SocTek® Modules

Up to 5x 1GbE ports pluggable module with reconfigurable networking capabilities

SMARTzynq Module

Overview

SMARTzynq is a pluggable System-on-Module (SoM) designed to streamline the implementation of custom-made Ethernet networking designs. This facilitates an easy integration of Ethernet industrial networks into equipment for the Electric, Transportation, Aerospace, and Industrial Automation sectors. The SMARTzynq module is built on the AMD/Xilinx Zynq-7000 System-on-Programmable Chip (SoPC).

This SoM enables the implementation of custom switches and/or end-equipment with robust networking capabilities. Network frame processing can be executed in hardware using specific SOC-E IP Cores.

What sets the SMARTzynq module apart is its high level of firmware flexibility. It functions as a programmable platform, allowing customers to incorporate their own FPGA-based designs. Alternatively, it can be preprogrammed with a firmware based on SOC-E's IP Cores, featuring technologies like HSR/PRP/RSTP for redundancy and/or PTP for time synchronization.

To facilitate its integration into customer platform, a compatible carrier board is available for purchase. A reference firmware and FPGA design is also available from SOC-E, along with carrier design files (schematics, connector information and CAD files).

With SMARTzynq module, you have the power to transform your industrial network within your reach.

Key Features

- Multiple gigabit PHY's: includes 5x Ethernet PHYs, 4x available with direct connection to the programmable logic (PL) of Zynq SoPC and a remaining one to the processing system (PS).
- All-in-one solution: in-built Dual-Core CPU, programmable logic (PL), DDR3 Memory, Flash Memory, microSD slot, 4x (PL) Gigabit PHY's, 1x (PS) Gigabit PHY, and much more.
- Industrial grade components only.
- Reduced time-to-market: thanks to the use of SOC-E networking IP Core portfolio, a smooth integration is possible.
- Accurate technical support: whenever using SMARTzynq along with SOC-E IP Cores customers will receive first hand detailed technical advice from SOC-E support team during development & integration phases.

Technical Specifications

Communication Interfaces

- Up to 5x GbE Ethernet PHY
- Copper (10BASE-T, 100BASE-TX, 1000BASE-T) and fibre (100BASE-FX, 1000BASE-X, SFP) supported

Memory

- 1GB DDR3 memory
- 128 Mb Quad SPI Flash
- 2Kbit EEPROM with unique MAC address available for the user
- microSD card slot
- 512 bit user-programmable EEPROM for key storage with SHA-256 hash algorithm protection

SoC

- AMD Zynq™ 7000 SoCs (XC7Z020)
  - Dual-Core ARM Cortex-A9 MPCore
- FPGA (Artix-7 PL equivalent) resources
  - 85K Logic Cells
  - 53,200 Look-up Tables (LUTs)
  - 106,400 Flip-Flops
  - Total Block RAM 4.9Mb

Other Interfaces

- 24x Zynq SoC PS & PL GPIO available at the board-to-board connector
- 4x LED indicators: Power-up LED, FPGA “DONE” LED and 2 General purpose LEDs
- I2C temperature sensor
- Debug connector: easily accessible connector on the top of the module that accepts stand-alone powering, JTAG, I2C, SPI and UART

Physical & Electrical Characteristics

- VCC_VIN: compatible with 3.3V
- Power consumption: typically below 6W (dependant on the SoC firmware)
- Dimensions: 88mm(L) x 60mm(W) x 10.5mm(H), Weight: ~30g
- Component temperature range: -40°C to +85°C
- Operating temperature range: depends on the thermal dissipation system installed by customer (-40°C to +55°C recommended)
- Storage temperature range: -40°C to +85°C

Warranty

- 2 years

Ordering Code

Ordering code
SOM00.12-ID1 (SMARTzynq module)
EVB04.28 (SMARTzynq brick)

To know more about other available refere[illegible] please contact your sales representative.

Functionality Examples

- 4x 1G external ports managed Ethernet switch with IEEE 1588 (PTP)
- HSR/PRP Redundancy Box (RedBox)
- HSR Ring coupler (QuadBox)
- TSN Endpoint implementation with port redundancy (FRER)

Evaluation & Design-in Kit

Description

SMARTzynq brick is an out-of-the box kit that allows evaluating SMARTzynq module in a plug & play approach.Either if you are looking into evaluating the module itself, or a SOC-E IP Core, SMARTzynq brick is the right choice for that.

The hardware can also be used later as a development platform, what allows to shorten the development phase.

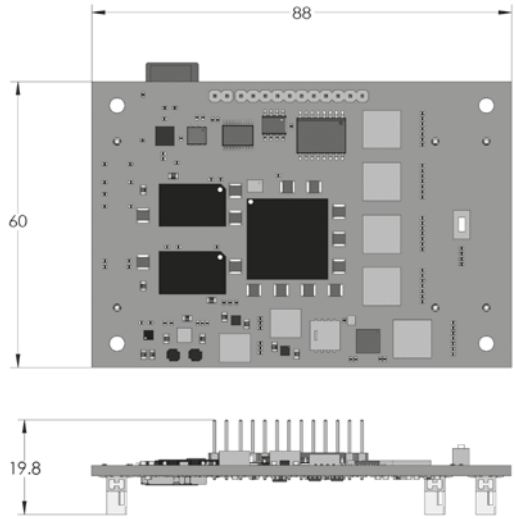
Features

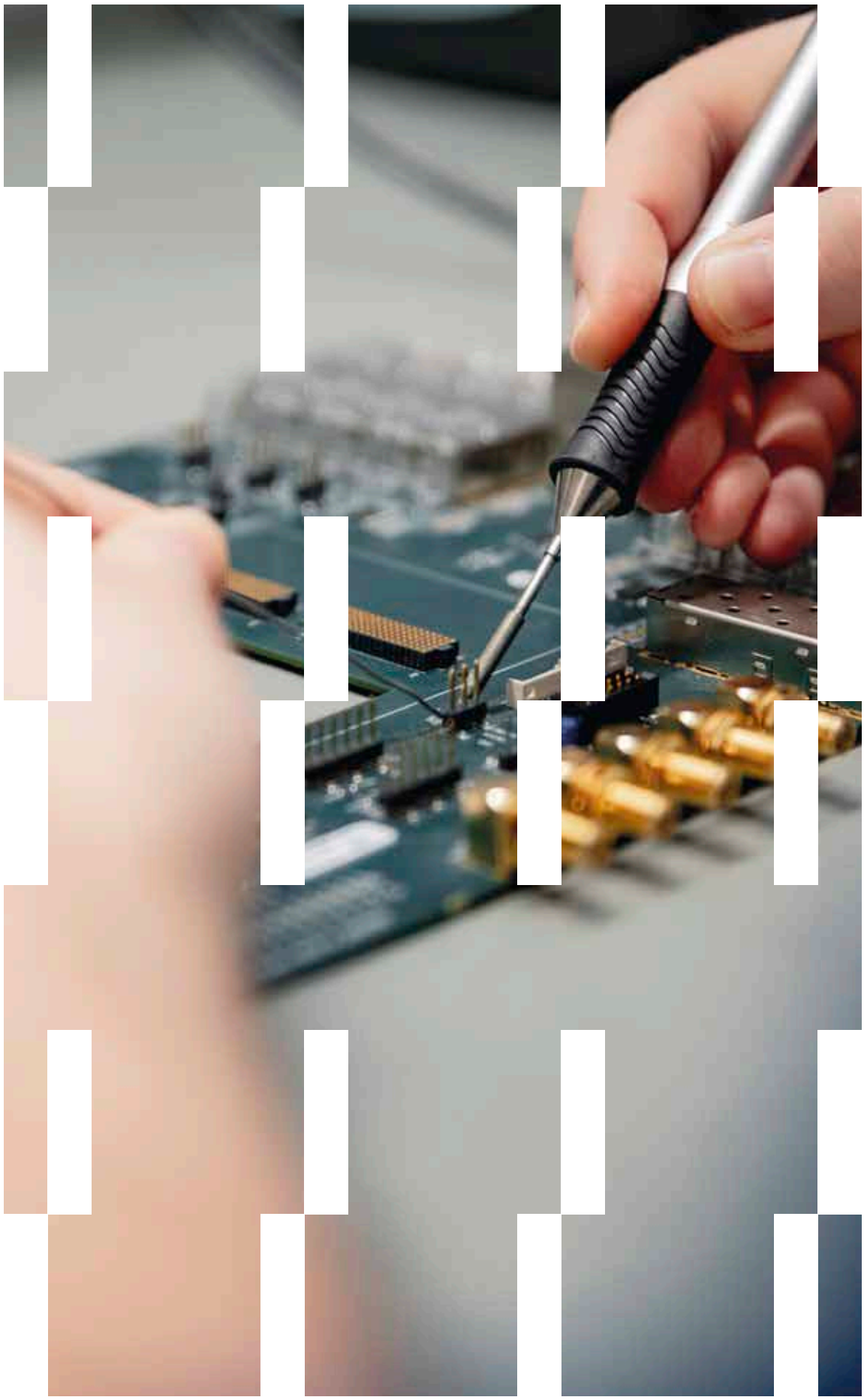
- 4x SFP cages for 1000BASE-T, 100BASE-TX, 10BASE-T, 100BASE-FX or 1000BASE-X
- 1x RJ45 for 1000BASE-T, 100BASE-TX or 10BASE-T
- UART console (USB)
- 2x PMOD connectors

SMARTzynq brick consists of the following package

- SMARTzynq module (1x)
- Carrier board (1x)
- Reference firmware (predefined image) preloaded into non-volatile flash memory storage (1x)
- Power supply (1x)
- Fibre/Copper SFP modules (optional, purchased separately)

Dimensions





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By

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