

# FOGPSAL-RM



## Fiber Optic GPS Antenna Link Technical Product Data Components

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- 1U 19" Rackmount RF-to-Fiber Transmitter
- 1U 19" Rackmount Fiber-to-RF Receiver
- L1GPSA-N: GPS L1 Roof Antenna
- L1RAMB: Roof Antenna Mounting Bracket
- Transmitter Power Supply
- Receiver Power Supply



## Description

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This **Fiber Optic GPS Antenna Link (FOGPSAL)** is a complete GPS-over-Fiber package that can link the included L1 GPS antenna to distant or electrically isolated receivers for timing and diagnostic purposes. The **FOGPSAL** transmitter receives and encodes RF signals from 1.1 GHz to 1.7 GHz into optical data which is then sent up to 40KM over a customer-supplied single-mode fiber optic cable. The **FOGPSAL** receiver converts the optical pulses back into an RF signal which can be distributed to a network of GPS receivers. This device is designed to replace lossy and expensive long-distance coaxial cable runs.

The **FOGPSAL** has been designed for installation in a standard 19" equipment rack with a 1U height. The transmitter features an N-female RF input port and two outputs: an FC/APC simplex fiber output and an N-female RF output for diagnostic purposes. In the standard configuration, the transmitter unit supplies 5 VDC through the RF output port to power a connected antenna or other devices upline from the **FOGPSAL** transmitter. The receiver unit features an FC/APC simplex fiber input and two N-female RF outputs. The two output ports are DC blocked and loaded with 200Ω resistors to simulate antenna current draw which prevents antenna alarm faults on connected GPS receivers. Custom configurations are available upon request.

## Use Cases

- Any GNSS application with a long cable run between the roof antenna and the GNSS device.
- To supply a GNSS signal to devices within an electrically isolated environment or other applications where standard RF cable cannot be used. Bunkers, control rooms, etc.
- A **FOGPSAL** unit is often used in large buildings to supply basement cell sites with a GNSS timing signal.

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## Electrical Specifications, TA=25°C

### General Transmitter and Receiver Specification

Parameter	Notes	Min	Typ	Max	Unit
Frequency Range	Covers all major GNSS constellations.	1.1		1.7	GHz
Characteristic Impedance	Unused ports should be terminated with 50Ω loads.		50		Ω
Req. DC Input V.	Operating Voltage Range.		12		VDC
Current Draw: Tx	Typical current consumption per unit.		172		mA
Current Draw: Rx	Typical current consumption per unit.		72		mA

### FOGPSAL GPS L1 & L2 RF Specification <sup>(1)</sup>

Parameter	Notes	Min	Typ	Max	Unit
Gain	The relative increase in signal power provided by the amplifier.		30		dB
Input SWR	Input Standing Wave Ratio: S11		1.5:1	2.0:1	-
Output SWR	Output Standing Wave Ratio: S22		1.5:1	2.0:1	-
System Noise Figure	The NF of the FOGPSAL system when used with the included L1GPSA antenna.	1.8	2.0	3.0	dB
Gain Flatness	The difference in loss or gain between the L1 and L2 frequencies.		0.5	1.5	dB
Amplitude Balance	The difference in gain or loss between each output port.		0.5	1.0	dB
Isolation	The amount of attenuation between receiver output ports.		L2:17 L1:20		dB
Group delay flatness	The difference in signal delay between the L1 and L2 frequencies.		1	4	ns
Input P1dB	The 1dB compression point.		-20		dBm

### Transmitter Diagnostic Port GPS L1 & L2 RF Specification <sup>(1)</sup>

Parameter	Notes	Min	Typ	Max	Unit
Gain	The relative increase in signal power provided by the amplifier.	2.5	4.0	5.5	dB
Input SWR	Input Standing Wave Ratio: S11		1.5:1	2.0:1	-
Output SWR	Output Standing Wave Ratio: S22		1.5:1	2.0:1	-
L1 Noise Figure	The increase in noise power relative to an ideal amplifier.		3.8	4.3	dB
Gain Flatness	The difference in loss or gain between the L1 and L2 frequencies.		0.5	1	dB
Group delay flatness	The difference in signal delay between the L1 and L2 frequencies.		0.5	1	ns
Input P1dB	The 1dB compression point.		-20		dBm

(1): Performance is slightly reduced around GPS L5. If working on sensitive L5 applications, please request performance data.

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## Fiber Optic Link Characteristics

<u>Parameter</u>	<u>Notes</u>	<u>Min</u>	<u>Typ</u>	<u>Max</u>	<u>Unit</u>
Frequency Range	Covers all major GNSS constellations.	0.95		2.6	GHz
Wavelength	The wavelength of the light emitted from the fiber optic transmitter.		1550		nm
Output Power	Strength of fiber optic output signal.		+2.5		dBm
Receive Power	The input optical power range for the fiber optic receiver.	-10		+2.5	dBm
Maximum Range	The maximum length of the fiber optic portion of the system.			40	km

## Standard Port Configuration

<u>Port</u>	<u>Transmitter</u>	<u>Receiver</u>
RF Inputs	1 x N-type Female 5VDC Output	N/A
RF Outputs	1 x N-type Female Diagnostic Port DC Blocked w/ 200Ω load resistor	2 x N-type Female DC Blocked w/ 200Ω load resistor
Optical Inputs	N/A	1 x FC/APC
Optical Outputs	1 x FC/APC	N/A
Power	1 x MIL-DTL-5015 10SL-4P	1 x MIL-DTL-5015 10SL-4P

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## Part Number Configuration

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FOGPSAL - RM - N / 5 / 110

Base Part: \_\_\_\_\_  
**FOGPSAL = Fiber Optic GPS Antenna Link**

Form Factor: \_\_\_\_\_  
**RM = Rackmount Transmitter**  
**WP = Weatherproof**

Connector: \_\_\_\_\_  
**Type N only**

Output Voltage: \_\_\_\_\_  
**5 VDC, XX (Custom: "XX")**

Source Voltage: \_\_\_\_\_  
**110 = 110VAC, 220 = 220VAC (2 prong Euro), 240 = 240VAC (3 prong UK),**  
**MC = Military DC Connector (User supplies DC voltage range 9-32VDC)**

(Military DC Mating Connector is included standard with the MC power option).

Contact GPS Networking Technical Support at 1-800-463-3063 or [salestech@gpsnetworking.com](mailto:salestech@gpsnetworking.com) for any questions regarding non-standard configurations and corresponding part numbers.

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# FOGPSAL-RM

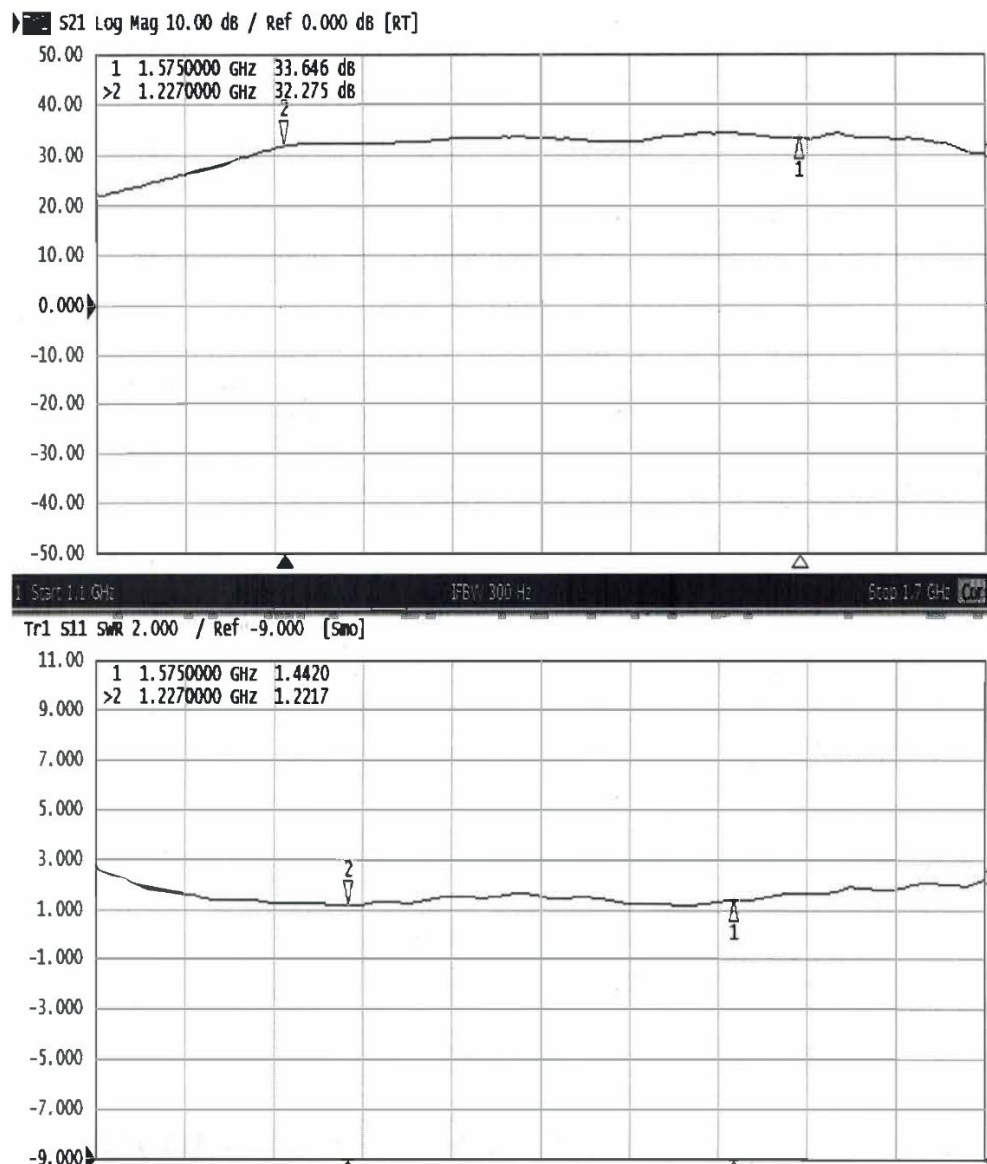
## Performance

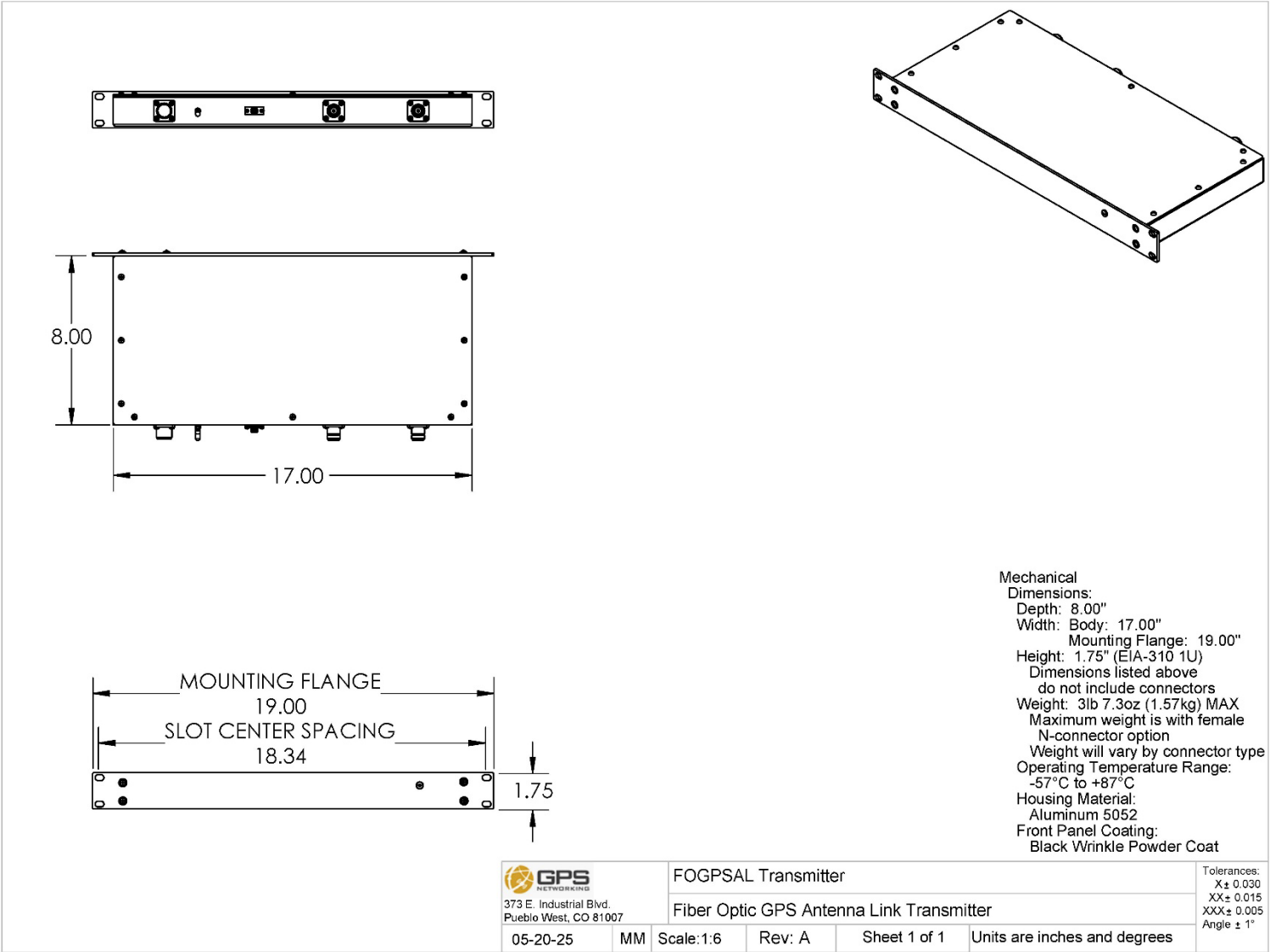


### FOGPSAL-RM (Standard Gain)

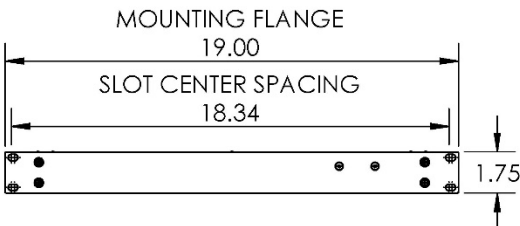
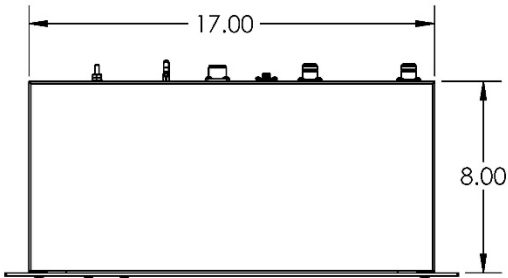
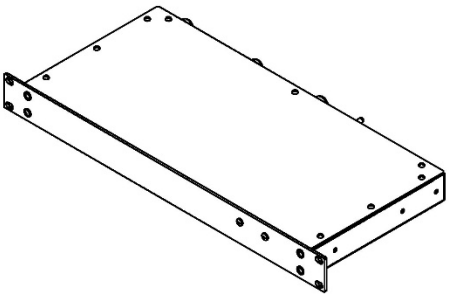
Each **FOGPSAL-RM** system ships with a test sheet that verifies critical performance characteristics, such as gain, input VSWR, and amplitude balance; a typical VNA test sheet is shown below.

### Test Data






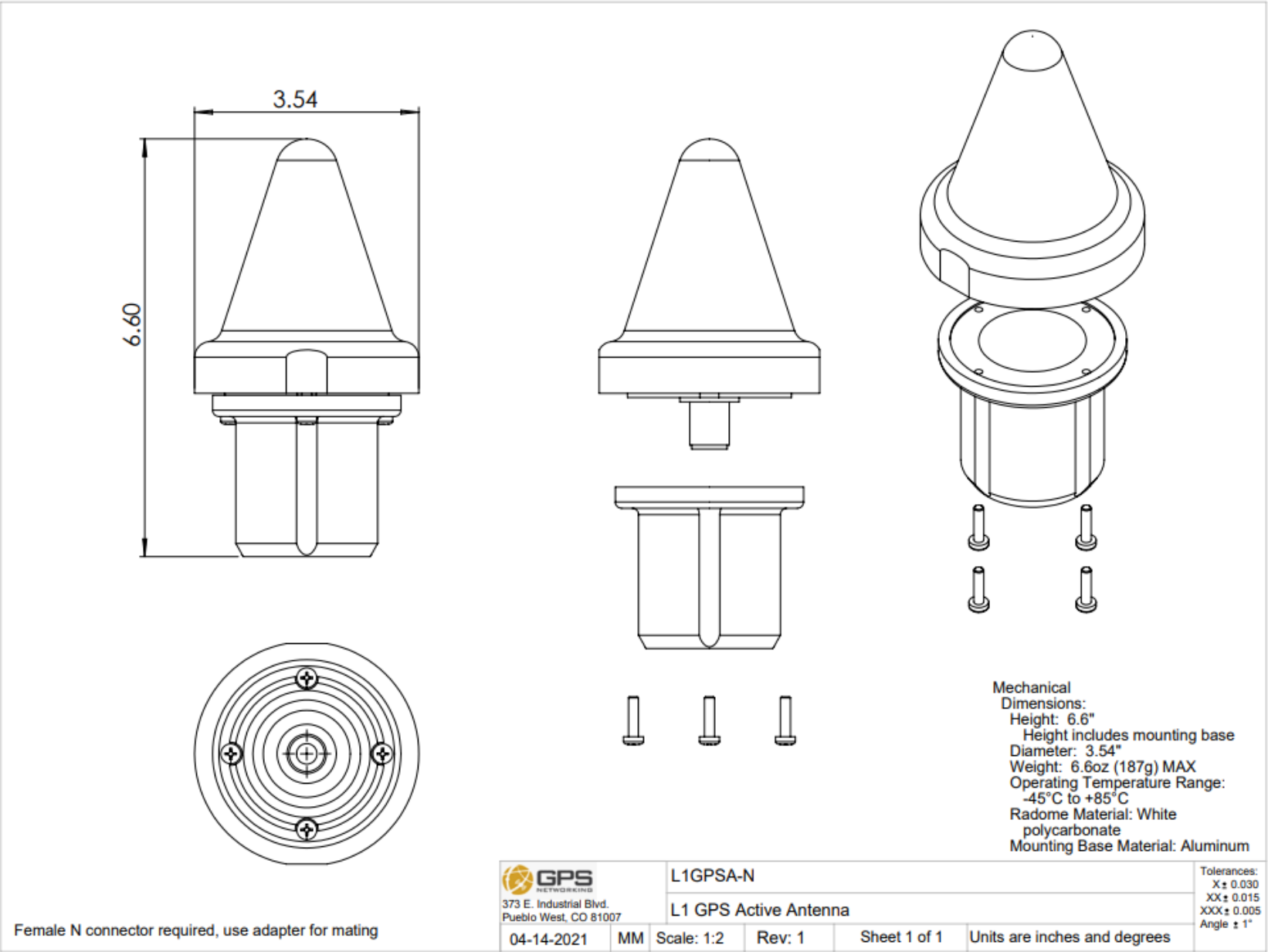
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Mechanical  
Dimensions:  
Depth: 8.00"  
Width: Body: 17.00"  
Mounting Flange: 19.00"  
Height: 1.75" (EIA-310 1U)  
Dimensions listed above  
do not include connectors  
Weight: 3lb 8.3oz (1.596kg) MAX  
Maximum weight is with female  
N-connector option  
Weight will vary by connector type  
Operating Temperature Range:  
-57°C to +87°C  
Housing Material:  
Aluminum 5052  
Front Panel Coating:  
Black Wrinkle Powder Coat

 373 E. Industrial Blvd. Pueblo West, CO 81007		FOGPSAL Receiver					Tolerances: X ± 0.030 XX ± 0.015 XXX ± 0.005 Angle ± 1°
		Fiber Optic GPS Antenna Link Receiver					
05-20-25	MM	Scale:1:6	Rev: A	Sheet 1 of 1	Units are inches and degrees		

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