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DATASHEET



Promentum ATCA-9100-TI

ATCA Media Resource Module

AdvancedTCA has become the industry standard form factor for carrier grade infrastructure. As the designers architect the next generation network elements such as Media Gateways and Radio Network Controllers, they seek latest and greatest technologies to address the processing density and scalability needed for the future requirements.

The RadiSys Promentum® ATCA-9100-TI is an ATCA media processing blade that provides the highest density of media processing through the use of latest multi-core DSP silicon from Texas Instruments (TNETV3020). It incorporates a powerful architecture to enable media processing for thousands of channels, yet offers flexibility in its design through modularity to provide smooth migration to future DSPs. Its AdvancedTCA form factor makes it appropriate for use in Carrier Grade network elements such as Media Gateways and high density Media Servers in Wireless, Broadband and IPTV applications. The AdvancedTCA module is available fully integrated into the award winning RadiSys Promentum® SYS-6010 10 Gigabit Application Ready Platform to enable faster time to market for TEMs to develop their next generation network elements.

The ATCA-9100-TI is a single slot AdvancedTCA Media Resource Module/Blade compliant with PICMG 3.1 Option 9 interface specification. It is based on a modular design for the DSP farms, and uses two purpose-built mezzanine cards to house up to ten 6-core TI TNETV302. Each multi-core DSP device is capable of processing hundreds of voice or video codec channels. The media resource module includes 10GE fabric capability (PICMG 3.1 Option 9) thus enabling high bandwidth connectivity to the DSPs for processing multi-media channels requiring direct high bandwidth connections to DSP. The ATCA-9100-TI also incorporates Serial RapidIO (sRIO) connectivity to each DSP device, supporting management and debug of DSP code. The sRIO path enables loading code into DSP memory, DSP access to the application flash, and communication between the DSPs and the Local Management Processor (LMP).

MODULAR DESIGN – DSP BASE BOARD

The base board of the ATCA-9100-TI is a carrier for hosting the DSP mezzanines. The base board includes a powerful Local Management Processor (LMP), Gigabit Ethernet switch, sRIO switch, and power and IPMI infrastructure. The LMPsubsystem features a 1.3 GHz PowerQUICC III processor with up to 1GB of DDR2 SDRAM and dual 128MB Flash memory containing redundant boot and Linux OS images and a local flash file system. Its primary responsibility is to host switch management software for both Gigabit Ethernet and sRIO switches, data path control software, diagnostics and application provisioning software.

The baseboard has two managed Broadcom BCM5650x switches to enable direct Gigabit Ethernet connectivity to the DSPs. The switches are capable of L2 and L3 functions in silicon and can be configured through CLI, API, or SNMP interfaces running on the LMP. Each of the multi-core DSPs has a dedicated Gigabit Ethernet link to separate switches connecting to the ATCA backplane Base and Fabric interfaces as well as the LMP. Such high bandwidth connections to the DSP cores make this blade very powerful for video and VoIP applications, carrying MPEG Transport Streams, iTDM, or RTP packets. The base (carrier) board also includes a Tundra sRIO switch array that facilitates access to each of the DSPs from the LMP as well as the Zone 3 interfaces to the RTM.

MODULAR DESIGN – DSP MEZZANINES

The ATCA-9100-TI design incorporates two purpose-built DSP mezzanines which are optimized to carry maximum number of multi-core DSPs the LMP as well as the Zone 3 interfaces to the RTM. The factory installed mezzanines are optimized for power and cooling to support the maximum number of multi-core DSPs. Each mezzanine incorporates 10 TI TNETV3020 six-core DSPs.

The TNETV3020 system-on-a-chip (SoC) is based upon TI's industry leading TMS320C64X+(tm) DSP subsystems. The TNETV3020 has six C64x(tm)DSP cores, each operating at 500 Mhz. The device has over 5.5 MB of integrated memory and advanced set of communication peripherals like Telecom Serial Interphase Ports (TSIP), Serial RapidIO, UTOPIA and Gigabit Ethernet making it ideal platform for TDM-and IP-based systems.

FEATURE SUMMARY

- Single slot PICMG 3.0/3.1 (Option 9) compliant
- Hosts up to Texas Instruments (TMS320TNETV3020 DSPs) on two mezzanine cards
- Powerful Local Management Processor
- Onboard L2 GE switch provides dedicated per DSP connectivity to ATCA Base Interface
- 256MB of per DSP external DDR2 memory

The mezzanine approach protects costly development investment and allows smooth upgrade to next generation DSPs or alternate DSP silicon as and when they become available. The mezzanines also include 256MB of external DDR2 DRAM memory per multi-core DSP, allowing support for more memory-intensive DSP applications.

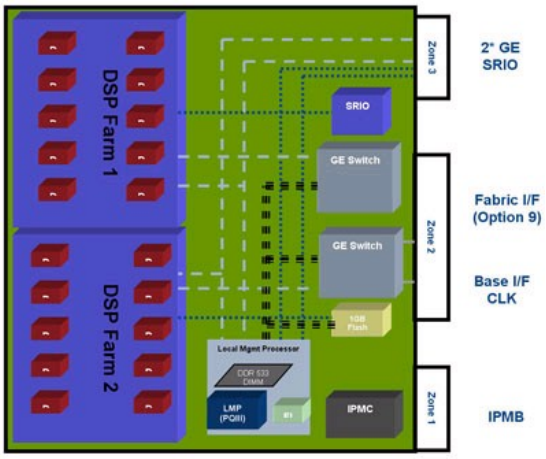
Board Support Software

The ATCA-9100-TI comes complete with all the board support software inclusive of the carrier grade OS on the LMP, diagnostics, application provisioning, switch management and blade management software. The LMP is validated for the Wind River PNE LE carrier grade operating system. The diagnostics software includes tests that verify system health at power up and are accessible through the LMP. The software also includes comprehensive switch management for Layer 2 functions including setting up VLANs and various port specific functions. The Broadcom switches offer powerful “content aware” functions. These functions can also be accessed for increased sophistication in data flow and control for this board. The switch management API is accessible through CLI, API, or SNMP interfaces. The blade management support also includes sRIO switch provisioning and control. Using the sRIO switch it is possible to access any of the DSP internal code or data for debug purposes.

DSP Support Software

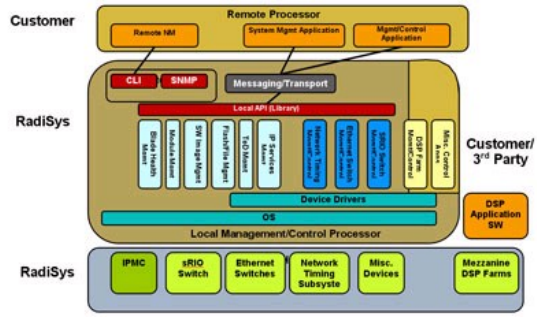
The ATCA-9100-TI is designed to be used in both legacy and green field applications. Customers with legacy code use the ATCA-9100-TI such that they do all the development on the DSP with just the board support software. The DSP modules are entirely at their disposal for development starting with “bare metal”. On the other hand, green field applications requiring a COTS DSP frame work and DSP OS can leverage TI's Telogy framework and codecs. RadiSys will work with both the customer and the DSP software provider to enable smooth DSP application development as a services offering.

ATCA-9100-TI Hardware Block Diagram



Note: Not all connections shown to reduce complexity

ATCA-9100-TI Software Architecture Overview



Promentum ATCA-9100-TI Specifications

FEATURE	FUNCTION	DESCRIPTION
PHYSICAL	Dimensions	8Ux6HPx280mm ATCA, single slot
	Compliance	PICMG 3.0 Revision 2.0
ETHERNET SWITCHING	Component	One 24 1GE port BCM56500 and One 24 1GE+2 10GE port BCM56502 Broadcom L2/L3 Ethernet switches
	Base Interface	Two 10/10/1000BASE-T ports routed to Zone 2 Base Channel on the backplane
	Fabric Interface	ATCA 3.1 option 9 with 2 x 10GE XAUI
ETHERNET SWITCHING	CLI	Full-featured CLI for controlling all switch features
	SNMP Agent	SNMPv2c
	SNMP MIBs	Support for all switch features via standard and enterprise MIBs. Standard MIBs include: RFC1213, RFC1907, RFC2863, RFC2011, RFC2012, RFC2013, RFC1493, RFC2674, RFC2665, RFC2819, IEEE8023-LAG-MIB
SRIO SWITCH ARRAY	Component	Dual Tundra Tsi578 8/16 port sRIO switches configured to provide 20 1x, 3 4x interfaces
	Mezzanine Interface	1x sRIO link to each DSP on both Mezzanines
PLATFORM MGMT	IPMI	Version 1.5 with ATCA extensions
LOCAL MANAGEMENT PROCESSOR (LMP)	Processor	Freescale MPC8548 clocked at 1.3GHz
	Memory	Up to 1 GB of DDR2 SDRAM – One 244 pin miniDIMM socket.
		Redundant pair of 128MB Spansion Flash for PQIII configuration, Linux OS boot image and file system
		Up to 1GB application Flash memory (optional)
NETWORK TIMING SUBSYTEM		CLK1 / CLK2 - 8KHz / 19.44MHz redundant backplane input
		TCLKA - 1.544MHz, 2.048MHz, 19.44MHz, or 8KHz output
		RTC – 19.44MHz to Real Time Clock on processor
FRONT PANEL LEDS	LEDs	DSP#, Hot Swap, Out of Service, Power Good, Activity
RTM MODULE CONNECTORS	Gigabit Ethernet	SFP to Fabric switch for debug
		SFP to Base switch for debug
	sRIO	4x Interface for debug (physical connection defined by user)
	LMP	10/100 BASE-T Interface Direct to LMP
BACKPLANE CONNECTORS	Ethernet Base, Fabric, Power, and Clock	ATCA Zone 1, P10 connector
		ATCA Zone 2, J20 & J23 connector only
		ATCA Zone 3, RTM connectors
POWER ENVIRONMENT	-	On-board regulation supplying up to 250W for the board
SOFTWARE	Operating System (standard)	Wind River PNE LE 1.3
		Additional distribution supported on demand
	Blade Management (standard)	Blade health management, module management, IP Services management, Time of Day management, Software (image) management, flash/file management
FRONT PANEL	LEDs	Per DSP Dual Color RED/GREEN DSP Status (20 total LEDs)
		Red or Yellow User Defined (Application LED)
		Hot Swap (Blue)
		Red or Yellow Out of Service (ATCA “LED 1”)
		Green Power Good (ATCA “LED 2”)
	Mechanical	Hot Swap extraction ejector
		Reset Button
POWER	ATCA-9100	200W Max. and TBD Typical
ENVIRONMENT	Temperature (operating)	Continuous : +5° C to +45° C
	Temperature (storage)	–40 o C to +70 o C
	Vibration (operating)	0.1g, 5 to 100 Hz and back, 0.1 octave/min sine sweep 3
		5% to 85% RH non-condensing
	Relative Humidity (non-condensing)	5 – 90% (operating), 5 – 90% (non-operating)
REGULATORY	Safety	UL/EN/IEC 60950-1, CSA 22.2
	EMC	FCC Part 15, Class A, EN 55022: 1998, Class A 60950
WARRANTY		Two years, parts only

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Ordering Information

ORDER CODE – A9100-T - ATCA media resource module with two DSP mezzanines each with 10 Texas Instruments TNETV3020 DSPs each with 256MB memory.

Base board includes PQIII LMP and supports GE switching and SRIO switching path to individual quad-core DSPs. Pricing includes Wind River PNE LE OS support, switch management software for GE and SRIO, and other blade management and diagnostics software. No DSP framework or DSP OS or CODECs included.

Please contact RadiSys for pricing and availability.

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