



Standard Space Antennas

SPACE-READY ANTENNAS, WHEN TIME AND RELIABILITY MATTER

Datasheet

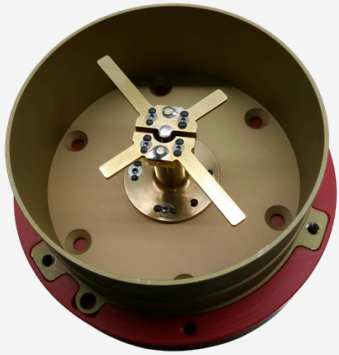
PN: SSA075C

Last Update: 10/07/26

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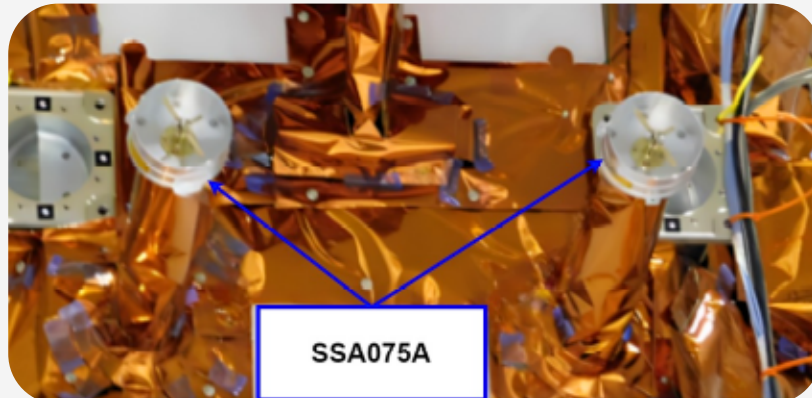
S Band Antenna

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





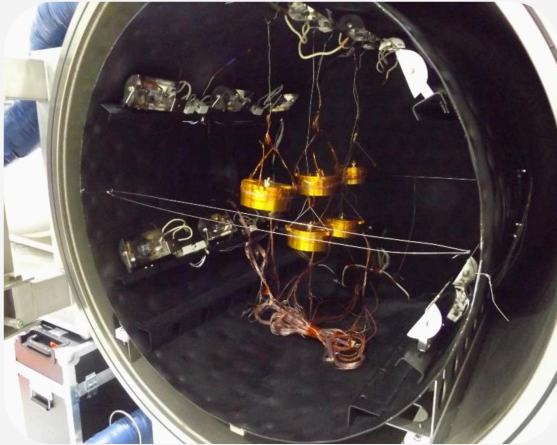
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Benefits

- **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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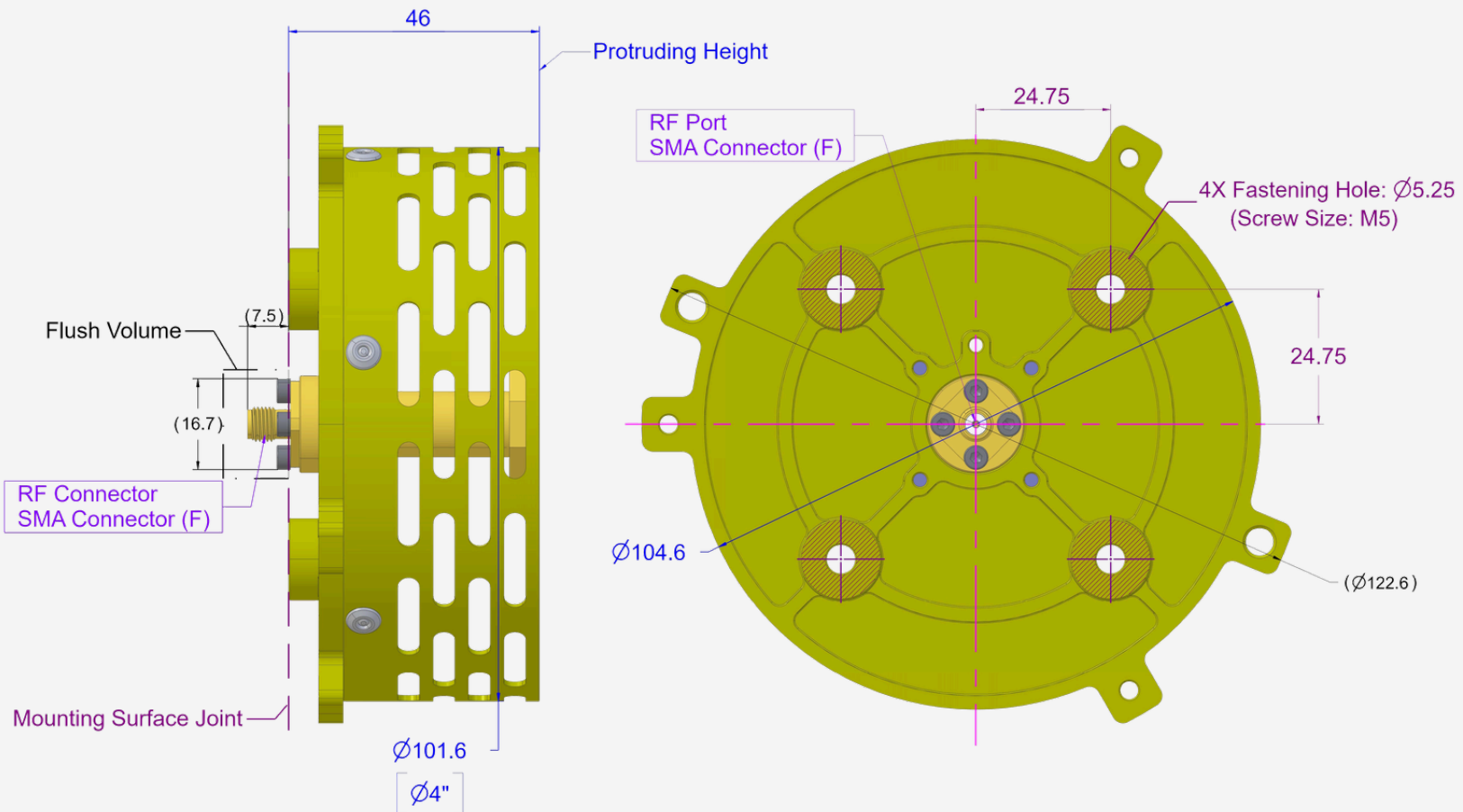
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Mechanical Envelope





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Typical Specifications @ Isolated condition

Parameter	Values	Remark
Frequency Range [GHz]	Uplink: 2.025 – 2.110 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] Assuming a 5% degradation from expected
Total Efficiency [%]	>90	Worst Case @ Frequency Range, [AD 18] 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. Z=0 $\equiv$ Joint Surface
Gain @ Boresight [dBi]	7.7 8	Mean @ Uplink Centerband. [AD 16] Mean @ Downlink Centerband. [AD 16]
HPBW [deg]	~80	@ Frequency Range. From [AD 2]
Polarization Sense	Circular	Optional: RHCP / LHCP
Polarization Ratio [dB] Worst Case	16.6 @theta < 60° ; 13.6 @theta < 90° 14.3 @theta < 60° ; 12.7 @theta < 90°	@ Uplink Centerband. [AD 16] @ Downlink Centerband. [AD 16]
Multipath Ratio [dB] Worst Case Ref: G_RHCP(theta)/G_LHCP(180-theta)	21 @theta < 30° ; 18 @theta < 60° 22 @theta < 30° ; 19 @theta < 60°	@ Uplink Centerband. [AD 16] @ 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 % 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] (Possesses Flight Heritage in Scientific Earth Observation Missions)
Vacuum [Hpa]	$\leq 1.33 \times 10^{-5} \pm 80\%$	In Thermal Vacuum Test [AD 4] (Possesses Flight Heritage in Scientific Earth Observation Missions)
1st Natural Frequency [Hz]	928	Verified by Analysis in [AD 11] Success with several Mast and Bracket Configuration [AD 3]. Numerical versus Test Deviation < 4% (Possesses Flight Heritage in Scientific Earth Observation Missions)
Dynamic Acceleracion Loads [Grms]	20 - 50 Hz: +6 dB/oct 50 - 70 Hz: 0.16 g ² /Hz 70 - 80 Hz: +6 dB/oct 80 - 350 Hz: 0.2 g ² /Hz 350 - 400 Hz: -6 dB/oct 400 - 800 Hz: 0.16 g ² /Hz 800 - 2000 Hz: -6 dB/oct <u>Overall: 14.55</u>	Shaker Test @ Random Vibration, Three Axis, 2 min / axis. [AD 3] According to NASA GEVS (General Environmental Verification Standard). Baseline $\approx$ 6.8 Grms (Maximum Expected Environment according to Review of Typical Launch Vehicles) Acceptance $\approx$ 10 Grms, 1.41* Baseline (ASD + 3 dB) Qualification $\approx$ 14.1 Grms, 1.41* Acceptance (ASD + 6 dB) (Possesses Flight Heritage in Scientific Earth Observation Missions) Verified by Analysis in [AD 11]
Static Acceleration Loads [G]	Peak: 54	Shaker Test @ Sine Burst, Three Axis [AD 3], Qualification Level (Possesses Flight Heritage in Scientific Earth Observation Missions)





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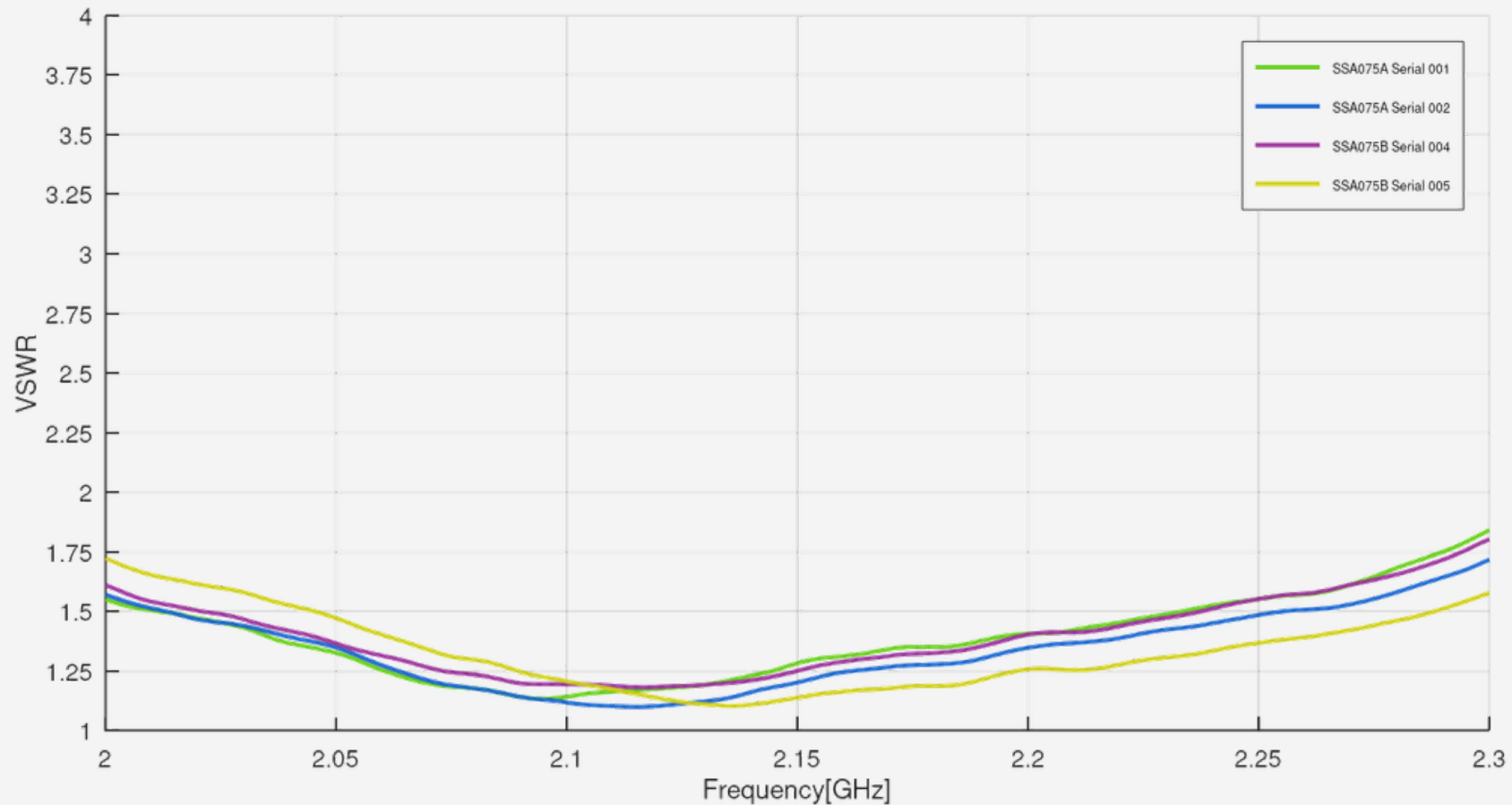
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VSWR

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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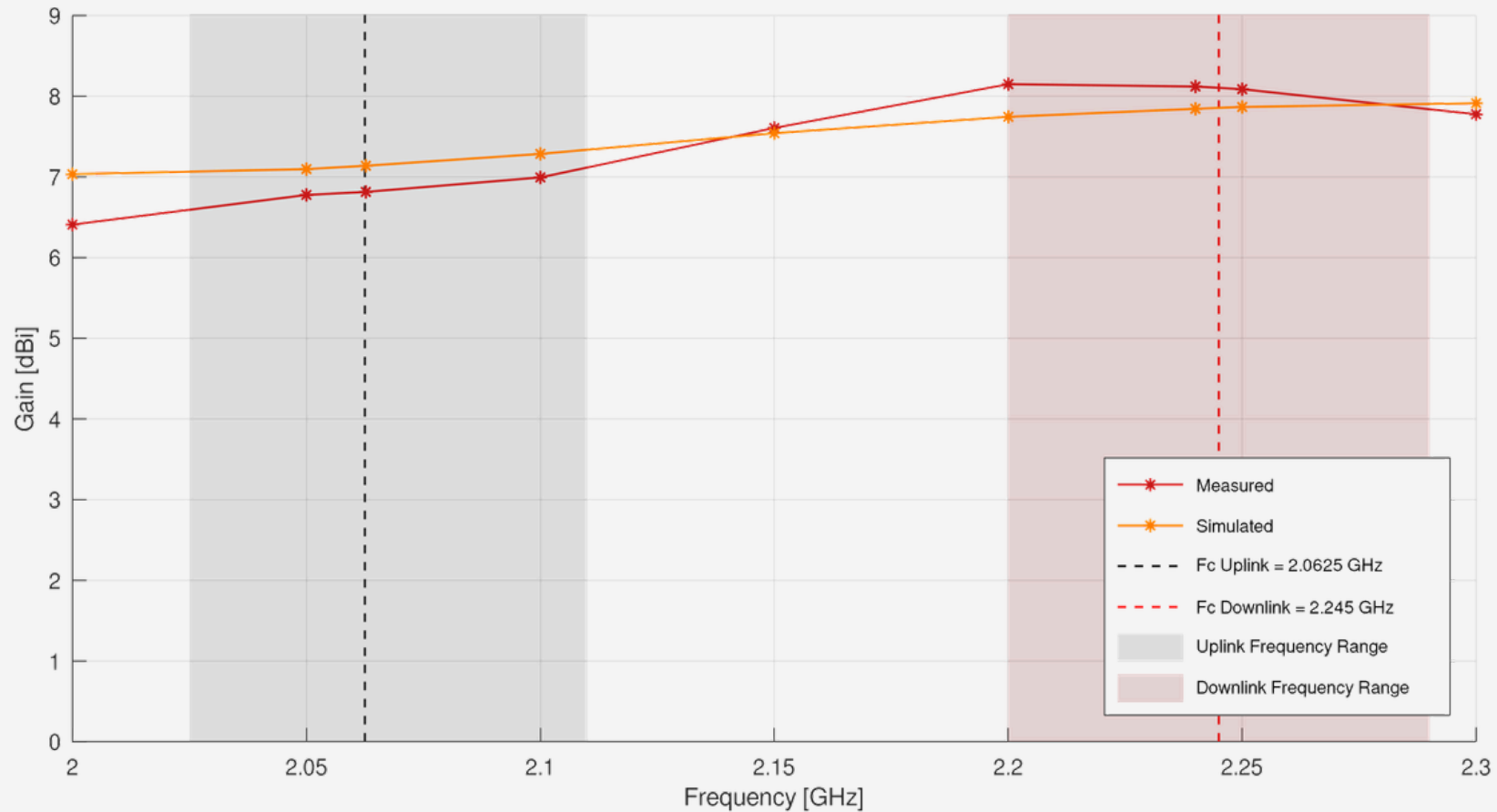
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Gain @ Boresight vs Frequency

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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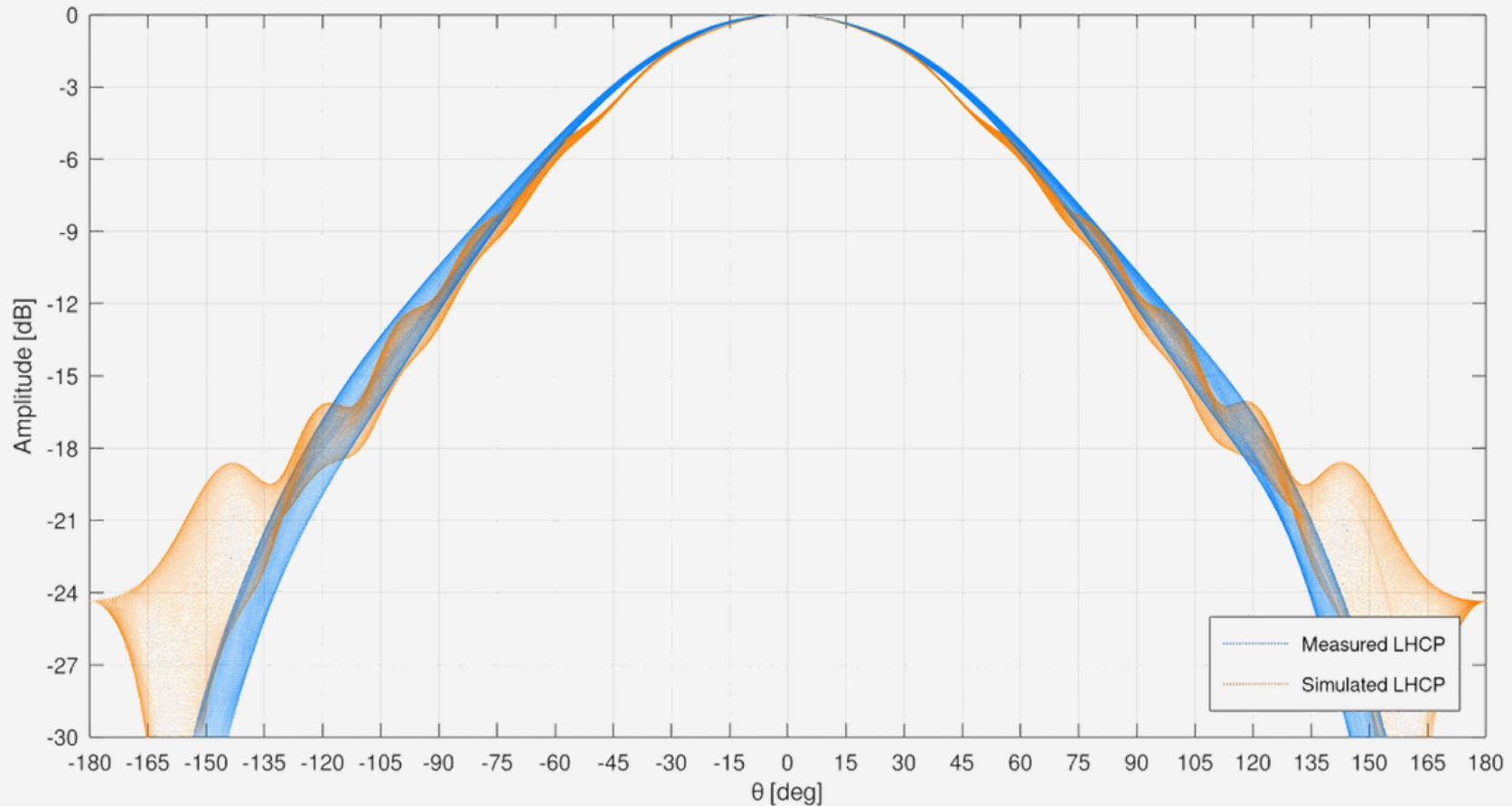
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Radiation Pattern @ 2.05 GHz

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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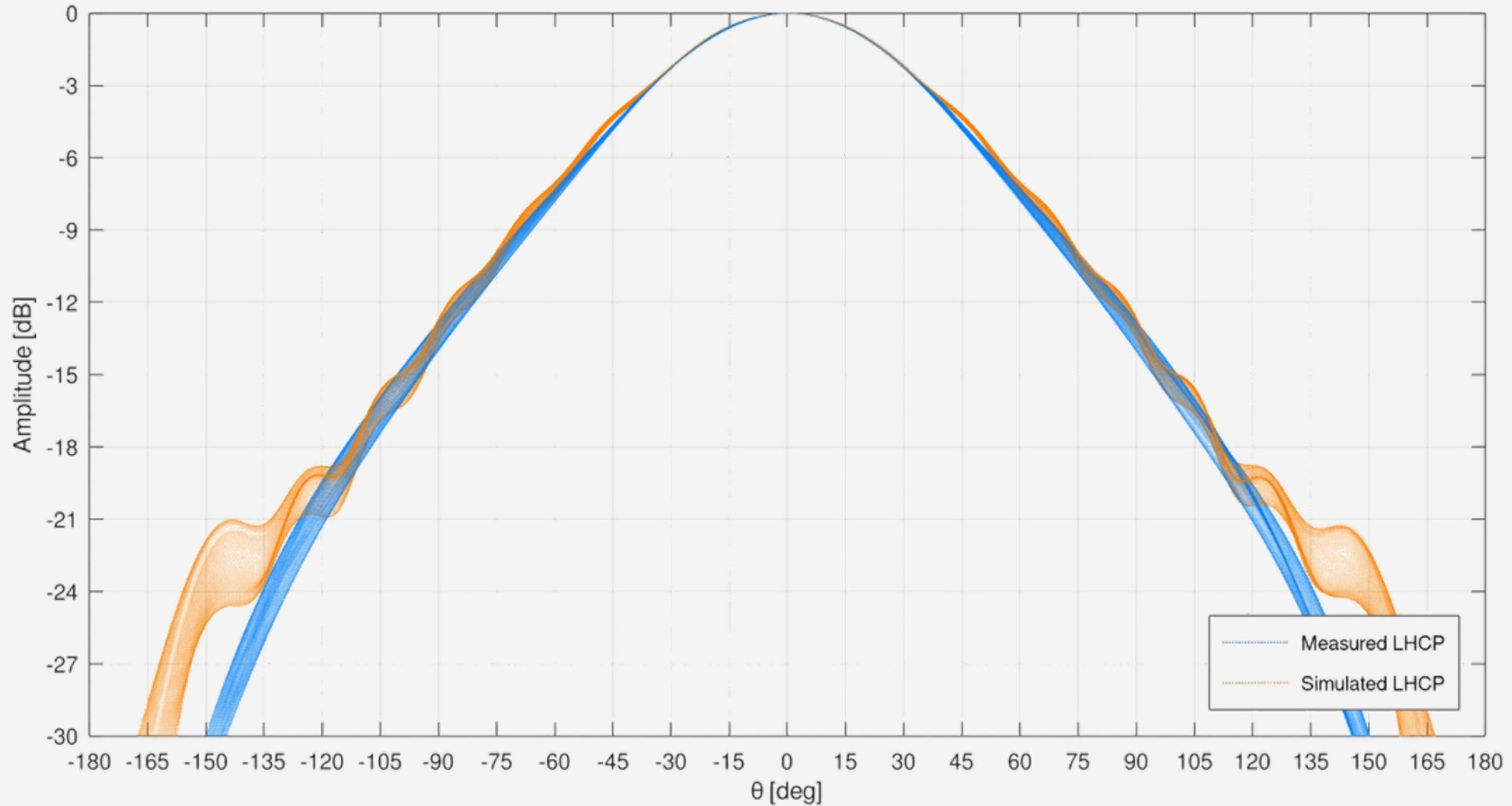
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Radiation Pattern @ 2.25 GHz

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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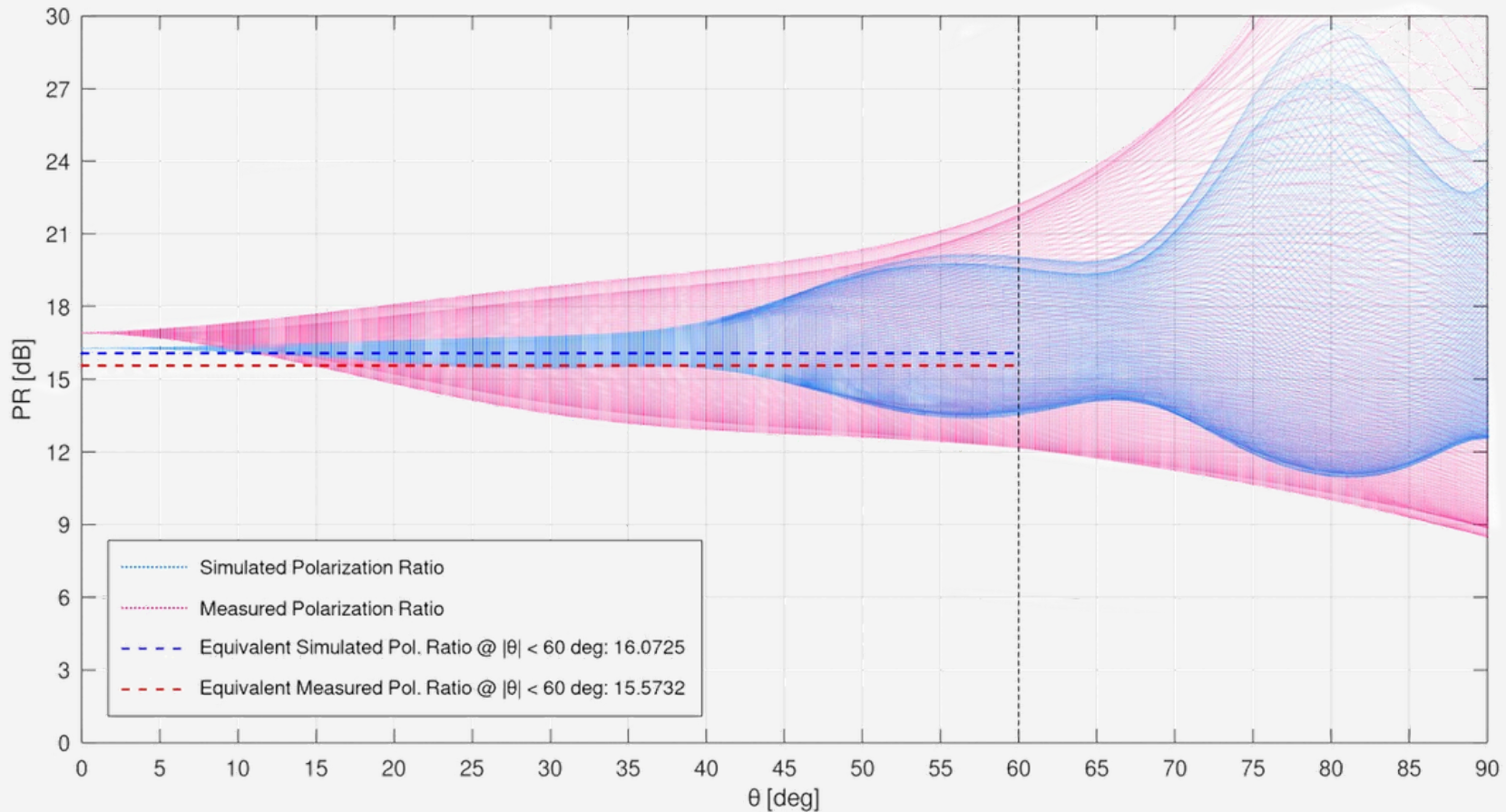
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Polarization Ratio Pattern Principal Cuts @ 2.05 GHz

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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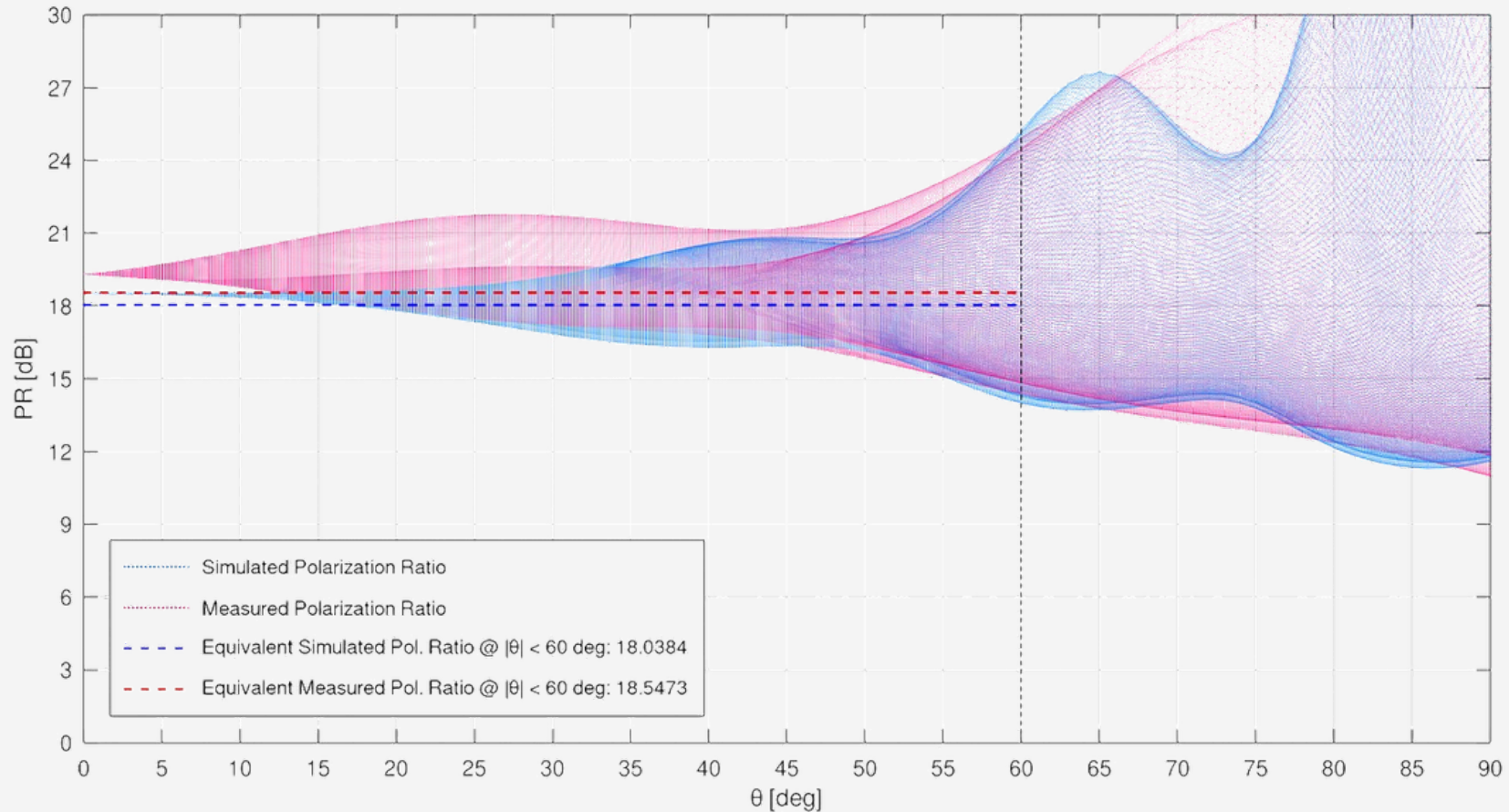
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Polarization Ratio Pattern Principal Cuts @ 2.25 GHz

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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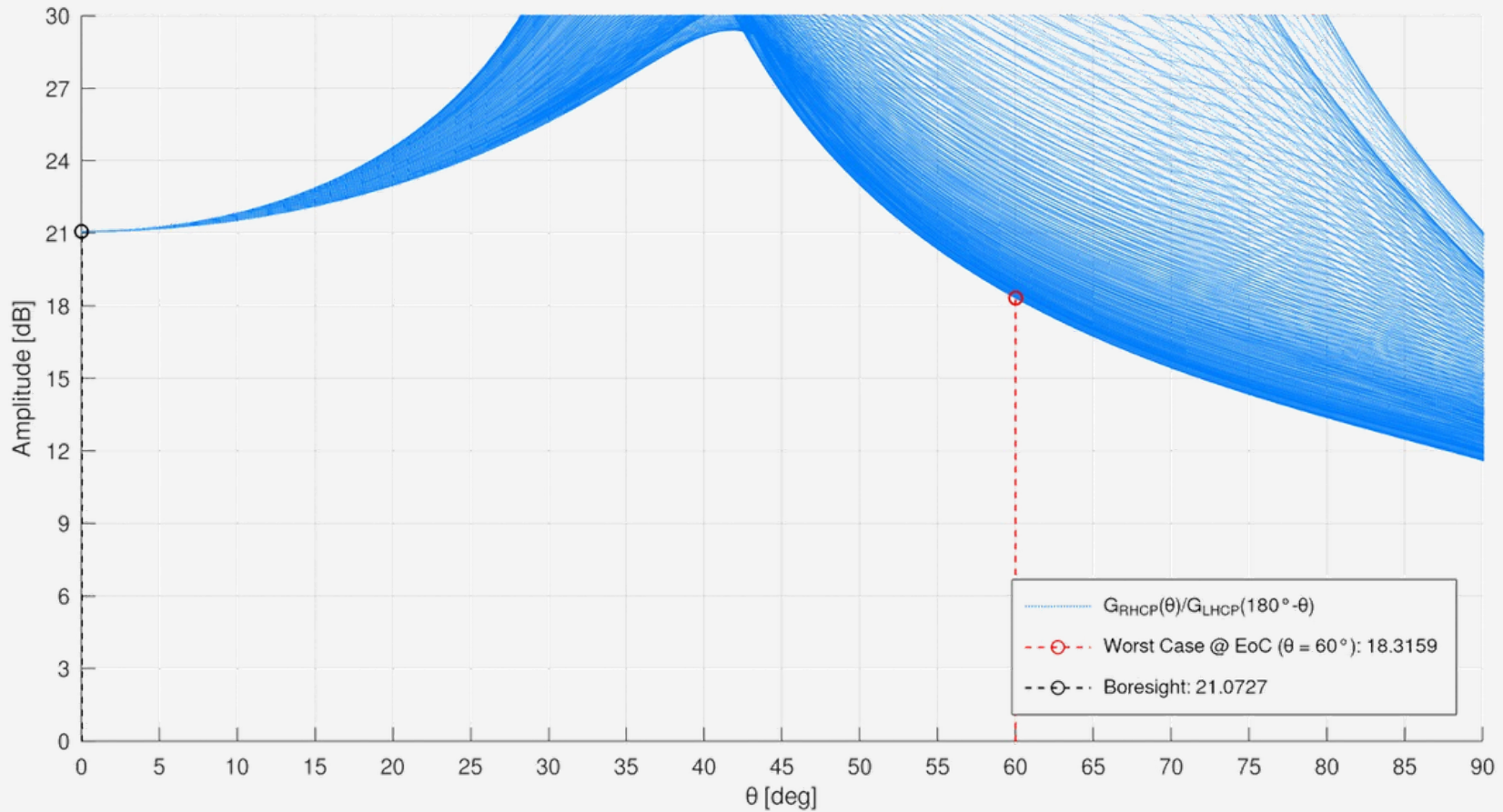
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Multipath Ratio Pattern @ Freq= 2.05 GHz

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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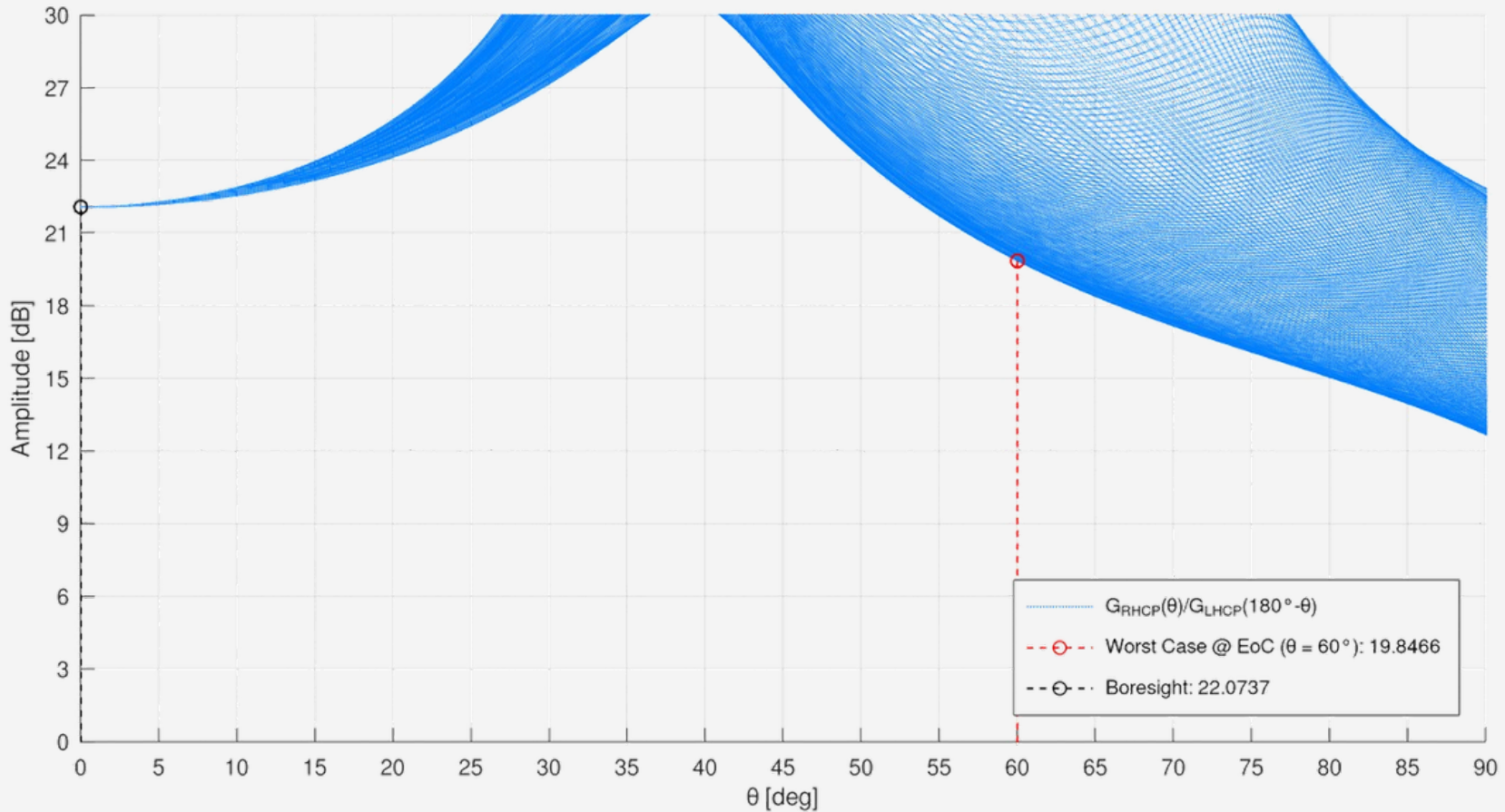
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Multipath Ratio Pattern @ Freq= 2.25 GHz

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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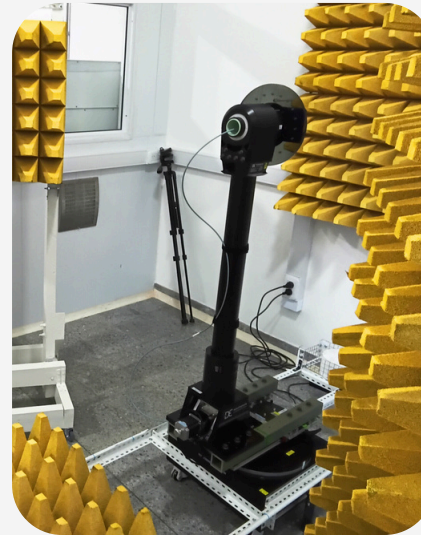
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Our Additional Services Include:

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

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successful.**



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