

PUMPKIN™

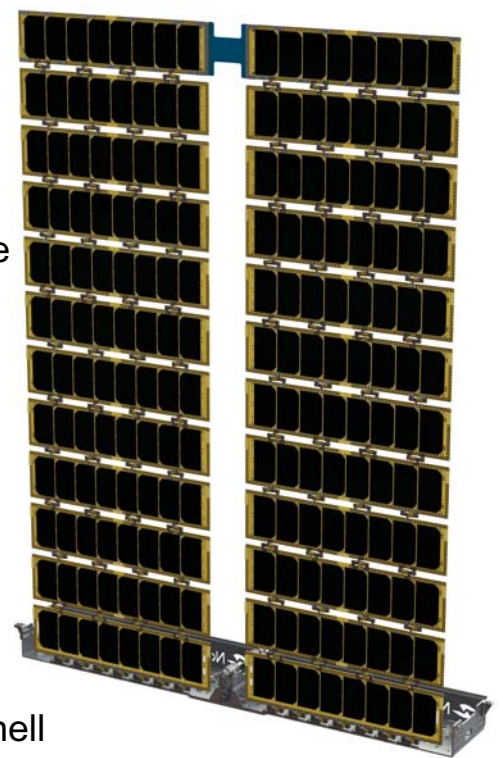
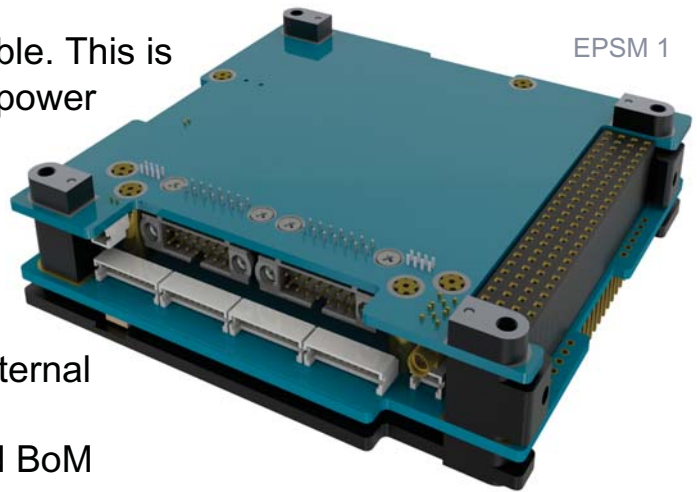
SPACE SYSTEMS

Update Q3 2019

Electrical Power Systems

Pumpkin's high-power EPSM 1 is now available. This is a ground-breaking small satellite electrical power system with unrivaled performance:

- GaNFET-based switching (>98.5% eff.)
- Optional rad-hard FPGA to manage all power functions; high-speed switching & fast control loops suppress noise from external connected loads (e.g., cryopumps)
- Space-grade components from controlled BoM
- 60V power ring topology, with:
 - 6 solar array inputs (8-55V, 2A/4A) w/MPPT
 - 4 outputs (3.3-50V, 5-8A), with soft current limiting
 - 2 battery blocks (3.3-50V, 8A), w/custom charging
 - Polyphase dc/dc switching block operation
 - Active solar array overvoltage shunt
- Gentle turn-on despite massive ring bus capacitance
- Agile PAO MPPT operating at kHz rate is capable of powering a rapidly tumbling (20 rpm) satellite
- SCPI commands & fully formatted telemetry via SupMCU; easily field-reprogrammed
- Parallelable for higher power or more inputs/outputs
- Integrated radiation dosimeter
- Compatible with a wide variety of batteries
- <0.25U, <300g, <3W SWaP
- Available now



200W DCSA in deployed
8S12P + 8S12P configuration

Solar Arrays

- Pumpkin has delivered more of its Deployable Clamshell Solar Arrays (DCSAs) to the industry's most innovative LEO/MEO/GEO/GTO small satellite manufacturer. These two new units are evolutions of our prior, cost-effective, space-proven DCSAs, but with even more panels and higher power (200W in a 4U stowed volume).

Pumpkin solar panel customers enjoy the same cost-effective, high-quality PMDSAS panels across our entire solar power line -- panels with a 100% on-orbit success rate in LEO and GTO applications.

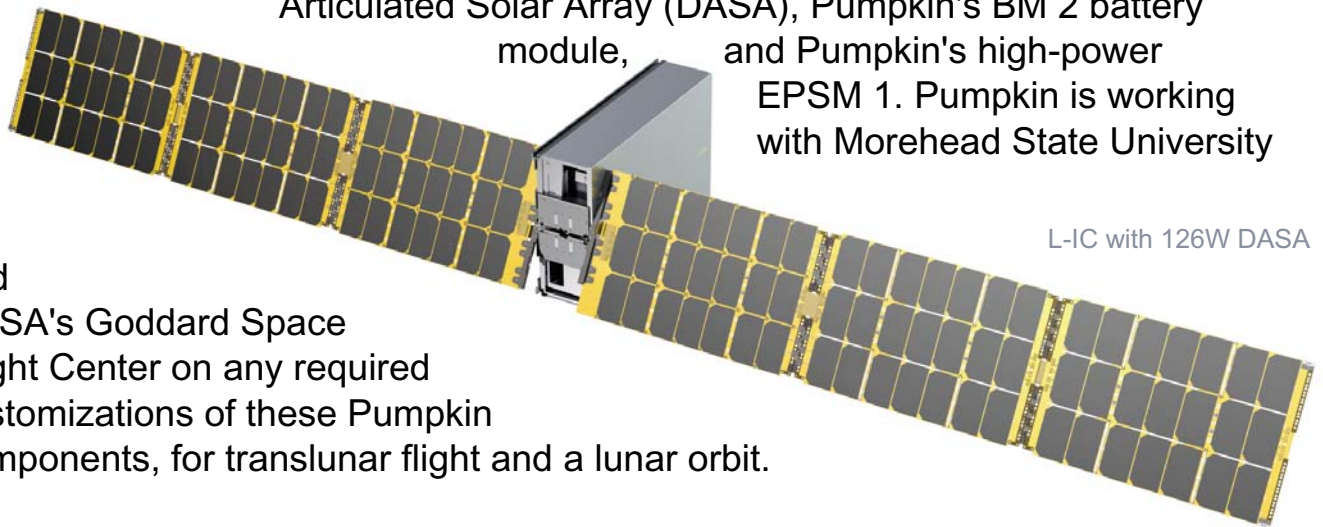


Two 200W DCSAs in
stowed configuration

The Moon

- Pumpkin nanosat-class components are a critical part of the upcoming Lunar IceCube mission. This 6U CubeSat will use Pumpkin's Deployable Articulated Solar Array (DASA), Pumpkin's BM 2 battery module, and Pumpkin's high-power EPSM 1. Pumpkin is working with Morehead State University

and NASA's Goddard Space Flight Center on any required customizations of these Pumpkin components, for translunar flight and a lunar orbit.



Custom

- Standardization and mass production are hallmarks of Pumpkin's approach to product development. Yet each nanosatellite mission has unique requirements. Our specialty is integrating CubeSat systems to increase functionality within a constrained form factor. Whether your requirements are for a particular processor, or for a choice of radios, antennas, or other systems, no one can integrate nanosatellite systems like Pumpkin Space Systems. Our proven track record in space, modular architecture, rapid engineering services, supplier relationships and broad assortment of standard components allow us to rapidly reconfigure each spacecraft to suit your particular mission, at attractive prices.

Partners

- Pumpkin Space Systems is seeking complimentary technologies to incorporate into its product lineup. Our goal is to qualify a second source for each major system, and to offer customers multiple configurations based on mission requirements. Advanced solar cells, radios, antenna systems, micropropulsion, and deorbit devices are among the systems we seek to incorporate or upgrade. Certification as a *Pumpkin Space Partner* gives your company access to the highest volume nanosatellite spacecraft market. Contact us if your company currently builds or plans to build high-quality components for small satellites and would like to be included as optional equipment in Pumpkin's expanding CubeSat, MISC 3 and SUPERNOVA families of nanosatellites.

Pumpkin Space Systems serves demanding government, commercial and educational customers with P-POD and CSD-compatible nanosatellite spacecraft and buses. Our integrated designs are based on our own flight-proven CubeSat Kit™ and SUPERNOVA™ components and have completed flight qualification.



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Contact