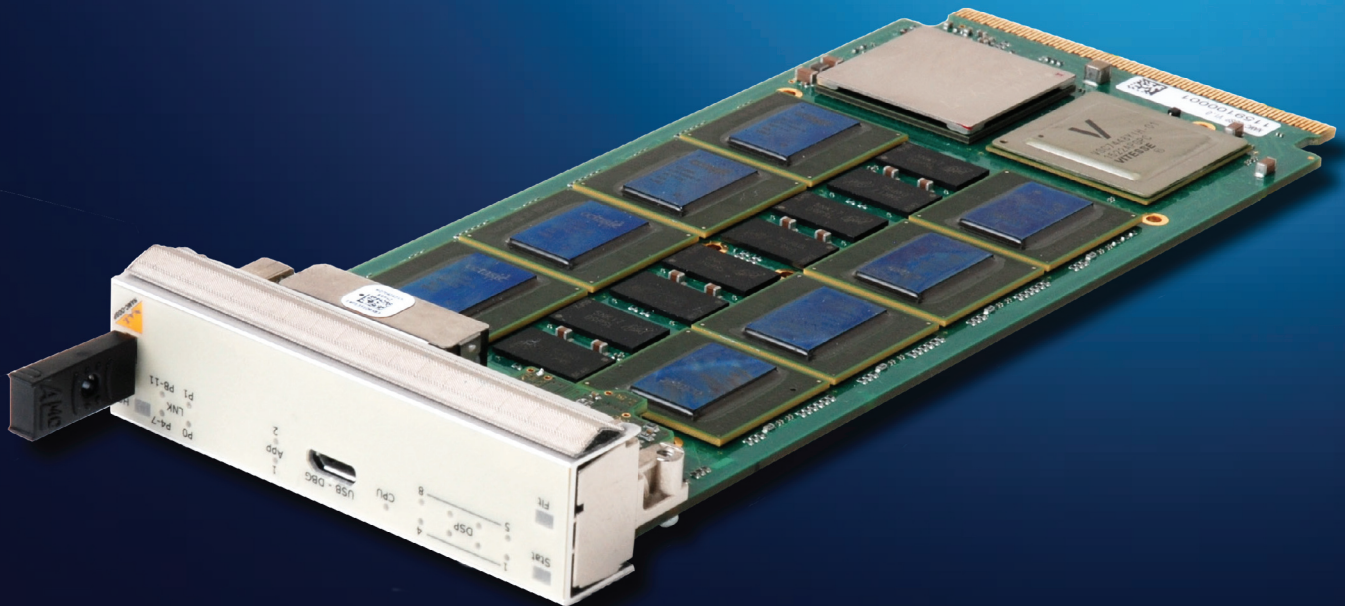# NAMC-ODSP-M

Media Processing Acceleration for ATCA & MTCA

The **NAMC-ODSP-M** enables you to add video and audio acceleration to your AdvancedTCA® (ATCA®) and MicroTCA® (µTCA, MTCA) systems. It provides a broad range of audio/video codecs and algorithms, including H.264, MPEG4, H.263, and G.711, G.729, SILK and Opus, in a compact AMC module. We have enhanced this standard functionality with additional video and voice quality features. An on-board FPGA simplifies management while enabling you to extend and customize the module to suit the exact needs of your application. Integrated media gateway software provides rich audio and video applications with many codecs and protocols included and a simple configuration API so no DSP programming is required.

Key features

· Up to eight OCT2224M DSPs
· Xilinx Kintex-7 FPGA
· Redundant 1/10G Ethernet connectivity
· Integrated media gateway software
· Capable of up to:
    · 5,120 channels G.729AB/G.711 transcoding
    · 16 simultaneous H.264 HD/SD transcodes
    · 16,384 TDM/iTDM channels

Applications

· Session border controller
· Media server / media resource function
· Audio/video conferencing server (MCU)
· Interactive voice and video response
· Carrier grade media gateway
· Mobile video optimization
· Content detection and analysis
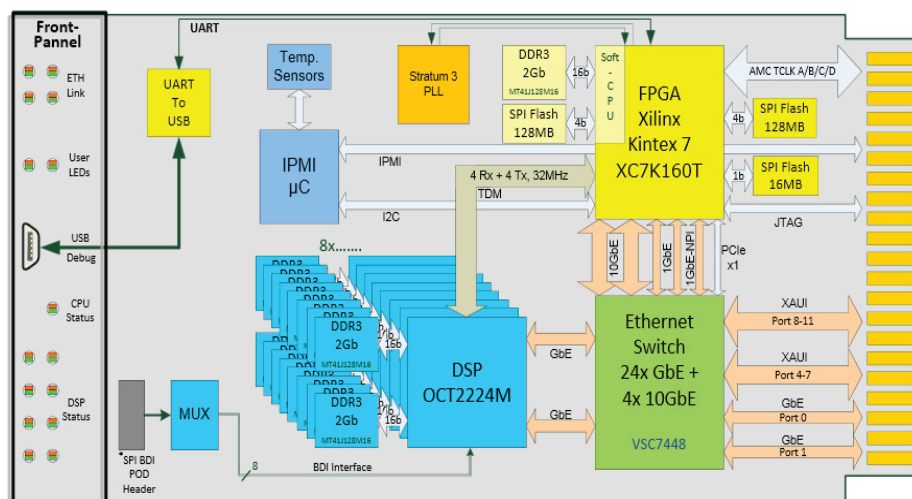
Overview

The **NAMC-ODSP-M** from N.A.T. combines a powerful FPGA with an array of DSPs, an on-board switch and advanced media gateway software in a single-width, mid-size AMC module package to make it easier for you to add video and audio acceleration to your communications and networking systems.

Subsystem Processor
The on-board Xilinx Kintex-7 FPGA provides a local Linux processor for low-overhead management to the interfacing host system, while also giving you headroom for further extension and customization.

Media Processing Array
Up to eight Octasic OCT2224M DSPs, each with twenty-four DSP cores, provide the specialized processing power needed for video and audio acceleration. Each DSP is equipped with its own private external 512MB DDR3 memory. This pool of DSPs is controlled from a host application over Ethernet using one of the redundant 1/10GbE ports of the NAMC-ODSP-M.

Interfaces
The AMC Ethernet ports are connected to the onboard managed Ethernet switch, to which each individual DSP is also connected by two separate 1GbE links to support, for example, 1080p video conferencing functions.

An FPGA-based ITDM to TDM controller enables one or two 8k channel ITDM interfaces, resulting in up to 16k ITDM channels.

The NAMC-ODSP-M provides two redundant 10GbE interfaces at ports 4-7 and 8-11, and two redundant 1GbE interfaces at ports 0 & 1 of the common options region of the AMC backplane connector.

API
We provide an integrated Ethernet-based API for simple connection and configuration, and to enable the attachment of media gateway software.

Media Gateway Software
The NAMC-ODSP-M comes with Octasic's Vocallo media gateway software, providing rich audio and video applications based on IP and TDM, with many codecs and protocols included, such as high density H.264, MPEG4, H.263 video codec and G.711, G.729, SILK and Opus voice transcoding. Octasic has enhanced this standard functionality with video and voice quality features such as video scaling, mixing and keying as well as echo cancellation, conferencing and adaptive noise reduction.

This covers many advanced audio / video applications, conferencing systems, audio / video transcoding, video surveillance and T.38 fax relay applications. The software provides an Ethernet packet-based configuration API so no DSP programming is required. It offers a very flexible architecture so that you can easily prototype, develop and deploy.

Application Optimization
N.A.T. can adapt the NAMC-ODSP-M to suit your application-specific needs with for example, fewer DSPs or a larger FPGA. Please contact us to discuss your requirements.

Key Features

Subsystem Processor
· Xilinx Kintex-7 XC7K160T, FBG676 (160k LE, 12Mbit internal SRAM, 8SerDes, 400 I/0)
· Microblaze soft-core CPU

Media Processing Array & Memory
· Up to eight 24-core Octasic OCT2224M DSPs. Each DSP connects to two 16-bit wide DDR3 memory slots. Using 2Gb devices this results in 512MB DRAM per DSP.
· Each DSP has its TDM interface (4 Rx + 4 Tx lines, up to 32MHz) connected to the FPGA.

Backplane Connectivity
· Two redundant 1GbE backplane at ports 0 and 1, and two redundant XAUI 10GbE backplane at ports 4-7 and 8-11. Full AMC TCLKA-D connectivity (for syncing onboard ITDM/TDM to system).

Clocking
· Clocking Chip Si5338 (4 programmable low jitter clock outputs)
· Stratum 3 Telecom PLL

Networking
· Vitesse VSC7448 Ethernet switch offering 24x 1GbE ports and four 10GbE ports. Each DSP has two 1GbE interfaces while the FPGA has three 1GbE and two 10GbE interfaces to the on-board Ethernet switch.
· L2 and L3 switching / routing

Codecs Supported: Audio
· Wireline: G.711, G.722, G.723, G.726, G.729a
· Wireless: AMR, AMR-WB, EFR, GSM-FR, EVRC -A/-B/-NW2K
· Internet: SILK, Opus, iLBC
· Acoustic echo cancellation, noise reduction, level control
· Tone detection / generation / relay
· Conferencing

Codecs Supported: Video
· H.263, MPEG4, H.264, MPEG2
· 1080p to QCIF resizing
· Bit rate / frame rate adaptation
· Mixer, picture-in-picture

· Data
· T.38 Fax Relay
· Voice band-data

Operating System Support
· Embedded Linux operating system

Environmental Conditions
Temperature (operating):
· 0ºC to +60ºC with forced air cooling
Temperature (storage):
· -40ºC to +85ºC
Relative Humidity:
· 10% to 90% at +55ºC (non-condensing)

Power Consumption
· 45W typical (TBD)

Standard Compliance
· AMC.0 R2.0, AMC.2, IMPI V1.5 & V2.0, HPM.1
· EN60950, UL1950, CE, RoHS