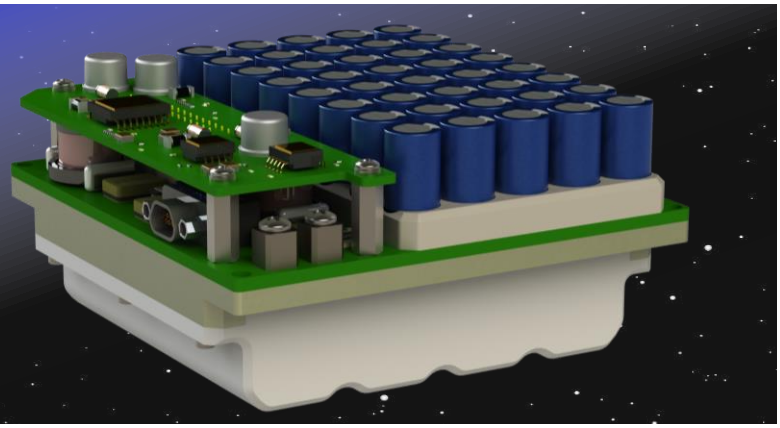
CUBIC AEROSPACE

Hybrid Energy Storage Architecture

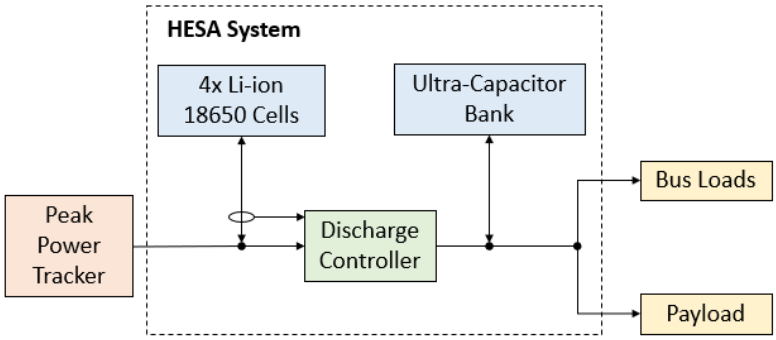
FACT SHEET



OVERVIEW

Cubic Aerospace's CubeSat Hybrid Energy Storage Architecture (HESA) is an innovative battery/ultracapacitor hybrid architecture that enables very high peak power applications at a size, weight, and cost beyond the capability of stand-alone battery implementations. A Cubic Aerospace software tool is used to generate optimal HESA solutions based on power requirements. Steady state and pulsed power requirements drive the selection of volume and/or mass optimal battery cells and ultracapacitors.

A discharge controller decouples the capacitor voltage from the lithium-ion cells, maximizing the usable energy of the ultracapacitors. A HESA system's input power interface looks like a standard battery with separate output interfaces for high power payloads. HESA is optimized for sub-second pulse loads with low duty cycles such as SAR, LIDAR, etc.



FEATURES

Mil-461C Compliant

- Conducted Emissions
- Conducted Susceptibility

Outputs

- Bus Loads
- Payload

Discrete Telemetry

- Charge Current
- Payload Current
- Bus Current
- Battery Voltage
- Ultracapacitor Voltage
- Battery Temperature
- Ultracapacitor Temperature

Built-In Protection

- Under/Over-voltage
- Over-current
- Over-temperature

INQUIRIES

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SPECIFICATIONS

Pulse Discharge Efficiency	**>90%**	**%**
Operating Temperature	-40 to +50	°C
Single Event	Operate: LET > 37 Survive: LET > 55	MeV-cm2/mg
Total Ionizing Dose	30 (including ELDRS)	kRad (Si)