ATCA-7540-D
Ruggedized Dual-Star 40G Server Blade

Bladed server platform with flexible I/O connectivity and ultimate processing performance

- Two Intel® Xeon® Scalable processors (codename Skylake)
- Scalable performance range/core count
- Up to 384GB main memory
- DDR4 via 12 VLP DIMM sockets with speeds of 2400 MT/s
- Dual-star 40G Ethernet fabric
- Option for enterprise-grade, very high-reliability memory
- Choice of compatible rear transition modules for I/O and storage options
- Dual on-board M.2 SSD sites
- Optional configuration with crypto offload
- Linux support
- DPDK-ready

AdvancedTCA®

DESIGNED & ASSEMBLED IN USA

The SMART Embedded Computing ATCA-7540-D COTS server blade, featuring dual Intel® Xeon® Scalable processors (Intel® code name Skylake), provides the highest level of X86-based processing with long lifecycles for military high performance computing applications.

It has been adapted from the ATCA-7540 non-rugged variant with an alignment block that enables the blade to be secured in a chassis with captive screws, such as SMART EC's AXP1440-D chassis, which is specially hardened against shock and vibration for shipboard electronics applications.

The shipboard electronics environment is particularly demanding in terms of shock and vibration. Ship electronics must be able to withstand the effects of vibration from engines and other onboard systems, and must be able to withstand the intense shock of missile and torpedo hits. In conjunction with shock-hardened racks designed by the customer and SMART EC's AXP1440-D chassis, the ATCA-7540-D has been successfully deployed in navy shipboard data centers at the heart of very dense computing and signal processing applications.

Careful component choices have been made for an extended product life cycle. SMART EC has selected processor variants from the Intel® Xeon® Scalable processor embedded portfolio that offer 15-year availability to provide both the performance and longevity expected by military service branches and contractors.

ATCA is an open COTS standard with a rich ecosystem of both blades and systems from many vendors. With its rugged design, 5-nines high availability (99.999%) and shallow footprint, ATCA is being deployed in both shipborne and land-based military applications. The ATCA bladed architecture meets the requirements for Modular Open Systems Approach (MOSA) in a rugged, compact and power-efficient package.

The ATCA-7540-D offers multiple options for I/O and operating system to ensure a seamless upgrade path from existing systems and provide the tools and flexibility necessary for new deployments. Optional Intel QuickAssist™ technology offers crypto offload, enabling you to use in-system encryption to improve the product's security
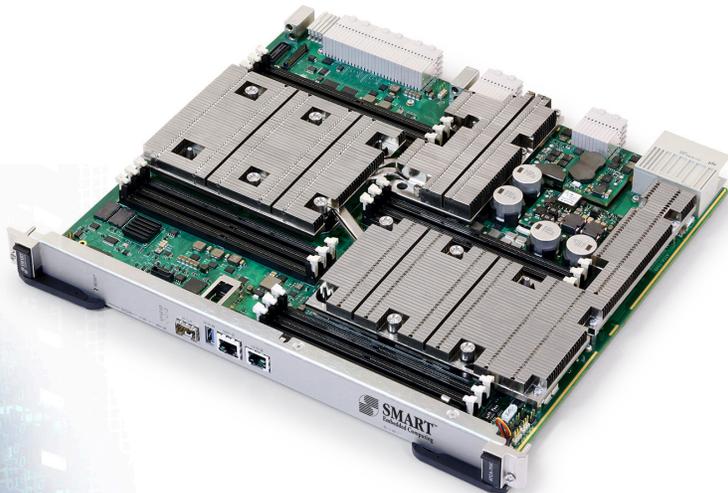
SMART™ Embedded Computing

ATCA-7540-D Block Diagram
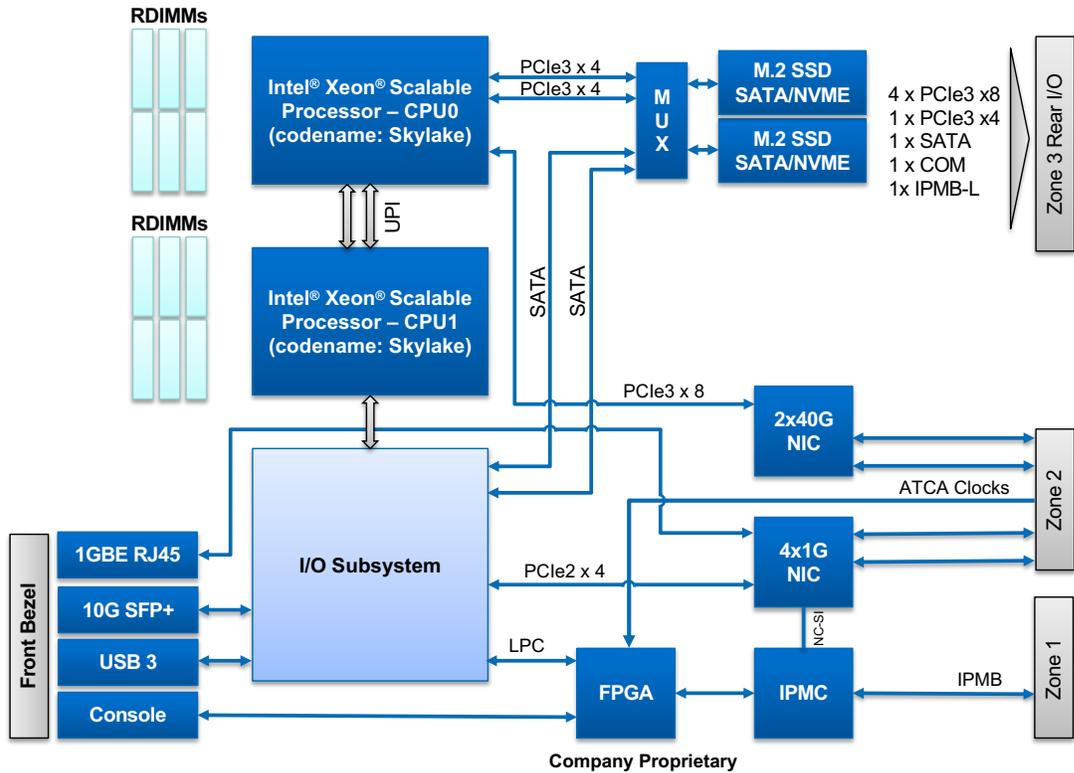
Software Enablement

The ATCA-7540-D blade can be configured with a variety of software offerings, from firmware-only to fully integrated and verified software operating environments.

FIRMWARE

The blade has a pre-installed BIOS and IPMC firmware that allows installing 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 interfaces as well as front panel network 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-7540-D 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
- Firmware rollback capability
- Support for serial port redirection over LAN interface

SUPPORTED OPERATING SYSTEMS AND APPLIANCES

The ATCA-7540 is capable of running many different operating systems such as CentOS, Ubuntu, RedHawk and Red Hat Linux.

SMART EC provides a CentOS 7 based operating system, DPDK and Basic Blade Services (BBS) for the ATCA-7540. The ATCA-7540 has also been certified with VMware ESXi 6.7.

BBS provides services that help to integrate the blade into a system context and manage blade resources. The Basic Blade Services include:

- Hardware Platform Management including local IPMC, LED, E-Keying and blade extraction software
- Firmware upgrade utility
- Supervision of optical modules

The ATCA-7540 can be configured for virtualization using Linux KVM. 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 blade.

Hardware Specificiations

PROCESSOR

- Two Intel® Xeon® Gold or Silver embedded processors
  - Intel® Xeon® Gold 5119T with 14 cores at 1.9GHz
  - Intel® Xeon® Silver 4114T with 10 cores at 2.2GHz
  - Optional PCH with Quick Assist Technology (QAT) adding hardware acceleration for network security, routing and storage
- Enhanced features (Intel AES-NI, AVX/SSE, VT, 64 bit, power management)
- SMP and HT support

MEMORY

- DDR4-2400 memory controllers integrated into processors
- Total of six independent memory channels per CPU socket
- Scalable memory capacity 64, 96, 128, 192 and 384GB
- Support for memory integrity (ECC)
- Option for enterprise-grade, very high-reliability memory

MASS STORAGE

- Up to two on-board M.2 SATA/NVME solid state disks (80 or 110mm)
- Hot-swappable hard disk options on RTM

BASE AND FABRIC INTERFACES

- PICMG® 3.0 base interface compliant, Gigabit Ethernet (1Gbps)
- Dual star ATCA Fabric Interface with two 40 Gigabit Ethernet (KR4) channels, or PICMG 3.1, Option 9 (10Gbps), Option 1 (1Gbps)

COUNTERS/TIMERS

- Real-time clock
- Programmable watchdog timer

POWER REQUIREMENTS

- Dual-redundant −48/−60 VDC (SELV) rail
- Input range: −39 to −60 VDC

EXTERNAL INTERFACES

- Front panel
  - One single-speed 10GbE or multi-speed 1/10GbE SR/LR SFP+
  - One 10/100/1000 Base-T Ethernet via RJ-45
  - Single serial console via RJ-45
  - One USB 3.0 (can be disabled for secure applications)
- Rear transition module
  - See RTM section for product options

THERMAL CHARACTERISTICS

- Blade variants designed for NEBS L3
  - Operating range: −5 °C to 55 °C
  - Airflow requirements: PICMG 3.7 Release 1.0 or higher depending on configuration options

BLADE PHYSICAL CHARACTERISTICS

- 8U form factor, 280 mm X 322.5 mm, single slot
- Alignment block that secures the blade in the SMART EC AXP1440-D ATCA chassis with captive screws
  - Improves operational shock and vibration performance
  - Prevents wear on connector contacts during operational vibration

RELEVANT STANDARDS

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

Supported Rear Transition Modules

Rear Transition Module	Networking Capabilities			Storage	I/O	
	40Gbps Ethernet (QSFP+)	10 Gbps Ethernet (SFP+)	1Gbps Ethernet 1000-base-T, RJ-45	Disk bay for hot-swap hard disk, 2.5"	SAS I/F on SFF-8470 connector	USB 2.0 interface
RTM-ATCA-7360	-	-	6	1	2 SAS	1
RTM-ATCA-STOR-1T2			1	2 (JBOD or RAID)		2
RTM-747X-10G-SP	-	6	4	-	-	-
RTM-747X-10G-D	-	4	4	1	2 SAS	-

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-7540-0GB	ATCA packet processing blade, dual Intel® Xeon® server 5119T Gold, 14-core (85W), 1.9 GHz, 12x DIMM sockets, 0GB, 40G, B.4
ATCA-7540-C06	ATCA packet processing blade, dual Intel® Xeon® server 5119T Gold, 14-core (85W), 1.9 GHz 12x DIMM sockets, 192GB, 40G, B.4, fastener
ATCA-7540-D	ATCA packet processing blade, dual Intel® Xeon® server 5119T Gold, 14-core (85W), 1.9 GHz 12x DIMM sockets, 192GB, 40G, B.4, fastener
ATCA-7540-64GB-L	ATCA packet processing blade, dual Intel® Xeon® server 4114T Silver, 10-core (85W), 2.2 GHz, 8 X 8GB DIMMS, 40G, B.4
ATCA-7540-0GB-QE40	ATCA packet processing blade, dual Intel® Xeon® server 5119T Gold, 14-core (85W), 1.9 GHz, 12X DIMM SOCKETS, 0GB, 40G, 40G QAT enabled
ATCA-7540-128GB-L	ATCA packet processing blade, dual Intel® Xeon® server 4114T SILVER, 10-core (85W), 2.2 GHZ, 8X 16GB DIMMS, 40G, B.4
ATCA-7540-192GB	ATCA packet processing blade, dual Intel® Xeon® server 5119T Gold, 14-core (85W), 1.9 GHz 12x DIMM sockets, 192GB, 40G, B.4
ATCA-7540-384GB	ATCA packet processing blade, dual Intel® Xeon® server 5119T Gold, 14-core (85W), 1.9 GHz 12x DIMM sockets, 384GB, 40G, B.4
ATCA-MEM-DDR4-8GB	8GB DDR4 VLP memory module
ATCA-MEM-DDR4-16GB	16GB DDR4 VLP memory module
ATCA-MEM-DDR4-32GB	32GB DDR4 VLP memory module
ATCA-75XX-KIT-M2	ATCA-75XX M.2 Riser kit
NVME-M.2-1TB	1TB NVME M.2 Media
RTM-ATCA-7360	RTM with 6x GbE, 2x SAS,1x slot for optional HDD
RTM-747X-10G-SP	RTM with 6x 10GbE, 4x GbE (*Optical modules are not included*)
RTM-747X-10G-D	RTM with 4x 10GbE (SFP+), 4x GbE, 1x slot for optional HDD (*Optical modules are not included*)
RTM-ATCA-STOR-1T2	ATCA RAID STORAGE RTM, 2 X 1TB U.2 SSD

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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