



# **Wireless Harvesting Evaluation Kit**

**QUICK START GUIDE**

# Overview and Box Contents

This guide explains how to set up a wireless power harvesting network using the Energos 1W PowerBridge transmitter, e-peas AEM30940 RF system harvesting charger, PMIC evaluation board and EnerCera EC382704P-T rechargeable battery.

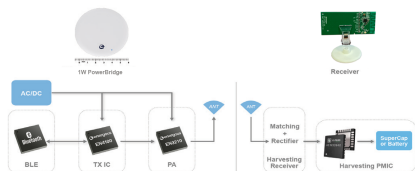


Figure 1: Wireless Power Network System Diagram

## Box Contents:

- Energos 1W PowerBridge transmitter (1)
- 5V/1A USB power adapter and USB-A to USB-C cable (1)
- Wall/ceiling mounting plate (1)
- E-peas AEM30940 RF system harvesting charger and PMIC evaluation board (1)
- EnerCera EC382704P-T rechargeable battery (1)



Figure 2: Energos 1W PowerBridge Transmitter and PMIC evaluation board

# 1. Energos PowerBridge Setup

- Connect the USB cable to the Energos 1W PowerBridge transmitter and the power supply.
- Mount the Energos 1W PowerBridge transmitter on a stand, a wall, or a ceiling using the keyhole screw mounts or with the included optional mounting plate. Position it so that it points towards the intended area of operation.



Figure 3: Mounting Diagram

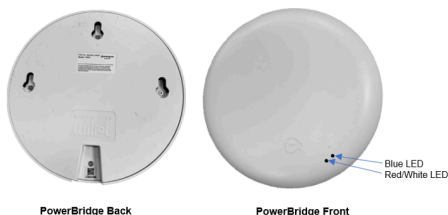


Figure 4: Energos 1W PowerBridge Transmitter Back/Front View

- Plug in the Energos 1W PowerBridge transmitter power supply.
- After power-on, the blue LED flashes for 30 seconds to indicate that the PowerBridge is running.
- The Energos 1W PowerBridge transmitter starts RF power transmission automatically in 918 MHz and the white LED turns on solid.

## 2. Receiver Setup

To avoid potentially damaging high input power, ensure that the receiver is not placed directly next to the transmitter. A 100k ohm resistor is connected to the HVOUT terminals, which generates a 25  $\mu$ A current draw when the HVOUT LDO is enabled, simulating the operation of an IoT sensor. Additionally, a 10 mF SuperCap storage element is connected to the system. The AEM30940 register defaults are SELMPP 00, CFG 101, and utilizes the Low RF path configuration.



Figure 5: Receiver Setup

- Position the receiver board 1.5m to 2m from the Energous 1W PowerBridge.
- The SuperCap is now charging. When the SuperCap voltage reaches 3.7V, the HVOUT and LVOUT LDO are enabled. A DMM can monitor the voltage across the SuperCap (headers are marked).

## Receiver Setup Cont'd.

- If the receiver is 2 meters or less from the Energous 1W PowerBridge transmitter, it should maintain continuous (net positive) operation.
- HVOUT will stay at 2.5V, and the SuperCap voltage will either charge up to 4.1V or remain near 3.7V, depending on whether the distance allows sufficient power to offset the 25  $\mu$ A load.
- When the receiver is positioned more than 2 meters away from the Energous 1W PowerBridge transmitter, it enters a duty cycle mode. In this mode, the SuperCap discharges to 3V, causing the AEM30940 to turn off the LDOs. The SuperCap then recharges up to 3.7V, at which point the AEM30940 turns the LDOs back on.

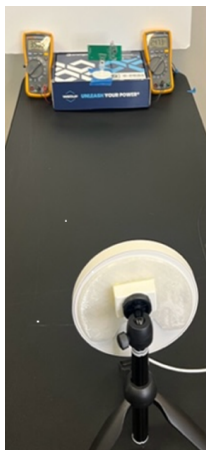


Figure 6: System Test Setup

# FCC Regulatory Information

## FCC ID: 2ADNG-VN25 Model: VN25

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1) This device may not cause harmful interference; and
- 2) This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy; and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the equipment being interfered with.
- Increase the separation between the charger and the equipment subject to interference.
- Connect the equipment into an outlet on a circuit different from that to which the charger is connected.
- Consult the dealer or an experienced radio/TV/electronics technician for help.

## FCC Regulatory Information Cont'd.

**CAUTION:** Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

VN25 RF wireless charger complies with FCC RF radiation exposure limits for an uncontrolled environment in accordance with FCC Rule Part 2.1093. The wireless charger transmitter is designed to be installed on the ceiling or on a side wall and must be installed accordingly to ensure a minimum 20 cm separation distance from persons.

### **IC: 23686-VN25, Model: VN25**

This device complies with Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions:

- 1) This device may not cause interference; and
- 2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- 1) l'appareil ne doit pas produire de brouillage;
- 2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

## FCC Regulatory Information Cont'd.

VN25 RF wireless charger complies with ISED radiation exposure limits. The wireless charger transmitter is designed to be installed on the ceiling or on a side wall and must be installed accordingly to ensure a minimum 22 cm separation distance from persons.

Le chargeur sans fil RF VN25 est conforme aux limites d'exposition aux rayonnements ISED. L'émetteur du chargeur sans fil est conçu pour être installé au plafond ou sur un mur latéral et doit être installé en conséquence pour assurer une distance de séparation minimale de 22 cm des personnes.





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