RF Exposure Evaluation Declaration

Product Name	:	Wireless N ADSL2+ 4-port USB Gateway
Model No.	:	P-660HNU-F1, DSL-100HNU-L1
FCC ID	:	I88P660HNUF1
IC	:	2468C-P660HNUF1

Applicant	:	ZyXEL Communications Corporation
Address	:	NO.6, Innovation Rd II, Science-Based Industrial Park, Hsin-Chu, Taiwan Hsin-Chu, Taiwan

Date of Receipt	:	10/10/2011
Issued Date	:	20/10/2011
Report No.	:	11AS010R-RF-US
Report Version	:	V1.0

Test Report Certification

Issued Date : 20/10/2011
Report No. : 11AS010R-RF-US

QuieTek

Product Name	:	Wireless N ADSL2+ 4-port USB Gateway
Applicant	:	ZyXEL Communications Corporation
Address	:	NO.6, Innovation Rd II, Science-Based Industrial Park, Hsin-Chu, Taiwan Hsin-Chu, Taiwan
Manufacturer	:	1. ZyXEL Communications Corporation 2. Wuxi MitraStar Technology Co. Ltd
Address	:	1. NO.6, Innovation Rd. Ⅱ Science Based Industrial Park Hsin-Chu, Taiwan 2. Wuxi New District Minshan road 60#-E Jiangsu PRC
Model No.	:	P-660HNU-F1, DSL-100HNU-L1
FCC ID	:	I88P660HNUF1
IC	:	2468C-P660HNUF1
EUT Voltage	:	12V 1A
Trade Name	:	ZyXEL
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; IC Lab Code: 4075B

Documented By	:	Alice Ni (Engineering ADM: Alice Ni)
Reviewed By	:	Jame yuan (Senior Engineer: Jame Yuan)
Approved By	:	Marlinchen (Engineering Supervisor: Marlin Chen)

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/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

Taiwan R.O.C.	**:**	**BSMI, NCC, TAF**
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://www.quietek.com/tw/ctg/cts/accreditations.htm
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

Testing Laboratory 1313

LinKou Testing Laboratory :
No. 5-22, 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

Testing Laboratory 0914

Suzhou (China) 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

Testing Laboratory 1596

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 ADSL2+ 4-port USB Gateway
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-6

Antenna Gain:
Antenna Gain: The maximum Gain measured in fully anechoic chamber is 3dBi in logarithm scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

Test Mode	Frequency Band (MHz)	Maximum Output Power to Antenna (dBm)	Maximum Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm2)
802.11b (Chain 0)	2412 ~ 2472	20.94	124.2	0.049
802.11g (Chain 0)	2412 ~ 2472	18.94	78.3	0.031
802.11n(20MHz) (Chain 0 + Chain 1)	2412 ~ 2472	20.76	119.1	0.047
802.11n(40MHz) (Chain 0 + Chain 1)	2422 ~ 2452	20.51	113.2	0.045