

EZConnect™ (FR05-S1-R-0-105) – AN for Zigbee 868 MHz

Fractus Antennas specializes in enabling effective mobile communications. Using Fractus technology, we design and manufacture optimized antennas to make your wireless devices more competitive. Our mission is to help our clients develop innovative products and accelerate their time to market through our expertise in antenna design, testing and manufacturing.



EZConnect™

FR05-S1-R-0-105

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Fractus Antennas is an ISO 9001:2015 certified company. All our antennas are lead-free and RoHS compliant.

ISO 9001: 2015 Certified



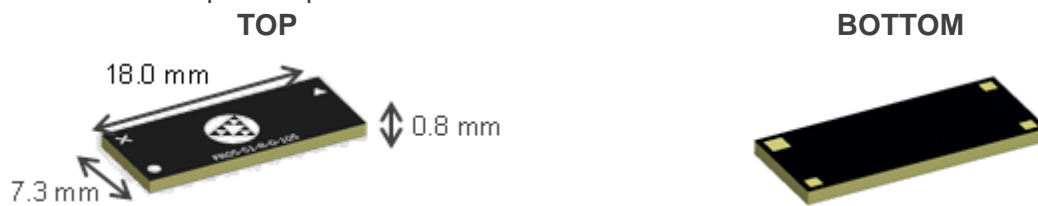
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1. ANTENNA DESCRIPTION

The EZConnect™ antenna has been specifically designed for wireless devices using Zigbee, RFID and other wireless standards operating at the ISM 868/915 MHz bands.

EZConnect™ antenna uses the space-filling properties of Fractus technology to become one of the smallest antennas for ISM868/915 applications. Additionally, the antenna maintains a high radiation efficiency that helps to improve the battery life of your devices and features an omnidirectional radiation pattern optimal for highly scattered environments such as indoor environments and public spaces.



Material: The EZConnect™ antenna is built on glass epoxy substrate.

APPLICATIONS

- Metering (Gas, Electricity, Water...)
- RFID (UHF Tags, Readers...)
- Sensors (Parking, Speed control, Optics...)
- Modules Zigbee
- Gateways

BENEFITS

- High efficiency and gain
- Small size
- Cost-effective
- Easy-to-use (pick and place)

2. QUICK REFERENCE GUIDE

Technical features	
Frequency	868 MHz
Antenna Efficiency	78.1 %
Peak Gain	2.3 dBi
Radiation Pattern	Omnidirectional
VSWR	< 2:1
Polarization	Linear
Weight (approx.)	0.2 g
Temperature	-40 to + 85 °C
Impedance	50 Ω
Dimensions (L x W x H)	18.0 mm x 7.3 mm x 0.8 mm

Table 1 – Technical Features. Measures from the evaluation board. See chapters 3 and 4.

Please contact info@fractusantennas.com if you require additional information on antenna integration or optimization on your PCB.

3. EVALUATION BOARD (868 MHz)

868 MHz configuration for the EZConnect™ chip antenna used in the PCB Evaluation Board.

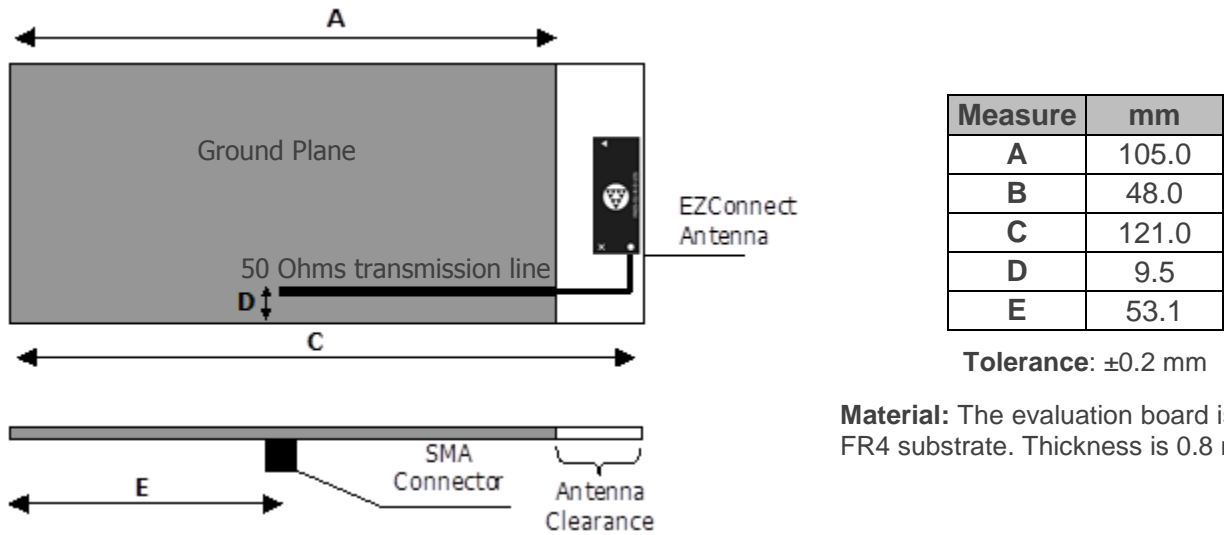


Figure 1 – EB_FR05-S1-R-0-105B. EZConnect™ Evaluation Board at 868 MHz. See pictures below and in page 5.

4. VSWR AND EFFICIENCY

VSWR (Voltage Standing Wave Ratio) and Efficiency versus Frequency (GHz).

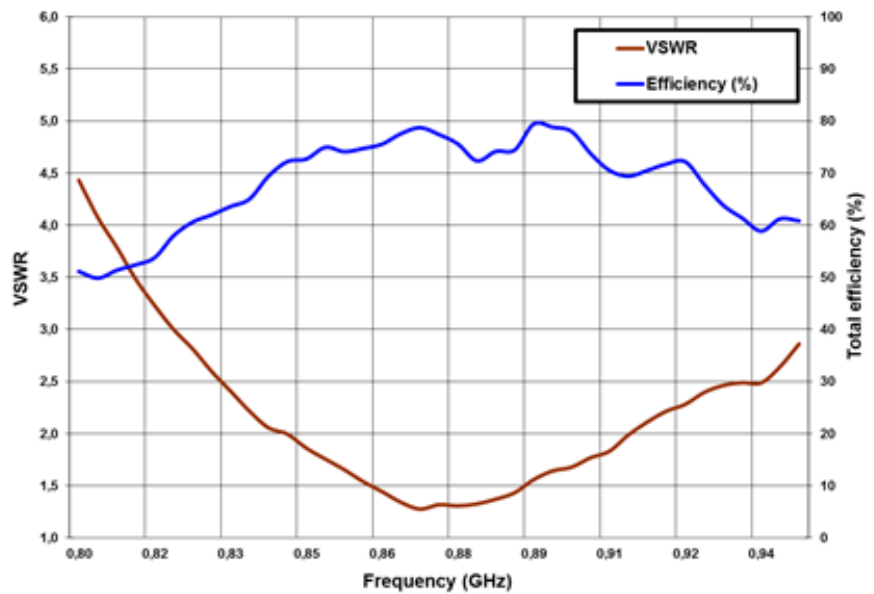
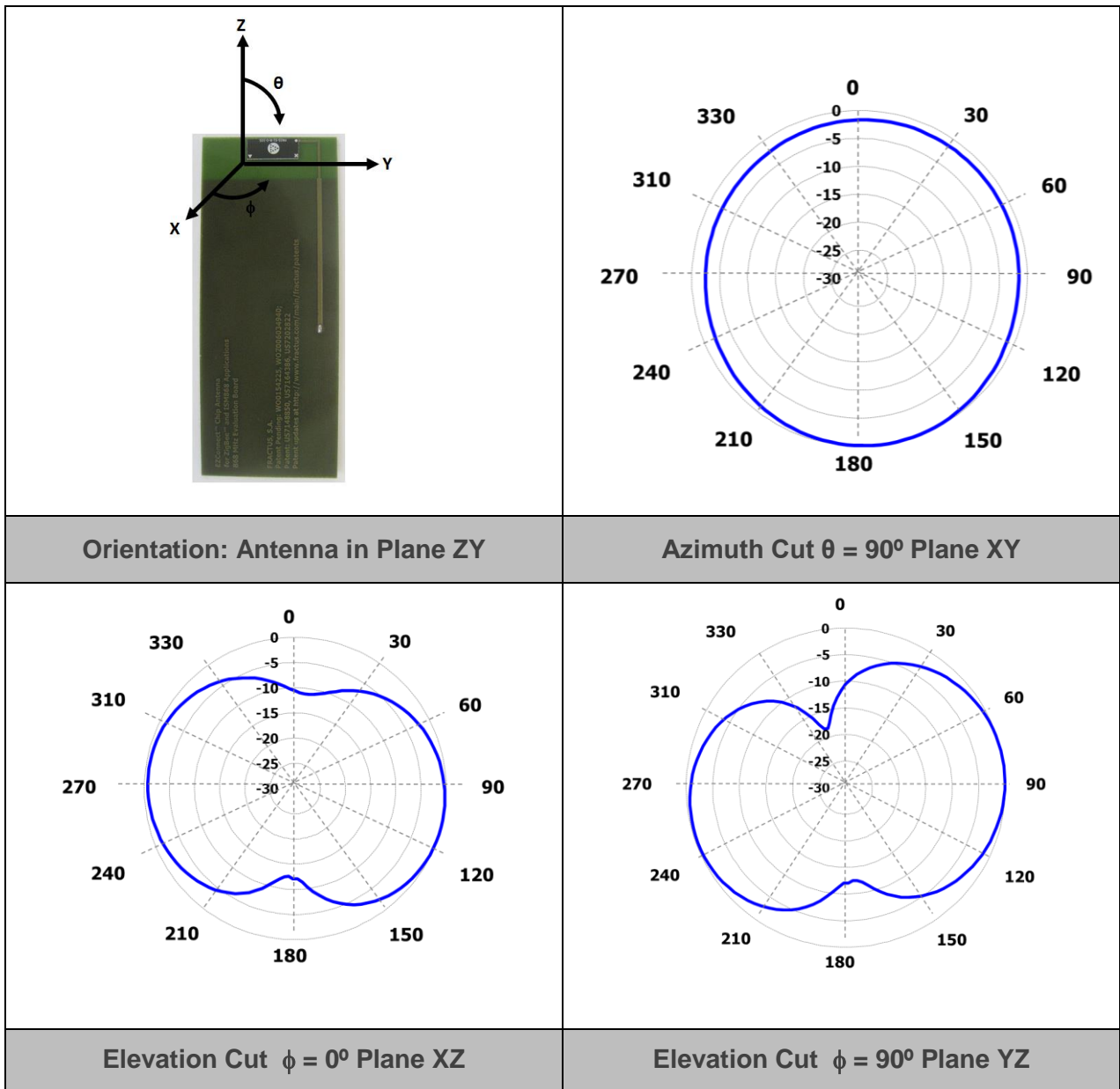


Figure 2 – Evaluation board at 868 MHz and graph of VSWR and Efficiency vs. Frequency (GHz)

5. RADIATION PATTERNS, GAIN AND EFFICIENCY (868 MHz)

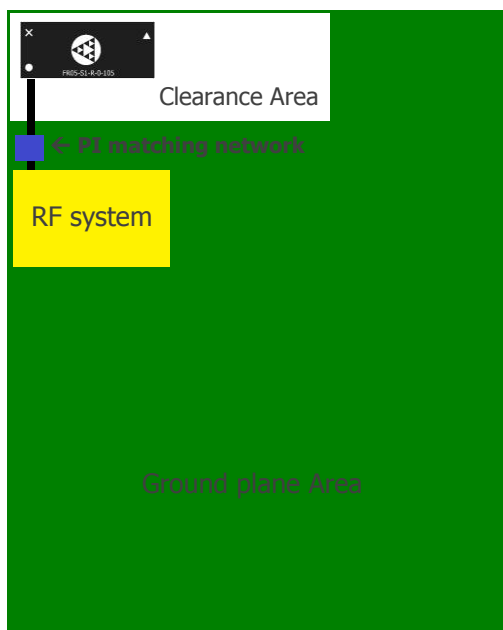


Gain	2.3 dBi
Efficiency	78.1 %

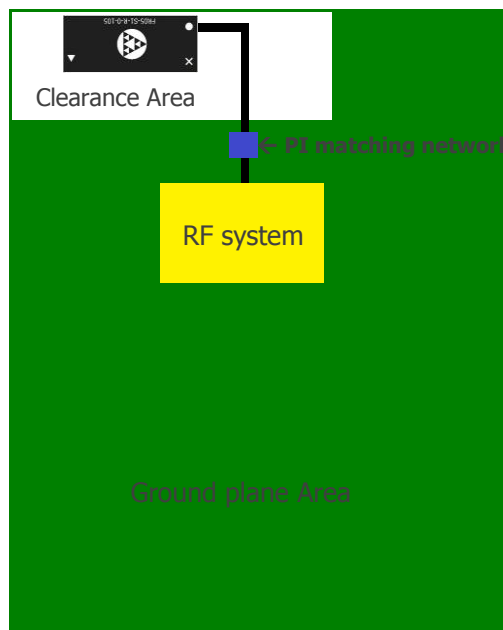
Table 2 – Antenna Gain and Efficiency at 868 MHz. Measures made in the evaluation board and in the Satimo STARGATE 32 anechoic chamber. Data across the band is not significant in this case because the bandwidth is very narrow (less than 1% or 8 MHz).

6. RECOMMENDED PCB LAYOUTS FOR A NEW DESIGN

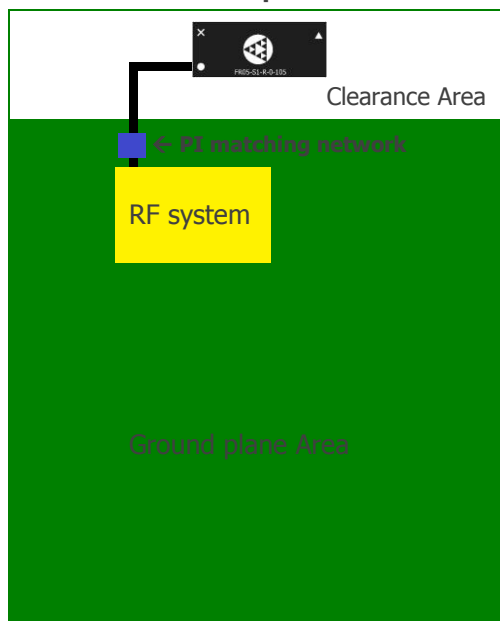
The following examples describe the basics for a new design with the EZConnect™ antenna. Notice the importance of the ground plane area, clearance area, antenna location (in the PCB corner or in the edge) and the pads for a PI matching network (close to the antenna feeding point but in the ground plane area).



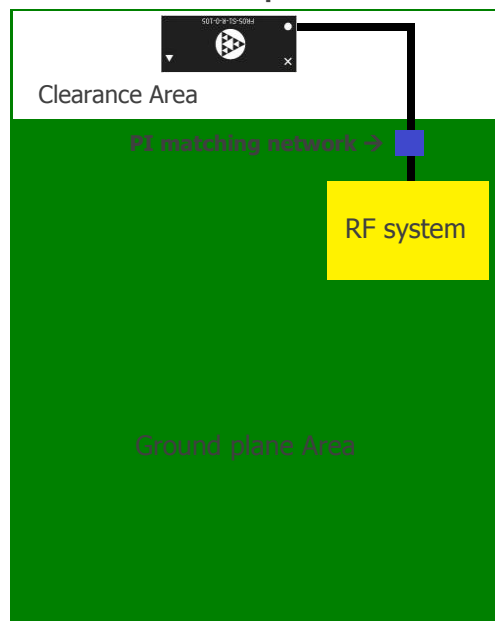
Example 1



Example 2



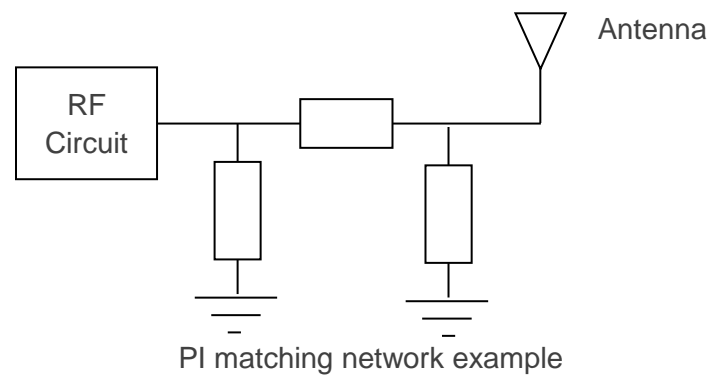
Example 3



Example 4

7. MATCHING NETWORK

The specs of a Fractus Antennas standard antenna are measured in their evaluation board, which is an ideal case. In a real design, components nearby the antenna, LCD's, batteries, covers, connectors, etc affect the antenna performance. This is the reason why it is highly recommended placing pads compatible with 0402 and 0603 SMD components for a PI matching network as close as possible to the antenna feeding point. Do it in the ground plane area, not in the clearance area. This is a degree of freedom to tune the antenna once the design is finished and taking into account all elements of the series (batteries, displays, covers, etc).



Please contact info@fractusantennas.com for more information related to the antenna matching service.