

Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

## FCC TEST REPORT

for

Notebook MODEL:PTB50,AMILO Pa1538, AMILO Pa1539, PTB50 series, AMILO Pa1538-x series, AMILO Pa1539-x series, AMILO Pa1538 series, AMILO Pa1539 series

> Test Report Number: KS060803A01-RP

> > Issued for

First International Computer, Inc. No.300, YangGuang st., NeiHu, Taipei, Taiwan, 114

Issued by:

Compliance Certification Services Inc. Kun shan Laboratory

No.10 Wei Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, P.R.O.C TEL: 86-512-57355888

FAX: 86-512-57370818

Issued Date: August 19, 2006





Lab. Code: 200581-0

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FCC ID :EUNPTB50L



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### **Revision History**

Rev.	lssue Date	Revisions	Effect Page	Revised By
00		Initial Issue	ALL	



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Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

### 1 TEST CERTIFICATION

Product: Notebook

Model: PTB50,AMILO Pa1538, AMILO Pa1539, PTB50 series, AMILO Pa1538-x series, AMILO Pa1539-x series, AMILO Pa1538 series, AMILO Pa1539 series

Brand: FIC, FUJITSU SIEMENS COMPUTERS

Tested: August 16~18, 2006

Applicant: First international Computer, Inc.

No.300, YangGuang st., NeiHu, Taipei, 114

Manufacturer: FIC (Suzhou) Inc.

Export Processing Zone, No 200, Central Suhong Road, SuZhou Industrial Park JiangSu, P.R. China

### APPLICABLE STANDARDS

Standard	Test Type	Standard	Test Type
15.207(a)	Power Line Conducted Emissions	15.247(d) 15.209(a)	<ul> <li>Spurious Emissions</li> <li>Conducted Measurement</li> <li>Radiated Emissions</li> </ul>
15.247(a)(2)	6dB Bandwidth Measurement	15.247(b)(3) 15.247(b)(4)	Peak Power Measurement
15.247(d)	Band Edges Measurement	15.247(e)	Peak Power Spectral Density

#### DEVIATION FROM APPLICABLE STANDARD

None

The above equipment was tested by Compliance Certification Services Inc. 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**: 2003 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247.

**Reviewed by:** 

Approved by:

Tony Houng General Manager Compliance Certification Service Inc.

Miro Chueh Section Manger Compliance Certification Service Inc.

Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

### 2 TEST RESULT SUMMARY

### APPLICABLE STANDARDS

Standard	Test Type	Result	Remark					
15.247(a)(2)	6dB Bandwidth Measurement	Pass	Meet the requirement of limit.					
15.247(b)(3) 15.247(b)(4)	Peak Power Measurement	Pass	Meet the requirement of limit.					
15.247(d)	Band Edges Measurement	Pass	Meet the requirement of limit.					
15.247(e)	Peak Power Spectral Density	Pass	Meet the requirement of limit.					
15.247(d) 15.209(a)	<ul><li>Spurious Emissions</li><li>Conducted Measurement</li><li>Radiated Emissions</li></ul>	Pass	Meet the requirement of limit.					
15.207(a)	Power line Conducted Emissions	Pass	Meet the requirement of limit.					

Note: 1. The test result judgment is decided by the limit of test standard

2. The information of measurement uncertainty is available upon the customer's request.



### **3 EUT DESCRIPTION**

Product	Notebook
Trade Name	FIC, FUJITSU SIEMENS COMPUTERS
Model Number	PTB50, AMILO Pa1538, AMILO Pa1539
Model Discrepancy	All the above models are identical except the model designation for different market.
Serial Number	TB50 series, AMILO Pa1538-x series, AMILO Pa1539-x series, AMILO Pa1538 series, AMILO Pa1539 series
Wireless LAN module Model Number	WN6301A-F4
Wireless LAN module Brand name	Liteon
Received Date	August 18, 2006
Power Supply	Powered from Power Adapter
Power Adapter Power Rating	Powered from an AC/DC power adapter Model Number:(1) LSE0202D2090 Manufacturer: LISHIN Input: AC 100-240V, 50-60Hz, 1.5A Output: DC 20V, 4.5A Model Number:(2) ADP-90SB AD Manufacturer: Delta Input: AC 100-240V, 50-60Hz, 1.5A Output: DC 20V, 4.5A
AC Power Cord Type	Unshielded, 1.8m (Detachable) to Power Adapter
DC Power Cable Type	Unshielded, 1.8m (Non-Detachable) at Power Adapter with a core
Frequency Range	2412 ~ 2462 MHz
Transmit Power	IEEE 802.11b: 16.64 dBm IEEE 802.11g: 15.51 dBm
Modulation Technique	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: DSSS (CCK, DQPSK, DBPSK) + OFDM (QPSK, BPSK, 16-QAM, 64-QAM)
Transmit Data Rate	IEEE 802.11b: 11, 5.5, 2, 1 Mbps IEEE 802.11g: 54, 48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2, 1 Mbps
Number of Channels	11 Channels
Antenna Specification	PIFA antenna with 2.80dBi gain (Max)

**Note:** 1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.

2. This submittal(s) (test report) is intended for FCC ID: <u>EUNPTB50L</u> filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.

#### **TEST METHODOLOGY** 4

### **4.1. DESCRIPTION OF TEST MODES**

The EUT (model: PTB50) had been tested under operating condition.

The EUT (model: PTB50) comes with two types of adapter for sale. After the preliminary test, the EUT with adapter (Model: LSE0202D2090 and ADP-90SB AD) was found to emit the worst emissions and therefore had been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting mode was programmed.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz, which worst case was in normal link mode only.

IEEE802.11b: Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with preliminary test 11, 5.5, 2, and 1, After the preliminary scan, the following test mode 11Mbps highest data rate (the worst case) are chosen for the final testing.

IEEE802.11g: Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with preliminary test 54/48/36/24/18/12/9/6, After the preliminary scan, the following test mode 6Mbps data rate (the worst case) are chosen for the final testing.

### 5 SETUP OF EQUIPMENT UNDER TEST

#### **5.1. DESCRIPTION OF SUPPORT UNITS**

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Device Type	Brand Model		Series No.	FCC ID Data Cable		Power Cord	
1.	USB Keyboard	DELL	KU-9985	2D41500275B	ID NO.	Shielded, 1.2m	N/A	
2.	USB Mouse	HP	MO19UCA	020440964	ID NO.	Shielded, 1.8m	N/A	

#### Note:

1) All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2) Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

### 5.2. CONFIGURATION OF SYSTEM UNDER TEST

See test photographs attached in Appendix II for the actual connections between EUT and support equipment.

### **6** FACILITIES AND ACCREDITATIONS

### 6.1. FACILITIES

All measurement facilities used to collect the measurement data are located at

No.10Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, P.R.O.C

The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

### 6.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	FCC,NVLAP
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA,
Taiwan	TAF, BSMI, DGT

Copies of granted accreditation certificates are available for downloading from our web site, http://www.ccsemc.com.

### 6.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in ETR 028:

Measurement	Frequency	Uncertainty
Conducted emissions	9kHz~30MHz	+/- 2.15dB
Radiated emissions	30MHz ~ 200MHz	+/- 2.50dB
	200MHz ~1000MHz	+/- 2.50dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

#### LIMITS AND RESULTS 7

### 7.1. POWER LINE CONDUCTED EMISSIONS MEASUREMENT

#### 7.1.1. LIMITS OF CONDUCTED EMISSIONS MEASUREMENT

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range		nits βµV)
(MHz)	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 in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

(3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

#### **TEST INSTRUMENTS**

C	onducted Emiss	sion Test Site A (′	10m chamber)	
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESI26	100068	02/11/2007
EMC Analyzer	Agilent	E7402A	US41160329	02/11/2007
LISN	FCC	FCC-LISN-50-50-2-M	01067	02/11/2007
LISN (EUT)	FCC	FCC-LISN-50-50-2-M	01068	02/11/2007
FOUR BALANCED TELECOM PAIRS ISN	FCC	FCC-TLISN-T8-02	20165	07/30/2006
4-WIRE ISN	R&S	ENY41	830663/024	04/08/2007
Double 2-Wire ISN	R&S	ENY22	830661/027	04/08/2007
TRANSIENT LIMITER	SCHAFFNER	CFL9206	1710	03/15/2007
EMI Monitor control box	FCC	0-SVDC	N/A	05/11/2007

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. N.C.R = No Calibration Request.

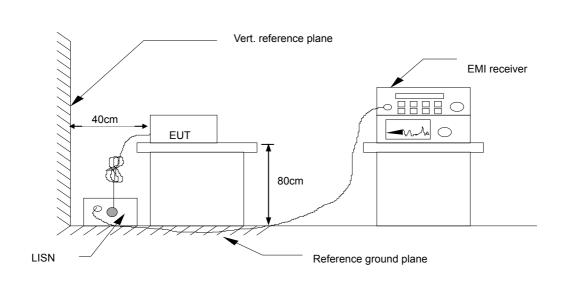
Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

#### 7.1.2. TEST PROCEDURES (please refer to measurement standard)

- The EUT and Support equipment, if needed, was placed on a non-conducted table, which is 0.8m above the ground plane and 0.4m away from the conducted wall.
- The test equipment EUT installed received AC main power, through a Line Impedance Stabilization Network (LISN), which supplied power source and was grounded to the ground plane. All support equipment power received from a second LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- The EUT test program was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
- The frequency range from 150 kHz to 30 MHz was searched. The test data of the worst-case condition(s) was recorded. Emission levels under limit 20dB were not recorded.

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#### 7.1.3. TEST SETUP



For the actual test configuration, please refer to the related item - Photographs of the Test Configuration.

#### 7.1.4. Data Sample:

Note

Frequency (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Correction factor (dB)	QP Result (dBuV)	AV Result (dBuV)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.20 37.58 35.11 0.10 37.68 35.21 63.49 53.49 -25.81 -18.28 I								L1		
Frequency Reading ( Correction Limit (dBu Margin (dB	dBuV) ´ i factor (c V)	IB)	= Emissio = Uncorro = Insertic = Limit st = Readin	ected An on loss of ated in s	alyzer/R f LISN tandard	eceiver r	eading			

= Current carrying line of reading

# 

Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

#### 7.1.5. TEST RESULTS

Model No			PTB50 Test Mode			Normal Link					
Environm	ental Co	nditions	25deg.	25deg.C, 65% RH, 991 hPa				dB BAND	WIDTH	9 kHz	
Tested by	<b>/:</b>		Spring				FOR FSC DELTA ADAPTER				2
rrequenc v (KHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB)	QP Result (dBuV)	AV Result (dBuV)	QP Limi (dBu)	t	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
152.2	19.62	16.6	10.38	30	26.98	65.94	4	55.94	-35.94	-28.96	L1
627.3	3.1	4.9	10.41	13.51	15.31	56.00	0	46.00	-42.49	-30.69	L1
1432.2	10.33	9.64	10.46	20.79	20.1	56.00	0	46.00	-35.21	-25.90	L1
2391.1	12.52	12.89	10.54	23.06	23.43	56.00	0	46.00	-32.94	-22.57	L1
6916.1	15.37	13.22	10.88	26.25	24.1	60.00	0	50.00	-33.75	-25.90	L1
22475.1	10.8	9.02	12.55	23.35	21.57	60.00	0	50.00	-36.65	-28.43	L1
153.7	25.71	22.34	10.42	36.13	32.76	65.89	9	55.89	-29.76	-23.13	L2
460.8	18.4	18.74	10.39	28.79	29.13	57.12	2	47.12	-28.33	-17.99	L2
603.25	14.76	15.61	10.4	25.16	26.01	56.00	0	46.00	-30.84	-19.99	L2
1413.55	7.17	7.46	10.45	17.62	17.91	56.00	0	46.00	-38.38	-28.09	L2
2418.1	16.51	15.76	10.53	27.04	26.29	56.00	0	46.00	-28.96	-19.71	L2
24903.363	16.83	10.78	13.29	30.12	24.07	60.00	0	50.00	-29.88	-25.93	L2
REMARI	<b>KS:</b> L1 =	Line One	e (Live I	Line) / L2	= Line T	wo (N	eı	utral Line)			
Model No	-		PTB50				T	est Mode		Normal	Link
Environm	ental Co	nditions	25deg.	C, 65% F	RH, 991 h	Pa	6dB BANDWIDTH			9 kHz	
Tested by	<b>/:</b>		Spring				F	OR FSC L	I SHIN A	DAPTER	र

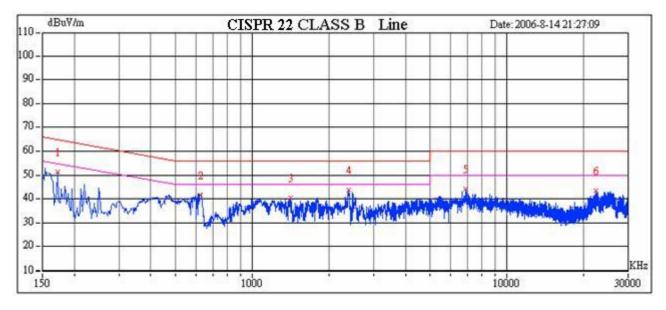
(KHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB)	QP Result (dBuV)	AV Result (dBuV)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
211.6	17.45	16.8	10.36	27.81	27.16	64.24	54.24	-36.43	-27.08	L1
311	10.1	11.81	10.4	20.5	22.21	61.40	51.40	-40.90	-29.19	L1
616.2	10.02	5.95	10.41	20.43	16.36	56.00	46.00	-35.57	-29.64	L1
1060	7.74	5.69	10.43	18.17	16.12	56.00	46.00	-37.83	-29.88	L1
2009.5	3.54	5.39	10.51	14.05	15.9	60.00	50.00	-45.95	-34.10	L1
12401.8	21.43	20.82	11.47	32.9	32.29	60.00	50.00	-27.10	-17.71	L1
164.8	12.54	12.69	10.41	22.95	23.1	65.58	55.58	-42.63	-32.48	L2
211.1	12.26	11.12	10.39	22.65	21.51	64.25	54.25	-41.60	-32.74	L2
611.2	3.96	3.01	10.4	14.36	13.41	56.00	46.00	-41.64	-32.59	L2
1154.2	6.18	7.73	10.43	16.61	18.16	56.00	46.00	-39.39	-27.84	L2
1977.6	9.67	9.88	10.5	20.17	20.38	56.00	46.00	-35.83	-25.62	L2
12611.8	17.35	16.46	11.66	29.01	28.12	60.00	50.00	-30.99	-21.88	L2

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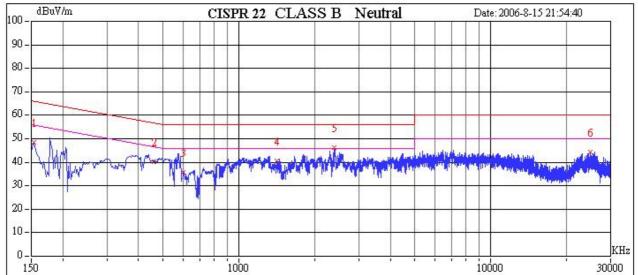
Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

#### Test Plots(FOR FSC DELTA ADAPTER)

#### Conducted emissions (Line 1)



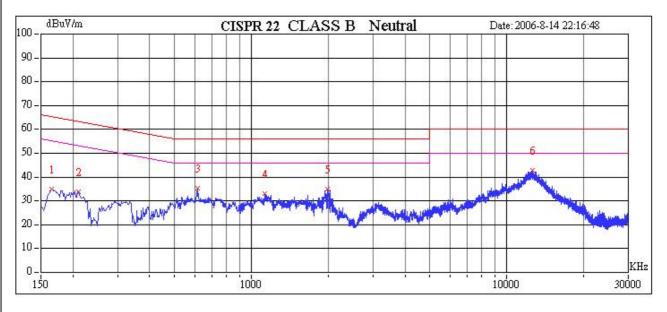
#### Conducted emissions (Line 2)



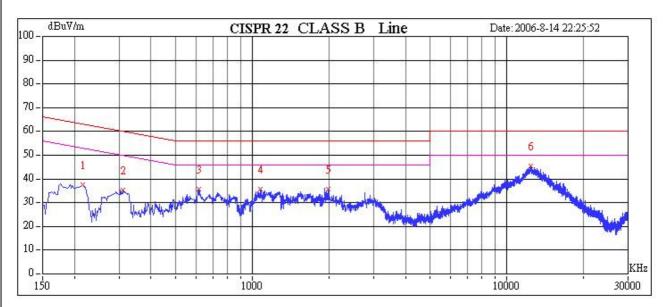
Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

#### Test Plots(FOR FSC LI SHIN ADAPTER)

#### Conducted emissions (Line 1)



#### Conducted emissions (Line 2)



### 7.2. SPURIOUS EMISSIONS MEASUREMENT

#### 7.2.1. LIMITS OF CONDUCTED EMISSIONS MEASUREMENT

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. 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) (see Section 15.205(c)).

#### 7.2.2. TEST INSTRUMENTS

Conducted Emissions Test Site						
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due		
Spectrum Analyzer	Agilent	E4446A	MY44020154	08/15/2007		
Spectrum Analyzer	Agilent	E4446A	US44300398	07/25/2007		

#### 7.2.3. TEST PROCEDURE (please refer to measurement standard)

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 or measurements on the radiated emissions site. The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 100 kHz.

Measurements are made over the 30MHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels.

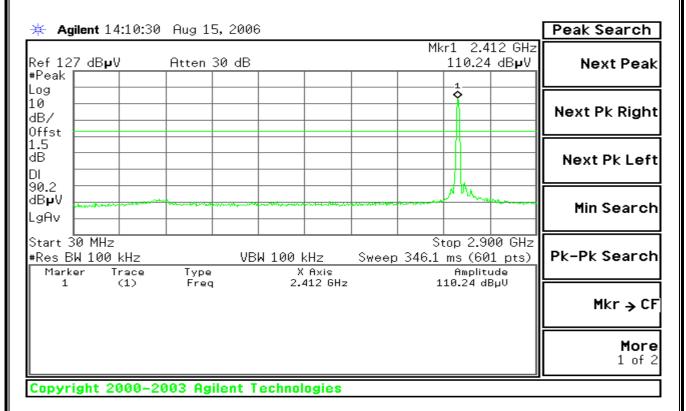
Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

#### 7.2.4. TEST RESULTS

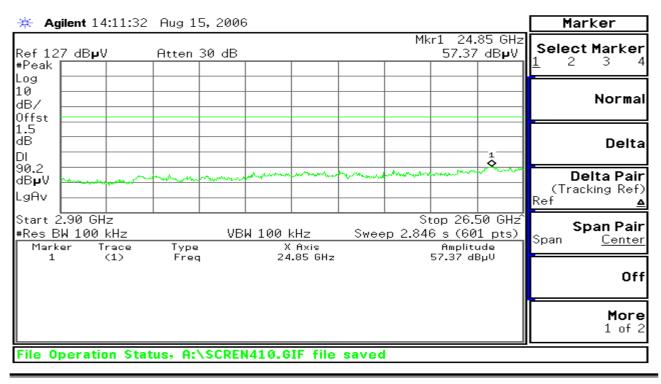
Test Plot (IEEE 802.11b mode)

#### CH Low

#### 30MHz ~ 2.9GHz



#### 2.9GHz ~ 26.5GHz



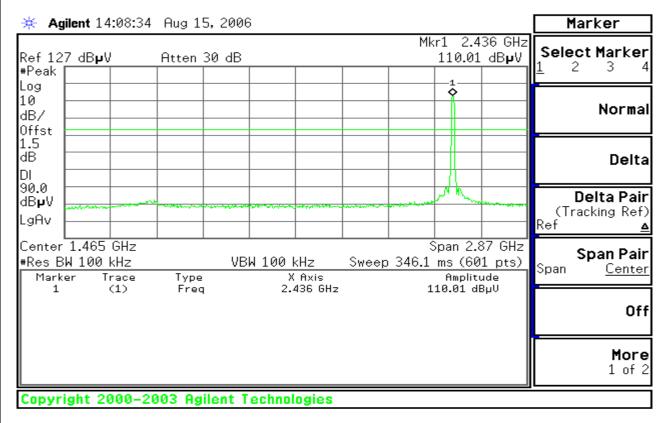
#### FCC ID : EUNPTB50L

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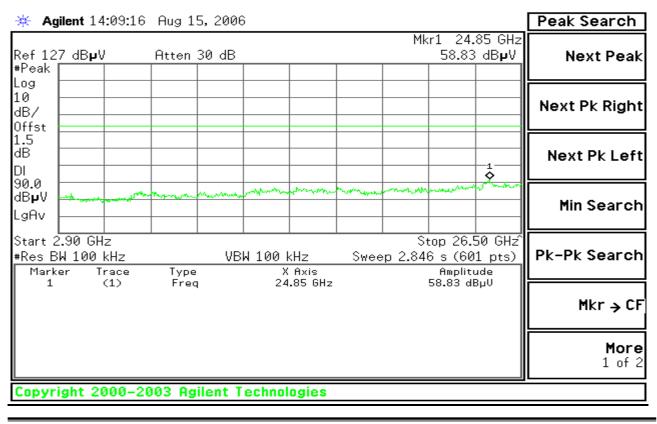
Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

#### **CH Mid**

#### 30MHz ~ 2.9GHz



#### 2.9GHz ~ 26.5GHz



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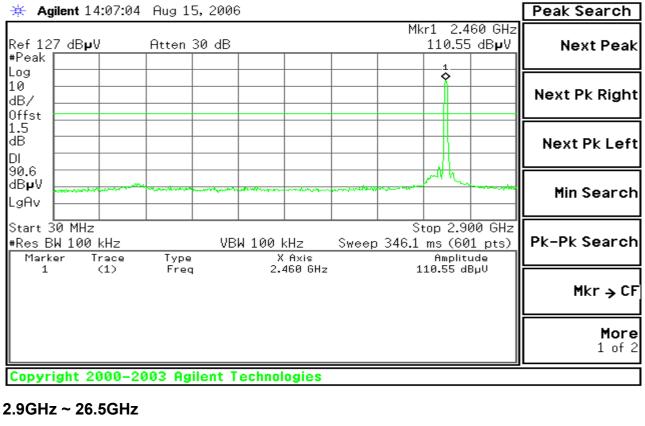
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#### <u>CH High</u>

#### 30MHz ~ 2.9GHz

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Peak Search		3:15 Aug 15, 2006	gilent 14:06:1!
Mkr1 24.93 GHz 57.81 dBµV Next Pea		Atten 30 dB	27 dBµV
Next Pk Righ			
Next Pk Lef			
Min Search		. man manual	······································
Stop 26.50 GHz Sweep 2.846 s (601 pts) Amplitude	100 kHz X Axis		L 2.90 GHz 3W 100 kHz ker Trace
57.81 dBμV Mkr → C	24.93 GHz		(1)
Mor 1 of			
Mo	chnologies	3-2003 Agilent To	ight 2000-2

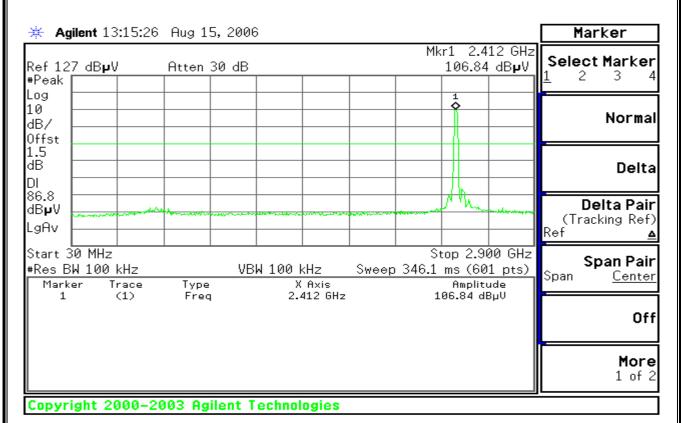
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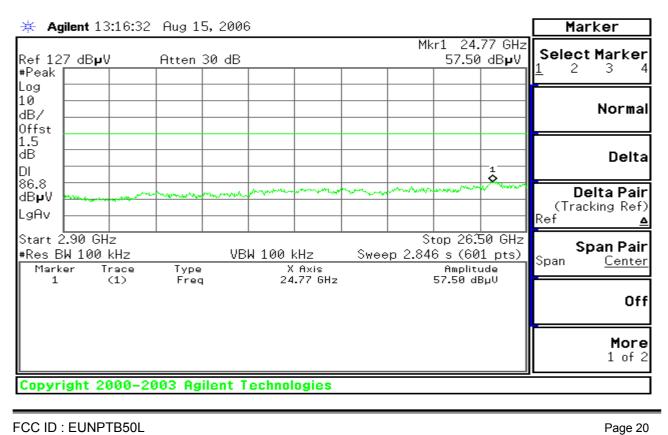
#### Test Plot (IEEE 802.11g mode)

<u>CH Low</u>

#### 30MHz ~ 2.9GHz



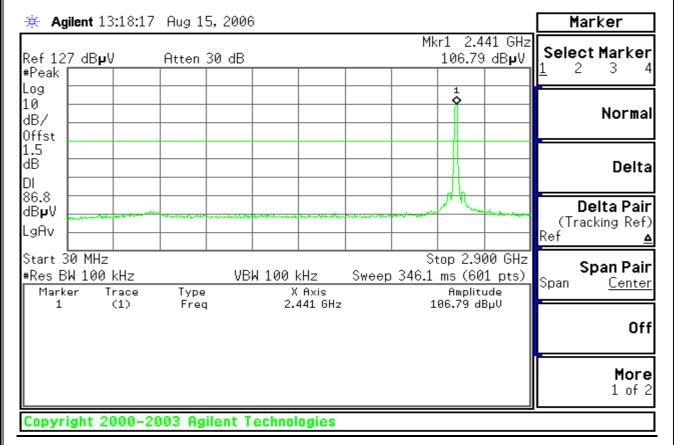
#### 2.9GHz ~ 26.5GHz



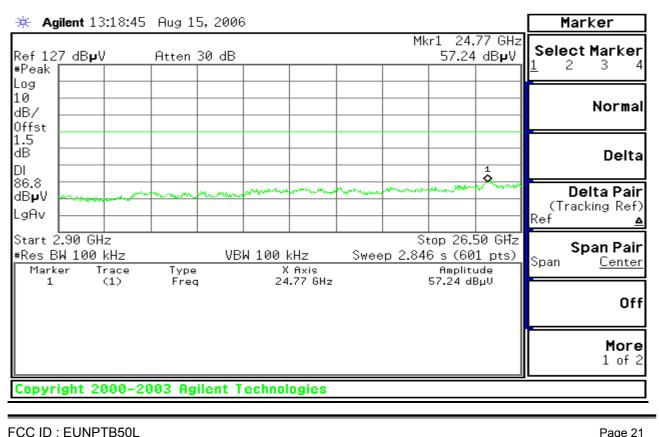
Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

#### CH Mid

#### 30MHz ~ 2.9GHz



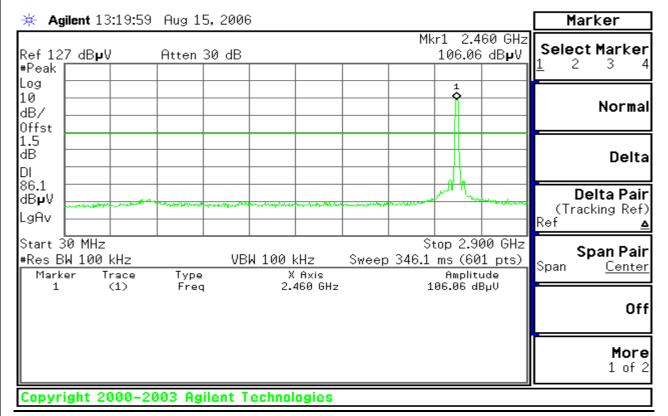
#### 2.9GHz ~ 26.5GHz



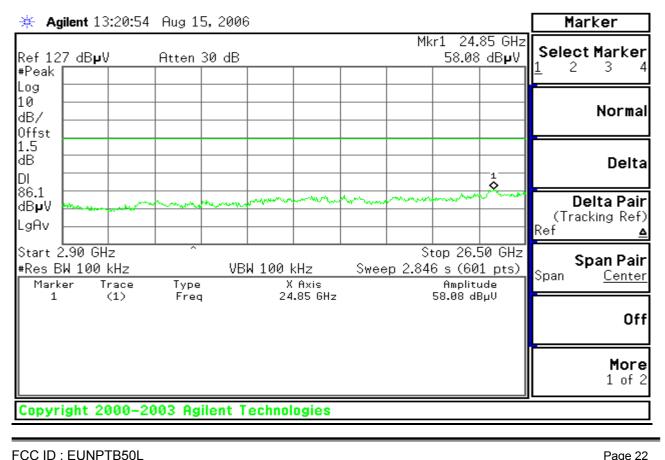
Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

#### <u>CH High</u>

#### 30MHz ~ 2.9GHz



#### 2.9GHz ~ 26.5GHz



#### 7.2.5. Radiated Emissions

#### 7.2.5.1. LIMITS OF RADIATED EMISSIONS MEASUREMENT

1. According to §15.209(a), except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (µV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

**Remark:** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

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

Frequency (MHz)	Field Strength (µV/m at 3-meter)	Field Strength (dBµV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

NOTE: (1) The lower limit shall apply at the transition frequencies.

(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).



#### 7.2.5.2. TEST INSTRUMENTS

3M Semi Anechoic Chamber (977)						
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due		
Spectrum Analyzer	Agilent	E4446A	MY44020154	08/15/2007		
Spectrum Analyzer	Agilent	E4446A	US44300398	07/25/2007		
EMI Test Receiver	R&S	ESPI3	101026	11/11/2006		
Pre-Amplfier	MINI	ZFL-1000VH2	d041703	12/13/2006		
Pre-Amplfier	Miteq	NSP4000-NF	870731	01/28/2007		
Bilog Antenna	Sunol	JB1	A110204-2	11/22/2006		
Horn-antenna	SCHWARZBECK	BBHA9120D	D:266	02/01/2007		
PSG Analog Signal Generator	Agilent	E8257C	MY43321570	12/19/2006		
Turn Table	СТ	CT123	4165	N.C.R		
Antenna Tower	СТ	CTERG23	3256	N.C.R		
Controller	СТ	CT100	95637	N.C.R		
Site NSA	CCS	N/A	N/A	04/06/2007		

**NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The FCC Site Registration number is 93105,90471.

4. N.C.R = No Calibration Required.

7.2.5.3. TEST PROCEDURE (please refer to measurement standard)

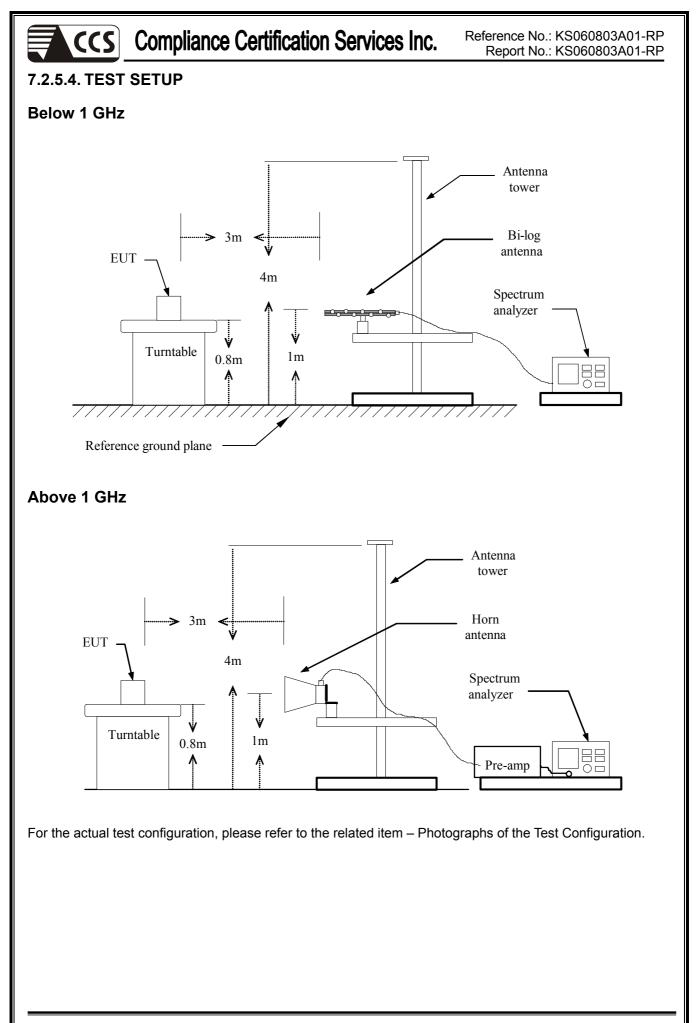
- 1. The EUT is placed on a turntable, which is 0.8m above ground plane.
- 2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 4. Maximum 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. Set the spectrum analyzer in the following setting as:

Below 1GHz:

RBW=100kHz / VBW=300kHz / Sweep=AUTO

Above 1GHz:

- (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
- (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
- 7. Repeat above procedures until the measurements for all frequencies are complete.





#### 7.2.5.5. Data Sample:

#### Below 1 GHz

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Remark) (dBuV)	Correction Factor (dB/m)	Result (Remark) (dBuV/m)	Limit (QP) (dBuV/m)	Margin (dB)	Remark
	V						Peak

#### Above 1 GHz

Freque (MHz		Ant.Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	· · · /	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1603.	00	V	65.45	63.00	-11.12	54.33	51.88	74.00	54.00	-2.12	AVG

	Frequency (MHz) Ant.Pol. (H/V) Reading (dBuV) Correction Factor (dB/m) Result (dBuV/m) Limit (dBuV/m) Margin (dB) Peak QP AVG	<ul> <li>= Emission frequency in MHz</li> <li>= Antenna polarization</li> <li>= Uncorrected Analyzer / Receiver reading</li> <li>= Antenna factor + Cable loss – Amplifier gain</li> <li>= Reading (dBuV) + Correction Factor (dB/m)</li> <li>= Limit stated in standard</li> <li>= Remark Result (dBuV/m) – Limit (dBuV/m)</li> <li>= Peak Reading</li> <li>= Quasi-peak Reading</li> <li>= Average Reading</li> </ul>
--	--	---

Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

#### 7.2.5.6. TEST RESULTS

#### Below 1 GHz

<b>Operation Mode:</b>	Normal Link
Temperature:	20°C
Humidity:	70 % RH

Test Date:	August 16, 2006
Tested by:	Spring
Polarity:	Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (QP) (dBuV/m)	Margin (dB)	Remark
77.67	V	30.15	-5.71	24.44	40.00	-15.56	Peak
146.87	V	30.42	-1.50	28.92	43.50	-14.58	Peak
323.85	V	31.78	-2.29	29.49	46.00	-16.51	Peak
431.86	V	32.64	3.35	35.99	46.00	-10.01	Peak
539.88	V	34.48	3.16	37.64	46.00	-8.36	Peak
757.31	V	29.75	8.82	38.57	46.00	-7.43	Peak
83.57	Н	30.78	-7.17	23.61	40.00	-16.39	Peak
182.58	Н	26.72	-4.90	21.82	43.50	-21.68	Peak
216.67	Н	28.43	-5.09	23.34	46.00	-22.66	Peak
431.86	Н	30.47	-2.17	28.30	46.00	-17.70	Peak
539.88	Н	35.54	2.16	37.70	46.00	-8.30	Peak
751.70	Н	29.27	2.70	31.97	46.00	-14.03	Peak

- 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/quasi-peak detector mode.
- 3. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
- 4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
- 5. Margin (dB) = Remark result (dBuV/m) Quasi-peak limit (dBuV/m).

Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

#### Above 1 GHz

<b>Operation Mode:</b>	TX / IEEE 802.11b / CH Low					
Temperature:	20°C					
Humidity:	70 % RH					

Test Date:	August 16, 2006
Tested by:	Spring
Polarity:	Ver. / Hor.

Frequency	Ant.Pol.	Reading	Reading	Correction Factor	Result	Result	Limit	Limit	Margin	Remark
(MHz)	(H/V)	(Peak)	(Average)	(dB/m)	(Peak)	(Average)	(Peak)	(Average)	(dB)	Kennark
		(dBuV)	(dBuV)		(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)		
3891.67	V	35.71		8.03	43.74		74.00	54.00	-30.26	Peak
4824.25	V	32.47		9.65	42.12		74.00	54.00	-31.88	Peak
7315.36	V	34.35		15.32	49.67		74.00	54.00	-24.33	Peak
N/A										Peak
N/A										Peak
N/A										Peak
3725.00	Н	36.45		7.85	44.3		74.00	54.00	-29.7	Peak
4875.00	Н	35.67		10.51	46.18		74.00	54.00	-27.82	Peak
7341.67	Н	34.47		15.93	50.4		74.00	54.00	-23.6	Peak
N/A										Peak
N/A										Peak
N/A										Peak

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
- 3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
- 4. 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.
- Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
- 6. Margin (dB) = Remark result (dBuV/m) Average limit (dBuV/m).

Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

Operation Mode:	TX / IEEE 802.11b / CH Mid					
Temperature:	20°C					
Humidity:	70 % RH					

Test Date:August 16, 2006Tested by:SpringPolarity:Ver. / Hor.

Frequency	Ant.Pol.	Reading	Reading	Correction Factor	Result	Result	Limit	Limit	Margin	
(MHz)	(H/V)	(Peak)	(Average)	(dB/m)	(Peak)	(Average)	(Peak)	(Average)	(dB)	Remark
		(dBuV)	(dBuV)		(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)		
3862.25	V	36.46		8.03	44.49		74.00	54.00	-29.51	Peak
4883.33	V	33.76		10.56	44.32		74.00	54.00	-29.68	Peak
7375.00	V	30.57		16.11	46.68		74.00	54.00	-27.32	Peak
N/A										Peak
N/A										Peak
N/A										Peak
3725.00	Н	36.69		7.85	44.54		74.00	54.00	-29.46	Peak
4875.00	Н	35.49		10.51	46		74.00	54.00	-28	Peak
7341.67	Н	30.47		15.93	46.4		74.00	54.00	-27.6	Peak
N/A										Peak
N/A										Peak
N/A										Peak

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
- 3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
- 4. 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.
- Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
- 6. Margin (dB) = Remark result (dBuV/m) Average limit (dBuV/m).

Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

<b>Operation Mode:</b>	TX / IEEE 802.11b / CH High	-
Temperature:	20°C	-
Humidity:	70 % RH	l l

Test Date:August 16, 2006Tested by:SpringPolarity:Ver. / Hor.

Frequency	Ant.Pol.	Reading	Reading	Correction Factor	Result	Result	Limit	Limit	Margin	
(MHz)	(H/V)	(Peak)	(Average)	(dB/m)	(Peak)	(Average)	(Peak)	(Average)	(dB)	Remark
		(dBuV)	(dBuV)		(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)		
3862.25	V	37.48		8.03	45.51		74.00	54.00	-28.49	Peak
4883.33	V	36.08		10.56	46.64		74.00	54.00	-27.36	Peak
7375.00	V	29.59		16.11	45.7		74.00	54.00	-28.3	Peak
N/A										Peak
N/A										Peak
N/A										Peak
3725.00	Н	39.49		7.85	47.34		74.00	54.00	-26.66	Peak
4875.00	Н	34.02		10.51	44.53		74.00	54.00	-29.47	Peak
7341.67	Н	29.85		15.93	45.78		74.00	54.00	-28.22	Peak
N/A										Peak
N/A										Peak
N/A										Peak

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
- 3. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
- 4. 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.
- Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
- 6. Margin (dB) = Remark result (dBuV/m) Average limit (dBuV/m).

Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

#### Above 1 GHz

<b>Operation Mode:</b>	TX / IEEE 802.11g / CH Low
Temperature:	20°C
Humidity:	70 % RH

Test Date:	August 16, 2006						
Tested by:	Spring						
Polarity:	Ver. / Hor.						

Frequency (MHz)	Ant.Pol. (H/V)	Reading (Peak)	Reading (Average)	Correction Factor (dB/m)	Result (Peak)	Result (Average)	Limit (Peak)	Limit (Average)	Margin (dB)	Remark
		(dBuV)	(dBuV)		(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)		
3782.96	V	36.44		8.03	44.47		74.00	54.00	-29.53	Peak
4825.36	V	35.82		9.65	45.47		74.00	54.00	-28.53	Peak
7248.25	V	30.38		15.32	45.7		74.00	54.00	-28.3	Peak
N/A										Peak
N/A										Peak
N/A										Peak
3775.00	Н	34.25		7.85	42.1		74.00	54.00	-31.9	Peak
4825.36	Н	35.02		10.51	45.53		74.00	54.00	-28.47	Peak
7246.52	Н	29.36		15.93	45.29		74.00	54.00	-28.71	Peak
N/A										Peak
N/A										Peak
N/A										Peak

- 7. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 8. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
- 9. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
- 10. 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.
- 11. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
- 12. Margin (dB) = Remark result (dBuV/m) Average limit (dBuV/m).

Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

Operation Mode:	TX / IEEE 802.11g / CH Mid
Temperature:	20°C
Humidity:	70 % RH

Test Date:August 16, 2006Tested by:SpringPolarity:Ver. / Hor.

Frequency	Ant.Pol.	Reading	Reading	Correction Factor	Result	Result	Limit	Limit	Margin	
(MHz)	(H/V)	(Peak)	(Average)	(dB/m)	(Peak)	(Average)	(Peak)	(Average)	(dB)	Remark
		(dBuV)	(dBuV)		(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)		
3775.00	V	36.44		8.03	44.47		74.00	54.00	-29.53	Peak
4883.33	V	35.82		10.56	46.38		74.00	54.00	-27.62	Peak
7325.00	V	28.21		16.11	44.32		74.00	54.00	-29.68	Peak
N/A										Peak
N/A										Peak
N/A										Peak
3783.33	Н	36.58		7.85	44.43		74.00	54.00	-29.57	Peak
4875.00	Н	36.16		10.51	46.67		74.00	54.00	-27.33	Peak
7333.33	Н	29.21		15.93	45.14		74.00	54.00	-28.86	Peak
N/A										Peak
N/A										Peak
N/A										Peak

- 7. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 8. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
- 9. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
- 10. 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.
- 11. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
- 12. Margin (dB) = Remark result (dBuV/m) Average limit (dBuV/m).

Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

Operation Mode:	TX / IEEE 802.11g / CH High	Test Date:	August 16, 2006
Temperature:	20°C	Tested by:	Spring
Humidity:	70 % RH	Polarity:	Ver. / Hor.

Frequency	Ant.Pol.	Reading	Reading	Correction Factor	Result	Result	Limit	Limit	Margin	Remark
(MHz)	(H/V)	(Peak) (dBuV)	(Average) (dBuV)	(dB/m)	(Peak) (dBuV/m)	(Average) (dBuV/m)	(Peak) (dBuV/m)	(Average) (dBuV/m)	(dB)	Keinark
3725.35	V	38.74		8.03	46.77		74.00	54.00	-27.23	Peak
4941.67	V	37.42		10.56	47.98		74.00	54.00	-26.02	Peak
7341.67	V	34.57		16.11	50.68		74.00	54.00	-23.32	Peak
N/A										Peak
N/A										Peak
N/A										Peak
3875.56	Н	41.57		7.85	49.42		74.00	54.00	-24.58	Peak
4941.67	Н	38.41		10.51	48.92		74.00	54.00	-25.08	Peak
7341.67	Н	30.45		15.93	46.38		74.00	54.00	-27.62	Peak
N/A										Peak
N/A										Peak
N/A										Peak

- 7. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 8. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
- 9. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
- 10. 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.
- 11. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
- 12. Margin (dB) = Remark result (dBuV/m) Average limit (dBuV/m).



### 7.3. 6dB BANDWIDTH MEASUREMENT

#### 7.3.1. LIMITS

According to §15.247(a)(2), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

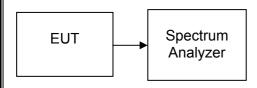
#### 7.3.2. TEST INSTRUMENTS

Conducted Emissions Test Site						
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due		
Spectrum Analyzer	Agilent	E4446A	MY44020154	08/15/2007		
Spectrum Analyzer	Agilent	E4446A	US44300398	07/25/2007		

#### 7.3.3. TEST PROCEDURES (please refer to measurement standard)

- 1. Place the EUT on the table and set it in the 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 = 50MHz, Sweep = auto.
- 4. Mark the peak frequency and –6dB (upper and lower) frequency.
- 5. Repeat until all the rest channels are investigated.

#### 7.3.4. TEST SETUP



# 

#### 7.3.5. TEST RESULTS

No non-compliance noted

#### <u>Test Data</u>

#### Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	11732		PASS
Mid	2437	12143	>500	PASS
High	2462	12155		PASS

#### <u>Test Data</u>

#### Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Test Result
Low	2412	16412		PASS
Mid	2437	16385	>500	PASS
High	2462	16394		PASS

# 

Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

#### Test Plot (IEEE 802.11b mode)

#### 6dB Bandwidth (CH Low)

🔆 Agilent 13:02:41 Aug 15, 2006	Meas Setup
Ch Freq 2.412 GHz Trig Free	Avg Number
Occupied Bandwidth	10 On <u>Off</u>
	Avg Mode Exp Repeat
Ref 20 dBm Atten 30 dB #Peak _og 10	Max Hold On Off
dB/ Dffst	0cc BW % Pwr 99.00 %
dB Center 2.412 00 GHz Page PU 100 kHz Span 20 MHz Span 20 MHz Span 20 MHz	<b>OBW Span</b> 20.0000000 MHz
*Res BW 100 kHz         *VBW 100 kHz         Sweep 2.44 ms (601 pts)           Occupied Bandwidth         Occ BW % Pwr         99.00 %           15.3012 MHz         × dB         -6.00 dB	<b>x dB</b> -6.00 dB
Transmit Freq Error –15.987 kHz x dB Bandwidth 11.732 MHz	Optimize RefLevel
copyright 2000-2003 Hynent Technologies	
dB Bandwidth (CH Mid) Agilent 13:03:45 Aug 15, 2006	Meas Setup
dB Bandwidth (CH Mid)	Avg Number
dB Bandwidth (CH Mid)	Avg Number 10
dB Bandwidth (CH Mid) Agilent 13:03:45 Aug 15, 2006 Ch Freq 2.437 GHz Trig Free	Avg Number 10
dB Bandwidth (CH Mid)	Avg Number 10 On <u>Off</u> Avg Mode
dB Bandwidth (CH Mid)	Avg Number 10 On <u>Off</u> Avg Mode Exp Repeat Max Hold
dB Bandwidth (CH Mid)	Avg Number 10 0n <u>Off</u> Avg Mode Exp Repeat Max Hold On Off Occ BW % Pwr
dB Bandwidth (CH Mid)	Avg Number 10 0n <u>Off</u> Avg Mode Exp Repeat Max Hold 0n Off Occ BW % Pwr 99.00 % 20.0000000 MHz x dB
dB Bandwidth (CH Mid)	Avg Number 10 0n <u>Off</u> Avg Mode Exp Repeat Max Hold On Off Occ BW % Pwr 99.00 % OBW Span
dB Bandwidth (CH Mid)         ** Agilent 13:03:45 Aug 15, 2006         Ch Freq 2.437 GHz       Trig Free         0ccupied Bandwidth	Avg Number 10 0n <u>Off</u> Avg Mode Exp Repeat Max Hold On Off Occ BW % Pwr 99.00 % 20.0000000 MHz x dB -6.00 dB

FCC ID : EUNPTB50L

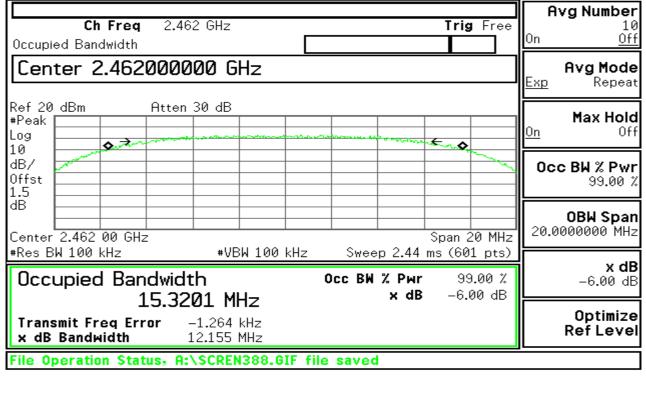
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Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

Meas Setup

### 6dB Bandwidth (CH High)

🔆 Agilent 13:04:58 Aug 15, 2006



### Test Plot (IEEE 802.11g mode)

### 6dB Bandwidth (CH Low)

🔆 Agilent 13:08:12 Aug 15, 2006		Meas Setup
Ch Freq 2.412 GHz Occupied Bandwidth	Trig Free	Avg Number 10 On <u>Off</u>
Center 2.412000000 GHz		Avg Mode Exp Repeat
Ref 20 dBm Atten 30 dB #Peak Log 10 → ♥ ······	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	<u>Max Hold</u> Off
dB/		Occ BW % Pwr 99.00 %
dB Center 2.412 00 GHz #Res BW 100 kHz #VBW 100	Span 20 MHz kHz Sweep 2.44 ms (601 pts)	<b>0BW Span</b> 20.0000000 MHz
Occupied Bandwidth 16,4554 MHz	OCC BW % Pwr 99.00 % x dB -6.00 dB	<b>x dB</b> -6.00 dB
Transmit Freq Error13.541 kHzx dB Bandwidth16.412 MHz		Optimize RefLevel
File Operation Status, A:\SCREN391.6	)IF file saved	

FCC ID : EUNPTB50L

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# 

Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

### 6dB Bandwidth (CH High)

🔆 Agilent 13:07:31 Aug :	15,2006			Meas Setup
Ch Freq 2.4	37 GHz		Trig Free	Avg Number 10
Occupied Bandwidth	57 онz Г			0n <u>0ff</u>
Center 2.437000	000 GHz			Avg Mode Exp Repeat
Ref 20 dBm Atter #Peak Log 10 → ♥ m M m m m m	1 30 dB	manter and a second	~~~~ <b>?</b> ←	Max Hold On Off
dB/				<b>Occ BW % Pwr</b> 99.00 %
Center 2.437 00 GHz #Res BW 100 kHz	#VBW 100 kHz	Sweep 2.44 m	Span 20 MHz is (601 pts)	<b>OBW Span</b> 20.0000000 MHz
Occupied Bandwid		Осс В₩ % Рwr ×dB	99.00 % -6.00 dB	<b>x dB</b> -6.00 dB
Transmit Freq Error x dB Bandwidth	4.014 kHz 16.385 MHz			Optimize Ref Level
File Operation Status, A	:\SCREN390.GIF fi	le saved		
OdB Bandwidth (CH Mid)         ** Agilent 13:06:44				Meas Setup
★ Agilent 13:06:44 Aug :	, 15,2006		Inia Francisco	Avg Number
* Agilent 13:06:44 Aug : Ch Freq 2.4			Trig Free	
★ Agilent 13:06:44 Aug :	, 15, 2006 62 GHz		Trig Free	Avg Number 10
<b>Agilent</b> 13:06:44       Aug         Ch Freq       2.4         Occupied Bandwidth <b>Center</b> 2.4620000         Ref 20 dBm       Atter         #Peak       Atter	0 15, 2006 62 GHz 000 GHz		Trig Free	Avg Number 10 On <u>Off</u> Avg Mode Exp Repeat
★ Agilent 13:06:44 Aug 2          Ch Freq       2.4         Occupied Bandwidth       2.4         Center       2.4620000         Ref 20 dBm       Atter         *Peak	, 15, 2006 62 GHz 000 GHz 1 30 dB			Avg Number 10 On <u>Off</u> Avg Mode Exp Repeat Max Hold
Agilent 13:06:44         Aug           Ch Freq         2.4           Occupied Bandwidth         Center 2.4620000           Ref 20 dBm         Atter           *Peak         Atter           10         Atter           0ffst         Atter           1.5         Atter           Center 2.462 00 GHz         Center 2.462 00 GHz	15, 2006 62 GHz 000 GHz		фее фее  брап 20 MHz	Avg Number 10 0n <u>Off</u> Avg Mode Exp Repeat Max Hold On Off Occ BW % Pwr
** Agilent 13:06:44       Aug 1         Ch Freq       2.4         Occupied Bandwidth       2.4         Center 2.4620000       2.4         Ref 20 dBm       Atter         *Peak       4         Log       10         0B/       10         0ffst       1.5         dB       10         Center 2.462 00 GHz         *Res BW 100 kHz	15, 2006 62 GHz 000 GHz 1 30 dB 1 30 dB 1 400 kHz +VBW 100 kHz		фее фее  брап 20 MHz	Avg Number 10 On <u>Off</u> Avg Mode Exp Repeat Max Hold On Off Occ BW % Pwr 99.00 % OBW Span
** Agilent 13:06:44 Aug         Ch Freq       2.4         Occupied Bandwidth         Center 2.4620000         Ref 20 dBm       Atter         *Peak       Atter         Log       Atter         10       Atter         dB/       Atter         Center 2.462 00 GHz       Center 2.462 00 GHz         *Res BW 100 kHz       Atter	15, 2006 62 GHz 000 GHz 1 30 dB 1 30 dB 1 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Sweep 2.44 m	A matrix (601 pts)	Avg Number 10 0n <u>Off</u> Avg Mode Exp Repeat Max Hold 0n Off Occ BW % Pwr 99.00 % OBW Span 20.0000000 MHz x dB
Agilent 13:06:44 Aug : Ch Freq 2.4 Occupied Bandwidth Center 2.4620000 Ref 20 dBm Atter #Peak Log 10 dB/ Offst 1.5 dB Center 2.462 00 GHz #Res BW 100 kHz Cccupied Bandwid 16.43 Transmit Freq Error	2006 62 GHz 000 GHz 1 30 dB 1 30 dB 1 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Sweep 2.44 m Occ BW % Pwr x dB	A matrix (601 pts)	Avg Number 10 0n <u>Off</u> Avg Mode Exp Repeat Max Hold On Off Occ BW % Pwr 99.00 % OBW Span 20.0000000 MHz x dB -6.00 dB

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### 7.4. PEAK OUTPUT POWER

### 7.4.1. LIMITS

The maximum peak output power of the intentional radiator shall not exceed the following:

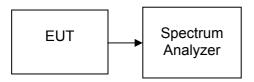
- 1. According to §15.247(b)(3), for systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 Watt.
- 2. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### 7.4.2. TEST INSTRUMENTS

Conducted Emissions Test Site					
Name of Equipment Manufacturer Model Serial Number Calibration Due					
Spectrum Analyzer	Agilent	E4446A	MY44020154	08/15/2007	
Spectrum Analyzer	Agilent	E4446A	US44300398	07/25/2007	

### 7.4.3. TEST PROCEDURES (please refer to measurement standard)

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the peak power detection.



### 7.4.4. TEST SETUP

# 

### 7.4.5. TEST RESULTS

No non-compliance noted

### <u>Test Data</u>

### Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	16.64	0.04613		PASS
Mid	2437	16.57	0.04539	1	PASS
High	2462	16.49	0.04457		PASS

### Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	15.42	0.03483		PASS
Mid	2437	15.51	0.03556	1	PASS
High	2462	15.16	0.03281		PASS

Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

### Test Plot (IEEE 802.11b mode)

### Peak Power (CH Low)

🔆 Agilent 11:55:38 Aug 1	5,2006		Marker
Ch Freq 2.41 Channel Power	.2 GHz	Trig	Free Select Marker
Marker 2.4120000			Normal
Ref 20 dBm Atten	30 dB		00 GHz 8 dBm
#Peak		10.0	Delta
10 dB/ Offst			Delta Pair     (Tracking Ref)     Ref
1.5 dB Start 2.399 50 GHz		Stop 2.424 5	Span Pair
#Res BW 1 MHz	₩VBW 3 MHz	Sweep 1 ms (60	
Channel Power	ſ	Power Spectral De	nsity Off
16.64 dBm /20.0	1000 MHz	-56.37 dBm∕	Hz More
File Operation Status, A:	\SCREN379.GIF file	saved	
Peak Power (CH MID)			
Peak Power (CH Mid) Agilent 11:58:04 Aug 1	5,2006		Marker
Agilent 11:58:04         Aug 1           Ch         Ch         Freq         2.43	5, 2006 37 GHz	Trig	Marker Select Marker Free 1 2 3 4
★ Agilent 11:58:04 Aug 1	37 GHz	Trig	
Agilent 11:58:04 Aug 1 Ch Freq 2.43 Channel Power Marker 2.4370000	37 GHz	Mkr1 2.437	Free Select Marker 1 2 3 4 Normal
Agilent 11:58:04       Aug 1         Ch Freq       2.43         Channel Power       2.4370000         Marker 2.4370000       Atten         *Peak       Atten	37 GHz	Mkr1 2.437	Free <u>1</u> 2 3 4 Normal
Agilent 11:58:04     Aug 1       Ch Freq     2.43       Channel Power     2.4370000       Marker     2.4370000       Ref 20 dBm     Atten       #Peak     410       Log     10       dB/     0ffst	87 GHz	Mkr1 2.437	Free Select Marker 1 2 3 4 Normal 00 GHz 1 dBm Delta Delta Pair (Tracking Ref)
Agilent 11:58:04     Aug 1       Ch Freq     2.43       Channel Power     2.4370000       Marker     2.4370000       Ref 20 dBm     Atten       *Peak     410       Log     10       dB/     410	87 GHz	Mkr1 2.437 9.6	Free Select Marker 1 2 3 4 Normal 00 GHz 1 dBm Delta Delta Pair
Agilent 11:58:04     Aug 1       Ch Freq     2.43       Channel Power     Addition of the second	87 GHz	Mkr1 2.437 9.6	Free       Select Marker         1       2       3       4         Normal       Normal         00 GHz       Delta         1 dBm       Delta         Delta       Span         Span       Center         1 pts)       Enter
** Agilent 11:58:04 Aug 1         Ch Freq       2.43         Channel Power       2.43         Marker 2.4370000       2.43         Ref 20 dBm       Atten         *Peak       Atten         Log       Atten         10       AB/         0ffst       Atten         Log       Atten         Center 2.437 00 GHz       Atten         *Res BW 1 MHz       Channel Power	37 GHz 100 GHz 30 dB 4 4 4 4 4 4 4 4 4 4 4 4 4	Mkr1 2.437 9.6 9.6 Span 2 Sweep 1 ms (60 Power Spectral Der	Free       Select Marker         1       2       3       4         Normal       Normal         00 GHz       Delta         1 dBm       Delta         00 GHz       Delta         1 dBm       Delta         Span       Center         1 pts)       Off
Agilent 11:58:04       Aug 1         Ch Freq       2.43         Channel Power       Channel Power         Marker 2.4370000       Atten         *Peak       Atten         Log       Atten         10       Add         0ffst       Add         1.5       Add         Center 2.437       00 GHz         *Res BW 1 MHz       Hz	37 GHz 100 GHz 30 dB 4 4 4 4 4 4 4 4 4 4 4 4 4	Mkr1 2.437 9.6	Free       Select Marker         1       2       3       4         Normal       Normal         00 GHz       Delta         1 dBm       Delta         00 GHz       Delta         1 dBm       Delta         Span       Center         1 pts)       Off
** Agilent 11:58:04 Aug 1         Ch Freq       2.43         Channel Power       2.43         Marker 2.4370000       2.43         Ref 20 dBm       Atten         *Peak       Atten         Log       Atten         10       AB/         0ffst       Atten         Log       Atten         Center 2.437 00 GHz       Atten         *Res BW 1 MHz       Channel Power	37 GHz 30 dB 30 dB 4 4 4 4 4 4 4 4 4 4 4 4 4	Mkr1 2.437 9.6 Span 2 Sweep 1 ms (60 Power Spectral Der -56.44 dBm/	Free Select Marker 1 2 3 4 Normal 00 GHz 1 dBm Delta Delta Pair (Tracking Ref) Ref ▲ Span Center 1 pts) Off Hz More

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Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

## Peak Power (CH High)

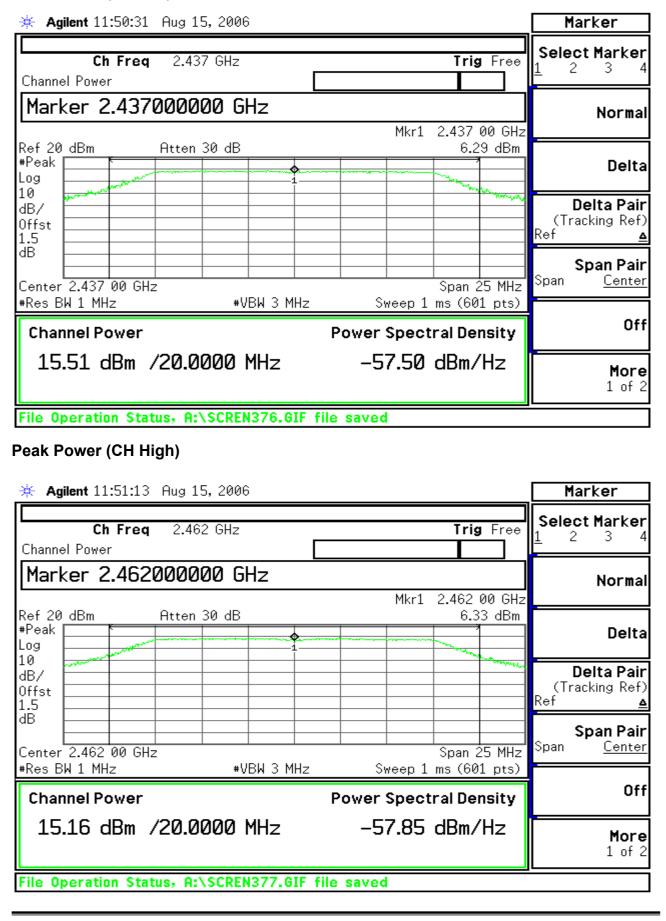
🔆 Agilent 11:58:29 Aug 15, 2006	Marker
Ch Freq 2.462 GHz Trig Free Channel Power	<b>Select Marker</b> <u>1</u> 2 3 4
Marker 2.462000000 GHz Mkr1 2.462 00 GHz	Normal
Ref 20 dBm Atten 30 dB 10.25 dBm #Peak 4 10.25 dBm Log 1	Delta
1.0	<b>Delta Pair</b> (Tracking Ref) Ref <u>▲</u>
dB Center 2.462 00 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 1 ms (601 pts)	<b>Span Pair</b> Span <u>Center</u>
Channel Power Power Spectral Density	Off
16.49 dBm /20.0000 MHz -56.52 dBm/Hz	More 1 of 2
File Operation Status, A:\SCREN383.GIF file saved	
<u>Fest Plot</u> (IEEE 802.11g mode)	
Peak Power (CH Low)	Marker
	Marker Select Marker <u>1</u> 234
Agilent 11:47:23         Aug 15, 2006           Ch Freq         2.412 GHz         Trig         Free	Select Marker
Agilent 11:47:23         Aug 15, 2006           Ch Freq         2.412 GHz         Trig         Free           Channel Power         Marker	Select Marker <u>1</u> 234
Agilent 11:47:23         Aug 15, 2006           Ch Freq         2.412 GHz         Trig           Channel Power         Mkr1         2.412 00 GHz           Mkr1         2.412 00 GHz         Mkr1         2.412 00 GHz           Ref         20 dBm         Atten 30 dB         7.35 dBm           #Peak         Image: Channel Power         Image: Channel Power         Image: Channel Power           Mkr1         2.412 00 GHz         Image: Channel Power         Ima	Select Marker <u>1</u> 234 Normal
* Agilent 11:47:23         Aug 15, 2006           Ch Freq         2.412 GHz         Trig           Channel Power         Mkr1         2.412 00 GHz           Mkr1         2.412 00 GHz         Mkr1         2.412 00 GHz           Ref         20 dBm         Atten 30 dB         7.35 dBm           *Peak         Image: Constraint of the second seco	Select Marker <u>1</u> 2 3 4 Normal Delta Cracking Ref)
* Agilent 11:47:23 Aug 15, 2006           Ch Freq         2.412 GHz         Trig Free           Channel Power         Mkr1         2.412 00 GHz           Mkr1         2.412 00 GHz         Mkr1         2.412 00 GHz           Ref 20 dBm         Atten 30 dB         7.35 dBm           *Peak         Image: Comparison of the second of th	Select Marker <u>1</u> 2 3 4 Normal Delta (Tracking Ref) Ref ▲ Span Pair
* Agilent 11:47:23         Aug 15, 2006           Ch Freq         2.412 GHz         Trig           Channel Power         Mkr1         2.412 00 GHz           Marker 2.412000000 GHz         Mkr1         2.412 00 GHz           Ref 20 dBm         Atten 30 dB         7.35 dBm           *Peak         Mkr1         2.412 00 GHz           Log         Mkr1         2.412 00 GHz           0         0         0         0         0           B         Offst         0         0         0         0           Center 2.412 00 GHz         Span 25 MHz         Sweep 1 ms (601 pts)	Select Marker <u>1</u> 2 3 4 Normal Delta Delta Pair (Tracking Ref) Ref ▲ Span <u>Center</u>

Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

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### Peak Power (CH Mid)

FCC ID : EUNPTB50L



### 7.5. AVERAGE OUTPUT POWER

### 7.5.1. LIMITS

None; for reporting purposes only.

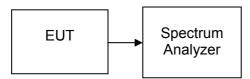
### 7.5.2. TEST INSTRUMENTS

Conducted Emissions Test Site					
Name of Equipment Manufacturer Model Serial Number Calibration Due					
Spectrum Analyzer	Agilent	E4446A	MY44020154	08/15/2007	
Spectrum Analyzer	Agilent	E4446A	US44300398	07/25/2007	

### 7.5.3. TEST PROCEDURES (please refer to measurement standard)

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the average power detection.

### 7.5.4. TEST SETUP





Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

### 7.5.5. TEST RESULTS

### <u>Test Data</u>

### Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	13.49	0.02234
M id	2437	13.50	0.02239
High	2462	13.58	0.02280

### Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	11.56	0.01432
M id	2437	11.15	0.01303
High	2462	11.62	0.01452

Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

#### Test Plot (IEEE 802.11b mode) Average Power (CH Low) 🔆 Agilent 11:56:04 Aug 15, 2006 Marker Select Marker Ch Frea 2.412 GHz Trig Free 2 3 Channel Power Marker 2.412000000 GHz Normal 2.412 00 GHz Mkr1 Ref 20 dBm Atten 30 dB 7.38 dBm #Avg Delta Log 10 Delta Pair dB/ (Tracking Ref) Offst Ref 1.5 dB Span Pair Span Center Start 2.399 50 GHz Stop 2.424 50 GHz #Res BW 1 MHz #VBW 3 MHz Sweep 1 ms (601 pts) Off **Channel Power Power Spectral Density** 13.49 dBm /20.0000 MHz -59.52 dBm/Hz More 1 of 2 File Operation Status, A:\SCREN380.GIF file saved Average Power (CH Mid) 🔆 Agilent 11:57:34 Aug 15, 2006 Marker Select Marker Ch Freq 2.437 GHz Trig Free 2 3 Channel Power Marker 2.437000000 GHz Normal Mkr1 2.437 00 GHz Ref 20 dBm Atten 30 dB 7.88 dBm #Avg Delta Log 10 canc**a Pair** (Tracking Ref) Ref Delta Pair ldB/ Offst 1.5dB Span Pair Span Center Center 2.437 00 GHz Span 25 MHz #Res BW 1 MHz #VBW 3 MHz Sweep 1 ms (601 pts) Off **Channel Power Power Spectral Density** 13.50 dBm /20.0000 MHz -59.51 dBm/Hz More 1 of 2 File Operation Status, A:\SCREN381.GIF file saved

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Agilent 11:58:53 Aug	15,2006			Marker
	62 GHz		Trig Fre	Select Marke
hannel Power <b>1arker 2.462000</b>	000 GHz			Norm
ef 20 dBm Atter	n 30 dB	Mkr1	2.462 00 GH 7.69 dBn	1
				Delt
3/ fst				<b>Delta Pa</b> (Tracking Re Ref
enter 2.462 00 GHz			Span 25 MH	
es BW 1 MHz Channel Power	#VBW 3 MHz	Sweep 1 Yower Spect	ms (601 pts) ral Density	<b>1</b> 0
13.58 dBm /20.0	0000 MHz	-59.43	dRm/Hz	
				Mor 1 of
le Operation Status, A st Plot (IEEE 802.11)	:\SCREN384.GIF file g mode)			
le Operation Status, A st Plot (IEEE 802.11) erage Power (CH Low	:\SCREN384.GIF file g mode) /)			
le Operation Status, A st Plot (IEEE 802.11) erage Power (CH Low Agilent 11:48:52 Aug	:\SCREN384.GIF file g mode) /) 15, 2006			1 of Marker
le Operation Status, A st Plot (IEEE 802.11) erage Power (CH Low Agilent 11:48:52 Aug Ch Freq 2.4	:\SCREN384.GIF file g mode) /)		Trig Free	1 of Marker
le Operation Status, A st Plot (IEEE 802.11) erage Power (CH Low Agilent 11:48:52 Aug Ch Freq 2.4 hannel Power	:\SCREN384.GIF file g mode) /) 15, 2006 12 GHz			1 of Marker Select Marke
te Operation Status, A <u>st Plot</u> (IEEE 802.11) erage Power (CH Low Agilent 11:48:52 Aug Ch Freq 2.4 hannel Power Harker 2.4120000 af 20 dBm Atter	:\SCREN384.GIF file g mode) /) 15, 2006 12 GHz 2000 GHz	saved		1 of Marker Select Marke <u>1</u> 2 3 Norm
Ie Operation Status, A         st Plot       (IEEE 802.11)         erage Power (CH Low         erage Power (CH Low         Agilent 11:48:52       Aug         Ch Freq       2.4         hannel Power       Ch Freq       2.4         hannel Power       Atter         Agilent 12:0000       Atter         Agilent 12:0000       Atter	:\SCREN384.GIF file g mode) /) 15, 2006 12 GHz 2000 GHz	saved	Trig Free 2.412 00 GF 3.37 dBr	1 of Marker Select Marke <u>1</u> 2 3 Norm
Ie Operation Status, A         st Plot       (IEEE 802.11)         erage Power (CH Low         Agilent 11:48:52       Aug         Ch Freq       2.4         hannel Power       2.4         hannel Power       2.4         f 20 dBm       Atter         arker       2.4120000         arker       2.4120000	:\SCREN384.GIF file g mode) /) 15, 2006 12 GHz 2000 GHz	saved	<b>Trig</b> Fred 2.412 00 GF	1 of Marker Select Marke <u>1</u> 2 3 Norm
Ie Operation Status, A         st Plot       (IEEE 802.11g)         erage Power (CH Low         erage Power         Ch Freq       2.4         hannel Power         Marker 2.4120000         ef 20 dBm       Atter         a         a         a         b         b         a         b         b         b         b         c         b         b         c         b         c         b         b         b         b         c         c         c         d         d         d         d         d         d         d	:\SCREN384.GIF file g mode) /) 15, 2006 12 GHz 2000 GHz	saved Mkr1	Trig Fred 2.412 00 GF 3.37 dBr	Marker Select Marke 1 2 3 Norm Delta Ref Span Cent
Ie Operation Status, A         st Plot       (IEEE 802.11)         erage Power (CH Low         erage Power         Ch Freq       2.4         hannel Power         Marker 2.4120000         ef 20 dBm       Atter         a       Atter         a       a         a       a         a       a	:\SCREN384.GIF file g mode) /) 15, 2006 12 GHz 000 GHz 130 dB 1 130 dB 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	saved Mkr1	Trig Fred 2.412 00 GH 3.37 dBr 3.37 dBr 3.37 dBr 5pan 25 MH ms (601 pts	Marker Select Marke 1 2 3 Norm Delta Pa (Tracking Re Ref Span <u>Cent</u>

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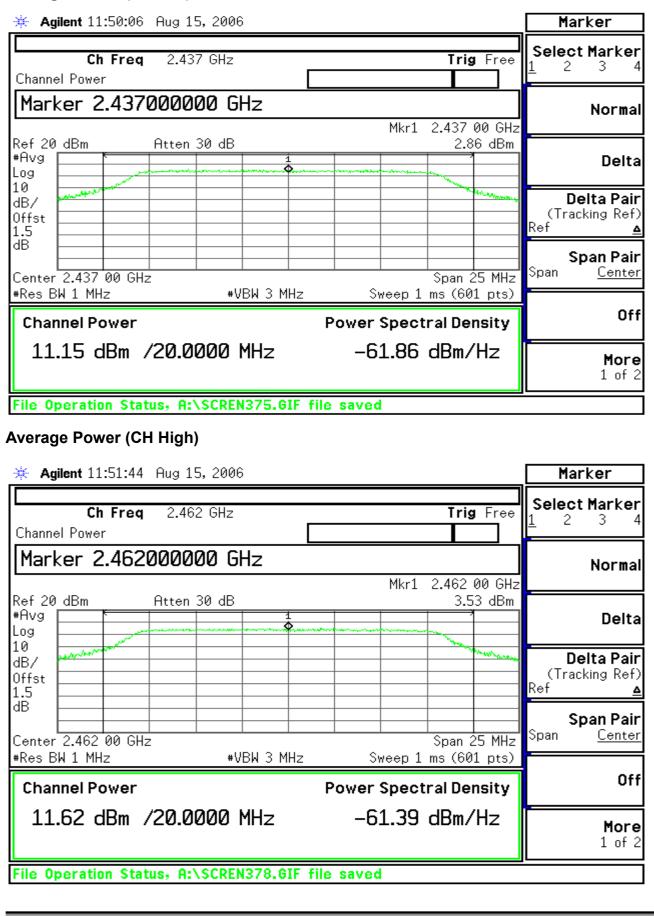
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### **Average Power (CH Mid)**

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### 7.6. BAND EDGES MEASUREMENT:

### 7.6.1. LIMITS

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. 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) (see Section 15.205(c)).

### 7.6.2. TEST INSTRUMENTS

### 7.6.2.1.

	3M Semi Anechoic Chamber (977)						
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due			
Spectrum Analyzer	Agilent	E4446A	MY44020154	08/15/2007			
Spectrum Analyzer	Agilent	E4446A	US44300398	07/25/2007			
EMI Test Receiver	R&S	ESPI3	101026	11/11/2006			
Pre-Amplfier	MINI	ZFL-1000VH2	d041703	12/13/2006			
Pre-Amplfier	Miteq	NSP4000-NF	870731	01/28/2007			
Bilog Antenna	Sunol	JB1	A110204-2	11/22/2006			
Horn-antenna	SCHWARZBECK	BBHA9120D	D:266	02/01/2007			
PSG Analog Signal Generator	Agilent	E8257C	MY43321570	12/19/2006			
Turn Table	СТ	CT123	4165	N.C.R			
Antenna Tower	СТ	CTERG23	3256	N.C.R			
Controller	СТ	CT100	95637	N.C.R			
Site NSA	CCS	N/A	N/A	04/06/2007			

**NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The FCC Site Registration number is 93105,90471.

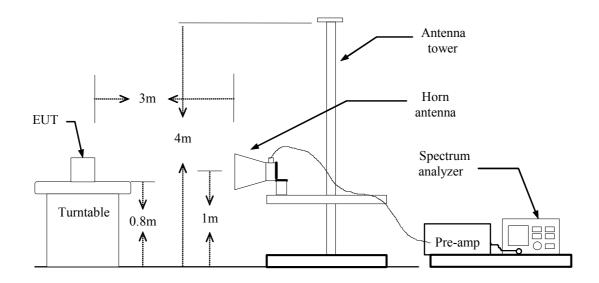
4. N.C.R = No Calibration Required.

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7.6.3. TEST PROCEDURES (please refer to measurement standard)

- 1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
- 2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
- 4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
  - (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
  - (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
- 5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are

### 7.6.4. TEST SETUP



## Compliance Certification Services Inc. Reference No.: KS060803A01-RP Report No.: KS060803A01-RP 7.6.5. TEST RESULTS

**Polarity: Vertical** 

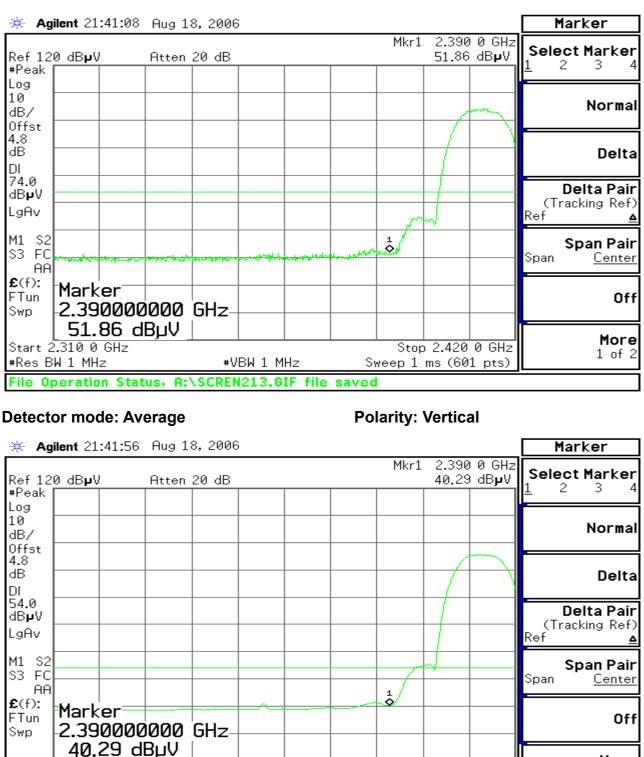
### Test Plot (IEEE 802.11b mode)

### Band Edges (CH Low)

### **Detector mode: Peak**

Start 2.310 0 GHz

#Res BW 1 MHz



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File Operation Status, A:\SCREN216.GIF file saved

#VBW 10 Hz

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More

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Stop 2.420 0 GHz

Sweep 8.577 s (601 pts)

Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

#### **Detector mode: Peak**

**Polarity: Horizontal** 



#### **Detector mode: Average**

#### **Polarity: Horizontal**

🔆 Agilent 21:37:46 Aug 18, 2006 Marker Mkr1 2.390 0 GHz Select Marker Ref 120 dB**µ**V Atten 20 dB 39.59 dBµV 2 3 #Peak Log 10 Normal ldB/ Offst 4.8 dB Delta DL 54.0 Delta Pair dB₽V (Tracking Ref) LgAv Ref M1 S2 Span Pair \$3 FC Span Center AA £(f): Marker FTun Off 2.390000000 GHz Swp 39.59 dBµV More Start 2.310 0 GHz Stop 2.420 0 GHz 1 of 2 #Res BW 1 MHz #VBW 10 Hz Sweep 8.577 s (601 pts) File Operation Status, A:\SCREN212.GIF file saved

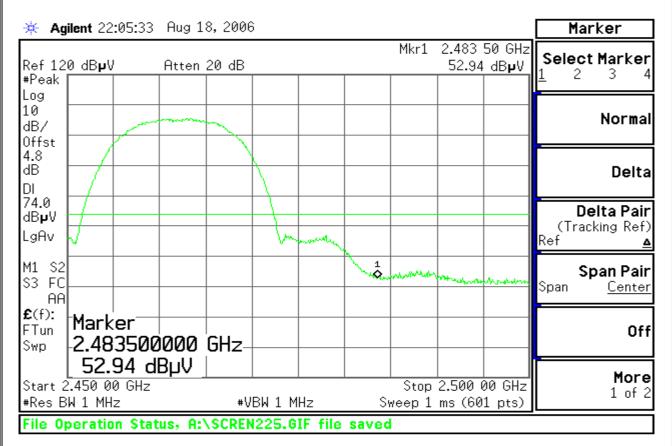
FCC ID : EUNPTB50L

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Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

### Band Edges (CH High)

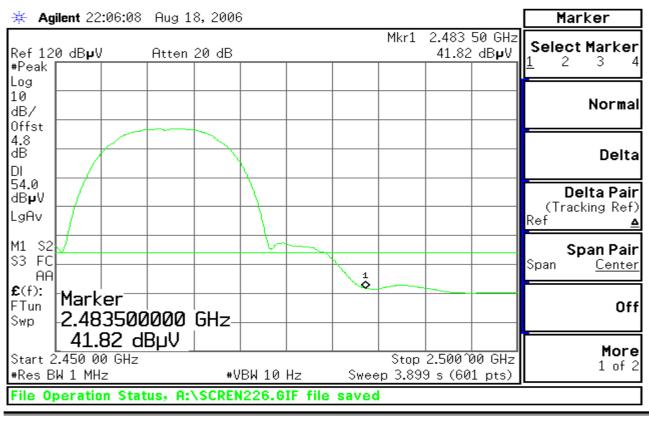
### Detector mode: Peak



### **Detector mode: Average**

### **Polarity: Vertical**

**Polarity: Vertical** 



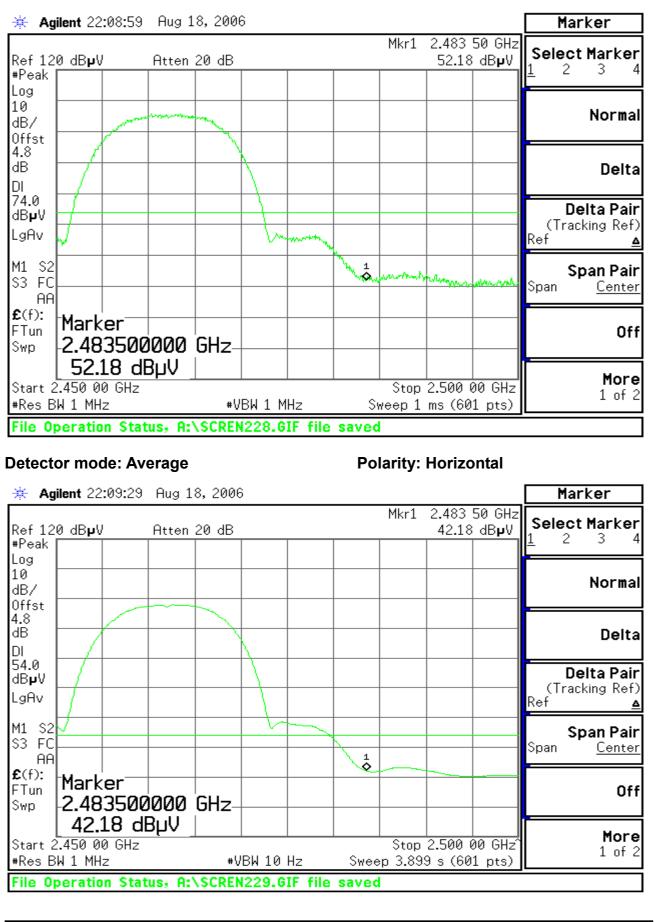
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### **Detector mode: Peak**

**Polarity: Horizontal** 



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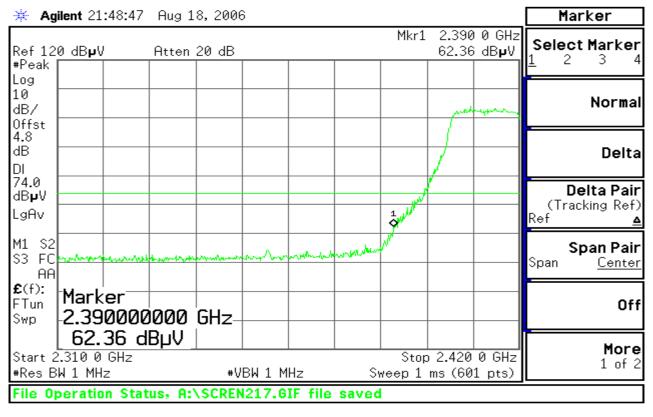
Reference No.: KS060803A01-RP Report No.: KS060803A01-RP



### Band Edges (CH Low)

### **Detector mode: Peak**

**Polarity: Vertical** 



### Detector mode: Average

#### Polarity: Vertical

🔆 Agilent 21:49:33 Aug 18, 2006 Marker Mkr1 2.390 0 GHz Select Marker 45.49 dBµV Ref 120 dB**µ**V Atten 20 dB 2 3 #Peak Log 10 Normal dB/ Offst 4.8 dB Delta DL 54.0 Delta Pair dB₽V (Tracking Ref) LgAv Ref Δ M1 S2 Span Pair S3 FC Span Center 0 AA £(f): Marker FTun Off 2.390000000 GHz Swp 45.49 dBµV More Start 2.310 0 GHz Stop 2.420^0 GHz 1 of 2 #Res BW 1 MHz #VBW 10 Hz Sweep 8.577 s (601 pts) File Operation Status, A:\SCREN218.GIF file saved

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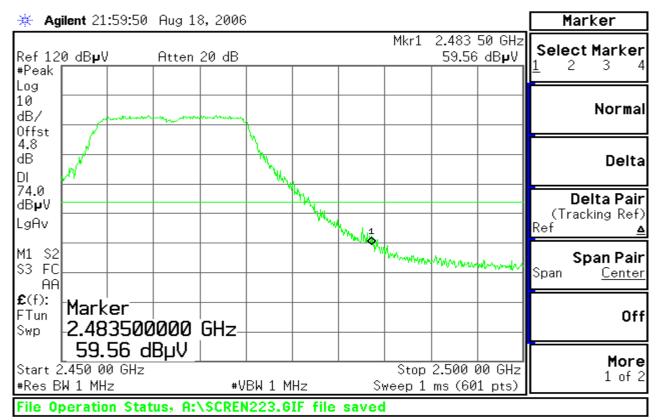
Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

or mode: Peak Polarity: Horizontal							
ilent 21:52:05 Aug	18,2006						Marker
0 dB <b>µ</b> V Atter	n 20 dB			Mkr1		0 0 GHz . dB <b>µ</b> V	Select Marke
adp <b>u</b> Htter					61.41		<u>1</u> 23
							Norm
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		_					Del
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		_		- Ref	r		Delta Pa
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a and a survey that has been been been been been been been bee			moundal	W <sup>r</sup>			Span Pa
anahard madi tina di tani tani ta	helesenter (	No November					Span <u>Cent</u>
Marker							C
2.390000000	GHz-						
<u>61.41 dBµV</u>					- 0.400		Мо
310 0 GHz V 1 MHz	₩VBW 1	MHz	SI	Stop Neep 1		0 GHz 1 pts)	1 of
	L CORFLICA O						4
		.GIF file			Horiza	ontal	
or mode: Average	)	.GIF file		larity:			Marker
or mode: Average ilent 21:52:39 Aug	) 18,2006	.GIF file			2.390	0 0 GHz	
or mode: Average ilent 21:52:39 Aug	)	.GIF file		larity:	2.390		
or mode: Average lent 21:52:39 Aug	) 18,2006	.GIF file		larity:	2.390	0 0 GHz	Select Mark <u>1</u> 23
or mode: Average ilent 21:52:39 Aug	) 18,2006	.GIF file		larity:	2.390	0 0 GHz	Select Mark <u>1</u> 23
or mode: Average lent 21:52:39 Aug	) 18,2006	.GIF file		larity:	2.390	0 0 GHz	Select Mark <u>1</u> 23 Norm
or mode: Average ilent 21:52:39 Aug	) 18,2006	.GIF file		larity:	2.390	0 0 GHz	Select Marko <u>1</u> 23 Norm Del
or mode: Average lent 21:52:39 Aug	) 18,2006	.GIF file		larity:	2.390	0 0 GHz	Select Mark <u>1</u> 23 Norm Del Delta Pa
or mode: Average lent 21:52:39 Aug	) 18,2006	.GIF file		larity:	2.390	0 0 GHz	Select Marko <u>1</u> 23 Norm
or mode: Average lent 21:52:39 Aug	) 18,2006	.GIF file		Mkr1	2.390	0 0 GHz	Select Mark <u>1</u> 23 Norm Del Delta Pa (Tracking Ref Span Pa
or mode: Average ilent 21:52:39 Aug	) 18,2006	.GIF file		Mkr1	2.390	0 0 GHz	Select Mark <u>1</u> 23 Norn Delta (Tracking Ref
Marker	9 18, 2006 120 dB	.GIF file		Mkr1	2.390	0 0 GHz	Select Mark <u>1</u> 23 Norn Delta (Tracking Ref Span Pa
Dr mode: Average lent 21:52:39 Aug dBµV Atter	9 18, 2006 120 dB	.GIF file		Mkr1	2.390	0 0 GHz	Select Mark <u>1</u> 23 Norn Delta CTracking Ref Span <u>Cen</u> i
Dr mode: Average lent 21:52:39 Aug 0 dBµV Atter 0 dBµV	9 18, 2006 120 dB	.GIF file		Mkr1	2.390	0 GHz	Select Mark <u>1</u> 23 Norn Delta Pa (Tracking Ref Span <u>Cen</u> t Mo
Dr mode: Average ilent 21:52:39 Aug 0 dBµV Atter 0 dBµV	9 18, 2006 1 20 dB	0 Hz	Po	Mkr1	2.390	0 GHz	Select Mark <u>1</u> 2 3 Norr De Delta P (Tracking R Ref Span <u>Cen</u> (
Marker 2.39000000	9 18, 2006 1 20 dB	0 Hz	Po	Mkr1	2.390	0 GHz	Select Mark <u>1</u> 2 3 Norr De Delta Pa (Tracking R Ref Span <u>Cen</u> (
or mode: Average ilent 21:52:39 Aug 0 dBµV Atter 0 dBµV	9 18, 2006 1 20 dB	0 Hz	Po	Mkr1	2.390	0 GHz	Select Mark <u>1</u> 2 3 Norr De Delta Pa (Tracking R Ref Span <u>Cen</u> (Mo

Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

### Band Edges (CH High)

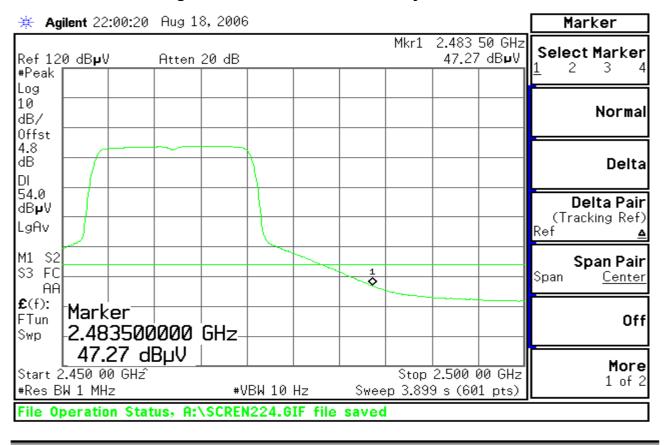
### **Detector mode: Peak**



### **Detector mode: Average**

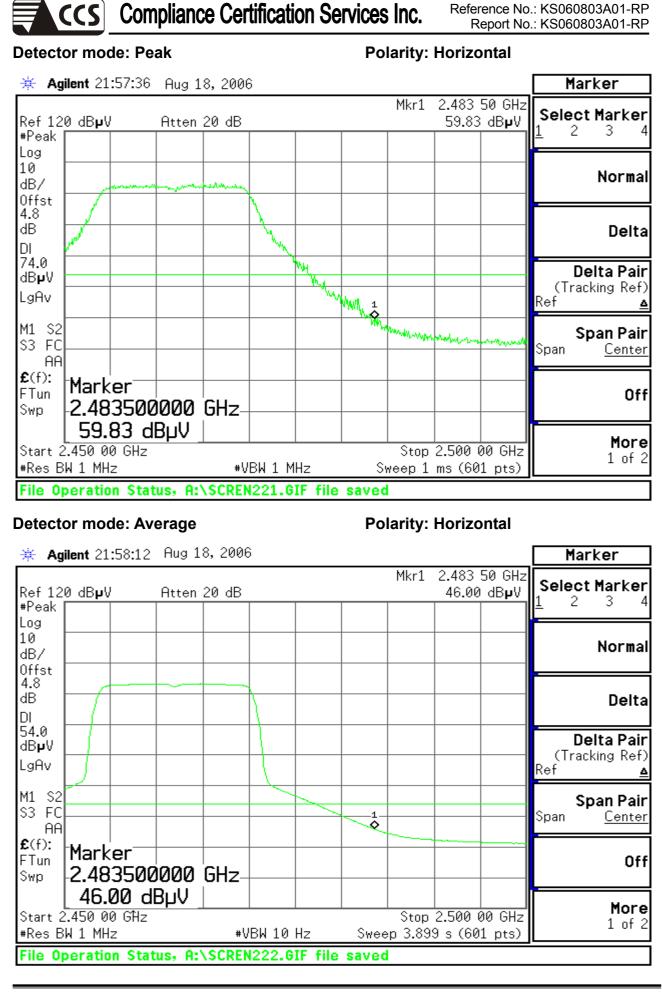
### **Polarity: Vertical**

**Polarity: Vertical** 



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### 7.7. PEAK POWER SPECTRAL DENSITY MEASUREMENT

### 7.7.1. LIMITS

- 1. According to §15.247(e), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.
- 2. According to §15.247(f), the digital modulation operation of the hybrid system, with the frequency hopping turned off, shall comply with the power density requirements of paragraph (d) of this section.

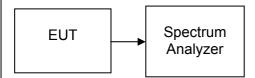
### 7.7.2. TEST INSTRUMENTS

Conducted Emissions Test Site									
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due					
Spectrum Analyzer	Agilent	E4446A	MY44020154	08/15/2007					
Spectrum AnalyzerAgilentE4446AUS4430039807/25/2007									

### 7.7.3. TEST PROCEDURES (please refer to measurement standard)

- 1. Place the EUT on the table and set it in transmitting mode. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 2. Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Span = 300kHz, Sweep=100s
- 3. Record the max. reading.
- 4. Repeat the above procedure until the measurements for all frequencies are completed.

### 7.7.4. TEST SETUP



### 7.7.5. TEST RESULTS

No non-compliance noted

### <u>Test Data</u>

### Test mode: IEEE 802.11b

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Test Result
Low	2412	-9.54		PASS
Mid	2437	-10.34	8.00	PASS
High	2462	-7.39		PASS

### <u>Test Data</u>

### Test mode: IEEE 802.11g

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Test Result
Low	2412	-14.50		PASS
Mid	2437	-13.06	8.00	PASS
High	2462	-13.05		PASS

# 

# **CCS** Compliance Certification Services Inc.

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### Test Plot (IEEE 802.11b mode)

### PPSD (CH Low)

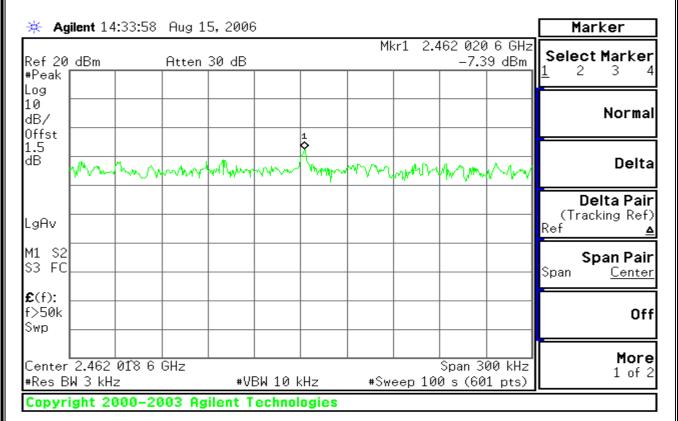
🔆 Agilent 14:23:56 Aug 15, 2006	Peak Search
Mkr1 2.412 022 6 GHz Ref 20 dBm Atten 30 dB -9.54 dBm #Peak	Next Peak
Log 10 dB/	Next Pk Right
dB and why the way of the way and the way	Next Pk Left
LgAv	Min Search
M1 S2 S3 FC	Pk-Pk Search
£(f): f>50k Swp	Mkr → CF
Center 2.412 000 0 GHz Span 300 kHz #Res BW 3 kHz #VBW 10 kHz #Sweep 100 s (601 pts)	<b>More</b> 1 of 2

### PPSD (CH Mid)

Atten	30 dB			-10.34	4 dBm	Next Peak
					┣	
		-i				Next Pk Right
mathin many	montherent	1 Amment May	and many may	mporte	ym	Next Pk Left
					[	Min Search
					[	Pk-Pk Search
						Mkr → Cl
00 0 GHz ^	#VBW 10	kHz	#Sweep 1			<b>More</b> 1 of 2
	00 0 GHz ^	00 0 GHz ^ #VBW 10		00 0 GHz ^ #VBW 10 kHz #Sweep 10	100 0 GHz ^ Span 30 #VBW 10 kHz #Sweep 100 s (601	#VBW 10 kHz

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### PPSD (CH High)



### Test Plot (IEEE 802.11g mode)

### PPSD (CH Low)

🔆 Ag	ilent 14	:55:06	Aug 1	5,2006							Marker
Ref 20 #Peak	dBm		Atten	30 dB			MI	kr1 2.4		3 0 GHz 50 dBm	Select Marker
Log 10 dB/											Normal
		چىرى		~~~~	vu <sup>1</sup>	her	who	h	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Delta
LgAv											<b>Delta Pair</b> (Tracking Ref) Ref <u>▲</u>
M1 S2 S3 FS											<b>Span Pair</b> Span <u>Center</u>
<b>£</b> (f): f>50k Swp											Off
Center #Res B			GHz	+VE	3W 10 F	Hz	#Sw	eep 10		00 kHz^ 1 pts)	More 1 of 2
Copyri	ight 20	000-20	003 Ag	ilent T	echnol	ogies					

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### PPSD (CH Mid)

🔆 Ag	<b>ilent</b> 14	1:46:28	Aug 1	5,2006	i						Marker
Ref 20 #Peak	dBm		Atten	30 dB			Mł	kr1 2.4		) 6 GHz 16 dBm	Select Marker <u>1</u> 234
Log 10 dB/ Offst											Normal
1.5 dB			morm			multi	m	males	money	~~~	Delta
LgAv											<b>Delta Pair</b> (Tracking Ref) Ref <u>▲</u>
M1 S2 S3 FS											<b>Span Pair</b> Span <u>Center</u>
<b>£</b> (f): f>50k Swp											Off
Center #Res B			GHz	#VE	3W 10 k	(Hz	#Sw	eep 10	Span 3 0 s (60	00 kHz^ 1 pts)	More 1 of 2
File 0	peratio	on Stat	us, A:	SCREN	416.6	IF file	saved				-

### PPSD (CH High)

🔆 Ag	ilent 14	4:40:42	Aug 1	5,2008	ì						Marker
Ref 20 #Peak	dBm		Atten	30 dB			MI	kr1 2		4 GHz )5 dBm	Select Marker <u>1</u> 234
Log 10 dB/ Offst											Normal
1.5 dB	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	<u></u>	m	m	mut		h	m	mur	~~~	Delta
LgAv											<b>Delta Pair</b> (Tracking Ref) Ref <u>▲</u>
M1 S2 S3 FC											<b>Span Pair</b> Span <u>Center</u>
<b>£</b> (f): f>50k Swp											Off
Center #Res B		926 9 z	GHz	 #V{	3W 10 I	 <hz< td=""><td>  #Sw</td><td>eep 10</td><td>  Span 3 0 s (60</td><td>00 kHz 1 pts)</td><td>More 1 of 2</td></hz<>	 #Sw	eep 10	 Span 3 0 s (60	00 kHz 1 pts)	More 1 of 2
Copyri	ight 2	000-20	003 Ag	ilent T	echnol	ogies					

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## **APPENDIX I RADIO FREQUENCY EXPOSURE**

### <u>LIMIT</u>

According to §15.247(i), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See § 1.1307(b)(1) of this chapter.

### EUT Specification

EUT	Notebook					
	🛛 WLAN: 2.412GHz ~ 2.462GHz					
Frequency band	🗌 WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz					
(Operating)	🗌 WLAN: 5.745GHz ~ 5.825GHz					
	Bluetooth: <u>2.402GHz ~ 2.480 GHz</u>					
Dovice estadory	Portable (<20cm separation)					
Device category	Mobile (>20cm separation)					
	$\Box$ Occupational/Controlled exposure (S = 5mW/cm <sup>2</sup> )					
Exposure classification	General Population/Uncontrolled exposure					
	(S=1mW/cm <sup>2</sup> )					
	Single antenna					
	🖂 Multiple antennas					
Antenna diversity	Tx diversity					
	Rx diversity					
	⊠ Tx/Rx diversity					
Max. output power	IEEE 802.11b: 16.64 dBm (46.13mW)					
	IEEE 802.11g: 15.51 dBm (35.56mW)					
Antenna gain (Max)	2.80 dBi (Numeric gain: 1.91)					
	MPE Evaluation*					
Evaluation applied	SAR Evaluation					
	□ N/A					

### Remark:

- The maximum output power is <u>16.64dBm (46.13mW)</u> at <u>2412MHz</u> (with <u>1.91 numeric</u> <u>antenna gain</u>.)
- DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.
- For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is 1.0 mW/cm<sup>2</sup> even if the calculation indicates that the power density would be larger.



### TEST RESULTS

No non-compliance noted. **Calculation** 

E =

Given

$$\frac{\sqrt{30 \times P \times G}}{d} \quad \& \quad S = \frac{E^2}{3770}$$

Where *E* = Field strength in Volts / meter *P* = Power in Watts *G* = Numeric antenna gain *d* = Distance in meters *S* = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770d^2}$$

Changing to units of mW and cm, using:

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$
 Equation 1

Where d = Distance in cm P = Power in mW G = Numeric antenna gain S = Power density in  $mW / cm^2$ 

### Maximum Permissible Exposure

EUT output power = 46.13mW Numeric Antenna gain = 1.91 Substituting the MPE safe distance using d = 20 cm into Equation 1:

Yields

 $S = 0.000199 \times P \times G$ 

Where P = Power in mW G = Numeric antenna gain  $S = Power density in mW / cm^2$  $\rightarrow Power density = 0.0175mW / cm^2$ 

(For mobile or fixed location transmitters, the maximum power density is  $1.0 \text{ mW/cm}^2$  even if the calculation indicates that the power density would be larger.)

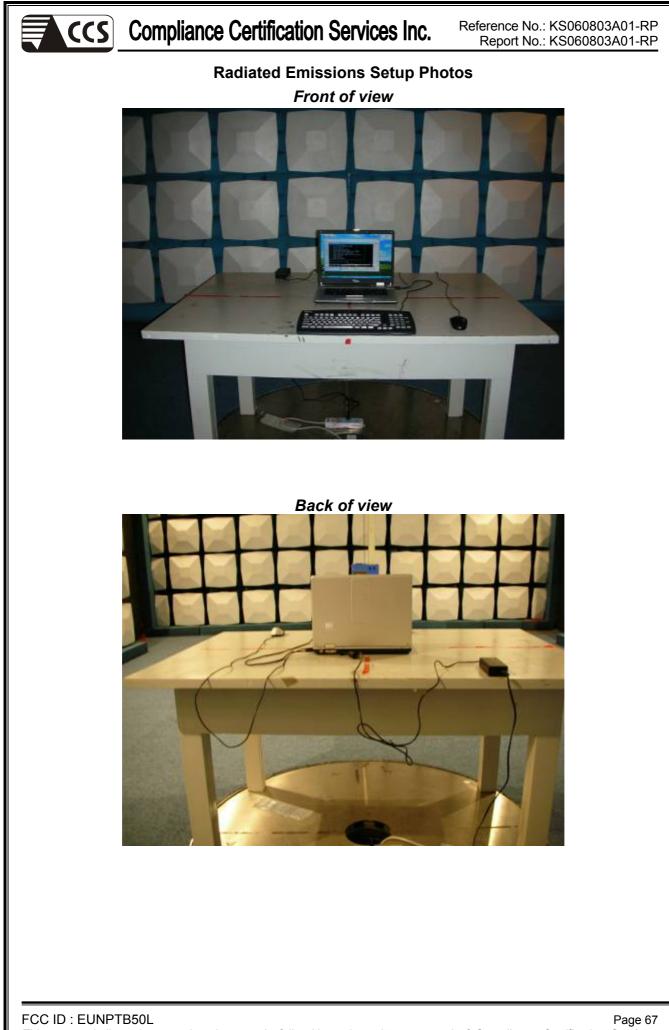


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## APPENDIX II PHOTOGRAPHS OF THE TEST CONFIGURATION

**Conducted Emissions Setup Photo** 







Reference No.: KS060803A01-RP Report No.: KS060803A01-RP

### Power Line Conducted Emissions Setup Photos Front of view



Right of view

