

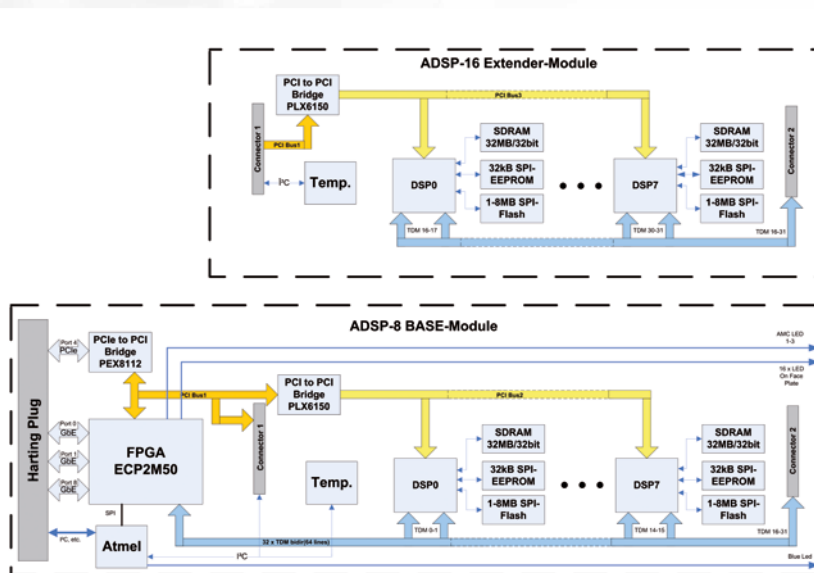


The module is designed to process standard telecom algorithms like voice/data compression/decompression or DTMF detection/generation.

The NAMC-ADSP is a multi-purpose (tele)communication resource board in AMC (**A**dvanced **M**ezzanine **C**ard) form factor, being equipped with either 8 or 16 Blackfin DSPs from Analog Devices.

The NAMC-ADSP is targeted at applications in telecom environments with extensive need for voice or data computation.

Because of its capability to let any single or a group of DSPs process any individual timeslot transmitted via I-TDM protocol over backplane Gigabit-Ethernet, the NAMC-ADSP is an ideal solution for any voice/data application in any signalling or VoP solution such as in ISDN, SS7, ATM, VoIP or 3G environments.



Overview

The NAMC-ADSP is a multi-purpose (tele) communication resource board in AMC (Advanced Mezzanine Card) form factor, being equipped with either 8 or 16 Blackfin DSPs from Analog Devices. The NAMC-ADSP is targeted at Telecom applications with extensive need for voice or data computation. The module is designed to process standard telecom algorithms like voice and data com- and decompression or DTMF detection and generation. The module is capable of handling individual timeslots transmitted via I-TDM protocol over backplane Gigabit-Ethernet. The design is optimized for handling in parallel as many timeslots (TDM data) as possible. The TDM data streams are supplied by a standard I-TDM backplane interface located on port 0 or port 1 (redundant configuration) or port 8 of the AMC connector.

AMC-Interface

The NAMC-16ADSP is a single-width, half-height AMC module, also available in full-height.

The PCIe-X1 lane directly connects the local bus and onboard devices to the backplane.

Backplane I-TDM Access

The TSI (Time Slot Interchanger) as well as the TDM-to-iTDM bridge are incorporated in a ECP2M50 FPGA from Lattice. The TSI allows flexible routing as well as multi-casting of 64kbps timeslots between the various DSPs. The TDM-to-iTDM bridge converts the TDM oriented bit stream into Ethernet packets and vice versa. The Ethernet packets are sent and received via a 1000BaseT-BX Ethernet interface.

Each DSP is able to handle 256 bidirectional TDM channels. The NAMC-ADSP is providing up to 4096 timeslots of 64kbps bandwidth. Due to the FPGA design of the TSI controller sub-channeling or super-channeling is possible as well.

DSP resources

The NAMC-ADSP-8 is equipped with 8 ADSP-BF535P Blackfin CPUs from Analog Devices, running at a core frequency of 350MHz. The NAMC-ADSP-16 is equipped with sixteen ADSP-BF535P Blackfin CPUs in total. Each of the DSPs has 32MB of individual SDRAM as well as 1MB individual FLASH aside to ensure a most flexible and individual utilization of its resources.

Due to its internal design the Blackfin DSP is a very powerful but cost efficient processing engine with 700 MMACs (max.) and 3.5MIPS per TDM channel. Special coding algorithms that are often used in telecom environments, i.e. G.711, are built-in features.

Beside special DSP cores from N.A.T., Analog Devices and other third parties offer cores for most commonly used applications including

- Multi-Rate Filter
- FFT
- Convolutional Encoders
- QAM, BPSK and QPSK modulation
- Image Processing

to name just a few. The NAMC-ADSP is suitable for any voice/date application in any signalling or VoP solution such as in ISDN, SS7, ATM, VoIP or 3G environments are suitable.

Technical Data NAMC-ADSP

PCIe Interface and Compliance

x1 on port 4
PICMG AMC.1 R1.0

GbE Interface and Compliance

GbE on port 0 and 1

IPMI and Compliance

PICMG AMC.0 R2.0
PICMG 2.9 R1.0

I-TDM

4096 bidirectional iTDM channels connecting to the DSP's serial ports

DSPs

ADSP-BF535P Blackfin DSPs from Analog Devices, 350MHz core frequency, 700 MMACs, 3.5MIPS per TDM channel, 8 pcs ADSP (NAMC-ADSP-8), 16 pcs ADSP (NAMC-ADSP-16)

Memory

32 MB SDRAM and 1MB FLASH per DSP

Indicator LEDs

16 software programmable LEDs (1 status indicator LED per DSP) front panel

Clocks

TCLK A-D as input supported, FCLKA or local 100MHz osc. as fabric reference clock

Host Operating System Support

OK-1, VxWorks, LINUX, dependent on application

Power Consumption

3.3V MP 0.1A (typ.)
12V 1.1A (typ.) (NAMC-8ADSP)
12V 2.0A (typ.) (NAMC-16ADSP)

Environmental

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

Applications

voice and data compression and decompression
voice and data encryption and decryption
DTMF detection and generation
VoP
special handling of signalling protocols (i.e. SS7, 3G TFO, etc.)

