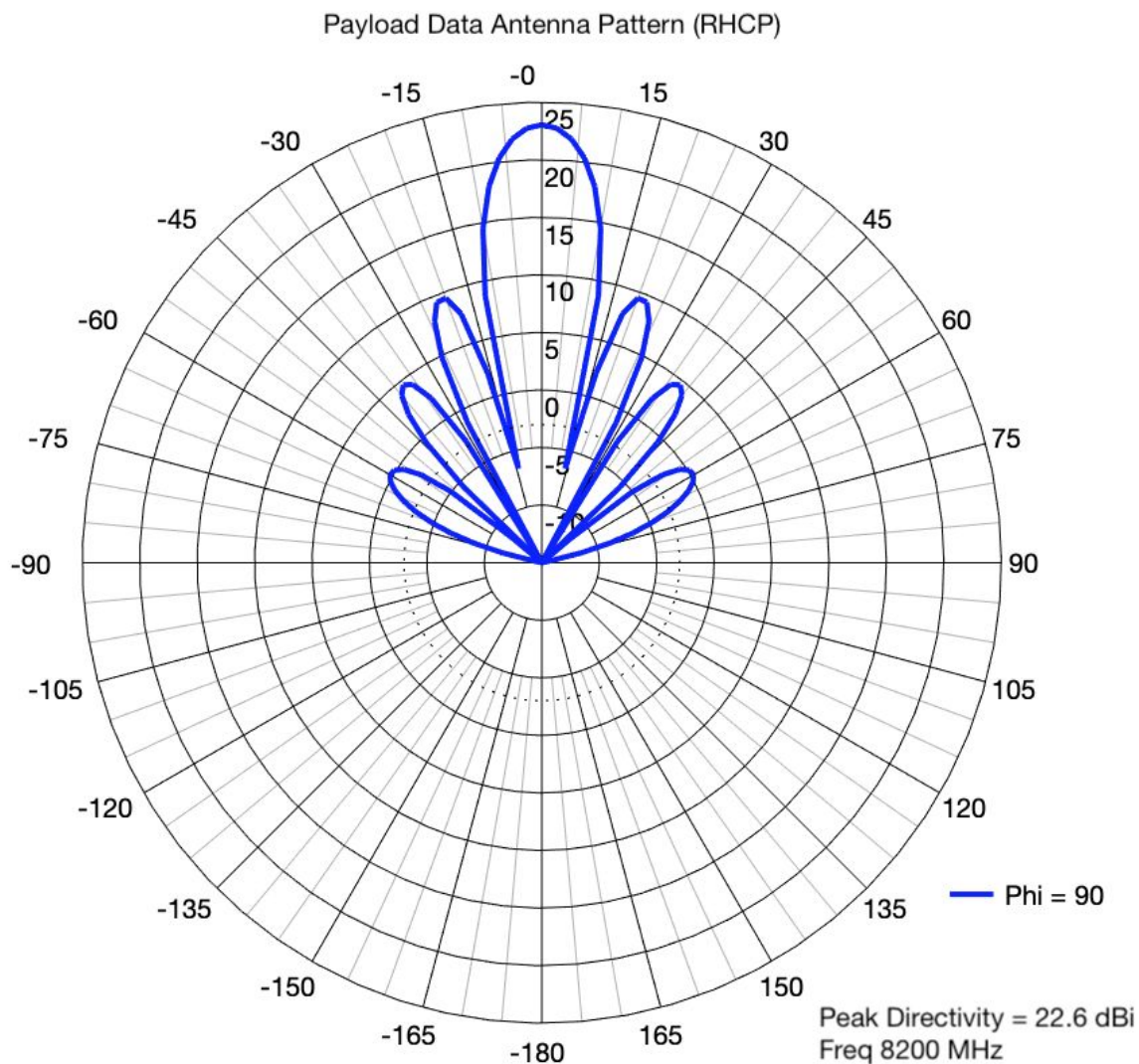




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Antenna patterns for the Communication Channels

The V1 satellite will use a Planet developed X-band passive phased array antenna for the payload data downlink. The S-band and X-band telemetry and command channel antennas will be widebeam patch antennas. The UHF TT&C channels will be a dipole type antenna. The beam patterns are shown below in Figures 5 through 9 for each respective channel in Table 2 of the application narrative.



**Figure 5: Payload Downlink X-band Antenna Beam Pattern,
22.6 dBi directivity, (~21 dBi power gain), 12.7 degree HPBW**



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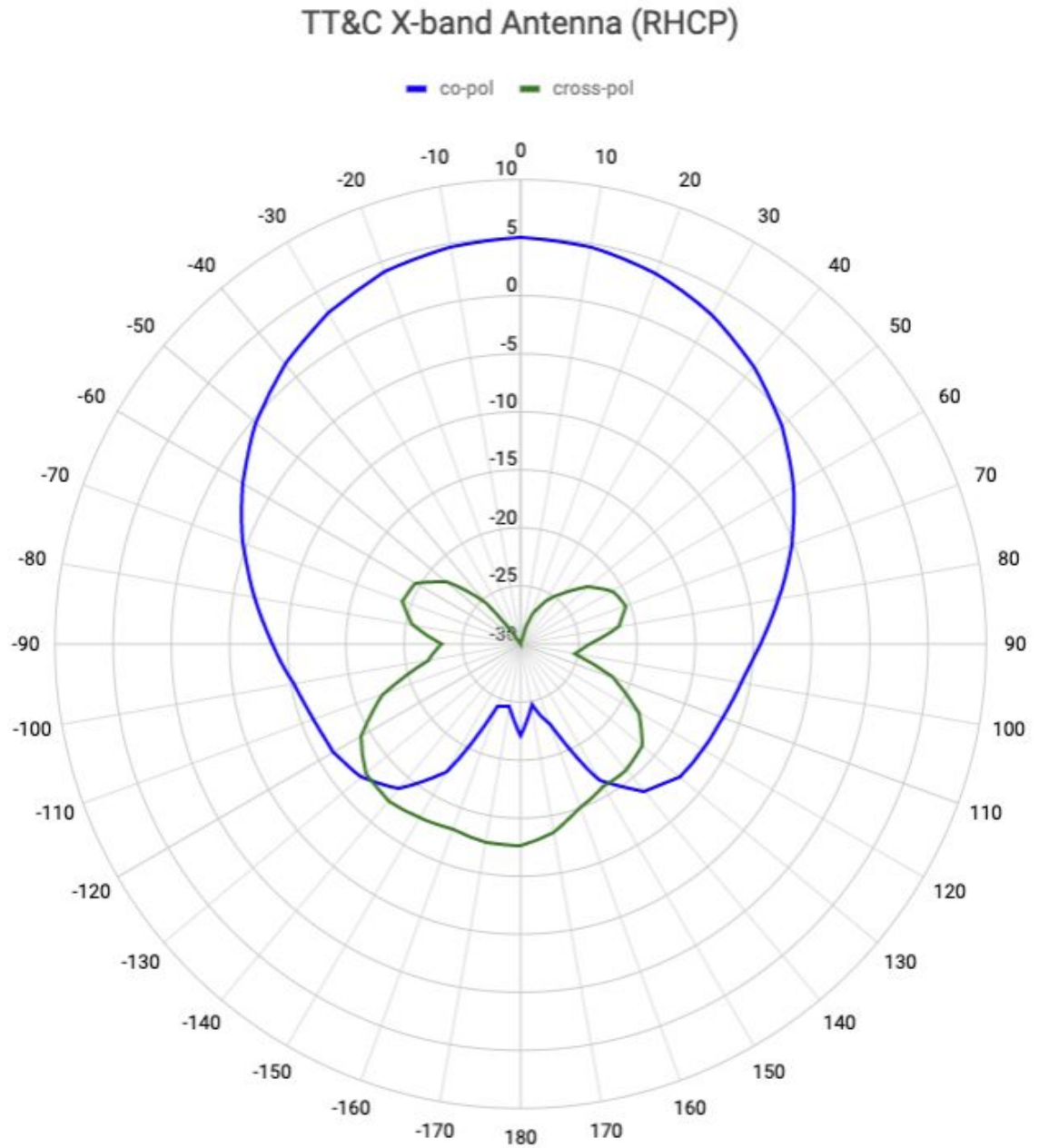


Figure 6: Telemetry Downlink X-band Antenna beam pattern



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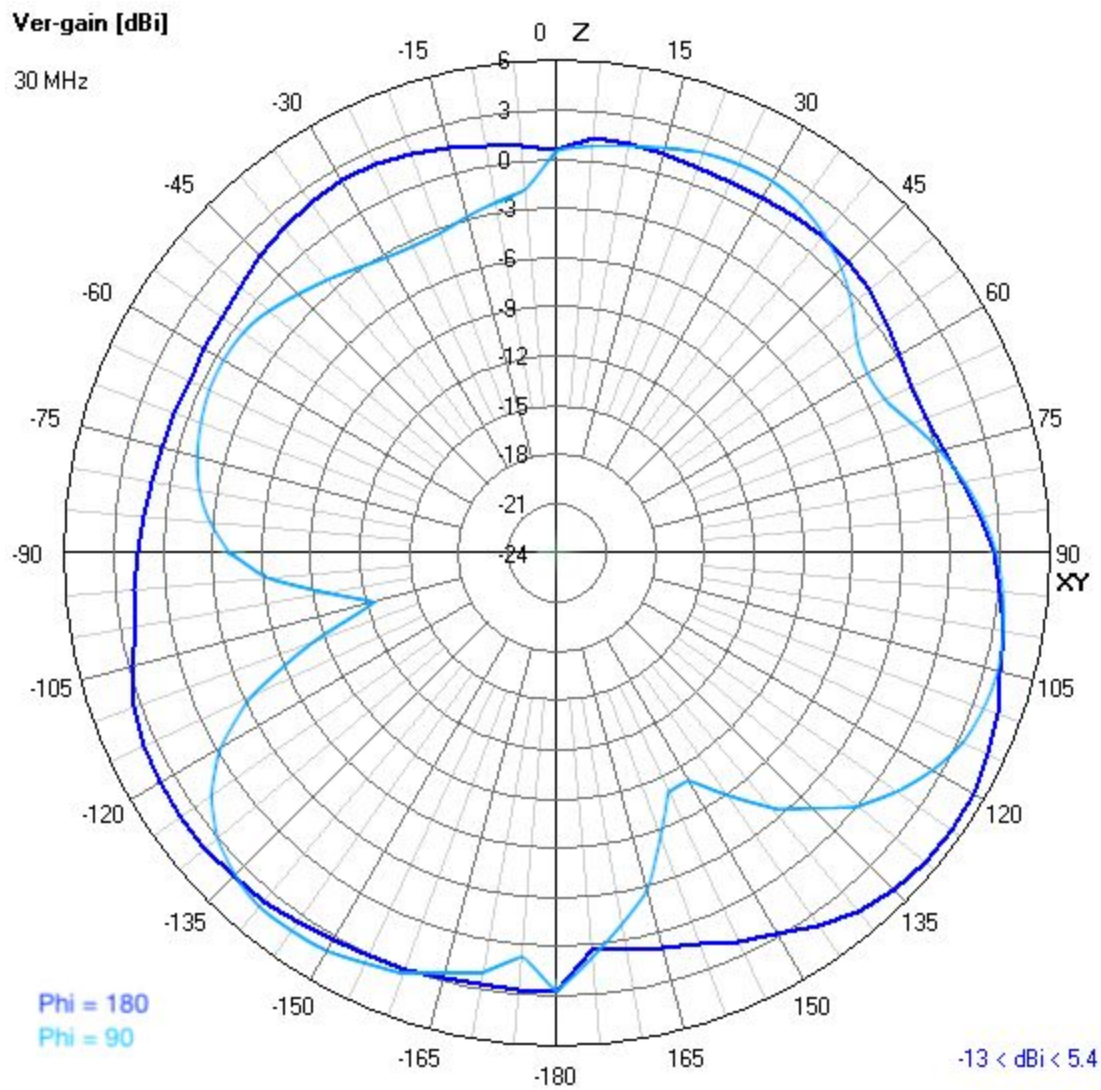


Figure 7: Telemetry Downlink UHF Antenna beam pattern (401 MHz)

TT&C S-band Antenna (RHCP)

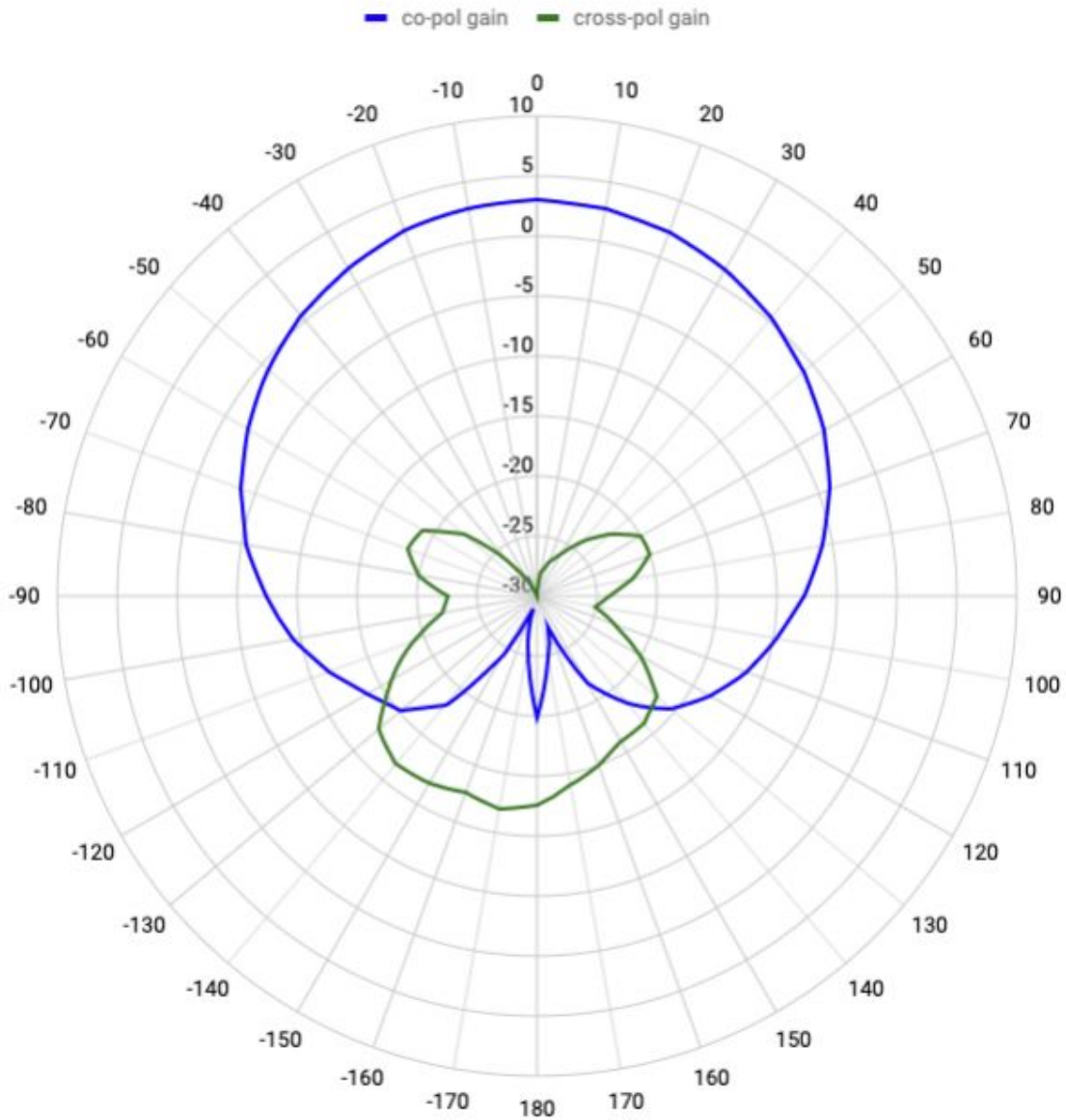


Figure 8: Command Uplink S-band Antenna beam pattern



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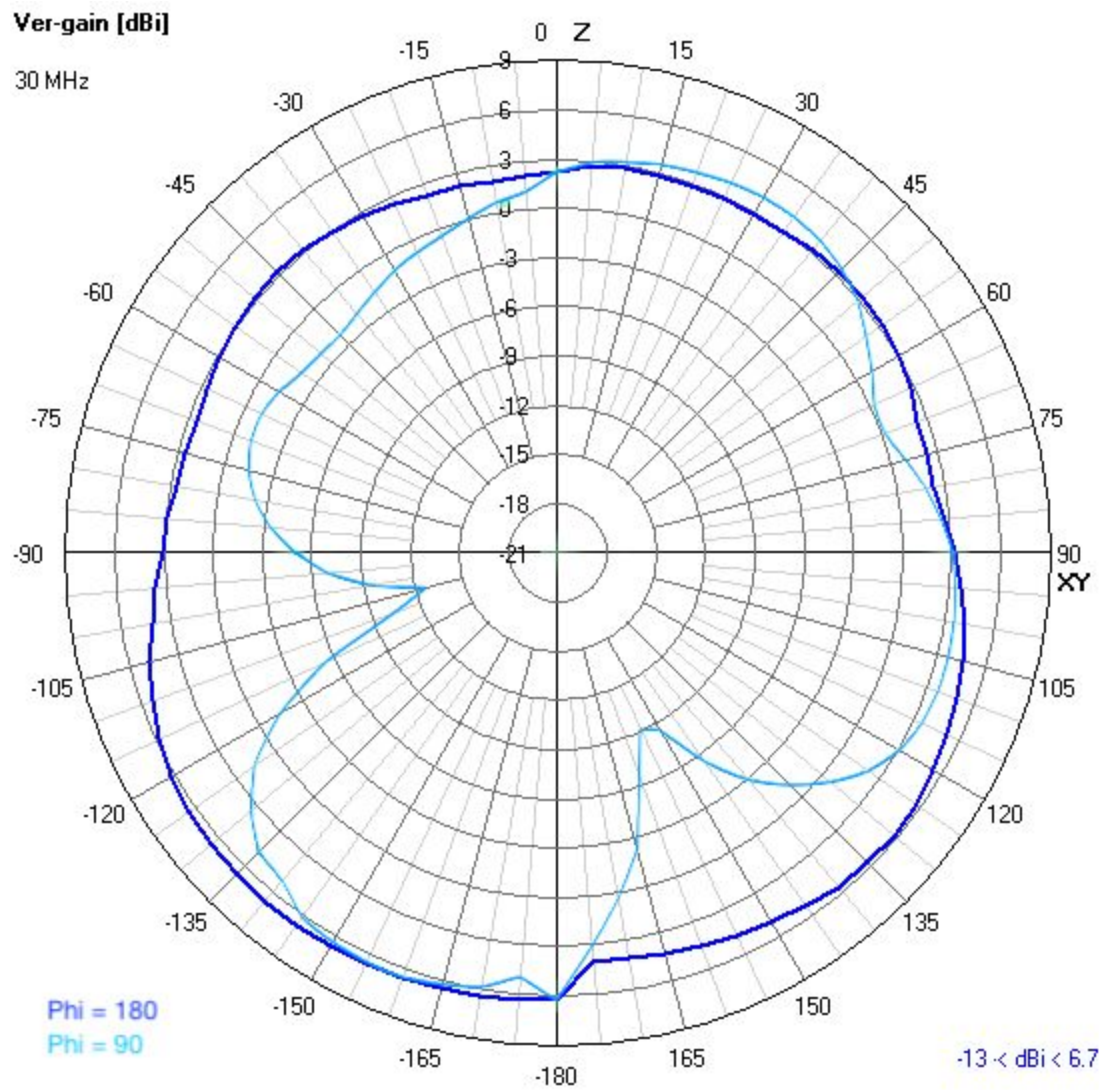


Figure 9: Command Uplink UHF Antenna beam pattern (450 MHz)