

ATCA-7480

QuadStar™ 40G Packet Processing/Server Blade

DATA SHEET

An ideal solution for communications equipment requiring powerful data processing performance, flexible mass storage and network options

- Two Intel® Xeon® processors, E5-2600 v3 family
- Scalable performance range with up to 12 cores per processor
- Up to 512GB main memory, DDR4, configurable for highest capacity or cost effective memory configurations
- Large scale on-board solid state storage
- QuadStar™ 40G fabric interfaces enabling multiple bandwidth and redundancy options
- Hot-swappable mass storage options and RAID 0/1 support
- Suitable for open source and commercial Linux derivatives
- Intel DPDK ready
- Designed for NEBS and ETSI compliance (configuration dependent)

Designers and system integrators of communications equipment look for solutions to mitigate infrastructure cost as much as possible. Therefore it is crucial to maximize the available data processing throughput per rack unit. As more and more data will be concentrated in network elements, network bandwidth inside and between equipment is rapidly growing. The SMART Embedded Computing ATCA-7480 blade is the ideal work load unit for meeting this new class of performance and network requirements. Its design has been optimized for providing best in class computational performance and optimized packet throughput combined with high-bandwidth network connectivity. It enables a wide range of applications including packet processing, security functions, NFV environments and control tasks on a single platform. This can help simplifying development and integration of the target application and shortening time to market of the end product.

The ATCA-7480 features a QuadStar™ interface consisting of four 40G Ethernet channels that connect to the shelf's backplane. System integrators have the choice of combining channels to different kinds of redundant and non-redundant topologies depending on the applications bandwidth and availability requirements. The networking design is optimized for use with Intel DPDK and is prepared for supporting future releases.

The ATCA-7480 is based on two Intel® Xeon® E5-2600 v3 family processors providing the highest performance class with up to 24 processing cores per blade. Data paths to main memory and I/O are highly optimized by the use of DDR4 and PCIe Gen 3 protocol. The scalable memory capacity of up to 512GB is ideal for large in-memory databases and look-up/routing tables. This will allow for shorter response times of database accesses, accelerated pattern matching and it can help optimizing routing decisions in virtualized network environments. Cost sensitive applications will benefit from the possibility to use up to sixteen memory DIMMs with lower capacity while still achieving attractive memory capacities.

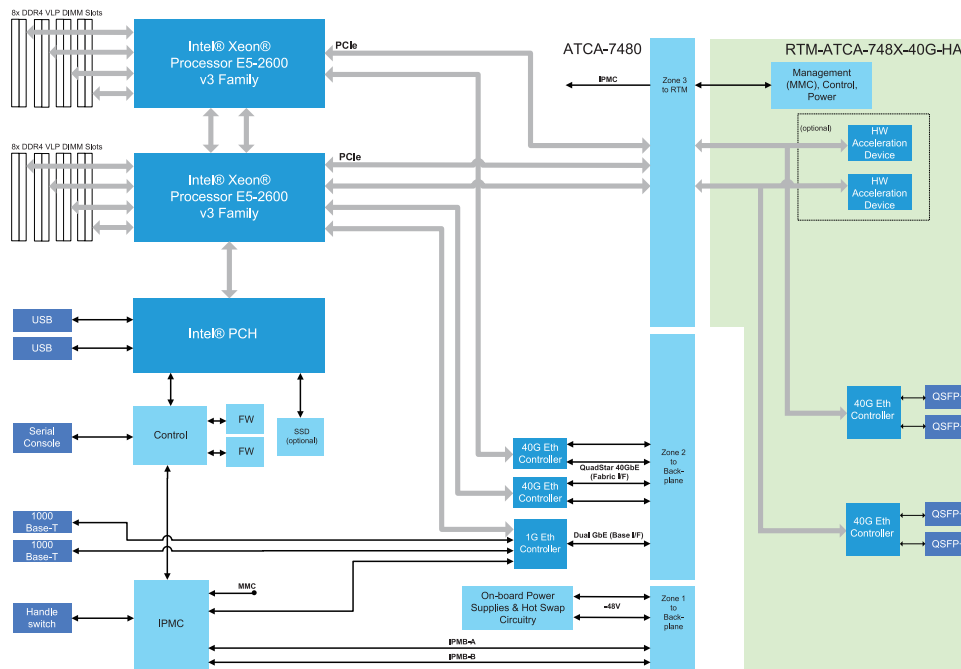


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ATCA-7480 Block Diagram



The ATCA-7480 features two Intel® Xeon® E5-2600 v3 family processors with high bandwidth data paths to all memory and I/O resources. The board power and cooling design has been optimized for processor derivatives supporting highest core count per socket (max. 12 cores per CPU) and highest available clock frequencies (up to 2.5GHz at 12 cores). Depending on the applications need, derivatives with lower core count and frequency selections can be used.

The SMART EC Centellis family is the optimal platform for enabling this performance potential in both NEBS L3 and data center environments. The ATCA-7480 can also be integrated into shelves and operated at excellent performance under NEBS L3 conditions.

With a total of sixteen DIMM sockets the board is prepared for hosting memory capacities of up to 512GB. By populating two DIMMs per memory channel, cost efficient modules with lower capacity can be used for achieving capacities of 128 GB or 256 GB. Eight memory channels featuring DDR4 technology

allow for highest data throughput at reduced power consumption. Furthermore the ATCA-7480 carries optional solid state disks that allow configuring the blade with large mass storage. Each SSD is connected via SATA 3 interface which can enable a maximum bandwidth of 6Gbps for optimal system throughput.

The ATCA-7480 features four 40G Ethernet channels on the fabric interface to the backplane allowing for QuadStar™, dual-dual star and dual star configurations. The system integrator can pick from a variety of topologies including 4+0, 3+1 and 2+2 redundancy exploiting connectivity of four installed hub blades such as the SMART EC ATCA-F140. With three network interfaces concurrently operating aggregated bandwidths beyond 80 Gbps can be exploited, while keeping one channel in standby for redundancy purposes (Note 1, page 3). With all four interfaces concurrently working, the available bandwidth can be even further increased. Applications requiring 2+2 (dual-dual star) redundancy can benefit from 80Gb bandwidth. And certainly the ATCA-7840 is well suited for applications that require a single active 40Gb interface (dual-star) with a single set of two hub blades.

ATCA-7480 DATA SHEET



The ATCA-7480 is fully backward compliant with RTMs available for the successful SMART EC ATCA Intel architecture product portfolio. This easily allows extending the boards I/O and storage capabilities. The main I/O interconnect from the processor complex to the ATCA Zone 3 is based on PCIe supporting multiple I/O connections to meet high bandwidth requirements with up to Gen3.

Further members of the RTM family provide selections of 1 and 10 Gb Ethernet I/O and optional on-board storage. Hot-swappable disk drives can be serviced through the RTMs faceplate.

Supported Rear Transition Modules

RTM	Networking Capabilities		Storage	I/O	
	10Gbps Ethernet (SFP+)	1Gbps Ethernet (1000Base-T, RJ45)	Disk bay for hot-swappable hard disk, 2.5"	SAS I/F on SFF-8470 connector	USB 2.0 Interface
RTM-747X-10G-SP	Six (6)	Four (4)	-	-	-
RTM-747X-10G-D	Four (4)	Four (4)	One (1)	Two (2) SAS	-
RTM-ATCA-7360	-	Six (6)	One (1)	Two (2) SAS	One (1)

Note 1: Maximum aggregated bandwidth of two 40G Ethernet interfaces located in the same network silicon is constraint by the available PCIe bandwidth. Ethernet bandwidth of two network interfaces residing in different network controllers is not impacted by PCIe constraints. Independently maximum achievable bandwidth can be limited by communication protocols being used.

Software Enablement

The ATCA-7480 blade can be configured with a variety of software offerings, from firmware-only to fully integrated and verified software operating environments.

FIRMWARE

The board is preinstalled with BIOS and IPMC firmware that allows combining the board with operating systems and integrating it into hardware platform management.

BIOS firmware includes support for:

- Unified Extensible Firmware Interface (UEFI)
- Power management
- Multiple boot options including:
 - Local and externally connected hard disks
 - On-board solid state disks
 - External USB boot media
 - PXE boot via ATCA base and fabric interface
- Serial redirection of the BIOS console
- Serial over LAN of the BIOS console via ATCA base interface
- BIOS upgrade via local host

INTELLIGENT PLATFORM MANAGEMENT CONTROL

The ATCA-7480 features an intelligent platform management controller (IPMC). The IPMC provides interfaces for hardware platform management that allow monitoring status, event logging, and recovery control of the blade. Features include:

- Compliance with PICMG 3.0 and IPMI 2.0
- Firmware (BIOS, IPMC, FPGA) upgradable from IPMI interface (LAN, IPMB), PICMG HPM.1 support or via Basic Blade Services (BBS) firmware upgrade utility
- FW rollback capability
- Support for serial port redirection over LAN interface

SUPPORTED OPERATING SYSTEMS AND APPLIANCES

The ATCA-7480 is designed to operate with:

- Open source operating systems
- Commercial operating systems
- Intel Data Plane Development Kit
- VMware ESXi 5.5

Operating systems such as CentOS, Ubuntu, OpenSuse and Red Hat 7.x can run on the board. Linux derivatives are combinable with Basic Blade Services (BBS) provided by SMART EC. BBS provides services that help to integrate the board into a system context and manage board resources. The Basic Blade Services include:



- Hardware Platform Management including local IPMC, LED, E-Keying and blade extraction software
- Firmware upgrade utility
- Local management access (CLI)
- Supervision of optical modules

The ATCA-7480 can be configured for virtualization using Linux KVM or VMware ESXi 5.5.

Applications can benefit from the Intel Data Plane Development Kit (DPDK). DPDK enables ways for effectively handling packet processing capabilities by exploiting network silicon, processing resources and hardware off-load engines available to the board.

Hardware Specification

PROCESSOR

- Two Intel® Xeon® processors E5-2600 v3 family
- Dual QuickPath Interface (QPI) – 9.6 GT/s max.
- Max. 35M L3 cache, 2.5MB per available core
- Enhanced features (Intel AES-NI, AVX/SSE, VT, 64 bit, power management)
- SMP and HT support

MEMORY

- DDR4-1600/1866/2133 memory controllers integrated into processors
- Total of four independent memory channels per CPU socket
- Scalable memory capacity 64, 128, 256 GB, prepared for 512 GB
- Support for memory integrity (ECC)

MASS STORAGE

- Up to three on-board solid state disks at 6Gbps SATA
- Hot-swappable hard disk options on RTM
- Mass storage options (various capacities)
 - Enterprise class disks
 - SSD options

BASE AND FABRIC INTERFACES

- PICMG® 3.0 base interface compliant, Gigabit Ethernet (1Gbps)
- QuadStar™ ATCA Fabric Interface with four (4) 40 Gigabit Ethernet (KR4) channels, or PICMG 3.1, Option 9 (10Gbps), Option 1 (1Gbps)
- Configurable as 3+1, 2+2, 1+1 (redundant) or 4+0, 3+0, 2+0, 1+0 (non-redundant), see Note 1 on page 3

COUNTERS/TIMERS

- Real-time clock
- Programmable watchdog timer

EXTERNAL INTERFACES

- Front panel
 - 10/100/1000Base-T Ethernet (2), RJ-45
 - Serial console (1), RJ-45
 - USB 3.0 (2)
- Rear transition module
 - See RTM section on page 3 for product options

POWER REQUIREMENTS

- Dual-redundant –48/–60 VDC (TNV-2) rail
- Input range: –39 to –72 VDC

THERMAL CHARACTERISTICS

- Board variants designed for NEBS L3
 - Operating range: –5 °C to 55 °C
 - Airflow requirements: CP-TA B.4 or higher depending on configuration options
- Board variants designed for data center environments
 - Operating range: 0 °C to 35 °C (depending on available cooling)
 - Airflow cooling requirements: CP-TA B.4 or higher depending on configuration options

RELEVANT BLADE SIZE

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

RELEVANT STANDARDS

- PICMG 3.0 (form factor, IPMI, base interface, hot swap, RTM)
- PICMG 3.1 R2 (fabric interface)



The SMART Embedded Computing Experience

SMART EC has over 30 years of experience serving the defense and telecommunications industries and has hundreds of thousands of products deployed in the world's communications networks and defense systems. With that long experience comes a deep understanding of our customers' requirements for on-time, consistent and high quality product coupled with excellent customer support. We deliver on all counts from our own world-class factory and seasoned support experts.

We're very flexible and agile. We recognize that you may need your system to have your own unique branding. No problem. We're used to that. We have services that allow you to define the look and feel that's consistent with your company's branding and aesthetic standards. Our flexibility isn't just limited to look and feel. Integration services, unique support requirements, longevity of supply, drop shipments and many more services are designed to make it easy to do business with us and quick for you to get to market and deploy smoothly.

Ordering Information

Part Number	Description
ATCA-7480-0GB	ATCA packet processing blade with dual 12-core Intel® Xeon® processors, E5-2648L v3 (1.8 GHz), 16X DIMM sockets, 0GB, QuadStar™ 40G support, CP-TA B.4 compliant. Designed for NEBS L3/ETSI. See Note 2
ATCA-7480-64GB	ATCA packet processing blade with dual 12-core Intel® Xeon® processors, E5-2648L v3 (1.8 GHz), 16X DIMM sockets, 64GB, QuadStar™ 40G support, CP-TA B.4 compliant. Designed for NEBS L3/ETSI.
ATCA-7480-0GB-L	ATCA packet processing blade with dual 8-core Intel® Xeon® processors, E5-2618L v3 (2.3 GHz), 16X DIMM sockets, 0GB, QuadStar™ 40G support, CP-TA B.4 compliant. Designed for NEBS L3/ETSI. See Note 2
ATCA-MEM-DDR4-8GB	8GB DDR4-2133 VLP memory module at maximum memory speed
ATCA-MEM-DDR4-16G	16GB DDR4-2133 VLP memory module at maximum memory speed
ATCA-748XMMOD-KIT	SLIM SATA (MO-297) MODULE CARRIER KIT, 3 SSD sites, 0GB
ATCA-7XMMOD-SATA3	128GB Slim SATA (MO-297) MLC Module for ATCA-737X and ATCA-747X product series, 3Gb SATA I/F
ATCA-7XMMOD-SATA5	256GB Slim SATA (MO-297) MLC Module for ATCA-748X product series, 6Gb SATA I/F
CBL-B-OPT-QSFP-5M	40G QSFP+ optical break-out cable - multimode – 1x MTP (MPO) connector, 8x LC connectors - 5 meter
RTM-747X-10G-D	RTM for the ATCA-747X and ATCA-748X product series, 4x 10GbE (SFP+), 4x GbE, 1x slot for optional HDD. See Note 3
ATCA736X-HDD1-SAS	300GB SAS HDD kit for the RTM-ATCA-736X-10G
ATCA736X-HDD2-SAS	600GB SAS HDD kit for the RTM-ATCA-736X-10G
ATCA736X-SSD1-SATA	480GB SATA SSD kit for the RTM-ATCA-736X-10G
RTM-747X-10G-SP	RTM for the ATCA-747X product series, 6x 10GbE, 4x GbE. See Note 3
RTM-ATCA-7360	RTM for the ATCA-736X, ATCA-737X and ATCA-747X product series, 6x GbE, 2x SAS, 1x slot for optional HDD
ATCA7360-HDD2-SAS	300GB SAS HDD kit for the RTM-ATCA-7360 and RTM-ATCA-7360-L
ATCA7360-HDD4-SAS	600GB SAS HDD kit for the RTM-ATCA-7360 and RTM-ATCA-7360-L
ATCA7360-HDD5-SAS	900GB SAS HDD kit for the RTM-ATCA-7360 and RTM-ATCA-7360-L
RTM-7360-HDDKIT	Carrier and mounting kit for HDD or SSD devices used with RTM-ATCA-7360 or RTM-ATCA-7360-L (no disk included)
RJ45-DSUB-ATCA	RJ-45 DSUB cable for the ATCA-7140, 7X50, 736X, 737X, 747X blades

Note 2: No memory is installed

Note 3: Optical modules are not included

Note 4: To be released with sufficient customer demand



Regulatory Compliance	
Item	Description
Designed to comply with NEBS, Level 3 (for product variants that are designed for NEBS L3 and ETSI compliance)	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 (for product variants that are designed for NEBS L3 and ETSI compliance)	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	EN 55022 Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement (for product variants that are designed for datacenter environments)
	EN 55024 Information technology equipment - Immunity characteristics - Limits and methods of measurement (for product variants that are designed for datacenter environments)
	ETSI EN 300 386 Electromagnetic compatibility and Radio spectrum Matters (ERM); telecommunication network equipment; ElectroMagnetic Compatibility (EMC) requirements, Telecommunication equipment room (attended) (for product variants that are designed for NEBS L3 and ETSI compliance)
	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 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS).
	DIRECTIVE 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on waste electrical and electronic equipment (WEEE)

SOLUTION SERVICES

SMART Embedded Computing 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 worldwide technical support. Renewal services enable product longevity and technology refresh.

CONTACT DETAILS

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