

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: Re-orient or relocate the receiving antenna, Increase the separation between the equipment and receiver, Connect equipment and receiver to outlets on different circuits, or Consult the dealer or an experienced radio/TV technician for help.

FCC-Approved Antennas (2.4 GHz)

The XBee and XBee-PRO RF Module can be installed utilizing antennas and cables constructed with standard connectors (Type-N, SMA, TNC, etc.) if the installation is performed professionally and according to FCC guidelines. For installations not performed by a professional, non-standard connectors (RPSMA, RPTNC, etc.) must be used.

The modules are FCC approved for fixed base station and mobile applications on channels 0x0B-0x1A for Xbee ZB and on channels 0x0B - 0x18 for Xbee-PRO ZB. If the antenna is mounted at least 20cm (8 in.) from nearby persons, the application is considered a mobile application. Antennas not listed in the table must be tested to comply with FCC Section 15.203 (Unique Antenna Connectors) and Section 15.247 (Emissions).

XBee RF Modules: XBee RF Modules have been tested and approved for use with all the antennas listed in the tables below. (Cable-loss IS required when using gain antennas as shown below.)

The antennas in the tables below have been approved for use with this module. Digi does not carry all of these antenna variants. Contact Digi Sales for available antennas.

Antennas approved for use with the XBee®/XBee-PRO® (S2) ZB RF Modules (Cable-loss is not required.)

Part Number	Type (Description)	Gain	Application*	Min. Separation
A24-HASM-450	Dipole (Half-wave articulated RPSMA - 4.5")	2.1 dBi	Fixed/Mobile	20 cm
A24-HABSM	Dipole (Articulated RPSMA)	2.1 dBi	Fixed	20 cm
A24-HABUF-P5I	Dipole (Half-wave articulated bulkhead mount U.F.L. w/ 5" pigtail)	2.1 dBi	Fixed	20 cm
A24-HASM-525	Dipole (Half-wave articulated RPSMA - 5.25")	2.1 dBi	Fixed/Mobile	20 cm
A24-QI	Monopole (Integrated whip)	1.5 dBi	Fixed	20 cm

Antennas approved for use with the XBee®/XBee-PRO® (S2B) ZB RF Modules (Cable-loss is not required.)

OMNI-DIRECTIONAL ANTENNAS for All Channels					
Part Number	Type (Description)	Gain	Application*	Min Separation	Minimum Cable Loss/Power Reduction/Attenuation Required
A24-HASM-450	Dipole (Half-wave articulated RPSMA - 4.5")	2.1 dBi	Fixed/Mobile	20 cm	N/A
A24-HABSM	Dipole (Articulated RPSMA)	2.1 dBi	Fixed	20 cm	N/A
A24-HABUF-P5I	Dipole (Half-wave articulated bulkhead mount U.F.L. w/ 5" pigtail)	2.1 dBi	Fixed	20 cm	N/A
A24-HASM-525	Dipole (Half-wave articulated RPSMA - 5.25")	2.1 dBi	Fixed/Mobile	20 cm	N/A
A24-QI	Monopole (Integrated whip)	1.5 dBi	Fixed	20 cm	N/A
29000294	Integral PCB antenna	-0.5 dBi	Fixed/Mobile	20 cm	N/A

Antennas approved for use with the XBee-PRO (S2B) RF Module

YAGI CLASS ANTENNAS for Channels 11 to 24					
Part Number	Type (Description)	Gain	Application*	Min. Separation	Minimum Cable Loss/ Power Reduction/ Attenuation Required for 18dBm Output
A24-Y6NF	Yagi (6-element)	8.8 dBi	Fixed	2 m	N/A
A24-Y7NF	Yagi (7-element)	9.0 dBi	Fixed	2 m	N/A
A24-Y9NF	Yagi (9-element)	10.0 dBi	Fixed	2 m	N/A
A24-Y10NF	Yagi (10-element)	11.0 dBi	Fixed	2 m	N/A
A24-Y12NF	Yagi (12-element)	12.0 dBi	Fixed	2 m	N/A
A24-Y13NF	Yagi (13-element)	12.0 dBi	Fixed	2 m	N/A
A24-Y15NF	Yagi (15-element)	12.5 dBi	Fixed	2 m	N/A
A24-Y16NF	Yagi (16-element)	13.5 dBi	Fixed	2 m	N/A
A24-Y16RM	Yagi (16-element, RPSMA connector)	13.5 dBi	Fixed	2 m	N/A
A24-Y18NF	Yagi (18-element)	15.0 dBi	Fixed	2 m	N/A
OMNI-DIRECTIONAL ANTENNAS for Channels 11 to 24					
Part Number	Type (Description)	Gain	Application*	Min. Separation	Minimum Cable Loss/ Power Reduction/ Attenuation Required for 18dBm Output
29000294	Integral PCB antenna	-0.5 dBi	Fixed/Mobile	20 cm	N/A
A24-HASM-450	Dipole (Half-wave articulated RPSMA - 4.5")	2.1 dBi	Fixed/Mobile	20 cm	N/A
A24-HABSM	Dipole (Articulated RPSMA)	2.1 dBi	Fixed	20 cm	N/A
A24-HABUF-P5I	Dipole (Half-wave articulated bulkhead mount U.F.L. w/ 5" pigtail)	2.1 dBi	Fixed	20 cm	N/A
A24-HASM-525	Dipole (Half-wave articulated RPSMA - 5.25")	2.1 dBi	Fixed/Mobile	20 cm	N/A
A24-QI	Monopole (Integrated whip)	1.5 dBi	Fixed	20 cm	N/A
A24-F2NF	Omni-directional (Fiberglass base station)	2.1 dBi	Fixed/Mobile	20 cm	N/A
A24-F3NF	Omni-directional (Fiberglass base station)	3.0 dBi	Fixed/Mobile	20 cm	N/A
A24-F5NF	Omni-directional (Fiberglass base station)	5.0 dBi	Fixed/Mobile	20 cm	N/A
A24-F8NF	Omni-directional (Fiberglass base station)	8.0 dBi	Fixed	2 m	N/A
A24-F9NF	Omni-directional (Fiberglass base station)	9.5 dBi	Fixed	2 m	N/A
A24-F10NF	Omni-directional (Fiberglass base station)	10.0 dBi	Fixed	2 m	N/A
A24-F12NF	Omni-directional (Fiberglass base station)	12.0 dBi	Fixed	2 m	N/A
A24-F15NF	Omni-directional (Fiberglass base station)	15.0 dBi	Fixed	2 m	N/A
A24-W7NF	Omni-directional (Base station)	7.2 dBi	Fixed	2 m	N/A
A24-M7NF	Omni-directional (Mag-mount base station)	7.2 dBi	Fixed	2 m	N/A
OMNI-DIRECTIONAL ANTENNAS for Channels 11 to 25					
Part Number	Type (Description)	Gain	Application*	Min. Separation	Minimum Cable Loss/ Power Reduction/ Attenuation Required for 18dBm Output
29000294	Integral PCB antenna	-0.5 dBi	Fixed/Mobile	20 cm	N/A
A24-HASM-450	Dipole (Half-wave articulated RPSMA - 4.5")	2.1 dBi	Fixed/Mobile	20 cm	N/A
A24-HABSM	Dipole (Articulated RPSMA)	2.1 dBi	Fixed	20 cm	N/A
A24-HABUF-P5I	Dipole (Half-wave articulated bulkhead mount U.F.L. w/ 5" pigtail)	2.1 dBi	Fixed	20 cm	N/A
A24-HASM-525	Dipole (Half-wave articulated RPSMA - 5.25")	2.1 dBi	Fixed/Mobile	20 cm	N/A
A24-QI	Monopole (Integrated whip)	1.5 dBi	Fixed	20 cm	N/A
A24-F2NF	Omni-directional (Fiberglass base station)	2.1 dBi	Fixed/Mobile	20 cm	N/A
A24-F3NF	Omni-directional (Fiberglass base station)	3.0 dBi	Fixed/Mobile	20 cm	N/A
A24-F5NF	Omni-directional (Fiberglass base station)	5.0 dBi	Fixed/Mobile	20 cm	N/A
A24-F8NF	Omni-directional (Fiberglass base station)	8.0 dBi	Fixed	2 m	N/A
PANEL CLASS ANTENNAS for Channels 11 to 24					
Part Number	Type (Description)	Gain	Application*	Min. Separation	Minimum Cable Loss/ Power Reduction/ Attenuation Required for 18dBm Output
A24-P8SF	Flat Panel	8.5 dBi	Fixed	2 m	N/A
A24-P8NF	Flat Panel	8.5 dBi	Fixed	2 m	N/A
A24-P13NF	Flat Panel	13.0 dBi	Fixed	2 m	N/A
A24-P14NF	Flat Panel	14.0 dBi	Fixed	2 m	0.8 dB

YAGI CLASS ANTENNAS for Channels 11 to 24					
Part Number	Type (Description)	Gain	Application*	Min. Separation	Minimum Cable Loss/ Power Reduction/ Attenuation Required for 18dBm Output
A24-P15NF	Flat Panel	15.0 dBi	Fixed	2 m	1.8 dB
A24-P16NF	Flat Panel	16.0 dBi	Fixed	2 m	2.8 dB
A24-P19NF	Flat Panel	19.0 dBi	Fixed	2m	5.8 dB

* **If using the RF module in a portable application** (for example - if the module is used in a handheld device and the antenna is less than 20cm from the human body when the device is in operation): The integrator is responsible for passing additional SAR (Specific Absorption Rate) testing based on FCC rules 2.1091 and FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields, OET Bulletin and Supplement C. The testing results will be submitted to the FCC for approval prior to selling the integrated unit. The required SAR testing measures emissions from the module and how they affect the person.

RF Exposure



WARNING: To satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operations at closer than this distance are not recommended. The antenna used for this transmitter must not be co-located in conjunction with any other antenna or transmitter.

The preceding statement must be included as a CAUTION statement in OEM product manuals in order to alert users of FCC RF Exposure compliance.

Europe (ETSI)

The XBee RF Modules have been certified for use in several European countries. For a complete list, refer to www.digi.com

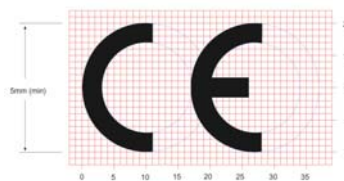
If the XBee RF Modules are incorporated into a product, the manufacturer must ensure compliance of the final product to the European harmonized EMC and low-voltage/safety standards. A Declaration of Conformity must be issued for each of these standards and kept on file as described in Annex II of the R&TTE Directive.

Furthermore, the manufacturer must maintain a copy of the XBee user manual documentation and ensure the final product does not exceed the specified power ratings, antenna specifications, and/or installation requirements as specified in the user manual. If any of these specifications are exceeded in the final product, a submission must be made to a notified body for compliance testing to all required standards.

OEM Labeling Requirements

The 'CE' marking must be affixed to a visible location on the OEM product.

CE Labeling Requirements



The CE mark shall consist of the initials "CE" taking the following form:

- If the CE marking is reduced or enlarged, the proportions given in the above graduated drawing must be respected.
- The CE marking must have a height of at least 5mm except where this is not possible on account of the nature of the apparatus.
- The CE marking must be affixed visibly, legibly, and indelibly.

Restrictions

France: Outdoor use limited to 10 mW EIRP within the band 2454-2483.5 MHz.

Norway: Norway prohibits operation near Ny-Alesund in Svalbard. More information can be found at the Norway Posts and Telecommunications site (www.npt.no).