

Overview

This compact module is excellent for converting wireless power to a measurable and stable DC voltage. Operating over a wide range of frequencies, it can harvest wireless energy from 60Hz to 6GHz. When connected to an antenna, the module can extract power from wireless sources or be used as a sensor for low power wireless signals.

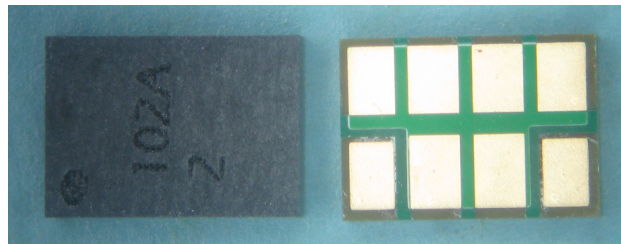


Figure 1. RFD102A 5mm x 7mm x 1.8mm wireless energy harvesting module.

Electrical Properties

Standard V output @ 915 MHz into 1MOHM

-13 dBm	0.4 V
0 dBm	2.9 V
10 dBm	10.4 V
20 dBm	30.0 V
30 dBm	34.0 V

Operational Frequency Range

60Hz to 6GHz

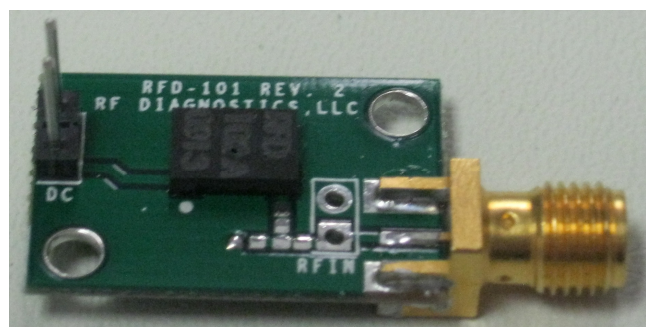
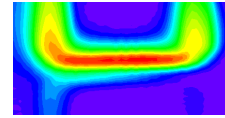
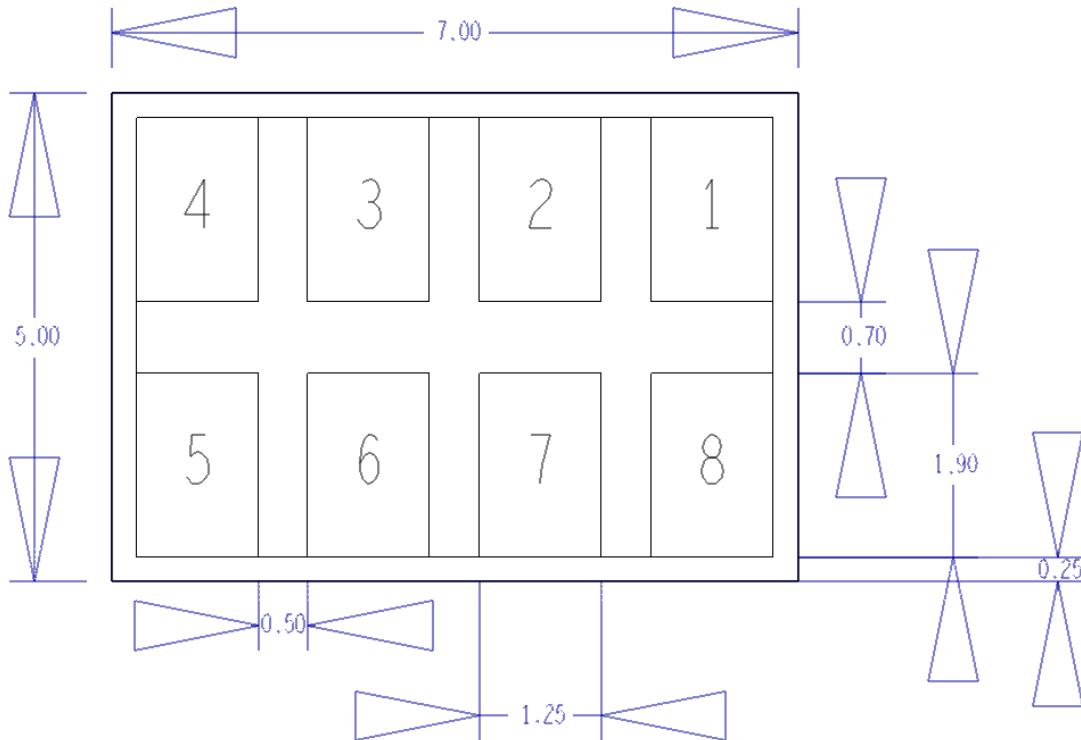


Figure 2. RFD102A evaluation board with impedance matching sites on RFIN and optional 2-pin header connection for a through hole antenna connection.



Pin-out and Schematic



Footprint of the module viewed from above

dimensions in mm

Pin 1	Pin 4	Pins 2, 3, 5 - 8
DC Output	RF Input	Ground

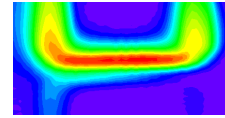
Module thickness is 1.8 mm max.

Additional Technical Information

Maximum Ratings and Output Voltage Protection

The RFD102A includes the following features:

- ESD protection for 8 kV pulse protection on the RF input line
- +/-10V maximum on the RF input line.
- +33dBm maximum RF input power on the RF input pin.



- An external Zener diode is recommended for use with the RFD102A to avoid device failure.
- -0.5V/+40V maximum on the DC output pin.
- Maximum output current is 18mA.
- Exceeding the above limits can cause partial or permanent module damage.

Other Comments

The recommended load on the DC output is 1-10 KOhm for maximally efficient power transfer. Some input impedance tuning is needed to optimize the design for a specific frequency. The module is capable of producing a maximum of 18mA DC current into a 50-Ohm load.

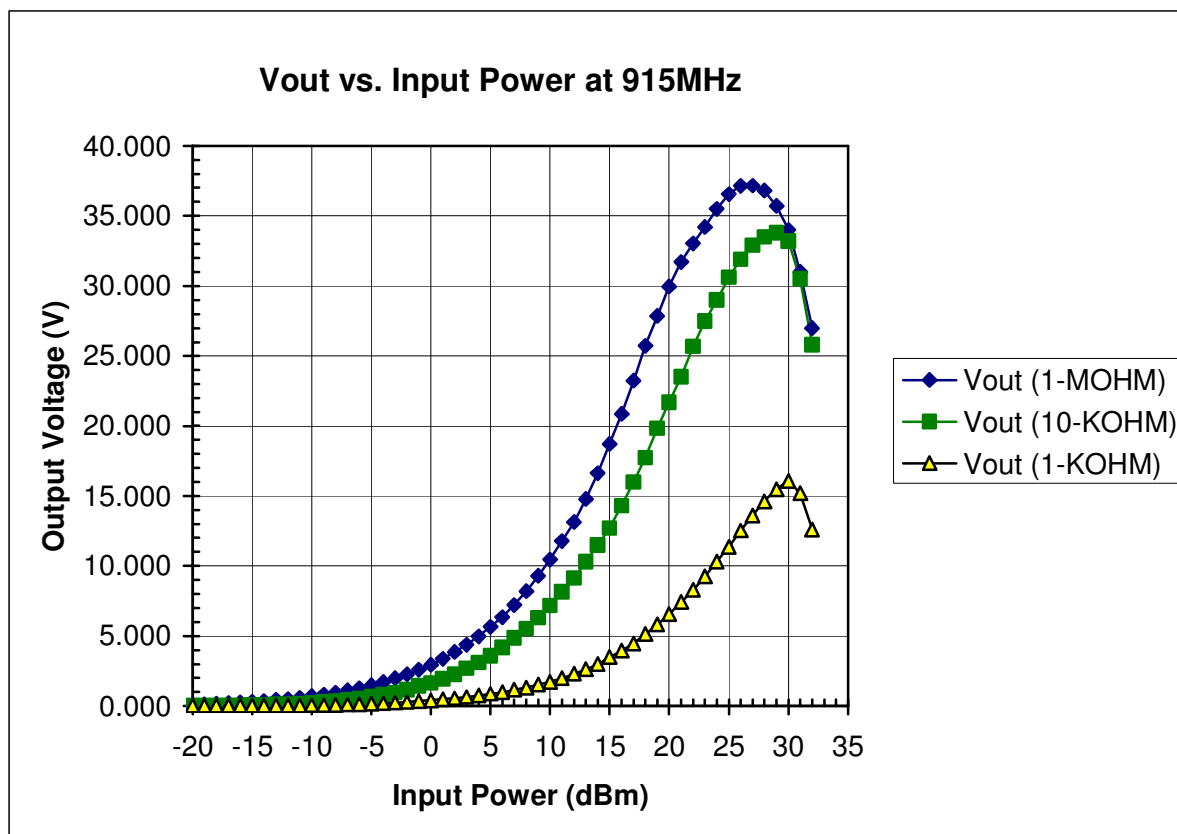


Figure 3. DC output vs. RF input power for the RFD102A into a 1MOHM, 10KOHM and 1KOHM load.

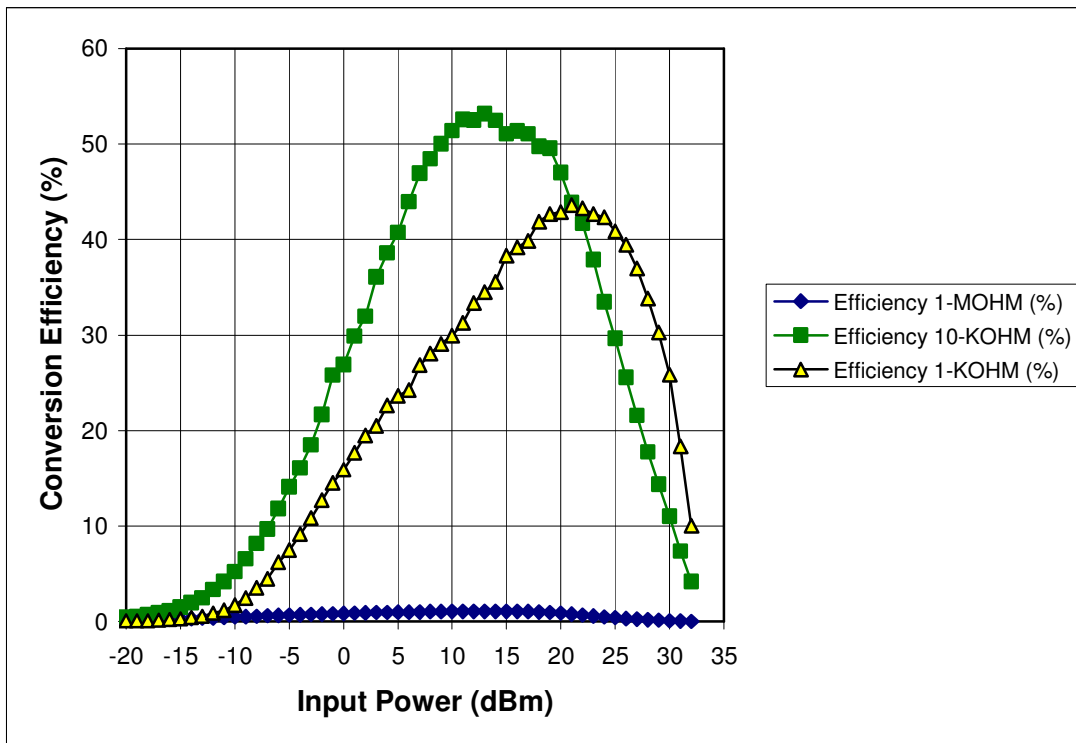
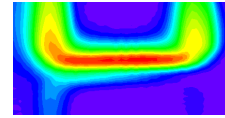


Figure 4. RF to DC conversion efficiency ($100 \times P_{out_DC}/P_{in_RF}$) vs. RF input power for the RFD102A into 1MOHM, 10KOHM and 1KOHM loads at 915MHz.

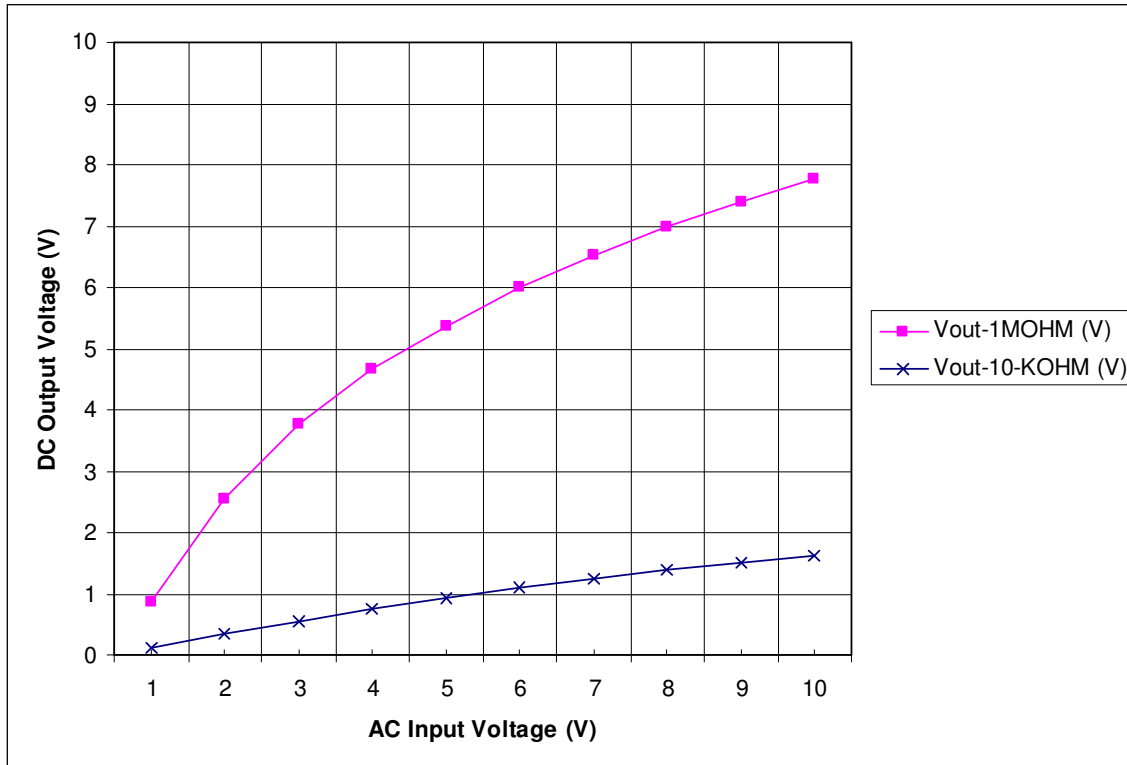
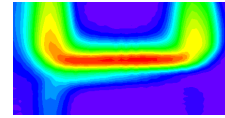


Figure 5. DC output voltage vs. AC input voltage at 60Hz into a 1MOHM and a 10KOHM load.

Disclaimer

This module is guaranteed to be defect free upon shipment. However the module is not intended for use in critical applications such as medical devices, automotive safety, or anywhere else where poor performance can result in injury, loss of life or property. The user agrees to assume all risks arising from use of the module and releases RF Diagnostics from all liability for its malfunction or misuse. Specifications listed on datasheets are subject to change without notice.

Datasheet Revision: 6-30-2014