



# **Development of a High Volume Capable Process to Manufacture High Performance Photovoltaic Cells**

**Cooperative Research and Development Final Report**

**CRADA Number: CRD-08-322**

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**NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.**

**CRADA Report**  
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## Cooperative Research and Development Final Report

In accordance with Requirements set forth in Article XI.A(3) of the CRADA document, this document is the final CRADA report, including a list of Subject Inventions, to be forwarded to the Office of Science and Technical Information as part of the commitment to the public to demonstrate results of federally funded research.

**CRADA Number:** CRD-08-322

**CRADA Title:** Development of a High Volume Capable Process to Manufacture High Performance Photovoltaic Cells

**Parties to the Agreement:** RF Micro Devices Inc.

### **Joint Work Statement Funding Table showing DOE commitment:**

<b>Estimated Costs</b>	<b>NREL Shared Resources</b>
Year 1	\$ 00.00
Year 2	\$ 00.00
Year 3	\$ 00.00
TOTALS	\$ 00.00

### **Abstract of CRADA work:**

The intent of the work is for RFMD and NREL to cooperate in the development of a commercially viable and high volume capable process to manufacture high performance photovoltaic cells, based on inverted metamorphic (IMM) GaAs technology. The successful execution of the agreement will result in the production of a PV cell using technology that is capable of conversion efficiency at par with the market at the time of release (reference 2009: 37-38%), using RFMD's production facilities.

The CRADA work has been divided into three phases:

- A foundation phase where the teams will demonstrate the manufacturing of a basic PV cell at RFMD's production facilities;
- A technology demonstration phase where the teams will demonstrate the manufacturing of prototype PV cells using IMM technology at RFMD's production facilities, and;
- A production readiness phase where the teams will demonstrate the capability to manufacture PV cells using IMM technology with high yields, high reliability, high reproducibility and low cost.

### **Summary of Research Results:**

RFMD, in cooperation with NREL, has fabricated dual-junction PV cells that integrate gallium arsenide (GaAs) and indium gallium phosphide (InGaP) PV junctions using the Company's standard six-inch

semiconductor equipment. The successful fabrication of the dual-junction PV cells clears the way for RFMD to develop triple-junction structures, with the ultimate goal of developing a commercially viable and high volume-capable compound semiconductor-based process for high-performance PV cells. RFMD's development efforts related to a compound semiconductor-based process for PV cells are broadly applicable across technologies, including IMM as well as conventional triple-junction Germanium-based CPV devices.

(taken from <http://ir.rfmd.com/releasedetail.cfm?releaseid=554243>)

**Subject Inventions Listing:**

None

**Report Date:**

10/1/12

**Responsible Technical Contact at Alliance/NREL:**

John F. Geisz

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