SurfAce-112/PCI™

General-Purpose PCI Form Factor DSP Resource Board for Robust Media Processing

Main Features

- Exceptional processing power
- Multiple interface options
- Flexible DSP Open Framework™
- Extensive host software support

Target Applications

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

Overview

The SurfAce-112/PCI is a fully integrated 3/4-size PCI DSP resource board providing robust processing capabilities for developers of telecom, military, medical and other processing-intensive applications. Featuring cost-effective unmatched processing power and Surf's patent-pending Open Framework design, which allows seamless integration of user-defined and proprietary algorithms, the SurfAce-112/PCI is the ideal choice for such target applications.

The SurfAce-112/PCI DSP resource. The board is supplied with multiple drivers and a variety of interfaces, including 100MB Ethernet and universal PCI. Developers can choose to work with the DSP BIOS supplied by Texas Instruments, or leverage the operating system supplied by Surf to greatly reduce development time. For developers of telecom infrastructure equipment, the SurfAce-112/PCI integrates with SurfUP™, Surf's telecom-ready media processing software that facilitates development of media gateway and media server applications.

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 voice, video, and wireless applications. The SurfAce-112/PCI DSP resource board, which supports the C6412 DSP, is a flexible, high-capacity, programmable platform for processing-intense applications such as video processing, VoIP, cryptography, and medical imaging.

The SurfAce-112/PCI DSP resource board is universal PCI-compliant (32-bit / 33MHz), compatible with a wide range of host platforms, and integrates with mezzanine boards, such as the SurfRider-812/PTMC™.

Features

Exceptional Processing Power

- Includes a single C6412 32-bit fixed point DSP running at 500/600/720MHz
- High density processing
- 64MBytes SDRAM (64bit-access at 133MHz)
- Enhanced DMA channels for peripherals

Multiple Interface Options

- 32-bit/33MHz universal PCI interface
- E1/T1 RJ-45 supporting PRI signaling[1]
- Fast Ethernet RJ-45 (10/100Mbps)
- 1 or 2 internal IP addresses
- 4 SLIC RJ-11 POTS on board (FXS)
- H.100 connector
- PTMC connectors

Flexible, Open Framework Operating System[1]

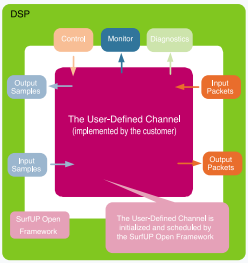
- Unique operating system for extensive DSP software support
- Quick integration of user applications/value-add code
- Simple, high-level access to DSP interfaces
- Real-time optimized operating system
- Integrated file streaming support to/from the host
- Supports SurfUP, a complete media processing package for voice, video, modem and fax integrated into the Open Framework

Extensive Host Software Support

- Sample application provided in ANSI-C code (including download and operation examples)
- Linux/VxWorks/Windows drivers

Open Framework

The Open Framework[1] 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.

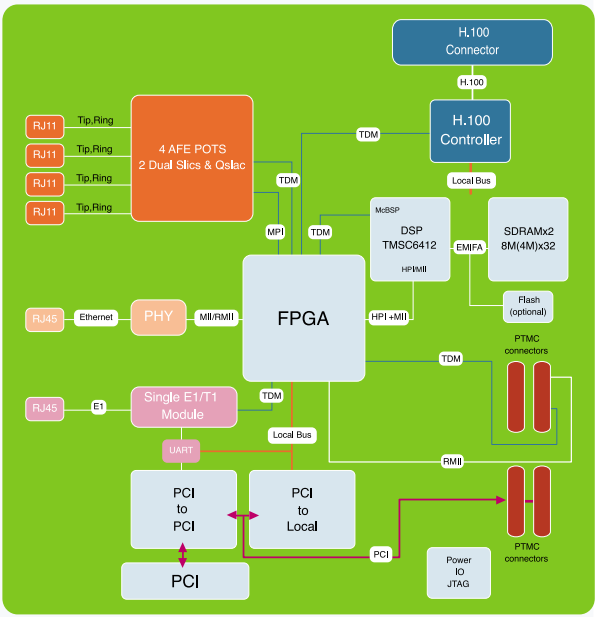
Documentation

The SurfAce-112/PCI 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.

[1] Optional

Architecture

The SurfAce-112/PCI DSP resource board is based on the following building blocks:



Block diagram of the SurfAce-112/PCI DSP resource board.

Base circuit — The DSP circuit includes the TMSC6412 DSP , two SDRAM chips of 4Mx32 (8Mx32), and PLL clocks

PCI — The PCI interface includes a PCI-to-PCI bridge and PCI-to-local bridge

AFE — SLIC and SLAC circuit includes two dual SLICS, one QSLAC and analog peripherals

E1 — Single E1 interface including UART and propriety connectors[1]

PTMC interface

Ethernet — Ethernet circuit includes MII/rMII PHY and analog peripherals

H.100 — H.100 matrix

Hardware Specifications

Power Consumption

- Total 11.5 Watts

DSP

- C6412@500 / 600 / 720 MHz

SDRAM

- 64MB organized as 2 x 8M x 32 bits

JTAG

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

Operating Conditions

- Temperature: 0ºC-55ºC (32ºF-131ºF)
- Humidity: 20% to 80% (non-condensing)

Storage Conditions

- Temperature: -25ºC-85ºC (-13ºF-185ºF)
- Humidity: 20% to 80% (non-condensing)

Dimensions & Conformity

- Length: 255mm (PCI form factor)
- Width: 110mm

Pending Certifications

- RoHS-compliance
- **Europe:** E1 framed interface -TBR 13:96; POTS - TBR 21
- **USA:** T1 interface - TIA/EIA-IS-968; POTS - TIA/EIA-IS-968

Optional Modules

Remote diagnostics extraction from deployed systems is available through SurfDetect™, which provides diagnostics on a per-DSP/per-port/per-service basis. In addition, decoding and analysis of Fax and Modem communications is available via SurfInsight™, Surf's expert troubleshooting tool (see sample workspace, left).

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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