Beijing InHand Networks Technology Co,. Ltd.

Industrial Cellular Router

Main Model: IR615PH01-AP
Serial Model: Please See Page5

March 20, 2013
Report No.: 13020108-2-FCC-H1
(This report supersedes NONE)

Modifications made to the product : None

This Test Report is Issued Under the Authority of:		
Deon Dai	Alex Liu	
Deon Dai **Compliance Engineer**	**Alex Liu** **Technical Manager**	

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Test result presented in this test report is applicable to the representative sample only.

RF Exposure Evalution Report

To: FCC 2.1091: 2012

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Laboratory Introduction

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Accreditations for Conformity Assessment

Country/Region	Accreditation Body	Scope
USA	FCC, A2LA	EMC , RF/Wireless , Telecom
Canada	IC, A2LA, NIST	EMC, RF/Wireless , Telecom
Taiwan	BSMI , NCC , NIST	EMC, RF, Telecom , Safety
Hong Kong	OFTA , NIST	RF/Wireless ,Telecom
Australia	NATA, NIST	EMC, RF, Telecom , Safety
Korea	KCC/RRA, NIST	EMI, EMS, RF , Telecom, Safety
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	Safety, EMC , RF/Wireless, Telecom
Europe	A2LA, NIST	EMC, RF, Telecom , Safety

Accreditations for Product Certifications

Country/Region	Accreditation Body	Scope
USA	FCC TCB, NIST	EMC , RF , Telecom
Canada	IC FCB , NIST	EMC , RF , Telecom
Singapore	iDA, NIST	EMC , RF , Telecom
EU	NB	EMC & R&TTE Directive
Japan	MIC, (RCB 208)	RF , Telecom
Hong Kong	OFTA (US002)	RF , Telecom

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1. EXECUTIVE SUMMARY & EUT INFORMATION

The purpose of this test programme was to demonstrate compliance of the Beijing InHand Networks Technology Co,. Ltd. Industrial Cellular Router and model: IR615PH01-AP against the current Stipulated Standards. The Industrial Cellular Router has demonstrated compliance with the FCC 2.1091: 2012.

EUT Information

EUT Description	:	**Industrial Cellular Router**
Main Model	:	**IR615PH01-AP**
Serial Model		**IR605PH01-AP, IR605PH01-STA, IR615PH01-STA, IR695PH01-AP, IR695PH01-STA, IG605PH01-AP, IG605PH01-STA, IG615PH01-AP, IG615PH01-STA, IG695PH01-AP, IG695PH01-STA**
Antenna Gain	:	**GSM/WCDMA: 0.8dBi WLAN: 3dBi**
Input Power	:	**Adapter Model：AW018WR-1200 100CV Input：100-240V 50/60Hz 0.5A Output: 12V 1A EUT Power supply: 9-26V DC Power Terminal**
Maximum Conducted Peak Power to Antenna	:	**GSM850:32.52dBm PCS1900:28.98dBm 802.11b:14.08dBm 802.11g:17.75dBm 802.11n (20M):18.56dBm 802.11n (40M):17.40dBm**
Classification Per Stipulated Test Standard	:	**FCC 2.1091: 2012**

2. TECHNICAL DETAILS

Purpose	**Compliance testing of Industrial Cellular Router with stipulated standard**
Applicant / Client	**Beijing InHand Networks Technology Co,. Ltd. West Wing, 11th Floor, Building G, Wang Jing Science Park, Chaoyang District, Beijing, 100102 China**
Manufacturer	**Beijing InHand Networks Technology Co,. Ltd. West Wing, 11th Floor, Building G, Wang Jing Science Park, Chaoyang District, Beijing, 100102 China**
Laboratory performing the tests	**SIEMIC Nanjing (China) Laboratories NO.2-1,Longcang Dadao, Yuhua Economic Development Zone, Nanjing, China Tel:+86(25)86730128/86730129 Fax:+86(25)86730127 Email:info@siemic.com**
Test report reference number	**13020108-2-FCC-H1**
Date EUT received	**March 06, 2013**
Standard applied	**FCC 2.1091: 2012**
Dates of test	**March 15, 2013**
No of Units	**#1**
Equipment Category	**Spread Spectrum System/Device**
Trade Name	**N/A**
RF Operating Frequency (ies)	**GSM850 TX : 824.2 ~ 848.8 MHz; RX : 869.2 ~ 893.8 MHz PCS1900 TX : 1850.2 ~ 1909.8 MHz; RX : 1930.2 ~ 1989.8 MHz WLAN:2.4GHz band: 802.11b/g/n(HT 20) : 2412-2462 MHz 802.11n(HT 40): 2422~2452MHz**
Number of Channels	**299CH (PCS1900) and 124CH (GSM850) WiFi: 11CH**
Modulation	**GSM / GPRS: GMSK WLAN: DSSS/OFDM**
FCC ID	**ZAZIR6X5PAP**

3. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

FCC §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

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

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm2)	Averaging Time (minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

Test Data

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

Where: S = power density (in appropriate units, e.g. mW/cm2)
P = power input to the antenna (in appropriate units, e.g., mW).
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

GSM 850

Antenna Gain (dBi)	Antenna Gain (numeric)	Max Tune up power (dBm)	Average Output Power (mW)	Duty factor	The maximum sourced based time-averaged transmit power(mW)	Calculated RF Exposure (mW/m^2)	Limit (mW/m^2)
0.8	1.202	34	2511.886	1/8	313.986	0.075	0.549

PCS 1900

Antenna Gain (dBi)	Antenna Gain (numeric)	Max Tune up power (dBm)	Average Output Power (mW)	Duty factor	The maximum sourced based time-averaged transmit power(mW)	Calculated RF Exposure (mW/m^2)	Limit (mW/m^2)
0.8	1.202	29	794.328	1/8	99.291	0.024	1

802.11b:

Maximum peak output power at antenna input terminal: 14.08 (dBm)
Maximum peak output power at antenna input terminal: 25.59 (mW)

Prediction distance: >20 (cm)
Predication frequency: 2412 (MHz)
Antenna Gain (typical): 3.0 (dBi)
Antenna Gain (typical): 1.995 (numeric)

The worst case is power density at predication frequency at 20 cm: 0.010 (mW/cm2)
MPE limit for general population exposure at prediction frequency: 1.0 (mW/cm2)

0.010(mW/cm2) < 1.0(mW/cm2)

802.11g:

Maximum peak output power at antenna input terminal: 17.75 (dBm)
Maximum peak output power at antenna input terminal: 59.57 (mW)

Prediction distance: >20 (cm)

Predication frequency: 2412 (MHz)
Antenna Gain (typical):3 (dBi)
Antenna Gain (typical): 1.995 (numeric)

The worst case is power density at predication frequency at 20 cm: 0.024 (mW/cm2)
MPE limit for general population exposure at prediction frequency:1.0 (mW/cm2)

0.024 (mW/cm2) < 1.0(mW/cm2)

802.11n (20M):

Maximum peak output power at antenna input terminal: 18.56 (dBm)
Maximum peak output power at antenna input terminal: 71.78 (mW)

Prediction distance: >20 (cm)
Predication frequency: 2412 (MHz)
Antenna Gain (typical):3 (dBi)
Antenna Gain (typical): 1.995 (numeric)

The worst case is power density at predication frequency at 20 cm: 0.028 (mW/cm2)
MPE limit for general population exposure at prediction frequency:1.0 (mW/cm2)

0.028 (mW/cm2) < 1.0(mW/cm2)

802.11n (40M):

Maximum peak output power at antenna input terminal: 17.40 (dBm)
Maximum peak output power at antenna input terminal: 54.95 (mW)

Prediction distance: >20 (cm)
Predication frequency: 2437 (MHz)
Antenna Gain (typical):3 (dBi)
Antenna Gain (typical): 1.995 (numeric)

The worst case is power density at predication frequency at 20 cm: 0.022 (mW/cm2)
MPE limit for general population exposure at prediction frequency:1.0 (mW/cm2)

0.022 (mW/cm2) < 1.0(mW/cm2)

Result: Pass