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FOR IMMEDIATE RELEASE

XILINX SET TO PENETRATE NEW MARKETS

WITH BIGGEST PRODUCT LAUNCH IN HISTORY OF PLD INDUSTRY

SAN JOSE, Calif., September 28, 1998, – In a sweeping move to address new markets and enhance its product portfolio, Xilinx, Inc., (NASDAQ: XLNX), today announced it will begin shipment of three new lines of advanced, 3.3-volt programmable logic devices (PLDs) and an expanded line of 2.5-volt high density, high performance products.

The Xilinx products are expected to drive the use of PLDs into the consumer, PC-related and automotive markets. In the consumer market, new applications include digital cameras, digital television, set-top boxes, arcade games and badge and credit card readers. In the PC-related market, the PLDs are targeted at applications such as PCMCIA modem cards, PC screen projectors and graphics boards. In the automotive market, designers are expected to incorporate PLDs into GPS driver information systems and internal cabin controls.

Moreover, the new Xilinx products are expected to further penetrate traditionally strong markets for programmable logic devices. New telecommunications applications, for example, range from portable phones and digital subscriber line interfaces for Internet access to very high performance digital signal processing systems. New data processing applications include peripheral cards and I/O interface boards, while networking applications now include products such as Ethernet adapters.

In all, Xilinx unveiled more than 20 new products, including both complex programmable logic devices (CPLDs) and field programmable gate arrays (FPGAs). The rollout brings to market the broadest choice of 3.3-volt and 2.5-volt devices available from a single supplier, with densities ranging from 800 to 500,000 system gates.

“This launch constitutes the largest breadth of new offerings ever announced at one time in the programmable logic industry,” said Xilinx president and CEO Wim Roelandts. “Today, Xilinx is in its

An editor's glance at the Xilinx 3.3-volt Spartan Series

New 3.3-volt Spartan series from Xilinx offers programmable logic advantages to high volume ASIC users

The SpartanXL family is a 3.3-volt derivative of the popular 5-volt Spartan FPGA family, announced in January 1998, targeted for high-volume, high-performance, low-voltage applications. All five members of the 5-Volt Spartan family have been in production for nine months and receiving overwhelming demand for the RAM capabilities, low-power benefits an ASIC-like price points. The SpartanXL family continues the Xilinx standard of superior high performance set with the 5-volt version at a reduced cost, lower power, and improved performance.

Technology description:

- First FPGA to combines on-chip RAM, high performance, and robust core support at ASIC prices.
- Manufactured on a hybrid process at the Seiko facility in Taiwan

Key features:

- Inherent performance improvements and lower cost and price in the migration to 0.35-micron process
- Spartan series has fastest unit shipment growth rate of any other FPGA in the industry
- Addresses high-volume ASIC applications up to 40,000 system gates
- Industry's smallest die size FPGA with RAM due to addressing the cost of manufacturing in all stages of cycle: packaging, assembly, test, and overhead costs
- Footprint compatible across multiple package options
- Programmable 5V/3V compatibility with 5-volt version of Spartan series
- Priced lower than the 5-volt predecessors due to the migration to 0.35-micron technology

<i>Product availability:</i>	Logic cells	System gates	Maximum I/Os	Maximum RAM bits	Price *	Production Availability
XCS05XL-3 (PC84)	238	2,000 - 5,000	80	3,200	\$2.95	98Q4
XCS10XL-3 (PC84)	466	3,000 - 10,000	112	6,272	4.45	98Q4
XCS20XL-3 (VQ100)	950	7,000 - 20,000	160	12,800	5.45	98Q4
XCS30XL-3 (VQ100)	1368	10,000 - 30,000	192	18,432	6.95	now
XCS40XL-3 (PQ208)	1862	13,000 - 40,000	224	25,088	9.90	98Q4

* Pricing for 100,000-plus unit quantities in mid-1999

Package options:

plastic leaded chip carrier (PLCC); plastic quad (PQ), thin quad (TQ), very thin quad (VQ), flat packs; and ball grid array (BGA)

Software support:

Available now in the latest version, version 1.5, both the Foundation and Alliance Series software

Cores support:

- Cores available specifically targeting this series from several Xilinx AllianceCORE partners
- PCI and DSP cores in Xilinx LogiCORE series
- New PCI interface from the Xilinx LogiCORE offerings are available, including the zero wait-state 33 MHz PCI LogiCORE

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An editor's glance at the XC9500XL ISP CPLD family

Xilinx Ships First 0.35-micron 3.3-volt FLASH CPLDs

Leadership Speed, Cost, and Reliability Enable New Markets

The in-system programmable XC9500XL family is the first 3.3-volt CPLD family to offer substantially higher speed and lower cost than equivalent 5-volt devices. These features open new applications currently out of reach of CPLDs, such as communications and computing market segments, as well as penetrate new markets in consumer and automotive applications. The XC9500XL family has the fastest pin-to-pin performance, smallest die size, and highest level of in-system reliability of any CPLDs currently available. It is expected to further accelerate the CPLD industry technology switch to double-polysilicon FLASH technologies from the older single-polysilicon EEPROM technologies.

Process:

- highly scalable FastFLASH technology to 0.25-micron and 0.18-micron feature-sizes
- the first mainstream CPLDs to be shipping on a 0.35-micron feature-size technology
- FastFLASH technology employs 0.35-micron rules for the 4-layer metal as well as drawn transistor lengths, with 0.25-micron (L_{eff})

XC9500XL Product Features:

- first 3.3-volt CPLD product to deliver the highest available reliability characteristics available to JTAG ISP devices
 - ~ 20-year data retention and 10,000 endurance cycles—qualities normally associated with FLASH memory
 - ~ data retention that's twice as long and 100 times more reliable than other JTAG ISP CPLDs
- Highest performance: 4 nanoseconds pin-to-pin speed and 200 MHz system frequency
- Leading-edge CSP for small hand-held consumer applications; allows increased user programmability with the highest reliability at the lowest cost
- Ultra wide block fan-in of 54, for superior pin-locking characteristics
- Most product-terms per macrocell of 90
- Leading-edge I/O flexibility and compatible with 5-volt, 3.3-volt, and 2.5-volt signals
 - ~ input hysteresis on all pins and bus-hold circuitry for simple bus interfaces
- Most complete JTAG boundary-scan support with 8 instructions
- Fast concurrent programming times

<i>Product availability:</i>	Macro cells	Maximum I/Os	Pin-to-pin delay (t_{PD})	System frequency (f_{SYS})	Price *	price per macrocell
XC9536XL-10 (PC44)	36	34	4 ns	200 MHz	\$1.20	\$0.03
XC9572XL-10 (PC44)	72	72	5 ns	178 MHz	1.85	0.03
XC95144XL-10 (TQ100)	144	117	5 ns	178 MHz	5.65	0.04
XC95288XL-10 (TQ144)	288	168	6 ns	151 MHz	11.95	0.04

* Pricing for 100,000-plus unit quantities in mid-1999

Package options:

44-pin PLCC; 100-pin and 144-pin TQFP; 352-pin BGA; 208-pin PQFP; 48-pin and 144-pin CSP

Software support:

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An editor's glance at the XC4000XLA FPGA family

Xilinx introduces new XC4000XLA FPGA family with 65 percent die size and 75 percent price reduction over industry-leading XC4000XL family

The XC4000XLA family is a derivative of the popular 3.3-volt XC4000XL family targeted for high-performance, low-voltage applications. All 11 members of the XC4000XL family have been in production for a year and receiving overwhelming demand for their capabilities, density capacities, and low-power benefits. The XC4000XLA continues the Xilinx standard of superior high performance set with the preceding family at a reduced cost, die size, and improved performance.

Technology description:

- based on an advanced 0.25 micron, 3.3-volt process from Seiko
- complete redesign of the XC4000XL family delivering reduced die size and price and increased performance

Key features:

- 65 percent die size reduction over the XC4000XL devices
- 55 to 76 percent price reduction over the XC4000XL devices
- 30 percent power reduction over the XC4000XL devices
- up to 30 percent performance improvement over the XC4000XL devices
- high-performance synchronous DRAM (SDRAM) 100 MHz support and beyond
- footprint compatible across multiple package options
- one millimeter ball grid array package offering

<i>Product availability:</i>	Logic cells	System gates	Maximum I/Os	Price *	low volume availability
XC4013XLA	1368	10k - 13k	192	\$11.80	now
XC4020XLA	1862	13k - 40k	224	13.90	98Q4
XC4028XLA	2432	18k - 50k	256	23.80	98Q4
XC4036XLA	3078	22k - 65k	288	31.50	now
XC4044XLA	3800	27k - 80k	320	39.00	98Q4
XC4052XLA	4598	33k - 100k	352	46.50	98Q4
XC4062XLA	5472	40k - 130k	384	55.00	now
XC4085XLA	7448	55k - 180k	448	75.00	now

* Pricing for 100,000-plus unit quantities in mid-1999

Package options:

160-, 208-, 240-, and 304-pin quad flat packs; 256-, 352-, 432-, and 560-pin ball grid arrays (BGA); one millimeter ball grid array

Configuration solutions:

The Xilinx XC1704L and XC1702L SPROM in 44-pin very thin quad flat packs (VQ44) support these higher density devices

- largest SPROMs for FPGAs in the industry in serial configuration bit size—only 2 and 4Mb SPROM offering
- easiest to design as FPGA designer generates and downloads the bitstream
- lowest cost configuration solution for FPGA designers, saving board space and other combinations

Software support:

Available now in the latest version, version 1.5, both the Foundation and Alliance Series software

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Xilinx set to penetrate new markets with biggest product launch in history of industry

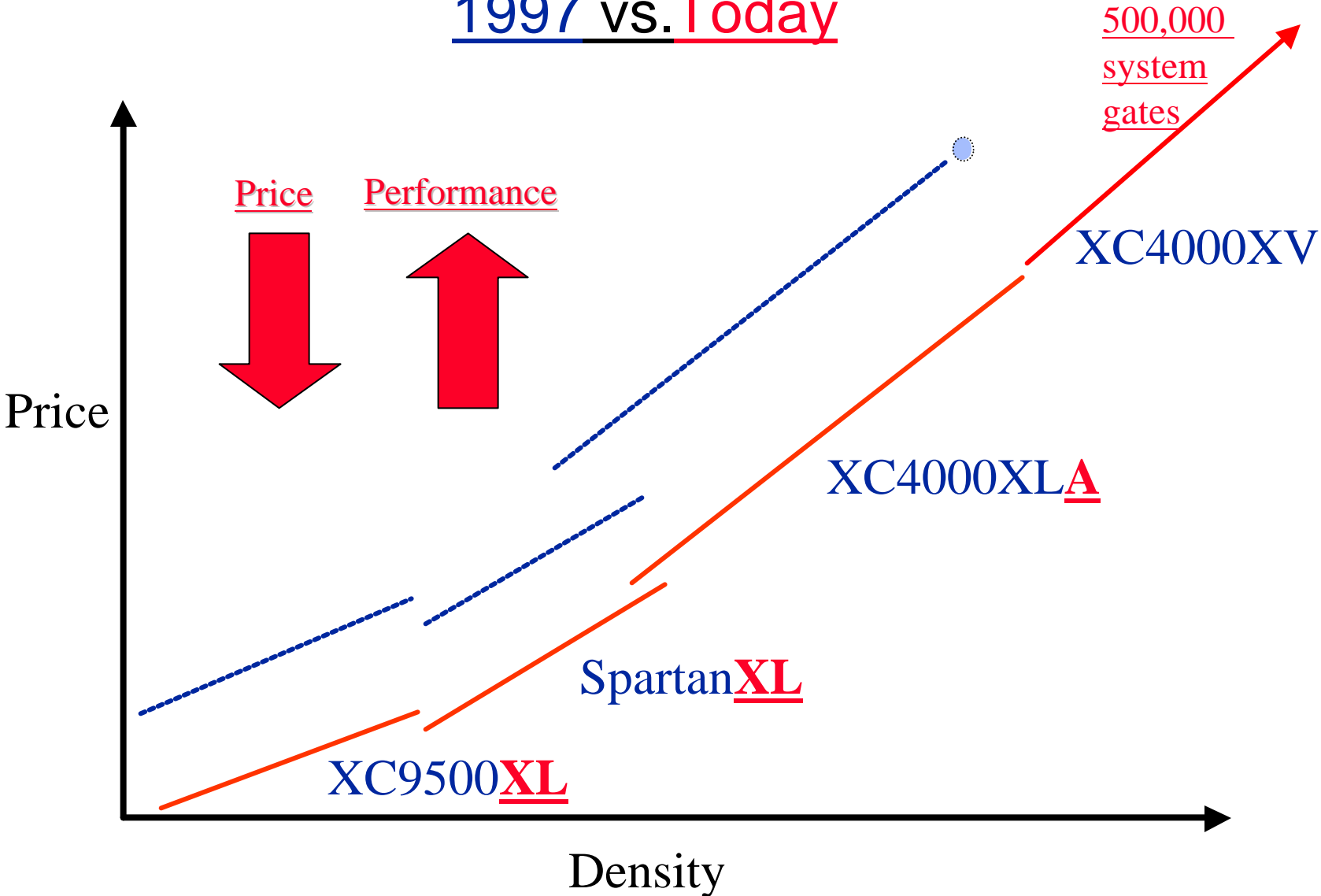
Programmable logic leader covers the playing field for high-performance, low-cost, high-density



September 1998

Xilinx Product Portfolio

1997 vs. Today



The Xilinx Approach

◆ Business units

- Focused efforts for specific end markets
- Dedicated marketing, engineering, and support teams
- First PLD supplier to re-organize into business units

◆ Mainstream process technologies, common architectures

- First on mainstream SRAM and Flash technologies
- First with common architectural platform among families: segmented routing, distributed RAM

Once a device is built, the entire family tapes out in a matter of weeks

Xilinx Broadbased Announcement

- ◆ XC9500XL: Industry's speed and cost leader
First 0.35 micron and 3.3V Flash CPLD technology
- ◆ XC4000XLA: Industry's fastest and lowest-power 3.3V FPGA
- ◆ XC4000XV: First 500,000 gate FPGA
Doubles FPGA density
- ◆ SpartanXL: FPGAs for under \$3

Xilinx ships 21 new devices in 2H 1998



XC9500XL CPLD Key Features

- ◆ Lowest cost CPLD solution
- ◆ First ISP CPLD with 10,000 program/erase cycles and 20 year data retention
- ◆ Highest performance: $t_{pD} = 4ns$, $f_{SYS} = 200$ MHz
- ◆ First CPLD in chip scale packaging (CSP)
- ◆ Lowest price per macrocell solution

Industry's first 0.35 μ m Flash CPLD technology



CPLD Process Pioneers

<u>Non-Volatile Technology</u>	<u>Year used in Memories</u>	<u>Year used in SPLD/CPLD</u>	<u>SPLD/CPLD Pioneer</u>
Bipolar Fuse	1973	1978	MMI (AMD)
EPROM	1979	1984	Altera EP-series
5V EEPROM	1986	1991	Lattice ispLSI
5V FLASH	1990	1995	<i>Xilinx XC9500</i>
3.3V FLASH	1993	1998	<i>Xilinx XC9500XL</i>

Xilinx is CPLD process leader



Leadership CPLD Pricing

<u>Device</u>	<u>Macrocells</u>	<u>Price</u>	<u>Price/MC</u>
XC9536XL	36	\$ 1.20	\$0.03
XC9572XL	72	\$ 1.85	\$0.03
XC95144XL	144	\$ 5.65	\$0.04
XC95288XL	288	\$11.95	\$0.04

Note: Pricing for 100,000-plus unit quantities in mid-1999



Penetrating New CPLD Applications

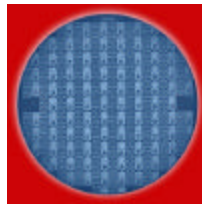
- ◆ Motherboards for high-end PCs and servers
- ◆ PC peripherals and add-on cards
 - DVD players and controller cards
 - Graphics cards
- ◆ Automotive
 - Engine control
 - Automotive navigation systems (GPS)
- ◆ Consumer
 - Local Operating Networks (LON)
 - Coffeemakers
 - Toys

New price points open up new markets



Lowering Cost Across the Supply Chain

LEADING EDGE TECHNOLOGY



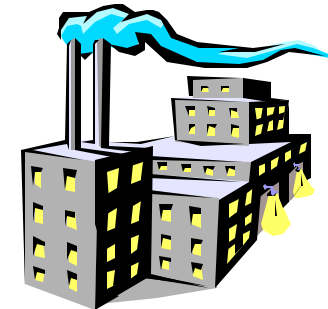
- ◆ 1st with Flash
- ◆ Only true 0.35 μm

STREAM-LINED



- ◆ Stream-lined device/pkg offerings
- ◆ High volume packages
- ◆ -10 slowest speed grade

MEMORY STYLE MANUFACTURING



- ◆ Off-shore sort, test and assembly
- ◆ Multi-site parallel test


Xilinx is lowest cost manufacturer of CPLDs



CPLD Process Comparison

Small Die
(0.35 μm metal)

Big Die
(0.5 μm metal)

	<u>True 3.3V 0.35μm</u> 
<u>Derated 5V</u> Lattice ispLSI2000V Vantis Mach5LV	<u>Inefficient 3.3V</u> Altera Max7000A

Slow

(0.5 μm drawn length)
(0.35 μm effective length)

Fast

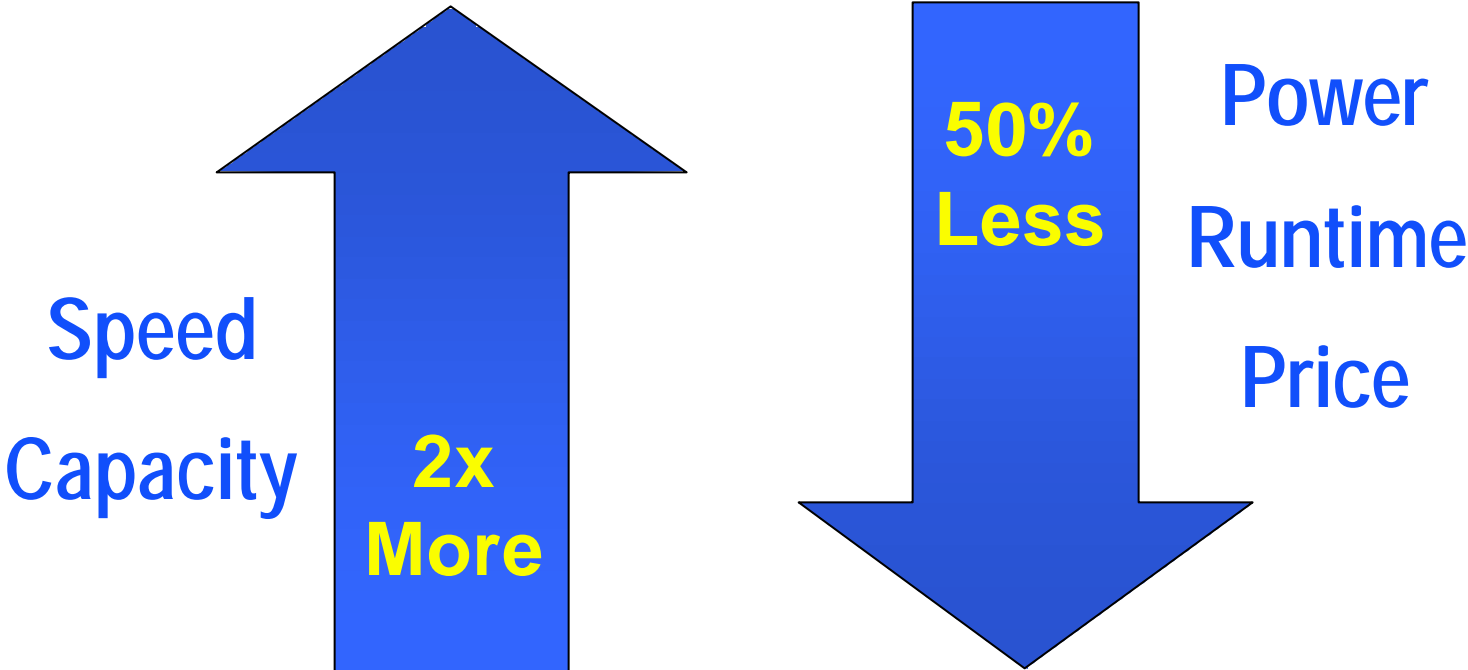
(0.35 μm drawn length)
(0.25 μm effective length)

Xilinx has fastest CPLDs with smallest die size

XC4000X Series FPGAs

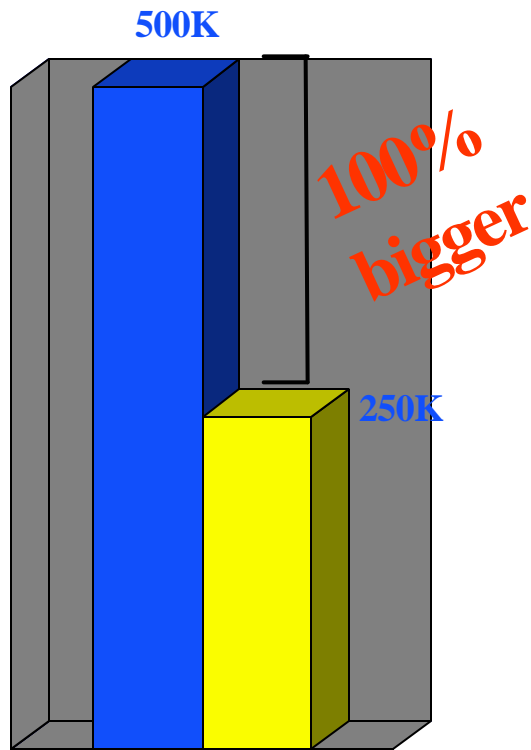
- ◆ Doubles performance and density while cutting power and runtimes in half
- ◆ XC4000XLA Family: Fastest 3.3V FPGAs
 - 200 MHz chip-to-chip speeds
- ◆ XC4000XV Family: 500,000 system gates
 - Doubles FPGA density
 - Advanced 0.25 mm 5LM process
- ◆ *New target applications*
 - Gigabit Ethernet
 - Universal Mobile Telephony Service (UMTS)

XC4000X Advancements vs. XC4000XL Family



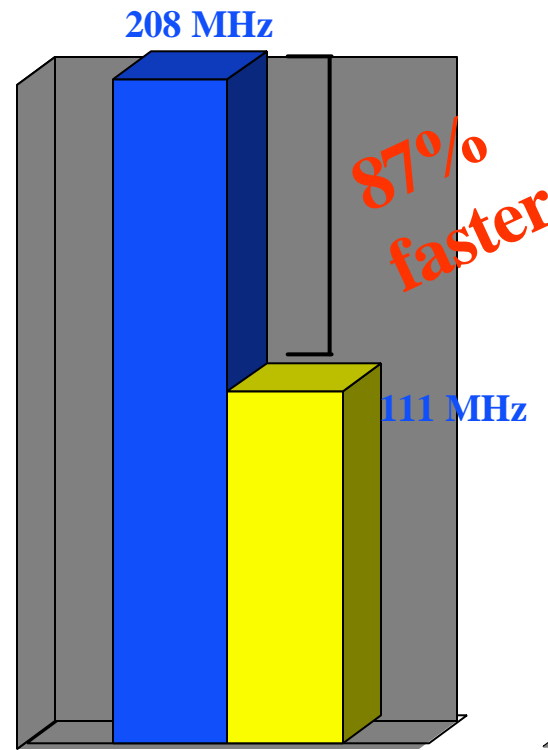
XC4000X Competitive Leadership

BIGGER



System Gates

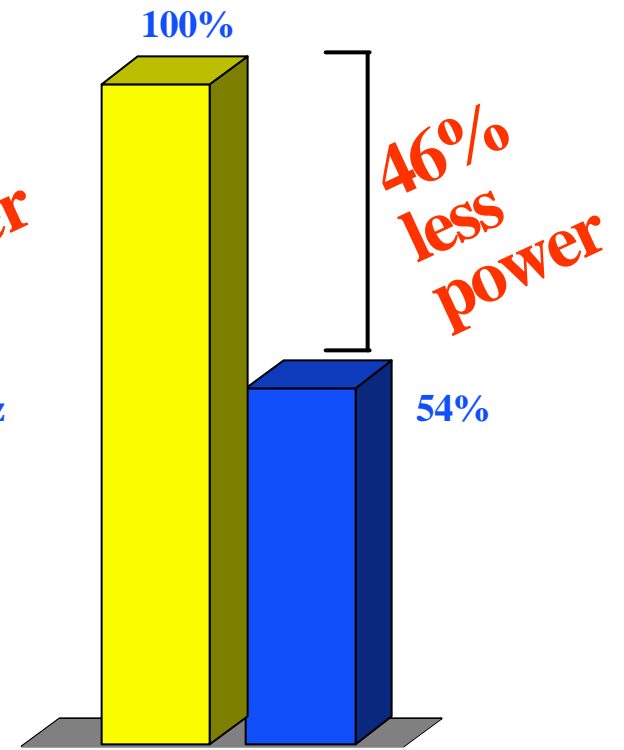
FASTER



System Speed

(Clk-Out + Setup + Hold)

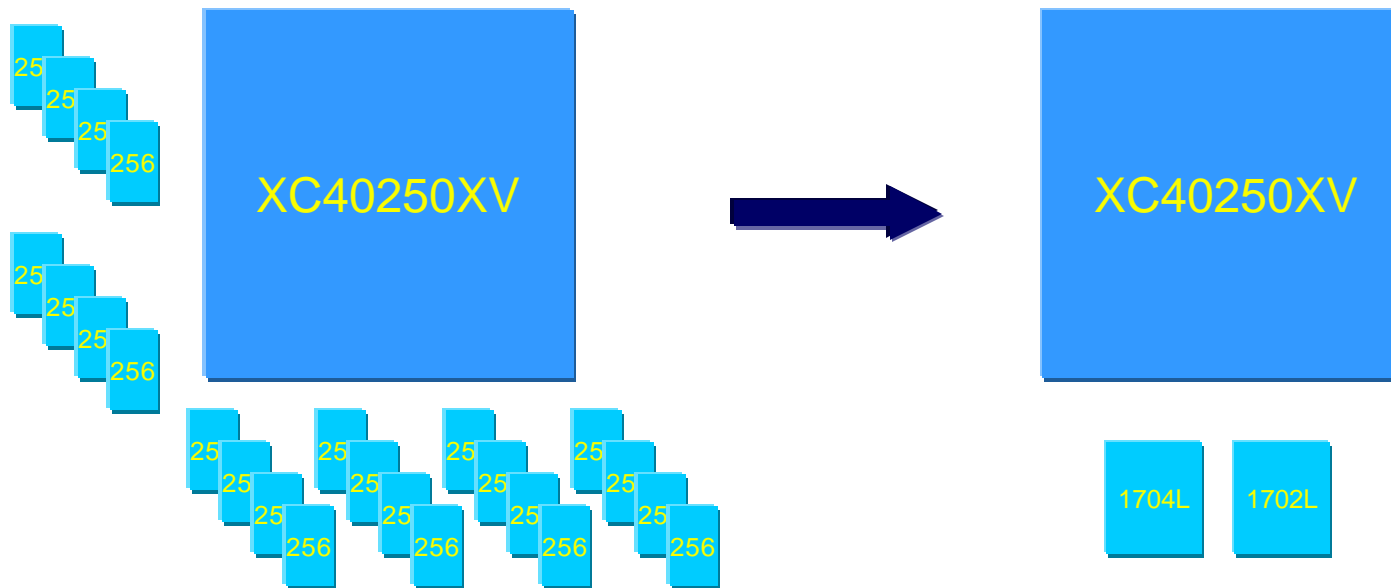
LOWER POWER



Rel. Power

- Xilinx 4000X-07
- Altera FLEX 10K-1

Xilinx Unveils 4 Mb SPROM



*256 kbit
Previously*

*2 Mb & 4 Mb SPROM
Today*

Largest configuration SPROM in the industry



SpartanXL 3.3 Volt FPGAs

	Logic Cells	System Gates	Max I/Os	Price*
XCS05XL	238	2-5K	80	\$2.95
XCS10XL	466	3-10K	112	\$4.45
XCS20XL	950	7-20K	160	\$5.45
XCS30XL	1368	10-30K	192	\$6.95
XCS40XL	1862	13-40K	224	\$9.90

* 100,000-plus unit price for mid-1999

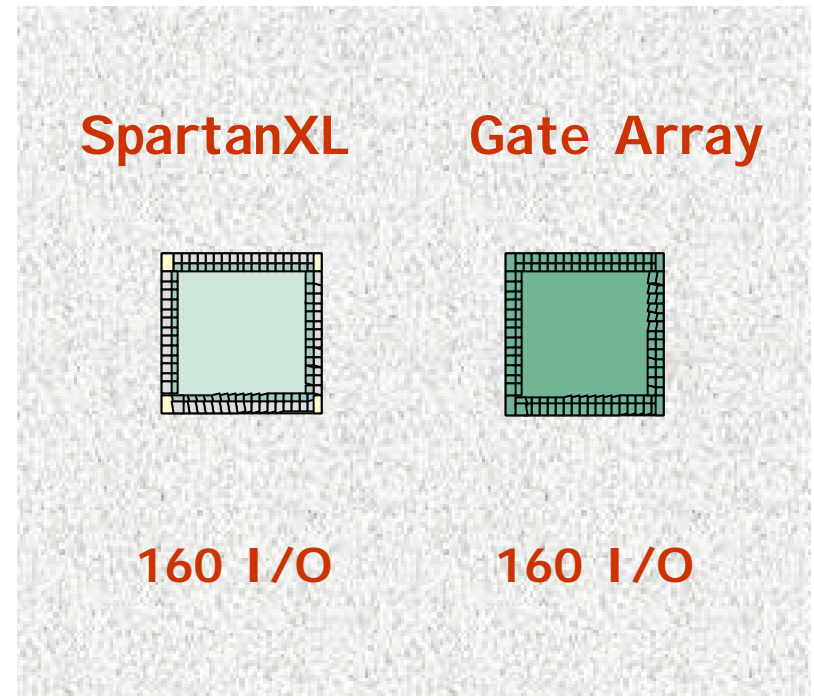
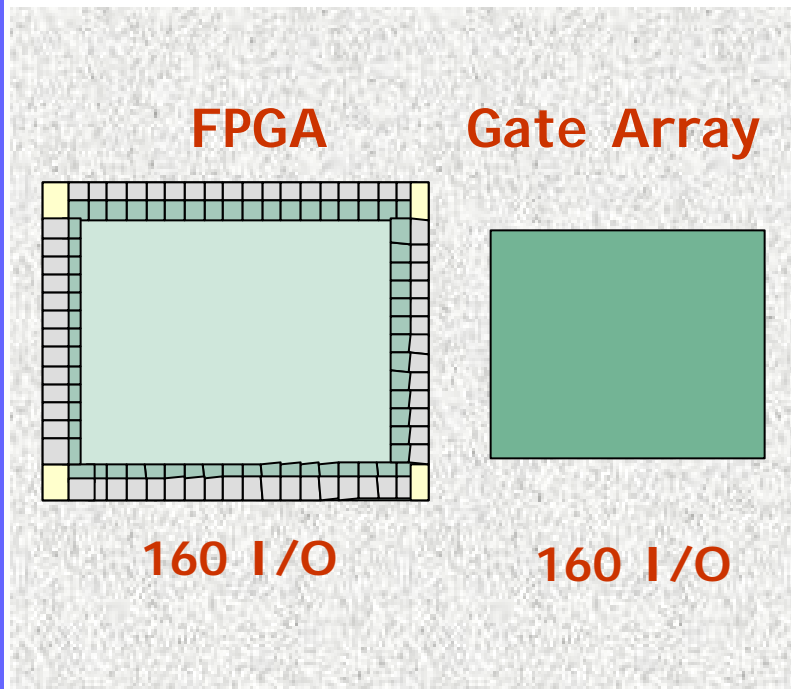
- ◆ First FPGA below \$3.00
- ◆ Entire family of 5 devices under \$10.00
 - Up to 40,000 system gates with on-chip SelectRAM™
- ◆ Programmable logic advantages at ASIC prices



Spartan Equals Gate Array Die Size & Cost

1995

1998

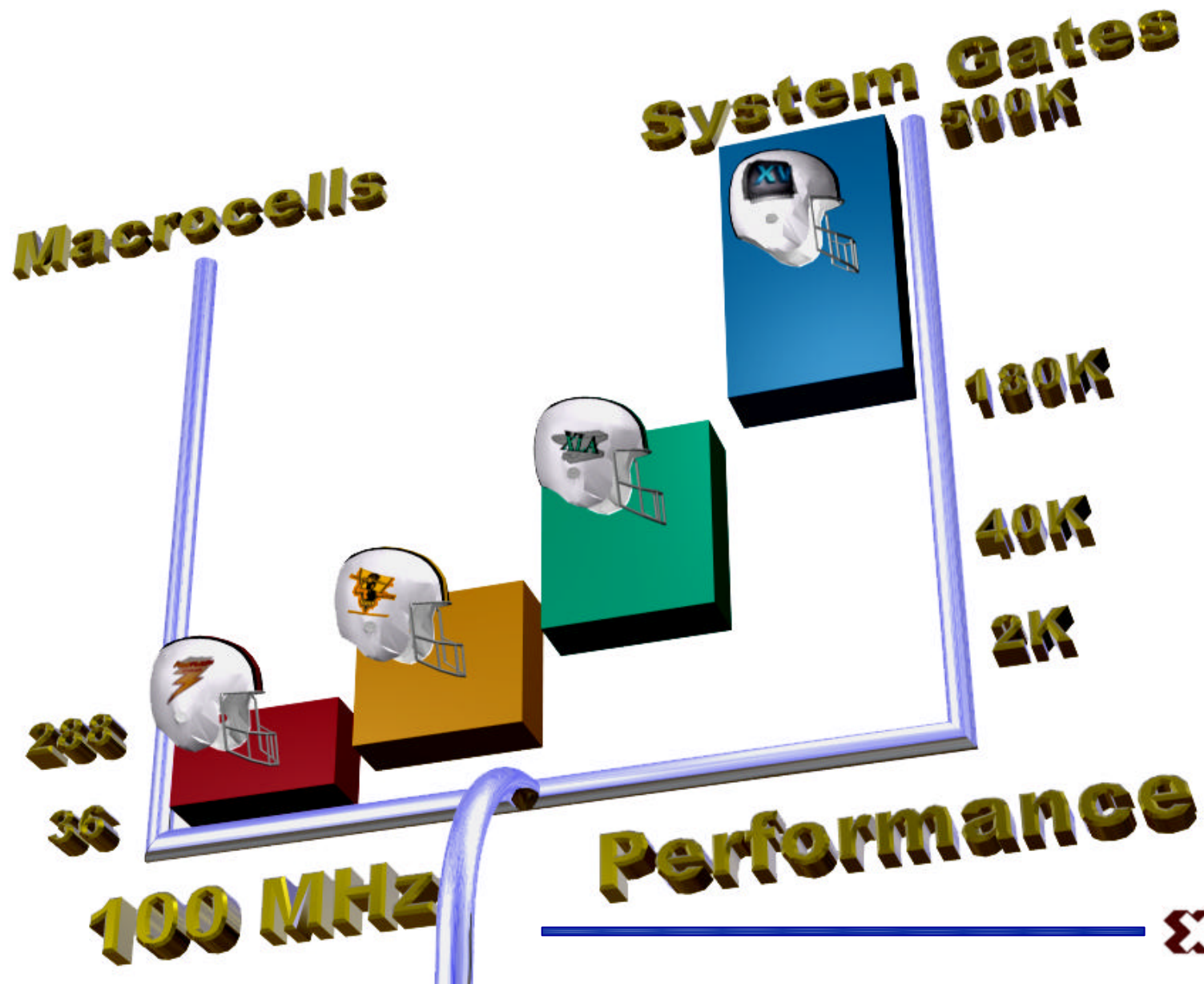




SpartanXL Addresses High Volume ASIC Applications

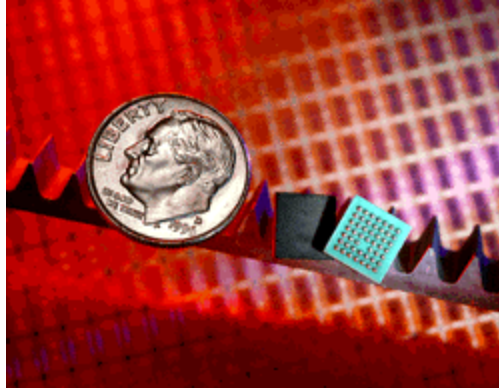
<u>Consumer Electronics</u>	<u>Quantity</u>	<u>PC-Related</u>	<u>Quantity</u>
Video	200Ku	PC I/O Card	100Ku
ADSL Modem	150Ku	PC Peripheral	50Ku
Color Printer	120Ku	PC Video MPEG	50Ku
LCD Projector	100Ku	Plasma Display Panel	50Ku
Smartcard Reader	100Ku		
Arcade Game	70Ku		
Audio Equipment	50Ku	<u>Automotive</u>	
Set-Top Box	50Ku	Automotive tester	100Ku
Wireless Telephone	50Ku	PCI multimedia card	50Ku

Xilinx Scores at All Densities



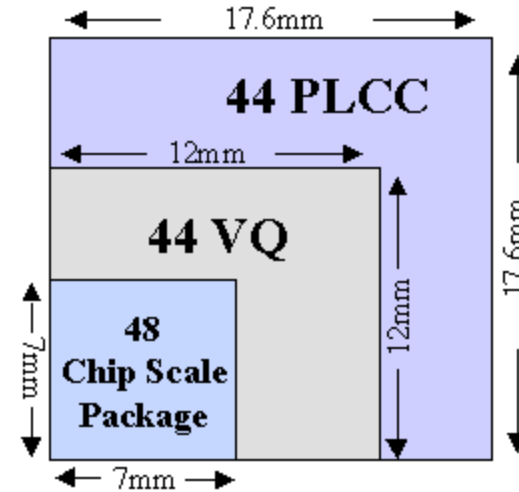
Reference slides

Chip Scale Packaging Leadership

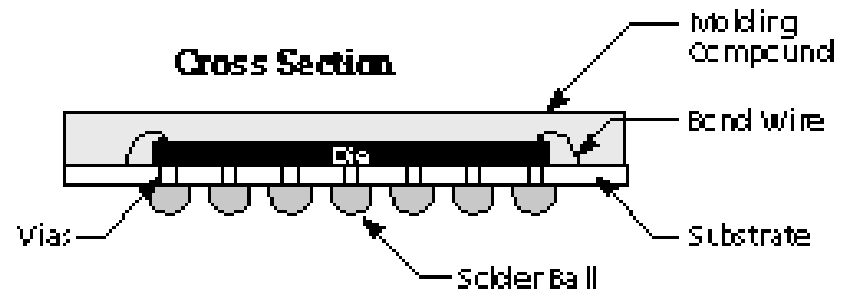


**Supports high-growth market segments:
Communications,
Computers, Consumer**

Uses standard IR techniques for mounting to PC board



**New 48-pin CSP:
1/3 size of the VQ44**





New XC9500XL 3.3V Family

	XC9536XL	XC9572XL	XC95144XL	XC95288XL
Macrocells	36	72	144	288
Usable Gates	800	1600	3200	6400
t_{PD} (ns)	4	5	5	6
f_{SYSTEM}	200	178	178	151
Packages (Max. User I/Os)	44PC (34) 64VQ (36)	44PC (34) 64VQ(52) 100TQ (72)	100TQ (81) 144TQ (117)	144TQ (117) 208TQ (168) 352BG (168)
BGA				
CSPs	48CS (36)	48CS (36)	144CS (117)	



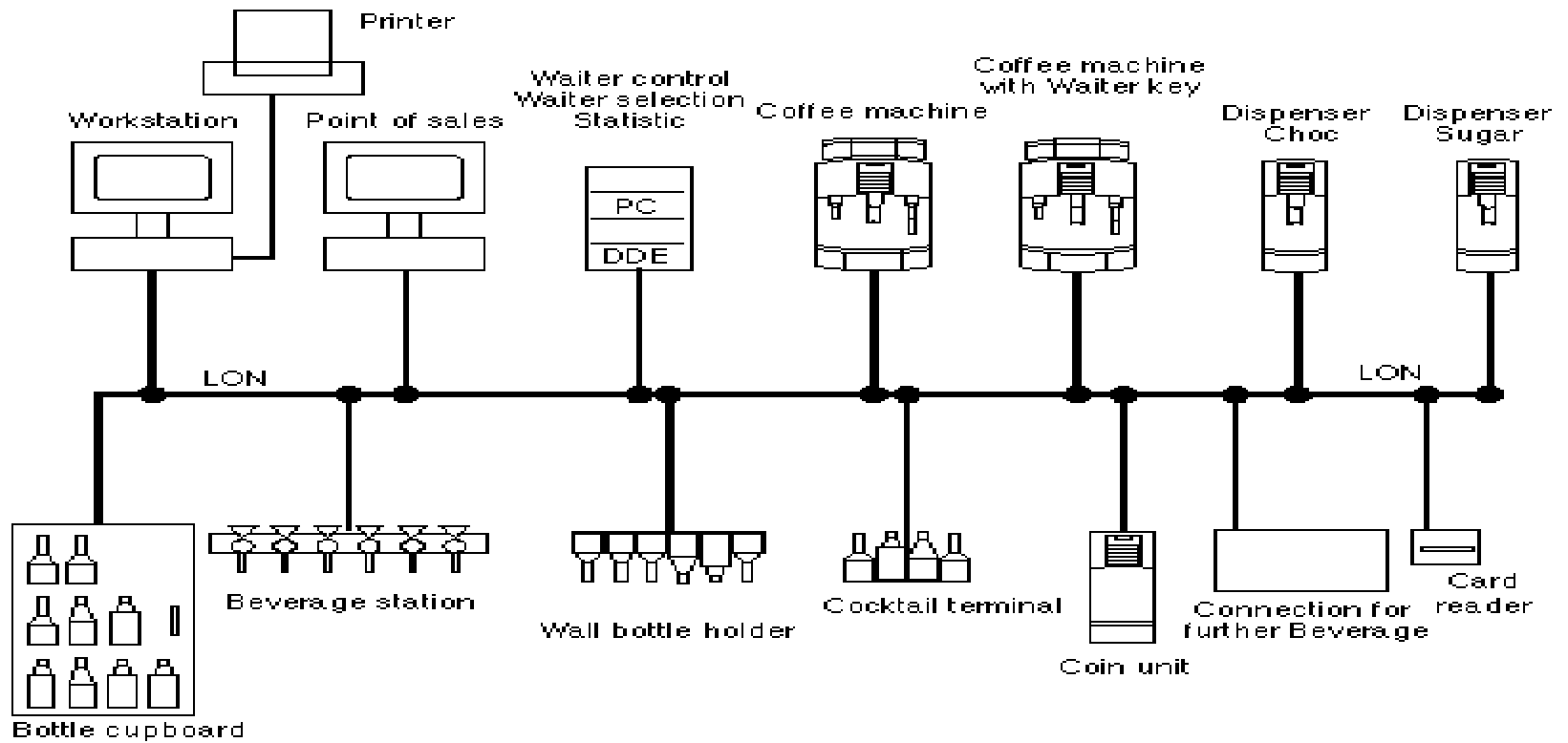
CPLDs Used in Networked Coffeemakers



First coffeemakers, next - the world!



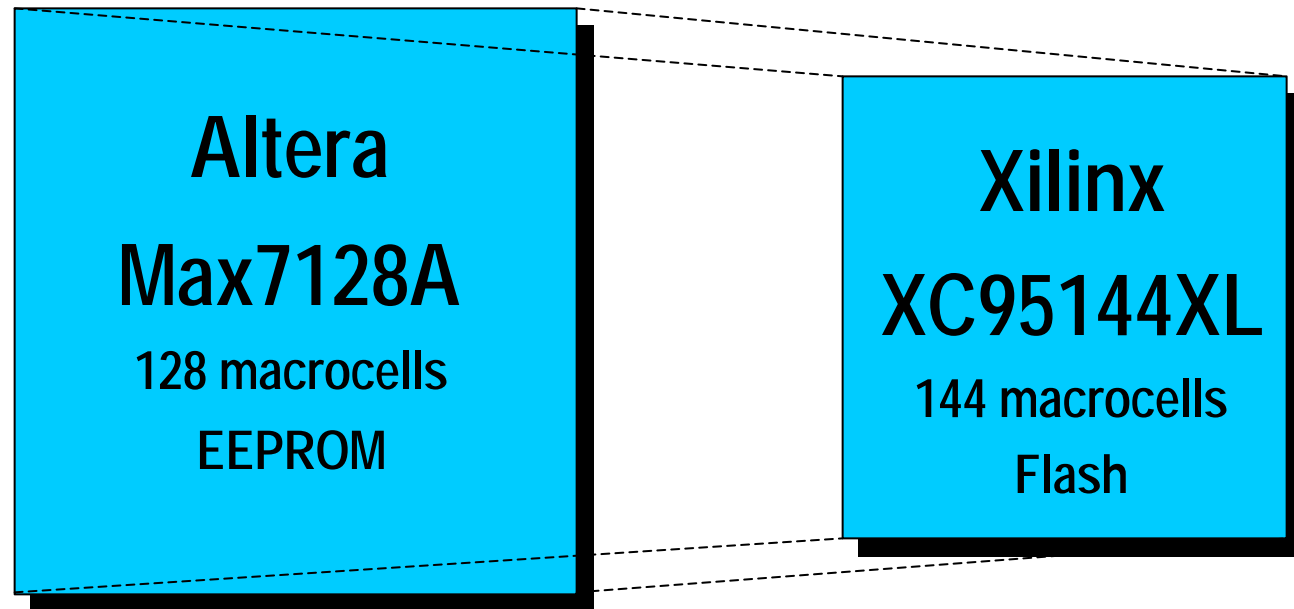
Local Operating Network Example



LON = "Infranet"



FastFLASH Die Size Leadership

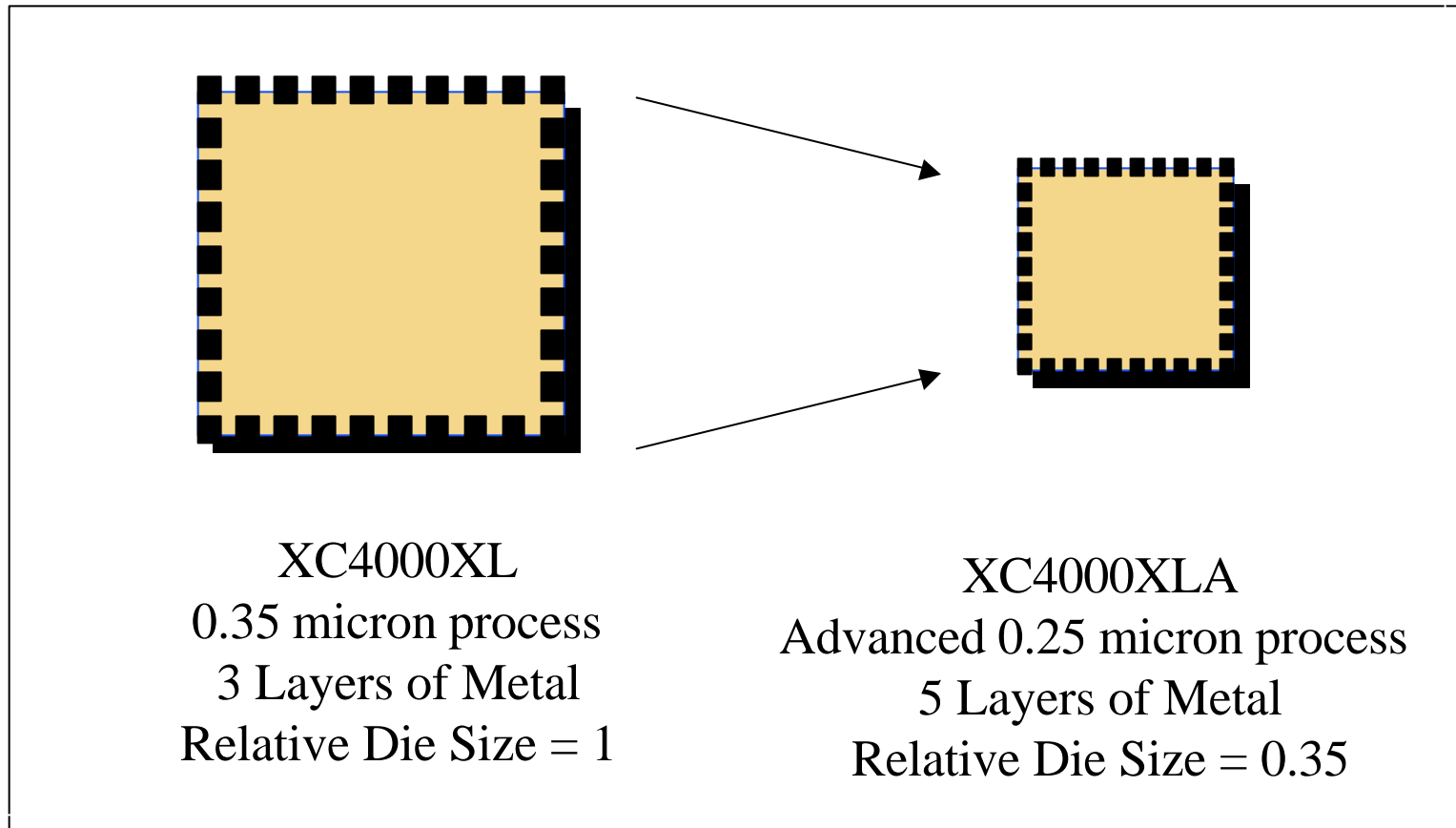


18% smaller

Smallest Die, Lowest Cost

Note: Reported on a per macrocell basis

XLA Yields 65 percent Die Size Reduction



Process Leadership Delivers Cost Leadership



Spartan/XL Customer Profiles

	<u>Low-Volume</u>	<u>High-Volume</u>
<i>Volumes</i>	thousands	hundreds of thousands
<i>Design Cycle</i>	1-2 years	1-2 quarters
<i>Volume Ramp</i>	2-3 years	2-3 quarters
<i>Product Life</i>	4-6 years	4-6 quarters
<i>Markets</i>	Hi-End Networking, Hi-End Telecom, Industrial Automation	Consumer Electronics, PC Related, High-Volume Com.
<i>Competition</i>	Altera, Lucent, etc.	ASICs



New Market Opportunities for SpartanXL

◆ Networking → New Applications

Router
Bridges
Hubs

Network Interface
Cards

◆ Telecom → New Applications

Central Office
Switching Trunks
Base Stations

Handsets
Modems
Portable Phones
Subscriber Interface

◆ Data Processing → New Applications

Servers
High End System

Peripheral Card
Interface Card

New Markets

Consumer

Set-top boxes
Digital TV/Camera
Badge/Smart/Credit
Card Readers
Arcade Game
Systems

PC-Related

I/O Cards
Peripherals
Video

Automotive

GPS Systems
Internal Cabin
Controls



Spartan Addresses >\$1B of the ASIC Market

Spec

Spartan

Design starts*

Gates

40K system gates

40% of GA starts

Pin count

44-224 pins

70% of ASIC starts

Performance

85 MHz

60% of ASIC starts

Design Flow

VHDL / Verilog

>90% of ASIC starts

Features

SelectRAM™
Xilinx COREs

75% of ASIC starts

* Source: Dataquest, 1997



Spartan's Extensive Core Support

Spartan Core Advantages:

- Pre-verified in silicon
- Much lower cost than ASIC cores
- Simple distribution and licensing

Standard Bus Interface Products

Peripheral Component Interconnect Bus (PCI)
Other Standard Bus Products

Digital Signal Processing

Correlators
Filters
Transforms
DSP Building Blocks

Communications & Networking Products

Asynchronous Transfer Mode
Forward Error Correction

Base-Level Products

Basic Elements
Math Functions

RISC CPU Cores

8-bit RISC core

Processor Peripherals

UARTs
Others





Cost Effective Cores

Replace Standard Devices



Core Function	XCS30XL Price	Percentage of Device Used	Effective Function Cost
UART	\$6.95	17%	\$1.20
16-bit RISC Processor	\$6.95	36%	\$2.50
16-bit, 16-tap Symmetrical FIR Filter	\$6.95	27%	\$1.90
Reed-Solomon Encoder	\$6.95	6%	\$0.40
PCI Interface (w/ faster speed)	\$12.00	45%	\$5.40

The XC9500XL family is supported in the Foundation and Alliance Series Software version 1.5. Device programming can be done with the supplied cable, and embedded controller, or automatic test equipment.

strongest product position ever. This announcement encompasses everything from low cost, very fast CPLDs to the largest and highest performance FPGAs, and it includes virtually everything in-between.”

The new Xilinx programmable logic devices include:

- The XC9500XL family, featuring the industry's highest performance CPLDs with pin-to-pin speeds of 4 nanoseconds and system frequencies of 200 MHz. The XC9500XL family consists of four 3.3-volt devices with logic densities ranging from 36 to 288 macrocells (or about 800 to 6,400 gates). All XC9500XL devices are manufactured using advanced 0.35 micron Flash process technology for the industry's highest reliability in programming and data retention, as well as lowest device cost and smallest die size. The devices are available in the most popular surface mount technology, including chip-scale packaging. XC9500XL products offer the industry's best pin locking and in-system programming capability as well as enhanced JTAG boundary-scan support. New markets include automotive, consumer electronics and PC peripherals and add-ins. High-volume pricing begins at \$1.20 for the XC9536XL.

- The XC4000XLA FPGA family, consisting of eight 3.3-volt devices ranging in density from 13,000 to 180,000 system gates. The XC4000XLA devices are manufactured with an advanced 0.25-micron process that boosts performance by 30 percent over the current XC4000XL product line at about half the cost. The XC4000XLA family is the industry's lowest power, highest performance, full line of 3.3-volt FPGA products. New markets: high-density ASIC replacements. High-volume pricing begins at \$11.80 for the XC4013XLA.

- The XC4000XV family, first unveiled last October, now consists of five 2.5-volt devices, including the newly announced XC40110XV. This second generation of 0.25 micron Xilinx FPGA devices offers the industry's highest performance regardless of operating voltage. With densities from 200,000 to 500,000 system gates, the XC4000XV product line includes the largest FPGA devices available on the market today. New markets: very high performance DSP applications. High-volume pricing begins at \$132 for the XC40110XV.

- The SpartanXL family of FPGAs consists of five 3.3-volt devices. These new devices follow the introduction earlier this year of the 5-volt Spartan line of low-cost FPGAs that feature on-chip RAM and broad support for predefined system functions, or cores. The new SpartanXL products are available in densities ranging from 5,000 to 40,000 system gates. New markets: ASIC replacements for high

volume applications such as PC peripherals, internal cabin controls and GPS systems for automobiles, digital television, badge and credit card readers.

New applications for SpartanXL devices in existing markets include portable phones, network interface cards, handsets, modems, and computer interface boards. High-volume pricing for the XCS05XL begins at \$2.95, and all SpartanXL devices will be less than \$10 in mid-1999.

Pricing for all the new Xilinx devices is based on 100,000-plus unit orders for delivery in mid-1999. Production of the devices is scheduled to ramp up this quarter and next.

All the devices are supported in the Xilinx Foundation Series and Alliance Series version 1.5 software, which began shipping earlier this summer. These tools include new Xilinx *AKAspeed* technology that delivers fast compile times and high clock speeds. The tools also support ASIC-like design features such as minimum timing delays and voltage and temperature ratings. A variety of predefined system functions, or cores, are available from Xilinx and its third party AllianceCORE partners. Serial configuration memory devices are also available to support the new FPGAs.

Xilinx is the leading innovator of complete programmable logic solutions, including advanced integrated circuits, software design tools, predefined system functions delivered as cores, and unparalleled field engineering support. Founded in 1984 and headquartered in San Jose, Calif., Xilinx invented the field programmable gate array (FPGA) and commands more than half of the world market for these devices today. Xilinx solutions enable customers to reduce significantly the time required to develop products for the computer, peripheral, telecommunications, networking, industrial control, instrumentation, high-reliability/military, and consumer markets. For more information, visit the Xilinx web site at www.xilinx.com.