

## Reverse Polarity SMA Connectors

Reverse polarity SMA (RP-SMA) is a variation of the SMA connector specification which reverses the gender of the interface, as shown in Figures 1-4 below. The term "reverse polarity" refers only to the gender of the connector's contact pin, not in any way to the signal polarity.

A RP-SMA(F) connector is a JACK type - has outside threads - but has an inner pin (hence reversed), and male RP-SMA connector has inside threads and a center receptacle.

RP-SMA connectors were introduced to separate professional and commercially available equipment, preventing unintentional or intentional connection of high-gain professional antennas with SMA connectors and commercial wireless equipment with RP-SMA connectors, violating federal or international laws. Today, however, both types of connectors are readily available.

The RP-SMA(F) connector has the same external housing as a standard or conventional female SMA connector, which consists of an outer shell with the threads on the outside; however, the center receptacle is replaced by a male pin. Similarly, the RP-SMA(M) has threads on the inside like a conventional male, but has a center receptacle instead of the male pin in the middle.

	Male central Pin	Female central Receptacle
<b>Plug(Inside Thread)</b>	SMA(M)(Fig.1)	RP-SMA(M)(Fig.2)
<b>Jack(Outside Thread)</b>	RP-SMA(F)(Fig.3)	SMA(F)(Fig.4)

RP-SMA connectors are widely used by 2.4GHz(Bluetooth, Wi-Fi, Zigbee etc) equipment manufacturers to comply with specific local regulations {Section 15.203 Antenna requirement}, e.g., the FCC, which were intended to make it difficult for consumers to connect antennas with gain and thereby breach compliance.

SMA connectors are generally used industry wide with GPS and cellular antennas.



Fig.1 SMA(M)



Fig.2 RP-SMA(M)



Fig.3 SMA(F)



Fig.4 RP-SMA(F)