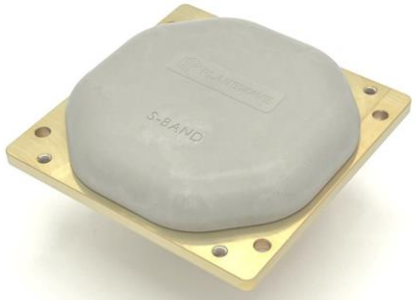
PW2022-002 Active S-Band RHCP Dual-Port (TX+RX) Omni Antenna, 15 dB

Features

- ✓ Size < 1U
- ✓ Shared aperture with separate TX and RX ports
- ✓ Excellent TX to RX isolation
- ✓ Integrated LNA and filter with low current consumption
- ✓ Radiation tolerant
- ✓ Omni-directional pattern
- ✓ Wide operating temperature range
- ✓ Designed to NASA GEVS (GSFC-STD-7000)
- ✓ TRL 9



Benefits

- ✓ Commercial off-the-shelf (COTS)
- ✓ Acceptance Tests available
- ✓ Compatible Test Hat available
- ✓ Qualified for space applications
- ✓ True circular polarization with extremely low Axial Ratio over the entire frequency band
- ✓ Consultation services available (link budget, architecture and system design)

Product Overview

PW2022-002 is a high-performance antenna designed for TT&C applications in harsh space environments. It features excellent axial ratio over the entire frequency band, making it ideal for demanding and reliable space communication links. This is a 3-in-1 antenna that supports both TX and RX bands on two separate ports. While the TX path is passive, this antenna includes an integrated LNA and filter in the RX path to further improve received signal fidelity and mitigate interference.

This antenna is a perfect choice for LEO, MEO, and GEO missions. Specifically, it is designed to overcome challenges present in the LEO environment over long mission lives, such as Atomic Oxygen, MMOD, etc. PW2022-002 is radiation tolerant, lightweight and easy to integrate. It is also available with Test Hats and HITL versions to facilitate testing and integration.

Related Products

Part Number	Description
PW2022-302	S-Band RHCP Dual-Port (TX+RX) Omni Test Hat
PW2022-102	S-Band RHCP Dual-Port (TX+RX) Omni Antenna
PW2022-111	S-Band Dual-CP Wideband Omni Antenna

Electrical Specifications

Parameter / Condition	Min	Typ	Max	Unit
Operating Frequency				
TX	2200		2300	MHz
RX	2025		2120	MHz
Polarization		RHCP		
Axial Ratio				
TX	2	3	4	dB
RX	1	1.5	2	dB
VSWR			2:1	
TX Port to RX Port Leakage at RX Frequency				
Including LNA Gain		-20	-10	dB
Excluding LNA Gain		-35	-25	dB
Passive Gain				
TX	3	3.5	4	dBic
RX	2	3	4	dBic
LNA Gain (Notes 1 and 2)	14	16	18	dB
Noise Figure (Note 2)	1	2	3	dB
Rejection @ 2200 MHz	60			dBc
Voltage	4.5	5	12	V
Current		25	35	mA
Pattern Coverage		Omni		
Half Power Beam Width				
TX	85	90	100	deg
RX	85	90	100	deg
TX Power Handling	20			W

Note 1: LNA gain is customizable upon request

Note 2: Measured over the full operating temperature range

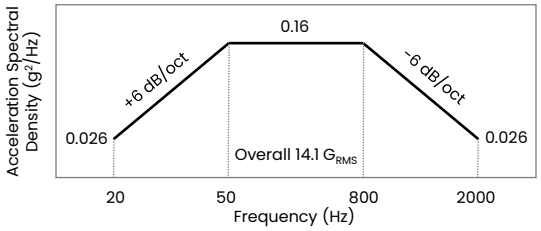
Mechanical Specifications

Parameter / Condition	Value	Unit	Limits
Connector	SMA Female		
Mass	290	g	Max
Compatible Test Hat	PW2022-302		

Environmental Specifications

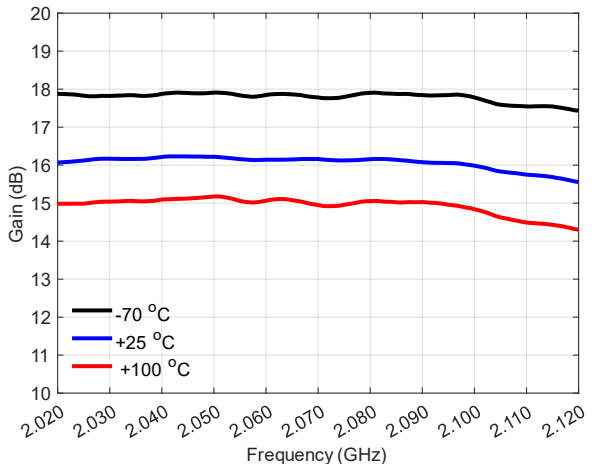
Parameter / Condition	Min	Typ	Max	Unit
LEO Mission Life	5			years
Operating Temperature	-70		100	°C
Humidity (MIL-STD-810 Method 507.6)	65%			
Sealing	Sealed + Venting Mechanism			
Radiation Hardness (TID)	500			krad(Si)
Destructive Single Event Effects (Note 1)	37			MeV-cm²/mg
Multipactor Margin (Note 2)	10			dB
Vibration	14.1			G_{RMS}

Random Vibration Test Levels
(GSFC-STD-7000)

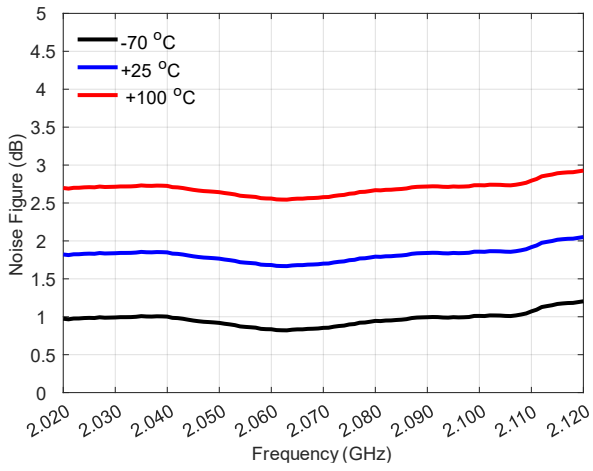


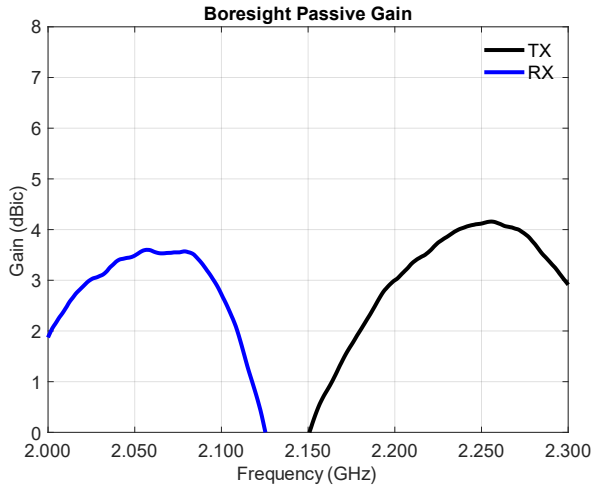
Note 1: No destructive SEE was observed when tested with heavy ions up to the above LET
Note 2: Verified by simulation for 20W TX power

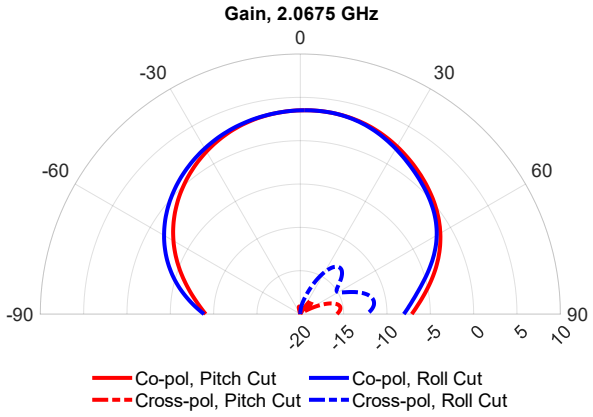
LNA Gain

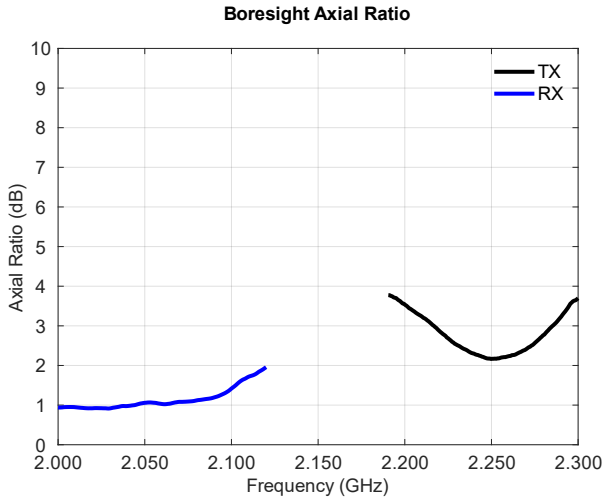


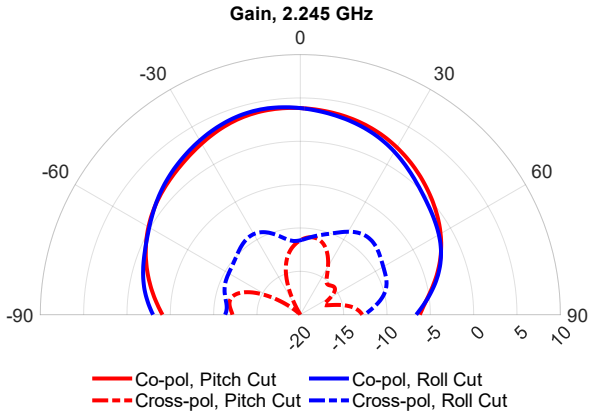
Noise Figure

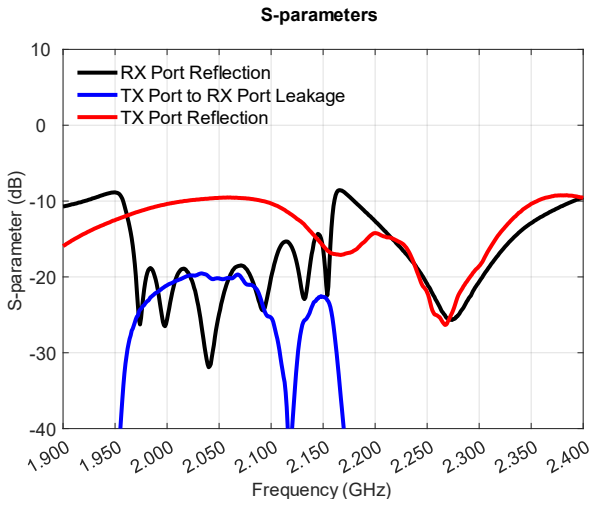


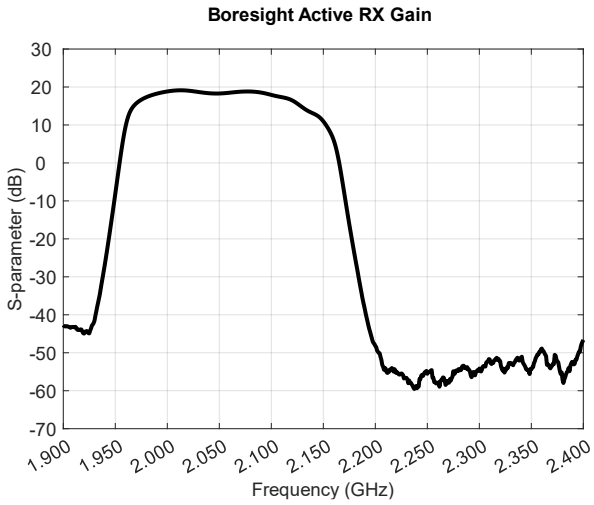

Boresight Passive Gain
TX
RX
Gain (dBic)
Frequency (GHz)


Gain, 2.0675 GHz
Co-pol, Pitch Cut
Co-pol, Roll Cut
Cross-pol, Pitch Cut
Cross-pol, Roll Cut

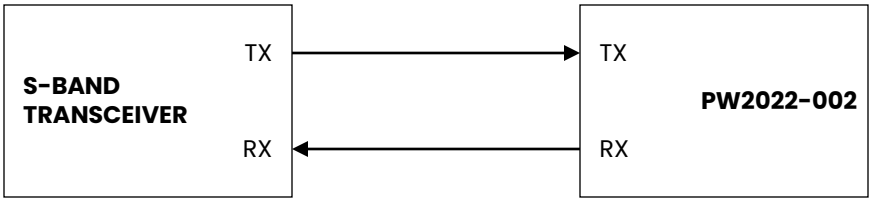

Boresight Axial Ratio
TX
RX
Axial Ratio (dB)
Frequency (GHz)


Gain, 2.245 GHz
Co-pol, Pitch Cut
Co-pol, Roll Cut
Cross-pol, Pitch Cut
Cross-pol, Roll Cut

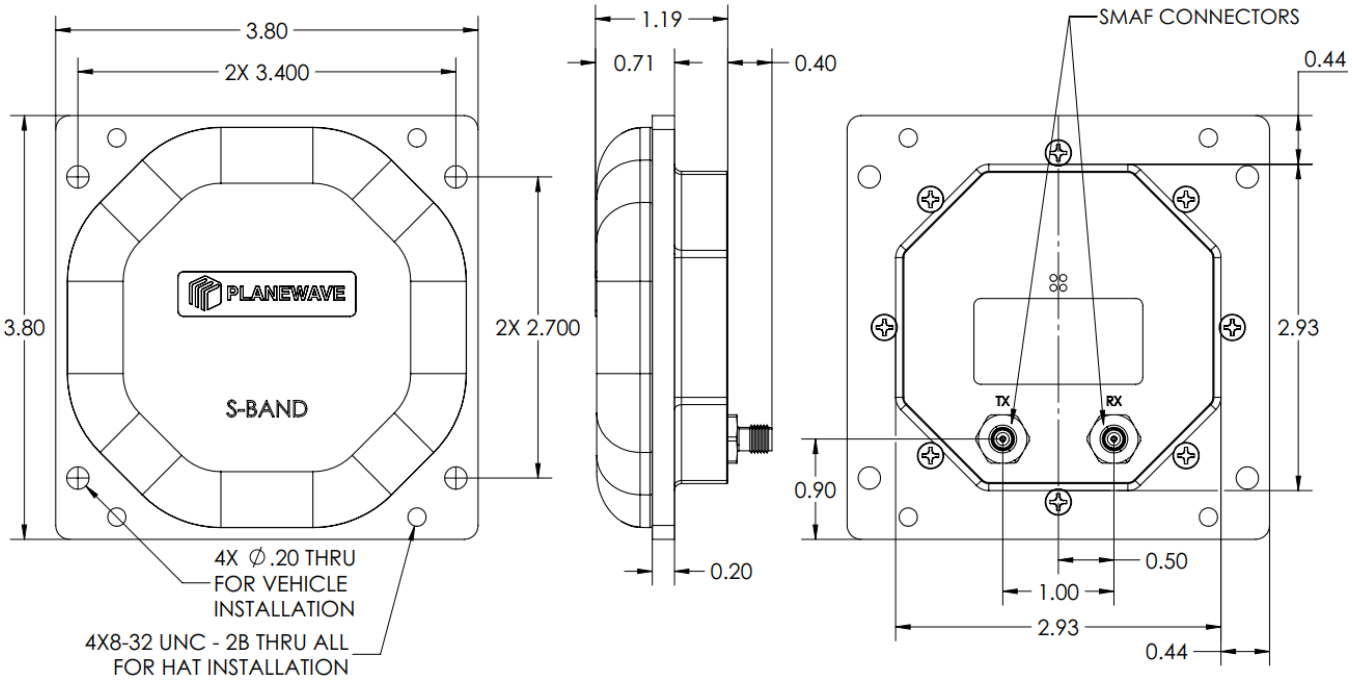

S-parameters
RX Port Reflection
TX Port to RX Port Leakage
TX Port Reflection
S-parameter (dB)
Frequency (GHz)


Boresight Active RX Gain
S-parameter (dB)
Frequency (GHz)

Typical Application Diagram



Mechanical Outline



Dimensions shown in inches.
Tolerances - Two Place Decimal: ±0.010, Three Place Decimal: ±0.005

Contact PlaneWave, Inc.

6925 Canby Ave, Ste 110
Reseda, CA 91335

www.planewaveinc.com
sales@planewaveinc.com