

Subject: Application note explaining the difference between a Standard and Reverse Polarity Antennas and differences between Evaluation Modules (EVMs) and FCC certified Modules (FCC)

The purpose of this application note is to address frequently asked questions (FAQs) from customers on which antenna and connector are matched to the appropriate module type and also to explain the differences between Radiotronix EVM and FCC modules.

1. Differences between Radiotronix Evaluation Modules (EVMs) and Radiotronix FCC Certified Modules (FCC Modules)

A. Evaluation Module (EVM)

Radiotronix “standard” Rapid Development kits (RK-Wi.XXX) for the Wi.232 family of embedded modules include 2ea Wi.XXX-EVM-R evaluation modules and 2ea standard polarity antennas. These modules are a carrier board with antenna matching circuit and a standard polarity SMA antenna connector on board, a voltage regulator circuit and include the specific embedded module per part number.

Evaluation modules (EVMs) are designed for engineering prototyping and use standard polarity Female (center socket for pin) connectors that require matching standard polarity Male (center pin present) antennas. The evaluation modules are able to connect with most standard test equipment for fast evaluation and development.

EXAMPLE: The RK-Wi.232DTS-R Rapid Development Kit is designed for development for the embedded radio module, Wi.232DTS-R. In each kit, there are 2ea Wi.232DTS-EVM-R evaluation modules (EVMs).

These EVM modules use a PN CON-ST SMA-ST standard polarity Female straight connector and are designed for any standard polarity Male antenna. Standard Radiotronix kit antennas include ANT-915-03A (1/4 wave whip antenna) or ANT-915-09A (1/2 wave dipole antenna). The Wi.232DTS-R embedded module is also on the EVM module.

2. FCC Certified Modules (FCC Modules)

Radiotronix “FCC Module” Rapid Development kits (RK-Wi.XXX-FCC) for the Wi.232 family of embedded modules include 2ea Wi.XXX-FCC-R evaluation modules and 2ea FCC certified reverse polarity antennas. These modules are a carrier board with antenna matching circuit and a reverse polarity RPSMA antenna connector on board, a voltage regulator circuit and include the specific FCC certified embedded module per part number. In addition, these modules will have an FCC ID label and shield.

FCC certified modules (FCC modules) are designed for engineering prototyping and also production and use reverse polarity Male (center pin present) connectors that require matching reverse polarity Female (center socket for pin) antennas. The FCC modules are designed for non-standard antennas that are required by the FCC to meet modular level certification. These modules also have a family of matching certified reverse polarity antennas available to support the Modular level certification approval. (See FCC modular level approval application note)

EXAMPLE: The RK-Wi.232DTS-FCC-R Rapid Development Kit is designed for development of both the Wi.232DTS-FCC-RA-R (Right angle) and Wi.232DTS-FCC-ST-R (straight). In each kit, there are 2ea Wi.232DTS-FCC-ST-R FCC certified modules (FCC Modules).

These FCC modules use a PN# CON-RPSMA-ST reverse polarity Male straight connector and are designed for any non-standard reverse polarity Female antenna. FCC Radiotronix kit antennas include ANT-915-02A (1/4 wave whip antenna) or ANT-915-06A (1/2 wave dipole antenna). The Wi.232DTS-R embedded module is also on the FCC module and has been scanned to meet FCC certification requirements.

2. Differences between Radiotronix Standard Polarity Antennas and Connectors (EVMs) and Radiotronix FCC Certified Reverse Polarity Antennas and Connectors

A. Standard Polarity Antennas and Connectors (SMA)

Radiotronix “standard polarity” antennas and connectors are designed for support of the Wi.232XXX-EVM-R development modules.

Evaluation modules (EVMs) are designed for engineering prototyping and use standard polarity Female (center socket for pin) connectors that require matching standard polarity Male (center pin present) antennas. The evaluation modules are able to connect with most standard test equipment for fast evaluation and development.

EXAMPLE: PN CON-STSMA-ST standard polarity Female straight connectors are designed for any standard polarity Male antenna. Standard Radiotronix kit antennas include ANT-915-03A (1/4 wave whip antenna) or ANT-915-09A (1/2 wave dipole antenna).

B. FCC Certified Reverse Polarity (Non-standard) Antennas and Connectors

Radiotronix “Reverse Polarity” antennas and connectors are designed for support of the Wi.XXX-FCC-R modules and all Wi.XXX embedded radio modules that require non-standard FCC connectors and antennas in order to meet FCC certification requirements.

FCC certified modules(FCC modules) are designed for engineering prototyping and also production and use reverse polarity Male (center pin present) connectors that require matching reverse polarity Female (center socket for pin) antennas. The FCC modules are designed for non-standard antennas that are required by the FCC to meet modular level certification. The Radiotronix non-standard reverse polarity antennas and connectors were certified with our FCC Module family of products. (see FCC modular level approval application note)

EXAMPLE: PN# CON-RPSMA-ST reverse polarity Male straight connectors are designed for any non-standard reverse polarity Female antenna. FCC Radiotronix kit antennas include ANT-915-02A (1/4 wave whip antenna) or ANT-915-06A (1/2 wave dipole antenna).

C. Description of SMA and Reverse Polarity (RP-SMA) connectors and antennas types

Connection Type	Connector Pin Type	Antenna Pin Type
SMA	Female (center socket for pin)	Male (center pin present)
RP-SMA	Male (center pin present)	Female (center socket for pin)

For more information, contact Radiotronix technical support. 405-794-7730 or sales@radiotronix.com

