



A Test Lab Techno Corp.

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MPE Report



Test Report No.	: 1108FS19-01
Applicant	: Netronix INC.
Manufacturer	: Netronix (Dongguan) INC
Product Type	: 802.11n Wireless 2T2R Router
Trade Name	: Netronix
Model Number	: W242D
Dates of Test	: Aug. 23, 2011
Date of Issued	: Sep. 23, 2011
Test Specification	: 47 CFR § 2.1091 47 CFR §1.1310 ANSI / IEEE Std.C95.1-1999
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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(Sam Chuang)

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Contents

1.	Description of Equipment under Test (EUT).....	3
1.1	RF Output Power	4
2.	Human Exposure Assessment.....	13
3.	Test Result	14



1. Description of Equipment under Test (EUT)

Applicant	Netronix INC.
Applicant Address	No. 945, Boai St. Jubei City. Hsinchu, Taiwan, 30265 R.O.C.
Manufacturer	Netronix (Dongguan) INC
Manufacturer Address	Heng Guang, Industrial Park, Huang Cao Lang 2nd Industrial Zone, Dalang Town, Dongguan City, Guangdong Province, China.
Product Type	802.11n Wireless 2T2R Router
Trade Name	Netronix
Model Number	W242D
FCC ID	NOI-W242D
Frequency Range	2412 - 2462 MHz IEEE 802.11b / IEEE 802.11g 2412 - 2462 MHz draft 802.11n Standard-20MHz 2422 - 2452 MHz draft 802.11n Wide-40MHz
Transmit Power (conducted power)	IEEE 802.11b: 0.027 W / 14.38 dBm IEEE 802.11g: 0.328 W / 25.16 dBm draft 802.11n Standard-20MHz: 0.574 W / 27.59 dBm draft 802.11n Wide-40MHz: 0.505 W / 27.03 dBm
Antenna specification	Antenna 1: 0.93dBi Antenna 2: 2.51dBi
Antenna Designation	Antenna 1: Chip Antenna Antenna 2: Exposed Antenna
Temperature Range	-30 ~ +70°C

The above equipment was tested by Compliance Certification Services Inc. 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



1.1 RF Output Power

Band	Data Rate	CH	Frequency (MHz)	Avg Conducted power (dBm)
IEEE 802.11b (Chain A)	1M	1	2412.0	13.12
		6	2437.0	13.08
		11	2462.0	13.32
	2M	1	2412.0	12.88
		6	2437.0	13.17
		11	2462.0	13.30
	5.5M	1	2412.0	12.76
		6	2437.0	12.88
		11	2462.0	13.31
	11M	1	2412.0	12.79
		6	2437.0	12.99
		11	2462.0	13.15
IEEE 802.11b (Chain B)	1M	1	2412.0	14.38
		6	2437.0	14.34
		11	2462.0	14.09
	2M	1	2412.0	14.28
		6	2437.0	14.28
		11	2462.0	14.14
	5.5M	1	2412.0	14.27
		6	2437.0	14.30
		11	2462.0	14.17
	11M	1	2412.0	14.29
		6	2437.0	14.33
		11	2462.0	14.19



Band	Data Rate	CH	Frequency (MHz)	Avg Conducted power (dBm)
IEEE 802.11g (Chain A)	6M	1	2412.0	23.89
		6	2437.0	23.62
		11	2462.0	23.58
	9M	1	2412.0	23.42
		6	2437.0	23.47
		11	2462.0	23.42
	12M	1	2412.0	23.88
		6	2437.0	23.79
		11	2462.0	23.70
	18M	1	2412.0	23.26
		6	2437.0	23.27
		11	2462.0	23.24
	24M	1	2412.0	23.72
		6	2437.0	23.64
		11	2462.0	23.59
	36M	1	2412.0	23.79
		6	2437.0	23.75
		11	2462.0	23.61
	48M	1	2412.0	23.62
		6	2437.0	23.55
		11	2462.0	23.42
	54M	1	2412.0	23.78
		6	2437.0	23.73
		11	2462.0	23.64



Band	Data Rate	CH	Frequency (MHz)	Avg Conducted power (dBm)
IEEE 802.11g (Chain B)	6M	1	2412.0	25.16
		6	2437.0	24.85
		11	2462.0	24.39
	9M	1	2412.0	25.01
		6	2437.0	24.81
		11	2462.0	24.46
	12M	1	2412.0	25.11
		6	2437.0	24.91
		11	2462.0	24.44
	18M	1	2412.0	24.81
		6	2437.0	24.62
		11	2462.0	24.22
	24M	1	2412.0	25.13
		6	2437.0	24.90
		11	2462.0	24.51
	36M	1	2412.0	25.18
		6	2437.0	24.93
		11	2462.0	24.50
	48M	1	2412.0	24.97
		6	2437.0	24.78
		11	2462.0	24.36
	54M	1	2412.0	25.15
		6	2437.0	24.89
		11	2462.0	24.50



Band	Data Rate	CH	Frequency (MHz)	Avg Conducted power (dBm)
draft 802.11n 20MHz(Chain A)	MCS0	1	2412.0	23.95
		6	2437.0	23.58
		11	2462.0	23.48
	MCS1	1	2412.0	23.66
		6	2437.0	23.65
		11	2462.0	23.61
	MCS2	1	2412.0	23.72
		6	2437.0	23.71
		11	2462.0	23.61
	MCS3	1	2412.0	23.43
		6	2437.0	23.48
		11	2462.0	23.35
	MCS4	1	2412.0	23.67
		6	2437.0	23.62
		11	2462.0	23.57
	MCS5	1	2412.0	23.39
		6	2437.0	23.46
		11	2462.0	23.40
	MCS6	1	2412.0	23.92
		6	2437.0	23.86
		11	2462.0	23.72
	MCS7	1	2412.0	23.49
		6	2437.0	23.43
		11	2462.0	23.42



Band	Data Rate	CH	Frequency (MHz)	Avg Conducted power (dBm)
draft 802.11n 20MHz(Chain B)	MCS0	1	2412.0	25.23
		6	2437.0	24.67
		11	2462.0	24.27
	MCS1	1	2412.0	24.96
		6	2437.0	24.75
		11	2462.0	24.40
	MCS2	1	2412.0	25.10
		6	2437.0	24.89
		11	2462.0	24.48
	MCS3	1	2412.0	24.92
		6	2437.0	24.68
		11	2462.0	24.29
	MCS4	1	2412.0	25.02
		6	2437.0	24.79
		11	2462.0	24.36
	MCS5	1	2412.0	24.89
		6	2437.0	24.69
		11	2462.0	24.25
	MCS6	1	2412.0	25.20
		6	2437.0	24.97
		11	2462.0	24.54
	MCS7	1	2412.0	24.89
		6	2437.0	24.70
		11	2462.0	24.40



Band	Data Rate	CH	Frequency (MHz)	Avg Conducted power (dBm)
draft 802.11n 40MHz(Chain A)	MCS0	3	2422.0	23.43
		6	2437.0	23.72
		9	2452.0	23.42
	MCS1	3	2422.0	23.35
		6	2437.0	23.25
		9	2452.0	23.31
	MCS2	3	2422.0	23.20
		6	2437.0	23.40
		9	2452.0	23.23
	MCS3	3	2422.0	23.69
		6	2437.0	23.68
		9	2452.0	23.53
	MCS4	3	2422.0	23.52
		6	2437.0	23.53
		9	2452.0	23.49
	MCS5	3	2422.0	23.56
		6	2437.0	23.41
		9	2452.0	23.43
	MCS6	3	2422.0	23.40
		6	2437.0	23.53
		9	2452.0	23.29
	MCS7	3	2422.0	23.22
		6	2437.0	23.17
		9	2452.0	23.25



Band	Data Rate	CH	Frequency (MHz)	Avg Conducted power (dBm)
draft 802.11n 40MHz(Chain B)	MCS0	3	2422.0	24.85
		6	2437.0	24.48
		9	2452.0	24.44
	MCS1	3	2422.0	24.65
		6	2437.0	24.49
		9	2452.0	24.29
	MCS2	3	2422.0	24.62
		6	2437.0	24.30
		9	2452.0	24.21
	MCS3	3	2422.0	24.81
		6	2437.0	24.73
		9	2452.0	24.54
	MCS4	3	2422.0	24.79
		6	2437.0	24.52
		9	2452.0	24.43
	MCS5	3	2422.0	24.73
		6	2437.0	24.50
		9	2452.0	24.45
	MCS6	3	2422.0	24.66
		6	2437.0	24.42
		9	2452.0	24.18
MCS7	3	2422.0	24.74	
	6	2437.0	24.39	
	9	2452.0	24.37	



Band	Data Rate	CH	Frequency (MHz)	Avg Conducted power (dBm)
draft 802.11n 20MHz(MIMO)	MCS8	1	2412.0	27.59
		6	2437.0	27.37
		11	2462.0	27.17
	MCS9	1	2412.0	26.57
		6	2437.0	26.53
		11	2462.0	26.54
	MCS10	1	2412.0	26.53
		6	2437.0	26.56
		11	2462.0	27.11
	MCS11	1	2412.0	26.42
		6	2437.0	26.50
		11	2462.0	26.33
	MCS12	1	2412.0	25.99
		6	2437.0	25.53
		11	2462.0	25.87
	MCS13	1	2412.0	25.12
		6	2437.0	24.98
		11	2462.0	25.01
MCS14	1	2412.0	26.59	
	6	2437.0	26.66	
	11	2462.0	26.62	
MCS15	1	2412.0	25.16	
	6	2437.0	25.25	
	11	2462.0	25.11	



Band	Data Rate	CH	Frequency (MHz)	Avg Conducted power (dBm)
draft 802.11n 40MHz(MIMO)	MCS8	3	2422.0	25.49
		6	2437.0	25.63
		9	2452.0	25.54
	MCS9	3	2422.0	24.84
		6	2437.0	24.84
		9	2452.0	24.84
	MCS10	3	2422.0	25.21
		6	2437.0	25.13
		9	2452.0	25.53
	MCS11	3	2422.0	27.03
		6	2437.0	27.01
		9	2452.0	26.95
	MCS12	3	2422.0	25.49
		6	2437.0	25.68
		9	2452.0	25.78
	MCS13	3	2422.0	25.01
		6	2437.0	25.06
		9	2452.0	24.93
	MCS14	3	2422.0	25.94
		6	2437.0	25.41
		9	2452.0	25.35
	MCS15	3	2422.0	26.14
		6	2437.0	26.20
		9	2452.0	26.28



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. Test Result

Chain A									
Band	Data Rate	Frequency (MHz)	Limit (mw)	Distance (cm) [R]	Power (dBm) [P]	ANT Gain (dBi) [G]	EIRP (W)	Duty Cycle	Power Density [S]
IEEE 802.11b	1M	2412.0	1.000	20	13.12	2.95	0.040	1.000	0.005
	1M	2437.0	1.000	20	13.08	2.95	0.040	1.000	0.005
	1M	2462.0	1.000	20	13.32	2.95	0.042	1.000	0.005
IEEE 802.11g	6M	2412.0	1.000	20	23.89	2.95	0.483	1.000	0.059
	6M	2437.0	1.000	20	23.62	2.95	0.454	1.000	0.055
	6M	2462.0	1.000	20	23.58	2.95	0.450	1.000	0.055
IEEE 802.11n 20MHz	MCS0	2412.0	1.000	20	23.95	2.95	0.490	1.000	0.059
	MCS0	2437.0	1.000	20	23.58	2.95	0.450	1.000	0.055
	MCS0	2462.0	1.000	20	23.48	2.95	0.440	1.000	0.053
IEEE 802.11n 40MHz	MCS0	2412.0	1.000	20	23.43	2.95	0.435	1.000	0.053
	MCS0	2437.0	1.000	20	23.72	2.95	0.465	1.000	0.056
	MCS0	2462.0	1.000	20	23.42	2.95	0.434	1.000	0.053

NOTE: For mobile or fixed location transmitters, minimum separation distance is 20cm, even if calculations indicate MPE distance is less.

Chain B									
Band	Data Rate	Frequency (MHz)	Limit (mw)	Distance (cm) [R]	Power (dBm) [P]	ANT Gain (dBi) [G]	EIRP (W)	Duty Cycle	Power Density [S]
IEEE 802.11b	1M	2412.0	1.000	20	14.38	2.95	0.054	1.000	0.007
	1M	2437.0	1.000	20	14.34	2.95	0.054	1.000	0.007
	1M	2462.0	1.000	20	14.09	2.95	0.051	1.000	0.006
IEEE 802.11g	6M	2412.0	1.000	20	25.16	2.95	0.647	1.000	0.079
	6M	2437.0	1.000	20	24.85	2.95	0.603	1.000	0.073
	6M	2462.0	1.000	20	24.39	2.95	0.542	1.000	0.066
IEEE 802.11n 20MHz	MCS0	2412.0	1.000	20	25.23	2.95	0.658	1.000	0.080
	MCS0	2437.0	1.000	20	24.67	2.95	0.578	1.000	0.070
	MCS0	2462.0	1.000	20	24.27	2.95	0.527	1.000	0.064
IEEE 802.11n 40MHz	MCS0	2412.0	1.000	20	24.85	2.95	0.603	1.000	0.073
	MCS0	2437.0	1.000	20	24.48	2.95	0.553	1.000	0.067
	MCS0	2462.0	1.000	20	24.44	2.95	0.548	1.000	0.067

NOTE: For mobile or fixed location transmitters, minimum separation distance is 20cm, even if calculations indicate MPE distance is less.



MIMO									
Band	Data Rate	Frequency (MHz)	Limit (mw)	Distance (cm) [R]	Power (dBm) [P]	ANT Gain (dBi) [G]	EIRP (W)	Duty Cycle	Power Density [S]
IEEE 802.11n 20MHz	MCS8	2412.0	1.000	20	27.59	2.95	1.132	1.000	0.137
	MCS8	2437.0	1.000	20	27.37	2.95	1.076	1.000	0.131
	MCS8	2462.0	1.000	20	27.17	2.95	1.028	1.000	0.125
IEEE 802.11n 40MHz	MCS8	2412.0	1.000	20	27.03	2.95	0.995	1.000	0.121
	MCS8	2437.0	1.000	20	27.01	2.95	0.991	1.000	0.120
	MCS8	2462.0	1.000	20	26.95	2.95	0.977	1.000	0.119

NOTE: For mobile or fixed location transmitters, minimum separation distance is 20cm, even if calculations indicate MPE distance is less.