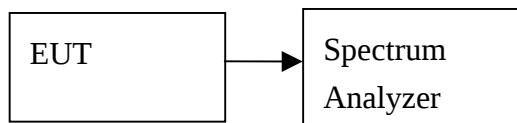
1. The radiated emission tests were performed in the 3 meter open-test site, using the setup in accordance with the ANSI C63.4-1992.
2. The host Notebook system was placed on the center of the back edge on the test table. The peripherals like printer, K/B, and mouse were placed on the side of the host 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 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 dropped along the edge of the test table and bundle when necessary.
6. The host Notebook system was connected with 110Vac/60Hz power source.

5.3 Measurement Procedure

- (1) Conducted test:
 1. Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation
- (2) Radiation test:
 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.

5.4 Test Set-up (Block Diagram of Configuration)

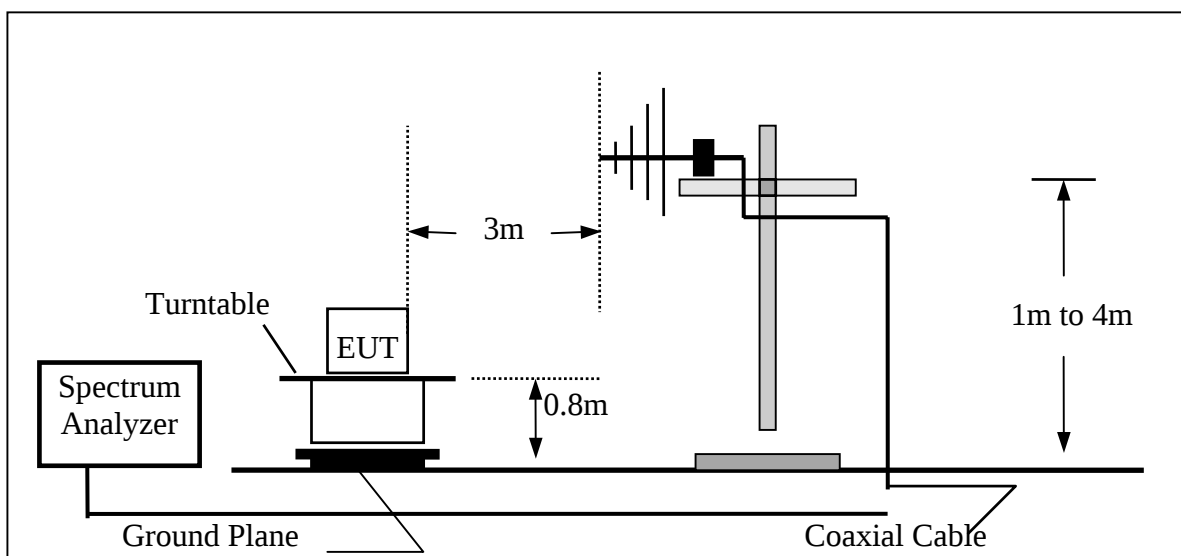
1. Conducted test:



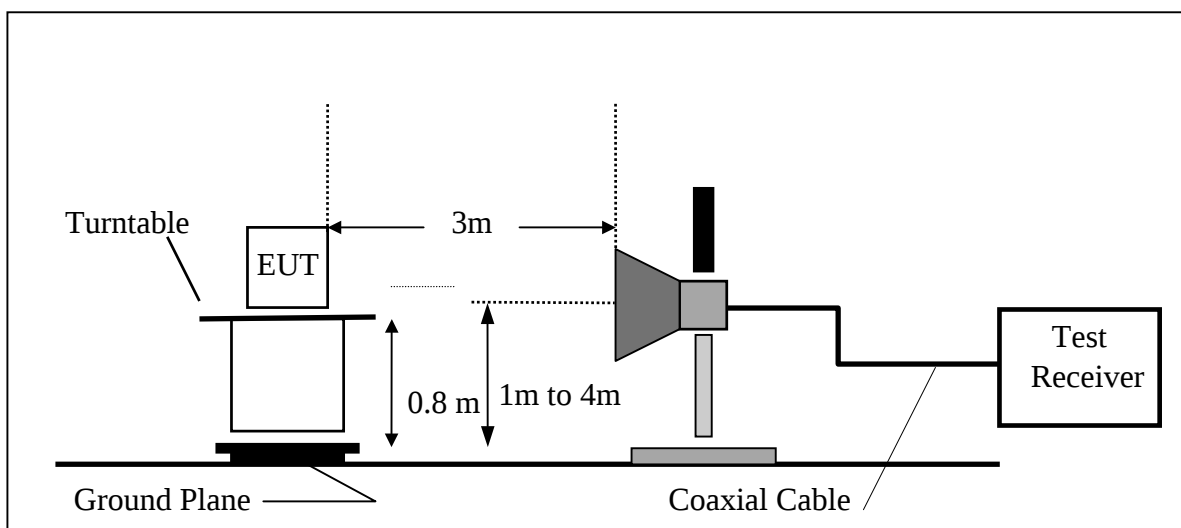
The EUT was connected to the spectrum analyzer through a 50 Ω RF cable.

2. Radiation test:

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



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



5.5 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	Agilent	E4446A	US42510252	04/28/2003	04/27/2004
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	07/06/2003	07/05/2004
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	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:

$$F = AF + CL - AG$$

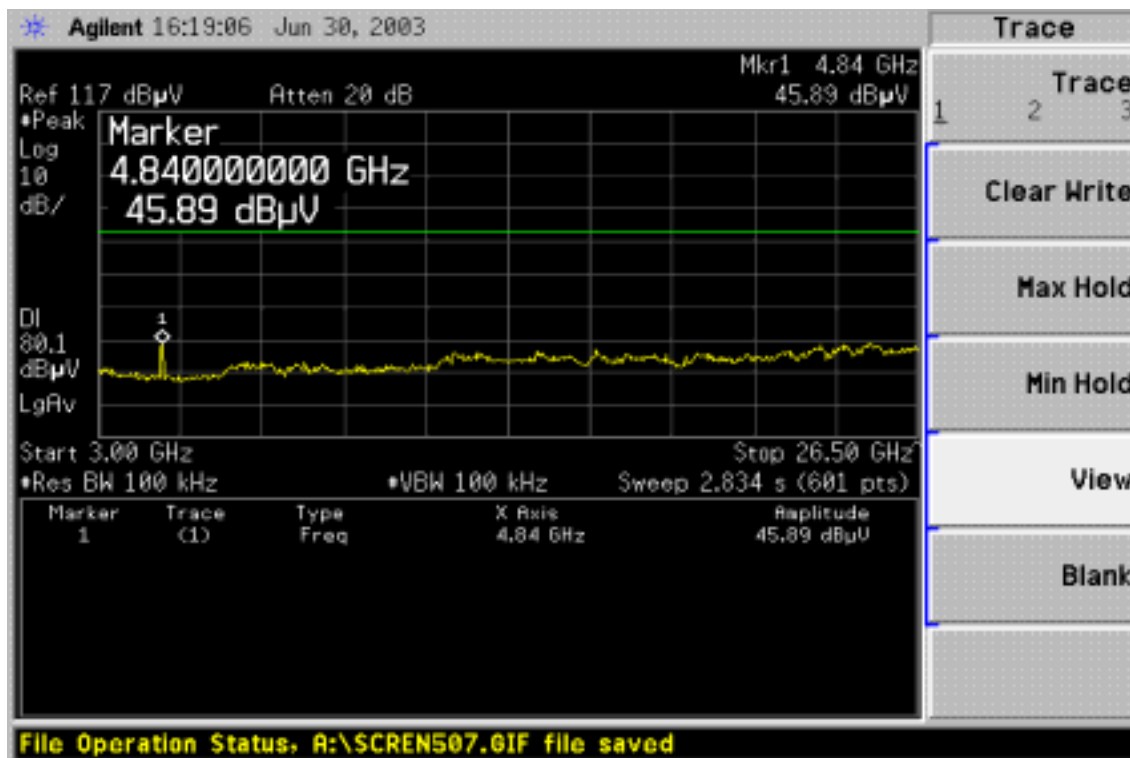
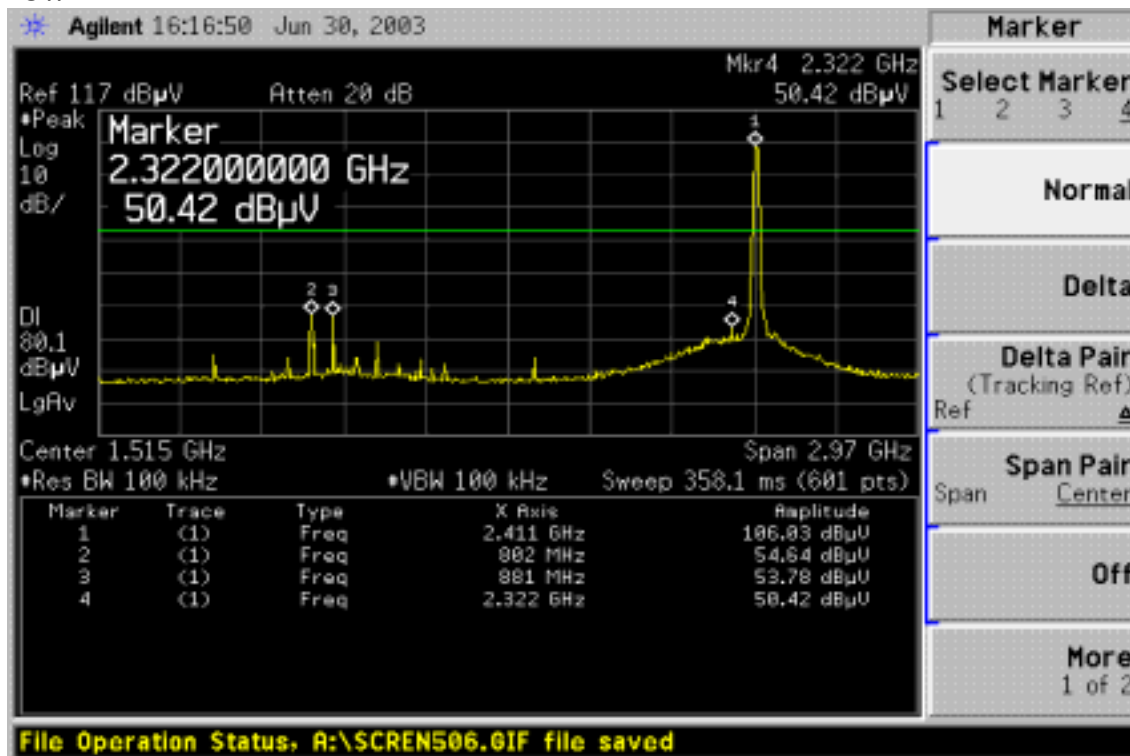
Where F = Factor	CL = Cable Attenuation Factor (Cable Loss)
AF = Antenna Factor	AG = Amplifier Gain

5.6 Measurement Result

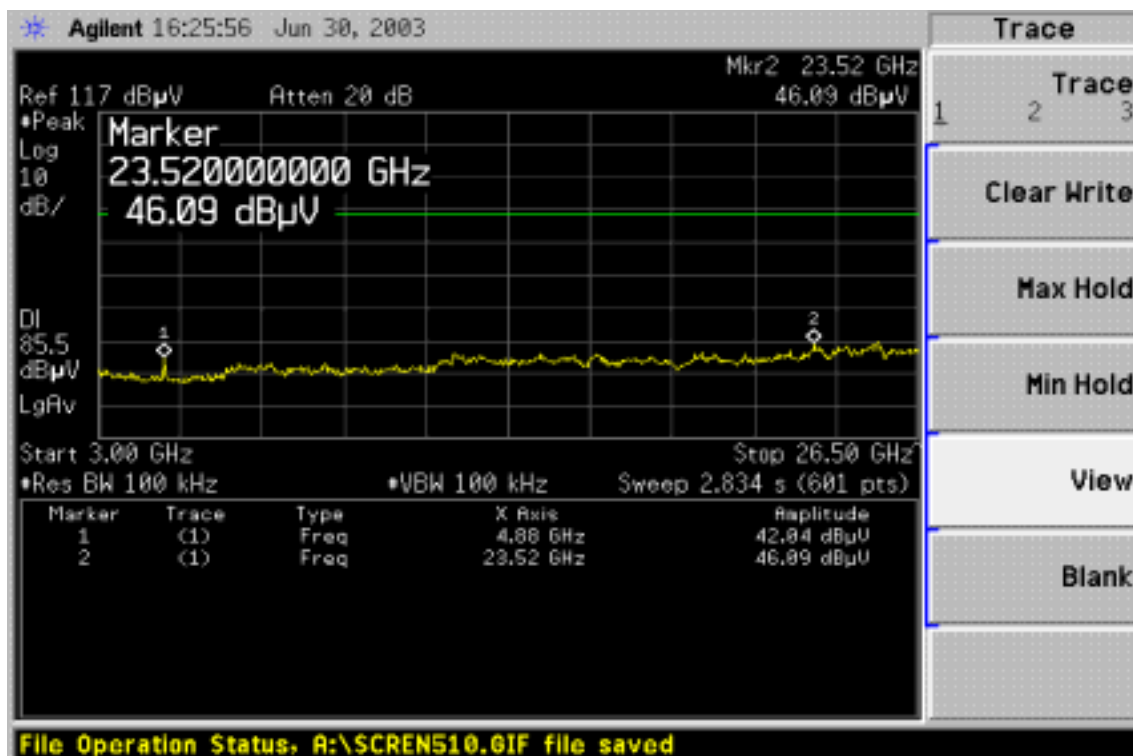
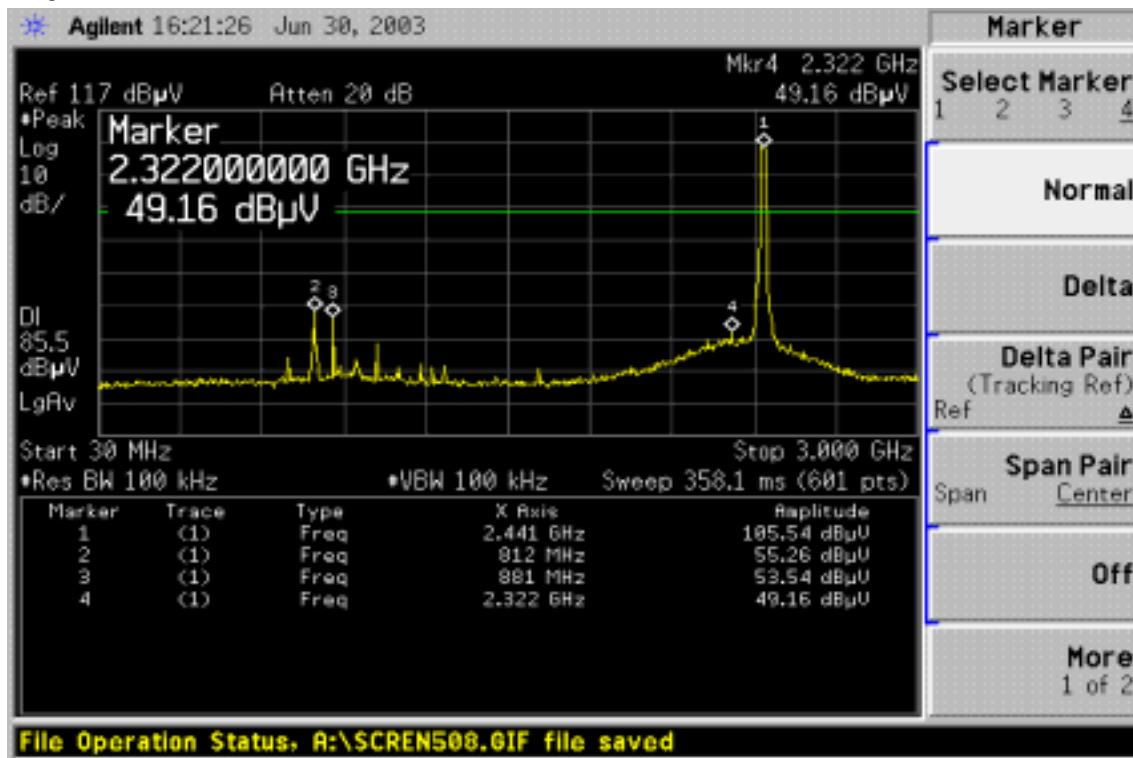
Refer to attach tabular data sheets.

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.

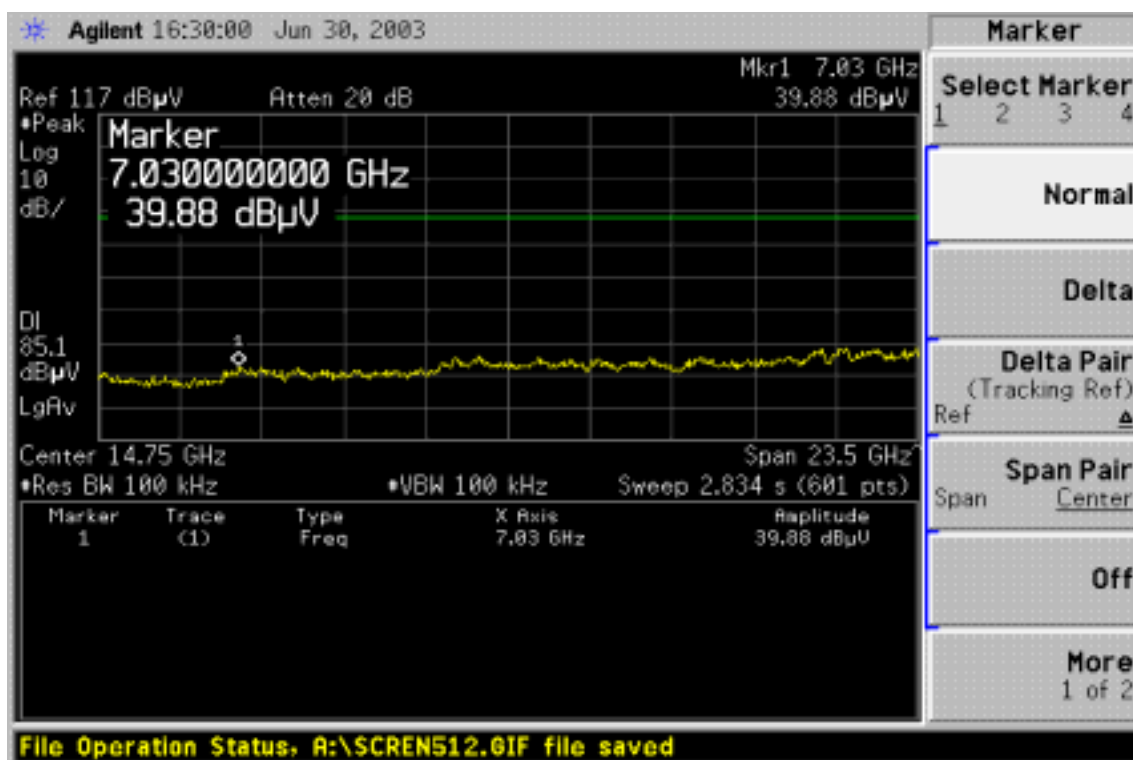
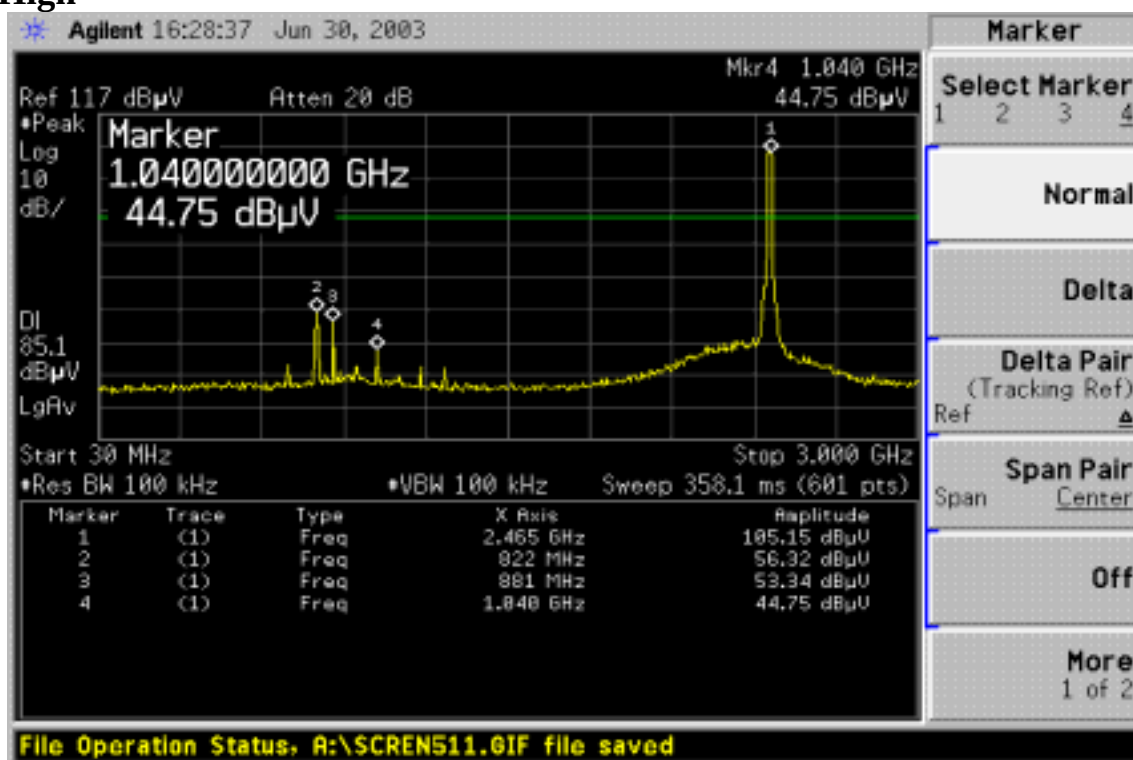
Conducted Spurious Emission Measurement Result CH Low



CH Mid



CH High



Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode: TX CH Low Mode Test Date: June 30, 2003
Temperature: 30°C Test By: Jacky
Humidity: 70 % Pol: Ver./Hor.
Test Mode: w / Foxconn antenna

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
185.70	V	Peak	21.41	13.50	34.91	43.50	-8.59
203.25	V	Peak	20.43	14.97	35.40	43.50	-8.10
283.80	V	Peak	21.61	16.05	37.66	46.00	-8.34
455.16	V	Peak	23.45	20.41	43.86	46.00	-2.14
767.83	V	Peak	7.87	25.97	33.84	46.00	-12.16
792.30	V	Peak	7.72	26.10	33.82	46.00	-12.18
89.40	H	Peak	25.46	11.94	37.40	43.50	-6.10
182.55	H	Peak	21.33	13.18	34.51	43.50	-8.99
283.80	H	Peak	24.44	16.05	40.49	46.00	-5.51
405.00	H	Peak	19.98	20.66	40.64	46.00	-5.36
455.16	H	Peak	22.62	20.41	43.03	46.00	-2.97
659.30	H	Peak	12.42	25.05	37.47	46.00	-8.53

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) Data 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 (below 1GHz)

Operation Mode:	TX CH Mid Mode	Test Date:	June 30, 2003
Temperature:	30°C	Test By:	Jacky
Humidity:	70 %	Pol:	Ver./Hor.
Test Mode:	w / Foxconn antenna		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
185.70	V	Peak	23.24	13.50	36.74	43.50	-6.76
203.25	V	Peak	20.09	14.97	35.06	43.50	-8.44
283.80	V	Peak	18.27	16.05	34.32	46.00	-11.68
455.16	V	Peak	22.79	20.41	43.20	46.00	-2.80
567.16	V	Peak	11.49	24.65	36.14	46.00	-9.86
767.83	V	Peak	7.37	25.97	33.34	46.00	-12.66
89.40	H	Peak	24.79	11.94	36.73	43.50	-6.77
203.70	H	Peak	19.28	14.98	34.26	43.50	-9.24
283.80	H	Peak	26.77	16.05	42.82	46.00	-3.18
402.66	H	Peak	20.32	20.69	41.01	46.00	-4.99
455.16	H	Peak	20.45	20.41	40.86	46.00	-5.14
567.16	H	Peak	13.49	24.65	38.14	46.00	-7.86

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) Data 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 (below 1GHz)

Operation Mode: TX CH High Mode Test Date: June 30, 2003
Temperature: 30°C Test By: Jacky
Humidity: 70 % Pol: Ver./Hor.
Test Mode: w / Foxconn antenna

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
183.45	V	Peak	21.68	13.27	34.95	43.50	-8.55
203.25	V	Peak	20.93	14.97	35.90	43.50	-7.60
283.80	V	Peak	22.27	16.05	38.32	46.00	-7.68
455.16	V	Peak	23.95	20.41	44.36	46.00	-1.64
767.83	V	Peak	7.70	25.97	33.67	46.00	-12.33
815.66	V	Peak	7.00	26.50	33.50	46.00	-12.50
89.40	H	Peak	22.46	11.94	34.40	43.50	-9.10
203.25	H	Peak	19.09	14.97	34.06	43.50	-9.44
283.80	H	Peak	25.94	16.05	41.99	46.00	-4.01
336.16	H	Peak	18.27	17.66	35.93	46.00	-10.07
403.83	H	Peak	17.66	20.68	38.34	46.00	-7.66
455.16	H	Peak	20.45	20.41	40.86	46.00	-5.14

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) Data 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 (below 1GHz)

Operation Mode: TX CH Low Mode Test Date: June 30, 2003
Temperature: 30°C Test By: Jacky
Humidity: 70 % Pol: Ver./Hor.
Test Mode: w / Hannstar antenna

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
105.60	V	Peak	18.60	13.41	32.01	43.50	-11.49
205.50	V	Peak	23.15	15.01	38.16	43.50	-5.34
283.80	V	Peak	22.61	16.05	38.66	46.00	-7.34
520.50	V	Peak	17.71	23.24	40.95	46.00	-5.05
767.83	V	Peak	8.70	25.97	34.67	46.00	-11.33
792.30	V	Peak	9.22	26.10	35.32	46.00	-10.68
166.35	H	Peak	22.45	11.87	34.32	43.50	-9.18
203.25	H	Peak	21.76	14.97	36.73	43.50	-6.77
283.80	H	Peak	22.27	16.05	38.32	46.00	-7.68
520.50	H	Peak	18.05	23.24	41.29	46.00	-4.71
792.33	H	Peak	13.22	26.10	39.32	46.00	-6.68
863.50	H	Peak	10.60	27.51	38.11	46.00	-7.89

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) Data 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 (below 1GHz)

Operation Mode:	TX CH Mid Mode	Test Date:	June 30, 2003
Temperature:	30°C	Test By:	Jacky
Humidity:	70 %	Pol:	Ver./Hor.
Test Mode:	w / Hannstar antenna		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
105.60	V	Peak	20.44	13.41	33.85	43.50	-9.65
203.70	V	Peak	23.61	14.98	38.59	43.50	-4.91
267.15	V	Peak	20.83	15.90	36.73	46.00	-9.27
455.16	V	Peak	24.45	20.41	44.86	46.00	-1.14
519.33	V	Peak	18.41	23.19	41.60	46.00	-4.40
791.16	V	Peak	9.88	26.09	35.97	46.00	-10.03
105.60	H	Peak	29.45	13.41	42.86	43.50	-0.64
204.60	H	Peak	23.47	14.99	38.46	43.50	-5.04
266.70	H	Peak	22.32	15.91	38.23	46.00	-7.77
455.16	H	Peak	23.95	20.41	44.36	46.00	-1.64
520.50	H	Peak	18.38	23.24	41.62	46.00	-4.38
791.16	H	Peak	14.05	26.09	40.14	46.00	-5.86

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) Data 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 (below 1GHz)

Operation Mode:	TX CH High Mode	Test Date:	June 30, 2003
Temperature:	30°C	Test By:	Jacky
Humidity:	70 %	Pol:	Ver./Hor.
Test Mode:	w / Hannstar antenna		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit3m (dBuV/m)	Safe Margin (dB)
105.60	V	Peak	19.27	13.41	32.68	43.50	-10.82
203.70	V	Peak	24.78	14.98	39.76	43.50	-3.74
259.95	V	Peak	20.16	16.07	36.23	46.00	-9.77
455.16	V	Peak	25.29	20.41	45.70	46.00	-0.30
520.50	V	Peak	18.21	23.24	41.45	46.00	-4.55
792.30	V	Peak	9.22	26.10	35.32	46.00	-10.68
169.50	H	Peak	22.89	12.12	35.01	43.50	-8.49
259.95	H	Peak	21.00	16.07	37.07	46.00	-8.93
455.16	H	Peak	24.29	20.41	44.70	46.00	-1.30
519.33	H	Peak	18.08	23.19	41.27	46.00	-4.73
791.16	H	Peak	13.21	26.09	39.30	46.00	-6.70
863.50	H	Peak	10.26	27.51	37.77	46.00	-8.23

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) Data 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: June 30, 2003
Temperature: 30°C Test By: Jacky
Humidity: 70 % Pol: Vertical
Test Mode: w / Foxconn antenna

Freq. (MHz)	Peak	AV	Ant./CL CF(dB)	Actual FS		Peak	AV	Margin (dB)	Remark
	Reading (dBuV)	Reading (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Limit (dBuV/m)	Limit (dBuV/m)		
1703.33	51.00	---	-6.23	44.77	---	74.00	54.00	-9.23	Peak
1983.33	47.34	---	-4.50	42.84	---	74.00	54.00	-11.16	Peak
4824	--					74.00	54.00		
7236	--					74.00	54.00		
9648	--					74.00	54.00		
12060	--					74.00	54.00		
14472	--					74.00	54.00		
16884	--					74.00	54.00		
19296	--					74.00	54.00		
21708	--					74.00	54.00		
24120	--					74.00	54.00		

Remark :

- (1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- (2) Data 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- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 26GHz, 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: June 30, 2003
Temperature: 30°C Test By: Jacky
Humidity: 70 % Pol: Horizontal
Test Mode: w / Foxconn antenna

Freq. (MHz)	Peak	AV	Ant./CL CF(dB)	Actual FS		Peak	AV	Margin (dB)	Remark
	Reading (dBuV)	Reading (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Limit (dBuV/m)	Limit (dBuV/m)		
1606.66	49.00	---	-6.75	42.25	---	74.00	54.00	-11.75	Peak
1706.66	49.00	---	-6.22	42.78	---	74.00	54.00	-11.22	Peak
4824	--					74.00	54.00		
7236	--					74.00	54.00		
9648	--					74.00	54.00		
12060	--					74.00	54.00		
14472	--					74.00	54.00		
16884	--					74.00	54.00		
19296	--					74.00	54.00		
21708	--					74.00	54.00		
24120	--					74.00	54.00		

Remark :

- (1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- (2) Data 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- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 26GHz, 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: June 30, 2003
Temperature: 30°C Test By: Jacky
Humidity: 70 % Pol: Vertical
Test Mode: w / Foxconn antenna

Freq. (MHz)	Peak	AV	Ant./CL CF(dB)	Actual FS		Peak	AV	Margin (dB)	Remark
	Reading (dBuV)	Reading (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Limit (dBuV/m)	Limit (dBuV/m)		
1623.33	50.17	---	-6.66	43.51	---	74.00	54.00	-10.49	Peak
1716.66	48.84	---	-6.16	42.68	---	74.00	54.00	-11.32	Peak
4874	--					74.00	54.00		
7311	--					74.00	54.00		
9748	--					74.00	54.00		
12185	--					74.00	54.00		
14622	--					74.00	54.00		
17059	--					74.00	54.00		
19496	--					74.00	54.00		
21933	--					74.00	54.00		
24370	--					74.00	54.00		

Remark :

- (1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- (2) Data 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- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.
- (5) $\text{Emission(dBuV/m)} = \text{Reading(dBuV)} + \text{Cable loss(dB)} + \text{Ant.Fact.(dB/m)} - \text{Pre-amp.(dB)}$

Radiated Spurious Emission Measurement Result (Above 1GHz)

Operation Mode: TX Mid Mode Test Date: June 30, 2003
Temperature: 30°C Test By: Jacky
Humidity: 70 % Pol: Horizontal
Test Mode: w / Foxconn antenna

Freq. (MHz)	Peak	AV	Ant./CL CF(dB)	Actual FS		Peak	AV	Margin (dB)	Remark
	Reading (dBuV)	Reading (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Limit (dBuV/m)	Limit (dBuV/m)		
1623.33	49.17	---	-6.66	42.51	---	74.00	54.00	-11.49	Peak
1670	48.50	---	-6.41	42.09	---	74.00	54.00	-11.91	Peak
4874	--					74.00	54.00		
7311	--					74.00	54.00		
9748	--					74.00	54.00		
12185	--					74.00	54.00		
14622	--					74.00	54.00		
17059	--					74.00	54.00		
19496	--					74.00	54.00		
21933	--					74.00	54.00		
24370	--					74.00	54.00		

Remark :

- (1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- (2) Data 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- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 26GHz, 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: June 30, 2003
Temperature: 30°C Test By: Jacky
Humidity: 70 % Pol: Vertical
Test Mode: w / Foxconn antenna

Freq. (MHz)	Peak	AV	Ant./CL CF(dB)	Actual FS		Peak	AV	Margin (dB)	Remark
	Reading (dBuV)	Reading (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Limit (dBuV/m)	Limit (dBuV/m)		
1556.66	50.50	---	-7.14	43.36	---	74.00	54.00	-10.64	Peak
1700	50.00	---	-6.25	43.75	---	74.00	54.00	-10.25	Peak
4924	--					74.00	54.00		
7386	--					74.00	54.00		
9848	--					74.00	54.00		
12310	--					74.00	54.00		
14772	--					74.00	54.00		
17234	--					74.00	54.00		
19696	--					74.00	54.00		
22158	--					74.00	54.00		
24620	--					74.00	54.00		

Remark :

- (1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- (2) Data 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- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 26GHz, 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: June 30, 2003
Temperature: 30°C Test By: Jacky
Humidity: 70 % Pol: Horizontal
Test Mode: w / Foxconn antenna

Freq. (MHz)	Peak	AV	Ant./CL CF(dB)	Actual FS		Peak	AV	Margin (dB)	Remark
	Reading (dBuV)	Reading (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Limit (dBuV/m)	Limit (dBuV/m)		
1640	49.84	---	-6.57	43.27	---	74.00	54.00	-10.73	Peak
1666	49.84	---	-6.43	43.41	---	74.00	54.00	-10.59	Peak
4924	--					74.00	54.00		
7386	--					74.00	54.00		
9848	--					74.00	54.00		
12310	--					74.00	54.00		
14772	--					74.00	54.00		
17234	--					74.00	54.00		
19696	--					74.00	54.00		
22158	--					74.00	54.00		
24620	--					74.00	54.00		

Remark :

- (1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- (2) Data 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- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 26GHz, 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: July 5, 2003
Temperature: 30°C Test By: Jacky
Humidity: 70 % Pol: Vertical
Test Mode: w / Hannstar antenna

Freq. (MHz)	Peak	AV	Ant./CL CF(dB)	Actual FS		Peak	AV	Margin (dB)	Remark
	Reading (dBuV)	Reading (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Limit (dBuV/m)	Limit (dBuV/m)		
1606.66	48.34	---	-6.75	41.59	---	74.00	54.00	-12.41	Peak
1693.33	49.00	---	-6.29	42.71	---	74.00	54.00	-11.29	Peak
4824	--					74.00	54.00		
7236	--					74.00	54.00		
9648	--					74.00	54.00		
12060	--					74.00	54.00		
14472	--					74.00	54.00		
16884	--					74.00	54.00		
19296	--					74.00	54.00		
21708	--					74.00	54.00		
24120	--					74.00	54.00		

Remark :

- (1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- (2) Data 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- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 26GHz, 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: July 5, 2003
Temperature: 30°C Test By: Jacky
Humidity: 70 % Pol: Horizontal
Test Mode: w / Hannstar antenna

Freq. (MHz)	Peak	AV	Ant./CL CF(dB)	Actual FS		Peak	AV	Margin (dB)	Remark
	Reading (dBuV)	Reading (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Limit (dBuV/m)	Limit (dBuV/m)		
1606.66	49.67	---	-6.75	42.92	---	74.00	54.00	-11.08	Peak
1706.66	49.00	---	-6.22	42.78	---	74.00	54.00	-11.22	Peak
4824	--					74.00	54.00		
7236	--					74.00	54.00		
9648	--					74.00	54.00		
12060	--					74.00	54.00		
14472	--					74.00	54.00		
16884	--					74.00	54.00		
19296	--					74.00	54.00		
21708	--					74.00	54.00		
24120	--					74.00	54.00		

Remark :

- (1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- (2) Data 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- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 26GHz, 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: July 5, 2003
Temperature: 30°C Test By: Jacky
Humidity: 70 % Pol: Vertical
Test Mode: w / Hannstar antenna

Freq. (MHz)	Peak	AV	Ant./CL CF(dB)	Actual FS		Peak	AV	Margin (dB)	Remark
	Reading (dBuV)	Reading (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Limit (dBuV/m)	Limit (dBuV/m)		
1623.33	49.17	---	-6.66	42.51	---	74.00	54.00	-11.49	Peak
1710	49.50	---	-6.20	43.30	---	74.00	54.00	-10.70	Peak
4874	--					74.00	54.00		
7311	--					74.00	54.00		
9748	--					74.00	54.00		
12185	--					74.00	54.00		
14622	--					74.00	54.00		
17059	--					74.00	54.00		
19496	--					74.00	54.00		
21933	--					74.00	54.00		
24370	--					74.00	54.00		

Remark :

- (1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- (2) Data 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- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 26GHz, 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: July 5, 2003
Temperature: 30°C Test By: Jacky
Humidity: 70 % Pol: Horizontal
Test Mode: w / Hannstar antenna

Freq. (MHz)	Peak	AV	Ant./CL CF(dB)	Actual FS		Peak	AV	Margin (dB)	Remark
	Reading (dBuV)	Reading (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Limit (dBuV/m)	Limit (dBuV/m)		
2266.66	45.84	---	-3.49	42.35	---	74.00	54.00	-11.65	Peak
4874	--					74.00	54.00		
7311	--					74.00	54.00		
9748	--					74.00	54.00		
12185	--					74.00	54.00		
14622	--					74.00	54.00		
17059	--					74.00	54.00		
19496	--					74.00	54.00		
21933	--					74.00	54.00		
24370	--					74.00	54.00		

Remark :

- (1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- (2) Data 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- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 26GHz, 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: July 5, 2003
Temperature: 30°C Test By: Jacky
Humidity: 70 % Pol: Vertical
Test Mode: w / Hannstar antenna

Freq. (MHz)	Peak	AV	Ant./CL CF(dB)	Actual FS		Peak	AV	Margin (dB)	Remark
	Reading (dBuV)	Reading (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Limit (dBuV/m)	Limit (dBuV/m)		
1640	48.67	---	-6.57	42.10	---	74.00	54.00	-11.90	Peak
1683.33	49.34	---	-6.34	43.00	---	74.00	54.00	-11.00	Peak
4924	--					74.00	54.00		
7386	--					74.00	54.00		
9848	--					74.00	54.00		
12310	--					74.00	54.00		
14772	--					74.00	54.00		
17234	--					74.00	54.00		
19696	--					74.00	54.00		
22158	--					74.00	54.00		
24620	--					74.00	54.00		

Remark :

- (1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- (2) Data 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- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 26GHz, 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: June 30, 2003
Temperature: 30°C Test By: Jacky
Humidity: 70 % Pol: Horizontal
Test Mode: w / Hannstar antenna

Freq. (MHz)	Peak	AV	Ant./CL CF(dB)	Actual FS		Peak	AV	Margin (dB)	Remark
	Reading (dBuV)	Reading (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Limit (dBuV/m)	Limit (dBuV/m)		
1336.66	49.34	---	-8.51	40.83	---	74.00	54.00	-13.17	Peak
1823.33	45.00	---	-5.58	39.42	---	74.00	54.00	-14.58	Peak
4924	--					74.00	54.00		
7386	--					74.00	54.00		
9848	--					74.00	54.00		
12310	--					74.00	54.00		
14772	--					74.00	54.00		
17234	--					74.00	54.00		
19696	--					74.00	54.00		
22158	--					74.00	54.00		
24620	--					74.00	54.00		

Remark :

- (1) Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- (2) Data 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- 26GHz, RBW= 1MHz, VBW= 1MHz, Sweep time= 200 ms.
Spectrum AV Setting 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.
- (5) Emission(dBuV/m)=Reading(dBuV)+Cable loss(dB)+Ant.Fact.(dB/m)-Pre-amp.(dB)

6. AC POWER LINE CONDUCTED EMISSION TEST

6.1 Standard Applicable

According to §15.207, frequency within 150KHz to 30MHz shall not exceed

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

6.2 EUT Setup

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4-1992.
2. The EUT was plug-in the host Notebook via PCMCIA / MiniPCI testing platform. 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.

6.3 Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

6.4 Measurement Equipment Used:

Conducted Emission Test Site # 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESHS30	828144/003	08/08/2002	08/07/2003
LISN	R&S	ESH2-Z5	843285/010	10/17/2002	10/16/2003
LISN	EMCO	3825/2	9003-1628	07/26/2002	07/25/2003
2X2 WIRE ISN	R&S	ENY22	100020	06/20/2003	06/19/2004
FOUR WIRE ISN	R&S	ENY41	100006	06/20/2003	06/19/2004

6.5 Measurement Result

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

AC POWER LINE CONDUCTED EMISSION TEST

Operation Mode:	TX + RX Mode			Test Date:	June 30, 2003
Temperature:	30°C	Humidity:	70%	Test By:	Jacky
Test Mode:	Foxconn				

FREQ MHz	Q.P. Raw dBuV	AVG Raw dBuV	Q.P. Limit dBuV	AVG Limit dBuV	Q.P. Margin dB	AVG Margin dB	NOTE
0.220	48.56	---	62.82	52.82	-14.26	---	L1
0.322	47.32	---	59.66	49.66	-12.34	---	L1
0.387	44.93	---	58.13	48.13	-13.20	---	L1
0.529	41.34	---	56.00	46.00	-14.66	---	L1
0.871	42.40	---	56.00	46.00	-13.60	---	L1
4.720	41.34	---	56.00	46.00	-14.66	---	L1
0.220	47.35	---	62.82	52.82	-15.47	---	L2
0.387	45.98	---	58.13	48.13	-12.15	---	L2
0.612	41.85	---	56.00	46.00	-14.15	---	L2
1.133	42.95	---	56.00	46.00	-13.05	---	L2
4.106	41.88	---	56.00	46.00	-14.12	---	L2
4.720	41.46	---	56.00	46.00	-14.54	---	L2

Remark :

- (1) Measuring frequencies from 0.15 MHz to 30MHz.
- (2) The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-Peak detector and Average detector.
- (3) “---” denotes the emission level was or more than 2dB below the Average limit, so no re-check anymore.
- (4) The IF bandwidth of SPA between 0.15MHz to 30MHz was 10KHz;
The IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9KHz;
- (5) L1 = Line One (Live Line side) / L2 = Line Two (Neutral Line side)

Conducted Emission Test Data L1

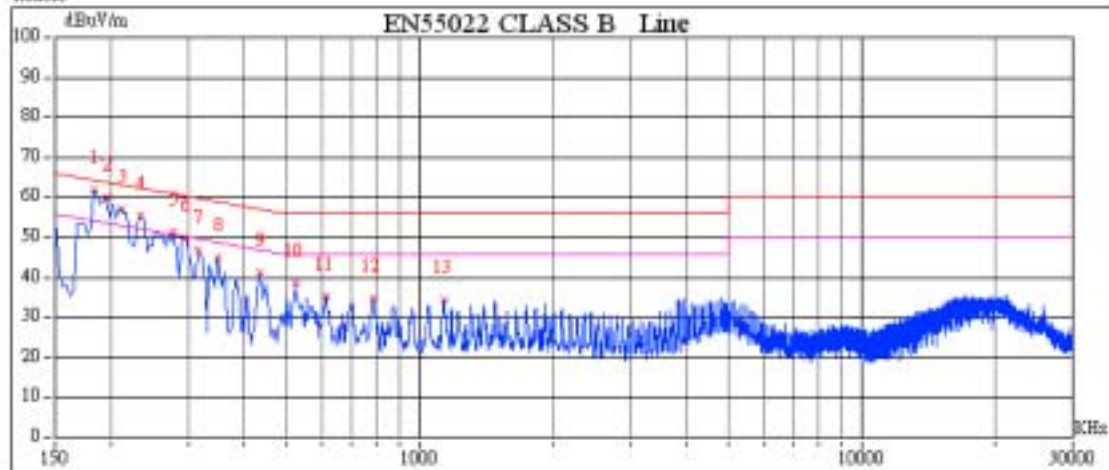


Tel: 886-3-3245966
Fax: 886-3-3245235

Test Mode:

Customer Name: 廣達
Model Name: BMC94309MP
Project No.:
Engineer Name:

Index:



Conducted Emission Test Data L2

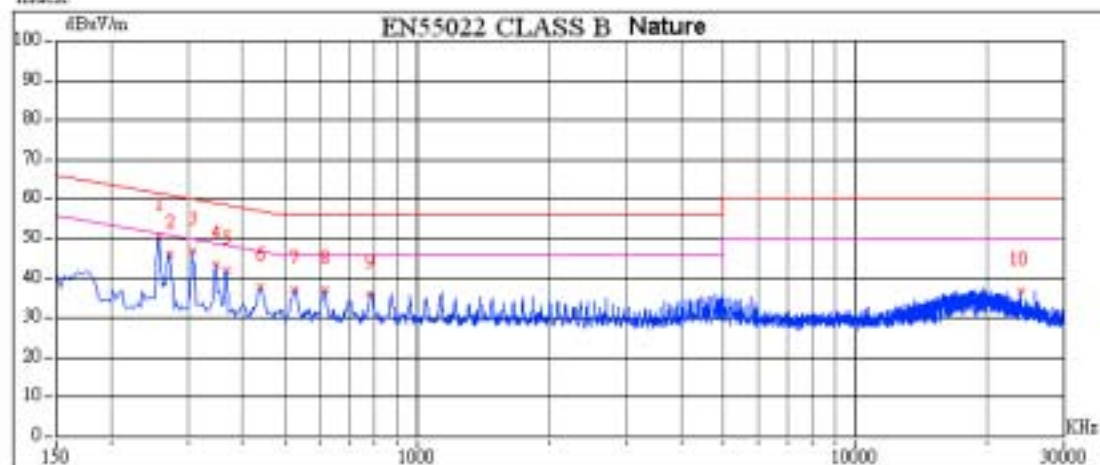


Tel: 886-3-3245966
Fax: 886-3-3245235

Test Mode:

Customer Name: 廣達
Model Name: BMC94309MP
Project No.:
Engineer Name:

Index:



7. 6 dB Bandwidth Measurement

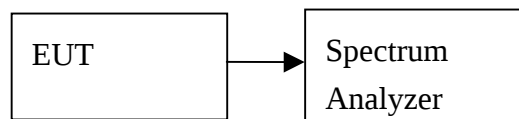
7.1 Standard Applicable

According to §15.247(a)(2), DSSS Systems operating in the 2400MHz-2483.5 MHz and 5725MHz – 5850MHz bands. The Minimum 6dB bandwidth shall be at least 500KHz.

7.2 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	Model No.	Serial No.	LAST CAL.	Cal. Due.
Spectrum Analyzer	Advantest	R3182	110600647	11/16/2002	11/15/2003
Spectrum Analyzer	Agilent	E4446A	US42510252	04/28/2003	04/27/2004

7.3 Test Set-up:



The EUT was connected to a spectrum analyzer through a 50 Ω RF cable.

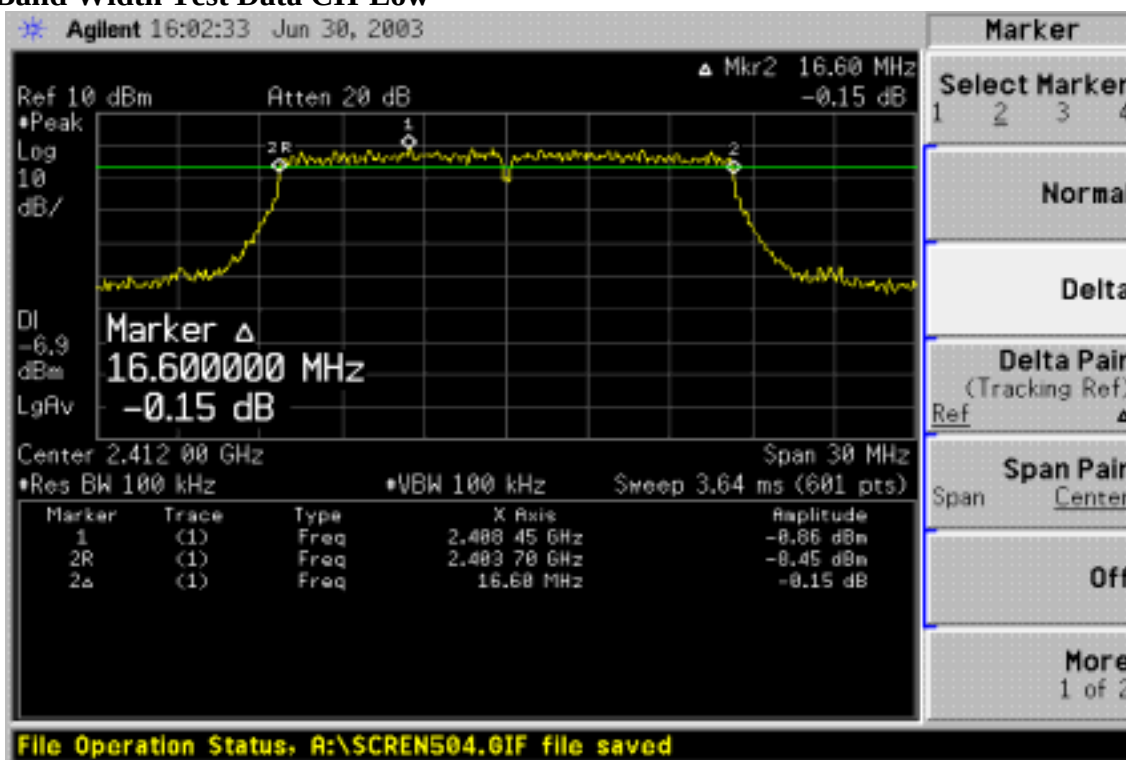
7.4 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=100KHz, VBW = RBW, Span= Applicable Span, Sweep=auto
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured were complete.

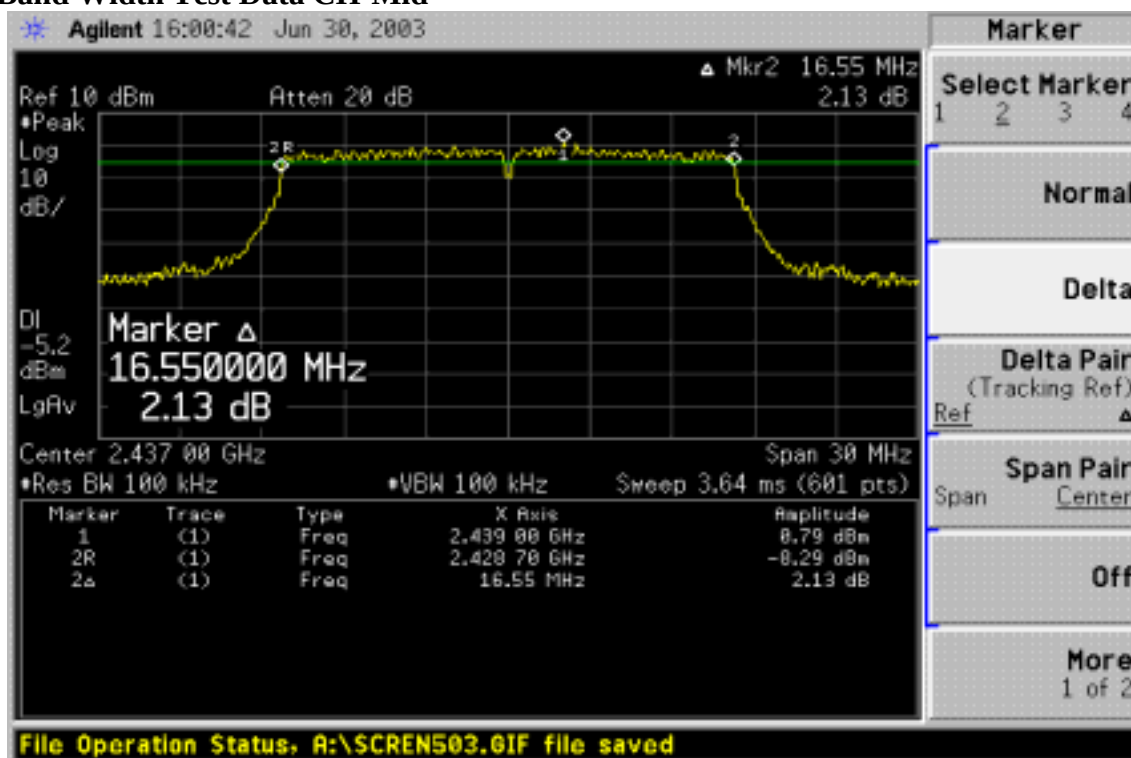
7.5 Measurement Result

Channel	Frequency (MHz)	6dB BW (kHz)	Limit (kHz)	Margin (kHz)
Low	2412	16600	500	-16100
Mid	2437	16550	500	-16050
High	2462	16600	500	-16100

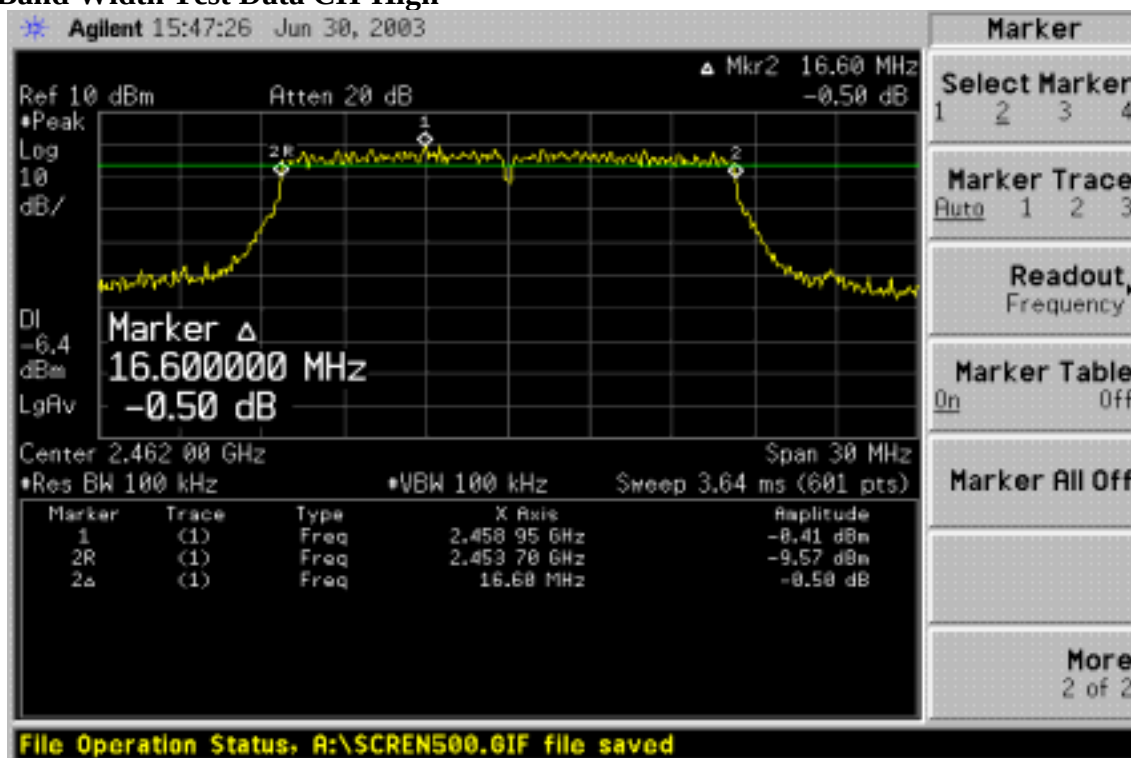
6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid



6dB Band Width Test Data CH-High

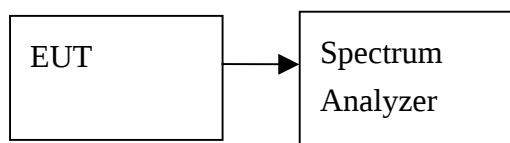


8. PEAK OUTPUT POWER MEASUREMENT

8.1 Standard Applicable

According to §15.247(b)(2), for the maximum peak output power of the intentional radiator shall not exceed 1 Watt.

8.2 Test Setup



The EUT was connected to a Spectrum Analyzer through a 50 Ω RF cable.

8.3 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer (Channel power function, RBW, VBW = 1MHz, Bandwidth=26dB occupied Bandwidth)
3. Record the max. reading.
4. Repeat above procedures until all frequency measured were complete.

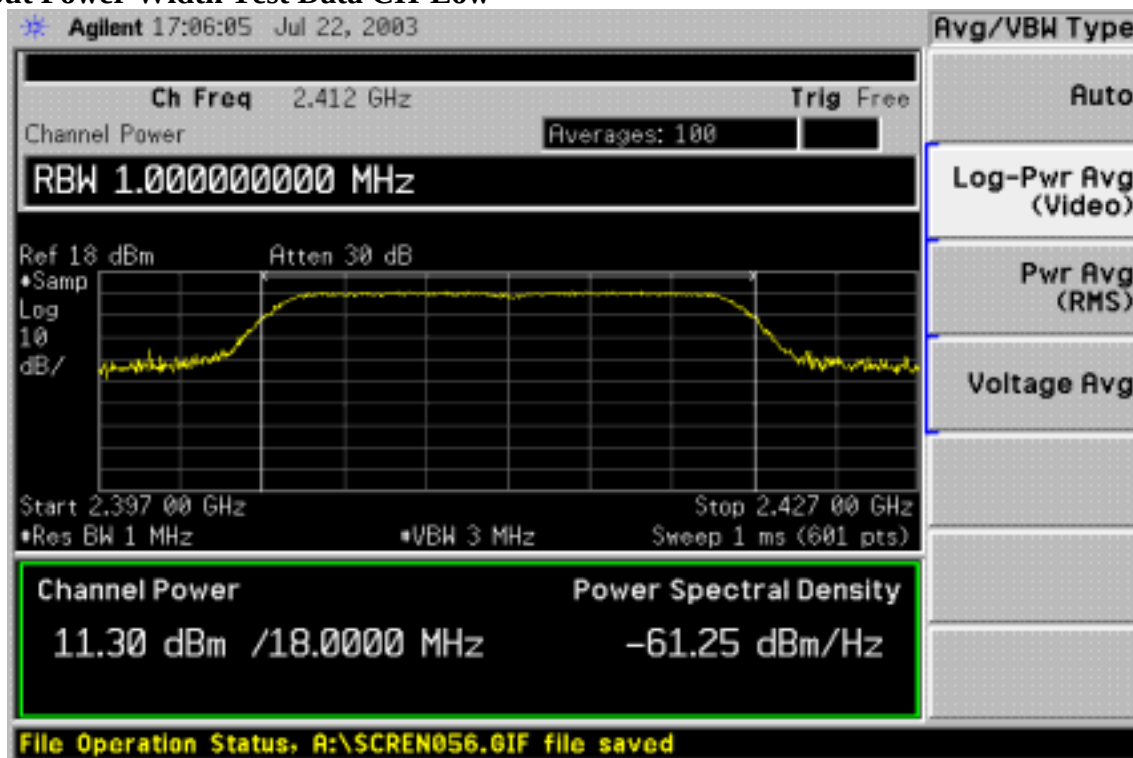
8.4 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	Model No.	Serial No.	LAST CAL.	Cal. Due.
Spectrum Analyzer	Agilent	E4446A	US42510252	04/28/2003	04/27/2004
Peak Power Sensor	BOONTON	56218	2240	01/03/2003	01/02/2004

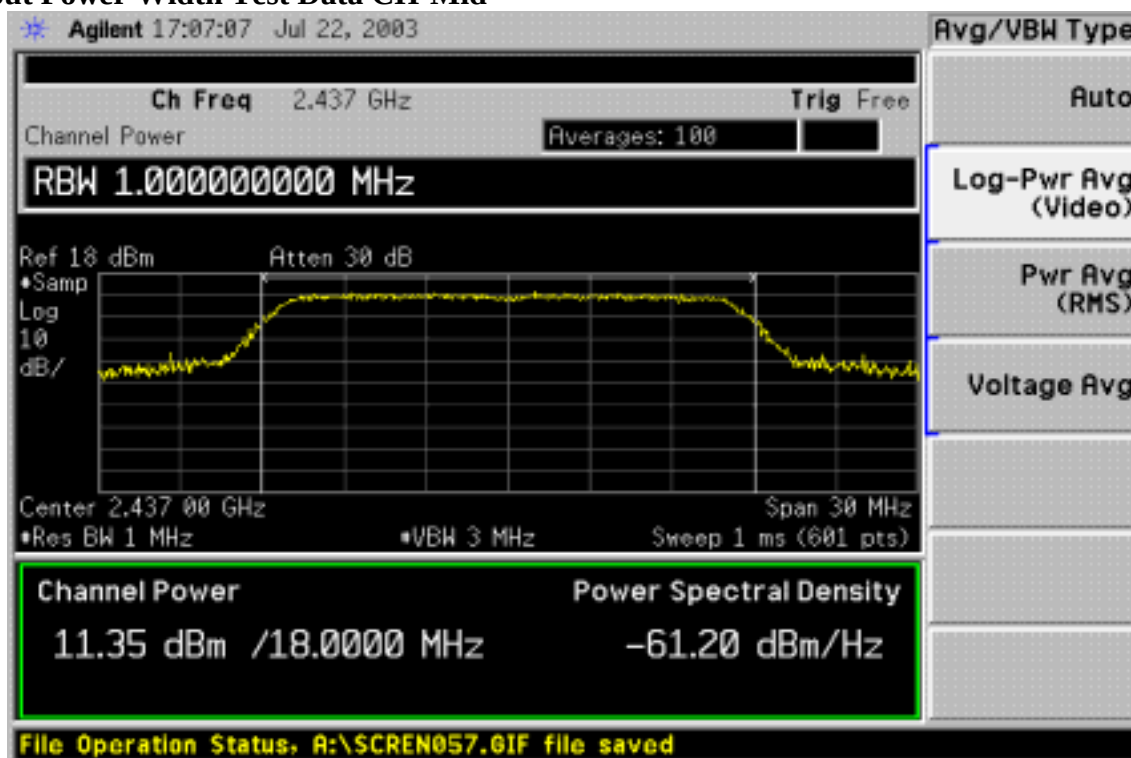
8.5 Test Results:

Channel	Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	Output Power (dBm)
Low	2412	11.30	2.50	13.80
Mid	2437	11.35	2.50	13.85
High	2462	10.93	2.50	13.43

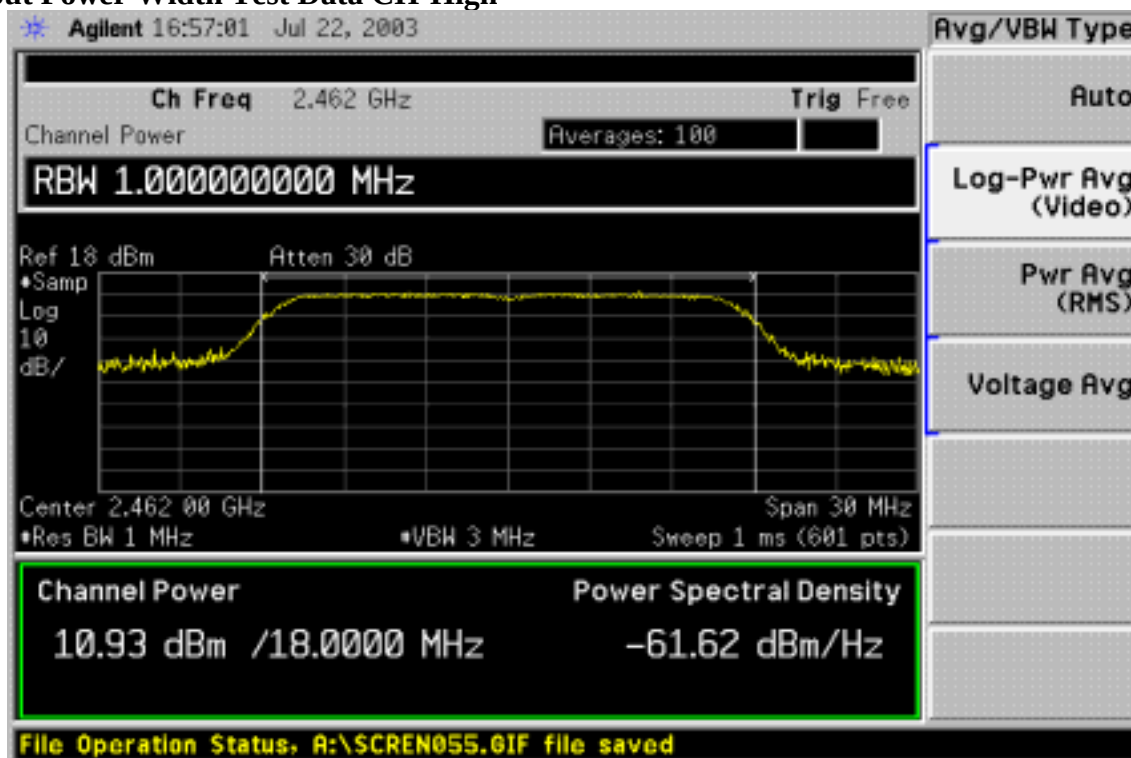
Output Power Width Test Data CH-Low



Output Power Width Test Data CH-Mid



Output Power Width Test Data CH-High



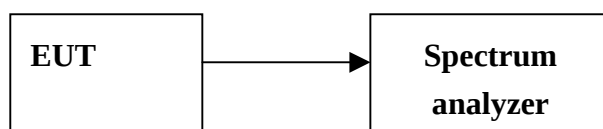
9. BAND EDGES MEASUREMENT

9.1 Standard Applicable

According to §15.247(c), in any 100 KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

9.2 Test Setup

1. Conducted test



The EUT was connected to the spectrum analyzer through a 50 Ω RF cable.

2. Radiation test

The EUT is placed on the wooden table. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4/1992.

9.3 Measurement Procedure

1. Conducted test:

The transmitter output is connected to the spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 100 kHz. The sweep time is coupled.

2. Radiation test

For measurements above 1 GHz, the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

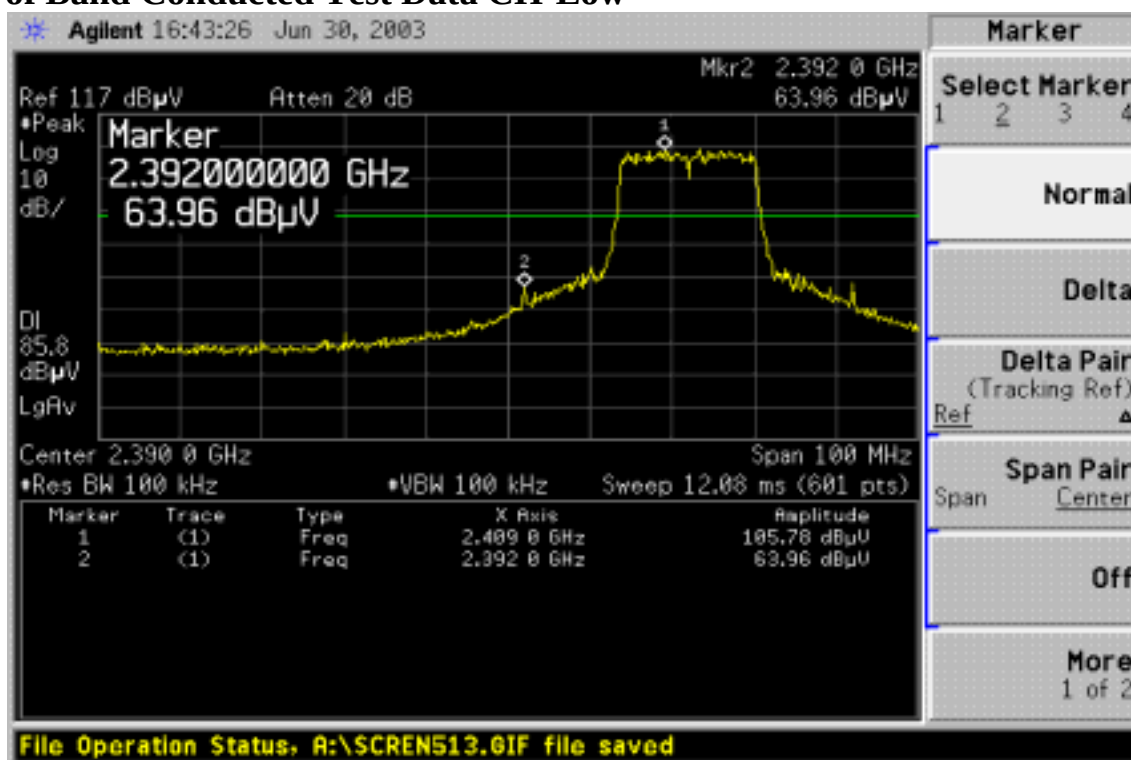
9.4 Measurement Equipment Used:

Equip. Applied	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	Agilent	E4446A	US42510252	04/28/2003	04/27/2004
	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	SCHWAZBEC K	VULB9163	145	07/06/2003	07/05/2004
	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	EMCO	3116	2487	11/11/2002	11/10/2003
	Pre-Amplifier	HP	8449B	3008B00965	10/01/2002	10/02/2003

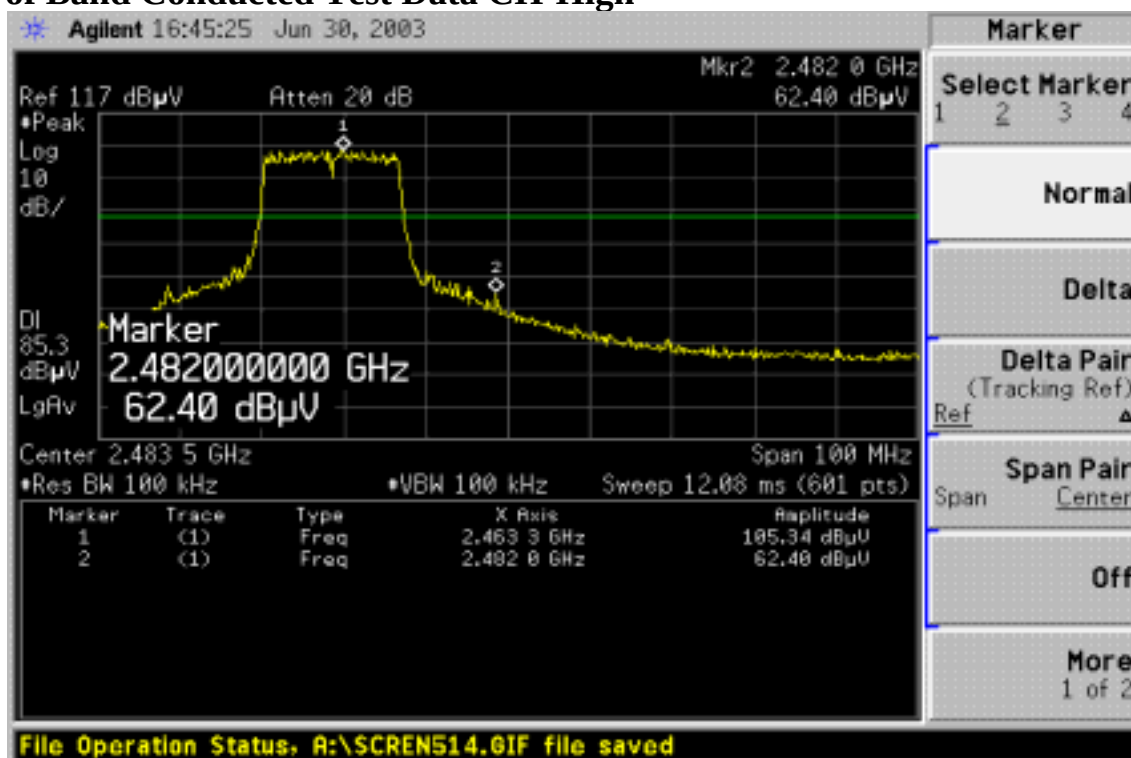
9.5 Test Results:

Refer to attach spectrum analyzer data chart.

Out of Band Conducted Test Data CH-Low



Out of Band Conducted Test Data CH-High



10. Peak Power Spectral Density

10.1 Standard Applicable

According to §15.247(d), for direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3kHz band during any time interval of continuous transmission.

10.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 3KHz, VBW = 10KHz, Span = 300KHz, Sweep=100s
4. Record the max reading.
5. Repeat above procedures until all frequency measured were complete.

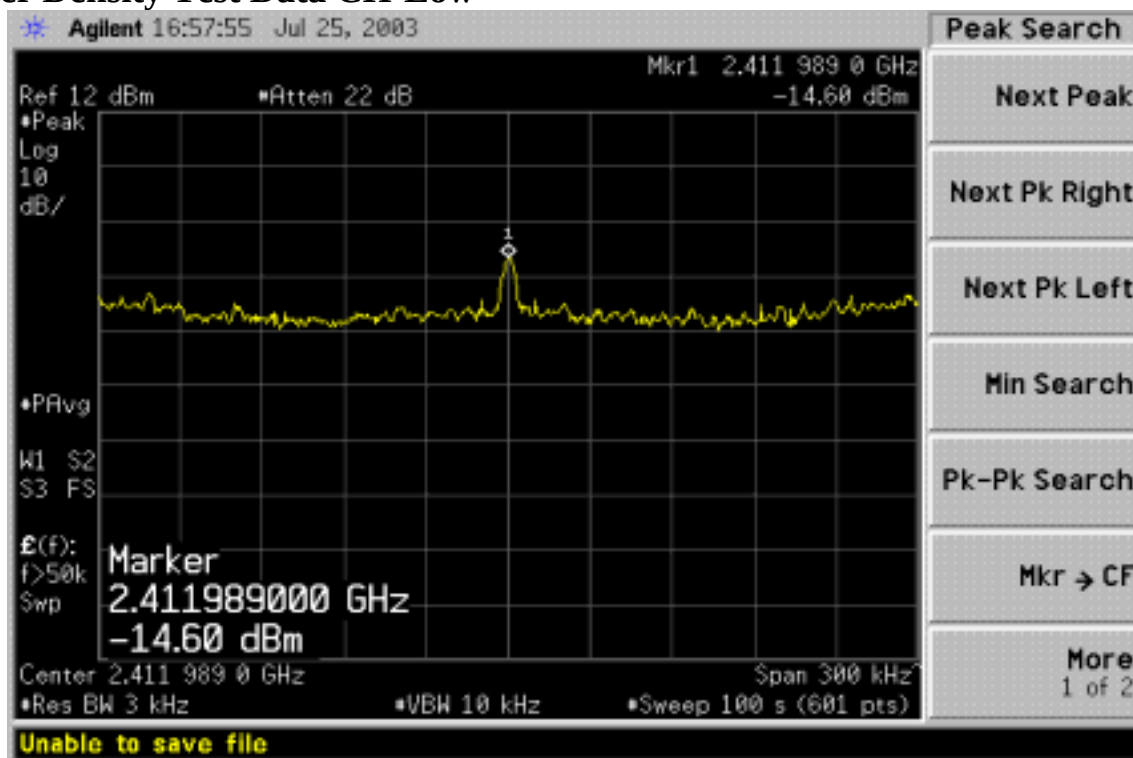
10.3 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	Model No.	Serial No.	LAST CAL.	Cal. Due.
Spectrum Analyzer	Advantest	R3182	110600647	11/16/2002	11/15/2003
Spectrum Analyzer	Agilent	E4446A	US42510252	04/28/2003	04/27/2004

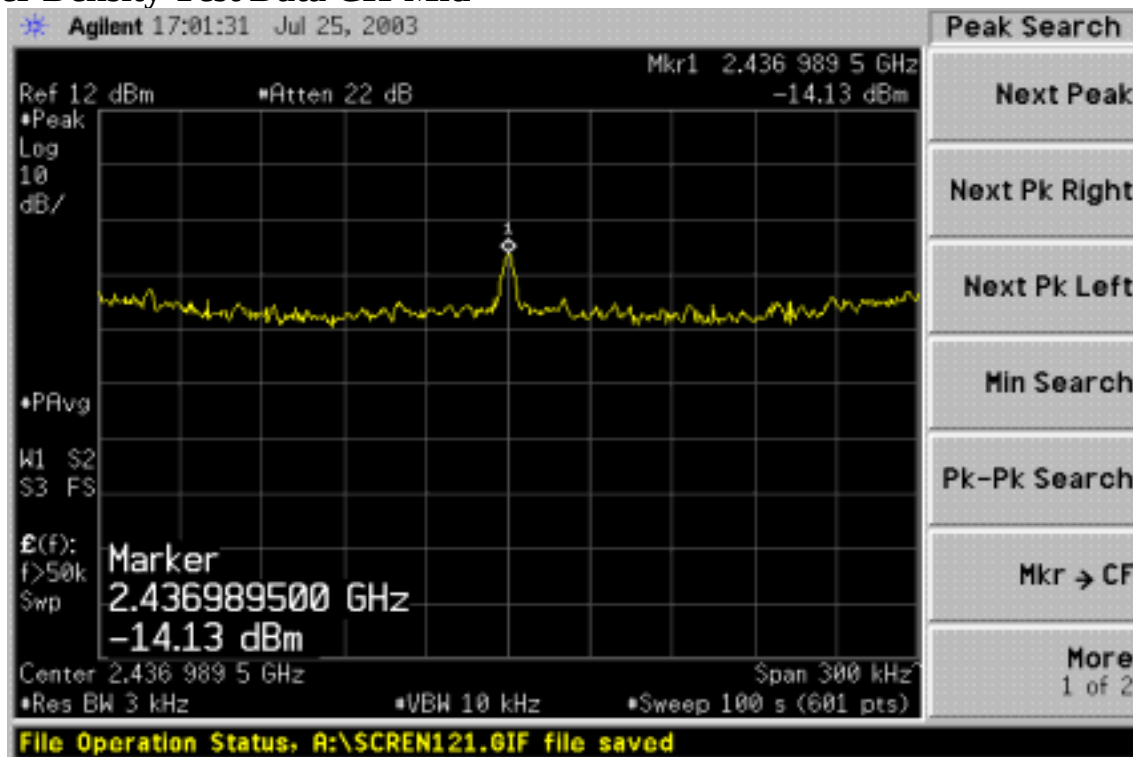
10.4 Measurement Result

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412.00	-14.60	8.00	-22.60
Mid	2437.00	-14.13	8.00	-22.13
High	2462.00	-14.67	8.00	-22.67

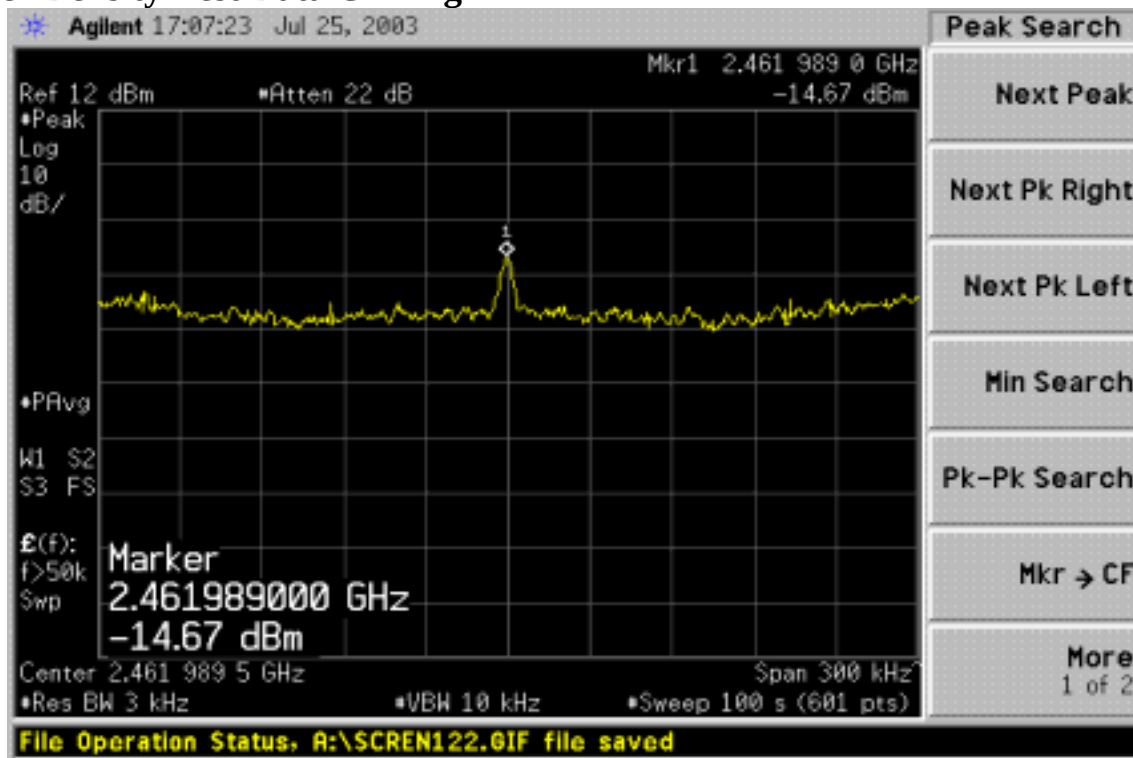
Power Density Test Data CH-Low



Power Density Test Data CH-Mid



Power Density Test Data CH-High



11. ANTENNA REQUIREMENT

11.1 Standard Applicable

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

And according to §15.247(i), if transmitting antennas of directional gain greater than 6dBi are used the power shall be reduced by the amount in 1dB that the directional gain of the antenna exceeds 6 dBi.

11.2 Antenna Connected Construction

The directional gins of antenna used for transmitting is 2.97dBi for Foxconn and -1.1dBi for Hannstar (IEEE802.11g) and one of the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

12. RF Exposure

12.1 Standard Applicable

According to §15.247(b)(4) 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.

This device is classed as a Mobile Device.

According to §1.1310 and §2.1093 RF exposure is calculated.

Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-15000	/	/	1.0	30

F = frequency in MHz

* = Plane-wave equipment power density

MPE Prediction

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal: 14.07(dBm)

Maximum peak output power at antenna input terminal: 25.52 (mW)

Antenna gain (typical): 2.97 (dBi)

Maximum antenna gain: 1.98 (numeric)

Prediction distance: 20 (cm)

Prediction frequency: 2412 (MHz)

MPE limit for uncontrolled exposure at prediction frequency: 1 (mW/cm²)

Power density at predication frequency at 3 (cm) distance

S	P	P	G	G	R
mW/cm ²	mW	dBm	dBi	(numeric)	cm
0.010068166	25.52701303	14.07	2.97	1.981527	20

12.1 Measurement Result

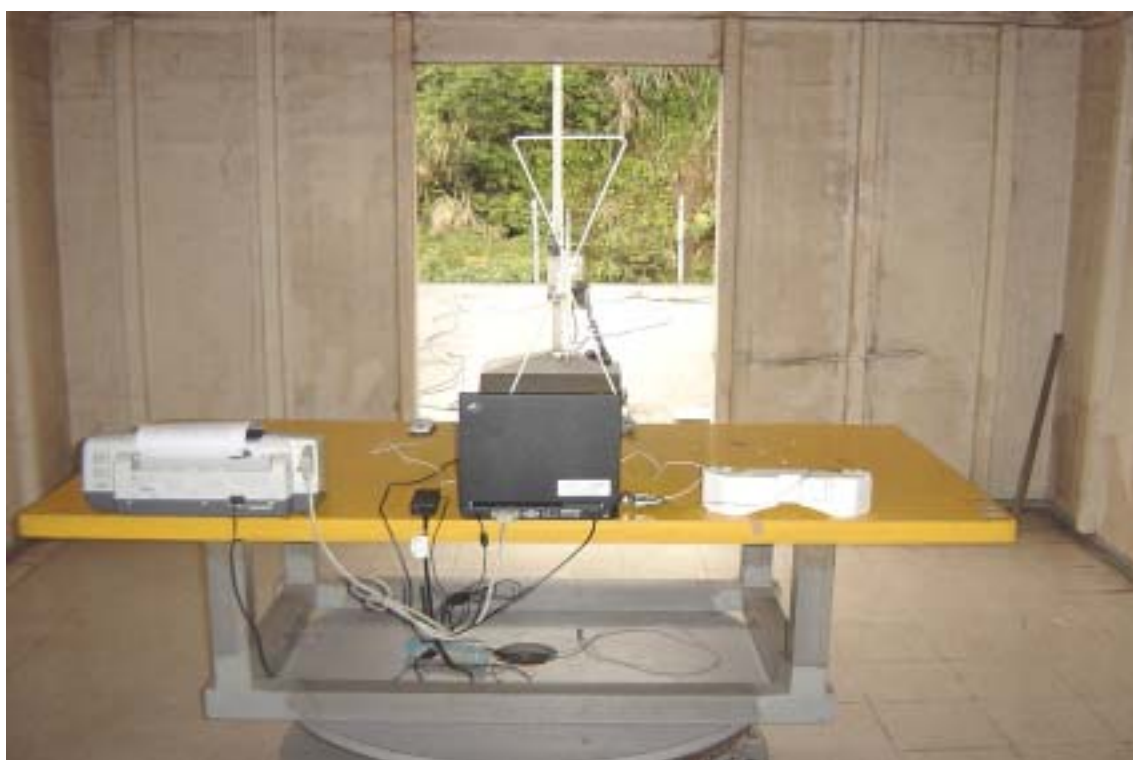
The predicted power density level at 20 cm is 01010068166 mW/cm². This is below the uncontrolled exposure limit of 1 mW/cm² at 2412MHz.

13. TERMS OF ABRIVATION

ACP	Adjecent Channel Power
ANSI	Americal National Standard Institute
Ant.	Antenna
AV.	Average detection
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
VBW	Video bandwidth
Vert.	Vertical direction

APPENDIX 1 PHOTOGRPHS OF SET UP

Radiated Emission Set up Photos



Conducted Emission Set Up Photos

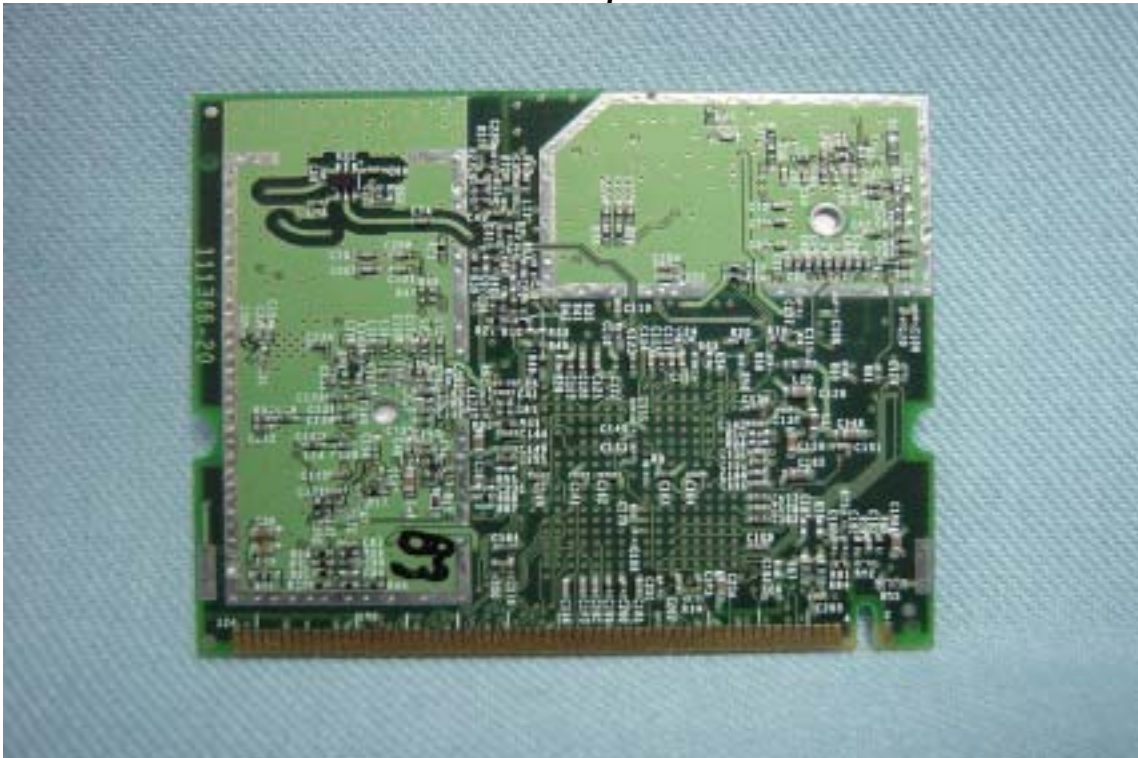


APPENDIX 2 EXTERNAL PHOTOGRPHS OF EUT

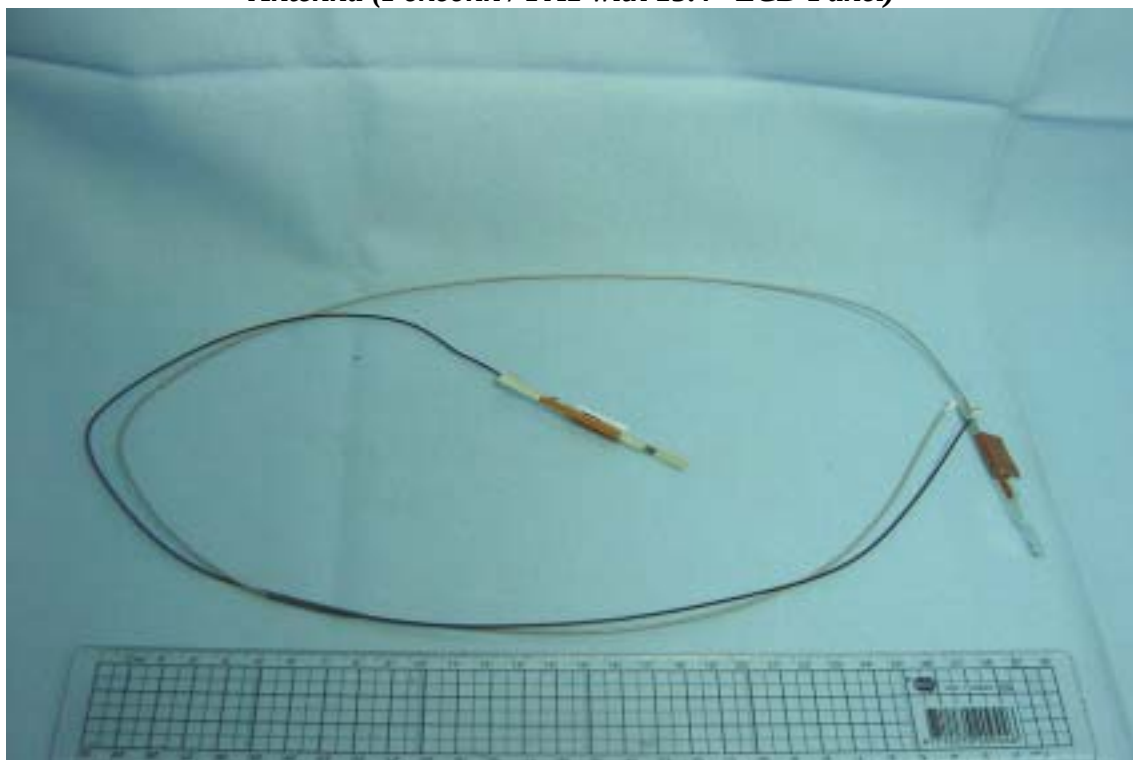
Front view of EUT



Back view of EUT



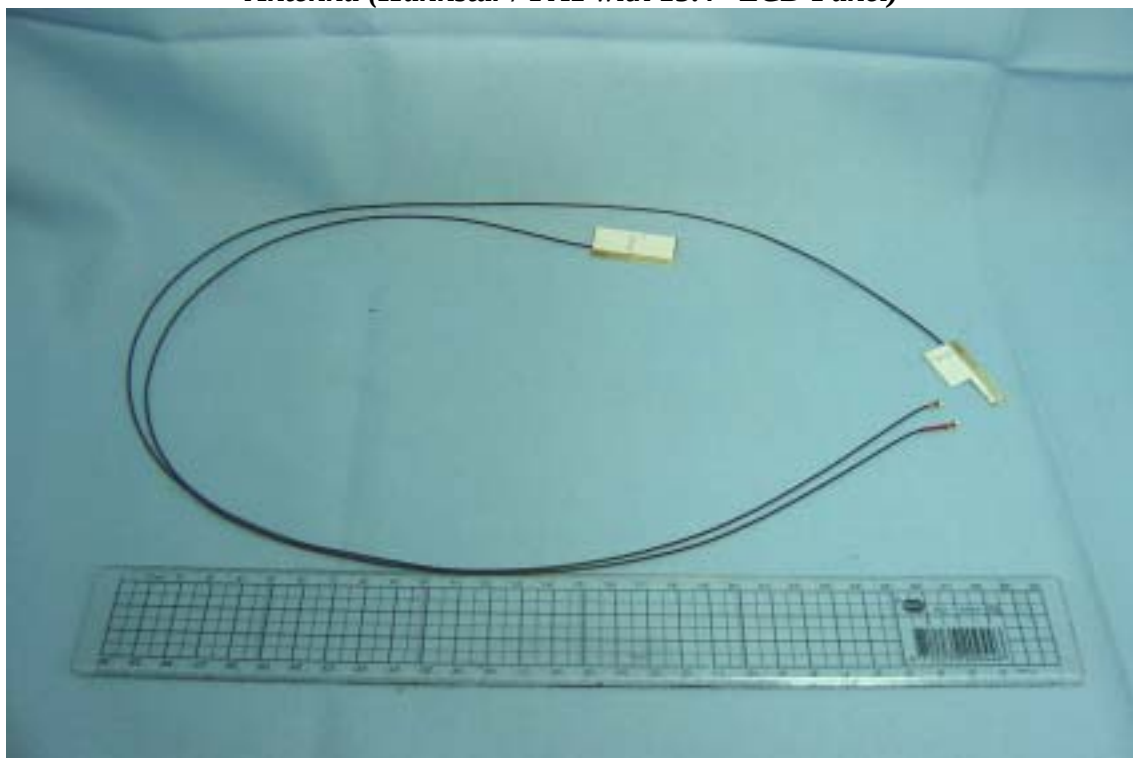
Antenna (Foxconn / PA1 with 15.4" LCD Panel)



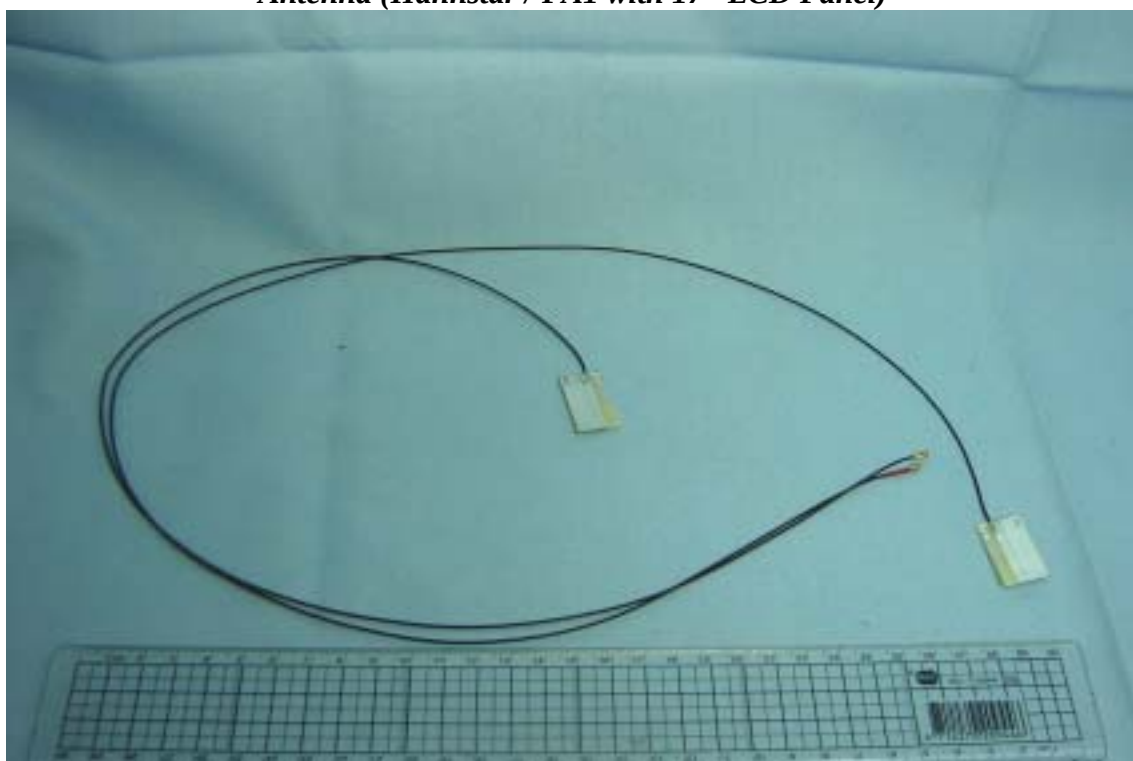
Antenna (Foxconn / OA5L with 14.1" LCD Panel)



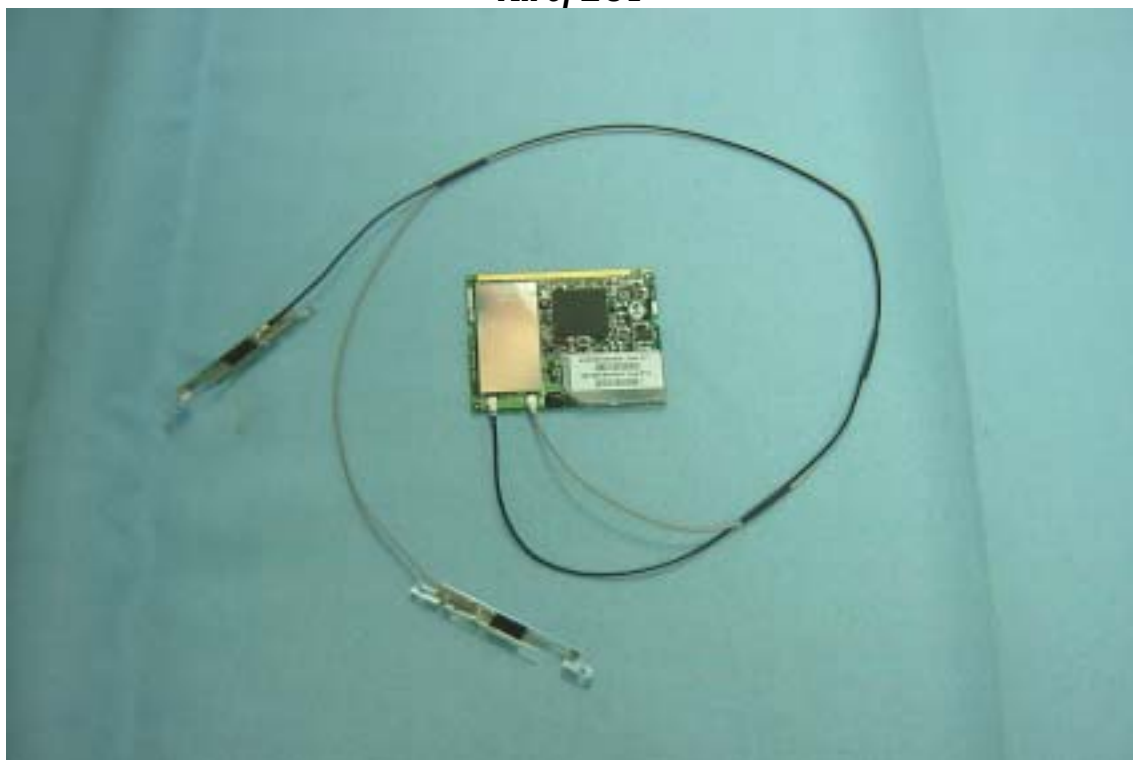
Antenna (Hannstar / PA1 with 15.4" LCD Panel)



Antenna (Hannstar / PA1 with 17" LCD Panel)



All of EUT



APPENDIX 3 INTERNAL PHOTOGRPHS OF EUT

Internal view of EUT --- 1

