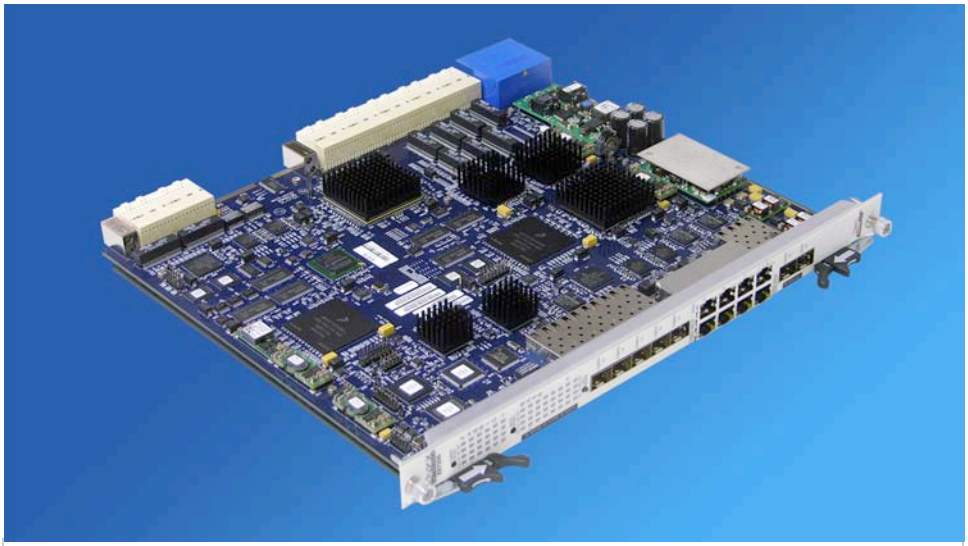
OpenArchitect® ZX7250

ATCA 10-Gigabit Ethernet Switching Platform

The Perfect Entry for ATCA 10-Gigabit Backplanes



PRODUCT DESCRIPTION

The OpenArchitect® ZX7250 is an ATCA 3.1 switch that achieves the full potential of the 10-Gigabit Backplane market. With twenty 10-Gigabit Fabric ports, the ZX7250 can support a full-chassis of Option 9 / Option 1 payload boards while providing 10-Gigabit Ethernet ports for chassis egress. The Base Interface is served by a separate switch with 24 Gigabit Ethernet ports and an additional two 10-Gigabit Ethernet ports.

THE PERFECT ENTRY FOR 10-GIGABIT BACKPLANES

The 10-Gigabit backplane market is developing very rapidly and requires a precise balance between features and cost. The ZX7250 helps leading edge projects remain competitive by providing advanced features and the lowest parts count possible in its product class. By emphasizing simplicity and elegance in the ATCA 3.1 Option 9 chassis environment, the ZX7250 combines low power consumption with straightforward configuration and trouble-free operation. The use of recently standardized SFP+ modules for 10-Gigabit egress ports allows cost-optimization for low-bandwidth deployments, while enabling up to 99 Gigabits of flexible egress bandwidth when it is needed.

FULL DATA AND CONTROL PLANE SEPARATION

By providing completely separate switches and control processors for the Fabric and the Base networks, the ZX7250 meets the rigorous security requirements of carrier environments. No matter what happens on the data plane, the control plane can be kept isolated and secure, assuring total control over the network at all times.

ORDERING INFORMATION

Part Number	Description
ZX7250	ATCA 3.1 Option 1 / 9 Ethernet Switch
ZX6000-RTM	ATCA RTM w/ Four 1G Base (RJ45)
ZX6000-CLK-RTM	ATCA RTM w/ Four 1G Base (RJ45) + Master Clock Generator
ZX7250-RTM	ATCA RTM w/ Six 1G Base (RJ45) + One 1G/10G Fabric (SFP+) + One 1G/10G Base
ZX10GSFP-SR	SFP+ 10Gb Optical Transceiver
ZX1GSFP-SR	SFP 1Gb Optical Transceiver
ZX1GSFP-CU	SFP 1Gb Copper Transceiver

FEATURES

FABRIC INTERFACE

- **20-port 10GigE Fabric Switch**
  - 20-port 10GigE switch (Broadcom BCM56800)
  - Twelve ATCA Fabric ports for Option 1 or Option 9 payload nodes, individually selectable
  - Six SFP+ 1G/10G ports to front panel
  - One SFP+ 1G/10G port to rear panel
  - One 10GigE inter-switch link (ISL)
  - IPv4 switching at Layer 3, IPv6 capable
  - VLANs with flexible Class of Service (CoS)
  - Content Aware Processor (CAP) for packet vectoring with OpenArchitect®/PV™
- **Fabric Switch Control Processor**
  - OpenArchitect® Linux Switch Control Software
  - Freescale 8270VV at 450MHz (50MHz PCI bus)
  - 256MB ECC SDRAM (100MHz SDRAM bus)
  - 128MB Flash ROM for redundant system image
  - Recessed front-panel reset button
  - RS-232 Console RJ45 to front panel & RTM
  - 10/100 Ethernet RJ45 OOB to front panel & RTM

BASE INTERFACE

- **26-port Base Switch**
  - 24-port 1GigE switch with 2 10GigE ports (Broadcom BCM56502)
  - Twelve ATCA Base ports for payload nodes
  - One SFP+ 10G port to front panel
  - One SFP+ 10G port to rear panel
  - Three RJ45 for 10/100/1000Base-T to front panel
  - Six RJ45 for 10/100/1000Base-T to RTM
  - Two 10/100 Shelf Manager ports (ECN.001)
  - One GigE inter-switch link (ISL)
  - IPv4 switching at Layer 3, IPv6 capable
  - VLANs with flexible Class of Service (CoS)
  - Content Aware Processor (CAP) for packet vectoring with OpenArchitect/PV
- **Base Switch Control Processor**
  - OpenArchitect® Linux Switch Control Software
  - Freescale 8270VV at 450MHz (50MHz PCI bus)
  - 256MB ECC SDRAM (100MHz SDRAM bus)
  - 128MB Flash ROM for redundant system image
  - Recessed front-panel reset button
  - RS-232 Console RJ45 to front panel & RTM
  - 10/100 Ethernet RJ45 OOB to front panel & RTM

AUXILIARY FEATURES

- **IPMC**
  - Front Panel Ethernet 10/100 Port
  - RS-232 via RJ45
  - Serial-over-LAN (SOL)
- **RTM**
  - Six Base 1GigE in-band ports (RJ45)
  - One Base 1G/10G SFP+ Port
  - One Fabric 1G/10G SFP+ Port
  - OOB port for both Base and Fabric
  - Mirrored RS-232 console ports
  - Master Clock Generator

Note: All SFP+ ports can operate at 1G and 10G, with copper or fiber modules

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OPENARCHITECT®

The core software technology of the ZX7250 goes far beyond simple Ethernet switch management. The field proven OpenArchitect® embedded operating system provides Linux-enabled flexibility in management protocols, configuration, packet vectoring, and high-availability features. Only ZNYX OpenArchitect® uses familiar, industry-standard Linux interfaces, enabling simple system configuration and true transparency for network integration.

OPENARCHITECT® FEATURES

OpenArchitect® uses open-source, industry compatible APIs for networking. This allows any Linux-compatible protocol stack to work, giving ISVs flexibility in the choice of protocol stacks.

Feature	Benefit
bash shell	Familiar command-line interface with scripting capability
ssh	Secure remote sessions
BusyBox tool kit	All the familiar UNIX/Linux/POSIX tools
vi editor	Widely used text editor for maintaining configuration files
tftp/ftp	Standard file transfer mechanisms
telnet	Remote session access
thttpd daemon	Web-based file service
net-SNMP	The latest in SNMP v1, v2, and v3 protocol support
STP/RSTP/MSTP	IEEE 802.1D automatic network configuration
iptables	Filter/Forward packets based on arbitrary rules for security
dhcpd	DHCP server for auto-configuration of payload and other nodes
port-based DHCP	IP Address assignment based on chassis slot number
zconfig	Complete control over VLAN configuration

OPENARCHITECT® / HIGH-AVAILABILITY (OA/HA)

Continuous ("five nines" or better) operation is a hard requirement in most networks, making hardware redundancy a must. Software facilities are equally critical to enable automatic, rapid re-convergence of the network around failed components. OpenArchitect/HA fills this need with the fastest fail-over performance possible in packet-switched networks. Instead of convergence in seconds or minutes as is typical for STP/RSTP failover schemes, OpenArchitect/HA can fail-over in milliseconds, often faster than the dual-SONET standard of 50 milliseconds.

OPENARCHITECT® / PACKET VECTORING (OA/PV)

A bonus feature unique to ZNYX Networks OpenArchitect® switches is also found on the ZX7250. Packet Vectoring refers to the ability of the switch to send packets port to port using any information within the packet. This enables load balancing, security monitoring, and many other applications that would otherwise not be possible. Because the silicon handles the real-time decision making, all packet vectoring happens at full line rate without restrictions.

The OA/PV implementation uses the familiar Linux *iptables* control interface to implement packet vectoring rules. With very little learning curve, network technicians can configure packet vectoring subsystems that eliminate the need for expensive external load balancing or network processing systems.

FEATURES (cont'd)

ATCA 3.0 FEATURES

- **AdvancedTCA® form factor**
  - Ideal for 14 slot Chassis
  - Complies with ATCA cooling envelope
  - Single-PCB design
  - Standard ATCA LED suite
  - Positive-latch ejector handles
- **IPMI Management Module (IPMC)**
  - Thermal & Fuse-Failure sensors
  - Voltage Sensors for each power rail
  - Serial-Over-LAN (SOL)
  - I2C FRU ROM
  - ATCA 3.0 compliant E-Key function
- **Multiple-mode LED status Display**
  - Link/Activity/Speed Status for Base and Fabric Interface by port number
  - Operational Status of each logical payload slot.
  - Front panel mode-select button
- **ATCA Stratum-3 Telco Clock Option**
  - Uses ZX6000 RTM Master Clock Generator
  - Automatic Fail-over
  - Automatic Configuration

NETWORKING FEATURES

- **Layer 2 and Layer 3**
  - Wire-speed L2/L3 Switching
  - Wire-speed L2-L7 Packet Classification
  - IEEE 802.1Q VLANs
  - IEEE 802.1P Class-of-Service
  - IEEE 802.3ad Link Aggregation (static)
  - IEEE 802.1D Spanning Tree (STP)
  - IEEE 802.1D-2004 Rapid Spanning Tree (RSTP)
  - Virtual Router Redundancy Protocol (VRRP)
  - Common Open Policy Service (COPS)
  - Differentiated Services (DiffServ)
  - Sophisticated Load Balancing
  - Port Mirroring in hardware
- **Management**
  - Linux shell interface (bash, iptables, et.al.)
  - SNMP management (v1, v2, v3)
  - Secure Shell daemon (SSH v2)
  - DHCP server / client / relay
  - Network Time Protocol (NTP) client
  - Web server (HTTPD) for browser access

ADDITIONAL FEATURES

- **Capacitor-backed Real-time Clock**
- **Write protect switch for Flash ROMs**
- **OpenArchitect® LED Status Display**
  - CLK indicates CPU health
  - OK indicates software ready
  - EXT Fault indicates external cable/link problem
  - INT Fault indicates internal hardware fault
- **Telco Compliance Engineering Standards**
  - NEBS / ETSI

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STANDARDS AND SPECIFICATIONS

Standard	Revision	Description	Status
ATCA 3.0	2.0	AdvancedTCA® Base Specification	Designed for compliance
ATCA 3.1	1.0	AdvancedTCA® for Ethernet	Fully adopted.
IEEE 802.3-2005	9 Dec. 2005	IEEE 802.3 Ethernet Specifications	Fully adopted.
IPMI	2.0	Intelligent Platform Management Interface	Fully adopted.
GR-1089-CORE, GR-63-CORE		Network Equipment Building System	Designed for compliance
SFF-8431	Rev.1.2 Dec. 21, 2006	SFF Committee Specifications for Enhanced 8.5 and 10 Gigabit Small Form Factor Pluggable Module "SFP+"	Marked "This is not a final draft"

Emissions

Standard	Class	Agency/Report Format	Description
CFR 47, Part 15, Subpart B 1998 (ANSIC63.4 1992)	A	FCC	United States
CE Conformity	A	EN55022 (2006) Class A EN55024 (1998), A1 – 2001, A2 – 2003 EN60950-1: (2001) A11 – 2004 EN61000-4-2: ESD EN61000-4-3: RF EM Field, AM EN61000-4-4: EFT, Signal Ports EN61000-4-6: RF, conducted continuous	European Union
VCCI (ANSI C63.4-1992/ CISPR 22-1997)	A	VCCI	Japan/International
ICES-003, Issue 3	A	ICES 003	Canada
KN22, KN24	A	MIC	South Korea

Environment

Specification	Unit Measure	Lower Limit	Upper Limit
Temperature, Operating - Normal	Celcius	+5C	+40C
Temperature, Operating – Short Term	Celcius	-5C	+55C*
Ambient Temperature, Storage	Celcius	-40C	+70C
Operating Voltage Range	Volts	-39V	-72V
Ambient Humidity (Non-Condensing) Operating/Storage	Percent	5%	90%

** It is not recommended that the ZX7250 be operated at the upper limit of the Ambient Operating Temperature for extended periods of time. When operating at the upper limit, it is recommended that 500 lfm airflow is used.*

Safety

Standard	Description
UL 60950 1st Edition	United States
CAN/CSA 22.2 No 60950-1 1st Edition	Canadian
IEC 60950-1 : 2001 First Edition	International
EN 60950 (1992) Amendments 1, 2, 3, 4, & 11	European Union

Power Consumption

Maximum Power Consumption	<120 Watts
Power Consumption per Gigabit	~ 0.5W

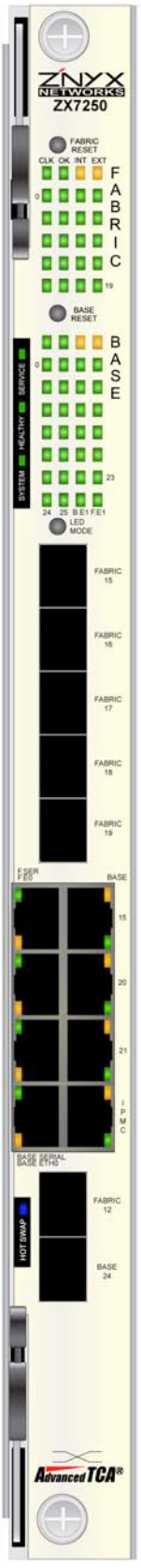
Reliability

MTBF	>160,000 hours

Hazardous Substances

JIG A / JIG B Compliant	Japan
RoHS Compliant (6 of 6)	European Union
WEEE Directive	European Union

Front Panel



PRODUCT SPECIFICATIONS

10G Ethernet Switching Platform for ATCA Chassis

ZNYX Networks

ZNYX specializes in the development of blade-based Switching Platforms for proprietary and open-standards based systems including PICMG 2.16 and AdvancedTCA®.

ZNYX's OpenArchitect® Switch Management Software and HA Suite provide a highly integrated solution based on a hardened Linux environment. Developers and Integrators can leverage the Linux environment to customize and re-use application code across multiple switching/routing platforms.

ZNYX products service the following markets:

- Mobile
- Communications
- Telephony
- Military
- Homeland Security
- Aerospace
- Medical
- Automation
- Storage
- Enterprise

PICMG 3.0 Interfaces

- (12) 10/100/1000Base-T to payload slots
- (1) GigE Inter-Switch Link (ISL)
- (2) 10/100Base-T to Shelf Manager (ECN.001)

PICMG 3.1 Interfaces

- (12) 10GBASE-BX4 (XAUI) to payload slots for Channel Option 9, individually selectable to 1000BASE-BX for Option 1
- (1) 10GigE Inter-Switch Link (ISL)

Base / Fabric Hardware (each)

- Freescale 820VV at 450MHz (50MHz PCI bus)
- 256MB ECC SDRAM (100MHz SDRAM bus)
- 128MB Flash ROM

AdvancedTCA® Features

- PICMG 3.0 compliant HotSwap Power Management Controller
- PICMG 3.0/3.1 Extended Mode Support
- PICMG 3.0 Status Indicators
- PICMG 3.0 FRUID support
- PICMG 3.0 compliant IPMI controller (IPMC)
- Compliant with PICMG 3.0 ECN.001 for shelf manager cross-connect
- Power plane sensors
- Temperature sensor

Front / Rear Panel Interfaces

Note: All SFP+ ports can operate at 1G and 10G, with copper or fiber modules

- (9) 10/100/1000Base-T Base Egress (RJ45)
- (7) Fabric Egress 1G/10G (SFP+)
- (2) Base Egress 10G (SFP+)
- (2) 10/100Base-T Base Out-of-Band (RJ45)
- (2) RS-232 Base Console (RJ45)
- (2) 10/100Base-T Fabric Out-of-Band (RJ45)
- (2) RS-232 Fabric Console (RJ45)
- (1) Serial Over LAN (SOL) to IPMC

Network Services

- FTP / TFTP servers for remote file transfer
- HTTP server for web-based access
- DHCP server / client / relay
- NFS client for remote filesystems
- NTP client for network-based time service
- SSH / Telnet server for remote session access

Layer 2 / 3 Switch/Routing Features

- IEEE 802.1Q VLANs with double tagging
- IEEE 802.1D Spanning Tree Protocol (STP)
- IEEE 802.1D-2004 Rapid Spanning Tree (RSTP)
- IEEE 802.3ad Link Aggregation (LACP)
- Jumbo Frames Support (9kB, L2, non-host)
- On-Chip MAC table (16k addresses)
- Port Mirroring in hardware
- Per-port traffic shaping, policies, broadcast storm control
- Line-Rate Layer 3 Forwarding (8k IP addresses)

QoS and Priority Queues

- IEEE 802.1p Class of Service (CoS) with 8 priority queues per VLAN
- Supports IETF DiffServ DSCP marking
- Supports IETF Type-of-Service (TOS)

Management Features

- Command Line Interface (CLI)
- IPMI v2.0 client
- SNMP v1, v2, v3 with extensive MIB support
- RMON counters

High Availability Features

- Power-On Diagnostics
- Switch-to-Switch Failover (policy-based)
- VLAN-to-VLAN Failover (policy-based)
- Port-to-Port Failover (policy-based)
- Automatic Reconfiguration after HotSwap
- Redundant OpenArchitect® runtime and bootloader image in flash
- Automatic ROM Integrity Failover
- Full PICMG 3.0 HotSwap support
- Bonding driver for transparent failovers on client
- Scriptable, policy-based link failure correction

Status Indicators

- Network status, per channel Link, Activity LEDs
- PICMG 3.0 status indicators (Out-of-Service, Health, System, HotSwap)
- OpenArchitect® status indicators

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Specifications Subject to Change

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