



TEST REPORT

Report No. : AL023278-001 Date : 2009-06-30

Application No. : LL215228(9)

Client : Janam Technologies LLC
100 Crossways Park West,
Suite 105, Woodbury, NY 11797

Sample Description : One(1) submitted sample(s) stated to be Handheld Computer Type Barcode Scanner of Model No. XM60, XM61 and XM66
Radio Frequency : 2402MHz ~ 2480MHz Bluetooth Transceiver
Rating : 1 x 3.7 V rechargeable battery
AC 100V ~ 240V to DC 5V adaptor
No. of submitted sample : Three (3) piece(s)

Date Received : 2009-04-28.

Test Period : 2009-05-18 to 2009-06-12.

Test Requested : FCC Part 15 Certification.

Test Method : 47 CFR Part 15 (10-1-08 Edition)
ANSI C63.4 – 2003

Test Result : See attached sheet(s) from page 2 to 14.

Conclusion : The submitted sample was found to comply with requirement of FCC Part 15 Subpart C.

Remark : All three models are the same in circuitry, components and constructions. Therefore, model XM60 was chosen to be the representative of the test sample. The receiver mode within the Bluetooth transceiver is subject to verification procedure.

For and on behalf of
CMA Industrial Development Foundation Limited

Authorized Signature : _____


Mr. Wong Lap-Pong, Andrew
Assistant Manager
Electrical Division

FCC ID: UTWXM6X

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1 General Information

1.1 General Description

The equipment under test (EUT) is a PDA for Handheld Computer Type Barcode Scanner. The EUT is powered by 1 x 3.7V rechargeable battery. The operation system is WinCE and built-in SDRAM, NAND Flash Memory, Barcode Scanner, Bluetooth and Wi-Fi features.

The brief circuit description is saved with filename: OpDes.pdf.



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1.2 Location of the test site

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003. A Semi-Anechoic Chamber Testing Site is set up for investigation and located at:

Ground Floor, Yan Hing Centre,
9 – 13 Wong Chuk Yeung Street,
Fo Tan, Shatin,
New Territories,
Hong Kong.

Conducted emissions measurements are investigated and also taken pursuant to the procedures of ANSI C63.4 – 2003. A shielded room is located at :

Ground Floor, Yan Hing Centre,
9 – 13 Wong Chuk Yeung Street,
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1.3 List of measuring equipment

Equipment	Manufacturer	Model No.	Serial No.	Calibration Due Date
Spectrum Analyzer	R&S	FSP30	100628	2009-09-23
Horn Antenna	Schwarzbeck	9120D	9120D-531	2010-05-19
Pre-Amplifier	Schwarzbeck	9718	9718-119	2010-05-08
EMI Test Receiver	R&S	ESCS30	100001	2010-01-16
LISN	R&S	ESH3-Z5	100038	2010-05-11
LISN	R&S	ESH3-Z5	100010	2009-08-24

1.4 List of supporting equipment

- Computer:
1. Intel CPU P4 2.8GHz / 512k cache / 533MHz bus
Model: 9426A657
 2. Intel Mother Board
Model: Intel Type: D845EPI/D845GVSR
 3. Seagate Hard-Disk
Model: ST380011A, 80GB
 4. Proview LCD Monitor
Model: 568
 5. Logitech Mouse
Model: M-S34
 6. Hewlett Packard Keyboard
Model: SK-2502C
 7. Hewlett Packard LaserJet 2100TN
Model: C4172A
 8. PenPower Handwriting System
Model: PP403N
 9. RS-232 DB9 Serial Cable with DC Adapter Connector
(Provided by Applicant)



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2 Description of the radiated emission test

2.1 Test Procedure

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003.

The equipment under test (EUT) was placed on a non-conductive turntable with dimensions of 1.5m x 1m and 0.8m high above the ground. 3m from the EUT, a broadband antenna mounting on the mast received the signal strength. The turntable was rotated to maximize the emission level. The antenna was then moving along the mast from 1m up to 4m until no more higher value was found. Both horizontal and vertical polarization of the antenna were placed and investigated.

For below 30MHz, a loop antenna with its vertical plane is placed 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1 m above the ground.

The device was rotated through three orthogonal axes to determine which attitude and configuration produce the highest emission during radiated emission measurement.

The antenna output terminal was connected to a spectrum analyzer directly for conducted output power measurement.

2.2 Test Result

Peak Detector data was measured for fundamental frequency unless otherwise stated.

“#” means emissions appearing within the restricted bands shall follow the requirement of section 15.205.

The frequencies from fundamental up to the tenth harmonics were investigated, and emissions more 20dB below limit were not reported. Thus, those highest emissions were presented in next pages (section 2.3 and 2.4)

The harmonic emissions meeting the requirement of section 15.209 are based on measurements employing the CISPR quasi-peak detector below 1000MHz and average detector for frequencies above 1000MHz.

It was found that the EUT meets the FCC requirement.



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2.3 Radiated Emission Measurement Data

**Radiated Emission
pursuant to
the requirement of FCC part 15 subpart C**

Operation Mode: Bluetooth Channel 00

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dB μ V)	Transducer Factor (dB/m)	Field Strength at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
2402.000	V	100.5	-6.8	93.7	N/A	N/A
#4803.960	V	52.2	1.0	53.2	54.0	-0.8
7205.940	H	43.9	9.9	53.8	54.0	-0.2
9607.940	H	38.3	12.8	51.1	54.0	-2.9

Operation Mode: Bluetooth Channel 39

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dB μ V)	Transducer Factor (dB/m)	Field Strength at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
2440.980	V	97.5	-6.8	90.7	N/A	N/A
#4882.000	V	48.9	1.0	49.9	54.0	-4.1
#7322.920	H	43.6	9.9	53.5	54.0	-0.5
9763.920	H	41.0	12.8	53.8	54.0	-0.2

Operation Mode: Bluetooth Channel 78

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dB μ V)	Transducer Factor (dB/m)	Field Strength at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
2480.080	V	95.5	-6.8	88.7	N/A	N/A
#4960.080	V	44.1	1.0	45.1	54.0	-8.9
#7440.920	H	40.6	9.9	50.5	54.0	-3.5
9920.820	H	39.7	12.8	52.5	54.0	-1.5

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2.4 Conducted Emission Measurement Data

**Conducted Emission
pursuant to
the requirement of FCC part 15 subpart C**

Operation Mode: Bluetooth Channel 00

Transmission Power

Frequency (MHz)	Reading (dB μ V)	Reading (μ W)	Limit (W)	Margin (W)
2402.050	103.8	479.767	1.0	-0.999

Harmonic Emission

Frequency (MHz)	Measured Reading (dB μ V)	Limit - 20dB below Carrier (dB μ V)	Margin (dB)
4804.450	59.6	83.8	-24.2
7206.010	65.8	83.8	-18.0
9608.050	63.1	83.8	-20.7

Operation Mode: Bluetooth Channel 39

Transmission Power

Frequency (MHz)	Reading (dB μ V)	Reading (μ W)	Limit (W)	Margin (W)
2441.040	102.9	389.969	1.0	-0.999

Harmonic Emission

Frequency (MHz)	Measured Reading (dB μ V)	Limit - 20dB below Carrier (dB μ V)	Margin (dB)
4882.080	59.0	82.9	-23.9
7323.080	63.8	82.9	-19.1
9764.070	62.3	82.9	-20.6



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2.4 Conducted Emission Measurement Data (Con't)

Conducted Emission
pursuant to
the requirement of FCC part 15 subpart C

Operation Mode: Bluetooth Channel 78

Transmission Power

Frequency (MHz)	Reading (dBμV)	Reading (μW)	Limit (W)	Margin (W)
2480.090	102.1	324.362	1.0	-0.999

Harmonic Emission

Frequency (MHz)	Measured Reading (dBμV)	Limit - 20dB below Carrier (dBμV)	Margin (dB)
4960.170	58.0	82.1	-24.1
7439.950	60.8	82.1	-21.3
9919.920	60.8	82.1	-21.3



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3 Description of the Line-conducted Test

3.1 Test Procedure

Conducted emissions measurements are investigated and also taken pursuant to the procedures of ANSI C63.4 – 2003. The EUT was setup as described in the procedures, and both lines were measured.

3.2 Test Result

The PC connected mode was tested. The Bluetooth function was enabled by the PC.

It was found that the EUT met the FCC requirement.

3.3 Graph and Table of Conducted Emission Measurement Data

For electronic filing, the documents are saved with filename TestRpt2.pdf.



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4 Photograph

4.1 Photographs of the Test Setup for Radiated Emission and Conduction Emission

For electronic filing, the photos are saved with filename TSup1.jpg to TSup5.jpg.

4.2 Photographs of the External and Internal Configurations of the EUT

For electronic filing, the photos are saved with filename ExPho1.jpg to ExPho2.jpg and InPho1.jpg to InPho4.jpg.



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5 Supplementary document

The following document were submitted by applicant, and for electronic filing, the document are saved with the following filenames:

Document	Filename
ID Label/Location	LabelSmp.jpg
Block Diagram	BlkDia.pdf
Schematic Diagram	Schem.pdf
Users Manual	UserMan.pdf
Operational Description	OpDes.pdf

5.1 Bandwidth

The plot saved in TestRpt3.pdf shows the channel spacing has minimum 25kHz.

The plot saved in TestRpt4.pdf shows the frequency hopping channel over 75 hopping frequencies.

The plot saved in TestRpt5.pdf shows the fundamental emission is confined in the specified band. It shows the 20dB bandwidth met the 15.247(d) requirement for frequency band 2400 to 2483.5MHz.

5.2 Duty Cycle

Not Applicable

5.3 Transmission Time

Not Applicable

5.4 Power Spectral Density

Not Applicable



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5.5 Average on time

The plot saved in TestRpt6.pdf shows the average on time for frequency hopping channel is with in 0.4 seconds.

The calculation for average on time as below:

Average hopping channel = Number of transmitted carrier / Sweep time

Average on time = Packet on time x Average hopping channel

Dwell time = Average on time x Total frequency hopping channel x 0.4

Test result:

Frequency Channel (MHz)	Packet	Dwell Time (Seconds)	Limit (Seconds)	Margin (Seconds)
2402	DH1	0.125	0.4	-0.275
2402	DH3	0.261	0.4	-0.139
2402	DH5	0.367	0.4	-0.033
2441	DH1	0.125	0.4	-0.275
2441	DH3	0.261	0.4	-0.139
2441	DH5	0.367	0.4	-0.033
2480	DH1	0.125	0.4	-0.275
2480	DH3	0.261	0.4	-0.139
2480	DH5	0.367	0.4	-0.033



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6 Appendices

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A2.	Photos of the set-up of Conducted Emissions	2	pages
A3.	Photos of External Configurations	1	page
A4.	Photos of Internal Configurations	2	pages
A5.	ID Label/Location	1	page
A6.	Conducted Emission Measurement Data	2	pages
A7.	Bluetooth Channel Spacing	1	page
A8.	Bluetooth Hopping Channel	1	page
A9.	Bluetooth Band Edge	1	page
A10.	Bluetooth Average On Time	6	pages
A11.	Block Diagram	1	page
A12.	Schematics Diagram	15	pages
A13.	User Manual	4	pages
A14.	Operation Description	2	pages

***** End of Report *****