


# Tundra System Interconnect







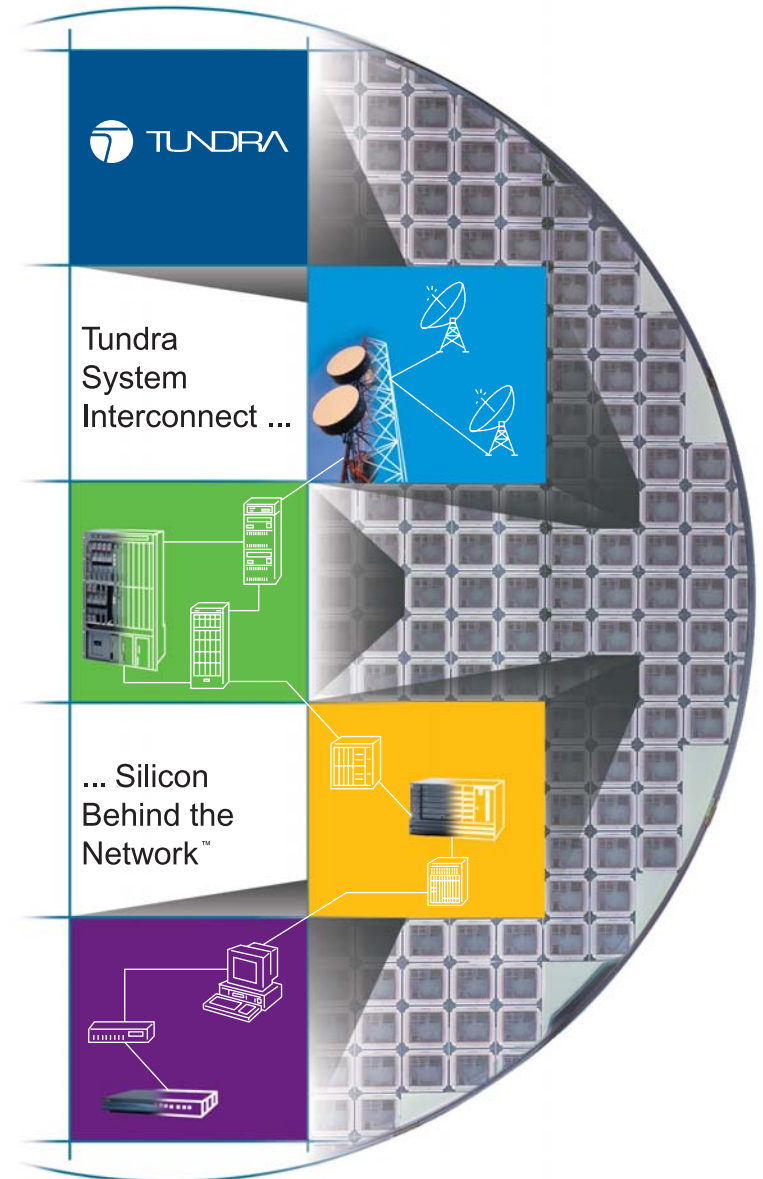
**Tundra Semiconductor Corporation (Tundra) (TSX: TUN)**  
is the leader in System Interconnect,  
an integral enabling technology  
that addresses a complex challenge  
faced by designers of communications  
infrastructure equipment and storage systems:  
how to effectively interconnect critical system  
components without sacrificing product performance,  
stretching product development schedules  
or eroding product margins.

**Tundra designs and delivers high-impact semiconductor products that enable innovative architectures in communications infrastructure and storage systems.**

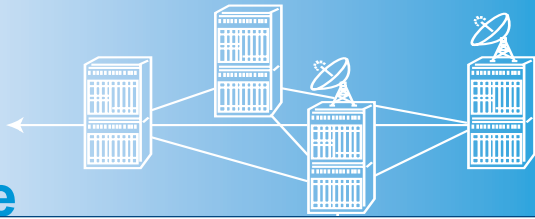
The ever-growing demand for bandwidth from Internet and network users means communications infrastructure equipment suppliers are under enormous pressure to get to market faster with increasingly sophisticated and scalable products. This has created the need for a class of System Interconnect products that can connect critical system components without sacrificing product performance, extending product development schedules or eroding product margins.

Tundra helps address these demands with Tundra System Interconnect products that eliminate internal system bottlenecks in networking equipment. Communications infrastructure and storage vendors rely on Tundra for off-the-shelf, standards-based, easy-to-deploy, and highly reliable System Interconnect.

**Tundra System Interconnect ...  
... Silicon Behind the Network™**



**Core**  
switching equipment



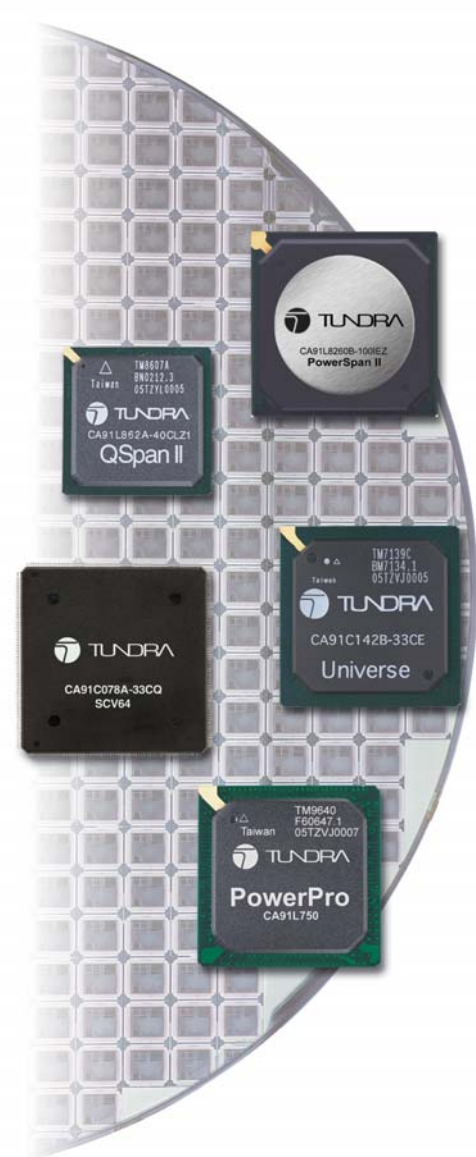
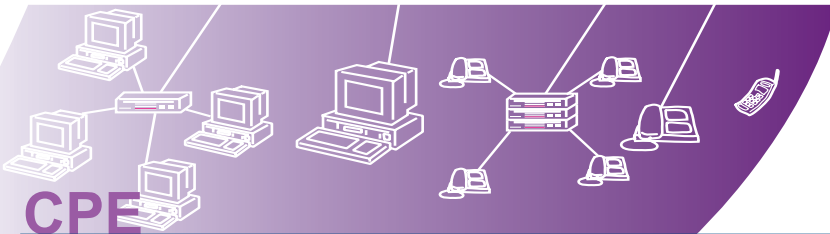
**Edge**  
switching equipment



**Access**  
transmission and access equipment



**CPE**  
customer premise equipment



**PCI-X and RapidIO: Tundra is at the forefront of defining new interconnect standards that address the demand for high performance, scalable equipment architectures.**

**Tundra provides semiconductor products that enable equipment designers to fully leverage the benefits of these new standards.**

## PCI-X

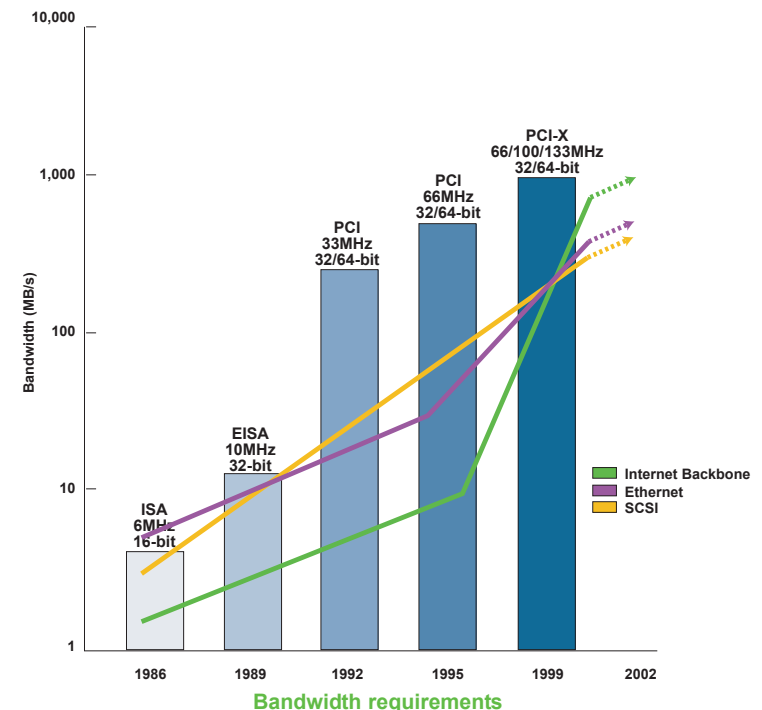
PCI-X is a high-speed mode of operation for PCI, a chip-level interface used to connect two or more I/O devices. PCI-X is compatible with PCI, ensuring evolution from older systems and option cards. The standard overcomes the I/O bottleneck that limits processing speed between a CPU and its peripherals. Through a more efficient protocol, PCI-X can support more than one Gbyte/second of sustainable I/O bandwidth at 64-bits and 133 MHz. This doubles the throughput of current 66 MHz, 64-bit buses.

As part of our ongoing commitment to provide next-generation System Interconnect to the leading communications infrastructure vendors, Tundra is helping to pioneer the new PCI-X interconnect standard.

## Setting the standard for System Interconnect

### Benefits

- Supports bandwidth-intensive applications that require operating bus speeds of up to 133 MHz, and one Gbyte per second transactions
- Backwards compatibility with PCI standard ensures PCI-based applications are fully supported
- Evolutionary I/O technology that increases system performance through greater throughput and efficiency
- Simplifies design
- Increases the fault isolation of the PCI bus
- Offers both added performance and flexibility, minimizing the trade-off between PCI slots and bus speed





## RapidIO

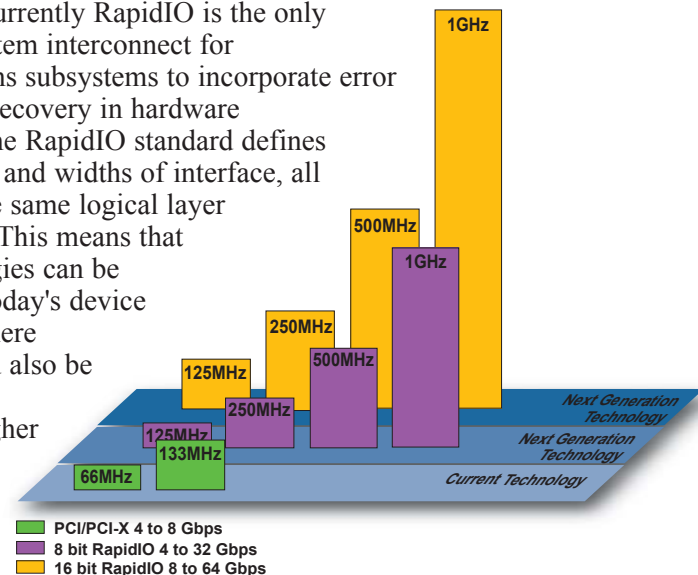
RapidIO is a new data communications standard for connecting chips on a circuit board, and for connecting circuit boards across a backplane. It is a high-performance, packet-switched, system interconnect architecture, primarily targeted at the networking industry. The interconnect architecture is an open standard which addresses the needs of embedded systems, primarily for the networking and communications markets.

The RapidIO architecture is designed to provide higher bandwidth, greater reliability, and faster time-to-market than other computer-based bus protocols. Compatible with network processors, communications processors, and digital signal processors, RapidIO offers software transparency and speeds in excess of 10 Gbits per second.

Tundra, along with other industry leaders in networking, communications, semiconductors, and embedded systems, founded the RapidIO Trade Association to develop and support the open standard. Tundra is an active member on the technical and marketing working groups. For more information on the RapidIO Trade Association and the RapidIO interconnect standard, please visit: [www.rapidio.org](http://www.rapidio.org)

## Benefits

- **Performance** - has low overhead and low latency: optimized as an "inside the box", device-level interface. Unlike other packetized system interconnect standards, RapidIO allows peer-peer transactions without the intervention of a host, providing the highest possible concurrency in intelligent I/O subsystems.
- **Functionality** - packet-switched, point-to-point interconnect to effectively connect host CPU's, network processors, memory, DSP's and I/O devices
- **Cost** - Because RapidIO is a memory-mapped I/O standard, there is no requirement to support a complex protocol stack as with other interconnect schemes, dramatically reducing the software development costs associated with migrating PCI based topologies to RapidIO. Also, I/O modules are readily available from FPGA and ASIC vendors, enabling custom parts to be developed quickly and effectively
- **Compatibility** - is software transparent; an extension of the microprocessor bus; allows direct, physical memory mapping of the entire machine
- **Reliability** - currently RapidIO is the only packetized system interconnect for communications subsystems to incorporate error detection and recovery in hardware
- **Scalability** - the RapidIO standard defines various speeds and widths of interface, all working on the same logical layer specification. This means that system topologies can be optimized to today's device capabilities where applicable, and also be positioned for tomorrow's higher performance requirements where appropriate



RapidIO Performance diagram

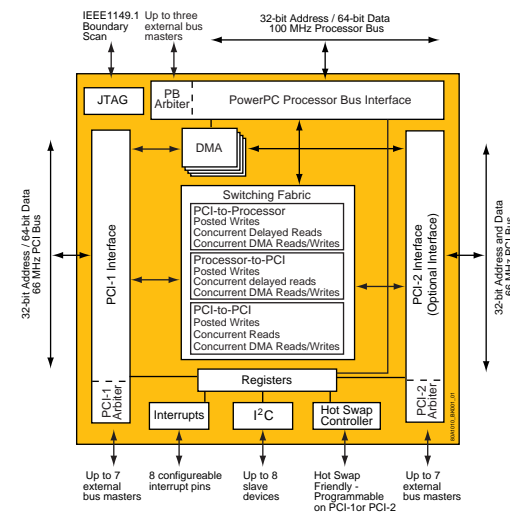
# PowerSpan™ II: Proven Multi-Port PCI Bus Switch for Motorola PowerQUICC™ II and PowerPC™ Processors

**A revolutionary approach to improving communications system performance.** PowerSpan II provides an advanced switching fabric technology, Switched PCI, to interconnect Motorola processors such as the PowerQUICC II (MPC8260) to multiple PCI-bus segments. This switching fabric architecture offers significant benefits over conventional PCI bridge products, including minimizing transfer serialization and improving the burst performance and efficiency on the PCI and processor buses. These are key elements of I/O processor performance. Other PowerSpan II features include integrated PCI-to-PCI bus bridging, concurrent prefetch read capability, and multi-port Direct Memory Access (DMA) operation. PowerSpan II is available in Single or Dual PCI variants, which are up to 50 per cent smaller than the original PowerSpan. PowerSpan II comes with comprehensive Design Support Tools (DST) that provide designers with real-world software and hardware development environments, allowing them to solve design challenges and get to market quicker. As a result, PowerSpan II is the ideal choice as a proven, low-risk multi-port PCI Bus Switch for Motorola's portfolio set of PowerQUICC II processors.

## Significantly improves system performance

### Benefits

- Smaller packages reduce board area required for system design
- Flexible PCI interfaces enable PowerSpan II to meet many different application requirements
- Integrated, non-transparent PCI-to-PCI bridge connects traffic between the two PCI interfaces. This decreases individual component count and simplifies conventional CompactPCI board architecture
- Supports reads from multiple I/O devices in parallel, non-blocking streams which decreases bus latency
- Integrated PCI bus, processor bus arbiters decrease individual component count on boards
- The Tundra PowerQUICC II and PowerPC™ architecture expertise is passed to customers with the Design Support Tools
- Detailed design documentation including device manuals and application notes



PowerSpan II block diagram



## Features

### Packaging

- Single PCI PowerSpan II
  - 64-bit/66 MHz
  - 420 HSBGA: 1.27 mm ball pitch, 35 mm body size
  - 484 PBGA: 1.0 mm ball pitch, 23 mm body size
- Dual PCI PowerSpan II
  - 32-bit/66 MHz and 64-bit/66 MHz
  - 480 HSBGA: 1.27 mm ball pitch, 37.5 mm body size
  - 504 HSBGA: 1.0 mm ball pitch, 27 mm body size

### Processor Support

- Direct connect interface for MPC8260, PowerPC 7400, 740, 750 and Wintegra WinPath™
- Up to 100 MHz bus frequency
- Programmable endian conversion
- MPC8260 Configuration Slave support for power-up options
- Eight programmable memory maps to PCI from the processor bus
- Processor bus arbiter with support for three requesters

### PCI Support

- Integrated, non-transparent PCI-to-PCI bridge in the Dual PCI PowerSpan II
- PCI arbiters on each PCI interface
- CompactPCI Hot Swap Friendly Support
- I<sub>2</sub>O messaging unit

## Design Support Tools

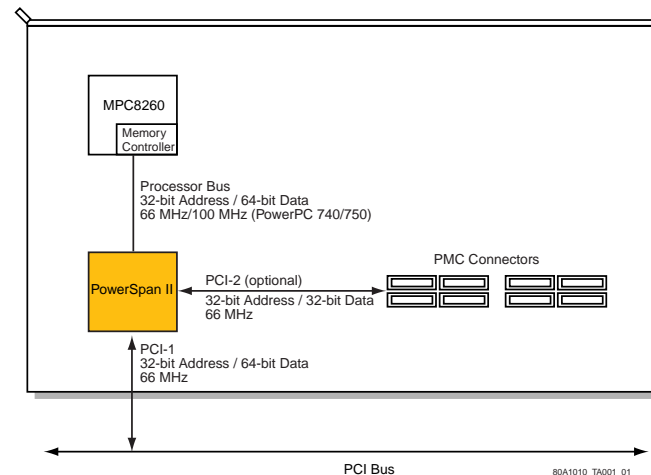
Our extensive suite of Design Support Tools (DST) consists of hardware and software development tools that are available on our website and the DST CD-ROM. The Reference Design Kit (RDKit) is an ideal platform for your software and hardware development and debug needs.

## Applications

- ADSL Concentrators
- VoIP Gateways
- Ethernet Switches
- Virtual Private Network (VPN) Equipment
- MPEG 2 Encoders
- Exchange Carrier Switching Equipment



NEW!



PowerSpan II application diagram

# PowerPro™: The Industry's Most Flexible, Low Latency Discrete PowerPC™ Memory Controller

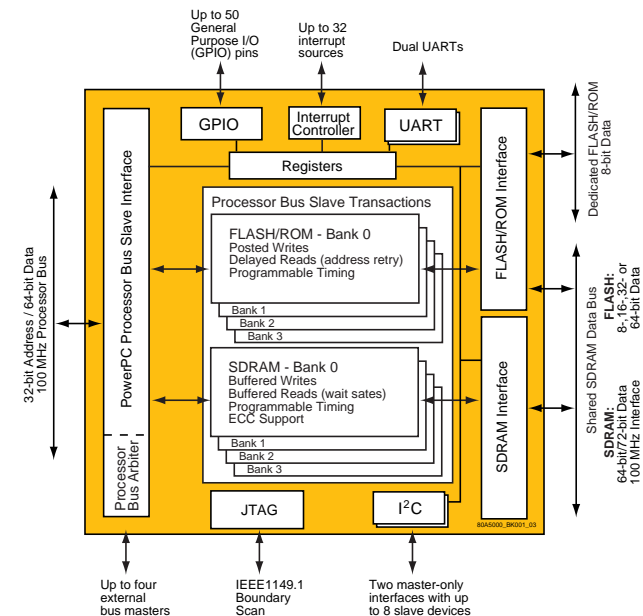
## PowerPro provides support for a wide array of PowerPC processors.

PowerPro delivers memory control support for the PowerPC 750 and 7400 processors. PowerPro provides the flexibility of a PCI-independent memory controller to a wide array of PowerPC applications. In PowerPC 750/MPC8260 designs, PowerPro enables ECC memory protection, which is not otherwise available from the MPC8260's memory controller in this application. PowerPro provides and supports PC-100 SDRAM control, ECC protection, 8/16/32/64-bit Flash, and other local peripheral devices such as UARTs. The device comes with a comprehensive Design Support Tools (DST) suite that lets designers test it in their specific working environment and design supporting software quickly and easily.

## Low latency memory access

### Benefits

- The first discrete, off-the-shelf memory controller for PowerPC processors
- Increases throughput with memory system optimization
- Provides industry's most flexible page management scheme
- Supports many peripherals, such as UARTs, timers and interrupt controllers



PowerPro block diagram

## Features

### Packaging

- 376 PBGA, 1 mm ball pitch package

### Processor Support

- Direct connect with MPC8260 and PowerPC 740/750/7400
- 64-bit /100 MHz
- Address and data parity
- PowerPC bus arbiter

### SDRAM Interface

- PC-100 compliant
- Optional ECC protection
- Direct control of data latching
- 64-bit data bus - 72-bit with ECC
- 32 MBytes to 4 GBytes of SDRAM
- Read Ahead buffer
- Flexible page management - independently controls up to 32 pages.

### Integrated Features

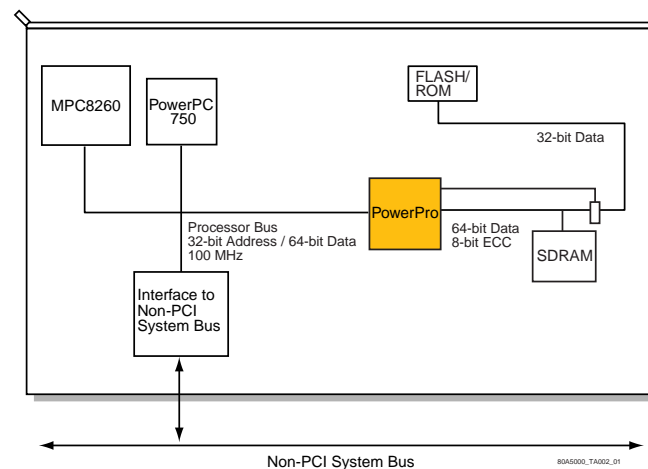
- 50-bit General Purpose I/O port
- Dual Universal Asynchronous Receiver Transmitter (DUART)
- Interrupt Controller
- I<sup>2</sup>C Interface

## Design Support Tools

Our extensive suite of Design Support Tools (DST) consists of hardware and software development tools that are available on our website and the DST CD-ROM.

## Applications

- ADSL concentrators
- Wireless base stations
- VoIP gateways
- Ethernet switches
- Virtual Private Network (VPN) equipment
- Optical Networking Equipment
- Exchange carrier switching equipment



PowerPro application diagram

## QSpan™ II: Proven PowerQUICC™ -to-PCI System Interconnect Device

QSpan II provides the most cost-effective, high performing PCI interface in the smallest footprint on the market (17 mm x 17 mm).

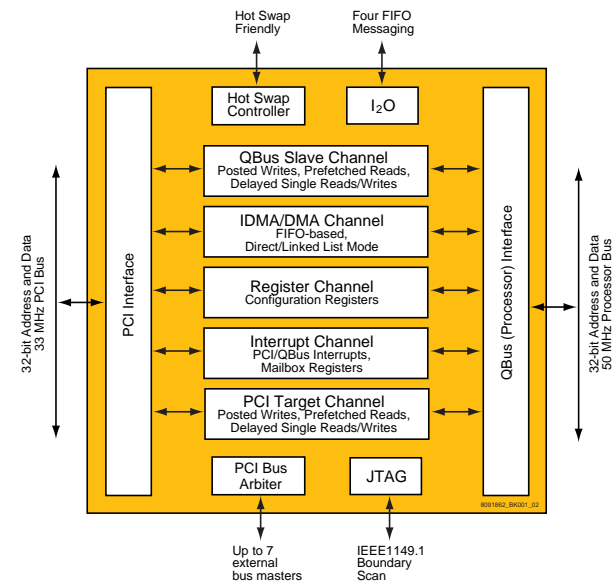
QSpan II is the industry-proven leader in bridging Motorola's range of communications processors to standard PCI buses in the latest communications systems. QSpan II is a direct-connect PCI bridge for the Motorola PowerQUICC™ (MPC8xx), and QUICC™ (MC68360), and processors.

The QSpan II contains an integrated PCI Bus Arbiter which allows designers to save board real estate and cost. As a result, QSpan II is the ideal choice as a proven, low latency device that brings PCI-based products to market faster and at less cost. The device comes with a comprehensive Design Support Tools (DST) suite that lets designers test it in their specific working environment and design supporting software quickly and easily.

## Redefining board architecture

### Benefits

- The QSpan II advanced features, including integrated PCI Arbiter, and the industry's first and smallest package- almost 50 per cent smaller than the original QSpan and our competitors - enable designers to develop lower cost, sophisticated systems with increasingly higher channel density
- Industry-proven PCI System Interconnect device
- QSpan II Design Support Tools reduces customer's design hours and time-to-market
- Backwards compatible with QSpan™



QSpan II block diagram

## Features

### Packaging

- Commercial and Industrial variants
- Offered in two 256-pin PBGA packages: a 17 x 17 mm (with a 1.0 mm ball pitch) and a 27 x 27 mm (with a 1.27 mm ball pitch)

### Processor Support

- Direct connect for PowerQUICC (MPC8xx) and QUICC (MC68360) processors
- Supports prefetched reads and burst writes at up to 50 MHz
- Programmable bus parity/master-slave capability

### PCI Support

- Integrated PCI Bus Arbiter
  - Supports up to seven external bus masters
- PCI v2.2 compliant
- CompactPCI Hot Swap Friendly
- Zero wait-state bursts, prefetched reads on PCI
- Serial EEPROM interface for plug and play compatibility
- Universal (3.3V/5V) PCI buffers

### Other

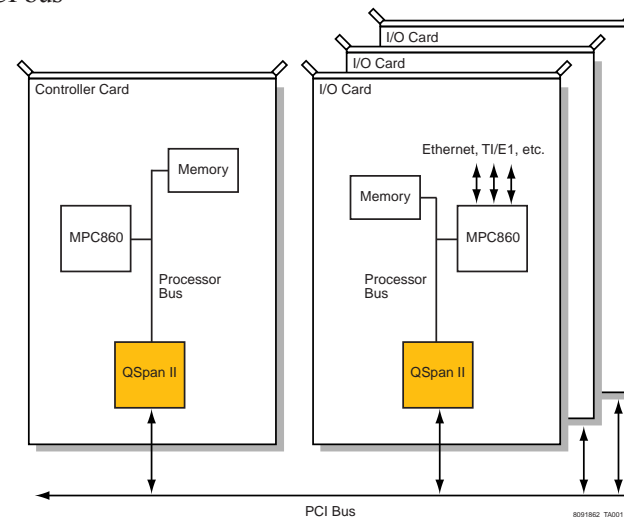
- High performance Direct Memory Access (DMA) engine
  - Direct and Linked-List (Scatter/Gather) mode
  - Independent 256-byte FIFO and Mailbox registers (4)
- Intelligent I/O (I<sub>2</sub>O) messaging
- Comprehensive Design Support Tools

## Design Support Tools

Our extensive suite of Design Support Tools (DST) consists of hardware and software development tools that are available on our website and the DST CD-ROM. The Reference Design Kit (RDKit) is available in two versions - CompactPCI and Desktop PCI.

## Applications

- Network interface cards
- Routers
- Servers
- VoIP Gateways
- Process control equipment
- Data acquisition systems
- Any 68K-based or PowerPC™-based system migrating to the PCI bus



QSpan II application diagram

# Universe II™: The Industry-leading High Performance 64-bit VMEbus-to-PCI Interconnect

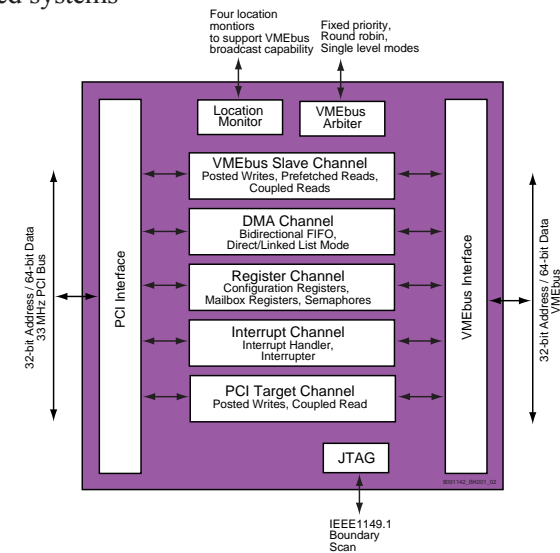
## The interface of choice for the latest generation of PCI-to-VME interconnection.

Universe II supports the latest VME applications with its high performance 64-bit VMEbus interface and fully compliant, 32-bit or 64-bit, PCI bus interface. Its zero-wait state implementation, multi-beat transactions, and support for bus parking ensure high performance on the PCI bus. The device is ideally suited for CPU boards functioning as both master and slave in the VMEbus system, and that require access to PCI systems.

# High performance interface

## Benefits

- Provides high performance on the PCI bus
  - Zero-wait state implementation
  - Multi-beat transactions
  - Supports bus parking
- Features a wide range of VMEbus address and data transfer modes
  - A32/A24/A16 master and slave
  - D64/D32/D16/D08 master and slave
  - MBLT, BLT, ADOH, RMW, LOCK, location monitors
- Supports nine user programmable slave images on VMEbus and PCI bus ports
- Provides seven interrupt lines on either bus and flexible mapping of software and hardware sources of hardware interrupt
- Provides four mailboxes and location monitor for message-oriented systems



Universe II block diagram

## Features

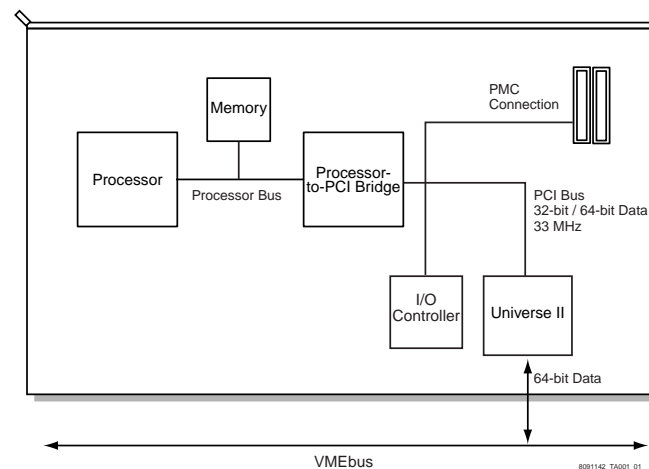
- Industry-proven, high performance 64-bit VMEbus interconnect
- Fully compliant, 32-bit or 64-bit, 33 MHz PCI bus interconnect
- Integral FIFOs for write posting to maximize bandwidth utilization
- Programmable DMA controller with Linked-List mode (Scatter/Gather) support
- Flexible interrupt logic
- Sustained transfer rates up to 60-70 Mbytes/s
- Extensive suite of VMEbus address and data transfer modes
- Automatic initialization for slave-only applications
- Flexible register set, programmable from both the PCI bus and VMEbus ports
- Full VMEbus system controller
- Support for Read Modify Write (RMW), Address Only with Handshake (ADOH), PCI LOCK # cycles, and semaphores
- Commercial, industrial, and extended temperature variants
- IEEE 1149.1 JTAG
- Available in:
  - 25 mm x 25 mm, 361-contact dimpled ceramic Ball Grid Array (DBGA)
  - 35 mm x 35 mm, 313-contact plastic BGA packages

## Design Support Tools

Tundra understands your design challenges and works to help you overcome them. The Universe II is supported by a number of tools that get you to market faster, including IC documentation, IC models, and a VxWorks driver.

## Applications

- Single board computers
- Telecommunications equipment
- Test equipment
- Command and control systems
- Factory automation equipment
- Medical equipment
- Military
- Aerospace



Universe II application diagram

## Bridges



# SCV64™: The High Performance VME64 Bus Bridge

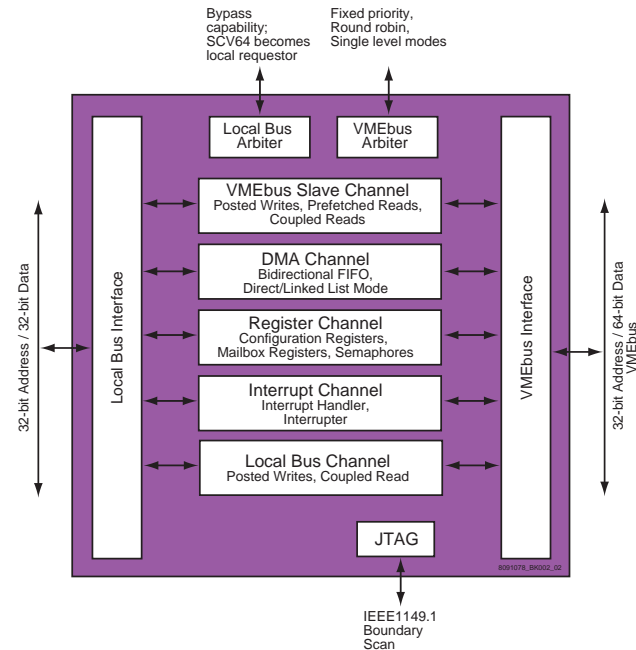
The industry-proven VME64-to-host bus bridge supports the latest generation of VME applications.

SCV64 is a VME64-to-host processor bridge that supports data transfer rates of up to 70 Mbytes per second. SCV64 uses internal FIFOs to decouple data transfers between the VMEbus and local bus to compensate for mismatches in relative bus performance. This allows each bus to operate at its optimal rate, unobstructed by the other. Block transfer capability (both BLT and MBLT), an integral DMA controller, an asynchronous VMEbus interface, and 40 MHz local bus operation ensure that the SCV64 is the choice for designs requiring high-performance interfaces.

# High speed VME64 data path

## Benefits

- Cost-effective, industry-proven VME64-to-host bus bridge
- Supports the latest generation of VME applications



SCV64 block diagram



## Features

- Proven VME64 compliance
- Local bus interface support for a variety of processors:  
Intel 'x86 and 'ix60; Motorola '680x0; and Texas Instruments 'TMS320Cx0.
- Integral write posting FIFOs to optimize bandwidth utilization
- Programmable bi-directional DMA controller
- Asynchronous VMEbus interface for maximum throughput
- 60 to 70 Mbytes per second transfer rates
- Complete suite of VMEbus address and data transfer modes
- Automatic initialization for slave-only applications (supports ability to tap SCV64 without on-board intelligence)
- Flexible register set, programmable from both the local bus and VMEbus ports
- Full VMEbus system controller functionality
- Available in 304-lead PQFP and 299-pin PGA packages

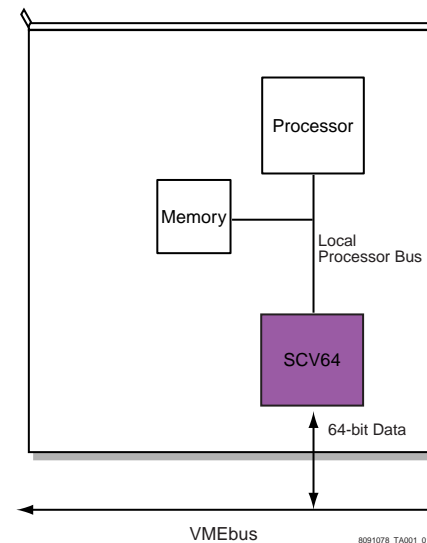
## Design Support Tools

Tundra understands your design challenges and works to help you overcome them. The SCV64 is supported by a highly efficient technical team and IC documentation.

## Applications

- Control systems (military and commercial)
- Application accelerators
- Video graphic
- Communication systems
- DSP systems such as medical imaging

## Bridges



SCV64 application diagram

## Tundra Design Support Tools

**Our tools cut development time, risk, and cost.**

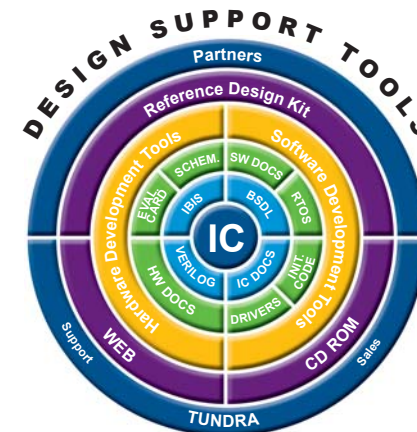
Tundra understands your design challenges and works to help you overcome them. We are committed to making our products easy to use. A powerful suite of Design Support Tools (DST) for each of our devices helps accelerate and simplify your product designs. Tools include comprehensive documentation, extensive Reference Design Kits including third-party evaluation boards and software, and easy access to skilled technical support staff. Most tools are available through our website within our DST section or Third Party Partner page. Design Support Tools help you integrate our ICs into your system designs quickly and shorten your time-to-market.

**Ease of use =  
Ease of design + Ease of access**

### Design Support Tools

- Reference Design Kit (RDK) and evaluation boards (see Third Party Partner offerings)
- Software Development Kit (SDK): Tundra offers free source code for device initialization code, drivers, libraries, RTOS BSPs, host and/or embedded applications where applicable. Software is available through third party partners in support of most RDKs.
- IC models: Analog simulation: IBIS, Functional simulation: Verilog, Manufacturing/Test: BSDL
- Reference schematics and device symbols
- IC User Manuals
- Application notes
- Hardware design manuals
- Software design manuals

These tools are available through Tundra DST section of our web page and through third party partners.



### Third Party Partner Program

The goal of the Tundra partner program is to provide customers with increased "Ease of Use" value through our partner solutions. This represents a fundamental part of our Design Support Tool philosophy.

Tundra partners are leaders in the embedded systems community, providing a range of hardware & software design and debug tools that complement Tundra products. These tools address the demands for shorter customer development cycles. Partner products include: RTOS, development and diagnostic tools, and evaluation boards. Together with our partners, Tundra delivers the product coverage, quality, expertise, and support required to meet the Ease of Design and Ease of Access needs of our customers.

The following is a cross reference of Tundra products to related partner products and services.

Product	RTOS	Development & Diagnostic Tools	Evaluation Board	Design Services
QSpan	WindRiver	WindRiver	WindRiver	WindRiver
QSpan II	WindRiver QNX	WindRiver	Tundra	WindRiver
PowerSpan	WindRiver OSE QNX	WindRiver	Tundra WindRiver	Blackline WindRiver
PowerSpan II	WindRiver	WindRiver	WindRiver	Blackline WindRiver

Tundra Design Support Tools & Partners



blackline systems

OSE systems  
An Enea Company

QNX RTOS Build a more reliable world

WindRiver

## Committed to customer support

### Australia

---

*Impact Components Pty. Ltd.*  
Unit 2, 17-19 Melrich Road  
Bayswater VIC 3153  
Australia  
Tel: 61-3-9760-4222  
Fax: 61-3-9760-4210

*Impact Components Pty. Ltd.*  
Suite 5, Level 1, 124 Forest Road  
Hurstville NSW 2220  
Australia  
Tel: 61-2-9585-5577  
Fax: 61-2-9585-5579

*Memec Pty. Ltd.*  
Unit 14, 1048 Beaudesert Road  
Coopers Plain QLD 4108  
Australia  
Tel: 61-7-3246-5214  
Fax: 61-7-3275-3662

### Austria

---

*Atlantik Elektronik GmbH*  
Hadikgasse 74/2  
A-1140 Wien  
Austria  
Tel: 43-1-897-2637  
Fax: 43-1-897-2737

### Belgium, Luxembourg, The Netherlands

---

*Atlantik Elektronik GmbH*  
Industrieweg Oost 13u Elst,  
Netherlands NL 6662 NE  
Tel: 31-481-365180  
Fax: 31-481-365181

### Eastern Canada

---

*Neutronics Components Ltd.*  
232 Herzberg Rd., Ste. 201  
Ottawa, ON K2K 2A1  
Tel: 613-599-1263  
Fax: 613-599-4750

*Neutronics Components Ltd.*  
6305 Northam Dr., Ste. 5  
Mississauga, ON L4V 1W9  
Tel: 905-672-3378  
Fax: 902-672-5950

*Neutronics Components Ltd.*  
189 Hymus Blvd., Ste. 604  
Pointe Claire, PQ H9R 1E9  
Tel: 514-428-5838  
Fax: 514-428-5837

### Western Canada

---

*Electronic Sources, Inc.*  
12501 Bel-Red Road, Ste. 208  
Bellevue, WA 98005  
Tel: 619-549-5360  
Fax: 619-549-5365

### Denmark

---

*Impact MEMEC*  
Tempovej 16  
DK-2750 Ballerup, Denmark  
Tel: 45-44-44-6666  
Fax: 45-44-44-6669

### Norway

---

*Impact MEMEC*  
P.O. Box 194  
N-1378 Nesbru  
Norway  
Tel: 47-66-77-6500  
Fax: 47-66-77-6501

### Finland

---

*Impact MEMEC*  
Kutojantie 7  
FIN-02631 Espoo  
FINLAND  
Tel: 358-9-2535-4400  
Fax: 358-9-2535-4450

### France

---

*Impact MEMEC*  
4, rue de la Couture; Silic 250  
Rungis, cedex,  
France 94568  
Tel: 33-1-49-78-9494  
Fax: 33-1-49-78-0324

### Germany

---

*Atlantik Elektronik, GmbH*  
Fraunhoferstrasse 11A  
82152 Planegg  
Germany  
Tel: 49-89-89505-0  
Fax: 49-89-89505-100

### Hong Kong & China

---

*Solomon QCE Ltd.*  
Rm 1901  
19/ F. Nan Fung Centre  
264-298 Castle Peak Road  
Tsuen Wan, N.T. Hong Kong  
Tel: 852-2493-4202  
Fax: 852-2413-6307

### India

---

*Hynetic Electronics*  
78/1, 3rd Cross  
Gavipuram Extension,  
Bangalore, 560019, India  
Tel: 91-080-6614627  
91-080-6524577  
Fax: 91-080-6614649  
91-080-6524073

### Ireland

---

*Impact MEMEC*  
Lock Quay  
Limerick, Ireland 123  
Tel: 353-61-316-068  
Fax: 353-61-316-069

### Israel

---

*Migvan Technologies and  
Engineering Ltd.*  
13 Hashiloach Street  
P.O. Box 7022  
Petach-Tikva 49170, Israel  
Tel: 972-3-9240784  
Fax: 972-3-9240787

## Italy

---

*Impact MEMEC*  
Via Cesare Cantu 29  
Cinisello Balsamo,  
Italy 20092  
Tel: 39-02-61-29-0800  
Fax: 39-02-61-29-0816

## Japan

---

*Tokyo Electron Device Ltd.*  
No. 1, Higashikata-cho,  
Tsuzuki-ku,  
Yokohama-City, Kanagawa,  
224-0045 Japan  
Tel: 81-45-474-7032  
Fax: 81-45-474-7016

## Korea

---

*ForeTek Microsystems Co. Ltd.*  
#202, Youngkwang, B/D 254-17,  
Nonhyun-dong, Kangnam-ku  
Seoul, Korea 135-010  
Tel: 81-45-474-7044  
Fax: 81-45-474-7034

## Mexico/South America

---

*OM Associates*  
Univ. de las Americas #9712  
Frac: Residencial Universidad  
Chihuahua,  
Chihuahua, Mexico 31106  
Tel: 521-421-6345  
Fax: 521-421-6345

*OM Associates*  
Av. Lopez Mateos Sur  
1480.201 Col. Chapalita  
Guadalajara, Jalisco  
Mexico 45040  
Tel: 523-647-7881  
Fax: 523-647-7868

*OM Associates*  
Av. Morones Prieto #2805,  
Pte. Suite 1001  
Torre GIA, Piso 10  
Col. Lomas de San Fco.  
Monterrey, Nuevo Leon  
Mexico 64710  
Tel: 528-399-0093  
Fax: 528-399-0094

## New Zealand

---

*Impact Components Pty.*  
Unit 5, 9 Washington Way  
Christchurch, New Zealand  
Tel: 64-3-379-3889  
Fax: 64-3-379-3072

## Singapore

---

*Excelpoint Systems (PTE) Ltd.*  
24 Kaki Bukit Crescent  
Kaki Bukit TechPark 1  
Singapore 416255  
Tel: 65-741-8966  
Fax: 65-741-8980

## South Africa

---

*Impact MEMEC*  
Unit 5, Bartlett Lake Office Park  
186 Leith Road  
Bartlett, Gauteng  
South Africa 1459  
Tel: 27-11-897-8600  
Fax: 27-11-918-3193

## Spain & Portugal

---

*Impact MEMEC Iberica*  
c/ Ochandiano 8, 2 Izda  
Centro Empresarial El Plantio  
Madrid, Spain 28023  
Tel: 34-91-307-68-93  
Fax: 34-91-372-94-53

## Sweden

---

*Impact MEMEC*  
Ulvsvandavagen 106C  
Box 11113  
S-161 11 Bromma, Sweden  
Tel: 46-8-86-3466  
Fax: 46-8-26-2275

## Switzerland

---

*Egli, Fischer & Co. Ltd. Zurich*  
Gotthardstrasse 6, Ch-8022  
Zurich, Switzerland  
Tel: 41-1-209-8111  
Fax: 41-1-201-2275

## Taiwan

---

*Toptrend Technologies Corp*  
8F-2, No. 15, Lane 360  
Sec. 1, Nei-Hu Road  
Taipei, Taiwan R.O.C.  
Tel: 886-2-2659-3636  
Fax: 886-2-2659-1518

## United Kingdom

---

*Impact MEMEC*  
Thame Park Road  
Thame, Oxfordshire  
United Kingdom OX9 3UQ  
Tel: 44-1-844-261188  
Fax: 44-1-844-261681

## Central U.S.

---

**Illinois, Michigan, Wisconsin**  
*Horizon Technical Sales*  
4340 Cross Street,  
Downer's Grove, IL 60106  
Tel: 630-852-2500  
Fax: 630-852-2520

**Alabama, Georgia, Mississippi,  
North Carolina, South Carolina,  
Tennessee**

*BITS, Inc.*  
2707 Artie Street,  
Building 100, Suite 17  
Huntsville, AL 35805  
Tel: 256-534-4020  
Fax: 256-534-0410

*BITS, Inc.*  
5425 Sugarloaf Parkway  
Suite 2201  
Lawrenceville, GA 30043  
Tel: 770-513-8610  
Fax: 770-513-8680

*BITS, Inc.*  
940 Main Campus Drive, Ste. 120  
Raleigh, NC 27606  
Tel: 919-807-1000  
Fax: 919-807-1001

**Tundra  
Sales Network**

## **Texas, Arkansas, Louisiana, Oklahoma**

*OM Associates*  
11410 Jollyville Rd., Ste. 2201  
Austin TX 78759  
Tel: 512-794-9971  
Fax: 512-794-9987

*OM Associates*  
690 W. Campbell Rd.  
Richardson, TX 75080  
Tel: 972-690-6746  
Fax: 972-690-8721

*OM Associates*  
1200 Golden Key Circle,  
Suite 365  
El Paso, TX 79925  
Tel: 915-591-9123  
Fax: 915-590-3731

*OM Associates*  
20405 S.H. 249, Suite 170  
Houston, TX 77070  
Tel: 281-376-6400  
Fax: 281-376-6490

## **Minnesota, North and South Dakota, Wisconsin**

*Electromec Sales Inc.*  
1601 East Highway 13, Ste. 102  
Burnsville, MN 55337  
Tel: 952-894-8200  
Fax: 952-894-9352

**Iowa**  
*Electromec Sales Inc.*  
1721 Applewood Place N.E.  
Cedar Rapids, IA 52402  
Tel: 319-399-1917  
Fax: 319-399-1939

## **Kansas, Missouri, Nebraska, Southern Illinois,**

Please contact Tundra  
Semiconductor directly at:  
1-800-267-7231

## **Eastern U.S.**

**D.C., Maryland, Virginia**  
*Chesapeake Technologies*  
7262 Cradle Rock Way  
Columbia, MD 21045  
Tel: 301-236-0530  
Fax: 301-384-9596

## **New York, Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, Rhode Island, Vermont**

*Daner Hayes Inc.*  
300 Eliot Street, Suite 342  
Ashland, MA 01721  
Tel: 508-881-0400  
Fax: 508-881-8227

*Daner Hayes Inc.*  
2-22 Thomas St.  
Portland, ME 04102-3638  
Tel: 207-772-2999  
Fax: 207-772-6111

*Daner Hayes Inc.*  
26 Ellen Court  
Wayside, NJ 07712  
Tel: 732-918-0302  
Fax: 732 918 0302

*Daner Hayes Inc.*  
42 Obtuse Road South  
Brookfield, CT 06804  
Tel: 203-740-1091  
Fax: 203 740 0480

**Upstate New York**  
*Supertech*  
230 Tarrington Road  
Rochester, NY 14609  
Tel: 585-288-1403  
Fax: 585-288-5112

*Supertech*  
33 Wildherd Drive  
Henrietta, NY 14467  
Tel: 585-321-1893  
Fax: 585-288-5112

## **Ohio, Western Pennsylvania, Kentucky, West Virginia**

*DDolfuss-Root & Company*  
P.O. Box 1468  
35 North Liberty Street  
Powell, OH 43065-9289  
Phone: 614-781-0725  
Fax: 614-781-0728

*Dolfuss-Root & Company*  
7550 Lucerne Dr., Ste. 410  
Middleburg Heights, OH 44130-6583  
Phone: 440-816-1660  
Fax: 440-816-0861

## **Mountain U.S.**

### **Colorado, Idaho, Montana, Utah, Wyoming**

*Thorson Rocky Mountain, Inc.*  
7108 South Alton Way, Building-D  
Englewood, Colorado 80112  
Tel: 303-773-6300  
Fax: 303-773-6302

*Thorson Rocky Mountain, Inc.*  
141 E 5600S, Ste. 210  
Salt Lake City, UT 84107  
Tel: 801-264-9665  
Fax: 801-264-9881

*Thorson Rocky Mountain, Inc.*  
2668 E. Hampshire Court  
Eagle, ID 83616  
Tel: 208-938-8090  
Fax: 208-938-8070

**Arizona, New Mexico, Southern Nevada**  
*Earle Associates Arizona*  
1900 W. University Dr., Ste. 222  
Tempe, AZ 85281  
Tel: 480-921-3305  
Fax: 480-921-3316

*Earle Associates*  
650 Cougar Loop, N.E.  
Albuquerque, NM 87122  
Tel: 505-856-7351  
Fax: 505-856-1527

## **Western U.S.**

**Northern California, Northern Nevada**  
*Nexus, Inc.*  
Technology Sales  
1288 Hammerwood Ave.  
Sunnyvale, CA 94089  
Tel: 408-321-0201  
Fax: 408-321-7408

**San Diego**  
*Earle Associates*  
7585 Ronson Road, Ste. 200  
San Diego, CA 92111  
Tel: 858-278-5441  
Fax: 858-278-5443

### **Oregon, Washington State**

*Electronic Sources, Inc.*  
6800 SW 105th, Ste. 210  
Beaverton, OR 97008  
Tel: 503-627-0838  
Fax: 503-627-0238

*Electronic Sources, Inc.*  
12501 Bel-Red Road, Ste. 208  
Bellevue, WA 98005  
Tel: 425-451-3500  
Fax: 425-451-1038

### **Southern California**

*Infinity Sales Inc.*  
3002 Dow Avenue, Ste. 306  
Tustin, CA 92780  
Tel: 714-669-8520  
Fax: 949-833-0303

*Infinity Sales Inc.*  
26560 W. Agoura Rd., Ste. 203  
Calabasas, CA 91302  
Tel: 818-880-6480  
Fax: 818-880-1922

# Ordering Information

Product Name	Product Code	Frequency	Voltage	Temperature	Package	Pin Count
<b>PowerSpan II</b> 	<b>PowerSpan – Dual PCI</b>					
	CA91L8200-100CE	100MHz	3.3/2.5	0° to 70°C	37.5 mm BGA	480
	CA91L8200-83IE	83MHz	3.3/2.5	-40° to 85°C	37.5 mm BGA	480
	<b>PowerSpan – Single PCI</b>					
	CA91L8260-100CE	100MHz	3.3/2.5	0° to 70°C	35 mm BGA	420
	CA91L8260-83IE	83MHz	3.3/2.5	-40° to 85°C	35 mm BGA	420
	<b>PowerSpan II – Dual PCI</b>					
	CA91L8200B-100CE	100MHz	3.3/2.5	0° to 70°C	37.5 mm BGA	480
	CA91L8200B-100IE	100MHz	3.3/2.5	-40° to 85°C	37.5 mm BGA	480
	CA91L8200B-100CL	100MHz	3.3/2.5	0° to 70°C	27 mm BGA	504
	CA91L8200B-100IL	100MHz	3.3/2.5	-40° to 85°C	27 mm BGA	504
	<b>PowerSpan II – Single PCI</b>					
	CA91L8260B-100CE	100MHz	3.3/2.5	0° to 70°C	35 mm BGA	420
	CA91L8260B-100IE	100MHz	3.3/2.5	-40° to 85°C	35 mm BGA	420
	CA91L8260B-100CL	100MHz	3.3/2.5	0° to 70°C	23 mm BGA	484
	CA91L8260B-100IL	100MHz	3.3/2.5	-40° to 85°C	23 mm BGA	484
	<b>PowerPro</b>	CA91L750-100IL	100MHz	3.3/2.5	-40° to 85°C	PBGA
<b>QSpan II</b> 	CA91L862A-40CE	40MHz	3.3	0° to 70°C	27 mm PBGA	256
	CA91L862A-50CE	50MHz	3.3	0° to 70°C	27 mm PBGA	256
	CA91L862A-50IE	50MHz	3.3	-40° to 85°C	27 mm PBGA	256
	CA91L862A-40CL	40MHz	3.3	0° to 70°C	17 mm PBGA	256
	CA91L862A-50CL	50MHz	3.3	0° to 70°C	17 mm PBGA	256
	CA91L862A-50IL	50MHz	3.3	-40° to 85°C	17 mm PBGA	256

\*\*\* please call Tundra for QSpan ordering information\*\*\*



Tundra Products  
at a glance



Tundra Semiconductor  
Corporation

603 March Road  
Ottawa, ON K2K 2M5 CANADA  
1-800-267-7231  
(613) 592-0714  
fax (613) 592-1320  
www.tundra.com

# Ordering Information

Product Name	Product Code	Frequency	Voltage	Temperature	Package	Pin Count
<b>Universe II</b> 	CA91C142B-33CE	33MHz	5	0° to 70°C	35 mm PBGA	313
	CA91C142B-33IE	33MHz	5	-40° to 85°C	35 mm PBGA	313
	CA91C142B-25EE	25MHz	5	-55° to 125°C	35 mm PBGA	313
	CA91C142D-33CE	33MHz	5	0° to 70°C	35 mm PBGA	313
	CA91C142D-33IE	33MHz	5	-40° to 85°C	35 mm PBGA	313
	CA91C142D-25EE	25MHz	5	-55° to 125°C	35 mm PBGA	313
	CA91C142B-33CB	33MHz	5	0° to 70°C	35 mm DBGA	361
	CA91C142B-33IB	33MHz	5	-40° to 85°C	35 mm DBGA	361
	CA91C142B-25EB	25MHz	5	-55° to 125°C	35 mm DBGA	361
<b>SCV64</b> 	CA91C078A-33CQ	33MHz	5	0° to 70°C	40 mm PQFP	304
	CA91C078A-40CQ	40MHz	5	0° to 70°C	40 mm PQFP	304
	CA91C078A-25IQ	25MHz	5	-40° to 85°C	40 mm PQFP	304
	CA91C078A-33IQ	33MHz	5	-40° to 85°C	40 mm PQFP	304
	CA91C078A-33CG	33MHz	5	0° to 70°C	2" CPGA	299
	CA91C078A-40CG	40MHz	5	0° to 70°C	2" CPGA	299
	CA91C078A-25EG	25MHz	5	-55° to 125°C	2" CPGA	299
	CA91C078A-33EG	33MHz	5	-55° to 125°C	2" CPGA	299

For the most current product information and for information regarding Development Boards, please visit [www.tundra.com](http://www.tundra.com) or contact your local Sales office.

**Note**

- 0° to 70°C = Commercial temperature
- 40° to 85°C = Industrial temperature
- 55° to 125°C = Extended temperature







**Tundra Semiconductor Corporation**

603 March Road  
Ottawa, Ontario  
K2K 2M5 CANADA

1-800-267-7231  
613-592-0714  
fax 613-592-1320

TUNDRA is a registered trademark of Tundra Semiconductor Corporation (Canada, U.S., and U.K.).

TUNDRA, the Tundra logo, PowerSpan II, PowerPro, QSpan II, SCV64, Universe II, and Silicon Behind the Network are trademarks of Tundra Semiconductor Corporation.

All other registered and unregistered marks (including trademarks, service marks and logos) are the property of their respective owners. The absence of a mark identifier is not a representation that a particular product name is not a mark.

© Copyright 2002 Tundra Semiconductor Corporation.

All rights reserved.

Information subject to change without notice.

8000000\_MD002\_05