Wireless LAN Card Features

The Wireless LAN Card is a wireless network card that fits into a Mini-PCI TypeIII slot.

Wireless LAN Card Types

The Wireless LAN Card is a wireless network card that complies with the IEEE 802.11 standard on wireless LANs (Revision A, B) and Turbo Mode. Revision A supports data rates up to 54 Mbit/s. Revision B supports data rates up to 11 Mbit/s.

- Wi-Fi (Wireless Fidelity) certified by the Wi-Fi Alliance. This means that your Wireless hardware will communicate with other vendors' IEEE 802.11 compliant wireless LAN product. The 'Wi-Fi CERTIFIED' logo is a certification mark of the Wi-Fi Alliance.
- Fully compatible with any other wireless LAN system based on Direct Sequence Spread Spectrum (DSSS)/ Orthogonal Frequency Division Multiplexing (OFDM) radio technology that complies with the "IEEE 802.11 standard on wireless LANs (Revision A, B).

Wireless LAN Cards

The Wireless LAN Card supports the following wireless LAN features:

- Automatic Transmit Rate Select mechanism in the transmit range of 54,48,36,24,18,12, 9 and 6 Mbit/s. (Revision A)
- Automatic Transmit Rate Select mechanism in the transmit range of 11, 5.5, 2 and 1 Mbit/s. (Revision B)
- Frequency Channel Selection (2.4GHz:Revision B, 5GHz: Revision A).
- Roaming over multiple channels.
- Card Power Management.
- Wired Equivalent Privacy (WEP) data encryption, based on 152bit encryption algorithm.
- Advanced Encryption Standard (AES) data encryption, based on 256bit encryption algorithm.

Card Specifications

Form Factor	- Mini PCI TypeIII
Capability	- IEEE 802.11 Standard for Wireless LANS Wi-Fi (Wireless Fidelity) certified by the Wi-Fi Alliance.
Network Operating System	- Microsoft Windows® Networking
Media Access Protocol	- CSMA/CA (Collision Avoidance) with Acknowledgment (ACK)
Data Rate	- 54/48/36/24/18/12/9/6 Mb/s (Revision A) - 11/5.5/2/1 Mb/s (Revision B)

Radio Characteristics

Radio Characteristics of Wireless LAN Cards may vary according to:

- country/region where the product was purchased
- Type of product

Wireless communication is often subject to local radio regulations. Although Wireless LAN Wireless networking products have been designed for operation in the license-free 2.4GHz/5GHz band, local radio regulations may impose a number of limitations to the use of wireless communication equipment.

NOTE: Refer to the flyer "Information to the User" for regulatory information that may apply in your country/region.

R-F Frequency	-Band2.4GHz (2400-2483.5 MHz) (Revision B)
	-Band 5GHz (5150-5350 MHz) (Revision A)
Modulation Technique	-DSSS-CCK, DSSS-DQPSK, DSSS-DBPSK (Revision B)
	-OFDM-BPSK, OFDM-QPSK, OFDM-16QAM, OFDM-64QAM (Revision A)

The range of the wireless signal is related to the Transmit Rate of the wireless communication. Communications at lower Transmit range may travel larger distances.

- The range of your wireless devices can be affected when the antennas are placed near metal surfaces and solid high-density materials.
- Range is also impacted due to "obstacles" in the signal path of the radio that may either absorb or reflect the radio signal.

Supported Frequency Sub-bands

Subject to the radio regulations that apply in your country, your Wireless LAN Card may support a different set of 2.4GHz channels.
Consult your Authorized Wireless LAN or TOSHIBA Sales office for information about the radio regulations that apply in your country/region.

Wireless IEEE 802.11 Channels Sets (Revision B)

Frequency Range Channel ID	2400-2472 MHz	Note
1	2412	
2	2417	
3	2422	
4	2427	
5	2432	
6	2437	
7	2442	
8	2447	
9	2452	
10	**2457***	*1)
11	2462	

*1) Factory-set default channels

When installing Wireless LAN Cards, the channel configuration is managed as follows:

- For wireless clients that operate in a Wireless LAN Infrastructure, the Wireless LAN Card will automatically start operation at the channel identified by the Wireless LAN Access Point, when roaming between different access points the station can dynamically switch to another channel if required.
- For Wireless LAN Cards installed in Wireless clients that operating in a peer-to-peer mode, the card will use the default channel 10.
- In a Wireless LAN Access Point, the Wireless LAN card will use the factory-set default channel (printed in bold), unless the LAN Administrator selected a different channel when configuring the Wireless LAN Access Point device.

Wireless IEEE 802.11 Channels Sets (Revision A)

Frequency Range	5150-5350 MHz	Note
Channel ID		
36	5180	
40	5200	
44	5220	
48	5240	
52	5260	
56	5280	
60	5300	
64	5320	

Information sheet

Wireless Interoperability

The Intel(R) PRO/Wireless 2100A LAN Mini PCI Adapter products are designed to be interoperable with any wireless LAN product that is based on Direct Sequence Spread Spectrum (DSSS)/Orthogonal Frequency Division Multiplexing(OFDM) radio technology, and is compliant to:

- The IEEE 802.11 Standard on Wireless LANs(Revision A/B), as defined and approved by the Institute of Electrical and Electronics Engineers.
- The Wireless Fidelity(Wi-Fi) certification as defined by the Wi-Fi Alliance. The "Wi-Fi CERTIFIED" logo is a certification mark of the Wi-Fi Alliance.

CAUTION

Bluetooth™ and WirelessLAN devices operate within the same radio frequency range and may interfere with one another. If you use Bluetooth™ and WirelessLAN devices simultaneously, you may occasionally experience a less than optimal network performance or even lose your network connection.
If you should experience any such problem, immediately turn off either one of your Bluetooth™ or WirelessLAN.
Please contact Toshiba PC product support on web site
http://www.toshiba-europe.com/computers/tnt/bluetooth.htm in Europe or
http://www.pc.support.global.toshiba.com in the United States for more information.

CAUTION

This device is restricted to indoor use due to its operation in the 5.15 to 5.35 GHz frequency range.

Wireless LAN and your Health

Wireless LAN products, like other radio devices, emit radio frequency electromagnetic energy. The level of energy emitted by Wireless LAN devices however is far much less than the electromagnetic energy emitted by wireless devices like for example mobile phones.
Because Wireless LAN products operate within the guidelines found in radio frequency safety standards and recommendations, TOSHIBA believes Wireless LAN is safe for use by consumers. These standards and recommendations reflect the consensus of the scientific community and result from deliberations of panels and committees of scientists who continually review and interpret the extensive research literature.
In some situations or environments, the use of Wireless LAN may be restricted by the proprietor of the building or responsible representatives of the organization. These situations may for example include:

- Using the Wireless LAN equipment on board of airplanes, or
- In any other environment where the risk of interference to other devices or services is perceived or identified as harmful.

If you are uncertain of the policy that applies on the use of wireless devices in a specific organization or environment (e.g. airports), you are encouraged to ask for authorization to use the Wireless LAN device prior to turning on the equipment.

Regulatory Information

The Intel(R) PRO/Wireless 2100A LAN Mini PCI Adapter must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product. This device complies with the following radio frequency and safety standards.

PM0014971010

Canada – Industry Canada (IC)

This device complies with RSS 210 of Industry Canada.
Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of this device."
L ' utilisation de ce dispositif est autorisée seulement aux conditions suivantes : (1) il ne doit pas produire de brouillage et (2) l' utilisateur du dispositif doit étre prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.
The term "IC" before the equipment certification number only signifies that the Industry Canada technical specifications were met.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication.
To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing.

Pour empecher que cet appareil cause du brouillage au service faisant l'objet d'une licence, il doit etre utilize a l'interieur et devrait etre place loin des fenetres afin de Fournier un ecram de blindage maximal. Si le matriel (ou son antenne d'emission) est installe a l'exterieur, il doit faire l'objet d'une licence.

USA-Federal Communications Commission (FCC)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of 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. If not installed and used in accordance with the instructions, it 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 tuning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna
-Increase the distance between the equipment and the receiver.
-Connect the equipment to outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

TOSHIBA is not responsible for any radio or television interference caused by unauthorized modification of the devices included with this Intel(R) PRO/Wireless 2100A LAN Mini PCI Adapter, or the substitution or attachment of connecting cables and equipment other than specified by TOSHIBA.
The correction of interference caused by such unauthorized modification, substitution or attachment will be the responsibility of the user.

Caution: Exposure to Radio Frequency Radiation.

The radiated output power of the Intel(R) PRO/Wireless 2100A LAN Mini PCI Adapter is far below the FCC radio frequency exposure limits. Nevertheless, the Intel(R) PRO/Wireless 2100A LAN Mini PCI Adapter shall be used in such a manner that the potential for human contact during normal operation is minimized. The antenna(s) used in this device are located at the upper edge of the LCD screen, and this device has been tested as portable device as defined in Section 2.1093 of FCC rules when the LCD screen is rotated 180 degree and covered the keyboard area. In addition, Wireless LAN has been tested with Bluetooth transceiver for co-location requirements. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter. Antenna(s) used in 5.15-5.25GHz frequency band must be integral antenna which provide no access to the end user.
Refer to the Regulatory Statements as identified in the documentation that comes with those products for additional information.
The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's website www.hc-sc.gc.ca/rpb.

Caution: Radio Frequency Interference Requirements.

This device is restricted to indoor use due to its operation in the 5.15 to 5.25 GHz frequency range. FCC requires this product to be used indoors for frequency range 5.15 to 5.25 GHz to reduce the potential for harmful interference to co-channel Mobile Satellite systems.

High power radars are allocated as primary users of the 5.25 to 5.35 GHz and 5.65 to 5.85 GHz bands. These radar stations can cause interference with and/or damage this device.

Taiwan

Article 14 Unless approved, for any model accredited low power radio frequency electric machinery, any company, trader or user shall not change the frequency, increase the power or change the features and functions of the original design.

Article 17 Any use of low power radio frequency electric machinery shall not affect the aviation safety and interfere with legal communications. In event that any interference is found, the use of such electric machinery shall be stopped immediately, and reusing of such products can be resumed until no interference occurs after improvement.

The legal communications mentioned in the above item refer to radio communications operated in accordance with telecommunication laws and regulations.

Low power radio frequency electric machinery shall resist against interference from legal communications or from industrial, scientific and medical radio emission electric machinery.

Trademark

Bluetooth is a trademark owned by its proprietor and used by TOSHIBA under license.