

ENGINES FOR GLOBAL CONNECTIVITY

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# ASPEN Express™

High-performance, High-density,  
ATM Cell Switch

## Your Single Chip Solution for *CellBus*® Multi-PHY Access.

*The ASPEN Express supports high-density switching of up to 64 PHY ports for throughput rates of up to 622 Mb/s of data traffic. It features outstanding traffic management capabilities including prioritized service level support and ATM cell transfer at OC-12 rates - dramatically expanding the range and performance of ATM applications supported by TranSwitch's *CellBus* technology. These high performance features simplify your system's design architecture - reducing your costs and time-to-market in applications such as:*

- DSLAMs
- ATM LAN switches
- ATM access multiplexers
- Remote access equipment
- ATM internetworking equipment
- Frame relay switches

# ASPEN Express

High-performance ATM Switch

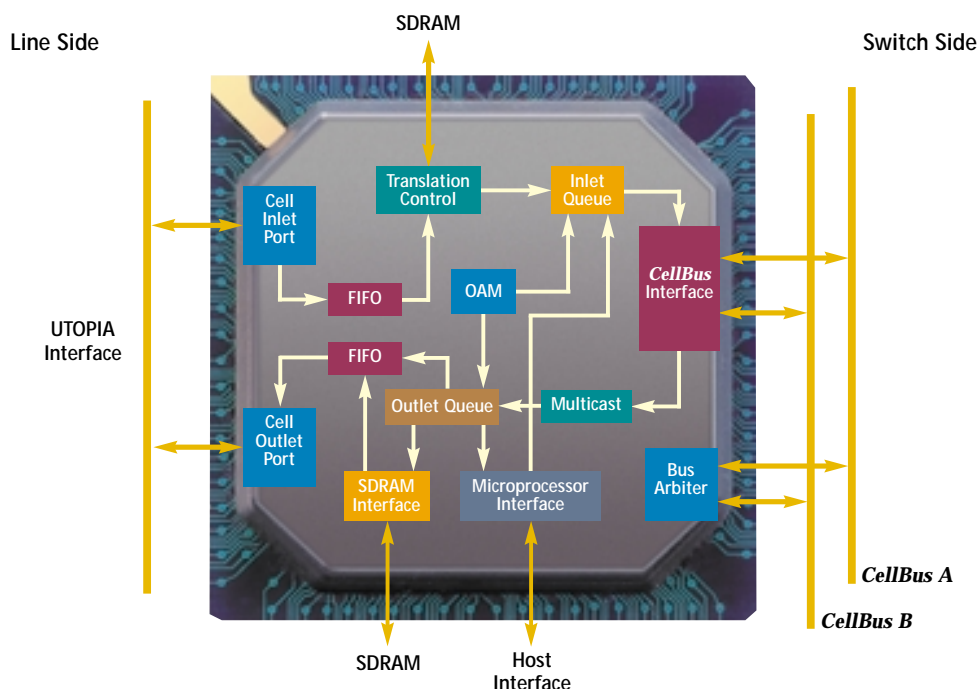
## Historical-based success.

Based on TranSwitch's field-proven *CellBus* technology, the **ASPEN Express** is a high-performance ATM switch that interfaces directly with UTOPIA level 1/2 (8/16-bit) compliant devices. It provides exceptional support for high-density switching of up to 64 PHY ports with maximum total throughput rates of up to 622 Mb/s. The **ASPEN Express** efficiently incorporates all functions necessary for ATM cell transfer at OC-12 rates including cell address translation, cell routing and outlet cell queuing. Outstanding traffic management capabilities such as policing, and eight levels of prioritized service support for unicast and multicast cell transfers ensures ultra reliable high bandwidth switching. The **ASPEN Express** supports a multitude of system configurations based on TranSwitch's patented *CellBus* switch fabric technology including multiplexing and switching systems. In all, **ASPEN Express** offers the ultimate in high-performance and increased throughput in a flexible cost-effective package.

## Interface compatibility creating design flexibility.

A UTOPIA level 1/2 port is the main interface for cell traffic between the **ASPEN Express** and other PHY layer devices on the line side. This ATM Forum compatible interface can address up to 64 physical devices in ATM layer emulation mode. In addition, the **ASPEN Express** supports cell sizes from 53 bytes to 57 bytes in 8-bit interface mode and 54 to 58 bytes in 16-bit interface mode while flexibly supporting both master and slave modes of operation.

On the switch side, the **ASPEN Express** interfaces with a dual *CellBus*, TranSwitch's widely deployed switch fabric technology. *CellBus* provides synchronous bus operation with a central bus arbiter that manages access transmissions with a defined 16-cycle frame structure. Since communication between any of the devices on the bus is possible, any cell distributed onto the bus by an **ASPEN Express** device can be unicast, broadcast or multicast addressed to its destination. This inherent flexibility allows for the development of system designs that meet your unique requirements.





## Comprehensive traffic management.

The **ASPEN Express** delivers all the functionality necessary to implement high-density ATM applications including cell address translation, cell routing and outlet cell queuing. The extensive traffic management capabilities of the **ASPEN Express** guarantee that allocated bandwidth and QoS requirements are completely satisfied. Eight service classes are accommodated by the **ASPEN Express**: CBR, VBR-rt, VBR-nrt, GFR, ABR, and three user defined classes, which can be used to support differential services with multiple levels of UBR priority. This allows for minimal delay of critical data service types. The **ASPEN Express**' outstanding traffic management features are executed through Early Packet Discard (EPD) and Partial Packet Discard (PPD), policing per TM4.1, and OAM Fault Management per ITU-T I.610. Ingress queuing enhances the ability to fully utilize the *CellBus* bandwidth so that during congestion, low priority traffic can be queued on the inlet side until high priority traffic has been de-queued. **ASPEN Express** also implements a backpressure mechanism that prevents cell loss from egress queue congestion - thus enhancing your system's overall quality and efficiency.

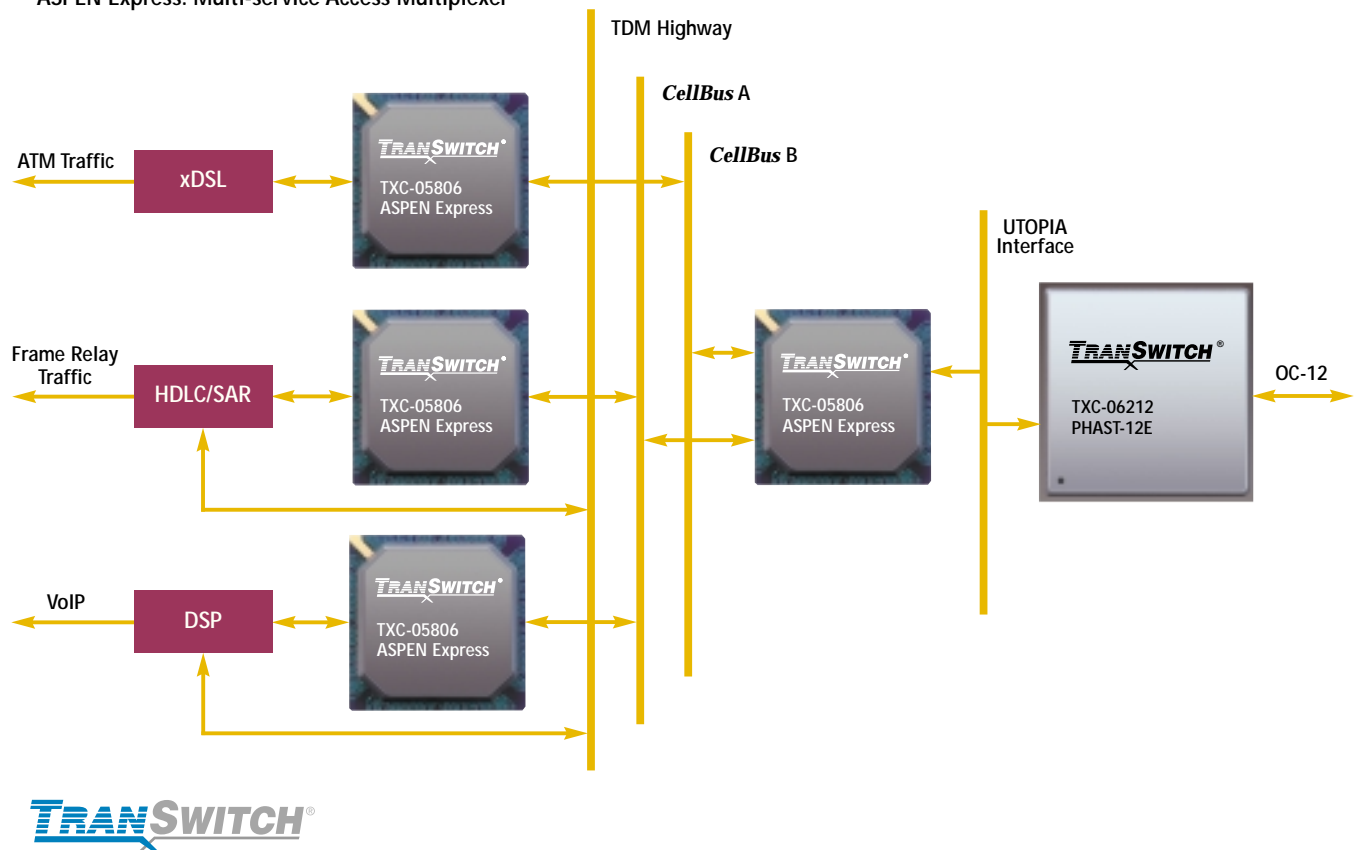
## Expanding your future possibilities.

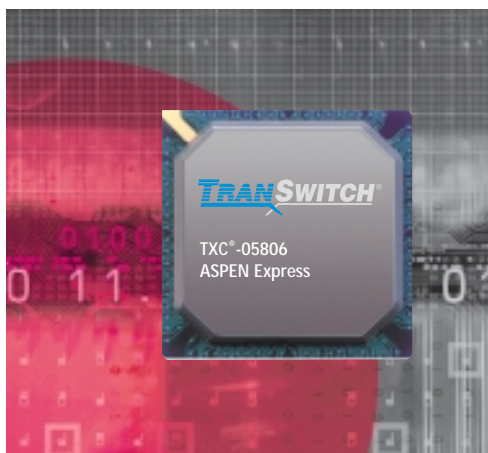
In combination with other TranSwitch complementary products such as the *CellBus* family and the PHAST family of VLSI devices, the **ASPEN Express** supports a multitude of system configurations including multiplexing and switching systems, thus providing high-performance and increased throughput in a flexible, cost-effective package.

## Foundation for success.

To maximize your development resources, TranSwitch provides for **ASPEN Express** and the rest of our product line, an extensive array of design support. **ASPEN Express** support includes an easy-to-use API-based device driver, evaluation kit, IBIS model, BSDL file, reference designs, and comprehensive documentation; all of which contribute to streamlining your software development. Factor in TranSwitch's world-class customer engineering support and you are well on your way to reduced design costs and an accelerated time-to-market.

## ASPEN Express: Multi-service Access Multiplexer





## KEY FEATURES of the ASPEN® Express TXC-05806

### Interfaces

- Line: 64 port Multi-PHY UTOPIA level 1/2 interface
- Switch: Dual *CellBus* interfaces for load sharing or redundancy
- Control: Motorola and Intel compatible microprocessor interface
- Memory: Translation and buffer RAM
- Test: Boundary scan per IEEE 1149.1

### Performance Features

- 622 Mb/s bi-directional throughput
- Inlet side address translation and routing header insertion
- EPD and PPD in both inlet and outlet directions
- Support for over-reservation of GFR, UBR, and VBR traffic

### Management Functions

- Service level priority management
- OAM fault management per ITU-T I.610
- Policing on ingress compliant with TM4.1
- MCR guarantees for egress queues
- *CellBus* traffic monitor mode

### Physical Characteristics

- Voltage: 1.8v power supply, 3.3v I/O tolerance
- Size: Compact - 27 x 27 mm
- Package: 456-lead PBGA

TranSwitch Corporation is a leading innovator of VLSI solutions for multi-service access and transport applications. TranSwitch serves the Original Equipment Manufacturers (OEMs) who supply three fast-growing communications end markets: Multi-service Access Infrastructure (including Wireless), Broadband Internet Infrastructure, and Converged Public Networks. Our solutions span Asynchronous/PDH, SONET/SDH, and ATM/IP technologies, providing the core functionality for network elements including:

*Multi-service Access Devices • DSLAMs • SONET/SDH Add/Drop Multiplexers • Access Concentrators*

*Edge Switches • Voice Gateways • ATM, IP, and Frame Relay Switches*



TranSwitch Corporation  
3 Enterprise Drive  
Shelton, CT 06484  
USA  
Tel +1.203.929.8810  
Fax +1.203.926.9453  
www.transwitch.com  
NASDAQ: TXCC

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