

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 μW 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 2.3mm x 2.3mm ceramic device built on glass epoxy substrate
- Compact RX Antenna PCB design (e.g. 6mm x 60mm)

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 and 2.4 GHz
- Compatible with any AEM30xxx EVK

Multiple bands

- 863 – 870 MHz / 902 – 928 MHz / 2.4 GHz / 5 GHz

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 100 MHz to 6 GHz band, and can be implemented with any of the e-peas AEM30xxx PMIC's.

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 an endless battery life.

The EP112 is designed for RF energy harvesting enabling your device to recharge. The compact component turns your PCB into an antenna that receives energy for your wireless device on multiple frequencies, including the 868 MHz and 915 MHz or the 2.4 GHz - 2.5 GHz frequency bands. 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.

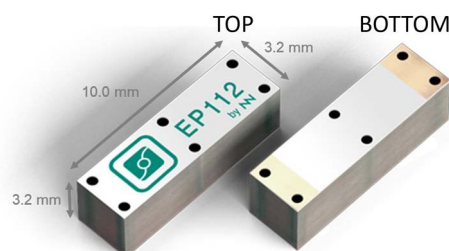
EP112 device performances can be evaluated with e-peas EP112 evaluation boards (900 MHz or 2.4 GHz). These evaluation boards can be connected with either AEM30940 EVK or AEM30330 EVK.

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 2.3 x 2.3mm



1. Functional Block Diagram

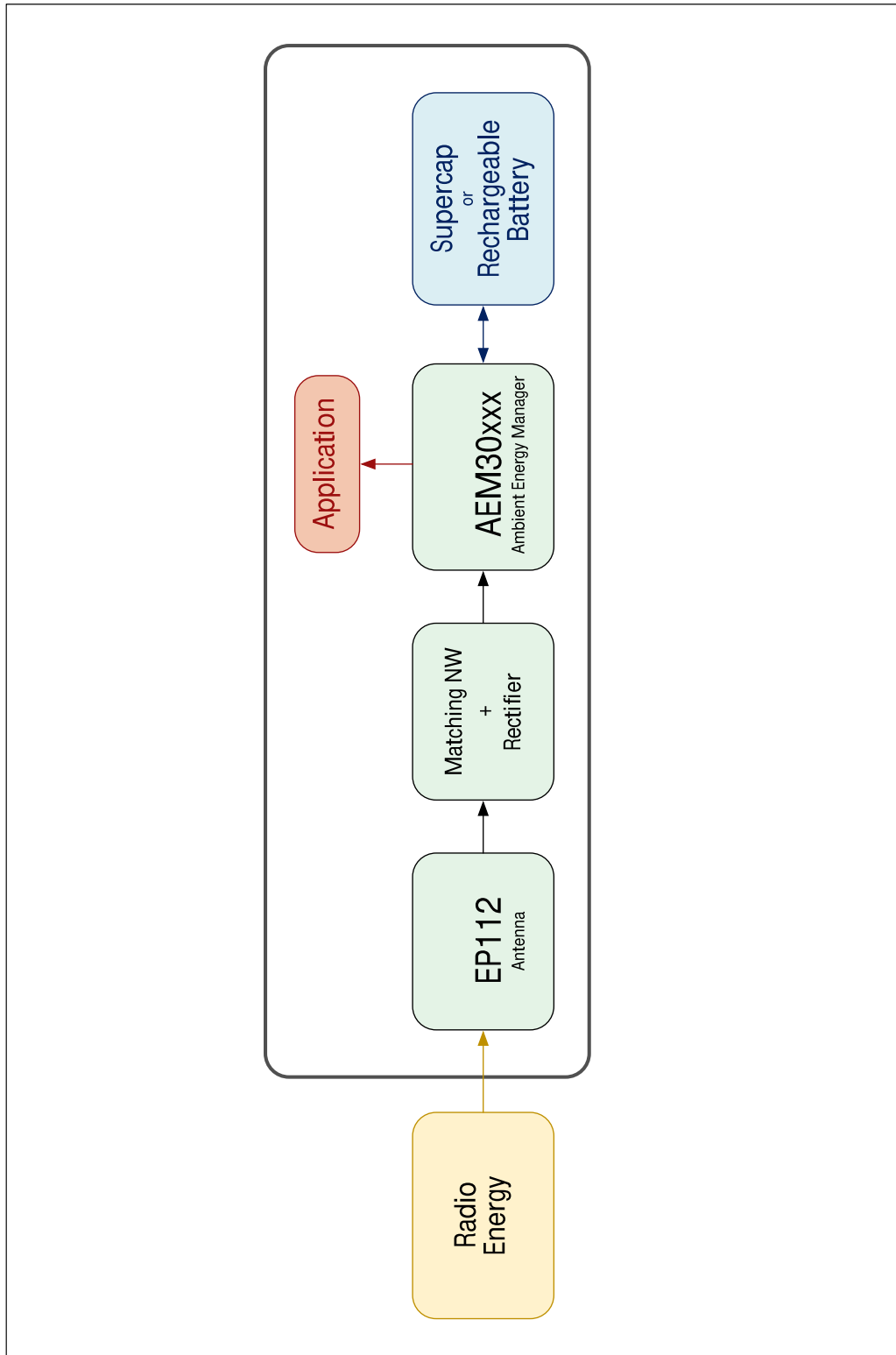
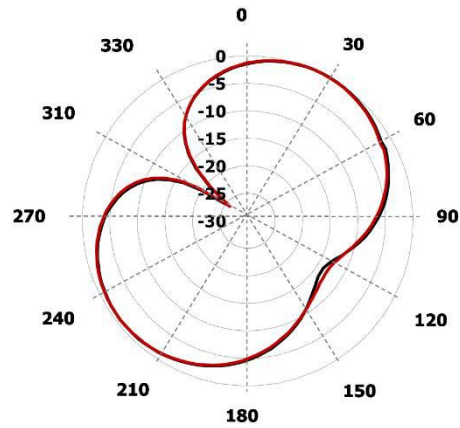
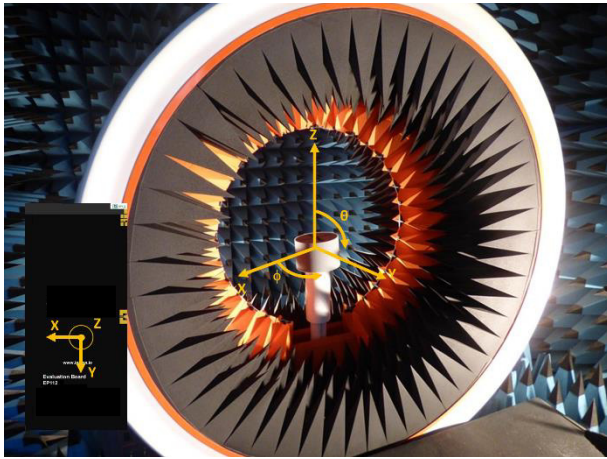


Figure 1: Functional block diagram

2. Radiation Patterns of EP112 on EVK PCB

2.1. 863 - 921 MHz



Measurement system setup
Evaluation board in plane XY

$\theta = 90^\circ$ plane XY at 868 MHz & 915 MHz

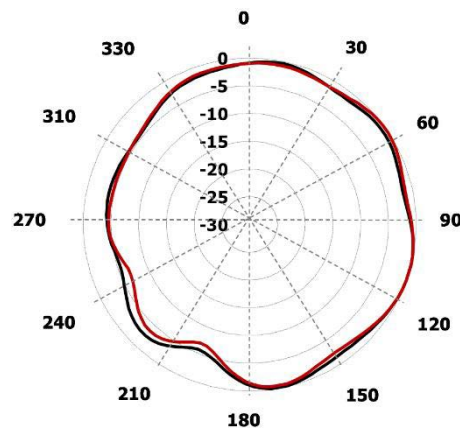
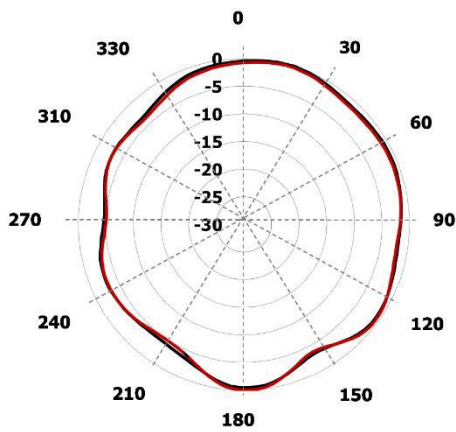
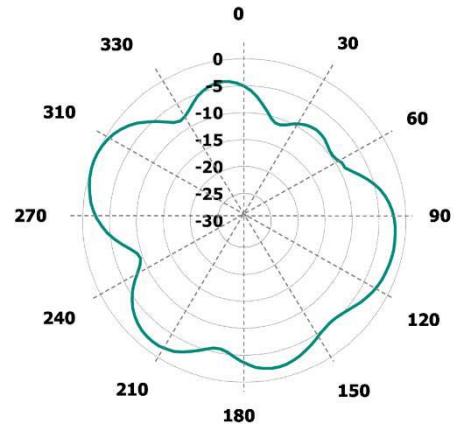
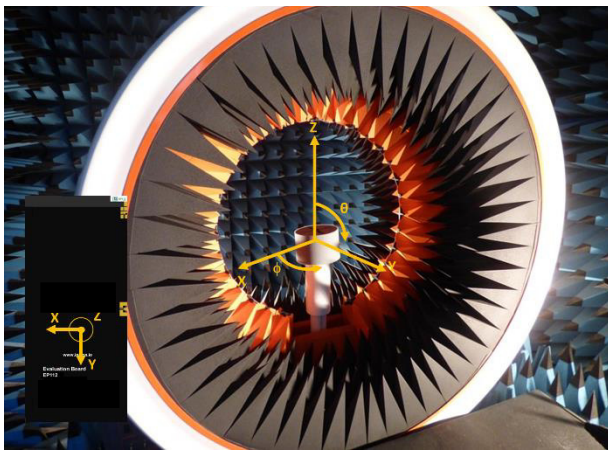


Figure 2: EP112 863 - 921 MHz radiation pattern

2.2. 2400 - 2500 MHz



Measurement system setup
Evaluation board in plane XY

$\theta = 90^\circ$ plane XY at 2450 MHz

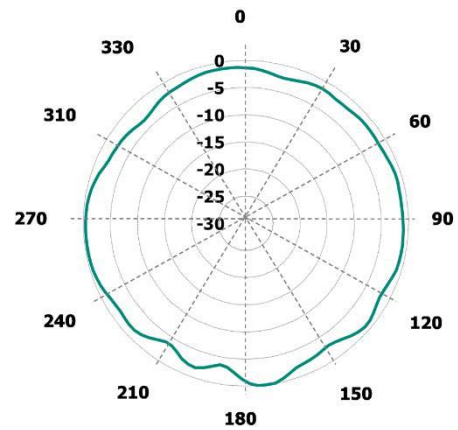
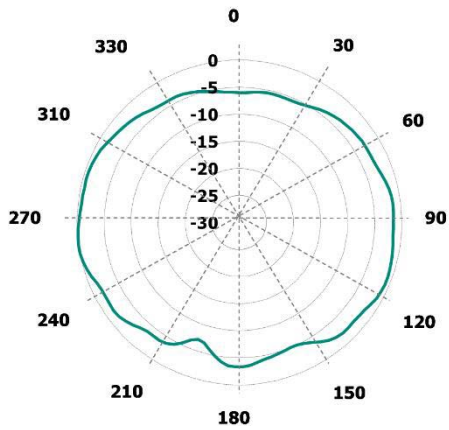


Figure 3: EP112 2400 - 2500 MHz radiation pattern