

## **AUTOMATED TEST SYSTEM FOR SUNPOWER**

The use of solar power is increasing both in commercial and residential applications across the globe as the world begins to recognize the importance of renewable energy resources. Though currently sitting at around 3% of American energy generation, solar power is projected to make up approximately 20% of American energy by 2050.

Realizing the growth of solar energy, SunPower Corporation began working towards ensuring it is accessible and efficient. In order to do this, SunPower developed easy-to-use home monitoring and control solutions for their customers. Not only do customers save money by using solar power as their energy resource, but with SunPower, they also gain control over and insight into their individual energy usage. It's important that every one of SunPower's products is reliable and consistent with their standards, which is why SunPower came to G Systems for help.

G Systems, known for their expertise in test system development, was granted the task to help SunPower develop an automated system to test new printed circuit boards (PCBs). Through this project, G Systems aided in the increase of production line accuracy, reliability, and efficiency, all while decreasing costs to SunPower.

#### **CHALLENGE**

G Systems was challenged to design and commission three end of line production test systems for testing new PCBs. SunPower needed a system that would take accurate measurements of the boards' voltage, current, and power levels, while also verifying proper communications to other devices in the system. After the PCBs go through G Systems' custom test system and are confirmed consistent with SunPower's requirements, they are installed in SunPower's SunVault energy storage system for residential use. Once installed in a customer's home, the data and measurements acquired from the boards can signal to both SunPower's engineers and customers how the energy storage system is performing and allow the system to be controlled.

For this project, reusability was a highlighted design feature, as the production test systems needed to be engineered in a way in which it could be used with future designs of the PCBs.

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### SOLUTION

G Systems developed a solution involving a guick and modular software powered by a flexible test executive and tailored software. The advantage of using a flexible test executive is that additional PCBs under test can be easily added for future projects, which decreases the amount of non-recurring expenses (NRE) to the company. With the ability to alter the software to fit the needs of each project instead of redesigning the system from scratch, efficiency increases and operating costs decrease. Utilizing a mass interconnect system, as seen in Figure A, most of the design effort for the test system can be reused to duplicate and modify it to work with other PCBs under test in the future. This again decreases the amount of recurring costs to the company in the future, as the main component that needs to be redesigned is the interchangeable test adapter (ITA)/test fixture. Using this approach allows SunPower to quickly test more product and reduce the chance of user error when setting up a new test. G Systems designed and built a selftest fixture that was used to verify proper assembly and functioning of the rack prior to connecting the customer's PCB. The final product created for SunPower is seen below in Figure B.



Figure A

### RESULTS

G Systems was able to successfully create a flexible test platform that will scale with SunPower's evolving needs. The turnkey solution allows SunPower to utilize the benefits of consistent and reliable testing before the product is launched or sent to customers. G Systems is excited to continue working with SunPower as they develop more energy storage products.

**Do you need a test framework that will grow with your company's future needs?** Contact G Systems today to learn more and let our team of experts develop your test sequences and build your test equipment!

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# SUNPOWER®

SunPower (NASDAQ: SPWR) is a leading solar, storage and energy services provider in North America. SunPower offers the only solar + storage solution designed and warranted by one company that gives customers control over electricity consumption and resiliency during power outages while providing cost savings to homeowners. For more information, visit www.sunpower.com.



Figure B

