

MP54G-BT (MS-6855)
Wireless 11g + Bluetooth
Combo MiniPCI Card

User's Guide

FCC Caution

1. The 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.
2. FCC RF Radiation Exposure Statement: The equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.
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.

FCC Statement

This device is intended only for OEM integrators under the following

- 1) The antenna must be installed such that 20 cm is maintained between 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 required. However, the OEM integrator is still responsible for testing end-product for any additional compliance requirements required with module installed (for example, digital device emissions, PC peripheral requirements, etc.).

Important Note

In the event that these conditions can not be example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid the FCC ID can not be used on the final product. In these circumstances, 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 antenna may be installed such that 20 cm may be maintained between antenna and users (for example access points, routers, wireless ADSL and similar equipment). The final end product must be labeled in a area with the following: “Contains TX FCC ID: G14L-MS6855”.

Manual Information for End Users

The end user must not have manual instructions to remove or install device. The user manual for end users 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 operating in conjunction with any other antenna or transmitter.” as a result of e-mail transmission.”

Important Safety Precautions

Always read and follow these basic safety precautions carefully when handling any piece of electronic component.

1. Keep this *User's Guide* for future reference.
2. Keep this equipment away from humidity.
3. Lay this equipment on a reliable flat surface before setting it up.
4. The openings on the enclosure are for air convection hence protects the equipment from overheating.
5. All cautions and warnings on the equipment should be noted.
6. Never pour any liquid into the opening that could damage or cause electrical shock.
7. If any of the following situations arises, get the equipment checked by a service personnel:
 - Liquid has penetrated into the equipment
 - The equipment has been exposed to moisture
 - The equipment has not work well or you can not get it work according to User's Manual
 - The equipment has dropped and damaged
 - If the equipment has obvious sign of breakage
8. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60°C OR BELOW -20°C, IT MAY DAMAGE THE EQUIPMENT.

1

Introduction

>>> 1.1 MP54G-BT (MS-6855) - Wireless 11g + Bluetooth Combo MiniPCI Card

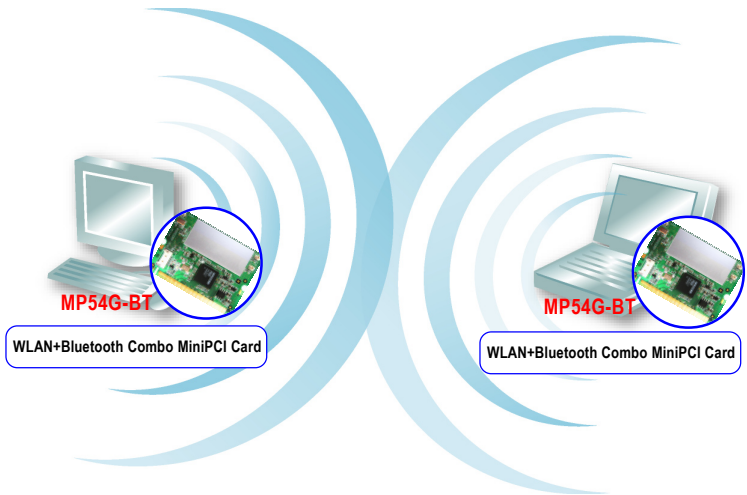
MSI MP54G-BT, the Wireless 11g + Bluetooth Combo miniPCI Card, is a **Type IIIB** card, which can be used to integrate with such systems as notebook, mini-barebone, PDA, portable PC. With MSI MP54G-BT embedded inside, a system could provide users with the ability and flexibility to connect up to Internet wirelessly via **802.11g** with speed up to 54Mbps, and to link with peripherals wirelessly through **Bluetooth™ v1.2** and advanced **UBC (UltimateBlue™ Coexistence)** technology. UBC technology complements the **AFH (Adaptive Frequency Hopping)** techniques in Bluetooth v1.2 while minimizing interference and enhancing performance in Bluetooth v1.1 devices.

MSI MP54G-BT is taking advantage of leading technologies from Inprocomm and RFMD. It addresses the co-existence issues in PAN (Personal Area Network) and WLAN (Wireless Local Area Network) markets by providing true simultaneous connectivity while deploying IEEE 802.11g and Bluetooth v1.2. Along with this combo solution, a system installed with a single card is able to offer dual mode capability of WiFi and Bluetooth™. It will benefit system vendors in miniaturization of system dimension and BOM cost reduction, as well as also make users happy with the all-in-one functionality.

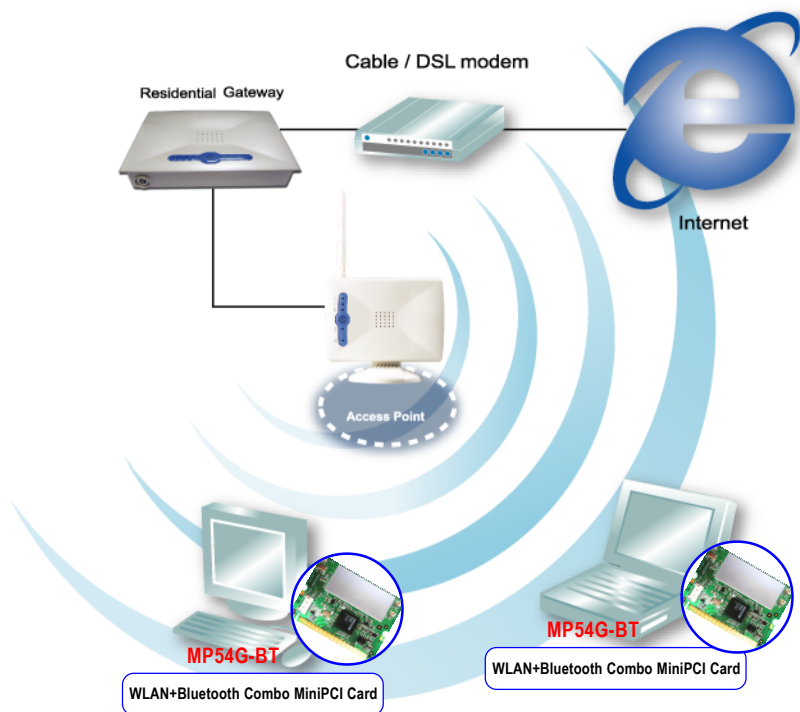
>>> 1.2 How MP54G-BT Works

1.2.1 In WLAN Environment

- **Ad-hoc Mode :** An Ad-hoc network is a local area network or other small network, especially one with wireless or temporary plug-in connections, in which some of the network devices are part of the network only for the duration of a communications session. Users in the network can share files, print to a shared printer, and access the Internet with a shared modem. In this kind of network, new devices can be quickly added; however, users can only communicate with other wireless LAN computers that are in this wireless LAN workgroup, and are within range.



- ❏ **Infrastructure Mode :** The difference between Infrastructure network and Ad-hoc network is that the former one includes an Access Point. In an Infrastructure network, the Access Point can manage the bandwidth to maximize bandwidth utilization. Additionally, the Access Point enables users on a wireless LAN to access an existing wired network, allowing wireless users to take advantage of the wired networks resources, such as Internet, email, file transfer, and printer sharing. The scale and range of the Infrastructure networking are larger and wider than that of the Ad-hoc networking.



1.2.2 In Bluetooth Connection

The term “Bluetooth” refers to a worldwide standard for the wireless exchange of data between two devices. In order to exchange data, two Bluetooth devices must establish a connection. Before a connection is established, one device must request a connection with another. The second device accepts (or rejects) the connection. The originator of the request is known as the client. The device that accepts (or rejects) the request is known as the server. Many Bluetooth devices can act as both client and server. Every Bluetooth device that provides a service must be prepared to respond to a connection request. Bluetooth software is always running in the background on the server, ready to respond to connection requests.



Bluetooth-enabled Devices

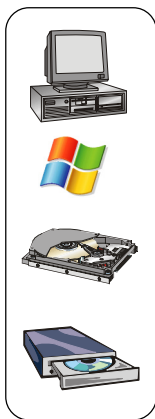
>>> 1.3 Specifications

Hardware Specification	Form Factor	32-bit Type IIIB
	Operation voltage	3.3V
	Antenna Connector	Two antenna connectors
	Operating System	Microsoft® Windows® 98SE/ME/2000 /XP
	Environmental	- Operating Temperature: 0 ~ 55°C - Operating Humidity: 10 ~ 90%, non-condensing
	Dimensions (WxDxH)	59.75 x 44.6 x 3.5mm
	Weight	15 g
WLAN Specification	Network Standard	IEEE 802.11; IEEE 802.11b/g
	Frequency Band	2.412-2.484 GHz
	Data Rate	IEEE 802.11g (auto-fallback): - OFDM: 54, 48, 36, 24, 18, 12, 9 and 6Mbps IEEE 802.11b (auto-fallback): - CCK: 11, 5.5 Mbps - DQPSK: 2 Mbps - DBPSK: 1 Mbps
	Media Access Control	CSMA/CA with ACK
	Transmission	DSSS (direct sequential spread spectrum)
	Network Architecture	Ad-Hoc Mode (Peer-to-Peer); Infrastructure Mode
	Antenna Type	Two antenna connectors support
	Power Consumption	360mA in continue Tx & 260mA in continue Rx 50mA (sleep mode)

Channel	IEEE 802.11g: Ch. 1-11 – N. America Ch. 1-13 – Japan Ch. 1-13– Europe ETSI Ch. 10-11 – Spain Ch. 10-13 – France IEEE 802.11b: Ch. 1-11 – N. America Ch. 1-14 – Japan Ch. 1-13– Europe ETSI Ch. 10-11 – Spain Ch. 10-13 – France
Output Power	IEEE 802.11g: 54Mbps 15dBm 48Mbps 15dBm 36Mbps 17dBm 24Mbps 17dBm 18Mbps 17dBm 12Mbps 17dBm 9Mbps 17dBm 6Mbps 17dBm IEEE 802.11b: 11Mbps 17dBm 5.5Mbps 17dBm 2Mbps 17dBm 1Mbps 17dBm
Receiver Sensitivity (Average Value)	54 Mbps OFDM @ 10% PER = -71 dBm 48 Mbps OFDM @ 10% PER = -74 dBm 36 Mbps OFDM @ 10% PER = -77 dBm 24 Mbps OFDM @ 10% PER = -79 dBm 18 Mbps OFDM @ 10% PER = -82 dBm 12 Mbps OFDM @ 10% PER = -86 dBm 11 Mbps CCK @ 8% PER = -86 dBm 9 Mbps OFDM @ 10% PER = -85 dBm 6 Mbps OFDM @ 10% PER = -87 dBm 5.5 Mbps CCK @ 8% PER = -89 dBm 2 Mbps QPSK @ 8% PER = -90 dBm 1 Mbps BPSK @ 8% PER = -93 dBm

Bluetooth Specification	Network Standard	Bluetooth Class II v1.1 and v1.2
	Frequency Band	2.4-2.483 GHz
	Data Rate	Up to 723kbps
	Channel	79 sub-channels
	Transmission	FHSS (Frequency Hopping Spread Spectrum)
	Modulation	GFSK
	Antenna Type	One antenna connector support
	Power Consumption	100mA (maximum, continuous TX)
	Max. Output Power	Up to 0dBm
	Max. Input Level	0dBm
	Receiver Sensitivity	-79dBm @ BER<0.1%
	Range	Up to 30 m
	Physical Links	Support ACL link
	Network Capabilities	Support piconet point-to-point and point-to multipoint connections
	Link Manager	3-slot Packets: Yes 5-slot Packets: Yes Slot Offset: Yes Timing Accuracy: Yes Switch: Yes Hold Mode: Yes Sniff Mode: Yes Test Mode: Yes Park Mode: Yes RSSI: Yes Power Control: Yes Authentication: Yes Encryption: Yes

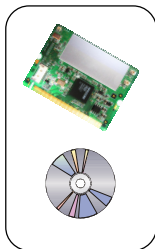
>>> 1.4 System Requirements



Before installing MP54G-BT, your PC should meet the following items:

- One desktop/notebook PC with an available MiniPCI slot.
- Windows® 98SE/ME/2000/XP operating system.
- Minimum 5MB free disk space for installing the driver and utilities.
- One CD-ROM drive, double speed or higher.

>>> 1.5 Package Contents



Unpack the package and check all the items carefully. If any item contained is damaged or missing, please contact your local dealer as soon as possible. Also, keep the box and packing materials in case you need to ship the unit in the future. The package should contain the following items:

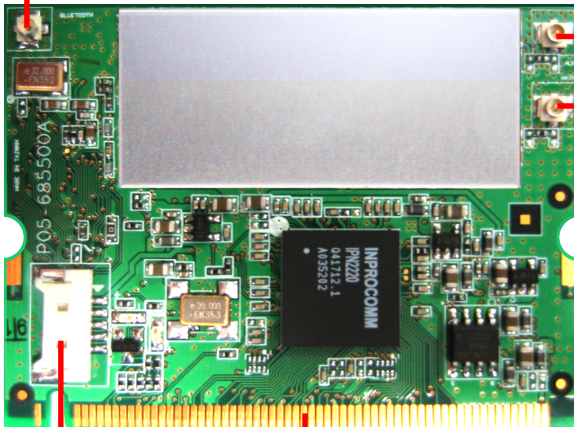
- One Wireless 11g + Bluetooth Combo MiniPCI Card.
- One Installation CD-ROM including drivers, utilities, and the manual files.

>>> 1.6 Product View

Bluetooth antenna Connector

WLAN 11g antenna connectors

Connect to external antennas for enhanced data transmission and reception. The external antennas are well designed on the desktop or notebook computers.



USB Connector

Connect to your mainboard using the provided USB cable.

Golden Finger

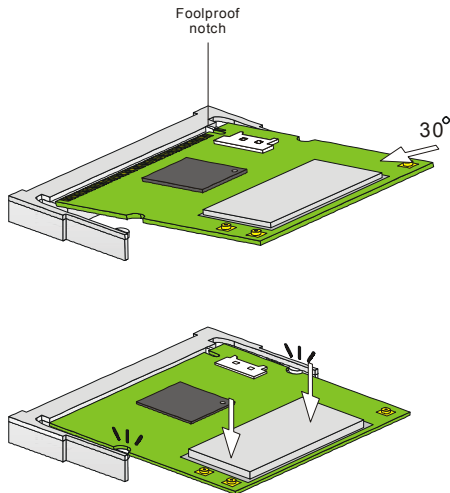
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Hardware Installation

The following diagrams provide you a basic installation for your MP54G-BT. The instruction below is suitable for most computers with MiniPCI slot. For more information about the MiniPCI module, please refer to your computer's manual.

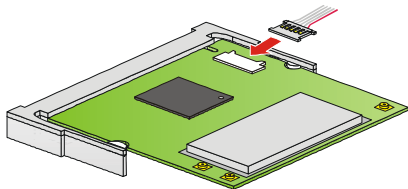
Installing MP54G-BT:

1. Locate the MiniPCI slot on the mainboard.
2. Place your MP54G-BT over the MiniPCI slot (at an angle of 30 degrees). Then, gently insert it into the slot until the golden finger of the card gets fully inserted.
3. Press down the card, and the retaining clips (on two sides of the slot) will lock onto the notches of the card.



4. Connect one end of the USB cable to the five-pin USB connector on MP54G-BT, and the other end to the USB connector located on your mainboard.

Note: If the MiniPCI interface in your mainboard reserves USB bus in pin 21 and 22, you can skip step 4.



3

Software Installation

This chapter describes the procedures of installing the driver and utility. Follow the instruction step by step to finish the installation. If you use Windows® 98SE/ME, please prepare the Windows® Setup CD at hand before installing the driver; because the system will ask you to insert the Setup CD to copy files during the installation.

Please **NOTE** that the MP54G-BT should be installed into your computer before installing the driver and utility. Then, the operating system will detect a new device and start to configure the new device. Click **Cancel** here to start installation from the InstallShield Wizard.



Click

Tip: The MP54G-BT adapter should be installed into your PC before installing the driver and utility.

STEP 1

Insert the software CD into your CD-ROM drive, and the Setup program should launch automatically.

If the Autorun program doesn't launch automatically, click **Start** at the taskbar and select **Run....** Type **E:\setup.exe** (where **E** is your CD-drive) in the Open box and click **OK** to launch the Setup program manually.

The main screen of Setup program will appear as below.

**STEP 2**

1. Click the **Install WLAN Driver** button.
2. The welcome screen of InstallShield Wizard appears. Click **Next**.
3. Read and accept the License Agreement; then, click **Next**.
4. Click **Install** and the program will copy the necessary files to the system. The progress indicator shows the installing status.
5. Click **Finish** when the WLAN driver installation is completed.

STEP 3

1. Click the **Install Bluetooth Driver** button.
2. The welcome screen of InstallShield Wizard appears. Click **Next**.
3. Read and accept the License Agreement; then, click **Next**.
4. Click **Next** to install the driver in the default destination folder.
5. Click **Install** and the program will copy the necessary files to the system. The progress indicator shows the installing status.
6. Click **Finish** when the bluetooth driver installation is completed.

STEP 4

Click the **Exit** button.

The Wireless LAN icon and Bluetooth icon will appear in the status bar.

