



# 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

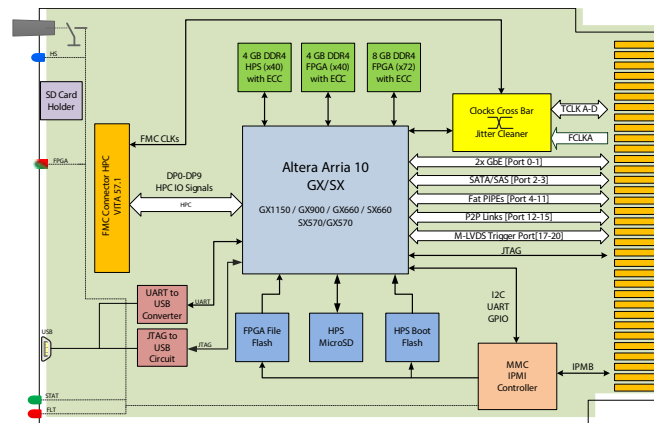
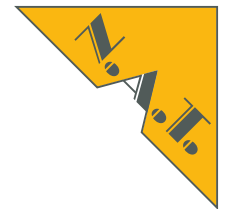
- Telecommunications
  - SDR, wireless backhaul, optical transport
- Radar/sonar
- Test and measurement
- Video and image processing
  - Medical, broadcast and more



# 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<sup>1</sup>.

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.

<sup>1</sup> 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