

# **Wireless Lan 802.11n**

miniPCI

User's Manual

Version 1.0

## WNR834M IEEE 802.11b/g with EWC

### Mini-PCI Wireless LAN Module Specification

|   |   |  |
|---|---|--|
| Product Name                            | WNR834M   |  |
| Host Interface                          | miniPCI   |  |
| Dimensions                              | 59 x 89 x 3.5 mm (non standard size, for module only)   |  |
| Frequency Band                          | 2.400 ~ 2.4835GHz (subject to local regulations)  |  |
| Number of Channel                       | USA and Canada:<br>11ch~<br>1,2,3,4,5,6,7,8,9,10,11<br>(EWC 40MHz mode:<br>1&5,2&6,3&7,4&8,5&9,6&10,7<br>&11)   | Most European countries:<br>13ch~<br>1,2,3,4,5,6,7,8,9,10,11,12,13<br>(EWC 40MHz mode:<br>1&5,2&6,3&7,4&8,5&9,6&1<br>0,7&11,8&12,9&13) |
|   | France:<br>4ch~<br>10,11,12,13<br>(EWC 40MHz mode: TBD)   | Japan:<br>13ch (optional 14ch)<br>1,2,3,4,5,6,7,8,9,10,11,12,13<br>(EWC 40MHz mode:<br>1&5,2&6,3&7,4&8,5&9,6&1<br>0,7&11,8&12,9&13)    |
| Modulation                              | 802.11b: CCK, QPSK, BPSK<br>802.11g: 64-QAM, 16-QAM<br>EWC: 64-QAM, 16-QAM, QPSK, BPSK  |  |
| Spreading                               | 802.11b DSSS (Direct Sequence Spread Spectrum)<br>802.11g OFDM (Orthogonal Frequency Division Multiplexing)<br>EWC: see Achievable Data-Rate Based on EWC |  |
| Data Rate                               | IEEE 802.11b: 11, 5.5, 2, 1Mbps<br>IEEE 802.11g: 54, 48, 36, 24, 18, 12, 9, 6Mbps<br>EWC: see Achievable Data-Rate Based on EWC                           |  |
| Operating Voltage                       | DC 3.3V +/- 10%   |  |
| Current consumption                     | Continuous TX: 570±10mA @ 802.11b, 14dBm Power<br>Continuous TX: 560±10mA @ 802.11g, 14dBm Power<br>Continuous TX: 580±10mA @ EWC mode, 14dBm Power       |  |
| Nominal Temp Range of Transmit Power    | 802.11b: 21 dBm@2TX<br>802.11g: 22 dBm@2TX<br>EWC: 22 dBm@2TX<br>Tolerance: +/- 1.5dB   |  |
| Receive Sensitivity in room temperature | -86dBm @ 802.11b, 11Mbps PER ≤ 8%<br>-80dBm @ EWC, 6.5Mbps PER ≤ 10%<br>-71dBm @ EWC, 135Mbps PER ≤ 10%   |  |

|                       |  |
|-----------------------|--|
| Security              | TBD- (Hardware 64/128-bit WEP; WEP weak key avoidance; TKIP; hardware AES engine, WPA, 802.1x and 802.11i) |
| Driver                | ?  |
| Standards             | IEEE 802.11b, 802.11g, EWC, Wi-Fi compliant (TBD)  |
| Warranty              | 1 year   |
| Temperature Range     | 0 ~ 65°C (Operating), -20~85°C (Storing)   |
| Humidity              | Operating Humidity 10% to 85% Non-Condensing<br>Storage Humidity 5% to 90% Non-Condensing                  |
| Antenna               | No, with 3 RF connectors   |
| Operating Range       | The transmission speed varies in the surrounding environment.  |
| Roaming               | Full mobility and seamless roaming from cell to cell and across access points (subject to access point)    |
| Network Architectures | Infrastructure and Ad Hoc  |
| Management Utility    | Link config for network join and diagnostics   |
| EMC certification     | TBD(FCC part 15C/15.247; ETS 300 328-2; UL; IEC60950; EN301 489-1, 17; prEN50371; CE Mark; TELEC.)         |

### Achievable Data-Rate Based on EWC

| MCS Index | Nss | Modulation | R   | NBPS | NCBPS |       | NDBPS |       | Datarate(Mbps) |       |         |       |
|-----------|-----|------------|-----|------|-------|-------|-------|-------|----------------|-------|---------|-------|
|           |     |            |     |      | 20MHz | 40MHz | 20MHz | 40MHz | 800nsGI        |       | 400nsGI |       |
|           |     |            |     |      |       |       |       |       | 20MHz          | 40MHz | 20MHz   | 40MHz |
| 0         | 1   | BPSK       | 1/2 | 1    | 52    | 108   | 26    | 54    | 6.5            | 13.5  | 7.200   | 15    |
| 1         | 1   | QPSK       | 1/2 | 2    | 104   | 216   | 52    | 108   | 13.0           | 27.0  | 14.400  | 30    |
| 2         | 1   | QPSK       | 3/4 | 2    | 104   | 216   | 78    | 162   | 19.5           | 40.5  | 21.700  | 45    |
| 3         | 1   | 16-QAM     | 1/2 | 4    | 208   | 432   | 104   | 216   | 26.0           | 54.0  | 28.900  | 60    |
| 4         | 1   | 16-QAM     | 3/4 | 4    | 208   | 432   | 156   | 324   | 39.0           | 81.0  | 43.300  | 90    |
| 5         | 1   | 64-QAM     | 2/3 | 6    | 312   | 648   | 208   | 432   | 52.0           | 108.0 | 57.800  | 120   |
| 6         | 1   | 64-QAM     | 3/4 | 6    | 312   | 648   | 234   | 486   | 58.5           | 121.5 | 65.000  | 135   |
| 7         | 1   | 64-QAM     | 5/6 | 6    | 312   | 648   | 260   | 540   | 65.0           | 135.0 | 72.200  | 150   |
| 8         | 2   | BPSK       | 1/2 | 1    | 104   | 216   | 52    | 108   | 13.0           | 27.0  | 14.444  | 30    |
| 9         | 2   | QPSK       | 1/2 | 2    | 208   | 432   | 104   | 216   | 26.0           | 54.0  | 28.889  | 60    |
| 10        | 2   | QPSK       | 3/4 | 2    | 208   | 432   | 156   | 324   | 39.0           | 81.0  | 43.333  | 90    |
| 11        | 2   | 16-QAM     | 1/2 | 4    | 416   | 864   | 208   | 432   | 52.0           | 108.0 | 57.778  | 120   |
| 12        | 2   | 16-QAM     | 3/4 | 4    | 416   | 864   | 312   | 648   | 78.0           | 162.0 | 86.667  | 180   |
| 13        | 2   | 64-QAM     | 2/3 | 6    | 624   | 1296  | 416   | 864   | 104.0          | 216.0 | 115.556 | 240   |
| 14        | 2   | 64-QAM     | 3/4 | 6    | 624   | 1296  | 468   | 972   | 117.0          | 243.0 | 130.000 | 270   |
| 15        | 2   | 64-QAM     | 5/6 | 6    | 624   | 1296  | 520   | 1080  | 130.0          | 270.0 | 144.444 | 300   |

**MARVELL SEMICONDUCTOR  
PROPRIETARY INFORMATION**

**WMIM-205GN  
Block Diagram**

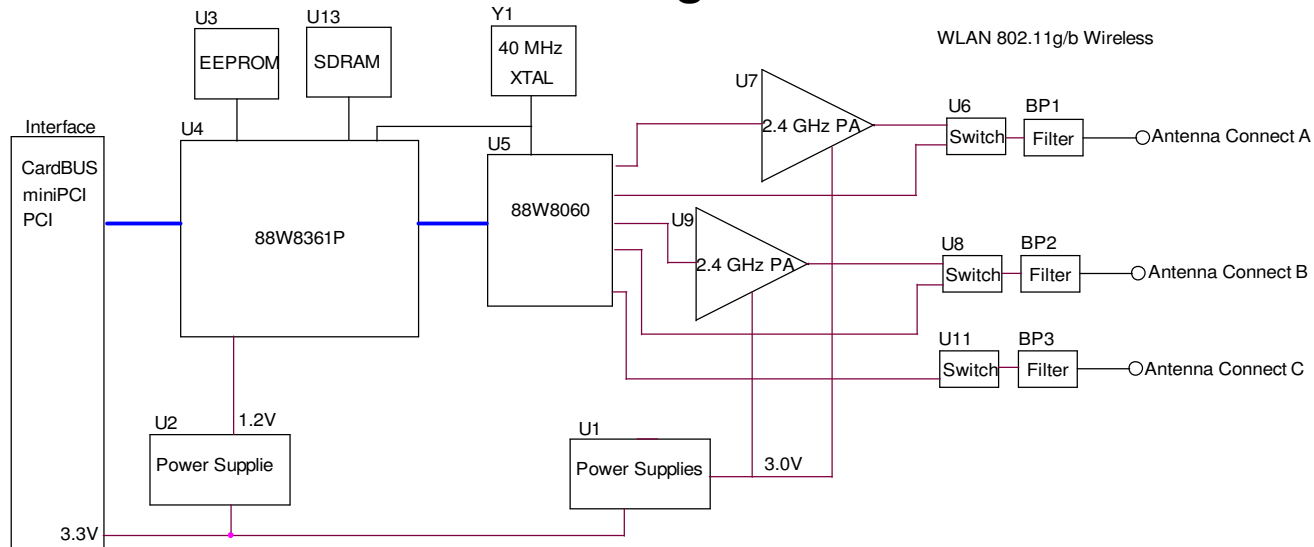


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**Design Schematic v1.1**

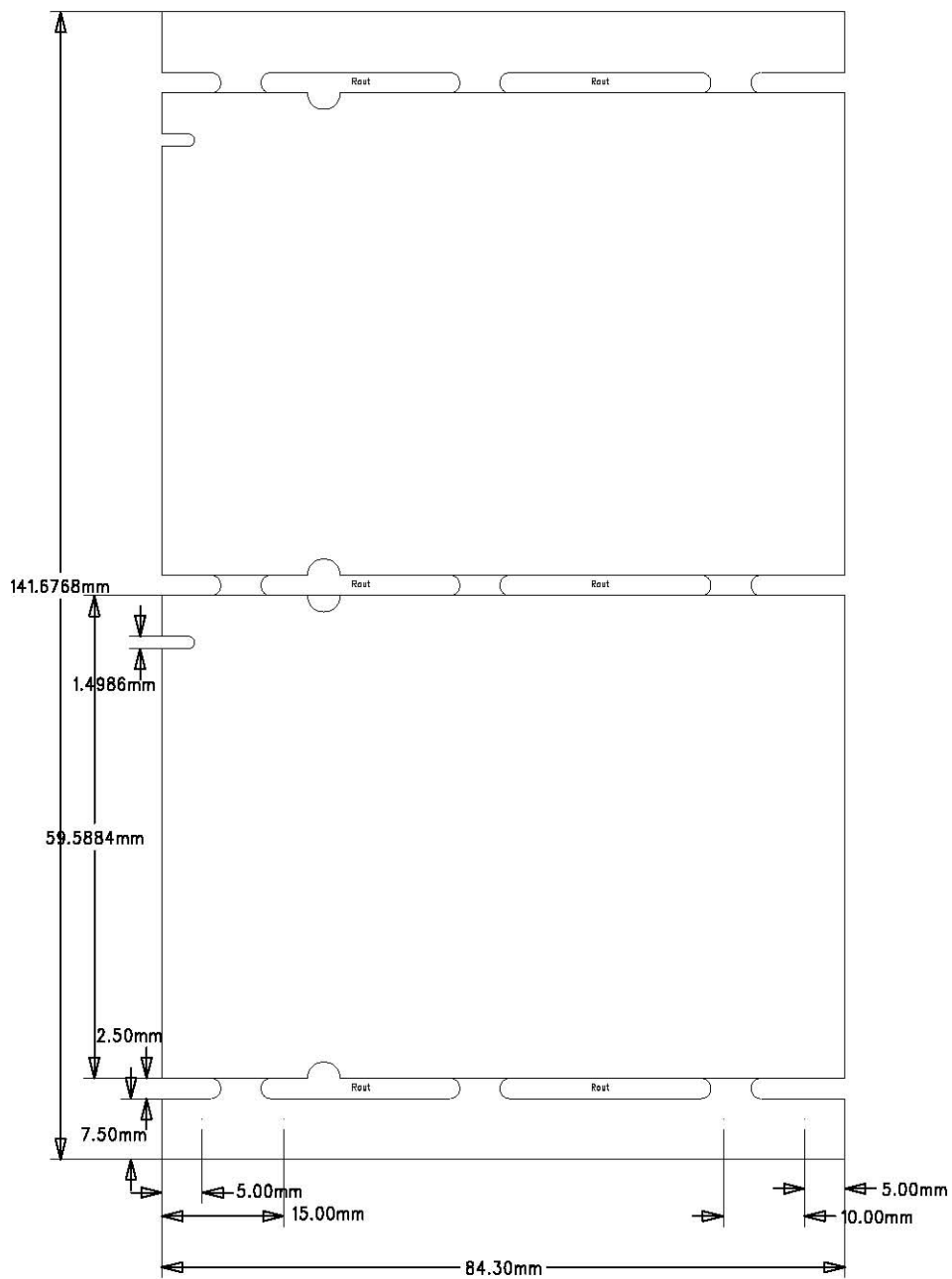
**Model name: WNR834M for NETGEAR**



**WLAN 802.11g/b 2x3 MIMO  
Reference Design Schematic  
MB-82 v1.0**

NOTE: THIS SCHEMATIC IS AN ADVANCED DESIGN.  
MARVELL RESERVES THE RIGHT TO MAKE CHANGES  
TO THE SCHEMATIC AT ANY TIME WITHOUT NOTICE.

|                                    |   |              |
|------------------------------------|---|--------------|
| MARVELL SEMICONDUCTOR CONFIDENTIAL |   |              |
| Company                            | Marvell Semiconductor Inc.<br>5488 Marvell Lane<br>Santa Clara, CA 95054, USA |              |
| Title                              | MB-82 v 1.0 Reference Schematic   |              |
| Size                               | Document Number   | Rev          |
| B                                  | MV-SR00101-01   | -            |
| Date:                              | Thursday, May 04, 2006  | Sheet 1 of 7 |



### **Federal Communication Commission Interference Statement**

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 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.

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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

#### **IMPORTANT NOTE:**

##### **FCC Radiation Exposure Statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

**NETGEAR declares that US model of WNR834M (FCC ID: PY306200049) is limited in CH1-CH11 for 2.4G band by specific firmware controlled by the manufacturer and is not user changeable.**

**This device is intended only for OEM integrators under the following conditions:**

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

**IMPORTANT NOTE:** In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

#### **End Product Labeling**

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users (for example: Access point, Router...etc). The final end product must be labeled in a visible area with the following: "Contains TX FCC ID: PY306200049".

#### **Manual Information That Must be Included**

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the users manual of the end product which integrate this module.

The users manual for OEM integrators must include the following information in a prominent location " IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.