

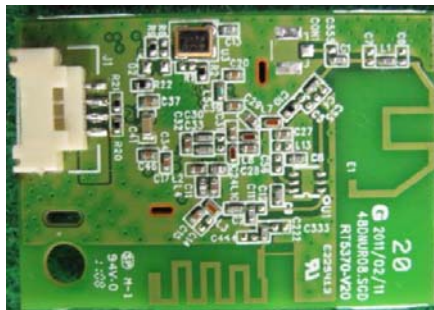
## User manual

*Product description:* IEEE 802.11g/n 1x1 USB module

*WNC model name:* DNUR-S1

*Samsung model name:* DNURS1

*Version:* V1.0



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## 1. Introduction

DNUR-S1 is an USB embedded module compliant with IEEE802.11n Draft 2.0 standard. The core chipset is from Ralink, part number RT5370.

## 2. Features

- CMOS Technology with PA, LNA, RF, Baseband, and MAC integrated.
- 1T1R Mode with 150Mbps PHY Rate for Both TX & RX.
- 20MHz Bandwidth
- Reverse Direction Grant Data Flow and Frame Aggregation
- WEP 64/128, WPA, WPA2, TKIP, AES, WAPI
- QoS-WMM, WMM-PS
- WPS, PIN, PBC
- Multiple BSSID Support
- USB 2.0
- Cisco CCX Support
- Bluetooth Co-existence
- Operating Systems – Windows XP 32/64, 2000, Windows 7, Vista 32/64, Linux, Macintosh

### 3. Hardware Architecture:

#### 3.1 Main Chipset Information

Item	Vender	Part number
MAC/BBP/Radio Transceiver/PA	Ralink	RT5370

#### 3.2 Circuit Block Diagram

The major internal components and external interfaces of DNUR-S1 are illustrated in Figure 1-1.

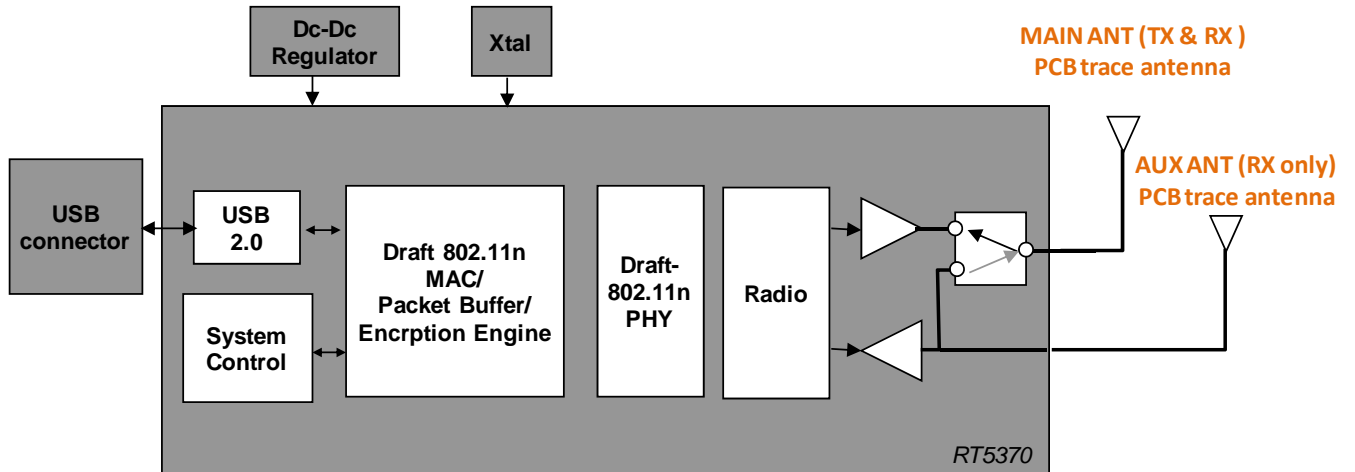
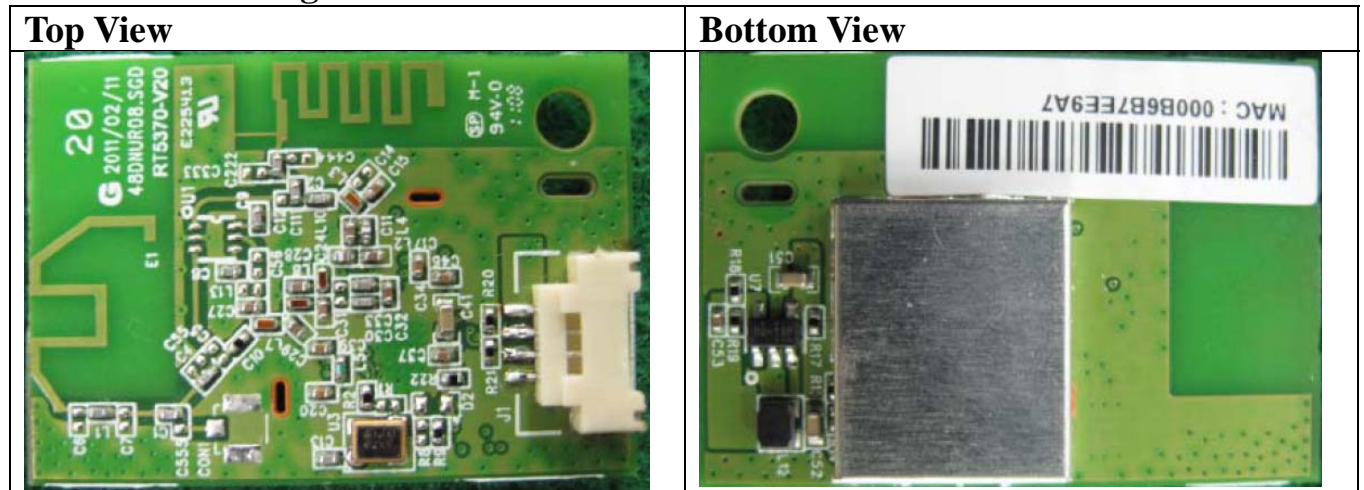


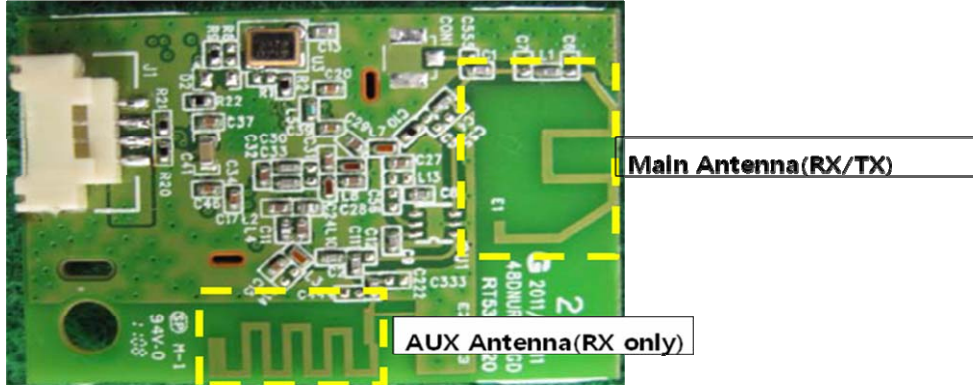
Figure 1-1 DNUR-S1 Major Component and System Interface

#### 3.3 Outlook Diagram



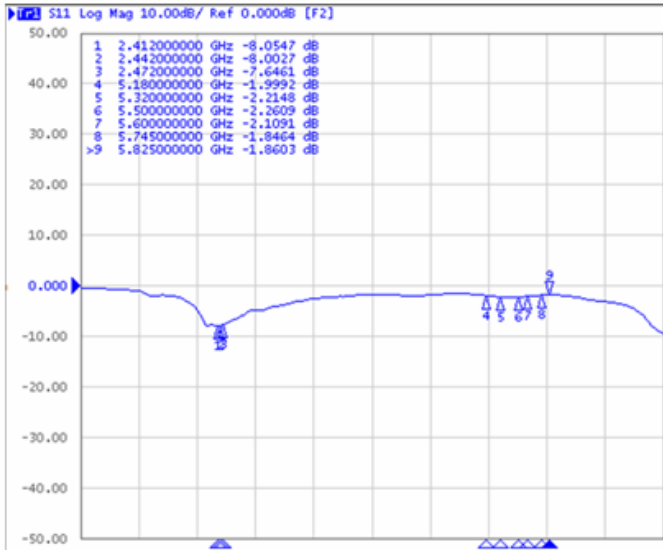
### 3.4 Antennas Information

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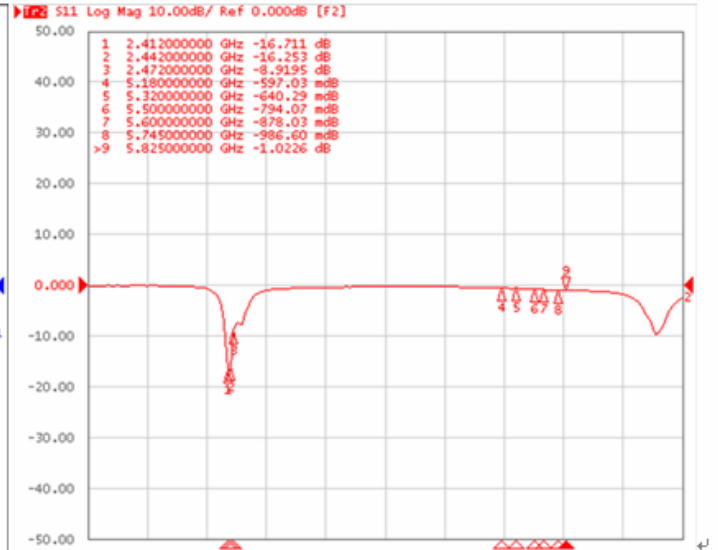


#### 3.4.1 VSWR

MAIN



AUX

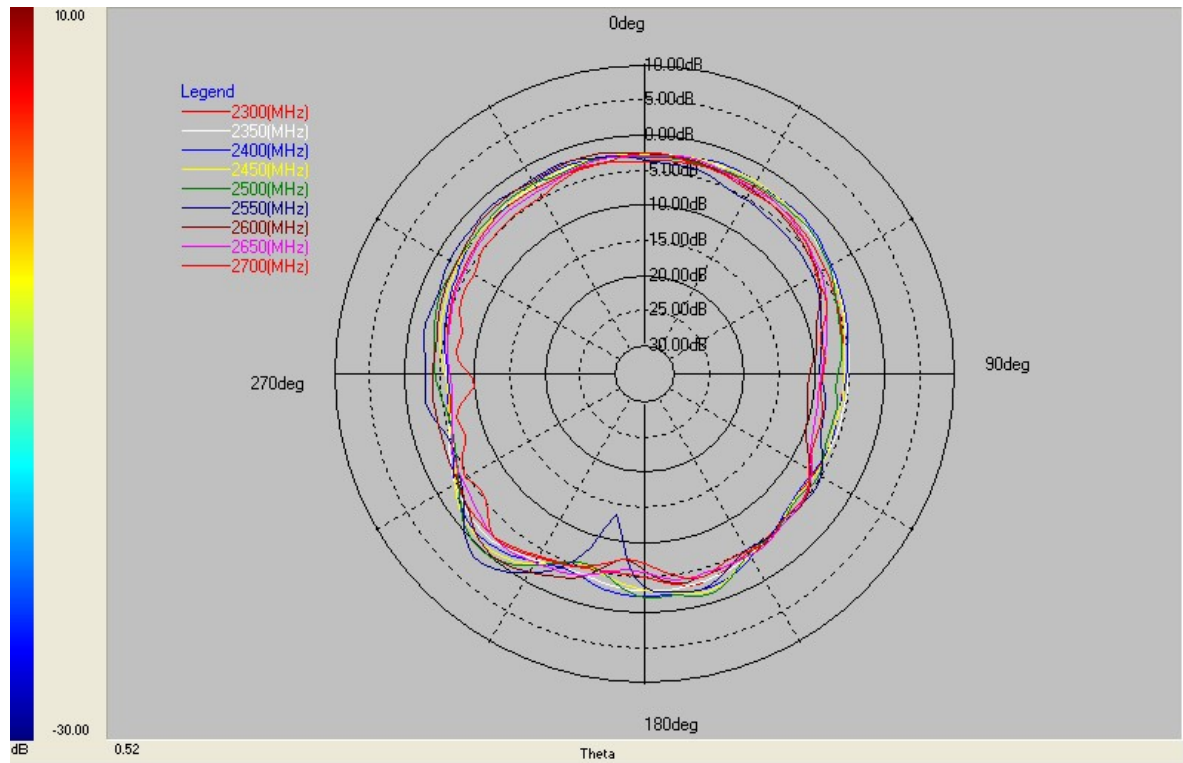


#### 3.4.2 Notice

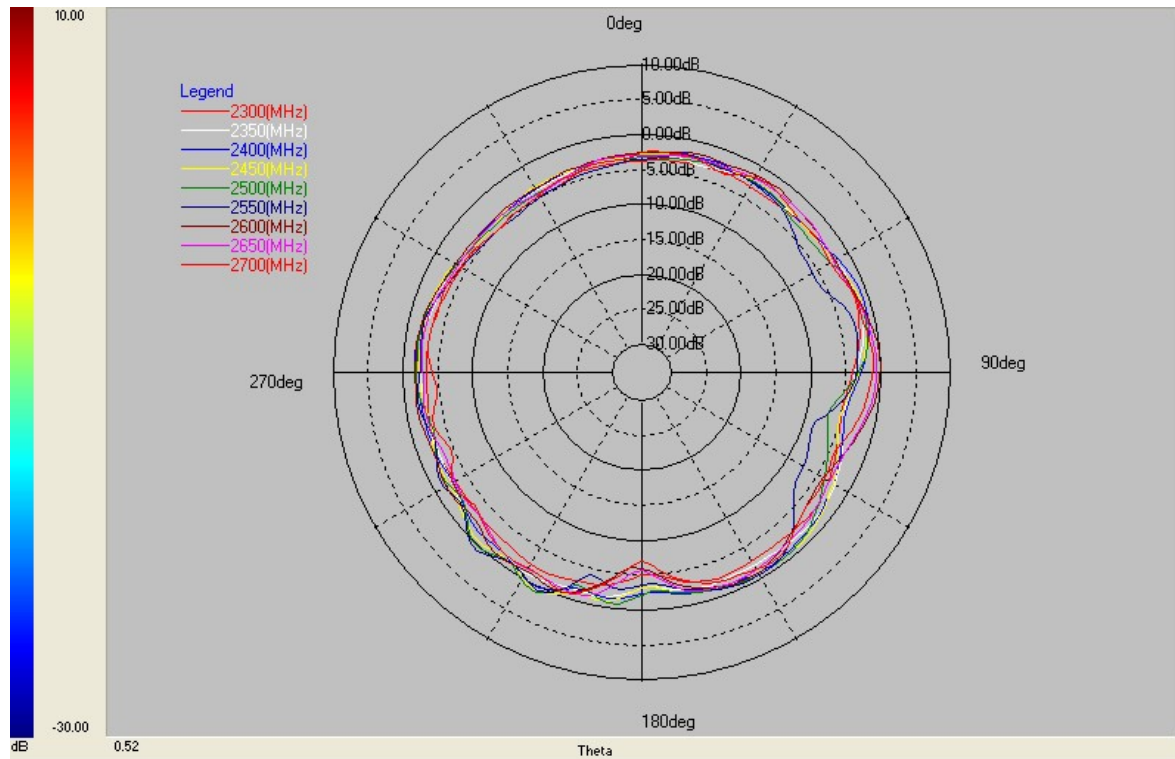
No other antennas other than the on-board trace antenna are permitted for use with this device(DNUR-S1).

### 3.4.2 Antenna Pattern

#### XZ-Cut (Main ANT)

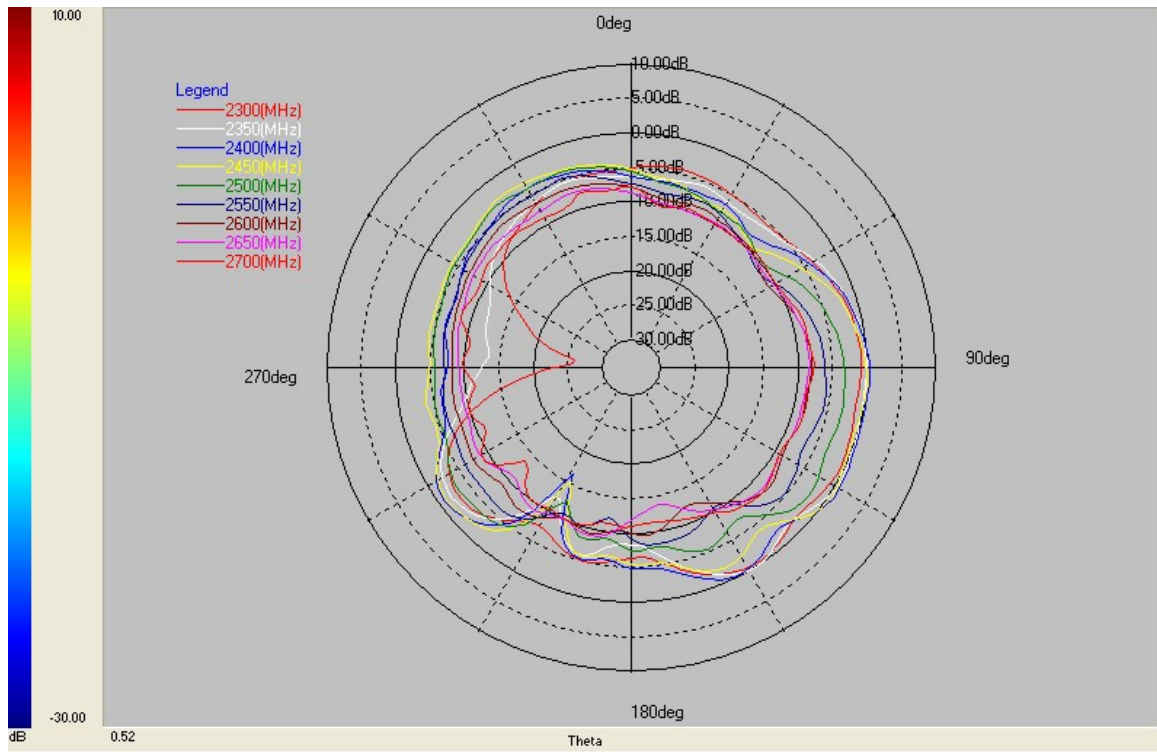


#### YZ-Cut (MAIN ANT)

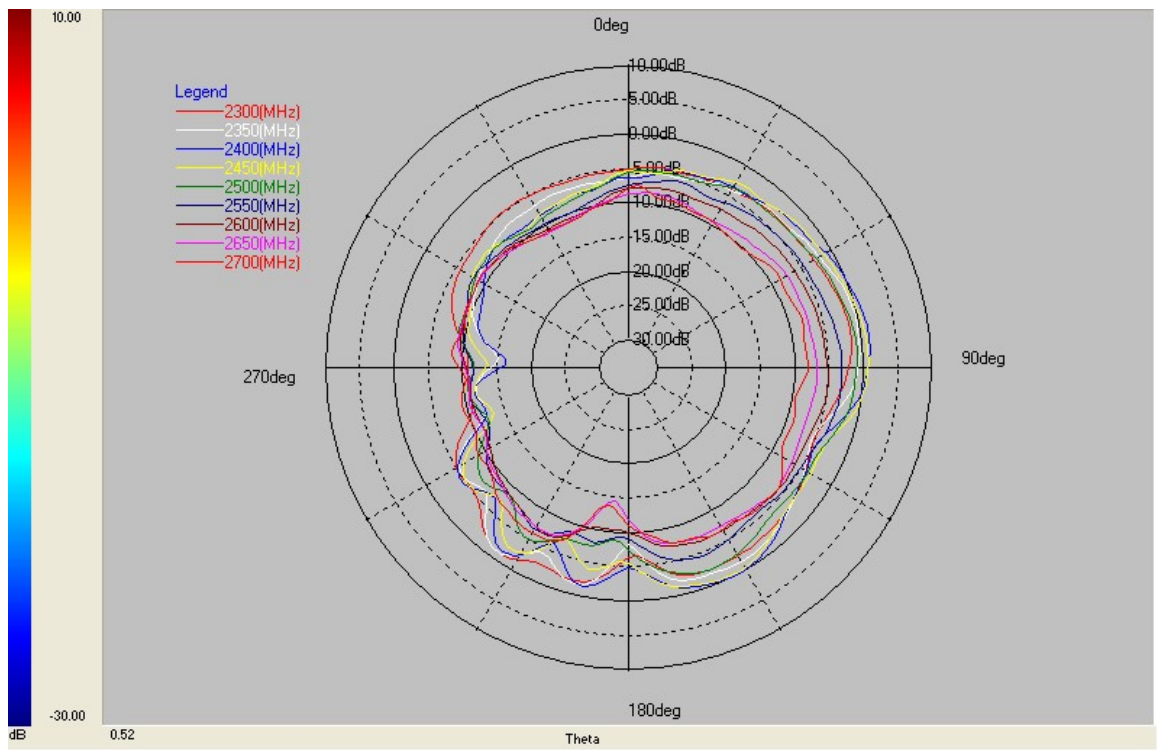




XZ-Cut (AUX ANT)



YZ-Cut (AUX ANT)



### 3.4.3 Efficiency

Main:↵

Frequency	2.4E+09	2.45E+09	2.5E+09
Efficiency	50.28%	49.59%	48.07%

Aux:↵

Frequency	2.4E+09	2.45E+09	2.5E+09
Efficiency	40.30%	40.37%	29.42%

### 3.4.4 Gain Table

	Frequency	2.4E+09	2.45E+09	2.5E+09
MAIN	Efficiency	50.28%	49.59%	48.07%
	Avg. Gain	-2.99	-3.05	-3.18
	Peak Gain	0.78	0.54	1.02
AUX	Efficiency	40.30%	40.37%	29.42%
	Avg. Gain	-3.95	-3.94	-5.31
	Peak Gain	1.31	0.83	-0.73





## 5. Specifications:

### 5.1 Supply Voltage:

5V±5% DC

### 5.2 Current Consumption

Condition	5V supply only		Unit
	AVG	Max	
11b Cont. Tx@ 6M	400		mA
11g Cont. Rx@6M	180		
11N Cont.HT40@MCS7	200		
11N Cont.HT40@MCS0	360		
AP link	160		
Associated and idle with power saving	110		

### 5.3 RF power

(Typical power level, for each TX with +/- 2 dB tolerance, unit:dBm )

20MHz BW	MHz		
	2412	2442	2472
1Mbps	18	18	18
2Mbps	18	18	18
5.5Mbps	18	18	18
11Mbps	18	18	18
6Mbps	18	18	18
9Mbps	18	18	18
12Mbps	18	18	18
18Mbps	18	18	18
24Mbps	16	16	16
36Mbps	16	16	16
48Mbps	14	14	14
54Mbps	14	14	14
HT20MCS0	18	18	18
HT20MCS1	18	18	18
HT20MCS2	18	18	18
HT20MCS3	18	18	18
HT20MCS4	16	16	16
HT20MCS5	16	16	16
HT20MCS6	14	14	14
HT20MCS7	14	14	14

Notes: Power level for different country domains is country dependent and Broadcom driver & SPROM will control the regulatory power table. Therefore, the actual power may be lower

than this number.

## 5.4 RF Sensitivity

(Typical sensitivity level, 2RX with +/- 3 dB tolerance ( unit:dBm ))

20MHz BW	MHz		
	2412	2442	2472
1Mbps	-92	-92	-92
2Mbps	-89	-89	-89
5.5Mbps	-87	-87	-87
11Mbps	-87	-87	-87
6Mbps	-90	-90	-90
9Mbps	-89	-89	-89
12Mbps	-88	-88	-88
18Mbps	-87	-87	-87
24Mbps	-87	-87	-87
36Mbps	-80	-80	-80
48Mbps	-75	-75	-75
54Mbps	-74	-74	-74
HT20 MCS0	-90	-90	-90
HT20 MCS1	-87	-87	-87
HT20 MCS2	-85	-85	-85
HT20 MCS3	-82	-82	-82
HT20 MCS4	-79	-79	-79
HT20 MCS5	-75	-75	-75
HT20 MCS6	-74	-74	-74
HT20 MCS7	-72	-72	-72

## 5.5 Environmental Spec.

Operating Temperature Range: 0degree C~ 60degree C  
 Storage Temperature Range: Temperature: -20~80°C Humidity: 95%(MAX)  
 Operating Humidity Range: 10% ~90% (No dew condensation)

## 6. Regulatory Notice

### 6.1 Information for US Users (FCC Notice)

#### FCC ID : A3LDNURS1

In accordance with FCC Part 15, the A3LDNURS1 is listed as a Modular Transmitter device. End products that include the A3LDNURS1 shall have the words “Contains Transmitter module FCC ID: A3LDNURS1” on an exterior label

**This device complies with Part 15 of FCC Rules. Operation is Subject to following two conditions:**

- (1) This device may not cause harmful interference, and**
- (2) This device must accept any interference received including interference that cause undesired operation.**

This equipment has been tested and found to comply within the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a different circuit from that to which the receiver is connected
  - Consult the dealer or an experienced radio/TV technician for help.

The transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

The available scientific evidence does not show that any health problems are associated with using low power wireless devices. There is no proof, however, that these low power wireless devices are absolutely safe. Low power wireless devices emit low levels of radio frequency energy (RF) in the microwave range while being used. Whereas high levels of RF can produce health effects (by heating tissue), exposure to low-level RF that does not produce heating effects causes no known adverse health effects. Many studies of low-level RF exposures have not found any biological effects. Some studies have suggested that some biological effects might occur, but such findings have not been confirmed by additional research.

To satisfy RF exposure requirements, this device and its antenna(s) must operate with a separation distance of at least 20 centimeters from all persons and must not be co-located or operated in conjunction with any other antenna or transmitter. End-users must be provided with specific operating instructions for satisfying RF exposure.

**FCC WARNING:**

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## **6.2 Information for Canadian Users (IC Notice)**

### **IC : 649E-DNURS1**

The term “IC” before the radio certification number only signifies that Industry Canada technical specifications were met. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

This Class B digital apparatus complies with Canadian ICES-003.

To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment that is installed outdoors is subject to licensing.

This device has been designed to operate with an antenna having a maximum gain of 0.6dB. Antennas having a higher gain are strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 ohms.

To reduce potential radio interference to others, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than required for successful communication.

The available scientific evidence does not show that any health problems are associated with using low power wireless devices. There is no proof, however, that these low power wireless devices are absolutely safe. Low power wireless devices emit low levels of radio frequency energy (RF) in the microwave range while being used. Whereas high levels of RF can produce health effects (by heating tissue), exposure to low-level RF that does not produce heating effects causes no known adverse health effects. Many studies of low-level RF exposures have not found any biological effects. Some studies have suggested that some biological effects might occur, but such findings have not been confirmed by addition

## 7. Installation

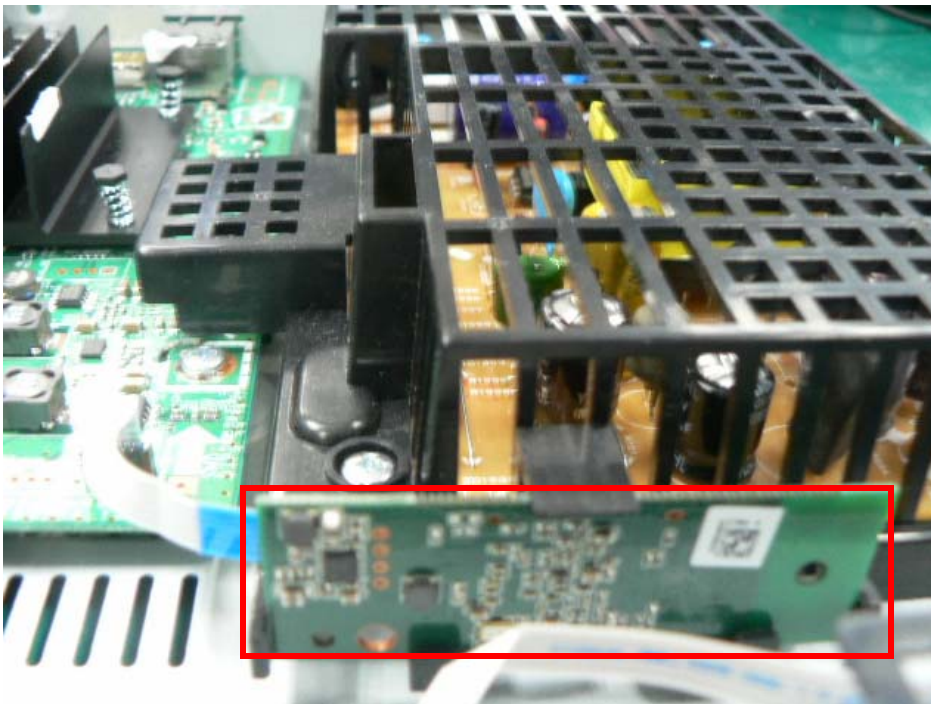
This radio module must be installed in a device and not allow the user to replace nor modify it. Besides, it was under FCC modular approval, therefore there are some rules need to follow while adopting this module :

1. Include content “FCC ID : A3LDNURS1” on the label of your device.
2. Use the on-board trace antenna (refer to the spec in this document ).

### 7.1 Installation Procedure

1. Be sure to use the proper antistatic handling techniques.
2. Insert the DNURS1 into the machine and fix it by bracket.

#### Side view



TOP view

