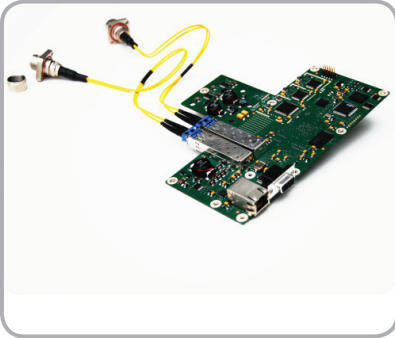


HSDU BTS/RRH IPs

PRODUCT BRIEF

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Overview



The HSDU (High Speed Digital Unit) is an OBSAI/CPRI-compliant low-cost hardware platform designed for Remote Radio Heads and Base Station applications.

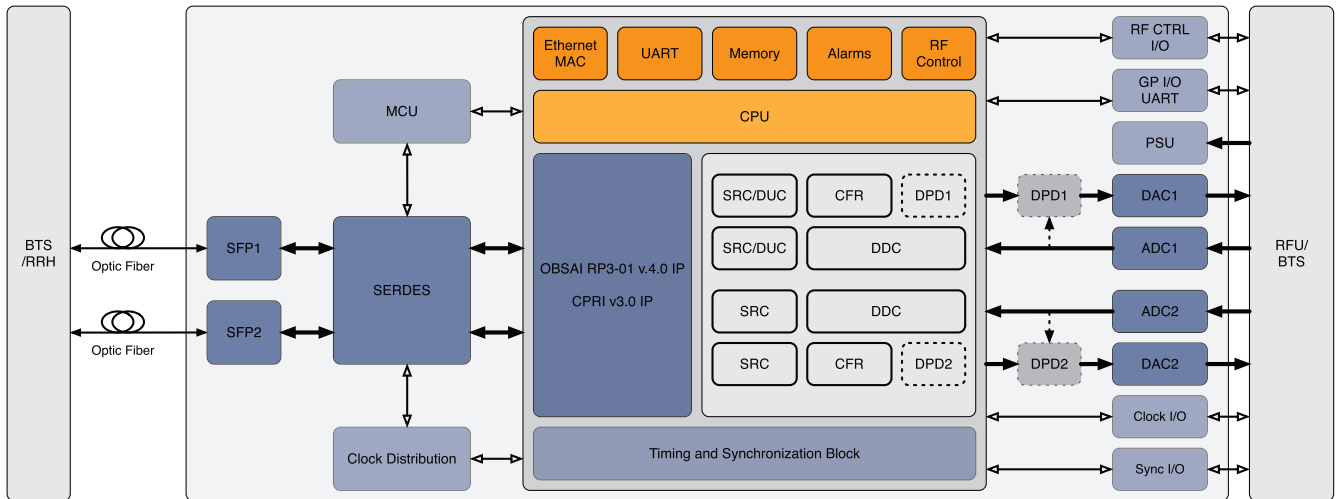
It comprises high-performance analog-to-digital and digital-to-analog conversion functionality for current and future wireless standards, such as mobile WiMAX and 3GPP LTE. The HSDU platform family supports bandwidths of up to 20 MHz per radio channel. A wide portfolio of IP cores ensures performance and flexibility, minimizing the time-to-market for new products.

Description

The HSDU core is hosting efficiently OBSAI RP3-01/CPRI protocols, Digital Signal Processing functions for base-band and IF (Intermediate Frequency) signals, and an embedded CPU solution.

The platform is equipped with high performance D/A and A/D converters, higher quality clock circuitry, and all OAM&P software management functions and GP I/Os.

All OBSAI RP3-01 (v.4.0)/CPRI (v.3.0) line rates for WiMAX 802.16e application layers are supported. RRH network topologies such as single-end and daisy-chain/ring are also supported, as is Link Redundancy. The unit provides a high-quality system clock synchronized with the BTS reference clock. The recovered system clock is used to synchronize all platform operations and, together with the synchronization signals, is used for MIMO/TDD operations in the RF unit.



The HSDU has been designed for both RRH and BTS applications. For RRH applications in the DL the HSDU provides two independent channels with support for SRC/DUC (Sample-Rate/Digital Up Conversion) IP blocks with selectable channel bandwidths from 1.75 to 20 MHz. The CFR (Crest Factor Reduction) IP engine is used to improve the PA efficiency on each channel together with an optional DPD (Digital Pre-Distortion) IP functionalities.

In UL direction, the HSDU has two independent channels with DDC/SRC (Digital Down/Sample-Rate Conversion) block. The Altera Nios II processing environment handles all the OAM&P (Operation, Administration, Maintenance and Provisioning) operations over Ethernet and UART. Platform operations and firmware can be safely controlled and updated remotely over the optical fibre link. For BTS applications the card has clock, synchronization and general purpose I/Os to easily connect to base-band channel processing modules.

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TECHNICAL DATA SHEET

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IP Technical description

General Features:

- Digital development card for Base Station and Remote Radio Heads applications using WiMAX 802.16e-2005 and WCDMA/LTE standards
- Integrates a dual SERDES channels up to 3.072 Gbps
- Integrates a dual channel high performance ADC and DAC converters up to 20 MHz channel bandwidth per channel
- High performance jitter cleaning recovery circuitry

OBSAI RP3-01/CPRI IPs Key Features

- Support 768 / 1.536 / 3.072 Gbps rates for OBSAI RP3-01 v.4.0
- Support 614.4 / 1.288 / 2.456 / 3.072 Gbps rates for CPRI 3.0
- Supports WiMAX and WCDMA/LTE. All other standards are also supported (GSM/CDMA2000)
- Support for RRH daisy chaining

Embedded Processing Features Support

- **Altera NiosII CPU**
RTOS TCP/IP or UDPCP
SOAP/XML O&M Support
Safe Remote upgrades capabilities
- **Flash Memory**
Configurations and firmware storage
- **Alarm Monitoring**
Local monitoring of internal alarms

Digital IF Processing Features Support

- **SRC IP**
Converts the WiMAX base-band rates into a common rate
- **DDC/DUC IP**
Up/Down Conversion core for single or Multi-carrier configurations are supported. It is Software configurable to support different channel bandwidths (up to 20MHz)

Synchronization

- In RRH mode all the air-interface related operations are synchronized with the BTS timing. Air-interface timing and TDD switching are supported
- In BTS mode, the board has direct I/Os in LVDS format for Clock and Synchronization references

Interfaces

- **Optical Link 1**
Principal link to the BTS in single-ended topologies
- **Optical Link 2**
Redundant/Secondary link for daisy chain topologies
- **Ethernet**
Local and Remote OAM&P operations
- **UART**
Local unit configuration and monitoring via RS232
- **TX Ch1/Ch2**
RF interface to the RF platform
- **RX Ch1/Ch2**
RF interface from the RF platform
- **RF Controls**
SPI bus to initialize/configure the RF unit

Delivery Package

- **HSDU platform**
- **User Manual**
- **Configuration Software**

Optimized for



The HSDU platform is based on Altera Cyclone III device. The OBSAI RP3/CPRI v4.0 and CPRI 3.0 IPs are optimized for Altera CycloneII, CycloneIII, Stratix II GX and Arria GX devices, which devices names and logo all are registered trademarks of Altera Corporation.