



# A Test Lab Techno Corp.

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## MPE Report

Test Report No.	: 1308FS13
Applicant	: Ubiquiti Networks, Inc.
Manufacturer	: Ubiquiti Networks, Inc.
Product Type	: NBE-M2
Trade Name	: UBiQUiTi
Model Number	: NBE-M2
Date of Received	: Apr. 11, 2013
Test Period	: Aug. 01, 2013
Date of Issued	: Aug. 19, 2013
Test Specification	: 47 CFR § 2.1091 47 CFR §1.1310 ANSI / IEEE Std.C95.1-1992
Location of Test Lab.	: Chang-an Lab.

1. The test operations have to be performed with cautious behavior, the test results are as attached.
2. The test results are under chamber environment of A Test Lab Techno Corp. A Test Lab Techno Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples.
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Approved By : Yung-Tan Tsai Tested By : Bill Hu  
(Yung Tan Tsai) (Bill Hu)



# Contents

1. Description of Equipment under Test (EUT).....	3
2. Human Exposure Assessment .....	4
3. RF Output Power.....	5
4. Test Result.....	7



## 1. Description of Equipment under Test (EUT)

Applicant	Ubiquiti Networks, Inc.
Applicant Address	12F, No105, Song Ren Rd., SinYi District, Taipei, Taiwan
Manufacturer	Ubiquiti Networks, Inc.
Manufacturer Address	12F, No105, Song Ren Rd., SinYi District, Taipei, Taiwan
Product Type	NBE-M2
Trade Name	UBiQUiTi
Model Number	NBE-M2
FCC ID	SWX-NBM2HP
Frequency Range	IEEE 802.11b / IEEE 802.11g / 802.11n 2.4GHz (20MHz): 2412 ~ 2462 MHz IEEE 802.11n 2.4GHz (40MHz): 2422 ~ 2452 MHz
Transmit Power (conducted power)	IEEE 802.11b: 0.020 W / 13.07 dBm IEEE 802.11g: 0.012 W / 10.86 dBm IEEE 802.11n 2.4GHz (20MHz): 0.012 W / 10.81 dBm IEEE 802.11n 2.4GHz (40MHz): 0.005 W / 6.75 dBm
Antenna Gain	18 dBi
Antenna Designation	Dish Antenna
Temperature Range	-30 ~ +70°C

The above equipment was tested by A Test Lab Techno Corp. For compliance with the requirements set forth in 47 CFR § 2.1091 & 47 CFR § 1.1310. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties



## 2. Human Exposure Assessment

Due to the design and installation of this product, it is not possible to conduct SAR evaluation. This is because client either manufactures or supplies the antenna(s) that will be used in the installation of this product. Therefore, this product will be evaluated as a mobile device per 47 CFR §1.1310 titled "Radiofrequency radiation exposure limits", generally referred to as MPE limits.

In 47 CFR § 2.1091, paragraph (b) defines a mobile device as "a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 cm is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons." This product is intended to be installed into a vehicle such that the unit is physically secured at one location. In the installation guide supplied with the product,

Client has made the following statement: "IMPORTANT: To meet the FCC's RF Exposure Guidelines, the antenna should be installed so there is at least 20 cm of separation between the body of the user and nearby persons and the antenna". Based on the installation of the transceiver and the antenna, the transmitters radiating structure is more than 20 cm from the user. Thus, this product is a "mobile device" as defined in section § 2.1091 paragraph (b).

### Exposure evaluation

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{PG}{4\pi R^2}$$

Where

S: power density

P: power input to the antenna

G: power gain of the antenna in the direction of interest relative to an isotropic radiator.

R: distance to the center of radiation of the antenna.



### 3. RF Output Power

Band	Data Rate	CH	Frequency (MHz)	Time-Avg. Conducted power (dBm)	
				Antenna 1	Antenna 2
IEEE 802.11b	1M	1	2412.0	13.07	11.09
		6	2437.0	12.92	11.16
		11	2462.0	12.43	10.83
	2M	6	2437.0	12.86	11.12
	5.5M	6	2437.0	12.84	11.10
	11M	6	2437.0	12.80	11.08
IEEE 802.11g	6M	1	2412.0	10.86	9.29
		6	2437.0	10.56	9.31
		11	2462.0	10.10	9.08
	9M	6	2437.0	10.50	9.21
	12M	6	2437.0	10.52	9.24
	18M	6	2437.0	10.49	9.17
	24M	6	2437.0	10.53	9.23
	36M	6	2437.0	10.51	9.20
	48M	6	2437.0	10.47	9.25
	54M	6	2437.0	10.45	9.21
IEEE 802.11n (2.4GHz) 20MHz	6.5M	6	2437.0	10.47	9.12
	13M	6	2437.0	10.54	9.20
	19.5M	6	2437.0	10.52	9.21
	26M	6	2437.0	10.50	9.18
	39M	6	2437.0	10.55	9.15
	52M	6	2437.0	10.50	9.20
	58.5M	6	2437.0	10.48	9.23
	65M	6	2437.0	10.51	9.18
	13M	1	2412.0	10.81	9.50
		6	2437.0	10.57	9.25
		11	2462.0	10.25	9.00
	26M	6	2437.0	10.53	9.10
	39M	6	2437.0	10.52	9.16
	52M	6	2437.0	10.48	9.13
	78M	6	2437.0	10.52	9.11
104M	6	2437.0	10.49	9.15	
117M	6	2437.0	10.47	9.21	
130M	6	2437.0	10.53	9.14	



Band	Data Rate	CH	Frequency (MHz)	Time-Avg. Conducted power (dBm)	
				Antenna 1	Antenna 2
IEEE 802.11n (2.4GHz) 40MHz	13.5M	6	2437.0	6.61	5.16
	27M	6	2437.0	6.62	5.25
	40.5M	6	2437.0	6.60	5.21
	54M	6	2437.0	6.59	5.17
	81M	6	2437.0	6.55	5.15
	108M	6	2437.0	6.63	5.11
	121.5M	6	2437.0	6.60	5.14
	135M	6	2437.0	6.57	5.10
	27M	3	2422.0	6.60	5.15
		6	2437.0	6.75	5.27
		9	2452.0	6.10	4.60
	54M	6	2437.0	6.53	5.11
	81M	6	2437.0	6.49	5.16
	108M	6	2437.0	6.46	5.12
	162M	6	2437.0	6.54	5.16
	216M	6	2437.0	6.52	5.13
	243M	6	2437.0	6.57	5.10
	270M	6	2437.0	6.51	5.12



#### 4. Test Result

Band	Data Rate	Frequency (MHz)	Limit (mw/cm <sup>2</sup> )	Distance (cm) [R]	Max tune-up power (upper limit) (dBm) [P]	ANT Gain (dBi)	Numeric Gain [G]	Duty Cycle	[P]+ [G] (mW) [TP]	Power Density [S] (mw/cm <sup>2</sup> )
IEEE 802.11b	1 M	2412	1.000	113	13.07	18	63.1	1	1279.47	0.0080
		2437	1.000	113	13.07	18	63.1	1	1279.47	0.0080
		2462	1.000	113	13.07	18	63.1	1	1279.47	0.0080
IEEE 802.11g	6 M	2412	1.000	113	10.86	18	63.1	1	769.18	0.0048
		2437	1.000	113	10.86	18	63.1	1	769.18	0.0048
		2462	1.000	113	10.86	18	63.1	1	769.18	0.0048
IEEE 802.11n 2.4GHz (20MHz)	13 M	2412	1.000	113	10.81	18	63.1	1	760.38	0.0047
		2437	1.000	113	10.81	18	63.1	1	760.38	0.0047
		2462	1.000	113	10.81	18	63.1	1	760.38	0.0047
IEEE 802.11n 2.4GHz (40MHz)	27 M	2422	1.000	113	6.75	18	63.1	1	298.56	0.0019
		2437	1.000	113	6.75	18	63.1	1	298.56	0.0019
		2452	1.000	113	6.75	18	63.1	1	298.56	0.0019

Note: The numeric ant gain =  $10^{(18/10)} = 63.1$