

OASIS Protofab Engineering Services Overview

Multidisciplinary Research & Development Engineering

Engineering services spanning custom electronics, embedded and FPGA systems, power electronics, photonics, mechanical design, scientific instrumentation, and complete concept-to-prototype development.

- **Analog, Digital & Mixed-Signal Design**
Precision analog, digital logic, signal conditioning, ADC/DAC, sensor, and control electronics.
 - **PCB Design & Development**
Altium schematic capture, multilayer PCB layout, fabrication, assembly, bring-up, and verification.
 - **Legacy Electronics Modernization**
SMT conversion, EOL component replacement, redesign, documentation recovery, and system consolidation.
 - **FPGA & SoC Systems**
Xilinx FPGA/Zynq control, data acquisition, timing, synchronization, and Verilog HDL development.
 - **Embedded Systems**
Microcontroller hardware, embedded C/C++, interfaces, control systems, and hardware/firmware integration.
 - **Scientific Instrumentation**
Custom research and laboratory instrumentation from concept through deployment and operation.
 - **Precision Data Acquisition & Control**
High-speed ADC/DAC, sensor, FPGA, timing, synchronization, and automated control systems.
 - **Power Electronics**
DC-DC conversion, power monitoring, protection, distribution, and high-efficiency power systems.
 - **High-Voltage Power Systems**
High-voltage distribution, measurement, isolation, protection, interlocks, and 1 kV-class systems.
 - **Photovoltaic & MPPT Systems**
Custom MPPT, photovoltaic conversion, monitoring, and Silicon/InGaAs receiver electronics.
 - **Battery & Energy Storage**
Lithium battery charging, balancing, monitoring, protection, and multi-kWh storage integration.
 - **Laser & Directed-Energy Systems**
Laser control, photodiode monitoring, safety electronics, phased arrays, and power-beaming systems.
 - **Photonics & Optoelectronics**
Detector electronics, fiber-optic control, photonic integration, packaging, and microassembly.
 - **Free-Space Optical Communications**
Laser communications, FPGA-based PPM, precision timing, synchronization, and transmitter control.
 - **Mechanical & Electromechanical Design**
SolidWorks/NX design, packaging, actuators, encoders, positioning systems, and prototype hardware.
 - **Thermal & Harsh-Environment Engineering**
Vacuum, cryogenic, high-temperature, space, and thermal-management system development.
 - **System Integration & Prototyping**
Electrical, mechanical, thermal, photonic, embedded, FPGA, legacy, and COTS system integration.
 - **Design for Manufacturing**
DFMA, cost reduction, component selection, manufacturing documentation, and production transition.
 - **Troubleshooting & Design Review**
Circuit, PCB, and system debugging, root-cause analysis, optimization, verification, and validation.
 - **Technical Leadership & R&D Support**
System architecture, design reviews, project planning, technical oversight, integration, and field deployment.
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Specialized experience: Space & Lunar Systems • Directed Energy • Scientific Instrumentation • Photovoltaics • Optical Communications • Cryogenic & Vacuum Systems