



# U.S. Department of Energy Categorical Exclusion Determination Form



Program or Field Office: Office of Energy Efficiency and Renewable Energy:  
Phase III Xlerator Program

Funding Opportunity Number DE-FOA-0000397

Applicant Name: Microlink Devices, Inc

Location: Niles, IL

Project Title Backside Contact Multijunction Solar Cells for High  
Concentration Applications

Proposed Action or Project Description American Recovery and Reinvestment Act:

In Phase I, a complete fabrication process was developed for producing backside contact interconnects in epitaxial liftoff-based solar cells. Detailed device simulations of the backside contact solar cell device show excellent performance under high concentration and a relative performance improvement of more than 10% at 500 suns compared with a conventional topside contact solar cell. In the Phase III project, the backside contact fabrication process will be extended to fabricate high efficiency, triple-junction, inverted-multijunction-metamorphic (IMM) epitaxial liftoff devices that are optimized for operation at high concentration. A process will be developed for attaching backside contact solar cells to submounts which will be tested in the solar concentrator test beds of three commercial concentrator companies. Microlink Devices, Inc., proposes to reduce the cost of cells by transitioning to larger diameter wafers and investing in high capacity production tools. The backside contact solar cells will also be subjected to reliability testing for system qualification. The goal is to achieve a peak efficiency of > 44% at 500 suns. The high efficiency cells to be developed in this project would be used in concentrator photovoltaic systems for utility and commercial electricity generation. The cells should result in a decrease in the cost of solar generated electricity. Concentrator photovoltaics are projected to account for several gigawatts of generating capacity by 2020. Increased availability of low-cost solar power generation should result in reduced emission of greenhouse gases, increased domestic energy production, and increased national energy security. Specific tasks for Phase III include: backside contact device fabrication process for triple-junction IMM structures; backside contact cell design optimization for high concentration; submount assembly process for backside contact device; improve backside contact process throughput and yield; cost reduction; reliability testing; and system integration.

Conditions: None

Categorical Exclusion(s) Applied: B3.6, B5.1

\*-For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, see Subpart D of 10 CFR 10 21

This action would not: threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, including DOE and/or Executive Orders; require siting, construction, or major expansion of waste storage, disposal, recovery, or treatment facilities, but may include such categorically excluded facilities; disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; or adversely affect environmentally sensitive resources (including but not limited to those listed in paragraph B.(4)) of Appendix B to Subpart D of 10 CFR 1021). Furthermore, there are no extraordinary circumstances related to this action that may affect the significance of the environmental effects of the action; this action is not "connected" to other actions with potentially significant impacts, is not related to other proposed actions with cumulatively significant impacts, and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211.

Based on my review of information conveyed to me and in my possession (or attached) concerning the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

ORO NEPA Compliance Officer

**James L. Elmore**

Date Determined:

9/14/2010



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