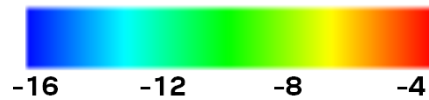


1 u-blox PCB trace antenna radiation patterns

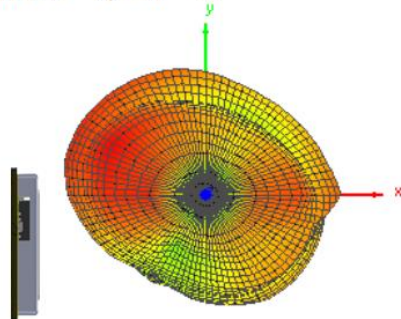
The “u-blox PCB trace antenna” is created with antenna technology licensed by ProAnt AB. It is integrated into the module PCB.

The below radiation patterns show the relative output power of a MAYA module equipped with the u-blox PCB trace antenna transmitting at 0 dBm output power. Both horizontal and vertical antenna polarizations are shown, as well as the total of both.

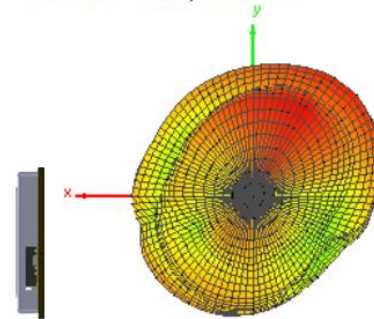
The gain of the antenna is summarized for the top, middle, and bottom of each frequency band (2G and 5G) in



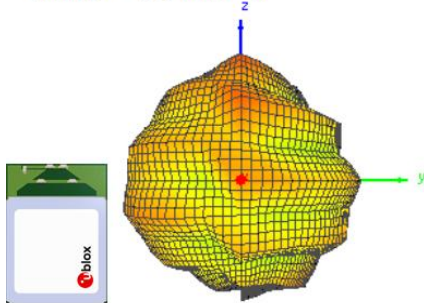
Theta = 0, Phi = 0



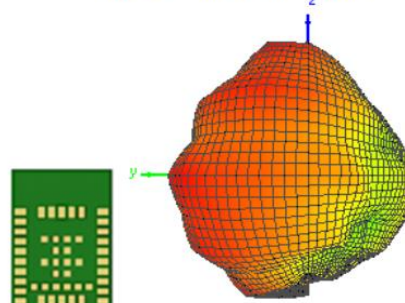
Theta = 180, Phi = 0



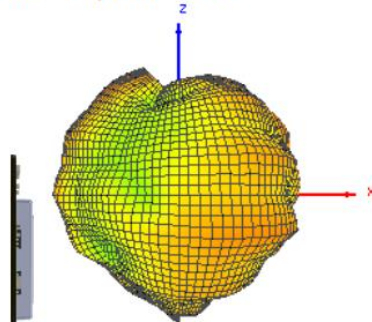
Theta = 90, Phi = 0



Theta = 90, Phi = 180



Theta = 90, Phi = 270



Theta = 90, Phi = 90

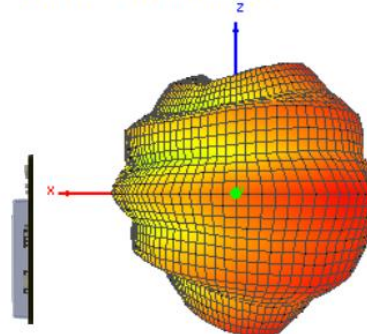
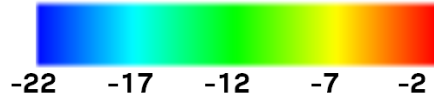
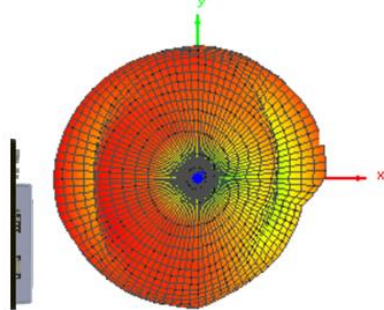


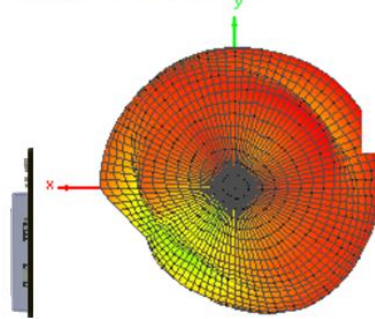
Table 2: Wi-Fi and Bluetooth antenna characteristics at 2.44 GHz



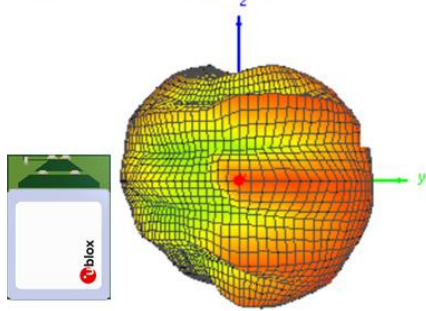
Theta = 0, Phi = 0



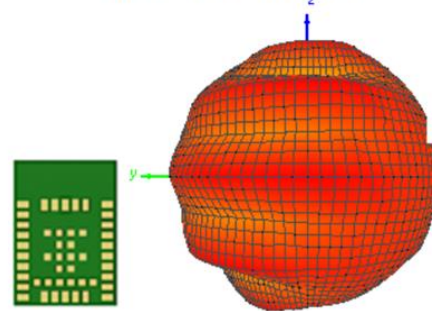
Theta = 180, Phi = 0



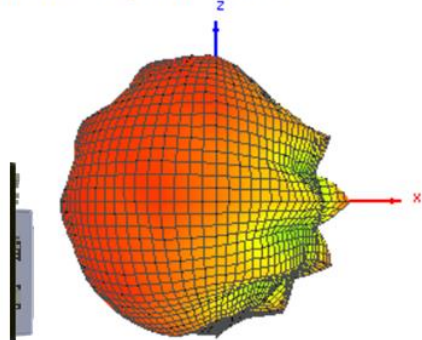
Theta = 90, Phi = 0



Theta = 90, Phi = 180



Theta = 90, Phi = 270



Theta = 90, Phi = 90

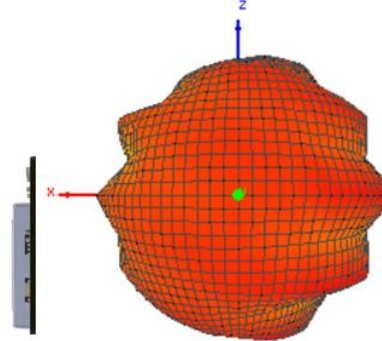
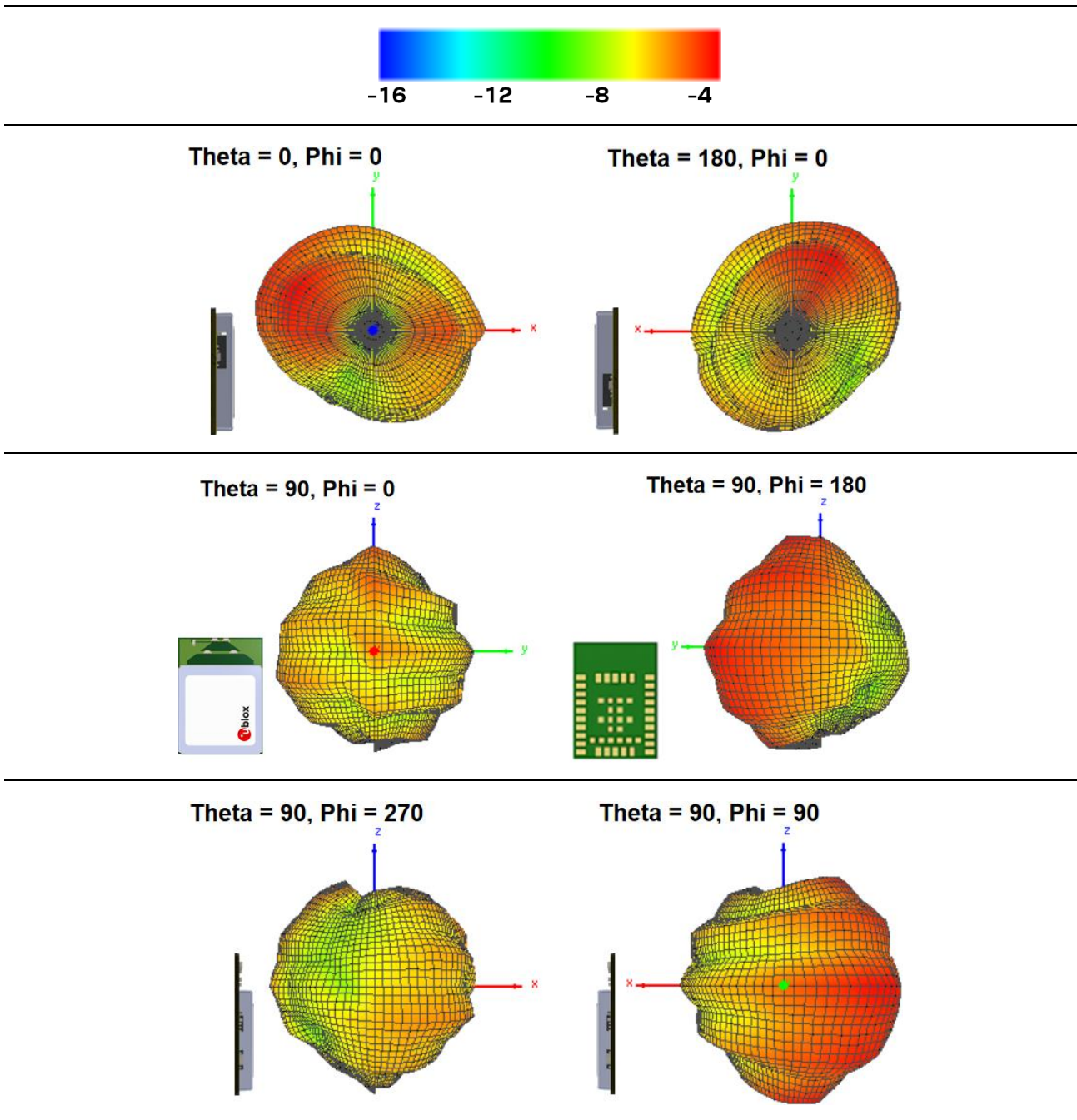


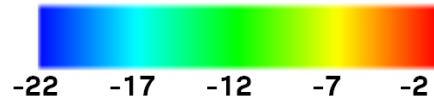
Table 3: Wi-Fi antenna characteristics at 5.50 GHz **Error! Reference source not found.** Table 2 and Table 3 show the radiation diagrams of the antenna in the middle of each frequency band, 2G and 5G respectively.



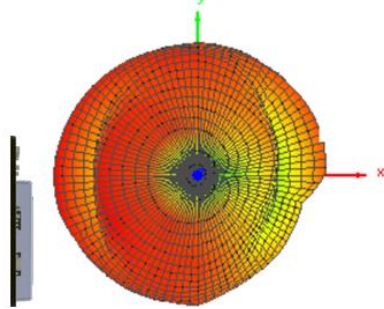
Figure 1: A MAYA-166 module with the u-blox PCB trace antenna

Transmission	Measured TRP	Measured peak gain
Channel 1, 2.412 GHz	-6.80 dBm	-3.42 dBi
Channel 6, 2.437 GHz	-6.65 dBm	-4.36 dBi
Channel 13, 2.472 GHz	-7.96 dBm	-5.81 dBi
Channel 36, 5.180 GHz	-3.49 dBm	-0.87 dBi
Channel 100, 5.500 GHz	-3.66 dBm	-1.51 dBi
Channel 159, 5.795 GHz	-4.23 dBm	-2.08 dBi

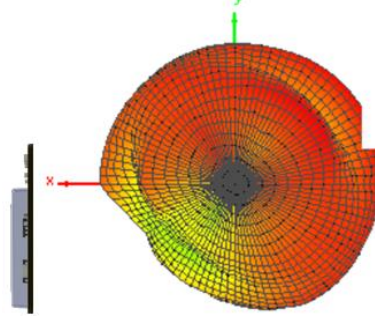
Table 1: MAYA PCB trace antenna radiation patterns

Table 2: Wi-Fi and Bluetooth antenna characteristics at 2.44 GHz



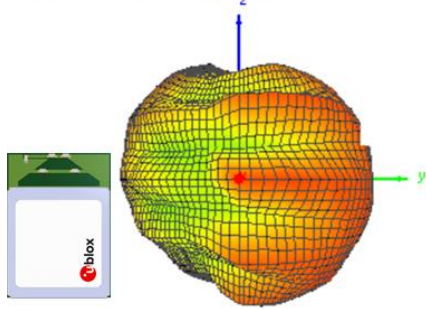
Theta = 0, Phi = 0



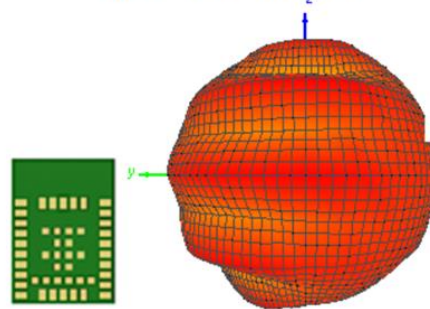
Theta = 180, Phi = 0



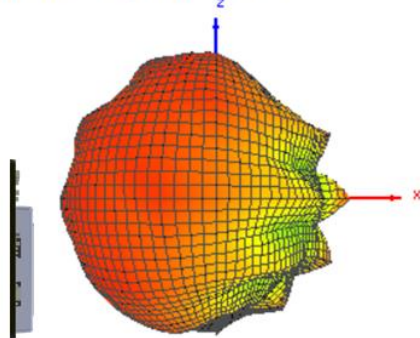
Theta = 90, Phi = 0



Theta = 90, Phi = 180



Theta = 90, Phi = 270



Theta = 90, Phi = 90

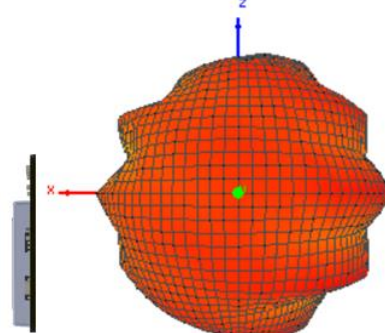


Table 3: Wi-Fi antenna characteristics at 5.50 GHz