

HSI Software Stack

Overview

To address the explosive growth in the mobile industry, the Mobile Industry Processor Interface (MIPI®) Alliance was created to define and promote open standards for interfaces to mobile application processors. The High Speed Synchronous Serial Interface (HSI) is one in a family of standards addressing the mobile market.

HSI is an interface designed to provide a multi-processor, low latency communication channel with multiple logical channels aggregated over a die-to-die link at the hardware level.

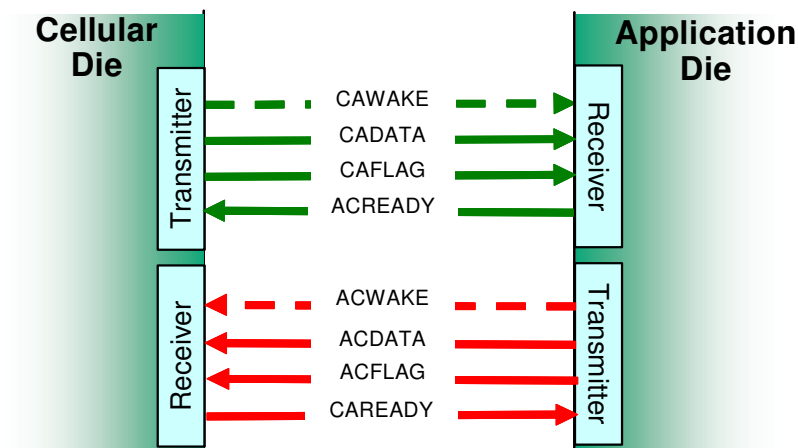
The HSI stack is compliant to MIPI HSI Specification version 1.0 and is designed to support HSI devices running on various operating systems and hardware platforms. The stack supports system with multiple HSI devices and includes support for the full implementation of HSI data link layer for audio and general purpose data transfer.

Arasan's HSI Software stack consists of the Application interface layer (API Layer), general purpose data link layer, audio data link layer, HSI hardware specific programming layer, OS specific driver layer and bus specific interface layer. The layered architecture allows porting to various operating systems, platforms and HSI hardware devices.

Client applications access the device through an API layer interface. The low-level details of the protocol is abstracted for the end-user and is completely handled in the software stack. A set of well defined APIs are provided at this layer. These APIs include commonly used device operations such as initialization, configuration, stream registration/un-registration, data transfer, and registration of callbacks for event notification and device shutdown.



Arasan MIPI HSI Block Diagram



Features

Compliance

- MIPI™ HSI v 1.0

Development Environment

- x86 platform
- Linux OS GNU
- OS and HW independent architecture wrapped around OS and HW abstraction layer
- Configurable bus master and slave DMA model support
- Portable to other environments

Protocol Features

- Data link protocol layer - general and audio data
- Break event handling and option to send Break command at API layer
- Runtime configurability for hardware parameters
- Error detection and recovery

API Interface

- Generic API interface for device operations
- Break event transmission for synchronization

Quality of Service

- 8 priority levels for logical channel
- Special latency handling requirements for a connection

Software Key features

- Aging of packets handling
- Event notifications
- Parallel communications on multiple links

Testing Aid

- Test stub to validate while in development

Applications Interface Layer

This layer provides a generic set of API's for device operation. It abstracts the HSI protocol to the user applications.

General Purpose Data Link Layer

This layer implements the HSI data link protocol for general purpose data.

Audio Data Link Layer

This layer implements the HSI data link protocol for audio data.

HSI Hardware Programming Layer

This layer implements the API's for programming target HSI hardware. It is dependent on the target hardware being used.

Driver Layer

This layer is the interface and platform dependent part of the stack. It initializes the bus interface for the communications with the target hardware.

Hardware Bus Interface Layer

It serves as a hardware interface abstraction layer and contains platform dependent functions such as DMA handling, interrupt handling and similar functions.

Operating system Abstraction Layer

This layer abstracts OS resources (memory management, threads, spinlocks, etc.) to other layers.

Benefits:

- Conforms to MIPI HSI specification v1.0
- Modular and layered architecture
- Portable to any OS or platform
- Easy-to-use applications interface
- Fully documented generic API device operation
- Simple maintenance
- Premier direct support from Arasan engineering team

Deliverables:

- Full software stack (source code in C)
- API User's Guide
- Build and Installation Guide
- Sample example application
- Test stub to validate the stack in the software environment

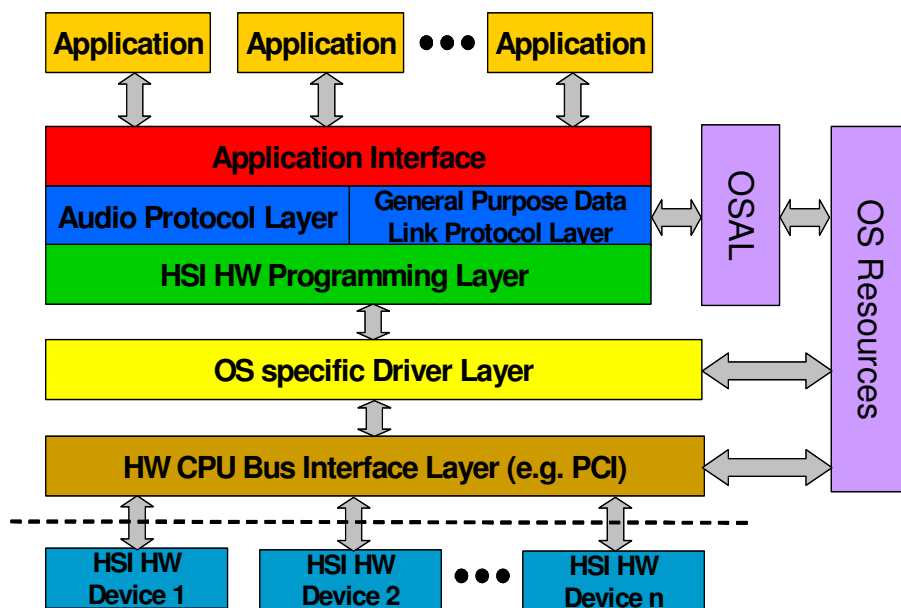
Use Models:

- End user - to produce end system solution
- Silicon developers - to test during device development
- Silicon vendors - to create a reference system design

Services:

- Extensive MIPI protocol domain expertise
- Validation and Reference design creation

Arasan HSI Stack Architecture



Arasan Chip Systems, Inc.

Data Sheet Link:



2010 N. First St. Suite #510
 San Jose CA 95131
 Phone: 408-282-1600
 Fax: 408-282-7800

HSI IP Core:
<http://www.arasan.com/totalmipi>