

SurfRider/AMC™

Main Features

- Revolutionary patent-pending modular design for exceptional flexibility
- ROHS-compliant
- Pre-integrated with leading ATCA and μ TCA platforms
- Multiple interface options
- Flexible DSP Open Framework™
- Extensive host software support

Target Applications

- **Telecom Applications**
 - Audio and Video Gateways
 - Media Servers
 - Packet-to-Packet Applications
 - Session Border Controllers
- **Military Applications**
 - Cryptography
 - Lawful Interception
- **Medical Applications**
 - Image Processing



General-Purpose Modular AMC Form Factor DSP Resource Board for Flexible, Heavy-Duty Processing

Overview

The SurfRider/AMC is a fully-integrated full/half-height ROHS-compliant AMC DSP resource board providing flexible yet heavy-duty processing capabilities for developers of telecom, military, medical and other processing-intensive applications. Featuring Surf's revolutionary patent-pending modular design and Open Framework approach, which allows seamless integration of user-defined and proprietary algorithms, the SurfRider/AMC is the ideal choice for such target applications.

The SurfRider/AMC introduces a highly innovative patent-pending design featuring the SurfDock™ modular plug-in, which carries up to four pairs of mixed types of DSPs and supports a variety of configurations to meet the application developer's requirements. This paradigm allows varying types of DSPs to be assembled simultaneously on a single AMC carrier, including TI's C64x generation, C54x generation, or any new processor that is released to market. Up to four SurfDock modules can be plugged into a single SurfRider/AMC, for a total of eight DSPs per AMC board.

For developers of telecom infrastructure equipment, the SurfRider/AMC integrates with SurfUP™, Surf's telecom-ready media processing software that allows proprietary applications to be embedded directly into the DSP framework. The SurfRider/AMC supports the standards-based PICMG® SFP I-TDM protocol over Gigabit Ethernet for transporting audio, video, fax and modem traffic. This makes the SurfRider/AMC the perfect solution for ATCA and MicroTCA platforms in various types of systems.

Texas Instruments' C64x series of DSP devices are specifically designed to handle converged applications that require a high-performance fixed-point processing architecture with significant memory and multiple high-speed I/O paths, such as audio, video, and wireless applications.

Features

Exceptional Processing Power

- Up to eight DSPs (e.g., C6412/C6455), running at up to 1GHz
- High-density processing
- Large external memory per DSP (e.g., 64MB SDRAM per 6412DSP; 32MB DDR2 DRAM per 6455 DSP)

Multiple Interface Options

- All AMC interfaces as defined in AMC.0; AMC.1; AMC.2; AMC.3; AMC.4 standards
- I-TDM

Flexible, Open Framework Operating System¹

- Unique operating system for extensive DSP software support
- Quick integration of user applications/value-add code
- Simple, high-level access to DSP interfaces
- Real-time optimized operating system
- Integrated file streaming support to/from the host

Telecom-ready Media Processing Software¹

- Supports SurfUP, a complete media processing package for audio, video, modem and fax integrated into the Open Framework

Extensive Host Software Support

- Sample application (including download and operation examples)
- Linux/VxWorks/Windows drivers
- BIT diagnostics package

Carrier Boards Compatibility

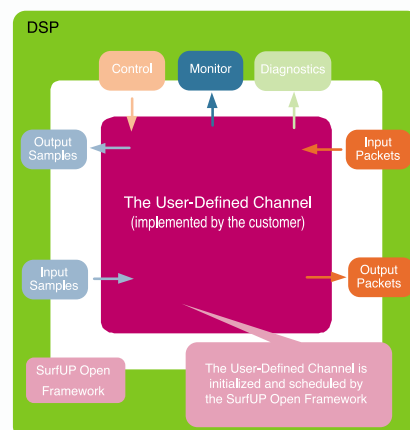
The SurfRider/AMC has been pre-integrated with a number of leading carrier manufacturers' products and can be mounted on various platforms, as follows:

- ATCA
- μ TCA

Open Framework

The Open Framework¹ add-on module allows application developers to activate their own proprietary algorithm that can run either independently or alongside the existing DSP capabilities that are provided as part of the SurfUP media processing subsystem. The proprietary user implementation is compiled and linked with the existing DSP framework to create a single DSP executable.

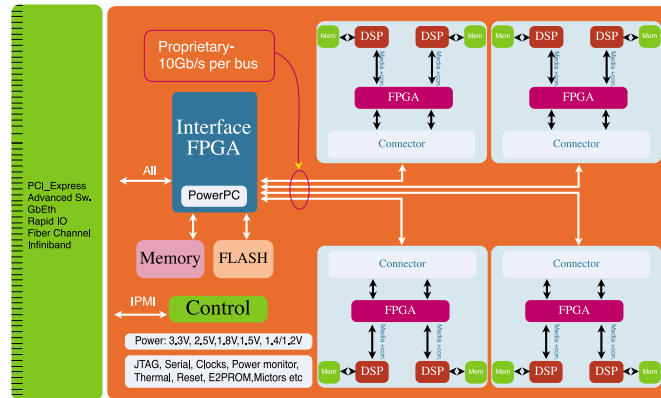
Block diagram illustrating the relationship between SurfUP Open Framework and a single user-defined channel created by the application developer.



¹ Optional

Architecture

The SurfRider/AMC is a fully integrated full/half-height mezzanine card that can be mounted on an ATCA blade or in a μ TCA chassis. It is comprised of a **main AMC board** and up to four SurfDock **plug-in modules**, as follows:



Block diagram of the SurfRider/AMC DSP resource board.

Main Board

- Supports all AMC configurations/standards (AMC.0, AMC.1, AMC.2, AMC.3, AMC.4)
- Hosts up to eight DSPs using 1-4 SurfDock plug-in modules, with two DSPs on each module (i.e., flexible support for 2, 4, 6, or 8 DSPs)
- Supports different types of DSPs on the same AMC board, using different SurfDock plug-in modules (e.g., start with C6412 DSPs; replace with more advanced DSPs later, or mix C5x and C64x on the same board).
- PowerPC 405 implemented within the Interface FPGA for board management
- Features shared memory architecture that enables superior performance when heavy intra-DSP communication is required.

SurfDock Plug-in Module (module differs per DSP type)

- Two DSPs from the C64x family (supports other TI DSPs, e.g., C5xx)
- Private memory per DSP (SDRAM, DDR, DDR2; based on the DSP)
- FPGA²: handles the interface between the main board and the specific DSP



Complete Solution

- A single main board hosting 1-4 SurfDock plug-in modules, carrying two DSPs each
- Interface between the AMC connector and the DSPs is controlled by the FPGA on the main board and the FPGAs on each SurfDock plug-in module, resulting in a distributed switching architecture
- Interfaces to each DSP based on DSP type, including Rapid I/O, Infiniband, Gbit Ethernet, I-TDM, etc.
- Half-height, single-size AMC; up to eight AMC boards per ATCA
- Up to 40W per fully-populated board (main board with 4 plug-in modules); < 20W for C6412 solution

Documentation

The SurfRider/AMC DSP resource board is delivered with complete and detailed documentation, as well as various sample code applications, which dramatically shorten integration time and the entire development cycle.

² A different FPGA software load is optimized for each DSP type.

Hardware Specifications

Power Requirements

- Up to 40W per fully-populated board (up to 20W for fully-populated C6412)

DSP

- Up to 8 x C64x DSPs (supports entire family, as well as additional TI DSPs, e.g., C5x)

SDRAM

- 64MB SDRAM per 6412 DSP;
32MB DDR2 DRAM per 6455 DSP

PowerPC

- Implemented in FPGA for board management

Shared Memory

- 64 MB of shared memory for all DSPs

Flash Memory

- 64 MB of flash memory for PowerPC

Control

- Full support for IPMI

Supported Standards

- AMC.0, AMC.1, AMC.2, AMC.3, AMC.4

Supported Interfaces

- All AMC interfaces as defined in above standards
- I-TDM

JTAG

- DSP JTAG connector for DSP emulation
- FPGA JTAG connector for FPGA booting and programming
- Boundary-Scan JTAG

Operating Conditions

- Temperature: 0°C-55°C (32°F-131°F)
- Humidity: 20% to 80% (non-condensing)

Storage Conditions

- Temperature: -25°C-85°C (-13°F-185°F)

Dimensions & Conformity

- According to AMC.0 spec

Pending Certifications

- ROHS-compliance
- As defined in AMC.0 spec

About Surf

Surf Communication Solutions®, established in 1996, designs, develops, and markets high-capacity, general-purpose, multimedia processing boards. In the telecommunication infrastructure field, Surf's customers use these boards in their Media Gateway and Media Server products. Using their comprehensive transcoding capabilities, Surf's products greatly shorten time to market, are cost effective, and enable true convergence of all major media types—Audio, Video, and Data (Fax/Modem)—over IP, Mobile, Wireline, and Wireless networks. These solutions are provided at various integration levels: PTMC/AMC DSP farm boards; PCI cards; and DSP hardware/software.

Surf Communication Solutions is a member of TI's TMS320™ third party program, the most extensive collection of global DSP development support in the industry. With more than 650 independent companies and consultants, TI's customers have easy access to a broad range of application software, development hardware and software and consulting services. For more information on the TI third party program, please visit www.ti.com/3p.

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