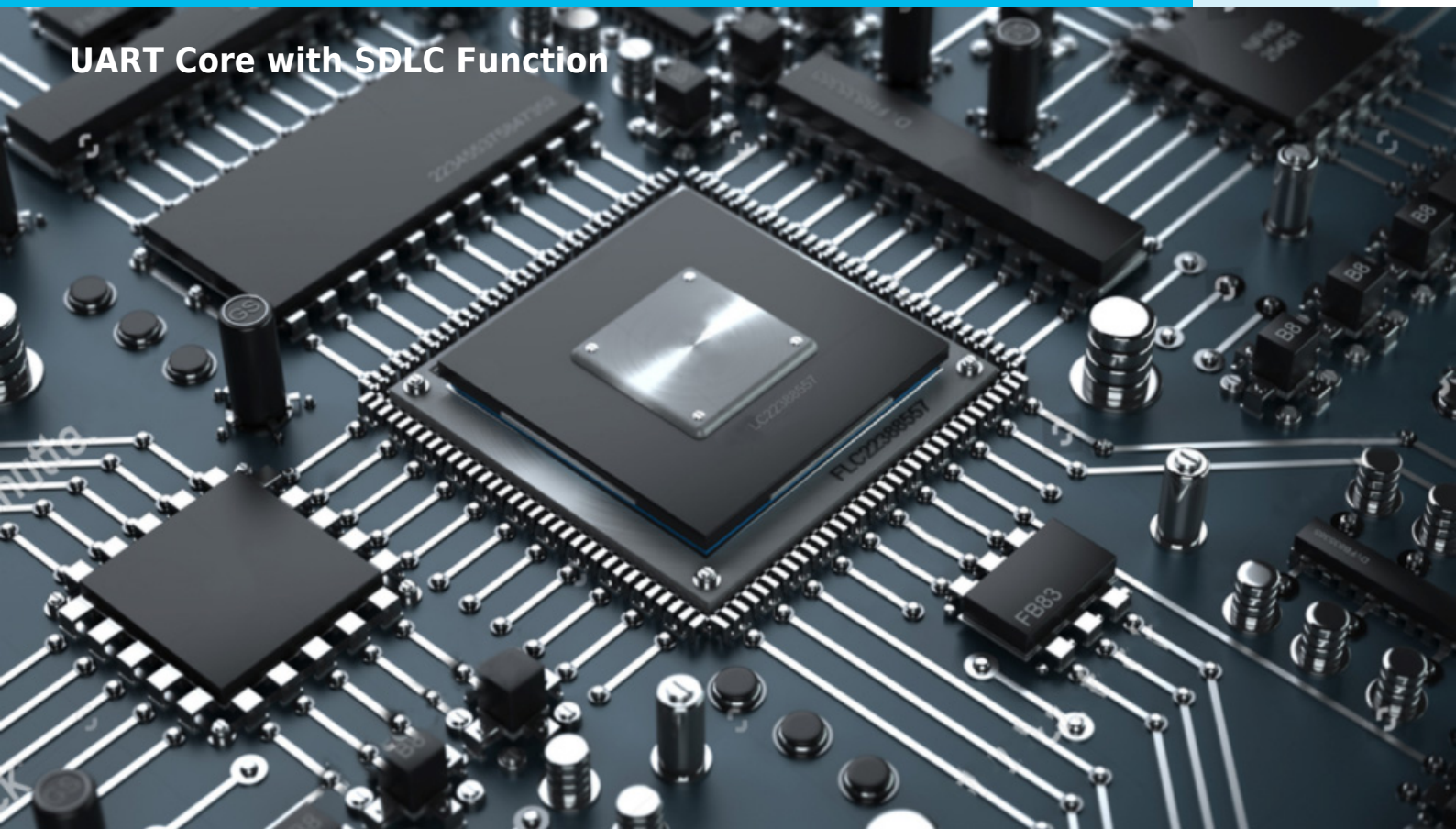




# D8530



UART Core with SDLC Function



## COMPANY OVERVIEW

DCD-SEMI is a leading IP Core provider and a System-on-Chip design house. The company was founded in 1999 and since the very beginning has been focused on IP Core architecture improvements. Our innovative, silicon proven solutions have been employed by over 300 customers and with more than 500 hundred licenses sold to companies like Intel, Siemens, Philips, General Electric, Sony and Toyota. Based on more than 70 different architectures, starting from serial interfaces to advanced microcontrollers and SoCs, we are designing solutions tailored to your needs.

## IP CORE OVERVIEW

**D8530** bridge to APB, AHB, AXI bus, it is a dual-channel USART (Universal Synchronous/Asynchronous Receiver/Transmitter) device, designed for use with 8 and 16-bit microprocessors. It works as a **serial-to-parallel, parallel-to-serial converter/controller** and can be software-configured to satisfy a wide range of serial communications applications. The device contains a variety of new, sophisticated internal functions, including on-chip baud rate generators. The D8530 handles asynchronous formats, synchronous byte-oriented protocols (such as **IBM® Bisync**), and synchronous bit-oriented protocols, like HDLC and IBM SDLC. This versatile device supports virtually any serial data transfer application (telecommunication, LAN, etc.). It can also **generate and check CRC codes** in any synchronous mode and can be programmed to check data integrity in various modes. The D8530 supports modem control in both channels – in applications where these controls are not needed, modem controls can be used for general-purpose I/O. You can configure the IP Core to handle all synchronous formats, regardless of data size, stop bits, or parity requirements. The D8530 is controlled through access to 14 Write registers and 7 Read registers per channel (the number of the registers varies depending on the version). Within each operating mode the D8530 allows **protocol variations** by checking odd or even parity bits, character insertion or deletion, CRC generation, checking break and abort generation and detection, and many other protocol-dependent features.

### DESIGN FEATURES:

**ALL DCD'S IP CORES ARE TECHNOLOGY INDEPENDENT WHICH MEANS THAT THEY ARE 100% COMPATIBLE WITH ALL FPGA & ASIC VENDORS E.G.**

- **Altera / Intel,**
- **Xilinx / AMD,**
- **Lattice,**
- **Microsemi / Microchip,**  
**and others.**

- **TSMC**
- **UMC**

- **SK Hynix**  
**and others.**

## KEY FEATURES

- Software compatible with Z85C30
- Dual Channel: A, B
- Configuration capability
- Asynchronous mode:
  - Asynchronous (x16, x32, or x64 clock)
  - Isochronous (x1 clock)
- Character-Oriented mode:
  - Monosynchronous
  - Bisynchronous
  - External Synchronous
- Bit-Oriented mode:
  - SDLC/HDLC
  - SDLC/HDLC Loop
- Complete status reporting capabilities
- Receiver data FIFO and Error FIFO
- SDLC Frame FIFO
- Data encoder\decoder:
  - NRZ, NRZI
  - FM0, FM1
  - Manchester (require external logic)
- Line break generation and detection
- Internal diagnostic capabilities:
  - Loop-back controls for communications link fault isolation
  - Auto Echo
  - Break, parity, overrun, framing error simulation
- Fully synchronous design with no internal tristate buffers
- **Available system interface wrappers:**
  - **AMBA - APB / AHB / AXI Bus**
  - **Altera Avalon Bus**
  - **Xilinx OPB Bus**

### Transmission modes:

- Synchronous Byte (Bisync) features
  - *5 to 8 Bit characters*
  - *Programmable Sync character*
  - *Transparent text mode operation*
  - *Automatic Sync insertion during Idle*
  - *Hardware CRC generation and detection*
  - *CRC-16 or CRC-CCITT polynomials*
- Asynchronous Features
  - *5-8 Bits per character*
  - *1, 1,5 and 2 stop bits*
  - *Break generation and detection*
  - *Parity, overrun and framing error detection*
  - *Even, Odd or no parity*
- Modem controls and indicators
  - *CTS, DSR, DCD and RI lines, usable for modem control or user defined input*
  - *DTR and RTS usable for modem control or user defined output*
- Synchronous SDLC features
  - *1-8 Bits character (transmitter)*
  - *5-8 Bits receiver character*

- Hardware address recognition
- Automatic zero insertion and deletion
- I-Field residue handling
- Automatic flag insertion between messages
- Hardware CRC generation and reception
- Interrupt system features
  - Channel functions and timers internally prioritized
  - Channel functions and timers generate unique interrupt mode
  - Prioritized Daisy-chain
- LOOPBACK test mode

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## APPLICATIONS

- Serial Data communications applications
- Modem interface
- Embedded microprocessor boards

## PERFORMANCE

The following table gives a survey about the Core area and performance in **XILINX®** devices after Place & Route:

Device	LUTs /Slices	Mem. Blocks	F <sub>max</sub> MHz
Artix 7	1 785/797	2	165
Kintex Ultra Scale	1 754	2	330
Kintex 7	1 877/676	2	239
Zynq 7000	1 816	2	330
Zynq	1 868/774	2	171
Virtex Ultra Scale	1 752	2	330
Virtex 7	1 869/878	2	194
Virtex 6	1 801/850	2	144
Virtex 5	1 861/846	2	161
Virtex 4	2 533/1 598	2	121
Spartan 6	1 815/681	2	122

Spartan 3E	2 647/1 655	2	75
Spartan 3	2 625/1 645	2	72

## DELIVERABLES

- **Source code:**
  - VERILOG or VHDL Source Code
  - VERILOG or VHDL test bench environment
    - Active-HDL automatic simulation macros
    - ModelSim automatic simulation macros
    - Tests with reference responses
  - Technical documentation
    - Installation notes
    - HDL core specification
    - Datasheet
  - Synthesis scripts
  - Example application
- **Netlist**
  - Netlist for selected FPGA family
  - Sample FPGA project
  - Technical documentation
    - HDL core specification
    - Datasheet
- **Technical support**
  - IP Core implementation
  - 12 months maintenance
    - Delivery of the IP Core and documentation updates
    - Phone & email support
    - Design consulting

## LICENSING

Comprehensible and clearly defined licensing methods without royalty-per-chip fees make use of our IP Cores easy and simple.

- **Single-Site license option** - dedicated to small and middle sized companies which run their business at one place.
- **Multi-Site license option** - dedicated to corporate customers which operate at several locations. The licensed product can be used at selected company branches.

In all cases the number of IP Core instantiations within a project and the number of manufactured chips are unlimited. There are no restrictions regarding the time of use.

There are two formats of the delivered IP Core that you can choose from:

- Verilog or VHDL RTL synthesizable source code (called HDL Source code)
- FPGA EDIF/NGO/NGD/QXP/VQM (called Netlist)

HDL Source code is suitable for ASIC and FPGA projects. The Netlist license is intended for FPGA projects only.

## CONTACT

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