FCC TEST REPORT (15.247)

REPORT NO.: RF940414L13
MODEL NO.: SL-3050
(refer to page 8 for other models)
RECEIVED: Apr. 27, 2005
TESTED: Apr. 27 ~ May 07, 2005
ISSUED: May 12, 2005

APPLICANT: 3Com Corporation

ADDRESS: 350 Campus Dirve, Marlborough, MA 10752-3064. U.S.A.

ISSUED BY: Advance Data Technology Corporation

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang 244, Taipei Hsien, Taiwan, R.O.C.

TEST LOCATION: No. 19, Hwa Ya 2nd Rd., Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

This test report consists of 118 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by CNLA, A2LA or any government agencies. The test results in the report only apply to the tested sample.

0528
ILAC MRA

No. 2177-01

Table of Contents

1. CERTIFICATION 5
2. SUMMARY OF TEST RESULTS 6
2.1 MEASUREMENT UNCERTAINTY 7
3. GENERAL INFORMATION 8
3.1 GENERAL DESCRIPTION OF EUT 8
3.2 DESCRIPTION OF TEST MODES 10
3.2.1 CONFIGURATION OF SYSTEM UNDER TEST 11
3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL: 12
3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS 14
3.4 DESCRIPTION OF SUPPORT UNITS 14
4. TEST TYPES AND RESULTS (802.11b & g 2412~2462MHz BAND) 15
4.1 CONDUCTED EMISSION MEASUREMENT 15
4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT 15
4.1.2 TEST INSTRUMENTS 15
4.1.3 TEST PROCEDURES 16
4.1.4 DEVIATION FROM TEST STANDARD 16
4.1.5 TEST SETUP 17
4.1.6 EUT OPERATING CONDITIONS 17
4.1.7 TEST RESULTS 18
4.2 RADIATED EMISSION MEASUREMENT 24
4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT 24
4.2.2 TEST INSTRUMENTS 25
4.2.3 TEST PROCEDURES 26
4.2.4 DEVIATION FROM TEST STANDARD 26
4.2.5 TEST SETUP 27
4.2.6 EUT OPERATING CONDITIONS 27
4.2.7 TEST RESULTS 28
4.3 6dB BANDWIDTH MEASUREMENT 36
4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT 36
4.3.2 TEST INSTRUMENTS 36
4.3.3 TEST PROCEDURE 37
4.3.4 DEVIATION FROM TEST STANDARD 37
4.3.5 TEST SETUP 37
4.3.6 EUT OPERATING CONDITIONS 37
4.3.7 TEST RESULTS 38
4.4 MAXIMUM PEAK OUTPUT POWER 46
4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT 46
4.4.2 INSTRUMENTS 46

4.4.1 TEST PROCEDURES 47
4.4.2 DEVIATION FROM TEST STANDARD 47
4.4.3 TEST SETUP 47
4.4.4 EUT OPERATING CONDITIONS 47
4.4.3 TEST RESULTS 48
4.5 POWER SPECTRAL DENSITY MEASUREMENT 50
4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT 50
4.5.2 TEST INSTRUMENTS 50
4.5.3 TEST PROCEDURE 51
4.5.4 DEVIATION FROM TEST STANDARD 51
4.5.5 TEST SETUP 51
4.5.6 EUT OPERATING CONDITION 51
4.5.7 TEST RESULTS 52
4.6 BAND EDGES MEASUREMENT 60
4.6.1 LIMITS OF BAND EDGES MEASUREMENT 60
4.6.2 TEST INSTRUMENTS 60
4.6.3 TEST PROCEDURE 60
4.6.4 DEVIATION FROM TEST STANDARD 60
4.6.5 EUT OPERATING CONDITION 60
4.6.6 TEST RESULTS 61
4.7 ANTENNA REQUIREMENT 73
4.7.1 STANDARD APPLICABLE 73
4.7.2 ANTENNA CONNECTED CONSTRUCTION 73
5. TEST TYPES AND RESULTS (802.11a 5725~5850MHz BAND) 74
5.1 CONDUCTED EMISSION MEASUREMENT 74
5.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT 74
5.1.2 TEST INSTRUMENTS 74
5.1.3 TEST PROCEDURES 75
5.1.4 DEVIATION FROM TEST STANDARD 75
5.1.5 TEST SETUP 76
5.1.6 EUT OPERATING CONDITIONS 76
5.1.7 TEST RESULTS 77
5.2 RADIATED EMISSION MEASUREMENT 79
5.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT 79
5.2.2 TEST INSTRUMENTS 80
5.2.3 TEST PROCEDURES 81
5.2.4 DEVIATION FROM TEST STANDARD 81
5.2.5 TEST SETUP 82
5.2.6 EUT OPERATING CONDITIONS 82
5.2.7 TEST RESULTS 83
5.3 6dB BANDWIDTH MEASUREMENT 89

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT 89
5.3.2 TEST INSTRUMENTS 89
5.3.3 TEST PROCEDURE 90
5.3.4 DEVIATION FROM TEST STANDARD 90
5.3.5 TEST SETUP 90
5.3.6 EUT OPERATING CONDITIONS 90
5.3.7 TEST RESULTS 91
5.4 MAXIMUM PEAK OUTPUT POWER 96
5.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT 96
5.4.2 INSTRUMENTS 96
5.4.3 TEST PROCEDURES 97
5.4.4 DEVIATION FROM TEST STANDARD 97
5.4.5 TEST SETUP 97
5.4.6 EUT OPERATING CONDITIONS 97
5.4.7 TEST RESULTS 98
5.5 POWER SPECTRAL DENSITY MEASUREMENT 100
5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT 100
5.5.2 TEST INSTRUMENTS 100
5.5.3 TEST PROCEDURE 101
5.5.4 DEVIATION FROM TEST STANDARD 101
5.5.5 TEST SETUP 101
5.5.6 EUT OPERATING CONDITION 101
5.5.7 TEST RESULTS 102
5.6 BAND EDGES MEASUREMENT 107
5.6.1 LIMITS OF BAND EDGES MEASUREMENT 107
5.6.2 TEST INSTRUMENTS 107
5.6.3 TEST PROCEDURE 107
5.6.4 DEVIATION FROM TEST STANDARD 107
5.6.5 EUT OPERATING CONDITION 108
5.6.6 TEST RESULTS 108
5.7 ANTENNA REQUIREMENT 115
5.7.1 STANDARD APPLICABLE 115
5.7.2 ANTENNA CONNECTED CONSTRUCTION 115
6. PHOTOGRAPHS OF THE TEST CONFIGURATION 116
7. INFORMATION ON THE TESTING LABORATORIES 118

1. CERTIFICATION

PRODUCT:	11a/b/g Wireless PC Card with XJACK Antenna
BRAND NAME:	3Com
MODEL NO.:	SL-3050
	(refer to page 8 for other models)
APPLICANT:	3Com Corporation
TEST SAMPLE:	ENGINEERING SAMPLE
TESTED:	Apr. 27 ~ May 07, 2005
STANDARDS:	FCC Part 15, Subpart C (Section 15.247), ANSI C63.4-2003

The above equipment has been tested by **Advance Data Technology Corporation,** and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY	: for (Candice Chen)	, **DATE:**	May 12, 2005
TECHNICAL ACCEPTANCE Responsible for RF	: Gary Chang (Gary Chang)	, **DATE:**	May 12, 2005
APPROVED BY	: (Cody Chang, Deputy Manager)	, **DATE:**	May 12, 2005

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.247)			
Standard Section	**Test Type and Limit**	**Result**	**Remark**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is –16.50dB at 0.197MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is –0.80dB at 4824.00MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4:

Measurement	Frequency	Uncertainty
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.73 dB
	200MHz ~1000MHz	3.74 dB
	1GHz ~ 18GHz	2.20 dB
	18GHz ~ 40GHz	1.88 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	11a/b/g Wireless PC Card with XJACK Antenna
MODEL NO.	SL-3050
POWER SUPPLY	3.3Vdc from host equipment
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b:11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps (Turbo mode: up to 108Mbps *see Note 3) 802.11a: 54/48/36/24/18/12/9/6Mbps (Turbo mode: up to 108Mbps *see Note 3)
FREQUENCY RANGE	802.11b & 802.11g: 2.412 ~ 2.462GHz 802.11a: 5.150 ~ 5.350GHz and 5.725 ~ 5.850GHz
NUMBER OF CHANNEL	802.11b & 802.11g: 11 for Normal mode / 1 for Turbo mode 802.11a: 13 for Normal mode / 5 for Turbo mode
CHANNEL SPACING	802.11b & 802.11g: 5MHz 802.11a: 20MHz for Normal mode / 40MHz for Turbo mode
OUTPUT POWER	66.222mW for 802.11b 89.743mW for 802.11g 37.670mW for 5.150 ~ 5.350GHz 63.680mW for 5.725 ~ 5.850GHz
ANTENNA TYPE	2.4GHz band: Printed antenna with 2.5dBi gain 5GHz band: Printed antenna with 0dBi gain
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

1. The EUT operates in both the 5GHz and 2.4GHz Bands and compatibility with 802.11a and 802.11b, 802.11g technology.
2. There are three model names provided to this EUT. Please refer to the table as below for EUT's information:

Brand	Model Name
3Com	SL-3050
3Com	3CRPAG175B
3Com	3CRPAG175B-AP

3. This EUT is capable of providing data rates of up to 108 Mbps in Turbo mode depending upon reception quality.
4. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

Operated in 2400 ~ 2483.5MHz band:

For 802.11b/g: Eleven channels are provided to this EUT for normal mode.

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

For 802.11g: One channel is provided to this EUT for turbo mode.

Channel	Frequency
6	2437 MHz

Operated in 5725 ~ 5850MHz band:

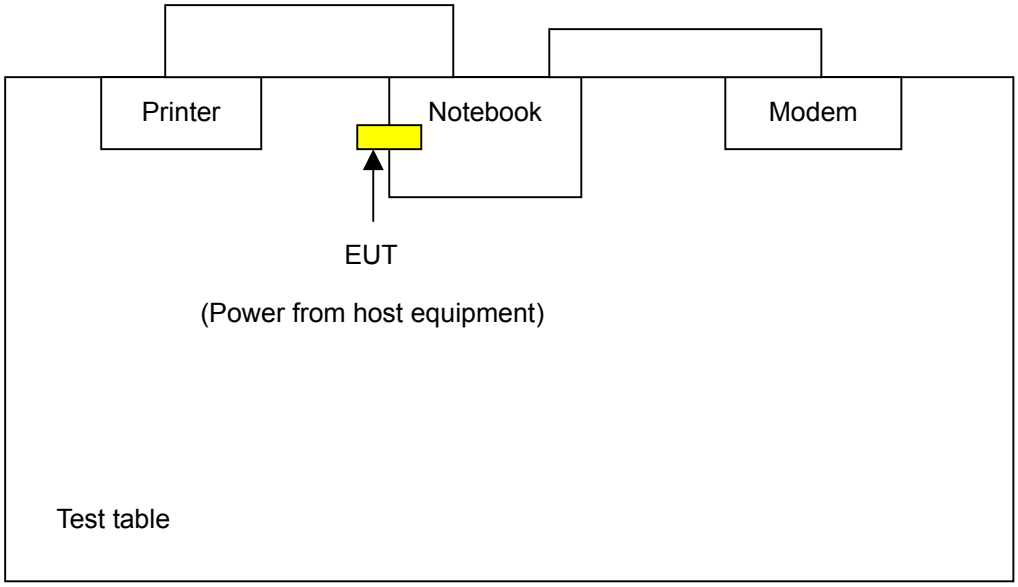
For 802.11a: Five channels are provided to this EUT for normal mode.

Channel	Frequency
1	5745 MHz
2	5765 MHz
3	5785 MHz
4	5805 MHz
5	5825 MHz

For 802.11a: Two channels are provided to this EUT for turbo mode.

Channel	Frequency
1	5760 MHz
2	5800 MHz

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

EUT configure mode	Applicable to				Description
	PLC	RE<1G	RE≥1G	APCM	
-	x	x	x	x	NA

Where PLC: Power Line Conducted Emission RE<1G RE: Radiated Emission below 1GHz
RE≥1G: Radiated Emission above 1GHz APCM: Antenna Port Conducted Measurement

Power Line Conducted Emission Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11a	1 to 5	3	OFDM	BPSK	6

Radiated Emission Test (Below 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11g	1 to 11	11	OFDM	BPSK	6
802.11a	1 to 5	3	OFDM	BPSK	6

Radiated Emission Test (Above 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	CCK	11
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11g Turbo	6	6	OFDM	BPSK	12
802.11a	1 to 5	1, 3, 5	OFDM	BPSK	6
802.11a Turbo	1 to 2	1, 2	OFDM	BPSK	12

Bandedge Measurement:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	1, 11	DSSS	CCK	11
802.11g	1 to 11	1, 11	OFDM	BPSK	6
802.11g Turbo	6	6	OFDM	BPSK	12
802.11a	1 to 5	1, 5	OFDM	BPSK	6
802.11a Turbo	1 to 2	1, 2	OFDM	BPSK	12

Antenna Port Conducted Measurement:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	CCK	11
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11g Turbo	6	6	OFDM	BPSK	12
802.11a	1 to 5	1, 3, 5	OFDM	BPSK	6
802.11a Turbo	1 to 2	1, 2	OFDM	BPSK	12

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is an 11a/b/g Wireless PC Card with XJACK Antenna. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C. (15.247)
ANSI C63.4-2003

All test items have been performed and recorded as per the above standards.

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.4 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.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP05L	20838027664	E2K24CLNS
2	PRINTER	EPSON	LQ-300+	DCGY054147	FCC DoC Approved
3	MODEM	ACEEX	1414V/3	0401008269	IFAXDM1414

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.8 m shielded cable without core
3	1.8 m shielded cable without core

NOTE: All power cords of the above support units are non shielded (1.8m).

4. TEST TYPES AND RESULTS (802.11b & g 2412~2462MHz Band)

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	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.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS30	100291	Nov. 16, 2005
RF signal cable Woken	5D-FB	Cable-HYC01-01	Jan. 09, 2006
LISN ROHDE & SCHWARZ	ESH3-Z5	100312	Feb. 15, 2006
LISN ROHDE & SCHWARZ	ESH2-Z5	100104	Feb. 15, 2006
Software ADT	ADT_Cond_V3	NA	NA

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 test was performed in HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-2040.

4.1.3 TEST PROCEDURES

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

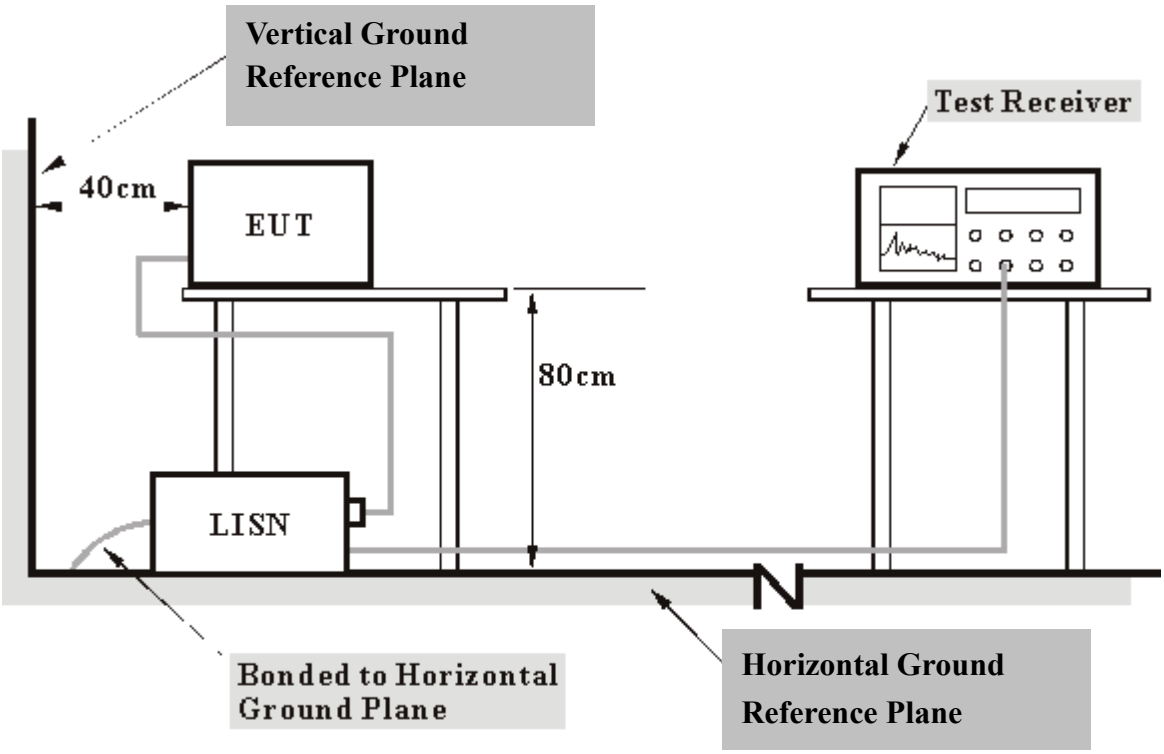
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

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

4.1.6 EUT OPERATING CONDITIONS

a. Connected the EUT with notebook system and placed on a testing table.
b. The notebook system ran a test program (provided by manufacturer) to enable EUT under transmission/receiving condition continuously at specific channel frequency.
c. The notebook system sent "H" messages to its screen.
d. The notebook system sent “H” messages to modem.
e. The notebook system sent "H" messages to printer, and the printer printed them on paper.
f. Steps c ~ e were repeated.

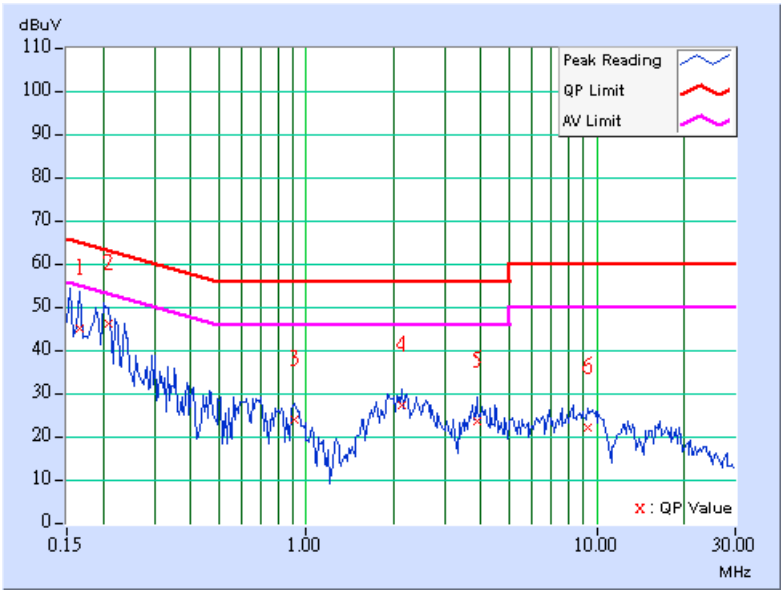
4.1.7 TEST RESULTS

Conducted Worst-Case Data

EUT	11a/b/g Wireless PC Card with XJACK Antenna	MEASUREMENT DETAIL	
MODEL	SL-3050	PHASE	Line 1
CHANNEL	Channel 1	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Match Tsui		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.166	0.11	44.69	-	44.80	-	65.18	55.18	-20.38	-
2	0.209	0.11	45.83	23.60	45.94	23.71	63.26	53.26	-17.32	-29.55
3	0.912	0.22	23.54	-	23.76	-	56.00	46.00	-32.24	-
4	2.141	0.27	26.84	-	27.11	-	56.00	46.00	-28.89	-
5	3.871	0.38	23.28	-	23.66	-	56.00	46.00	-32.34	-
6	9.309	0.52	21.68	-	22.20	-	60.00	50.00	-37.80	-

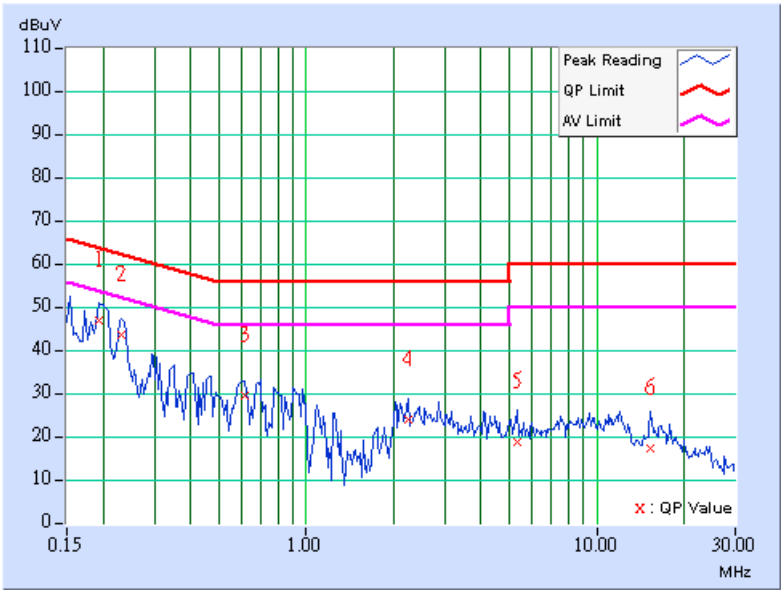
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



EUT	11a/b/g Wireless PC Card with XJACK Antenna	MEASUREMENT DETAIL	
MODEL	SL-3050	PHASE	Line 2
CHANNEL	Channel 1	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Match Tsui		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.193	0.11	46.47	25.09	46.58	25.20	63.91	53.91	-17.33	-28.71
2	0.232	0.11	43.17	25.25	43.28	25.36	62.38	52.38	-19.10	-27.02
3	0.615	0.16	29.10	-	29.26	-	56.00	46.00	-26.74	-
4	2.250	0.28	23.47	-	23.75	-	56.00	46.00	-32.25	-
5	5.301	0.40	18.55	-	18.95	-	60.00	50.00	-41.05	-
6	15.344	0.47	17.03	-	17.50	-	60.00	50.00	-42.50	-

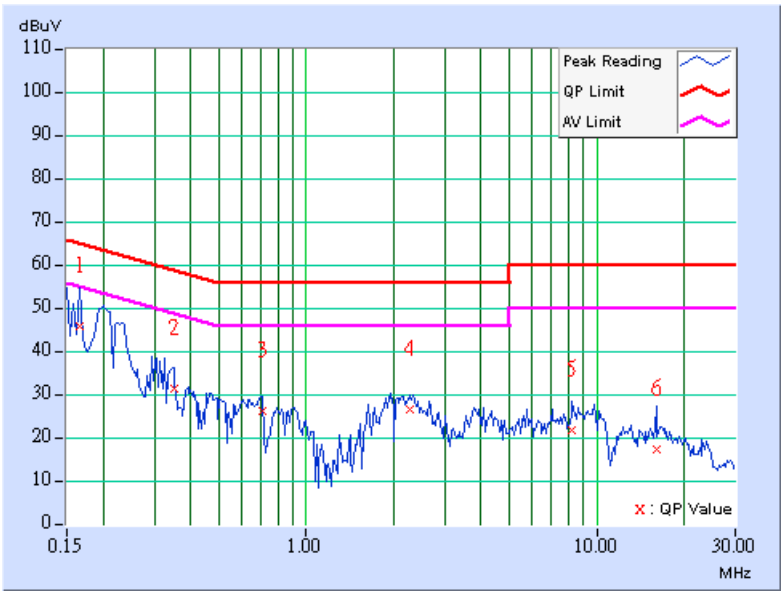
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



EUT	11a/b/g Wireless PC Card with XJACK Antenna	MEASUREMENT DETAIL	
MODEL	SL-3050	PHASE	Line 1
CHANNEL	Channel 6	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Match Tsui		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.166	0.11	45.41	16.03	45.52	16.14	65.18	55.18	-19.66	-39.04
2	0.349	0.11	30.80	-	30.91	-	58.98	48.98	-28.07	-
3	0.709	0.18	25.77	-	25.95	-	56.00	46.00	-30.05	-
4	2.262	0.28	25.91	-	26.19	-	56.00	46.00	-29.81	-
5	8.223	0.50	21.18	-	21.68	-	60.00	50.00	-38.32	-
6	16.023	0.65	16.93	-	17.58	-	60.00	50.00	-42.42	-

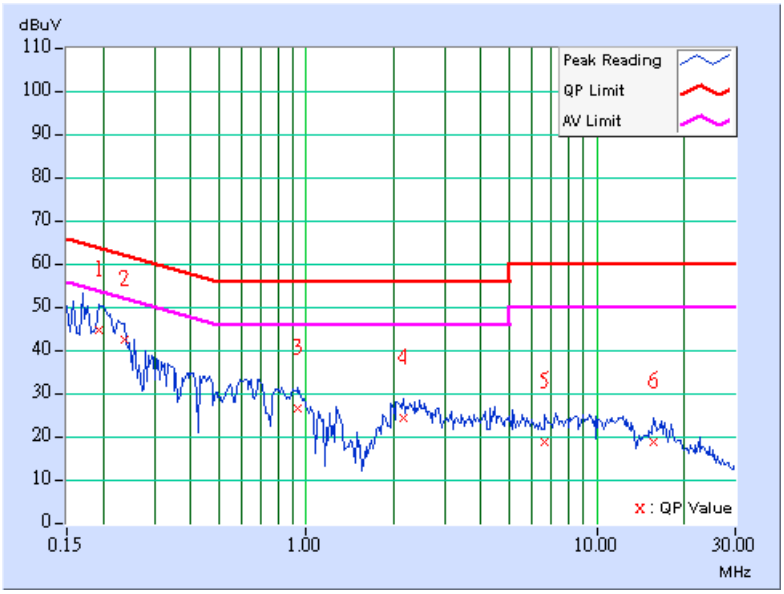
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



EUT	11a/b/g Wireless PC Card with XJACK Antenna	MEASUREMENT DETAIL	
MODEL	SL-3050	PHASE	Line 2
CHANNEL	Channel 6	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Match Tsui		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.193	0.11	44.22	22.11	44.33	22.22	63.91	53.91	-19.58	-31.69
2	0.236	0.11	42.17	-	42.28	-	62.24	52.24	-19.96	-
3	0.939	0.23	26.22	-	26.45	-	56.00	46.00	-29.55	-
4	2.172	0.27	23.95	-	24.22	-	56.00	46.00	-31.78	-
5	6.652	0.41	18.52	-	18.93	-	60.00	50.00	-41.07	-
6	15.789	0.49	18.22	-	18.71	-	60.00	50.00	-41.29	-

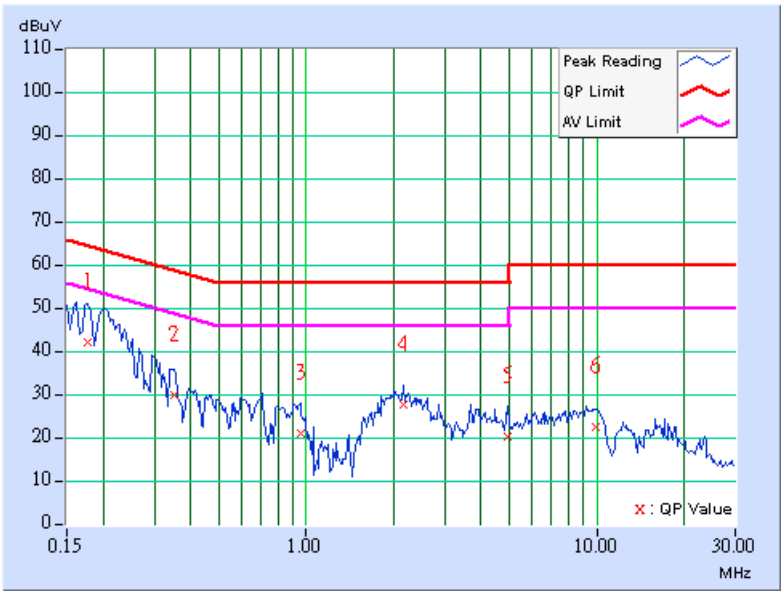
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



EUT	11a/b/g Wireless PC Card with XJACK Antenna	MEASUREMENT DETAIL	
MODEL	SL-3050	PHASE	Line 1
CHANNEL	Channel 11	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Match Tsui		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.177	0.11	41.76	-	41.87	-	64.61	54.61	-22.74	-
2	0.349	0.11	29.46	-	29.57	-	58.98	48.98	-29.41	-
3	0.955	0.23	20.60	-	20.83	-	56.00	46.00	-35.17	-
4	2.164	0.27	27.28	-	27.55	-	56.00	46.00	-28.45	-
5	4.938	0.41	19.71	-	20.12	-	56.00	46.00	-35.88	-
6	9.902	0.54	22.05	-	22.59	-	60.00	50.00	-37.41	-

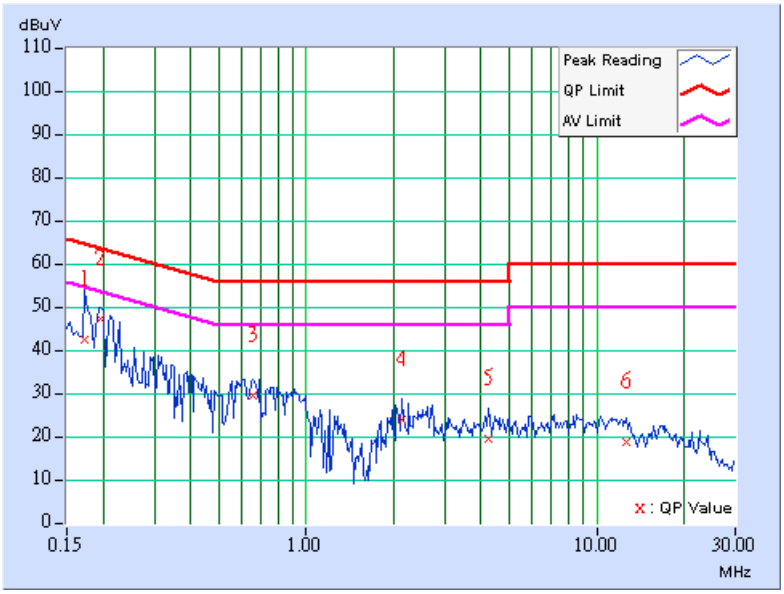
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



EUT	11a/b/g Wireless PC Card with XJACK Antenna	MEASUREMENT DETAIL	
MODEL	SL-3050	PHASE	Line 2
CHANNEL	Channel 11	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Match Tsui		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.173	0.11	41.98	-	42.09	-	64.79	54.79	-22.71	-
2	0.197	0.11	47.13	28.51	47.24	28.62	63.74	53.74	-16.50	-25.12
3	0.654	0.17	29.29	-	29.46	-	56.00	46.00	-26.54	-
4	2.129	0.27	23.46	-	23.73	-	56.00	46.00	-32.27	-
5	4.234	0.39	19.34	-	19.73	-	56.00	46.00	-36.27	-
6	12.617	0.45	18.52	-	18.97	-	60.00	50.00	-41.03	-

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESIB7	100188	Dec. 19, 2005
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Nov. 21, 2005
BILOG Antenna SCHWARZBECK	VULB9168	9168-157	Jan. 22, 2006
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-407	Jan. 16, 2006
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA 9170241	Feb. 23, 2006
Preamplifier Agilent	8449B	3008A01961	Nov. 09, 2005
Preamplifier Agilent	8447D	2944A10629	Nov. 09, 2005
RF signal cable HUBER+SUHNER	SUCOFLEX 104	218182/4	Feb. 17, 2006
RF signal cable HUBER+SUHNER	SUCOFLEX 104	218194/4	Feb. 17, 2006
Software ADT.	ADT_Radiated_V5.14	NA	NA
Antenna Tower ADT.	AT100	AT93021702	NA
Turn Table ADT.	TT100.	TT93021702	NA
Controller ADT.	SC100.	SC93021702	NA

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 test was performed in HwaYa Chamber 1.

3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

4. The IC Site Registration No. is IC4924-2.

4.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi- anechoic. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

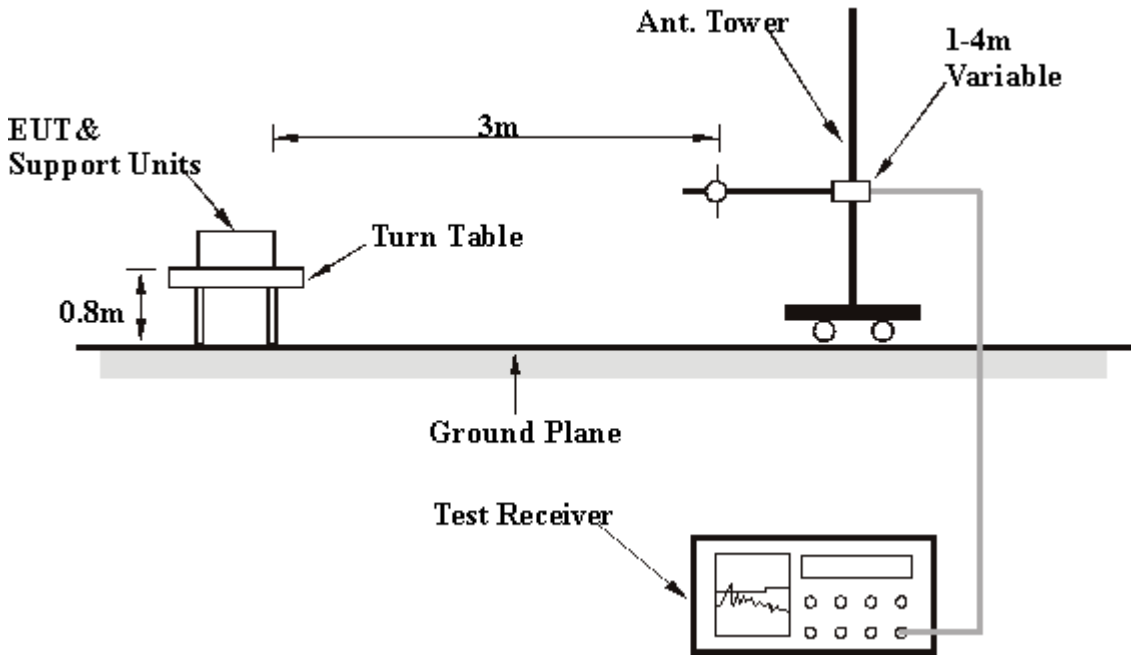
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

4.2.7 TEST RESULTS

Below 1GHz Worst-Case Data

EUT	11a/b/g Wireless PC Card with XJACK Antenna	**MEASUREMENT DETAIL**	
MODEL	SL-3050	**FREQUENCY RANGE**	Below 1000MHz
CHANNEL	Channel 11	**DETECTOR FUNCTION**	Quasi-Peak
MODULATION TYPE	BPSK	**ENVIRONMENTAL CONDITIONS**	25deg. C, 64%RH, 991hPa
TRANSFER RATE	6Mbps	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	119.42	34.85 QP	43.50	-8.65	1.50 H	100	22.11	12.74
2	160.24	31.48 QP	43.50	-12.02	2.00 H	79	16.85	14.63
3	232.16	29.81 QP	46.00	-16.19	1.50 H	259	17.40	12.41
4	267.15	32.31 QP	46.00	-13.69	1.00 H	250	18.78	13.53
5	399.34	35.05 QP	46.00	-10.95	2.00 H	85	18.43	16.62
6	584.01	28.75 QP	46.00	-17.25	1.50 H	235	8.27	20.48
7	702.59	40.10 QP	46.00	-5.90	1.00 H	55	17.80	22.31

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	78.60	29.54 QP	40.00	-10.46	1.00 V	64	19.43	10.11
2	119.42	29.90 QP	43.50	-13.60	1.00 V	241	17.16	12.74
3	265.21	33.51 QP	46.00	-12.49	2.00 V	10	20.07	13.45
4	584.01	32.79 QP	46.00	-13.21	1.00 V	325	12.30	20.48
5	663.71	31.95 QP	46.00	-14.05	1.00 V	148	10.18	21.77
6	702.59	35.89 QP	46.00	-10.11	1.50 V	322	13.58	22.31

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

802.11b DSSS modulation

EUT	11a/b/g Wireless PC Card with XJACK Antenna	MEASUREMENT DETAIL	
MODEL	SL-3050	FREQUENCY RANGE	1 ~ 25GHz
CHANNEL	Channel 1	DETECTOR FUNCTION	Peak(PK) Average (AV)
MODULATION TYPE	CCK	ENVIRONMENTAL CONDITIONS	25deg. C, 64%RH, 991hPa
TRANSFER RATE	11Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2386.00	56.92 PK	74.00	-17.08	1.05 H	19	25.96	30.96
1	2386.00	47.35 AV	54.00	-6.65	1.05 H	19	16.39	30.96
2	*2412.00	115.37 PK			1.05 H	19	84.31	31.06
2	*2412.00	107.26 AV			1.05 H	19	76.20	31.06
3	4824.00	71.45 PK	74.00	-2.55	1.05 H	19	35.02	36.43
3	4824.00	48.92 AV	54.00	-5.08	1.05 H	19	12.49	36.43

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2386.00	56.84 PK	74.00	-17.16	1.00 V	255	25.88	30.96
1	2386.00	46.12 AV	54.00	-7.88	1.00 V	255	15.16	30.96
2	*2412.00	108.72 PK			1.00 V	254	77.66	31.06
2	*2412.00	101.42 AV			1.00 V	254	70.36	31.06
3	**4824.00**	**73.20 PK**	**74.00**	**-0.80**	**1.02 V**	**220**	**36.77**	**36.43**
3	4824.00	50.89 AV	54.00	-3.11	1.02 V	220	14.46	36.43

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

EUT	11a/b/g Wireless PC Card with XJACK Antenna	**MEASUREMENT DETAIL**	
MODEL	SL-3050	**FREQUENCY RANGE**	1 ~ 25GHz
CHANNEL	Channel 6	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
MODULATION TYPE	CCK	**ENVIRONMENTAL CONDITIONS**	25deg. C, 64%RH, 991hPa
TRANSFER RATE	11Mbps	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	114.86 PK			1.33 H	360	83.69	31.17
1	*2437.00	107.43 AV			1.33 H	360	76.26	31.17
2	4874.00	70.21 PK	74.00	-3.79	1.13 H	30	33.67	36.54
2	4874.00	49.58 AV	54.00	-4.42	1.13 H	30	13.04	36.54

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	109.12 PK			1.00 V	255	77.95	31.17
1	*2437.00	101.68 AV			1.00 V	255	70.51	31.17
2	4874.00	71.23 PK	74.00	-2.77	1.07 V	235	34.69	36.54
2	4874.00	50.41 AV	54.00	-3.59	1.07 V	235	13.87	36.54

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. “ * “ : Fundamental frequency

EUT	11a/b/g Wireless PC Card with XJACK Antenna	**MEASUREMENT DETAIL**	
MODEL	SL-3050	**FREQUENCY RANGE**	1 ~ 25GHz
CHANNEL	Channel 11	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
MODULATION TYPE	CCK	**ENVIRONMENTAL CONDITIONS**	25deg. C, 64%RH, 991hPa
TRANSFER RATE	11Mbps	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	114.77 PK			1.27 H	19	83.49	31.28
1	*2462.00	106.38 AV			1.27 H	19	75.10	31.28
2	2488.00	57.42 PK	74.00	-16.58	1.27 H	19	26.03	31.39
2	2488.00	47.23 AV	54.00	-6.77	1.27 H	19	15.84	31.39
3	4924.00	70.04 PK	74.00	-3.96	1.00 H	1	33.38	36.66
3	4924.00	48.34 AV	54.00	-5.66	1.00 H	1	11.68	36.66

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	107.89 PK			1.21 V	304	76.61	31.28
1	*2462.00	100.30 AV			1.21 V	304	69.02	31.28
2	2487.00	54.28 PK	74.00	-19.72	1.21 V	304	22.90	31.38
2	2487.00	45.37 AV	54.00	-8.63	1.21 V	304	13.99	31.38
3	4924.00	72.48 PK	74.00	-1.52	1.18 V	237	35.82	36.66
3	4924.00	51.98 AV	54.00	-2.02	1.18 V	237	15.32	36.66

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

802.11g OFDM modulation)

EUT	11a/b/g Wireless PC Card with XJACK Antenna	MEASUREMENT DETAIL	
MODEL	SL-3050	FREQUENCY RANGE	1 ~ 25GHz
CHANNEL	Channel 1	DETECTOR FUNCTION	Peak(PK) Average (AV)
MODULATION TYPE	BPSK	ENVIRONMENTAL CONDITIONS	25deg. C, 64%RH, 991hPa
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	67.52 PK	74.00	-6.48	1.07 H	19	36.55	30.97
1	2390.00	52.08 AV	54.00	-1.92	1.07 H	19	21.11	30.97
2	*2412.00	112.77 PK			1.07 H	19	81.71	31.06
2	*2412.00	100.62 AV			1.07 H	19	69.56	31.06
3	4824.00	59.76 PK	74.00	-14.24	1.07 H	57	23.33	36.43
3	4824.00	45.78 AV	54.00	-8.22	1.07 H	57	9.35	36.43

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	62.23 PK	74.00	-11.77	1.00 V	254	31.26	30.97
1	2390.00	48.74 AV	54.00	-5.26	1.00 V	254	17.77	30.97
2	*2412.00	106.73 PK			1.00 V	254	75.67	31.06
2	*2412.00	97.62 AV			1.00 V	254	66.56	31.06
3	4824.00	63.07 PK	74.00	-10.93	1.66 V	257	26.64	36.43
3	4824.00	50.04 AV	54.00	-3.96	1.66 V	257	13.61	36.43

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. “ * “ : Fundamental frequency

EUT	11a/b/g Wireless PC Card with XJACK Antenna	**MEASUREMENT DETAIL**	
MODEL	SL-3050	**FREQUENCY RANGE**	1 ~ 25GHz
CHANNEL	Channel 6	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
MODULATION TYPE	BPSK	**ENVIRONMENTAL CONDITIONS**	25deg. C, 64%RH, 991hPa
TRANSFER RATE	6Mbps	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	114.12 PK			1.05 H	20	82.95	31.17
1	*2437.00	104.13 AV			1.05 H	20	72.96	31.17
2	4874.00	63.01 PK	74.00	-10.99	1.20 H	54	26.47	36.54
2	4874.00	48.13 AV	54.00	-5.87	1.20 H	54	11.59	36.54

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	107.04 PK			1.21 V	305	75.87	31.17
1	*2437.00	98.30 AV			1.21 V	305	67.13	31.17
2	4874.00	64.47 PK	74.00	-9.53	1.00 V	223	27.93	36.54
2	4874.00	49.57 AV	54.00	-4.43	1.00 V	223	13.03	36.54

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. “ * “ : Fundamental frequency

EUT	11a/b/g Wireless PC Card with XJACK Antenna	**MEASUREMENT DETAIL**	
MODEL	SL-3050	**FREQUENCY RANGE**	1 ~ 25GHz
CHANNEL	Channel 11	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
MODULATION TYPE	BPSK	**ENVIRONMENTAL CONDITIONS**	25deg. C, 64%RH, 991hPa
TRANSFER RATE	6Mbps	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	111.98 PK			1.04 H	19	80.70	31.28
1	*2462.00	100.20 AV			1.04 H	19	68.92	31.28
2	2483.50	68.91 PK	74.00	-5.09	1.04 H	19	37.54	31.37
2	2483.50	52.65 AV	54.00	-1.35	1.04 H	19	21.28	31.37
3	4924.00	61.06 PK	74.00	-12.94	1.10 H	128	24.40	36.66
3	4924.00	48.03 AV	54.00	-5.97	1.10 H	128	11.37	36.66

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	108.98 PK			1.00 V	256	77.70	31.28
1	*2462.00	99.07 AV			1.00 V	256	67.79	31.28
2	2483.50	65.61 PK	74.00	-8.39	1.00 V	256	34.24	31.37
2	2483.50	51.38 AV	54.00	-2.62	1.00 V	256	20.01	31.37
3	4924.00	62.71 PK	74.00	-11.29	1.31 V	239	26.05	36.66
3	4924.00	50.52 AV	54.00	-3.48	1.31 V	239	13.86	36.66

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. “ * “ : Fundamental frequency

802.11g Turbo OFDM modulation

EUT	11a/b/g Wireless PC Card with XJACK Antenna	MEASUREMENT DETAIL	
MODEL	SL-3050	FREQUENCY RANGE	1 ~ 25GHz
CHANNEL	Channel 6	DETECTOR FUNCTION	Peak(PK) Average (AV)
MODULATION TYPE	BPSK	ENVIRONMENTAL CONDITIONS	25deg. C, 64%RH, 991hPa
TRANSFER RATE	12Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	59.74 PK	74.00	-14.26	1.05 H	7	32.68	27.06
1	2390.00	49.61 AV	54.00	-4.39	1.05 H	7	22.55	27.06
2	*2437.00	107.50 PK			1.05 H	7	80.44	27.06
2	*2437.00	98.15 AV			1.05 H	7	71.09	27.06
3	2483.50	60.61 PK	74.00	-13.39	1.05 H	7	33.55	27.06
3	2483.50	48.62 AV	54.00	-5.38	1.05 H	7	21.56	27.06
4	4874.00	61.87 PK	74.00	-12.13	1.11 H	39	34.81	27.06
4	4874.00	44.53 AV	54.00	-9.47	1.11 H	39	17.47	27.06

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	56.04 PK	74.00	-17.96	1.00 V	254	25.07	30.97
1	2390.00	46.21 AV	54.00	-7.79	1.00 V	254	15.24	30.97
2	*2437.00	103.03 PK			1.00 V	254	71.86	31.17
2	*2437.00	93.86 AV			1.00 V	254	62.69	31.17
3	2483.50	57.48 PK	74.00	-16.52	1.00 V	254	26.11	31.37
3	2483.50	47.36 AV	54.00	-6.64	1.00 V	254	15.99	31.37
4	4874.00	63.04 PK	74.00	-10.96	1.05 V	237	26.50	36.54
4	4874.00	47.02 AV	54.00	-6.98	1.05 V	237	10.48	36.54

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “ : Fundamental frequency

4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK 30	100049	Aug. 12, 2005

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

4.3.3 TEST PROCEDURE

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

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP

4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

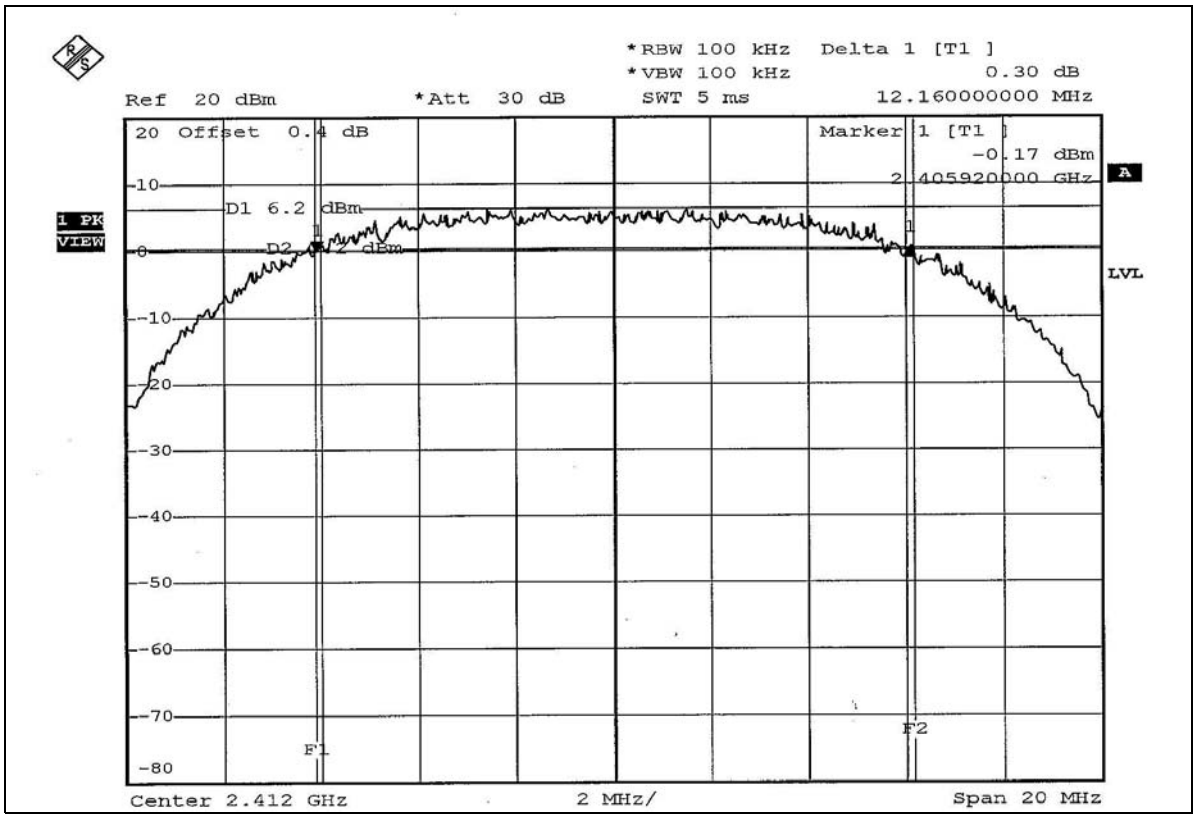
4.3.7 TEST RESULTS

802.11b DSSS modulation

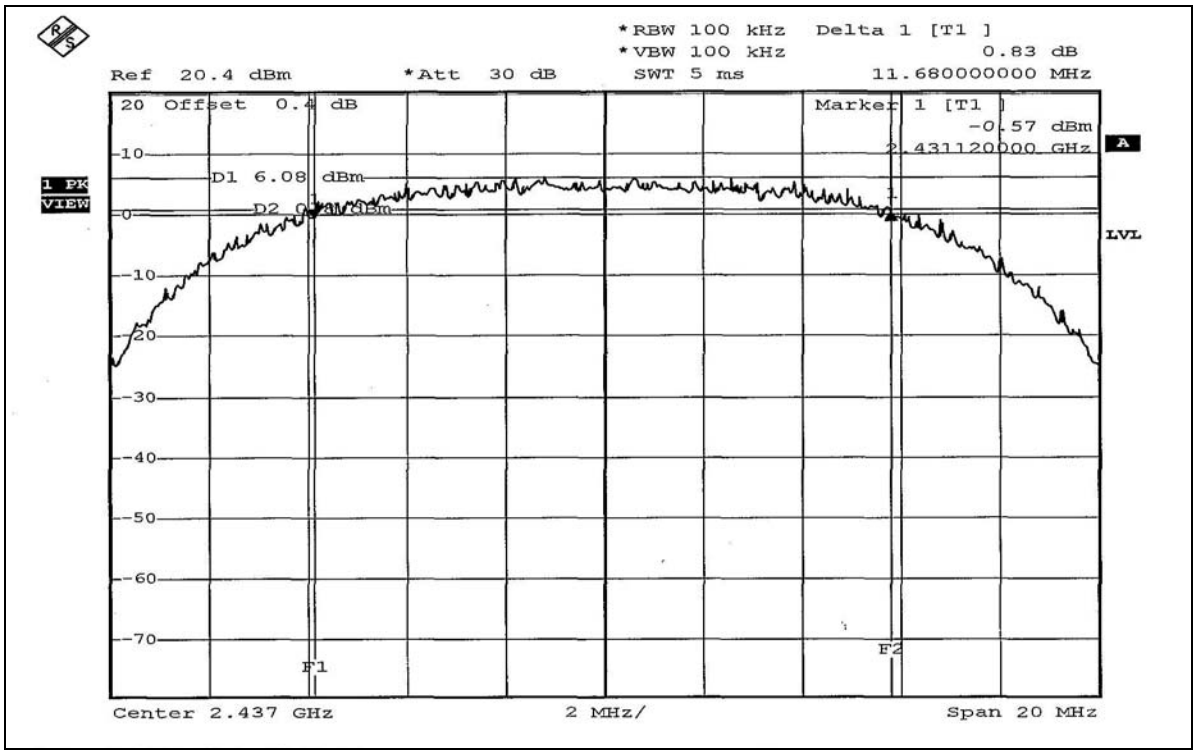
EUT	11a/b/g Wireless PC Card with XJACK Antenna	**MODEL**	SL-3050
MODULATION TYPE	CCK	**TRANSFER RATE**	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	26deg.C, 64%RH, 991hPa
TESTED BY	Match Tsui		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	12.16	0.5	PASS
6	2437	11.68	0.5	PASS
11	2462	11.40	0.5	PASS

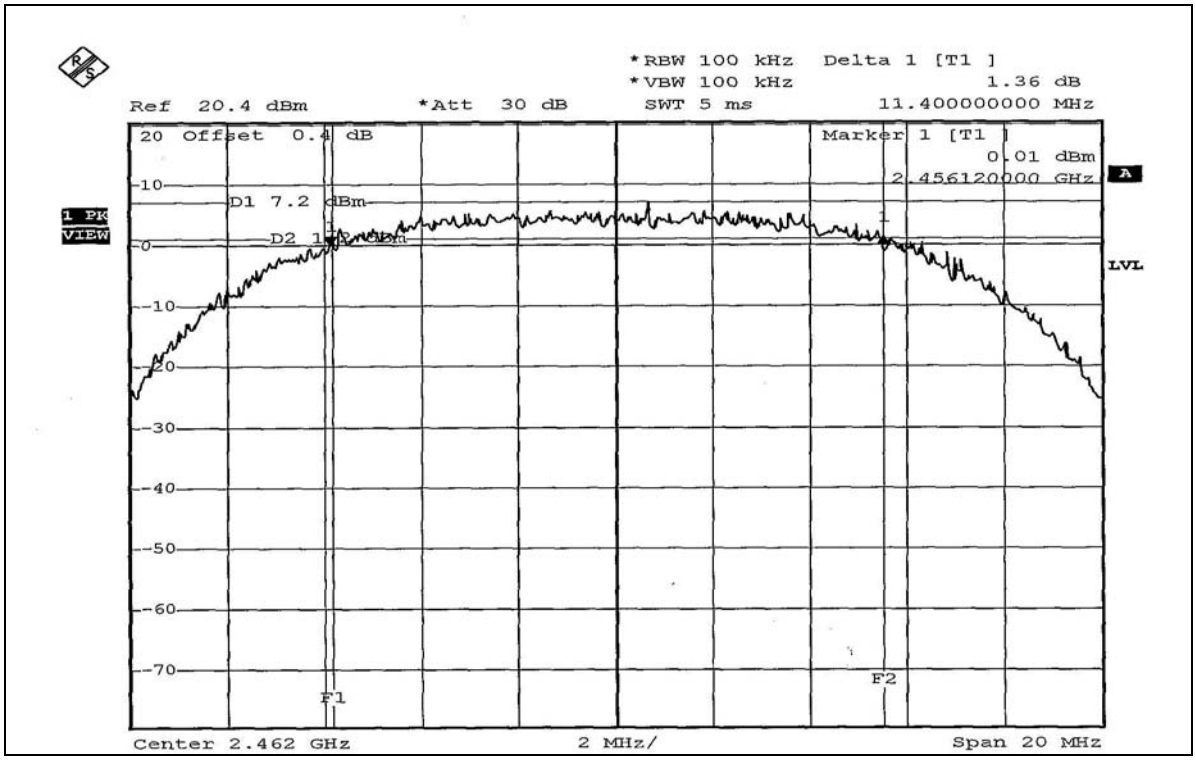
CH 1


*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 1 [T1]
0.30 dB
12.160000000 MHz
Ref 20 dBm
*Att 30 dB
20 Offset 0.4 dB
Marker 1 [T1]
-0.17 dBm
2.405920000 GHz
D1 6.2 dBm
D2 0.2 dBm
1 PK
VIEW
A
LVL
F1
F2
Center 2.412 GHz
2 MHz/
Span 20 MHz

CH 6


*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 1 [T1]
0.83 dB
11.680000000 MHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
Marker 1 [T1]
-0.57 dBm
2.431120000 GHz
D1 6.08 dBm
D2 0.08 dBm
1 PK
VIEW
A
LVL
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz

CH 11

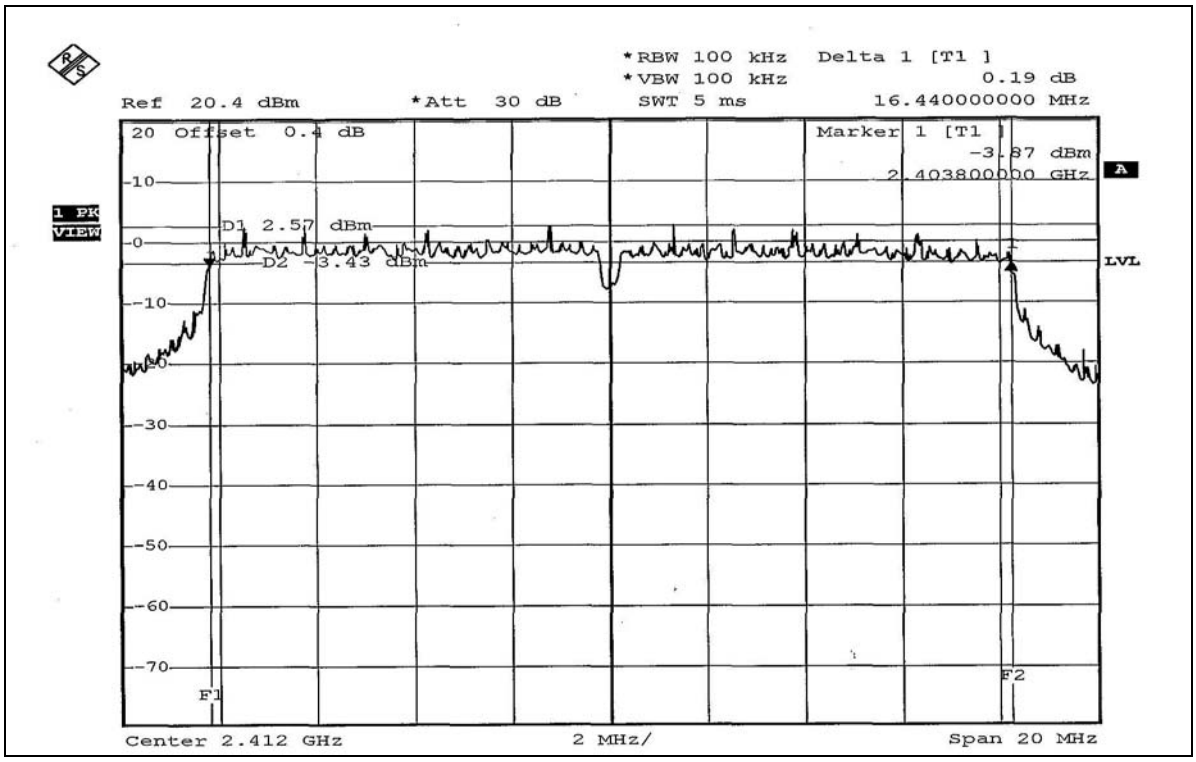

*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 1 [T1]
1.36 dB
11.400000000 MHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
Marker 1 [T1]
0.01 dBm
2.456120000 GHz
D1 7.2 dBm
D2 1
1 PK
VIEW
A
LVL
10
0
-10
-20
-30
-40
-50
-60
-70
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz

802.11g OFDM modulation

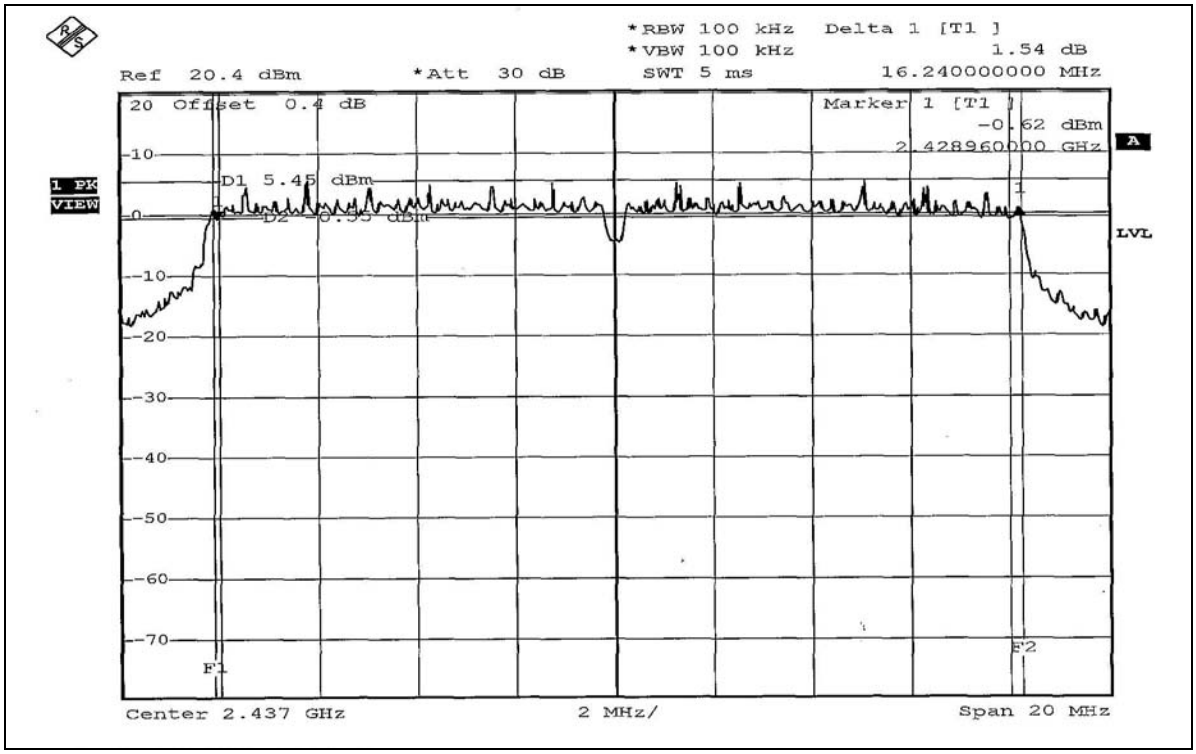
EUT	11a/b/g Wireless PC Card with XJACK Antenna	**MODEL**	SL-3050
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	26deg.C, 64%RH, 991hPa
TESTED BY	Match Tsui		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	16.44	0.5	PASS
6	2437	16.24	0.5	PASS
11	2462	16.36	0.5	PASS

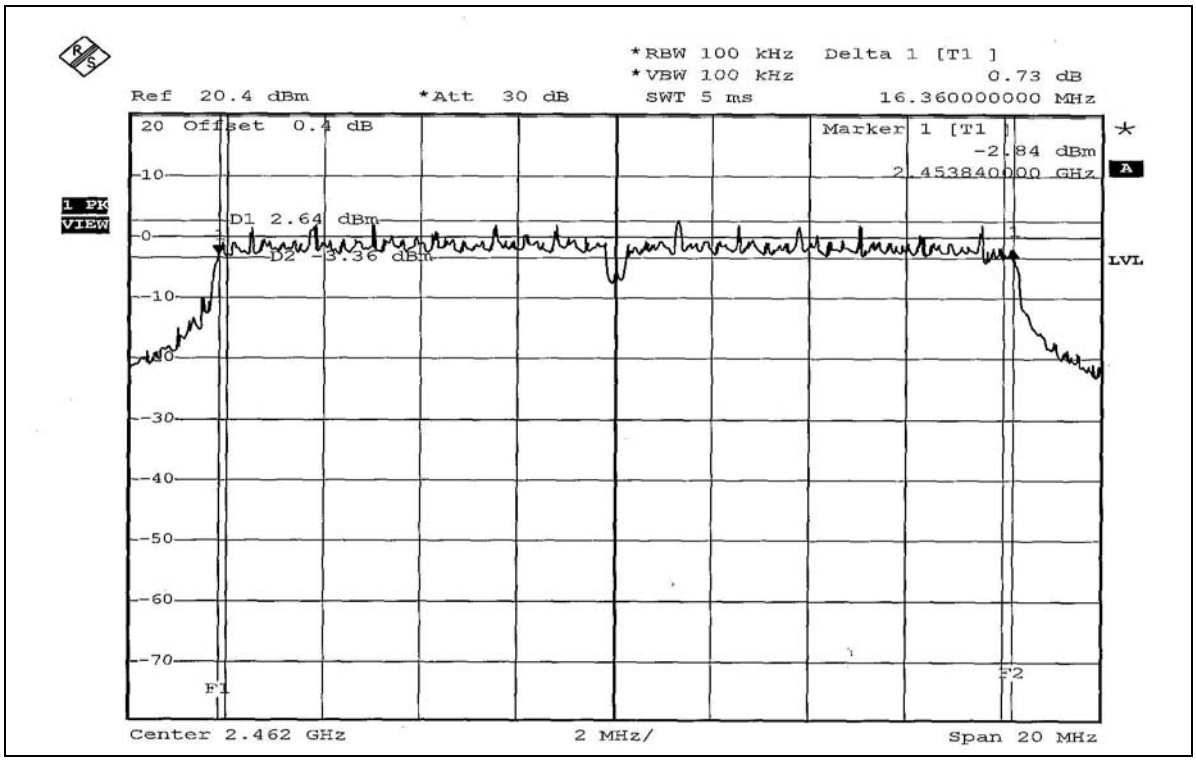
CH 1


*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 1 [T1]
0.19 dB
16.440000000 MHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
Marker 1 [T1]
-3.87 dBm
2.403800000 GHz
D1 2.57 dBm
D2 -3.43 dBm
1 PK VIEW
A
LVL
F1
F2
Center 2.412 GHz
2 MHz/
Span 20 MHz

CH 6


*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 1 [T1]
1.54 dB
16.240000000 MHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
Marker 1 [T1]
-0.62 dBm
2.428960000 GHz
D1 5.45 dBm
1 PK VIEW
A
LVL
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz

CH 11

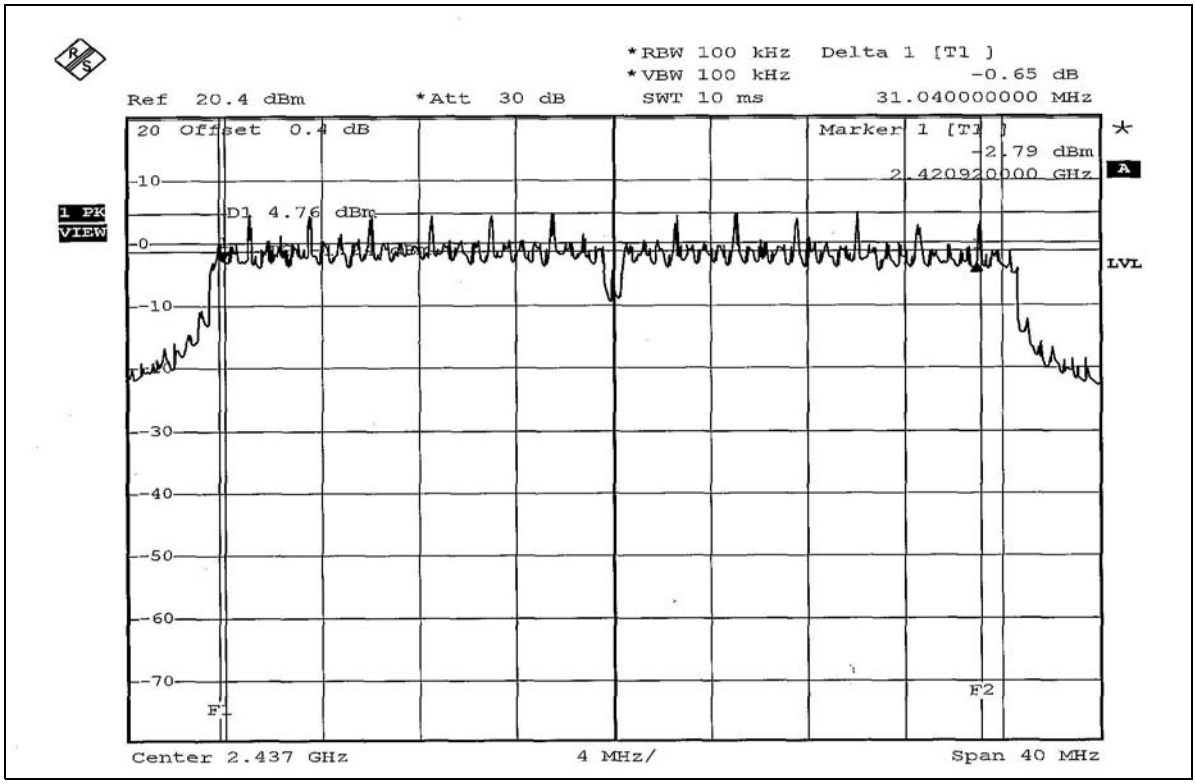

*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 1 [T1]
0.73 dB
16.360000000 MHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
Marker 1 [T1]
-2.84 dBm
2.453840000 GHz
1 PK
VIEW
D1 2.64 dBm
D2 -3.36 dBm
LVL
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz

802.11g Turbo OFDM modulation

EUT	11a/b/g Wireless PC Card with XJACK Antenna	**MODEL**	SL-3050
MODULATION TYPE	BPSK	**TRANSFER RATE**	12Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	26deg.C, 64%RH, 991hPa
TESTED BY	Match Tsui		

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
6	2437	31.04	0.5	PASS

CH 6


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Delta 1 [T1]
-0.65 dB
31.040000000 MHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
Marker 1 [T1]
-2.79 dBm
2.420920000 GHz
D1 4.76 dBm
1 PK
VIEW
A
LVL
F1
F2
Center 2.437 GHz
4 MHz/
Span 40 MHz

4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005
AGILENT SIGNAL GENERATOR	E8257C	MY43320668	Dec. 31, 2005
TEKTRONIX OSCILLOSCOPE	TDS 1012	C019167	Feb. 01, 2006
NARDA DETECTOR	4503A	FSCM99899	NA

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

4.4.1 TEST PROCEDURES

1. A detector was used on the output port of the EUT. An oscilloscope was used to read the response of the detector.
2. Replaced the EUT by the signal generator. The center frequency of the S.G was adjusted to the center frequency of the measured channel.
3. Adjusted the power to have the same reading on oscilloscope. Record the power level.

4.4.2 DEVIATION FROM TEST STANDARD

No deviation

4.4.3 TEST SETUP

4.4.4 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.3 TEST RESULTS

802.11b DSSS modulation

EUT	11a/b/g Wireless PC Card with XJACK Antenna	**MODEL**	SL-3050
MODULATION TYPE	CCK	**TRANSFER RATE**	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	26deg.C, 64%RH, 991hPa
TESTED BY	Match Tsui		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	64.565	18.10	30	PASS
6	2437	66.222	18.21	30	PASS
11	2462	64.417	18.09	30	PASS

802.11g OFDM modulation

EUT	11a/b/g Wireless PC Card with XJACK Antenna	**MODEL**	SL-3050
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	26deg.C, 64%RH, 991hPa
TESTED BY	Match Tsui		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	51.404	17.11	30	PASS
6	2437	89.743	19.53	30	PASS
11	2462	50.466	17.03	30	PASS

802.11g Turbo OFDM modulation

EUT	11a/b/g Wireless PC Card with XJACK Antenna	**MODEL**	SL-3050
MODULATION TYPE	BPSK	**TRANSFER RATE**	12Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	26deg.C, 64%RH, 991hPa
TESTED BY	Match Tsui		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
6	2437	80.168	19.04	30	PASS

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

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

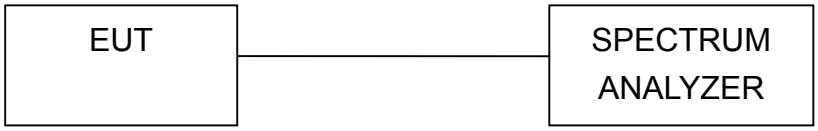
4.5.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.
The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

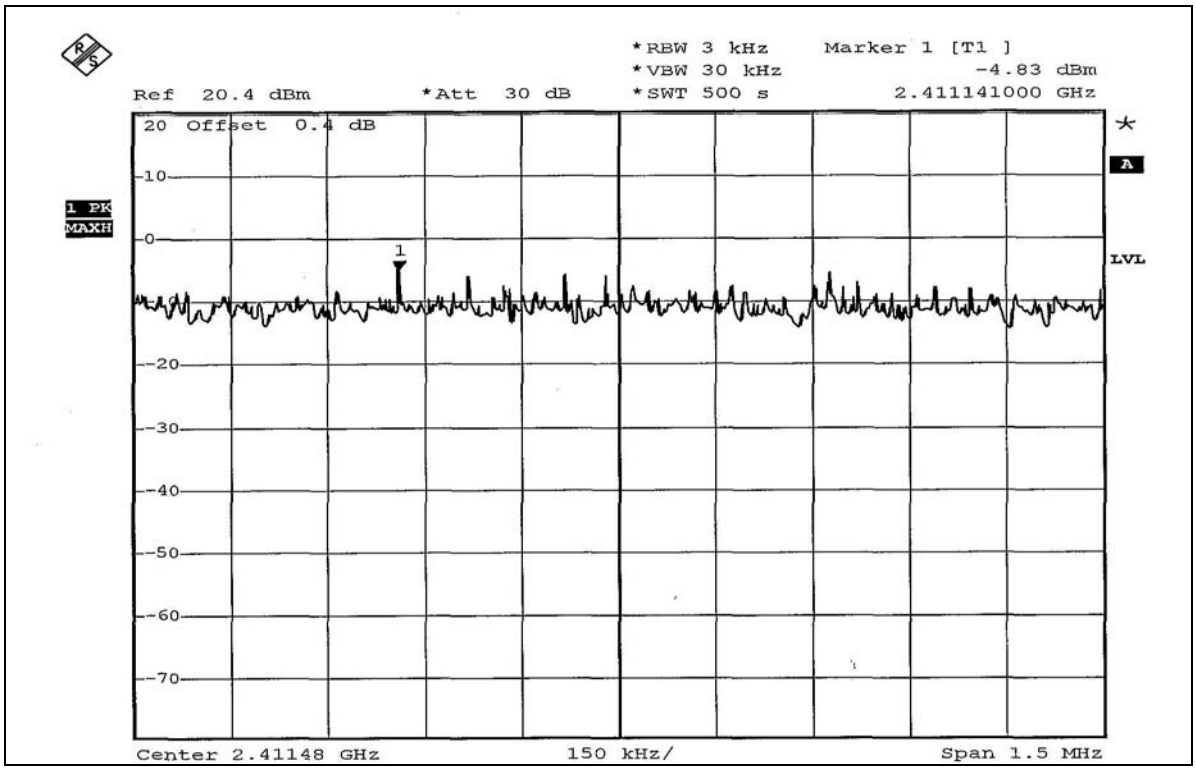
4.5.7 TEST RESULTS

802.11b DSSS modulation

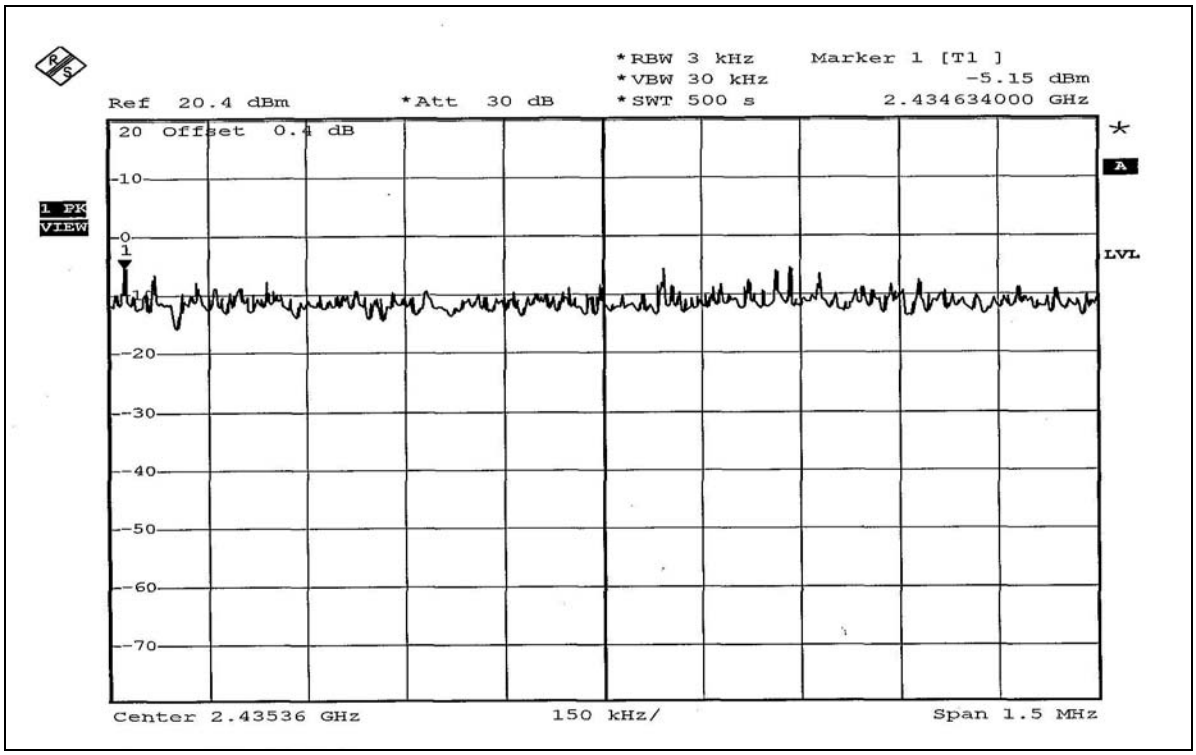
EUT	11a/b/g Wireless PC Card with XJACK Antenna	**MODEL**	SL-3050
MODULATION TYPE	CCK	**TRANSFER RATE**	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	26deg.C, 64%RH, 991hPa
TESTED BY	Match Tsui		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-4.83	8	PASS
6	2437	-5.15	8	PASS
11	2462	-4.98	8	PASS

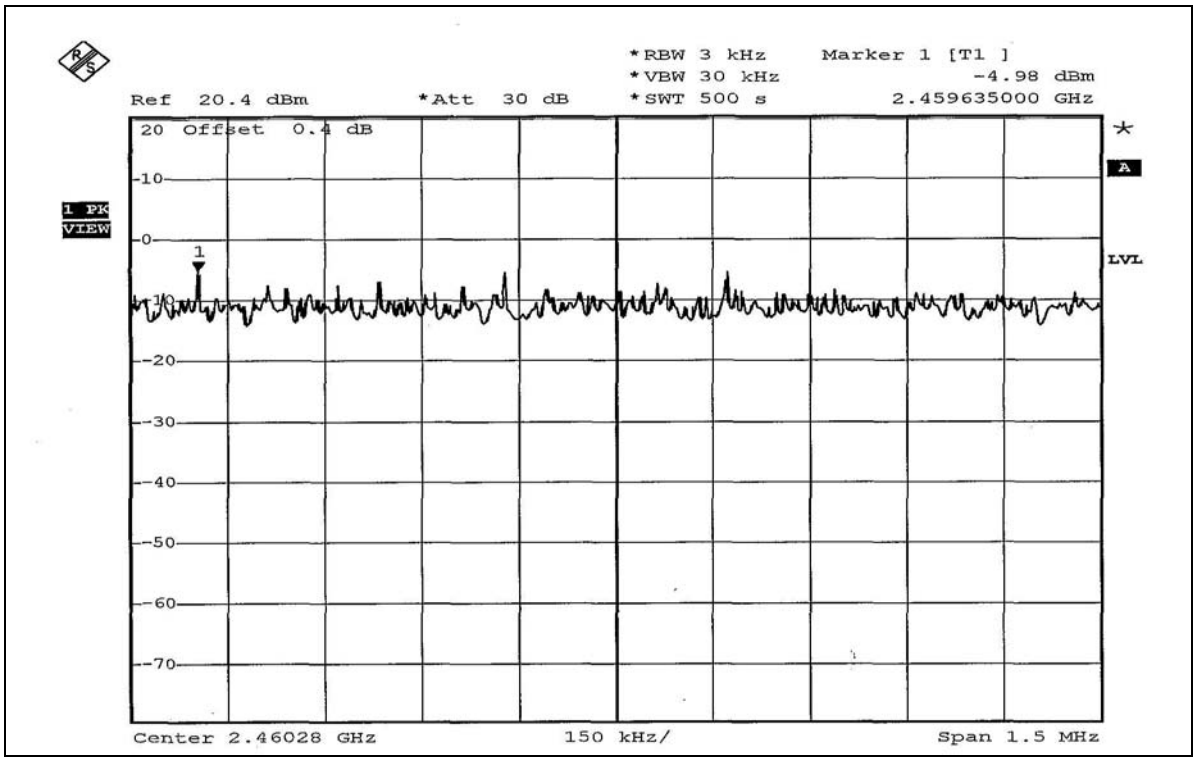
CH 1


*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-4.83 dBm
2.411141000 GHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
1 PK
MAXH
A
LVL
Center 2.41148 GHz
150 kHz/
Span 1.5 MHz

CH 6


*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-5.15 dBm
2.434634000 GHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
1 PK
VIEW
A
LVL
Center 2.43536 GHz
150 kHz/
Span 1.5 MHz

CH 11

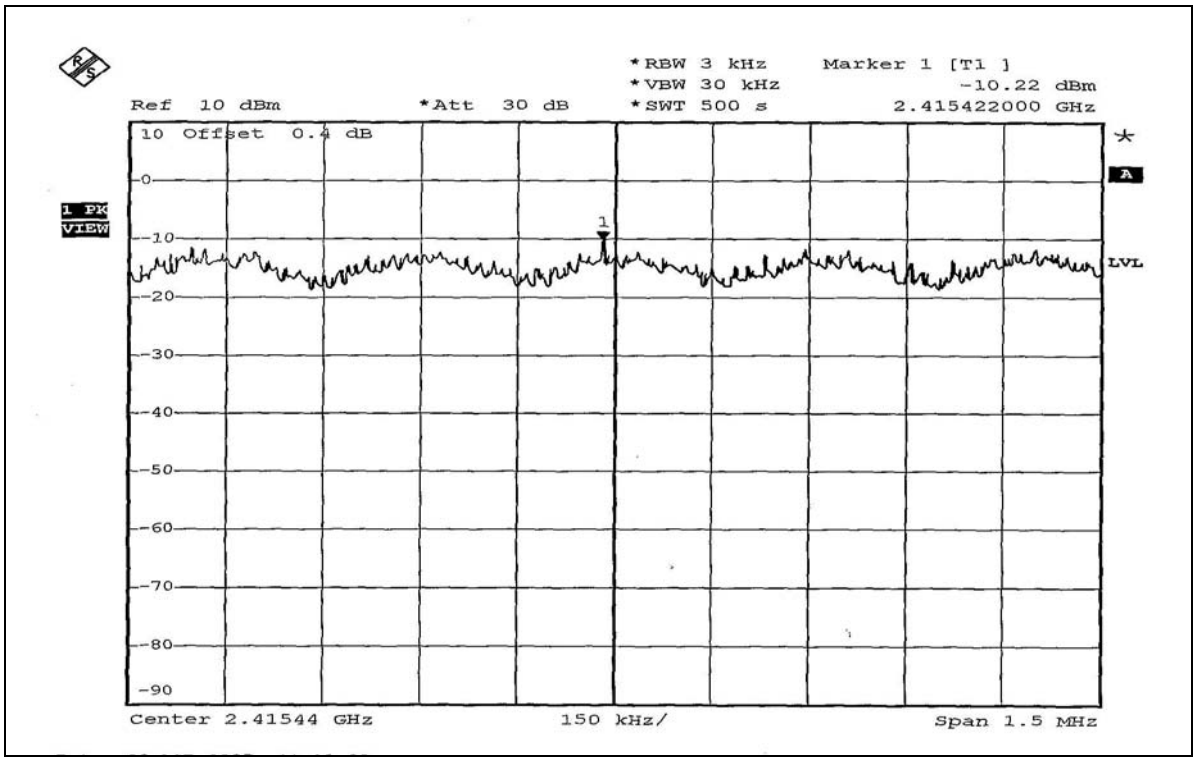

*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-4.98 dBm
2.459635000 GHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
1 PK
VIEW
A
LVL
-10
0
-20
-30
-40
-50
-60
-70
Center 2.46028 GHz
150 kHz/
Span 1.5 MHz

802.11g OFDM modulation

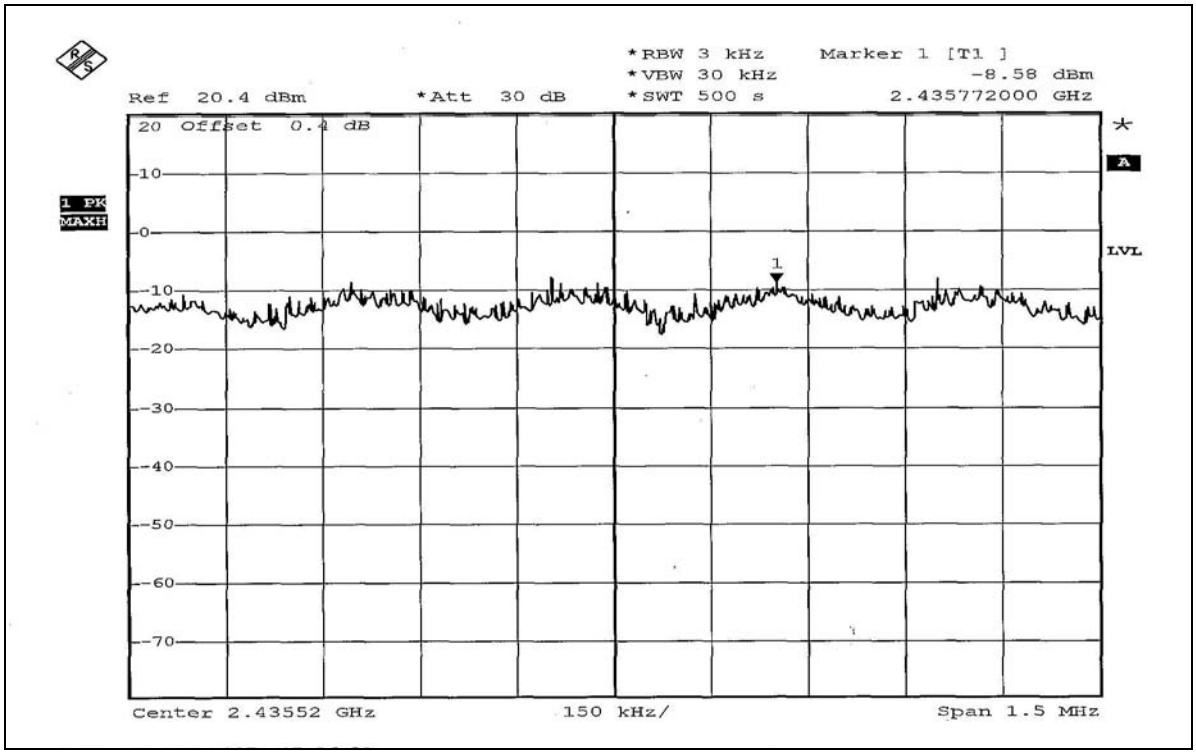
EUT	11a/b/g Wireless PC Card with XJACK Antenna	**MODEL**	SL-3050
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	26deg.C, 64%RH, 991hPa
TESTED BY	Match Tsui		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-10.22	8	PASS
6	2437	-8.58	8	PASS
11	2462	-10.68	8	PASS

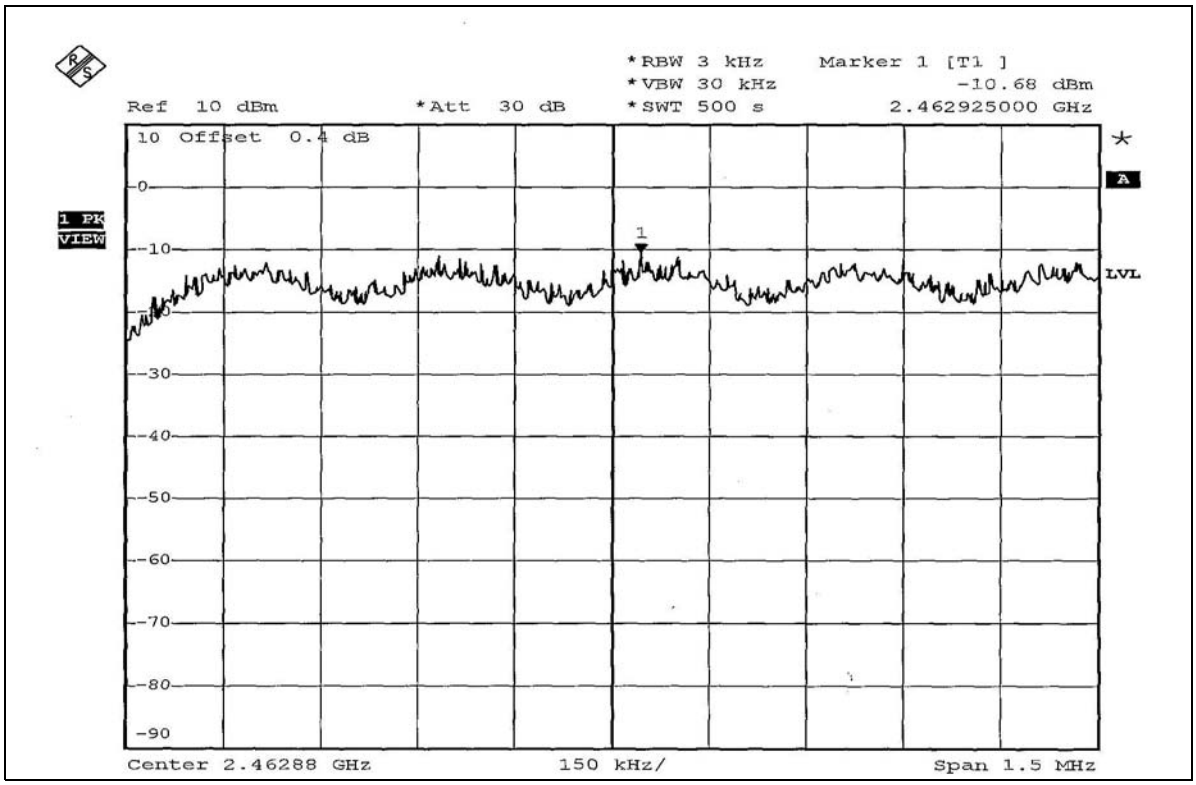
CH 1


*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-10.22 dBm
2.415422000 GHz
Ref 10 dBm
*Att 30 dB
10 Offset 0.4 dB
1 PK VIEW
A
LVL
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.41544 GHz
150 kHz/
Span 1.5 MHz

CH 6


*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-8.58 dBm
2.435772000 GHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
1 PK MAXH
A
LVL
10
0
-10
-20
-30
-40
-50
-60
-70
Center 2.43552 GHz
150 kHz/
Span 1.5 MHz

CH 11

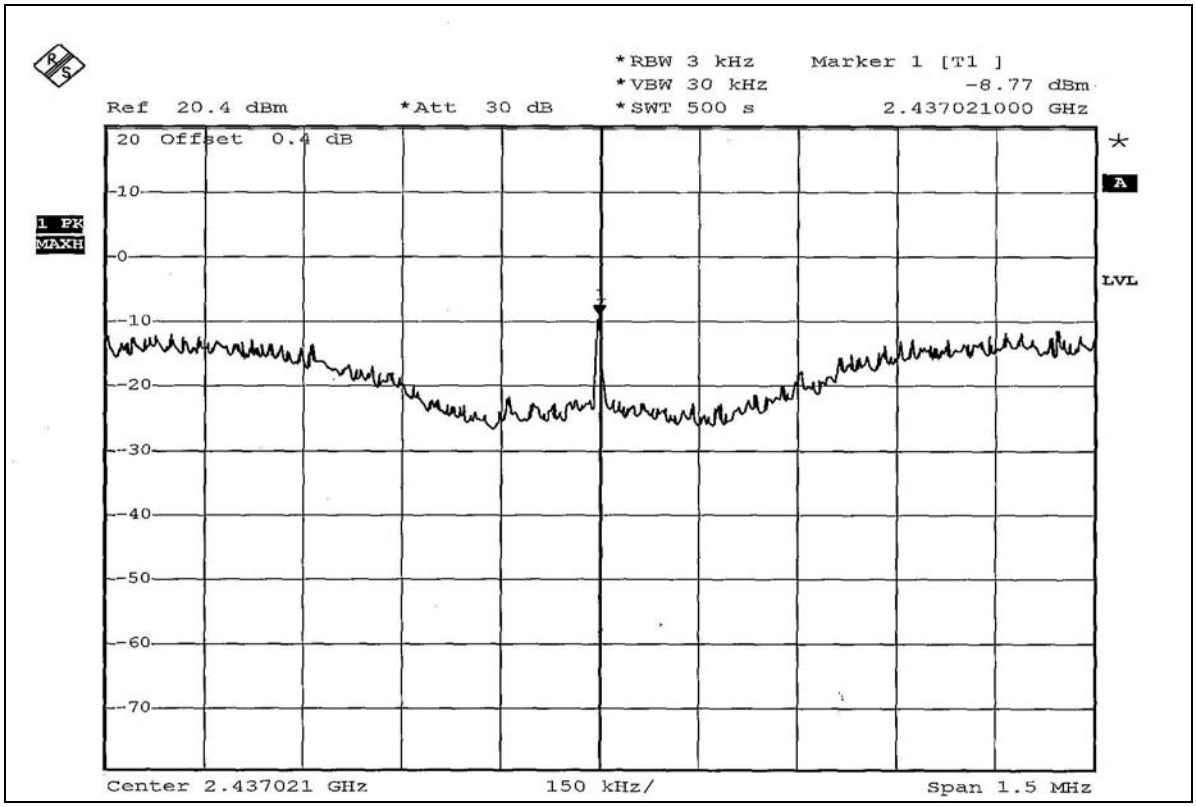

*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-10.68 dBm
2.462925000 GHz
Ref 10 dBm
*Att 30 dB
10 Offset 0.4 dB
1 PK
VIEW
A
LVL
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Center 2.46288 GHz
150 kHz/
Span 1.5 MHz

802.11g Turbo OFDM modulation

EUT	11a/b/g Wireless PC Card with XJACK Antenna	**MODEL**	SL-3050
MODULATION TYPE	BPSK	**TRANSFER RATE**	12Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	26deg.C, 64%RH, 991hPa
TESTED BY	Match Tsui		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
6	2437	-8.77	8	PASS

CH 6


*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-8.77 dBm
2.437021000 GHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
1 PK
MAXH
A
LVL
10
0
-10
-20
-30
-40
-50
-60
-70
Center 2.437021 GHz
150 kHz/
Span 1.5 MHz