

High Efficiency RF Harvesting Antenna

Features

Harvesting SMD antenna

- Bundled SMD Antenna / Adaptation network
- Work in conjunction with high performance PMIC (AEM30xxx family) for RF energy harvesting (RFEH)

Ultra low power start-up

- PMIC cold starts from 275 mV input voltage and 3 μ W input power (typical)
- RF input power from -19 dBm up to 10 dBm (typical)

Compatible with wide transmitter power range

- Linear polarization for higher energy transfer efficiency from emitter to harvester
- Omni-directional pattern for better user experience
- +2 dBi max gain for better performances

Ultra compact design

- SMD antenna design: 10mm x 3.2mm x 3.2mm ceramic device built on glass epoxy substrate
- Compact RX Antenna PCB design (e.g. 132mm x 61mm)

Reference design

- EP112 evaluation board (EP112 EVK) comes with complete part list, layout, clearance area, matching network, SMA connector and PCB instructions for evaluation at 900 MHz
- Compatible with any AEM30xxx EVK

Compatible with multiple frequency bands

- 863 – 870 MHz / 902 – 928 MHz

SMD design

- Standard Component re-flow profile (260C peak)
- No complex 3D antenna with metallic inlay

Multiple PCB form factor

- Design optimization for custom size PCB

Description

EP112 is the Virtual Antenna™ component for RF energy harvesting solution. It works at any frequency within the 828 MHz and the 915 MHz bands, and can be implemented with any of the e-peas AEM30xxx PMICs.

The Virtual Antenna™ component EP112 allows to collect RF energy and becomes an integrated solution with the energy harvesting Power Management Integrated Circuit (PMIC) to provide IoT devices with an endless battery life.

The EP112 is designed to harvest RF energy to recharge your device. This compact component turns your PCB into an antenna that receives energy for your wireless device on multiple frequencies. One of the main advantages of this product is that it can be easily tuned to these frequencies through the proper adjustment of the matching network.

The benefits are: small footprint, PCB standard mounting technology, lower cost, easy tuning (validation by simulation), easy fit in any wireless platform, off-the-shelf standard products.

EP112 device performances can be evaluated with e-peas EP112 evaluation board (900 MHz). This evaluation board can be connected with any AEM30xxx EVK.

Applications

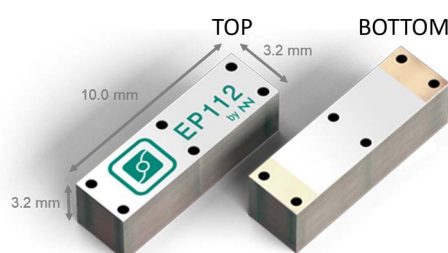
Asset Tracking/Monitoring	Smart home/building
Retail ESL/Smart sensors	Industrial applications

Device Information

Part Number	Package	Body size [mm]
EP112	SMD	10 x 3.2 x 3.2mm

Evaluation Board

The EP112 evaluation board is available at www.e-peas.com/product/ep112-rf-energy-harvesting-antenna



1. Functional Block Diagram

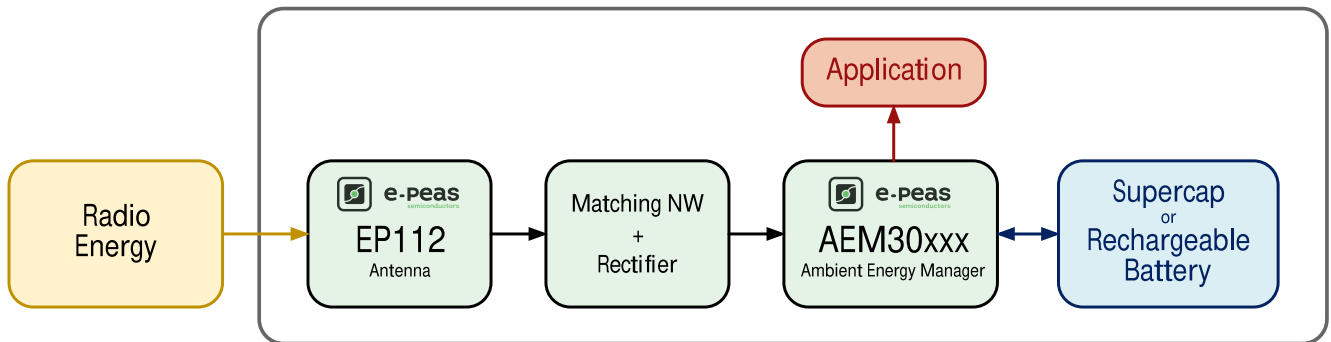


Figure 1: Functional block diagram

2. Radiation Patterns of EP112 on the 900MHz EVK PCB

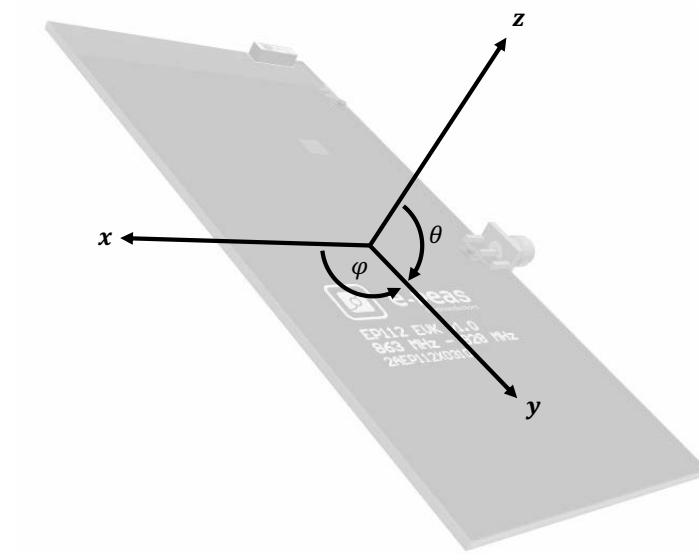


Figure 2: EP112 900 MHz EVK radiation pattern coordinates

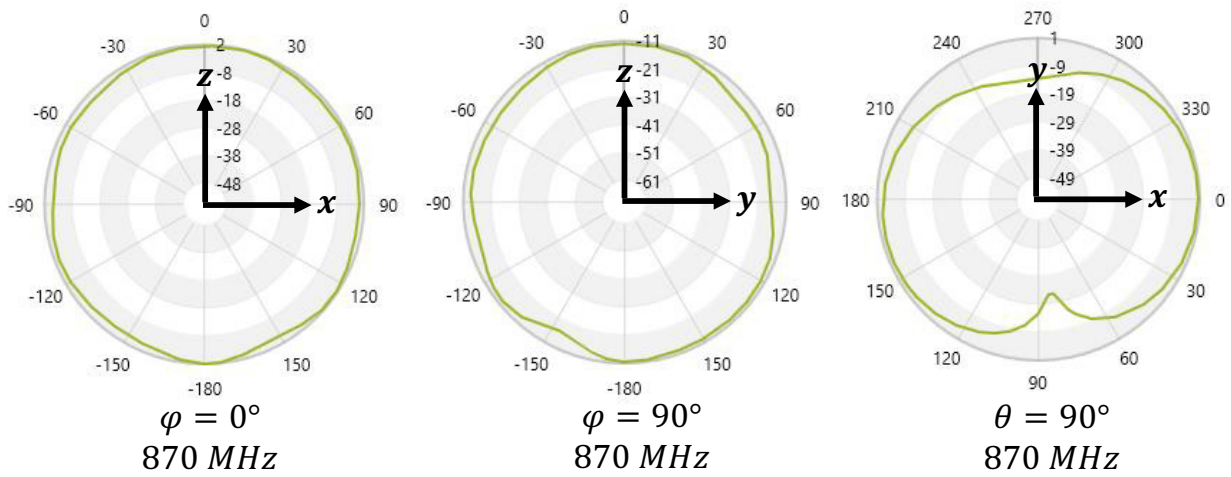


Figure 3: EP112 900 MHz EVK radiation patterns

3. Revision History

Revision	Date	Description
1.0	March, 2022	Creation of the document
1.1	April, 2022	Updated radiation patterns
1.2	May, 2023	<ul style="list-style-type: none">- References to frequencies other than the 863-928 MHz frequency range removed- Radiation pattern coordinates figure added- Radiation patterns figure replaced by the datasheet one

Table 1: Revision history