

# WLM200N5-26MINIPCI

## 2 x 2 802.11N MIMO mini-PCI Modules



WLM200N5-26dBm MiniPCI network adapter provides leading 802.11a/n performance, supporting up to 300Mbps physical data rates and 200Mbps of actual user throughput on both the uplink and downlink. Adding Wireless N to your Wireless device, it provides higher efficiency for everyday activities such as file transfers, Internet browsing, and media streaming. Compex WLM200N5-26dBm miniPCI network adapter offers high output power of 400 mW, allowing an extended range of wireless coverage. Combined with excellent receiver sensitivity, WLM200N5-26dBm is the miniPCI choice for long distance links, or those where signal levels are reduced due to minor obstructions such as trees or building.

Built on Atheros chipset, it can be used with all draft IEEE 802.11n compatible WLANs, and is ideally suited to be integrated into a wide range of OEM devices.

### Features

- 5GHz IEEE 802.11a/n standard
- Output Power of up to 26dBm @ a Band
- Support for up to 2x2 MIMO with spatial multiplexing
- Four times the throughput of 802.11a and 802.11n
- Wireless Encryption and Authentication Supported
- Transmission Power Control (TPC)
- Enhanced performance with Atheros XSPAN technology Optimized for higher throughput at long range
- High Performance (up to 300Mbps physical data rates and 200Mbps of actual throughput) with Low Power Consumption
- Dynamic Frequency Selection (DFS)
- Multi-Country Roaming Support (IEEE802.11d)
- 2 X MMCX Antenna Connector
- Suitable for Embedded System or OEM Project
- Affordable and Ideal for a Variety of Applications

| Technical Specifications   |                                                      |                                               |                                                 |        |        |        |        |       |       |  |
|----------------------------|------------------------------------------------------|-----------------------------------------------|-------------------------------------------------|--------|--------|--------|--------|-------|-------|--|
| Chipset                    | AR9220                                               |                                               |                                                 |        |        |        |        |       |       |  |
| Host Interface             | PCI Interface v2.3 (Type III-B Mini PCI form factor) |                                               |                                                 |        |        |        |        |       |       |  |
| Operating Voltage          | 3.3/5.0 VDC                                          |                                               |                                                 |        |        |        |        |       |       |  |
| Power Consumption          | 7W                                                   |                                               |                                                 |        |        |        |        |       |       |  |
| Antenna Connector          | 2 x MMCX Antenna Connector                           |                                               |                                                 |        |        |        |        |       |       |  |
| Data Rate                  | IEEE 802.11a :                                       | 54Mbps                                        | 48Mbps                                          | 36Mbps | 24Mbps | 18Mbps | 12Mbps | 9Mbps | 6Mbps |  |
|                            | IEEE 802.11n :                                       | 20MHz                                         | 1Nss: 65Mbps @ 800GI, 72.2Mbps @ 400GI (Max.)   |        |        |        |        |       |       |  |
|                            |                                                      |                                               | 2Nss: 130Mbps @ 800GI, 144.4Mbps @ 400GI (Max.) |        |        |        |        |       |       |  |
|                            |                                                      | 40MHz                                         | 1Nss: 135Mbps @ 800GI, 150Mbps @ 400GI (Max.)   |        |        |        |        |       |       |  |
|                            |                                                      | 2Nss: 270Mbps @ 800GI, 300Mbps @ 400GI (Max.) |                                                 |        |        |        |        |       |       |  |
| Modulation Techniques      | OFMD: BPSK, QPSK, 16 QAM, 64QAM                      |                                               |                                                 |        |        |        |        |       |       |  |
| Security                   | 64/128-bit WEP, TKIP, AES, IEEE802.1x authentication |                                               |                                                 |        |        |        |        |       |       |  |
| Certificate                | FCC, CE                                              |                                               |                                                 |        |        |        |        |       |       |  |
| ROHS Compliance            | Yes                                                  |                                               |                                                 |        |        |        |        |       |       |  |
| Environment Specifications | Operating: -20°C to 70°C<br>Storage: -65°C to 100°   |                                               |                                                 |        |        |        |        |       |       |  |
| Humidity                   | 5% to 95% (non-condensing)                           |                                               |                                                 |        |        |        |        |       |       |  |
| Dimension                  | 59.6 x 51 x 6.2mm                                    |                                               |                                                 |        |        |        |        |       |       |  |

| WLM200NX MIMO MINIPCI CARD RADIO |            |                                      |      |                   |                    |                                  |                                      |  |           |  |
|----------------------------------|------------|--------------------------------------|------|-------------------|--------------------|----------------------------------|--------------------------------------|--|-----------|--|
| TX SPECIFICATIONS                |            |                                      |      | TX SPECIFICATIONS |                    |                                  |                                      |  |           |  |
|                                  | DataRate   | TX Power                             |      | DataRate          |                    |                                  | TX Power                             |  |           |  |
| 802.11a                          | 6-24Mbps   | 26dBm                                |      | 802.11n           | 5GHz               | HT20 @800GI(400GI): +16 ~ +24dBm |                                      |  |           |  |
|                                  | 36Mbps     | 24dBm                                |      |                   |                    |                                  |                                      |  |           |  |
|                                  | 48Mbps     | 23dBm                                |      |                   |                    |                                  |                                      |  |           |  |
|                                  | 54Mbps     | 22dBm                                |      |                   |                    |                                  |                                      |  |           |  |
| RX SPECIFICATIONS(802.11a)       |            |                                      |      |                   |                    |                                  |                                      |  |           |  |
|                                  | Data Rate  | Sensitivity<br>(Typical/Maximum 2Rx) |      | Tolerance         |                    | Data Rate                        | Sensitivity<br>(Typical/Maximum 2Rx) |  | Tolerance |  |
| 802.11a                          | 6M         | -95/-91dBm                           |      | ±2dB              |                    |                                  |                                      |  |           |  |
|                                  | 9M         | -95/-91dBm                           |      | ±2dB              |                    |                                  |                                      |  |           |  |
|                                  | 12M        | -95/-91dBm                           |      | ±2dB              |                    |                                  |                                      |  |           |  |
|                                  | 18M        | -94/-90dBm                           |      | ±2dB              |                    |                                  |                                      |  |           |  |
|                                  | 24M        | -90/-86dBm                           |      | ±2dB              |                    |                                  |                                      |  |           |  |
|                                  | 36M        | -87/-83dBm                           |      | ±2dB              |                    |                                  |                                      |  |           |  |
|                                  | 48M        | -83/-79dBm                           |      | ±2dB              |                    |                                  |                                      |  |           |  |
| 54M                              | -82/-78dBm |                                      | ±2dB |                   |                    |                                  |                                      |  |           |  |
| 802.11 a/n HT20                  | MCS0       | -95/-91dBm                           |      | ±2dB              | 802.11a/<br>n HT40 | MCS0                             | -91/-87dBm                           |  | ±2dB      |  |
|                                  | MCS1       | -94/-90dBm                           |      | ±2dB              |                    | MCS1                             | -90/-86dBm                           |  | ±2dB      |  |
|                                  | MCS2       | -92/-88dBm                           |      | ±2dB              |                    | MCS2                             | -88/-84dBm                           |  | ±2dB      |  |
|                                  | MCS3       | -88/-84dBm                           |      | ±2dB              |                    | MCS3                             | -85/-81dBm                           |  | ±2dB      |  |
|                                  | MCS4       | -85/-81dBm                           |      | ±2dB              |                    | MCS4                             | -82/-78dBm                           |  | ±2dB      |  |
|                                  | MCS5       | -81/-77dBm                           |      | ±2dB              |                    | MCS5                             | -78/-74dBm                           |  | ±2dB      |  |
|                                  | MCS6       | -80/-76dBm                           |      | ±2dB              |                    | MCS6                             | -77/-73dBm                           |  | ±2dB      |  |
|                                  | MCS7       | -77/-73dBm                           |      | ±2dB              |                    | MCS7                             | -74/-70dBm                           |  | ±2dB      |  |
|                                  | MCS8       | -94/-90dBm                           |      | ±2dB              |                    | MCS8                             | -91/-87dBm                           |  | ±2dB      |  |
|                                  | MCS9       | -92/-87dBm                           |      | ±2dB              |                    | MCS9                             | -88/-84dBm                           |  | ±2dB      |  |
|                                  | MCS10      | -89/-85dBm                           |      | ±2dB              |                    | MCS10                            | -86/-82dBm                           |  | ±2dB      |  |
|                                  | MCS11      | -86/-82dBm                           |      | ±2dB              |                    | MCS11                            | -83/-79dBm                           |  | ±2dB      |  |
|                                  | MCS12      | -83/-79dBm                           |      | ±2dB              |                    | MCS12                            | -80/-76dBm                           |  | ±2dB      |  |
|                                  | MCS13      | -78/-74dBm                           |      | ±2dB              |                    | MCS13                            | -75/-71dBm                           |  | ±2dB      |  |
|                                  | MCS14      | -77/-73dBm                           |      | ±2dB              |                    | MCS14                            | -73/-69dBm                           |  | ±2dB      |  |
| MCS15                            | -74/-69dBm |                                      | ±2dB | MCS15             | -70/-66dBm         |                                  | ±2dB                                 |  |           |  |



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| DRIVER INFORMATION |                                                        |
|--------------------|--------------------------------------------------------|
| Driver             | Linux Madwifi, WindowsXP , Windows 2000, Windwos Vista |

#### ORDERING CONFIGURATIONS<sup>①</sup>

| CODES            | SPEED                                 | Carton Dimension |
|------------------|---------------------------------------|------------------|
| WLM200NX 6AA1100 | Up to 300 Mbps<br>physical data rates |                  |
| WLM200NX 6AA1300 | Up to 300 Mbps<br>physical data rates |                  |

① Configurations are subjected to change without notice

## COMPLIANCE INFORMATION

**FCC Compliance 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. This device must accept any interference received, including interference that may cause undesired operation. Product that is a radio transmitter is labeled with FCC ID.

#### FCC Caution:

- (1) Exposure to Radio Frequency Radiation. This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter. End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.
- (2) Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.
- (3) This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
- (4) Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user authority to operate the equipment.
- (5) Outdoor Operations in the 5.15~5.25GHz band is prohibited.



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**NOTE:**

(1) This device is approved for OEM installation with specified antennas as listed in this Manual. It is the responsibility of the Installer to comply with the separation distance for satisfying RF exposure compliance.

(2) This device only could work when being installed into "client devices" which could not transmit automatically, such as Notebook P.C. , with the software driver limit.

**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.

**WARNING:** This Wireless Mini PCI Adapter does not support ad-hoc mode Function

**FCC ID: TK4-WLM200N5-26**

**IMPORTANT NOTE: EQUIPMENT MANUFACTURERS  
COMPEX FOR DISPLAYING WLM200N5-26 MODULAR  
FCC ID ON FINAL INTEGRATED**

**IMPORTANT NOTE REGARDING ANTENNA USE**

**Antenna Use (Point to Multipoint)**

**2x2 Operation**

Chain1 Chain2

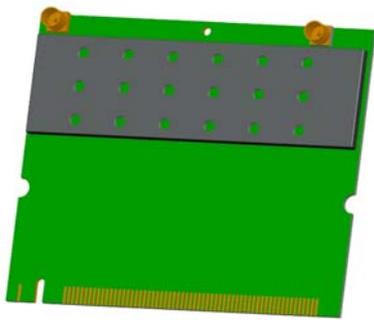
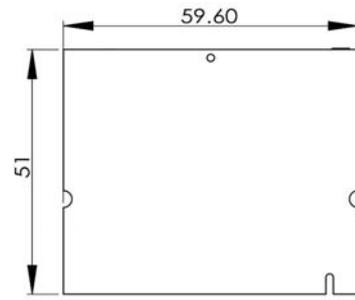
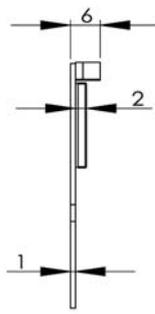
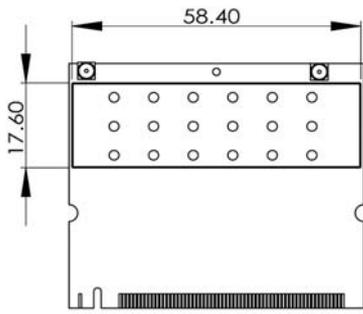


**DIMENSIONS DRAWING**



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### WLM FAMILY SERIES OF MINIPCI

|                        |                                                                                                                                                                                                                                                                                                                                                            | b / g (2.4GHz)                                |                                               |                           |                                                                                        | a / b / g (2.4/5GHz)      |                           |                   |  |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------|---------------------------|----------------------------------------------------------------------------------------|---------------------------|---------------------------|-------------------|--|
| MODEL                  | WLM 54G-20dBm                                                                                                                                                                                                                                                                                                                                              | WLM 54G-23dBm                                 | WLM 54G-26dBm                                 | WLM 54G - 28dBm           | WLM200N2                                                                               | WLM 54AG - 20dBm          | WLM 54 AG - 23dBm         | WLM 54A - 26dBm   |  |
| CHIPSET                | AR 2413/2414 (AR5005G/GS)                                                                                                                                                                                                                                                                                                                                  | AR 2413/2414 (AR5005G/GS)                     | AR 2413/2414 (AR5005G/GS)                     | AR 2413/2414 (AR5005G/GS) | AR9223                                                                                 | AR 5413/5414 (AR5006X/XS) | AR 5413/5414 (AR5006X/XS) | AR5414 (AR5006XS) |  |
| SPEED                  | UP TO 54/108Mbps                                                                                                                                                                                                                                                                                                                                           | UP TO 54/108Mbps                              | UP TO 54/108Mbps                              | UP TO 54/108Mbps          | UP TO 300Mbps physical data rates                                                      | UP TO 54/108Mbps          | UP TO 54/108Mbps          | UP TO 108Mbps     |  |
| OUTPUT POWER (Average) |                                                                                                                                                                                                                                                                                                                                                            |                                               |                                               |                           |                                                                                        |                           |                           |                   |  |
| 802.11a                | -                                                                                                                                                                                                                                                                                                                                                          | -                                             | -                                             | -                         | -                                                                                      | -                         | 23dBm@6-24Mbps            | 26dBm@6-24Mbps    |  |
|                        |                                                                                                                                                                                                                                                                                                                                                            |                                               |                                               |                           |                                                                                        |                           | 17dBm@36Mbps              | 21dBm@36Mbps      |  |
|                        |                                                                                                                                                                                                                                                                                                                                                            |                                               |                                               |                           |                                                                                        |                           | 16dBm@48Mbps              | 19dBm@48Mbps      |  |
|                        |                                                                                                                                                                                                                                                                                                                                                            |                                               |                                               |                           |                                                                                        |                           | 13dBm@54Mbps              | 17dBm@54Mbps      |  |
| 802.11b                | 20dBm@1-11Mbps                                                                                                                                                                                                                                                                                                                                             | 23dBm@1-11Mbps                                | 26dBm@1-11Mbps                                | 28dBm@1-11Mbps            | 20dBm@1-11Mbps                                                                         | 20dBm@1-11Mbps            | 23dBm@1-11Mbps            |                   |  |
| 802.11g                | 20dBm@6-24Mbps                                                                                                                                                                                                                                                                                                                                             | 23dBm@6-24Mbps                                | 26dBm@6-24Mbps                                | 28dBm@6-24Mbps            | 20dBm@6-24Mbps                                                                         | 20dBm@6-24Mbps            | 23dBm@6-24Mbps            |                   |  |
|                        | 19dBm@36Mbps                                                                                                                                                                                                                                                                                                                                               | 22dBm@36Mbps                                  | 25dBm@36Mbps                                  | 26dBm@36Mbps              | 19.5dBm@36Mbps                                                                         | 18dBm@36Mbps              | 21dBm@36Mbps              |                   |  |
|                        | 17dBm@48Mbps                                                                                                                                                                                                                                                                                                                                               | 19dBm@48Mbps                                  | 24dBm@48Mbps                                  | 25dBm@48Mbps              | 18.5dBm@48Mbps                                                                         | 17dBm@48Mbps              | 19dBm@48Mbps              |                   |  |
|                        | 16dBm@54Mbps                                                                                                                                                                                                                                                                                                                                               | 17dBm@54Mbps                                  | 22dBm@54Mbps                                  | 23dBm@54Mbps              | 17dBm@54Mbps                                                                           | 15dBm@54Mbps              | 17dBm@54Mbps              |                   |  |
| Modulation Techniques  | OFDM and DSSS OFDM: BPSK, QPSK, 16QAM, 64QAM<br>DSSS: DBPSK, DQPSK, CCK                                                                                                                                                                                                                                                                                    |                                               |                                               |                           |                                                                                        |                           |                           |                   |  |
| Interface              | PCI Interface v2.3 (Type III-B Mini PCI Form Factor)                                                                                                                                                                                                                                                                                                       |                                               |                                               |                           |                                                                                        |                           |                           |                   |  |
| Receiver Sensitivity   | 802.11g < -90dBm @ 6Mbps<br>< -70dBm @ 54Mbps                                                                                                                                                                                                                                                                                                              | 802.11b < -92dBm @ 6Mbps<br>< -87dBm @ 11Mbps | 802.11a < -90dBm @ 6Mbps<br>< -70dBm @ 54Mbps |                           |                                                                                        |                           |                           |                   |  |
| Channels               | IEEE 802.11g:<br>13 Channel (US & Canada)<br>19 Channel (Europe)<br>10 Channel (Japan)                                                                                                                                                                                                                                                                     |                                               |                                               |                           | IEEE 802.11a:<br>13 Channel (US & Canada)<br>19 Channel (Europe)<br>10 Channel (Japan) |                           |                           |                   |  |
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|                       |                                                                        |
|-----------------------|------------------------------------------------------------------------|
| Operating Temperature | -20°C to 70°C                                                          |
| Dimensions            | 6.0cm x 4.5cm<br>High Power Cards (26dBm/30dBm) has bigger dimensions. |

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