

FCC TEST REPORT

Under:

FCC 15 Subpart C, Paragraph 15.247

Prepared For:

Fu Kuang Hui Electronics Co., Ltd. (Shen-Zhen)

The Second Industrial Park of Xia Village, Gongming Baoan District, Shenzhen city, Guangdong
Province, China

FCC ID: P2DBTU9X

EUT: UFD + Bluetooth

Model: BTU9X

September 23, 2003

Report Type: Original Report

Test Engineer: Peter Lin

Test Date: August 26, 2003

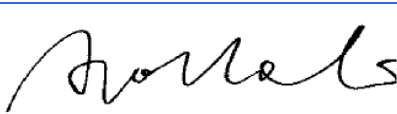

Review By: Apollo Liu / Manager

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1. General Information

1.1 Notes

The test results of this report relate exclusively to the test item specified in 1.5. The KMO Lab does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the KMO Lab.

1.2 Testing Laboratory

Ke Mei Ou Laboratory Co., Ltd.

7A, Jiexiangge, Jiahuixincheng, No.3027, Shennan Rd., Futian, Shenzhen, Guangdong, P.R.China.

Tel: +86 755 83642690 Fax: +86 755 83297077

Email: kmolab@tom.com

Internet: www.kmolab.com

1.3 Details of Applicant

Name : Fu Kuang Hui Electronics Co., Ltd. (Shen-Zhen)
Address : The Second Industrial Park of Xia Village, Gongming Baoan District, Shenzhen City, Guangdong Province, China.
Contact : Ms. Vicky
Tel : + 86 755 27123796
Fax : + 86 755 27123877

1.4 Application Details

Date of Receipt of Application : August 18, 2003
Date of Receipt of Test Item : August 23, 2003
Date of Test : August 26, 2003 ~ September 23, 2003

1.5 Test Item

Manufacturer : See Applicant
Model No. : BTU9X
Description : UFD + Bluetooth

Additional Information

Frequency : 2401.992 MHz ~ 2479.992 MHz
Type of Modulation : GFSK BbT = 0.5 (FHSS)
Number of Channels : 79
Channel Spacing : 1MHz
Rated RF Output Power : Class 2 (0dBm max)
Antenna : Chip antenna
Power Supply : 5Vdc from USB port of Host
Extreme Temp. Tolerance : 0°C to +40°C

1. 6 Test Standards

FCC 15 Subpart C, Paragraph 15.247

Note: All radiated measurements were made in all three orthogonal planes. The values reported are the maximum values.

2. Technical Test

2.1 Summary of Test Results

Both conducted and radiated testing were performed during the max. EMI emission evaluation.

Test procedures according to the technical standards: (Antenna to EUT distance is 3 m)

EUT has been tested according to the following specifications:

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.207	Conducted Emission Test	PASS	0.15MHz~30MHz, Class B.
FCC Part 15 Subpart C Paragraph 15.247(a)(1) Limit	Channel Separation Test	PASS	$\geq 25\text{KHz}$ or the 20dB bandwidth of the hopping channel
FCC Part 15, Subpart C Paragraph 15.247(a)(1)(ii)	Quantity of Hopping Channel Test	PASS	Complies.
FCC Part 15, Subpart C Paragraph 15.247(a)(1)(ii)	Average Time of Occupancy Test	PASS	≤ 0.4 sec (a 30 second period)
FCC Part 15, Subpart C Paragraph 15.247(a)(1)(ii)	20DBC Bandwidth Test	PASS	$\leq 1\text{MHz}$ (20dB bandwidth)
FCC Part 15, Subpart C Paragraph 15.247(b)(1)	Peak Power Test	PASS	1 watt or 30dBm (at least 75 hopping channel)
FCC Part 15.247(C)	Band Edge Test	PASS	Complies
FCC Part 15, Subpart C Paragraph 15.247(c)	Power Density Test	PASS	Complies
FCC Part 15, Subpart C Paragraph 15.247(c)	Radiated Emission Test	PASS	15.209(a)

3. EUT Modifications

No modification by Ke Mei Ou Laboratory Co., Ltd.

4. Technical Characteristics Test

4.1 Conducted Emission Test

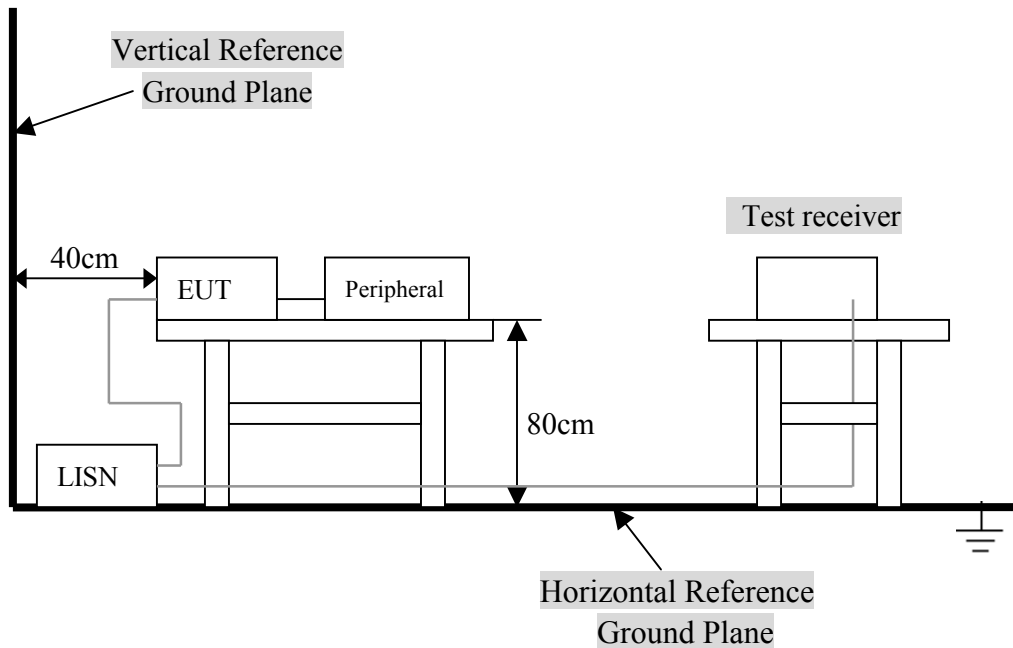
4.1.1 Test Equipment

Please refer to Section 7 this report.

4.1.2 Test Procedure

The EUT was tested according to ANSI C63.4 - 2001. The frequency spectrum from 0.15 MHz to 30 MHz was investigated. The LISN used was 50 ohm / 50 uHenry as specified by section 5.1 of ANSI C63.4 - 2001. cables and peripherals were moved to find the maximum emission levels for each frequency.

4.1.3 Test Setup



For the actual test configuration, Please refer to the related items– Photos of Testing.

4.1.4 Configuration of The EUT

79 channels are provide by EUT. The 3 channel of lower, medium and higher were chosen for test.

Channel	Frequency (MHz)
0	2402
39	2441
78	2480

Note:

- Below 1 GHz, the channel 0, 39, and 78 were pre-tested in chamber. The channel 78, worst case one, was chosen for conducted and radiated emission test.
- Above 1 GHz, the channel 0, 39 and 78 were tested individually.

All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

A. EUT

Device	Manufacturer	Model #	FCC ID
UFD + Bluetooth	Fu Kuang Hui Electronics Co., Ltd. (Shen-Zhen)	BTU9X	P2DBTU9X

B. Internal Devices

Device	Manufacturer	Model #	FCCID / DoC
N/A			

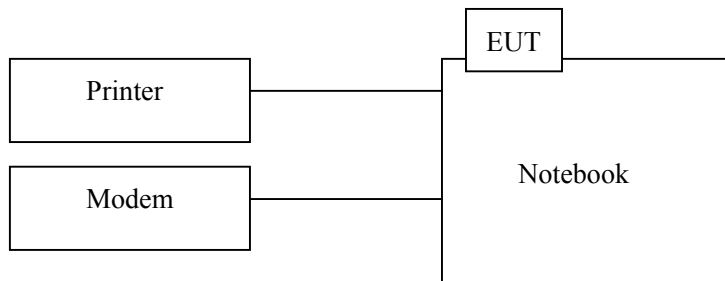
C. Peripherals

Device	Manufacturer	Model # Serial #	FCC ID/DoC	Cable
Notebook	IBM	A31	ANOVNCBDC80211B	1.5m unshielded power cord
Printer	HP	HP930C	DoC	1.6m unshielded power cord
Modem	GVC	G450	DoC	1.5m unshielded power cord 1.2m shielded data cable.

4.1.5 EUT Operating Condition

Operating condition is according to ANSI C63.4 - 2001.

- A. Setup the EUT and simulators as shown on follow.
- B. Enable RF signal and confirm EUT active.
- C. Modulate output capacity of EUT up to specification.



4.1.6 Conducted Power Line Emission Limits

FCC Part 15 Paragraph 15.207 (dBuV)		
Frequency Range (MHz)	Class A QP/AV	Class B QP/AV
0.15 – 0.5	79/66	66-56/56-46
0.5 – 5.0	73/60	56/46
5.0 - 30	73/60	60/50

NOTE : In the above table, the tighter limit applies at the band edges.

4.1.7 Conducted Power Line Test Result

The frequency spectrum from 0.15 MHz to 30 MHz was investigated. All readings are quasi -peak values with a resolution bandwidth of 9 KHz.

- Temperature : 26 °C
- Humidity : 53 % RH
- Mode : Ch78

EN55022 CLASS B				
Frequency (MHz)	Emission Level QP/AV (dBuV)	Line/ Neutral	Limit (dBuV) QP/AV	Margin (dB) QP/AV
0.166	46.56/24.14	LINE	64.96/54.96	-18.4/-30.8
0.150	49.41/29.01	NEUTRAL	66.00/56.00	-16.6/-27.0
0.210	51.38/40.89	LINE	63.21/53.21	-11.8/-12.3
0.214	48.19/37.36	NEUTRAL	63.21/53.21	-11.8/-12.3
0.282	43.01/34.80	LINE	60.82/50.82	-17.8/-16.0
0.242	37.87/21.59	NEUTRAL	62.10/52.10	-24.2/-30.5

Note:

1. Uncertainty in conducted emission measured is <+/- 2dB.
2. The emission levels of other frequencies were very low against the limit.
3. The Quasi-peak emission level also meets average limit and measurement with the average detector is unnecessary.
4. Emission = Meter Reading + Factor ; Factor = Insertion Loss + Cable Loss.
5. Margin Value = EMISSION Level - LIMIT Value.

Continuous Disturbance**EN55022**

EUT: UFD+Bluetooth M/N: BTU9X

Manufacturer: FU Kuang Hui Electronics Co., Ltd. (Shen-Zhen)

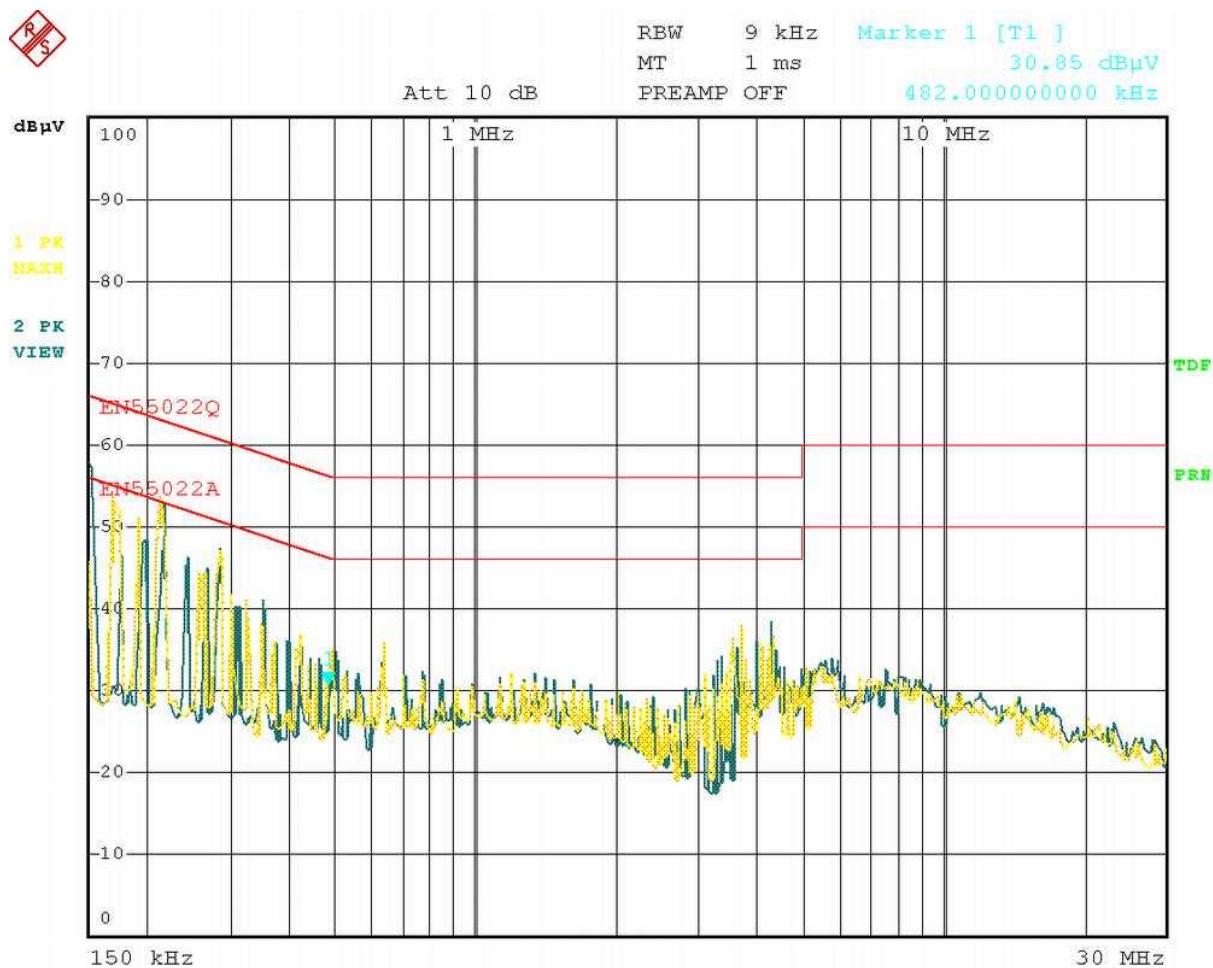
Operating Condition: Normal

Test Site: Ke Mei Ou Laboratory Co., Ltd.

Operator: Peter Lin

Test Specification: LINE&NEUTRAL

Comment:



Date: 4.SEP.2003 22:15:57

4.2 Radiated Emission Test

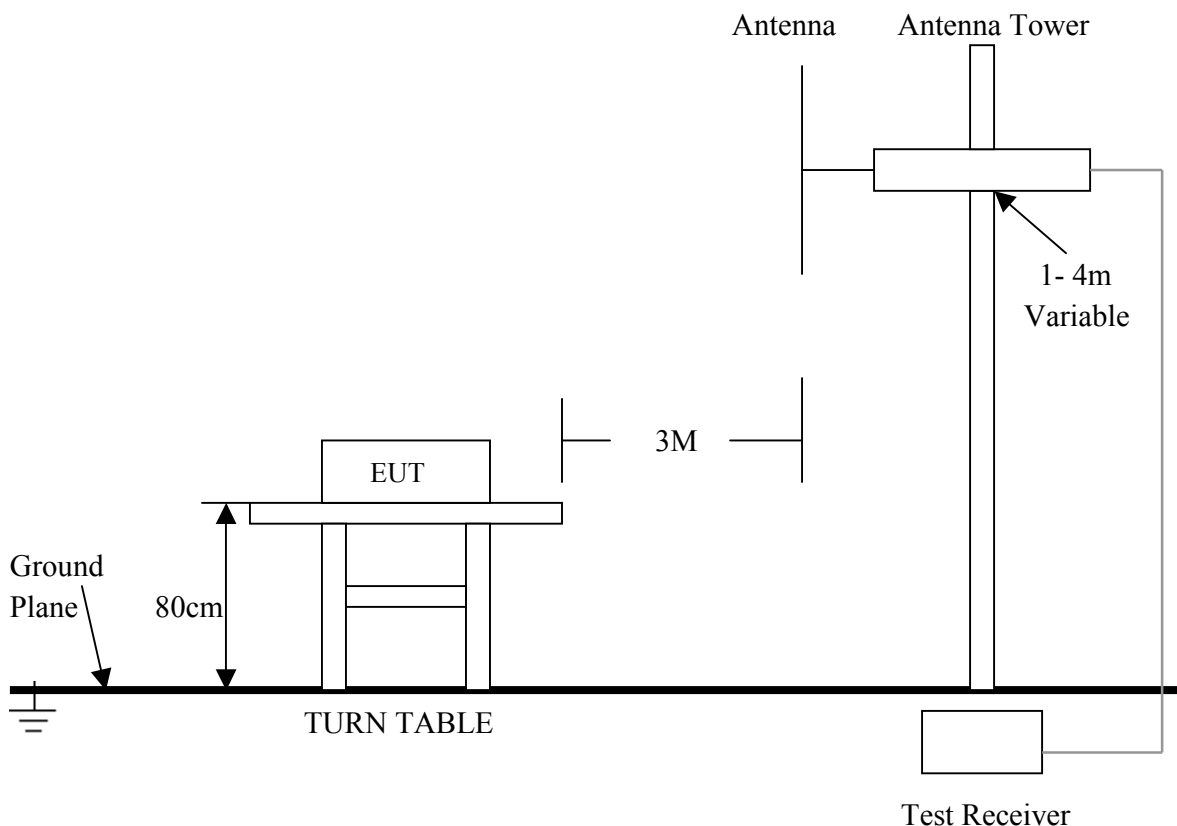
4.2.1 Test Equipment

Please refer to Section 7 this report.

4.2.2 Test Procedure

1. The EUT was tested according to ANSI C63.4 - 2001. The radiated test was performed at Ke Mei Ou Laboratory. This site is on file with the FCC laboratory division, Registration No. 125782.
2. The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2001.
3. The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 KHz. All readings are above 1 GHz , peak values with a resolution bandwidth of 1 MHz . Measurements were made at 3 meters.
4. The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
5. Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "QP" in the data table.
6. The antenna polarization : Vertical polarization and Horizontal polarization.

4.2.3 Radiated Test Setup



For the actual test configuration , please refer to the related items – Photos of Testing.

4.2.4 Configuration of The EUT

Same as section 4.1.4 of this report

4.2.5 EUT Operating Condition

Same as section 4.1.5 of this report

4.2.6 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below :

A. FCC Part 15 Subpart C Paragraph 15.249 Limit

Fundamental Frequency (MHz)	Field Strength of Fundamental (3m)		Field Strength of Harmonics (3m)	
	mV/m	Peak/Average (dBuV/m)	uV/m	Peak/Average (dBuV/m)
2400~2483.5	50	114.0/94.0	500	74.0/54.0

- Note:**
- (1) RF Voltage (dBuV) = 20 log RF Voltage (uV)
 - (2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
 - (3) The emission limit in this paragraph is based on measurement instrumentation employing an average detector. Measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.

B. Frequencies in restricted band are complied to limit on Paragraph 15.209.

Frequency (MHz)	Distance (m)	Field Strength (dBuV/m)
30 - 88	3	40.0
88 - 216	3	43.5
216 - 960	3	46.0
Above 960	3	54.0

- Note:**
- (1) RF Voltage (dBuV) = 20 log RF Voltage (uV)
 - (2) In the Above Table, the tighter limit applies at the band edges.
 - (3) Distance refers to the distance in meters between the measuring instrument antenna and the

4.2.7 Radiated Emission Test Result

A. Fundamental Radiated Emission Data

Product	: UFD+Bluetooth	Test Mode	: Ch0, Ch39, Ch78
Test Item	: Fundamental Radiated Emission Data	Temperature	: 25 °C
Test Voltage	: 5VDC from USB port of Host	Humidity	: 56%RH
Test Result	: PASS		

CH0

Freq. (MHz)	Emission (dBuV/m)	Horiz. /Vert.	Limits (dBuV/m)	Margin (dB)
2401.992	103.96	Horiz.	114.0	-10.04
2401.993	101.68	Vert.	114.0	-12.32

CH39

Freq. (MHz)	Emission (dBuV/m)	Horiz. /Vert.	Limits (dBuV/m)	Margin (dB)
2440.988	100.63	Horiz.	114.0	-13.37
2440.988	98.76	Vert.	114.0	-15.24

CH78

Freq. (MHz)	Emission (dBuV/m)	Horiz. /Vert.	Limits (dBuV/m)	Margin (dB)
2479.992	106.01	Horiz.	114.0	-7.99
2479.992	103.69	Vert.	114.0	-10.31

- Note:**
- (1) All Readings are Peak value.
 - (2) Emission Level = Reading Level + Probe Factor + Cable Loss.
 - (3) The average measurement was not performed when the peak measured data under the limit of average detection.

B. General Radiated Emission Data

Product	: UFD+Bluetooth	Test Mode	: Ch78
Test Item	: General Radiated Emission Data	Temperature	: 25 °C
Test Voltage	: 5VDC from USB port of Host	Humidity	: 56%RH
Test Result	: PASS		

Freq. (MHz)	Emission (dBuV/m)	Horiz. / Vert.	Limits (dBuV/m)	Margin (dB)
133.125	29.9	Horiz	43.5	-13.6
133.026	33.7	Vert	43.5	-9.8
202.363	26.3	Horiz	43.5	-17.2
486.981	42.2	Vert.	46.0	-3.8
401.682	42.8	Horiz.	46.0	-3.2
668.762	42.0	Vert.	46.0	-4.0

- Note:**
- (1) All Reading Levels below 1GHz are Quasi-Peak, above are peak and average value.
 - (2) Emission Level = Reading Level + Probe Factor + Cable Loss.

C. Harmonics Radiated Emission Data

Product	: UFD+Bluetooth	Test Mode	: Ch0, Ch39, Ch78
Test Item	: Harmonics Radiated Emission Data	Temperature	: 25 °C
Test Voltage	: 5VDC from USB port of Host	Humidity	: 56%RH
Test Result	: PASS		

CH0

Freq. (MHz)	Emission Peak / Average (dBuV/m)		Horiz./ Vert.	Limits Peak / Average (dBuV/m)		Margin Peak / Average (dB)
2209.78	65.0	41.6	Horiz.	74.0	54.0	-9.0 / -12.4
2209.89	61.3	35.1	Vert.	74.0	54.0	-12.7 / -18.9
2258.27	70.1	42.1	Horiz.	74.0	54.0	-3.9 / -11.9
2458.36	67.2	39.1	Vert.	74.0	54.0	-6.8 / -14.9
2480.62	71.3	42.7	Horiz.	74.0	54.0	-2.7 / -11.3
2480.67	68.9	36.0	Vert.	74.0	54.0	-5.1 / -18.0
4804.06	71.2	41.1	Horiz.	74.0	54.0	-2.8 / -12.9
4803.98	67.3	39.8	Vert.	74.0	54.0	-6.7 / -14.2
7205.96	69.1	41.5	Horiz.	74.0	54.0	-4.9 / -12.5
7206.05	71.3	42.3	Vert.	74.0	54.0	-2.7 / -11.7
9607.89	65.6	36.9	Horiz.	74.0	54.0	-8.4 / -17.1
9608.08	65.1	37.8	Vert.	74.0	54.0	-8.9 / -16.2

CH39

Freq. (MHz)	Emission Peak / Average (dBuV/m)		Horiz./ Vert.	Limits Peak / Average (dBuV/m)		Margin Peak / Average (dB)
2248.91	68.92	35.2	Horiz.	74.0	54.0	-5.08 / -18.8
2248.32	61.39	36.7	Vert.	74.0	54.0	-12.61 / -17.3
2297.47	67.62	33.9	Horiz.	74.0	54.0	-6.38 / -20.1
2297.63	66.13	34.3	Vert.	74.0	54.0	-7.87 / -19.7
2462.38	62.33	31.1	Horiz.	74.0	54.0	-11.67 / -22.9
2462.60	61.25	29.6	Vert.	74.0	54.0	-12.75 / -24.4
4881.67	65.14	39.4	Horiz.	74.0	54.0	-8.86 / -14.6
4881.20	64.85	35.5	Vert.	74.0	54.0	-9.15 / -18.5
7323.64	69.36	41.9	Horiz.	74.0	54.0	-4.64 / -12.1
7322.87	70.39	43.8	Vert.	74.0	54.0	-3.61 / -10.2
9761.98	66.26	40.7	Horiz.	74.0	54.0	-7.74 / -13.3
9763.31	65.11	40.9	Vert.	74.0	54.0	-8.89 / -13.1

CH78

Freq. (MHz)	Emission Peak / Average (dBuV/m)		Horiz./ Vert.	Limits Peak / Average (dBuV/m)		Margin Peak / Average (dB)
2240.63	68.62	38.9	Horiz.	74.0	54.0	-5.38 / -15.1
2240.26	63.59	35.9	Vert.	74.0	54.0	-10.41 / -18.1
2287.97	69.75	41.7	Horiz.	74.0	54.0	-4.25 / -12.3
2288.16	61.30	38.1	Vert.	74.0	54.0	-12.70 / -15.9
2483.50	70.18	47.3	Horiz.	74.0	54.0	-3.82 / -6.7
2483.51	69.26	42.9	Vert.	74.0	54.0	-4.74 / -11.1
4960.61	65.42	45.3	Horiz.	74.0	54.0	-8.58 / -8.7
4960.01	64.58	42.8	Vert.	74.0	54.0	-9.42 / -11.2
7439.28	70.13	48.5	Horiz.	74.0	54.0	-3.87 / -5.5
7439.56	70.80	50.6	Vert.	74.0	54.0	-3.20 / -3.4
9919.99	65.31	46.3	Horiz.	74.0	54.0	-8.69 / -7.7
9920.64	66.30	47.2	Vert.	74.0	54.0	-7.70 / -6.8

Note: All Reading Levels below 1GHz are Quasi-Peak, above are peak and average value.
Emission Level = Reading Level + Probe Factor + Cable Loss.

4.3 Channel Separation Test

4.3.1 Test Equipment

Please refer to Section 7 this report.

4.3.2 Test Procedure

The EUT was operation in hopping mode or could be controlled its channel.

4.3.3 Test Setup

Please refer to Section 4.2.3 this report.

4.3.4 Configuration of The EUT

Same as section 4.1.4 of this report

4.3.5 EUT Operating Condition

Same as section 4.1.5 of this report

4.3.6 Limit

FCC Part15, Subpart C Paragraph 15.247(a)(1). Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

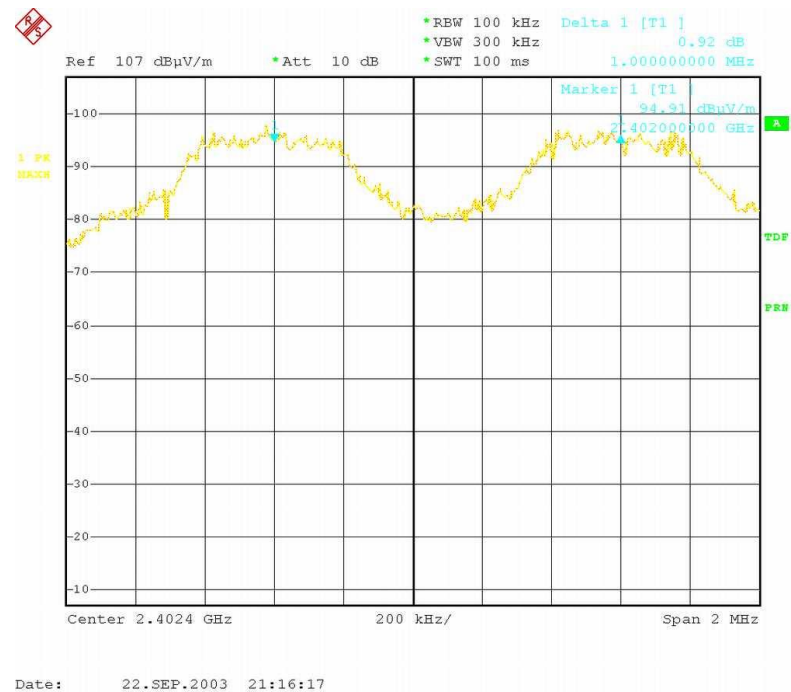
Frequency (MHz)	Limit (kHz)
2400-2483.5	>25kHz

4.3.7 Test Result

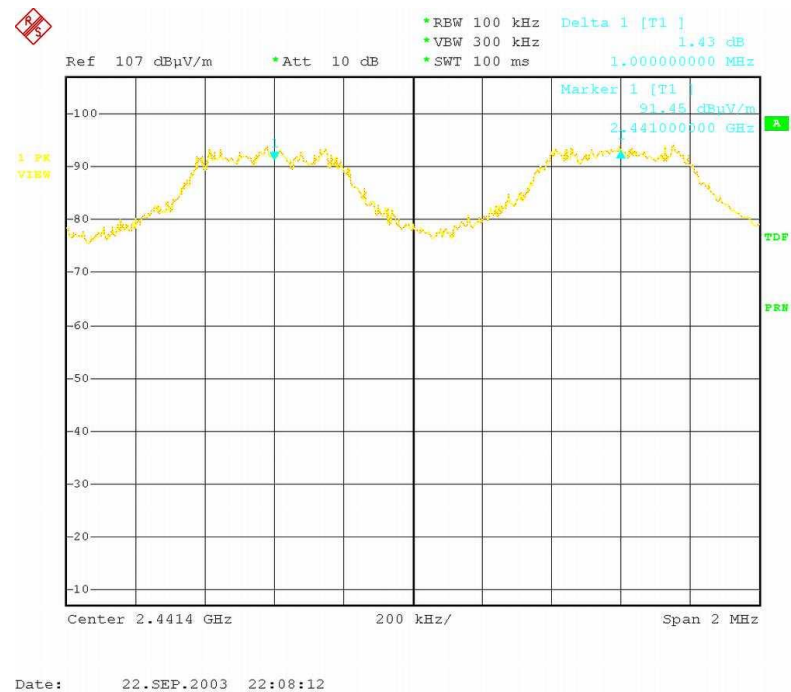
Product	: UFD+Bluetooth	Test Mode	: Ch0, Ch39, Ch78
Test Item	: Channel Separation Test	Temperature	: 25 °C
Test Voltage	: 5VDC from USB port of Host	Humidity	: 56%RH
Test Result	: PASS		

Channel Number	Channel Frequency (MHz)	Separation Read Value (kHz)	Separation Limit (kHz)
0	2402	1000	>25kHz
39	2441	1000	>25kHz
78	2480	1000	>25kHz

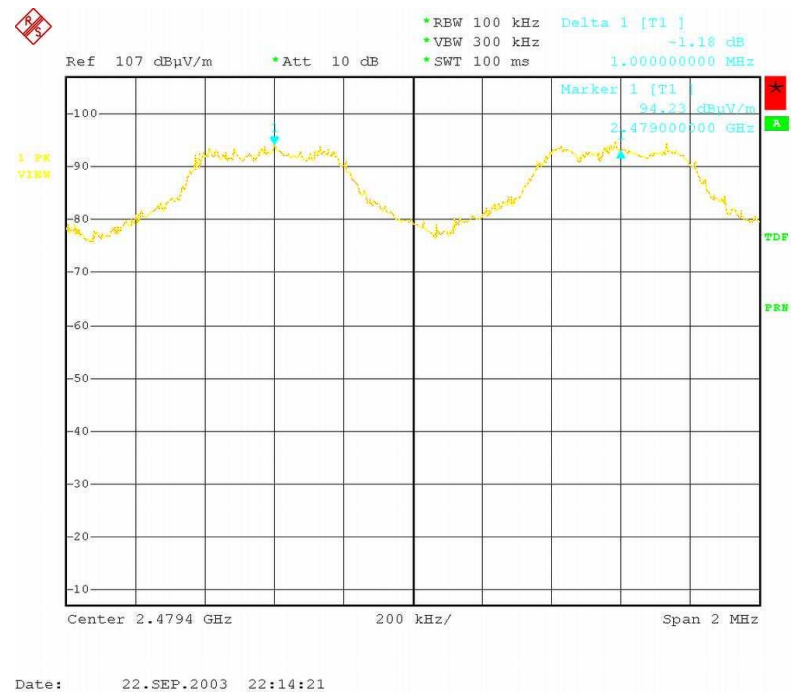
CH0



CH39



CH78



4.4 Quantity of Hopping Channel Test

4.4.1 Test Equipment

Please refer to Section 7 this report.

4.4.2 Test Procedure

The EUT was operation in hopping mode or could be controlled its channel.

4.4.3 Test Setup

Please refer to Section 4.2.3 this report.

4.4.4 Configuration of The EUT

Same as section 4.1.4 of this report

4.4.5 EUT Operating Condition

Same as section 4.1.5 of this report

4.4.6 Limit

FCC Part15, Subpart C Paragraph 15.247.

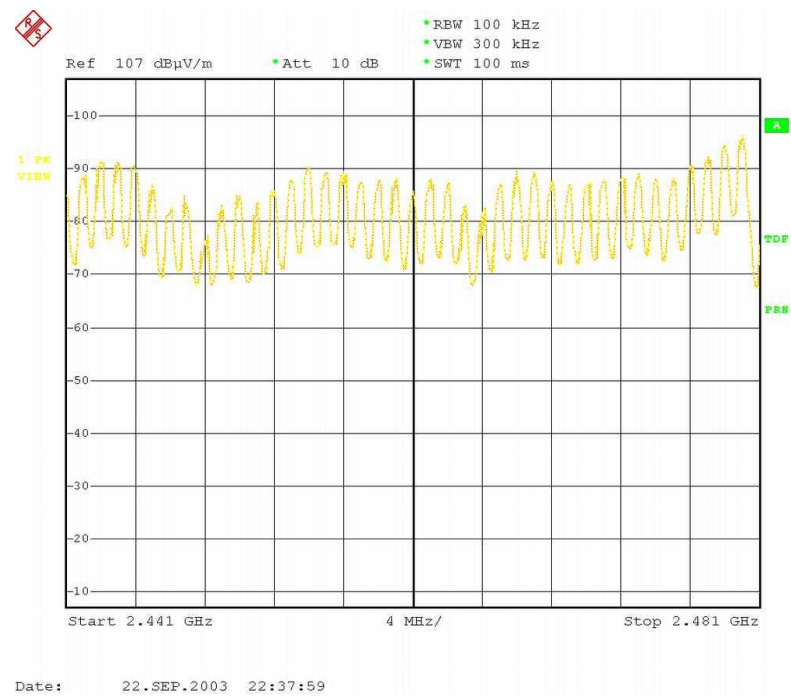
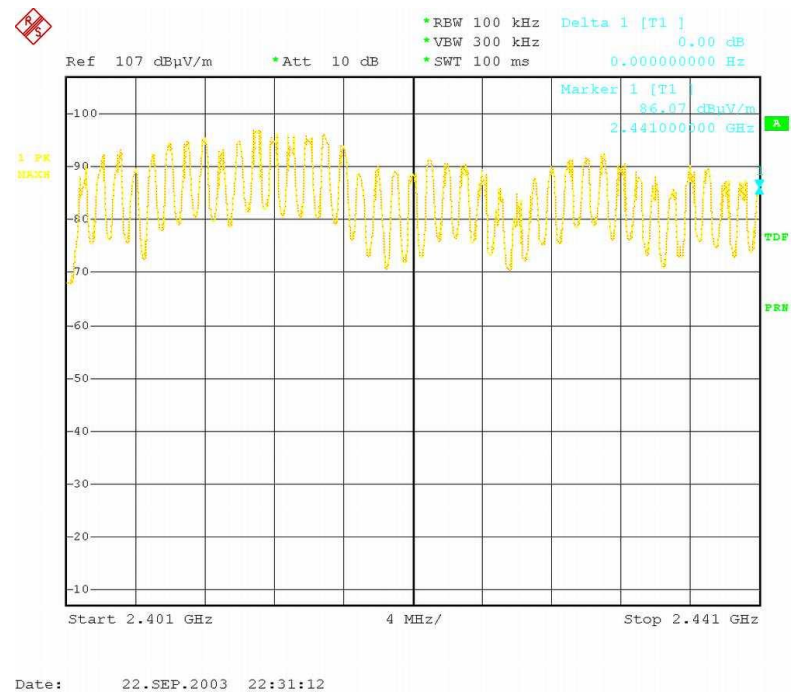
Frequency Range (MHz)	Limit (Quantity of Hopping Channel)			
	20dB bandwidth <250kHz	20dB bandwidth >250kHz	20dB bandwidth <1MHz	20dB bandwidth >1MHz
2400-2483.5	N/A	N/A	75	15

4.4.7 Test Result

Product	: UFD+Bluetooth	Test Mode	: Ch0-Ch78
Test Item	: Quantity of Hopping Channel Test	Temperature	: 25 °C
Test Voltage	: 5VDC from USB port of Host	Humidity	: 56%RH
Test Result	: PASS		

Hopping Channel Frequency Ranger	Quantity Hopping Channel Read Value	Quantity of Hopping Channel Limti
2400~2480	79	75

CH0~CH78



4. 5 Average Time of Occupancy Test

4.5.1 Test Equipment

Please refer to Section 7 this report.

4.5.2 Test Procedure

The EUT was operation in hopping mode or could be controlled its channel.

4.5.3 Test Setup

Please refer to Section 4.2.3 this report.

4.5.4 Configuration of The EUT

Same as section 4.1.4 of this report

4.5.5 EUT Operating Condition

Same as section 4.1.5 of this report

4.5.6 Limit

FCC Part15, Subpart C Paragraph 15.247

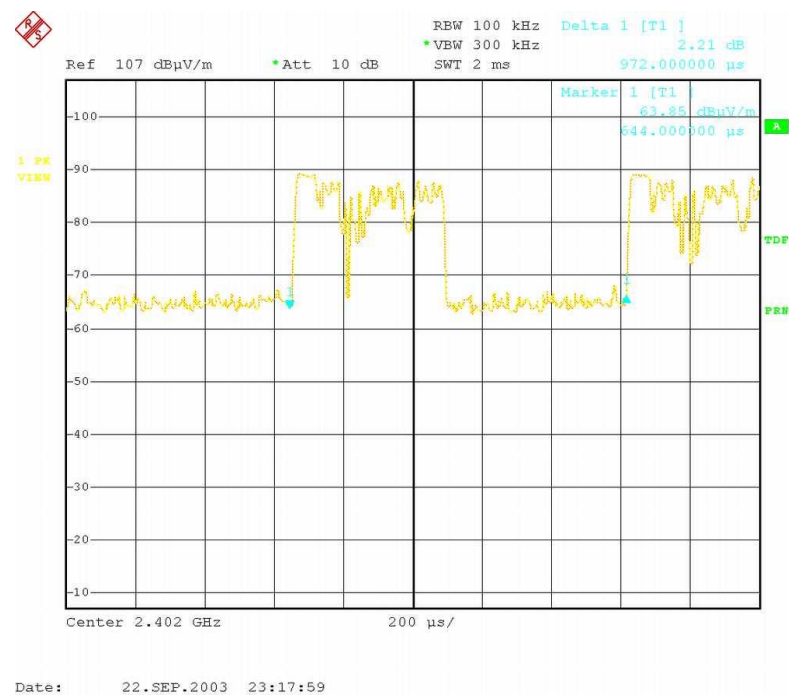
Frequency Range (MHz)	Limit (ms)		
	20dB bandwidth <250kHz (50Channel)	20dB bandwidth >250kHz (25Channel)	20dB bandwidth <1MHz (75Channel)
2400-2483.5	N/A	N/A	400(30s)

4.5.7 Test Result

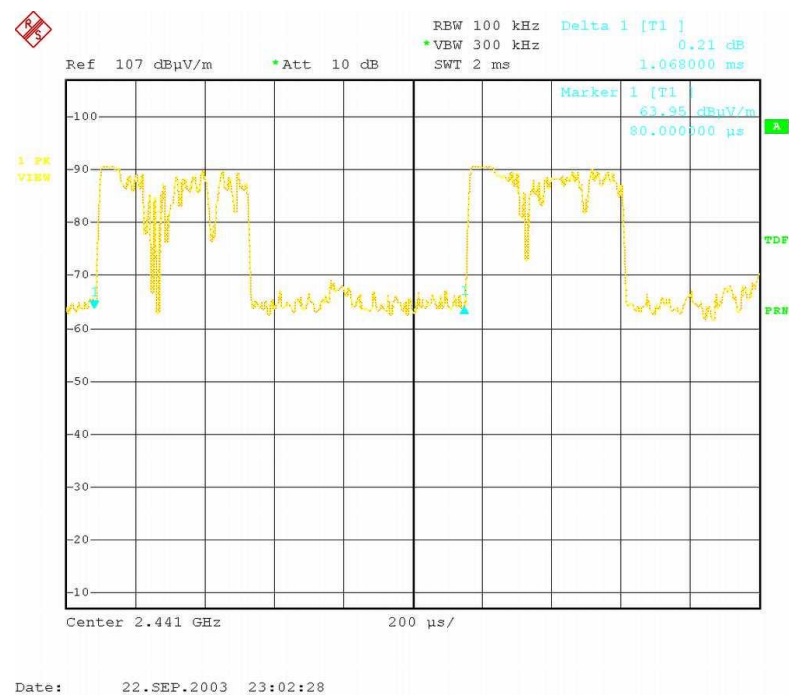
Product	: UFD+Bluetooth	Test Mode	: Ch0, Ch39, Ch78
Test Item	: Average Time of Occupancy Test	Temperature	: 25 °C
Test Voltage	: 5VDC from USB port of Host	Humidity	: 56%RH
Test Result	: PASS		

Channel Number	Channel Frequency(MHz)	Average time of occupancy Read Value(ms)	Average time of occupancy Limit(ms)
0	2402	0.972	400
39	2441	1.068	400
78	2480	1.052	400

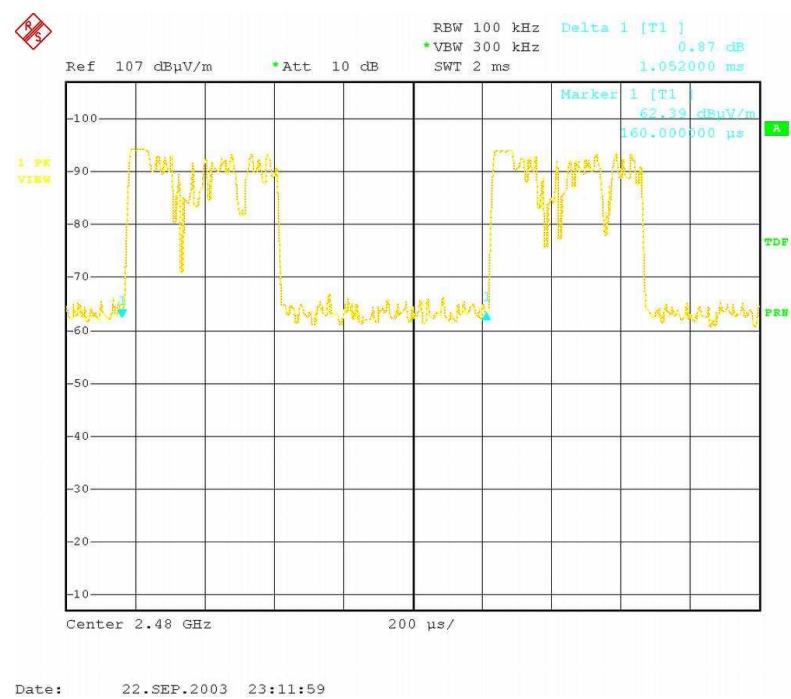
CH0



CH39



CH78



4. 6 20dBc Bandwidth Test

4.6.1 Test Equipment

Please refer to Section 7 this report.

4.6.2 Test Procedure

The EUT was operation in hopping mode or could be controlled its channel.

4.6.3 Test Setup

Please refer to Section 4.2.3 this report.

4.6.4 Configuration of The EUT

Same as section 4.1.4 of this report

4.6.5 EUT Operating Condition

Same as section 4.1.5 of this report

4.6.6 Limit

FCC Part15, Subpart C Paragraph 15.247

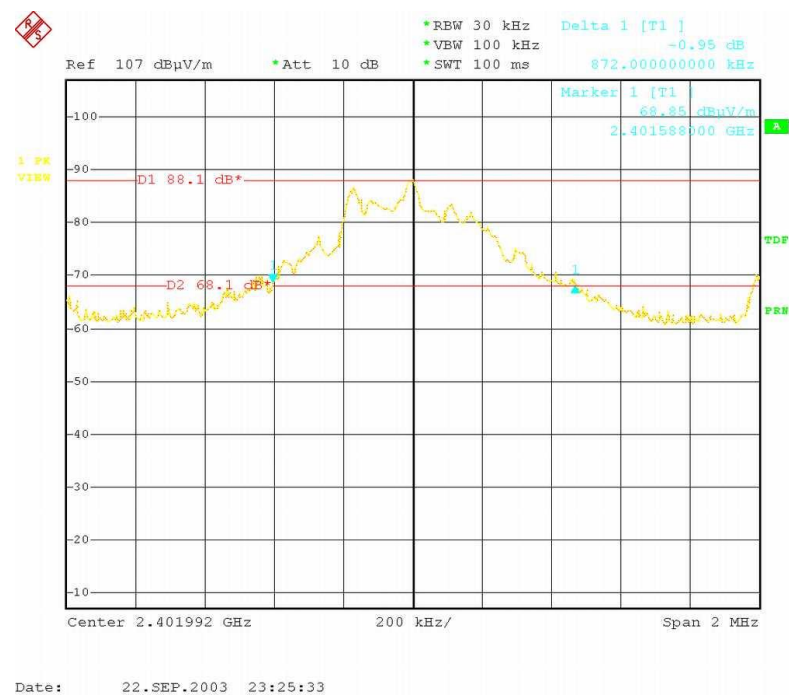
Frequency Range (MHz)	Limit (KHz)				
	Quantity of Hopping Channel	50	25	15	75
2400-2483.5		N/A	N/A	>1000	<1000

4.6.7 Test Result

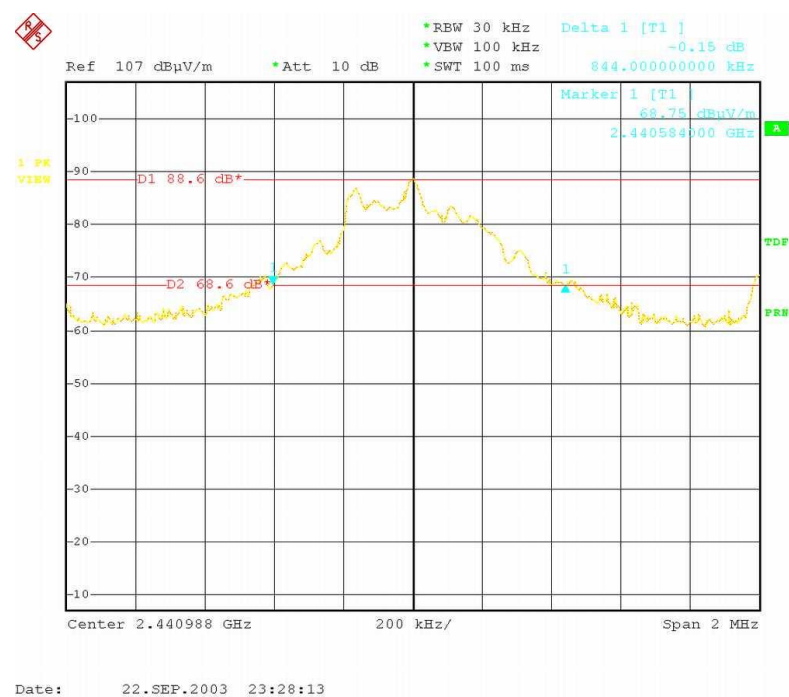
Product	: UFD+Bluetooth	Test Mode	: Ch0, Ch39, Ch78
Test Item	: 20dBc Bandwidth Test	Temperature	: 25 °C
Test Voltage	: 5VDC from USB port of Host	Humidity	: 56%RH
Test Result	: PASS		

Channel Number	Channel Frequency	20 dB Down BW (kHz)	Maximum Limit (kHz)
0	2402	872	1000
39	2441	844	1000
78	2480	808	1000

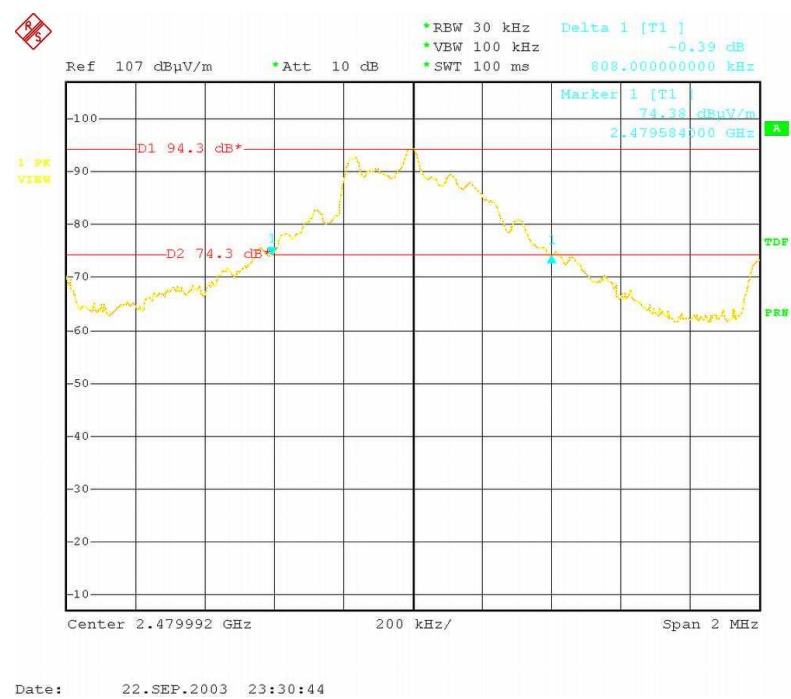
CH0



CH39



CH78



4.7 Peak Power Test

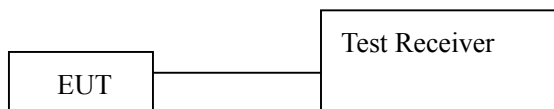
4.7.1 Test Equipment

Please refer to Section 7 this report.

4.7.2 Test Procedure

The EUT was operation in hopping mode or could be controlled its channel.

4.7.3 Test Setup



The EUT was connected to a test receiver through a 50 ohm RF cable.

4.7.4 Configuration of The EUT

Same as section 4.1.4 of this report

4.7.5 EUT Operating Condition

Same as section 4.1.5 of this report

4.7.6 Limit

FCC Part15, Subpart C Paragraph 15.247

Frequency Range (MHz)	Limit (W)				
	Quantity of Hopping Channel	50	25	15	75
2400-2483.5		N/A	N/A	0.125(21dBm)	1(30dBm)

4.7.7 Test Result

Product	: UFD+Bluetooth	Test Mode	: Ch0, Ch39, Ch78
Test Item	: Peak Power Test	Temperature	: 25 °C
Test Voltage	: 5VDC from USB port of Host	Humidity	: 56%RH
Test Result	: PASS		

Channel Number	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)
0	2401.992	-0.92	30
39	2440.988	-1.96	30
78	2479.992	-0.02	30

4.8 Band Edge Test

4.8.1 Test Equipment

Please refer to Section 7 this report.

4.8.2 Test Procedure

1. The EUT was operation in hopping mode or could be controlled its channel.
2. The EUT was tested according to the requirement of ANSI C63.4 and CISPR 22. The measurements were made at an open area test site with 10 meter measurement distance under 1 GHz and with 3m distance above 1GHz. The frequency test receiver measured started from 30MHz. Under 1 GHz, all readings were quasi-peak values with 120kHz resolution bandwidth of the test receiver. Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak and average values with 1 MHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency.

4.8.3 Test Setup

Please refer to Section 4.2.3 this report.

4.8.4 Configuration of The EUT

Same as section 4.1.4 of this report

4.8.5 EUT Operating Condition

Same as section 4.1.5 of this report

4.8.6 Limit

FCC Part15, Subpart C Paragraph 15.247. In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.20(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a)(see Section 15.205(c)).

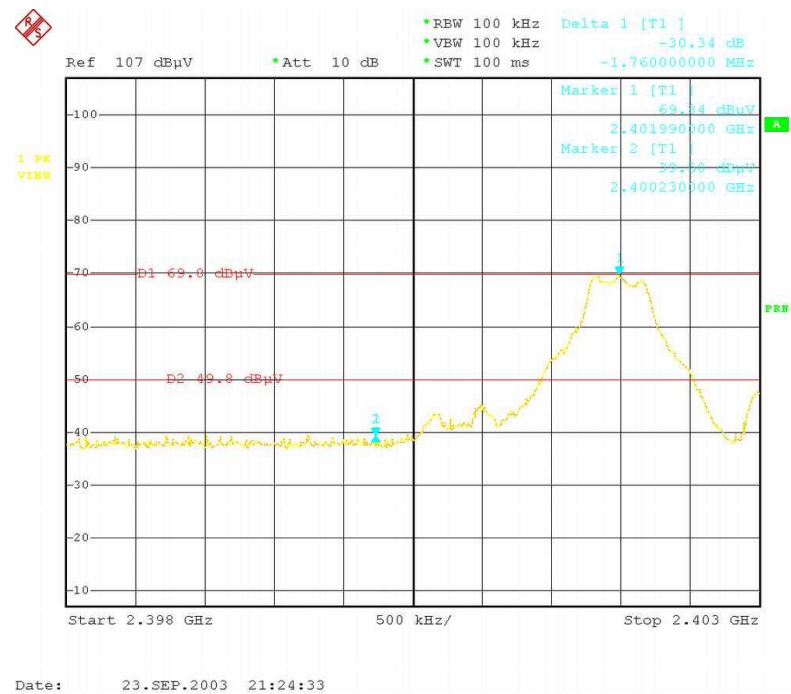
Frequency Range (MHz)	Spurious Emission Frequency (MHz)	Limit (W)	
		Peak Power Ration to Emission(dBc)	Emission Level(dBuV/m)
2400~2483.5	<2400	>20	N/A
	>2483.5~2500	N/A	54

4.8.7 Test Result

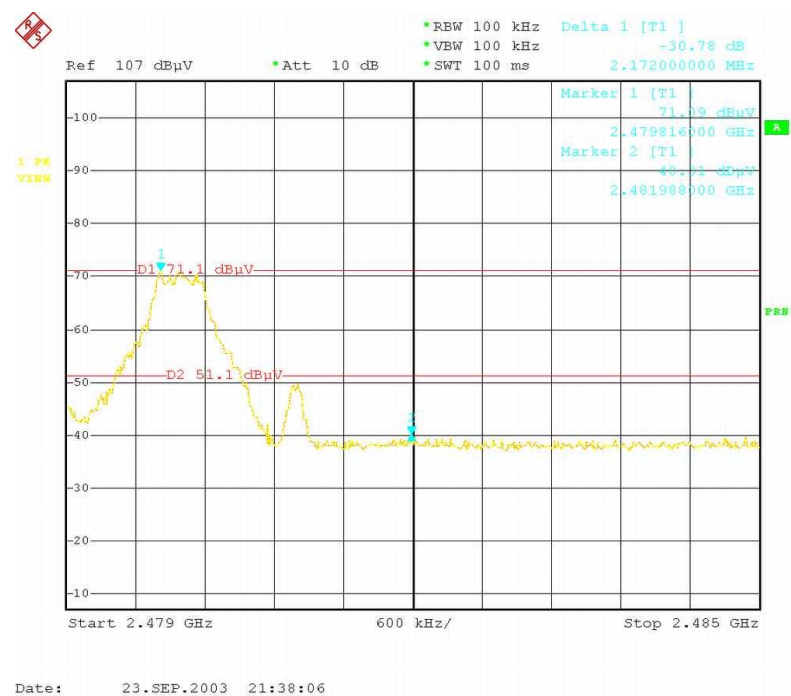
Product	: UFD+Bluetooth	Test Mode	: <2400MHz and >2483.5MHz
Test Item	: Band Edge Test	Temperature	: 25 °C
Test Voltage	: 5VDC from USB port of Host	Humidity	: 56%RH
Test Result	: PASS		

Channel	Lower Band Edge	Upper Band Edge
Band Edge difference from main channel	30.34dB	30.78dB

Lower Band Edge



Upper Band Edge



4.9 Power Density Test

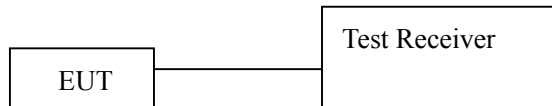
4.9.1 Test Equipment

Please refer to Section 7 this report.

4.9.2 Test Procedure

The EUT was operation in hopping mode or could be controlled its channel.

4.9.3 Test Setup



The EUT was connected to a test receiver through a 50 ohm RF cable.

4.9.4 Configuration of The EUT

Same as section 4.1.4 of this report

4.9.5 EUT Operating Condition

Same as section 4.1.5 of this report

4.9.6 Limit

FCC Part15, Subpart C Paragraph 15.247

Frequency Range (MHz)	Limit(dBm/kHz)
2400~2483.5	8dBm/3kHz

4.9.7 Test Result

Product	: UFD+Bluetooth	Test Mode	: Ch0, Ch39, Ch78
Test Item	: Power Density Test	Temperature	: 25 ℃
Test Voltage	: 5VDC from USB port of Host	Humidity	: 56%RH
Test Result	: PASS		

Channel Number	Channel Frequency (MHz)	RF Power Level in 3kHz BW	Maximum (dbm/3kHz)
0	2401.992	-11.15	8
39	2440.988	-12.19	8
78	2479.992	-10.35	8

4.10 Antenna Application

4.10.1 Antenna Requirement

The EUT's antenna is met the requirement of FCC part15C section 15.203 and 15.204.

FCC part15C section 15.247 requirement:

Systems operating in the 2400~2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

4.10.2 Result

The EUT's antenna used a monopole antenna and integrated on PCB. The antenna's gain is 1 dBi and meets the requirement.

5. Photos of Testing

5.1 EUT Test Photographs

Conducted emission test view



Radiated emission test view



5. 2 EUT Detailed Photographs

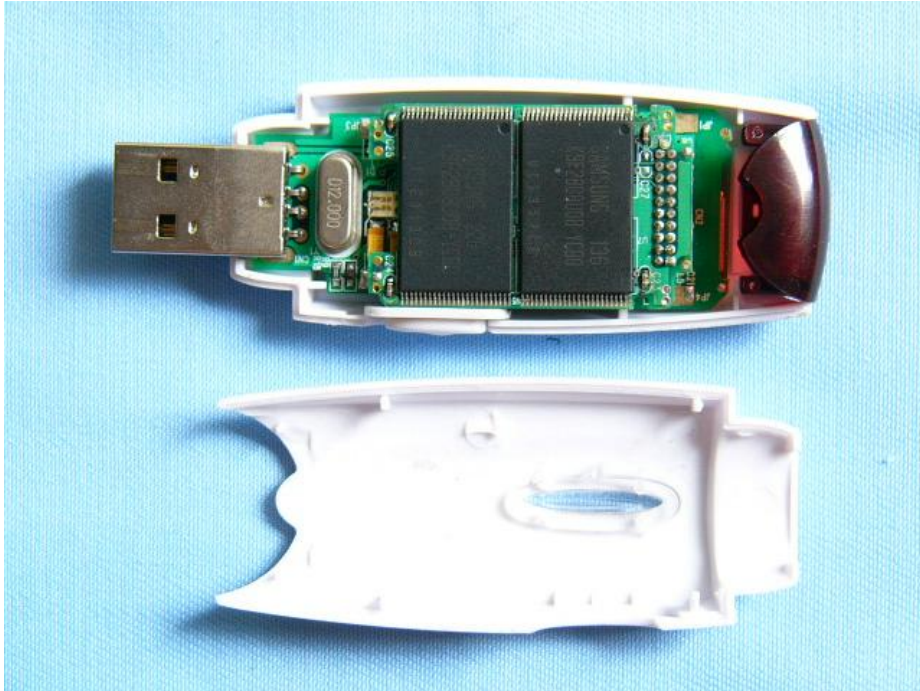
(1) EUT top view



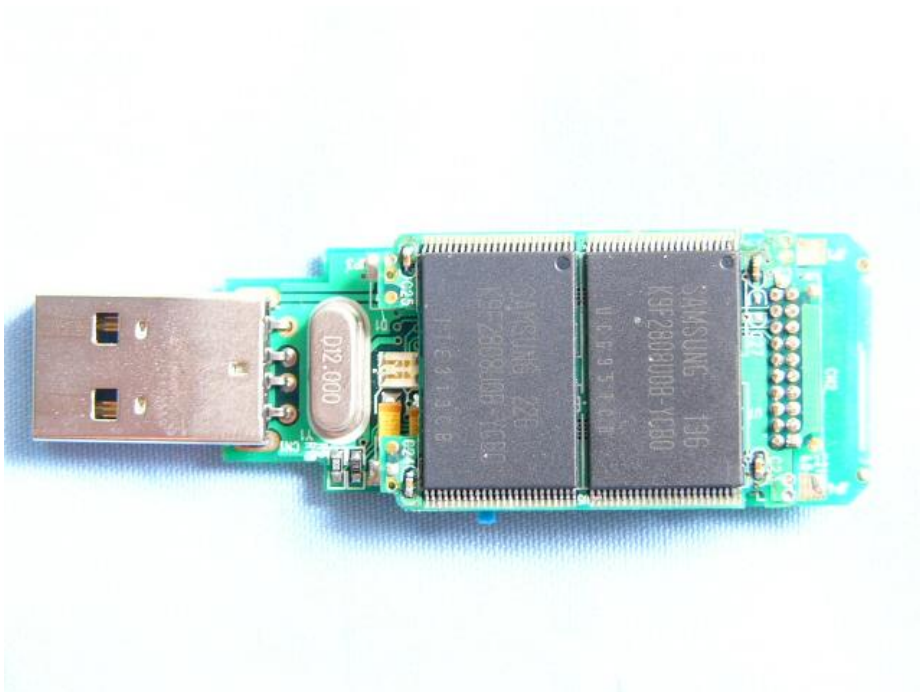
(2) EUT bottom view

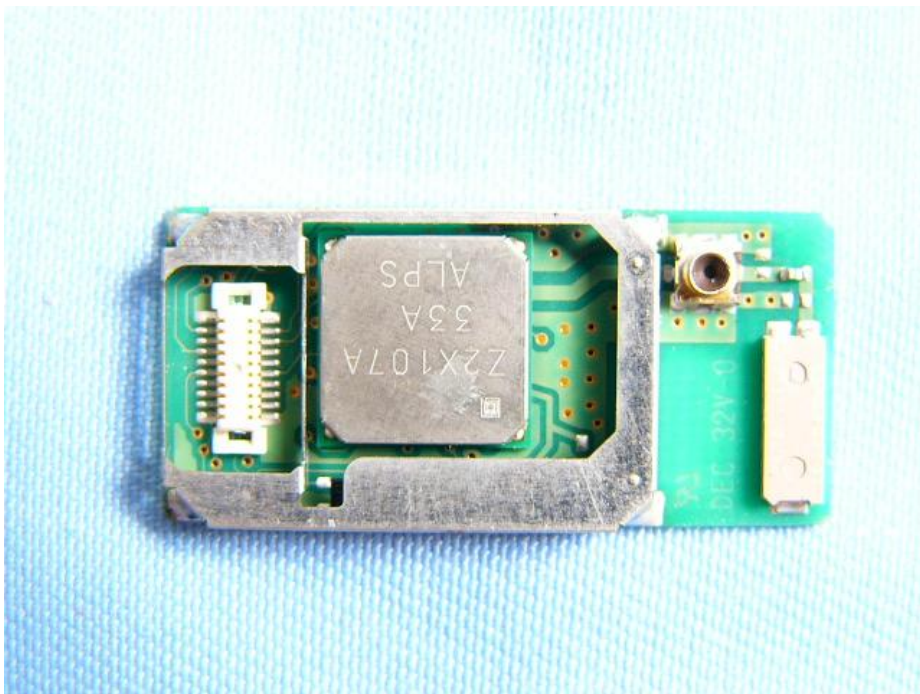
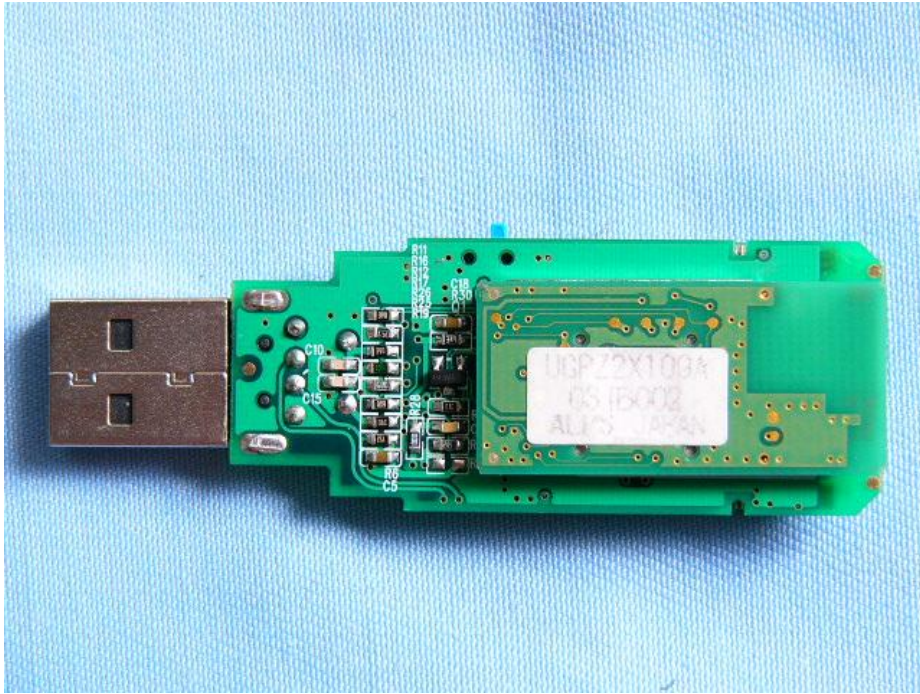


(3) EUT inside whole view

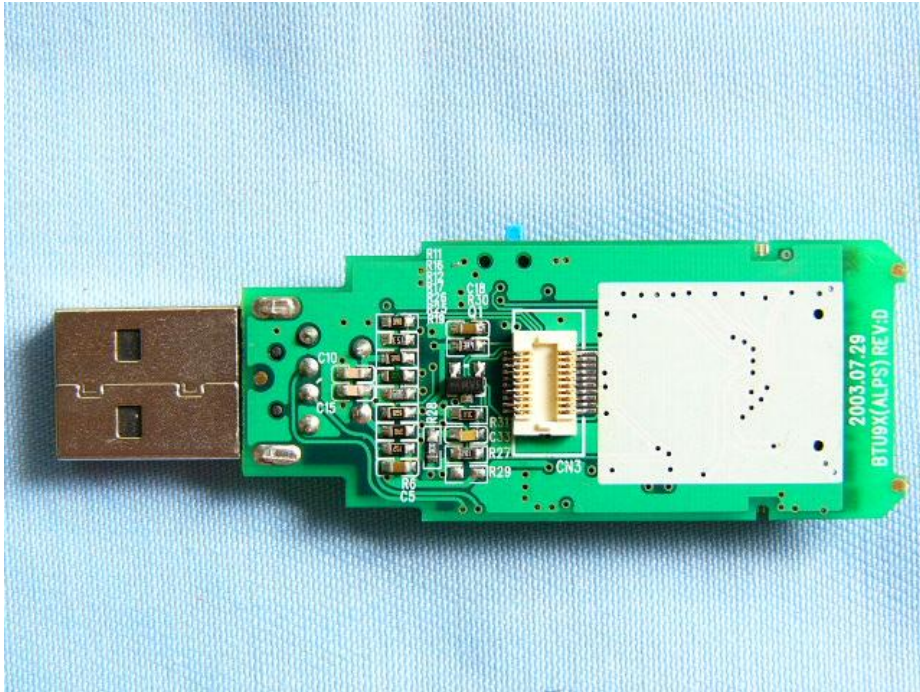


(4) Main board component side





(5) Main board solder side



6. FCC ID Label

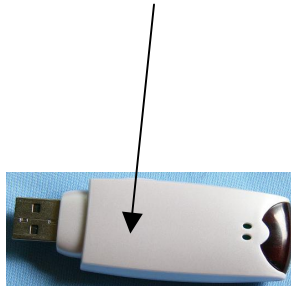
FCC ID: P2DBTU9X

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The Label must not be a stick-on paper label. The Label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Proposed Label Location on EUT

EUT Bottom View/Proposed FCC ID Location



7. Test Equipment

The following test equipments were used during the radiated & conducted emission test:

Equipment/ Facilities	Manufacturer	Model #	Serial No.	Date of Cal.	Due Date
Turntable	KMO	KSZ001T	200306	NCR	NCR
Antenna Tower	KMO	KSZ002AT	200307	NCR	NCR
OATS	KMO	KSZSITE001	N/A	July 06, 2003	July 06, 2004
EMI Test Receiver	Rohde & Schwarz	ESPI3	100180	Oct.18, 2002	Oct.18, 2003
Signal Generator	Rohde & Schwarz	SMT03	100059	Feb.01, 2003	Feb.01, 2004
Bilog Antenna	Chase	CBL6111C	2576	Feb.01, 2003	Feb.01, 2004
Ultra Broadband Antenna	Rohde & Schwarz	HL 562	100110	June.05, 2003	June.05, 2004
AMN	Rohde & Schwarz	ESH3-Z5	100196	Oct. 23,2003	Oct. 23, 2004
AMN	Rohde & Schwarz	ESH3-Z5	100197	Oct. 23,2003	Oct. 23, 2004
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	N/A	N/A	N/A
KMO Shielded Room	KMO	KMO-001	N/A	N/A	N/A
EMI Test Receiver	Rohde & Schwarz	ESCS30	100003	Feb. 27, 2003	Feb.27, 2004
AMN	Rohde & Schwarz	ESH3-Z5	100002	Feb. 01, 2003	Feb.01, 2004
LISN	Kyoritsu	KNW-407	8-1441-8	Feb. 23, 2003	Feb.23, 2004
EMI Test Receiver	Rohde & Schwarz	ESI26	838786/013	Feb. 01, 2003	Feb.01, 2004
Bilog Antenna	Chase	CBL6112B	2591	Feb. 01, 2003	Feb.01, 2004
Horn Antenna	Rohde & Schwarz	HF906	100014	Feb. 01, 2003	Feb.01, 2004
Power Meter	Rohde & Schwarz	NRVD	100041	Feb. 01, 2003	Feb.01, 2004
Radio Communication Test Set	IFR	2955B	100015	Feb 01, 2003	Feb 01, 2004
Multifunction Synthesizer	Hewlett-Packard	8904A	100016	Feb 01, 2003	Feb 01, 2004
Temperature Chamber	TABAI	PSL-4GTW	N/A	Feb 06,2003	Feb 06, 2004
3m Semi-Anechoic Chamber	Albatross Projects	9mX6mX6m	N/A	Feb. 01, 2003	Feb.01, 2004