NAMC-ARRIA10-FMC
ARM/FPGA Board with FMC-HPC Slot

The **NAMC-ARRIA10-FMC** is an AdvancedMC (AMC) featuring the Intel® Arria® 10 GX or SX FPGA and a high pin-count FMC slot (VITA 57.1). Intel® Arria® 10 FPGAs deliver massive performance and power consumption improvements compared to prior-generation FPGAs, both midrange and high-end devices.

When combined with an FMC slot, which can accept a wide variety of modules providing data acquisition, networking, RF or other functionality, you can create a range of powerful single-slot embedded computing solutions. Application examples include computing node, data acquisition and processing engine or software-defined radio module for wireless backhaul, optical transport, military radar, test and measurement, as well as video and image processing for broadcast, medical imaging and therapy.

Key features

· Single width, full-size or mid-size
  AdvancedMC (AMC)
· Intel® Arria® 10 GX or SX FPGA
· Choice of GX1150 / GX900 / GX660 / SX660
  / GX 570 / SX 570
· High pin-count FMC slot (VITA 57.1)
· Up to 16 GB DDR4 with ECC

Applications

· Telecommunications
  · SDR, wireless backhaul, optical transport
· Radar/sonar
· Test and measurement
· Video and image processing
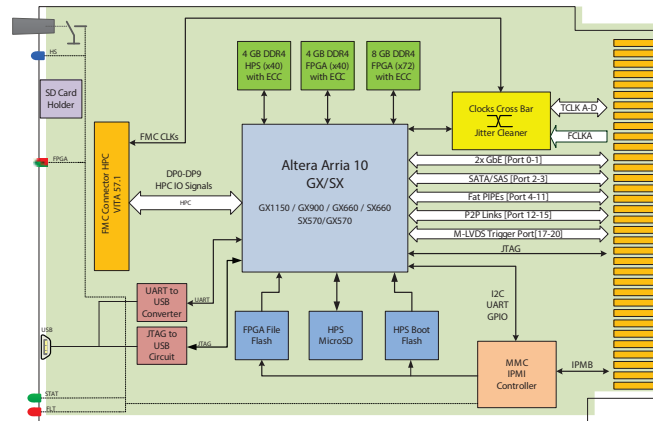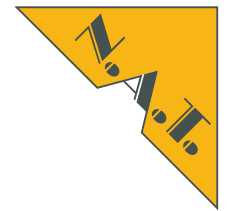 · Medical, broadcast and more

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Technical Data

NAMC-ARRIA10-FMC

NAMC-ARRIA10-FMC Diagram

Overview

The NAMC-ARRIA10-FMC is an AdvancedMC (AMC) featuring the Intel® Arria® 10 GX or SX FPGA and a high pin-count FMC slot (VITA 57.1).

Built on TSMC's 20 nm process technology, Intel® Arria® 10 FPGAs combine up to 1.5M logic elements, high speed SERDES interconnects and dual-core ARM Cortex A9 cores. They deliver 60% higher performance than the previous generation of mid-range FPGAs and 15% higher performance than the fastest previous-generation high-end FPGAs.

A comprehensive set of advanced power saving features and power-optimized MultiTrack routing and core architecture results in up to 40% lower power compared to the previous generation of mid-range FPGAs and up to 60% lower power compared to the previous generation of high-end FPGAs[1].

N.A.T. has combined this processing performance with an FMC slot, enabling you to create a range of powerful single-slot embedded computing solutions.

The FMC slot can accommodate a wide variety of third-party VITA 57.1-compliant modules providing data acquisition, networking, RF or other functionality.

Application examples include computing node, data acquisition and processing engine or software-defined radio module for wireless backhaul, optical transport, military radar, test and measurement, as well as video and image processing for broadcast, medical imaging and therapy.

[1] Data from Intel

Key Features

Dimensions
· Single-width, full-size or mid-size AMC
· Width 73.5mm X Depth 180.6mm

FPGA
· Intel® Arria® 10 FPGA (SoC system on chip) with up to 1150k LE, 47Mbit memory, 48 SerDes lanes, 588 I/O (GX1150 version)
· Up to 16 GB of DDR4 memory with ECC
· 128 MB Flash configuration memory

CPU
· Dual-core ARM Cortex A9 processor, up to 1.5 GHz

Memory: SX660/SX570 Variants
· 4 GB DDR4 (x32) memory bank with ECC dedicated to CPU
· 8 GB DDR4 (x64) memory bank with ECC dedicated to FPGA
· 4 GB DDR4 (x32) memory bank with ECC dedicated to FPGA
· 128 MB FPGA configuration flash (QSPI)
· 128 MB Boot flash memory
· MicroSD card slot for operating system and storage

Memory: GX1150/GX900/GX660/GX570 Variants
· 8 GB DDR4 (x64) memory bank with ECC dedicated to FPGA
· 2x 4 GB DDR4 (x32) memory bank with ECC dedicated to FPGA
· 128 MB HPS configuration flash (QSPI)
· HPS MicroSD / eMMC

Software/Firmware
· IPMI 1.5 compliant
· Reconfiguration of FPGA via IPMI
· Linux boot – Linux drivers (SX660, SX570 only)
· API for all external/internal interfaces (SX660, SX570 only)

FPGA Programming Interface
· Onboard Intel (Altera) header connector
· Embedded USB-Blaster circuitry
· Front panel USB connector
· IPMI/HPM via onboard MMC controller

FMC Slot
· Single HPC (High Pin Count) FMC (FPGA Mezzanine Card) slot
· VITA 57.1 compliant
· All HPC differential pairs (LA/HA/HB) are routed to the FPGA
· DP0 to DP09 are routed to the FPGA

Backplane Interconnect
· Dual 1GbE connect to Port 0 and Port 1
· Ports 2 and 3 for SATA, SAS
· One x8 PCI Express Gen3 connect to Fat-Pipe-Region Ports 4-11 or
· Dual x4 PCI Express Gen3 to Fat-Pipe-Region Ports 4-7 and Ports 8-11 or
· Dual x4 SRIO Gen2 to Fat-Pipe-Region Ports 4-7 and Ports 8-11
· Any Combinations of PCIe, SRIO, XAUI (on request)
· Full AMC TCLKA-D and FCLKA connectivity (bidirectional)
· Point to point connectivity: Ports 12-15 routed to FPGA (2 x 4 LVDS)
· 8x MLVDS trigger lines (Ports 17-20)

Front Panel
· HPC FMC slot
· Dual UART-USB to ARM core (SX660, SX570 only) and MMC
· AMC standard LEDs and hot swap handle
· Application LEDs
· Embedded USB-Blaster circuitry

Compliance
· AMC.0 R2.0, AMC.1, AMC.2, AMC.3, AMC.4, IMPI V1.5, HPM.1
· EN60950, UL1950, RoHS

Operating Environment
· Default: 0 to +55°C
· Optional: -25 to +85°C
· Optional: -40 to +100°C
· Humidity: 5% to 95% (non-condensing)
· Vibrations: sinusoidal, 0.38mm peak from 5Hz to 36Hz, 2g from 36Hz to 2KHz
· Shocks: 20g, 11ms, 1/2 sine
· Altitude: 0 to 5000m

Storage Environment
· Default: -40 to +100°C
· Humidity: 5% to 95% (non-condensing)
· Vibrations: sinusoidal , 0.38mm peak from 5Hz to 36Hz, 3g from 36Hz to 2KHz
· Shocks: 30g, 11ms, 1/2 sine
· Altitude: 0 to 15000m