

USER MANUAL

X-Band 4 Element Patch Antenna Array

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X-BAND 4 ELEMENT PATCH ANTENNA ARRAY

USER MANUAL

This user manual details the applications, features and operation of EnduroSat's X-Band 4 Element Patch Antenna Array.

Please read carefully the manual before unpacking the antenna in order to ensure safe and proper use.

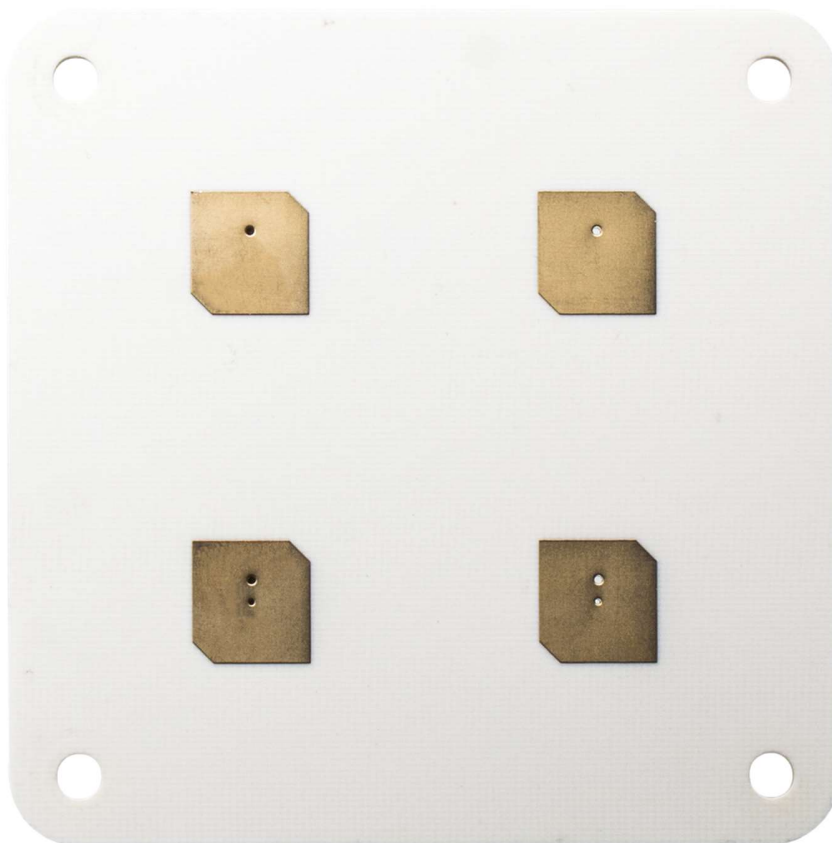


Figure 1: EnduroSat's X-band 4 Element Patch Array Antenna

1 CHANGE LOG

Date	Version	Note
10/05/2018	Rev 1	The provided parameters are based on electromagnetic simulations
18/09/2018	Rev 1.1	Text modifications.
05/11/2018	Rev 1.2	Updated dimensions and added measurements results
05/12/2018	Rev 1.3	Added picture of the actual antenna

2 ACRONYMS LIST

RF	Radio Frequency
RHCP	Right Hand Circular Polarization
SMA	Sub-Miniature version A
SMP	Sub-Miniature Push-On

3 OVERVIEW

EnduroSat’s X-Band 4 Element Patch Antenna Array is designed to operate in the 8025-8400 MHz band. The antenna’s form-factor is small which makes it easily mounted on different kinds of satellite structures.

4 HIGHLIGHTED FEATURES

- Operating frequency: 8025-8400 MHz
- RF output power: up to 4 W
- Circularly Polarized (Right-Hand)
- Half Power Beam Width (HPBW): 40 degrees
- Gain > 12dBi

5 ANTENNA LAYOUT

The antenna is an array of four nearly-square-slanted patches operating with right hand circular polarization.

Figure 2 shows the dimensions of the antenna array with a mounted SMP connector.

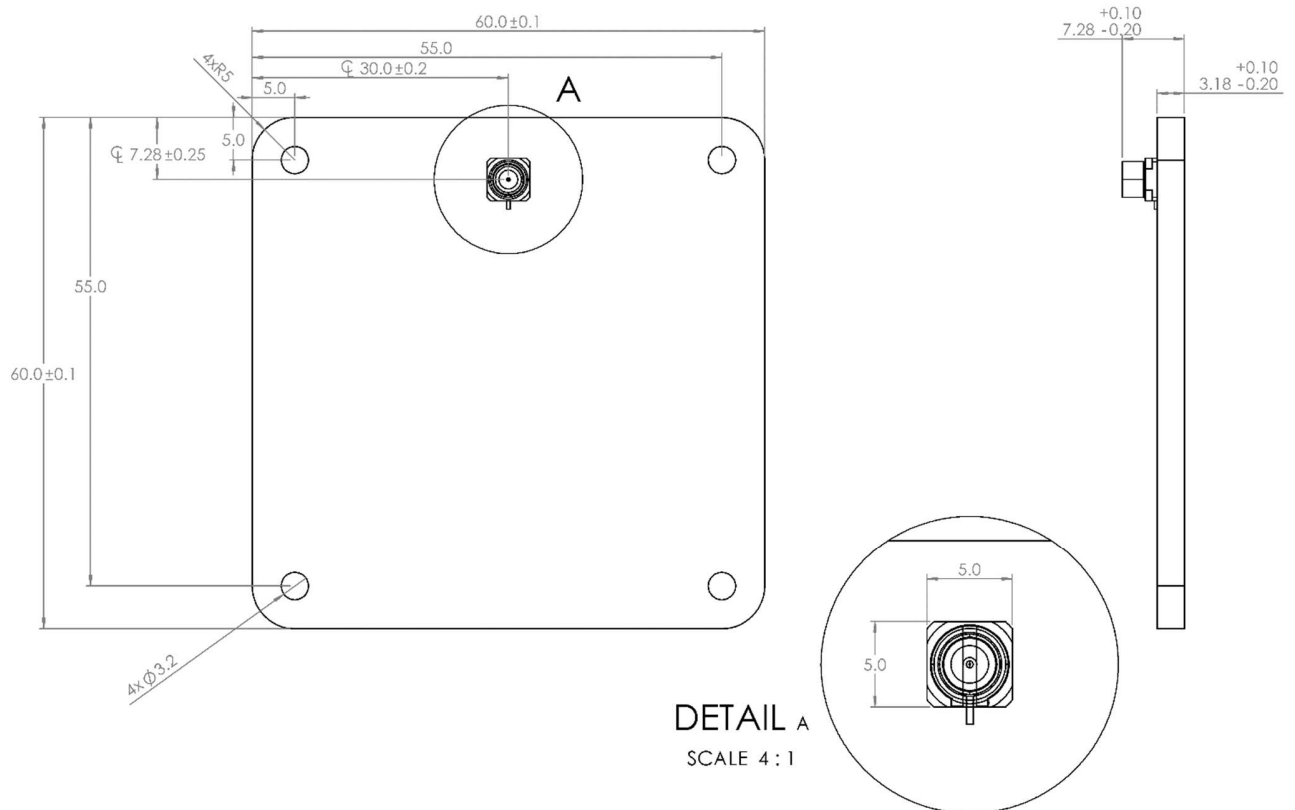


Figure 2: X-band Antenna Dimensions (all values are in mm)

6 ANTENNA PARAMETERS

Figure 3 shows the measured return loss of the antenna.

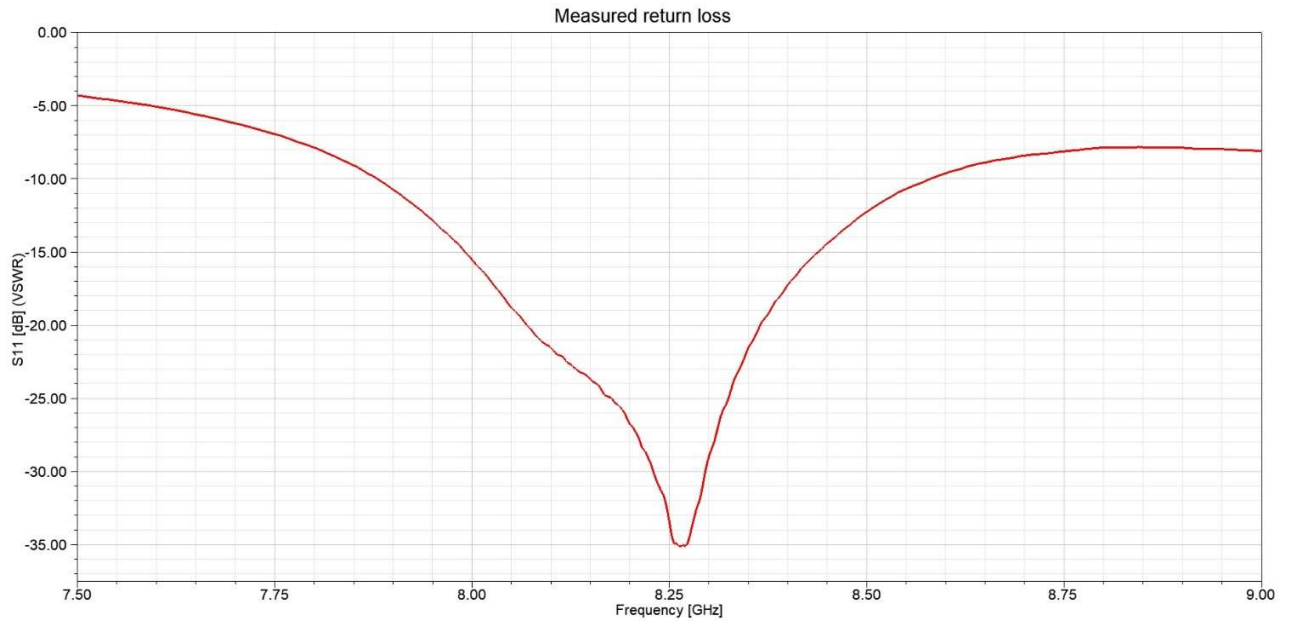


Figure 3: Measured Return Loss

Figure 4 shows the measured RHCP gain with respect to frequency.

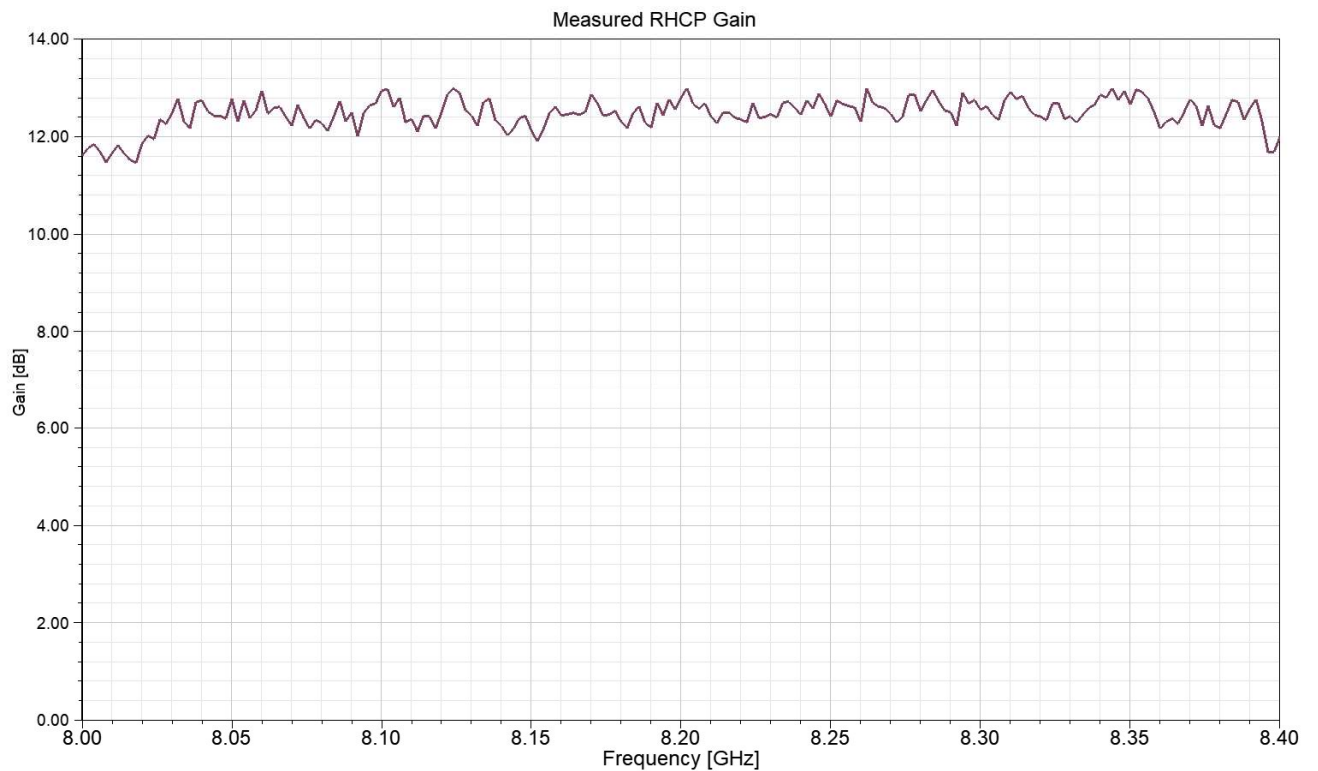


Figure 4: Measured Gain

Figure 5 shows the simulated radiation pattern of the antenna at 8.2 GHz for phi (azimuth) angles: 0°, 45°, 90°, 135° and 180°.

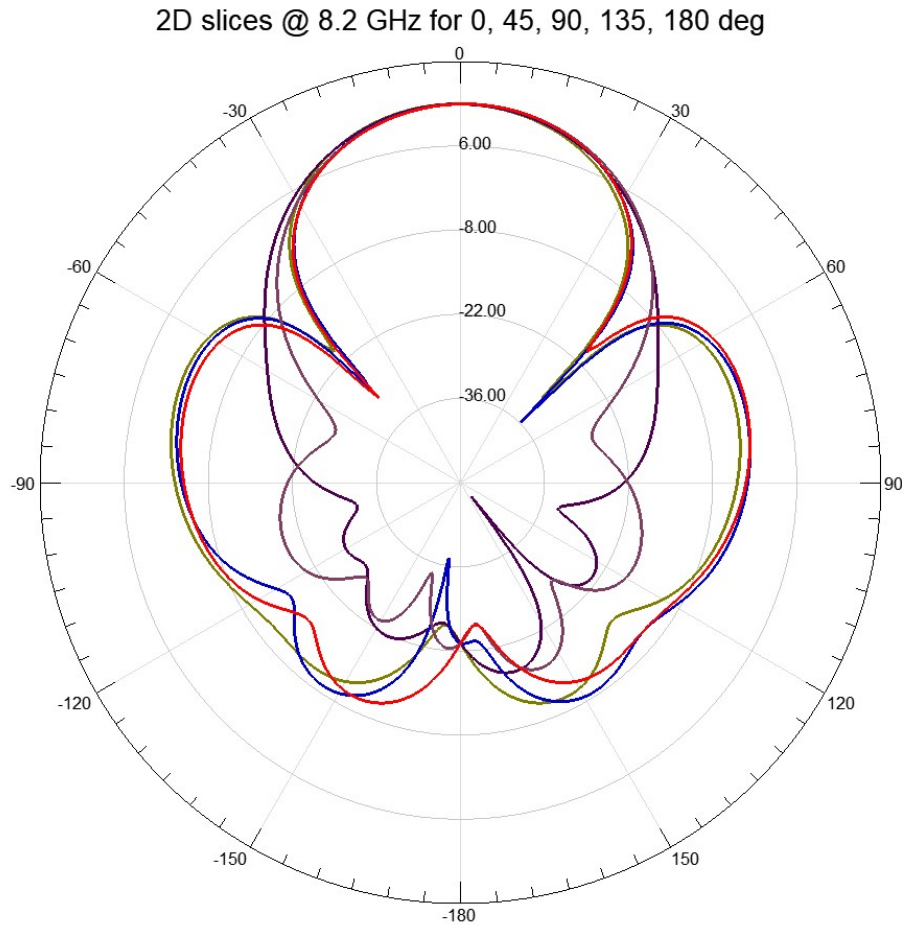


Figure 5: Simulated Radiation Pattern

7 INCLUDED IN THE SHIPMENT

EnduroSat provides additional items with the X-Band Patch Antenna:

- USB stick with user manual

8 HANDLING AND STORAGE

Particular attention shall be paid to the avoidance of damage to the antenna during handling, storage and preservation. The handling of the antenna should be performed in compliance with the following instructions:

- Handle using PVC, latex, cotton (lint free) or nylon gloves.
- The environment where the antenna will be handled shall meet the requirements for a class environment 100,000, free of contaminants such as dust, oil, grease, fumes and smoke from any source.
- Store in such a manner as to preclude stress and prevent damage.
- To prevent deterioration, the antenna must be stored in a controlled environment, i.e. the temperature and humidity levels shall be maintained in the proper ranges:
 - Ideal storage temperature range: 15°C to 27°C
 - Ideal storage humidity range: 30% to 60% relative humidity (RH)

9 WARNINGS



This product uses very fragile components. Observe precautions for handling.