

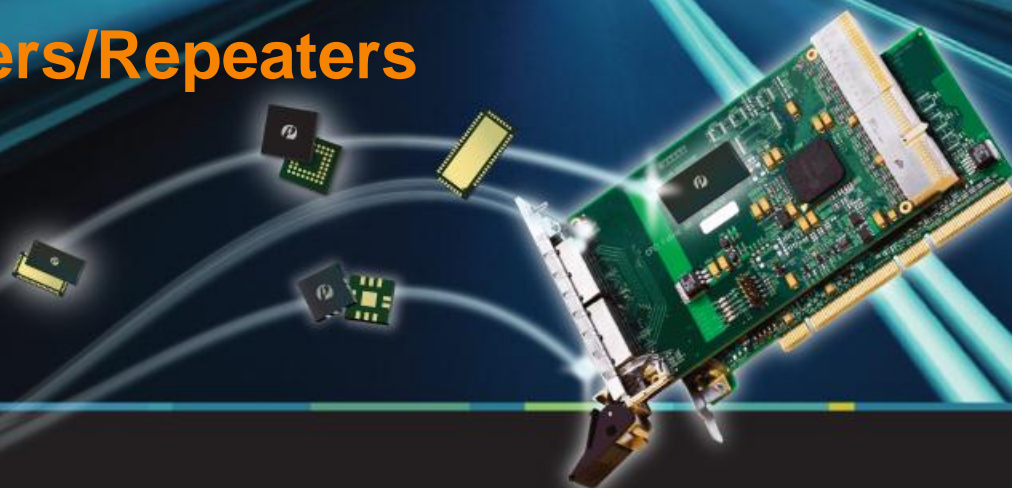
Enabling High-speed Serial Connectivity

For all your Timing, Signal Integrity & Connectivity Needs

PRODUCT TRAINING MODULE

PCIe and USB3 ReDrivers/Repeaters

August, 2014

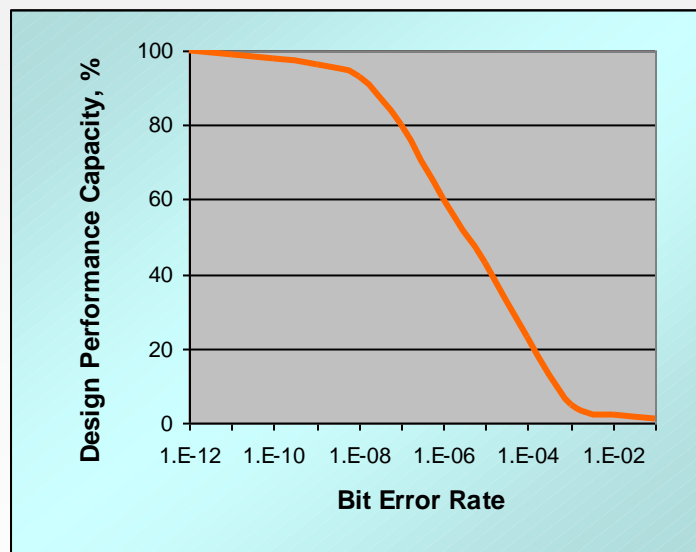
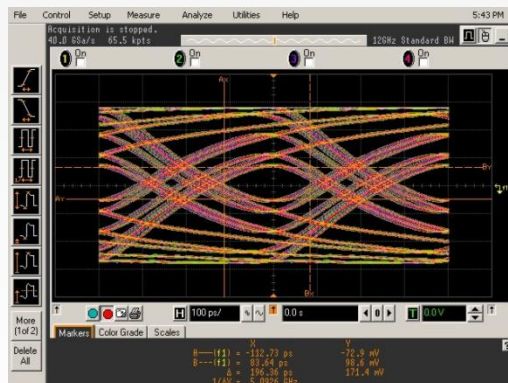
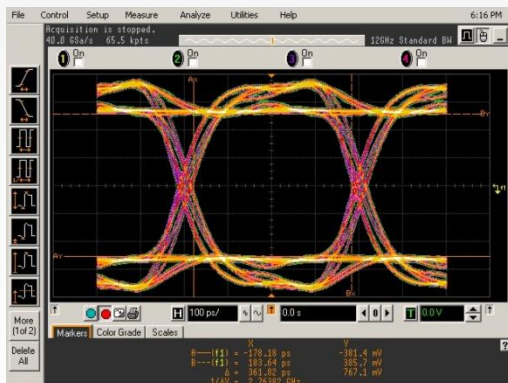
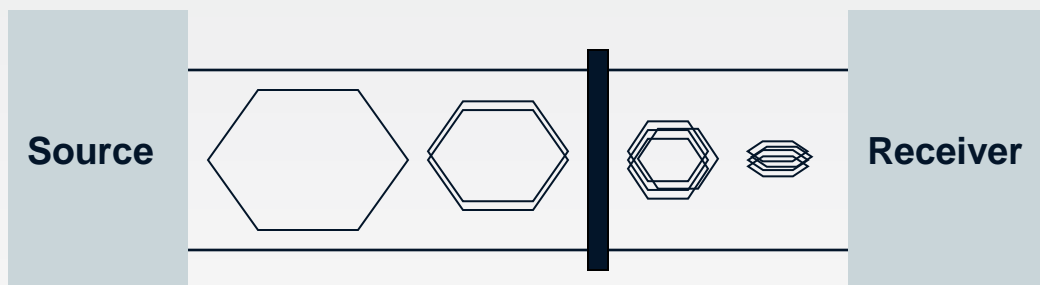


Pericom ReDriver Background

- **A Leader in Signal Integrity:**
 - >60 million units shipped since 2005
 - Key applications include smart phones, NB, TV, servers/storage, networking, embedded, consumer, and more
 - Key partnerships with major CPU vendors
- **Broadest protocol offering in the industry:**
 - PCIe Gen1/2/3
 - USB3
 - SATA 2/3 and SAS 2/3
 - XAUI
 - HDMI and Display Port
 - 10Gb/40Gb Ethernet

ReDrivers and System Performance

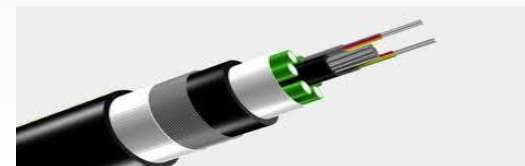
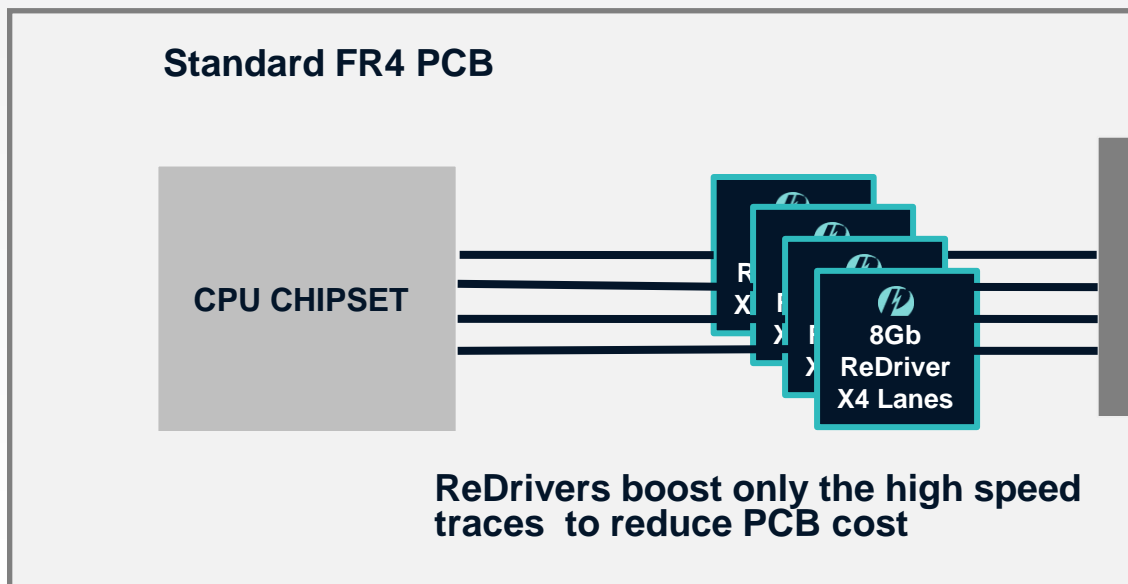
- Communication errors reduce system performance, poor signal quality results in communication errors
- Signal quality is reduced by noise (jitter) and attenuation, but can be restored with signal conditioners

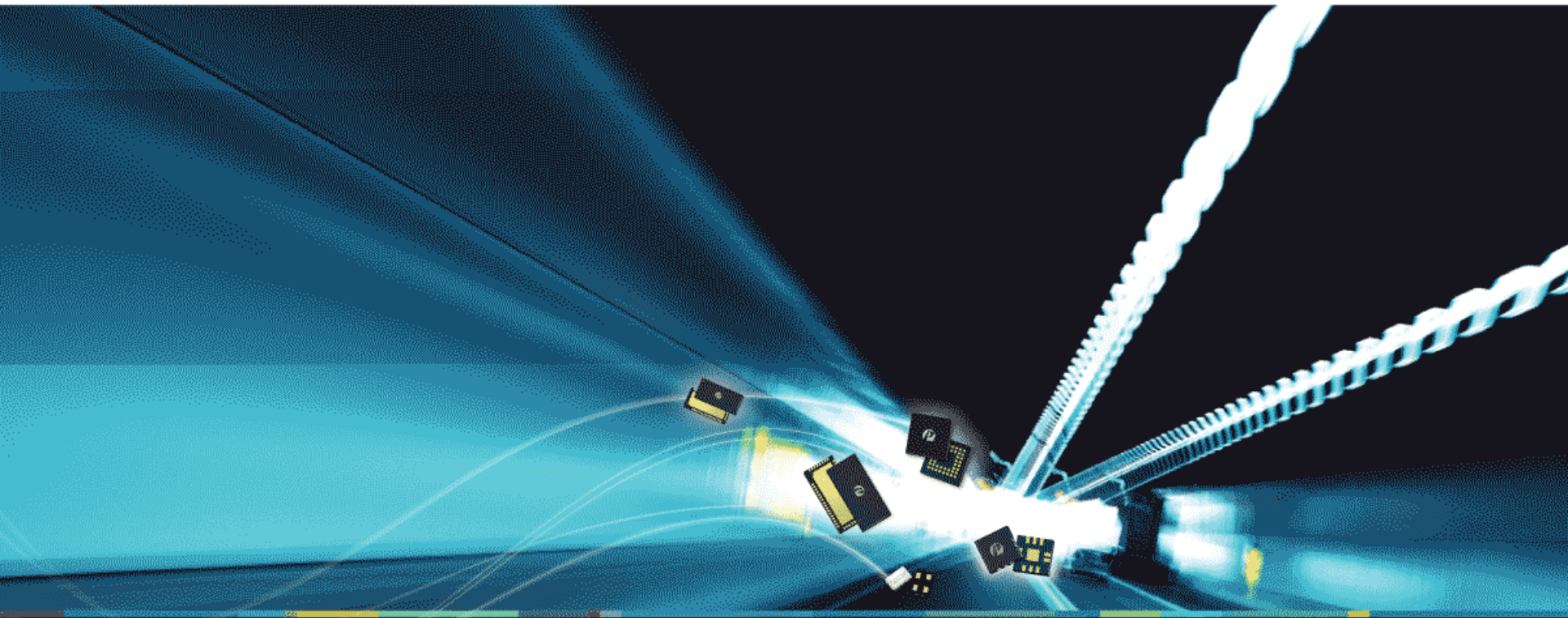


ReDrivers – a Versatile Cost Saver!

ReDrivers can help reduce system cost in many ways:

- Replace the need for more expensive 'retimer' based products
- Replace the need for more expensive PCB board material - it is much more cost effective to use ReDrivers than pay for entire PCB upgrade.
- Allow use of lower cost / smaller gauge cable by using ReDriver






PCIe ReDrivers


PCIe ReDriver Portfolio


Pericom has the broadest selection of PCIe ReDrivers – excellent for PCB trace and cable extension in server, storage, networking applications. Validated by PCISIG workshop testing.

PCIe


PCIe Gen1 – 2.5Gbps


 **PI2EQX4432D**
PCIe 1
2.5Gbps, 2-lane, 48-TQFN


 **PI2EQX4402D**
PCIe 1
2.5Gbps, 2-lane, 84-LFBGA

 **PI2EQX4401D**
PCIe 1
2.5Gbps, 1-lane, 36-TQFN


PCIe Gen2 – 5Gbps


 **PI2EQX5904**
PCIe 1/2
5.0Gbps, 4-lane, 100-LBGA

 **PI2EQX5984**
PCIe 1/2
5.0Gbps, 4-lane, 72TQFN
Enhanced Performance
Compatible to 8984 pinout

 **PI2EQX5801**
PCIe 1/2
5.0Gbps, 1 lane, 72TQFN
Very low Power, I2C

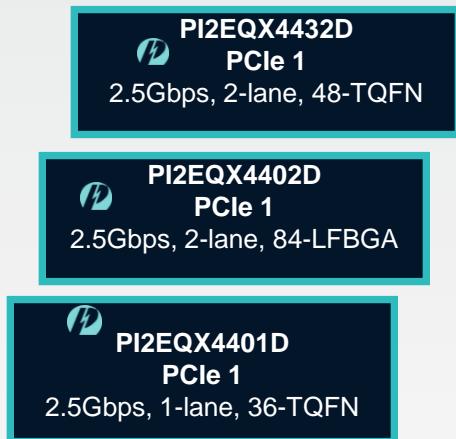
PCIe Gen3 – 8Gbps

 **PI3EQX8908**
PCIe 1/2/3
8 Channels
Flow Thru Pinout- 54 TQFN

 **PI3EQX8984**
PCIe1/2/3
4 Lanes
Interleave Pinout-72 TQFN
Compatible to 5984 pinout

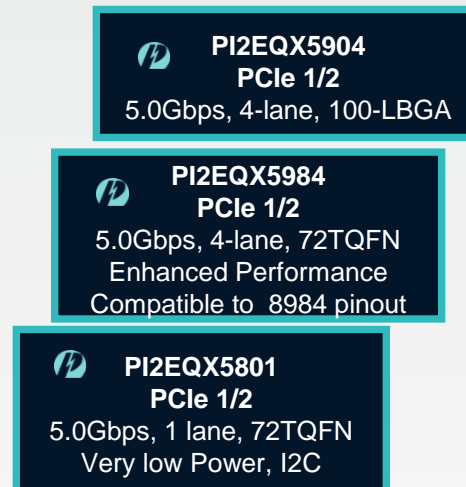
PCIe1 and PCIe2 ReDriver Portfolio

PCIe Gen1 – 2.5Gbps



- PCIe 1 only speeds
- Pin Strap programming only (no I2C)
- 1 Lane and 2 lane options
- Also good for GMII Networking Apps

PCIe Gen2 – 5Gbps



- PCIe 1 and 2 speeds
- Both I2C and Pin Strap Programming
- 4 Lane and 1 Lane Options
- 5801 – lowest power 1 Lane in industry
- 5984 - pin compatible to GEN3 8984

PCIe GEN 3 and 10Gb ReDriver Portfolio

PCIe 1/2/3



PI3EQX8908

PCIe 1/2/3

8 Channels

Flow Thru Pinout- 54 TQFN



PI3EQX8984

PCIe1/2/3

4 Lanes

Interleave Pinout-72 TQFN

Compatible to 5984 pinout

10 GbE



PI3EQX10908

10Gb Ethernet/Other

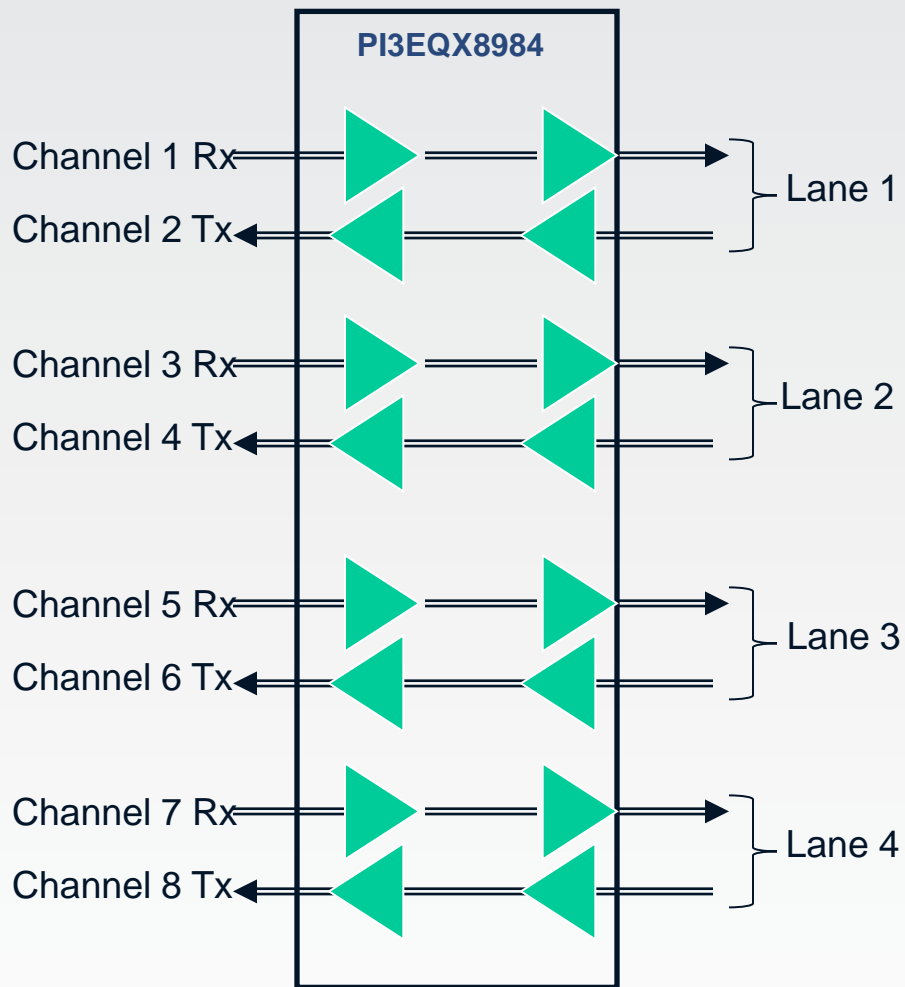
8 Channels

FlowThru Pinout

Key Features

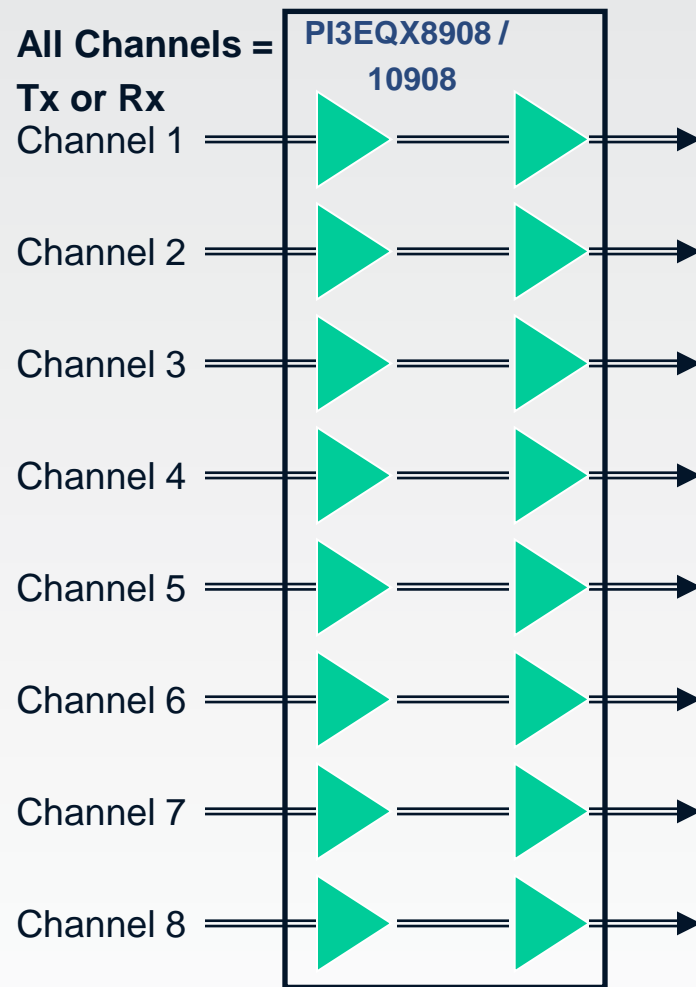
- Flow Thru or Interleave pinout options (only Pericom offers both options)
- Advanced analog design in BiCMOS SiGe process – 4th generation redriver
- Scalable linear amplifier gain (unique to Pericom) – allows further channel and eye adjustments *
- Single Power Supply - 3.3V +/-10%.
- I2C master or slave – up to 16 devices controllable via single low cost EEPROM *
- Low power dissipation - ~1W at 1V output swing – all 8 Channels operating
- Industrial Temp rated -40C to +85C
- Rj contribution <1.0pS (based on actual silicon measurement) – extremely low!

Pinout Options – Interleave & Flow-Thru



INTERLEAVE

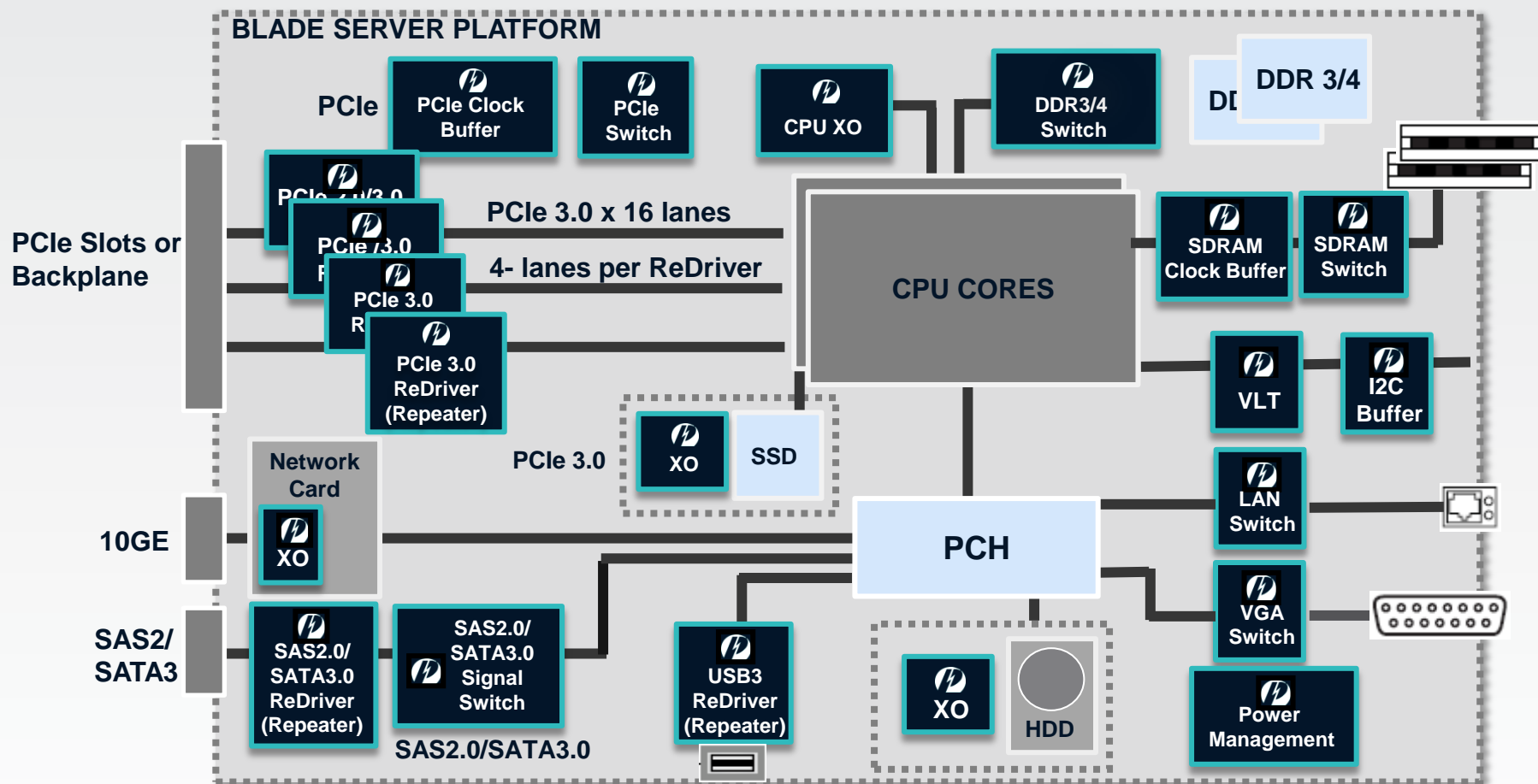
On PCB, the channels
go back and forth in 2 directions
Lanes are 'paired' at IC level



FLOW-Thru

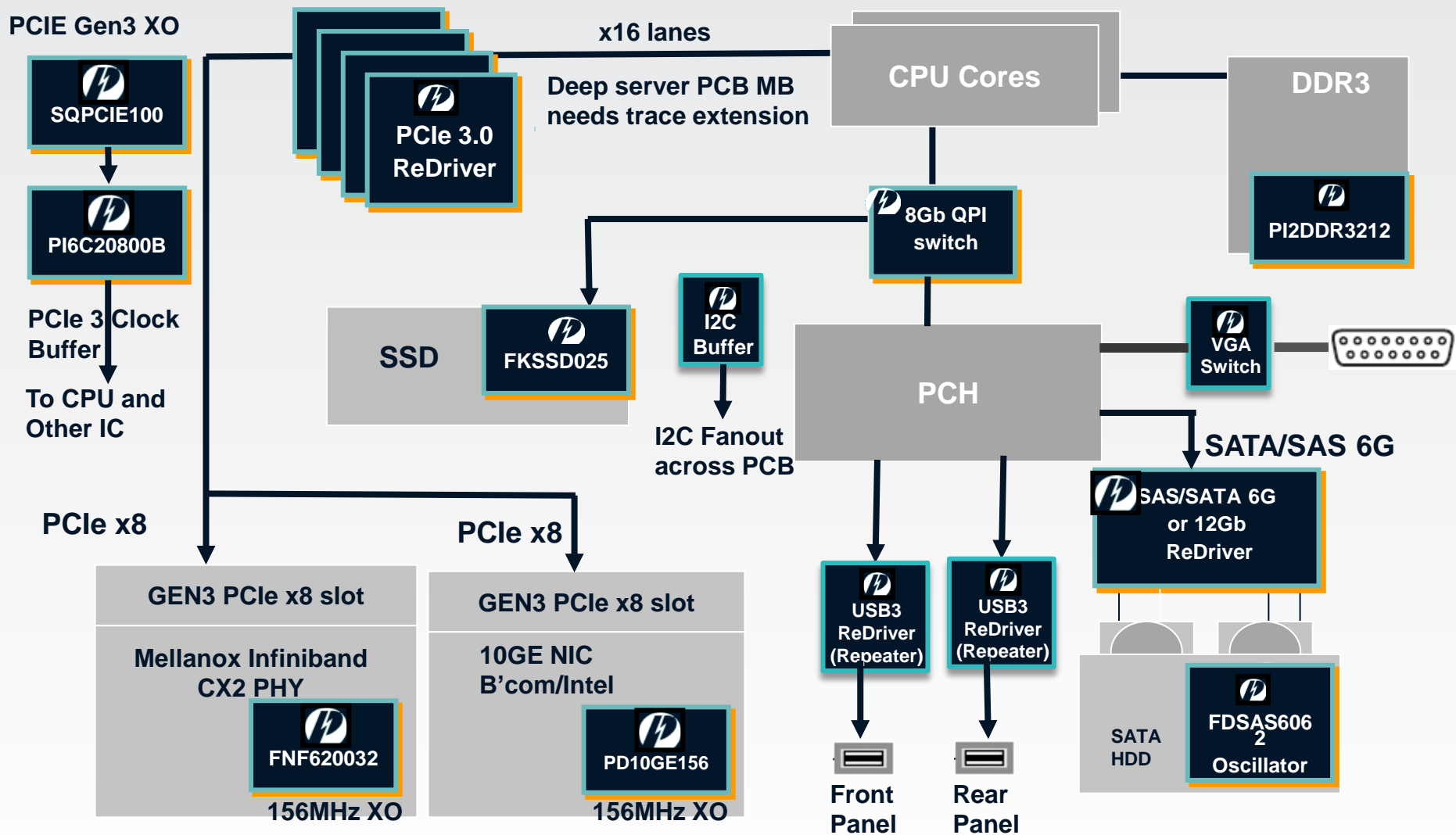
On PCB, all channels
go in 1 direction
Lanes are 'paired' at PCB level

Example – Blade Server



➔ Multiple Pericom Switching, Timing, ReDriver solutions

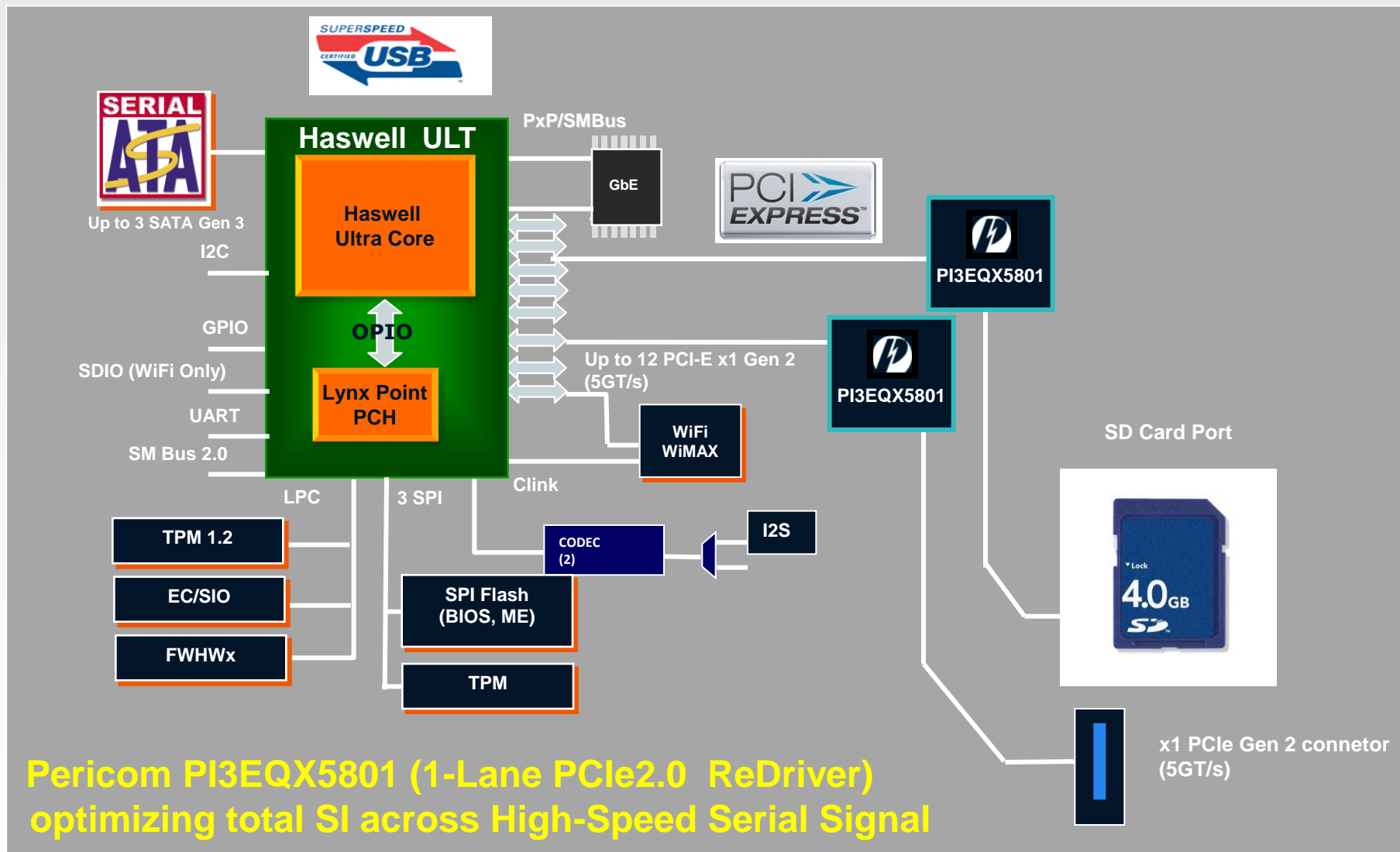
Example - Rack Server

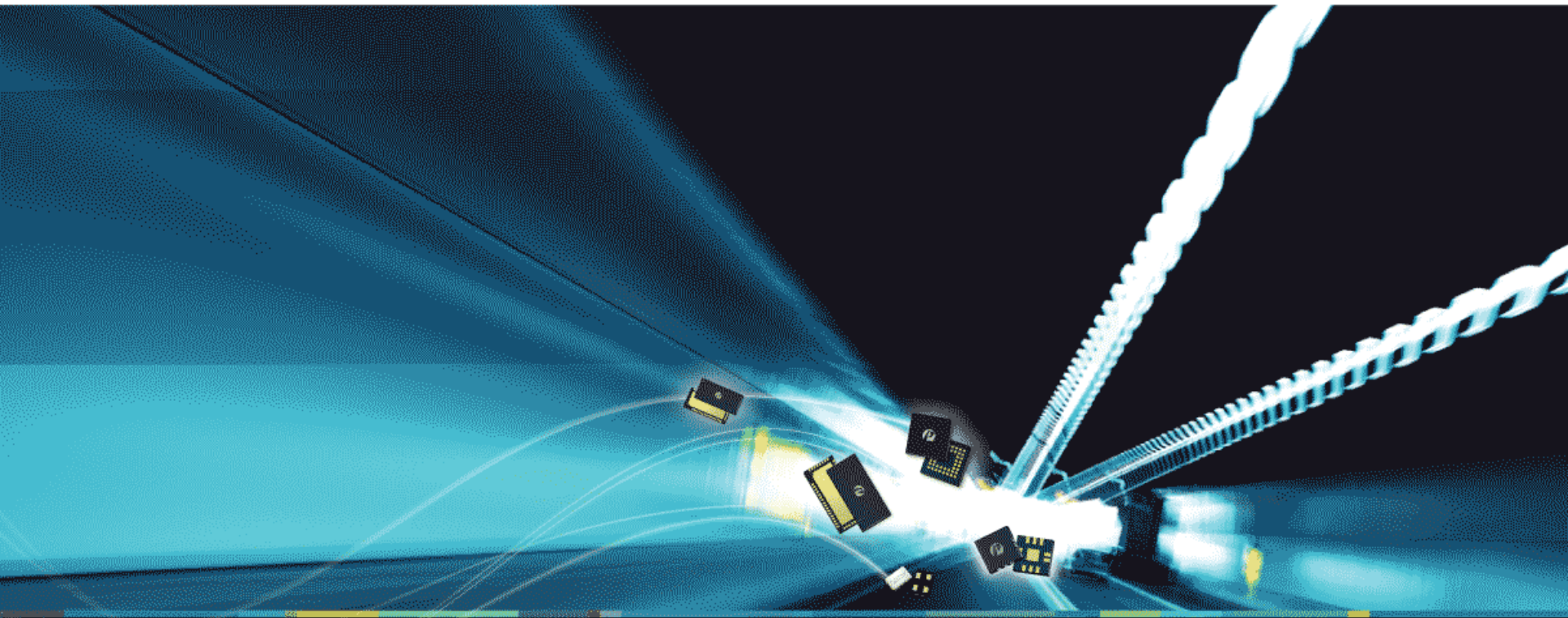


➔ Multiple Pericom Switching, Timing, ReDriver solutions

Pericom PI3EQX5801 (1-Lane PCIe2.0 ReDriver)

App: Haswell AIO PC/Workstation or Notebook/Dock





USB3 ReDrivers

Pericom USB3.0 ReDriver/ReTimer Portfolio

USB3.0–5.0Gbps
3.3V

Low Power

PI3EQX501I

Single Channel
8-pin, 2x2mm TQFN
USB3.0 Compliant (3.3V)

PI3EQX502I

1-Port
16-pin, 3x3mm TQFN
USB3.0 Compliant (3.3V)

PI3EQX7502AI

1-Port
24-pin, 4x4mm TQFN
USB3.0 Compliant (3.3V)

PI3EQX7841

1-Port + I2C Control TQFN
USB3.0 Compliant (3.3V)

In Production

USB3.0 - 5.0Gbps
1.8V

Ultra Low Power

PI2EQX511E

Single-Channel,
12-pin, 1.6x1.6mm, TQFN
USB3.0 Compliant (1.8V)

PI2EQX510E

Single-Channel,
10-pin, 1.6x1.6mm, TQFN
USB3.0 Compliant (1.8V)

PI2EQX502E

1-Port
16-pin, 3x3mm, TQFN
USB3.0 Compliant (1.8V)

In Production

USB3.0 - 5.0Gbps
1.2V

Ultra Low Power

PI2EQX511T

Single-Channel,
12-pin, 1.6x1.6mm TQFN
USB3.0 Compliant (1.2V)

PI2EQX510T

Single-Channel,
10-pin, 1.6x1.6mm TQFN
USB3.0 Compliant (1.2V)

PI2EQX502T

1-Port
16-pin, 3x3mm, TQFN
USB3.0 Compliant (1.2V)

In Production

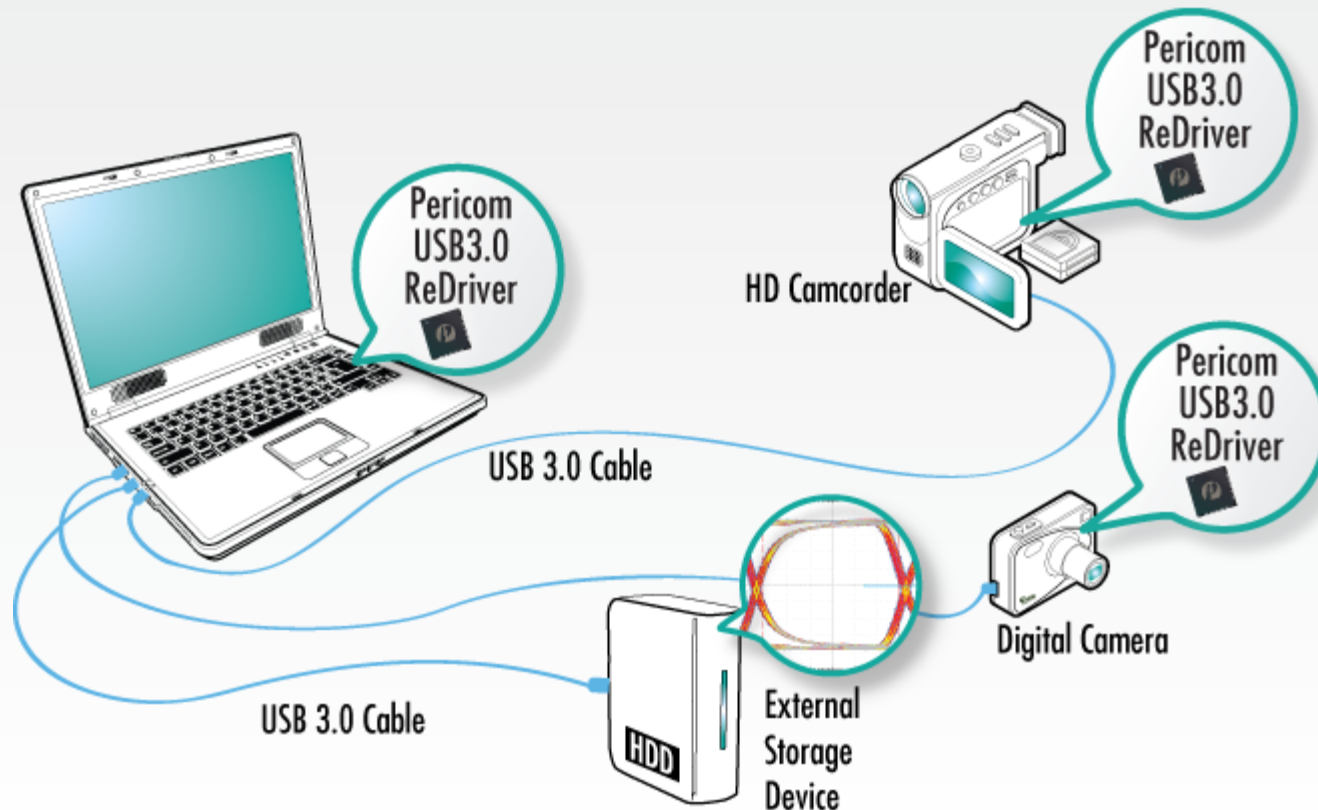
Key Values:

- Supply Voltage family to match CPU and application – (Intel or ARM)
- Fully certified by USB3.0 Compliance Workshop and listed in USB3.0 Integrator's list
- Fully compliant USB3.0 Link Power Management – industry lowest power consumption
- Big selection – package, features, supply voltage
- Strong Customer Support – worldwide technical support from design to production

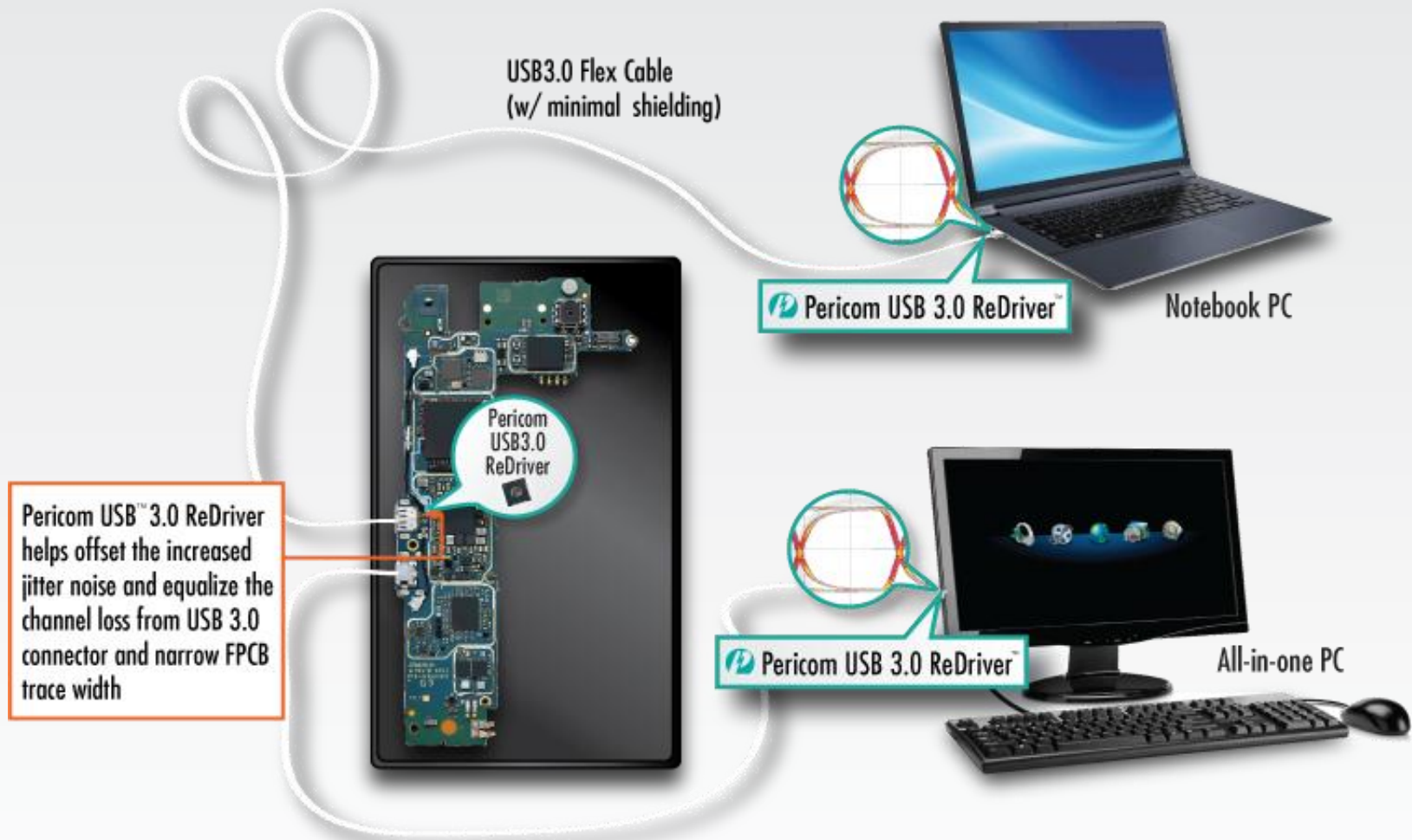
USB3.0 ReDriver App Examples

Application: Pericom 501/502/7502/7741/7742 USB3.0 ReDrivers deliver strong USB3.0 Tx/Rx Signal to USB3.0 Ports of AIO PC / Notebook / Digital CAM / CAMCODER Systems

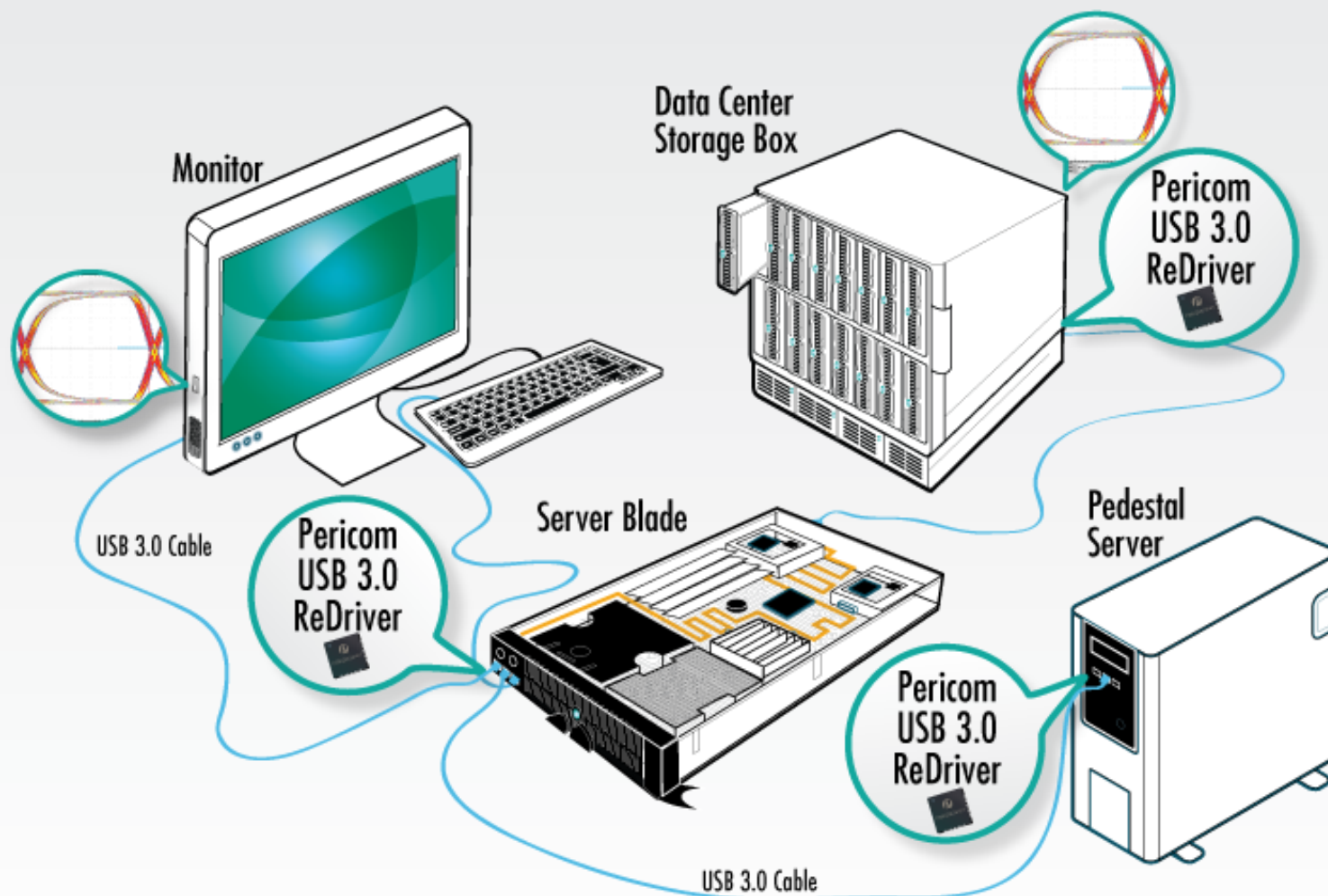
ReDriver Benefit: Insures high quality of 5 Gbps USB3.0 signal across FR4 PCB trace or long USB3.0 Cables, allowing strong USB3.0 signal optimization



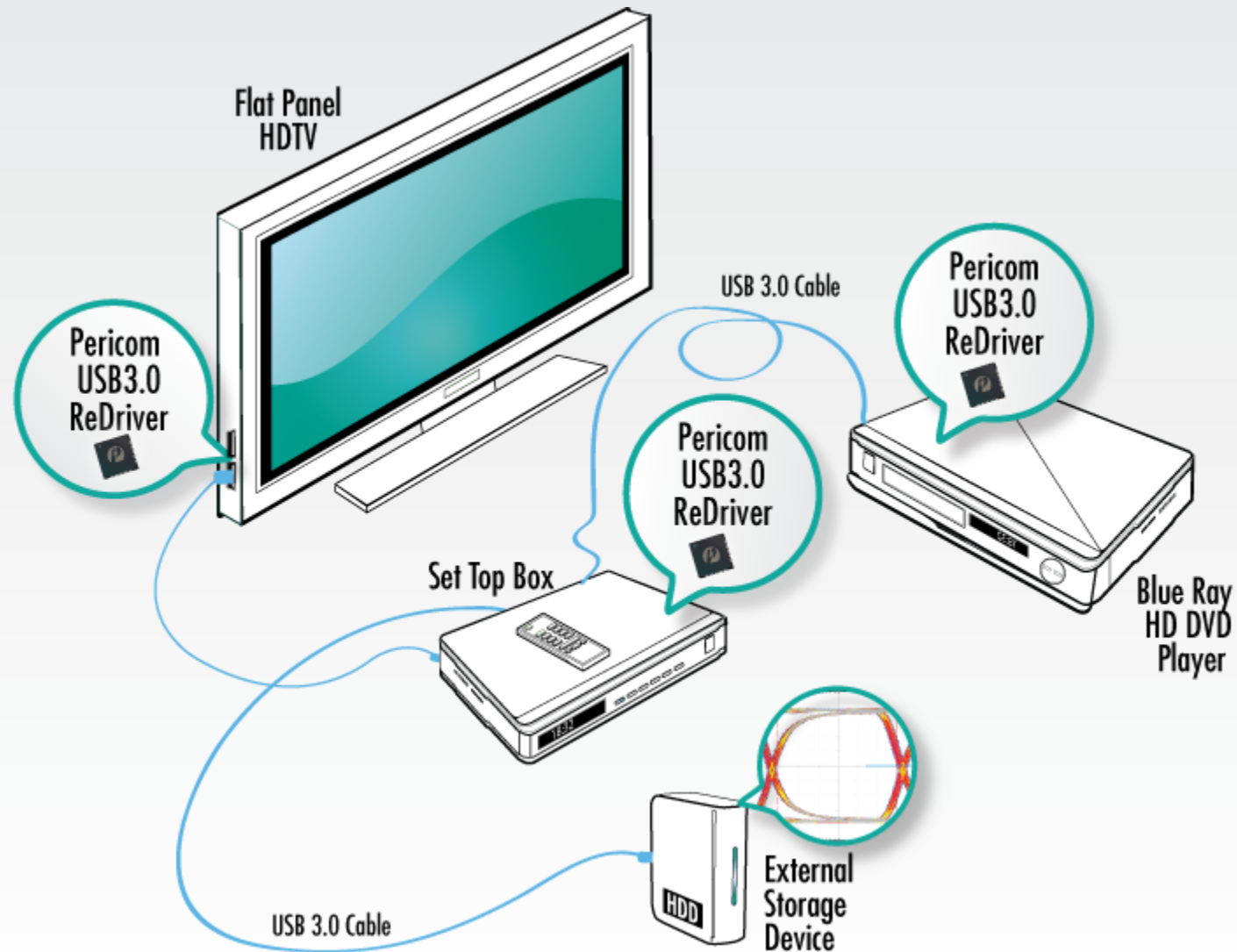
Pericom USB3.0 ReDriver on Smart Handheld Device



Pericom USB3.0 ReDriver on Server Blade or WS



Pericom USB3.0 ReDriver on HD Set-Top Box



Pericom's Automotive Solutions

Pericom's Products: Infotainment Center

Packet Switch

PI7C9X2G303EL

HDMI Switch

PI3HDMI336

HDMI Splitter

PI3HDMI412AD

HDMI ReDriver

PI3HDMI511

PCIe to USB 2.0 Swidge

PI7C9X442SLB

Switch

PI5USB266/66

PI3PD22920/19

PI6PD2065

PI6PD2069

PI6PD2051B

Timing

FL, FK, JX322

KX321/251

PI6C557-03ALE

PI6C557-05LE

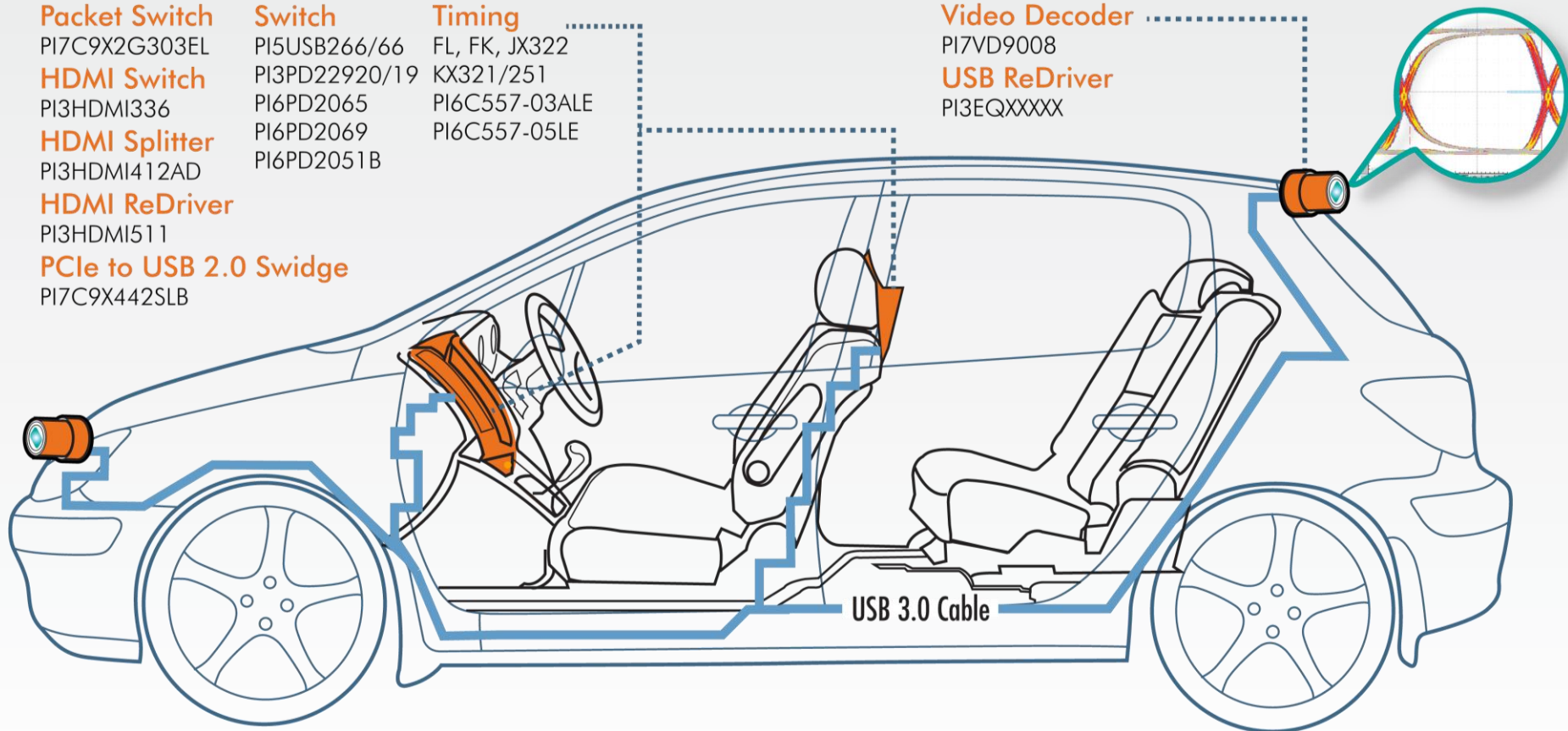
Pericom's Products: Surveillance Camera

Video Decoder

PI7VD9008

USB ReDriver

PI3EQXXXXX





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32.768 KHz Xtal Oscillator

Latest News: Pericom to Attend IDF SF Sept 9 2-014 — Sep 9, 2014

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Crystals and Crystal Oscillators
Home Appliance
Interface Logic
PCIe Switch
PCIe / PCI Bridges
Power Management IC
ReDriver / Repeater / Signal Conditioners
Signal Switch IC / Multiplexers
UART
Video Decoder
Part Cross Reference

Protocols

Bluetooth / WiFi
DDR Technology
Ethernet
Fibre Channel
InfiniBand
LVDS
PCI and PCIe Technology
SATA / SAS Technology
USB Technology
Video Technology
XAUI
SRIO

Applications

Automotive
Computer and Peripheral
Digital Media
Embedded
Networking and Telecom
Server and Storage
Ultra Mobility & Wireless
Application Notes

Product Demos



Pericom Video Switch / ReDriver


Switch between DisplayPort and HDMI port using a single video switch



ReDriver™

Restore signal quality with our USB 3.0 ReDriver

Market Segments



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Applications

Pericom is committed to providing innovative product solutions to meet your application needs. We deliver the expertise vital to today's designs for major markets such as consumer, communications, computing, core storage, connectivity and display technologies. Pericom supplies essential solutions for the timing, switching, bridging and conditioning of high-speed signals required by today's ever-increasing speed and bandwidth demanding applications like computers, digital video, embedded systems, networking, telecom, server, storage, ultra mobility and wireless technologies.




See Pericom's PC & Notebook Segment Solutions




Automotive

Today, semiconductors are an integral part of modern automobiles. A typical car may have up to 100 electronic control units (ECU) embedded in to its many systems, which include its engine, transmission, to its active safety system all the way to its in-car passenger comfort and infotainment system. Pericom has designed a wide range of products that can be integrated in to any and all of these systems, from timing devices to USB controllers. [More »](#)



Computer and Peripheral


Pericom products are found in nearly every Notebook in the world. Our broad selections of high-speed next-generation devices are excellent match for this rapidly growing market. These solutions are essential in managing signal integrity and system efficiency through , timing, and routing within the desktop PC, notebook PC, docking station, and various peripherals. [More »](#)



Digital Media

Digital Media standards such as DVI (Digital Video Interface), HDMI (High definition multimedia interface), and DP (DisplayPort).

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The background of the slide is an abstract image with a dark blue and black color scheme. It features several glowing, curved lines that suggest motion or data flow. In the center, there are several small, rectangular electronic components, possibly microchips or connectors, which are illuminated with a bright yellow light. The overall effect is one of high-tech and dynamic energy.

The End

Thank You