



TEST REPORT

Report No. : AK026333-001 Date : 2008-07-30

Application No. : LK213865(3)

Client : Janam Technologies LLC
40 Goose Hill Road, Cold Spring Harbor,
New York 11724, United States

Sample Description : One(1) submitted sample(s) stated to be Janam barcode scanning mobile computer of Model No. XP30W-1P, XP30W-1N, XM60W-1P, XM60W-1N, XM65W-1P and XM65W-1N
Rating : 1 x 3.7 V rechargeable battery
: AC 100V ~ 240V to DC 5V adaptor
No. of submitted sample : One (1) piece(s) ***

Date Received : 2008-05-29.

Test Period : 2008-05-29 to 2008-06-30.

Test Requested : FCC Part 15 Certification.

Test Method : 47 CFR Part 15 (10-1-07 Edition)
ANSI C63.4 – 2003

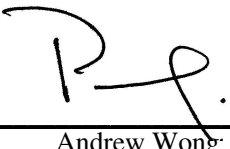
Test Result : See attached sheet(s) from page 2 to 18.

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

Remark : All six models are the same in circuitry and components; and therefore model has been XP30W-1N chosen to be the representative of the test sample.

For and on behalf of
CMA Industrial Development Foundation Limited

Authorized Signature : _____


Andrew Wong
Senior Technical Officer
Electrical Division

FCC ID: UTWM60M65W

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1 General Information

1.1 General Description

The equipment under test (EUT) is a PDA for Janam barcode scanning mobile computer. The EUT is powered by 1 x 3.7V rechargeable battery. The operation system is Palm and built-in 34888 KB RAM, Barcode Scanner, Bluetooth and Wi-Fi features. The operation system in between six models as below:

- Model XP30W-1P and XP30W-1N is Palm platform.
- Model XM60W-1P and XM60W-1N is WinCE platform.
- Model XM65W-1P and XM65W-1N is Window Mobile platform.

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,
Fo Tan, Shatin,
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1.3 List of measuring equipment

Equipment	Manufacturer	Model No.	Serial No.	Calibration Due Date
EMI Test Receiver	R&S	ESCI	100152	2008 October 14
Spectrum Analyzer	R&S	FSP30	100628	2008 July15
Broadband Antenna	Schaffner	CBL6112B	2692	2009 February 04
Horn Antenna	Schwarzbeck	9120D	9120D-531	2010 May 19
Pre-Amplifier	Schwarzbeck	9718	9718-119	2010 May 08
EMI Test Receiver	R&S	ESCS30	100001	2008 August 20
LISN	R&S	ESH3-Z5	100038	2009 March 02
LISN	R&S	ESH3-Z5	100010	2008 July 16



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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 spectrum analyzer directly for conducted output power measurement.

2.2 Test Result

Peak Detector data was measured unless otherwise stated.

The Frequencies from fundamental up to that tenth harmonics were investigated, and emissions more 20dB below limited were not reported. Thus, those higher emissions were presented in next page (section 2.3 and 2.4)

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

It was found that the EUT meet the FCC requirement.



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2.3 Radiated Emission Measurement Data

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

Operation Mode: PC connected mode with Barcode scanning

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dB μ V/m)	Antenna and Cable factor (dB)	Field Strength (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
88.476	H	24.5	7.1	31.6	43.5	-11.9
398.964	H	28.9	14.7	43.6	46.0	-2.4
432.216	H	24.7	17.2	41.9	46.0	-4.1
531.957	H	25.9	19.0	44.9	46.0	-1.1
598.448	H	25.9	19.0	44.9	46.0	-1.1
615.082	H	23.6	21.2	44.8	46.0	-1.2
665.000	H	22.2	21.2	43.4	46.0	-2.6
672.321	H	20.2	21.2	41.4	46.0	-4.6
698.198	H	19.7	21.2	40.9	46.0	-5.1
708.760	V	8.6	21.5	30.1	46.0	-15.9



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

Operation Mode: Wi-Fi Channel 01

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV/m)	Transducer factor (with 35dB Pre-amplify)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
2412.000	H	114.3	-6.8	107.5	N/A	N/A
4823.970	V	52.9	-1.0	51.9	54.0	-2.1
7235.950	V	38.4	9.9	48.3	54.0	-5.7

Operation Mode: Wi-Fi Channel 06

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV/m)	Transducer factor (with 35dB Pre-amplify)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
2436.900	H	114.8	-6.8	108.0	N/A	N/A
4873.960	V	50.8	-1.0	49.8	54.0	-4.2
7310.950	V	38.9	9.9	48.8	54.0	-5.2

Operation Mode: Wi-Fi Channel 11

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV/m)	Transducer factor (with 35dB Pre-amplify)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
2462.000	H	115.0	-6.8	108.2	N/A	N/A
4923.910	V	49.5	-1.0	48.5	54.0	-5.5
7385.960	V	39.4	9.9	49.3	54.0	-4.7



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Operation Mode: Bluetooth Channel 00

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dB μ V/m)	Transducer factor (with 35dB Pre-amplify)	Field Strength at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
2401.900	H	99.1	-6.8	92.3	N/A	N/A
4803.920	V	45.3	-1.0	44.3	54.0	-9.7
7205.880	V	36.3	9.9	46.2	54.0	-7.8

Operation Mode: Bluetooth Channel 39

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dB μ V/m)	Transducer factor (with 35dB Pre-amplify)	Field Strength at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
2441.000	H	95.8	-6.8	89.0	N/A	N/A
4881.890	V	48.1	-1.0	47.1	54.0	-6.9
7322.880	V	36.5	9.9	46.4	54.0	-7.6

Operation Mode: Bluetooth Channel 78

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dB μ V/m)	Transducer factor (with 35dB Pre-amplify)	Field Strength at 3m (dB μ V/m)	Limit at 3m (dB μ V/m)	Margin (dB)
2480.000	H	101.0	-6.8	94.2	N/A	N/A
4959.920	V	48.4	-1.0	47.4	54.0	-6.6
7439.880	V	35.9	9.9	45.8	54.0	-8.2



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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 (dBμV)	Reading (μW)	Limit (W)	Margin (W)
2402.000	100.1	200.693	1.0	-0.999

Harmonic Emission

Frequency (MHz)	Measured Field Strength (dBμV)	Limit (20dBμV below Carrier)	Margin (dB)
4803.960	27.5	80.1	-52.6
7205.920	33.9	80.1	-46.2
9607.920	30.3	80.1	-49.8



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Operation Mode: Bluetooth Channel 39

Transmission Power

Frequency (MHz)	Reading (dB μ V)	Reading (μ W)	Limit (W)	Margin (W)
2440.920	100.0	208.874	1.0	-0.999

Harmonic Emission

Frequency (MHz)	Measured Field Strength (dB μ V)	Limit (20dB μ V below Carrier)	Margin (dB)
4881.920	27.8	80.0	-52.2
7322.800	33.0	80.0	-47.0
9764.040	31.7	80.0	-48.3

Operation Mode: Bluetooth Channel 78

Transmission Power

Frequency (MHz)	Reading (dB μ V)	Reading (μ W)	Limit (W)	Margin (W)
2479.960	100.6	227.253	1.0	-0.999

Harmonic Emission

Frequency (MHz)	Measured Field Strength (dB μ V)	Limit (20dB μ V below Carrier)	Margin (dB)
4960.040	27.4	80.6	-53.2
7439.880	36.8	80.6	-43.8
9920.000	30.8	80.6	-49.8



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Operation Mode: Wi-Fi Channel 01

Transmission Power

Frequency (MHz)	Reading (dBμV)	Reading (μW)	Limit (W)	Margin (W)
2412.000	101.8	249.600	1.0	-0.999

Spurious Emission

Frequency (MHz)	Measured Field Strength (dBμV)	Limit (20dBμV below Carrier)	Margin (dB)
4823.960	39.1	81.8	-42.7
7236.040	38.0	81.8	-43.8
9647.900	33.8	81.8	-48.0
12060.000	33.0	81.8	-48.8
14472.000	35.0	81.8	-46.8

Operation Mode: Wi-Fi Channel 06

Transmission Power

Frequency (MHz)	Reading (dBμV)	Reading (μW)	Limit (W)	Margin (W)
2437.000	101.5	241.711	1.0	-0.999

Spurious Emission

Frequency (MHz)	Measured Field Strength (dBμV)	Limit (20dBμV below Carrier)	Margin (dB)
4873.980	25.6	81.5	-55.9
7310.860	39.1	81.5	-42.4
9747.960	33.0	81.5	-48.5
12184.960	30.0	81.5	-51.5
14621.060	33.7	81.5	-47.8



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Operation Mode: Wi-Fi Channel 11

Transmission Power

Frequency (MHz)	Reading (dBμV)	Reading (μW)	Limit (W)	Margin (W)
2462.000	102.6	363.9	1.0	-0.999

Spurious Emission

Frequency (MHz)	Measured Field Strength (dBμV)	Limit (20dBμV below Carrier)	Margin (dB)
4924.000	24.9	82.6	-57.7
7385.960	38.9	82.6	-43.7
9847.940	35.8	82.6	-46.8
12309.900	31.0	82.6	-51.6
14772.140	33.6	82.6	-49.0



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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 and battery charging mode has been tested. The EUT

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 for PC connection and TestRpt11 for battery charging mode.



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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 Tsup8.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 InPho6.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 TestRpt6.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 248305MHz.

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 frequency.

The plot saved in TestRpt5.pdf shows the band edge is fulfil 15.205 restricted band, and 15.247 (d) requirement.

The plot saved in TestRpt7.pdf shows the 6dB bandwidth has minimum 500kHz for frequency channel 2412MHz, 2437MHz and 2462MHz. It fulfils the section 15.247(a) 2 requirement.

The plot saved in TestRpt8.pdf shows the band edge of frequency channel 11 met the 15.205 restricted band requirement.

5.2 Duty Cycle

N/A

5.3 Transmission Time

N/A



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5.4 Power Spectral Density

The plot saved in TestRpt9.pdf shows the frequency channel 2412 MHz, 2437MHz and 2462MHz did not greater than 8dBm for 3kHz bandwidth. It fulfils the section 15.247(e) requirement.

5.5 Average on time

The plot saved in TestRpt10.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
2402	DH1	0.132	0.4	-0.268
2402	DH3	0.260	0.4	-0.140
2402	DH5	0.364	0.4	-0.036
2441	DH1	0.132	0.4	-0.268
2441	DH3	0.260	0.4	-0.140
2441	DH5	0.364	0.4	-0.036
2480	DH1	0.132	0.4	-0.268
2480	DH3	0.260	0.4	-0.140
2480	DH5	0.364	0.4	-0.036



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6 Appendices

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A4.	Photos of Internal Configurations	3	pages
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A8.	Bluetooth Hopping channel	1	page
A9.	Bluetooth band edge	1	page
A10.	Wi-Fi Bandwidth	2	pages
A11.	Wi-Fi 6dB Bandwidth Plot	4	pages
A12.	Wi-Fi Restricted band	1	page
A13.	Wi-Fi Power Spectral Density	4	pages
A14.	Bluetooth Average on time	6	pages
A15.	Block Diagram	1	page
A16.	Schematics Diagram	11	pages
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A18.	Operation Description	2	pages

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