Product Specification

< MWG3401NM >

Single-Band Draft-802.11n 2x2 MIMO

Half Mini Card (PCI-express)

Wireless Network Adapter

Version: 1.0.2

Content

Change History

Version	Revised Date	Editor	Content Revised
1.0.0	2009/10/12	Cathy Tseng	First Edition (baseline)
1.0.1	2009/10/16	Cathy Tseng	Modify Product Specifications
1.0.2	2009/12/25	Cathy Tseng	Modify Product Specifications

1   Product Descriptions

The **MWG3401NM** provides ultra-high performance (up to 300 Mbps) transmission rate in the 2.4GHz band. Backward compatible with the current 802.11b/g/n network devices gives your laptop the freedom of wireless connectivity with the performance, security, and manageability that businesses desire. A firmware-based architecture is capable of supporting the latest industry standards in the security and quality of service (QoS), as the draft 802.11i and 802.11e standards, respectively. The **MWG3401NM** is complemented by drivers and networking tools for various versions of the *Windows*® operating system. Extensive technical documentation on integration issues such as antenna design, customizing drivers, and management software can be obtained by request.

2   Application

- Home and/or office wireless networking
- Wireless multimedia
- Wireless extension of existing wired network

3   Features

- IEEE 802.11 b/g/n standard compliant
- 2x2 MIMO wireless system
- Ultra-high data rate up to 300 Mbps
- Auto fallback data rate under noisy environment
- Support 2.4GHz band operation
- Support WEP (64-bit/128-bit), 802.1x, and WPA/WPA2
- Conformable to industry-standard Half Mini Card specification
- Easy integration into mobile and hand-held platforms
- Flexible for design and antenna placement
- Low power consumption & Automatic power management to reduce battery use
- Independent Tx Power Control on a per channel
- Automatic Tx Gain adjustment during temperature variations

4 Product Specifications

Main Chip	BCM43225
WLAN Standards	IEEE 802.11b/g/n compliant
Antenna	External antenna & IPEX connector
Modulation	802.11b: CCK(11&5.5 Mbps), DQPSK (2Mbps), DBPSK (1Mbps), 802.11g/n: DBPSK, DQPSK, OFDM, BPSK, QPSK, 16QAM, 64QAM
Operating Frequencies	2412 ~ 2462 MHz for North America 2412 ~ 2472 MHz for Europe 2412 ~ 2484 MHz for Japan
Frequency Band	2.4GHz
Channel Numbers	11 for North America 13 for Europe 14 for Japan
Output Power	11b: 24.1dBm 11g: 25.8dBm 11n:HT20:24.2dBm /HT40:25.7dBm
Power Consumption	Operation (average) < 560mA
Security	WEP (64-bit/128-bit), 802.1x / WPA/WPAs (TKIP, AES)
Operating System	Windows 2K/XP, Linux
Maximum Receive Level	-20dBm (with PER<10%)
Receive Sensitivity	**Data Rates** **Receive Sensitivity** 802.11n - 40 MHz -67 dBm (typical) 802.11n - 20 MHz -70 dBm (typical) 54 Mbps -72 dBm (typical) 11 Mbps -86 dBm (typical) 6 Mbps -87 dBm (typical) 1 Mbps -96 dBm (typical)
Transfer Rate	802.11b: 11 / 5.5 / 2 / 1Mbps 802.11g: 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6Mbps HT20 MCS 0~7 (800ns GI): 65 / 58.5 / 52 / 39 / 26 / 19.5 / 13 / 6.5Mbps. HT20 MCS 8~15 (800ns GI): 130 / 117 / 104 / 78 / 52 / 39 / 26 / 13Mbps. HT40 MCS 0~7 (800ns GI): 135 / 121.5 / 108 / 81 / 54 / 40.5 / 27 / 13.5Mbps. HT40 MCS 8~15 (800ns GI): 270 / 243 / 216 / 162 /108 / 81 / 54 / 27Mbps. HT20 MCS 0~7 (400ns GI): 72.2 / 65 / 57.8 / 43.3 / 28.9 / 21.7 / 14.4 / 7.2Mbps. HT20 MCS 8~15 (400ns GI): 144.444 / 130 / 115.556 / 86.667 / 57.778 / 43.333 / 28.889 / 14.444Mbps. HT40 MCS 0~7 (400ns GI): 150 / 135 / 120 / 90 / 60 / 45 / 30 / 15Mbps. HT40 MCS 8~15 (400ns GI): 300 / 270 / 240 / 180 / 120 / 90 / 60 / 30Mbps.
Voltage	3.3 VDC from host (+/- 0.2V)

5   Mechanism & Packaging

5.1   PCB Dimension

- 26.65mm x 29.85mm

5.2   Packing

- Carton dimension：406mm x 268mm x 182mm

6   Physical & Environment

6.1   Operation Temperature & Humidity

- Temperature：32℉ to 104℉ (0 ℃ to 40 ℃)
- Humidity：10% ~ 90% R.H.

6.2   Storage Temperature& Humidity

- Temperature：-4℉ to 158℉ (-20 ℃ to 70 ℃)
- Humidity：10% ~ 95% R.H.

7   Compliance

Note：Product was designed to comply with below regulation. While the formal certificate process will be performed under customer request only.

EMC Certifications

- CE EN55022, EN55024
- FCC Part 15 B

RF Certifications

- CE EN 301 489-1&17
- CE EN 300 328
- FCC Part 15 C

Safety Certifications

- CSA International

  CSA60950-1, EN60950-1, IEC60950-1, UL60950-1
- CE LVD EN60950-1

Others

- RoHS compliant
- WiFi certified (after Q1, 2007)

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.

IEEE 802.11b or 802.11g operation of this product in the U.S.A. is firmware-limited to channels 1 through 11.

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,

3) For all products market in US, OEM has to limit the operation channels in CH1 to CH11 for 2.4G band by supplied firmware programming tool. OEM shall not supply any tool or info to the end-user regarding to Regulatory Domain change.

As long as 3 conditions above are met, further <u>transmitter</u> 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 <u>can not be met</u> (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID <u>can not</u> 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. The final end product must be labeled in a visible area with the following: "Contains FCC ID: RU4-MWG3401NM".

Manual Information To the End User

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 user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.