

# RF Exposure Evaluation Declaration

Product Name : WIRELESS-A/N 23DBM NETWORK MINI PCI  
ADAPTER WITH ESD

Model No. : WLM200N5-23ESD

Series Model : MMC543HVN5-23ESD, MMC543AHVN5-23ESD,  
MMS2543HVN5-23ESD, MMS2543AHVN5-23ESD,  
MMJ2543HVN5-23ESD, MMJ2543AHVN5-23ESD

FCC ID : TK4WLM200N5-23ESD

Applicant : Compex Systems Pte Ltd

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

Date of Receipt : Jun. 07, 2010  
Issued Date : Aug. 11, 2010  
Report No. : 106S012R-RF-US  
Report Version : V1.0

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF, NVLAP, NIST or any agency of the Government.

The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.

# Test Report Certification

Issued Date: Apr. 19, 2010  
Report No.: 106S012R-RF-US

# QuieTek

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ADAPTER WITH ESD

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Singapore 368363

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FCC ID : TK4WLM200N5-23ESD

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  
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TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098  
FCC Registration Number: 800392

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( Engineering Supervisor: Marlin Chen )

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( Engineering Manager: Dream Cao )

## 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:

<b>Taiwan R.O.C.</b>	: BSMI, NCC, TAF
<b>Germany</b>	: TUV Rheinland
<b>Norway</b>	: Nemko, DNV
<b>USA</b>	: FCC, NVLAP
<b>Japan</b>	: 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/emc/accreditations/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 :

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TEL : +86-512-6251-5088 / FAX : 86-512-6251-5098      E-Mail : [service@quietek.com](mailto:service@quietek.com)



## 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/cm <sup>2</sup> )	Average Time (Minutes)
<b>(A) Limits for Occupational/ Control Exposures</b>				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
<b>(B) Limits for General Population/ Uncontrolled Exposures</b>				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

F= Frequency in MHz

Friis Formula

Friis transmission formula:  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = 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

$P_d$  is the limit of MPE, 1 mW/cm<sup>2</sup>. 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°C and 78% RH.

## 1.3. Test Result of RF Exposure Evaluation

Product	:	WIRELESS-A/N 23DBM NETWORK MINI PCI ADAPTER WITH ESD
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-6

### Antenna Gain:

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 26dBi in logarithm scale.

### RF Exposure Measurement Results:

Operation Mode	Frequency Range (MHz)	Maximum EIRP (dBm)	Limit of Power Density S(W/m <sup>2</sup> )	Safety Distance r(cm)
802.11an	5470 ~ 5850	52.51	10	119.1

So the safety distance is 119.1cm for WIRELESS-A/N 23DBM NETWORK MINI PCI ADAPTER WITH ESD installed without any other radio equipment.