3DR COMPUTING

Lightning 4

10 Channel, 16 Bit, 160MHz Analog-to-Digital Converter

Model Number: 3DR-V6-ADC-160MSPS

COLORADO ENGINEERING, Inc.

3D COMPUTING OVERVIEW

3DR Computing technology brings together high performance computing, ease of programmability, low-cost, and commercial I/O flexibility in a modular, open systems and standards architecture to realize uniquely scalable and widely configurable, high speed embedded processing solutions for the development of radar, EW, SIGINT, and communication systems.

3DR Computing possesses the unique ability to morph in size, shape, and processing capacity. This flexibility provides a low cost, standard solution capable of rapidly conforming to the vastly different power, space, and environmental requirements found aboard any surface, sub-surface, or airborne system or platform.

FEATURES

FPGA

- Xilinx Virtex 6 (XC6VLX240T)
- LX365T & LX550T available in 1759 package
- DDR memory module
- Up to two FPGA configurations
- JTAG Programmable
- 2 NOR flash configuration/user
- Programmable memories (master BPI configuration, write protect available)

Analog-to-Digital Conversion

- 10 channel
- 16 bit
- 160MSPS
- SNR 78dB
- SFDR 95dB

I/O Support Available Via

- Y-connector (2x)
- Z-connector (2x)
- JTAG
- DB29 connections
- 14 Gbps in Z

Clocking and Triggering Flexibility

- Sample gates (SMA)
- Trigger (SMA)
- Clock inputs (SMA/ TwinAx)

DDR2

- Up to 3GB

Clocking Options

- Onboard oscillator
- Offboard SMA
- Offboard TwinAx
- Board-to-Board Y connector
- Board-to-Board Z connector

PRODUCT DESCRIPTION

The 3DR-V6-ADC-160MSPS, known as Lightning IV, is a 10 channel, 16 bit, 160MHz Analog-to-Digital converter board for digitizing and processing analog inputs. High performance, low latency processing can be implemented via the onboard VIRTEX–6 FPGA (XC6VLX240T). As with all 3DR computing modules, Lightning IV supports three dimensional connectivity, allowing the user to stack and/ or tile modules to address a wide variety of processing, I/O, size, weight, and power requirements.

Lightning IV provides PCIe and LVDS interfaces via the Y and Z connectors to other modules in the 3DR computing family. It also offers additional external interfaces including TwinAx, and SMA connections for clocking and triggering flexibility. Lightning IV standard microcontroller architecture is interfaced through the I2C bus to provide FPGA temperature, voltage, and current monitoring for automatic shut-down during critical over heat and/or voltage conditions.

BENEFITS

- Enough FPGA flash memory to hold two FPGA configurations
- On board circuitry fuse and temperature monitoring for board protection
- Standard 4-pin power connector

APPLICATIONS

- Digital signal processing/data acquisition
- Radar receiver (digital receiver)
- Digital array processing & beamforming
- Electronic warfare/attack systems
- Digital image processing
- Remote sensing

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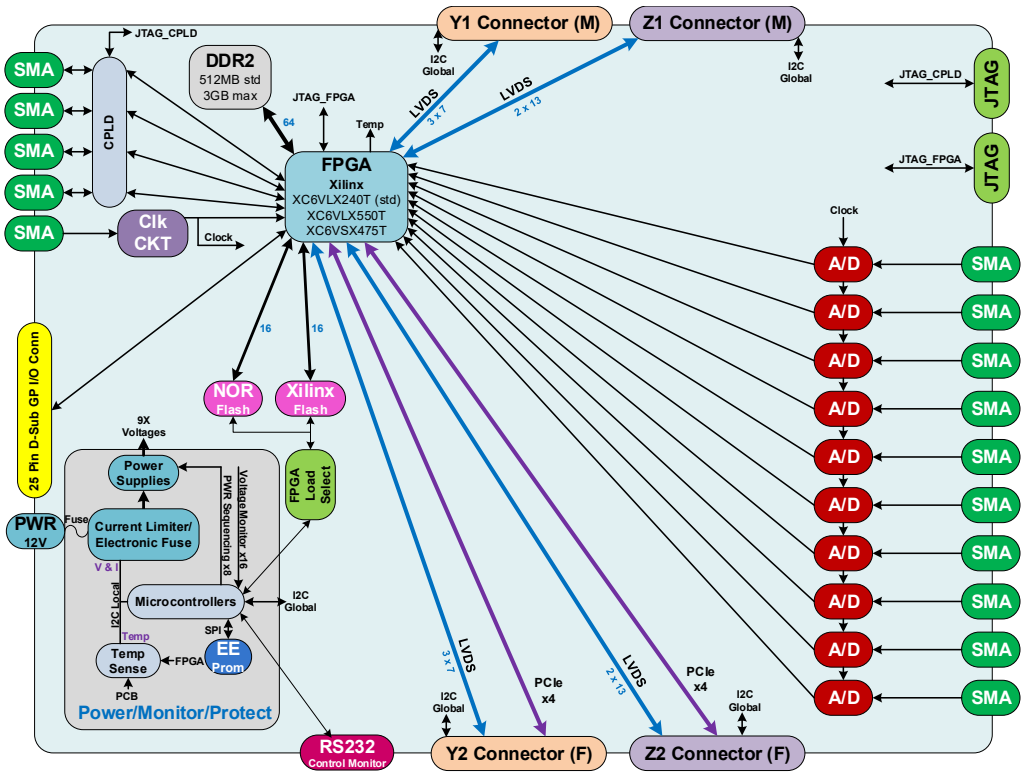
BLOCK DIAGRAM



CONFIGURATIONS

Model Number	Configuration
3DR-V6-ADC-160MSPS -C	Commercial temp 0°C-50°C

*Please contact CEI for extended temperature range options

SPECIFICATIONS

Microcontroller Interface

Dual microcontrollers programmable over SPI bus

Controls power-on and power-down sequencing

Monitors voltages and reports faults over I2C bus

Monitors current, e-fuse shut-down, and reports over I2C bus

Monitors board/chip temperature over I2C bus (external user defined sensor available)

On board EEPROM for data storage and logging (write protect available)

FPGAs and CPLDs programmable over JTAG Bus (for applicable modules with FPGAs and CPLDs)

Externalities

Y1, Z1 connectors : LVDS (FPGA)

Y2, Z2 connectors: PCIe & LVDS (FPGA)

A/D channels: up to ten 25 pin d-sub general

Purpose I/O

A/D

Texas Instruments ADC 6DV160 (2 channels / device)

16 bit, 160MHz, 160 MSPS

Up to 10 channels

DDR LVDS output

+/- 1.1v PP Input, 50 Ohm input impedance

Physical

Dimensions: 6.25”L x 6.25”W (including connectors: 6.668”L x 6.289”W)

Distance Between Boards (Stacked; Board-to-Board) : 1.1”

Weight: ~13oz.

Environmental

Operating temperature:
0 - 50 °C (commercial configuration)

Storage temperature : (est)
-55°C to 100° C, cooling airflow recommended, FPGA application dependent (heat sink mounts available)

Power

Power consumption (based on FPGA loading)
12V @2.0 Amps

REV 1

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