

SPARK - 102

Altera Cyclone® V SoC-based System on Module

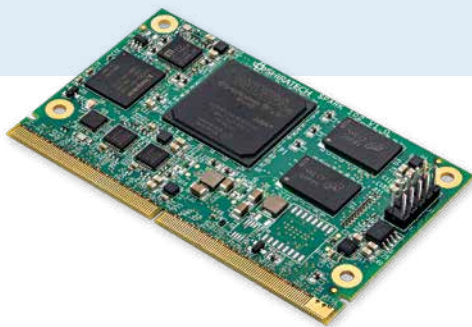


Ready to use FPGA and ARM environments

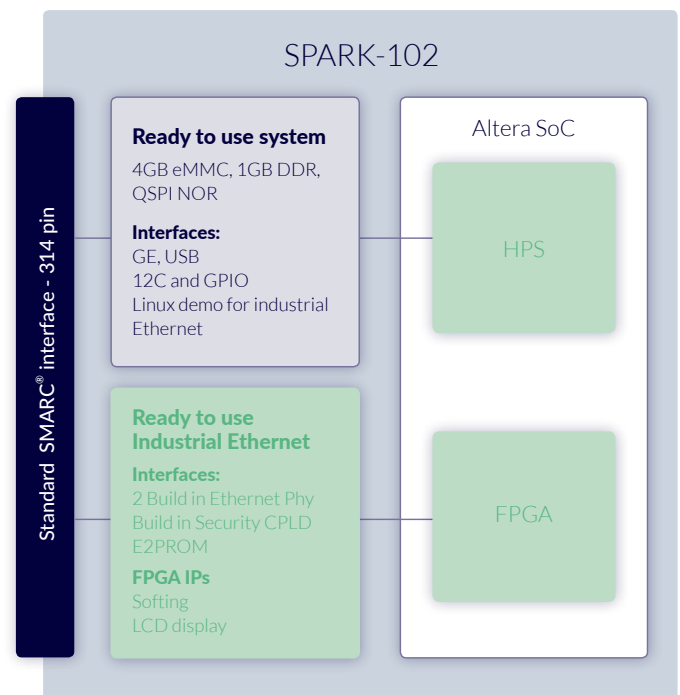
Built-in multi-protocol Industrial Ethernet slave function including Phy, FPGA IP and Linux

Cost optimized

Standard SMARC® connector



BLOCK DIAGRAM



The Spark-102 is a ready to use System-On-Module (SoM) based on Altera Cyclone® V SoC with optional ready to use Industrial Ethernet and HMI blocks. The SoC integrates a dual-core ARM Cortex®-A9 processor (HPS), peripherals and memory controllers with a large FPGA fabric.

Using the FPGA's configurable logic, the Spark enables unlimited possibilities to add customized accelerators and virtually any peripheral set giving the developer the power and flexibility to design the optimal solution for his application.

Ready for use EtherCat and Profinet Slave as well as HMI are fully integrated on the SOM including hardware, Linux OS and FPGA IP. This increases SOM advantage of shorter time to market, reduced costs and lower risk exponentially.

The Spark-102 uses a standard SMARC® interface supported by key industry vendors offering compatibility with other vendor's platforms and future hardware upgrade options. ARM and FPGA signals are routed to the interface as per SMARC® standard definitions, yet FPGA interfaces can be freely configured according to user application.

SPARK-102 Altera Cyclone® V-based System on Module

MAIN FEATURES

GENERAL

- Altera CycloneV SoC U672 package

PROCESSOR (HPS)

- Single or dual Cortex A9 @ 800/925MHZ
- Per core:
 - NEON™ SIMD coprocessor
 - Floating Point Unit VFPv3

MEMORY

- Up to 2G DDR3, 32bits wide @400Mhz, 32MB or 128 MB NOR Flash
- Up to 128GB eMMC

FPGA AND ARM BRIDGE

- High speed 3x AXI Bridges

HPS CONNECTIVITY

- 1G Ethernet with built-in PHY
- Two USB V2.0 Host or single USB OTG port
- SD Card interface
- Two I2C buses
- Up to 2 USART ports (TX, Rx, CTS, RTS)
- Up to two SPI buses
- Up to two CAN interfaces
- GPIOs

DEBUG

- On board JTAG interface for byte blaster

FPGA CAPABILITIES

- From 25KLE and up to 110KLE
- 97 free I/Os
- 6x3.125G transceivers
- PCIe Gen1 x1 and x4
- Optional 2xFast Ethernet
- Industrial Ethernet Block
 - EtherCAT and Profinet Master/Slave firmware by Softing (www.softing.com)
 - Linux OS
 - 2xFE Phy for IE
 - IE clock distribution
 - Built-in authentication EPLD

POWER

- Single input power 5V

MECHANICAL

Standard SMARC form factor:

- Dimensions: 82mm x 50mm (3.22 x 1.96 inch)
- 314 pin edge connector

OS SUPPORT

- Linux distribution

DEVELOPMENT BOARDS

- CB-52 evaluation board
- Kontron SMARC™ Evaluation Carrier - 51100

CB-52 Networking development board for Spark-102

The CB-52 is a full-featured development board for the Shiratech Spark-102, with an emphasis on Industrial Ethernet and networking applications. It provides extensive connectivity to both HPS and FPGA, with built in networking and connectivity interfaces along with an HSMC slot for expansion modules and capacitive touch screen. Quick start up with pre loaded Linux software as well as sample FPGA firmware for the available interfaces. CB-52 schematics can be used free of charge for reference design.

MAIN FEATURES



HPS INTERFACES

- 1G Ethernet, RJ-45
- UART, Build in UART to USB converter, Micro USB connector
- USB host, type A
- Expansion interface which includes the following interfaces:
 - 2 CAN ports
 - 2xI2C buses
 - 2xSPI buses
 - GPIOs

FPGA INTERFACES

- Standard HSMC slot
- 2xFast Ethernet ports for Industrial Ethernet & Ethernet networking (optional)

- PCI slot

DEBUG

- JTAG/ICE interface

SD CARD

- Micro SD slot for SW bring up and storage

POWER

- 12V inlet, PS included

