Antenna

The BoosterPack includes onboard etched antennas for the four receivers and three transmitters, which enables tracking multiple objects with their distance and angle information. This antenna design enables estimation of both azimuth and elevation angles, which enables object detection in a 3-D plane.

In the mmwave SDK, the antenna configuration is selected using bitmask. For example, 2 transmit antennas can be enabled through bitmask 0b101 (such as tx1 and tx3). The corresponding physical location of rx1 to rx4 and tx1 to tx3 and are labeled in Figure 1.
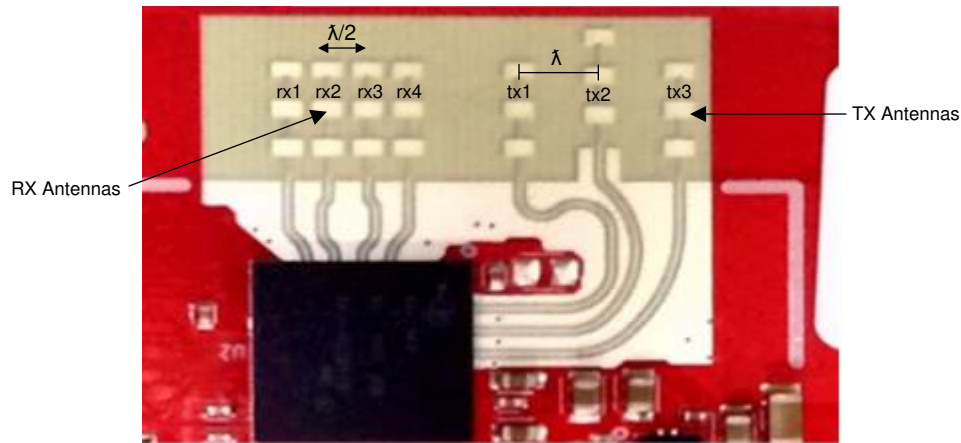

Figure 1.   PCB Antenna

The antenna peak gain is   25.7 dBi across the frequency band of 76 to 81 GHz. The radiation pattern of the antenna in the horizontal plan (H-plane) and elevation plan (E-plane) is as shown in Figure 2.

The beamwidth of the antenna design can be determined from the radiation patterns. For example, at 80 GHz, based on 3-dB drop in the gain as compared to bore sight, the horizontal 3dB-beamwidth is approximately 7.9 degrees (see Figure 3).
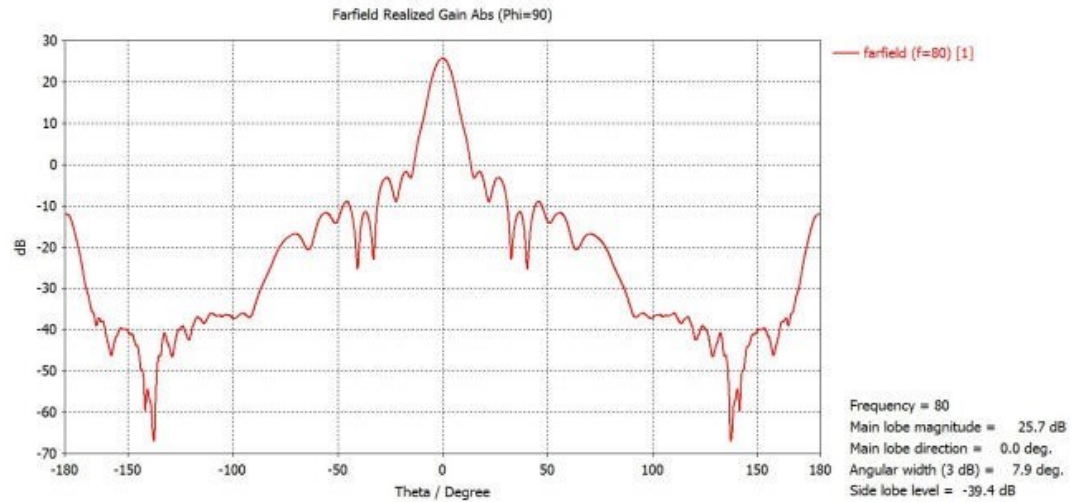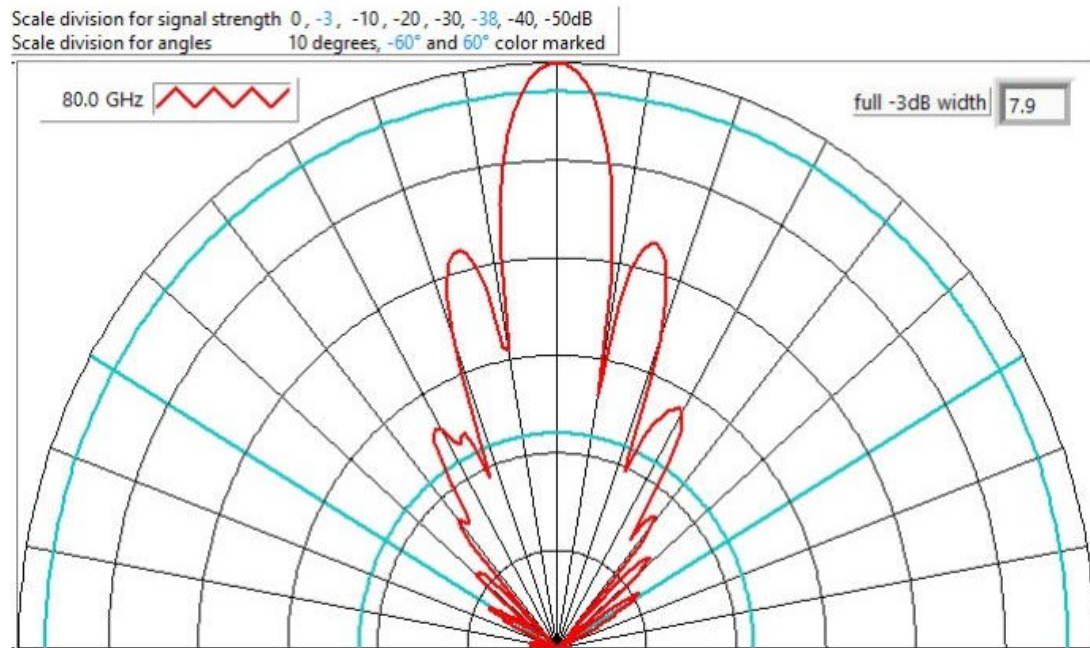
Figure 1.   Antenna Pattern H-Plane

Figure 2.   Antenna Pattern 3dB - H-Plane