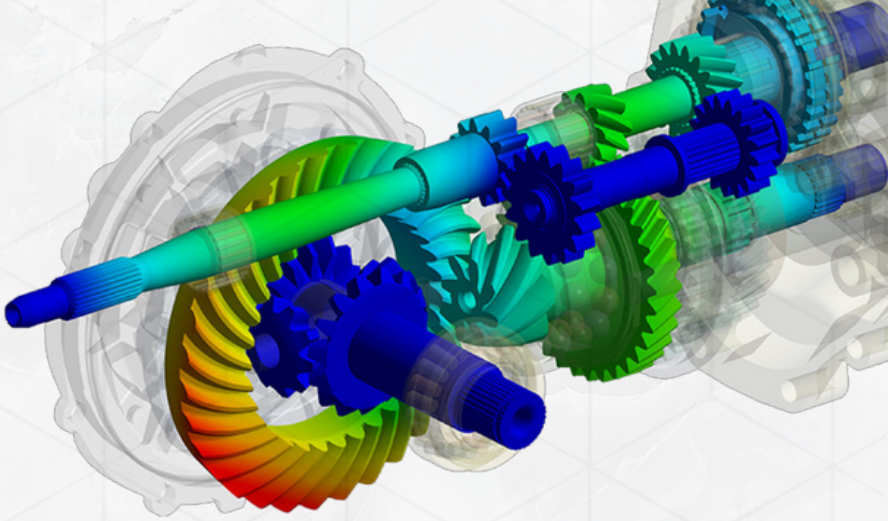

CASE STUDY

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CASE STUDY

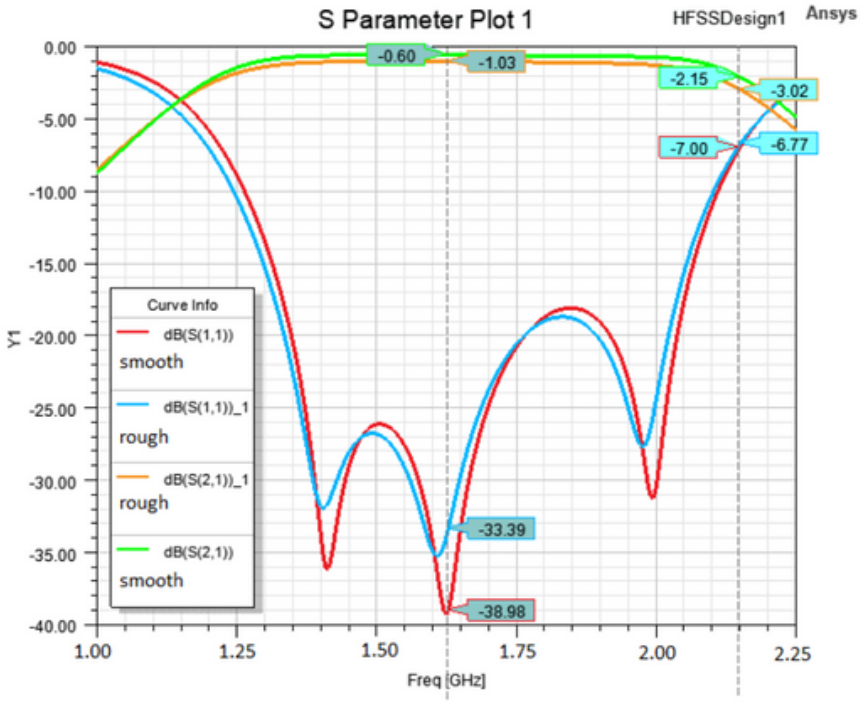
SAAB

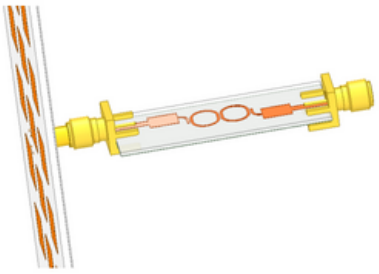
INTEGRATING AND TESTING ANTENNA-RF CHAIN USING ANSYS HFSS

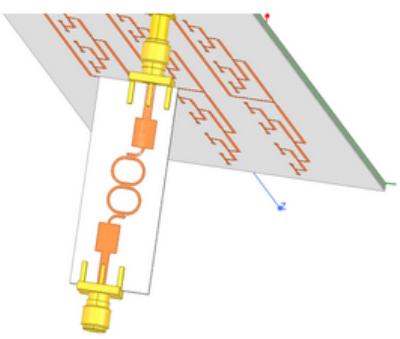
The project aimed to bridge the gap between RF design theory and practical application, acknowledging the complexities of real-life factors such as manufacturing tolerances, material loss, and component interconnections.

The project began with the design, simulation, and optimization of an array of patch antennas using ANSYS HFSS. The antennas were then integrated with the Antenna Feed-Network, which involved the use of lumped and wave ports as excitation to the in/out ports of the feed network and connecting the feed-network to the antenna array elements using through vias.

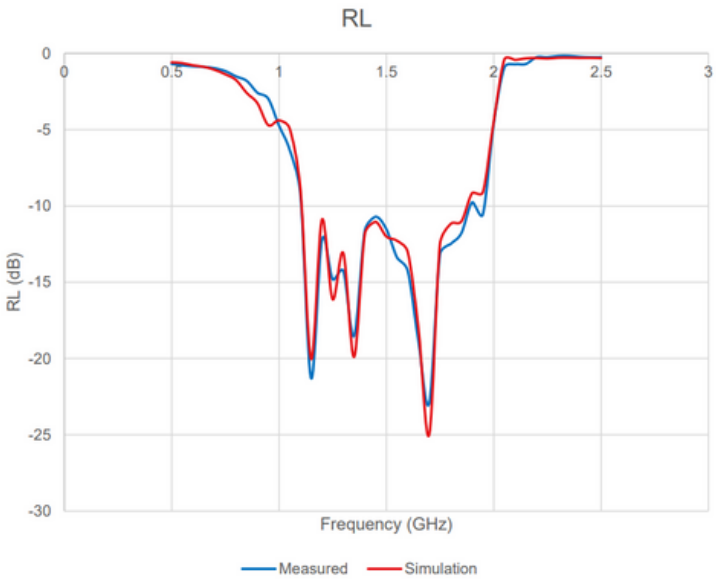
Additionally, a band-pass filter was designed, simulated, and optimized using ANSYS HFSS. In the preliminary design simulation, lumped port excitation was used at both sides of the filter. After optimizing the filter performance based on system requirements, a 3D model of a connector was added to the design. The bandpass filter was then connected to the input of the feed-network using an SMA connector, and the integration was simulated and optimized, considering different manufacturing variables.

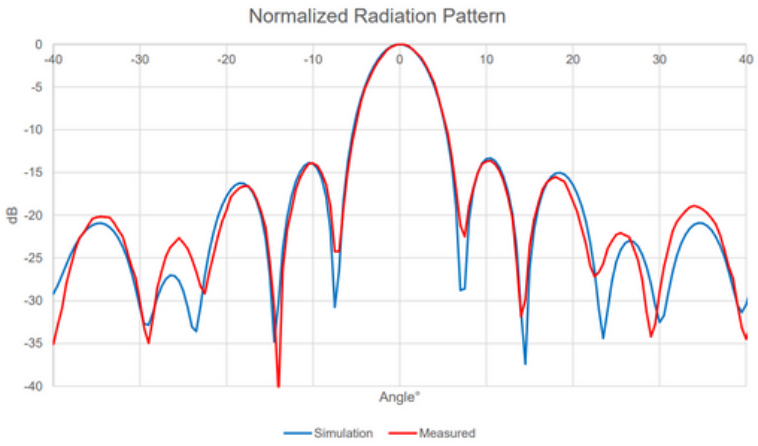






The use of simulation tools helped achieve results as close as possible to practical applications. This involved simulating the entire system with sub-components, interconnections, and transitions before the circuits were sent for prototyping and testing. The accuracy and reliability of the RF system design and integration was confirmed by comparing the test results with the simulation data.





CONCLUSION

In conclusion, the project showcased the successful integration and testing of an Antenna-RF chain using ANSYS HFSS, demonstrating the practical application of RF design theory. The approach of utilizing 3D models for connectors and interfaces, as well as the emphasis on comparing simulation and measured results, provide valuable insights into the complexities of real-world RF system design and integration.