



Unmatched Performance



Lightweight & Flexible



Seamless Integration

World Record Efficiency: 29.1% and 31.6%
Custom 4x3 (Series x Parallel) Solar Module

Solar Power for Small UAVs

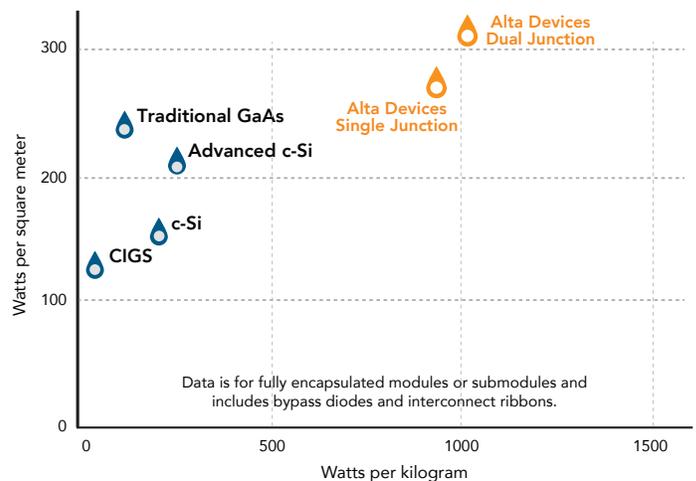
The Power Problem

Fly longer and carry more. That's what every small UAV (sUAV) consumer wants. As the uses for small, electric, commercial UAVs expand, the demand for the sUAVs to stay aloft longer and carry heavier, more powerful payloads constantly increases. Right now there are few alternatives to extend electric UAV endurance other than adding batteries, making improvements to the electrical systems, or redesigning the UAV to be more aerodynamic. While the first option tends to add significant weight and takes up a lot of extra space, the latter two options can be very expensive. There is, however, another way.

The Solar Solution

Solar power technology has improved dramatically over the years. Efficiency has gone up, but the existing technology is still too heavy, too rigid, or too inefficient for use on UAVs — until now. Alta Devices has developed an extremely lightweight, flexible, and thin, gallium arsenide (GaAs) solar cell that has set the single and dual junction world record efficiency at 29.1% and 31.6% respectively.

Mass and Area Ratios



Power Output	260 W/m ² (24 W/ft ²)
Weight (encapsulated)	280 g/m ² (0.87 oz/ft ²)
Flexibility	5 cm (2 in) radius of curvature

Note: Numbers are for the Alta Devices single junction solar cell under AM 1.5 standard test conditions. For information on performance under other conditions or on our dual junction product please visit www.altadevices.com or email us at info@altadevices.com.

Solar Power for Small UAVs

The Benefits

Flight endurance increase depends greatly on the aircraft's design and mission, but in most cases an increase can be seen without any changes to the structure or electrical systems. In cases where aircraft are optimized for solar, increases of up to 5x the flight time are possible.

Limited Aerodynamic Impact

Because our solar cells are so thin and flexible, they can easily be adhered directly to a wing or fuselage surface with negligible impact to aerodynamics. It's also possible to place the cells into a carbon fiber or fiberglass mold so that the solar cells become an integrated part of the aircraft's structure. Further, due to our capability to create custom solar arrays and shapes, we can deliver a solar solution designed specifically to your product.



Alta Devices solar cells integrated into carbon fiber on a curved wing.



Flight Time:
09:11:45

AeroVironment Puma

Alta Devices worked with AeroVironment to develop a solar layout specifically designed for the Puma; a small, hand-launched military UAV primarily used for intelligence, surveillance, and reconnaissance. AeroVironment optimized their aircraft for the use of solar and was able to improve their original flight endurance from around 2.5 hours to over 9 hours!

Teamwork

Alta Devices solar cells are very customizable and can be tailored to each sUAV's specific electrical needs. Our highly skilled and knowledgeable application engineers work closely with each customer, providing technical support from beginning to end of every project to ensure a successful integration.