

ALP's

RBS

Routing & Backplane Solutions

***Providing High Speed Routing & Connectivity
for Networking and Video***

High Speed Buffered Muxes & Crosspoints

MULTIPLEXERS

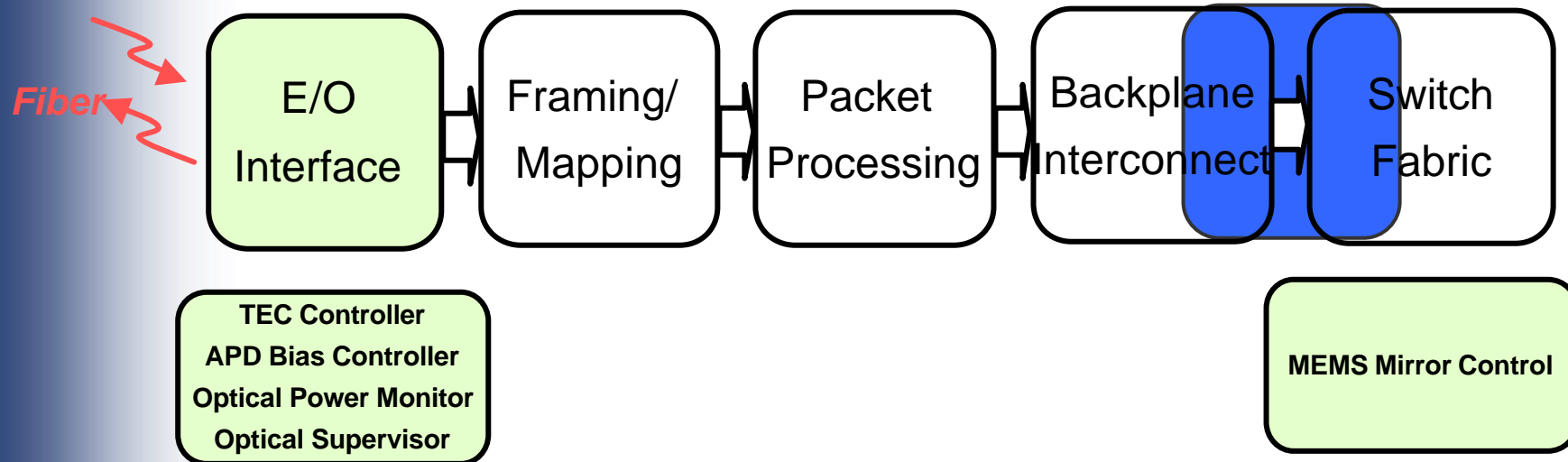
- Broad Range of Muxes for High Speed Video & Data Applications
- High Speed and Low Cost
- Available in Standard Packages
- Fully Buffered Inputs and Outputs
- Fixed Gain, or Gain Set by a Resistor

CROSSPOINTS

- Volume Supplier of High Speed Video Crosspoint Switches
- High Performance and Low Cost
- Matrix up to 16 x16(Analog) & 34 x 34 and larger (Digital) in a Single Package
- Gain of +1 or +2 Available to Meet System Requirements

*Networking Market
&
Digital Crosspoint Switches*

Semiconductor Market Segmentation



■ E/O Interface

- Clock and Data Recovery
- Laser Diode Drivers

■ Bit Processing

- Framers and mappers
- Network processors
- Traffic classification, prioritization, scheduling, and management

■ Backplane Interconnect

- Serializer/Deserializer
- Electrical Crossconnect

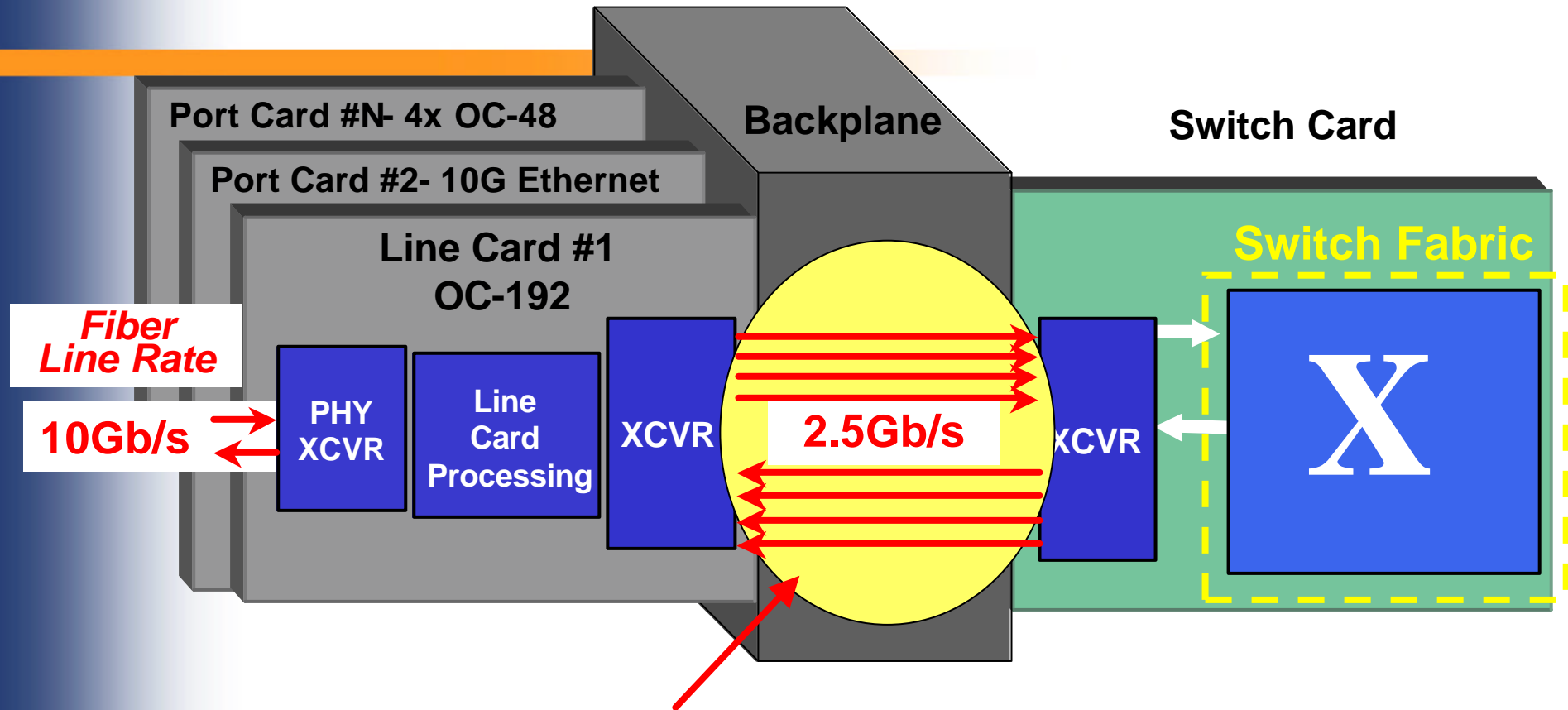
■ Switch fabric

- Electrical or Optical Cross connects
- Scheduler / controller

■ Control Electronics

- Laser Diode control
- Optical Power Monitoring

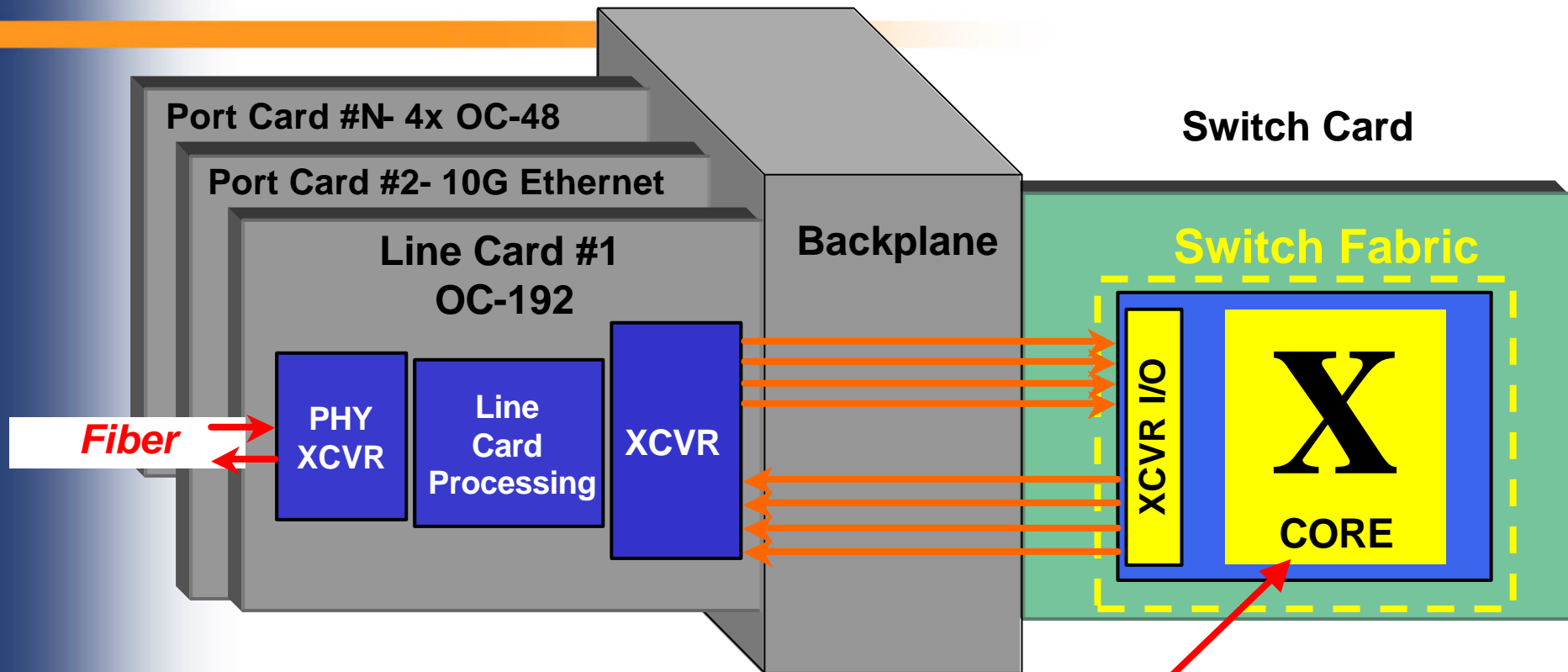
System Issues- Density and Power



➤ **Backplane Bottleneck due to:**

- Link Speeds \ll Line Rate
- Transmission Length
- Density (i.e. number of links)

System Issues- Power Efficiency



➤ **IC Power Efficiency is Crucial
(Lower Power in the Switch Core):**

$$P_{\text{TOTAL}} = P_{\text{XCVR I/O}} + P_{\text{CORE}}$$

System Issues (cont.)

Total System Power due to Backplane Link

$$P_{\text{LINK}} = \left\{ \frac{\text{BW}_{\text{SYS}}}{\text{BW}_{\text{LINK}}} \times 2 \right\} \left\{ V_{\text{CC}} \times \frac{V_{\text{SWING}}}{Z_0} \right\}$$

of Backplane Serial Links

Power for each serial link

RBS is focused on 2 Key Parameters:

All while maintaining low core power!

Reducing

V_{SWING} :

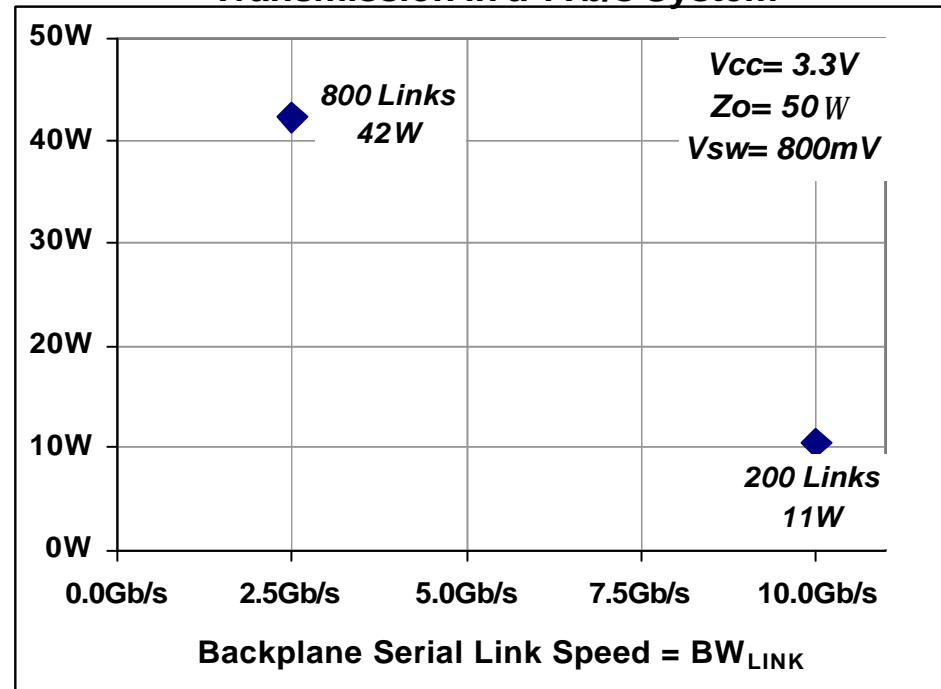
2-for-1. If you can reduce V_{SWING} you can also reduce V_{CC}

Increasing

BW_{LINK} :

Reduces complexity, power and allows for higher density systems.

Power Due to Backplane Serial Link Transmission in a 1Tb/s System



Why we are suited to solve these problems

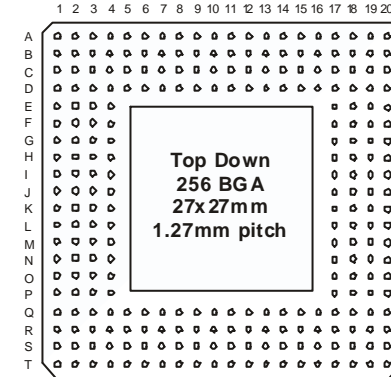
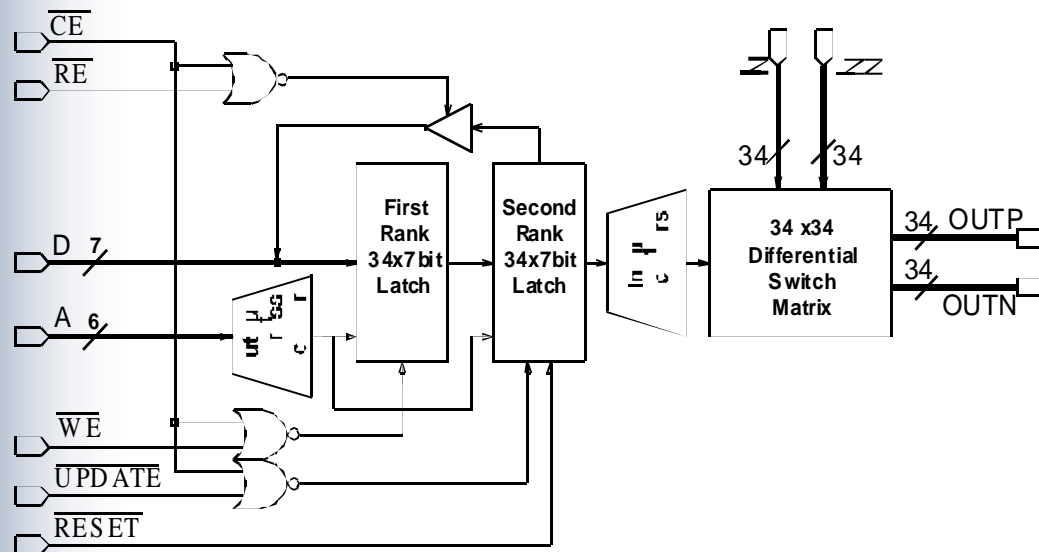
Increasing BW_{LINK} (transmission line signal attenuation w/ ωf)

Reduced V_{SWING}

- Both solutions require Receivers with High Sensitivity and High Gain under Low SNR conditions.
- This is an “analog” issue. A challenge which is well suited to Analog Devices core competence.
 - Wideband VGAs (Barrie Gilbert)
 - Multi-Rate CDR
 - PLLs

AD8152 X-stream™ 3.2 Gb/s 34 x 34 Digital Crosspoint Switch

The AD8152 is the next breakthrough in *high-speed* digital switching! It is a 34 x 34 Crosspoint Switch which will operate at data rates > 3.2Gb/s, making it ideally suited for SONET/SDH OC-48 applications. Like its predecessors, it will have fully differential signal paths. The AD8152 will be fab'd on a proprietary BiCMOS process, and will be the lowest power solution in the market place.



***In Development
Samples Jan '02**

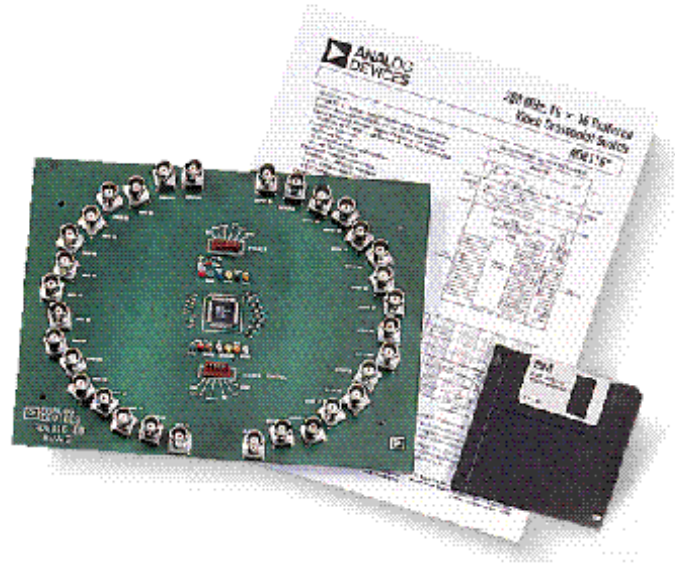
AD8152

AD8152 *X-stream*[™] 3.2 Gb/s 34 x 34 Digital Crosspoint Switch

Features

- **3.2Gb/s/port** min Data Rate (NRZ)
 - Supports SONET, OC-48 Standard w/ 8b/10b FEC
- Lowest Solution **Cost** for 3.2Gb/s, 34x34 (**\$195/1K**)
- Lowest **Power** <2.5W, No Heat Sink Required!
- Most **Flexible**: Operates on 2.5 or 3.3Volts
Digitally Program V_{OUT} - on a per output basis
- **Large Array**: 34 input x 34 outputs
- **50W Termination Resistors** **Integrated** On-Board
- **Compact** 256L SBGA Packaging

Design-in Kits & Web Site Support



Design-in Kit: Saves designers months in development time!

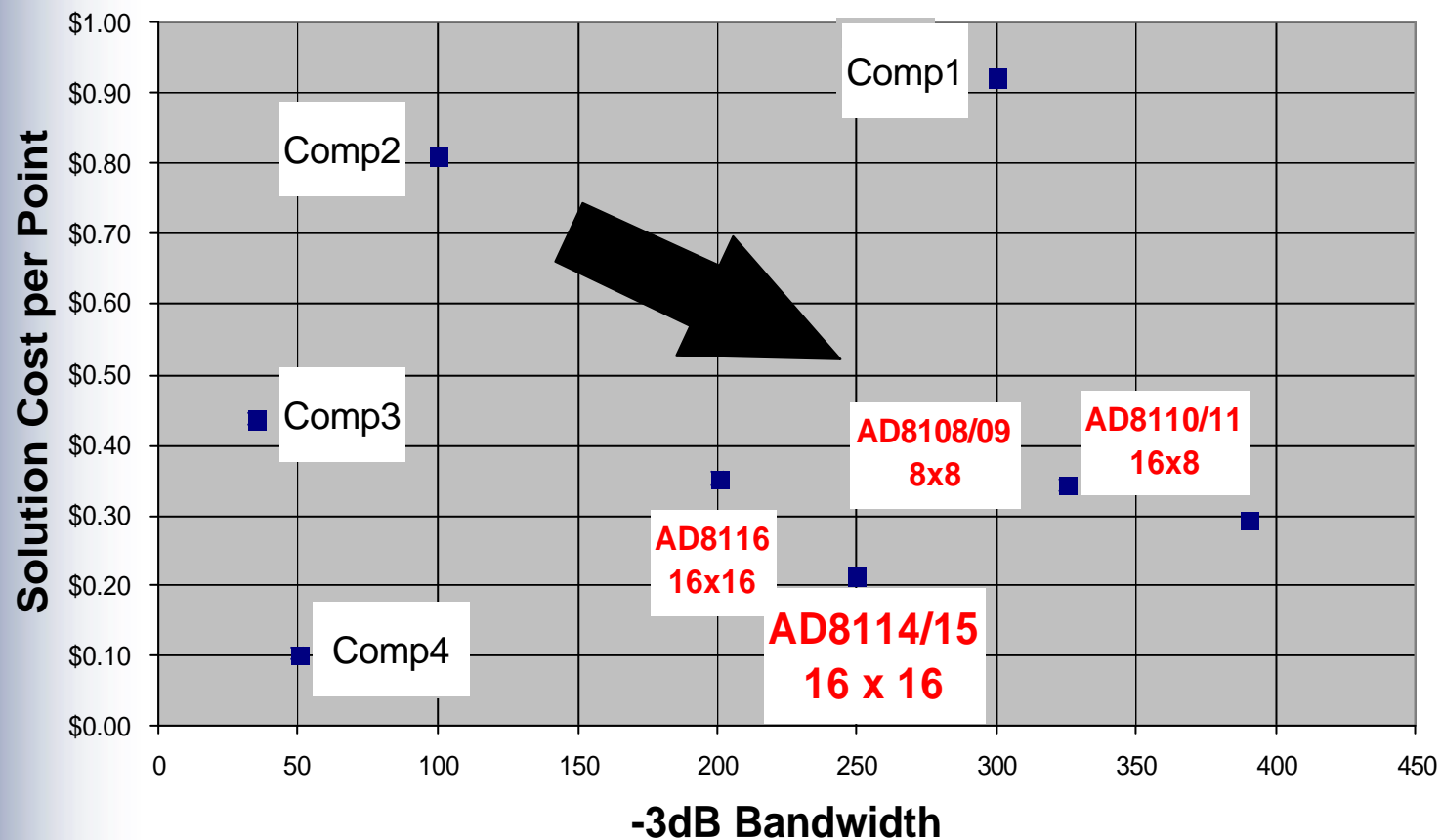
- Fully Populated Evaluation Board for all Products.
- Windows™ Compatible Software to Control Eval Bd. from PC.
- Custom Cable to Connect Eval Bd to PC Printer Port.
- Gerber Files of Evaluation Board Layout.

Web Site Support: www.analog.com/high-speed-switches

- On line samples, technical reports, and data sheets.

ADI Crosspoints Offer High Speed & Low Solution Cost

Bandwidth Vs. Density



High Speed Buffered Multiplexers

BUFFERED MUXES

AD8180/82 - Single/Dual 2:1, 800MHz, 10ns Switch

AD8184 - Single 4:1, 700MHz, 10ns Switch

AD8170/74 - Single 2:1 & 4:1, 750MHz w/ Auxiliary Amp

AD8183/85 - Triple 2:1, 400MHz, G = +1/+2 SR=1000/1150V/us, 15ns Switch

AD8074/75 - Triple Buffer w/ Output Disable, G = +1/+2, 500MHz, SR=1400/1800V/us,

**Samples
Jan 2002**

AD8186/87 - Triple 2:1, Single Supply, G = +1/+2, 500MHz, SR=1400V/us, 10ns Switch

High-Speed Buffered Crosspoints

Analog Solutions

AD8116 - 200MHz, 16x16, G= +1, $\Delta G = .01\%$, $\Delta\phi = 0.01^\circ$

AD8114/15 - 225MHz, 16x16, G=+1/+2, $\Delta G = .05\%$, $\Delta\phi = 0.05^\circ$

AD8108/09 - 250MHz, 8x8, G=+1/+2, $\Delta G = .01\%$, $\Delta\phi = 0.01^\circ$

AD8110/11 - 250MHz, 16x8, G=+1/+2, $\Delta G = .01\%$, $\Delta\phi = 0.01^\circ$

AD8113 - 60MHz, 16x16, G=+2, $V_{sup} = +/-12$ or $+/-5V$, Audio or Video

Digital Solutions

AD8150 - 1.5Gb/s, 33 x 17, 5V or 3.3V Supply Fully Differential ECL & PECL compatible!

AD8151 - 3.2Gb/s, 33 x 17, 5V or 3.3V Supply, Fully Differential ECL & PECL compatible!

***Under Development
Sample Dec '01***

AD8152 - 3.2Gb/s, 34 x 34, 3.3V or 2.5V Supply, Fully Differential LVPECL/CML compatible!