LANTRONIX®

XChip SoC – Networking and Web Services on a Chip

▶ Connects to host microcontroller for serial to Ethernet (LAN) applications

▶ Robust networking and applications firmware included – no coding required; zero royalty licensing agreement

▶ Integrated 10-100 MAC/PHY; 256K SRAM; up to 921 Kbps data rate

▶ Compact 12mm x 12mm 184 BGA package

▶ Firmware includes web server, Email and SNMP support

RoHS
WEEE COMPLIANT

Powerful Device Networking & Embedded Web Server in a Deployment-Ready Chip

A member of the DeviceLinx™ XChip™ family of networking system-on-chip solutions, the XChip SoC is a turnkey and application-bundled co-processor for device networking. It delivers the same high-performance connectivity and web server capabilities as the market-leading XPort® embedded device server module. Manufacturers of high-volume, price-sensitive products can now rapidly and affordably offer networking, complete with built-in web server for remote monitoring and control, as a standard feature on virtually any product with a serial interface on its microcontroller.

Highly-integrated Networking Co-Processor

Fabricated using an industry-standard CMOS process, the XChip is a highly-integrated x86-class processor that includes a built in Ethernet MAC and 10-100 PHY, 256 KB zero wait-state SRAM, up to 3 GPIOs and a high-performance serial UART in a compact 12mm x 12mm 184 BGA RoHS-compliant, industrial temperature package.

Simply connect the serial port to the XChip and load the royalty-free standard application and network protocol firmware in an external Flash chip. Finish by adding an RJ45 jack and magnetics to instantly connect virtually any product to an Ethernet network or the Internet and serve web pages!

A dedicated networking co-processor, it enables the host microcontroller to function at maximum capacity without the computing burdens of network and web server processing. Serial data from the device's host microcontroller's CMOS logic-level serial port is packetized and delivered over an Ethernet network via TCP or UDP data packets. Similarly, incoming TCP or UDP packets are packaged and sent to the attached device over its microcontroller's serial interface. This enables OEMs to use less expensive, less powerful host microcontrollers on their products without sacrificing performance.

Feature-rich, Royalty-free Application and Network Protocol Firmware

XChip comes with a robust, licensed networking and applications firmware binary, so virtually zero programming is required. Powered by the same firmware already deployed in millions of networked nodes, this networking co-processor makes it easy to design-in connectivity and significantly speed time-to-market. The application-ready networking firmware and a feature-rich network protocol stack includes TCP/IP, UDP, BootP, DHCP and AutoIP. It also features a variety of configurable options for serial-to-Ethernet tunneling (baud rate, flow control, port number, data packing control intervals, inactivity timeout and MTU size). It can trigger email alerts on in-band serial data patterns or configurable pins inputs. Optional 256-bit AES (Rijndael) end-to-end encryption is available.

Ideal for High-Volume Applications

With its low cost, small size and powerful feature set, XChip is an ideal solution for high-volume, cost sensitive products.

- Consumer electronics
- RFID readers
- Energy/metering applications
- Sensors and controllers
- Point of sale (POS) products
- Vending machines
- White/durable goods
- Building automation (lighting, etc.)
- Home automation (high-end audio, alarm panels, etc.)

Complete Hardware Reference Design Package

XChip comes complete with a compact, 4-layer reference design optimized for cost, compliance and performance.

- Gerber Files (RS-274-X)
- Fabrication drawing
- PADS PCB design file (PADS2005 Spac 2)
- Design Integration Guide
- Schematic and assembly diagram (PDF and DSN)

Additional Software Utilities for Easy Configuration & Network Deployment

Deploying products in volume on a network typically require additional Windows software to simplify implementation. Dynamic Host Protocol Support (DHCP) and additional IP configuration methods included with XChip's Windows®-based DeviceInstaller™ software streamline device deployment and network initiation.

Additionally, the included Com Port Redirector™ (CPR) software maps "virtual COM" ports on a PC platform and redirects application data destined for an attached device. Rather than going out the local COM port, the data is transmitted across the Ethernet network to and from the XChip using TCP/IP.

Features

Architecture
CPU: x86 architecture
Memory: 256 KB on-chip SRAM (No external RAM required)
Ethernet MAC/PHY: 10-100, integrated inside the CPU

Electrical Characteristics:
1.8VDC core supply voltage
3.3 VDC I/O supply voltage

Serial Interface
Data Rates: 300 bps to 921,600 bps
Characters: 7 or 8 data bits
Parity: odd, even, none
Stop Bits: 1 or 2
Control Signals: DTR/DCD, CTS,RTS
Flow Control: XON/XOFF, RTS/CTS

Programmable I/O:
3 PIO pins (software selectable)

Network Interface
Interface: Ethernet 10Base-T or 100Base-TX
(Using external RJ45 Jack)

Packaging
184 BGA, 12mm x 12mm, RoHS Compliant

Environmental
Operating: -40° to 85℃ (-40° to 185°F)
Storage: -40° to 85℃ (-40° to 185°F)

Firmware (Licensed with XChip)
Network Protocols:
TCP/IP, UDP/IP, ARP, ICMP, SNMP, TFTP, Telnet, server
DHCP, BOOTP, HTTP and AutoIP
Web Server:
Web server with Java support
Customizable/brandable
Web Page Storage capacity:
384KB (Uses a portion of the 512 KB External Flash)
SMTP Email
Management:
Internal web server,
SNMP
Serial login
Telnet login
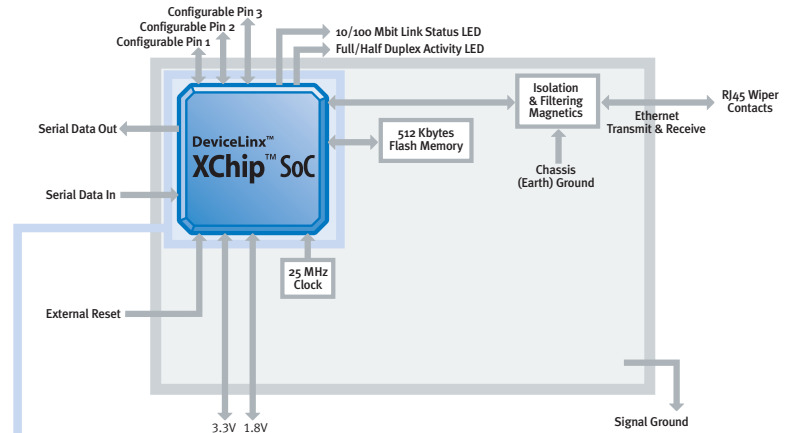Serial to Ethernet (LAN) Application

Data Security
Optional 256-bit AES Rijndael encryption (Different Firmware Load)

Software Utilities (Licensed with XChip)
DeviceInstaller software
COM Port Redirector

XChip Reference Design
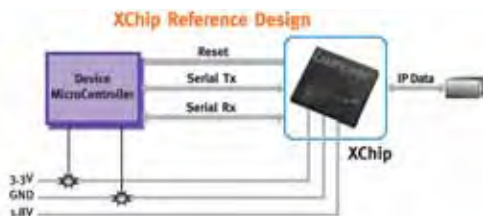
XChip Layout and Included Software

Note: OEM supplies Flash Memory, RJ45-Magnetics, Clock crystal and regulated power inputs.

APPLICATIONS	TUNNELING		3RD PARTY CUSTOMIZATION
APPLICATIONS SUPPORT	WEB MANAGER		CONFIGURATION STORE
	FILE SYSTEM	GPIO MANAGER	SMTP EMAIL
SECURITY	AES		PACKET FILTER
NETWORK	UDP / IP	HTTP / TCP / ICMP / ARP	CGI / PPP / AUTO-IP	DNS / TFTP / BOOTP	MIB II / DISCOVERY / SNMP / DHCP
DRIVERS	FLASH DRIVER / ETHERNET	WATCH DOG / SERIAL LINES	EEPROM / PIO (CP) DRIVER
KERNEL	TASKING MODULE	MEMORY (HEAP) MODULE	TIMERS

Reference Design
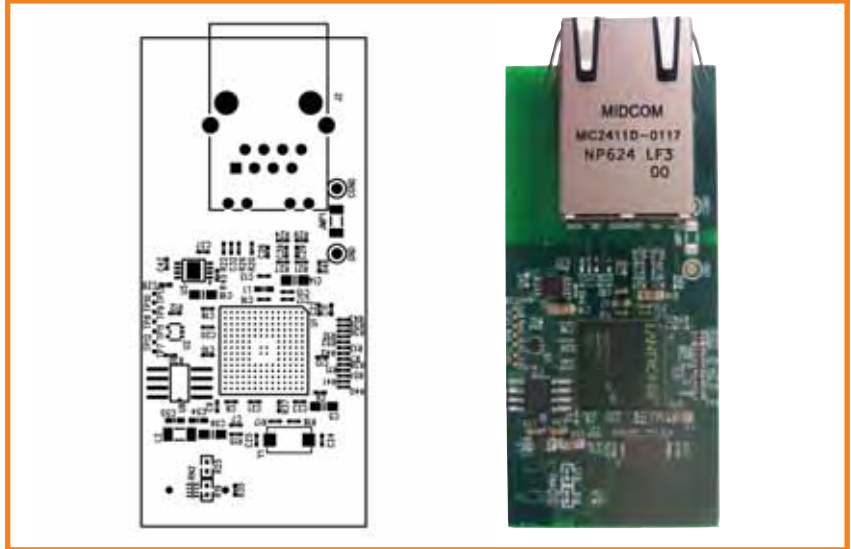
Ordering Information

Part Number	Description
XCP1001000-01	XChip Embedded Device Server SoC Co-processor, 184 Pin BGA, Bulk
XCP100100S-01	XChip Embedded Device Server SoC Co-processor, 184 Pin BGA, Sample
XCP100100K-01	XChip Embedded Device Server SoC Co-processor, 184 Pin BGA, Kit

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