



# Standard Space Antennas

SPACE-READY ANTENNAS, WHEN TIME AND RELIABILITY MATTER

Datasheet

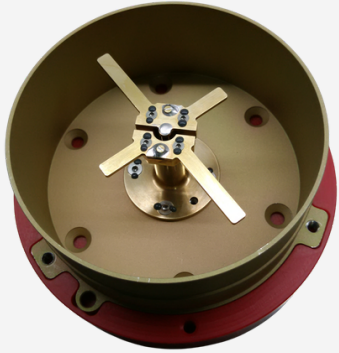
PN: SSA075C

Last Update: 09/02/26

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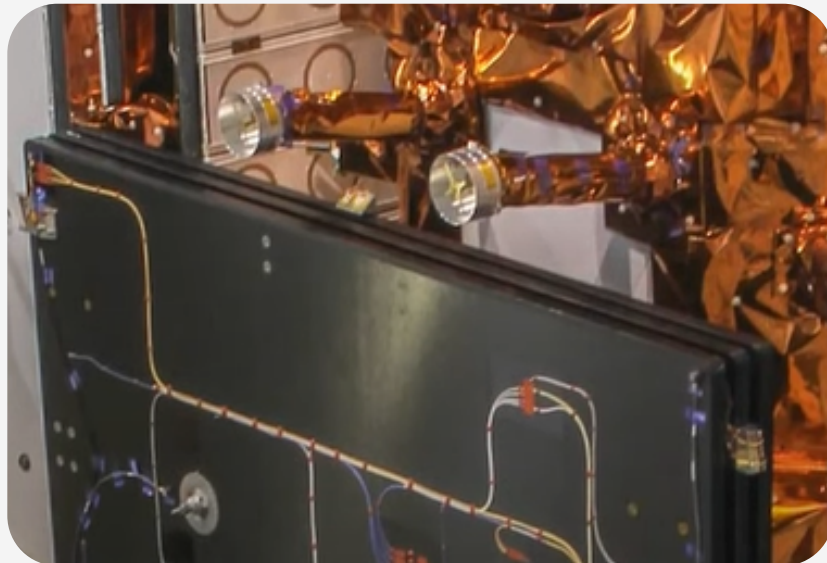
**S Band Antenna**

**ET.dipole™**

**Hemispherical Coverage**

**TRL 9**

**Mass: 136g**



## Features

- **All Metal Construction & Ultra Low Loss**

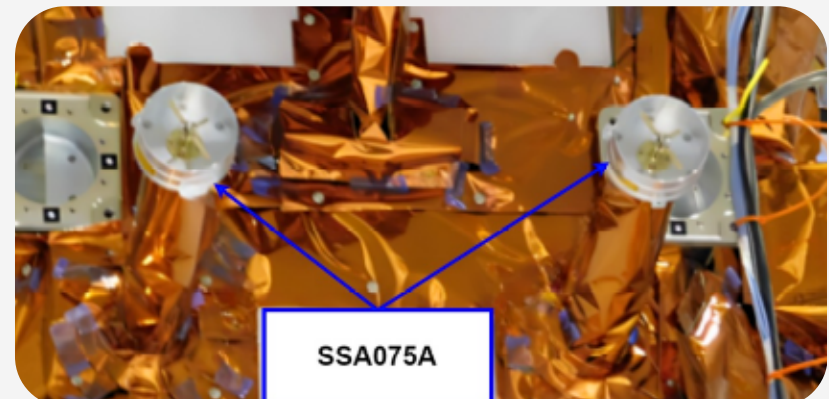
True Total Efficiency. There are no hidden internal reflections or coupling power through the "isolated" port because a hybrid splitter is not used

- **Cavity Backed, minimizing interference with back plane and surrounding objects**

Isolated dipoles or small patches do not provide consistent performance under operating conditions

- **Impedance matching and polarization ratio tuning are not required**

Across the entire TT&C bandwidth 2.0-2.3GHz





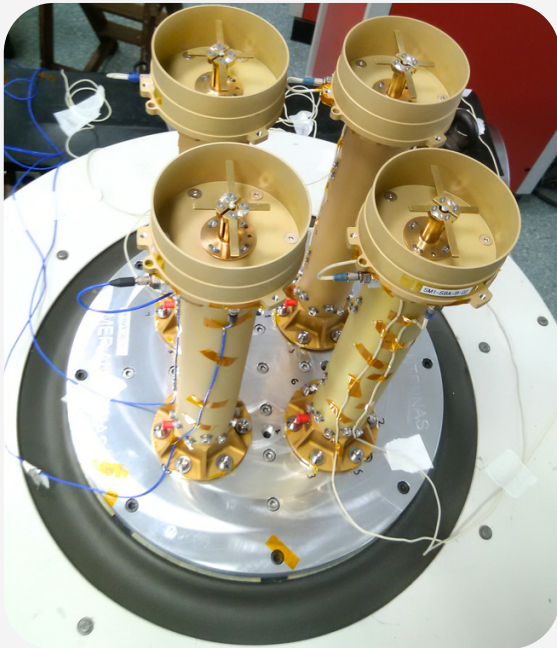
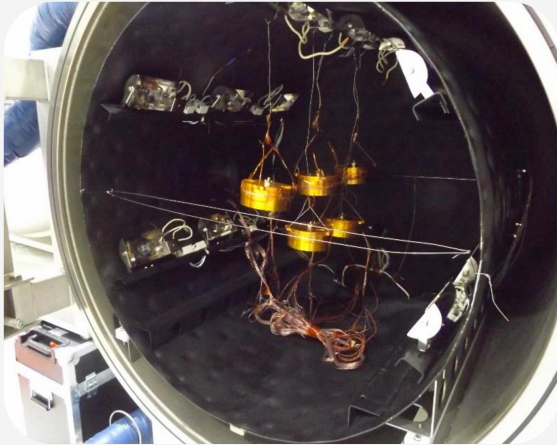
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## Benefits

- **Designed for assembly, automation suitability, and optimal cost-effectiveness for high production batches**

Suitable for high-reliability TTC service in satellite constellations or critical missions

- **No performance degradation at end-of-life by design**

Without a dome, feed network, or dielectric load, sensitivity to radiation and temperature is not an issue

- **Consistent operational performance**

Due to the perfect match with the simulation results, the high symmetry in the azimuth of the radiation pattern, and lossless by design

- **High coverage and minimal gain ripple when two opposing antennas are combined**

Typical array of Nadir RHCP & Zenith LHCP

- **Multipactor & Corona discharge free by design with margin > 9dB**

Aerospace Corporation model





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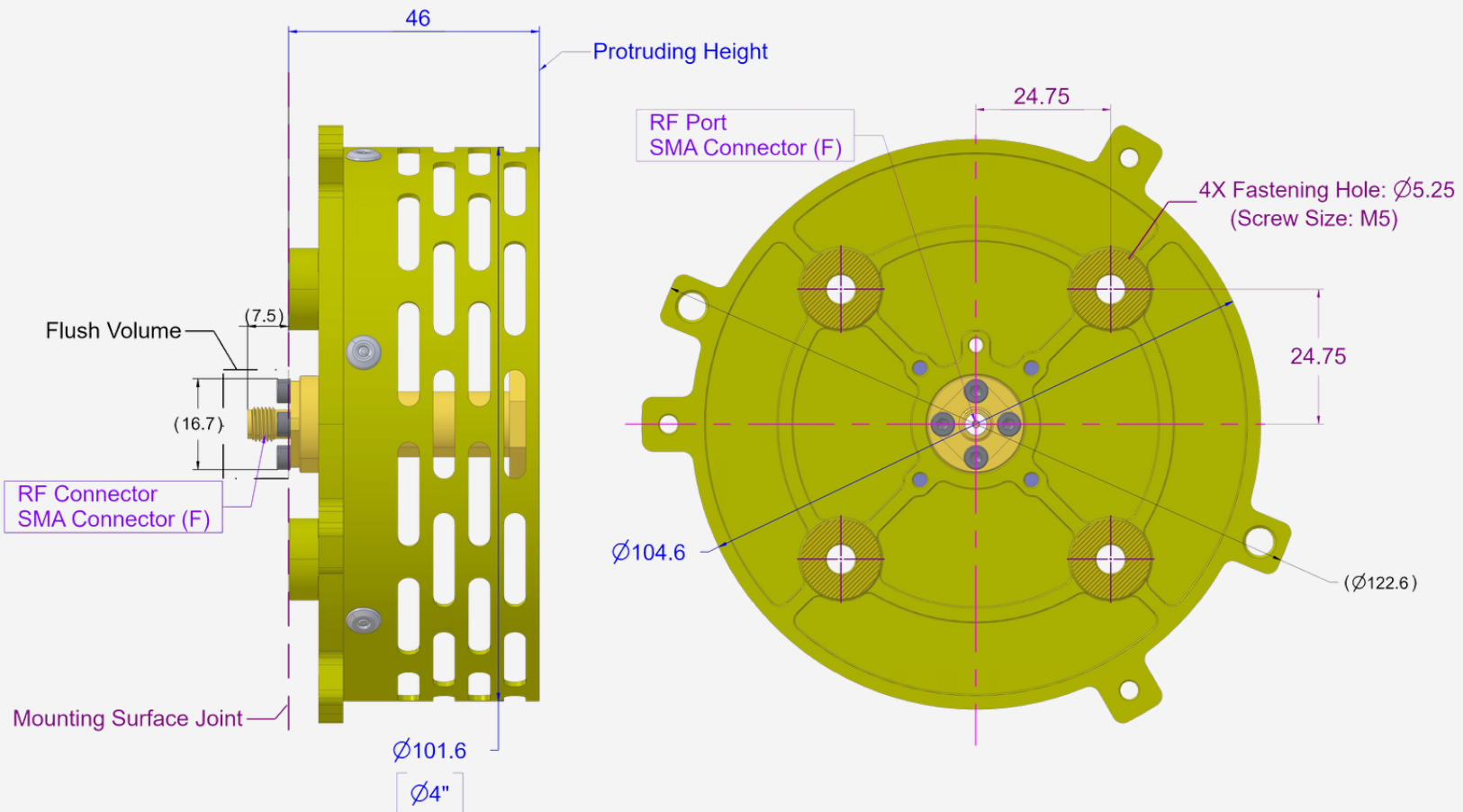
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## Mechanical Envelope





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## Typical Specifications @ Isolated condition

| Parameter                                                                  | Values                                                                         | Remark                                                                           |
|----------------------------------------------------------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Frequency Range [GHz]                                                      | Uplink: 2.025 – 2.110<br>Downlink: 2.2 – 2.290                                 |                                                                                  |
| VSWR                                                                       | < 1.6                                                                          | @ Frequency Range. From [AD 15]                                                  |
| Bandwidth @ VSWR = 1.8 [GHz]                                               | 2.0 – 2.3                                                                      | [AD 15]                                                                          |
| Port to Port Isolation [dB]                                                | NA                                                                             | Single Port                                                                      |
| Radiation Efficiency [%]                                                   | >95                                                                            | Worst Case @ Frequency Range, [AD 18]<br>Assuming a 5% degradation from expected |
| Total Efficiency [%]                                                       | >90                                                                            | Worst Case @ Frequency Range, [AD 18]<br>Assuming a 5% degradation from expected |
| Radiation Pattern Envelope                                                 | Hemispherical                                                                  | Cardioid [AD 2]                                                                  |
| Phase Center [mm]                                                          | X= 0 ; Y= 0 ; Z= 59                                                            | Relative to Antenna Coordinated System.<br>Z=0 $\equiv$ Joint Surface            |
| Gain @ Boresight [dBi]                                                     | 7.7<br>8                                                                       | Mean @ Uplink Centerband. [AD 16]<br>Mean @ Downlink Centerband. [AD 16]         |
| HPBW [deg]                                                                 | ~80                                                                            | @ Frequency Range. From [AD 2]                                                   |
| Polarization Sense                                                         | Circular                                                                       | Optional: RHCP / LHCP                                                            |
| Polarization Ratio [dB]<br>Worst Case                                      | 16.6 @theta < 60° ; 13.6 @theta < 90°<br>14.3 @theta < 60° ; 12.7 @theta < 90° | @ Uplink Centerband. [AD 16]<br>@ Downlink Centerband. [AD 16]                   |
| Multipath Ratio [dB]<br>Worst Case<br>Ref: G_RHCP(theta)/G_LHCP(180-theta) | 21 @theta < 30° ; 18 @theta < 60°<br>22 @theta < 30° ; 19 @theta < 60°         | @ Uplink Centerband. [AD 16]<br>@ Downlink Centerband. [AD 16]                   |
| Front to Back Ratio [dB]                                                   | > 22                                                                           | Total Power [AD 2]                                                               |
| Multipactor Margin [dB]                                                    | < 9                                                                            | @ 5 W. By Aerospace Corporation Model Analysis                                   |
| Corona Discharge Margin [dB]                                               | < 9                                                                            | @ 5 W. By Aerospace Corporation Model Analysis                                   |





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## Enviromental Test & Mechanical Interface

| Parameter                         | Values                                                                                                                                                                                                                                                | Remark                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mass [g]                          | 136                                                                                                                                                                                                                                                   | Center of Mass: [0.5, 0.1, 14.2] mm from Mounting Joint Surface ( $\equiv Z=0$ of Antenna Coordinate System). [AD 1]                                                                                                                                                                                                                                                                                                                                                                               |
| Size [mm]                         | 101.6 (120)                                                                                                                                                                                                                                           | Cavity Diameter (Max Envelope) [AD 1]                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Height [mm]                       | 43.5                                                                                                                                                                                                                                                  | Overall Height measured from Mounting Joint Surface. [AD 1] (Flush: 10 mm)                                                                                                                                                                                                                                                                                                                                                                                                                         |
| RF Interface                      | SMA Female                                                                                                                                                                                                                                            | [AD1]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Electrostatic Discharge           | ESD Free                                                                                                                                                                                                                                              | Verified by Review of Design                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Outgassing                        | TML < 1.00 %<br>CVCM < 0.05%                                                                                                                                                                                                                          | According to Declared Material, Component and Processes List [AD 5]                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Temperature Range [°C]            | (-70; 120)                                                                                                                                                                                                                                            | Thermal Vacuum Test, Eight Cycles, 4 hours Dwell. [AD 4]<br>(Possesses Flight Heritage in Scientific Earth Observation Missions)                                                                                                                                                                                                                                                                                                                                                                   |
| Vacuum [Hpa]                      | $\leq 1.33 \times 10^{-5} \pm 80\%$                                                                                                                                                                                                                   | In Thermal Vacuum Test [AD 4]<br>(Possesses Flight Heritage in Scientific Earth Observation Missions)                                                                                                                                                                                                                                                                                                                                                                                              |
| 1st Natural Frequency [Hz]        | 928                                                                                                                                                                                                                                                   | Verified by Analysis in [AD 11]<br>Success with several Mast and Bracket Configuration [AD 3]. Numerical versus Test Deviation < 4%<br>(Possesses Flight Heritage in Scientific Earth Observation Missions)                                                                                                                                                                                                                                                                                        |
| Dynamic Acceleracion Loads [Grms] | 20 - 50 Hz: +6 dB/oct<br>50 - 70 Hz: 0.16 g <sup>2</sup> /Hz<br>70 - 80 Hz: +6 dB/oct<br>80 - 350 Hz: 0.2 g <sup>2</sup> /Hz<br>350 - 400 Hz: -6 dB/oct<br>400 - 800 Hz: 0.16 g <sup>2</sup> /Hz<br>800 - 2000 Hz: -6 dB/oct<br><u>Overall: 14.55</u> | Shaker Test @ Random Vibration, Three Axis, 2 min / axis. [AD 3]<br>According to NASA GEVS (General Environmental Verification Standard).<br>Baseline $\approx$ 6.8 Grms (Maximum Expected Environment according to Review of Typical Launch Vehicles)<br>Acceptance $\approx$ 10 Grms, 1.41* Baseline (ASD + 3 dB)<br>Qualification $\approx$ 14.1 Grms, 1.41* Acceptance (ASD + 6 dB)<br>(Possesses Flight Heritage in Scientific Earth Observation Missions)<br>Verified by Analysis in [AD 11] |
| Static Acceleration Loads [G]     | Peak: 54                                                                                                                                                                                                                                              | Shaker Test @ Sine Burst, Three Axis [AD 3], Qualification Level<br>(Possesses Flight Heritage in Scientific Earth Observation Missions)                                                                                                                                                                                                                                                                                                                                                           |





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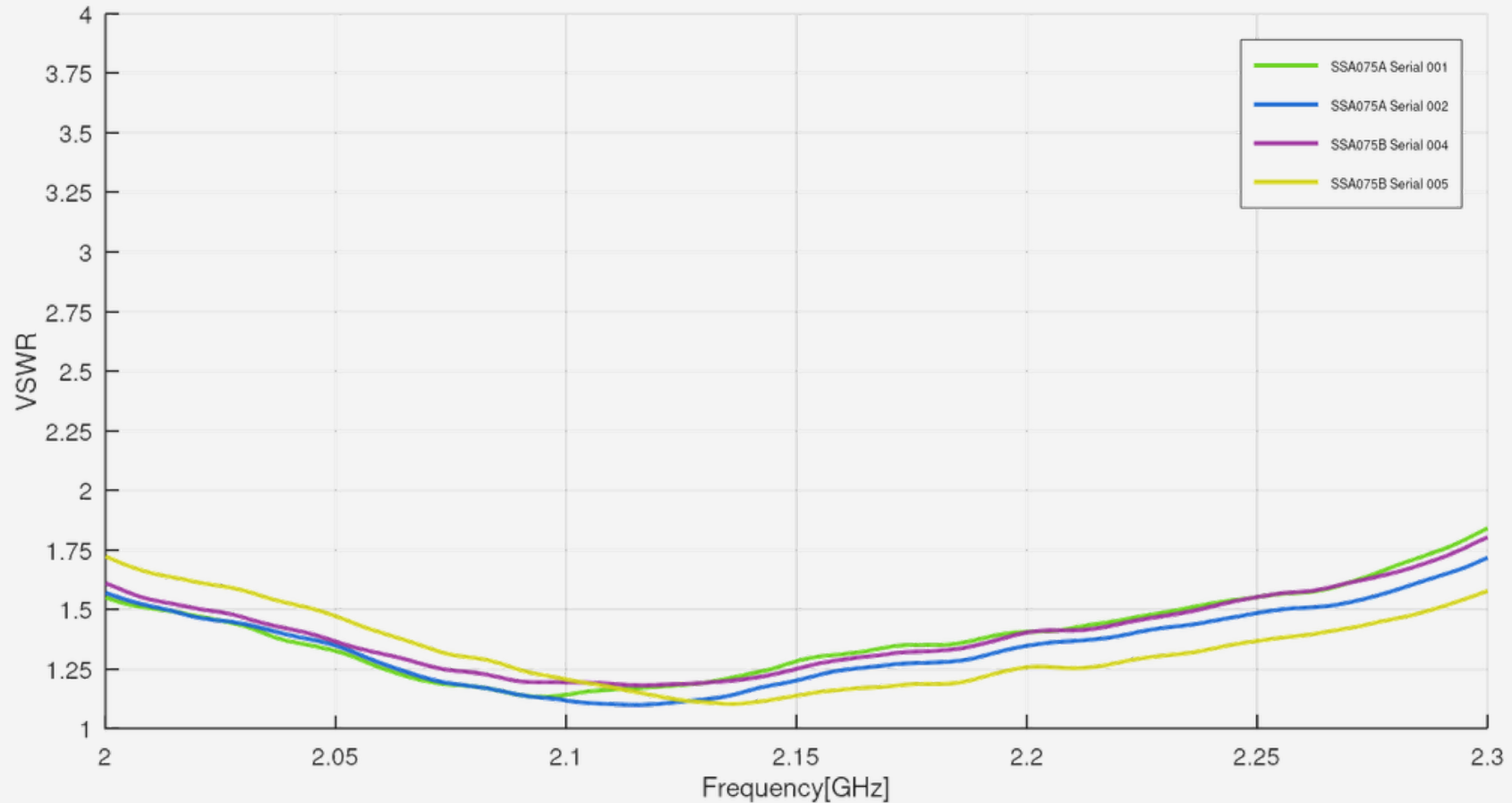
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## VSWR

Verification by Test of VSWR - PN: SSA075A Serial 001-002 & PN: SSA075B Serial 004-005

Process: Product Inspection, Instrument: VNA S5085, Calibration: Full 1-Port (OSL), Calibration Kit: S911T 3.5 mm





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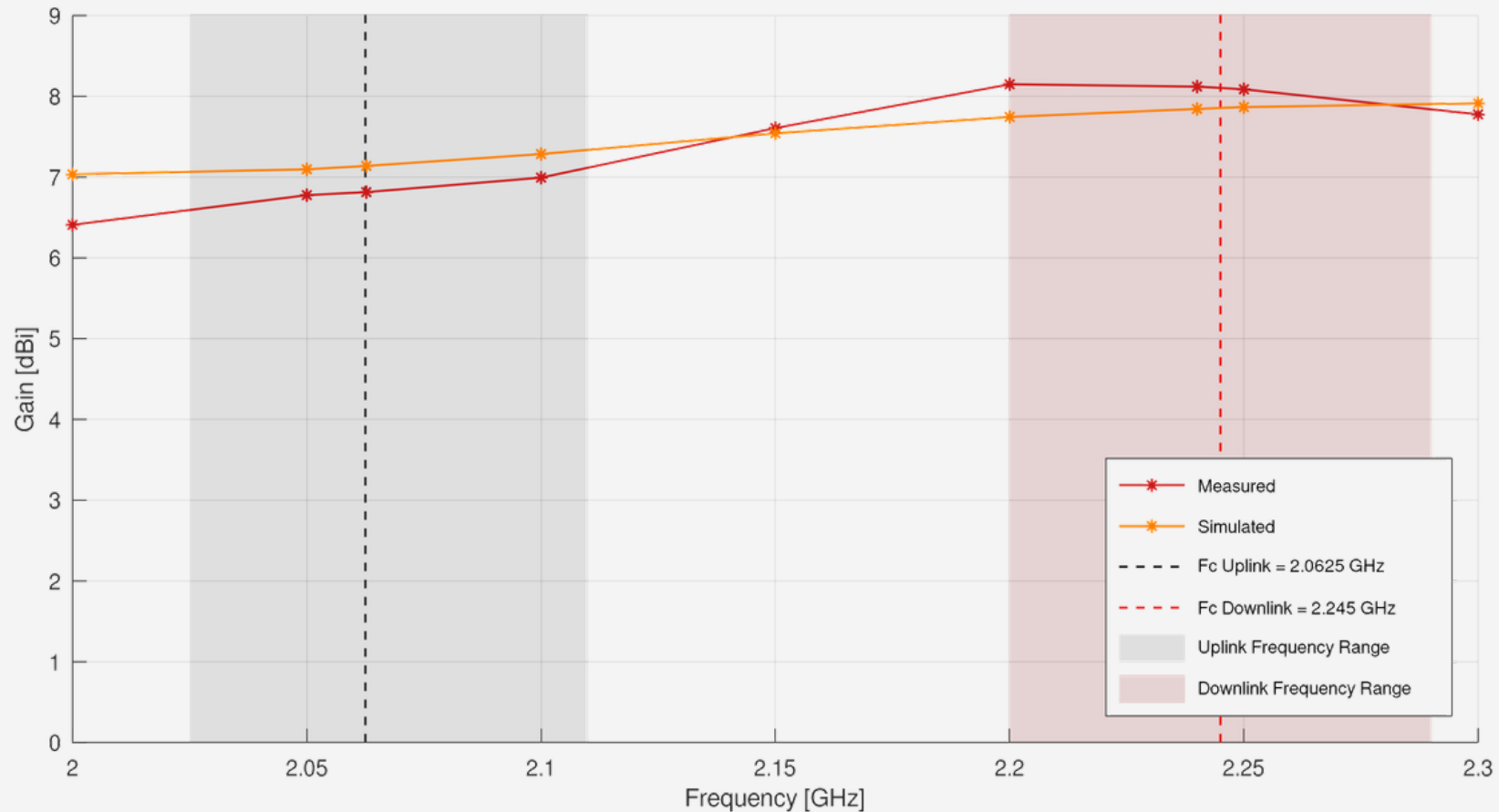
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## Gain @ Boresight vs Frequency

Verification by Test of Gain @ Boresight - PN: SSA075B Serial 003

Frequency Range: 2:0.05:2.3 GHz, Method: Spherical Near-Field,  $\theta = 0$  deg, Boundary Conditions: Antenna With Mast, Probe Polarization: Linear OWG





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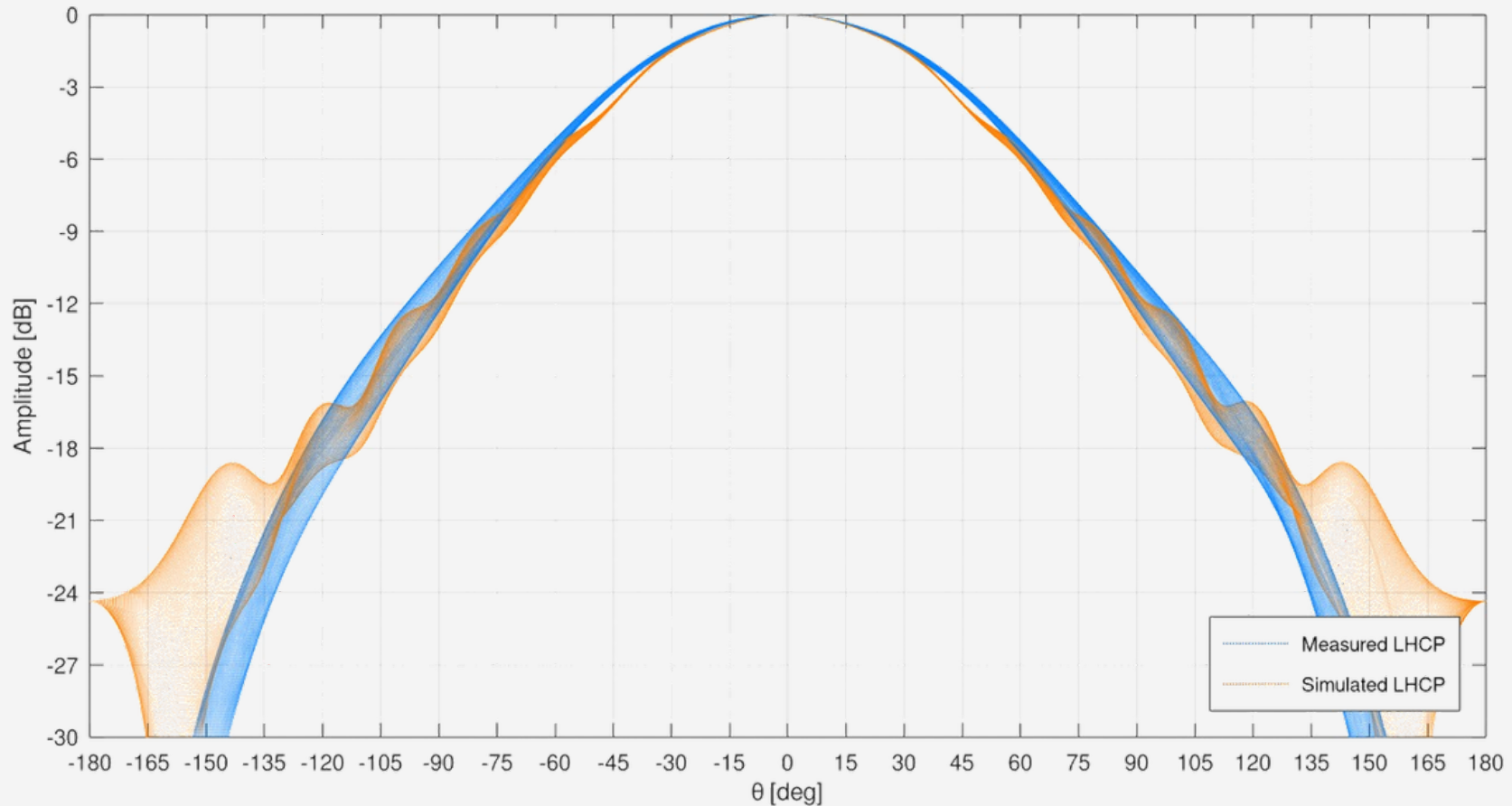
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## Radiation Pattern @ 2.05 GHz

Verification by Test of Radiation Pattern - PN: SSA075B Serial 003

Freq. 2.05 GHz, Method: Spherical Near Field,  $\theta = [-180:1:180]$  deg,  $\phi = [0:1:180]$  deg, Boundary Conditions: Antenna with Mast, Probe: Linear OWG





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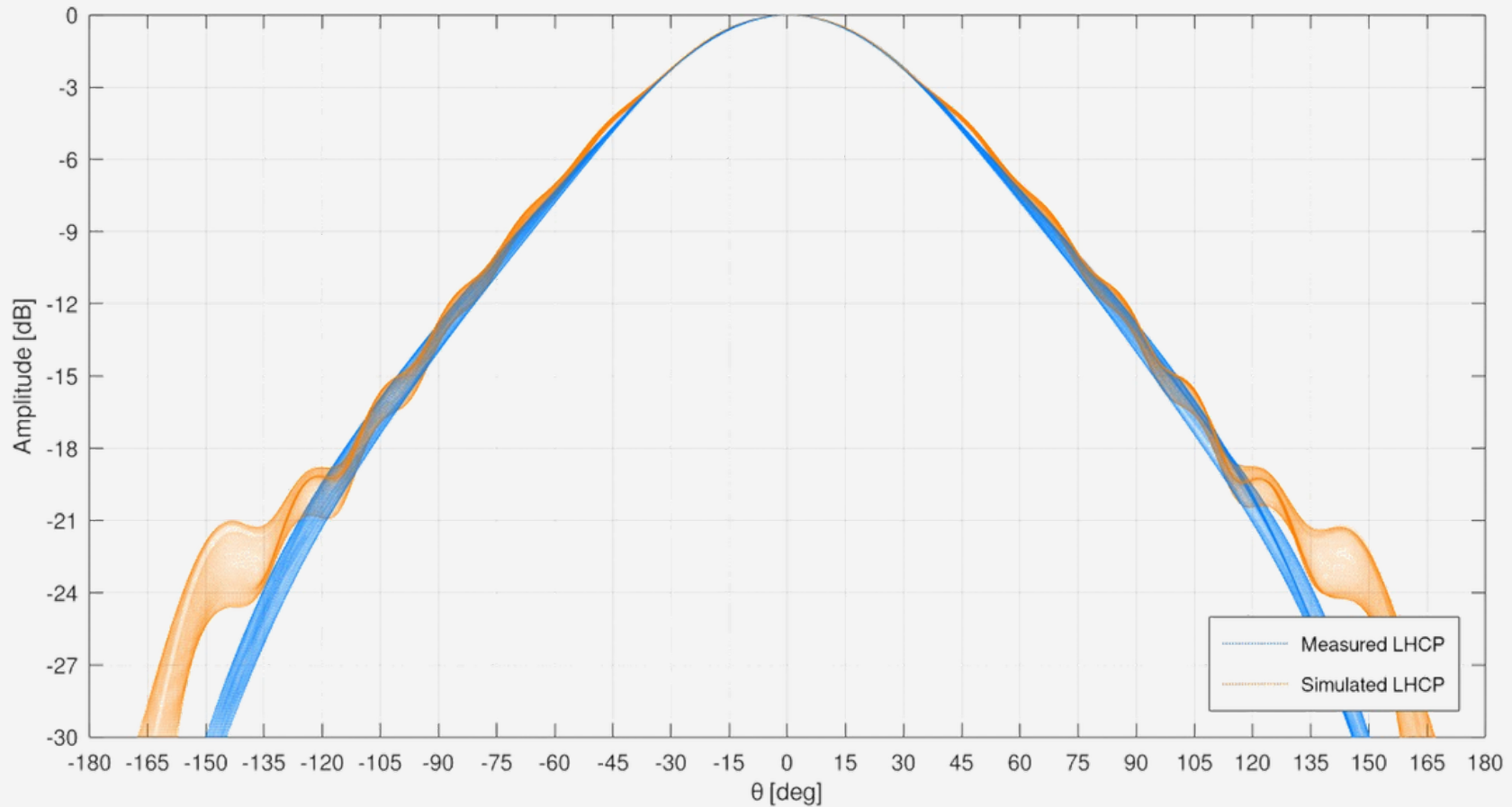
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## Radiation Pattern @ 2.25 GHz

Verification by Test of Radiation Pattern - PN: SSA075B Serial 003

Freq. 2.25 GHz, Method: Spherical Near Field,  $\theta = [-180:1:180]$  deg,  $\phi = [0:1:180]$  deg, Boundary Conditions: Antenna with Mast, Probe: Linear OWG





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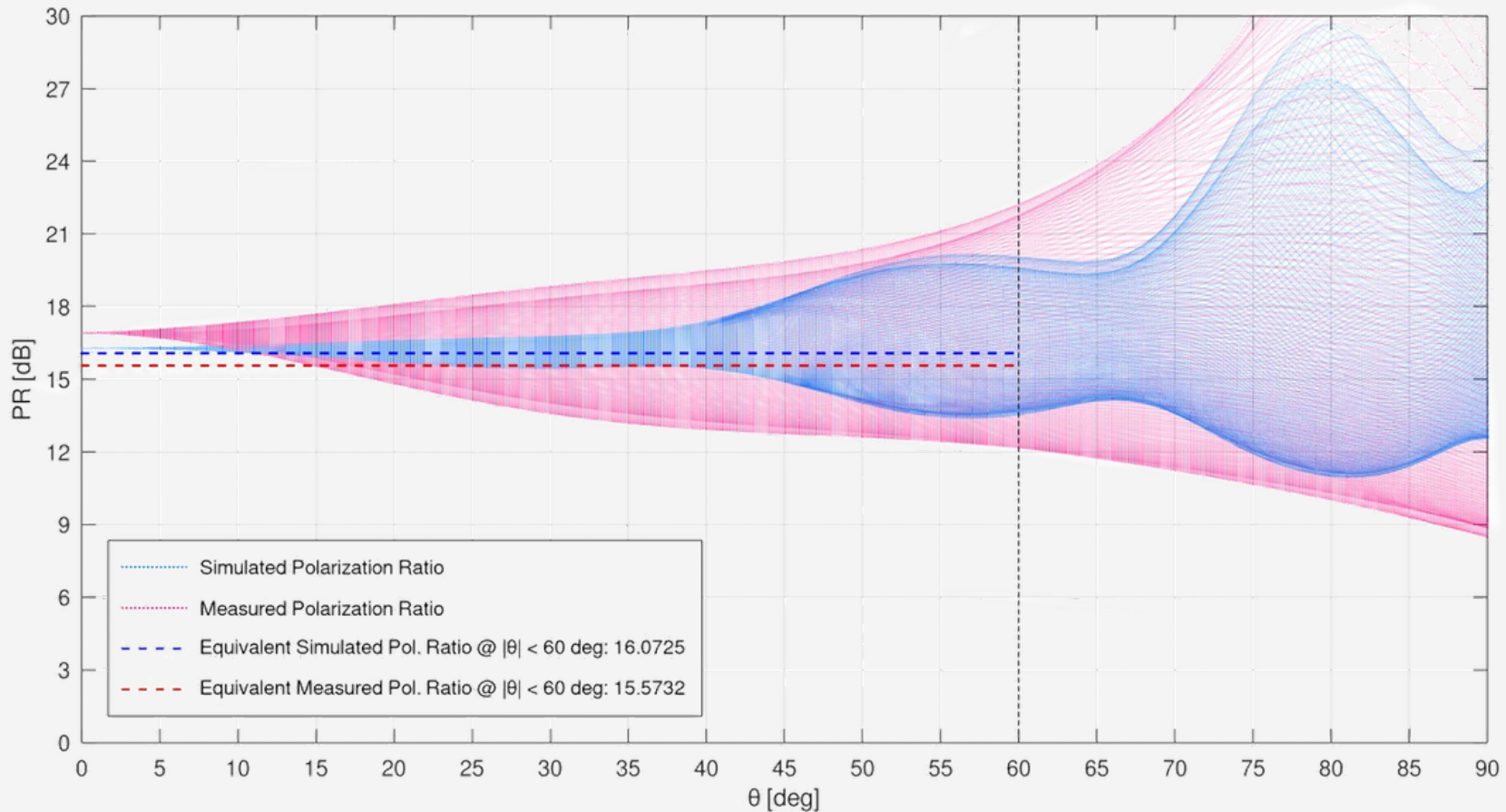
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## Polarization Ratio Pattern Principal Cuts @ 2.05 GHz

Verification by Test of Polarization Ratio - PN: SSA075B Serial 003

Frequency: 2.05 GHz, Method: Spherical Near-Field, Boundary Conditions: Antenna with Mast, Probe: Linear OWG





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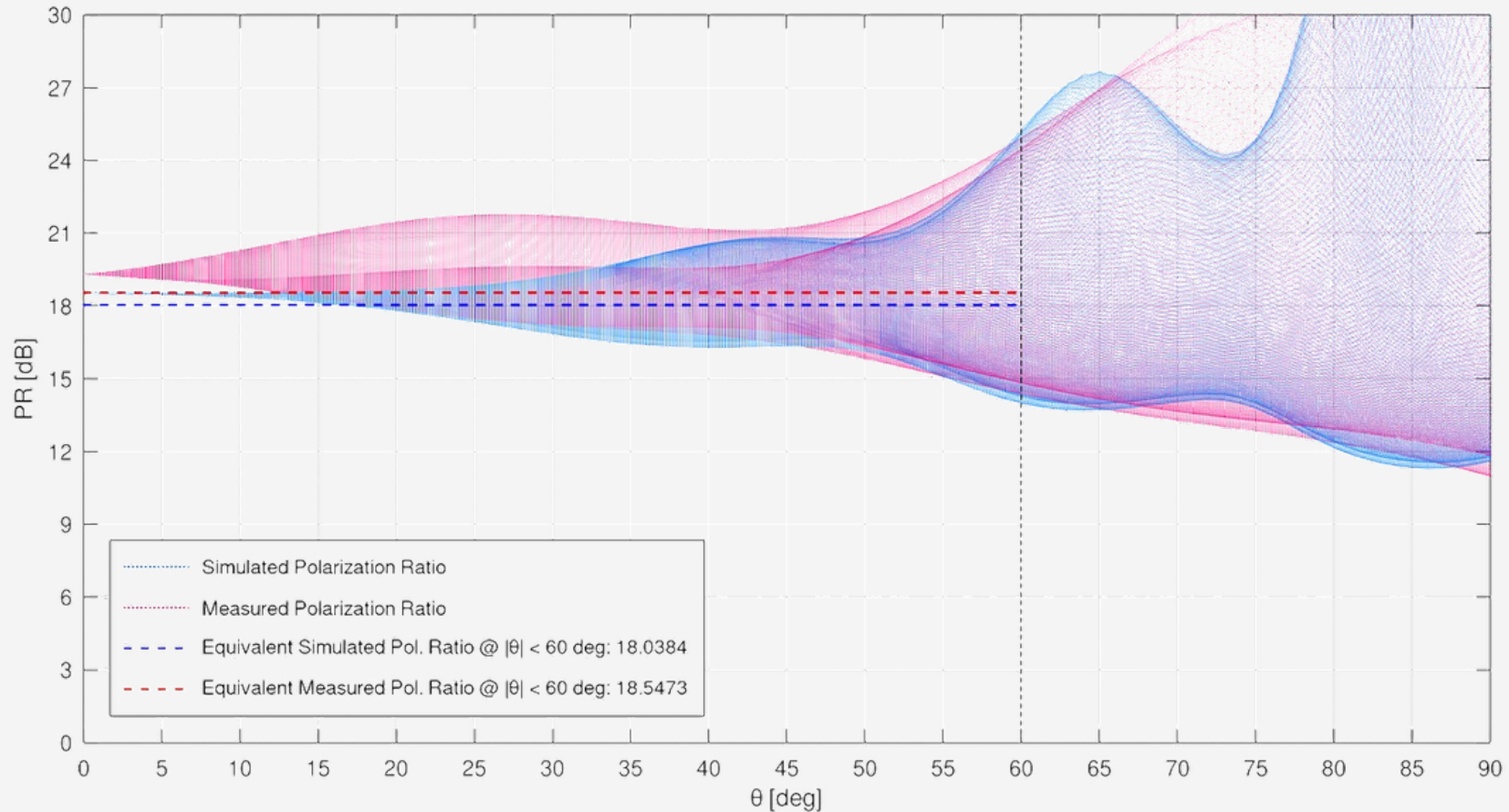
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## Polarization Ratio Pattern Principal Cuts @ 2.25 GHz

Verification by Test of Polarization Ratio - PN: SSA075B Serial 003

Frequency: 2.25 GHz, Method: Spherical Near-Field, Boundary Conditions: Antenna with Mast, Probe: Linear OWG





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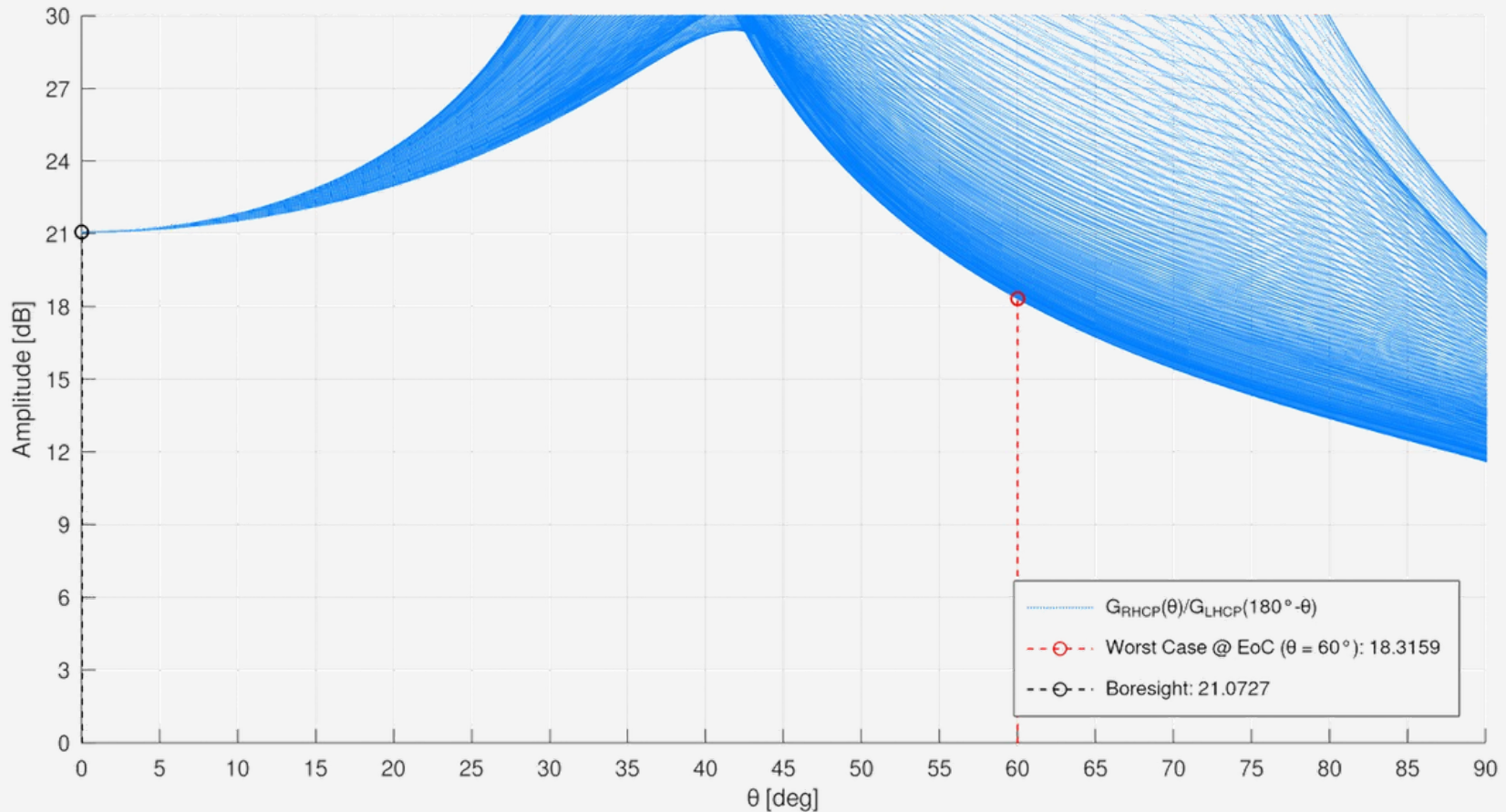
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## Multipath Ratio Pattern @ Freq= 2.05 GHz

Verification by Simulation of Multipath Ratio - PN: SSA075C

Full Spherical Cuts, Freq. 2.05 GHz,  $\theta = [0:1:90]$ deg,  $\phi = [0:1:180]$ deg, Boundary Conditions: Isolated Antenna





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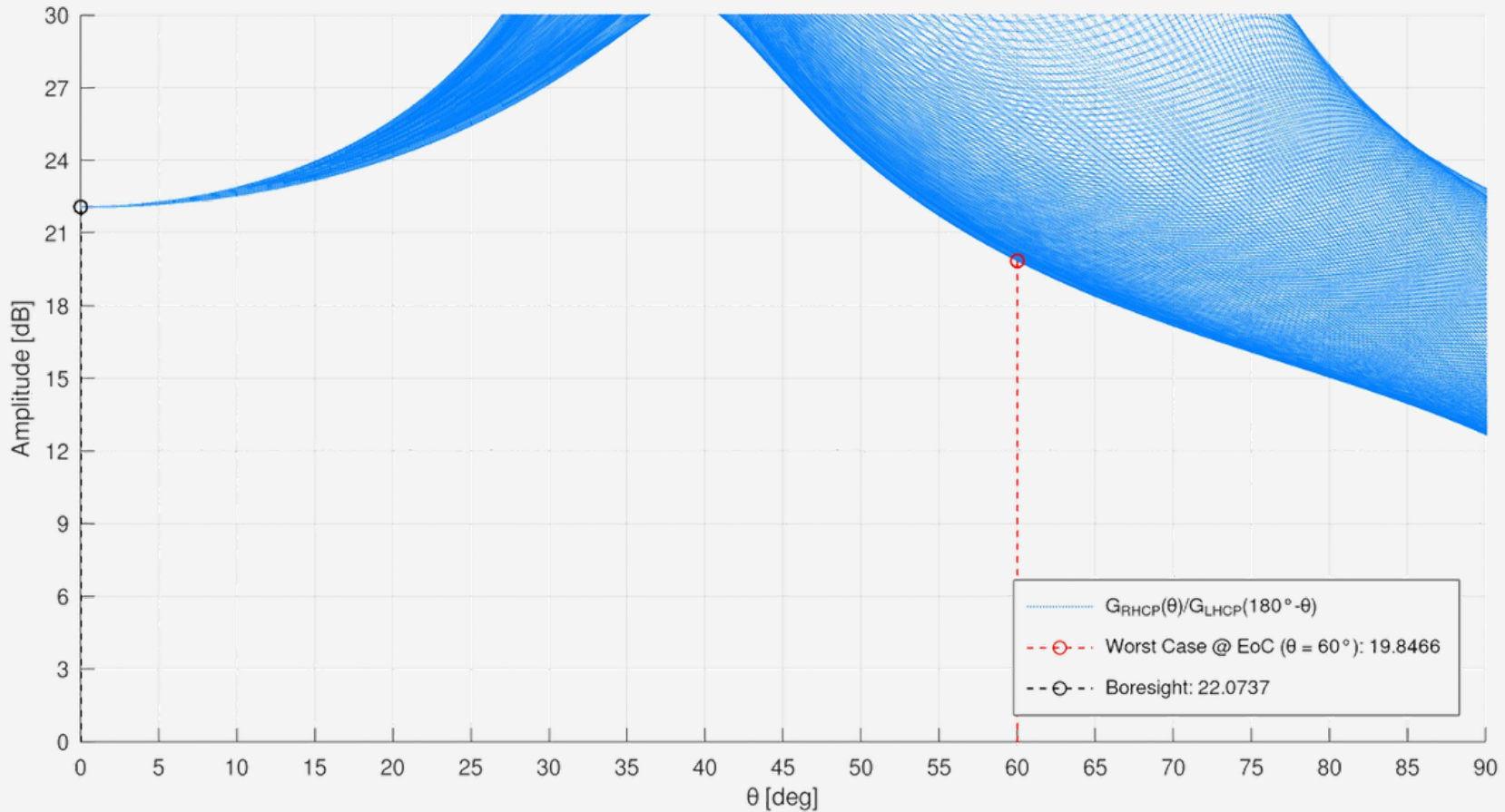
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## Multipath Ratio Pattern @ Freq= 2.25 GHz

Verification by Simulation of Multipath Ratio - PN: SSA075C

Full Spherical Cuts, Freq. 2.25 GHz,  $\theta = [0:1:90]$ deg,  $\phi = [0:1:180]$ deg, Boundary Conditions: Isolated Antenna





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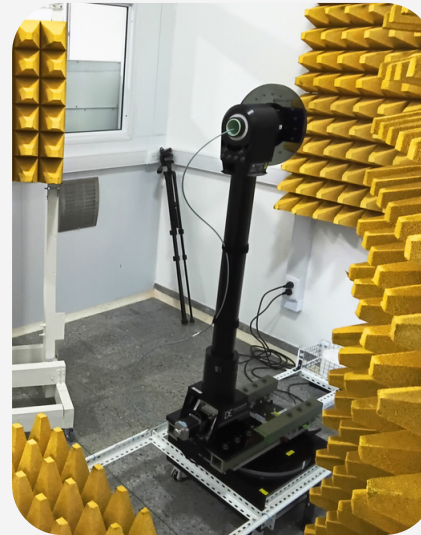
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## Our Additional Services Include:

- **Installed Performance: Pattern Distortion, Coverage & Cosite Interference**
- **Full Functional Test**
- **Environmental Test: Shaker, Thermal vacuum**
- **Antenna Bracket Design & Supply**
- **Electrical Ground Support Equipment (Hat)**

Contact Us for More Information



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**Keep the antenna  
from deciding if  
your mission is  
successful.**

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