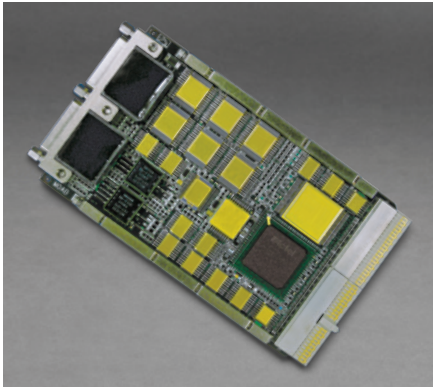


## MULTI-OPERATION AVIONICS BOARD (MOAB™) SERIES OF BOARDS



The MOAB Series of Boards provide a single 3U cPCI card solution for interfacing to a large number and variety of commonly found subsystems, payloads, and sensors. The MOAB boards handle complex and common C&DH functions. The MOAB series of boards includes versions for general purpose I/O (Standard MOAB - SMOAB), high speed I/O and mass memory (Camera MOAB - CMOAB/ Digital MOAB - DMOAB), and analog I/O

(Analog MOAB - AMOAB). All MOAB series boards support a large mix of commonly found interfaces.

### STANDARD MOAB FEATURES

- 2 Million Gate FPGA (Actel RTAX2000S)
- 32-bit/33MHz cPCI target interface with P2 custom local interface bus
- 12 Gbytes Flash / 4 Gbytes Flash with TMR
- 2 Mbytes of Asynchronous SRAM with EDAC
- 32 Kbyte of FPGA Block RAM for buffering
- 24 Discrete Outputs (Configurable to 3.3V or 5V)
- 23 Discrete Inputs (Configurable to 3.3V or 5V)
- 20 Differential RS422/LVDS Transmitters
- 20 Differential RS422/LVDS Receivers
- 1 MIL-STD-1553B Interface using Aeroflex Summit Chip
- 12 Sun Sensor Channels
- 3 Sun Sensor Excitations
- 47 AD590 Temperature Sensor Channels
- 8 AD590 Excitations
- 24 General Purpose Analog Channels +/-10V

### MASS, POWER, DIMENSIONS

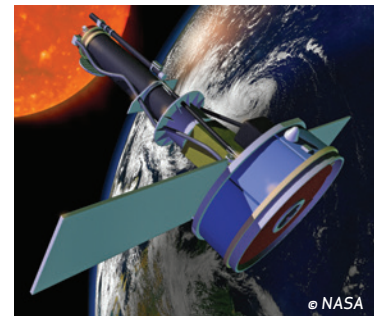
- < 0.4 kg
- < 8.0 Watts Peak, Worst-Case
- 100 mm x 175 mm x 30 mm (3U cPCI)



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# MOAB SERIES OF BOARDS

## ANALOG MOAB FEATURES

- 2 Million Gate FPGA (Actel RTAX2000S)
- 32-bit/33MHz cPCI target interface with P2 custom local interface bus
- 4 Sun Sensor excitations (+10V)
- 12 AD590 Voltage Excitations (+15V)
- 2 A/D Converters (one designed for higher sample rates)
- 188 +/-10V Analog Input Channels:
  - (12) Configurable as Sun Sensor Inputs
  - (32) Configurable as (16) +/-5V Differential Analog Inputs
  - (72) Configurable as AD590 Temperature Channels
  - (48) Configurable as PRT or Thermistor Channels
  - (08) Configurable as 28V (bus voltage) inputs
  - (16) General Purpose Analog Inputs
- 9 Internal Analog Channels (local temperature, secondary voltages, and calibration references)
- 4 +/-5V Analog Output Channels with 8mA drive capability (HW configurable to multiple ranges)
- 4 Differential RS422/LVDS TX Outputs (functionality configurable in FPGA)
- 3 Differential RS422/LVDS RX Inputs (functionality configurable in FPGA)
- (1) Configurable as an LVSEP input
- 4 Discrete Inputs (functionality configurable in FPGA)

## MASS, POWER, DIMENSIONS

- < 0.4 kg
- < 7.0 Watts Peak, Worst-Case
- 100 mm x 175 mm x 30 mm (3U cPCI)

## DIGITAL MOAB FEATURES

- 2 Million Gate FPGA (Actel RTAX2000S)
- 32-bit/33MHz cPCI target interface with P2 custom local interface bus
- 2 Gbyte of Synchronous DRAM (Independent Set #1)
- 2 Gbyte of Synchronous DRAM (Independent Set #2)
- 32 Kbyte of FPGA Block RAM for buffering
- 32 Discrete Inputs with Cold-Sparing (Configurable to 3.3V or 5V)
- 40 Differential RS422/LVDS TX Outputs
- 31 Differential RS422/LVDS RX Inputs
- 4 LVDS DeSerializers (3:21 Aeroflex or 4:28 CameraLink)
- 3 SpaceWire PHYs

## MASS, POWER, DIMENSIONS

- < 0.4 kg
- < 6.0 Watts Peak, Worst-Case
- 100 mm x 175 mm x 30 mm (3U cPCI)

## MOAB SERIES OF BOARDS RELIABILITY FEATURES

- All Parts SEL immune
- SEU Mitigated Design
- 30 kRad Standard (100 kRad Option)
- Conduction Cooled Design
- All parts MIL-883B

The MOAB series of boards includes various implementations that address the most commonly found interfaces, ranging from serial asynchronous RS-422 interfaces, to SpaceWire interfaces, to MIL-STD-1553 to analog interfaces, including temperature sensors, and voltage and current inputs and outputs.

All MOAB boards provide a radiation tolerant Actel RTAX2000S FPGA that is used for managing the board functions, interfacing to the backplane via PCI, and to implement mission specific logic, such as autonomous state-of-health collection and reporting.

## STANDARD AND CUSTOM LOGIC FEATURES

To interface to common telecommand components, a MOAB board may be configured to be compatible with CCSDS, SGLS and other command decoding & telemetry encoding formats. Using these formats, the MOAB board may autonomously decode hardware commands, without the need for a system processor. The large amount of FPGA resource available may be used for mission customer specific processing functions.

## GENERAL PURPOSE ANALOG INTERFACES

MOAB boards are available with a number of different analog interfaces. Input voltage ranges include +/-10V, 28V, and +/-5V. Current inputs and outputs are available with configurable voltage and current ranges. MOAB boards feature one or two 12-bit or 14-bit A/D converters with configurable sample rates.

## SOLID STATE MEMORY

The memory on the MOAB boards may include up to a total of 12 GBytes of Flash memory which can be used as-is or configured as 3 GBytes of Triple-Modular-Redundant Flash with voting logic implemented in the MOAB FPGA. Boards may provide 2 MBytes of shared SRAM for general purpose use by the MOAB board or any devices on the cPCI bus.



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