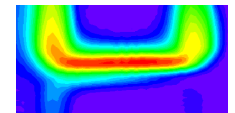


RFD102A-TB & RFD-ASSY-01 RF-DC Converter Module Performance Summary at 5.2GHz

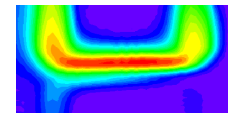
Contact: Thomas Budka, Ph.D.
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www.rfdiagnostics.com



RF Diagnostics, LLC

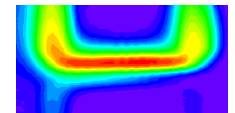
RFD-102A-TB Summary

- The RFD102A is a compact broadband 60Hz...6GHz RF-DC converter 5mm x 7mm surface mount module that can be used for wireless energy harvesting with a peak efficiency of 60% under certain frequency and input power conditions. The module can also be used as a medium power wireless power detector when connected to an antenna.
- The following performance curves are measured directly from the RFD102A-TB (test board) in a 50-Ohm measurement system without any deembedding or matching. Further performance improvements are possible with narrowband matching. S-parameters vs. power files are available upon request.



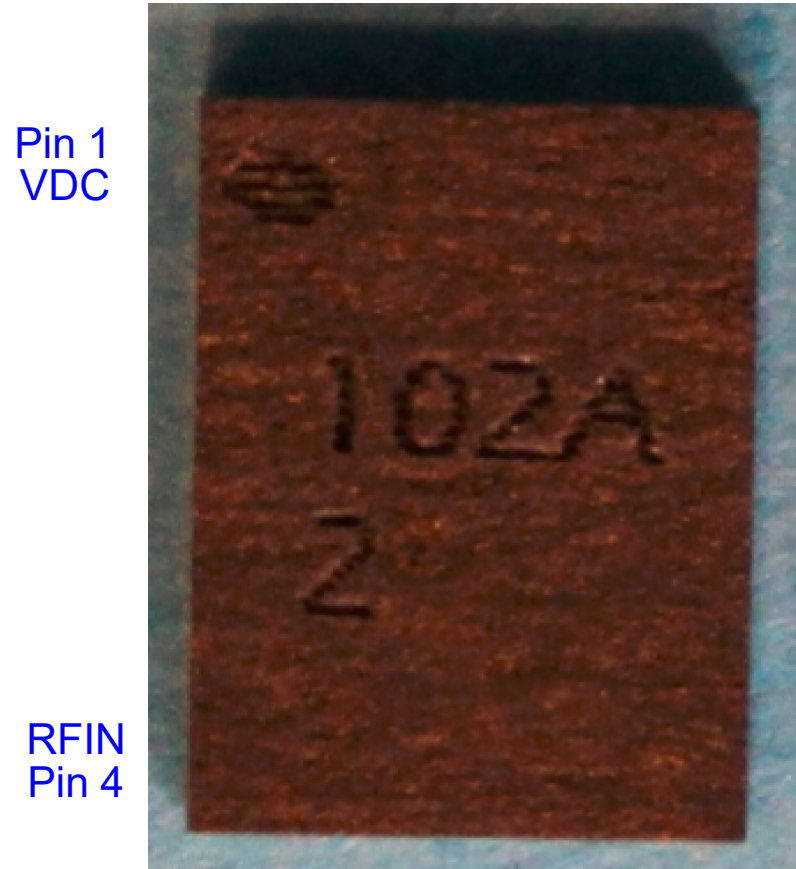
RFD102A-TB Test Instructions

- Since the input to the RFD102A-TB is not 50-Ohms, we recommend using a 1dB...6dB attenuator at the RF input to get more repeatable results from test stand to test stand.
- With RF Off, connect a SMA coaxial cable to the DUT. Tighten the SMA while holding the SMA connector. Avoid holding and flexing the test board while tightening the SMA connector since this may cause damage to the solder joints on the test board.
- Connect ground first to the board and then connect DCOUT.
- The part is ready for testing.
- Do not exceed 33dBm (2W) into the RFD102A-TB or damage may result.
- The DC Output Pin is not ESD protected and should not be hot connected. Be sure RF is off when connecting to the DC output pin.

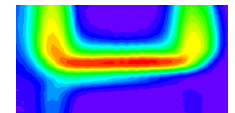
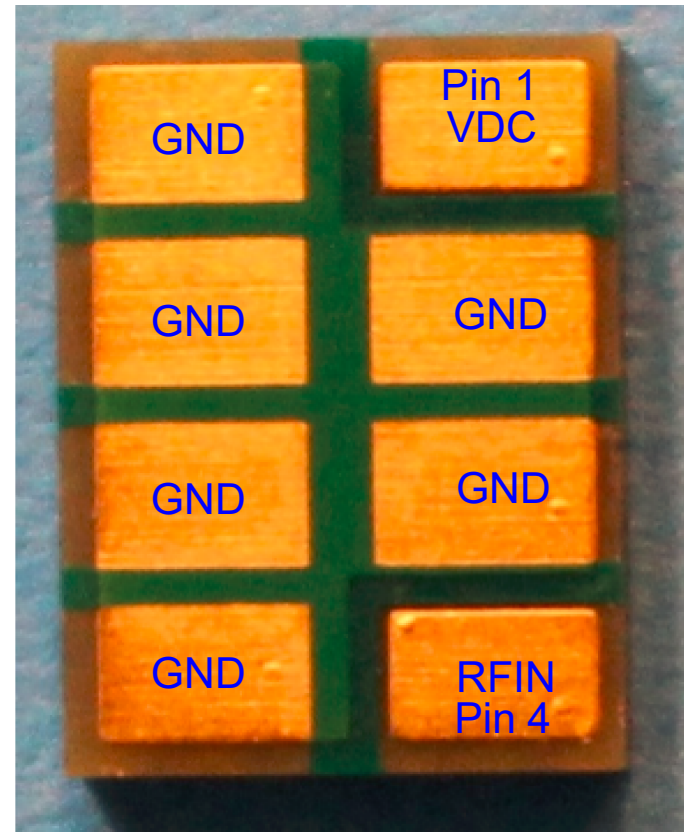


RFD102A Pin Out

Top View

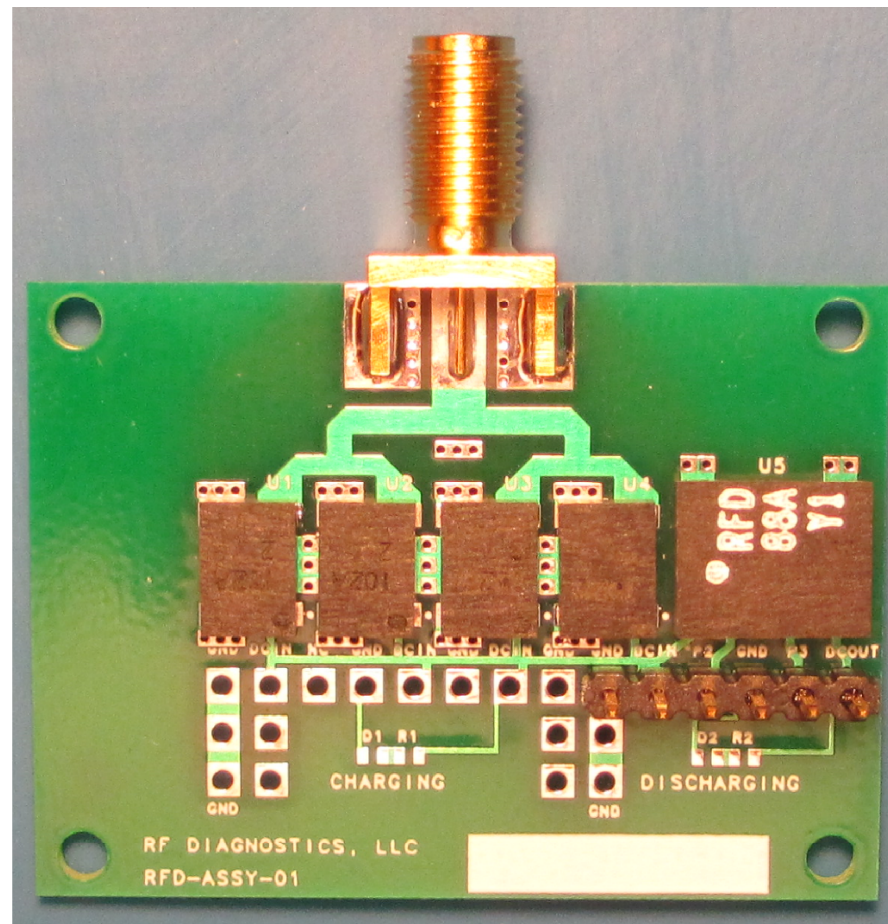


Bottom View



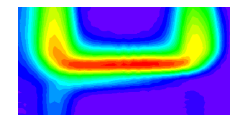
RFD-ASSY-01

- The RFD-ASSY-01 is a reference design that uses 4 RFD102A modules with a power combiner network to achieve higher output currents. The output of the RFD102A array is connected to the input of the RFD88A Energy Harvesting Engine Module for power output control and regulation.



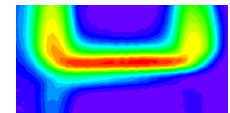
Pin Description

1. GND
2. DC OUT from RFD102A's
3. Pin 2 of RFD88A – Ground this pin to get VHIGH=2.5V
4. GND
5. Pin 3 of RFD88A – Ground this pin to get VHIGH=3.0V
6. Regulated DC Out of RFD88A. VHIGH=5.2V, 3.0V, 2.5V depending upon jumper settings



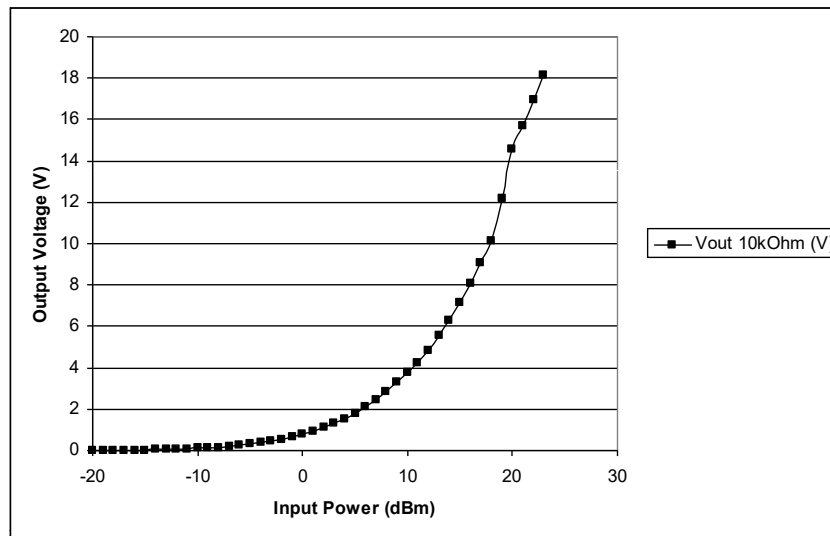
RFD-ASSY-01 Test Instructions

- Since the input to the RFD-ASSY-01 is not 50-Ohms, we recommend using a 1dB...6dB attenuator at the RF input to get more repeatable results from test stand to test stand.
- Select a large value capacitor to use and connect it to DCIN (Pin 2) and GND (Pin 1) of the assembly.
- Important: Do not operate the RFD-ASSY-01 without a load resistor on the DCOUT pin to GND. If DCIN reaches 6V with an open or high impedance on DCOUT then the RFD88A will be damaged. Under normal operation the RFD88A will switch on when the DCIN level reaches 5.2V. If there is no load then the RFD88A's internal components will attempt to dissipate this voltage and become damaged when DCIN reaches ~6V.
- With RF Off, connect a SMA coaxial cable to the DUT. Tighten the SMA while holding the SMA connector. Avoid holding and flexing the test board while tightening the SMA connector since this may cause damage to the solder joints on the test board.
- Connect ground first to the board and then connect DCOUT to a load resistor.
- The part is ready for testing.
- Do not exceed 36dBm (4W) into the RFD102A-TB or damage may result.
- The DC Output Pin is not ESD protected and should not be hot connected. Be sure RF is off when connecting to the DC output pin.

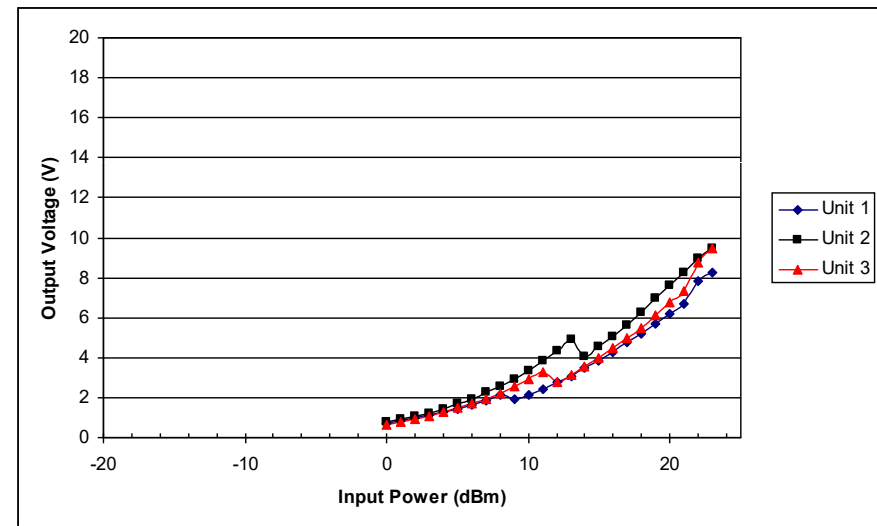


5.2GHz Performance Comparison – 10kOhm Load

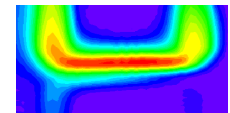
RFD102A-TB



RFD-ASSY-01



RF-DC Conversion Efficiency: 14-19% from
10dBm...23dBm



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