



NVLAP LAB CODE 200707-0



## FCC PART 15.247

# MEASUREMENT AND TEST REPORT

For

**Tobii Technology AB**

Karlsrovägen 2D, 18256 Danderyd, Sweden

**FCC ID: W5MTOBIIC8**

<b>Report Type:</b> Original Report	<b>Product Type:</b> A Laptop Computer with Bluetooth, WiFi and GSM Modules
<b>Test Engineer:</b> <u>Bruce Zhang</u> <i>Bruce Zhang</i>	
<b>Report Number:</b> <u>RSZ08121003-BT</u>	
<b>Report Date:</b> <u>2009-03-11</u>	
<b>Reviewed By:</b> <u>EMC Engineer</u> <i>Merry Zhao</i>	
<b>Prepared By:</b> Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008	

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\* This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk “\*” (Rev.2)

## TABLE OF CONTENTS

<b>GENERAL INFORMATION.....</b>	<b>4</b>
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	4
OBJECTIVE .....	4
RELATED SUBMITTAL(S)/GRANT(S).....	4
TEST METHODOLOGY .....	4
TEST FACILITY .....	4
<b>SYSTEM TEST CONFIGURATION.....</b>	<b>6</b>
DESCRIPTION OF TEST CONFIGURATION .....	6
EQUIPMENT MODIFICATIONS .....	6
HOST SYSTEM CONFIGURATION LIST AND DETAILS .....	7
LOCAL SUPPORT EQUIPMENT LIST AND DETAILS .....	7
EXTERNAL I/O CABLE.....	7
CONFIGURATION OF TEST SETUP .....	8
BLOCK DIAGRAM OF TEST SETUP .....	8
<b>SUMMARY OF TEST RESULTS.....</b>	<b>9</b>
<b>CFR47 §15.247 (i), §1.1307 (b), §2.1093 - RF EXPOSURE.....</b>	<b>10</b>
STANDARD APPLICABLE .....	10
<b>§15.203 - ANTENNA REQUIREMENT.....</b>	<b>11</b>
STANDARD APPLICABLE .....	11
<b>CFR47 §15.207 (a) - CONDUCTED EMISSIONS .....</b>	<b>12</b>
APPLICABLE STANDARD .....	12
MEASUREMENT UNCERTAINTY .....	12
EUT SETUP.....	12
EMI TEST RECEIVER SETUP.....	13
TEST EQUIPMENT LIST AND DETAILS.....	13
TEST PROCEDURE .....	13
TEST RESULTS SUMMARY.....	13
TEST DATA .....	14
PLOT(S) OF TEST DATA.....	14
<b>CFR47 §15.205, §15.209, §15.247 - RADIATED EMISSIONS.....</b>	<b>17</b>
APPLICABLE STANDARD .....	17
MEASUREMENT UNCERTAINTY .....	17
EUT SETUP .....	17
EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP .....	18
TEST EQUIPMENT LIST AND DETAILS.....	18
TEST PROCEDURE .....	18
CORRECTED AMPLITUDE & MARGIN CALCULATION .....	18
TEST RESULTS SUMMARY.....	19
TEST DATA .....	19
<b>CFR47 §15.247(a) (1)-CHANNEL SEPARATION TEST .....</b>	<b>23</b>
APPLICABLE STANDARD .....	23
TEST DATA .....	23
<b>CFR47 §15.247(a) (1) – 20dB BANDWIDTH TESTING.....</b>	<b>24</b>

APPLICABLE STANDARD .....	24
TEST DATA .....	24
<b>CFR47 §15.247(a) (1) (iii)-QUANTITY OF HOPPING CHANNEL TEST .....</b>	<b>25</b>
APPLICABLE STANDARD .....	25
TEST DATA .....	25
<b>CFR47 §15.247(a) (1) (iii) -TIME OF OCCUPANCY (DWELL TIME).....</b>	<b>26</b>
APPLICABLE STANDARD .....	26
TEST DATA .....	26
<b>CFR47 §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT .....</b>	<b>27</b>
APPLICABLE STANDARD .....	27
TEST DATA .....	27
<b>CFR47 §15.247(d) - BAND EDGES TESTING .....</b>	<b>28</b>
APPLICABLE STANDARD .....	28
TEST DATA .....	28

## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

The *Tobii Technology AB*'s product, model number: *T-C84-R1.0A-V0* or the "EUT" as referred to in this report is a *Tobii C8 (A Laptop Computer with Bluetooth, WiFi and GSM Modules)*, which measures approximately: 23.2 cm L x 20.6 cm W x 3.9 cm H, input voltage: DC 24V Adapter or DC 11.1V battery.

Frequency band: PCS 1900: 1850-1910 MHz (Tx), 1930-1990 MHz (Rx)  
Bluetooth: 2402-2480 MHz (Tx/ Rx)

*\* All measurement and test data in this report was gathered from production sample serial number: 0812032 (Assigned by BACL, Shenzhen). The EUT was received on 2008-12-10.*

### Objective

This Type approval report is prepared on behalf of *Tobii Technology AB* in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

This measurement and test report only pertains to the Bluetooth portion of the EUT; for measurement and test results to the GSM 1900 function please refer to report RSZ09020402-24E issued by Shenzhen BACL.

### Related Submittal(s)/Grant(s)

FCC Part 24E and Part 15 B submission with FCC ID: W5MTOBIIC8.

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

### Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 21, 2007. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



The current scope of accreditations can be found at  
<http://ts.nist.gov/Standards/scopes/2007070.htm>

## **SYSTEM TEST CONFIGURATION**

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### **Description of Test Configuration**

The system was configured for testing in a typical fashion (as normally used by a typical user).

### **Equipment Modifications**

No modification was made to the unit tested.

## Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
DELL	Motherboard	OWC297	CN-OWC297-70821-566-02BR	DoC
DELL	Power	NPS-250KB D	CN-0H2678-17972-56E8NBM	DoC
Seagate	Hard Disk	ST340014A	5JXK3NAD	DoC
DELL	3.5' Floppy	N/A	CN-0N8893-69802-54Q-02OZ	DoC
Lite-ON	CD-Rom	LTN-489S	N/A	DoC
Intel	CPU	Celeron D-2533	N/A	N/A
ProMOS	Memory	V826632K24SATG-C0	0525-K1933700	N/A
Intel	Ethernet	PRO 10/100 VE	N/A	DoC

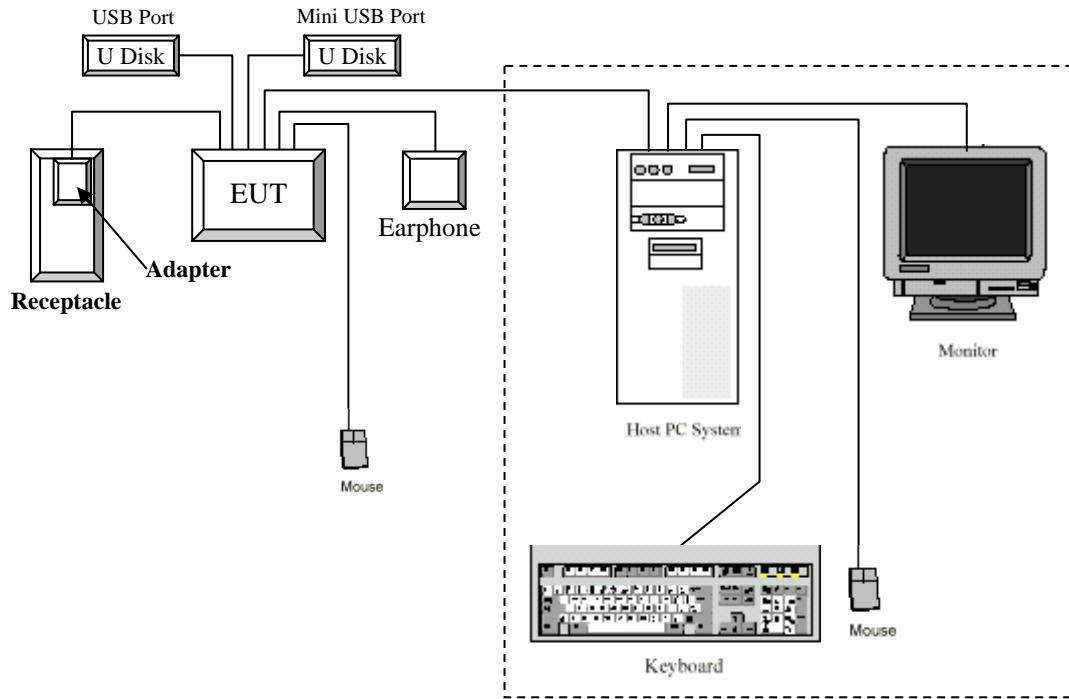
## Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
DELL	PC	DELL 170L	CN-0TC670-70821-560-F4WQ	DoC
DELL	Keyboard	SK-8110	CN07N244-71616-56I-1I0O	DoC
DELL	Mouse	M071KC	519046820	DoC
DELL	Mouse	MUC5UO	N/A	DoC
DELL	LCD Monitor	1505FP	Y4287-7168-574-GBSH	DoC
SOMIC	Earphone	ST-818	N/A	DoC
Kingston	U disk 1	Data Traveler	N/A	DoC
HuaPu	U Disk 2	DPF-802	N/A	DoC
Powerbox AB	Adapter	EXM805121	084700072/FC:11	Verification

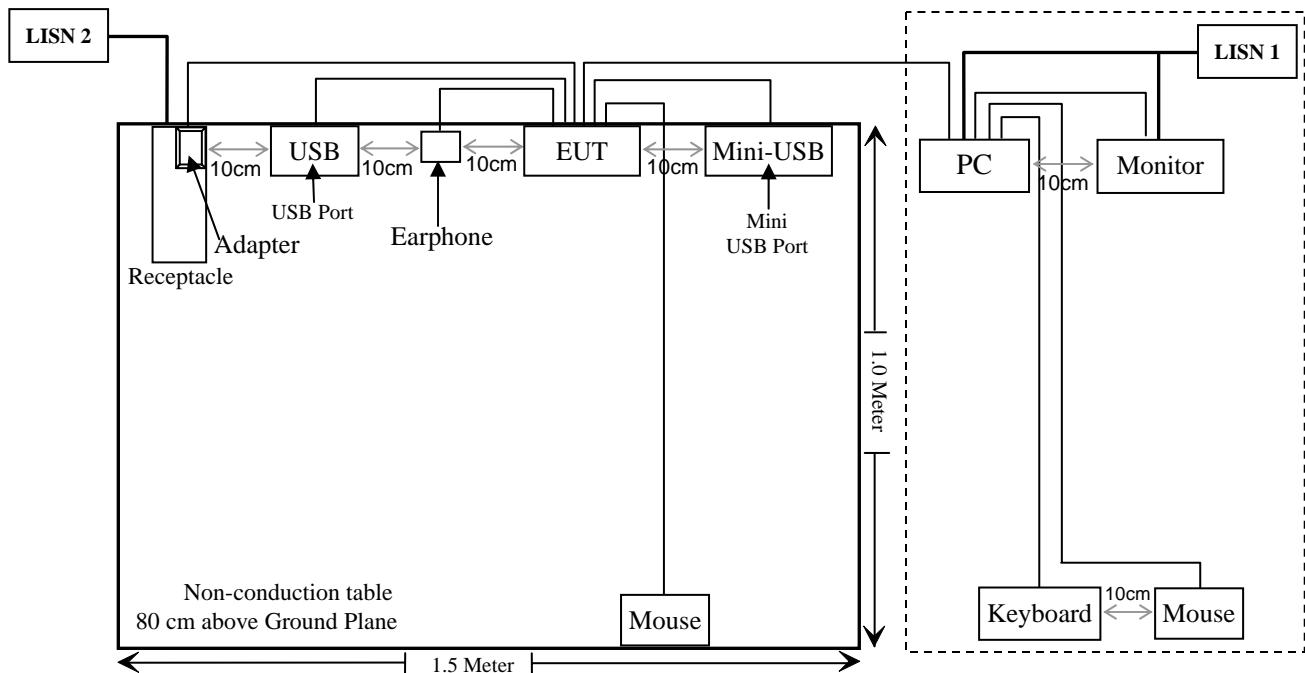
## External I/O Cable

Cable Description	Length (M)	From/Port	To
Shielded Detachable K/B Cable	1.5	K/B Port	K/B
Shielded Detachable Mouse Cable	1.5	Mouse Port	Mouse
Shielded Detachable VGA Cable	1.5	VGA Port	Monitor
Shielded Detachable Power Line	1.96	EUT	Adapter

## Configuration of Test Setup



## Block Diagram of Test Setup



## SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §2.1093	RF Exposure	Compliant*
§15.203	Antenna Requirement	Compliant*
§15.207 (a)	Conducted Emissions	Compliant
§15.205, §15.209, §15.109, §15.247(d)	Radiated Emissions	Compliant
§15.247 (a)(1)	20 dB Bandwidth	Compliant*
§15.247(a)(1)	Channel Separation Test	Compliant*
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliant*
§15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliant*
§15.247(b)(1)	Peak Output Power Measurement	Compliant*
§15.247(d)	Band edges	Compliant*

\* Please refer to FCC ID: RUJ-QBTM400 granted on 2006-01-12, report number. RE941229L01.

**CFR47 §15.247 (i), §1.1307 (b), §2.1093 - RF EXPOSURE****Standard Applicable**

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

**Limits for General Population/Uncontrolled Exposure**

According to FCC Exclusion list, In the following table,  $f_{\text{GHz}}$  is mid-band frequency in GHz, and  $d$  is the distance to a person's body, excluding hands, wrists, feet, and ankles.

Exposure category	<u>low threshold</u>	<u>high threshold</u>
general population	$(60/f_{\text{GHz}})$ mW, $d < 2.5$ cm $(120/f_{\text{GHz}})$ mW, $d \geq 2.5$ cm	$(900/f_{\text{GHz}})$ mW, $d < 20$ cm
occupational	$(375/f_{\text{GHz}})$ mW, $d < 2.5$ cm $(900/f_{\text{GHz}})$ mW, $d \geq 2.5$ cm	$(2250/f_{\text{GHz}})$ mW, $d < 20$ cm

Routine SAR evaluation refers to that specifically required by § 2.1093, using measurements or computer simulation. When routine SAR evaluation is not required, portable transmitters with output power greater than the applicable low threshold require SAR evaluation to qualify for TCB approval.

**Result: Pass**

Three antennae are available for the EUT, one is PCS antenna, the other is Wifi antenna and the third is Bluetooth antenna, according to FCC KDB 648474 D01 SAR Handsets Multi Xmter and ant, V01r05 released on September 2008, the Max ouput power is  $1.714 \text{ mW} < P_{\text{Ref}}$  (12 mW) stand-alone SAR is not required for Bluetooth.

The SAR measurement is exempt.

## §15.203 - ANTENNA REQUIREMENT

### Standard Applicable

According to § 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.247 (b), if the 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 6 dBi.

**Result:** Compliant. Antennae are integral.

\* Please refer to FCC ID: RUJ-QBTM400 granted on 2006-01-12, report number. RE941229L01.

## CFR47 §15.207 (a) - CONDUCTED EMISSIONS

### Applicable Standard

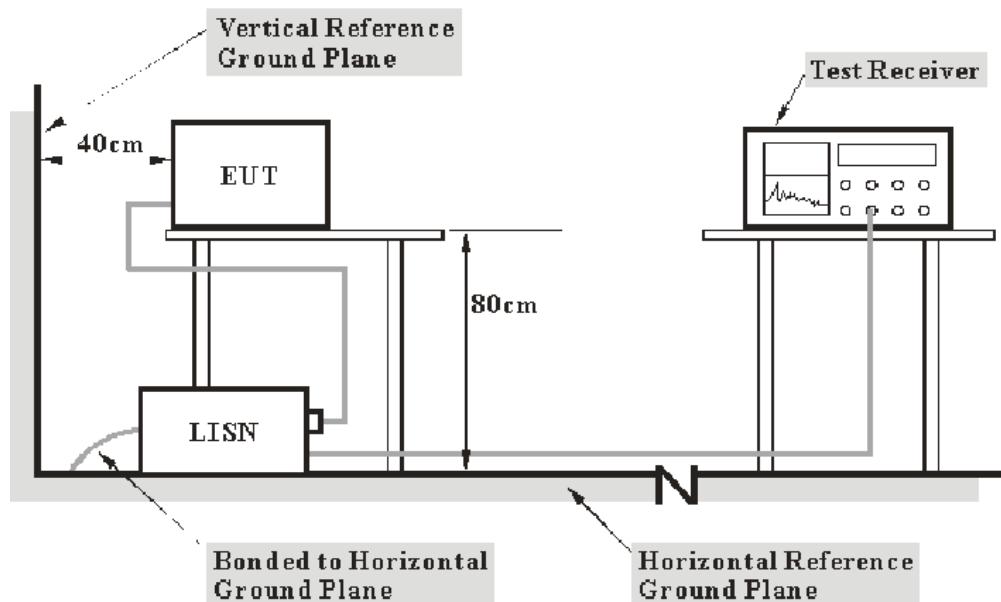
CFR47 §15.207

### Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratory Corp. (Shenzhen) is  $\pm 2.4$  dB.

### EUT Setup



**Note:**

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

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz power source.

## EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

<b><u>Frequency Range</u></b>	<b><u>IF B/W</u></b>
150 kHz – 30 MHz	9 kHz

## Test Equipment List and Details

<b>Manufacturer</b>	<b>Description</b>	<b>Model</b>	<b>Serial Number</b>	<b>Calibration Date</b>	<b>Calibration Due Date</b>
Rohde & Schwarz	EMI Test Receiver	ESCS30	DE25330	2008-03-25	2009-03-25
Rohde & Schwarz	L.I.S.N.	ESH2-Z5	892107/021	2008-03-25	2009-03-25

\* **Statement of Traceability:** Bay Area Compliance Laboratory Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

## Test Procedure

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

## Test Results Summary

According to the recorded data in following table, the EUT complied with the [FCC Part 15.207](#), with the worst margin reading of:

**2.50 dB at 0.1500 MHz** in the **Neutral** conductor mode

## Test Data

### Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0 kPa

\* The testing was performed by Bruce Zhang on 2009-02-26.

Test Mode: Operating (Bluetooth)

Line Conducted Emissions				FCC Part 15.207	
Frequency (MHz)	Amplitude (dB $\mu$ V)	Detector (QP/AV)	Conductor (Line/Neutral)	Limit (dB $\mu$ V)	Margin (dB)
0.1500	63.50	QP	Neutral	66.00	2.50
0.1500	61.30	QP	Line	66.00	4.70
12.3050	44.70	AV	Neutral	50.00	5.30
23.4200	44.60	AV	Line	50.00	5.40
12.0600	44.30	AV	Line	50.00	5.70
24.0300	43.70	AV	Neutral	50.00	6.30
22.0150	43.00	AV	Line	50.00	7.00
23.4150	49.80	QP	Line	60.00	10.20
22.1200	48.60	QP	Line	60.00	11.40
12.0600	48.50	QP	Line	60.00	11.50
12.2450	48.40	QP	Neutral	60.00	11.60
7.7850	47.70	QP	Line	60.00	12.30
7.6650	47.40	QP	Neutral	60.00	12.60
7.6650	36.40	AV	Neutral	50.00	13.60
0.5900	42.30	QP	Neutral	56.00	13.70
23.9700	45.80	QP	Neutral	60.00	14.20
7.7850	35.70	AV	Line	50.00	14.30
0.7050	40.30	QP	Line	56.00	15.70
1.1050	39.00	QP	Neutral	56.00	17.00
0.5900	28.40	AV	Neutral	46.00	17.60
0.7000	25.90	AV	Line	46.00	20.10
1.1000	24.90	AV	Neutral	46.00	21.10
0.1500	29.70	AV	Neutral	56.00	26.30
0.1500	26.50	AV	Line	56.00	29.50

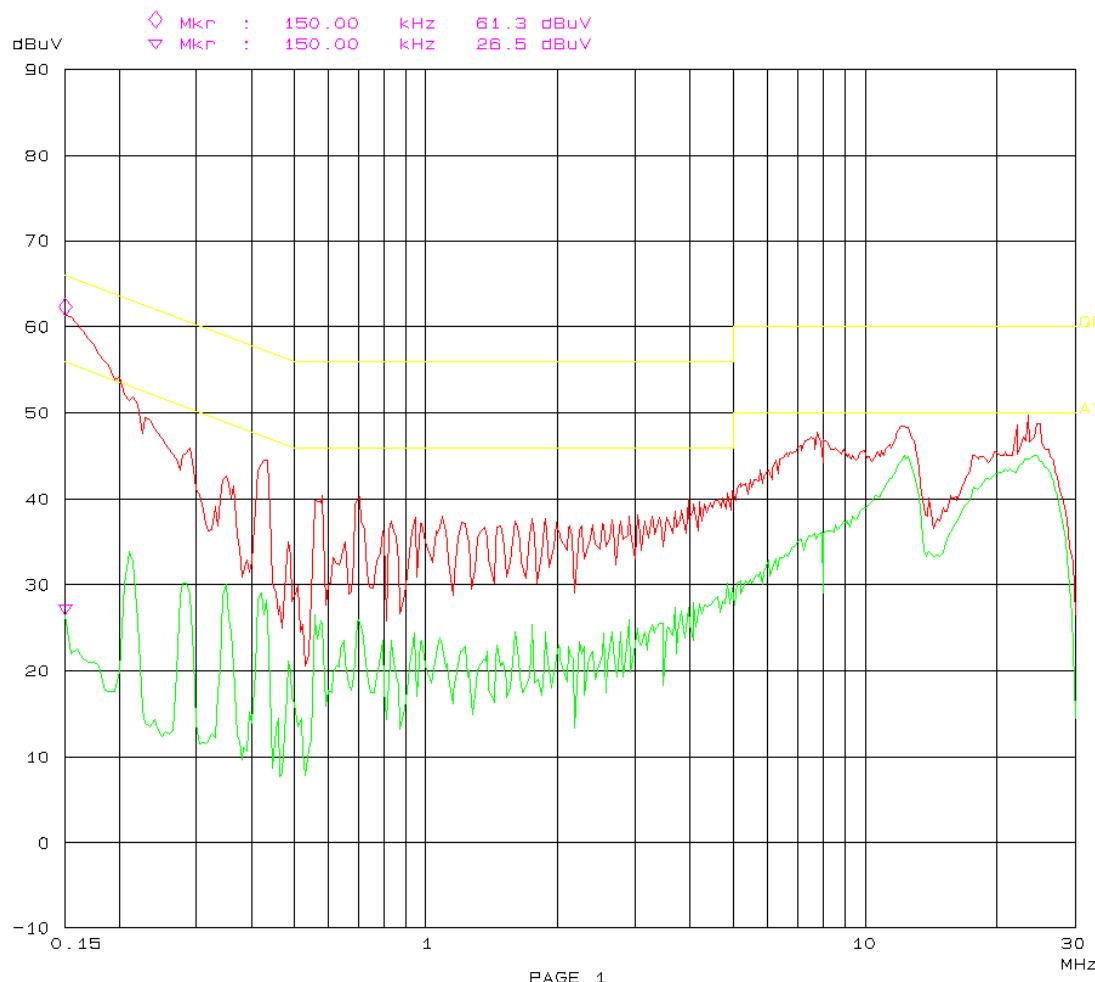
### Plot(s) of Test Data

Plot(s) of Test Data is presented hereinafter as reference.

Conducted emission  
FCC part15

02. Mar 09 11:44

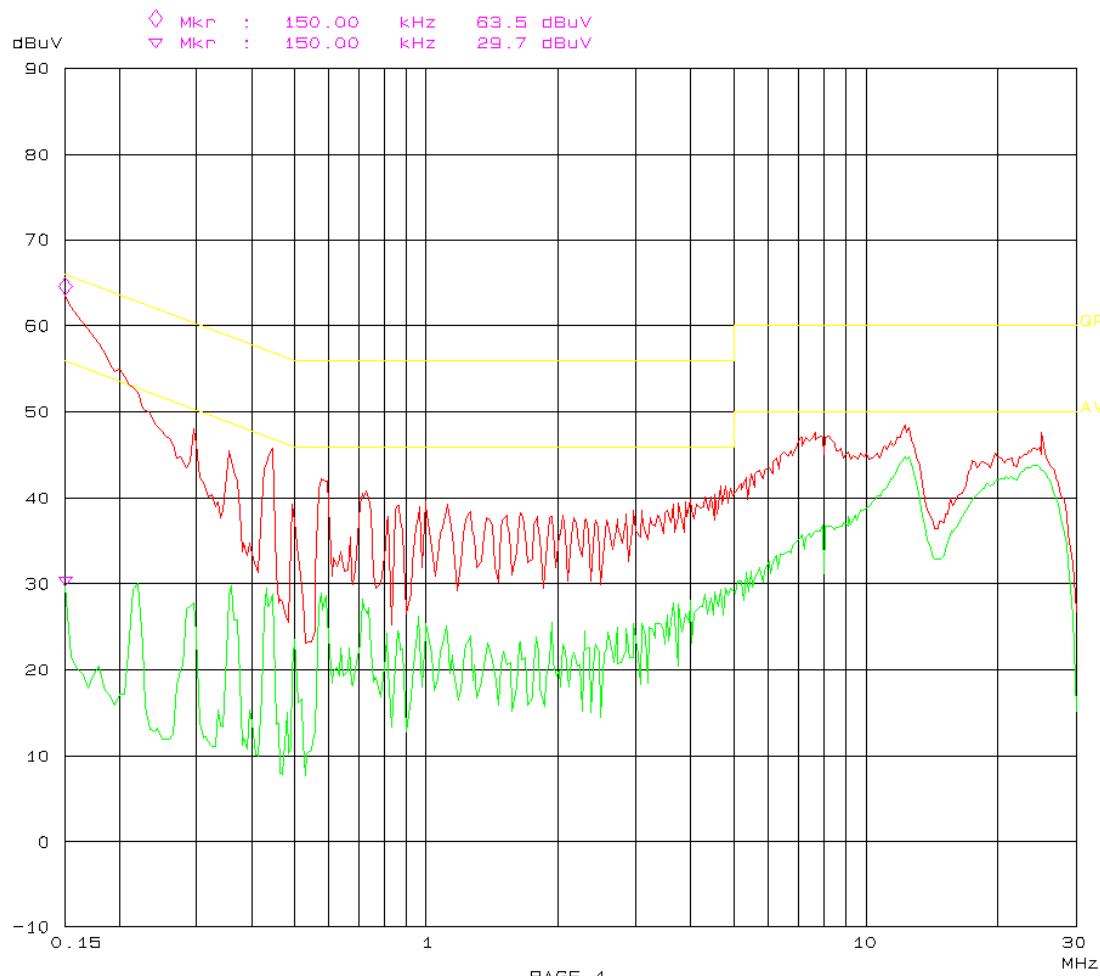
EUT: Tobii C8 M/N: T-C84-R1.0A-VO  
Manuf: Tobii  
Op Cond: Operating  
Operator: Bruce  
Test Spec: AC 120V/60Hz L  
Comment: Temp: 25 Hum: 56%  
BACL



Conducted emission  
FCC part15

02. Mar 09 13:13

EUT: Tobii C8 M/N: T-C84-R1.0A-VO  
Manuf: Tobii  
Op Cond: Operating  
Operator: Bruce  
Test Spec: AC 120V/60Hz N  
Comment: Temp: 25 Hum: 56%  
BACL



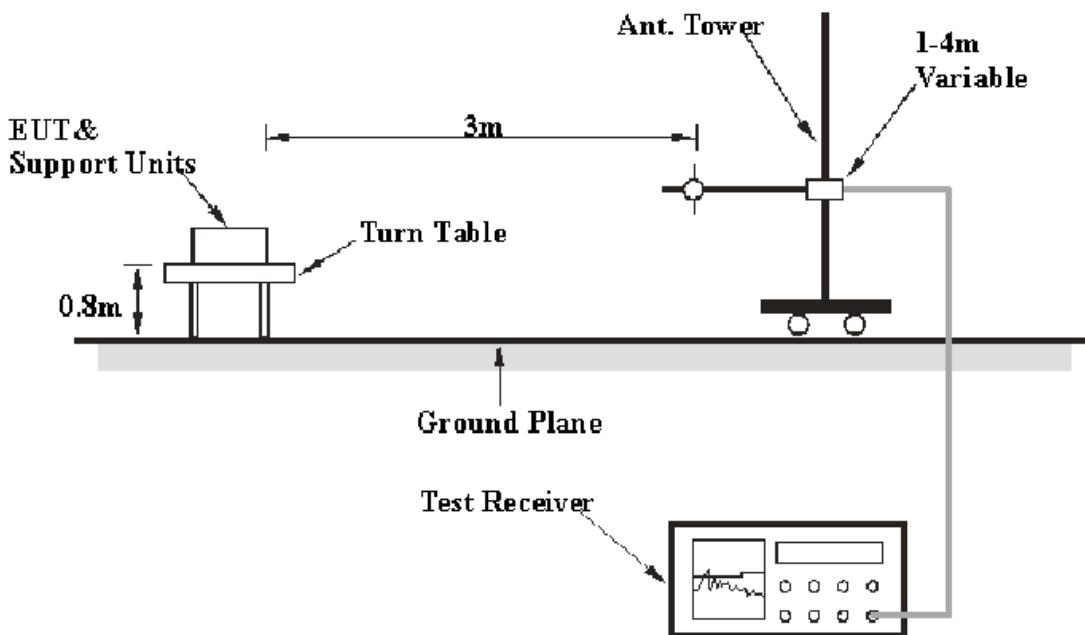
**CFR47 §15.205, §15.209, §15.247 - RADIATED EMISSIONS****Applicable Standard**

CFR47 §15.205; §15.209; §15.247 (d)

**Measurement Uncertainty**

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Shenzhen) is  $\pm 4.0$  dB.

**EUT Setup**

The radiated emission tests were performed in the 3 meters chamber B test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15.209 and FCC 15.247 limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz power source.

## EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

<b><u>Frequency Range</u></b>	<b><u>RBW</u></b>	<b><u>Video B/W</u></b>
30MHz – 1000 MHz	100 kHz	300 kHz
1000 MHz – 25 GHz	1 MHz	3 MHz

## Test Equipment List and Details

<b>Manufacturer</b>	<b>Description</b>	<b>Model</b>	<b>Serial Number</b>	<b>Calibration Date</b>	<b>Calibration Due Date</b>
HP	Amplifier	HP8447D	2944A09795	2008-11-15	2009-11-15
Rohde & Schwarz	EMI Test Receiver	ESCI	100035	2008-10-16	2009-10-16
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2008-03-11	2009-03-11
HP	Amplifier	8449B	3008A00277	2008-09-29	2009-09-29
Sunol Sciences	Horn Antenna	DRH-118	A052604	2008-09-25	2009-09-25
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2008-05-09	2009-05-09

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

## Test Procedure

For the radiated emissions test, the adapter was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1GHz and peak and Average detection modes for frequencies above 1GHz.

## Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

## Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.209 and 15.247, with the worst margin reading of:

### Transmitting mode (Below 1GHz):

**4.9** dB at **30.628150** MHz in the **Vertical** polarization

### Transmitting mode (Above 1 GHz):

**10.41** dB at **1602** MHz in the **Vertical** polarization (Low Channel)

**10.15** dB at **1600** MHz in the **Vertical** polarization (Middle Channel)

**9.08** dB at **1600** MHz in the **Vertical** polarization (High Channel)

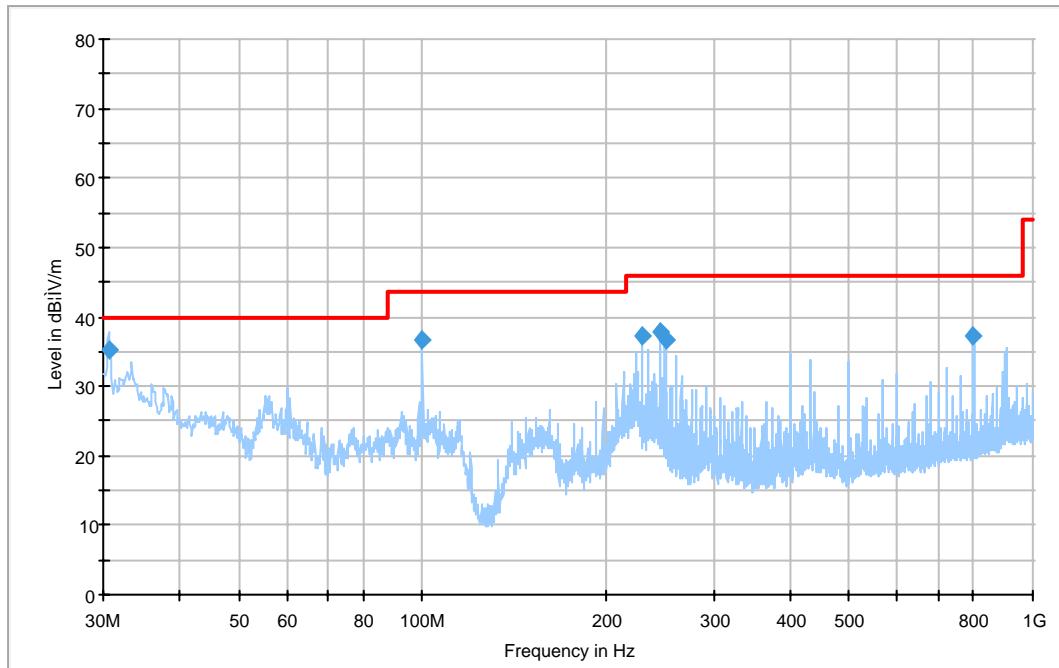
## Test Data

### Environmental Conditions

<b>Temperature:</b>	27 °C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.9 kPa

\* The testing was performed by Bruce Zhang on 2009-03-05.

*Test Mode: Transmitting (Bluetooth) (below 1 GHz)*



Frequency (MHz)	Corrected Amp. (dB $\mu$ V/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (deg)	Correction Factor (dB)	Limit (dB $\mu$ V/m)	Margin (dB)
30.628150	35.1	220.0	V	0.0	-9.0	40.0	4.9
100.002275	36.8	217.0	H	183.0	-20.2	43.5	6.7
244.663400	37.8	153.0	H	175.0	-16.0	46.0	8.2
800.126000	37.2	105.0	V	8.0	-5.4	46.0	8.8
229.107350	37.1	139.0	H	153.0	-16.6	46.0	8.9
249.990700	36.7	105.0	H	172.0	-15.9	46.0	9.3

*Test Mode: Transmitting (Bluetooth) (Above 1 GHz)*

Freq. (MHz)	S.A. Reading (dB $\mu$ V/m)	Detector PK/QP/AV	Direction Degree	Antenna			Cable Loss (dB)	Pre- Amp. Gain (dB)	Cord. Amp. (dB $\mu$ V/m)	FCC Part 15.247/209		
				Height (m)	Polar (H/V)	Factor (dB)				Limit (dB $\mu$ V/m)	Margin (dB)	Remarks
<b>Low Channel (2402 MHz)</b>												
2402.0	86.21	PK	360	1.32	H	28.9	7.22	33.9	88.43			Fund.
2402.0	54.62	AV	360	1.32	H	28.9	7.22	33.9	56.84			Fund.
2402.0	78.59	PK	324	1.10	V	29.1	7.22	33.9	81.01			Fund.
2402.0	47.34	AV	324	1.10	V	29.1	7.22	33.9	49.76			Fund.
1602.0	47.43	AV	276	1.01	V	25.5	5.06	34.4	43.59	54	10.41	spurious
4804.0	34.67	AV	37	1.74	V	33.5	6.45	33.7	40.92	54	13.08	harmonic
4804.0	32.13	AV	240	1.02	H	33.8	6.45	33.7	38.68	54	15.32	harmonic
1602.0	58.49	PK	276	1.01	V	25.5	5.06	34.4	54.65	74	19.35	spurious
2328.1	32.52	AV	260	1.68	V	29.1	7.01	34.0	34.63	54	19.37	spurious
1602.0	38.64	AV	160	1.40	H	25.3	5.06	34.4	34.60	54	19.40	spurious
2348.6	32.47	AV	360	1.00	H	28.9	7.01	34.0	34.38	54	19.62	spurious
4804.0	46.03	PK	37	1.74	V	33.5	6.45	33.7	52.28	74	21.72	harmonic
4804.0	45.02	PK	240	1.02	H	33.8	6.45	33.7	51.57	74	22.43	harmonic
2328.1	47.96	PK	260	1.68	V	29.1	7.01	34.0	50.07	74	23.93	spurious
2348.6	47.24	PK	360	1.00	H	28.9	7.01	34.0	49.15	74	24.85	spurious
1602.0	53.01	PK	160	1.40	H	25.3	5.06	34.4	48.97	74	25.03	spurious
<b>Middle Channel (2441 MHz)</b>												
2441	84.33	PK	0	1.30	H	28.9	7.22	33.9	86.55			Fund.
2441	53.85	AV	0	1.30	H	28.9	7.22	33.9	56.07			Fund.
2441	77.92	PK	360	1.44	V	29.1	7.22	33.9	80.34			Fund.
2441	47.33	AV	360	1.44	V	29.1	7.22	33.9	49.75			Fund.
1600	47.69	AV	130	1.10	V	25.5	5.06	34.4	43.85	54	10.15	spurious
1600	61.63	PK	130	1.10	V	25.5	5.06	34.4	57.79	74	16.21	spurious
4882	31.02	AV	180	1.00	V	33.5	6.45	33.7	37.27	54	16.73	harmonic
4882	29.16	AV	0	1.45	H	33.8	6.45	33.7	35.71	54	18.29	harmonic
1600	38.70	AV	141	1.30	H	25.3	5.06	34.4	34.66	54	19.34	spurious
4882	44.68	PK	180	1.00	V	33.5	6.45	33.7	50.93	74	23.07	harmonic
4882	43.15	PK	0	1.45	H	33.8	6.45	33.7	49.70	74	24.30	harmonic
1600	52.9	PK	141	1.30	H	25.3	5.06	34.4	48.86	74	25.14	spurious

Freq. (MHz)	S.A. Reading (dB $\mu$ V/m)	Detector PK/QP/AV	Direction Degree	Antenna			Cable Loss (dB)	Pre- Amp. Gain (dB)	Cord. Amp. (dB $\mu$ V/m)	FCC Part 15.247/209		
				Height (m)	Polar (H/V)	Factor (dB)				Limit (dB $\mu$ V/m)	Margin (dB)	Remarks
<b>High Channel (2480 MHz)</b>												
2480.0	80.69	PK	360	1.29	H	28.9	7.22	33.9	82.91			Fund.
2480.0	49.16	AV	360	1.29	H	28.9	7.22	33.9	51.38			Fund.
2480.0	78.13	PK	0	1.4	V	29.1	7.22	33.9	80.55			Fund.
2480.0	37.19	AV	0	1.4	V	29.1	7.22	33.9	39.61			Fund.
1600.0	48.76	AV	0	1.4	V	25.5	5.06	34.4	44.92	54	9.08	spurious
4960.0	31.06	AV	250	1.3	H	33.8	6.45	33.7	37.61	54	16.39	harmonic
1600.0	60.4	PK	0	1.4	V	25.5	5.06	34.4	56.56	74	17.44	spurious
4960.0	29.68	AV	160	1.4	V	33.5	6.45	33.7	35.93	54	18.07	harmonic
2483.6	32.24	AV	350	1.7	H	28.9	7.01	34	34.15	54	19.85	spurious
1600.0	38.13	AV	180	1.4	H	25.3	5.06	34.4	34.09	54	19.91	spurious
2495.7	31.08	AV	275	1.70	V	29.1	7.01	34	33.19	54	20.81	spurious
4960.0	44.36	PK	250	1.3	H	33.8	6.45	33.7	50.91	74	23.09	harmonic
2483.6	47.63	PK	350	1.7	H	28.9	7.01	34	49.54	74	24.46	spurious
4960.0	43.16	PK	160	1.4	V	33.5	6.45	33.7	49.41	74	24.59	harmonic
2495.7	46.26	PK	275	1.70	V	29.1	7.01	34	48.37	74	25.63	spurious
1600.0	52.2	PK	180	1.4	H	25.3	5.06	34.4	48.16	74	25.84	spurious

**CFR47 §15.247(a) (1)-CHANNEL SEPARATION TEST****Applicable Standard**

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater provided the systems operate with an output power no greater than 125 mW.

**Test Data**

\* Please refer to FCC ID: RUJ-QBTM400 granted on 2006-01-12, report number. RE941229L01.

**CFR47 §15.247(a) (1) – 20dB BANDWIDTH TESTING****Applicable Standard**

Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125mW.

**Test Data**

\* Please refer to FCC ID: RUJ-QBTM400 granted on 2006-01-12, report number. RE941229L01.

**CFR47 §15.247(a) (1) (iii)-QUANTITY OF HOPPING CHANNEL TEST****Applicable Standard**

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. 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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

**Test Data**

\* Please refer to FCC ID: RUJ-QBTM400 granted on 2006-01-12, report number. RE941229L01.

**CFR47 §15.247(a) (1) (iii) -TIME OF OCCUPANCY (DWELL TIME)****Applicable Standard**

Frequency hopping systems in the 2400-2483.5 MHz shall use at least 15 channels. 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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

**Test Data**

\* Please refer to FCC ID: RUJ-QBTM400 granted on 2006-01-12, report number. RE941229L01.

**CFR47 §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT****Applicable Standard**

According to §15.247(b) (1), for frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

**Test Data**

\* Please refer to FCC ID: RUJ-QBTM400 granted on 2006-01-12, report number. RE941229L01.

**CFR47 §15.247(d) - BAND EDGES TESTING****Applicable Standard**

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

**Test Data**

\* Please refer to FCC ID: RUJ-QBTM400 granted on 2006-01-12, report number. RE941229L01.

\*\*\*\*\* END OF REPORT \*\*\*\*\*