ATCA-8310

AdvancedTCA DSP Blade

Embedded Computing for Business-Critical Continuity™

DATA SHEET

Supports up to 30 DSPs with local packet processing resources and a powerful general purpose processor all on one blade

- PICMG® compliant single-slot AdvancedTCA blade with 1/10G Ethernet fabric ports
- Up to 30 Texas Instruments TMS320TCI6486 6-core DSPs
- 8-core Freescale QorIQ™ P4080 for packet processing and load balancing in the IP I/O path
- Pre-installed Linux on P4080 with utilities for blade configuration, switch management and DSP setup
- Red Hat RHEL certified 2-core Intel® Core™ i7 processor for control plane application
- Local Ethernet switch connecting all DSPs, CPUs, ATCA networks and I/O
- IP RTM supporting 10Gigabit Ethernet
- Designed for NEBS and ETSI compliance in a CP-TA B.4 class enclosure

The ATCA-8310 from Emerson Network Power is a state-of-the-art AdvancedTCA® DSP/Media Processing platform designed to provide power-efficient, high-density voice and video transcoding functions. The blade features a uniquely flexible mix of processing technologies to support:

- “DSP farm” architectures for scalable voice and video gateways based on multiple ATCA-8310 blades, featuring a high processing density with up to 180 DSP cores on a single blade.
- "Gateway-on-a-blade" architectures for small systems with just one or two ATCA-8310 blades, providing DSP functionality, packet processing functionality and an Intel® CPU all on each blade.
- "Pay-as-you-grow" capability with field-upgradeable DSP expansion options.

The ATCA-8310 is optimized for IP to IP applications, but may be adapted to support legacy TDM applications in specific customer configurations using a range of TDM rear transition modules (RTMs), including variants with multiple OC/3 and OC/12 line terminations.

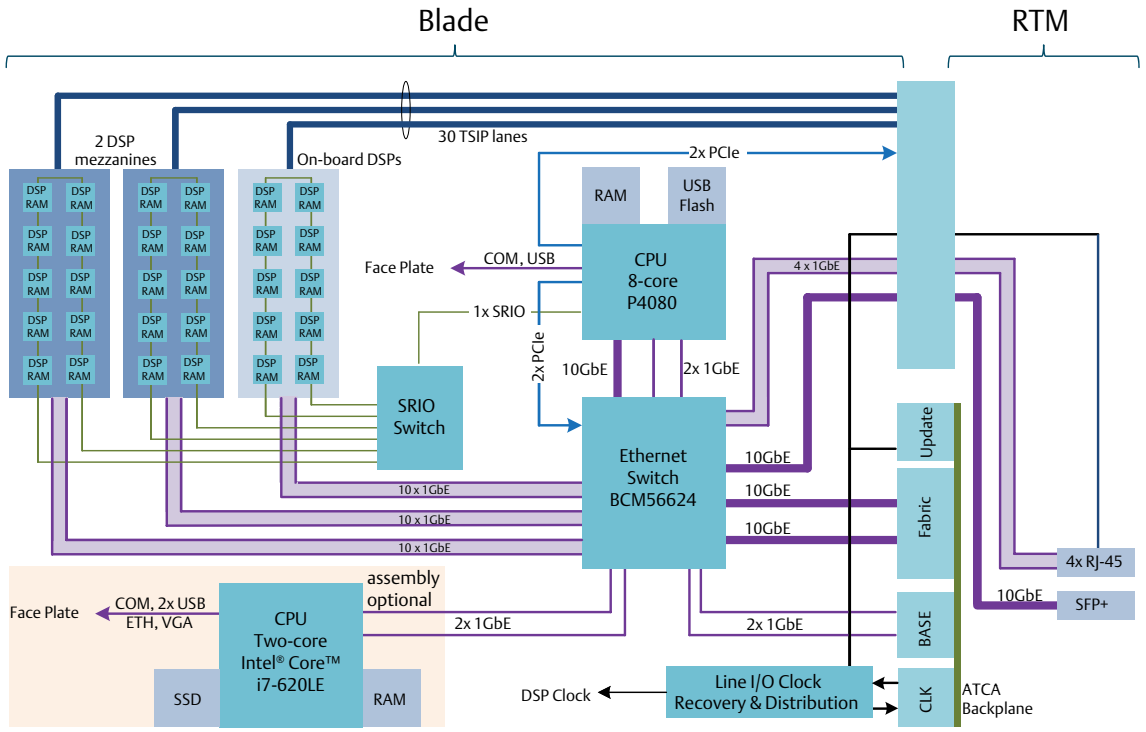
In a fully expanded voice configuration, the ATCA-8310 is capable of handling over 8000 channels of TDM to compressed (G.729AB) Voice over IP conversion including tone detection and echo cancellation, or over 6000 channels of GSM-AMR mobile voice transcode in a single ATCA slot. The ATCA-8310 is also ready for video transcode and transrate applications, estimated to be able to handle up to 350 individual mobile video streams per slot.

RoHS 6/6 COMPLIANT

AdvancedTCA®

EMERSON™ Network Power

ATCA-8310 Block Diagram



ATCA-8310 Overview

The ATCA-8310 utilizes a base board and media mezzanine module approach for maximum flexibility and scalability, while also supporting the insertion of new technology as it becomes available. At the heart of the board is a Freescale P4080 packet processing CPU and a Broadcom Layer 2/3 Ethernet switch that interconnects all the various processing elements and provides access to the ATCA fabric. The P4080 implements powerful security and load balancing functions that hide the complexity of the voice and video processing subsystem from external networks.

The initial ATCA-8310 digital signal processor (DSP) array is based on the Texas Instruments powerful TMS320TCI6486 DSPs, each with external memory, and each connected to the local Ethernet switch. Up to 30 DSPs can be carried in a NEBS configuration; 5 or 10 on the base board, and 10 on each of two field-upgradeable mezzanines. The mezzanines are designed to support connectivity appropriate to next generation DSPs for future-proofing. Using mezzanines allows for low entry costs and pay-as-you-grow scalability.

Finally, the board offers an optional Intel® Core™ i7 processor subsystem that, when fitted, allows the board to operate as a fully functional "media gateway on a blade" for small systems. The Intel Core i7 processor can run both management and call agent applications. It avoids the need for additional ATCA blades to perform this task, again minimizing the cost to first call.

STANDARD NETWORKING SUPPORT

The ATCA-8310 media processing blade provides PICMG® 3.0 base interface connectivity in a dual star configuration using standard Gigabit Ethernet (GbE) technology. The PICMG 3.1 fabric interface features both dual 10Gbps (Option 9) and dual 1Gbps (Option 1).

DIGITAL SIGNAL PROCESSING COMPLEX

The ATCA-8310 contains up to 30 DSPs on three logical modules with 10 DSPs each. The first module is fixed assembled on the ATCA baseboard, the 2nd and 3rd module are located on two mezzanines. Factory assembly options allow baseboard module configurations with 0, 5 and 10 DSPs. In total this gives options for 5, 10, 15, 20, 25 and 30 DSPs. The DSPs are connected to the infrastructure with two SRIO ports per module, two concentrated TSIP SERDES interfaces per module and one GbE link per DSP. The DSPs are TMS320TCI6486 operating at 500 MHz. Future DSP technologies can be supported via new DSP
mezzanine modules.

PACKET PROCESSING AND LOCAL MANAGEMENT COMPLEX

The ATCA-8310 contains a powerful multi-core Freescale P4080 packet processor. In default configuration all cores run Mentor Graphics Embedded Linux. Light Weight Executives (LWE) allow execution of packet processing software, either inside Linux using User Space Data Path Acceleration Architecture (USDPAA), or separated via the Freescale Hypervisor.

- Freescale QorIQ P4080 communications processor @ 1.5 GHz
- Two 244-pin DDR3 Mini-DIMM sockets, bus-width 64-bit plus 8-bit ECC
  - 2x 1GB DDR3 memory DIMMS
  - Up to 2x 4GB on request
- 4GB USB user flash memory
  - Up to 16GB on request
- Front panel connections
  - 1x COM
  - 1x USB

GENERAL PURPOSE PROCESSING COMPLEX

The ATCA-8310 contains a build option for a general purpose processor building block based on the Intel® Core™ i7 Mobile Processor. This processing complex is operating independent from the rest of the media processing functionality. It is connected to the local Ethernet switch via two Gigabit Ethernet connections. Its intended usage are control plane functions like call servers.

- Intel® Core™ i7-620LE Processor @ 2.00 GHz
  - Two 244-pin DDR3 Mini-DIMM sockets, bus-width 64-bit plus 8-bit ECC
  - 2x 2GB DDR3 memory DIMMS
  - Up to 2x 4GB on request
- Solid State Disk option
- Front panel connections
  - 1x COM
  - 2x USB
  - 1000Base-T Ethernet
  - VGA

Rear Transition Modules

IP RTM

- 1x 10 Gigabit Ethernet via a SFP+ interface
- 4x 10/100/1000BaseTx via RJ-45

OC-3, OC-12, DS1 and DS3 RTM options are available on request.

Performance Estimations

Performance figures below are based on a configuration with 30x TMS320TCI6486 DSPs @ 500 MHz and are estimations based on typical voice and video codecs.

ESTIMATED VOICE CODING PERFORMANCE

- 14,000 channels of TDM↔G.711 VoIP as used in access media gateways
- 8,000 channels of TDM↔G.729 AB compressed VoIP as used in trunk media gateways
- 6,000 channels of G.711/IP↔AMR/IP as used extensively in mobile voice gateways

ESTIMATED VIDEO CODING PERFORMANCE

- 350 channels of H.264 CIF mobile video transcoding as used in mobile video applications
- 100 channels of MPEG2/H.264 transode used in IPTV applications

Software Support

MULTI-CORE CPU (Freescale P4080)

User configurable symmetrical multiprocessing (SMP) Linux distribution with real-time extensions and Light Weight Executives (LWE).

- Boot firmware
- Mentor Graphics Embedded Linux
- Emerson Basic Blade Services (BBS) with
  - All necessary drivers for the ATCA-8310 and the ARTM-831X-IP
  - Control, boot and operation of the DSP hardware
  - Firmware upgrade utility
  - IPMI support
  - Emerson SRstackware for switch management
    - Comprehensive L2 and selected L3 functionality
    - Packet classification and forwarding supporting a single IP address for the entire DSP farm
    - CLI and SNMP based user interfaces

DIGITAL SIGNAL PROCESSORS

- Basic platform support software to support DSP image load and control
- Validated to run Texas Instruments Voice and Video Software

INTEL PROCESSOR (Intel Core i7 Mobile processor)

- Red hat Enterprise Linux 6
- Blade specific drivers as supported binary and sample source code

Hardware Specifications

POWER REQUIREMENTS

- Dual-redundant -48 to -60 VDC (TNV-2)
- Input range: 39 to 72 VDC
- Power consumption front blade: Full power mode - 300 Watts (estimated)

THERMAL CHARACTERISTICS

- Operating range: –5 °C to 55 °C
- Cooling requirements at ETSI/NEBS conditions according to CP-TA B.4

BLADE SIZE

- PICMG 3.0: 8U form factor, 280 mm X 322.5 mm, single slot

BASE AND FABRIC INTERFACES

- Dual star configuration
- PICMG 3.0 base interface compliant, Gigabit Ethernet (1.0Gbps)
- PICMG 3.1 fabric interface compliant, Gigabit Ethernet
  - PICMG 3.1, Option 1 - Single, redundant Gigabit Ethernet pair (1.0Gbps)
  - PICMG 3.1, Option 9 - Single, redundant 10 Gigabit Ethernet pair (10Gbps)
- PICMG 3.0 Update Channel Gigabit Ethernet (1.0Gbps)

RELEVANT STANDARDS

- PICMG 3.0 (form factor, IPMI, base interface, hot swap, RTM)
- PICMG 3.1, Option 1, 9

Ordering Information

Part Number	Description
ATCA-8310-0-T10	ATCA BLADE - P4080/2GB - no I7-620LE - 10 X TMS320TCI6486/256MB - SRIO - 2 FREE MODULE SLOTS - SW LICENSES: P4080 BBS
ATCA-8310-IA-T5	ATCA BLADE - P4080/2GB - I7-620LE/4GB - 5 X TMS320TCI6486/256MB - SRIO - 2 FREE MODULE SLOTS - SW LICENSES: P4080 BBS
ATCA-8310-IA-T10	ATCA BLADE - P4080/2GB - I7-620LE/4GB - 10 X TMS320TCI6486/256MB - SRIO - 2 FREE MODULE SLOTS - SW LICENSES: P4080 BBS
ARTM-831X-IP	ARTM-831X-2X10GE-4X1GBE
SM-BBS-WR-ATCA-8310	BASIC BLADE SERVICES SW AND SRSTACKWARE PROTOCOLS BASED ON WR PNE – CD MEDIA ONLY
MEZZ-83XX-EXTR-TOOL	EXTRACTION TOOL FOR THE ATCA-83XX MEZZANINE MODULES
831X-MEZZ-T10	DSP MODULE FOR ATCA-8310 - 10 X TMS320TCI6486/256MB
8310-SSD-100GB-MLC	SSD FOR ATCA-83XX IA PROCESSOR - 100GB NET CAPACITY - MLC TECHNOLOGY
RJ45-DSUB-ATCA	RJ45 DSUB CABLE FOR THE ATCA-7140, 7X50, 736X, 737X, 747X, 83XX, 940X ATCA BLADES (ROHS 6/6)

Regulatory Compliance

Item	Description
Designed to comply with NEBS, Level 3	Telcordia GR-63-CORE, NEBS Physical Protection
	Telcordia GR-1089-CORE, Electromagnetic Compatibility and Electrical Safety – Generic Criteria for Network Telecommunications Equipment. Equipment Type 2
Designed to comply with ETSI	ETSI Storage, EN 300 019-1-1, Class 1.2 equipment, Not Temperature Controlled Storage Locations
	ETSI Transportation, EN 300 019-1-2, Class 2.3 equipment, Public Transportation
	ETSI Operation, EN 300 019-1-3, Class 3.1(E) equipment, Temperature Controlled Locations
	ETSI EN 300 132-2 Environmental Engineering (EE); Power supply interface at the input to telecommunications equipment; Part 2: Operated by direct current (dc)
	ETSI ETS 300 753, Equipment Engineering (EE); Acoustic noise emitted by telecommunications equipment
CE Conformity	Directive 2004/108/EC, Directive 2006/95/EC
EMC	ETSI EN 300 386 Electromagnetic compatibility and Radio spectrum Matters (ERM); telecommunication network equipment; ElectroMagnetic Compatibility (EMC) requirements, Telecommunication equipment room (attended)
	CFR 47 FCC Part 15 Subpart B, Class A (US); FCC Part 15 - Radio Frequency Devices; Subpart B: Unintentional Radiators
	AS/NZS CISPR 22 (Australia/New Zealand), Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment
	VCCI Class A (Japan), Voluntary Control Council for Interference by Information Technology Equipment
	CISPR 22 Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement
	CISPR 24 Information technology equipment – Immunity characteristics – Limits and methods of measurement
Safety	Certified to UL/CSA 60950-1, EN 60950-1 and IEC 60950-1 CB Scheme
	Safety of information technology equipment, including electrical business equipment
RoHS/WEEE compliance	DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)
	DIRECTIVE 2002/96/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on waste electrical and electronic equipment (WEEE)
Interoperability	Designed to operate within a CP-TA B.4 system environment at full performance

SOLUTION SERVICES

Emerson Network Power provides a portfolio of solution services optimized to meet your needs throughout the product lifecycle. Design services help speed time-to-market. Deployment services include global 24x7 technical support. Renewal services enable product longevity and technology refresh.

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ATCA-8310-D1 02/29/12