

Standard vs. Reverse Polarity (RP) SMA Connectors

Application Note AN-00600



Standard connectors like SMA, TNC, BNC and N styles are not permitted for use on an antenna connection per the United States Federal Communications Commission (FCC). Title 47, Part 15.203 states:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

The intent is to ensure that the end user cannot attach an antenna to the device that was not tested with that device. The risk is that the product could start radiating over more important systems, like police and fire radios or aircraft navigation. Prohibiting the use of "standard" connectors is used as a way to protect the more important systems.

Reverse polarity connectors were created to meet this requirement. These connectors simply swap which end has the center socket and center pin. This enables companies to use existing tooling and keep costs down.

The table below shows the difference between standard and reverse polarity connectors.

Standard vs. Reverse Polarity SMA		
	Center Pin	Center Socket
Internal Thread	Male / Plug	RP Male / Plug
External Thread	RP Female / Jack	Female / Jack

The diagram shows four images of SMA connectors. The top row shows a standard male center pin (center socket) and a standard male center socket (center pin). The bottom row shows a reverse polarity female center pin (center socket) and a reverse polarity female center socket (center pin). The reverse polarity versions have the center pin and center socket swapped.

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