



# XTX™ Embedded Modules



# Not a new Standard

- XTX™ is an expansion and continuation of the well-established and highly successful ETX® standard.
- 100% backwards-compatible to ETX® (when not using the ISA bus)
- XTX™ - open industrial standard  
Use of logo and name is free for members  
Membership is free of charge
- Supported by many leading companies

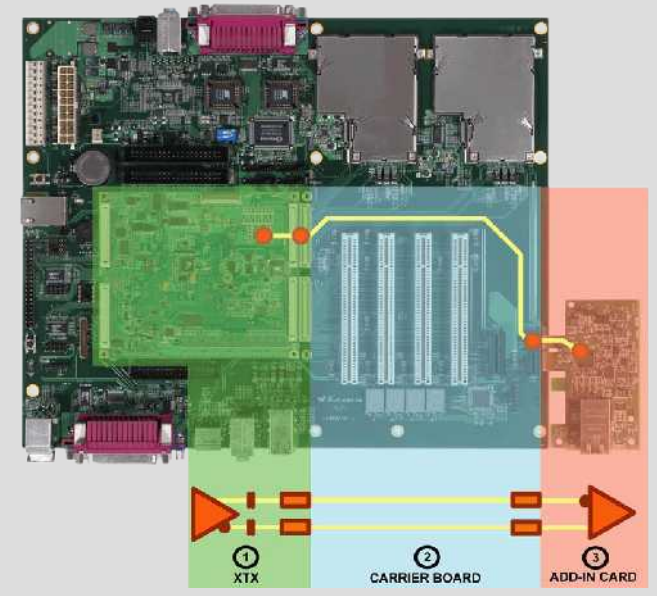


# Facelift for ETX<sup>®</sup>

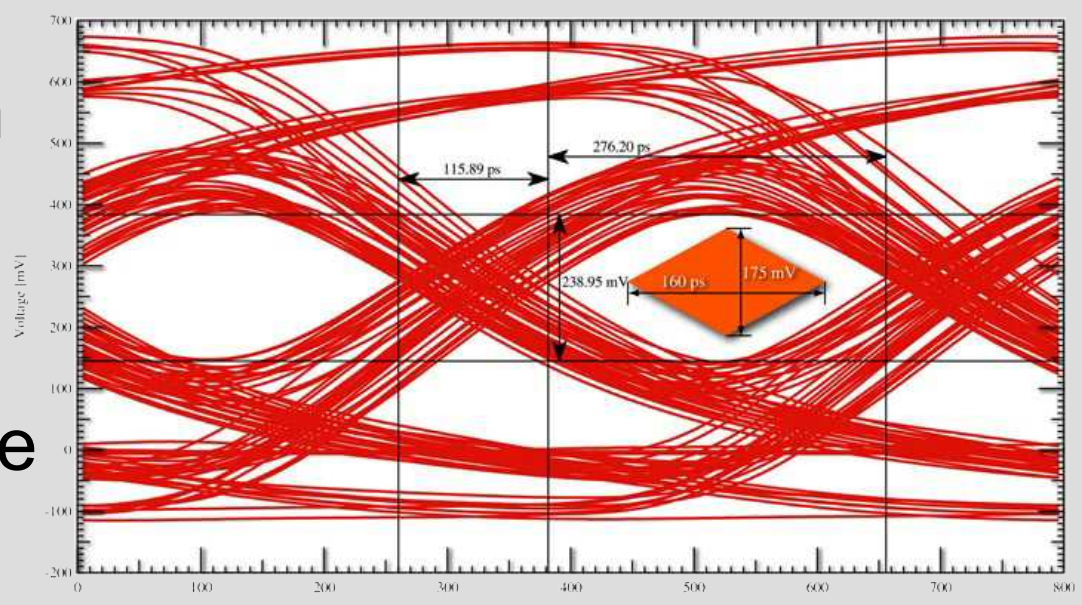
- XTX<sup>™</sup> offers the newest I/O technologies on a proven form factor
- High speed buses such as PCI Express and Serial-ATA are replacing the ISA bus at the ETX<sup>®</sup> connector X2
- Serialized ISA bus (LPC) is available for slow speed extensions
- All other signals found on connectors X1, X3 and X4 will remain the same in accordance to the ETX<sup>®</sup> standard (Rev. 2.7)

# Simulation of PCI Express

- High speed analog simulation
  - Complete PCI Express signal path
    - XTX CPU module
    - Hirose connector
    - Carrier board
    - Add-in card



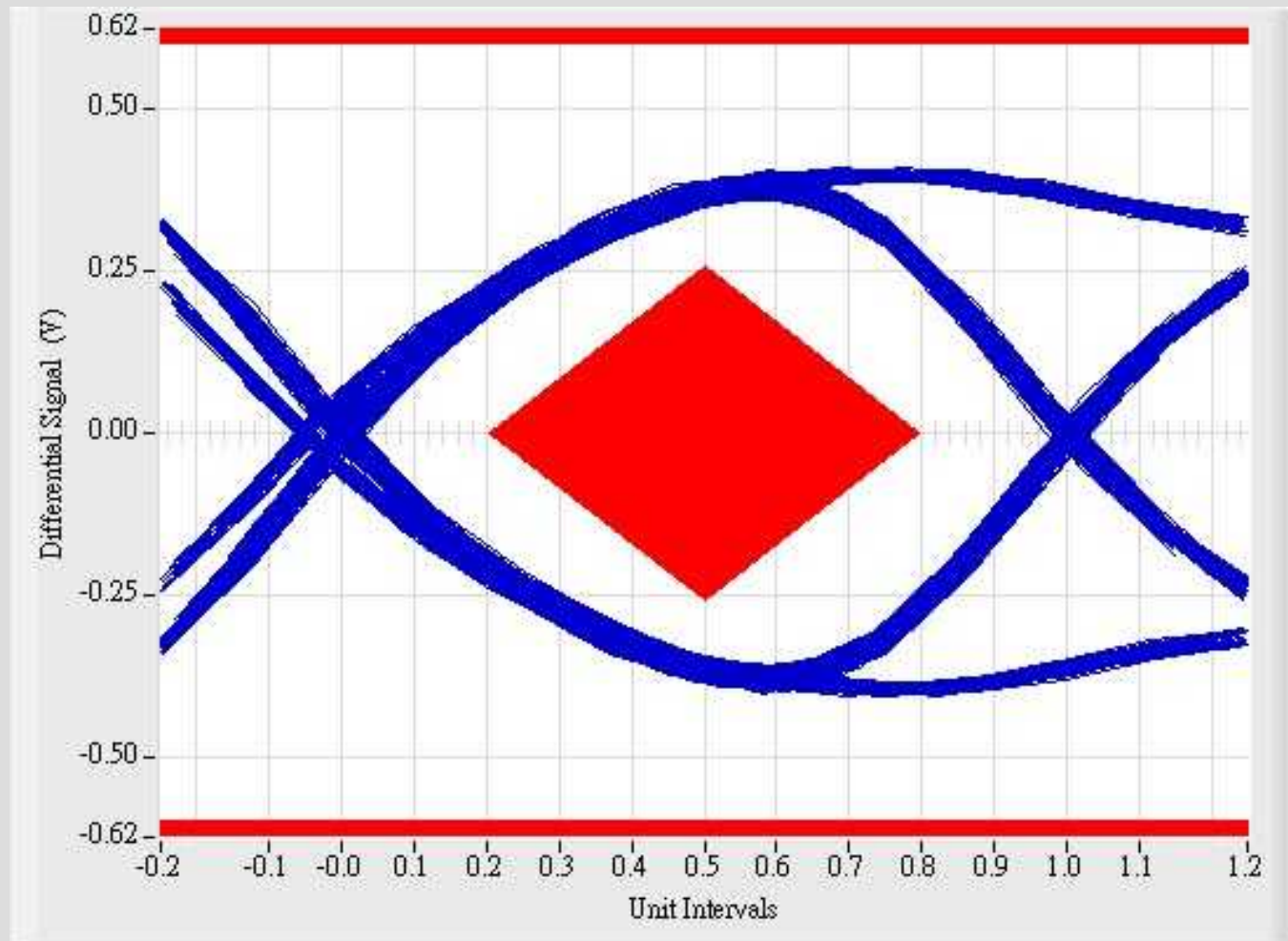
- Result
  - Large signal headroom even in worst case conditions
  - Successful verification of the XTX design guide



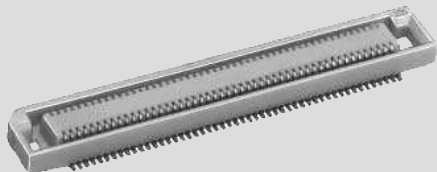


# PCI Express Measurement

- Simulation is verified by the PCI Express Compliance Test



## ETX<sup>®</sup>-X1, X3 and X4 connector

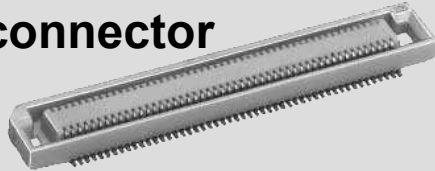


- Signals on connectors X1, X3, and X4 will remain the same in accordance to the ETX<sup>®</sup> Specification (Rev. 2.7)
  - X1: PCI, USB, Sound
  - X3: VGA, LCD, TV, COM/IrDA, LPT/Floppy, Mouse/Keyb.
  - X4: IDE, LAN, I<sup>2</sup>C, miscellaneous



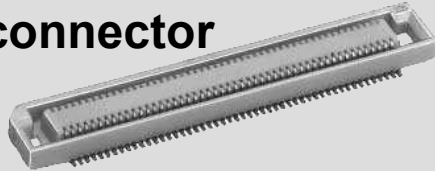
# Features

ETX<sup>®</sup>-X2  
connector



- 4 PCI Express<sup>™</sup> Lanes
  - Increased Performance & Bandwidth
    - 500 MB/s per lane (theoretical bandwidth of PCI Bus: 133MB/s)
    - Scalable bus widths: x1, x2 and x4
  - Pin reduction by Serial Differential Interface (LVDS)
  - Advanced Power Management to reduce power consumption and emission
  - Hot Plug/Hot Swap capability
  - Point-to-point serial interconnections between devices
  - 100% compatible with PCI Software

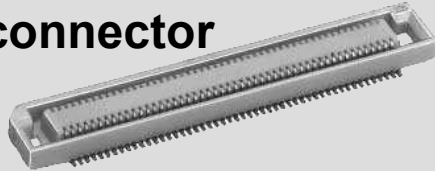
ETX<sup>®</sup>-X2  
connector



- 4 Serial ATA<sup>®</sup> Interfaces

- SATA is a high-speed serial link replacement for PATA
  - 150 MB/s transfer rate (300/600 MB/s envisioned for the future)
- Lower signaling voltages and reduced pin count (LVDS)
- 4 SATA Hard disks can be used on XTX
- Point-to-Point connection allows easy cable routing within a system
- Hot Plug capable
- Completely software compatible with parallel ATA

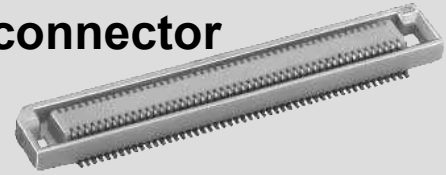
ETX<sup>®</sup>-X2  
connector



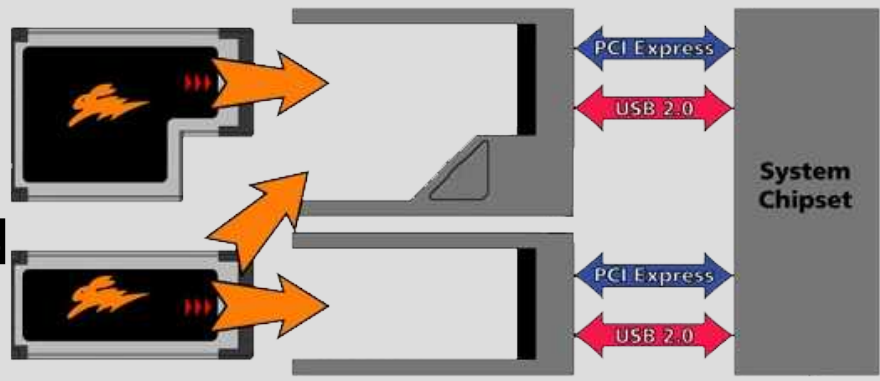
- 2 Hi-Speed USB ports
  - In addition to the standard 4 USB ports, XTX<sup>™</sup> will also offer 2 more USB ports bringing you a total number of 6 USB ports for your embedded designs.
  - Data transmission up to 480 Mb/s (60 MByte/s)

# Features

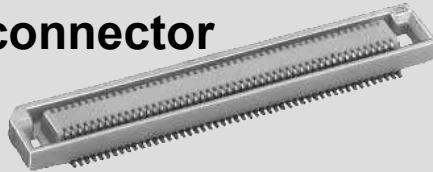
ETX<sup>®</sup>-X2  
connector



- Support for 2 ExpressCards™
  - ExpressCard next generation of 'plug-in' I/O cards
  - ExpressCard takes advantage of the scalable, high-bandwidth serial PCI Express and USB 2.0 interfaces
  - Smaller, faster and less expensive than PC Card Solution
  - Lower System Complexity
    - less signal lines
    - no additional controller required



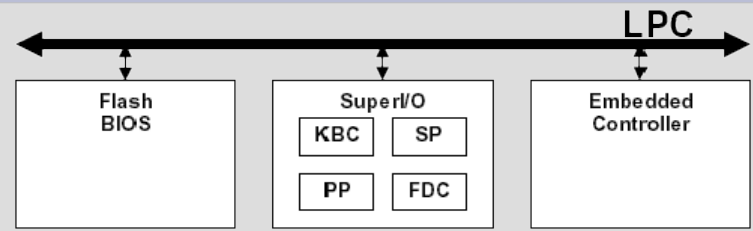
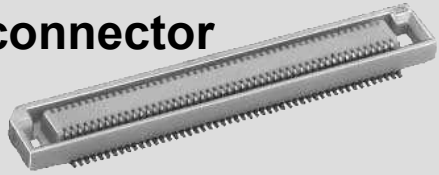
ETX<sup>®</sup>-X2  
connector



- High Definition Audio Interface (HDA)
  - High Definition Audio Codec for:
    - Dolby-quality surround sound (5.1 / 6.1 / 7.1)
    - DVD Audio
    - Telephony (VoIP), Audio Conferencing
    - Enhanced voice capture (higher-quality input for voice recognition)
    - Multi-streaming capabilities (play audio tracks on CD and DVD simultaneously)
    - Dynamic jack configuration
- Backwards compatible to AC'97

# Features

ETX<sup>®</sup>-X2  
connector

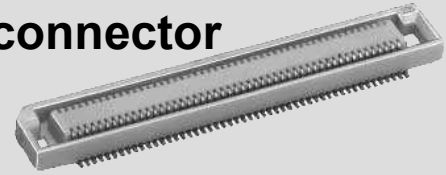


- Low Pin Count Bus (LPC)
  - Serial Bus as replacement for the soon to be obsolete ISA bus
  - Reduced pin count for easier, cost-effective designs (7 signal lines)
  - Examples of devices that can be connected:
    - Super I/O (Floppy, COM, LPT, ...)
    - Audio controller
    - Generic Application Memory
    - Embedded Controller



# Features

ETX<sup>®</sup>-X2  
connector

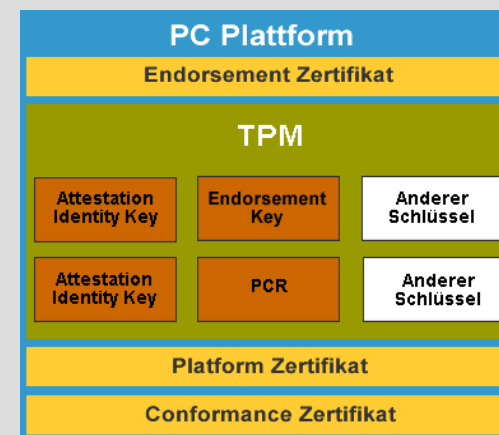


ACPI

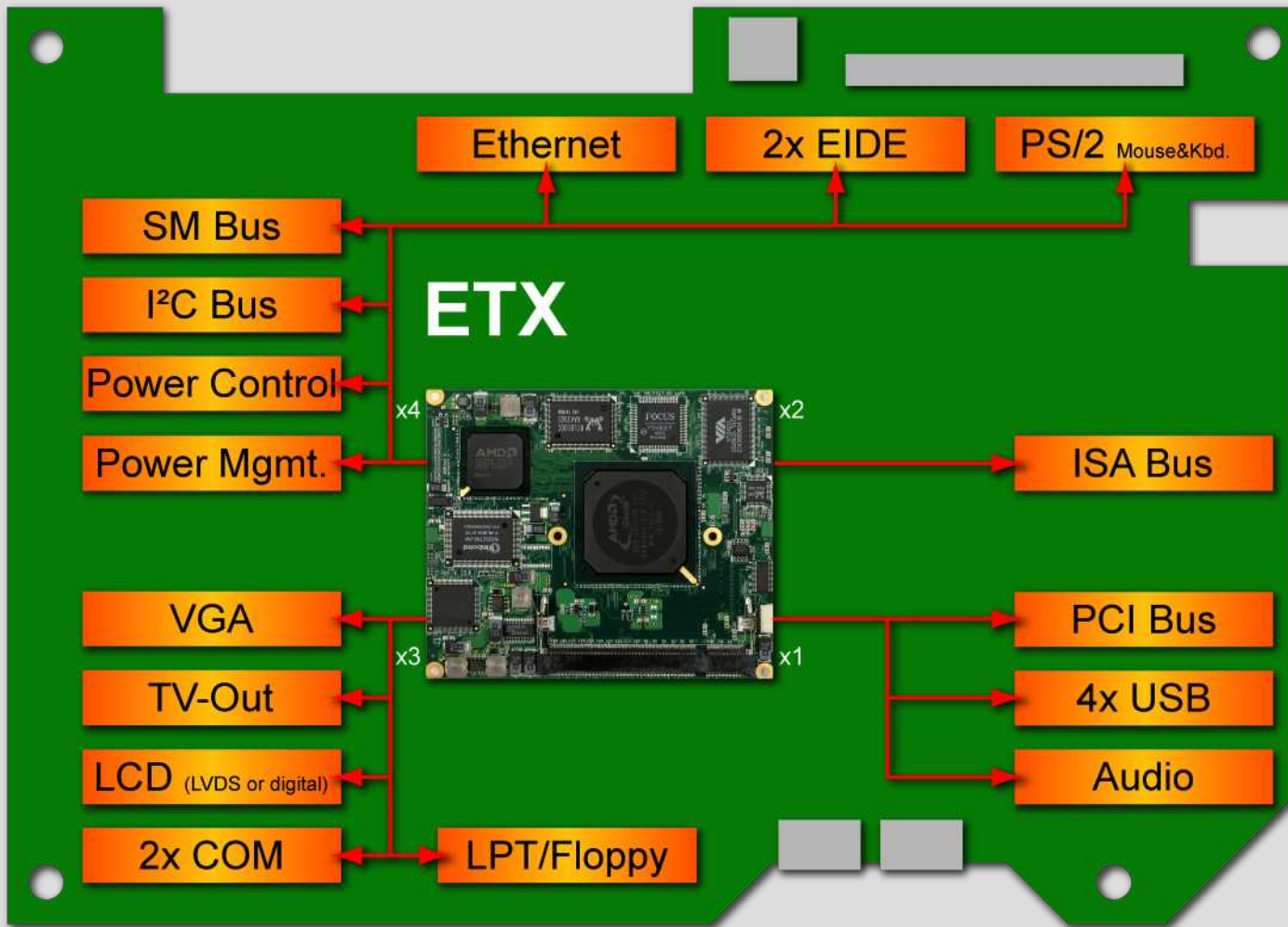


- Extended Power Management
  - Fan control via PWM Output and Encoder Input signal
  - Additional Power Management signals for efficient low power designs
  - The standby power driven congatec Board Controller allows system control in soft-off mode

- Trusted Platform Module (TPM) Support
  - Trusted Computing Group (TCG) Specification 2.1
  - TPM hardware on the XTX modules
    - Stores keys, digital certificates, passwords and data securely in hardware
    - Enhances network security
    - Protection against viruses, worms and other malicious attacks
    - Protects digital identities
    - Enables digital signatures for financial and other transactions

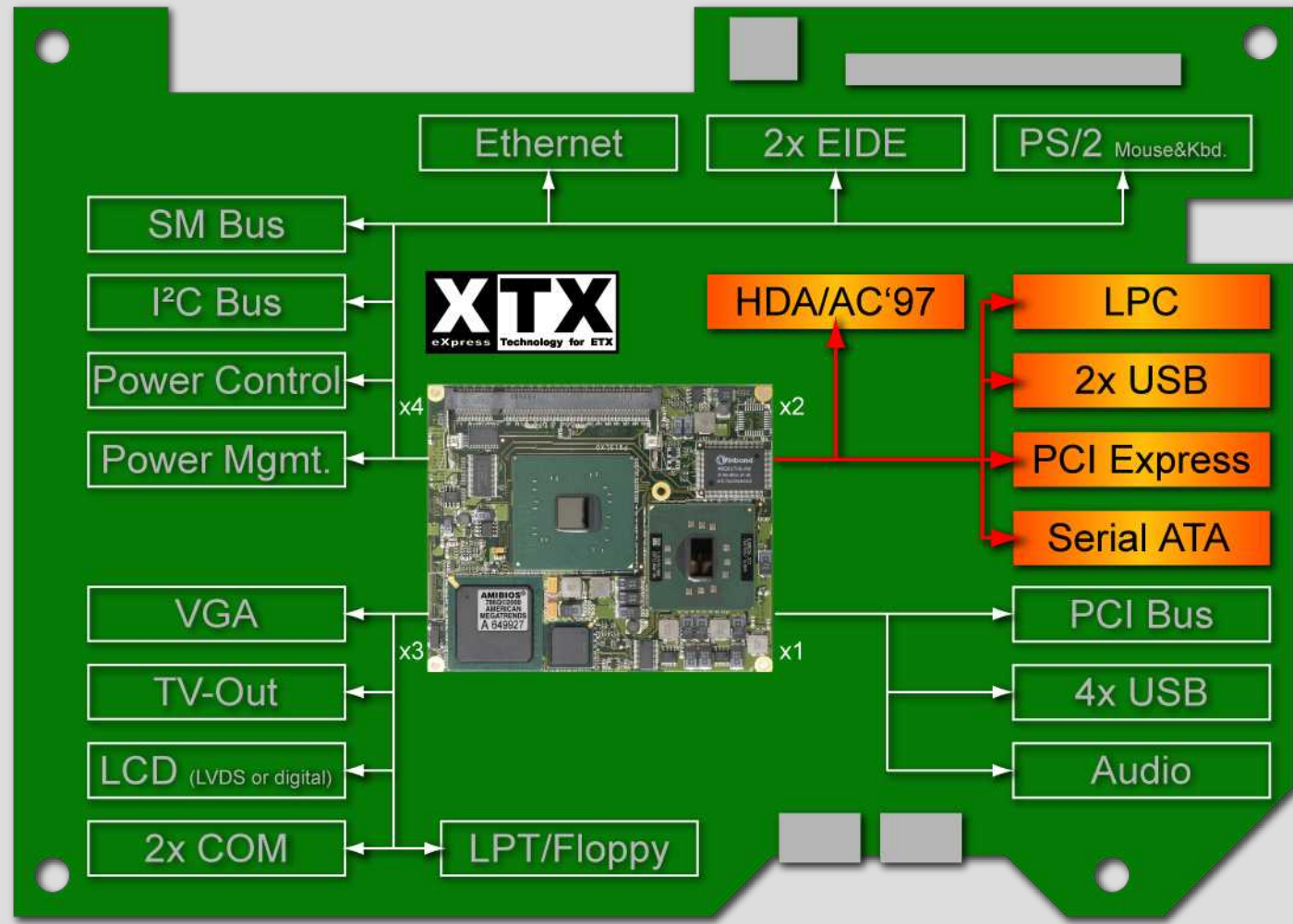


- ETX<sup>®</sup> Baseboard



# Upgrade

- XTX is 100% backward compatible to ETX<sup>®</sup>  
(for all designs that are not using the ISA bus)



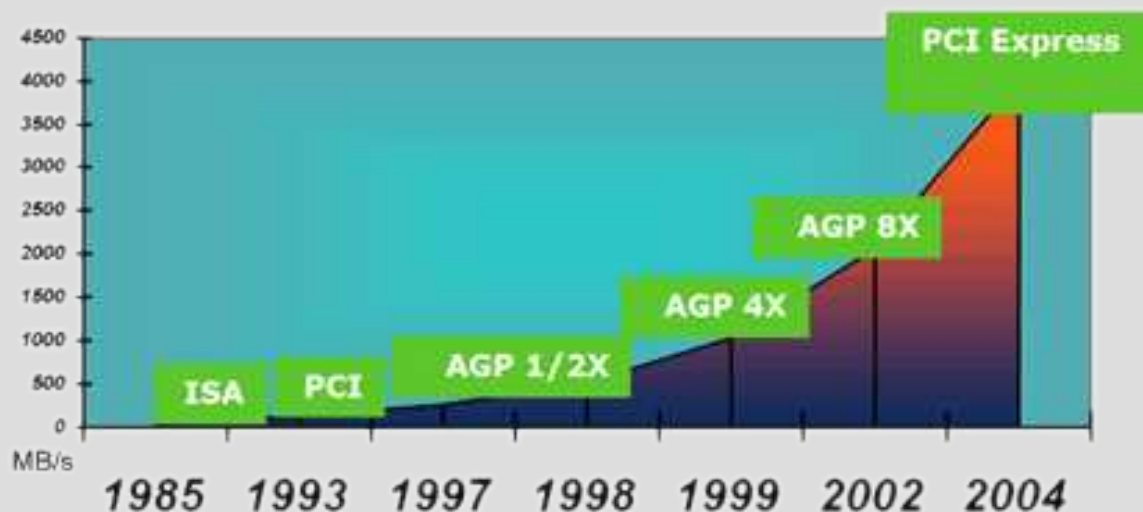
- Most baseboards will not need to be redesigned



# Increased Performance

- **ISA / PCI / AGP / PCI Express**

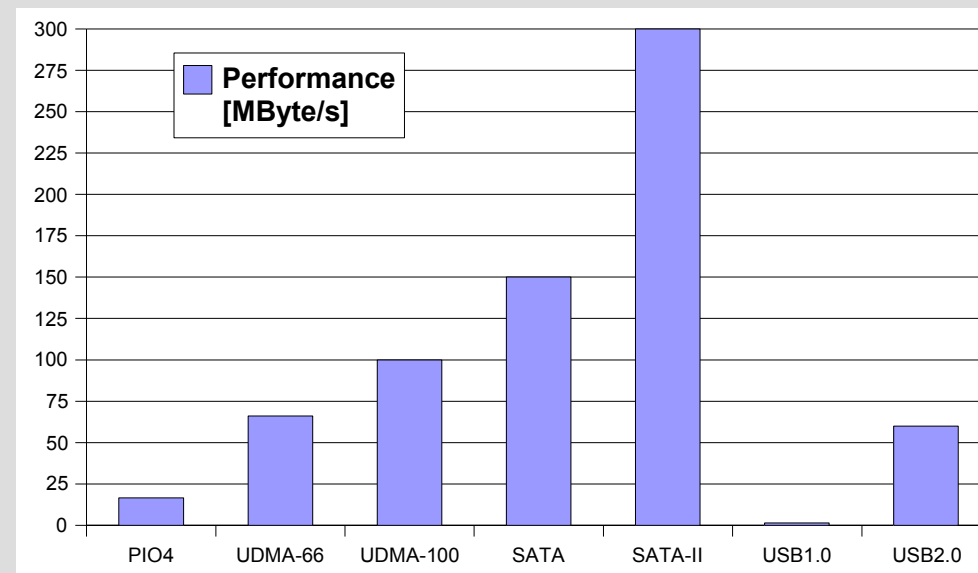
- ISA: 8 MByte/s
- PCI: 132 MByte/s
- AGP x1: 266 MByte/s
- AGP x8: 2,1 GByte/s



- PCI Express x1: 500 MByte/s (bidirectional)
- PCI Express x4: 2 GByte/s (bidirectional)
- PCI Express x16: 4 GByte/s (bidirectional)

## • EIDE / SATA / USB

- EIDE
  - PIO Mode 4: 16,6 MByte/s
  - UDMA-66: 66 MByte/s
  - UDMA-100: 100 MByte/s
- SATA
  - SATA: 150 MByte/s
  - SATA-II : 300 MByte/s
- USB
  - Specification 1.0: 1,5 MByte/s
  - Specification 2.0: 60 MByte/s





# Consortium

- XTX also supported by:





# Conclusion

- XTX – increases the life cycle of ETX<sup>®</sup>
- XTX – open industrial standard
- Companies are welcome to join the XTX Consortium



Thank You

