RF Exposure Evaluation Declaration

Product Name ： WIRELESS-N NETWORK MINI PCI ADAPTER

Model No. ： IWAVEPORT WLM200NX

FCC ID ： TK4-08-WLM200NX

Applicant ： Compex Systems Pte Ltd.

Address ： 135 Joo Seng Road, #08-01 PM Industrial Building
Singapore 368363

Date of Receipt ： 2008/09/10

Issued Date ： 2009/01/16

Report No. ： 091S027R-RF-US

Test Report Certification

Issued Date : 2009/01/16
Report No. : 091S027R-RF-US

QuieTek

Product Name	:	WIRELESS-N NETWORK MINI PCI ADAPTER
Applicant	:	Compex Systems Pte Ltd
Address	:	135 Joo Seng Road, #08-01 PM Industrial Building Singapore 368363
Manufacturer	:	Compex Systems Pte Ltd
Address	:	135 Joo Seng Road, #08-01 PM Industrial Building Singapore 368363
Model No.	:	IWAVEPORT WLM200NX
FCC ID	:	TK4-08-WLM200NX
Rated Voltage	:	AC 120V/60Hz
EUT Voltage	:	DC 3.3V
Trade Name	:	COMPEX
Applicable Standard	:	FCC OET 65
Test Result	:	Complied
Performed Location	:	SuZhou EMC laboratory No.99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., SuZhou, China TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098 FCC Registration Number: 800392

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Laboratory Information

We , **QuieTek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited by the following accreditation Bodies in compliance with ISO 17025, EN 45001 and Guide 25:

Taiwan R.O.C.	**:**	**BSMI, DGT, CNLA**
Germany	**:**	**TUV Rheinland**
Norway	**:**	**Nemko, DNV**
USA	**:**	**FCC, NVLAP**
Japan	**:**	**VCCI**

The related certificate for our laboratories about the test site and management system can be downloaded from QuieTek Corporation's Web Site : http://tw.quietek.com/modules/myalbum/
The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site : http://www.quietek.com/
If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

HsinChu Testing Laboratory :

No.75-2, 3rd Lin, Wangye Keng, Yonghxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C.
TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : service@quietek.com

NVLAP Lab Code : 200347-0

LinKou Testing Laboratory :

No. 5, Ruei-Shu Valley, Ruei-Ping Tsuen, Lin-Kou Shiang, Taipei, Taiwan, R.O.C.
TEL : +886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : service@quietek.com

NVLAP Lab Code: 200533-0

Suzhou Testing Laboratory :

No.99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., SuZhou, China
TEL : +86-512-6251-5088 / FAX : 86-512-6251-5098 E-Mail : service@quietek.com

NVLAP Lab Code : 200743-0

1. RF Exposure Evaluation

1.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm2)	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: Pd = (Pout*G)/(4*pi*r2)

Where

Pd = power density in mW/cm2

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

Pd id the limit of MPE, 1 mW/cm2 . If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

1.2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.
The temperature and related humidity: 18℃and 78％ RH.

1.3. Test Result of RF Exposure Evaluation

Product	:	WIRELESS-N NETWORK MINI PCI ADAPTER
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-4
Test Mode	:	Mode 1: Transmit by 802.11b – chain 010

Antenna Gain:
Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2 dBi or 1.58 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
01	2412.00	105.9254	0.033399
06	2437.00	121.3389	0.038259
11	2462.00	98.6279	0.031098

Product	:	WIRELESS-N NETWORK MINI PCI ADAPTER
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-4
Test Mode	:	Mode 2: Transmit by 802.11g – chain 010

Antenna Gain:

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2 dBi or 1.58 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
01	2412.00	112.2018	0.035378
06	2437.00	120.7814	0.038083
11	2462.00	84.7227	0.026713

Product	:	WIRELESS-N NETWORK MINI PCI ADAPTER
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-4
Test Mode	:	Mode 3: Transmit by 802.11a – chain 010

Antenna Gain:

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2 dBi or 1.58 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
36	5180.00	41.5911	0.013114
40	5200.00	42.8549	0.013512
48	5240.00	41.9759	0.013235
149	5745.00	119.6741	0.037734
157	5785.00	116.6810	0.036790
165	5825.00	121.0598	0.038171

Product	:	WIRELESS-N NETWORK MINI PCI ADAPTER
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-4
Test Mode	:	Mode 4: Transmit by 802.11n (20MHz) – chain 010

Antenna Gain:

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2 dBi or 1.58 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
1	2412.00	83.1764	0.026226
6	2437.00	108.1434	0.034098
11	2462.00	82.9851	0.026166
36	5180.00	41.3048	0.013024
40	5200.00	43.6516	0.013764
48	5240.00	42.6580	0.013450
149	5745.00	119.3988	0.037647
157	5785.00	116.1449	0.036621
165	5825.00	120.2264	0.037908

Product	:	WIRELESS-N NETWORK MINI PCI ADAPTER
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-4
Test Mode	:	Mode 5: Transmit by 802.11n (40MHz) – chain 010

Antenna Gain:

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2dBi or 1.58 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
3	2422.00	80.5378	0.025394
6	2437.00	107.1519	0.033786
9	2452.00	82.2243	0.025926
38	5190.00	44.6684	0.014084
46	5230.00	44.3609	0.013987
151	5755.00	121.3389	0.038259
159	5795.00	127.0574	0.040062

Product	:	WIRELESS-N NETWORK MINI PCI ADAPTER
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-4
Test Mode	:	Mode 1: Transmitter by 802.11b – chain 100

Antenna Gain:

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2 dBi or 1.58 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
01	2412.00	123.3105	0.038880
06	2437.00	133.3521	0.042047
11	2462.00	88.5116	0.027908

Product	:	WIRELESS-N NETWORK MINI PCI ADAPTER
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-4
Test Mode	:	Mode 2: Transmit by 802.11g – chain 100

Antenna Gain:

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2 dBi or 1.58 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
01	2412.00	119.6741	0.037734
06	2437.00	130.3167	0.041089
11	2462.00	123.3105	0.038880

Product	:	WIRELESS-N NETWORK MINI PCI ADAPTER
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-4
Test Mode	:	Mode 3: Transmit by 802.11a – chain 100

Antenna Gain:

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2 dBi or 1.58 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
36	5180.00	44.3609	0.013987
40	5200.00	42.8549	0.013512
48	5240.00	42.9536	0.013543
149	5745.00	120.7814	0.038083
157	5785.00	133.3521	0.042047
165	5825.00	88.5116	0.027908

Product	:	WIRELESS-N NETWORK MINI PCI ADAPTER
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-4
Test Mode	:	Mode 4: Transmit by 802.11n (20MHz) – chain 100

Antenna Gain:

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2dBi or 1.58 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
1	2412.00	83.1764	0.026226
6	2437.00	108.1434	0.034098
11	2462.00	82.9851	0.026166
36	5180.00	43.5512	0.013732
40	5200.00	41.8794	0.013205
48	5240.00	41.6869	0.013144
149	5745.00	119.3988	0.037647
157	5785.00	116.1449	0.036621
165	5825.00	120.2264	0.037908

Product	:	WIRELESS-N NETWORK MINI PCI ADAPTER
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-4
Test Mode	:	Mode 5: Transmit by 802.11n (40MHz) – chain 100

Antenna Gain:

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2 dBi or 1.58 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
3	2422.00	93.5406	0.029494
6	2437.00	116.6810	0.036790
9	2452.00	90.1571	0.028427
38	5190.00	44.7713	0.014117
46	5230.00	45.2898	0.014280
151	5755.00	109.6478	0.034572
159	5795.00	105.4387	0.033245

Product	:	WIRELESS-N NETWORK MINI PCI ADAPTER
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-4
Test Mode	:	Mode 4: Transmit by 802.11n (20MHz) – chain 110

Antenna Gain:

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2dBi or 1.58 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
1	2412.00	146.5548	0.046209
6	2437.00	153.8155	0.048499
11	2462.00	138.0384	0.043524
36	5180.00	43.1519	0.013606
40	5200.00	43.9542	0.013859
48	5240.00	41.4954	0.013084
149	5745.00	106.1696	0.033476
157	5785.00	104.7129	0.033016
165	5825.00	103.0386	0.032489

Product	:	WIRELESS-N NETWORK MINI PCI ADAPTER
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-4
Test Mode	:	Mode 5: Transmit by 802.11n (40MHz) – chain 110

Antenna Gain:

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2dBi or 1.58 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

Channel	Channel Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
3	2422.00	109.1440	0.034414
6	2437.00	109.6478	0.034572
9	2452.00	99.5405	0.031386
38	5190.00	44.4631	0.014019
46	5230.00	45.7088	0.014412
151	5755.00	107.3989	0.033863
159	5795.00	114.8154	0.036202