CONFORMANCE TEST REPORT
FOR
FCC 47 CFR, Part 15 Subpart C

Report No.: 11-11-MAS-223-01

Client:	Agilent Technologies Microwave Products (Malaysia) Sdn Bhd.
Product:	IR-to-Bluetooth Adaptor
Model:	U1177A
FCC ID:	ZKMAGILENT-U1177A
Manufacturer/supplier:	Agilent Technologies Microwave Products (Malaysia) Sdn Bhd.

Date test item received:	2011/09/22
Date test campaign completed:	2011/11/30
Date of issue:	2011/11/30

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Total number of pages of this test report: 19 pages

Total number of pages of photos: External photos 1 pages
Internal photos 3 pages
Setup photos 2 pages

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Address	: Bayan Lepas Free Industrial Zone 11900 Penang, Malaysia
Manufacturer	: Agilent Technologies Microwave Products (Malaysia) Sdn Bhd.
Address	: Bayan Lepas Free Industrial Zone 11900 Penang, Malaysia
EUT	: IR-to-Bluetooth Adaptor
Trade name	: Agilent
Model No.	: U1177A
Power Source	: 3Vdc (Battery)
Regulations applied	: FCC 47 CFR, Part 15 Subpart C Canada RSS-210 Issue 8 / RSS-Gen Issue 3 / RSS-102 Issue 4

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⑥ Industry Canada Site Regisitation number: IC 2949A-2

NVLAP Lab Code 200133-0

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1 GENERAL INFORMATION

1.1 Product Description

a) Type of EUT : IR-to-Bluetooth Adaptor
b) Trade Name : Agilent
c) Model No. : U1177A
d) FCC ID : ZKMAGILENT-U1177A

※ For FCC application:

1. Schematic updated:

1-1. cut off the line between C15 and R11 on PCBA

2-2. Jump wire between C10 and R11 on PCBA

2. RF module covered with absorbing sheet part no. : AAS-02050-K.

The proposed change does not affect the antenna port measurements for output power and the 15.247 requirements related to frequency hopping operation only radiated spurious emissions were re-measured.

This test report confirms the new EUT will conform to the rule of FCC.

1.2 Characteristics of Device

The EUT is a IR-to-Bluetooth Adaptor based on the Bluetooth technology. Bluetooth is a short-range radio link intended to be a cable replacement between portable or fixed electronic devices. Bluetooth operates in the unlicensed ISM Band at 2.4GHz. In this band, 79 RF channels spaced 1MHz apart are defined. The rated output power is 5.59 dBm (3.622 mW).

1.3 Test Methodology

All testing were performed according to the procedures in ANSI C63.4 (2009) and FCC CFR 47 Part 2 and Part 15 and DA 00-705.

1.4 Modifiction List of EUT

N/A

1.5 Test Facility

The semi-anechoic chamber and conducted measurement facility used to collect the radiated and conducted data are located inside the Building at No.8, Lane 29, Wen-ming Road, Lo-shan Tsun, Kweishan Hsiang, Taoyuan, Taiwan, R.O.C.
This site has been accreditation as a FCC filing site.

1.6 Test Summary

Requirement	FCC Paragraph #	IC Paragraph #	Test Pass
Radiated Emission	15.247 (c)	RSS-210_2.2	☒
Conducted Emission	15.207	RSS-Gen_7.2.4	N/A
Antenna Requirement	15.203	RSS-210_A8.4(2)	☒

2 PROVISIONS APPLICABLE

2.1 Definition

Unintentional radiator:
A device that intentionally generates and radio frequency energy for use within the device, or that sends radio frequency signals by conduction to associated equipment via connecting wiring, but which is not intended to emit RF energy by radiation or induction.

Class A Digital Device:
A digital device which is marketed for use in commercial or business environment; exclusive of a device which is market for use by the general public, or which is intended to be used in the home.

Class B Digital Device :
A digital device which is marketed for use in a residential environment notwithstanding use in a commercial, business of industrial environment. Example of such devices that are marketed for the general public.

Note : A manufacturer may also qualify a device intended to be marketed in a commercial, business, or industrial environment as a Class B digital device, and in fact is encouraged to do so, provided the device complies with the technical specifications for a Class B Digital Device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B Digital Device, Regardless of its intended use.

Intentional radiator:
A device that intentionally generates and emits radio frequency energy by radiation or induction.

2.2 Requirement for Compliance

(1) Radiated Emission Requirement

For intentional device, according to RSS-210 2.2, category I licence-exempt equipment is required to comply with the provisions in RSS-Gen with respect to emissions falling within restricted frequency bands. These restricted frequency bands are listed in RSS-Gen.

(2) Antenna Requirement

For intentional device, according to RSS-210 A8.4(2), for frequency hopping systems operating in the band 2400-2483.5 MHz and employing at least 75 hopping channels, the maximum peak conducted output power shall not exceed 1 W; for all other frequency hopping systems in the band, the maximum peak conducted output power shall not exceed 0.125 W. Except as provided in Section A8.4 (5), the e.i.r.p. shall not exceed 4W.

2.3 Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below :

MHz	MHz	MHz	GHz
0.090 - 0.110	12.57675-12.57725	960-1427	9.0-9.2
2.1735 - 2.1905	13.36-13.41	1435-1626.5	9.3-9.5
3.020 - 3.026	16.42-16.423	1645.5-1646.5	10.6-12.7
4.125 – 4.128	16.69475-16.69525	1660-1710	13.25-13.4
4.17725 - 4.17775	16.80425-16.80475	1718.8-1722.2	14.47-14.5
4.20725 - 4.20775	25.5-25.67	2200-2300	15.35-16.2
5.677 - 5.683	37.5-38.25	2310-2390	17.7-21.4
6.215 - 6.218	73-74.6	2655-2900	22.01-23.12
6.26775 - 6.26825	74.8-75.2	3260-3267	23.6-24.0
6.31175 - 6.31225	108-138	3332-3339	31.2-31.8
8.291 - 8.294	156.52475-156.52525	3345.8-3358	36.43-36.5
8.362 - 8.366	156.7-156.9	3500-4400	Above 38.6
8.37625 - 8.38675	240-285	4500-5150	
8.41425 - 8.41475	322-335.4	5350-5460	
12.29 - 12.293	399.9-410	7250-7750	
12.51975 - 12.52025	608-614	8025-8500	

3. SYSTEM TEST CONFIGURATION

3.1 Justification

For the purposes of this test report ancillary equipment is defined as equipment which is used in conjunction with the EUT to provide operational and control features to the EUT during the test. Notebook PC was used to control the RF channel under the highest, middle and lowest frequency and transmit the maximum RF power. Customer would not use it. But never the less ancillary equipment can influence the test results..

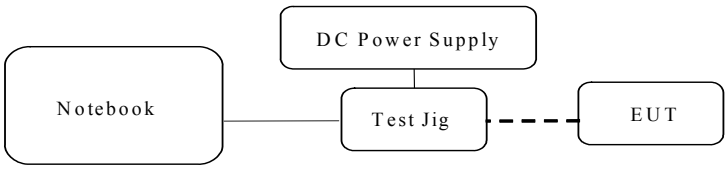
3.2 Devices for Tested System

3.2.1

Device	Manufacture	Model	Cable Description
* IR-to-Bluetooth Adaptor	Agilent Technologies Microwave Products (Malaysia) Sdn Bhd	U1177A	----
Notebook	HP	nx6320	2.5m*1, Unshielded Power Line/Adapter 1.0m*1 Unshielded Signal Line(Printer cable)
Test Jig	N/A	N/A	1.2m*1, Unshielded Power Line 0.02m*1 Unshielded Signal Line
DC Power Supply	GW	GPC3030D	1.7m*1, Unshielded Power Line

Remark

1. "*" means equipment under test.



Note: A HP notebook performs the control test mode. The notebook removes away after the control command is ready.

2.

Software:	Bluetest3.exe.
Power Setting:	Power (Ext， Int) = (0，63) for GFSK Power (Ext， Int) = (0，105) for 8DPSK and π/4-DQPSK

3.2.2 Test Mode Description

3.2.2.1 Modulation Type

Test Mode	Modulation
A	GFSK
B	π/4-DQPSK
C	8-DPSK

Test Channel	Frequency (MHz)
Channel Low (L)	2402
Channel Mid (M)	2441
Channel High (H)	2480

3.2.2.2 Test Mode and Worse Case Determination

Item	Test Item	Test Mode	Test Frequency (MHz)
1.1	Radiated Emission (below 1GHz)	A	M (Worse Case)
1.2	Radiated Emission (above 1GHz)	A	L, M, H

note:

1. The worse case is determined as the modulation with highest output power.
2. Pretest result is no difference in three test modes by channl low, middle and high. Choose mode A, channel middle for final testing and record the result.

4 RADIATED EMISSION MEASUREMENT

4.1 Applicable Standard

For intentional device, according to RSS-210 2.2, category I licence-exempt equipment is required to comply with the provisions in RSS-Gen with respect to emissions falling within restricted frequency bands. These restricted frequency bands are listed in RSS-Gen.

4.2 Measurement Procedure

A.Preliminary Measurement For Portable Devices.

For portable devices, the following procedure was performed to determine the maximum emission axis of EUT (X 、Y and Z axis):

1. With the receiving antenna is H polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
2. With the receiving antennna is V polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
3. Compare the results derived from above two steps. The axis of maximum emission from EUT was determined and the configuration was used to perform the final measurement.
4. The position in which the maximum noise occurred was “Z axis”. (Please see the test setup photos)

B. Final Measurement

1. Setup the configuration per figure 1 and 2 for frequencies measured below and above 1 GHz respectively.
2. For emission frequencies measured below 1 GHz, it is performed in a semi-anechoic chamber to determine the accurate frequencies of higher emissions. For emission frequencies measured above 1 GHz, a pre-scan be performed with a 1 meter measuring distance before final test.
3. For emission frequencies measured below and above 1 GHz, set the spectrum analyzer on a 120 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.
4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 ° to 360 ° with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading. A RF test receiver is also used to confirm emissions measured.
   Note : A filter was used to avoid pre-amplifier saturated when measure TX operation mode.
5. Repeat step 4 until all frequencies need to be measured were complete.
6. Repeat step 5 with search antenna in vertical polarized orientations.
7. Check the three frequencies of highest emission with varying the datarate, placement of ANT. cables associated with EUT to obtain the worse case and record the result.

Figure 1 : Frequencies measured below 1 GHz configuration

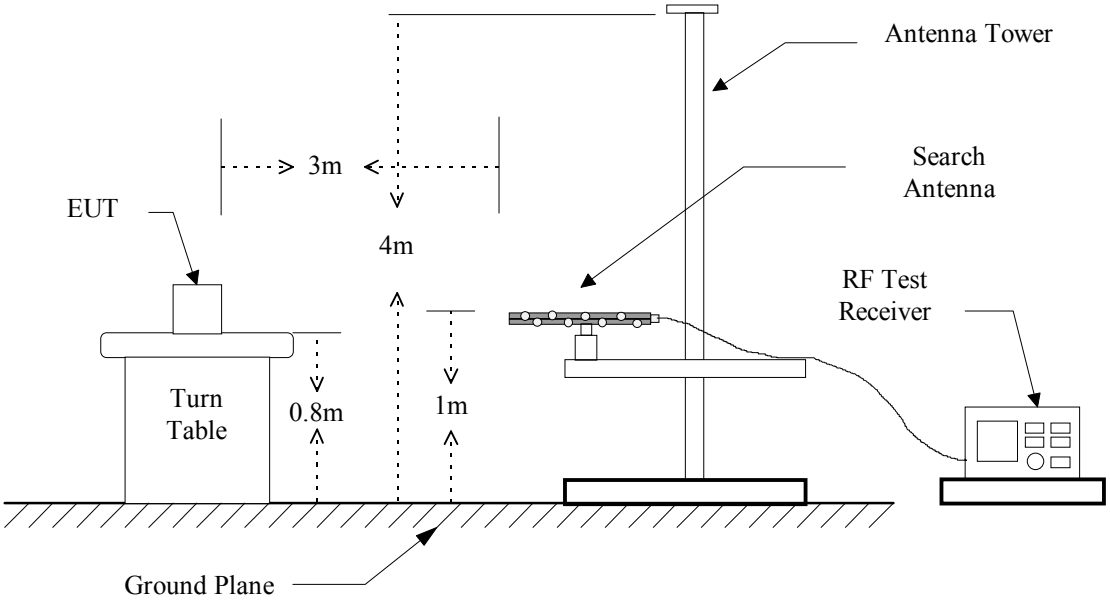
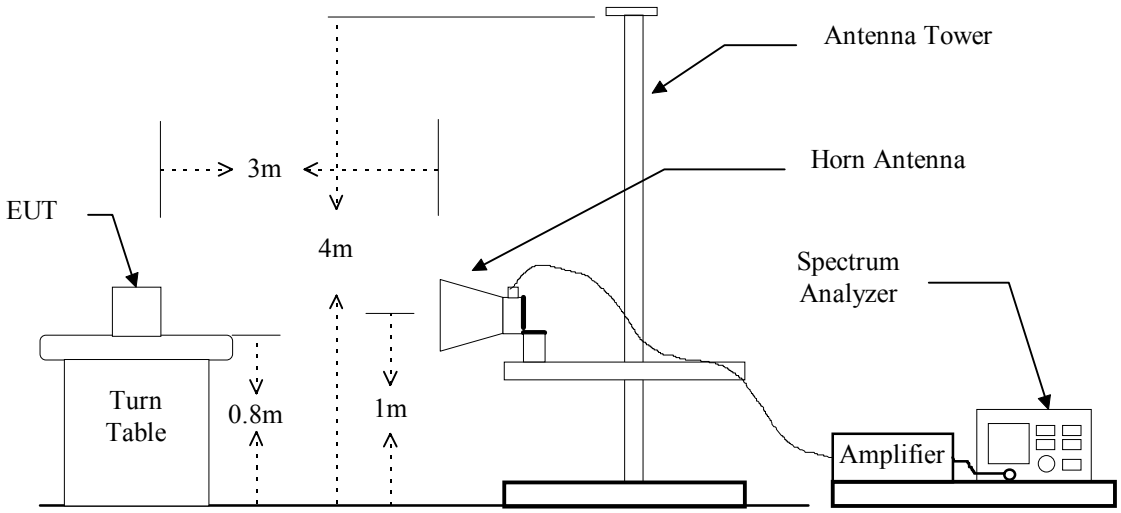


Figure 2 : Frequencies measured above 1 GHz configuration



4.3 Measuring Instrument

The following instrument are used for radiated emissions measurement :

Equipment	Manufacturer	Model No.	Next Cal. Due
EMI Test Receiver	R&S	ESIB7	06/25/2012
Spectrum Analyzer	Rohde & Schwarz	FSU46	12/23/2011
Horn Antenna	EMCO	3115	07/21/2012
BiLog Antenna	ETC	MCTD2756	12/06/2011
Horn Antenna	EMCO	3116	07/21/2012
Preamplifier	Hewlett-Packard	8449B	10/25/2012

Measuring instrument setup in measured frequency band when specified detector function is used :

Frequency Band (MHz)	Instrument	Function	Resolution Bandwidth	Video Bandwidth
30 to 1000	RF Test Receiver	Quasi-Peak	120 kHz	300 kHz
	RF Test Receiver	Peak	120 kHz	300 kHz
Above 1000	Spectrum Analyzer	Peak	1 MHz	1 MHz
	Spectrum Analyzer	Average	1 MHz	10 Hz

4.4 Radiated Emission Data

4.4.1 RF Portion

a) Channel 0

Operation Mode : Tx
Fundamental Frequency : 2402 MHz
Test Date : Nov. 15, 2011 Temperature : 22℃ Humidity : 55%

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak (H/V Max.)	Result @3m (dBuV/m) Ave (H/V Max.)	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.
4804.000	64.5	37.6	73.2	43.2	-2.53	70.7	40.7	74.0	54.0
7206.000	---	---	---	---	0.35	---	---	74.0	54.0
9608.000	---	---	---	---	2.26	---	---	74.0	54.0

b) Channel 39

Fundamental Frequency : 2441 MHz

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak (H/V Max.)	Result @3m (dBuV/m) Ave (H/V Max.)	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.
4882.000	65.6	40.0	73.5	42.7	-2.36	71.1	40.3	74.0	54.0
7323.000	---	---	---	---	0.61	---	---	74.0	54.0
9764.000	---	---	---	---	2.36	---	---	74.0	54.0

c) Channel 78

Fundamental Frequency : 2480 MHz

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak (H/V Max.)	Result @3m (dBuV/m) Ave (H/V Max.)	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.
4960.000	71.2	42.9	72.8	44.2	-2.19	70.6	42.0	74.0	54.0
7440.000	---	---	---	---	0.87	---	---	74.0	54.0
9920.000	---	---	---	---	2.45	---	---	74.0	54.0
14880.000	---	---	---	---	7.15	---	---	74.0	54.0
17360.000	---	---	---	---	9.45	---	---	74.0	54.0

Note :

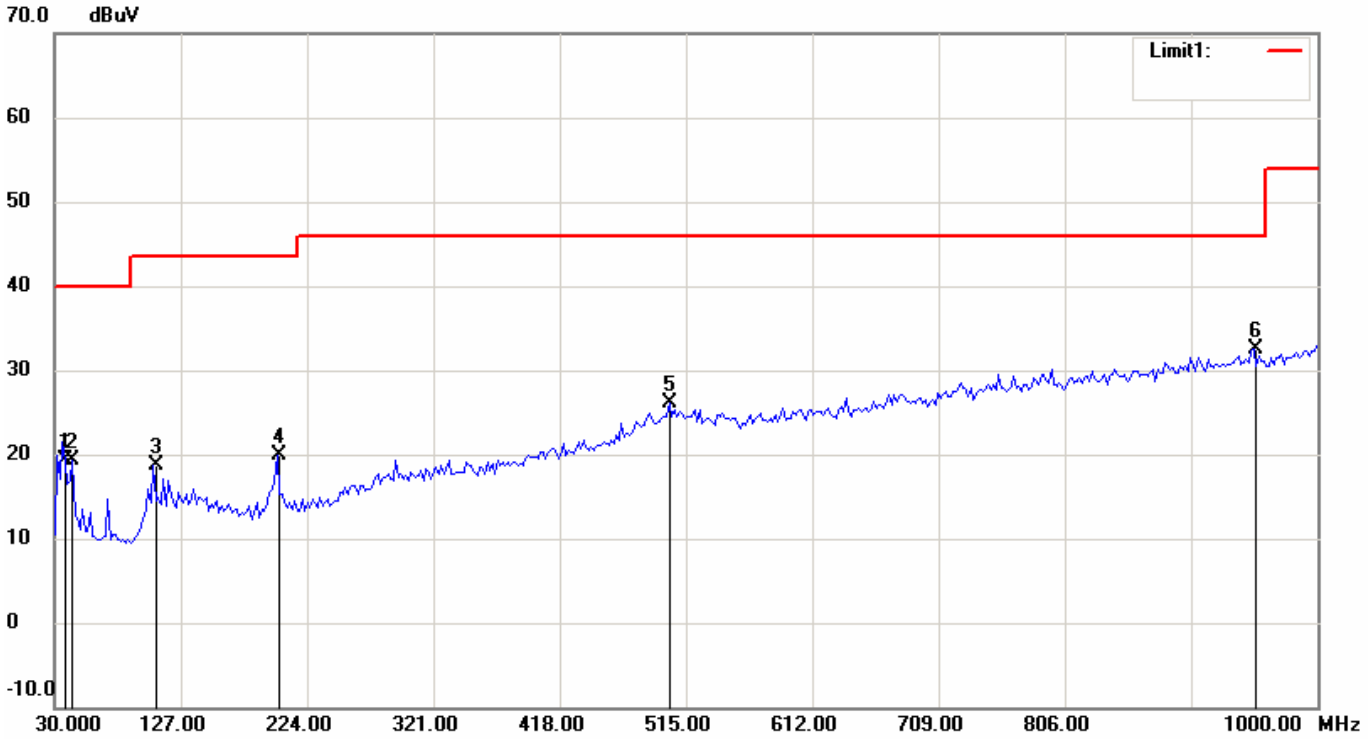
1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emissions level is too low to be measured.
3. Item "Margin" referred to Average limit while there is only peak result.
4. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental frequency and show the significant frequencies, other means the value is too low to be detected.

4.4.2 Other Emission

4.4.2.1 Operation Mode : Tx & Rx

4.4.2.1.1 below 1GHz

File: 1177 **Data:** #94 **Date:** 2011/9/22 **Temperature:** 26 ℃
Time: AM 10:49:34 **Humidity:** 55 %

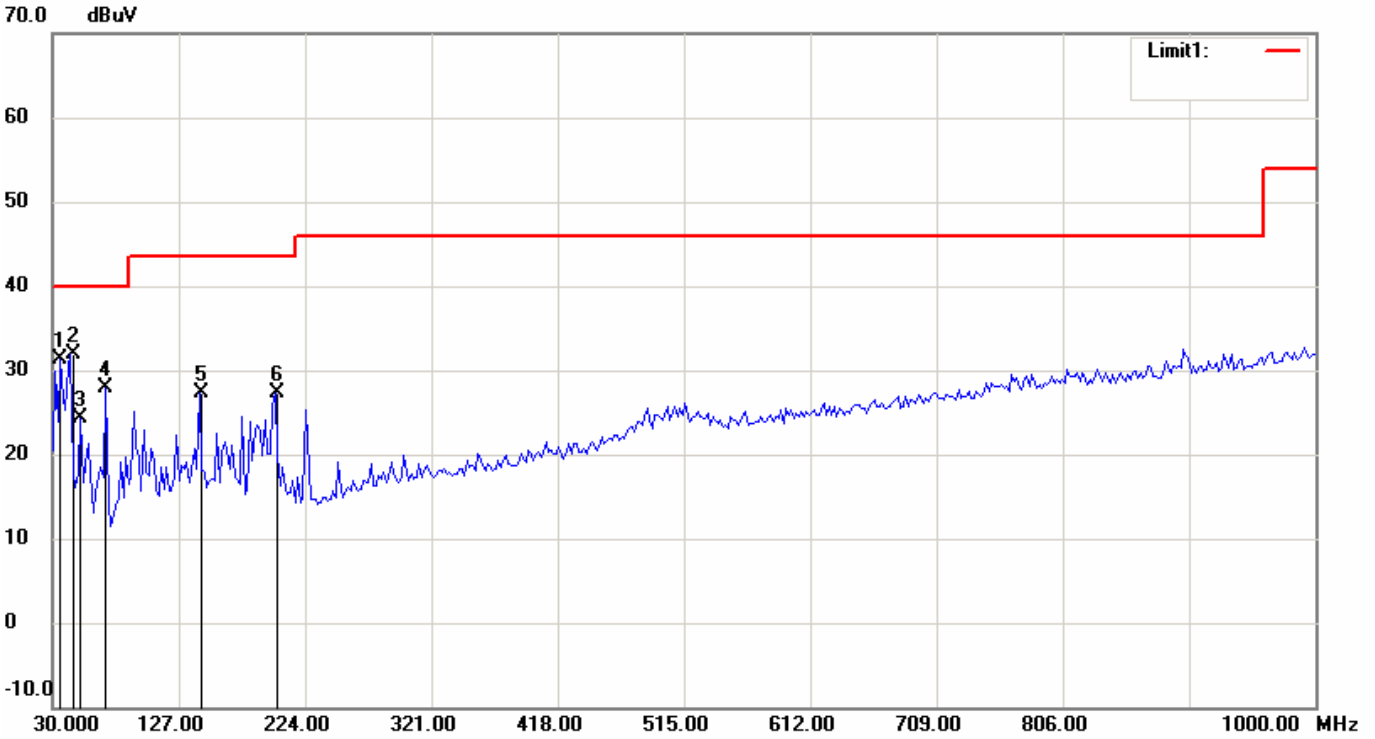


Condition: FCC Part15 RE-Class B_30-1000MHz **Polarization:** Horizontal
EUT: EUTZ **Distance:** 3m
Model:
Test Mode:

No.	Frequency (MHz)	Reading (dBuV)	Detector	Corrected dB	Result (dBuV)	Limit (dBuV)	Margin (dB)
1	37.7755	3.61	peak	15.72	19.33	40.00	-20.67
2	43.6071	6.61	peak	12.66	19.27	40.00	-20.73
3	105.8116	6.95	peak	11.69	18.64	43.50	-24.86
4	201.0621	4.08	peak	15.77	19.85	43.50	-23.65
5	502.3647	2.01	peak	24.12	26.13	46.00	-19.87
6	951.4028	2.90	peak	29.69	32.59	46.00	-13.41

File: 1177 **Data:** #96 **Date:** 2011/9/22 **Temperature:** 26 ℃

Time: AM 10:53:38 **Humidity:** 55 %



Condition: FCC Part15 RE-Class B_30-1000MHz **Polarization:** Vertical

EUT: EUTZ **Distance:** 3m

Model:

Test Mode:

No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBuV)		dB	(dBuV)	(dBuV)	(dB)
1	35.8316	14.48	peak	16.77	31.25	40.00	-8.75
2	43.6072	19.22	peak	12.66	31.88	40.00	-8.12
3	51.3828	14.52	peak	9.79	24.31	40.00	-15.69
4	70.8215	19.27	peak	8.56	27.83	40.00	-12.17
5	142.7455	13.93	peak	13.43	27.36	43.50	-16.14
6	201.0621	11.46	peak	15.77	27.23	43.50	-16.27

4.4.2.1.2 above 1GHz

4.4.2.1.2.1 Fundamental Frequency : 2402 MHz

Frequency	Ant Pol	Reading (dBuV) @3m			Factor	Result (dBuV) @3m			Limit (dBuV/m) @3m		
(MHz)	H/V	Peak	QP	AVG	(dB/m)	Peak	QP	AVG	Peak	QP	AVG
1602.0224	H	63.4	----	----	-11.60	51.8	----	----	74.0	----	54.0
1602.0224	V	61.7	----	----	-11.60	50.1	----	----	74.0	----	54.0

4.4.2.1.2.2 Fundamental Frequency : 2441 MHz

Frequency	Ant Pol	Reading (dBuV) @3m			Factor	Result (dBuV) @3m			Limit (dBuV/m) @3m		
(MHz)	H/V	Peak	QP	AVG	(dB/m)	Peak	QP	AVG	Peak	QP	AVG
1628.0192	H	62.7	----	----	-11.46	51.2	----	----	74.0	----	54.0
1628.0192	V	60.6	----	----	-11.46	49.1	----	----	74.0	----	54.0

4.4.2.1.2.3 Fundamental Frequency : 2480 MHz

Frequency	Ant Pol	Reading (dBuV) @3m			Factor	Result (dBuV) @3m			Limit (dBuV/m) @3m		
(MHz)	H/V	Peak	QP	AVG	(dB/m)	Peak	QP	AVG	Peak	QP	AVG
1654.0288	H	63.1	----	----	-11.33	51.8	----	----	74.0	----	54.0
1654.0288	V	61.5	----	----	-11.33	50.2	----	----	74.0	----	54.0

Note:
1. Place of Measurement: Measuring site of the ETC.
2. If the data table appeared symbol of "***" means the value was too low to be measured.
3. The estimated measurement uncertainty of the result measurement is
   ±4.6dB (30MHz≦f<300MHz).
   ±4.4dB (300MHz≦f<1000MHz).
   ±4.1dB (1GHz≦f≦18GHz).
   ±4.4dB (18GHz<f≦40GHz).

4 Remark “---” means that the emissions level is too low to be measured.

4.4.3 Radiated Measurement at Bandedge with Fundamental Frequencies

(A)

Channel 0

Operation Mode : Transmitting

Fundamental Frequency : 2402 MHz

Test Date : Nov. 15, 2011 Temperature : 22℃ Humidity : 55%

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak (H/V Max.)	Result @3m (dBuV/m) Ave (H/V Max.)	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.
2390.000	26.7	14.2	27.1	14.7	29.8	56.9	44.5	74.0	54.0

Note:

1. The result is the highest value of radiated emission from restrict band of 2310 ~2390 MHz.
2. Remark "---" means that the emissions level is too low to be measured.

(B)

Channel 78

Operation Mode : Transmitting

Fundamental Frequency : 2480 MHz

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak (H/V Max.)	Result @3m (dBuV/m) Ave (H/V Max.)	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.
2483.500	26.7	15.5	29.9	17.7	29.8	59.7	47.5	74.0	54.0

Note:

1. The result is the highest value of radiated emission from restrict band of 2483.5 ~2500 MHz.
2. Remark "---" means that the emissions level is too low to be measured.

4.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor, High Pass Filter Loss(if used) and Cable Loss, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

where

Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Amplifier Gain

5 CONDUCTED EMISSION MEASUREMENT

This EUT is excused from investigation of conducted emission, for it is powered by battery only. According to RSS-Gen 7.2.4, measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

6 ANTENNA REQUIREMENT

6.1 Standard Applicable

For intentional device, according to RSS-210 A8.4(2), for frequency hopping systems operating in the band 2400-2483.5 MHz and employing at least 75 hopping channels, the maximum peak conducted output power shall not exceed 1 W; for all other frequency hopping systems in the band, the maximum peak conducted output power shall not exceed 0.125 W. Except as provided in Section A8.4 (5), the e.i.r.p. shall not exceed 4W.

6.2 Antenna Construction and Directional Gain

The antennas is a Bluetooth chip antenna.

Antenna Type	Meander Line PCB
Peak Antenna Gain	0 dBi

The directional gain of antenna doesn't greater than 6 dBi, the power won't be reduced.