

FCC TEST REPORT (15.247)

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MODEL NO.: PK292010700 (with miniPCI
WLAN WMIA-123AG47)
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ILAC MRA



No. 2177-01

Table of Contents

1.	CERTIFICATION	7
2.	SUMMARY OF TEST RESULTS	8
2.1	MEASUREMENT UNCERTAINTY	9
3.	GENERAL INFORMATION	10
3.1	GENERAL DESCRIPTION OF EUT	10
3.2	DESCRIPTION OF TEST MODES	11
3.2.1	CONFIGURATION OF SYSTEM UNDER TEST	13
3.2.2	TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:	14
3.3	GENERAL DESCRIPTION OF APPLIED STANDARDS	16
3.4	DESCRIPTION OF SUPPORT UNITS	16
	FOR WLAN FUNCTION	17
4.	TEST TYPES AND RESULTS (802.11b & g 2412~2462MHz BAND)	17
4.1	CONDUCTED EMISSION MEASUREMENT	17
4.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	17
4.1.2	TEST INSTRUMENTS	17
4.1.3	TEST PROCEDURES	18
4.1.4	DEVIATION FROM TEST STANDARD	18
4.1.5	TEST SETUP	19
4.1.6	EUT OPERATING CONDITIONS	19
4.1.7	TEST RESULTS	20
4.2	RADIATED EMISSION MEASUREMENT	26
4.2.1	LIMITS OF RADIATED EMISSION MEASUREMENT	26
4.2.2	TEST INSTRUMENTS	27
4.2.3	TEST PROCEDURES	28
4.2.4	DEVIATION FROM TEST STANDARD	28
4.2.5	TEST SETUP	29
4.2.6	EUT OPERATING CONDITIONS	29
4.2.7	TEST RESULTS	30
4.3	6dB BANDWIDTH MEASUREMENT	38
4.3.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT	38
4.3.2	TEST INSTRUMENTS	38
4.3.3	TEST PROCEDURE	39
4.3.4	DEVIATION FROM TEST STANDARD	39
4.3.5	TEST SETUP	39
4.3.6	EUT OPERATING CONDITIONS	39
4.3.7	TEST RESULTS	40
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	49
4.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	49
4.5.2	TEST INSTRUMENTS.....	49
4.5.3	TEST PROCEDURE.....	50
4.5.4	DEVIATION FROM TEST STANDARD	50
4.5.5	TEST SETUP	50
4.5.6	EUT OPERATING CONDITION	50
4.5.7	TEST RESULTS	51
4.6	BAND EDGES MEASUREMENT	57
4.6.1	LIMITS OF BAND EDGES MEASUREMENT	57
4.6.2	TEST INSTRUMENTS.....	57
4.6.3	TEST PROCEDURE.....	57
4.6.4	DEVIATION FROM TEST STANDARD	57
4.6.5	EUT OPERATING CONDITION	57
4.6.6	TEST RESULTS	58
4.7	ANTENNA REQUIREMENT	66
4.7.1	STANDARD APPLICABLE	66
4.7.2	ANTENNA CONNECTED CONSTRUCTION.....	66
5.	TEST TYPES AND RESULTS (802.11a 5725~5850MHz BAND)	67
5.1	CONDUCTED EMISSION MEASUREMENT	67
5.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT.....	67
5.1.2	TEST INSTRUMENTS.....	67
5.1.3	TEST PROCEDURES	68
5.1.4	DEVIATION FROM TEST STANDARD	68
5.1.5	TEST SETUP	69
5.1.6	EUT OPERATING CONDITIONS	69
5.1.7	TEST RESULTS	70
5.2	RADIATED EMISSION MEASUREMENT	72
5.2.1	LIMITS OF RADIATED EMISSION MEASUREMENT.....	72
5.2.2	TEST INSTRUMENTS.....	73
5.2.3	TEST PROCEDURES	74
5.2.4	DEVIATION FROM TEST STANDARD	74
5.2.5	TEST SETUP	75
5.2.6	EUT OPERATING CONDITIONS	75
5.2.7	TEST RESULTS	76
5.3	6dB BANDWIDTH MEASUREMENT	83
5.3.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT	83
5.3.2	TEST INSTRUMENTS.....	83
5.3.3	TEST PROCEDURE.....	84
5.3.4	DEVIATION FROM TEST STANDARD	84
5.3.5	TEST SETUP	84
5.3.6	EUT OPERATING CONDITIONS	84
5.3.7	TEST RESULTS	85



5.4	MAXIMUM PEAK OUTPUT POWER	90
5.4.1	LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT	90
5.4.2	INSTRUMENTS.....	90
5.4.3	TEST PROCEDURES	91
5.4.4	DEVIATION FROM TEST STANDARD	91
5.4.5	TEST SETUP	91
5.4.6	EUT OPERATING CONDITIONS	91
5.4.7	TEST RESULTS	92
5.5	POWER SPECTRAL DENSITY MEASUREMENT.....	93
5.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	93
5.5.2	TEST INSTRUMENTS.....	93
5.5.3	TEST PROCEDURE.....	94
5.5.4	DEVIATION FROM TEST STANDARD	94
5.5.5	TEST SETUP	94
5.5.6	EUT OPERATING CONDITION	94
5.5.7	TEST RESULTS	95
5.6	BAND EDGES MEASUREMENT	100
5.6.1	LIMITS OF BAND EDGES MEASUREMENT	100
5.6.2	TEST INSTRUMENTS.....	100
5.6.3	TEST PROCEDURE.....	100
5.6.4	DEVIATION FROM TEST STANDARD	100
5.6.5	EUT OPERATING CONDITION	101
5.6.6	TEST RESULTS	101
5.7	ANTENNA REQUIREMENT	108
5.7.1	STANDARD APPLICABLE	108
5.7.2	ANTENNA CONNECTED CONSTRUCTION.....	108
	FOR BLUETOOTH FUNCTION	109
6.	TEST PROCEDURES AND RESULTS	109
6.1	CONDUCTED EMISSION MEASUREMENT	109
6.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT.....	109
6.1.2	TEST INSTRUMENTS.....	109
6.1.3	TEST PROCEDURES	110
6.1.4	DEVIATION FROM TEST STANDARD	110
6.1.5	TEST SETUP	111
6.1.6	EUT OPERATING CONDITIONS	111
6.1.7	TEST RESULTS	112
6.2	NUMBER OF HOPPING FREQUENCY USED	118
6.2.1	LIMIT OF HOPPING FREQUENCY USED	118
6.2.2	TEST INSTRUMENTS.....	118
6.2.3	TEST PROCEDURES	119
6.2.4	DEVIATION FROM TEST STANDARD	119
6.2.5	TEST SETUP	120
6.2.6	TEST RESULTS	120
6.3	DWELL TIME ON EACH CHANNEL	122
6.3.1	LIMIT OF DWELL TIME USED.....	122

6.3.2	TEST INSTRUMENTS.....	122
6.3.3	TEST PROCEDURES	123
6.3.4	DEVIATION FROM TEST STANDARD	123
6.3.5	TEST SETUP	123
6.3.6	TEST RESULTS	124
6.4	CHANNEL BANDWIDTH.....	128
6.4.1	LIMITS OF CHANNEL BANDWIDTH	128
6.4.2	TEST INSTRUMENTS.....	128
6.4.3	TEST PROCEDURE.....	129
6.4.4	DEVIATION FROM TEST STANDARD	129
6.4.5	TEST SETUP	129
6.4.6	EUT OPERATING CONDITION	129
6.4.7	TEST RESULTS	130
6.5	HOPPING CHANNEL SEPARATION	133
6.5.1	LIMIT OF HOPPING CHANNEL SEPARATION	133
6.5.2	TEST INSTRUMENTS.....	133
6.5.3	TEST PROCEDURES	134
6.5.4	DEVIATION FROM TEST STANDARD	134
6.5.5	TEST SETUP	134
6.5.6	TEST RESULTS	135
6.6	MAXIMUM PEAK OUTPUT POWER	138
6.6.1	LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT	138
6.6.2	INSTRUMENTS.....	138
6.6.3	TEST PROCEDURES	139
6.6.4	DEVIATION FROM TEST STANDARD	139
6.6.5	TEST SETUP	140
6.6.6	EUT OPERATING CONDITION	140
6.6.7	TEST RESULTS	141
6.7	RADIATED EMISSION MEASUREMENT	144
6.7.1	LIMITS OF RADIATED EMISSION MEASUREMENT	144
6.7.2	TEST INSTRUMENTS.....	145
6.7.3	TEST PROCEDURES	146
6.7.4	DEVIATION FROM TEST STANDARD	146
6.7.5	TEST SETUP	147
6.7.6	EUT OPERATING CONDITIONS	147
6.7.7	TEST RESULTS	148
6.8	BAND EDGES MEASUREMENT	152
6.8.1	LIMITS OF BAND EDGES MEASUREMENT	152
6.8.2	TEST INSTRUMENTS	152
6.8.3	TEST PROCEDURE	152
6.8.4	DEVIATION FROM TEST STANDARD	152
6.8.5	EUT OPERATING CONDITION	153
6.8.6	TEST RESULTS.....	153
6.9	ANTENNA REQUIREMENT	156
6.9.1	STANDARD APPLICABLE	156



6.9.2	ANTENNA CONNECTED CONSTRUCTION.....	156
	WLAN FUNCTION + BLUETOOTH FUNCTION.....	157
7.	TEST TYPES AND RESULTS (FOR 802.11b/g).....	157
7.1	CONDUCTED EMISSION MEASUREMENT	157
7.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT.....	157
7.1.2	TEST INSTRUMENTS.....	157
7.1.3	TEST PROCEDURES	158
7.1.4	DEVIATION FROM TEST STANDARD.....	158
7.1.5	TEST SETUP.....	159
7.1.6	EUT OPERATING CONDITIONS	159
7.1.7	TEST RESULTS	160
7.2	RADIATED EMISSION MEASUREMENT	162
7.2.1	LIMITS OF RADIATED EMISSION MEASUREMENT.....	162
7.2.2	TEST INSTRUMENTS.....	163
7.2.3	TEST PROCEDURE.....	164
7.2.4	DEVIATION FROM TEST STANDARD.....	164
7.2.5	TEST SETUP.....	165
7.2.6	EUT OPERATING CONDITIONS	165
7.2.7	TEST RESULTS.....	166
	WLAN FUNCTION + BLUETOOTH FUNCTION.....	169
8	TEST TYPES AND RESULTS (FOR 802.11a)	169
8.1	CONDUCTED EMISSION MEASUREMENT.....	169
8.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	169
8.1.2	TEST INSTRUMENTS.....	169
8.1.3	TEST PROCEDURES	170
8.1.4	DEVIATION FROM TEST STANDARD.....	170
8.1.5	TEST SETUP	171
8.1.6	EUT OPERATING CONDITIONS	171
8.1.7	TEST RESULTS.....	172
8.2	RADIATED EMISSION MEASUREMENT.....	174
8.2.1	LIMITS OF RADIATED EMISSION MEASUREMENT	174
8.2.2	TEST INSTRUMENTS.....	175
8.2.3	TEST PROCEDURE.....	176
8.2.4	DEVIATION FROM TEST STANDARD.....	176
8.2.5	TEST SETUP	177
8.2.6	EUT OPERATING CONDITIONS	177
8.2.7	TEST RESULTS.....	178
8.	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	181
9.	INFORMATION ON THE TESTING LABORATORIES	183



1. CERTIFICATION

PRODUCT: Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)
BRAND NAME: Motion Computing
MODEL NO.: PK292010700 (with miniPCI WLAN WMIA-123AG47)
APPLICANT: Gemtek Technology Co., Ltd.
TEST SAMPLE: Engineering Sample
TESTED: Feb. 14 ~ Mar. 17, 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 : Andrea Hsia, **DATE:** Mar. 22, 2005
(Andrea Hsia)

TECHNICAL
ACCEPTANCE : Gary Chang, **DATE:** Mar. 22, 2005
Responsible for
RF
(Gary Chang)

APPROVED BY : Cody Chang, **DATE:** Mar. 22, 2005
(Cody Chang, Deputy Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For WLAN Function

APPLIED STANDARD: FCC Part 15, Subpart C			
Standard Section	Test Type and Limit	Result	Remark
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit Minimum passing margin is -11.48dB at 0.209MHz
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)	Transmitter Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is -1.58dB at 57.21MHz
15.247 (e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit
15.247 (d)	Band Edge Measurement Limit: 20 dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit

For Bluetooth Function

APPLIED STANDARD: FCC Part 15, Subpart C			
Standard Section	Test Type and Limit	Result	Remark
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit Minimum passing margin is -13.54dB at 0.489MHz
15.247 (a) (1) (iii)	Number of Hopping Frequency Used Spec.: At least 15 channels	PASS	Meet the requirement of limit
15.247 (a) (1) (iii)	Dwell Time on Each Channel Spec.: Max. 0.4 second within 31.6 second	PASS	Meet the requirement of limit
15.247 (a) (1)	Hopping Channel Separation Spec. : Min. 25 kHz or 20 dB bandwidth, which ever is greater	PASS	Meet the requirement of limit

15.247 (a) (1)	Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System	NA	NA
15.247 (b)	Maximum Peak Output Power Spec.: max. 30dBm	PASS	Meet the requirement of limit
15.247 (d)	Transmitter Radiated Emissions Spec.: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is -1.58dB at 47.49MHz
15.247 (d)	Band Edge Measurement	PASS	Meet the requirement of limit

For WLAN + Bluetooth

APPLIED STANDARD: FCC Part 15, Subpart C			
Standard Section	Test Type and Limit	Result	Remark
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit Minimum passing margin is -5.63dB at 0.150MHz
15.247 (d)	Transmitter Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is -1.73dB at 199.12MHz

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	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)
MODEL NO.	PK292010700 (with miniPCI WLAN WMIA-123AG47)
POWER SUPPLY	3.3Vdc from host equipment
MODULATION TYPE	For WLAN: CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM For Bluetooth: GFSK
MODULATION TECHNOLOGY	For WLAN: DSSS, OFDM For Bluetooth: FHSS
TRANSFER RATE	For WLAN: 802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps 802.11a: 54/48/36/24/18/12/9/6Mbps (Turbo mode: up to 108Mbps *see Note 5) For Bluetooth: 732kbps
FREQUENCY RANGE	For WLAN: 802.11b & 802.11g: 2.412 ~ 2.462GHz 802.11a: 5.150 ~ 5.350GHz and 5.725 ~ 5.850GHz For Bluetooth: 2402 MHz ~ 2480 MHz
NUMBER OF CHANNEL	For WLAN: 802.11b & 802.11g: 11 802.11a: 13 for Normal mode / 5 for Turbo mode For Bluetooth: 79
CHANNEL SPACING	For WLAN: 802.11b & 802.11g: 5MHz 802.11a: 20MHz for Normal mode / 40MHz for Turbo mode For Bluetooth: 1MHz
OUTPUT POWER	For WLAN: 80.724mW for 802.11b 70.795mW for 802.11g 38.905mW for 5.150 ~ 5.350GHz 40.458mW for 5.725 ~ 5.850GHz For Bluetooth: 0.635mW
ANTENNA TYPE	For WLAN: 802.11b & 802.11g: Patch antenna with 0.02dBi gain 802.11a: Patch antenna with 1.05dBi gain For Bluetooth: Integrated Printed with 0.5dBi gain
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

**NOTE:**

1. The EUT is installed in a tablet PC which brand is Motion and the model is PK292010700.
2. The tablet PC is power by following adapter:

Brand	DELTA ELECTRONICS, INC.
Model	ADP-50HH REV.A
Input	100-240Vac, 50~60Hz, 1.5A
Output	19Vdc, 2.64A
Power Line	AC 1.8m non-shielded cable without core DC 1.8m non-shielded cable with one core

3. The EUT operates in both the 5GHz and 2.4GHz Bands and compatibility with 802.11a and 802.11b, 802.11g technology.
4. Bluetooth technology is used in this EUT.
5. This EUT is capable of providing data rates of up to 108 Mbps in 802.11a Turbo mode depending upon reception quality.
6. 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**WLAN Function:****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		

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

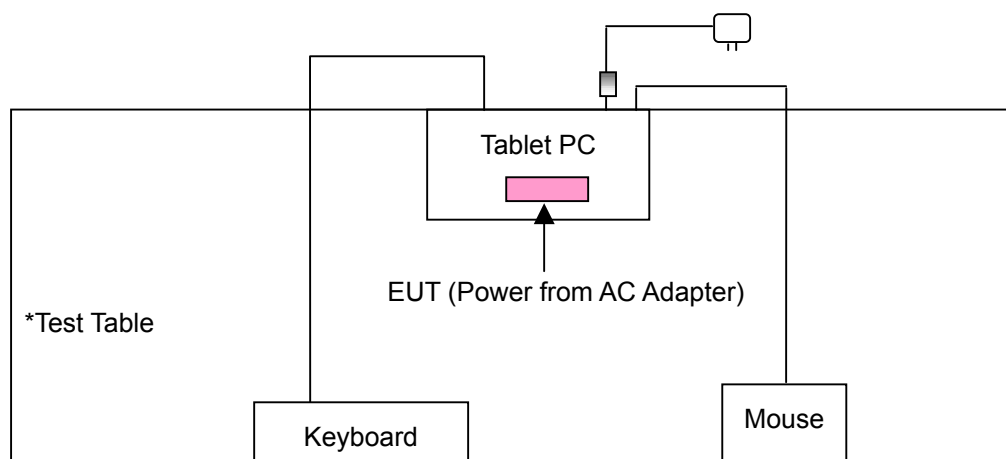
Bluetooth Function:

Operated in 2400 ~ 2483.5MHz Band:

79 channels are provided to this EUT.

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2431	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

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	-

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, Packet Type, XYZ Axis 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)	Axis	Packet Type
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	Z	-
802.11a	1 to 5	3	OFDM	BPSK	6	Z	-
Bluetooth	0 to 78	0, 39, 78	FHSS	GFSK	0.732	Z	DH5
802.11g+Bluetooth	1 to 11, 0 to 78	1 78	OFDM FHSS	BPSK GFSK	6, 0.732	Z	DH5
802.11a+Bluetooth	1 to 5, 0 to 78	3 78	OFDM FHSS	BPSK GFSK	6, 0.732	Z	DH5

Note: The test mode of simultaneous transmit is chosen from the combination of each transmitter under the worst situation.

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, Packet Type, XYZ Axis 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)	Axis	Packet Type
802.11g	1 to 11	1	OFDM	BPSK	6	Z	-
802.11a	1 to 5	3	OFDM	BPSK	6	Z	-
Bluetooth	0 to 78	78	FHSS	GFSK	0.732	Z	DH5
802.11g+Bluetooth	1 to 11, 0 to 78	1 78	OFDM FHSS	BPSK GFSK	6, 0.732	Z	DH5
802.11a+Bluetooth	1 to 5, 0 to 78	3 78	OFDM FHSS	BPSK GFSK	6, 0.732	Z	DH5

Note: The test mode of simultaneous transmit is chosen from the combination of each transmitter under the worst situation.



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, Packet Type, XYZ Axis 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)	Axis	Packet Type
802.11b	1 to 11	1, 6, 11	DSSS	CCK	11	Z	-
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	Z	-
802.11a	1 to 5	1, 3, 5	OFDM	BPSK	6	Z	-
802.11a Turbo	1 to 2	1, 2	OFDM	BPSK	12	Z	-
Bluetooth	0 to 78	0, 39, 78	FHSS	GFSK	0.732	Z	DH5
802.11g+Bluetooth	1 to 11, 0 to 78	1, 78	OFDM FHSS	BPSK GFSK	6, 0.732	Z	DH5
802.11a+Bluetooth	1 to 5, 0 to 78	3, 78	OFDM FHSS	BPSK GFSK	6, 0.732	Z	DH5

Note: The test mode of simultaneous transmit is chosen from the combination of each transmitter under the worst situation.

Bandedge Measurement:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, Packet Type 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)	Packet Type
802.11b	1 to 11	1, 11	DSSS	CCK	11	-
802.11g	1 to 11	1, 11	OFDM	BPSK	6	-
802.11a	1 to 5	1, 5	OFDM	BPSK	6	-
802.11a Turbo	1 to 2	1, 2	OFDM	BPSK	12	-
Bluetooth	0 to 78	0, 78	FHSS	GFSK	DH5	DH5

Antenna Port Conducted Measurement:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, Packet Type 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)	Packet Type
802.11b	1 to 11	1, 11	DSSS	CCK	11	-
802.11g	1 to 11	1, 11	OFDM	BPSK	6	-
802.11a	1 to 5	1, 5	OFDM	BPSK	6	-
802.11a Turbo	1 to 2	1, 2	OFDM	BPSK	12	-
Bluetooth	0 to 78	0, 78	FHSS	GFSK	DH5	DH5

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN) . 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	TABLET PC	MOTION	PK292010700	NA	FCC DoC Approved
2	USB KEYBOARD	BTC	5200U	G09302046570	E5XKB5122U
3	MOUSE	DELL	M056U0	349003922	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.5m shielded cable without core
3	1.8m shielded cable without core

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

FOR WLAN FUNCTION

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.



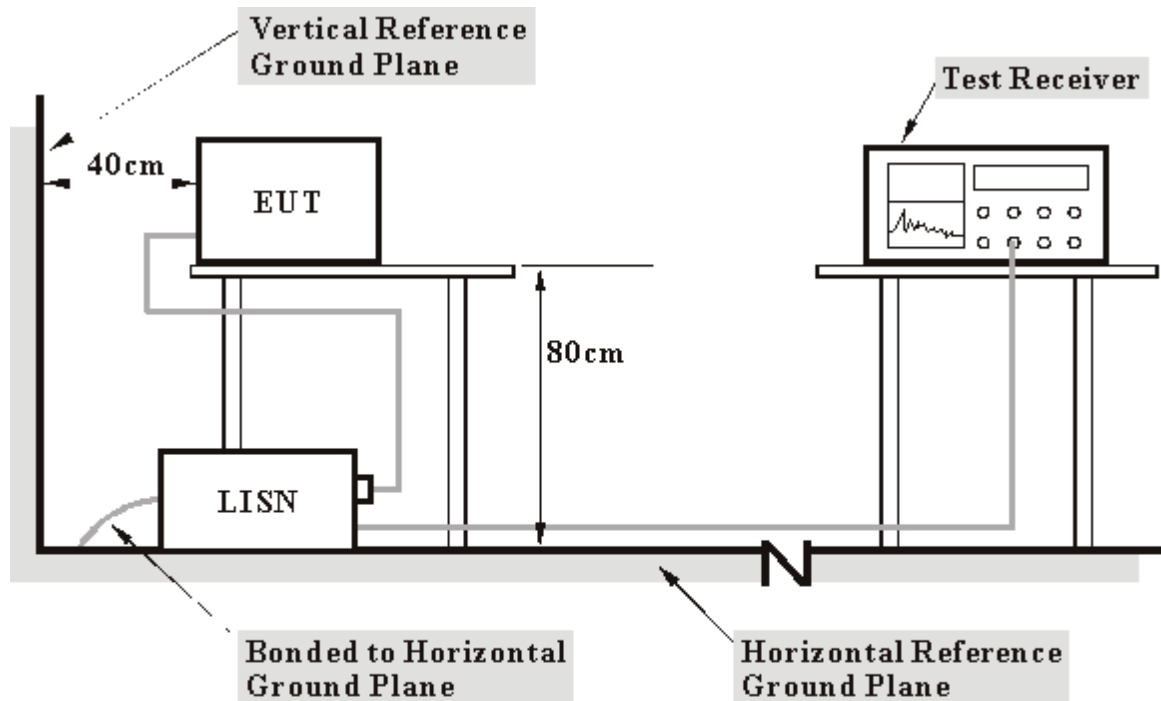
4.1.3 TEST PROCEDURES

- 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 into Tablet PC and placed on the testing table.
- b. The Tablet PC run a test program (provided by manufacturer) to enable EUT under transmission/receiving condition continuously at specific channel frequency.
- c. The Tablet PC sent "H" messages to its screen.

4.1.7 TEST RESULTS

Conducted Worst-Case Data

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 1	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa	TESTED BY	Match Tsui

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.154	0.10	49.62	-	49.72	-	65.79	55.79	-16.07	-
2	0.209	0.11	51.67	-	51.78	-	63.26	53.26	-11.48	-
3	0.763	0.15	31.93	-	32.08	-	56.00	46.00	-23.92	-
4	4.012	0.29	33.53	-	33.82	-	56.00	46.00	-22.18	-
5	7.648	0.40	33.10	-	33.50	-	60.00	50.00	-26.50	-
6	23.961	1.07	42.13	-	43.20	-	60.00	50.00	-16.80	-

REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.

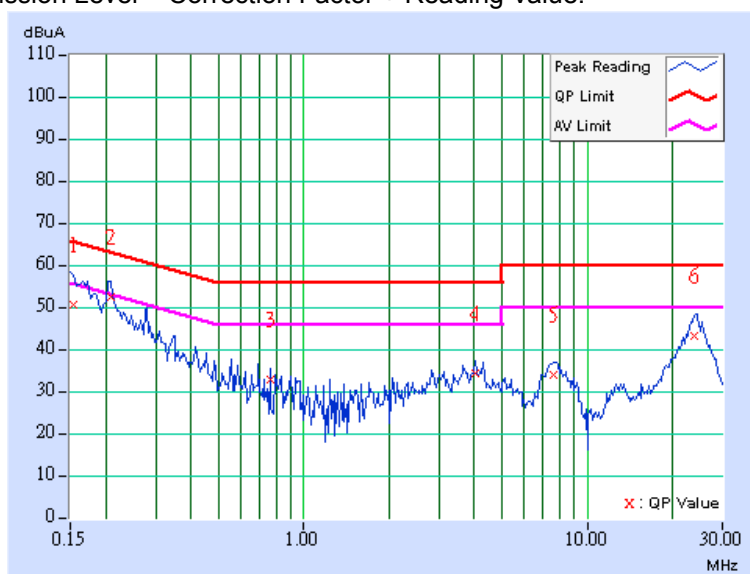
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.

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

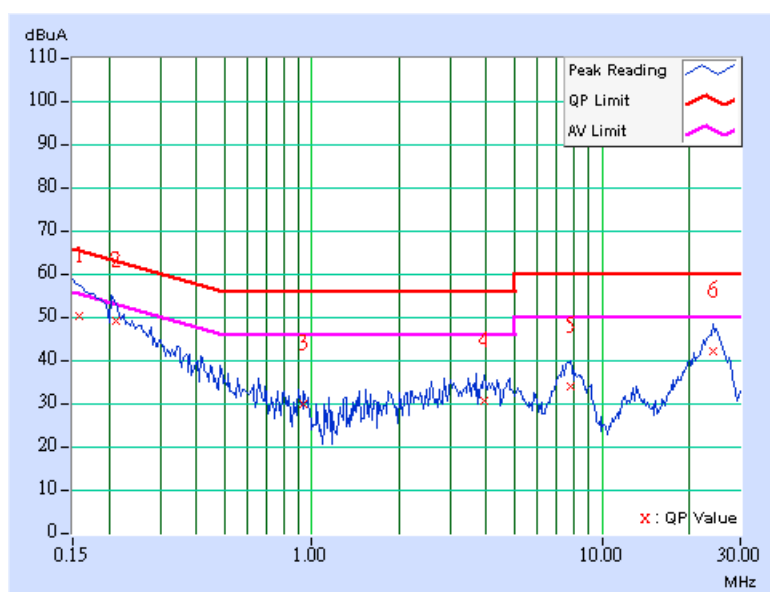
6. Emission Level = Correction Factor + Reading Value.



EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 1	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa	TESTED BY	Match Tsui

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.10	49.62	-	49.72	-	65.58	55.58	-15.86	-
2	0.211	0.10	48.57	-	48.67	-	63.18	53.18	-14.51	-
3	0.935	0.17	29.27	-	29.44	-	56.00	46.00	-26.56	-
4	3.922	0.28	30.25	-	30.53	-	56.00	46.00	-25.47	-
5	7.836	0.38	33.46	-	33.84	-	60.00	50.00	-26.16	-
6	24.219	0.61	41.70	-	42.31	-	60.00	50.00	-17.69	-

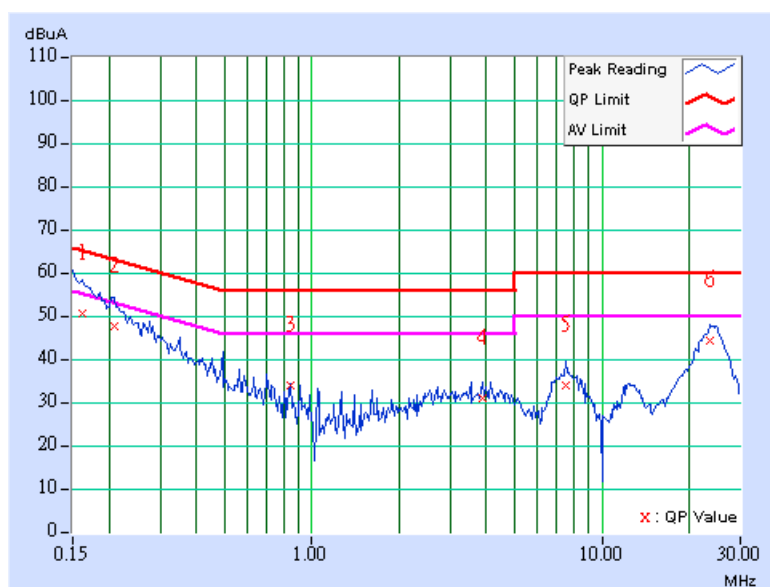
- REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value =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



EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 6	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa	TESTED BY	Match Tsui

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.162	0.10	49.69	-	49.79	-	65.38	55.38	-15.58	-
2	0.209	0.11	46.88	-	46.99	-	63.26	53.26	-16.27	-
3	0.841	0.16	33.16	-	33.32	-	56.00	46.00	-22.68	-
4	3.891	0.28	29.94	-	30.22	-	56.00	46.00	-25.78	-
5	7.504	0.40	32.90	-	33.30	-	60.00	50.00	-26.70	-
6	23.629	1.06	43.39	-	44.45	-	60.00	50.00	-15.55	-

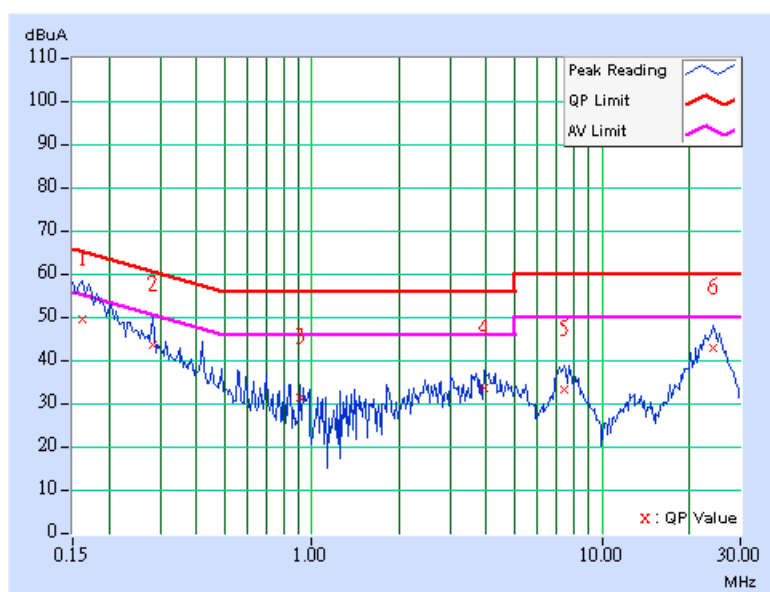
- REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value =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



EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 6	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa	TESTED BY	Match Tsui

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.162	0.10	49.20	-	49.30	-	65.38	55.38	-16.08	-
2	0.283	0.10	43.18	-	43.28	-	60.73	50.73	-17.45	-
3	0.908	0.17	31.04	-	31.21	-	56.00	46.00	-24.79	-
4	3.910	0.28	33.26	-	33.54	-	56.00	46.00	-22.46	-
5	7.430	0.38	32.90	-	33.28	-	60.00	50.00	-26.72	-
6	24.148	0.61	42.29	-	42.90	-	60.00	50.00	-17.10	-

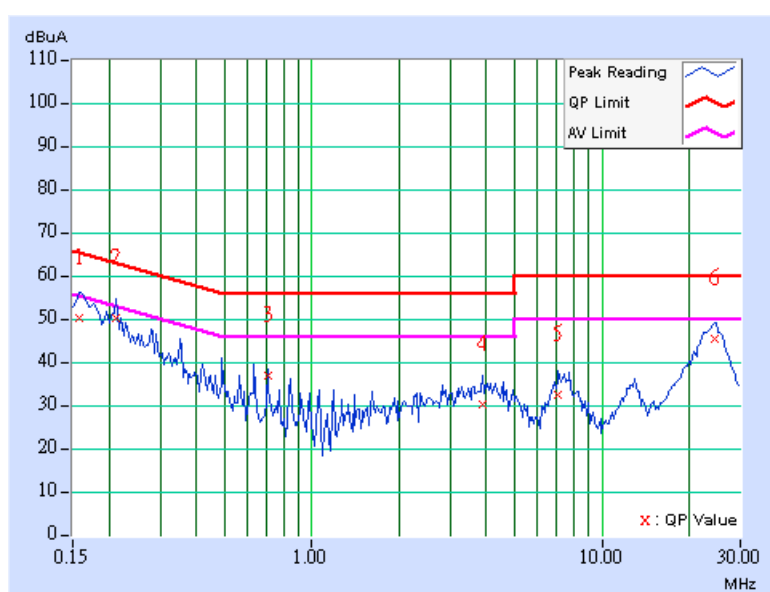
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 11	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa	TESTED BY	Match Tsui

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.10	49.18	-	49.28	-	65.58	55.58	-16.30	-
2	0.213	0.11	49.28	-	49.39	-	63.11	53.11	-13.72	-
3	0.705	0.15	35.98	-	36.13	-	56.00	46.00	-19.87	-
4	3.867	0.28	29.22	-	29.50	-	56.00	46.00	-26.50	-
5	7.082	0.40	31.55	-	31.95	-	60.00	50.00	-28.05	-
6	24.410	1.08	44.40	-	45.48	-	60.00	50.00	-14.52	-

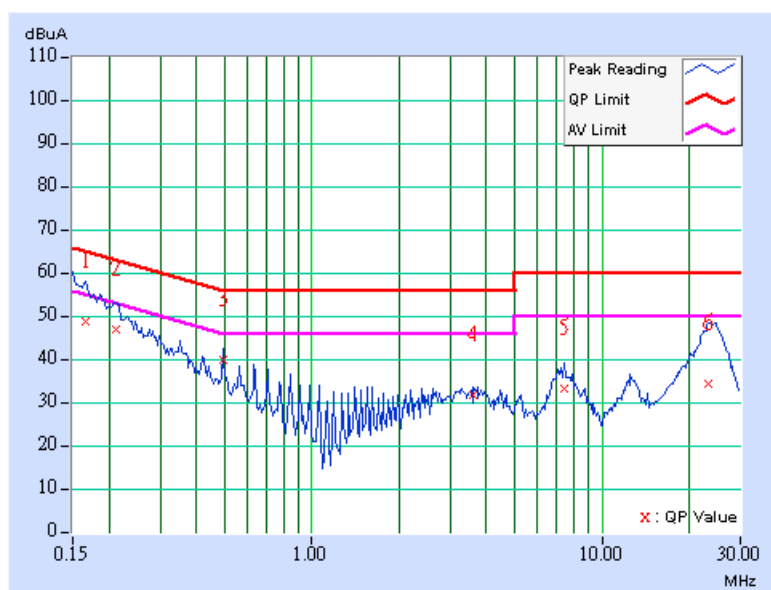
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 11	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa	TESTED BY	Match Tsui

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.166	0.10	48.14	-	48.24	-	65.18	55.18	-16.94	-
2	0.210	0.10	46.37	-	46.47	-	63.20	53.20	-16.73	-
3	0.494	0.11	39.26	-	39.37	-	56.10	46.10	-16.73	-
4	3.609	0.27	31.41	-	31.68	-	56.00	46.00	-24.32	-
5	7.371	0.38	32.90	-	33.28	-	60.00	50.00	-26.72	-
6	23.367	0.62	33.98	-	34.60	-	60.00	50.00	-25.40	-

- 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.

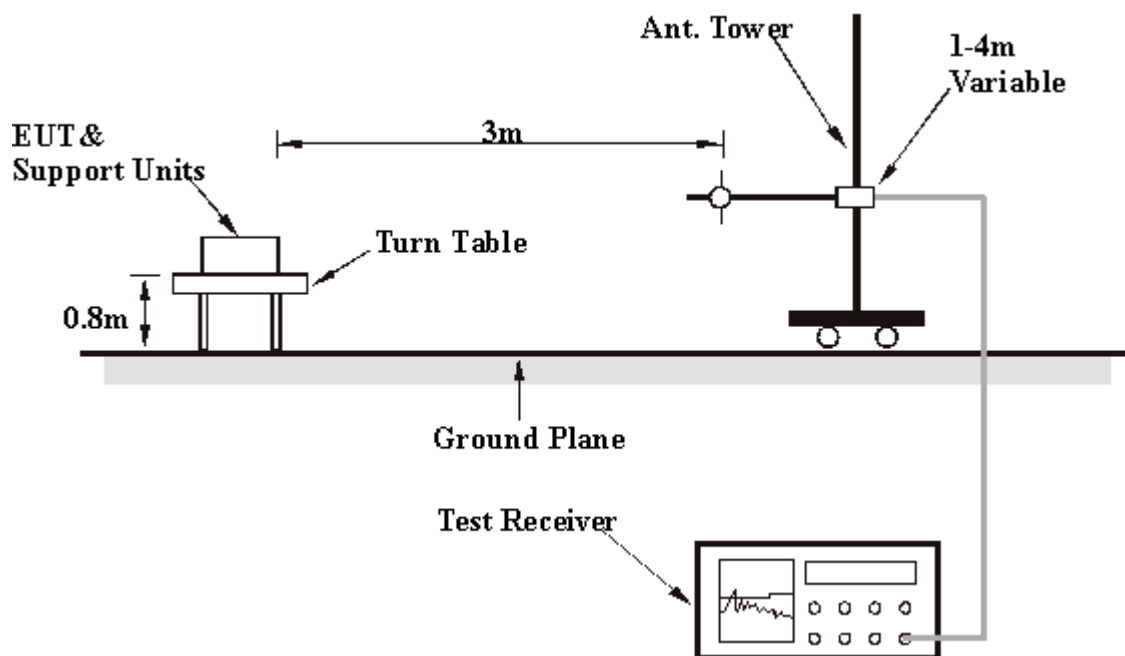
NOTE:

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	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	20deg. C, 72%RH, 991hPa	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	41.66	25.25 QP	40.00	-14.75	1.50 H	148	10.01	15.25
2	84.43	33.02 QP	40.00	-6.98	1.50 H	274	22.94	10.08
3	119.42	36.38 QP	43.50	-7.12	1.25 H	280	23.40	12.97
4	183.57	34.97 QP	43.50	-8.53	1.25 H	196	22.31	12.66
5	214.67	35.48 QP	43.50	-8.02	1.50 H	295	23.76	11.72
6	255.49	30.19 QP	46.00	-15.81	1.00 H	172	16.88	13.32
7	286.59	37.36 QP	46.00	-8.64	1.00 H	166	23.02	14.33
8	366.29	30.66 QP	46.00	-15.34	1.00 H	295	14.61	16.04
9	399.34	32.72 QP	46.00	-13.28	1.00 H	145	15.93	16.79
10	469.32	35.92 QP	46.00	-10.08	1.50 H	190	17.55	18.37
11	500.42	37.26 QP	46.00	-8.74	1.50 H	244	18.51	18.75
12	549.02	33.37 QP	46.00	-12.63	1.50 H	238	13.63	19.74
13	671.48	31.80 QP	46.00	-14.20	1.00 H	253	9.77	22.03
14	714.25	31.21 QP	46.00	-14.79	1.25 H	148	8.49	22.71
15	916.41	30.74 QP	46.00	-15.26	1.25 H	220	5.28	25.46

- 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



EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	20deg. C, 72%RH, 991hPa	TESTED BY	Match Tsui

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	57.21	38.42 QP	40.00	-1.58	1.25 V	130	24.43	13.99
2	96.09	32.53 QP	43.50	-10.97	1.25 V	340	21.86	10.68
3	129.14	27.75 QP	43.50	-15.75	1.00 V	112	14.09	13.66
4	166.07	32.27 QP	43.50	-11.23	1.00 V	34	17.99	14.28
5	222.44	31.71 QP	46.00	-14.29	1.25 V	31	19.72	11.99
6	265.21	31.88 QP	46.00	-14.12	1.50 V	28	18.27	13.61
7	333.25	30.02 QP	46.00	-15.98	1.50 V	331	14.73	15.29
8	397.39	31.32 QP	46.00	-14.68	1.50 V	190	14.58	16.75
9	469.32	29.80 QP	46.00	-16.20	2.00 V	106	11.43	18.37
10	500.42	30.14 QP	46.00	-15.86	1.25 V	4	11.39	18.75
11	766.73	31.86 QP	46.00	-14.14	1.25 V	325	8.17	23.68
12	912.53	33.08 QP	46.00	-12.92	1.00 V	310	7.66	25.42

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	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	CCK	TRANSFER RATE	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 991hPa	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	57.26 PK	74.00	-16.74	1.01 H	322	25.66	31.60
1	2386.00	49.18 AV	54.00	-4.82	1.01 H	322	17.58	31.60
2	*2412.00	104.15 PK			1.01 H	322	72.44	31.71
2	*2412.00	96.42 AV			1.01 H	322	64.71	31.71
3	2688.00	43.34 PK	74.00	-30.66	1.08 H	305	10.84	32.50
3	2688.00	38.31 AV	54.00	-15.69	1.08 H	305	5.81	32.50
4	4824.00	47.91 PK	74.00	-26.09	1.19 H	308	10.36	37.55
4	4824.00	38.70 AV	54.00	-15.30	1.19 H	308	1.15	37.55

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	2320.00	46.79 PK	74.00	-27.21	1.11 V	244	15.48	31.31
1	2320.00	37.27 AV	54.00	-16.73	1.11 V	244	5.96	31.31
2	2386.00	57.82 PK	74.00	-16.18	1.02 V	282	26.22	31.60
2	2386.00	49.53 AV	54.00	-4.47	1.02 V	282	17.93	31.60
3	*2412.00	105.24 PK			1.02 V	282	73.53	31.71
3	*2412.00	98.04 AV			1.02 V	282	66.33	31.71
4	2688.00	44.34 PK	74.00	-29.66	1.14 V	287	11.84	32.50
4	2688.00	38.52 AV	54.00	-15.48	1.14 V	287	6.02	32.50
5	4824.00	49.61 PK	74.00	-24.39	1.08 V	246	12.06	37.55
5	4824.00	40.96 AV	54.00	-13.04	1.08 V	246	3.41	37.55

- 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	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	CCK	TRANSFER RATE	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 991hPa	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	103.40 PK			1.18 H	360	71.58	31.82
1	*2437.00	95.81 AV			1.18 H	360	63.99	31.82
2	2688.00	43.50 PK	74.00	-30.50	1.09 H	301	11.00	32.50
2	2688.00	36.43 AV	54.00	-17.57	1.09 H	301	3.93	32.50
3	4874.00	47.46 PK	74.00	-26.54	1.00 H	258	9.78	37.67
3	4874.00	37.83 AV	54.00	-16.17	1.00 H	258	0.15	37.67

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	105.58 PK			1.03 V	256	73.76	31.82
1	*2437.00	98.34 AV			1.03 V	256	66.52	31.82
2	2688.00	43.32 PK	74.00	-30.68	1.14 V	253	10.82	32.50
2	2688.00	36.84 AV	54.00	-17.16	1.14 V	253	4.34	32.50
3	4874.00	49.80 PK	74.00	-24.20	1.20 V	235	12.12	37.67
3	4874.00	41.92 AV	54.00	-12.08	1.20 V	235	4.24	37.67

- 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	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA- 123AG47)
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	CCK	TRANSFER RATE	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 991hPa	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	103.88 PK			1.21 H	311	71.95	31.93
1	*2462.00	96.54 AV			1.21 H	311	64.61	31.93
2	2488.00	57.55 PK	74.00	-16.45	1.21 H	311	25.50	32.05
2	2488.00	48.28 AV	54.00	-5.72	1.21 H	311	16.23	32.05
3	2688.00	42.82 PK	74.00	-31.18	1.07 H	306	10.32	32.50
3	2688.00	35.50 AV	54.00	-18.50	1.07 H	306	3.00	32.50
4	4924.00	47.72 PK	74.00	-26.28	1.17 H	306	9.91	37.81
4	4924.00	38.83 AV	54.00	-15.17	1.17 H	306	1.02	37.81

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	106.73 PK			1.00 V	279	74.80	31.93
1	*2462.00	99.30 AV			1.00 V	279	67.37	31.93
2	2488.00	59.44 PK	74.00	-14.56	1.00 V	279	27.39	32.05
2	2488.00	50.36 AV	54.00	-3.64	1.00 V	279	18.31	32.05
3	2688.00	43.22 PK	74.00	-30.78	1.14 V	289	10.72	32.50
3	2688.00	35.67 AV	54.00	-18.33	1.14 V	289	3.17	32.50
4	4924.00	49.39 PK	74.00	-24.61	1.14 V	277	11.58	37.81
4	4924.00	40.60 AV	54.00	-13.40	1.14 V	277	2.79	37.81

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	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 991hPa	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	58.96 PK	74.00	-15.04	1.10 H	355	27.34	31.62
1	2390.00	47.52 AV	54.00	-6.48	1.10 H	355	15.90	31.62
2	*2412.00	98.46 PK			1.10 H	355	66.75	31.71
2	*2412.00	88.77 AV			1.10 H	355	57.06	31.71
3	2688.00	43.67 PK	74.00	-30.33	1.06 H	297	11.17	32.50
3	2688.00	36.77 AV	54.00	-17.23	1.06 H	297	4.27	32.50
4	4824.00	45.25 PK	74.00	-28.75	1.04 H	181	7.70	37.55
4	4824.00	32.68 AV	54.00	-21.32	1.04 H	181	-4.87	37.55

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	68.75 PK	74.00	-5.25	1.05 V	254	37.13	31.62
1	2390.00	50.08 AV	54.00	-3.92	1.05 V	254	18.46	31.62
2	*2412.00	102.56 PK			1.05 V	254	70.85	31.71
2	*2412.00	92.25 AV			1.05 V	254	60.54	31.71
3	2688.00	43.29 PK	74.00	-30.71	1.14 V	292	10.79	32.50
3	2688.00	36.35 AV	54.00	-17.65	1.14 V	292	3.85	32.50
4	4824.00	45.93 PK	74.00	-28.07	1.14 V	360	8.38	37.55
4	4824.00	33.25 AV	54.00	-20.75	1.14 V	360	-4.30	37.55

- 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	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 991hPa	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	101.36 PK			1.21 H	292	69.54	31.82
1	*2437.00	91.83 AV			1.21 H	292	60.01	31.82
2	2688.00	45.65 PK	74.00	-28.35	1.06 H	297	13.15	32.50
2	2688.00	39.96 AV	54.00	-14.04	1.06 H	297	7.46	32.50
3	4874.00	45.81 PK	74.00	-28.19	1.24 H	200	8.13	37.67
3	4874.00	32.58 AV	54.00	-21.42	1.24 H	200	-5.10	37.67

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	103.51 PK			1.30 V	259	71.69	31.82
1	*2437.00	93.20 AV			1.30 V	259	61.38	31.82
2	2688.00	45.37 PK	74.00	-28.63	1.14 V	289	12.87	32.50
2	2688.00	40.37 AV	54.00	-13.63	1.14 V	289	7.87	32.50
3	4874.00	45.55 PK	74.00	-28.45	1.08 V	250	7.87	37.67
3	4874.00	33.64 AV	54.00	-20.36	1.08 V	250	-4.04	37.67

- 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	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 991hPa	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	101.36 PK			1.20 H	288	69.43	31.93
1	*2462.00	91.32 AV			1.20 H	288	59.39	31.93
2	2483.50	64.10 PK	74.00	-9.90	1.20 H	288	32.07	32.03
2	2483.50	49.88 AV	54.00	-4.12	1.20 H	288	17.85	32.03
3	2688.00	45.63 PK	74.00	-28.37	1.06 H	299	13.13	32.50
3	2688.00	39.70 AV	54.00	-14.30	1.06 H	299	7.20	32.50
4	4924.00	45.75 PK	74.00	-28.25	1.24 H	120	7.94	37.81
4	4924.00	32.85 AV	54.00	-21.15	1.24 H	120	-4.96	37.81

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	102.66 PK			1.02 V	286	70.73	31.93
1	*2462.00	93.41 AV			1.02 V	286	61.48	31.93
2	2483.50	70.21 PK	74.00	-3.79	1.02 V	286	38.18	32.03
2	2483.50	50.82 AV	54.00	-3.18	1.02 V	286	18.79	32.03
3	2688.00	45.10 PK	74.00	-28.90	1.12 V	292	12.60	32.50
3	2688.00	40.32 AV	54.00	-13.68	1.12 V	292	7.82	32.50
4	4924.00	45.71 PK	74.00	-28.29	1.04 V	250	7.90	37.81
4	4924.00	33.70 AV	54.00	-20.30	1.04 V	250	-4.11	37.81

- 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



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.

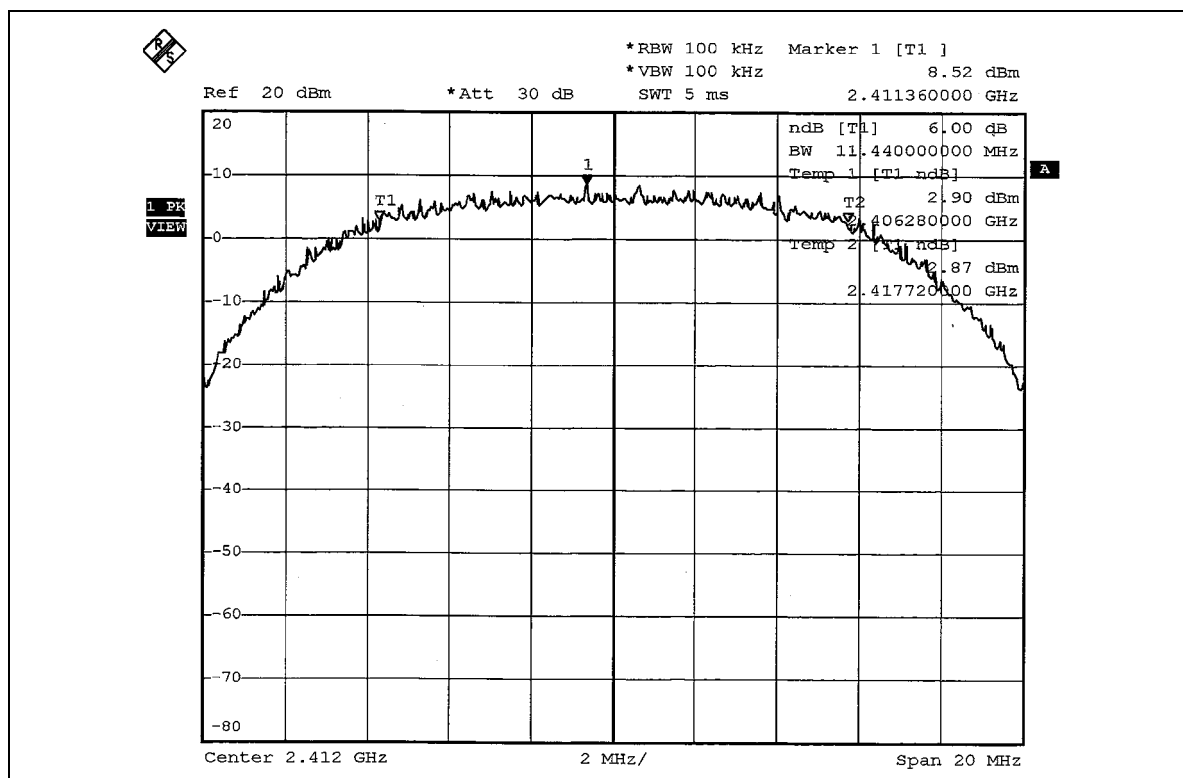
4.3.7 TEST RESULTS

802.11b DSSS modulation

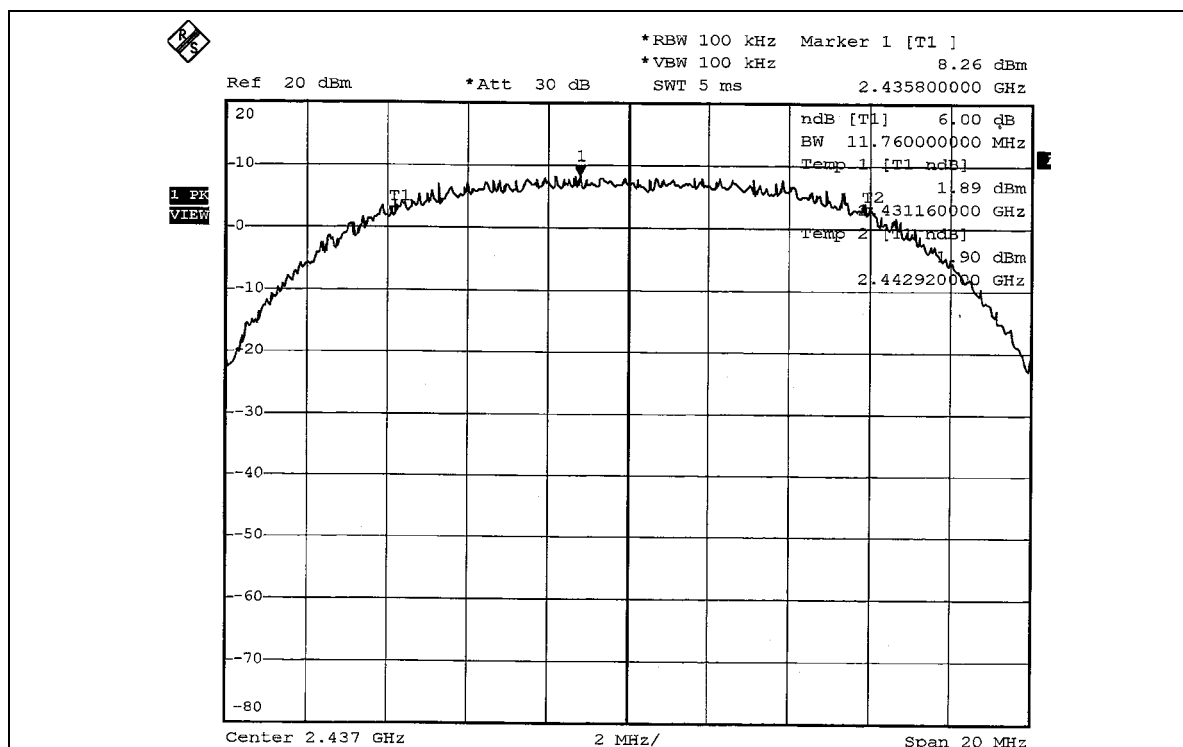
EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
MODULATION TYPE	CCK	TRANSFER RATE	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24deg.C, 57%RH, 991hPa
TESTED BY	Gary Chang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	11.44	0.5	PASS
6	2437	11.76	0.5	PASS
11	2462	11.04	0.5	PASS

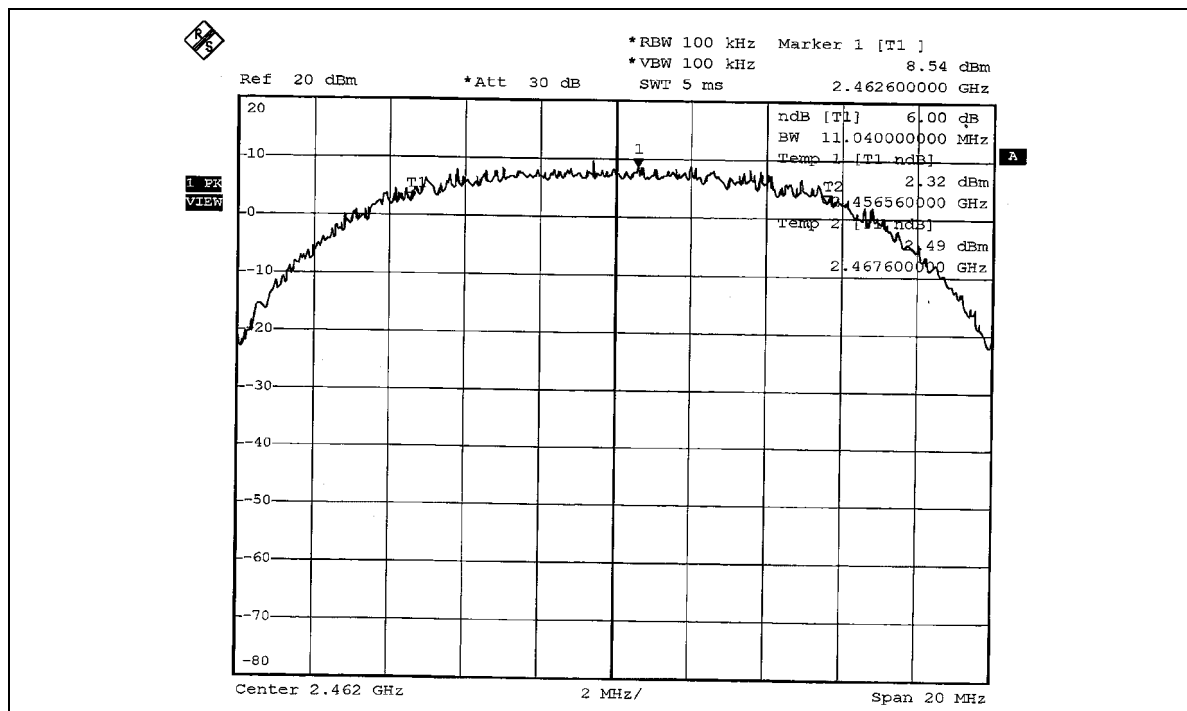
CH 1



CH 6



CH 11

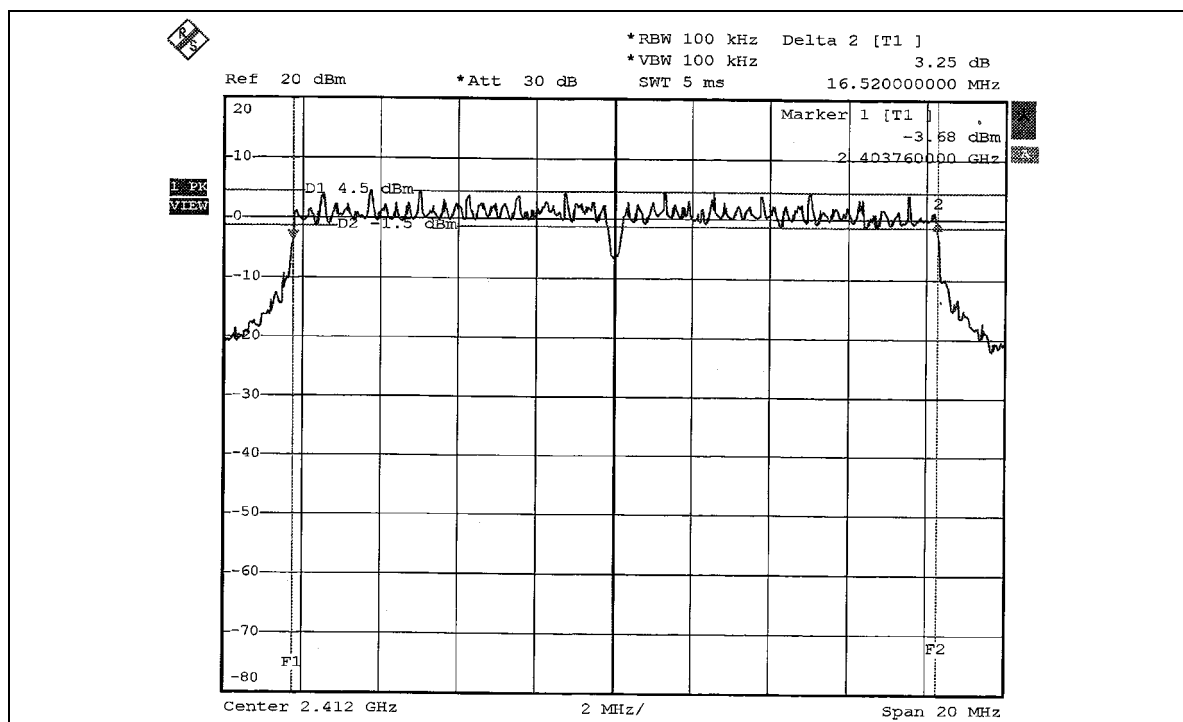


**802.11g OFDM modulation**

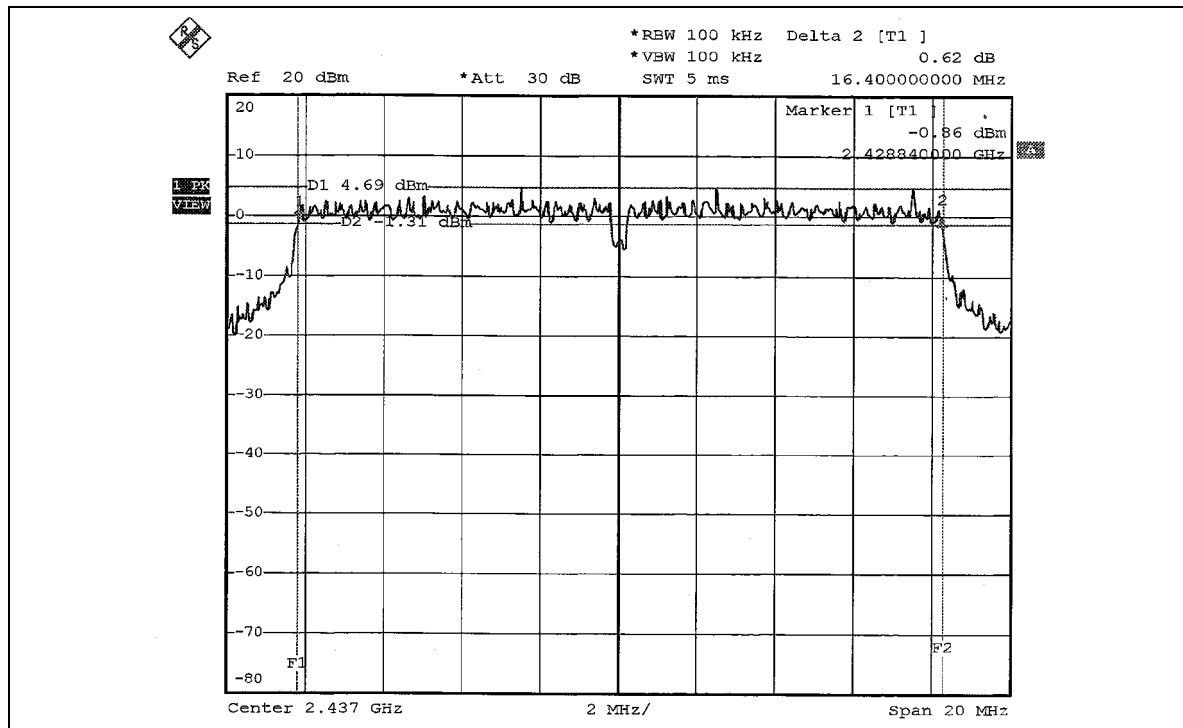
EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA- 123AG47)
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24deg.C, 57%RH, 991hPa
TESTED BY	Gary Chang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	16.52	0.5	PASS
6	2437	16.40	0.5	PASS
11	2462	16.44	0.5	PASS

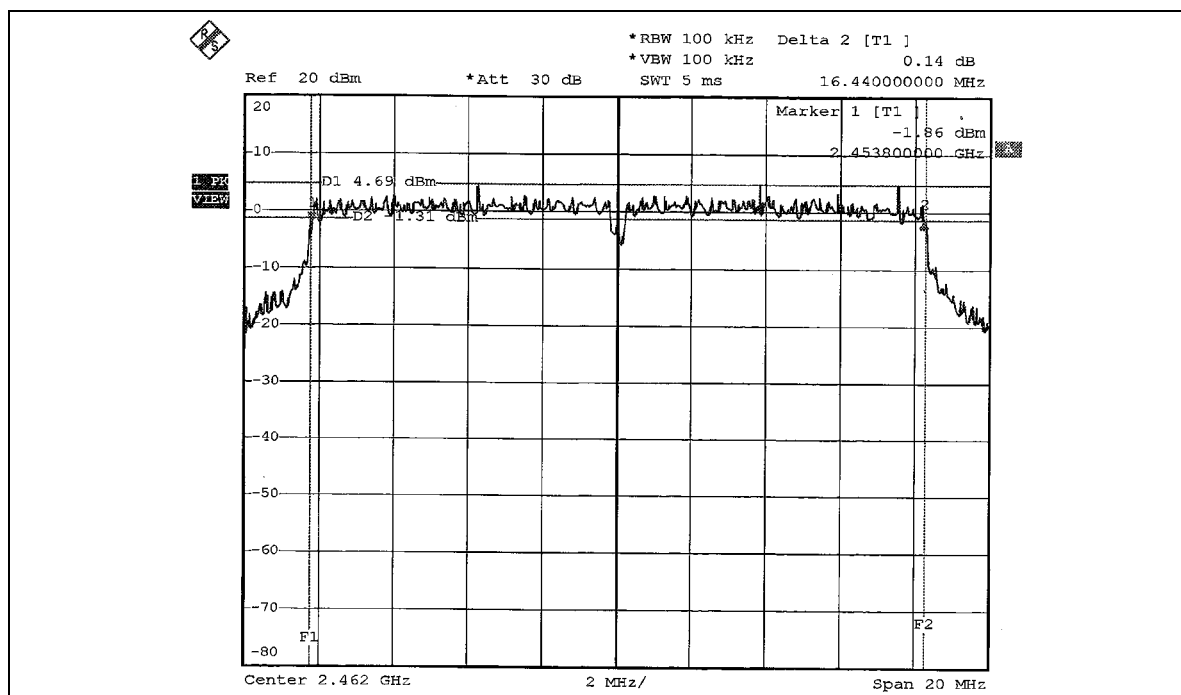
CH 1



CH 6



CH 11





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	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
MODULATION TYPE	CCK	TRANSFER RATE	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24deg.C, 57%RH, 991hPa
TESTED BY	Gary Chang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	79.799	19.02	30	PASS
6	2437	80.724	19.07	30	PASS
11	2462	80.168	19.04	30	PASS

802.11g OFDM modulation

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24deg.C, 57%RH, 991hPa
TESTED BY	Gary Chang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	60.256	17.80	30	PASS
6	2437	70.795	18.50	30	PASS
11	2462	61.660	17.90	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

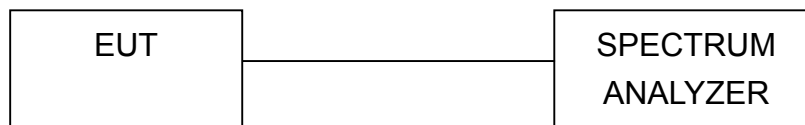
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.

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



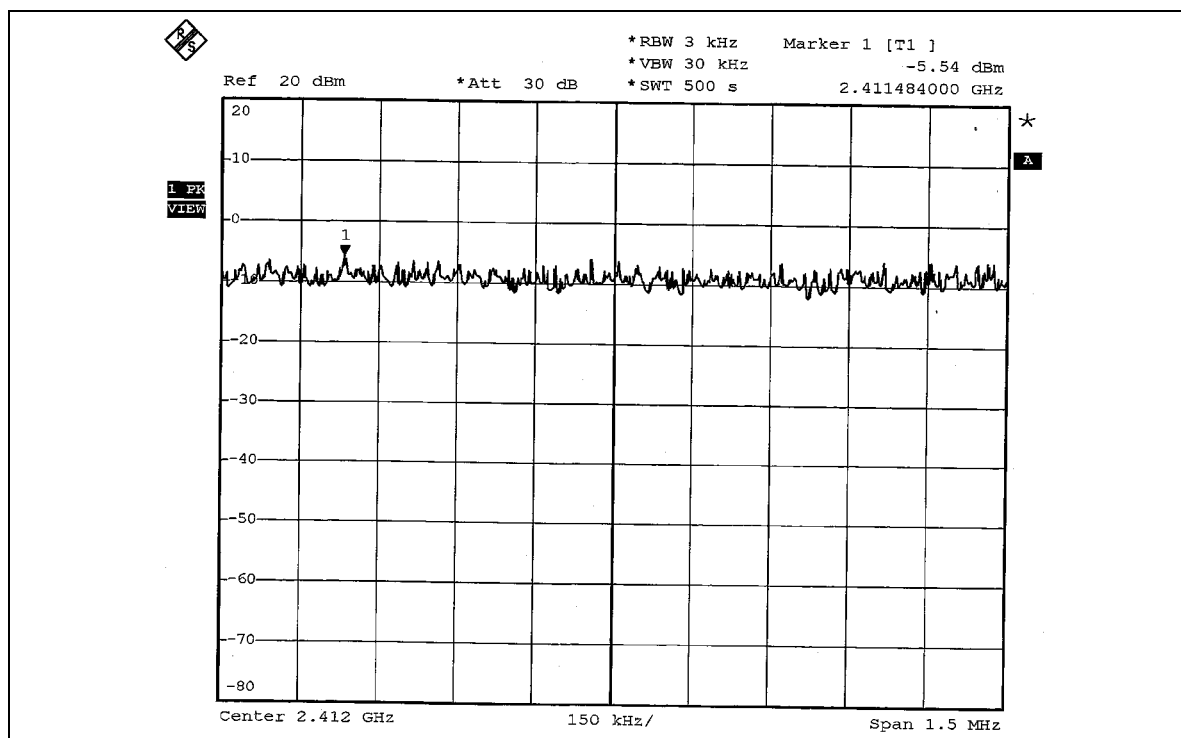
4.5.7 TEST RESULTS

802.11b DSSS modulation

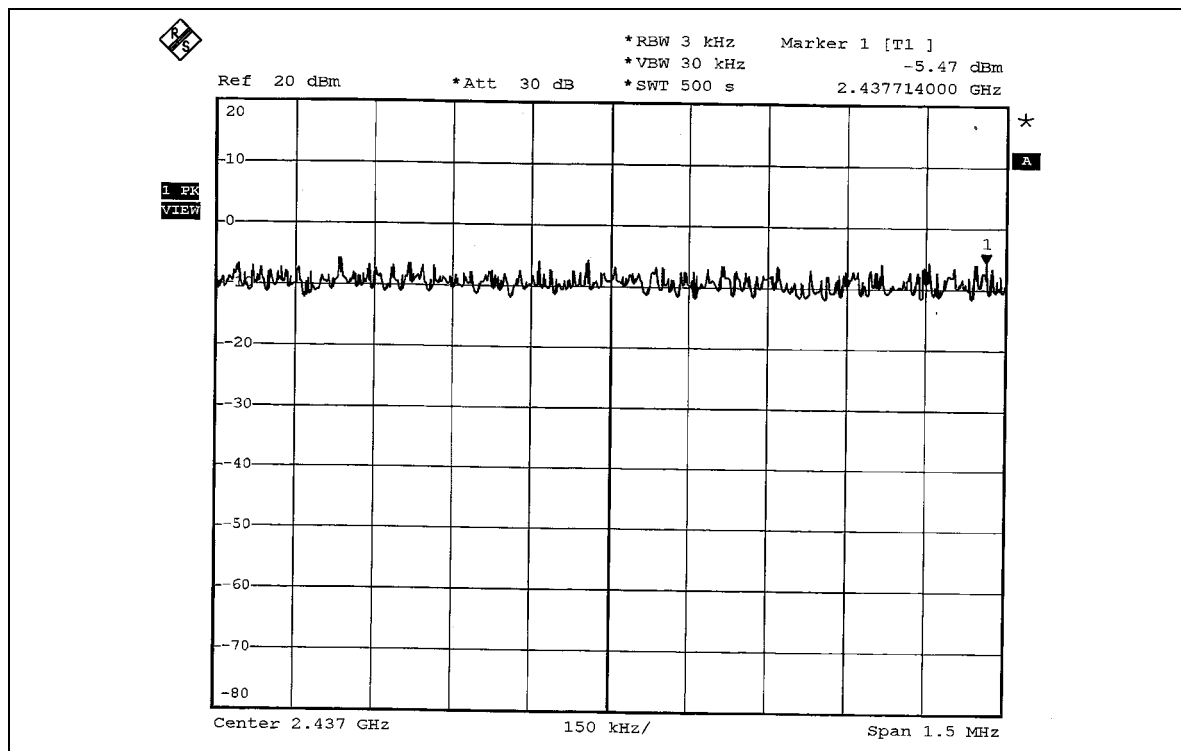
EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
MODULATION TYPE	CCK	TRANSFER RATE	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24deg.C, 57%RH, 991hPa
TESTED BY	Gary Chang		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-5.54	8	PASS
6	2437	-5.47	8	PASS
11	2462	-5.37	8	PASS

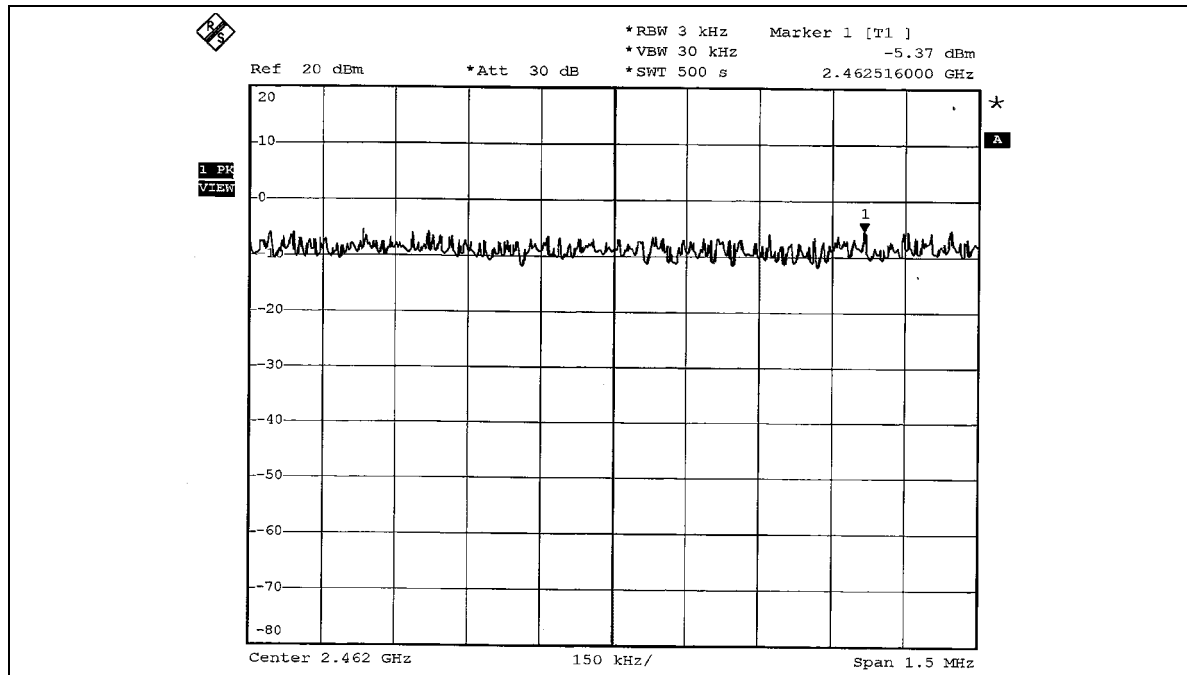
CH 1



CH 6



CH 11

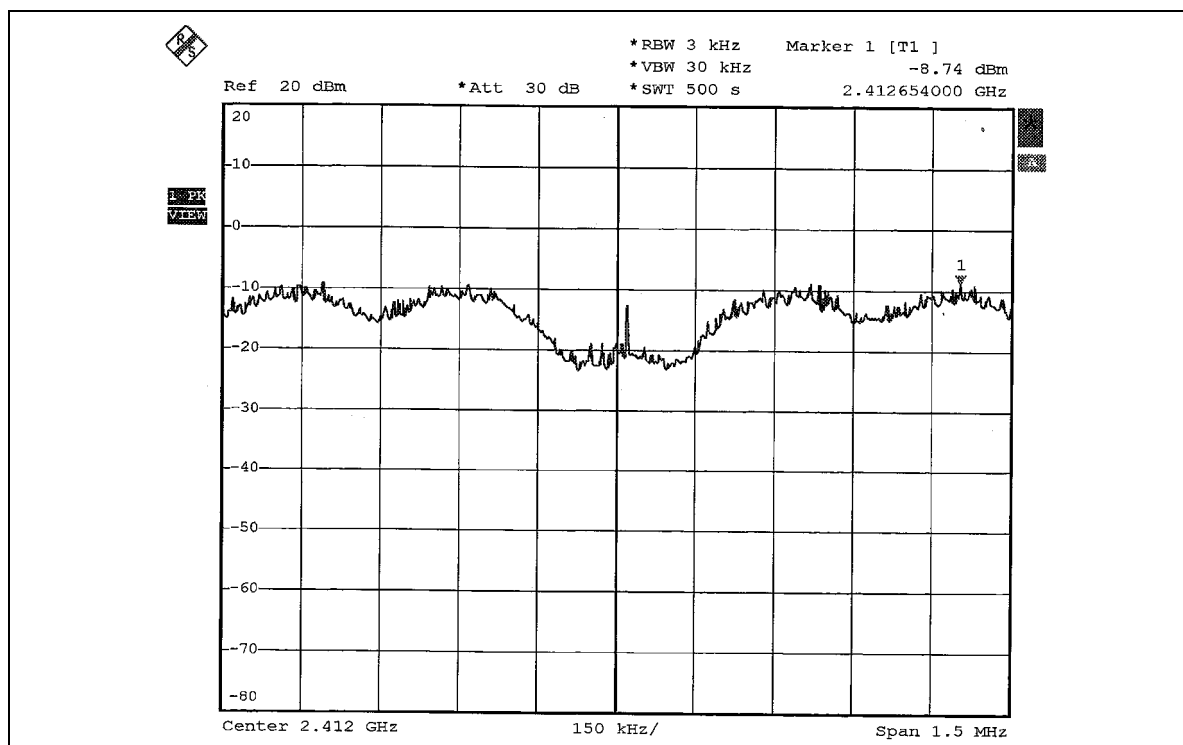


**802.11g OFDM modulation**

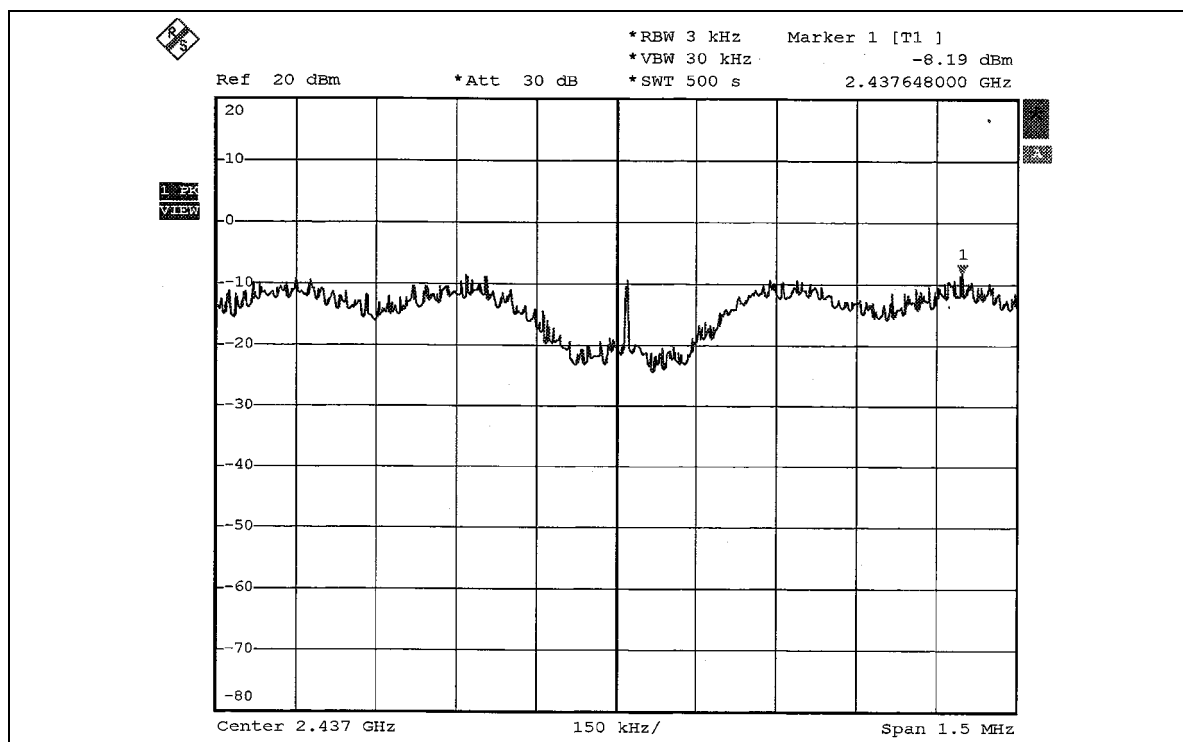
EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24deg.C, 57%RH, 991hPa
TESTED BY	Gary Chang		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-8.74	8	PASS
6	2437	-8.19	8	PASS
11	2462	-8.22	8	PASS

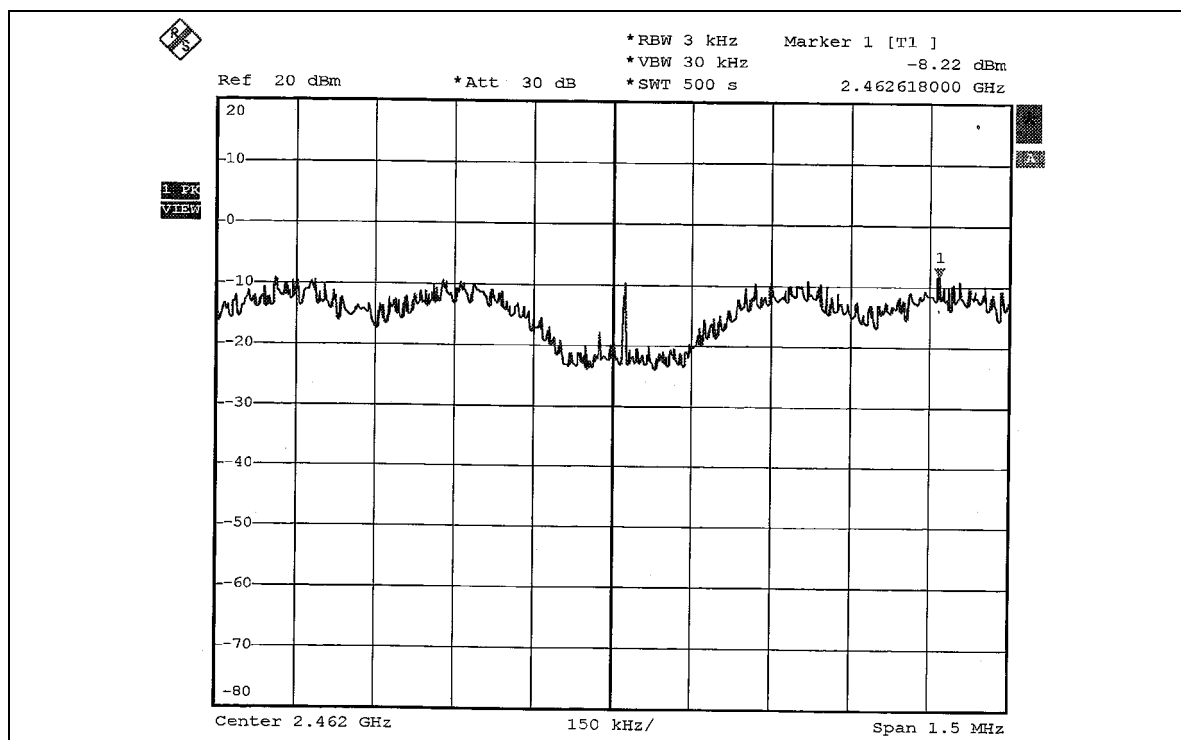
CH 1



CH 6



CH 11



4.6 BAND EDGES MEASUREMENT

4.6.1 LIMITS OF BAND EDGES MEASUREMENT

Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 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.

4.6.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots (Peak RBW=VBW=100kHz ; Average RBW=1MHz, VBW=10Hz) are attached on the following pages.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 EUT OPERATING CONDITION

Same as Item 4.3.6



4.6.6 TEST RESULTS

The spectrum plots are attached on the following 12 images. D2 line indicates the highest level, and D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(d).

802.11b DSSS modulation

NOTE 1: The band edge emission plot on page 60 shows 49.77dBc between carrier maximum power and local maximum emission in restrict band (2.3866GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 105.24dBuV/m (Peak), so the maximum field strength in restrict band is $105.24 - 49.77 = 55.47$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot of on page 60 shows 52.72dBc between carrier maximum power and local maximum emission in restrict band (2.3865GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 98.04dBuV/m (Average), so the maximum field strength in restrict band is $98.04 - 52.72 = 45.32$ dBuV/m which is under 54dBuV/m limit.

NOTE 2: The band edge emission plot on page 61 shows 50.60dBc between carrier maximum power and local maximum emission in restrict band (2.4876GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 106.73dBuV/m (Peak), so the maximum field strength in restrict band is $106.73 - 50.60 = 56.13$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on page 62 shows 52.79dBc between carrier maximum power and local maximum emission in restrict band (2.4873GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 99.30dBuV/m (Average), so the maximum field strength in restrict band is $99.30 - 52.79 = 46.51$ dBuV/m which is under 54dBuV/m limit.



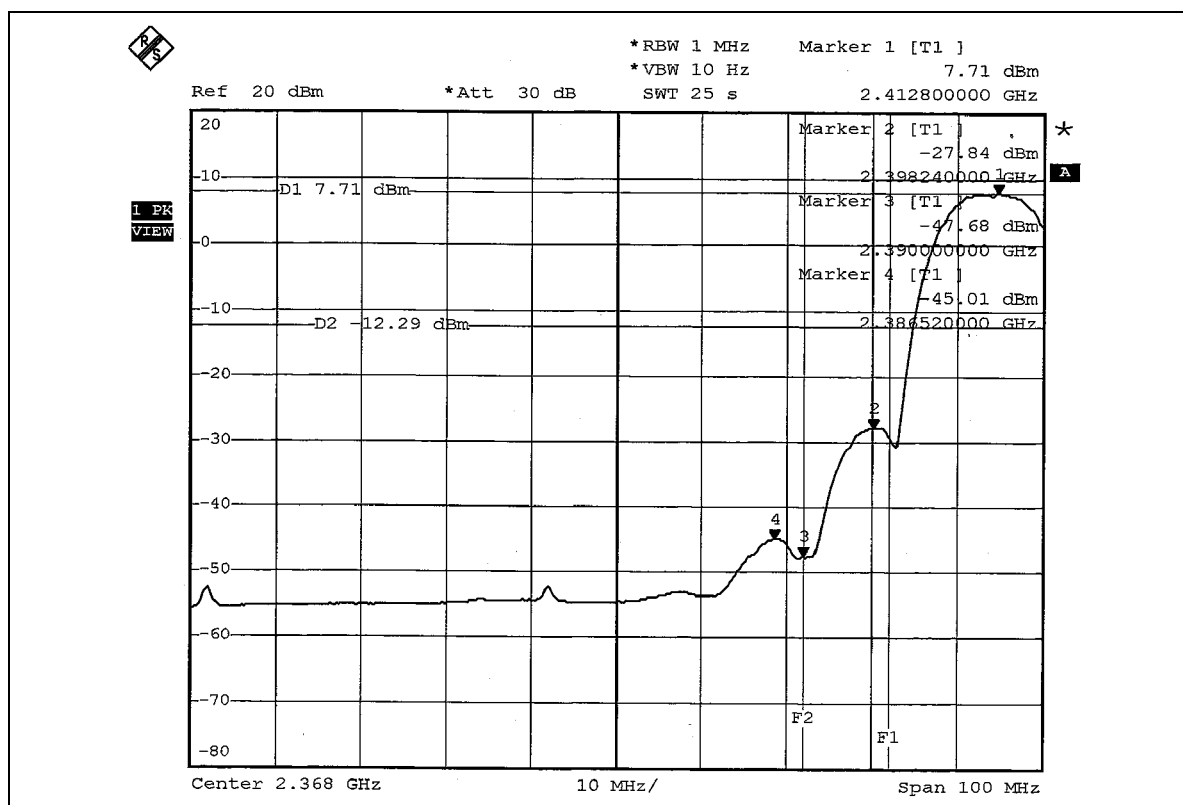
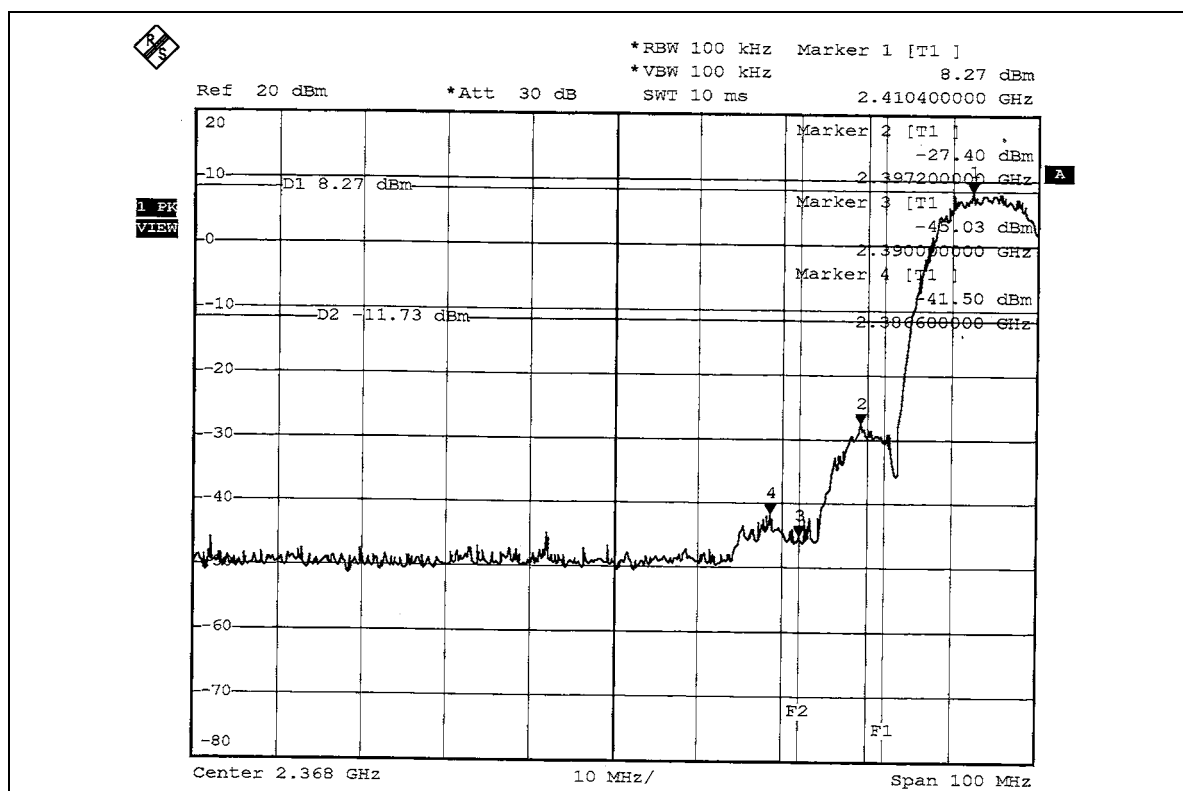
802.11g OFDM modulation

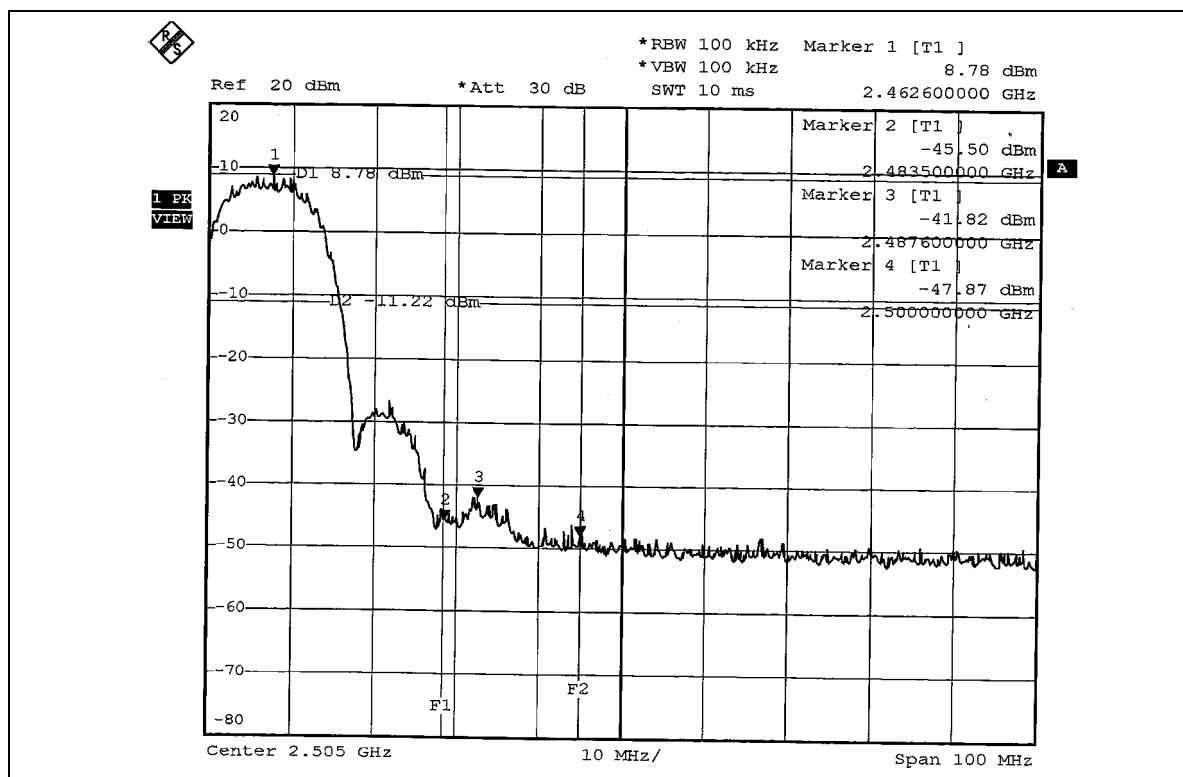
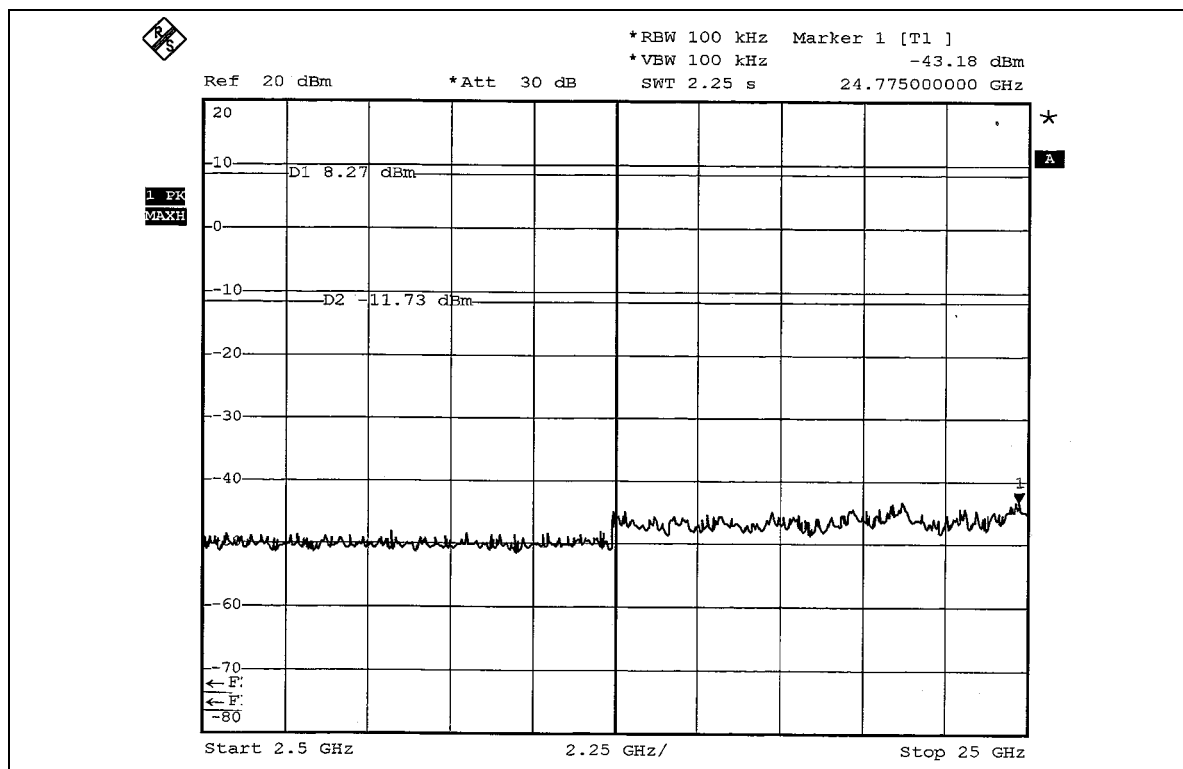
NOTE 1: The band edge emission plot on page 63 shows 43.11dBc between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 102.56dBuV/m (Peak), so the maximum field strength in restrict band is $102.56 - 43.11 = 59.45$ dBuV/m which is under 74dBuV/m limit.

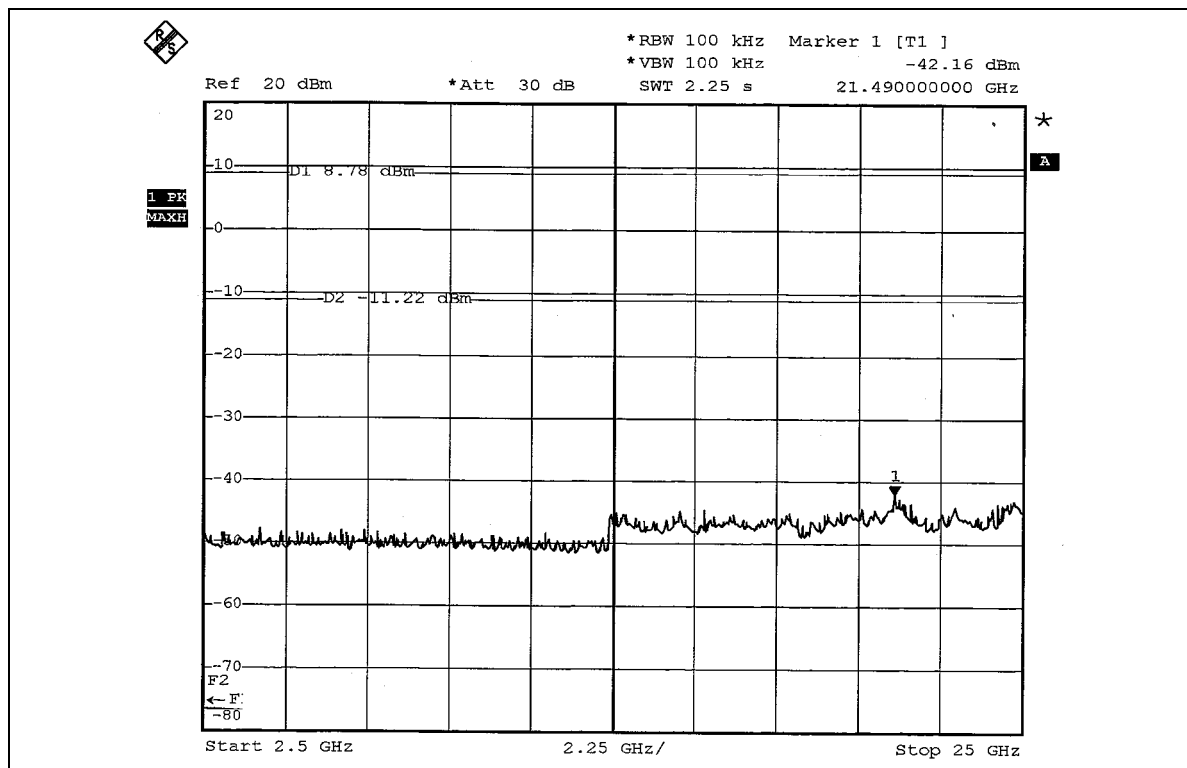
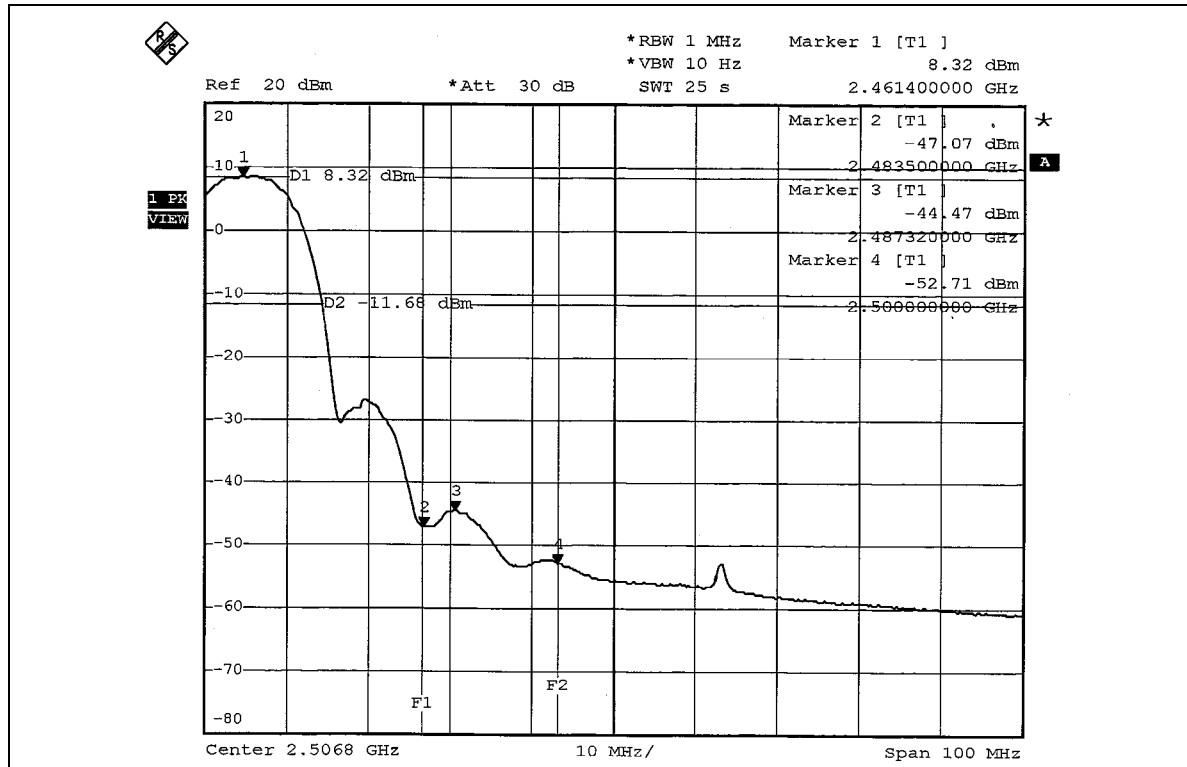
The band edge emission plot of on page 63 shows 44.68dBc between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 92.25dBuV/m (Average), so the maximum field strength in restrict band is $92.25 - 44.68 = 47.57$ dBuV/m which is under 54dBuV/m limit.

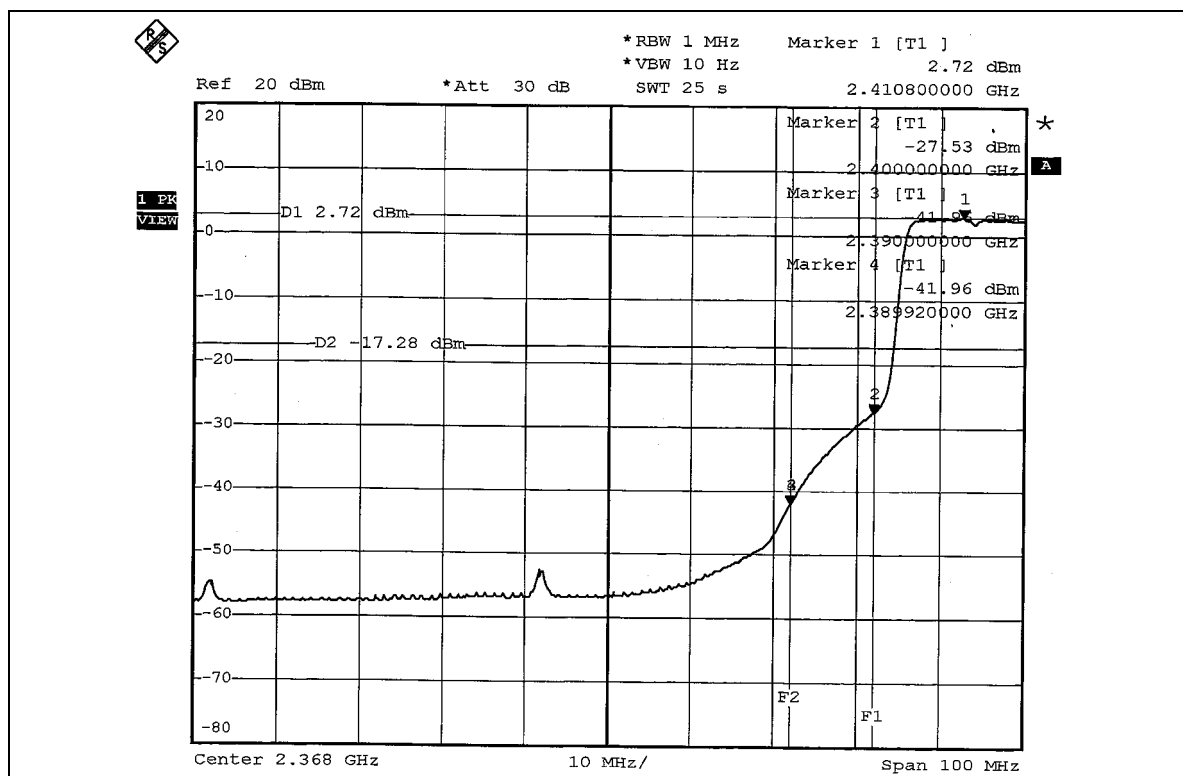
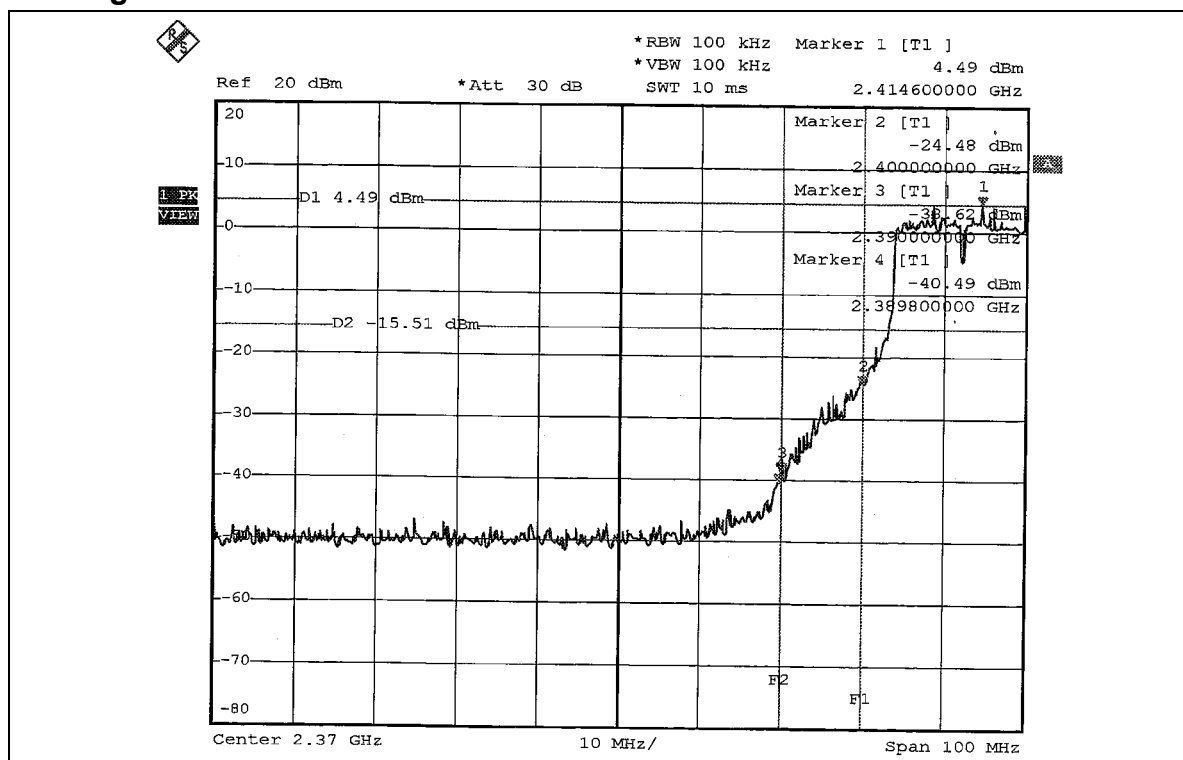
NOTE 2: The band edge emission plot on page 64 shows 40.33dBc between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 102.66dBuV/m (Peak), so the maximum field strength in restrict band is $102.66 - 40.33 = 62.33$ dBuV/m which is under 74dBuV/m limit.

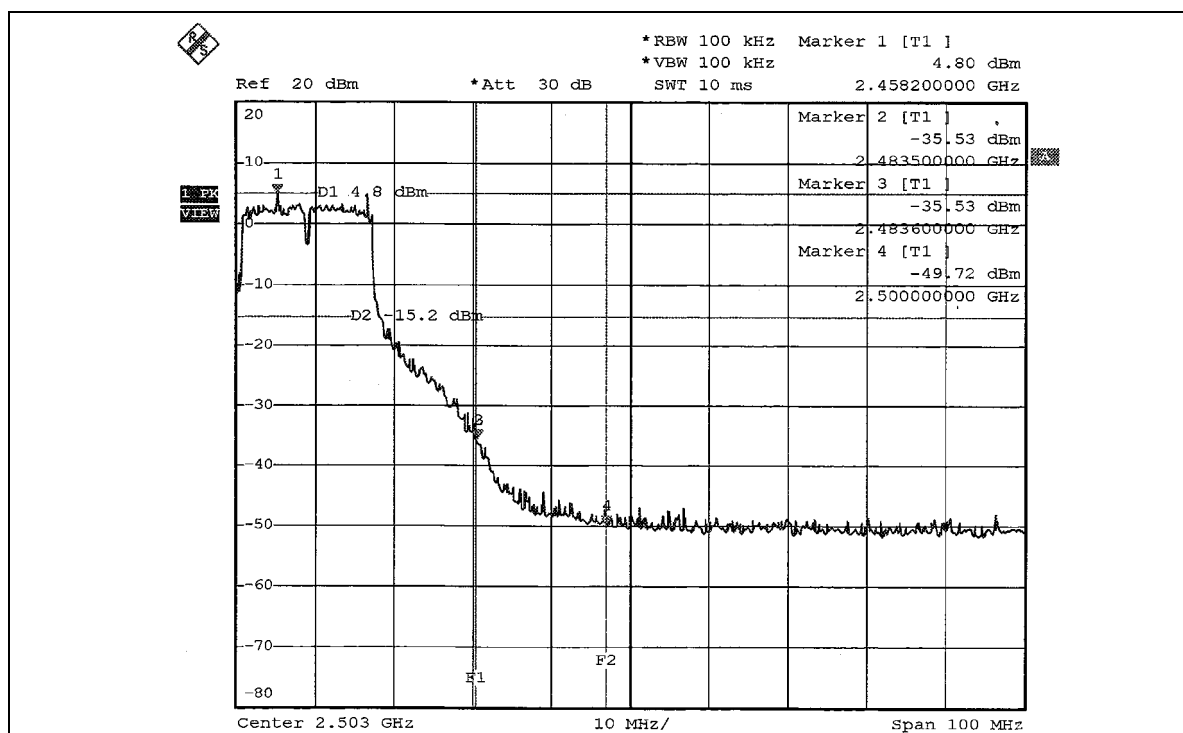
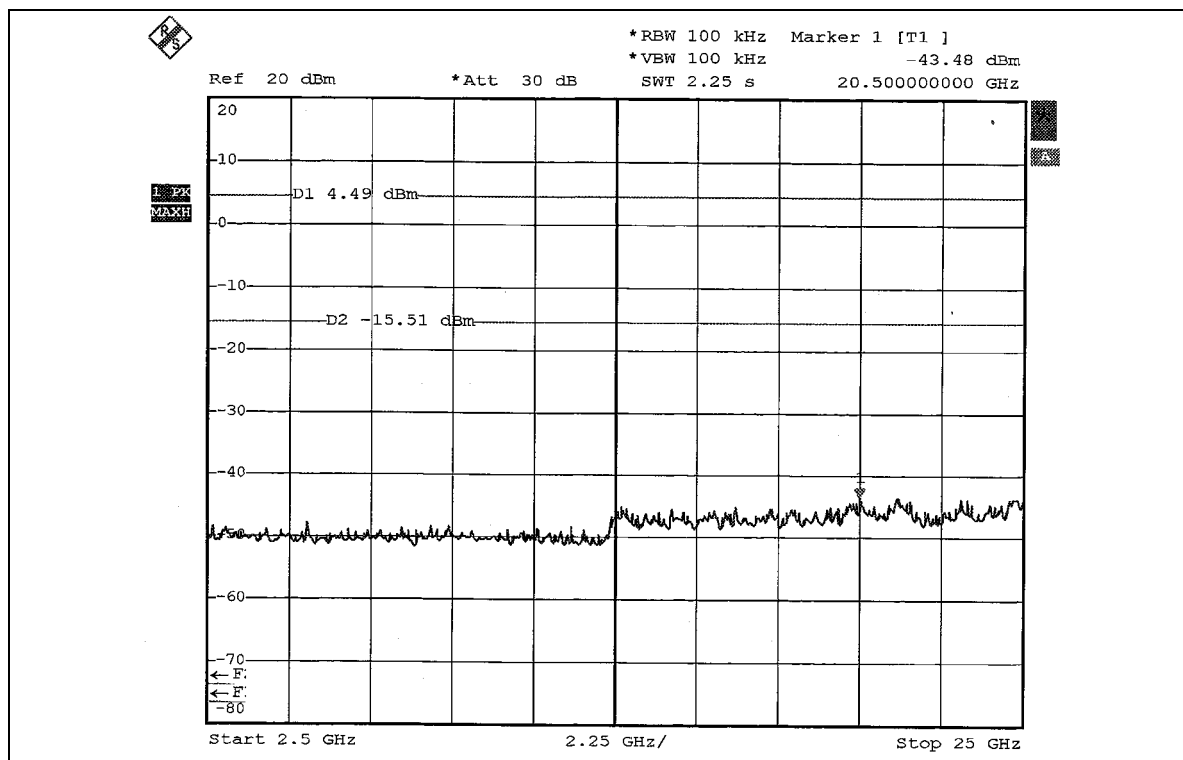
The band edge emission plot on page 65 shows 42.92dBc between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 93.41dBuV/m (Average), so the maximum field strength in restrict band is $93.41 - 42.92 = 50.49$ dBuV/m which is under 54dBuV/m limit.

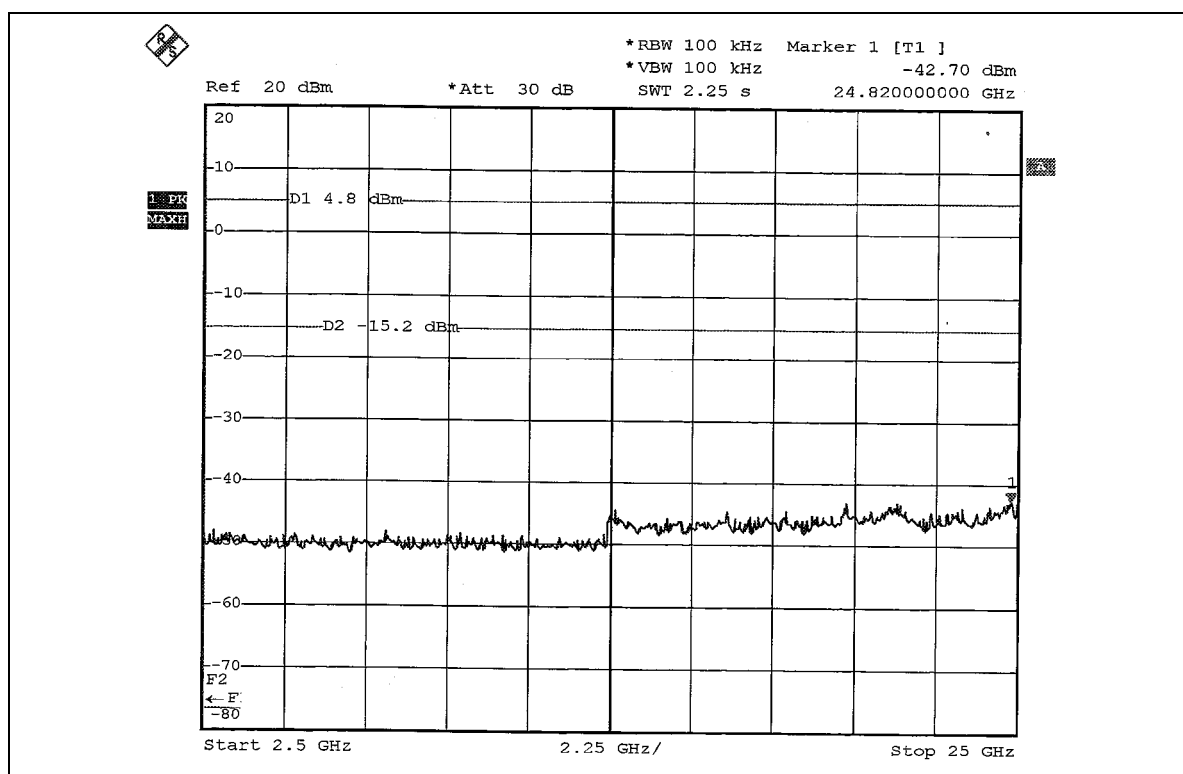
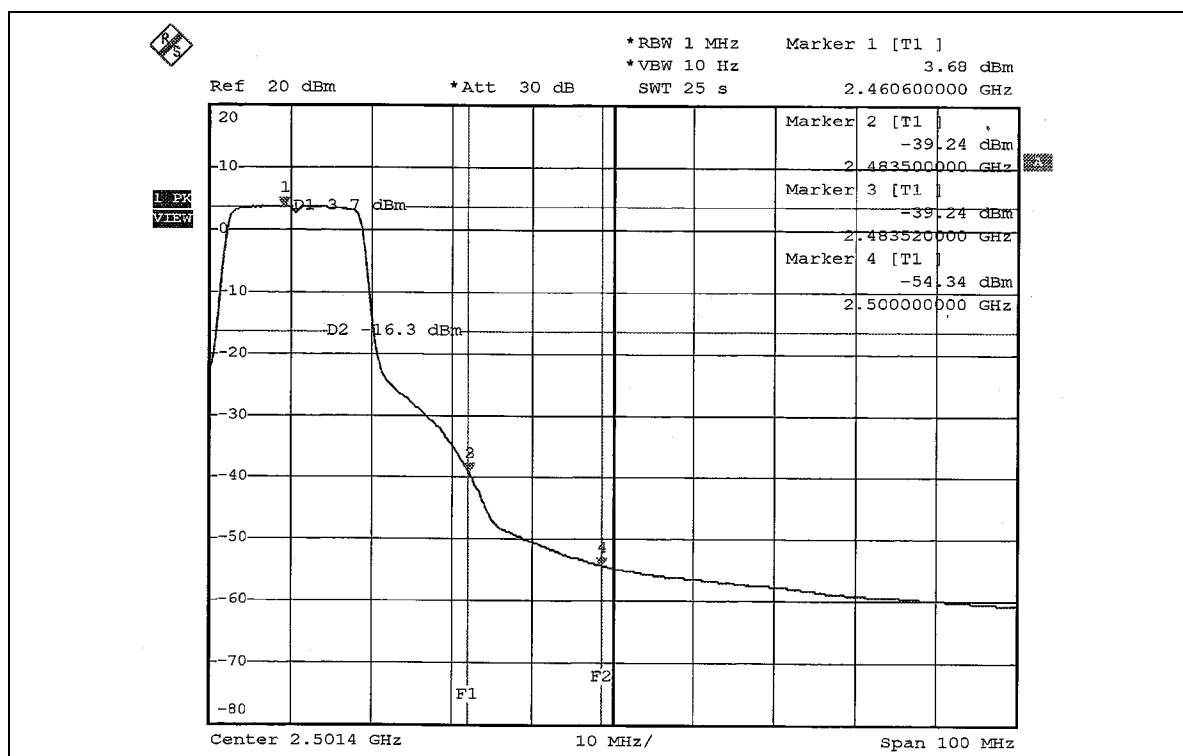
802.11b DSSS modulation





802.11g OFDM modulation







4.7 ANTENNA REQUIREMENT

4.7.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.7.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Patch antenna with UFL connector. The maximum Gain of the antenna is 0.02dBi.

5. TEST TYPES AND RESULTS (802.11a 5725~5850MHz Band)

5.1 CONDUCTED EMISSION MEASUREMENT

5.1.1 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:**
- The lower limit shall apply at the transition frequencies.
 - The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
 - 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.

5.1.2 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:**
- The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 - The test was performed in HwaYa Shielded Room 1.
 - The VCCI Site Registration No. is C-2040.



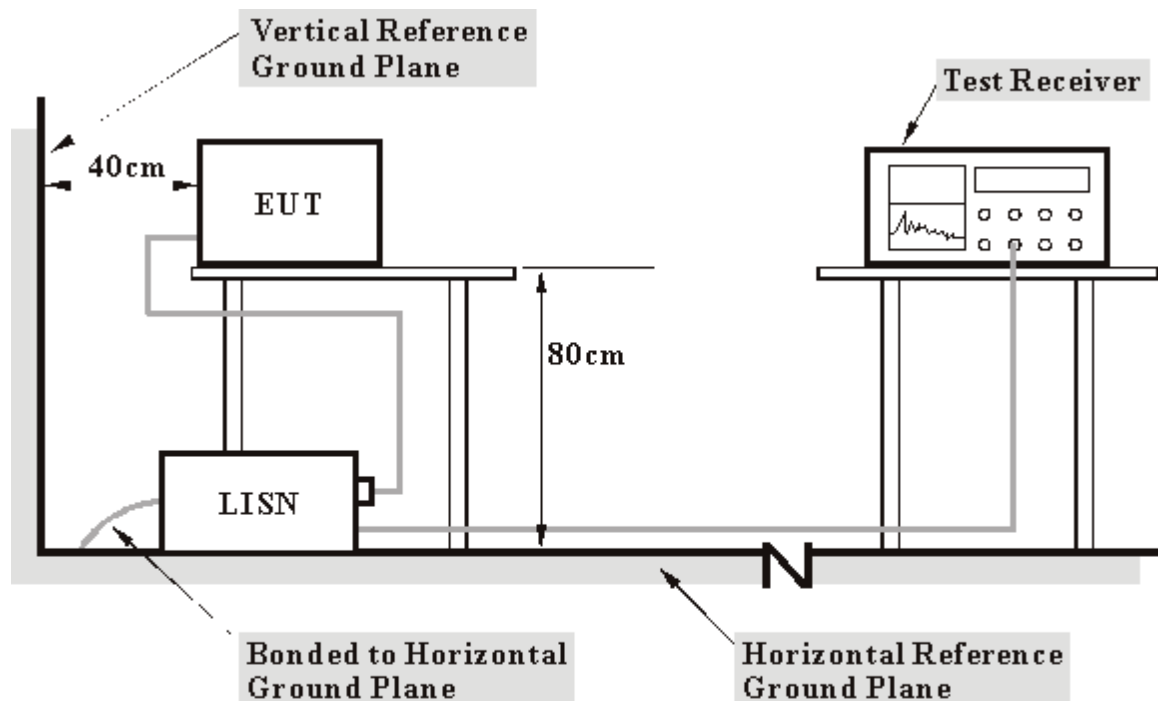
5.1.3 TEST PROCEDURES

- 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.

5.1.4 DEVIATION FROM TEST STANDARD

No deviation

5.1.5 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.

5.1.6 EUT OPERATING CONDITIONS

Same as 4.1.6

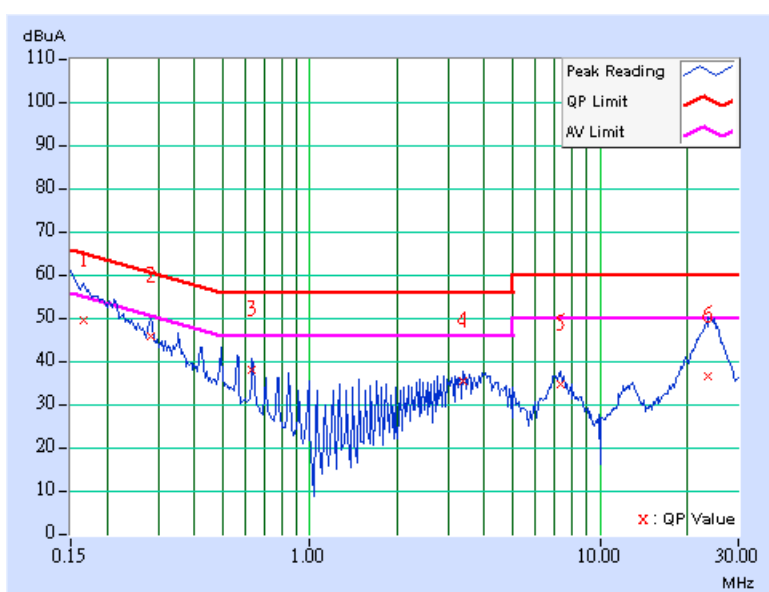
5.1.7 TEST RESULTS

Conducted Worst-Case Data

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 3	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa	TESTED BY	Match Tsui

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.166	0.10	48.59	-	48.69	-	65.18	55.18	-16.48	-
2	0.283	0.11	44.81	-	44.92	-	60.73	50.73	-15.81	-
3	0.634	0.14	37.25	-	37.39	-	56.00	46.00	-18.61	-
4	3.387	0.26	34.54	-	34.80	-	56.00	46.00	-21.20	-
5	7.336	0.40	33.65	-	34.05	-	60.00	50.00	-25.95	-
6	23.695	1.06	35.68	-	36.74	-	60.00	50.00	-23.26	-

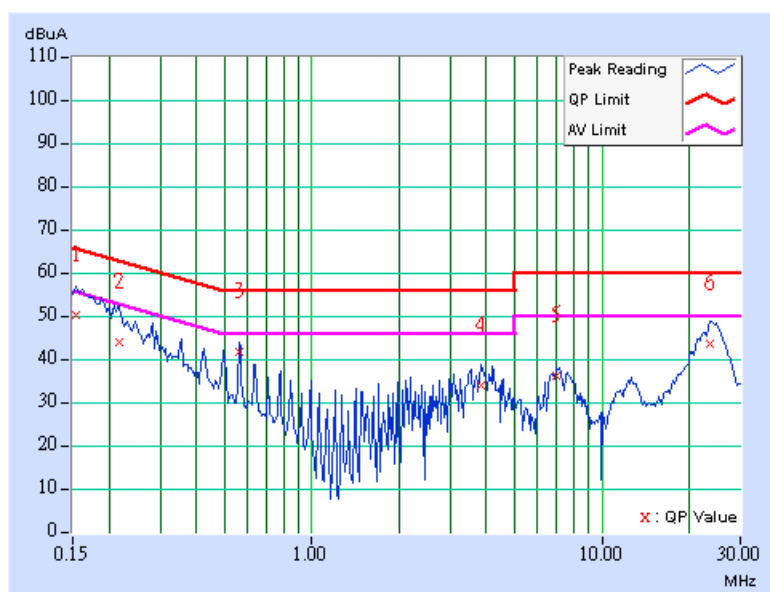
- REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value =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



EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 3	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 991hPa	TESTED BY	Match Tsui

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.154	0.10	49.71	-	49.81	-	65.79	55.79	-15.98	-
2	0.216	0.10	43.45	-	43.55	-	62.96	52.96	-19.41	-
3	0.564	0.12	41.23	-	41.35	-	56.00	46.00	-14.65	-
4	3.813	0.27	33.39	-	33.66	-	56.00	46.00	-22.34	-
5	6.926	0.37	35.78	-	36.15	-	60.00	50.00	-23.85	-
6	23.672	0.62	43.21	-	43.83	-	60.00	50.00	-16.17	-

- 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.





5.2 RADIATED EMISSION MEASUREMENT

5.2.1 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.

5.2.2 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.



5.2.3 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 chamber. 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 10dB 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 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

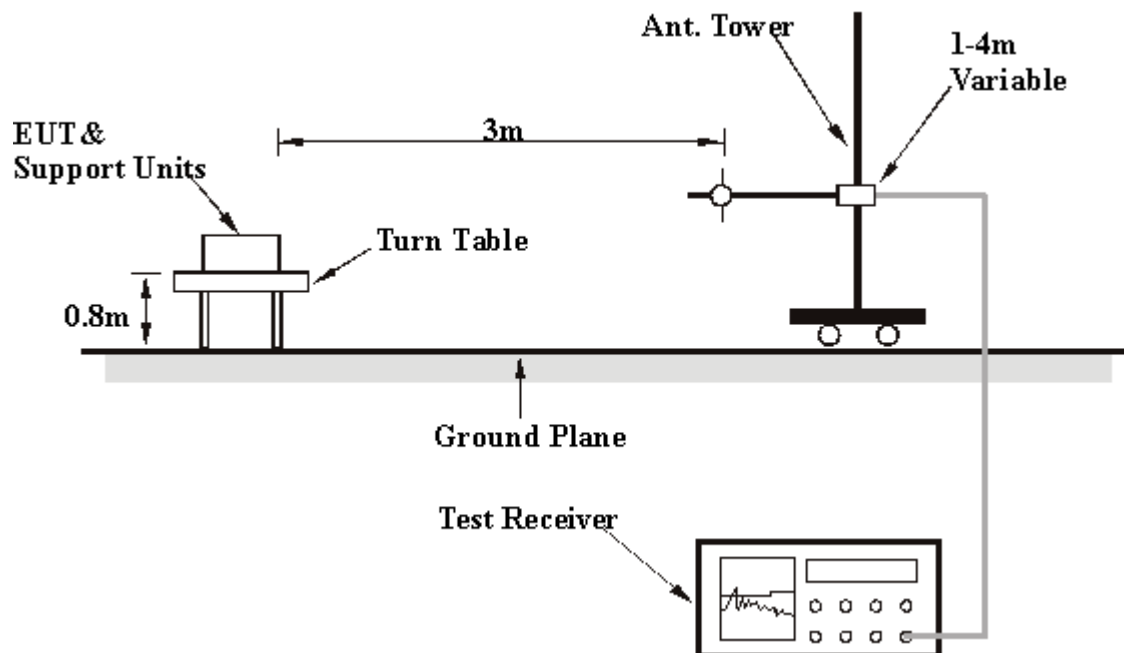
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection 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.

5.2.4 DEVIATION FROM TEST STANDARD

No deviation

5.2.5 TEST SETUP



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

5.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

5.2.7 TEST RESULTS

Below 1GHz Worst-Case Data

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 3	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	20deg. C, 72%RH, 991hPa	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	65.08	32.84 QP	40.00	-7.16	1.25 H	120	19.70	13.14
2	119.61	37.63 QP	43.50	-5.87	1.00 H	334	24.64	12.99
3	160.02	35.14 QP	43.50	-8.36	1.25 H	296	20.28	14.86
4	214.42	36.24 QP	43.50	-7.26	1.00 H	351	24.53	11.71
5	286.49	36.94 QP	46.00	-9.06	1.25 H	358	22.61	14.33
6	451.40	36.14 QP	46.00	-9.86	1.25 H	184	17.99	18.15
7	500.10	38.41 QP	46.00	-7.59	1.25 H	108	19.67	18.74
8	574.50	33.17 QP	46.00	-12.83	1.00 H	198	12.74	20.43
9	671.15	33.87 QP	46.00	-12.13	1.25 H	105	11.84	22.03
10	762.12	31.32 QP	46.00	-14.68	1.50 H	125	7.66	23.66

- 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

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 3	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	20deg. C, 72%RH, 991hPa	TESTED BY	Match Tsui

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	33.40	34.26 QP	40.00	-5.74	1.25 V	350	20.09	14.17
2	57.34	38.18 QP	40.00	-1.82	1.00 V	250	24.20	13.98
3	88.54	33.63 QP	43.50	-9.87	1.25 V	305	23.47	10.16
4	165.87	33.40 QP	43.50	-10.10	1.25 V	350	19.10	14.30
5	222.87	33.96 QP	46.00	-12.04	1.50 V	25	21.94	12.02
6	265.48	33.90 QP	46.00	-12.10	1.25 V	30	20.28	13.62
7	397.71	30.89 QP	46.00	-15.11	1.75 V	100	14.13	16.76
8	469.74	30.98 QP	46.00	-15.02	2.50 V	150	12.60	18.38
9	634.00	29.98 QP	46.00	-16.02	1.25 V	238	8.41	21.57
10	766.84	33.96 QP	46.00	-12.04	1.25 V	360	10.28	23.68

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

802.11a OFDM modulation

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 40 GHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 991hPa	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	*5745.00	98.99 PK			1.26 H	1	59.71	39.28
1	*5745.00	89.31 AV			1.26 H	1	50.03	39.28
2	#7660.00	51.96 PK	74.00	-22.04	1.19 H	224	7.43	44.53
2	#7660.00	38.84 AV	54.00	-15.16	1.19 H	224	-5.69	44.53
3	#11490.00	56.52 PK	74.00	-17.48	1.11 H	184	7.45	49.07
3	#11490.00	43.86 AV	54.00	-10.14	1.11 H	184	-5.21	49.07

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	*5745.00	104.21 PK			1.42 V	290	64.93	39.28
1	*5745.00	94.51 AV			1.42 V	290	55.23	39.28
2	#7660.00	52.02 PK	74.00	-21.98	1.21 V	100	7.49	44.53
2	#7660.00	40.37 AV	54.00	-13.63	1.21 V	100	-4.16	44.53
3	#11490.00	56.36 PK	74.00	-17.64	1.17 V	352	7.29	49.07
3	#11490.00	43.99 AV	54.00	-10.01	1.17 V	352	-5.08	49.07

- NOTE:**
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
 6. "#"The radiated frequency falling in the restricted band.
 7. The limit value is defined as per 15.247

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 3	FREQUENCY RANGE	1 ~ 40 GHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 991hPa	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	*5785.00	100.72 PK			1.25 H	350	61.34	39.38
1	*5785.00	90.51 AV			1.25 H	350	51.13	39.38
2	#7713.00	51.11 PK	74.00	-22.89	1.01 H	12	6.48	44.63
2	#7713.00	39.25 AV	54.00	-14.75	1.01 H	12	-5.38	44.63
3	#11570.00	57.12 PK	74.00	-16.88	1.04 H	23	8.08	49.04
3	#11570.00	43.99 AV	54.00	-10.01	1.04 H	23	-5.05	49.04

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	*5785.00	105.12 PK			1.42 V	289	65.74	39.38
1	*5785.00	95.90 AV			1.42 V	289	56.52	39.38
2	#7713.00	52.06 PK	74.00	-21.94	1.00 V	1	7.43	44.63
2	#7713.00	39.88 AV	54.00	-14.12	1.00 V	1	-4.75	44.63
3	#11570.00	56.64 PK	74.00	-17.36	1.11 V	139	7.60	49.04
3	#11570.00	44.69 AV	54.00	-9.31	1.11 V	139	-4.35	49.04

- NOTE:**
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
 6. "#"The radiated frequency falling in the restricted band.
 7. The limit value is defined as per 15.247

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 5	FREQUENCY RANGE	1 ~ 40 GHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 991hPa	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	*5825.00	100.08 PK			1.36 H	355	60.63	39.46
1	*5825.00	90.52 AV			1.36 H	355	51.07	39.46
2	7766.00	51.30 PK	80.08	-28.78	1.14 H	120	6.56	44.74
2	7766.00	39.33 AV	70.52	-31.19	1.14 H	120	-5.41	44.74
3	#11650.00	56.73 PK	74.00	-17.27	1.04 H	320	7.74	48.99
3	#11650.00	44.09 AV	54.00	-9.91	1.04 H	320	-4.90	48.99

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	*5825.00	105.99 PK			1.41 V	289	66.53	39.46
1	*5825.00	95.99 AV			1.41 V	289	56.53	39.46
2	7766.00	52.25 PK	85.99	-32.25	1.02 V	159	7.51	44.74
2	7766.00	40.15 AV	75.99	-35.84	1.02 V	159	-4.59	44.74
3	#11650.00	57.13 PK	74.00	-16.87	1.24 V	210	8.14	48.99
3	#11650.00	44.93 AV	54.00	-9.07	1.24 V	210	-4.06	48.99

- NOTE:**
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
 6. "#"The radiated frequency falling in the restricted band.
 7. The limit value is defined as per 15.247

802.11a Turbo OFDM modulation

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 40 GHz
MODULATION TYPE	BPSK	TRANSFER RATE	12Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 991hPa	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	*5760.00	98.98 PK			1.27 H	356	59.66	39.32
1	*5760.00	89.78 AV			1.27 H	356	50.46	39.32
2	#7680.00	51.05 PK	74.00	-22.95	1.04 H	230	6.48	44.57
2	#7680.00	38.92 AV	54.00	-15.08	1.04 H	230	-5.65	44.57
3	#11520.00	56.41 PK	74.00	-17.59	1.11 H	120	7.35	49.06
3	#11520.00	44.45 AV	54.00	-9.55	1.11 H	120	-4.61	49.06

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	*5760.00	103.39 PK			1.40 V	288	64.07	39.32
1	*5760.00	93.95 AV			1.40 V	288	54.63	39.32
2	#7680.00	51.73 PK	74.00	-22.27	1.10 V	123	7.16	44.57
2	#7680.00	39.73 AV	54.00	-14.27	1.10 V	123	-4.84	44.57
3	#11520.00	57.06 PK	74.00	-16.94	1.20 V	273	8.00	49.06
3	#11520.00	44.54 AV	54.00	-9.46	1.20 V	273	-4.52	49.06

- NOTE:**
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
 6. "#"The radiated frequency falling in the restricted band.
 7. The limit value is defined as per 15.247



EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 2	FREQUENCY RANGE	1 ~ 40 GHz
MODULATION TYPE	BPSK	TRANSFER RATE	12Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 991hPa	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	*5745.00	99.42 PK			1.35 H	347	60.14	39.28
1	*5745.00	89.09 AV			1.35 H	347	49.81	39.28
2	#7733.00	51.18 PK	74.00	-22.82	1.10 H	120	6.50	44.67
2	#7733.00	39.05 AV	54.00	-14.95	1.10 H	120	-5.63	44.67
3	#11600.00	57.24 PK	74.00	-16.76	1.04 H	130	8.21	49.03
3	#11600.00	44.09 AV	54.00	-9.91	1.04 H	130	-4.94	49.03

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	*5800.00	104.02 PK			1.40 V	289	64.61	39.41
1	*5800.00	93.87 AV			1.40 V	289	54.46	39.41
2	#7733.00	52.44 PK	74.00	-21.56	1.14 V	230	7.76	44.67
2	#7733.00	40.13 AV	54.00	-13.87	1.14 V	230	-4.55	44.67
3	#11600.00	57.45 PK	74.00	-16.55	1.20 V	111	8.42	49.03
3	#11600.00	44.91 AV	54.00	-9.09	1.20 V	111	-4.12	49.03

- NOTE:**
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
 6. "#"The radiated frequency falling in the restricted band.
 7. The limit value is defined as per 15.247



5.3 6dB BANDWIDTH MEASUREMENT

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

5.3.2 TEST INSTRUMENTS

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

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

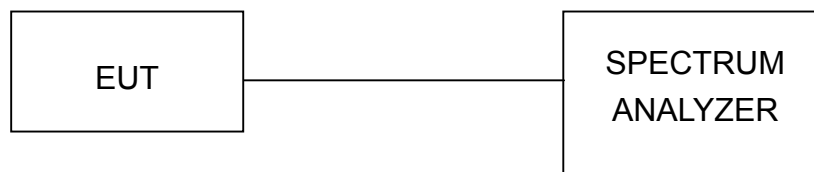
5.3.3 TEST PROCEDURE

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.

5.3.4 DEVIATION FROM TEST STANDARD

No deviation

5.3.5 TEST SETUP



5.3.6 EUT OPERATING CONDITIONS

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

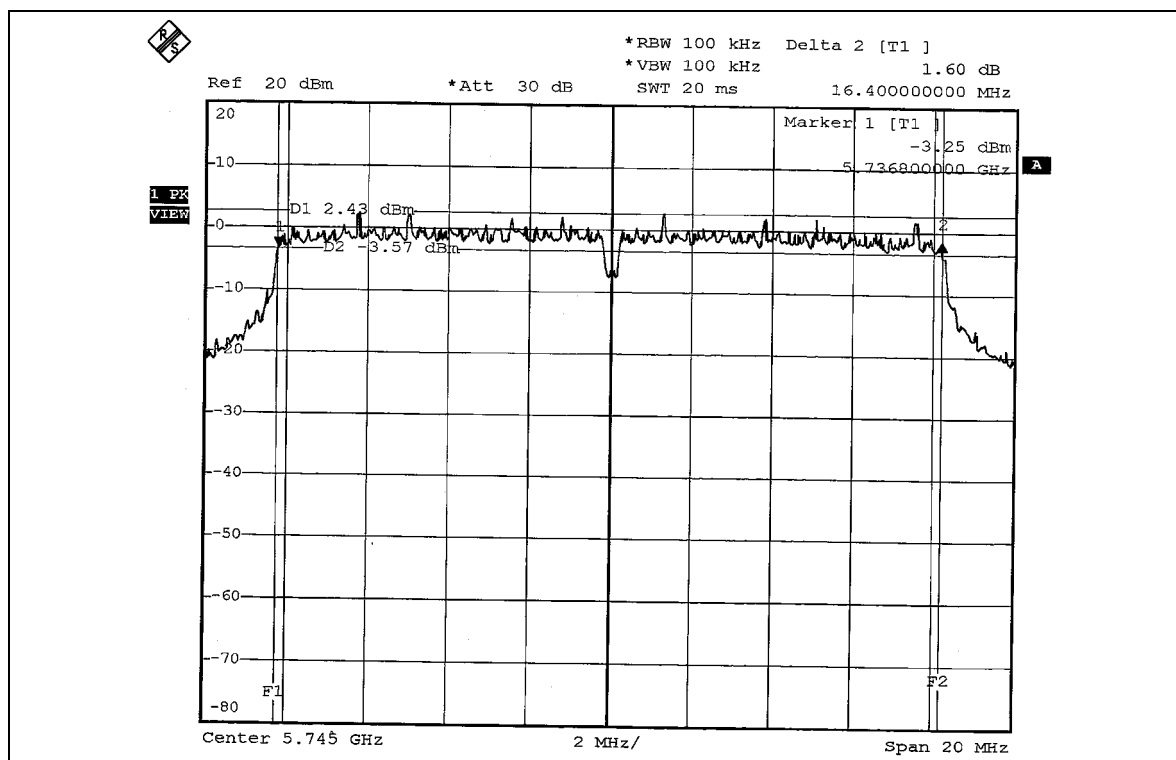
5.3.7 TEST RESULTS

802.11a OFDM modulation

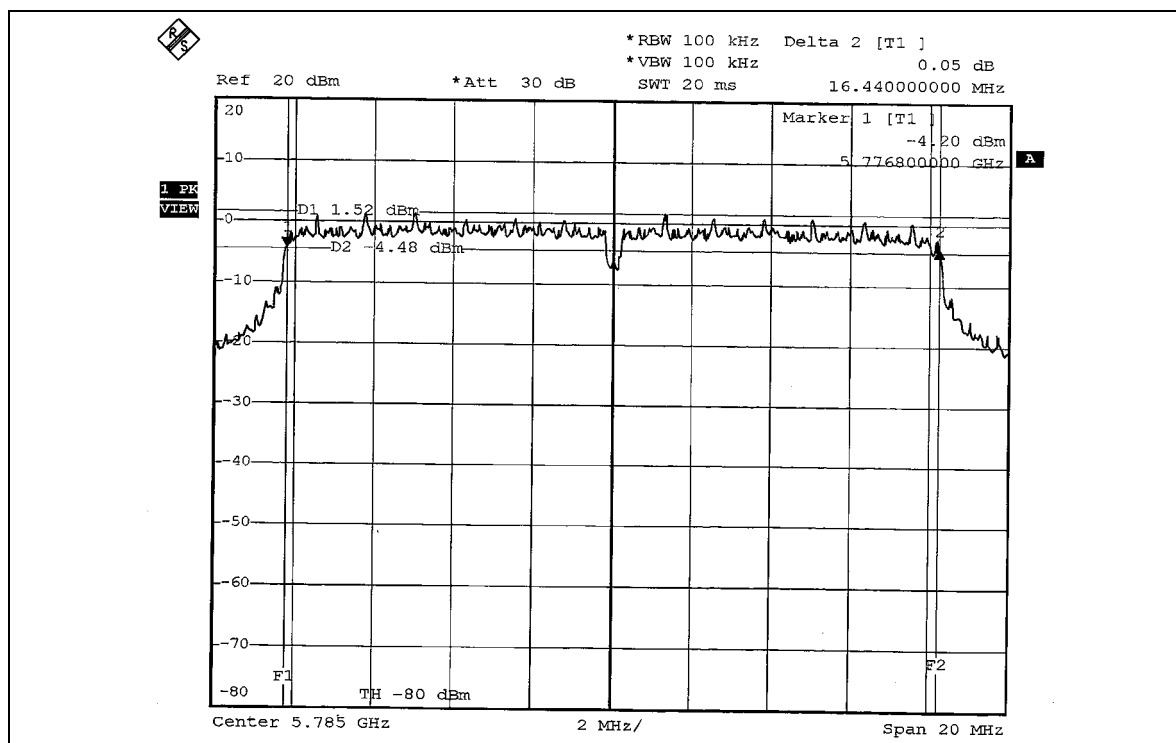
EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24deg.C, 57%RH, 991hPa
TESTED BY	Gary Chang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	5745	16.40	0.5	PASS
3	5785	16.44	0.5	PASS
5	5825	16.40	0.5	PASS

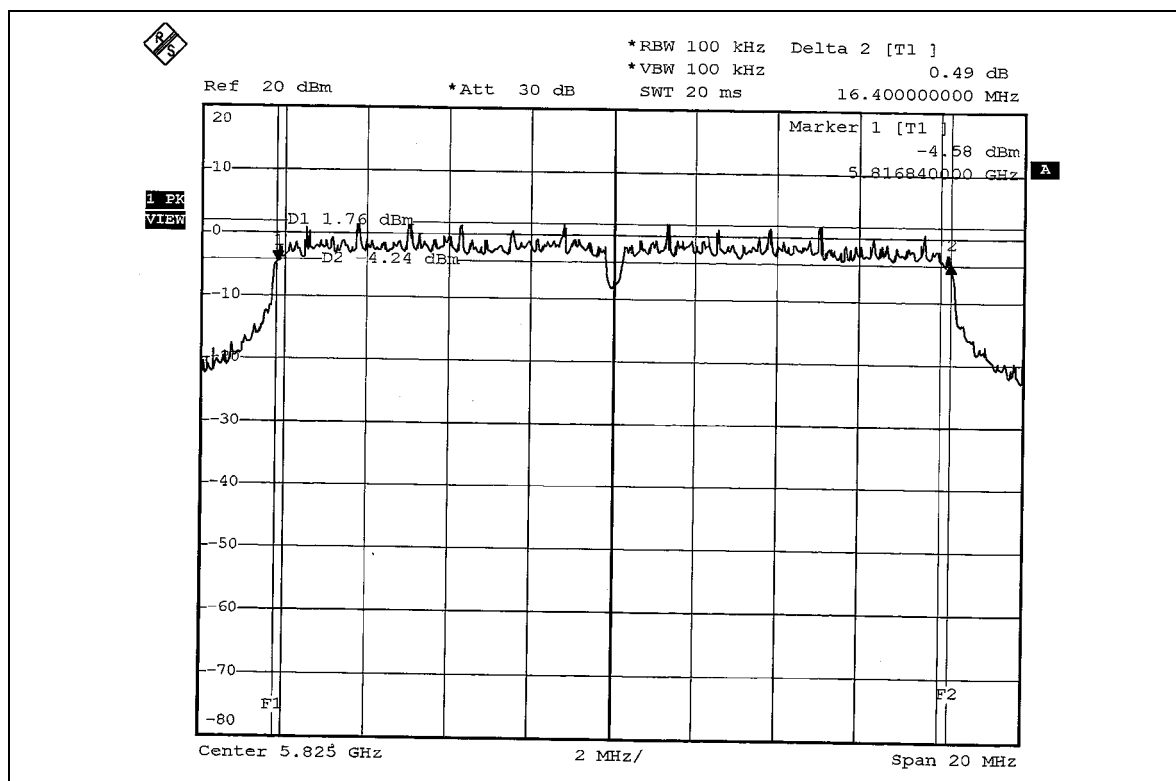
CH 1



CH 3



CH 5

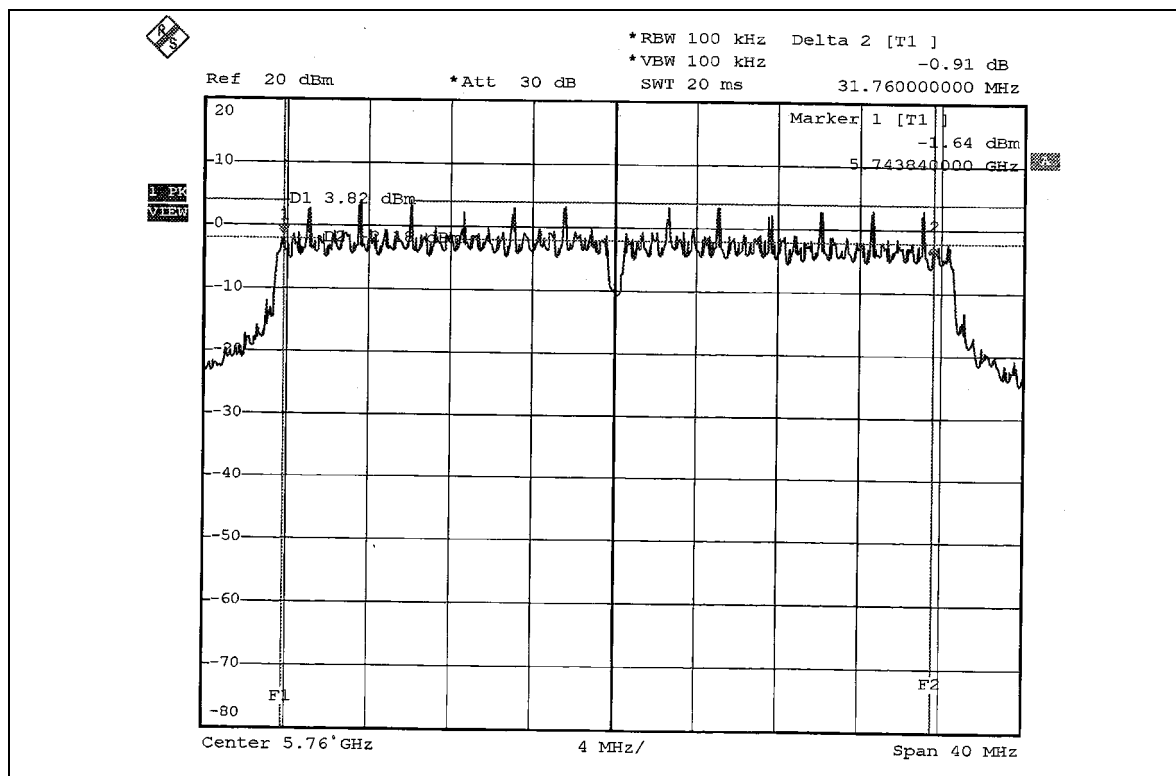


**802.11a Turbo OFDM modulation**

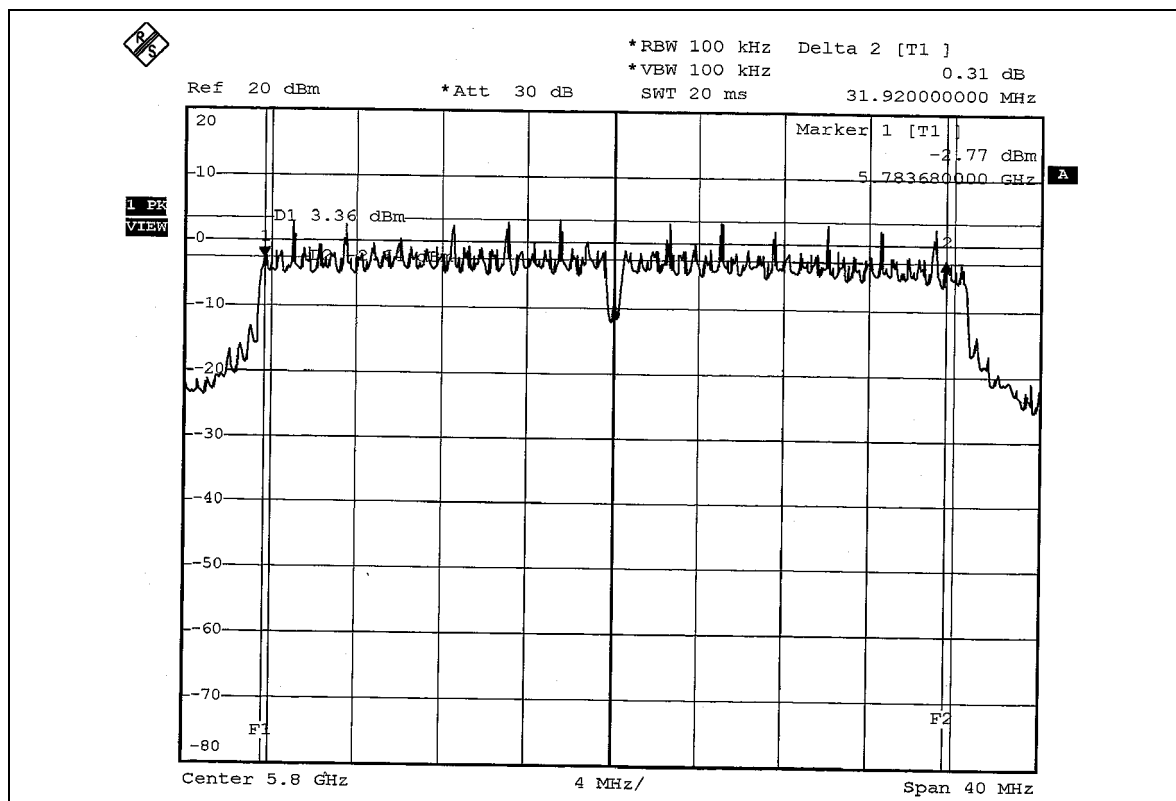
EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
MODULATION TYPE	BPSK	TRANSFER RATE	12Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24deg.C, 57%RH, 991hPa
TESTED BY	Gary Chang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	5760	31.76	0.5	PASS
2	5800	31.92	0.5	PASS

CH 1



CH 2



5.4 MAXIMUM PEAK OUTPUT POWER

5.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

5.4.2 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..

5.4.3 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.

5.4.4 DEVIATION FROM TEST STANDARD

No deviation

5.4.5 TEST SETUP



5.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

5.4.7 TEST RESULTS

802.11a OFDM modulation

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24deg.C, 57%RH, 991hPa
TESTED BY	Gary Chang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	5745	39.994	16.02	30	PASS
3	5785	40.272	16.05	30	PASS
5	5825	40.458	16.07	30	PASS

802.11a Turbo OFDM modulation

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
MODULATION TYPE	BPSK	TRANSFER RATE	12Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24deg.C, 57%RH, 991hPa
TESTED BY	Gary Chang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	5760	40.087	16.03	30	PASS
2	5800	40.458	16.07	30	PASS

5.5 POWER SPECTRAL DENSITY MEASUREMENT

5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.5.2 TEST INSTRUMENTS

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

NOTES:

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

5.5.3 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 3 kHz RBW and 30 kHz VBW, set sweep time = span/3 kHz. The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span/3 kHz for a full response of the mixer in the spectrum analyzer.

5.5.4 DEVIATION FROM TEST STANDARD

No deviation

5.5.5 TEST SETUP



5.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

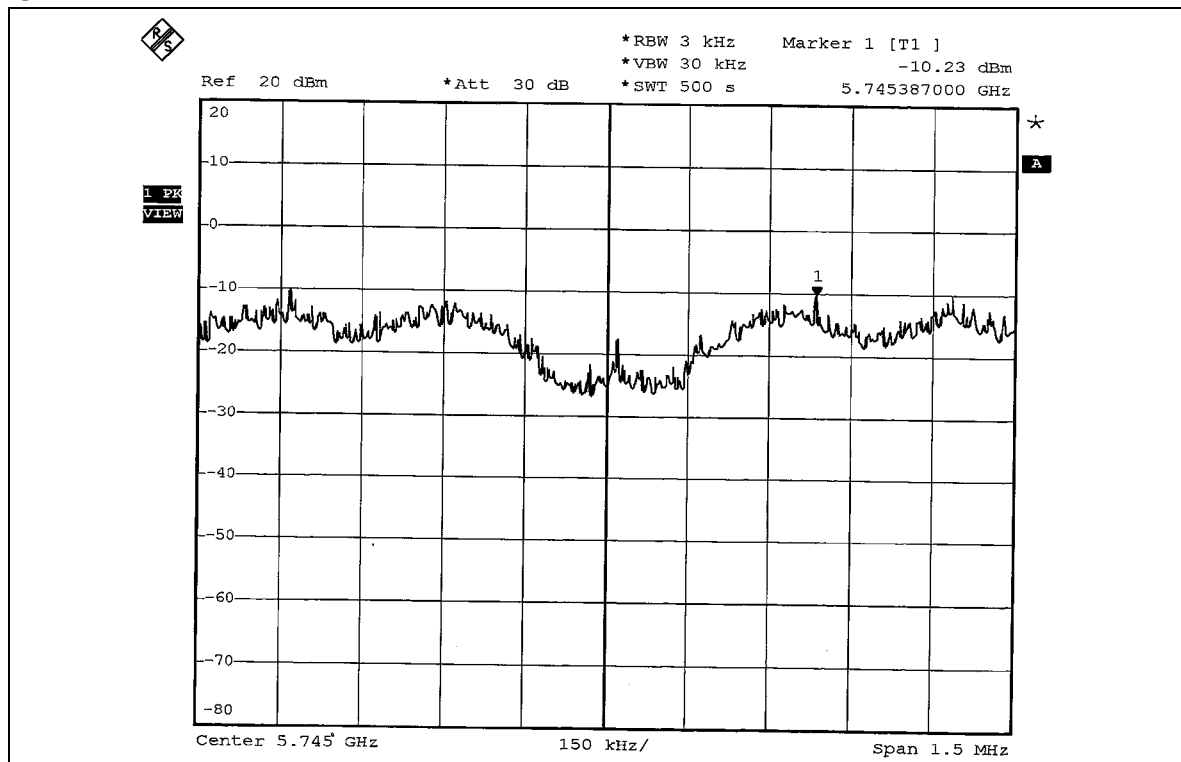
5.5.7 TEST RESULTS

802.11a OFDM modulation

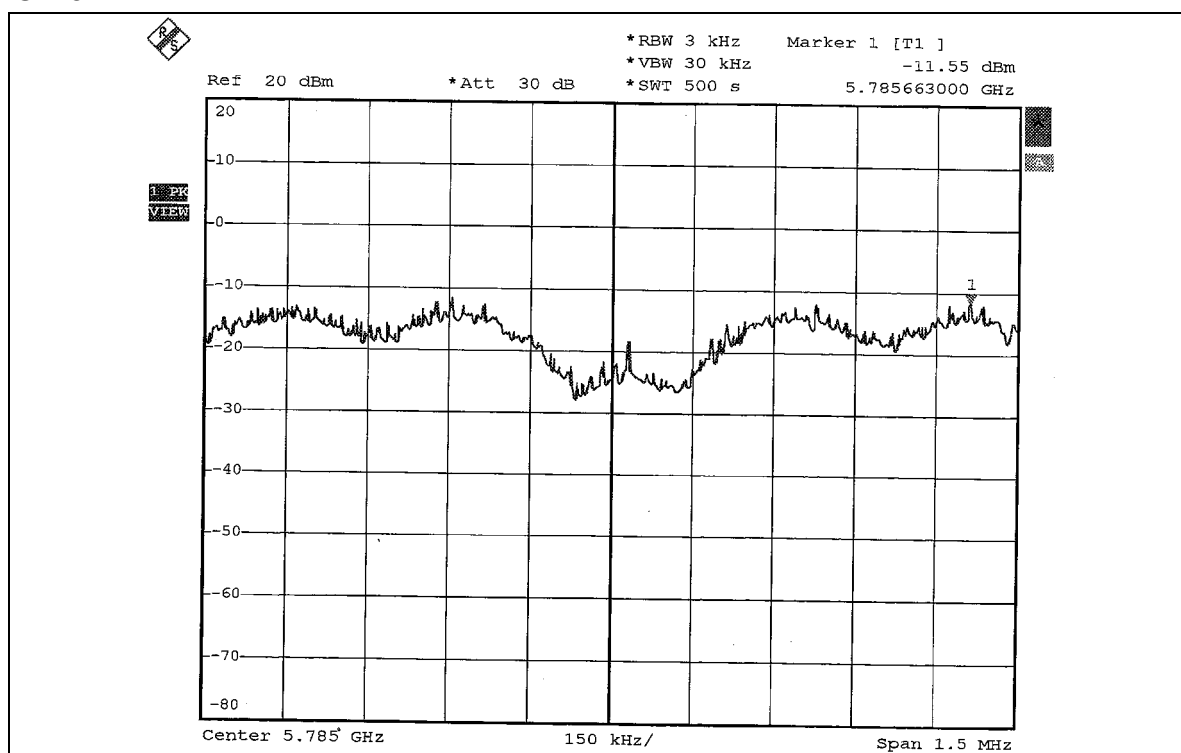
EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24deg.C, 57%RH, 991hPa
TESTED BY	Gary Chang		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	5745	-10.23	8	PASS
3	5785	-11.55	8	PASS
5	5825	-11.35	8	PASS

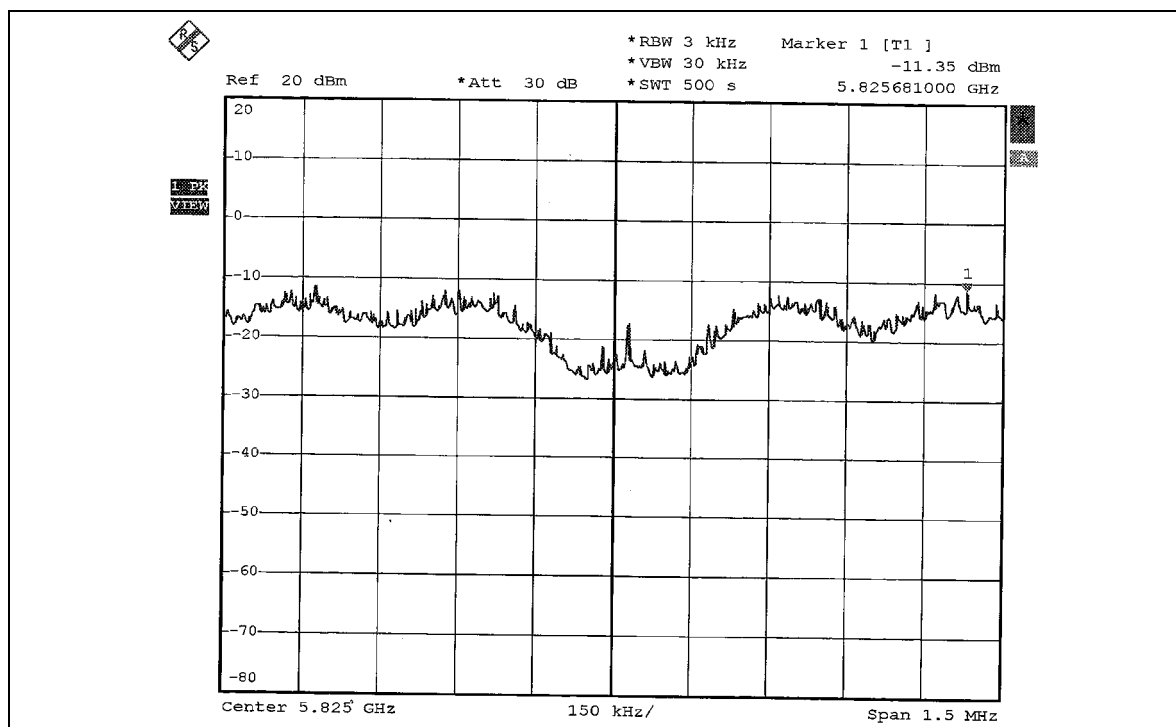
CH 1



CH 3



CH 5

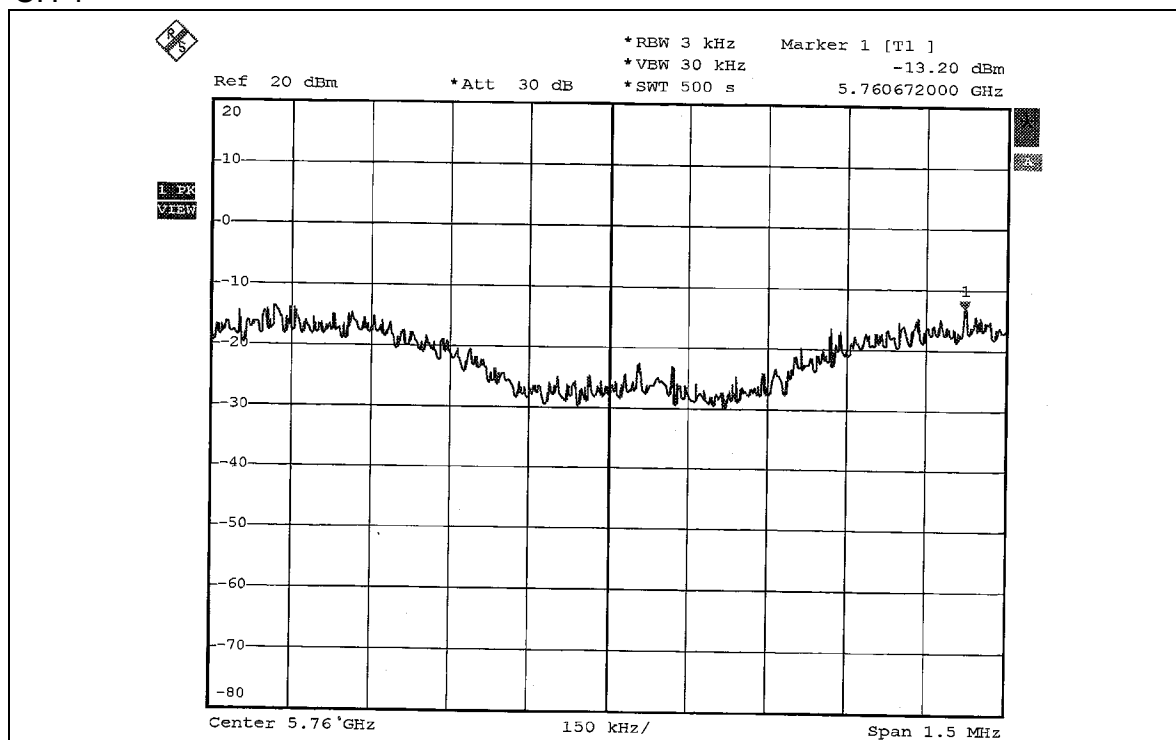


802.11a Turbo OFDM modulation

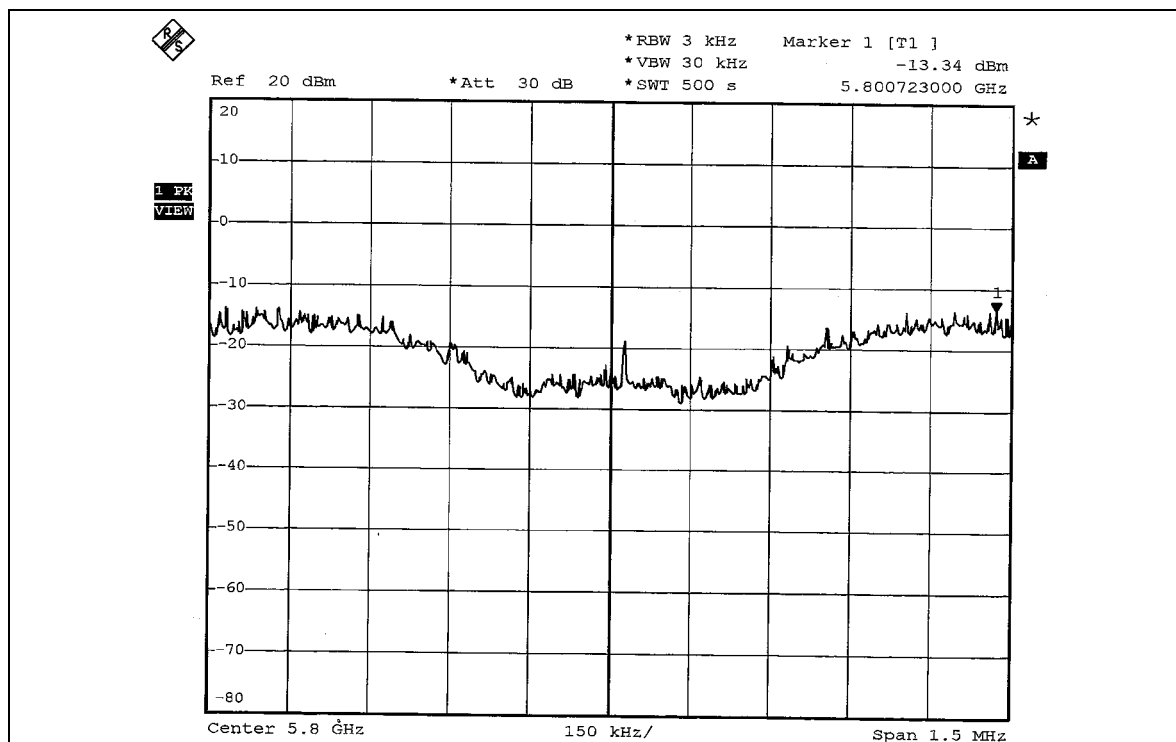
EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
MODULATION TYPE	BPSK	TRANSFER RATE	12Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24deg.C, 57%RH, 991hPa
TESTED BY	Gary Chang		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	5760	-13.20	8	PASS
2	5800	-13.34	8	PASS

CH 1



CH 2



5.6 BAND EDGES MEASUREMENT

5.6.1 LIMITS OF BAND EDGES MEASUREMENT

Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

5.6.2 TEST INSTRUMENTS

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

NOTES:

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

5.6.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set both RBW and VBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

5.6.4 DEVIATION FROM TEST STANDARD

No deviation

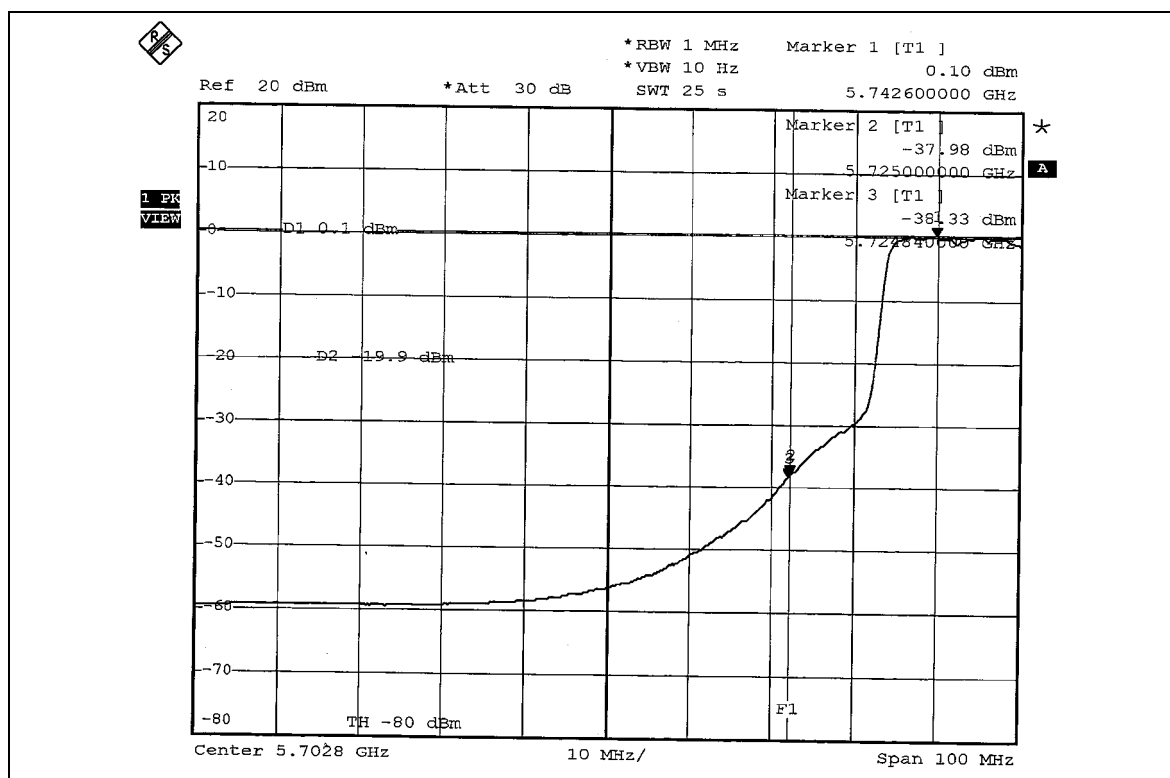
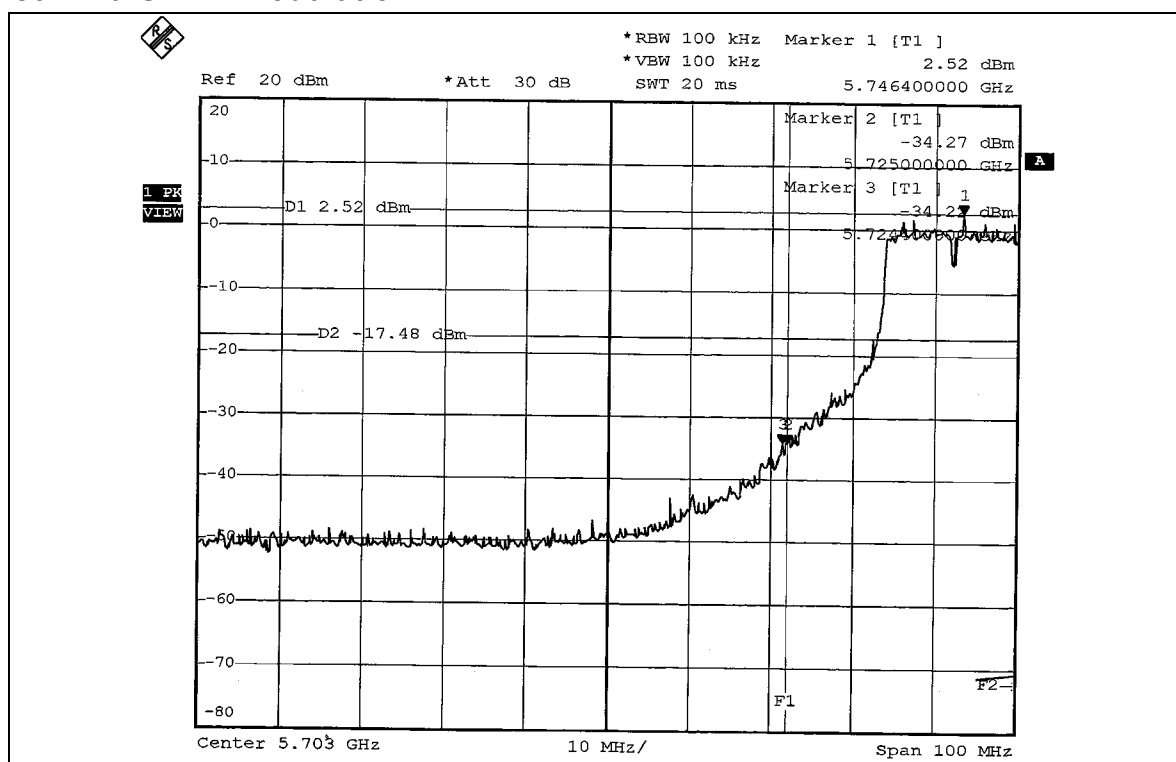


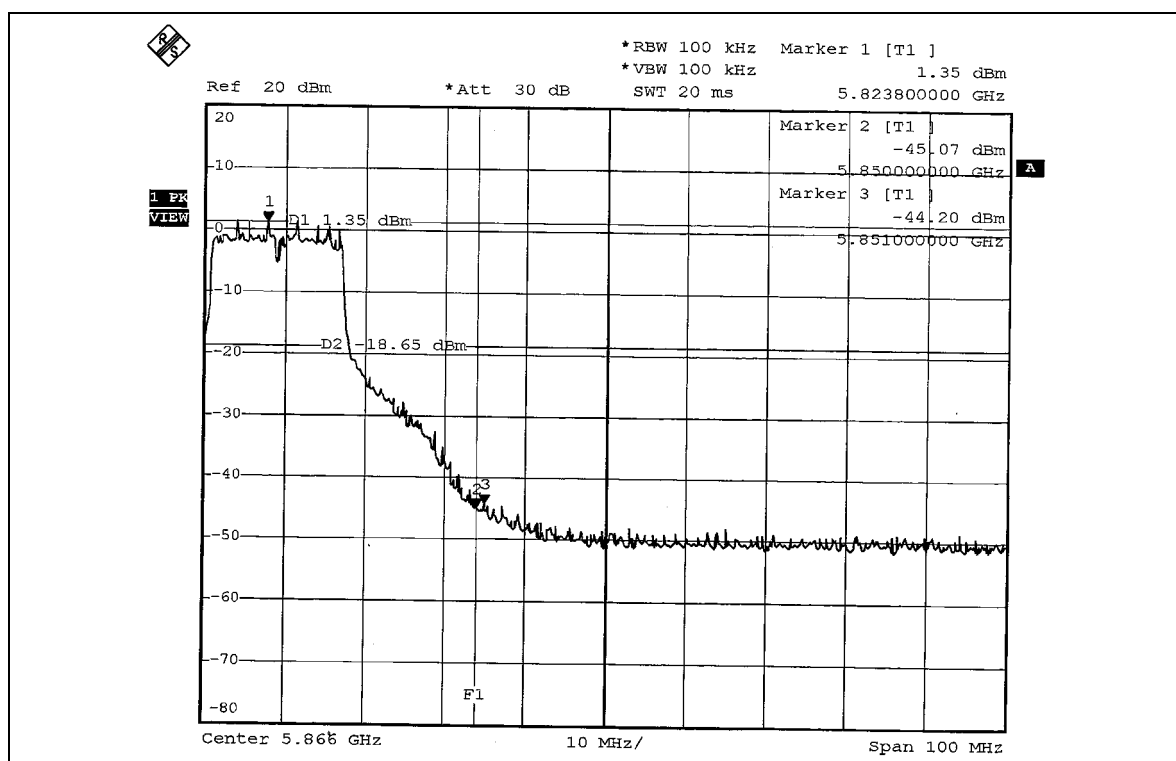
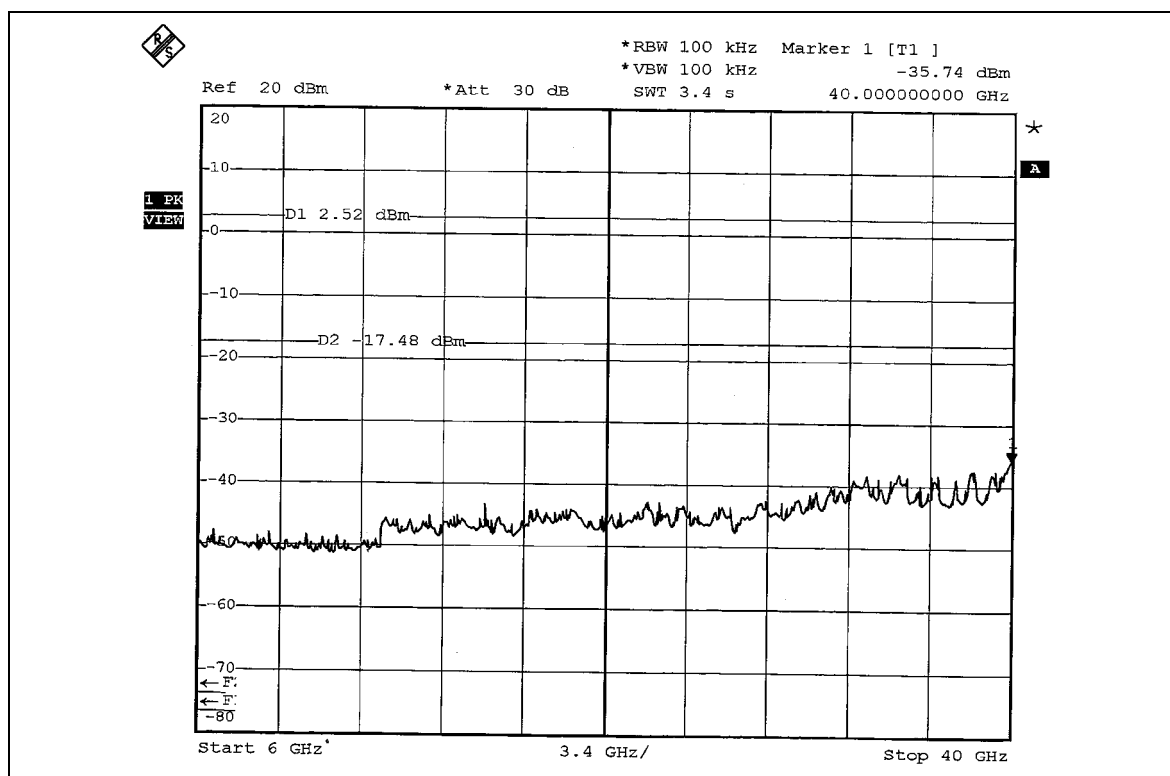
5.6.5 EUT OPERATING CONDITION

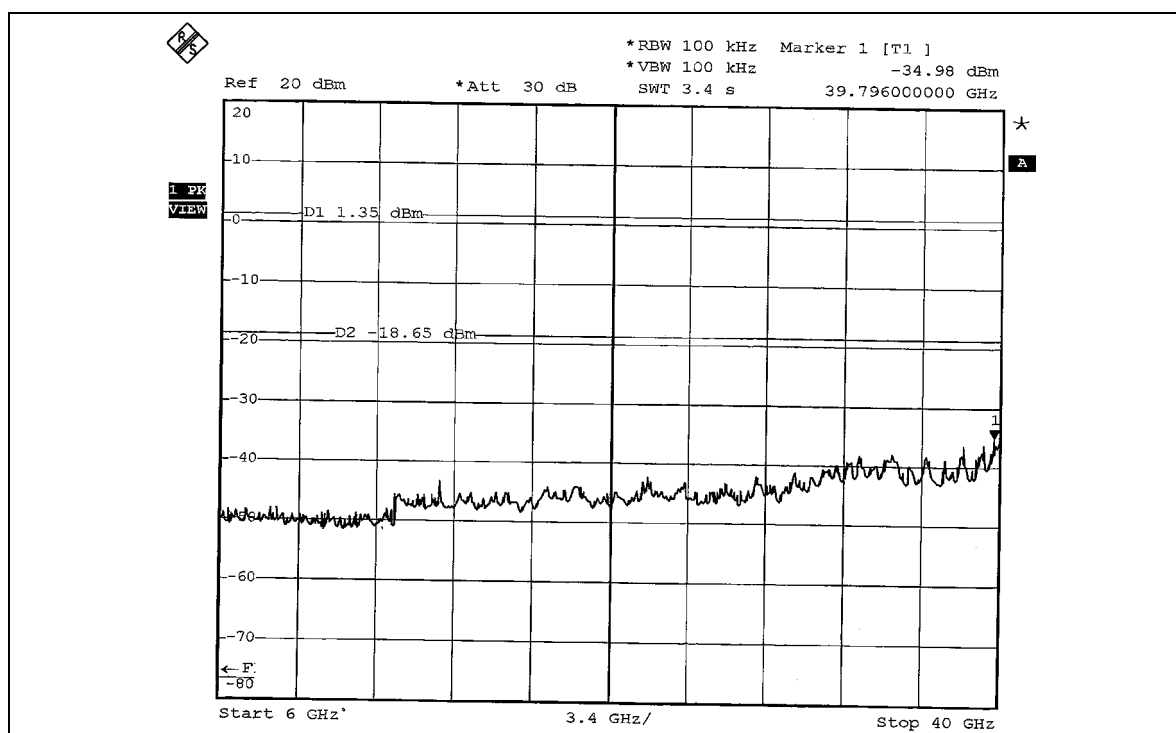
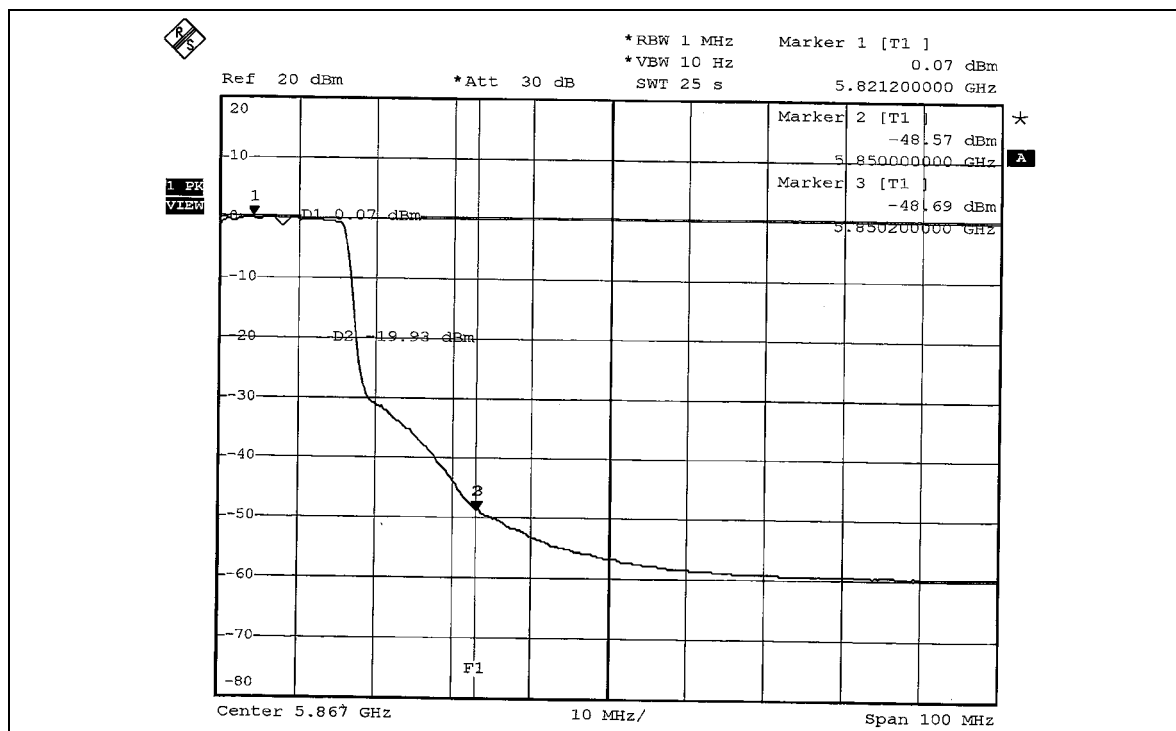
Same as Item 5.9.6

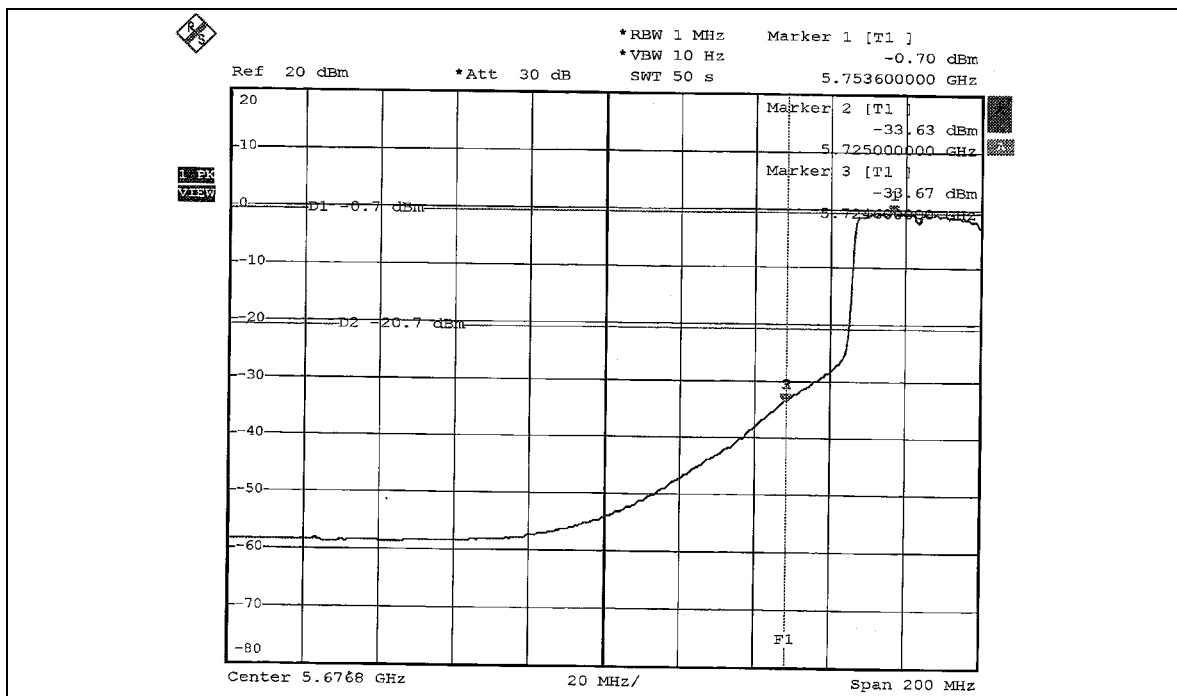
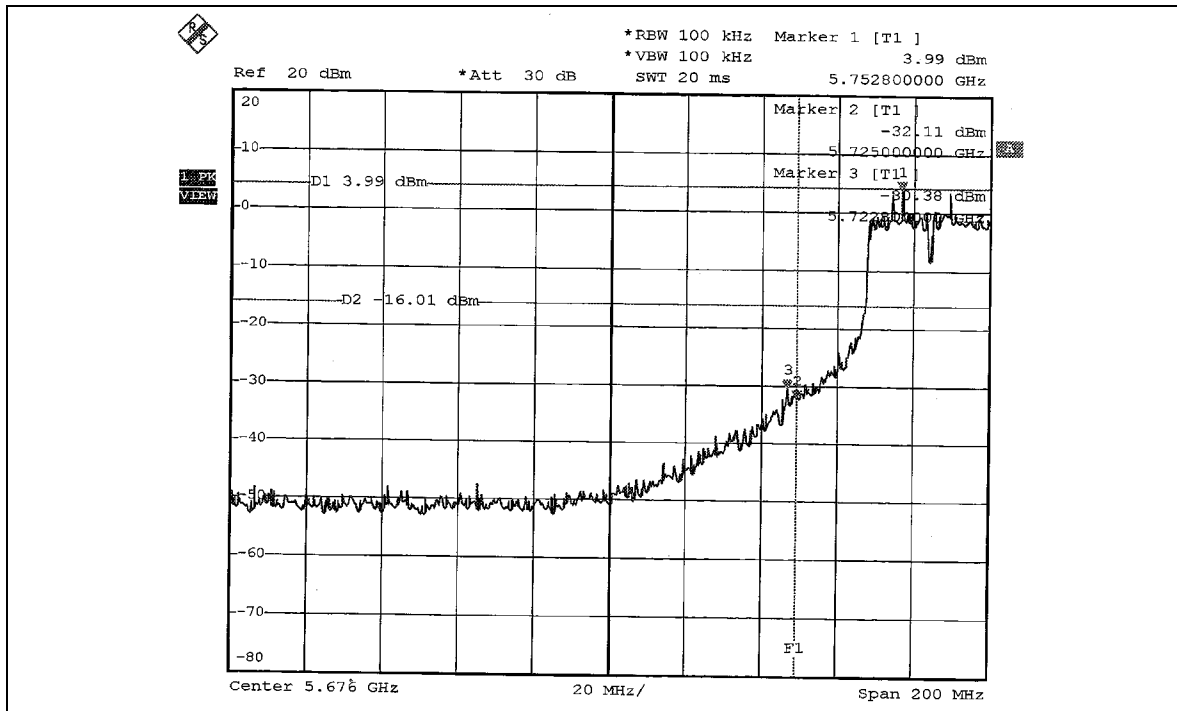
5.6.6 TEST RESULTS

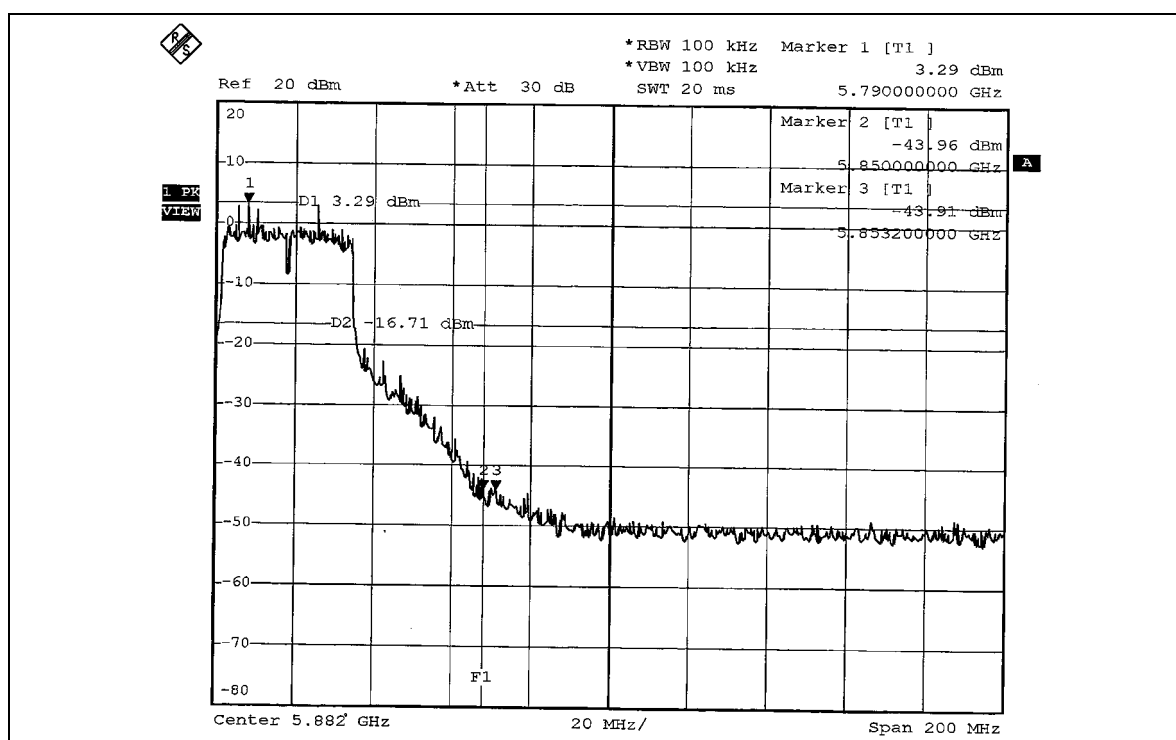
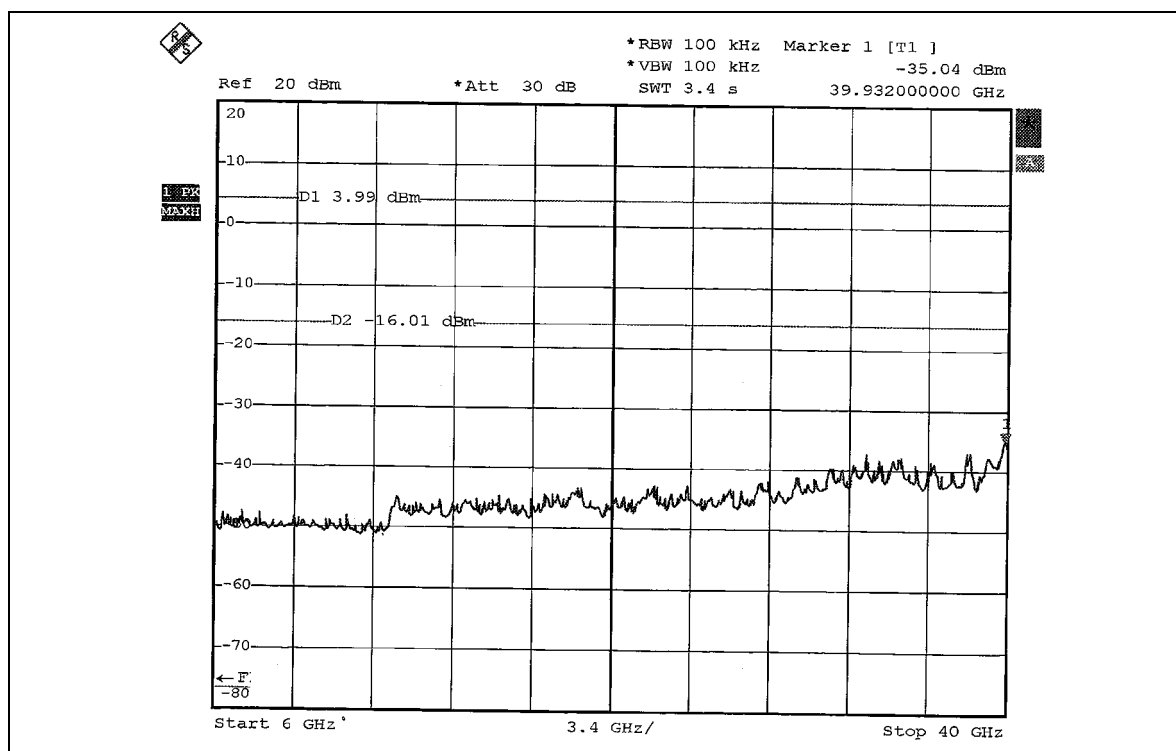
The spectrum plots are attached on the following pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(d).

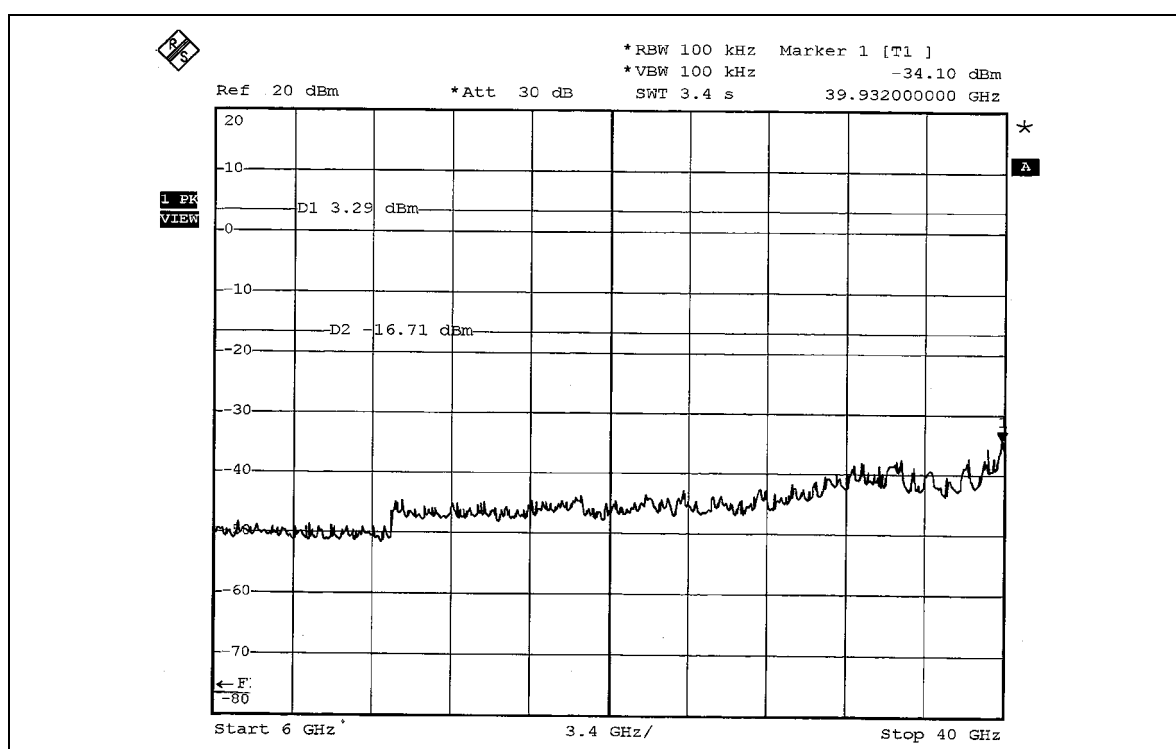
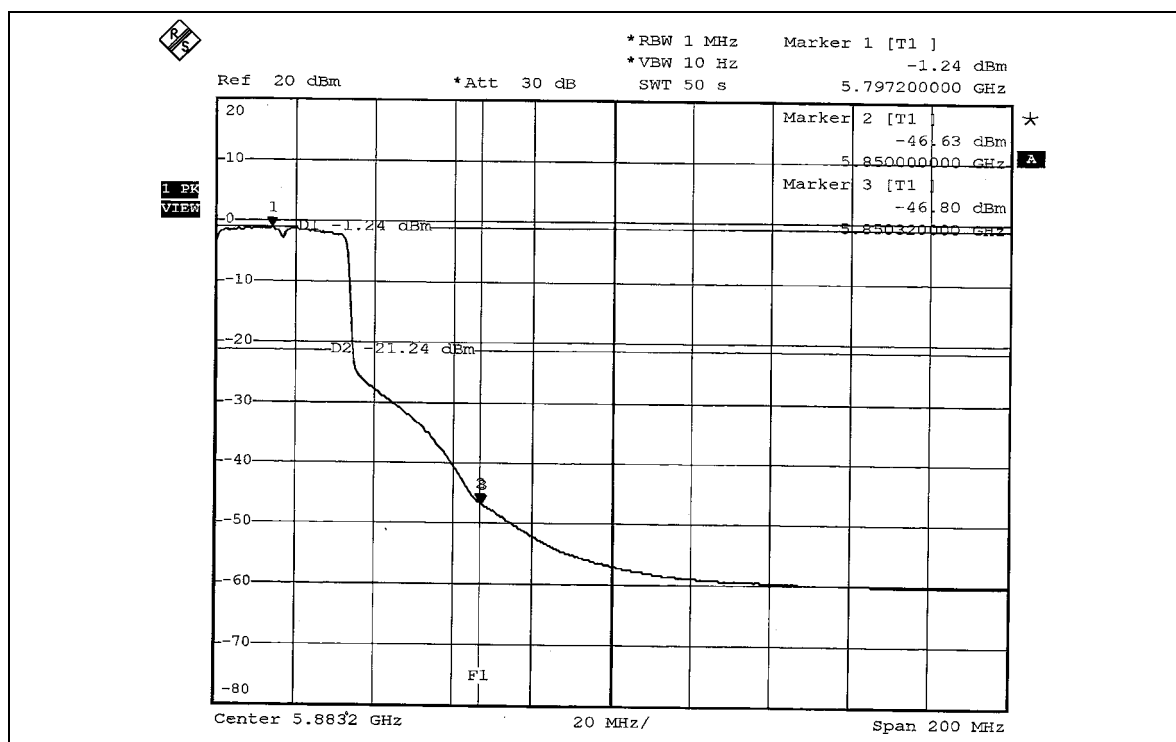
802.11a OFDM modulation





802.11a Turbo OFDM modulation







5.7 ANTENNA REQUIREMENT

5.7.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247(a), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

5.7.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Patch antenna with UFL connector. The maximum Gain of the antenna is 1.05dBi.

FOR BLUETOOTH FUNCTION

6. TEST PROCEDURES AND RESULTS

6.1 CONDUCTED EMISSION MEASUREMENT

6.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	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. 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.

6.1.2 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.



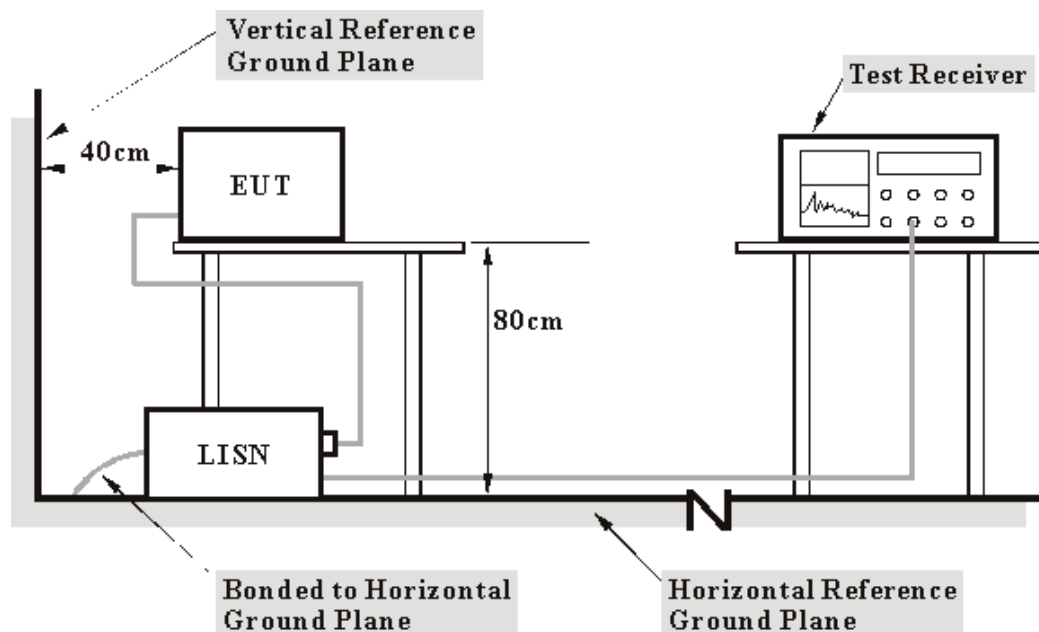
6.1.3 TEST PROCEDURES

- 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.

6.1.4 DEVIATION FROM TEST STANDARD

No deviation

6.1.5 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.

6.1.6 EUT OPERATING CONDITIONS

Same as 4.1.6

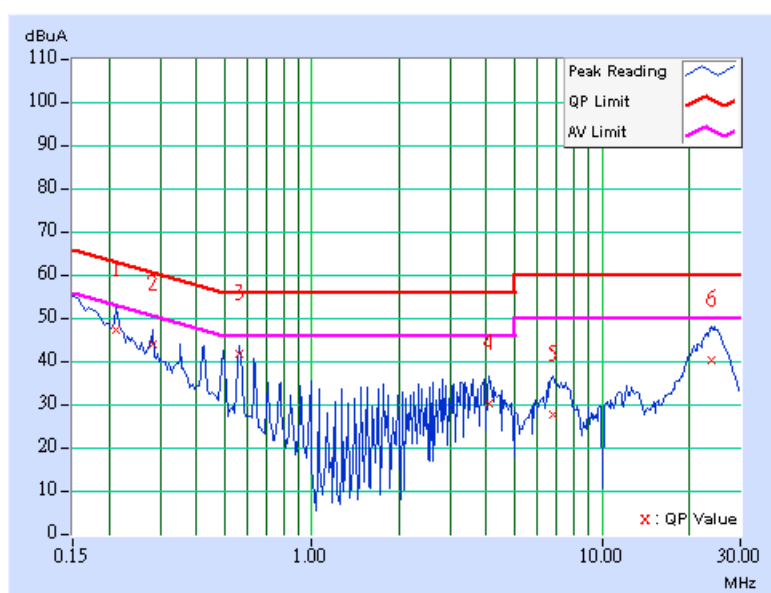
6.1.7 TEST RESULTS

Conducted Worst-Case Data

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 0	6dB BANDWIDTH	9 kHz
MODULATION TYPE	GFSK	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	20 deg. C, 60% RH, 991 hPa	INPUT POWER (SYSTEM)	120 Vac, 60 Hz
TESTED BY	Match Tsui		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.213	0.11	46.39	-	46.50	-	63.11	53.11	-16.61	-
2	0.283	0.11	42.97	-	43.08	-	60.73	50.73	-17.65	-
3	0.564	0.13	40.86	-	40.99	-	56.00	46.00	-15.01	-
4	4.094	0.29	29.43	-	29.72	-	56.00	46.00	-26.28	-
5	6.777	0.39	26.67	-	27.06	-	60.00	50.00	-32.94	-
6	23.801	1.06	39.46	-	40.52	-	60.00	50.00	-19.48	-

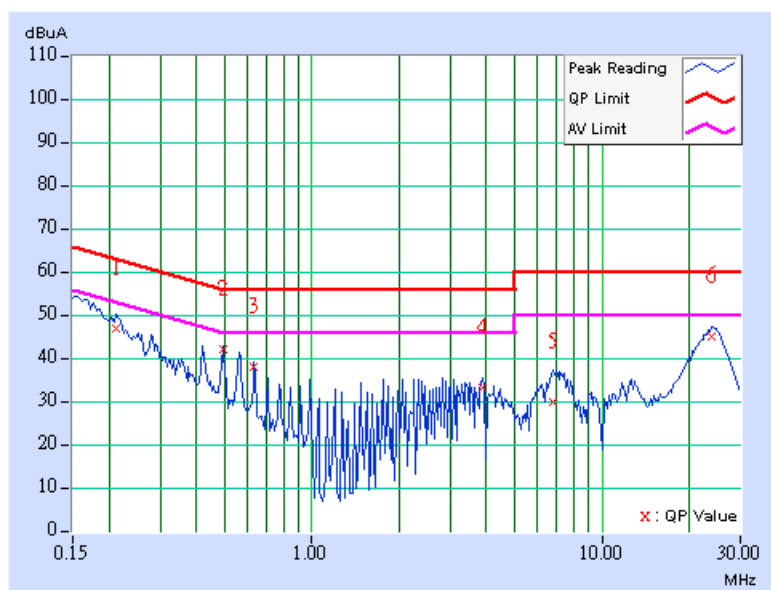
- REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value =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



EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 0	6dB BANDWIDTH	9 kHz
MODULATION TYPE	GFSK	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	20 deg. C, 60% RH, 991 hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Match Tsui		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.213	0.10	46.35	-	46.45	-	63.11	53.11	-16.66	-
2	0.494	0.11	41.49	-	41.60	-	56.10	46.10	-14.50	-
3	0.634	0.13	37.58	-	37.71	-	56.00	46.00	-18.29	-
4	3.875	0.28	32.54	-	32.82	-	56.00	46.00	-23.18	-
5	6.766	0.37	29.49	-	29.86	-	60.00	50.00	-30.14	-
6	23.933	0.61	44.71	-	45.32	-	60.00	50.00	-14.68	-

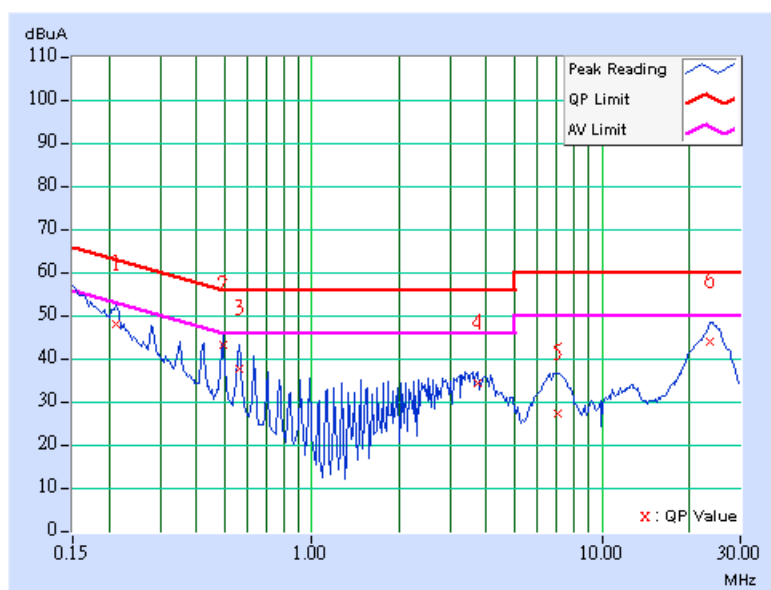
- REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value =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



EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 39	6dB BANDWIDTH	9 kHz
MODULATION TYPE	GFSK	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	20 deg. C, 60% RH, 991 hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Match Tsui		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.213	0.11	47.01	-	47.12	-	63.11	53.11	-15.99	-
2	0.492	0.12	42.44	-	42.56	-	56.13	46.13	-13.56	-
3	0.564	0.13	36.76	-	36.89	-	56.00	46.00	-19.11	-
4	3.719	0.28	33.43	-	33.71	-	56.00	46.00	-22.29	-
5	7.031	0.40	26.33	-	26.73	-	60.00	50.00	-33.27	-
6	23.707	1.06	42.92	-	43.98	-	60.00	50.00	-16.02	-

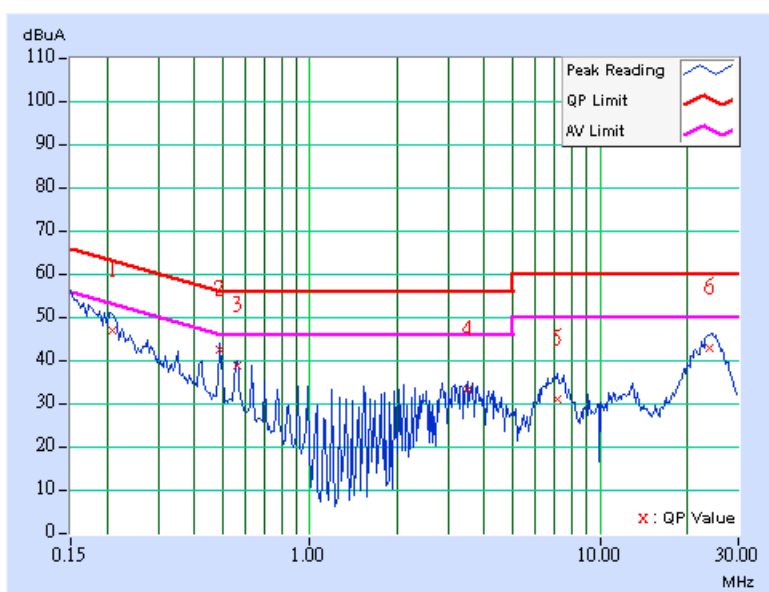
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 39	6dB BANDWIDTH	9 kHz
MODULATION TYPE	GFSK	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	20 deg. C, 60% RH, 991 hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Match Tsui		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.210	0.10	46.56	-	46.66	-	63.21	53.21	-16.55	-
2	0.490	0.11	42.14	-	42.25	-	56.17	46.17	-13.92	-
3	0.560	0.12	38.22	-	38.34	-	56.00	46.00	-17.66	-
4	3.504	0.26	32.83	-	33.09	-	56.00	46.00	-22.91	-
5	7.154	0.38	30.50	-	30.88	-	60.00	50.00	-29.12	-
6	23.822	0.61	42.30	-	42.91	-	60.00	50.00	-17.09	-

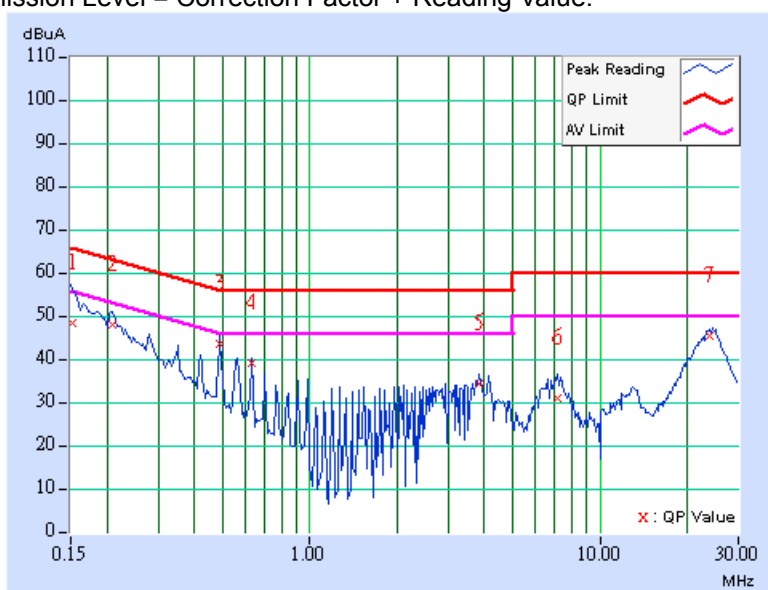
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 78	6dB BANDWIDTH	9 kHz
MODULATION TYPE	GFSK	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	20 deg. C, 60% RH, 991 hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Match Tsui		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.151	0.10	47.42	-	47.52	-	65.93	55.93	-18.41	-
2	0.210	0.11	47.22	-	47.33	-	63.21	53.21	-15.88	-
3	0.489	0.12	42.53	-	42.65	-	56.19	46.19	-13.54	-
4	0.630	0.14	38.17	-	38.31	-	56.00	46.00	-17.69	-
5	3.852	0.28	33.20	-	33.48	-	56.00	46.00	-22.52	-
6	7.145	0.40	30.07	-	30.47	-	60.00	50.00	-29.53	-
7	23.862	1.06	44.38	-	45.44	-	60.00	50.00	-14.56	-

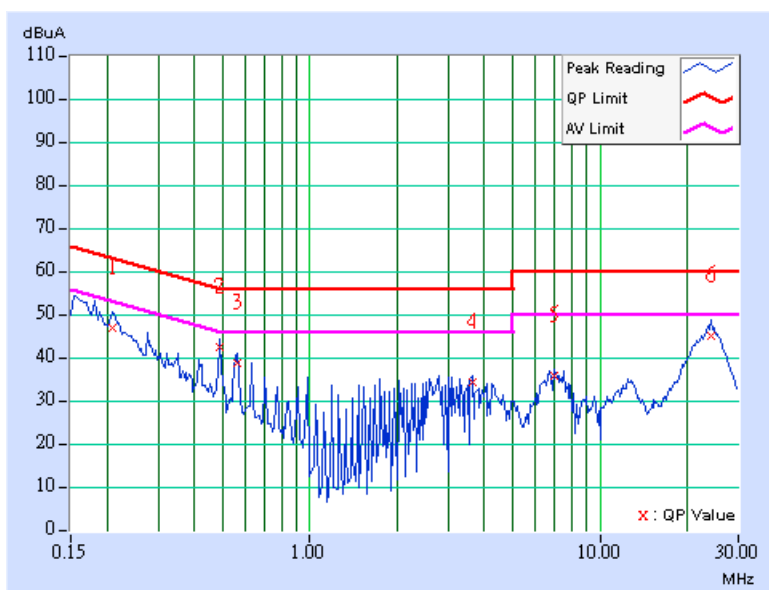
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	Channel 78	6dB BANDWIDTH	9 kHz
MODULATION TYPE	GFSK	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	20 deg. C, 60% RH, 991 hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Match Tsui		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.209	0.10	46.48	-	46.58	-	63.26	53.26	-16.68	-
2	0.490	0.11	42.08	-	42.19	-	56.17	46.17	-13.98	-
3	0.560	0.12	38.24	-	38.36	-	56.00	46.00	-17.64	-
4	3.637	0.27	33.90	-	34.17	-	56.00	46.00	-21.83	-
5	6.922	0.37	35.46	-	35.83	-	60.00	50.00	-24.17	-
6	24.050	0.61	44.66	-	45.27	-	60.00	50.00	-14.73	-

- 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.





6.2 NUMBER OF HOPPING FREQUENCY USED

6.2.1 LIMIT OF HOPPING FREQUENCY USED

At least 15 channels frequencies, and should be equally spaced.

6.2.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
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.



6.2.3 TEST PROCEDURES

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Set the SA on MaxHold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.
4. Set the SA on View mode and then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

6.2.4 DEVIATION FROM TEST STANDARD

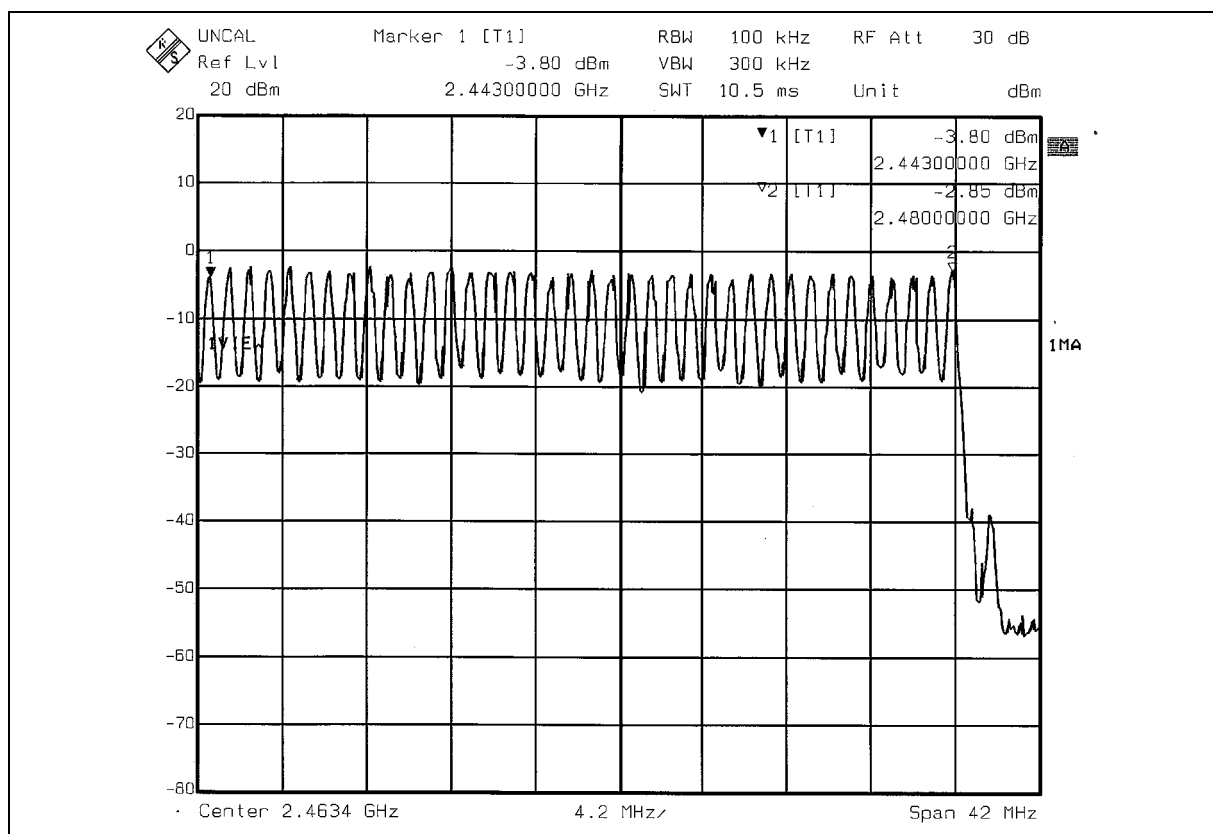
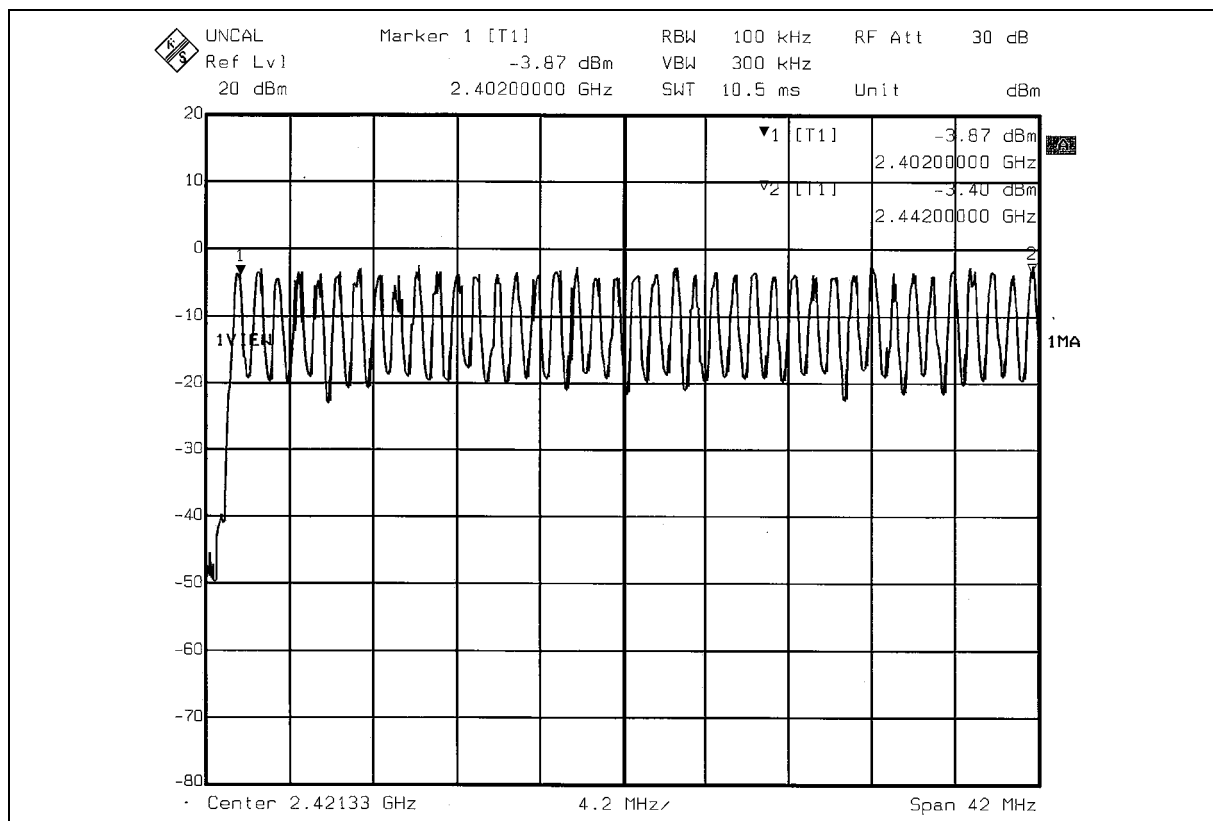
No deviation

6.2.5 TEST SETUP



6.2.6 TEST RESULTS

There are 79 hopping frequencies in the hopping mode. Please refer to next two pages for the test result. On the plots, it shows that the hopping frequencies are equally spaced.





6.3 DWELL TIME ON EACH CHANNEL

6.3.1 LIMIT OF DWELL TIME USED

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

6.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
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.

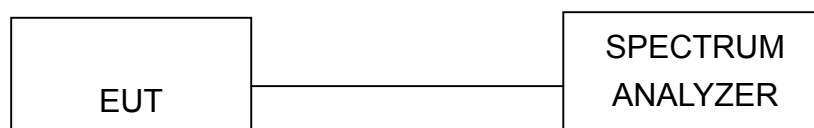
6.3.3 TEST PROCEDURES

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Adjust the center frequency of SA on any frequency be measured and set SA to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
4. Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
5. Repeat above procedures until all frequencies measured were complete.

6.3.4 DEVIATION FROM TEST STANDARD

No deviation

6.3.5 TEST SETUP

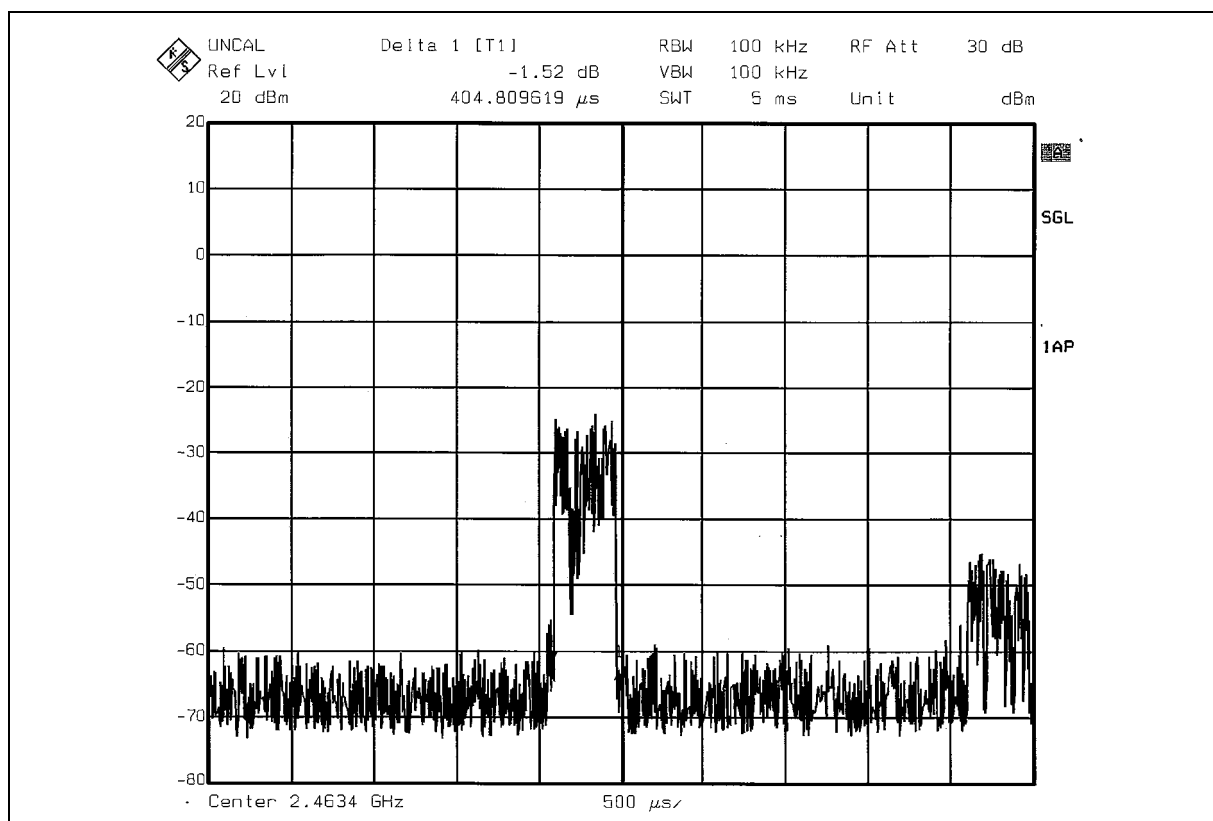
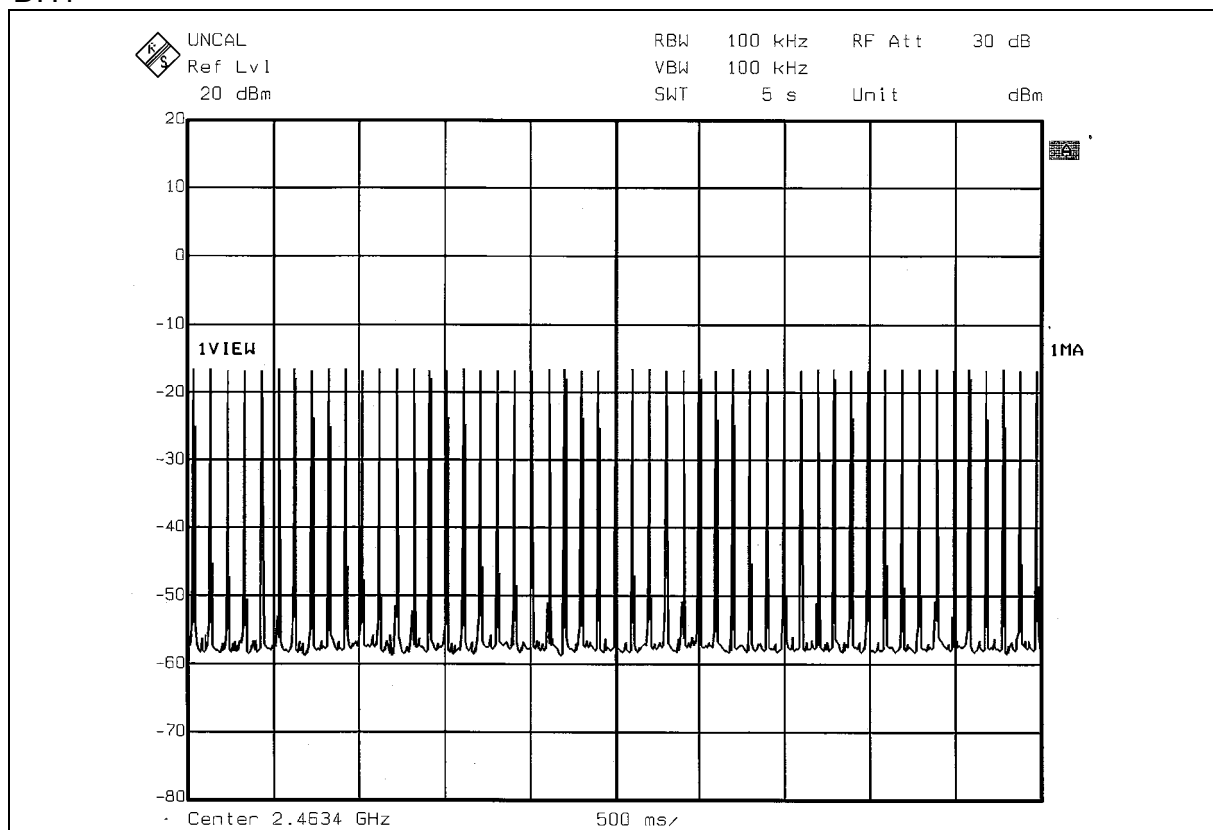


6.3.6 TEST RESULTS

Mode	Number of transmission in a 31.6 (79Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (msec)
DH1	51 times / 5 sec * 6.32=322.32 times	0.404	130.22	400
DH3	25 times / 5 sec * 6.32=158.00 times	1.737	274.45	400
DH5	17 times / 5 sec * 6.32=107.44 times	3.006	322.96	400

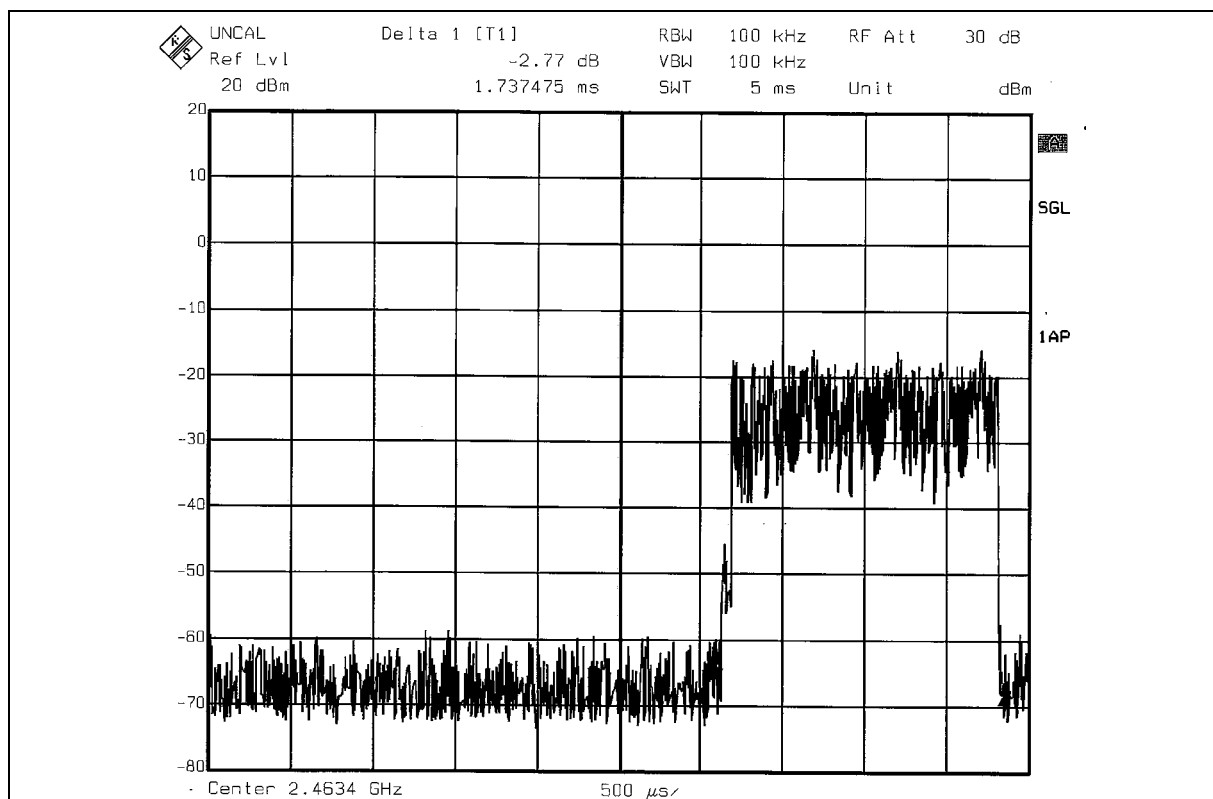
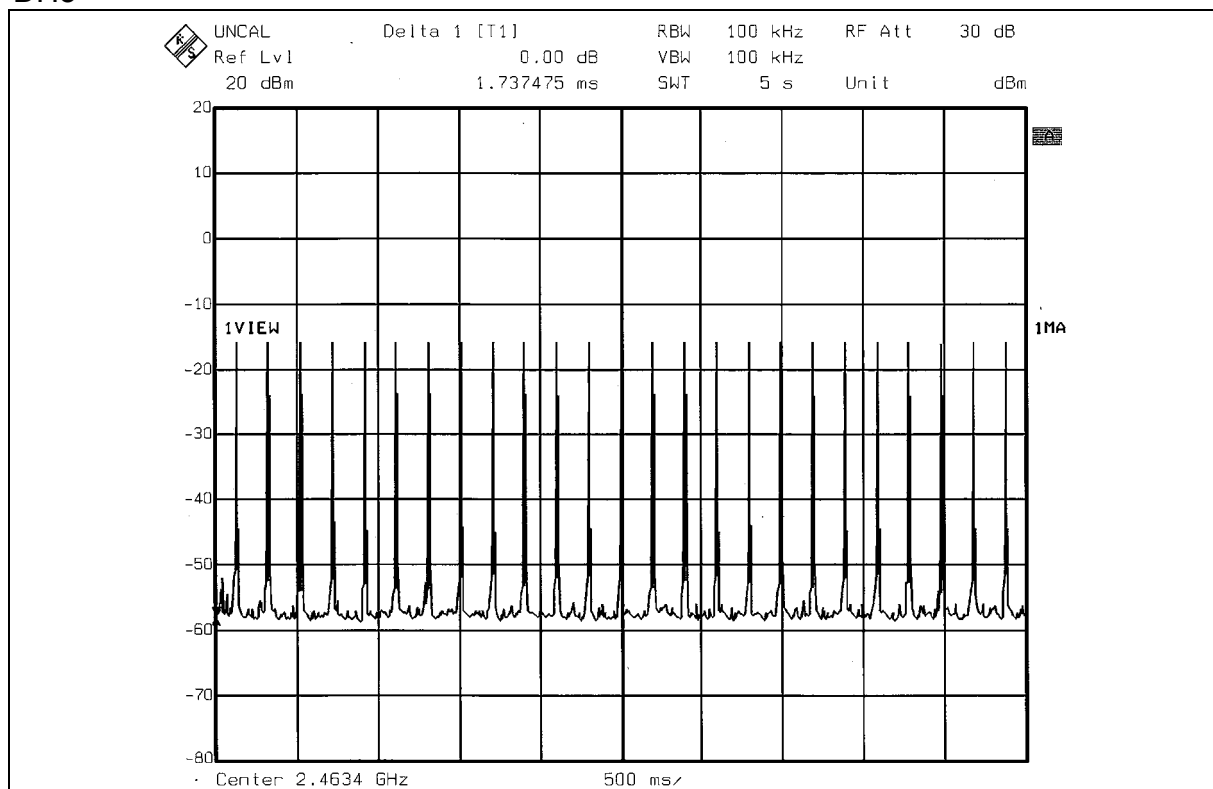
Test plots of the transmitting time slot are shown on next 3 pages.

DH1

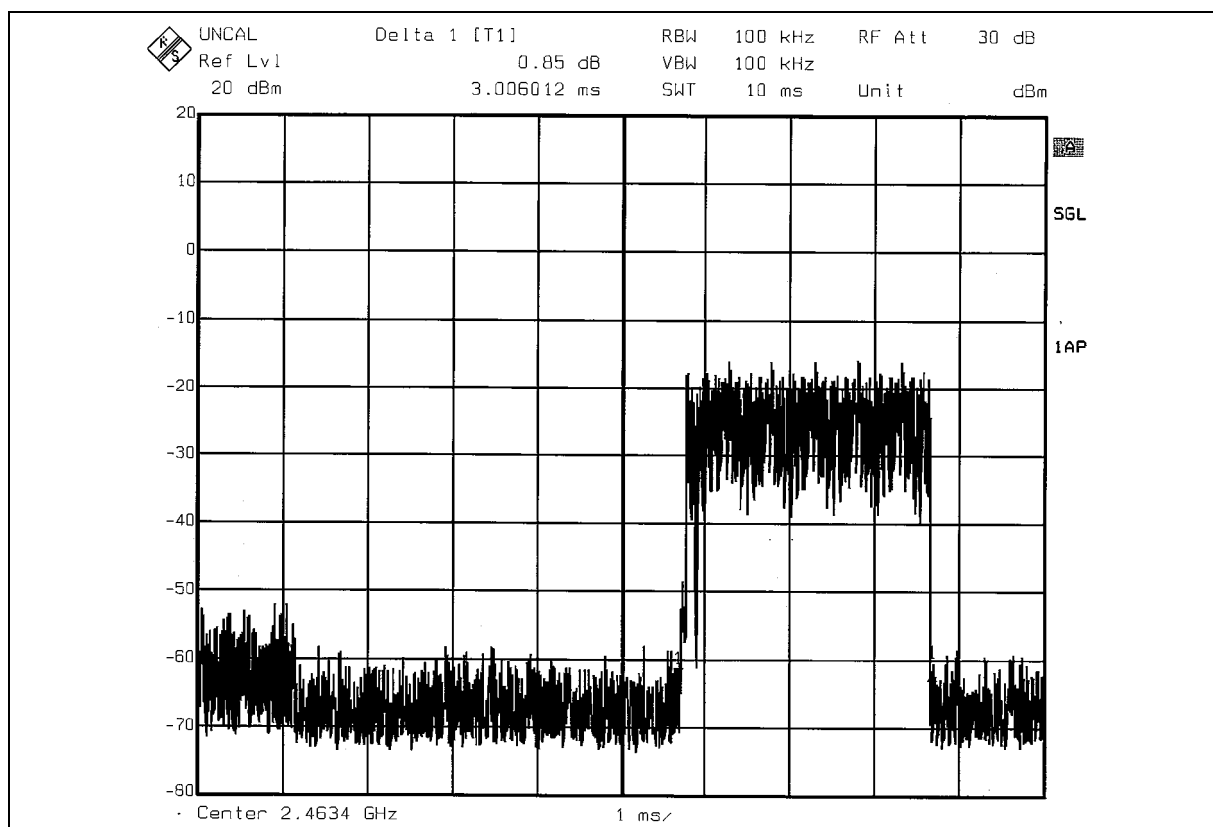
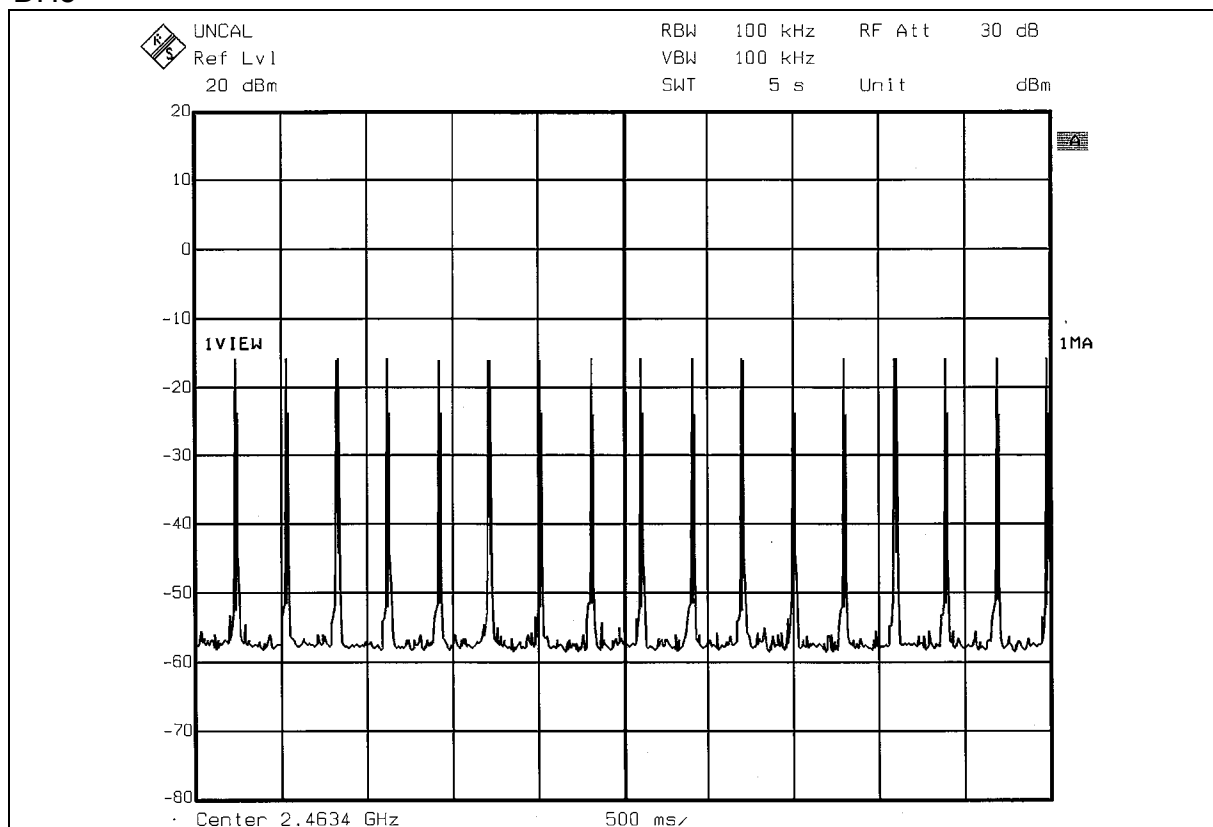




DH3



DH5



6.4 CHANNEL BANDWIDTH

6.4.1 LIMITS OF CHANNEL BANDWIDTH

For frequency hopping system operating in the 2400-2483.5MHz, If the 20dB bandwidth of hopping channel is greater than 25kHz, the 20dB bandwidth of hopping channel shall be a minimum limit for the hopping channel separation.

6.4.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
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.

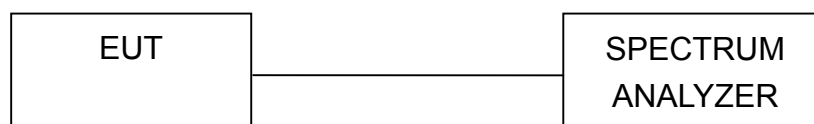
6.4.3 TEST PROCEDURE

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

6.4.4 DEVIATION FROM TEST STANDARD

No deviation

6.4.5 TEST SETUP



6.4.6 EUT OPERATING CONDITION

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

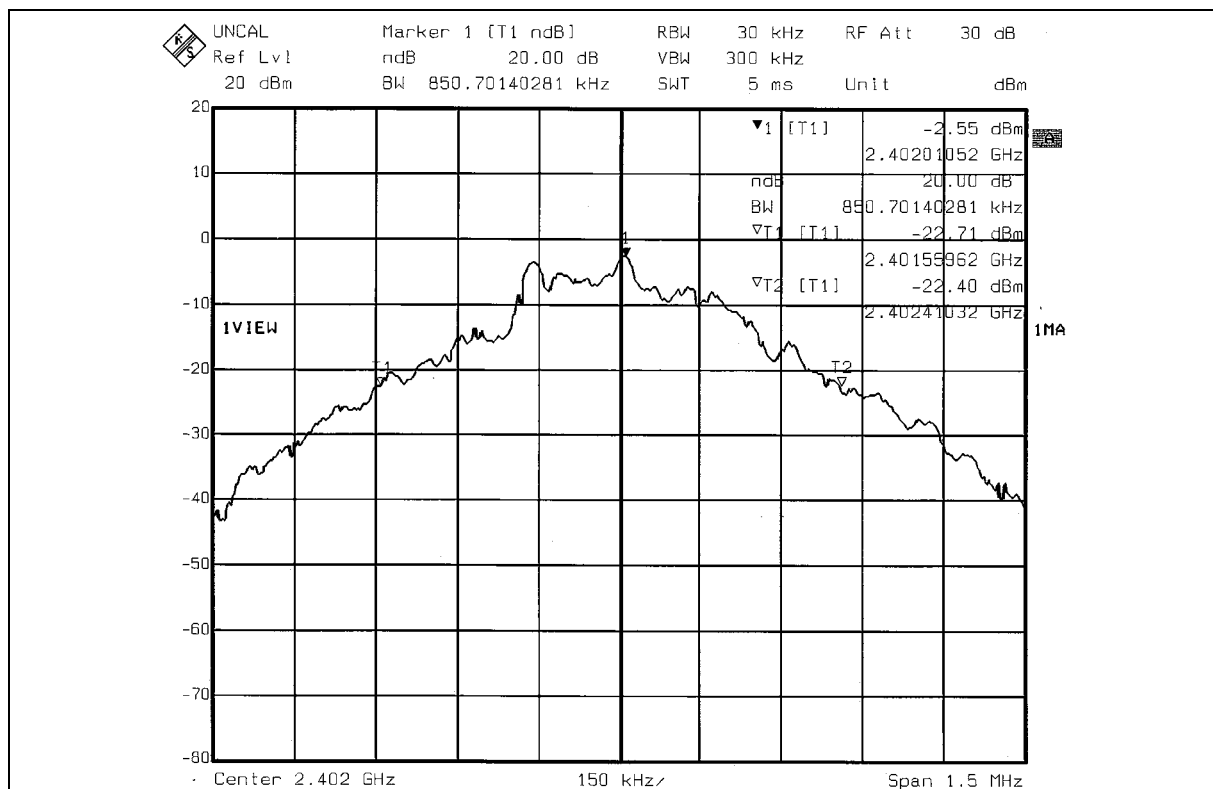


6.4.7 TEST RESULTS

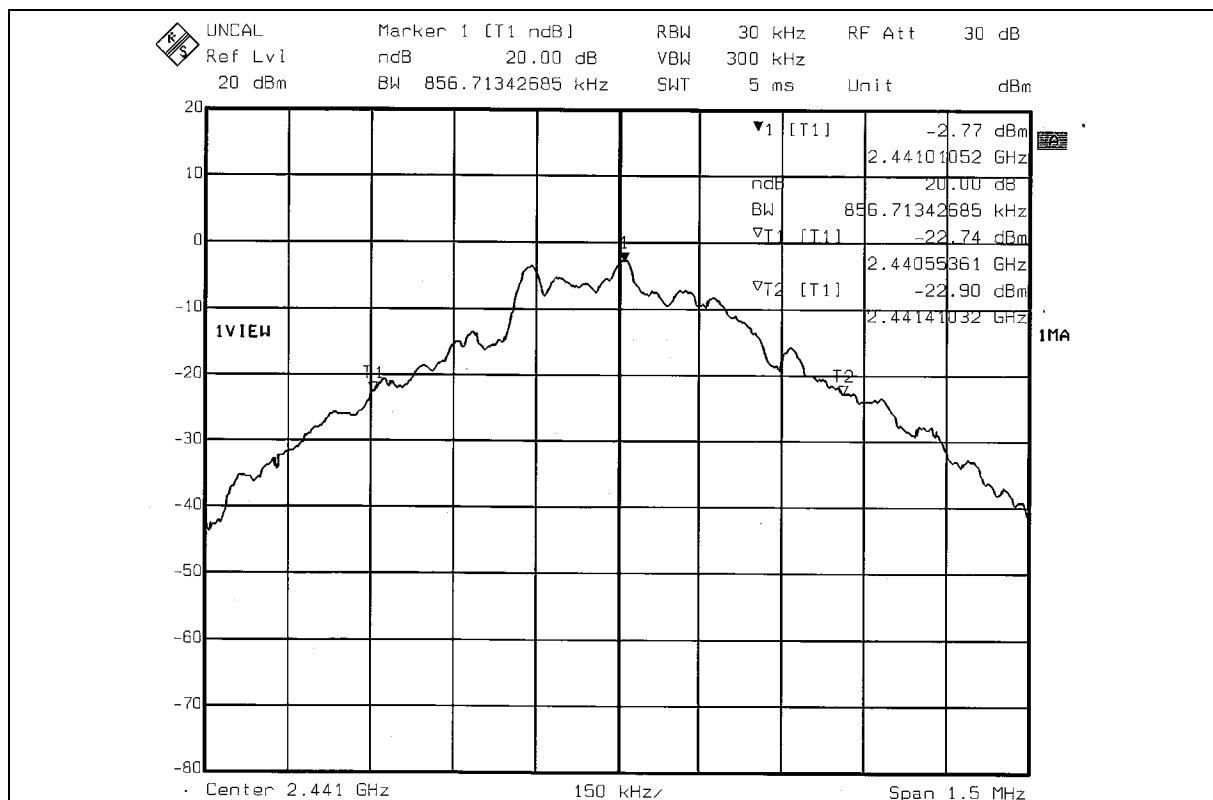
EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
MODULATION TYPE	GFSK	ENVIRONMENTAL CONDITIONS	23 deg. C, 65% RH, 991 hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Gary Chang

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)	More Than 25kHz
0	2402	0.851	Yes
39	2441	0.857	Yes
78	2480	0.857	Yes

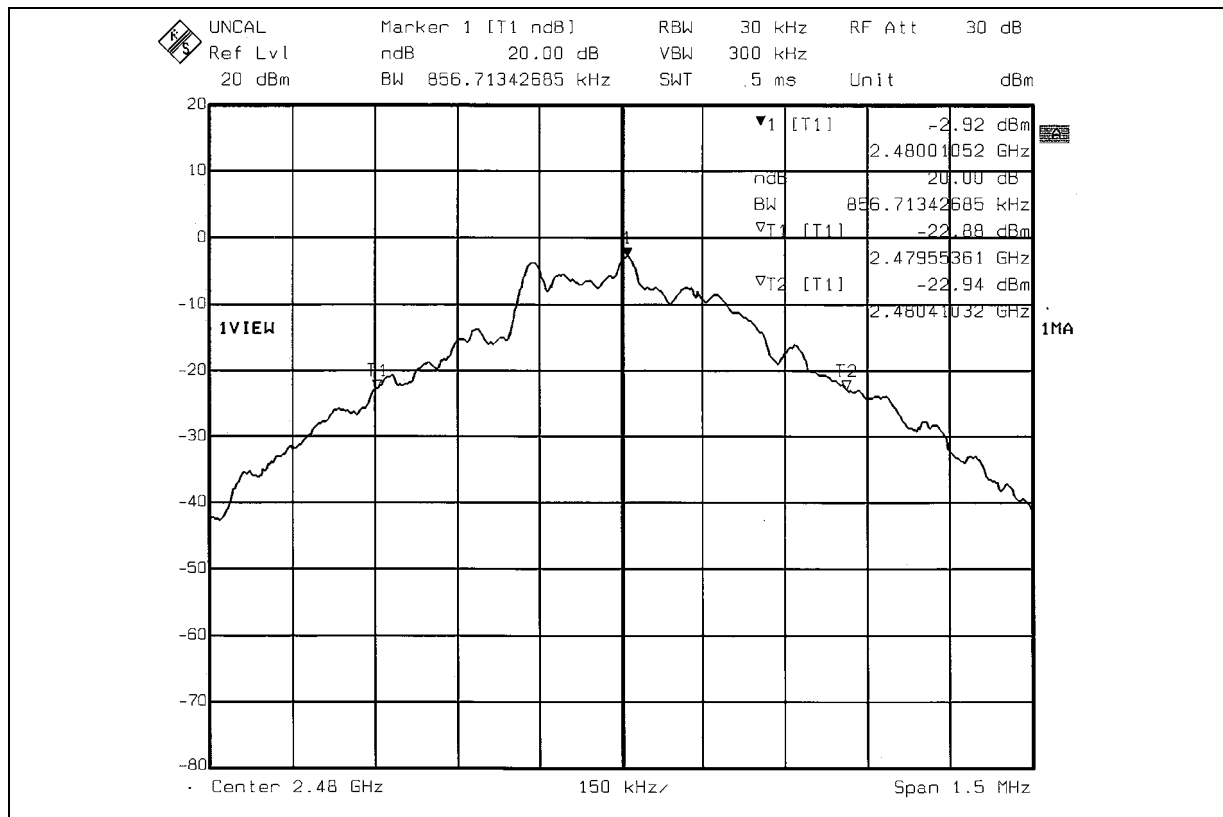
Channel 0



Channel 39



Channel 78



6.5 HOPPING CHANNEL SEPARATION

6.5.1 LIMIT OF HOPPING CHANNEL SEPARATION

At least 25kHz or 20dB bandwidth (whichever is greater).

6.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
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.

6.5.3 TEST PROCEDURES

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
3. By using the MaxHold function record the separation of two adjacent channels.
4. Measure the frequency difference of these two adjacent channels by SA MARK function. And then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

6.5.4 DEVIATION FROM TEST STANDARD

No deviation

6.5.5 TEST SETUP



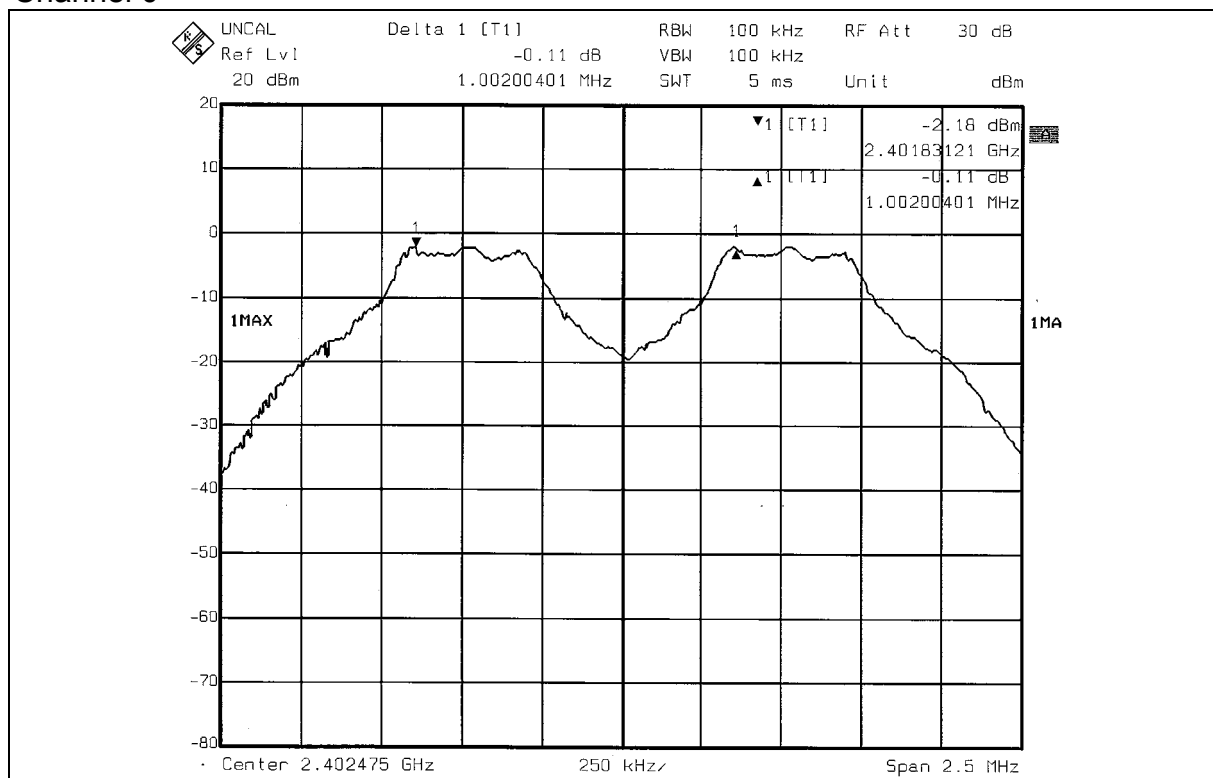
6.5.6 TEST RESULTS

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
MODULATION TYPE	GFSK	ENVIRONMENTAL CONDITIONS	23 deg. C, 65% RH, 991 hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Gary Chang

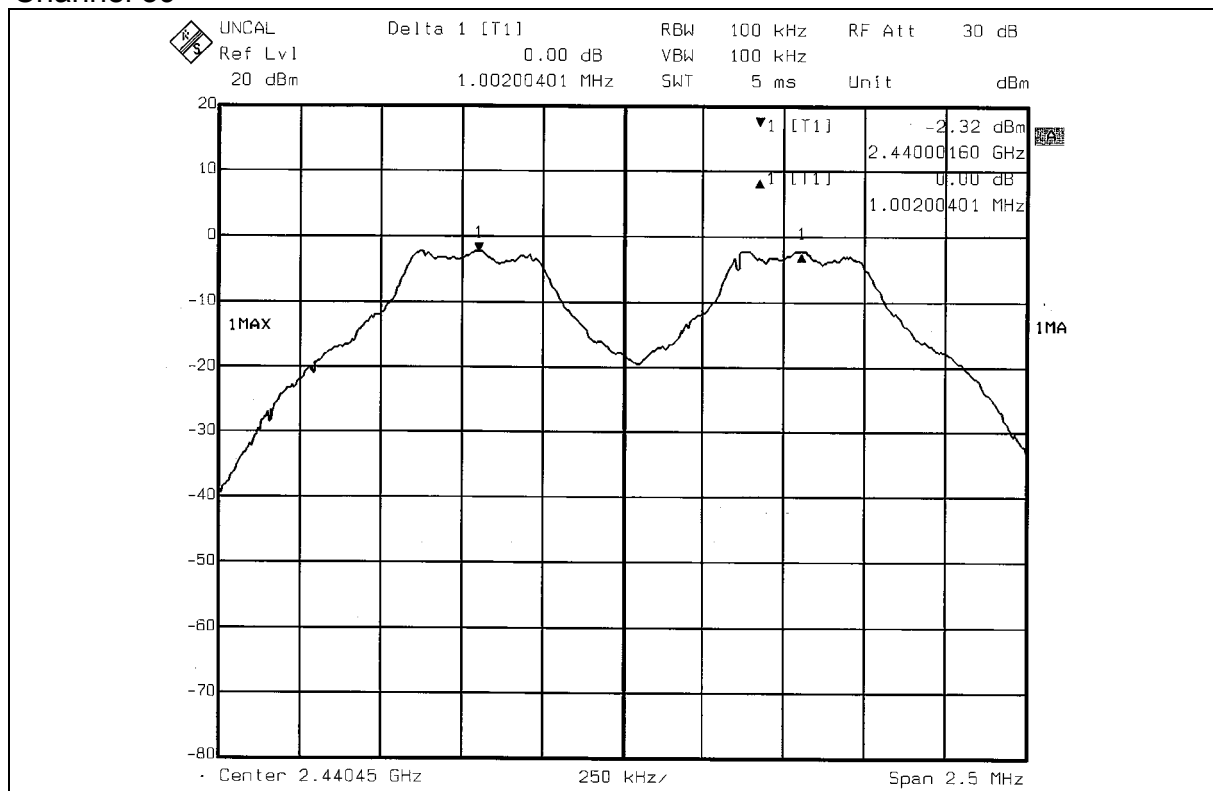
Channel	Frequency (MHz)	Adjacent Channel Separation	Minimum Limit (MHz)	Pass / Fail
0	2402	1.002 MHz	0.851	PASS
39	2441	1.002 MHz	0.857	PASS
78	2480	1.007 MHz	0.857	PASS

The minimum limit is 20dB bandwidth. Test results please refer to next 2 pages.

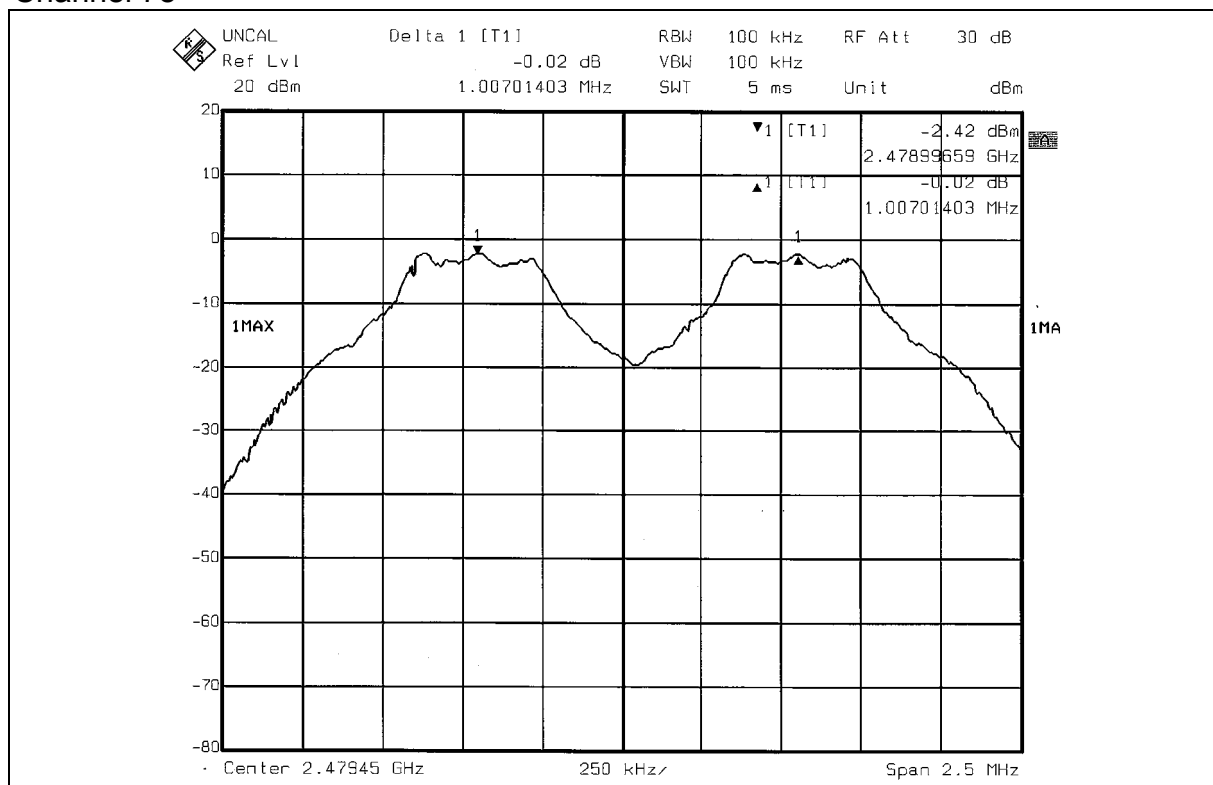
Channel 0



Channel 39



Channel 78



6.6 MAXIMUM PEAK OUTPUT POWER

6.6.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

6.6.2 INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYEER	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.



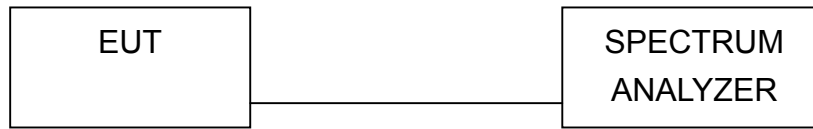
6.6.3 TEST PROCEDURES

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. The center frequency of the spectrum analyzer is set to the fundamental frequency and using 1 MHz RBW and 3 MHz VBW.
4. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
5. Repeat above procedures until all frequencies measured were complete.

6.6.4 DEVIATION FROM TEST STANDARD

No deviation

6.6.5 TEST SETUP



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

6.6.6 EUT OPERATING CONDITION

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

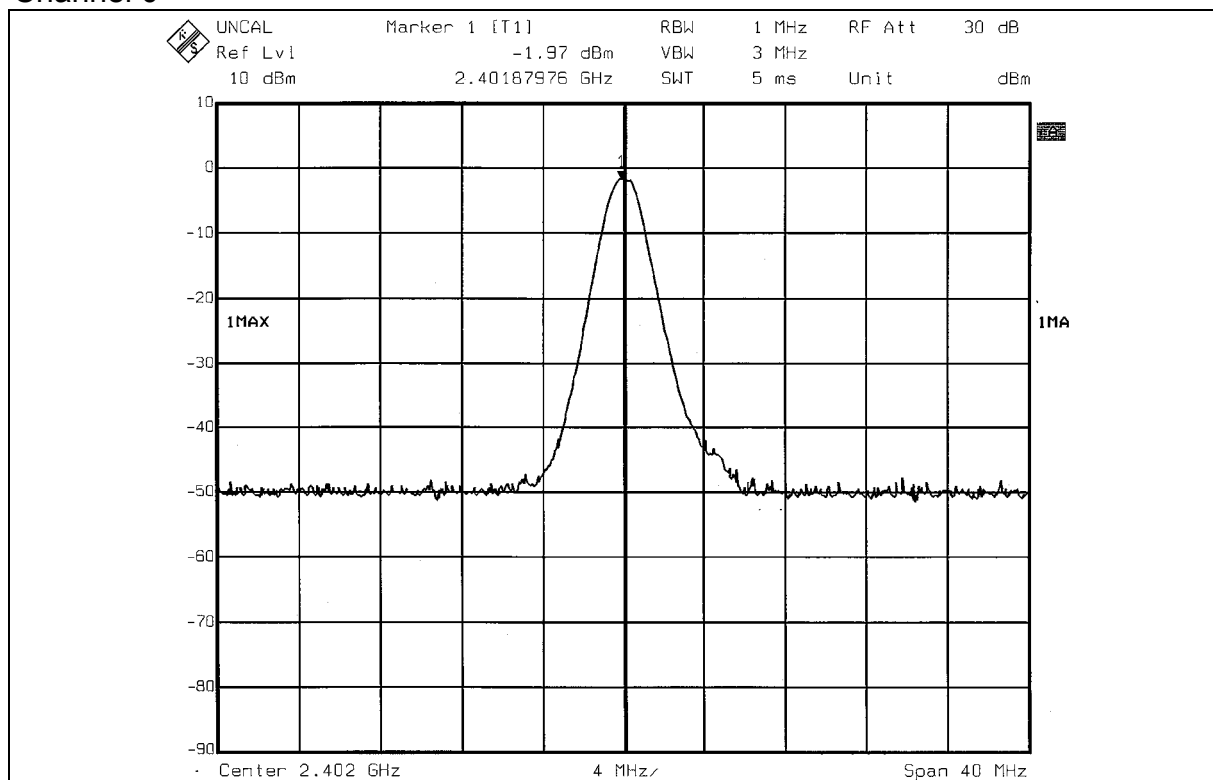


6.6.7 TEST RESULTS

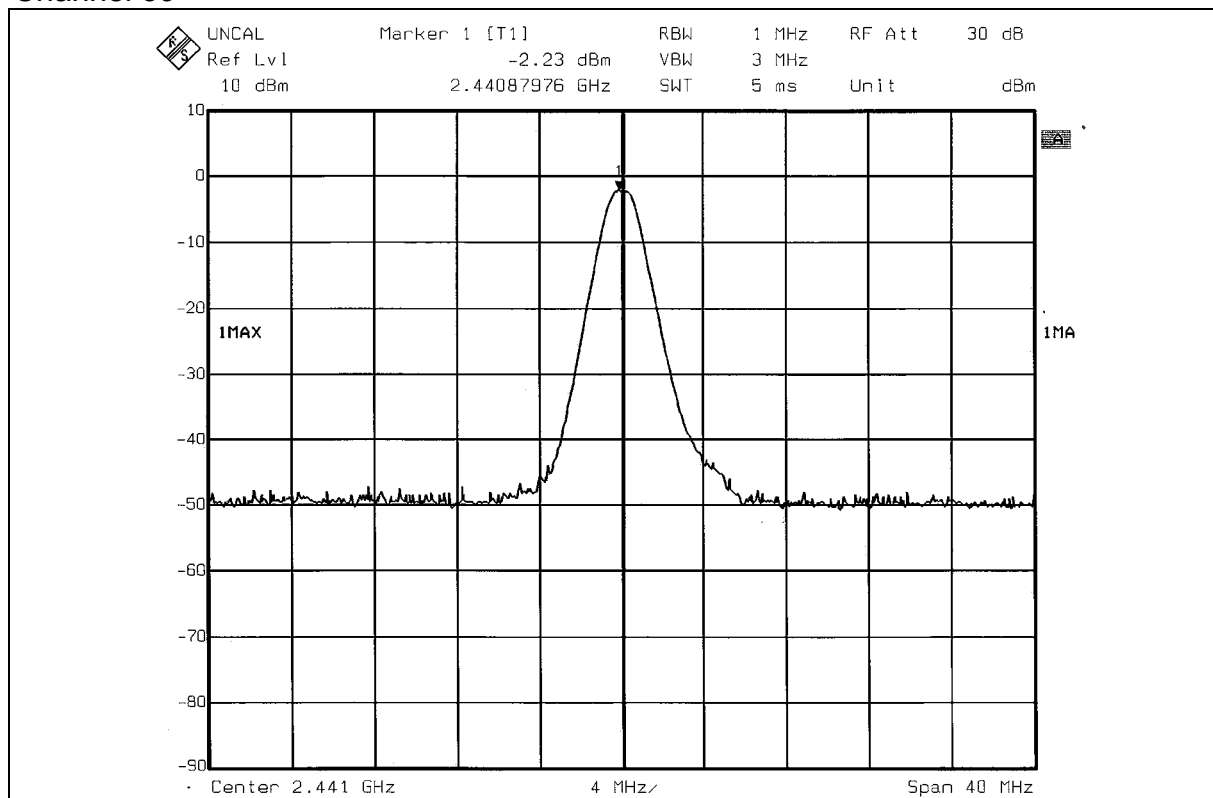
EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
MODULATION TYPE	GFSK	ENVIRONMENTAL CONDITIONS	23 deg. C, 65% RH, 991 hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Gary Chang

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
0	2402	0.635	-1.97	30	PASS
39	2441	0.598	-2.23	30	PASS
78	2480	0.603	-2.20	30	PASS

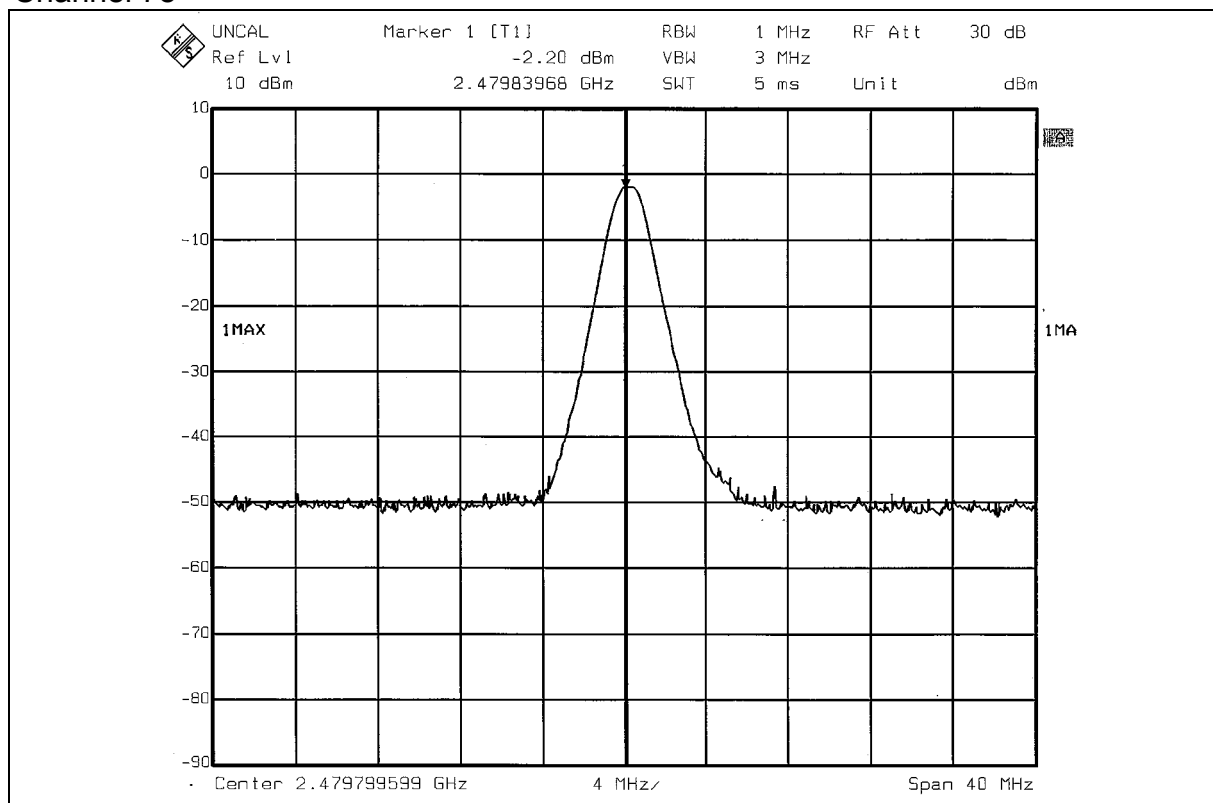
Channel 0



Channel 39



Channel 78



6.7 RADIATED EMISSION MEASUREMENT

6.7.1 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	$2400/F(\text{kHz})$	300
0.490-1.705	$24000/F(\text{kHz})$	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

NOTE: The limit for radiated test was performed according to CISPR 22: 1997, which was specified in FCC PART 15B 15.109(g). Also the limits of ICES-003: 2004 and CISPR 22: 1997 are same.



6.7.2 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.



6.7.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. 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 peak, quasi-peak or average method as specified and then reported in a data sheet.

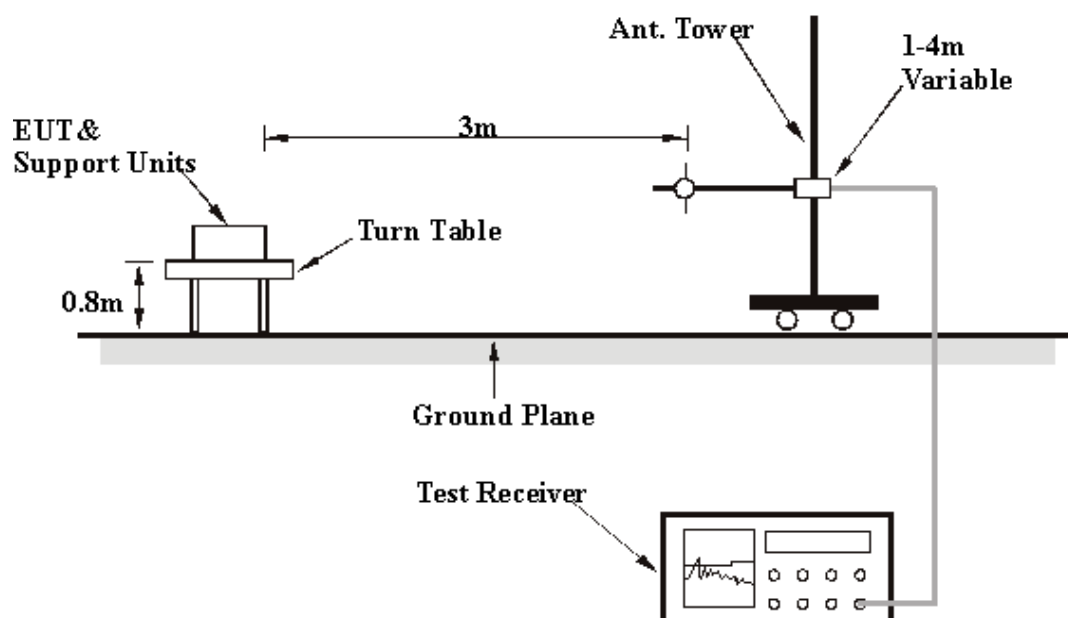
NOTE:

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

6.7.4 DEVIATION FROM TEST STANDARD

No deviation.

6.7.5 TEST SETUP



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

6.7.6 EUT OPERATING CONDITIONS

Same as 4.1.6

6.7.7 TEST RESULTS

Below 1GHz Worst-Case Data

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	78	FREQUENCY RANGE	Below 1 GHz
MODULATION TYPE	GFSK	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24 deg. C, 65% RH, 991 hPa	INPUT POWER (SYSTEM)	120 Vac, 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	86.37	33.51 QP	40.00	-6.49	1.75 H	115	23.64	9.88
2	117.47	36.49 QP	43.50	-7.01	1.50 H	286	23.95	12.54
3	179.68	35.60 QP	43.50	-7.90	1.50 H	226	22.86	12.74
4	239.94	34.62 QP	46.00	-11.38	1.25 H	121	21.70	12.91
5	263.27	34.53 QP	46.00	-11.47	1.00 H	313	21.17	13.36
6	333.25	33.34 QP	46.00	-12.66	1.00 H	301	18.25	15.08
7	426.55	34.13 QP	46.00	-11.87	1.75 H	184	16.82	17.31
8	457.66	33.59 QP	46.00	-12.41	1.75 H	286	15.57	18.01
9	564.57	31.62 QP	46.00	-14.38	1.50 H	295	11.63	19.98
10	630.66	32.30 QP	46.00	-13.70	1.25 H	277	10.98	21.32
11	696.75	32.10 QP	46.00	-13.90	1.00 H	280	9.90	22.20
12	766.73	31.46 QP	46.00	-14.54	1.00 H	286	7.95	23.51

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	47.49	38.42 QP	40.00	-1.58	1.25 V	187	23.65	14.76
2	84.43	32.99 QP	40.00	-7.01	2.00 V	40	23.15	9.84
3	117.47	33.99 QP	43.50	-9.51	1.75 V	157	21.45	12.54
4	197.17	35.02 QP	43.50	-8.48	1.75 V	82	23.67	11.35
5	220.50	32.12 QP	46.00	-13.88	1.75 V	109	20.46	11.66
6	325.47	33.61 QP	46.00	-12.39	1.75 V	349	18.71	14.91
7	354.63	35.60 QP	46.00	-10.40	1.75 V	28	20.03	15.57
8	397.39	36.27 QP	46.00	-9.73	1.75 V	58	19.70	16.58
9	442.10	33.80 QP	46.00	-12.20	1.75 V	358	16.09	17.71
10	700.64	32.08 QP	46.00	-13.92	1.75 V	46	9.82	22.26
11	762.85	33.22 QP	46.00	-12.78	1.50 V	160	9.73	23.49
12	900.86	33.78 QP	46.00	-12.22	1.75 V	271	8.67	25.11

- 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.

1 ~ 25GHz Worst-Case Data

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	0	FREQUENCY RANGE	1 ~ 25 GHz
MODULATION TYPE	GFSK	DETECTOR FUNCTION	Peak(PK) Average (AV)
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24 deg. C, 65% RH, 991 hPa
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	1602.00	41.27 PK	74.00	-32.73	1.34 H	305	13.30	27.96
1	1602.00	11.27 AV	54.00	-42.73	1.34 H	305	-16.69	27.96
2	2390.00	55.24 PK	74.00	-18.76	1.10 H	325	24.27	30.97
2	2390.00	25.24 AV	54.00	-28.76	1.10 H	325	-5.73	30.97
3	*2402.00	87.07 PK			1.10 H	325	56.05	31.02
3	*2402.00	57.07 AV			1.10 H	325	26.05	31.02
4	4804.00	46.79 PK	74.00	-27.21	1.00 H	279	10.41	36.38
4	4804.00	16.79 AV	54.00	-37.21	1.00 H	279	-19.59	36.38

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	1602.00	41.22 PK	74.00	-32.78	1.06 V	312	13.25	27.96
1	1602.00	11.22 AV	54.00	-42.78	1.06 V	312	-16.74	27.96
2	2390.00	53.80 PK	74.00	-20.20	1.00 V	251	22.83	30.97
2	2390.00	23.80 AV	54.00	-30.20	1.00 V	251	-7.17	30.97
3	*2402.00	85.51 PK			1.00 V	254	54.49	31.02
3	*2402.00	55.51 AV			1.00 V	254	24.49	31.02
4	4804.00	36.96 PK	74.00	-37.04	1.08 V	316	0.58	36.38
4	4804.00	6.96 AV	54.00	-47.04	1.08 V	316	-29.42	36.38

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
6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 247 ms per channel. Therefore, the duty cycle be equal to: $20\log(3.125/100) = -30\text{dB}$
7. Average value = peak reading $-20\log(\text{duty cycle})$

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	39	FREQUENCY RANGE	1 ~ 25 GHz
MODULATION TYPE	GFSK	DETECTOR FUNCTION	Peak(PK) Average (AV)
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24 deg. C, 65% RH, 991 hPa
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	1628.00	40.20 PK	74.00	-33.80	1.29 H	305	12.19	28.01
2	*2441.00	87.85 PK			1.08 H	324	56.66	31.19
2	*2441.00	57.85 AV			1.08 H	324	26.66	31.19
3	4882.00	40.52 PK	74.00	-33.48	1.06 H	1	3.96	36.56
3	4882.00	10.52 AV	54.00	-43.48	1.06 H	1	-26.04	36.56

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	1628.00	41.78 PK	74.00	-32.22	1.10 V	281	13.77	28.01
2	*2441.00	85.64 PK			1.00 V	252	54.45	31.19
2	*2441.00	55.64 AV			1.00 V	252	24.45	31.19
3	4882.00	34.32 PK	74.00	-39.68	1.22 V	306	-2.24	36.56
3	4882.00	4.32 AV	54.00	-49.68	1.22 V	306	-32.24	36.56

- 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
 6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 247 ms per channel. Therefore, the duty cycle be equal to: $20\log(3.125/100) = -30\text{dB}$
 7. Average value = peak reading $-20\log(\text{duty cycle})$

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	78	FREQUENCY RANGE	1 ~ 25 GHz
MODULATION TYPE	GFSK	DETECTOR FUNCTION	Peak(PK) Average (AV)
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	24 deg. C, 65% RH, 991 hPa
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	1654.00	40.40 PK	74.00	-33.60	1.23 H	307	12.34	28.06
1	1654.00	10.40 AV	54.00	-43.60	1.23 H	307	-17.66	28.06
2	*2480.00	88.76 PK			1.09 H	330	57.41	31.35
2	*2480.00	58.76 AV			1.09 H	330	27.41	31.35
3	2483.50	55.87 PK	74.00	-18.13	1.09 H	330	24.50	31.37
3	2483.50	25.87 AV	54.00	-28.13	1.09 H	330	-5.50	31.37
4	4960.00	26.36 PK	74.00	-47.64	1.00 H	3	-10.39	36.75
4	4960.00	-4.64 AV	54.00	-58.64	1.00 H	3	-41.39	36.75

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	1654.00	40.25 PK	74.00	-33.75	1.03 V	279	12.19	28.06
1	1654.00	10.25 AV	54.00	-43.75	1.03 V	279	-17.81	28.06
2	*2480.00	86.85 PK			1.00 V	255	55.50	31.35
2	*2480.00	56.85 AV			1.00 V	255	25.50	31.35
3	2483.50	53.91 PK	74.00	-20.09	1.00 V	255	22.54	31.37
3	2483.50	23.91 AV	54.00	-30.09	1.00 V	255	-7.46	31.37
4	4960.00	46.67 PK	74.00	-27.33	1.03 V	321	9.92	36.75
4	4960.00	16.67 AV	54.00	-37.33	1.03 V	321	-20.08	36.75

- 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
 6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 247 ms per channel. Therefore, the duty cycle be equal to: $20\log(3.125/100) = -30\text{dB}$
 7. Average value = peak reading $-20\log(\text{duty cycle})$

6.8 BAND EDGES MEASUREMENT

6.8.1 LIMITS OF BAND EDGES MEASUREMENT

Below -20dB of the highest emission level of operating band (in 100KHz RBW).

6.8.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
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.

6.8.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

6.8.4 DEVIATION FROM TEST STANDARD

No deviation

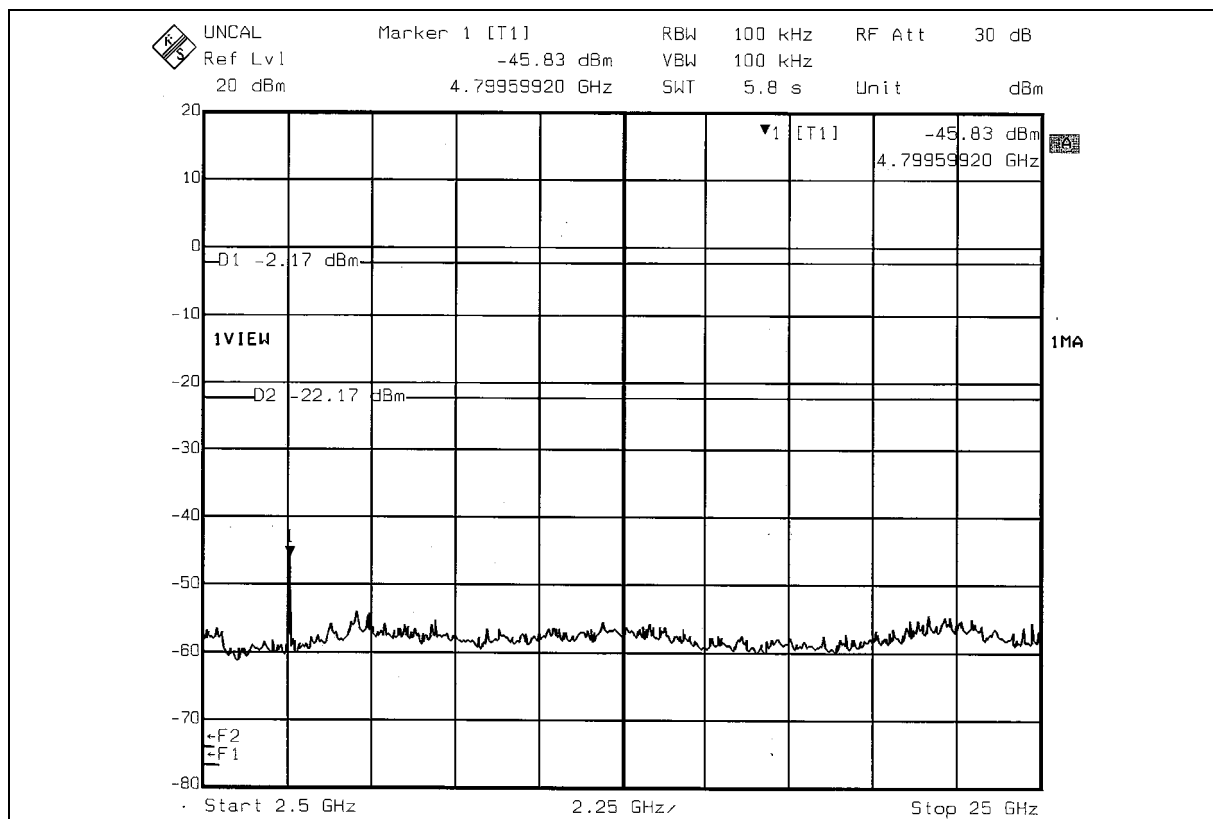
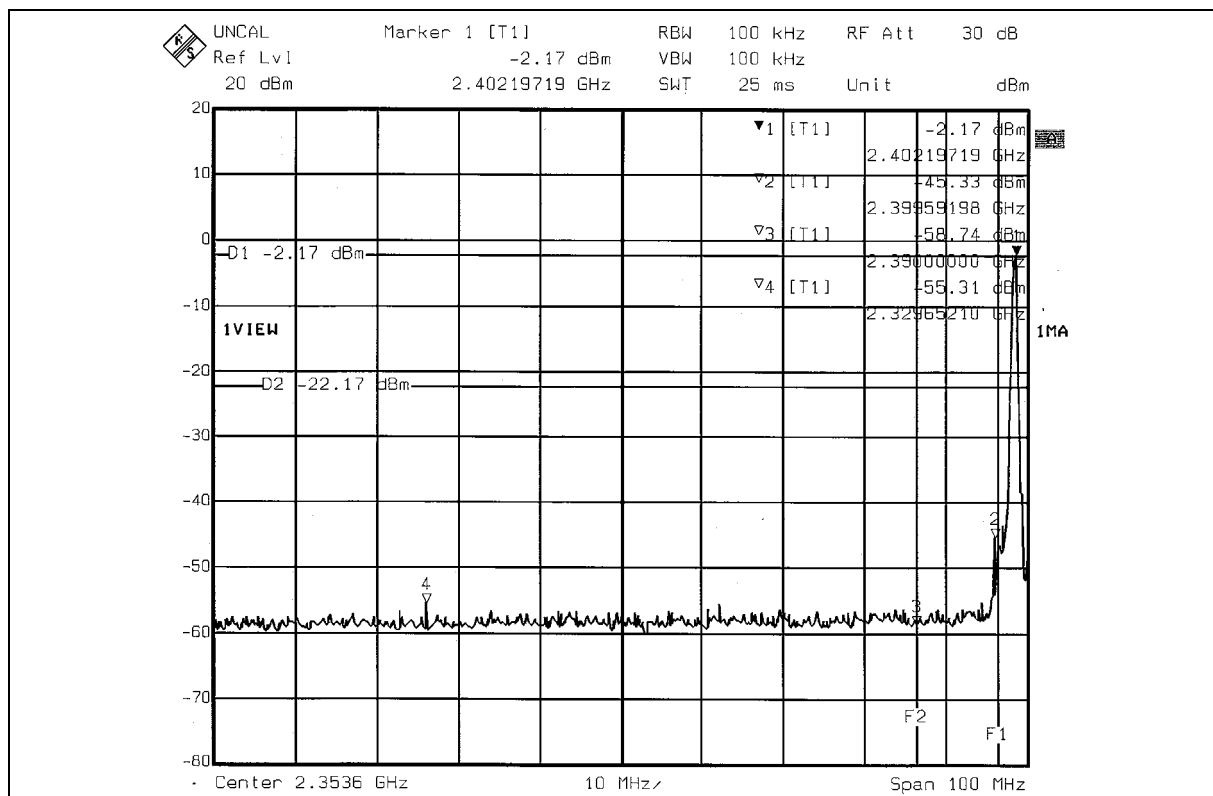


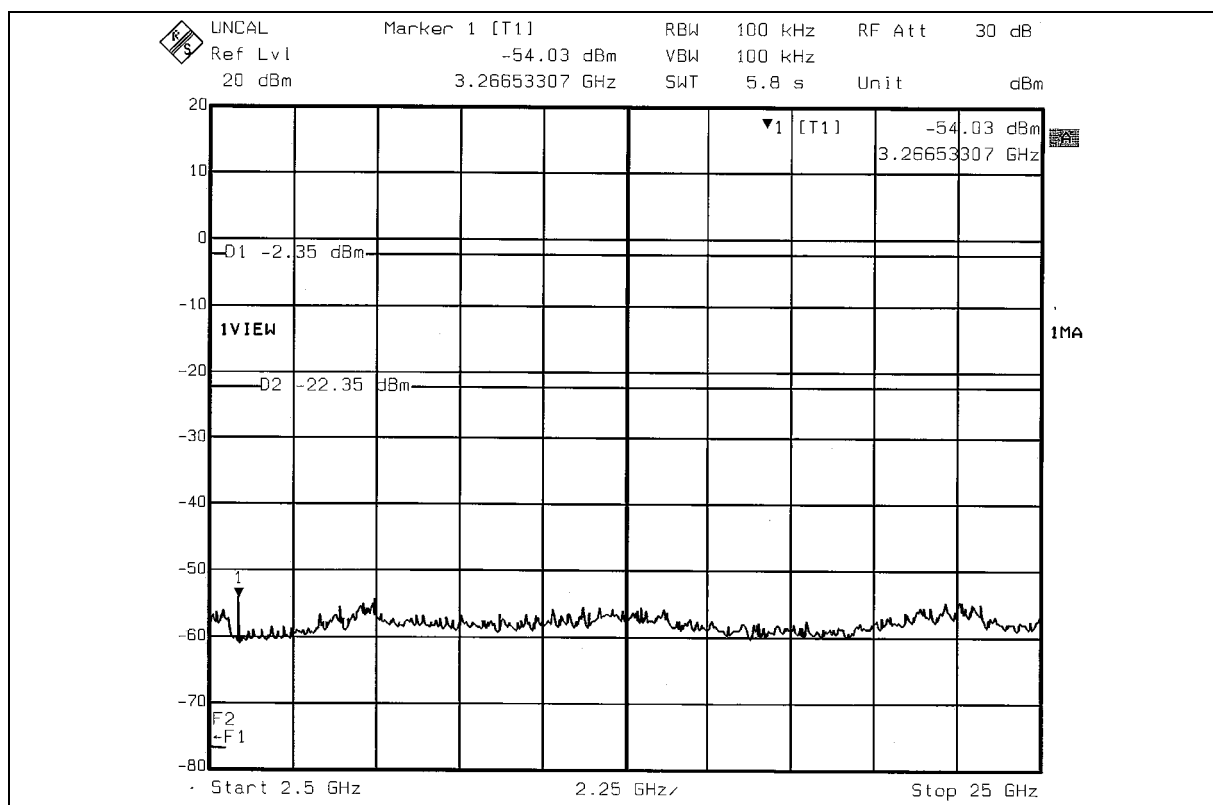
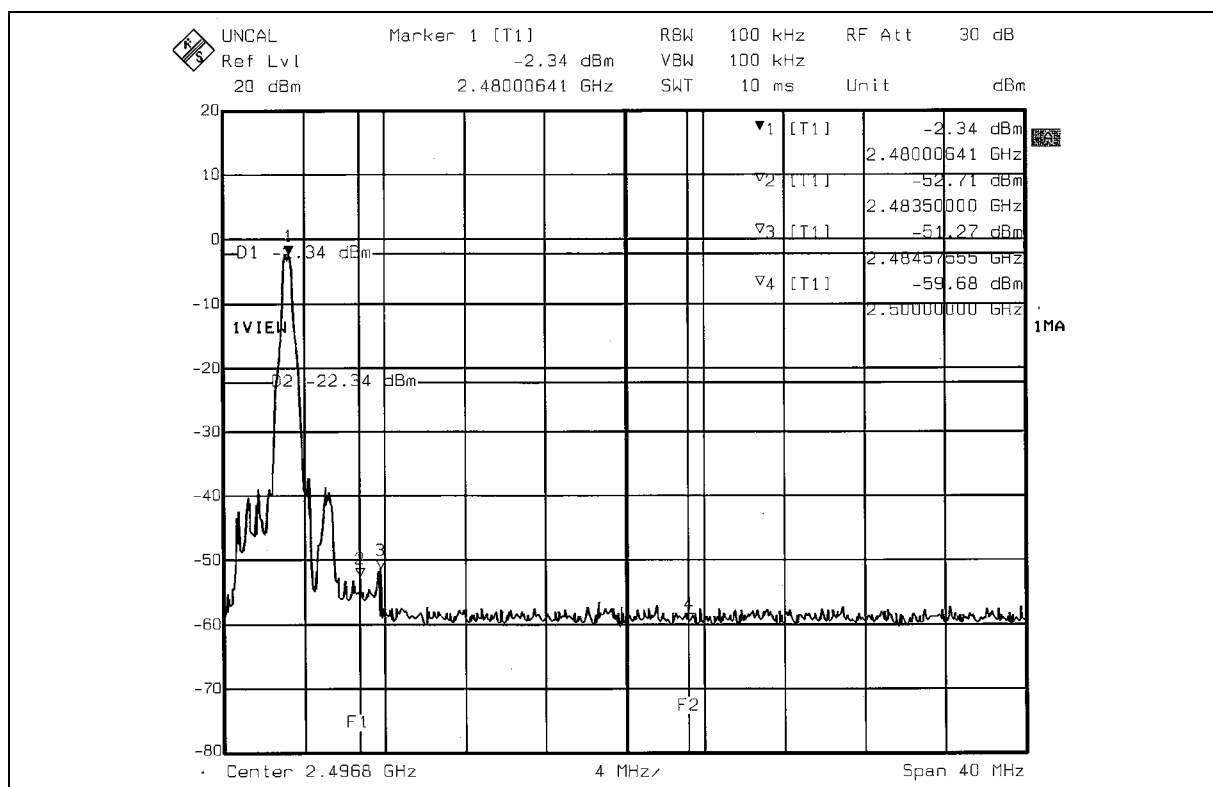
6.8.5 EUT OPERATING CONDITION

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

6.8.6 TEST RESULTS

The spectrum plots are attached on the following 4 images. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(d).







6.9 ANTENNA REQUIREMENT

6.9.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

6.9.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Integrated Printed antenna without antenna connector. The maximum gain of this antenna is 0.5dBi.

WLAN FUNCTION + BLUETOOTH FUNCTION

7. TEST TYPES AND RESULTS (for 802.11b/g)

7.1 CONDUCTED EMISSION MEASUREMENT

7.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	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.

7.1.2 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.



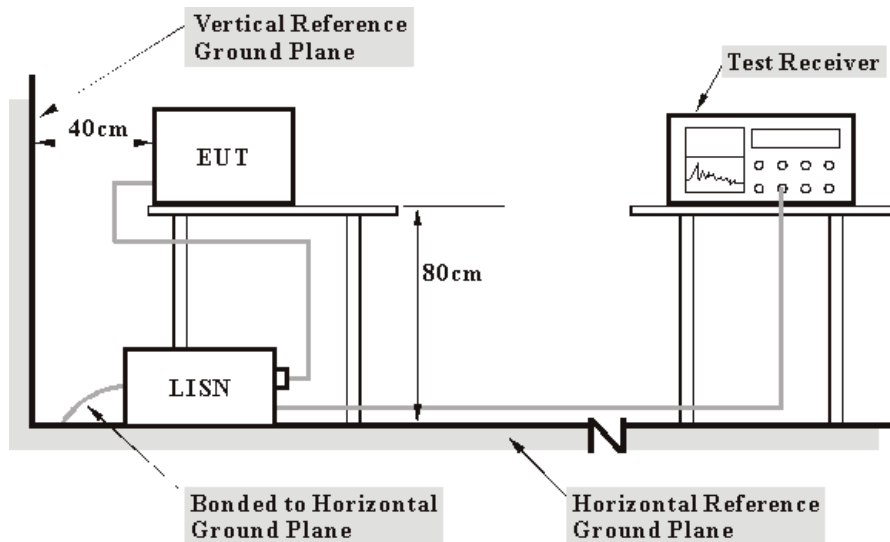
7.1.3 TEST PROCEDURES

- 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 150 kHz to 30 MHz was searched. Emission levels (Limit -20dB) was not recorded.

7.1.4 DEVIATION FROM TEST STANDARD

No deviation.

7.1.5 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.

7.1.6 EUT OPERATING CONDITIONS

Same as 4.1.6

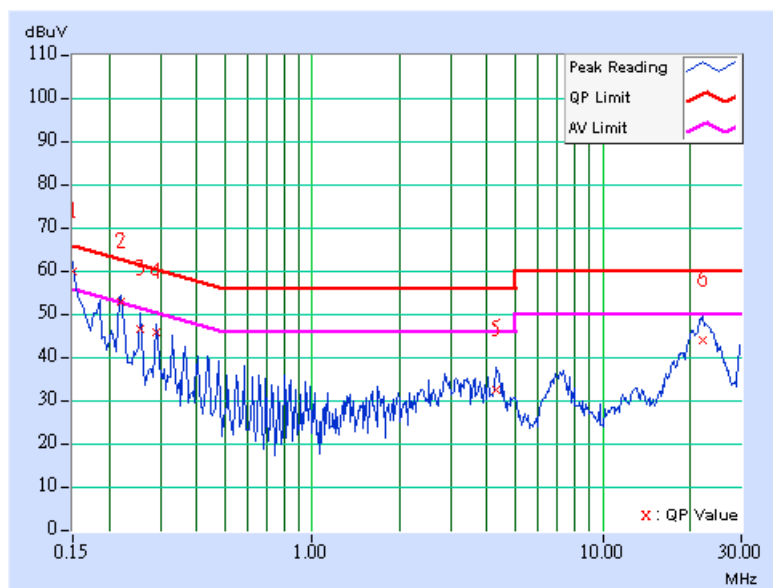
7.1.7 TEST RESULTS

Conducted Worst-Case Data

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	1 (WLAN) / 78 (Bluetooth)	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK , GFSK	PHASE	Line (L)
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23 deg. C, 65% RH, 991 hPa
TESTED BY	Gary Chang		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.10	58.99	50.22	59.09	50.32	66.00	56.00	-6.91	-5.68
2	0.220	0.11	52.08	-	52.19	-	62.81	52.81	-10.62	-
3	0.255	0.11	45.79	-	45.90	-	61.58	51.58	-15.68	-
4	0.291	0.11	44.82	-	44.93	-	60.51	50.51	-15.57	-
5	4.309	0.30	31.52	-	31.82	-	56.00	46.00	-24.18	-
6	21.980	1.00	43.02	-	44.02	-	60.00	50.00	-15.98	-

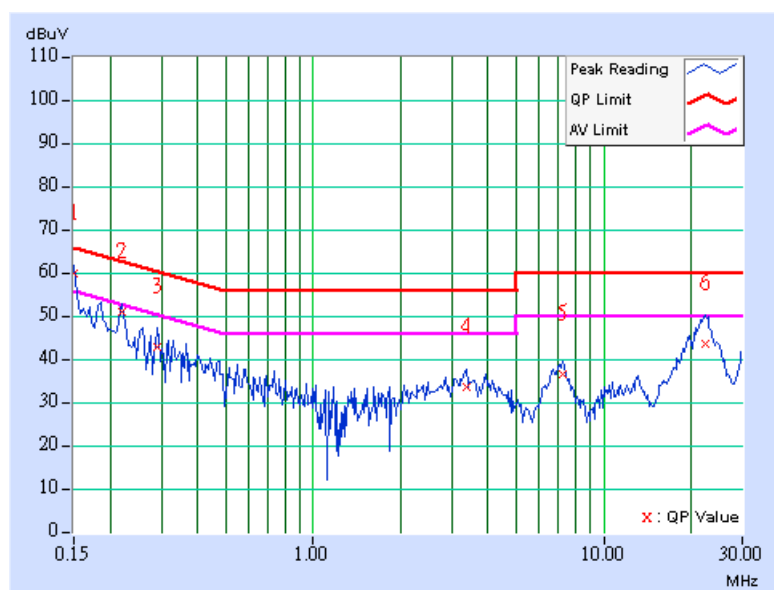
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	1 (WLAN) / 78 (Bluetooth)	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK , GFSK	PHASE	Neutral (N)
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23 deg. C, 65% RH, 991 hPa
TESTED BY	Gary Chang		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.10	59.29	49.93	59.39	50.03	66.00	56.00	-6.61	-5.97
2	0.220	0.10	50.40	-	50.50	-	62.81	52.81	-12.31	-
3	0.291	0.10	42.48	-	42.58	-	60.51	50.51	-17.92	-
4	3.363	0.26	33.22	-	33.48	-	56.00	46.00	-22.52	-
5	7.211	0.38	36.04	-	36.42	-	60.00	50.00	-23.58	-
6	22.391	0.62	43.03	-	43.65	-	60.00	50.00	-16.35	-

- 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.



7.2 RADIATED EMISSION MEASUREMENT

7.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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



7.2.2 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.

7.2.3 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. 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 peak, quasi-peak or average method as specified and then reported in a data sheet.

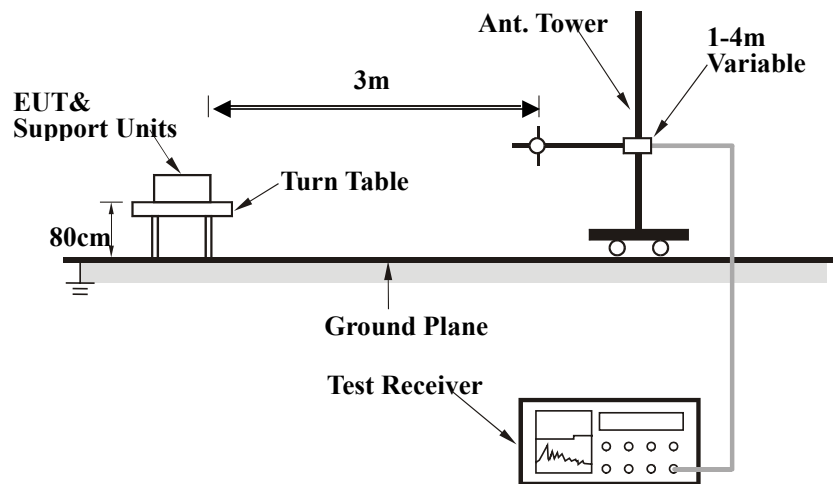
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1GHz.

7.2.4 DEVIATION FROM TEST STANDARD

No deviation.

7.2.5 TEST SETUP



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

7.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

7.2.7 TEST RESULTS

Below 1GHz Worst-Case Data

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	1 (WLAN) / 78 (Bluetooth)	FREQUENCY RANGE	Below 1 GHz
MODULATION TYPE	BPSK, GFSK	DETECTOR FUNCTION	Quasi-Peak
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	21 deg. C, 58% RH, 991 hPa
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	84.43	29.27 QP	40.00	-10.73	2.00 H	160	19.43	9.84
2	117.47	33.80 QP	43.50	-9.70	1.50 H	67	21.26	12.54
3	160.24	33.65 QP	43.50	-9.85	1.50 H	13	19.02	14.63
4	199.12	40.64 QP	43.50	-2.86	1.50 H	154	29.44	11.20
5	265.21	38.99 QP	46.00	-7.01	1.50 H	205	25.54	13.45
6	333.25	35.22 QP	46.00	-10.78	1.00 H	199	20.14	15.08
7	407.11	33.72 QP	46.00	-12.28	1.00 H	271	16.90	16.82
8	475.15	35.12 QP	46.00	-10.88	2.00 H	229	16.87	18.25
9	762.85	31.61 QP	46.00	-14.39	1.00 H	136	8.12	23.49

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	31.94	32.23 QP	40.00	-7.77	1.50 V	199	18.55	13.68
2	64.99	35.80 QP	40.00	-4.20	2.00 V	235	22.90	12.90
3	191.34	37.50 QP	43.50	-6.00	1.00 V	181	25.68	11.81
4	265.21	32.32 QP	46.00	-13.68	1.00 V	217	18.87	13.45
5	397.39	31.44 QP	46.00	-14.56	1.00 V	148	14.87	16.58
6	397.39	31.44 QP	46.00	-14.56	1.00 V	148	14.87	16.58
7	500.42	34.53 QP	46.00	-11.47	1.00 V	157	15.94	18.59
8	566.51	35.16 QP	46.00	-10.84	1.00 V	154	15.12	20.03
9	630.66	36.17 QP	46.00	-9.83	1.50 V	181	14.85	21.32
10	764.79	30.73 QP	46.00	-15.27	1.00 V	61	7.23	23.50

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.

1 ~ 25GHz Worst-Case Data

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	1 (WLAN) / 78 (Bluetooth)	FREQUENCY RANGE	1 ~ 25 GHz
MODULATION TYPE	BPSK, GFSK	DETECTOR FUNCTION	Peak(PK) Average (AV)
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	19 deg. C, 66% RH, 991 hPa
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	1654.00	38.65 PK	74.00	-35.35	1.12 H	187	10.59	28.06
1	1654.00	31.31 AV	54.00	-22.69	1.12 H	187	3.25	28.06
2	2016.00	45.20 PK	74.00	-28.80	1.41 H	201	15.79	29.41
2	2016.00	41.67 AV	54.00	-12.33	1.41 H	201	12.26	29.41
3	2386.00	62.47 PK	74.00	-11.53	1.19 H	48	31.51	30.96
3	2386.00	50.12 AV	54.00	-3.88	1.19 H	48	19.16	30.96
4	*2412.00	106.19 PK			1.19 H	48	75.13	31.06
4	*2412.00	99.23 AV			1.19 H	48	68.17	31.06
5	*2480.00	86.43 PK			1.04 H	216	55.08	31.35
5	*2480.00	56.43 AV			1.04 H	216	25.08	31.35
6	2483.50	55.20 PK	74.00	-18.80	1.04 H	216	23.83	31.37
6	2483.50	25.20 AV	54.00	-28.80	1.04 H	216	-6.17	31.37
7	2688.00	42.03 PK	74.00	-31.97	1.27 H	310	10.25	31.78
7	2688.00	34.42 AV	54.00	-19.58	1.27 H	310	2.64	31.78
8	4824.00	50.47 PK	74.00	-23.53	1.16 H	250	14.04	36.43
8	4824.00	43.33 AV	54.00	-10.67	1.16 H	250	6.90	36.43
9	4960.00	44.80 PK	74.00	-29.20	1.12 H	102	8.05	36.75
9	4960.00	14.80 AV	54.00	-39.20	1.12 H	102	-21.95	36.75

- 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
 6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 247 ms per channel. Therefore, the duty cycle be equal to: $20\log(3.125/100) = -30\text{dB}$
 7. Average value = peak reading $-20\log(\text{duty cycle})$

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	1 (WLAN) / 78 (Bluetooth)	FREQUENCY RANGE	1 ~ 25 GHz
MODULATION TYPE	BPSK, GFSK	DETECTOR FUNCTION	Peak(PK) Average (AV)
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	19 deg. C, 66% RH, 991 hPa
TESTED BY	Match Tsui		

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	2016.00	40.86 PK	74.00	-33.14	1.20 V	121	11.45	29.41
1	2016.00	34.06 AV	54.00	-19.94	1.20 V	121	4.65	29.41
2	2386.00	54.09 PK	74.00	-19.91	1.19 V	287	23.13	30.96
2	2386.00	43.79 AV	54.00	-10.21	1.19 V	287	12.83	30.96
3	*2412.00	97.59 PK			1.19 V	287	66.53	31.06
3	*2412.00	89.92 AV			1.19 V	287	58.86	31.06
4	*2480.00	82.27 PK			1.22 V	72	50.92	31.35
4	*2480.00	52.27 AV			1.22 V	72	20.92	31.35
5	2483.50	54.05 PK	74.00	-19.95	1.22 V	72	22.68	31.37
5	2483.50	24.05 AV	54.00	-29.95	1.22 V	72	-7.32	31.37
6	4824.00	49.18 PK	74.00	-24.82	1.02 V	295	12.75	36.43
6	4824.00	41.78 AV	54.00	-12.22	1.02 V	295	5.35	36.43
7	4960.00	44.71 PK	74.00	-29.29	1.08 V	196	7.96	36.75
7	4960.00	14.71 AV	54.00	-39.29	1.08 V	196	-22.04	36.75

- 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
 6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 247 ms per channel. Therefore, the duty cycle be equal to: $20\log(3.125/100) = -30\text{dB}$
 7. Average value = peak reading $-20\log(\text{duty cycle})$

WLAN FUNCTION + BLUETOOTH FUNCTION

8 TEST TYPES AND RESULTS (for 802.11a)

8.1 CONDUCTED EMISSION MEASUREMENT

8.1.1 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.

8.1.2 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.



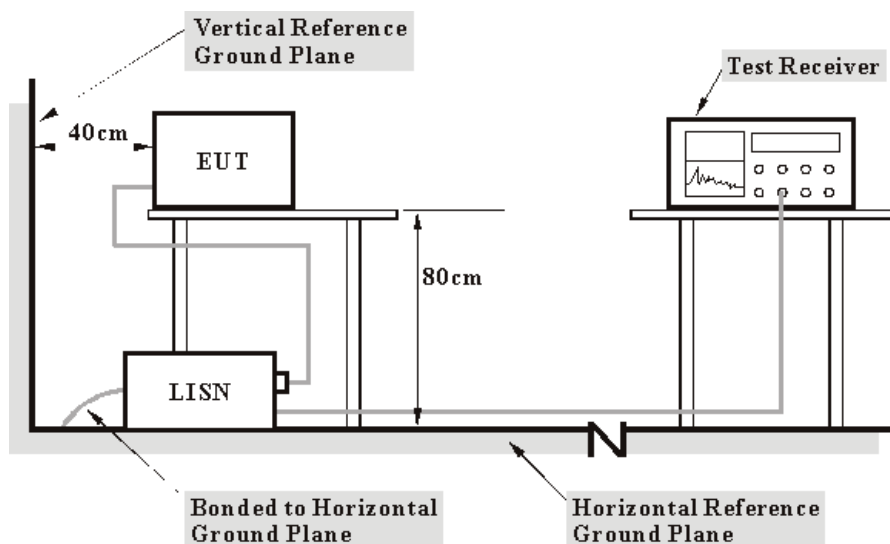
8.1.3 TEST PROCEDURES

- 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 150 kHz to 30 MHz was searched. Emission levels (Limit -20dB) was not recorded.

8.1.4 DEVIATION FROM TEST STANDARD

No deviation.

8.1.5 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.

8.1.6 EUT OPERATING CONDITIONS

Same as 4.1.6

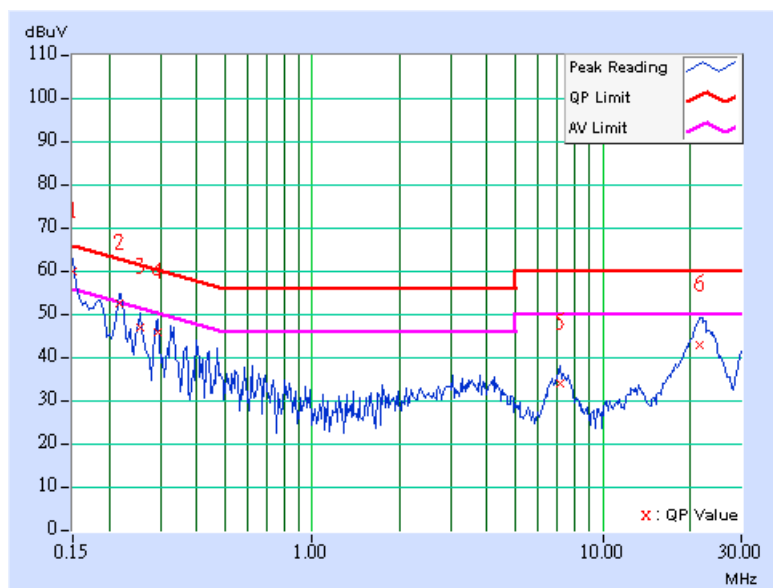
8.1.7 TEST RESULTS

Conducted Worst-Case Data

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	3 (WLAN) / 78 (Bluetooth)	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK , GFSK	PHASE	Line (L)
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23 deg. C, 65% RH, 991 hPa
TESTED BY	Gary Chang		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.10	59.13	50.22	59.23	50.32	66.00	56.00	-6.77	-5.68
2	0.216	0.11	51.52	-	51.63	-	62.96	52.96	-11.33	-
3	0.255	0.11	46.11	-	46.22	-	61.58	51.58	-15.36	-
4	0.295	0.11	45.09	-	45.20	-	60.40	50.40	-15.19	-
5	7.117	0.40	33.11	-	33.51	-	60.00	50.00	-26.49	-
6	21.500	0.99	41.84	-	42.83	-	60.00	50.00	-17.17	-

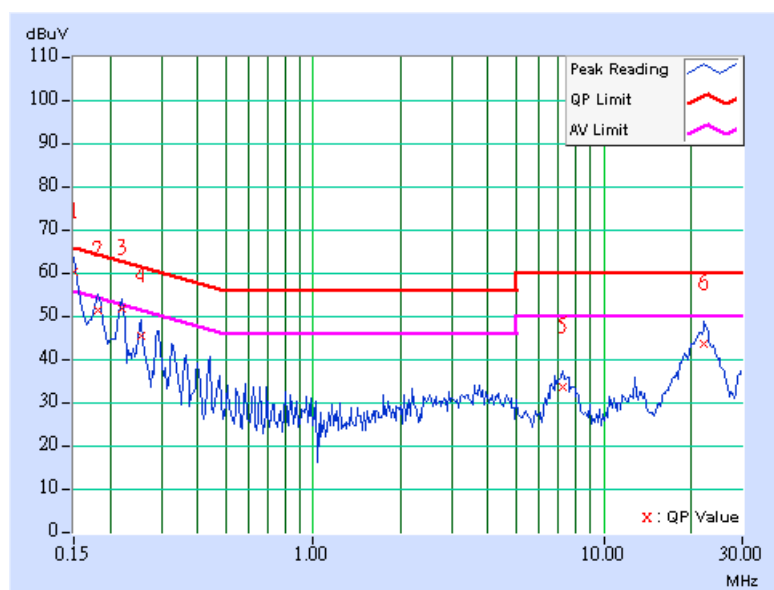
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	3 (WLAN) / 78 (Bluetooth)	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK , GFSK	PHASE	Neutral (N)
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23 deg. C, 65% RH, 991 hPa
TESTED BY	Gary Chang		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.10	59.69	50.27	59.79	50.37	66.00	56.00	-6.21	-5.63
2	0.181	0.10	50.87	-	50.97	-	64.43	54.43	-13.46	-
3	0.220	0.10	51.30	-	51.40	-	62.81	52.81	-11.41	-
4	0.255	0.10	45.05	-	45.15	-	61.58	51.58	-16.43	-
5	7.211	0.38	33.07	-	33.45	-	60.00	50.00	-26.55	-
6	22.230	0.62	43.18	-	43.80	-	60.00	50.00	-16.20	-

- 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.



8.2 RADIATED EMISSION MEASUREMENT

8.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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



8.2.2 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.

8.2.3 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. 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 peak, quasi-peak or average method as specified and then reported in a data sheet.

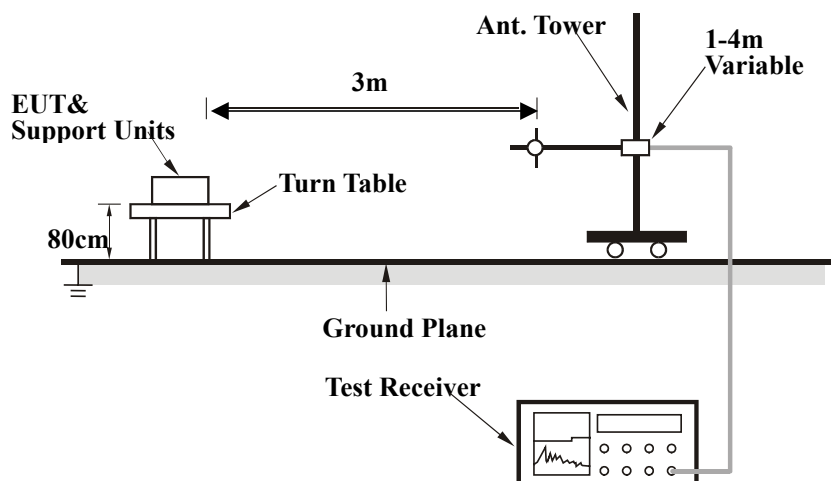
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1GHz.

8.2.4 DEVIATION FROM TEST STANDARD

No deviation.

8.2.5 TEST SETUP



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

8.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

8.2.7 TEST RESULTS

Below 1GHz Worst-Case Data

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	3 (WLAN) / 78 (Bluetooth)	FREQUENCY RANGE	Below 1 GHz
MODULATION TYPE	BPSK, GFSK	DETECTOR FUNCTION	Quasi-Peak
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	ENVIRONME NTAL CONDITIONS	21 deg. C, 58% RH, 991 hPa
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	90.26	31.80 QP	43.50	-11.70	2.00 H	97	21.84	9.97
2	160.24	34.58 QP	43.50	-8.92	1.50 H	16	19.94	14.63
3	199.12	41.77 QP	43.50	-1.73	1.50 H	178	30.57	11.20
4	265.21	39.36 QP	46.00	-6.64	1.50 H	202	25.92	13.45
5	333.25	35.50 QP	46.00	-10.50	1.00 H	202	20.41	15.08
6	399.34	33.99 QP	46.00	-12.01	1.00 H	211	17.37	16.62
7	475.15	35.08 QP	46.00	-10.92	2.00 H	184	16.83	18.25
8	766.73	34.00 QP	46.00	-12.00	1.00 H	124	10.49	23.51

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	31.94	31.66 QP	40.00	-8.34	1.50 V	352	17.98	13.68
2	64.99	36.95 QP	40.00	-3.05	1.00 V	205	24.06	12.90
3	86.37	32.30 QP	40.00	-7.70	1.50 V	124	22.43	9.88
4	199.12	37.17 QP	43.50	-6.33	1.00 V	196	25.96	11.20
5	265.21	32.04 QP	46.00	-13.96	1.50 V	256	18.60	13.45
6	333.25	30.38 QP	46.00	-15.62	1.00 V	274	15.30	15.08
7	399.34	32.33 QP	46.00	-13.67	1.00 V	145	15.71	16.62
8	496.53	35.45 QP	46.00	-10.55	1.00 V	154	16.91	18.54
9	564.57	34.45 QP	46.00	-11.55	1.00 V	154	14.47	19.98
10	632.61	36.03 QP	46.00	-9.97	1.50 V	169	14.68	21.35

- 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.

1 ~ 25GHz Worst-Case Data

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	3 (WLAN) / 78 (Bluetooth)	FREQUENCY RANGE	1 ~ 25 GHz
MODULATION TYPE	BPSK, GFSK	DETECTOR FUNCTION	Peak(PK) Average (AV)
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	19 deg. C, 66% RH, 991 hPa
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	*2480.00	88.55 PK			1.06 H	143	57.20	31.35
1	*2480.00	58.55 AV			1.06 H	143	27.20	31.35
2	#2483.50	55.50 PK	74.00	-18.50	1.06 H	143	24.13	31.37
2	#2483.50	25.50 AV	54.00	-28.50	1.06 H	143	-5.87	31.37
3	#4960.00	45.12 PK	74.00	-28.88	1.10 H	100	8.37	36.75
3	#4960.00	15.08 AV	54.00	-38.92	1.10 H	100	-21.67	36.75
4	*5785.00	100.12 PK			1.20 H	300	61.97	38.15
4	*5785.00	90.24 AV			1.20 H	300	52.09	38.15
5	#7713.00	52.01 PK	74.00	-21.99	1.00 H	350	8.75	43.26
5	#7713.00	40.10 AV	54.00	-13.90	1.00 H	350	-3.16	43.26
6	#11570.00	56.47 PK	74.00	-17.53	1.02 H	100	9.35	47.12
6	#11570.00	44.08 AV	54.00	-9.92	1.02 H	100	-3.04	47.12

- 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
 6. “ # ” The radiated frequency falling in the restricted band.
 7. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 247 ms per channel. Therefore, the duty cycle be equal to: $20\log(3.125/100) = -30\text{dB}$
Average value = peak reading $-20\log(\text{duty cycle})$

EUT	Motion Computing LE1600 (with IEEE 802.11a/b/g miniPCI WLAN)	MODEL	PK292010700 (with miniPCI WLAN WMIA-123AG47)
CHANNEL	3 (WLAN) / 78 (Bluetooth)	FREQUENCY RANGE	1 ~ 25 GHz
MODULATION TYPE	BPSK, GFSK	DETECTOR FUNCTION	Peak(PK) Average (AV)
INPUT POWER (SYSTEM)	120 Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	19 deg. C, 66% RH, 991 hPa
TESTED BY	Match Tsui		

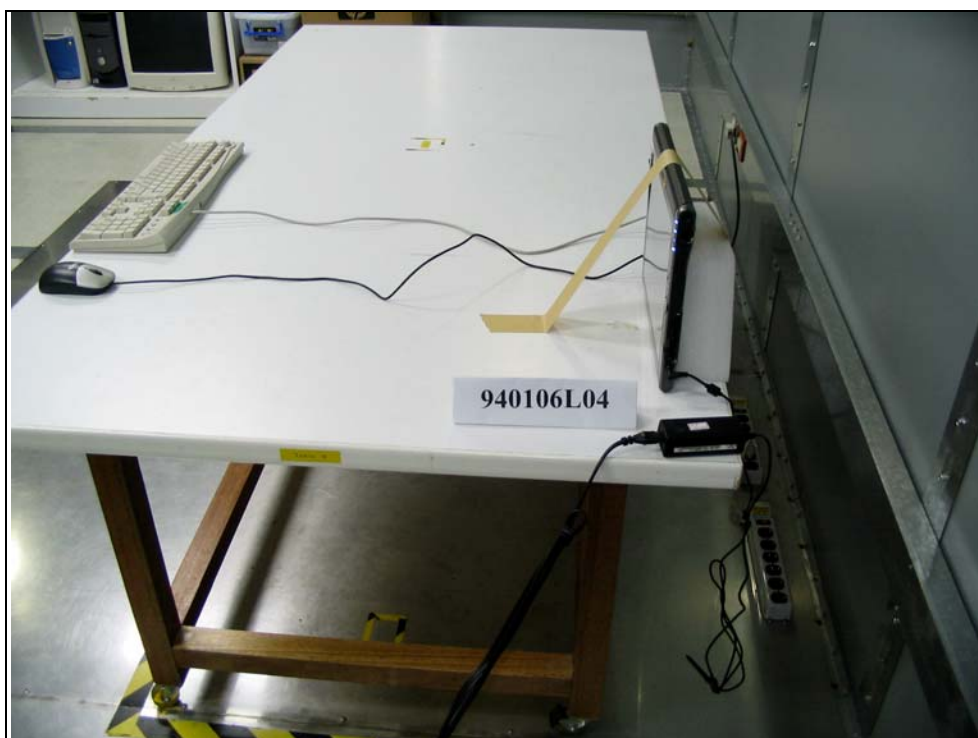
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

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	*2480.00	81.56 PK			1.17 V	92	50.21	31.35
1	*2480.00	51.56 AV			1.17 V	92	20.21	31.35
2	#4960.00	44.95 PK	74.00	-29.05	1.10 V	160	8.20	36.75
2	#4960.00	14.95 AV	54.00	-39.05	1.10 V	160	-21.80	36.75
3	*5785.00	104.88 PK			1.32 V	250	66.73	38.15
3	*5785.00	96.02 AV			1.32 V	250	57.87	38.15
4	#7713.00	51.38 PK	74.00	-22.62	1.01 V	360	8.12	43.26
4	#7713.00	39.45 AV	54.00	-14.55	1.01 V	360	-3.81	43.26
5	#11570.00	56.47 PK	74.00	-17.53	1.10 V	121	9.35	47.12
5	#11570.00	44.42 AV	54.00	-9.58	1.10 V	121	-2.70	47.12

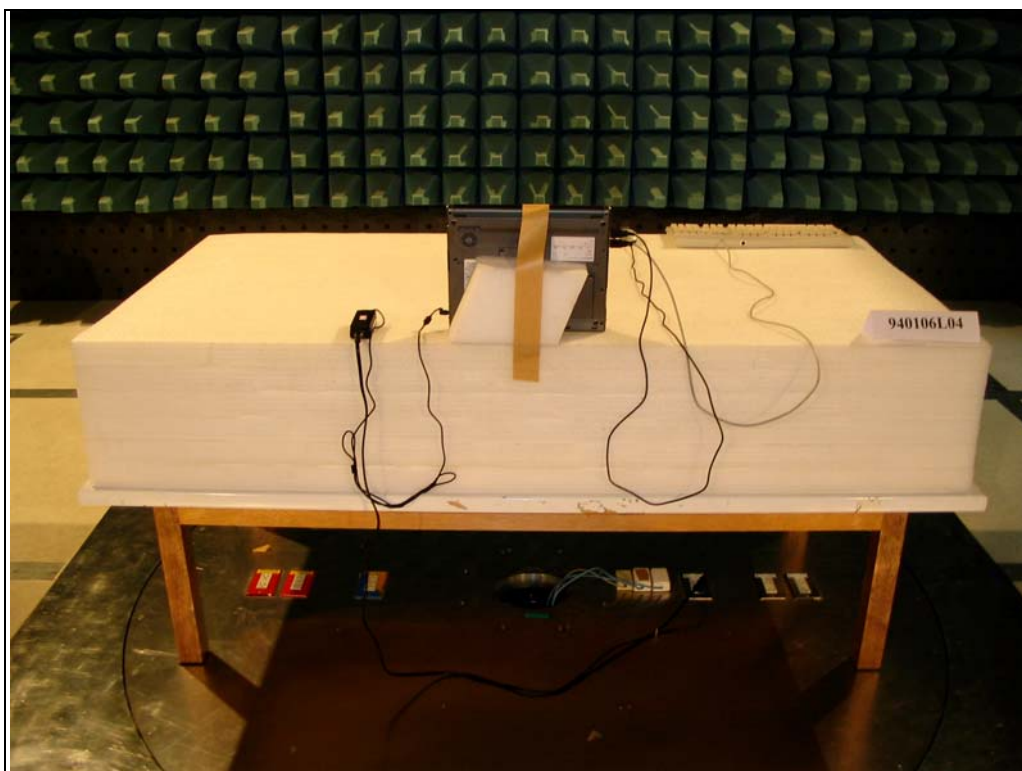
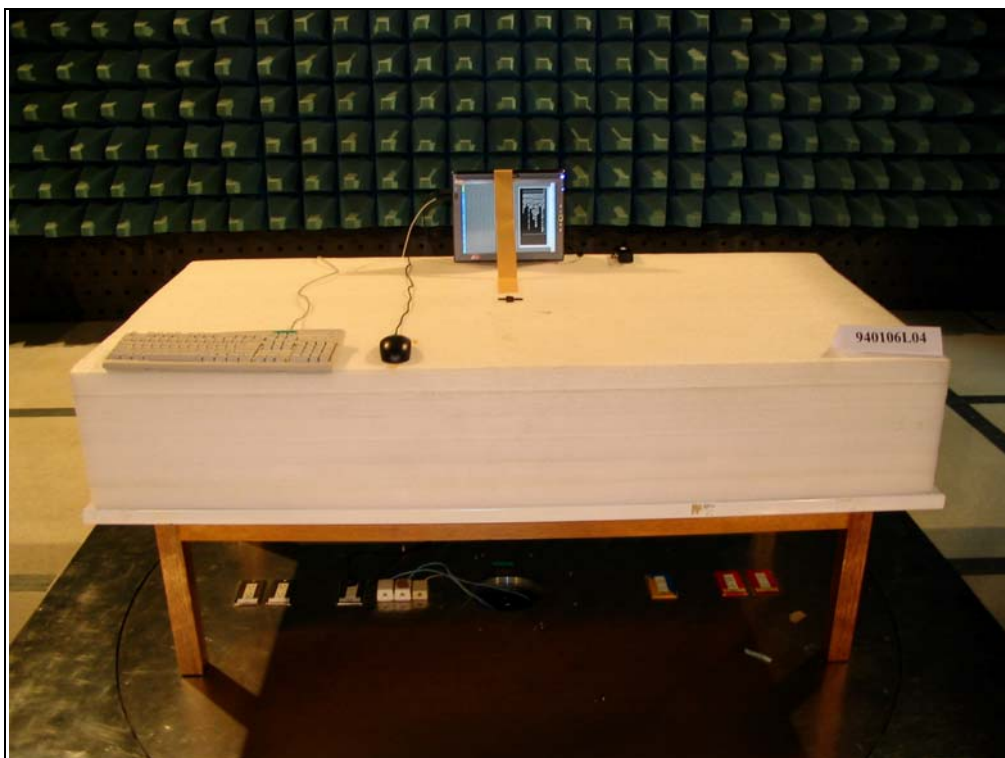
- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * ” : Fundamental frequency
 6. “ # ” The radiated frequency falling in the restricted band.
 7. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 247 ms per channel. Therefore, the duty cycle be equal to: $20\log(3.125/100) = -30\text{dB}$
Average value = peak reading $-20\log(\text{duty cycle})$

8. PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST



RADIATED EMISSION TEST





9. INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	FCC, NVLAP, UL, A2LA
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA , CSA
R.O.C.	CNLA, BSMI, DGT
Netherlands	Telefication
Singapore	PSB , GOST-ASIA(MOU)
Russia	CERTIS(MOU)

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site:

www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also