

RADIO FREQUENCY RADIATION EXPOSURE REPORT

Mobiles /Fixed Base Station Maximum Permissible Exposure (MPE)

OF

Product Name: 3G36W-V

Brand Name: NetComm

Model Name: 3G36W-V

Model Different: N/A

FCC ID: XIA-3G36WV

IC: 8847A-3G36WV

Report No.: EH/2011/80029

Issue Date: Sep. 26, 2011

Prepared for: NetComm Limited

Level 2, 18-20 Orion Road, Lane Cove, NSW
Australia

Prepared by: SGS Taiwan Ltd.

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Member of SGS Group

VERIFICATION OF COMPLIANCE

Applicant: NetComm Limited
Level 2, 18-20 Orion Road, Lane Cove, NSW Australia

Product Name: 3G36W-V

Brand Name: NetComm

FCC ID: XIA-3G36WV

IC: 8847A-3G36WV

Model No.: 3G36W-V

Model Difference: N/A

File Number: EH/2011/80029

Date of test: Aug. 10, 2011 ~ Sep. 23, 2011

Date of EUT Received: Aug. 10, 2011

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd., Electronics & Communication Laboratory. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in FCC OET Bulletin 65 Supplement C and 47 CFR §2.1091 and RSS102.

The test results of this report relate only to the tested sample identified in this report.

Test By:	<i>Lion Wang</i>	Date	Sep. 28, 2011
	_____ <i>Lion Wang / Engineer</i>		_____
Prepared By:	<i>Gigi yeh</i>	Date	Sep. 28, 2011
	_____ <i>Gigi Yeh / Clerk</i>		_____
Approved By:	<i>Jim Chang</i>	Date	Sep. 28, 2011
	_____ <i>Jim Chang / Supervisor</i>		_____

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Report Version

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00	Sep. 28, 2011	

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1. GENERAL INFORMATION

General:

General:

Product Name:	3G36W-V
Model No.:	3G36W-V
Brand Name:	NetComm
Model Difference	N/A
Marketing Name:	HSPA+ Data Gateway
Antenna Spec:	PIF Antenna 824~968MHz: 0.8~1.6 dBi 1710~2170 MHz: 2.0~4.3dBi
Power Supply:	12V from AC/DC adapter, model: Au-79Dmu, Supplier: ELEMEN

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WLAN: 802.11 b/g/n

Frequency Range:	802.11b / g / n_20MHz: 2412 – 2462 MHz 802.11 n_40MHz: 2422 – 2452 MHz
Channel number:	802.11b / g / n_20MHz: 11 channels 802.11 n_40MHz: 9 channels
Max. Output Power:	802.11 b: 18.35 dBm (Peak) 802.11 g: 15.47 dBm (Peak) 802.11 n_20MHz: 12.38dBm (Peak) 802.11 n_40MHz: 12.66dBm (Peak) 802.11 n_20MHz(MIMO): 15.21dBm (Peak) 802.11 n_40MHz(MIMO): 15.76dBm (Peak)
Modulation Technology:	DSSS, OFDM
Modulation type:	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Transition Rate:	802.11 b: 1/2/5.5/11 Mbps; 802.11 g: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 7.2 – 144.4Mbps 802.11 n_40MHz: 15 – 300Mbps
Antenna Designation:	PIF Antenna $4.35\text{dBi} + 10\log(2) = 7.36\text{ dBi}$
Type of Emission:	802.11 b : 15M2G1D 802.11 g : 17M2G1D 802.11 n_20MHz : 17M4G1D 802.11 n_40MHz : 35M6G1D

The EUT is compliance with IEEE 802.11 b/g/n Standard.

This report applies for frequency IEEE 802.11 b/g/n

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1.1 Standard Applicable

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a Mobile device, the MPE is required.

According to §1.1310 and §2.1093 RF exposure is calculated.

Limits for Maximum Permissive Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-15000	/	/	1.0	30

F = frequency in MHz

* = Plane-wave equipment power density

1.2 Maximum Permissible Exposure (MPE) Evaluation

MPE Prediction (802.11b/g)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to 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

2412MHz

Maximum peak output power at antenna input terminal:	18.35	(dBm)
Maximum peak output power at antenna input terminal:	68.39116473	(mW)
Duty cycle:	100	(%)
Maximum Pav :	68.39116473	(mW)
Antenna gain (typical):	4.35	(dBi)
Maximum antenna gain:	2.722701308	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2412	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.0370638	(mW/cm ²)
Measurement Result:		
The predicted power density level at 20 cm is	0.370638363	(W/m ²)
This is below the uncontrolled exposure limit of 1 mW/cm	2412	MHz

Measurement Result

The predicted power density level at 20 cm is 0.36893543 W/cm². This is below the uncontrolled exposure limit of 1 mW/cm² at 2412MHz.

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MPE Prediction (802.11n_20M) (MIMO mode)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to 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

The worst case: 802.11n_20M MIMO mode

Maximum peak output power at antenna input terminal:	15.21	(dBm)
Maximum peak output power at antenna input terminal:	33.18944576	(mW)
Duty cycle:	100	(%)
Maximum Pav :	33.18944576	(mW)
Antenna gain (typical):	7.36	(dBi)
Maximum antenna gain:	5.445026528	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2412	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.0359708	(mW/cm ²)
Measurement Result:		
The predicted power density level at 20 cm is	0.359708226	(W/m ²)
This is below the uncontrolled exposure limit of 1 mW/cm	2412	MHz

Measurement Result

The predicted power density level at 20 cm is 0.35970823 W/cm². This is below the uncontrolled exposure limit of 1 mW/cm² at 2412MHz.

Note: directional gain = Gain + 10 Log (N) dBi = 4.35 + 3.0103 = 7.36 dBi, where n is number of antenna used with host, is employed as Max. Gain as per 662911

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MPE Prediction (802.11n_40mM (MIMO mode))

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to 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

The worst case: 802.11n_40M MIMO mode

Maximum peak output power at antenna input terminal:	15.76	(dBm)
Maximum peak output power at antenna input terminal:	37.6703799	(mW)
Duty cycle:	100	(%)
Maximum Pav :	37.6703799	(mW)
Antenna gain (typical):	7.36	(dBi)
Maximum antenna gain:	5.445026528	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2437	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm ²)
Power density at predication frequency at 20 (cm)	0.0408273	(mW/cm ²)
Measurement Result:		
The predicted power density level at 20 cm is	0.408272727	(W/m ²)
This is below the uncontrolled exposure limit of 1 mW/cm	2437	MHz

Measurement Result

The predicted power density level at 20 cm is 0.40827273 W/cm². This is below the uncontrolled exposure limit of 1 mW/cm² at 2437MHz.

Note: directional gain = Gain + 10 Log (N) dBi = 4.35 + 3.0103 = 7.36 dBi, where n is number of antenna used with host, is employed as Max. Gain as per 662911

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