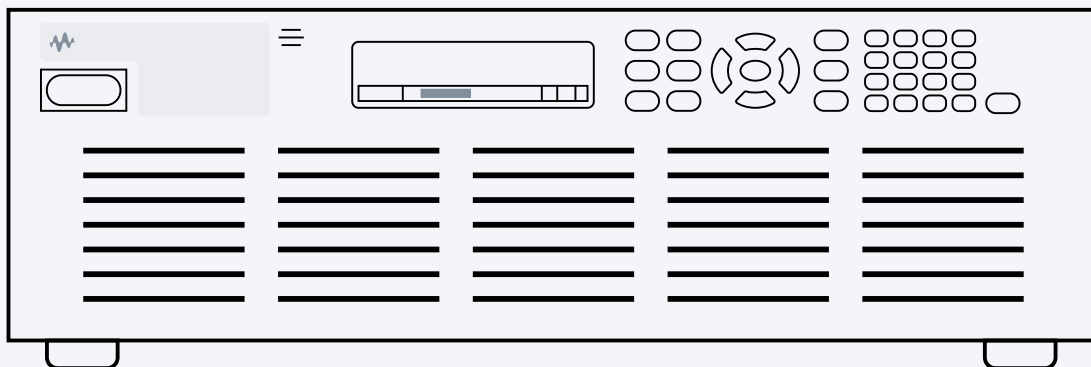


< How to Test Satellite Batteries

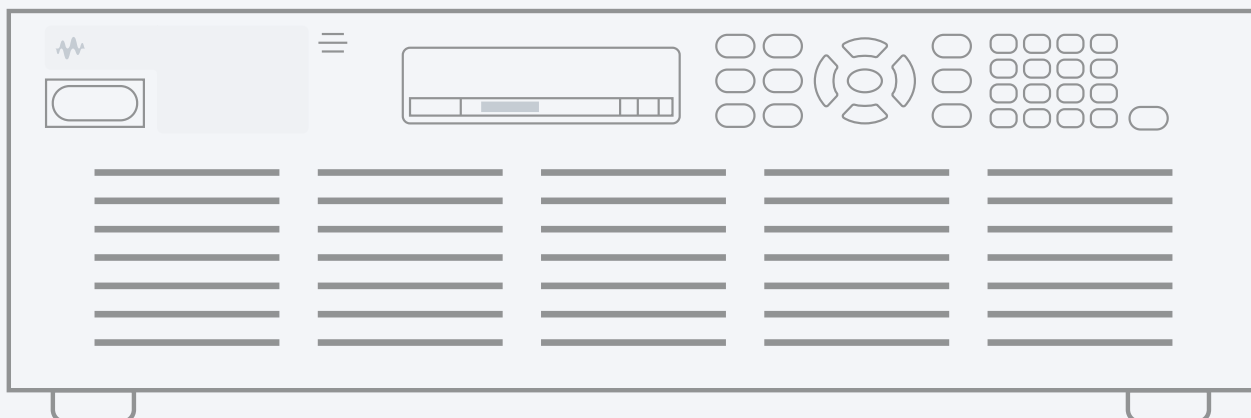
How to Test Satellite Batteries

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+ ATE System Power Supply



+ ATE System Power Supply

Validating Satellite Batteries and PCUs Without Compromise

Aerospace and defense satellites rely on battery systems to power payloads, communications, and critical subsystems during eclipse or other power limited phases. Validating battery behavior and its interaction with the power conditioning unit (PCU) demands accurate replication of mission conditions: variable state of charge (SoC), temperature extremes, rapid sun to eclipse transitions, and high current events. Edge cases such as over /under voltage events, fast bus transients, and thermal cycling must be recreated with high fidelity and measured with sub millisecond resolution.

Conventional methods that depend on flight batteries are hard to scale, slow to iterate, and expensive. Long-duration cycles generate heat, increase cooling load and energy costs, and introduce safety and scheduling constraints. A regenerative, automation-ready platform lets you emulate the battery, inject mission-critical faults on demand, and run unattended validation for days or weeks with enterprise-grade data integrity. Regenerating discharge energy back to the grid reduces operating costs while expanding test coverage to extreme conditions — accelerating integration while improving mission readiness.

Satellite Battery Test Solution

Validating satellite batteries and PCU behavior requires reproducing eclipse transitions, variable state-of-charge, rapid bus transients, and long-duration cycles with precise timing, repeatable fault injection, and traceable data capture. The Keysight regenerative power supply with the automated power suite emulates mission profiles and injects faults while automating long tests and capturing high-resolution telemetry data for traceability. The solution allows for configurable pass/fail



criteria, simultaneous voltage and current measurement, integrated power, amp-hour, and watt-hour calculations, and the ability to parallel multiple units for higher power testing. The system's regenerative capability returns energy to the grid, significantly reducing operating costs while expanding test coverage to extreme conditions, enabling faster integration and improved mission readiness.

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Regenerative



1

2

3

4



Related Use Cases

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Stage 4: System Validation

How to Test Satellite Payload Systems

Simulate mission power conditions and run long-duration validation for satellite payloads using regenerative loads and automated power-suite workflows.

Learn More →

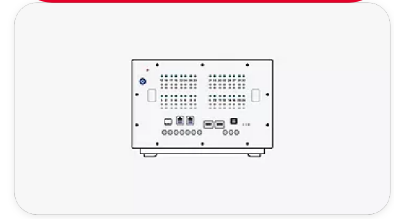


Stage 3: Compliance Test

RF Phase Noise Measurement

Learn the fundamentals of RF phase noise and how to measure it accurately.

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Stage 4: System Validation

How to Test Beamforming Performance for Massive MIMO

Conducting physical trials to forecast 5G system performance and identify potential issues requires simulating and testing 5G massive MIMO beamforming algorithms and antenna configurations. Learn how to ensure precision in spatial targeting, effective channel emulation, and reliable performance by thoroughly simulating and optimizing beamforming techniques before moving to physical trials.

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