RF Exposure Evaluation Declaration

Product Name : WIRELESS-ABGN 3X3 NETWORK MINI PCIE ADAPTER

Model No. : WLE350NX

Applicant : Compex Systems Pte Ltd

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

Date of Receipt : 04/02/2013

Test Date : 05/02/2013~08/04/2013

Issued Date : 08/04/2013

Report No. : 132S008R-RF-CE-P18V02

Report Version : V1.0

Test Report Certification

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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.	:	WLE350NX
EUT Voltage	:	DC: 3.3V
Brand Name	:	COMPEX
Applicable Standard	:	EN 62311: 2008
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

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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/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**
China	**:**	**CNAS**

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 :
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TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : service@quietek.com

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1. RF Exposure Measurement

The scope of this standard is limited to apparatus which is intended for use by the general public as defined in the Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz) (Official Journal L 199 of 30 July 1999).
This generic standard applies to electronic and electrical apparatus for which no dedicated product or product family standard regarding human exposure to electromagnetic fields applies.
This generic standard does not cover equipment, which fulfils the requirements given in EN 50371 or is medical equipment as defined in the Council Directive 93/42/EEC of 14 June 1993 concerning medical devices.
The frequency range covered is 0 Hz to 300 GHz.
The object of this standard is to demonstrate the compliance of such apparatus with the basic restrictions or reference levels on exposure of the general public related to electric, magnetic, electromagnetic fields and induced and contact current.

1.1. Limits

The electronic and electro-technical apparatus shall comply with the basic restriction as specified in Annex II of Council Recommendation 1999/519/EC.
The reference levels in the Council Recommendation 1999/519/EC on public exposure to electromagnetic fields are derived from the basic restrictions using worst-case assumptions about exposure.
According to EN62311, the reference level listed in the following table 2 shall be used to evaluate the environment impact of human exposure human exposure to electromagnetic fields (0 Hz - 300 GHz) as specified in 1999/519/EC.

Council Recommendation 1999/519/EC of 12 July 1999

Table 2

Reference levels for electric, magnetic and electromagnetic fields
(0 Hz to 300 GHz, unperturbed rms values)

Frequency Range	E-field Strength (V/m)	H-field Strength (A/m)	B-field (μT)	Equivalent plane wave power density Seq (W/m2)
0-1 Hz	–	3.2×10^4	4×10^4	–
1-8 Hz	10000	$3.2 \times 10^4/f^2$	$4 \times 10^4/f^2$	–
8-25 Hz	10000	4000/f	5000/f	–
0.025-0.8 kHz	250/f	4/f	5/f	–
0.8-3 kHz	250/f	5	6.25	–
3-150 kHz	87	5	6.25	–
0.15-1 MHz	87	0.73/f	0.92/f	–
1-10 MHz	$87/f^{1/2}$	0.73/f	0.92/f	–
10-400 MHz	28	0.73	0.092	2
400-2000 MHz	$1.375\ f^{1/2}$	$0.0037\ f^{1/2}$	$0.0046\ f^{1/2}$	f/200
2-300G Hz	61	0.16	0.20	10

Notes:

1. f as indicated in the frequency range column.
2. For frequencies between 100 kHz and 10 GHz, Seq, E2, H2, and B2 are to be averaged over any six-minute period.
3. For frequencies exceeding 10 GHz, Seq, E2, H2, and B2 are to be averaged over any 68/ f1.05 -minute period (f in GHz).
4. No E-field value is provided for frequencies < 1 Hz, which are effectively static electric fields. For most people the annoying perception of surface electric charges will not occur at field strengths less than 25 kV/m. Spark discharges causing stress or annoyance should be avoided.

1.2. Assessment methods

Under normal use of condition, this device has a separation distance of at least 20cm between the antenna and the body of the user. A radiation exposure statement" this equipment should be installed and operated with minimum distance between the antenna

and your body" is shown on the user manual, so human exposure to the electromagnetic field of this product is at far-field region under normal use.

Far-field region Calculation Formula:

P watts are radiated, from a point, uniformly over the surface of sphere of radius r.

In free space

E = η0H = [30*P*G(θ ,ϕ)]^0.5 / r

Where

G = antenna gain relative to an isotropic antenna

θ ,ϕ = elevation and azimuth angles to point of investigation

r = distance from observation point to the antenna (m)

η = characteristic impedance of free space

Safety Distance Calculation Formula:

The power flux:

$$S = \frac{P*G_{(\theta,\phi)}}{4*\pi*r^2}$$

So safety distance as following:

$$r = \sqrt{\frac{P*G}{4*\pi*S}}$$

P = input power of the antenna

G = antenna gain relative to an isotropic antenna

θ, Φ = elevation and azimuth angles.

r = distance from the antenna to the point of investigation

1.3. 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.

1.4. Test Result of RF Exposure Evaluation

Product	:	WIRELESS-ABGN 3X3 NETWORK MINI PCIE ADAPTER
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-6

Antenna Gain

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 4.5dBi for 2.4GHz and 7dBi for 5GHz in logarithm scale.

RF Exposure Measurement Results:

Operation Mode	Frequency Range (MHz)	Maximum EIRP (dBm)	Limit of Power Density $S(W/m^2)$	Safety Distance r(cm)
802.11b/g/n(20MHz)	2412 ~ 2472 MHz	19.74	10	2.74
802.11n(40MHz)	2422 ~ 2462 MHz	19.73	10	2.73
802.11a/n(20MHz)	5180~5320MHz, 5500~5700MHz, 5745~5825MHz	30.68	10	9.65
802.11n(40MHz)	5190~5310MHz, 5510~5670MHz	29.08	10	8.02

So the safety distance is 9.65cm for WIRELESS-ABGN 3X3 NETWORK MINI PCIE ADAPTER installed without any other radio equipment.

The End