

## Radiometrics Guide to FCC & Canada Compliance

### for Unintentional Radiators

Since 1934, the FCC has had the authority to regulate the electromagnetic emissions from electronic devices. Since October 1, 1983, all computer devices are required to be compliant with the Rules and Regulations. These regulations can be found in the Code of Federal Regulations, Title 47 Parts 2 and 15. The FCC's website is <http://www.fcc.gov/>.

Radiometrics Midwest Corporation has been performing FCC compliance testing since 1983. Our business philosophy is simply to go beyond just testing. If there is a problem, Radiometrics is part of the solution. Our sole goal is to have your product approved. If there is anything that we at Radiometrics can do to be of assistance, please contact us at 815-293-0772.

The following is an overview of the FCC Requirements for Unintentional Radiators. These are direct excerpts from the FCC part 15 rules.

### **Equipment Authorization of Unintentional Radiators**

The FCC defines an Unintentional Radiator as a device that intentionally generates radio frequency energy for use within the device, or that sends radio frequency signals by conduction to associated equipment via connecting wiring, but which is not intended to emit RF energy by radiation or induction. Unintentional radiators shall be authorized prior to the initiation of marketing, as follows:

Type of device	Equipment authorization required
TV broadcast receiver	Verification
FM broadcast receiver	Verification
CB receiver	Declaration of Conformity (DOC) or Certification
Superregenerative receiver	DOC or Certification
Scanning receiver	Certification
All other receivers subject to Part 15 (30 to 960 MHz Only)	DOC or Certification
TV interface device	DOC or Certification
Cable system terminal device	DOC
Stand-alone cable input selector switch	Verification
Class B personal computers and peripherals	DOC or Certification
CPU boards and internal power supplies used with Class B personal computers	DOC or Certification
Class B personal computers assembled using authorized CPU boards or power supplies	DOC
Class B external switching power supplies	Verification
Other Class B digital devices & peripherals	Verification
Class A digital devices, peripherals & external switching power supplies	Verification
All other devices	Verification

The DOC option is allowed only for products tested by an accredited laboratory such as Radiometrics.

The following devices are exempt from the specific technical standards and other requirements contained in this Part 15 subpart B. The operator of the exempted device shall be required to stop operating the device upon a finding by the Commission or its representative that the device is causing harmful interference. Operation shall not resume until the condition causing the harmful interference has been corrected. Although not mandatory, it is strongly recommended that the manufacturer of an exempted device endeavor to have the device meet the specific technical standards in Part 15.

(a) A digital device utilized exclusively in any transportation vehicle including motor vehicles and aircraft.

(b) A digital device used exclusively as an electronic control or power system utilized by a public utility or in an industrial plant. The term public utility includes equipment only to the extent that it is in a dedicated building or large room owned or leased by the utility and does not extend to equipment installed in a subscriber's facility.

(c) A digital device used exclusively as industrial, commercial, or medical test equipment.

(d) A digital device utilized exclusively in an appliance, e.g., microwave oven, dishwasher, clothes dryer, air conditioner (central or window), etc.

(e) Specialized medical digital devices (generally used at the direction of or under the supervision of a licensed health care practitioner) whether used in a patient's home or a health care facility. Non-specialized medical devices, i.e., devices marketed through retail channels for use by the general public, are not exempted. This exemption also does not apply to digital devices used for record keeping or any purpose not directly connected with medical treatment.

(f) Digital devices that have a power consumption not exceeding 6 nW.

(g) Joystick controllers or similar devices, such as a mouse, used with digital devices but which contain only non-digital circuitry or a simple circuit to convert the signal to the format required (e.g., an integrated circuit for analog to digital conversion) are viewed as passive add-on devices, not themselves directly subject to the technical standards or the equipment authorization requirements.

(h) Digital devices in which both the highest frequency generated and the highest frequency used are less than 1.705 MHz and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Digital devices that include, or make provision for the use of, battery eliminators, AC adapters or battery chargers which permit operation while charging or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, do not fall under this exemption.

(i) Responsible parties should note that equipment containing more than one device is not exempt from the technical standards in this part unless all of the devices in the equipment meet the criteria for exemption. If only one of the included devices qualifies for exemption, the remainder of the equipment must comply with any applicable regulations. If a device performs more than one function and all of those functions do not meet the criteria for exemption, the device does not qualify for inclusion under the exemptions.

Personal computers shall be authorized in accordance with one of the following methods:

(1) The specific combination of CPU board, power supply and enclosure is tested together and authorized under a DOC or a grant of certification;

(2) The personal computer is authorized under a DOC or a grant of certification, and the CPU board or power supply in that computer is replaced with a CPU board or power supply that has been separately authorized under a DOC or a grant of certification; or,

(3) The CPU board and power supply used in the assembly of a personal computer have been separately authorized under a DOC or a grant of certification.

(4) Personal computers assembled using either of the methods specified in paragraphs (2) or (3) of this section must, by themselves, also be authorized under a DOC if they are marketed. However, additional testing is not required for this DOC, provided the procedures in FCC Section 15.102(b) are followed. FCC Part 15 can be downloaded from the web address on the first paragraph of page 1.

Computers and peripheral devices fall into two categories. They are either a Class A or a Class B device. A Class A device is "a digital device that is marketed for use in a commercial, industrial or business environment, exclusive of a device that is marketed for use by the general public or intended to be used in the home." A Class B device is "a digital device that is marketed for use in a residential environment notwithstanding use in commercial, business and industrial environments."

The FCC encourages responsible manufacturers of commercial, industrial or business product to comply with the Class B requirements if possible. They note that "In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B digital device, regardless of its intended use."

## Labeling Requirements

Receivers associated with the operation of a licensed radio service, e.g., FM broadcast under Part 73, land mobile operation under Part 90, etc., shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

All other devices for certification or verification shall bear the following statement in a conspicuous location on the device:

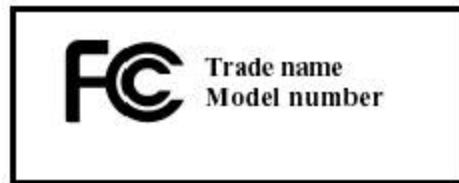
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The FCC ID is added to the above label for devices that require certification.

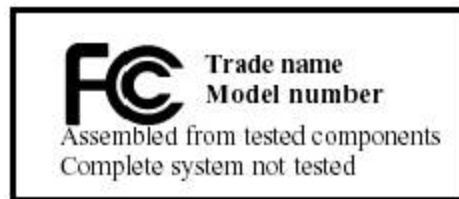
When the device is so small or for such use that it is not practicable to place applicable statement as previously specified, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.

Products subject to authorization under a DOC shall be labeled with one of the following two logos. The label shall be located in a conspicuous location on the device and shall contain the unique identification described in Section 2.1074 of this chapter and the following logo:

If the product is authorized based on testing of the product or system use the following label:



If the product is authorized based on assembly using separately authorized components and the resulting product is not separately tested use the following label:



The terms “Tested to Comply with FCC standards” and “For Home or Office Use” are no longer required for the above DOC labels as of July 2003.

The label text and information should be in a size of type large enough to be readily legible, consistent with the dimensions of the equipment and the label. The type size for the text is required to be at least 8 point.

When the device is so small or for such use that it is not practicable to place the statement specified in section on it, such as for a CPU board or a plug-in circuit board peripheral device, the text associated with the logo may be placed in a prominent location in the instruction manual or pamphlet supplied to the user. However, the unique identification (trade name and model number) and the logo must be displayed on the device.

The label shall not be a stick-on, paper label. The label on these products shall be permanently affixed to the product and shall be readily visible to the purchaser at the time of purchase. "Permanently affixed" means that the label is etched, engraved, stamped, silk-screened, indelibly printed, or otherwise permanently marked on a permanently attached part of the equipment or on a nameplate of metal, plastic, or other material fastened to the equipment by welding, riveting, or a permanent adhesive. The label must be designed to last the expected lifetime of the equipment in the environment in which the equipment may be operated and must not be readily detachable.

## Requirements for the Instruction Manual

The instruction manual shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. The manual shall also inform the end user about any unique accessories required for compliance. For example the user may be required to use shielded cables on specific ports.

In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the Internet, the information required by this section may be included in the manual in that alternative form, provided the user can reasonably be expected to have the capability to access information in that form.

For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: 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 or more of the following measures:

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

This is not required for a receiver unless the receiver also contains a digital device.

For a receiver, the instruction manual shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## Canadian Labeling and Documentation

Canada's rules are technically equivalent to the FCC's. One set of tests are performed for both the US and Canada EMC requirements. The following is the labeling requirement for Canada.

A record of the measurements and results, showing the date that the measurements were completed, shall be retained by the manufacturer or importer for a period of at least five years from the date shown in the record and made available for examination on the request of the Minister. (6.1)

A written notice indicating compliance must accompany each unit of digital apparatus to the end user. The notice shall be in the form of a label that is affixed to the apparatus. Where because of insufficient space or other constraints it is not feasible to affix a label to the apparatus, the notice may be in the form of a statement included in the user's manual.

The Suggested text for the notice indicating compliance with the Canadian Standard is:

English: This Class [\*] digital apparatus complies with Canadian ICES-003.

French: Cet appareil numérique de la classe [\*] est conforme à la norme NMB-003 du Canada.

[\*] Insert either "A" or "B" but not both as appropriate for the equipment requirements.

Industry Canada's Website:

<http://strategis.ic.gc.ca>

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Type of device	Equipment authorization required
TV broadcast receiver	Verification
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CB receiver	Declaration of Conformity (DOC) or Certification
Superregenerative receiver	DOC or Certification
Scanning receiver	Certification
All other receivers subject to Part 15 (30 to 960 MHz Only)	DOC or Certification
TV interface device	DOC or Certification
Cable system terminal device	DOC
Stand-alone cable input selector switch	Verification
Class B personal computers and peripherals	DOC or Certification
CPU boards and internal power supplies used with Class B personal computers	DOC or Certification
Class B personal computers assembled using authorized CPU boards or power supplies	DOC
Class B external switching power supplies	Verification
Other Class B digital devices & peripherals	Verification
Class A digital devices, peripherals & external switching power supplies	Verification
All other devices	Verification

The DOC option is allowed only for products tested by an accredited laboratory such as Radiometrics.

The following devices are exempt from the specific technical standards and other requirements contained in this Part 15 subpart B. The operator of the exempted device shall be required to stop operating the device upon a finding by the Commission or its representative that the device is causing harmful interference. Operation shall not resume until the condition causing the harmful interference has been corrected. Although not mandatory, it is strongly recommended that the manufacturer of an exempted device endeavor to have the device meet the specific technical standards in Part 15.

(a) A digital device utilized exclusively in any transportation vehicle including motor vehicles and aircraft.

(b) A digital device used exclusively as an electronic control or power system utilized by a public utility or in an industrial plant. The term public utility includes equipment only to the extent that it is in a dedicated building or large room owned or leased by the utility and does not extend to equipment installed in a subscriber's facility.

(c) A digital device used exclusively as industrial, commercial, or medical test equipment.

(d) A digital device utilized exclusively in an appliance, e.g., microwave oven, dishwasher, clothes dryer, air conditioner (central or window), etc.

(e) Specialized medical digital devices (generally used at the direction of or under the supervision of a licensed health care practitioner) whether used in a patient's home or a health care facility. Non-specialized medical devices, i.e., devices marketed through retail channels for use by the general public, are not exempted. This exemption also does not apply to digital devices used for record keeping or any purpose not directly connected with medical treatment.

(f) Digital devices that have a power consumption not exceeding 6 nW.

(g) Joystick controllers or similar devices, such as a mouse, used with digital devices but which contain only non-digital circuitry or a simple circuit to convert the signal to the format required (e.g., an integrated circuit for analog to digital conversion) are viewed as passive add-on devices, not themselves directly subject to the technical standards or the equipment authorization requirements.

(h) Digital devices in which both the highest frequency generated and the highest frequency used are less than 1.705 MHz and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Digital devices that include, or make provision for the use of, battery eliminators, AC adapters or battery chargers which permit operation while charging or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, do not fall under this exemption.

(i) Responsible parties should note that equipment containing more than one device is not exempt from the technical standards in this part unless all of the devices in the equipment meet the criteria for exemption. If only one of the included devices qualifies for exemption, the remainder of the equipment must comply with any applicable regulations. If a device performs more than one function and all of those functions do not meet the criteria for exemption, the device does not qualify for inclusion under the exemptions.

Personal computers shall be authorized in accordance with one of the following methods:

(1) The specific combination of CPU board, power supply and enclosure is tested together and authorized under a DOC or a grant of certification;

(2) The personal computer is authorized under a DOC or a grant of certification, and the CPU board or power supply in that computer is replaced with a CPU board or power supply that has been separately authorized under a DOC or a grant of certification; or,

(3) The CPU board and power supply used in the assembly of a personal computer have been separately authorized under a DOC or a grant of certification.

(4) Personal computers assembled using either of the methods specified in paragraphs (2) or (3) of this section must, by themselves, also be authorized under a DOC if they are marketed. However, additional testing is not required for this DOC, provided the procedures in FCC Section 15.102(b) are followed. FCC Part 15 can be downloaded from the web address on the first paragraph of page 1.

Computers and peripheral devices fall into two categories. They are either a Class A or a Class B device. A Class A device is "a digital device that is marketed for use in a commercial, industrial or



business environment, exclusive of a device that is marketed for use by the general public or intended to be used in the home." A Class B device is "a digital device that is marketed for use in a residential environment notwithstanding use in commercial, business and industrial environments."

The FCC encourages responsible manufacturers of commercial, industrial or business product to comply with the Class B requirements if possible. They note that "In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B digital device, regardless of its intended use."

## Labeling Requirements

Receivers associated with the operation of a licensed radio service, e.g., FM broadcast under Part 73, land mobile operation under Part 90, etc., shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

All other devices for certification or verification shall bear the following statement in a conspicuous location on the device:

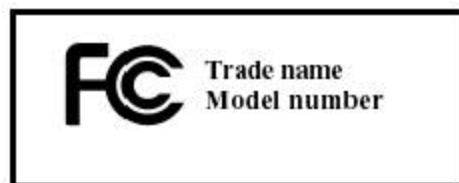
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The FCC ID is added to the above label for devices that require certification.

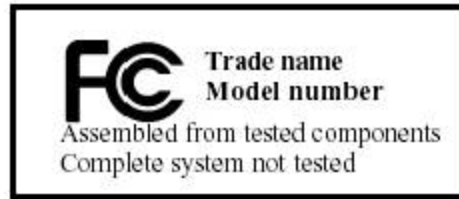
When the device is so small or for such use that it is not practicable to place applicable statement as previously specified, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.

Products subject to authorization under a DOC shall be labeled with one of the following two logos. The label shall be located in a conspicuous location on the device and shall contain the unique identification described in Section 2.1074 of this chapter and the following logo:

If the product is authorized based on testing of the product or system use the following label:



If the product is authorized based on assembly using separately authorized components and the resulting product is not separately tested use the following label:



The terms “Tested to Comply with FCC standards” and “For Home or Office Use” are no longer required for the above DOC labels as of July 2003.

The label text and information should be in a size of type large enough to be readily legible, consistent with the dimensions of the equipment and the label. The type size for the text is required to be at least 8 point.

When the device is so small or for such use that it is not practicable to place the statement specified in section on it, such as for a CPU board or a plug-in circuit board peripheral device, the text associated with the logo may be placed in a prominent location in the instruction manual or pamphlet supplied to the user. However, the unique identification (trade name and model number) and the logo must be displayed on the device.

The label shall not be a stick-on, paper label. The label on these products shall be permanently affixed to the product and shall be readily visible to the purchaser at the time of purchase. "Permanently affixed" means that the label is etched, engraved, stamped, silk-screened, indelibly printed, or otherwise permanently marked on a permanently attached part of the equipment or on a nameplate of metal, plastic, or other material fastened to the equipment by welding, riveting, or a permanent adhesive. The label must be designed to last the expected lifetime of the equipment in the environment in which the equipment may be operated and must not be readily detachable.

## Requirements for the Instruction Manual

The instruction manual shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. The manual shall also inform the end user about any unique accessories required for compliance. For example the user may be required to use shielded cables on specific ports.

In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the Internet, the information required by this section may be included in the manual in that alternative form, provided the user can reasonably be expected to have the capability to access information in that form.

For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential

area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: 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 or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
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A record of the measurements and results, showing the date that the measurements were completed, shall be retained by the manufacturer or importer for a period of at least five years from the date shown in the record and made available for examination on the request of the Minister. (6.1)

A written notice indicating compliance must accompany each unit of digital apparatus to the end user. The notice shall be in the form of a label that is affixed to the apparatus. Where because of insufficient space or other constraints it is not feasible to affix a label to the apparatus, the notice may be in the form of a statement included in the user's manual.

The Suggested text for the notice indicating compliance with the Canadian Standard is:

English: **This Class [\*] digital apparatus complies with Canadian ICES-003.**

French: **Cet appareil numérisé de la classe [\*] est conforme à la norme NMB-003 du Canada.**

[\*] Insert either "A" or "B" but not both as appropriate for the equipment requirements.

**Industry Canada's Website:**

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