



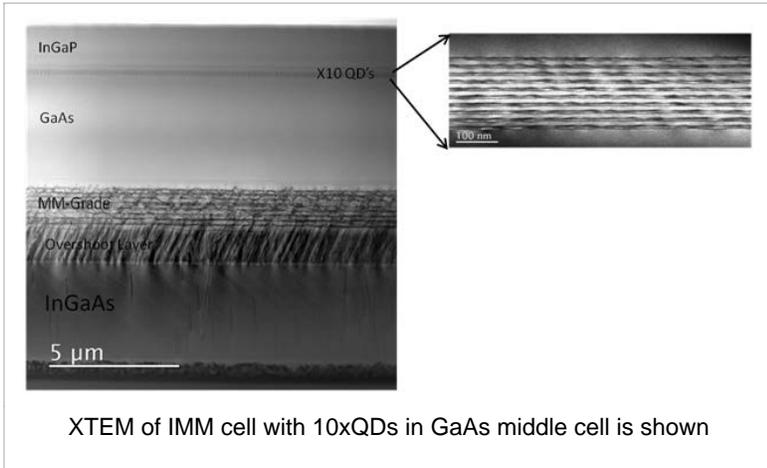
High-Efficiency, Radiation-Hard, Lightweight IMM Solar Cells

MicroLink Devices, Inc.

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OBJECTIVES

In this Phase II project, MicroLink and its collaborator, the Rochester Institute of Technology (RIT), successfully developed for the first time IMM Solar cells with QDs (quantum dots) embedded in the GaAs middle cell and InGaAs bottom cell. The cells with QDs in the GaAs middle cell were exhibiting AM0 efficiency >27%. Calculated remaining EQE from experimental data as a function of electron fluence at 690 nm where emitter absorption is dominant, 830 nm where base absorption is dominant, and at 940 nm where the QDs absorb clearly showed that the quantum efficiency of the QD absorption region is hardly affected by particle irradiation.



ACCOMPLISHMENTS

NOTABLE DELIVERABLES PROVIDED

1. QDs embedded in GaAs middle cell of InGaP/GaAs/InGaAs IMM 3J ELO solar cell
2. QDs embedded in InGaAs bottom cell of InGaP/GaAs/InGaAs IMM 3J ELO solar cell
3. Radiation Exposure experiments on InGaP/GaAs:QDs/InGaAs IMM solar cells showed no Quantum efficiency degradation due to electron and proton radiation exposure.

KEY MILESTONES MET

1. Development of a radiation hard IMM cell with Quantum dots (QDs) in the GaAs middle cell and InGaAs bottom cell.
2. IMM cells with QDs in GaAs middle cell exhibited efficiency >27% AM0.

FUTURE PLANNED DEVELOPMENTS

PLANNED POST-PHASE II PARTNERS

The solar cells developed in this program could be further qualified to space customers such as Loral, Boeing, Lockheed Martin, Airbus, and Thales.

PLANNED/POSSIBLE MISSION INFUSION

Further qualification for space could be made by flying these solar cells in Cubesats followed by further space qualification.

PLANNED/POSSIBLE COMMERCIALIZATION

These solar cells have applications in HALE, UAV, and portable power. The lightweight flexible nature of the solar cells is highly attractive.

CONTRACT (CENTER)	NNX15CC20C (GRC)	SOLICITATION-PHASE	SBIR 2014-II
SUBTOPIC	S3.01 Power Generation and Conversion	TA	3.1.3 Solar (PV & thermal)

