

### 3.7 Antennas

The BGT24LTR11 shield features a 4 x 1 array antenna for the transceiver and receiver sections. The antenna has a gain of 10 dBi and a Half-Power Beam Width (HPBW) of 29 x 80 degrees. Figure 8 shows the simulated 2D and 3D radiation pattern.

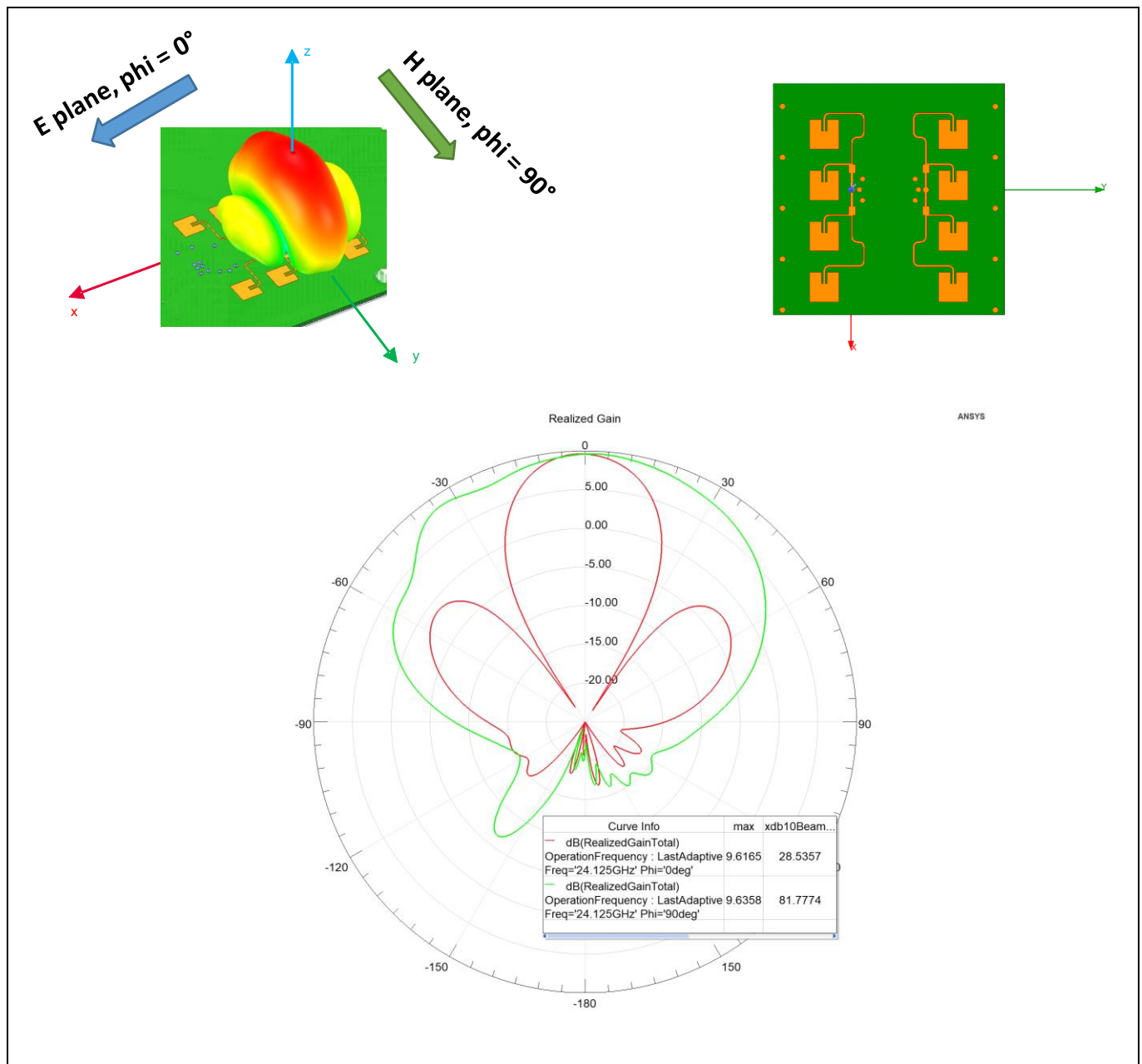


Figure 8 2D radiation pattern for array antennas

### 3.8 Sample and Hold (S&H) circuitry

The BGT24LTR11 shield has S&H circuitry between the MMIC and the baseband section. The I/Q signals from the BGT24LTR11 are connected to the inputs of SPST switches. The control signal S&H\_EN is generated by the MCU on the radar baseboard and routed via connectors to the RF shield. When the switch is closed (sample mode), the hold capacitor ( $C_{hold}$ ) follows the I/Q analog signal of the BGT and charges to its peak value. When the switch is opened (hold mode), the  $C_{hold}$  holds the sampled voltage. This implementation allows us to turn the