

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

FCC ID: XIA-3G36WV

IC: 8847A-3G36WV

Report No.: EH/2011/80028

Issue Date: Sep. 28, 2011

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

Prepared by: SGS Taiwan Ltd.
Electronics & Communication Laboratory
No. 134, Wu Kung Rd., Wuku Industrial
Zone, Taipei County, Taiwan.

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VERIFICATION OF COMPLIANCE

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

Product Name: 3G36W-V

FCC ID Number: XIA-3G36WV

IC Number: 8847A-3G36WV

Brand Name: NetComm

Model No.: 3G36W-V

Model Difference: N/A

File Number: EH/2011/80028

Date of test: Aug. 09, 2011 ~ Sep. 23, 2011

Date of EUT Received: Aug. 09, 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.

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

Test By:	<i>Lion Wang</i>	Date:	Sep. 26, 2011
	_____ <i>Lion Wang / Engineer</i>		_____
Prepared By:	<i>Gigi yeh</i>	Date:	Sep. 26, 2011
	_____ <i>Gigi Yeh / Clerk</i>		_____
Approved By:	<i>Jim Chang</i>	Date:	Sep. 26, 2011
	_____ <i>Jim Chang / Supervisor</i>		_____

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Version

Version No.	Date	Description
00	Sep. 26, 2011	Initial creation of document

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1. GENERAL INFORMATION

General:

Product Name:	3G36W-V
Brand Name:	NetComm
Model No.:	3G36W-V
Marketing Name:	HSPA+ Data Gateway
Model Difference:	N/A
Power Supply:	15Vdc from AC/DC adapter, model: Au-79Dmu, Supplier: ELEMEN

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GSM and WCDMA:

	Operating Frequency	Rated Power	
Cellular Phone Standards Frequency Range and Power:	GSM / GPRS 850, Class 12	824.2 MHz– 848.8 MHz	33 dBm
	EDGE 850, Class 12	824.2 MHz– 848.8 MHz	27 dBm
	GSM / GPRS 1900, Class 12	1850.2MHz – 1909.8MHz	30 dBm
	EDGE 1900, Class 12	1850.2MHz – 1909.8MHz	26 dBm
	WCDMA/HSUPA/HSDPA /HSPA+ Band II	1852.4MHz – 1907.6MHz	24 dBm
	WCDMA/HSUPA/HSDPA /HSPA+ Band IV	1712.4MHz – 1752.6MHz	24 dBm
	WCDMA/HSUPA/HSDPA /HSPA+ Band V	826.4MHz - 846.6MHz	24 dBm
Type of Emission:	GSM 850: 251KGXW, GSM 1900: 242KGXW, GPRS 850: 244KGXW, GPRS 1900: 245KGXW, EDGE 850: 245KG7W, EDGE 1900: 245KG7W, WCDMA Band II: 4M17F9W, WCDMA Band IV: 4M18F9W, WCDMA Band V: 4M17F9W, HSUPA Band II: 4M15F9W, HSUPA Band IV: 4M18F9W, HSUPA Band V: 4M18F9W, HSDPA Band II: 4M18F9W, HSDPA Band IV: 4M17F9W, HSDPA Band V: 4M17F9W		
Hardware Version:	V1.31		
Software Version:	TBA		
Antenna Spec:	PIF Antenna 824~968MHz: 0.8~1.6 dBi 1710~2170 MHz: 2.0~4.3dBi		
IMEI:	35794502041126500		

This test report applies for GSM/GPRS/EDGE 850/1900, WCDMA/HSDPA/HSUPA/HSPA+ and band II / IV / V

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1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended to comply with Section Part 22, subpart H and part 15.247 of the FCC CFR 47 Rules. For 47 CFR 1.1310 Radio frequency Radiation Exposure requirement.

1.3 Special Accessories

Not available for this EUT intended for grant.

1.4 Equipment Modifications

Not available for this EUT intended for grant.

1.5 Limitation

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

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1.6 Maximum Permissible Exposure (MPE) Evaluation

In this application we seek approval to the 3G36W-V. Based on the FCC OET Bulletin 65 Supplement C and 47 CFR §2.1091, we have concluded that the NCMOMO0407 module will comply with the FCC rules on RF exposure for mobile devices in GSM/GPRS/EDGE 850/1900, WCDMA/HSDPA/HSUPA/HSPA+ and band II / IV / V. The following analysis will demonstrate such compliance. The analysis will be done in two US bands.

Operation in GPRS 850 band (824 – 849 MHz)

The ERP of 3G36W-V in GPRS 850 band is 33.91dBm max at GSM/GPRS mode. The resulted power density at a distance of 20 cm can be deducted as follows:

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
GPRS 850	824.20	128	H	V	131.22	44.83	-7.87	3.62	33.33	38.45
				H	128.56	42.29	-7.87	3.62	30.79	38.45
	836.60	190	H	V	131.26	45.01	-7.88	3.65	33.48	38.45
				H	128.14	41.91	-7.88	3.65	30.38	38.45
	848.80	251	H	V	131.59	45.47	-7.88	3.68	33.91	38.45
				H	129.07	42.88	-7.88	3.68	31.32	38.45

$$\text{EIRP} = 33.91 + 2.14 = 36.05 \text{ dBm} = 4027.17 \text{ mW}$$

$$\begin{aligned} \text{Power Density} &= \text{EIRP} * \text{Duty Cycle} / (4 \pi R^2) \\ &= 4027.17 * 0.5 / (4 * \pi * 20^2) = 0.401 \text{ mW/cm}^2 \end{aligned}$$

where Duty Cycle is 0.5 for GPRS operation (class 12) and R is 20 cm.

The MPE limit for General Population/Uncontrolled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 824/1500 = 0.55 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore 3G36W-V in cellular band is compliant with the FCC rules on RF exposure.

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Operation in GPRS1900 band (1850 – 1910 MHz)

The EIRP of 3G36W-V in GPRS 1900 is 30.68 dBm. max. The resulted EIRP can be expressed as follows:

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
GPRS 1900	1850.20	512	H	V	130.73	26.34	9.90	5.56	30.68	33.00
				H	124.04	19.86	9.90	5.56	24.20	33.00
	1880.00	661	H	V	129.86	25.50	9.99	5.61	29.88	33.00
				H	123.47	19.33	9.99	5.61	23.70	33.00
	1909.80	810	H	V	129.53	25.20	10.08	5.66	29.62	33.00
				H	124.42	20.31	10.08	5.66	24.73	33.00

$$\text{EIRP} = 30.68 \text{ dBm} = 714.5 \text{ mW}$$

$$\begin{aligned} \text{Power Density} &= \text{EIRP} * \text{Duty Cycle} / (4 \pi R^2) \\ &= 714.5 * 0.5 / (4 * \pi * 20^2) = 0.071 \text{ mW/cm}^2 \end{aligned}$$

where Duty Cycle is 0.5 for GPRS operation (class 12) and R is 20 cm.

The MPE limit for General Population/Uncontrolled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 1.0 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore 3G36W-V in GPRS 1900 band is compliant with the FCC rules on RF exposure.

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Operation in HSUPA Band II (1852.4– 1907.6 MHz)

The EIRP of 3G36W-V in HSUPA band II is 27.62 dBm. max. The resulted EIRP can be expressed as follows:

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
HSUPA Band II	1852.40	9262	H	V	127.67	23.29	9.90	5.56	27.62	33.00
				H	120.79	16.61	9.90	5.56	20.95	33.00
	1880.00	9400	H	V	127.26	22.90	9.99	5.61	27.28	33.00
				H	119.94	15.80	9.99	5.61	20.17	33.00
	1907.60	9538	H	V	126.86	22.53	10.07	5.66	26.94	33.00
				H	119.51	15.40	10.07	5.66	19.81	33.00

$$\text{EIRP} = 27.62 \text{ dBm} = 353.18 \text{ mW}$$

$$\begin{aligned} \text{Power Density} &= \text{EIRP} * \text{Duty Cycle} / (4 \pi R^2) \\ &= 353.18 * 0.5 / (4 * \pi * 20^2) = 0.035 \text{ mW/cm}^2 \end{aligned}$$

where Duty Cycle is 0.5 for GPRS operation (class 12) and R is 20 cm.

The MPE limit for General Population/Uncontrolled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 1.0 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore 3G36W-V in HSUPA band II is compliant with the FCC rules on RF exposure.

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Operation in HSUPA band V (826.4 – 846.6 MHz)

The ERP of 3G36W-V in HSUPA band V is 27.14 dBm max.

The resulted power density at a distance of 20 cm can be deducted as follows:

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
HSUPA Band V	826.40	4132	H	V	124.70	38.34	-7.88	3.63	26.83	38.45
				H	119.23	32.97	-7.88	3.63	21.47	38.45
	836.60	4183	H	V	124.93	38.67	-7.88	3.65	27.14	38.45
				H	119.21	32.98	-7.88	3.65	21.45	38.45
	846.60	4233	H	V	124.81	38.66	-7.88	3.67	27.11	38.45
				H	119.11	32.91	-7.88	3.67	21.36	38.45

$$\text{EIRP} = 27.14 + 2.14 = 29.28 \text{ dBm} = 847.23 \text{ mW}$$

$$\text{Power Density} = \text{EIRP} * \text{Duty Cycle} / (4 \pi R^2)$$

$$= 847.23 * 0.5 / (4 * \pi * 20^2) = 0.084 \text{ mW/cm}^2$$

where Duty Cycle is 0.5 for GPRS operation (class 12) and R is 20 cm.

The MPE limit for General Population/Uncontrolled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 824/1500 = 0.55 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore 3G36W-V in cellular band is compliant with the FCC rules on RF exposure.

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Operation in HSUPA band IV (1712.4 – 1752.6 MHz)

The EIRP of 3G36W-V in HSUPA band IV is 28.90 dBm. max. The resulted EIRP can be expressed as follows:

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
HSUPA Band IV	1712.4	1312	H	V	128.50	23.98	9.48	5.33	28.12	33.00
				H	121.94	17.61	9.48	5.33	21.75	33.00
	1732.6	1413	H	V	128.25	23.75	9.54	5.36	27.92	33.00
				H	120.97	16.66	9.54	5.36	20.83	33.00
	1752.6	1513	H	V	129.18	24.70	9.61	5.40	28.90	33.00
				H	122.22	17.93	9.61	5.40	22.14	33.00

$$\text{EIRP} = 28.90 \text{ dBm} = 474.24 \text{ mW}$$

$$\begin{aligned} \text{Power Density} &= \text{EIRP} * \text{Duty Cycle} / (4 \pi R^2) \\ &= 474.24 * 0.5 / (4 * \pi * 20^2) = 0.047 \text{ mW/cm}^2 \end{aligned}$$

where Duty Cycle is 0.5 for GPRS operation (class 12) and R is 20 cm.

The MPE limit for General Population/Uncontrolled Exposure is shown in the FCC OET Bulletin 65 Supplement C and can be calculated as follows:

$$\text{MPE limit} = 1.0 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore 3G36W-V in HSUPA band IV is compliant with the FCC rules on RF exposure.

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APPENDIX 1 PHOTOGRPHS OF EUT

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All of EUT



Front View of EUT - 1



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Back View of EUT - 1



Side View of EUT - 1



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Side View of EUT – 2



Side View of EUT – 3



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Side View of EUT – 4



Adapter



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Open View of EUT – 1



Open View of EUT – 2



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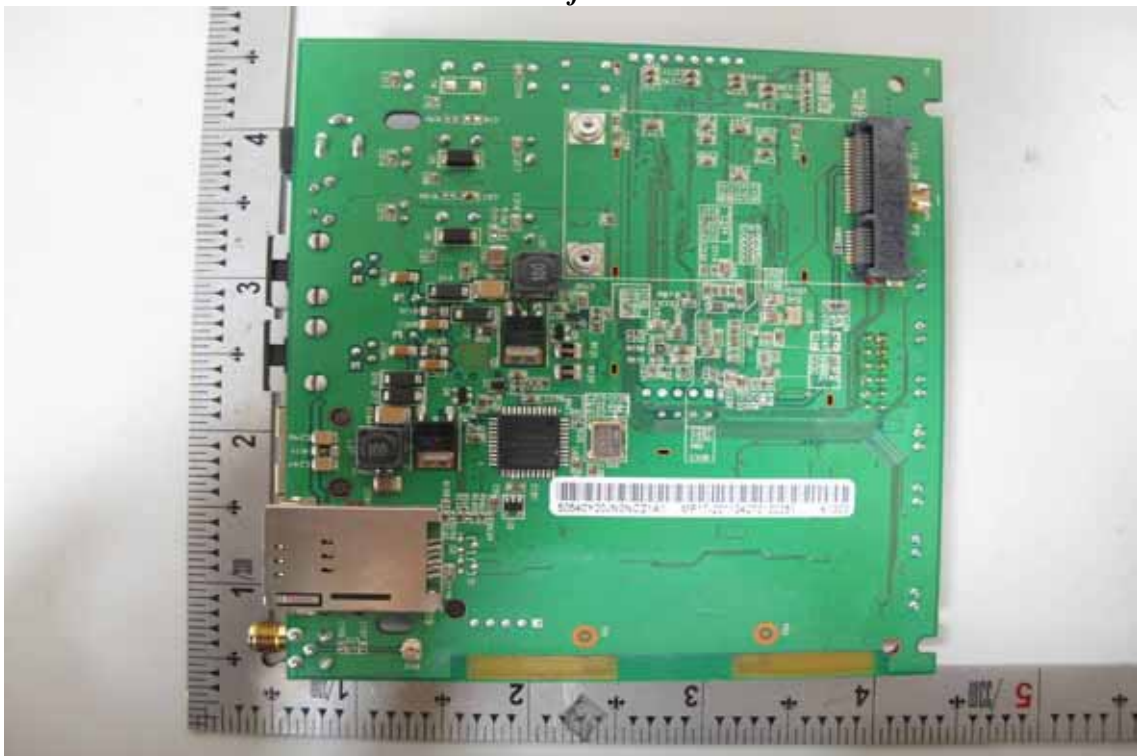
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Internal of EUT – 2



Internal of EUT – 3



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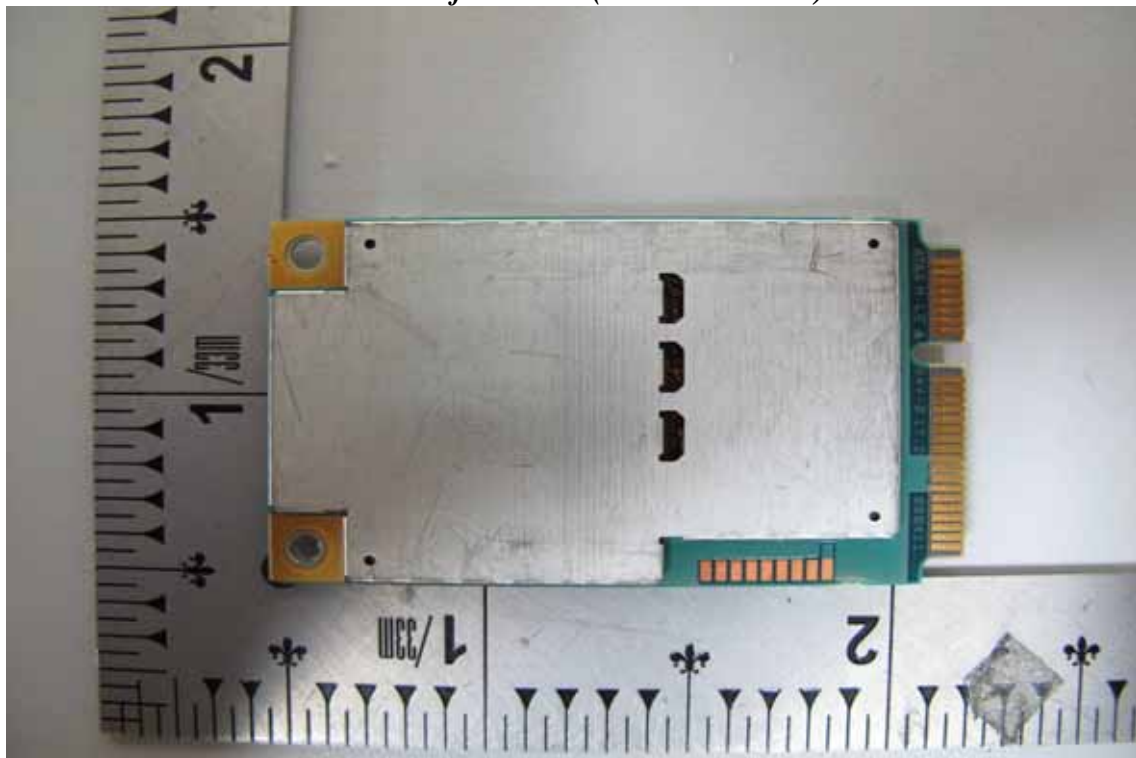
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Internal of EUT – 4 (WWAN Module)



Internal of EUT – 5 (WWAN Module)



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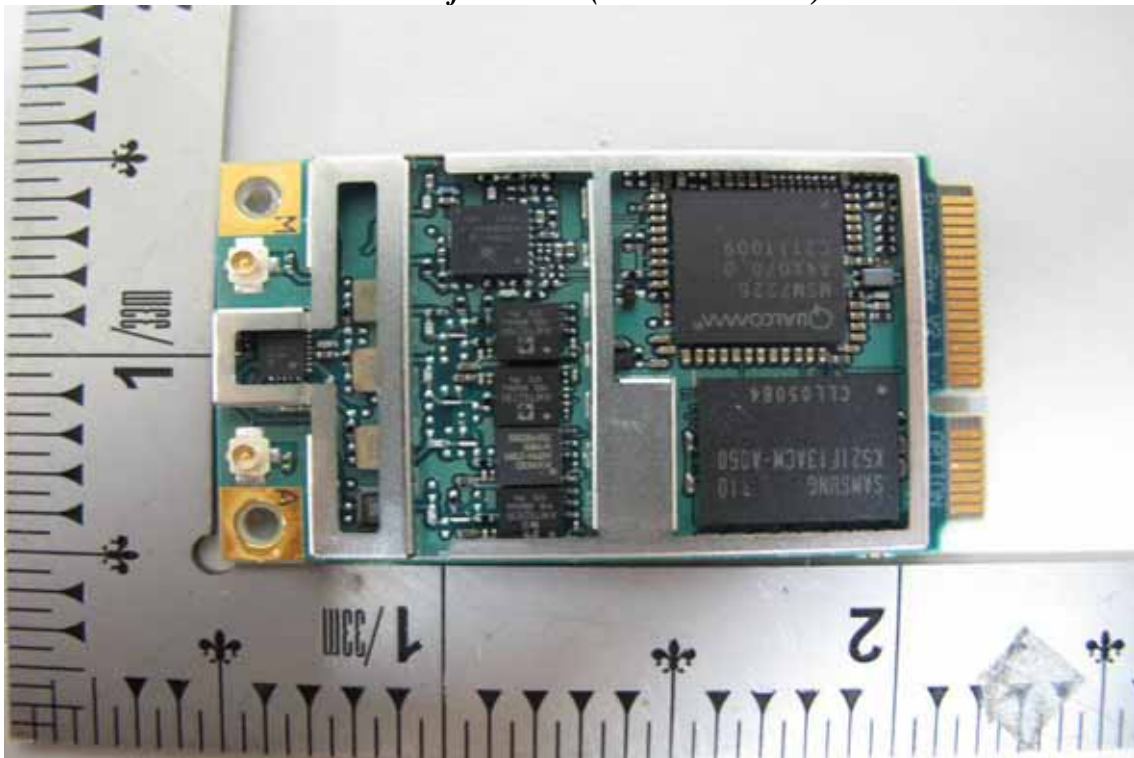
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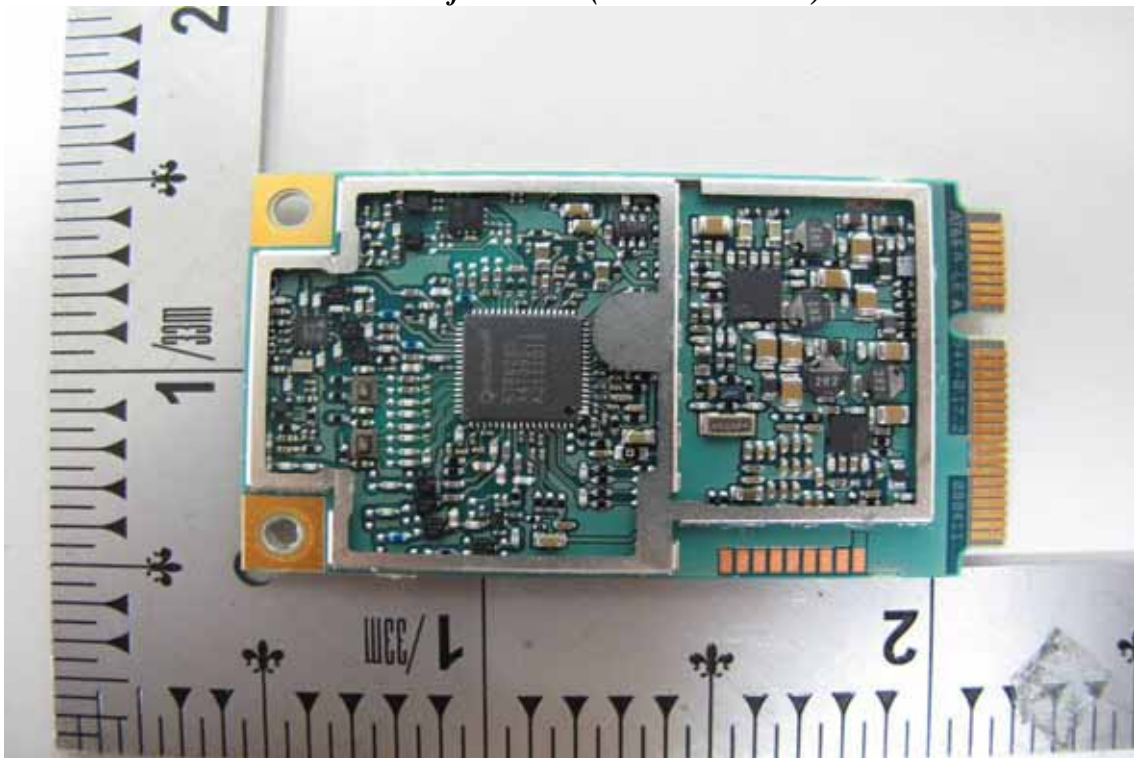
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Internal of EUT – 6 (WWAN Module)



Internal of EUT – 7 (WWAN Module)



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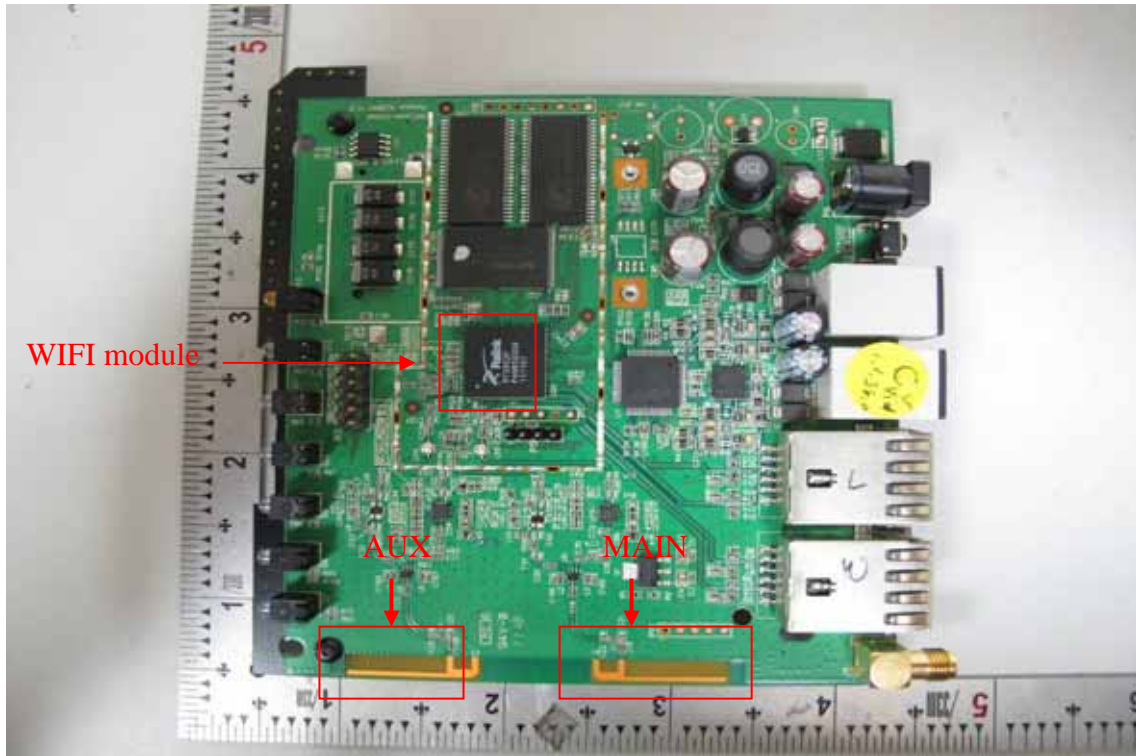
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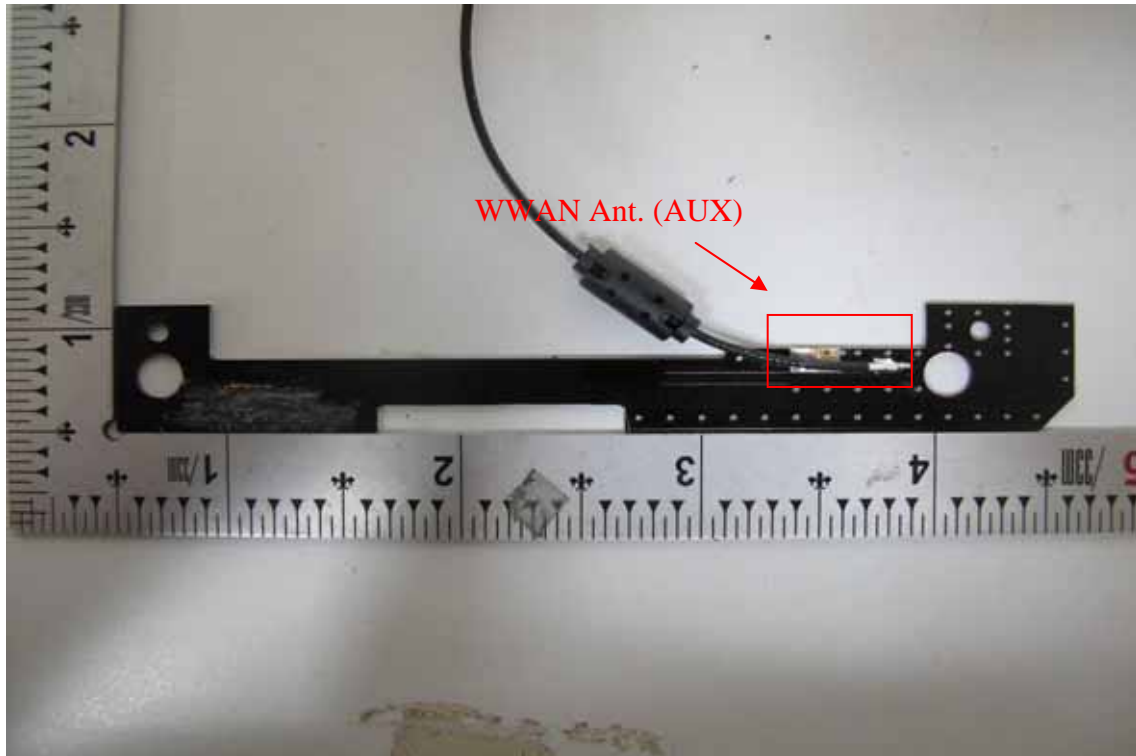
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Antenna Location and distance



Antenna Location and distance



~ End of Report ~

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