RF EXPOSURE REPORT

REPORT NO.: SA120921C21A

MODEL NO.: WM-MB92M

FCC ID: VZ9120002

RECEIVED: Sep. 21, 2012

TESTED: Dec. 26 to 27, 2012

ISSUED: Feb. 05, 2014

APPLICANT: 4IPNET, INC.

ADDRESS: 3F-3, No. 369, Fusing N. Rd., Taipei 105, Taiwan,R.O.C.
CA 94089

ISSUED BY: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory

LAB ADDRESS: No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by any government agencies.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA120921C21A	Original release	Feb. 05, 2013

1. CERTIFICATION

PRODUCT:	802.11a/b/g/n Wireless Module
BRAND NAME:	4ipnet
MODEL NO.:	WM-MB92M
TEST SAMPLE:	ENGINEERING SAMPLE
APPLICANT:	4IPNET, INC.
TESTED DATE:	Dec. 26 to 27, 2012
STANDARDS:	FCC Part 2 (Section 2.1091)
	FCC OET Bulletin 65, Supplement C (01-01)
	IEEE C95.1

The above equipment (Model: WM-MB92M) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : _____ , **DATE:** *Feb. 05, 2014*
(Midoli Peng, Specialist)

APPROVED BY : _____ , **DATE:** *Feb. 05, 2014*
(May Chen, Manager)

2. RF EXPOSURE LIMIT

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

FREQUENCY RANGE (MHz)	ELECTRIC FIELD STRENGTH (V/m)	MAGNETIC FIELD STRENGTH (A/m)	POWER DENSITY (mW/cm^2)	AVERAGE TIME (minutes)
LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE				
300-1500	…	…	F/1500	30
1500-100,000	…	…	1.0	30

F = Frequency in MHz

3. MPE CALCULATION FORMULA

$Pd = (Pout*G) / (4*pi*r^2)$

where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

pi = 3.1416

r = distance between observation point and center of the radiator in cm

4. CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

5. ANTENNA GAIN

The antennas provided to the EUT, please refer to the following table:

No.	Brand	Part No.	Antenna Type	Gain (dBi)	Connector Type
1	UNI LINK	MCS-304-01	Dipole	2.4GHz: 2.7 5GHz :4	Re-SMA(M)
2	UNI LINK	UT-700-04	PIFA	2.4GHz: 3.7 5GHz :4.5	MMCX plug
Note: The dipole antenna has two different colors (black and white) and the dipole antenna (white) was chosen for final test.					

6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

For PIFA antenna
For 15.247(2.4GHz):
802.11b

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
2412-2462	186.209	3.7	20	0.08684	1

802.11g

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
2412-2462	446.684	3.7	20	0.20832	1

802.11n (HT20)

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
2412-2462	751.724	6.71	20	0.70111	1

Directional gain = 3.7dBi + 10log(2) = 6.71dBi

802.11n (HT40)

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
2412-2462	409.322	6.71	20	0.38176	1

Directional gain = 3.7dBi + 10log(2) = 6.71dBi

For PIFA antenna

For 15.247(5GHz):

802.11a

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5745 ~ 5825	288.403	4.5	20	0.16171	1

802.11n (HT20)

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5745 ~ 5825	538.450	7.51	20	0.60377	1

Directional gain = 4.5dBi + 10log(2) = 7.51dBi

802.11n (HT40)

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5745 ~ 5825	566.070	7.51	20	0.63474	1

Directional gain = 4.5dBi + 10log(2) = 7.51dBi

For PIFA antenna

For 15.407(5GHz):

802.11a

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5180-5240	44.771	4.5	20	0.02510	1

802.11n (HT20)

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5180-5240	43.767	7.51	20	0.04908	1

Directional gain = 4.5dBi + 10log(2) = 7.51dBi

802.11n (HT40)

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5180-5240	48.561	7,51	20	0.05445	1

Directional gain = 4.5dBi + 10log(2) = 7.51dBi

For DIPOLE antenna
For 15.247(2.4GHz):

802.11b

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
2412-2462	186.209	2.7	20	0.06898	1

802.11g

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
2412-2462	446.684	2.7	20	0.16547	1

802.11n (HT20)

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
2412-2462	751.724	5.57	20	0.55691	1

Directional gain = 2.7dBi + 10log(2) = 5.57dBi

802.11n (HT40)

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
2412-2462	409.322	5.57	20	0.30325	1

Directional gain = 2.7dBi + 10log(2) = 5.57dBi

For DIPOLE antenna

For 15.247(5GHz):

802.11a

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5745 ~ 5825	288.403	4.0	20	0.14412	1

802.11n (HT20)

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5745 ~ 5825	538.450	7.01	20	0.53811	1

Directional gain = 4.0dBi + 10log(2) = 7.01dBi

802.11n (HT40)

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5745 ~ 5825	566.070	7.01	20	0.56572	1

Directional gain = 4.0dBi + 10log(2) = 7.01dBi

For DIPOLE antenna

For 15.407(5GHz):

802.11a

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5180-5240	44.771	4.0	20	0.02237	1

802.11n (HT20)

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5180-5240	43.767	7.01	20	0.04374	1

Directional gain = 4.0dBi + 10log(2) = 7.01dBi

802.11n (HT40)

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm^2)	LIMIT (mW/cm^2)
5180-5240	48.561	7.01	20	0.04853	1

Directional gain = 4.0dBi + 10log(2) = 7.01dBi

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