

# **USER Manual**

LS6-N22S-M

## **SPECIFICATIONS**

- 1.power up for MT7620A with battery 7.4V
- 2.Connect to the PC with RS232.
- 3.run the CMD on PC
- 4.run the MT7620A's QA tools which given by the supplier.
5. The MT7620 router module with two antenna ports which pattern is MOMI,the two antenna are the same one.

The antenna manufacturer A:Suzhou point positive electronic technology co.,ltd

Model No:RC8WFI0063A or Model No:FCIWF10779A

Ant. Gain: Ref Ant. spec

## **FCC Statement**

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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

NOTE: This equipment has been tested and found to comply with 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 circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement The modular can be installed or integrated in mobile or fix devices only. This modular cannot be installed in any portable device, for example, USB dongle like

transmitters is forbidden.

This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This modular must be installed and operated with a minimum distance of 20 cm between the radiator and user body.

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: Contains Transmitter Module FCC ID: XCO-LS6 and IC: 7756A-LS6

when the module is installed inside another device, the user manual of this device must contain below warning statements;  
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

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

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

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

### **Information for the OEM Integrators**

This device is intended for OEM integrators only. Please see the full grant of equipment document for restrictions.

### **Label Information to the End User by the OEM or Integrators**

If the FCC ID of this module is not visible when it is installed inside another device, then the outside of the device into which the module is installed must be label with Contains FCC ID: XCO-LS6 and IC: 7756A-LS6”.

# 1. Introduction

Libre LS6-N22S is a complete network media module. It includes an 802.11n MAC and baseband, a 2.4 GHz 2x2 MIMO radio and FEM, a 580MHz MIPS® 24K™ CPU core, with supporting FLASH and DRAM memory. The module also includes all the necessary I/O and control interfaces required to build feature rich networked media products, yet cost effective with very little additional electronic design.

The embedded high performance CPU can process many advanced applications, such as network media streaming, rendering, routing, security and special advanced Libre technology features. The LS6-N22S also includes a selection of interfaces to support a variety of applications, such as I2S audio interface, a USB port and SD port for accessing external storage, SPI and UART for data and control.

Combined with the extensive LibreSync software, this small form factor and low cost design provide excellent Wi-Fi and processing performance for the wireless connectivity required in today CE products.

## 2. Module Feature Summary

### Key Features

- Embedded MIPS24KEc (580 MHz) with 64 KB I-Cache and 32 KB D-Cache
- 2T2R 2.4 GHz with 130 Mbps PHY data rate
- Legacy 802.11b/g and HT 802.11n modes
- 20 MHz channel bandwidth
- Libre's advanced multi-zone audio streaming technology
- Reverse Data Grant (RDG)
- Maximal Ratio Combining (MRC)
- Space Time Block Coding (STBC)
- 16-bit DDR2 64Mbytes
- Serial Flash 16Mbytes
- SPI, SD-XC
- 1x USB 2.0
- An optimized PMU

- Green AP
- Intelligent Clock Scaling (exclusive)
- DDR2: ODT off, Self-refresh mode
- I2C, I2S, SPI, UART, JTAG, GPIO
- I2S interface supports 16-bit/96kHz (slave mode)
- Hardware NAT with IPv6
- WEP64/128, TKIP, AES, WPA, WPA2, WAPI
- QoS: WMM, WMM-PS
- WPS: PBC, PIN

### 3. LibreSync Features

LibreSync modules have extensive software features for connected media streaming and control applications. These include system level control and interface features as well as networking features.

Please refer to the full “LibreSync Feature List” for details of supported features.



**Note:**

Platform features can vary based on module configuration/derivatives and commercial engagement details.

## 4. Block Diagram

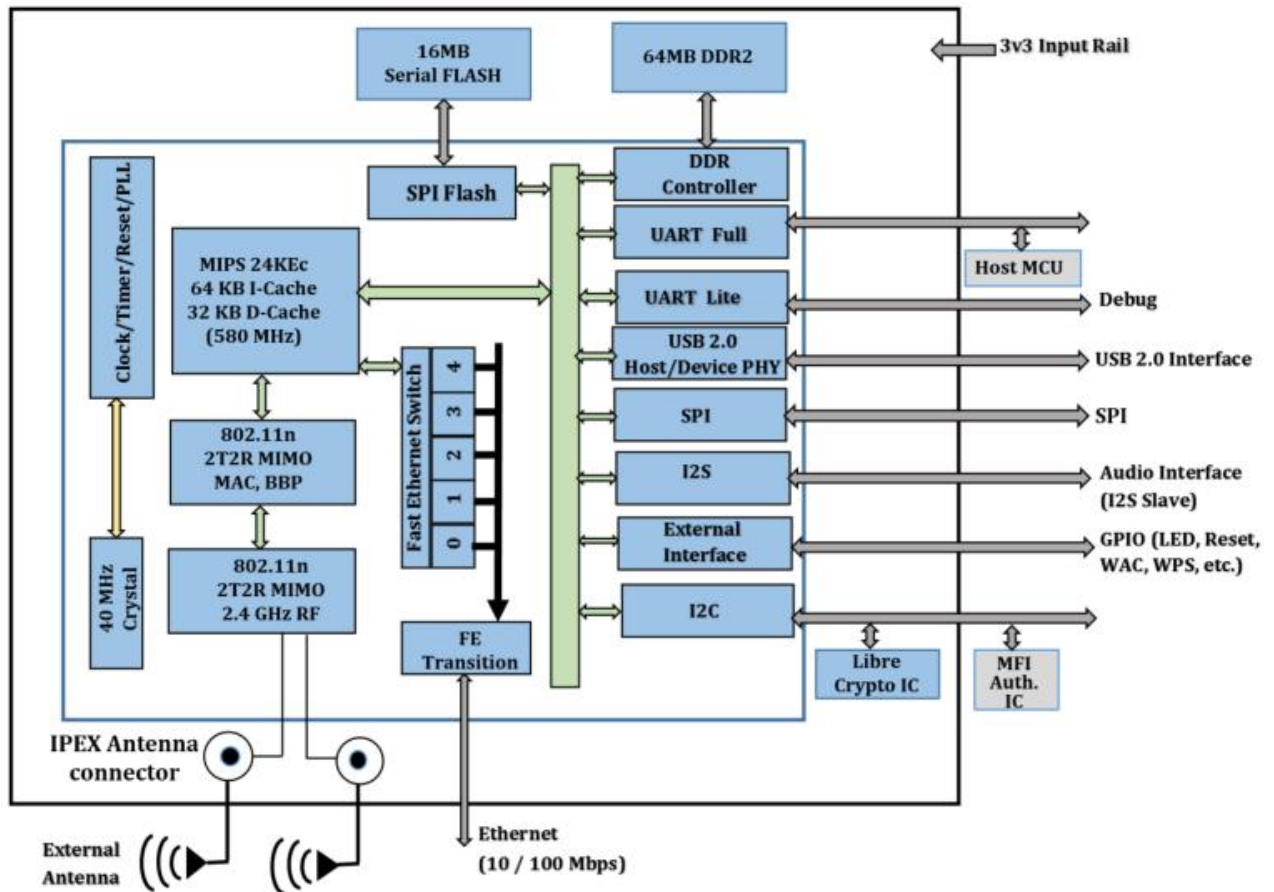


Figure 4-1: LS6-N22S Block Diagram

## 5. Specifications

### 5.1. General Specification

Parameter	Description / Values
Model	LS6-N22S
Product Name	LibreSync LS6 Network Media Module
Chipset	MT7620A
Standard	Wi-Fi – IEEE802.11b, IEEE802.11g, IEEE802.11n, standards

Data Transfer Rate	1,2,5.5,6,11,12,18,22,24,30,36,48,54,60,90,120, and maximum of physical layer rate of 130Mbps
Frequency Band	2.4 GHz
Input Voltage	3.3 V $\pm$ 5 %
Operating Temperature	-20°C to + 55°C
Dimensions	40mm X 26mm X 5.1mm (L x W x H) $\pm$ 0.2mm

## 5.2. Wi-Fi Specification

Parameter	Description / Values
Standard	IEEE802.11b, IEEE802.11g, IEEE802.11n standards
Data Rate	<ul style="list-style-type: none"> <li>802.11b : 11, 5.5, 2, 1 Mbps</li> <li>802.11g : 54, 48, 36, 24, 18, 12, 9, 6 Mbps</li> <li>802.11n : MCS 0 to 7 for HT20MHz</li> </ul>
Modulation	<ul style="list-style-type: none"> <li>802.11b : CCK, DQPSK, DBPSK</li> <li>802.11g : 64QAM, 16QAM, QPSK, BPSK</li> <li>802.11n : 64QAM, 16QAM, QPSK, BPSK</li> </ul>
Network Architecture	<ul style="list-style-type: none"> <li>Ad-hoc mode (Peer-to-Peer)</li> <li>Infrastructure Mode</li> </ul>
Operation Channel	2.4GHz <ul style="list-style-type: none"> <li>11: (Ch. 1-11) – United States</li> <li>13: (Ch. 1-13) – Europe</li> </ul>
Frequency Range	2.412 ~ 2.483 GHz

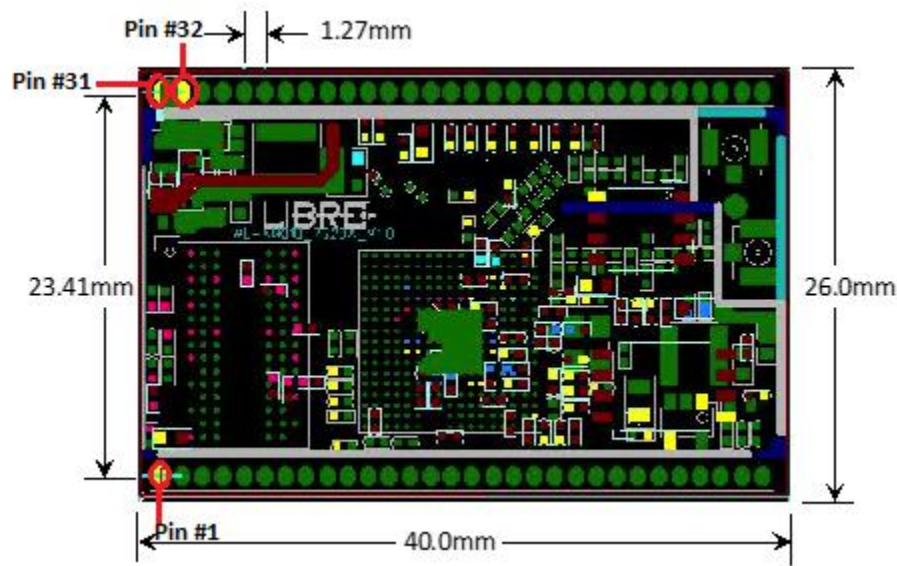


Transmit Output Power	<ul style="list-style-type: none"> <li>802.11b : &lt; 19.5 dBm at 11Mbps</li> <li>802.11g : &lt; 16.5 dBm at 54Mbps</li> <li>802.11n : &lt; 15.5 dBm at MCS7</li> </ul>
Receiver Sensitivity	<ul style="list-style-type: none"> <li>802.11b : -84 dBm at 11Mbps</li> <li>802.11g : -73 dBm at 54 Mbps</li> <li>802.11n : -64 dBm at 130 Mbps (MCS7)</li> </ul>
Security	WEP 64&128 bit, WPA, WPA-PSK, WPA2, WPA2-PSK, WPS, IEEE 802.1x, IEEE 802.11i
Current Consumption	<ul style="list-style-type: none"> <li>TX Mode : 420 mA</li> <li>RX Mode : 220 mA</li> </ul>

## 6. Mechanical, Connectors and Interfaces

### 6.1. Physical Module

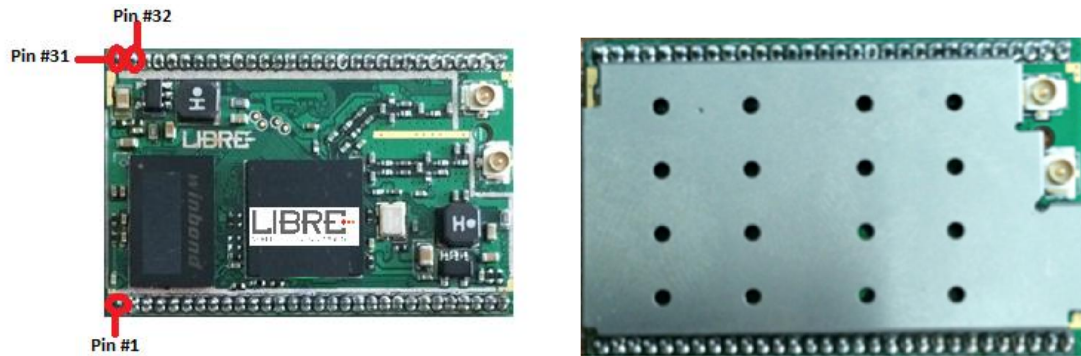
Estimated at 40mm x 26mm x 5.1mm (L x W x H)  $\pm$  0.2mm



**Figure 6-1: LS6-N22S Physical Dimensions**

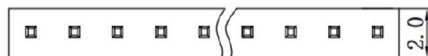
**Note:**

- Dimensions are in millimetres
- Dimensional tolerance is +/- 0.2mm
- PCB thickness is 1mm
- Design for 5.1mm physical Z height clearance (space for shields/clearance)



**Figure 6-2: LS6-N22S Top View With and Without Shield**

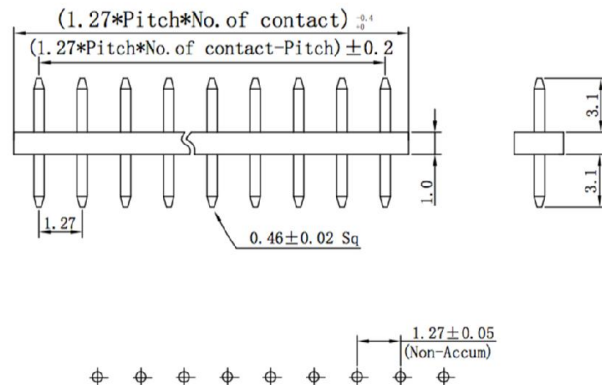
## 6.2. Connector Specification



**SPECIFICATIONS**

Current Rating: 2Amps  
 Insulator resistance: 5000 Megchms min.  
 Dielectric Withstanding: AC 500V  
 Operating Temperature: -40° ~ +105° C  
 Max Processing Temp: 230° for 30~60 seconds  
 (260° for 10 seconds)  
 Contact Material: Brass  
 Insulator Material: NYLON-6T

UNSPECIFIED TOLERANCE: ±0.20



**Dimensions List**

Contacts Per row	Dimensions		Contacts Per row	Dimensions	
	A	B		A	B
1	1.27	0	1*21	26.67	25.40
1*2	2.54	1.27	1*22	27.94	26.67
1*3	3.81	2.54	1*23	29.21	27.94
1*4	5.08	3.81	1*24	30.48	29.21
1*5	6.35	5.08	1*25	31.75	30.48
1*6	7.62	6.35	1*26	33.02	31.75
1*7	8.89	7.62	1*27	34.29	33.02
1*8	10.16	8.89	1*28	35.56	34.29
1*9	11.43	10.16	1*29	36.83	35.56
1*10	12.70	11.43	1*30	38.10	36.83
1*11	13.97	12.70	1*31	39.37	38.10
1*12	15.24	13.97	1*32	40.64	39.37
1*13	16.51	15.24	1*33	41.91	40.64
1*14	17.78	16.51	1*34	43.18	41.91
1*15	19.05	17.78	1*35	44.45	43.18
1*16	20.32	19.05	1*36	45.72	44.45
1*17	21.59	20.32	1*37	46.99	45.72
1*18	22.86	21.59	1*38	48.26	46.99
1*19	24.13	22.86	1*39	49.53	48.26
1*20	25.40	24.13	1*40	50.80	49.53

**Figure 6-3: LS6-N2SS Connector Specification**