

High-Volume Production of Lightweight Multijunction Solar Cells

Reduces the cost of cells via a 6-inch gallium arsenide (GaAs) epitaxial lift-off and substrate reclaim process

MicroLink Devices, Inc., has transitioned its 6-inch epitaxial lift-off (ELO) solar cell fabrication process into a manufacturing platform capable of sustaining large-volume production. This Phase II project improves the ELO process by reducing cycle time and increasing the yield of large-area devices. In addition, all critical device fabrication processes have transitioned to 6-inch production tool sets designed for volume production. An emphasis on automated cassette-to-cassette and batch processes minimizes operator dependence and cell performance variability. MicroLink Devices established a pilot production line capable of at least 1,500 6-inch wafers per month at greater than 80 percent yield. The company also increased the yield and manufacturability of the 6-inch reclaim process, which is crucial to reducing the cost of the cells.

Applications

NASA

- ▶ Solar electric propulsion programs

Commercial and Military

- ▶ Electric-powered unmanned aerial vehicles (UAVs)
- ▶ Commercial and military satellites
- ▶ Portable solar electric power chargers



Phase II Objectives

- ▶ Improve the manufacturability and reduce the cost of the 6-inch ELO process for fabricating high-efficiency, large-area multijunction solar cells
- ▶ Optimize the 6-inch ELO process for high throughput and yield (greater than 80 percent)
- ▶ Use automated process tool sets capable of more than 1,500 6-inch wafers per month
- ▶ Establish a production-ready 6-inch GaAs substrate reclaim process

Benefits

- ▶ Produces lightweight and high specific power multijunction solar cells
- ▶ Offers an inexpensive and streamlined manufacturing process

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